



grass valley

A **BELDEN** BRAND

# **MV-820 MULTIVIEWER**

SDI OR IP VIDEO STAND-ALONE MULTIVIEWER

## **User Manual**

Issue 2 Revision 5

2019 August 01

[www.grassvalley.com](http://www.grassvalley.com)

## FCC Compliance

In order to comply with FCC/CFR47: Part 15 regulations, it is necessary to use Mini HDMI to HDMI high-quality triple-screened 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/](http://www.grassvalley.com/patents/)

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Warranty information is available from the Legal Terms and Conditions section of Grass Valley's website ([www.grassvalley.com](http://www.grassvalley.com)).

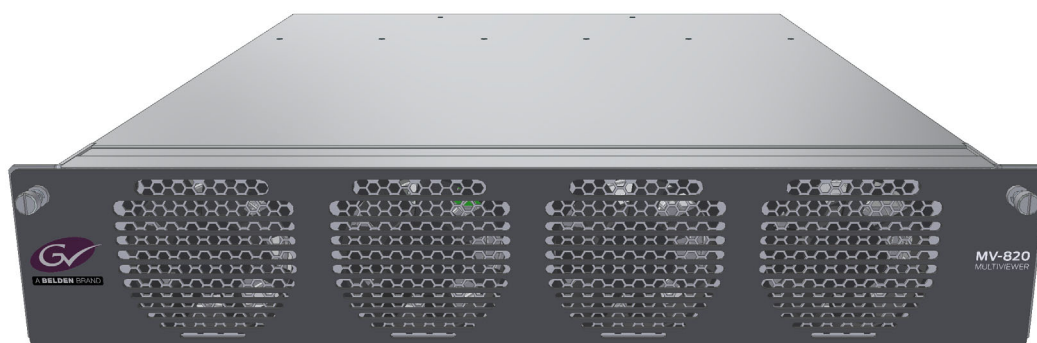
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## About this Manual

Thank you for purchasing your new MV-820 Multiviewer.

This user manual describes how to install, configure and operate the MV-820 Multiviewer, and provides any relevant safety information. It also covers the MV-820-IP product version.

If you have any questions regarding the installation and setup of your product, please contact Grass Valley Customer Support.



MV-820 SDI Video or IP Video Standalone Multiviewer

## Related Documents

The following Grass Valley manuals are related documents:

Document		Description
User Manual:	MV-8 Series Multiviewer	User manual for the multiviewer 'engine' within MV-8X0 Multiviewer products.
User Manual:	Orbit - Introduction	A general introduction to Grass Valley Orbit and its applications.
User Manual:	Orbit for Multiviewers	Describes multiviewer-specific details of Orbit.
User Manual:	Orbit for IP Routing	Describes Orbit configuring IP routing in a system.

## 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.



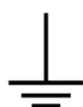
Indicates that the user, operator or service technician should refer to the product manuals for important operating, maintenance, or service instructions.



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:

- This equipment is meant to be installed in a restricted access location.
- When installing this equipment, do not attach the power cord to building surfaces.
- Products that have no on/off switch, and use an external power supply must be installed in proximity to a main power outlet that is easily accessible.
- Use the correct voltage setting. If this product lacks auto-ranging power supplies, before applying power ensure that each power supply is set to match the power source.
- Provide proper ventilation. To prevent product overheating, provide equipment ventilation in accordance with the installation instructions.

- Do not operate with suspected equipment failure. If you suspect product damage or equipment failure, have the equipment inspected by qualified service personnel.
- To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.
- 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 ESD voltages. If no wrist strap is available, ground yourself by touching the *unpainted* metal part of the chassis.
- For safety, periodically check the resistance value of the antistatic strap, which should be between 1 and 10 megohms.
- When temporarily storing a card make sure it is placed in an ESD bag.
- Cards in an earth grounded metal frame or casing do not require any special ESD protection.

## Battery Handling



This product 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](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.



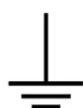
Avertit l'utilisateur, l'opérateur ou le technicien de maintenance que des instructions importantes relatives à l'utilisation et à l'entretien se trouvent dans la documentation accompagnant l'équipement.



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 :

- L'appareil est conçu pour être installé dans un endroit à accès restreint.
- Au moment d'installer l'équipement, ne fixez pas les cordons d'alimentation aux surfaces intérieures de l'édifice.



- Les produits qui n'ont pas d'interrupteur marche-arrêt et qui disposent d'une source d'alimentation externe doivent être installés à proximité d'une prise de courant facile d'accès.
- Si l'équipement n'est pas pourvu d'un modules d'alimentation auto-adaptables, vérifiez la configuration de chacun des modules d'alimentation avant de les mettre sous tension.
- Assurez une ventilation adéquate. Pour éviter toute surchauffe du produit, assurez une ventilation de l'équipement conformément aux instructions d'installation.
- N'utilisez pas l'équipement si vous suspectez un dysfonctionnement du produit. Faites-le inspecter par un technicien qualifié.
- Pour réduire le risque de choc électrique, n'effectuez pas de réparations autres que celles qui sont décrites dans le présent manuel, sauf si vous êtes qualifié pour le faire. Confiez les réparations à un technicien qualifié. La maintenance doit se réaliser dans un milieu libre d'électricité statique.
- L'appareil peut comporter plus d'un cordon d'alimentation. Afin de prévenir les chocs électriques, débrancher tous les cordons d'alimentation avant toute opération d'entretien.
- Veillez à toujours prendre les mesures de protection antistatique appropriées quand vous manipulez l'équipement.
- 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 usagées 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](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](http://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](mailto:environment@grassvalley.com).

## Safety Information Continued

### 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's  
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.

## Fiber Output Modules and Laser Safety

The MV-820 unit has 'small form-factor' module cages at its rear for SFP (small form-factor pluggable) and (in the case of MV-820-IP) QSFP (quad small form-factor pluggable) plug-in modules. Various SFP and QSFP optical fiber modules may be fitted into some rear cages.

### 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.

## Ventilation

Although the unit is constructed to meet normal environmental requirements, ensure that there is a free flow of air at the front, rear, and sides of the unit to dissipate the heat produced during operation. Installations should be designed to allow for this.

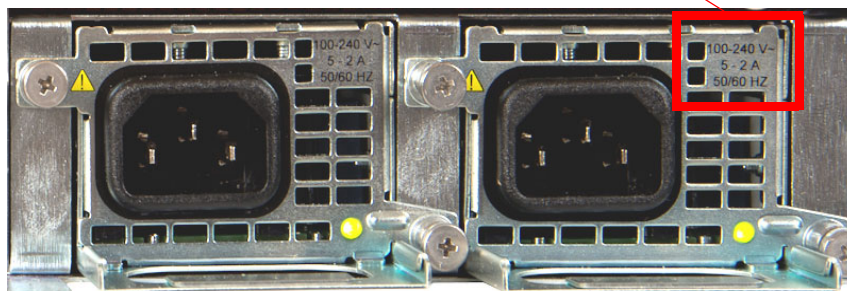
### CAUTION

Do not obstruct the unit's ventilation holes: Damage to the equipment may result.

## Equipment Mains Supply Voltage

Before connecting the equipment, observe the safety warnings section and ensure that the local mains supply is within the rating stated on the rear of the equipment.

Mains supply rating for the equipment.



*MV-820 Multiviewer Mains Inlets*

## Power Cords Supplied

### WARNING

To reduce the risk of electric shock, plug each power supply cord into separate branch circuits employing separate service grounds.

### Power Cords Supplied for the USA

Power cords:

2-off RMW8 18 USA MAINS LEAD IEC TO 3BLADE PLUG 2.4M

GREEN lead connected to E (Protective Earth Conductor)

WHITE lead connected to N (Neutral Conductor)

BLACK lead connected to L (Live Conductor)

### Power Cords Supplied for Countries other than the USA

Power cords:

2-off RMW8 16 POWER CORD 10A 2M (IECSKT-IEC PLG)

GREEN/YELLOW lead connected to E (Protective Earth Conductor)

BLUE lead connected to N (Neutral Conductor)

BROWN lead connected to L (Live Conductor)

### WARNING

- Always ensure that the unit is properly earthed and power connections correctly made.
- Isolate the unit from the outputs of other products before servicing.
- The unit's IEC power inlets are the mains disconnection devices for this unit.

## Safety and EMC Standards

This equipment complies with the following standards:

### Safety Standards



#### Information Technology Equipment - Safety Part 1

##### **EN60950-1: 2006**

Safety of Information Technology Equipment Including Electrical Business Equipment.

##### **UL1419 (4<sup>th</sup> 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

##### **EN55103-2:2009 (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.

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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.

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## 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  $\Omega$  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.

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# 1 Product Overview

The MV-820 Multiviewer is a standalone 2RU unit with high i/o density. It has 48 video inputs and up to 12 multiviewer head display outputs. Different video input types are supported by different product versions (SDI coax, high-density SDI connections, or video IP inputs).

Video input standards supported include up to 3Gb/s SDI and 4K via quad-link. Multiviewer head display outputs can be HDMI, fiber SDI or HD-BNC. Additionally, they can be video-over-IP.



*Figure 1 MV-820 Multiviewer*

## **Product Versions:**

- **MV-820-HDBNC** - with 48 BNC SDI video input coax connectors.
- **MV-820-DENSI** - for high-density SDI video input connection via DS-Link.
- **MV-820-IP** - with integrated IP-to-SDI conversion for 48-off video IP inputs and for multiviewer display IP outputs.

A single MV-820 can directly drive up to 12 multiviewer display monitors, offering multiviewer video wall layouts from multi-channel quad-splits to flexible multi-tile screens, see Figure 2.



Figure 2 MV-820 Multiviewer Video Walls and Screens

# 1.1 Features

## Video Inputs:

- 48 multiviewer inputs.
- Input connectors:
  - HD-BNC coax (MV-820-HDBNC),
  - DensiShield (MV-820-DENSI),
  - and QSFP+ cages (MV-820-IP).
- SDI Video Inputs:
  - Up to 3Gb/s SDI inputs, with 4K inputs supported via quad-link SDI.
- SDI IP Video Inputs (requires 100G QSFP28 modules):
  - Standards supported:  
SMPTE 2022-6, SDI in IP, and SMPTE 2022-07, network redundancy;  
VSF TR-03 and VSF TR-04 IP stream flows;  
SMPTE 2110; SMPTE 2042; RFC4175.
  - Resolution: 1080p/1080i/720p 50/59.94; 4K via quad-link.
  - Reference Timing:  
Using IEEE-1588v2 (PTP), compliant with SMPTE 2059-2.  
Analog reference input.

## Advanced broadcast media monitoring:

- Media biometric signature generation for all 48 multiviewer inputs.
  - Low-bandwidth video and audio signatures streamed.
  - Applications include: Lip sync, Channel mapping detection, Confidence monitoring, identification and comparison.
- HDR support.

## Up to 12 head display outputs:

- 3G 1080p head display outputs.
- 4K UHD support with four display outputs used together as a 4K quad-link.
- Four head display outputs on baseline MV-820 model.  
And more display outputs enabled with MV-820 options.
- Uses flexible SFP modules. Outputs can be a mixture of 3G SDI dual-coax SFPs or dual-fiber SFPs, or single-HDMI SFPs.
- Available as video IP streams (MV-820-IP only) uncompressed 2022-6/-7 and 2110.

## Screen layout flexibility:

- Additionally display web pages, automation play lists, device status screens etc.
- Display status and alarms from external devices.
- Drag and Drop objects onto the screen layout.
- Adjustable layering, transparencies and fine-positioning.

## Flexible alarm capability:

- Monitoring of video, audio and metadata, with alarm notification.
- Intelligent monitoring of external devices, with configurable on-screen alarms.
- Control and acknowledgment of alarms from hardware- and soft-panels.

**Streaming out of MV-820 Video Inputs:**

- MV-820 multiviewer inputs can be H.264-encoded to create copies of inputs which can then be streamed out over IP.  
(And viewed on a desktop PC with appropriate software. For example, Grass Valley Orbit.)

---

**Note: Viewing H.264-encoded video IP streams with MV-800-DT:**

MV-800-DT is a license for the Grass Valley Orbit software tool. It enables the 'Orbit for Multiviewers' software to be used as a PC-based streamed video monitoring wall. This is ideal for secondary monitoring applications.

Video inputs from one or more MV-8X0 multiviewer module may be displayed on a PC monitor, showing live video, audio levels and alarms.

---

**Note: Orbit:**

For information on Orbit for multiviewers, please refer to the 'Orbit Introduction' and 'Orbit for Multiviewers' user manuals.

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**Note: MV-800-DT:**

For specific information on MV-800-DT, please refer to the 'MV-8 Series Multiviewer' user manual.

---



## 1.2 Order Codes

Table 1 Order Codes

Order Code	Description
<b>Product versions:</b>	
<b>MV-820-HDBNC</b>	MV-820 2RU standalone multiviewer, 48 video inputs via HD-BNC. Includes license for four multiviewer display outputs (1 to 4).
<b>MV-820-DENSI</b>	MV-820 2RU standalone multiviewer, 48 video inputs via high-density DensiShield connectors. Includes license for four multiviewer display outputs (1 to 4).
<b>MV-820-IP</b>	MV-820 2RU standalone multiviewer, 48 video inputs via QSFP28 video IP connections. Includes license for four multiviewer display outputs (1 to 4).  <b>Note 1:</b> MV-820-IP ships with QSFP blanking plugs fitted: <b>Note 2:</b> QSFP28 modules must be ordered separately.
<b>Additional Licenses:</b>	
SDI outputs:	A license comprises a code to enable more multiviewer display outputs.  MV-820-OPxx licenses are applied to the multiviewer block within an MV-820. A license enables multiviewer display outputs on SDI connectors at the rear of the unit.  <b>Note:</b> Video SFP Video modules must be ordered separately, see <a href="#">Display Output SFP Video Modules</a> : in this table below.
<b>MV-820-OP56</b>	Upgrade to enable outputs 5 and 6.
<b>MV-820-OP78</b>	Upgrade to enable outputs 7 and 8.
<b>MV-820-OP910</b>	Upgrade to enable outputs 9 and 10.
<b>MV-820-OP112</b>	Upgrade to enable outputs 11 and 12.
IP outputs:	For MV-820-IP only. MV-820-IPOPxx licenses are applied to the multiviewer block within an MV-820. A license enables multiviewer display outputs as IP streams on the media network interfaces at the rear of the unit.  <b>Note:</b> 100G QSFP28 modules for media network connections must be ordered separately.
<b>MV-820-IPOP14</b>	License to enable outputs 1 and 4 (factory installed on MV-820-IP by default).
<b>MV-820-IPOP56</b>	Password license to upgrade and enable outputs 5 and 6.
<b>MV-820-IPOP78</b>	Password license to upgrade and enable outputs 7 and 8.
<b>MV-820-IPOP910</b>	Password license to upgrade and enable outputs 9 and 10.
<b>MV-820-IPOP112</b>	Password license to upgrade and enable outputs 11 and 12.
<b>Display Output SFP Video Modules:</b>	
<b>CC-TTH-3G-N</b>	One SFP video module offers: 2-off SDI outputs (coaxial or fiber) or 1-off HDMI output.
<b>ST31ST31-3</b>	HD-BNC coaxial dual output SFP module.
<b>FC1-HDMI1</b>	Fiber dual output SFP module (1310 nm, single mode LC/PC).
<b>SFPBLANK</b>	HDMI single output SFP module
<b>QSFPCOVER</b>	SFP blanking cover (dust and EMC cover).
<b>QSFPCOVER</b>	QSFP blanking cover (dust and EMC cover).
<b>DS-Link Cables:</b>	
<b>WDS6THIN</b>	Used with MV-820-DENSI 6m (19 feet) DS-Link cable, fitted with DensiShield mating connectors.

## 1.3 MV-820 Architecture

Figure 3 shows an MV-820 block diagram. There are two main blocks: Input circuitry and a MV-8 Series Multiviewer block.

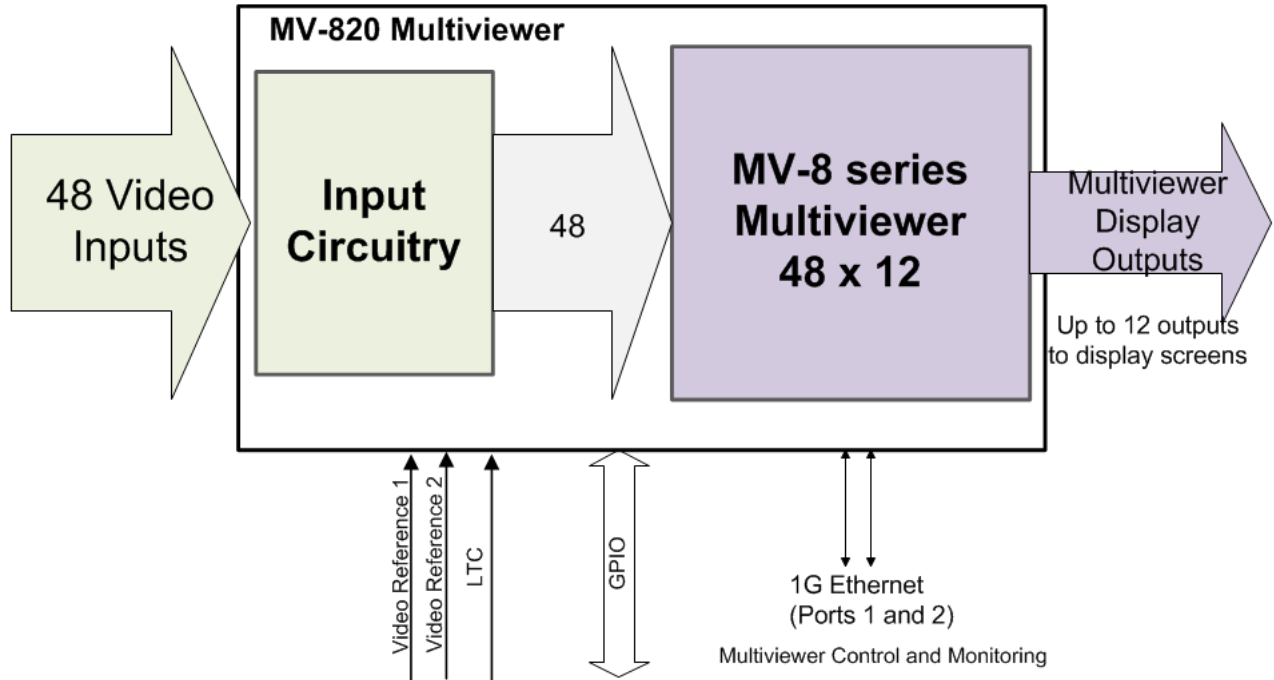


Figure 3 MV-820 Block Diagram

The main inputs and outputs comprise:

- 48 video inputs:
  - HD-BNC or DensiShield or IP stream.
  - Up to 3Gb/s SDI. 4K supported via quad-link.
- Analogue video reference inputs.  
(2-off inputs for MV-820-HDBNC and MV-820-DENSI. 1-off input for MV-820-IP.)
- Multiviewer display outputs:
  - Up to 12 outputs for monitor display screens, via up to six 'small format pluggable' modules (SFPs).
  - Output types available: SDI coax, fiber or HDMI. Additionally, the MV-820-IP offers video-over-IP display outputs.

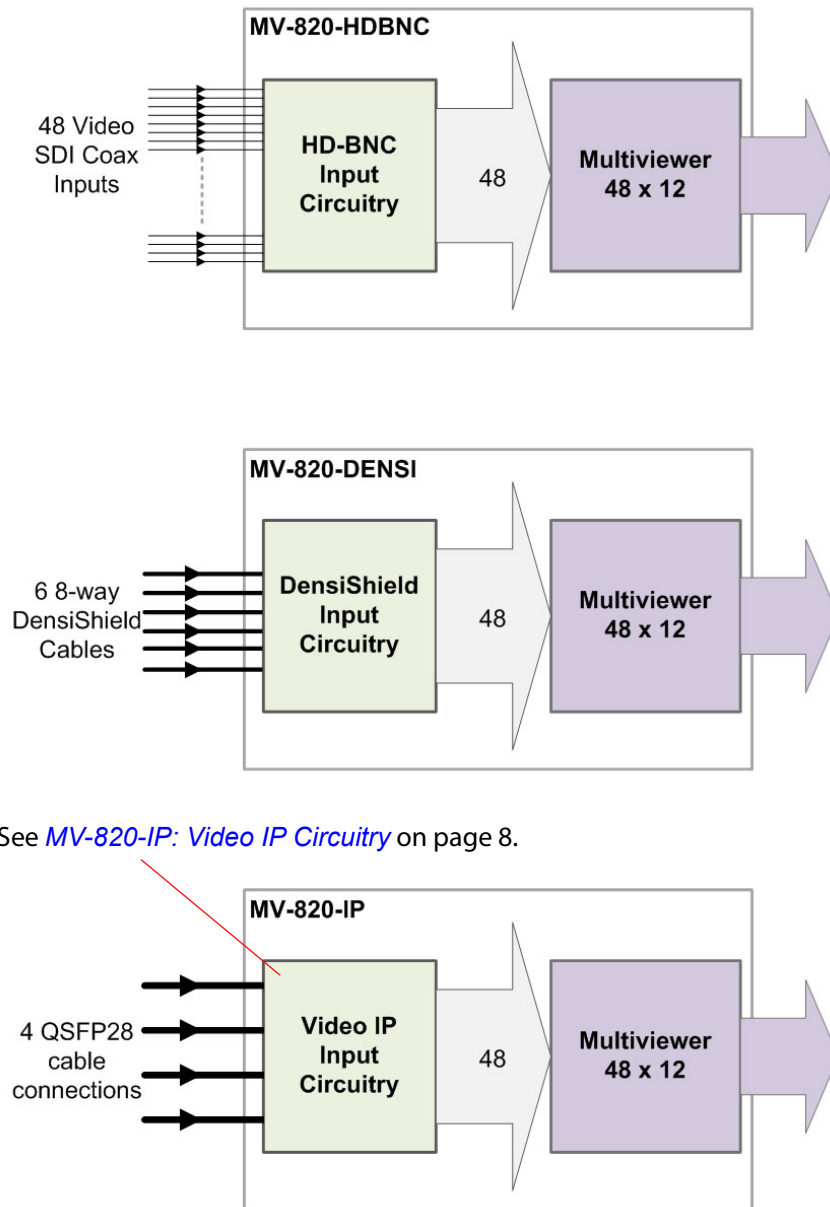
**Note:** There is only one HDMI connector per HDMI SFP. Thus, there are only up to 6 HDMI display outputs.

  - 4K-capable outputs via quad-link.
- Multiviewer Control and Monitoring Ethernet connections:
  - 2-off 1G - Communications traffic and H.264 streaming out of multiviewer inputs.
- LTC input and GPIO.

### 1.3.1 Input Circuitry Variants

The different MV-820 product versions contain the same multiviewer block with specific input circuitry, shown in Figure 4:

- **MV-820-HDBNC** - 48-off SDI video input circuits for BNC connectors.
- **MV-820-DENSI** - 48-off SDI video input circuits for DensiShield connectors.
- **MV-820-IP** - 4-off Video IP circuits for '50G' network connections, providing 48 video input signals in total.



See [MV-820-IP: Video IP Circuitry](#) on page 8.

Figure 4 MV-820 Product Versions and Input Circuitry

From the input circuitry, each of the internal 48 video input signals is directly connected to an input of the internal '48 x 12' multiviewer block. Any video IP input signal can appear on any multiviewer display output.

For more detailed information about the rear, external connections to the MV-820, see [Hardware Chassis and Connectors](#) on page 21.

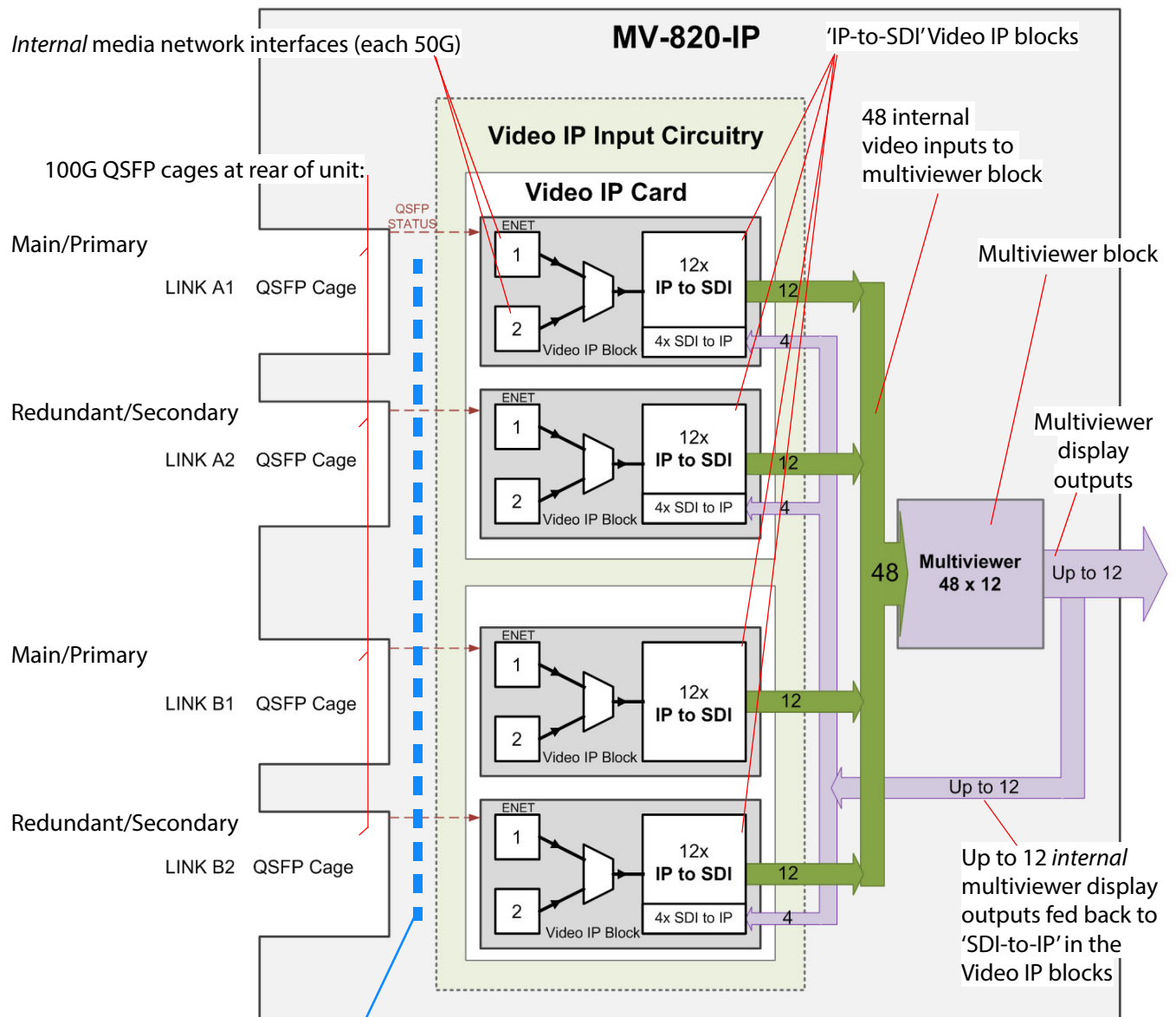
### 1.3.2 MV-8 Series 48 x 12 Multiviewer Block

The 48 x 12 multiviewer block is a Grass Valley MV-8 Series Multiviewer and is common to other MV-8X0 products.

*Refer To:* 'MV-8 Series Multiviewer' user manual for full information about the MV-820's multiviewer block.

### 1.3.3 MV-820-IP: Video IP Circuitry

A functional overview of the 'Video IP' circuitry inside a MV-820-IP unit and its network connections is covered in this subsection. The IP circuitry comprises two internal video IP cards, each with two Video IP blocks of 'IP-to-SDI' video conversion. The 'IP-to-SDI' blocks have external media network connections via QSFP cages at the rear of the unit. See Figure 5.



See Figure 7 on page 10 for external QSFP cage link connections to internal Video IP blocks

Figure 5 'IP-to-SDI' Blocks

Each Video IP block:

- Has two media network interfaces; this allows for redundant video IP streams over different media network connections.
- Converts 12 received video IP streams into 12 internal SDI video signals supplied to the internal multiviewer block.
- Can convert 4 internal SDI 'multiviewer display output' signals into IP streams for *sending* as video IP streams.
- Has a separate control network interface.

Each Video IP block circuitry is derived from a Grass Valley IQMIX modular card. Unlike a Grass Valley IQMIX modular card, however, the MV-820-IP unit has a fixed 'Video IP input' and 'IP output' spigot configuration. See Figure 6.

A Video IP block carries out IP to SDI or SDI to IP conversion on 16 "spigots":

- Spigots 1 to 4 are configured as sources of video IP streams.
- Spigots 5 to 16 are configured as destinations for video IP streams.

Video IP streams may be sent/received on redundant networks. Note: SDI video connections to a Video IP block (in and out) are internal to the MV-820-IP unit.

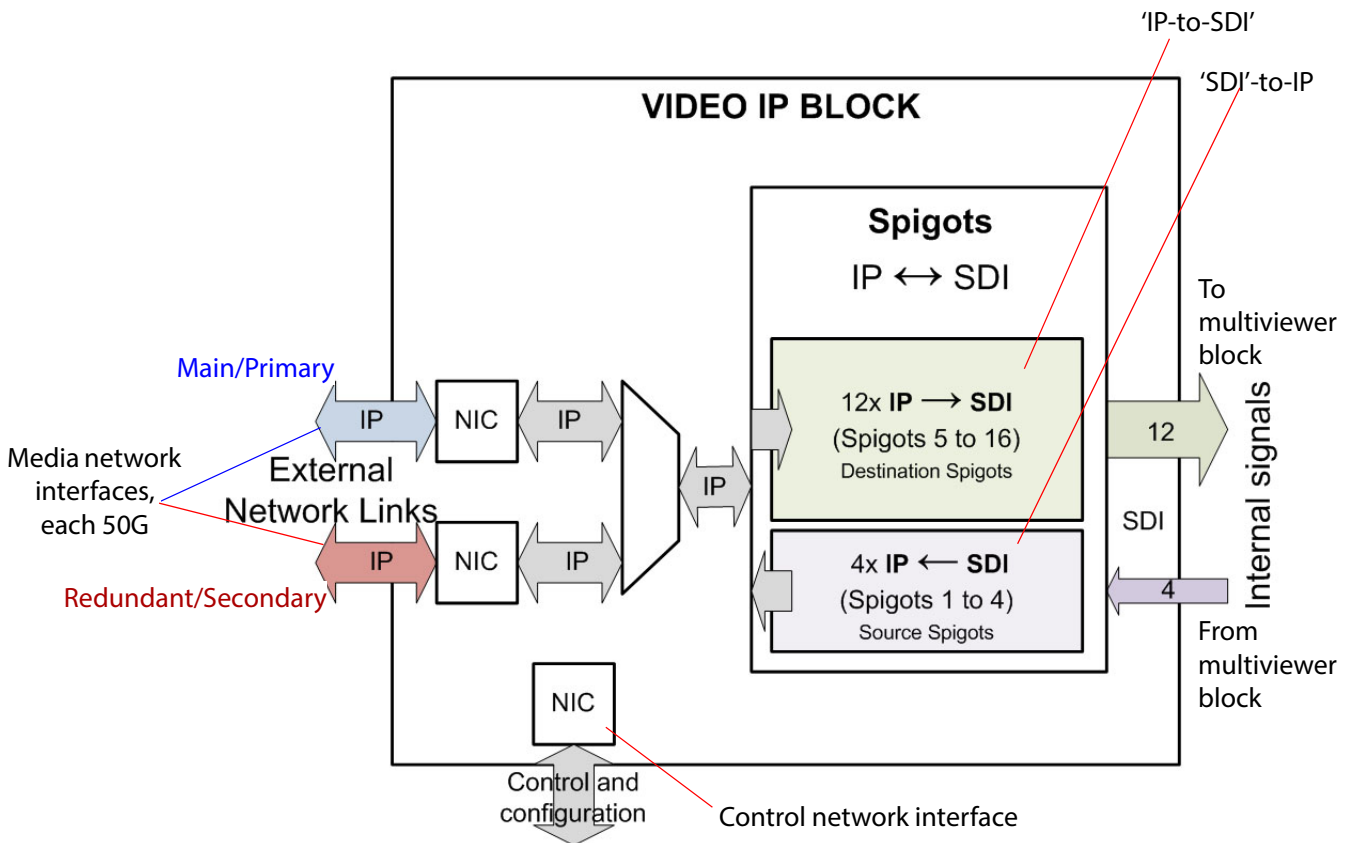


Figure 6 Video IP Block

### 1.3.4 MV-820-IP: Media Network Connection

The physical media network link uses QSFP cages on the rear of the unit ('Link A1'...'Link B2') and are 100G Ethernet links that are each configured for 2x 50G operation. When fitted, QSFP transceivers are internally connected to the Video IP blocks via a hard-wired network 'cross-over' arrangement (which can remove the need for external break-out cables in some cases). See Figure 7.

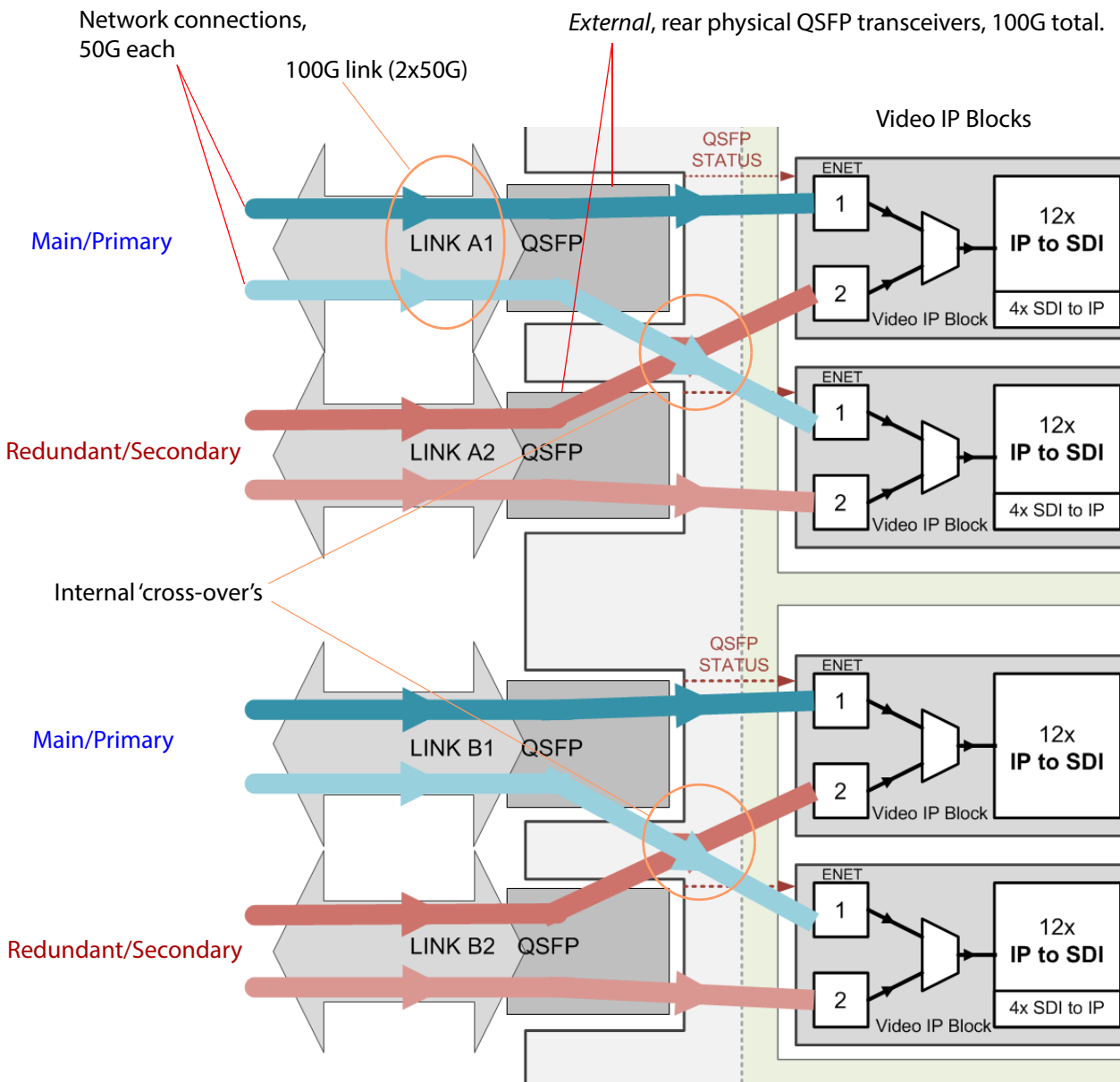


Figure 7 Video IP Block Media Network Link Connections

Thus, one rear physical rear media network 'link' feeds two Video IP blocks.

Video input IP streams for multiviewer inputs 1 to 24 can be carried either in network link 'Link A1', or in 'Link A2', or in both links for redundancy.

The second Video IP card is similarly connected but via 'Link B1' and Link B2', which carry the video IP streams for multiviewer video inputs 25 to 48.

Video IP connection examples are shown in Figure 8a, for no link redundancy, and in Figure 8b, for link redundancy.

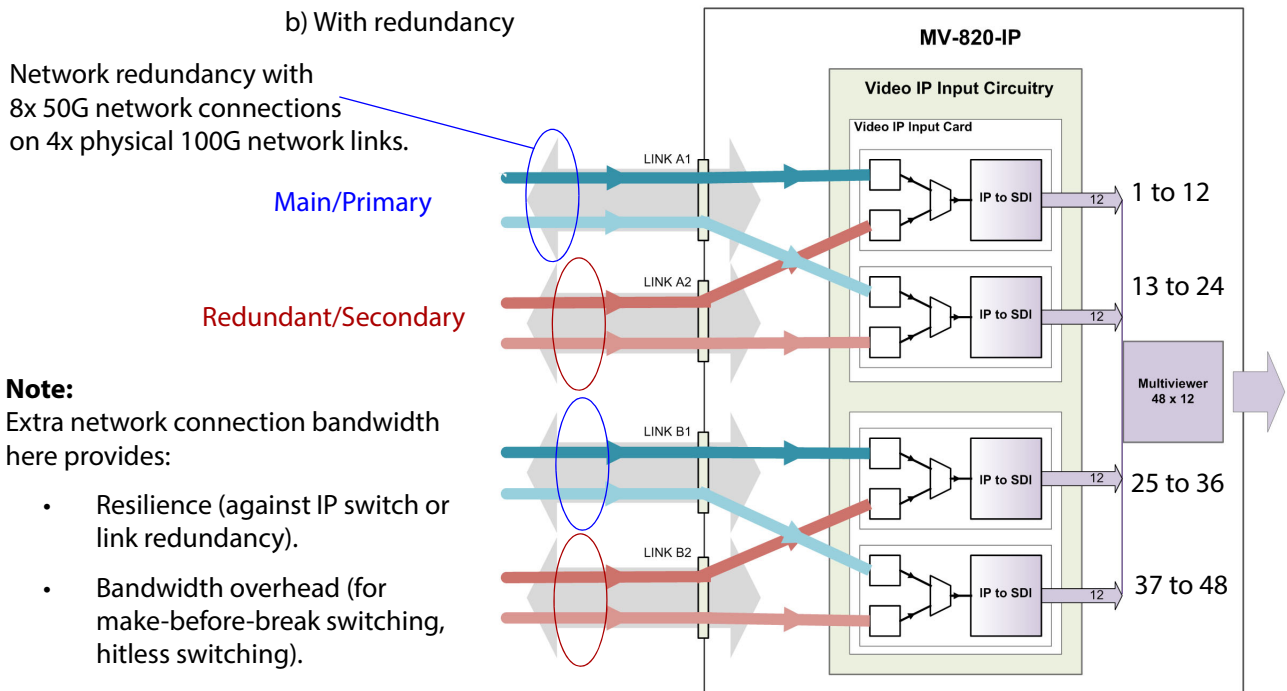
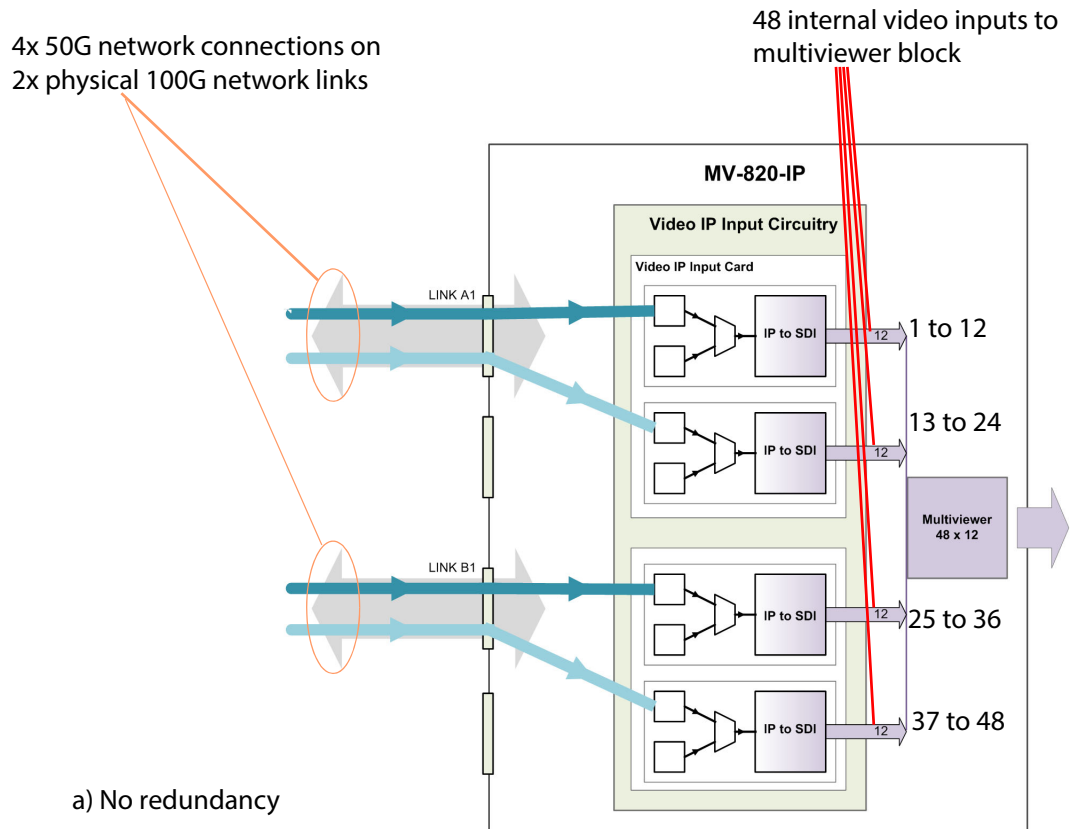


Figure 8 Network Connections and Video Inputs:  
a) No redundancy.  
b) With redundancy.

