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**KAYENNE/KARRERA/GV
KORONA**

GV K-FRAME XP

Video Production Center

Installation & Service Manual

VERSION 16.0

076159401-AD

2021-10-15

FCC Compliance

In order to comply with FCC/CFR47: Part 15 regulations, it is necessary to use high-quality triple-screened Media or Monitor cable assemblies with integrated ferrite suppression at both ends.

Patent Information

This product may be protected by one or more patents.

For further information, please visit: www.grassvalley.com/patents/

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Part Number 076159401-AD

Revision 2021-10-15

Important Safety Information

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



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



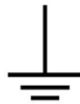
Indicates that the user, operator or service technician should refer to the product manuals for important operating, maintenance, or service instructions.



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 Underwriters Laboratory (UL) regulations and recommendations for USA.



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



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 rated mains voltage.
- This product relies on the building's installation for short-circuit (over-current) protection. Ensure that a fuse or circuit breaker for the rated mains voltage 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



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:

- Only trained or skilled personnel should install and use this product.
- Follow installation (including rack mounting) and usage procedure carefully to minimize risk of hazard.
- This equipment is meant to be installed in a restricted access location.

Note: Limited access restrictions apply to Video Processor Frames and Servers, not to operator controlled equipment such as Control Panels, Menus, Aux Panels, etc.

- 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.
- 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. Servicing should be done in a static-free environment.
- To reduce the risk of electric shock, plug each power supply cord into separate branch circuits employing separate service grounds.

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 EST 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 may include 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 at:

http://www.grassvalley.com/assets/media/5692/Take-Back_Instructions.pdf

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

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.



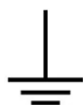
Avertit l'utilisateur, l'opérateur ou le technicien de maintenance que des instructions importantes relatives à l'utilisation et à l'entretien se trouvent dans la documentation accompagnant l'équipement.



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 UL 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 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



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



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 :

- Seul un personnel formé ou qualifié doit installer et utiliser ce produit.
- Suivez attentivement la procédure d'installation (y compris le montage en rack) et d'utilisation pour minimiser les risques de danger.
- L'appareil est conçu pour être installé dans un endroit à accès restreint.

Remarque: Les restrictions d'accès s'appliquent aux châssis et serveurs de traitement vidéo, et non aux équipements contrôlés par l'opérateur tels que les panneaux de contrôle, les menus, les panneaux auxiliaires, etc.

- 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 module d'alimentation auto-adaptable, 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, débranchez 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.
- Pour réduire le risque de choc électrique, branchez chaque cordon d'alimentation dans des circuits de dérivation distincts utilisant des zones de service distinctes

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.

Manipulation de la pile



Ce produit peut inclure une pile de sauvegarde. Il y a un risque d'explosion si la pile est remplacée de manière incorrecte. Remplacez la pile uniquement par un modèle identique ou équivalent recommandé par le fabricant. Disposez des piles usages conformément aux instructions du fabricant. Avant de vous séparer de votre équipement Grass Valley, veuillez consulter les *informations de mise au rebut et de recyclage* à:

http://www.grassvalley.com/assets/media/5692/Take-Back_Instructions.pdf

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

Environmental Information

European (CE) WEEE directive.



This symbol on the product(s) means that at the end of life disposal it should not be mixed with general waste.

Visit www.grassvalley.com for recycling information.

Grass Valley believes this environmental information to be correct but cannot guarantee its completeness or accuracy since it is based on data received from sources outside our company. All specifications are subject to change without notice.

If you have questions about Grass Valley environmental and social involvement (WEEE, RoHS, REACH, etc.), please contact us at environment@grassvalley.com.

Lithium Batteries

Battery Warning

CAUTION

This equipment contains a lithium battery
There is a danger of explosion if this is replaced incorrectly
Replace only with the same or equivalent type.
Dispose of used batteries according to the manufacturer
instructions.
Batteries **shall only** be replaced by trained service technicians.

Your Grass Valley equipment usually comes with at least one button battery located on the main printed circuit board. The batteries are used for backup and should not need to be replaced during the lifetime of the equipment.

Battery Disposal

Before disposing of your Grass Valley equipment, please remove the battery as follows:

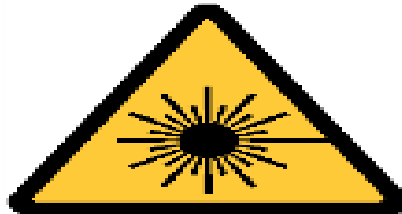
- 1 Make sure the AC adapter / power Cord is unplugged from the power outlet.
- 2 Remove the protective cover from your equipment.
- 3 Gently remove the battery from its holder using a blunt instrument for leverage such as a screwdriver if necessary. In some cases the battery will need to be desoldered from the PCB.
- 4 Dispose of the battery and equipment according to your local environmental laws and guidelines.

WARNING

- Be careful not to short-circuit the battery by adhering to the appropriate safe handling practices.
- Do not dispose of batteries in a fire as they may explode.
- Batteries may explode if damaged or overheated.
- Do not dismantle, open or shred batteries.
- In the event of a battery leak, do not allow battery liquid to come in contact with skin or eyes.
- Seek medical help immediately in case of ingestion, inhalation, skin or eye contact, or suspected exposure to the contents of an opened battery.

Laser Safety - Fiber Output SFP and QSFP Modules Warning

LASER SAFETY



The average optical output power does not exceed 0 dBm (1mW) under normal operating conditions. Unused optical outputs should be covered to prevent direct exposure to the laser beam.

Even though the power of these lasers is low, the beam should be treated with caution and common sense because it is intense and concentrated. Laser radiation can cause irreversible and permanent damage of eyesight. Please read the following guidelines carefully:

- Make sure that a fiber is connected to the board's fiber outputs before power is applied. If a fiber cable (e.g. patchcord) is already connected to an output, make sure that the cable's other end is connected, too, before powering up the board.
- **Do not** look in the end of a fiber to see if light is coming out. The laser wavelengths being used are totally invisible to the human eye and can cause permanent damage. Always use optical instrumentation, such as an optical power meter, to verify light output.

Safety and EMC Standards

This equipment complies with the following standards:

Safety Standards



Information Technology Equipment - Safety Part 1

IEC 62368-1: 2019

Safety of Information Technology Equipment Including Electrical Business Equipment.

UL1419 (4th Edition)

Standard for Safety – Professional Video and Audio equipment (UL file number E193966)

EMC Standards

This unit conforms to the following standards:

EN55032:2015 (Class A)

Electromagnetic Compatibility of multimedia equipment - Emission requirements

EN61000-3-2:2014 (Class A)

Electromagnetic Compatibility - Limits for harmonic current emissions

EN61000-3-3:2013

Electromagnetic Compatibility - Limits of voltage changes, voltage fluctuations and flicker

EN55035:2017 (Environment E2)

Electromagnetic Compatibility, Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use. Part 2. Immunity

WARNING

This equipment is compliant with Class A of CISPR 32. In a residential environment this equipment may cause radio interference.

FCC / CFR 47:Part 15 (Class A)

Federal Communications Commission Rules Part 15, Subpart B

Caution to the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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.

EMC Performance of Cables and Connectors

Grass Valley products are designed to meet or exceed the requirements of the appropriate European EMC standards. In order to achieve this performance in real installations it is essential to use cables and connectors with good EMC characteristics.

All signal connections (including remote control connections) shall be made with screened cables terminated in connectors having a metal shell. The cable screen shall have a large-area contact with the metal shell.

SIGNAL/DATA PORTS

For unconnected signal/data ports on the unit, fit shielding covers. For example, fit EMI blanking covers to SFP+ type ports; and fit 75 Ω RF terminators to BNC type ports.

COAXIAL CABLES

Coaxial cables connections (particularly serial digital video connections) shall be made with high-quality double-screened coaxial cables such as Belden 8281 or BBC type PSF1/2M and Belden 1694A (for 3Gbps).

D-TYPE CONNECTORS

D-type connectors shall have metal shells making good RF contact with the cable screen. Connectors having "dimples" which improve the contact between the plug and socket shells, are recommended.

toc

Table of Contents

| | |
|---|-----------|
| FCC Compliance..... | ii |
| Patent Information..... | ii |
| Copyright and Trademark Notice..... | ii |
| Safety and EMC Standards | xiii |
| Safety Standards..... | xiii |
| EMC Standards | xiii |
| EMC Performance of Cables and Connectors..... | xiv |
| 1 Introduction | 1 |
| Overview..... | 1 |
| Features | 1 |
| General..... | 1 |
| GV K-Frame XP Compact Frame | 3 |
| GV K-Frame XP Standard Frame | 3 |
| K-Frame Control Surfaces..... | 3 |
| Kayenne Control Surface..... | 3 |
| Flat or Curved Control Panel Orientation | 5 |
| Control Panel Stripes | 5 |
| Touch Screen Menu Panel | 5 |
| Basic Single Suite Kayenne Panel System..... | 6 |
| Multiple Suite Kayenne Panel System Example..... | 6 |
| Karrera Control Surface..... | 8 |
| Basic Single Suite Karrera Panel System..... | 9 |
| GV Korona Control Surfaces | 10 |
| Basic Single Suite GV Korona Panel System Example..... | 10 |
| Multiple Suites and Control Surfaces Example | 10 |
| Supported Control Protocols..... | 11 |
| 2 Frame Installation | 13 |
| Overview..... | 13 |
| Weight Distribution..... | 13 |
| Cooling Requirements | 13 |
| Power Connections | 13 |
| 8-RU (GV K-Frame XP Compact) Video Processor Dimensions | 14 |
| 8RU Video Processor Installation and Airflow..... | 16 |
| 8RU Video Processor Views..... | 17 |
| Compact Power Supply AC Requirements | 18 |

| | |
|---|----|
| Supplied Power Cables for 8-RU | 18 |
| About High Line (208V-240V) Versus Low Line (120V) Operations | 19 |
| About Low Line (120V) Operational Considerations | 19 |
| GV K-Frame XP Compact Video Processor Door Removal Clearance | 20 |
| Replacing Compact Power Supplies | 20 |
| 15-RU (GV K-Frame XP Standard) Video Processor Dimensions | 22 |
| 15RU Video Processor Installation and Airflow | 24 |
| 15RU Video Processor Views | 25 |
| 15RU Power Supply Views | 27 |
| 15RU Power Supply Frame Rack Installation and Airflow | 29 |
| Standard Power Cooling | 30 |
| Standard Power Supply AC Requirements | 30 |
| Supplied Power Cables for 8-RU | 30 |
| About High Line (208V-240V) Versus Low Line (120V) Operations | 31 |
| About Low Line (120V) Operational Considerations | 31 |
| GV K-Frame XP Standard Video Processor Door Removal Clearance | 32 |
| Replacing Standard Power Supplies | 32 |

3 Control Surface Installation 34

| | |
|--|----|
| Control Surfaces | 34 |
| Kayenne Control Surfaces | 34 |
| Control Panel and Support Structure Assembly | 34 |
| Control Panel Variations | 34 |
| Control Panel Cooling | 35 |
| Truck and High Vibration Environment Considerations | 35 |
| 4-M/E 35 Control Panel, Curved Assembly | 36 |
| 4-M/E 35 Control Panel, Flat Assembly | 36 |
| 4-M/E 25 Control Panel | 40 |
| 3-M/E 35 Control Panel, Curved Assembly | 41 |
| 3-M/E 35 Control Panel, Flat Assembly | 44 |
| 3-M/E 25 Control Panel | 46 |
| 2-M/E 35 Control Panel, Curved Assembly | 46 |
| 2-M/E 35 Control Panel, Flat Assembly with Local Aux | 49 |
| 2-M/E 35 Control Panel, Flat without Local Aux | 51 |
| 2-M/E 25 Control Panel | 52 |
| 1-M/E 15 Control Panel | 53 |
| Separately Mounted Local Aux Stripe (35 & 25 Models) | 54 |
| Control Panel Stripe-PCU Connections | 54 |
| Touch Screen Menu Panel Installation | 55 |
| Karrera Control Surface | 58 |
| 3-M/E Karrera Control Panel Installation | 59 |
| 2-M/E Compact Karrera Control Panel Installation | 61 |
| PC Requirements | 63 |
| Macintosh Computer Operation | 63 |
| Hardware Installation | 63 |
| Menu on User PC Software Installation | 63 |
| User PC Configuration | 64 |
| Optional Touch Screen Menu Panel Installation | 64 |
| Menu Panel Dimensions | 65 |
| Menu Panel Connectors | 66 |

| | |
|---|----|
| Menu Panel Cooling..... | 66 |
| Fanless PC Dimensions and Connectors | 67 |
| Menu Panel Articulated Arm Installation | 68 |
| Menu Panel Hardware Installation With Articulated Arm | 69 |
| Wall Mounting Without Articulated Arm | 69 |
| Optional Local Aux Panel Installation | 70 |
| Local Aux 25 Panel Dimensions..... | 71 |
| GV Korona Control Surfaces | 75 |
| 3-M/E GV Korona Control Panel Dimensions | 75 |
| 2-M/E GV Korona Control Panel Dimensions..... | 78 |
| 2-M/E GV Korona Control Panel Cutout Dimensions | 80 |
| 1-M/E GV Korona Control Panel Dimensions..... | 81 |
| 1-M/E GV Korona Control Panel Cutout Dimensions..... | 83 |

4 System Cabling..... 84

| | |
|---|-----|
| About the GV K-Frame XP System Cabling Section | 84 |
| System Cabling Overview | 84 |
| Ethernet Tally Verses Serial Tally | 84 |
| Suites and Control Surfaces | 84 |
| Network Cabling..... | 84 |
| Ethernet Switch | 85 |
| Customer Supplied Ethernet Routers and Switches..... | 85 |
| Factory Default Network Settings..... | 86 |
| System Cabling for Kayenne Control Panels | 87 |
| Kayenne Network Cabling | 87 |
| Kayenne Suites and Control Surfaces..... | 88 |
| Kayenne Control Panel Cabling..... | 90 |
| Kayenne M/E and Local Aux Stripe Connections | 90 |
| Kayenne Satellite Panel Cabling | 91 |
| Kayenne Touch Screen Menu Panels (Used with PCU) | 92 |
| System Cabling for the Karrera Control Panel | 92 |
| Karrera Suites and Control Surfaces..... | 92 |
| Karrera Control Panel Network Cabling | 93 |
| Optional Touch Screen Menu Panel Cabling..... | 93 |
| Optional Karrera Local Aux Panel Cabling | 93 |
| System Cabling for the GV Korona Control Panel | 96 |
| GV Korona Suites and Control Surfaces..... | 96 |
| GV K-Frame XP Video Cabling | 97 |
| SDI Inputs..... | 97 |
| SDI Outputs | 98 |
| Reference Input | 98 |
| Supported Media Port Frame Rates | 98 |
| GV K-Frame XP Video Processor Frame GPI/Relay Tally Interface | 98 |
| GPI and Relay Tally Connections | 98 |
| GPI Inputs..... | 99 |
| Relay Tally/GPI Outputs | 99 |
| GPI In, GPI Out, Relay Tally Pin Assignments..... | 101 |

| | |
|---|-----|
| RS-422/485 Port Pin Assignments..... | 105 |
| RS-232 Port Pin Assignments..... | 106 |
| Remote Aux Panels | 107 |
| GV-RAP-100 and GV-RAP-200 Remote Aux Panels | 108 |

5 Basic Configuration..... 109

| | |
|---|-----|
| Introduction | 109 |
| Configuration Steps | 109 |
| Configuration Data | 109 |
| GV Switcher Menu Application | 110 |
| Menu Top Line | 111 |
| Data Pads and Touch Buttons | 111 |
| Data Pads and Soft Knobs..... | 112 |
| Menu Selection | 112 |
| Power Up and Initialize the System | 112 |
| Power and Initialization Indications..... | 113 |
| Menu Application Initialization | 113 |
| Default System Communications | 113 |
| Establishing Menu to Frame Communication..... | 113 |
| Connecting the Menu Application to a Frame | 114 |
| About Network Configuration..... | 114 |
| IP Address Background Information..... | 114 |
| Gateway IP Addresses | 115 |
| Default IP Addresses On Isolated Network..... | 115 |
| Connecting to an Existing Network | 115 |
| About NMOS AMWA IS-04 and IS-05 | 115 |
| IS-04 | 115 |
| IS-05 | 116 |
| Menu..... | 116 |
| Configure the Global Registry | 116 |
| About using NMOS IS-04/IS-05 to Change Receivers/Senders | 117 |
| About the Group Hint Prefix | 117 |
| Configure the Group Hint Prefix..... | 117 |
| Unicast DNS-SD | 118 |
| Requirements for In-band Unicast-SD | 118 |
| Unicast-SD sequence of events | 119 |
| Static Routes for the Primary and Secondary Control Systems | 120 |
| Set the IPs Using Device Web Pages | 120 |
| Changing the Image Store IP Address | 121 |
| Changing Control Panel IP Addresses..... | 121 |
| Changing the Kayenne or Karrera Menu Panel IP Address | 122 |
| 32-Crosspoint Remote Aux Panel IP Address | 122 |
| Restoring the Default IP Address..... | 124 |
| GV-RAP-100 and GV-RAP-200 Remote Aux Panels | 125 |
| Install Remote Aux Panel Software..... | 126 |
| Configure the Remote Aux Panel System..... | 126 |
| Configure the Remote Aux Panel Network | 126 |

| | |
|--|-----|
| Connect the Remote Aux Panel to the Switcher IP Network..... | 127 |
| Delegate Control of a Switcher Aux Bus to the Remote Aux Panel..... | 127 |
| Map Switcher Sources to Remote Aux Bus Buttons..... | 127 |
| About S25/S50 Remote Aux Panel Upgrade | 128 |
| Switcher Remote Aux Button Functionality | 128 |
| Install S25/S50 Remote Aux Panel Software | 129 |
| Configure the Remote Aux Panel System..... | 129 |
| Configure the Remote Aux Panel Network | 129 |
| Connect the Remote Aux Panel to the Switcher IP Network..... | 130 |
| Delegate Control of a Switcher Aux Bus to the Remote Aux Panel..... | 130 |
| Map Switcher Sources to Remote Aux Bus Buttons..... | 130 |
| IP I/O Configuration Menus | 131 |
| About Single Stream Full Frame UHD-4K..... | 136 |
| Streams/SFPs | 136 |
| I/O IP Config Bulk Configuration | 136 |
| About 4K TICO Compression Formats in the IP I/O Config Menu..... | 140 |
| About IP I/O Address and Port Configuration | 140 |
| Configure the IP I/O IP Address and Ports..... | 141 |
| Configure ST 2110-40 Ancillary..... | 143 |
| SDI/IP Input Output Configuration..... | 143 |
| Hot Swappable IP I/O Boards and SFPs..... | 146 |
| Troubleshooting..... | 146 |
| Configure the IP Board SFPs..... | 148 |
| About Board Bulk Configuration and the Import/Export Config File | 150 |
| About IP Audio, Ancillary, and Redundancy | 151 |
| About Extended Input Buffer | 152 |
| K-Frame IP Switcher System Auto-timing (771-0741-01 Board)..... | 152 |
| Menu..... | 153 |
| Video I/O IP Setup and Configuration Overview | 153 |
| Configure the Port Config SFPs | 154 |
| Configure System Inputs/Outputs | 154 |
| Configure System Input or Output SFPs in Bulk from the Menu..... | 155 |
| Bulk Configure SFPs Using a Spreadsheet..... | 160 |
| IP SFP Statistics Web Access..... | 161 |
| Setting the RTP Payload Type..... | 162 |
| Registering System Nodes | 163 |
| Kayenne and Karrera Menu Panel Registration | 163 |
| Control Panel Registration | 163 |
| Remote Aux Panel Registration | 165 |
| Control Panel Brightness Adjustment..... | 165 |
| Engineering Setups | 166 |
| Source Definition Inputs | 166 |
| Change Direct Source Definition..... | 167 |
| Source Naming Background Information..... | 167 |
| Engineering Names, Eng IDs, and Logical IDs..... | 167 |
| Alternative Source Names | 168 |
| Source Patch Feature..... | 170 |
| Output Assignments..... | 171 |
| Default Output Assignments..... | 171 |
| Change Output Assignments..... | 171 |
| Configuring Aux Buses..... | 173 |
| Switcher Relay Tally Configuration..... | 175 |

| | |
|---|-----|
| About Relay Tally Systems | 175 |
| Switcher Relay Tally Calculator Menus..... | 176 |
| Creating an On Air Relay Tally Calculator Using M/Es or PGM/PST | 177 |
| Create an On Air Relay Tally Calculator Using Aux Buses | 178 |
| Creating a Look Ahead Relay Tally Calculator | 178 |
| Creating a Bus Relay Tally Calculator..... | 179 |
| Relay Assign Menu..... | 181 |
| Assign Sources to Tally Relays..... | 181 |
| Ethernet Tally Configuration..... | 182 |
| Configure the On-Air Tally Program M/E | 182 |
| Configure the GV Switcher Ethernet Tally System Interface | 182 |
| Set Source Names with External Ethernet Tally | 183 |
| ClipStore Configuration | 185 |
| Summit/Solo Software Version | 185 |
| Setting the Summit IP Address | 185 |
| Install the ClipStore License | 185 |
| Configure ClipStore as a Node | 186 |
| Configure Source Definitions | 187 |
| Configure Outputs..... | 188 |
| Acquire and Assign CS channels in another suite | 188 |
| ClipStore Config Menu..... | 189 |
| Assigning ClipStore Channel Resources to a Suite..... | 190 |
| Set the Summit/Solo IP Address | 191 |
| Configure the Remote Desktop Connection | 192 |
| ClipStore Hosts File Update..... | 194 |
| Update Hosts File for Windows 7 and Newer | 194 |
| Camera Control with Ethernet Tally Configuration | 195 |
| Configure Node Settings..... | 196 |
| Configure Source Definitions | 197 |
| Acquire Resources | 199 |
| Switcher Ethernet Camera Tally | 200 |
| Tally Calc Menus | 200 |
| Color Assign Menu | 200 |
| User Setups..... | 201 |
| Configuration File Save and Load..... | 202 |
| File Storage Organization | 203 |
| K-Frame Drive Access | 203 |
| Eng Setup File Operations | 205 |
| Save Eng Setup Files | 205 |
| Load Eng Setup Files..... | 205 |
| Multiple Suite Resource Sharing..... | 206 |
| Collaborative Resource Sharing | 206 |
| Independent Resource Sharing..... | 206 |
| Suites | 207 |
| Control Surface | 207 |
| Logical Aux Buses | 208 |
| Remote Aux Panels..... | 208 |
| External Control Points | 208 |
| Setting Up Resource Sharing | 208 |
| Prepare Worksheet | 209 |
| About the Frame Suite Nodes and ID Menu | 209 |
| Configure Control Surfaces | 211 |

| | |
|---|-----|
| Kayenne (Only) PCU Configuration | 211 |
| Define Default Multi-Suite Engineering Resources | 213 |
| Acquire Resources in Suites | 213 |
| Save Default Multi-Suite Engineering Setup File | 216 |
| Define and Save Default Suite Prefs..... | 216 |
| Define and Save Default Panel Prefs..... | 216 |
| Multi-Suite Independent Operation | 216 |
| Engineering Login..... | 216 |
| MatchDef and SetDef..... | 217 |
| MatchDef Input Conversion..... | 218 |
| SetDef Output Conversion | 219 |
| About MatchDef and SetDef Conversion..... | 220 |
| Supported MatchDef Input Conversion | 220 |
| Supported SetDef Output Conversion..... | 220 |
| Format Conversion Menus | 222 |
| Format Conversion Pane | 223 |
| MatchDef Conversion Configuration Pane..... | 224 |
| SetDef Conversion Configuration Pane | 225 |
| Standard Definition | 226 |
| About 4K Conversion | 227 |
| Media Port Menus | 229 |
| Configure MatchDef for the Video I/O Output Format Conversion | 229 |
| Match Sync..... | 230 |
| About the 12G SDI GB (Gearbox) Board SDI Input and Output Formatting..... | 231 |
| Input/Output 2160p Video Streams | 231 |
| Input Gearboxing 4K 2SI and 4K SDQS | 231 |
| Output Gearboxing SDI 4K 2SI..... | 232 |
| IP I/O Gearboxing on Outputs..... | 233 |
| About Timing..... | 233 |
| MatchSync | 233 |
| Supported Gearbox Format and Frame Operating Mode Compatibility..... | 234 |
| I/O Config Menu Button and Labels | 235 |
| Mode Configuration Pane Buttons and Labels..... | 237 |
| UltraMatch and GearBox on IP I/O and Gearbox Boards..... | 238 |
| Gearbox Bulk Configuration Menu..... | 240 |
| I/O Bulk Config Pane | 242 |
| Apply I/O Bulk Config Settings..... | 243 |
| IP I/O Config Menu..... | 245 |
| Saving/Loading I/O Config Parameters | 247 |
| Video Settings..... | 248 |
| Reference Sync Selection | 248 |
| About PTP Reference | 248 |
| Configuring the PTP Master | 249 |
| SFP Redundancy..... | 250 |
| SFP Input Status..... | 250 |
| Port Configuration..... | 250 |
| Frame Operating Mode | 251 |
| ME Blanking Settings | 251 |
| About Switcher System Timing..... | 251 |
| Timing Analyzer | 252 |
| Time Zones and the Autotiming Window | 253 |
| Switcher System Timing..... | 255 |

| | |
|---|------------|
| IP Auto-timing..... | 255 |
| SDI Auto-timing Specifications..... | 256 |
| Timing Analyzer Menu..... | 259 |
| Timing Window Status..... | 260 |
| Correcting an Out-of-Time Stream..... | 261 |
| Other Settings..... | 261 |
| Nominal IP Stream Throughput..... | 264 |
| IP Timing Troubleshooting..... | 264 |
| Node Settings..... | 264 |
| Frame Suite Nodes & ID Menu..... | 264 |
| Mapping Logical Remote Aux Panels..... | 265 |
| Remote Aux Button Mapping..... | 265 |
| About the Status Menu..... | 266 |
| Acquire Resources..... | 266 |
| General Procedure to Acquire Resources..... | 266 |
| 6 External Interfaces..... | 267 |
| Introduction..... | 267 |
| General External Device Interfacing..... | 266 |
| Ports & Devices..... | 268 |
| PBus Ports..... | 268 |
| Copy Trigger Names..... | 269 |
| GPI Outputs..... | 270 |
| PBus and GPI Enables..... | 271 |
| External Devices..... | 273 |
| VDCP Ethernet..... | 274 |
| VDCP on Ethernet Configuration..... | 274 |
| Device Definition..... | 275 |
| Create an External Device Definition..... | 276 |
| Configure an External Device for XPression Control..... | 277 |
| Ethernet Tally Ports..... | 277 |
| Configure Ethernet Tally Ports..... | 278 |
| About Editor Ports..... | 278 |
| Router Interface..... | 281 |
| Router Source Name Changes (at the Router) and GV Switcher Updates..... | 281 |
| Features..... | 282 |
| Control Interface Cabling..... | 282 |
| Video Interface Cabling..... | 282 |
| External Routing System Configuration..... | 282 |
| Setting IP Addresses..... | 282 |
| Primary and Secondary Router Communications..... | 283 |
| About Router Types..... | 284 |
| About Destination Polling..... | 284 |
| Configuring Milliseconds Between Takes..... | 285 |
| Define Routed Source Definitions..... | 285 |
| User Setups..... | 286 |
| 7 Maintenance..... | 287 |
| Introduction..... | 287 |
| Servicing Precautions..... | 287 |

| | |
|--|-----|
| Grass Valley Web Site..... | 287 |
| Grass Valley Customer Support FAQ Database | 287 |
| Video Processor Frame Reset Procedure | 287 |
| Panel Control Unit (PCU) Reset (Kayenne only) | 288 |
| Kayenne Control Panel Adjustments | 288 |
| Kayenne Lever Arm Calibration | 288 |
| Calibrating the Joystick..... | 289 |
| M/E Stripe Mapping | 290 |
| Karrera Control Panel Adjustments | 291 |
| Lever Arm Calibration | 291 |
| Karrera Joystick Calibration..... | 293 |
| Karrera Panel Saver Time Adjustment..... | 295 |
| Kayenne and Karrera Touchscreen Calibration..... | 295 |
| GV Korona Control Panel Adjustments | 298 |
| GV Korona Lever Arm Calibration | 298 |
| GV Korona Joystick Calibration | 300 |
| GV Korona Panel Saver Time Adjustment..... | 301 |
| Software Installation | 302 |
| Software Option Authorization..... | 302 |
| Authorization Codes | 302 |
| Expiration Dates | 302 |
| Authorization Procedure..... | 303 |
| Control Panel Web Pages | 304 |
| Control Panel NV Memory..... | 304 |
| Clear Control Panel NV Memory Procedure | 305 |
| Control Panel IP Information..... | 306 |
| Kayenne/Karrera Menu Panel IP Information | 306 |
| Video Processor Frame Maintenance | 306 |
| Video Processor Frame NV Memory..... | 306 |
| Clear NV RAM for Control Panel and Frame | 306 |
| Restore System Files..... | 307 |
| Restoring Multiple Suites | 307 |
| IP Address Information..... | 307 |
| License Information..... | 307 |
| VP Frame Processor Board Replacement..... | 308 |
| Lifetime of the Internal Battery | 308 |
| Video Processor Frame Battery Replacement..... | 308 |
| IP Information | 309 |
| Kayenne/Karrera Menu Panel IP Information | 309 |
| Kayenne Control Panel System Bar Maintenance | 309 |
| Removing the Kayenne System Bar | 310 |
| Replacing the Kayenne System Bar | 311 |
| 3-ME Karrera Control Panel Interior..... | 312 |
| 2-ME Karrera Control Panel Interior..... | 316 |
| General Control Panel Lid Switch Board Remove and Replace..... | 318 |
| Source Select Switch Board Remove and Replace | 318 |
| Transition Board Remove and Replace | 319 |
| Multi-Function Board Remove and Replace | 319 |
| Diagnostics | 319 |
| Capture Software Diagnostic Data | 319 |
| Kayenne Control Panel Module Diagnostics | 320 |
| HAD FPGA Updates | 322 |

| | |
|---|------------|
| When to Update the HAD FPGA | 322 |
| Upgrade the HAD FPGA | 323 |
| 12.X to 14.3 Upgrade: Install IP Board ARM Software | 327 |
| PTP Mezzanine Board ARM Software Upgrade | 329 |
| Downgrade the IP Board ARM Software..... | 331 |
| V14.6 Upgrade/Downgrade Path (V14.5.3)..... | 333 |
| Troubleshooting..... | 333 |
| Creating Compact Flash Cards | 333 |
| Materials Required..... | 333 |
| CF Card Formatting Procedure | 334 |
| Updating System Software on a New Control Panel CF Card | 335 |
| Restore Control Panel Configuration Files | 336 |
| SNMP | 337 |
| Grass Valley Switcher Device Monitoring by SNMP | 338 |
| K-Frame SNMP Monitoring..... | 338 |
| Control Panel SNMP Monitoring | 338 |
| GV Korona Control Panel SNMP Monitoring..... | 338 |
| Menu Panel Processor SNMP Monitoring | 338 |
| SNMP Installation | 339 |
| SNMP Licensing..... | 339 |
| Licensing Definitions..... | 340 |
| SNMP Power Up License Processing | 340 |
| SNMP Licensed Configuration..... | 340 |
| Switcher Device SNMP Configuration Procedure | 341 |
| Switcher Trap Messages | 342 |
| Appendix A Specifications | 345 |
| GV K-Frame XP Video Processor Specifications | 345 |
| Kayenne Control Panel Specifications | 349 |
| Karrera Control Panel Specifications..... | 351 |
| GV Korona Control Panel Specifications..... | 353 |
| Appendix B Field Replaceable Units..... | 354 |
| Video Processor Frame..... | 354 |
| Control Panels..... | 354 |
| Kayenne | 354 |
| Karrera | 358 |
| GV Korona | 359 |
| Appendix C Regulatory Notices | 361 |
| Certifications and Compliances | 361 |
| FCC Emission Control | 361 |
| Canadian EMC Notice of Compliance..... | 361 |
| EN55022 Class A Warning | 361 |
| Canadian Certified AC Adapter..... | 361 |
| FCC Emission Limits | 362 |
| Certification..... | 362 |
| DEKRA Certificate | 363 |

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 Video Processors are the heart of the system, providing extensive video switching and signal processing capabilities:

- GV K-Frame XP Compact
- GV K-Frame XP Standard

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, the 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 4K, HDR (HLG and PQ), 1080p, and 2160p support:
 - SDI—2160p, 1080p level-A and 720p
 - IP I/O—1080p level-A
 - IP I/O—2160p (GV K-Frame XP Standard and Compact are the only models with internal 2160p processing. The rest are Quad processing for 4K.)
- Optional smart I/O modules provide up/down/cross-conversion when licensed with SetDef and MatchDef.
- 4K UHD using 2SI (2 Sample Interleave) or SDQS (Square Division QuadSplit) is converted to 2160p video for internal processing using hardware on the IP and SDI I/O boards.
- 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.

- 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 supporting Native Protocol.
- Optional Integrated Image Store capable of delivering up to 32 GB, 64GB, or 128GB storage of Stills (3,000/6,000/12,000 images) or “Movies” (a total of 50 seconds or 1 minute 40 seconds or 3 minutes 20 seconds) of 1080p video or up to 50 seconds of 2160p video.
- LDK Series and LDX Series camera control with Ethernet tally via Connect Gateway.
- 999 macros with many 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 (ME-View) provides a method to check and monitor any input to an M/E on a single output.
- SERIAL or Ethernet VDCP control.
- 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 6 pre-configured layouts (maximum 16 panes per layout) with On-Air and Preview tally.

GV K-Frame XP Compact Frame

- Up to 80 inputs and 48 outputs.
- Up to 6 VPEs which can be used as MEs or Multiviewers
- Up to 6 M/Es, accessible across four suites, increased to 12 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 can use the pool of floating 3DiDPMs.
- 2D-DPMs with perspective on every keyer, so iDPMs can be utilized for more complex effects.
- Up to 16 iDPMs (Integrated Digital Picture Manipulators), assigned as either floating iDPMs or within an eDPM at user's discretion.
- An optional built-in multiviewer with six pre-configured layouts (maximum 64 panes per layout) and On-Air/Preview tally which does not use one of the VPEs.

GV K-Frame XP Standard Frame

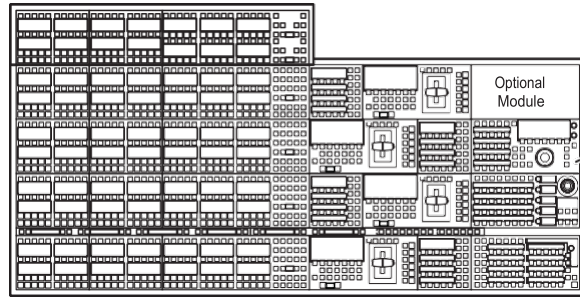
- Up to 192 inputs and 96 outputs.
- Up to 9 VPEs which can be used as MEs or Multiviewers
- Up to 9 M/Es, accessible across four suites—by using DoubleTake this may be increased to 18 virtual M/Es. , accessible across two suites—by using DoubleTake this may be increased to 18 virtual M/Es.
- Every M/E has six keyers with standard keying modes including Chroma Key, two frame stores per keyer.
- 2D-DPMs with perspective on every keyer, so iDPMs can be utilized for more complex effects.
- Up to 16 iDPMs (Integrated Digital Picture Manipulators), assigned as either floating iDPMs or within an eDPM at user's discretion.
- Up to 16 iDPMs (Integrated Digital Picture Manipulators), assigned as either floating iDPMs on any keyer or within an eDPM at user's discretion.

K-Frame Control Surfaces

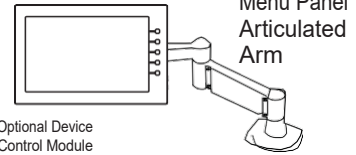
Kayenne Control Surface

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. Representative Kayenne control surfaces are shown in the following illustrations.

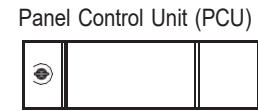
4-ME 35 Control Panel



Menu Panel

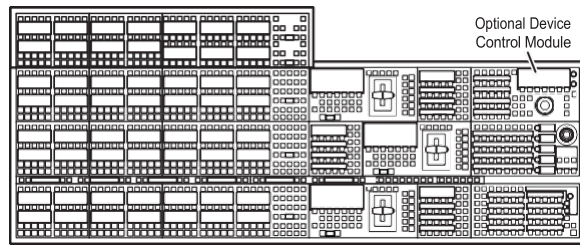


Optional Device Control Module

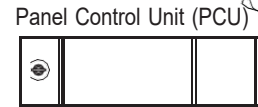
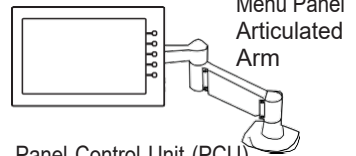


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3-ME 35 Control Panel

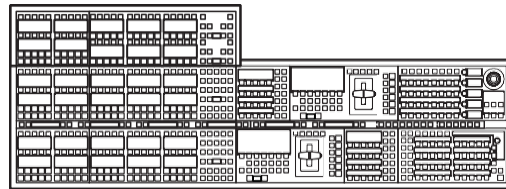


Menu Panel

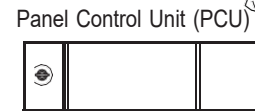
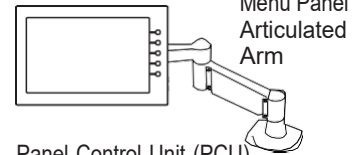


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2-ME 25 Control Panel

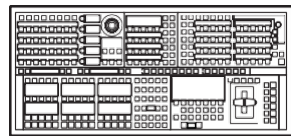


Menu Panel

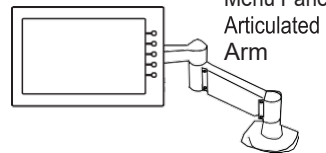


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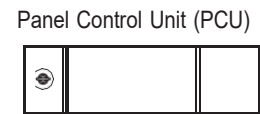
1-ME 15 Control Panel



Menu Panel



Menu Panel Articulated Arm



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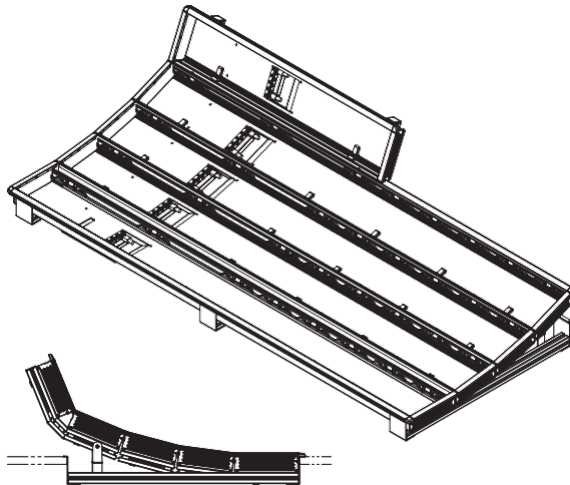
The modular design and use of a separate PCU supports the hot-replacement of individual Control Panel components, if necessary, while the rest of the system remains operational.

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

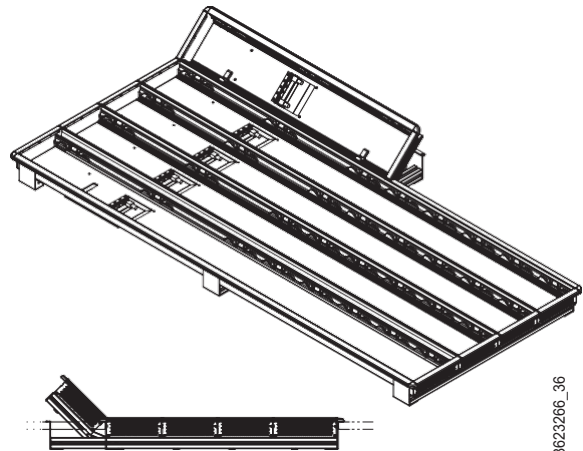
Flat or Curved Control Panel Orientation

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.

Curved Control Panel Assembly



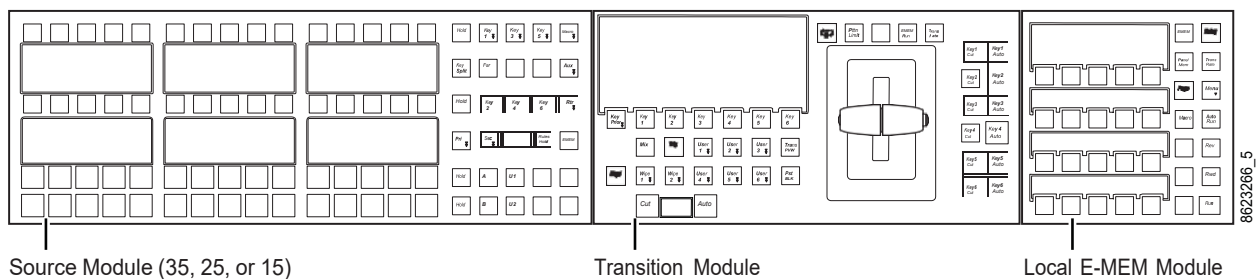
Flat Control Panel Assembly



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Control Panel Stripes

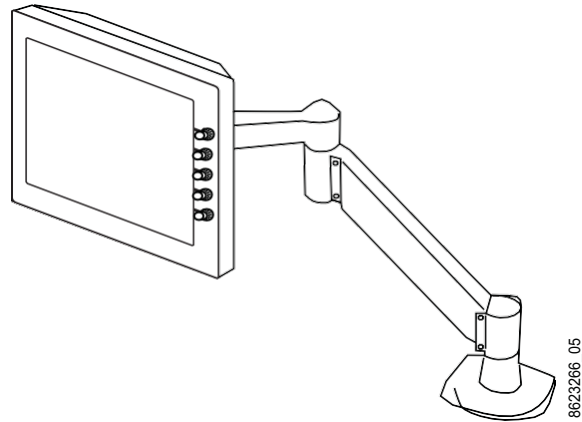
The main Kayenne Control Panel is organized into from one to five Stripes. Each Stripe consists of a tray and its complement of drop-in modules. An M/E Stripe has a module for Source Selection, Transition, and individual E-MEM control. Additional Master E-MEM, Machine Control, Multi-Function, and Local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



Touch Screen Menu Panel

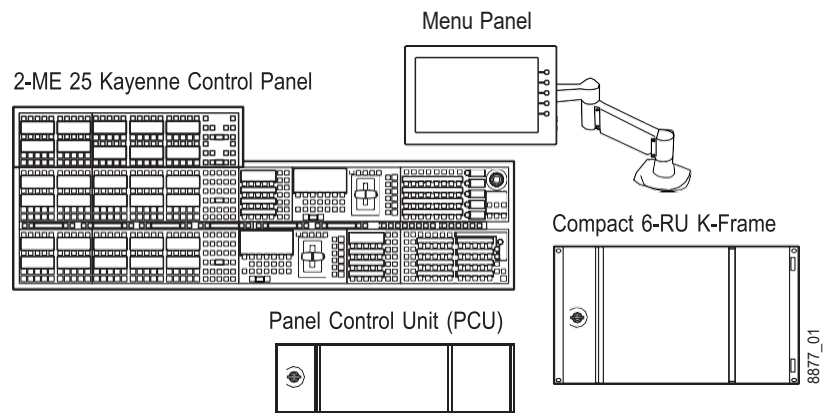
Each Kayenne control surface includes a Menu Panel that features a wide format 15 in. touch screen display. An articulated arm is also included, offering a wide variety of installation options. The Menu Panel has a standard VESA-75 hole pattern and M4 threads, compatible with this and many other mounting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



Basic Single Suite Kayenne Panel System

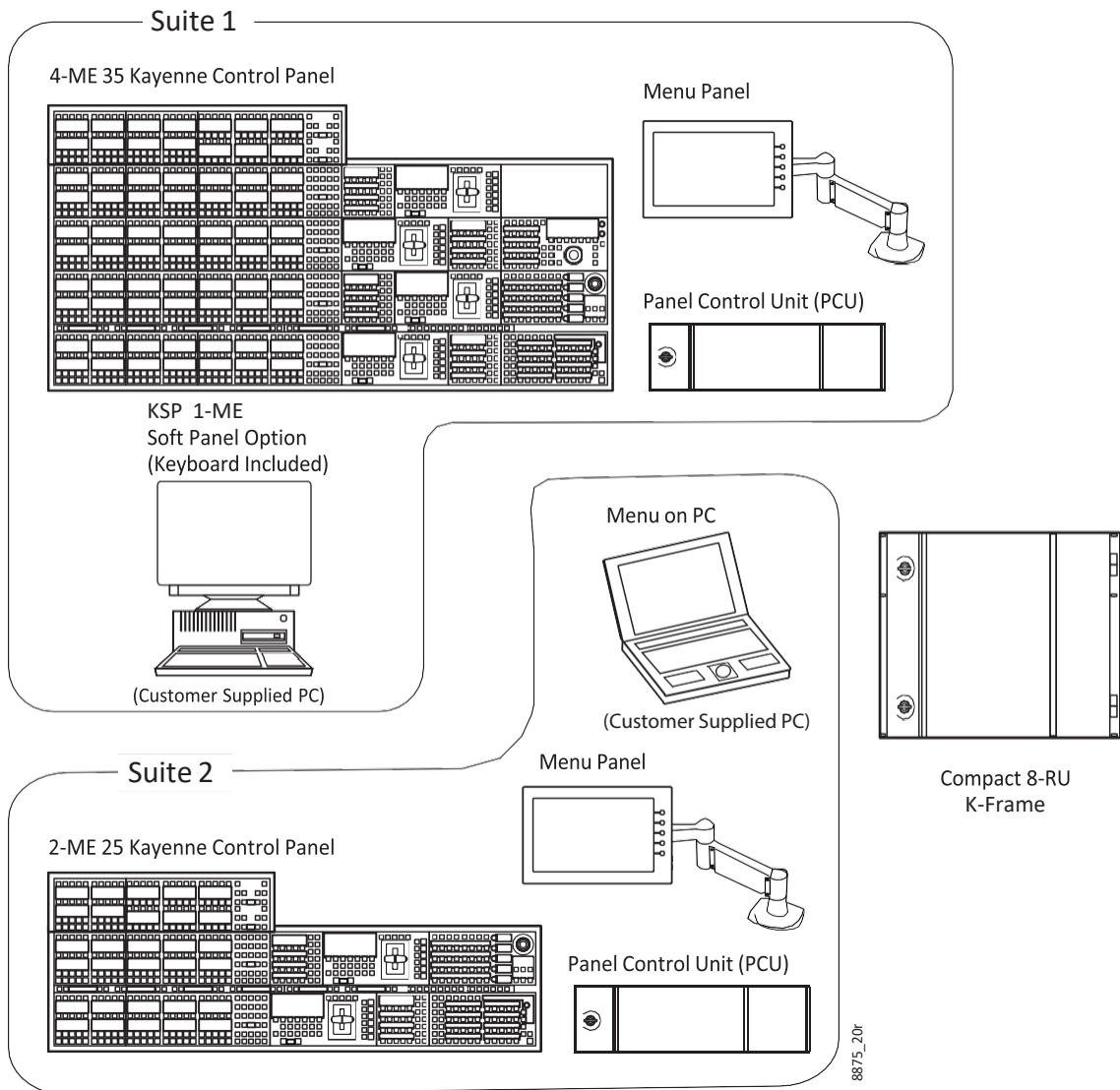
A basic K-Frame system consists of a Control Panel, a Menu application running on a touch screen Menu Panel, and a Video Processor Frame. The Control Panel and Menu application make up a control surface associated with that frame. The Kayenne Control Panel and Menu Panel have associated active electronics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



Multiple Suite Kayenne Panel System Example

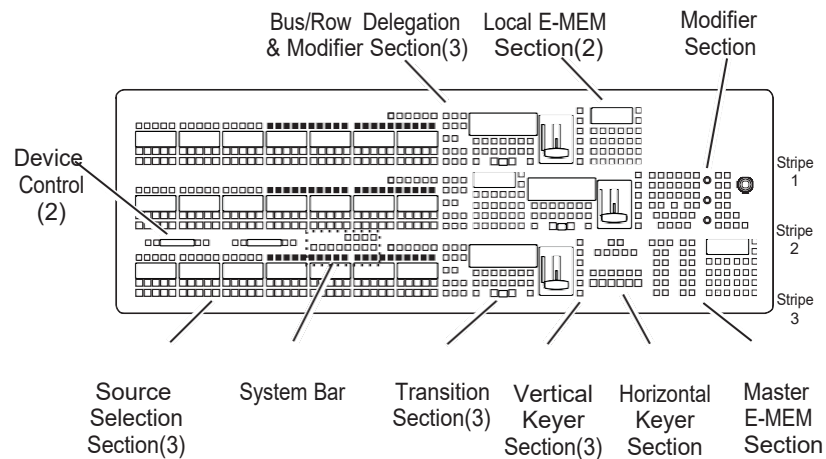
A K-Frame system can be subdivided into two suites, if desired, each of which can have two control surfaces (Surface A and Surface B). Each surface has its own set of Panel Preferences for configuration of the control panel behavior and independent macro systems to allow for independent building and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

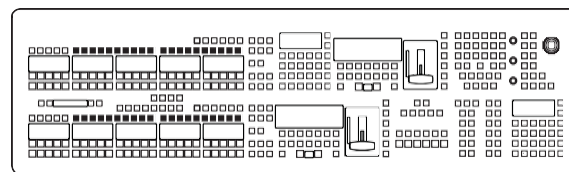


Karrera Control Surface

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 2-ME 25 Control Panel



Karrera Menu on PC

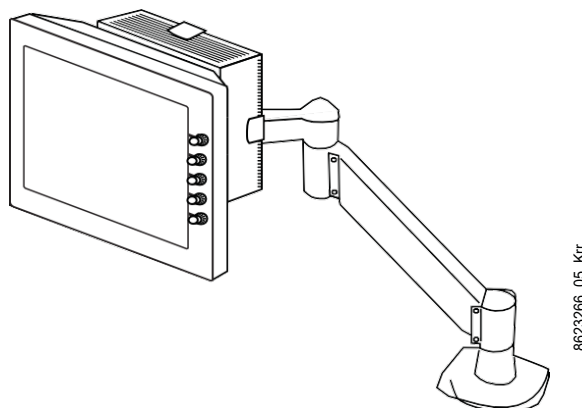


(Customer Supplied PC)

8623266_03_Krr

Touch Screen Menu Option

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



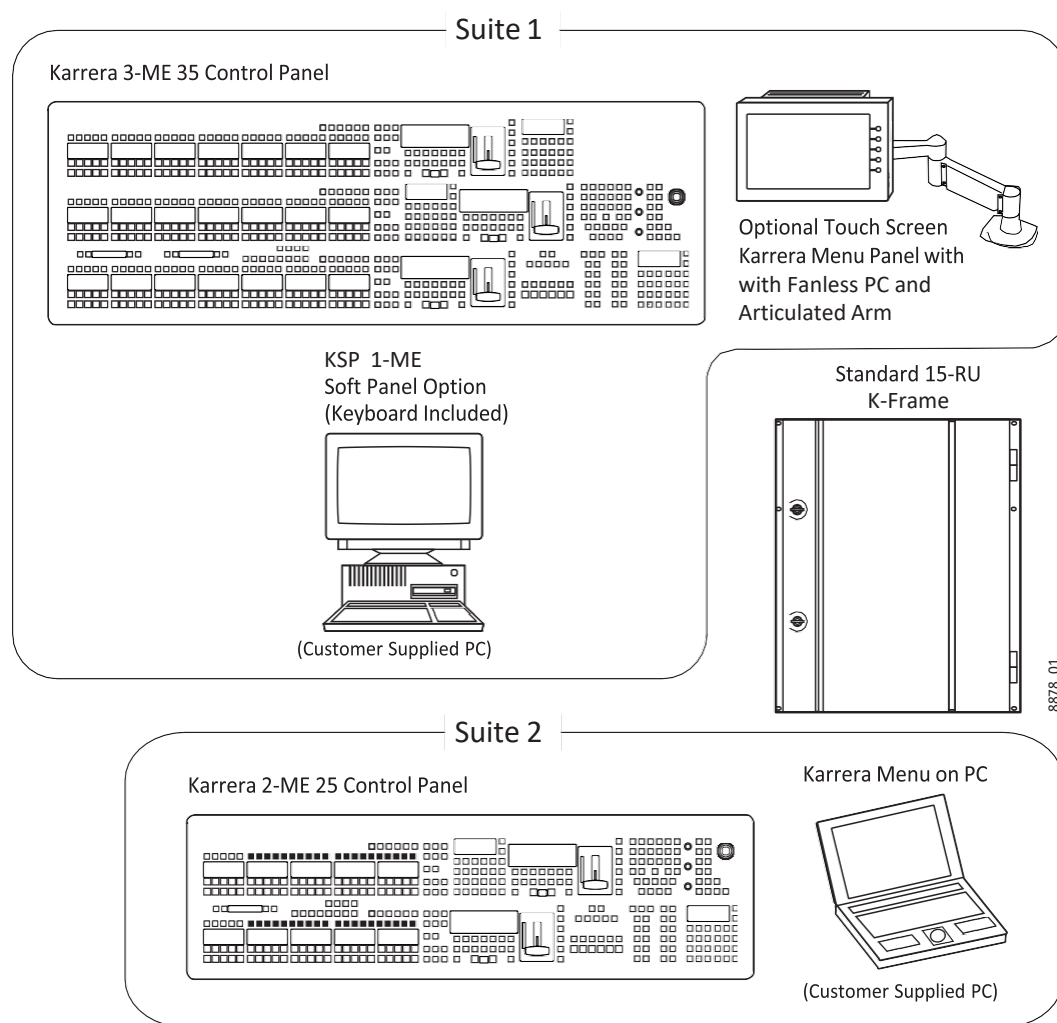
8623266_05_Krr

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.

Basic Single Suite Karrera Panel System

A basic Karrera 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.



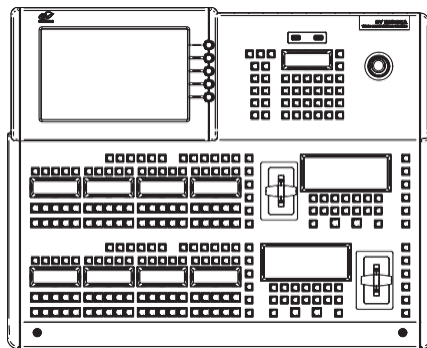
GV Korona Control Surfaces

A GV Korona control surface consists of a Control Panel with Source Select, Transition, Delegation, and Master/Local E-MEM areas, and a built-in multi-touch display with menu system.

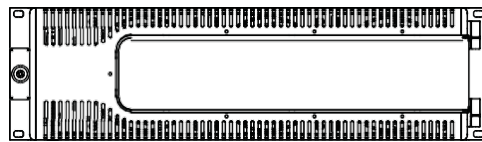


Basic Single Suite GV Korona Panel System Example

GV Korona 2-M/E 20 Control Panel



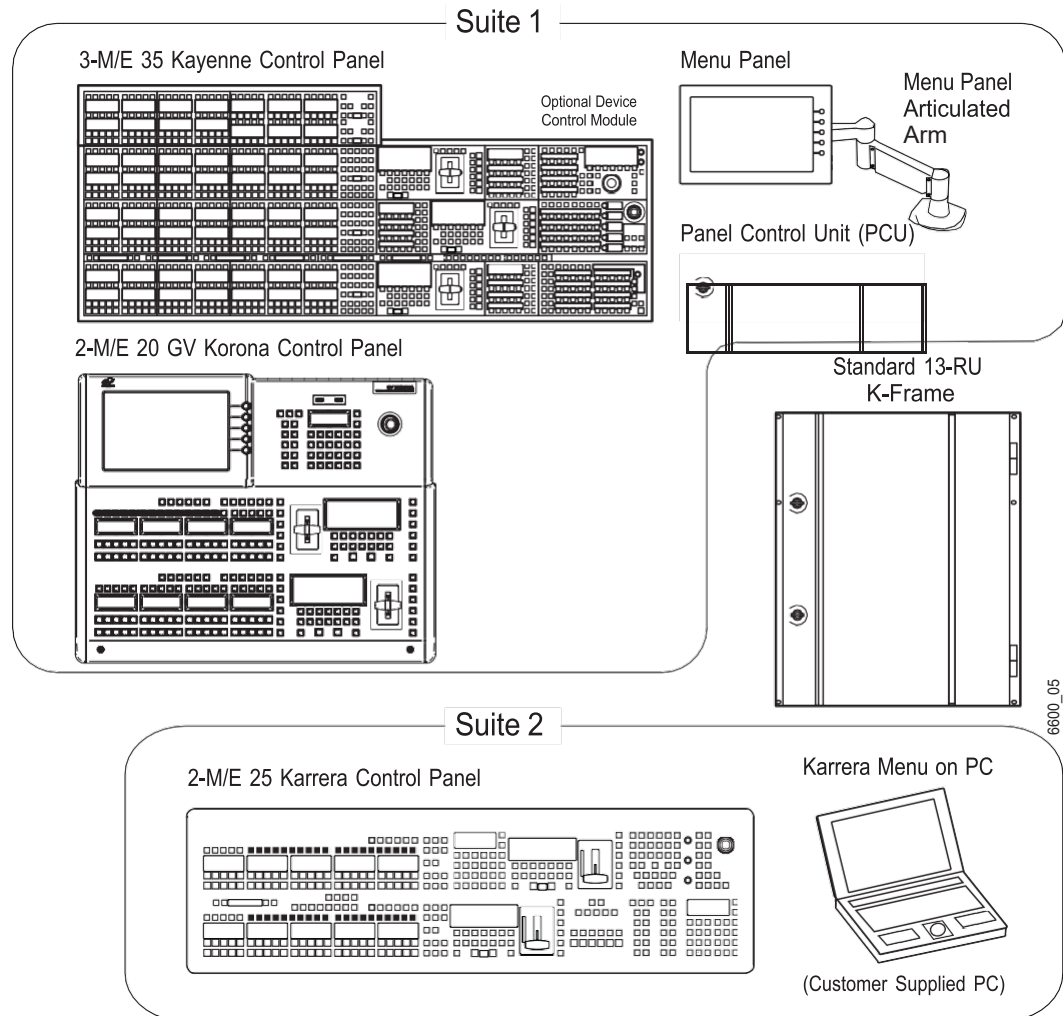
K-Frame V-series 3-RU



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 four 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 four separate switchers sharing one Frame. See the K-Frame Installation & Service Manual for suite configuration information



Supported Control Protocols

- PBus II
- 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
- Ethernet CPL to control Grass Valley external remote AUX Panels
- Grass Valley Editor protocol
- SNMP system monitoring
- Serial and Ethernet VDCP
- Control of Ross Xpression using RossTalk
- Control of RossTalk GPI devices
- Control Lyric and other devices via Ethernet Bases AMPLDK Series & LDX Series™ camera control with Ethernet tally via Connect Gateway

2

Frame Installation

Overview

- This section provides Grass Valley Video Production Center rack installation instructions, cooling and power requirements, and chassis and board descriptions for the GV K-Frame XP Compact Frame.

Weight Distribution

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

Cooling Requirements

The maximum ambient temperature for a GV K-Frame XP chassis is 40-degrees C (104-degrees F) monitored at the air intake. Installing the frame in a closed or multi-unit rack assembly together with other units could increase the maximum ambient temperature for this unit.

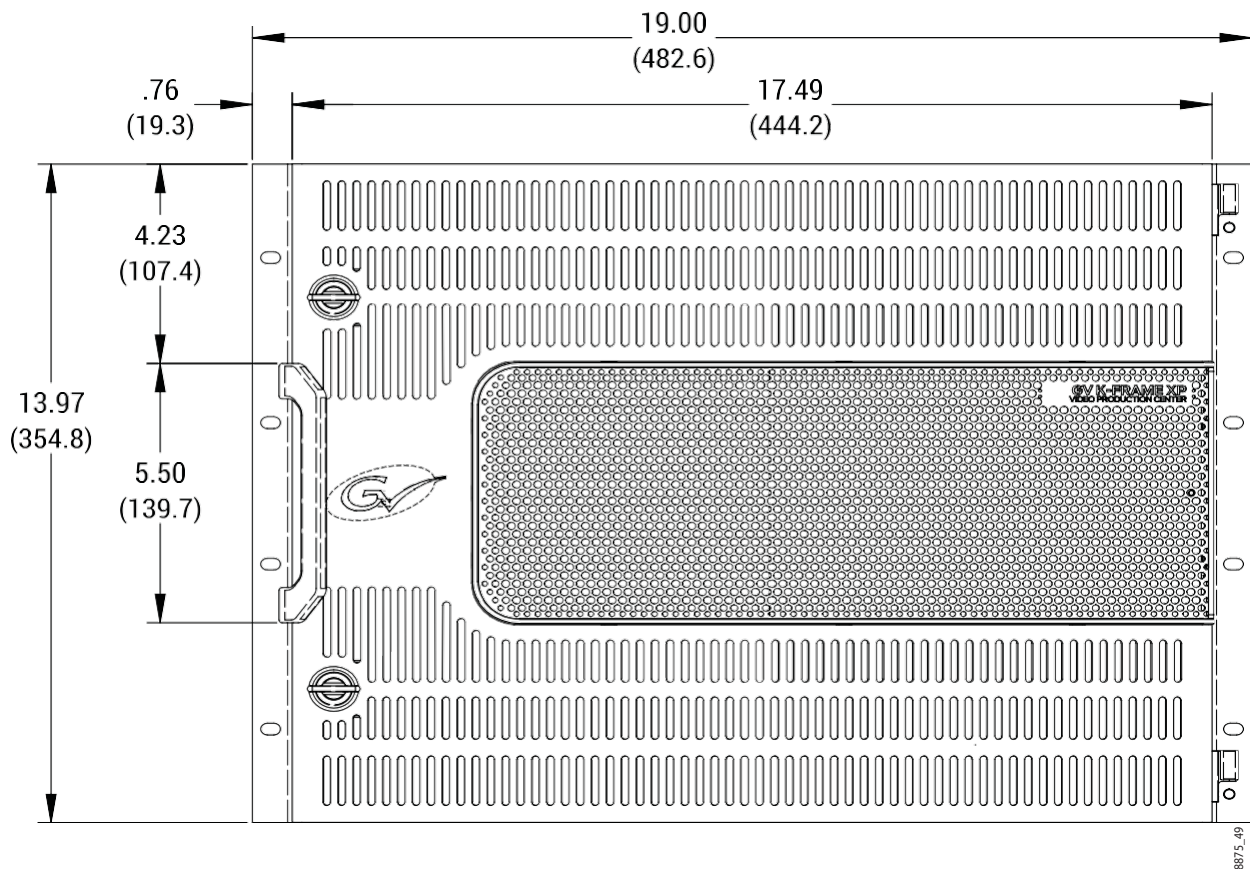
Make sure you install the frame to allow for cooling airflow. When the unit is installed in a rack, ventilation openings should not be blocked or otherwise covered. Air intake holes exist on the front of the Video Processor and air exhaust holes are on the left.

Power Connections

When connecting the unit to the supply circuit be sure that the supply circuit of the rack is not overloaded. The unit must be well-grounded. The safety ground is accomplished via the third wire in the AC line cord(s).

All Video Processor power supplies are 100V-240V AC +/-10% autorange, power factor corrected. Each power supply has its own line IEC line cord. Connecting each line cord to a separate AC circuit is recommended.

8-RU (GV K-Frame XP) Video Processor Dimensions

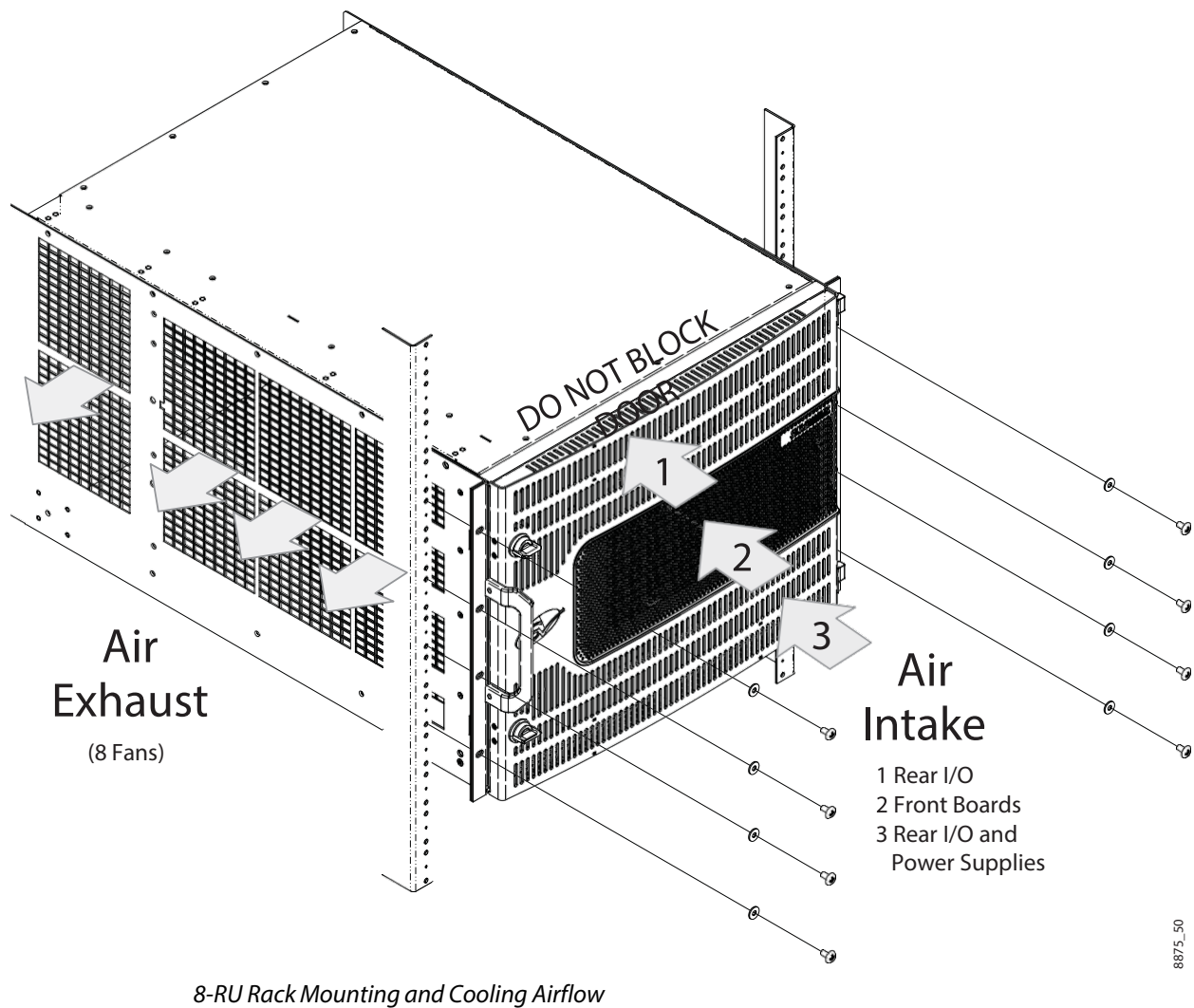


8-RU Dimensions (Front View)

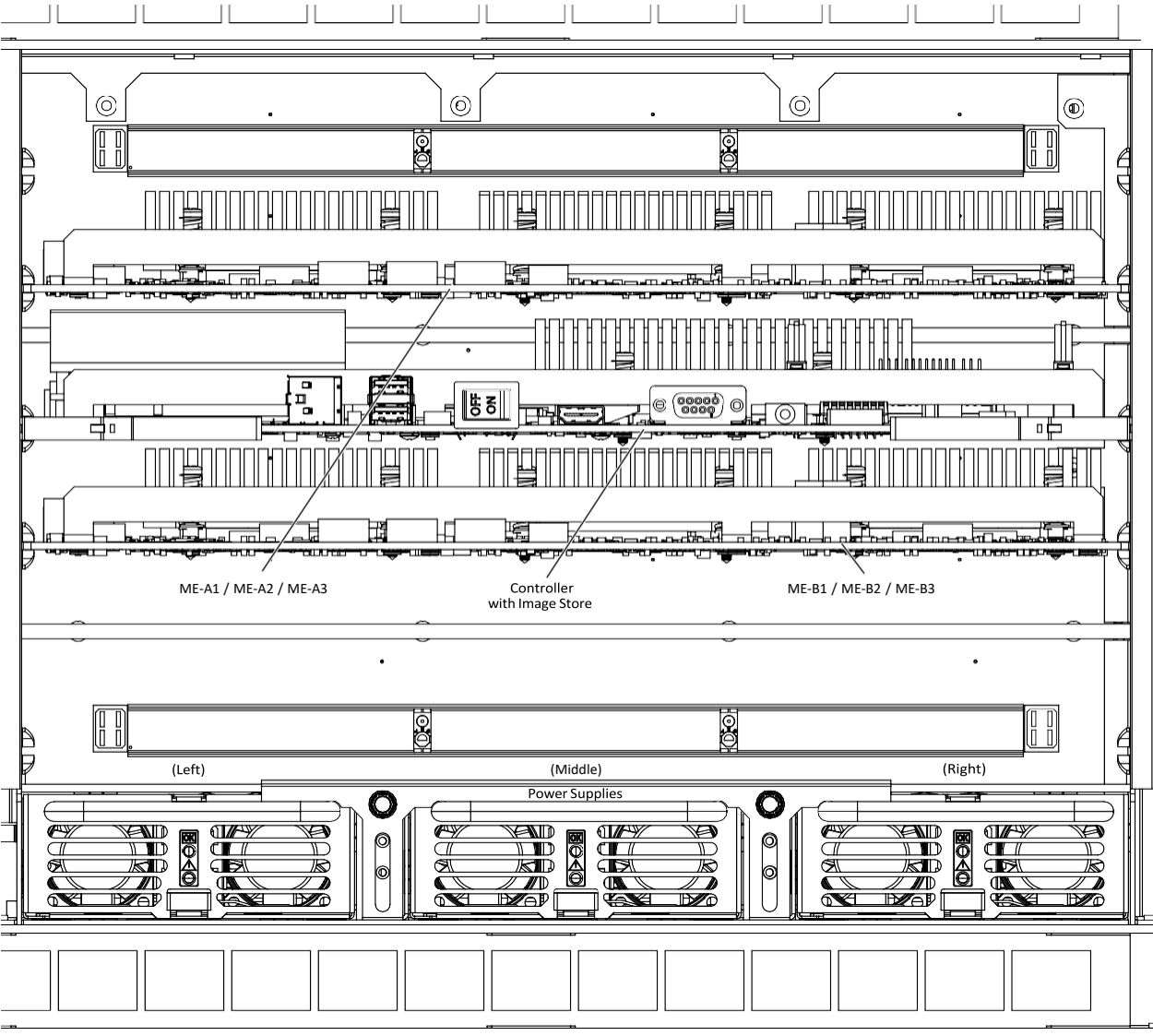
CAUTION: Mounting a GV K-Frame XP in a rack immediately below equipment that extends forward from the rack may not provide enough clearance to completely remove the door.



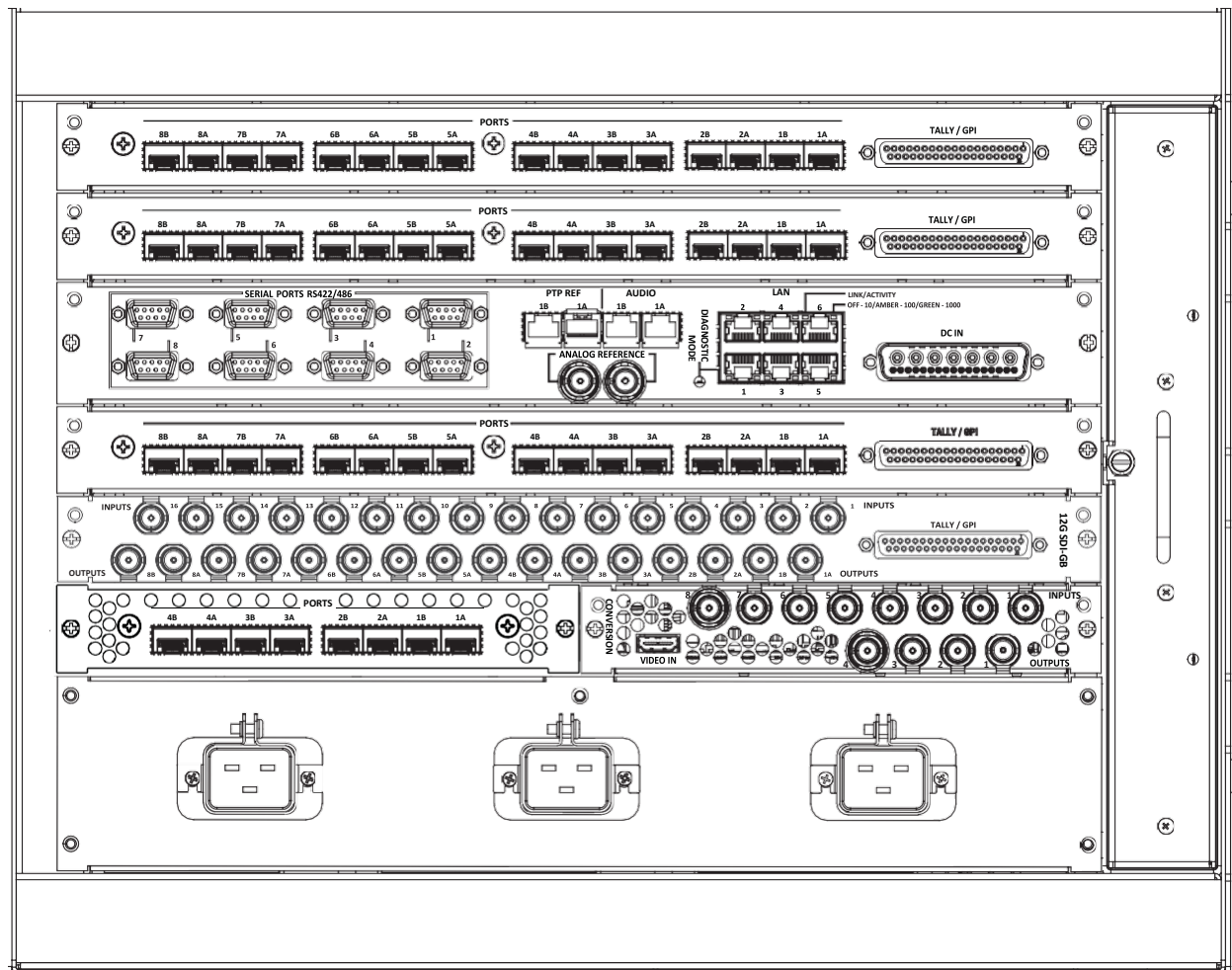
8RU Video Processor Installation and Airflow



8RU Video Processor Views



8-RU, Front View with Door Removed



8-RU, Rear View IP/Gearbox/Conversion

Compact Power Supply AC Requirements

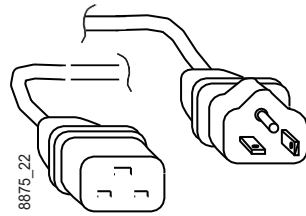
The GV K-Frame XP 8-RU Power Supplies have provision to support up to three hot swappable power modules. These convert the AC line input to 48V DC for the Video Processor Frame. The cells for the three modules (referred to as left, center, right) are identical and any or all cells can have a module installed. 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 supplies have a rating of 90-140V AC for low line and 180-240V AC high line to accommodate under and over voltage conditions.

The 8RU Frame is supplied with two power modules. A third power module can be fitted as a redundant (n+1) power supply option.

Supplied Power Cables for 8-RU

The GV K-Frame XP Compact Power Supply Frame has IEC C19 sockets, instead of the more common C13 style, to accommodate potentially higher currents. Cables provided with the

systems are matched to the destination country's standard. For example, in the USA C19 to NEMA 5-20P cables are provided.



USA Power Cable Example

About High Line (208V-240V) Versus Low Line (120V) Operations

North American users usually have a choice to use low line (120 volts) or high line (208-240 volts) as the AC source. If Low line is used, an 8RU Compact Frame with all options installed and running at 120 volts will draw a total of approximately 15 amps from the line cords. At 100 volts, this increases to approximately 18 amps. This load will be evenly distributed among the line cords.

IMPORTANT: Each line cord must be serviced by a dedicated 20 amp circuit. Two power supplies on the same circuit could exceed 20 amps. With a fully loaded system, a third power supply is needed for redundancy.

The possibility of drawing as much as 15 amps from a line cord explains the 20 amp (NEMA 5-20P) plug on the line cords supplied. The NEC in the US specifies that the ubiquitous 15 amp outlet be de-rated to 12 amps for continuous loads. A 20 amp outlet is needed for the rare case of a 15 amp load experienced during a fault condition.

Most of the above is not an issue if high line (240V) operation is used. Since AC line currents are approximately half of those at low line, exceeding the current rating of a circuit should not be a problem. In areas where there is a choice between high line or low line operation, the user should consider the advantages and disadvantages of each power sourcing scheme.

About Low Line (120V) Operational Considerations

If low line (120V) operation is used (mostly in North America) three characteristics of the switcher should be kept in mind when provisioning AC power for the system, which will result in the most reliable system possible:

- Consider brown-out—Modern switching power supplies are constant power devices and as such, unlike resistive loads, the input current increases as the input voltage decreases.
- Consider power supply failure—If two or three power modules are present, they will load share. For instance, if two modules are fitted and the total AC line current is 10 amps, each of the two line cords will draw about 5 amps. If one supply fails, the other supply takes up the entire load. At this point, one line cord will draw 0 amps and the other cord will draw 10 amps.

Consider future options—The total AC power consumption is significantly influenced by the number and type of hardware options installed. This includes the number of boards: M/Es, I/Os, and Modular I/Os.

GV K-Frame XP Video Processor Door Removal Clearance

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

The GV K-Frame XP Video Processor door on all Frames can be completely removed when installed in a rack immediately below conventional flush mounted rack-ear only equipment. Mounting any GV K-Frame XP in a rack immediately below other equipment that extends forward from the rack (for example, under another GV K-Frame XP chassis) may not provide enough clearance to remove the door.

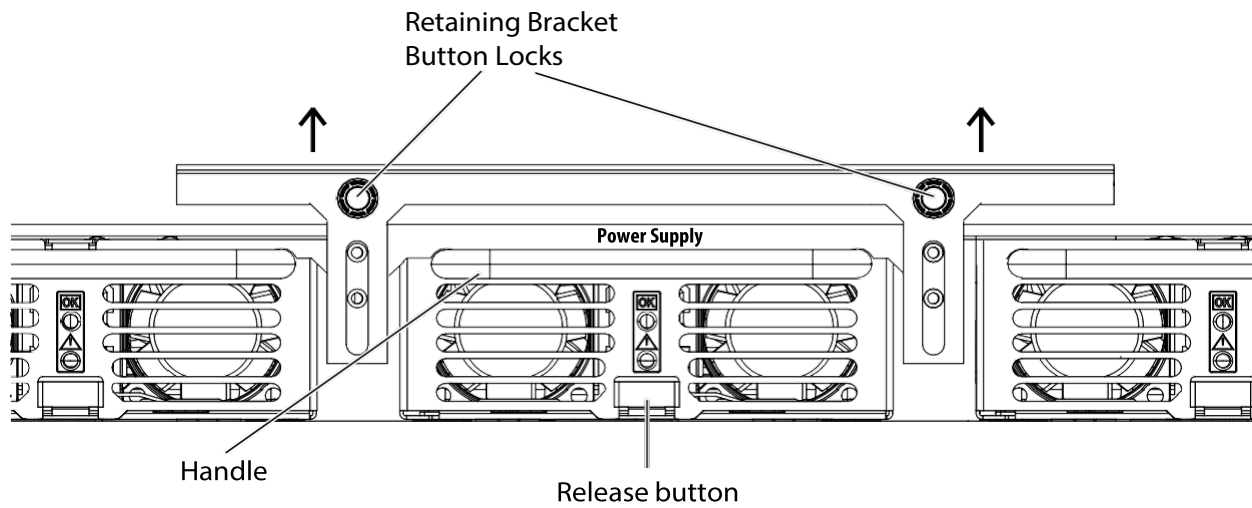
If mounted below equipment that extends forward from the rack, allow at least 24 mm (0.94 in.) of vertical clearance above the GV K-Frame XP to permit door removal. A flush design 1 RU blank filler panel can be used for clearance, if required.

Replacing Compact Power Supplies

GV K-Frame XP Video Processors come with two power supplies with the option of a third, located in the front of the chassis. Power supplies are hot swappable in systems containing two or more power supplies.

CAUTION: ESD equipment and procedures should be used when servicing electronic components.

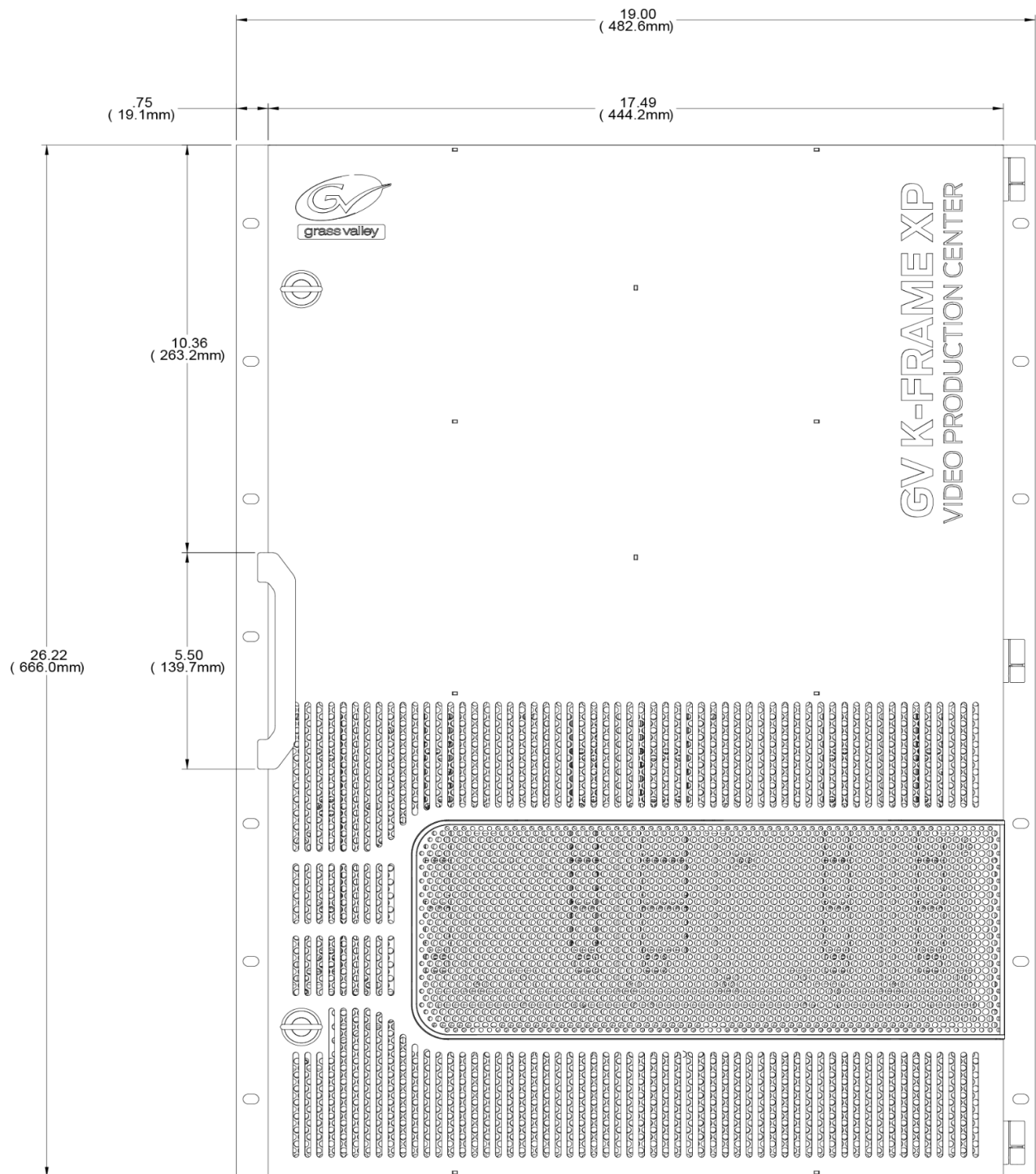
- 1 To remove the power supply.
 - a Open the front door of the Frame.



Compact Frame Power Supply Replacement

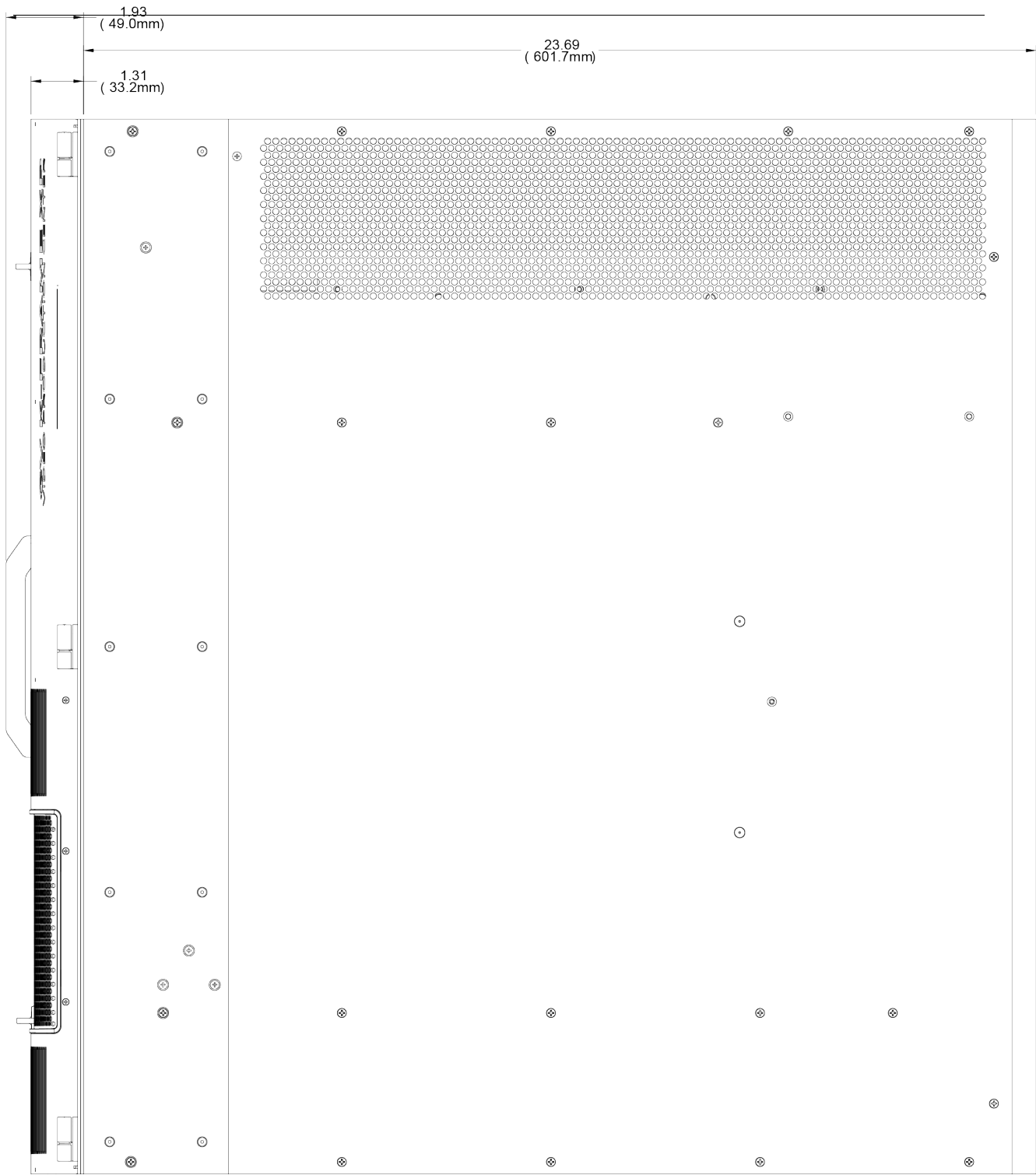
- b Locate the two button locks on either side of the power supply retainer bracket.
 - c Pull the lock buttons straight forward simultaneously, then slide the retainer up until it stops and release the lock buttons
 - d While grasping the handle on the front of the power supply, using your thumb press the release button upward and pull the power supply straight out.
- 2 To install the power supply.
 - a If the power supply retainer bracket is in the down and locked position (for example when adding a third, redundant power supply, not replacing one), perform steps [step a](#), [step b](#), and [step c](#) from the *Remove the power supply* procedure above.
 - b Insert the power supply straight into the slot and slide it in until the release button locks into place.
 - c On the Retaining Bracket, pull the lock buttons straight forward then slide the retainer down until it stops and release the lock buttons.
 - d Verify that the locks are in the closed position and the power supply is completely seated.
 - e Close the Compact GV K-Frame XP door, making sure that it latches in the closed position.

15-RU (GV K-Frame XP) Video Processor Dimensions



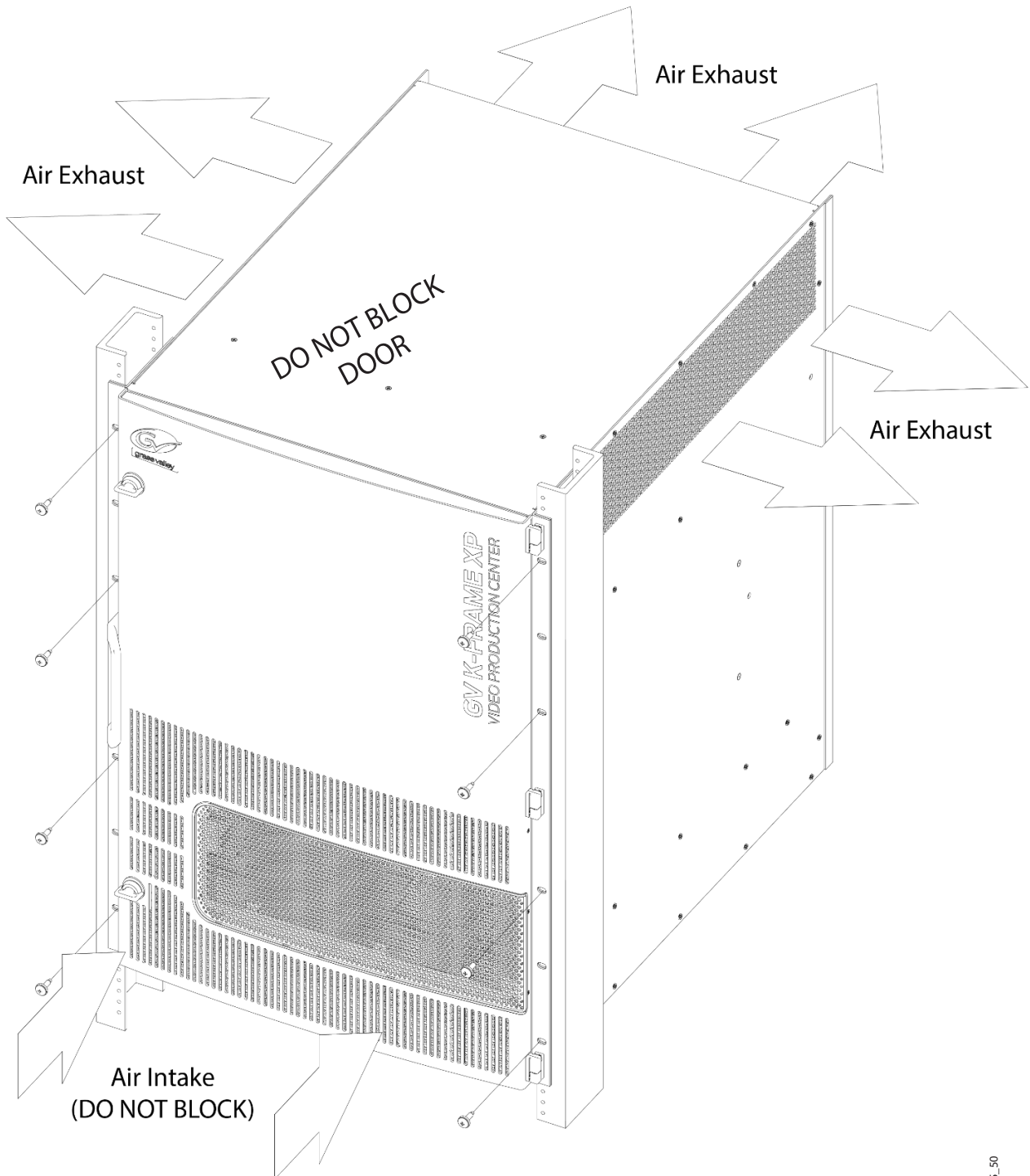
15-RU Dimensions (Front View)

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

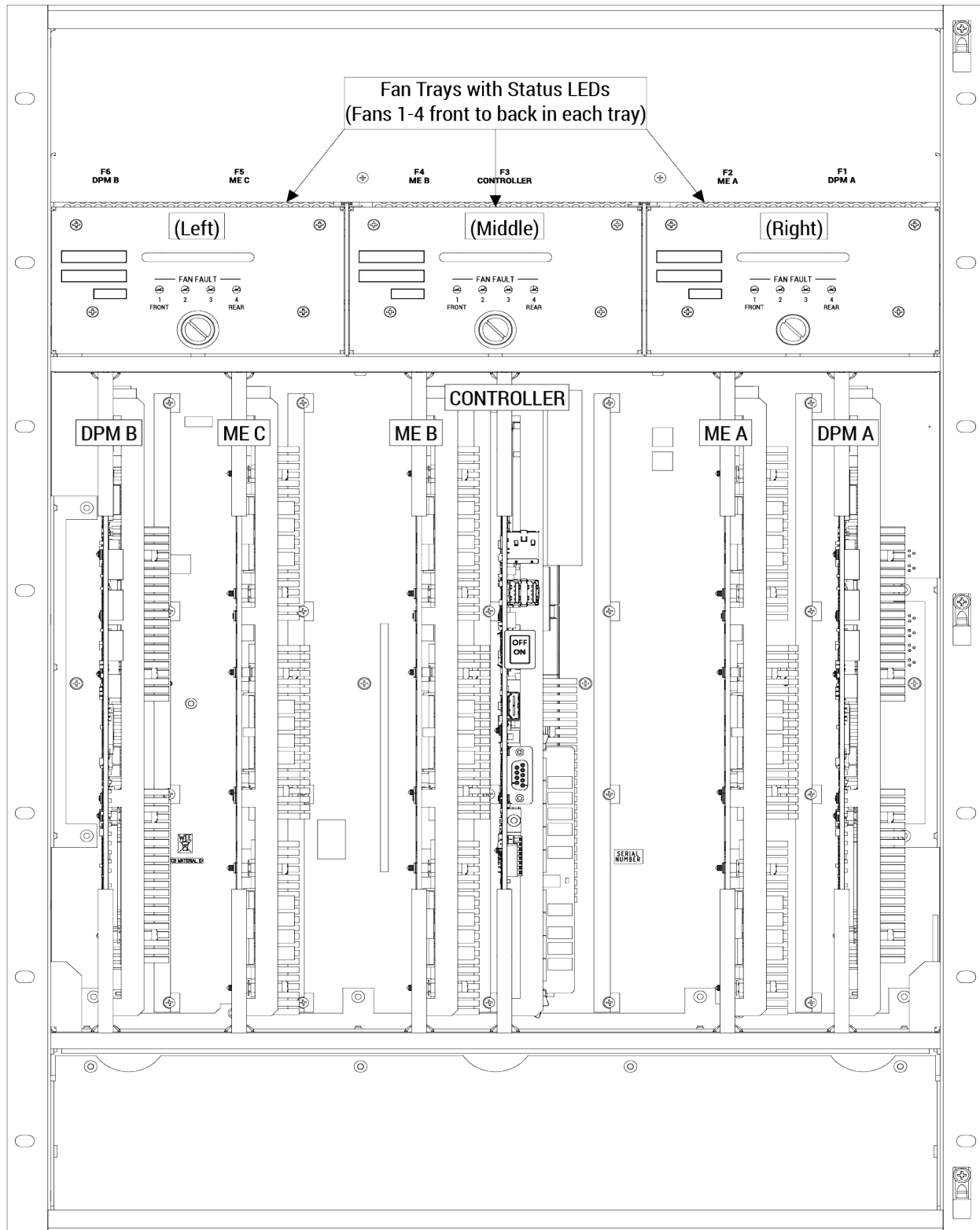


15-RU Dimensions (Side View)

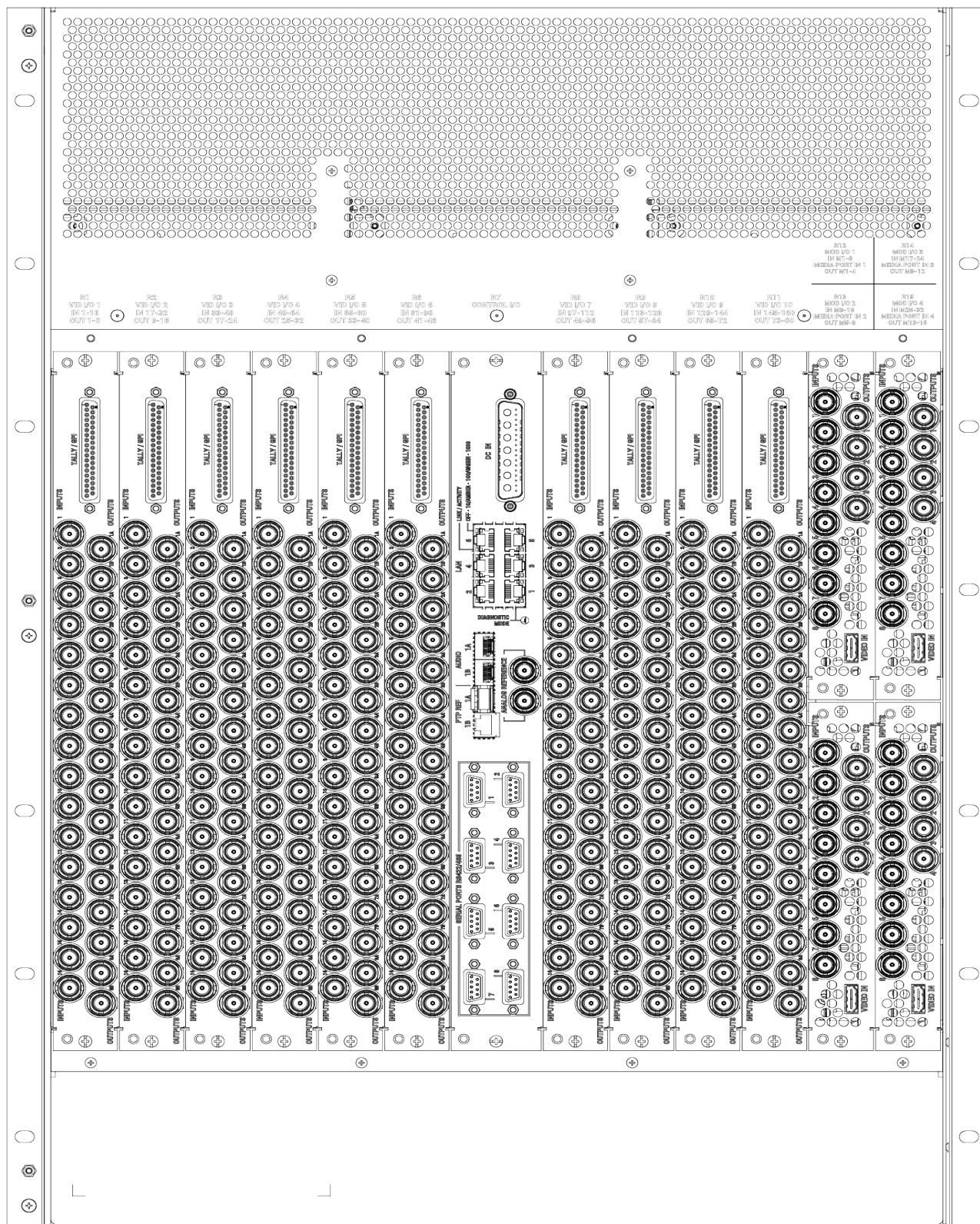
15RU Video Processor Installation and Airflow



15-RU Rack Mounting and Cooling Airflow



15-RU, Front View with Door Removed

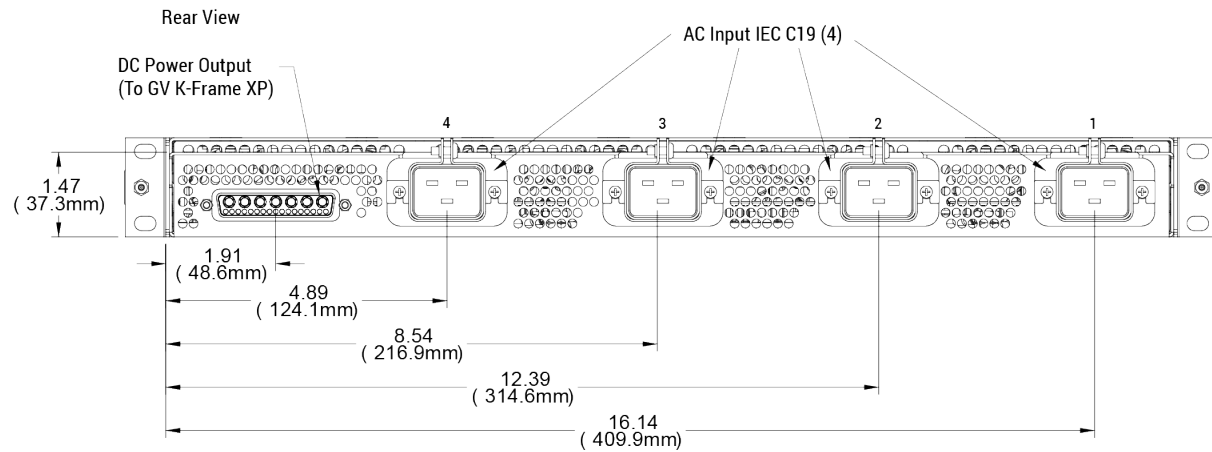
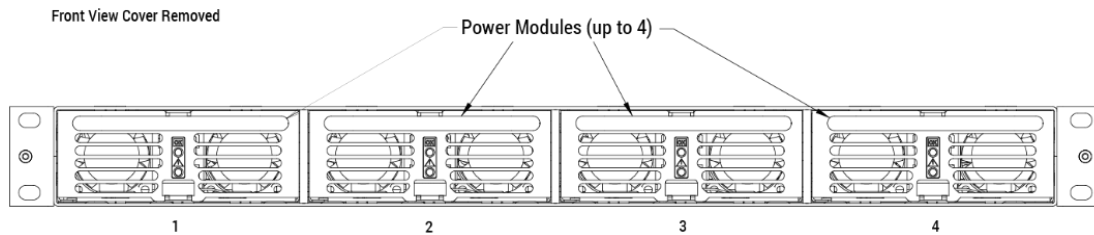
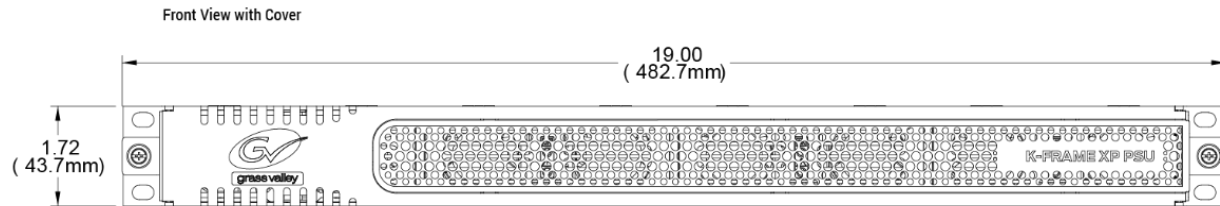
26

15-RU, Rear View IP/Gearbox/Conversion

Power Supply Views

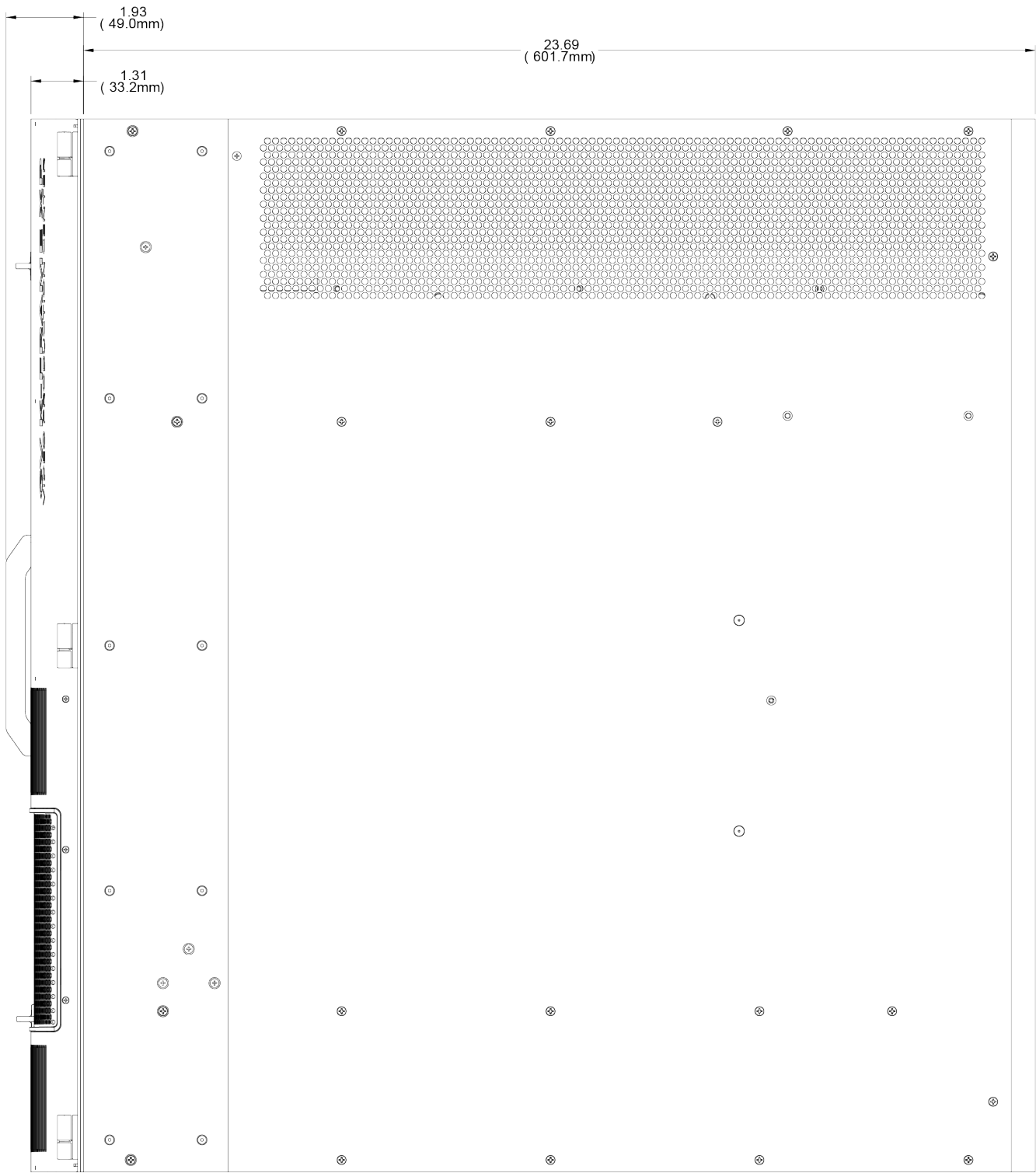
A 1-RU Power Supply Frame provides DC power for the 15-RU Video Processor Frame.

Front View with Cover



PowerSupplyFrameDimensions (Front and Rear Views)

Frame Installation



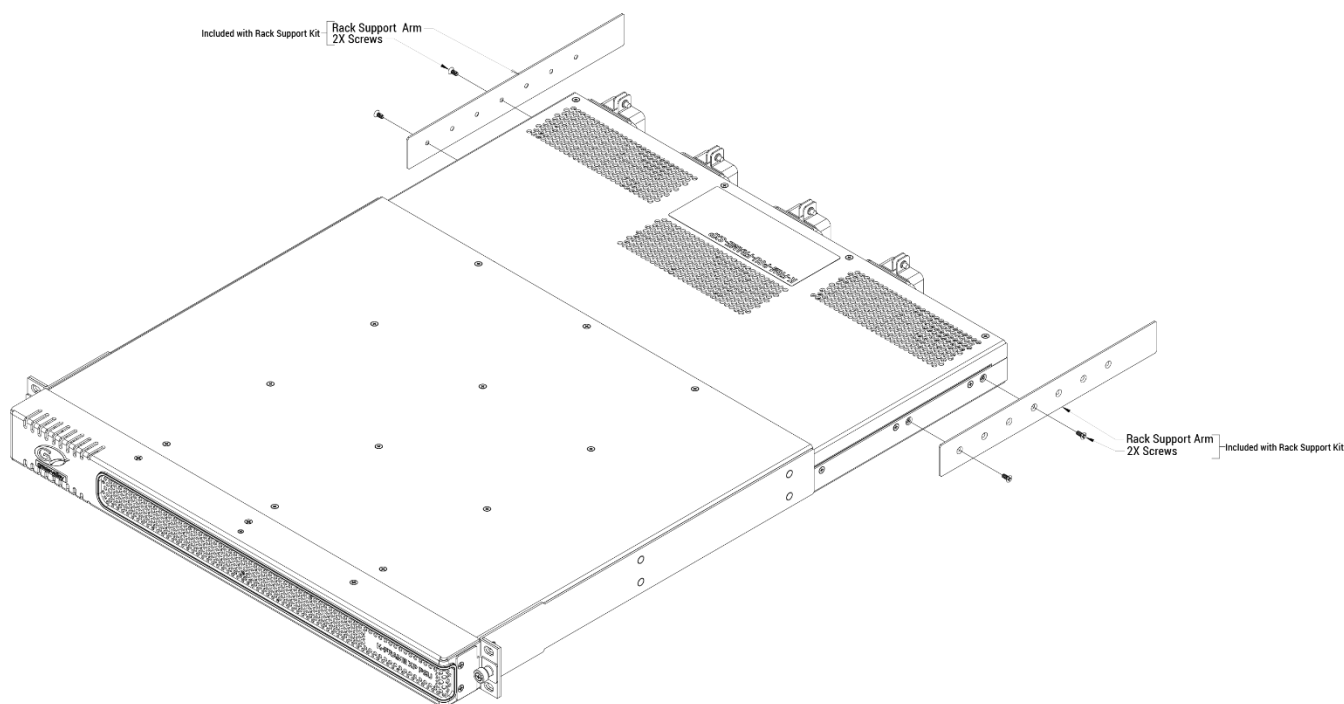
PowerSupplyFrameDimensions (TopView)

Power Supply Frame Rack Installation and Airflow

The power supply frame used with the 15-RU GV K-Frame XP is ideally rack mounted immediately above the Video Processor chassis. The power supply frame is then supported by the lower chassis and eliminates the need for power supply rear rack supports.

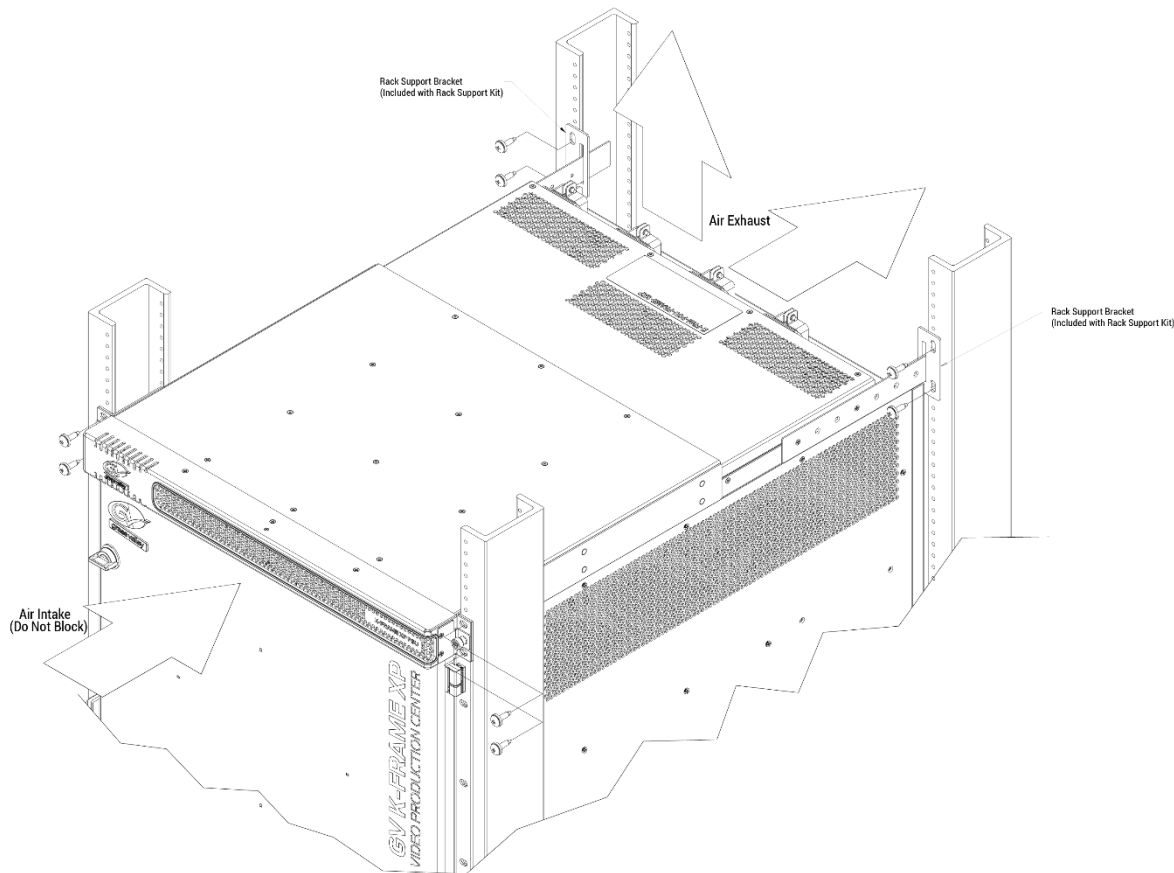
In addition, this placement allows removal of the GV K-Frame XP front door.

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



Power Supply Rack Installations and Cooling Airflow

Frame Installation



Power Supply Rack Installation

Standard Power Cooling

The GV K-Frame XP 1-RU 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.

Standard Power Supply AC Requirements

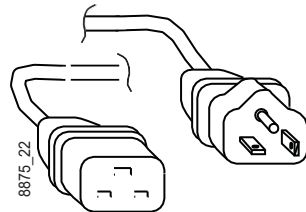
The GV K-Frame XP 15-RU Power Supplies have provision to support up to four hot swappable power modules. These convert the AC line input to 48V DC for the Video Processor Frame. The cells for the four modules (referred to as left, center-left, center-right, right) are identical and any or all cells can 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 supplies have a rating of 90-140V AC for low line and 180-240V AC high line to accommodate under and over voltage conditions.

The 15RU Frame is supplied with three power modules. A fourth power module can be fitted as a redundant (n+1) power supply option.

Supplied Power Cables for 25-RU

The GV K-Frame XP Standard Power Supply Frame has IEC C19 sockets, instead of the more common C13 style, to accommodate potentially higher currents. Cables provided with the

systems are matched to the destination country's standard. For example, in the USA C19 to NEMA 5-20P cables are provided.



USA Power Cable Example

About High Line (208V-240V) Versus Low Line (120V) Operations

North American users usually have a choice to use low line (120 volts) or high line (208-240 volts) as the AC source. If Low line is used, a 15RU Compact Frame with all options installed and running at 120 volts will draw a total of approximately 15 amps from the line cords. At 100 volts, this increases to approximately 18 amps. This load will be evenly distributed among the line cords.

IMPORTANT: Each line cord must be serviced by a dedicated 20 amp circuit. Two power supplies on the same circuit could exceed 20 amps. With a fully loaded system, a third power supply is needed for redundancy.

The possibility of drawing as much as 15 amps from a line cord explains the 20 amp (NEMA 5-20P) plug on the line cords supplied. The NEC in the US specifies that the ubiquitous 15 amp outlet be de-rated to 12 amps for continuous loads. A 20 amp outlet is needed for the rare case of a 15 amp load experienced during a fault condition.

Most of the above is not an issue if high line (240V) operation is used. Since AC line currents are approximately half of those at low line, exceeding the current rating of a circuit should not be a problem. In areas where there is a choice between high line or low line operation, the user should consider the advantages and disadvantages of each power sourcing scheme.

About Low Line (120V) Operational Considerations

If low line (120V) operation is used (mostly in North America) three characteristics of the switcher should be kept in mind when provisioning AC power for the system, which will result in the most reliable system possible:

- Consider brown-out—Modern switching power supplies are constant power devices and as such, unlike resistive loads, the input current increases as the input voltage decreases.
- Consider power supply failure—If three or four power modules are present, they will load share. For instance, if three modules are fitted and the total AC line current is 10 amps, each of the three line cords will draw about 5 amps. If one supply fails, the other supply takes up the entire load. At this point, one line cord will draw 0 amps and the other cord will draw 10 amps.

Consider future options—The total AC power consumption is significantly influenced by the number and type of hardware options installed. This includes the number of boards: DPMs, VPEs, I/Os, and Modular I/Os supply takes up the entire load.

At this point, one line cord will draw 0 amps and the other cord will draw 10 amps. Consider future options—The total AC power consumption is significantly influenced by the number and type of hardware options installed. This includes the number of boards: M/Es, I/Os, and Modular I/Os.

GV K-Frame XP Video Processor Door Removal Clearance

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

The GV K-Frame XP Video Processor door on all Frames can be completely removed when installed in a rack immediately below conventional flush mounted rack-ear only equipment. Mounting any GV K-Frame XP in a rack immediately below other equipment that extends forward from the rack (for example, under another GV K-Frame XP chassis) may not provide enough clearance to remove the door.

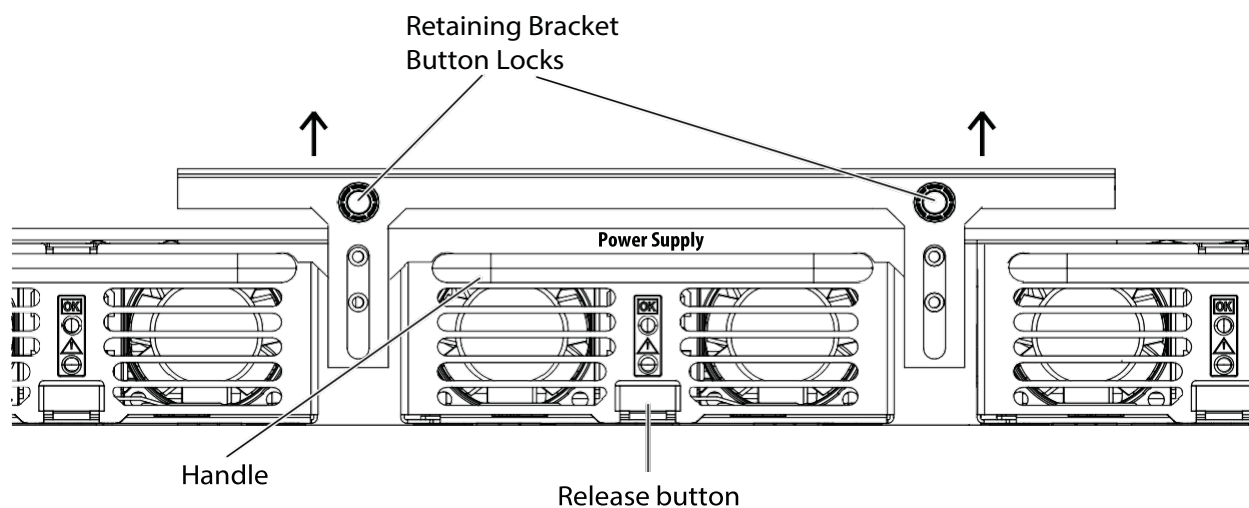
If mounted below equipment that extends forward from the rack, allow at least 24 mm (0.94 in.) of vertical clearance above the GV K-Frame XP to permit door removal. A flush design 1 RU blank filler panel can be used for clearance, if required.

Replacing Standard Power Supplies

GV K-Frame XP Video Processors come with three power supplies with the option of a fourth, located in the front of the chassis. Power supplies are hot swappable in systems containing three or more power supplies.

CAUTION: ESD equipment and procedures should be used when servicing electronic components.

- 3 To remove the power supply.
 - a Open the front door of the Frame.
 - b Locate the two button locks on either side of the power supply retainer bracket.
 - c Pull the lock buttons straight forward simultaneously, then slide the retainer up until it stops and release the lock buttons.
 - d While grasping the handle on the front of the power supply, using your thumb press the release button upward and pull the power supply straight out.



