



grass valley

A **BELDEN** BRAND

K-FRAME

VIDEO PRODUCTION FRAMES

Video Production Center

Installation Planning Guide

13-00006-000AA

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www.grassvalley.com

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Important Safeguards and Notices

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This section provides important safety guidelines for operators and service personnel. Specific warnings and cautions appear throughout the manual where they apply. Please read and follow this important information, especially those instructions related to the risk of electric shock or injury to persons.

Symbols and Their Meanings

Important Safeguards and Notices iii



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



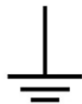
Indicates that the user, operator or service technician should refer to the product manuals for important operating, maintenance, or service instructions.



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



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



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



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



Indicates that the equipment has more than one power supply cord, and that all power supply cords must be disconnected before servicing to avoid electric shock.



The presence of this symbol in or on Grass Valley equipment means that it has been tested and certified as complying with applicable Canadian Standard Association (CSA) regulations and recommendations for USA/Canada.



The presence of this symbol in or on Grass Valley equipment means that it has been tested and certified as complying with applicable Underwriters Laboratory (UL) regulations and recommendations for USA/Canada.



The presence of this symbol in or on Grass Valley equipment means that it has been tested and certified as complying with applicable Intertek Testing Services regulations and recommendations for USA/Canada.



The presence of this symbol in or on Grass Valley product means that it complies with all applicable European Union (CE) directives.



The presence of this symbol in or on Grass Valley product means that it complies with safety of laser product applicable standards.

Warnings

Important Safeguards and Notices iii



A warning indicates a possible hazard to personnel, which may cause injury or death. Observe the following general warnings when using or working on this equipment:

- Appropriately listed/certified mains supply power cords must be used for the connection of the equipment to the mains voltage at either 120 V AC or 240 V AC.
- This product relies on the building's installation for short-circuit (over-current) protection. Ensure that a fuse or circuit breaker for 120 V AC or 240 V AC is used on the phase conductors.
- Any instructions in this manual that require opening the equipment cover or enclosure are for use by qualified service personnel only.
- Do not operate the equipment in wet or damp conditions.
- This equipment is grounded through the grounding conductor of the power cords. To avoid electrical shock, plug the power cords into a properly wired receptacle before connecting the equipment inputs or outputs.
- Route power cords and other cables so they are not likely to be damaged. Properly support heavy cable bundles to avoid connector damage.
- Disconnect power before cleaning the equipment. Do not use liquid or aerosol cleaners; use only a damp cloth.
- Dangerous voltages may exist at several points in this equipment. To avoid injury, do not touch exposed connections and components while power is on.
- High leakage current may be present. Earth connection of product is essential before connecting power.
- Prior to servicing, remove jewelry such as rings, watches, and other metallic objects.
- To avoid fire hazard, use only the fuse type and rating specified in the service instructions for this product, or on the equipment.
- To avoid explosion, do not operate this equipment in an explosive atmosphere.
- Use proper lift points. Do not use door latches to lift or move equipment.
- Avoid mechanical hazards. Allow all rotating devices to come to a stop before servicing.
- Have qualified service personnel perform safety checks after any service.

Cautions

Important Safeguards and Notices iii



A caution indicates a possible hazard to equipment that could result in equipment damage. Observe the following cautions when operating or working on this equipment:

- This equipment is meant to be installed in a restricted access location.
- When installing this equipment, do not attach the power cord to building surfaces.
- Products that have no on/off switch, and use an external power supply must be installed in proximity to a main power outlet that is easily accessible.
- Use the correct voltage setting. If this product lacks auto-ranging power supplies, before applying power ensure that each power supply is set to match the power source.
- Provide proper ventilation. To prevent product overheating, provide equipment ventilation in accordance with the installation instructions.
- Do not operate with suspected equipment failure. If you suspect product damage or equipment failure, have the equipment inspected by qualified service personnel.
- To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel. Servicing should be done in a static-free environment.
- This unit may have more than one power supply cord. Disconnect all power supply cords before servicing to avoid electric shock.
- Follow static precautions at all times when handling this equipment.

Electrostatic Discharge (ESD) Protection



Electrostatic discharge occurs when electronic components are improperly handled and can result in intermittent failure or complete damage adversely affecting an electrical circuit. When you remove and replace any card from a frame always follow ESD-prevention procedures:

- Ensure that the frame is electrically connected to earth ground through the power cord or any other means if available.
- Wear an ESD wrist strap ensuring that it makes good skin contact. Connect the grounding clip to an *unpainted surface* of the chassis frame to safely ground unwanted ESD voltages. If no wrist strap is available, ground yourself by touching the *unpainted* metal part of the chassis.
- For safety, periodically check the resistance value of the antistatic strap, which should be between 1 and 10 megohms.
- When temporarily storing a card make sure it is placed in an ESD bag.
- Cards in an earth grounded metal frame or casing do not require any special ESD protection.

Battery Handling



This product includes a backup battery. There is a danger of explosion if the battery is replaced incorrectly. Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions. Before disposing of your Grass Valley equipment, please review the *Disposal and Recycling Information* appendix.

Cautions for LCD and TFT Displays



Excessive usage may harm your vision. Rest for 10 minutes for every 30 minutes of usage.

If the LCD or TFT glass is broken, handle glass fragments with care when disposing of them. If any fluid leaks out of a damaged glass cell, be careful not to get the liquid crystal fluid in your mouth or skin. If the liquid crystal touches your skin or clothes, wash it off immediately using soap and water. Never swallow the fluid. The toxicity is extremely low but caution should be exercised at all times.

Mesures de sécurité et avis importants

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La présente section fournit des consignes de sécurité importantes pour les opérateurs et le personnel de service. Des avertissements ou mises en garde spécifiques figurent dans le manuel, dans les sections où ils s'appliquent. Prenez le temps de bien lire les consignes et assurez-vous de les respecter, en particulier celles qui sont destinées à prévenir les décharges électriques ou les blessures.

Signification des symboles utilisés



Signale la présence d'une tension élevée et dangereuse dans le boîtier de l'équipement ; cette tension peut être suffisante pour constituer un risque de décharge électrique.



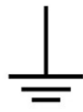
Avertit l'utilisateur, l'opérateur ou le technicien de maintenance que des instructions importantes relatives à l'utilisation et à l'entretien se trouvent dans la documentation accompagnant l'équipement.



Invite l'utilisateur, l'opérateur ou le technicien de maintenance à prendre note du calibre du fusible lors du remplacement de ce dernier. Le fusible auquel il est fait référence dans le texte doit être remplacé par un fusible du même calibre.



Identifie une borne de mise à la terre de protection. Il faut relier cette borne à la terre avant d'effectuer toute autre connexion à l'équipement.



Identifie une borne de mise à la terre externe qui peut être connectée en tant que borne de mise à la terre supplémentaire.



Signale la présence de composants sensibles à l'électricité statique et qui sont susceptibles d'être endommagés par une décharge électrostatique. Utilisez des procédures, des équipements et des surfaces antistatiques durant les interventions d'entretien.



Le symbole ci-contre signifie que l'appareil comporte plus d'un cordon d'alimentation et qu'il faut débrancher tous les cordons d'alimentation avant toute opération d'entretien, afin de prévenir les chocs électriques.



La marque C-CSA-US certifie que l'appareil visé a été testé par l'Association canadienne de normalisation (CSA) et reconnu conforme aux exigences applicables en matière de sécurité électrique en vigueur au Canada et aux États-Unis.



La marque C-UL-US certifie que l'appareil visé a été testé par Underwriters Laboratory (UL) et reconnu conforme aux exigences applicables en matière de sécurité électrique en vigueur au Canada et aux États-Unis.



La marque ETL Listed d'Intertek pour le marché Nord-Américain certifie que l'appareil visé a été testé par Intertek et reconnu conforme aux exigences applicables en matière de sécurité électrique en vigueur au Canada et aux États-Unis.



Le marquage CE indique que l'appareil visé est conforme aux exigences essentielles des directives applicables de l'Union européenne en matière de sécurité électrique, de compatibilité électromagnétique et de conformité environnementale.



Le symbole ci-contre sur un appareil Grass Valley ou à l'intérieur de l'appareil indique qu'il est conforme aux normes applicables en matière de sécurité laser.

Avertissements

Mesures de sécurité et avis importants vi



Les avertissements signalent des conditions ou des pratiques susceptibles d'occasionner des blessures graves, voire fatales. Veuillez vous familiariser avec les avertissements d'ordre général ci-dessous :

- Un cordon d'alimentation dûment homologué doit être utilisé pour connecter l'appareil à une tension de secteur de 120 V CA ou 240 V CA.
- La protection de ce produit contre les courts-circuits (surintensités) dépend de l'installation électrique du bâtiment. Assurez-vous qu'un fusible ou un disjoncteur pour 120 V CA ou 240 V CA est utilisé sur les conducteurs de phase.
- Dans le présent manuel, toutes les instructions qui nécessitent d'ouvrir le couvercle de l'équipement sont destinées exclusivement au personnel technique qualifié.
- N'utilisez pas cet appareil dans un environnement humide.

- Cet équipement est mis à la terre par le conducteur de mise à la terre des cordons d'alimentation. Pour éviter les chocs électriques, branchez les cordons d'alimentation sur une prise correctement câblée avant de brancher les entrées et sorties de l'équipement.
- Acheminez les cordons d'alimentation et autres câbles de façon à ce qu'ils ne risquent pas d'être endommagés. Supportez correctement les enroulements de câbles afin de ne pas endommager les connecteurs.
- Coupez l'alimentation avant de nettoyer l'équipement. Ne pas utiliser de nettoyeurs liquides ou en aérosol. Utilisez uniquement un chiffon humide.
- Des tensions dangereuses peuvent exister en plusieurs points dans cet équipement. Pour éviter toute blessure, ne touchez pas aux connexions ou aux composants exposés lorsque l'appareil est sous tension.
- Avant de procéder à toute opération d'entretien ou de dépannage, enlevez tous vos bijoux (notamment vos bagues, votre montre et autres objets métalliques).
- Pour éviter tout risque d'incendie, utilisez uniquement les fusibles du type et du calibre indiqués sur l'équipement ou dans la documentation qui l'accompagne.
- Ne pas utiliser cet appareil dans une atmosphère explosive.
- Présence possible de courants de fuite. Un raccordement à la masse est indispensable avant la mise sous tension.
- Après tout travail d'entretien ou de réparation, faites effectuer des contrôles de sécurité par le personnel technique qualifié.

Mises en garde

Mesures de sécurité et avis importants vi



Les mises en garde signalent des conditions ou des pratiques susceptibles d'endommager l'équipement. Veuillez vous familiariser avec les mises en garde ci-dessous :

- L'appareil est conçu pour être installé dans un endroit à accès restreint.
- Au moment d'installer l'équipement, ne fixez pas les cordons d'alimentation aux surfaces intérieures de l'édifice.
- Les produits qui n'ont pas d'interrupteur marche-arrêt et qui disposent d'une source d'alimentation externe doivent être installés à proximité d'une prise de courant facile d'accès.
- Si l'équipement n'est pas pourvu d'un modules d'alimentation auto-adaptables, vérifiez la configuration de chacun des modules d'alimentation avant de les mettre sous tension.
- Assurez une ventilation adéquate. Pour éviter toute surchauffe du produit, assurez une ventilation de l'équipement conformément aux instructions d'installation.
- N'utilisez pas l'équipement si vous suspectez un dysfonctionnement du produit. Faites-le inspecter par un technicien qualifié.
- Pour réduire le risque de choc électrique, n'effectuez pas de réparations autres que celles qui sont décrites dans le présent manuel, sauf si vous êtes qualifié pour le faire. Confiez les réparations à un technicien qualifié. La maintenance doit se réaliser dans un milieu libre d'électricité statique.

- L'appareil peut comporter plus d'un cordon d'alimentation. Afin de prévenir les chocs électriques, débrancher tous les cordons d'alimentation avant toute opération d'entretien.
- Veillez à toujours prendre les mesures de protection antistatique appropriées quand vous manipulez l'équipement.

Protection contre les décharges électrostatiques (DES)



Une décharge électrostatique peut se produire lorsque des composants électroniques ne sont pas manipulés de manière adéquate, ce qui peut entraîner des défaillances intermittentes ou endommager irrémédiablement un circuit électrique. Au moment de remplacer une carte dans un châssis, prenez toujours les mesures de protection antistatique appropriées :

- Assurez-vous que le châssis est relié électriquement à la terre par le cordon d'alimentation ou tout autre moyen disponible.
- Portez un bracelet antistatique et assurez-vous qu'il est bien en contact avec la peau. Connectez la pince de masse à une *surface non peinte* du châssis pour détourner à la terre toute tension électrostatique indésirable. En l'absence de bracelet antistatique, déchargez l'électricité statique de votre corps en touchant une surface métallique *non peinte* du châssis.
- Pour plus de sécurité, vérifiez périodiquement la valeur de résistance du bracelet antistatique. Elle doit se situer entre 1 et 10 mégohms.
- Si vous devez mettre une carte de côté, assurez-vous de la ranger dans un sac protecteur antistatique.
- Les cartes qui sont reliées à un châssis ou boîtier métallique mis à la terre ne nécessitent pas de protection antistatique spéciale.

Remplacement et élimination des piles



L'appareil renferme une pile. Pour réduire le risque d'explosion, vérifiez la polarité et ne remplacez la pile que par une pile du même type, recommandée par le fabricant. Mettez les piles usagées au rebut conformément aux directives du fabricant. Avant de vous défaire de l'équipement, assurez-vous d'avoir lu l'appendice *Disposal and Recycling Information*.

Précautions pour les écrans LCD et TFT



Regarder l'écran pendant une trop longue période de temps peut nuire à votre vision. Prenez une pause de 10 minutes, après 30 minutes d'utilisation.

Si l'écran LCD ou TFT est brisé, manipulez les fragments de verre avec précaution au moment de vous en débarrasser. veillez à ce que le cristal liquide n'entre pas en contact avec la peau ou la bouche. En cas de contact avec la peau ou les vêtements, laver immédiatement à l'eau savonneuse. Ne jamais ingérer le liquide. La toxicité est extrêmement faible, mais la prudence demeure de mise en tout temps.

Recycling

Visit www.grassvalley.com for recycling information.

Certification and Compliance

<i>Safety Compliance</i>	<i>x</i>
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<i>Restriction on Hazardous Substances (RoHS)</i>	<i>xi</i>
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Safety Compliance



This equipment complies with the requirements of CSA/UL/IEC/EN 60950-1, 2nd Ed. + AM1: 2009, AM2:2013, AM22014, Safety of information technology equipment.

The power cords supplied with this equipment meet the appropriate national standards for the country of destination.

Restriction on Hazardous Substances (RoHS)

Restriction of Hazardous Substances (RoHS)

KAYN-2-25-2M-KC, KAYN-2-25-3M-KC, KAYN-3-35-3M-KC, KAYN-3-35-4M-KC, KAYN-3-35-4M-KS, KAYN-3-35-5M-KS, KAYN-4-35-4M-KS, KAYN-4-35-5M-KS, KAYN-PNL-100-15, KAYN-PNL-200-25, KAYN-PNL-200-35, KAYN-PNL-300-25, KAYN-PNL-300-35, KAYN-PNL-400-25, KAYN-PNL-400-35, KOR-1-15-1M-KCS, KOR-2-20-2M-KCS, KRR-2-25-2M-KC, KRR-2-25-C-2M-KC, KRR-2-25-C-2M-KCS, KRR-2-25-2M-KCS, KRR-2-25-3M-KC, KRR-3-35-3M-KCS, KRR-2-25-C-3M-KC, KRR-3-35-3M-KC, KRR-3-35-4M-KC, KRR-3-35-4M-KS, KRR-3-35-5M-KS, KRR-PNL-200-25, KRR-PNL-200-25-C and KRR-PNL-300-35	有毒有害物质或元素 (Toxic or hazardous Substances and Elements)						
	部件名称 Part name	铅 (Pb)	汞(Hg)	镉(Cd)	六价铬 (Cr6)	多溴联苯 (PBB)	多溴二苯 (PBDE)
	电缆及电缆组件 Cables and Cable Assemblies	X	0	0	0	0	0
	电路模块 Circuit Modules	X	0	0	0	0	0
	显示装置 Display Assemblies	X	0	0	0	0	0
	组装风扇 Fan Assemblies	X	0	0	0	0	0
	金属零件 Metal Parts	X	0	0	0	0	0
塑料和聚合物零件 Plastic and Polymeric Parts	X	0	0	0	0	0	
KOR-PNL-100-15, KOR-PNL-200-20KRR-ELITE-25-PS and KRR-ELITE-35-PS	有毒有害物质或元素 (Toxic or hazardous Substances and Elements)						
	部件名称 Part name	铅 (Pb)	汞(Hg)	镉(Cd)	六价铬 (Cr6)	多溴联苯 (PBB)	多溴二苯 (PBDE)
	电缆及电缆组件 Cables and Cable Assemblies	X	0	0	0	0	0
	电路模块 Circuit Modules	X	0	0	0	0	0
	显示装置 Display Assemblies	X	0	0	0	0	0
	金属零件 Metal Parts	X	0	0	0	0	0
	塑料和聚合物零件 Plastic and Polymeric Parts	X	0	0	0	0	0
K-FRM-100C, K-FRM-100CS and K-FRM-PSU	有毒有害物质或元素 (Toxic or hazardous Substances and Elements)						
	部件名称 Part name	铅 (Pb)	汞(Hg)	镉(Cd)	六价铬 (Cr6)	多溴联苯 (PBB)	多溴二苯 (PBDE)
	电缆及电缆组件 Cables and Cable Assemblies	X	0	0	0	0	0
	电路模块 Circuit Modules	X	0	0	0	0	0
	组装风扇 Fan Assemblies	X	0	0	0	0	0
	金属零件 Metal Parts	X	0	0	0	0	0
	塑料和聚合物零件 Plastic and Polymeric Parts	X	0	0	0	0	0
KSP-PNL-1ME-KBD	有毒有害物质或元素 (Toxic or hazardous Substances and Elements)						
	部件名称 Part name	铅 (Pb)	汞(Hg)	镉(Cd)	六价铬 (Cr6)	多溴联苯 (PBB)	多溴二苯 (PBDE)
	电缆及电缆组件 Cables and Cable Assemblies	X	0	0	0	0	0
	电路模块 Circuit Modules	X	0	0	0	0	0
	金属零件 Metal Parts	X	0	0	0	0	0
	塑料和聚合物零件 Plastic and Polymeric Parts	X	0	0	0	0	0
	K-FRM-100S and KOR-PNL-PSU,	有毒有害物质或元素 (Toxic or hazardous Substances and Elements)					
部件名称 Part name		铅 (Pb)	汞(Hg)	镉(Cd)	六价铬 (Cr6)	多溴联苯 (PBB)	多溴二苯 (PBDE)
电缆及电缆组件 Cables and Cable Assemblies		X	0	0	0	0	0
电路模块 Circuit Modules		X	0	0	0	0	0
金属零件 Metal Parts		X	0	0	0	0	0
KAYN-ELITE-PS, KAYN-PRO-PS, K-FRM-100CS-KIT,	有毒有害物质或元素 (Toxic or hazardous Substances and Elements)						

K-FRM-CTRL-CS, K-FRM-INPUT, K-FRM-IO, K-FRM-IO-10GE, K-FRM-ME-DPM-S, K-FRM-OUTPUT and KRR-PRO-PS 部件名称 Part name	铅 (Pb)	汞(Hg)	镉(Cd)	六价铬 (Cr6)	多溴联苯 (PBB)	多溴二苯 (PBDE)
电路模块 Circuit Modules	X	O	O	O	O	O
金属零件 Metal Parts	X	O	O	O	O	O
KOR-PNL-LAN-20 部件名称 Part name	有毒有害物质或元素 (Toxic or hazardous Substances and Elements)					
	铅 (Pb)	汞(Hg)	镉(Cd)	六价铬 (Cr6)	多溴联苯 (PBB)	多溴二苯 (PBDE)
电缆及电缆组件 Cables and Cable Assemblies	X	O	O	O	O	O
KOR-PNL-KIT 部件名称 Part name	有毒有害物质或元素 (Toxic or hazardous Substances and Elements)					
	铅 (Pb)	汞(Hg)	镉(Cd)	六价铬 (Cr6)	多溴联苯 (PBB)	多溴二苯 (PBDE)
电路模块 Circuit Modules	X	O	O	O	O	O
<p>O: 表示该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T 11364-2014 规定的限量要求以下。 O: Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in GB/T 26572-2011.</p> <p>X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T 11364-2014 规定的限量要求。 X: Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials for this part is above the limit requirement in GB/T 26572-2011.</p> <p>技术条款解释: 此声明所依据之数据由 Grass Valley 环境管理部门向我们的部件供应商获取。Grass Valley 公司相信此信息的正确性, 但由于数据来源于公司外部, 我们无法保证它的完整和准确。所有这些特性可能在未获通知的情况下更改。 Technical explanations: This statement is based on the information provided by our suppliers of components and collected through our Grass Valley's environmental management system. Grass Valley believes this environmental information to be correct but cannot guarantee its completeness or accuracy as it is based on data received from sources outside our company. All specifications are subject to change without notice.</p>						

Electromagnetic Compatibility



This equipment has been tested for verification of compliance with FCC Part 15, Subpart B requirements for class A digital devices.

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



This equipment has been tested and found to comply with the requirements of the EMC directive 2004/108/EC:

- EN 55022 Class A Radiated and conducted emissions
- EN 61000-3-2 Limits for harmonic current emissions
- EN 61000-3-3 Limitation of voltage fluctuations and flicker

- EN 61000-4-2 Electrostatic discharge immunity
- EN 61000-4-3 Radiated, radio-frequency, electromagnetic field immunity
- EN 61000-4-4 Electrical fast transient immunity
- EN 61000-4-5 Surge transient immunity
- EN 61000-4-6 Conducted disturbances immunity
- EN 61000-4-8 Power frequency magnetic field immunity
- EN 61000-4-11 Voltage dips, short interruptions and voltage variations immunity

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1 Introduction

Overview

The Grass Valley K-Frame family of multi-format digital production switchers provides powerful, ground-breaking features designed to meet the widest range of requirements for live studio, mobile, and post-production applications.

The following K-Frame Video Processors are the heart of the system, providing extensive video switching and signal processing capabilities:

- Standard
- Compact
- S-series
- V-series

This functionality is controlled using any Control Panel with any Video Processor Frame:

- Kayenne control surface,
- Karrera control surface,
- GV Korona control surface,
- the Soft Panel (KSP option), and/or
- the Menu application running on a PC (Menu on PC).

In addition, a K-Frame system supports direct control of external devices (DDRs, Servers) and bi-directional control to and from routing and automation systems.

Features

General

- Fully digital 10-bit 4:2:2 video switcher including Future-Ready 4K (available on Standard, Compact, S-series, and V-series) and 1080p (level A or B) support.
- Optional smart I/O modules provide up/down/cross-conversion when licensed with SetDef and MatchDef.
- The optional K-FRM-IO-10GE IP I/O board for the K-Frame video processing engine offers Video-Over-IP connectivity for all K-Frame Video Production Switchers (except V-series), using either uncompressed SMPTE 2022-6 or 4K 1-wire compressed IP.
- 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 and wipes on aux bus outputs.

- Interfaces with Grass Valley routers and Kaleido Multiviewers and their control systems.
- Optional Integrated Image Store capable of delivering up to 64 GB storage (up to 32GB for S-series and V-series) of Stills (3,000 images) or “Movies” (up to 50 seconds) of 1080p video.
- LDK Series and LDX Series camera control with Ethernet tally via Connect Gateway.
- Optional integrated external ClipStore provides multiple channels of video/key pairs for up to 10+ hours of nonvolatile video/key/audio clip content.
- 999 macros with many new ways to recall macros from the Control 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 on the Standard, Compact, and Compact S-series.
- VDCP Ethernet connection.
- 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.
- Optional multiple Multiviewer capability with 5 pre-configured layouts (maximum 14 panes per layout) with On-Air and Preview tally.

K-Frame Standard Frame

- Up to 192 inputs and 96 outputs.
- Up to 9 M/Es, accessible across two suites—by using DoubleTake this may be increased to 18 virtual M/Es.
- Every M/E has six keyers with standard keying modes including Chroma Key, two frame stores per keyer—every keyer except for Controller M/E can use the pool of floating 3D iDPMs.
- 2D-DPMs (resizers) on every keyer, with 6 Video/Key pairs per M/E so iDPMs can be utilized for more complex effects.
- The Controller M/E has a complement of 6 full keyers with Chroma Key and 2D-DPMs.
- Up to 16 iDPMs (Integrated Digital Picture Manipulators), assigned as either floating iDPMs or within an eDPM at user’s discretion.

K-Frame Compact Frame

- Up to 80 inputs and 48 outputs.
- Up to 5 M/Es, accessible across two suites, increased to 10 virtual M/Es by using DoubleTake.

- Every M/E has six keyers with standard keying modes including Chroma Key, two frame stores per keyer—every keyer except for Controller M/E can use the pool of optional floating 3D iDPMs.
- 2D-DPMs (resizers) on every keyer, with 6 Video/Key pairs per M/E.
- Up to 8 iDPMs (Integrated Digital Picture Manipulators), assigned as either floating iDPMs or within an eDPM at user's discretion.