### 1.3.5 Control Network Interface

The control network interfaces are used for control purposes and for software upgrades etc.

#### 1.3.5.1 MV-820-HDBNC and MV-820-DENSI

The MV-820-HDBNC and MV-820-DENSI units can each be considered to be a single unit from a control perspective. Control and configuration of the units is done through either of two 'MV Control' Ethernet ports on the rear of the unit. See Figure 9a and b.

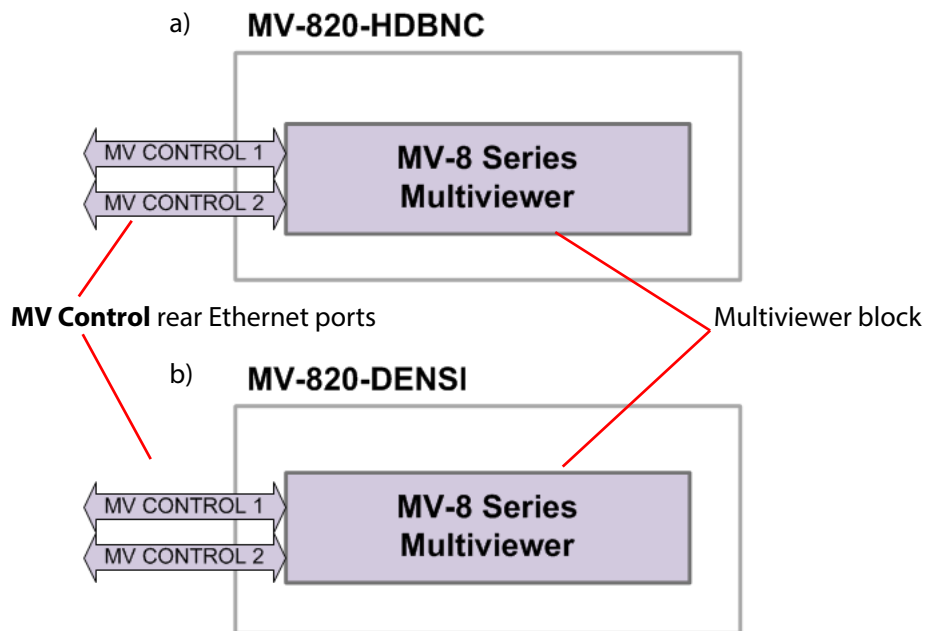


Figure 9 MV-820 - Controllable Units:  
a) MV-820-HDBNC.  
b) MV-820-DENSI.



### 1.3.5.2 MV-820-IP Control Interface

A MV-820-IP unit contains a multiviewer block and also has four integrated video IP blocks, which convert video IP streams to internal SDI video streams. Each video IP block forms a separate block from a control perspective. See Figure 10.

Control and configuration of these different blocks uses different rear Ethernet connectors:

- **Multiviewer** - use either of the two rear **'MV Control'** Ethernet ports.
- **Video IP** - use either of the two rear **'Control A'** and **'Control B'** Ethernet ports.

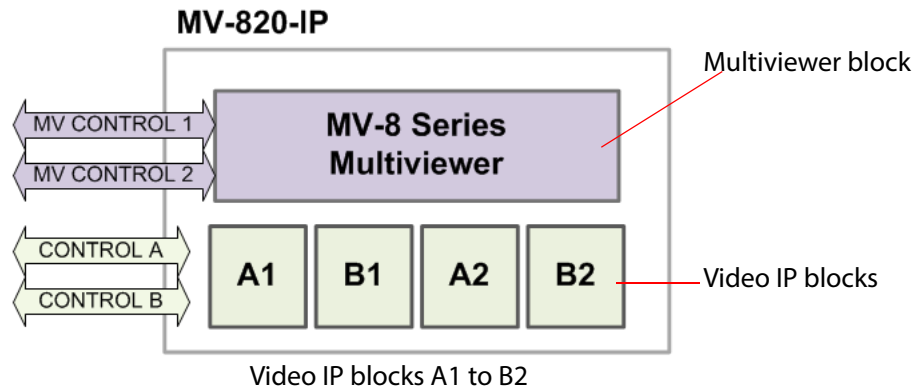


Figure 10 MV-820-IP Controllable Blocks - Multiviewer and Video IP

Each Video IP block has an internal control Ethernet connection. Each control connection and the two rear Ethernet ports ('Control A' and 'Control B') connect to an internal Ethernet switch, which allows any one of the control connections to be accessed via either of the rear 'Control A' or 'Control B' connectors. See Figure 11.

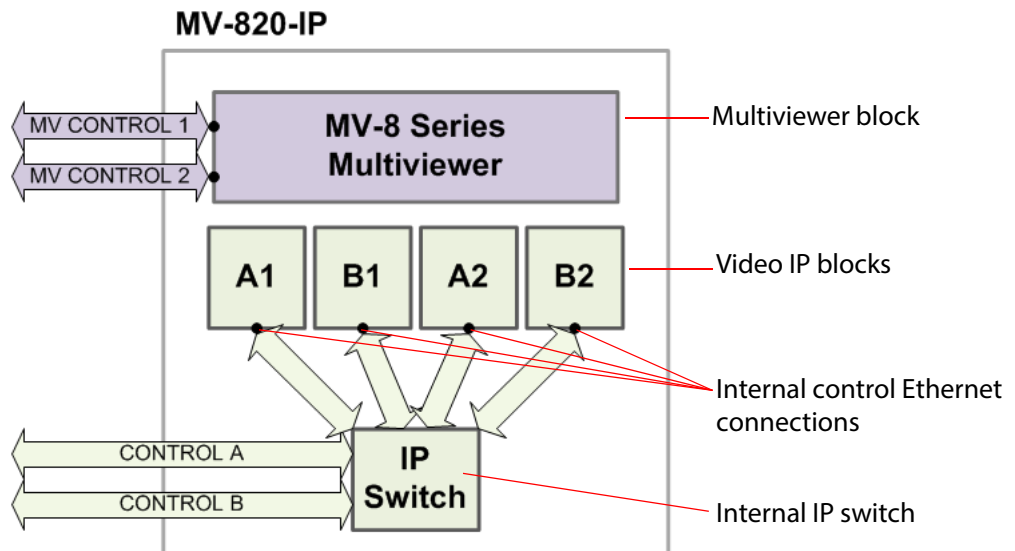


Figure 11 Control of Video IP Blocks via Internal IP Switch

Additionally, a Video IP block's control interface may be accessed via either of its media network connections.

## 1.4 MV-820-IP: Input Video IP Streams and Head Output IP Streams

Multiviewer video inputs 1 to 24,  
and Head Display Outputs 1 to 8.

Multiviewer video inputs 25 to 48,  
and Head Display Outputs 9 to 12.

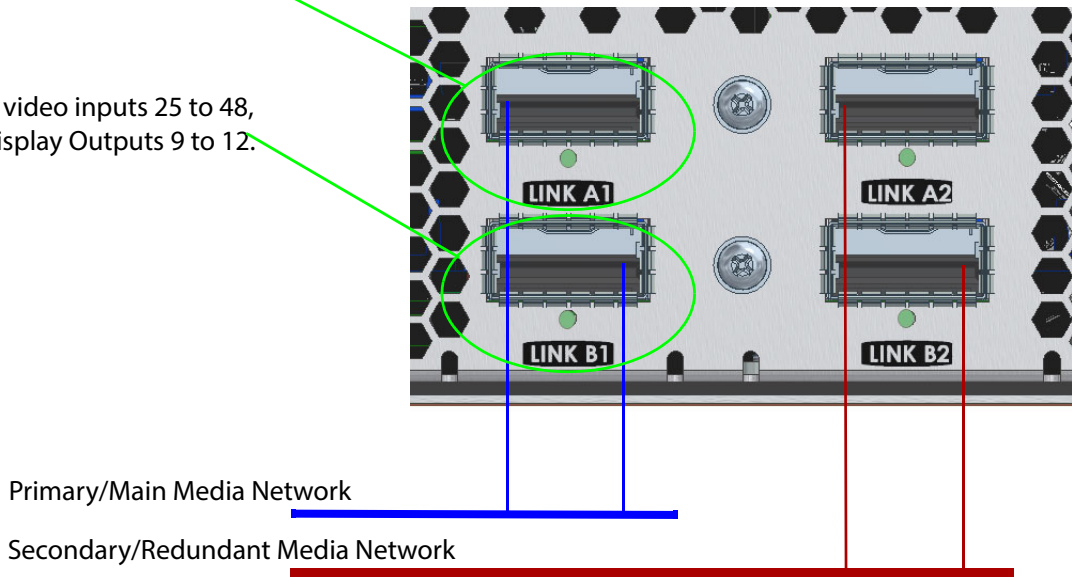


Figure 12 Four Rear Panel QSFP Cages

### 1.4.1 IP Input and Output Streaming

The Video IP circuitry has bi-directional network connections and the MV-820-IP unit can receive up to 48 video IP stream inputs (multiviewer inputs comprising video, audio and metadata IP flows) over its media network connections for display on the MV-820-IP unit’s multiviewer head display outputs (i.e. on a video wall).

Additionally, the Video IP circuitry can source full-resolution, video-IP-stream versions of each multiviewer head display output (head display outputs 1 to 12) and transmit on media network connections. Four streamed head display outputs are sourced from three of the four Video IP blocks for a total of 12 streamed head display outputs. Four such IP head outputs are available as standard; further IP head outputs are licensable.

Table 2 lists the video IP streams passing through each rear media network connector.

Figure 13 shows the media network connections, video input IP streams and multiviewer head display output IP streams for a case with no redundancy and using ‘Link A1’ and ‘Link B1’. If ‘Link A2’ and ‘Link B2’ are used in addition (i.e. for redundancy), then the multiviewer display output IP streams appear on those network connections in a similar way.

Table 2 Video Inputs/Head Display Outputs on the Four Rear QSFP Cages on MV-820-IP Unit

	Upper Left	Upper Right
<b>Label</b>	LINK A1	LINK A2
<b>Video Inputs</b>	1 to 12, and 13 to 24	1 to 12, and 13 to 24
<b>Head Display Outputs</b>	5 to 8, and 1 to 4	5 to 8, and 1 to 4
	Lower Left	Lower Right
<b>Label</b>	LINK B1	LINK B2
<b>Video Inputs</b>	25 to 36, and 37 to 48	25 to 36, and 37 to 48
<b>Head Display Outputs</b>	9 to 12	9 to 12

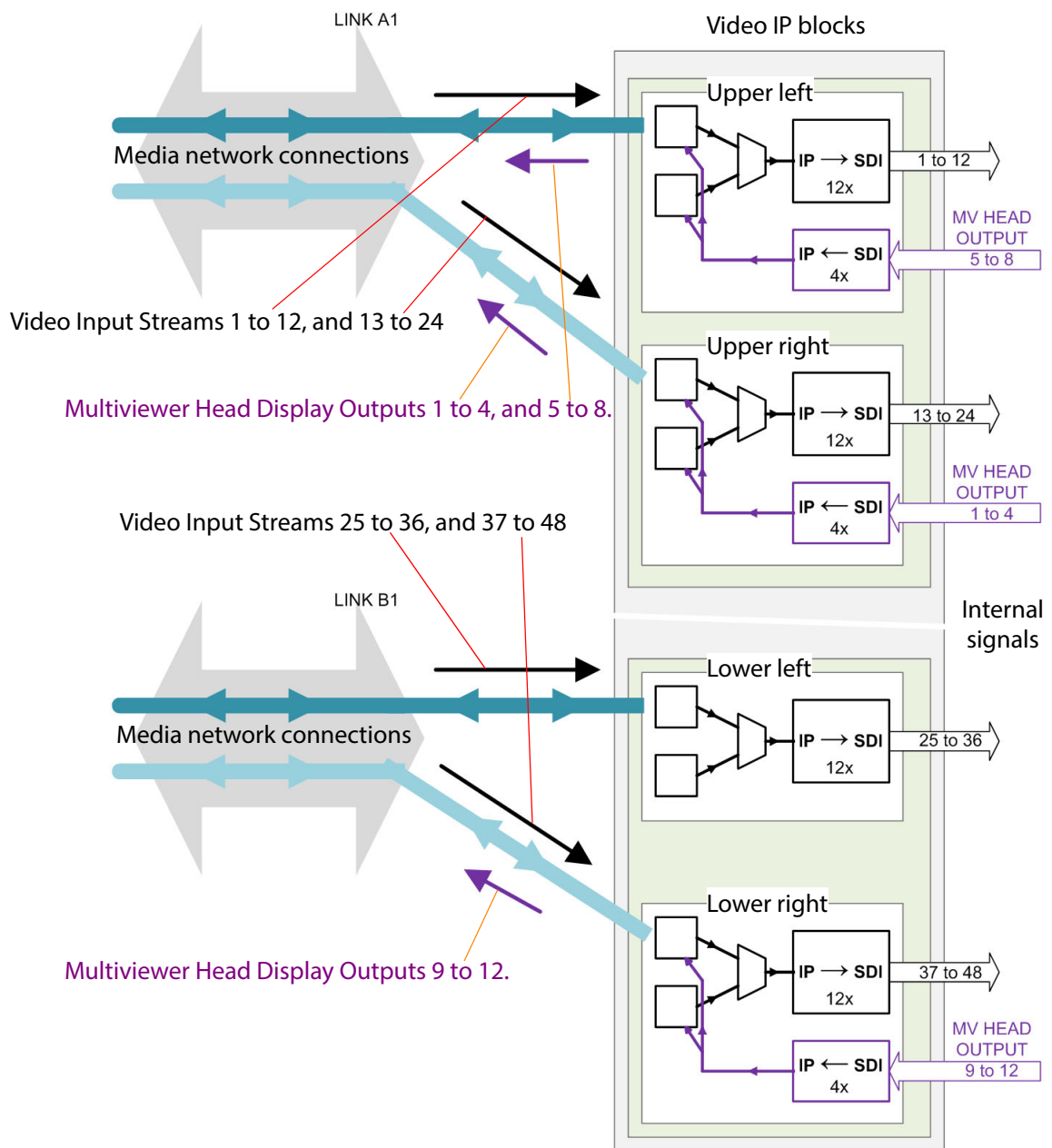


Figure 13 Video IP Blocks Sourcing Full-Resolution Multiviewer Display Outputs

## 1.4.2 IP Routing Control

The Video IP block can be configured for 'in-band' or 'out-of-band' control. Use rear connectors 'Control A' and 'Control B' for out-of-band control.

## 1.4.3 IP System Applications

The MV-820-IP unit can be used in the following IP system applications:

- Simple manual control of the video input routing and with static IP addresses.
- Grass Valley IP routing system with an IP Routing System Controller (IP-RSC) Unit.
- Third-party system using a Grass Valley IQTIC card and the Grass Valley open-API 'SDC-01' protocol.

## 1.5 Reference Timing

The analog reference inputs can be used to lock the multiviewer's display outputs and used as the reference for the video inputs.

For the MV-820-IP model, there is only one analog reference input and PTP can also be used as the reference for the Video IP blocks.

## 1.6 Terminology

### 1.6.1 Multiviewer Terminology

---

*Refer To:* 'MV-8 Series Multiviewer' user manual  
for a glossary of multiviewer terminology.

---

### 1.6.2 IP Routing Terminology

See [IP Routing Terminology](#) on page 158 for some IP routing terminology.

## 1.7 MV-820 Set up

### 1.7.1 Hardware Installation

Hardware installation is described in [Hardware Installation](#) on page 42.

### 1.7.2 Multiviewer Block Configuration

Each MV-820 unit's multiviewer block is configured separately: The MV-8 Series multiviewer functionality is a separate, independent sub-system within the unit.

Typically, a new MV-820 multiviewer will be using a default IP address (10.54.31.221, 10.54.31.226 or 10.54.31.231) on Ethernet port 1 ("1G1") for its MV-8 Series multiviewer. See Appendix A [Ethernet Rear Panel Connectors](#) on page 152:

- See [MV-820-HDBNC and MV-820-DENSI Ethernet Connectors](#) on page 152, for default IP addresses on "1G1" Ethernet ports for MV-820-HDBNC and -DENSI products.
- See [MV-820-IP Ethernet Connector Interfaces](#) on page 153, for default IP addresses on "1G1" Ethernet ports for MV-820-IP products.

Initial configuration and set up of the MV-820 multiviewer is done via Grass Valley's RollCall Control Panel application and the unit's RollCall templates. See the 'MV-8 Series Multiviewer' user manual, in the section about RollCall templates and "Getting Started".

---

*Refer To:* 'MV-8 Series Multiviewer' user manual  
for information about MV-820 multiviewer block RollCall  
templates and getting started with the multiviewer block.

---

### 1.7.3 Multiviewer Block Configuration Screens (RollCall Templates)

Following the initial configuration of the MV-820 multiviewer block, the RollCall Control Panel tool may then be used to access RollCall templates and control various other MV-820 multiviewer block items, including:

- selection of video wall layouts;
- monitoring alarm status;
- acknowledging alarms; and
- control of timer widgets on the video wall.

Refer to the 'MV-8 Series Multiviewer' user manual for full details of the MV-820 module's multiviewer block RollCall templates and configuration information.

### 1.7.4 MV-820-IP Video IP Block Configuration

Initial setting up of each of an MV-820-IP unit's Video IP blocks is done via Grass Valley's RollCall Control Panel application.

- For a description of the RollCall Video IP block templates, see [RollCall Templates for Video IP Blocks](#) on page 51.
- For instruction on getting started, see [Getting Started](#) on page 118.

## 1.7.5 Multiviewer Video Wall Design

The layout and style of the MV-820 video walls are designed with the Orbit software application. Wall designs are stored as individual projects (Orbit projects), which are pushed to an MV-820 unit for use.

Multiple wall layout designs may be generated and stored on a PC. Different wall designs can then be pushed to the multiviewer for various MV-820 multiviewer user-case applications.

---

*Refer To:* 'MV-8 Series Multiviewer' user manual  
for information about the design and management of MV-820  
multiviewer video wall layouts with the Orbit application.

*Refer To:* 'Orbit - Introduction' and 'Orbit for Multiviewers' user manuals  
for information about using the Orbit tool.

---

## 1.8 Maintenance

### 1.8.1 Multiviewer Licensing

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*Refer To:* 'MV-8 Series Multiviewer' user manual  
for information about licensing the MV-820 multiviewer.

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### 1.8.2 Multiviewer Software Upgrade

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*Refer To:* 'MV-8 Series Multiviewer' user manual  
for information about software upgrading the MV-820 multiviewer.

---

The MV-820-IP product comprises one multiviewer block and four Video IP blocks which must be controlled/ configured and upgraded separately. See Table 3.

*Table 3 Network Connections to use for Control/ Configuration/ Upgrade*

Product	Rear Network Connection...	for Control/ Configuration/ Upgrade of:
<b>MV-820-HDBNC</b>	MV CONTROL 1, MV CONTROL 2	Multiviewer block
<b>MV-820-DENSI</b>	MV CONTROL 1, MV CONTROL 2	Multiviewer block
<b>MV-820-IP</b>	MV CONTROL 1, MV CONTROL 2	Multiviewer block
	CONTROL A, CONTROL B	Video IP blocks, see <b>Note 1</b> .
<b>Note 1:</b> Video IP block control/configuration may also use the media network connections.		

---

Note:

Information about:

- The MV-820 Multiviewer block (software version, serial number etc) is displayed on the multiviewer block's RollCall **System - Setup** template screen.
  - All Video IP blocks (MV-820-IP only) is displayed on the respective Video IP block RollCall **Set Up** template screen.
-

## **1.9 MV-800-DT Desktop Multiviewer Option**

The MV-800-DT desktop multiviewer provides live video wall capabilities to a PC, extending the capabilities of a MV-820. It is used with the Grass Valley Orbit software. Live information on a MV-800-DT video wall includes video, audio levels and alarms. The MV-800-DT video wall can display live video from one or more MV-8X0 multiviewer units. It can show the same video wall as an MV-8X0 Multiviewer unit or it can show a different video wall layout.

See the 'MV-8 Series Multiviewer' user manual for more information.



# 2 Hardware Chassis and Connectors



This section describes the MV-820 Multiviewer from the outside and contains information on:

• 2.1	“Unpacking”	page 21
• 2.2	“Chassis Overview”	page 22
• 2.3	“Chassis Front”	page 24
• 2.4	“Front Controls and Indicators”	page 26
• 2.5	“Rear Panel - MV-820-HDBNC”	page 28
• 2.6	“Rear Panel - MV-820-DENSI”	page 30
• 2.7	“Rear Panel - MV-820-IP”	page 31
• 2.8	“Rear Panel Connectors”	page 33

## 2.1 Unpacking

The MV-820 Multiviewer is supplied in dedicated packaging provided by the manufacturer and should not be accepted if delivered in inferior or unauthorized materials.

1. Carefully unpack the system components and check them against the packing list. An MV-820 Quick Setup Guide is shipped with the unit. If there is anything incorrect, then notify your Grass Valley Partner, or Grass Valley, at once.
2. Check that the equipment has not been damaged in transit. If any damage has occurred notify your Grass Valley Partner (or Grass Valley directly) and the carrier immediately.
3. Always retain the original packing materials if possible, they could prove useful should it ever be necessary to transport or ship the equipment.
4. Always read the installation guide and the user instructions (separate manual) carefully, it will provide you with helpful hints and tips about care and maintenance and help you get the most out of your MV-820 Multiviewer.

In the unlikely event of an equipment failure, contact your Grass Valley Partner, or Grass Valley, at once, contact details are at the start of this manual, see [Grass Valley Technical Support](#) on page 162.

## 2.2 Chassis Overview

The MV-820 Multiviewer is a 2RU 19" rack-mount chassis with connectors at the rear, see Figure 14, Figure 15, and Figure 16 showing the different product versions which cover different video input types.

Note:

### Product Versions MV-820-HDBNC, MV-820-DENSI, and MV-820-IP:

- The products contain the same 48-input multiviewer core function.
- The products have different rear panels, with some different rear panel video input connectors.
- Each product contains dedicated video input circuitry.
- The products are not modular and cannot be converted from one version to another.

The MV-820 has a door at the front. The door has a grille and integral cooling fans for the MV-820 unit. The chassis is air-cooled and the airflow is front-to-back.

On the rear, there are two power inlets and an array of video, control and data signal connectors.

Some rear connections use quad small form-factor pluggable (QSFP28) plug-in transceiver modules for video input IP streams.

Some rear connections use small form-factor pluggable (SFP) plug-in modules (for the multiviewer control).



### Optical Output Warnings:

**Warning:** With some SFP or QSFP28 modules fitted, the MV-820 may be equipped with optical input/outputs which contain low-power laser beams.

**Warning:** Do not look into an optical output. Laser radiation can cause irreversible and permanent damage of eyesight.

**Warning:** Do not look at the end of a fiber to see if light is coming out. Use optical instrumentation.

**Warning:** Unused optical outputs should be covered, to prevent direct exposure to the laser beam.

There are two dual-redundant power supply units (PSU's) in the chassis. These are removable from the rear of the chassis.

For chassis dimensions, see [MV-820 Dimensions](#) on page 156.



48 HD-BNC video input connectors

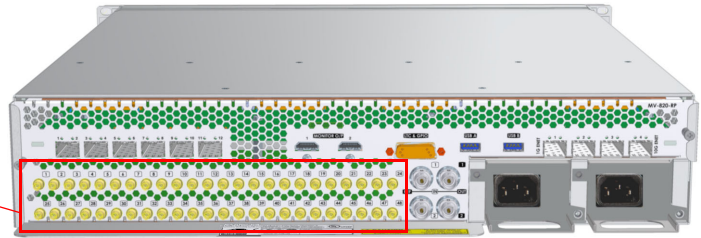


Figure 14 MV-820 Multiviewer views - MV-820-HDBNC



6-off 8-way DensiShield video input connectors

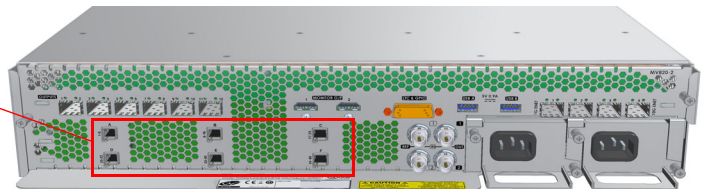


Figure 15 MV-820 Multiviewer views - MV-820-DENSI



4-off QSF+ cages for video IP input connections (via QSF28 transceiver modules)

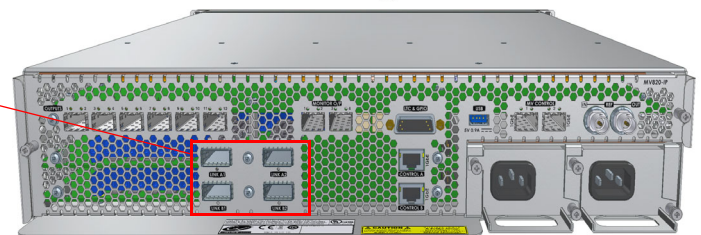


Figure 16 MV-820 Multiviewer views - MV-820-IP

## 2.3 Chassis Front

The front door has two knurled fastening screws and a grille, behind which are fitted four fans which draw air in at the front, see Figure 17.

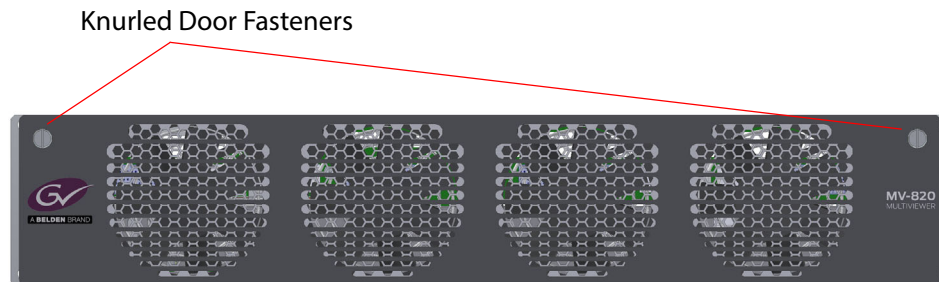


Figure 17 MV-820 Multiviewer Front View, Door Closed (MV-820-HDBNC shown)

### 2.3.1 To Open the Front Door

1. Unscrew the two captive knurled door fasteners, see Figure 17.
2. Pull the door outwards about 2 cm and then down. The door hinges along its bottom edge. See Figure 18. When the door is open, the door fans and the fan supply wires are visible.

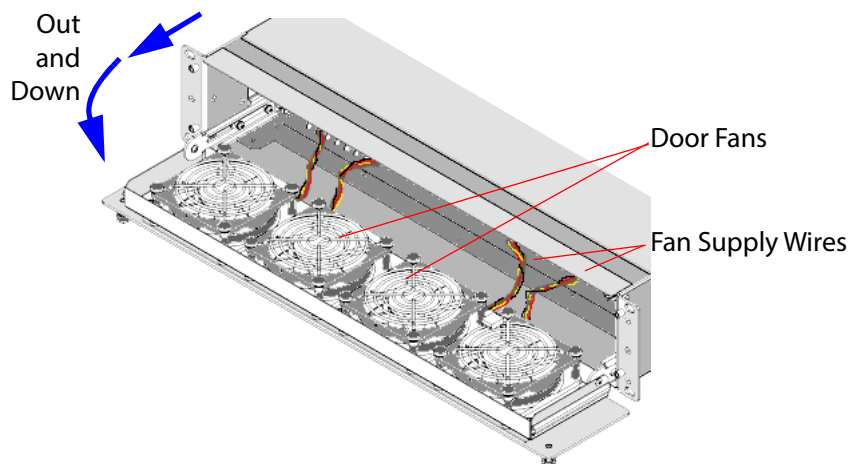


Figure 18 MV-820 Multiviewer - Front Door Open, Hinged Down

## 2.3.2 To Close the Front Door

Before closing the door:

1. Check that the fan supply wires are all connected to the front edge of the MV-820 Main Module. See Figure 19.

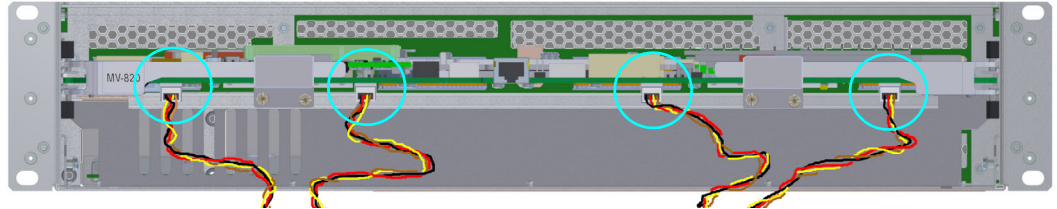


Figure 19 Fan Supply Wires Connected to front of the Main Module

Closing the door:

2. Pull the door upwards into a vertical position (the door hinges along its bottom edge) and then push it fully into the front of the chassis.
3. Secure the door by tightening the two captive knurled door fasteners.

Keep the front door closed when the equipment is powered, to maintain cooling airflow.



### **Close the Door:**

Always keep the MV-820 front door closed. This ensures correct ventilation and operation of the equipment.

The integral door fans ensure cooling airflow through the MV-820 chassis when the door is properly closed.

When the front door is open, there is no cooling airflow through the frame. Do not leave the door open for longer than 45 seconds.

## 2.4 Front Controls and Indicators

With the front door open and dropped down, a front main card can be seen in the top half of the chassis frame. This is the MV-820 Main Module, see Figure 20.

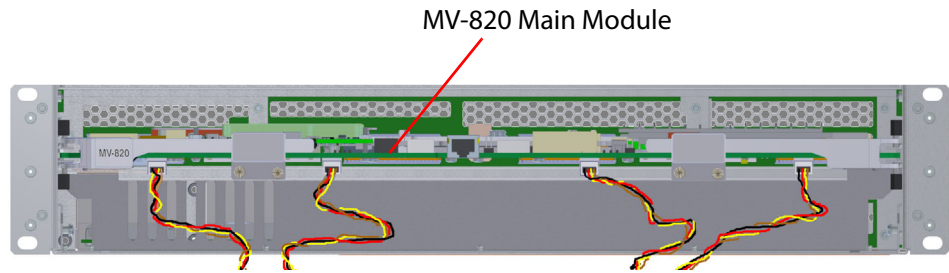


Figure 20 MV-820 Multiviewer Front View with Front Door Open

**Note:** The front door should not need to be opened in normal operation. And the MV-820 Main Module is not a serviceable item.  
Close the front door when the equipment is powered, to maintain cooling airflow.

LED status indicators are on the front edge of the main card within the MV-820 chassis and are viewed by opening the front door. Figure 21 shows the front edge of the module and Table 4 lists the LED color codes for the the MV-820 Main Module.

Along the underside of the card are four header connectors. These supply power for the front door fans. See Figure 21.

Other DIP switches and connectors along the front edge are for engineering use only.

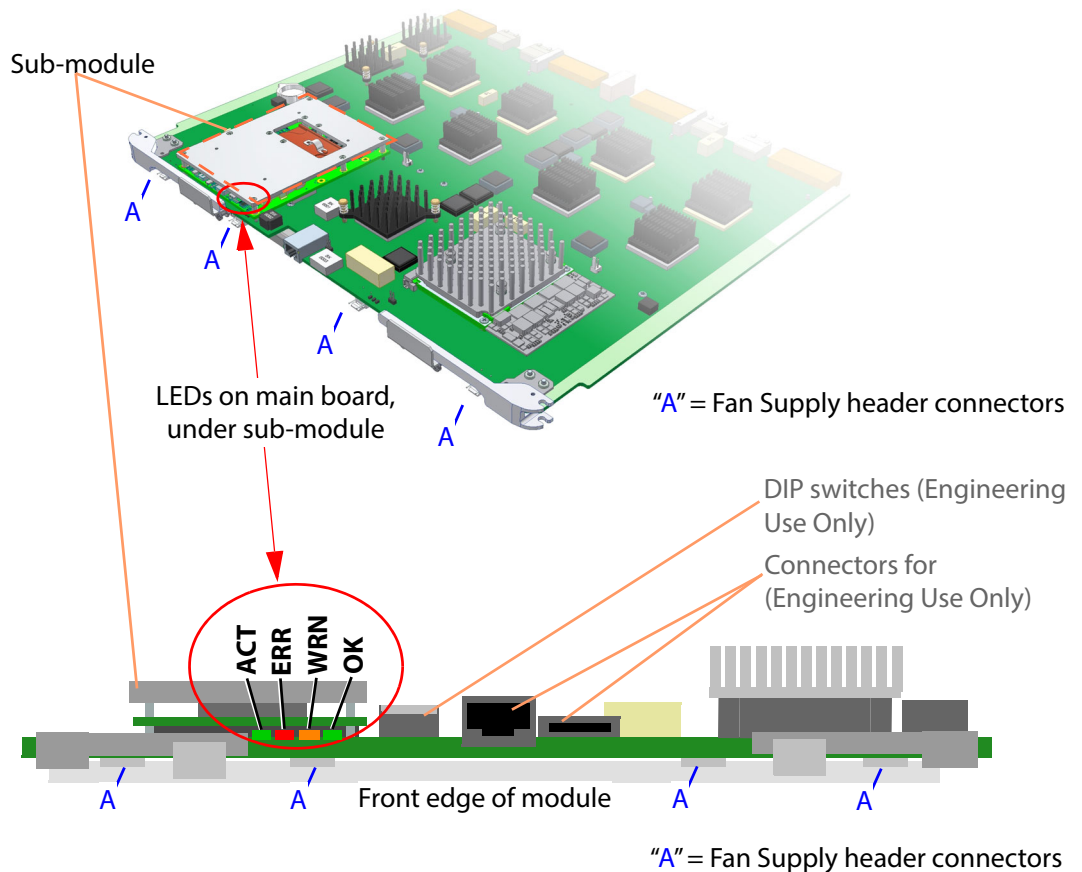


Figure 21 MV-820 Main Module - Status Indicating LEDs and Fan Supply Headers

Table 4 MV-820 Multiviewer Main Module Status LED Information

Label	LED Color	Detail	Status
ACT	Green	"CPU Activity"	<p><b>Flashing (2Hz):</b> CPU heartbeat, working correctly.</p> <p><b>Solid On or Off:</b> Software fault detected. Contact Grass Valley Customer Support, see <a href="#">Grass Valley Technical Support</a> on page 162.</p>
ERR	Red	Error	<p><b>Off:</b> Working correctly.</p> <p><b>On:</b> Hardware fault detected. Contact Grass Valley Customer Support, see <a href="#">Grass Valley Technical Support</a> on page 162.</p>
WRN	Amber	Over Temperature Warning	<p><b>Off:</b> Working correctly.</p> <p><b>On:</b> MV-820 module overheating. Ensure the chassis front door is closed and the fans are all operating correctly.</p>
OK	Green	Hardware Communications Status	<p><b>Solid On:</b> Working correctly.</p> <p><b>Flashing (2Hz):</b> Hardware communications fault detected. Contact Grass Valley Customer Support, see <a href="#">Grass Valley Technical Support</a> on page 162.</p>

**Fan Supply headers:**

The front door fan supply wires connect to the four small headers on the underside of the front of the card.

**DIP switches:**

The four DIP switches are not used. Check that all four switches are in the "up" position.

**Engineering connectors:**

There are two other connectors on the front edge of the module, see Figure 21. These are for Engineering use only and should not be used.

**Electrostatic Damage**

Static precautions must be observed when touching or handling modules.

## 2.5 Rear Panel - MV-820-HDBNC

The MV-820-HDBNC Rear Panel is shown in Figure 22. The rear panel houses various video, data and control connectors and two power supply modules (PSUs). Each PSU module is fitted into the unit from the rear and houses an IEC mains inlet.

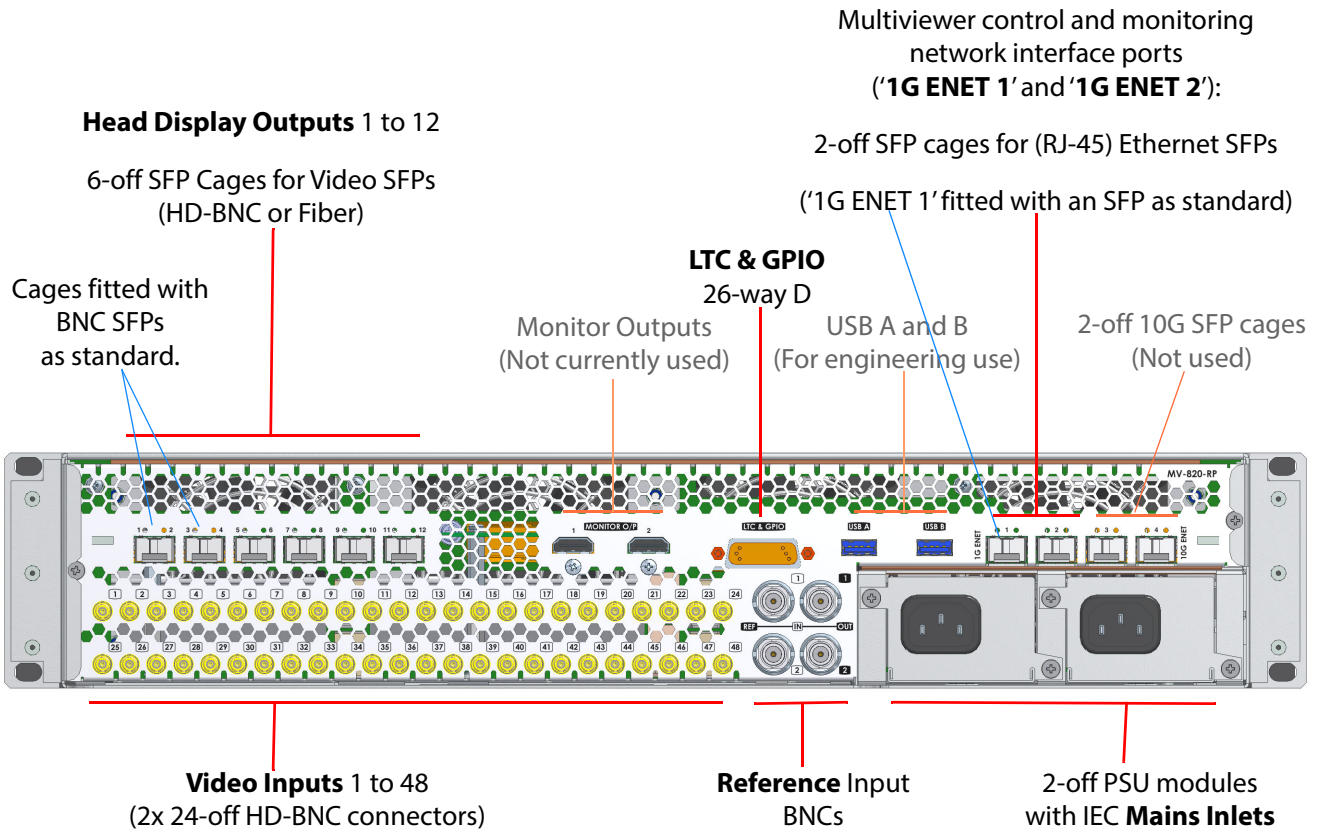


Figure 22 MV-820-HDBNC Rear Panel



Table 5 MV-820 Rear Connectors

MV-820-HDBNC Connection	Description
<b>Video Inputs 1 to 48</b>	48-off HD-BNC video inputs. Two rows: Upper 1 to 24, Lower 25 to 48.  (See <a href="#">Rear Connectors - HD BNC Video Inputs</a> on page 33.)
<b>Reference 1 and 2</b>	4-off BNC's. Two Analog Reference inputs, numbered 1 and 2. Ref Input BNC and Ref "Loop-through" Output BNC per Reference.  (See <a href="#">Rear Connectors - BNC Reference Inputs</a> on page 36.)
<b>Mains Inlets</b>	2-off IEC mains inlets. One per PSU module.
<b>Head Display Outputs 1 to 12</b>	Multiviewer video wall outputs. 6-off SFP cages for outputs 1 to 12.  Two dual-BNC SFPs are fitted as standard< providing outputs 1 and 2, and outputs 3 and 4.  (See <a href="#">Rear Connectors - Head Display Outputs</a> on page 37.)
<b>Monitor Outputs 1 and 2</b>	2-off connectors. Not currently used
<b>USB A and B</b>	2-off USB connectors. For engineering use.
<b>'1G ENET 1' and '1G ENET 2'</b>	2-off SFP+ Ethernet cages for multiviewer control and monitoring: 1 Gbps, RJ45. ("1G1", "1G2")  '1G ENET 1' is fitted with an SFP as standard.  (See <a href="#">Rear Connectors - Network Interface Ports (Control and Monitoring)</a> on page 39.)
<b>10G ENET SFP cages 1 to 2</b>	2-off 10 Gbps, RJ45. ("1G3", "1G4". For future use.)
<b>LTC &amp; GPIO</b>	26 Way High Density "D" Type female connector.  (See Section <a href="#">Rear Connectors - LTC and GPI</a> on page 40 for more details, including pinout details.)