Compact Frame Power Supply Replacement

4 To install the power supply.

- f If the power supply retainer bracket is in the down and locked position (for example when adding a third, redundant power supply, not replacing one), perform steps [step a](#), [step b](#), and [step c](#) from the *Remove the power supply* procedure above.
- g Insert the power supply straight into the slot and slide it in until the release button locks into place.
- h On the Retaining Bracket, pull the lock buttons straight forward then slide the retainer down until it stops and release the lock buttons.
- i Verify that the locks are in the closed position and the power supply is completely seated.
- j Close the Compact GV K-Frame XP door, making sure that it latches in the closed position.

3 Control Surface Installation

Control Surfaces

- Kayenne and Karrera Control Panels support an optional external Menu Panel, included in this section.
- GV Korona Control Panels have a built-in multi-touch menu.

Kayenne Control Surfaces

A typical Kayenne control surface has a modular Control Panel, a Menu Panel, and is driven by a Panel Control Unit (PCU) frame. Additional Menu Panels and Satellite Panels are available as options.

A Control Panel consists of system operation modules, which mount into trays, which are in turn held in place by a Control Panel support structure. One Control Panel tray filled with modules is called a Stripe. Various numbers and types of modules and trays can be combined to create a wide variety of control surface functionality.

The Control Panel and Menu Panel's processing electronics are located in the PCU. The Stripes and Menu Panels are connected to the PCU via multi-pin cables that carry power and communication signals.

Kayenne Control Panels ship to the customer as boxed Stripes, which are assembled with the support structure on site. You will need to know what Control Panel configuration(s) you intend to use at your facility in order to plan your installation effectively.

The Kayenne Control Panel support kit uses 30mm series components sourced from Bosch Rexroth.

Control Panel and Support Structure Assembly

If you purchased commissioning with your Grass Valley switcher system, assembly of the Control Panel support is included as part of the commissioning.

If you did not purchase commissioning, but would like to reconsider the option, contact Grass Valley Customer Support.

Control Panel Variations

Seven basic Control Panel assemblies are considered standard: 4-M/E 35, 4-M/E 25, 3-M/E 35, 3-M/E 25, 2-M/E 35, 2-M/E 25, and 1-M/E 15. Each assembly name identifies the number of M/Es present and the number of source selector buttons in each M/E.

Two Control Panel Assembly orientations are possible, flat and curved. The curved panel provides improved operator ergonomics. This orientation raises the Control Panel height, so visibility of a monitor wall should be considered prior to installation.

An assembled Control Panel can be operated from a tabletop, or it can be installed into a cutout.

The Local Aux Stripe can be connected to the Control Panel support structure at a 45 degree angle, or it can be mounted separately in its own backsplash cutout.

The following diagrams show some standard Control Panel assemblies. It is also possible to create different Control Panel assemblies (for example, a 2-M/E 35), since the parts are interchangeable. Specific information for non-standard configurations is not included in this document.

Control Panel Cooling

The Kayenne Control Panel is externally powered and does not have internal cooling fans. Electronics in the panel are convection cooled and require free air movement. Do not install the panel into a sealed space.

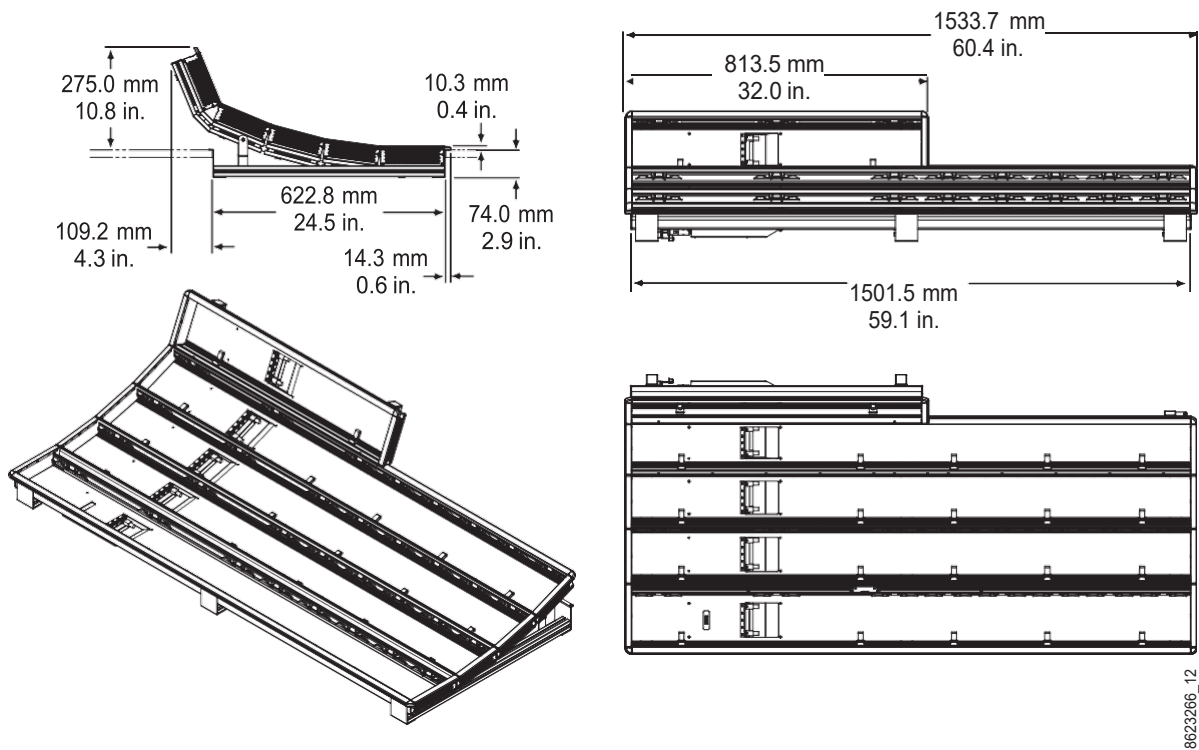
CAUTION: If the panel is mounted in a counter-top, do not enclose the lower portion of the cutout. Leave the bottom open to allow passive air movement.

Truck and High Vibration Environment Considerations

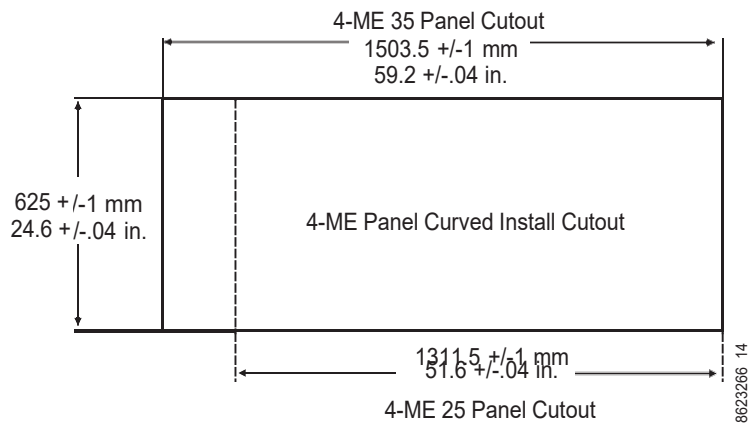
The Kayenne Control Panel has several bolt and screw tightened components. In high vibration environments these attachments could loosen over time. Loctite Blue 242 or equivalent thread locking compound is recommended for these environments. This compound is designed to lock threaded components together during assembly, but permits them to be loosened if necessary later using hand tools.

During Control Panel assembly, apply a drop of the locking compound to the ends of the threads of the support beam bolts, to the screws connecting the cutout lip brackets to the support beams, and to the bolts attaching the trays to the support beams. Make sure the locking compound is present where the thread interfaces to each bolt or beam.

4-M/E 35 Control Panel, Curved Assembly



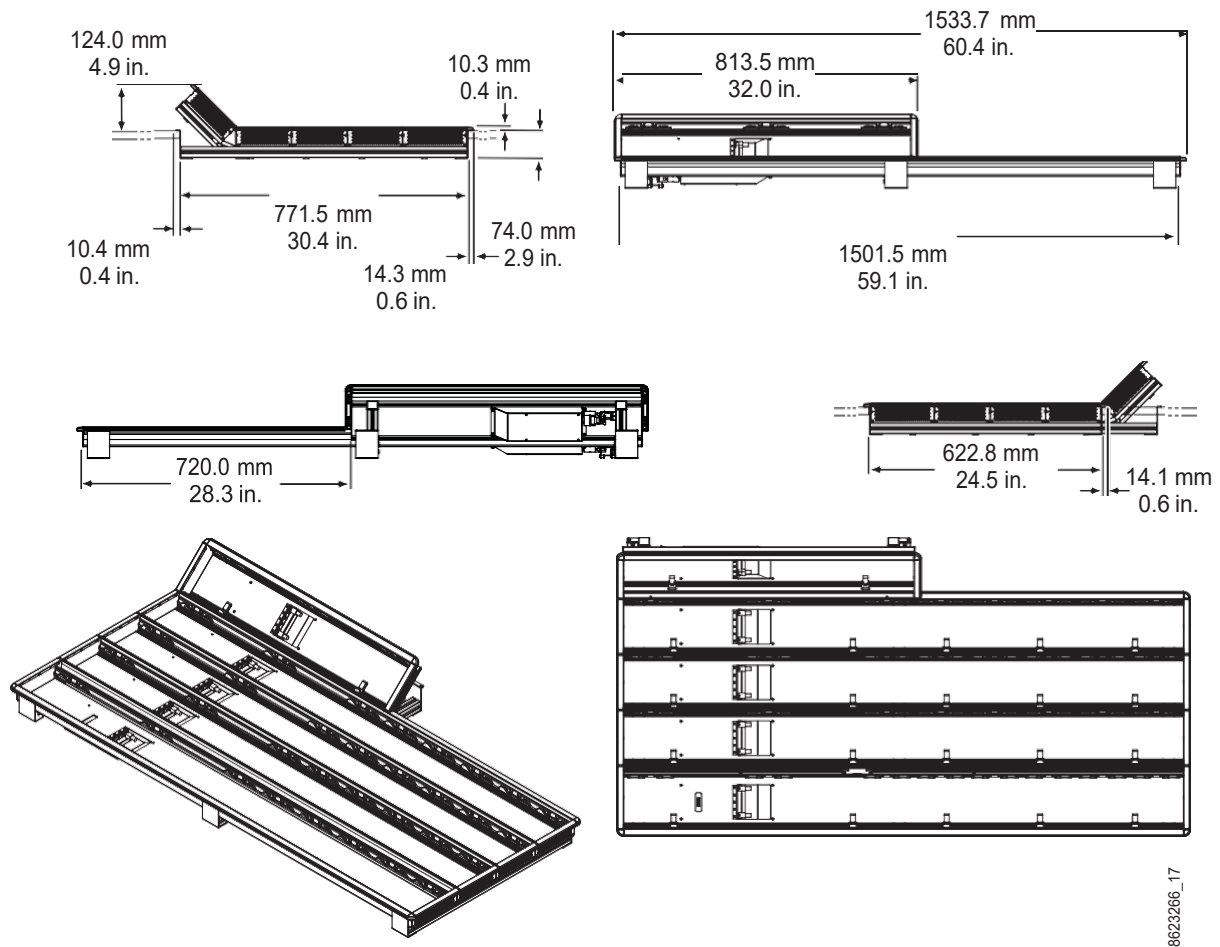
4-M/E 35 Control Panel Dimensions, Curved Installation



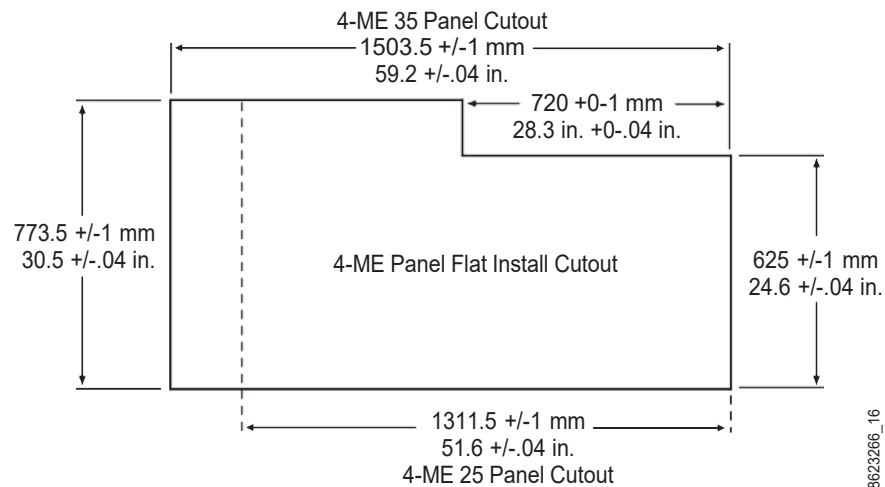
4-M/E Control Panel Cutout Dimensions, Curved Installation

4-M/E 35 Control Panel, Flat Assembly

Note: Read through the entire procedure before you begin actual assembly.



4-M/E 35 Control Panel Dimensions, Flat Installation

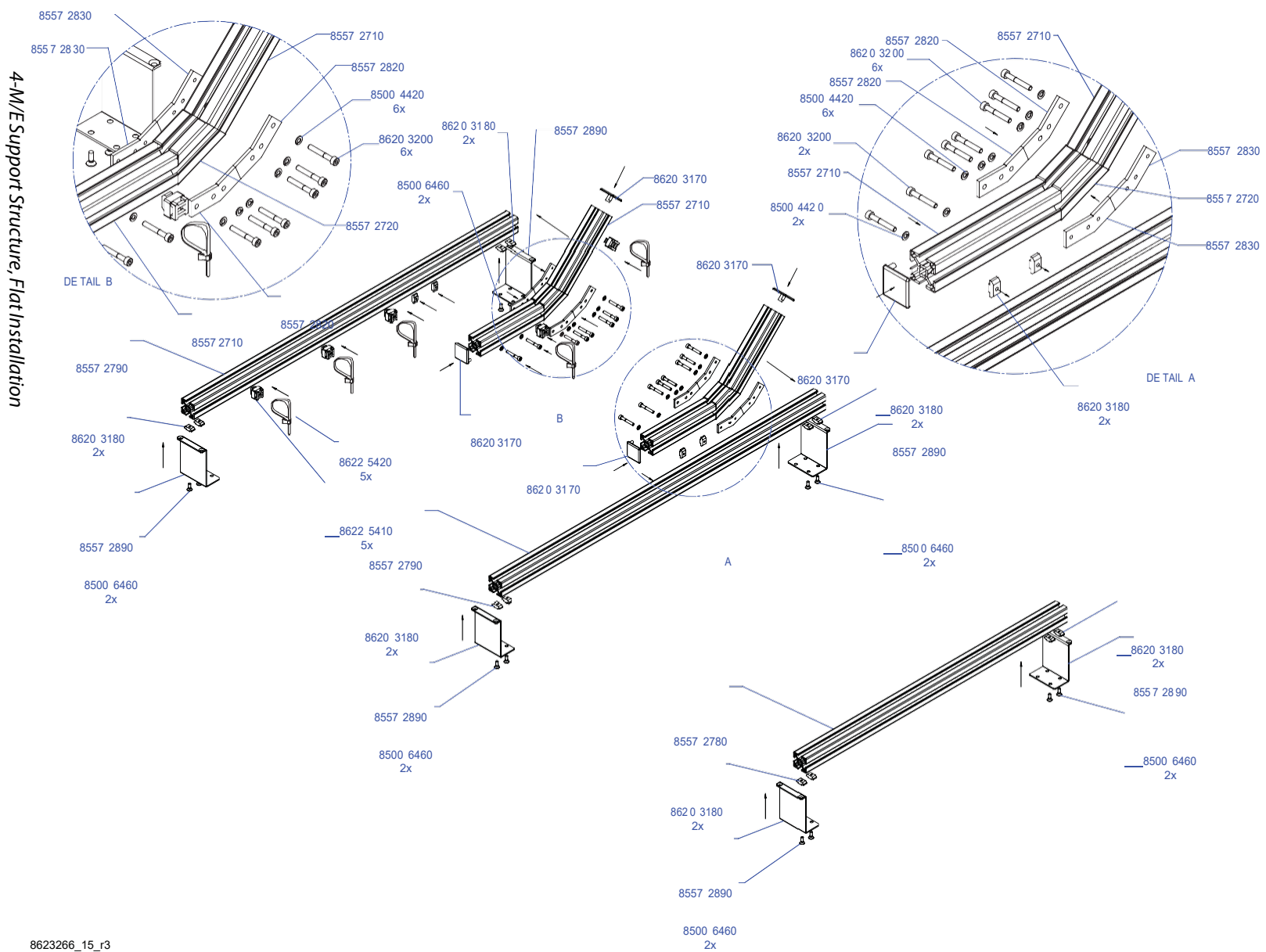


4-M/E Control Panel Cutout Dimensions, Flat Installation

[illegible]

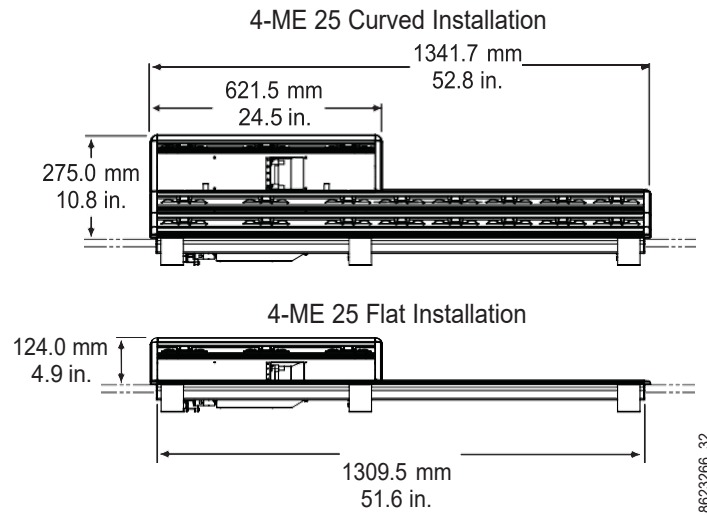
Control Surface Installation

4-M/E 35 Control Panel, Flat Assembly



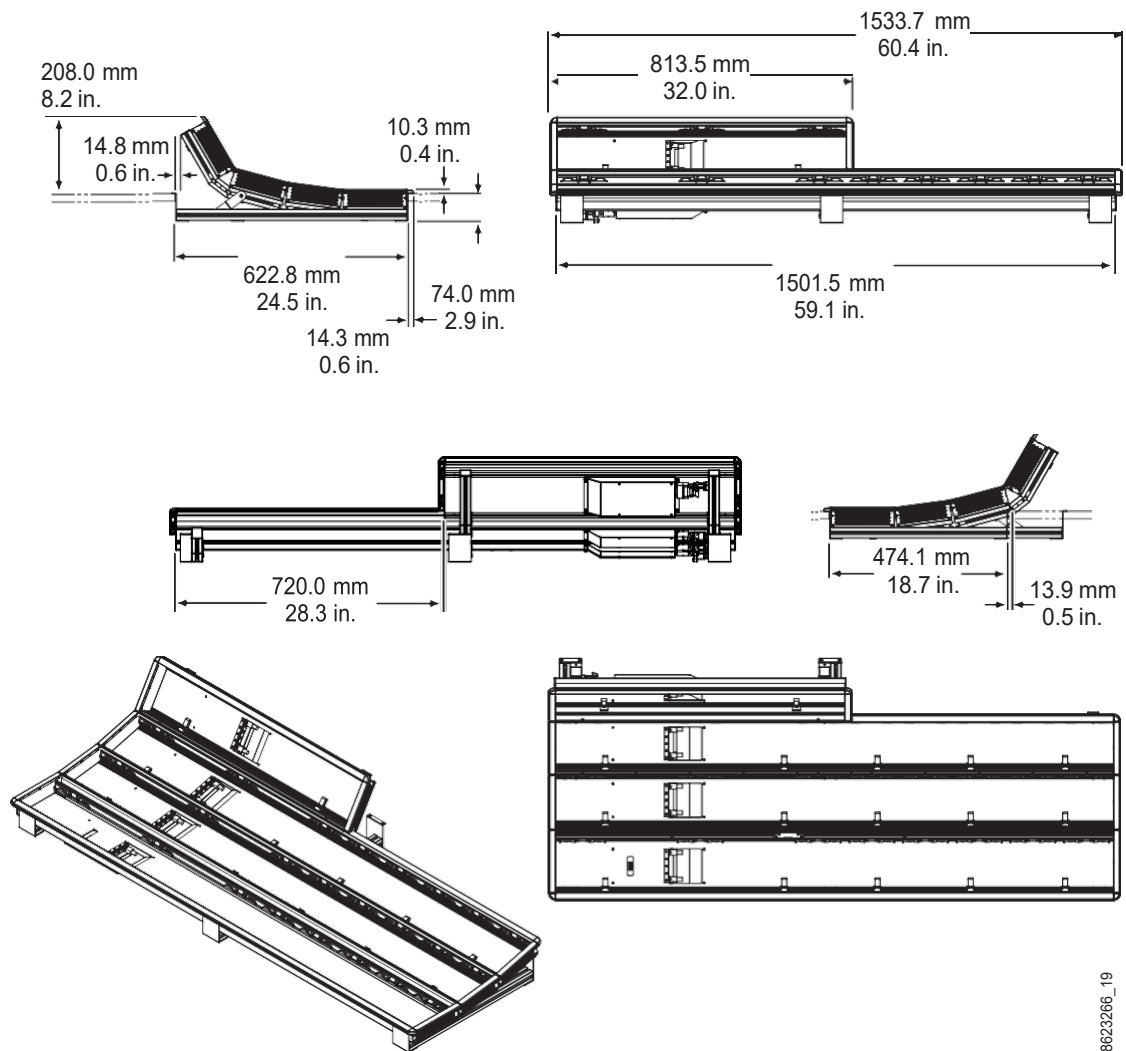
4-M/E 25 Control Panel

Control panels with 25 source selection buttons are narrower in width, but otherwise have the same dimensions as 35 source button models.

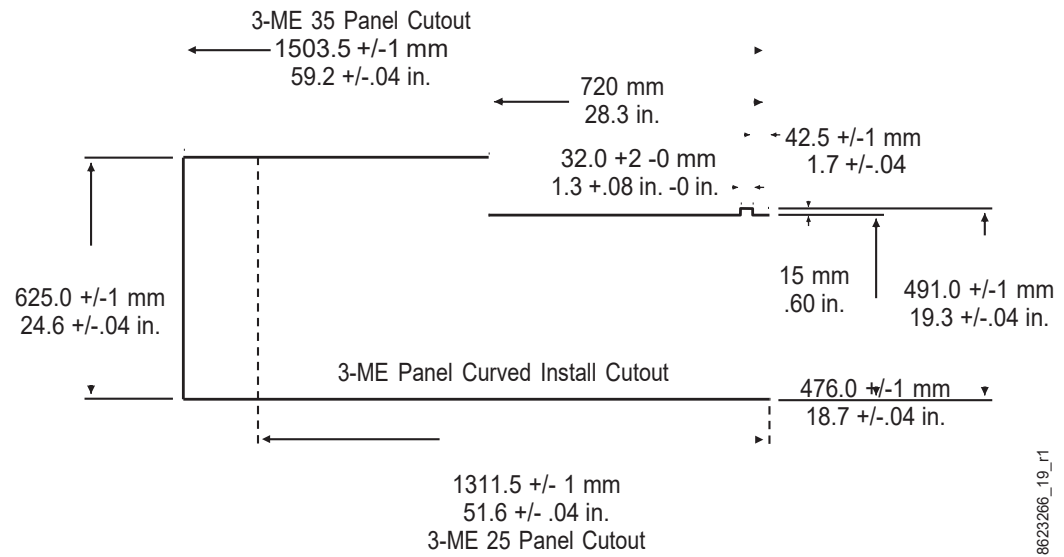


4-M/E 25 Control Panel Dimensions

3-M/E 35 Control Panel, Curved Assembly

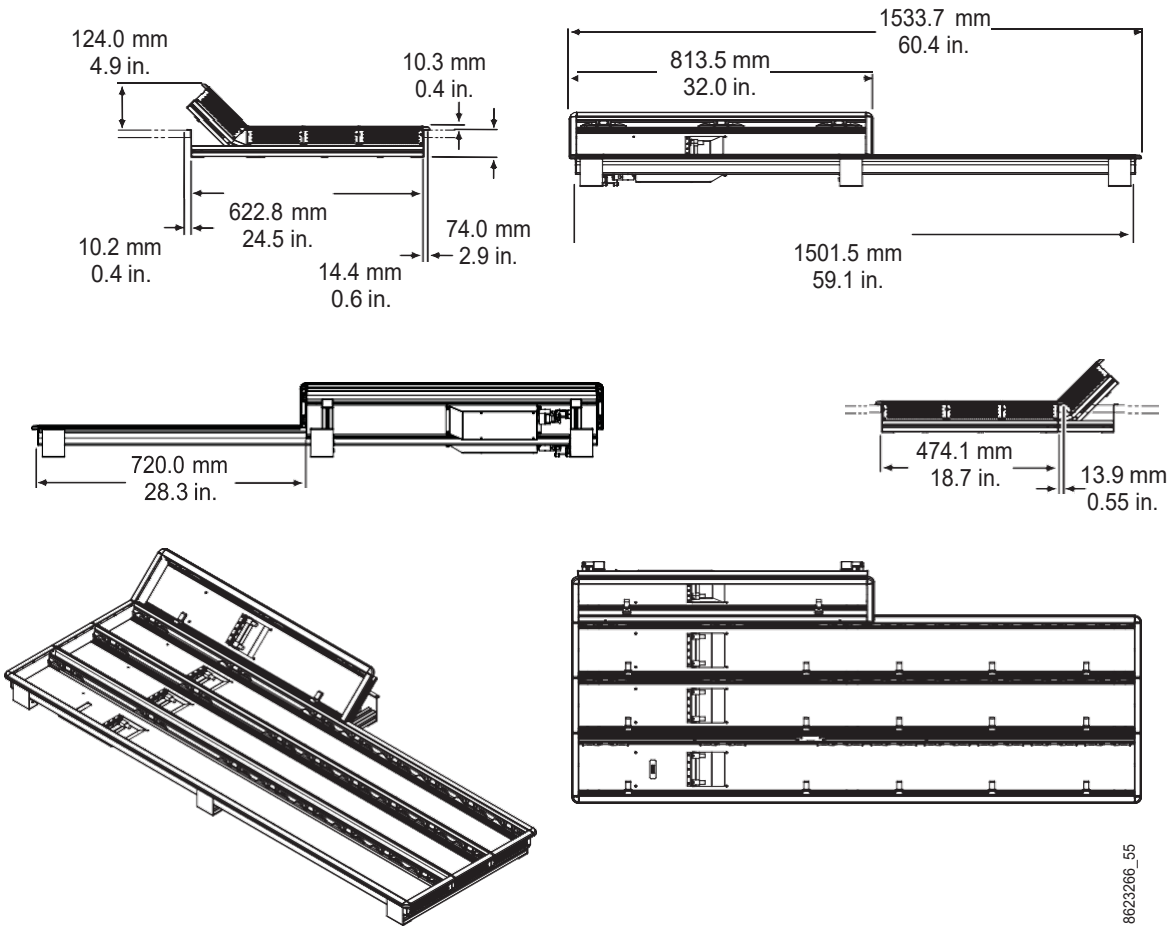


3-M/E 35 Control Panel Dimensions, Curved Installation

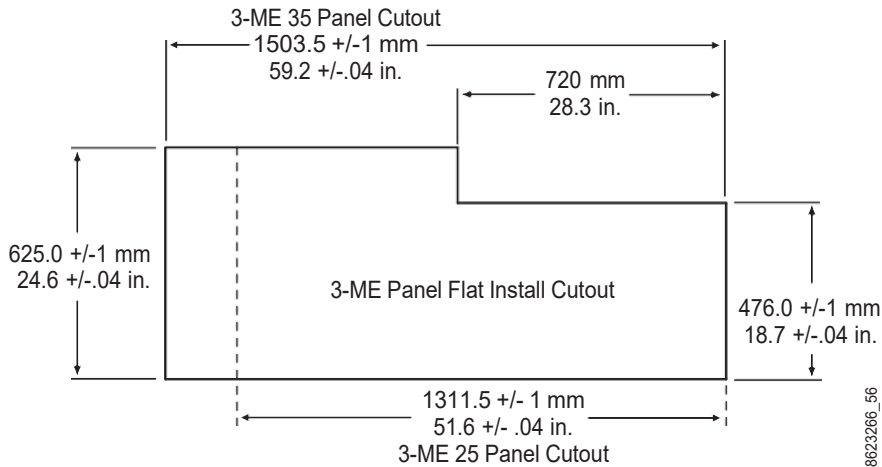


3-M/E Control Panel Cutout Dimensions, Curved Installation

3-M/E 35 Control Panel, Flat Assembly

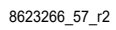


3-M/E 35 Control Panel Dimensions, Flat Installation



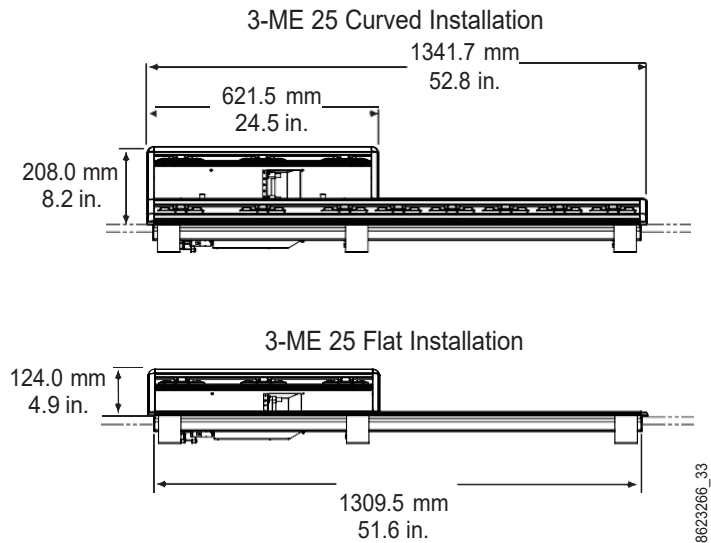
3-M/E Control Panel Cutout Dimensions, Flat Installation

3-M/E Support Structure, Flat Installation



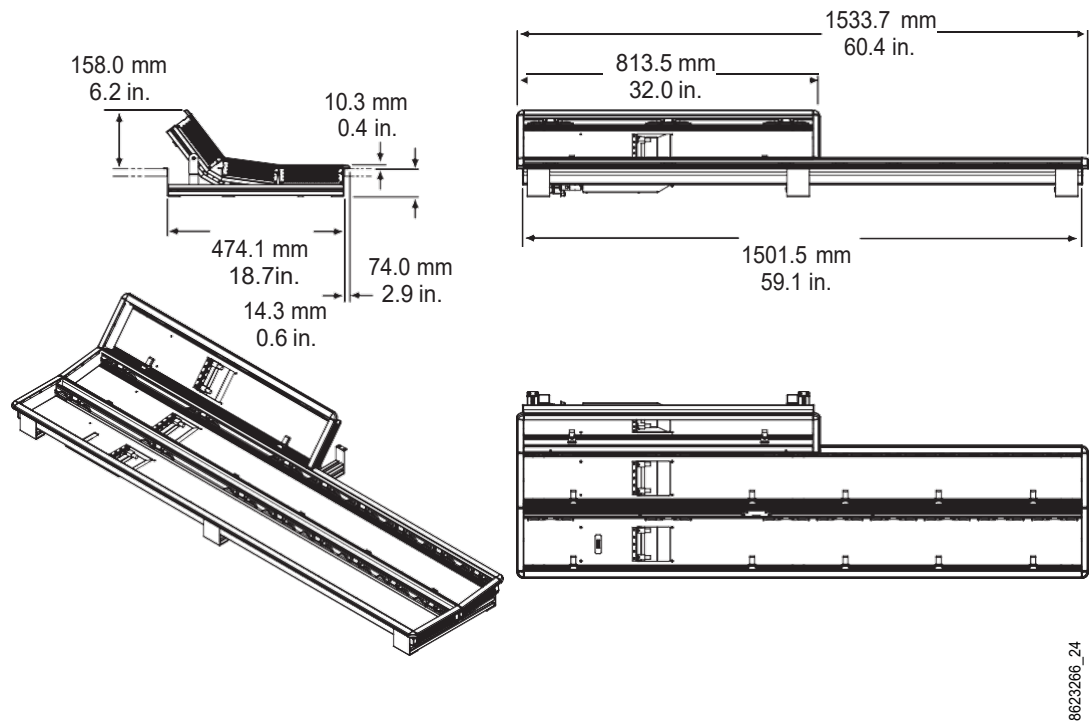
3-M/E 25 Control Panel

Control panels with 25 source selection buttons are narrower in width, but otherwise have the same dimensions as 35 source button models.

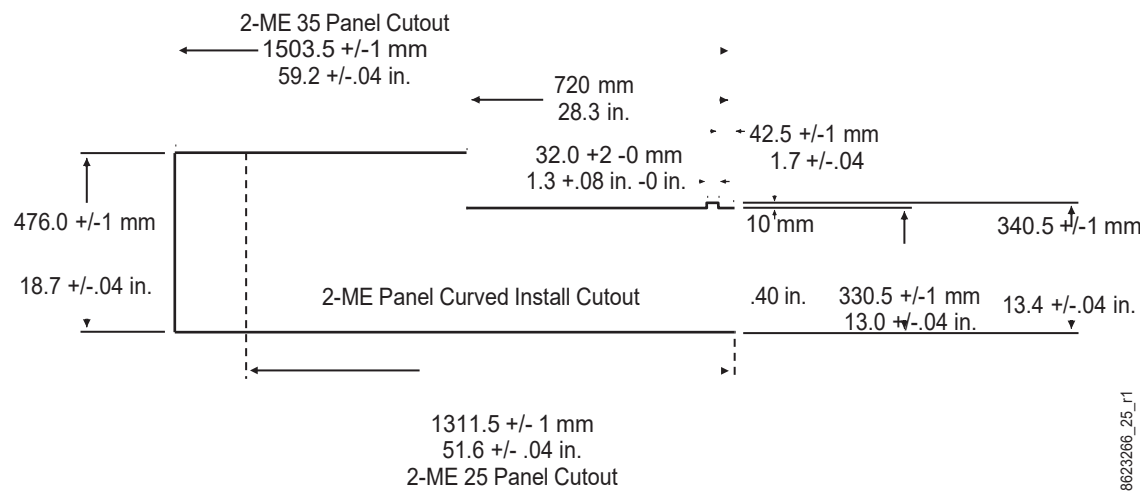


4-M/E 25 Control Panel Dimensions

2-M/E 35 Control Panel, Curved Assembly



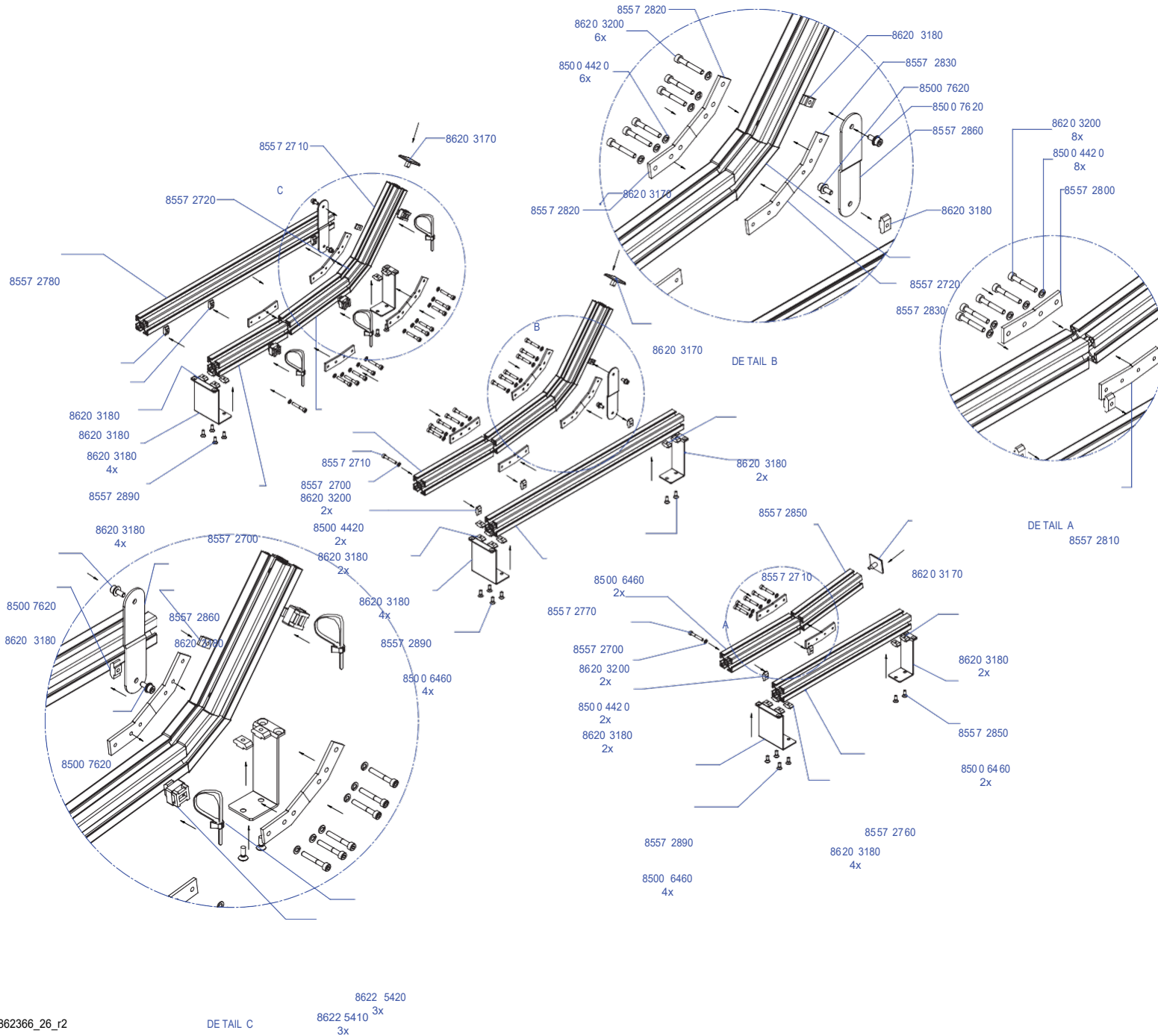
2-M/E 35 Control Panel Dimensions, Curved Installation



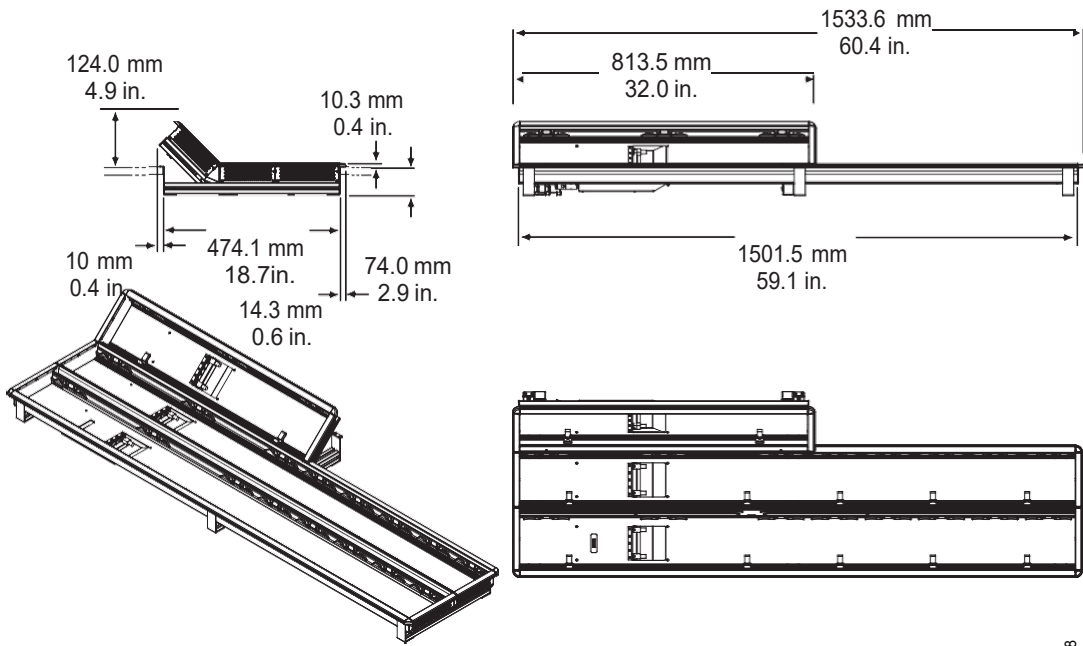
2-M/E Control Panel Cutout Dimensions, Curved Installation

Control Surface Installation

2-M/E Support Structure, Curved Installation

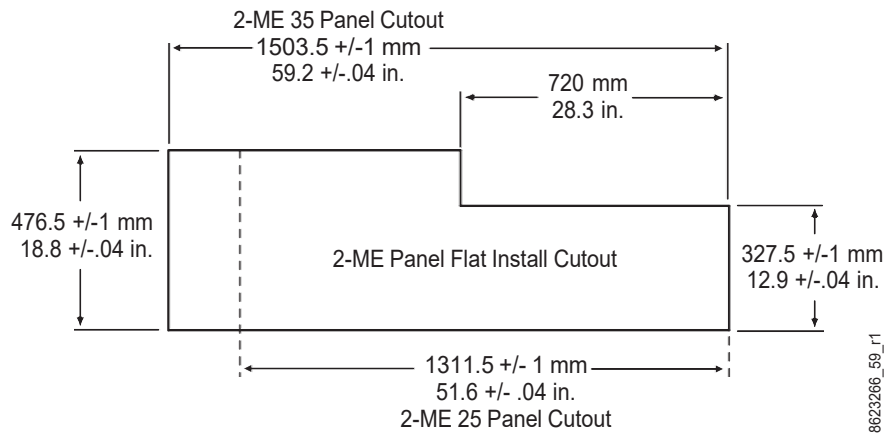


2-M/E 35 Control Panel, Flat Assembly with Local Aux



8623266_58

2-M/E 35 Control Panel Dimensions, Flat Installation

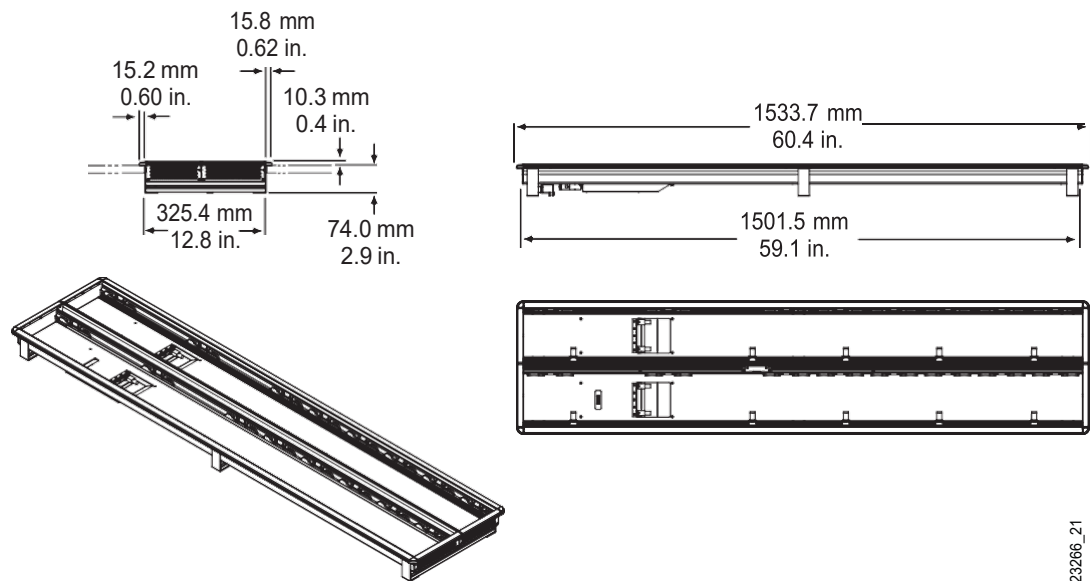


8623266_59_r1

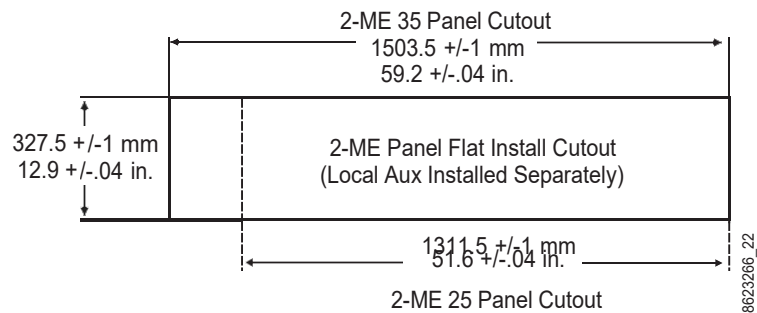
2-M/E Control Panel Cutout Dimensions, Flat Installation

[illegible]

2-M/E 35 Control Panel, Flat without Local Aux

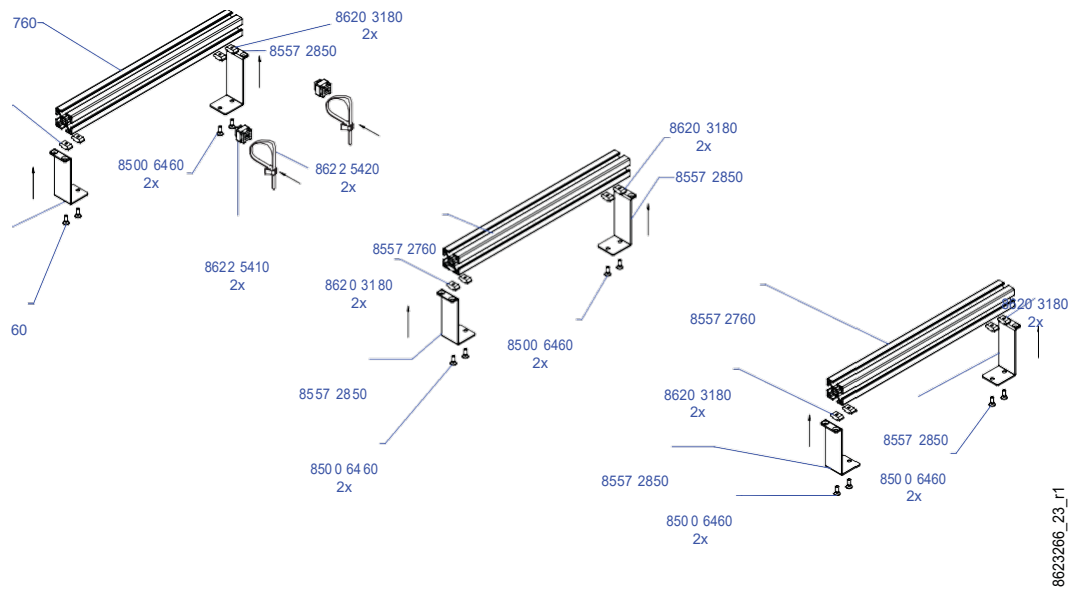


2-M/E 35 Control Panel Dimensions, Flat Installation



2-M/E Control Panel Cutout Dimensions, Flat Installation

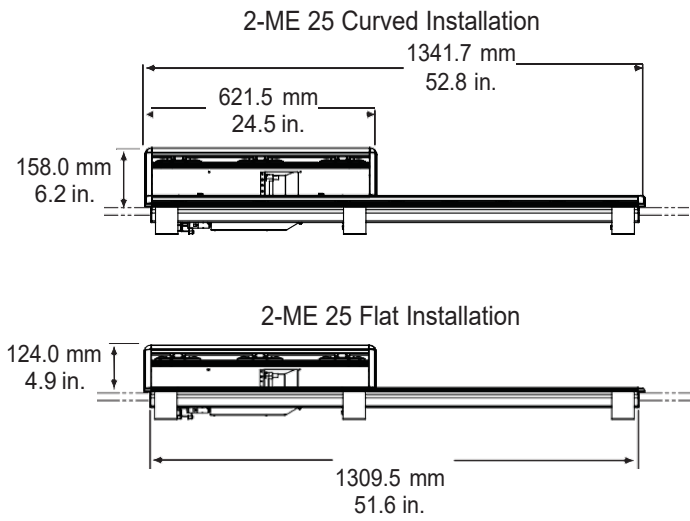
Control Surface Installation



2-M/E Support Structure, Flat Installation, w/o Local Aux Stripe

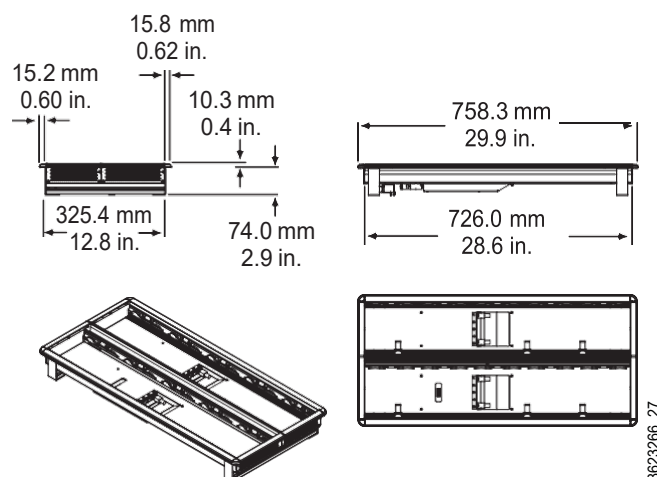
2-M/E 25 Control Panel

Control panels with 25 source selection buttons are narrower in width, but otherwise have the same dimensions as 35 source button models.

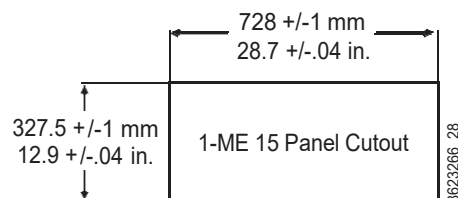


2-M/E 25 Control Panel Dimensions

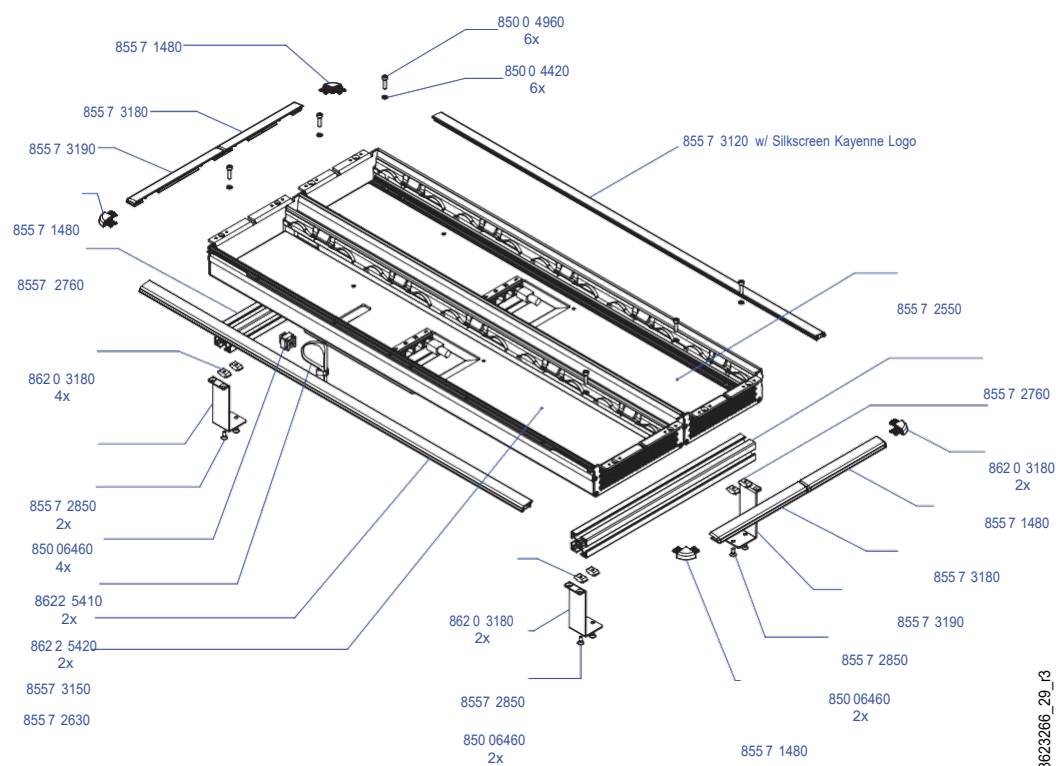
1-M/E 15 Control Panel



1-M/E 15 Control Panel Dimensions, Flat Installation

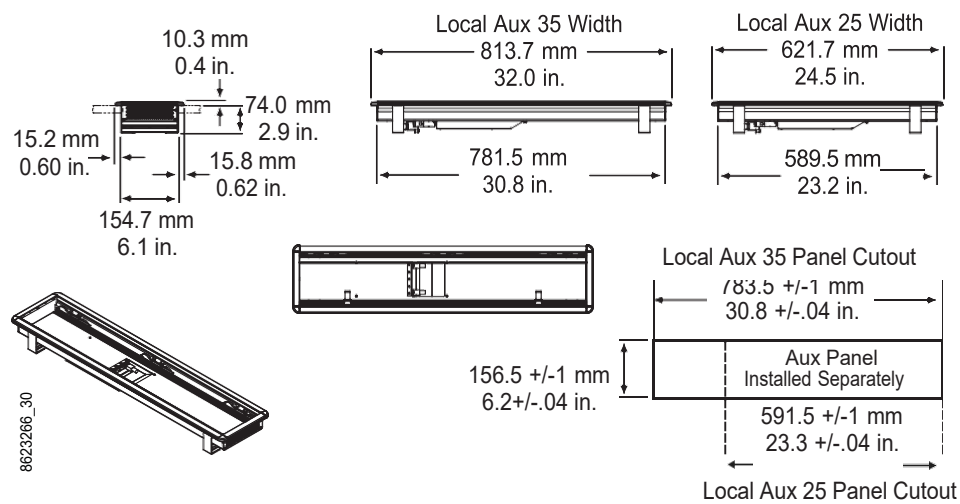


1-M/E 15 Control Panel Cutout Dimensions, Flat Installation

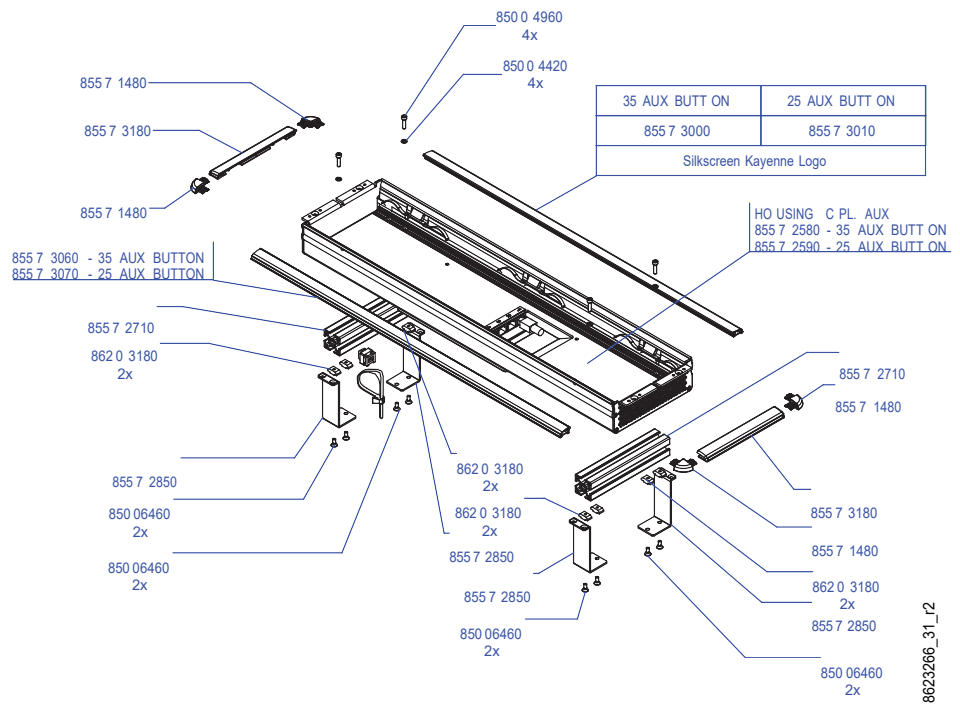


1-M/E Support Structure and Trim, Flat Installation

Separately Mounted Local Aux Stripe (35 & 25 Models)



Local Aux Stripe Separate Installation Dimensions



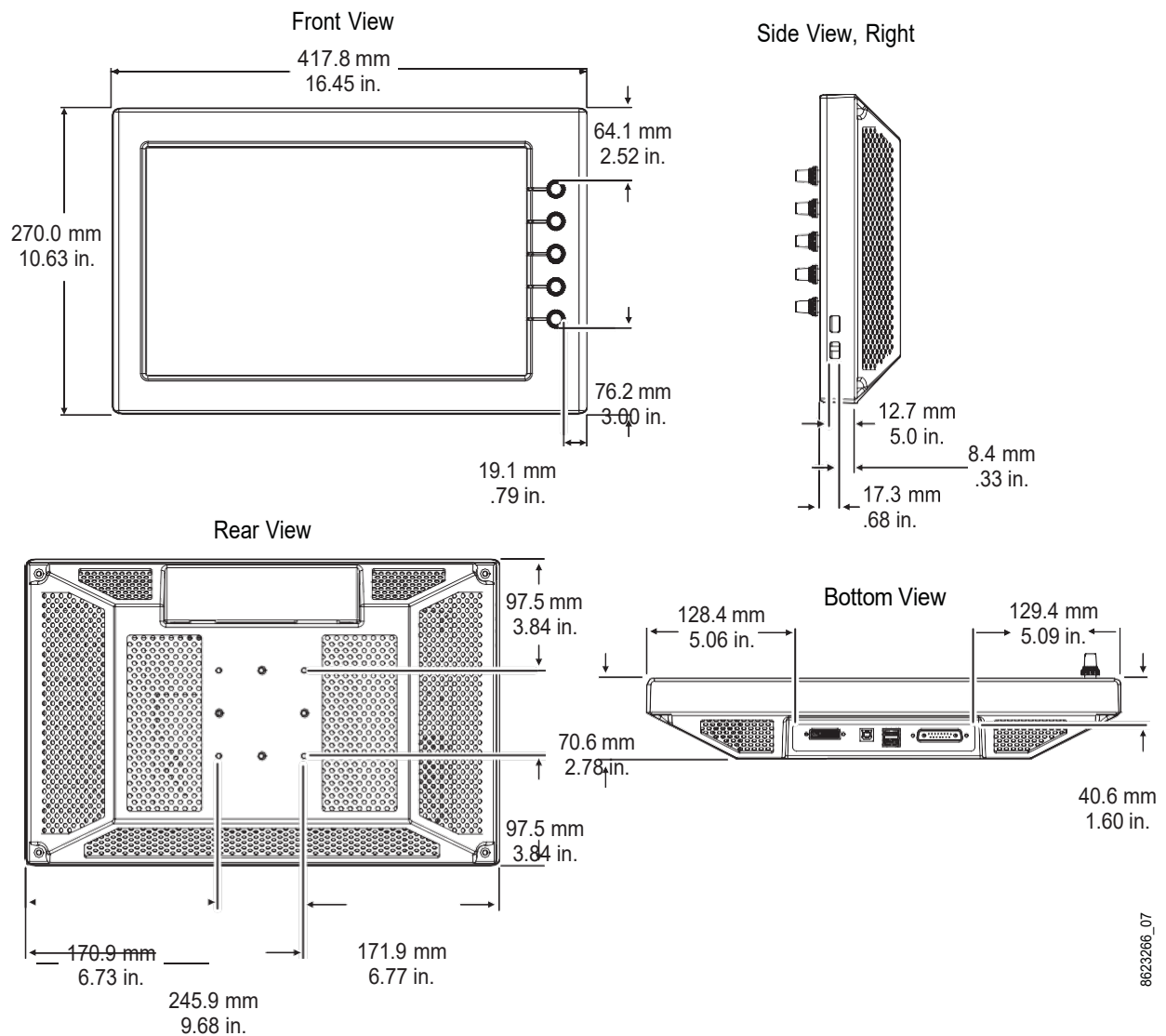
Local Aux Stripe Support Structure, Tray, and Trim

Control Panel Stripe-PCU Connections

Connectors on the outside bottom of the Stripe connect to the PCU, using a special multi-pin cable that carries both power and communications (see [System Cabling for Kayenne Control Panels](#), on page 102).

Touch Screen Menu Panel Installation

Menu Panel Dimensions



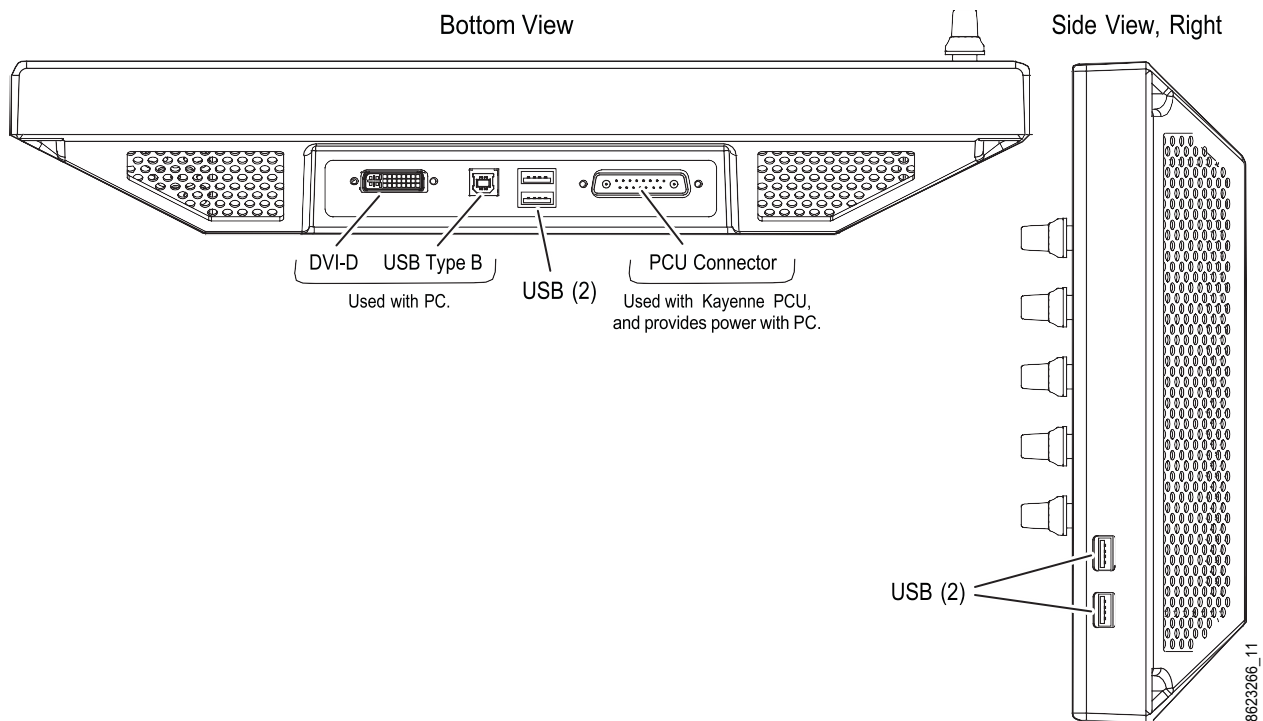
8623266_07

Menu Panel Dimensions

Menu Panel Connectors

The Kayenne Menu Panel's processor is located in the PCU. The Menu Panel connects to the PCU with a special multi-pin cable that carries both power and communications signals.

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



Menu Panel Connections

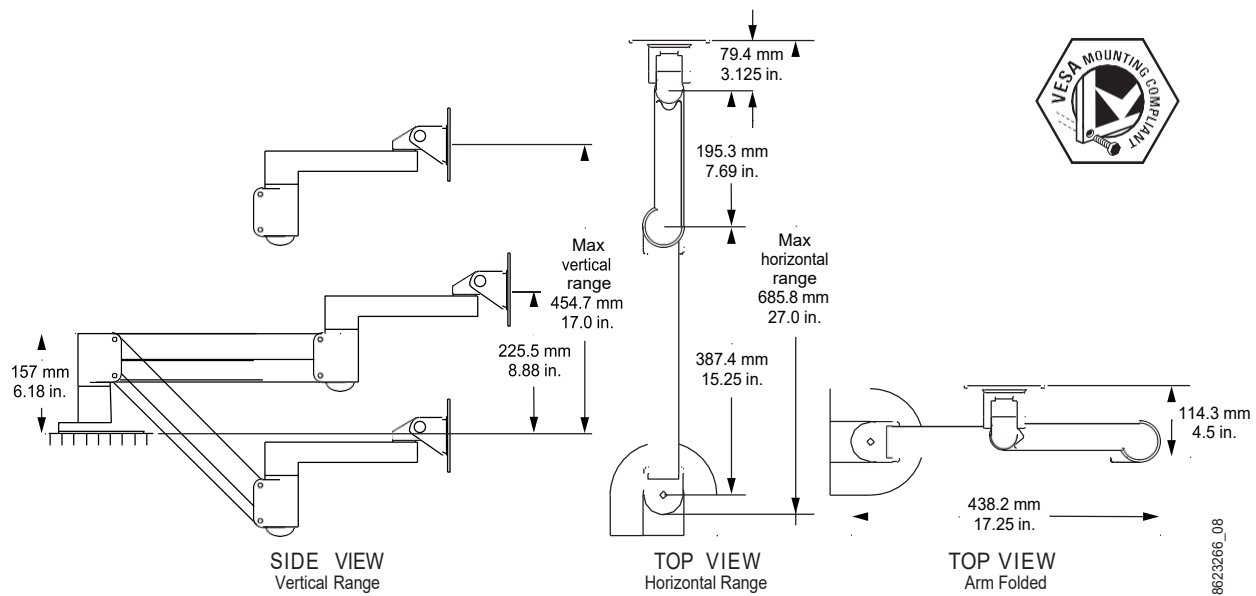
Menu Panel Cooling

CAUTION: Do not install the Menu Panel into an enclosed space. Passive air movement is required for cooling.

The Kayenne Menu Panel is externally powered and does not have internal cooling fans. The electronics are convection cooled through perforations in the rear of the Menu Panel chassis. Mounting the panel free-standing with the articulated arm allows maximum air movement, and is the preferred installation method. If an alternative method is used, ensure that all vents are unobstructed and adequate airflow is available.

Menu Panel Articulated Arm Installation

The Kayenne Menu Panel has VESA 75 threads on the back that can be used to mount the Menu Panel to the supplied articulated arm, or any VESA compliant mounting system.



Articulated Arm Range of Motion Dimensions

The supplied articulated arm is equipped with a flex-mount system, permitting a variety of mounting options (table-top, wall mount, etc.). See the documentation provided with the articulated arm for specific installation instructions.

Additional Touch Screen Menu Panel Using PCU

An additional Touch Screen Menu Panel, available as an option, requires a second Menu Panel processor board in the PCU. A multi-pin cable is provided with the option to supply power and signals to the Menu Panel.

Additional Touch Screen Menu Panel Using PC

A Touch Screen Menu Panel can be configured to operate without a PCU, using a PC. Communication between the Menu Panel and the switcher system is handled using the PC's Ethernet connection. A special power supply brick is required, which powers the Menu Panel through the PCU connector.

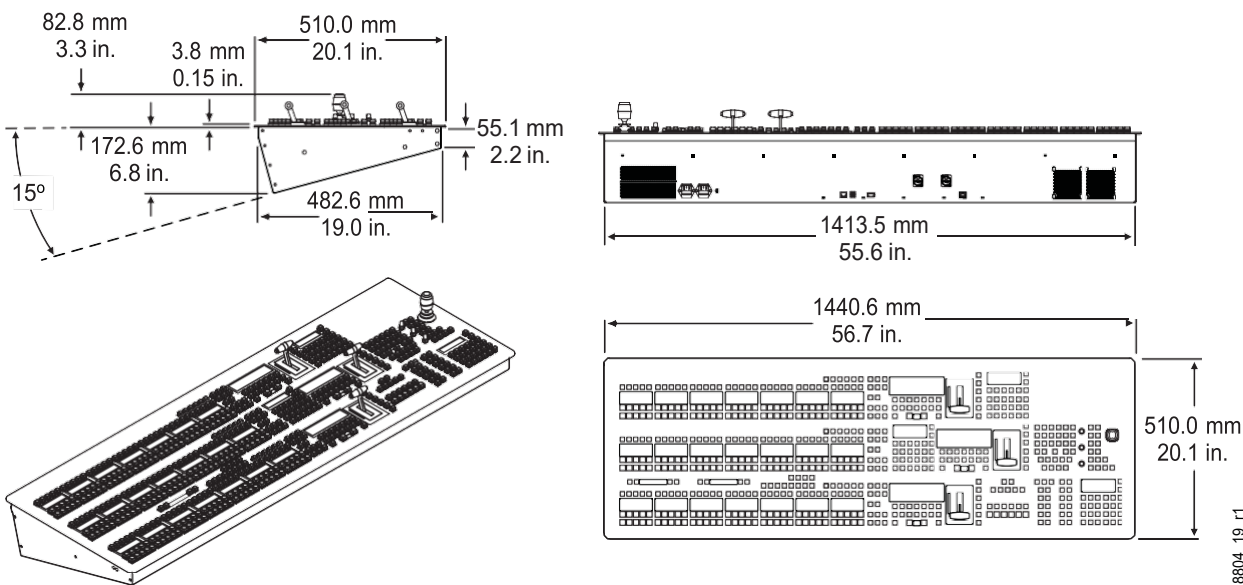
Menu Application on PC (Keyboard & Mouse)

The Kayenne menu application can also be run on a standard PC, permitting mouse and keyboard control from a nearby laptop, or remote control of the switcher system from any location on the network. If a PC is used for Kayenne Menu operation, the PC's IP address must be set to a compatible value to work with the rest of the system.

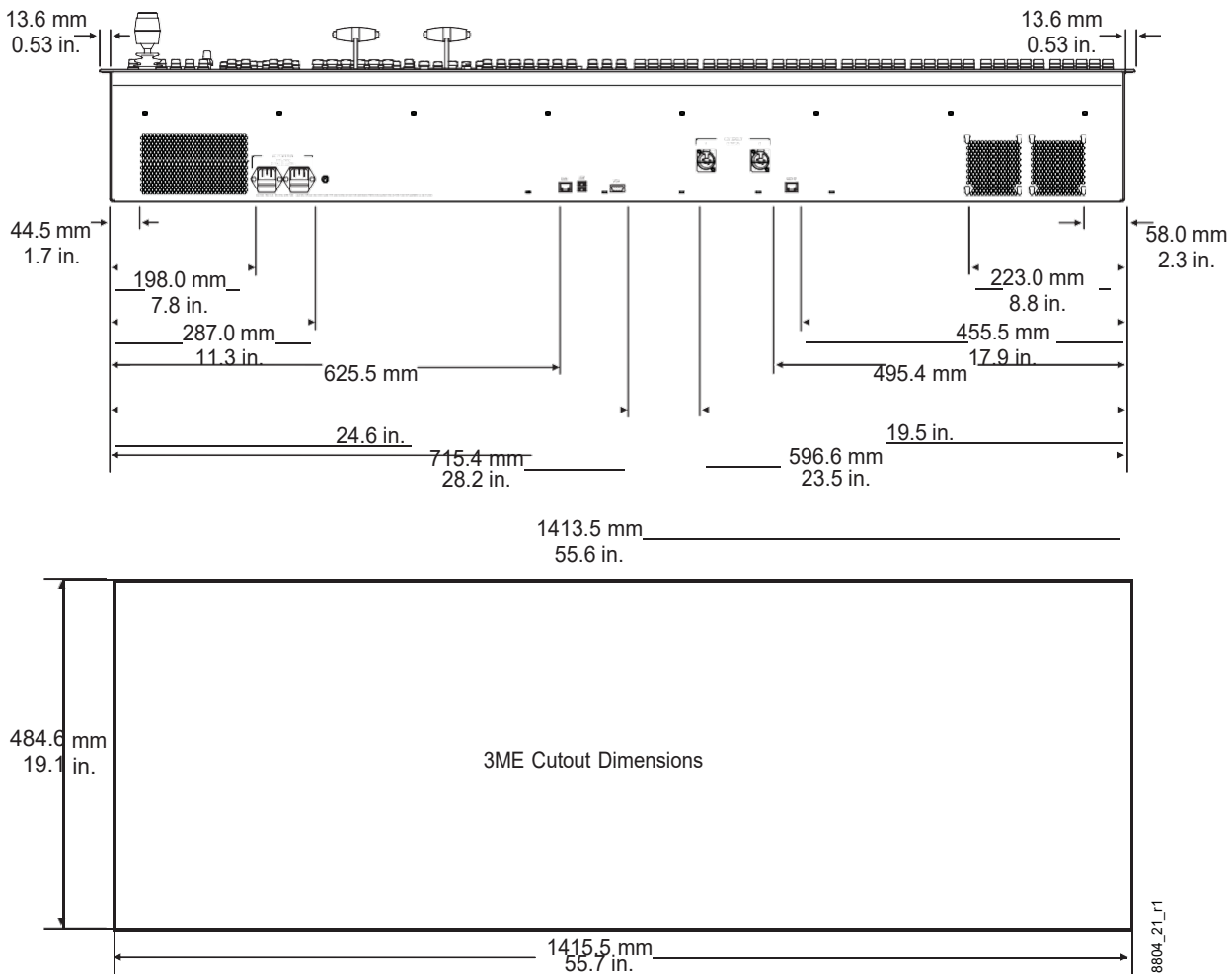
Karrera Control Surface

A typical Karrera control surface has a Control Panel and a Karrera Menu on PC or Menu Panel option.

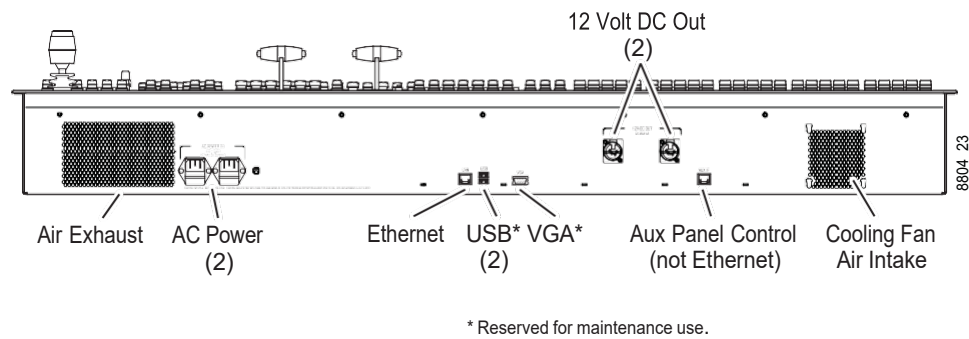
3-M/E Karrera Control Panel Installation



3-M/E Karrera Control Panel Dimensions

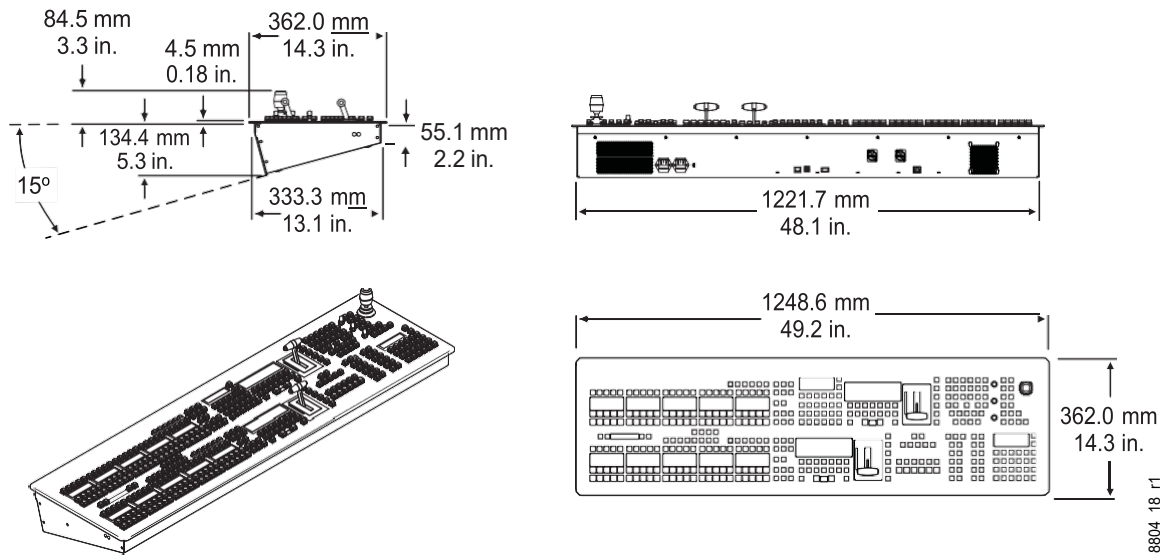


3-M/E Karrera Control Panel Cutout Dimensions

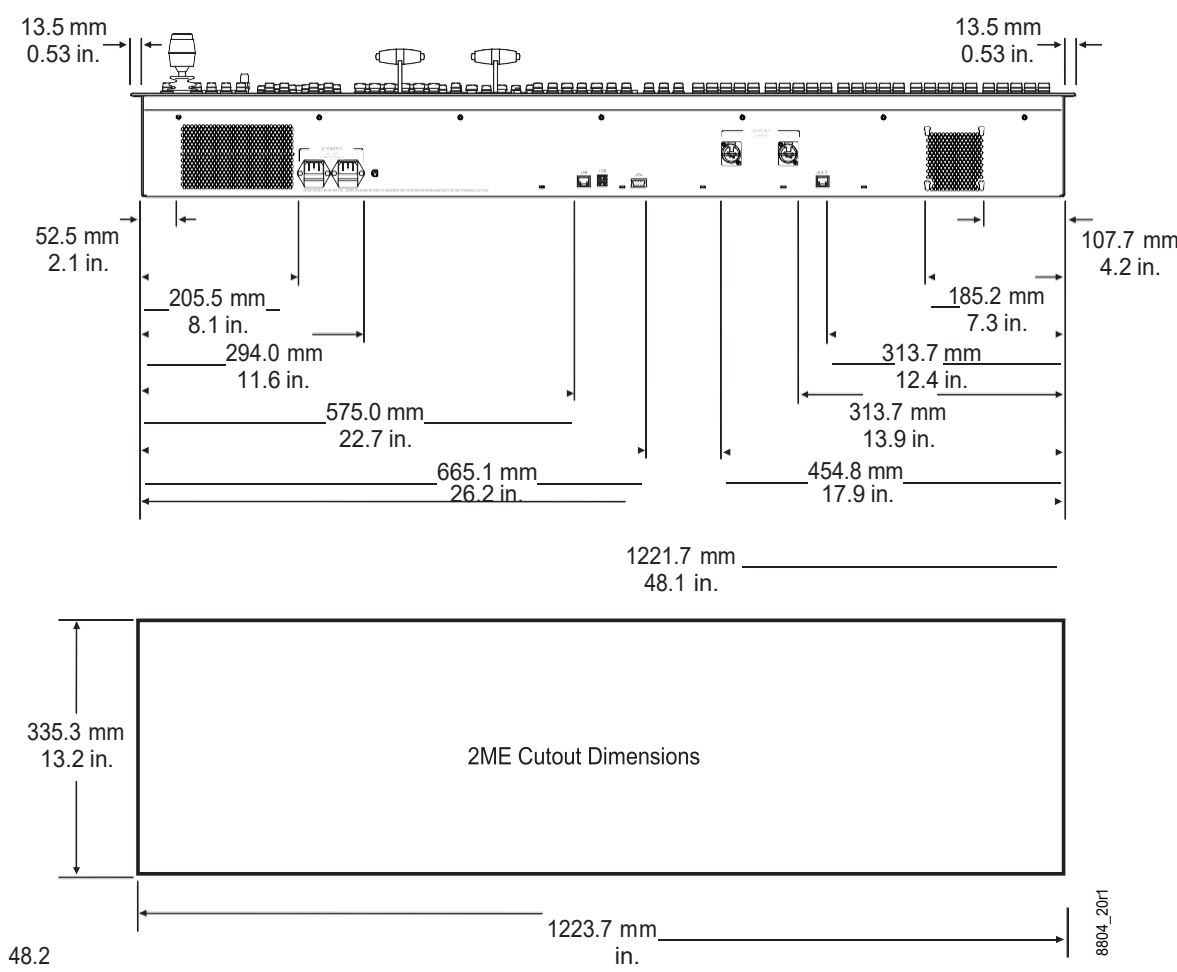


3-M/E Karrera Control Panel Rear Connections

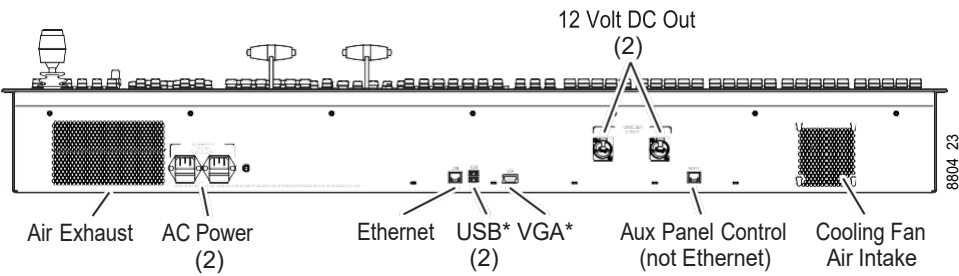
Control Surface Installation



2-M/E Karrera Control Panel Dimensions



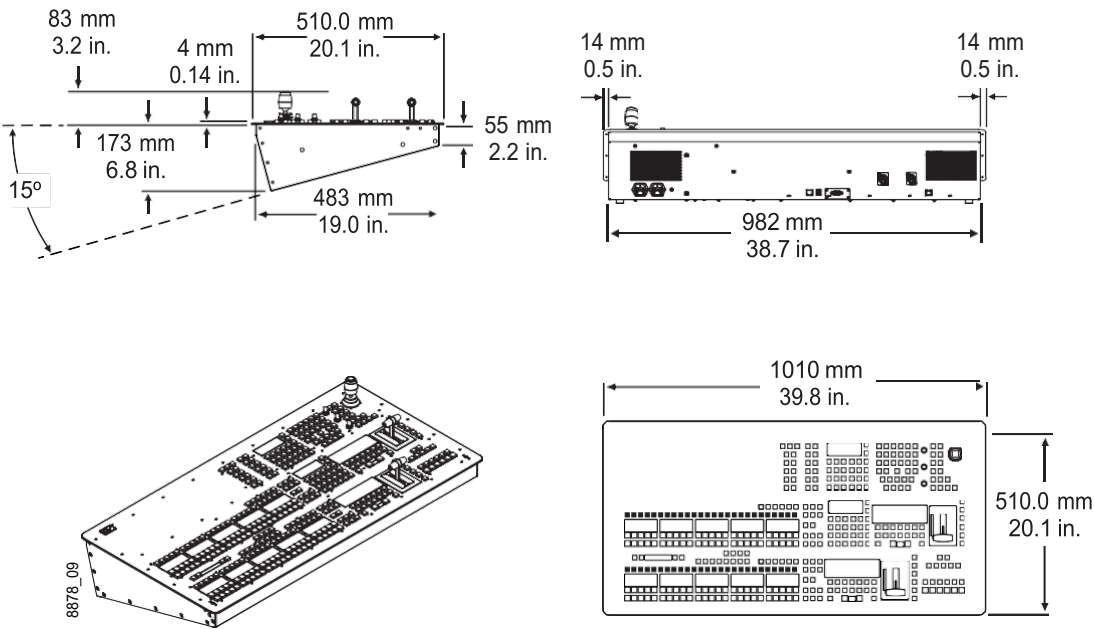
2-M/E Karrera Control Panel Cutout Dimensions



* Reserved for maintenance use.

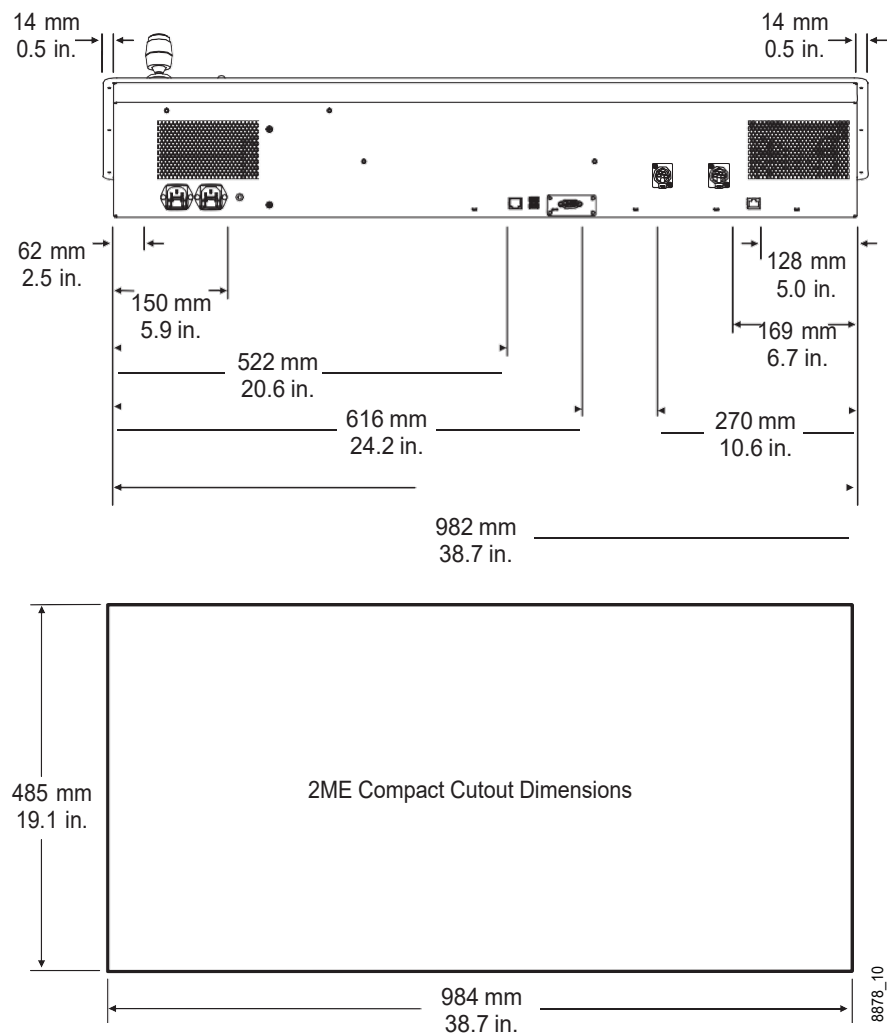
2-M/E Karrera Control Panel Rear Connections

2-M/E Compact Karrera Control Panel Installation

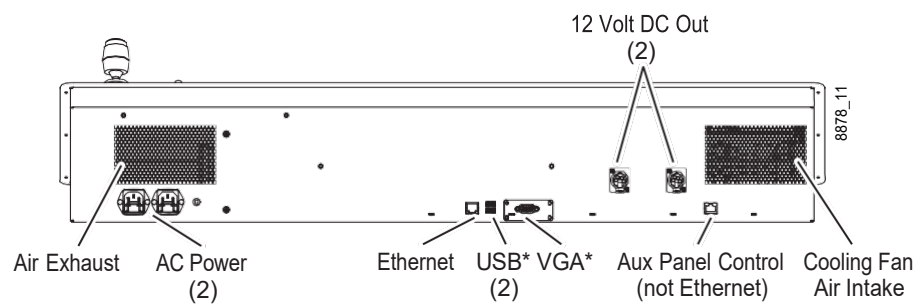


2-M/E Compact Karrera Control Panel Dimensions

Control Surface Installation



2-M/E Compact Karrera Control Panel Cutout Dimensions



* Reserved for maintenance use.

2-M/E Compact Karrera Control Panel Rear Connections

Karrera Menu on User PC Installation

The Karrera Menu application can be installed on a user PC, which can be configured with the Karrera network to provide a primary or additional control point to the Karrera system.

CAUTION: Access to the user PC should be controlled when the Karrera system is in use, to prevent accidental changes to Karrera system operations.

PC Requirements

The PC running the Karrera Menu application should have at least 2 GB RAM, a 2 GHz processor, 500 MB available hard disk space, 1280 x 1024 minimum screen resolution, and be running Windows 10. The PC must also support 10Base-T or 100Base-T Ethernet and high-speed USB.

Macintosh Computer Operation

Macintosh computers with Intel processors can run Windows programs (including the Karrera Menu application), using the Apple computer Boot Camp mechanism (booting into the Windows OS partition), or by running a Virtual Machine (VM). VM operation allows running two different operating systems on the same computer simultaneously, with instantaneous switching between the two environments. Parallels and VMWare are two commercially available VM solutions for Mac. The Mac hardware and VM created must meet the PC requirements listed above.

In all cases, a Windows OS will need to be installed on the Mac (into the Boot Camp partition or as a VM), and the Windows environment will need to be configured (including I/O device access, IP addresses, etc.). When a working Windows environment exists on the Mac, the Grass Valley Switcher Installer program can be used to install the Karrera Menu application into the Mac's Windows environment, and the application can operate with a Karrera system the same as if it was running on a Windows PC.

Hardware Installation

Connect a Category 5 Ethernet cable from the user PC to the Karrera network, either directly into an available port on the Frame, or with a customer provided Ethernet switch, or indirectly via a properly configured network gateway. The PC's IP address must be compatible with the Karrera system network.

Menu on User PC Software Installation

Karrera Menu Panel software is included on the Karrera Software USB stick, and is installed using the standard Grass Valley Switcher software installation process. The Karrera Menu application requires Microsoft .NET Framework software, which is also included on the USB stick.

If the correct version of the Microsoft .NET Framework software is already present on your PC, the Karrera Menu application can be installed using the standard software update process.

If .NET Framework software is not present, it can be installed by running the executable file located in the DotNet folder on the Karrera Software USB stick.

Refer to the separate *Karrera Release Notes* for specific software installation information.

User PC Configuration

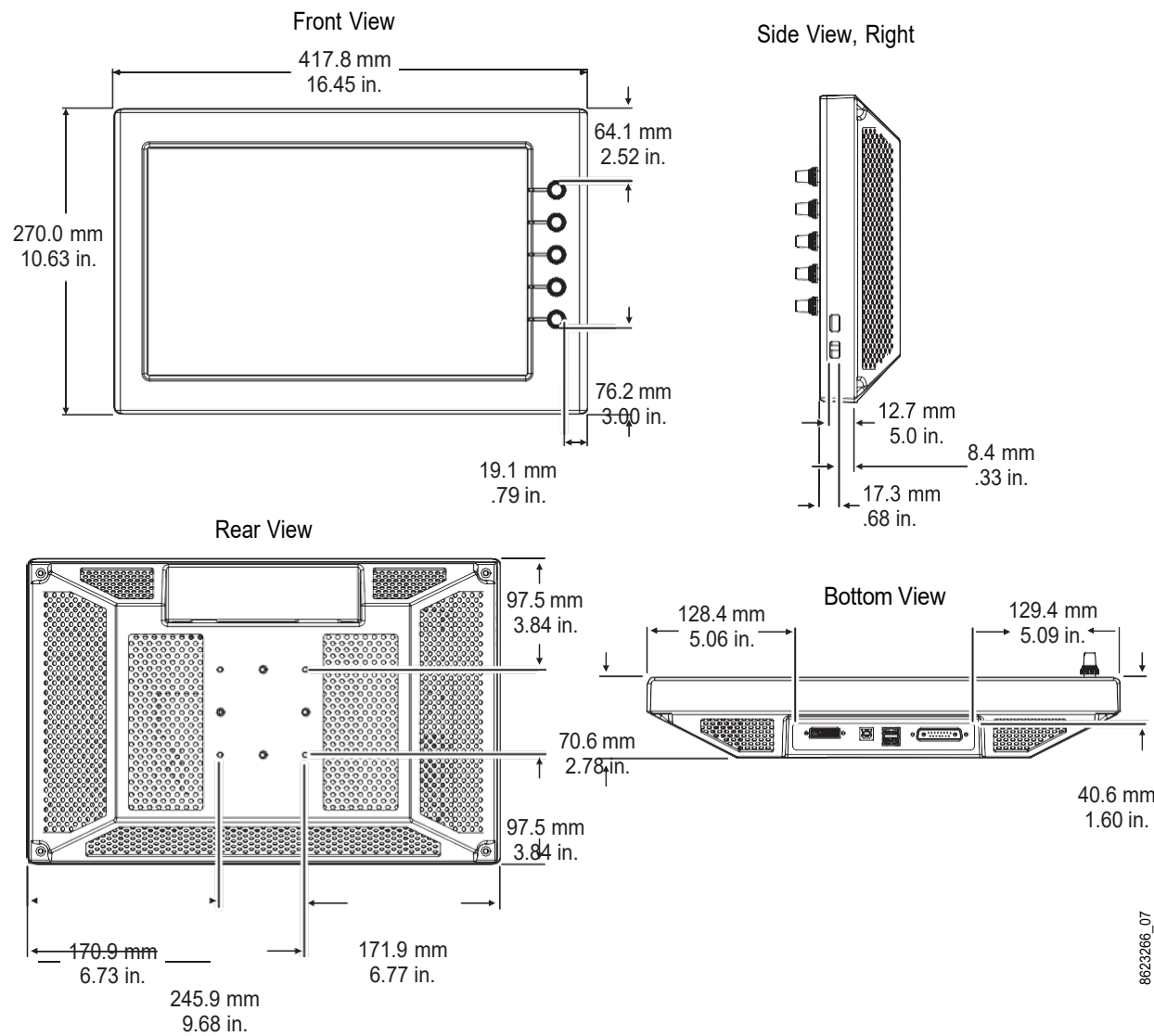
Windows Firewall, and any other firewall security software (e.g. Officescan Personal Firewall), must be disabled to use the Switcher Installer program or NetConfig on a user PC.

Optional Touch Screen Menu Panel Installation

The Touch Screen Menu Option consists of:

- Touch Screen Menu,
- Fanless PC,
- Articulated arm support,
- Two mounting brackets ("U" and "T" shaped),
- Two power supply bricks, and
- associated cables and screws.

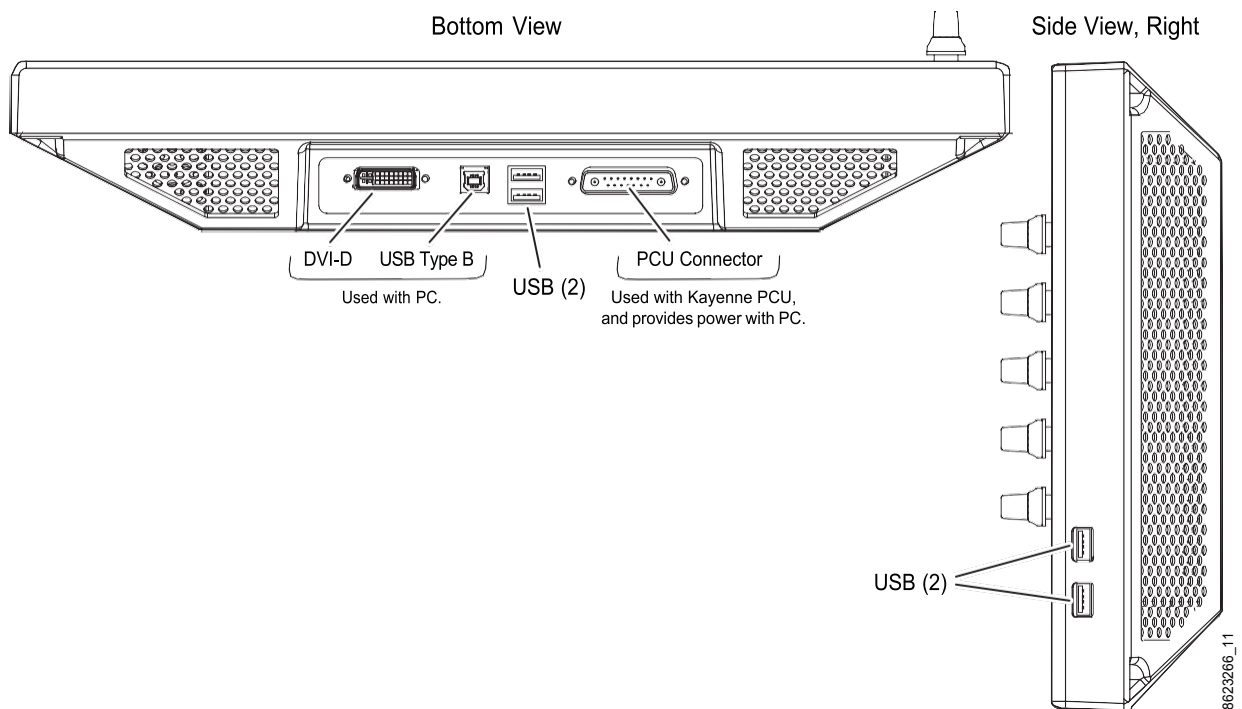
Menu Panel Dimensions



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Menu Panel Dimensions

Menu Panel Connectors



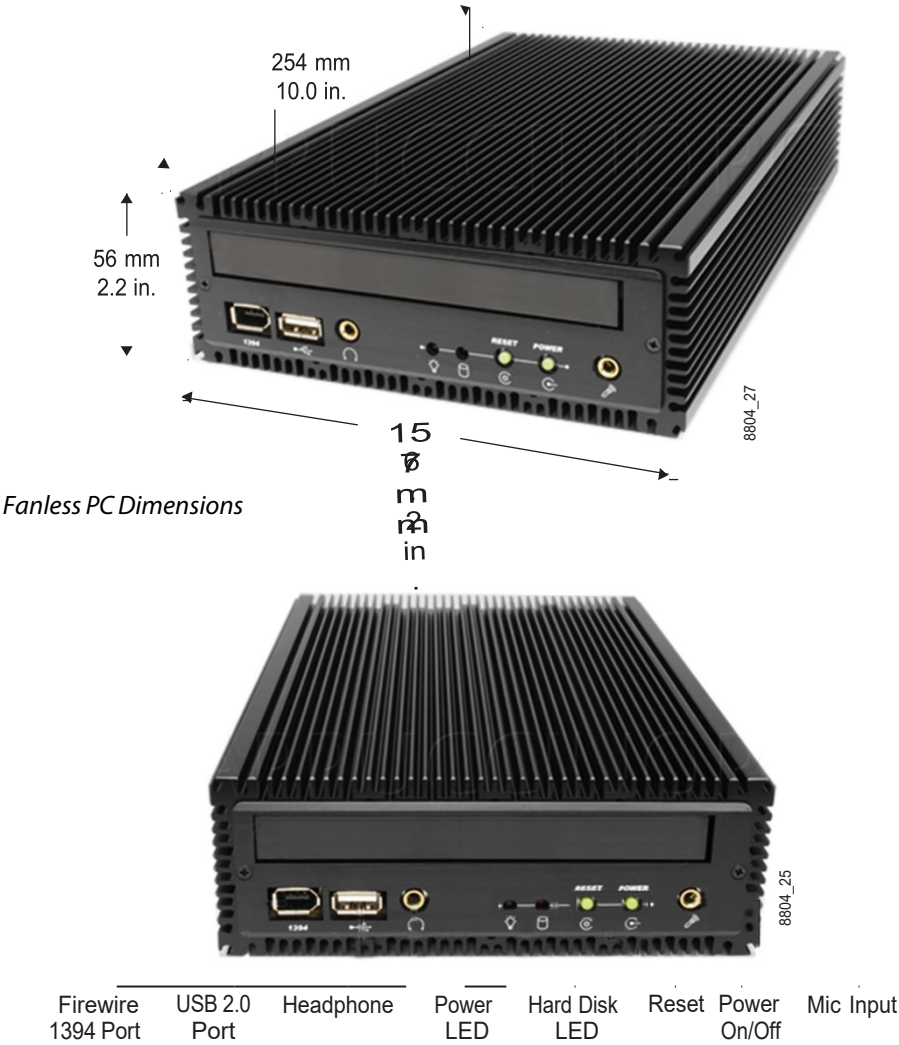
Menu Panel Connections

Menu Panel Cooling

CAUTION: Do not install the Menu Panel into an enclosed space. Passive air movement is required for cooling.

The Menu Panel is externally powered and does not have internal cooling fans. The electronics are convection cooled through perforations in the rear of the Menu Panel chassis. Mounting the panel free-standing with the articulated arm allows maximum air movement, and is the preferred installation method. If an alternative method is used, ensure that all vents are unobstructed and adequate airflow is available.

Fanless PC Dimensions and Connectors



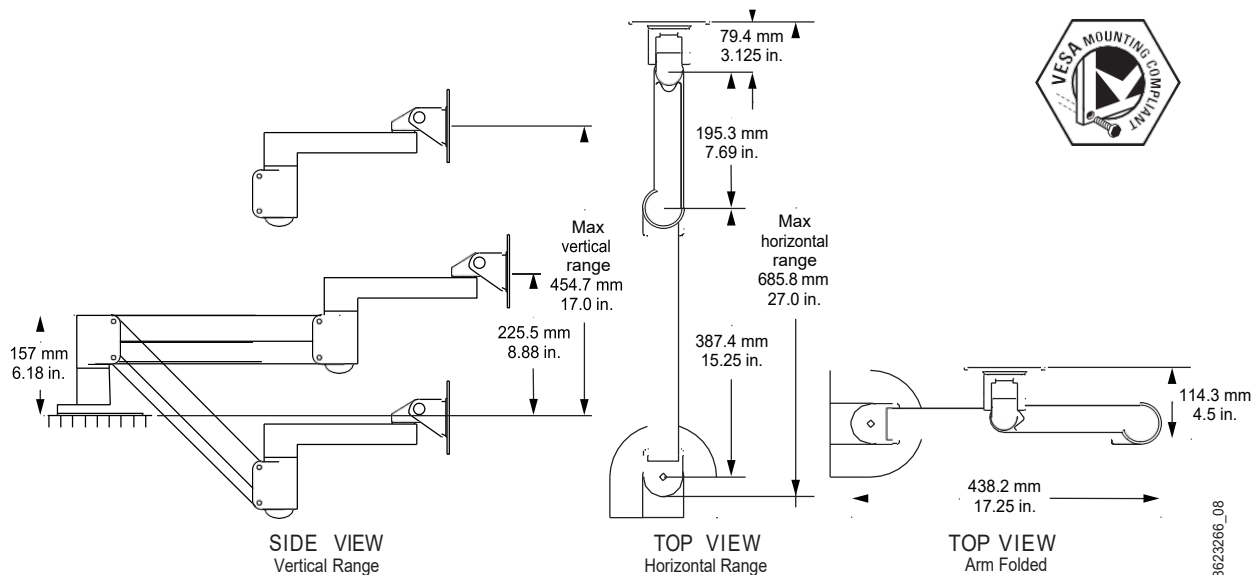
Fanless PC Front Connectors



Fanless PC Rear Connectors

Menu Panel Articulated Arm Installation

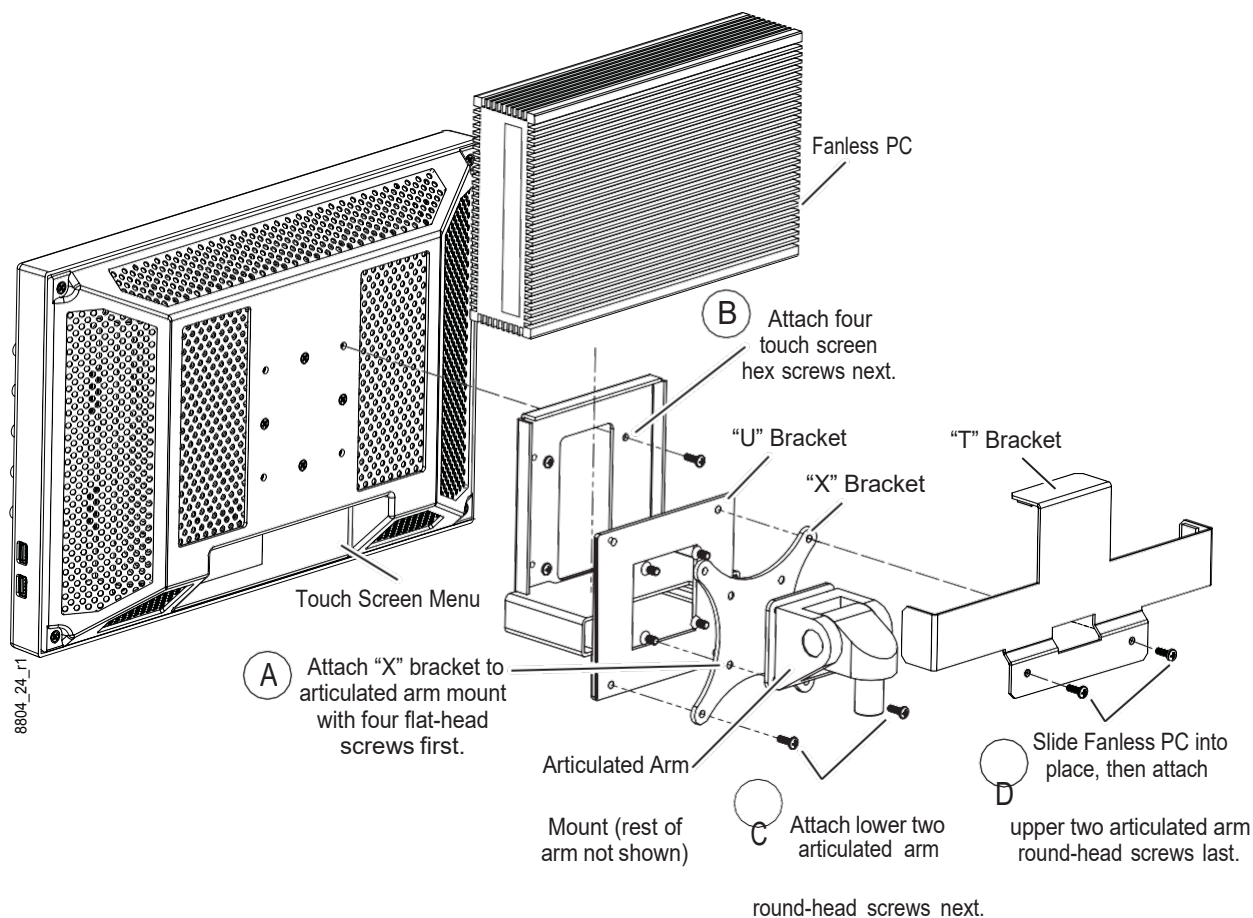
The Menu Panel has VESA 75 threads on the back that can be used to mount the Menu Panel to the supplied articulated arm, or any VESA compliant mounting system.



Articulated Arm Range of Motion Dimensions

The supplied articulated arm is equipped with a flex-mount system, permitting a variety of mounting options (table-top, wall mount, etc.). See the documentation provided with the articulated arm for specific installation instructions.

Menu Panel Hardware Installation With Articulated Arm



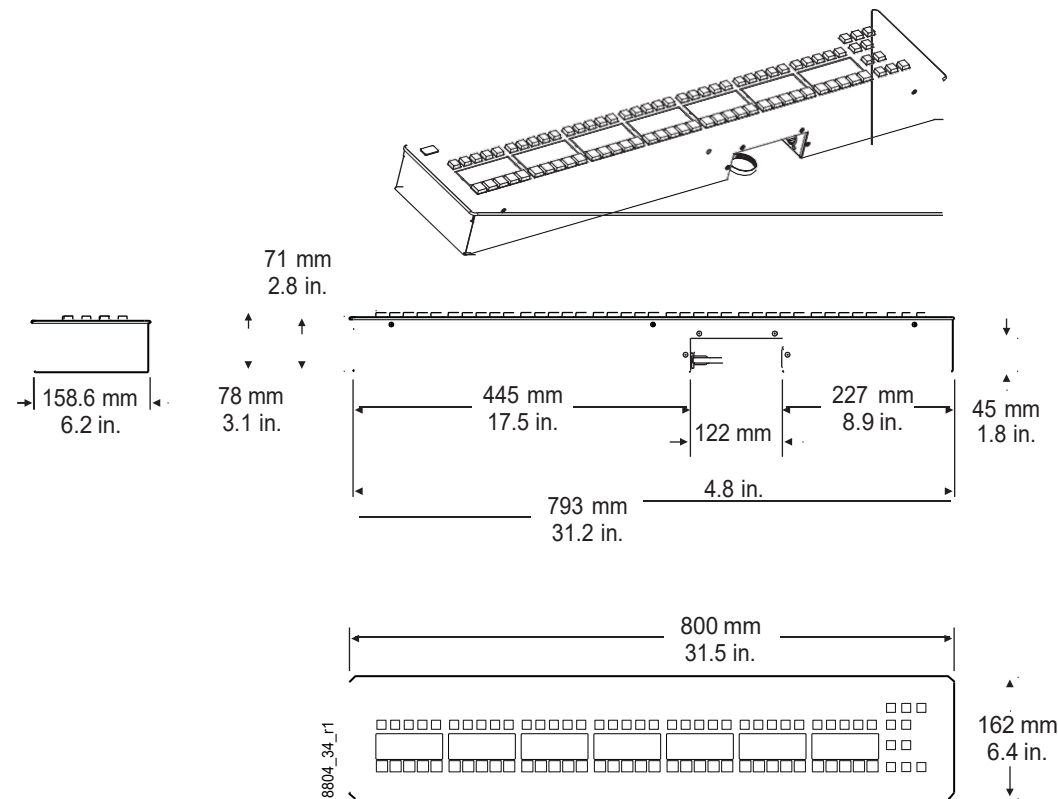
Fanless PC Mounting Bracket Assembly

Wall Mounting Without Articulated Arm

For flat mounting directly to a vertical surface without using the articulated arm, two #10 screw sized washers (2.5 mm/0.10 in. thick) can be used at the lower two "U" bracket screw locations.

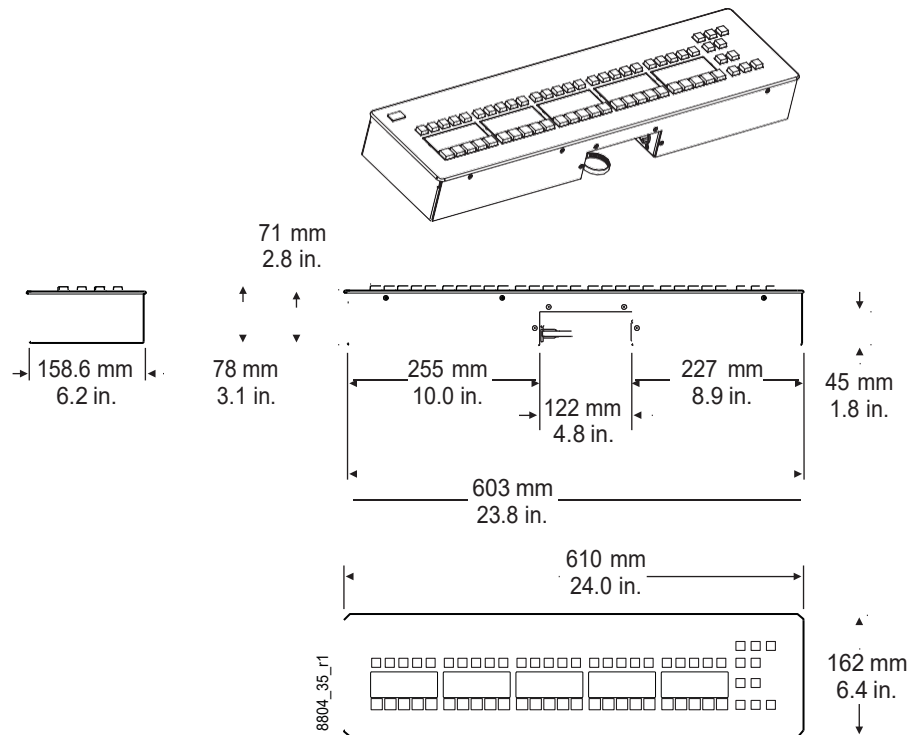
Optional Local Aux Panel Installation

Local Aux Panel Dimensions



Local Aux 35 Panel Dimensions

Local Aux 25 Panel Dimensions

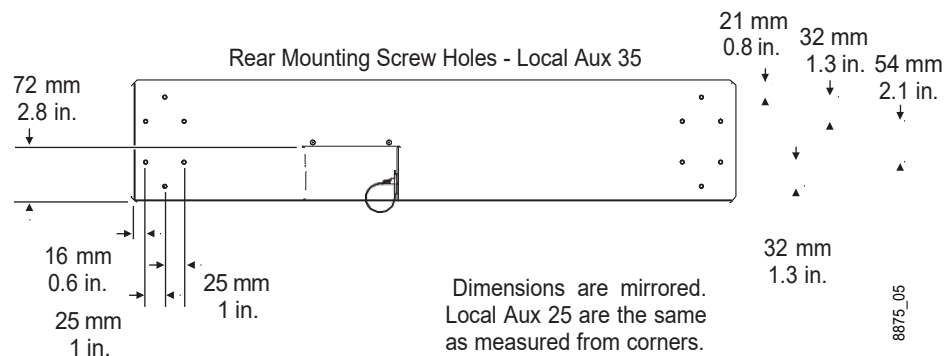


Local Aux 25 Panel Dimensions

Local Aux Panel Installation Options

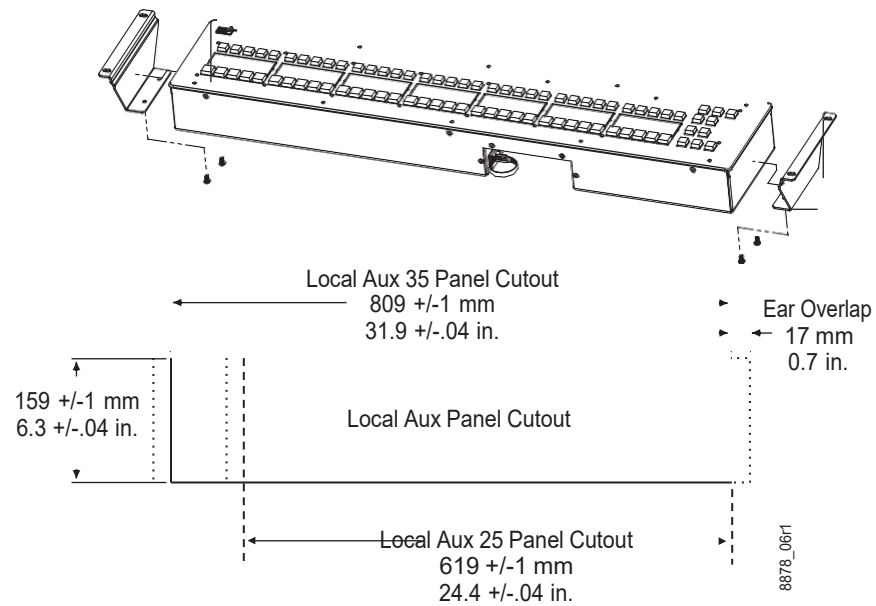
Rear Screw Hole Dimensions

Two sets of brackets are provided with the Local Aux Panel, one intended for use in mounting into a tabletop cutout, and the other for mounting on a tabletop surface. Both brackets connect to threaded holes located on the rear of the Local Aux Panel.



Local Aux Panel Rear Dimensions

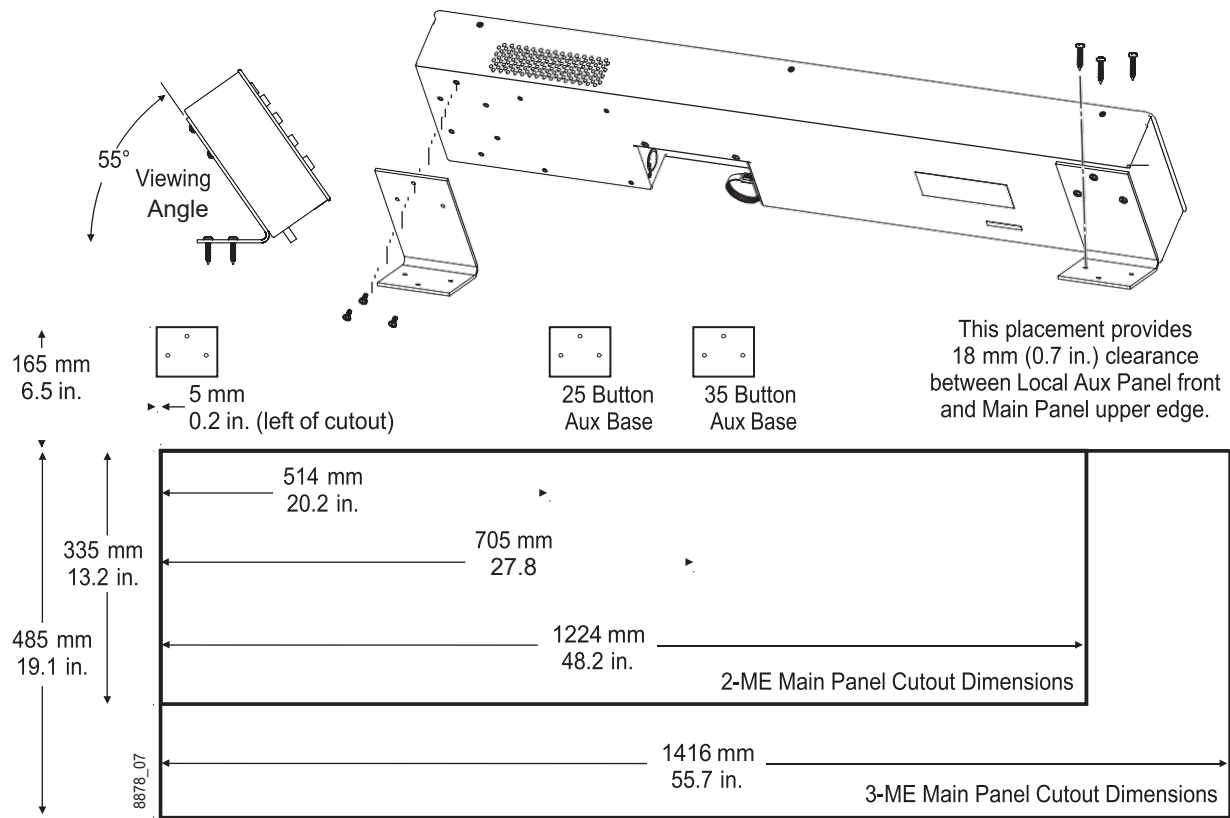
Tabletop/Backsplash Cutout Installation



Local Aux Panel Cutout Dimensions

Tabletop Bracket Installation: 2-M/E and 3-M/E Main Panels

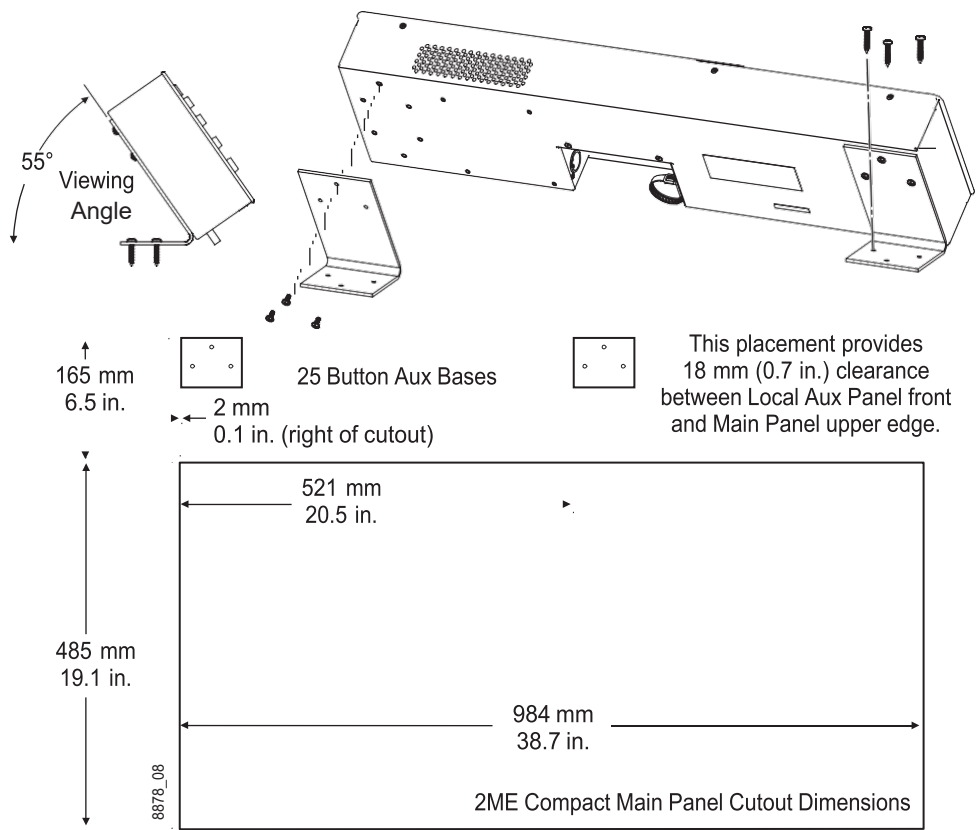
The following suggested angle bracket mounting locations will orient the Local Aux panel with the buttons on the Main Panel, and leaves vertical clearance for removing the Main Panel from its cutout.