K-Frame Compact S-series Frame

- Up to 80 inputs and 48 outputs.
- Up to 6 M/Es, accessible across two suites, increased to 12 virtual M/Es by using DoubleTake.
- Every M/E has four keyers with standard keying modes including Chroma Key—every keyer can use the pool of floating 3D iDPMs.
- 2D-DPMs (resizers) on every keyer, with 4 Video/Key pairs per M/E.
- The Controller M/E has a complement of 6 full keyers with Chroma Key and 2D-DPMs.
- Up to 8 iDPMs (Integrated Digital Picture Manipulators), assigned as either floating iDPMs or within an eDPM at user's discretion.
- Two Built-in multiviewers with five pre-configured layouts (maximum 14 panes per layout) with On-Air and Preview tally.

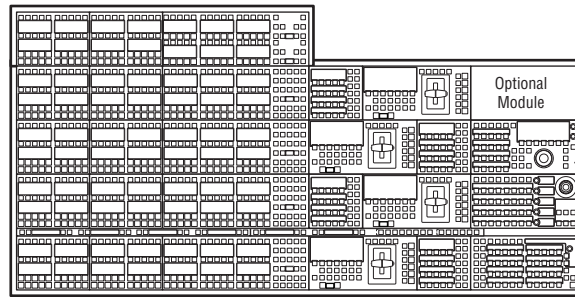
K-Frame V-series Frame

- Up to 32 SDI inputs and 16 SDI outputs.
- Up to four Media Port inputs and two Media Port outputs.
- Up to 3 M/Es plus 2 VPEs, accessible across two suites, increased to 10 virtual M/Es by using DoubleTake.
- Every M/E and VPE has four keyers with standard keying modes including Chroma Key—every keyer can use the pool of floating 3D iDPMs.
- 2D-DPMs (resizers) on every keyer, with 4 Video/Key pairs per M/E and VPE.
- Two Built-in multiviewers with five pre-configured layouts (maximum 14 panes per layout) with On-Air and Preview tally.

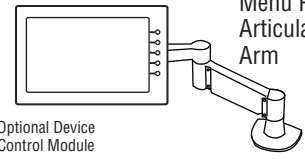
Kayenne Control Surface

A Kayenne control surface typically consists of a Control Panel, a Menu Panel with an included articulated support arm, a Panel Control Unit (PCU) frame, and optional Satellite Panels. This control surface has an innovative modular design.

4-ME 35 Control Panel



Menu Panel



Menu Panel
Articulated
Arm

Optional Device
Control Module

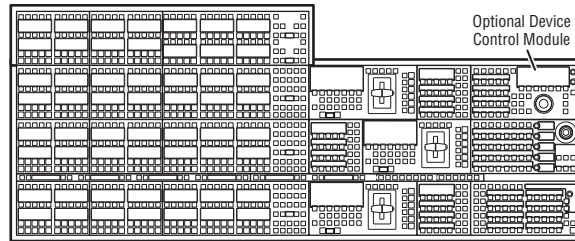
Panel Control Unit (PCU)



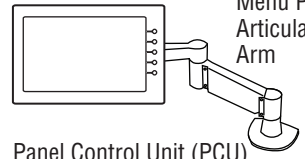
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Kayenne 4-M/E 35 Control Surface

3-ME 35 Control Panel



Menu Panel



Menu Panel
Articulated
Arm

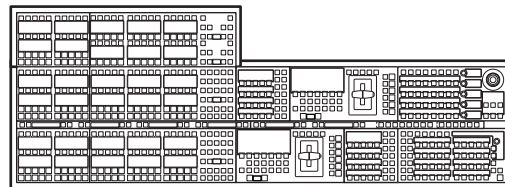
Panel Control Unit (PCU)



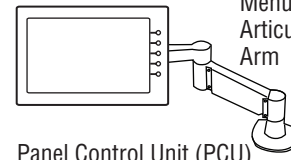
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Kayenne 3-M/E 35 Control Surface

2-ME 25 Control Panel



Menu Panel



Menu Panel
Articulated
Arm

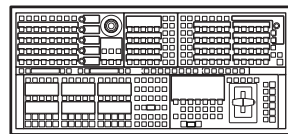
Panel Control Unit (PCU)



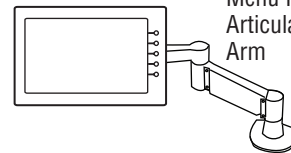
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Kayenne 2-M/E 25 Control Surface

1-ME 15 Control Panel



Menu Panel



Menu Panel
Articulated
Arm

Panel Control Unit (PCU)



8623266_04

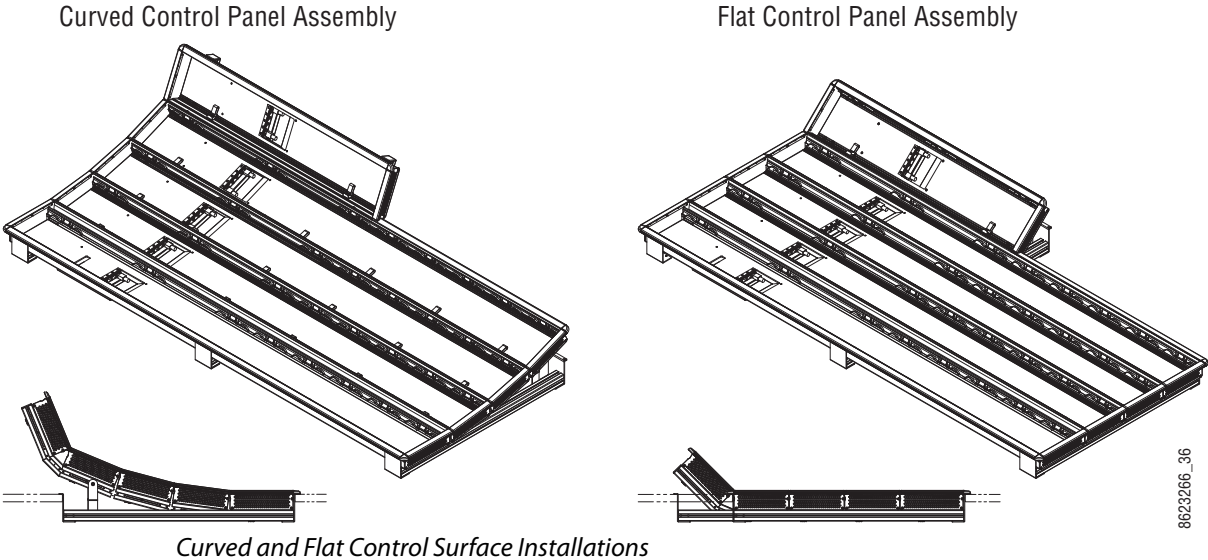
Kayenne 1-M/E 15 Control Surface

The modular design and use of a separate PCU supports the hot-replacement of individual Control Panel components, if necessary, while the rest of the system remains operational.

CAUTION: Do not connect or disconnect the PCU to Control Panel cables while the system is powered on.

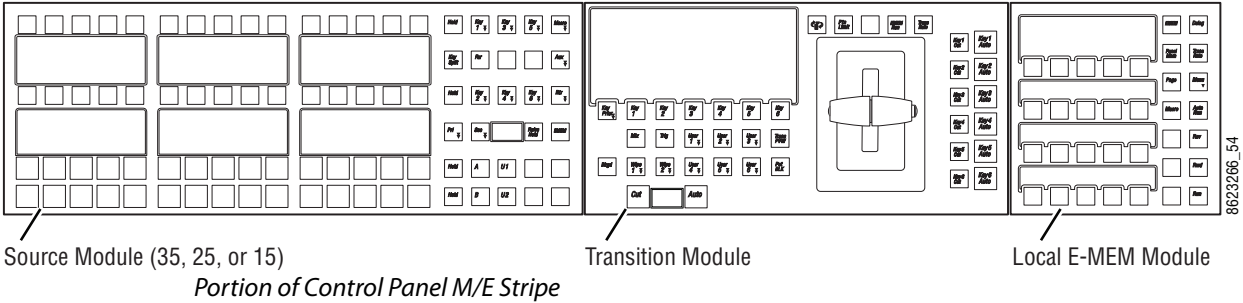
Flat or Curved Control Panel Orientation

The main Kayenne Control Panel supports different physical orientations. Besides a conventional flat surface, a special support design permits a curved working surface, where the M/Es progressively tilt for improved ergonomics.



Control Panel Stripes

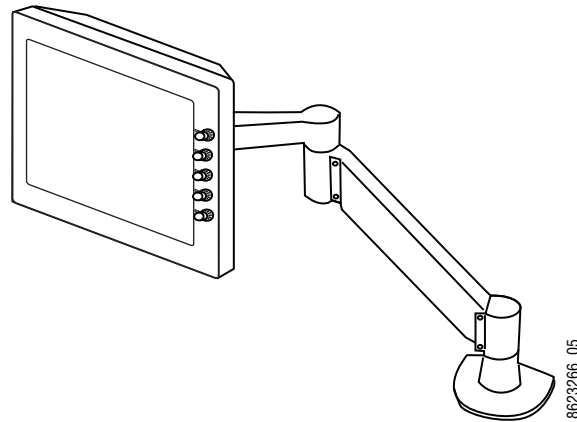
The main Kayenne Control Panel is organized into from one to five Stripes. Each Stripe consists of a tray and its complement of drop-in modules. An M/E Stripe has a module for Source Selection, Transition, and individual E-MEM control. Additional Master E-MEM, Machine Control, Multi-Function, and Local Aux modules are populated to complete the control surface functionality.



Touch Screen Menu Panel

Each Kayenne control surface includes a Menu Panel that features a wide format 15 in. touch screen display. An articulated arm is also included, offering a wide variety of installation options. The Menu Panel has a standard VESA-75 hole pattern and M4 threads, compatible with this and many other mounting devices.

The Menu Panel has four USB ports, two on the right side edge of the panel and two on the back for keyboard and mouse (wired or wireless are supported).



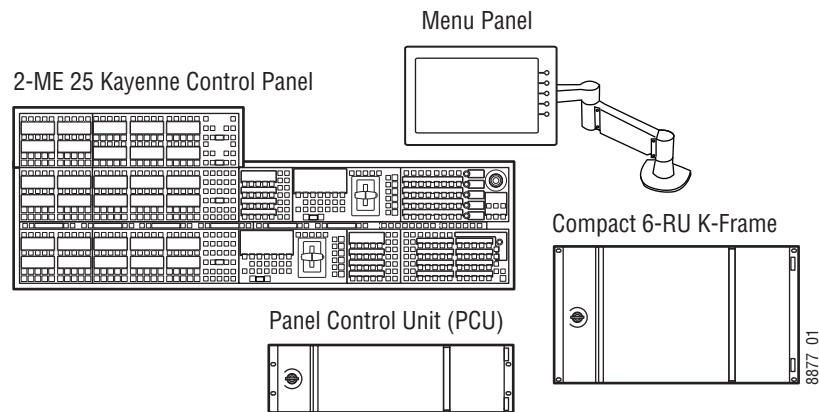
Menu Panel with Articulated Arm

Menu Application

The Menu application software provided with every K-Frame system can be run on a standard PC. This software accesses all the system's functionality, permitting mouse and keyboard control from a laptop, or remote control from any location on the network.

Basic Single Suite Kayenne Panel System

A basic K-Frame system consists of a Control Panel, a Menu application running on a touch screen Menu Panel, and a Video Processor Frame. The Control Panel and Menu application make up a control surface associated with that frame. The Kayenne Control Panel and Menu Panel have associated active electronics housed in the Panel Control Unit (PCU).

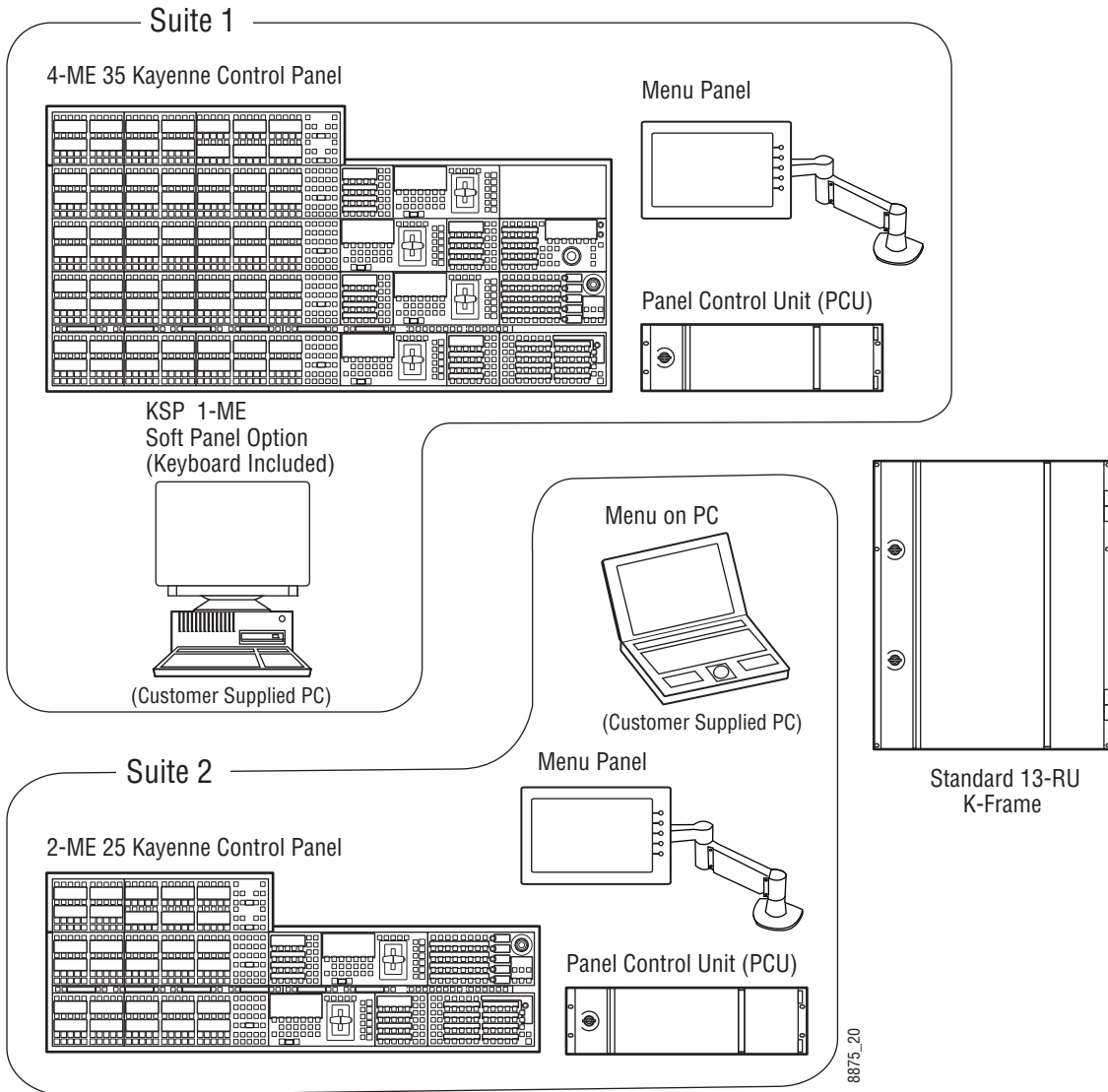


Kayenne Single Suite Compact Frame Example

Multiple Suite Kayenne Panel System

A K-Frame system can be subdivided into two suites, if desired, each of which can have two control surfaces (Surface A and Surface B). Each surface has its own set of Panel Preferences for configuration of the control panel behavior and independent macro systems to allow

for independent building and running of macros by each operator at the control surface. Hardware resources in the Video Processor Frame can be assigned to an individual suite during configuration, essentially creating two separate switchers sharing one frame.

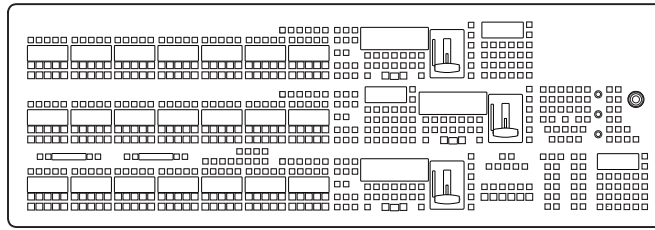


Kayenne Multi-Suite Standard Frame Example

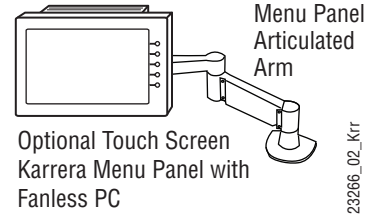
Karrera Control Surface

A Karrera control surface typically consists of a Control Panel and a Menu application. Representative Karrera control surfaces are shown in the following illustrations.

Karrera 3-ME 35 Control Panel

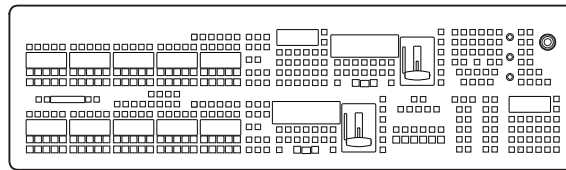


Karrera 3-M/E 35 Control Surface



8623266_02_Krr

Karrera 2-ME 25 Control Panel



Karrera 2-M/E 25 Control Surface

Karrera Menu on PC

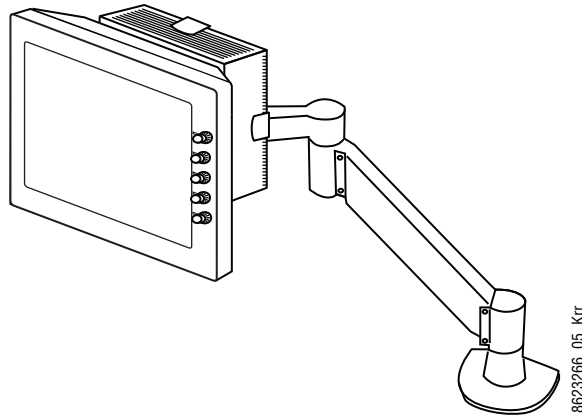


(Customer Supplied PC)

8623266_03_Krr

Touch Screen Menu Panel Option

A hardware Karrera Menu Panel is available as an option, which features a wide format 15 inch touch screen display. An articulated arm is also included, offering a wide variety of installation options.



8623266_05_Krr

Menu Panel with Articulated Arm

The Menu Panel has a standard VESA-75 hole pattern and M4 threads, compatible with this and many other mounting devices. The Menu Panel also has four USB ports, two on the right side edge of the panel and two on the back for keyboard and mouse (wired or wireless are supported).

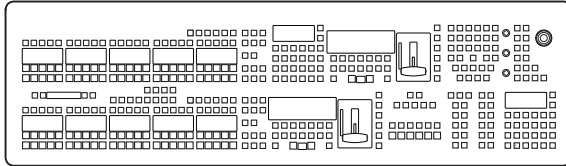
A fanless PC, running Windows OS, is available which mounts behind the Menu Panel.

Karrera K-Frame System Examples

Basic Single Suite Karrera Panel System

A basic K-Frame system consists of a Control Panel, a Menu application running on a PC, and a Video Processor Frame. The Control Panel and Menu application make up a control surface associated with that frame.

Karrera 2-ME 25 Control Panel



Karrera Menu on PC



(Customer Supplied PC)

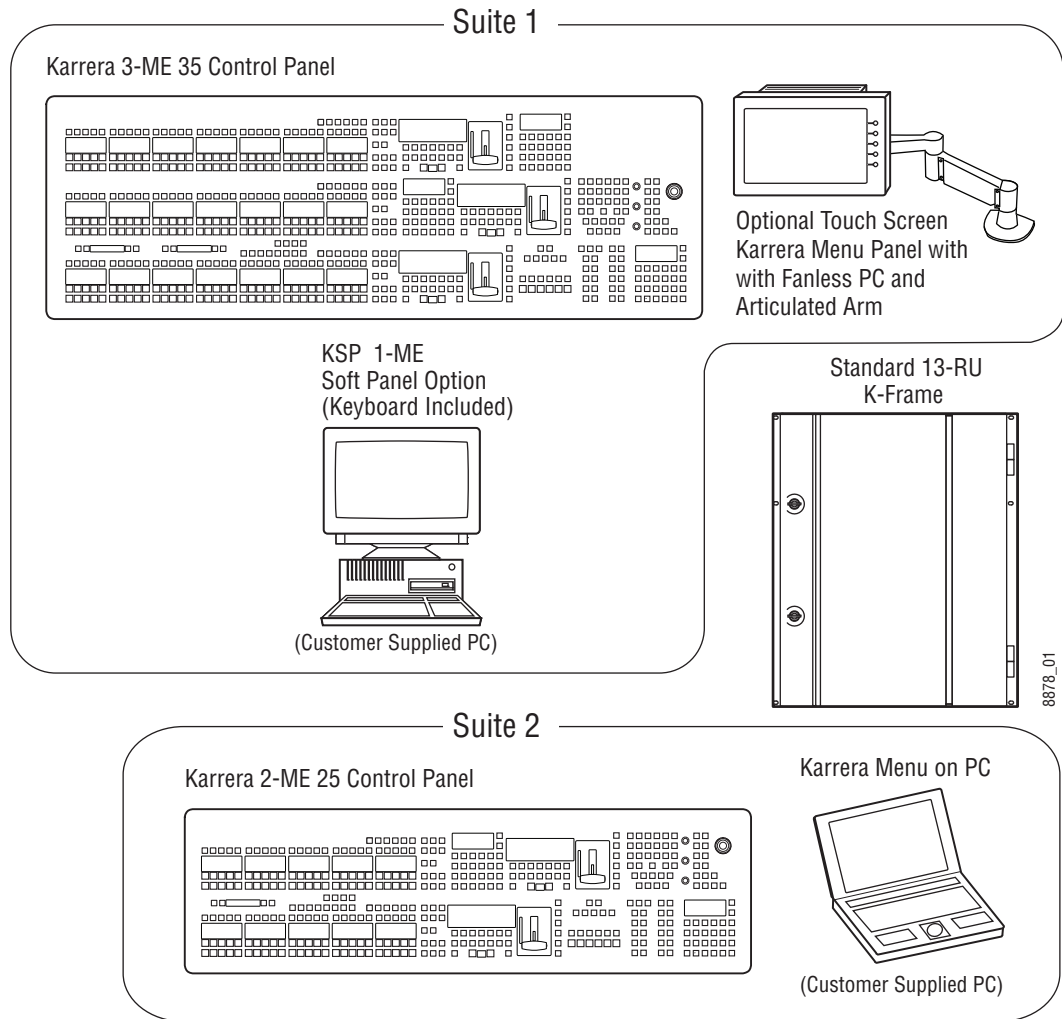
Compact 6-RU K-Frame



Karrera Single Suite Compact Frame Example

Multiple Suites and Control Surfaces

A K-Frame system can be subdivided into two suites, if desired, each of which can have two control surfaces. Hardware resources in the Video Processor Frame can be assigned to an individual suite during configuration, essentially creating two separate switchers sharing one K-Frame.



Karrera Multi-Suite Standard Frame Example

GV Korona Control Surfaces

A GV Korona control surface consists of:

- A Control Panel with stripes of buttons,
- System Control area with a Device Control area,
- Switched preview,
- Alternate bus and Aux bus delegation,
- Macro controls,
- Controls for background and keyer source selection,
- Multi-Function and E-MEM area,
- Horizontal keyer cut/mix,
- Multi-function keypad and display, and
- Includes a built-in multi-touch display and menu system.

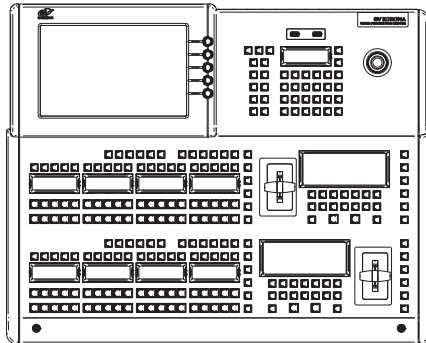


GV Korona Control Surfaces

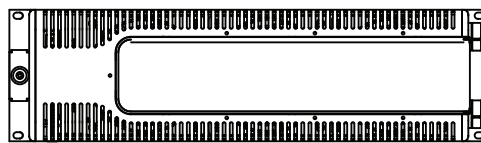
Basic Single Suite GV Korona Panel System Example

A Basic K-Frame GV Korona system consists of a Control Panel with a fully integrated multi-touch menu system and an S-series 6RU Frame.