## 2.6 Rear Panel - MV-820-DENSI

The MV-820-DENSI rear panel is shown in Figure 23. The rear panel houses various video, data and control connectors and two power supply modules (PSUs). Each PSU module is fitted into the unit from the rear and houses an IEC mains inlet.

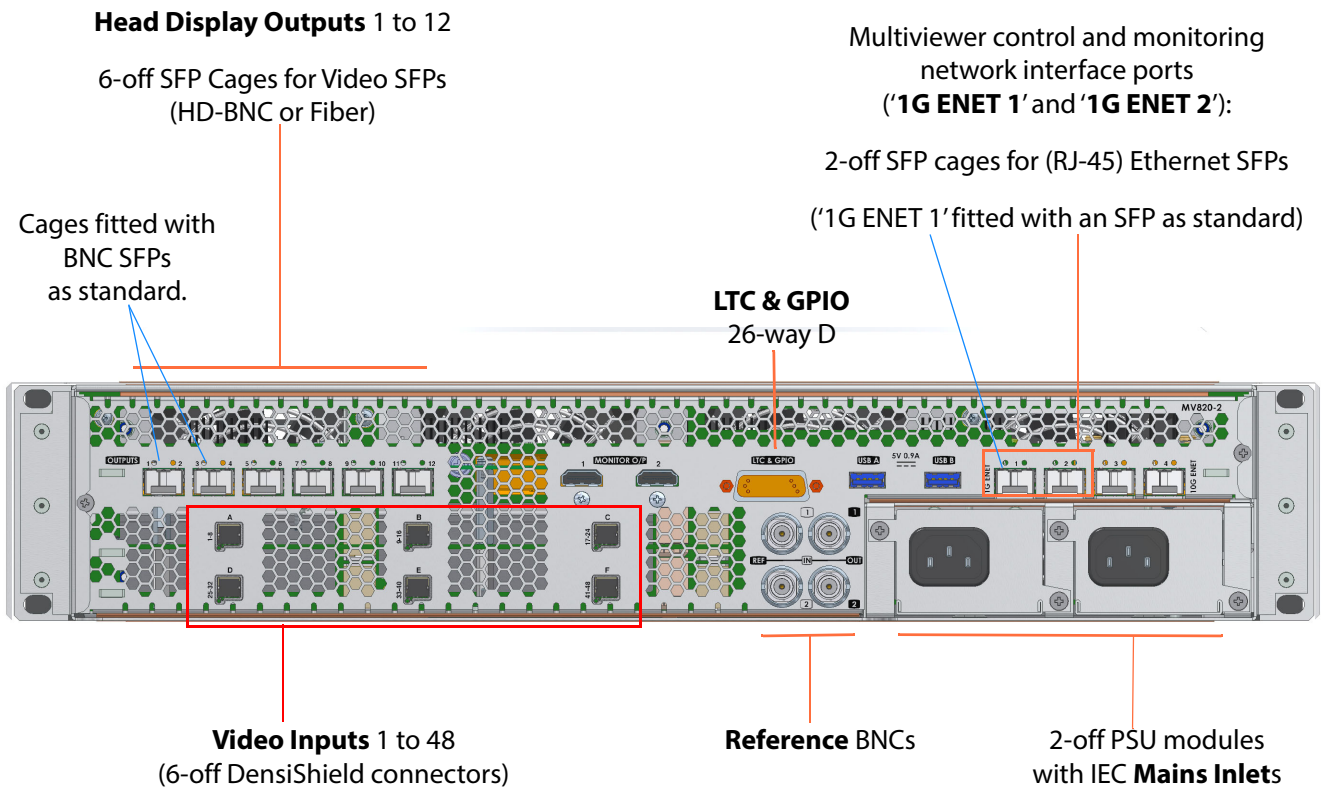


Figure 23 MV-820-DENSI Rear Panel

Table 6 MV-820-DENSI Rear Connectors

MV-820-DENSI Connection	Description
<b>Video Inputs 1 to 48</b>	6-off DensiShield connectors for 48-off video inputs.  (See <a href="#">Rear Connectors - DensiShield, Video Inputs</a> on page 33.)
<b>Reference 1 and 2</b>	See <b>Note 1.</b> (See <a href="#">Rear Connectors - BNC Reference Inputs</a> on page 36.)
<b>Mains Inlets</b>	See <b>Note 1.</b>
<b>Head Display Outputs 1 to 12</b>	See <b>Note 1.</b> (See <a href="#">Rear Connectors - Head Display Outputs</a> on page 37.)
<b>'1G ENET 1' and '1G ENET 2'</b>	2-off SFP+ Ethernet cages for multiviewer control and monitoring: 1 Gbps, RJ45. ("1G1", "1G2")  '1G ENET 1' is fitted with an SFP as standard.  See <b>Note 1.</b> (See <a href="#">Rear Connectors - Network Interface Ports (Control and Monitoring)</a> on page 39.)
<b>LTC &amp; GPIO</b>	See <b>Note 1.</b> (See <a href="#">Rear Connectors - LTC and GPI</a> on page 40 for more details, including pinout details.)
<b>Note 1:</b> Connector(s) are common to MV-820-DENSI and MV-820-HDBNC, see "MV-820 Rear Connectors" Table 5 on page 29.	

## 2.7 Rear Panel - MV-820-IP

The MV-820-IP Rear Panel is shown in Figure 24. The rear panel houses various video, data and control connectors and two power supply modules (PSUs). Each PSU module is fitted into the unit from the rear and houses an IEC mains inlet.

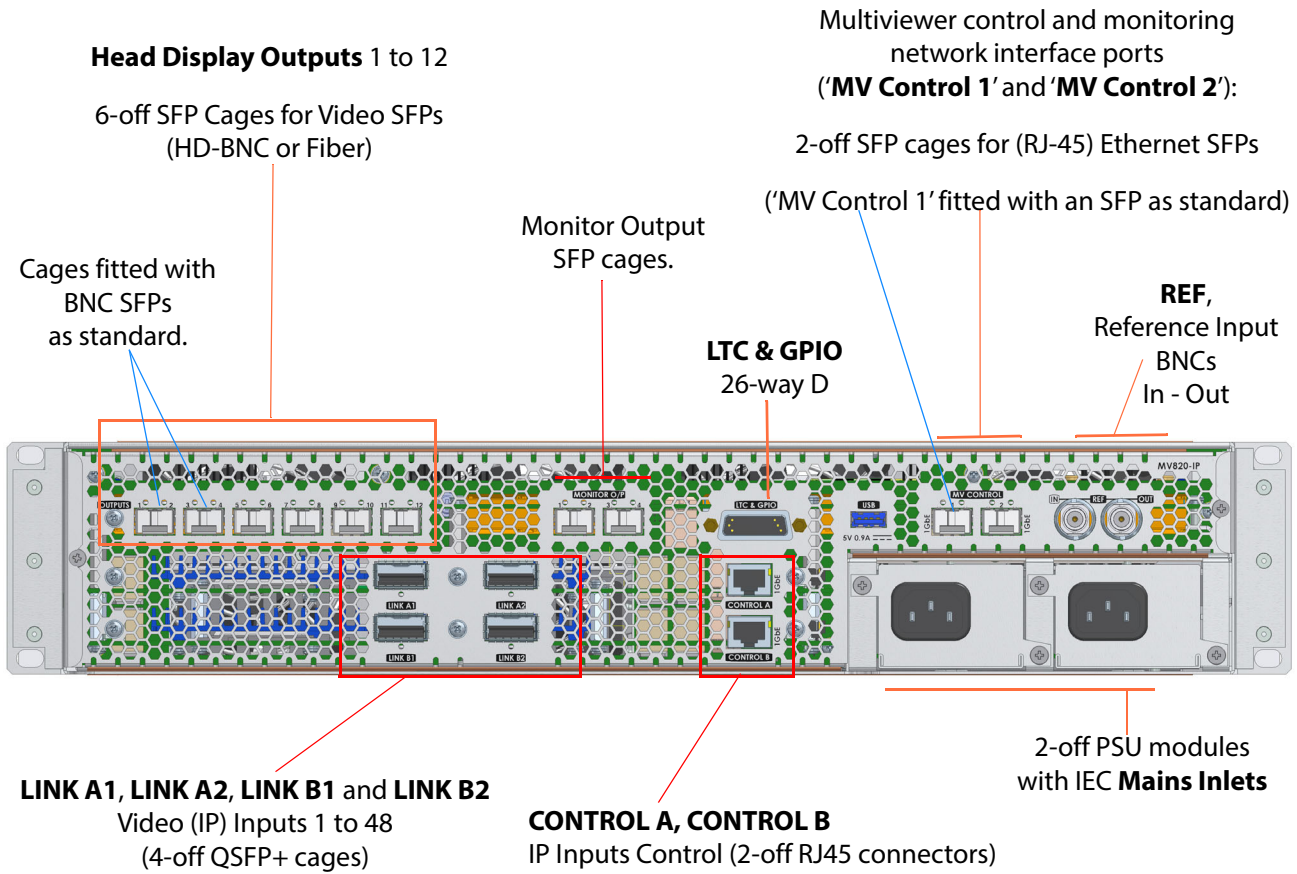


Figure 24 MV-820-IP Rear Panel

<b>LINK A1</b> Upper Left	<b>LINK A2</b> Upper Right
<b>LINK B1</b> Lower Left	<b>LINK B2</b> Lower Right

Table 7 MV-820-IP Rear Connectors

MV-820-IP Connection	Description
<b>LINK A1, LINK A2, LINK B1, LINK B2</b>	Video (IP) Inputs 1 to 48  4-off QSFP+ cages for QSFP28 transceiver modules.  These IP network connections are the carriers for 48-off video input IP streams.  <b>Note:</b> The QSFP28 transceiver modules are not fitted as standard and must be ordered separately.  (See <a href="#">Rear Connectors - Video IP Inputs</a> on page 34.)
<b>CONTROL A, CONTROL B</b>	IP Inputs control. 2-off RJ45 connectors for IP routing control network connections and service updates to the IP input circuitry.  (See <a href="#">Rear Connectors - Video IP Inputs</a> on page 34.)
<b>REF</b>	Single analogue reference input and loop-thru output. See <b>Note 1</b> .  (See <a href="#">Rear Connectors - BNC Reference Inputs</a> on page 36.)
<b>Mains Inlets</b>	See <b>Note 1</b> .
<b>Display Outputs 1 to 12</b>	See <b>Note 1</b> . (See <a href="#">Rear Connectors - Head Display Outputs</a> on page 37.)
<b>Monitor Outputs 1 to 2</b>	SFP cages for Monitor outputs, unused (for future use).
<b>MV Control 1, MV Control 2</b>	2-off SFP+ Ethernet cages for multiviewer control and monitoring: 1 Gbps. ("1G1", "1G2" on RollCall template.)  'MV Control 1' is fitted with a 1G RJ45 SFP as standard.  See <b>Note 1</b> . (See <a href="#">Rear Connectors - Network Interface Ports (Control and Monitoring)</a> on page 39.)
<b>LTC &amp; GPIO</b>	See <b>Note 1</b> .  (See <a href="#">Rear Connectors - LTC and GPI</a> on page 40 for more details, including pinout details.)
<b>Note 1:</b> Connector(s) are common to MV-820-IP and MV-820-HDBNC, see Table 5 on page 29.	

## 2.8 Rear Panel Connectors

### 2.8.1 Rear Connectors - HD BNC Video Inputs

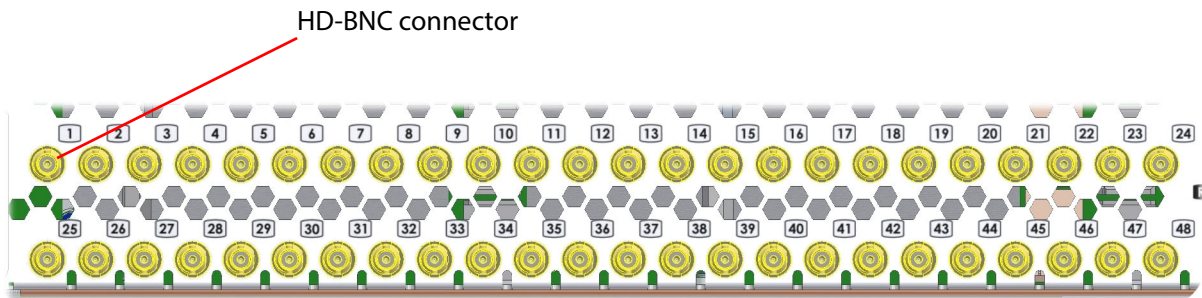


Figure 25 MV-820-HDBNC Video Input Connectors - 1 to 24, and 25 to 48

### 2.8.2 Rear Connectors - DensiShield, Video Inputs

High-density, 8-way connectors for Grass Valley equipment interconnection with Grass Valley DS-Link cables.

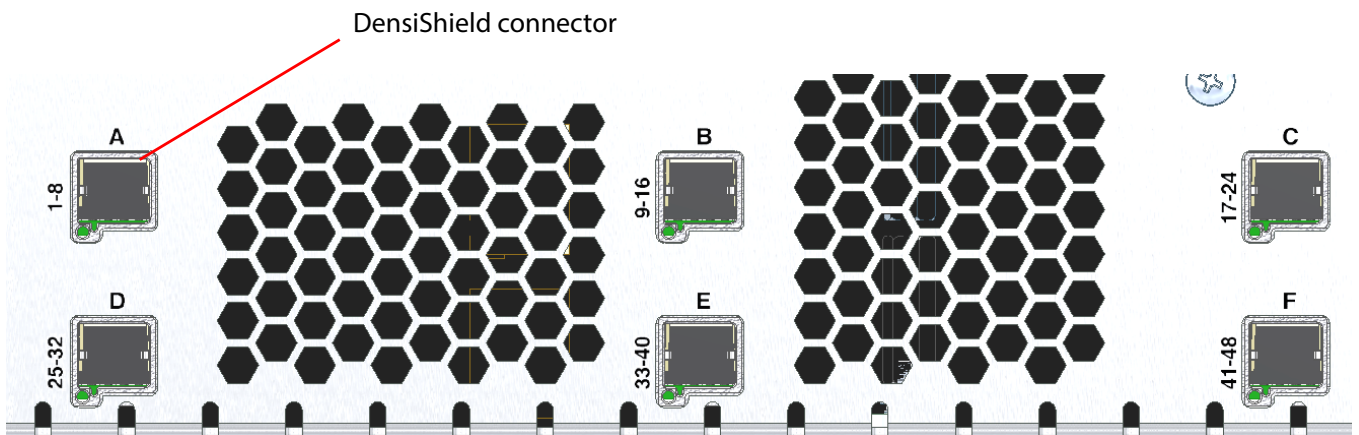


Figure 26 MV-820-DENSI Video Input Connectors A to C, and D to F

Table 8 Multiviewer Video Inputs and DensiShield Connectors

DensiShield Connector	Video Inputs
A	1 to 8
B	9 to 16
C	17 to 24
D	25 to 32
E	33 to 40
F	41 to 48

The high-density DensiShield connector contains 16 pins. The proprietary pinout supports the transport of 8-off SDI video signals, using suitable Grass Valley DS-Link multi-way cabling.

### 2.8.3 Rear Connectors - Video IP Inputs

The multiviewer video inputs are video signals comprising multicast IP streams and are routed by a video IP routing system. Video IP streams enter the MV-820-IP unit via QSFP28 transceiver modules at the QSFP+ cages on the rear ('Link A1' etc.).

IP routing control messages for the multiviewer video inputs are carried by a control IP network and have separate rear connections ('Control A' and 'Control B') for out-of-band control. Control connection may also be in-band, via each media IP interface.

For IP routing redundancy, two IP networks (fabrics) are used, "Fabric A" and "Fabric B" (also referred to as 'primary' and 'secondary' on RollCall templates).

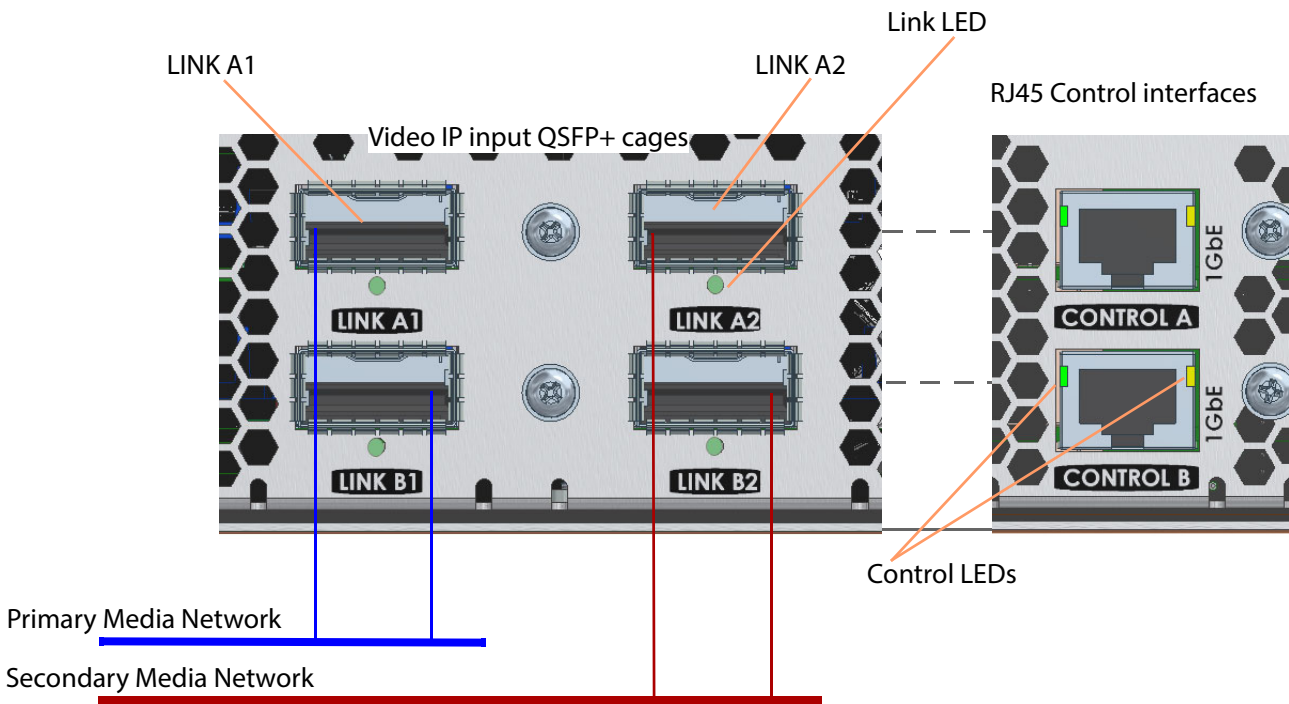


Figure 27 MV-820-IP Video Input Connectors - QSFP+ cages and RJ45 connectors

### 2.8.3.1 Connectors and LEDs

Table 9 Video IP Connectors

Physical Connector	Connector Type	Supported Network Connections	Comment
<b>Link A1</b>	QSFP+ cage	2-off 50G	Network connections for media IP streams - Video inputs 1 to 24. Use two physical connections for redundancy. <b>Note:</b> QSFP28 transceivers are required to fit the rear QSFP+ cages.
<b>Link A2</b>	QSFP+ cage	2-off 50G	
<b>Control A</b>	RJ45 Ethernet	1G	Control network connector for out-of-band control and upgrades to IP Input blocks. See Note 1.
<b>Link B1</b>	QSFP+ cage	2-off 50G	Similar to 'Link A1' and 'Link A2' but for video inputs 25 to 48.
<b>Link B2</b>	QSFP+ cage	2-off 50G	<b>Note:</b> QSFP28 transceivers are required to fit the rear QSFP+ cages.
<b>Control B</b>	RJ45 Ethernet	1G	Similar to 'Control A'. See Note 1.

**Note 1:** Control network connectors 'Control A' and 'Control B' are connected to a small, *internal* IP switch within the MV-820-IP unit. Either control network connector can provide a connection to the four Video IP Input blocks' control network interfaces.

Table 10 Video IP LEDs

LED	Color	Description
<b>Link A1, Link A2, Link B1, Link B2</b>		Single LED per QSFP+ cage.
	<b>Off</b>	No QSFP28 module fitted.
	<b>Flashing Blue</b>	Flashing blue. QSFP28 module fitted, but network link is down.
	<b>Blue</b>	Solid blue. QSFP28 module fitted and link is up.
<b>Control A and B</b>		Pair of LEDs.
	Left LED.	<b>Green</b> Flashes to show 1Gbit link activity.
	Right LED.	<b>Yellow</b> On when link is present.

### 2.8.3.2 Physical Link Connection and Network Interface Connections

Each physical "Link" network interface uses a QSFP28 transceiver module. This is overall a 100G link configured for 2x 50G network connection operation. Each 50G connection has sufficient bandwidth for 12-off 3G video IP streams.

Links A1 and A2 can provide 24-off video inputs to the multiviewer, with connection redundancy and 'make-before-break' switching capability. Links B1 and B2 similarly provide 24-off video inputs.

Each QSFP28 status is reported by one of the internal Video IP blocks via RollCall.

<b>LINK A1</b> Upper Left	<b>LINK A2</b> Upper Right
<b>LINK B1</b> Lower Left	<b>LINK B2</b> Lower Right

For a functional description on these network interfaces, see [MV-820-IP: Video IP Circuitry](#) on page 8 and [MV-820-IP Control Interface](#) on page 13.

### 2.8.4 Rear Connectors - BNC Reference Inputs

The Reference Inputs are unterminated. Termination should be done at the Reference Out connector with a 75 ohm termination, or the reference signal may be "looped through", via the Reference Out connector, and taken to another piece of equipment (where the signal must be terminated).

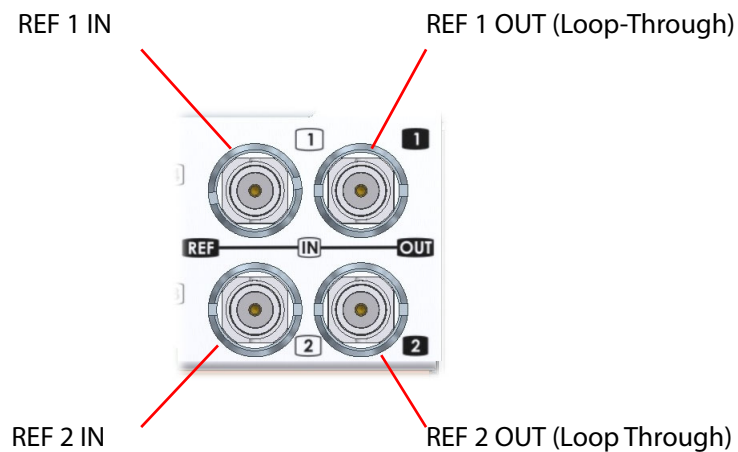


Figure 28 MV-820 Multiviewer Video Reference Connectors (MV-820-HDBNC shown)

The reference input is used for SDI video input timing and display output timing.

#### **MV-820-HDBNC and MV-820-DENSI:**

There are two analog Reference inputs and two loop outputs on MV-820-HDBNC and MV-820-DENSI product versions.

#### **MV-820-IP:**

There is one analog Reference Input and loop output on **MV-820-IP**. This can be used to lock the multiviewer display outputs. It can also be selected as the reference for the video IP inputs. (The video IP inputs can also use PTP as their reference timing.)



### 2.8.5 Rear Connectors - Mains Inlets

The IEC power inlets are the mains disconnection devices for this unit. Each power supply unit (PSU) has a status LED. See Table 11.

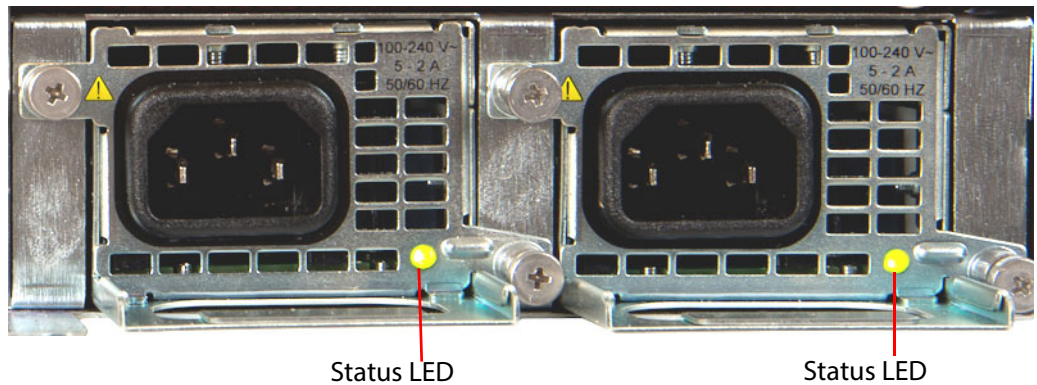


Figure 29 MV-820 Multiviewer IEC Mains Connectors

Table 11. PSU Status LED

Status	LED Color	Main Output	Standby Output	Other
Normal Operation	Green	ON	ON	-
Stand by	Flashing Green	Off	ON	AC Mains Present
Warning	Flashing Yellow	Over-current, Under-voltage, or Over-voltage warning		-
Fault	Yellow	Over-current, Under-voltage, or Over-voltage fault		Fan Fault or Over-temperature fault

### 2.8.6 Rear Connectors - Head Display Outputs

Head display outputs 1 to 12 come from Video SFPs fitted into the 6-off SFP cage positions. The SFPs fitted depend on which display output options have been purchased.

Different types of video SFP modules provide:

- 2-off SDI Coax outputs per SFP,
- or 2-off SDI Fiber outputs per SFP,
- or 1-off HDMI output per SFP.

SFP blanking plugs must be fitted if no SFP is present.

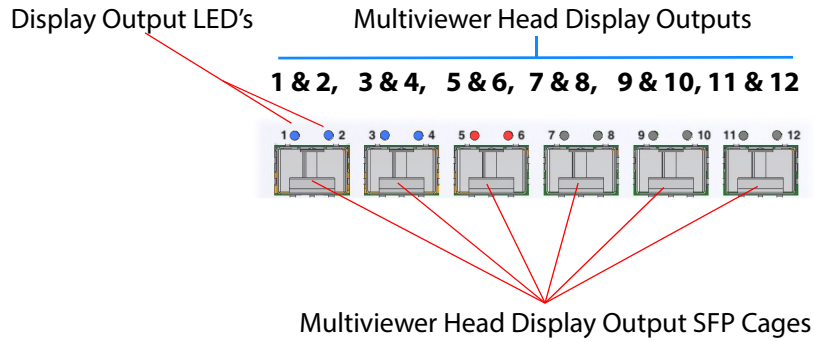


Figure 30 MV-820 Multiviewer Head Display Output SFP Cages

Each display output has an associated LED which indicates the output status. Table 12 describes the LED function.

Table 12 Head Display Output Status LED

LED Color	Status
Blue	Licensed Output; SFP Fitted. 1080p video output signal.
Blue/White at 1 Hz	Blue/white flashing at 1 Hz. Licensed Output; SFP Fitted. 1080p video output signal with embedded audio.
Green	Licensed Output; SFP Fitted. 720p video output signal.
Green/White at 1 Hz	Green/white flashing at 1 Hz. Licensed Output; SFP Fitted. 720p video output signal with embedded audio.
Red	Licensed Output; No SFP Fitted.
Off	Unlicensed output.
Red Green Flashing	Flashes Red/Green at 1Hz <i>during</i> an internal FPGA upgrade (part of a unit software upgrade).
Red Flashing	Flashes Red/Off at 1Hz <i>after</i> a unit software upgrade if: <ul style="list-style-type: none"> <li>internal FPGA upgrading was unsuccessful; or</li> <li>internal FPGAs fail to load during unit boot.</li> </ul> <p><b>Note:</b> A unit upgrade to the same version may be carried out to recover a unit if FPGA upgrading was unsuccessful. Otherwise, contact Grass Valley support.</p>

## 2.8.7 Rear Connectors - Network Interface Ports (Control and Monitoring)

Ports "1G1" and "1G2" are currently used. The other two ports are for future use.

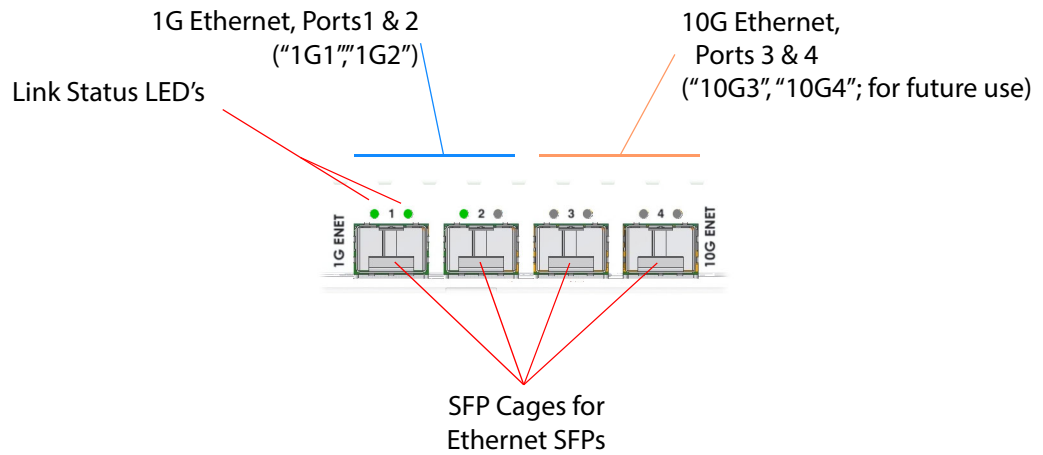








Figure 31 MV-820 Multiviewer Control and Monitoring Ethernet Port Connectors

There are 2 link status LED's associated with each Ethernet SFP module connector. Table 13 describes the LED function.

Table 13 Control and Monitoring Ethernet Port Status LEDs

Color	LEDs		Status
	○	○	
Green / Off			Ethernet link established
Green Solid / Flashing			Activity on Ethernet link
Off / Off			Establishing link, or unconnected.

## 2.8.8 Rear Connectors - LTC and GPI

### 2.8.8.1 LTC and GPIO Connector Pin-outs

Female high density 26 way 'D' type connector assignments

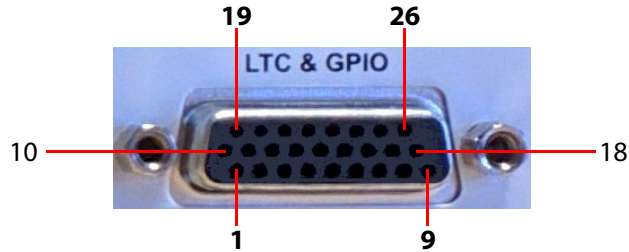


Figure 32 Female High Density 26 Way 'D' Type LTC and GPIO Connector

The following table gives the pin assignments for the LTC and GPIO connector:

Table 14 Female High Density 26 Way 'D' Type LTC and GPIO Connector

Pin Number	Signal	Pin Number	Signal
1	+5 Vdc Out	14	GND
2	+5 Vdc Out	15	GND
3	Do Not Connect	16	GND
4	nc	17	GND
5	nc	18	GND
6	Do Not Connect	19	nc
7	Do Not Connect	20	Do Not Connect
8	nc	21	nc
9	LTC+	22	GPI 1
10	nc	23	GPI 2
11	nc	24	GPI 3
12	nc	25	GPI 4
13	GND	26	LTC-

**Note:** 'nc' denotes a "not connected" connector pin.

**Note:**

MV-820 GPI outputs - Open collector outputs. Require external pull-up resistors of value between 10 kΩ and 100 kΩ. Each output can sink up to 100 mA.

- "+5 Vdc Out" pins are provided on the connector for this purpose.
- Maximum voltage, +5 V.
- See [Example: Driving LEDs from the GPI Outputs](#) on page 41 for an example of how GPI outputs can be used to drive LEDs.

**MV-820 GPI inputs** - Inputs have weak internal pull-down resistors.

- Can be driven by input voltages of up to +5 V.
- A logic "low" input is represented by an input voltage below +0.8 V.

### 2.8.8.2 Example: Driving LEDs from the GPI Outputs

MV-820 GPI outputs have open collector drivers. There is a +5 V DC pin on the GPIO connector to provide the power needed to drive LEDs or relays.

The following schematic is an example of the circuit needed to drive an LED by each GPI output. MV-820 GPIO connector pin names and numbers are shown on the left.

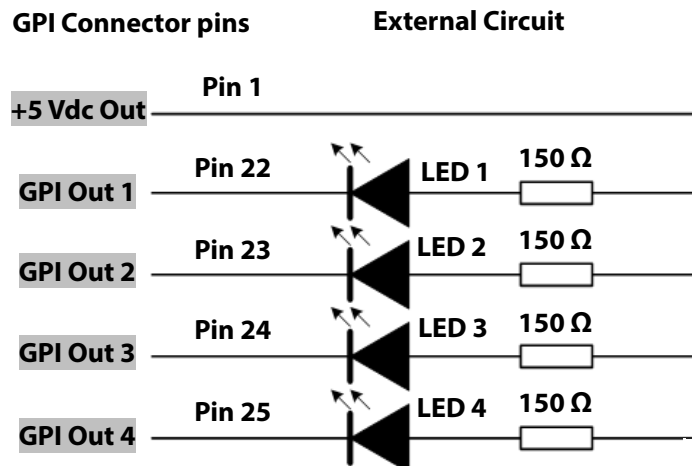


Figure 33 Connecting LEDs to GPI Outputs

# 3 Hardware Installation

## 3.1 Environmental Considerations

The ambient temperature for all the supplied equipment should not exceed the limits specified in [MV-820 Specification](#) on page 147.

Installing the equipment in a clean environment with moderate temperature and humidity will promote a long and trouble-free equipment life.

## 3.2 Chassis Dimensions

See:

- Appendix A [Overall Dimensions](#) on page 147.
- Appendix B [MV-820 Dimensions](#) on page 156 for a chassis dimension drawing.

### 3.3 Chassis Ventilation

The MV-820 Multiviewer is a 2RU 19" rack-mount chassis with front-to-back air cooling. Cooling fans are mounted in the chassis front door. Additionally, each PSU module has an internal variable-speed cooling fan.

Figure 34 shows the external chassis air flow and air intake and exhaust holes.

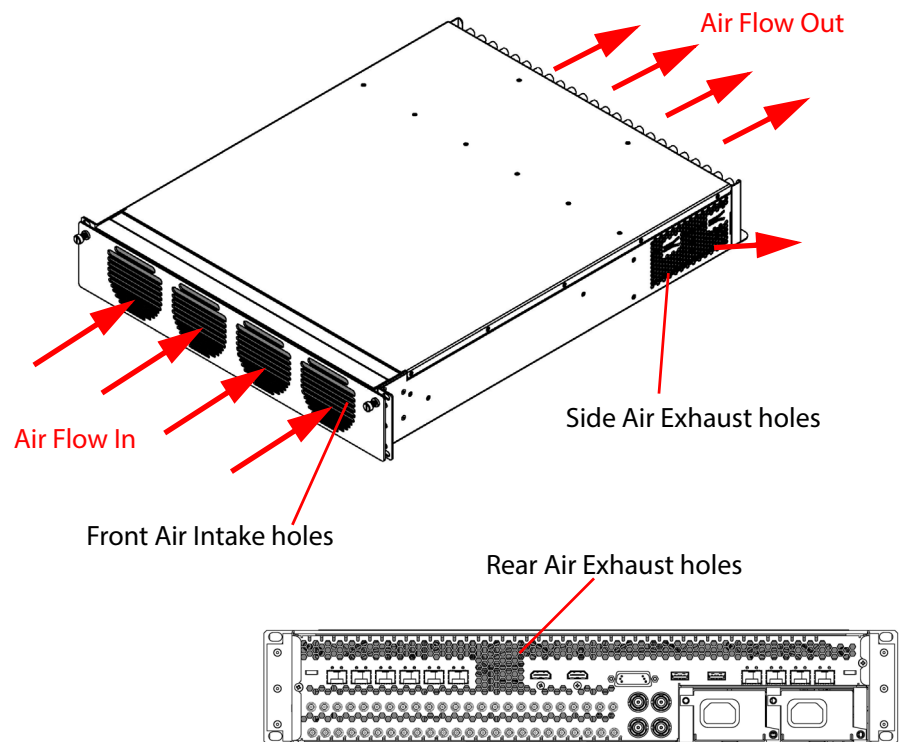


Figure 34 MV-820 Multiviewer Chassis Air Flow and Air Intake/Exhaust Holes

#### Important

Do not block MV-820 chassis air intake and exhaust holes. This allows for correct unit operation,

Figure 35 shows the internal chassis air flow.

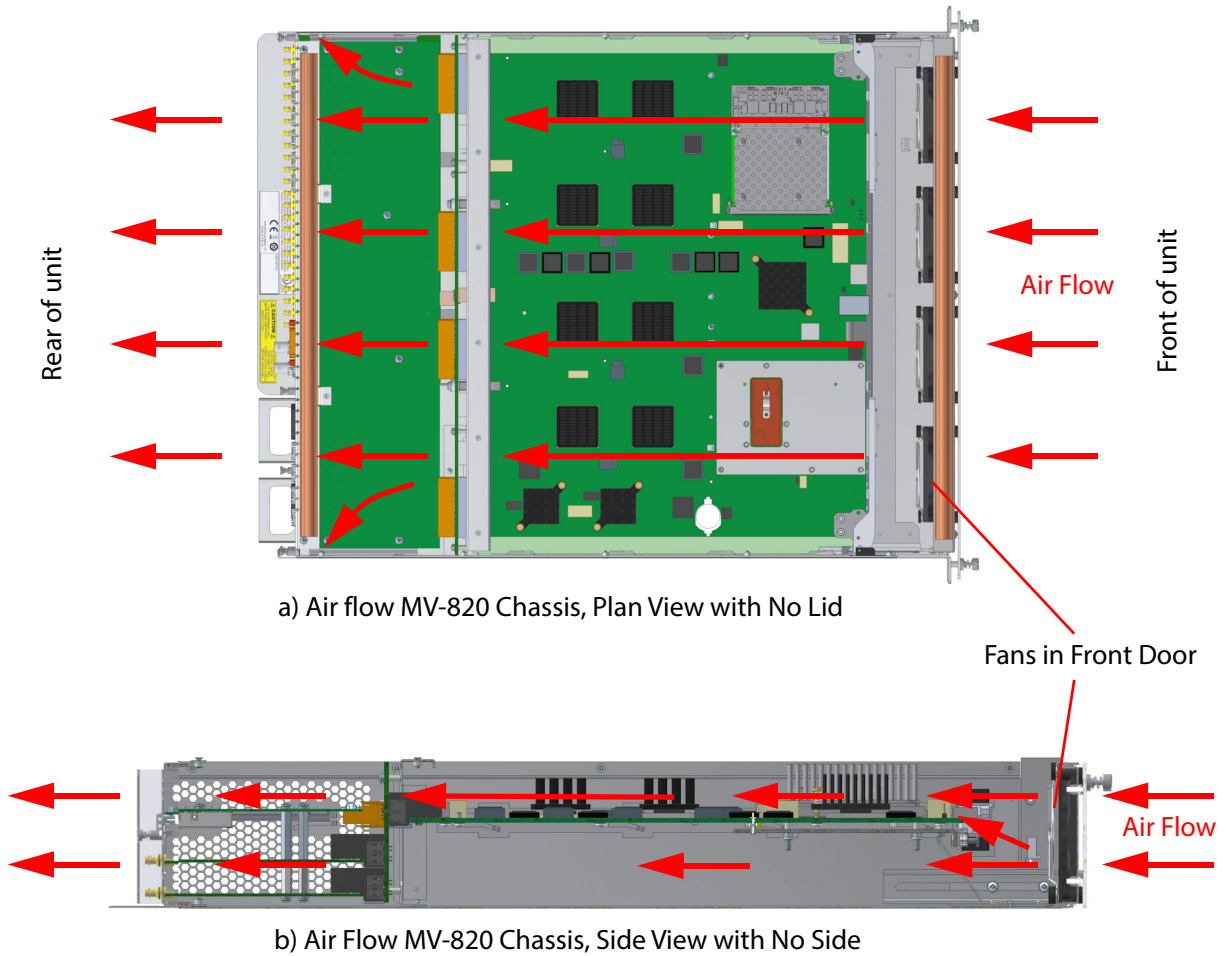


Figure 35 MV-820 Multiviewer Air Flow (MV-820-HDBNC shown)  
a) Chassis Plan View with No Lid.  
b) Chassis Side View with No Side.