Local Aux Panel Surface Mount Dimensions

Tabletop Bracket Installation: 2-M/E Compact Panel

The suggested bracket placement is different when mounting the Local Aux panel with a 2-M/E Compact Control Panel.



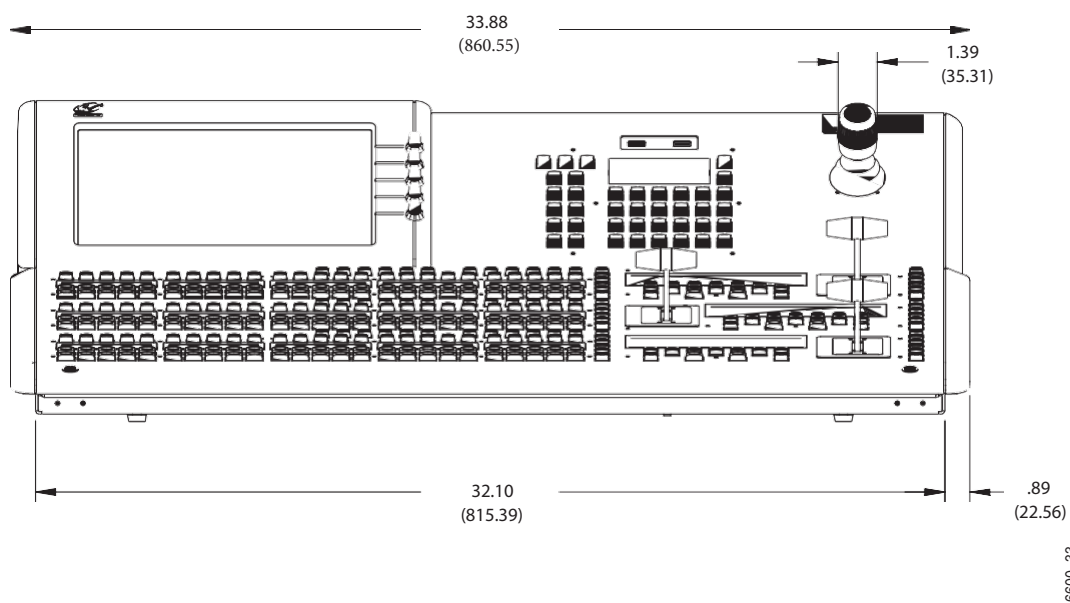
Local Aux Panel Surface Mount Dimensions

GV Korona Control Surfaces

Use the GV Korona control surface cutout dimensions ([2-M/E GV Korona Control Panel Cutout Dimensions](#), on page 95 and [1-M/E GV Korona Control Panel Cutout Dimensions](#), on page 98) to prepare your consoles for GV Korona Control Panel installation.

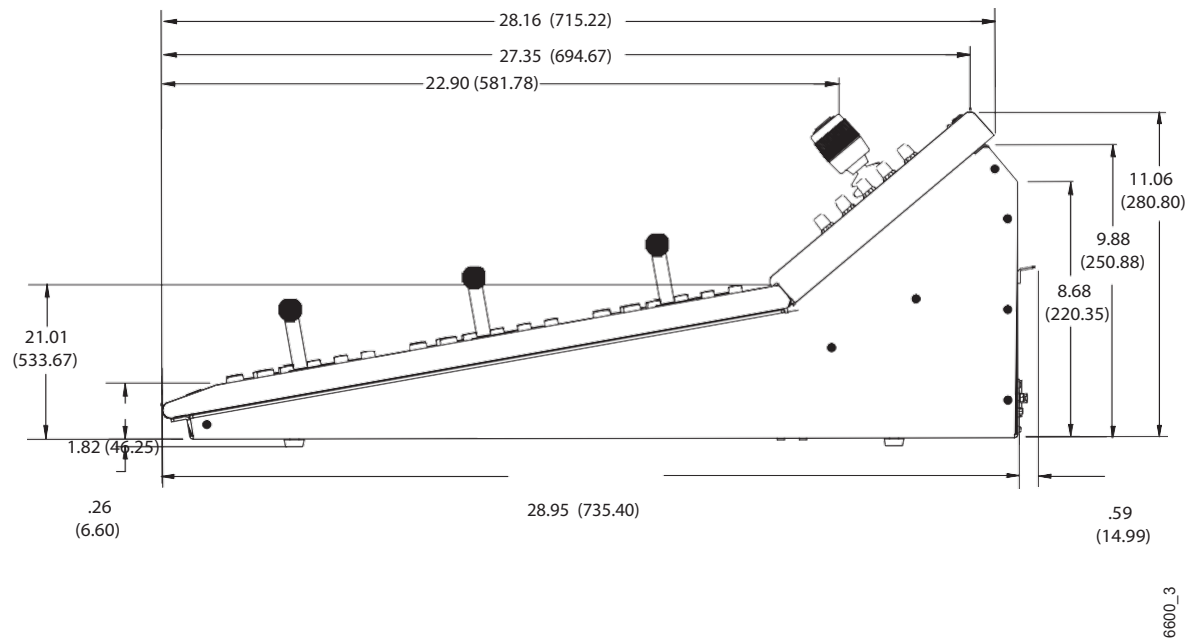
3-M/E GV Korona Control Panel Dimensions

IMPORTANT: All dimensions are in inches with millimeters in parenthesis.

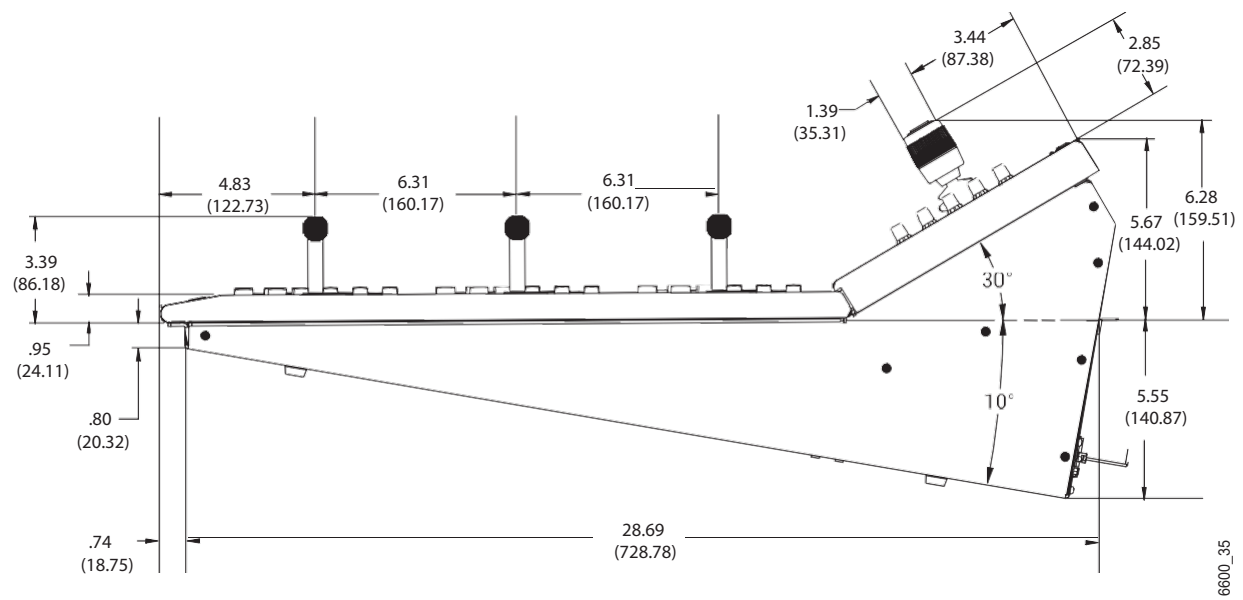


3-M/E GV Korona Control Panel Front Dimensions

Control Surface Installation



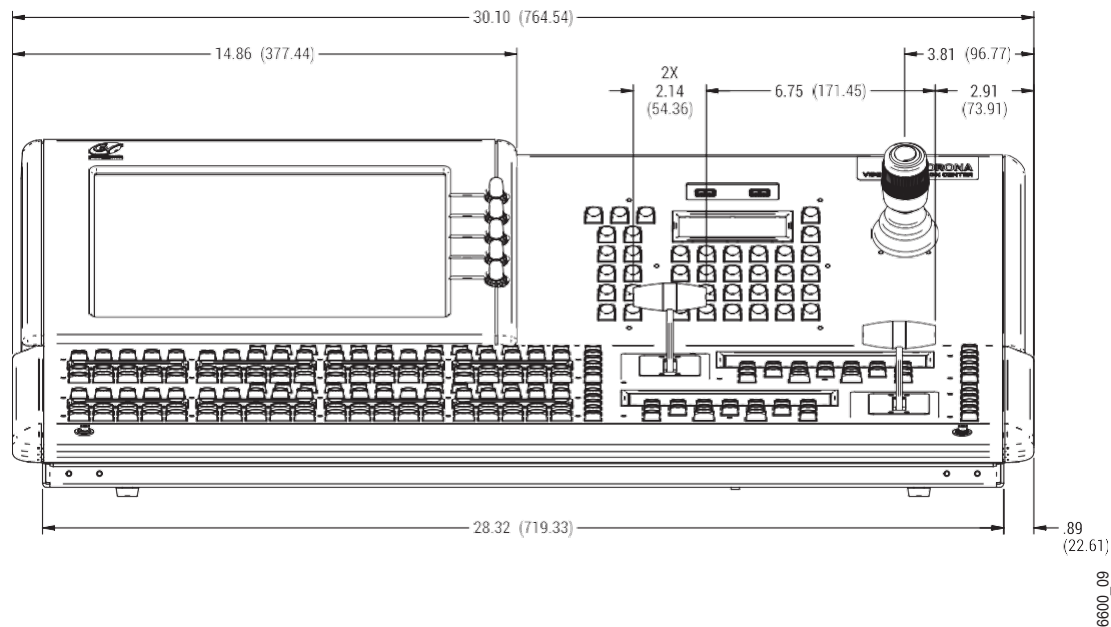
3-M/E GV Korona Control Panel Side Dimensions



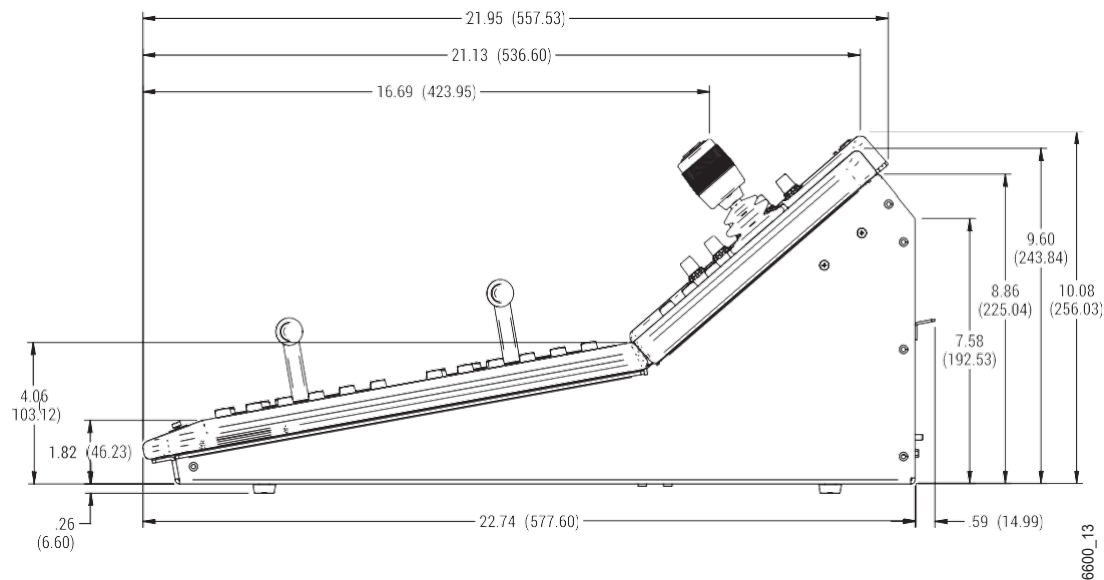
3-M/E GV Korona Control Panel Mounting Dimensions

2-M/E GV Korona Control Panel Dimensions

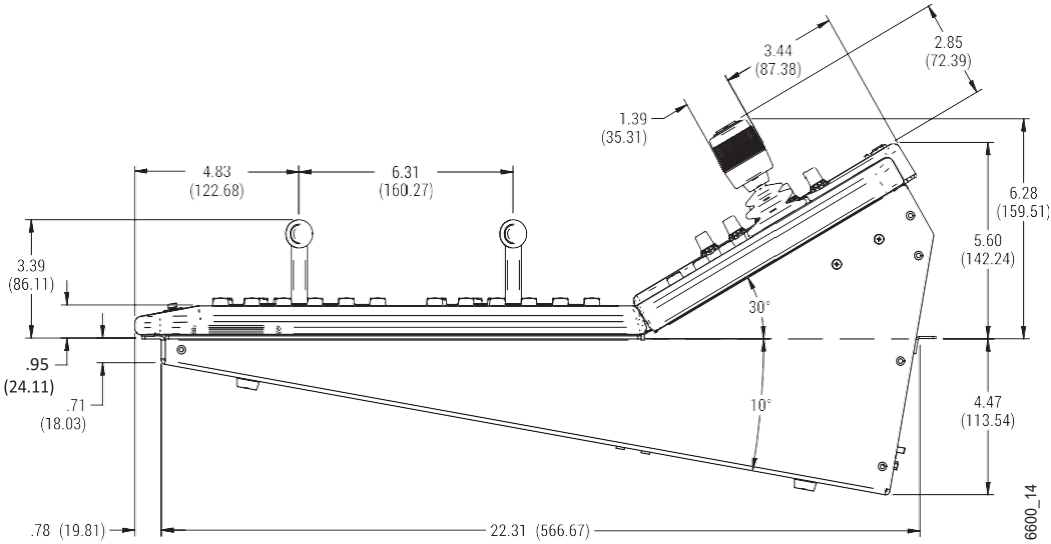
IMPORTANT: All dimensions are in inches with millimeters in parenthesis.



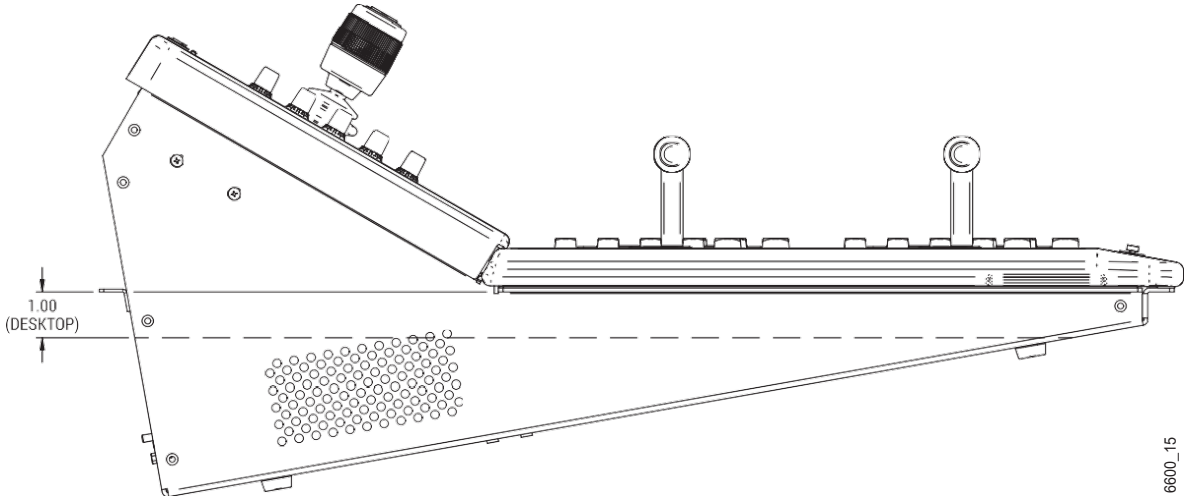
2-M/E GV Korona Control Panel Front Dimensions



2-M/E GV Korona Control Panel Side Dimensions



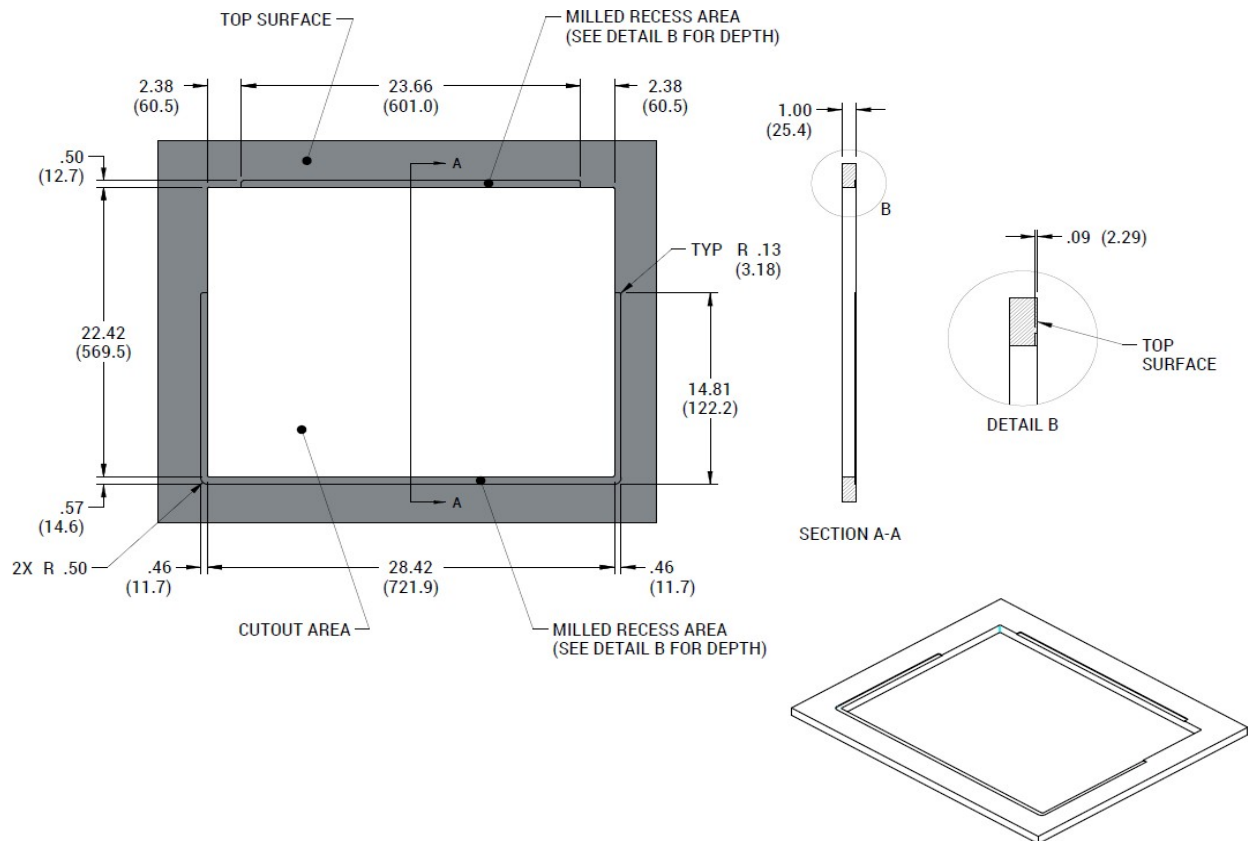
2-M/E GV Korona Control Panel Mounting Dimensions



2-M/E GV Korona Control Panel Left Side Mount to Vent Dimensions

2-M/E GV Korona Control Panel Cutout Dimensions

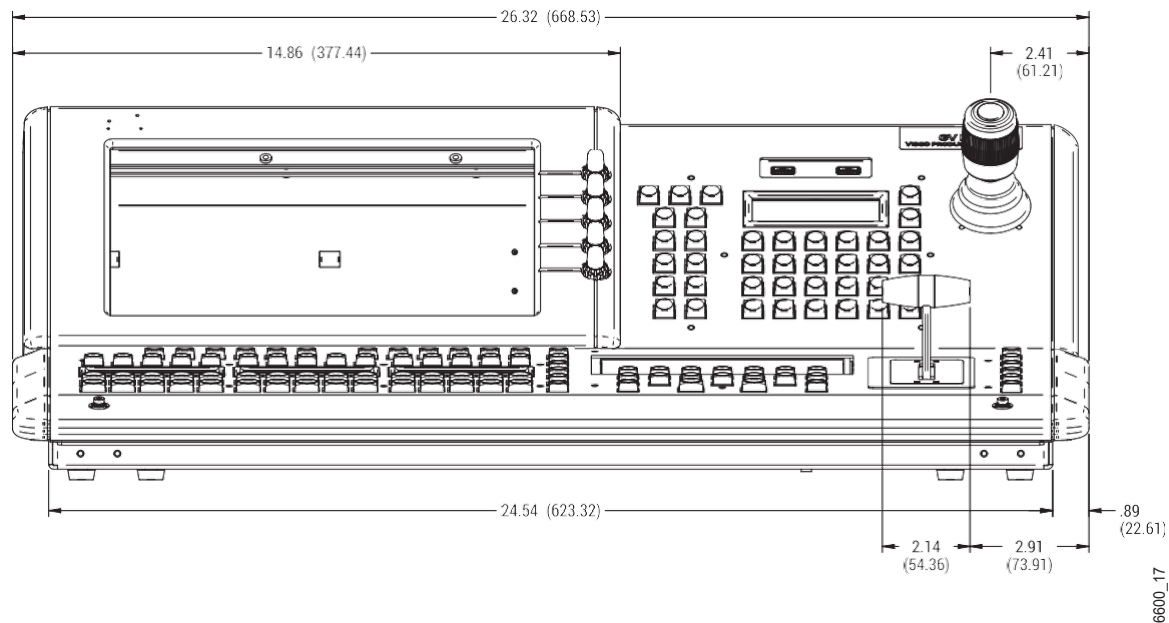
IMPORTANT: All dimensions are in inches with millimeters in parenthesis.



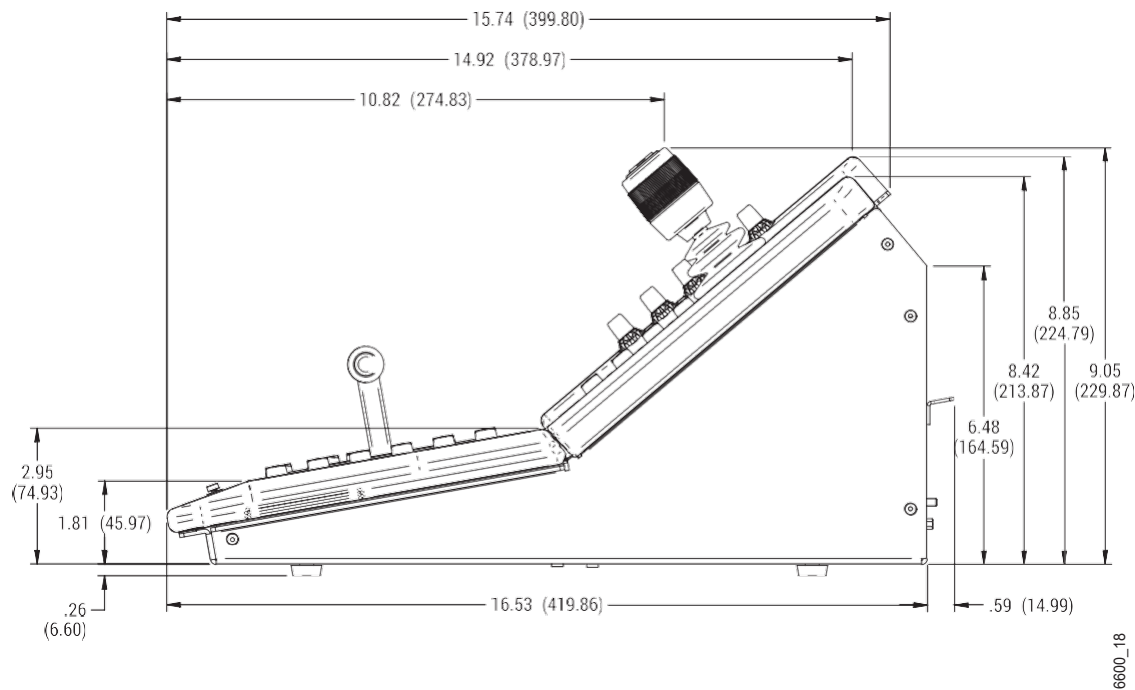
2-M/E GV Korona Control Panel Cutout Dimensions

1-M/E GV Korona Control Panel Dimensions

IMPORTANT: All dimensions are in inches with millimeters in parenthesis.



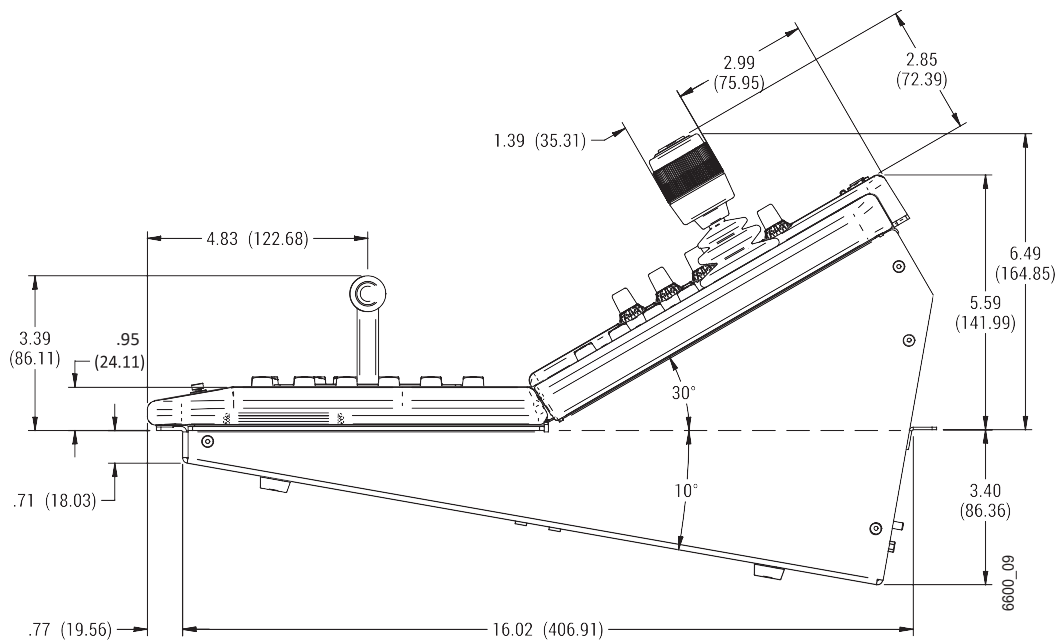
1-M/E GV Korona Control Panel Front Dimensions



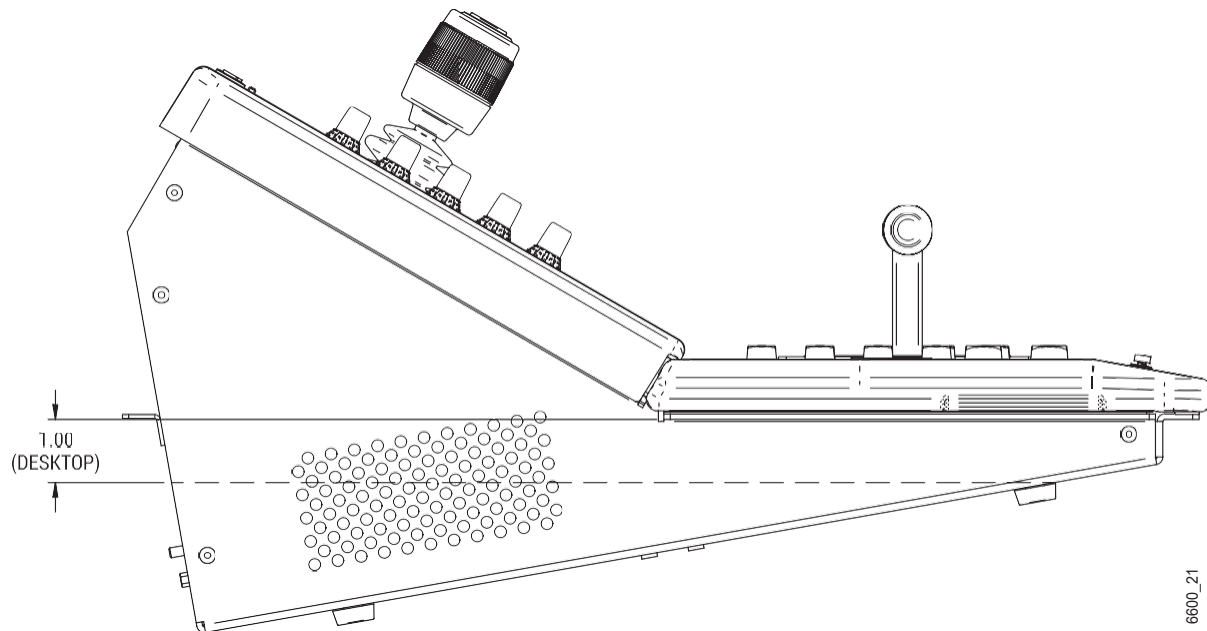
1-M/E GV Korona Control Panel Side Dimensions

Control Surface Installation

1-M/E GV Korona Control Panel Dimensions



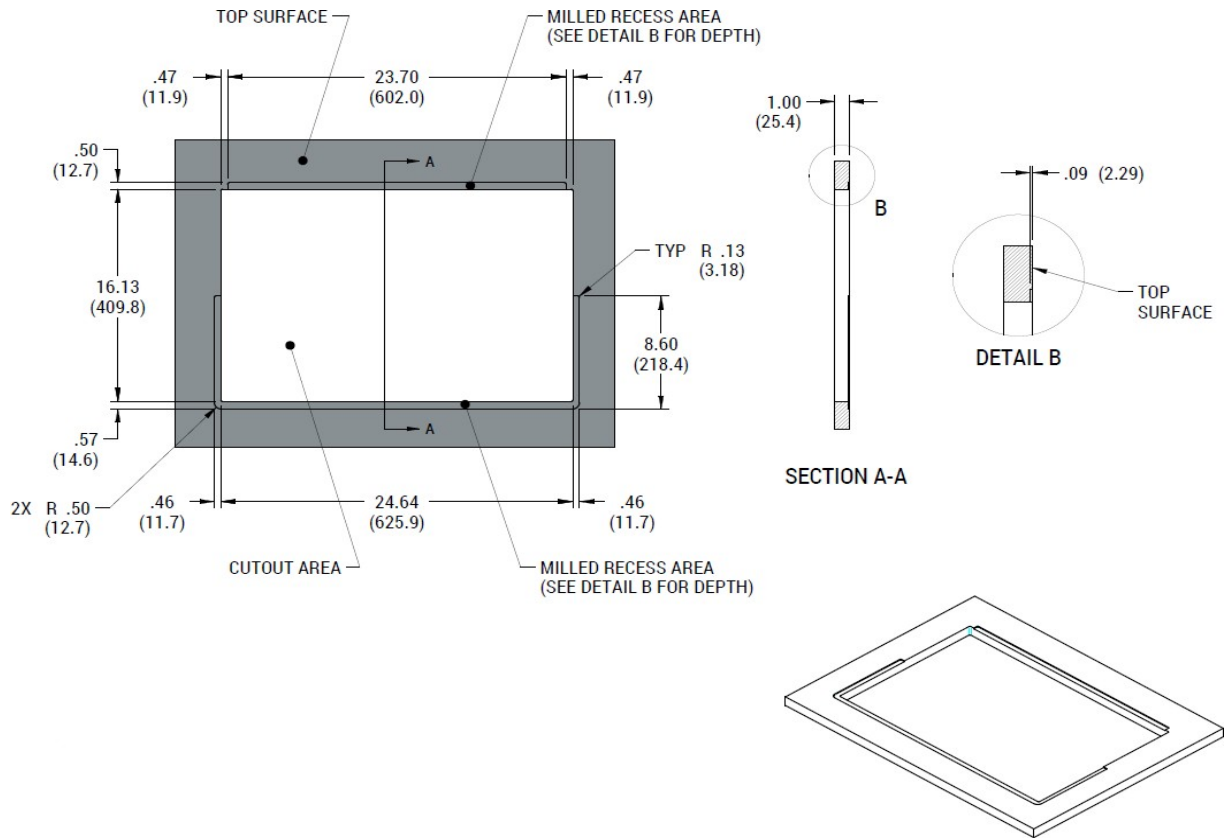
1-M/E GV Korona Control Panel Mounting Dimensions



1-M/E GV Korona Control Panel Left Side Mount to Vent Dimension

1-M/E GV Korona Control Panel Cutout Dimensions

IMPORTANT: All dimensions are in inches with millimeters in parenthesis.



4

System Cabling

About the GV K-Frame XP System Cabling Section

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

System Cabling Overview

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

Ethernet Tally Verses Serial Tally

Our GV K-Frame XP 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 GV K-Frame XP Ethernet tally support information.

Suites and Control Surfaces

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

Network Cabling

The Ethernet switches built into the GV K-Frame XP 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 Video Processor or PCU power down, the internal Ethernet switches will also power down, interrupting communication to devices connected to that Frame's or PCU's internal Ethernet switches. Only connect devices that are GV K-Frame XP system related.

Ethernet Switch

The Ethernet switch built into the GV K-Frame XP auto-detects speed and polarity, and is 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 Frame power down, the internal Ethernet switch will also power down, interrupting communication to devices connected to that Frame's internal Ethernet switch. Only connect devices that are system related.

Customer Supplied Ethernet Routers and Switches

Existing facility Ethernet switches can be used in conjunction with a switcher system. If connecting to a network area outside that used by the switcher system, use of an appropriately configured Ethernet Router is strongly advised. This reduces network traffic on the GV K-Frame XP network and keeps it isolated. Any Ethernet switches added specifically for use with the switcher 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 GV K-Frame XP 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 GV K-Frame XP devices to the mask of the local network.

Factory Default Network Settings

GV K-Frame XP 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 |
| 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 GV K-Frame XP network. |
| Video Processor Frame Gigabit Ethernet | 192.168.0.172 |
| PCU Panel Reserved LAN Port | 192.168.0.174 |

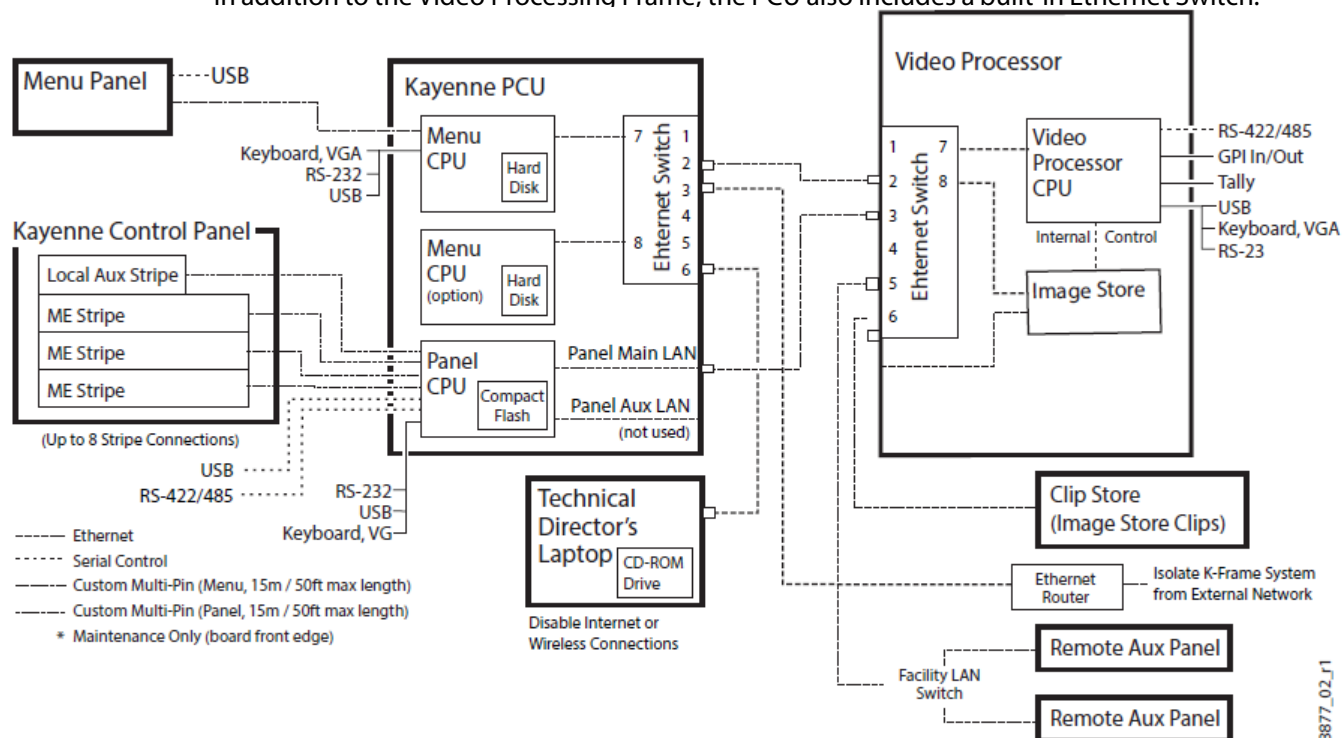
Note: Customer orders with multiple Control Panels will be pre-configured to the listed IP addresses. However, if one of these additional Control Panels is reset to factory defaults, it will be given the standard 1A default 192.168.0.173 address.

To integrate GV K-Frame XP 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.

System Cabling for Kayenne Control Panels

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.



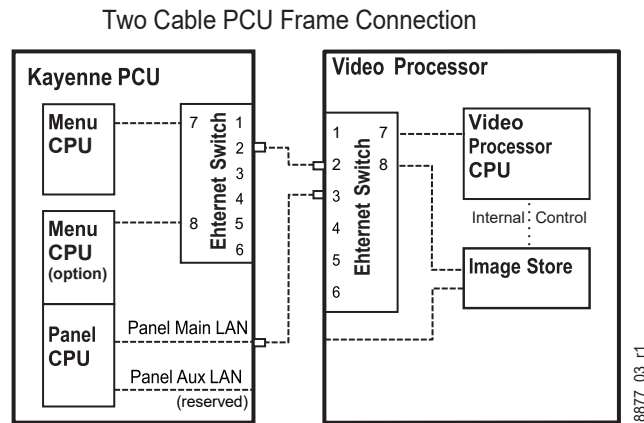
Kayenne GV K-Frame XP System Communications Overview

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

Kayenne Network Cabling

Network connections are required between the GV K-Frame XP 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 Video Processor is recommended.



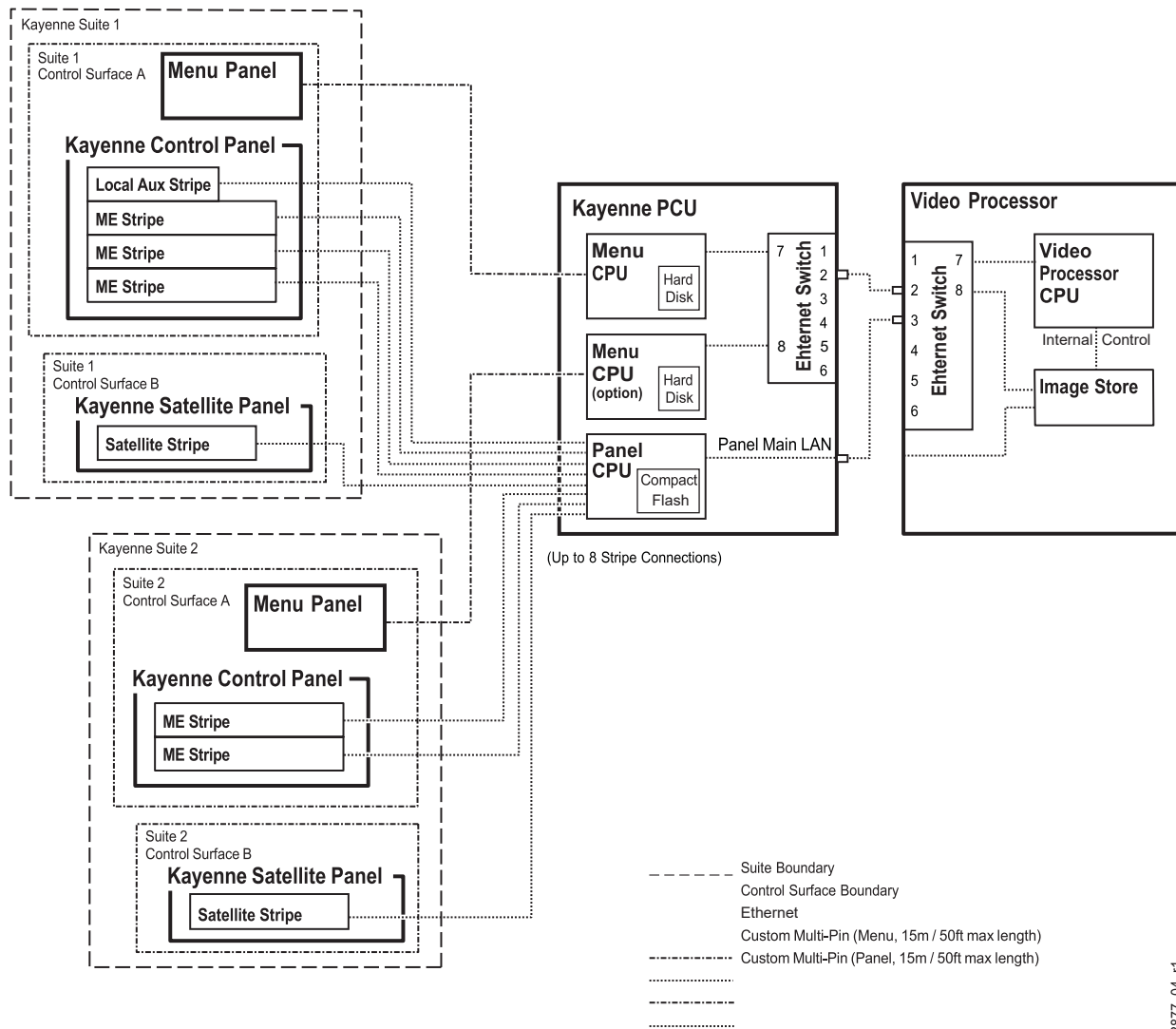
PCU to Kayenne GV K-Frame XP Network Connection Methods

The PCU Ethernet switch to GV K-Frame XP Video Processor Ethernet switch cable connection is used for Menu Panel communications. The second cable connects the Panel PCU directly to the 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 system. Either the Menu Panel or the Control Panel will remain operational after a single network cable failure.

Kayenne Suites and Control Surfaces

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

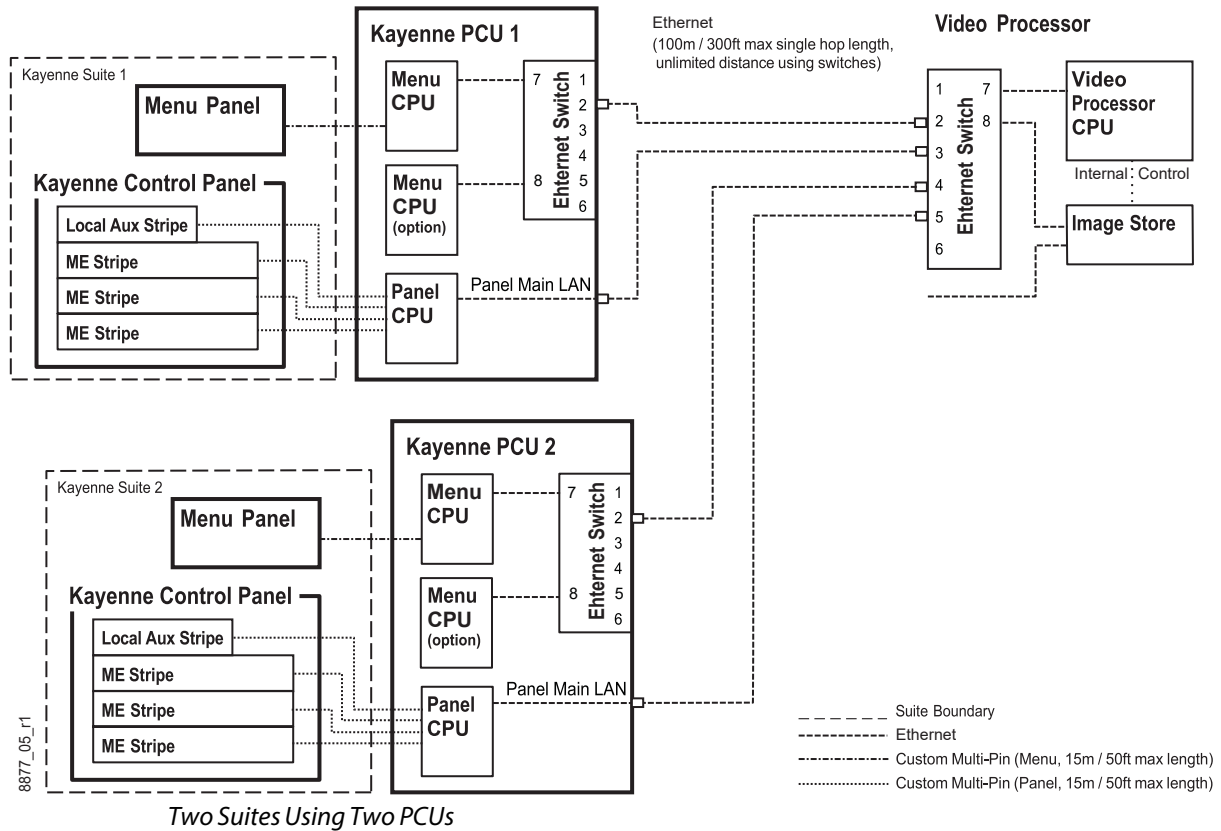
Custom multi-pin cable runs are limited to 15 meters (50 ft.) If this length is sufficient, a single PCU can be used for an entire multi-suite system.



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

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



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 E-MEM, 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.

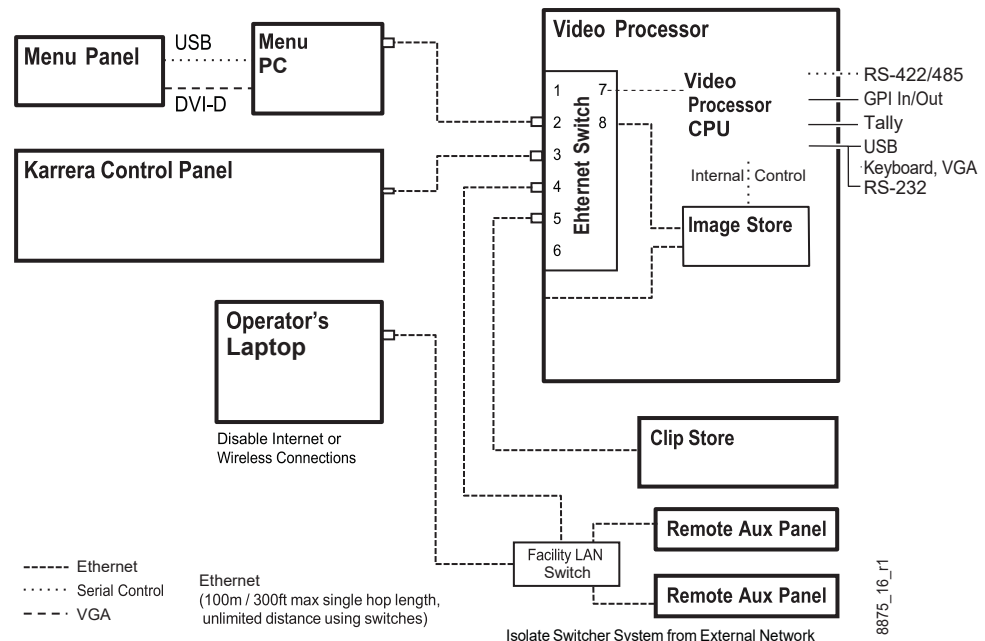
The Double Module Satellite Panel has a similar internal cabling arrangement, but one cable passes through a hole to the other tray.

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.

System Cabling for the Karrera Control Panel

The Karrera switcher system uses Ethernet, serial, DVI, and USB connections for system communications.

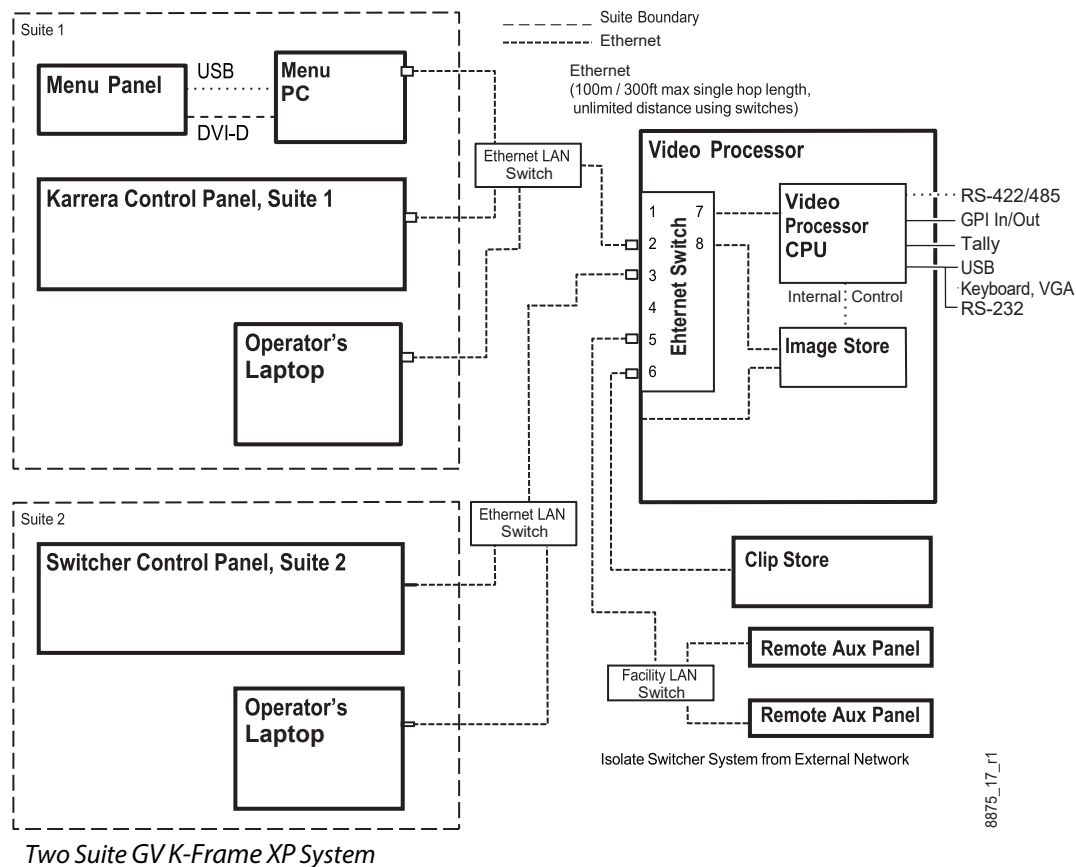


Karrera GV K-Frame XP System Communications Overview

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

Karrera Suites and Control Surfaces

The GV K-Frame XP 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.



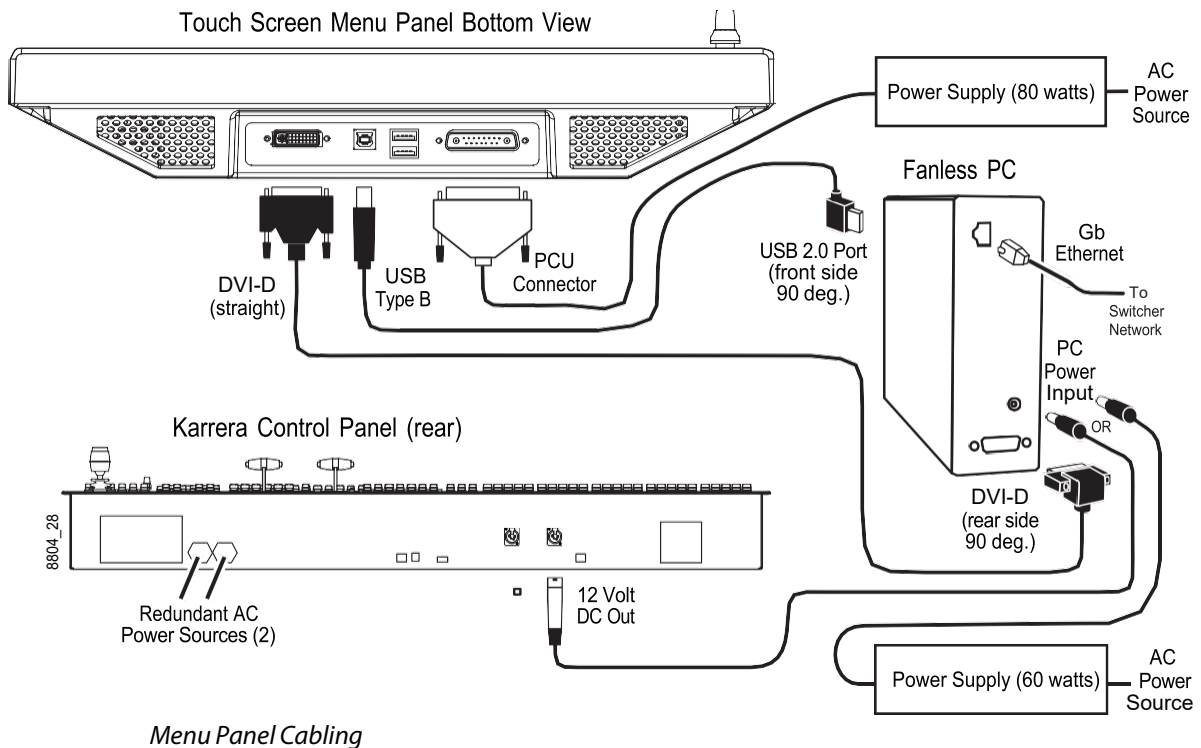
Karrera Control Panel Network Cabling

Ethernet, USB, and DVI-D connections are used between the GV K-Frame XP 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.

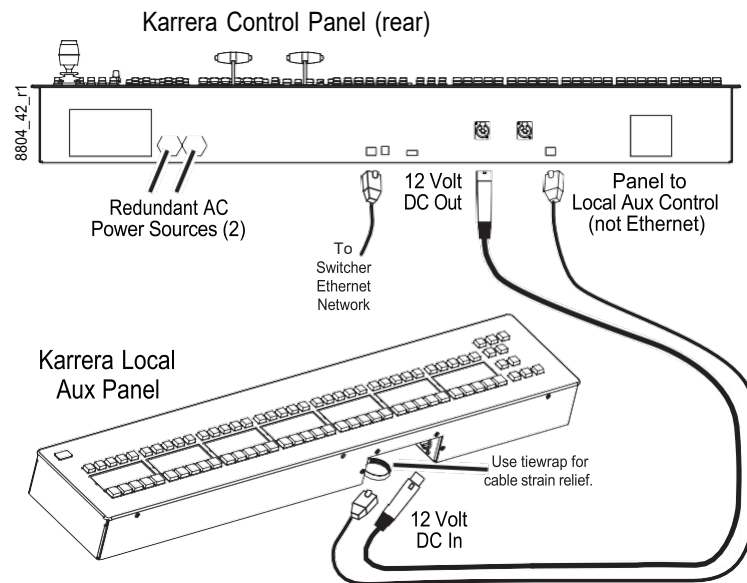
System Cabling



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

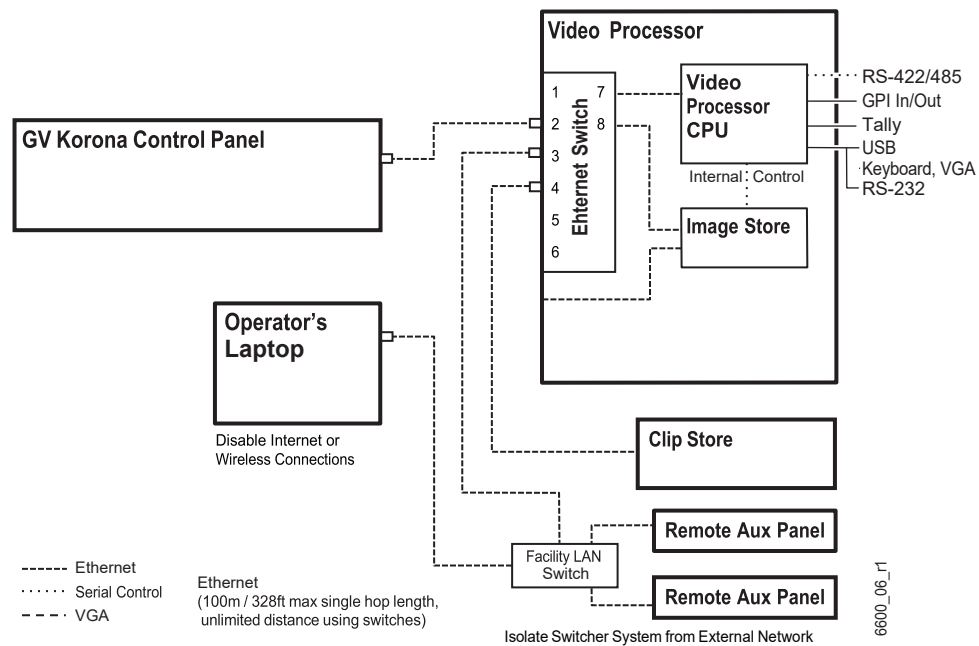
The Karrera GV K-Frame XP Local Aux Panel is powered from the Control Panel, using a 4-pin XLR cable. System control is provided using a RJ-45 connecting cable, which uses a proprietary communications protocol (not Ethernet).

*Local Aux Panel Cabling*

System Cabling for the GV Korona Control Panel

The GV Korona GV K-Frame XP system uses Ethernet connections for communications. The 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 Frame.

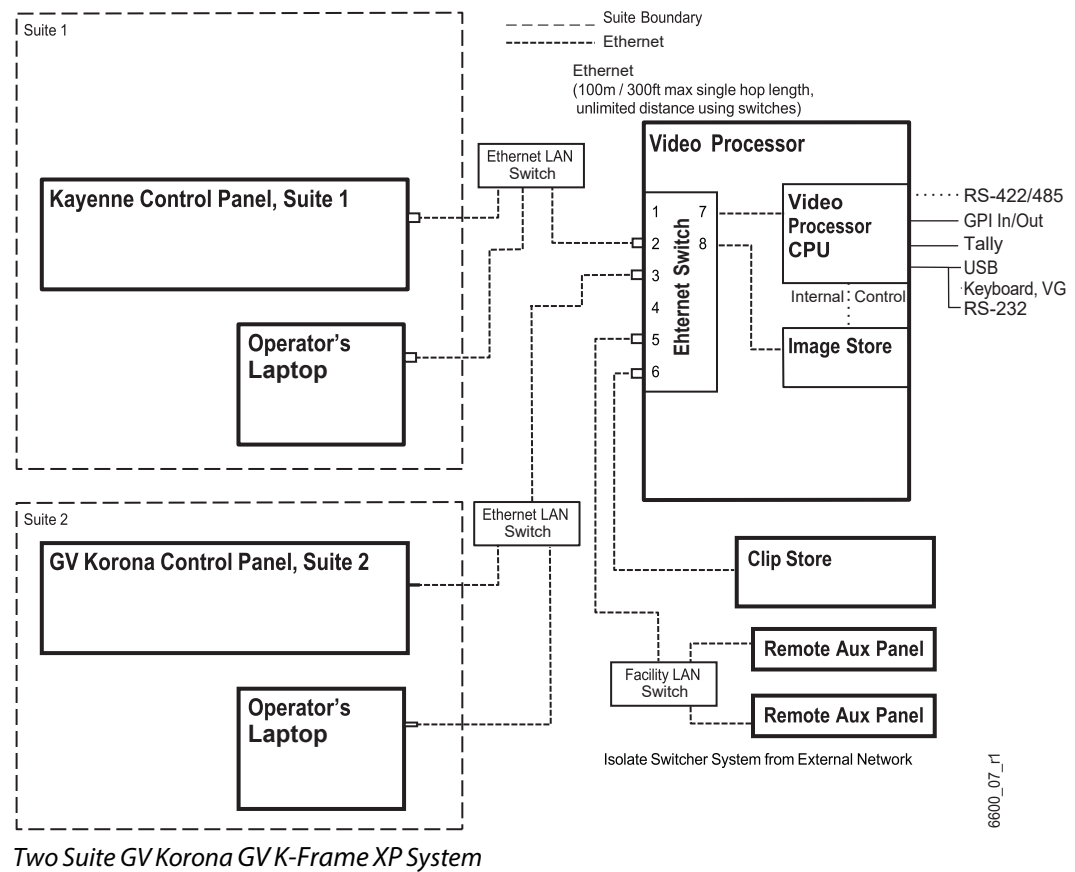
CAUTION: The facility network used for your GV K-Frame XP system (and other video production equipment) should be kept separate from any external network, to prevent network traffic from adversely affecting system operation.



GV Korona GV K-Frame XP System Communications Overview

GV Korona Suites and Control Surfaces

The GV K-Frame XP 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.



GV K-Frame XP Video Cabling

All GV K-Frame XP 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 GV K-Frame XP 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.

SDI Inputs

Non-looping video inputs on the back of the Video Processor Frame accept a 270 MHz, 1.485 GB, 3 GB, or 12 GB serial digital video signal.

SDI Outputs

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

Reference Input

The GV K-Frame XP Video Processor has 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.

Note: The Frame Operating Mode does not automatically set to the reference input and does not follow the input sync rate. The Frame Operating Mode is set in the Eng Setup, Video Settings menu.

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.

Input Sync Rates will show 'Locked' in the Frame Status pane of the Eng Setup, Video Settings menu when the Frame Operating Mode matches an evenly divisible input reference frequency. For example, if your reference is NTSC color black (frame rate 29.97Hz, field rate 59.94Hz) you can select any Frame Operating Mode that has a vertical rate of 29.97Hz or 59.94Hz.

Supported Media Port 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.

GV K-Frame XP Video Processor Frame GPI/Relay Tally Interface

GV K-Frame XP 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, 60V.

GPI and Relay Tally Connections

Each Video Input/Output module has a 37 pin female sub-miniature D connector on the rear of the chassis, available for GPI and relay tally. Each connector has 4 GPI Inputs, 4 GPI Outputs, and 16 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.

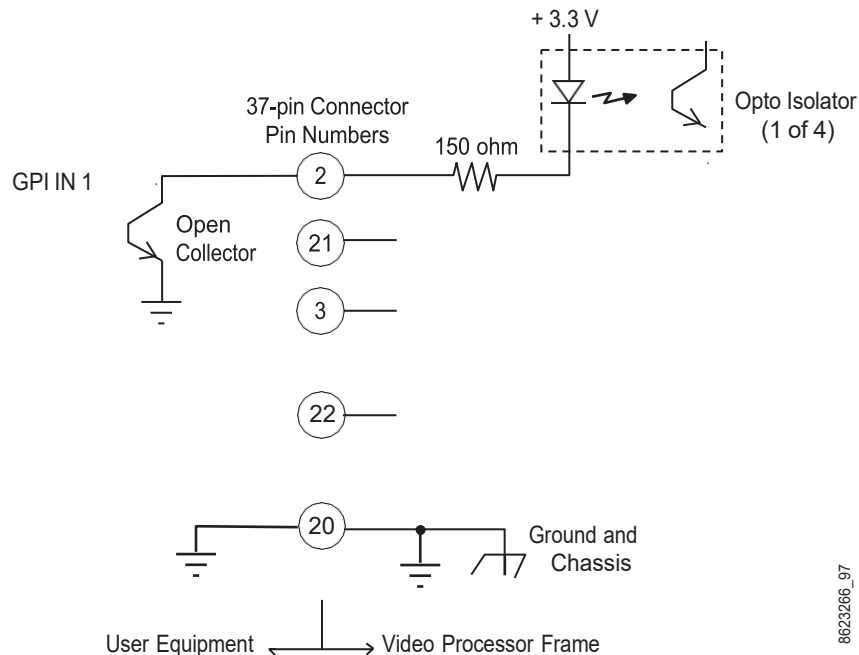
GPI Inputs The purpose of the GPI In pins is to provide a stimulus from the external devices to the switcher. A simple connection of two pins activates the corresponding input. An external relay contact or an open-collector output can be employed.

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

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 20). Pins 1 and 20 of each connector are connected to ground. For applications that span across more than one connector, only one ground (common) connection is required.

The following diagram has the GV K-Frame X GPI inputs on the left.

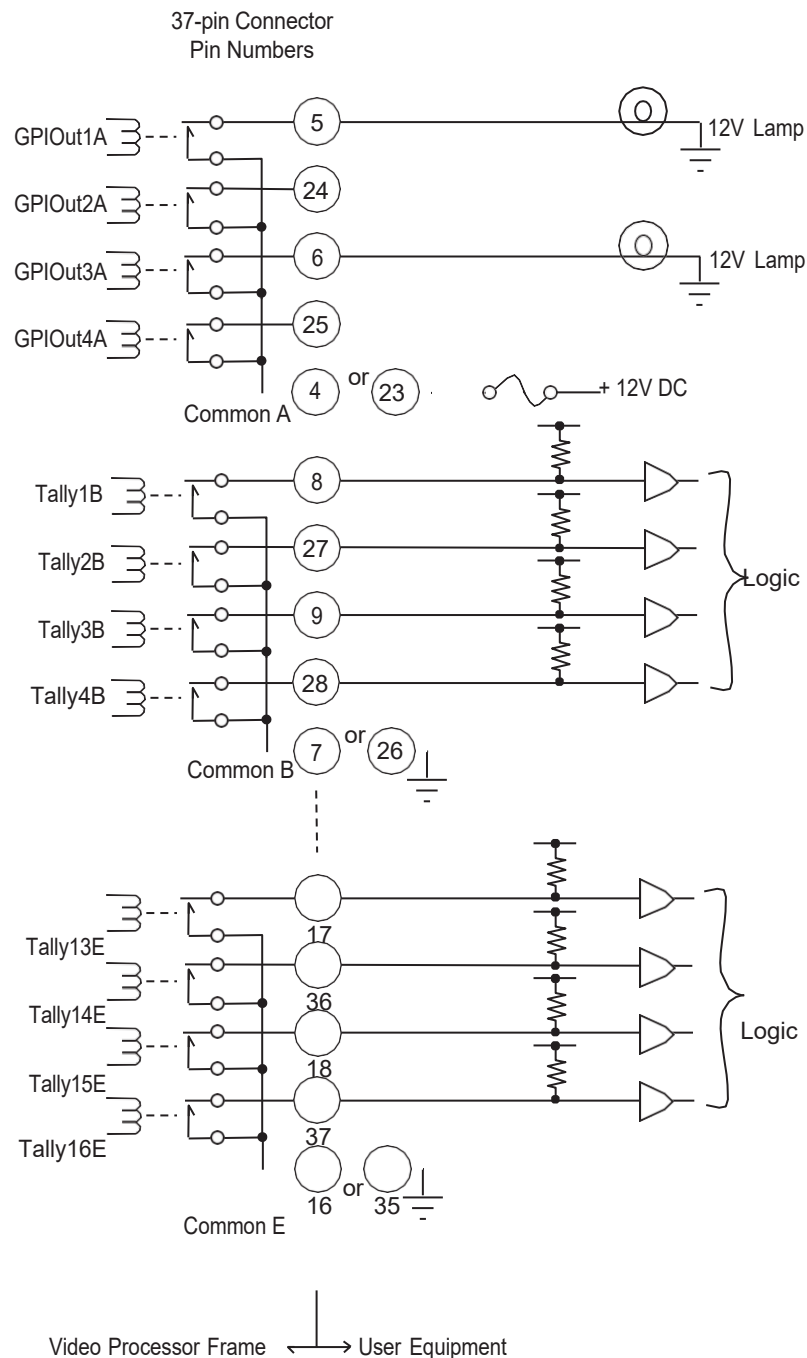


GPI Input Connections (Typical 1 of 4 Connections)

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 +12 Volts. This drives the relay tally lamp system. The last outputs have the common bus tied to ground; this drives a logic 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

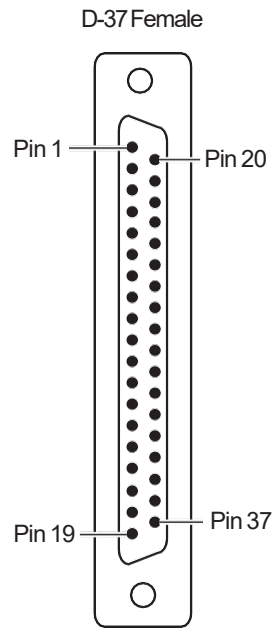
| | |
|--|---------------|
| Maximum current for any one output | 1 amp AC/DC |
| Maximum current for any one common | 2 amp AC/DC |
| Maximum off (open circuit) voltage between output and common | 60 Volts peak |
| Maximum voltage between any point and ground (chassis) | 60 Volts peak |

GPI In, GPI Out, Relay Tally Pin Assignments

Each GV K-Frame X Input/Output Module has a 37 pin connector for GPI and Relay Tally. The connectors are arranged in left to right order on the rear of the Frame.

Input/Output Module Connectors

| Module Number | Signals | Module Number | Standard 13RU Frame |
|---------------|-------------------|---------------|---------------------|
| 1 | GPI In 1-4 | 6 | GPI In 21-24 |
| | GPI Out 1-4 | | GPI Out 21-24 |
| | Relay Tally 1-16 | | Relay Tally 81-96 |
| 2 | GPI In 5-8 | 7 | GPI In 25-28 |
| | GPI Out 5-8 | | GPI Out 25-28 |
| | Relay Tally 17-32 | | Relay Tally 97-112 |
| 3 | GPI In 9-12 | 8 | GPI In 29-32 |
| | GPI Out 9-12 | | GPI Out 29-32 |
| | Relay Tally 33-48 | | Relay Tally 113-128 |
| 4 | GPI In 13-16 | 9 | GPI In 33-36 |
| | GPI Out 13-16 | | GPI Out 33-36 |
| | Relay Tally 49-64 | | Relay Tally 129-144 |
| 5 | GPI In 17-20 | 10 | GPI In 37-40 |
| | GPI Out 17-20 | | GPI Out 37-40 |
| | Relay Tally 65-80 | | Relay Tally 145-160 |



Socket Pinout

GPI Signals

GPI In, Tally, GPI Out Signals (first five boards from left to right)

| Ribbon Cable | 37-Pin D-Sub | 1 | 2 | 3 | 4 | 5 |
|--------------|--------------|-----------|-----------|-----------|-----------|-----------|
| 1 | 1 | GPIInCom | GPIInCom | GPIInCom | GPIInCom | GPIInCom |
| 2 | 20 | GPIInCom | GPIInCom | GPIInCom | GPIInCom | GPIInCom |
| 3 | 2 | GPIIn1 | GPIIn5 | GPIIn9 | GPIIn13 | GPIIn17 |
| 4 | 21 | GPIIn2 | GPIIn6 | GPIIn10 | GPIIn14 | GPIIn18 |
| 5 | 3 | GPIIn3 | GPIIn7 | GPIIn11 | GPIIn15 | GPIIn19 |
| 6 | 22 | GPIIn4 | GPIIn8 | GPIIn12 | GPIIn16 | GPIIn20 |
| 7 | 4 | GPIOutCom | GPIOutCom | GPIOutCom | GPIOutCom | GPIOutCom |
| 8 | 23 | GPIOutCom | GPIOutCom | GPIOutCom | GPIOutCom | GPIOutCom |
| 9 | 5 | GPIOut1 | GPIOut5 | GPIOut9 | GPIOut13 | GPIOut17 |
| 10 | 24 | GPIOut2 | GPIOut6 | GPIOut10 | GPIOut14 | GPIOut18 |
| 11 | 6 | GPIOut3 | GPIOut7 | GPIOut11 | GPIOut15 | GPIOut19 |
| 12 | 25 | GPIOut4 | GPIOut8 | GPIOut12 | GPIOut16 | GPIOut20 |
| 13 | 7 | TallyComA | TallyComE | TallyComI | TallyComM | TallyComQ |
| 14 | 26 | TallyComA | TallyComE | TallyComI | TallyComM | TallyComQ |
| 15 | 8 | Tally1A | Tally17E | Tally33I | Tally49M | Tally65Q |
| 16 | 27 | Tally2A | Tally18E | Tally34I | Tally50MK | Tally66Q |
| 17 | 9 | Tally3A | Tally19E | Tally35I | Tally51M | Tally67Q |
| 18 | 28 | Tally4A | Tally20E | Tally36I | Tally52M | Tally68Q |
| 19 | 10 | TallyComB | TallyComF | TallyComJ | TallyComN | TallyComR |
| 20 | 29 | TallyComB | TallyComF | TallyComJ | TallyComN | TallyComR |
| 21 | 11 | Tally5B | Tally21F | Tally37J | Tally53N | Tally69R |
| 22 | 30 | Tally6B | Tally22F | Tally38J | Tally54N | Tally70R |
| 23 | 12 | Tally7B | Tally23F | Tally39J | Tally55N | Tally71R |
| 24 | 31 | Tally8B | Tally24F | Tally40J | Tally56N | Tally72R |
| 25 | 13 | TallyComC | TallyComG | TallyComK | TallyComO | TallyComS |
| 26 | 32 | TallyComC | TallyComG | TallyComK | TallyComO | TallyComS |
| 27 | 14 | Tally9C | Tally25G | Tally41K | Tally57O | Tally73S |
| 28 | 33 | Tally10C | Tally26G | Tally42K | Tally58O | Tally74S |
| 29 | 15 | Tally11C | Tally27G | Tally43K | Tally59O | Tally75S |
| 30 | 34 | Tally12C | Tally28G | Tally44K | Tally60 | Tally76S |
| 31 | 16 | TallyComD | TallyComH | TallyComL | TallyComP | TallyComT |
| 32 | 35 | TallyComD | TallyComH | TallyComL | TallyComP | TallyComT |
| 33 | 17 | Tally13D | Tally29H | Tally45L | Tally61P | Tally77T |
| 34 | 36 | Tally14D | Tally30H | Tally46L | Tally62P | Tally78T |

GPI In, Tally, GPI Out Signals (first five boards from left to right)

| Ribbon Cable | 37-Pin D-Sub | 1 | 2 | 3 | 4 | 5 |
|--------------|--------------|----------|----------|----------|----------|----------|
| 35 | 18 | Tally15D | Tally31H | Tally47L | Tally63P | Tally79T |
| 36 | 37 | Tally16D | Tally32H | Tally48L | Tally64P | Tally80T |
| 37 | 19 | Reserved | Reserved | Reserved | Reserved | Reserved |

GPI In, Tally, GPI Out Signals (second five boards from left to right)

| Ribbon Cable | 37-Pin D-Sub | 6 | 7 | 8 | 9 | 10 |
|--------------|--------------|-----------|------------|------------|------------|------------|
| 1 | 1 | GPIInCom | GPIInCom | GPIInCom | GPIInCom | GPIInCom |
| 2 | 20 | GPIInCom | GPIInCom | GPIInCom | GPIInCom | GPIInCom |
| 3 | 2 | GPIIn21 | GPIIn25 | GPIIn29 | GPIIn33 | GPIIn37 |
| 4 | 21 | GPIIn22 | GPIIn26 | GPIIn30 | GPIIn34 | GPIIn38 |
| 5 | 3 | GPIIn23 | GPIIn27 | GPIIn31 | GPIIn35 | GPIIn39 |
| 6 | 22 | GPIIn24 | GPIIn28 | GPIIn32 | GPIIn36 | GPIIn40 |
| 7 | 4 | GPIOutCom | GPIOutCom | GPIOutCom | GPIOutCom | GPIOutCom |
| 8 | 23 | GPIOutCom | GPIOutCom | GPIOutCom | GPIOutCom | GPIOutCom |
| 9 | 5 | GPIOut21 | GPIOut25 | GPIOut29 | GPIOut33 | GPIOut37 |
| 10 | 24 | GPIOut22 | GPIOut26 | GPIOut30 | GPIOut34 | GPIOut38 |
| 11 | 6 | GPIOut23 | GPIOut27 | GPIOut31 | GPIOut35 | GPIOut39 |
| 12 | 25 | GPIOut24 | GPIOut28 | GPIOut32 | GPIOut36 | GPIOut40 |
| 13 | 7 | TallyComU | TallyComY | TallyComAC | TallyComAG | TallyComAK |
| 14 | 26 | TallyComU | TallyComY | TallyComAC | TallyComAG | TallyComAK |
| 15 | 8 | Tally81U | Tally97Y | Tally113AC | Tally129AG | Tally145AK |
| 16 | 27 | Tally82U | Tally98Y | Tally114AC | Tally130AG | Tally146AK |
| 17 | 9 | Tally83U | Tally99Y | Tally115AC | Tally131AG | Tally147AK |
| 18 | 28 | Tally84U | Tally100Y | Tally116AC | Tally132AG | Tally148AK |
| 19 | 10 | TallyComV | TallyComZ | TallyComAD | TallyComAH | TallyComAL |
| 20 | 29 | TallyComV | TallyComZ | TallyComAD | TallyComAH | TallyComAL |
| 21 | 11 | Tally85V | Tally101Z | Tally117AD | Tally133AH | Tally149AL |
| 22 | 30 | Tally86V | Tally102Z | Tally118AD | Tally134AH | Tally150AL |
| 23 | 12 | Tally87V | Tally103Z | Tally119AD | Tally135AH | Tally151AL |
| 24 | 31 | Tally88V | Tally104Z | Tally120AD | Tally136AH | Tally152AL |
| 25 | 13 | TallyComW | TallyComAA | TallyComAE | TallyComAI | TallyComAM |
| 26 | 32 | TallyComW | TallyComAA | TallyComAE | TallyComAI | TallyComAM |
| 27 | 14 | Tally89W | Tally105AA | Tally121AE | Tally137AI | Tally153AM |
| 28 | 33 | Tally90W | Tally106AA | Tally122AE | Tally138AI | Tally154AM |
| 29 | 15 | Tally91W | Tally107AA | Tally123AE | Tally139AI | Tally155AM |

GPI In, Tally, GPI Out Signals (second five boards from left to right)

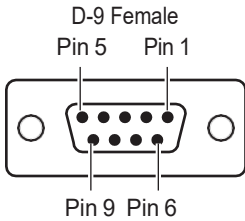
| Ribbon Cable | 37-Pin D-Sub | | 6 | 7 | 8 | 9 | 10 |
|--------------|--------------|----|-----------|------------|------------|-------------|------------|
| 30 | | 34 | Tally92W | Tally108AA | Tally124AE | Tally1 40AI | Tally156AM |
| 31 | 16 | | TallyComX | TallyComAB | TallyComAF | TallyComAJ | TallyComAN |
| 32 | | 35 | TallyComX | TallyComAB | TallyComAF | TallyComAJ | TallyComAN |
| 33 | 17 | | Tally93X | Tally109AB | Tally125AF | Tally141AJ | Tally157AN |
| 34 | | 36 | Tally94X | Tally110AB | Tally126AF | Tally142AJ | Tally158AN |
| 35 | 18 | | Tally95X | Tally111AB | Tally127AF | Tally1 43AJ | Tally159AN |
| 36 | | 37 | Tally96X | Tally112AB | Tally128AF | Tally144AJ | Tally150AN |
| 37 | 19 | | Reserved | Reserved | Reserved | Reserved | Reserved |

RS-422/485 Port Pin Assignments

Eight RS-422/485 ports are available on the rear of the GV K-Frame XP 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.

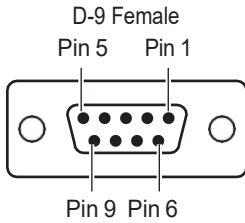
RS-422/485 Pinouts

| Socket | Pin | Bus Controller | Tributary |
|---|-----|----------------|----------------|
|  | 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), available for maintenance and diagnostics. Standard VGA and keyboard ports, 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 |

Remote Aux Panels

For configuration, see [Install Remote Aux Panel Software](#), on page 142.

GV-RAP-100 and GV-RAP-200 Remote Aux Panels

The GV-RAP-100 and GV-RAP-200 have the same rear panel layout.



Remote Aux Panel Power Supply AC Requirements

The GV-RAP-100 and GV-RAP-200 external Power Supply is power factor corrected and automatically accommodates low line (120V nominal) or high line (240V nominal). The power supply 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. GV-RAP Aux panels are supplied with one power module. An optional second power module can be added for redundancy (n+1).

Supplied Power Cables

The GV-RAP-100 and GV-RAP-200 external Power Supply has IEC C14 sockets. Cables provided are matched to the destination country's standard. For example, in the USA C14 to NEMA 5-20P cables are provided.

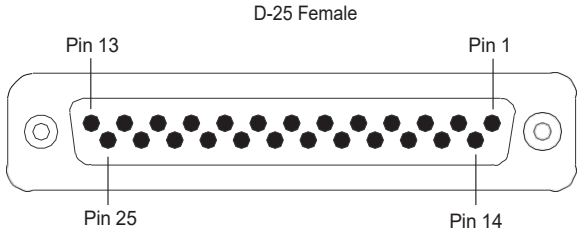
Ethernet Requirements

Cable 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.

RAP 100/200 GPI I/O Port Pin Assignments

Pin assignments are for both the GPI I/O 1-8 and GPI I/O 9-16 D-25 Female connector ports.

| Socket | Pin | Signal |
|---|-----|-------------------------------|
|  | 1 | Tally Out 15 |
| | 2 | Tally Out 13 |
| | 3 | Tally Out Common for 12 to 15 |
| | 4 | Tally Out 11 |
| | 5 | Tally Out 9 |
| | 6 | Tally Out Common for 8 to 11 |
| | 7 | GND |
| | 8 | Tally In 14 |
| | 9 | Tally In 13 |
| | 10 | GND |
| | 11 | Tally In 10 |
| | 12 | Tally In 9 |
| | 13 | GND |
| | 14 | Tally Out 14 |
| | 15 | Tally Out 12 |
| | 16 | GND |
| | 17 | Tally Out 10 |
| | 18 | Tally Out 8 |
| | 19 | GND |
| | 20 | Tally In 15 |
| | 21 | GND |
| | 22 | Tally In 12 |
| | 23 | Tally In 11 |
| | 24 | GND |
| | 25 | Tally In 8 |

5 Basic Configuration

Introduction

IMPORTANT: The GV K-Frame XP Compact and Standard Video ProductionCenter is supported by V16.0.0

This section provides basic system configuration information for the GV K-Frame XP Video Production Center switcher systems. Refer to the *KAYENNE/KARRERA/GV KORONA User Manual* for your Frame model for switcher operation information.

Configuration Steps

Note: See the *Switcher Concepts Manual* at grassvalley.com for basic concepts including Keyers, E-MEMs, Backgrounds, M/Es, etc.

GV K-Frame XP basic system configuration includes the following steps:

- 1 Power up the system.
- 2 Set IP addresses for your facility (if not using defaults). Node Settings will also need to be configured for proper system communications.
- 3 If necessary, adjust Control Panel button and display illumination.
- 4 If necessary, calibrate Control Panel lever arms and joystick (see [Maintenance](#) section).
- 5 Define your basic Engineering Setups. Essential settings include:
 - Source Definition
 - Outputs
 - Tally
- 6 Define a baseline User Setups (Panel Prefs and Suite Prefs). Important settings include:
 - Button Mapping
 - Source Patching
 - Default Keyframe
- 7 Configure external devices with the switcher system.
- 8 Save your configuration files.
- 9 Additional configuration will be required if multiple suites are being used.

Configuration Data

Current configuration settings for the GV K-Frame XP reside on the Video Processor Frame (in the NV folder on the Compact Flash drive on the Processor Board). These settings affect GV switcher system operation. When the Video Processor resets,

these settings are read and enacted. Configuration settings can be saved to files and loaded back into the system at a later time to restore those operational settings.

Configuration Basic Categories

Eng Setup

Engineering Setup defines basic switcher system functionality, including how it is cabled into a facility. Eng Setup applies to the entire system and can affect all configured suites. Engineering Setups are intended to be used and maintained by technical staff. These parameters are typically set once and seldom changed, unless the facility changes in some way (new devices installed, signals rerouted, etc.).

User Setups

User Setups can customize switcher system behavior for personal preferences, and to meet workflow requirements of a particular show. These settings are divided into **Panel Prefs** and **Suite Prefs**.

- Panel Prefs affects how a specific control surface operates for an individual user, including Button Mapping, Source Colors, etc. These settings apply to a single control surface.
- Suite Prefs controls more fundamental system behavior like Resource Allocation, Source Patching, E-MEM Prefs, etc. These settings apply to all control surfaces within that suite, and so can affect multiple operators. On systems configured with multiple suites, each suite will have its own independent Suite Prefs settings.

Network IPs and Node Settings

The switcher system employs Ethernet IP communications. IP addresses are set on the Video Processor Frame, Image Store, Control Panel, Menu Panel, etc. The Video Processor Frame maintains a list of IP nodes to enable communication with the other devices in the system. This list is stored separately from the Eng Setup and User Setups configuration files. This permits loading these configuration files without the danger of accidentally disrupting system communications.

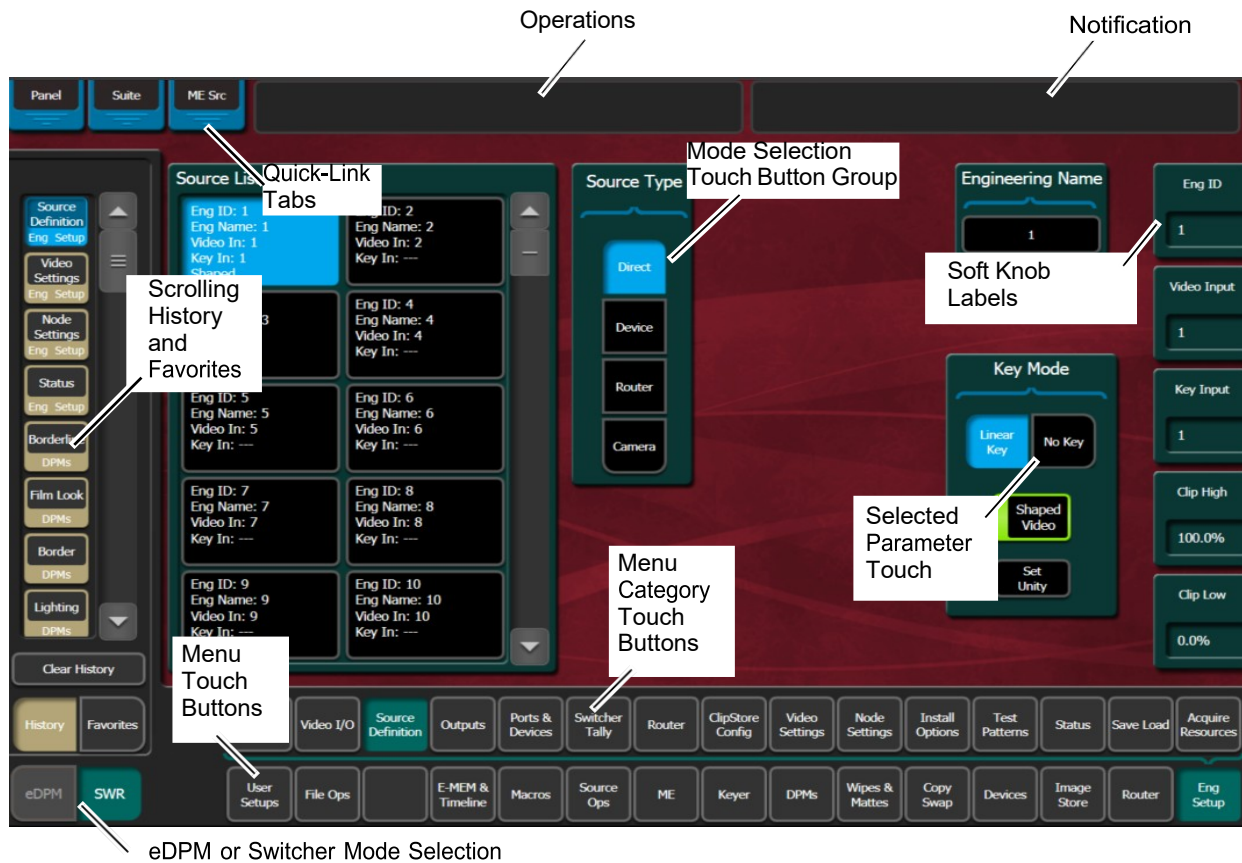
One exception is Remote Aux Panel IP network settings, which are stored in the Eng Setup configuration file, along with other Remote Aux Panel settings.

GV Switcher Menu Application

Note: A brief description of the GV Switcher menu application is presented here. Refer to the separate *KAYENNE/KARRERA/GV KORONA User Manual* for detailed information.

The GV Switcher menu application is used to configure your switcher system. This application can run on a user supplied PC, using a mouse and keyboard, and can run on the Touch Screen menu, allowing system operation by touching the screen.

The GV Switcher system menus are context sensitive. They display different information and provide various types of controls depending on what area of the system is involved.



Menu Top Line

The top line is identical in all the GV Switcher system menus:

- The left portion of the top line has three **Quick-Link** tabs, which provide access to other related GV Switcher menus.
- The center portion of the top line displays operations status messages.
- The right portion of the top line is an operator notification area, where messages generated by the GV K-Frame XP system are displayed.

Data Pads and Touch Buttons

Data pads are active areas on the screen that display a summary of the status of an object, and when clicked or touched bring up additional controls and information for that object.

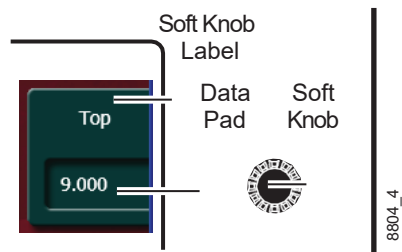
Touch buttons are labeled by their function and do not display data. Clicking or touching these buttons will immediately activate their function.

Touch buttons can control on/off functions, and have an indicator on the left side, or they can select from a group of parameters, and turn light blue to indicate the state of that parameter. For on/off buttons, green indicates this is a normal parameter and

that either anon or off state is typical. Yellow indicates an active function that may change expected behavior. Red indicates an active function which significantly changes normal behavior.

Data Pads and Soft Knobs

Data pads on the right side of the screen allow adjusting parameters with ranges of values. Left clicking or touching a data pad opens a numeric keypad, allowing entry of a specific value.



When equipped with a Touch Screen Menu Panel, knobs along the right side of the panel can be used to dial in parameter values for functions displayed. When a knob is active, the touch screen shows the parameter name and its current value on that data pad.

Menu Selection

Various GV Switcher system operating menus are selected using the menu buttons at the bottom of the Menu panel touch screen. Menu category selection touch buttons are directly above the Menu touch buttons. Touching one of these buttons displays that category.

As each menu is accessed, a button for it appears in the scrolling **History** pane on the left, providing a quick return to that menu. **Favorites** can also be programmed for quick access to specific menus that are not overwritten.

Note: The optional eDPM system has its own set of operating menus, accessed by touching the **eDPM** button on the lower left. For basic switcher configuration be sure the **SWR** button is selected.

Power Up and Initialize the System

The Video Processor Frame, Control Panel, and menu application must be running for full system operation.

- 1 Turn on the Video Processor power switch located inside the front door of the Frame, on the front of the control board.

CAUTION: The front doors of the Video Processor Frame must remain closed during normal system operation for proper cooling airflow.

- 2 Turn on the PCU power switch located inside the front door, near the center of the upper board of the unit or at the rear of the Frame.
- 3 Turn on the Menu Panel (Kayenne and Karrera only) and/or customer supplied PC and monitor running the GV Switcher menu application.

Power and Initialization Indications

Power to the system is indicated by operation of the fans in the Video Processor Frame, illuminated buttons on the Control Panel, and a screen is displayed on the Menu Panel.

Menu Application Initialization

When the GV Switcher menu application initialization completes, the Status menu is displayed. This menu reports any connected devices, IP addresses, and software versions and dates of those devices in the center of the screen.

Default System Communications

Grass Valley Video Production systems ship with factory default settings that allow components to communicate with one another when powered up, provided they are connected properly. These components appear on the Status menu.

We recommend you use an isolated Ethernet network with your switcher system (to prevent possible IP address or network traffic conflicts), particularly when first setting up your system.

Establishing Menu to Frame Communication

If a Video Processor Frame is not found by the GV Switcher menu application, the Status menu central window will be empty and a NO FRAME COM message will be displayed in the upper right Notification Area.

The following conditions need to be met before the GV Switcher menu application can communicate with the Video Processor Frame. This list assumes the Touch Screen Menu Panel is being used. Similar requirements apply when the GV Switcher menu application is run on a PC:

- The Video Processor Frame must be powered up and running.
- The IP address of the Menu Panel (Kayenne and Karrera only) is on the same network as the Video Processor Frame.
- Ethernet cabling should connect the Control Panel to the Video Processor Frame, either directly or through an Ethernet switch.
- The IP Address the menu application will use to communicate with the Frame must be in the Frame IP Address field of the Eng Setup, Frame Suite Nodes & ID menu.

Note: For GV Korona, the same IP Address is used for both the Control Panel and built-in Touch Menu.

- The Menu Panel's IP address (Kayenne and Karrera only) must be in the IP Address field of the Control Surfaces menu (to register that Menu Panel as a node on the Frame).

Connecting the Menu Application to a Frame

Use the following procedure to connect the menu application to a Video Processor Frame. Two menu application resets will be required, one to connect to the Frame and another to register the menu application IP with that Frame:

- 1 Select **Eng Setup, Node Settings, Frame Suites Nodes & ID** in the GV switcher menu.
- 2 Select the **Frame IP Address** data pad and enter the Frame's IP Address in the pop-up keypad and select **Enter**.

Result: A Restart menu dialog box will appear.

- 3 You can either select **Restart Now** to restart the menu application or select **Cancel**, make changes to the Image Store IP Address and Track DPOPs from Panel IP, and then restart the menu.
- 4 After the menu application restarts, select **Node Settings, Control Surfaces**. This is the only GV switcher menu that will be active when the menu is not registered with the Frame.
- 5 Select a Node Name data pad and enter a descriptive name for the menu application, using the pop-up keyboard and select **Enter**.
- 6 Select the IP Address data pad associated with the Node Name enter its IP Address using the pop-up keypad.
- 7 Select the **Status** menu button to exit the menu.

Result: A Restart menu dialog box will appear.

- 8 Select **Restart Now**.

Result: The Status menu displays the Video Processor Frame and menu as fully operational.

About Network Configuration

Grass Valley recommends putting Switcher systems on an isolated internal network with direct connections from the Control Panels and menu application to the Video Processor's internal Ethernet switch.

CAUTION: Grass Valley does *not* recommend putting Switcher systems on a domain which could expose the control LAN to a WAN or the Internet.

IP Address Background Information

Each device connected to any Ethernet network must have a unique IP address. An IP address has two components: the network address and the node address. The Subnet mask defines the dividing line between the two. The first three octets of Subnet mask provide the network address; the fourth is the node address. Nodes with the same network address can communicate directly with each other, while nodes with different network addresses normally do not communicate directly.

The switcher system uses Ethernet switches built into the Video Processor Frame. The switch provides isolation between port pairs, providing deterministic communication for panel and frame messaging, and also allows Control Panel and Menu Panel communication for DPOPs. All nodes must also have the same network and be given a different node address.

Gateway IP Addresses

A gateway IP address can be entered to allow communication with devices not located on the local GV switcher system network. Communication outside the local network requires using a configured network gateway server, a description of which is beyond the scope of this document. See your network administrator for information about gateway server installation and configuration.

Default IP Addresses On Isolated Network

Each system is shipped with default IP addresses. Grass Valley has chosen these default IP addresses to make configuration easy. GV switcher devices should communicate with each other right out of the box when properly connected on an isolated network.

Connecting to an Existing Network

Additional network configuration is required if you connect the GV K-Frame XP switcher Ethernet LAN to your facility Ethernet backbone, install additional system components, or have multiple switcher systems on the same network cabling. For example, if more than one system resides on the same network, the IP address of each additional device must be changed before it is connected to the network.

To enable communication between the GV switcher and other facility devices, you will need to change the system default network addresses to match the facility address, or place a router between the GV switcher and the facility networks. This complexity of network configuration is beyond the scope of this manual. Consult a networking expert if such networking is desired.

See your network System Administrator before connecting the GV switcher system to an existing network or making any IP address changes. The IP addresses (including any Subnet mask) of all the GV switcher devices on the network must be known before any changes are made.

About NMOS AMWA IS-04 and IS-05

The GV K-Frame XP IP I/O systems support NMOS (Networked Media Open Specifications) AMWA (Advanced Media Workflow Association) IS-04 Discovery and Registration using in-band mDNS (Multicast DNS) and IS-05 Connection Management.

IS-04

IS-04 allows control and monitoring applications to find the resources on a network, including *Nodes*, *Devices*, *Senders*, *Receivers*, and *Flows*.

The IP I/O board is discoverable and registered as a *Node* by its UUID number. The node registers each of its sub-resources:

- *Receivers*—SFP Inputs,

- *Senders*—SFP Outputs, and
- *Flows*—IP streams,

and begins to post regular heartbeats between the node and the registry. Upon connection to a network, nodes discover the registry as advertised with mDNS.

IS-05

NMOS IS-05 is an API presented by Devices that can control the switcher's SFP IGMP addresses.

Menu

The switcher system default is *enabled*. The feature can be enabled/disabled by selecting the **IS-04 & IS-05 Enable** button in the Node Settings, NMOS Configuration menu tab.



Configure the Global Registry

Setting the Global Registry allows the switcher system to bypass mDNS and connect directly to the registry.

- 1 In the Eng Setup, Node Settings, NMOS Configuration menu, select the **IP Address** data pad, enter the IP Address for the device, and select **Enter**.
- 2 Select the **IP Port** data pad, enter the IP Port for the device, and select **Enter**.

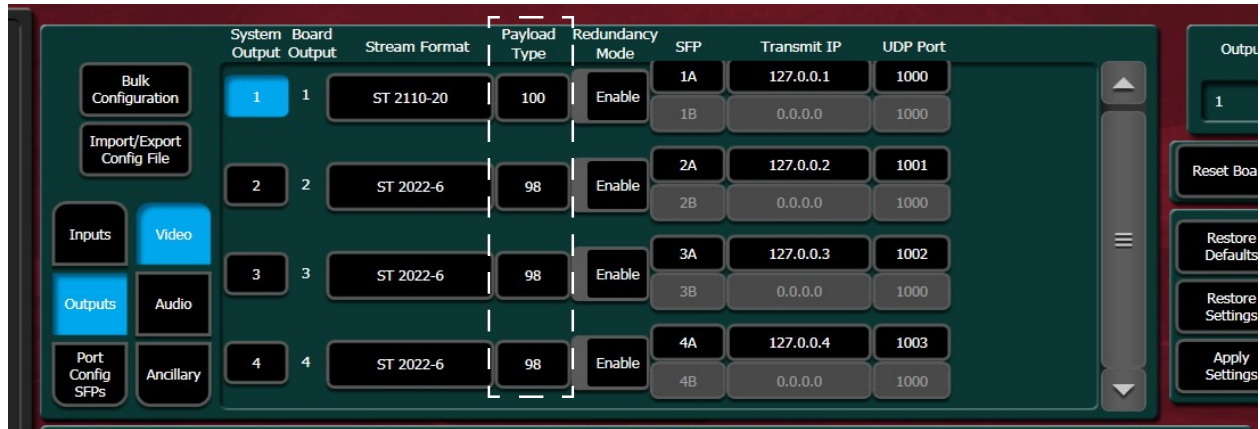
Note: If the Frame cannot locate the node using the provided IP Address and/or IP Port, it will revert to mDNS.

About using NMOS IS-04/IS-05 to Change Receivers/Senders

NMOS-IS 04/IS-05 does not update the Payload Type in the IP I/O Config menu, however receivers will be adjusted internally to recognize the correct format.

Outputs are *not* adjusted internally so if there is a Payload Type mismatch between the switcher sender and the downstream receiver, the Payload Type must be changed in the Eng Setup, Video I/O, IP I/O Config menu.

See the *Kayenne/Karrera/GV Korona Installation & Service Manual* for configuration details.



About the Group Hint Prefix

It is *not* recommended to use the Group Hint Prefix unless multiple Grass Valley Video Processor Frames are part of a single topology.

CAUTION: Setting the Group Hint Prefix is a pre-configuration requirement that must be done prior to adding switcher resources to the topology.

The prefix will be published as a Group Hint tag and can be used by a router control system to group video, audio, and ancillary streams for inputs and outputs.

Character Limitation

The Group Hint Prefix is limited to five characters to ensure the generated device mnemonic is less than eight characters which makes them router control system compliant.

Configure the Group Hint Prefix

IMPORTANT: These are system level configurations and must be performed by qualified service personnel only.

- 1 In the Eng Setup, Node Settings, NMOS Configuration menu, select the **Group Hint Prefix** data pad.



- 2 Read, and if you agree to the Warning, select **OK**.
- 3 Enter a prefix in the pop-up keyboard and select **Enter**.

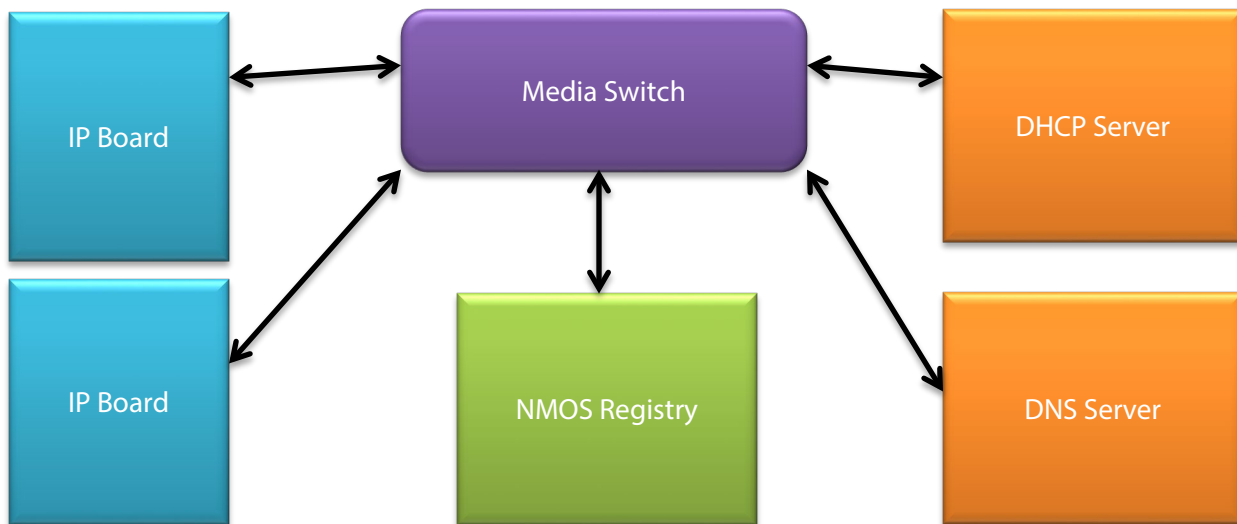
Unicast DNS-SD

Unicast DNS-SD and mDNS are supported. By default NMOS discovery will attempt both mDNS and Unicast-SD to discover a registry on the network.

Entering an IP address other than 0.0.0.0 for the Global Registry in the menu Eng Setup > Node Settings > NMOS Configuration > Global Registry IP Address and Port, will disable mDNS and Unicast-SD and the Frame will only attempt to connect to the given IP address. Redundancy not possible in this mode.

Requirements for In-band Unicast-SD

1. DHCP Server on the Media Network
2. DNS on the Media Network
3. Configuration file for the DHCP server which provides domain-name-servers AND domain-name
4. DNS configuration file which contains the NMOS services (`_nmos-register`, `_nmos-query`, ...) which refer to the NMOS registry(s)
5. IP Board needs to be visible to the DHCP Server and DNS (ping test)



Unicast-SD sequence of events

1. IP Board issues a DHCP Request for option 6 (DNS IP) and option 15 (Domain Name)
2. DHCP Server responds with a DHCP Inform providing info for option 6 and 15
3. IP Board issues a DHCP ACK
4. IP Board takes the given DNS IP provided by the DHCP Server and issues a DNS query for the various NMOS services (_nmos-register, _nmos-query)
5. DNS responds with the NMOS services information
6. IP Board registers with the highest priority NMOS Registry provided by the DNS

Example DHCP Configuration file for Linux dhcpd

```

authoritative;
subnet 192.168.10.0 netmask 255.255.255.0 {
range 192.168.10.40 192.168.10.250;
option domain-name-servers 192.168.10.10;
option domain-name "gvswitcherlab.com";
option host-name "GVC.gvswitcherlab.com";
option subnet-mask 255.255.255.0;
option routers 192.168.10.255;
option broadcast-address 192.168.10.255;
default-lease-time 600;
max-lease-time 7200;
option dhcp-lease-time 3600;
option dhcp-rebinding-time 3600;
option dhcp-renewal-time 3600;
}

```

Required fields

- domain-name-servers
- domain-name

Static Routes for the Primary and Secondary Control Systems

Static Route capabilities allow the IP I/O Boards to communicate with NMOS control systems such as GV Orbit (GVO). In the V15.3.0 software, the static routes are configured via the Console Menu. Because of network security issues, in version V15.0.0 and higher, the Console Menu is accessed via Secure Shell (SSH). Telnet is no longer supported.

In the top menu of the Console Menu enter 5 for "Vid 16x8 IO" or 6 for "Mod 8x4 IO". Next choose the # for the board you are interested in (for example 1 for "16x8 IO IP 1"). Next, choose A (for ARM) and then S (for Static Routes). From here you can either choose 1 to enter a new route, 2 to view existing routes, or 3 to clear/delete a static route.

To enter a new route you would choose 1 "Set Static Route". Next, choose 1 for the Primary Interface or 2 for the Secondary (Redundant) Interface. Next, enter the destination IP, which is the IP for the network you are trying to reach. For example, you might enter an address such as 172.0.0.0. Next enter the gateway associated with the interface for this route. Note, for Primary this should be the gateway associated with SFP 1A as shown on the Port Config SFPs menu, and for Secondary this will be the gateway associated with SFP 1B. For example, you might enter a gateway such as 172.21.12.1. Finally, enter the appropriate Genmask (aka subnet mask) for the network you are trying to reach. Following along with the previous example this might be something such as 255.192.0.0. Now your route has been entered.

To view the route, choose 2 "View Static Routes". This should allow you to see the route(s) you entered.

To delete a route, choose 3 "Clear Static Route". Then choose 1 for Primary or 2 for Secondary depending upon which route you'd like to delete.

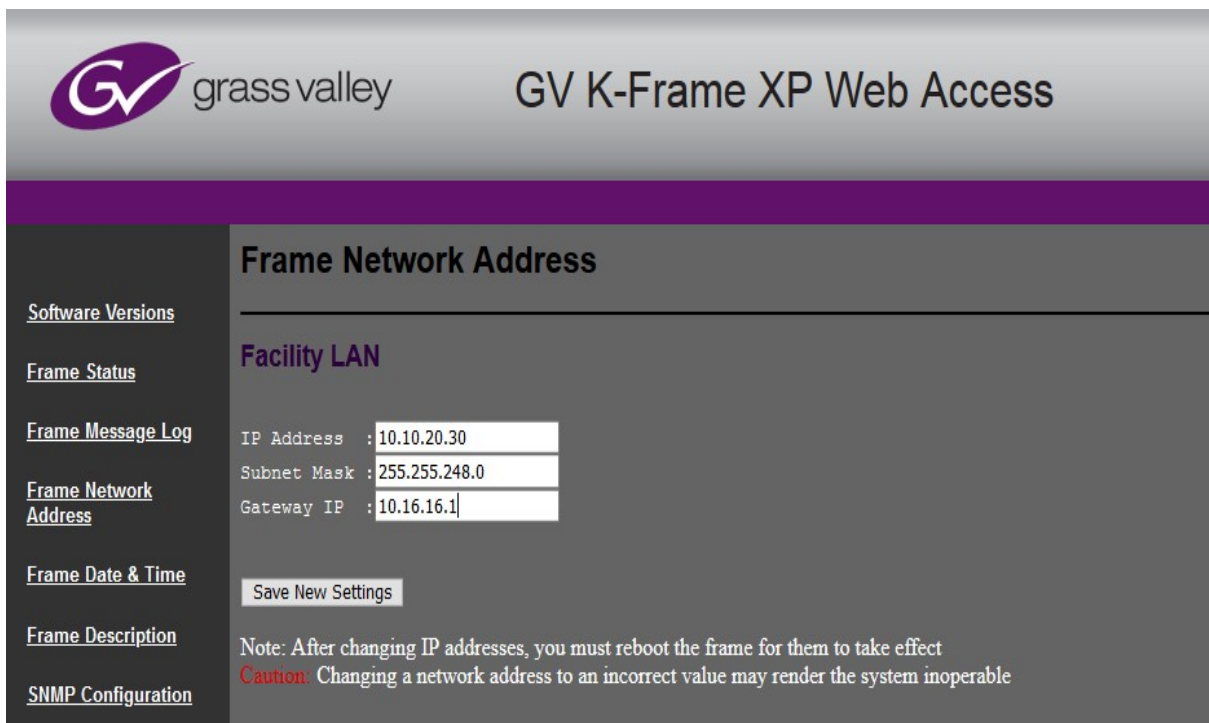
Set the IPs Using Device Web Pages

You need to know the current IP address of the GV K-Frame XP Video Processor or Control Panel before you can change it using a Web browser, mouse and keyboard.

Note: The NetConfig application, included with the software, can be used to find IP Addresses of devices accessible on the network. Refer to the separate *NetConfig Instruction Manual* for more information.

- 1 Using any web browser connected to your GV K-Frame XP network, enter the IP Address of the device in the IP Address field and press **Enter**.

2 Select **Frame Network Addresses**.



The screenshot shows the 'GV K-Frame XP Web Access' interface. On the left is a navigation menu with links: [Software Versions](#), [Frame Status](#), [Frame Message Log](#), [Frame Network Address](#) (which is highlighted), [Frame Date & Time](#), [Frame Description](#), and [SNMP Configuration](#). The main content area is titled 'Frame Network Address' and contains a section for 'Facility LAN'. This section has three input fields: 'IP Address' with the value '10.10.20.30', 'Subnet Mask' with '255.255.248.0', and 'Gateway IP' with '10.16.16.1'. Below these fields is a 'Save New Settings' button. At the bottom of the main area, there is a note: 'Note: After changing IP addresses, you must reboot the frame for them to take effect' and a red 'Caution' message: 'Caution: Changing a network address to an incorrect value may render the system inoperable'.

- 3 Under Facility LAN, type in the new IP Address (and subnet mask and gateway if needed). Make sure you enter the correct number exactly. A typing error can make the frame inaccessible over the network, since you need to know its IP address for use with the Web browser.
- 4 Select the **Save New Settings** button.
- 5 Reset the device.

Result: The device will boot up with the new IP Address.

When a Video Processor Frame IP Address has been changed, communications will no longer occur with any switcher system devices that are configured to use the old frame IP Address. You will need to go to each device and change the address they use to communicate with the Video Processor Frame.

Changing the Image Store IP Address

The Image Store IP address can be changed using the Video Processor Frame web page.

Changing Control Panel IP Addresses

A Control Panel's IP address can be changed using various methods:

- Switcher Installer program.
- Control Panel Web page, or
- Grass Valley NetConfig application

Changing the Kayenne or Karrera Menu Panel IP Address

Set the Menu Panel IP addresses using the Windows interface. You may use the touch screen to access the Windows settings but you will need to use a mouse and keyboard connected to the Menu Panel for entering the IP address values. To set the Menu Panel address:

- 1 Select **Eng Setup, Status**, then select the **Minimize Menu** button. This will take you to the Windows desktop.
- 2 Select **Start, Settings, Network Connection, Local Area Connection, Properties**, and follow the standard Windows IP address setting procedure.

32- Crosspoint Remote Aux Panel IP Address

The default IP addresses of Remote Aux Panels are set to at the factory before shipment will not work with a switcher system whose other components are set to defaults. Typically, systems are equipped with more than one Remote Aux Panel. If more than one Remote Aux Panel will be used on your system, you will need to change each panels' IP addresses so none are duplicated, and this must be done before you connect them to the network. This will require a mouse and keyboard connected to a PC disconnected from the network.

Check with your network administrator to learn what IP addresses should be used at your facility.

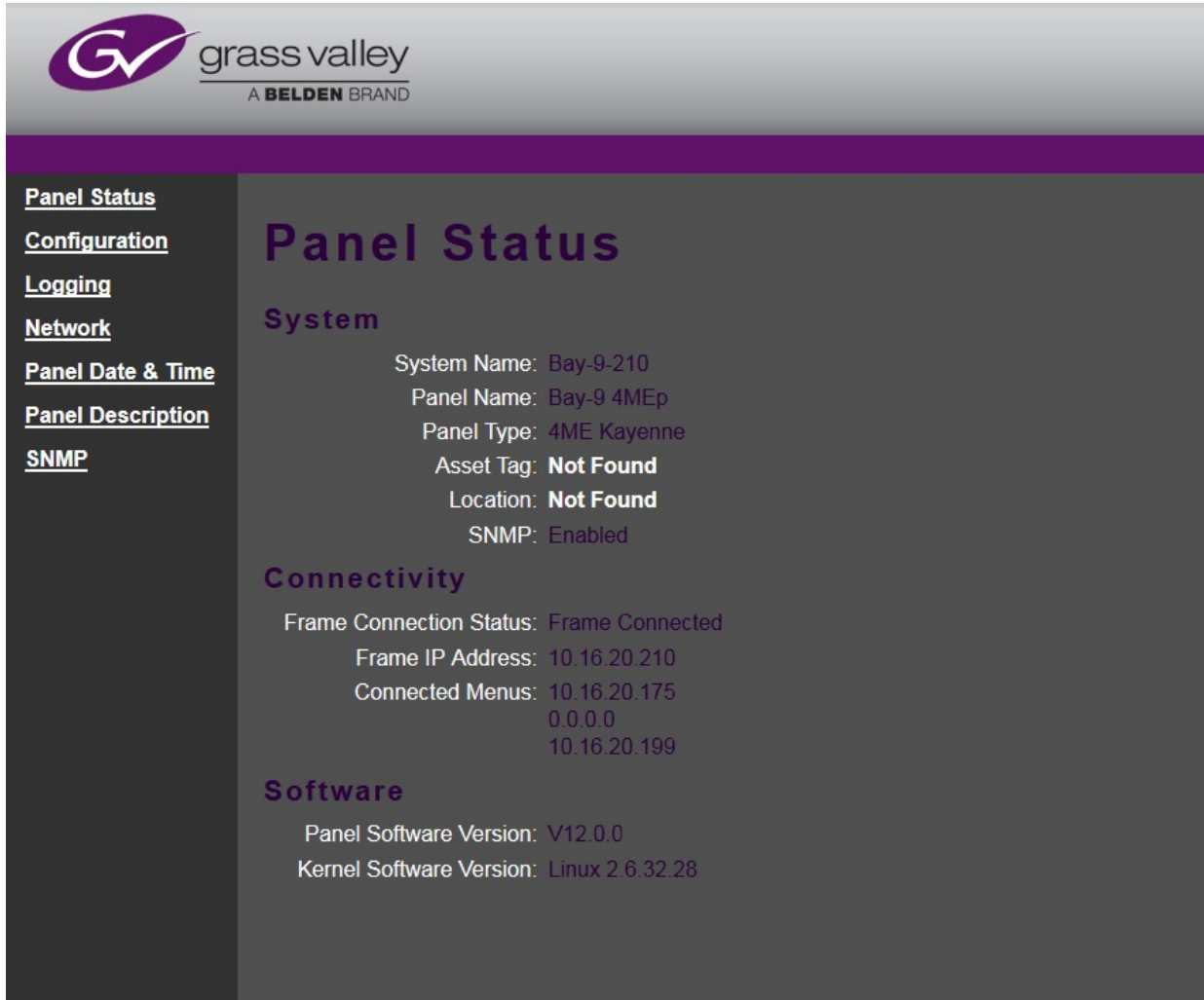
Setting the IP Address

A PC equipped with an Ethernet interface and a web browser is required to change Remote Aux Panel IP addresses.

- 1 With the PC disconnected from all facility networks, connect the PC's Ethernet port directly to the Remote Aux Panel.

Note: A crossover Ethernet cable (Tx/Rx pair crossed) is needed when connecting a PC directly to the Remote Aux Panel without a hub intermediary.

- 2 Start the web browser, enter the default IP address (192.168.1.2) in the address field, and press **Enter**. If the address is found, a Panel Status screen will appear.



Panel Status

System

System Name: Bay-9-210
Panel Name: Bay-9 4MEp
Panel Type: 4ME Kayenne
Asset Tag: **Not Found**
Location: **Not Found**
SNMP: Enabled

Connectivity

Frame Connection Status: Frame Connected
Frame IP Address: 10.16.20.210
Connected Menus: 10.16.20.175
0.0.0.0
10.16.20.199

Software

Panel Software Version: V12.0.0
Kernel Software Version: Linux 2.6.32.28

- 3 Select **Network**. A Network Configuration screen, displaying the factory default settings.

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A BELDEN BRAND

Panel Status
Configuration
Logging
Network
Panel Date & Time
Panel Description
SNMP

Network Configuration

Panel Name: Bay 6

Network Settings

Panel IP Address: 10.16.20.153
Subnet Mask: 255.255.248.0
Gateway IP: 10.16.16.1
Frame IP Address: 10.16.20.198
Connected Menus: 10.16.23.20
0.0.0.0
10.16.20.155
Panel Ethernet MAC Address: 00:13:95:05:42:86

Note: Changes to the Panel Network settings or Panel Name will cause the Panel to reset

Note: Changes to the Frame IP Address will cause the panel to reconnect to the new Frame without resetting

Caution: Changing Panel IP address to an incorrect value may render the system inoperable

Apply Show Factory Defaults Show Current Settings

- Enter the IP addresses and other information appropriate for your system.
 - **Panel Name** is used to name the panel, for user convenience. This field does not affect the operation of the unit.
 - The **Frame IP Address** field is for the Video Processor.
- 4 Select **Apply**. The new IP addresses will be saved and the Remote Aux Panel will reset. You should label the panel with its IP address and keep a record of all IP addresses for future reference.
 - 5 Disconnect the PC, and connect the Remote Aux Panel to the switcher system network.
 - 6 Repeat this procedure on all the Remote Aux Panels to be used with your switcher system, entering a unique IP address for each Remote Aux Panel.

Restoring the Default IP Address

You need to know the current IP address of the Remote Aux Panel in order to change it using the Web browser. If a panel's IP address has been changed and its new value not recorded, it will be impossible to change its IP address. You can restore the panel to its factory default address, if necessary, with the following procedure.

- 1 Disconnect the Ethernet cable and the AC power cable from the Remote Aux Panel.
- 2 Reconnect only the AC power cable. The panel will enter a diagnostic mode.

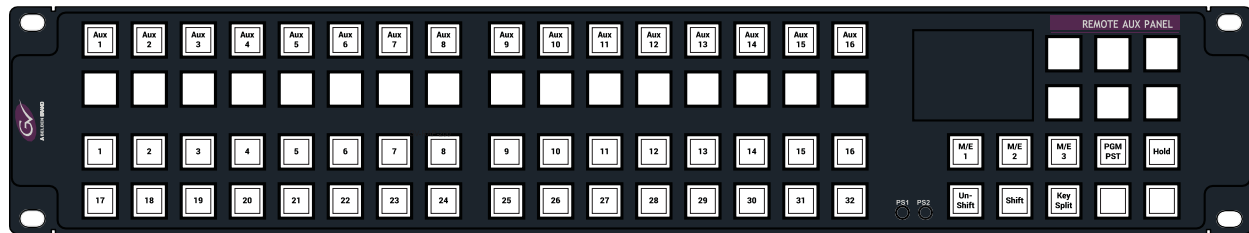
- 3 Push down and hold any panel button. After three seconds panel buttons will light up sequentially, indicating different available diagnostics.
- 4 When three buttons illuminate, release the held button. This places the panel in IP Address reset mode, and one button will be flashing.
- 5 Press the flashing button. This resets the IP address to factory default.

GV-RAP-100 and GV-RAP-200 Remote Aux Panels

The GV-RAP-100 and GV-RAP-200 Remote Aux Panels provide control of GV K-Frame XP Aux buses from a remote location (see [GV-RAP-100 and GV-RAP-200 Remote Aux Panels](#), on page 125 for cabling instructions). Both 32-Crosspoint Remote Aux panel models are designed to select 64 external sources (32 unshifted/32 shifted). The 1RU GV-RAP-100 panel is dedicated to a single bus. The GV-RAP-200 3RU model is multi-destination with 16 bus delegate buttons (Aux1-Aux 16).