GV Korona 2-ME 20 Control Panel



K-Frame V-series 3-RU

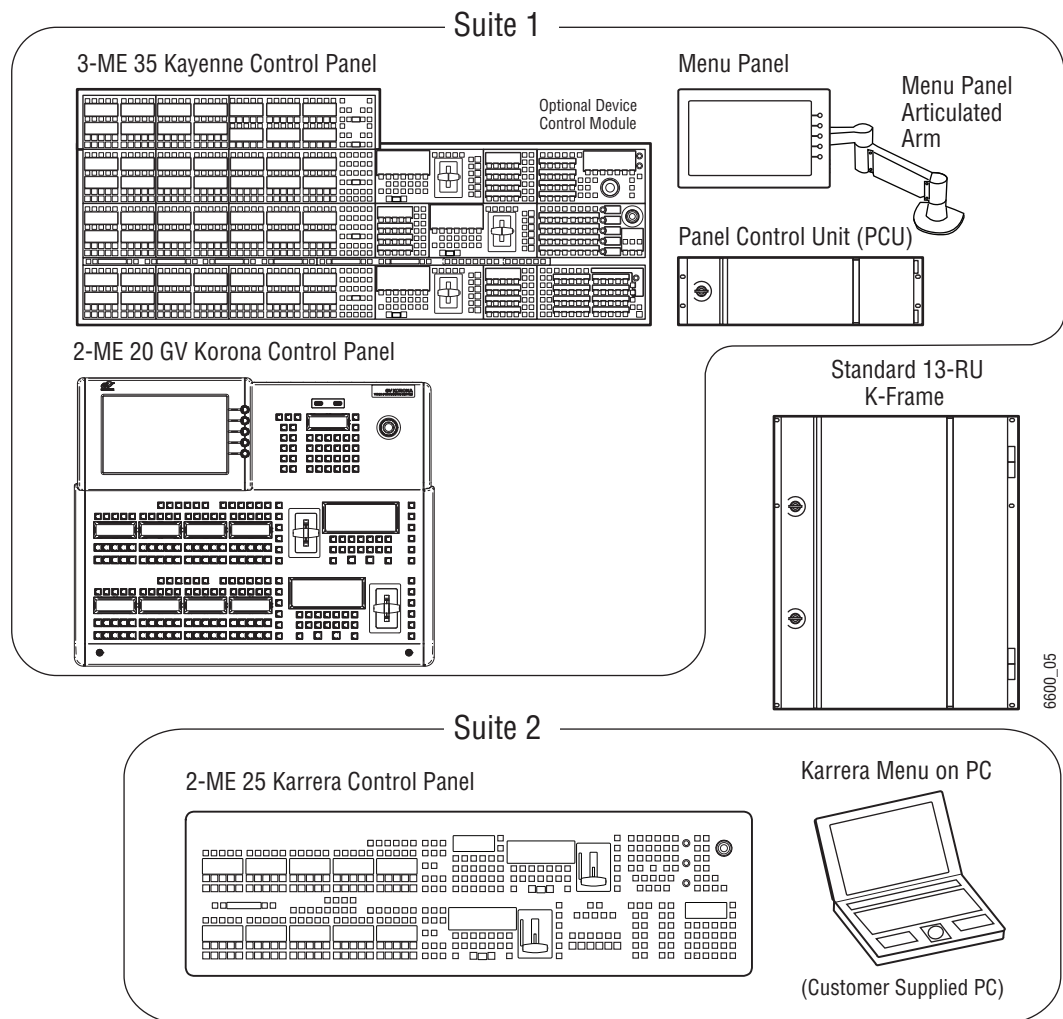


GV Korona Single Suite S-Series Frame Example

6600_04r1

Multiple Suites and Control Surfaces Example

Any K-Frame Kayenne, Karrera, or GV Korona Control Panel can be configured with any K-Frame Video Processor. The K-Frame system can be subdivided into two suites and each suite can have up to two control surfaces. Hardware resources in the Video Processor Frame can be assigned to an individual suite during configuration, essentially creating two separate switchers sharing one Frame. See the K-Frame Installation & Service Manual for suite configuration information.



K-Frame Multi-Suite Frame Example

Soft Panel (KSP) Option



Soft Panel Application

The KSP is an optional 1-M/E Soft Panel GUI which provides direct control of switching crosspoints, recalling effects and macros together with an integrated version of the Menu application. A customized PC keyboard is included with the option for users who like quick cut and mix action from a hard-button interface. The KSP can be used as an adjunct to a main panel, providing a second seat (second control surface) in a Suite.

The KSP GUI application is designed to run on a PC platform. The screen must be 1920x1080 resolution or better (which is common in professional video environments). A touchscreen is not required, but can be very useful.

The KSP software is included with the switcher application software. Purchasing the option provides a software license that enables the interface for the selected switcher, and includes a customized PC keyboard. The license activates an unlimited number of KSP applications associated with the licensed video processor frame. Additional customized PC keyboards are also available for purchase.

Menu Application

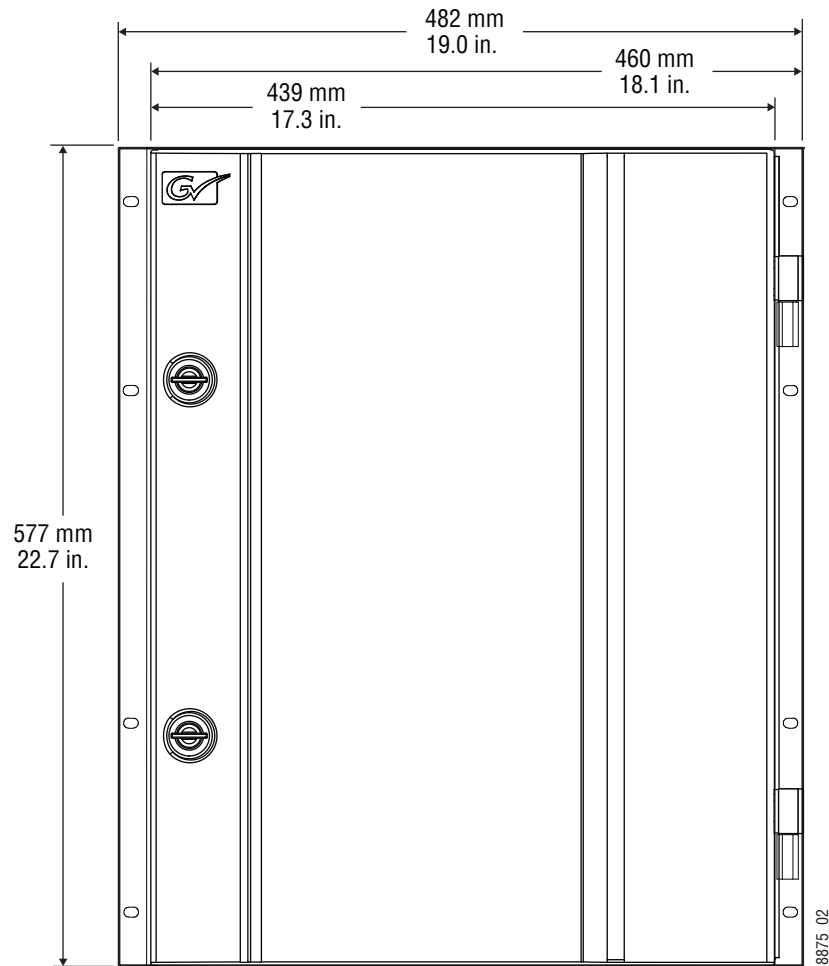
The Menu application software provided with every K-Frame system can be run on a standard PC. This software accesses all the system's functionality, permitting mouse and keyboard control from a laptop, or remote control from any location on the network.

Supported Control Protocols

- PBus II
- Grass Valley CPL (Control Point Language) for Control Panel, Menu, Frame, and Automation systems
- GPI Inputs and Outputs
- Serial BVW-75 for VTR control
- Odetics protocol 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
- Grass Valley Native Protocol for routers/routing control systems (Trinix/Trinix NXT, Venus™, Triton™, and third-party routers; Jupiter NV9000 and NV920, and Encore router control systems)
- Tally (contact closure)
- K-Frame Ethernet Tally protocol
- Grass Valley Editor protocol
- SNMP system monitoring
- Serial and Ethernet VDCP
- LDK Series & LDX Series™ camera control with Ethernet tally via Connect Gateway
- RossTalk for XPression control

2 Frame Installation

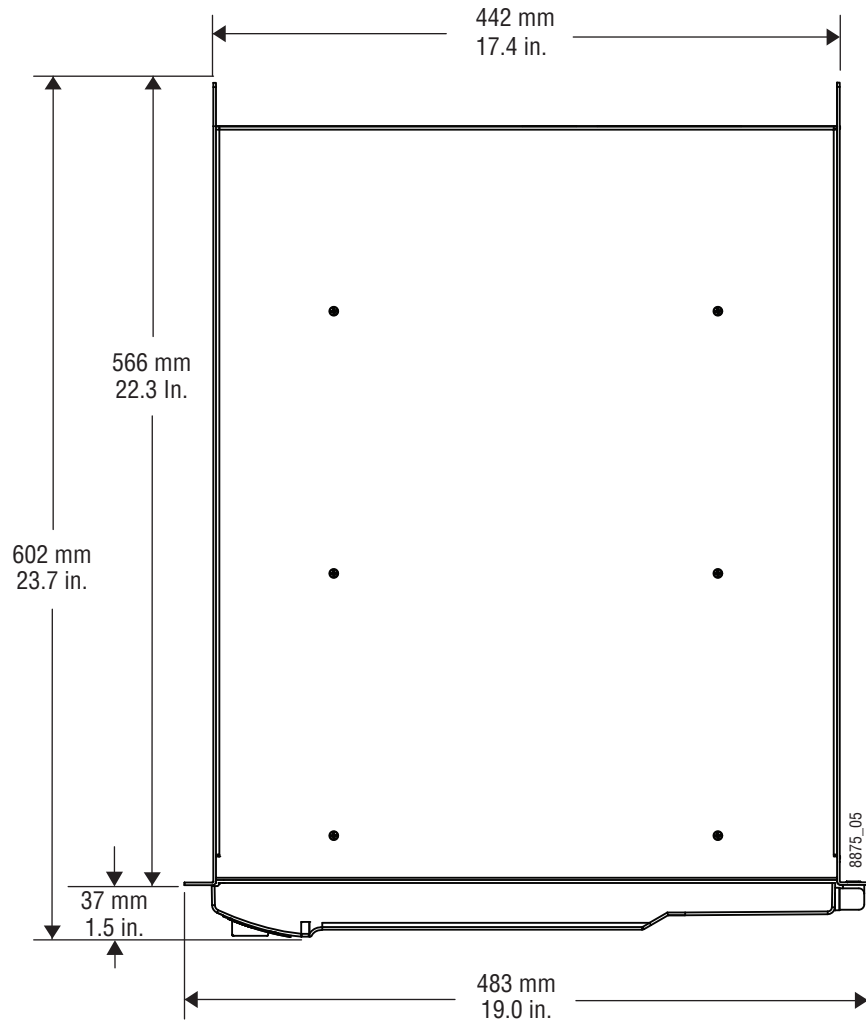
13-RU Video Processor Dimensions



K-Frame 13-RU Dimensions (Front View)

CAUTION: Mounting a K-Frame in a rack immediately below equipment that extends forward from the rack may not provide enough clearance to completely remove the K-Frame door.

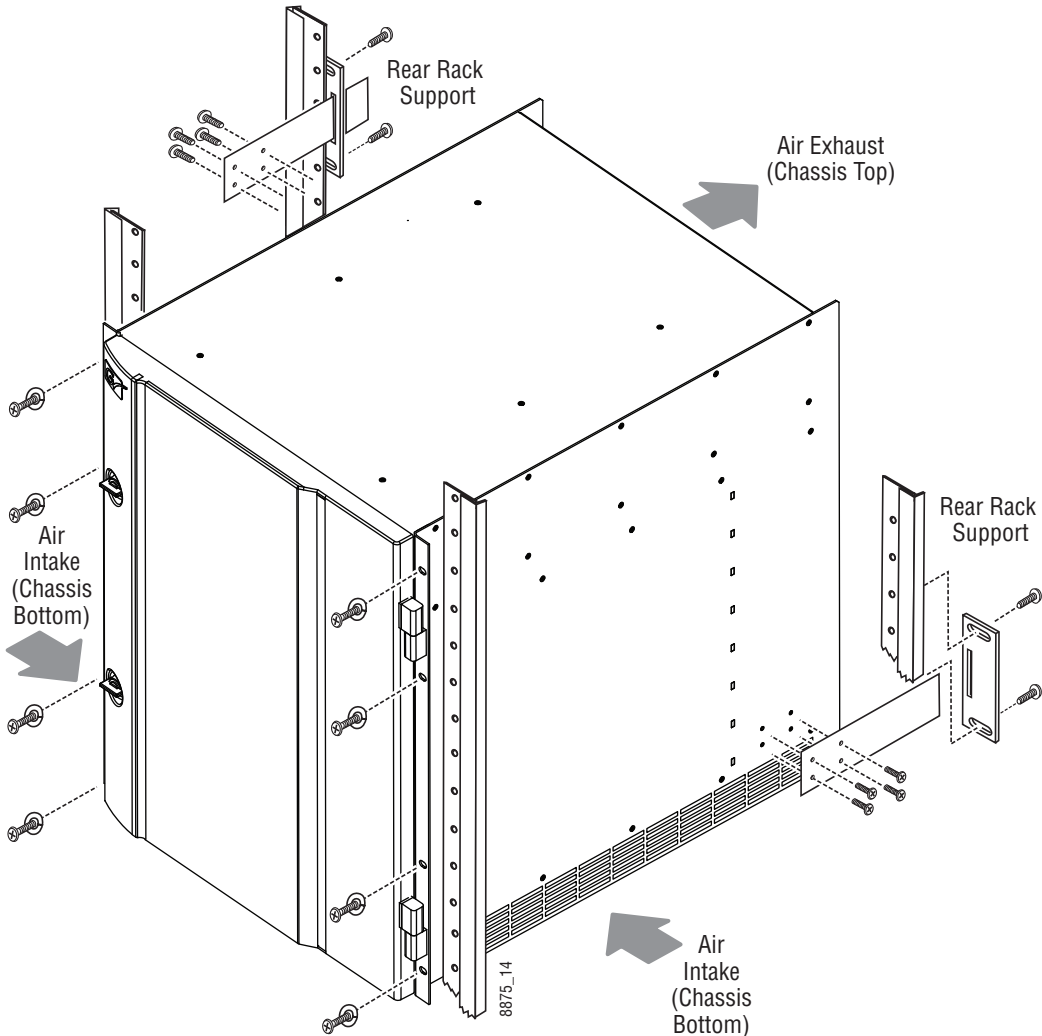
Frame Installation
13-RU Video Processor Dimensions



K-Frame 13-RU Dimensions (Top View)

13RU Video Processor Installation and Airflow

CAUTION: K-Frame installations require the use of the provided rear rack supports.

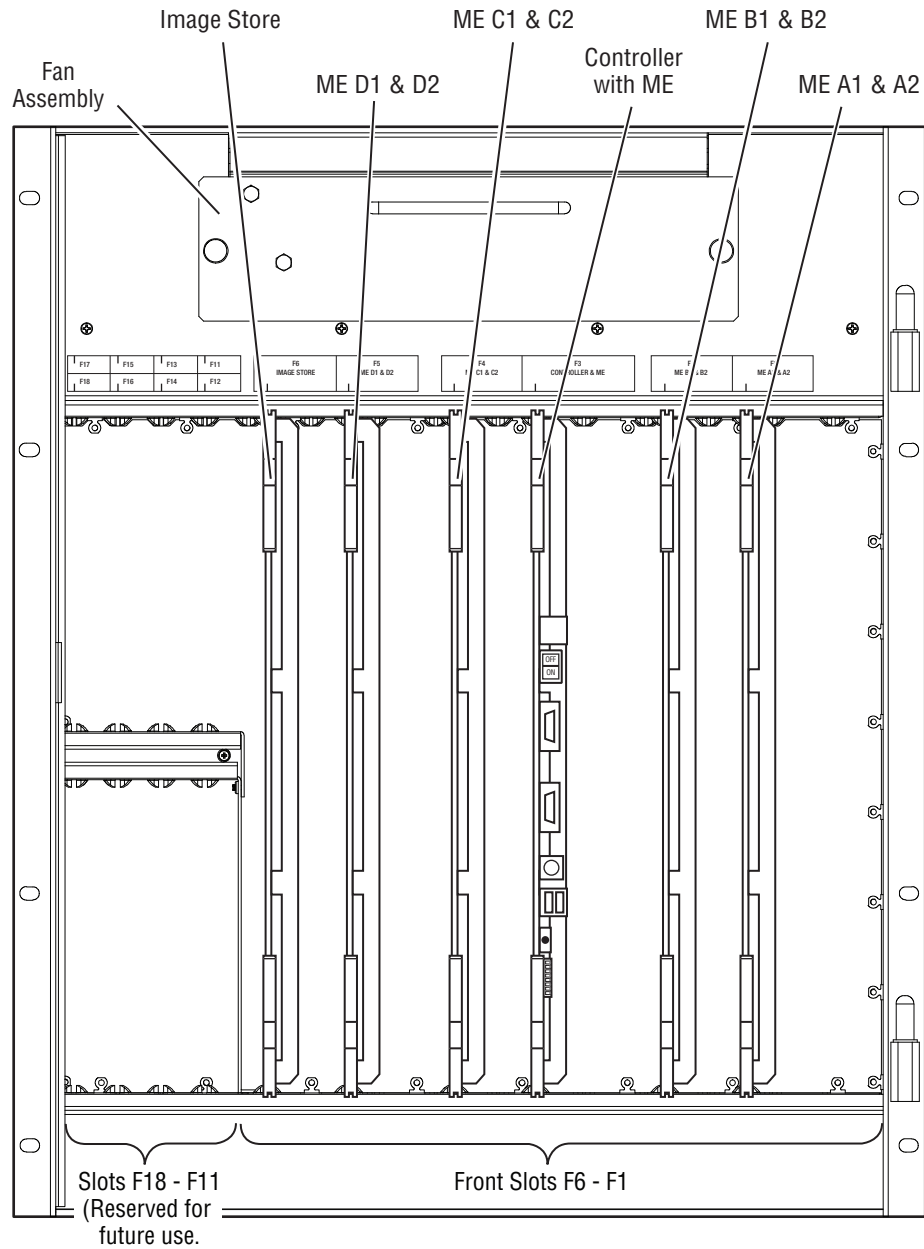


K-Frame 13-RU Rack Mounting and Cooling Airflow

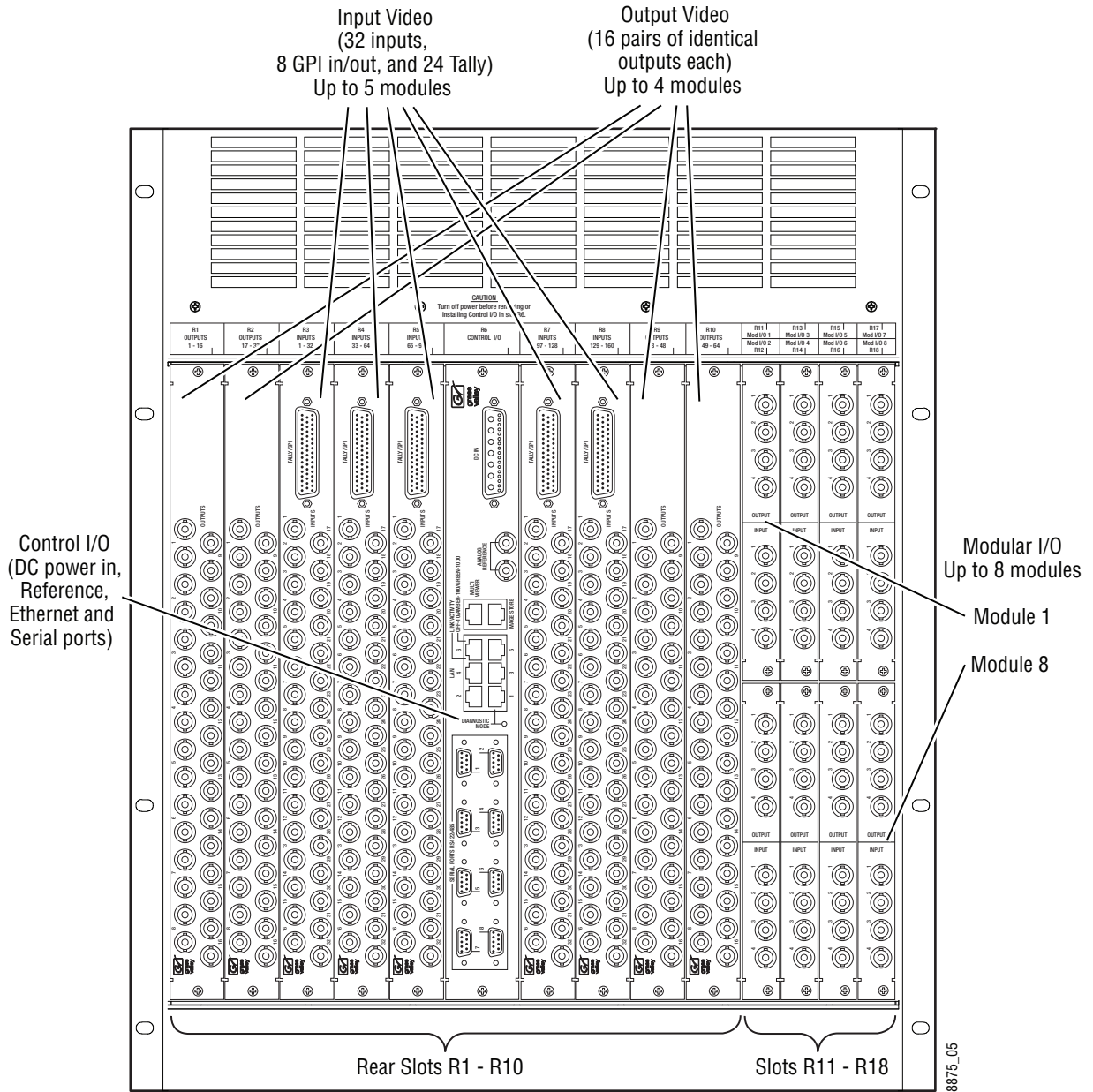
13RU Video Processor Views

CAUTION: The Video Processor front door must remain in place and closed during normal system operation to maintain maximum cooling efficiency.

Frame Installation
 13RU Video Processor Views



K-Frame 13-RU, Front View with Door Removed

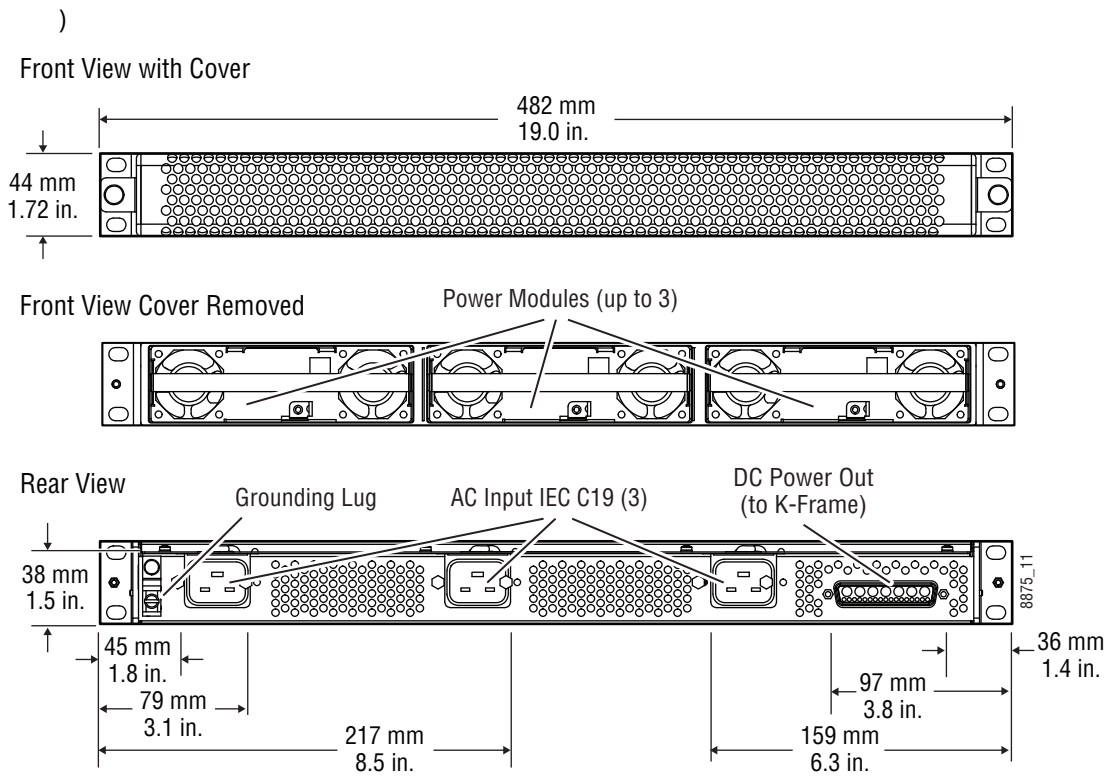


K-Frame 13-RU, Rear View

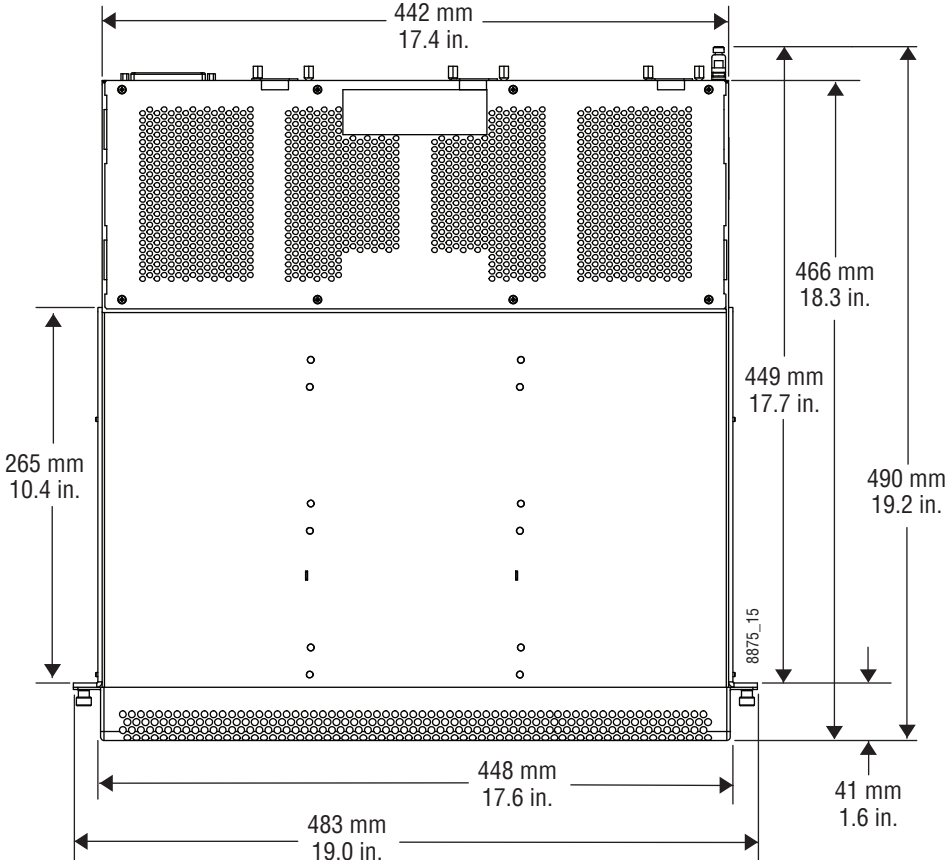
K-Frame 13-RU Power Supply Views

A 1-RU Power Supply Frame provides DC power for the 13RU K-Frame Video Processor.