### 3.3.1 Cooling Fan Failure

Cooling fan status is reported via RollCall logging messages and can be monitored by a control and monitoring system. Fan status is available to be shown on a multiviewer monitor wall and monitored.



**CAUTION**

If the cooling fans on the MV-820 Multiviewer should stop for any reason, then the unit should be switched off immediately. Otherwise permanent damage may result.

In the case of a cooling fan failure, depending on the length of time the MV-820 Multiviewer has been run with no fan, the unit may need to be returned for checking and repair. Contact Grass Valley or your Grass Valley dealer to discuss the situation.



## 3.4 Rack Mounting

### 3.4.1 Location in Rack

The MV-820 Multiviewer is designed to be installed in a standard 483mm (19 inch) equipment rack for use. The unit requires a 2RU high space within a rack.

The following precautions should be observed:

1. Do not obstruct the front air intake holes. These are to allow the inlet of cooling air and the air exhaust holes at the sides and rear of the unit.



Do not obstruct the front air inlet holes.

2. Do not obstruct the air exhaust holes at the sides and rear of the unit.



Do not obstruct the side and rear air exhaust holes.

3. Ensure that there is a minimum clearance at the rear of the mainframe of 200mm (8 inches). This is **ESSENTIAL**.



Ensure a minimum clearance at the rear of the chassis frame of 200mm (8 inches).

### 3.4.2 Mounting the MV-820 Multiviewer into a Rack



The MV-820 Multiviewer is heavy (14kg – 30.3lb) and will require two people to lift into position, using correct lifting procedures. If you are unsure of the lifting procedures, ask a Health and Safety adviser for information.

Preliminaries:

1. Check that the rack is rigid enough for the MV-820 Multiviewer chassis.
2. Use a suitable rack tray in the rack to take the weight of the MV-820 Multiviewer. The chassis rear will become heavier when cables are connected.

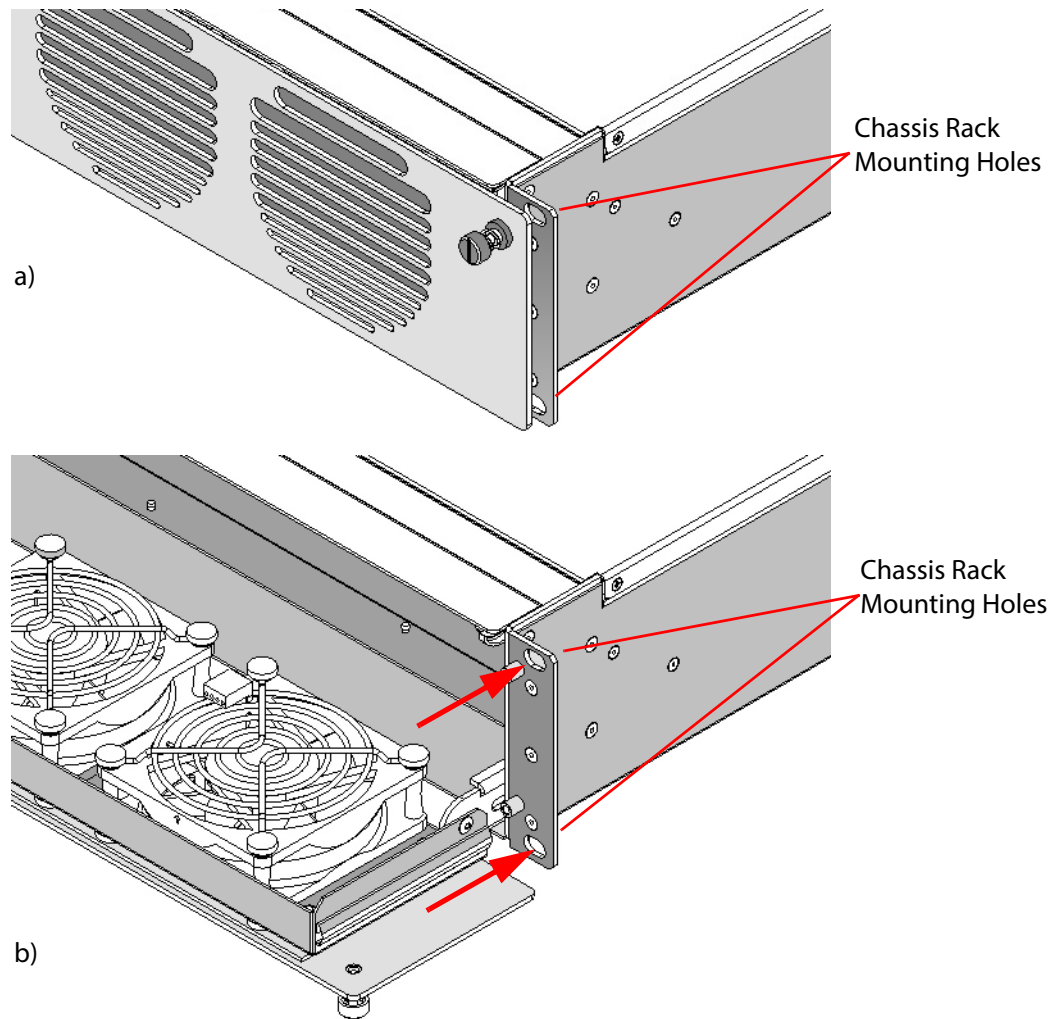
**Note:**

If the rack tray has sides, make sure that they do not block the ventilation holes on the sides of the MV-820 Multiviewer.

Fitting the Multiviewer:

3. Position the MV-820 Multiviewer in the rack on the shelf. Use the correct lifting procedures.

4. Open the MV-820 front door (see [To Open the Front Door](#) on page 24). Four chassis rack mounting holes are revealed, two on each side. See Figure 36.



*Figure 36 MV-820 Multiviewer Chassis Rack Mounting Holes  
a) Front Door Closed.  
b) Front Door Open, Allowing Access to Mounting Holes.*

5. Secure the MV-820 Multiviewer chassis in the rack at each mounting hole using 4-off M6 (1/4 inch) screws. See Figure 37. (Screws are available from rack suppliers.)

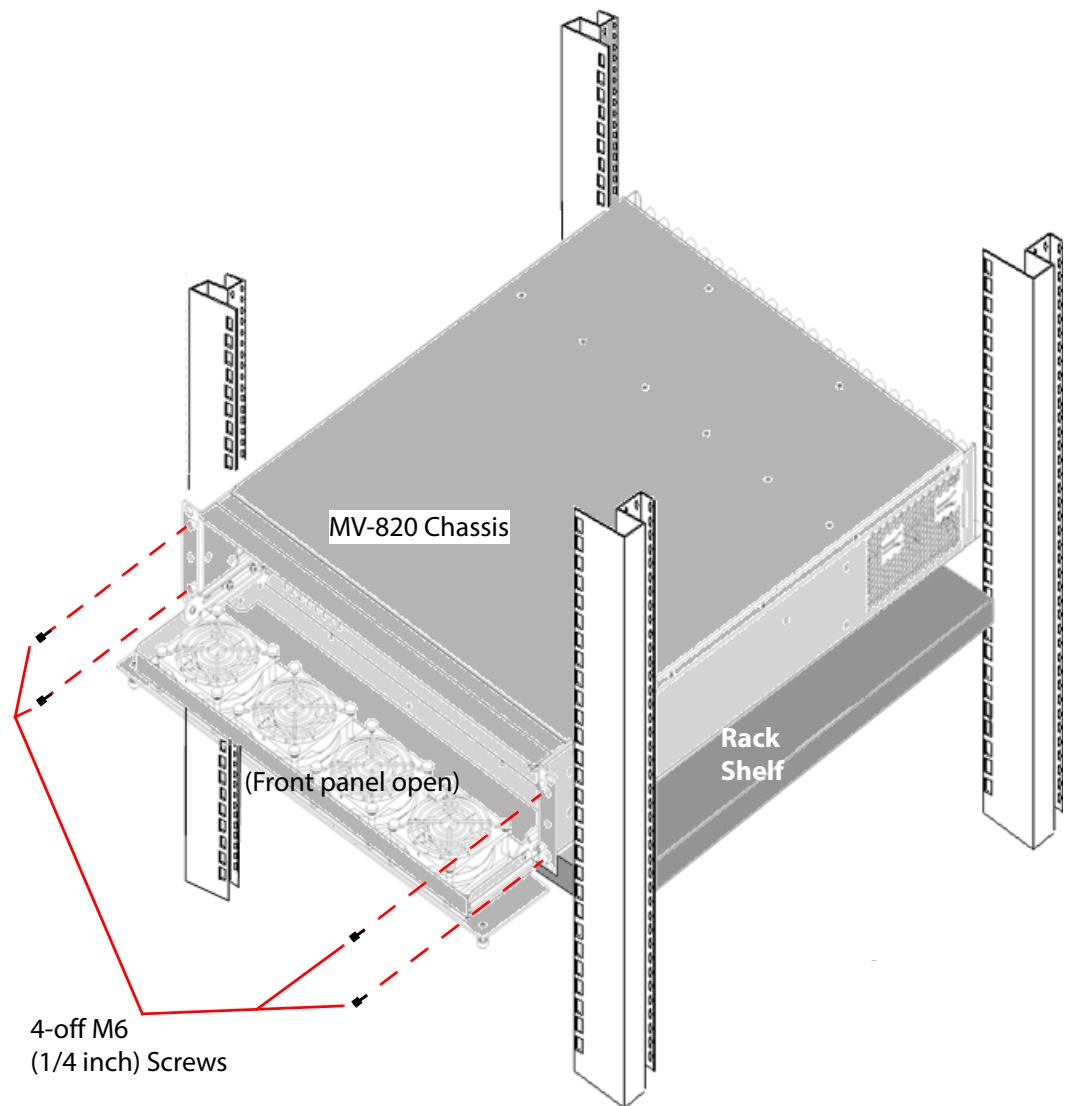


Figure 37 Rack Mounting MV-820 Multiviewer.

6. Close and secure the front door (see [To Close the Front Door](#) on page 25).

### 3.4.3 Cabling Up in a Rack

When connecting cables to the MV-820 Multiviewer, it is recommended that cable supports are used (clamps and bars) to relieve the strain on rear connectors.

See [Rear Panel Connectors](#) on page 33

Cable connection examples for the MV-820 Multiviewer are shown in Figure 38, Figure 39 and Figure 40.

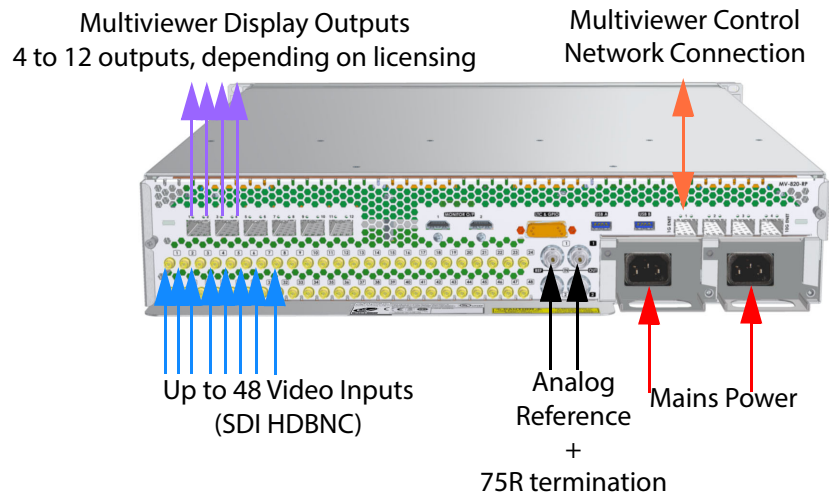


Figure 38 MV-820-HDBNC Cable Connection Example

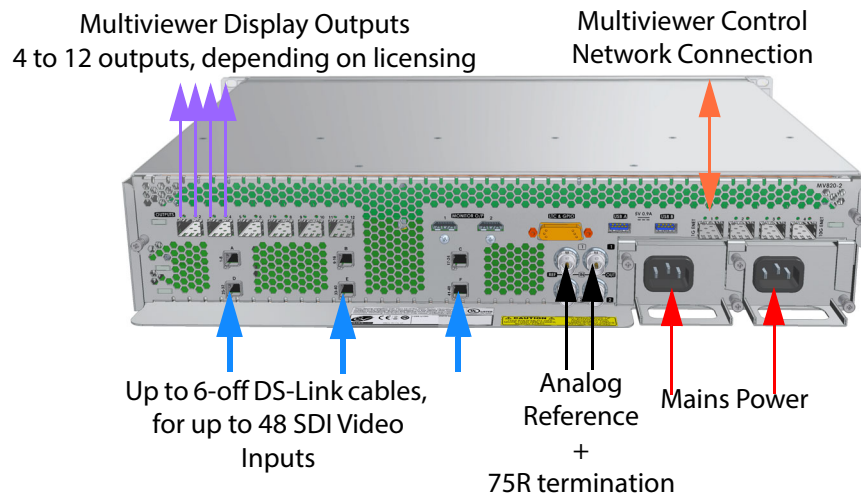


Figure 39 MV-820-DENSI Cable Connection Example

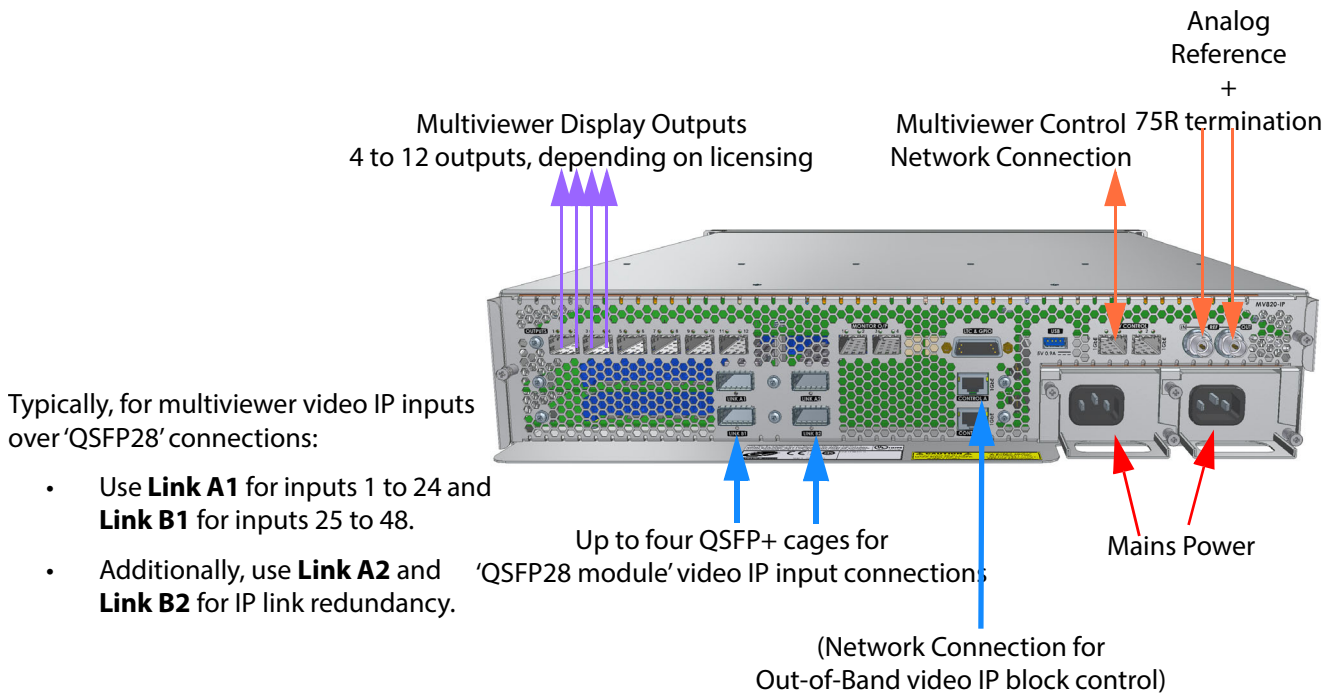


Figure 40 MV-820-IP Cable Connection Example

### 3.4.4 Powering

**Note:** To reduce the risk of electric shock, plug each power supply cord into separate branch circuits employing separate service grounds.

Power consumption is listed in [MV-820 Specification](#) on page 147

## 3.5 MV-820 Booting

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*Refer To:* 'MV-8 Series Multiviewer' user manual for information about MV-820 booting and start-up splash screen.

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Note: Use the '1G1' network interface when performing the initial unit configuration with Grass Valley RollCall control panel.

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Note: The 'Eng' interface is a reserved internal IP network interface, do not use this interface.

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# 4 RollCall Templates for Video IP Blocks

This section lists and describes the RollCall templates of a Video IP block in an MV-820-IP unit. (For RollCall template of the multiviewer block, refer to the 'MV-8 Series Multiviewer' user manual.)

Video IP RollCall Template	Used For	See
Configuration	Basic parameters	Section 4.4 on page 59
Time Sync Configuration	Time synchronization source selection	Section 4.5 on page 61
TPG	Video test patterns on IP outputs	Section 4.6 on page 65
Counters	Clearing internal counters	Section 4.7 on page 67
FEC	Forward Error Correction control	Section 4.8 on page 68
Ethernet 1, Ethernet 2	Media network interface IP settings	Section 4.9 on page 70
Ethernet 1 RTP Sender, Ethernet 2 RTP Sender	RTP sender stats	Section 4.10 on page 74
Ethernet 1 RTP Receiver, Ethernet 2 RTP Receiver	RTP receiver stats	Section 4.11 on page 75
Ethernet RTP Receiver Video Stats	Received video flow stats	Section 4.12 on page 76
Ethernet RTP Receiver Audio Stats	Received audio flow stats	Section 4.13 on page 77
Ethernet RTP Receiver Metadata Stats	Received metadata flow stats	Section 4.14 on page 78
Link Control	4K quad-link control	Section 4.15 on page 79
Destination Timing	Received IP flow video input timing	Section 4.16 on page 80
Spigot 1, Spigot 2, ... Spigot 16	Spigot IP settings (source and destination spigots)	Section 4.17 on page 82
Logging Configuration	Configuring logging	Section 4.18 on page 96
Logging SDI Info	SDI status logging settings	Section 4.19 on page 97
Logging System	System status logging	Section 4.20 on page 98
Logging Network	Network status logging	Section 4.21 on page 101
Logging SFP	Designated QSFP28 module status logging	Section 4.22 on page 103
Logging FPGA	FPGA status information logging	Section 4.23 on page 106
Logging Spigot 1, Logging Spigot 2, ... Logging Spigot 16	Spigot name and spigot information logging. (Set multiviewer video input names.)	Section 4.24 on page 107

<b>Video IP RollCall Template</b>	<b>Used For</b>	<b>See</b>
Logging Card Diagnostics	Video IP block diagnostics	Section 4.25 on page 110
Loopback Router	Loopback IP routing	Section 4.26 on page 111
Setup	Display of basic information, plus 'restart' and 'default settings' buttons.	Section 4.27 on page 112
Ethernet Rear	Control interface IP settings	Section 4.28 on page 113
Interop	IP interoperability settings	Section 4.29 on page 114
SFP Configuration	Configuration of designated QSFP28 module.	Section 4.30 on page 116



## 4.1 Introduction

This section describes the RollCall templates of a Video IP block of an MV-820-IP unit. Each MV-820-IP unit contains four separate Video IP blocks, each identified out of the box in RollCall Control Panel as 'MV-820-IP-Rear'.

The key distinguishing item for each Video IP block is its **Slot** location, which is shown on each RollCall **Configuration** template. See Figure 41.

Each Video IP block is independently configured via its own RollCall template.

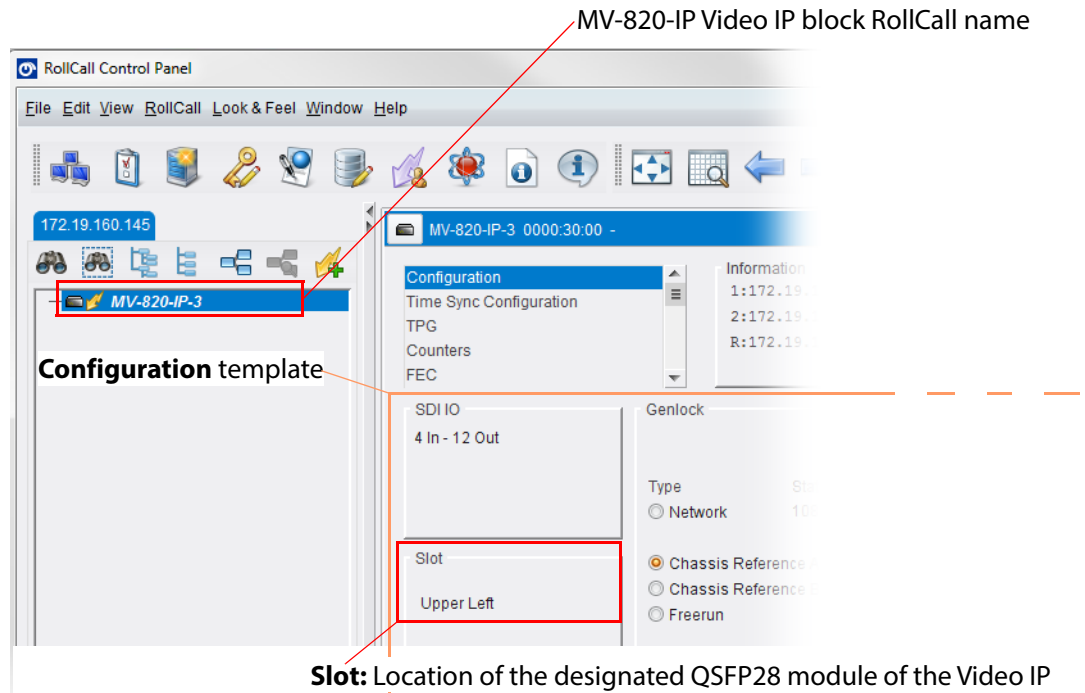


Figure 41 RollCall Initial Template Screen

**Note:** **MV-820-IP Video IP Blocks and Designated QSFP28 modules:**

There are four Video IP blocks. Each reports on the status of one rear designated QSFP cage/link in the MV-820-IP unit.

Slot (location of designated QSFP)	Rear QSFP cage label (see Figure 42)
'Upper Left'	"LINK A1"
'Upper Right'	"LINK A2"
'Lower Left'	"LINK B1"
'Lower Right'	"LINK B2"

Table 15 Designated QSFPs

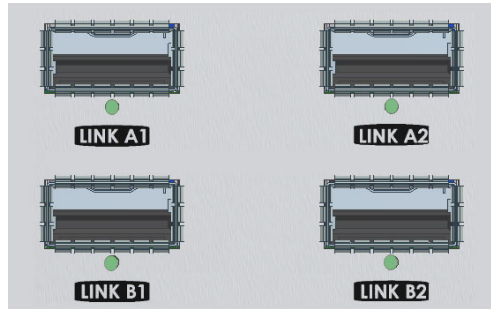


Figure 42 Rear Panel QSFP+ Cages

**Note:**

**Tools:**

**Grass Valley Orbit:**

The Grass Valley Orbit software tool is used to configure Grass Valley products. The Roll-Call templates may be viewed and used via Orbit.

For more information about Orbit, please see the Orbit user manuals.

**RollCall Control Panel:**

The Grass Valley RollCall Control Panel tool is part of the RollCall Suite. (For RollCall installation instructions, see the “RollCall V4 Suite & RollCall Lite” Introduction manual.)

Install the RollCall Control Panel software on your computer.

See the RollCall Control Panel User Manual and contact Grass Valley Support for information.

Use RollCall Control Panel version 4.16.11 or later.

Making a connection (to a Multiviewer or Video IP block) with RollCall Control Panel is described in the ‘MV-8 Series Multiviewer’ user manual. For default IP addresses of the control network ports, see [MV-820-IP Ethernet Connector Interfaces](#) on page 153.

The Video IP block templates are described in this section.

**Video IP Block:**

The RollCall templates of the MV-820-IP Video IP block are derived from the templates of a Grass Valley IQMIX modular card. Unlike a Grass Valley IQMIX modular card, however, the MV-820-IP unit has a fixed Video IP input and output configuration and only exposes IP inputs and outputs externally, its SDI inputs and outputs are internal to the MV-820-IP unit. (See Figure 6 in [IP Routing Control](#) on page 16.)

For each Video IP block:

- **Spigots 1 to 4** source up to 4 video IP signals for external consumption. (Converted from 4 internal SDI video signals carrying multiviewer display output pictures.)
- **Spigots 5 to 16** receive up to 12 video IP signals from external sources. (Converted to 12 internal SDI video signals which pass to the multiviewer block - multiviewer inputs).

## 4.2 Navigating RollCall Video IP Template Screens

When RollCall has connected to the Video IP block, several template screens are available: The initial screen is shown. See Figure 43.

The template screens are listed in the **Template Selection** box. Click on an item in the **Template Selection** box to go to that template screen.

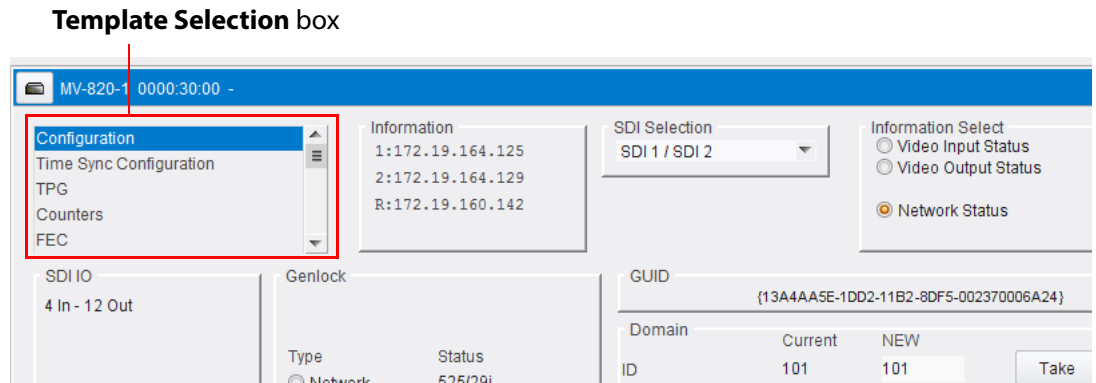


Figure 43 RollCall Initial Template Screen

Alternatively, to navigate to another template:

1. Right-click anywhere in a template screen.  
A pop-up list of the unit's template screens is shown.  
(Figure 44 shows a list of MV-820-IP Video IP block template screens.)
2. Click on an item in the list to go to that template screen.

- Configuration
- Time Sync Configuration
- TPG
- Counters
- FEC
- Ethernet 1
- Ethernet 1 RTP Sender
- Ethernet 1 RTP Receiver
- Ethernet 2
- Ethernet 2 RTP Sender
- Ethernet 2 RTP Receiver
- Ethernet RTP Receiver Video Stats
- Ethernet RTP Receiver Audio Stats
- Ethernet RTP Receiver Meta Stats
- Link Control
- Destination Timing
- Spigot 1
- Spigot 2
- Spigot 3
- Spigot 4
- Spigot 5
- Spigot 6
- Spigot 7
- Spigot 8
- Spigot 9
- Spigot 10
- Spigot 11
- Spigot 12
- Spigot 13
- Spigot 14
- Spigot 15
- Spigot 16
- Logging - Configuration
- Logging - SDI Info
- Logging - System
- Logging - Network
- Logging - SFP
- Logging - Fpga
- Logging - Spigot 1
- Logging - Spigot 2
- Logging - Spigot 3
- Logging - Spigot 4
- Logging - Spigot 5
- Logging - Spigot 6
- Logging - Spigot 7
- Logging - Spigot 8
- Logging - Spigot 9
- Logging - Spigot 10
- Logging - Spigot 11
- Logging - Spigot 12
- Logging - Spigot 13
- Logging - Spigot 14
- Logging - Spigot 15
- Logging - Spigot 16
- Logging - Card Diagnostics
- Loopback Router
- Setup
- Ethernet Rear
- Interop
- SFP Configuration

Right-click anywhere in a template screen to see a pop-up list of all of the unit's template screens.

The following template screens are available:

- **Configuration** - see Section 4.4 on page 59.
- **Time Sync Configuration** - see Section 4.5 on page 61.
- **TPG (Test Pattern Generator)** - see Section 4.6 on page 65.
- **Counters** - see Section 4.7 on page 67.
- **FEC** - see Section 4.8 on page 68.
- **Ethernet 1 and 2** - see Section 4.9 on page 70.
- **Ethernet 1 and 2 RTP Sender** - see Section 4.10 on page 74.
- **Ethernet 1 and 2 RTP Receiver** - see Section 4.11 on page 75.
- **Ethernet RTP Receiver Video Stats** - see Section 4.12 on page 76.
- **Ethernet RTP Receiver Audio Stats** - see Section 4.13 on page 77.
- **Ethernet RTP Receiver Metadata Stats** - see Section 4.14 on page 78.
- **Link Control** - see Section 4.15 on page 79.
- **Destination Timing** - see Section 4.16 on page 80.
- **Spigot 1 to 16** - see Section 4.17 on page 82.
- **Logging Configuration** - see Section 4.18 on page 96.
- **Logging SDI Info** - see Section 4.19 on page 97.
- **Logging System** - see Section 4.20 on page 98.
- **Logging Network** - see Section 4.21 on page 101.
- **Logging SFP** - see Section 4.22 on page 103.
- **Logging FPGA** - see Section 4.23 on page 106.
- **Logging Spigot 1 to 16** - see Section 4.24 on page 107.
- **Logging Card Diagnostics** - see Section 4.25 on page 110.
- **Loopback Router** - see Section 4.26 on page 111.
- **Setup** - see Section 4.27 on page 112.
- **Ethernet Rear** - see Section 4.28 on page 113.
- **Interop** - see Section 4.29 on page 114.
- **SFP Configuration** - see Section 4.30 on page 116.

Figure 44 Right-Click to get a List of Template Screens

### 4.2.1 Setting Values

Many of the settings within the templates have values, either alpha or numeric.

When setting a value in a field, the value, whether text or a number, must be set by pressing the ENTER key, or clicking the **S Save Value** button.

Clicking an associated **P Preset Value** button returns the value to the factory default setting.

### 4.3 Common Information Display

An **Information Display** area appears at the top of each template screen and shows basic information about the input, standard and status of the Video IP blocks.

Information is displayed in an **Information** box and is selected in the **SDI Selection** and **Information Selection** sections of the **Information Display**. See Figure 45.

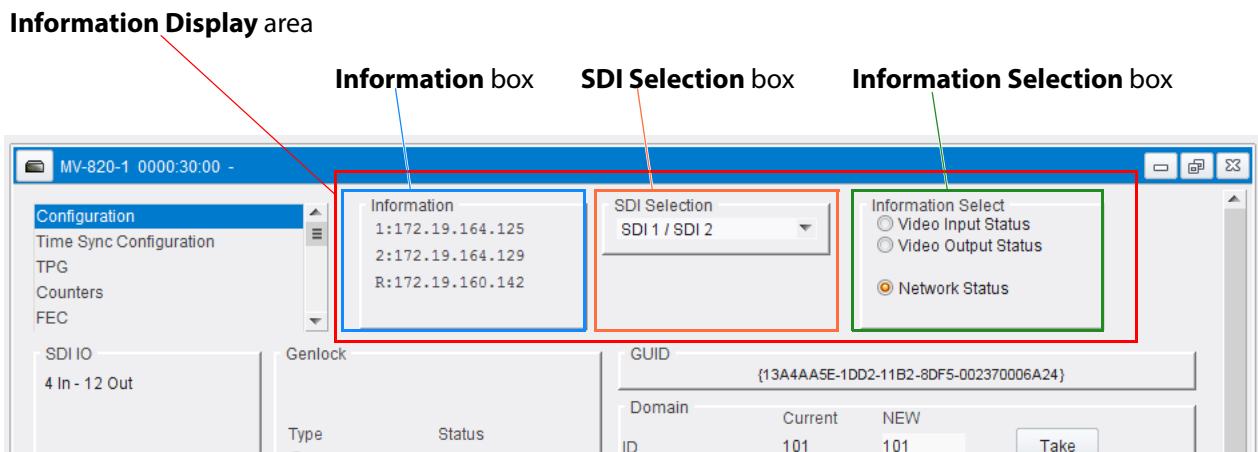
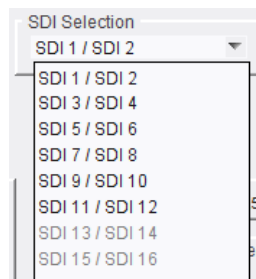


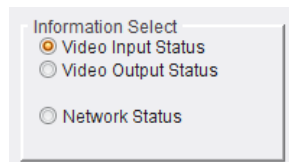
Figure 45 Information Display Area

#### 4.3.1 Selecting the Information to Display

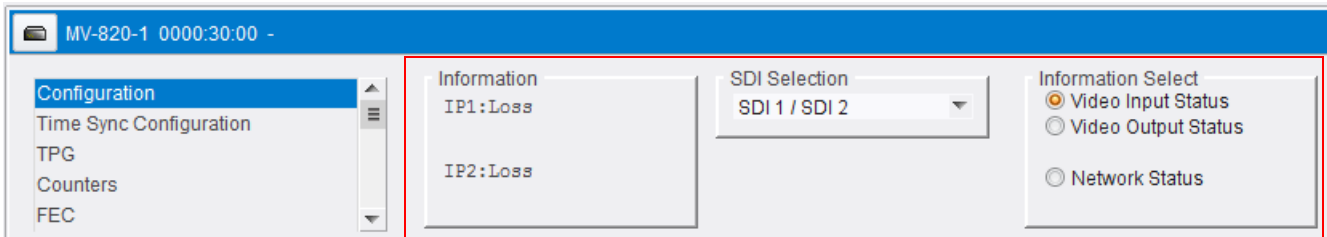
- Select the outputs to display data for from the **SDI Selection** drop-down list. (For each MV-820-IP Video IP block, select from SDI 1 to SDI 12.)



- Select **Video Input Status**, **Video Output Status** or **Network Status** from the **Information Selection** pane, as required.

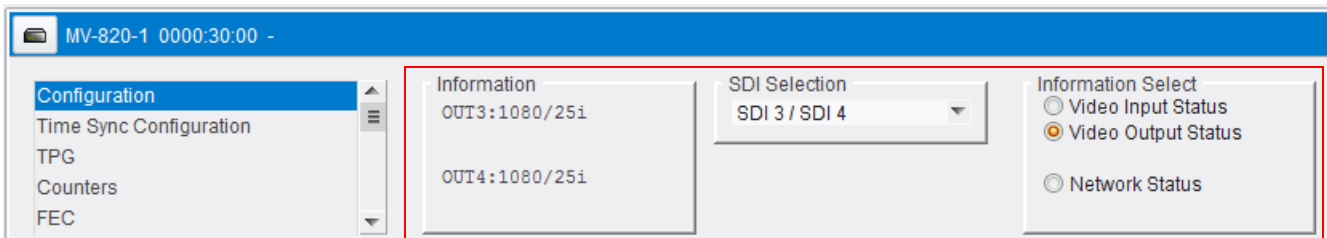


The selected information will be displayed on the **Information** box. Figure 46a, Figure 46b and Figure 46c show some example **Information Display** areas.



a) Video input status (for *internal* SDI 1 and SDI 2 video inputs to the Video IP block)

**Note:** Video IP streams *from* the MV-820-IP unit's Video IP block carry multiviewer display output pictures.  
(See Section 1.4.2 "IP Routing Control" on page 16.)

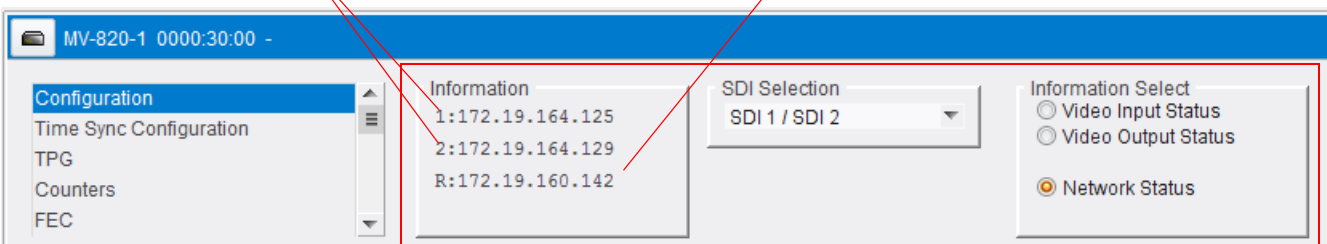


b) Video output status (for *internal* SDI 3 and SDI 4 video outputs from the Video IP block)

**Note:** SDI video outputs *from* the Video IP block pass internally to the multiviewer block, within the MV-820-IP unit.  
(See Figure 5 in Section 1.3.3 "MV-820-IP: Video IP Circuitry" on page 8 and see Section 1.4.2 "IP Routing Control" on page 16)

Video IP block's media interfaces.

Video IP block's control interfaces.



c) Network interface status example

**Note:** Network interfaces of an MV-820-IP unit's Video IP block comprise two media and one control interface.  
(See [MV-820-IP: Video IP Circuitry](#) on page 8 and [MV-820-IP Control Interface](#) on page 13.)

Figure 46 Example Information Display Areas:

- a) Video Input Status example.
- b) Video Output Status example.
- c) Network Status example.

## 4.4 Configuration Template

The **Configuration** template screen allows basic Video IP block parameters to be set.

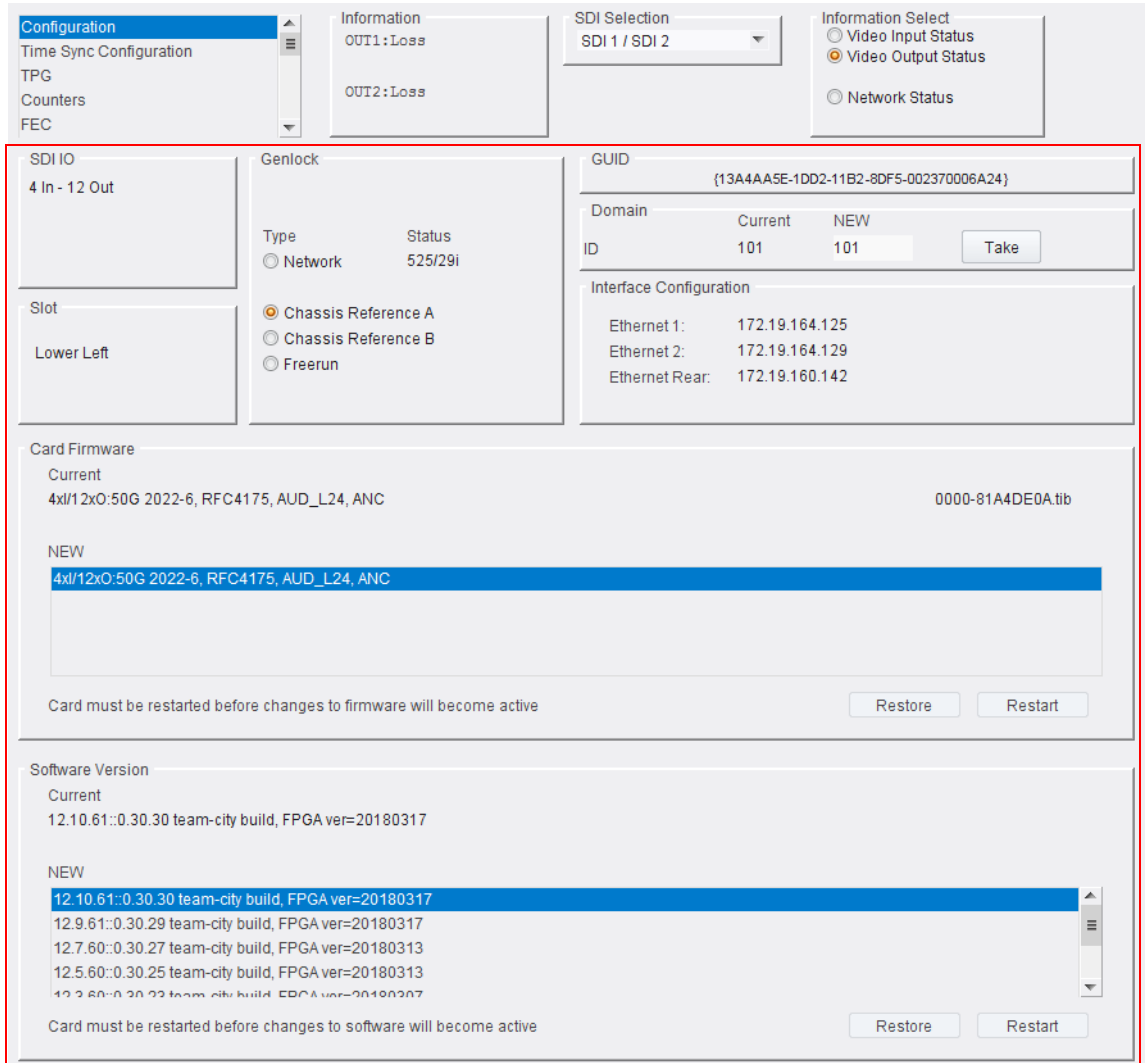


Figure 47 Configuration Template

The following facilities are available from this template:

Table 16 Configuration Template Settings

Configuration Setting	Operation
<b>SDI IO</b>	Displays how the source and destination spigots are currently configured.
<b>Slot</b>	A Video IP blocks sets up and reports the status of one QSFP28 transceiver on the unit rear. <b>Slot</b> identifies the position of the Video IP block’s designated QSFP+ cage and QSFP28 transceiver on the MV-820-IP unit rear: <ul style="list-style-type: none"> <li>• Lower Left, 'LINK B1'</li> <li>• Lower Right, 'LINK B2'</li> <li>• Upper Left, 'LINK A1'</li> <li>• Upper Right, 'LINK A2'</li> </ul>

Table 16 Configuration Template Settings (continued)

Configuration Setting	Operation
<b>Genlock</b>	Select <b>Genlock</b> type: <ul style="list-style-type: none"> <li>• <b>Network</b> - click to select PTP.</li> <li>• <b>Chassis Reference A/B</b> - click to select which MV-820 external reference to use.</li> <li>• <b>Freerun</b> - click to allow free running.</li> </ul>
<b>GUID</b>	Displays the absolute unique identifier associated with the MV-820-IP Video IP block.
<b>Domain</b>	RollCall+ uses domains to partition a RollCall+ network; only nodes on the same RollCall+ domain can communicate with one another. A domain is uniquely identified with a number and a friendly name/alias. <ol style="list-style-type: none"> <li>1. Set a new RollCall+ ID as required.</li> <li>2. Press <b>Take</b> to confirm the change.</li> </ol>
<b>Interface Configuration</b>	Displays the IP address for each of the network interfaces.
<b>Card Firmware</b>	The current firmware version is shown.  Each software version may contain multiple firmware images. Typically, there is one firmware image for an MV-820-IP's Video IP block. Although, multiple images are possible (for example, for different spigot input/output and flow standard combinations).  For MV-820-IP Video IP blocks, the firmware configures 4 SDI inputs and 12 SDI outputs. I.e. 4 SDI-to-IP conversions and 12 IP-to-SDI conversions.
<b>Software Version</b>	Each software version may contain multiple firmware images.  The current software version is shown.