GV-RAP-100



GV-RAP-200

Remote Aux Button Descriptions

| Aux Panel | Row | Button Label | Description |
|------------|---------|----------------|--|
| GV-RAP-100 | Top | 1-16 | 16 Mappable Source Select buttons/ 32 external sources total (16 unshifted/16 shifted) per row |
| | Bottom | 17-32 | |
| GV-RAP-200 | 1 (Top) | Aux 1 - Aux 16 | 16 Mappable Aux buttons |
| | 2 | Blank | Reserved for future |
| | 3 | 1-16 | 16 Mappable Source Select buttons/ 32 external sources total (16 unshifted/16 shifted) per row |
| | 4 | 17-32 | |

Panel Operations button group (right side) GV-RAP-100/200:

Remote Aux Button Descriptions

| Aux Panel | Row | Button Label | Description |
|----------------|-----|--------------|--|
| GV-RAP-100/200 | | M/E 1 | M/E 1 Fixed Output Source (M1 A) |
| | | M/E 2 | M/E 2 Fixed Output Source (M2 A) |
| | | M/E 3 | M/E 3 Fixed Output Source (M3 A) |
| | | PGM PST | PGM PST Fixed Output Source (Pg A) |
| | | Hold | Source Hold—Other external devices cannot change the source, e.g. another router |
| | | Un-Shift | Buttons 1-32 Unshifted mode—Sources 1-32 |
| | | Shift | Buttons 1-32 Shifted mode—Sources 33-64 |
| | | Key Split | Map a different source to the B or key side of the Video/Key pair (Aux bus must be in paired mode) |

Install Remote Aux Panel Software

The NetConfig utility is used to install the Aux Panel software.

- 1 Install the NetConfig application from the K-Frame Installer (see the *Kayenne/Karrera/GV Korona Release Notes*).
- 2 Launch the Netconfig application.
- 3 Select the **Load SW** button (top-left) in the NetConfig application.
- 4 In the “Select devices to load:” pane, select **Switcher, RAP**.
- 5 Select the **AMD-DCC6/ASD E27E Aux Panels** and NetConfig will search for the panel IP Addresses.
Result: Located Aux Panels of that type are displayed in the list, right.
- 6 Select the check box next to the panels to be updated.
- 7 Select the **Load** button below the list.
- 8 Reboot the Aux Panel to complete the installation.

Configure the Remote Aux Panel System

Configure the Remote Aux Panel System through the Product Web Access page.

- 1 Enter the Aux Panel IP address into your browser.
Result: the Product Web Access page for the Aux Panel is displayed.
- 2 Select **Panel System** on the left.
- 3 Set the parameters by entering values into the fields for Panel Device Name, Asset Tag, etc.
- 4 Select the **Do reset**.
- 5 Select **Save New Settings**.

Configure the Remote Aux Panel Network

Configure the Remote Aux Panel Network through the Product Web Access page.

- 1 Enter the Aux Panel IP address into your browser.
Result: the Product Web Access page for the Aux Panel is displayed.
- 2 Select **Panel Network** on the left.
- 3 Enter the Ethernet IP Settings.
- 4 Scroll down and select **CPL** as the Connection Type.
- 5 In the LAN Primary Host IP field, enter the switcher IP.
- 6 Select the **Do reset**.
- 7 Select **Save New Settings**.

Connect the Remote Aux Panel to the Switcher IP Network

The Remote Aux panel connects to the switcher via Ethernet over an IP Network. To connect, add the Remote Aux panel as a switcher node.

- 1 Select **Eng Setup, Node Settings, Remote Aux IP Network** in the menu.
- 2 In an unused row, select and enter values for the Aux Panel Name, Remote Aux IP Address, and Suite number using the pop-up keypads displayed when you select each data pad.
- 3 Under Aux Panel Type, select the Single data pad as the delegation.
Result: Status indicator LED turns green when connected.

Delegate Control of a Switcher Aux Bus to the Remote Aux Panel

Map the switcher Logical Aux Bus for Remote Aux panel control.

- 1 Select **Eng Setup, Node Settings, Remote Aux Logical Map** in the menu.
- 2 Select the remote aux panel under the Remote Aux Panel Name scrolling list on the left.
- 3 Select a Logical Aux Bus.
Result: The switcher Aux Bus sources can be mapped to and controlled by the Remote Aux panel.

Map Switcher Sources to Remote Aux Bus Buttons

Map switcher sources to the physical source select buttons on the Remote Aux panel.

- 1 Select **Eng Setup, Node Settings, Remote Aux Button Map** in the menu.
- 2 Select the remote aux panel under the Remote Aux Panel Name scrolling list on the left.
- 3 Select a source from the Logical Sources or Fixed Sources columns (right) for your Remote Aux source select buttons 1-32 in the Unshift column and 1-32 in the Shift column.
Result: The mapped switcher Aux Bus sources can be controlled by the Remote Aux panel.

About S25/S50 Remote Aux Panel Upgrade

S25 and S50 model Aux panels can be upgraded to become GV K-Frame XP Switcher Remote Aux Panels. The upgrade primarily consists of updating the Aux panel and switcher software, switcher configuration through the menu, and Remote Aux panel configuration through the Web page.

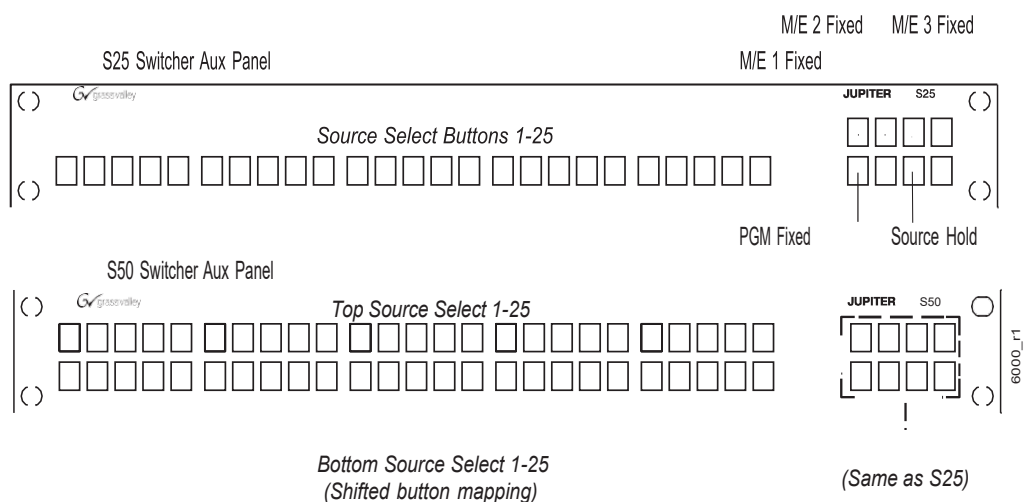
Switcher Remote Aux Button Functionality

Switcher Remote Aux Button Descriptions

| Aux Panel | Button | Description |
|-----------|---|----------------------------------|
| S25 | 1-25 Source Select | 25 Logical Source Select buttons |
| S50 | Top 1-25 Source Select Bottom 1-25 Source Select | 50 Logical Source Select buttons |

Eight-button group located on right of S25/S50 Aux Panel:

| | | |
|---------|----------|--|
| S25/S50 | Top 1 | M/E 1 Fixed Source |
| | Top 2 | M/E 2 Fixed Source |
| | Top 3 | M/E 3 Fixed Source |
| | Top 4 | Reserved |
| | Bottom 1 | PGM Fixed Source |
| | Bottom 2 | Reserved |
| | Bottom 3 | Source Hold (source bus hold): When on (high tally), the mapped source for the selected source button will not be affected by E-MEM recall. |
| | Bottom 4 | Reserved |



S25/S50 Switcher Remote Aux Panel Buttons

Install S25/S50 Remote Aux Panel Software

The NetConfig utility is used to install the Aux Panel software.

- 1 Install the NetConfig application from the K-Frame Installer (see the *Kayenne/Karrera/GV Korona Release Notes*).
- 2 Launch the Netconfig application.
- 3 Select the **Load SW** button (top-left).
- 4 In the "Select devices to load:" pane, select **Routers, Jupiter**.
- 5 Select the **S25** and/or **S50** Aux Panels and NetConfig will search for the panel IP Addresses.

Result: Located Aux Panels of that type are displayed in the list, right.

- 6 Select the check box next to the panels to be updated.
- 7 Select the **Load** button below the list.
- 8 Reboot the Aux Panel to complete the installation.

Configure the Remote Aux Panel System

Configure the Remote Aux Panel System through the Product Web Access page.

- 1 Enter the Aux Panel IP address into your browser.
Result: the Product Web Access page for the Aux Panel is displayed.
- 2 Select **Panel System** on the left.
- 3 Set the parameters by entering values into the fields for Panel Device Name, Asset Tag, etc.
- 4 Optionally, Disable S50 auto-shift for the bottom 25 buttons:
 - *Enabled*: Bottom 25 buttons are auto-shifted.
 - *Disabled*: 32 buttons starting with the top 25 and the first seven on the bottom, from left to right, can be mapped. Enabling the shift button provides another 32 shifted sources, using the same buttons, for a total of 64 mappable buttons.
- 5 Select the **Do reset**.
- 6 Select **Save New Settings**.

Configure the Remote Aux Panel Network

Configure the Remote Aux Panel Network through the Product Web Access page.

- 1 Enter the Aux Panel IP address into your browser.
Result: the Product Web Access page for the Aux Panel is displayed.
- 2 Select **Panel Network** on the left.
- 3 Enter the Ethernet IP Settings.
- 4 Scroll down and select **CPL** as the Connection Type.
- 5 In the LAN Primary Host IP field, enter the switcher IP.
- 6 Select the **Do reset**.
- 7 Select **Save New Settings**.

Connect the Remote Aux Panel to the Switcher IP Network

The Remote Aux panel connects to the switcher via Ethernet over an IP Network. To connect, add the Remote Aux panel as a switcher node.

- 1 Select **Eng Setup, Node Settings, Remote Aux IP Network** in the menu.
- 2 In an unused row, select and enter values for the Aux Panel Name, Remote Aux IP Address, and Suite number using the pop-up keypads displayed when you select each data pad.
- 3 Under Aux Panel Type, select the **Single** data pad as the delegation.

Result: Status indicator LED turns green when connected.

Delegate Control of a Switcher Aux Bus to the Remote Aux Panel

Map the switcher Logical Aux Bus for Remote Aux panel control.

- 1 Select **Eng Setup, Node Settings, Remote Aux Logical Map** in the menu.
- 2 Select the remote aux panel under the Remote Aux Panel Name scrolling list on the left.
- 3 Select a Logical Aux Bus.

Result: The switcher Aux Bus sources can be mapped to and controlled by the Remote Aux panel.

Map Switcher Sources to Remote Aux Bus Buttons

Map switcher sources to the physical source select buttons on the Remote Aux panel. The first 25 Buttons will be mapped for the S25. For the S50, the first 25 Unshifted and first 25 Shifted button mappings will be used for a total of 50. However, if the auto-shift feature has been disabled, 32 unshifted and 32 shifted sources can be mapped (top 25, first seven on the bottom from left to right).

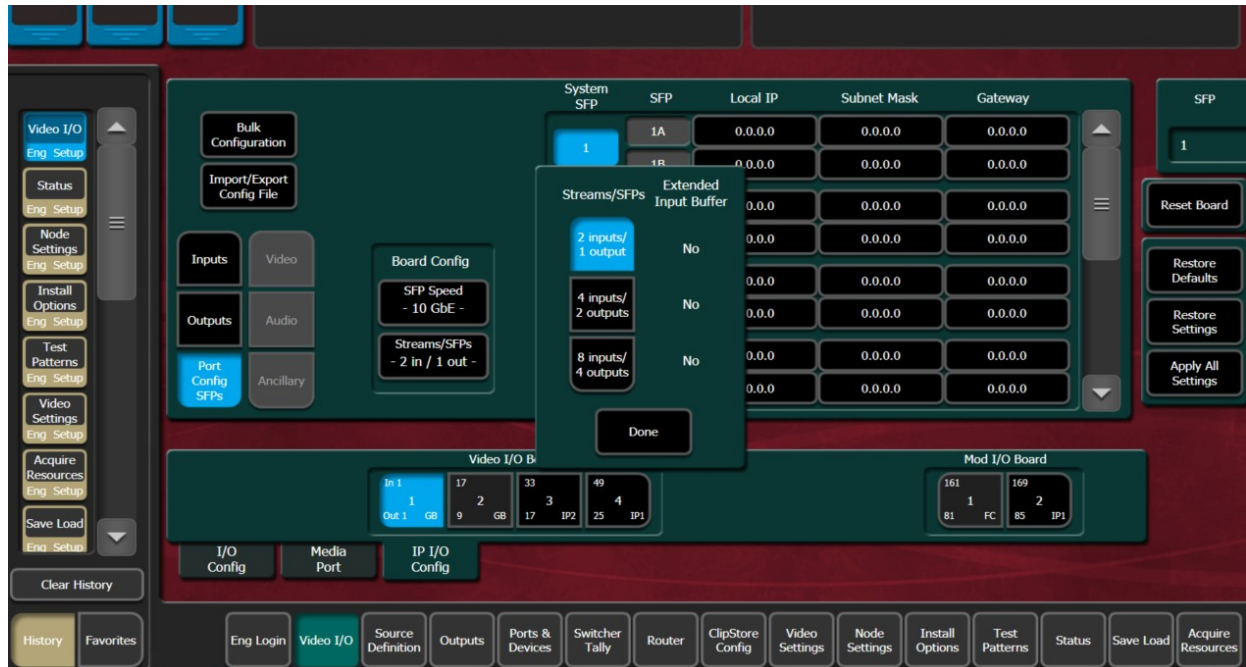
- 1 Select **Eng Setup, Node Settings, Remote Aux Button Map** in the menu.
- 2 Select the remote aux panel under the Remote Aux Panel Name scrolling list on the left.
- 3 Select a source from the Logical Sources or Fixed Sources columns (right) for your Remote Aux source select buttons 1-25 in the Unshift column.
- 4 For the S50 model, select sources for buttons 1-25 in the Shift column.
- 5 If the auto-shift for the bottom 25 source selection is disabled, select up to 32 shifted sources.

Result: The mapped switcher Aux Bus sources can be controlled by the Remote Aux panel.

IP I/O Configuration Menus

IP/IO Config Menu

SFPs are configured in the Eng Setup, Video I/O, IP I/O Config menu.



Button descriptions are added to the Port Config SFPs Menu Buttons and Data Pads table.

Port Config SFPs Menu Buttons and Data Pads

| Menu | Button/Label | Description |
|------------------|--------------|---|
| Port Config SFPs | SFP Speed | Select configured dual-use SFP speed of selected board: 10GbE or 25GbE |
| | Streams/SFP | Select to choose input/output configuration buttons: <ul style="list-style-type: none"> • 2 inputs/1 output, • 4 inputs/2 outputs, or • 8 inputs/4 outputs |
| | System SFP | Displays the SFP selection/search result |
| | SFP (label) | Physical SFP, the "B" SFP is used for I/O Redundancy Mode |
| | Local IP | IP Address for the Frame to transmit/receive external device data over the network |
| | Subnet mask | Facility Subnet Mask Address |
| | Gateway | Facility Gateway Address |

The IP Config menu control is delegated with the following port type buttons:

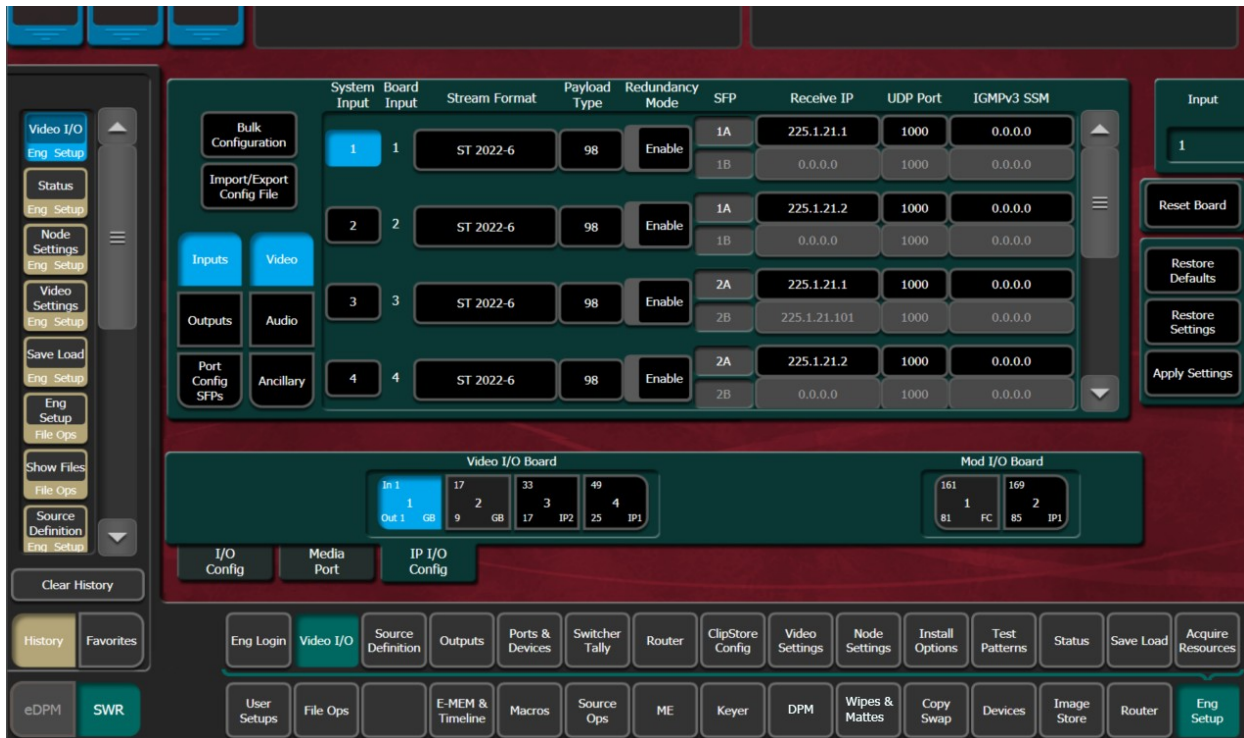
- Inputs,
- Outputs, and

- Port Config SFPs.

IMPORTANT: Perform the Port Config SFP configuration first, in the IP I/O Config menu (see [Port Config System SFPs Configuration Menu Buttons](#) and [System Input Configuration Buttons](#)).

Video I/O Board and Mod I/O Board Configuration Data

| Button/Label | Description |
|--|---|
| | |
| <i>Board selection button enhancements apply to I/O Config and IP/IO Config menu tabs.</i> | |
| <div>Board Selection</div> | <div>Board configuration settings:</div> <ul style="list-style-type: none">• First system input on the board—Top left• First system output on the board—Bottom left• Board slot in Frame—Center• Board type—Bottom right<ul style="list-style-type: none">• SDI (Serial Digital Interface)• IP (Internet Protocol)• FC (Format Conversion)• GB (Gearbox)• --- No board |



GVK-Frame XP, IP I/O Config

Multiple parameters can be set, then applied. New parameter settings are highlighted in pink, indicating the menu settings for each input have not been sent to the Frame. Once the Apply Settings button is selected, the settings are sent to the Frame and the new settings are displayed in the menu. Buttons and data pads return to white text over a black background.



Common Configuration Buttons

Some IP I/O Config menu buttons are common to all menu delegations (Inputs, Outputs, and Port Config SFPs).

IP I/O Common Config Menu Buttons

| Button | Description |
|---------------------------|---|
| Bulk Configuration | Bulk Configuration menu |
| Import/Export Config File | Import/Exports IP Config File menu |
| Inputs | Inputs menu |
| Outputs | Outputs menu |
| Port Config SFPs | Port Config SFPs menu |
| Video | Video stream delegation |
| Audio | Audio stream delegation (AES Audio) |
| Ancillary | Ancillary stream delegation (Closed captioning, subtitles, etc.) |
| Restore Defaults | Restores IP system defaults (Restores the menu, does not apply settings to the Frame) |
| Restore Settings | Restores the IP settings last applied (Restores the menu, does not apply settings to the Frame) |
| Apply Settings | Applies new settings made to the menu parameters, e.g. streaming format, IP Addresses, UDP Port numbers, etc. |
| Video I/O Board | Select the physical Video I/O Board |
| Mod I/O Board | Select the physical Mod I/O |

Port Config System SFPs Configuration Menu Buttons

In the Eng Setup, IP I/O Config menu with the Port Config SFPs delegation button selected.

Port Config SFPs Menu Buttons and Data Pads

| Menu | Button/Label | Description |
|------------------|--------------|---|
| Port Config SFPs | SFP Speed | Select configured dual-use SFP speed of selected board: 10GbE or 25GbE |
| | Streams/SFP | Select to choose input/output configuration buttons: <ul style="list-style-type: none"> • 2 inputs/1 output, • 4 inputs/2 outputs, or • 8 inputs/4 outputs |
| | System SFP | Displays the SFP selection/search result |
| | SFP (label) | Physical SFP, the "B" SFP is used for I/O Redundancy Mode |
| | Local IP | IP Address for the Frame to transmit/receive external device data over the network |
| | Subnet mask | Facility Subnet Mask Address |
| | Gateway | Facility Gateway Address |

System Input Configuration Buttons

In the Eng Setup, IP I/O Config menu with the Inputs delegation button selected.

IP I/O Input Menu Buttons and Data Pads

| Button/Data pad/Label | Description |
|-----------------------|---|
| System Input | System Inputs with Engineering IDs: <ul style="list-style-type: none"> • 16 to 80 • |
| Board Input | Input number on the physical board |
| Stream Format | Selects the type of IP Stream Format Video Standard (default is ST 2022-6): <ul style="list-style-type: none"> • Auto Detect (future release) • ST 2110-20 • ST 2022-6 • 4K TICO ST 2022-6 (Quad to Single Stream) • 4K ST 2110-20 (Quad to Single Stream) |
| Payload Type | Set the RTP (Real-time Transport Protocol) Payload Type |
| Enable | Enable/Disable Redundancy Mode |
| SFP | Upcoming feature for SFP selection (currently a fixed value) |
| Receive IP | IP Address for the input |
| UDP Port | UDP Port number to receive data (default 1000) |
| IGMPv3 SSM | IGMPv3 SSM IP Address (default 0.0.0.0) |
| Input | Scroll through or directly select an input (values reflected in Video I/O and Mod I/O Board buttons) |

System Output Configuration Buttons

In the Eng Setup, IP I/O Config menu with the Outputs delegation button selected.

Output Menu Buttons and Data Pads

| Button/Data pad/Label | Description |
|-----------------------|---|
| System Output | <ul style="list-style-type: none"> • GV K-Frame X 8 to 40 • |
| Board Output | Output number on the physical board |
| Stream Format | Selects the type of IP Stream Format Video Standard (default is ST 2022-6): <ul style="list-style-type: none"> • ST 2110-20 • ST 2022-6 • 4K TICO ST 2022-6 (Quad to Single Stream) • 4K ST 2110-20 (Quad to Single Stream) |
| Payload Type | Set the RTP (Real-time Transport Protocol) Payload Type |
| Enable | Enable/Disable Redundancy Mode |
| Transmit IP | Output video to the Transmit IP (default 0.0.0.0) |

Output Menu Buttons and Data Pads

| Button/Data pad/Label | Description |
|-----------------------|---|
| UDP Port | UDP Port number to transmit data |
| Output | Scroll through or directly select an output (values reflected in Video I/O and Mod I/O Board buttons) |

About Single Stream Full Frame UHD-4K

UHD-4K ST 2110-20 (2160p) single stream format can be configured for system IP I/O with 25Gb/s SFPs. Bulk configuration is also supported.

Streams/SFPs

25Gb/s SFPs can be configured in three input/output modes, 2/1, 4/2, and 8/4 input/output streams. The 4/2 and 8/4 modes support single stream 4K ST 2110-20. Four inputs are required to receive a 4K ST 2110-20 signal and four outputs are required to transmit a 4K 2110-20 signal. All three types are supported for the 4K TICO ST 2022-6 format.

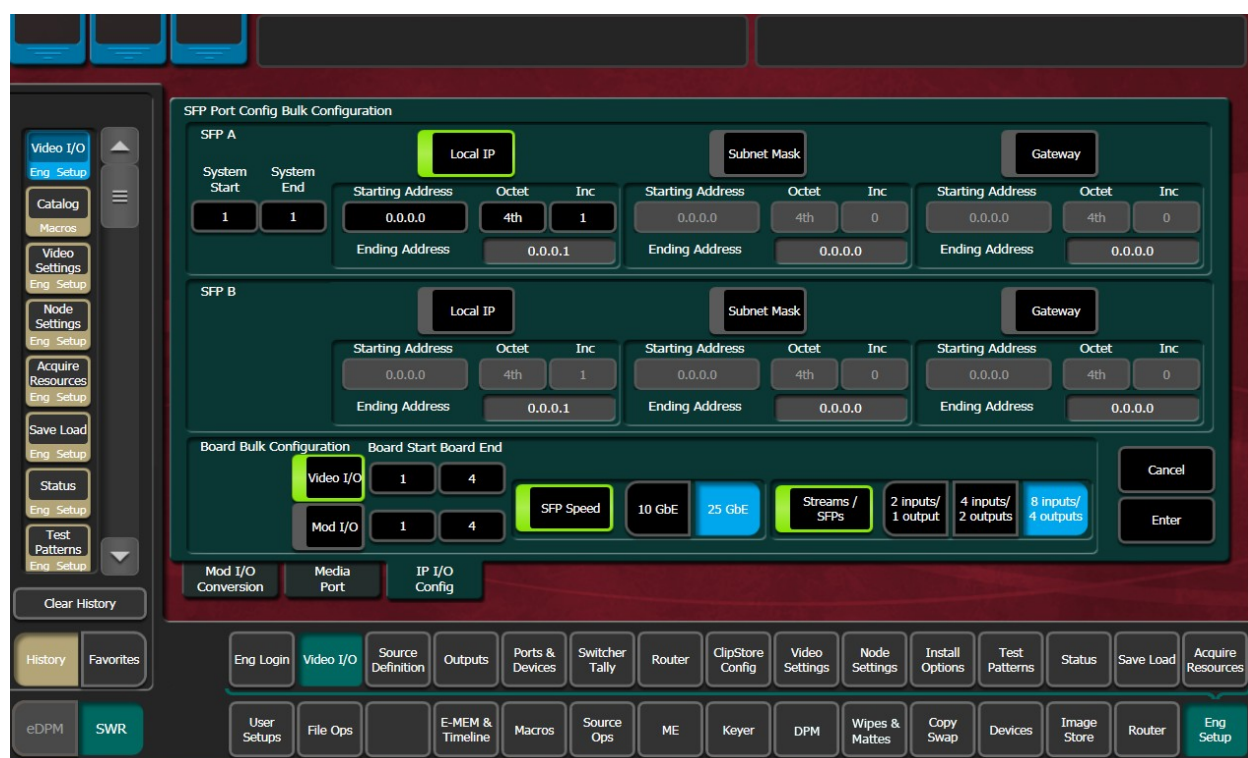
I/O IP Config Bulk Configuration

Accessed by selecting the Bulk Configuration button in the IP I/O Config menu, you can configure multiple System Input, Output, or SFP parameters with the Bulk Configuration menus. Also, bulk configuration can be done by exporting, editing, and importing an Excel spreadsheet offline, using the Import/Export Config File button see [About Import/Export Config File \(Bulk Configuration\)](#), on page 173.

IP I/O Config Bulk Configuration Menu

The Input, Output, and Port Config SFP Video Bulk Configuration menus are divided into the SFP A and SFP B menu panes. The SFP B pane is for the Redundancy Mode and appears

below the System Start and System End values entered for SFP A. Other parameters can be set and enabled/disabled independently for each SFP.



25GbE SFP speeds and stream options are configurable.

Input Video/Audio/Ancillary Bulk Configuration Menu Buttons

| Button Group | Button/Data pad | Description |
|--------------------------|------------------|---|
| SFP A/B System SFP Range | System Start | First System SFP in the range |
| | System End | Last System SFP in the range |
| SFP A: Receive IP | Receive IP | Include/exclude the Receive IP settings |
| | Starting Address | IP Address for first SFP Input in the range |
| | Octet | Select the 1st, 2nd, 3rd, or 4th octet (default 4th) to increment the IP Address from the first IP Address in the range |
| | Inc | Enter the number to increment/decrement the IP Addresses in the range |
| SFP A: UDP Port | UDP Port | Include/exclude the UDP Port settings |
| | Port | Enter the UDP Port number for the range (default 1000) |
| | Inc | Enter the number to increment/decrement the UDP Port number in the range (default 0) |

Input Video/Audio/Ancillary Bulk Configuration Menu Buttons

| Button Group | Button/Data pad | Description |
|---|-------------------|---|
| SFP A: IGMPv3 SSM | IGMPv3 SSM | Include/exclude the IGMPv3 SSM (Source Specific Multicast) settings (default 0.0.0.0) |
| | Starting Address | First IGMPv3 SSM IP Address on the SFP Input in the range (default 0.0.0.0) |
| | Octet | Select the 1st, 2nd, 3rd, or 4th octet (default 4th) to increment the IGMPv3 SSM IP Address from the first in the range |
| | Inc | Enter the number to increment/decrement the IGMPv3 SSM IP Addresses in the range (default 1) |
| SFP B: Redundancy Mode | Redundancy Mode | Include/exclude the Redundancy Mode settings |
| | Enable | Enable/Disable Redundancy Mode (default is Disabled) |
| SFP B: Receive IP, UDP Port, IGMPv3 SSM | All | Same as SFP A above |
| Stream Format | Stream Format | Include/exclude the Stream Format settings |
| | ST 2110-20 | Video stream |
| | ST 2022-6 | Video stream |
| | 4K TICO ST 2022-6 | video stream (Single to Quad Stream) |
| | 4K ST 2110-20 | Video stream (2160p Single to Quad Stream) |
| Enter | Enter | Apply bulk configuration |
| Cancel | Cancel | Cancel settings, return to IP I/O Config menu |

Output Video/Audio/Ancillary Bulk Configuration Menu Buttons

| Button Group | Button/Data pad | Description |
|--------------------------|------------------|--|
| SFP A/B System SFP Range | System Start | First System SFP in the range (default 0.0.0.0) |
| | System End | Last System SFP in the range (default 0.0.0.0) |
| SFP A: Transmit IP | Transmit IP | Include/exclude the Transmit IP settings |
| | Starting Address | IP Address for first SFP Output in the range (default 0.0.0.0) |
| | Octet | Select the 1st, 2nd, 3rd, or 4th octet (default 4th) to increment the IP Address from the first in the range |
| | Inc | Enter the number to increment/decrement the IP Addresses in the range |
| SFP A: UDP Port | UDP Port | Include/exclude the UDP Port settings |
| | Port | Enter the UDP Port number for the range (default 1000) |
| | Inc | Enter the number to increment/decrement the UDP Port number in the range (default 1) |

Output Video/Audio/Ancillary Bulk Configuration Menu Buttons

| Button Group | Button/Data pad | Description |
|---------------------------|-------------------|--|
| SFP B: Redundancy Mode | Redundancy Mode | Include/exclude the Redundancy Mode settings |
| | Enable | Enable/Disable Redundancy Mode settings (default is Disable) |
| Stream Format | Stream Format | Include/exclude the Stream Format settings |
| | ST 2110-20 | Video stream |
| | ST 2022-6 | Video stream |
| | 4K TICO ST 2022-6 | Video stream (Single to Quad) |
| | 4K ST 2110-20 | Video stream (2160p Single to Quad) |
| Enter | Enter | Apply bulk configuration |
| Cancel | Cancel | Cancel settings, return to IP I/O Config menu |

Port Config SFP Bulk Configuration Menu Buttons

| Button Group | Button/Data pad | Description |
|--------------------------|------------------|---|
| SFP A/B System SFP Range | System Start | First System SFP in the range |
| | System End | Last System SFP in the range |
| SFP A: Local IP | Local IP | Include/exclude the Local IP settings |
| | Starting Address | Local IP Address for first SFP Input in the range (default 0.0.0.0) |
| | Octet | Select the 1st, 2nd, 3rd, or 4th octet to increment the Local IP Address from the first in the range |
| | Inc | Enter the number to increment/decrement the Local IP Addresses in the range |
| SFP A: Subnet Mask | Subnet Mask | Include/exclude the Subnet Mask settings |
| | Starting Address | Subnet Mask Address for first SFP Input in the range |
| | Octet | Select the 1st, 2nd, 3rd, or 4th octet to increment the Subnet Mask Address from the first in the range |
| | Inc | Enter the number to increment the Subnet Mask Address in the range |
| SFP A: Gateway | Gateway | Include/exclude the Gateway settings |
| | Starting Address | Gateway Address for first SFP Input in the range |
| | Octet | Select the 1st, 2nd, 3rd, or 4th octet to increment the Gateway Address from the first Gateway Address in the range |
| | Inc | Enter the number to increment the Gateway Address in the range |

Port Config SFP Bulk Configuration Menu Buttons

| Button Group | Button/Data pad | Description |
|---|-----------------|---|
| SFP B: Local IP, Subnet Mask, Gateway | All | Same as SFP A above |
| Enter | Enter | Apply bulk configuration |
| Cancel | Cancel | Cancel settings, return to IP I/O Config menu |

About 4K TICO Compression Formats in the IP I/O Config Menu**Inputs**

The 4K TICO input stream uses four grouped inputs when a 4K TICO compression format is selected in the menu. For example, if the 4K TICO ST 2022-6 format is selected for System Input 6, System Inputs 5, 7, and 8 will also be streaming 4K TICO (groups of inputs are fixed, e.g. 1-4, 5-8, 9-12, etc.).

For System Input groups, the first input in the group streams the video signal routed to deliver the 4K signal.

Outputs

The 4K TICO output stream uses four grouped outputs when a 4K TICO compression format is selected in the menu. For example if the 4K TICO ST 2022-6 format is selected for System Output 35, outputs 33, 34, and 36 will be set to stream 4K TICO (groups of outputs are fixed, e.g. 1-4, 5-8, 9-12, etc.).

For System Output groups, the first output in the group streams the video signal routed to deliver the 4K signal. The second output is a 1080p output of a sub-image that can be routed to a monitor.

Note: Changing any one 4K input/output to a non-4K streaming format (ST 2110-20, ST 2022-6), results in all the inputs/outputs in the group being changed to the selected format.

About IP I/O Address and Port Configuration**Transmit IP Addresses and UDP Ports**

The Transmit IP Address and the UDP Port Address must match. You can use the default UDP port setting of 1000 or change it to fit your workflow. Setting the UDP Port number allows you to send two video streams with different UDP port numbers to the same IP address.

Multicast signals can be transmitted to and from the switcher by setting the first octet of the address to between 234 and 239 (see [Configure a IP I/O Multicast Video Signal](#)). Ethernet switches enable an IGMP Query Server in order to pass Multicast signals.

Local IP Addresses

The Local IP Address is used for two purposes:

- To transmit the Local IP Address from the switcher system so other devices can identify where data is being transmitted from, and
- As the Receive IP Address so devices can send data to the switcher system.

Receive IP Addresses and UDP Ports

For the Receive IP address channels, you can either use the default presets or change them to fit your preferences, including the Local IP. The default port setting for Receive IP is N/A. The N/A setting means signals from an IP address with any port setting is available to the configured device. Setting the UDP Port number allows you to filter signals, for example signals from two or more channels using the same IP address.

Configure the IP I/O IP Address and Ports

Configure IP I/O Transmit IP Addresses and UDP Ports

To transmit a video signal from a Switcher IP I/O Module channel, the Transmit IP address must be set; the factory default is 0.0.0.0. The default port assignment is 1000.

- 1 In the Eng Setup, Video I/O, Modular IP Config switcher menu tab, select the Transmit IP Address data pad for the IP I/O channel, enter the IP address in the pop-up keypad, and select **Enter**.
- 2 To set the Transmit IP UDP Port, select the data pad for the channel, enter a port number, and select **Enter**.
- 3 Select the **Apply Settings** button.

Configure IP I/O Receive IP Addresses and UDP Ports

To receive signals over IP, you must set the Local IP address so the signal is available to your device. For the Receive IP address channels, you can either use the factory presets or change them to fit your preferences, including the Local IP. The default port setting for Receive IP is N/A (see [Receive IP Addresses and UDP Ports](#))

- 1 In the Eng Setup, Video I/O, Modular IP Config switcher menu tab, select the Local IP data pad for the I/O IP channel you wish to configure, enter the IP address for your device, and select **Enter**.
- 2 Select the Receive IP Address data pad for the Modular I/O IP channel, enter the IP address in the pop-up keypad or select dot (.) to select the Local IP address, and select **Enter**.
- 3 To set the Receive IP UDP Port, select the UDP Port data pad for the channel, enter a port number, and select **Enter**.
- 4 Select the **Apply Settings** button.

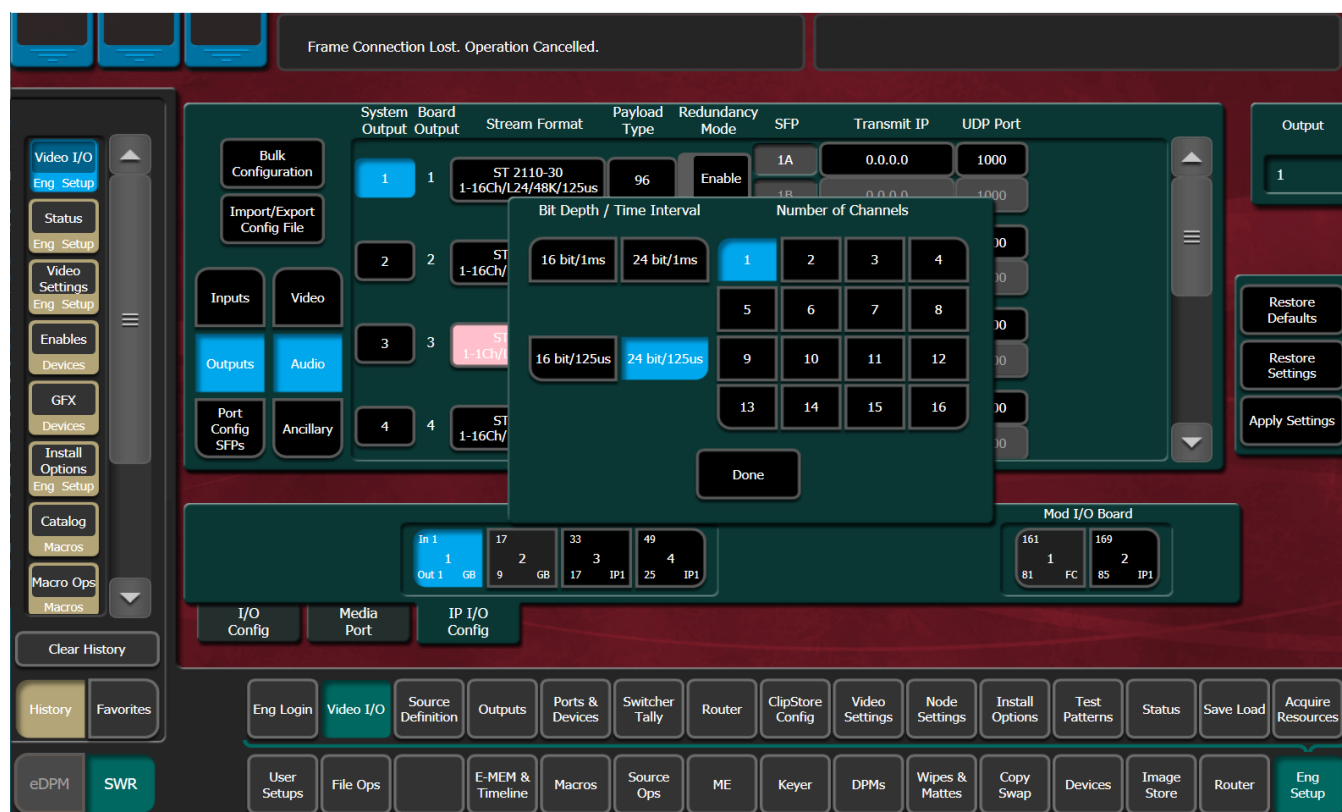
Configure a IP I/O Multicast Video Signal

IP addresses for Multicast must use 224 through 239 as the first octet in the address. A Multicast signal can then be sent to an Ethernet switch or received to your local device.

Note: Ethernet switches must have the IGMP Query Server enabled to receive a Multicast signal.

- 1 In the Eng Setup, Video I/O, IP Config menu tab, select the Receive IP or Transmit IP data pad (see [SDI/IP Input Output Configuration](#)) for the IP I/O channel you wish to configure, enter the Multicast IP address, and select **Enter**.
- 2 To set an IP UDP Port, select the UDP Port data pad for the channel, enter a port number, and select **Enter**.
- 3 Select the **Apply Settings** button.

Configure ST 2110-30 Audio Type for Inputs/Outputs



The K-Frame IP I/O Cards can be configured to send or receive in a bit depth of either 16 or 24 bits and a Time Interval of 1ms or 125 microseconds. The K-Frame switcher does not make conversions of the Bit Depth or Time Interval as the audio passes through the I/O Cards and the switcher. Therefore the audio format on input to the switcher must match the audio format at of the output of the switcher.

Configure ST 2110-40 Ancillary

- 1 Select Eng Setup, Video I/O, IP I/O Config in the menu.
 - 2 Select the **Inputs** then **Ancillary** button to delegate the menu.
 - 3 Navigate to a System Input using the scroll bar or select the SFP data pad (top right) and scroll with the Menu Panel soft knob or a mouse wheel.
 - 4 Optionally, select the Redundancy **Enable** button.
 - 5 Select the **Receive IP/Transmit IP** data pad, enter the IP Address in the pop-up keypad, and select **Enter**.
 - a If Redundancy Mode is enabled, configure the Receive IP Address for SFP B also.
 - 6 Select the **UDP Port** data pad, enter a port number.
- Select **Enter**.

SDI/IP Input Output Configuration

The GV K-Frame XP from Grass Valley offers an all IP, all SDI, or hybrid IP/SDI I/O board set-up:

- Video 16x8 I/O IP
- Video 16x8 Gearbox
- Mod 8x4 I/O IP
- Mod 8x4 I/O SDI Conversion

Supported Frame Rates

Video I/O, SDI Video Frame Rates (Hz)

| | | | | | |
|---------------|----|-------|----|-------|----|
| 720p | 50 | 59.94 | 60 | | |
| 1080i | 25 | 29.97 | 30 | | |
| 1080p | 25 | 29.97 | 30 | 23.98 | 24 |
| 1080p-Level A | 50 | 59.94 | 60 | | |
| 1080p-Level B | 50 | 59.94 | 60 | | |
| 2160p | 25 | 29.97 | 30 | 23.98 | 24 |
| 2160p | 50 | 59.94 | 60 | | |

Video I/O, IP Video Frame Rates (Hz)

| | | | | | |
|---------------|----|-------|----|-------|----|
| 720p | 50 | 59.94 | 60 | | |
| 1080i | 25 | 29.97 | 30 | | |
| 1080p | 25 | 23.98 | 30 | 23.98 | 24 |
| 1080p-Level A | 50 | 59.94 | 60 | | |
| 2160p | 25 | 29.97 | 30 | 23.98 | 24 |
| 2160p | 50 | 59.94 | 60 | | |

Supported SFP Modules

The following SFP modules are supported for the GV K-Frame X and V-series Video IP I/O boards, available from Grass Valley:

- SFP-ETH10G-RT-M85-LC
- K-FRM-IO-SFP10-25G

10GbE IP I/O boards (SFP-ETH10G-RT-M85-LC)

For boards with 10Gb/s SFPs, there are two inputs and one output provided per SFP, on the IP I/O boards.

- Large IP I/O boards have 16 SFPs—eight “A” SFPs providing 16 primary inputs and eight primary outputs and the same number of “B” SFPs for redundancy, per board.
- Small IP I/O boards have 8 SFPs—four “A” SFPs providing eight primary inputs four primary outputs and the same number of “B” SFPs for redundancy, per board.

10GbE/25GbE IP I/O boards (K-FRM-IO-SFP10-25G)

IP boards equipped with the dual-use 10GbE/25GbE SFPs allow for more bandwidth through fewer SFPs and fiber connections.

IMPORTANT: Each IP board with Dual-use SFPs must be configured as either all 10GbE or all 25GbE, however the boards can be mixed within the Frame.

Each 10Gbe/25Gbe dual-use SFP can be configured to stream video signals in three input/output modes: 2/1, 4/2, or 8/4, depending on video format and the IP board SFP configuration as 10GbE or 25GbE.

SFP Input/Output Mode Configuration

Determine the minimum SFP board speed and supported input/output mode options:

- 2 inputs/1 output—SFP in each port
- 4 inputs/2 outputs—SFP in every other port, or
- 8 inputs/4 outputs—SFP for every four ports.

IP Board SFP Speed and Input/Output Calculation Examples

| Image Format | SMPTE | Format Speed Gb/s | Board SFP Speed (Gb/s) | | Bandwidth used Gb/s |
|---|--|-------------------|------------------------|--------------------|---------------------|
| | | | 10GbE | 25GbE | |
| 720p 59.94Hz 1080i 29.97Hz 1080p 29.97Hz | ST 2110-20 | 1.3 | 2 inputs/1 output | 2 inputs/1 output | 2.6/1.3 |
| | | | 4 inputs/2 outputs | 4 inputs/2 outputs | 5.2/2.6 |
| | | | N/A | 8 inputs/4 outputs | 10.4/5.2 |
| 720p 59.94Hz 1080i 29.97Hz 1080p 29.97Hz | ST 2022-6 | 1.5 | 2 inputs/1 output | 2 inputs/1 output | 3.1/1.55 |
| | | | 4 inputs/2 outputs | 4 inputs/2 outputs | 6.2/3.1 |
| | | | N/A | 8 inputs/4 outputs | 12.4/6.2 |
| 1080p 59.94Hz | ST 2110-20 | 2.6 | 2 input/1 outputs | 2 input/1 outputs | 5.2/2.6 |
| | | | N/A | 4 inputs/2 outputs | 10.4/5.2 |
| | | | N/A | 8 inputs/4 outputs | 20.8/10.4 |
| 1080p 59.94Hz | ST 2022-6 | 3.1 | 2 input/1 outputs | 2 input/1 outputs | 6.2/3.1 |
| | | | N/A | 4 inputs/2 outputs | 12.4/6.2 |
| | | | N/A | N/A | N/A |
| 4K 59.94Hz Single to Quad Link and Quad to Single Link | ST 2022-6 TICO ^a Compressed | 3.1 | 2 input/1 outputs | 2 input/1 outputs | 3.1/3.1 |
| | | | 4 inputs/2 outputs | 4 inputs/2 outputs | 3.1/6.2 |
| | | | 8 inputs/4 outputs | 8 inputs/4 outputs | 6.2/6.2 |
| 2160p 29.97 | ST 2110-20 Uncompressed | 10.4 | N/A | 2 input/1 output | 10.4/5.2 |
| 2160p 59.94 | | | | | 20.8/10.4 |
| 4K 59.94Hz Single to Quad Link and Quad to Single Link | ST 2110-20 ^b Uncompressed | 10.4 | N/A | 2 input/1 outputs | 20.8/10.4 |
| | | | N/A | N/A | N/A |
| | | | N/A | N/A | N/A |

a. 4K 2022-6 TICO provides a 1080p monitor output stream.b.
Quad to Single Link.

Hot Swappable IP I/O Boards and SFPs

IP I/O boards are hot swappable. SFPs are also hot swappable on each board, provided the SFP modules are all of the same (supported) type. Swapping an SFP module on a board requires that the new module be identical to the one being replaced.

Troubleshooting

When the Frame IP Address is entered into a browser, the IP SFP Statistics web page provides useful data for determining if the bandwidth for an SFP has been exceeded in relation to the image format speed (Gb/s), Board SFP Speed (Gb/s), and Streams/SFPs mode selected (e.g. 4 inputs/2 outputs, 8 inputs, 2 outputs).


CAUTION: Exceeding the SFP bandwidth will result in a signal loss for the associated SFP ports.

Additionally, it can be determined if an SFP is passing video; if an SFP is configured and the Gb/s throughput column displays a number lower than the configured SFP speed, there may be an issue with the SFP module or the bandwidth has been exceeded.

Open the GV K-Frame Web Access pages by entering the Frame IP Address into a browser on the system network and selecting **IP SFP Statistics** on the left.

Note: The Phy Link/Lock Status column (far right) in the SFP Statistics Web Access page, provides Ethernet link status. If the status is "Up", the Ethernet link is up and locked, the speed is matched between the switcher and the external device, and it is working properly. If the status is "Down", there is either an issue with the link connection or a mis-match of Ethernet link speed.

In the example following, the SFP Stream mode type is 8 inputs/4 outputs and the Rx Throughput is over 10Gb/s, requiring a 25Gb/s SFP IP board configuration. The image format speed coupled with the 8/4 mode selection requires 25Gb/s of bandwidth. The Link Speed (Gb/s) column (second from the right) shows that the IP board SFPs are configured as 25Gb/s.



GV K-Frame XP Web Access

[Software Versions](#)
[Frame Status](#)
[Frame Message Log](#)
[Frame Network Address](#)
[Frame Date & Time](#)
[Frame Description](#)
[SNMP Configuration](#)
[IP SFP Statistics](#)
[IP Video Input](#)
[IP Video Output](#)
[IP Audio Input](#)
[IP Audio Output](#)
[IP Ancillary Input](#)
[IP Ancillary Output](#)
[PTP Mezz](#)

Board

16x8 IO IP 7

Reset Packet Counts

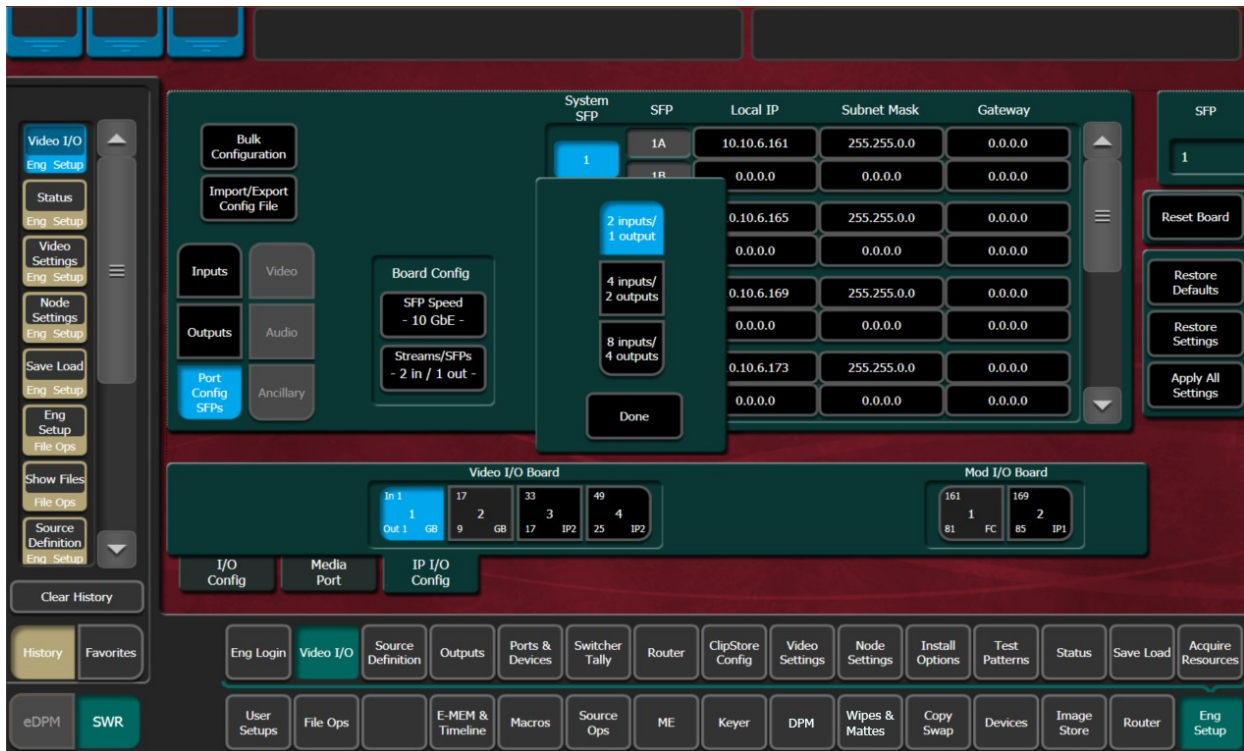
Refresh Page

| 8B | 00:50:1e:05:83:d2 | 0.000000 | 0 | 0 | 2.632212 | 872062508 | 0 | 25 | DOWN |
|-----|-------------------|----------------------|----------------|---------------|----------------------|----------------|---------------|-------------------|----------------------|
| SFP | MAC Address | Rx Throughput (Gb/s) | Rx PacketCount | Rx ErrorCount | Tx Throughput (Gb/s) | Tx PacketCount | Tx ErrorCount | Link Speed (Gb/s) | Phy Link/Lock Status |
| 1A | 00:50:1e:05:84:43 | 5.260740 | 2599744532 | 0 | 2.628824 | 1300323794 | 0 | 10 | UP |
| 1B | 00:50:1e:05:84:44 | 0.000000 | 0 | 0 | 0.000000 | 0 | 0 | 10 | DOWN |
| 2A | 00:50:1e:05:84:45 | 5.284256 | 2669951375 | 0 | 2.629657 | 1300424818 | 0 | 10 | UP |
| 2B | 00:50:1e:05:84:46 | 0.000000 | 0 | 0 | 0.000000 | 0 | 0 | 10 | DOWN |
| 3A | 00:50:1e:05:84:47 | 5.262852 | 2600894330 | 0 | 2.629889 | 1300404677 | 0 | 10 | UP |
| 3B | 00:50:1e:05:84:48 | 0.000000 | 0 | 0 | 0.000000 | 0 | 0 | 10 | DOWN |
| 4A | 00:50:1e:05:84:49 | 5.283578 | 2670432109 | 0 | 2.629325 | 1300415462 | 0 | 10 | UP |
| 4B | 00:50:1e:05:84:4a | 0.000000 | 0 | 0 | 0.000000 | 0 | 0 | 10 | DOWN |
| 5A | 00:50:1e:05:84:4b | 5.261707 | 2600936655 | 0 | 2.629319 | 1300425785 | 0 | 10 | UP |
| 5B | 00:50:1e:05:84:4c | 0.000000 | 0 | 0 | 0.000000 | 0 | 0 | 10 | DOWN |
| 6A | 00:50:1e:05:84:4d | 5.283172 | 2670472106 | 0 | 2.629114 | 1300433735 | 0 | 10 | UP |
| 6B | 00:50:1e:05:84:4e | 0.000000 | 0 | 0 | 0.000000 | 0 | 0 | 10 | DOWN |
| 7A | 00:50:1e:05:84:4f | 5.261334 | 2601030196 | 0 | 2.629126 | 1300475893 | 0 | 10 | UP |
| 7B | 00:50:1e:05:84:50 | 0.000000 | 0 | 0 | 0.000000 | 0 | 0 | 10 | DOWN |
| 8A | 00:50:1e:05:84:51 | 5.283193 | 2671058798 | 0 | 2.629128 | 1300479970 | 0 | 10 | UP |
| 8B | 00:50:1e:05:84:52 | 0.000000 | 0 | 0 | 0.000000 | 1 | 0 | 10 | DOWN |
| SFP | MAC Address | Rx Throughput (Gb/s) | Rx PacketCount | Rx ErrorCount | Tx Throughput (Gb/s) | Tx PacketCount | Tx ErrorCount | Link Speed (Gb/s) | Phy Link/Lock Status |

Configure the IP Board SFPs

IMPORTANT: Each IP board with Dual-use SFPs must be configured as either all 10GbE or all 25GbE streaming speed, however the boards can be mixed within the Frame.

- 1 Select **Eng Setup, Video I/O, IP I/O Config** in the switcher menu.



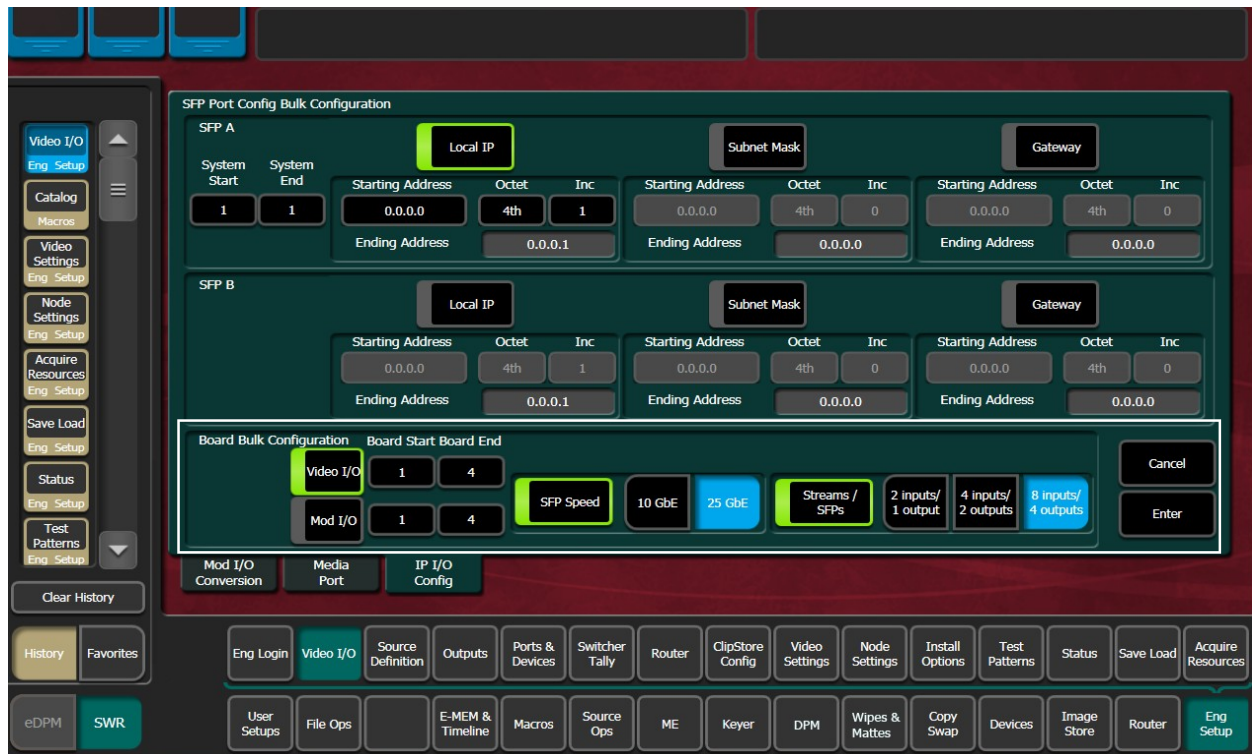
- 2 Select the **Port Config SFPs** button (below Inputs and Outputs).
- 3 Select a board from the Video I/O Board or Mod I/O Board (GV K-Frame X) or Video I/O Board (V-series) button row.
- 4 In the Board Config button pane, select the **SFP Speed** button, choose the configured SFP speed for the IP board **10GbE** or **25GbE**, and select **Done**.
- 5 Select the **Streams/SFPs in/out** button and make a selection ([SFP Input/Output Mode Configuration](#)), select **Done**.
- 6 Select **Apply Settings**.

Note: When the Apply Settings button is selected in the Port Config SFPs menu, the settings for Inputs, Outputs, and SFPs (Video, Audio, and Ancillary) are applied. Only the changes are sent to the Frame.

If you are attempting to set the IP board to 25GbE and you have 10Gb/s only SFPs, the system will report an error but still attempt to run at the 25Gb/s speed.

Configure Boards in Bulk

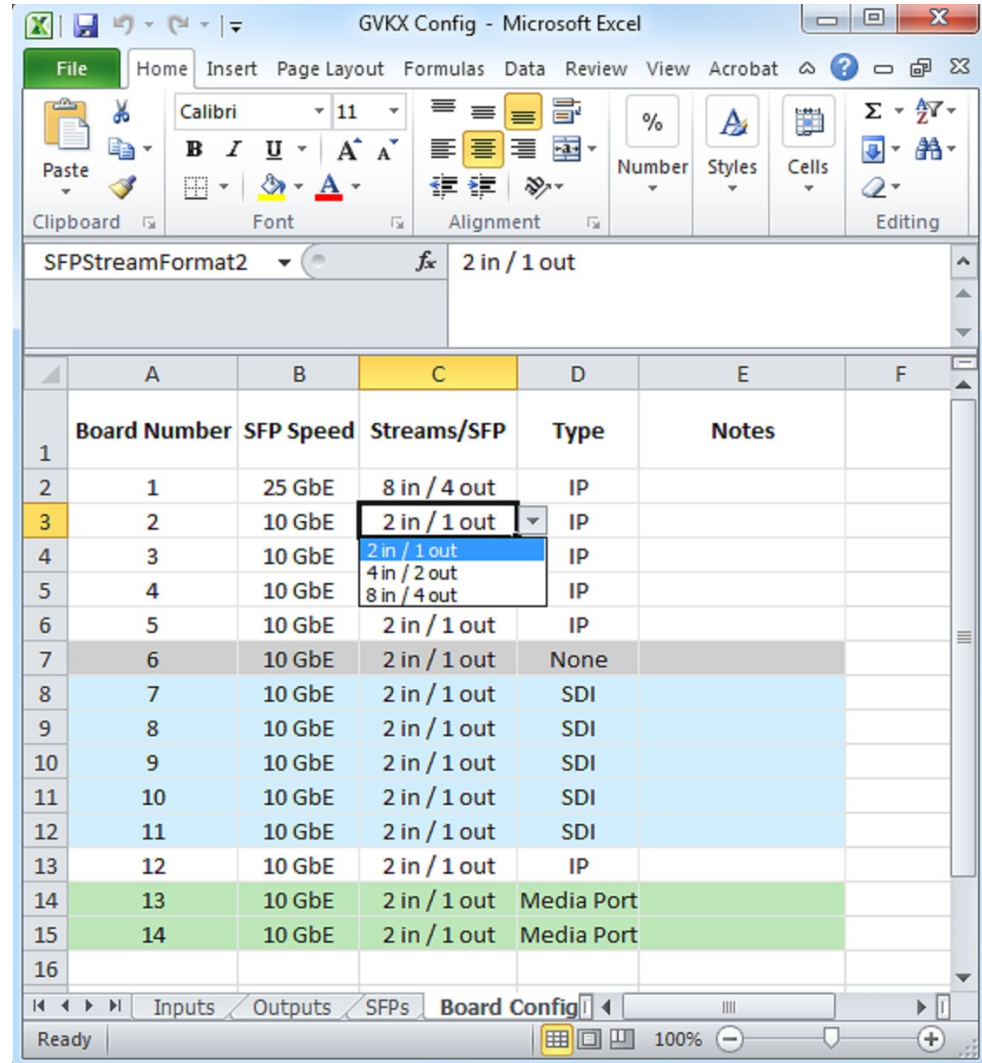
- 1 Select **Eng Setup, Video I/O, IP I/O Config**.
- 2 Select **Port Config SFPs, Bulk Configuration** to display the SFP Port Config Bulk Configuration menu.



- 3 In the Board Bulk Configuration menu, enable the **Video I/O** or **Mod I/O** button.
- 4 Select the **Board Start/Board End** button and enter the board in the **Video I/O Board Start/Video I/O Board End** pop-up keypad.
- 5 Based on the configured throughput speed of the SFPs installed, enable the **SFP Speed** button and select **10GbE** or **25GbE**.
- 6 Enable the **Streams/SFPs** button and select: ([SFP Input/Output Mode Configuration](#))
 - **2 inputs/1 output**,
 - **4 inputs/2 outputs**, or
 - **8 inputs/4 outputs**.
- 7 Select **Enter**.

About Board Bulk Configuration and the Import/Export Config File

The Board Config tab has been added to the Import/Export Config File generated spreadsheet.



Drop down lists are provided to make selections in each cell for the SFP Speed, Streams/SFP, and Type columns. Row color will reflect the changes. The Input and Output tabs will be updated accordingly.

In the Inputs and Outputs tabs, the SFP Number column will reflect the Streams/SFP configuration in the Board Config tab. For example, with a board configured as 8 inputs/4 outputs, then board inputs 1-8 will be on SFP Number 1 and board inputs 9-16 will be on SFP Number 5.

GVKX Config - Microsoft Excel

Formula Bar: `=IF('Board Config'!C2="8 in / 4 out",1,IF('Board Config'!C2="4 in / 2 out",1,IF('Board Config'!C2="2 in / 1 out",1)))`

| | A | B | C | D | E | F | G | H |
|----|--------------|--------------|-------------|-----------------|------------|---------------------|--------------------|-------|
| | System Input | Board Number | Board Input | Redundancy Mode | SFP Number | Video Stream Format | Video Payload Type | Video |
| 1 | | | | | | | | |
| 2 | 1 | 1 | 1 | Off | 1 | ST 2022-6 | 98 | |
| 3 | 2 | 1 | 2 | Off | 1 | ST 2022-6 | 98 | |
| 4 | 3 | 1 | 3 | Off | 1 | ST 2022-6 | 98 | |
| 5 | 4 | 1 | 4 | Off | 1 | ST 2022-6 | 98 | |
| 6 | 5 | 1 | 5 | Off | 1 | ST 2022-6 | 98 | |
| 7 | 6 | 1 | 6 | Off | 1 | ST 2022-6 | 98 | |
| 8 | 7 | 1 | 7 | Off | 1 | ST 2022-6 | 98 | |
| 9 | 8 | 1 | 8 | Off | 1 | ST 2022-6 | 98 | |
| 10 | 9 | 1 | 9 | Off | 5 | ST 2022-6 | 98 | |
| 11 | 10 | 1 | 10 | Off | 5 | ST 2022-6 | 98 | |
| 12 | 11 | 1 | 11 | Off | 5 | ST 2022-6 | 98 | |
| 13 | 12 | 1 | 12 | Off | 5 | ST 2022-6 | 98 | |
| 14 | 13 | 1 | 13 | Off | 5 | ST 2022-6 | 98 | |
| 15 | 14 | 1 | 14 | Off | 5 | ST 2022-6 | 98 | |
| 16 | 15 | 1 | 15 | Off | 5 | ST 2022-6 | 98 | |
| 17 | 16 | 1 | 16 | Off | 5 | ST 2022-6 | 98 | |
| 18 | 17 | 2 | 1 | Off | 1 | ST 2022-6 | 98 | |
| 19 | 18 | 2 | 2 | Off | 1 | ST 2022-6 | 98 | |
| 20 | 19 | 2 | 3 | Off | 2 | ST 2022-6 | 98 | |
| 21 | 20 | 2 | 4 | Off | 2 | ST 2022-6 | 98 | |
| 22 | 21 | 2 | 5 | Off | 3 | ST 2022-6 | 98 | |

Ready | Average: 3 | Count: 16 | Sum: 48 | 100%

About IP Audio, Ancillary, and Redundancy

SMPTE standards ST 2110-30 Audio, ST 2110-40 Ancillary Data, and ST 2022-7 Redundancy are supported for IP streaming with the GV K-Frame X and V-series switcher systems, in the Video I/O, IP I/O Config switcher menu. Audio and Ancillary data are not currently supported for 4K TICO Compression formats.

Note: ST 2022-6 video can be configured to package ST 2110-30 audio and ST 2110-40 Ancillary data from other IP streams, the source's embedded audio and/or ancillary data will be replaced.

Redundancy

Redundancy requires that the IP stream on SFP B is being received on a separate network from SFP A so if one stream is compromised, the other stream is not affected.

About Extended Input Buffer

The 771-0741-01 IP I/O boards installed, the IP Timing Window has been extended to just under one frame to accommodate the three types of senders defined in the SMPTE ST 2110-21 standard (see the SMPTE ST 2110-21 standard for detailed information). These types define limits for the amount of packet delay variation (i.e. burstiness) that a sender is allowed to exhibit in its output stream:

- NL (Narrow Linear)—Corresponds to a stream where all the packets for a video signal are evenly spaced across the duration of each video frame,
- N (Narrow)—Similar to NL in that it corresponds to a stream where all the packets for a video signal are evenly spaced across the duration of each video frame except the sender does not send packets during the time that would correspond to the VBI (Vertical Blanking Interval) or VANC (Vertical Ancillary data space) of the corresponding traditional SDI video signal, and
- W (Wide)—Senders are allowed to have significantly greater burstiness to accommodate software based senders, such as graphics generators.

IMPORTANT: Each sender type has specific characteristics and should be configured by qualified service personnel only.

771-0741-01 version 16x8 IP I/O board is required for the Extended Input Buffer. The 771-0741-01 IP I/O boards can be mixed in the Frame with earlier 771-0741-00 boards. Each version of the IP I/O boards are identified in the Video I/O, IP I/O Config menu, Video I/O Board pane as either IP 1 (771-0741-00) or IP 2 (771-0741-01).



K-Frame IP Switcher System Auto-timing (771-0741-01 Board)

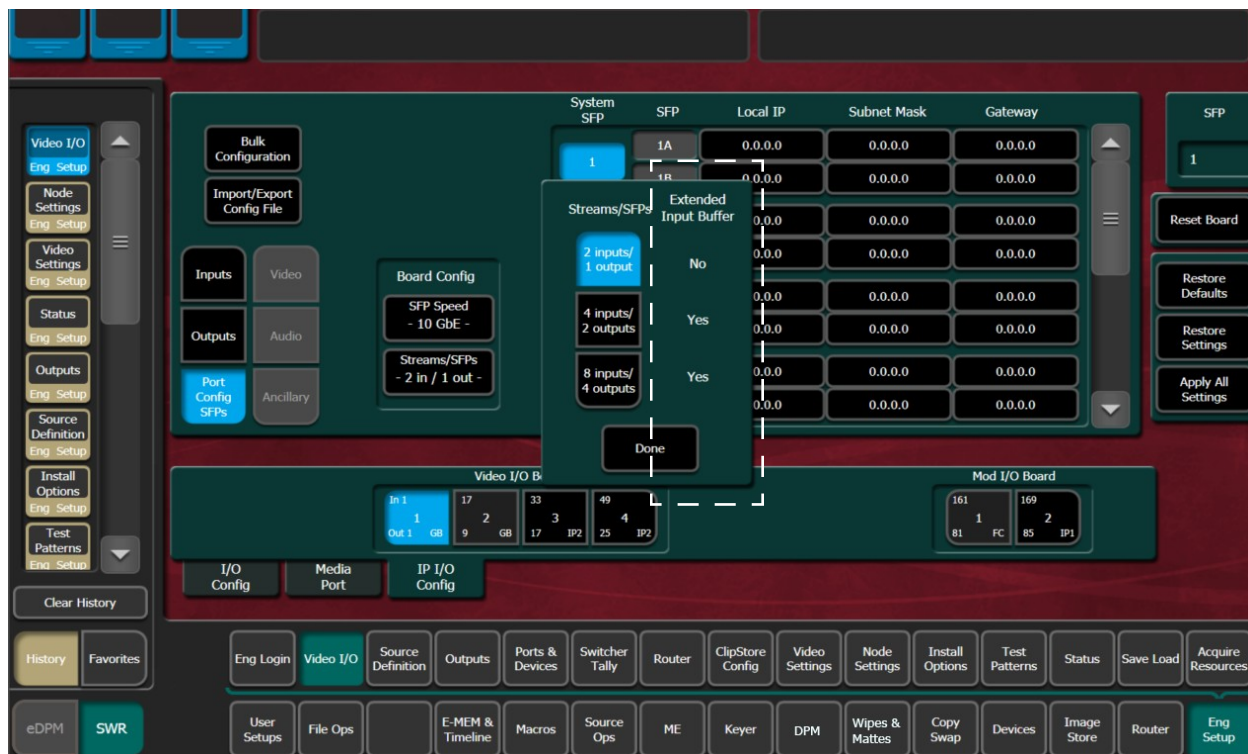
K-Frame IP Switcher System 771-0741-01 IP I/O Board Auto-timing Window, by Format (Hz)

| Frame Operating Mode | ST 2110-20 | ST 2022-6 | ST TICO 2022-6 |
|------------------------|--|---|---|
| 720p/59.94/60 | -12 μ s, -24 lines/-12 μ s, 0 lines | -20 μ s, -21 lines/-7 μ s, 0 lines | N/A |
| 720p/50 | -10 μ s, -25 lines/-22 μ s, 0 lines | -10 μ s, -18 lines/-11 μ s, 0 lines | N/A |
| 1080i-1080psf/29.97/30 | -21 μ s, -16 lines/-5 μ s, 0 lines | -12 μ s, -16 lines/-6 μ s, 0 lines | N/A |
| 1080i-1080psf/25 | -32 μ s, -16 lines/-10 μ s, 0 lines | -29 μ s, -13 lines/-12 μ s, 0 lines | N/A |
| 1080psf 23.98/24 | N/A | N/A | N/A |
| 1080pA 59.94/60 | -9 μ s, -16 line/-4 μ s, 0 lines | -5.7 μ s, -16 lines/-4 μ s, 0 lines | -5 μ s, -18 lines/-3 μ s, -2 lines |
| 1080pA 50 | -15 μ s, -16 line/-7 μ s, 0 lines | -13 μ s, -13 lines/-7 μ s, 0 lines | -13 μ s, -15 lines/-7 μ s, -2 lines |
| 2160p 59.94/60 | -2.0 μ s, -9 lines/-7.0 μ s, 0 lines | N/A | N/A |
| 2160p 50 | -3.0 μ s, -9 lines/-9.0 μ s, 0 lines | N/A | N/A |

Menu

IP I/O boards with Extended Input Buffer enabled are labeled as IP2 in the Video I/O Board menu pane, bottom right of the button.

Extended Input Buffer Status is displayed in the IP I/O Config menu by selecting the Streams/SFPs button in the Board Config pane of the Port Config SFPs menu tab. For the menu to return a Yes, indicating the Extended Input Buffer is enabled, the correct IP I/O board must be present and selected. Extended input Buffer is available for the 4 in/2 out and 8 in/4 out SFP configurations with either 10Gb/s or 25Gb/s SFP board configurations.



Video I/O IP Setup and Configuration Overview

In the GV K-Frame XP Eng Setup, Video I/O, IP I/O Config menu, configure the Video I/O IP in the following order:

- 1 Configure the SFPs
 - a Port Config SFPs (Local IP, Subnet Mask, Gateway),
 - b Inputs (Streaming Format, Redundancy, Receive IP, UDP Port),
 - c Outputs (Streaming Format, Redundancy, Transmit IP, UDP Port),
- 2 Review the IP Statistics Web Access page to verify stream throughput,
- 3 Troubleshoot any throughput issues, and
- 4 Verify timing for all sources using the Timing Analyzer in the Video Settings, Timing menu ([Timing Analyzer](#), on page 269).
- 5 Optionally, configure Audio and/or Ancillary data.

Configure the Port Config SFPs

Perform this procedure before configuring the inputs and outputs:

- 1 Select **Eng Setup, Video I/O, IP I/O Config**.
- 2 Select **Port Config SFPs, Bulk Configuration** to display the SFP Port Config Bulk Configuration menu.
- 3 In the Board Bulk Configuration menu, enable the **Video I/O** or **Mod I/O** button.
- 4 Select the **Board Start/Board End** button and enter the board in the **Video I/O Board Start/Video I/O Board End** pop-up keypad.
- 5 Based on the configured throughput speed of the SFPs installed, enable the **SFP Speed** button and select **10GbE** or **25GbE**.
- 6 Enable the **Streams/SFPs** button and select: ([SFP Input/Output Mode Configuration](#))
 - **2 inputs/1 output**,
 - **4 inputs/2 outputs**, or
 - **8 inputs/4 outputs**.
- 7 Select **Enter**.

Configure System Inputs/Outputs

- 1 Select Eng Setup, Video I/O, IP I/O Config in the menu.
- 2 Select the **Inputs** or **Outputs** button to delegate the menu.
- 3 Navigate to a System Input/Output SFP by selecting a Video I/O or Mod I/O Board button (bottom) and using the scroll bar or select the SFP data pad (top right) and scroll with the Menu Panel soft knob or a mouse wheel.
- 4 Select the **Stream Format** data pad to select a format (**ST 2110-20, ST 2022-6, 4K TICO ST 2022-6**).
- 5 Select the **Enable** button for Redundancy.
- 6 Select the **Receive IP/Transmit IP** data pad, enter the IP Address in the pop-up keypad, and select **Enter**.
 - a If Redundancy Mode is enabled, configure the IP Address for SFP B also.
- 7 Select the **UDP Port** data pad, enter a port number.
- 8 Select **Enter**.

Configure System Input or Output SFPs in Bulk from the Menu

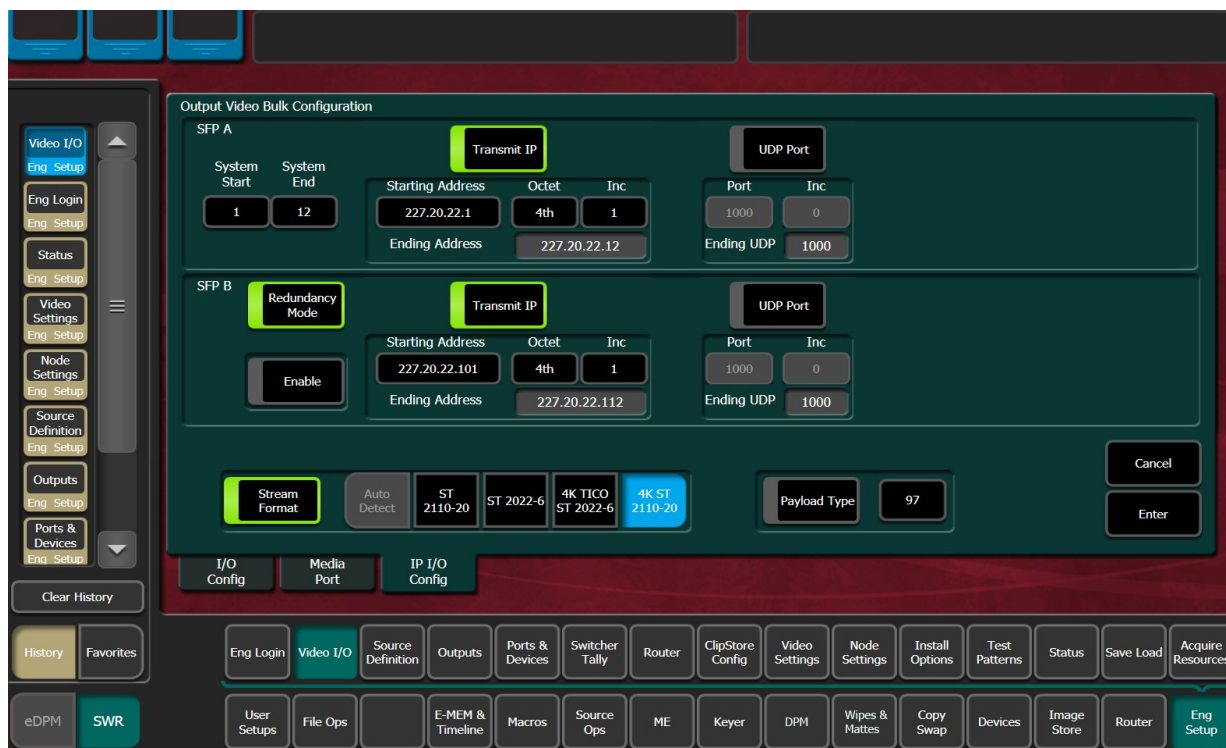
Bulk IP I/O spreadsheets can be imported between GV K-Frame XP systems and between GV K-Frame XP and GV K-Frame X systems, and vice versa. When importing to a Compact Frame from a Standard Frame, additional inputs/outputs will be ignored in the spreadsheet.

- 1 In the Video I/O, IP I/O Config menu, select **Inputs** or **Outputs** from the menu delegation buttons.
- 2 Select **Video**, **Audio**, or **Ancillary** from the stream type delegation buttons.

Basic Configuration

Configure System Input or Output SFPs in Bulk from the Menu

- 3 Select the **Bulk Configuration** button in the IP I/O Config menu.



- 4 Enter a range of SFP Inputs or Outputs for Video, Audio, or Ancillary in the Video Bulk Configuration menu:
 - a Select the **System Start** data pad, enter a System Input/Output number in the pop-up keypad, and select **Enter**.
 - b Select the **System End** data pad, enter a System Input/Output number.
- 5 With the **Transmit IP** or **Receive IP** button on, select the **Starting Address** data pad and enter the IP Address.
- 6 Optionally:
 - a Select the **Octet** data pad and select the octet to increment when configuring the IP Addresses, and/or,
 - b Select the **Inc** data pad and enter a positive or negative incremental value.
- 7 With the **UDP Port** button on, select the **Port** data pad and enter a port number (1000 is the default).
- 8 Optionally, enable the **Stream Format** button for Audio, select a Stream Format type, and select **Enter**.
- 9 Optionally, enable the **Payload Type** button, select the **Payload ID** button (just right of the Payload Type enable button), enter a value between **96** and **127** and select **Enter** (see [Setting the RTP Payload Type](#) for configuration information).

About Import/Export Config File (Bulk Configuration)

Accessed by selecting the Import/Export Config File button in the IP I/O Config menu, you can configure all of the IP I/O Config menu settings within an offline Excel spreadsheet and

then import the file and apply the configuration. (For Bulk Configuration from the menu, see [Configure Single Stream 4K ST 2110-20 \(2160p\)](#), on page 171).

When exported, a .ipe configuration file is created in Remote Storage (remote from the switcher, it is not recommended to install a third-party spreadsheet application on the switcher system).

The IP Config settings are exported as a Microsoft Excel file. Pull-down menus are provided for cells that have multiple options in the Video I/O, IP I/O Config menu. The Inputs and Outputs tabs (bottom) are provided to access those menu delegations. In addition, the far right column is for notes. All Excel functionality is supported, including incrementing the IP Addresses in a column.

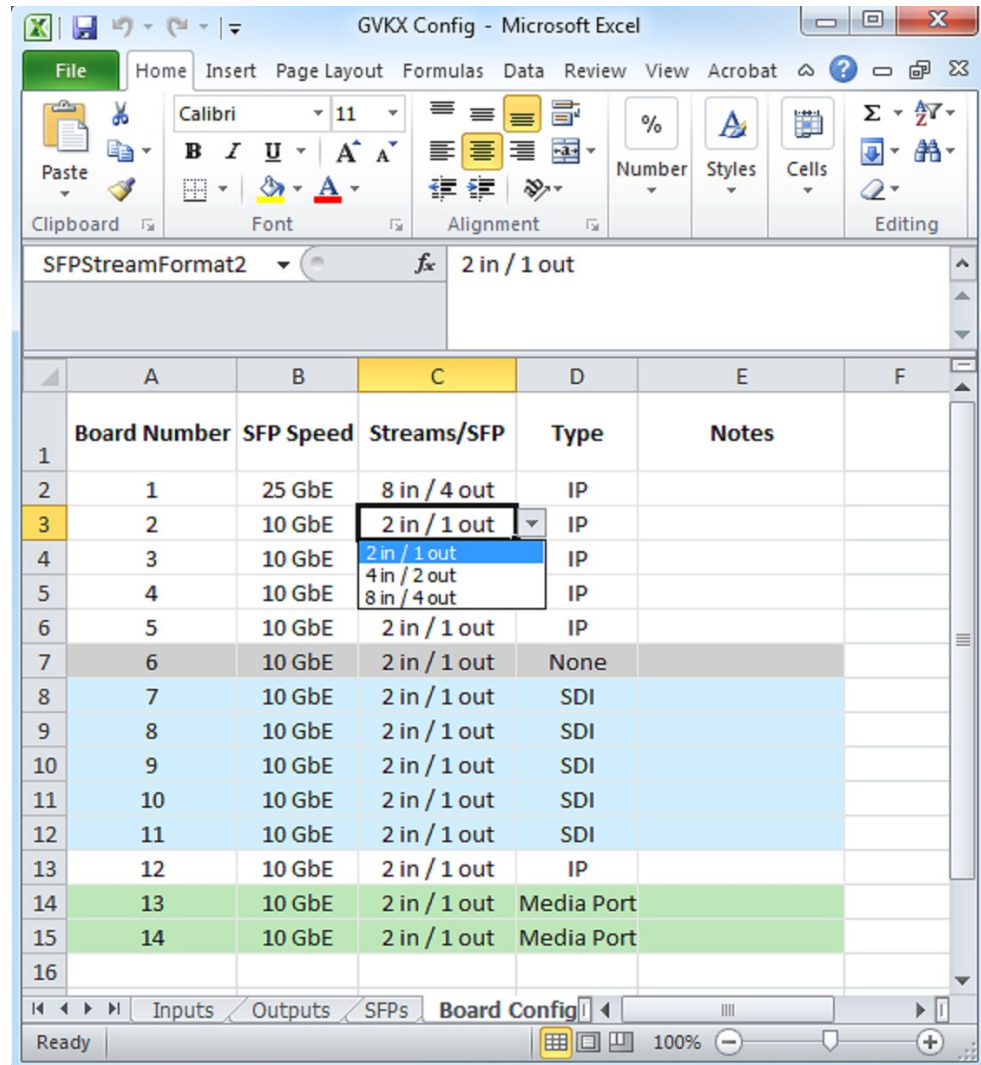
| F2 | | ST 2022-6 | | | | | |
|----|--------------|--------------|-------------|-----------------|------------|---------------------|------------|
| | A | B | C | D | E | F | G |
| 1 | System Input | Board Number | Board Input | Redundancy Mode | SFP Number | Video Stream Format | Video A Re |
| 2 | 1 | 1 | 1 | On | 1 | ST 2022-6 | 127.0.0.1 |
| 3 | 2 | 1 | 2 | On | 1 | Auto Detect | 127.0.0.2 |
| 4 | 3 | 1 | 3 | Off | 2 | ST 2022-6 | 0.0.0.0 |
| 5 | 4 | 1 | 4 | Off | 2 | ST 2110-20 | 0.0.0.0 |
| 6 | 5 | 1 | 5 | Off | 3 | 4K TICO ST 2022-6 | 0.0.0.0 |
| 7 | 6 | 1 | 6 | Off | 3 | ST 2022-6 | 0.0.0.0 |
| 8 | 7 | 1 | 7 | Off | 4 | ST 2022-6 | 0.0.0.0 |
| 9 | 8 | 1 | 8 | Off | 4 | ST 2022-6 | 0.0.0.0 |
| 10 | 9 | 2 | 1 | Off | 1 | ST 2022-6 | 0.0.0.0 |
| 11 | 10 | 2 | 2 | Off | 1 | ST 2022-6 | 0.0.0.0 |
| 12 | 11 | 2 | 3 | Off | 2 | ST 2022-6 | 0.0.0.0 |
| 13 | 12 | 2 | 4 | Off | 2 | ST 2022-6 | 0.0.0.0 |
| 14 | 13 | 2 | 5 | Off | 3 | ST 2022-6 | 0.0.0.0 |
| 15 | 14 | 2 | 6 | Off | 3 | ST 2022-6 | 0.0.0.0 |
| 16 | 15 | 2 | 7 | Off | 4 | ST 2022-6 | 0.0.0.0 |
| 17 | 16 | 2 | 8 | Off | 4 | ST 2022-6 | 0.0.0.0 |
| 18 | 17 | 3 | 1 | Off | 1 | ST 2022-6 | 0.0.0.0 |
| 19 | 18 | 3 | 2 | Off | 1 | ST 2022-6 | 0.0.0.0 |
| 20 | 19 | 3 | 3 | Off | 2 | ST 2022-6 | 0.0.0.0 |

Note: Importing the bulk config file with alterations to the System Input, Board Number, or Board Input cells can result in reported errors, however this will not prevent other valid settings from being imported.

Basic Configuration

Configure System Input or Output SFPs in Bulk from the Menu

The Board Config tab is used to Import/Export the Config File generated spreadsheet.



Drop down lists are provided to make selections in each cell for the SFP Speed, Streams/SFP, and Type columns. Row color will reflect the changes. The Input and Output tabs will be updated accordingly.

In the Inputs and Outputs tabs, the SFP Number column will reflect the Streams/SFP configuration in the Board Config tab. For example, with a board configured as 8 inputs/4 outputs, then board inputs 1-8 will be on SFP Number 1 and board inputs 9-16 will be on SFP Number 5.

GVKX Config - Microsoft Excel

Formula Bar: `=IF('Board Config'!C2="8 in / 4 out",1,IF('Board Config'!C2="4 in / 2 out",1,IF('Board Config'!C2="2 in / 1 out",1)))`

| | A | B | C | D | E | F | G | H |
|----|--------------|--------------|-------------|-----------------|------------|---------------------|--------------------|-------|
| | System Input | Board Number | Board Input | Redundancy Mode | SFP Number | Video Stream Format | Video Payload Type | Video |
| 1 | | | | | | | | |
| 2 | 1 | 1 | 1 | Off | 1 | ST 2022-6 | 98 | |
| 3 | 2 | 1 | 2 | Off | 1 | ST 2022-6 | 98 | |
| 4 | 3 | 1 | 3 | Off | 1 | ST 2022-6 | 98 | |
| 5 | 4 | 1 | 4 | Off | 1 | ST 2022-6 | 98 | |
| 6 | 5 | 1 | 5 | Off | 1 | ST 2022-6 | 98 | |
| 7 | 6 | 1 | 6 | Off | 1 | ST 2022-6 | 98 | |
| 8 | 7 | 1 | 7 | Off | 1 | ST 2022-6 | 98 | |
| 9 | 8 | 1 | 8 | Off | 1 | ST 2022-6 | 98 | |
| 10 | 9 | 1 | 9 | Off | 5 | ST 2022-6 | 98 | |
| 11 | 10 | 1 | 10 | Off | 5 | ST 2022-6 | 98 | |
| 12 | 11 | 1 | 11 | Off | 5 | ST 2022-6 | 98 | |
| 13 | 12 | 1 | 12 | Off | 5 | ST 2022-6 | 98 | |
| 14 | 13 | 1 | 13 | Off | 5 | ST 2022-6 | 98 | |
| 15 | 14 | 1 | 14 | Off | 5 | ST 2022-6 | 98 | |
| 16 | 15 | 1 | 15 | Off | 5 | ST 2022-6 | 98 | |
| 17 | 16 | 1 | 16 | Off | 5 | ST 2022-6 | 98 | |
| 18 | 17 | 2 | 1 | Off | 1 | ST 2022-6 | 98 | |
| 19 | 18 | 2 | 2 | Off | 1 | ST 2022-6 | 98 | |
| 20 | 19 | 2 | 3 | Off | 2 | ST 2022-6 | 98 | |
| 21 | 20 | 2 | 4 | Off | 2 | ST 2022-6 | 98 | |
| 22 | 21 | 2 | 5 | Off | 3 | ST 2022-6 | 98 | |

Ready | Average: 3 | Count: 16 | Sum: 48 | 100%

About the “Type” Column

The IP Config file Type column (scroll to the far right) provides a list of the IP I/O and SDI I/O boards installed in the system, as of the last export. SDI board types can be configured for IP so if an IP board were to be installed in that slot later, the imported IP Config file settings would be applied.

Note: Pre-configured IP I/O settings in the SDI Type cells are informational only, until a physical IP I/O board is installed in the Frame.

Spreadsheet Formatting Tip

To make the spreadsheet much easier to read and edit, format the alignment of the heading cells to vertical (90 degrees). This will reduce the width of the spreadsheet significantly.

Bulk Configure SFPs Using a Spreadsheet

- 1 In the Video I/O, IP I/O Config menu, select the **Import/Export Config File** button.
- 2 Navigate to the location you wish to save the GV K-Frame XP config file, (C:\K_Frame\User).

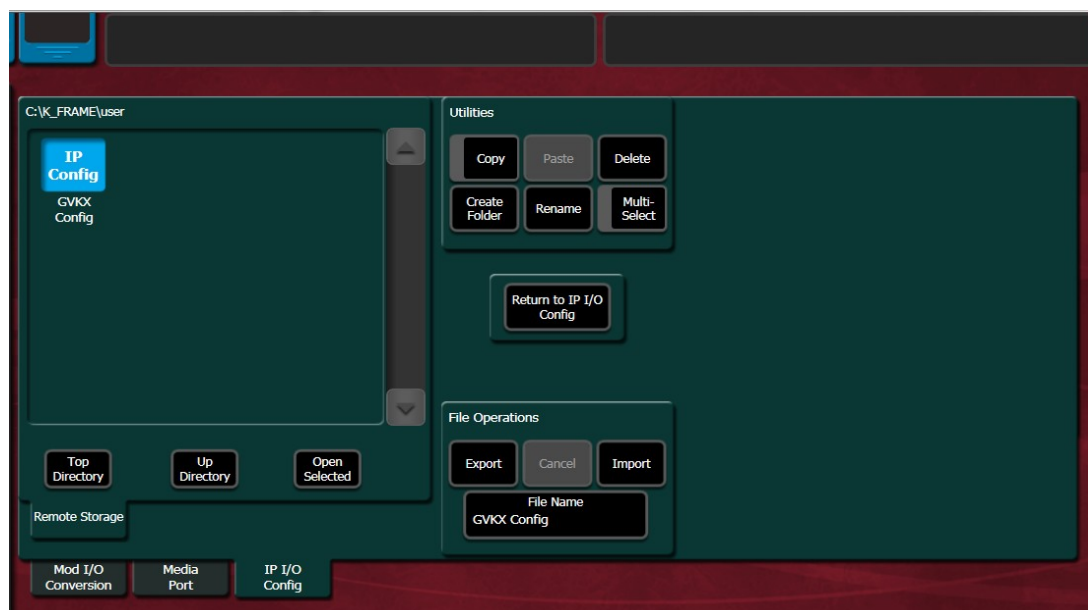


- 3 Select the **File Name** button in the File Operations pane and enter a name in the pop-up keypad, select **Enter**.
- 4 Select **Export**.
- 5 Open the **Config.ipe** folder (C:\K_FRAME\user\GVKX Config.ipe).
- 6 Open and edit the Excel Workbook Config file.

IMPORTANT: For tables with button descriptions corresponding to the cells, see [IP I/O Config Bulk Configuration Menu](#), on page 152.

- 7 Save the file in Excel.

- 8 Navigate to and select the **IP Config** folder in the IP I/O Config menu you named and select **Import**.



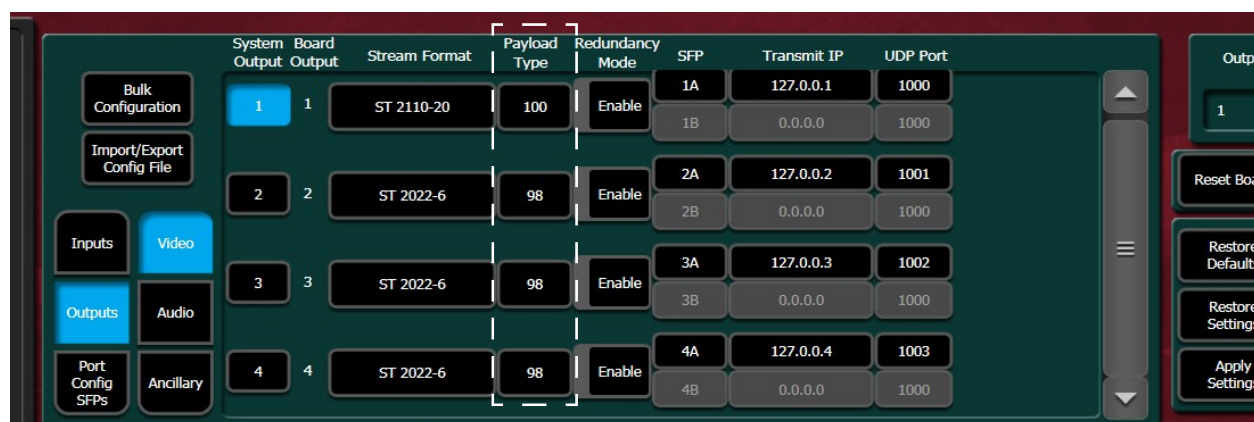
IP SFP Statistics Web Access

IP SFP Statistics are available the GV K-Frame XP Web Access pages. You can connect to the Web Access by entering the Video Frame's IP Address into a browser from a PC on the network. Buttons are provided to reset packet counts for each I/O board and to refresh the page (refreshes the entire website).

| IP SFP Statistics | | | | | | | | | |
|-------------------|-------------------|---------------|----------------|---------------|---------------|----------------|---------------|-------------------|--|
| SFP | MAC Address | Rx Throughput | Rx PacketCount | Rx ErrorCount | Tx Throughput | Tx PacketCount | Tx ErrorCount | Link Speed (Gb/s) | |
| 1A | 00:50:1e:05:78:07 | 655,774,175 | 1,468,896,764 | 0 | 327,886,885 | 734,424,203 | 0 | 10 | |
| 1B | 00:50:1e:05:78:08 | 327,748,130 | 734,472,431 | 0 | 327,746,591 | 734,424,005 | 0 | 10 | |
| 2A | 00:50:1e:05:78:09 | 661,311,595 | 1,514,276,562 | 0 | 327,886,963 | 734,424,079 | 0 | 10 | |
| 2B | 00:50:1e:05:78:0a | 655,774,536 | 1,468,896,362 | 0 | 327,886,782 | 734,424,001 | 0 | 10 | |
| 3A | 00:50:1e:05:78:0b | 655,494,837 | 1,468,896,115 | 0 | 330,526,185 | 757,368,912 | 0 | 10 | |
| 3B | 00:50:1e:05:78:0c | 655,815,638 | 1,468,897,798 | 0 | 330,685,906 | 757,369,772 | 0 | 10 | |
| 4A | 00:50:1e:05:78:0d | 655,534,764 | 1,468,896,404 | 0 | 330,545,088 | 757,369,061 | 0 | 10 | |
| 4B | 00:50:1e:05:78:0e | 655,535,033 | 1,468,896,373 | 0 | 330,545,354 | 757,369,046 | 0 | 10 | |
| 5A | 00:50:1e:05:78:0f | 655,810,915 | 1,468,848,467 | 0 | 330,683,958 | 757,369,628 | 0 | 10 | |
| 5B | 00:50:1e:05:78:10 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | |
| 6A | 00:50:1e:05:78:11 | 655,530,086 | 1,468,848,283 | 0 | 330,544,410 | 757,369,536 | 0 | 10 | |
| 6B | 00:50:1e:05:78:12 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | |
| 7A | 00:50:1e:05:78:13 | 655,495,049 | 1,468,846,222 | 0 | 330,526,285 | 757,368,478 | 0 | 10 | |
| 7B | 00:50:1e:05:78:14 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | |
| 8A | 00:50:1e:05:78:15 | 655,760,623 | 1,468,846,545 | 0 | 330,659,049 | 757,368,638 | 0 | 10 | |
| 8B | 00:50:1e:05:78:16 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | |
| SFP | MAC Address | Rx Throughput | Rx PacketCount | Rx ErrorCount | Tx Throughput | Tx PacketCount | Tx ErrorCount | Link Speed (Gb/s) | |

Setting the RTP Payload Type

Located in the Eng Setup, Video I/O, IP I/O Config menu, the *Payload Type* column allows you to set RTP (Real-time Transport Protocol) Payload types for each IP System Input and System Output Video, Audio, and Ancillary data streams. In most cases the RTP Payload Type defaults are used, however the switcher supports types 96 through 127. Bulk Configuration is also supported.



K-Frame/Formerly SAM/Everts Product RTP Payload Values

The RFC specification does not provide specific values for the RTP Payload Type. Each manufacturer has the freedom to choose their own. Some K-Frame and formerly SAM branded product's along with Everts default payload values are listed below. It is recommended that a single set of values be used across a site whenever possible. In order to work with some formerly SAM branded products, for example the IQ Modular products and the Kahuna and Kula video switchers, these values will need to be set to either Set 1 or Set 2 Payload Types.

IMPORTANT: The Extended Headers must be turned off on formerly branded SAM products.

K-Frame/Formerly SAM/Everts Default Payload Types

| RTP Payload Type | K-Frame Switchers | Formerly SAM branded products Set 1 | Formerly SAM branded products Set 2 | Everts (As of October 2018) |
|--|-------------------|-------------------------------------|-------------------------------------|-----------------------------|
| Video: ST 2022-6/ ST 2022-6 TICO 4K | 0x98 | 0x98 | 0x98 | 0x112 |
| Video ST 2110-20 | 0x97 | 0x96 | 0x100 | 0x96 |
| Audio ST 2110-30 | 0x96 | 0x97 | 0x102 | 0x97 |
| Ancillary ST 2110-40 | 0x100 | 0x100 | 0x103 | 0x100 |

To reset the Payload Type to the default, select the **Payload Type** data pad and enter **.** (dot) in the pop-up keypad (entering any number below 96 inserts 96 and entering any number above 127 inserts 127).

Set the RTP Payload Type

- 1 Select **Inputs/Outputs**.
- 2 Select **Video, Audio, or Ancillary**.
- 3 Select the **Payload Type** data pad, enter the Payload Type number in the pop-up keypad (numbers lower than 96 will return 96 and numbers higher than 127 will return 127).
- 4 Select **Apply Settings** (middle right).

Set the RTP Payload Type in Bulk Configuration

RTP Payload Type can be configured for multiple System Inputs/System Outputs in the Bulk Configuration menu.

- 1 Select **System Input** or **System Output**, then **Video, Audio, or Ancillary**.
- 2 Select the **Bulk Configuration** button.
- 3 Enter the **System Start** and **System End** (top left) parameters (Inputs/Outputs) by selecting each and entering the number in the pop-up keypad.
- 4 Turn on the **Payload Type** enable button (lower right).
- 5 Select the **Payload Type** data pad (right of the Payload Type enable button), enter the number in the pop-up keypad, and select **Enter**.
- 6 Select **Enter** in the Bulk Configuration menu (right of the Payload Type data pad).
- 7 Select **Apply Settings** in the IP I/O Config menu (middle right).

Set Payload Type to Default

- 1 Select the **System Input** or **System Output**.
- 2 Select the **Payload Type** data pad.
- 3 Enter a . (**dot**) in the pop-up keypad.

Registering System Nodes

When IP addresses have been changed on GV K-Frame XP system components, or new components are added, the Video Processor Frame needs to know what new addresses it will use to communicate with those components. This is accomplished by registering those addresses with the Frame using the GV Switcher menu application Node Settings menus (see the *K-Frame Kayenne/Karrera/GV Korona User Manual*).

Kayenne and Karrera Menu Panel Registration

Registering the Menu Panel (or PC running the GV Switcher menu application) with the Frame was described earlier (see [Establishing Menu to Frame Communication](#)). The GV Switcher menu application needs to be in communication with the Video Processor Frame before other nodes can be registered.

Control Panel Registration

- 1 Touch **Eng Setup, Node Settings, Control Surfaces**.

- 2 Touch an available set of buttons and enter a Node Name and the IP address of the Control Panel.
- 3 You can assign the component to a suite and control surface now if you wish, but it is recommended to initially configure your GV Switcher system as a single suite. Later, you can modify the configuration for multi-suite operation.
- 4 Optionally, for Control Panel button DPOPs (double press open button) to affect this Menu Panel, touch **Frame Suite Nodes & ID** and enter the IP address of that Control Panel in the Track DPOPs from Panel ID field.
- 5 Reset the Control Panel:
 - a **Kayenne**—On the Control Panel Multi-Function Module access the Home menu, then press **Panel, IP, Boot** and press **Yes**.
 - b **Karrera**—In the Master E-MEM Area, select the **Menu** hard button, **Page** hard button, then in the LED, select **IP Addresses, Panel Boot**.
 - c **GV Korona**—Select the **Status** menu button, then select **Closedown Menu Computer** and select **Restart** from the Windows pull-down menu.

CAUTION: Selecting Shutdown in the Windows pull-down will require you to power cycle the GV Korona Control Panel.

Remote Aux Panel Registration

Note: Do not confuse the Kayenne or Karrera Local Aux Panels, which are considered a Control Panel Stripes, with Remote Aux Panels, which are small panels used to change Aux Bus sources from a different location. The Local Aux Panel Stripe is not configured with the following menus.

- 1 Select **Eng Setup, Node Settings, Remote Aux IP Network** in the GV K-Frame XP GV switcher menu.



- 2 Select an available set of buttons and enter an Aux Panel Name and IP address of each Aux Panel.
- 3 Identify the type of Remote Aux Panel (Single or Multi- Destination).
- 4 You can assign the component to a suite and control surface now if you wish but it is recommended to initially configure your GV K-Frame XP system as a single suite. Later, you can modify the configuration for multi-suite operation.

Control Panel Brightness Adjustment

All GV K-Frame XP Control Panels are calibrated at the factory for even brightness and color balance. Individual panel area illumination levels cannot be adjusted in the field. However, the relative brightness of button tally, source name displays, and text displays can be adjusted on a global basis to meet individual requirements (for example, to accommodate varying ambient room lighting levels).

- 1 Access the Control Panel Web page, by entering its IP address in a Web browser, then selecting **Configuration**.

The screenshot shows a web interface for the Control Panel Configuration. On the left is a sidebar with navigation links: Panel Status, Configuration (highlighted), Logging, Network, Panel Date & Time, Panel Description, and SNMP. The main content area is titled 'Configuration' and 'Brightness Configuration'. It contains four input fields with their current values and ranges: OLED Brightness (2560, 0 to 4095), Text Display Brightness (3072, 500 to 4095), High Tally (3072, 0 to 4095), and Low Tally (1024, 0 to 4095). At the bottom are three buttons: 'Apply' (highlighted with a blue border), 'Show Factory Defaults', and 'Show Current Settings'.

- 2 Enter the desired values for OLED, Text Display, High Tally, and Low Tally, and then select **Apply**.

IMPORTANT: To extend the life of display illumination hardware (in particular the OLEDs), the Control Panel automatically enters a panel saver state when its controls have not been touched for a specified time (ranging from 10 to 30 minutes). In the panel saver state all the Control Panel buttons and displays go dark, except the **Key 1** through **Key 6** and **Key Prior** buttons are illuminated blue and cycle. Touching any button or control on the Control Panel exits the panel saver state.

Engineering Setups

GV K-Frame XP inputs and outputs are connected at the rear of the Video Processor Frame. These video signals need to be configured to your facility's requirements. Engineering Setups defines system component functionality and how it is cabled into a facility. Engineering setups are intended to be used and maintained by technical staff, and can be loaded and saved to disk.

The Engineering Setup menus are accessed by touching the **Eng Setup** menu button at the bottom of the screen, and then selecting the appropriate Menu Category button.

Source Definition Inputs

Source definition tells the system which physical inputs or internal signals to use when a particular external (only) source is selected. The source definition, denoted by an Engineering ID number, specifies the signals involved, how to process that signal, and what external devices, if any, are associated with that source. Each GV K-Frame XP Video Processor has one source definition set, shared by all users of that system (control surfaces in all suites).

About GV K-Frame XP Compact Source Definition Inputs

The GV K-Frame XP supports a maximum configuration of 80 inputs: 4 boards with 16 inputs (80 inputs) and 2 boards with eight inputs (16 inputs). Up to two Media Ports (one per board) can be added by installing the 8x4 SDI Conversion I/O boards in the Mod I/O board slots.

GV K-Frame XP Source Definition Inputs

| IP/SDI Inputs | Modular I/O | Media Port |
|---------------|-------------|------------|
| 1-16 | 161-168 | 501 |
| 17-32 | 169-176 | 502 |
| 33-48 | | |
| 49-64 | | |

Change Direct Source Definition

- 1 Select **Eng Setup, Source Definition** in the menu.
- 2 Select a Source from the scrolling list located on left side of the screen.
- 3 Select the **Engineering Name** data pad to name the source using the pop up alphanumeric keypad or standard keyboard. Up to 30 characters can be entered, but shorter names are recommended.
- 4 Select the **Video Input** data pad to enter or scroll to the input number of the connector the source will use for video. The change is immediate and can be viewed on a connected monitor.
- 5 If the source includes a key signal, select **Linear** key with the lower touch buttons. Then select the **Key Input** data pad and enter to the input number of the connector the source will use for the key.
- 6 For Chroma keys you can select either **Linear** or **No Key**. Chroma keys always use the video signal for keying, ignoring any separate key signal.
- 7 If desired, define **Clip High** and **Clip Low** values (used when a fixed linear key is selected for that source) with the labeled soft knobs and data pads.

Source Naming Background Information

Facility engineers need to know the exact routing of all the video signals connecting all the devices they are responsible for. These engineers need to be able to identify video signals in a way that will help them connect devices properly. Production personnel, on the other hand, are interested in the content they work with for their shows, and are generally not concerned about which individual device or routing path is used to make those signals available. They just need a way to identify the content and access it when they need it. To support these differing needs, two source naming mechanisms are available on GV K-Frame XP systems.

Engineering Names, Eng IDs, and Logical IDs

Engineering names are intended to identify a source as it applies to a specific facility. In a truck, for example, cameras may be hard wired to the production switcher and might be given Engineering names 1, 2, and 3. Names like Patch 14 or Rtr 5 may be

used for inputs that are patched or routed. Engineering names are entered in the Eng Setup Source Definition menu, as described above. Engineering source IDs are numeric only, and are available on data pads and scroll knobs for quick selection. The GV K-Frame XP system also has logical IDs, that can be used for source patching, as explained later.

Alternative Source Names

Alternative names can be assigned to sources for the convenience of production personnel. For example, you may give the cameras menu names that include the operator (C1 Bob, C2 Phil, and C3 Bill), but remove the operator names from the OLED names to show C1, C2, and C3 in larger characters. These alternative names are entered in the Source Patch menu.

The User Setups, Suite Prefs, Source Patch menu has three editable columns for defining up to three alternative names:

A **Panel Name** is limited to four characters, to fit the space available on the Control Panel's Transition Module. This name is only displayed on the Control Panel.

An **OLED Name** appears only on the Source Name Displays on the Control Panel. Up to eight characters are displayed.

A **Menu Name** is limited to eight characters, and appears on all the GV Switcher menu application screens except Engineering Setup menus, which always display engineering IDs or names.

Multiple Suites and Source Names

Different sets of these alternative source names are defined for each GV K-Frame XP suite. Ensure the GV Switcher menu application you are using is logged into the correct suite (**Eng Setup, Eng Login**). The same set of engineering names will be used by all suites, however.

Name Display Hierarchy

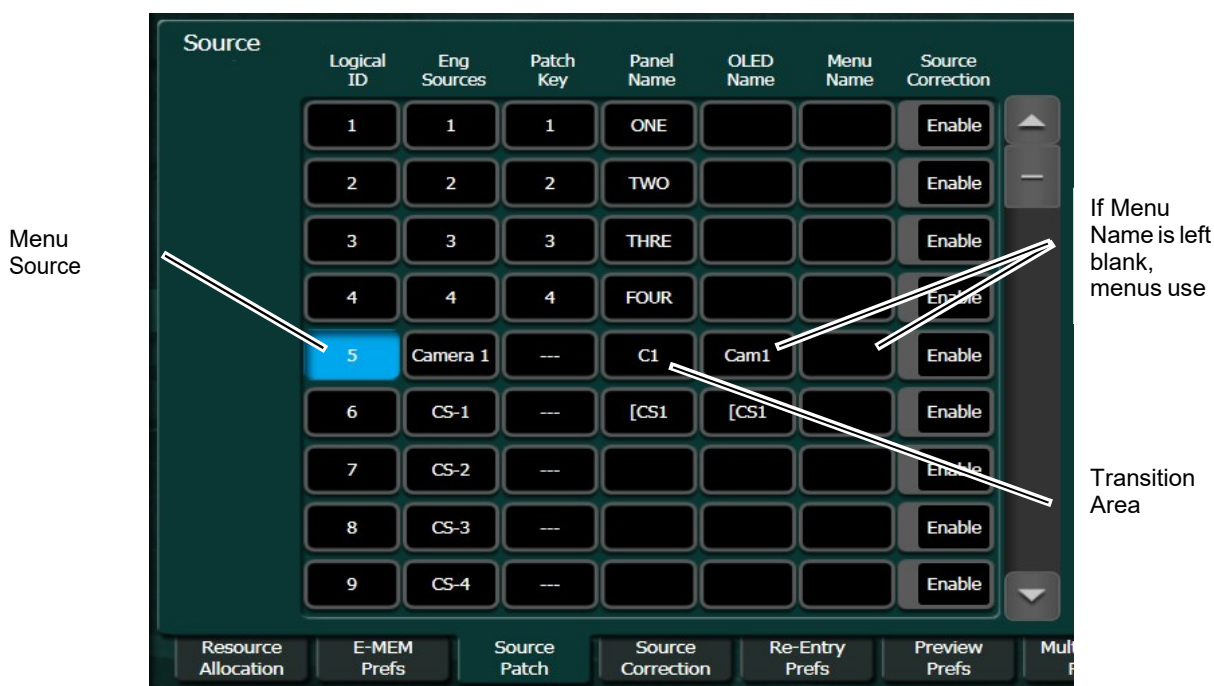
If a source's engineering name is left blank, the Eng ID number will be used. If no alternative names are defined for that source, then that Eng ID number will appear on all the switcher system displays.

If an engineering name has been entered, then the engineering name will be shown on all switcher system displays, including menus. Engineering names will be truncated to the character limits of the display, starting with the first character.

For alternative names entered in the User Setups, Suite Prefs, Source Patch menu, the following rules apply:

For the three editable columns: **Panel Name**, **OLED Name**, and **Menu Name**, if any of the three are left blank for that source, the first name to the left appears in that display on the system (if all three are left blank, the name in the Eng. Source Column is displayed). For example, if an alternative name is entered in the OLED Name column for a source and the other two columns remain blank, the Menu Name takes the OLED Name (OLED Name being first to the left of the Menu Name) but the Panel Name takes the Eng. Source column's name

(first name to its left). If names are entered in all three alternative name columns, each area of the system displays the name entered in each column of the Source Patch menu.



It a good practice to create the least number of names possible. This ensures consistency in the various displays and reduces the time needed to enter and edit the names. If you can create short engineering names that work for both the production staff and engineering, complete naming consistency is assured. However, this level of simplicity is probably only feasible at a fixed installation where all the shows use the same source names. When multiple names are created, try to keep the first four characters unique, and make different names for the same source similar for ease of recognition.

Fixed Sources

Additional, fixed internal sources exist on a GV K-Frame XP system. These internal sources do not have user accessible Engineering IDs and are not displayed on the Eng Setup Source Definition menu.

Fixed Internal K-Frame Sources

| Area | Signals | Source Patch Eng. Source Names |
|---------------------|---|---|
| M/E 1, 2, 3, 4, Pgm | A, B, C, D, Preview A, Preview C, and M/E Viewer (pM) outputs | M1 A, M1 B, M1 C, M1 D, M1 pA, M1 pC, M1 pM same for M2 - M4, Pg A, Pg B, Pg C, Pg D, Pg pA, Pg pC, Pg pM |
| eDPM | Video Out A, C | eDA, eDC |
| | Key Out A, B, C, D | eDAk, eDCk |

Fixed Internal K-Frame Sources

| Area | Signals | Source Patch Eng. Source Names |
|------------------------------|------------------|--------------------------------|
| internally generated signals | Test 1, Test 2 | Test |
| | Black, Black Key | Blk |
| | White | Wht |
| | Background 1 | BG 1 |
| | Background 2 | BG 2 |
| Image Store | Video Out 1 - 8 | IS 1A - IS 8A |
| | Key Out 1-8 | IS 1B - IS 8B |

These fixed sources are accessible via:

- User Setups, Suite Prefs, Source Patch menu
- User Setups, Panel Prefs, Button Mapping menu
- Eng Setup, Outputs menu

Source Patch Feature

The GV K-Frame XP system provides a way to map engineering source IDs to logical IDs, using the Source Patch feature. By default this mapping is one-to-one, but this feature can be used to quickly set up production elements for use in a different facility. For example, a show's effects, DDR clips, and taped material may have been built in one production truck with one set of devices, but the next show is scheduled for a different truck. Previously, to use effects in the other truck the Technical Director (TD) would need to edit the engineering source definitions in the new truck so they exactly matched the old truck. By remapping the engineering sources of the devices in the new truck to the logical sources used to build the effects, all the effects can be used without having to edit them. Source Patching can also be used to quickly swap out a defective device during a show without having to reconfigure the engineering sources. In this case logical names seen by the production personnel would be identical for that content, even though the actual device playing the material changed.

Note: Source Patching is the bridge between engineering sources and logical sources. Both TD and EIC should make reference to this menu when resolving source issues. The mechanism is similar in concept to a physical patch panel. Effects and all source selections are based on logical sources. Tally and associations with external devices are based on engineering sources.

After sources have been defined they can be mapped to Control Panel buttons. The Button Mapping menu (accessed by touching **User Setups, Panel Prefs, Button Mapping**) is used to map the sources associated with each source selection button. Refer to the *Kayenne/Karrera/GV Korona User Manual* for specific button mapping instructions.

Output Assignments

Any outputs can be assigned as fixed outputs, which includes any M/E, Image Store, or eDPM outputs. In addition, any Logical input source can be assigned to any output.

About GV K-Frame XP Source Definition Outputs

The GV K-Frame XP supports a maximum configuration of 40 outputs: four boards with eight outputs (32 outputs) and 2 boards with four outputs (8 outputs).

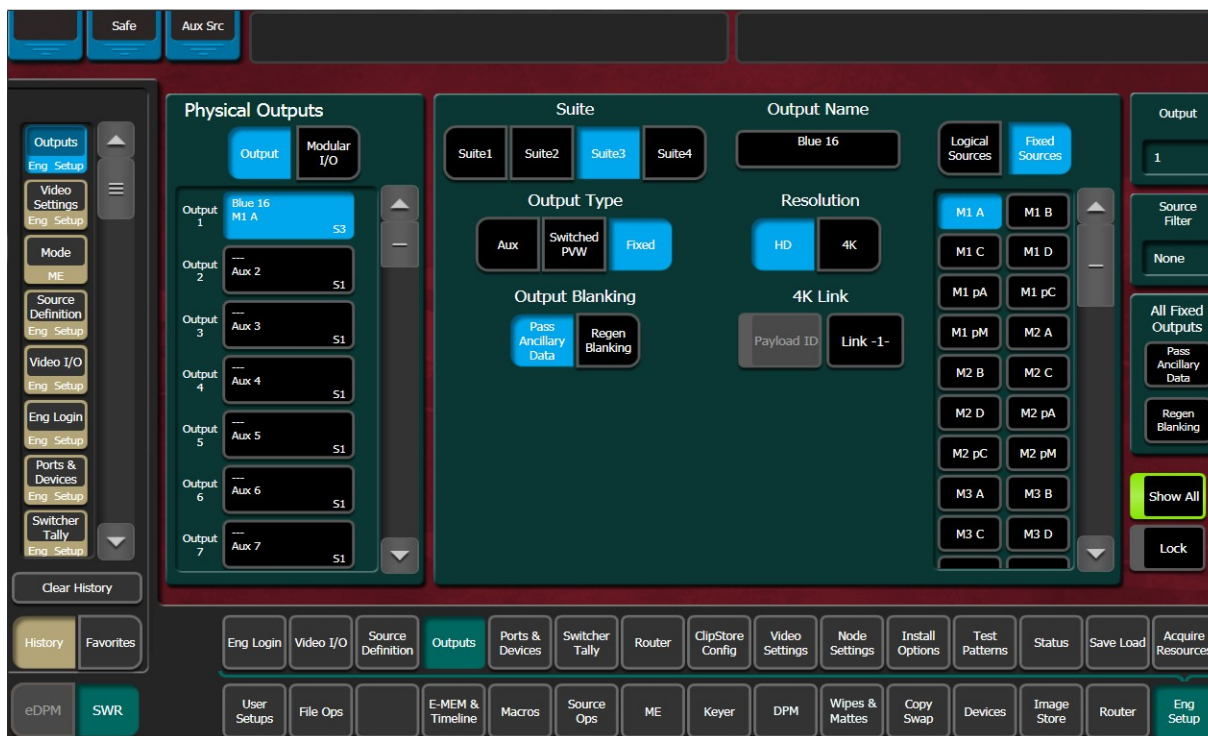
| Outputs | Modular Outputs |
|---------|-----------------|
| 1-8 | 81-84 |
| 9-16 | 85-88 |
| 17-24 | |
| 25-32 | |

Default Output Assignments

Default output assignments are one-to-one with the Aux buses, beginning with Aux 1.

Change Output Assignments

The Outputs menu is used to change the system output assignments. The current output assignments can be viewed in this menu. The scrolling list of data pads along the left side of the screen shows the currently assigned output for each listed output connector. The right side of the menu shows the items available for assignment to that output connector. Different choices appear, depending on the **Output Type** selected, as shown below.



- 1 Select **Eng Setup, Outputs** in the menu.
- 2 Select an output data pad from the left scrolling list to select it and display information for that output connector.
- 3 Select the appropriate Output Type:
 - a **Fixed** if the output is to be dedicated. Later you will be able to select from either Logical Sources or Fixed Sources for that output.
 - b **Switched PVW** if the output will be used for switched preview. Switched preview can be assigned to multiple outputs.
 - c **Aux** if the output will be an Aux bus.

The **Suite 1** through **Suite 4** buttons are used to assign the currently selected output to a suite. The default setting is **Suite 1**.