Frame Installation
 K-Frame 13-RU Power Supply Views



K-Frame 13RU Power Supply Frame Dimensions (Front and Rear Views)



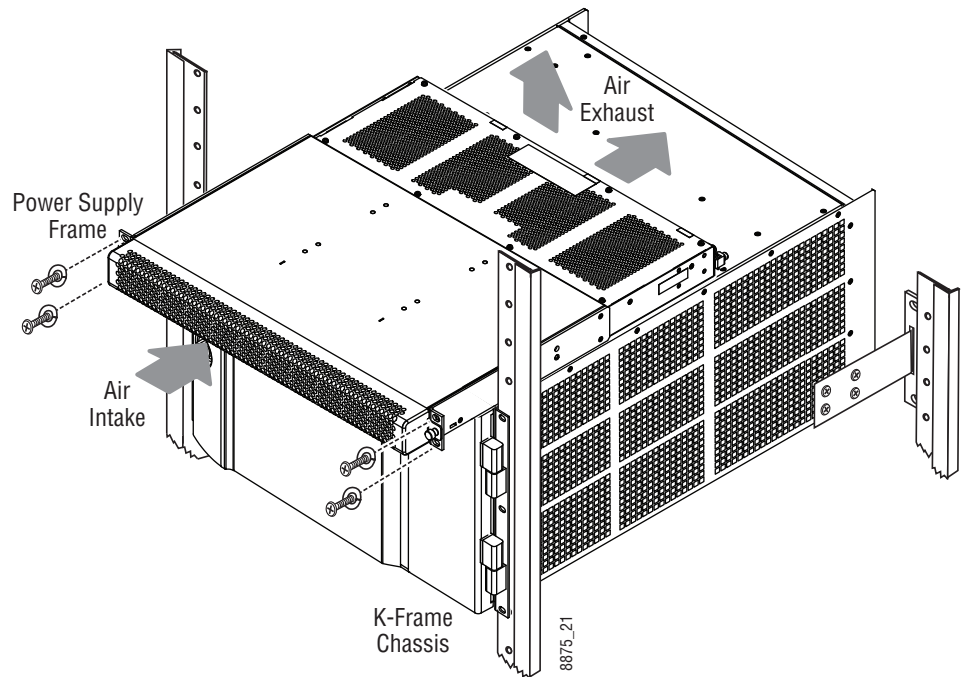
K-Frame 13RU Power Supply Frame Dimensions (Top View)

K-Frame 13-RU Power Supply Frame Rack Installation and Airflow

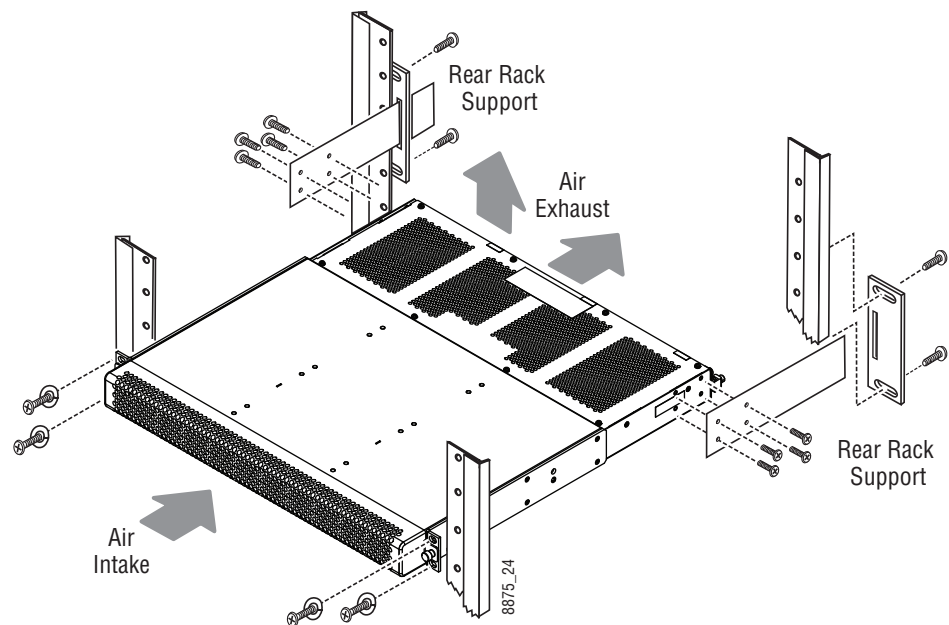
The K-Frame power supply frame is ideally rack mounted immediately above the 13-RU Video Processor chassis. The power supply frame is then supported by the lower chassis and eliminates the need for power supply rear rack supports.

In addition, this placement allows removal of the front door of the K-Frame.

If the power supply frame is not mounted above the K-Frame chassis, rear rack supports are required. If mounting in an alternative location, allow for the 34" DC interconnect cable length.



13-RU K-Frame Power Supply Rack Installation and Cooling Airflow



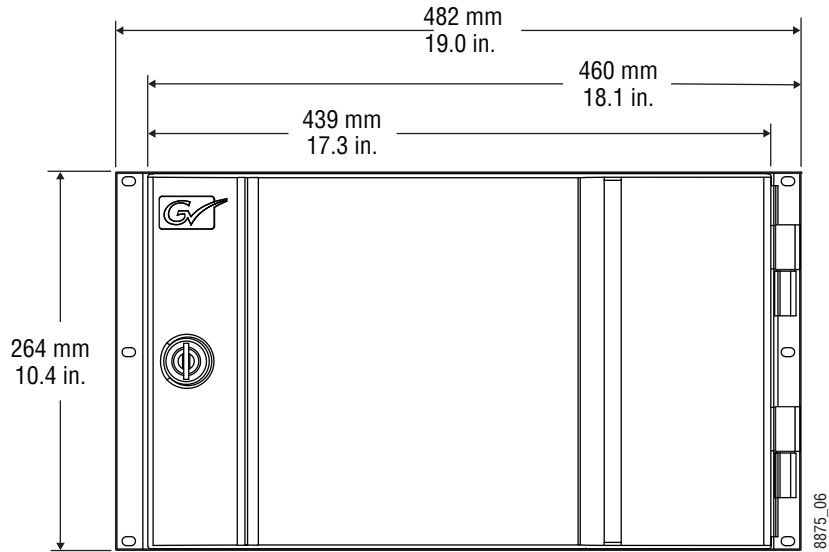
Isolated K-Frame 13-RU Power Supply Rack Installation

K-Frame 13-RU Power Supply Cooling

The top surface of the rear of the K-Frame Power Supply Frame has air holes and is slightly recessed, which permits air flow even if equipment is mounted in the rack directly above.

These top recessed air holes must remain open for proper cooling. Ensure paper or other obstructions do not block these air holes.

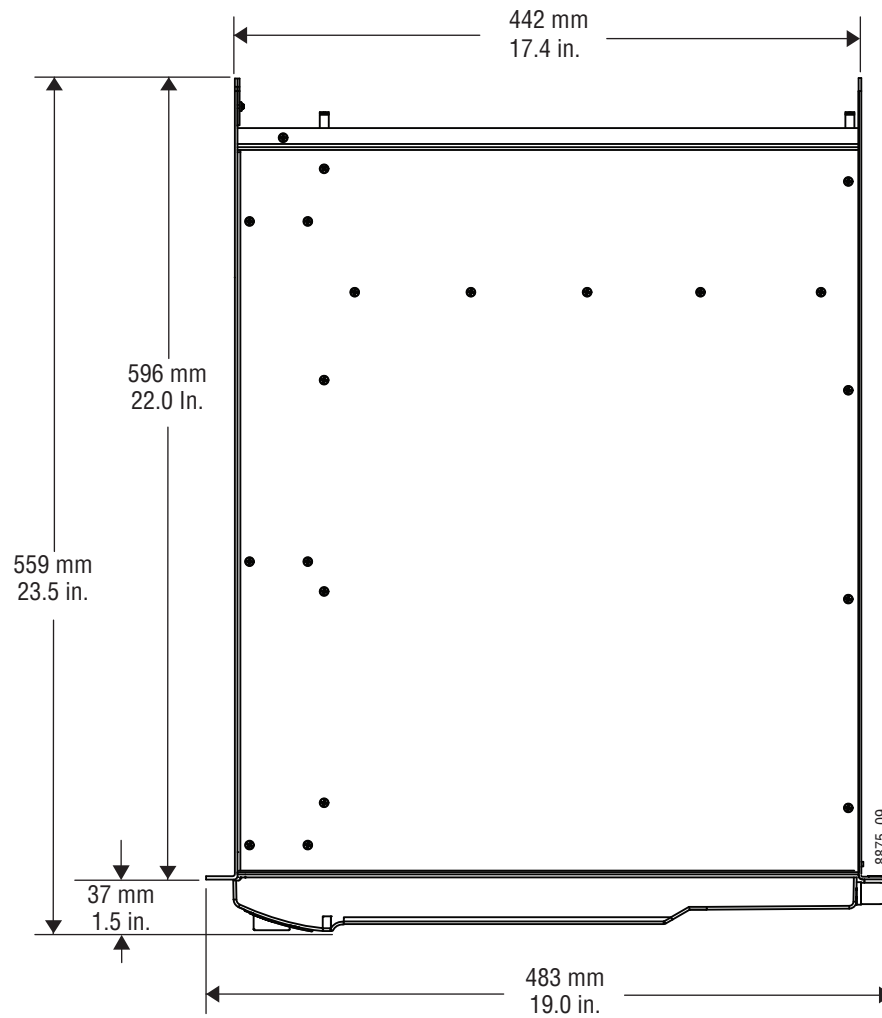
6-RU Video Processor Dimensions



K-Frame 6-RU Dimensions (Front View)

CAUTION: Mounting a K-Frame in a rack immediately below equipment that extends forward from the rack may not provide enough clearance to completely remove the K-Frame door.

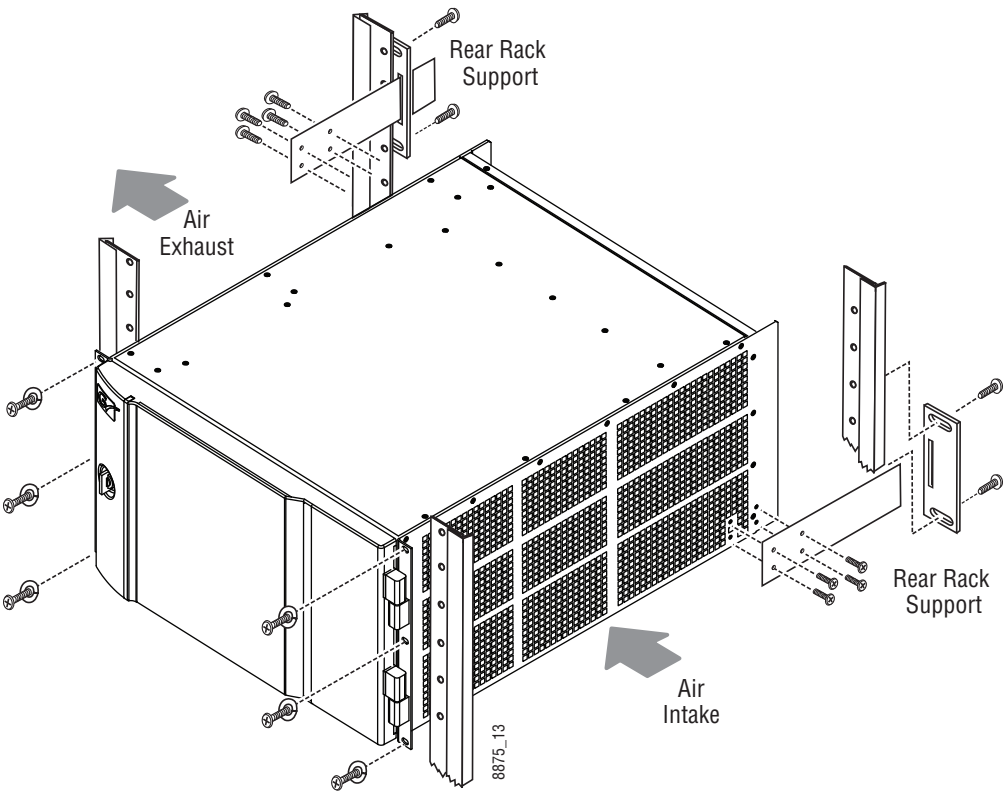
Frame Installation
6-RU Video Processor Dimensions



K-Frame 6-RU Dimensions (Top View)

6RU Video Processor Installation and Airflow

CAUTION: K-Frame installations require the use of the provided rear rack supports.



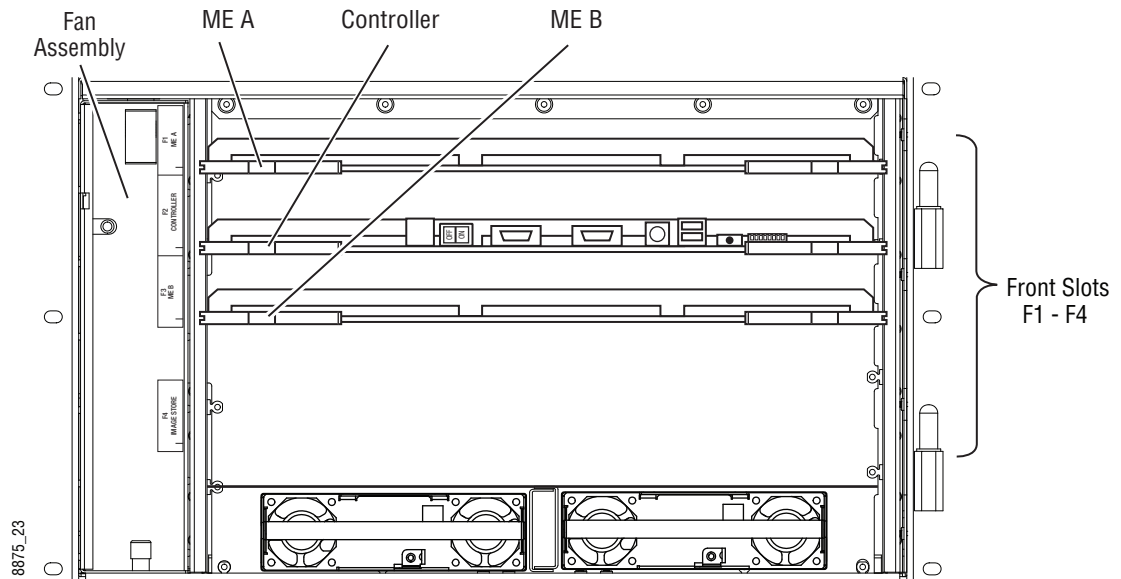
K-Frame 6-RU Rack Installation and Cooling Airflow

6RU Compact S-series Front View with Door Removed

The Compact S-series Frame includes four keys per M/E and two Multiviewers on the Controller board.

CAUTION: The Video Processor front door must remain in place and closed during normal system operation to maintain maximum cooling efficiency.

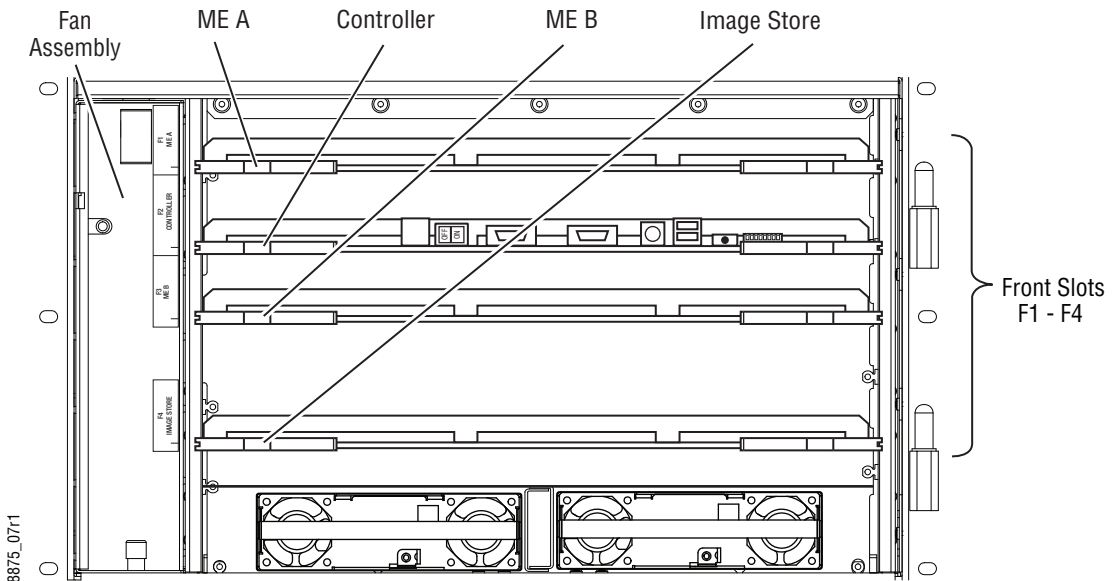
Frame Installation
6RU Compact Front Views with Door Removed



K-Frame Compact S-series 6-RU, Front View with Door Removed

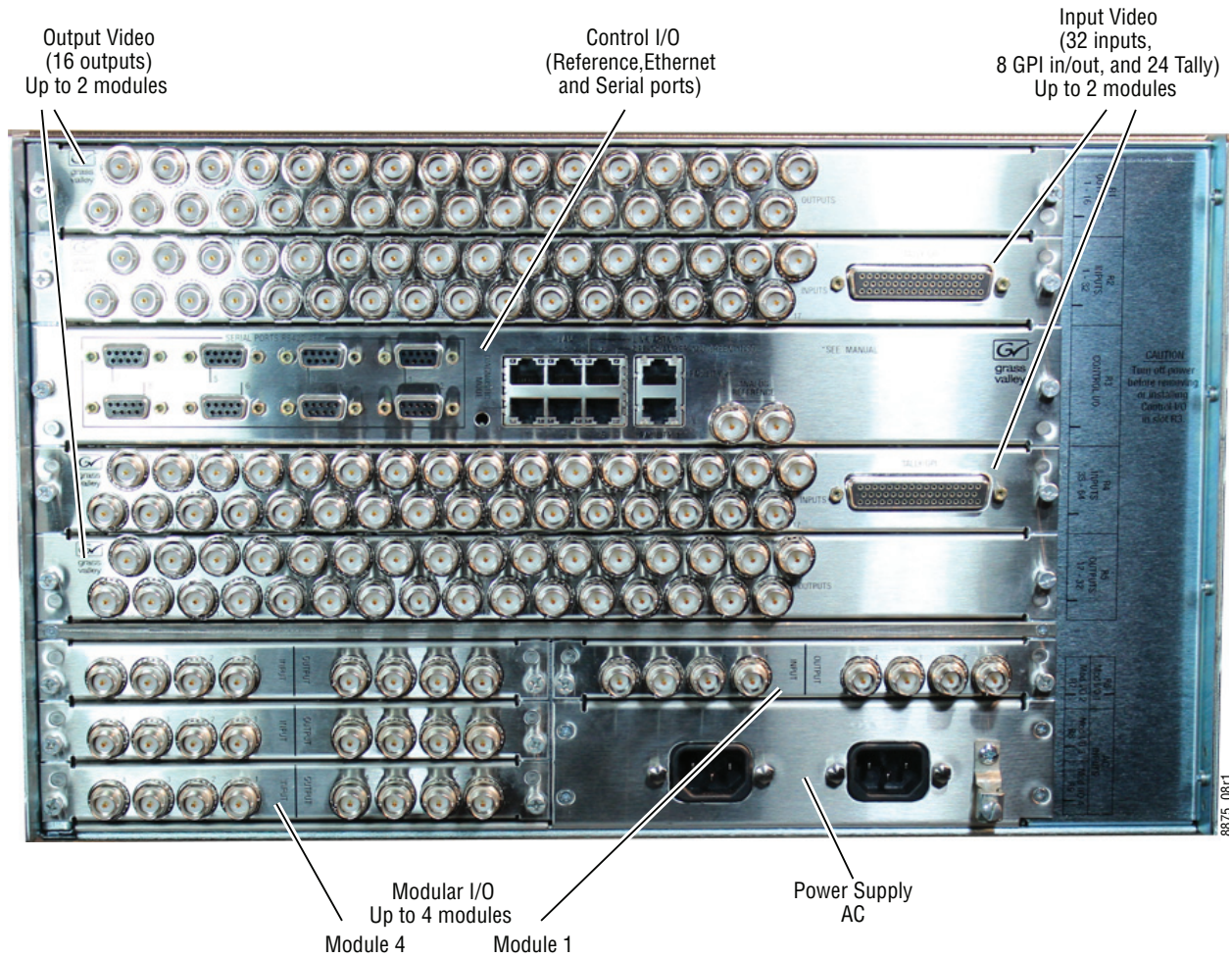
6RU Compact Front Views with Door Removed

The Compact Frame includes optionally, an Image Store board and six keys per M/E.



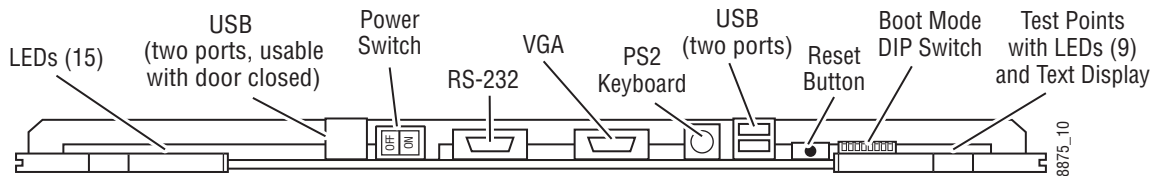
K-Frame Compact Performance Frame 6-RU, Front View with Door Removed

6RU Video Processor Rear View



K-Frame 6-RU, Rear View

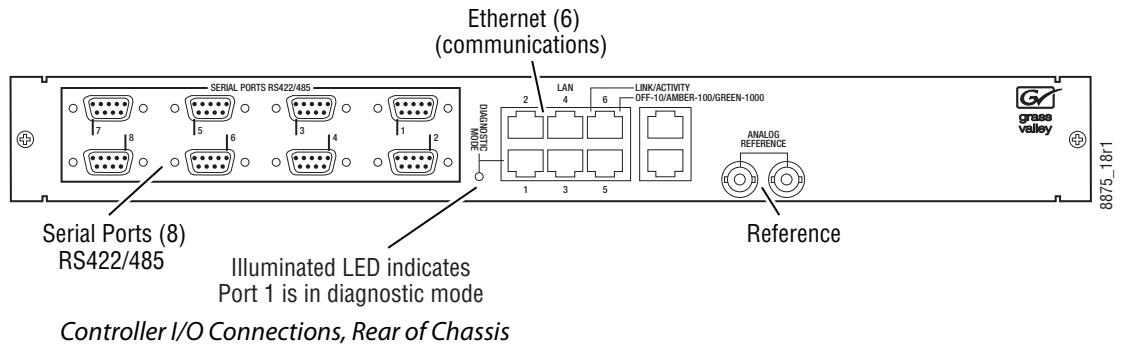
K-Frame Standard/Compact/S-series Controller Connections



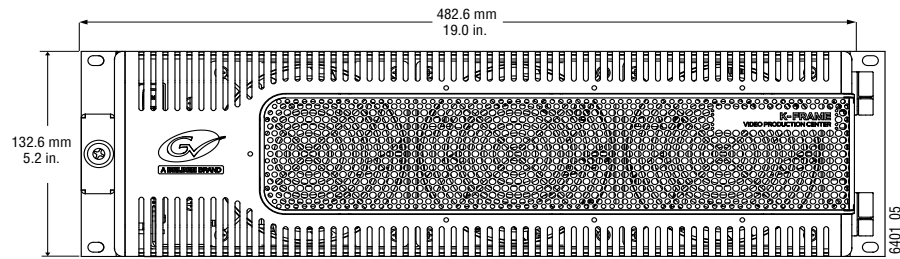
NOTE: Ports and indicators here are intended only for diagnostic and service procedures.