#### 4.4.1 Load Different Card Firmware Version

**Note:** Selecting a firmware version is *not* normally required for MV-820-IP.

To use a new card firmware:

1. Select the firmware item in the list displayed in the **Card Firmware** pane.

**Note:** **Restore** and **Restart** buttons are displayed only when a 'not-currently-loaded' firmware item is selected.
2. Click **Restore** to load the selected firmware.
3. Click **Restart** to restart the Video IP block.

#### 4.4.2 Load Different Software Version

To use a new software version:

1. Select the required software in the **Software Version** pane.

**Note:** **Restore** and **Restart** buttons are displayed only when a 'not-currently-loaded' software item is selected.
2. Click **Restore** to load the required software version.
3. Click **Restart** to restart the Video IP block.



## 4.5 Time Sync Configuration Template

The **Time Sync Configuration** template allows selection of the source to be used for synchronizing flows through the Video IP blocks, and configuration of any properties associated with the relevant source.

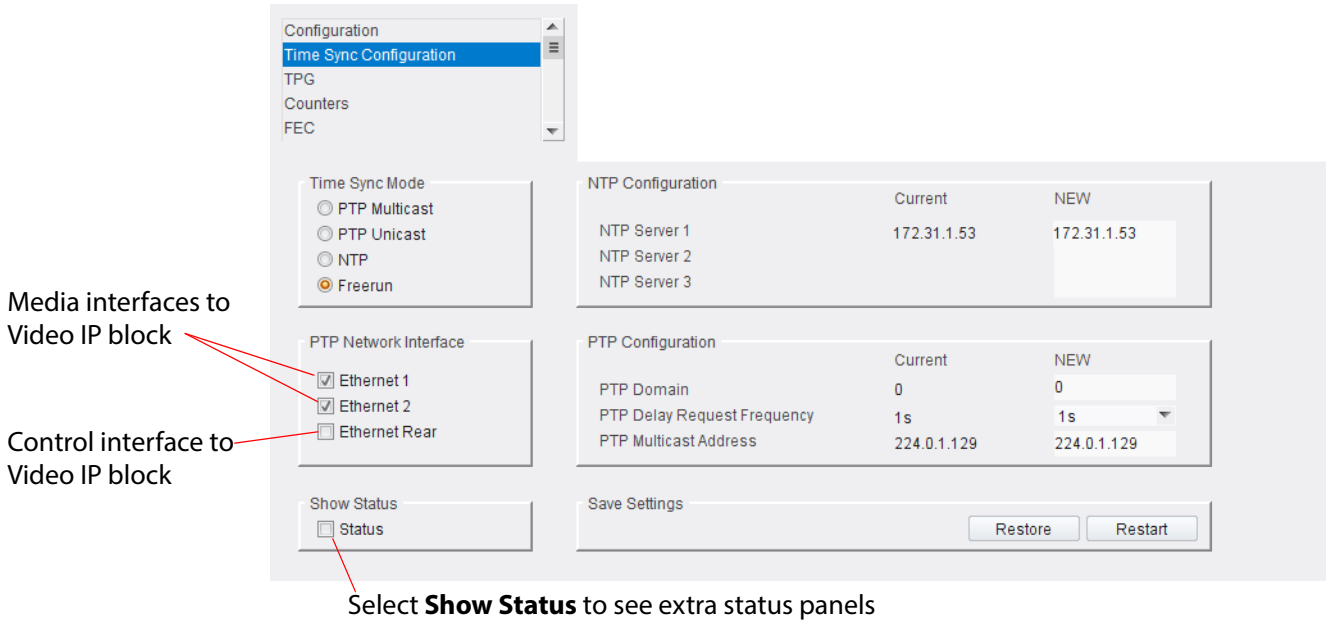


Figure 48 Time Sync Configuration Template

Table 17 Time Sync Configuration Template Settings

Time Sync Configuration Setting	Operation
<b>Time Sync Mode</b>	Select the required time sync mode. <b>Note:</b> PTP options require a grandmaster clock to be present in the network system.
<b>NTP Configuration</b>	NTP servers are listed. To add a new NTP server: <ul style="list-style-type: none"> <li>Enter server’s IP address into the <b>New</b> field.</li> </ul>
<b>PTP Network Interface</b>	Select one or more required network interfaces for PTP data traffic. If a network interface fails, the next interface on the list will be switched to automatically for PTP data traffic.
<b>PTP Configuration</b>	<b>PTP Domain:</b> Enter the PTP clock domain number. <b>PTP Delay Request Frequency:</b> Select the duration in the drop-down list, as required. <b>PTP Multicast:</b> Enter the appropriate IP address into the <b>PTP Multicast</b> address field.
<b>Show Status</b>	Select to display time sync status information in the template. See <a href="#">Time Sync Status Panel</a> on page 63.
<b>Save Settings</b>	Displayed only if settings on this template are changed.
<b>Restore</b>	Click <b>Restore</b> to discard the changes.

Table 17 Time Sync Configuration Template Settings (continued)

Time Sync Configuration Setting	Operation
<b>Restart</b>	Click <b>Restart</b> to implement the changes made in the template and restart the MV-820-IP's Video IP block.

### 4.5.1 Time Sync Status Panel

Select **Show Status** in the **Time Sync Configuration** template to display extra status panels showing important system time status information on a single convenient panel.

**Status** check box selected in **Time Sync Configuration** template.

Status panel, expanded in Figure 50.

Histogram panel, see Section 4.5.2 "Time Sync Histogram Panel" on page 64.

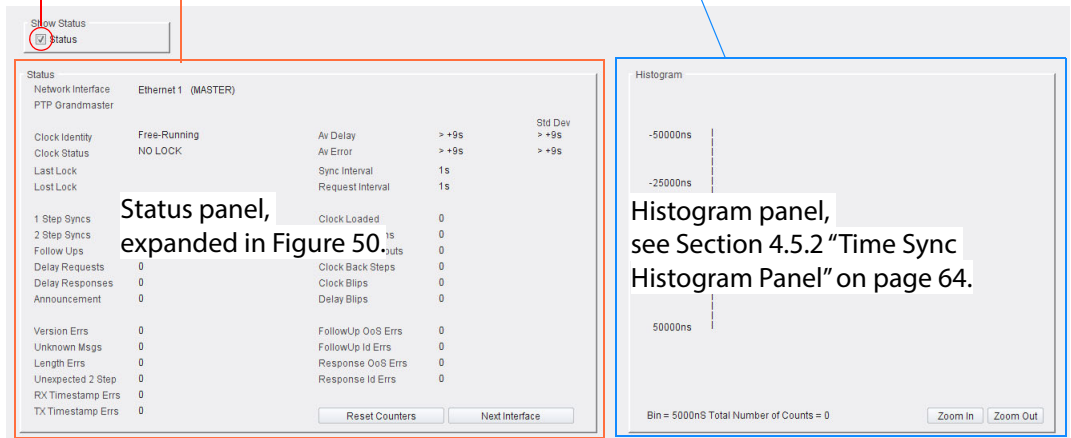
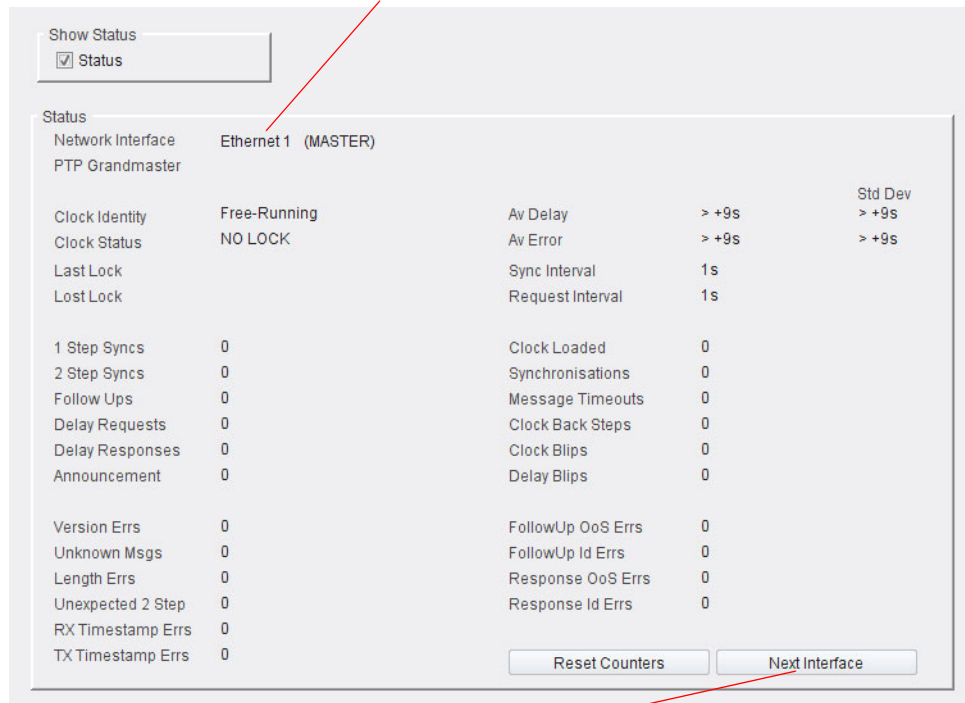


Figure 49 Time Sync Status

Network interface shown



Click to see status of next network interface

Figure 50 Time Sync - Status Panel

To see the status of another network interface of the Video IP block in the **Status** panel:

- Click the **Next Interface** button. (This cycles through the interfaces.)

### 4.5.2 Time Sync Histogram Panel

Select **Show Status** in the **Time Sync Configuration** template to display extra status panels showing important system time status histogram information on a single convenient panel.

The **Histogram** panel is located to the right of the **Status** panel and it provides a graphical representation of the distribution of differences between the Video IP block's own clock and the network system's PTP grandmaster clock. The histogram is available when a Video IP block is locked.

- Use the **Zoom-in** and **Zoom-out** controls to see the corresponding histogram.

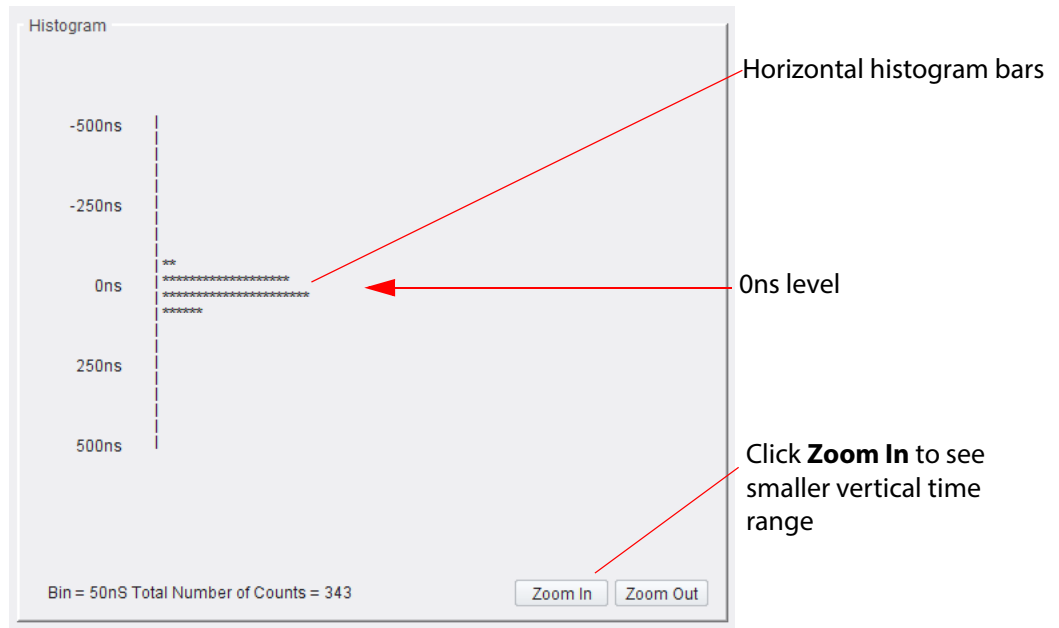


Figure 51 Time Sync Status - Histogram Panel

Every time a clock difference is recalculated, the relevant horizontal histogram bar is incremented and shown. A correctly functioning system will show a distinct peak around the 0ns level.

## 4.6 TPG (Test Pattern Generator) Template

The **TPG** template allows test patterns to be applied on a spigot-by-spigot basis for IP output. For an MV-820-IP's Video IP block, there are four spigot test pattern panels (corresponding to the four spigots that are configured for video IP output). See Figure 52a.

**Note:** When a test pattern is applied to a spigot (either a video test pattern or an audio test tone), then that test pattern appears on the IP flow from that spigot and the spigot cannot be used for video streaming any other IP flow.

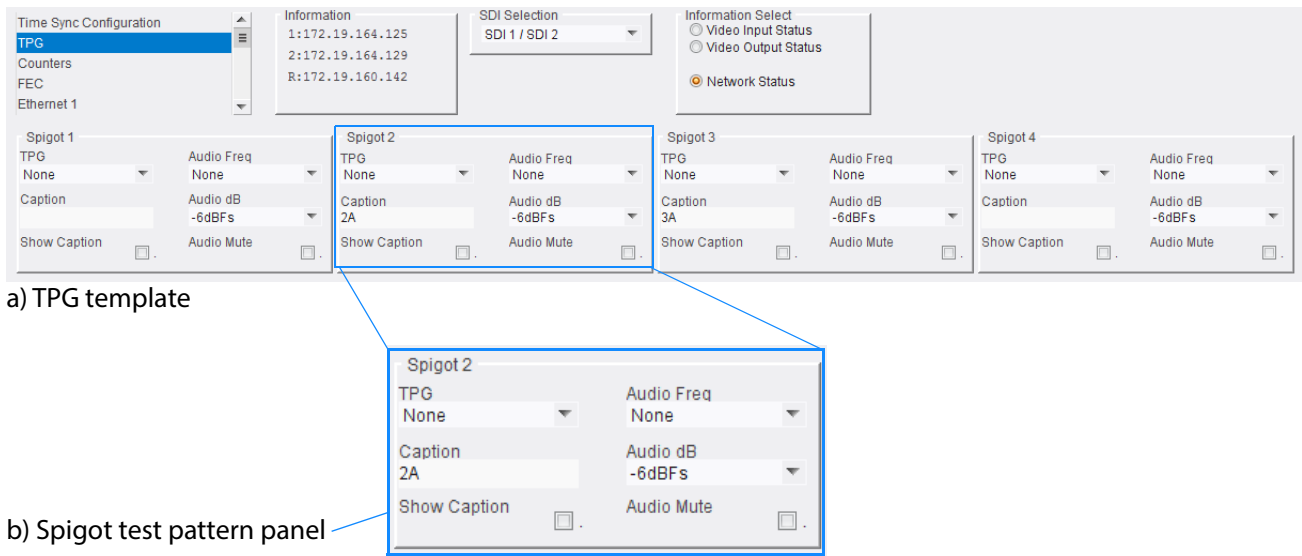


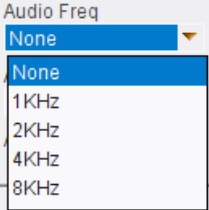
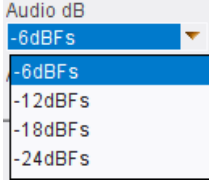
Figure 52 TPG Template and Spigot Test Pattern Panel:  
 a) Template.  
 b) Spigot Test Pattern Panel.

The following options are available for each spigot:

Table 18 Spigot Test Pattern Panel Settings

Spigot Test Pattern Setting	Operation
<b>TPG</b>	Select the video standard of the 'moving color bars' test pattern to apply to the spigot from the drop-down list. Select 'None' to turn off the test pattern. <div style="text-align: center; margin-top: 10px;"> </div>

Table 18 Spigot Test Pattern Panel Settings (continued)

Spigot Test Pattern Setting	Operation
<b>Audio Freq</b>	Select the audio frequency to apply to the spigot from the drop-down list. 
<b>Caption</b>	Enter a caption (maximum 19 characters) to optionally be overlaid onto the test pattern.
<b>Audio dB</b>	Select the dB level to apply to the spigot from the drop-down list. 
<b>Show Caption</b>	Select to display the <b>Caption</b> with the test pattern.
<b>Audio Mute</b>	Select to mute the audio tone.

## 4.7 Counters Template

The **Counters** template contains controls to clear various global counters on Video IP block templates, which count various types of error conditions that might occur.

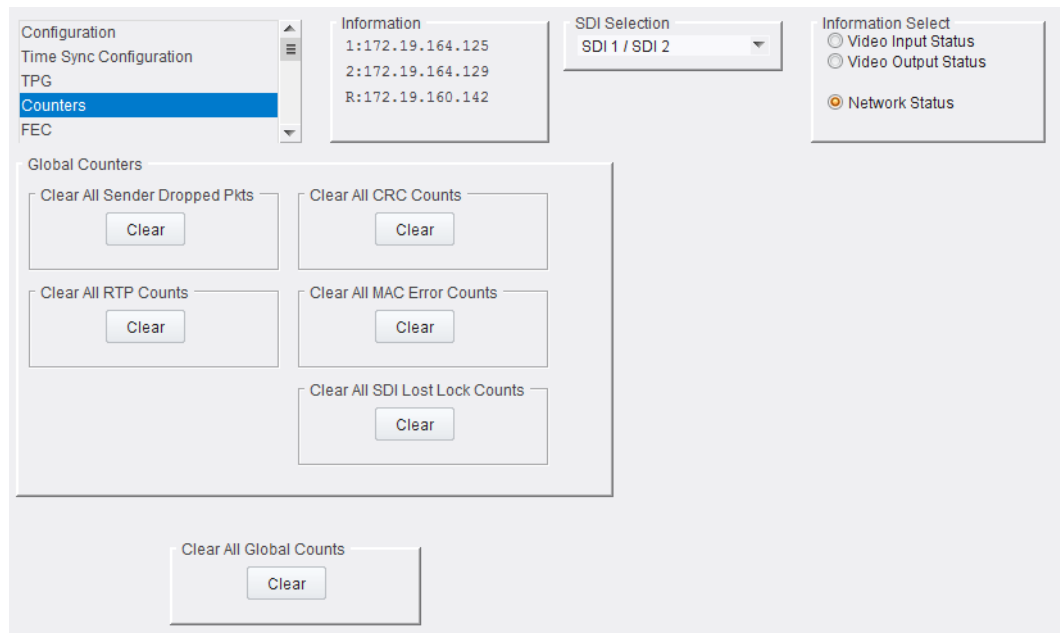


Figure 53 Counters Template

Table 19 Counters Template Settings

Control	Click to clear the counters for ...
<b>Clear All Sender Dropped Pkts</b>	Sender dropped data packets counters.  Counts the number of data packets an IP sender has had to drop. For example, if an IP connection were oversubscribed, a sender may drop data packets to prevent the total IP sending bandwidth being exceeded.
<b>Clear All CRC Counts</b>	CRC counters. These count any SDI video CRC errors in the <i>internal</i> multiviewer display output video signals (from the multiviewer block to the Video IP blocks).
<b>Clear All RTP Counts</b>	All RTP packet counters.  Counts jumps in an RTP packet ID sequence in an IP flow. This indicates any lost, dropped or out-of-sequence RTP packets.  Counters are found on RTP Receiver and Ethernet templates.
<b>Clear All MAC Error Counts</b>	All MAC error counters.  Counts packets marked as bad, for example, for a data packet CRC error. (Such an error is normally also accompanied by an RTP error because a packet would be dropped.)
<b>Clear All SDI Lost Lock Counts</b>	All SDI lock error counts.  Counts the number of times an (internal) SDI input to the Video IP block comes and goes.  Counters found on the SDI input spigot templates and published via RollCall log fields.
<b>Clear All Global Counts</b>	All the global counts.

## 4.8 FEC Template

The **FEC** template allows forward error correction (FEC) to be enabled on the spigot and FEC logging to be activated, if required. FEC is implemented to Clause 74 FEC of IEEE 802.3. FEC statistics are also available.

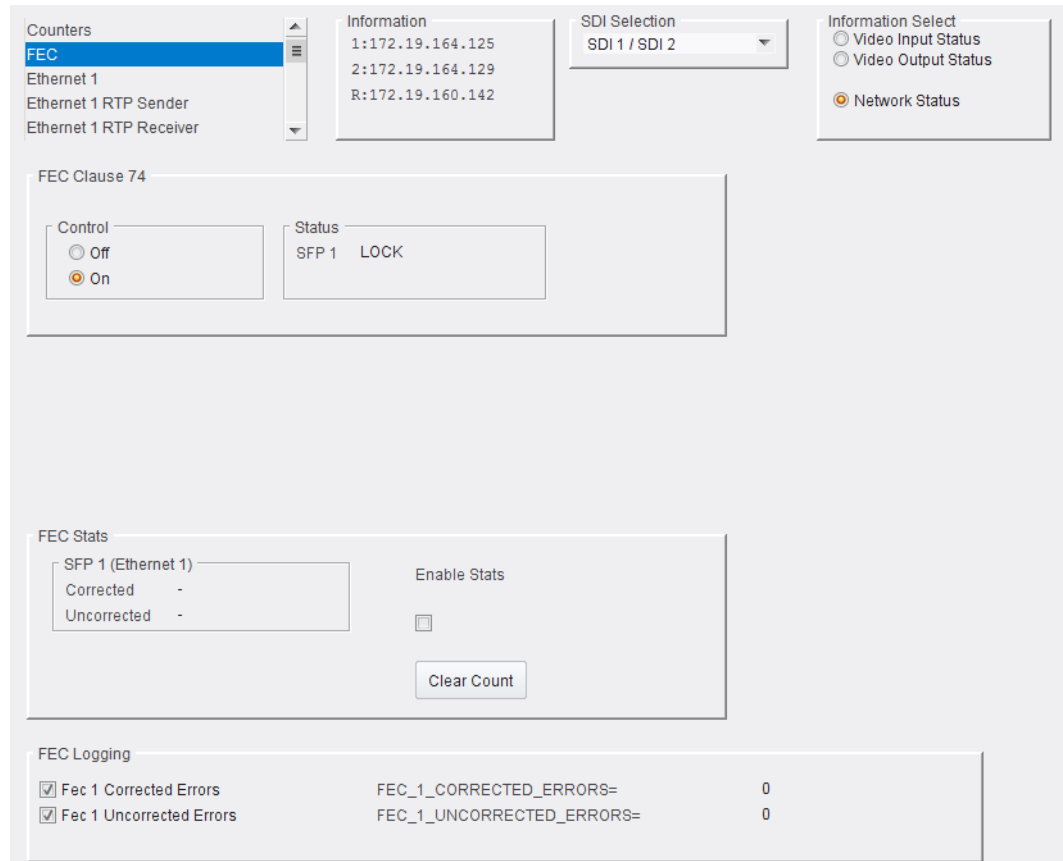


Figure 54 FEC Template

Table 20 FEC Template Settings

FEC Setting	Description
<b>FEC Clause 74</b>	<p><b>Allows low-latency FEC Clause 74 error correction to be used.</b></p> <ul style="list-style-type: none"> <li>Select <b>On</b> to enable FEC.</li> <li>Select <b>Off</b> to disable FEC.</li> </ul>
<b>Status</b>	Displays lock status for the QSFP28 of the Video IP.
<b>FEC Stats</b>	<p>Displays the number of corrected and uncorrected errors received via the QSFP28 modules.</p> <ul style="list-style-type: none"> <li>Select <b>Enable Stats</b> to activate the display.</li> <li>Click <b>Clear Count</b> to clear the counters.</li> </ul>
<b>FEC Logging</b>	<p>Information on several parameters can be made available to a logging device connected to the RollCall network. Select the check boxes to activate log fields, as required.</p> <p>Available log fields are shown in Table 21.</p>



*Table 21*    *FEC Log Fields*

<b>Log Field</b>	<b>Description</b>
FEC_1_CORRECTED_ERRORS	Number of corrected errors for FEC 1.
FEC_1_UNCORRECTED_ERRORS	Number of uncorrected errors for FEC 1.

## 4.9 Ethernet 1 and 2 Templates

**Note:**

**Ethernet 1 and 2** templates refer to two the media network connections (primary/secondary or main/backup) to each MV-820-IP Video IP block.

Each media network connection is 50G Ethernet.

For a description of the media network connection, see [MV-820-IP: Video IP Circuitry](#) on page 8.

Both the **Ethernet 1** and **Ethernet 2** templates show IP configuration details and status for a media network interface. The Video IP block defaults to use DHCP for the interface, but this can be overridden and a static IP address defined if required.

The screenshot displays the configuration page for Ethernet 1. It includes a sidebar with navigation options, an information panel with IP addresses, an SDI Selection dropdown, and an Information Select panel with radio buttons for Video Input Status, Video Output Status, and Network Status. The main configuration area shows Ethernet settings for Rear - SFP 1, including IP Address, Default Gateway, Subnet Mask, MAC Address, Mode (STATIC), Link Status (UP), SFP Status, and SFP Fitted status. It also features a New Mode section with DHCP and Static options, a Restart button, and a Clear Link Change Count button. Below this are sections for Switch LLDP Info, All Traffic (with a table of capacity and usage), and CPU Traffic (with a table of sent and received packets and bytes).

Name	Arista7504R	Port ID	Ethernet4/18/3	Port VLAN	164
------	-------------	---------	----------------	-----------	-----

	Capacity	Gb/s	Actual (Mb/s)	Used %	Free %	Enable Stats
Sender	50		10372.18	20.74	79.26	<input checked="" type="checkbox"/>
Receiver	50		1549.98	3.10	96.90	

	Sent		Received	
Total Unicast Packets		244807	Total Unicast Packets	772123
Total Broadcast Packets		92	Total Broadcast Packets	1795648
Total Multicast Packets		41256	Total Multicast Packets	8039754
Total Bytes		41101356	Total Bytes	2842111163
Bytes / sec		645	Bytes / sec	50867

Figure 55 Ethernet 1 and Ethernet 2 Template (Ethernet 1 Template shown)

The various panels in the template are described below:

- **Ethernet** panel  
- see [Ethernet Panel](#) on page 71.
- **Switch LLDP Info** panel  
- see [Switch LLDP Info Panel](#) on page 72.
- **All Traffic** panel  
- see [All Traffic Panel](#) on page 73.
- **CPU Traffic** panel  
- see [CPU Traffic Panel](#) on page 73.

### 4.9.1 Ethernet Panel

The **Ethernet** panel displays details of the currently selected media network interface and allows a static IP address to be defined. Additionally some summary link status and QSFP28 transceiver status is shown.

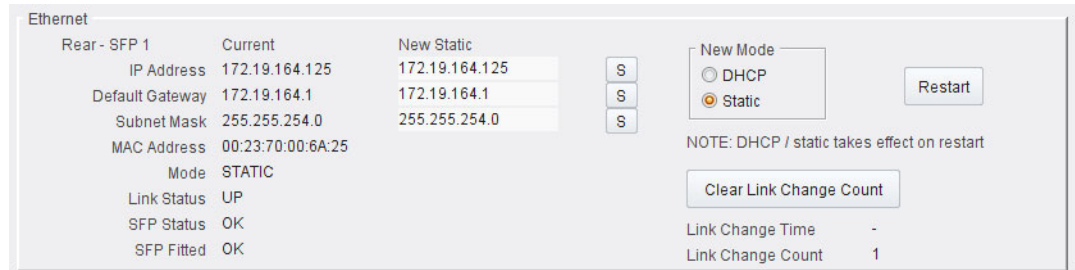


Figure 56 Ethernet Panel (of Ethernet 1 or 2 Templates)

Table 22 Ethernet Panel Settings and Controls

Ethernet Panel Item	Description
<b>IP Address</b>	Shows current IP address of the network interface.  Allows entry of a new, static IP address. Click <b>S</b> to enter a new value into the text box.
<b>Default Gateway</b>	Shows current default gateway IP address.  Allows entry of a new default gateway IP address.
<b>Subnet Mask</b>	Shows current subnet mask of the network interface.  Allows entry of a new mask.
<b>MAC Address</b>	Shows the MAC address of the interface.
<b>Mode</b>	Shows the current mode of the network interface: DHCP or Static.
<b>New Mode</b>	Radio buttons. Note: Changes take effect after clicking Restart.
<b>DHCP</b>	Select for DHCP interface mode.
<b>Static</b>	Select for static interface mode.
<b>Restart</b>	Button. Click to make IP address and mode change take effect.
<b>Link Status</b>	Reports network link status: UP or DOWN.
<b>SFP Status</b>	Reports the status of the designated QSFP cage/transceiver: <ul style="list-style-type: none"> <li>• OK</li> <li>• Fail</li> <li>• See other MV - Look on Video IP block's other Ethernet template (Eg. on <b>Ethernet 2</b> template instead of <b>Ethernet 1</b> template.)</li> </ul>

Table 22 Ethernet Panel Settings and Controls (continued)

Ethernet Panel Item	Description
<b>SFP Fitted</b>	Reports the fitted status of a QSFP cage/transceiver: <ul style="list-style-type: none"> <li>• OK</li> <li>• Not Fitted</li> </ul>
<b>Clear Link Change Count</b>	
	Button. Click to clear the link change count.
<b>Link Change Time</b>	Shows date and time of the last network link up or link down status change.
<b>Link Change Count</b>	Counts number of times the network link has changed state (link up or link down).

To change the mode of a network interface:

1. Select **DHCP** or **Static** for a new mode, as required.

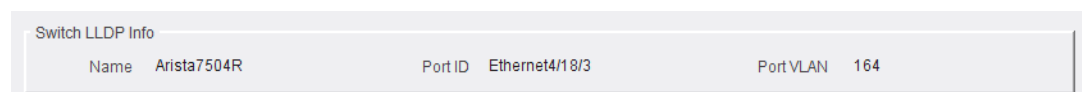
Then, as applicable:

2. Enter IP address information and click **S** to save.
3. Enter default gateway information and click **S** to save.
4. Enter subnet mask information and click **S** to save.

The new DHCP/static settings are applied when **Restart** is clicked and the Video IP block is restarted.

## 4.9.2 Switch LLDP Info Panel

The **Switch LLDP Info** panel displays information about the IP switch connected to the Video IP block's network interface. Information is obtained via the LLDP (Link Layer Discovery) protocol. See Figure 57.



Switch LLDP Info					
Name	Arista7504R	Port ID	Ethernet4/18/3	Port VLAN	164

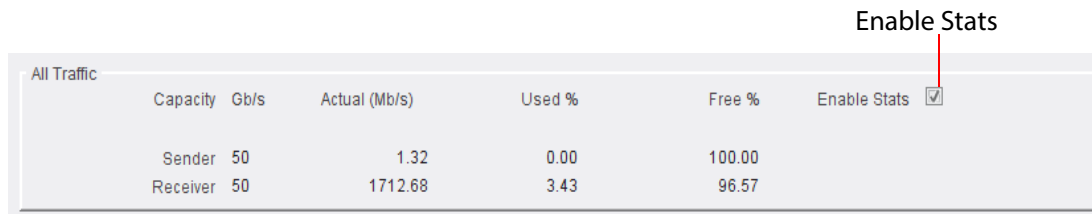
Figure 57 IP Switch LLDP Info Panel

Table 23 IP Switch LLDP Panel Settings

IP Switch LLDP Item	Description
<b>Name</b>	Shows the name assigned to the network IP switch.
<b>Port ID</b>	Shows the IP switch port ID.
<b>Port VLAN</b>	Shows the VLAN ID number used by the network interface.

### 4.9.3 All Traffic Panel

Select **Enable Stats** in the panel to display information on traffic through the MV-820-IP Video IP block network interface link. See Figure 58 (and see Figure 59).



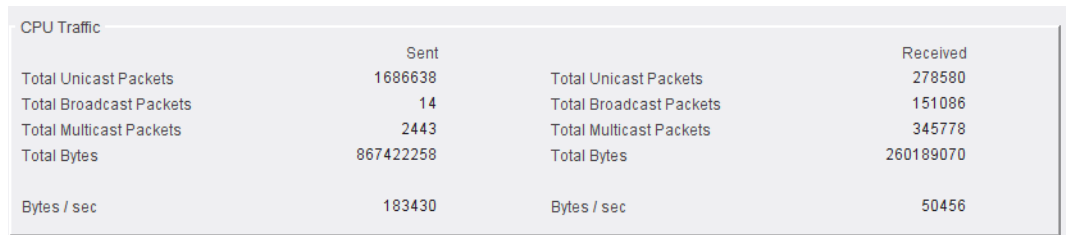
All Traffic				
	Capacity Gb/s	Actual (Mb/s)	Used %	Free %
Sender	50	1.32	0.00	100.00
Receiver	50	1712.68	3.43	96.57

Enable Stats

Figure 58 All Traffic Panel

### 4.9.4 CPU Traffic Panel

When **Enable Stats** is selected in the **All Traffic** panel, the **CPU Traffic** panel displays information on traffic through the CPU of the MV-820-IP Video IP block. See Figure 59.



	Sent		Received
Total Unicast Packets	1686638	Total Unicast Packets	278580
Total Broadcast Packets	14	Total Broadcast Packets	151086
Total Multicast Packets	2443	Total Multicast Packets	345778
Total Bytes	867422258	Total Bytes	260189070
Bytes / sec	183430	Bytes / sec	50456

Figure 59 CPU Traffic Panel

## 4.10 Ethernet 1 and 2 RTP Sender Templates

The **Ethernet 1 RTP Sender** and **Ethernet 2 RTP Sender** templates displays the amount of data transmitted on a spigot-by-spigot basis. Units are megabits per second. (MV-820-IP Video IP blocks transmit 'multiviewer display output' video IP data packets on spigots 1 to 4.) See Figure 60.

- Select **Enable Stats** to display values.

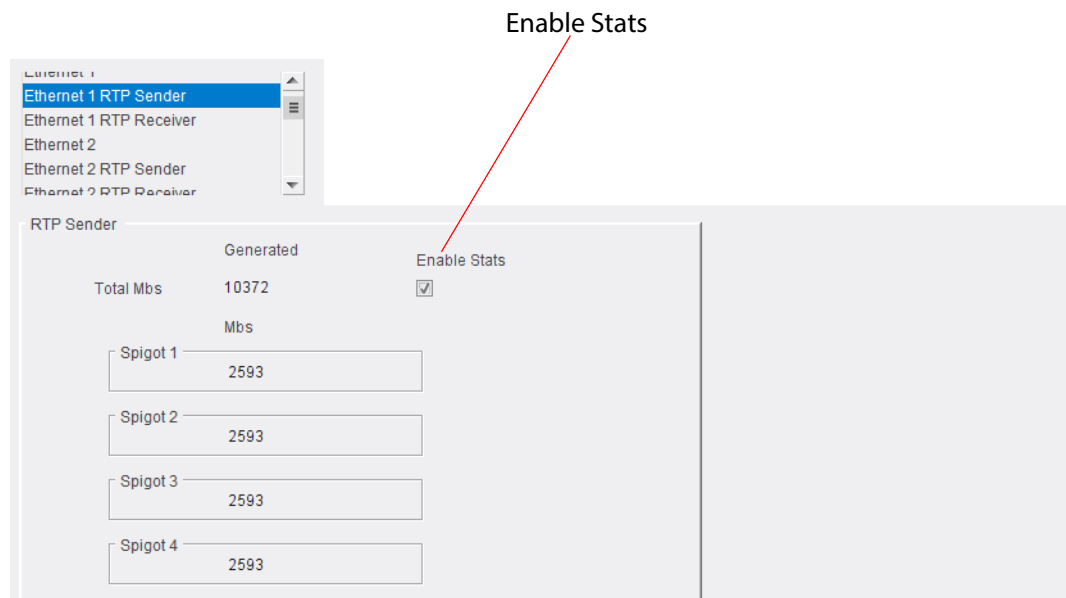


Figure 60 Ethernet RTP Sender Template

## 4.11 Ethernet 1 and 2 RTP Receiver Templates

The **Ethernet 1 RTP Receiver** and **Ethernet 2 RTP Receiver** templates display information on a spigot-by-spigot basis about:

- the amount of data received;
- packet loss; and
- any unwanted multicast traffic.

Units are megabits per second.

MV-820-IP Video IP blocks receive video IP data packets on spigots 5 to 16.

- Select **Enable Stats** to display the values.

**Enable Stats**

RTP Receiver

Total Received RTP Rate (Mbs)	3118	Enable Stats
Total Received RTP Pkt Rate	271440	<input checked="" type="checkbox"/>
RTP Sequence Discontinuity Count	1	Clear RTP Count
Mac Error Count	0	Clear Error Count

Click to clear RTP Count

Click to clear MAC Error Count

Unwanted Multicast Traffic

Multicast Drop Rate (Mbs)	0	Multicast Drop Pkt Rate	1
---------------------------	---	-------------------------	---

Last Few Dropped Packets

Source IP	Source Port	Destination IP	Destination Port	Packet Type
172.19.164.239	65219	224.0.0.252	5355	17
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

Figure 61 Ethernet RTP Receiver Template

## 4.12 Ethernet RTP Receiver Video Stats Template

The **RTP Receiver Video Stats** template displays information on the video IP flows to both network interfaces 1 and 2 of the Video IP block on a spigot-by-spigot basis.

- Select **Enable Stats** to display the values.

Ethernet 1 stats

Ethernet 2 stats

Enable Stats

Information  
1: 172.19.164.125  
2: 172.19.164.129  
R: 172.19.160.142

SDI Selection  
SDI 1 / SDI 2

Information Select  
 Video Input Status  
 Video Output Status  
 Network Status

Enable Stats

Spigots	Flow ID
5	17
6	17
7	17
8	17
9	17
10	17
11	17
12	17
13	17
14	17
15	17
16	17

Ethernet 1	
Byte Rate (Mbs)	RTP Discontinuity Count
312	0
312	0
312	0
312	0
312	0
312	0
312	0
312	0
312	0
312	0
312	0
312	0
312	0
312	0
312	0
312	0

Ethernet 2	
Byte Rate (Mbs)	RTP Discontinuity Count
312	0
312	0
312	0
312	0
312	0
312	0
312	0
312	0
312	0
312	0
312	0
312	0
312	0
312	0
312	0

Clear All RTP Counts

Clear All RTP Counts

Click to clear the RTP discontinuity counters

Figure 62 Ethernet RTP Receiver Video Stats Template



## 4.13 Ethernet RTP Receiver Audio Stats Template

The **RTP Receiver Audio Stats** template displays information on the audio IP flows to the network interfaces 1 and 2 of the Video IP block on a spigot-by-spigot basis.

- Select **Enable Stats** to display the values.



Figure 63 Ethernet RTP Receiver Audio Stats Template

## 4.14 Ethernet RTP Receiver Meta Stats Template

The **RTP Receiver Meta Stats** template displays information on the metadata IP flows to the network interfaces 1 and 2 of the Video IP block on a spigot-by-spigot basis.

- Select **Enable Stats** to display the values.



Figure 64 Ethernet RTP Receiver Meta Stats Template

## 4.15 Link Control Template

The **Link Control** template allows quad-link 4K inputs to be aggregated and synchronized by the MV-820-IP Video IP block.