- 4 Select an output connector from the list on the right. The change is immediate and can be viewed on a connected monitor. (Switched Preview mode does not offer any output sources).
- 5 If desired, select the **Output Name** data pad to change the name of the output using the pop up alphanumeric keypad or standard keyboard. This name appears on the data pad of the scrolling list on the left. Up to 12 characters can be entered.

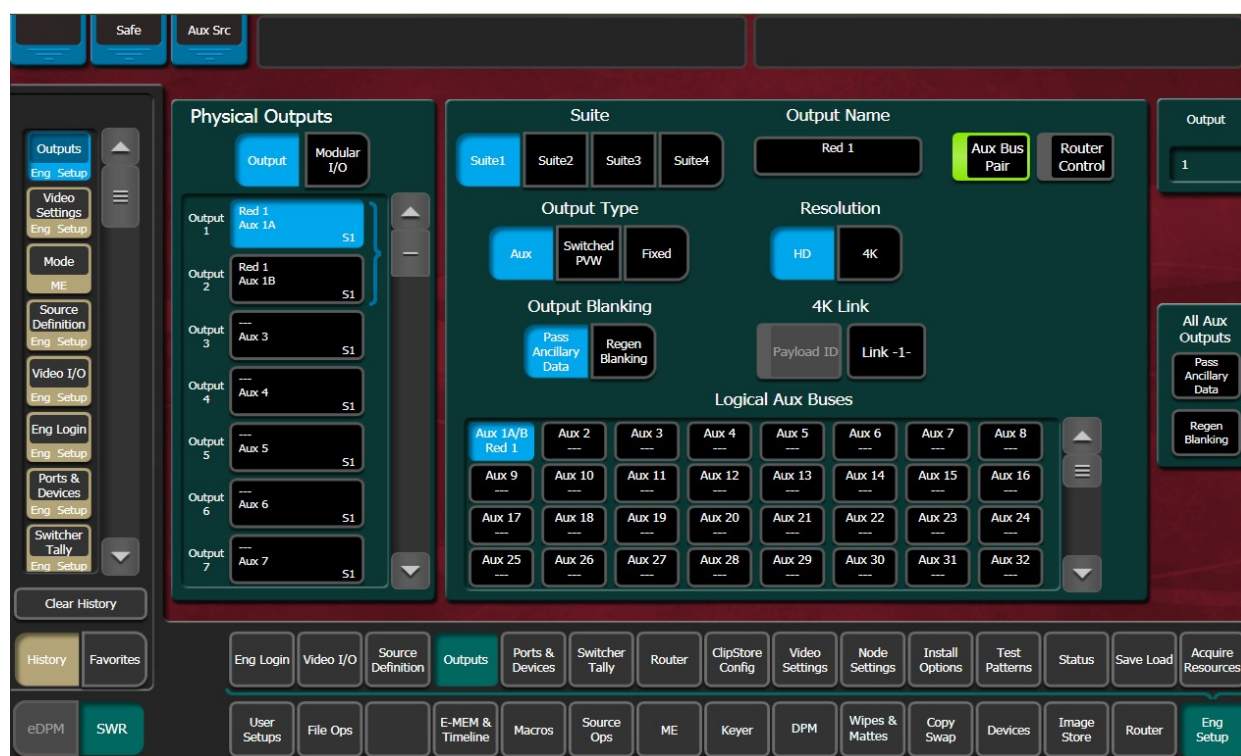
Configuring Aux Buses

Aux buses can be used to send dynamically selected sources to an output. Aux bus sources are selected using the Local Aux panel, delegating an M/E for Aux Bus control, or using Remote Aux Panels delegated to control that Aux bus.

The number of Aux buses on a GV K-Frame XP system varies, depending on how the physical outputs have been mapped. Any output that is not configured as Fixed or Switched Preview is available for use as an Aux bus.

Video Only Aux Bus

When the **Aux Bus Pair** button is not selected, the Aux bus is configured as a single video-only output.



Aux Bus Pairs

Selecting the **Aux Bus Pair** button configures the Aux Bus as an Aux Pair.

Aux Pairs are two physical Aux Buses that have been configured to send a video and associated key (or another video) signal. Pairing of the video and key signal to be used on the Aux bus is defined in the Sources menu as explained earlier. Aux pairs are indicated on the menu with a bracket beside the two connector buttons. The Aux Bus pairs are also identified with A and B letter indicators. The Aux A signal is always a video signal.

About Passing/Blanking Ancillary Data for Individual Outputs

M/E Blanking allows you to either pass all ancillary data or regenerate blanking for M/Es; no audio, subtitles, closed captioning, etc. (in the Eng Setup, Video Settings, Video Controls menu). However, you may want to configure blanking for individual

outputs for external devices or other specific uses. Output Blanking is provided in the Eng Setup, Outputs menu to allow this specialized control.

You can also choose to pass ancillary data or regenerate blanking for all Aux or all Fixed outputs in the Outputs menu. For example, if you selected All Aux Outputs to Pass Ancillary Data in the Outputs menu, you could then set individual aux outputs to Regenerate Blanking. This allows fast configuration of a large number of outputs.

Configure Aux Output Blanking

Configure Aux Output Blanking for all or individual Aux outputs to pass or blank ancillary data in the Eng Setup, Outputs menu.

- 1 In the Eng Setup, Outputs menu, select either **Output** or **Modular I/O**.
- 2 Select an Aux output from the Physical Outputs scrolling list or select **Aux** in the Output Type pane to display the Aux Outputs menu.
- 3 Result: The Logical Aux Bus selection pane is displayed (center) along with other Aux output parameter functions.
- 4 In the All Aux Outputs pane (right), select either the **Pass Ancillary Data** or **Regen Blanking** button to configure all Aux outputs.

With all outputs set to pass or blank ancillary data, you can change individual outputs to the opposite state.

- 5 Select any output in the Logical Aux Buses scrolling list (center).
- 6 Select either the **Pass Ancillary Data** or **Regen Blanking** buttons under the Output Blanking label to set Output Blanking for an individual output.
- 7 Outputs set to blanking have the word Regen in the upper right of the data pad (all other states are blank), in the Physical Outputs scrolling list.

Configure Fixed Output Blanking

Configure Fixed Output Blanking for all or individual Fixed outputs to pass or blank ancillary data in the Eng Setup, Outputs menu.

- 1 In the Eng Setup, Outputs menu, select either **Output** or **Modular I/O**.
- 2 Select a Fixed output from the Physical Outputs scrolling list or select **Fixed** in the Output Type pane to display the Fixed Outputs menu.
- 3 Result: The Logical Sources/ Fixed Sources scrolling list is displayed (right) along with other Fixed output parameter functions.
- 4 In the All Aux Outputs pane (right), select either the **Pass Ancillary Data** or **Regen Blanking** button to configure all Aux outputs.

With all outputs set to pass or blank ancillary data, you can change individual outputs to the opposite state (see [About Passing/Blanking Ancillary Data for Individual Outputs](#)).

- 5 Select any output in the Logical Aux Buses scrolling list (center).
- 6 Select either the **Pass Ancillary Data** or **Regen Blanking** buttons under the Output Blanking label to set Output Blanking for an individual output.

Outputs set to blanking have the word Regen in the upper right of the data pad (all other states are blank), in the Physical Outputs scrolling list.

Switcher Relay Tally Configuration

The GV K-Frame XP Switcher Tally menus are used to configure tally system relays. These menus include multiple relay tally calculators, three different relay tally calculation methods, and user assignment of tally relays. The results of the relay tally calculators are applied to the tally relays on the GPI/Relay Tally connectors on the rear of the Video Processor. Those relays can control external relay tally lights. The Switcher Relay Tally menus also allow the user to map Engineering Sources to the tally relays. Up to 96 tally relay outputs are available on a Video Processor, 24 for each installed Controller or M/E board. Relay tally is recalculated and refreshed every field.

Note: Relay tally Contribution is an alternative electronically mechanism that can be assigned to a K-Frame Video Processor serial port. Refer to the separate *Grass Valley Switcher Protocols Manual* for technical information.

About Relay Tally Systems

In general, a GV K-Frame XP tally system identifies which sources to the switcher contribute to the final picture at a selected point in the video chain. The identification is communicated by activating relays in the Video Processor Frame. The method by which the sources are determined is called the tally calculation.

The tally calculation begins at a point in the video path and then traces the path of the signals upstream to their original video (and key) sources. The state of the switcher affects tally. For example, tally on a true clean feed only includes sources that contribute to the main output, but tally on a programmable clean feed can include sources that do not contribute to the main output.

When configuring a tally calculation, the user chooses the starting video path point (called a tributary) to trace back to its origin. The main On Air tally video output point is Pgm-Pst PGM A, but Pgm-Pst PGM B, Pgm-Pst C, and Pgm-Pst D are included in case these alternate programmable clean feed outputs have keys (or utility buses) that don't contribute to the PGM A output.

The On Air tally calculations are essential for switcher operation. (One calculator is reserved for On Air.) This tally calculation forms the basis for On Air indication (panel, camera tally lights, etc.), and other functions such as external device Auto Start, Off Air Advance, or router protections. On Air tally calculations normally start at the Pgm-Pst PGM A-D outputs.

User tally calculations can be used for purposes other than On Air tally. These tally calculations still trace the video path up stream from the specified points in the video path, but the starting point does not necessarily have to be a program output. For example, a Look Ahead tally begins at the Pgm-Pst Look Ahead Preview (LAP). When a transition is not in progress the source feeding the PVW is not on air.

The Output tally calculator indicates which sources contribute to designated outputs. For example, an M/E Iso tally is a user configured Output tally set up to begin at an M/E's PGM A, B, C and D. The tally would indicate what contributes to the M/E's program outputs but not anything down stream of it. The tally would be the same whether or not the M/E was On Air.

The Look Ahead tally calculator indicates which sources will be on air if a main transition is performed on the selected level. One way this can be used is for a second set of tally lamps on a camera to alert the camera operator that his camera is next to be taken on air. Many control room monitor walls also include a secondary tally

indicator for Look Ahead. Look Ahead tributaries do not necessarily leave the switcher as video signals. For example, an M/E has four program outputs but only two physical preview outputs. The LAP information for all four program outputs may be included in a tally calculation.

However, if an M/E is placed down stream of Pgm-Pst the On Air tally calculation can be configured to start at that M/E's program outputs. If this situation is planned, it is recommended that aux buses be set up to provide the real program outputs for the switcher and the On Air calculation configured using those aux buses as the tributaries.

You can use more than one starting point for tally calculations. Programmable clean feed (FlexiKey) and DoubleTake allow the exclusion of video signals from the M/E main output (PGM A) that appear on one of the other program outputs. Include the other program outputs with the M/E main output (PGM A) as calculation starting points to tally all the On Air sources.

The Bus Selection tally calculator indicates which sources are selected on a specified set of switcher buses. The tally calculator using this method does not trace tributaries upstream; it only tells what sources contribute to the specified bus(es), even if the source is an M/E. For example, a Bus Selection tally calculation could be set up to indicate which source is selected on the Pgm-Pst A bus, permitting audio-follow-video selections to be run by the tally system.

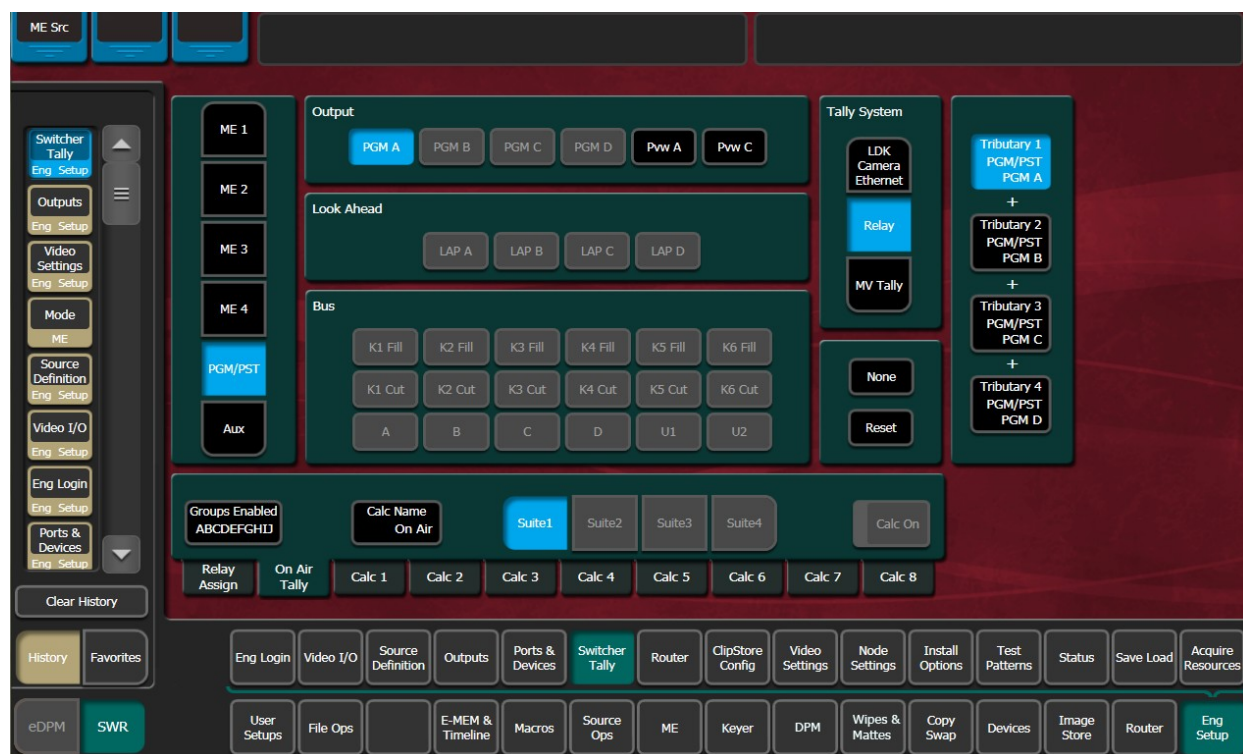
Switcher Relay Tally Calculator Menus

The GV K-Frame XP Switcher Tally menus are used to select calculators, methods, and levels, name calculators, and assign items to Tributaries.

There are six independently running tally calculators. For example, the system can calculate On Air tally independently each suite, and at the same time can calculate Look Ahead tally, and M/E output tallies for three M/Es. The first of the tally calculators is reserved for On Air tally calculations for the current suite. The other four tally calculators can be assigned to other suites.

Up to four tributaries can be included as the basis for each tally calculation. For example, multiple program outputs of the PGM/PST bank are typically included in the On Air tally calculation. The final tally source list is a union of the sources found on each of the four tributaries. If aux buses are used as the program outputs of the switcher, up to four aux buses can be the basis of On Air tally calculations. Tally calculations do not require actual outputs, for example, LAP tributaries are virtual and may never leave the M/E.

Selecting an **On Air Tally** or **Tally Calc 1-4** tab delegates the menu controls to the selected calculator as shown below.



Calc On - Turns the delegated Tally Calculator on or off. When on, the **Calculation Enables** button on the separate Relay Assign menu will be activated for that calculator.

Groups Enabled - Reports which Tally Groups are currently assigned for that calculator, by group letter (A, B, C, D, corresponding to Tally/GPI connectors 1-4 on the rear of the GV K-Frame XP Video Processor). To Enable a Tally Relay Group, it must first be turned on, using the **Calc On** button for that calculator.

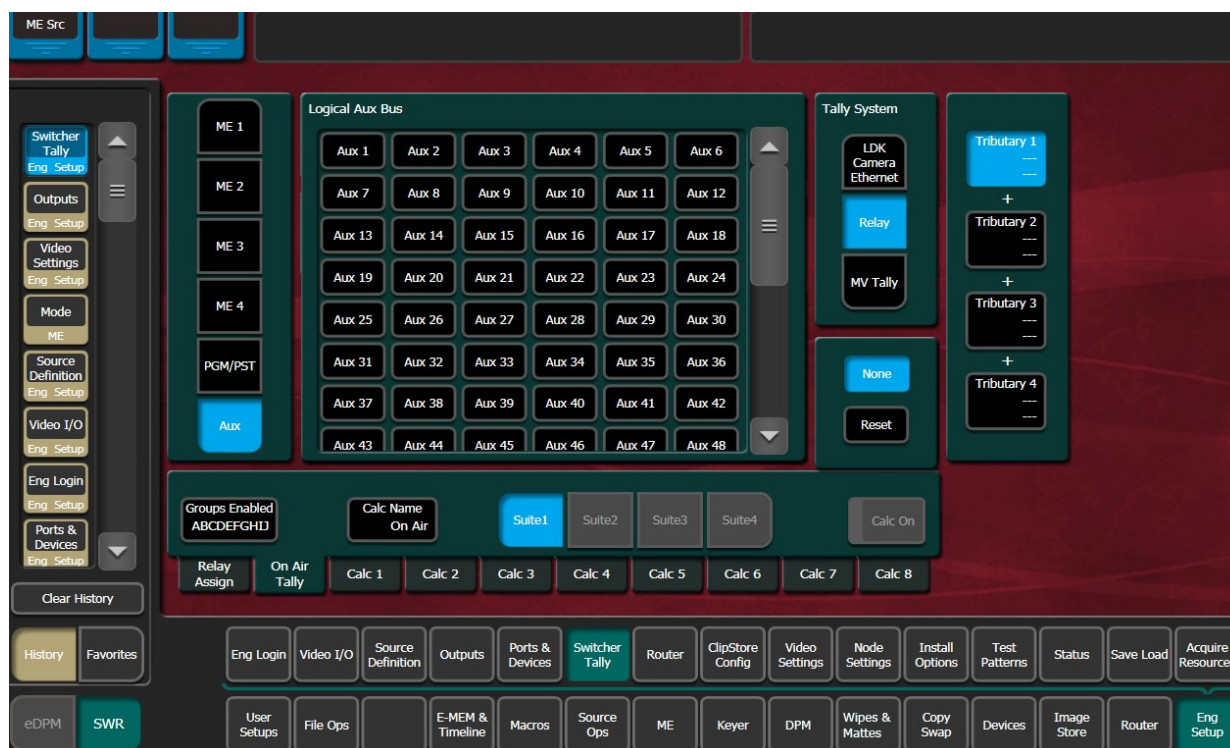
The first tally calculator name is fixed to **On Air**. Since the On Air Calculator is restricted the Look Ahead and Bus buttons are disabled (grayed out).

Creating an On Air Relay Tally Calculator Using M/Es or PGM/PST

- 1 If necessary, login to the desired suite (**Eng Setup**, **Eng Login**).
- 2 Select **Eng Setup**, **Switcher Tally**, **On Air Tally** to access the On Air Tally menu. The Suite button for the current suite will be highlighted.
- 3 Select a **Tributary** button on the right.
- 4 Select an **ME** or **PGM/PST** button on the left.
- 5 Select an Output button to assign that output of the M/E or PGM/PST to that tributary. The name of the output is displayed on the Tributary button.
- 6 Repeat the steps above for other Tributaries for all the outputs you wish to assign for On Air Tally.
 - Pressing the **None** button clears the assignment for that Tributary.
 - Pressing the **Reset** button clears all the assignments to all the Tributaries.

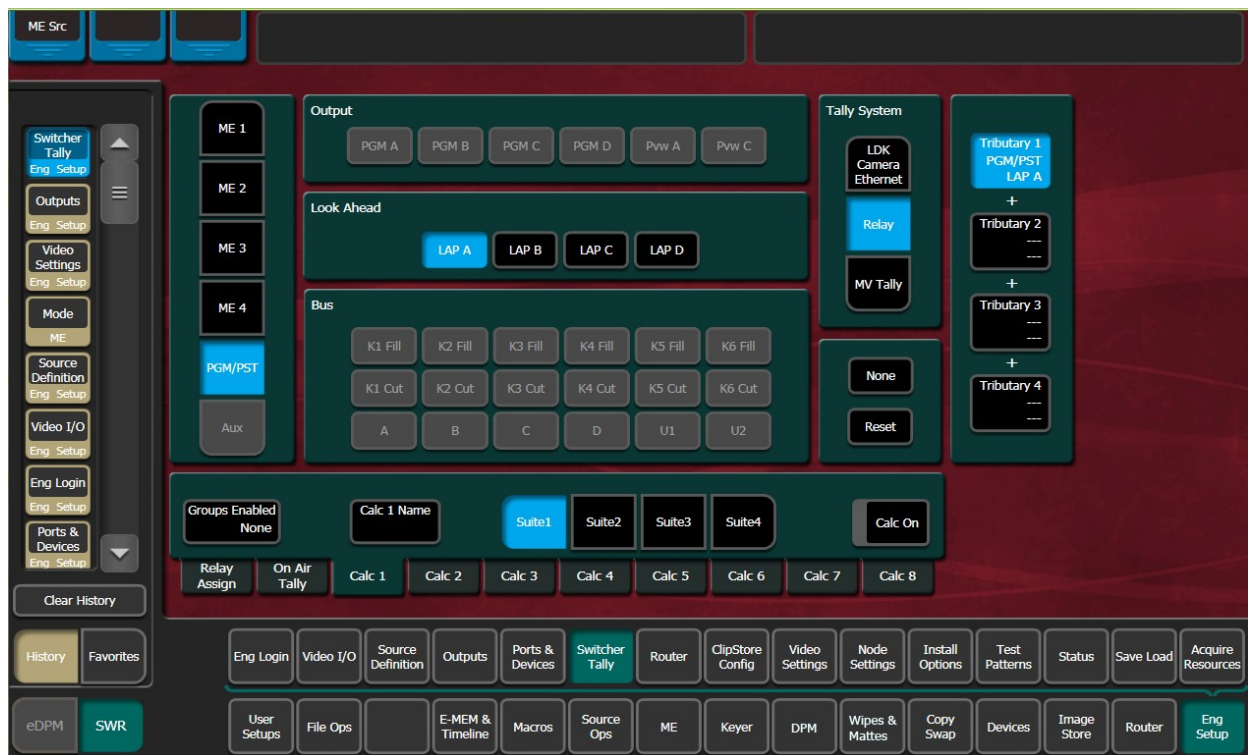
Create an On Air Relay Tally Calculator Using Aux Buses

- 1 If necessary, login to the desired suite (**Eng Setup, Eng Login**).
- 2 Select **Eng Setup, Switcher Tally, On Air Tally** to access the On Air Tally menu. The Suite button for the current suite will be highlighted.
- 3 Select a **Tributary** button on the right.
- 4 Select the **Aux** button on the left.
- 5 Select Aux bus button(s) to assign that output of that Aux bus to that tributary. The name of the output is displayed on the **Tributary** button.
- 6 Repeat the steps above for other Tributaries for all the outputs you wish to assign for On Air Tally.
 - Pressing the **None** button clears the assignment for that Tributary.
 - Pressing the **Reset** button clears all the assignments to all the Tributaries.



Creating a Look Ahead Relay Tally Calculator

- 1 Select **Eng Setup, Switcher Tally, Tally Calc 1-4** to access a Tally Calc menu.
- 2 Select the **Calc 1-4 Name** button to open a keypad you can use to name that calculator.
- 3 Select a **Suite 1 - Suite 4** button for the GV K-Frame XP suite that will use this calculator.
- 4 Select a **Tributary** button on the right.
- 5 Select an **ME** or **PGM/PST** button on the left.
- 6 Select a LAP 1-4 button to assign that look ahead to that Tributary.
- 7 Repeat to assign all the desired look ahead previews to the calculation.
- 8 To activate this calculator, touch the **Calc On** button so it is highlighted.



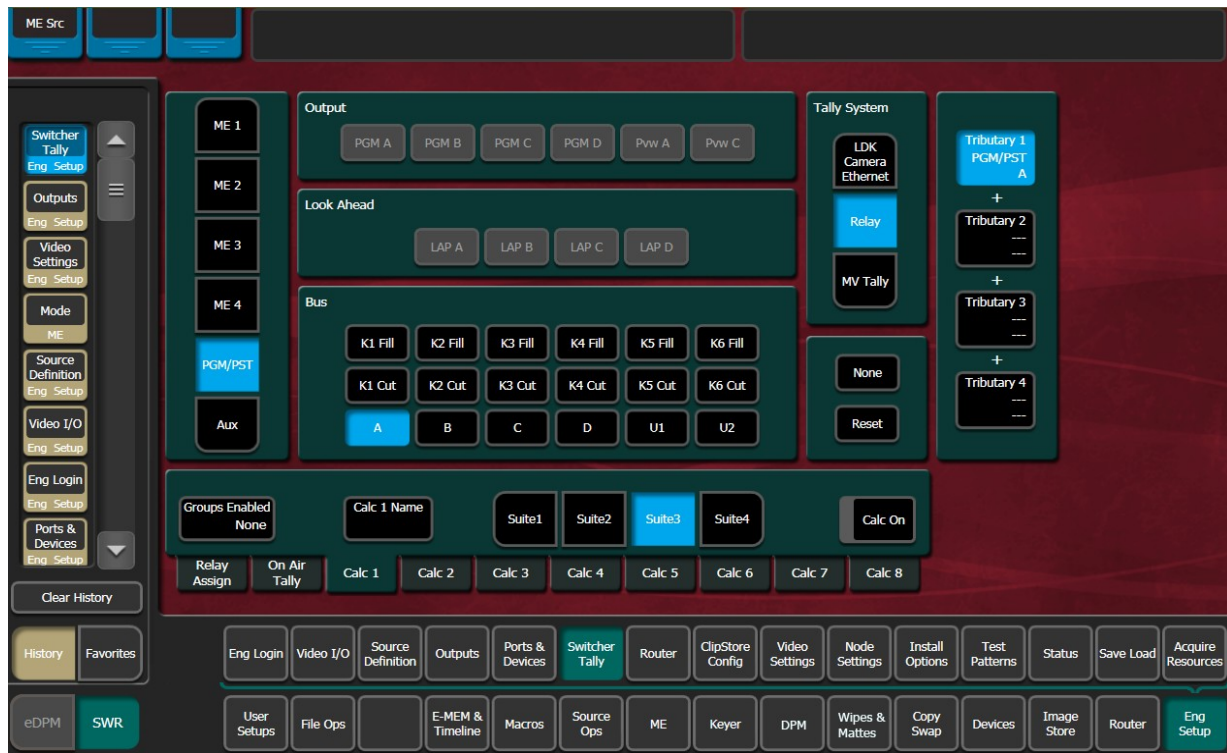
Note: Though the calculator is activated, it will not actually affect Video Processor Frame relay contacts until that calculator has been assigned to a Tally Group.

Creating a Bus Relay Tally Calculator

Bus tallies report what source(s) are currently selected on a particular set of buses, and does not trace tributaries upstream.

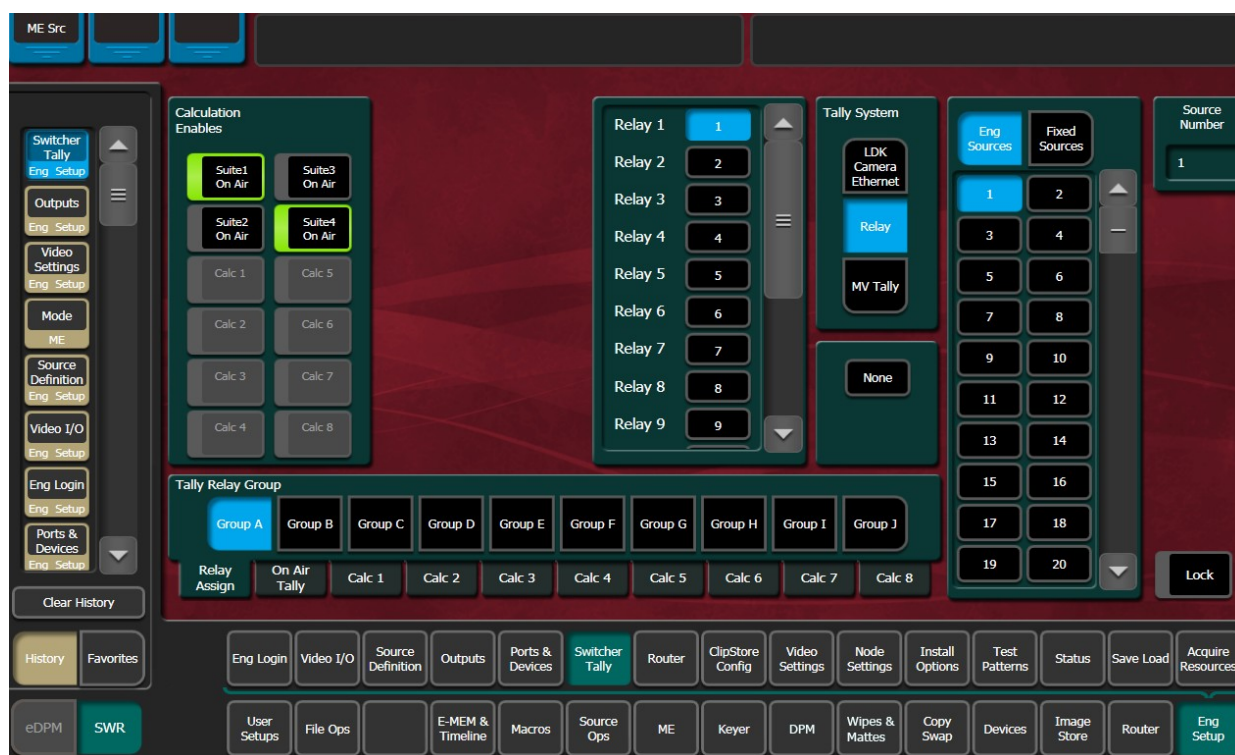
Use the Look Ahead Preview procedure above, but choose PGM/PST, ME, or Aux, on the left, and then select the desired bus in the center of the screen. Repeat for all the buses you wish to tally.

Basic Configuration



Relay Assign Menu

The Relay Assign menu is used to assign the Tally Calculators to Relay Groups, and assign Engineering/Fixed Sources to relays on the Video Processor Frame GPI/Tally connectors. Touch the Relay Assign tab to access the menu.



Tally Relay Group - Delegates the menu controls to configure the selected Tally Group. The A through J Tally Groups correspond to Tally/GPI connectors 1 through 10 (or 1 through 4) on the rear of the Video Processor.

Calculation Enables - Assigns the Tally Calculators to the delegated Tally Group. When a calculator button is off, that calculator's results will not trigger relays for that Tally Group.

Note: A calculator must be activated with its **Calc On** button before it can be assigned to a Tally Group.

Assign Sources to Tally Relays

Sources are assigned to specific relay connectors with the controls on the upper right.

- 1 Touch the button for the desired Relay in the center of the menu.
- 2 Choose the Engineering or Fixed Source in the scrolling list on the right. The name of the source will be displayed on the Relay button.
 - The **None** button clears the current Source assignment for the selected relay.
 - The **Source Number** data pad and scroll dial can be used to quickly select the desired Engineering Source.
 - The **Lock** button can be used to prevent the source list from scrolling automatically to that relay's source. This permits easy selection of adjacent sources.

Ethernet Tally Configuration

The GV K-Frame XP system provides all the tally data needed by the Ethernet tally client. Typically, the only user-defined selection for Ethernet tally from the switcher is the on-air Program M/E. PGM/PST is the default on-air tally Program M/E, however any licensed M/E can be defined as Program. Sources are on or off air based on the Program M/E selection.

Configure the On-Air Tally Program M/E

The default on-air Program M/E is PGM/PST.

- 1 Select **Eng Setup, Switcher Tally, On Air Tally**.
- 2 Select an available (licensed) M/E as the on-air tally Program M/E, for example ME 1, ME 2, Aux, etc.

Configure the GV Switcher Ethernet Tally System Interface

The switcher system must be configured to interface with third party Ethernet Tally systems. An initial tally client port selection can help ensure a successful connection.

- 1 Configure the Ethernet Tally interface IP Address:
 - a In the Eng Setup, Ports & Devices menu, select the **Tally Ports** tab.
 - b In the Tally Contribution pane, select an Ethernet Tally IP Address data pad and enter the IP address for an Ethernet Tally system in the pop-up keypad and press **Enter**.
- 2 Select the adjacent Enable button (highlights green when on).

Note: When the connection is enabled, the Connection Status LED turns green.

- 3 At the tally client, set the connection to **Port 2012** to establish the initial connection between the GV Switcher and Ethernet Tally systems.
- 4 At the tally client, set the connection to **Port 2012** to establish the initial connection between the GV Switcher and Ethernet Tally systems.

Set Source Names with External Ethernet Tally



Set Source Names with External Ethernet Tally

Support for setting source names through external Ethernet tally clients can be added by tally client developers. Once enabled, the tally client can send data to the Frame that will modify any or all source names in the system, including the Engineering Names for each source. Additionally, the Control Panel, OLED, and Menu names for each logical source in each suite can be set externally.

- 1 Select **Eng Setup, Ports & Devices, Tally Ports**.
- 2 Select an Ethernet Tally IP Address data pad, enter the IP Address of the external tally system in the pop-up keypad, and select **Enter**.

The Connection Status indicator for that tally contributor turns green when connected. The Tally Clients pane (right) displays which suites have external Ethernet tally contribution (S1-S4) and tally system information.

Connection Status Indicator colors:

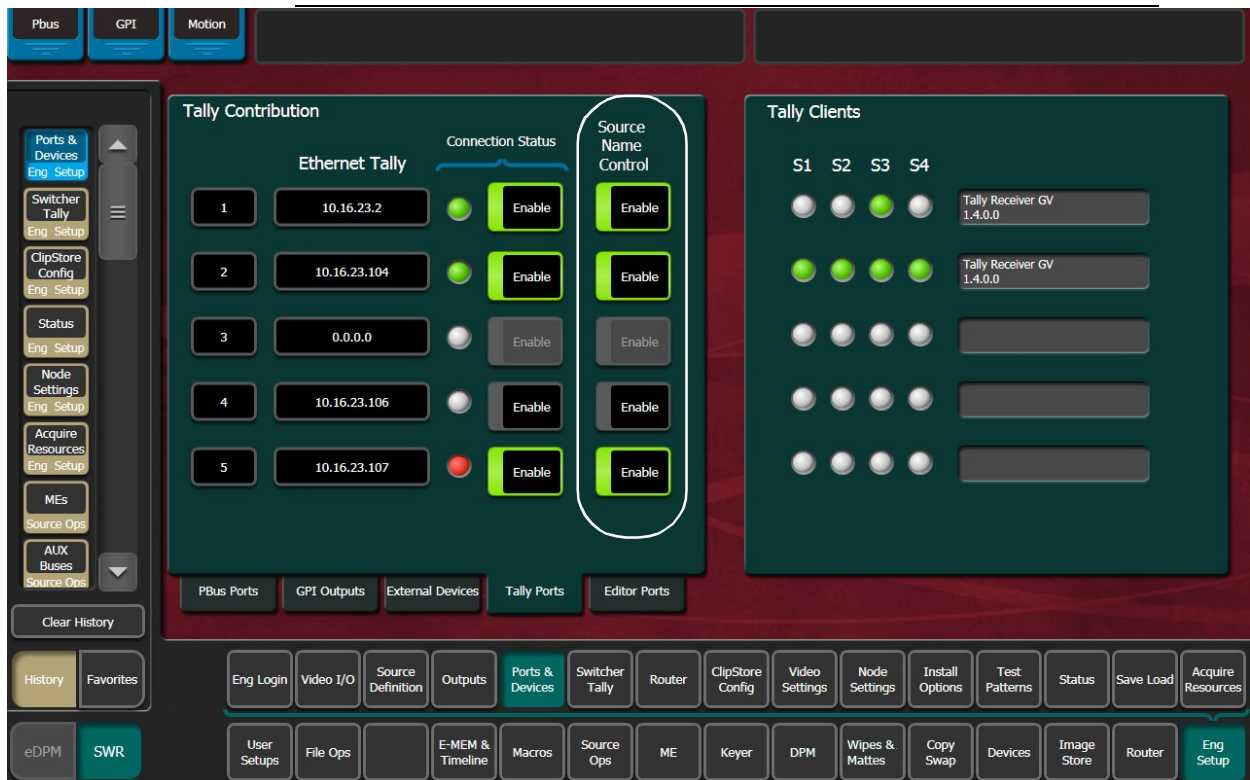
- White—no external Ethernet tally connection
- Green—external Ethernet tally client is connected
- Red—external Ethernet tally connection error

- 3 Select the Connection Status **Enable** button to connect to the external Ethernet tally client.
- 4 Enable the Source Name Control by selecting the **Enable** button for the external Ethernet tally connection.

Note: Source name control is enabled only when the Connection Status and Source Name Control **Enable** buttons are both enabled (highlighted

Basic Configuration

green).



ClipStore Configuration

ClipStore basic configuration includes preparing the Summit/Solo and GV K-Frame XP systems through licensing, IP addressing, software installation, cabling, and GV Switcher menu configurations.

Summit/Solo Software Version

The latest version of the ClipStore server software is available on the Grass Valley Switcher Software Download site.

CAUTION: Do not use AppCenter Elite software for ClipStore from the Summit/Solo server web site as it might not be compatible.

For more information about installing and updating AppCenter Elite software, see the Summit/Solo manuals.

Setting the Summit IP Address

The ClipStore Summit/Solo server is shipped with the following defaults:

- IP Address: 192.168.0.180
- Mask: 255.255.255.0
- Gateway: 192.168.0.1
- WINS: disabled (0.0.0.0)
- DNS: disabled (0.0.0.0)

You can temporarily change the default settings using Netconfig (see the *NetConfig Network Configuration Application Instruction Manual* at www.grassvalley.com).

The NetConfig Network Configuration Tool can be installed with the K-Frame Switcher Installer software.

IMPORTANT: Make note of the ClipStore IP Address, it will be used later to enable ClipStores as external devices in the configuration process.

Install the ClipStore License

Verify that the GV Switcher software is version 15.0 or later. For information about upgrading software, see the *Kayenne/Karrera/GV Korona Release Notes*.

Install the ClipStore license. The following are the ClipStore options:

- KRR-CLPS-2CH-PAK (2-Channel Solo Server Platform)

- KRR-CLPS-4CH-PAK (4-Channel Summit Server Platform)

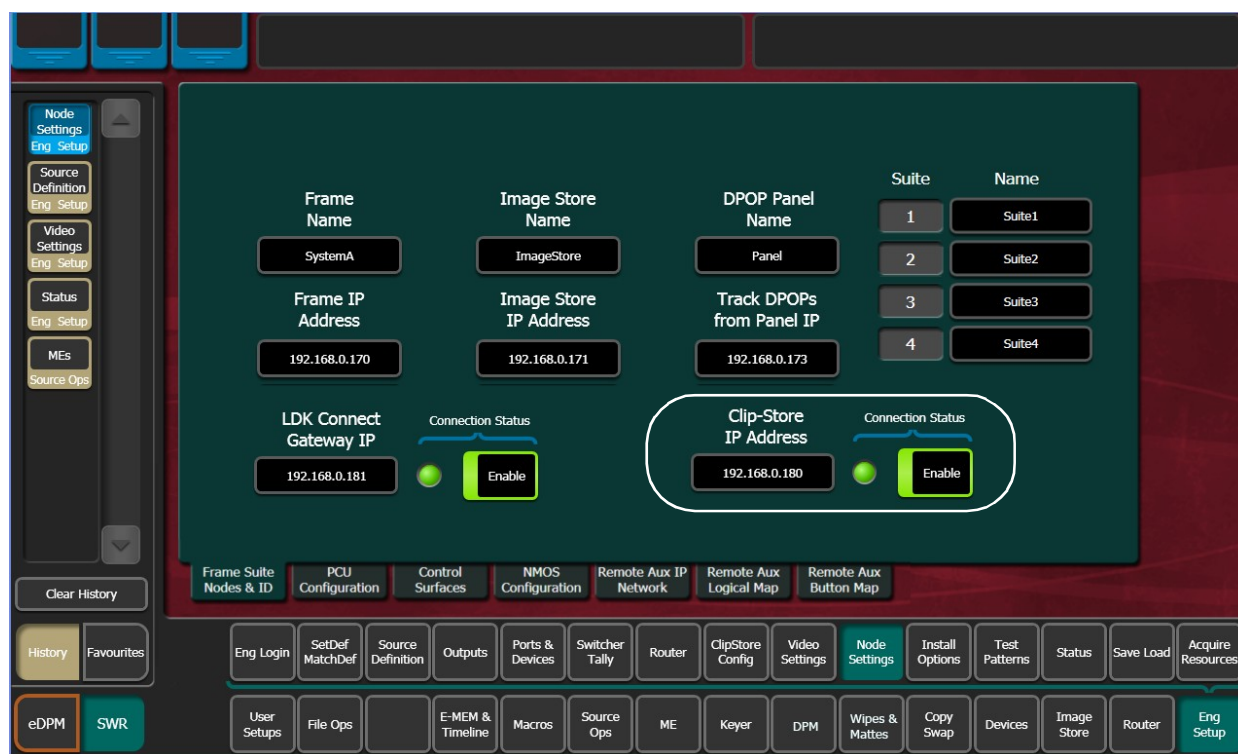


Configure ClipStore as a Node

ClipStore must be configured as a node in the Eng Setup, Node Settings menu before the system can communicate with the Summit/Solo ClipStore server.

- 1 Verify there is a valid network connection.
- 2 Select **Eng Setup, Node Settings, Frame Suite Nodes & ID** in the GV switcher menu.
- 3 Input a valid IP address for the ClipStore server by touching the **ClipStore IP Address** data pad, typing the address, and touching **Enter**.
- 4 Select **Enable**.
- 5 The Enable button allows communication between the GV K-Frame XP and the ClipStore server and highlights green indicating a proper connection. Red will show no connection and yellow shows that some channels are connected. For both red and

yellow indications, ensure that channels are in AMP mode and available for remote control. Other troubleshooting may be required.



Configure Source Definitions

To configure source definitions for ClipStore return outputs, choose a source, a source type “Device”, an input fed by the device, a Key Mode, and an Engineering Name for the source if desired.

The following example demonstrates the configuration of a Summit with four ClipStore channels. In this example the physical BNC connections from the ClipStore to the Frame are Inputs 25-32.

ClipStore can record Video only, Key only, or Video/Key clips. To do this, both a video and a key for the video must be configured for each ClipStore channel.

To configure a ClipStore source of a video/key pair as a video fill source:

- 1 Select **Eng Setup, Source Definition** in the menu.
- 2 From the Source List, select a source.
- 3 Use the default video input (Video In:) or change it using the **Video Input** data pad.
- 4 Select **Linear Key**.
- 5 Use the **Key Input** data pad (or soft knob) to select the source number of the Key source you will use for the ClipStore channel.
- 6 Configure the Source Type:
 - a Select the **Device** mode button in the Source Type pane.
 - b Select the **External Device** data pad, the External Device List is displayed.

c Select a **CS channel**.

The External Device List closes and the Engineering Name is filled in with the ClipStore External Device name automatically.

To configure a source as a ClipStore Key input (Key input to the ClipStore Video input created earlier):

- 7 From the Source List, Select a source.
- 8 Select the **No Key** button in the Key Mode (if not selected).
- 9 Use the default video input (Video In:) or change it using the **Video Input** data pad.
- 10 Select the **Direct** mode button in the Source Type pane.
- 11 Give the ClipStore key input an Engineering Name if desired by Selecting the **Engineering Name** data pad and entering the name in the pop-up keyboard.

You now have device control over this ClipStore resource, and it can be mapped. Repeat the preceding steps for each ClipStore channel.

Configure Outputs

Set the switcher outputs that are feeding into ClipStore. By selecting an Aux bus then touching one of the CS-1 through CS-4 enable buttons, those Aux bus outputs will be paired. In other words, if you select the output, then Aux 5, Aux 5a and Aux 5b will be paired as a ClipStore Video/Key pair when the ClipStore button is enabled.

- 1 Go to the Outputs menu by touching **Eng Setup, Outputs**.
- 2 Select the odd numbered output (first Aux bus output assigned for a video/key pair must be odd/fill) that you wish to use as the input to ClipStore. Then select Aux as the Output Type and the desired logical Aux bus.
- 3 Select one of the ClipStore buttons.
- 4 Repeat the preceding steps for each channel of ClipStore.

Note: It is only necessary to configure all channels as video/key if you wish to record on all channels.

The Engineering Names for each ClipStore channel will appear in the Local Aux area and/or can be button mapped as desired.

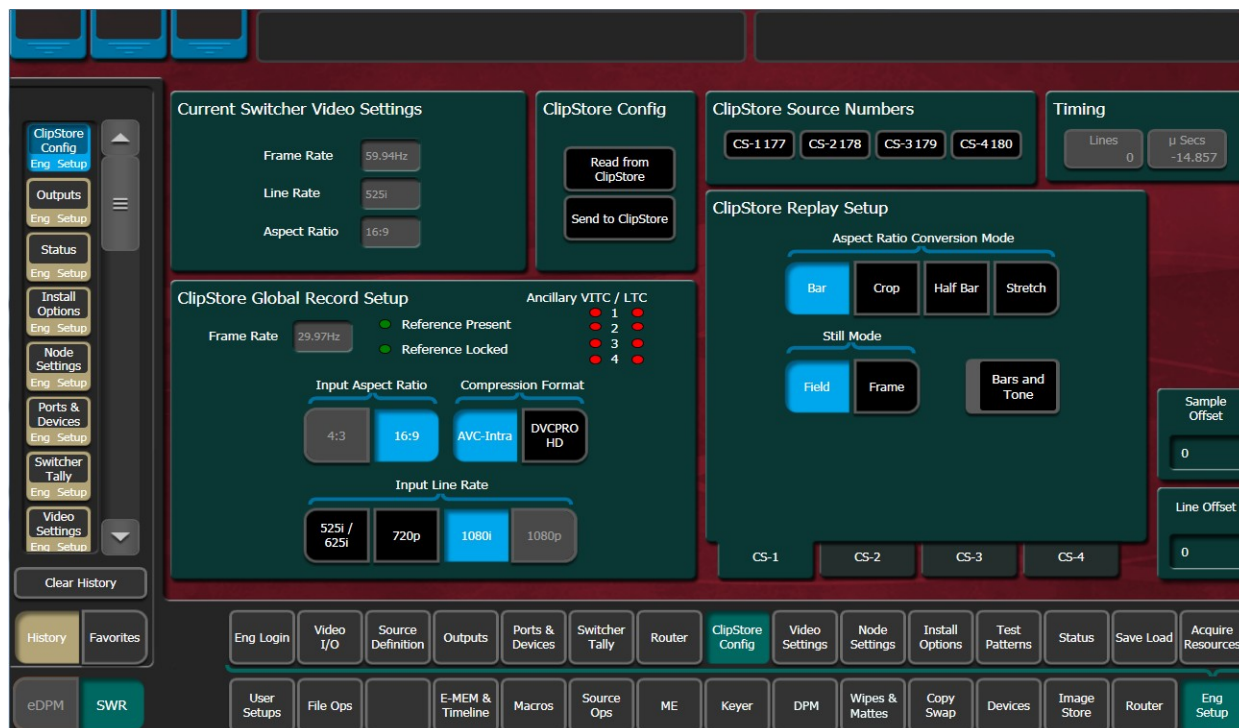
Acquire and Assign CS channels in another suite

- 1 In the Outputs menu, deselect the CS channels to be acquired.
- 2 Select a suite (**Suite 1 - Suite 4**) button to change suite delegation.
- 3 Re-acquire the CS outputs by Selecting the CS buttons (CS-1, CS-2, etc.).

It is recommended at this point that you save a new Eng Setup file that includes these changes.

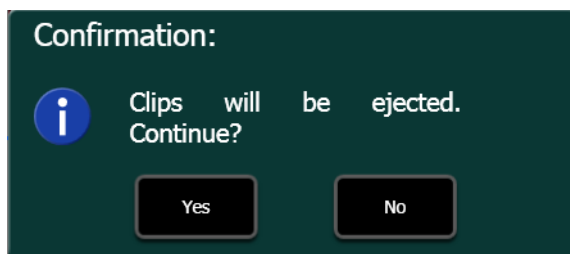
ClipStore Config Menu

The ClipStore Config menu is used to configure the ClipStore input/output parameters and read those input/output parameters from, or send them to, the ClipStore server.



Read from ClipStore button—Updates the Eng Setup, ClipStore Config menu with the current parameter settings for the configured ClipStore server channels.

Send to ClipStore button—Sends all parameter and system settings required by ClipStore to record, edit, and control clips to the server. Any changes to the Record Setup or Replay Setup parameter settings will also be sent to the ClipStore server. A dialog is displayed when this button is pressed, stating that all clips will be ejected as part of this operation; keep this in mind if considering this operation during a broadcast.



The ClipStore Source Numbers Pane (read-only), provides channel and source information, for example CS-1025 means ClipStore Channel1 (CS-1), Eng Source ID 25 (025).

Bars and Tone button—Turning this button on (highlighted green) then selecting the **Send to ClipStore** button, loads color bars (and updates the configuration) and sends a tone to the selected ClipStore channel for testing.

Assigning ClipStore Channel Resources to a Suite

ClipStore resources can be acquired in suites. ClipStore suite assignment buttons in the Eng Setup, Acquire Resources, Effects, Stores, & Viewers menu. For information about acquiring suite resources (see [Acquire and Assign CS channels in another suite](#), on page 205).

Set the Summit/Solo IP Address

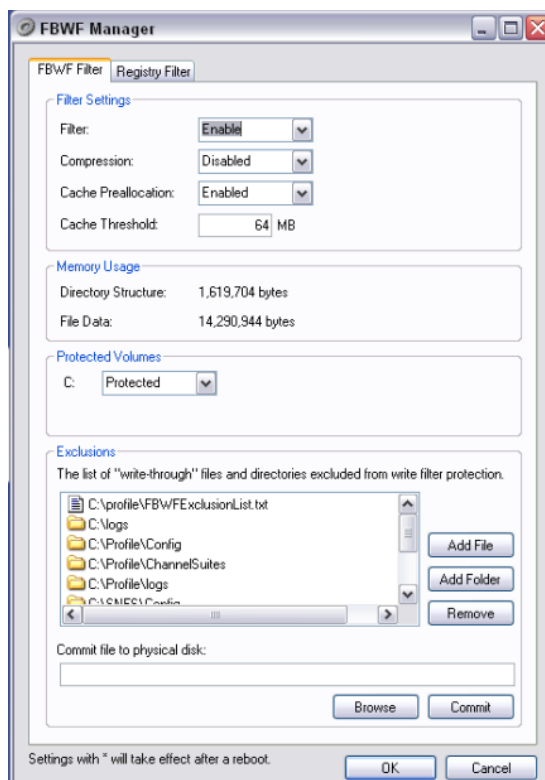
See the Summit/Solo manuals packaged with the system.

Configure the Remote Desktop Connection

To create a Remote Desktop Connection with the Summit/Solo, perform the following:

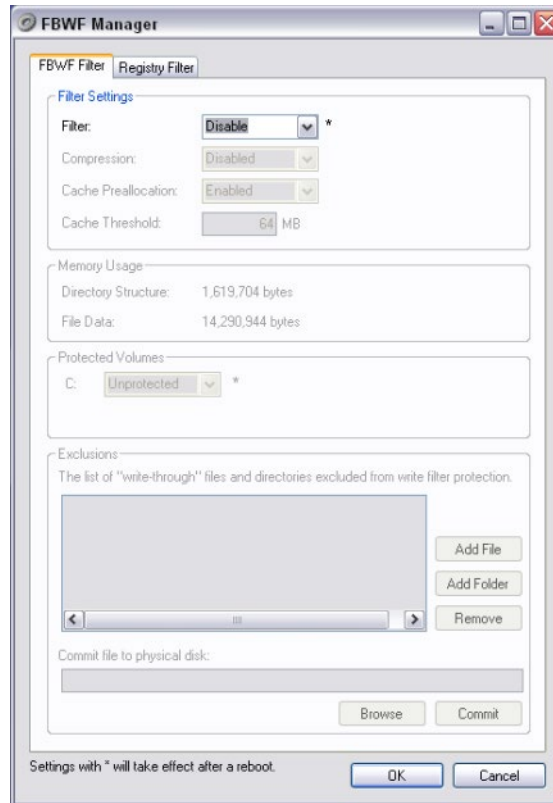
- 1 Minimize the GV Switcher menu on the menu Panel (or PC).
- 2 In Windows, click **Start, Programs, Accessories, Remote Desktop Connection**.
- 3 Enter the current IP Address for the Summit/Solo server. (default IP Address: 192.168.0.180) in the Remote Desktop Connection dialog.
- 4 Click **Connect**.
- 5 Enter the following in the Log On to Windows dialog:
- 6 Login: **administration**
- 7 Password: **adminK2**, touch enter.
- 8 The Elite AppCenter application window is displayed.

Result: The FBWF Manager is displayed.



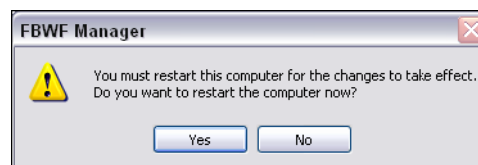
- a Under Filter Settings click the **Filter:** pull-down menu, click **Disable** (Enabled is the default), and click **OK**.

Result: An asterisk (*) will appear next to 'Disable' that indicates the system must be rebooted to implement the configuration change.



- b At the reboot prompt, click **Yes**.

t

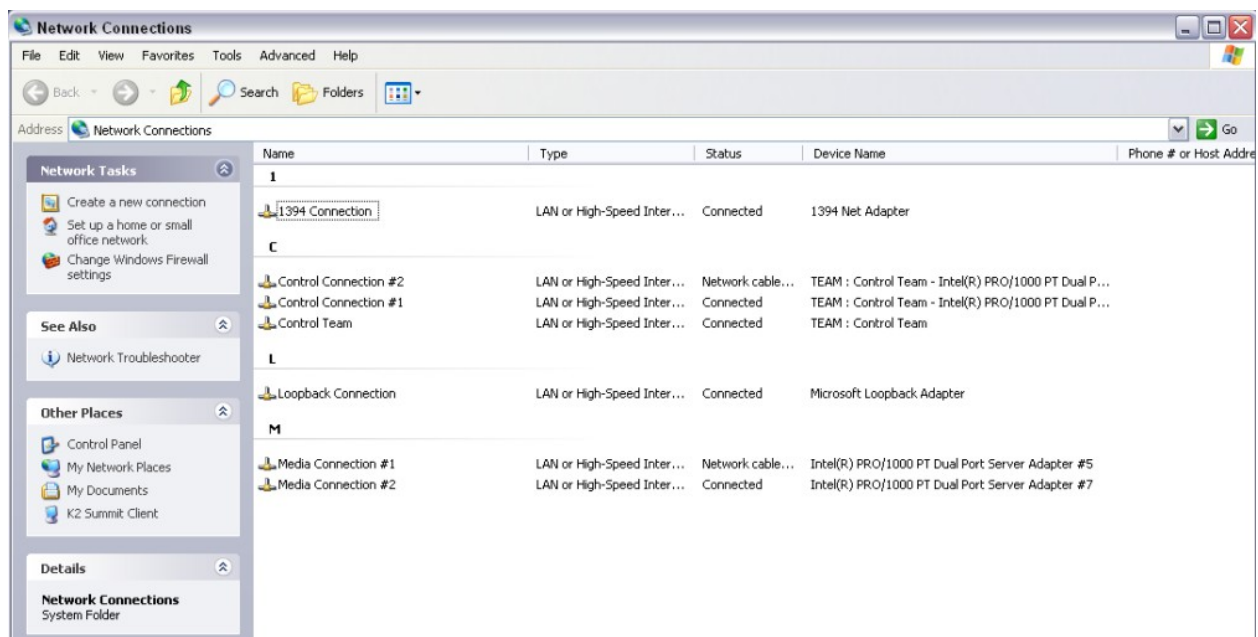


- 9 Right-click on **Network Places**.
10 Click **Properties**.

Basic Configuration

Configure the Remote Desktop Connection

11 Right-click on **Control Team**.



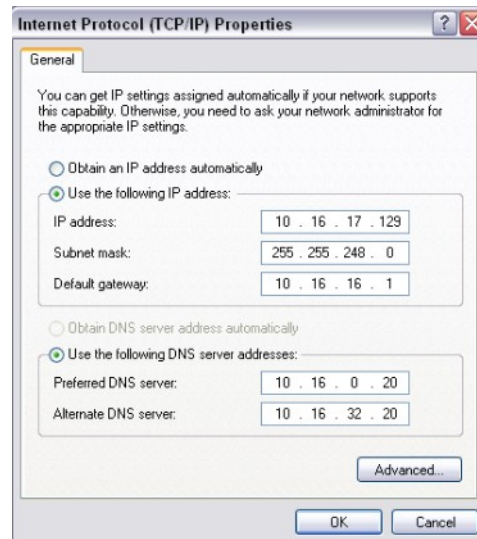
12 Click **Properties**.

13 Scroll down to "Internet Protocol (TCP/IP)" and click to highlight it.



14 Click **Properties**.

The TCP/IP Properties Dialog is displayed.



15 Enter the desired IP Address, and click **OK**.

16 The Subnet mask will be filled in automatically.

17 Click **OK**.

ClipStore Hosts File Update

Modify the Windows hosts file for the GV K-Frame XP system to optimize ClipStore performance. Procedures for Windows 7 and newer are provided.

The file is found on the ClipStore at C:\Windows\System32\drivers\etc and must be edited in notepad:

```
# Copyright (c) 1993-2009 Microsoft Corp.
#
# This is a sample HOSTS file used by Microsoft TCP/IP for Windows.
#
# This file contains the mappings of IP addresses to host names. Each
# entry should be kept on an individual line. The IP address should
# be placed in the first column followed by the corresponding host name.
# The IP address and the host name should be separated by at least one
# space.
#
# Additionally, comments (such as these) may be inserted on individual
# lines or following the machine name denoted by a '#' symbol.
#
# For example:
#
#       102.54.94.97       rhino.acme.com          # source server
#       38.25.63.10       x.acme.com              # x client host


# localhost name resolution is handled within DNS itself.
#   127.0.0.1      localhost
#   ::1            localhost
```

Update Hosts File for Windows 7 and Newer

Windows Embedded Security must be disabled and re-enabled as part of the hosts file update process.

- 1 Right-click on **Computer** on the ClipStore Desktop and select **Properties**, note the Computer Name.
- 2 Right-click on **My Computer** on the Menu Panel Desktop and select **Properties**, note the Computer Name.
- 3 Click the Start menu, enter Embedded Security Manager in the *Search Programs and Files* box, and select **Embedded Security Manager**.
- 4 Click **Enter** in the Update Mode line of the Embedded Security Controls pane.
- 5 Restart the computer, verify that the Current Status is "Update" in the Embedded Security Manager.
- 6 Navigate to C:\Windows\System32\drivers\etc.

- 7 Open the hosts file in Notepad and follow the Microsoft instructions to add the following entries:

```
192.168.200.200 local host
192.168.200.200 <Summit/Solo Computer Name>
192.168.0.175 <Menu Computer Name>
<Additional Menu IP> <Menu Computer Name>
```

Note: The default Menu Panel IP Address is shown in this example.

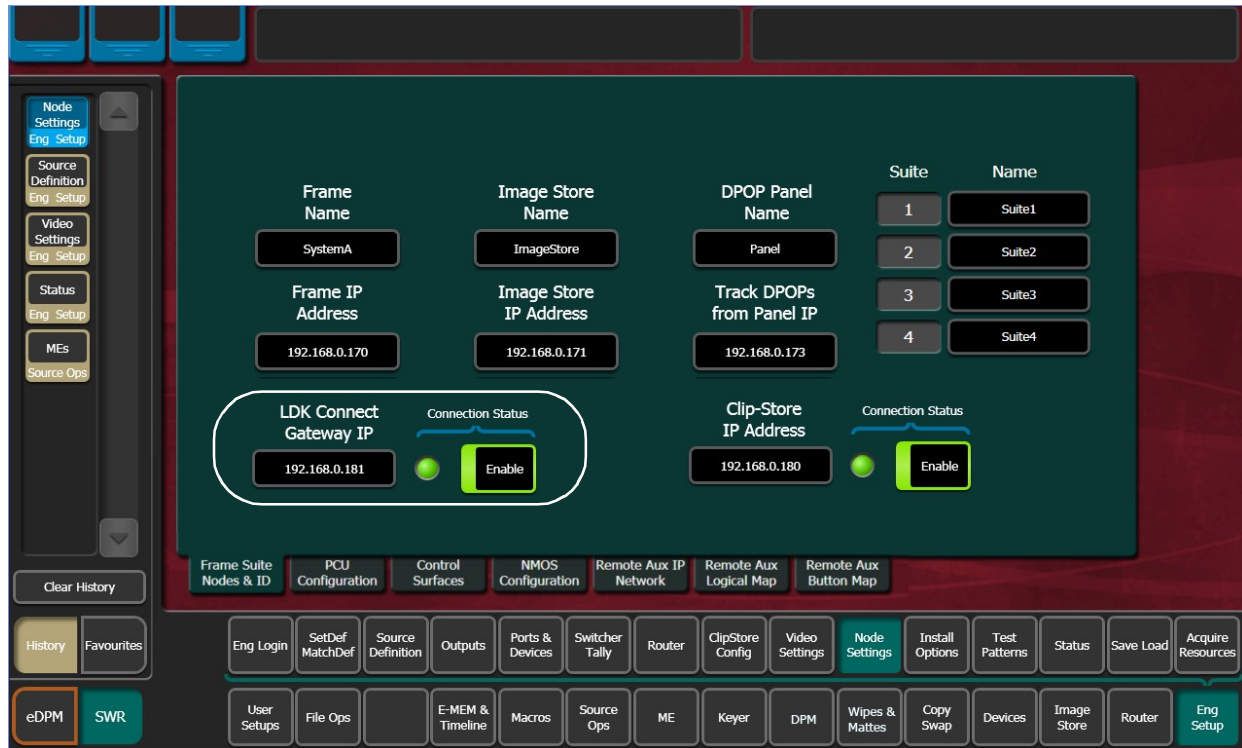
- 8 Save the file.
- 9 Open the Embedded Security Manager and click **Leave** in the Embedded Controls pane.
- 10 Restart the computer, verify that the Current Status is "Enabled" in the of the Embedded Security Manager.

Camera Control with Ethernet Tally Configuration

The GV K-Frame XP system uses Ethernet to communicate with the LDK Connect Gateway. Some basic configuration is required in the Eng Setup menu.

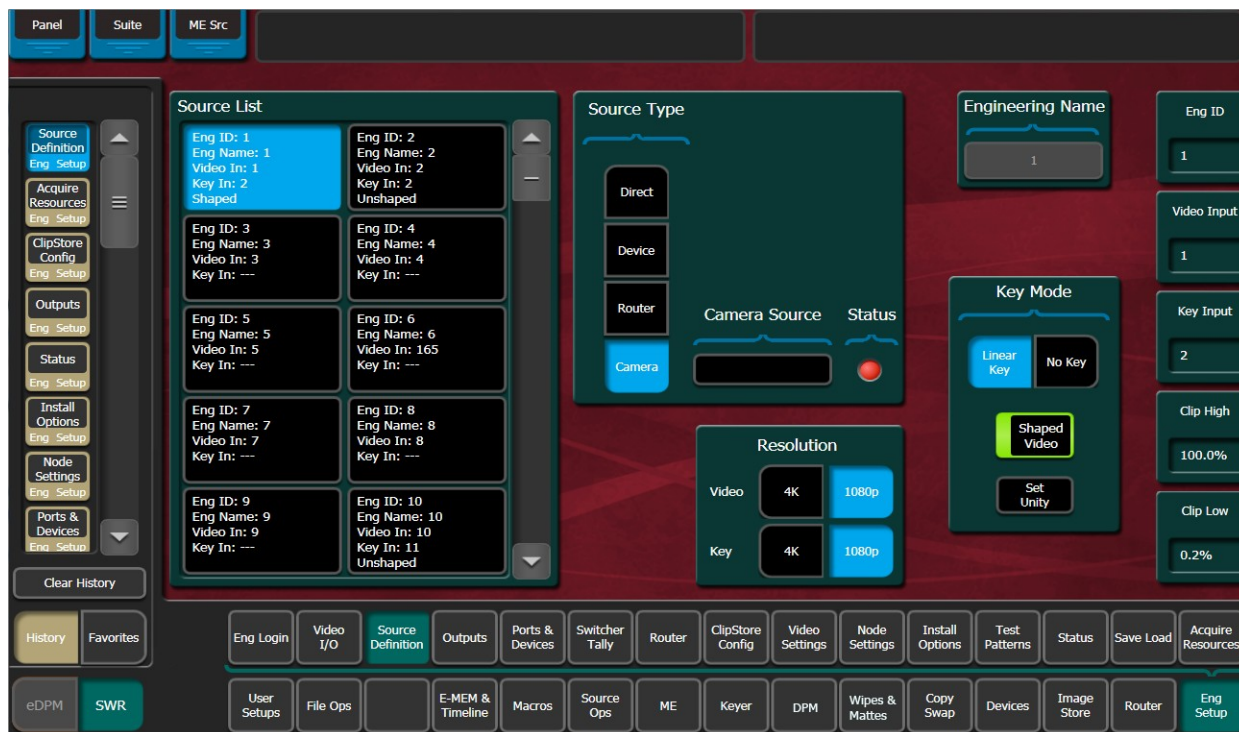
Configure Node Settings

- 1 Select **Eng Setup, Node Settings** in the menu.
 - 2 Enter a valid IP Address for the camera gateway and select **Enable**.
- Result: When connected, the LDK Connect LED will turn green.



Configure Source Definitions

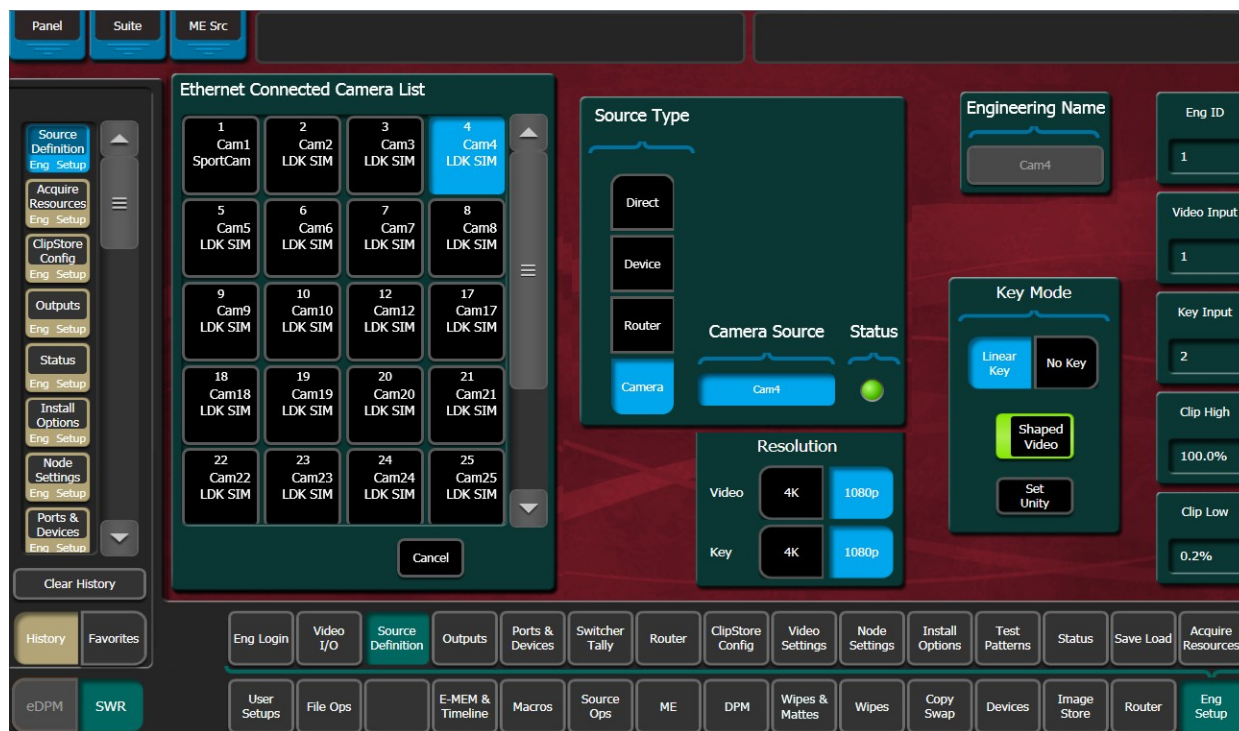
To enable camera control from the GV Switcher, the source is defined as a “Camera” type then assigned as a camera in the Eng Setup, Source Definition menu.



- 1 Select the desired source in the Source List.
- 2 Set the Video Input and Key Mode (see the *Kayenne/Karrera/GV Korona /User Manual* for more information).
- 3 Select the **Camera** source type button in the Source Type pane.

Once the “Source Type” is defined as Camera, the Camera Source can be selected.

- 4 Select the **Camera Source** data pad—the Ethernet Connected Camera List pane is displayed.



- 5 Select a camera in the Ethernet Connected Camera List.

The Ethernet Connected Camera List pane closes and the selected camera's Engineering Name is defined by the selection automatically. A green **Status LED** signifies a connected camera.

Note: The Engineering Name of the source becomes "Cam##" and cannot be edited, however the Panel, OLED, and Menu Name can be changed in the Source Patch menu (see the *Kayenne/Karrera GVKorona User Manual* for more information).

Acquire Resources

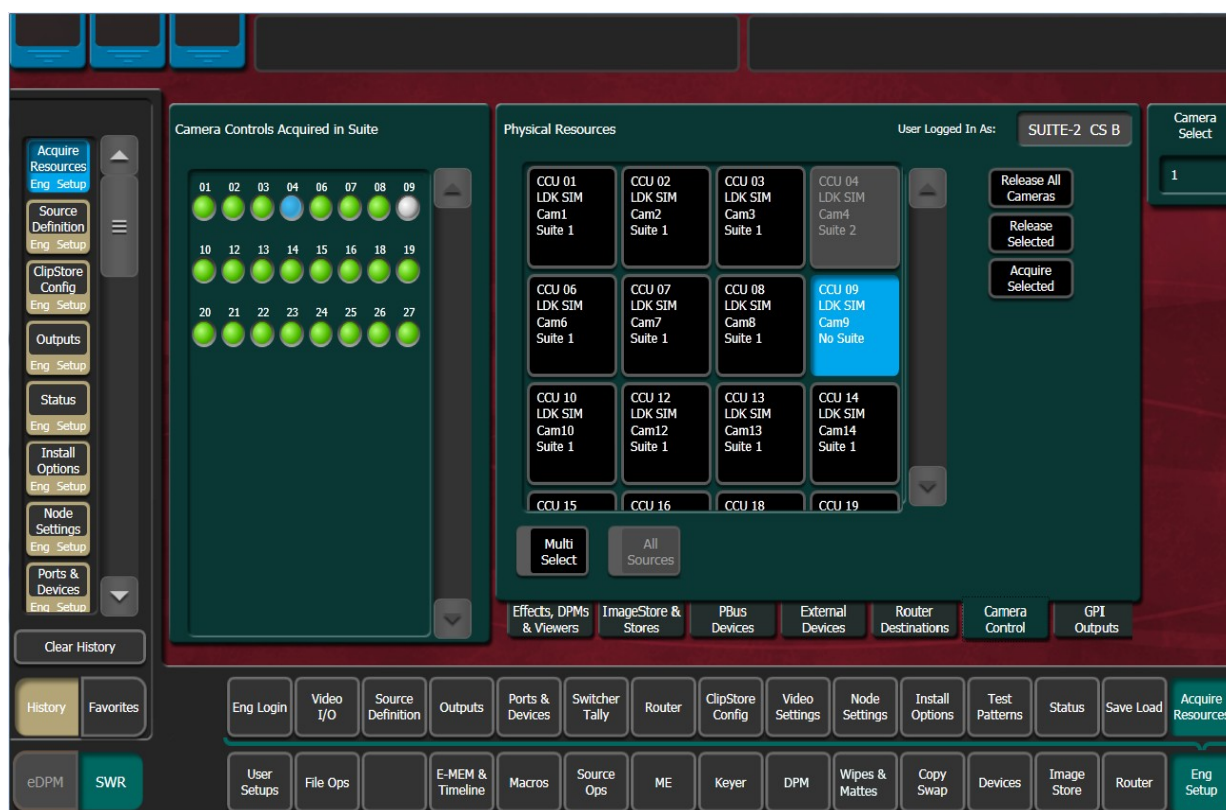
A camera resource can be acquired by any suite, one suite at a time (E-MEM control is only from the suite currently controlling the camera source). Camera resources are acquired in the Eng Setup, Acquire Resources, Camera Control menu.

Camera resource acquisition is represented in the Camera Controls Acquired in Suite pane in the Camera Controls menu as follows:

Green—Successfully acquired in the current suite

White—Resource not acquired in any suite

Blue—Resource successfully acquired by a suite other than the current suite

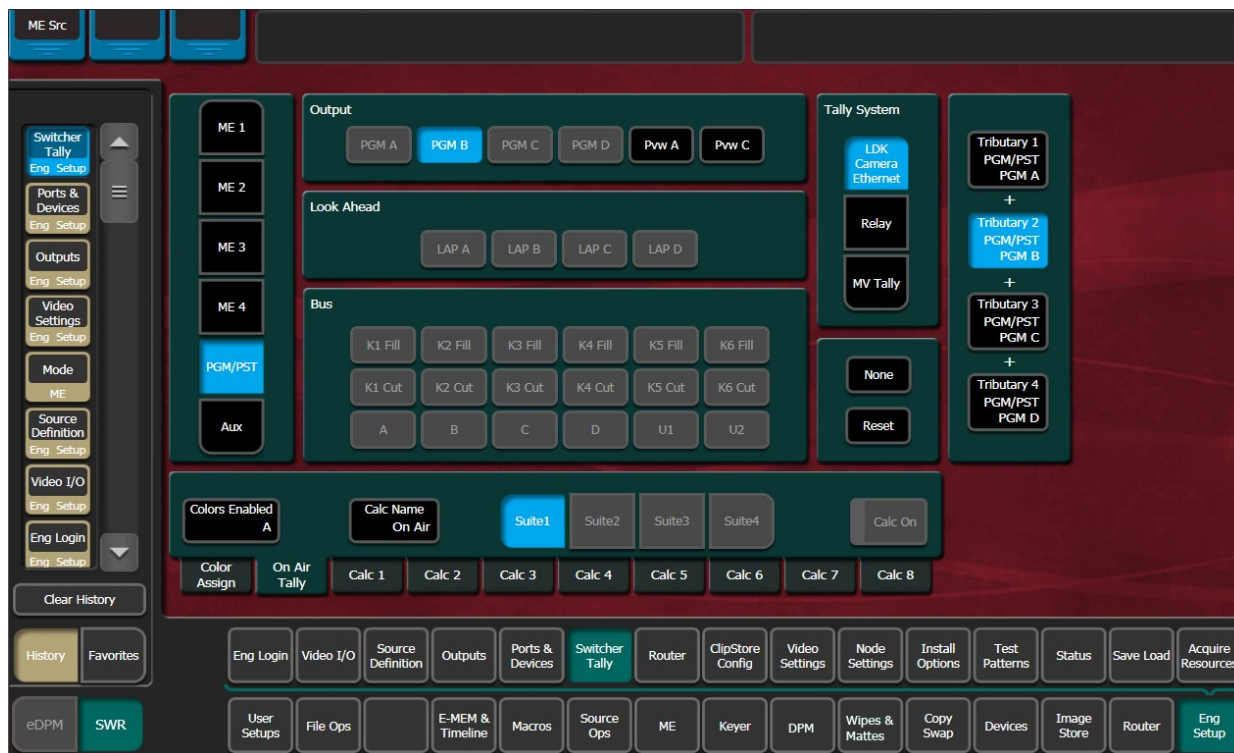


Acquire control of camera components in another suite by releasing one, several, or all components from the current suite using the **Release Selected** and **Release All Cameras** buttons, changing suites, then acquiring those components in the other suite. For more information on acquiring resources, see the *Kayenne/Karrera GV Korona User Manual*.

- 1 Select the components (cameras) you wish to acquire in another suite in the Components: Camera Control pane.
- 2 Release those components using the release buttons.
- 3 Select **Eng Setup**, **Eng Login** and select the **Change Identity** data pad.
- 4 Select the data pad of the desired suite.
- 5 Select **Eng Setup**, **Acquire**, **Camera Control** and select the component buttons you wish to acquire to the suite.
- 6 Select **Acquire Selected**.

Switcher Ethernet Camera Tally

The GV Switcher system provides a quickly connected, reliable, three color tally (Red, Yellow, and Green) via Ethernet to Grass Valley cameras.



Tally Calc Menus

As with Switcher Tally, the LDK Camera Ethernet menu is used to select calculators, name calculators, and assign bus contributors to tributaries.

Colors Enabled—Reports which colors are currently using that calculator, by color letter corresponding to the viewfinder indicators:

- R (Red=On-Air),
- Y (Yellow=media (record)), and
- G (Green=ND/RE or 'Call').

Color Assign Menu

Assigning a source as a Camera type and giving it a Camera Number is similar to assigning a source to a relay in a Switcher Tally Group.

The Color Assign menu is used to assign the Tally Calculators to the Tally Colors. Touch the Eng Setup, Switcher Tally, Color Assign menu tab to access this menu.



User Setups

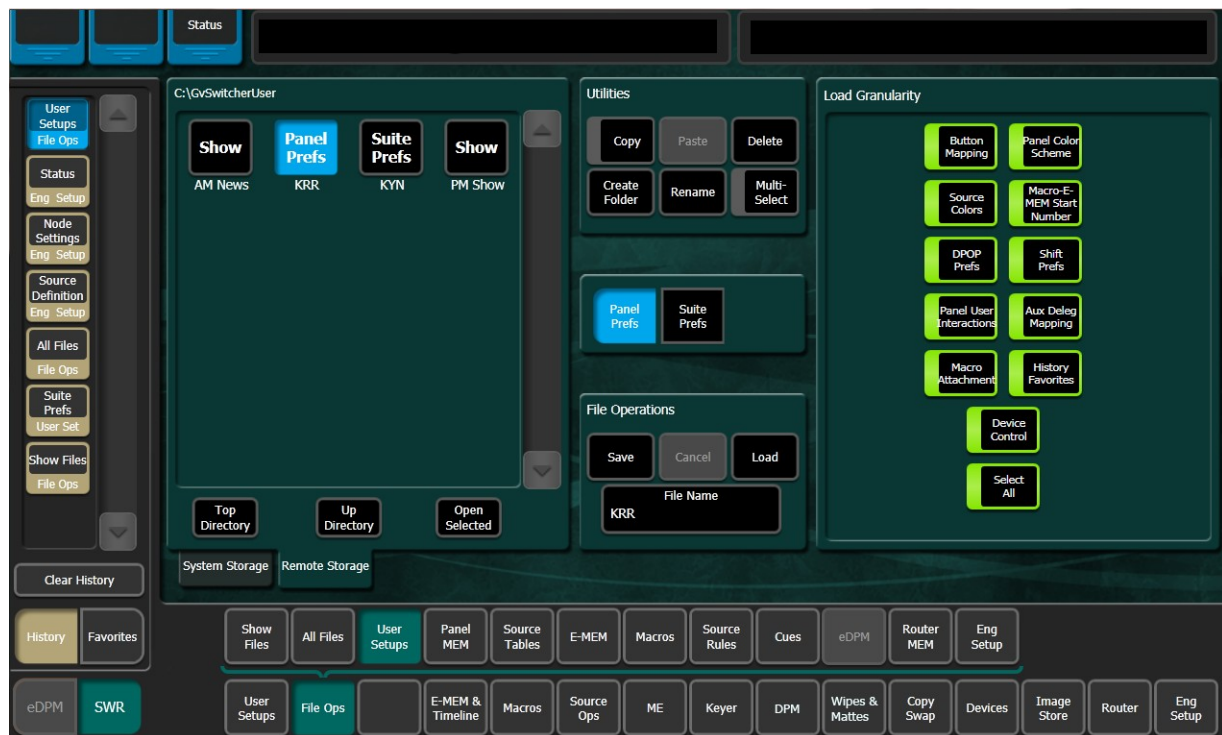
User Setups are intended primarily for operators, to allow them to customize their working environment. However, some settings affect basic system operation. The engineer in charge of a GV K-Frame XP system should create and save at least one default set of User Setups (Panel Prefs and Suite Prefs) so the system can be set to a known state.

Particularly important settings are described briefly below. Refer to the separate *Kayenne/Karrera GV Korona User Manual* for more information about User Setups.

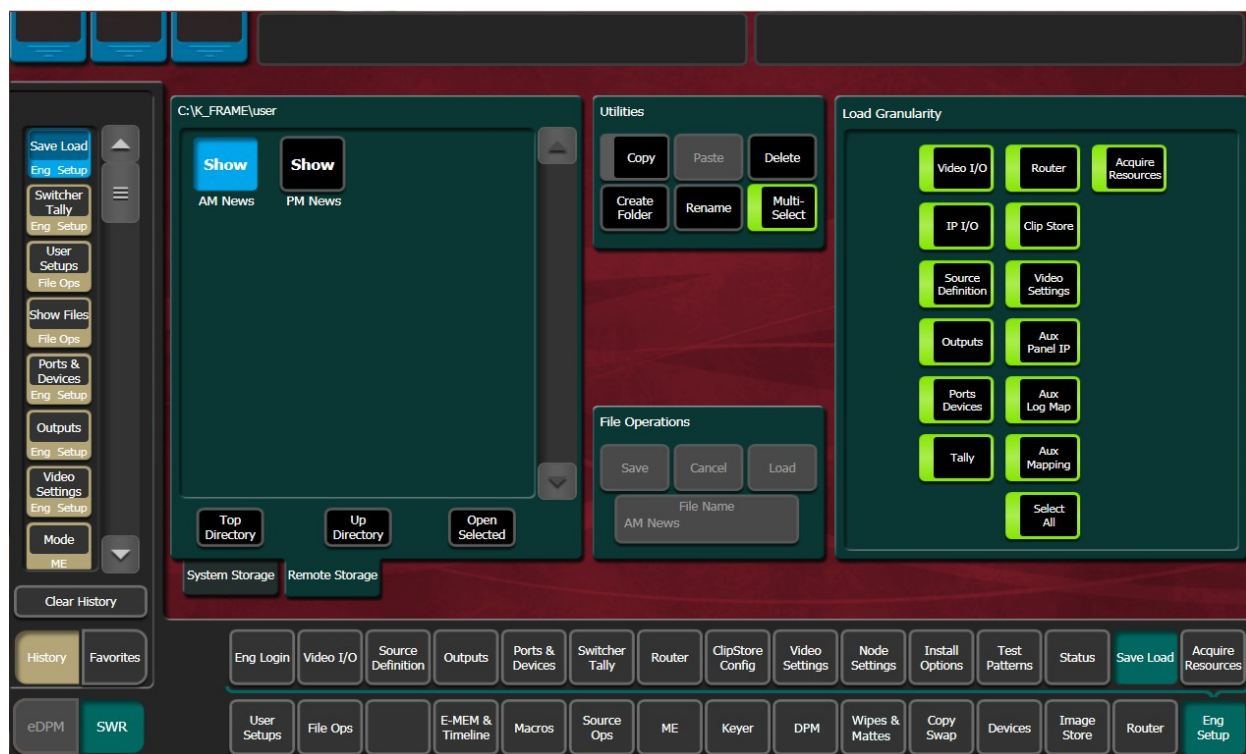
Configuration File Save and Load

K-Frame File Browser

The GV Switcher system has a file browser. You can browse through folders on the local Menu hard disk, the Video Processor, and the entire network file hierarchy of mapped drives. The various browser menus can be accessed via the **File Ops** menu tab.



Eng Setup files can be accessed two ways, via **File Ops**, **Eng Setup**, or via **Eng Setup, Save Load**.



File Storage Organization

The file browser gives you great flexibility for choosing and creating storage locations for your files. Any number of folders can be created in various locations. File folders and the files themselves can be named in any manner. To prevent accidentally saving and loading incorrect files, your facility should establish file storage and naming conventions and follow them consistently.

The engineer in charge should create default Eng Setup, Panel and Suite Prefs files that are not to be modified by anyone. These can provide a known starting point for users when they build their own preference files.

K-Frame Drive Access

The GV K-Frame XP File Operation menus can access directories located on the USB Memory Stick in the Video Processor Frame (System Storage) and the Menu Panel hard drive (Remote Storage). Local and network drives mapped on the Menu Panel's Windows system are also accessible (Remote Storage). Standard Windows functionality automatically maps all local drives during startup. Mapping network drives to a drive letter using the Windows Explorer allows them to appear at the top of the File Operation menus on that menu system.

Files saved to the **System Storage, Frame User Directory** will be available to any system user.

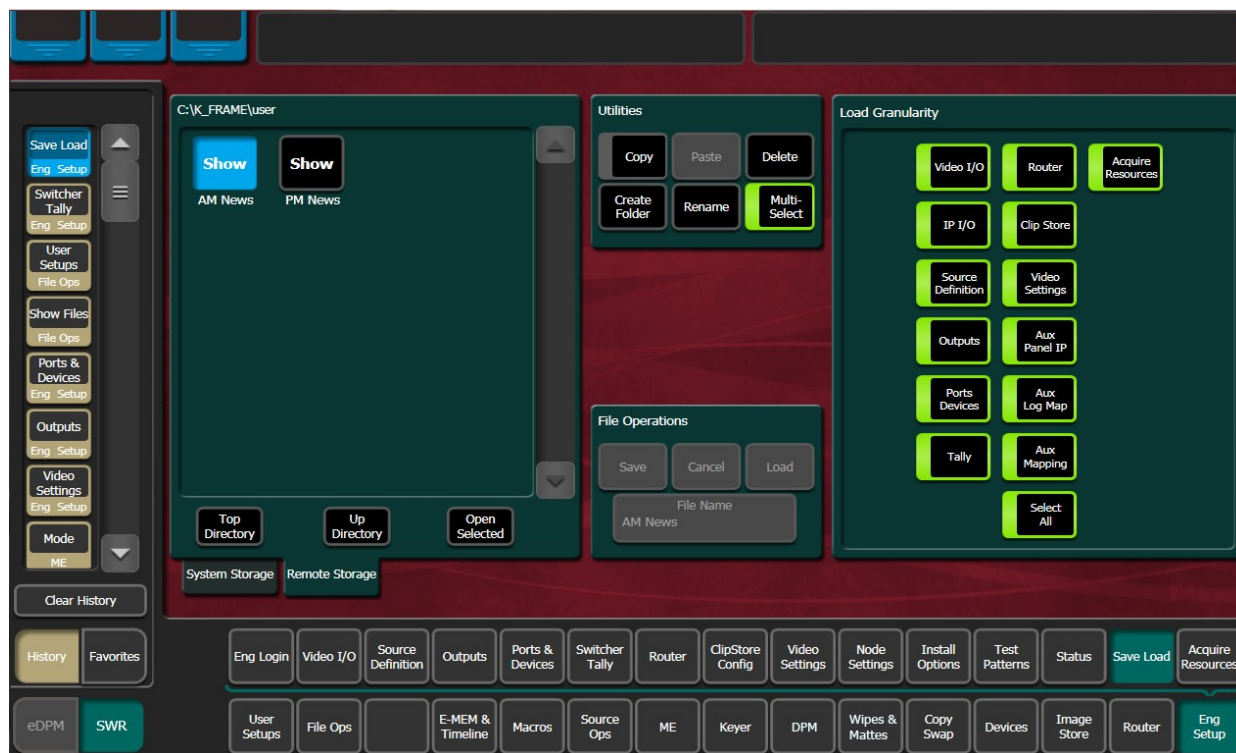
Files saved to the **Remote Storage, Menu C:** location on the Menu Panel will be available to any user of that Menu Panel. Multiple Menu Panels operating with that system will not be able to access files stored at this location on another Menu Panel, unless drives are mapped.

Files can also be saved to an external medium, like a USB Memory Stick, and then removed for personal storage unavailable to other users.

Save important files to multiple locations (for example, to the Video Processor Frame, Menu Panel, and a USB Memory Stick), clearly identify the files (perhaps including the date in the file name), and store removable media containing these files in a safe place.

Eng Setup File Operations

The Eng Setup, Save Load menu is used to save and load engineering setups information. Only this file format is supported in this menu.



Save Eng Setup Files

- 1 Select all or individual file types to save.
- 2 Select the **File Name** data pad and enter the name you wish the saved file to have.
- 3 Navigate to the desired destination directory using the buttons in the left navigation pane. You can create and name a new directory for the file with the **Create Folder** button in the Utilities pane if you wish.
- 4 Touch the **Save** button.

Load Eng Setup Files

- 1 Navigate to the directory containing the files you wish to load, using the buttons at the bottom of the left navigation pane.
- 2 Select the file(s) to be loaded (choose the **Multi-Select** button for multiple files).
- 3 Select **Load**.

CAUTION: The Load button immediately replaces information the system is currently using with the selected file information. When configuration files are loaded, significant changes to system operation are possible.

Multiple Suite Resource Sharing

The Resource Sharing feature permits the allocation of GV K-Frame XP system resources between suites. This allows independent system operation from multiple locations without conflict.

Logical resource assignments allow the reuse of E-MEM effects in any suite regardless of which specific hardware resources were allocated.

Each suite can be run with its own Suite Prefs settings, and two different Panel Prefs preference settings can operate simultaneously in each suite. These preferences can be saved and loaded, permitting reliable system changes to meet varying requirements.

The system retains the current suite/resource relationships. If the system powers down or is reset, resource allocations for each suite are restored when the system returns to operation.

Collaborative Resource Sharing

Collaborative resource sharing permits a group of operators to have simultaneous access to a resource. For example, a video operator may want access to an M/E so he can set up a chroma key, but the operator also wants control of that M/E so that he can put the chroma key on air. This type of sharing is available simply by installing additional Control Panels.

Corroborative system operation has inherent limitations. Since one operator can change the settings used by another operator, it is assumed the operators are in close communication with each other so they can avoid system control conflicts.

If two conflicting corroborative commands are sent, the switcher system ends in the state of the last command processed. For example, one operator could select a source on a bus of an M/E at nearly the same time another operator selects a different source on that same bus. The output of that M/E will momentarily display the first source and then switch to the last source selected, possibly causing an apparent flash on that output.

The Resource Sharing feature allows collaborative sharing of system components with different User Prefs. For example, when a smaller 25 source panel is used in a corroborative environment with a larger 35 source panel, the button mapping for the two panels must be different because of the different number of source buttons available.

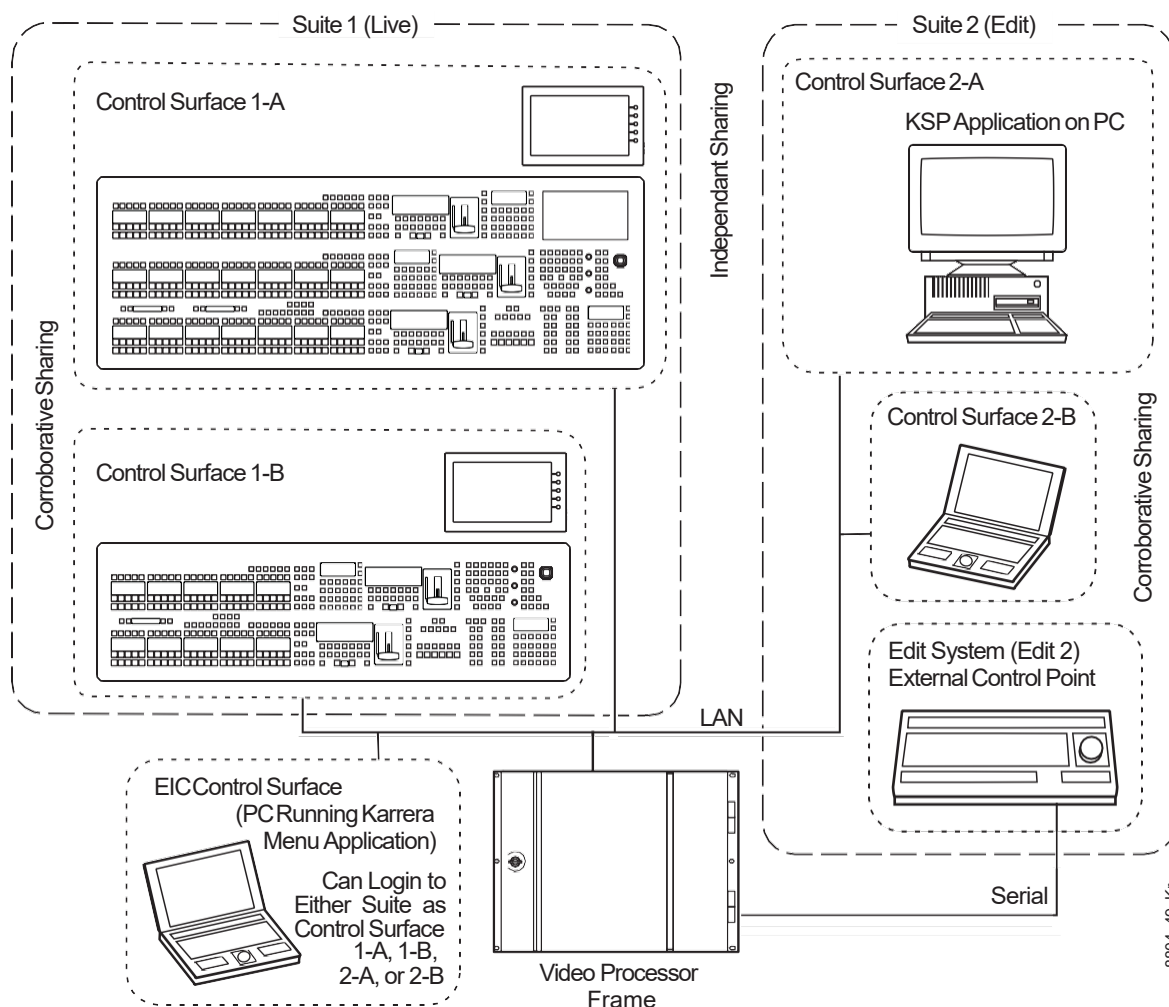
Independent Resource Sharing

Independent resource sharing isolates an operator or group of operators from other operators, by defining separate suites. When one suite has acquired a resource, only the operator or group of operators in that suite will be able to control it. An example of independent sharing is splitting a 4-M/E switcher system into two independent 2-M/E switchers.

When a suite acquires a physical resource (like an M/E) it uses that resource logically. For example, the M/E B physical resource can be used as a logical PGM PST bank. Each of the two switchers created can therefore have their own PGM PST bank, and this allows effects built in one suite to operate correctly when recalled in another suite. Effects will also run correctly in the same suite when run at a later time even if different physical resources have been acquired. Resources can be released by a suite. Once released, these resources can be acquired by another suite. This permits dynamic reconfiguration of the system resources to meet varying operational requirements.

Suites

A suite is a grouping of one or more control surfaces (described below), and constitutes a coordinated working environment. Resources are attached to a suite rather than to individual control surfaces. All control surfaces in one suite have access to all resources assigned to that suite (collaborative sharing). Control surfaces in one suite are not able to control resources assigned to another suite (independent sharing).



Control Surface

A control surface is generally a group of panels which interact and provide a single user a unified work surface. An example of this type of control surface is a Control Panel and Menu Panel of a 4-M/E switcher system. These panels combine to form a Technical Director's (TD) control surface. Other Control Panel modules or additional Menu Panels can be added to a control surface.

A control surface may also consist of a single item. For example, a Menu Panel (or a laptop computer running the GV Switcher menu application) or a KSP (see the KSP Switcher Soft

Panel Graphical User Interface Instruction Manual) can act as a separate control surface in a suite.

With Resource Sharing, up to two control surfaces can be created for each suite. Each control surface can load its own Panel Prefs, so they can behave differently from one another. For example, different sources can be mapped to the source select buttons of the two control surfaces in the same suite, permitting quick access to different sources appropriate for each work location.

Control surfaces allow operators to collaborate on the same production while providing isolation between the operators themselves. For example, a smaller Control Panel set up in the studio for rehearsals will need access to the same effects as a larger Control Panel in the control room, but may need access to a specific set of sources. The smaller panel also requires a different button mapping. If a Menu Panel is associated with each Main panel, the DPOP operations of one panel should affect its menu, not the other one.

Logical Aux Buses

Each suite can be configured to have its own set of numbered Logical Aux buses. This means effects built for one suite will run properly in another as long as the physical connections for the same numbered logical Aux buses are similar. For example, if Aux bus 5 in one suite is used to feed that studio's monitor wall, using Aux bus 5 in another suite to also feed that studio's monitor wall will make effects compatible between suites. Note that these Aux buses have different internal paths and different physical connections, but share the same logical Aux bus number.

Remote Aux Panels

Remote Aux Panels are set up as part of a particular suite. They then become another control surface of that suite, with functionality limited to controlling only the Aux buses assigned to that suite.

External Control Points

Some types of switcher system control originate from an external location, like an edit controller, or a GPI contact closure. The Resource Sharing feature accommodates these control points differently.

A separate Editor Port can be assigned to each suite. An edit controller connected to each port is considered part of only that suite, and controls only the resources currently acquired by that suite.

GPI inputs themselves are not assigned to individual suites. Each suite can be configured to respond to particular GPI commands, with the other suite ignoring these commands.

Setting Up Resource Sharing

Your switcher system should first be fully operational. For new customers, an initial system configuration will be required. This basic setup will become the baseline for suite 1 operation. This includes having an Eng Setup configured with the sources defined, suite 1 outputs assigned, suite 1 tally contacts connected and Ethernet tally defined (if used), and

any external interfaces (DDR, VTR.) that will be used in suite 1 should be installed and operational.

Default Suite Prefs should also be defined and saved under a file name identifying its use for suite 1. A default Panel Prefs file should also be defined and saved identifying it as a default setting for control surface A of suite 1. All these files will become the starting point from which changes will be made to make full use of Resource Sharing.

When the above is accomplished and basic system functionality is confirmed, you can then set up additional suites, and more easily troubleshoot any configuration issues that may arise.

If you will be adding new system components for use with Resource Sharing, all these components must be installed and configured on the network, using valid IP addresses. All control surfaces participating in Resource Sharing will also need to be in communication with the same Video Processor Frame. After the primary Main panel has been installed and its connectivity verified, one new panel should be installed and its connectivity also verified before you install any additional panels. This will make it easier to troubleshoot any IP addressing problems that may occur.

Prepare Worksheet

A worksheet is helpful for planning your multi-suite installation and configuration. The worksheet should list all Control Panels, Menu Panels, and PCs running the GV Switcher menu application, their IP addresses, and their suite and control surface associations. It should also list all Remote Aux Panels and which suite they belong to. Physical outputs should also be listed with their suite association and which Fixed output or Aux bus they are associated with, the main program and preview outs for the suite, etc.

About the Frame Suite Nodes and ID Menu

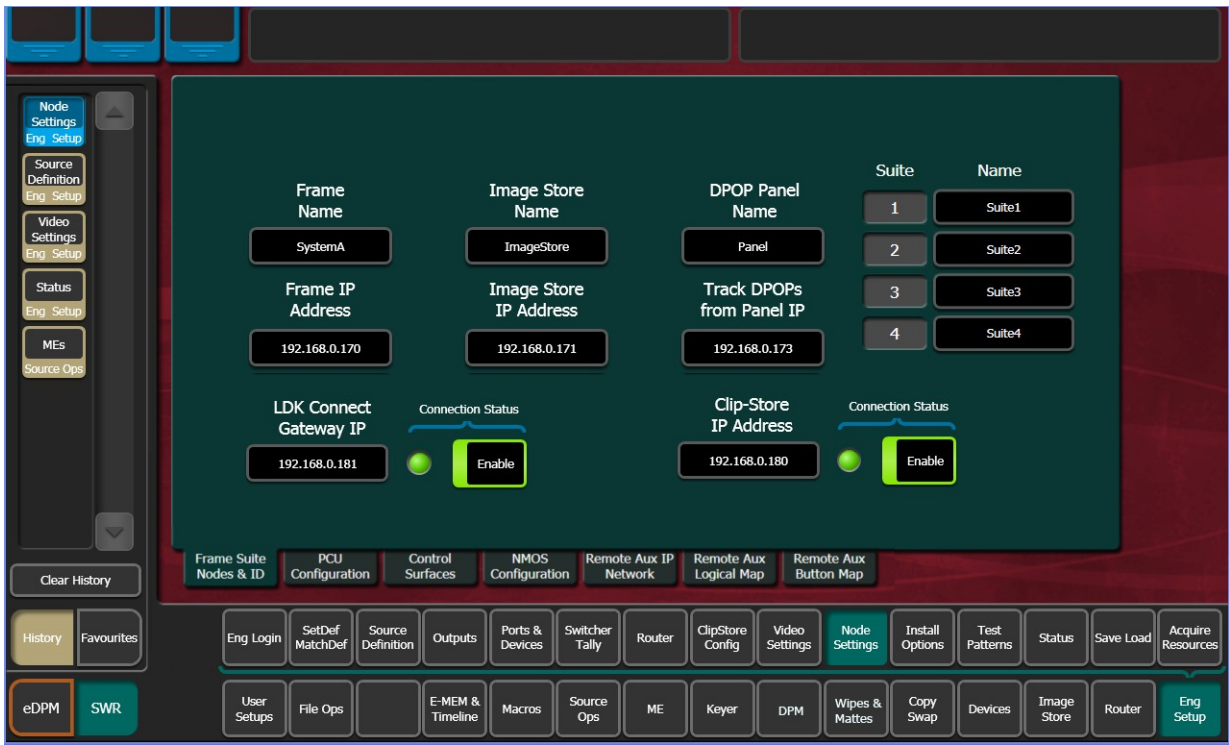
The Frame Suite Nodes & ID Menu provides fields for entering the IP addresses the Menu application uses to communicate with the Video Processor Frame, Image Store, and the Control Panel whose DPOPs will affect this application's menu displays. A Menu restart is required for updates.

When connected, the currently defined names of these devices are displayed. These names can be edited from this menu, and will be sent to the device as soon as the new name has been entered. Subsequent connections to this device from this or another menu will show

the edited name.

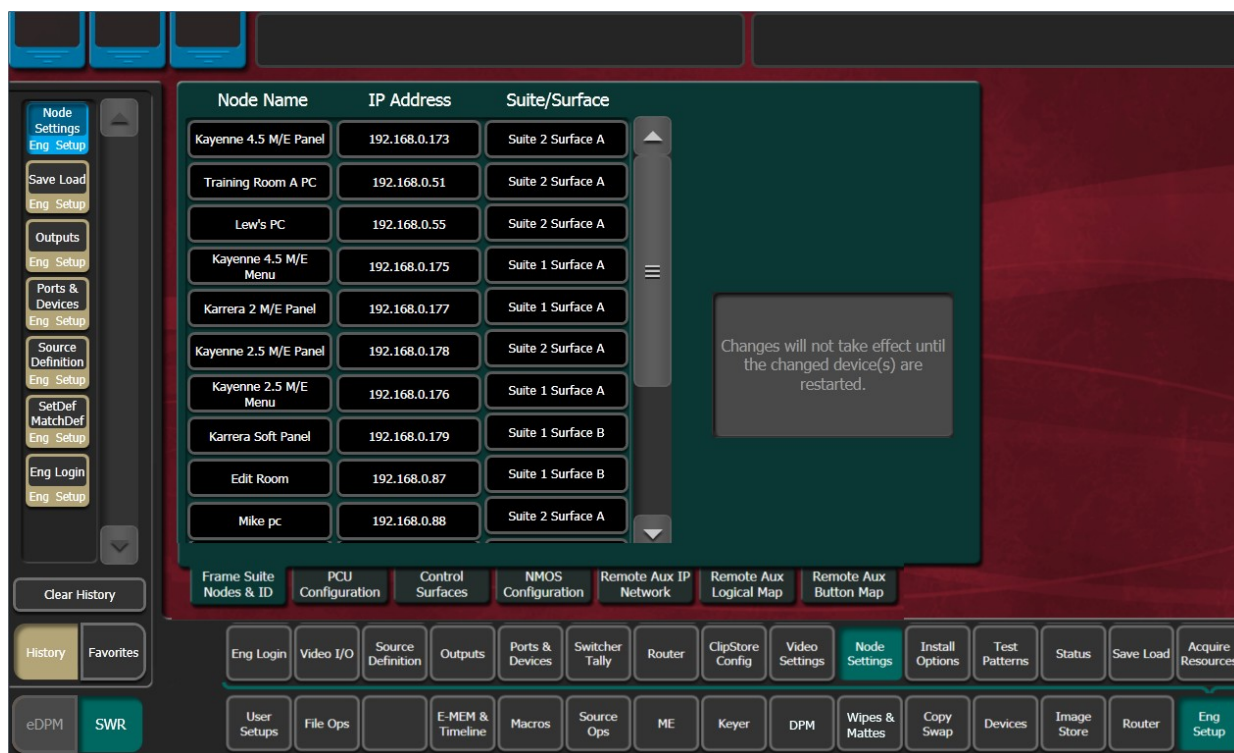
Note: Do not change device or suite names unnecessarily, it may confuse other switcher system users.

Basic Configuration



Configure Control Surfaces

- 1 Select **Eng Setup, Node Settings, Control Surfaces**, and enter the IP address and name the control surface you are adding. Assign it to another suite. If you are using an additional Menu Panel or PC for that suite, you can change it to the other at this time.

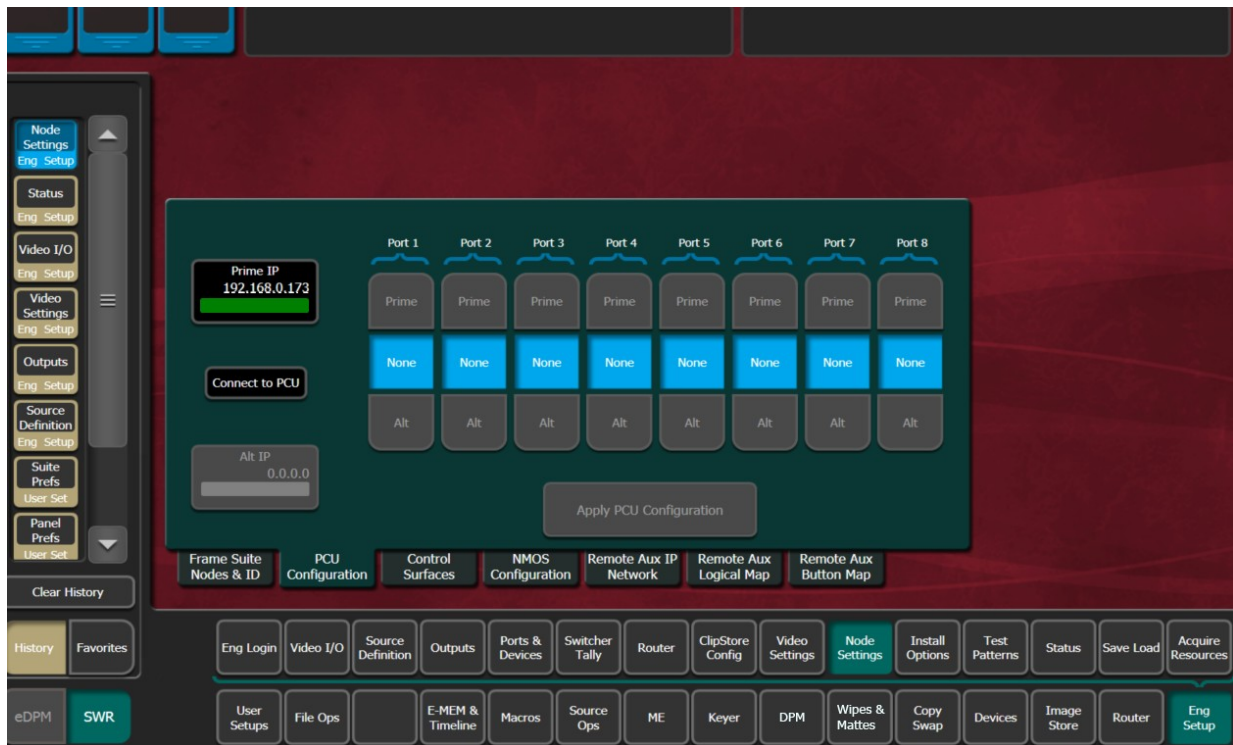


Kayenne (Only) PCU Configuration

- 1 If you are using a single PCU with two control surfaces, select **Eng Setup, Node Settings, PCU Configuration**, enter the Prime IP address for the primary (Suite 1) control panel, and reboot the Control Panel (on the Kayenne Multi-Function Module, touch **HOME, Pnl, IP, BOOT, Yes**).
- 2 After the Control Panel reboots, select **PCU Configuration** and select the **Connect to PCU** button. The Prime IP indicator should change to green
- 3 Optionally, select the **Alt IP** data pad and enter the address for the second (Alternate) control surface in the other suite in the pop-up keypad.
- 4 Select **Apply PCU Configuration**; a Reset Panel Caution dialog is displayed, select **Reset Panel**.

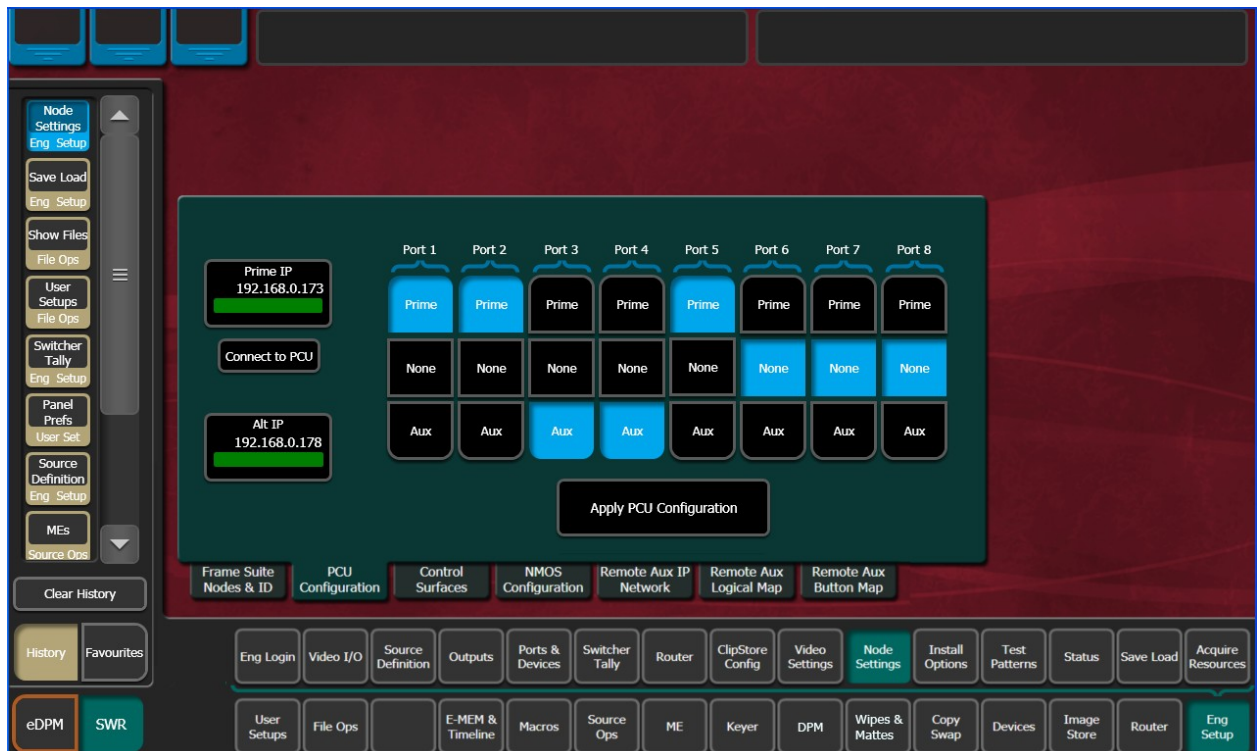
Result: After reset, a green indicator for Alt IP confirms a successful connection.

Basic Configuration



Define Default Multi-Suite Engineering Resources

- 5 Divide the PCU ports between the Prime and Alt control surfaces. Empty ports can be set to None.



- 6 Select **Apply PCU Configuration** to send the port information to the PCU. The Reset Panel Caution dialog is displayed again, select **Reset Panel** to re-establish system

communications. After restart, the Eng Setup, Status Menu will display the added control surface.

Result: Only the specified PCU ports will operate with the control surface Stripes in each suite.

Note: For Kayenne Control Panels, the Multi-Function Module only reports the Prime IP address (**Home, Panel, IP**), even if an Alternate IP Address is configured.

Define Default Multi-Suite Engineering Resources

Assign the following items as appropriate to each suite:

- Outputs (Pgm, Switched Preview, Aux Buses, etc. accessed via **Eng Setup, Outputs**).

Each suite has its own, logical set of outputs that are identically numbered. Use the **Suite 1** through **Suite 4** buttons to assign them to a suite.

- GPI Outputs (**Eng Setup, Acquire Resources, GPI Outputs**).
- Editor Port, if used, are permanently assigned for use by each suite (**Eng Setup, Ports & Devices, Editor Port**).
- Switcher Tally (**Eng Setup, Switcher Tally**).

Note: Each suite has its own logical set of outputs that are identically numbered. Use the Suite 1 through Suite 4 buttons to assign them to a suite.

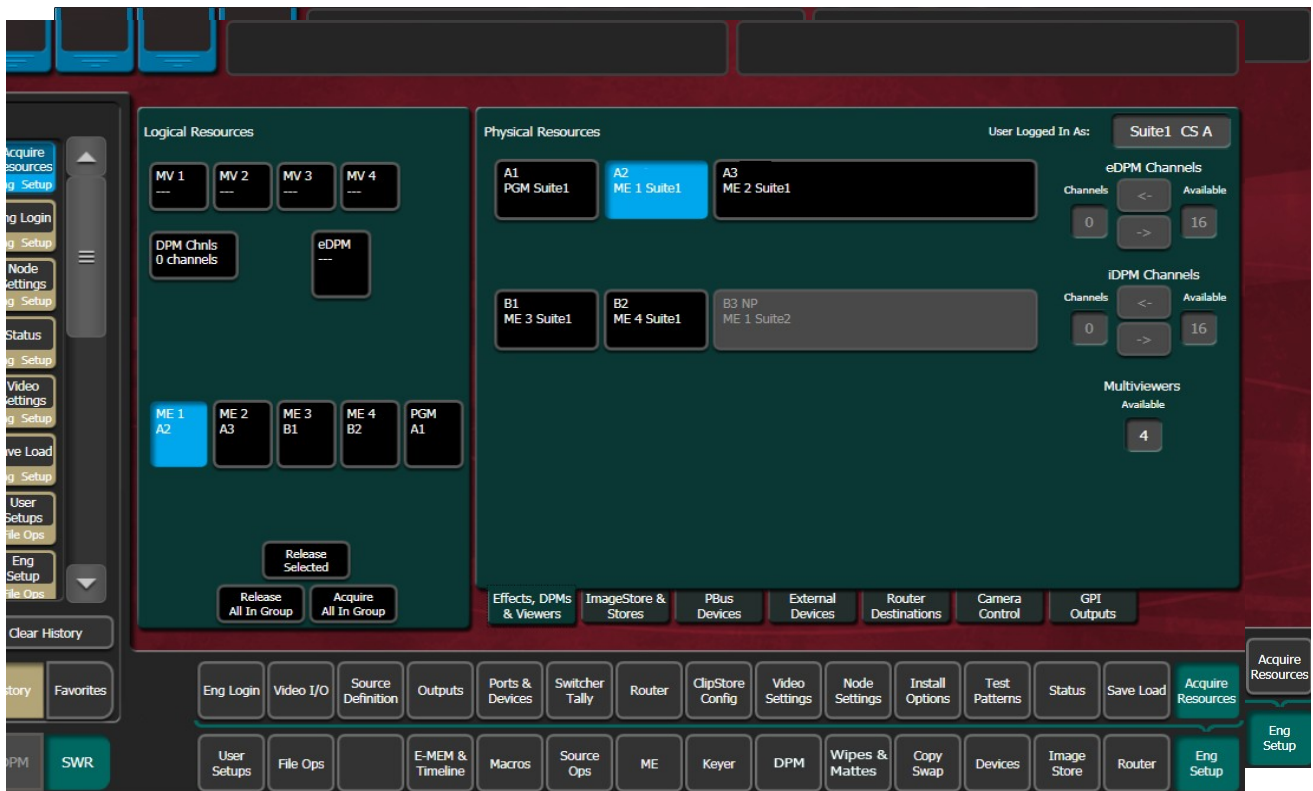
Acquire Resources in Suites

Note: Changes to Suites and Resource acquisition can have serious switcher system operation impacts that might not be completely obvious. For this reason, precautionary dialogs requiring a response will be displayed.

Resources are released from one suite then acquired in another. Suite 1 is configured as the default suite.

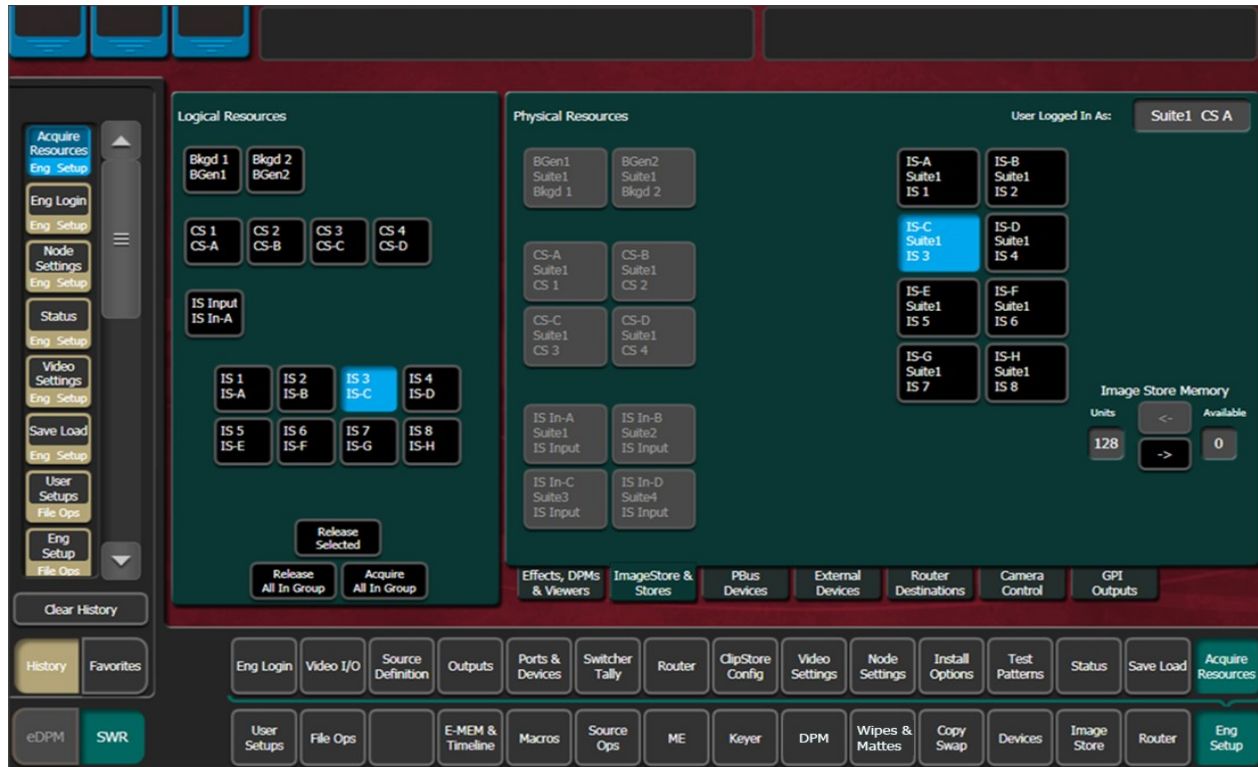
- 1 Select **Eng Setup, Eng Login** and answer **Yes** to the warning message, and login to a suite using the **Change Identity** button.

Basic Configuration



- 2 Select **Eng Setup, Acquire Resources** and select **Yes** to the warning message.
- 3 Select either the **Effects, DPMS & Viewers** or **ImageStore & Stores** menu tab, depending on the resources you wish to acquire.

Acquire Resources in Suites

Acquire Resources, Effects, DPMs & Viewers*Acquire Resources, Image Store & Stores*

- 4 Select a resource in the Logical Resources pane (left):
 - Effects, DPMs & Viewers menu tab:
 - DPM,
 - eDPM, or
 - ME (Mix/Effects)
 - ImageStore & Stores menu tab
 - Background (Bkgd),
 - CS (Clip Store)
 - IS Input (Image Store Input), or
 - IS (Image Store Channel)
- 5 Release resources:
 - a For ClipStore, IS Input, Multiviewers, Backgrounds, and M/Es, select the **Release Selected** button.
 - b For Image Store, DPM Channels, and eDPM Channels, use the right arrows in each category (right) to move resources to **Available** for Image Store, DPM Channels, and eDPM Channels.
- 6 Select **Eng Setup**, **Eng Login** and answer **Yes** to the warning message, and login to a suite using the **Change Identity** button.

- 7 Select **Eng Setup, Acquire Resources** and select **Yes** to the warning message.
- 8 Select a resource in the Logical Resources pane (left).
- 9 Acquire resources:
 - a For ClipStore, IS Input, Multiviewers, Backgrounds, and M/Es, select the released resource in the Physical Resource pane.
 - b For Image Store, DPM Channels, and eDPM Channels, use the right arrows in each category (right) to move resources to the acquired **Units/Channels** for Image Store, DPM Channels, and eDPM Channels.