K-Frame Controller Board, Inside Chassis

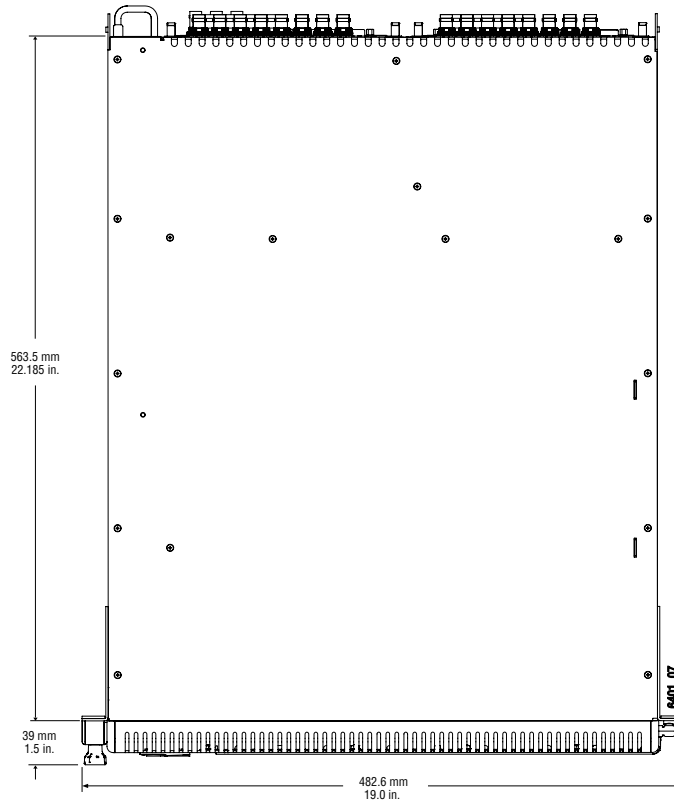
Frame Installation
 3RU Video Processor Dimensions



3RU Video Processor Dimensions



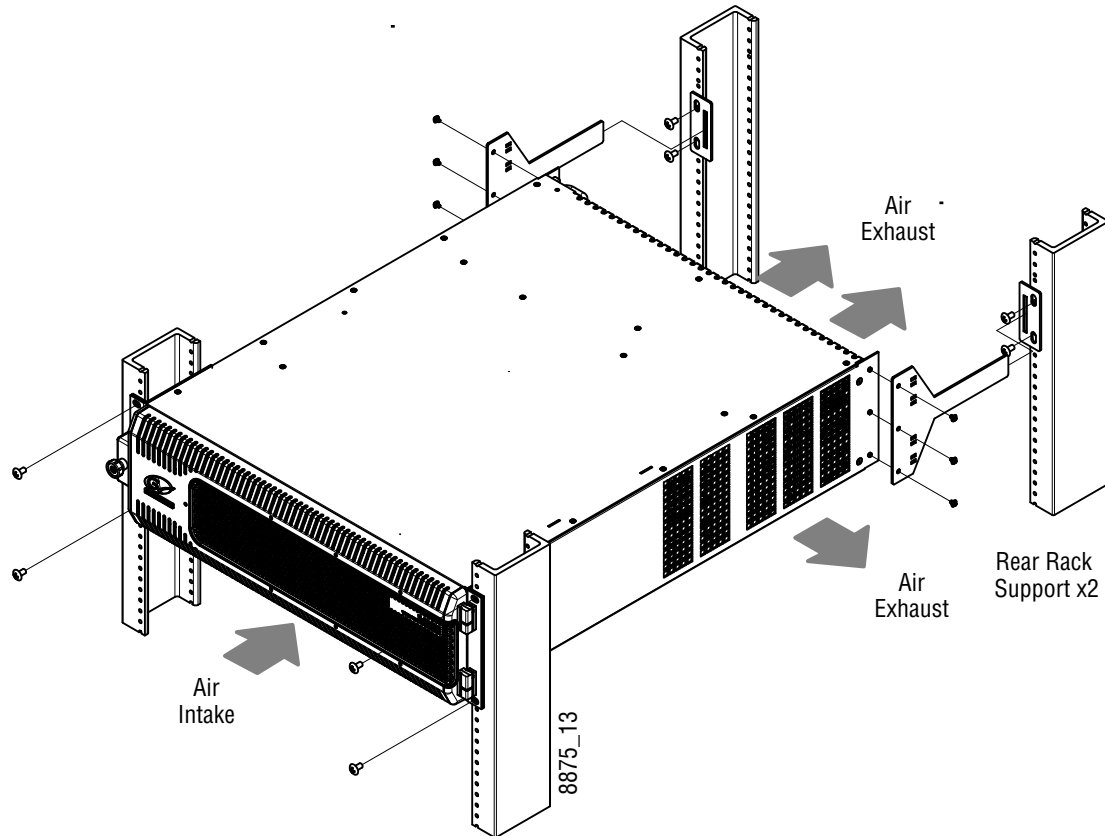
K-Frame V-series 3-RU Dimensions (Front View)



K-Frame V-series 3-RU Dimensions (Top View)

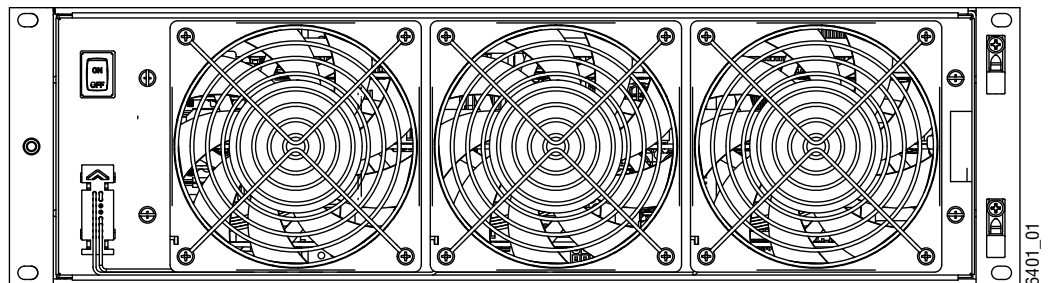
3RU Video Processor Installation and Airflow

CAUTION: K-Frame installations require the use of the provided rear rack supports.



3RU Front Views with Door Removed

The V-series Frame Fan Assembly is removed to access the Controller/Image Store, M/E and other boards.



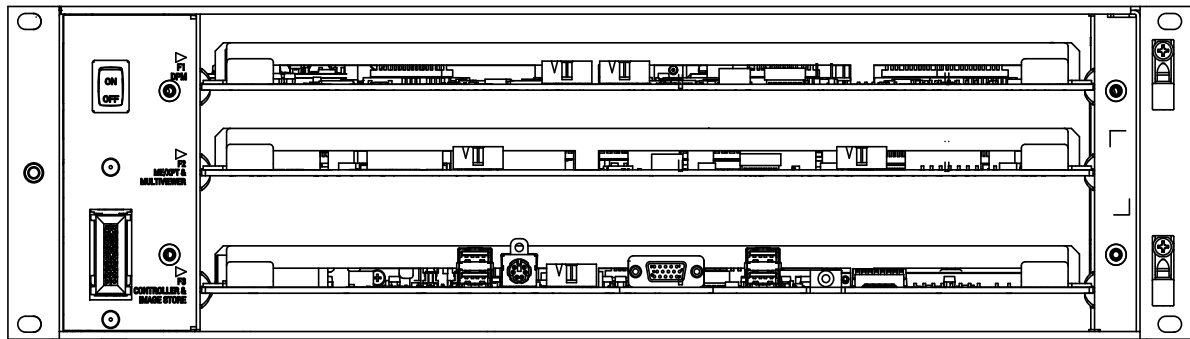
K-Frame Compact V-series 3-RU, Front View with Door Removed

Frame Installation

K-Frame V-series Controller Connections and Status Indicators

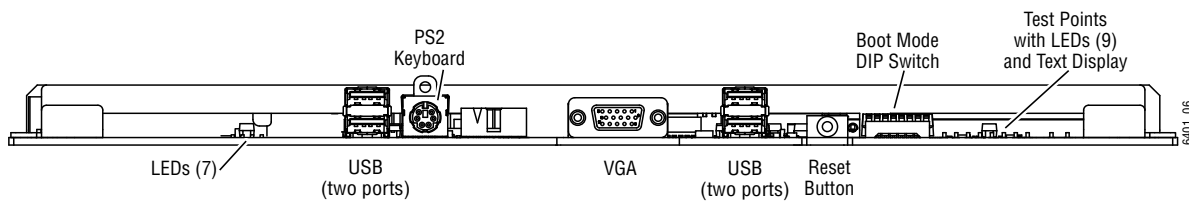
The V-series Frame includes a Controller/Image Store board, an M/E board, with four keys per licensed M/E and VPE.

Note: Slots are keyed to prevent damage resulting from boards being installed in the wrong slots.

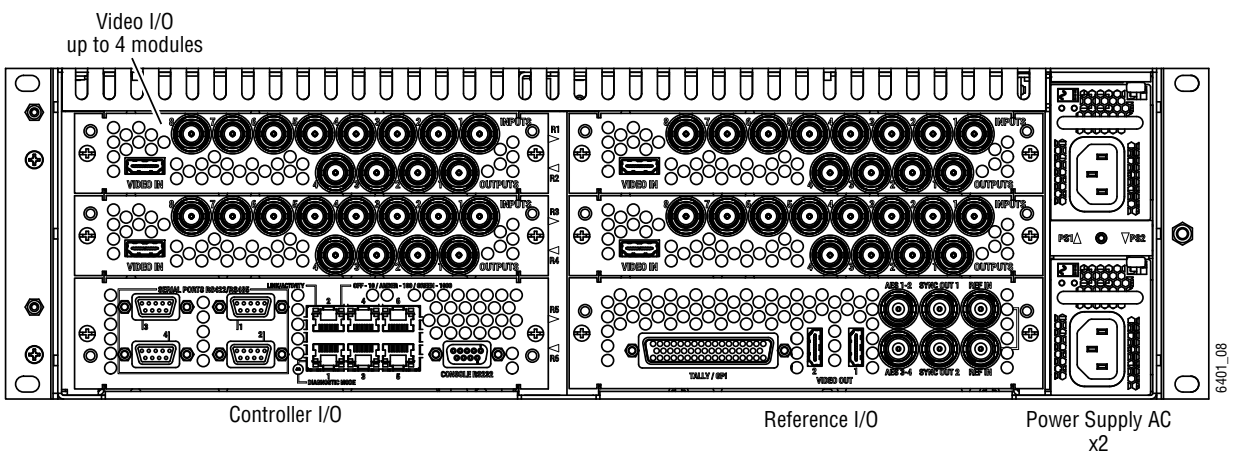


K-Frame V-series 3-RU, Front View with Door and Fan Assembly Removed

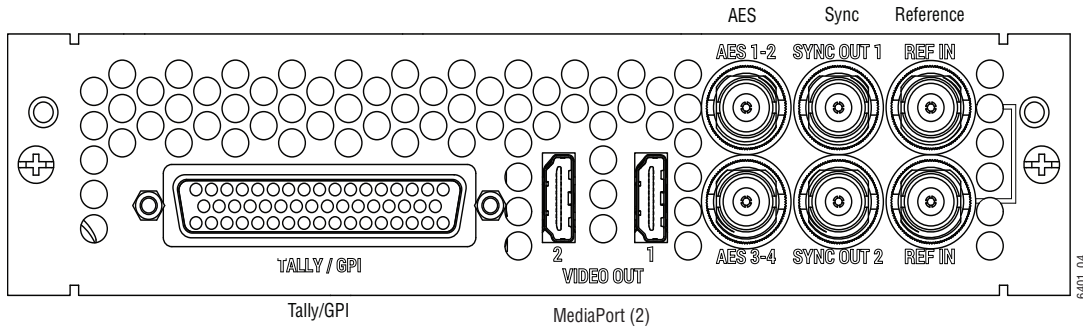
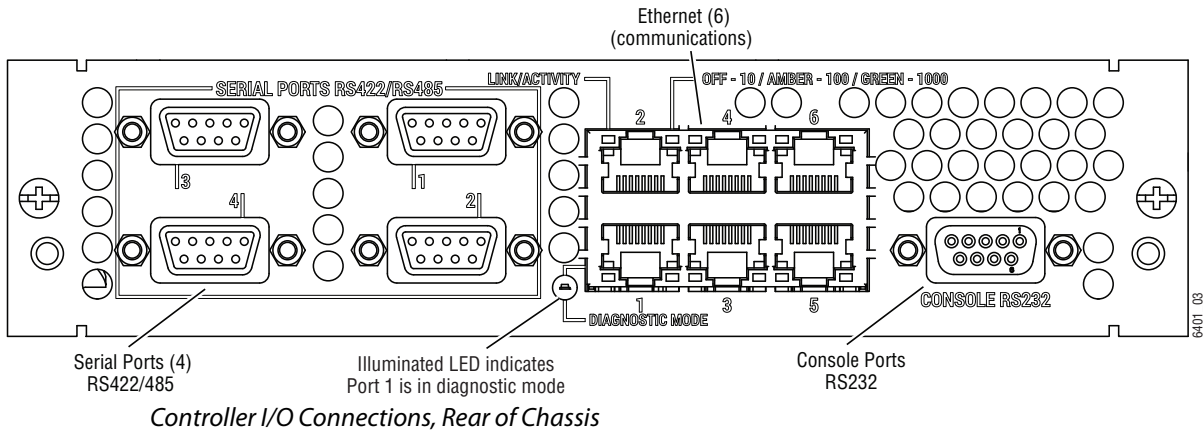
K-Frame V-series Controller Connections and Status Indicators



K-Frame V-series Video Processor Rear View



K-Frame V-series 3-RU, Rear View



K-Frame 13-RU Power Supply AC Requirements

The K-Frame 13-RU Power Supply Frame has provision to support up to three hot swappable power modules. These convert the AC line input to 48V DC for the Video Processor Frame. The cells for the three modules (referred to as left, center, right) are identical and any or all cells can have a module installed. Each cell has its own AC line cord. The supplies are power factor corrected and automatically accommodate low line (120V nominal) or high line (240V nominal). The power supply frame has a rating of 100 – 240 volts, although it is designed and tested for a range of 90 to 264 volts to accommodate under and over voltage conditions. A Compact K-Frame is supplied with one power module. A second power module can be fitted as a redundant power supply option. A 13-RU K-Frame is supplied with two power modules. A third power module can be fitted as a redundant (n+1) power supply option.

K-Frame Compact Power Supply AC Requirements

The K-Frame Compact/S-series chassis has provision to support up to two hot swappable power modules. These convert the AC line input to 48V DC for the Video Processor Frame. The cells for the two modules (referred to as left and right) are identical and either or both

cells can have a module installed. Each cell has its own AC line cord. The supplies are power factor corrected and automatically accommodate low line (120V nominal) or high line (240V nominal). The power supplies have a rating of 100 – 240 volts, although it is designed and tested for a range of 90 to 264 volts to accommodate under and over voltage conditions. A Compact K-Frame is supplied with one power module. A second power module can be fitted as a redundant power supply option.

K-Frame V-series Power Supply AC Requirements

The K-Frame V-series chassis has provision to support up to two hot swappable power modules. These convert the AC line input to 12V DC for the Video Processor Frame. The cells for the two modules (referred to as upper and lower) are identical and either or both cells can have a module installed. Each cell has its own AC line cord. The supplies are power factor corrected and automatically accommodate low line (120V nominal) or high line (240V nominal). The power supplies have a rating of 100 – 120 or 200 – 240 volts. A V-series K-Frame is supplied with one power module. A second power module can be fitted as a redundant power supply option.

3 System Cabling

About the K-Frame System Cabling Section

This section provides overview information that is common to all K-Frame systems as well as information specific to Kayenne, Karrera, and GV Korona K-Frame Control Panels and components.

K-Frame System Cabling Overview

The K-Frame systems use Ethernet, serial, and USB connections and custom multi-pin cables for Kayenne. The K-Frame Video Processors have built-in Ethernet switches. Each Video Processor has Tally outputs and GPI I/O (General Purpose Interface Input/Output) control available.

K-Frame Ethernet Tally Verses Serial Tally

Our K-Frame tally system provides significantly more information than the bandwidth of the serial connection. Therefore, we support Ethernet tally only. However, many tally vendors do support our Ethernet tally system so contact your tally vendor for K-Frame Ethernet tally support information.

Suites and Control Surfaces

A K-Frame system can be divided into two suites. K-Frame Video Processor resources (M/Es, eDPMs, external devices, etc.) can be assigned to each suite, creating two switchers with one K-Frame. Each suite can be subdivided into two control surfaces, using Kayenne, Karrera, GV Korona Control Panels and Soft Panels and Menu on PC. Each control surface is intended for use by a single operator. The K-Frame Control Panel system flexibility permits locating these control surfaces in physically separate locations.

Ethernet Switches

The Ethernet switches built into the K-Frame Video Processor and PCU (Kayenne only) auto-detect speed and polarity, and are 10/100/1000 Mbps capable. Either straight-through or crossover Ethernet cabling can be used. Available Ethernet connectors may be connected to the Facility LAN or other devices, as needed. However, should the K-Frame Video Processor or PCU power down, the internal Ethernet switches will also power down, interrupting communication to devices connected to that K-Frame's or PCU's internal Ethernet switches. Only connect devices that are K-Frame system related.

Customer Supplied Ethernet Routers and Switches

Existing facility Ethernet switches can be used in conjunction with a Kayenne system. If connecting to a network area outside that used by the Kayenne system, use of an appropriately configured Ethernet Router is strongly advised. This reduces network traffic on the Kayenne network and keeps it isolated. Any Ethernet switches added specifically for use with the Kayenne system should be 1000 Mbps capable for the most efficient operation.

Ethernet Specifications

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

To integrate K-Frame devices into an existing network, ask the local network administrator for that network's subnet mask. Before changing IP addresses always set the subnet masks of the K-Frame devices to the mask of the local network.

Factory Default Network Settings

K-Frame System Default IP Addresses

Devices	IP Address
Video Processor Frame CPU	192.168.0.170
Image Store CPU	192.168.0.171
Control Panel Surface 1A	192.168.0.173
Touch Screen Menu Panel 1 (Kayenne/Karrera)	192.168.0.175
Touch Screen Menu Panel 2 (Kayenne/Karrera)	192.168.0.176

K-Frame System Default IP Addresses

Devices	IP Address
Control Panel Surface 1B	192.168.0.177
Control Panel Surface 2A	192.168.0.178
Control Panel Surface 2B	192.168.0.179
Clip Store	192.168.0.180
Kayenne/Karrera only: 32-Crosspoint Remote Aux Panels V1.6.5 and higher software: (hard reset with the front panel buttons)	IP Address: 192.168.1.2 Frame IP: 192.168.1.1 Gateway IP: 192.168.1.1 Subnet Mask 255.255.255.0 Note: 32-Crosspoint Remote Aux Panel default settings must be changed to operate with a Kayenne/Karrera system whose other components are configured with their default IP addresses.
All Subnet Masks)	255.255.255.0
All Gateways (except V1.6.5 software Remote Aux panel)	192.168.0.1
Following Reserved For Future Use	CAUTION: Do not connect any devices configured with the following IP addresses to a Kayenne network.
Video Processor Frame Gigabit Ethernet	192.168.0.172
PCU Panel Reserved LAN Port	192.168.0.174

Note: Customer orders with multiple Control Panels will be pre-configured to the listed IP addresses. However, if one of these additional Control Panels is reset to factory defaults, it will be given the standard 1A default 192.168.0.173 address.

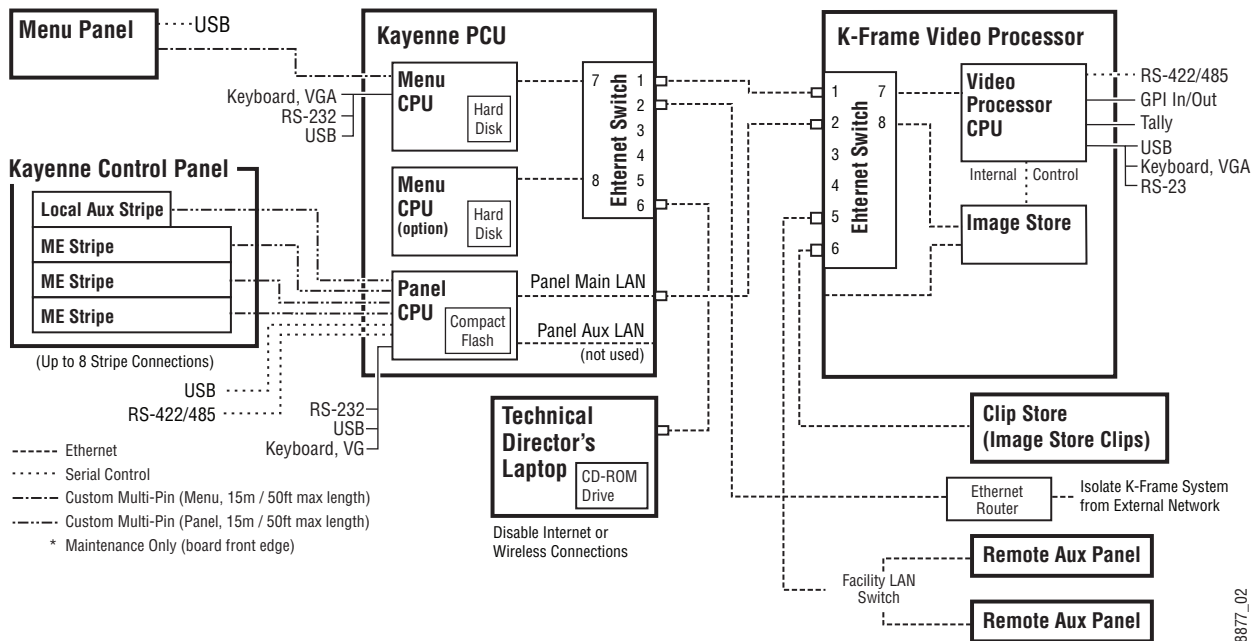
To integrate K-Frame system devices into an existing network, ask the local network administrator for that network's subnet mask. Before changing IP addresses always set the subnet masks of the devices to the mask of the local network.

Kayenne K-Frame System Cabling

USB, Ethernet, and custom multi-pin cabling is used to connect the Kayenne Video Processing Frame, Panel Control Unit (PCU), Control Panel, and Menu Panel components.

In addition to the Video Processing Frame, the PCU also includes a built-in Ethernet Switch.

CAUTION: The facility network used for your K-Frame system (and other video production equipment) should be kept separate from any external network, to prevent network traffic from adversely affecting K-Frame system operation.



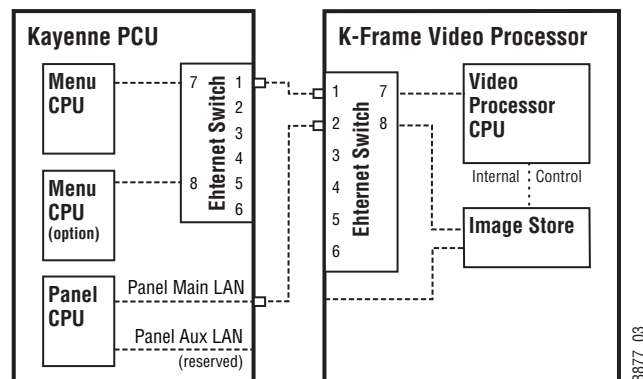
Kayenne K-Frame System Communications Overview

Kayenne Network Cabling

Network connections are required between the K-Frame Video Processor and the PCU. The PCU routes network communications to and from the Control Panel Stripes and Menu Panels, using custom multi-pin cables.

The use of two Ethernet cables to connect the PCU to the K-Frame Video Processor is recommended.

Two Cable PCU Frame Connection



PCU to Kayenne K-Frame Network Connection Methods

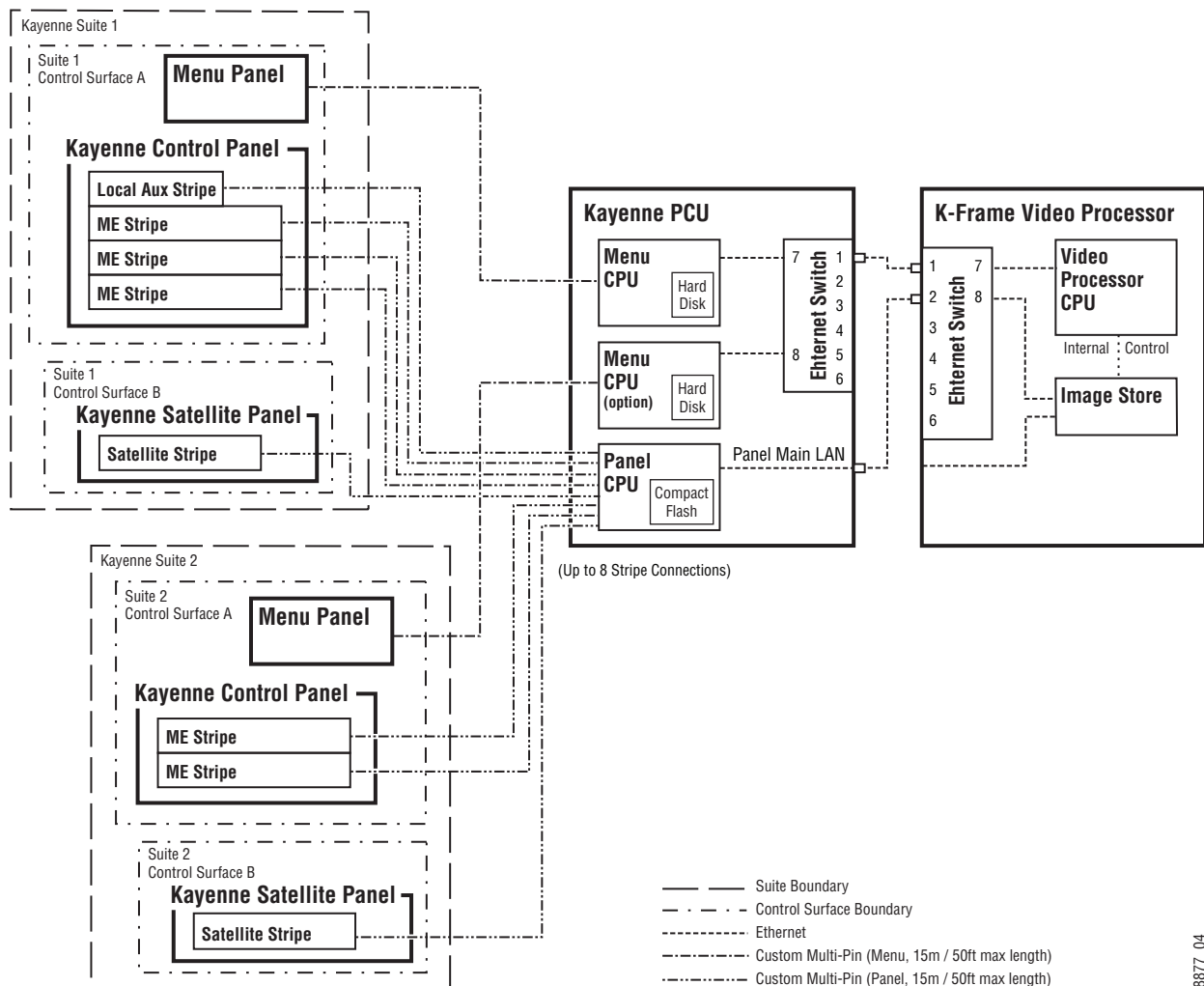
The PCU Ethernet switch to K-Frame Video Processor Ethernet switch cable connection is used for Menu Panel communications. The second cable connects the Panel PCU directly to the K-Frame's Ethernet switch. Using two cables provides additional Ethernet

communications throughput (to support Image Store file operations) and also offers redundancy. Because the Menu Panel and the Control Panel have independent cable connections, failure of one of these cables will not completely disable the K-Frame system. Either the Menu Panel or the Control Panel will remain operational after a single network cable failure.