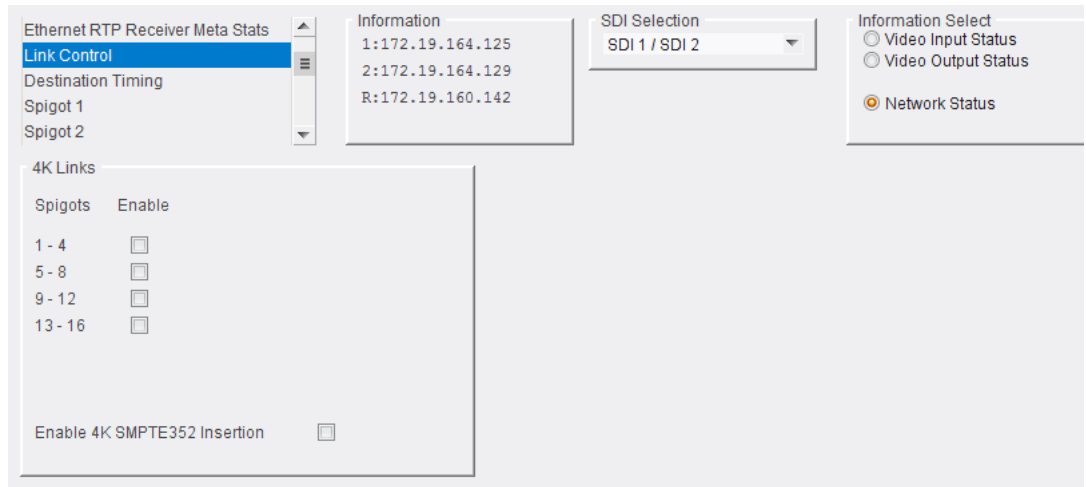


Figure 65 Link Control Template

To enable 4K quad-link video input IP streams on spigots:

- Select the 'Enable' check box for quad-link **Spigots**, as required:
  - '1 - 4'
  - '5 - 8'
  - '9 - 12'
  - '13 - 16'

To insert a 4K SMPTE352 payload identifier into a video IP output stream:

- Select the **Enable 4K SMPTE352 Insertion** check box.

This inserts the same timestamp information is inserted into each of the four 'quad-linked' video IP streams.

## 4.16 Destination Timing Template

The **Destination Timing** template shows video timing information for each destination spigot of the MV-820-IP Video IP block. For MV-820-IP, Video IP block spigots 5 to 16 are configured as destination spigots, they receive video IP streams, and spigots 1 to 4 are grayed out (because they are configured as source spigots).

Spigots 1 to 4 are grayed out because they are configured as IP output spigots (source spigots).

Spigots 5 to 16 configured as input spigots (destination spigots). See Figure 67.



Figure 66 Destination Timing Template

**Note:**

An MV-820-IP Video IP block:

- Sources up to 4 video IP streams (3G video) on spigots 1 to 4.
- Receives up to 12 video IP streams (up to 3G video) on spigots 5 to 16.

The template shows a panel of information for each spigot, see Figure 67. A spigot panel is grayed out for spigots not configured as destination spigots.

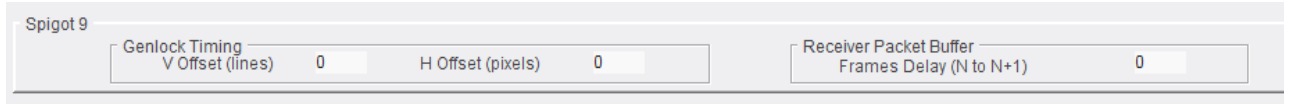


Figure 67 Destination Timing - Spigot Panel

Table 24 Destination Timing - Spigot Panel Information

Spigot Panel Item	Description
<b>Genlock Timing:</b>  <b>V Offset (lines)</b> <b>H Offset (pixels)</b>	Displays video timing with respect to the chosen video reference signal.  Displays vertical timing offset in units of video lines. Displays horizontal timing offset in units of pixels.
<b>Receiver Packet Buffer</b>  <b>Frames Delay (N to N+1)</b>	The receiver packet buffer can provide additional buffering to a received IP flow.  Enter number of frames of buffering (0 or 1).  Note: Adding buffering can affect the time it takes to switch between IP flows at a spigot.

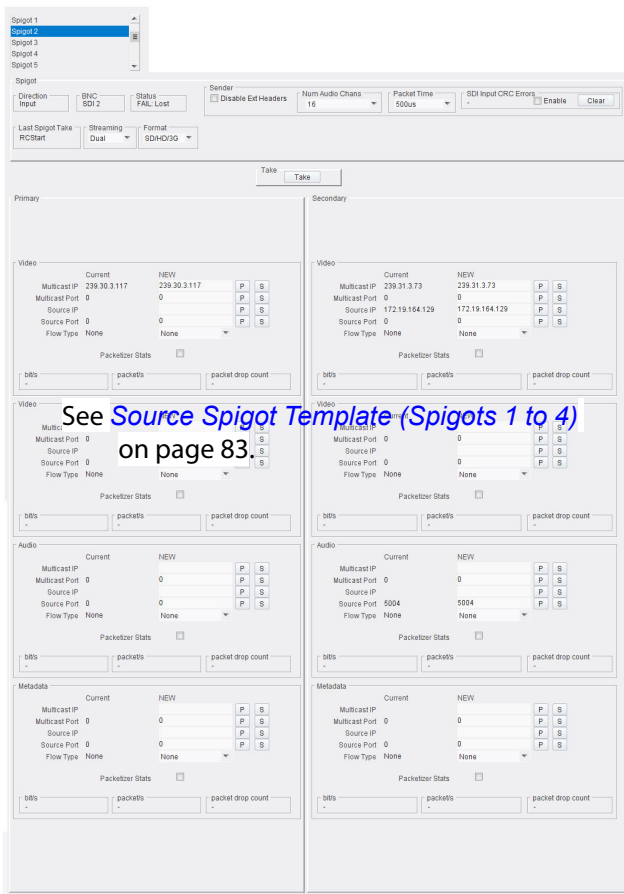
## 4.17 Spigot 1 to 16 Templates

A separate template is provided for each of the active spigots. These templates are dynamically configured by the MV-820-IP Video IP block to reflect the capabilities of its selected software version and firmware. Templates for destination spigots and source spigots are slightly different and are described separately below.

**Note:**

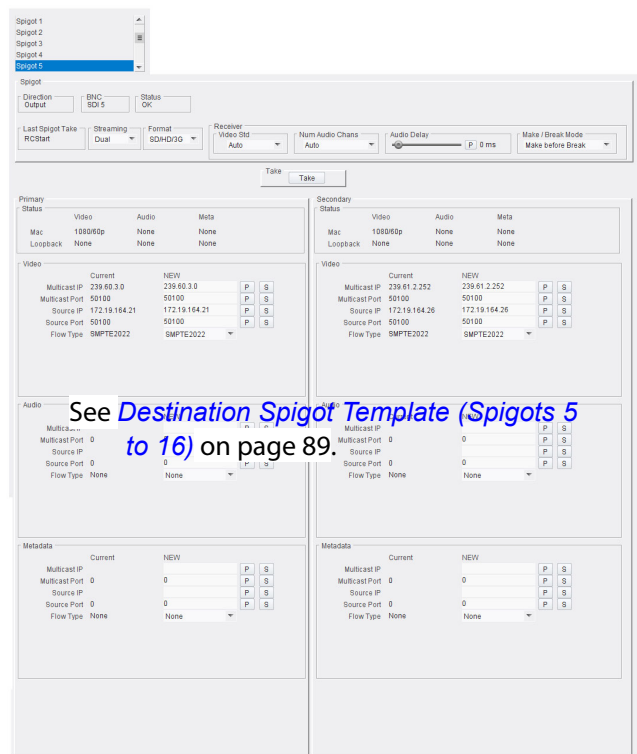
Reminder: For MV-820-IP Video IP blocks:

- **Spigots 1 to 4:** (See [Source Spigot Template \(Spigots 1 to 4\)](#) on page 83.)  
Configured as **Source Spigots** to transmit video IP streams.
- **Spigots 5 to 16:** (See [Destination Spigot Template \(Spigots 5 to 16\)](#) on page 89.)  
Configured as **Destination Spigots** to receive video IP streams.



See [Source Spigot Template \(Spigots 1 to 4\)](#) on page 83.

a) **Source** spigot template  
(for example, spigots 1 to 4)



See [Destination Spigot Template \(Spigots 5 to 16\)](#) on page 89.

b) **Destination** spigot template  
(for example, spigots 5 to 16)

Figure 68 Spigot Template:  
a) Source Spigot.  
b) Destination Spigot.

### 4.17.1 Source Spigot Template (Spigots 1 to 4)

The **Source Spigot** template is shown in Figure 69.

**Spigot**

Direction: Input | BNC: SDI 2 | Status: FAIL: Lost | Sender:  Disable Ext Headers | Num Audio Chans: 16 | Packet Time: 500us | SDI Input CRC Errors:  Enable | Clear

Last Spigot Take: RCStart | Streaming: Dual | Format: SD/HD/3G

**Spigot panel, see [Spigot Panel \(Source Spigot\)](#) on page 84.**

Take:  | **Take, see [Take](#) on page 86.**

**Primary** | **Secondary**

**Flow panels, see [Flow Panels \(Source Spigot\)](#) on page 87.**

**Video**

	Current	NEW		
Multicast IP	239.30.3.117	239.30.3.117	P	S
Multicast Port	0	0	P	S
Source IP			P	S
Source Port	0	0	P	S
Flow Type	None	None		

Packetizer Stats:

bit/s: - | packet/s: - | packet drop count: -

**Audio**

	Current	NEW		
Multicast IP			P	S
Multicast Port	0	0	P	S
Source IP			P	S
Source Port	0	0	P	S
Flow Type	None	None		

Packetizer Stats:

bit/s: - | packet/s: - | packet drop count: -

**Metadata**

	Current	NEW		
Multicast IP			P	S
Multicast Port	0	0	P	S
Source IP			P	S
Source Port	0	0	P	S
Flow Type	None	None		

Packetizer Stats:

bit/s: - | packet/s: - | packet drop count: -

Figure 69 Source Spigot Template

### 4.17.1.1 Spigot Panel (Source Spigot)

The **Spigot** panel provides basic monitoring for the selected **Spigot**.

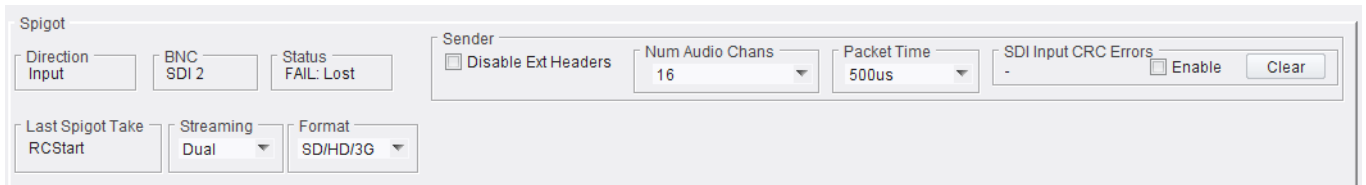


Figure 70 Spigot Panel (Source Spigot)

Table 25 Spigot Panel Information (Source Spigot)

Spigot Panel Item (Source Spigot)	Description
<b>Direction</b>	Shows the direction of the spigot. <ul style="list-style-type: none"> <li>• 'Input': Within the MV-820-IP unit, the spigot has an SDI input and it provides a video IP output externally.</li> <li>• 'Output': Within the MV-820-IP unit, the spigot has an SDI output and it receives a video IP input externally.</li> </ul>
<b>BNC</b>	Shows the associated (notional) SDI connector number. (Spigots 1 to 16 use notional BNC-type connectors 1 to 16 respectively.)
<b>Status</b>	Reports the current status of the spigot. <ul style="list-style-type: none"> <li>• OK</li> <li>• Warn:TPG</li> <li>• FAIL:Lost</li> </ul>
<b>Last Spigot Take</b>	Reports the 'control agency' which last performed a <b>Take</b> on the spigot. <ul style="list-style-type: none"> <li>• RC - RollCall. Operation from a control panel or by an external agent, like VSM.</li> <li>• IPCtrl - Grass Valley Orbit.</li> </ul>



Table 25 Spigot Panel Information (Source Spigot) (continued)

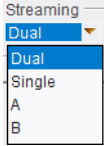
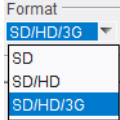
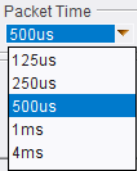
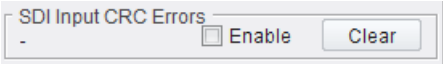
Spigot Panel Item (Source Spigot)	Description
<p><b>Streaming</b></p>	<p>Drop down box.                      Select the Video IP block’s Ethernet connections to use for this spigot. This will also determine the bandwidth to be used.                      Options are:</p> <ul style="list-style-type: none"> <li>• <b>Dual</b> - use both connections and all the available bandwidth.</li> <li>• <b>Single</b> - use either connection and half of the available bandwidth.</li> <li>• <b>A or B</b> - use one particular connection and half of the available bandwidth.</li> </ul> 
<p><b>Format</b></p>	<p>Drop down box.                      Select the video format to be used on this spigot.                      This will ensure that the appropriate level of bandwidth is allocated.</p> 
<p><b>Sender:</b></p> <p style="padding-left: 40px;"><b>Disable Ext Headers</b></p> <p style="padding-left: 40px;"><b>Num Audio Chans</b></p>	<p>Check box.                      Select to disable extended headers in the sourced IP data packets.                       Extended header operation can be disabled for TR-03/TR-04 compatibility.                       To disable extended headers:</p> <ol style="list-style-type: none"> <li>1. Select <b>Disable Extended Headers</b>.</li> <li>2. Click <b>Take</b>.</li> </ol> <p>Drop down box.                      Select the number of audio channels. (1 to 16)                       This setting allows the number of audio channels in use to be restricted. Select from the list the highest audio channel number to be used.</p>

Table 25 Spigot Panel Information (Source Spigot) (continued)

Spigot Panel Item (Source Spigot)	Description
<p><b>Packet Time</b></p>	<p>Drop down box. Select the duration of an audio data packet.</p> 
<p><b>SDI Input CRC Errors</b></p>	<p>Shows a count of any CRC errors on the SDI input. Select <b>Enable</b> to enable the count. Click <b>Clear</b> to clear the count.</p> 

### 4.17.1.2 Take

Click **Take** to apply any changes made to spigot or flow properties in the Spigot panel.

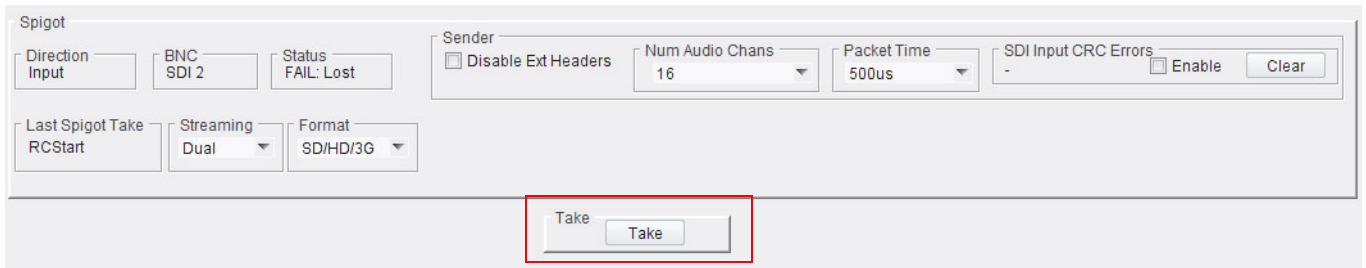


Figure 71 Take

### 4.17.1.3 Flow Panels (Source Spigot)

The **Flow** panels are arranged into two columns: **Primary** flows and **Secondary** flows. (Primary flows pass through one network connection to the Video IP block, secondary through the other.)

Each network connection can carry more than one flow. For spigots 1 to 4, there are two video flows, one audio flow and one metadata flow. Each flow has a **Flow** panel.

The **Flow** panel allows multicast IP flow and IP port details to be defined for the selected spigot. Statistics for the spigot can also be enabled. Figure 72 shows an example **Flow** panel.

In a Grass Valley IP routing system, some of these settings are set up by Grass Valley Orbit. This is indicated in Table 26.

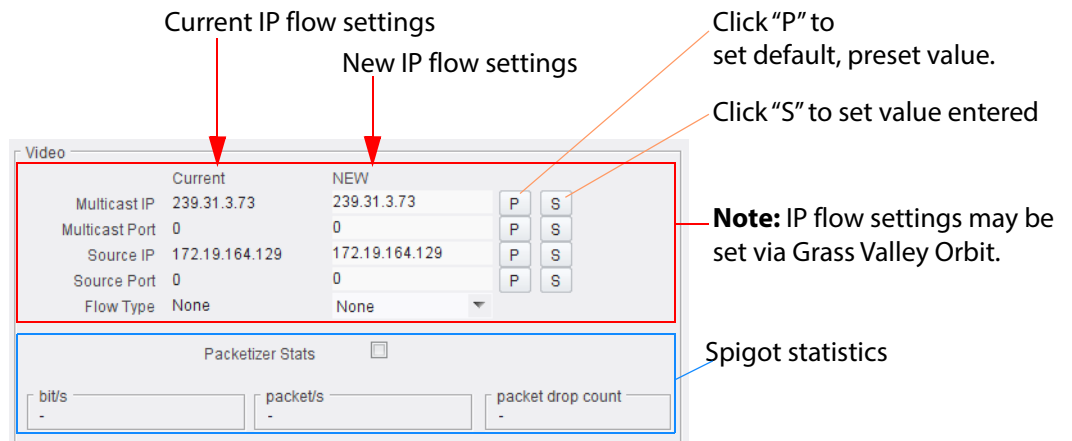


Figure 72 Flow Panel (Video Flow Example shown)

Table 26 Flow Panel Information and Settings (Source Spigot)

Flow Panel Item	Description								
<b>Multicast IP</b>	Multicast group IP address. See <b>Note 1</b> .								
<b>Multicast Port</b>	Multicast group IP port number. See <b>Note 1</b> .								
<b>Source IP</b>	Source IP address. See <b>Note 1</b> .								
<b>Source Port</b>	Source IP port number. See <b>Note 1</b> .								
<b>Flow Type</b>	Drop down box. Select the flow type. See <b>Note 1</b> . <ul style="list-style-type: none"> <li>Video flow types: (Note: Two simultaneous video flows are possible from the source spigot.)                             <table border="1" data-bbox="1061 1563 1417 1653"> <tr> <td>None</td> <td>None</td> </tr> <tr> <td>SMPTE2022</td> <td>RFC4175</td> </tr> </table> </li> <li>Audio flow types:                             <table border="1" data-bbox="1061 1758 1225 1848"> <tr> <td>None</td> </tr> <tr> <td>Audio</td> </tr> </table> </li> <li>Metadata flow types:                             <table border="1" data-bbox="1061 1863 1225 1953"> <tr> <td>None</td> </tr> <tr> <td>Data</td> </tr> </table> </li> </ul>	None	None	SMPTE2022	RFC4175	None	Audio	None	Data
None	None								
SMPTE2022	RFC4175								
None									
Audio									
None									
Data									

Table 26 Flow Panel Information and Settings (Source Spigot) (continued)

Flow Panel Item	Description
<b>Packetizer Stats</b>	Check box. Select to enable statistics on spigot IP data packets.
<b>bits/s</b>	Bits per second.
<b>packet/s</b>	Packets per second.
<b>packet drop count</b>	Number of dropped packets.

**Note 1:** These settings may be set by Orbit.

**Note:** **“S” and “P” buttons -**  
 After entering information in each text box, always click on the adjacent **“S”** button or press **“return”** to locally save the new setting. Do this for each text box.  
 (Note: Clicking on the **“P”** button will return the setting to its preset default value).  
**“S”** - Locally save new, entered setting value (or press “return”).  
**“P”** - Locally save default setting value.

To set multicast details:

1. Enter IP address and IP port number details in the ‘New settings’ column, as required. (Remember to click **S** or press the enter key to enter each new value.)
2. Select the **Flow Type**.
3. Click **Packetizer Stats** to view network statistics for an outgoing flow, if required.
4. Click **Take**.

In order to provide redundancy, primary and secondary flows are available on separate network connections to the MV-820-IP Video IP block. These require setting up separately.

### 4.17.2 Destination Spigot Template (Spigots 5 to 16)

The **Destination Spigot** template is shown in Figure 73.



Figure 73 Destination Spigot Template

### 4.17.2.1 Spigot Panel (Destination Spigot)

The **Spigot** panel provides basic monitoring for the selected **Spigot**.

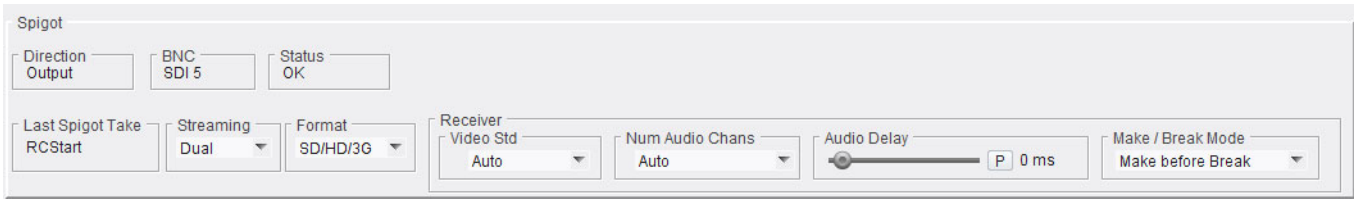


Figure 74 Spigot Panel (Destination Spigot)

Table 27 Spigot Panel Information (Destination Spigot)

Spigot Panel Item (Destination Spigot)	Description
<b>Direction</b>	Shows the direction of the spigot. <ul style="list-style-type: none"> <li>• 'Input': Within the MV-820-IP unit, the spigot has an SDI input and it provides a video IP output externally.</li> <li>• 'Output': Within the MV-820-IP unit, the spigot has an SDI output and it receives a video IP input externally.</li> </ul>
<b>BNC</b>	Shows the associated (notional) SDI connector number. (Spigots 1 to 16 use notional BNC-type connectors 1 to 16 respectively.)
<b>Status</b>	Reports the current status of the spigot. <ul style="list-style-type: none"> <li>• OK</li> <li>• Warn:TPG</li> <li>• FAIL:Lost</li> </ul>
<b>Last Spigot Take</b>	Reports the 'control agency' which last performed a <b>Take</b> on the spigot. <ul style="list-style-type: none"> <li>• RC - RollCall. Operation from a control panel or by an external agent, like VSM.</li> <li>• IPCtrl - Grass Valley Orbit.</li> </ul>

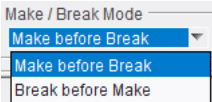
Table 27 Spigot Panel Information (Destination Spigot) (continued)

Spigot Panel Item (Destination Spigot)	Description
<p><b>Streaming</b></p>	<p>Drop down box.                      Select the Video IP block's Ethernet connections to use for this spigot. This will also determine the bandwidth to be used.                      Options are:</p> <ul style="list-style-type: none"> <li>• <b>Dual</b> - use both connections and all the available bandwidth.</li> <li>• <b>Single</b> - use either connection and half of the available bandwidth.</li> <li>• <b>A or B</b> - use one particular connection and half of the available bandwidth.</li> </ul> <div data-bbox="1043 689 1150 837" style="text-align: center;"> </div>
<p><b>Format</b></p>	<p>Drop down box.                      Select the video format to be used on this spigot.                      This will ensure that the appropriate level of bandwidth is allocated.</p> <div data-bbox="1038 1039 1155 1160" style="text-align: center;"> </div>





Table 27 Spigot Panel Information (Destination Spigot) (continued)

Spigot Panel Item (Destination Spigot)	Description
<p><b>Make / Break Mode</b></p>	<p>Drop down box. Select the make/break mode when changing the video IP signal to the spigot.</p> <p><b>Make before Break</b> - causes the destination spigot to buffer new IP stream data packets before connection to current IP stream is broken; this results in a smoother transition on-screen, but requires more bandwidth.</p> <p><b>Break before Make</b> - simply swaps IP data stream received at the destination spigot without buffering.</p> 

### 4.17.2.2 Take

Click **Take** to apply any changes made to spigot or flow properties in the Spigot panel.

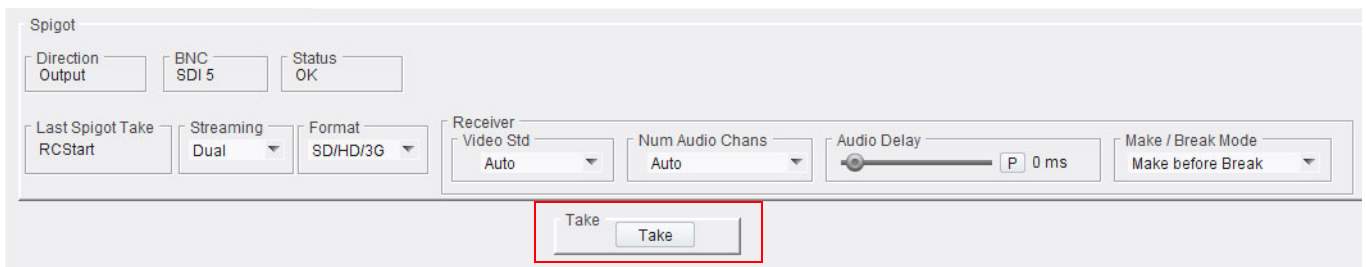


Figure 75 Take

### 4.17.2.3 Status and Flow Panels (Destination Spigot)

The **Flow** panels are arranged into two columns: **Primary** flows and **Secondary** flows. (Primary flows pass through one network connection to the Video IP block, secondary through the other.) Additionally, for each primary and secondary network connection, there is a summary **Status** panel (see Figure 76).

Each network connection can carry more than one flow. For spigots 5 to 16, there is: one video flow, one audio flow and one metadata flow. Each flow has a **Flow** panel.

**Status Panel:**

Status	Video	Audio	Meta
Mac	1080/60p	None	None
Loopback	None	None	None

Figure 76 Status Panel

The **Status** panel reports status information for each enabled flow.

- **Mac** - IP flow received over IP network.
- **Loopback** - IP flow received looped back from the Video IP block. (Either by setting the Video IP block to receive a flow from itself, or by using the loopback router facility offered by the block.)

**Flow Panel:**

The **Flow** panel allows multicast IP flow and IP port details to be defined for the selected spigot. Statistics for the spigot can also be enabled. Figure 72 shows an example **Flow** panel.

In a Grass Valley IP routing system, some of these settings are set up by Orbit. This is indicated in Table 28.

Current IP flow settings

New IP flow settings

Click "P" to set default, preset value.

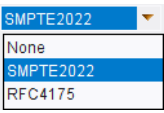
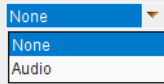
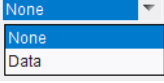
Click "S" to set value entered

**Note:** IP flow settings may be set via Grass Valley Orbit.

Video	Current	NEW		
Multicast IP	239.60.3.0	239.60.3.0	P	S
Multicast Port	50100	50100	P	S
Source IP	172.19.164.21	172.19.164.21	P	S
Source Port	50100	50100	P	S
Flow Type	SMPTE2022	SMPTE2022		

Figure 77 Flow Panel (Video Flow Example)

Table 28 Flow Panel Information and Settings (Destination Spigot)

Flow Panel Item (Destination Spigot)	Description
<b>Multicast IP</b>	Multicast group IP address. See <b>Note 1</b> .
<b>Multicast Port</b>	Multicast group IP port number. See <b>Note 1</b> .
<b>Source IP</b>	Source IP address. See <b>Note 1</b> .
<b>Source Port</b>	Source IP port number. See <b>Note 1</b> .
<b>Flow Type</b>	Drop down box. Select the flow type. <ul style="list-style-type: none"> <li>• Video flow types: </li> <li>• Audio flow types: </li> <li>• Metadata flow types: </li> </ul>

**Note 1:** These settings may be set by Grass Valley Orbit.

**Note:** **“S” and “P” buttons -**  
 After entering information in each text box, always click on the adjacent **“S”** button or press **“return”** to locally save the new setting. Do this for each text box.  
 (Note: Clicking on the **“P”** button will return the setting to its preset default value).  
**“S”** - Locally save new, entered setting value (or press “return”).  
**“P”** - Locally save default setting value.

**Setting Multicast Details:**

To set multicast details:

1. Select the required **Video Std** (video output standard from spigot as SDI video).
2. Enter IP address and IP port number details in the ‘New settings’ column, as required. (Remember to click **S** or press the enter key to enter each new value.)
3. Select the **Flow Type**.
4. Click **Take**.

In order to provide redundancy, primary and secondary flows are available on separate network connections to the MV-820-IP Video IP block. These require setting up separately.

## 4.18 Logging Configuration Template

The **Logging Configuration** template configures a connection to a RollCall LogServer. Figure 78 shows an example template. Logging connection is made via the Video IP block's control interface (referred to as 'Rear Ethernet Port' on the template).

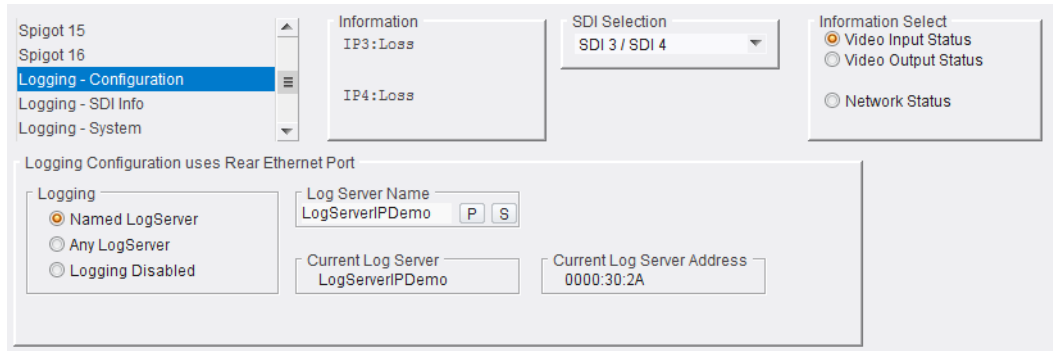


Figure 78 Logging Configuration Template

Table 29 Logging Configuration Template Settings

Logging Configuration Item	Description
<b>Logging:</b>	
<b>Named LogServer</b>	Radio button. Select to log to a named RollCall log server device.
<b>Any LogServer</b>	Radio button. Select to log to any discovered RollCall log server device.
<b>Logging Disabled</b>	Radio button. Select to disable logging.
<b>Log Server Name</b>	Text. Enter the log server host name.  (Click <b>S</b> or press the enter key to set the name. Click <b>P</b> to set the default name.)
<b>Current Log Server</b>	Shows the current log server name.
<b>Current Log Server Address</b>	Shows the current log server's RollCall address.

Note:

**“S” and “P” buttons -**

After entering information in each text box, always click on the adjacent “S” button or press “return” to locally save the new setting. Do this for each text box.

(Note: Clicking on the “P” button will return the setting to its preset default value).

“S” - Locally save new, entered setting value (or press “return”).

“P” - Locally save default setting value.

## 4.19 Logging SDI Info Template

The **Logging SDI Info** template shows SDI log message types: Log field names and current log values are listed. Each log message type can be enabled by selecting it in the template.

Figure 79 shows an example template.

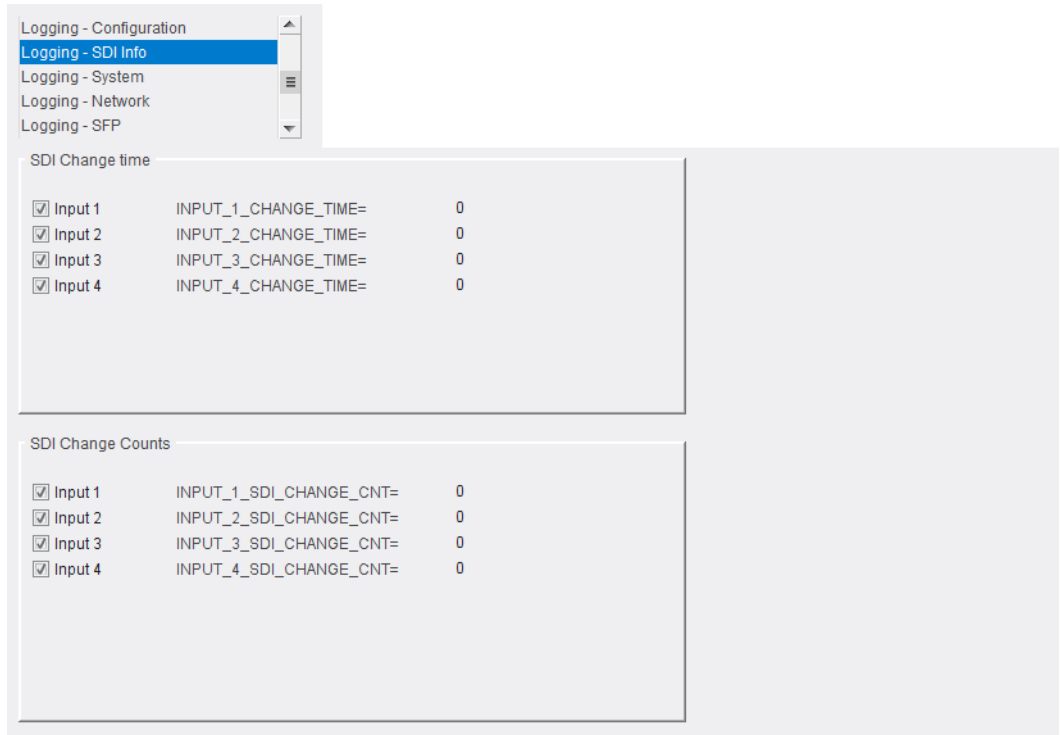


Figure 79 Logging SDI Info Template

Table 30 Logging SDI Info Template - Settings

Log Message	Description
<b>SDI Change Time</b> <i>INPUT_N_CHANGE_TIME</i>	The time when the state of the SDI input changed. (I.e. input lost or input standard changed.)
<b>SDI Change Count</b> <i>INPUT_N_CHANGE_CNT</i>	The number of times the state of the SDI input has changed.

## 4.20 Logging System Template

The **Logging System** template shows system message types: Log field names and log values are listed in the 'Log Field' and 'Log Value' columns respectively. Information on several parameters can be made available to a logging device connected to the RollCall network.

Each log message type can be enabled by selecting it in the template in the 'Log Enable' column.

Figure 80 shows an example template.

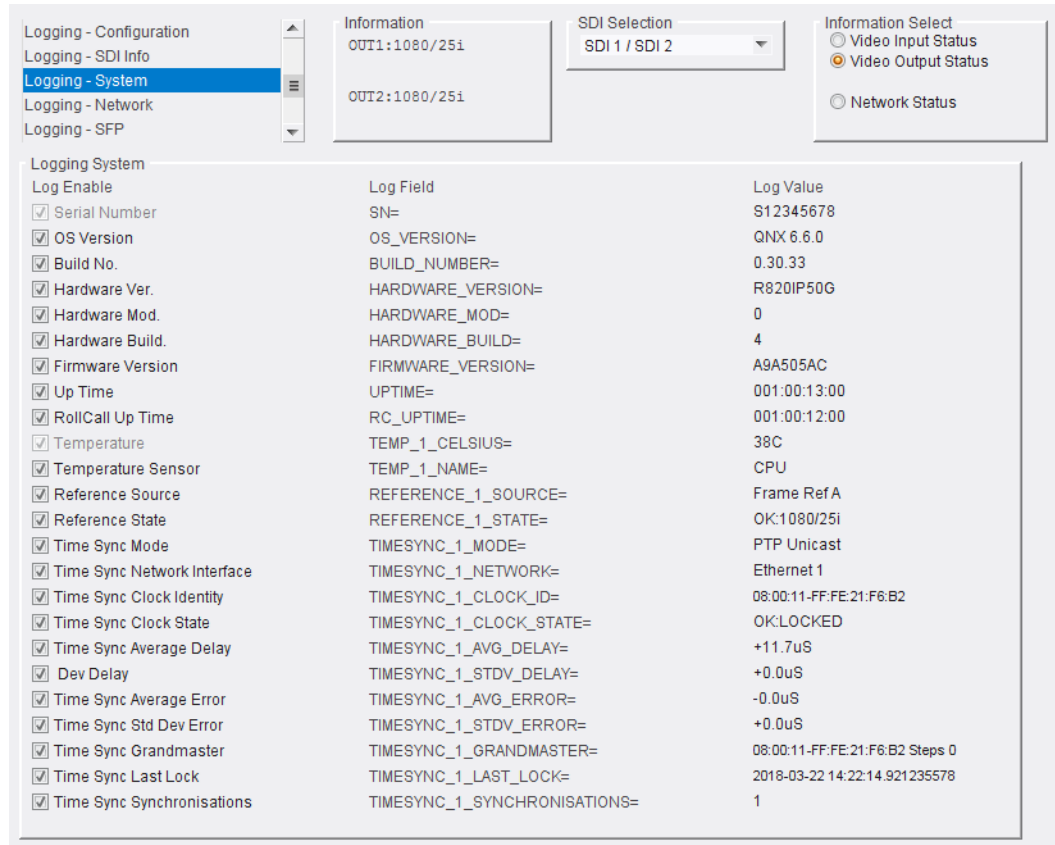


Figure 80 Logging System Template

Log fields are described in Table 31.

Table 31 Logging System Log Fields

Log Field	Description
<b>SN</b>	Reports the module serial number, which consists of an S followed by eight digits. <b>Note:</b> this cannot be deselected.
<b>OS_VERSION</b>	Reports the operating system name and version.
<b>BUILD_NUMBER</b>	Reports the build number.
<b>HARDWARE_VERSION</b>	Reports the hardware version number.
<b>HARDWARE_MOD</b>	Reports the hardware modification number.
<b>HARDWARE_BUILD</b>	Reports the hardware build number.
<b>FIRMWARE_VERSION</b>	Reports the firmware version number.

Table 31 Logging System Log Fields (continued)

Log Field	Description
<b>UPTIME</b>	Reports the time since the last Video IP block restart in the format <i>ddd:hh:mm:ss</i> .
<b>RC_UPTIME</b>	Reports the time since the last RollCall logserver restart in the format <i>ddd:hh:mm:ss</i> .
<b>TEMP_N_NAME</b>	Temperature measurement name.
<b>TEMP_N_CELSIUS</b>	Reports the temperature status.
<b>REFERENCE_N_SOURCE</b>	Reports time reference source.
<b>REFERENCE_N_STATE</b>	Valid values are: <ul style="list-style-type: none"> <li>• <b>OK: Locked</b></li> <li>• <b>OK: Input</b></li> <li>• <b>WARN: Freerun</b></li> <li>• <b>WARN: CrossLock</b></li> </ul>
<b>TIMESYNC_N_MODE</b>	Valid values are: <ul style="list-style-type: none"> <li>• <b>Free running:</b> Card is using its own clock with no reference to any other source.</li> <li>• <b>PTP Multicast:</b> Card is synchronizing to a PTP grandmaster clock using multicast network messages.</li> <li>• <b>PTP Unicast:</b> As <b>PTP Multicast</b> but using the delay request. Reply messages are unicast to minimize network traffic.</li> <li>• <b>NTP:</b> Module clock is synchronized to an NTP clock. Generally less precise than PTP.</li> </ul>
<b>TIMESYNC_N_NETWORK</b>	Network port currently being used for synchronization for IQMIX modules, dependant on the choice of interfaces made on the Time Configuration template. If PTP and multiple interfaces are enabled, the PTP synchronization will switch ports if it doesn't see regular sync messages on the port.
<b>TIMESYNC_N_CLOCK_ID</b>	Identification number of PTP clock being used for synchronization. This is not necessarily the grandmaster clock identity, as there can be intermediate clocks between the grandmaster and the card, depending on network configuration.
<b>TIMESYNC_N_CLOCK_STATE</b>	Valid values are: <ul style="list-style-type: none"> <li>• <b>Free running:</b> Card is not being synchronized.</li> <li>• <b>No Lock:</b> PTP being used but clocks haven't synchronized within +/- 1mS.</li> <li>• <b>Locked:</b> PTP being used and clocks are within the accepted range.</li> <li>• <b>NTP:</b> Module using NTP to synchronize.</li> </ul>
<b>TIMESYNC_N_AVG_DELAY</b>	The current network delay time between the card and the clock sending the synchronization messages. This should be relatively constant and is dependant on network configuration.

Table 31 Logging System Log Fields (continued)

Log Field	Description
<b>TIMESYNC_N_STDV_DELAY</b>	The current standard deviation in the network delay time between the card and the clock sending the synchronization messages. Should be a low number as the network delay is expected to be constant.
<b>TIMESYNC_N_AVG_ERROR</b>	The current difference between the cards time and the grandmaster time. Should be close to zero once card has synchronized.
<b>TIMESYNC_N_STDV_ERROR</b>	The standard deviation in the average error.
<b>TIMESYNC_N_GRANDMASTER</b>	Identity of network clock acting as PTP grandmaster. This is the source of the PTP synchronization messages used by all PTP slave clocks on the network. If there are multiple grandmasters, they should negotiate between themselves to identify the most accurate and then silence the others.
<b>TIMESYNC_N_LAST_LOCK</b>	Time when the module last changed from not locked to locked. Ideally this will be a few seconds after the module has powered up. This allows the user to confirm which clock the module has synchronized to.
<b>TIMESYNC_N_SYNCHRONISATIONS</b>	Reports the number of times the card has synchronized since it was powered up. Ideally this will be a low number, as cards are expected to synchronize and stay synchronized. Large numbers indicate possible problems with the network or grandmaster clock.



## 4.21 Logging Network Template

The **Logging Network** template shows network message types: Log field names and current log values are listed in the 'Log Field' and 'Log Value' columns respectively. Information on several parameters can be made available to a logging device connected to the RollCall network.

Each log message type can be enabled by selecting it in the template in the 'Log Enable' column.

Figure 81 shows an example template.