Note: Any number of licensed iDPM channels can be acquired to the selected resource, or acquired as eDPMs using the Acquire Resources menu.

Save Default Multi-Suite Engineering Setup File

Save this Eng Setup configuration to disk, naming the file to identify it as the default multi-suite engineering configuration for the facility.

Define and Save Default Suite Prefs

Define default Suite Preferences as appropriate for each suite. This is accomplished by logging in to each suite individually, accessing the various configuration menus, setting the available parameters, and then saving a Suite Prefs file for each suite while logged into that suite.

Define and Save Default Panel Prefs

Similar to Suite Prefs above, Panel Prefs files can be created and saved for each control surface, if you wish. For engineering troubleshooting purposes, you may be able to define and save a single Panel Prefs file for use on any control surface.

To use different Panel Prefs for different control surfaces, create and save each Panel Prefs file while logged into that suite and control surface. This is necessary for button mappings on each suite's control panel.

Multi-Suite Independent Operation

Once multiple suites are configured, operators can work on each control surface independently. Coordination between operators will ensure resources for each suite are shared as necessary.

Operators should also test any E-MEMs, R-MEMs, or other items created or saved previously, to be sure they work properly with their currently acquired resources.

Engineering Login

Multiple suites can be configured for GV K-Frame XP systems, with each suite having up to two control surfaces. The Eng Login menu is used to choose which suite and control surface the switcher menu will interact with and control.

To access a different Suite or Control Surface (CS):

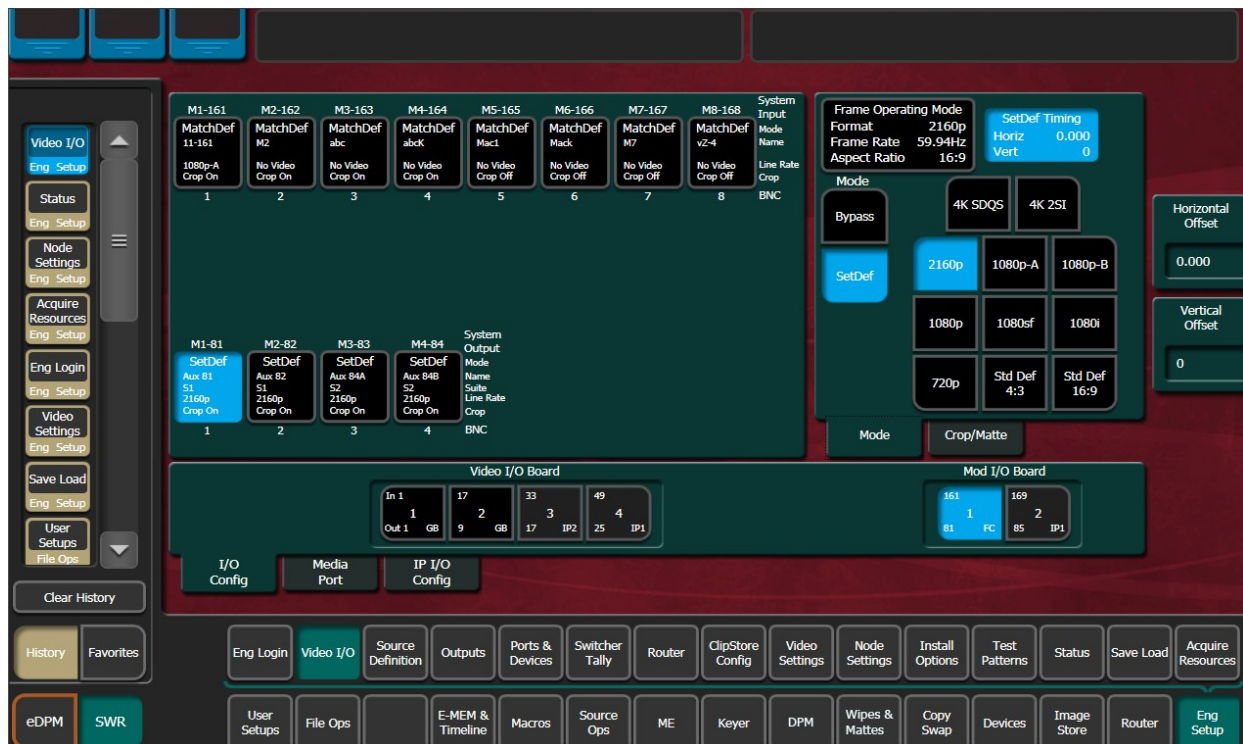
- 1 Select **Eng Setup, Eng Login**.
- 2 Select the **Change Identity** button. The **Suite** and **CS** buttons will then be available for selection. After selecting a different button, a warning message appears.
- 3 Select **Yes** to make the change, or **No** to cancel the change and retain the existing menu identity.

Note: Changing a menu's identity in this way is temporary. Reloading the menu application or rebooting the Menu Panel will restore the Suite and Control Surface identity defined in the Node Settings, Control Surfaces menu.

System resources can be allocated to each suite. By default, all system resources are allocated to Suite 1.

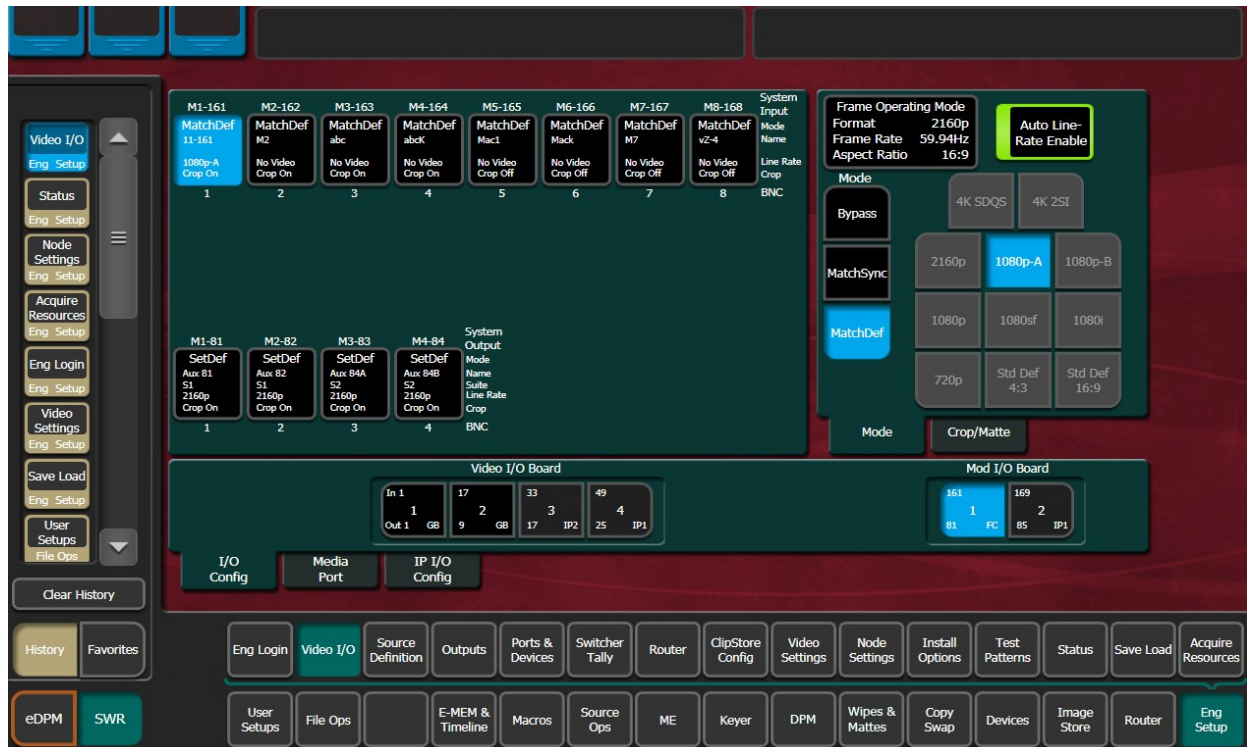
MatchDef and SetDef

The MatchDef and SetDef options permit line rate signal format conversion of system outputs and inputs. MatchDef input and SetDef output conversion is licensed in groups of four. Connectors are active when the associated Conversion I/O board is present and the license is enabled. Selecting a Modular I/O button, labeled M1, M2, etc., displays controls for either input or output conversion in the right-hand pane.



MatchDef Input Conversion

When MatchDef Mode is selected, the Modular I/O buttons report the current Mode, Engineering Name of the input, Suite, Output Name, input format and crop status for the input of the selected pair.



The currently operating video standard is shown in the Frame Operating Mode status display on the upper right portion of the menu.

Auto Line-Rate Enable – When on, the system detects the input video format and automatically chooses the appropriate line rate for the selected input. One frame of video is required for detection. If the incoming video signal format changes, one incorrect frame of video will be displayed. When Auto Line-Rate Enable is on, the Line Rate selection buttons below are inactive.

Note: Choosing the correct frame rate manually can often resolve a noisy signal on an incoming source.

When Auto-Line Rate Enable is off, the conversion format for the currently selected input can be chosen from the Line Rate selection buttons in the right pane (**4K SDQS, 4K 2SI, 2160p, 1080p-A, 1080p-B, 1080p, 1080sf, 1080i, 720p, Std Def 4:3, Std Def 16:9**).

Controls for Scale/Sync, Letterbox, Pillarbox, H-Center Cut and V-Center Cut are displayed, depending on the format selected. These controls are identical to those used for SetDef. The **Sync/Scale** button behaves the same as the SetDef **Scale** button, but also employs frame sync circuitry.

In the Crop menu (tab), the **Crop** button, when selected, displays Top, Bottom, Left, and Right crop data pads. Crop values can be entered and activated by touching the **Crop Enable** button.

When Crop, Letterbox, or Pillarbox is active, the **Matte** button can be selected, which displays Hue, Saturation, and Brightness data pads. The color values entered are applied to the non-image portion of the raster.

SetDef Output Conversion

When SetDef Mode is selected, the Modular I/O buttons report the Mode, Engineering Name for the input, Suite, Output Name, output format and crop status (Off/On) for the output of the selected pair.

The currently operating video standard is shown in the **Frame Operating Mode** status display on the upper right portion of the menu.

The **SetDef Timing** button, when selected, displays Horizontal and Vertical Offset data pads, allowing changes to the timing of that output relative the system video reference.

The conversion format for the selected output is chosen from the labeled buttons in the right pane (**4K SDQS, 4K 2SI, 2160p, 1080p-A, 1080p-B, 1080p, 1080sf, 1080i, 720p, Std Def 4:3, Std Def 16:9**). This format is applied to both output pairs.

Controls for Scale, Letterbox, Pillarbox, H-Center Cut and V-Center Cut are displayed, depending on the format selected.

Sync/Scale - Synchronizes the image then scales it to fill the full raster of the screen. If mismatched formats are involved, the image may distort and appear wider or narrower than its original state.

Letterbox - Used to convert 16:9 to 4:3 by adding bars above and below the image.

Pillarbox - Used to convert 4:3 to 16:9 by adding bars to the left and right sides of the image.

H-Center Cut - Fills the screen with the center portion of the image, cutting off some of the left and right sides.

V-Center Cut - Fills the screen with the center portion of the image, cutting off some of the top and bottom.

The **Crop** button, when selected, displays Top, Bottom, Left, and Right crop data pads. Crop values can be entered and activated by touching the **Crop Enable** button.

When Crop, Letterbox, or Pillarbox is active, the **Matte** button can be selected, which displays Hue, Saturation, and Brightness data pads. The color values entered are applied to the non-image portion of the raster.

About MatchDef and SetDef Conversion

MatchDef provides IP stream format conversion for inputs while SetDef converts IP streams for output. For Media Port conversion, the GV K-Frame XP provides MatchDef only.

Supported MatchDef Input Conversion

The following tables show the Frame Operating Mode (left column) and input video line and frame rates supported for conversion (right columns), for each mode (purple indicates supported).

The abbreviation *Sync* means that when an input video matches the Frame Operating Mode line/frame rate of the switcher Frame, the video is being synchronized internally; even though there is no conversion. This can cause a delay of up to one frame.

Highlighted cells support conversion.

| Frame Op Mode | Hz | Input Line Rate | | | | | | | | | | |
|---------------|-------------|-----------------|------|-------|--------|-------|------|---------|---------|------|------|-------|
| | | 525i | 625i | 1080i | 1080sf | 1080p | 720p | 1080p-A | 1080p-B | 2SI | SDQS | 2160p |
| 1080i | 25/29.97/30 | | | Sync | Sync | | | | | | | |
| 1080p | | | | | | Sync | | | | | | |
| 2160p | | | | | | | | | | | | Sync |
| 720p | 50/59.94/60 | | | | | | Sync | | | | | |
| 1080p-A | | | | | | | | Sync | | | | |
| 1080p-B | | | | | | | | | Sync | | | |
| 2160p | | | | | | | | | | | | Sync |
| 4K 2SI | | | | | | | | | | Sync | | |

| Frame Op Mode | Hz | Input Line Rate | | |
|---------------|----------|-----------------|-------|-------|
| | | 1080sf | 1080p | 2160p |
| 1080p | 23.98/24 | | Sync | |
| 2180p | | | | Sync |

Supported SetDef Output Conversion

The following tables show the Frame Operating Mode (left column) and output video line and frame rates supported for conversion (right), for each mode.

The abbreviation *Sync* means that when an input video matches the Frame Operating Mode line/frame rate of the Video Frame, the video is being synchronized internally; even though there is no conversion. This can cause a delay of up to one frame.

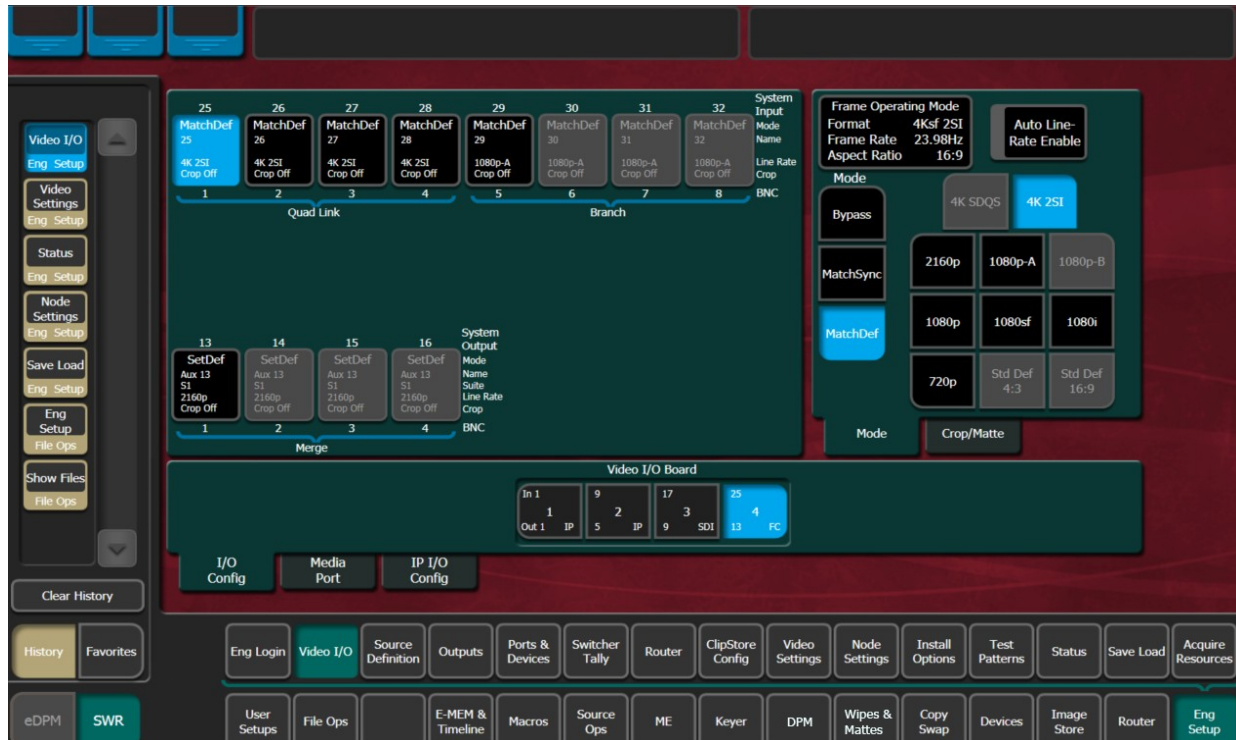
Highlighted cells support conversion.

| Frame Op Mode | Hz | Output Line Rate | | | | | | | | | | |
|-----------------|-----------------|------------------|------|-------|--------|-------|------|---------|---------|------|------|-------|
| | | 525i | 625i | 1080i | 1080sf | 1080p | 720p | 1080p-A | 1080p-B | 2SI | SDQS | 2160p |
| 1080i | 25/29.97/ 30 | | | Sync | Sync | | | | | | | |
| 1080p | | | | | | Sync | | | | | | |
| 2160p | | | | | | | | | | | | Sync |
| 720p | 50/59.94/ 60 | | | | | | Sync | | | | | |
| 1080p-A | | | | | | | | Sync | | | | |
| 1080p-B | | | | | | | | | Sync | | | |
| 2160p 4K 2SI | | | | | | | | | | Sync | | Sync |

| | | Output Line Rate | | |
|---------------|----------|------------------|-------|-------|
| Frame Op Mode | Hz | 1080sf | 1080p | 2160p |
| 1080p | 23.98/24 | | Sync | |
| 2160p | | | | Sync |

Format Conversion Menus

Located in the GV K-Frame XP switcher Eng Setup, Video I/O, I/O Config menu, the Conversion pane on the left provides Input, Output, and Video I/O and Mod I/O board selection buttons. Both inputs (top) and outputs (below) are displayed for the selected I/O Board. For the board selections (bottom), if a button is grayed out, there is no conversion board present.



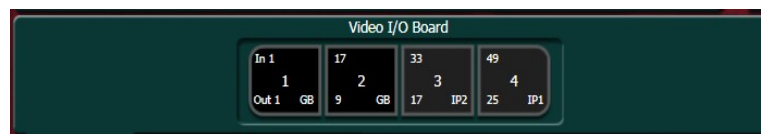
Format Conversion Pane

Mod I/O and Video I/O Conversion Pane Buttons and Labels

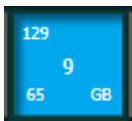
| Button/Label | Description |
|----------------------|---|
| Inputs | |
| Input (1-8) | Select the input for configuration, displays configuration pane (right) |
| Labels | System Input—Modular source definition Engineering Name and ID |
| | Mode—Input mode, Bypass or MatchDef |
| | Name—System Input Name, Source Definition menu |
| | Line Rate— Input video format |
| | Crop—Crop On/Crop Off |
| | BNC—Physical BNC on selected Mod I/O Board |
| Outputs | |
| Output (1-4) | Select the output for configuration, displays configuration pane (right) |
| Labels | System Output—Video I/O Physical Output definition, from Outputs menu |
| | Mode—Output mode, Bypass or MatchDef |
| | Name—System Output Name, from Outputs menu |
| | Suite—Current suite (example: Logged in as Suite 4 CA in Eng Login menu) |
| | Line Rate—Determined by the SetDef Line Rate button selection in the Configuration pane (right) |
| | Crop—Crop On/Crop Off |
| | BNC—Physical BNC on selected Mod I/O Board |
| Mod I/O Board | |
| Mod I/O Board (1-2) | Select the Mod I/O or Video I/O Board: Blue—Selected Black—Board present Gray—No board present |

Video I/O Board Configuration Data

| Button/Label | Description |
|--------------|-------------|
|--------------|-------------|



Board selection button enhancements apply to I/O Config and IP/IO Config menu tabs.

| | |
|---|---|
| Board Selection | Board configuration settings: |
|  | <ul style="list-style-type: none"> • First system input on the board—Top left • First system output on the board—Bottom left • Board slot in Frame—Center • Board type—Bottom right <ul style="list-style-type: none"> • IP (Internet Protocol) • GB (Gearbox) • --- No board |

MatchDef Conversion Configuration Pane

MatchDef Configuration Pane Buttons and Labels

| Button/Label | Description |
|-----------------------------|---|
| Mode | Bypass—Allows video to pass through without conversion MatchDef—Incoming stream will be converted to the Frame Operating Mode |
| Frame Operating Mode Labels | Format—Current Frame setting Frame Rate—Current Frame setting Aspect Ratio—Current Frame setting |
| Auto Line-Rate Enable | Enabled—Automatically detects line rate from incoming stream (does not currently detect 4K modes) and displays the incoming format Disabled—allows pass through stream and manual line rate selection in MatchDef (manually setting the line rate can sometimes be used to correct incoming video from an external device) |
| Line Rates | 4K SDQS, 4K 2SI, 2160p, 1080p-A, 1080p-B, 1080p, 1080sf, 1080i, 720p, Std Def 4:3, Std Def 16:9 (Standard Def buttons grayed out when in 4K Frame Operating Modes) |
| Crop/Matte Menu Tab | Displays Crop status and launches Crop adjustment data pads |
| Top | Crop image from the top down |
| Bottom | Crop image from the bottom up |
| Left | Crop image from the left |

MatchDef Configuration Pane Buttons and Labels

| Button/Label | Description |
|--------------|---|
| Right | Crop image from the right |
| Matte | Displays Matte status and launches Matte adjustment data pads |
| Hue | Increase/decrease matte hue percentage |
| Saturation | Increase/decrease matte saturation |
| Brightness | Increase/decrease matte brightness |
| Crop Enable | Enable crops |
| Clear All | Resets all crop and matte settings |

- System Input Name can be edited in the Eng Setup, Source Definition menu.
- Line rate selections (right) are determined with respect to the Frame Operating Mode. For example if the Frame mode is set to a 4K line rate, Std Def buttons will be grayed out because standard definition line rates are not currently supported for conversion in 4K modes.
- The Auto Line-Rate Enable button (right) must be off to manually select a conversion line rate button.

SetDef Conversion Configuration Pane

The following table shows the SetDef differences from MatchDef, see [MatchDef Conversion Configuration Pane](#).

Video I/O SetDef Configuration Pane Buttons and Labels

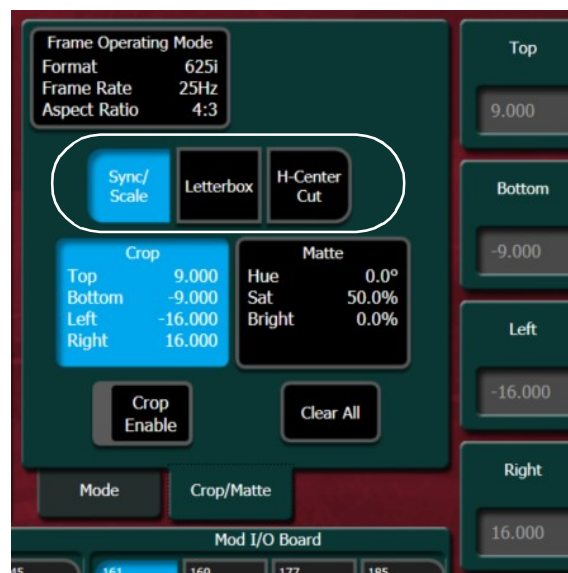
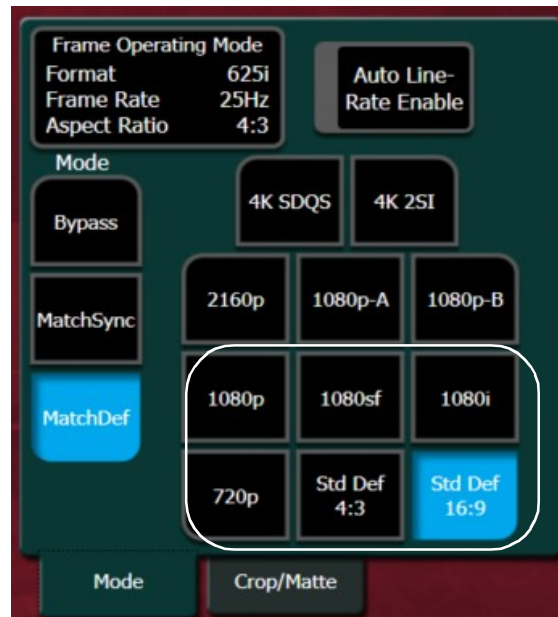
| Button/Label | Description |
|-------------------|---|
| Mode | Bypass—Allows video to pass through without conversion SetDef—Outgoing stream will be converted based on the Line Rate button selected |
| SetDef Timing | Displays the Horizontal Offset and Vertical Offset data pads |
| Horizontal Offset | Offsets the outputs SetDef timing horizontally |
| Vertical Offset | Offsets the outputs MatchDef timing vertically |

- SetDef
 - System Output Name can be changed in the Eng Setup, Outputs menu.
 - Standard Definition is supported for any Frame Operating mode.
- Inputs and Outputs are labeled with the Video Board number and the input/output. The labels match the Engineering IDs in the Source Definition and Outputs menus.
- When an input or output is selected, a modifier pane opens on the right.
- Bypass mode (right) can be selected to allow the video to pass through without conversion.
- Crop Enable, Clear, and crop data pads are provided at the far right when selected.

- Matte Enable, Hue, Saturation, and Brightness are provided at the far right when selected

Standard Definition

Standard Definition conversion buttons are available for configuration, including modifier buttons for Std Def 16:9. See the *Kayenne/Karrera/GV Korona User Manual* for standard definition parameter descriptions.

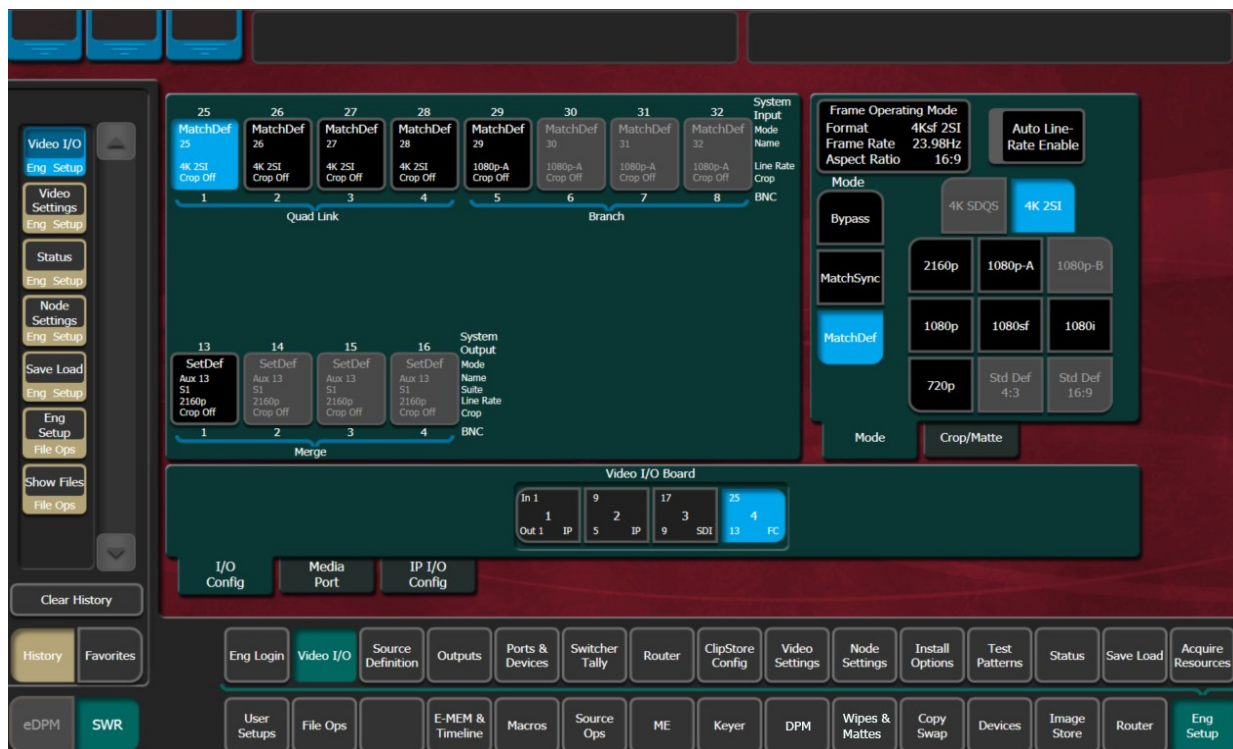


About 4K Conversion

Four inputs/outputs are used for 4K conversion, the first in the group is the valid source as shown in the Video I/O Conversion menu example.

IMPORTANT: Make sure the source definitions for 4K are defined correctly in the Source Definition menu.

MatchDef and SetDef modes are set in the Video I/O, I/O Config menu with an FC (Format Conversion) board selected.



V-series system with Conversion I/O

MatchDef Merge and Branch

A MatchDef *Branch* or *Merge* is performed during conversion on a stream input to the Frame, based on the Frame Operating Mode (Video Settings menu). For example, if the Frame Operating Mode is set to 4K 2SI and a 1080p stream is received on the input, the 1080p stream will be upsampled to 4K and branched into four 1080p streams. This is highlighted in the menu by the word **Branch** and a blue bracket under the four physical board inputs.

Conversely, if the Frame Operating Mode is set to 1080p and a 4K 2SI stream is received on an input, it is downsampled and merged into one 1080p signal. This is highlighted in the menu by the **Merge** label along with a blue bracket under the four physical inputs.

Note: 2160p signals are received and transmitted as a single 12G-SDI stream.

MatchDef Quad Link

When a 4K stream is input to the switcher *and* the Frame Operating Mode is set to a 4K format, it will be highlighted in the menu by the *Quad Link* label and a blue bracket under the four inputs. This means the four inputs are linked to the 4K signal.

SetDef Merge and Branch

A SetDef *Branch* or *Merge* is performed during conversion based on the Frame Operating Mode. For example, if the Frame Operating Mode is set to 1080p, the 1080p stream will be upscaled to 4K—four 3G 1080p streams. This is highlighted in the menu by the word **Branch** and a blue bracket under the four physical outputs.

Conversely, if the Frame Operating Mode is set to 4K 2SI, the four 3G 1080p streams are merged into one 1080p stream. This is highlighted in the menu by the **Merge** label along with a blue bracket under the four physical outputs.

Note: 2160p signals are received and transmitted as a single 12G-SDI stream.

SetDef Quad Link

When a 4K stream is output from the switcher *and* the Frame Operating Mode is set to a 4K format, it will be highlighted in the menu by the *Quad Link* label and a blue bracket under the four outputs. This means the four outputs are linked to the 4K signal.

Media Port Menus

The Video Frame supports up to two input Media Ports (one per I/O board).

The Media Port menu is located in the switcher Eng Setup, Video I/O menu. The Conversion pane on the left provides input selection buttons. The right side modifier pane provides the same functionality as the Video I/O menus.



Media Port Configuration Menu

Configure MatchDef for the Video I/O Output Format Conversion

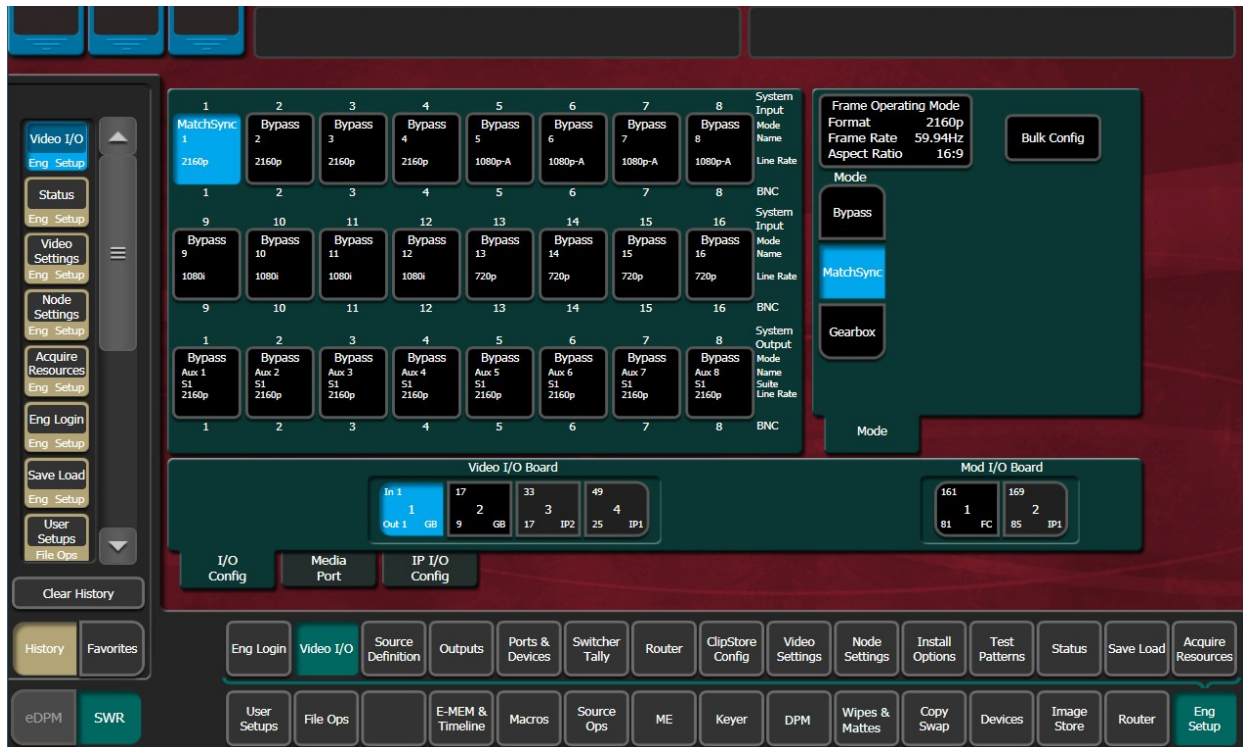
Auto Line Rate detection is not currently supported for 4K formats.

- 1 Disable the Auto Line Rate Enable button.
- 2 Select the Line Rate button matching the video line rate coming into the switcher input, in the MatchDef configuration pane of the Video I/O Conversion menu.

Match Sync

Match Sync delays incoming video the minimum amount of time and will synchronize incoming SDI signals to the system timing. Crop and Matt controls are provided for the Format Conversion board (FC), in the Crop/Matte menu tab (*Kayenne/Karrera/GV Korona User Manual*).

Match Sync is enabled in the Eng Setup, Video I/O, I/O Config menu.



About Gearbox Board 12G SDI Input and Output Formatting

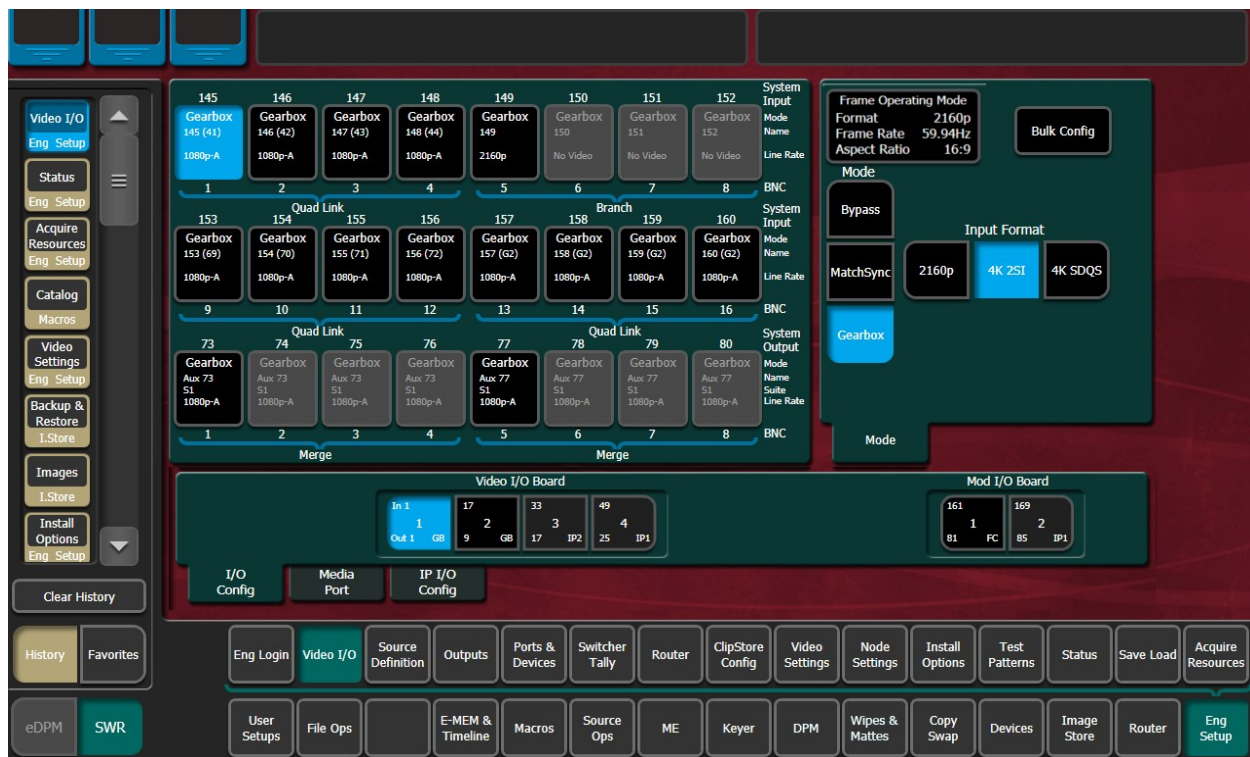
In the 2160p Frame Operating Mode, IP I/O boards can also output (only) a 2160p independent single stream, a 4K 2SI quad stream (four 1080p images), and a single 1080p stream. See [IP I/O Gearboxing on Outputs](#), on page 251.

Input/Output 2160p Video Streams

When the GV K-Frame XP FOM (Frame Operating Mode) is set to 2160p, all SDI inputs and outputs on the Gearbox Board (GB) can receive/transmit a single, independent 12G 2160p video stream.

Input Gearboxing 4K 2SI and 4K SDQS

A 4K 2SI or 4K SDQS 12Gbps SDI single stream is brought into the switcher as four 1080p signals that are connected to a group of four inputs. The four 1080p video inputs are then gearboxed into one 2160p video stream, on the first of the four inputs. The first group consists of inputs 1, 2, 3, and 4, the second group of inputs 5, 6, 7 and 8, and so on, through all 16 inputs.



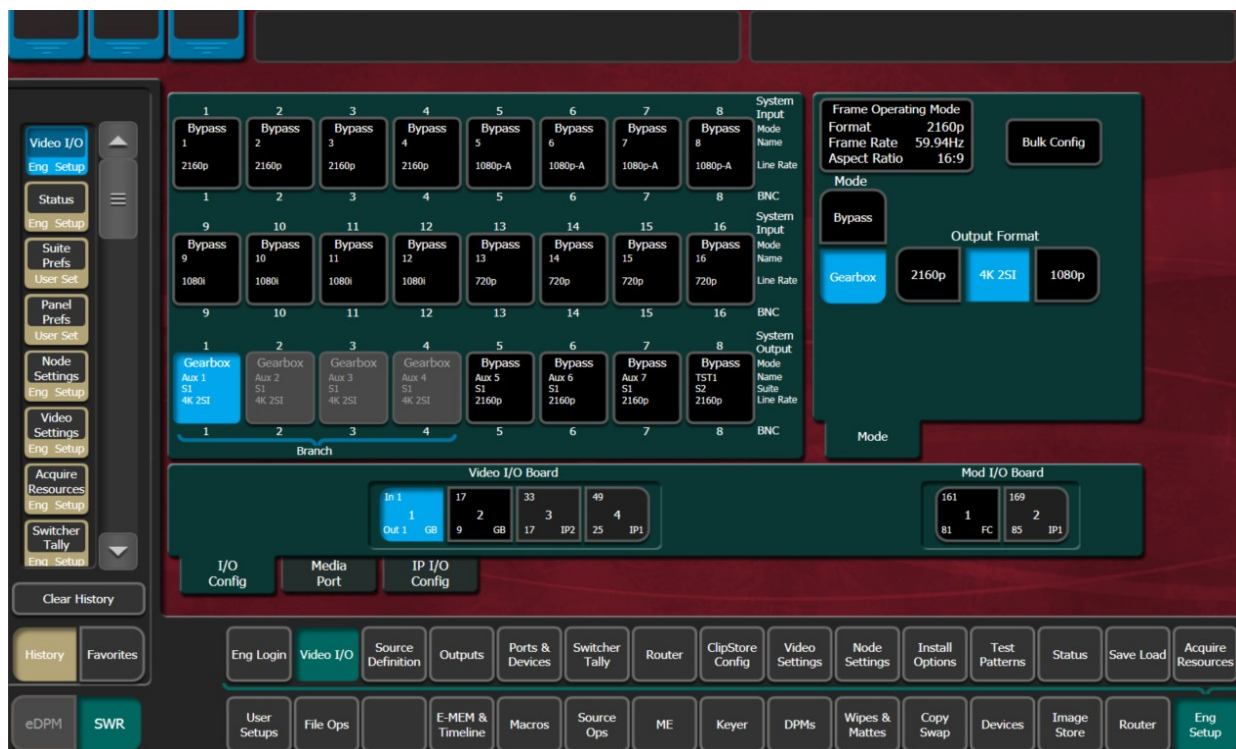
Output Gearboxing SDI 4K 2SI

A 4K 2SI 12Gbps SDI single stream is output from the switcher as four 1080p signals that are connected to a group of four outputs. The four 1080p video outputs are then gearboxed into one 2160p video stream, on the first of the four outputs. The first group consists of outputs 1, 2, 3, and 4 and the second group of outputs 5, 6, 7, and 8.

The 1080p Output Format setting provides a video stream for monitoring.

Safe Title, cursor, video processing (YUV Correction), etc. are supported on all outputs as with all K-Frame systems.

The Eng Setup, Video I/O, I/O Config menu is provided to configure the Gearbox settings.

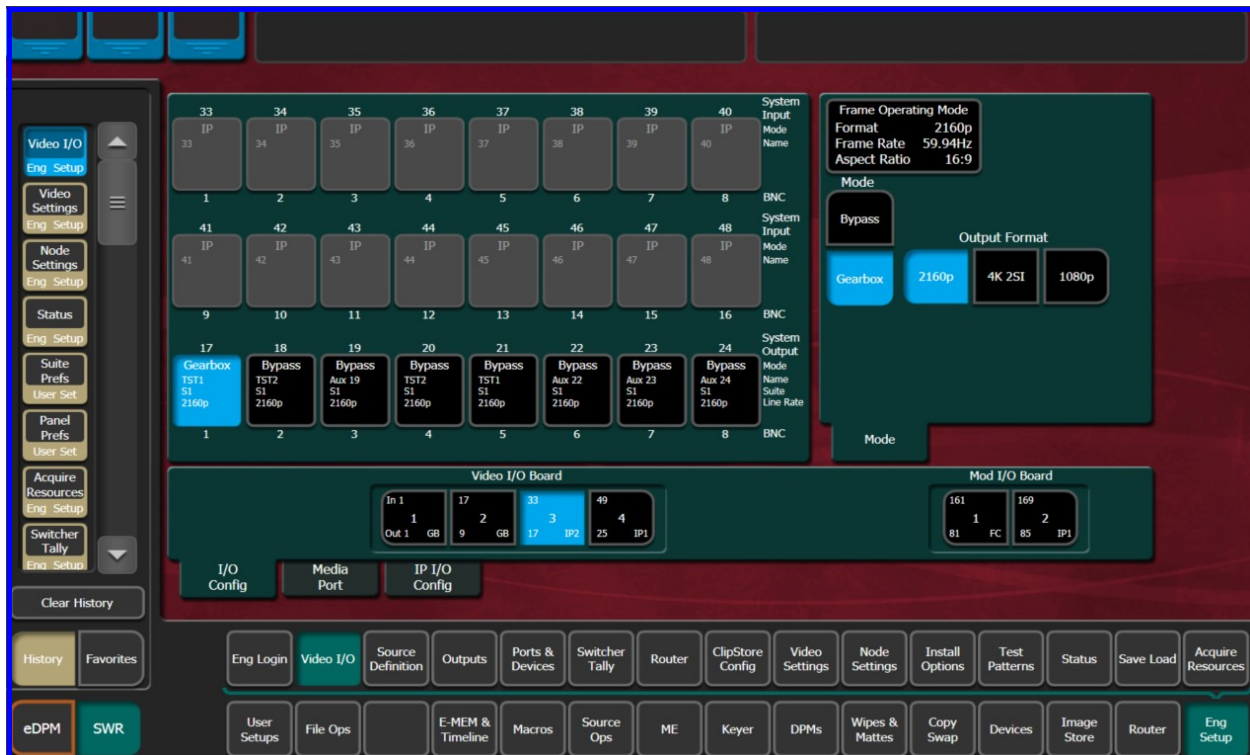


IP I/O Gearboxing on Outputs

IP I/O boards can be placed in Gearbox mode to output:

- 2160p independent single streams
- 4K 2SI streams tgearboxed into four 1080p streams transmitted on four outputs, the first group consists of outputs 1, 2, 3, and 4 and the second group of outputs 5, 6, 7, and 8, and
- Single 1080p gearboxed streams.

The 1080p Output Format setting provides a video stream for monitoring.



About Timing

The input video is timed to the internal switcher sync in both MatchSync and Gearbox mode. The delay can be up to a frame. In bypass mode, the input signals are auto-timed as long as they are in the normal auto-timing window ([About Switcher System Timing](#), on page 267). The auto-timing window for the MatchSync and Gearbox input is a full Frame Sync. The auto-timing input is measured in a few lines.

To properly time a mixed IP Video and SDI system, adjust the switcher system timing for the IP Video, then use the MatchSync or Gearbox inputs to match the timing of the incoming video.

MatchSync

MatchSync applies the minimum amount of delay to an incoming SDI video and synchronizes incoming signals with the system timing. MatchSync is supported on the GB(Gearbox) and FC (Format Conversion) boards for the GV K-Frame XP.

Supported Gearbox Format and Frame Operating Mode Compatibility

Inputs

| Mode | Frame Operating Mode | Input Format |
|------------|----------------------|--------------------------------|
| Bypass | All | Same as Frame Operating Mode |
| Match Sync | All | Same as Frame Operating Mode |
| Gearbox | 1080p Level A | 1080p Level A |
| | | 2160p ^a |
| | | 4K 2SI Quad Link ^b |
| | | 4K SDQS Quad Link ^b |
| | 4K 2SI Quad Link | 1080p |
| | | 2160p |
| | | 4K 2SI Quad Link |
| | | 4K SDQS Quad Link ^c |
| | 4K SDQS Quad Link | 2160p |
| | | 4K 2SI Quad Link |
| | | 4K SDQS Quad Link |
| | 2160p | 2160p (Same as Match Sync) |
| | | 4K 2SI Quad Link |
| | | 4K SDQS Quad Link |

a. Suitable for production video

b. 0p sub-image, slightly enhanced 1080p signal (not 4K)

c. Translated to 4K 2SI

Outputs

| Mode | Frame Operating Mode | Output Format |
|---------|----------------------|-------------------------------------|
| Bypass | All | Same as Frame Operating Mode |
| Gearbox | 1080p Level A | 1080p Level A |
| | | 2160p ^a |
| | | 4K SDQS Quad Link ^b |
| | 4K 2SI Quad Link | 1080p ^c |
| | | 2160p |
| | 2160p | 2160p (Same as Bypass) |
| | | 4K 2SI Quad Link ^a |
| | | 1080p Single to Single ^c |

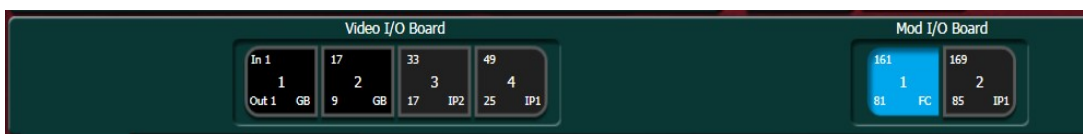
a. Suitable for production quality video

b. Translated to 4K 2SI

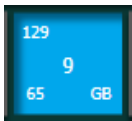
c. 2160p sub-image, slightly enhanced 1080p signal (not 4K)

Video I/O Board and Mod I/O Board Configuration Data

| Button/Label | Description |
|--------------|-------------|
|--------------|-------------|



Board Tile Button enhancements apply to I/O Config and IP/IO Config menu tabs.

| | |
|---|---|
| Board Selection | Board configuration settings: |
|  | <ul style="list-style-type: none"> • First system input on the board—Top left • First system output on the board—Bottom left • Board slot in Frame—Center • Board type—Bottom right <ul style="list-style-type: none"> • IP (Internet Protocol) • FC (Format Conversion) • GB (Gearbox) • --- No board |

I/O Config Menu Button and Labels

Inputs/Outputs Configuration Pane Buttons and Labels (Left)

| Button/Label | Description |
|----------------|--|
| Inputs | |
| Input (1-16) | Select the input for configuration from the top two rows of data pads labeled System Input (on the right side of the Configuration pane) |
| Labels | System Input—Source Definition Engineering ID |
| | Mode—Input modes based on Video I/O Board or Mod I/O Board type selections: <ul style="list-style-type: none"> • Gearbox Board: Bypass, MatchSync, Gearbox • Format Conversion Board: Bypass, MatchSync, MatchDef • IP: N/A (IP I/O Config menu) • |
| | Name—System Input Name (Eng Setup, Source Definition menu) |
| | Line Rate— Input video format |
| | Crop—Crop On/Crop Off (Format Conversion Board) |
| | BNC—Physical BNC on selected Video/Mod I/O Board |
| Outputs | |
| Output (1-8) | Select the output for configuration from the bottom row of data pads labeled System Output (on the right side of the Configuration pane) |

Inputs/Outputs Configuration Pane Buttons and Labels (Left)

| Button/Label | Description |
|--------------|--|
| Labels | System Output—Video I/O Physical Output definition from the Eng Setup, Outputs menu |
| | Mode—Output modes based on Video I/O Board or Mod I/O Board type selections: <ul style="list-style-type: none"> • Gearbox Board: Bypass, Gearbox • Format Conversion Board: Bypass, MatchSync, SetDef • IP: N/A (IP I/O Config menu) • |
| | Name—System Output Name (Outputs menu) |
| | Suite—Current suite assigned to the output |
| | Line Rate—Line rate of the output, modified by Gearbox or SetDef selection in the Configuration pane (right) |
| | Crop—Crop On/Crop Off (Format Conversion Board) |
| | BNC—Physical BNC on selected Video I/O Gearbox or Mod I/O Format Conversion Board |
| | |

Mode Configuration Pane Buttons and Labels (Right)

| Button/Label | Description |
|--|--|
| Mode Tab | |
| Frame Operating Mode Labels | Format—Current Frame setting (Video Settings Menu) |
| | Frame Rate—Current Frame setting (Video Settings Menu) |
| | Aspect Ratio—Current Frame setting (Video Settings Menu) |
| Auto Line-Rate Enable: Format Conversion | <p>Enabled—Automatically detects line rate from incoming stream (does not currently detect 4K modes) and displays the incoming format</p> <p>Disabled—allows pass through stream and manual line rate selection in MatchDef (manually setting the line rate can sometimes be used to correct incoming video from an external device)</p> |
| Mode: Gearbox | <p>Inputs:</p> <ul style="list-style-type: none"> • Bypass—Allows video to pass through without conversion • MatchSync—Incoming video delayed minimum amount, will synchronize incoming SDI signals to system timing • Gearbox—Select 2160p, 4K 2SI, or 4K SDQS |
| Mode: Format Conversion | <p>Inputs:</p> <ul style="list-style-type: none"> • Bypass—Allows video to pass through without conversion • MatchSync—Incoming video delayed minimum amount, will synchronize incoming SDI signals to system timing • MatchDef—Incoming stream will be converted to the Frame Operating Mode |
| Line Rates | 4Ksf 2SI, 4K 2SI, 4K SDQS, 2160p, 1080p-A, 1080p-B, 1080p, 1080sf, 1080i, 720p, Std Def 4:3, Std Def 16:9 (Standard Def buttons grayed out when in 4K Frame Operating Modes) |
| Crop/Matte Tab (Format Conversion only) | |
| Crop | Displays crop settings and displays Top, Bottom, Left, Right data pad/soft knobs |
| Top | Crop image from the top down |
| Bottom | Crop image from the bottom up |
| Left | Crop image from the left |
| Right | Crop image from the right |
| Matte | Displays Matte settings and launches Matte adjustment data pads |
| Hue | Increase/decrease matte hue percentage |
| Saturation | Increase/decrease matte saturation |
| Brightness | Increase/decrease matte brightness |
| Crop Enable | Enable crops |
| Clear All | Resets all crop and matte settings |

UltraMatch and GearBox on IP I/O and Gearbox Boards

The GV K-Frame XP Video Processing Frame introduced a new feature – “UltraMatch®” specifically developed to assist users in addressing mixed formats within a 4K/HD mixed mode production. A specialized mini-format converter has been enabled on SDI or IP 16x8 I/O boards (K-FRM-IO-FULL-X-GB and K-FRM-IO-FULL-X-I) and the IP 8x4 I/O board (K-FRM-IO-X-I) to convert incoming 2160p and 1080p video to either 2160p or 1080p video to match the selected HD or 4K Frame Operating Mode.

When the Input Mode is set to “Bypass/UltraMatch”, the individual input detects the incoming source’s video format and automatically performs the correct conversion. Alternatively, the Input Mode may be set to “GearBox” and the Input Format can be set manually to 2160p or either of the Quad Link Formats: 4K 2SI or 4K SDQS. Inputs which are 1080i can also be converted, some occasional motion artifacts may occur due to interlace and the audio will not be valid.

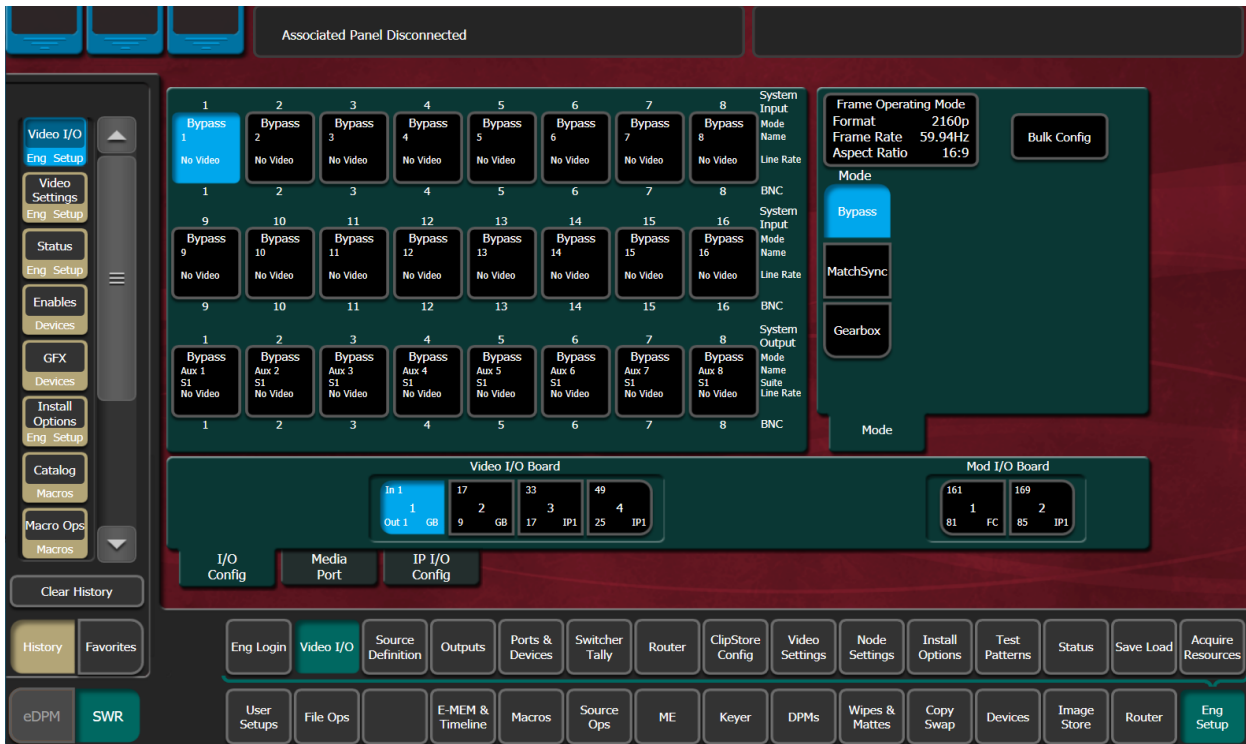
For the outputs, the GearBox mode allows the operator to individually select single stream 2160p, 1080p or Quad-Link 4K 2SI streams on each output when the Frame Operating Mode is 2160p or 1080p.

| UltraMatch and GearBox Controls | 2160p | 4K 2SI | 4K SDQS | 1080p |
|---------------------------------|--------|--------|---------|-------|
| Input Mode – Bypass/UltraMatch | Passes | | | Yes |
| Output Mode – Bypass/UltraMatch | Passes | | | |
| Input Mode - GearBox | Passes | Yes | Yes * | |
| Output Mode - GearBox | Passes | Yes | | Yes |

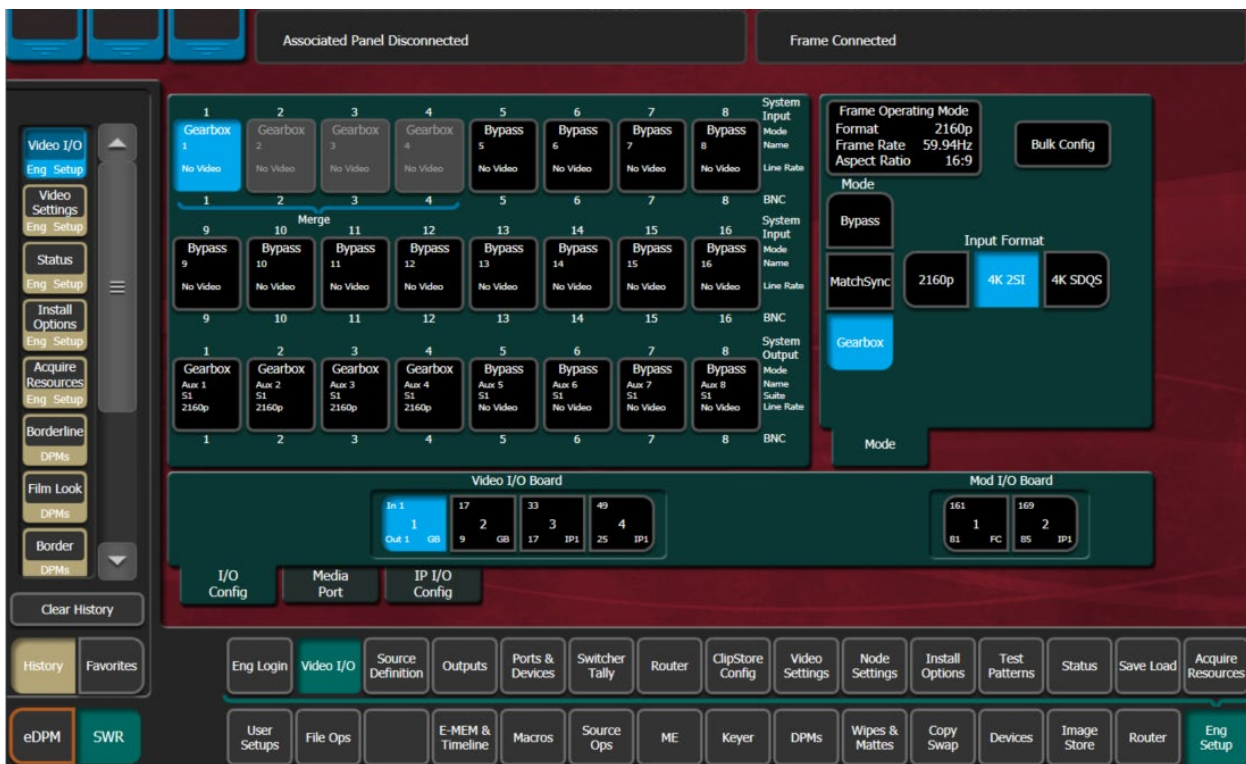
* Supported on the SDI GearBox Board only

These specialized mini-format convertors are specifically designed for converting between 2160p and 1080p formats. In most situations, it will be difficult for the eye to detect the difference between a conversion done on the K-Frame’s 8x4 SDI conversion board (K-FRM-IO-CONV-XP) and one accomplished by the UltraMatch® mini-format convertor or GearBox hardware on the SDI GearBox and IP I/O boards. If your production requirement calls for conversion to/from 720p video or Standard Definition Video, then the K-FRM-IO-CONV-XP board (SDI) or an external conversion box should be utilized.

The following menus show the controls for configuring the I/O Boards.



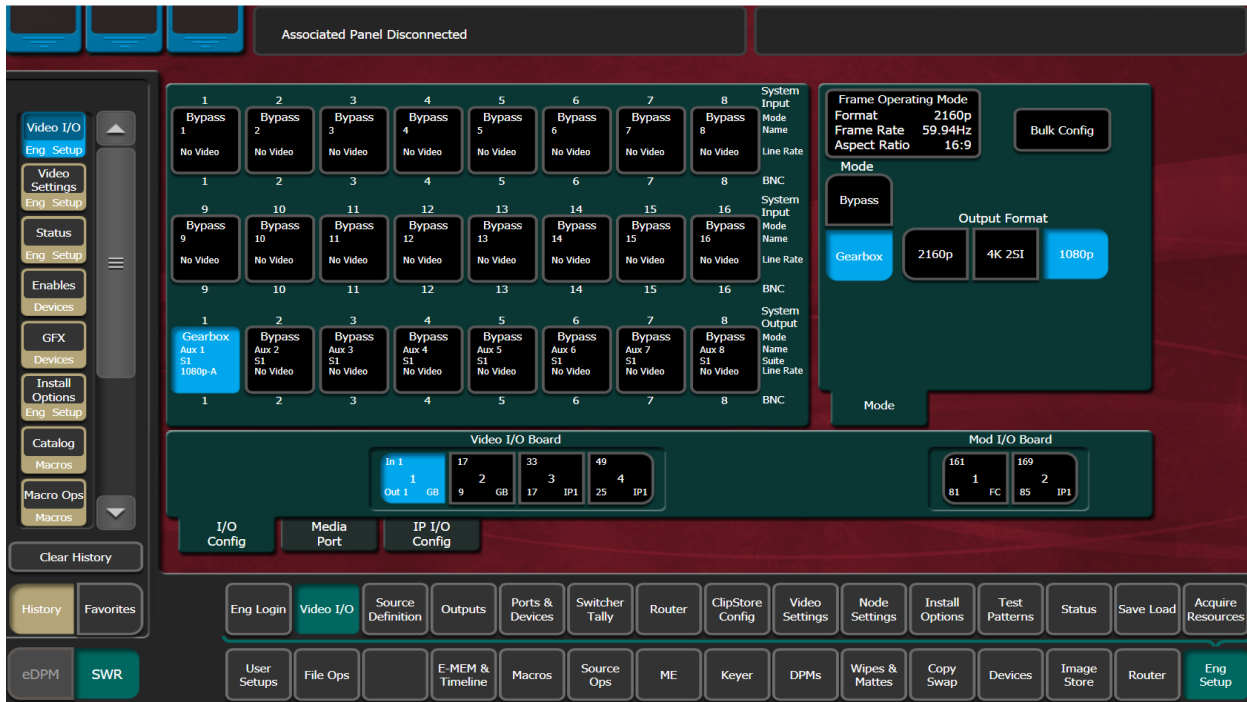
16 x 8 SDI GearBox Board – Input Mode set to Bypass/UltraMatch



16 x 8 SDI Gearbox I/O Board – Input Mode is set to GearBox, Input Format set to Quad Link 4K 2SI

Basic Configuration

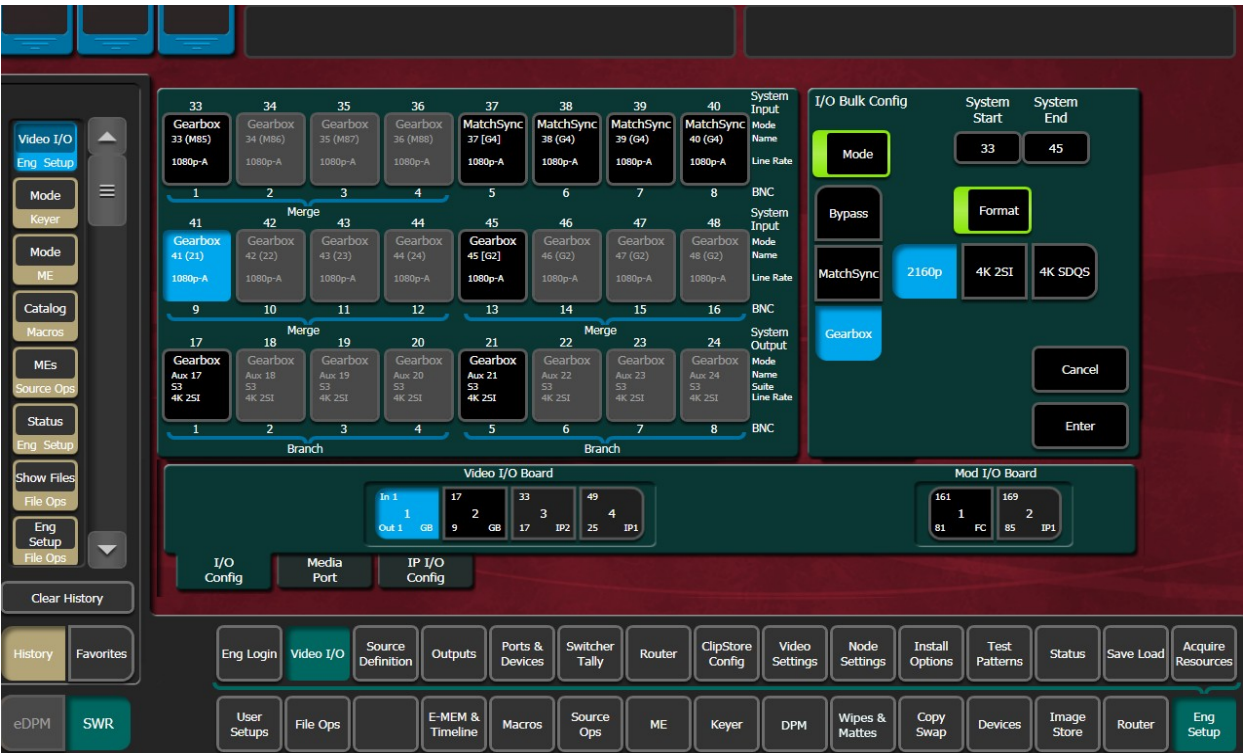
Supported Gearbox Format and Frame Operating Mode Compatibility



16 x 8 SDI GearBox IO Board – Output Mode set to GearBox, Output Format set to 1080p

Gearbox Bulk Configuration Menu

Bulk Configuration in the Eng Setup, Video I/O, I/O Config menu allows Gearbox mode configurations to be applied across multiple Gearbox system inputs and outputs for each mode: Bypass, MatchSync, and Gearbox.



I/O Bulk Config Pane

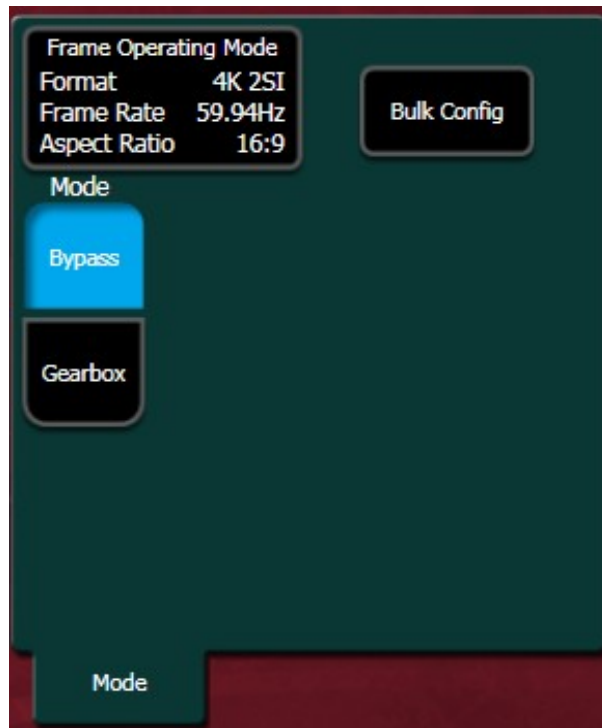


I/O Bulk Config (Mode) Pane Buttons and Labels

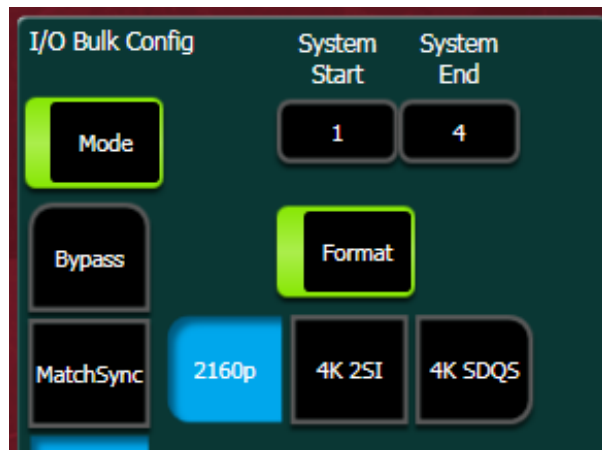
| Button/Label | Description |
|---|--|
| System Start/System End | System Start: First System Input/Output in range |
| | System End: Last System Input/Output in range |
| Mode | Select to enable bulk configuration |
| Bypass/MatchSync/Gearbox (Modes) | Select mode for bulk configuration |
| Format | Select to enable format selection |
| (Inputs format) 2160p/4K 2SI/4K SDQS (Outputs format) 2160p/4K 2SI/1080p | Input/Output video formats |
| Cancel | Cancel selections |
| Enter | Apply settings |

Apply I/O Bulk Config Settings

- 1 Select the **Bulk Config** button in the Eng Setup, Video I/O, I/O Config, Mode pane.



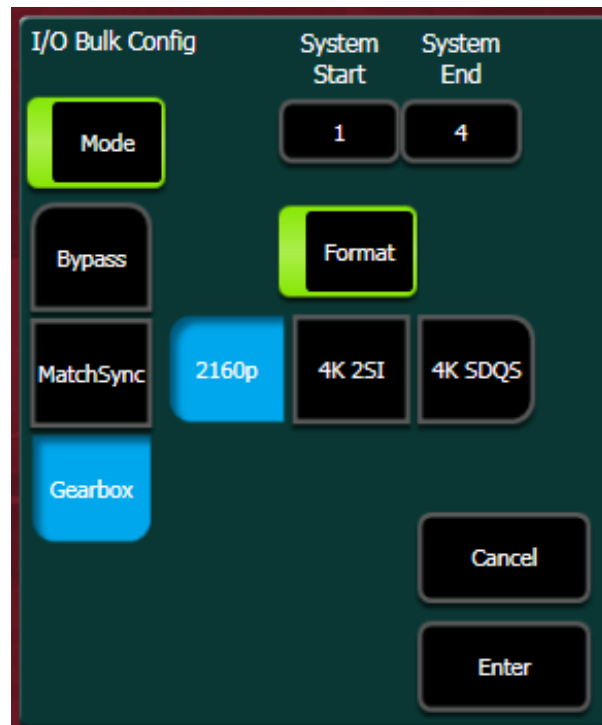
- 2 Select the System Start data pad and enter the number of the first System Input/Output in the range for bulk configuration in the System Start numeric keypad.



- 3 Select the System End data pad and enter the number of the last System Input/Output in the range for bulk configuration in the System End numeric keypad.

Note: Gearbox Mode and Format can be configured in bulk together or independently. The Mode or Format buttons must be enabled for the configuration to be applied.

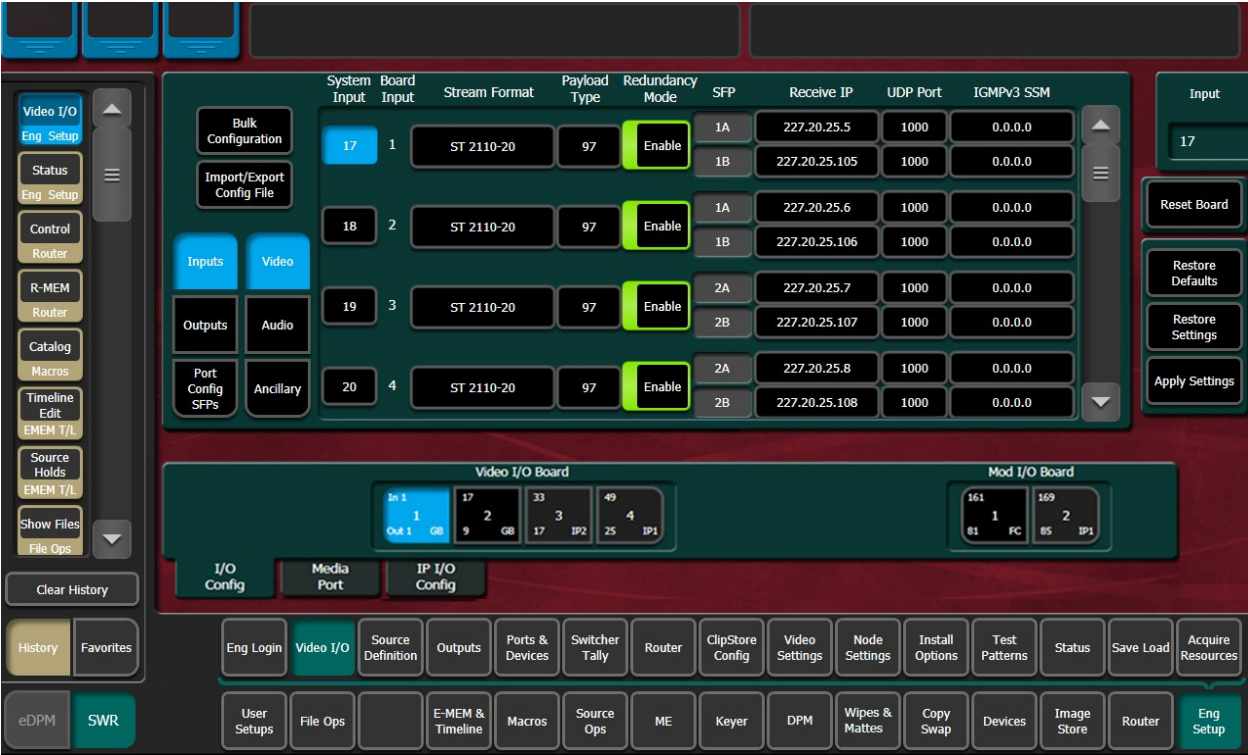
- 4 To bulk configure the Mode setting, enable the **Mode** button and select:
 - Bypass, MatchSync, or Gearbox for inputs or
 - Bypass or Gearbox for outputs, and

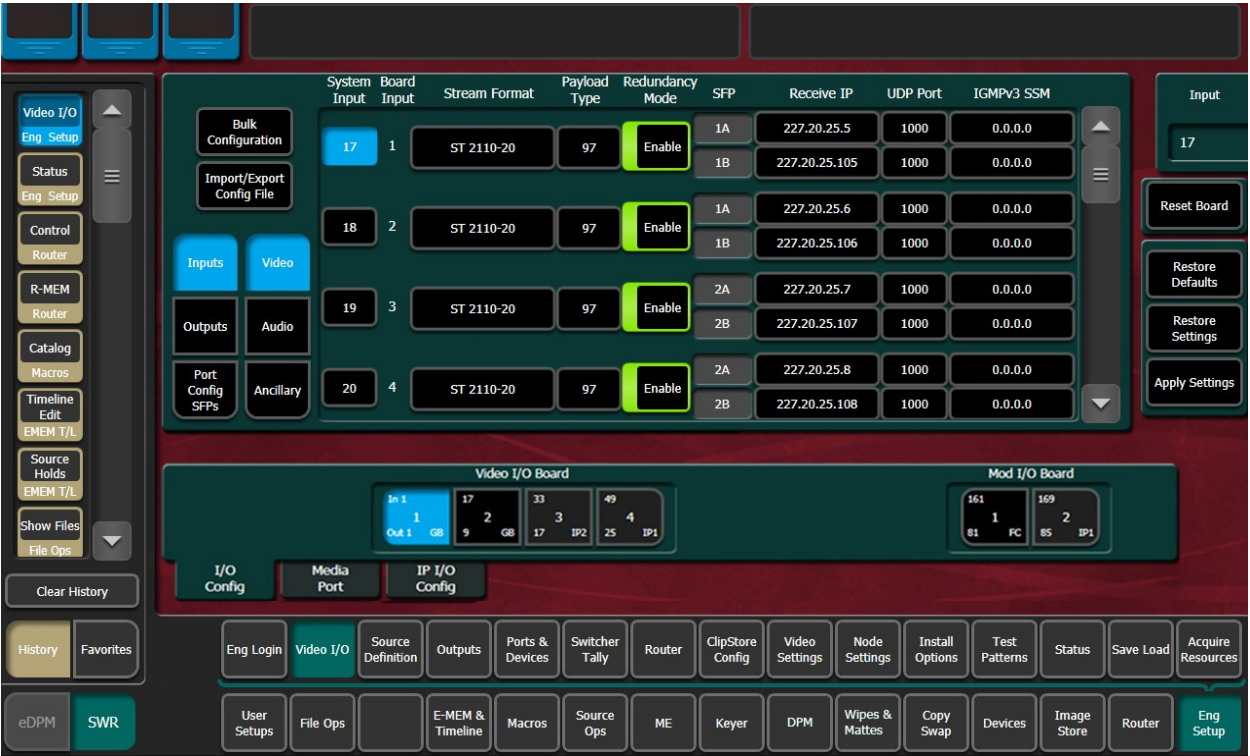


- 5 Select **Enter**.
- 6 To bulk configure the format in Gearbox mode, enable the **Format** button and select:
 - **2160p, 4K 2SI, 4K SDQS** for Inputs or
 - **2160p, 4K 2SI, 1080p** for Outputs, and
- 7 Select **Enter**.

IP I/O Config Menu

The IP I/O Config menu was updated to include the additional configuration settings on the Video I/O and Mod I/O Board data pads.



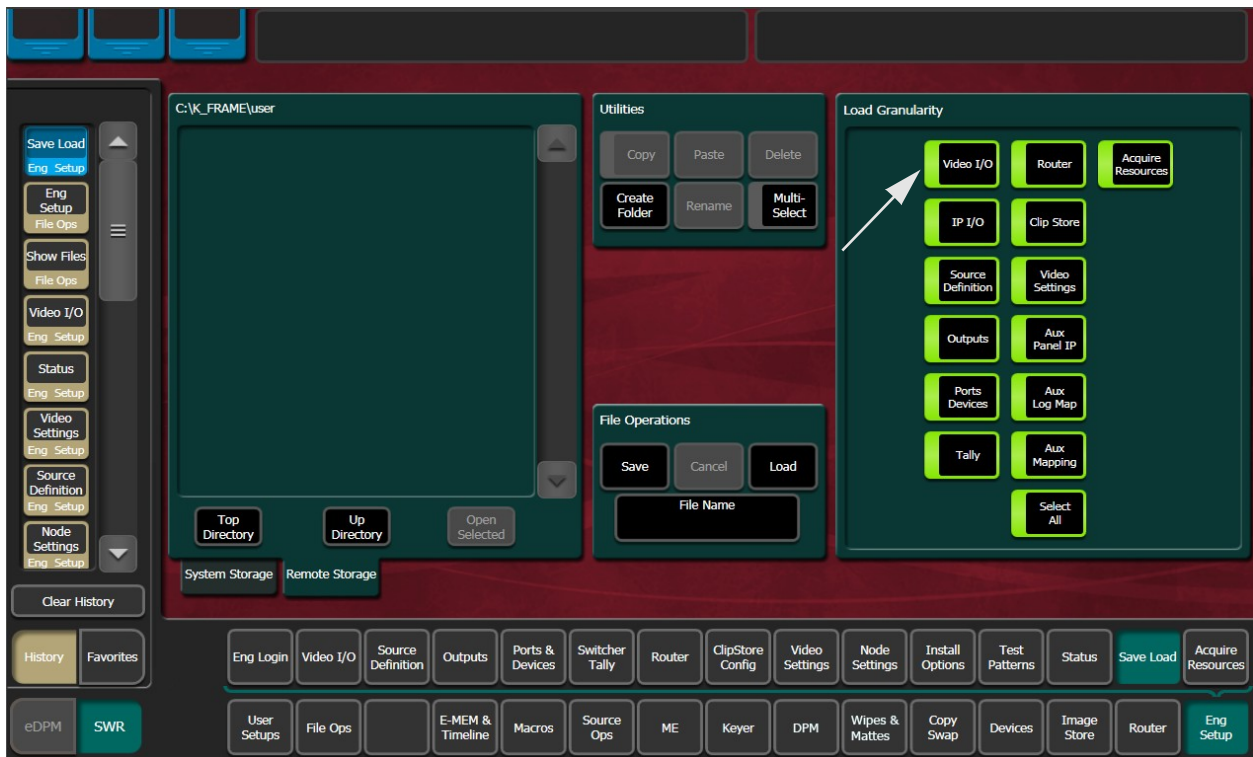


Video I/O Board and Mod I/O Board Configuration Data

| Button/Label | Description |
|--|---|
| <div><div>Video I/O Board</div><div><div>In 1 1 Out 1 GB</div><div>17 2 9 GB</div><div>33 3 17 IP2</div><div>49 4 25 IP1</div></div></div> <div><div>Mod I/O Board</div><div><div>161 1 81 FC</div><div>169 2 85 IP1</div></div></div> | |
| Board Selection | Board configuration settings: <ul style="list-style-type: none">• First system input on the board—Top left• First system output on the board—Bottom left• Board slot in Frame—Center• Board type—Bottom right<ul style="list-style-type: none">• IP (Internet Protocol)• FC (Format Conversion)• GB (Gearbox)• --- No board |

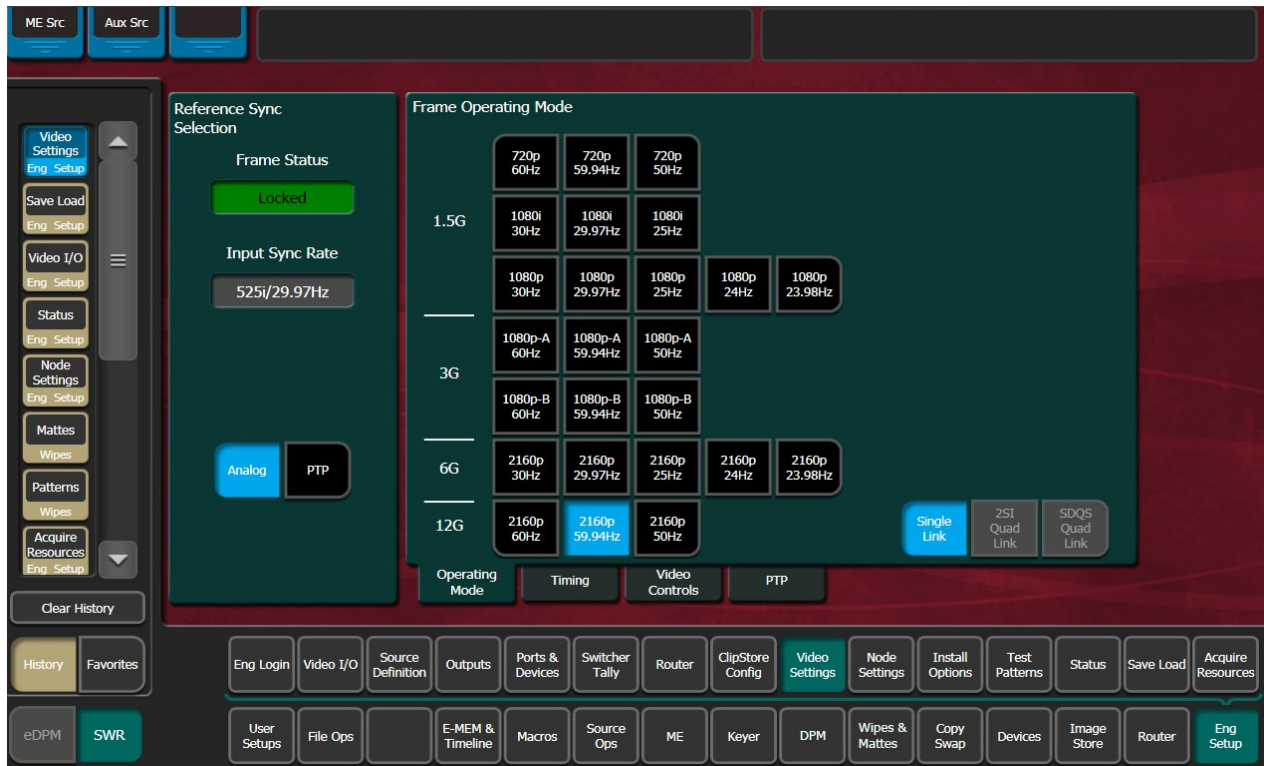
Saving/Loading I/O Config Parameters

I/O Config parameter settings are saved/loaded when the Video I/O button is enabled in the Load Granularity pane of the Eng Setup, Save Load (and File Ops, Eng Setup) menu.



Video Settings

The Video Settings menu reports the current system sync reference and status, allows selection of the Frame Operating Mode, and provides other system functions.



Reference Sync Selection

Choosing **Analog** in the Eng Setup, Video Settings menu, selects the Analog Reference connector on the Video Processor Frame for system reference. Any interruption of an analog reference source can cause GV K-Frame XP system problems.

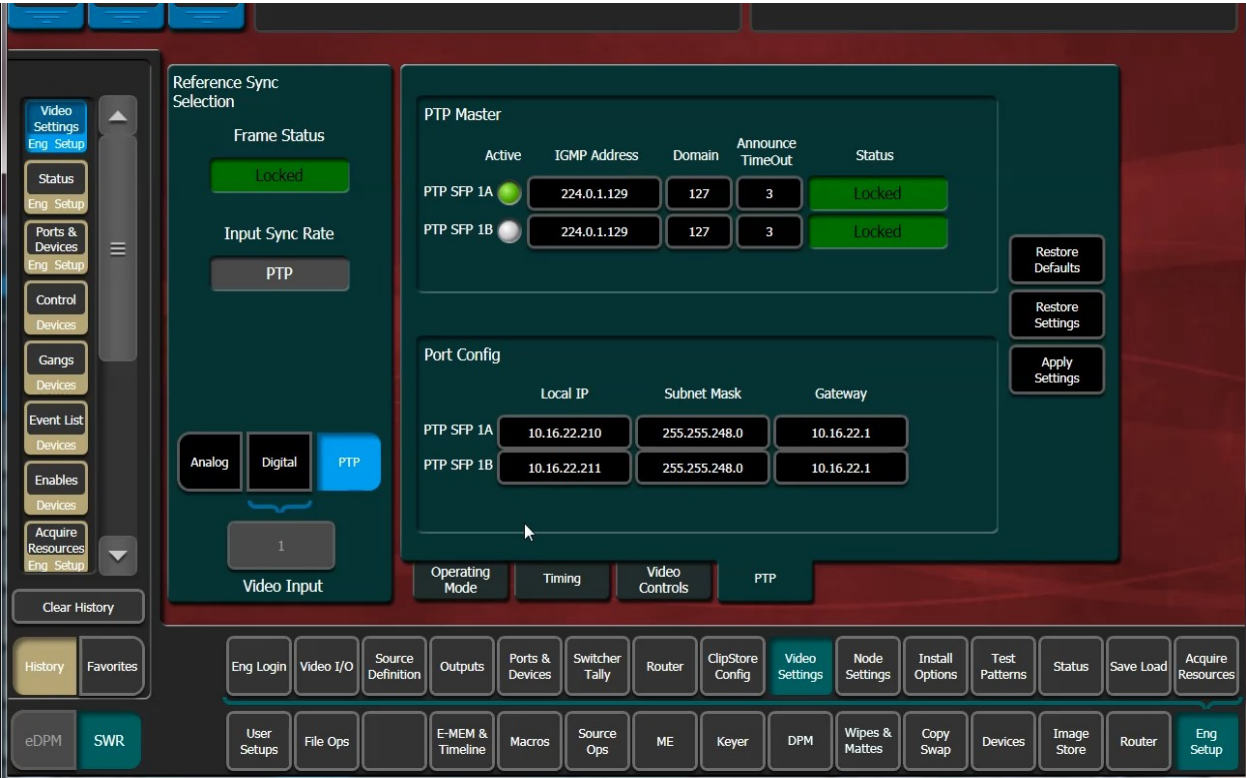
Frame Status – Reports the current sync status of the frame (for example, Locked).

Input Sync Rate – Reports the current input sync reference format.

About PTP Reference

GV K-Frame XP switchers connect to, and receive PTP reference from, the PTP Master server on the network. The Grass Valley switcher PTP reference parameters can be configured in

the Eng Setup, Video Settings, PTP menu tab. PTP settings are saved in Engineering Setups as part of the Video Settings.



Configuring the PTP Master

The networked PTP master server configuration is set by the administrator. The PTP master server network settings and the PTP Master switcher menu pane settings must match.



Default Switcher Master PTP configuration

PTP Master Pane Button Descriptions

| Button | |
|------------------|---|
| SFP A | Primary SFP input |
| SFP B | Secondary, redundant SFP input |
| Active | Active SFP <ul style="list-style-type: none">• Green=Active• White=Inactive |
| IGMP Address | Multicast network protocol address for PTP reference, select to enter address |
| Domain | Network domain, select to enter domain ID |
| Announce TimeOut | Number of timeouts before alerting to a PTP Master device data loss, select to enter Announce TimeOut number |
| Status | <ul style="list-style-type: none">• Locked=Synced,• Unlocked=Present not synced,• Not present=No connection |

SFP Redundancy

SFP inputs have redundancy and automatically change to the redundant channel if there is an interruption in the connection. If for example a disruption occurs with input SFP 1A, the primary, the secondary SFP 1B automatically becomes the active connection (green status). When SFP 1A reconnects, SFP 1A will again become the active SFP without any action on the part of the operator.

SFP Input Status

The SFP Status for each input can be locked while the Frame Status is unlocked; for example while the Frame is still connecting. Once connected, the Frame Status will display “Locked” and the PTP reference will be synced. However, both SFP inputs must be locked for the Frame to report a “Locked” status.

Port Configuration

The Local IP, Subnet Mask, and Gateway match the Frame backplane SFPs. The input SFPs must match the Master PTP server network settings to synchronize the signals. Local IPs for each SFP input must be different to support redundancy. Select each data pad and enter the Local IP, Subnet Mask, and Gateway using the pop-up numeric keypad.

The screenshot shows a 'Port Config' window with a dark green background. It contains two rows of configuration fields for 'PTP SFP 1A' and 'PTP SFP 1B'. Each row has three input fields: 'Local IP', 'Subnet Mask', and 'Gateway'. The values entered are: PTP SFP 1A (10.16.22.210, 255.255.248.0, 10.16.22.1) and PTP SFP 1B (10.16.22.211, 255.255.248.0, 10.16.22.1). A mouse cursor is visible at the bottom left of the window.

| | Local IP | Subnet Mask | Gateway |
|------------|--------------|---------------|------------|
| PTP SFP 1A | 10.16.22.210 | 255.255.248.0 | 10.16.22.1 |
| PTP SFP 1B | 10.16.22.211 | 255.255.248.0 | 10.16.22.1 |

Frame Operating Mode

The selected Frame Operating Mode determines the Frame's video input and output formats (excluding MatchDef and SetDef) and the internal processing used for the video.

ME Blanking Settings

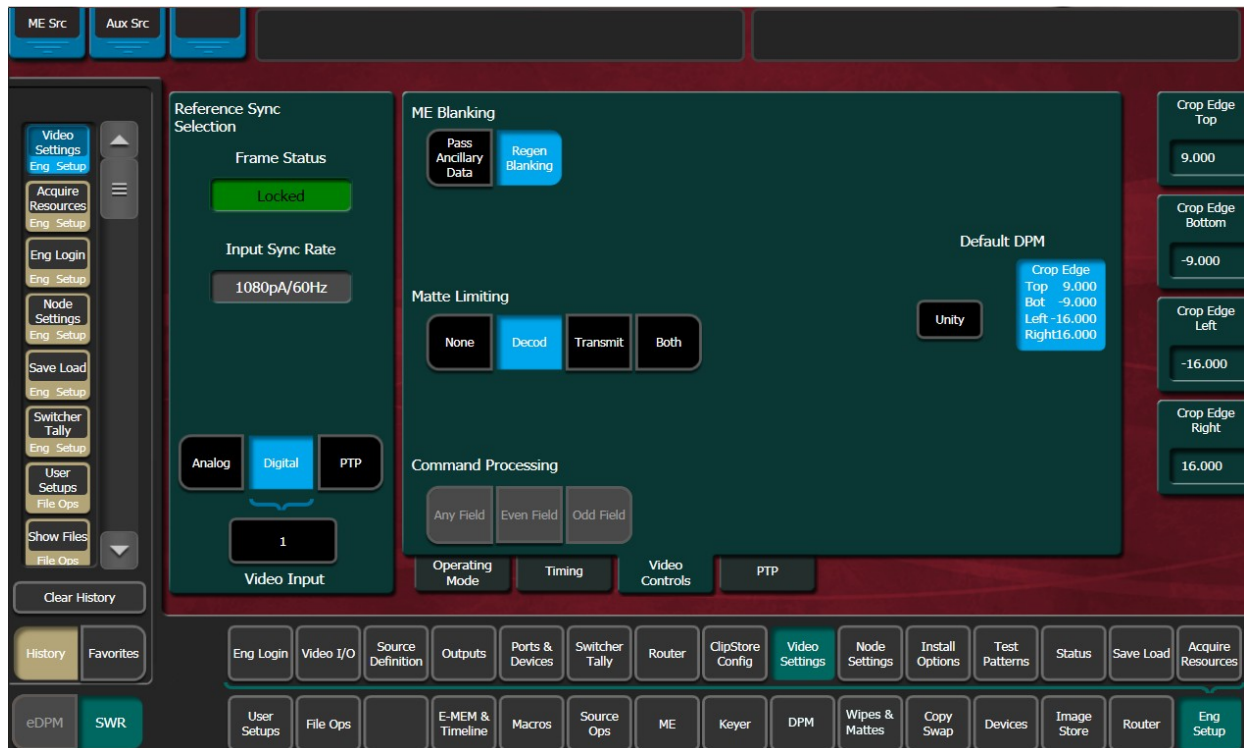
Production switchers normally regenerate a clean blanking interval. When the switcher must pass ancillary information such as embedded audio, this blanking regeneration can be disabled. This following settings apply to the output blanking of all the M/E.

Pass Bus A's Ancillary Data – Passes the ancillary data from the A bus to the M/E Program output during the vertical interval.

Regenerate Blanking – Regenerates blanking during the vertical and horizontal intervals.

To Regenerate blanking for M/Es; no audio, subtitles, closed captioning, etc.:

- 1 Select Eng Setup, Video Settings, in the menu.



- 2 Select **Regen Blanking** in the ME Blanking pane.

About Switcher System Timing

SST (Switcher System Timing) is the position of the switcher timing in relation to the reference signal. SST can be delayed or advanced using the Switcher Horizontal and Switcher Vertical Offsets in the Eng Setup, Video Settings, Timing menu.

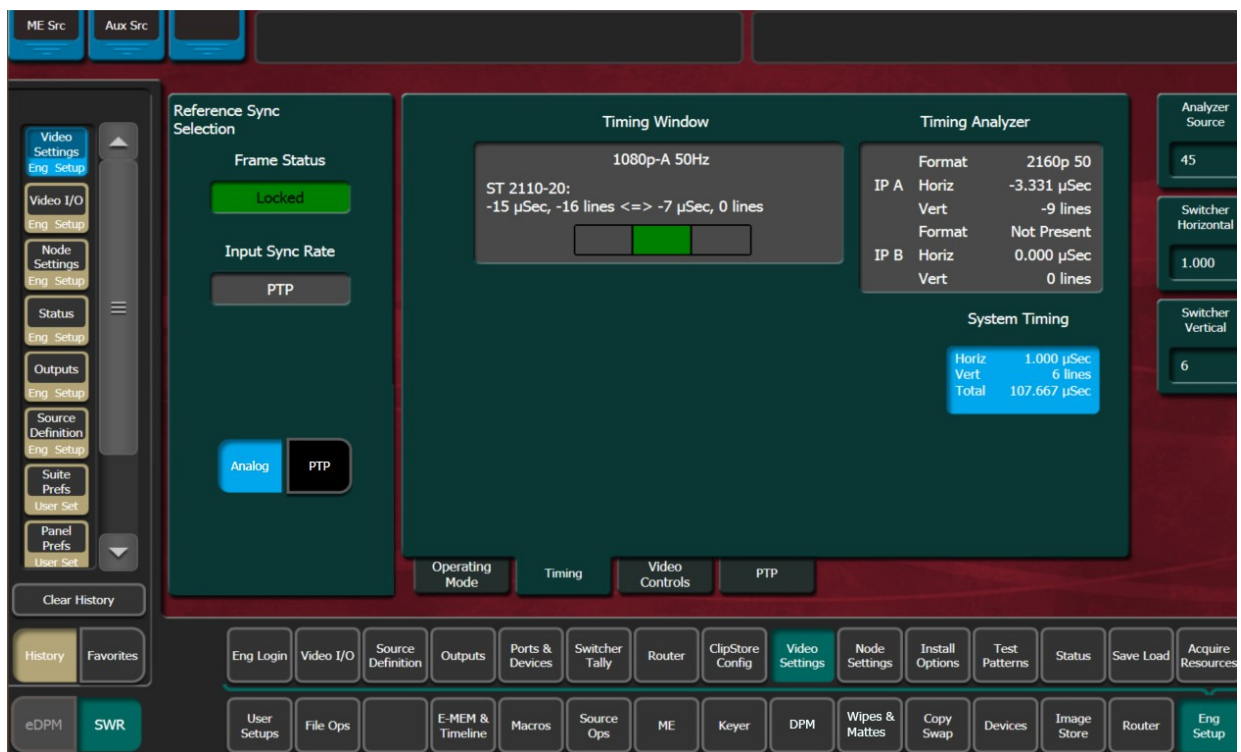
The total delay of a video input to the switcher output can vary according to the relationship of the input to the switcher reference. The switcher will automatically autotime inputs that fall within an autotiming window. Inputs must be within this

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).

Typically, there are two methods for timing the switcher system and sources: either the sources are at zero timing and the switcher is delayed or the switcher system timing is at zero and the sources are back-timed. Regardless of the method, all video signals must be received earlier than the SST and the source input timing must be within a specific timing window for an input signal to be timed correctly. The Timing menu provides the information and controls needed to insure the input timing is within the timing window.

Timing Analyzer

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



This analyzer reports the timing position of a selected source relative to the 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 µs. Positive values indicate the source is later in time than the internal sync generator, and negative values indicate the source is earlier.

GV K-Frame XP systems have an autotiming window, in the Video Settings, Timing tab. Sources that fall within that window will be properly timed throughout the system, even if the signal is cascaded through multiple M/Es.

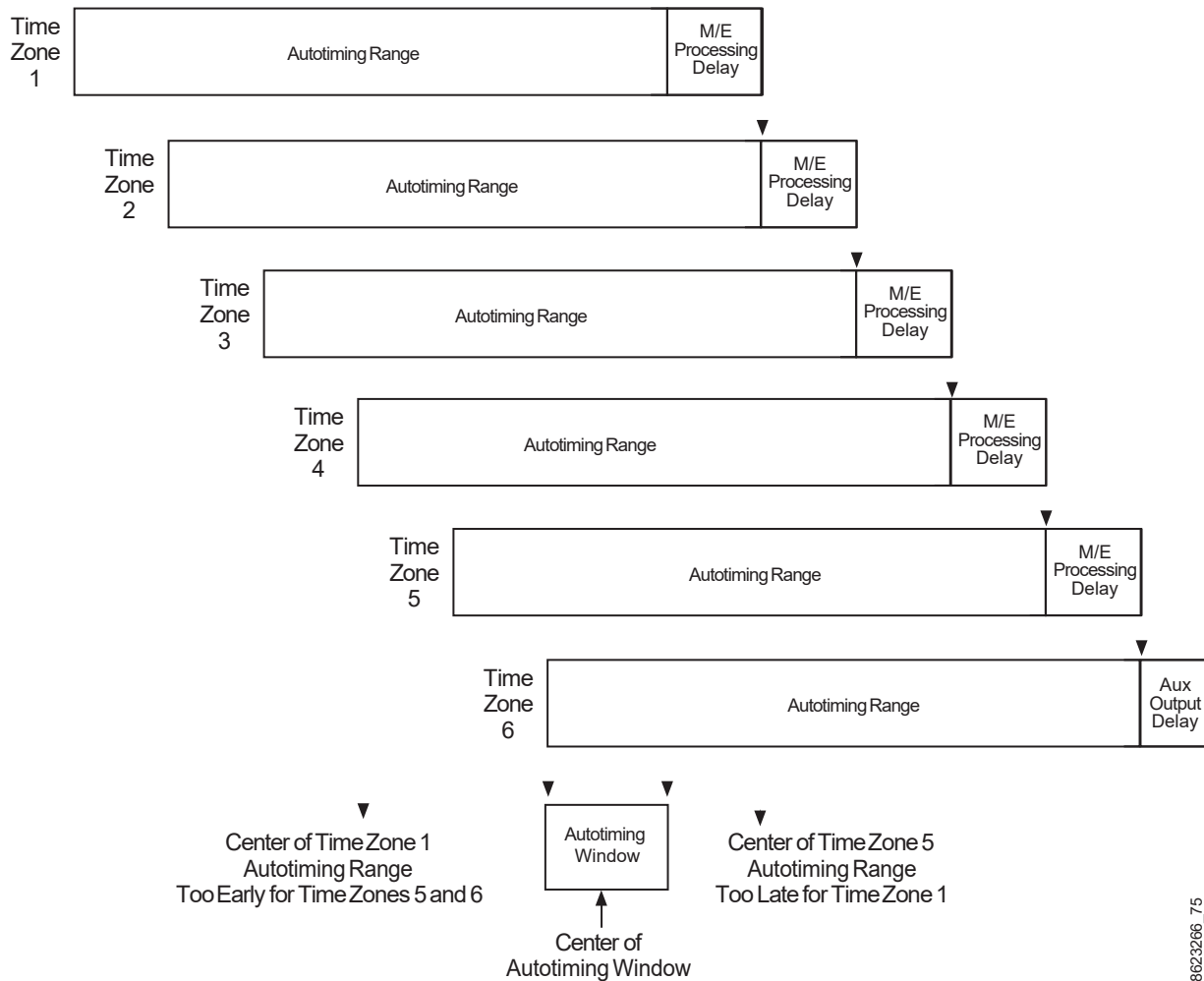
The Switcher Horizontal and Switcher Vertical soft knobs adjust the timing of the system relative to the incoming reference. These values are generally best left at zero.

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.

Basic Configuration

Time Zones and the Autotiming Window



8623266_75

Production Switcher Time Zones

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 above, 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.

Switcher System Timing

GV K-Frame XP systems can be configured for all IP, all SDI, or a combination, therefore the timing and delay must be planned for carefully.

IP Auto-timing

Decapsulation (data unpacking) buffers can accommodate multiple line differences between IP inputs but the output of the decapsulation must be SST plus a few microseconds in order to align all of the inputs for video processing.

Encapsulation (data packetizing) time varies depending on the video line rate. Encapsulation time is how long it takes to accumulate a packet of data; a packet will not be transmitted until the packet is full. 1080p and 1080i take approximately one quarter of the time of a line of video to complete encapsulation of one packet while 720p takes approximately one third of the time of a line of video.

Additionally, TICO encoding adds approximately five lines of delay and decoding adds approximately three lines of delay.

The following diagram shows the SDI/IP signal path and provides example of the timing delays and offsets that need to be considered as part of system configuration.

IP Auto-timing Specifications

The 771-0741-01 IP I/O Board supports Extended Input Buffer ([About Extended Input Buffer](#), on page 168).

IP Switcher System 771-0741-00 IP I/O Board Auto-timing Window, by Format (Hz)

| Frame Operating Mode | ST 2110-20 | ST 2022-6 | ST TICO 2022-6 |
|------------------------|---|---|--|
| 720p/59.94/60 | -22 μ s, 0 lines/-18 μ s, -21 lines | -10 μ s, 0 lines/-12 μ s, -22 lines | N/A |
| 720p/50 | -22 μ s, 0 lines/-24 μ s, -21 lines | -10 μ s, 0 lines/-18 μ s, 18 lines | N/A |
| 1080i-1080psf/29.97/30 | -8 μ s, -1 line/-26 μ s, -16 lines | -11 μ s, 0 lines/0 μ s, -17 lines | N/A |
| 1080i-1080psf/25 | -2 μ s, -1 line/-30 μ s, -16 lines | -11 μ s, 0 lines/-1 μ s, -14 lines | N/A |
| 1080psf 23.98/24 | -30 μ s, 0 lines/-32 μ s, -16 lines | -5 μ s, 0 lines/-23 μ s, -13 lines | N/A |
| 1080pA 59.94/60 | -5 μ s, -1 line/-10 μ s, -16 lines | -7 μ s, 0 lines/-12 μ s, -16 lines | -7 μ s, -3 lines/-14 μ s, -19 line |
| 1080pA 50 | -3 μ s, -1 line/-12 μ s, -16 lines | -7 μ s, 0 lines/-14 μ s, -13 lines | -7 μ s, -3 lines/-15 μ s, -16 line |

IP Switcher System 771-0741-01 IP I/O Board Auto-timing Window, by Format (Hz)

| Frame Operating Mode | ST 2110-20 | ST 2022-6 | ST TICO 2022-6 |
|------------------------|---|---|----------------|
| 720p/59.94/60 | -12 μ s, -24 lines/-12 μ s, 0 lines | -20 μ s, -21 lines/-7 μ s, 0 lines | N/A |
| 720p/50 | -10 μ s, -25 lines/-22 μ s, 0 lines | -10 μ s, -18 lines/-11 μ s, 0 lines | N/A |
| 1080i-1080psf/29.97/30 | -21 μ s, -16 lines/-5 μ s, 0 lines | -12 μ s, -16 lines/-6 μ s, 0 lines | N/A |
| 1080i-1080psf/25 | -32 μ s, -16 lines/-10 μ s, 0 lines | -29 μ s, -13 lines/-12 μ s, 0 lines | N/A |
| 1080psf 23.98/24 | N/A | N/A | N/A |

IP Switcher System 771-0741-01 IP I/O Board Auto-timing Window, by Format (Hz) (continued)

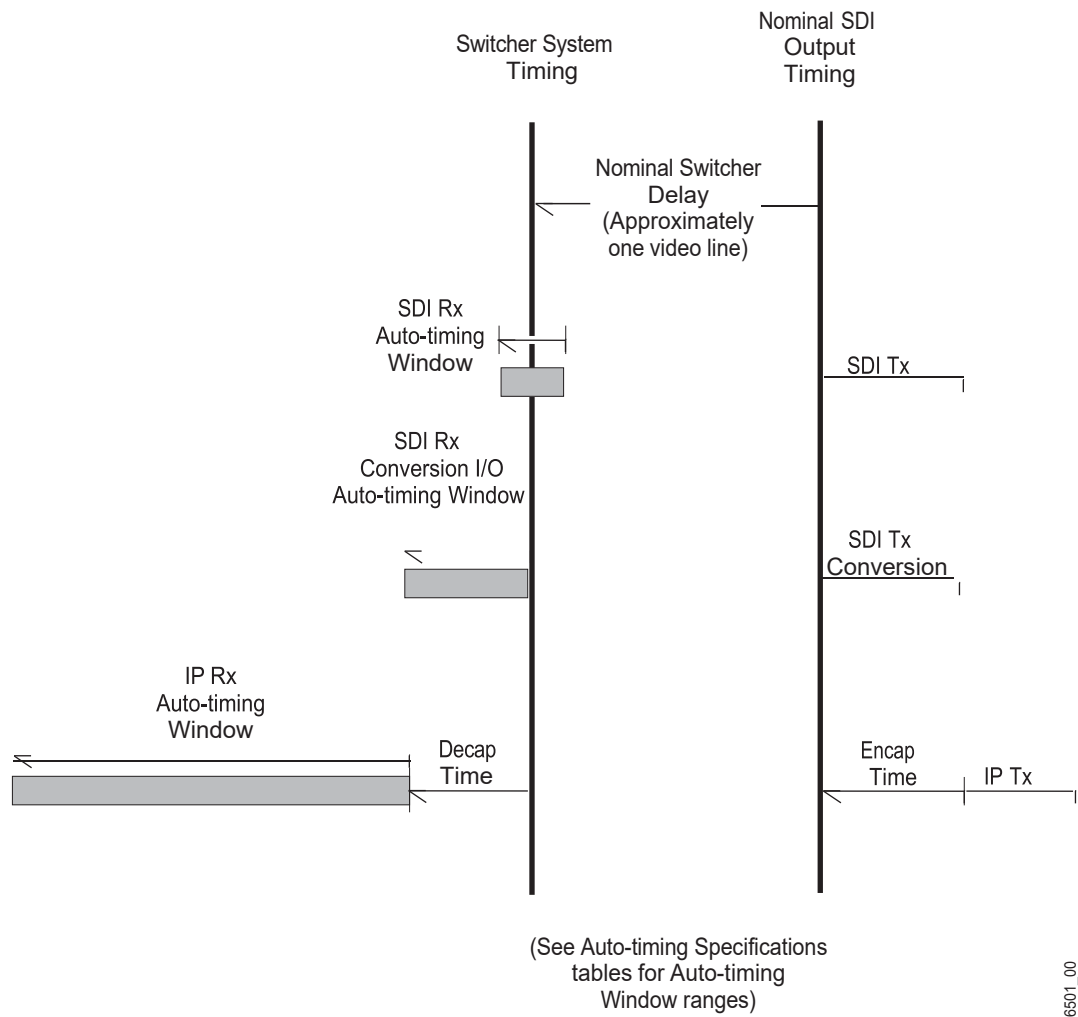
| Frame Operating Mode | ST 2110-20 | ST 2022-6 | ST TICO 2022-6 |
|----------------------|--|---|---|
| 1080pA 59.94/60 | -9 μ s, -16 line/-4 μ s, 0 lines | -5.7 μ s, -16 lines/-4 μ s, 0 lines | -5 μ s, -18 lines/-3 μ s, -2 lines |
| 1080pA 50 | -15 μ s, -16 line/-7 μ s, 0 lines | -13 μ s, -13 lines/-7 μ s, 0 lines | -13 μ s, -15 lines/-7 μ s, -2 lines |
| 2160p 59.94/60 | -2.0 μ s, -9 lines/-7.0 μ s 0 lines | N/A | N/A |
| 2160p 50 | -3.0 μ s, -9 lines/-9.0 μ s, 0 lines | N/A | N/A |

SDI Auto-timing Specifications

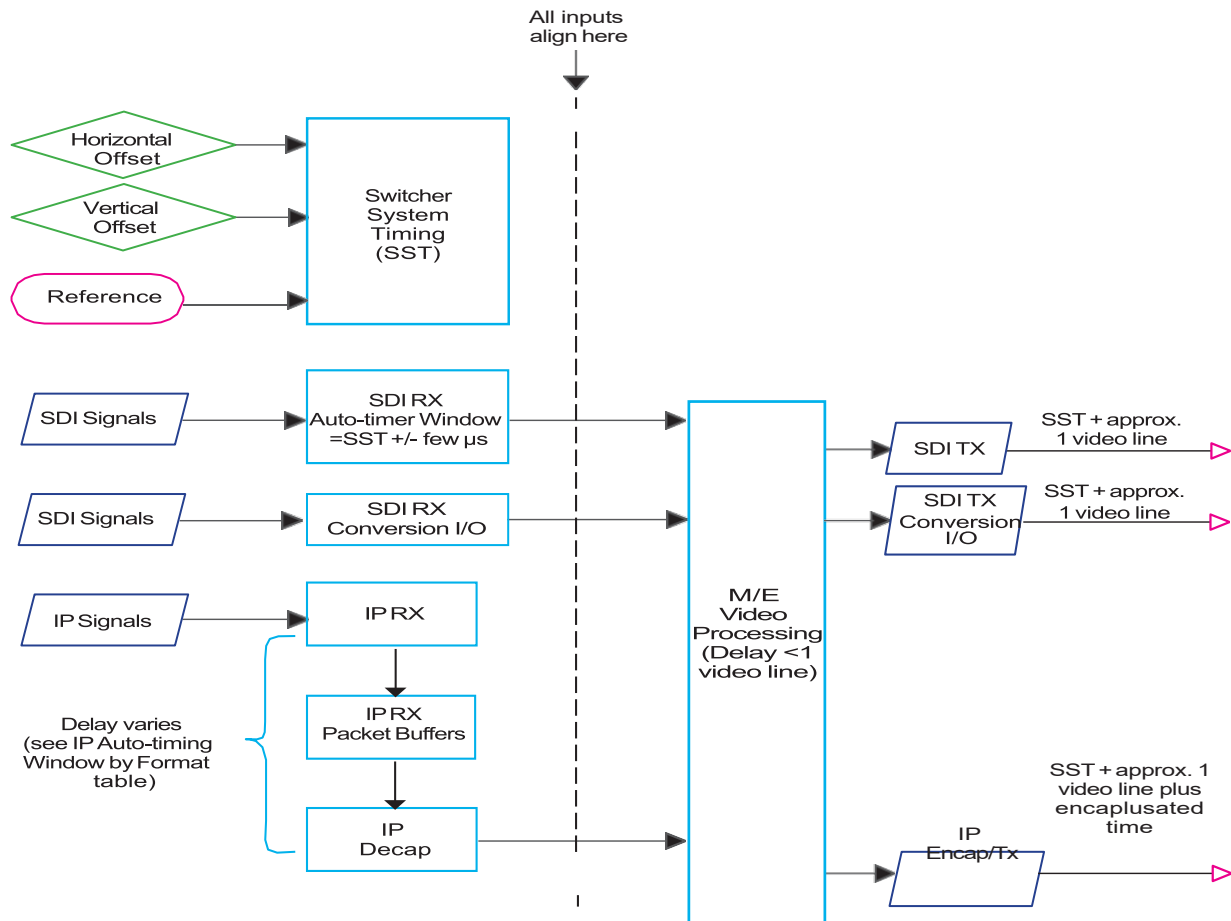
When conversion is on, video signals are automatically frame-synced.

SDI Timing Windows

| Frame Operating Mode | Standard SDI | Conversion Board (In Bypass Mode) |
|------------------------|-------------------|-----------------------------------|
| 525i 29.97 | +/- 8.69 μ s | -63.4 μ s/0 |
| 625i 50 | +/- 8.88 μ s | -64 μ s/0 |
| 720p/59.94/60 | +/- 2.02 μ s | -22.2 μ s/0 |
| 720p/50 | +/- 4.23 μ s | -26.6 μ s/0 |
| 1080i-1080psf/29.97/30 | +/- 5.73 μ s | -29.6 μ s/0 |
| 1080i-1080psf/25 | +/- 8.68 μ s | -35.5 μ s/0 |
| 1080psf 23.98/24 | +/- 9.43 μ s | -37.0 μ s/0 |
| 1080pA 59.94/60 | +/- 2.87 μ s | -14.8 μ s/0 |
| 1080pA 50 | +/- 4.34 μ s | -17.7 μ s/0 |
| 1080pB 59.9/60 | +/- 9.44 μ s | -29.6 μ s/0 |
| 1080pB 50 | +/- 12.39 μ s | -35.5 μ s/0 |



SDI/IP Switcher Timing Diagram

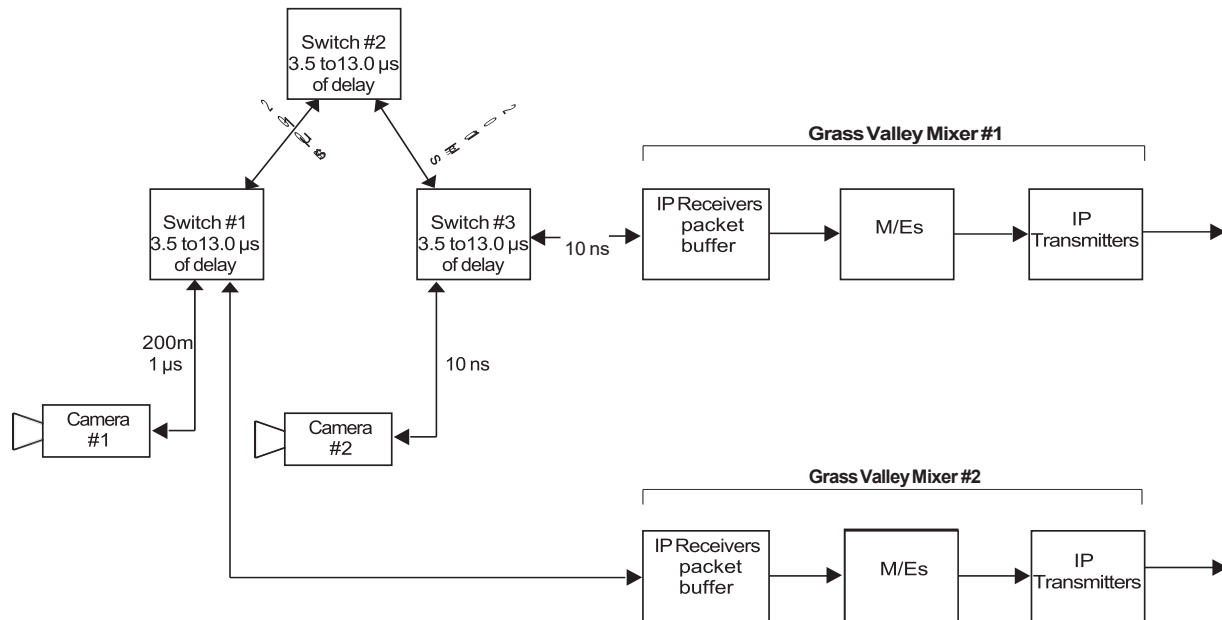


SDI/IP Switcher Signal Flow

Large Configurations

In a large event, there can often be multiple Grass Valley switchers and many sources. Some sources, for example cameras, might be routed through a spine and leaf architecture that includes more than one IP switch. Each switch adds delay that will affect the system timing. Use the Timing Analyzer in the Eng Setup, Video Settings, Timing menu to assist in adjusting for these delays.

The following signal flow illustrates that when Camera #1 is routed to Mixer #1, up to 52 μs of delay can be added, including delay for lengths of cable. Conversely, when Camera #2 is connected to Mixer #1, there can be as little 3.5 μs of delay.



Multi-Switcher System IP Timing Delay Example

Timing Analyzer Menu



For IP, the *Timing Window* displays the Frame Operating Mode, source type, and the timing window (range) that the source must be within to receive the video. Sources outside the timing window will most likely not pass through the switcher.

The Timing Analyzer displays the streaming format plus the horizontal and vertical position relative to the system timing for both the A and B streams of the selected source. If the Timing Analyzer reveals that the source is not within the range as displayed in the Timing Window, adjustments can be made at the source or at the switcher by adjusting the Switcher Horizontal and/or Vertical data pads at the far right of the menu.

The System Timing data pad shows the Switcher System Timing in microseconds for Horizontal and lines for Vertical. Changing the SST moves the overall switcher timing relative to its reference and the Auto-timing window relative to all sources.

When adjusting the Horizontal timing with the Switcher Horizontal knob or data pad and the end of a line is reached, the Switcher Vertical parameter will be incremented or decremented accordingly and the Switcher Horizontal parameter resets to zero.

The *Total* line under the Vert (Vertical) line in the System Timing pane to reflect the total amount of delay in μ secs.

Timing Window Status

IP and SDI video signal Timing Window status is provided in the Eng Setup, Video Settings, Timing menu:

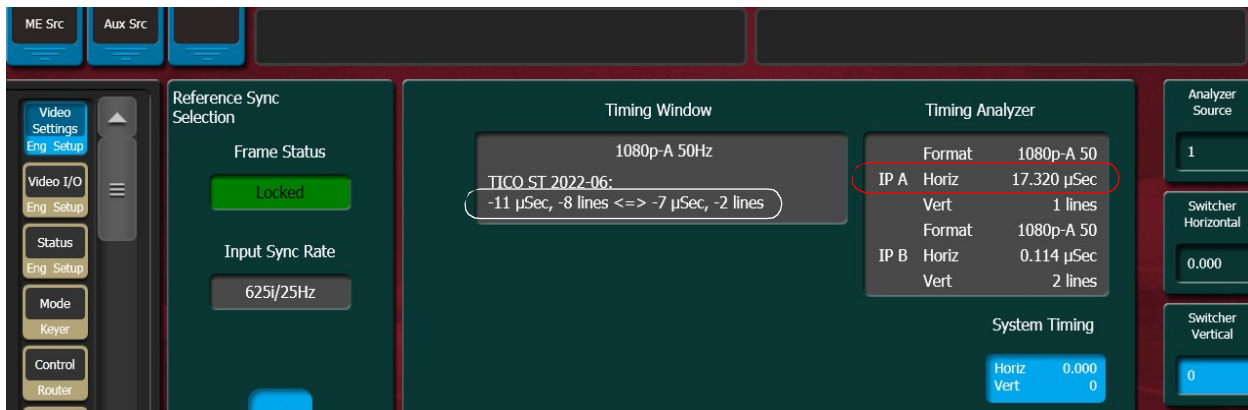
- Left Red—Outside the *minimum* timing window
- Center Green—Within the timing window
- Right Red—Outside the *maximum* timing window



Correcting an Out-of-Time Stream

CAUTION: Adjusting the Switcher Horizontal and Vertical Offsets moves the switcher's system timing which will affect all switcher sources.