Kayenne Suites and Control Surfaces

The K-Frame Control Panel system flexibility allows you to locate control surfaces in physically separate locations.

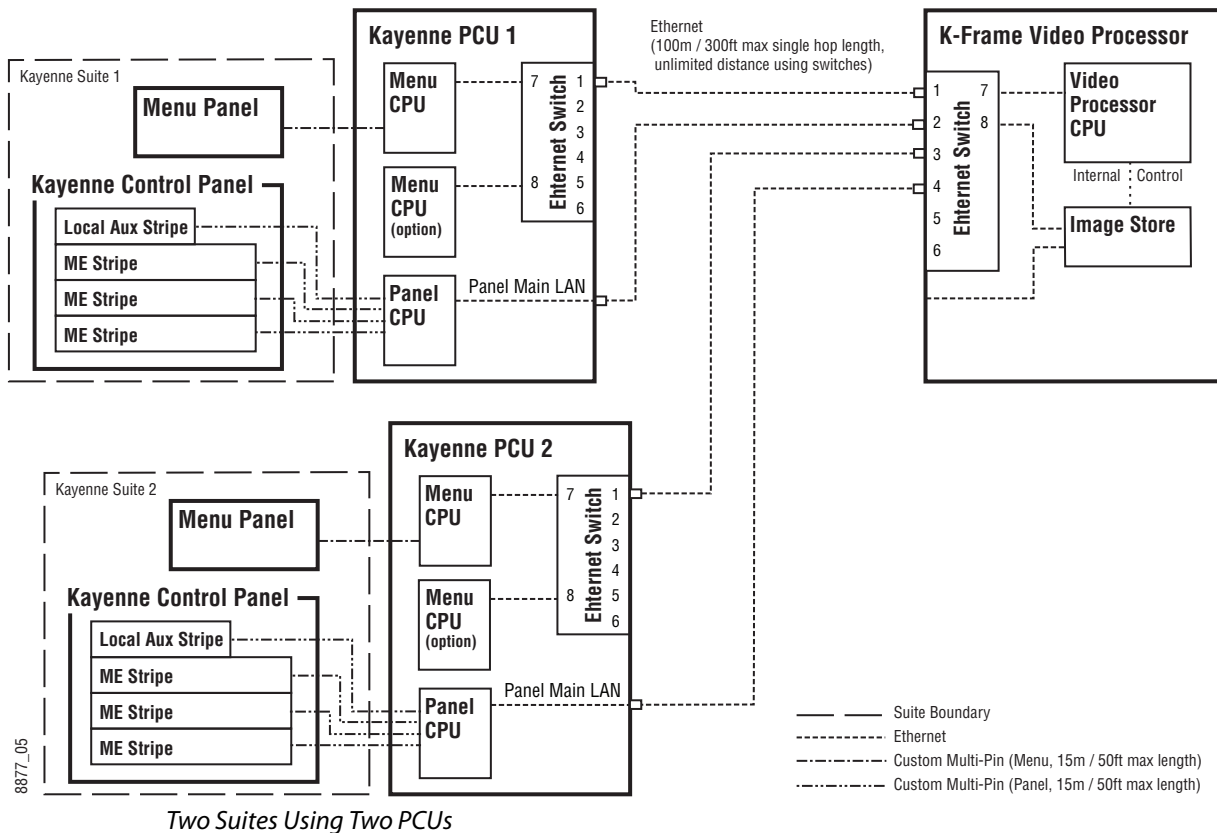
Custom multi-pin cable runs are limited to 15 meters (50 ft.) If this length is sufficient, a single PCU can be used for an entire multi-suite K-Frame system.



Two Kayenne K-Frame Suites with Two Control Surfaces Using One PCU

Using a second PCU, K-Frame suites can be located anywhere on the network, permitting system control from different rooms, floors, or even different buildings.

8877_04



Kayenne Control Panel Cabling

Connectors on the outside bottom of the Control Panel tray connect to numbered ports on the PCU, using special multi-pin cables that carry both power and communications signals. Special cables are also used to connect the Menu Panels to the PCU.

CAUTION: Do not connect or disconnect the multi-pin cables linking a Kayenne Control Panel tray or Menu Panel to the PCU while the PCU is powered up. Damage to the equipment can result.

Kayenne M/E and Local Aux Stripe Connections

It is recommended that the PCU numbered ports be connected to Control Panel Stripes in ascending M/E order, followed by the Local Aux Stripe. PCU port connections can be re-

mapped, but this order matches the default configuration. The table below shows the connections for various Kayenne Control Panel models used in a single suite.

PCU Port to Control Panel Stripe Connections, Single Suite

Control Panel Model	PCU Port	Panel Stripe
4-M/E with Local Aux	1	M/E 1 (top Stripe)
	2	M/E 2 (second Stripe)
	3	M/E 3 (third Stripe)
	4	M/E 4 (bottom Stripe)
	5	Local Aux Stripe
3-M/E with Local Aux	1	M/E 1 (top Stripe)
	2	M/E 2 (second Stripe)
	3	M/E 3 (bottom Stripe)
	4	Local Aux Stripe
2-M/E with Local Aux	1	M/E 1 (top Stripe)
	2	M/E 2 (bottom Stripe)
	3	Local Aux Stripe
1-M/E (without Local Aux)	2	Master EMEM, MFM (top tray)
	1	M/E (bottom tray)

Kayenne Satellite Panel Cabling

PCU Cabling

CAUTION: Do not connect or disconnect multi-pin PCU cables while the PCU is powered up. Damage to the equipment can result.

Each Satellite Panel has a standard multi-pin cable for connection to the PCU. Modules independent of a particular Stripe (for example Device Control or Master E-MEM modules) can use any available PCU connector.

Modules to be associated with a particular Stripe (like a Transition Module) must be connected to the next higher PCU port for that Stripe. For example, if you wish to use a Transition Module with M/E 4 that uses PCU Port 4, plug the Satellite Panel into PCU Port 5, and move the Local Aux Stripe connector (if used) to PCU Port 6.

Internal Cabling

CAUTION: The RJ-45 connectors inside the Satellite Panel trays are used for proprietary communications only. Ethernet devices may be damaged if plugged into these connectors.

The RJ-45 connectors inside the Satellite Panel trays are used for proprietary communications only. Ethernet devices may be damaged if plugged into these connectors.

The Single Module Satellite Panel has internal module cabling the same as the other Stripes. Simply plug the module into a port using the provided cable.

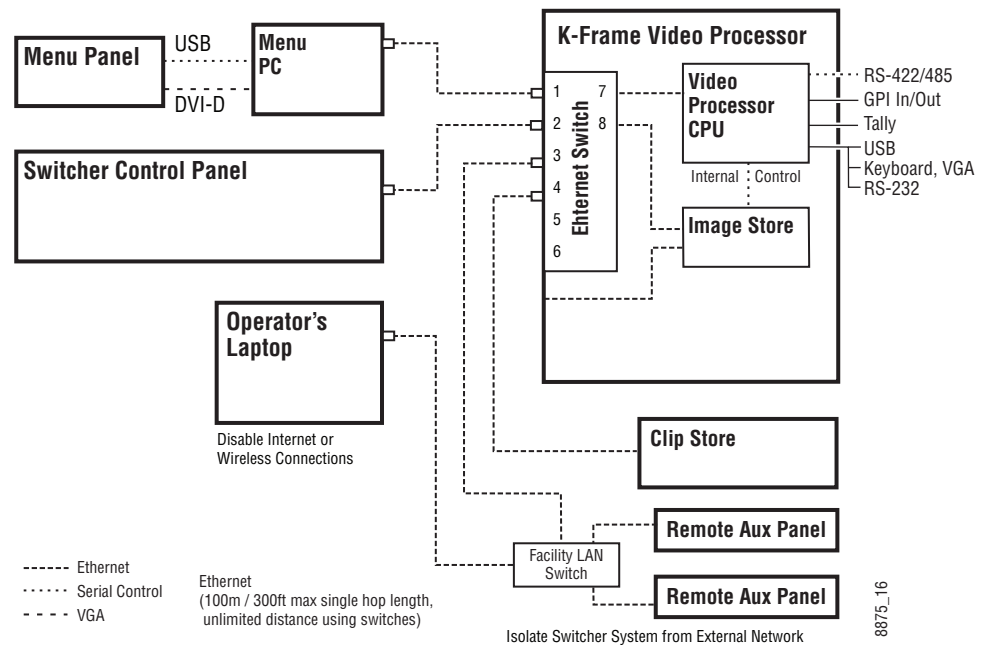
The Double Module Satellite Panel has a similar internal cabling arrangement, but one cable passes through a hole to the other tray.

Kayenne Touch Screen Menu Panels (Used with PCU)

Connect a single or primary Menu Panel to the PCU **Menu 1** connector, using the supplied custom multi-pin cable. Connect an optional second Menu Panel to the **Menu 2** connector. Menu Panels are assigned to suites during system configuration.

Karrera K-Frame System Cabling

The Karrera K-Frame system uses Ethernet, serial, DVI, and USB connections for system communications.

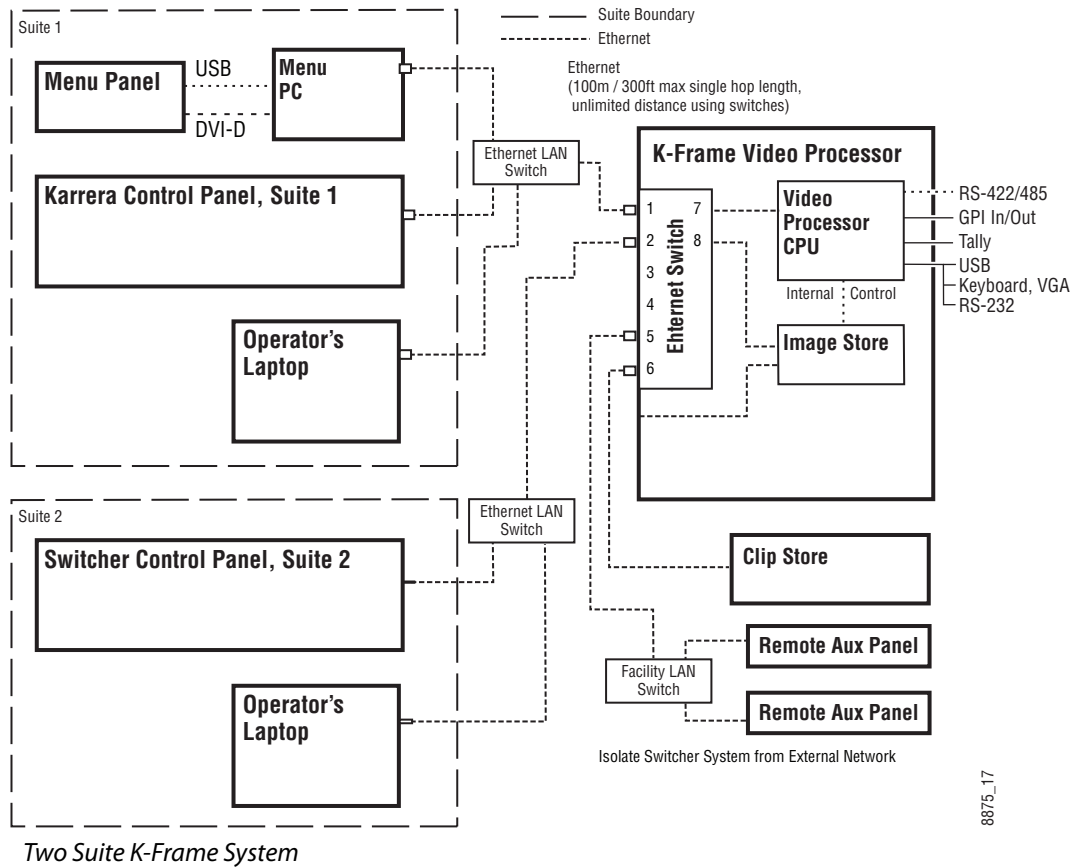


Karrera K-Frame System Communications Overview

CAUTION: The facility network used for your K-Frame system (and other video production equipment) should be kept separate from any external network, to prevent network traffic from adversely affecting K-Frame system operation.

Karrera Suites and Control Surfaces

The K-Frame Control Panel system flexibility allows you to locate control surfaces in physically separate locations. Two dedicated, customer supplied Ethernet switches may be required when multiple suites are being used.

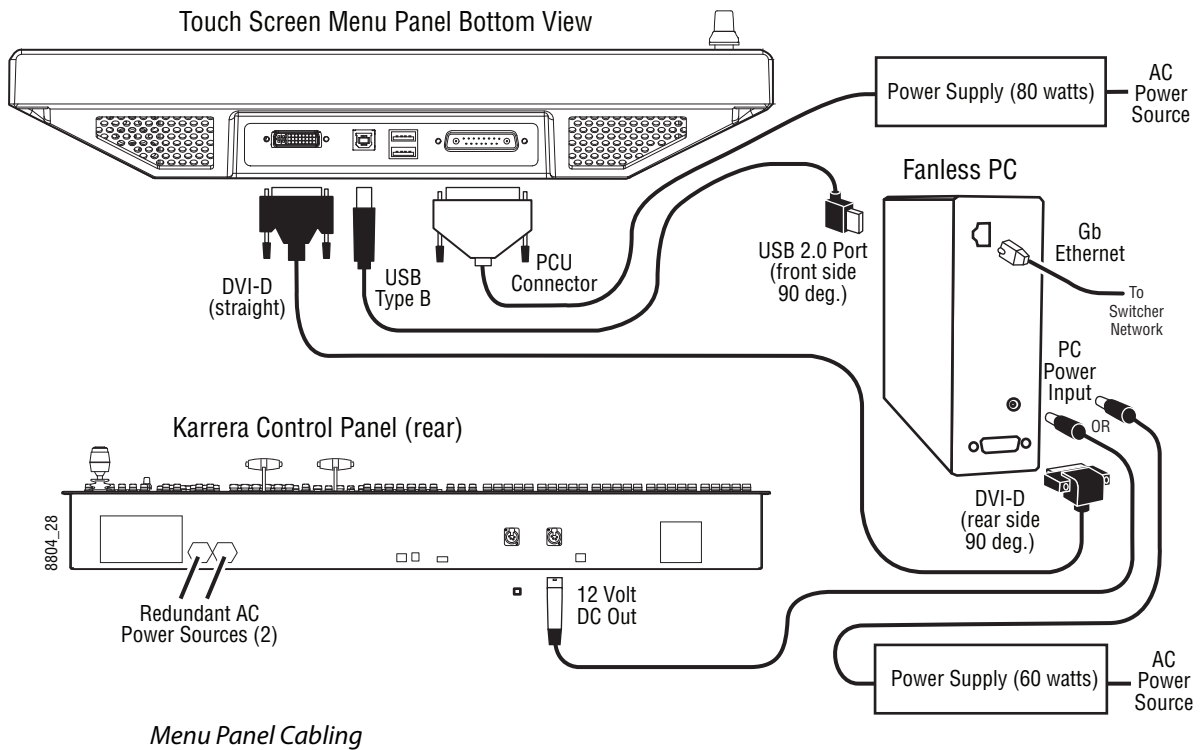


Karrera Control Panel Network Cabling

Ethernet, USB, and DVI-D connections are used between the K-Frame Video Processor, Control Panel, and optional Menu Panel PC.

Optional Touch Screen Menu Panel Cabling

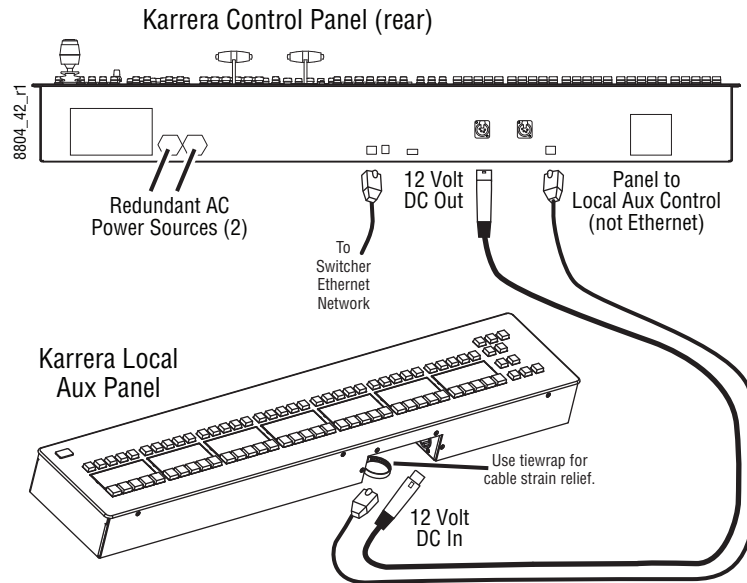
Five connections are required for the Touch Screen Menu option. If the articulated arm is used, some of these cables can be routed through channels in the arm that have covers that snaps into place.



CAUTION: Connect the USB port on the front of the Fanless PC (next to the firewire 1394 port) to the Menu Panel. The default PC settings enable knob control by mapping Com 3 to that front USB port.

Optional Karrera Local Aux Panel Cabling

The Karrera K-Frame Local Aux Panel is powered from the Control Panel, using a 4-pin XLR cable. System control is provided using a RJ-45 connecting cable, which uses a proprietary communications protocol (not Ethernet).

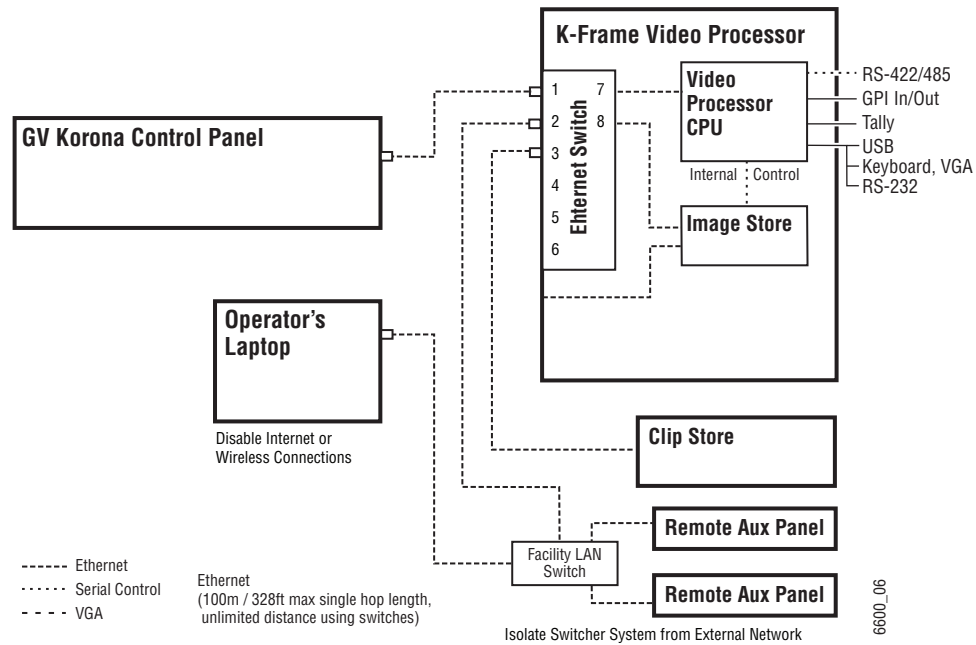


Local Aux Panel Cabling

GV Korona K-Frame System Cabling

The GV Korona K-Frame system uses Ethernet connections for communications. The K-Frame Video Processor has a built-in Ethernet switch. Tally outputs and GPI I/O (General Purpose Interface Input/Output) control are also available on the K-Frame.

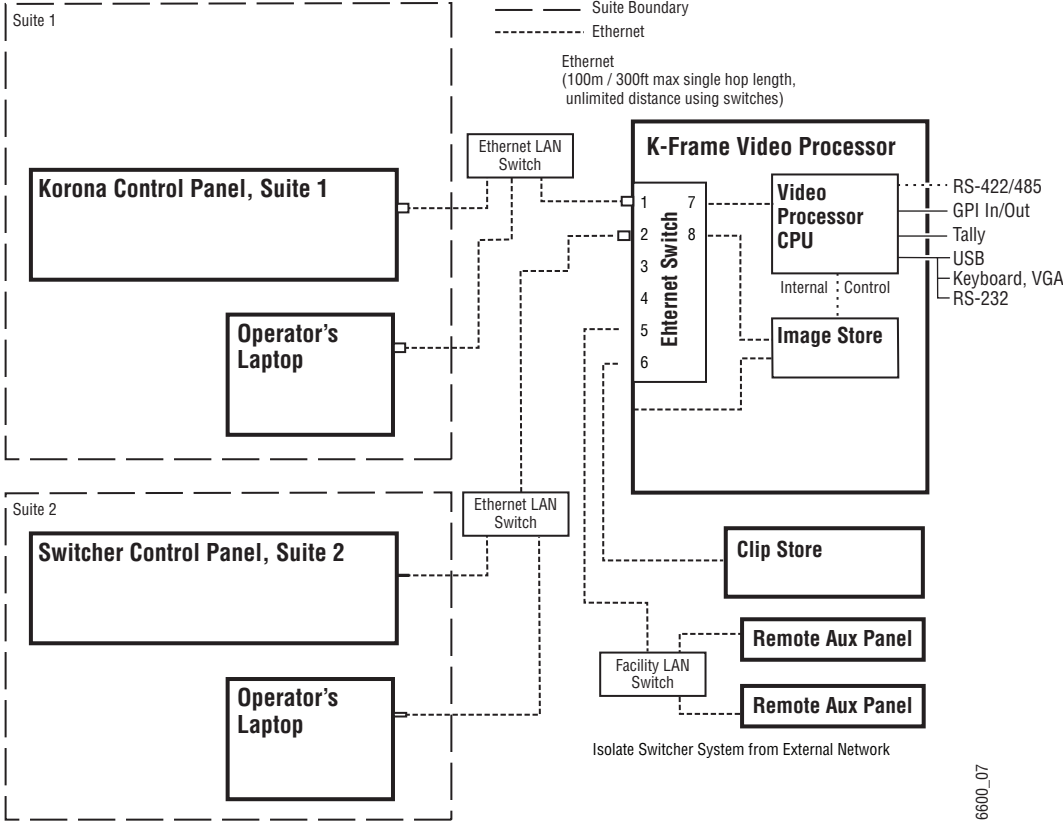
CAUTION: The facility network used for your K-Frame system (and other video production equipment) should be kept separate from any external network, to prevent network traffic from adversely affecting K-Frame system operation.



GV Korona K-Frame System Communications Overview

GV Korona Suites and Control Surfaces

The K-Frame Control Panel system flexibility allows you to locate control surfaces in physically separate locations. Two dedicated, customer supplied Ethernet switches may be required when multiple suites are being used.



Two Suite GV Korona K-Frame System

About K-Frame Video Cabling

All K-Frame system video inputs and outputs are configurable. For cabling configuration flexibility, each external primary input can be mapped to any control panel source select button, as can each internal video system source. Any K-Frame system video signal, such as M/E program, preview, clean feed, or PGM/PST, can be mapped to any output bus to be sent to any output connector, or an output bus can act as an auxiliary bus.

Modular 10GigE IP I/O Fiber Optic Cabling

Grass Valley recommends using OM3 (maximum of 300 meters) or OM4 (maximum of 400 meters) Multi-mode Fiber Optic cabling with the 10GBASE-SR Modules provided with the 10GE IP/IO boards.

Inputs/Outputs Standard, Compact, S-series Frames

Inputs Standard, Compact, S-series

Non-looping video inputs on the back of the Video Processor Frame are numbered 1 through 32 on each input module. Each accepts a 270 MHz, 1.485 Gb, or 3 Gb serial digital video signal.

Outputs Standard, Compact, and S-series

Paired outputs on the back of the Video Processor Frame are numbered 1-16 on each output module. Identical signals are present on each of the paired output connectors. All of the outputs carry the same video format, as determined by the standard selected and the connected reference signals.