The screenshot displays the 'Logging - Network' template configuration. On the left is a sidebar menu with options: Logging - Network (selected), Logging - SFP, Logging - Fpga, Logging - Spigot 1, and Logging - Spigot 2. The main area is titled 'Logging Network' and contains a table with three columns: 'Log Enable', 'Log Field', and 'Log Value'. The 'Log Enable' column contains checkboxes, all of which are checked. The 'Log Field' column lists various network parameters, and the 'Log Value' column shows their current values. At the top right, there is an 'Information Select' panel with three radio buttons: 'Video Input Status' (unselected), 'Video Output Status' (selected), and 'Network Status' (unselected). Below this is an 'SDI Selection' dropdown menu set to 'SDI 1 / SDI 2'. To the left of the dropdown is an 'Information' panel showing 'OUT1:1080/251' and 'OUT2:1080/251'.

Log Enable	Log Field	Log Value
<input checked="" type="checkbox"/>	Ethernet 1 Name	LAN_PORT_1_NAME=
<input checked="" type="checkbox"/>	Ethernet 1 Speed	LAN_PORT_1_SPEED=
<input checked="" type="checkbox"/>	Ethernet 1 IP Address	LAN_PORT_1_IPADDRESS=
<input checked="" type="checkbox"/>	Ethernet 1 MAC Address	LAN_PORT_1_MACADDRESS=
<input checked="" type="checkbox"/>	Ethernet 1 State	LAN_PORT_1_STATE=
<input checked="" type="checkbox"/>	Ethernet 1 Traffic In	LAN_PORT_1_TRAFFIC_IN=
<input checked="" type="checkbox"/>	Ethernet 1 Traffic Out	LAN_PORT_1_TRAFFIC_OUT=
<input checked="" type="checkbox"/>	Ethernet 1 CPU Traffic In State	LAN_PORT_1_CPU_TRAF_IN_STATE=
<input checked="" type="checkbox"/>	Ethernet 1 CPU Traffic Out State	LAN_PORT_1_CPU_TRAF_OUT_STATE=
<input checked="" type="checkbox"/>	Ethernet 1 RTP Discontinuity Rate	LAN_PORT_1_RTP_DIS_RATE=
<input checked="" type="checkbox"/>	Ethernet 1 Link Status	LAN_PORT_1_LINK_STATE=
<input checked="" type="checkbox"/>	Ethernet 1 MAC Link Status	LAN_PORT_1_MAC_LINK_STATE=
<input checked="" type="checkbox"/>	Ethernet 1 Switch Name	LAN_PORT_1_SWITCH_NAME=
<input checked="" type="checkbox"/>	Ethernet 1 Switch Port ID	LAN_PORT_1_SWITCH_PORT_ID=
<input checked="" type="checkbox"/>	Ethernet 1 Switch Port VLAN	LAN_PORT_1_SWITCH_PORT_VLAN=
<input checked="" type="checkbox"/>	Ethernet 2 Name	LAN_PORT_2_NAME=
<input checked="" type="checkbox"/>	Ethernet 2 Speed	LAN_PORT_2_SPEED=
<input checked="" type="checkbox"/>	Ethernet 2 IP Address	LAN_PORT_2_IPADDRESS=
<input checked="" type="checkbox"/>	Ethernet 2 MAC Address	LAN_PORT_2_MACADDRESS=
<input checked="" type="checkbox"/>	Ethernet 2 State	LAN_PORT_2_STATE=
<input checked="" type="checkbox"/>	Ethernet 2 Traffic In	LAN_PORT_2_TRAFFIC_IN=
<input checked="" type="checkbox"/>	Ethernet 2 Traffic Out	LAN_PORT_2_TRAFFIC_OUT=
<input checked="" type="checkbox"/>	Ethernet 2 CPU Traffic In State	LAN_PORT_2_CPU_TRAF_IN_STATE=
<input checked="" type="checkbox"/>	Ethernet 2 CPU Traffic Out State	LAN_PORT_2_CPU_TRAF_OUT_STATE=
<input checked="" type="checkbox"/>	Ethernet 2 RTP Discontinuity Rate	LAN_PORT_2_RTP_DIS_RATE=
<input checked="" type="checkbox"/>	Ethernet 2 Link Status	LAN_PORT_2_LINK_STATE=
<input checked="" type="checkbox"/>	Ethernet 2 MAC Link Status	LAN_PORT_2_MAC_LINK_STATE=
<input checked="" type="checkbox"/>	Ethernet 2 Switch Name	LAN_PORT_2_SWITCH_NAME=
<input checked="" type="checkbox"/>	Ethernet 2 Switch Port ID	LAN_PORT_2_SWITCH_PORT_ID=
<input checked="" type="checkbox"/>	Ethernet 2 Switch Port VLAN	LAN_PORT_2_SWITCH_PORT_VLAN=

Figure 81 Logging Network Template

Table 32 Logging Network Log Fields

Log Field	Description
<b>LAN_PORT_N_NAME</b>	Ethernet port name as defined by the OS running on the MV-820-IP Video IP block.
<b>LAN_PORT_N_SPEED</b>	Ethernet connection speed. Valid values are: <ul style="list-style-type: none"> <li>• <b>10 Mbit/s Full Duplex</b></li> <li>• <b>10 Mbit/s Half Duplex</b></li> <li>• <b>100 Mbit/s Full Duplex</b></li> <li>• <b>100 Mbit/s Half Duplex</b></li> <li>• <b>1 Gbit/s Full Duplex</b></li> <li>• <b>No Link</b></li> </ul>
<b>LAN_PORT_N_IPADDRESS</b>	Ethernet port IP address.
<b>LAN_PORT_N_MACADDRESS</b>	Ethernet port MAC address.
<b>LAN_PORT_N_STATE</b>	Ethernet connection state. Valid values are: <ul style="list-style-type: none"> <li>• <b>Active</b></li> <li>• <b>Inactive</b></li> </ul>
<b>LAN_PORT_N_TRAFFIC_IN</b>	Traffic in. Valid values are: <ul style="list-style-type: none"> <li>• <b>NNN.n kbps, Mbps, Gbps</b></li> </ul>
<b>LAN_PORT_N_TRAFFIC_OUT</b>	Traffic out. Valid values are: <ul style="list-style-type: none"> <li>• <b>NNN.n kbps, Mbps, Gbps</b></li> </ul>
<b>LAN_PORT_N_CPU_TRAF_IN_STATE</b>	Reports whether there is an incoming control data traffic connection on port N. OK, Fail.
<b>LAN_PORT_N_CPU_TRAF_OUT_STATE</b>	Reports whether there is an incoming control data traffic connection on port N. OK, Fail.
<b>LAN_PORT_N_RTP_DIS_RATE</b>	Reports the number of RTP discontinuities on port N.
<b>LAN_PORT_N_LINK_STATE</b>	Reports the state of Ethernet link N. OK, FAIL:Down.
<b>LAN_PORT_N_MAC_LINK_STATE</b>	Reports the state of the MAC (Media Access Controller) sub-circuit. OK, FAIL:Down.
<b>LAN_PORT_N_SWITCH_NAME</b>	Name of IP network switch that the media network connection of the MV-820-IP Video IP block is connected to.
<b>LAN_PORT_N_SWITCH_PORT_ID</b>	Name of IP network switch port that the media network connection of the MV-820-IP Video IP block is connected to.
<b>LAN_PORT_N_SWITCH_VLAN</b>	Name of IP network switch VLAN number that the media network connection of the MV-820-IP Video IP block is connected to.

## 4.22 Logging - SFP Template

The **Logging SFP** template shows SFP message types relating to the QSFP28 modules fitted: Log field names and current log values are listed in the 'Log Field' and 'Log Value' columns respectively. Information on several parameters can be made available to a logging device connected to the RollCall network.

For a Video IP block, only the designated QSFP28 module is reported.

Each log message type can be enabled by selecting it in the template in the 'Log Enable' column.

Figure 82 shows an example template.

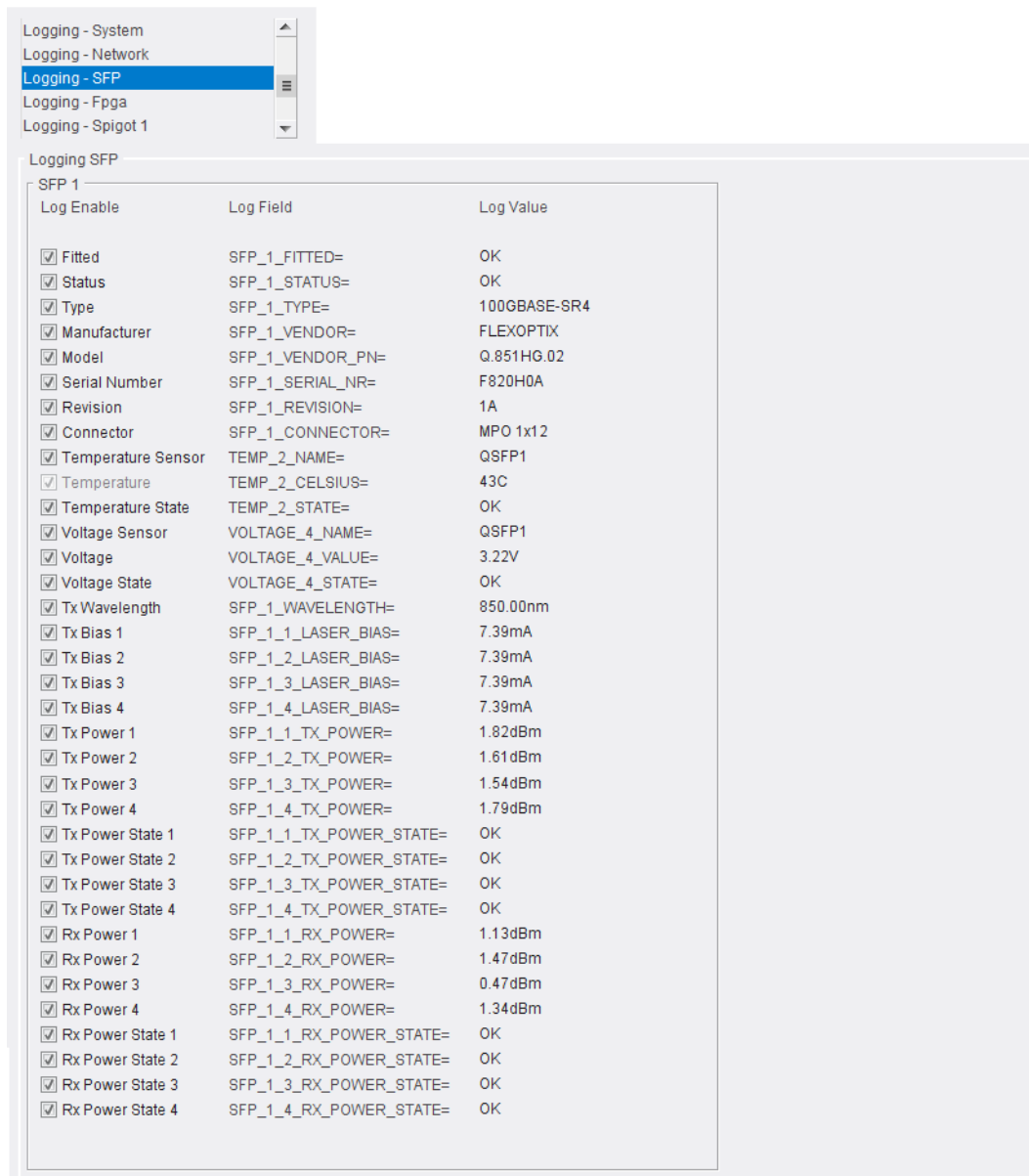


Figure 82 Logging SFP Template

Table 33 Logging SFP Log Fields

Log Field	Description
<b>SFP_N_FITTED</b>	Displays presence of the QSFP module. Valid values are: <ul style="list-style-type: none"> <li>• <b>OK</b></li> <li>• <b>Missing</b></li> </ul>
<b>SFP_N_STATUS</b>	Displays status of the QSFP module. Valid values are: <ul style="list-style-type: none"> <li>• <b>OK</b></li> <li>• <b>Fail</b> - The reason for a failure will be appended to the fail message. It is as reported by the QSFP28 module itself, per INF-8074 and SFF-8472.</li> </ul>
<b>SFP_N_TYPE</b>	Displays QSFP28 identifier from device.
<b>SFP_N_VENDOR</b>	Displays QSFP28 manufacturer from device.
<b>SFP_N_VENDOR_PN</b>	Displays QSFP28 model number from device.
<b>SFP_N_SERIAL_NR</b>	Displays the module serial number, which consists of an S followed by eight digits.
<b>SFP_N_REVISION</b>	Displays manufacturer revision number.
<b>SFP_N_CONNECTOR</b>	Displays connector type.
<b>TEMP_N_NAME</b>	Displays temperature sensor name.
<b>TEMP_N_CELSIUS</b>	Displays current temperature sensor reading.
<b>TEMP_N_STATE</b>	Displays temperature sensor state. Valid values are: <ul style="list-style-type: none"> <li>• <b>WARN: Disabled</b> - Temperature sensor disabled.</li> <li>• <b>WARN: Low</b> - Low, but in tolerance.</li> <li>• <b>WARN: High</b> - High, but in tolerance.</li> <li>• <b>OK.</b></li> <li>• <b>FAIL: Low</b> - Low and out of tolerance.</li> <li>• <b>FAIL: High</b> - High and out of tolerance.</li> </ul>
<b>VOLTAGE_N_NAME</b>	Displays voltage sensor name.
<b>VOLTAGE_N_VALUE</b>	Displays current voltage reading.
<b>VOLTAGE_N_STATE</b>	Displays temperature sensor state. Valid values are: <ul style="list-style-type: none"> <li>• <b>OK.</b></li> <li>• <b>WARN: Low</b> - Low, but in tolerance.</li> <li>• <b>WARN: High</b> - High, but in tolerance.</li> </ul>
<b>SFP_N_WAVELENGTH</b>	Displays transmit wavelength in nm.
<b>SFP_N_X_LASER_BIAS</b>	Displays bias level in mA.
<b>SFP_N_X_TX_POWER</b>	Displays transmit power level in dBm.
<b>SFP_N_X_TX_POWER_STATE</b>	Displays transmit power level. Valid values are: <ul style="list-style-type: none"> <li>• <b>OK.</b></li> <li>• <b>WARN: Low</b> - Low, but in tolerance.</li> <li>• <b>WARN: High</b> - High, but in tolerance.</li> <li>• <b>FAIL: Low</b> - Low and out of tolerance.</li> <li>• <b>FAIL: High</b> - High and out of tolerance.</li> </ul>

Table 33 Logging SFP Log Fields (continued)

Log Field	Description
<b>SFP_N_X_RX_POWER</b>	Reports receive power level in dBm.
<b>SFP_N_X_RX_POWER_STATE</b>	Reports receive power level. Valid values are: <ul style="list-style-type: none"><li>• <b>OK.</b></li><li>• <b>WARN: Low</b> - Low, but in tolerance.</li><li>• <b>WARN: High</b> - High, but in tolerance.</li><li>• <b>FAIL: Low</b> - Low and out of tolerance.</li><li>• <b>FAIL: High</b> - High and out of tolerance.</li></ul>

Where:

- **N** is the input/(Q)SFP number; and
- **X** is the lane number.

## 4.23 Logging - FPGA Template

The **Logging FPGA** template shows FPGA message types reporting temperature and voltages on an FPGA device: Log field names and current log values are listed in the 'Log Field' and 'Log Value' columns respectively. Information on several parameters can be made available to a logging device connected to the RollCall network.

Each log message type can be enabled by selecting it in the template in the 'Log Enable' column.

Figure 83 shows an example template.

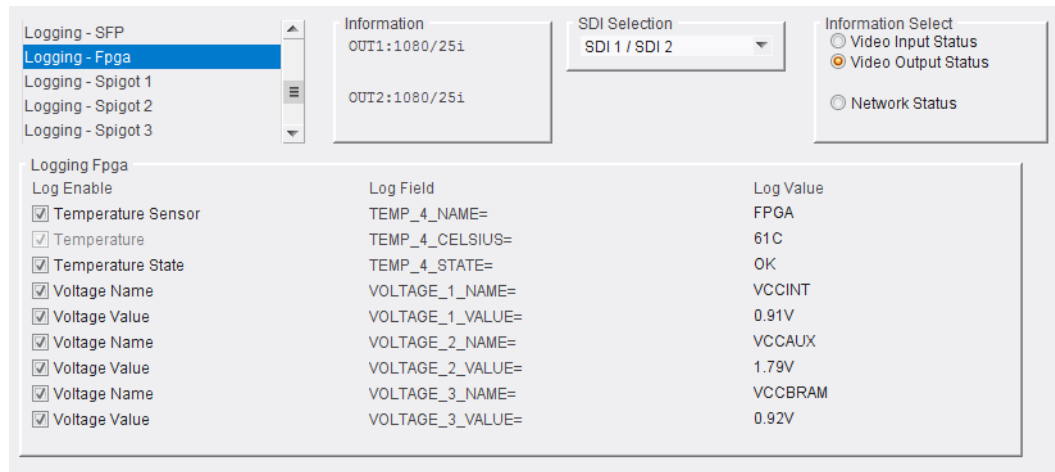


Figure 83 Logging SFP Template

Table 34 Logging SFP Log Fields

Log Field	Description
<b>TEMP_N_NAME</b>	Reports temperature sensor N name.
<b>TEMP_N_CELSIUS</b>	Reports current temperature sensor N reading.
<b>VOLTAGE_1_NAME</b>	Voltage sensor name. For example, VCCINT.
<b>VOLTAGE_1_VALUE</b>	Reports current voltage reading.
<b>VOLTAGE_2_NAME</b>	Voltage sensor name. For example, VCCAUX.
<b>VOLTAGE_2_VALUE</b>	Reports current voltage reading.
<b>VOLTAGE_3_NAME</b>	Voltage sensor name. For example, VCCBRAM.
<b>VOLTAGE_3_VALUE</b>	Reports current voltage reading.

Where:

- **N** is the input number (1 to 16) for the MV-820-IP Video IP block.

## 4.24 Logging - Spigot 1 to 16 Templates

The **Logging - Spigot** templates are used to view and select the Spigot log fields to be enabled for each available spigot. Each log message type can be enabled by selecting it in the template in the 'Log Enable' column.

Depending on whether the spigot is an IP source spigot ("Input N ...") or an IP destination spigot ("Output N ..."); the appropriate log fields are shown. Figure 84 and Figure 85 show example templates for source and destination spigots respectively.

The spigot can be given a name ("Input N Name" or "Output N Name"). Destination spigot names form the logging names of the MV-820-IP IP video inputs.

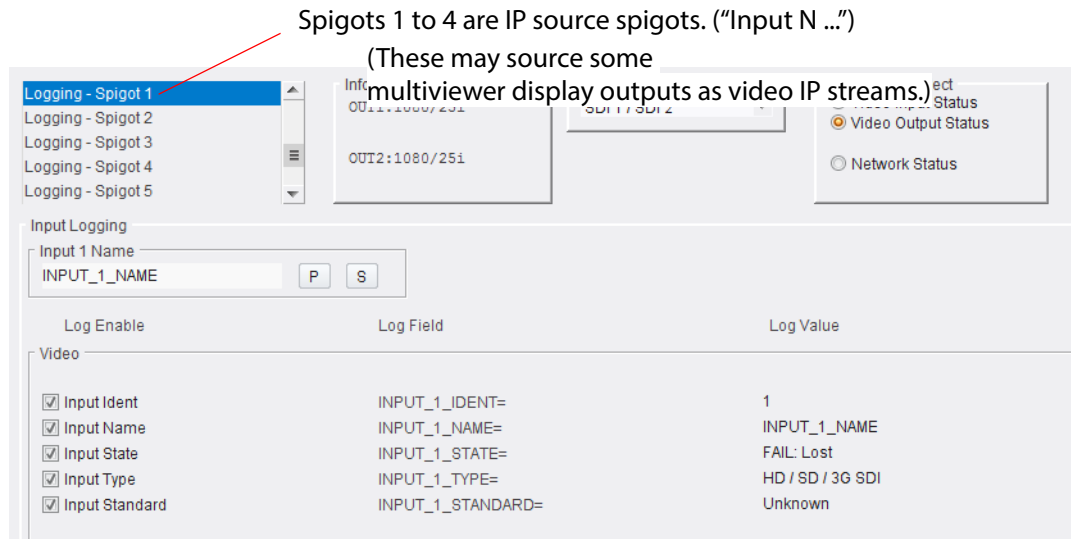


Figure 84 Logging Spigot Template (Source Spigots, Spigots 1 to 4)

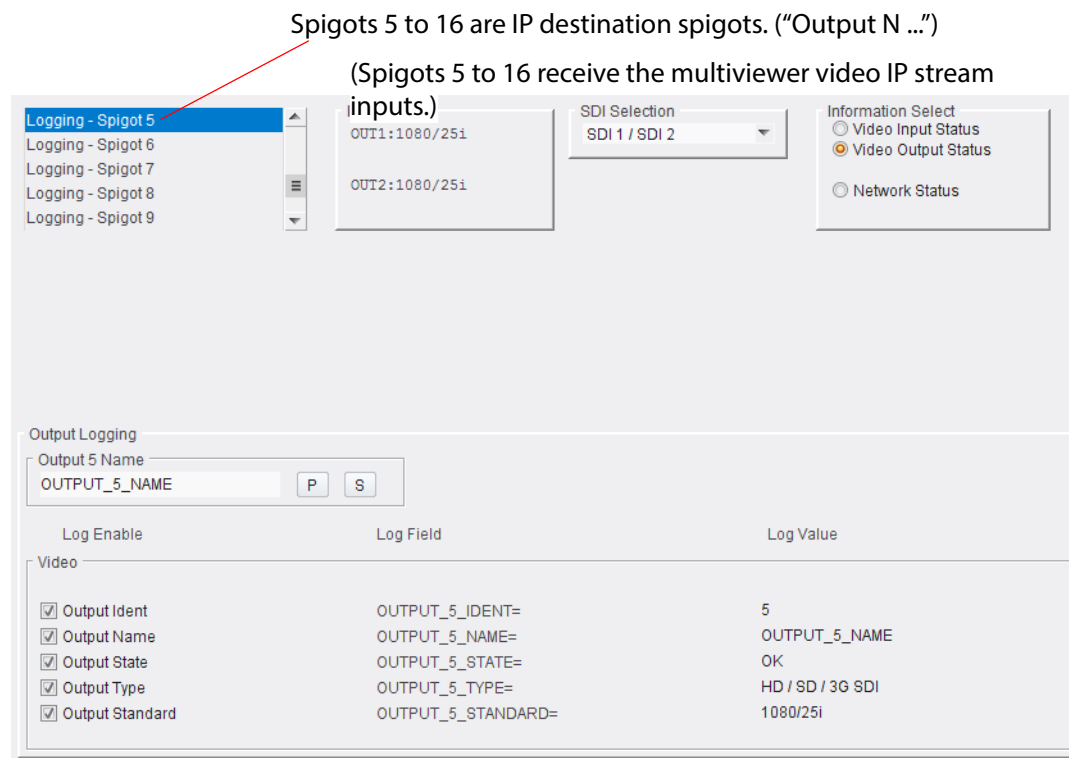


Figure 85 Logging Spigot Template (Destination Spigots, Spigots 5 to 16)

Log field names and current log values are listed in the 'Log Field' and 'Log Value' columns respectively. Information on several parameters can be made available to a logging device connected to the RollCall network.

An additional field is provided for the user to optionally specify a name for the spigot.

To specify a name for a source spigot:

- Enter a name in the **Input N Name** text field.  
(Remember to click **S** or press the enter key to enter the new name.)

To specify a name for a destination spigot:

- Enter a name in the **Output N Name** text field.  
(Remember to click **S** or press the enter key to enter the new name.)

**Note:** **"S" and "P" buttons -**  
 After entering information in each text box, always click on the adjacent **"S"** button or press **"return"** to locally save the new setting. Do this for each text box.  
 (Note: Clicking on the **"P"** button will return the setting to its preset default value).  
**"S"** - Locally save new, entered setting value (or press "return").  
**"P"** - Locally save default setting value.

Log fields are described in Table 35 and Table 36.

Table 35 Logging Spigot 1 to 4 Templates - Log Fields

Log Field (Source Spigot)	Description
<b>INPUT_N_IDENT</b>	System-defined identifier for the input, based on the rear ID.
<b>INPUT_N_NAME</b>	Name of the input, as defined by the user on the <b>Setup</b> template. <a href="#">Setup Template</a> on page 112.
<b>INPUT_N_STATE</b>	Valid values are: <ul style="list-style-type: none"> <li>• <b>OK:</b> input signal good.</li> <li>• <b>FAIL:</b> input signal not detected.</li> </ul>
<b>INPUT_N_TYPE</b>	HD/SD/3G SDI
<b>INPUT_N_STANDARD</b>	PAL/NTSC/625 Mono/525 Mono

Where:

- **N** is the input/output spigot number (1 to 16).



Table 36 Logging Spigot 5 to 16 Templates - Log Fields

Log Field (Destination Spigot)	Description
<b>OUTPUT_N_IDENT</b>	Name of the output as shown on the rear panel.
<b>OUTPUT_N_NAME</b>	Name of the output as defined by the user.
<b>OUTPUT_N_STATE</b>	Valid values are: <ul style="list-style-type: none"> <li>• <b>OK</b> - output signal good.</li> <li>• <b>FAIL</b> - output signal not detected.</li> <li>• <b>WARN: Freeze</b></li> <li>• <b>WARN: Pattern</b></li> <li>• <b>WARN: Black</b></li> </ul>
<b>OUTPUT_N_TYPE</b>	Valid values are: <ul style="list-style-type: none"> <li>• <b>SD SDI</b></li> <li>• <b>HD SDI</b></li> <li>• <b>HD/SD/3G SDI</b></li> </ul>
<b>OUTPUT_N_STANDARD</b>	Reports the output standard in the format: <p style="text-align: center;"><b>&lt;Lines&gt;( &lt;Active&gt; ) / &lt;Rate&gt; &lt;i/p/sf&gt;</b></p> Where: <ul style="list-style-type: none"> <li>• <b>Lines</b> = Total lines</li> <li>• <b>Active</b> = Active lines</li> <li>• <b>Rate</b> = Frame rate</li> <li>• <b>I</b> = interlaced</li> <li>• <b>P</b> = Progressive</li> <li>• <b>SF</b> = Segmented Frame</li> </ul> For example: <b>1080/50p</b> or <b>1125(1080)/25i</b>
Where: <ul style="list-style-type: none"> <li>• <b>N</b> is the input/output spigot number (1 to 16).</li> </ul>	

## 4.25 Logging Card Diagnostics Template

The **Logging Card Diagnostics** template is used to view log fields of the MV-820-IP Video IP block and select those log fields to be enabled.

Log field names and current log values are listed in the 'Log Field' and 'Log Value' columns respectively. Information on several parameters can be made available to a logging device connected to the RollCall network.

Each log message type can be enabled by selecting it in the template in the 'Log Enable' column.

Figure 86 shows an example template.

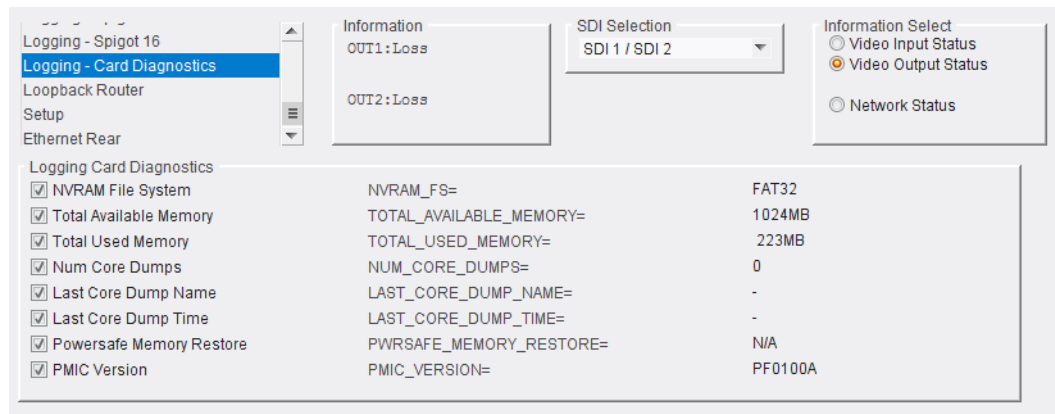


Figure 86 Logging Card Diagnostics Template

Table 37 Logging Card Diagnostics Template Log Fields

Log Field	Description
<b>NVRAM_FS</b>	Reports file system type. FAT32, or QNX6 PowerSafe FX
<b>TOTAL_AVAILABLE_MEMORY</b>	Reports amount of CPU free memory.
<b>TOTAL_USED_MEMORY</b>	Reports total amount of used CPU memory.
<b>NUM_CORE_DUMPS</b>	Reports number of CPU core dumps. For diagnostics purposes only.
<b>LAST_CORE_DUMP_NAME</b>	Reports name of last CPU core dump. For diagnostics purposes only.
<b>LAST_CORE_DUMP_TIME</b>	Reports time of last CPU core dump. For diagnostics purposes only.
<b>PWRSAFE_MEMORY_RESTORE</b>	Reports "OK".
<b>PMIC_VERSION</b>	Reports Power Management IC version. For diagnostics purposes only.

## 4.26 Loopback Router Template

The **Loopback Router** template is used to control a basic IP routing facility, which will loop IP flows from source spigots back into destination spigots. The flows are looped back and are not transmitted externally. The loop-back routing is all local to the Video IP block.

Figure 87 shows an example template.

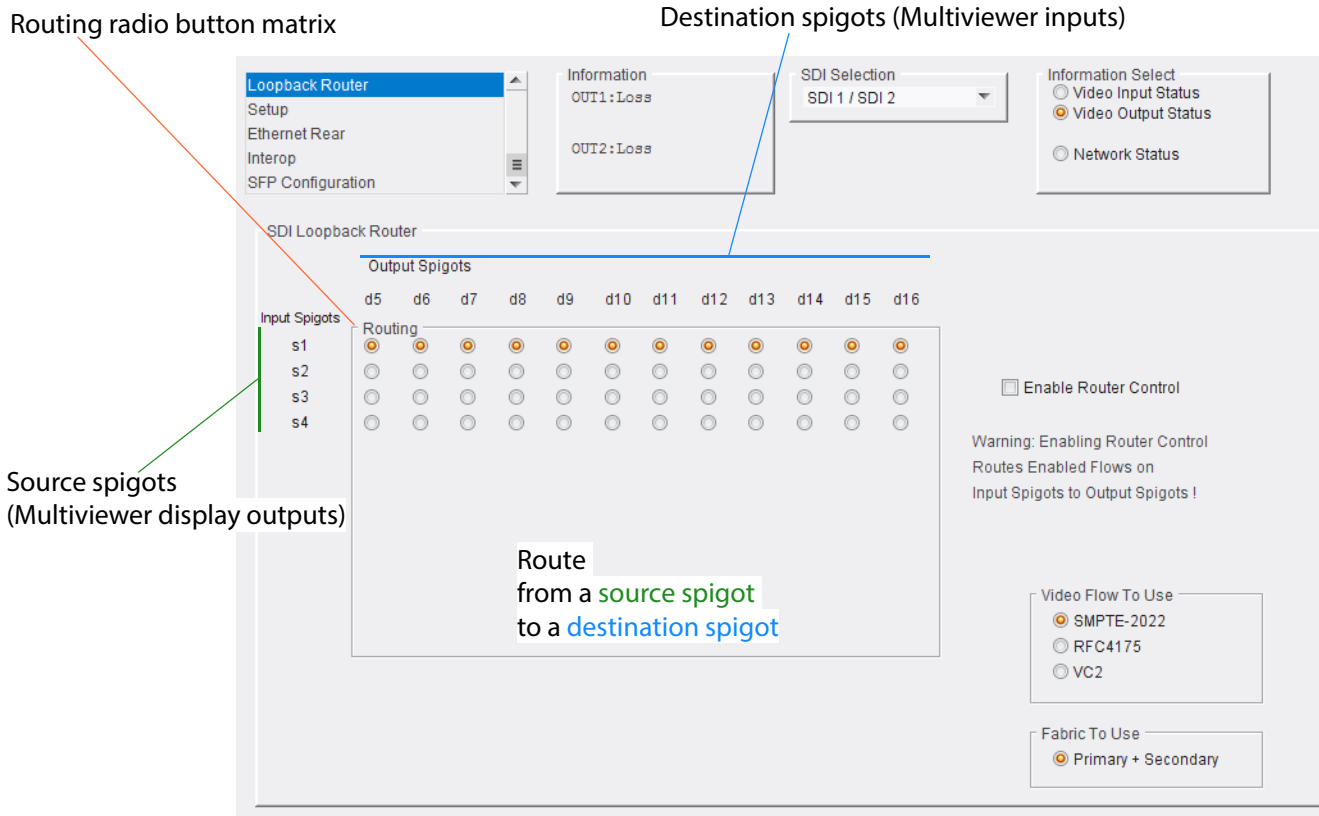


Figure 87 Loopback Router Template

To use the **Loopback Router**:

1. In router radio button matrix,< select the source spigots (SDI input) to be routed to destination spigots (SDI outputs).
2. Select the **Video Flow to Use**. (SMPTE-2022, RFC4175)
3. Select the **Primary + Secondary** IP fabric to use.

When all is set as required:

4. Select **Enable Router Control**.  
The selected routing is activated.  
Flows on source spigots are sent to destination spigots.

## 4.27 Setup Template

The **Setup** template (see Figure 88) displays basic information about the MV-820-IP Video IP block, such as the serial number and software version. This information may be required by Grass Valley Support if technical assistance is needed.

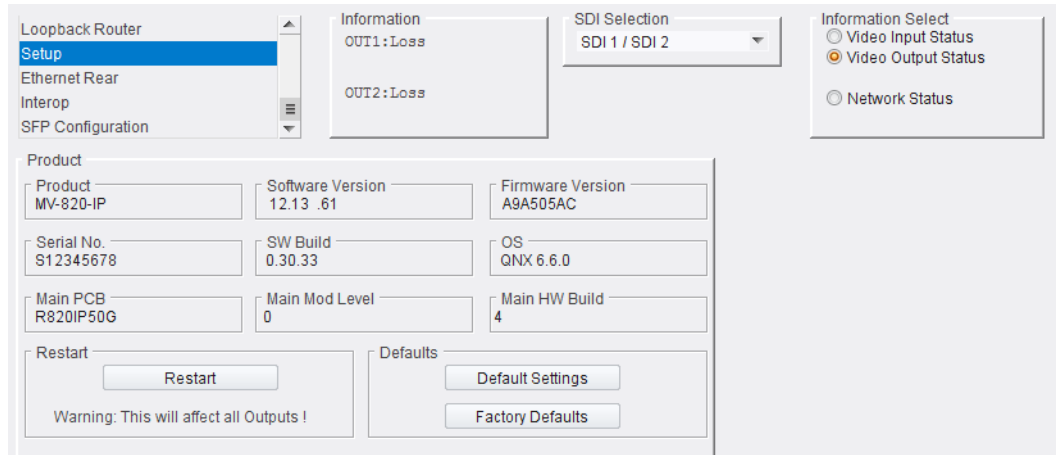


Figure 88 Setup Template

The **Product** panel displays technical information about the MV-820-IP Video IP block, and contains some restart and default-setting controls.

Table 38 Setup Template Settings and Controls

Item	Description
<b>Product</b>	<b>Name of the MV-820-IP Video IP block.</b>
<b>Software Version</b>	Currently installed software version number.
<b>Firmware Version</b>	Currently installed firmware version number.
<b>Serial No.</b>	Serial number of the MV-820-IP Video IP block.
<b>SW Build</b>	Factory software build number. This number identifies all parameters of the MV-820-IP Video IP block.
<b>Main PCB</b>	Printed Circuit Board (PCB) version number.
<b>Main Mod Level</b>	Main PCB modification level.
<b>Main HW Build</b>	Factory main hardware build number.
<b>Restart:</b>	
<b>Restart</b>	<p>Button. Click to restart the Video IP block.</p> <p><b>Note: Restart</b> power-cycles the Video IP block, producing disturbances at the block's outputs (<i>internal</i> to the MV-820-IP unit). The block feeds some MV-820-IP multiviewer block inputs and may result in some on-screen disturbance on the multiviewer display outputs.</p>
<b>Defaults:</b>	Provides options to reset the module to its defaults.
<b>Default Settings</b>	<p>Button. Click to return all Video IP block settings to their default values, <i>except</i> for network configuration and IP addresses.</p>
<b>Factory Defaults</b>	<p>Button. Click to return all Video IP block settings to their factory values, <i>including</i> network configuration and IP addresses.</p>

## 4.28 Ethernet Rear Template

The **Ethernet Rear** template (see Figure 89) displays details and the status of the control network connection of the MV-820-IP Video IP block.

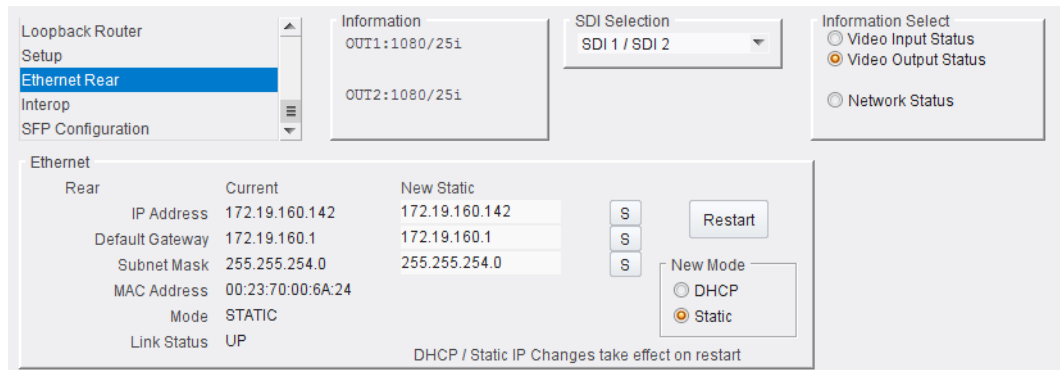


Figure 89 Ethernet Rear Template

Information is shown in a tabular format. DHCP or static IP address modes may be used. The template displays the current IP settings and allows new static IP details to be entered.

Table 39 Setup Template Settings and Controls

Ethernet Rear Item	Description
<b>IP Address</b>	Displays the current IP address. Enter a new (static) IP address in the text box. Click <b>S</b> or press the enter key to enter the new value. <span style="float: right;">See <b>Note 1</b>.</span>
<b>Default Gateway</b>	Displays the current default gateway IP address. Enter a new (static) IP address in the text box. Click <b>S</b> or press the enter key to enter the new value. <span style="float: right;">See <b>Note 1</b>.</span>
<b>Subnet Mask</b>	Displays the current subnet mask. Enter a new (static) subnet mask in the text box. Click <b>S</b> or press the enter key to enter the new value. <span style="float: right;">See <b>Note 1</b>.</span>
<b>MAC Address</b>	Displays the MAC address of the Video IP block’s control network connection.
<b>Mode</b>	Displays the IP mode in use by the Video IP block’s control network connection (STATIC or DHCP).
<b>Link Status</b>	Displays the link status of the Video IP block’s control network connection (UP or DOWN).
<b>New Mode:</b>	Radio buttons. <span style="float: right;">See <b>Note 1</b>.</span>
<b>DHCP</b>	Select to set DHCP IP address mode.
<b>Static</b>	Select to set a static IP address etc.
<b>Restart</b>	Button. Click to restart. <span style="float: right;">See <b>Note 1</b>.</span>
<b>Note 1:</b> DHCP / Static IP address changes take effect on a restart of the Video IP block.	

**Note:** **“S” button** -  
After entering information in each text box, always click on the adjacent **“S”** button or press **“return”** to locally save the new setting. Do this for each text box.  
  
**“S”** - Locally save new, entered setting value (or press **“return”**).

## 4.29 Interop Template

The **Interop** template (see Figure 90) controls various settings to enable interoperability with third parties, including disabling extended headers, and setting payload types.