- 1 Review the timing as displayed in the Timing Analyzer and compare it to the range in the Timing Window.
- 2 When the source is outside the timing window:



- a Change the source timing, or,
 - b Adjust the switcher timing in the Timing menu by selecting the Analyzer Source (far right) and changing the Switcher Horizontal and Switcher Vertical data pads until the source is within the timing window.
- 3 Once all the sources are timed correctly, power cycle the switcher and verify that all sources are still within the correct timing window.

Other Settings

Matte Limiting

Matte Limiting determines how the matte generators produce colors. Limits can be imposed to prevent downstream signal problems.

None – In this mode, no limiting is imposed. Analog signal paths and monitors may behave poorly to some colors produced in this mode.

Decodable – This limiter mode produces colors that decode to valid RGB components. Not all valid RGB colors can be transmitted in NTSC, however. Saturated colors near yellow and cyan over modulate an NTSC transmitter.

Transmittable – This limiter mode prevents over modulating an NTSC transmitter, but can produce colors which can not be decoded into RGB. For example, a 0% luminance blue produces negative green and red components.

Both – This limiter mode is similar to **Decodable**, except that maximum levels are reduced slightly around yellow and cyan to prevent over modulating an NTSC transmitter.

Command Processing

These controls determine when commands (like source selections or the initiation of mixes or wipes) will be enacted by the system (also known as field dominance). These controls can be useful for consistent match frame editing.

Any Field – The action will occur at the start of the next field, either even or odd. Use this setting if you are not going to edit the video output and want the fastest response.

Even Field – The action will always occur at the start of the next even field. This is probably only appropriate if your edit controller is set to edit in the middle of a frame.

Odd Field – The action will always occur at the start of the next odd field. This is the normal setting for almost all conditions, especially when the video output will be edited, and is compatible with most video editing systems that use the frame boundary for edits. This setting is essential, however, when controlling external devices like DDRs that execute commands only at the beginning of the frame.

Default iDPM Crop

Default crops are intended to define the extent of a standard image for a facility. The Default iDPM Crop controls adjust cropping when individual iDPM channel crop is turned off. Individual iDPM cropping is used to adjust for variations in individual sources.

SMPTE RP-187 establishes recommended practices for standard image sizes (production aperture, clean aperture). If a facility conforms to these practices, the system default values will be correct and no adjustment should be necessary. Changing the default crops is not recommended, unless absolutely necessary.

Unfortunately, not all video images have the transition to blanking (black) in exactly the same place. Normally, these blanking variations are hidden at the extreme edges of the picture and are not visible. If an image smaller than expected is transformed, however, black lines can occur at its edges, which are now visible because they have moved inside the visible picture area. If it is necessary to compensate for variations in your facility's nominal blanking, adjust the default crops so they just remove black edges on the facility's normal image.

The 4:3 and 16:9 aspect ratios have different default crops.

Crop Edge – Allows setting alternative cropping for iDPM processing.

Unity – Resets iDPM cropping to factory default.

Timing Analyzer

The Video Settings menu also has a timing analyzer and system timing adjustments (see the *Kayenne/Karrera/GV Korona User Manual*).

IP SFP Statistics Web Access

The IP SFP Statistics can be accessed by entering the Video Frame's IP Address into a browser from a PC on the same network as the Frame. Buttons are provided to reset packet counts for each I/O board and to refresh the page (refreshes the entire webpage).

The IP SFP Statistics Web Access page can be used to help identify the signals that make up an IP stream (Video, Audio, Ancillary) or streams that are not passing through the switcher (see [IP Timing Troubleshooting](#), on page 280).

ST 2110-20
Stream Missing

IP SFP Statistics

Board

16x8 IO IP 4

Reset Packet Counts

Refresh Page

| SFP | MAC Address | Rx Throughput | Rx PacketCount | Rx ErrorCount | Tx Throughput | Tx PacketCount | Tx ErrorCount | Link Speed (Gb/s) |
|-----|-------------------|---------------|----------------|---------------|---------------|----------------|---------------|-------------------|
| 1A | 00:50:1e:05:78:07 | 655,774,175 | 1,468,896,764 | 0 | 327,886,885 | 734,424,203 | 0 | 10 |
| 1B | 00:50:1e:05:78:08 | 327,748,130 | 734,472,431 | 0 | 327,746,591 | 734,424,005 | 0 | 10 |
| 2A | 00:50:1e:05:78:09 | 661,311,595 | 1,514,276,562 | 0 | 327,886,963 | 734,424,079 | 0 | 10 |
| 2B | 00:50:1e:05:78:0a | 655,774,536 | 1,468,896,362 | 0 | 327,886,782 | 734,424,001 | 0 | 10 |
| 3A | 00:50:1e:05:78:0b | 655,494,837 | 1,468,896,115 | 0 | 330,526,185 | 757,368,912 | 0 | 10 |
| 3B | 00:50:1e:05:78:0c | 655,815,638 | 1,468,897,798 | 0 | 330,685,906 | 757,369,772 | 0 | 10 |
| 4A | 00:50:1e:05:78:0d | 655,534,764 | 1,468,896,404 | 0 | 330,545,088 | 757,369,061 | 0 | 10 |
| 4B | 00:50:1e:05:78:0e | 655,535,033 | 1,468,896,373 | 0 | 330,545,354 | 757,369,046 | 0 | 10 |
| 5A | 00:50:1e:05:78:0f | 655,810,915 | 1,468,848,467 | 0 | 330,683,958 | 757,369,628 | 0 | 10 |
| 5B | 00:50:1e:05:78:10 | 0 | 0 | 0 | 0 | 0 | 0 | 10 |
| 6A | 00:50:1e:05:78:11 | 655,530,086 | 1,468,848,283 | 0 | 330,544,410 | 757,369,536 | 0 | 10 |
| 6B | 00:50:1e:05:78:12 | 0 | 0 | 0 | 0 | 0 | 0 | 10 |
| 7A | 00:50:1e:05:78:13 | 655,495,049 | 1,468,846,222 | 0 | 330,526,285 | 757,368,478 | 0 | 10 |
| 7B | 00:50:1e:05:78:14 | 0 | 0 | 0 | 0 | 0 | 0 | 10 |
| 8A | 00:50:1e:05:78:15 | 655,760,623 | 1,468,846,545 | 0 | 330,659,049 | 757,368,638 | 0 | 10 |
| 8B | 00:50:1e:05:78:16 | 0 | 0 | 0 | 0 | 0 | 0 | 10 |

ST 2110-20
Two Streams

ST 2110-20 +
ST 2110-30

Nominal IP Stream Throughput

Nominal IP Throughput

| Signal | Description | Format | MB per second |
|-----------|---------------|---------------------------------|---------------|
| Video | 3G | ST 2110-20 (59Hz ^a) | 327,745,613 |
| Video | 3G | ST 2022-6 | 389,771,715 |
| Video | HD | ST 2110-20 (59Hz) | 163,940,697 |
| Video | HD | ST 2022-6 | 194,886,286 |
| Audio | 1-8 Channels | ST 2110-30 | 1,209,594 |
| Audio | 1-16 Channels | ST 2110-30 | 2,768,482 |
| Ancillary | Data | ST 2110-40 | 10,910 |

a. ST 2110-20 throughput is dependent on the Video Frame frame rate.

IP Timing Troubleshooting

- 1 Use IP Statistics to verify throughput for each port. Throughput for similar ports should have similar numbers ([IP SFP Statistics Web Access](#), on page 278).
- 2 Ports with low numbers are missing signal streams. Check the Receive and Transmit IP addresses and port numbers.
- 3 For ports that have no throughput, check the Port Configuration and IP switch setup.
- 4 Check the cables and SFP connections.
- 5 If the statistics appear correct but there is no video from the source, it is likely the signal is out of time. Use the Timing Analyzer to verify the timing ([Timing Analyzer Menu](#), on page 275).

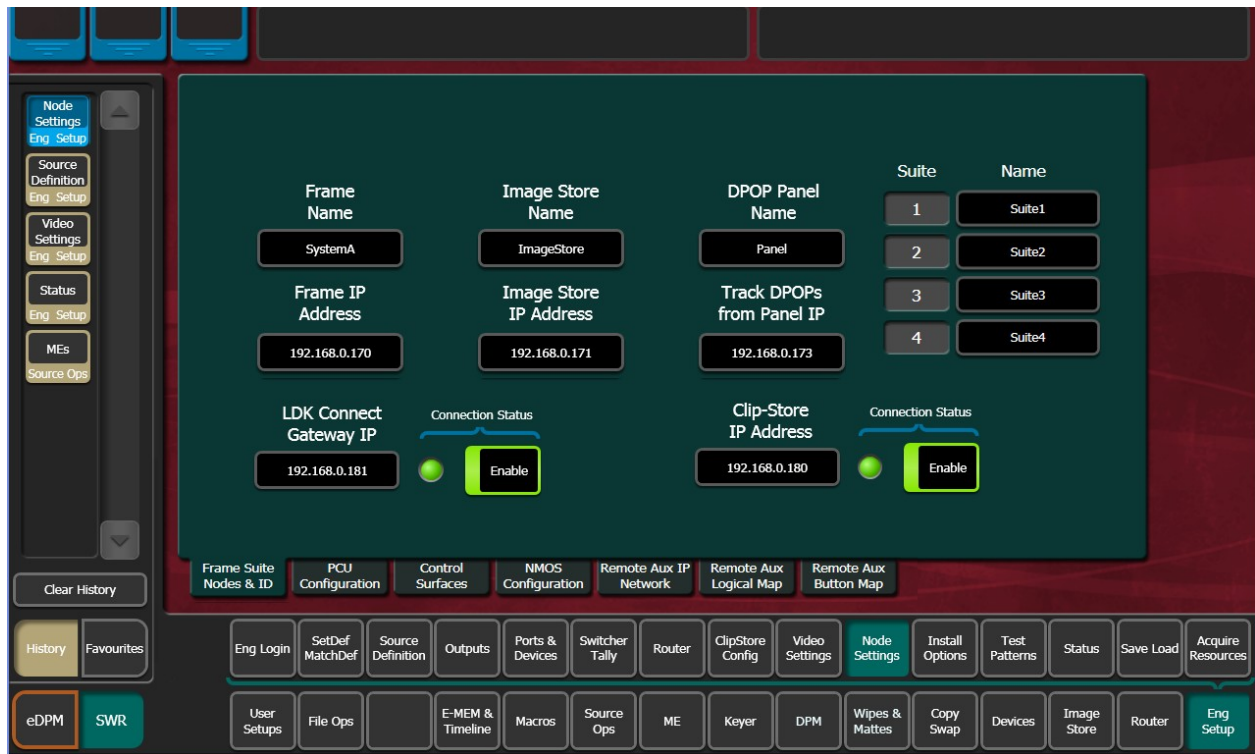
Node Settings

The GV K-Frame XP Node Settings menus are used to establish communications among various system components. These important settings are not included in Eng Setup configuration files, to prevent accidental system communication failures if Eng Setup files are loaded incorrectly.

Frame Suite Nodes & ID Menu

The Frame Suite Nodes & ID menu has fields to enter the IP addresses the GV Switcher menu application will use to communicate with the Video Processor Frame, Image Store, and the Control Panel whose DPOPs will affect this application's menu displays. A menu restart is required to make IP address changes take effect.

When connected, the currently defined names of these devices are displayed. These names can be edited from this menu, and will be sent to the device as soon as the new name has been entered. Subsequent connections to this device from this or another menu will show that edited name.



Note: Do not change device or suite names unnecessarily, as this could cause confusion to other system users.

Mapping Logical Remote Aux Panels

The GV K-Frame XP Remote Aux Logical Map menu is used to assign Aux Buses for control by that Remote Aux Panel. Single Aux Panels can control one Aux Bus, while Multi-Delegation panels can have several Aux Buses be assigned to delegation buttons on that panel.

To Assign Aux Buses on a Multi-Destination Panel:

- 1 Select **Eng Setup, Node Settings** in the menu.
- 2 Highlight a Panel Delegation button at the top of the screen.
- 3 Select one of the Logical Aux Buses buttons on the lower screen. That Aux Bus will then be selected when that Remote Aux Delegation button is pressed on that panel.

Remote Aux Button Mapping

The Remote Aux Button Map menu is used to configure sources to the Remote Aux Panel source select buttons.

To Map Remote Aux Panel Buttons:

- 1 Select **Eng Setup, Node Settings** in the menu.

- 2 Highlight a source select button in the central scrolling list.
- 3 Touch a source button on the scrolling list on the right. It will be assigned to that Remote Aux Panel button.
 - The Source Number data pad and scroll knob on the upper right can be used to quickly select a GV K-Frame XP source by its logical ID number
 - The Lock button at the bottom prevents the source list from scrolling when choosing different Remote Aux buttons.

About the Status Menu

The Status menu is accessed by selecting **Eng Setup, Status**. The Status menu reports the currently connected GV K-Frame XP devices by their name, control surface, type, IP address, software version, and date in the central window.

Note: The Control Surface of a Menu Panel indicated on this menu is defined by the Node Settings, Control Surfaces menu settings. It does NOT report the Control Surface to which the Menu Panel is currently logged in.

Menu Version – Reports the version of the GV Switcher menu application.

Memory Usage – Reports the amount E-MEM and other keyframe memory currently in use. If usage reaches 100%, no new keyframes will be able to be added to any effect. Deleting keyframes from any effect will regain space.

Capture Software Diagnostic Data – This button provides a convenient method to save the current configuration files, E-MEM, Macro, and also any frame software diagnostics data files that may exist (see Diagnostic Data Collection below). If you need to contact Grass Valley for assistance about any software problems, the engineering team will want these files for efficient troubleshooting. The **Minimize Menu** button minimizes the menu application, revealing the Windows desktop. The **Exit Menu** and **Closedown Menu Computer** buttons perform those functions.

Acquire Resources

The Acquire Resources menus are used to acquire and release GV K-Frame XP system resources when multiple suites are being used. Different menus are used for different resource types.

General Procedure to Acquire Resources

- 1 Login to the suite.
- 2 Select the button of the Logical Device you wish to acquire a resource for. These are the left most buttons on the scrolling list on the left. The menu will automatically display the menu for that resource type on the right.
- 3 Select the button of the physical resource you wish to acquire on the right side of the screen.

If no resources are available, you may need to Login to another suite, release resources, and login to the target suite.

6 External Interfaces

Introduction

The GV K-Frame XP Video Production Center has that name because it is more than just a video switcher. For example, a GV K-Frame XP switcher system is also able to control a variety of external devices.

Devices can be associated with sources, via source definition. Three types of source definitions for the GV K-Frame XP are available:

- **Direct** (used for standard video and key inputs, not for external interfaces),
- **Device** (used for DDR and VTRs). These devices can be controlled via Ethernet or serial port using various protocols. Each device uses a Device Definition that specifies the control mechanism.
- **Router** (used with an external routing system). This type permits the assignment of an external routing system destination to that source. Once assigned, different external routing system sources can be routed to that destination with the system. It is also possible to associate a router source to a device, to allow machine control of that source whenever it is selected on the a Grass Valley Control Panel.

Serial ports can also be used to control PBus configured external devices.

GPI outputs can be configured to provide relay closure control of hard-wired external devices from the system.

In addition, external control of a system is possible using GPI input connections, and by configuring an Editor with a serial port.

General External Device Interfacing

In general, interfacing an external device to the switcher system involves the following elements:

- Control cabling and configuration (Ethernet, serial ports, GPIs).
- Video cabling (input connectors).
- Creating an External Device Definition (for DDR, VTR, etc.) and assigning it to a source definition.
- Mapping that source to a Control Panel button.

Once configured, that external device can be selected as a source on the Control Panel. If a DDR or VTR it can be directly controlled from the System Bar, Device Control Module, Multi-Function Module, the Menu Panel, and E-MEM.

PBus and GPI control of external devices is generally accomplished by the operator using E-MEM. PBus and GPI triggers can be manually tested from the GV Switcher menu application, and Macros can be created to allow triggering using Control Panel buttons.

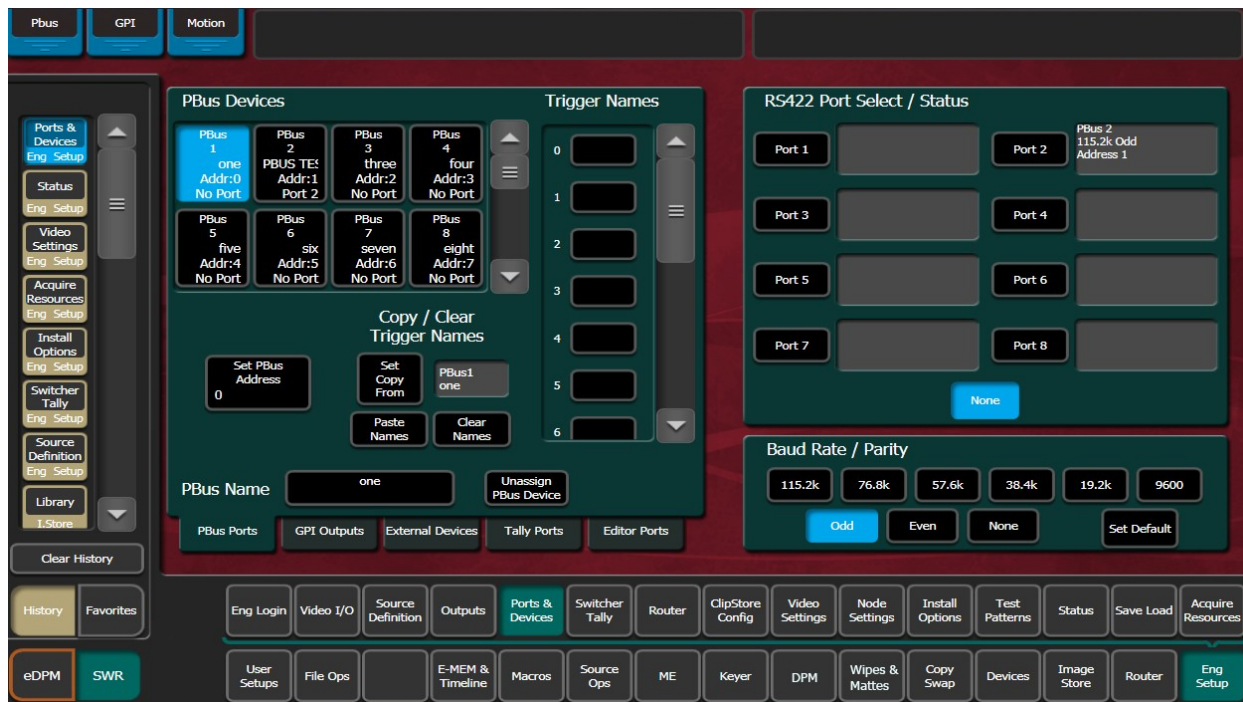
Routing System configuration with GV K-Frame XP involves establishing communications between the switcher and Routing control systems, assigning Router destinations to sources, and identifying which Router sources will be accessible to the system.

Ports & Devices

GV K-Frame XP control ports, GPI outputs, External Device Definitions, Ethernet Tally and Editor Ports are configured with the Ports & Devices menus, accessed via **Eng Setup, Ports & Devices**, and then touching the appropriate tab.

PBus Ports

The PBus Ports menu is used to configure serial ports for PBus control of external devices. Twenty four PBus devices are supported, which can be assigned to the same or different serial ports, using PBus addresses (0-23) when the same port is used for multiple devices.



PBus Devices – One of the twenty four available PBus devices can be selected on the upper left side of the menu. Once selected, the remainder of the menu is delegated to that PBus device.

RS422 Port Select / Status – The button for the port currently assigned to the selected item will be highlighted. Touching **None** clears the port assignment.

Baud Rate / Parity – Serial port settings are selected with these buttons. The **Set Default** button returns the settings to the factory defaults.

PBus Name – Touching this button opens an alphanumeric keypad used to give the PBus device a descriptive name. These names appear on the separate Devices, PBus and PBus & GPI Enables menus, to help the operator identify each function.

Set PBus Address – Touching this button opens a keypad allowing entry of a PBus address, which is required if multiple PBus devices use the same port.

Unassign PBus Device – Clears the name of the selected PBus device and also clears its port assignment.

Trigger Names – Names can be entered for each of the 16 PBus triggers (0-15), by touching each button.

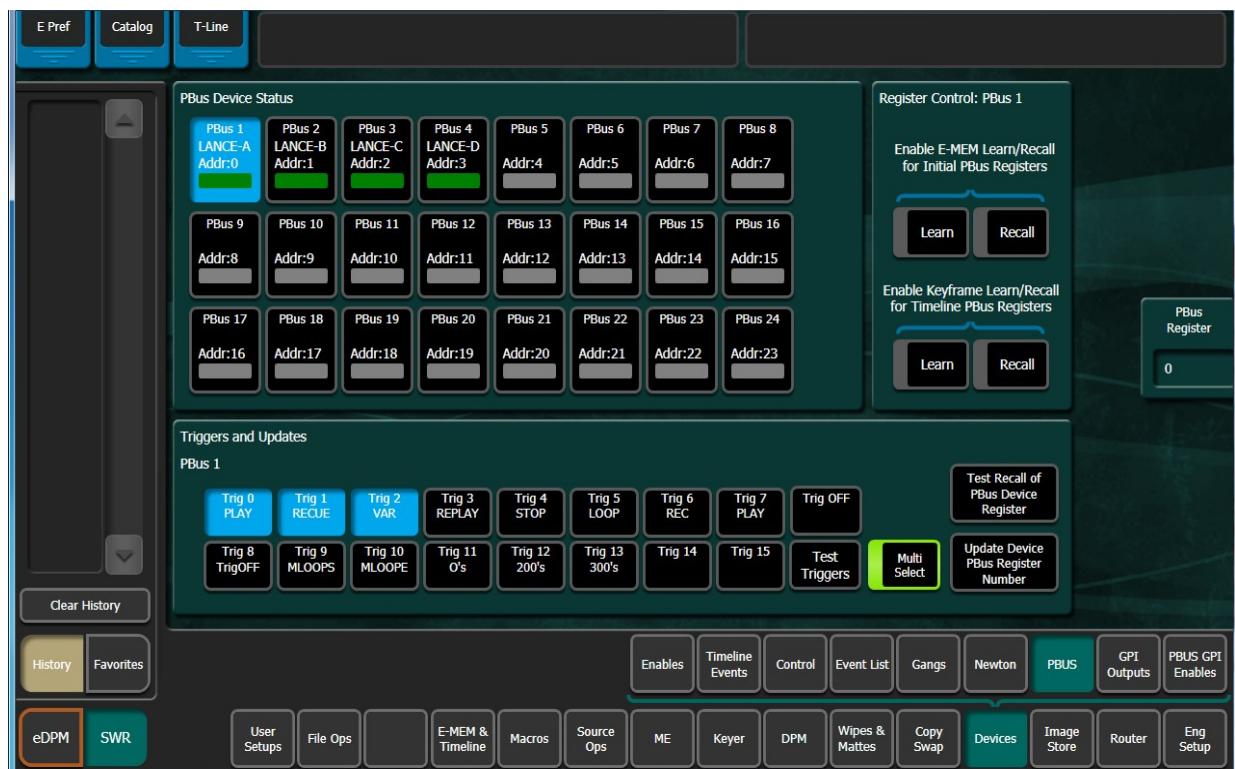
Clear Names – Removes the names from the currently selected PBus device.

Copy Trigger Names

Trigger names can be copied from one PBus device to another.

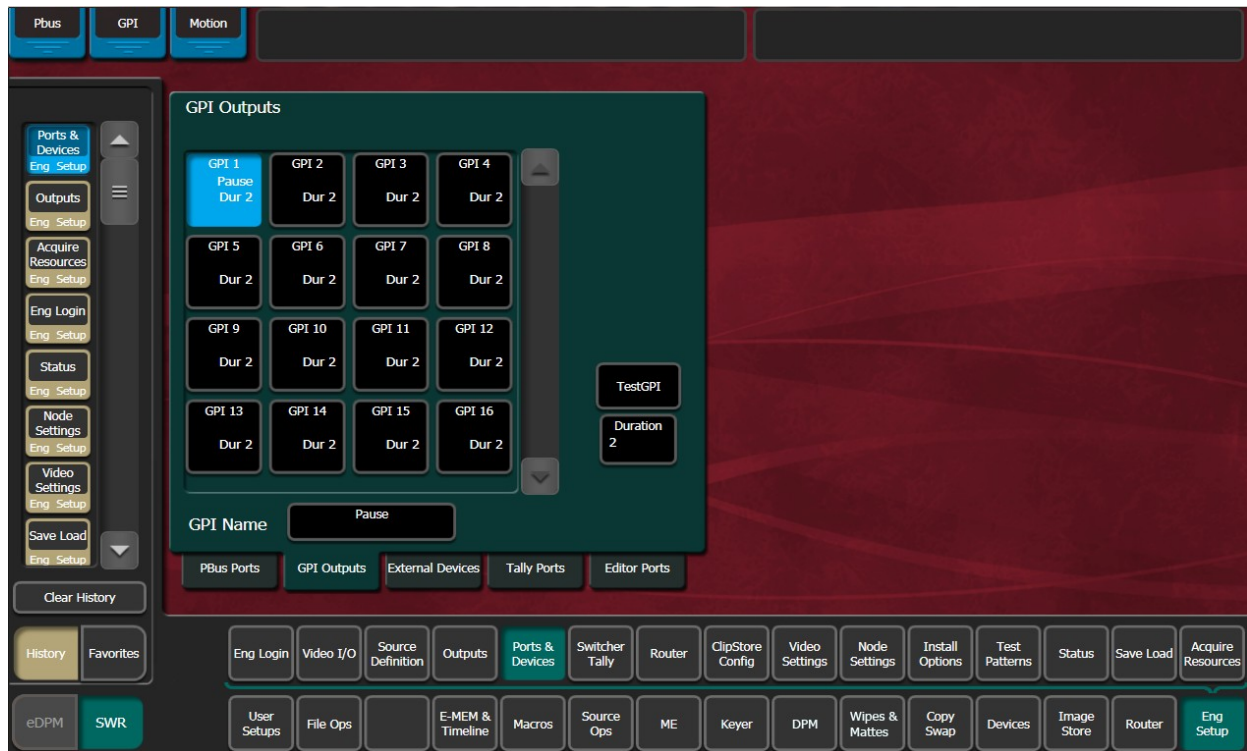
- 1 Highlight the PBus device you wish to copy names from.
- 2 Select **Set Copy From** to enter that device in the adjacent window.
- 3 Highlight the PBus device you wish to copy the trigger names to.
- 4 Select the **Copy Names** button.

Once configured, PBus devices will be available to operators for use with E-MEMs via the Devices, PBus menu.



GPI Outputs

The GPI Outputs menu is used to configure the GV K-Frame XP GPI connectors. GPI outputs can be assigned to any suite using the Eng Setup Acquire Resources menu.



GPI Outputs – The buttons in the scrolling list represent the physical GPI output relays available on the system. The functions performed by these relays depend on how they have been connected to the device being controlled. One output can be selected at a time.

GPI Name – Touching this button opens an alphanumeric keypad used to give the GPI Output a descriptive name. These names appear on the separate Devices, GPI Outputs and PBus & GPI Enables menus, to help the operator identify each function.

Duration – Sets the duration the relay will be closed, in video frames.

Test GPI – Touching this button triggers the selected GPI.

Once configured, GPI Outputs will be available to operators for use with E-MEMs on the Devices GPI Outputs menu.



PBus and GPI Enables

GV K-Frame XP PBus and GPI Output functionality (communications) can be enabled and disabled by an operator from the Devices, PBus and GPI Enables menu. This menu has two tabs, one for PBus, and the other for GPIs. When items are disabled on these menus, E-MEM or Macro programmed PBus and GPI Output triggers will be inactive when the E-MEM or Macro is run.

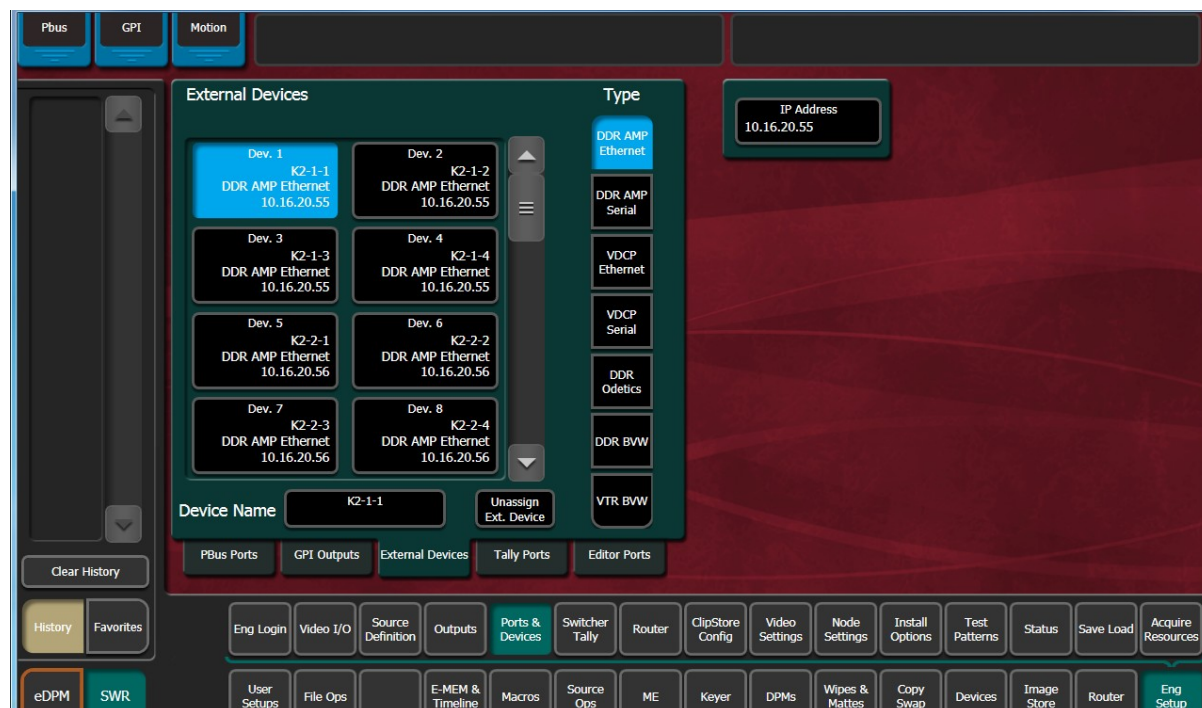
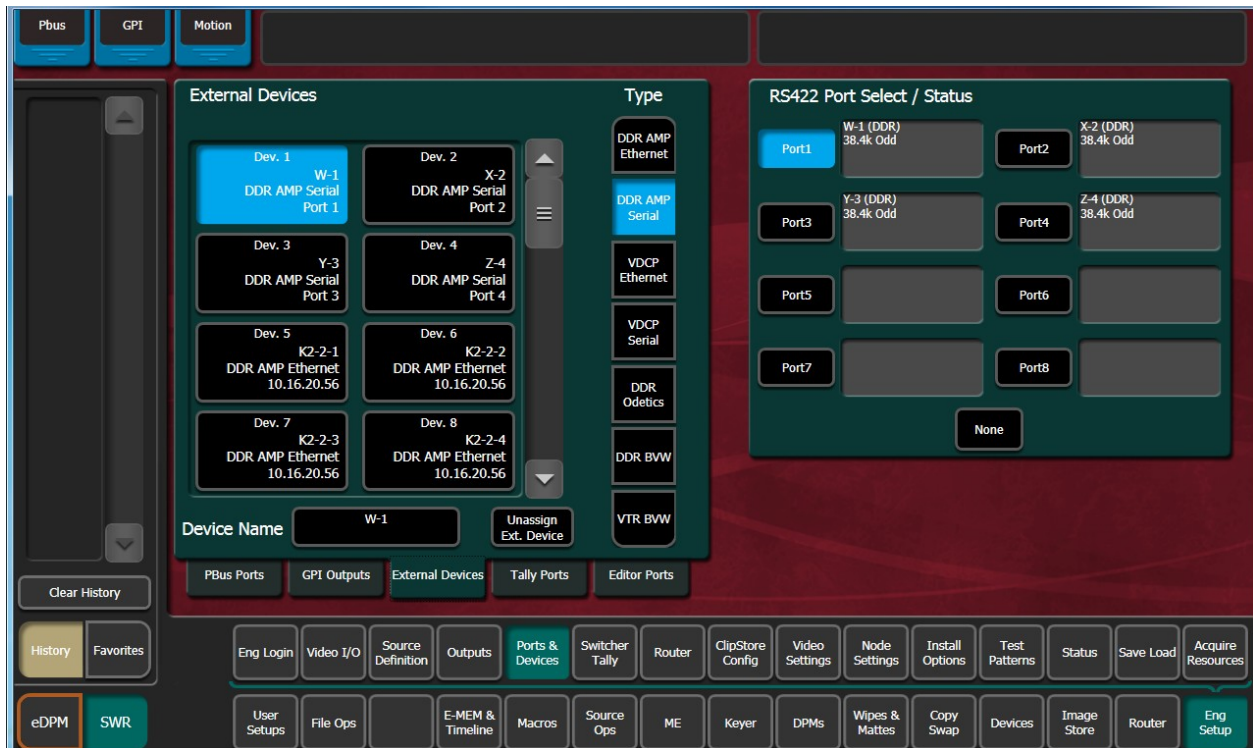
External Interfaces

PBus and GPI Enables



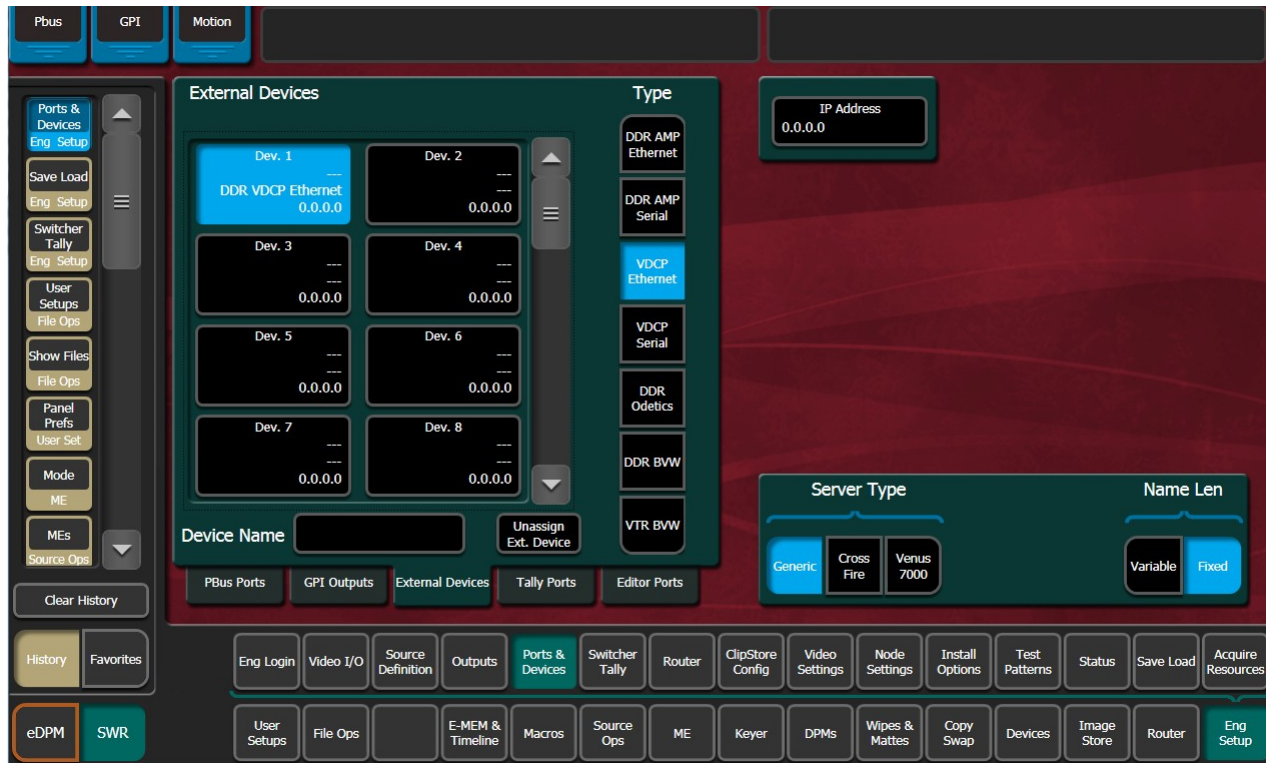
External Devices

The Eng Setup External Devices menus are used to create and edit Device Definitions. Different menus are displayed depending on whether a serial or Ethernet control type of device is selected.



VDCP Ethernet

When VDCP Ethernet is selected, additional parameters are available.



Server Type

- Generic
- CrossFire
- Venus 7000

Name Length

- Variable
- Fixed

VDCP on Ethernet Configuration

For Ethernet VDCP, the user must specify the IP Address of the device they are connecting to, in the Eng Setups/Ports & Devices/External Devices menu.

When configuring a device to connect to the switcher with Ethernet VDCP, the device should be configured to use port 8000. The one exception to this is when the Server Type is CrossFire. When the Server Type is CrossFire, the device should be configured to use port 8000 plus the Device number. For example, if Device 7 in the External Devices menu is configured to use Ethernet VDCP with a server type of CrossFire, the CrossFire device should be configured to accept the connection on port 8007.

Device Definition

The switcher system uses a software External Device Definition object to define the capabilities of each device interfaced with the system.

Use the Ports & Devices menu to define external devices.

External Device Definitions contain the interface information required for that external device, (e.g., IP Address or Serial Port). Each Device Definition is given a unique name. Once a Device Definition has been created for a device (DDR, or VTR), it can be assigned to a source. That source then supports the specific capabilities of that external device. (PBus and GPI configurations are different, and are not associated with a particular source.)

Selecting an already defined item in the scrolling External Devices list on the left brings up information for that device and delegates the rest of the menu to that object.

Device Name – Touching this button opens an alphanumeric keypad used to give the External Device a descriptive name. These names appear in the Control Panel System Bar and GV Switcher menus.

Note: When configuring servers with multiple channels, the channel number must be appended to the device name with a - character, and the base name be the same for all channels on the same server (e.g. 'Vdr4-1', 'Vdr4-2', etc.).

Type – Chooses a control protocol for the currently selected device.

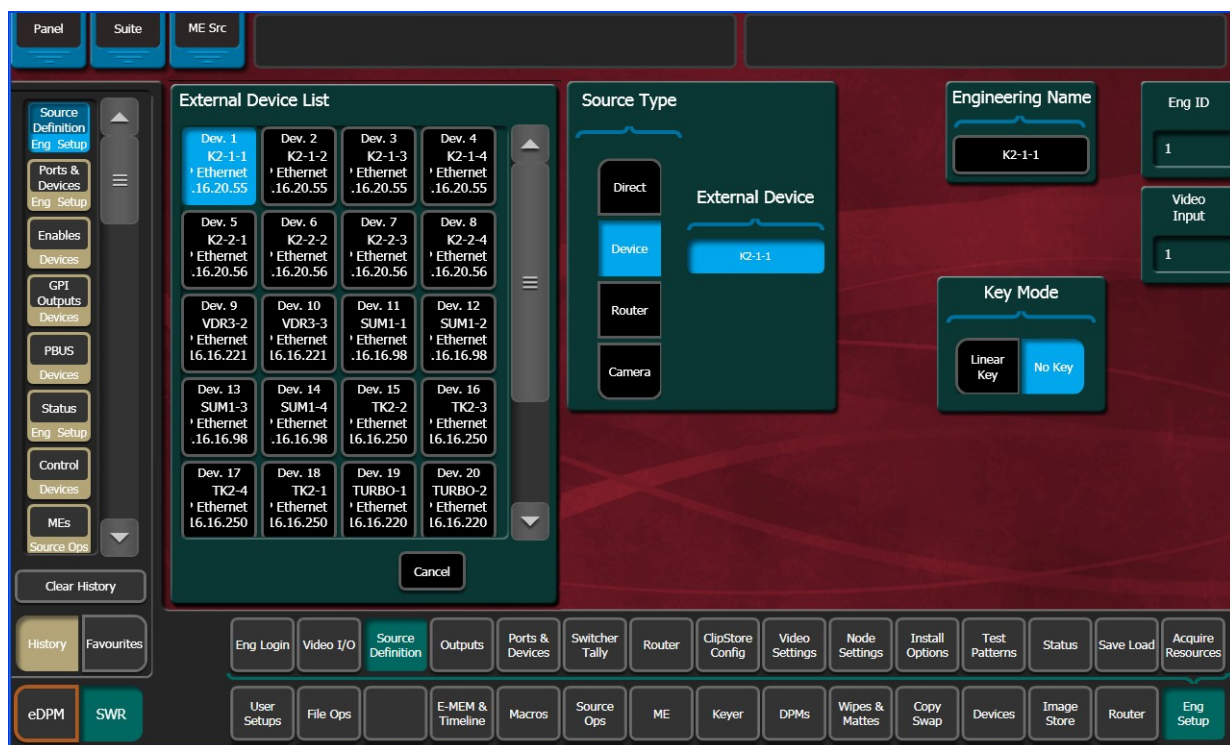
- For Ethernet devices, and IP address field is available for entering the IP address of the External Device.
- For serial control devices, selecting a Port button on the right assigns the selected device to that port in the Ports & Devices, External Devices menu.

Unassign Ext. Device – Clears the definition of the selected item.

Create an External Device Definition

- 1 Touch **Eng Setup, Ports & Devices, External Devices** to go to the External Device Definition menu.
- 2 Scroll through the list of devices on the left and select an available device.
- 3 Select **Device Name** and enter a descriptive name for the External Device.
- 4 Choose the control protocol for that device from the **Type** list.
 - If an Ethernet protocol was selected, enter the IP address for the External Device.
 - If a serial protocol was selected, choose the port the device will use.

When External Device Definitions have been created, the Source Definition menu lists them when the **Device** Source Type and **External Device** buttons are selected.



Configure an External Device for XPression Control

You can configure up to four XPression devices; GFX 1-GFX 4, allowing you to send commands from the Control Panel or menu to your external device. You can take IDs, fire up to four GPI sets, clear buffers, and override or fine tune the controls.

- 1 Select **Eng Setup, Ports & Devices, External Devices** in the menu.



- 2 In the External Devices pane, scroll down until GFX 1-GFX 4 is displayed and select one.
- 3 Enable the **XPression** Type button
- 4 Select the **Device Name** data pad, enter a name using the pop-up keypad, and select **Enter**.

IMPORTANT: The Device Name must end with *-n*, where *n* = a channel numbered 1 through 16. For example, GV Device-10.

- 5 Select the IP Address data pad and enter the IP Address of an XPression device in the pop-up keypad and select **Enter**. See the *Kayenne/Karrera/GV Korona User Manual* for operations information.

Ethernet Tally Ports

There are three configurable Ethernet Tally ports for the GV K-Frame XP. Ethernet tally port configuration can vary depending on your needs, for example two tally ports could be used for tally signal while the third is used for diagnostics. See the documentation that came with your Ethernet tally system for more information.

Additionally, tally is supported via GPO connections.

Note: Serial tally is not supported for switcher systems due to the vast amount of data being transmitted.

Configure Ethernet Tally Ports

- 1 In the menu, select **Eng Setup, Ports & Devices, Tally Ports**.



- 2 In one of the ports, select the **IP Address** data pad.
- 3 Enter the client IP Address in the pop-up keypad and select **Enter**.

About Editor Ports

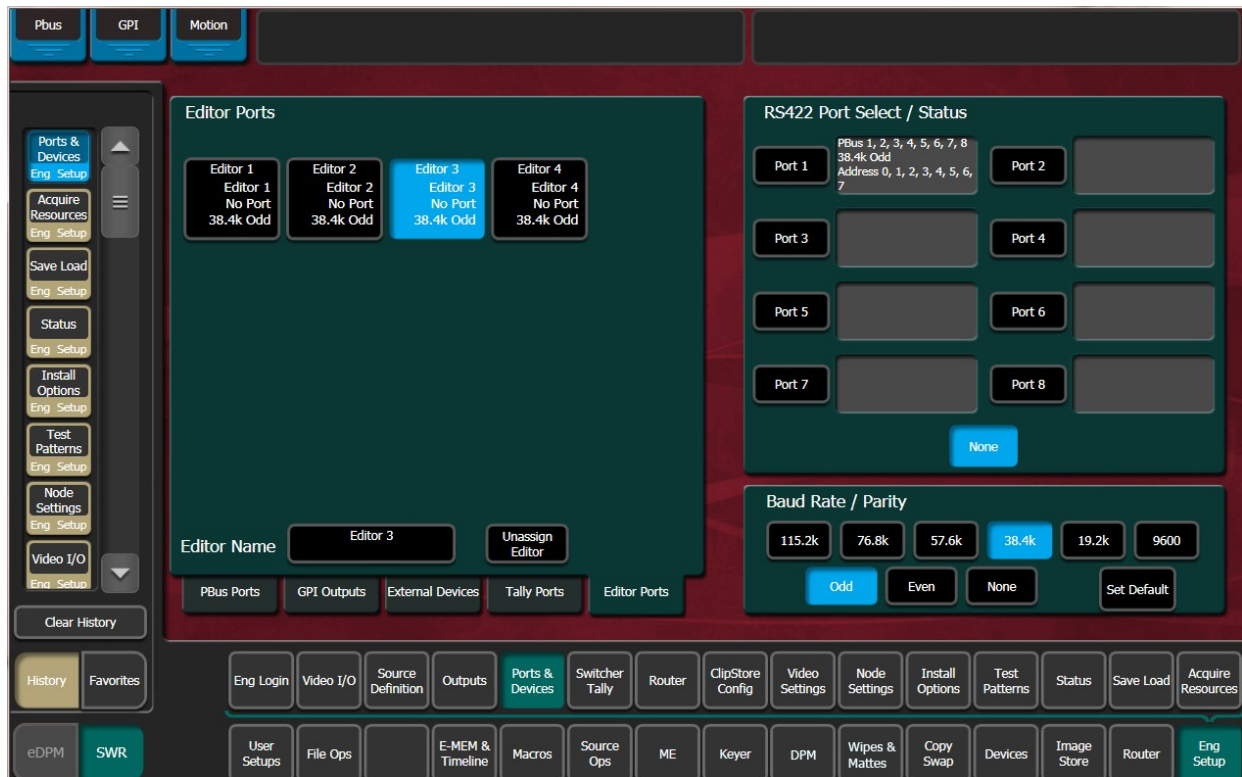
Editor Ports connect to external editor, using up to four of the eight RS422 Ports.

Button descriptions:

- **RS422 Port Select / Status** – The button for the port currently assigned to the selected item will be highlighted. Touching **None** clears the port assignment.
- **Editor Name** – Touching this button opens an alphanumeric keypad used to give the Editor a descriptive name.
- **Unassign Editor** – Clears the selected serial port's assignment.
- **Baud Rate / Parity** – Serial port settings are selected with these buttons. The **Set Default** button returns the settings to the factory defaults.

Configure Editor Ports

1 Select **Eng Setup**, **Ports & Devices**, **Editor Ports**.



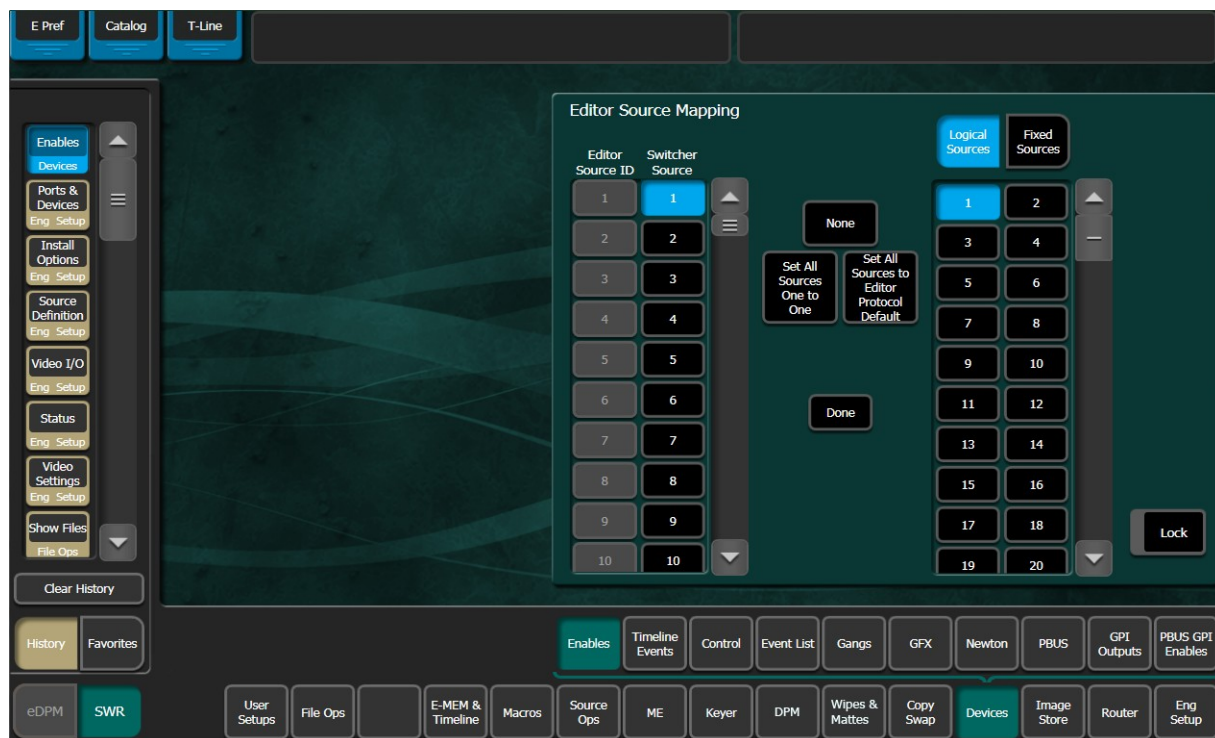
- 2 Select and name a port.
- 3 Set the Baud Rate/Parity.
- 4 Select the **Devices** menu.
- 5 In the Editor Control pane, top right, enable the **Editor Control Switcher** button. Verify the connection (green status LED).

External Interfaces

About Editor Ports

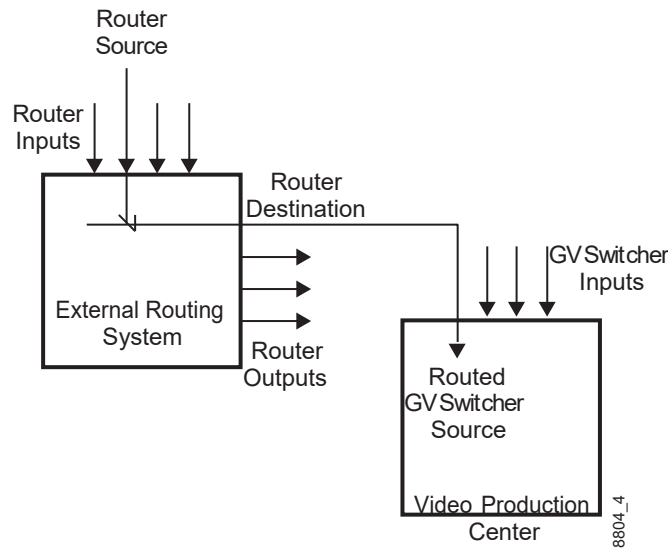


6 Select the **Map Sources** button and configure the Switcher Sources.



Router Interface

The GV K-Frame XP system can interface with an external routing system. A routing system connects a router source (router input) to a router destination (router output). Changing the router source sends a different signal to the destination (called a take). A router destination can in turn be connected to an input and be configured as a routed source (called switcher source in this discussion and in the GV Switcher menus). The router acts as a pre-selector for the switcher source, and so increases the number of inputs available to a button on a switcher system bus.



Router Source, Router Destination, and Routed Switcher Source

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

Note: Switcher system router Take commands are only applied to all router levels. The external routing system's destinations must be configured with all router levels selected.

Router control panels can also protect router destinations from being changed by other control panels. A protected router destination cannot be changed by a different control panel, but may be changed by the panel that set the protection. Protections help prevent inappropriate router source changes. The switcher system can be considered a type of router control panel, and so the system can protect router destinations. The switcher system router protect commands are applied to all router levels.

Router Source Name Changes (at the Router) and GV Switcher Updates

When an NV9000, Encore, or other supported router is connected to a GV Switcher system using Grass Valley's Native Protocol (SMS 7000), and router source names are changed, the system and menu will now be updated automatically, with a few limitations.

The following areas of the GV Switcher system will continue to require a manual update for a router source name change:

- R-MEMs—Learn a new R-MEM in the Router, R-MEM menu,
- Macros—Learn a new Macro in the Macro menu,
- Device Control configuration for router sources—Update the router source name in the Eng Setup, Router menu, and
- Switcher sources configured for router destinations—Update the Router Destination source name in the Eng Setup, Source Definition menu.

CAUTION: If these areas of the system are not manually updated, the router source may behave unexpectedly or no longer work.

Features

- Interfaces to the Grass Valley SMS 7000, Encore, and other routing systems via Native protocol.
- GV Switcher system configuration of routed switcher sources.
- Names of router sources are shown on the GV Switcher Control Panel and Menu Panel displays.
- Router source selection control via the GV Switcher Control Panel and Menu Panel displays.
- Protection types (None, Protect, and On Air).

Control Interface Cabling

Connect an Ethernet cable from a GV Switcher system Ethernet switch to the external routing system Ethernet network. The system can communicate with devices on different networks via a gateway router. If a gateway router is not used, the external routing system must be on the same subnet as the system.

Video Interface Cabling

Connect each external routing GV Switcher system destination to an available input connector on the Video Processor Frame. You will need to know the input connector number used for each destination when you configure the source.

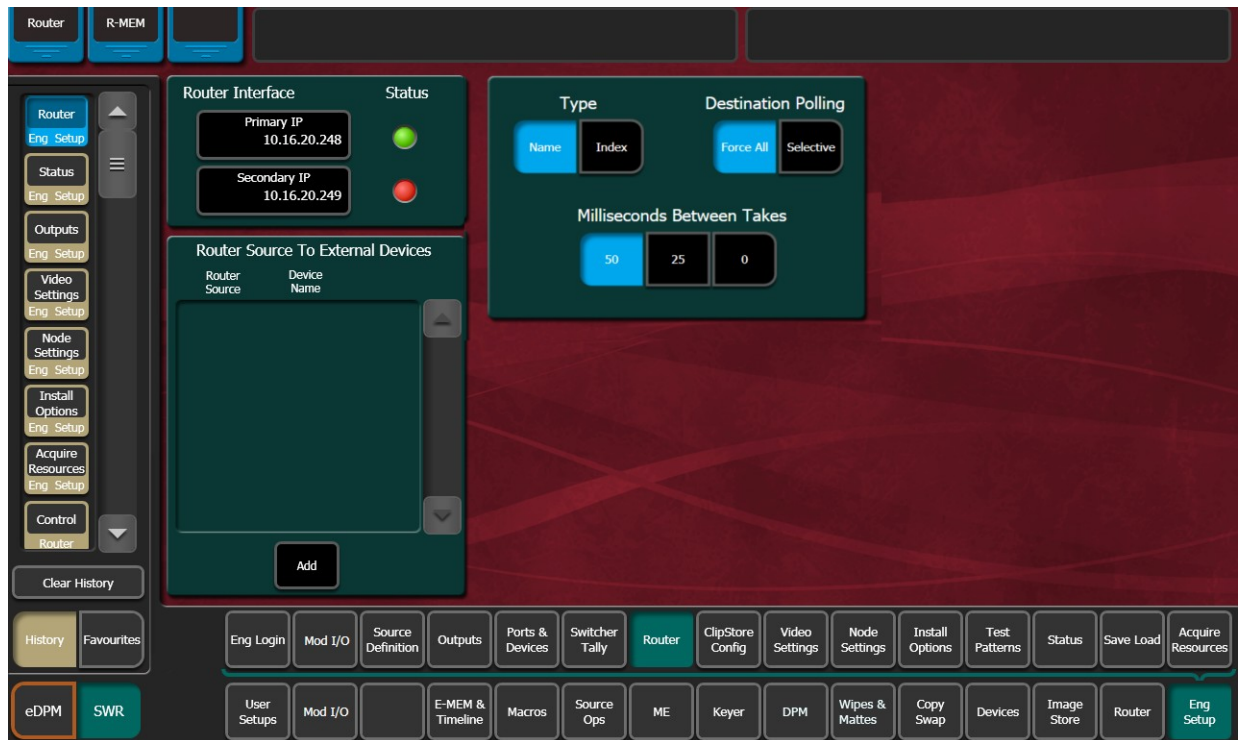
External Routing System Configuration

It is assumed the external routing system has already been configured for basic use in your facility, and only needs to be re-configured to interface with the GV Switcher system.

Setting IP Addresses

The Eng Setup Router menu is used to set the IP Address(es) the GV Switcher system will use to communicate to the external routing system. The external routing system can have an optional redundant, or secondary, controller which takes over should the primary fail. Both router control systems will require their own IP address settings.

1 Select **Eng Setup, Router**.



The **Status** indicator is red when communication is not detected, and goes green when communication is established.

To Set the IP Addresses:

- 2 Select the **Primary IP** data pad and enter the primary address of the router with the pop-up keypad.
- 3 Select the **Secondary IP** data pad and enter the secondary IP address of the router, if appropriate. If the router has only one control system, leave this address set to the blank default.

Note: If the GV Switcher system has been configured with a router IP address but a connection to the router has not been established, changing the IP address in this menu will not make the switcher system immediately try to connect to the new router address. The system will automatically try to connect after about 30 seconds using the entered router IP addresses.

Primary and Secondary Router Communications

The GV K-Frame XP switcher system will initially use the primary router control system IP Address for communications. If the primary router control system fails to respond, the switcher will attempt to use the secondary IP address for communications. If successful, it will continue using it in the future. If ever communication is lost to the secondary, the switcher will attempt to reestablish communications using the primary IP Address.

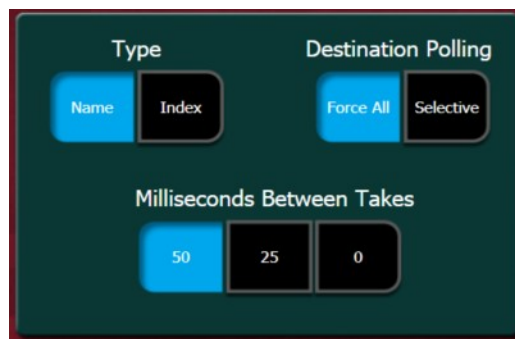
About Router Types

Router types include:

- **Name**—Name is used to identify the external Router Source. The external source name is used by the switcher to identify the Router Destination on the switcher input as a routed GV Switcher source, and

Note: If the Router Source's Name is changed, R-MEMs recalling that router source must be relearned (see the *Kayenne/Karrera/GV Korona User Manual*).

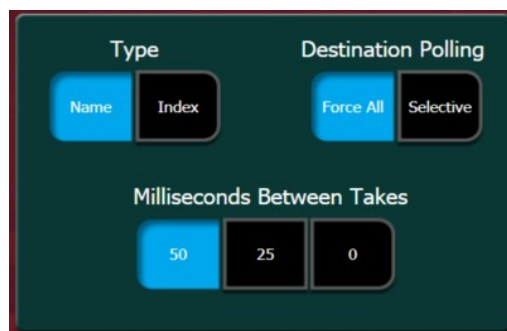
- **Index**—External router sources include a numerical identifier in addition to Name. When the **Index** button is selected, the GV Switcher system builds an index of external router sources using the routed source's number, rather than the name so R-MEMs are not affected if router source names are changed. (Shows created with systems configured before Switcher Version 9.0 can be updated to use router indexing (see the *Kayenne/Karrera/GV Korona User Manual*.)



About Destination Polling

The Destination Polling types include:

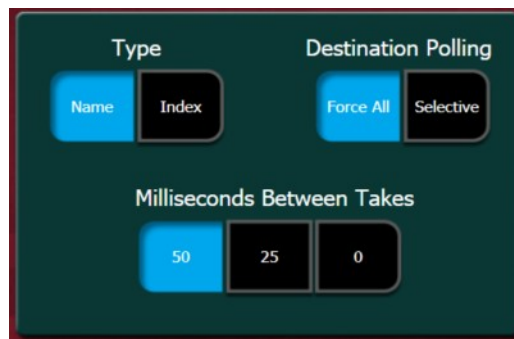
- **Force All** (the default)—Requests status of the entire router matrix (configured or not), and
- **Selective**—Only requests status of the configured router sources.



Configuring Milliseconds Between Takes

Many modern router control systems no longer require a delay, or less delay, between takes. The GV K-Frame XP can transmit takes with or without delay, however the external router control system must also support the faster settings.

- 1 Verify that the external device supports the number of milliseconds between takes to be configured in the menu.
- 2 In the Eng Setup, Router menu, select the **50**, **25**, or **0** **Milliseconds** Between Takes button.



Define Routed Source Definitions

The Eng Setup Source Definition menu is used to define routed GV Switcher sources, which includes specifying which router destination will be associated with each switcher source.

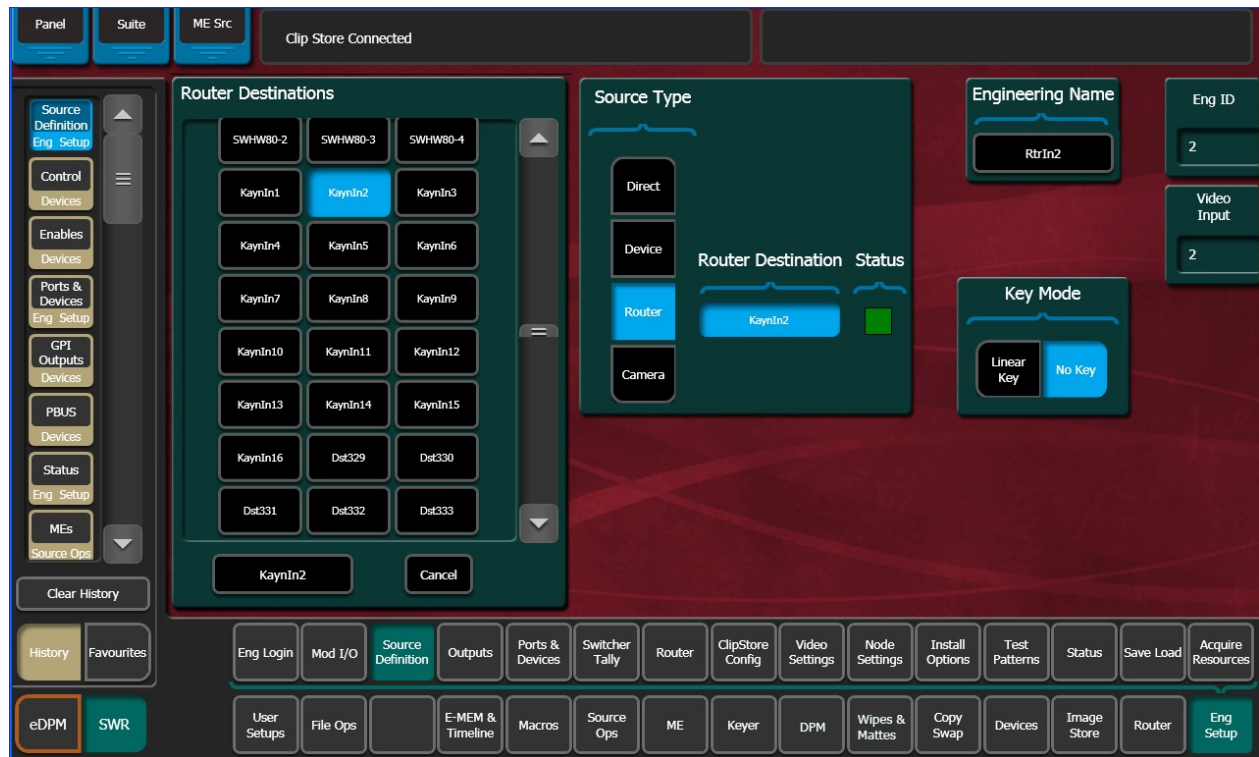
- 1 Select the **Eng Setup, Source Definition** in the menu.
- 2 Select the source to be configured with the router on the left scrolling list.
- 3 Select the Video Input data pad and enter the number of the input that will be used with the router video destination.
- 4 If the routed source will have an associated key signal, touch the appropriate Key Input button, then touch the Key Input data pad and enter the number of the input that will be used with the router key signal destination.

Note: If you assign a key input, the router system needs to be configured to switch that key destination along with the video destination. Router levels can be used to accomplish this.

- 5 Touch the **Router** type button to identify it as a routed source.

Note: The adjacent status indicator is green when a router is detected, and red when there is no response. If red, you should check the GV Switcher or router system configuration or the physical Ethernet connections.

- 6 Touch the **Router Destination** data pad to open the Router Destinations menu. The Video Processor receives a list of destination from the router and displays them on scrolling list on the left.



- 7 Touch the button for the desired destination to assign it to the previously selected router source.
- 8 Complete the source definition by entering an engineering name using the standard source definition procedure.

User Setups

Once a GV Switcher routed source has been defined, it can be mapped to source buttons using the standard button mapping procedure (User Prefs), and given alternate names (Suite Prefs, Source Patch menu). See the *Kayenne/Karrera/GV Korona User Manual* for more information.

7 Maintenance

Introduction

This section provides routine maintenance information for servicing the GV K-Frame XP Video Production Center.

Servicing Precautions

Before performing any type of GV Switcher system maintenance or troubleshooting, read the complete Important Safeguards and Notices section at the front of this manual.

Grass Valley Web Site

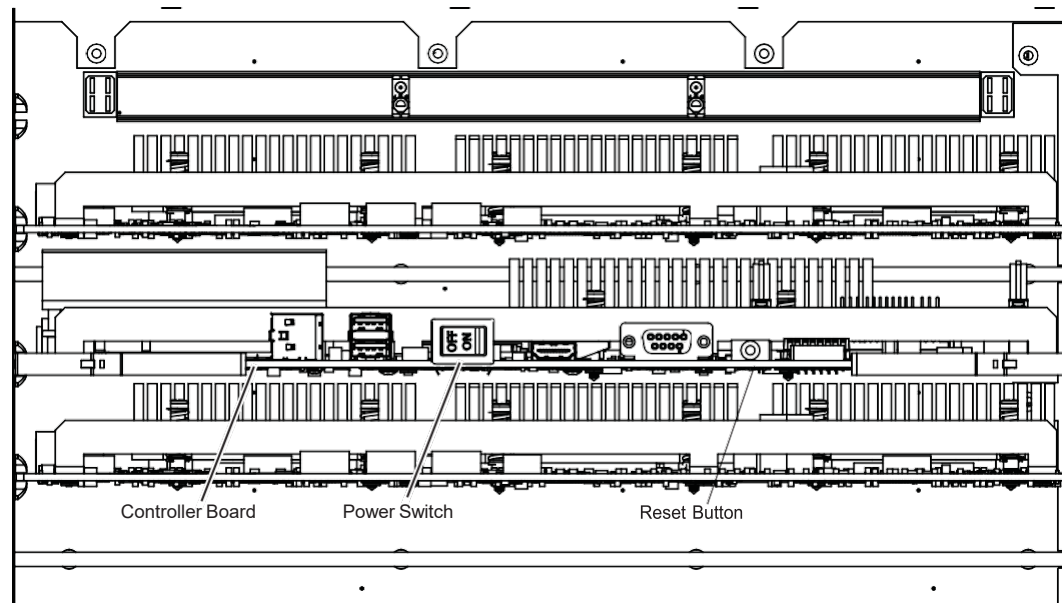
Visit the Grass Valley website for documentation, software updates, online support (including FAQs), spare parts information, and a link to the File Transfer Protocol (FTP) site.

Grass Valley Customer Support FAQ Database

Answers to many common questions can be found by searching the Grass Valley Customer Support Frequently Asked Questions (FAQ) database, available on the Grass Valley web site.

Video Processor Frame Reset Procedure

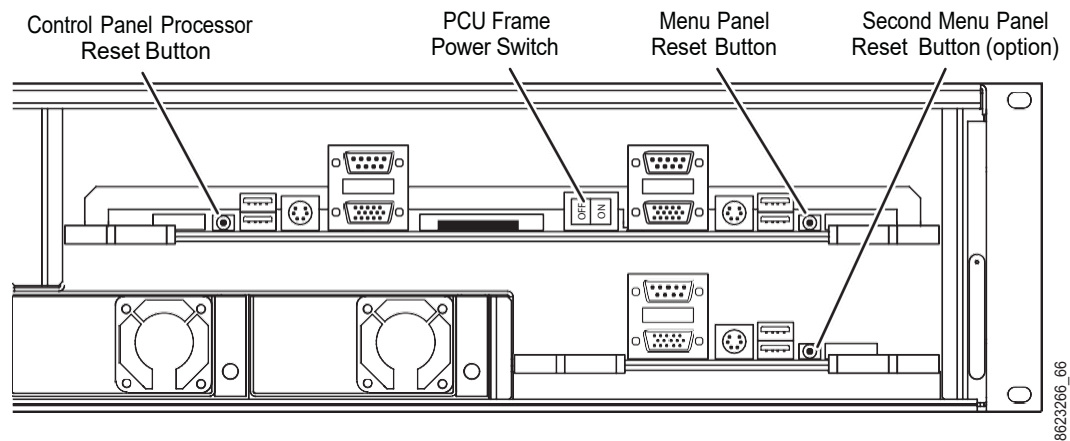
A GV K-Frame XP Video Processor Frame reset button is located near the center of the front edge of the Controller Board, accessed by opening the front door of the Frame. The 13-RU and 6-RU Frames use the same type of Controller Board. Pressing this button will reset both the Video Processor CPU and the Image Store Processor CPU. Powering the unit off and back on also resets the Video Processor Frame.



6-RU Video Processor Frame Reset Button and Power Switch

Panel Control Unit (PCU) Reset (Kayenne only)

The PCU has up to three reset buttons, one for the Control Panel Processor, one for the standard Menu Panel, and one for the optional second Menu Panel. These controls are accessible by opening the front door of the PCU Frame. Powering the unit off and back on also resets all installed components (Panel and Menus).



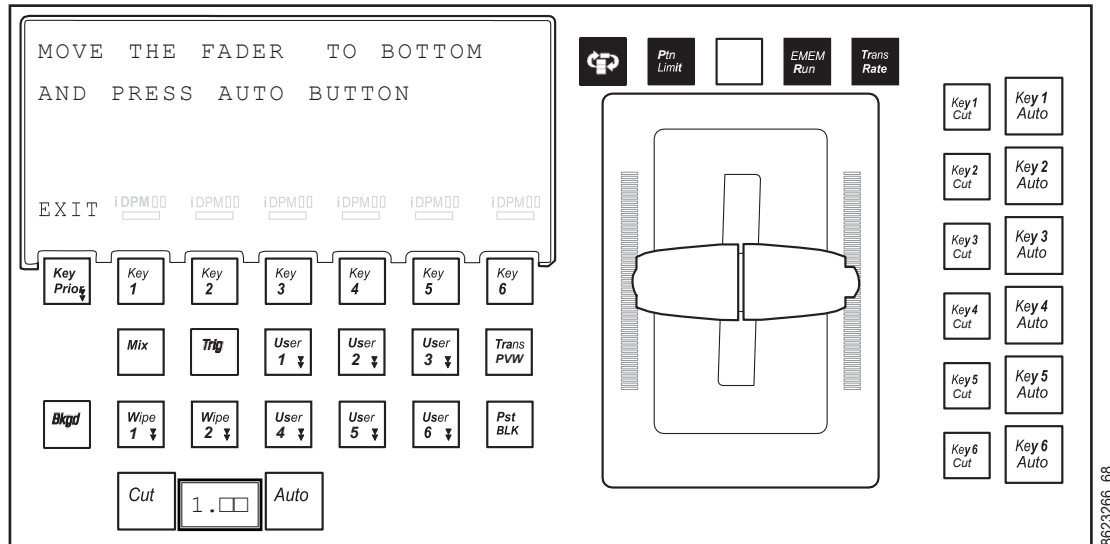
PCU Reset Buttons and Power Switch

Kayenne Control Panel Adjustments

Kayenne Lever Arm Calibration

Press the **Exchange ME** (the left-most graphic symbol button over the Lever Arm), **Ptn Limit**, **EMem Run**, and **Trans Rate** buttons simultaneously (in any order) to enter calibration mode for that module. Follow the instructions displayed, moving the fader to the bottom

and top limits and pressing the **Auto** button. When done, press the **Key Prior** button to exit calibration mode.

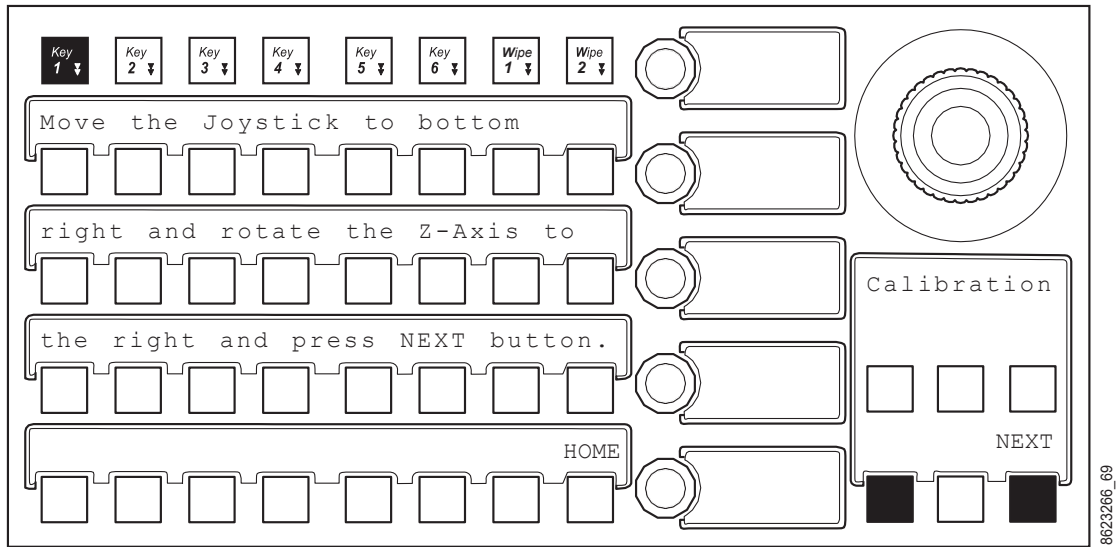


Button Hold Down for Lever Arm Calibration

Calibration settings are saved with the module. Disconnecting, reconnecting, or moving the module to a different location on the Control Panel (including a different Stripe) should not affect the calibration for that module.

Calibrating the Joystick

- 1 Press the **Home** button to take the Multi-Function module to its Home state.
- 2 Hold down the two bottom outside buttons below the Joystick and press the **Key 1** button on the upper left to put the module into Calibration mode.
- 3 Follow the instructions displayed, rotating the Joystick and pressing the bottom right button labeled **NEXT**.
Result: The **NEXT** button label changes to **END**.
- 4 Press the **END** button to complete the calibration and return the module to its Home state.



Button Hold Down for Joystick Calibration

Calibration settings are saved with the module. Disconnecting, reconnecting, or moving the module to a different location on the Control Panel (including a different Stripe) should not affect the calibration for that module.

M/E Stripe Mapping

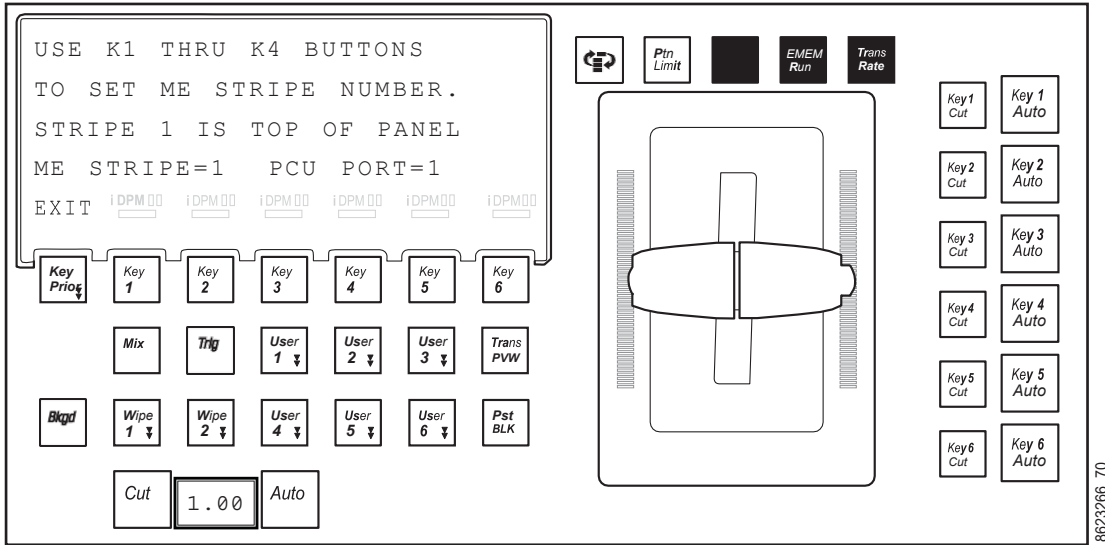
The recommended PCU port to Stripe multi-pin cable connection order uses the following conventions:

- Lowest PCU Port > Top M/E Stripe (under Local Aux Stripe if present)
- Next PCU Port > Next lower M/E Stripes in order
- Highest contiguous PCU Port > Local Aux Stripe
- Stripes in the same Suite should use contiguous PCU ports.

By following these cabling conventions, troubleshooting will be easier because the connections will be consistent.

It is possible to re-map M/E Stripe to PCU port connections. This can be useful if an essential M/E Stripe (for example, the one with the Multi-Function Module) fails due to a multi-pin cable problem. That essential M/E Stripe can be re-assigned to a different PCU port that has an operational multi-pin cable, restoring Kayenne Control Panel operation.

To remap M/E Stripes, on any Transition Module press the three right-most buttons over the Lever Arm at the same time to enter M/E Stripe Mapping mode.



Button Hold Down for M/E Stripe Mapping

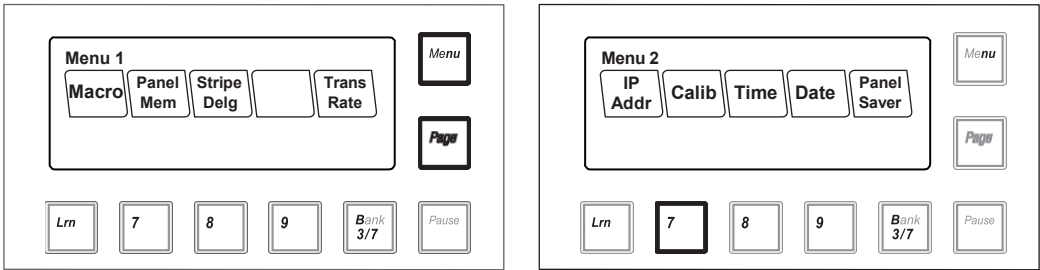
On the M/E Stripe you wish to remap, press a **Key 1** through **Key 6** button on the Transition Module in that Stripe to choose a PCU port for that Stripe. If that PCU port is used by another Stripe, it will be swapped.

When the Stripes are remapped, press the button labeled EXIT (**Key Prior**). The display informs you that mapping changes take place after reboot, and a with a Reboot Now prompt appears. Pressing the button labeled YES will reboot the Panel.

Karrera Control Panel Adjustments

Lever Arm Calibration

- 1 In any E-MEM area, press **Menu, Page**. This shows a list of menu items that are selected with the buttons below the display (on the left).

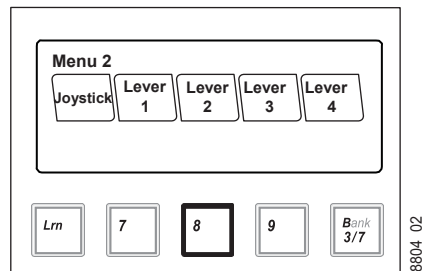


Karrera Calibration Menu, E-MEM Area

- 2 Select **Calib** (press **7**) to enter calibration mode (on the right).

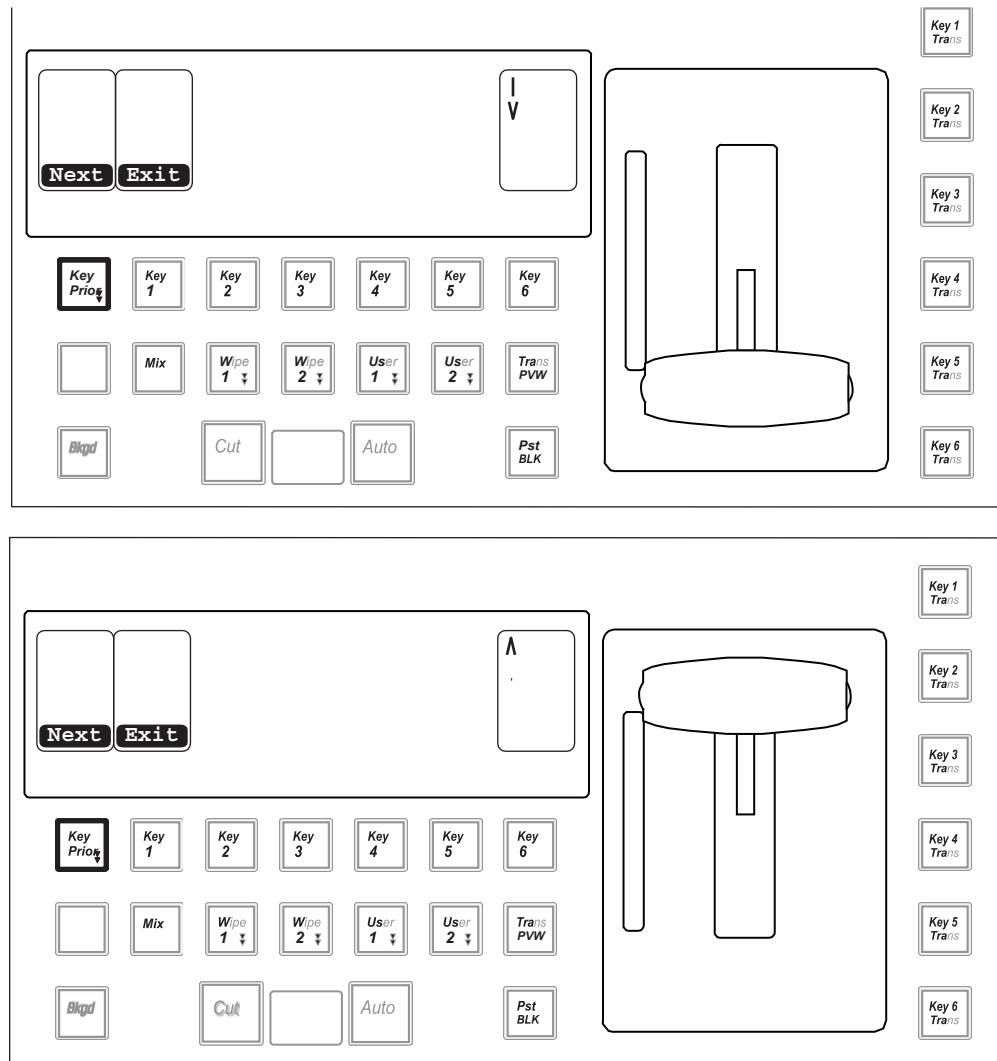
Note: Pressing the **Menu** button at this time exits calibration mode without making any changes.

- 3 Choose the M/E Lever Arm to calibrate. Lever 1 is the topmost Lever Arm on that panel. For example, to choose the second Lever Arm select **Lever 2 (8)**.



Karrera Lever Arm Selection, E-MEM Area

- 4 On the chosen M/E's Transition Area, follow the instructions displayed.
- a Move the Lever Arm down all the way and select **Next** (press **Key Prior**).
 - b Move the Lever Arm up all the way and select **Next** (press **Key Prior**). This saves the calibration values and exits calibration mode.



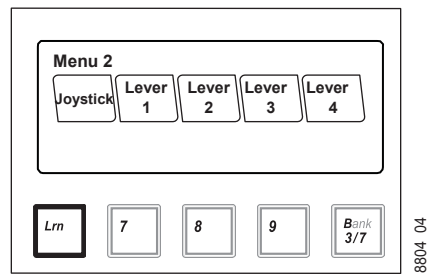
8804_03

Karrera Lever Arm Calibration Procedure, Transition Area

Note: Selecting **Exit** (pressing **Key 1**) cancels the Lever Arm calibration mode and returns that Transition Area to transition operations, but may leave the Lever Arm in an un-calibrated state. Complete the entire calibration procedure to ensure normal operation.

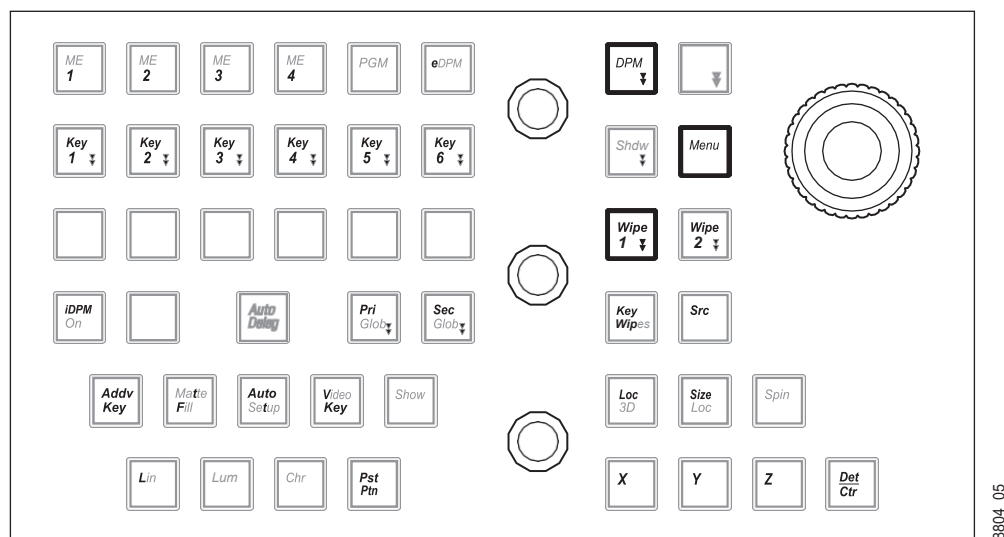
Karrera Joystick Calibration

- 1 In any E-MEM area, press **Menu, Page**. This shows a list of menu items that are selected with the buttons below the display.
- 2 Select **Calib** (press **7**) to enter calibration mode.
- 3 Choose the **Joystick** to calibrate (press **Lrn**).



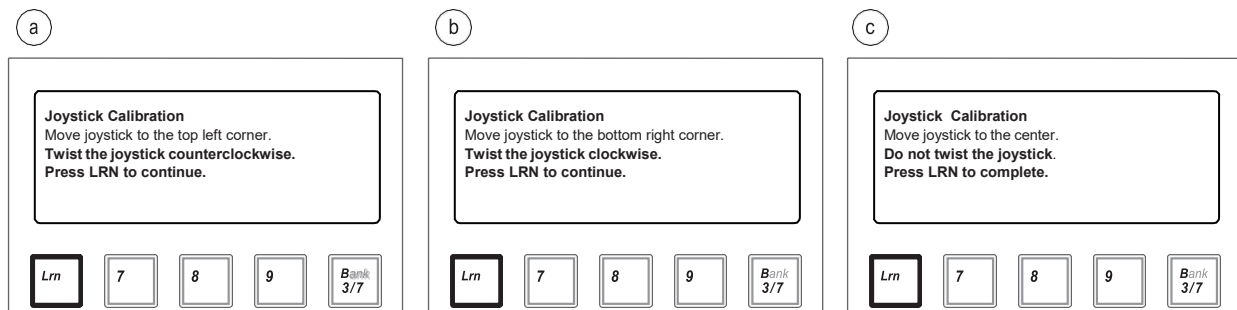
Karrera Joystick Selection, E-MEM Area

- 4 Three buttons near the Lever Arm will blink, indicating Joystick actions are required.



Joystick Calibration Indicator Buttons, Modifier Area

- 5 Follow the joystick calibration instructions shown on the E-MEM display.
- Move the Joystick to the top left corner, rotate it counter-clockwise, hold, and press **Lrn**.
 - Move the Joystick to the bottom right corner, rotate it clockwise, hold, and press **Lrn**.
 - Allow the Joystick to return to its center, unrotated position, hold, and press **Lrn**.

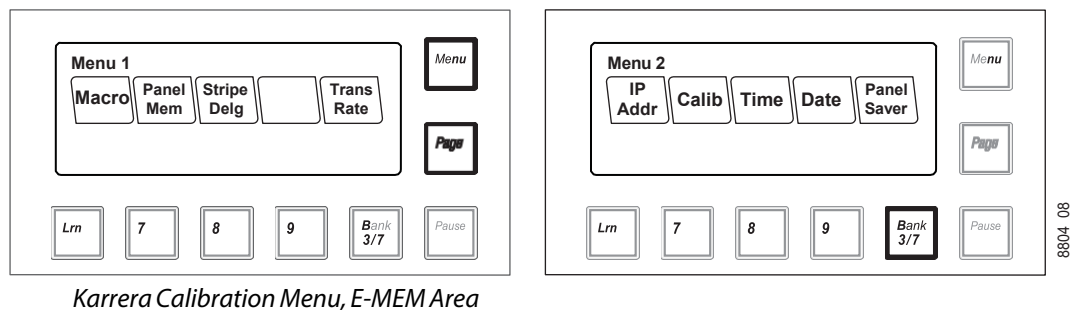


Joystick Calibration Instructions 2, 3, E-MEM Area

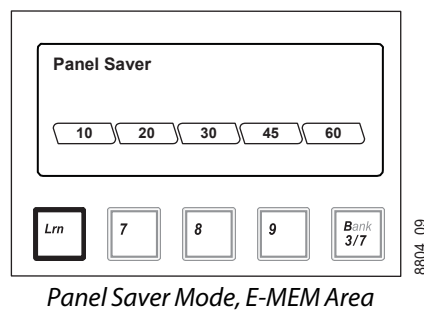
Note: Pressing the **Menu** button cancels the Joystick calibration mode, but may leave the Joystick in an un-calibrated state. Complete the entire calibration procedure to ensure normal operation.

Karrera Panel Saver Time Adjustment

- 1 In any E-MEM area, press **Menu, Page**. This shows a list of menu items that are selected with the buttons below the display (on the left).



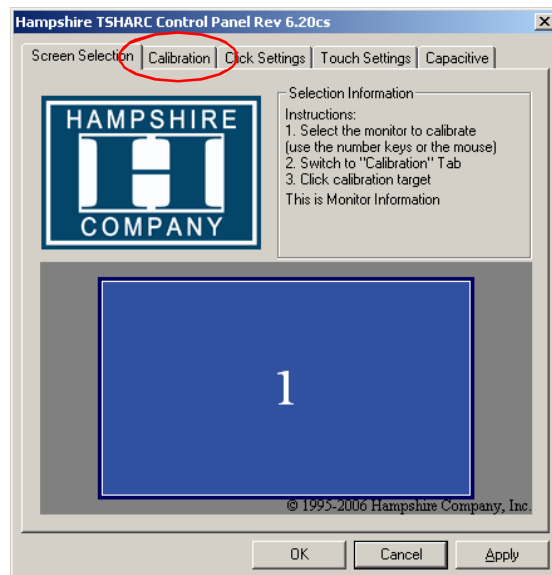
- 2 Select **Panel Saver** (press **Bank 3/7**) to adjust the panel saver timing (on the right).
- 3 Once in panel saver mode, select the time period (in minutes) of inactivity required to initiate the panel saver mode using the buttons below the display. The illuminated button indicates the current setting.



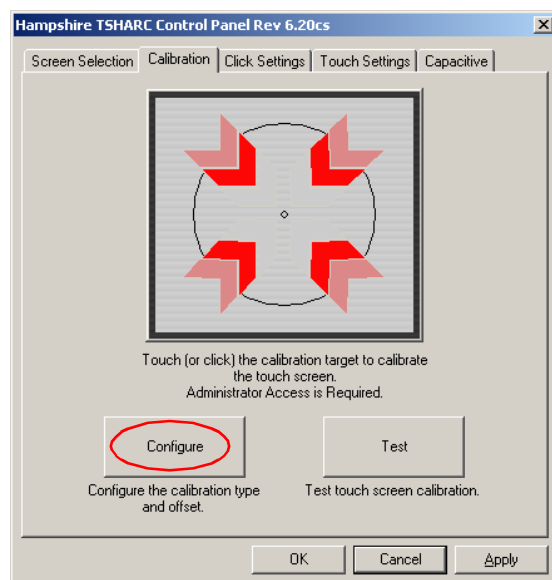
Kayenne and Karrera Touchscreen Calibration

The Kayenne and Karrera Touch Screen Menu Panels are adjusted in the factory before shipment, and so should not require calibration. If the Menu Panel does not respond correctly to screen touches, however, you can perform this procedure.

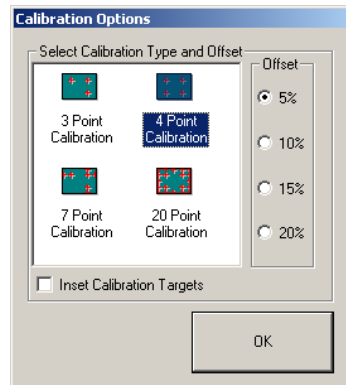
- 1 **Minimize** or **Exit** the menu application.
- 2 With the Windows desktop visible, click on **Start/Programs/Hampshire TSHARC Control Panel**. The Hampshire application will open.



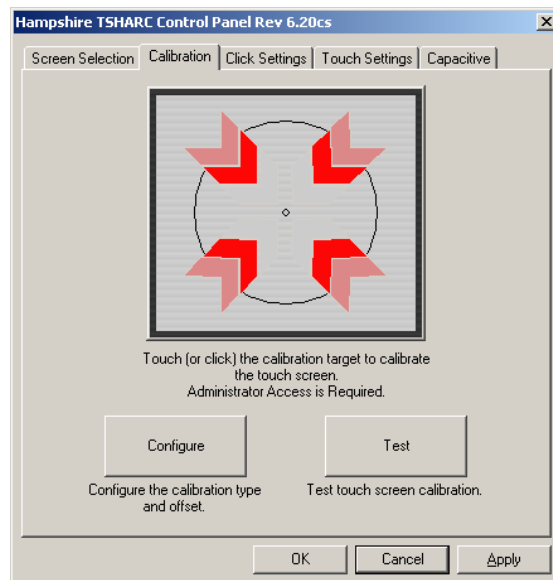
- 3 Select the second **Calibration** tab on the top to open that menu screen.



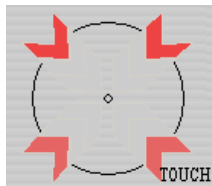
- 4 Touch **Configure** on the lower part of the screen to open a menu for selecting the calibration type.



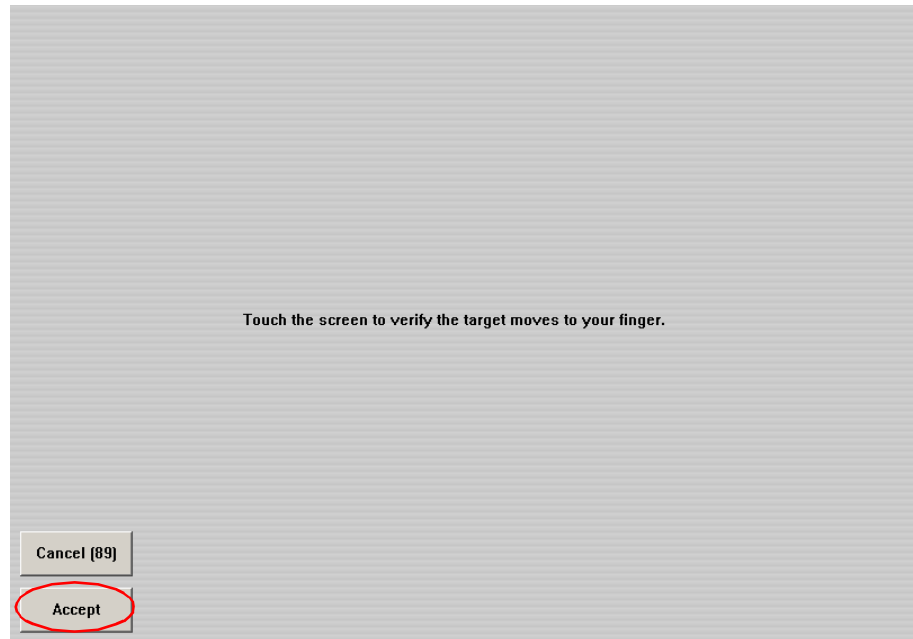
- 5 Touch **4 Point Calibration** and then **OK**. You will return to the Calibration Menu screen.



- 6 Start the calibration process by touching the center of the calibration box and circle where the red arrows are pointing.



- 7 The Calibration Menu screen will then go away and a new calibration target circle will appear in a corner of the screen.
- 8 Touch and hold the dot in the center of the small calibration box. The screen will report **TOUCH**, then **HOLD**, and then **RELEASE**. When done the application will register the location and move the circle to another corner. Repeat for all four corners. A blank screen will then appear.



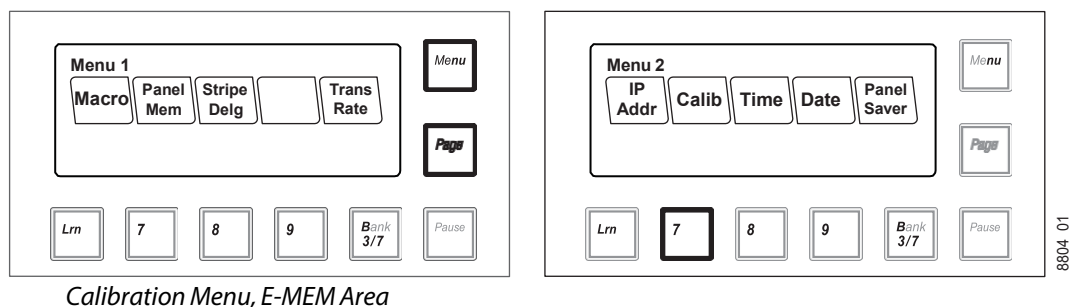
- 9 Touch the screen to verify the calibration. A calibration circle will appear and follow your finger touch across the screen. If satisfied, touch the **Accept** button at the bottom of the screen to save the calibration.

The Calibration Menu screen then reappears. Touch **OK** at the bottom of the screen to exit the application.

GV Korona Control Panel Adjustments

GV Korona Lever Arm Calibration

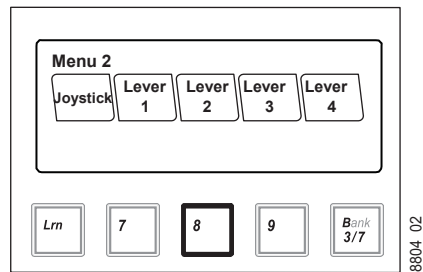
- 1 In any E-MEM area, press **Menu, Page**. This shows a list of menu items that are selected with the buttons below the display (on the left).



- 2 Select **Calib** (press **7**) to enter calibration mode (on the right).

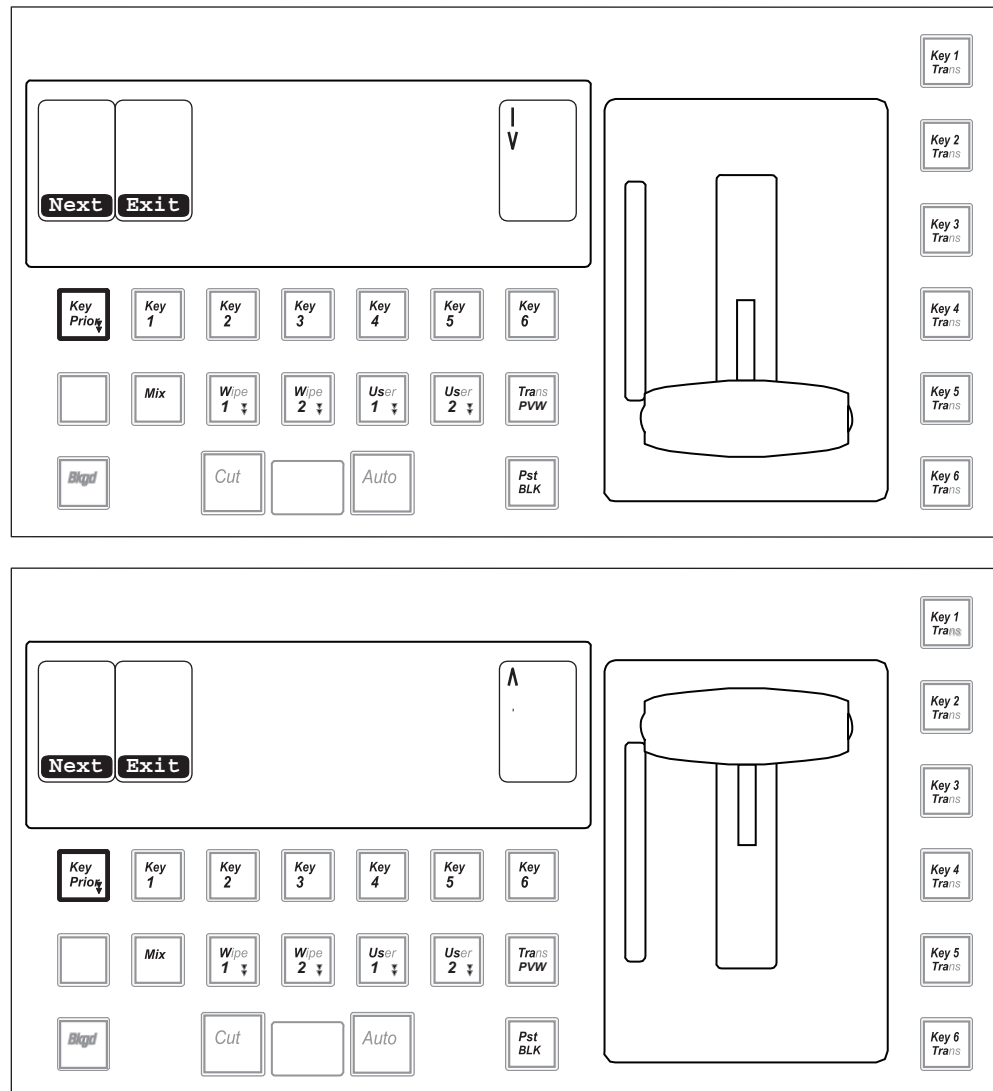
Note: Pressing the **Menu** button at this time exits calibration mode without making any changes.

- 3 Choose the M/E Lever Arm to calibrate. Lever 1 is the topmost Lever Arm on that panel. For example, to choose the second Lever Arm select **Lever 2** (press **8**).



Lever Arm Selection, E-MEM Area

- 4 In the Status Display, follow the instructions displayed (as shown):
 - a Move the Lever Arm down all the way and select **Next**.
 - b Move the Lever Arm up all the way and select **Next**. This saves the calibration values and exits calibration mode.

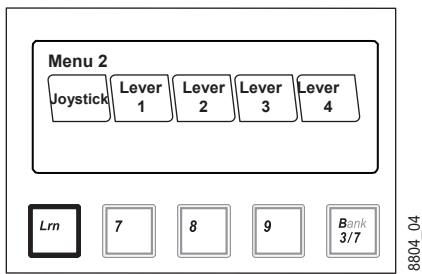


Lever Arm Calibration Procedure, Transition Area

Note: Selecting **Exit** cancels the Lever Arm calibration mode and returns that Transition Area to transition operations, but may leave the Lever Arm in an un-calibrated state. Complete the entire calibration procedure to ensure normal operation.

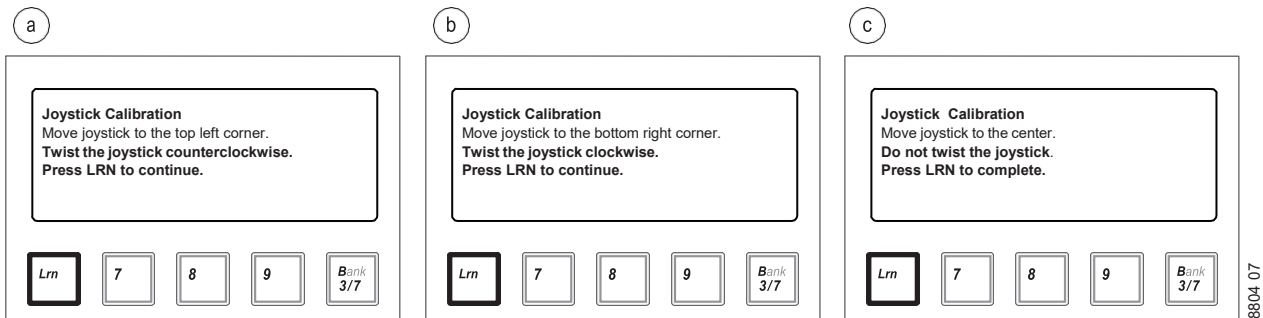
GV Korona Joystick Calibration

- 1 In any E-MEM area, press **Menu, Page**. This shows a list of menu items that are selected with the buttons below the display.
- 2 Select **Calib** (press **7**) to enter calibration mode.
- 3 Choose the **Joystick** to calibrate (press **Lrn**).



Karrera Joystick Selection, E-MEM Area

- 4 Follow the joystick calibration instructions shown on the E-MEM display.
- a Move the Joystick to the top left corner, rotate it counter-clockwise, hold, and press **Lrn**.
 - b Move the Joystick to the bottom right corner, rotate it clockwise, hold, and press **Lrn**.
 - c Allow the Joystick to return to its center, unrotated position, hold, and press **Lrn**.

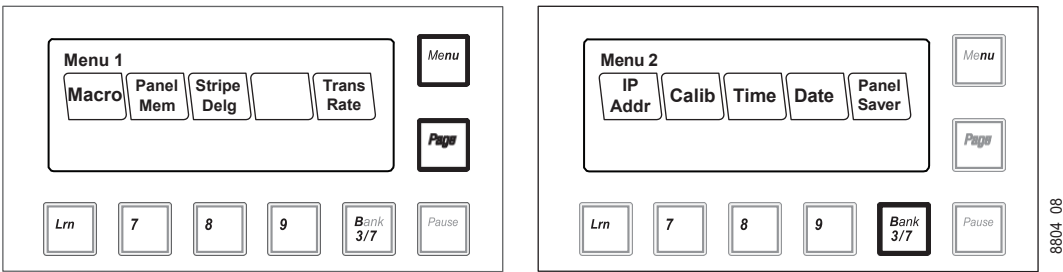


Joystick Calibration Instructions 2, 3, E-MEM Area

Note: Pressing the **Menu** button cancels the Joystick calibration mode, but may leave the Joystick in an un-calibrated state. Complete the entire calibration procedure to ensure normal operation.

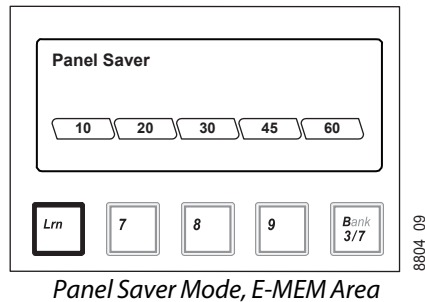
GV Korona Panel Saver Time Adjustment

- 1 In any E-MEM area, press **Menu, Page**. This shows a list of menu items that are selected with the buttons below the display (on the left).



Karrera Calibration Menu, E-MEM Area

- 2 Select **Panel Saver** (press **Bk 3/7**).
- 3 Once in panel saver mode, select the time period (in minutes) of inactivity required to initiate the panel saver mode using the buttons below the display. The illuminated button indicates the current setting.



Software Installation

GV K-Frame XP systems are shipped with the current software version installed. Updates to GV Switcher system software are available for download from the Grass Valley website. Software installation tools are provided with each update package.

Software Option Authorization

Some GV K-Frame XP system options have software components that can be enabled via an authorization process, using authorization codes. Authorization codes are also used for tracking maintenance contracts.

New systems ship with the appropriate authorization codes installed, enabling all purchased options. When new optional features become available, Grass Valley sends new authorization codes to the customers.

Authorization Codes

The authorization process involves receiving an authorization code from Grass Valley and entering it in a menu on the system. The authorization code is associated with a particular Video Processor, identified by a System ID#, and is not transferable to different hardware. If you have multiple systems at your facility, you will need to enter an authorization code onto each system.

Standard authorization codes (Permanent) apply to purchased options and maintenance contracts. Other authorization codes (Temporary) may also be available that can enable selected options for a limited time. Temporary authorizations can be used for trial demonstrations and other special purposes. Temporary authorizations add to any permanently enabled options, but these additional options are disabled after the allotted time elapses.

Expiration Dates

Maintenance contract and temporary authorizations have expiration dates. Messages will be posted on the GV Switcher menu when an expiration date approaches. Expirations occur

at midnight, but do not immediately go into effect. Instead, any expired options continue to operate until the system is power cycled or reset, at which time the options are disabled. This is intended to prevent loss of functionality during on-air operations. Expiration of the maintenance portion of an authorization will not disable any options.

Authorization Procedure

Acquire Authorization Code

Grass Valley will be sending authorization codes to all GV K-Frame XP system customers. If you have received your codes and the system IDs are correct, proceed to [Enter Permanent Authorization Code](#). If you do not have valid authorization codes you will need to acquire them from the Grass Valley.

- 1 Go to the Install Options menu by touching **Eng Setup, Install Options**.

The screenshot shows the Grass Valley K-Frame XP system interface. On the left, the 'System ID' is displayed as 'GV K-Frame XP' with the value '12345678'. The main area shows a table of system options with columns for 'Option', 'Enabled', 'Total Licensed', 'Perm', 'Temp 1', 'Temp 2', 'Temp 3', 'Temp 4', and 'New'. The 'Perm' column is highlighted in green. Below the table, there are 'Start Date' and 'End Date' fields. The bottom menu includes buttons for 'Eng Login', 'Video I/O', 'Source Definition', 'Outputs', 'Ports & Devices', 'Switcher Tally', 'Router', 'ClipStore Config', 'Video Settings', 'Node Settings', 'Install Options' (highlighted), 'Test Patterns', 'Status', 'Save Load', 'Acquire Resources', 'User Setups', 'File Ops', 'E-MEM & Timeline', 'Macros', 'Source Ops', 'ME', 'Keyer', 'iDPM', 'Wipes', 'Copy Swap', 'Devices', 'Image Store', 'Router', and 'Eng Setup'.

| Option | Enabled | Total Licensed | Perm | Temp 1 | Temp 2 | Temp 3 | Temp 4 | New |
|-----------------------------|---------|----------------|------------|--------|--------|--------|--------|-----|
| Full MES | 0 | 8 | 8 | | | | | 0 |
| ClipStore Channels | 4 | 4 | 4 | | | | | 0 |
| Image Store Cache Size (GB) | 128 | 128 | 128 | | | | | 0 |
| Chroma Keyers | 0 | 54 | 54 | | | | | 0 |
| DPM Channels | 0 | 16 | 16 | | | | | 0 |
| RGB Color Correction | Yes | Yes | Yes | | | | | --- |
| eDPM | 0 | 4 | 4 | | | | | 0 |
| FlexKey™ | --- | Yes | Yes | | | | | --- |
| DoubleTake™ | --- | Yes | Yes | | | | | --- |
| Ethernet Tally | Yes | Yes | Yes | | | | | --- |
| Soft Panel | Yes | Yes | Yes | | | | | --- |
| SNMP | Yes | Yes | Yes | | | | | --- |
| SetDef MatchDef Scalers | 0 | ALL | 32 | | | | | 0 |
| HD 1080p & UHD-1 2160p | Yes | Yes | Yes | | | | | --- |
| 2D DPMs | --- | Yes | Yes | | | | | --- |
| Image Store Movies | Yes | Yes | Yes | | | | | --- |
| ME View | --- | Yes | Yes | | | | | --- |
| Multiviewer | 4 | 4 | 4 | | | | | 0 |
| | | | Start Date | | | | | |
| | | | End Date | | | | | |

- 2 Write down the System ID displayed on the upper left portion of the menu.
- 3 If you have more than one system, repeat the above steps on every system that will have options enabled.
- 4 Contact Grass Valley Customer Support and request a code for each GV Switcher System ID. If options have not already been purchased, you can order the options directly from the service representative.

Enter Permanent Authorization Code

- 1 Go to the Install Options menu (**Eng Setup/Install Options**) on a menu of the system whose options you are enabling. Confirm that the System ID on the menu matches the System ID# of the authorization code.
- 2 Select the **Perm** button in the Option Group pane.
- 3 Select the **New Auth Code for Perm** data pad and enter the code on the pop-up keypad.

Note: System ID and Authorization Codes are alphanumeric and need to be entered exactly. Authorization codes do not use the letters "o" or "l" to avoid confusion with the numbers "0" and "1". The dashes in authorization codes are required for use.

- 4 Touch the button labeled either **Replace** or **Install** next to the new authorization code. The codes will be added and the expiration date of any maintenance contract will be indicated. If you do not believe the option statuses reported are correct, contact Grass Valley Customer Support to resolve the issue.
- 5 If options were removed, reset the Video Processor Frame.

Note: When an option is removed, it remains operational until the Video Processor Frame is reset or power cycled. When an option is added, it becomes operational immediately without requiring a Frame reset.

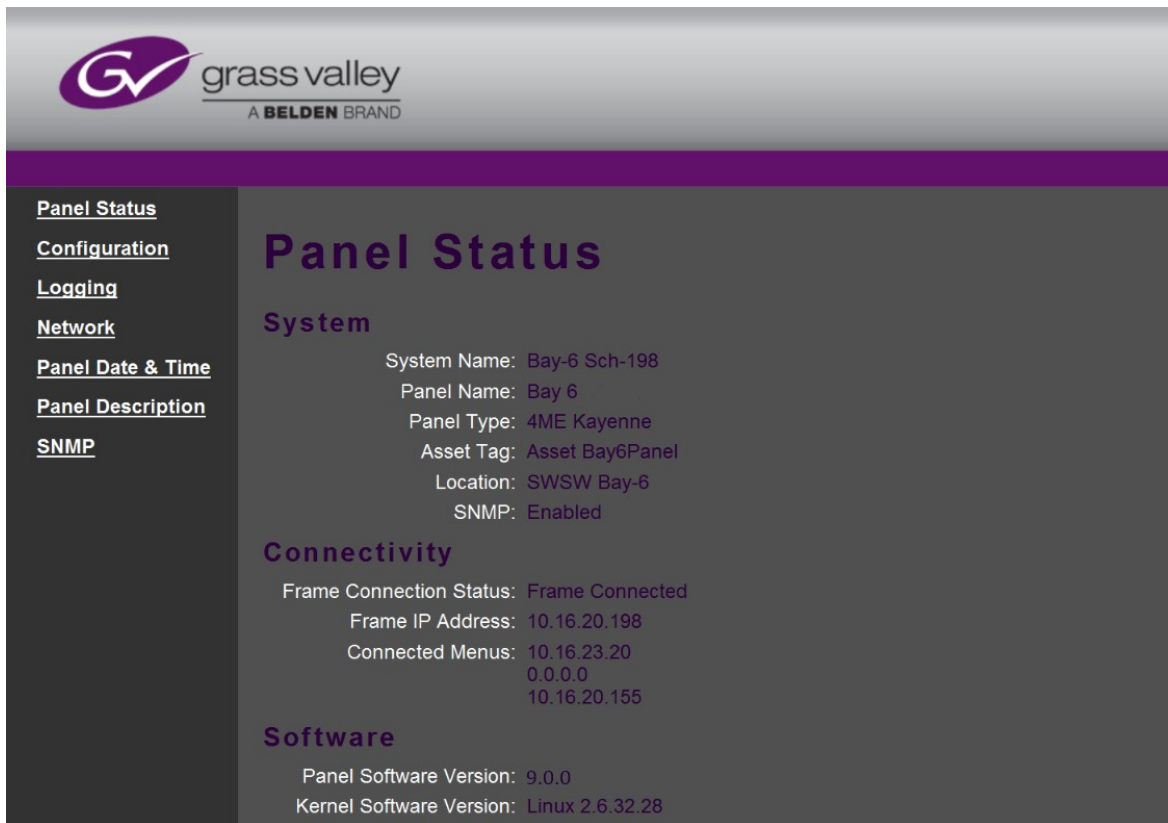
- 6 Write down the authorization codes, specifying which system they apply to, and store this information in a safe place, should you need to re-enter the codes at some time in the future.

Temporary Authorizations

For demonstration or rental, optional features can be authorized temporarily. Once you have obtained the temporary authorization code, enter it on the GV Switcher system using the procedure described above, except you first select one of the Temp buttons. Temporary authorization information is displayed on the right portion of the menu. Up to four temporary authorizations are allowed at a time. Temporary authorization features that are removed remains active until the Video Processor Frame is reset.

Control Panel Web Pages

Web browser access is available for the GV K-Frame XP Control Panels. Using any web browser able to access the network, type the IP address in the browser's Address field to view the Control Panel web pages.



Control Panel NV Memory

The GV K-Frame XP Control Panel circuitry has NV Memory, which stores some Control Panel configuration information, including:

- Macro Attachments
- Panel Memory

Some related panel settings can be saved as configuration files (Panel Prefs, Panel Memory), or as part of a Show file. Should Control Panel software problems occur, clearing the Control Panel NV memory may help with diagnostics and recovery.

Clear Control Panel NV Memory Procedure

Use the following procedure from the a GV switcher menu application that operates with the updated Video Processor Frame.

Note: A new Menu Panel or PC that has not been used with the switcher system will need to be configured as a Control Surface Node before it can operate with a switcher system.

- 1 From the Installer menu, select the **System** button and then the Kayenne, Karrera, or GV Korona Control Panel to be cleared.

- 2 Select **Clear NV**.
- 3 Select the **Clear NV** button. A Clear NV Files screen will appear.
- 4 Leave the **Reboot when complete** box filled and click **OK**.
- 5 NV Memory will be cleared and the Menu or Frame will be rebooted.

Restoring Multiple Control Panels

If your GV Switcher system has multiple Control Panels connected to the same Frame (PCU Frame for Kayenne), the Clear NV process will clear settings for all the connected panels. Because separate Panel Prefs exist for each Control Panel, you will need to restore each Control Panel's configuration files individually.

Control Panel IP Information

After a panel processor board replacement, the Video Processor Frame IP address will need to be re-entered into the Control Panel.

Kayenne/Karrera Menu Panel IP Information

Replacing a Menu Panel processor will require resetting all Menu Panel IP addresses. This includes the actual Menu Panel IP addresses, as well as the addresses the Menu Panel uses to communicate with the Video Processor Frame and Control Panel (DPOPs).

Video Processor Frame Maintenance

Video Processor Frame NV Memory

GV K-Frame XP system non-volatile memory (NV Memory) contains Engineering, Suite, and User configuration data, and also has data for all the effects registers. This data is stored as files on the Video Processor Frame Solid State Drive, and is loaded on bootup. Errors in this data could cause system problems, which may be overcome, perhaps only temporarily, by clearing the NV Memory.

Note: You should have backup copies of your configuration and E-MEM files compatible with your current software version so they can be restored after the NV Memory is cleared.

Clear NV RAM for Control Panel and Frame

Use the following procedure from the Menu Panel or Menu on PC running the Menu Panel application that operates with the updated Video Processor Frame.

Note: A new Menu Panel or PC that has not been used with the switcher system will need to be configured as a Control Surface Node before it can operate with a switcher system.

- 1 From the Installer menu, select the **System** button and then the device to be cleared.

- 2 Select **Clear NV**.
- 3 Select the **Clear NV** button. A Clear NV Files screen will appear.
- 4 Leave the **Reboot when complete** box filled and click **OK**.
- 5 NV Memory will be cleared and the Menu or Frame will be rebooted.

Restore System Files

If you have a Show File with a set of standard GV K-Frame XP system settings, you can load it now to restore your system to that state. However, if you are experiencing problems, you may want to reload the files individually to help find what might be causing problems.

- 1 For troubleshooting, restore your backup files in the following order:
 - a Reload your backup Engineering Setup file and make sure it is correct by, for example, checking that the proper source names appear in the Source Definition menu.
 - b Reload a Suite Prefs file and a User Setups file and check that these settings are correct.
 - c Load some E-MEMs and run them to check that they operate correctly.
- 2 If there are any problems with any of the restored files, they may have become corrupted and need to be deleted and rebuilt. If a problem file locks the system, you may need to clear NV Memory again to restore system operation, but you will know what file is responsible. Contact Grass Valley Customer Support if you need troubleshooting assistance.