Inputs/Outputs V-series Frame

Inputs V-series

Non-looping video inputs on the back of the Video Processor Frame are numbered 1-8 on each Video I/O module. Each accepts a 270 Mb, 1.485 Gb, or 3 Gb serial digital video signal.

Media Port Input

Each Video I/O module also has one Media Port input (labeled **Video In**) for non-broadcast signal source types, such as PCs, cameras, playout (non-HDCP), etc.

Outputs V-series

Outputs on the back of the Video Processor Frame are numbered 1 through 4 on each Video I/O module. All of the outputs carry the same video format, as determined by the standard selected and the connected reference signals.

Media Port Output

The Reference I/O module has two Media Port outputs (labeled **Video Out**) for non-broadcast signal source types, such as PCs, projectors, monitors, disk capture, etc.

Input/Output Port Assignments V-series

Input and Output ports are numbered based on the slot assignment of the Video I/O module, as labeled on the rear of the Video Processor Frame:

- Inputs: Slot **R1**=Ports 1-8, **R2**=Ports 9-16, etc., up to four modules.
- Outputs: Slot **R1**=Ports 1-4, **R2**=Ports 5-8, etc., up to four modules.

Reference Input Standard, Compact, and S-series

The K-Frame Video Processor has digital referencing that can lock to any digital input video signal or one analog looping reference input. Each can be used with any SD/HD/3G/4K standard.

For the analog looping reference input, 75-ohm termination of the looping input can be used either directly, on the adjacent connector, or at the end of a daisy chain looping to other equipment.

Analog Input Sync Rates will show 'Locked' in the Frame Status pane of the Eng Setup, Video Settings menu when the Frame Operating Mode matches a related frequency. For example, a 1080pA/50Hz signal will lock when the Frame is in the 625i/25Hz Frame Operating Mode because 25Hz is 'related' or a divisible of 50Hz.

Reference Input/Output V-series

Reference Input V-series

The K-Frame V-series Video Processor has one analog looping reference, used with any SD/HD/3G/4K standard.

For the analog looping reference input, 75-ohm termination of the looping input can be used either directly on the adjacent connector or at the end of a daisy chain looping to other equipment.

Analog Input Sync Rates will show 'Locked' in the Frame Status pane of the Eng Setup, Video Settings menu when the Frame Operating Mode matches a related reference frequency. For example, a 1080pA/50Hz signal will lock when the Frame is in the 625i/25Hz Frame Operating Mode because 25Hz is 'related' or a factor of 50Hz.

Reference Output V-series

There are two independent Video Sync Outputs (Sync Out 1/Sync Out 2) located on the Reference I/O module on the back of the V-series Frame. The Sync outputs support Bi-level (SD) and Tri-level (HD) Sync. The Sync Mode can be set to output SD or HD (720p, 1080i, and 1080p) sync rates, that can be offset horizontally and vertically in the switcher menu (see the *K-Frame Installation & Service Manual* for more information).

IMPORTANT: For V-series, the output sync vertical interval rate *must* match the switcher Frame Operating Mode vertical rate. However, the output sync line rates and the switcher line rates *do not* have to match.

Supported Media Port Line and Frame Rates

SD

- 720p (1440)x480i 29.97 Hz
- 720p (1440)x576i 25 Hz

HD

- 1280x720p 50/59.94/60 Hz

- 1920x1080i 25/29.97/30 Hz

Note: HDCP is *not* supported.

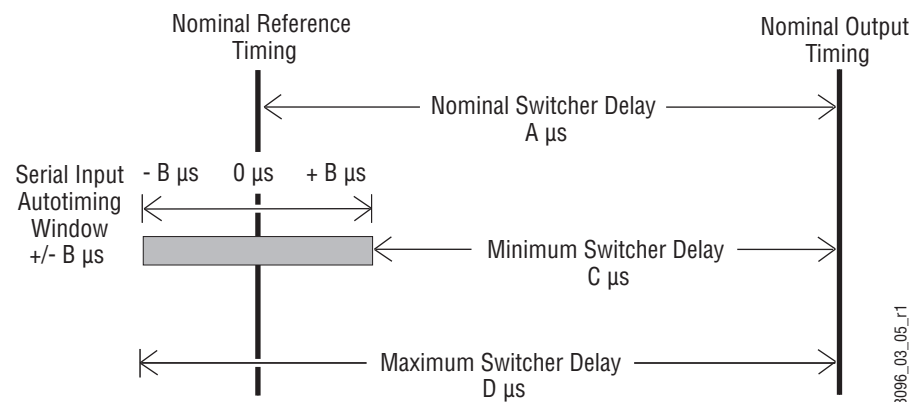
K-Frame System Video Timing and Delay

The total delay of a video input to the switcher output can vary according to the relationship of the input to the switcher reference. The switcher will automatically autotime inputs that fall within an autotiming window. Inputs must be within this range to be properly timed at the output. The calculation of the actual video delay of a specific input is the Nominal Switcher Delay minus the input time location within the autotiming window (the time location value can be zero, positive, or negative).

K-Frame System Timing, 4-M/E System

Frame Operating Mode	A Nominal Switcher Delay	B Autotiming Window	C Minimum Switcher Delay	D Maximum Switcher Delay
525i/29.97	54.91 μ s	+/- 8.69 μ s	46.22 μ s	63.56 μ s
625i/25	55.10 μ s	+/- 8.88 μ s	46.22 μ s	64.00 μ s
720p/59.94/60	20.22 μ s	+/- 2.02 μ s	18.20 μ s	22.24 μ s
720p/50	22.43 μ s	+/- 4.23 μ s	18.20 μ s	26.67 μ s
1080i-1080psf/29.97/30	23.93 μ s	+/- 5.73 μ s	18.20 μ s	29.66 μ s
1080i-1080psf/25	26.88 μ s	+/- 8.68 μ s	18.20 μ s	35.56 μ s
1080psf 23.98/24	27.63 μ s	+/- 9.43 μ s	18.20 μ s	37.04 μ s
1080pA 59.94/60	11.97 μ s	+/- 2.87 μ s	9.1 μ s	14.83 μ s
1080pA 50	13.44 μ s	+/- 4.34 μ s	9.1 μ s	17.78 μ s
1080pB 59.94/60	20.23 μ s	+/- 9.44 μ s	10.79 μ s	29.66 μ s
1080pB 50	23.18 μ s	+/- 12.39 μ s	10.79 μ s	35.56 μ s

A timing diagram of the input autotiming window and various switcher delay values is provided.



Switcher Timing Diagram

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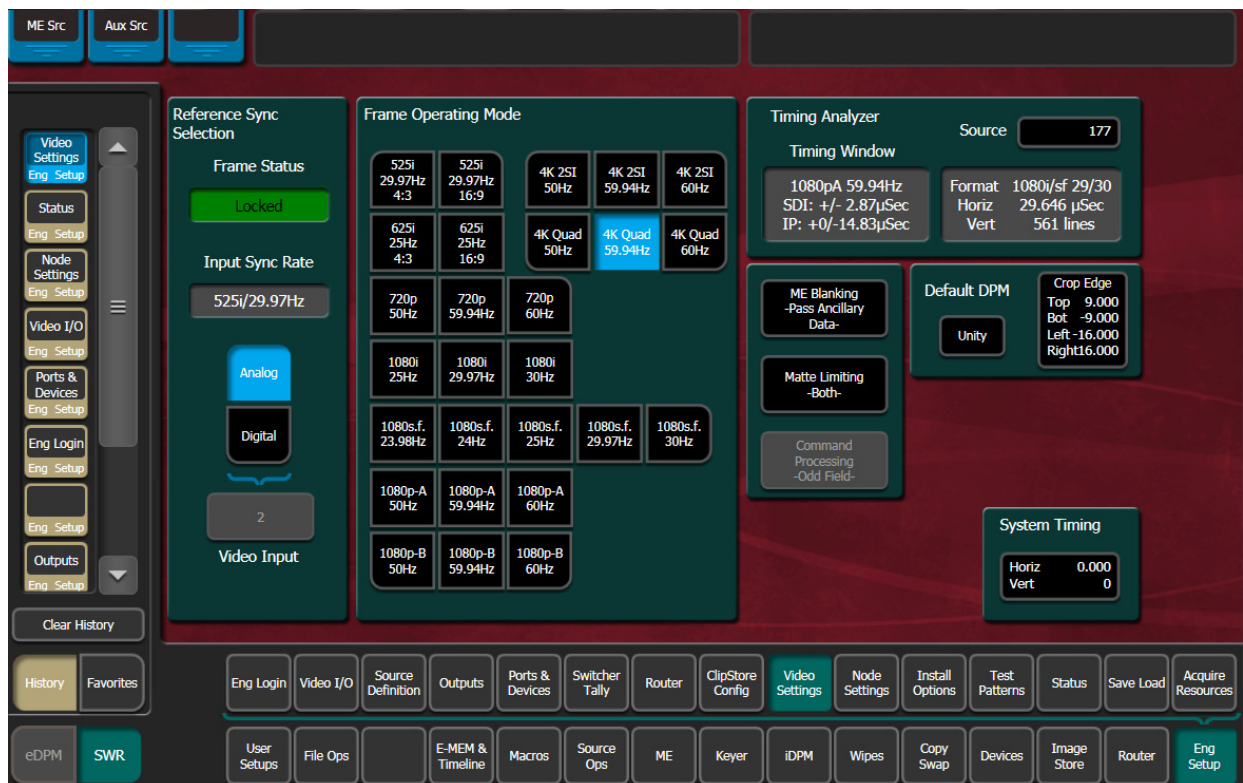
- For inputs entering the switcher in zero time with the reference, the total delay through the switcher is the Nominal Switcher Delay (A μ s).
- Inputs that reach the switcher at the latest point in the autotiming window (+B μ s) will have a total delay that equals the time required for switcher processing. This value is the Minimum Switcher Delay (C μ s).
- Inputs that reach the switcher at the earliest point in the autotiming window (-B μ s) will have a total delay equal to the Nominal Switcher Delay (A μ s) plus the autotiming window range. This value is the Maximum Switcher Delay value (D μ s).

On K-Frame systems the autotiming window varies depending on the operating mode. The Timing Analyzer in the Video Settings Menu displays this autotiming information.

Note: The maximum switcher delay is approximately one line of video.

Timing Analyzer

Use the Eng Setup, Video Settings menu when timing the system.



Video Settings Menu

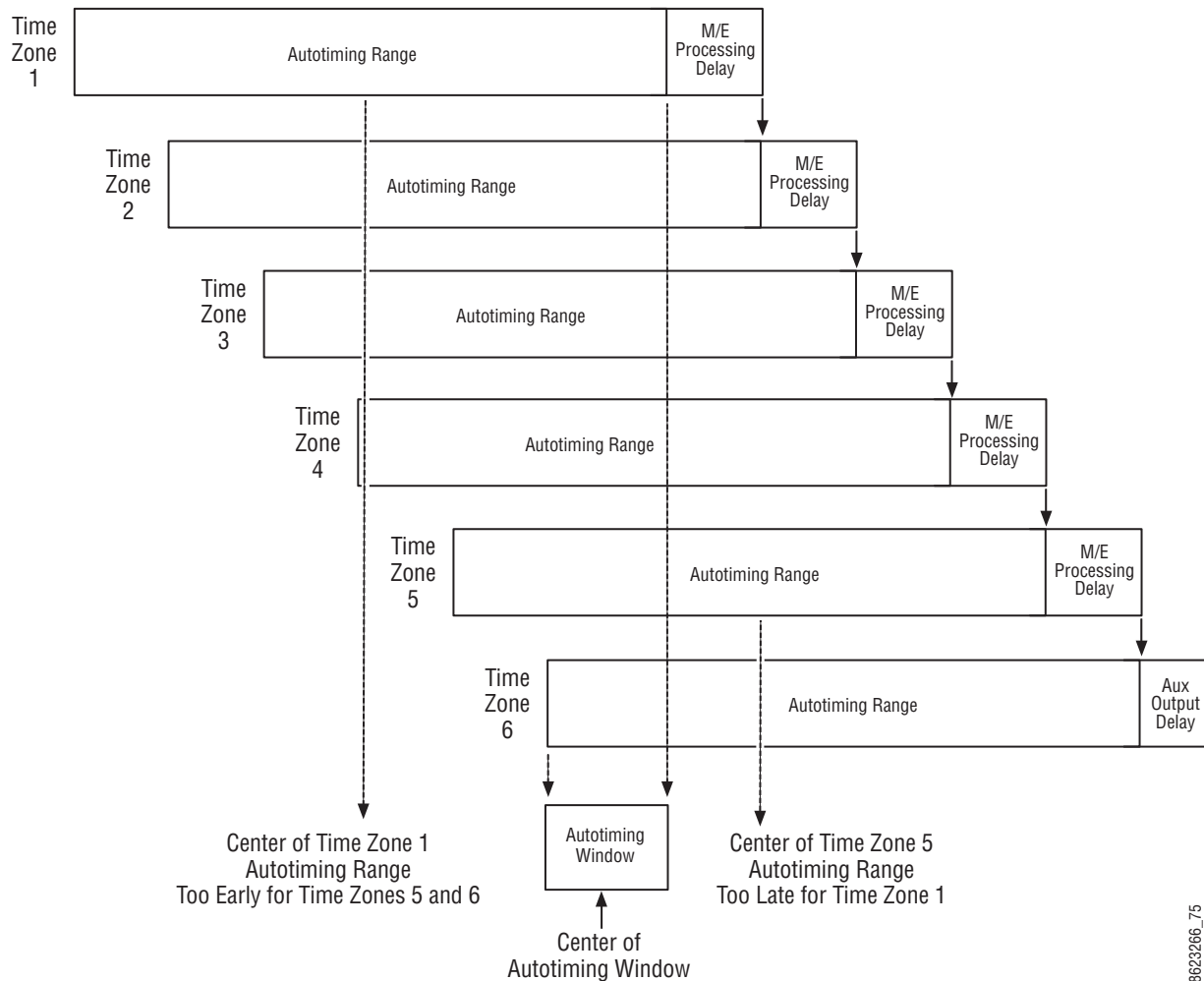
This analyzer reports the timing position of a selected source relative to the K-Frame internal sync generator. The source is selected with the upper right Analyzer Source soft knob and data pad. The relative position of that source is reported in lines and μ s. Positive values indicate the source is later in time than the internal sync generator, and negative values indicate the source is earlier.

K-Frame systems have an autotiming window. Sources that fall within that window will be properly timed throughout the Kayenne K-Frame system, even if the signal is cascaded through multiple M/Es.

The Switcher Horizontal and Switcher Vertical soft knobs adjust the timing of the Kayenne K-Frame system relative to the incoming reference. These values are generally best left at zero.

Time Zones and the Autotiming Window

Each M/E has a fixed amount of delay from its input to output. To allow reentries to remain in time, M/E timings are staggered such that the up stream M/E outputs are earlier in time than down stream M/E inputs. A 5 M/E production switcher has six time zones to accommodate reentry through all the M/Es to any output. When all M/Es are cascaded into each other, the most up stream M/E is in the earliest time zone. Aux buses and other outputs are always in the latest time zone. The overlapping range of all the autotimers is the published autotiming window for the switcher.



Production Switcher Time Zones

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Any source fed to the switcher must be within the autotiming range of all six time zones. If not, the source will be in time on some M/Es but not on others. As illustrated in the figure, a source centered in one time zone's autotiming range can be too early or late for other switcher time zones.

If a signal falls just outside the autotiming window, that image will be shifted one line up or down. On SD systems a shift of one line could be easily seen, but on higher resolution systems the lines are so narrow that a single line shift may be difficult to observe.

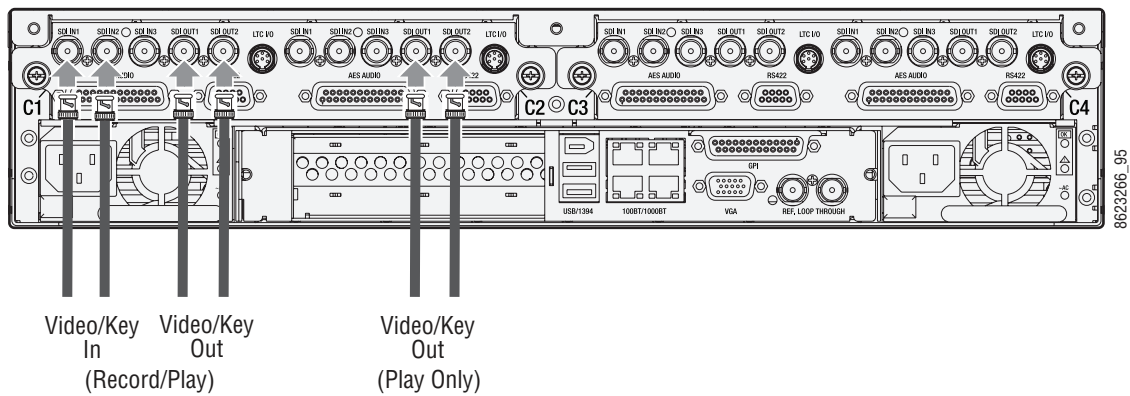
ClipStore Cabling

The K-Frame system uses an Ethernet connection for communications with ClipStore. Ethernet cables are connected from the K-Frame, either directly or through a dedicated Ethernet switch, to the bottom left (of the four) 100BT/1000BT Ethernet ports on the Summit/Solo backplane. Refer to the K2 Summit/Solo manuals included with the your K2 system.

ClipStore Video Cabling

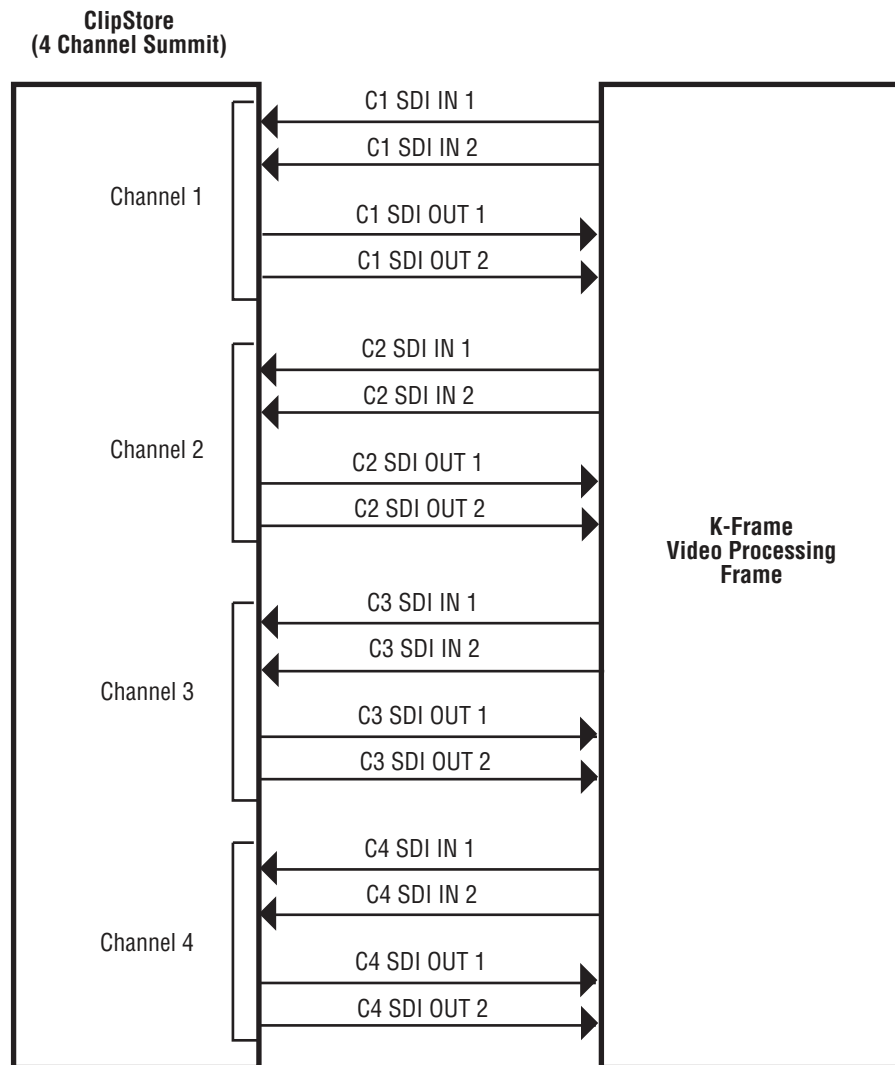
The ClipStore channels on the server backplane are labeled C1-C4 (Channel 1 through Channel 4 on the Summit) from left to right. The Solo backplane is not labeled, Channel 1 is on the left and Channel 2 is on the right when facing the backplane.

ClipStore requires SDI connections for both video and key— two connections In/Out per channel for recording and playback. For playback only, two SDI connections to Out 1 and Out 2 are all that is required per channel.



ClipStore Backplane Connections

The ClipStore server (4-channel Summit/2-Channel Solo) can be connected directly to the frame. It is also possible to connect to the ClipStore directly from a router and not use any switcher outputs.

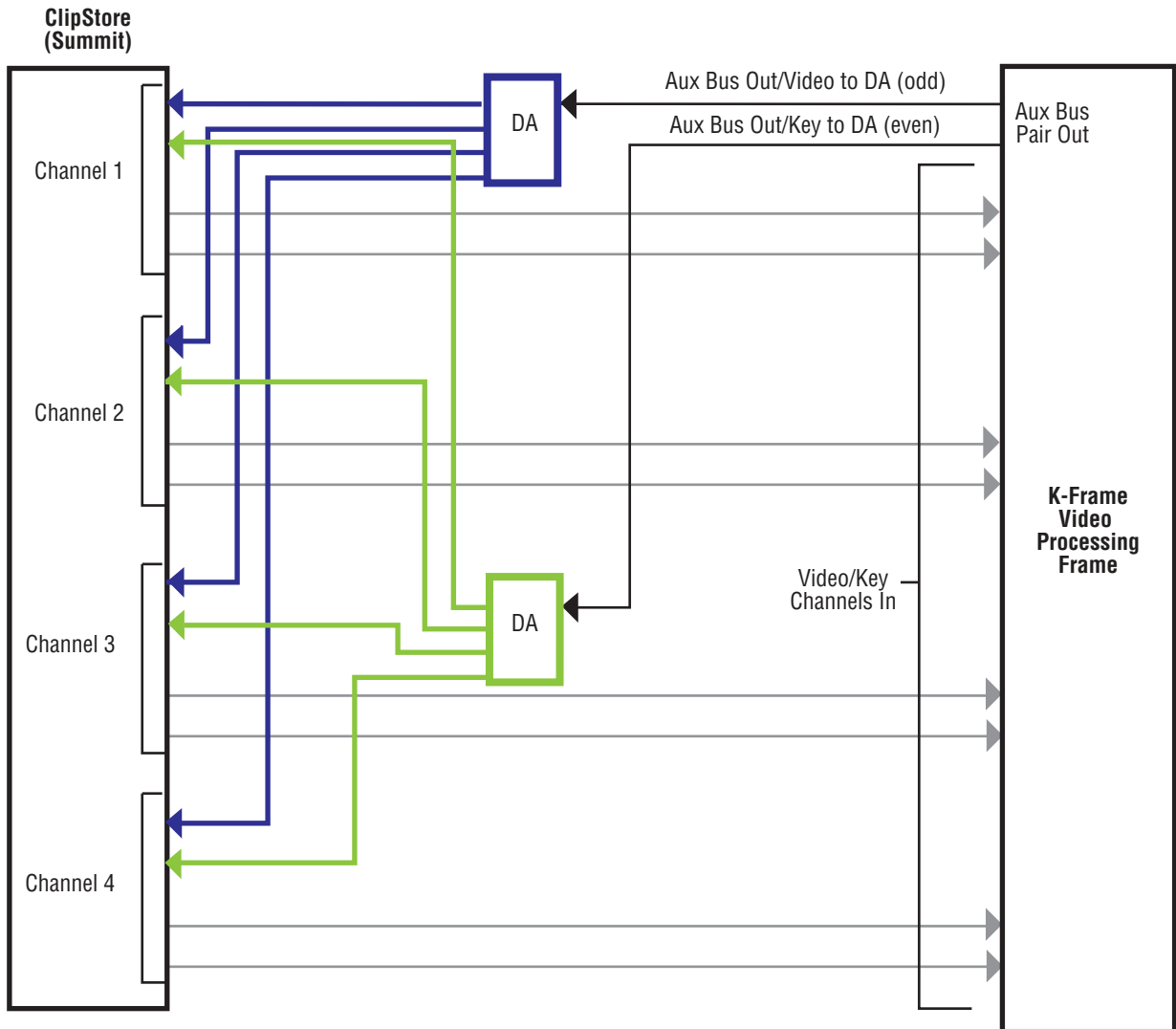


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ClipStore Direct Connection

Odd numbered outputs are used for fill and even are used for cut. The first output assigned to a ClipStore channel must be an odd numbered output.

Also, DAs (Distribution Amplifiers) can be used to distribute K-Frame Aux Bus output. The example shows DAs being used for both the Video and Key Aux Bus outputs from the frame.



ClipStore Connection Using Distribution Amplifiers

Video Processor Frame GPI/Relay Tally Interface

The GPI (General Purpose Interface) and relay tally interface provides a means to transfer commands to and from the switcher to external devices. A one wire per function parallel hardware relay mechanism is used. The nominal contact rating specification for each relay is 1A, 60 V.

GPI and Relay Tally Connections

Each K-Frame Video Input module has a 50 pin female sub-miniature D connector on the rear of the chassis, available for GPI and relay tally. Each connector has 8 GPI Inputs, 8 GPI Outputs and 24 Relay Tally Outputs. Relays are in groups of four with a common ground. The output relays are the same hardware but the GPI is being driven by the GPI output

software and the relay tally is driven by the Relay Tally system software. Relay tally connections can be used to trigger GPIs on external devices.