Restoring Multiple Suites

If your GV K-Frame XP system is configured has multiple suites, each suite will have its own Suite Prefs file. Clearing Video Processor Frame NV Memory will both suites, so to restore the system completely you will need to reload Suite Prefs for each suite.

IP Address Information

Storing GV K-Frame XP Video Processor Frame IP address information on the backplane of the Frame allows control processor board replacement without the need to enter the IP address of the Frame.

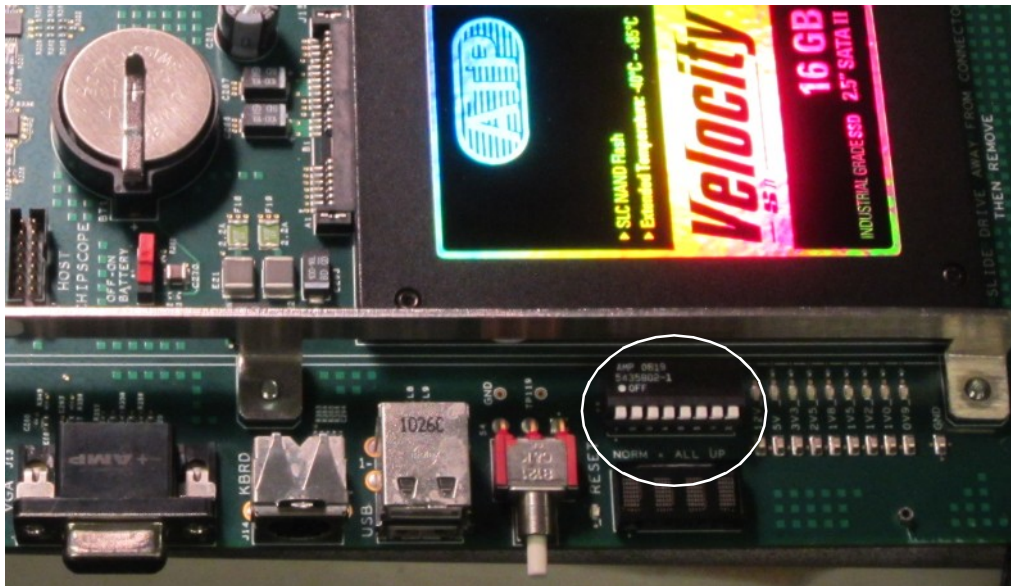
After control processor board replacement you will need to go to the Node Settings menus (**Eng Setup, Node Settings**) and re-enter Panel and Menu IP addresses (**Control Surfaces**), and Remote Aux information (**Remote Aux IP Network**)

License Information

License information stored on the GV K-Frame XP Video Processor Frame EEPROMS determine which features are available for use. Licensing is keyed to the serial number (System ID) for the Video Processor.

VP Frame Processor Board Replacement

When replacing the GV K-Frame XP Video Processor Frame control processor board, verify that the S2 Boot Mode Dipswitch settings are all in the **UP** or **Normal** position. The dipswitch is located below the SATA drive on the control processor board.



GV K-Frame XP Control Processor Board - S2 Boot Mode Dipswitch Location

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

Lifetime of the Internal Battery

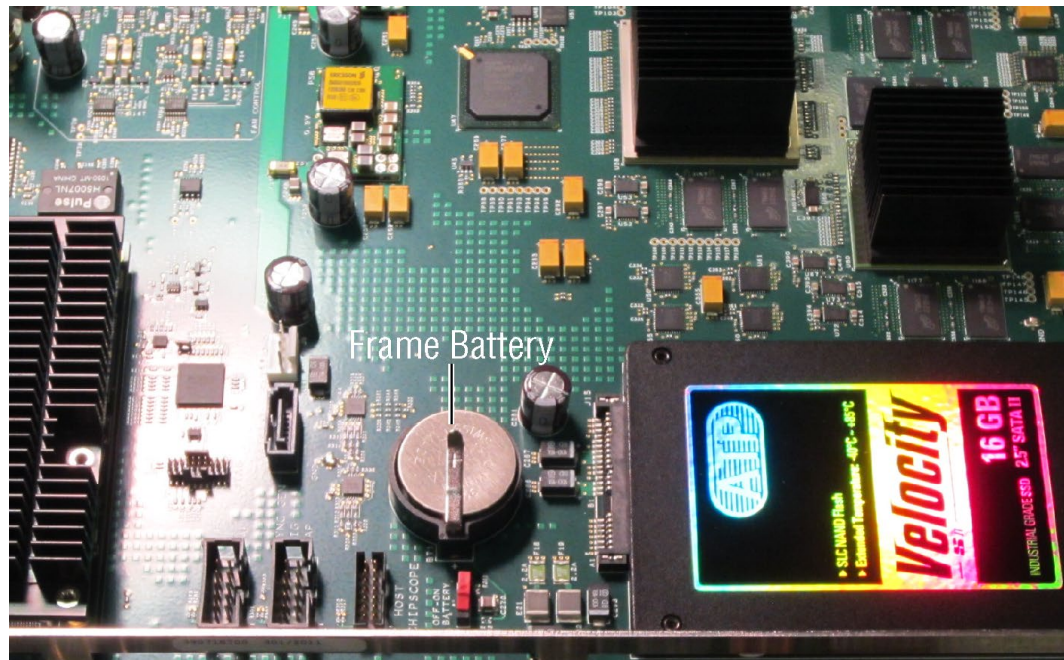
Battery life of the GV K-Frame XP Video Processor internal battery is dependent on the operating time of the switcher.

Battery information:

- Capacity:1000 mA/h
- GV Part Number:146013800
- Type:CR 2477

Video Processor Frame Battery Replacement

- 1 Turn off all power to the Frame before opening it.
- 2 Using a grounding strap, open the door to the Video Processor Frame and remove the Controller Board.
- 3 Remove the old battery by lifting the clip holding it in place.



Video Processor Frame Controller Board with Battery Indicated

- 4 Put the new battery in place and secure the clip.
- 5 Re-insert the Frame controller board and close the Frame door.

IP Information

The GV K-Frame XPVideo Processor Frame IP address will need to be re-entered using the GV Switcher Installer program.

Kayenne/Karrera Menu Panel IP Information

Menu Panel IP information resides on each Menu Panel processor, using standard Windows OS methods. Replacing a PCU processor board, or Menu Panel option board, will require resetting all Menu Panel IP addresses. This includes the actual Menu Panel IP addresses, as well as the addresses the Menu Panel uses to communicate with the Video Processor Frame and Control Panel (DPOPs).

Kayenne Control Panel System Bar Maintenance

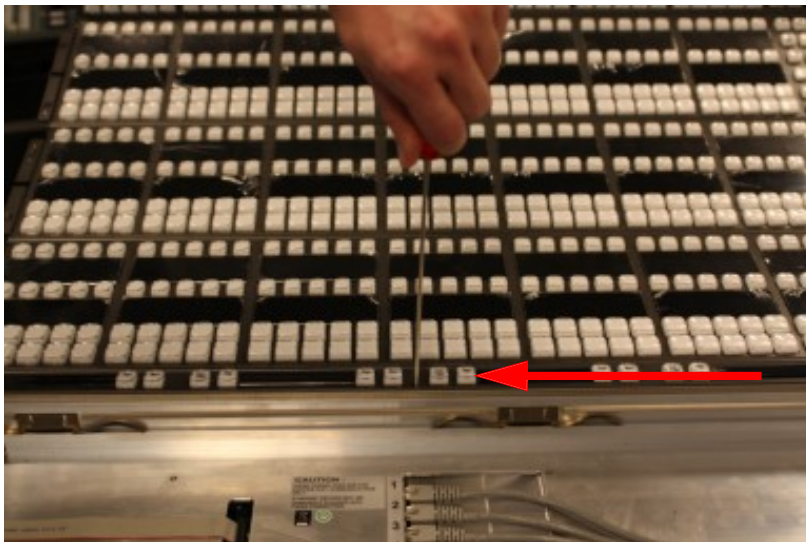
The GV K-Frame XP System Bar is only present on the Control Panel Pgm Pst Stripe. On larger Control Panels the System Bar has two main parts. The right active part is called the System Bar, and the left part is called the Extended System Bar. On 35 button Kayenne systems an additional System Bar blank panel is used.

The right System Bar has a socketed electrical connector inside the tray. The left Extended System Bar uses a flat ribbon cable.

Removing the Kayenne System Bar

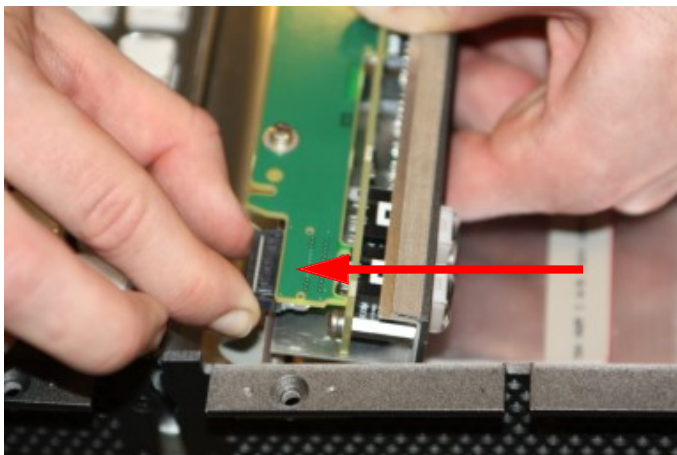
Each active System Bar part is fixed to the tray with one hex screw recessed into the top surface of the part. A 2.5 mm hexagonal driver (Allen wrench) is used for removal. This tool is provided with the Control Panel. The blank panel is held in place with a single crosshead Phillips screw located underneath, but lacking active components it will probably never need to be removed.

- 1 Insert the driver and turn the hex screw counter clockwise. As the screw is turned the System Bar part will lift up because it is spring loaded.



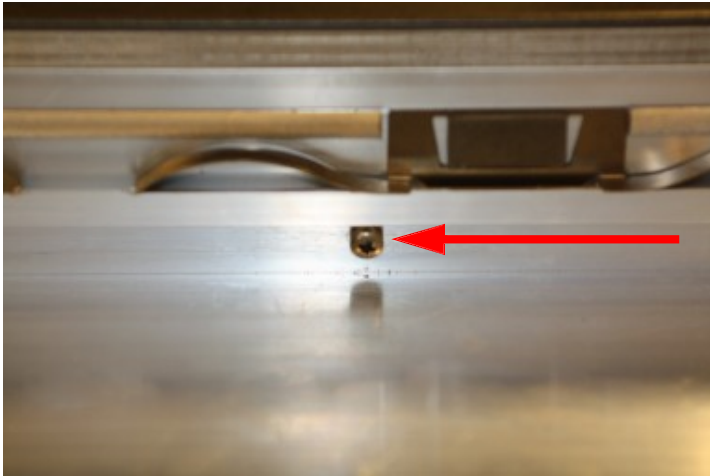
Unscrewing the System Bar

- 2 The right System Bar will disengage from its socket as it is unscrewed. Once it is completely unthreaded it can be lifted out of the tray. You may need to tilt it to a flat, horizontal position to allow clearance for removal.
- 3 After unscrewing the left Extended System Bar and lifting it out of the tray, the flat cable on the left will need to be removed. Press the push clamps on the plug to connect or disconnect the plug.



Extended System Bar Cable Removal

- 4 Should the blank panel need to be removed, you must first take out the module below it in the Pgm Pst tray to access a crosshead Phillips screw.

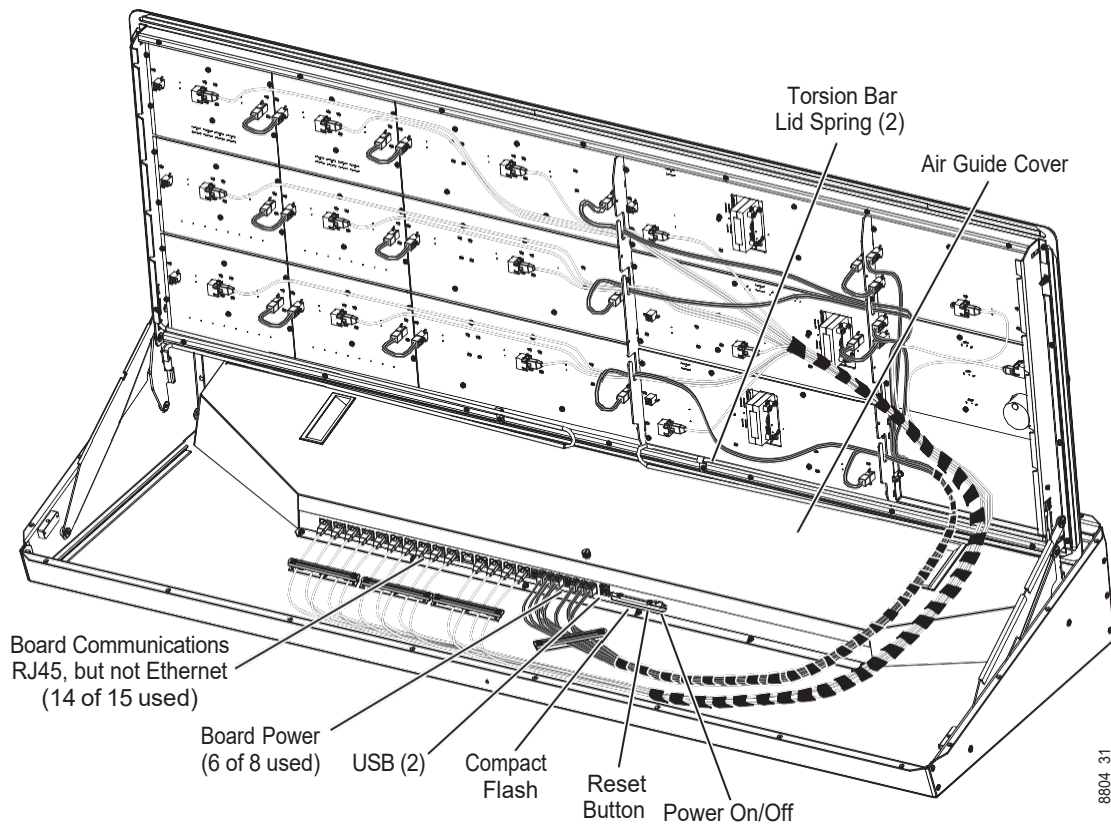
*System Bar Blank Panel Screw***Replacing the Kayenne System Bar**

- 1 Align the System Bar horizontally and screw it into place using the provided hex tool. Do not push down on the screw. The module pulls itself into the plug while the screw is tightened.

*Aligning the System Bar for Replacement*

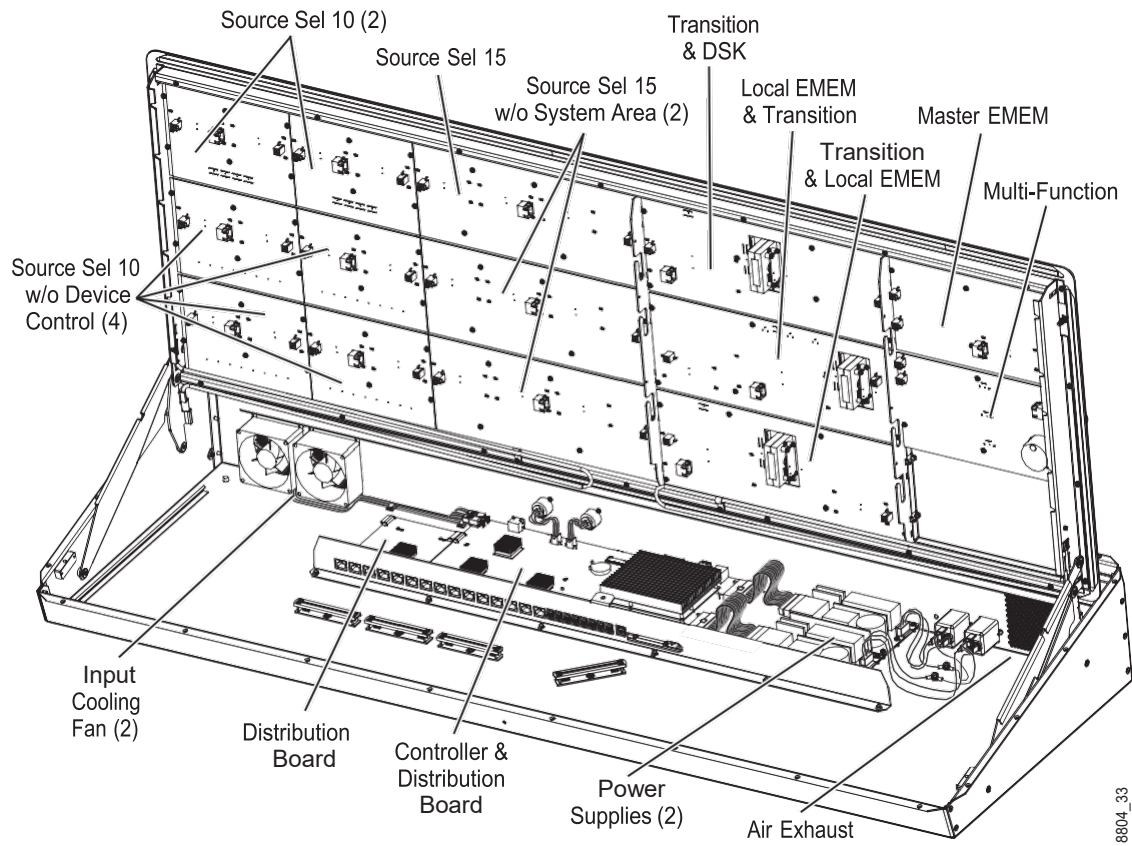
- 2 On larger Control Panels, connect the flat ribbon cable to the Extended System Bar, align it horizontally and screw it into place as above.
- 3 If the blank panel needs to be replaced, you will need to hold the blank panel parts in place so the screw holes are aligned before threading the screw.

3-ME Karrera Control Panel Interior

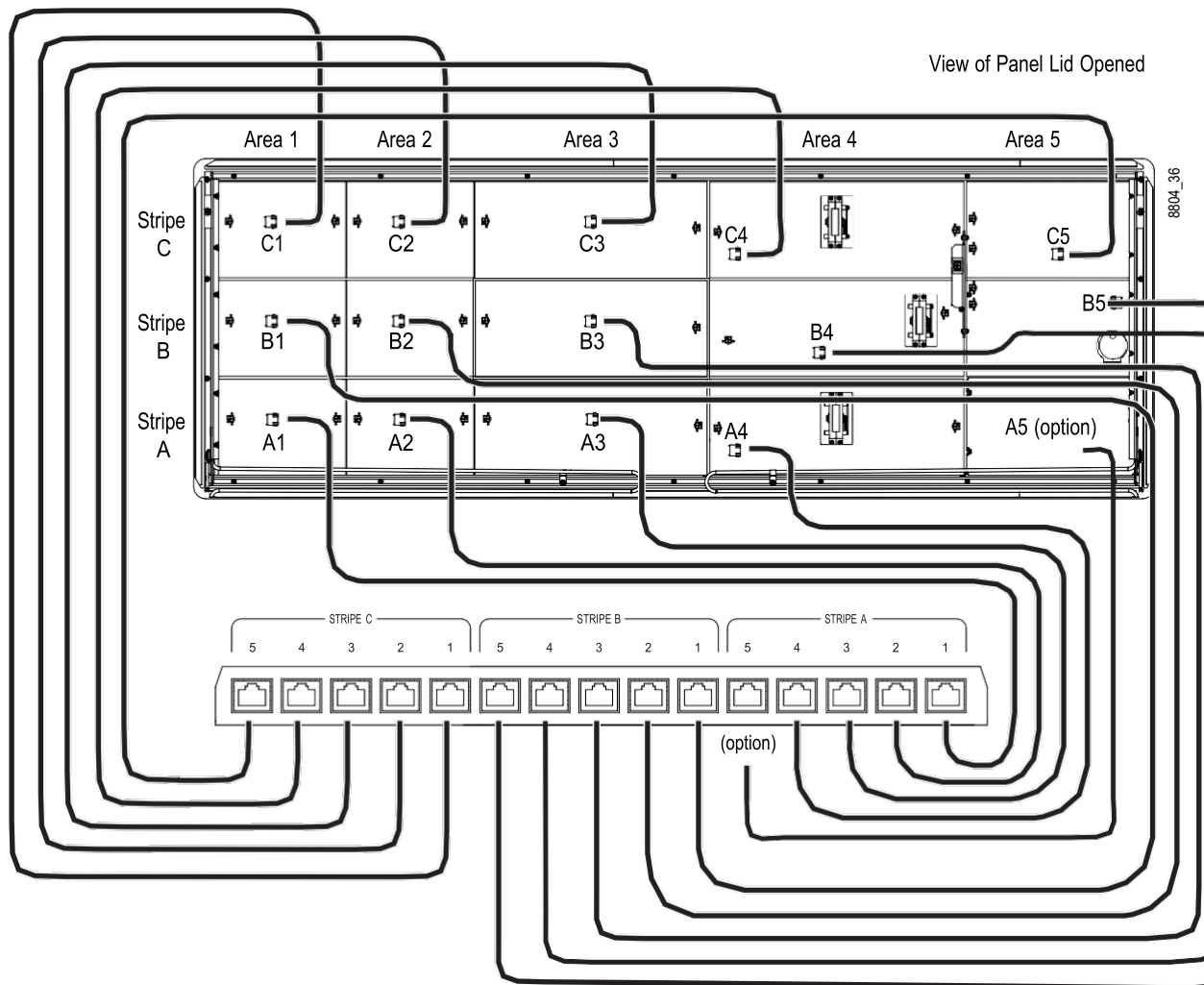


Karrera 3-ME Panel Open, Air Guide In Place

Note: Pressing the Reset button performs a hard reset of the panel processor. The preferred reset method is to use the E-MEM area, which performs a controlled shut-down of the panel software and then reboots the operating system. The Reset button should only be used if the panel is in a state that does not allow an E-MEM area reset.

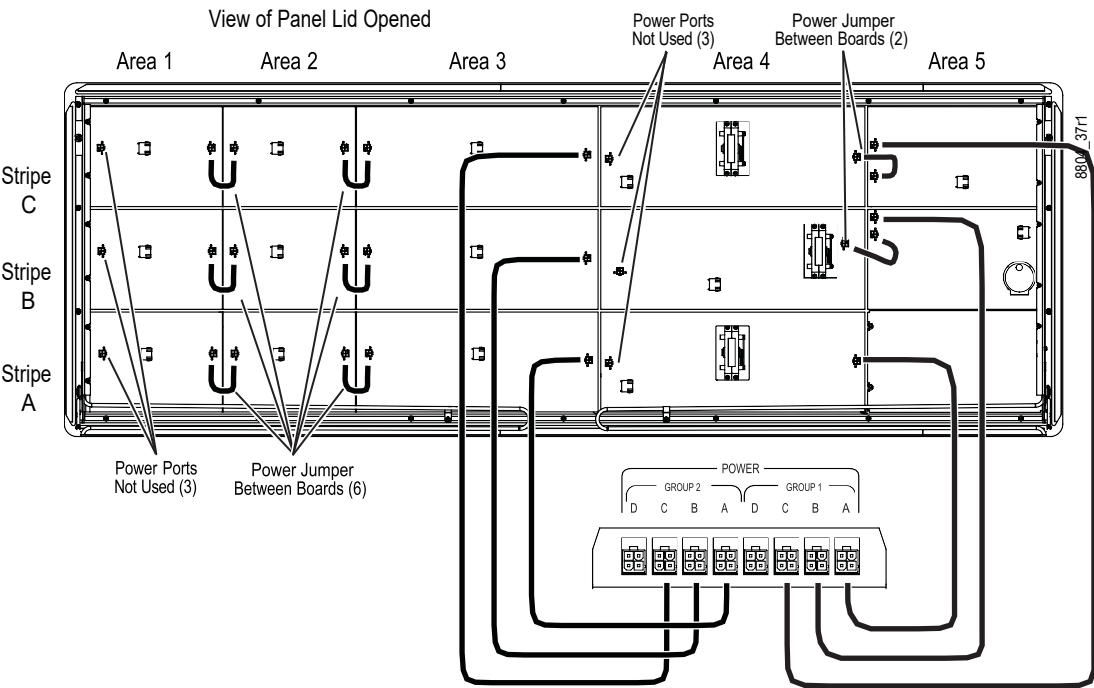


Karrera 3-ME Panel Open, Air Guide Removed



Data Cable Internal Connections, 3-ME Panel

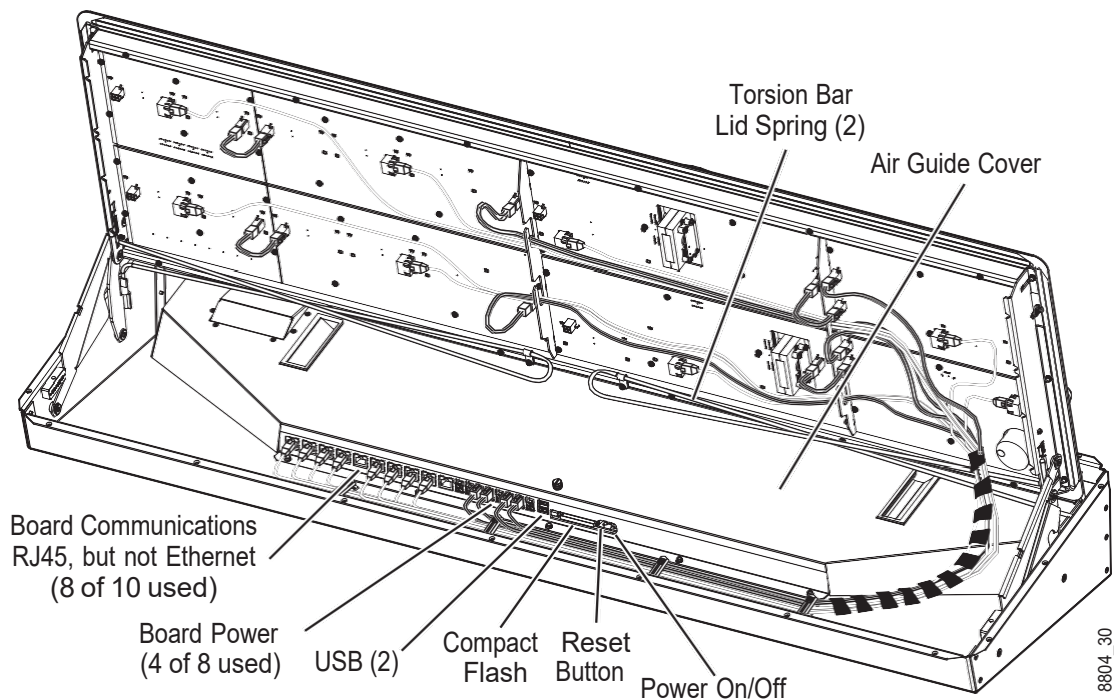
CAUTION: Karrera Control Panel data cables must be connected to the correct boards for proper system operation.



Power Cable Internal Connections, 3-ME Panel

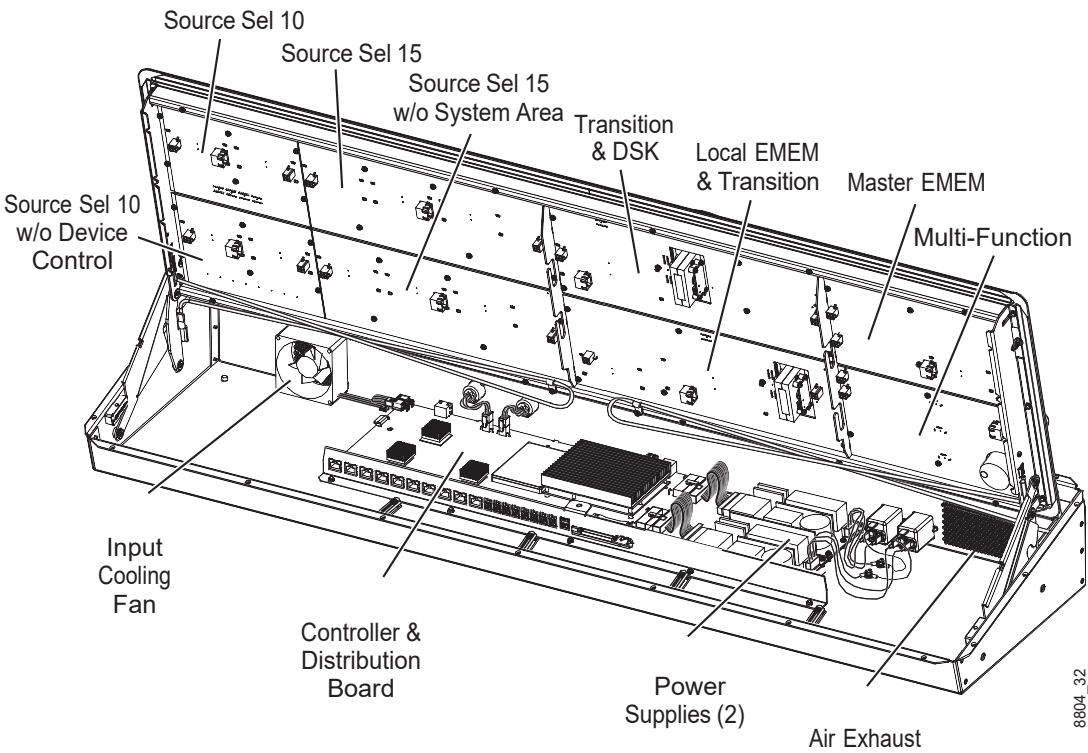
Note: All power ports supply identical power. Power cable routing and jumpers shown are as shipped from the factory.

2-ME Karrera Control Panel Interior

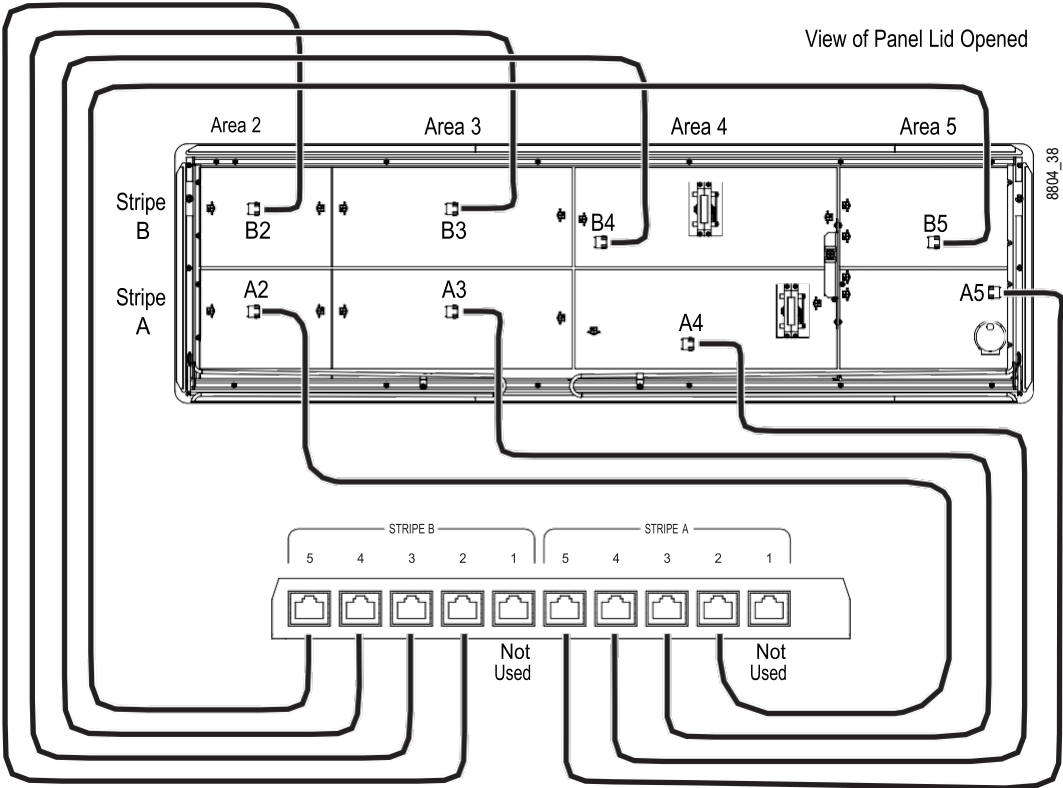


Karrera 2-ME Panel Open, Air Guide In Place

Note: Pressing the Reset button performs a hard reset of the panel processor. The preferred reset method is to use the E-MEM area, which performs a controlled shut-down of the panel software and then reboots the operating system. The Reset button should only be used if the panel is in a state that does not allow an E-MEM area reset.

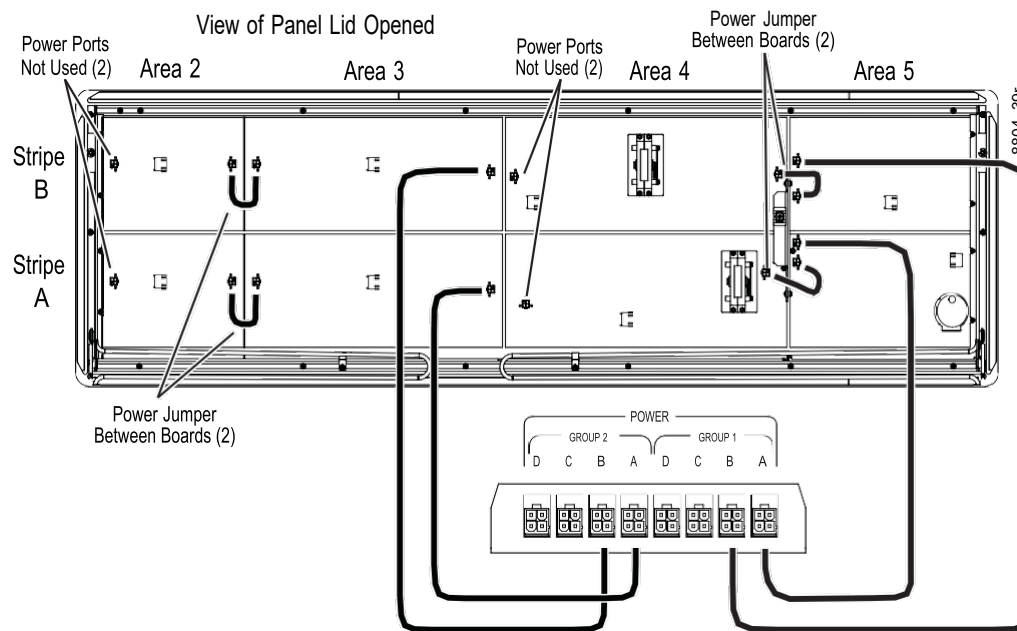


Karrera 2-ME Panel Open, Air Guide Removed



Data Cable Internal Connections, 2-ME Panel

CAUTION: Karrera Control Panel data cables must be connected to the correct boards for proper system operation.



Power Cable Internal Connections, 2-ME Panel

Note: All power ports supply identical power. Power cable routing and jumpers shown are as shipped from the factory.

General Control Panel Lid Switch Board Remove and Replace

In general, switch boards in the panel lid can be replaced as follows:

- 1 Power down and unplug panel from its power source.
- 2 Label any sockets and cables before you unplug them to ensure the cables are replaced in the correct sockets. This is especially important if you will be removing more than one board.
- 3 Disconnect the data and power cables from the board.
- 4 Remove the screws (from four to seven depending on board type).
- 5 Carefully remove the board from the lid.

Source Select Switch Board Remove and Replace

Panel source select boards have overlapping edges that share screws. These boards can be removed in left to right order with the general procedure above.

To remove an interior board, loosen the two left-most screws of the left adjacent board, remove the remaining 4 screws of that left board, then remove the 6 screws of the right adjacent switch board and carefully tilt the board out.

Transition Board Remove and Replace

Follow the general procedure above, except carefully unplug the wires connecting the Lever Arm to the Transition board before you remove the screws holding that board to the lid.

Multi-Function Board Remove and Replace

Follow the general procedure above, except after removing the screws you need tilt the Multi-Function board down and unplug the wires connecting the Joystick to the Multi-Function board.

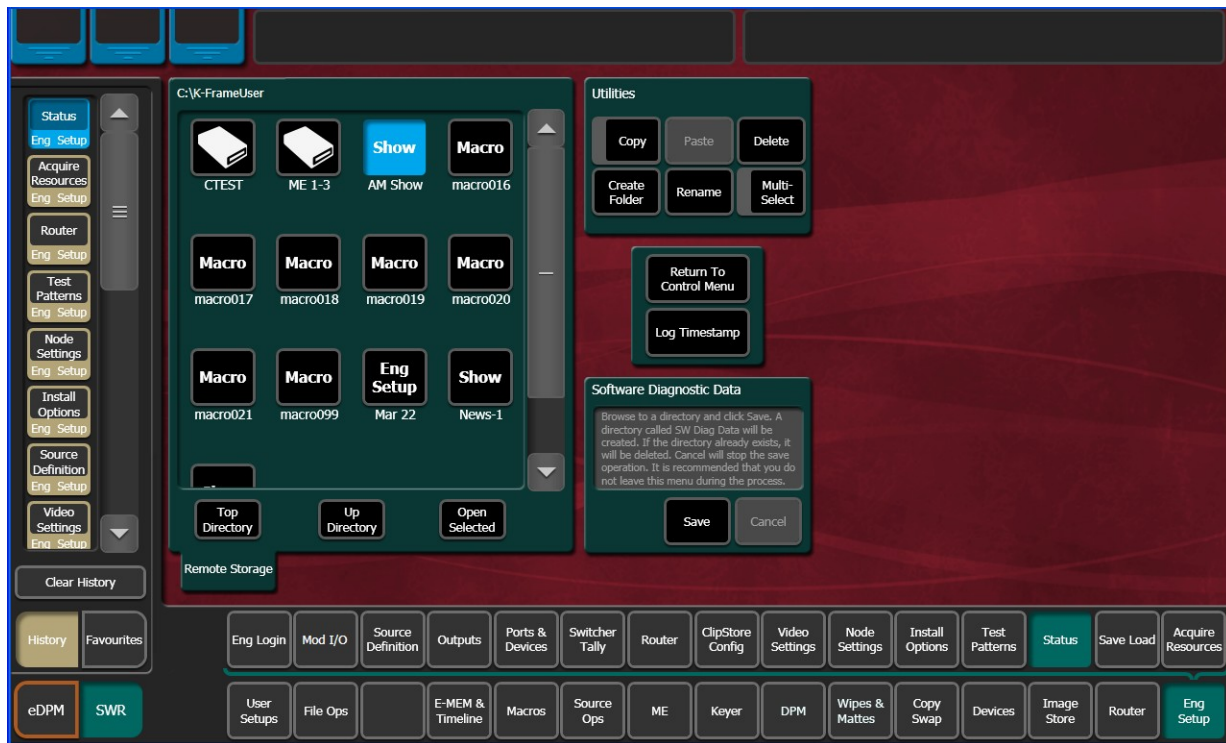
Diagnostics

Capture Software Diagnostic Data

Software diagnostic data can be captured on a GV K-Frame XP Video Processor. This information can be useful to Grass Valley engineers for troubleshooting purposes. Typically this procedure is only used when the system is experiencing problems, and is done after a Video Processor Frame reboot.

Note: During the diagnostic data capture the GV K-Frame XP system may remain functional, but system operation is not recommended at this time. Leave the Software Diagnostic menu displayed and monitor the file save process shown at the top of the menu to allow optimum information collection.

- 1 Select **Status, Capture Software Diagnostic Data** in the menu. A file browser window will open.



- 2 After selecting the destination for the files in the left pane, press the **Save** button to initiates the file copy process. A SW Diag Data directory will be created (or overwritten if on already exists) containing GV Switcher system data. The time required to transfer the files varies depending on the amount of data being saved, and may take several minutes.
- 3 After the files have been copied, the entire contents of the directory should be compressed into a .zip archive. Grass Valley Customer Support can provide instructions on how to send this information to the GV engineering team for analysis.

Kayenne Control Panel Module Diagnostics

On Control Panels, boot information/diagnostic is shown on the left most character display of every panel board. This information is immediately visible after a power cycle and present until the application software writes the first data to the character displays.

Control Panel Board Boot Display Codes

| Digit | | | | |
|--|---|---|---|--|
| 3 | 2 | 1 | 0 | Digit Zero shows the link and FPGA boot status. |
| | | | * | 1. Module interface link is working (normal/default). 2. FPGA was loaded over application area (normal/default). |
| | | | + | 1. Module interface link not working: link should display in 1-3 seconds or there may be a hardware issue. 2. FPGA was loaded over factory area: application area damaged, reprogramming necessary! |
| | | | | 1. Module interface link is working (normal/default). 2. FPGA was loaded over application area (normal/default). |
| | | | ! | 1. Module interface link not working: link should display in 1-3 seconds or there may be a hardware issue. 2. FPGA was loaded over factory area: application area damaged, reprogramming necessary! |
| | | | | |
| | | | Digit 2 shows the middle number of the FPGA firmware version. | |
| Digit 3 shows the upper number of the FPGA firmware version. (X1 always shows "!" to see the difference to the released versions). | | | | |

Example Codes: Control Panel Module Boot Display

| Digit | | | | |
|----------|----------|----------|----------|---|
| 0 | 3 | 7 | * | 1. Module interface link is working (normal/default). 2. FPGA was loaded over application area (normal/default). 3. FPGA firmware version is 037 (DS1281.037). |
| 0 | 3 | 7 | + | 1. Module interface link is working (normal/default). 2. FPGA was loaded over factory area: application area damaged, reprogramming necessary. 3. FPGA firmware version is 037 (DS1281.037). |
| 0 | 3 | 7 | | 1. Module interface link is not working: link should come up after 1-3 seconds, if not there may be a hardware problem. 2. FPGA was loaded over application area (normal/default). 3. FPGA firmware version is 037 (DS1281.037). |
| 0 | 3 | 7 | ! | 1. Module interface link is not working: link should come up after 1-3 seconds, if not there may be a hardware problem. 2. FPGA was loaded over factory area --> application area damaged, reprogramming necessary. 3. FPGA firmware version is 038 (DS1281.038). |
| ! | 3 | 5 | * | 1. Module interface link is working (normal/default). 2. FPGA was loaded over factory area because X1 doesn't have a application area (normal/default). 3. FPGA firmware version is X1 and 35 (DS5831.035). |
| ! | 3 | 5 | 0 | 1. Module interface link is not working: link should come up after 1-3 seconds, if not there may be a hardware problem. 2. FPGA was loaded over factory area because X1 doesn't have a application area (normal/default). 3. FPGA firmware version is X1 and 35 (DS5831.038). |

HAD FPGA Updates

HAD (Host Address Decoder) FPGA (Field Programmable Gate Array) updates for the GV K-Frame XP are to be performed by qualified personnel only, e.g. an EIC (Engineer In Charge).

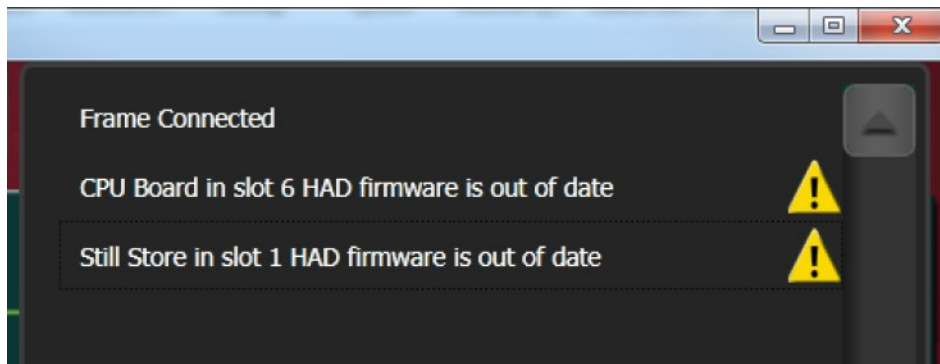
Each CPU, Image Store, Controller, M/E, Video I/O IP, PTP Mezzanine boards, etc. have a PCI Express endpoint for communication with the host processor. These PCI endpoints are governed by the HAD (Host Address Decoder) FPGA (Field Programmable Gate Array). Software updates can include firmware updates for these endpoint HADs.

When to Update the HAD FPGA

A HAD update is required if HAD out-of-date notifications appear in the menu approximately five minutes after the Frame is booted. A software upgrade or board replacement if the board has an older HAD version, can cause the out-of-date firmware notification to be displayed. It is recommended that spare CPU/Image Store boards are upgraded before use. Out-of-date firmware notification can also be seen from a connected serial console or SSH connection.

NOTE: The default username for an SSH connection is "user" and the default password is "gvuser".

Switcher menu notification:



HAD FPGA Menu Notification Message Example

Serial console message example:

```
CPU Board in slot 6 HAD firmware is out of date
HAD revision = 1, latest file revision = 2
HAD E5E00000: CPU Board 6, Num.Ver.Rev 2000.b.1, TimeStamp
05/17/2013 14:01, DMA:Yes
Still Store in slot 1 HAD firmware is out of date
HAD revision = 0, latest file revision = 1
HAD E1800000: Still Store 1, Num.Ver.Rev 5000.b.0, TimeStamp
03/21/2019 16:23, DMA:N/A
```

Upgrade the HAD FPGA

The switcher menu will report out of date HADs. If rebooting or after startup, it will take approximately five minutes for the menu to report the out of date HADs.

The HAD FPGA upgrade can be performed using serial console connection (recommended) or a SSH session.

NOTE: The default username for an SSH connection is "user" and the default password is "gvuser".

CAUTION: It is recommended that HAD (Host Address Decoder) FPGA (Field Programmable Gate Array) updates are performed by qualified personnel only, i.e. an EIC (Engineer In Charge).

Update the HAD FPGA Using a Serial Console

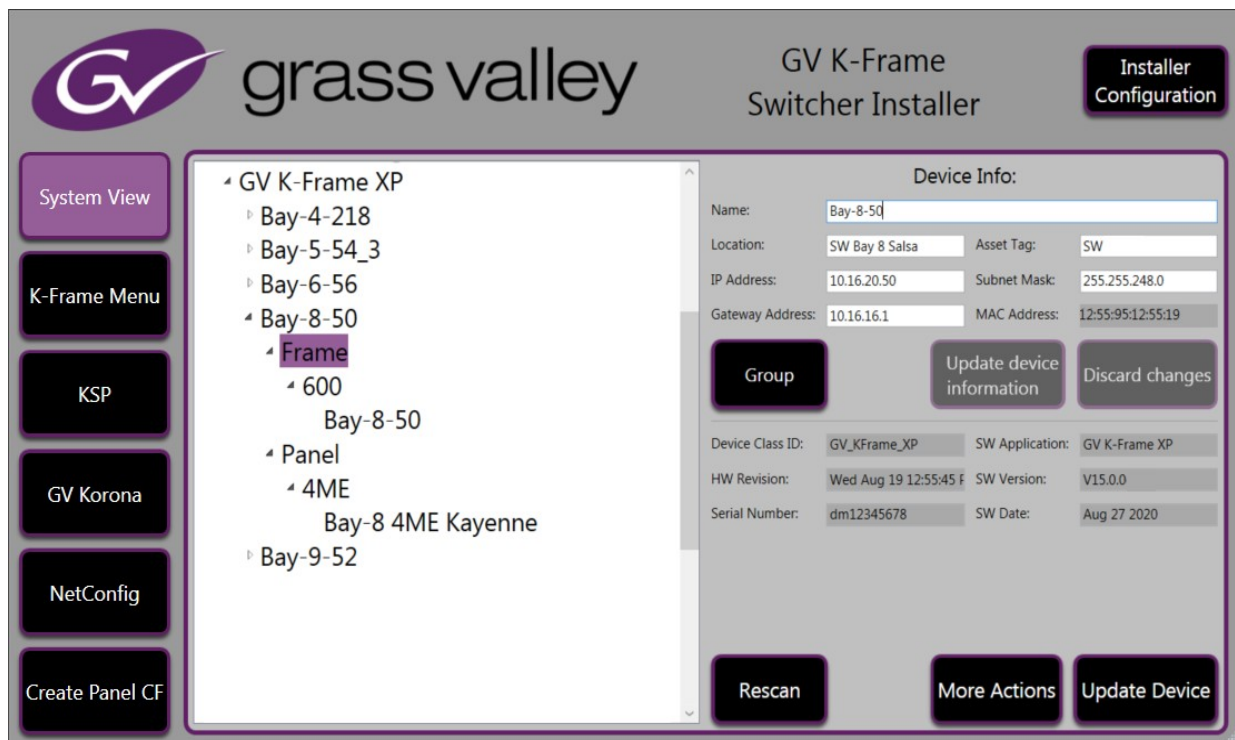
A serial console connection is recommended, although a SSH (Secure Shell) through SSH terminal emulator can be launched from the K-Frame Installer.

NOTE: The default username for an SSH connection is "user" and the default password is "gvuser".

For SSH, skip to [step 3](#).

- 1 Open the Frame door and attach the serial console cable to the front edge of the Controller board.
- 2 Verify and/or set the serial parameters to:

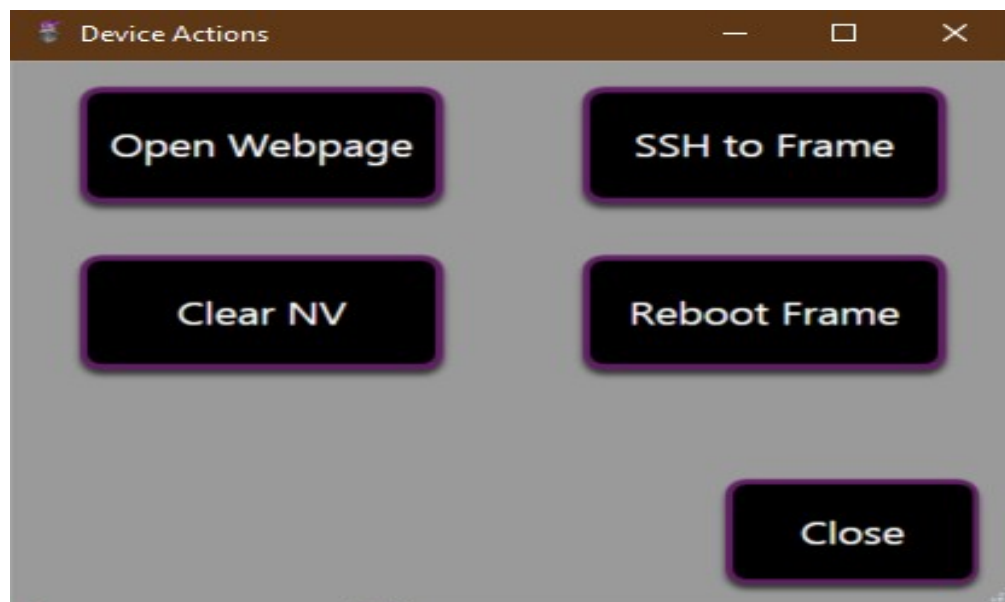
```
115200 baud
8 data
no parity
1stop
```
- 3 Optionally, start a SSH session through PuTTY from the K-Frame Installer (see the *Kayenne/Karrera/GV Korona Release Notes* for launching the K-Frame Installer).
 - a Select **System View** (left) and select a Frame.



b Select the device in the Devices: column, right.

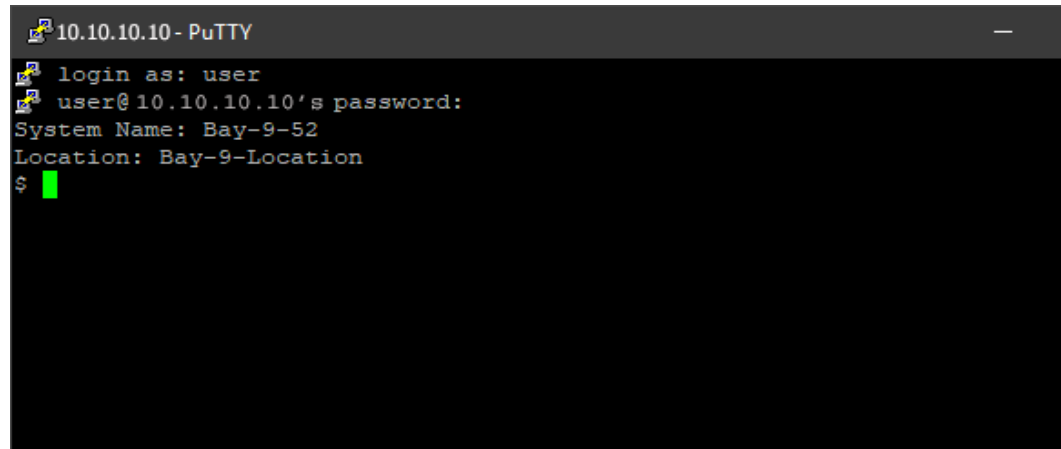
c Select **More Actions, SSH to Frame.**

NOTE: The default username for an SSH connection is "user" and the default password is "gvuser".



- d Enter the network login at the prompt and press **Enter**.
- e Enter the network password and press **Enter**.

Note: The terminal will not show any response when entering the password. This is a normal part of the SSH security.



```
10.10.10.10 - PuTTY
login as: user
user@10.10.10.10's password:
System Name: Bay-9-52
Location: Bay-9-Location
$
```

- f Type **consoleMenu** and press **Enter**.
- g Re-enter the password.

NOTE: The default username for an SSH connection is "user" and the default password is "gvuser".

- 4 Serial Console Only: To check the HAD status, enter checkHADs at the prompt:
->checkHADs

Result:

HADs up-to-date: value = 1 = 0x1

HADs out-of-date: value = 0 = 0x0

Note: The first time the consoleMenu is accessed, you must press Enter a second time to display the menu. Thereafter, it is not necessary unless the session is ended and a new session is started.

If the HADs are out of date, complete the following:

- 1 Enter the console menu by typing consoleMenu at the prompt:

->consoleMenu

Result:

```
[1] Status           [2] Controller       [3] ME
[4] PTP Mezz         [5] Vid 16x8 IO     [6] Mod 8x4 IO
[7] Image Store      [8] Spare           [9] Debug
[10] Software options [11] Fan Controller [P] Power Supply
[H] Boot SW Help     [D] DisableAllUpdates [M] DisableAllMonitoring
[x] Exit to shell
```

- 2 Enter the number nine [9] for the Debug menu, at the prompt: ->9

Result:

```
[1] GPI              [2] Tally            [3] MessageControl
[4] TimeThreads      [5] Router Control  [6] RDP/CPL Tests
[7] Show image info  [8] Show DMA info   [9] Feature Tests
[10] Transition       [11] Switch Image DMA [12] Temp Show All
[13] Temp Adjust Parm [14] Dump HAD Info  [15] Flash All HADs
[16] Flash All SD Cards [17] Flash All HADs/SDs [18] NP Aux Control
[19] Field Timing     [20] CPL Msg Timing [21] Display Re-entries
[22] DebugNetwork     [23] DebugImageStore [24] Debug Event Control
[x] Exit
```

- 3 Enter the number fifteen [15] for the Flash HADs menu, at the prompt:

->15

Result:

```
Debug> 15
Select FLASH Type
[G] Golden Configuration Image
[M] Multi Boot Configuration Image
[x] Exit (At any time, 'x' will exit)
```

- 4 Enter the letter m [M] for the Multi Boot Configuration menu, at the prompt: ->M

Result:

```
Confirm flashing all off HAD's?
Summary:
Flash Type:      MultiBoot
Is this correct? (Y or N)>
```

- 5 Enter the letter Y to begin the reprogramming of the HADs, at the prompt: ->Y

Result: HADs are being erased and programmed which can be seen on the serial console monitor. If successful, a confirmation similar to the following will be displayed on the serial console monitor:

12.X to 14.3 Upgrade: Install IP Board ARM Software

Result:

HAD Flashing Success! 8 Passed, 0 failed

| |
|--|
| CAUTION: Do not power down or reset the Frame during the update process, HAD programming takes several minutes to complete. |
|--|

- 6 Once the programming is completely finished, power cycle the Frame to complete the HAD update process.
- 7 To verify the update, enter checkHADs at the prompt: ->checkHADs

Result:

HADs up-to-date: value = 1 = 0x1

HADs out-of-date: value = 0 = 0x0 (followed by a list of out-of-date HADs)

-> checkHADs

value = 1= 0x1

->

12.X to 14.3 Upgrade: Install IP Board ARM Software

GV K-Frame XP IP systems with switcher software version 12.x.x require an upgrade to the latest IP I/O Board ARM software when installing 14.3.x software. Upgrade the ARM software using either a serial connection or SSH session.

| |
|---|
| NOTE: The default username for an SSH connection is "user" and the default password is "gvuser". |
|---|

| |
|--|
| Note: Starting with switcher software version 14.0.0, Board ARM Software upgrades for IP I/O boards are no longer required; the process has been automated. |
|--|

- 1 Using the GV K-Frame XP Installer, install the 14.3.1 software (see the *Kayenne/Karrera/GV Korona Release Notes* for specific instructions).
- 2 Open the Frame door and attach the serial console cable to the front edge of the Controller board. Upgrade or Verify that the board FPGA HADs are up to date.
- 3 To check the HAD status, enter checkHADs at the prompt:

->checkHADs

Result:

HADs up-to-date: value = 1 = 0x1

HADs out-of-date: value = 0 = 0x0

- 1 If the HADs are out of date, continue to the next steps.
- 2 Enter the console menu by typing consoleMenu at the prompt:

Maintenance

->consoleMenu

Result:

| | | |
|-----------------------|-----------------------|--------------------------|
| [1] Status | [2] Controller | [3] ME |
| [4] PTP Mezz | [5] vid 16x8 IO | [6] Mod 8x4 IO |
| [7] Image Store | [8] spare | [9] Debug |
| [10] Software Options | [11] Fan Controller | [P] Power Supply |
| [H] Boot SW Help | [D] DisableAllUpdates | [M] DisableAllMonitoring |
| [x] Exit to shell | | |

3 Enter the number nine [9] for the Debug menu, at the prompt: ->9Result:

```
> 9
[1] GPI
[4] TimeThreads
[7] Show image info
[10] Transition
[13] Temp Adjust Params
[16] Upgrade All ARM SW
[19] CPL Msg Timing
[22] DebugImageStore
[2] Tally
[5] Router Control
[8] Show DMA info
[11] Switch Image DMA
[14] Dump HAD Info
[17] NP Aux Control
[20] Display Re-entries
[23] Debug Event Control
[3] MessageControl
[6] RDP/CPL Tests
[9] Feature Tests
[12] Temp Show All
[15] Flash All HADs
[18] Field Timing
[21] DebugNetwork
[x] Exit
```

4 Enter the number sixteen [16] for Upgrade All ARM SW, at the prompt:

->16

5 For Serial Console:

Results will be similar to the following example, reporting the new version for *all* boards:

```
set request for configuration data for 16x8 IO IP 4
16x8 IO IP 4: Set to RUN from WAIT_FOR_RUN_AFTER_RESET
16x8 IO IP 4 reports SD Image version: V14.3.0
```

PTP Mezzanine Board ARM Software Upgrade

To enable the PTP feature, the following Board ARM Software upgrade procedure must be completed for the PTP Mezzanine board.

Note: Once software version 14.3 is installed, newer updates will no longer require the Board ARM Software upgrade procedure; it will be automatic.

- 1 Install the software (see the *Kayenne/Karrera/GV Korona Release Notes* for specific instructions).
- 2 Open the Frame door and attach the serial console cable to the front edge of the Controller board. Upgrade or verify that the board FPGA HADs are up to date.
- 3 To check the HAD status, enter checkHADs at the prompt:
->checkHADs

Result:

HADs up-to-date: value = 1 = 0x1

HADs out-of-date: value = 0 = 0x0

- 4 If the HADs are out of date, continue to the next steps.
- 5 Enter the console menu by typing consoleMenu at the prompt:
->consoleMenu

Result:

| | | |
|-----------------------|-----------------------|--------------------------|
| [1] Status | [2] Controller | [3] ME |
| [4] PTP Mezz | [5] Vid 16x8 IO | [6] Mod 8x4 IO |
| [7] Image Store | [8] Spare | [9] Debug |
| [10] Software Options | [11] Fan Controller | [P] Power Supply |
| [H] Boot Sw Help | [D] DisableAllUpdates | [M] DisableAllMonitoring |
| [x] Exit to shell | | |

- 6 Enter the number four [4] for PTP Mezz, at the prompt: ->4

Result:

```
-> consoleMenu
[1] Status           [2] Controller       [3] ME
[4] PTP Mezz         [5] Vid 16x8 IO      [6] Mod 8x4 IO
[7] Image Store      [8] Spare            [9] Debug
[10] Software Options [11] Fan Controller  [P] Power Supply
[H] Boot Sw Help     [D] DisableAllUpdates [M] DisableAllMonitoring
[x] Exit to shell
```

7 Enter the letter [a] for ARM at the prompt: ->A

Result:

```
[1] Peek             [2] Poke             [3] BlockPeek
[4] LongPeek         [5] LongPoke         [6] LongBlockPeek
[7] LoadFPGAs       [8] HAD              [9] PtpMezz
[A] ARM              [11] MAC Addresses   [B] Board ID
[T] Temp Monitor     [D] DisableBoardUpdates [x] Exit
```

8 Enter [u] for Upgrade ARM Image at the prompt ->U

Result:

```
[D] Debug           [V] Get ARM SW Img Versio [U] Upgrade ARM Image
[S] Get PTP Stats   [I] Set up IP             [x] Exit
```

CAUTION: Do not power cycle or reset the Frame until the following result is displayed, showing that upgrade is complete. Doing so can corrupt the SD card.

For Serial Console, the console will report data similar to the following example:

PTP: Set to RUN from WAIT_FOR_RUN_AFTER_RESET

PTP reports SD Image version: V14.3.1

Result:

```
[D] Debug           [V] Get ARM SW Img Versio [U] Upgrade ARM Image
[S] Get PTP Stats   [I] Set up IP             [x] Exit
```

a Enter the letter [d] for the Debug menu, at the prompt: ->D

b Enter [r] for reset at the prompt ->R

Result:

```
[C] Command         [S] SetCommType        [G] GetCommType
[R] ResetBoard      [E] Enable PTPController [D] Disable PTPController
[x] Exit
```

c Open an Internet Explorer window and enter the IP Address of the Frame to display the K-Frame Web pages.

- d Select **Frame Message Log** (left), then **Current** (it can take several minutes for data to transfer to the Frame Message Log, continue to select the **Frame Message Log** button until all boards report the new version).

CAUTION: Do not power cycle or reset the Frame until the following result is displayed, showing that all boards are updated. Doing so can corrupt the SD card.

Results will be similar to the following example in the Message Log, reporting the new version for *all* boards:

```
* 28 Nov 2018 14:55:09 (72378) PTP: Set to RUN from
WAIT_FOR_RUN_AFTER_RESET
* 28 Nov 2018 14:55:06 (72378) PTP reports SD Image version: V14.3.1
```

Downgrade the IP Board ARM Software

When downgrading the switcher software, the GV K-Frame X and V-series systems with IP boards installed require the Board ARM software version to be downgraded to match using the 'Flash All SD Cards' console command.

CAUTION: Do not downgrade to switcher software versions earlier than 14.1.0 from 14.3.x with IP I/O boards installed.

- 1 Install the *earlier* version of the software (see the *Kayenne/Karrera/GV Korona Release Notes* for specific instructions).
- 2 Open the Frame door and attach the serial console cable to the front edge of the Controller board.
- 3 Upgrade or verify that the board FPGA HADs are up to date.
- 4 To check the HAD status, enter checkHADs at the prompt:

->checkHADs

Result:

HADs up-to-date: value = 1 = 0x1

HADs out-of-date: value = 0 = 0x0

- 5 If the HADs are out of date, continue to the next steps.
- 6 Enter the console menu by typing consoleMenu at the prompt:

->consoleMenu

Result:

| | | |
|-----------------------|-----------------------|--------------------------|
| [1] Status | [2] Controller | [3] ME |
| [4] PTP Mezz | [5] vid 16x8 IO | [6] Mod 8x4 IO |
| [7] Image Store | [8] spare | [9] Debug |
| [10] Software Options | [11] Fan Controller | [P] Power Supply |
| [H] Boot SW Help | [D] DisableAllUpdates | [M] DisableAllMonitoring |
| [x] Exit to shell | | |

- 7 Enter the number nine [9] for the Debug menu, at the prompt: ->9

Result:

```
[1] GPI
[4] TimeThreads
[7] Show image info
[10] Transition
[13] Temp Adjust Parm
[16] Flash All SD Cards
[19] Field Timing
[22] DebugNetwork
[x] Exit

[2] Tally
[5] Router Control
[8] Show DMA info
[11] Switch Image DMA
[14] Dump HAD Info
[17] Flash All HADs/SDs
[20] CPL Msg Timing
[23] DebugImageStore

[3] MessageControl
[6] RDP/CPL Tests
[9] Feature Tests
[12] Temp Show All
[15] Flash All HADs
[18] NP Aux Control
[21] Display Re-entries
[24] Debug Event Control
```

8 Enter the number sixteen [16] for 'Flash All SD Cards', at the prompt:

->16

CAUTION: Do not power cycle or reset the Frame until the following result is displayed, showing that all boards are upgraded. Doing so can corrupt the SD cards.

Results will be similar to the following example, reporting the new version for *all* boards:

```
set request for configuration data for 16x8 IO IP 4
16x8 IO IP 4: Set to RUN from WAIT_FOR_RUN_AFTER_RESET
16x8 IO IP 4 reports SD Image version: V14.2.0
```

V14.6 Upgrade/Downgrade Path (V14.5.3)

See the *Kayenne/Karrera/GV Korona Release Notes* for software installation instructions.

The v14.6 upgrade/downgrade process includes v14.5.3 that has mechanisms to manage system level configurations required for v14.6 features. The following are required for upgrading or downgrading with v14.6:

- Switcher software versions earlier than v14.5.3 must upgrade to v14.5.3 before upgrading to v14.6 and
- Switcher software versions newer than v14.5.3 must be downgraded to v14.5.3 before they can be downgraded to earlier v14.x versions.

The v14.5.3 is packaged with the v14.6 software image available at www.grassvalley.com. Updates to SD cards (including ARM software) on installed boards (IP I/O, PTP, etc.) are automated.

CAUTION: Do not power down or reset the Frame during the update process, the software installation can take several minutes to complete.

Upgrading to or downgrading from v14.5.3 can take up to six minutes. Upgrading to v14.6 from v14.5.3 (or downgrading from v14.6 to v14.5.3) can take up to 25 minutes depending on board configuration.

Troubleshooting

On rare occasions, when updating software, resetting the Frame, clearing NV, or performing a Frame reboot, the IP I/O boards may not come up properly. Boards can be reset by selecting the **Port Config SFPs** button in the Video I/O, IP I/O Config menu, and selecting the **Reset Board** button.

CAUTION: Selecting the Reset Board button interrupts all inputs and outputs.

Creating Compact Flash Cards

The GV K-Frame XPControl Panels each use their own specially formatted and partitioned Compact Flash (CF) card. The system cannot use blank CF cards directly formatted by a PC or other device.

The GV K-Frame XP Switcher Installer program is used to format, partition, and load boot files onto system CF cards. Once prepared in this manner, the appropriate GV Switcher software (Control Panel) will need to be installed onto each card. System configuration information will also need to be reloaded and/or re-entered after CF card replacement to restore normal system operation.

Materials Required

To format a K-Frame Control Panel CF card you will need:

- A CF card reader/writer (USB 2.0 recommended),

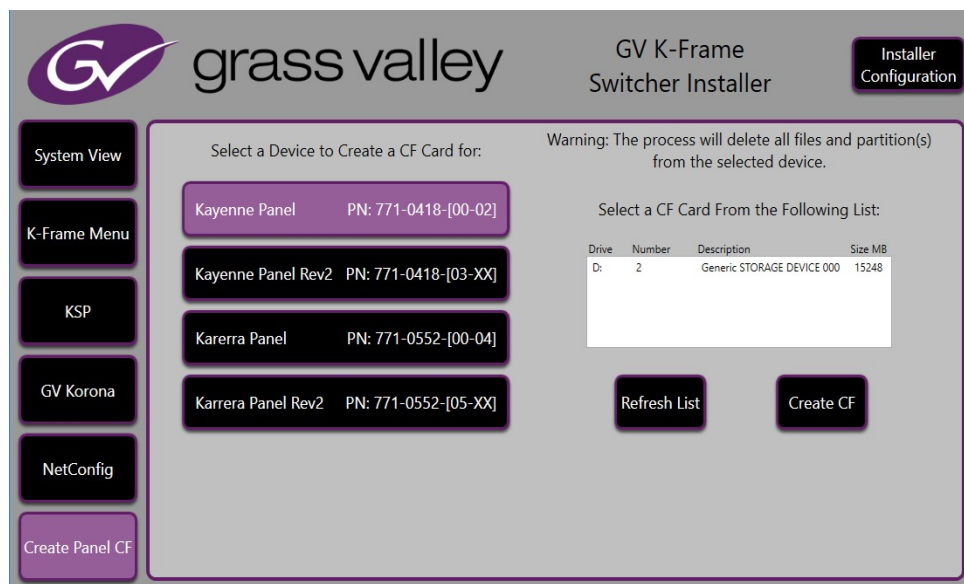
- PC, or Menu Panel equipped with a mouse and keyboard,
- K-Frame Switcher Installer application program deployed onto the PC or Menu Panel, and
- GV Switcher release software.

After creating new CF cards, you will need the following to restore your system to full operation:

- Backup system configuration files (a Show file, or a set of Eng Setups and User Setups files), and
- Node Settings information (IP addresses and names of all system components). This may be written notes, screen shots, or a spread sheet. This information is not saved to configuration files.

CF Card Formatting Procedure

- 1 Connect the CF card reader/writer to the USB port of the PC or Menu Panel and insert the CF card into the reader/writer.
- 2 Launch the K-Frame Switcher Installer program.
- 3 Select **Create CF** and select a device (left).

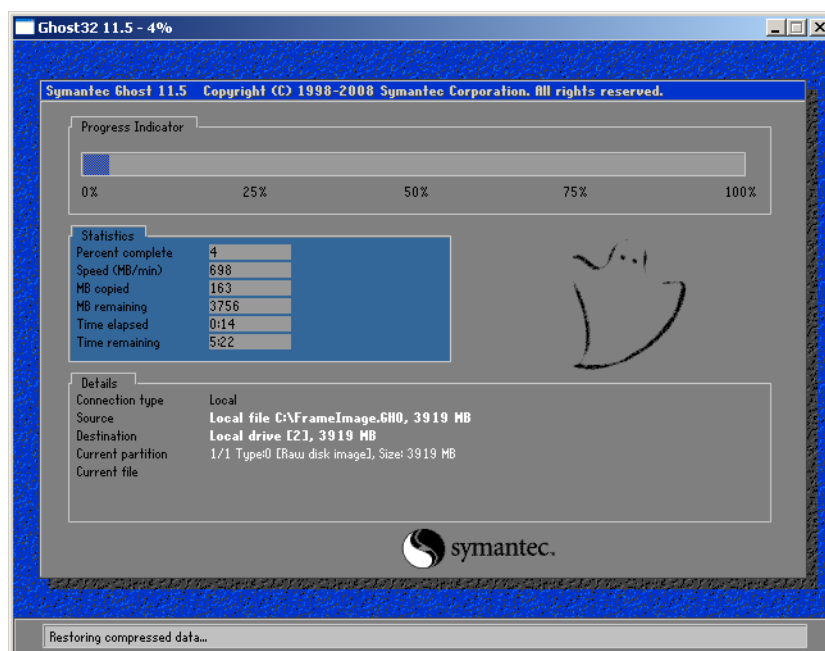


- 4 Select the CF Card from the list (right).
- 5 Select Create CF.

CAUTION: Any existing files or partitions on the CF card will be deleted.

- 6 Click **Yes**. A new Ghost application screen appears that reports the progress of the formatting. The process can take 8 to 20 minutes to fully erase, format, test and partition the CF card.

Note: For Control Panel CF cards, though the progress bar reaches 100% a couple more minutes are still required to complete the process. During this time **Configuring operating system disk layout...** is reported at the bottom of the screen.



Note: Additional formatting time may be required (perhaps more than an hour) if an older USB 1.1 port or slow reader/writer device is used.

- 7 When finished, the Ghost window will close by itself.
 - The VP Frame Solid State Drive contains a set of files making a SWUP bootable image. These files can be seen by the Windows OS.
 - The Control Panel CF card now has a Linux O/S that can boot the Control Panel. These files are not visible to the Windows OS.

CAUTION: Do Not format CF cards using Windows.

- 8 Proceed with the appropriate update process.

Updating System Software on a New Control Panel CF Card

- 1 Remove the CF card from the reader, power down the Control Panel, install the CF card in the Control Panel's processor, and power up the panel.
- 2 Follow the normal software update process, except the Control Panel will be identified as **Unknown/Panel** in the K-Frame Switcher Installer application program hierarchy.

Restore Control Panel Configuration Files

After installing the K-Frame release software, you can now reload a Show file containing the Eng Setups and User Setups for your system, or reload these configuration files individually.

You will also need to enter the Node Settings information. Go to **Eng Setup, Nodes Settings**, and enter the IP address and device name information in the **Control Surfaces** and **Frame Suite Nodes & ID** tabs.

Simple Network Management Protocol (SNMP) is an industry standard mechanism for monitoring devices over a network, primarily intended to support service and maintenance activity. With SNMP, devices can be interrogated about the current status of specific device components (reported as values), and devices can report without prompting (traps) certain conditions that may require immediate attention.

An SNMP system consists of one or more Managed Devices, each of which has an Agent (software running as a daemon on that device), and a Network Management System (NMS). The NMS is a software application running on a computer that communicates with the Agents over the network. The information exchanged is determined by a Management Information Base (MIB) database file. The MIB defines the structure and content of the variables that are available as data for monitoring and reporting. A Community Name is also used as a rudimentary security measure, acting as a password to enable communications with the Agent.

For example, a Managed Device may have a cooling fan and thermocouple. The MIB may define a variable for the thermocouple readout, and a request for this data can be sent from the NMS to the Agent, which will reply (if the community name matches) with the current temperature value. The MIB may also define a Trap that reports a fan failure. Should the device's fan stop working, the Agent sends an unprompted message to the NMS. The NMS can be configured to respond to that Trap message, and may have the capability to alert maintenance staff of the problem, via an automatic email message or by triggering a warning alarm.

SNMP is an optional feature for Grass Valley switchers, and requires the purchase and entry of a license key.

SNMP is an industry standard, however, any third party NMS can be used. For third party NMS installation & configuration, please contact your SNMP NMS software vendor.

SNMP Standards supported by Grass Valley K-Frame Family of Video Switchers:

| | |
|---------------|---|
| RFC 1155 | Structure and Identification Management for TCP/IP-based Internet |
| RFC 1157 | SNMP v1 |
| RFC 1901-1907 | SNMP v2c |
| RFC 1213 | MIBII |
| RFC 1215 | Convention for defining traps for use with the SNMP |

The Grass Valley switcher MIBs are available from Grass Valley Customer Support. Load the MIBs for the Video Processor Frame and Control Panel.

Grass Valley Proprietary MIBs

| MIB | Description | Video Processor Frame | Control Panel |
|-------------|------------------------------|-----------------------|---------------|
| gvg-reg | last updated "200402190000Z" | X | X |
| gvg-element | last updated "200503230000Z" | X | X |
| gvg-gcp | last updated "200503240000Z" | X | X |
| gvg-vsm | last updated "201304260000Z" | X | |

Grass Valley Switcher Device Monitoring by SNMP

Grass Valley K-Frame Family of switchers support monitoring of the devices and device components shown in the following tables. SNMP provides reporting for each board of the same type, for example M/E, Modular I/O input, Modular I/O output, etc.

Note: Only the capabilities described in this document are supported. For detailed information about each supported item, please refer to the MIBs

Supported K-Frame Video Processor SNMP Monitoring

| | |
|----------------------------|--|
| System Information | High level information regarding the Video Processor Frame including operating system, name, location, serial number, software revision and high level frame state. |
| Module | Each plug in board slot in the Frame is a module (Controller, M/E or eDPM). Information is provided regarding the board plugged into the slot and the current state of the slot. |
| Power Supply (Up to 3) | Reports power failure if a power supply fails or is not present. |
| Thermal | High level temperature and fan status for the entire system. If a failure is reported here then look at Fans or Temperature Sensor categories for details |
| Fans | Detailed speed and status for each fan in the frame. Five fans are on the compact frame and one fan in the standard frame. Typically inspected if Thermal category is reporting a cooling problem. |
| Temperature Sensors | Detailed information from each monitored temperature sensor on the Frame. Typically inspected if Thermal category is reporting a cooling problem. |
| Video Sync | Status of external video reference signal and what type of signal is present. |
| Network Configuration Data | IP address, Gateway and Netmask settings for external facing network interfaces. |

Supported K-Frame Control Panel SNMP Monitoring

| | |
|--------------|---|
| Fan | Kayenne: PCU has three fans Karrera: 2-M/E Control Panel has one fan, 3-M/E has two fans. Korona: One Fan |
| Power Supply | Will report power failure if a power supply is not present or not plugged in. |
| Temperature | Kayenne: One ambient temperature, one on CPU. Karrera: One ambient temperature, one on the Panel Processor FPGA, one on CPU. Korona: One ambient temperature, one on the Panel. |
| Modules | Status change traps are sent when a module is connected or disconnected. |

GV Korona Control Panel

GV Korona can be monitored separately, using the standard built-in Windows SNMP capabilities and a third-party NMS. No unique Grass Valley MIB entries or traps are available.

Menu Panel Processor

The Menu Panel Processor (the PC running the Menu application) can be monitored separately, using the standard built-in Windows SNMP capabilities and a third-party NMS. No unique Grass Valley MIB entries or traps are available.

Grass Valley K-Frame switchers system devices have SNMP Agent software already installed. No user installation is required.

Separate NMS software (third party package) will need to be installed onto a PC that resides on the switcher network. Refer to the documentation provided with the NMS for installation instructions.

SNMP Licensing

Grass Valley switcher system SNMP licensing is based on the Video Processor Frame, and is tied to that Frame's unique System ID number. All Control Panels associated with a Frame will use that same SNMP license.

The Frame's System ID is shown on the Menu Eng Setup > Install Options. This menu reports the current licensing status of that Frame for all of the software options. The SNMP is Licensed when the Enabled and Total Licensed row says "Yes".

Frame Connection Lost. Operation Cancelled.

Current Auth Code for Perm: [Clear]

New Auth Code for Perm: [Install]

System ID: GV K-Frame XP, 00000000

Option Group: Perm, Temp 1, Temp 2, Temp 3, Temp 4

| Option | Enabled | Total Licensed | Perm | Temp 1 | Temp 2 | Temp 3 | Temp 4 | New |
|-----------------------------|---------|----------------|------------|--------|--------|--------|--------|-----|
| Full MIs | 9 | 9 | | | | | | 0 |
| ClipStore Channels | 4 | 4 | | | | | | 0 |
| Image Store Cache Size (GB) | 128 | 128 | | | | | | 0 |
| Chroma Keys | 54 | 54 | | | | | | 0 |
| DPM Channels | 16 | 16 | | | | | | 0 |
| RGB Color Correction | Yes | Yes | | | | | | --- |
| eDPM | 4 | 4 | | | | | | 0 |
| FlexiKey™ | Yes | Yes | | | | | | --- |
| DoubleTake™ | Yes | Yes | | | | | | --- |
| Ethernet Tally | Yes | Yes | | | | | | --- |
| Soft Panel | Yes | Yes | | | | | | --- |
| SNMP | Yes | Yes | | | | | | --- |
| SetDef MatchDef Scalers | 12 | ALL | | | | | | 0 |
| HD 1080p & UHD-1 2160p | Yes | Yes | | | | | | --- |
| 2D DPMs | Yes | Yes | | | | | | --- |
| Image Store Movies | Yes | Yes | | | | | | --- |
| ME View | Yes | Yes | | | | | | 0 |
| Multiviewer | 4 | 4 | | | | | | --- |
| | | | Start Date | | | | | |
| | | | End Date | | | | | |

Clear History

History Favorites

Eng Login Video I/O Source Definition Outputs Ports & Devices Switcher Tally Router ClipStore Config Video Settings Node Settings **Install Options** Test Patterns Status Save Load Acquire Resources

eDPM SWR User Setups File Ops E-MEM & Timeline Macros Source Ops ME Keyer DPMs Wipes & Mattes Copy Swap Devices Image Store Router Eng Setup

An SNMP license is purchased from Grass Valley Customer Support. You need to provide the Frame's System ID with your payment, and you will then be given a license key. Enter that license key in the Install Options screen to license the SNMP feature for that entire K-Frame system.

Licensing Definitions

SNMP Licensed - SNMP is capable of running with all documented features available. See SNMP enable/disable for additional operational implications.

SNMP Unlicensed - SNMP runs minimal functionality provided by the operating system vendor (VxWorks on K-Frames, Linux on K-Frame Control Panels) and is always enabled.

SNMP Enabled - (licensed only) all SNMP variable requests are processed and SNMP traps are sent.

SNMP Disabled - (licensed only) all SNMP variable requests are ignored and SNMP traps are not sent.

SNMP Power Up License Processing

Frames and Control Panels power up with SNMP Unlicensed capabilities. If a SNMP license is detected on the Frame then the Frame and Control Panel initialize SNMP licensed capabilities. SNMP Licensed Configuration must be done to properly configure some of the licensed capabilities.

SNMP Licensed Configuration

SNMP Licensed capabilities require additional configuration through the web interface as noted in this document. The Video Processor Frame and Control Panel have separate web interfaces that are accessed by specifying the correct IP address in the URL (example: **http://192.168.1.170**). An example of the K-Frame Web page.

Configuration steps consist of:

- Enable/Disable SNMP
- Configure Trap Destination IP addresses
- Configure Community Name

Configuration of the NMS software itself will also be required to make full use of the SNMP feature.

The screenshot displays the 'K-FRAME Web Access' interface for 'grass valley A BELDEN BRAND'. The main heading is 'SNMP Configuration'. On the left, a sidebar contains links: 'Versions', 'Status', 'Message Log', 'Work', 'Time', 'Description', 'Configuration', 'Status', and 'Statistics'. The 'Configuration' section is active, showing 'SNMP' settings. The 'SNMP Status' is 'Enabled', and the 'Enable/Disable' checkbox is checked. Three 'Trap IP Address' fields are populated with '10.16.23.17', '10.16.15.1', and '10.16.47.20'. The 'Community Name' field is 'public'. A 'Save New Settings' button is at the bottom. A note states: 'Note: The Community Name will default to 'public' if none is entered'.

| | |
|-------------------|---------------------------------------|
| SNMP Status | : Enabled |
| Enable/Disable | : <input checked="" type="checkbox"/> |
| Trap IP Address 1 | : 10.16.23.17 |
| Trap IP Address 2 | : 10.16.15.1 |
| Trap IP Address 3 | : 10.16.47.20 |
| Community Name | : public |

Note: The Community Name will default to 'public' if none is entered

Switcher Device SNMP Configuration Procedure

1. Check the Enable/Disable box to activate SNMP for that device.
2. SNMP configuration fields are inoperable (grayed out) if a valid license is not accessible.
3. Enter the IP address of the PC running a NMS where you want trap messages to be sent. Up to three IPs can be entered.
4. If you are not using the public community, enter the name of the community to be used.
5. Select Save New Settings.

SNMP Trap Messages

The SNMP trap messages listed below are available for various switcher system components.

Note: Only the capabilities described in this document are supported. For detailed information about each supported item, please refer to the MIBs.

Supported SNMP Frame Traps

| Name | Type | Description | Severity ^a |
|----------------------------|---------|---|--|
| vsmPowerSupplyStatusChange | status | If the current status is different than the last, a trap is sent. A power supply OK message is only sent if all power supplies are OK after one or more power supplies have failed or were removed. At boot time, the first running status generates an informational message. After that, a transition to the running status generates a normal message. | comm error = alarm fault = alarm power supply removed = warning power supply OK = normal |
| vsmFanStatusChange | status | If the fan board is not present or if all fans have stopped working, a trap is sent. This trap is sent every 12 seconds until the condition is corrected. If any of the fans are not working properly, a trap is sent. The trap is sent every 20 seconds until the condition is corrected. When the system runs normally or returns from an abnormal condition to normal operation, a trap is sent. | fan board not present = alarm all fans not working = alarm fan not working = warning normal operation = informational (start up), normal (returning from a warning or alarm condition) |
| vsmTempStatusChange | status | If temperature crosses the warm threshold in any direction a trap is sent. | hot = alarm normal = normal |
| vsmModuleStatusChange | powerOK | If the current power status is different than the last power status, a trap is sent. | power OK = normal power Fault = alarm |
| vsmModuleStatusChange | status | If the current status is different than the last status, a trap is sent. | operational = normal failed = alarm not inserted = warning |

Supported SNMP Frame Traps

| Name | Type | Description | Severity ^a |
|--------------------------|--------|--|--|
| vsmReferenceStatusChange | status | When the video reference transitions between locked and not locked, in either direction, a trap is sent. | not locked = warning locked = normal |
| gvgElStateChange | status | When the switcher starts the boot process and the trap status is "initializing", a trap is sent. Another trap is sent when the switcher becomes fully operational and the trap status is "running". | initializing = warning running = normal |

a. Severity Levels: EGvgAlarm = 6, EGvgWarning = 5, EGvgNormal = 4

Supported SNMP Frame Traps

| Name | Type | Description | Severity ^a |
|----------------------------|---------|---|--|
| vsmPowerSupplyStatusChange | status | If the current status is different than the last, a trap is sent. A power supply OK message is only sent if all power supplies are OK after one or more power supplies have failed or were removed. At boot time, the first running status generates an informational message. After that, a transition to the running status generates a normal message. | comm error = alarm fault = alarm power supply removed = warning power supply OK = normal |
| vsmFanStatusChange | status | If the fan board is not present or if all fans have stopped working, a trap is sent. This trap is sent every 12 seconds until the condition is corrected. If any of the fans are not working properly, a trap is sent. The trap is sent every 20 seconds until the condition is corrected. When the system runs normally or returns from an abnormal condition to normal operation, a trap is sent. | fan board not present = alarm all fans not working = alarm fan not working = warning normal operation = informational (start up), normal (returning from a warning or alarm condition) |
| vsmTempStatusChange | status | If temperature crosses the warm threshold in any direction a trap is sent. | hot = alarm normal = normal |
| vsmModuleStatusChange | powerOK | If the current power status is different than the last power status, a trap is sent. | power OK = normal power Fault = alarm |

Supported SNMP Frame Traps

| Name | Type | Description | Severity ^a |
|--------------------------|--------|--|--|
| vsmModuleStatusChange | status | If the current status is different than the last status, a trap is sent. | operational = normal failed = alarm not inserted = warning |
| vsmReferenceStatusChange | status | When the video reference transitions between locked and not locked, in either direction, a trap is sent. | not locked = warning locked = normal |
| gvgElStateChange | status | When the switcher starts the boot process and the trap status is "initializing", a trap is sent. Another trap is sent when the switcher becomes fully operational and the trap status is "running". | initializing = warning running = normal |

a. Severity Levels: EGvgAlarm = 6, EGvgWarning = 5, EGvgNormal = 4

GV K-Frame XP Video Processor Specifications

GV K-Frame XP—Number of VPEs, Inputs, and Outputs

| Frame | M/Es and VPEs | Inputs | Outputs | GPI Inputs | GPI/Tally Outputs |
|----------|---------------|--|-----------------------------|-------------------------------|--|
| Compact | 1 to 6 VPEs | 16 to 80 SDI/IP, 0-2 Media Ports 0-16 MatchDef | 8-40 SDI/IP, 0-8 SetDef | 4 per, up to 4 modules | 4 GPI/24 Relay Tally, up to 4 modules |
| Standard | 1 to 9 VPEs | 16 to 192 SDI/IP, 02 Media Ports 0-32 MatchDef | 8-96 SDI/IP, 0-32 SetDef | 4 per, up to 10 modules | 4 GPI/24 Relay Tally, up to 10 modules |

GV K-Frame XP Video Standards (Hz)

4K UHD-SDI Modes

| | |
|-------------------------------|---------------|
| 2160p 50/59.94/60 | SMPTE 2082-10 |
| 2160p 23.96/24/25/29.97/30 | SMPTE 2081-10 |
| 4K 2SI Quad Link 50/59.94/60 | SMPTE 425-5 |
| 4K SDQS Quad Link 50/59.94/60 | SMPTE 425-5 |

3G Modes

| | |
|---------------------------|------------|
| 1080p50/59.94/60, Level A | SMPTE 424M |
|---------------------------|------------|

HD Modes

| | |
|-------------------------------|-------------|
| 1080i 29.97/30/25 | SMPTE 274M |
| 1080psf 23.976/24/25/29.97/30 | SMPTE RP211 |
| 1080p 23.976/24/25/29.97/30 | SMPTE 274M |
| 720p 50/59.94/60 | SMPTE 296 |

GV K-Frame XP Interfaces

| | |
|----------------|--|
| Video | <ul style="list-style-type: none"> ST 2110-20 ST 2110-21 => Receiver Type N (gapped only), Sender Type N ST 2022-6 4K UHD TICO over ST 2022-6 |
| Ancillary Data | ST 2110-40 |
| Redundancy | ST 2022-7 (Proposed Class D) |
| Timing | ST 2110-10 |

GV K-Frame XP Serial Digital Video Inputs

| | |
|--|---|
| Format | <ul style="list-style-type: none"> • ITU-R656, SMPTE 259M, 270 Mbit/s • SMPTE 292M, 1.5 Gbit/s • SMPTE 424M, 3 Gbit/s • SMPTE 2081 6 Gbit/s • SMPTE 2082 12 Gbit/s |
| Return loss | <ul style="list-style-type: none"> • >15db, 5.0 MHz to 1.5 GHz • >10 db, 1.5 GHz to 3.0 GHz • >7db, 3.0 GHz to 6.0 GHz • >4db, 6.0 GHz to 12.0 GHz |
| Type of Connector | 75 ohm BNC (SMPTE 259M) |
| Nominal Amplitude | 800mv peak-to-peak terminated |
| Input Impedance | 75 ohm |
| Maximum cable length (Using Belden 1694A type cable) | <ul style="list-style-type: none"> • SD Video 350 meters (1148 ft) • HD Video 200 meters (656 ft) • 3G Video 140 meters (459 ft) • 12G Video 55 meters (180 ft) |

GV K-Frame XP Serial Digital Video Outputs

| | |
|---|--|
| Format | <ul style="list-style-type: none"> • ITU-R656, SMPTE 259M, 270 Mbit/s. • SMPTE 292M, 1.5 Gbit/s • SMPTE 424M, 3 Gbit/s • SMPTE 2081 6 Gbit/s • SMPTE 2082 12 Gbit/s |
| Return loss | <ul style="list-style-type: none"> • >15db, 5.0 MHz to 1.5 GHz • >10 db, 1.5 GHz to 3.0 GHz • >7db, 3.0 GHz to 6.0 GHz • >4db, 6.0 GHz to 12.0 GHz |
| Ancillary Data/ Embedded audio | Blanked or passed (user selectable) |
| EDH | Blanked |
| Type of Connector | 75 ohm BNC (SMPTE 259M) |
| Nominal Amplitude | 800 mv peak-to-peak across 75 ohm +/- 10% |
| Rise & Fall Times (75 ohm termination between 20% and 80%) | <ul style="list-style-type: none"> • SD: 400 to 1400 picoseconds amplitude • HD/3G: ≤ 135 picoseconds amplitude • 6G: ≤ 80 picoseconds amplitude • 12G: ≤ 45 picoseconds amplitude |
| Timing Jitter | <ul style="list-style-type: none"> • SD: ≤ 0.2 UI • HD: ≤ 1.0 UI • 3G: ≤ 2.0 UI • 6G: ≤ 2.0 UI • 12G: ≤ 2.0 UI |
| Alignment jitter | <ul style="list-style-type: none"> • SD: ≤ 0.2 UI • HD: ≤ 0.2 UI • 3G: ≤ 0.3 UI • 6G: ≤ 2.0 UI • 12G: ≤ 0.3 UI |
| Output Impedance | 75 ohm |
| DC Offset | Not to exceed 50mV above or below the average peak-to-peak signal envelope, with 75 ohm termination |

GV K-Frame XP Analog Reference Input

| | |
|------------------|---|
| Video Standard | Tri-level Sync or Color Black, must be 1/2X (times), 1X, or 2X the Frame Operating Mode vertical rate |
| Return loss | > 40db, up to 5.0 MHz |
| Connectors | 2 BNC loop-through |
| Impedance | 75 ohm external |
| Alignment jitter | ≤ 2 UI (SD), ≤ 1 UI (HD) |
| Output Impedance | 75 ohm |
| DC Offset | Not to exceed 50mV above or below the average peak-to-peak signal envelope, with 75 ohm termination |

GV K-Frame XP Control Network Connections

| | |
|----------------------|---|
| Type of connection | 10/100/1000 Base T |
| Protocol | TCP(UDP)/IP: Auto speed detection, Auto crossover cable configuration |
| Diagnostics | Port mirroring |
| Cable and connectors | CAT5 UTP, RJ45 connectors |
| Maximum Cable Length | 100m / 300ft |

Note: The GV K-Frame XP 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.

GV K-Frame XP Power

| | | |
|---------------------------|---|-----------------|
| Line voltage | 100V-240V AC +/-10% autorange, power factor corrected Automatic line-voltage sensing for 120V and 240V sources | |
| Line frequency | 50/60Hz +/- 5% | |
| Maximum power consumption | Compact:1800W | Standard: 2500W |
| Leakage current | < 2.5 mA (per line cord) | |

Specifications

GV K-Frame XP Video Processor Specifications

GV K-Frame XP Compact Mechanical

| Component | In-rack Depth | Width | Height | Weight (All weights approximate) | Rack Units |
|----------------------|-------------------|------------------|--------------------|---|------------|
| Compact | 63.2 cm(24.90 in) | 48.3 cm(19 in) | 34.5 cm (13.97 in) | 59.7 kg (125 lbs) (Fully loaded) | 8 |
| Compact Power Supply | 32.1 cm (12.6 in) | 10.7 cm (4.2 in) | 4.0 cm (1.57 in) | 11 kg (24lbs) (Compact two PS modules, each weigh 2.5 kg (5.4 lbs), up to three modules supported) | 1 |

GV K-Frame XP Standard Mechanical

| Component | In-rack Depth | Width | Height | Weight (All weights approximate) | Rack Units |
|-----------------------------|--------------------|------------------|--------------------|--|------------|
| Standard | 60.4 cm (23.76 in) | 48.3 cm(19 in) | 66.2 cm (26.22 in) | 79.4 kg (175 lbs) (Fully loaded) | 15 |
| Standard Power Supply Frame | 58.4 cm (12.6 in) | 48.3 cm (4.2 in) | 4.4 cm (1.75 in) | 16 kg (35.4lbs) (Fully loaded) PS Frame 7.3kg / 16lbs Single supply each weigh 2.2 kg (4.85 lbs), up to four modules supported | 1 |

GV K-Frame XP Environmental

| | |
|-----------------------------|-----------------------------------|
| Storage temperature | -20 to 70 deg C (-4 to 158 deg F) |
| Operating temperature | 0 to 40 deg C (32 to 104 deg F) |
| Relative humidity | 0-95% (non-condensing) |
| Electromagnetic environment | E2 (according to EN55035:2017) |
| Maximum Altitude | < 2000 Meters |

Kayenne Control Panel Specifications

Kayenne PCU Interconnects

| | | |
|--|--|------------------|
| Control Panel - PCU Connections | | |
| Cable and connectors | Custom 7 Pin D style | |
| Number Required | 1 for each Control Panel Stripe, Local Aux Stripe, and Satellite Panel | |
| Maximum Interconnect Cable Length | 15 m / 50 ft (7.5 m / 25 ft cable length also available) | |
| Cable Weight | 15 m / 50 ft | 1.3 kg (2.9 lbs) |
| | 7.5 m / 25 ft | 0.7 kg (1.6 lbs) |
| Touch Screen Menu Panel - PCU Connection | | |
| Cable and connectors | Custom 17 Pin D style | |
| Number Required | 1 for each Menu Panel (2 maximum) | |
| Maximum Interconnect Cable Length | 15m / 50ft (7.5m / 25ft cable length also available) | |
| Cable Weight | 15 m / 50 ft | 1.6 kg (3.7 lbs) |
| | 7.5 m / 25 ft | 0.9 kg (2.0 lbs) |

Kayenne Power

| PCU (required for Control Panel and Touch Screen Menu Panel Operation) | |
|--|---|
| 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 | 500W maximum |
| Leakage current | < 2.5 mA |

Kayenne Control Panel Mechanical

| Component | Depth | Width | Height | Weight (All weights approximate) |
|---|--------------------------------------|------------------------|-----------------------|-------------------------------------|
| Control Panels | Curved Support Structure Orientation | | | |
| 4-M/E-35, with attached Local Aux Stripe, 15 m Cables | 746.3 mm (29.4 in) | 1533.7 mm (60.4 in) | 559.3 mm (22.0 in) | 58 kg (127 lbs) |
| 3-M/E-35, with Local Aux Stripe, 15 m Cables | 637.1 mm (25.1 in) | 1533.7 mm (60.4 in) | 292.3 mm (11.5 in) | 45 kg (99lbs) |

Kayenne Control Panel Mechanical

| Component | Depth | Width | Height | Weight (All weights approximate) |
|--|--------------------------------------|------------------------|------------------------|-------------------------------------|
| 2-M/E-25, with Local Aux Stripe, 15 m Cables | 488.4 mm (19.2 in) | 1341.7 mm (52.8 in) | 242.3 mm (9.5 in) | 30 kg (66 lbs) |
| 1-M/E-15, with 15 m Cables, without Local Aux Stripe | 356.4 mm (14.0 in) | 758.3 mm (29.9 in) | 84.3 mm (3.3 in) | 15 kg (33 lbs) |
| Local Aux Stripe | Separately Mounted, Flat Orientation | | | |
| Local Aux-35 with 15 m Cable | 185.7 mm (7.3 in) | 813.7 mm (32.0 in) | 84.3 mm (3.3 in) | 6 kg (14 lbs) |
| Local Aux-25 with 15 m Cable | 185.7 mm (7.3 in) | 621.7 mm (24.5 in) | 84.3 mm (3.3 in) | 4 kg (9 lbs) |
| Menu Panel | | | | |
| Touch Screen with 15 m cable | 91.7 mm (3.6 in) | 417.85 mm (16.5 in) | 270.10 mm (10.6 in) | 6 kg (14 lbs) |
| Menu Panel Support Arm | n/a | n/a | n/a | 5 kg (11 lbs) |
| 3-RU Panel Control Unit (PCU) | 588.5 mm (23.2 in) | 482.6 mm (19 in) | 132.6 mm (5.2 in) | 16 kg (36 lbs) |

Kayenne Environmental

| | |
|-----------------------------|-----------------------------------|
| Storage temperature | -20 to 70 deg C (-4 to 158 deg F) |
| Operating temperature | 0 to 40 deg C (32 to 104 deg F) |
| Relative humidity | 0-95% (non-condensing) |
| Electromagnetic environment | E2 (according to EN55103-1, -2) |

Karrera Control Panel Specifications

Karrera Power

Karrera Control Panels

| | |
|-------------------|---|
| 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 | 200W |
| Leakage current | < 2.5 mA |

Optional Touch Screen Menu System

Touch Screen Menu Panel (power brick provided and required)

| | |
|--------------------|----------------------------|
| Line voltage | 100V-240V AC, 1.06 - 0.45A |
| Line frequency | 47-63 Hz |
| Power consumption | 90W maximum |
| Power brick output | 48V, 1.87A |

Fanless PC (power brick provided, optionally powered from Karrera panel)

| | |
|--------------------|--------------------|
| Line voltage | 100V-240V AC, 1.7A |
| Line frequency | 50/60Hz |
| Power consumption | 60W |
| Power brick output | 12V, 5.0A |

Optional Local Aux Panel (35 or 25, powered from Karrera Panel)

| | |
|-------------------|----------------------|
| Power input | 12V DC, 0.8A maximum |
| Power consumption | < 10W |

Karrera Mechanical

| Component | Depth | Width | Height | Weight (All weights approximate) |
|------------------------------------|----------------------|-------------------------|--------------------|----------------------------------|
| 2-M/E Compact Control Panel | 510 mm (20.08 in) | 1010 mm (39.8 in) | 178 mm (7.0 in) | 25 kg (55 lbs) |
| 2-M/E Control Panel | 362 mm (14.3 in) | 1248.6 mm (49.2 in) | 132 mm (5.2 in) | 19 kg (41 lbs) |
| 3-M/E Control Panel | 510 mm (20.08 in) | 1440.6 mm (56.72 in) | 178 mm(7.01 in) | 28 kg (62 lbs) |

Optional Touch Screen Menu System:

| | | | | |
|---------------------------|---------------------|-----------------------|-----------------------|------------------|
| Touch Screen Panel | 91.7 mm (3.6 in) | 417.9 mm (16.5 in) | 270.1 mm (10.6 in) | 6 kg (14 lbs) |
| Menu PC (OEM)KRR-MENU-CPU | 254 mm (10.0 in) | 157 mm (6.2 in) | 56 mm (2.2 in) | 4 kg (8 lbs) |

Karrera Mechanical

| Component | Depth | Width | Height | Weight (All weights approximate) |
|------------------------|-------|-------|--------|--|
| Menu Panel Support Arm | n/a | n/a | n/a | 5 kg (11 lbs) |

Optional Local Aux Panel

| | | | | |
|--------------|-------------------|---------------------|--------------------|-----------------|
| Local Aux 35 | 78 mm (3.1 in) | 800 mm (31.5 in) | 162 mm (6.4 in) | 4 kg (9 lbs) |
| Local Aux 25 | 78 mm (3.1 in) | 610 mm (24.0 in) | 162 mm (6.4 in) | 3 kg (7 lbs) |

Karrera Environmental

| | |
|-----------------------------|-----------------------------------|
| Storage temperature | -20 to 70 deg C (-4 to 158 deg F) |
| Operating temperature | 0 to 40 deg C (32 to 104 deg F) |
| Relative humidity | 0-95% (non-condensing) |
| Electromagnetic environment | E2 (according to EN55103-1, -2) |

GV Korona Control Panel Specifications

GV Korona Network Connection

| | |
|----------------------|-----------------------------------|
| Type of connection | 10/100/1000 Base T |
| Protocol | TCP(UDP)/IP, Auto speed detection |
| Cable and connectors | CAT5 UTP, RJ45 connectors |
| Maximum cable length | 100m / 300ft |

GV Korona Power

| | |
|-------------------|---|
| 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 | 50W |
| Leakage current | < 2.5 mA |

GV Korona Mechanical

| Component | Depth | Width | Height | Weight (All weights approximate) |
|-------------------------------|-------------------|-------------------|------------------|----------------------------------|
| 3-M/E GV Korona Control Panel | 736.6mm (29 in) | 860.5mm (33.9 in) | 287mm (11.3 in) | 27.9 Kg (61.4 lbs) |
| 2-M/E GV Korona Control Panel | 576.6mm (22.7 in) | 764.5mm (30.1 in) | 256mm (10.1 in) | 17.6 Kg (38.7 lbs) |
| 1-M/E GV Korona Control Panel | 419.8mm (16.5 in) | 668.5mm (26.3 in) | 229.9mm (9.0 in) | 12.3 Kg (27.1 lbs) |

GV Korona Environmental

| | |
|-----------------------------|-----------------------------------|
| Storage temperature | -20 to 70 deg C (-4 to 158 deg F) |
| Operating temperature | 0-95% (non-condensing) |
| Relative humidity | 0 to 40 deg C (32 to 104 deg F) |
| Electromagnetic environment | E2 (according to EN55103-1, -2) |

B

Field Replaceable Units

This appendix provides lists of the Field Replaceable Units (FRU) and Critical Spares for the Installation & Service Manual Video Production Center. FRUs can be ordered from Grass Valley Customer Support.

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

Video Processor Frame

GV K-Frame XP Compact Video Processor Field Replaceable Units

| Field Replaceable Unit | Part Number | Replacement Notes and References |
|------------------------|--------------|----------------------------------|
| Frame | 94-06159-030 | |
| Controller Board | 90-00080-000 | |
| 12G SDI IO | 772002200 | Assembly |
| DPM Board | 90-00088-000 | |
| Triple M/E Board | 90-00087-000 | |
| Front Fan Tray | 90-00082-000 | |
| Rear Fan Tray | 90-00083-000 | |
| Control IO | 90-00062-000 | Assembly |
| 12G Conversion IO | 94-00083-000 | |

Control Panels

Kayenne

Kayenne K-Frame Control Panel Field Replaceable Units

| Component | Part Number | Replacement Notes and References |
|---------------|-------------|-------------------------------------|
| Control Panel | 050349600 | Local EMEM Lens Kit |
| Control Panel | 050349700 | Master EMEM/Device Control Lens Kit |
| Control Panel | 050349800 | Multifunction Module Lens Kit |
| Control Panel | 050349900 | Transition Lens Kit |
| Control Panel | 050350000 | Source Select Module Lower Lens Kit |

Kayenne K-Frame Control Panel Field Replaceable Units

| Component | Part Number | Replacement Notes and References |
|-------------------|-------------|--|
| Control Panel | 050350100 | Upper Source Select and Aux Panel Lens Kit |
| Control Panel | 050350200 | System Bar & Transition Rate/Delegate Lens Kit |
| Control Panel | 050351400 | Split Lever-arm Lock Button |
| Control Panel | 050351600 | Kayenne Panel OLED Display Assembly |
| -02 PCU | 050352600 | CF for -02 PCU w/ Curr. panel SW |
| -03 PCU | 050352700 | CF for -03 PCU w/ Curr. panel SW |
| Control Panel | 25-00023 | Key Cap small |
| Control Panel | 25-00024 | Key Cap large |
| Control Panel | 26-00106 | Key Cap small |
| Control Panel | 26-00107 | Key Cap small |
| Control Panel | 29-00227 | Ribbon Cable for System Bar |
| PCU | 369436800 | Kayenne PCU FAN Tray Assembly |
| Control Panel | 378209500 | Air Filter 3RU |
| PCU | 40-00075 | Power Supply |
| Menu Controller | 40-00093 | PCU Menu Controller Hard Disk |
| PCU | 52-00041 | 16GB CF CARD Not Imaged |
| PCU New Rebranded | 721008103 | PCU Chassis with door, w/o fans and PSUs |
| PCU Old Frame | 721012100 | Complete door assembly with latch and hinges |
| Control Panel | 721012900 | |
| Control Panel | 721013000 | |
| Control Panel | 721014501 | Key Cap Set Bus and Source Select KL |
| Control Panel | 721014600 | |
| Control Panel | 721022700 | Keycap upgrade kit incl. C+D and 2nd+3rd shift keycaps |
| Control Panel | 721022800 | Keycap upgrade kit converting Kayenne XL to Kayenne/K-Frame |
| Control Panel | 721024500 | Keycap Conversion Kit, Kayenne K-Frame to Classic |
| Menu | 731027500 | Coax multiconductor cable that goes between PCU and Menu panel |
| Menu | 731027600 | Coax multiconductor cable that goes between PCU and Menu panel |
| Menu | 731027700 | Coax multiconductor cable that goes between PCU and Menu panel |
| Menu | 731027800 | Coax multiconductor cable that goes between PCU and Menu panel |
| PCU | 751027900 | Backplane subassembly for PCU |

Kayenne K-Frame Control Panel Field Replaceable Units

| Component | Part Number | Replacement Notes and References |
|---------------------|-------------|--|
| PCU | 751028000 | Multiple Fan Assembly |
| Control Panel | 751033200 | Distribution board and housing for M/E & Aux |
| Control Panel | 751034101 | Split Lever Arm Assembly |
| PCU Rebranded Frame | 751056401 | PCU door assembly |
| PCU Rebranded Frame | 761037801 | PCU frame metal kit with backplane - does not include fan card |
| Menu | 761040606 | Menu Panel |
| Control Panel | 761043500 | Housing Tray Assembly Source Select 15 |
| Control Panel | 761043800 | 35 Button Aux Housing Tray Assembly |
| Control Panel | 761043900 | Housing Tray Assembly Aux 25 |
| Control Panel | 761044000 | Housing Tray Assembly System Bar 15 |
| Control Panel | 761044100 | Housing Tray Assembly System Bar 25 |
| Control Panel | 761044200 | Housing Tray Assembly System Bar 35 |
| Control Panel | 761045100 | Kayenne Panel Transition Module |
| -02 PCU | 771041813 | Kayenne PCU Controller (V4.2.4) |
| -03 PCU | 771041850 | PCU Controller PCBA w/ current K-Frame SW |
| PCU Old Frame | 771041911 | PCU Menu PCBA w/Kayenne (classic) menu SW |
| Control Panel | 85552020 | Module System Bar 1ME |
| Control Panel | 85552040 | Module System Bar 4ME |
| Control Panel | 85552380 | Module Bus and Source Select 15x |
| Control Panel | 85552620 | Module Bus and Source Select 25x |
| Control Panel | 85552910 | Module Bus and Source Select 35x w/Kayenne, K-Frame & XL keycaps |
| Control Panel | 85552970 | Module Aux Bus 35x |
| Control Panel | 85553240 | Module Local E-MEM |
| Control Panel | 85553430 | Module Multi-Function with Positioner |
| Control Panel | 85553810 | Module Master E-MEM w/KYN, K-frame & XL Keycaps |
| Control Panel | 85554000 | Module Machine Control |
| Control Panel | 85570000 | Key Cap Set System Bar - 1ME |
| Control Panel | 85570030 | Key Cap Set System Bar - 4ME - Common Keys |
| Control Panel | 85570160 | Key Cap Set Bus and Source Select |
| Control Panel | 85570180 | Key Cap Set Transition |
| Control Panel | 85570190 | Key Cap Set Local E-MEM |

Kayenne K-Frame Control Panel Field Replaceable Units

| Component | Part Number | Replacement Notes and References |
|---------------|-------------|---|
| Control Panel | 85570210 | Key Cap Set Master E-MEM |
| Control Panel | 85570220 | Key Cap Set Aux Bus |
| Control Panel | 85570230 | Key Cap Set System Bar - 1ME |
| Control Panel | 85570250 | Key Cap Set Machine Control |
| Control Panel | 85570330 | Key Cap Set Aux Bus, KAYENNE |
| Control Panel | 85570500 | Key Cap Set Bus and Source Select - Common Keys |
| Control Panel | 85570510 | Key Cap Set Aux Bus - Common Keys |
| Control Panel | 85570520 | Key Cap Set Local E-MEM - Common Keys |
| Control Panel | 85570530 | Key Cap Set Machine Control - Common Keys |
| Control Panel | 85570540 | Key Cap Set Master E-MEM - Common Keys |
| Control Panel | 85570550 | Key Cap Set Transition - Common Keys |
| Control Panel | 85570560 | Key Cap Set System Bar - 1ME - Common Keys |
| Control Panel | 85570600 | Key Cap Set Transition, KAYENNE |
| Control Panel | 85570630 | Key Cap Set Local E-MEM |
| Control Panel | 85570660 | Key Cap Set Multi-Function - Common Keys |
| Control Panel | 85570720 | Key Cap Set Master E-MEM |
| Control Panel | 85570750 | Key Cap Set Machine Control |
| Control Panel | 85571280 | Control Knob Digipot |
| Control Panel | 85571480 | PLASTIC CORNER TRIM PIECES |
| Control Panel | 85571600 | Window OLED Aux |
| Control Panel | 85571610 | Window OLED Source Select |
| Control Panel | 85571660 | Window Slanted Transition cpl |
| Control Panel | 85571670 | Window Lever Arm |
| Control Panel | 85571680 | Window 1 Row - Large |
| Control Panel | 85571690 | Window 2 Row |
| Control Panel | 85571700 | Window 1 Row - Small |
| Control Panel | 85571710 | Window Master E-Mem |
| Control Panel | 85571720 | Window Multi-Function |
| Control Panel | 85571730 | Window Knob |
| Control Panel | 85571740 | Window Joystick |
| Control Panel | 85571750 | Window Slanted - Machine Control |
| Control Panel | 85571760 | Window Frame - Machine Control |
| Control Panel | 85571770 | Window Slanted - Machine Control cpl. |
| Control Panel | 85571780 | Seperator Master E-Mem |

Kayenne K-Frame Control Panel Field Replaceable Units

| Component | Part Number | Replacement Notes and References |
|---------------|-------------------------|----------------------------------|
| Control Panel | 85572220 | Locking Spring |
| Control Panel | 85572250 | Cable Guide |
| Control Panel | 85572340 | Insulator |
| Menu | 85572370 | PCU - Menu Cable 7,5 m |
| Menu | 85572380 | PCU - Menu Cable 15 m |
| Menu | 85572390 | PCU - Panel Cable 7,5 m |
| Menu | 85572400 | PCU - Panel Cable 15 m |
| Control Panel | 85572430 | RJ45 CAT 6 500 mm |
| Control Panel | 85572440 | RJ45 CAT 6 750 mm |
| Control Panel | 85572450 | RJ45 CAT 6 1000 mm |
| Control Panel | 85572460 | RJ45 CAT 6 1250 mm |
| Control Panel | 85572470 | RJ45 CAT 6 1500 mm |
| Control Panel | 85574890 or 85552790 | Module Aux Bus 25x |

Karrera**Karrera K-Frame Control Panel Field Replaceable Units**

| Component | Part Number | Replacement Notes and References |
|---------------|----------------|--|
| Menu | 050352300 | Fanless PC for KRR Menu panel w/ Win7 V8.2.0,V4.2.3 |
| Menu | 050352500 | KRR Fanless PC w/ Win10 and Curr. Menu SW |
| Control Panel | 050351900 | Karrera Panel Source Select OLED Assembly |
| Control Panel | 050352000 | Karrera Large Green OLED and Mounting Assy |
| Control Panel | 050352800 | CF Card for Karrera Panel controller Imaged |
| Control Panel | 26-00093 | Karrera Panel Lever Arm Cable |
| Control Panel | 40-00060 (EOL) | Power Supply AC/DC 12VDC 400W 33.3 A |
| Control Panel | 721015400 | Key Cap Set KRR Local Aux |
| Control Panel | 721021901 | K-FRM-KRR-KEYS KARRERAPNL K-FRAME |
| Control Panel | 721022900 | Keycap upgrade kit converting classic frame to K-Frame for Karrera |
| Control Panel | 721024400 | Keycap Conversion Kit, Karrera K-Frame to Classic |
| Control Panel | 731029100 | DC Power Cable Panel XLR to Fanless PC |
| Control Panel | 751039000 | Fan Assy |
| Control Panel | 751040902 | ASSY,SINGLE LEVER ARM |
| Control Panel | 751041200 | KYN/KRR JOYSTICK, 3-AXIS HALLSENS. TRY10-551 |

Karrera K-Frame Control Panel Field Replaceable Units

| Component | Part Number | Replacement Notes and References |
|---------------|-------------|---|
| Control Panel | 761039300 | Menu Panel 48V Brick Power Supply |
| Control Panel | 761051900 | 25 button Aux Panel |
| Control Panel | 761052000 | 35 button Aux Panel |
| Control Panel | 771055220 | Panel Controller With New CF w/latest KFRM SW |
| Control Panel | 771055301 | Distro board |
| Control Panel | 771055600 | Transition & DSK |
| Control Panel | 771055800 | Transition & Local EMEM |
| Control Panel | 771056000 | Local EMEM & Transition |
| Control Panel | 771056100 | Master E-MEM |
| Control Panel | 771056200 | Multi-Function |
| Control Panel | 771056300 | Source Select 15 |
| Control Panel | 771056400 | Aux 15 |
| Control Panel | 771056600 | Source Select 10 w/o Machine Control |
| Control Panel | 771056700 | Source Select 10 w Machine Control |
| Control Panel | 771056800 | Aux 10 |
| Control Panel | 771057800 | Source Select 15 w/o Sel Area |
| Control Panel | 771058101 | Aux Distro |
| Control Panel | 85567300 | ROTARY OPTICAL ENCODER W/PUSH SWITCH |
| Menu | 390744400 | Karrera Fanless PC Mounting Bracket |
| Miscellaneous | 050350600 | GAS SHOCK,FRU KARRERA 2ME COMPACT |
| Miscellaneous | 25-00003 | KEYCAP BLANK E-SWITCH 12MM |
| Miscellaneous | 25-00004 | KEYCAP BLANK E-SWITCH 15MM |
| Miscellaneous | 331060900 | TRANSITION WINDOW LARGE |
| Miscellaneous | 331061000 | GV ASY MECA WINDOW LEVER ARM |
| Menu | 390714200 | GV ENCODER KNOB |

GV Korona**GV Korona K-Frame Control Panel Field Replaceable Units**

| Component | Part Number | Replacement Notes and References |
|---------------|-------------|---------------------------------------|
| Control Panel | 26-00225 | 1 Meter USB 2 Cable |
| Control Panel | 26-00226 | 1 Meter USB 3 Cable |
| Control Panel | 26-00234 | 80mm Lever Arm Cable |
| Control Panel | 721015500 | Korona, Karrera Transition Keycap Set |

GV Korona K-Frame Control Panel Field Replaceable Units

| Component | Part Number | Replacement Notes and References |
|------------------------|-------------|--|
| Control Panel | 721025000 | Korona 15 & 20 Source Select Keycap Set |
| Control Panel | 721025200 | Korona EMEM Keycap Set |
| Control Panel | 731015510 | 20 meter Crossover RJ45 Cable |
| Control Panel | 731028607 | 120mm Power Cable |
| Control Panel | 731028609 | 800mm Power Cable |
| Control Panel | 731028610 | 6 inch Power Cable |
| Control Panel | 731036800 | Touch Panel to USB Cable |
| Control Panel | 731036900 | Flat Panel Display Cable Assy. |
| Control Panel | 731037800 | 34 Pin Ribbon Cable |
| Control Panel | 731037900 | 20 Pin Ribbon Cable |
| Control Panel | 751040902 | Lever Arm Assembly for Karrera and Korona Panels |
| Control Panel | 751055800 | Korona Dual Power Supply Assembly |
| Control Panel | 751056200 | Control Panel Joystick |
| Menu | 761062900 | Korona Touchscreen Menu Assembly |
| Control Panel | 761063000 | OLED Assembly for Source Select & EMEM |
| Control Panel | 761063000 | Source Select & EMEM OLED Assembly |
| Control Panel | 771069000 | Control Panel Controller |
| 1-ME Control Panel | 771069100 | 1 ME Transition Board |
| 2-ME Control Panel | 771069200 | 2 ME Transition Board |
| Control Panel | 771069400 | Master EMEM Module |
| Control Panel | 771069500 | Menu Encoders Board |
| 2-ME Control Panel | 771069600 | 20 Button Source Select Board |
| 1 & 3 ME-Control Panel | 771069700 | 15 Button Source Select Board |
| 3 ME Control Panel | 771069800 | 10 Button Source Select Board |

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 édicté 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 55035-1/2 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 62368 | UL 62368-1 Issue 2014 Ed. 2 Audio/Video, Information and Communication Technology Equipment- Part 1 Safety Requirements. |
| | IEC 62368 | IEC 60950-1 Issue 2014 Ed. 2 Audio/Video, Information Technology Equipment-Safety Part 1 Safety Requirements |
| | CAN C22.2, No. 62368 | C22.2 #62368 Issue 2014 Ed. 2 Audio/Video, Information Technology Equipment Safety Part 1 Safety Requirements. |
| | EN62368 | Safety of Information Technology Equipment, including Electrical Business Equipment. |
| | 2014/35/EU | Low Voltage Directive |

| Category | Standard | Designed/tested for compliance with: |
|----------|--|--|
| EMC | EMC Directive 2014/108/EC via EN 55035-1 and 2 | Audio, Video and Entertainment Lighting Control for the European Community. |
| | EN55035-1 : 2017 | Electromagnetic compatibility. Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use. Part 1 Emissions, Environment E4 EN 55032: Class A Radiated Emissions EN 61000-3-2 (2014): Powerline Harmonic Emissions EN 61000-3-3: Voltage Fluctuations and Flicker Emissions EN 55032 (2014) + A11: Class A Conducted Emissions Radiated Magnetic Field Emissions Peak Inrush Current |
| | EN55035 : 2017 | 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 44035: Immunity |
| | US FCC Class A | CISPR 32 (2016) FCC Part 15 |
| | Canada FCC Industry Canada | ICES-003 Issue 7 |
| | Australia & New Zealand: | AS/NZS CISPR 22 (2002) |
| | Korea | KD C 9832 (2019) and KS C9835 (2019) in accordance with RRA NOTICE 2021-3 and RRA ANNOUNCEMENT 2021-10 |

DEKRA Certificate

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

CERTIFICATE

Certificate Number: 540040.002

The Environmental Management System of:

Grass Valley, and its Grass Valley Affiliates

3499 Douglas-B Floreani
Montreal, Quebec
H4S 2C6 Canada

Grass Valley Nederland B.V.

Bergschot 69
4817 PA Breda
The Netherlands

Including its implementation, meets the requirements of the standard:

ISO 14001:2015

Scope:

Montreal: Product Sales, design, manufacture and support of video and audio products and systems.

Breda: Design, manufacture, outsource manufacture and support of video and audio products and systems.

| | |
|----------------------|-------------------|
| Certificate Expires: | November 30, 2021 |
| Certificate Issued: | August 07, 2018 |
| Certified Since: | December 01, 2000 |



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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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