GPI Inputs

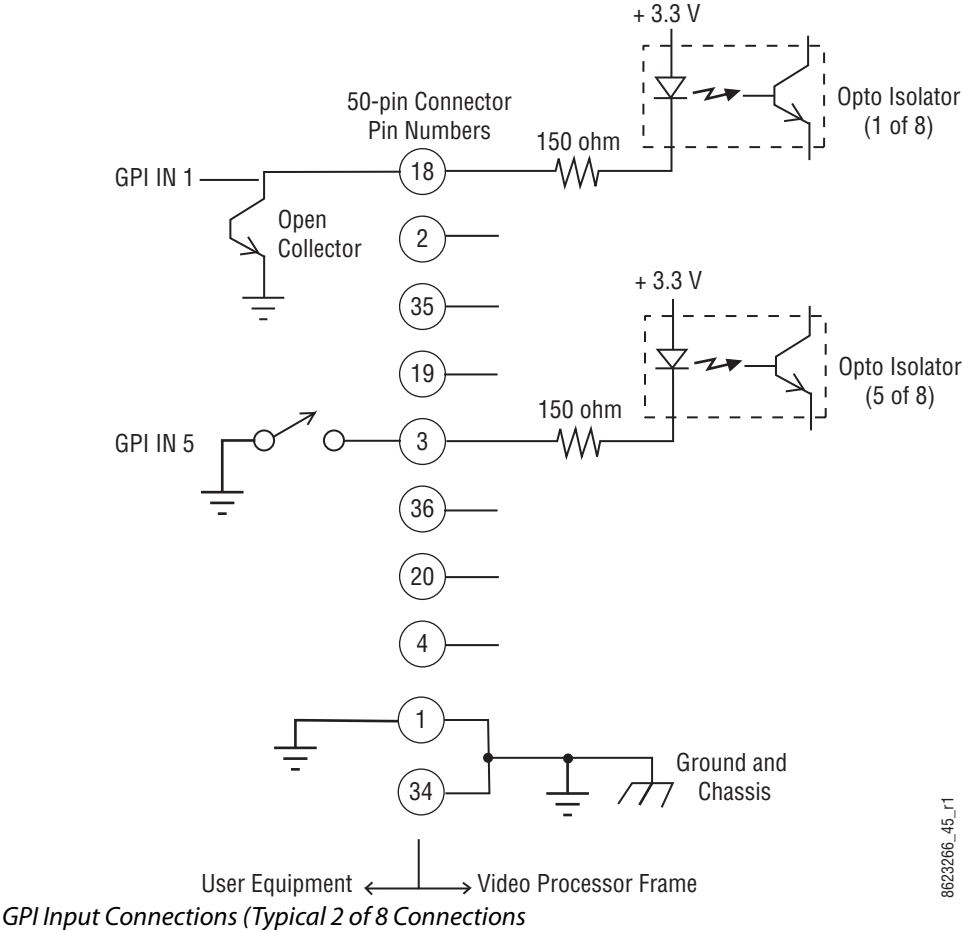
The purpose of the GPI In pins is to provide a stimulus from the external devices to the switcher. A simple connection of two pins activates the corresponding input. An external relay contact or an open-collector output can be employed.

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

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

Since the circuit ground is led out of the device, cabling should be shielded for this kind of control. Non-shielded cables may cause EMC and/or ESD problems. To activate a GPI In you must provide switch closure between a particular GPI In pin and its common (1 or 34). Pins 1 and 34 of each connector is connected to ground. For applications that span across more than one connector, only one ground (common) connection is required.

The following diagram has the GPI inputs on the left.

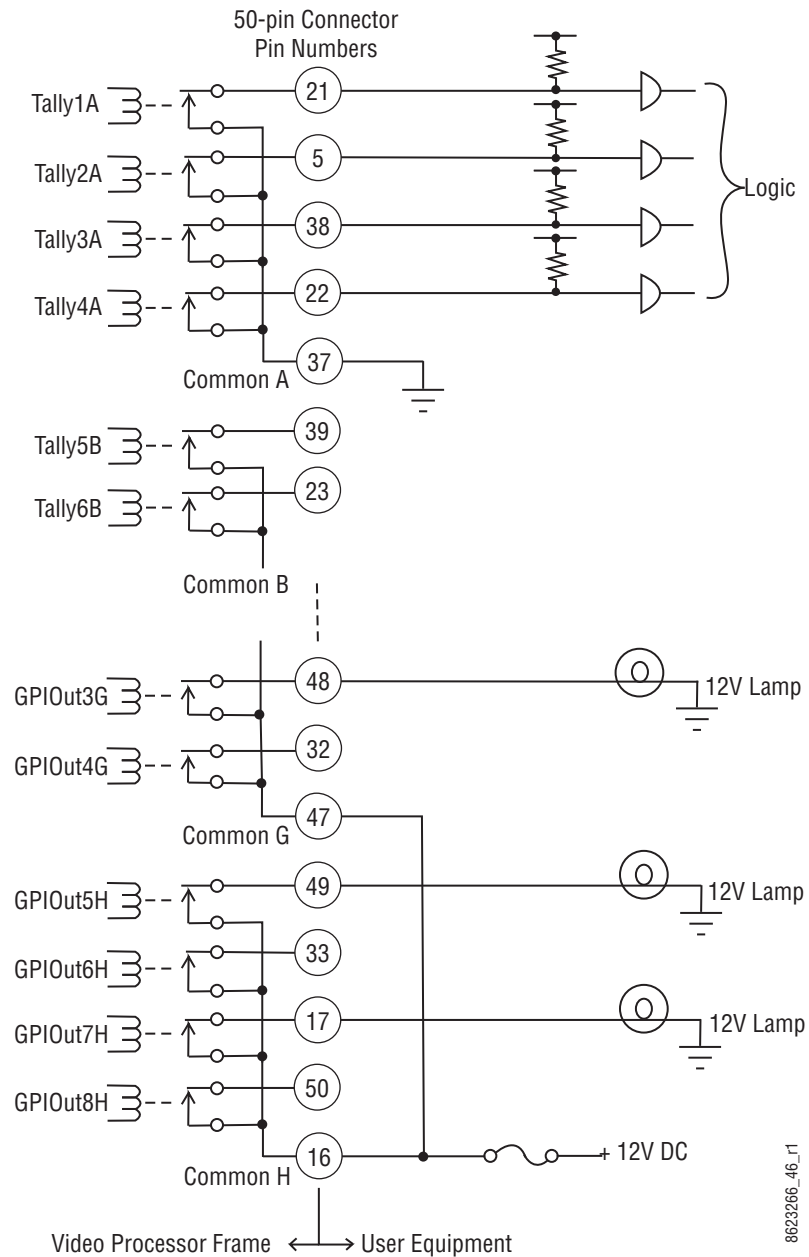


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Relay Tally/GPI Outputs

Relay Tally and GPI Outputs are arranged in groups of four. Each group has its own common connection. These commons can all be tied together, forming one common bus for all the outputs. Alternatively, multiple smaller commons can be constructed to interface with systems that need isolated common connections. This common or isolated bus scheme can extend across multiple connectors. For example, a situation may require two isolated common buses, half of the commons form the first common bus and the other half form the second common bus.

The first four outputs have the common bus tied to ground. This drives a logic system. The last outputs have the common bus tied to +12 volts. This drives a relay tally lamp system. All relays can be used to drive logic or control external circuitry.



Relay Tally and GPI Output Connection Example

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

Relay Tally and GPI Output Specifications

Maximum current for any one output	1 amp AC/DC
Maximum current for any one common	2 amp AC/DC

Relay Tally and GPI Output Specifications

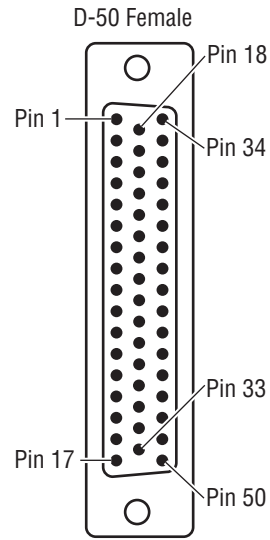
Maximum off (open circuit) voltage between output and common	60 Volts peak
Maximum voltage between any point and ground (chassis)	60 Volts peak

GPI In, GPI Out, Relay Tally Pin Assignments

Each Input Module has a 50 pin connector for GPI and Relay Tally. The connectors are arranged in left to right order on the rear of the Standard (13-RU) K-Frame, and in top to bottom order on the Compact (6RU) K-Frame and V-series (3RU) Frame.

Input Module Connectors

Module Number	Signals	V-series 3RU Frame	Compact/ S-series 6RU Frame	Standard 13RU Frame
1	GPI In 1-8	Yes (Reference I/O Board)	Yes	Yes
	GPI Out 1-8			
	Relay Tally 1-24			
2	GPI In 9-16	No	Yes	Yes
	GPI Out 9-16			
	Relay Tally 25-48			
3	GPI In 17-24	No	No	Yes
	GPI Out 17-24			
	Relay Tally 49-72			
4	GPI In 25-32	No	No	Yes
	GPI Out 25 - 32			
	Relay Tally 73-96			
5	GPI In 33-40	No	No	Yes
	GPI Out 33-40			
	Relay Tally 97-120			



Socket Pinout

GPI Signals

IMPORTANT: For V-series, use the column labeled "1" only.

GPI In, Tally, GPI Out Signals

Ribbon Cable	50-Pin D-Sub		1	2	3	4	5
1	1		GPIInCom	GPIInCom	GPIInCom	GPIInCom	GPIInCom
2		34	GPIInCom	GPIInCom	GPIInCom	GPIInCom	GPIInCom
3		18	GPIIn1	GPIIn9	GPIIn17	GPIIn25	GPIIn33
4	2		GPIIn2	GPIIn10	GPIIn18	GPIIn26	GPIIn34
5		35	GPIIn3	GPIIn11	GPIIn19	GPIIn27	GPIIn35
6		19	GPIIn4	GPIIn12	GPIIn20	GPIIn28	GPIIn36
7	3		GPIIn5	GPIIn13	GPIIn21	GPIIn29	GPIIn37
8		36	GPIIn6	GPIIn14	GPIIn22	GPIIn30	GPIIn38
9		20	GPIIn7	GPIIn15	GPIIn23	GPIIn31	GPIIn39
10	4		GPIIn8	GPIIn16	GPIIn24	GPIIn32	GPIIn40
11		37	TallyComA	TallyComJ	TallyComS	TallyComAA	TallyComAG
12		21	Tally1A	Tally25J	Tally49S	Tally73AA	Tally97AG
13	5		Tally2A	Tally26J	Tally50S	Tally74AA	Tally98AG
14		38	Tally3A	Tally27J	Tally51S	Tally75AA	Tally99AG
15		22	Tally4A	Tally28J	Tally52S	Tally76AA	Tally100AG
16	6		TallyComB	TallyComK	TallyComT	TallyComAB	TallyComAH
17		39	Tally5B	Tally29K	Tally53T	Tally77AB	Tally101AH

GPI In, Tally, GPI Out Signals

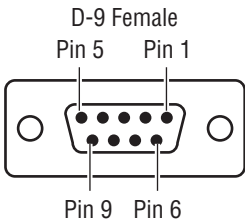
Ribbon Cable	50-Pin D-Sub		1	2	3	4	5
18		23	Tally6B	Tally30K	Tally54T	Tally78AB	Tally102AH
19	7		Tally7B	Tally31K	Tally55T	Tally79AB	Tally103AH
20		40	Tally8B	Tally32K	Tally56T	Tally80AB	Tally104AH
21		24	TallyComC	TallyComL	TallyComU	TallyComAC	TallyComAJ
22	8		Tally9C	Tally33L	Tally57U	Tally81AC	Tally105AJ
23		41	Tally10C	Tally34L	Tally58U	Tally82AC	Tally106AJ
24		25	Tally11C	Tally35L	Tally59U	Tally83AC	Tally107AJ
25	9		Tally12C	Tally36L	Tally60U	Tally84AC	Tally108AJ
26		42	TallyComD	TallyComM	TallyComV	TallyComAD	TallyComAK
27		26	Tally13D	Tally37M	Tally61V	Tally85AD	Tally109AK
28	10		Tally14D	Tally38M	Tally62V	Tally86AD	Tally110AK
29		43	Tally15D	Tally39M	Tally63V	Tally87AD	Tally111AK
30		27	Tally16D	Tally40M	Tally64V	Tally88AD	Tally112AK
31	11		TallyComE	TallyComN	TallyComW	TallyComAE	TallyComAL
32		44	Tally17E	Tally41N	Tally65W	Tally89AE	Tally113AL
33		28	Tally18E	Tally42N	Tally66W	Tally90AE	Tally114AL
34	12		Tally19E	Tally43N	Tally67W	Tally91AE	Tally115AL
35		45	Tally20E	Tally44N	Tally68W	Tally92AE	Tally116AL
36		29	TallyComF	TallyComP	TallyComX	TallyComAF	TallyComAM
37	13		Tally21F	Tally45P	Tally69X	Tally93AF	Tally117AM
38		46	Tally22F	Tally46P	Tally70X	Tally94AF	Tally118AM
39		30	Tally23F	Tally47P	Tally71X	Tally95AF	Tally119AM
40	14		Talley24F	Tally48P	Tally72X	Tally96AF	Tally120AM
41		47	GPIOutComG	GPIOutComQ	GPIOutComY	GPIOutComAG	GPIOutComAJ
42		31	GPIOut1G	GPIOut9Q	GPIOut17Y	GPIOut25AG	GPIOut33AJ
43	15		GPIOut2G	GPIOut10Q	GPIOut18Y	GPIOut26AG	GPIOut34AJ
44		48	GPIOut3G	GPIOut11Q	GPIOut19Y	GPIOut27AG	GPIOut35AJ
45		32	GPIOut4G	GPIOut12Q	GPIOut20Y	GPIOut28AG	GPIOut36AJ
46	16		GPIOutComH	GPIOutComR	GPIOutComZ	GPIOutComAH	GPIOutComAK
47		49	GPIOut5H	GPIOut13R	GPIOut21Z	GPIOut29AH	GPIOut37AK
48		33	GPIOut6H	GPIOut14R	GPIOut22Z	GPIOut30AH	GPIOut38AK
49	17		GPIOut7H	GPIOut15R	GPIOut23Z	GPIOut31AH	GPIOut39AK
50		50	GPIOut8H	GPIOut16R	GPIOut24Z	GPIOut32AH	GPIOut40AK

RS-422/485 Port Pin Assignments

Eight RS-422/485 ports (four for V-series) are available on the rear of the K-Frame Video Processor, and can be used to control various devices, or for switcher control by an external controller.

Note: The Frame serial port pinout is automatically configured based on assignment. The Frame is the bus controller when controlling external devices and PBus. The Frame is a tributary when controlled by an editor.

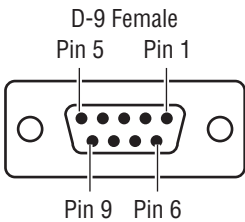
RS-422/485 Pinouts

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

RS-232 Port Pin Assignments

RS-232 serial ports are located on each processor board (Video Processor, Panel Processor, Menu PC and Controller I/O for V-series), available for maintenance and diagnostics. Standard VGA and keyboard ports (located at the rear for V-series), present on all processor boards, are also available for maintenance.

RS-232 Pinouts

Socket	Pin	Signal
 <p>D-9 Female Pin 5 Pin 1 Pin 9 Pin 6</p>	1	Chassis Ground
	2	Transmit Data
	3	Receive Data
	4	Not used
	5	Signal Ground
	6	Not used
	7	Clear to Send
	8	Request to Send
	9	Not used

A Specifications

K-Frame Video Processor Specifications

K-Frame Video Standards

3G Modes	
1080p 50/59.94/60, Level A and Level B	SMPTE 424M-2006
HD Modes	
1080i 29.97/30	SMPTE 274M Tables 4 and 5
1080i 25	SMPTE 274M Tables 6
1080psf 23.976/24/25/29.97	SMPTE RP211 Table 12-16
720p 50/59.94/60	SMPTE 296 Table 1-3
SD Modes	
525i 29.97	SMPTE 259M
625i 25	SMPTE 259M

K-Frame Mechanical

Component	Depth	Width	Height	Weight ^a	Rack Units
Standard 13-RU K-Frame	566.2 mm (22.29 in.)	482.8 mm (19 in.)	577.1 mm (22.72 in.)	55 kg (121 lbs.)	13
Power Supply Frame (Standard)	492 mm (19.73 in.)	483.1 mm (19 in.)	44 mm (1.75 in.)	11 kg (24lbs.) (Two PS modules, each weigh 2.5 kg (5.4 lbs.). Up to three modules supported.	1
Compact 6-RU/Compact S-series K-Frame	558.8 mm (22.0 in.)	482.8 mm (19 in.)	266 mm (10.47 in.)	31 kg. (68 lbs.)	6
V-series 3RU	563.5 mm (21.2 in.)	482.6 mm (19.0 in.)	132.6 mm (5.2in.)	28 kg (66.4 lbs.) (Two PS modules each weigh 1 kg (2.2lbs.)	3

a. All weights approximate.

K-Frame Environmental

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 and -2)

K-Frame Network Connections

Type of connection	10/100/1000 Base T
Protocol	TCP(UDP)/IP, Auto speed detection. Auto crossover cable configuration.
Cable and connectors	CAT5 UTP, RJ45 connectors
Max. Cable Length	100m / 300ft

Note: The K-Frame Video Processor has an internal Ethernet switch with six available external ports. One connection is required for each Control Panel and one is required for each Menu PC. An external Ethernet switch is required to connect more than six devices.

K-Frame Video Processor Power Supply

K-Frame Video Processor Power Supply	
Line voltage	100V-240V AC +/-10% autorange, power factor corrected. Automatic line-voltage sensing for 120V and 240V sources.
Line frequency	50/60Hz +/- 5%
Power consumption	13-RU K-Frame, max. 1400W 6-RU (Internal Power Supplies) K-Frame, max. 750W 3-RU 500W
Leakage current	< 2.5 mA
Interconnect DC cable length	864 mm/34 in.

K-Frame—Number of M/Es, Inputs, and Outputs

Frame	M/Es	Inputs	Outputs	GPI Inputs	GPI/Tally Outputs	Smart I/O Modules (MatchDef/SetDef)
Standard 13-RU	1 to 9	32 to 160 plus up to 32 MatchDef	16 to 64 dual plus up to 32 SetDef	8 per input board 32 per input board		Each Smart I/O module provides 4 inputs and 4 outputs with up/down/cross conversion capability
Compact 6-RU/ Compact S-series	1 to 6	32 to 64 plus up to 16 MatchDef	16 to 32 dual plus 4 to 16 SetDef			

K-Frame—Number of M/Es, Inputs, and Outputs

Frame	M/Es	Inputs	Outputs	GPI Inputs	GPI/Tally Outputs	Smart I/O Modules (MatchDef/SetDef)
V-series 3-RU	1 to 5	8 to 32 SDI, 1-4 Media Ports	4-16 with 2 Media Ports	8 per Frame	32 per Frame	N/A

Board Count

Standard 13-RU	Up to 4 M/E boards	Up to 5 input boards (32 inputs per input board)	Up to 4 output boards (16 dual outputs per output board)		Up to 8 modules
Compact 6-RU/ Compact S-series	Up to 2 M/E boards	Up to 4 input boards (32 inputs per input board)	Up to 2 output boards (16 dual outputs per output board)		Up to 4 modules
V-series 3-RU	1 M/E board	Up to 4 I/O boards (8 SDI and one Media Port input per board)	Up to 4 I/O boards (4 SDI and one Media Port per board)		N/A

K-Frame Serial Digital Video Inputs

Format	ITU-R656, SMPTE 259M, 270 Mbit/s. SMPTE 292M, 1.485 Gbit/s SMPTE 424M-2006, 3 Gbit/s
Return loss	>10 dB, 1.5GHz to 3GHz
Type of Connector	75 ohm BNC (SMPTE 259M)
Nominal Amplitude	800mV peak-to-peak terminated
Channel Coding	Conforms to SMPTE 259M, SMPTE 292M
Ancillary Data	Blanked or passed (user selectable)
Embedded audio	Blanked or passed (user selectable)
EDH	Blanked
Input Impedance	75 ohm
Max cable length	SD Video 350 meters (1148 ft.) using Belden 1694A type cable HD Video 200 meters (656 ft.) using Belden 1694A type cable 3G Video 140 meters (459 ft.) using Belden 1694A type cable

K-Frame Serial Digital Video Outputs

Format	ITU-R656, SMPTE 259M, 270 Mbit/s. SMPTE 292M, 1.485 Gbit/s SMPTE 424M-2006, 3 Gbit/s
Return loss	>10 dB, 1.5GHz to 3GHz
Type of Connector	75 ohm BNC (SMPTE 259M)
Nominal Amplitude	800 mv peak-to-peak across 75 ohm +/- 10%
Rise & Fall Times	400 to 1400 picoseconds 75 ohm termination between 20% and 80% amplitude
Timing Jitter	£ 1 UI R 601/656
Alignment jitter	£ 2 UI (SD), £ 1 UI (HD)
Output Impedance	75 ohm
DC Offset	< 50mV with 75 ohm termination

V-series Reference Output

Return loss	>40 dB, 0 to 5MHz
Nominal Amplitude	1Vpp into a 75 ohm load

Certifications and Compliances

FCC Emission Control

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. Changes or modifications not expressly approved by Grass Valley Group can affect emission compliance and could void the user's authority to operate this equipment.

Canadian EMC Notice of Compliance

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

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

EN55022 Class A Warning

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

Canadian Certified Power Cords

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

Canadian Certified AC Adapter

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

FCC Emission Limits

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesirable operation.

Certification

This product has been evaluated for Electromagnetic Compatibility under the EN 55103-1/2 standards for Emissions and Immunity and meets the requirements for E4 environment.

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

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

Category	Standard	Designed/tested for compliance with:
Safety	UL 60950	UL 60950-1 Issue 2007/03/27 Ed. 2 Information Technology Equipment-Safety Part 1 General Requirements.
	IEC 60950	IEC 60950-1 Issue: 2005/12/08 Ed. 2 Information Technology Equipment-Safety Part 1 General Requirements; Corrigendum 1: 8/2006; Amendment 1: 2009/12/17.
	CAN C22.2, No. 60950	C22.2 #60950-1 Issue 2007/03/01 Ed. 2 Information Technology Equipment-Safety-Part 1 General Requirements.
	EN60950	Safety of Information Technology Equipment, including Electrical Business Equipment.
	2006/95/EC	Low Voltage Directive

Category	Standard	Designed/tested for compliance with:
EMC	EMC Directive 2004/108/EC via EN 55103-1 and 2	Audio, Video and Entertainment Lighting Control for the European Community.
	EN55103-1 : 2009	Electromagnetic compatibility. Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use. Part 1 Emissions, Environment E4 EN 55022: Class A Radiated Emissions EN 61000-3-2: Powerline Harmonic Emissions EN 61000-3-3: Voltage Fluctuations "Flicker" EN 55022: Class A Conducted Emissions Radiated Magnetic Field Emissions Peak Inrush Current
	EN55103-2 : 2009	Electromagnetic compatibility--Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use. Part 2 Immunity, Environment E4 EN 61000-4-3: Radiated RF Immunity EN 61000-4-2: Electrostatic Discharge "ESD" EN 61000-4-4: Electrical Fast Transients "EFT" EN 61000-4-11: Voltage Dips & Fluctuations EN 61000-4-5: Power Line Surge EN 61000-4-6: Conducted RF Immunity Radiated Magnetic Field Immunity
	US FCC Class A	CISPR Pub. 22 (1985)
	Canada FCC Industry Canada	ICES-003
Australia & New Zealand:	AS/NZS 3548	

DEKRA Certificate

Certifying that Grass Valley product meets the ISO 9001: 2008 standard.

CERTIFICATE

Certificate Number: 510040.001

The Quality System of:

Grass Valley, A Belden Brand and its Grass Valley Affiliates

Headquarters: 3499 Douglas-B Floreani St. Laurent, Quebec H4S 2C6 Canada	3030 NW Aloclek Drive Hillsboro, OR 97124 United States
Street Bergschot 69 4817 PA Breda The Netherlands	125 Crown Point Court Grass Valley, CA 95945 United States

Including its implementation, meets the requirements of the standard:

ISO 9001:2008

Scope:

St. Laurent HQ: The design, manufacture and support of video and audio products and systems.

Grass Valley and Hillsboro: Design, outsource manufacture and support.

Breda: Design, manufacture, including outsource manufacture, and support.

This Certificate is valid until: June 14, 2018
This Certificate is valid as of: June 14, 2015
Certified for the first time: June 14, 2000

Dr. Cem O. Onus
Managing Director, Business Assurance
DEKRA Certification, Inc.

The method of operation for quality certification is defined in the DEKRA Master Services Agreement. Integral publication of this certificate is allowed.

DEKRA Certification, Inc.
1120 Welsh Road, Suite 210
North Wales, PA 19454
USA
Ph: (215)997-4519
Fax: (215)997-3810
ISO 9001 Cert 02662015 Rev C

Accredited By:
ANAB





Grass Valley Technical Support

For technical assistance, contact our international support center, at 1-800-547-8949 (US and Canada) or +1 530 478 4148.

To obtain a local phone number for the support center nearest you, please consult the Contact Us section of Grass Valley's website (www.grassvalley.com).

An online form for e-mail contact is also available from the website.

Corporate Head Office

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