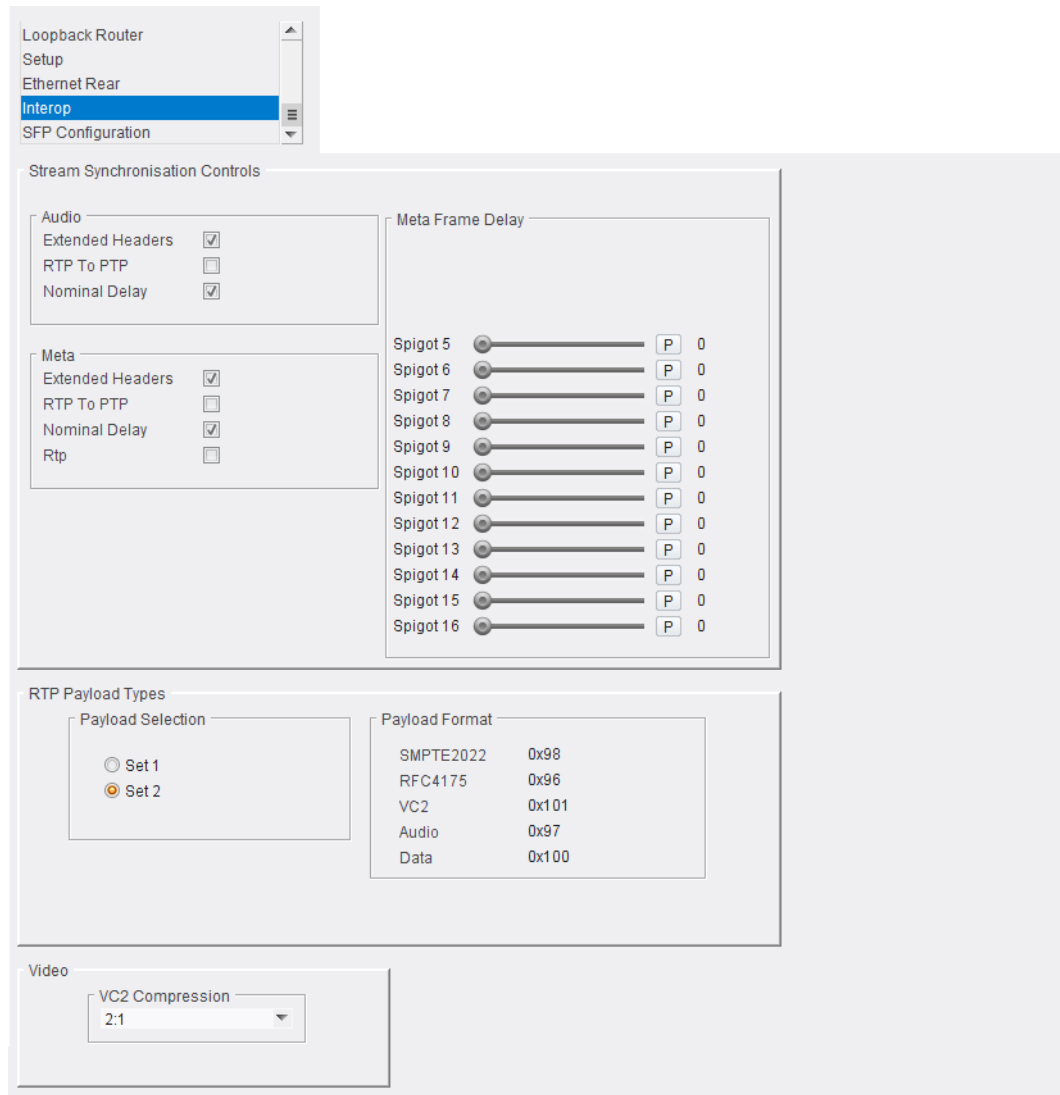


Figure 90 Interop Template

The template displays the following panels:

- Stream Synchronization Controls
- RTP Payload Types
- Video.

Table 40, Table 41 and Table 42 describe each panel.

Table 40 Interop Template - Stream Synchronization Controls


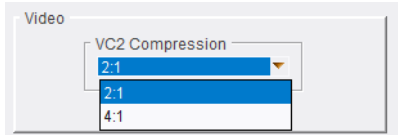
Stream Synchronization Controls Item	Description
<b>Audio:</b> <b>Extended Headers</b> <b>RTP to PTP</b> <b>Nominal Delay</b>	Check boxes: Select to use extended headers in the RTP audio stream. Select to synchronize RTP to PTP. Select to set up nominal delay at the spigot.
<b>Meta:</b> <b>Extended Headers</b> <b>RTP to PTP</b> <b>Nominal Delay</b> <b>Rtp</b>	Check boxes: Select to use extended headers in the RTP metadata stream. Select to synchronize RTP to PTP. Select to set up nominal delay at the spigot. Select to enable use of RTP timestamps only to synchronize metadata to video.
<b>Meta Frame Delay:</b> <b>Spigot N</b>	A slider control per destination spigot (spigots 5 to 16): Select required frame delay for metadata received on spigot. Frame delay value in range 0 to 5. Click <b>P</b> to select the factory default value (0). 

Table 41 Interop Template - RTP Payload Types

Interop RTP Payload Types	Description
<b>Payload Selection:</b> <b>Set 1</b> <b>Set 2</b>	Radio buttons: Select to use payload set 1. (Pre-standards-ratification value) Select to use payload set 2. (Post-standards-ratification value, default)
<b>Payload Format:</b> <b>SMPTE2022</b> <b>RFC4175</b> <b>VC2</b> <b>Audio</b> <b>Data</b>	Hexadecimal code used for payload types: SMPTE2022 payload type. RFC4175 payload type. VC2 payload type (not supported, possible future feature). Audio payload type identifier. Metadata payload type.

Table 42 Interop Template - Video

Interop Video Item	Description
<b>VC2 Compression</b>	Drop-down box. Select VC2 compression ratio. <b>(Note: VC2 is not currently supported.)</b> 

## 4.30 SFP Configuration Template

The **SFP Configuration** template allows various QSFP28 module parameters to be adjusted, if required. See Figure 91. The QSFP28 module adjusted is the designated QSFP module for the Video IP block concerned (see Table 15 *Designated QSFPs* on page 53).

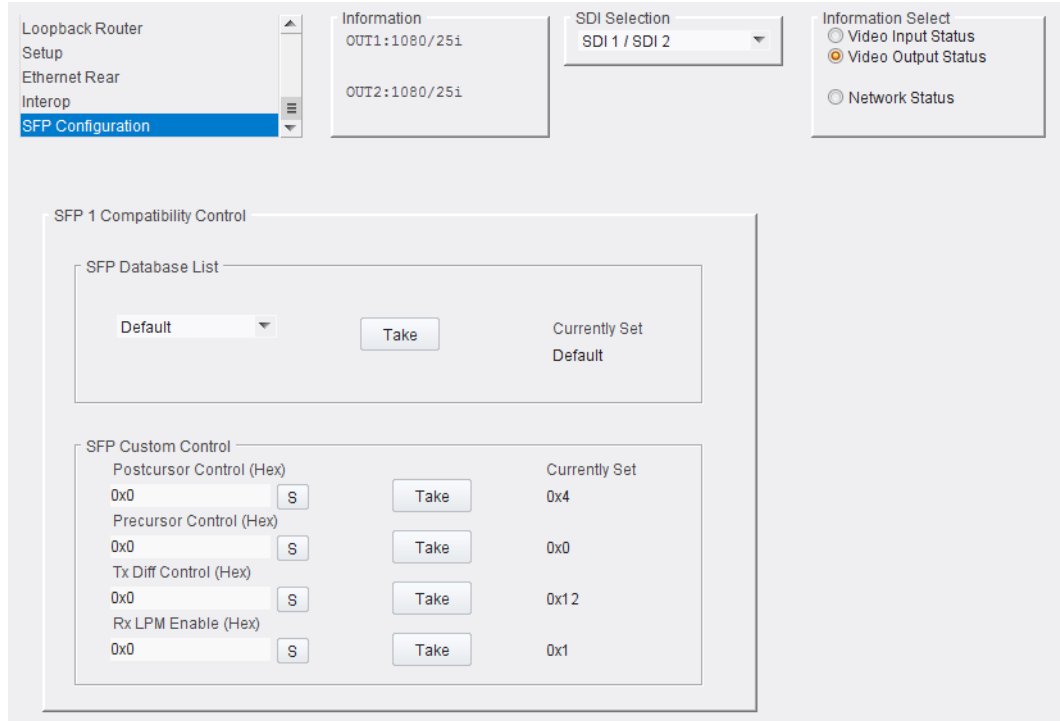


Figure 91 SFP Configuration Template

The majority of QSFP28 modules will operate correctly with the MV-820-IP Video IP block, without any need for adjustment. Some QSFP28 modules, however, may need to have some QSFP28 module parameters adjusted.

Table 43 SFP Configuration Template

SFP Configuration Item	Description
<b>SFP Database List:</b>	Drop-down box: Select the SFP type from the drop-down list.
<b>Take</b>	For <b>Custom</b> setting only, click to apply settings and save to memory.
<b>Currently Set</b>	Shows the current SFP type.

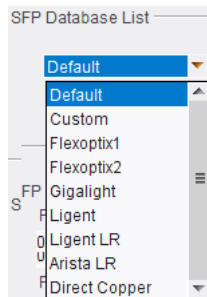




Table 43 SFP Configuration Template (continued)

SFP Configuration Item	Description
<b>SFP Custom Control:</b>	<p>Custom settings are set here. Select <b>Custom</b> in the SFP database list.</p> <p>Text boxes. Enter a new hexadecimal value for the Tx/Rx sub-circuits of the QSFP28 module.</p> <p>Parameters:</p> <ul style="list-style-type: none"> <li>• Postcursor Control (Hex)</li> <li>• Precursor Control (Hex)</li> <li>• Tx Diff Control (Hex)</li> <li>• Rx LPM Enable (Hex)</li> </ul> <p>Click <b>S</b> or press the enter key to save the value. The new value is then shown in the text box.</p> <p>The <b>Currently Set</b> value is also shown in the same row.</p> <p>Buttons. Click <b>Take</b> to change to the new value.</p>

If difficulties are encountered with a QSFP28 module not working as expected, follow these instructions:

1. Select the appropriate SFP type in the **SFP Database List**, and click **Take**.  
  
Verify whether the SFP is now working correctly.  
If it is now working correctly, then no further action is required; otherwise, continue.
2. Select **Custom** in the **SFP Database List**.  
This allows all the QSFP28 module settings shown in the **SFP Custom Control** panel to be adjusted as required.  
  
Change settings and click **Take** to apply each of them.
3. When a working settings configuration is found, click **S** beside each setting to save the setting value for future use.

# 5 Getting Started

5.1	<a href="#">MV-820 Hardware Installation</a>	page 119
5.2	<a href="#">Multiviewer Block</a>	page 119
5.3	<a href="#">Video IP Blocks</a>	page 120
5.3.1	<a href="#">Configuring Network Interfaces of Each Video IP Block</a>	page 120
5.3.2	<a href="#">Configuring IP Flows</a>	page 123
5.3.5	<a href="#">Test Pattern Generator</a>	page 131
5.3.6	<a href="#">Loopback Router</a>	page 131

This section describes how to get started with an MV-820.

- a) MV-820-HDBNC and MV-820-DENSI products have the same instructions.
- b) MV-820-IP is the same as a) with *additional* steps to set up all video IP inputs.

Table 44 Getting Started with MV-820

Product	Use Getting Started Instructions for...	
	Multiviewer Block	Video IP Input Block
<b>MV-820-HDBNC</b>	✓	
<b>MV-820-DENSI</b>	✓	
<b>MV-820-IP</b>	✓	✓ (x 4)

Install the hardware, configure the multiviewer block, followed by the Video IP blocks (MV-820-IP only).

## 5.1 MV-820 Hardware Installation

1. Unpack the unit.  
(See [Unpacking](#), on page 21.)
2. Install the unit in a rack.  
(See [Rack Mounting](#), on page 45.)  
Do not connect the IP network connections to the house IP network yet, because IP addresses etc. will need to be set up to suit the house IP network.
3. Power up the unit.  
(See [MV-820 Booting](#), on page 49.)

## 5.2 Multiviewer Block

These 'getting started' instructions are applicable to all MV-820s and describe getting the unit's MV-8 Series multiviewer block started:

For the configuration of the multiviewer block, refer to the 'MV-8 Series Multiviewer' user manual. See the 'Getting Started' chapter, which includes:

- initial unit configuration;
- further configuration; and the
- start-up splash screen.

---

*Refer To:* 'MV-8 Series Multiviewer' user manual, 'Getting Started' chapter, for information about configuring MV-820 multiviewer block.

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## 5.3 Video IP Blocks

This sub-section is applicable to MV-820-IP products only and should be carried out after setting up the multiviewer block (see [Multiviewer Block](#), on page 119).

A prerequisite for getting started with the MV-820-IP is a working video IP routing network infrastructure. Setting up of a house video IP network is beyond the scope of this manual. Typically, this includes a video IP routing system and router controller, which is the case for a Grass Valley video IP routing system.

After an MV-820-IP unit is hardware-installed and the multiviewer block set up, the next step is to configure the unit's video IP interfaces; this is described in this sub-section.

The MV-820-IP unit video IP interface comprises four Video IP blocks. Each block must be individually configured to accept and convert up to 48 video IP inputs into internal SDI video signals for the Multiviewer block.

**Note:**

Relevant information about the MV-820-IP specific rear IP network connections is found in Appendix A, sub-sections:

- [Ethernet Rear Panel Connectors](#), on page 152;
- [Video IP Blocks - Ethernet Control Interface Information](#), on page 154; and
- [Unused Rear Panel Connectors](#), on page 155.

### 5.3.1 Configuring Network Interfaces of Each Video IP Block

For each MV-820-IP Video IP block in turn, carry out the instructions below in sub-sections 5.3.1.1 to 5.3.1.9.

#### 5.3.1.1 Connection to House Video IP Network

1. Connect the QSFP cable/transceivers to the rear QSFP cages.

Typically, for multiviewer video IP inputs over the QSFP connections:

- Use **Link A1** for inputs 1 to 24.
  - Use **Link B1** for inputs 25 to 48.
  - Additionally:
    - use **Link A2** for IP link redundancy on inputs 1 to 24; and
    - use **Link B2** for IP link redundancy on inputs 25 to 48.
2. Connect the QSFP cables to the house video IP network.

#### 5.3.1.2 Connect RollCall Control Panel to Video IP Block

Using rear control network connection 'Control A':

3. Connect RollCall Control Panel to the Video IP block's default IP address, see [Video IP Blocks - Ethernet Control Interface Information, Table 49](#) on page 154. (Use a similar connection method to that described in the 'MV-8 Series Multiviewer' user manual.)

### 5.3.1.3 Configure Control Network Interface

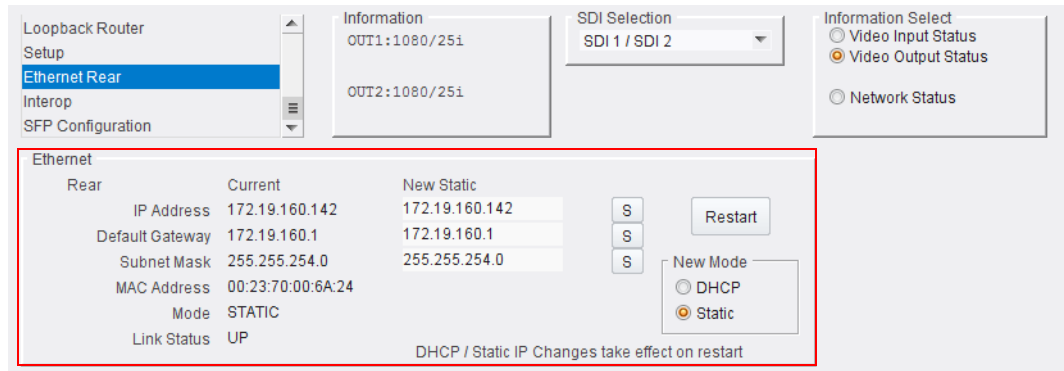


Figure 92 Ethernet Rear Template

On the **Ethernet Rear** RollCall template:

4. Select 'Static' mode.
5. Set up the IP settings, including: IP Address, Default Gateway, and Subnet Mask.

**Note:** Enter a value into a template field. Then press the 'enter' key on your keyboard, or simply click **S**, to enter the value into the template field.

### 5.3.1.4 Configure Media Network Interface 1

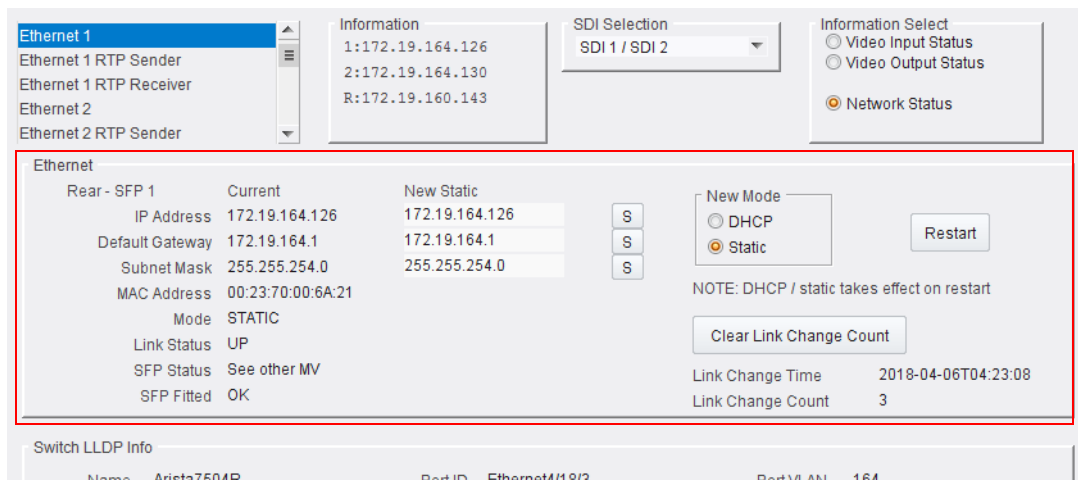


Figure 93 Ethernet 1 Template

On the **Ethernet 1** RollCall template:

6. Set 'Static' mode.
7. Set up the IP settings, including: IP Address, Default Gateway, and Subnet Mask.

**Note:** Enter a value into a template field. Press the 'enter' key on your keyboard, or simply click **S**, to enter the value into the template field.

### 5.3.1.5 Check SFP Status

On the **Ethernet 1** RollCall template:

8. Check that **SFP Fitted** is 'OK'

**Note:** If **SFP Status** is not 'OK', check the QSFP cable is fitted to the:

- MV-820-IP rear QSFP cage; and
- to the house video IP network switch.

9. Check that **SFP Status** is 'OK' or 'See other MV'.

**Note:** If **SFP Status** is not correct, then go to the **SFP Configuration** RollCall template to change settings for the QSFP. See [SFP Configuration Template](#), on page 116.

10. Check that IP **Link Status** is 'UP'.

**Note:** If **Link Status** is not correct, check:

- QSFP fitting.
- House Video IP network.

### 5.3.1.6 Configure Media Network Interface 2

On the **Ethernet 2** RollCall template:

11. Repeat the actions of sub-sections 5.3.1.4 and 5.3.1.5 but for the *other* media network interface, 'Ethernet 2' network interface.

### 5.3.1.7 Restart

On the **Ethernet Rear**, or **Ethernet 1**, or **Ethernet 2** RollCall template:

12. Click **Restart**.

The Video IP block is restarted. This takes approximately 2 minutes.

During this time, RollCall Control Panel disconnects. When the Video IP block restart is complete, the block is shown in the left-hand pane of RollCall Control Panel.

### 5.3.1.8 Repeat for Each Video IP Block

13. For each of the MV-820-IP Video IP blocks, re-do sub-sections 5.3.1.2 to 5.3.1.7.

### 5.3.1.9 Lastly

When all Video IP blocks are configured, then the media IP network interfaces are then ready to be configured to send/receive video IP streams. This is typically done with the Grass Valley Orbit tool to configure IP flows.

(See [Configuring IP Flows](#), on page 123 for video IP stream configuration instructions.)

**Note:**

The control interface of a Video IP block is accessible via:

- a) the 'CONTROL A' or 'CONTROL B' rear network connectors (for out-of-band control); and
- b) the block's (configured) media network (QSFP) Ethernet interfaces (for in-band control).

### 5.3.2 Configuring IP Flows

This sub-section is applicable to MV-820-IP products and should be carried out after [Video IP Blocks](#), on page 120. A house video IP routing system is required.

After an MV-820-IP unit is set up as per [Video IP Blocks](#), on page 120, the unit's media IP network connections are ready to be configured to send or receive video IP streams. This may be done in the following ways:

- a) **Grass Valley Orbit** (recommended)  
Use the Grass Valley Orbit IP routing tool in a Grass Valley video IP routing system. (See [Setting Up with Orbit](#), on page 123.)
- b) **Manually** (not recommended)  
(See [Setting Up IP Flows Manually](#), on page 127.)
- c) **Third-party**  
Use a Grass Valley IQTIC modular card to interface to a third-party video routing controller system. This uses the SDC-01 open-API protocol (specification available from Grass Valley).

### 5.3.3 Setting Up with Orbit

Use this sub-section if using a Grass Valley video IP routing system and Orbit.

When the media IP interfaces are connected to the house video IP network, the four MV-820-IP Video IP blocks are discoverable by Orbit. (Orbit runs on a PC connected to the house video IP network.)

#### Set up Orbit Devices:

In the Orbit **Devices** tab:

1. Find the four newly-discovered **Device** items which are the four Video IP blocks of the MV-820-IP unit.  
Note: Orbit treats each Video IP block as a *separate* video IP device.

**Note:**

Identify the four individual Video IP blocks by the media network interface IP addresses listed.

The newly-discovered devices are assigned a unique GUID (**Device GUID**) which is also initially used as the **Device Name**.

Newly-discovered devices

Device GUID	Device Name	Device Type	Software	Firmware	Primary IP Address	Secondary IP Address	Co
{13A4F87E-1DD2-11B2-A341-002370002298}	IQMIX40	IQMIX4000	10.67.53	55A331E5	10.100.10.40	10.100.20.40	
{13A7908E-1DD2-11B2-8AA3-002370006A29}	{13A7908E-1DD2-11B2-8AA3-002370006A29}	MV-820-IP-REAR	12.20.63	A9A505AC	10.100.10.10	10.100.20.10	
{13A4D16E-1DD2-11B2-989B-002370006A27}	{13A4D16E-1DD2-11B2-989B-002370006A27}	MV-820-IP-REAR	12.20.63	A9A505AC	10.100.10.20	10.100.20.20	
{13A853DE-1DD2-11B2-A620-002370006A18}	{13A853DE-1DD2-11B2-A620-002370006A18}	MV-820-IP-REAR	12.20.63	A9A505AC	10.100.10.30	10.100.20.30	
{13A82CCE-1DD2-11B2-99B4-002370006A1A}	{13A82CCE-1DD2-11B2-99B4-002370006A1A}	MV-820-IP-REAR	12.20.63	A9A505AC	10.100.10.50	10.100.20.50	

Figure 94 Discovered Devices in Orbit

- For each newly-discovered device, enter a **Device Name** for each MV-820-IP Video IP block:
  - Click in the **Device Name** text field and type in the new name.
  - Press 'enter' on the keyboard to enter the new name into the text field.

New device names added

Device GUID	Device Name	Device Type	Software	Firmware	Primary IP Address	Secondary IP Address	Co
{13A4F87E-1DD2-11B2-A341-002370002298}	IQMIX40	IQMIX4000	10.67.53	55A331E5	10.100.10.40	10.100.20.40	
{13A7908E-1DD2-11B2-8AA3-002370006A29}	TopLeft	MV-820-IP-REAR	12.20.63	A9A505AC	10.100.10.10	10.100.20.10	
{13A4D16E-1DD2-11B2-989B-002370006A27}	TopRight	MV-820-IP-REAR	12.20.63	A9A505AC	10.100.10.20	10.100.20.20	
{13A853DE-1DD2-11B2-A620-002370006A18}	BottomLeft	MV-820-IP-REAR	12.20.63	A9A505AC	10.100.10.30	10.100.20.30	
{13A82CCE-1DD2-11B2-99B4-002370006A1A}	BottomRight	MV-820-IP-REAR	12.20.63	A9A505AC	10.100.10.50	10.100.20.50	

Figure 95 New Device Names Added

To check IP link connection from Orbit to the devices:

- Click the **Connection Scan** button in the menu bar and click **Start** in the **Connection Scan** dialog shown.

Orbit tests its IP link connections to all devices. Link connection status is reported via icons adjacent to each IP address.



Connection status

Devices	Spigots	Src Flows	Dst Flows	Router Src Ports	Router Dst Ports	LLDP	LLDP A	LLDP B	Routing Status	Bandwidth Status	Log	Ro
Filter... <input type="checkbox"/> Regex Refresh Table Purge Export Import Subnet Scan Duplicate Scan Connection Scan												
Device GUID	Device Name	Device Type	Software	Firmware	Primary IP Address	Secondary IP Address	Contr					
{13A4F87E-1DD2-11B2-A341-002370002298}	IQMIX40	IQMIX4000	10.67.53	55A331E5	10.100.10.40	10.100.20.40						
{13A7908E-1DD2-11B2-8AA3-002370006A29}	TopLeft	MV-820-IP-REAR	12.20.63	A9A505AC	10.100.10.10	10.100.20.10						
{13A4D16E-1DD2-11B2-989B-002370006A27}	TopRight	MV-820-IP-REAR	12.20.63	A9A505AC	10.100.10.20	10.100.20.20						
{13A853DE-1DD2-11B2-A620-002370006A18}	BottomLeft	MV-820-IP-REAR	12.20.63	A9A505AC	10.100.10.30	10.100.20.30						
{13A82CCE-1DD2-11B2-99B4-002370006A1A}	BottomRight	MV-820-IP-REAR	12.20.63	A9A505AC	10.100.10.50	10.100.20.50						






-  Device reports its IP link is up.
-  Orbit has successfully pinged the device over the IP link.
-  Device reports its IP link is down. (Note: Reporting may use another open network connection.)
-  Orbit unable to successfully ping the device over the IP link.
-  No IP link interface reported by device. (For example, the SFP may be not fitted or wrongly fitted.)

Figure 96 Connection Status

**Assign Router Ports In the Orbit Spigots Tab:**

The MV-820-IP Video IP block’s available spigots (input and output) are not yet assigned to router ports of the Grass Valley IP routing system. When they are assigned, then video routing to the MV-820-IP can be done.

For each MV-820-IP Video IP block device, do the following:

4. Expand the device item to view all of its spigots.

Click to expand or collapse item

Empty **Port Name** and **Port Number** columns

Devices	Spigots	Src Flows	Dst Flows	Router Src Ports	Router Dst Ports	LLDP	LLDP A	LLDP B	Routing Status	Bandwidth Status	Log	Ro
Filter... <input type="checkbox"/> Regex Refresh Table Assign Ports Clear Ports Purge												
	Port Name	Short Name	Port Number	Mode	Linked	Flow Types A	Flow Types B					
▶ IQMIX40												
▼ TopLeft												
	Spigot 1			Src		2022-6 RFC4175 PCM Meta	2022-6 RFC4175 PCM					
	Spigot 2			Src		2022-6 RFC4175 PCM Meta	2022-6 RFC4175 PCM					
	Spigot 3			Src		2022-6 RFC4175 PCM Meta	2022-6 RFC4175 PCM					
	Spigot 4			Src		2022-6 RFC4175 PCM Meta	2022-6 RFC4175 PCM					
	Spigot 5			Dst		2022-6 RFC4175 PCM Meta	2022-6 RFC4175 PCM					
	Spigot 6			Dst		2022-6 RFC4175 PCM Meta	2022-6 RFC4175 PCM					
	Spigot 7			Dst		2022-6 RFC4175 PCM Meta	2022-6 RFC4175 PCM					
	Spigot 8			Dst		2022-6 RFC4175 PCM Meta	2022-6 RFC4175 PCM					
	Spigot 9			Dst		2022-6 RFC4175 PCM Meta	2022-6 RFC4175 PCM					
	Spigot 10			Dst		2022-6 RFC4175 PCM Meta	2022-6 RFC4175 PCM					
	Spigot 11			Dst		2022-6 RFC4175 PCM Meta	2022-6 RFC4175 PCM					
	Spigot 12			Dst		2022-6 RFC4175 PCM Meta	2022-6 RFC4175 PCM					
	Spigot 13			Dst		2022-6 RFC4175 PCM Meta	2022-6 RFC4175 PCM					
	Spigot 14			Dst		2022-6 RFC4175 PCM Meta	2022-6 RFC4175 PCM					
	Spigot 15			Dst		2022-6 RFC4175 PCM Meta	2022-6 RFC4175 PCM					
	Spigot 16			Dst		2022-6 RFC4175 PCM Meta	2022-6 RFC4175 PCM					
▶ TopRight												

Figure 97 Expanded Device to Show Spigots in Spigots Tab

There are four output spigots and 12 input spigots:

- Spigots 1 to 4 are outputs; these can transmit video multicast IP streams. They can act as video router sources.
  - Spigots 5 to 16 are inputs; these can receive video multicast IP streams. They can act as video router destinations.
5. Right-click on one of the MV-820-IP Video IP block devices and click **Assign Ports** in the drop-down menu.

The **Assign Port Mappings** dialog is shown. See Figure 98.

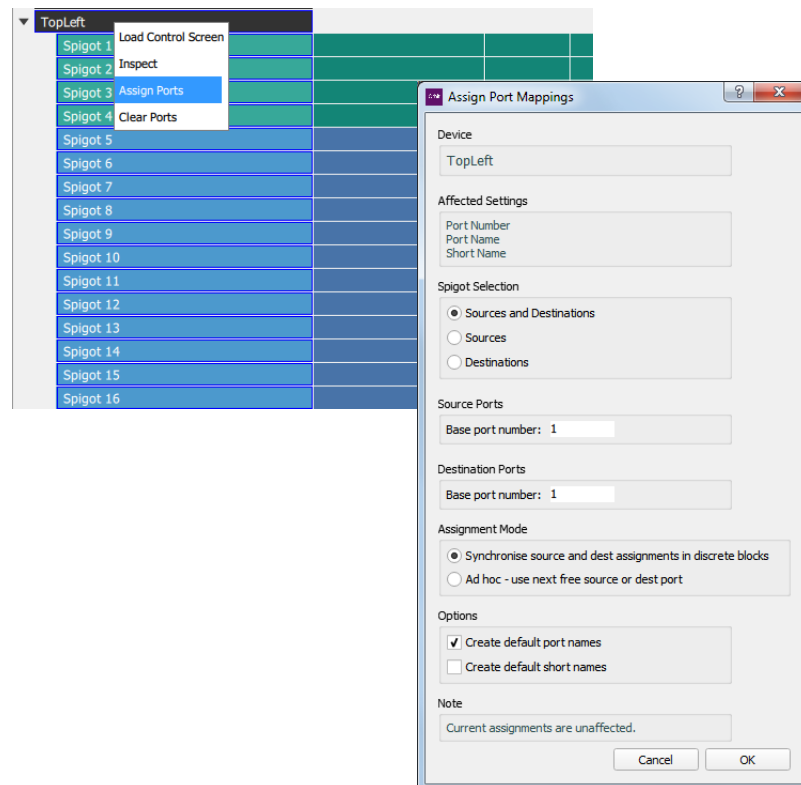


Figure 98 Assign Port Mappings Dialog

In the **Assign Port Mappings** dialog:

6. Verify that:
  - a) The selected device shown is correct.
  - b) **Sources and Destinations** is selected.
  - c) Source 'Base port number' is set to '1' and destination 'Base port number' is set to '1'.
  - d) **Create default port names** is selected.
7. Click **OK**.

Router port numbers and port names are assigned to the Video IP block's spigots.

8. Repeat from step 5 for each Video IP block.

This has now assigned video router ports (of a Grass Valley IP routing system) to all video IP inputs (router sources) and outputs (router destinations) of the MV-820-IP unit.

### Routing Video IP Signals:

Video signals of the video IP router can now be routed to destinations ports of the MV-820-IP unit.

9. Route video IP signals to each of the 48 video inputs of the MV-820-IP unit in the usual way for the video IP router system. For example, via a soft or a hard router control panel.

The Grass Valley video IP routing control system then:

- a) interprets the control panel route commands;
- b) routes the multicast IP flows to the device; and
- c) sets up the destination device to receive the multicast IP flows.

## 5.3.4 Setting Up IP Flows Manually

Manual setting of video IP stream parameters is not recommended because several precise settings changes are required when routing just one video IP signal to the MV-820-IP unit. With up to 48 video inputs to the multiviewer, such manual changes are not practicable.

The following instructions are presented to illustrate which settings changes occur within a Video IP block when a video IP signal is routed to a video IP input spigot in a video IP routing system.

Details of the house video IP routing system must be known, including IP addresses and IP port settings of devices and multicast streams.

Each video IP signal may comprise a video, an audio and a metadata essence. Each essence is carried in an IP data flow. Each type of IP flow is a multicast IP stream and requires both multicast and source IP address and IP port parameters to be set.

### 5.3.4.1 Setting Up IP Flows for a Video IP Input Spigot:

Each Video IP block has 12 video IP input 'spigots' (spigots 5 to 16, destination spigots).

**Note:** The first video IP input of a Video IP block is spigot 5.

The instructions below use spigot 5 as an example to set up IP flows for the spigot.

With the Video IP block connected to the house video IP network via the QSFP cables, to configure the spigot to accept a certain video IP signal:

1. Show the Video IP block's **Spigot 5** RollCall template.  
(Figure 99 shows a Spigot template.)

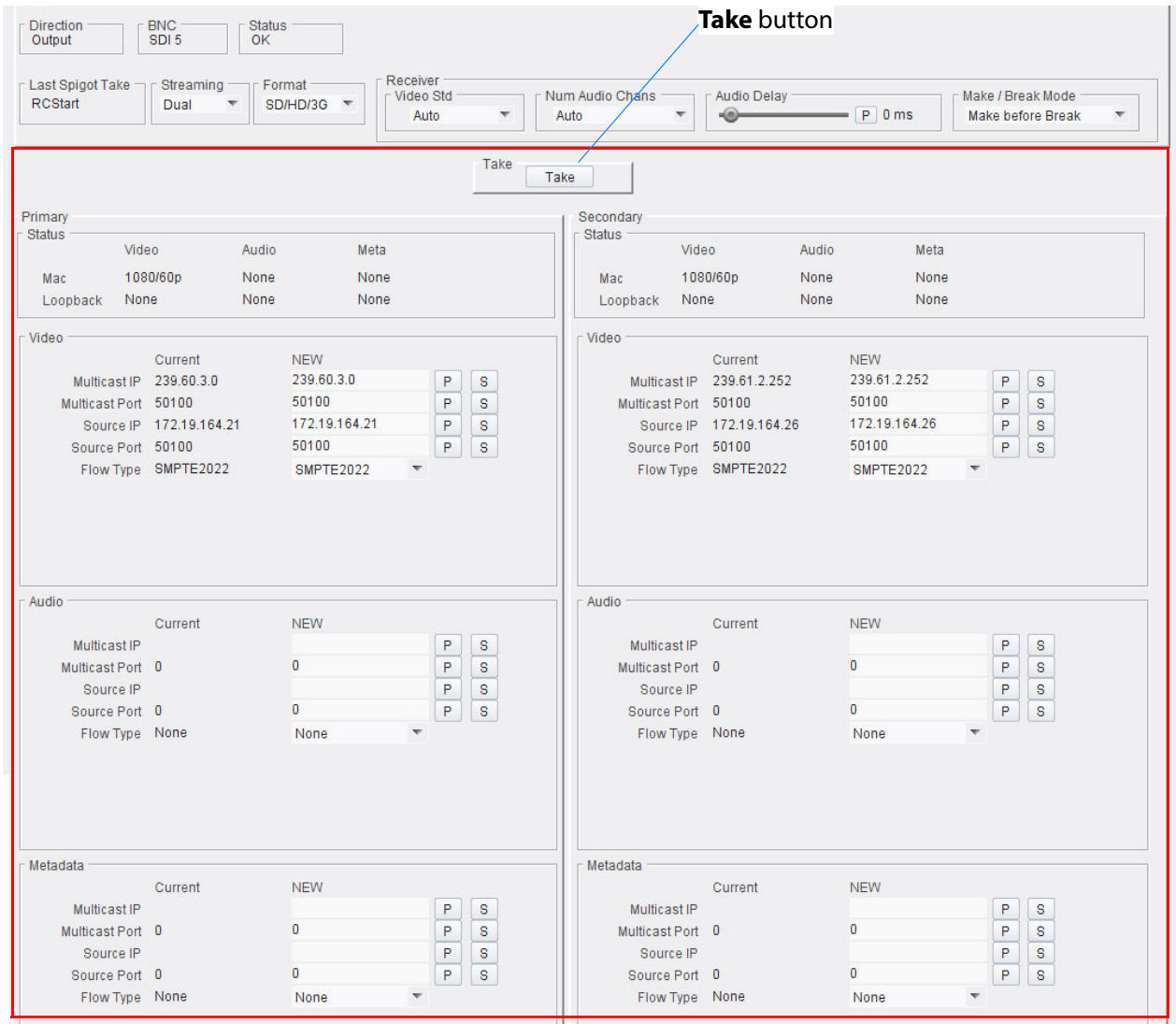


Figure 99 Spigot Template

2. Type new parameter values into the template’s data fields for the following settings, shown in Table 45 (click **S** each time to enter the value into the field):

Table 45 Destination Spigot IP Flow Parameters

Template Panel		Multicast IP address	Multicast IP port	Source IP address	Source IP port	Flow Type
<b>Primary</b>	<b>Video</b>	✓	✓	✓	✓	✓
	<b>Audio</b>	✓	✓	✓	✓	✓
	<b>Metadata</b>	✓	✓	✓	✓	✓
<b>Secondary (redundancy)</b>	<b>Video</b>	✓	✓	✓	✓	✓
	<b>Audio</b>	✓	✓	✓	✓	✓
	<b>Metadata</b>	✓	✓	✓	✓	✓

3. Click **Take** on the template to make the new spigot IP flow settings take effect.

**Note:** This template **Take** is a non-optimized operation and may take up to 10 seconds to complete.

The spigot will now accept the new multicast flows. These IP flows must be presented on the corresponding rear media IP interfaces of the MV-820-IP unit. I.e. the multicast IP flows must be routed to the corresponding MV-820-IP media network interfaces.

### 5.3.4.2 Changing a Video Input to the MV-820-IP Unit:

The full sequence of events for a change over of video IP input signal to the unit is:

- Step 1.**Route new video IP signal (i.e. all the corresponding multicast IP streams) to the MV-820-IPs media network interface(s).
- Step 2.**Set the spigot to accept the new video IP signal. (See the steps above.)
- Step 3.**‘Unroute’ the old video IP signal.

### 5.3.4.3 Setting Up a Video IP Output:

Each Video IP block has four video IP output ‘spigots’ (spigots 1 to 4, source spigots).

With the Video IP block connected to the house video IP network via the QSFP cables, to set the spigot to transmit video data:

1. Show the Video IP block’s **Spigot 1** RollCall template.  
(Figure 100 shows a source spigot template.)
2. Enter new parameter values in the template’s data fields for the following settings in Table 46 (click **S** each time to enter the value into the field):

Table 46 Destination Spigot IP Flow Parameters

Template Panel	Multicast IP address	Multicast IP port	Source IP address	Source IP port	Flow Type
<b>Primary</b>	<b>Video</b>	✓	✓	✓	✓
	<b>(Video<sup>†</sup>)</b>	(✓)	(✓)	(✓)	(✓)
	<b>Audio</b>	✓	✓	✓	✓
	<b>Metadata</b>	✓	✓	✓	✓
<b>Secondary (redundancy)</b>	<b>Video</b>	✓	✓	✓	✓
	<b>(Video<sup>†</sup>)</b>	(✓)	(✓)	(✓)	(✓)
	<b>Audio</b>	✓	✓	✓	✓
	<b>Metadata</b>	✓	✓	✓	✓

<sup>†</sup> Two video flows are possible from the spigot. Only one needs defining per Primary or Secondary spigot to get started.

3. Click **Take** on the template to make the new spigot IP flow settings take effect.

**Note:** This template **Take** is a non-optimized operation and may take up to 10 seconds to complete.

The spigot will now transmit multicast IP flows on the rear media IP interfaces of the MV-820-IP.



Figure 100 Source Spigot Template

### 5.3.5 Test Pattern Generator

Each of the four Video IP blocks in an MV-820-IP unit can source up to four video IP streams.

- Three blocks may be used to output full-resolution copies of the multiviewer display outputs 1 to 12. Licenses are required for display outputs 5 to 12.
- One block has four IP outputs which are unused for multiviewer display outputs.

**Note:**

[Video IP Blocks - Ethernet Control Interface Information](#), on page 154, defines which blocks source display outputs.

[Unused Rear Panel Connectors](#), on page 155, defines which QSFP connector is used.

Any of the blocks can source a video IP test pattern on any of their IP outputs. IP flow settings must be set up on the output spigot (source spigot) concerned (with the corresponding **Spigot** RollCall template).

A block's **TPG** RollCall template controls the test pattern generation.

### 5.3.6 Loopback Router

The **Loopback Router** is a useful facility on each Video IP block. It enables any of the block's four video IP outputs to be locally route to any of the block's 12 video IP inputs. This is controlled with the block's **Loopback Router** RollCall template. (See [Loopback Router Template](#), on page 111.)

# 6 Maintenance - Hardware

This section contains instruction on the removal and fitting of various hardware module items. Some removal/re-fitting operations are only for trained personnel to carry out and this is marked in each sub-section.

<b>6.1</b>	<b>"Fitting Video SFP Modules"</b>	page 133
<b>6.2</b>	<b>"Fitting/Removing Video QSFP28 Transceiver Modules"</b>	page 135
<b>6.3</b>	<b>"Power Supply Units"</b>	page 136
<b>6.4</b>	<b>"MV-820 Main Front Module"</b>	page 138



## 6.1 Fitting Video SFP Modules

SFP modules are fitted into the MV-820 Multiviewer chassis at the rear for:

- Video display outputs (Coax, Fiber or HDMI Video SFPs).
- Network interface ports (Ethernet SFPs).

**Note:** **SFP module types:**  
Ethernet SFP modules and Video SFP modules are *different*.

### 6.1.1 Ethernet SFPs (Multiviewer Control and Monitoring Interface)

A 1Gb Ethernet SFP module is fitted to the MV-820 unit. This module is NOT interchangeable with video SFP modules. However, fitting and removal instructions are similar to video SFPs.

### 6.1.2 Video SFPs (Multiviewer Display Outputs)

This sub-section provides SFP video module fitting guidelines.

**Note:** It is possible to hot-plug SFP modules.

Before inserting the SFP modules, take notice of the required SFP orientation for fitting into the SFP cages of the MV-820 Rear Panel, as shown in Figure 101.

Note the orientation of the SFPs in this figure.

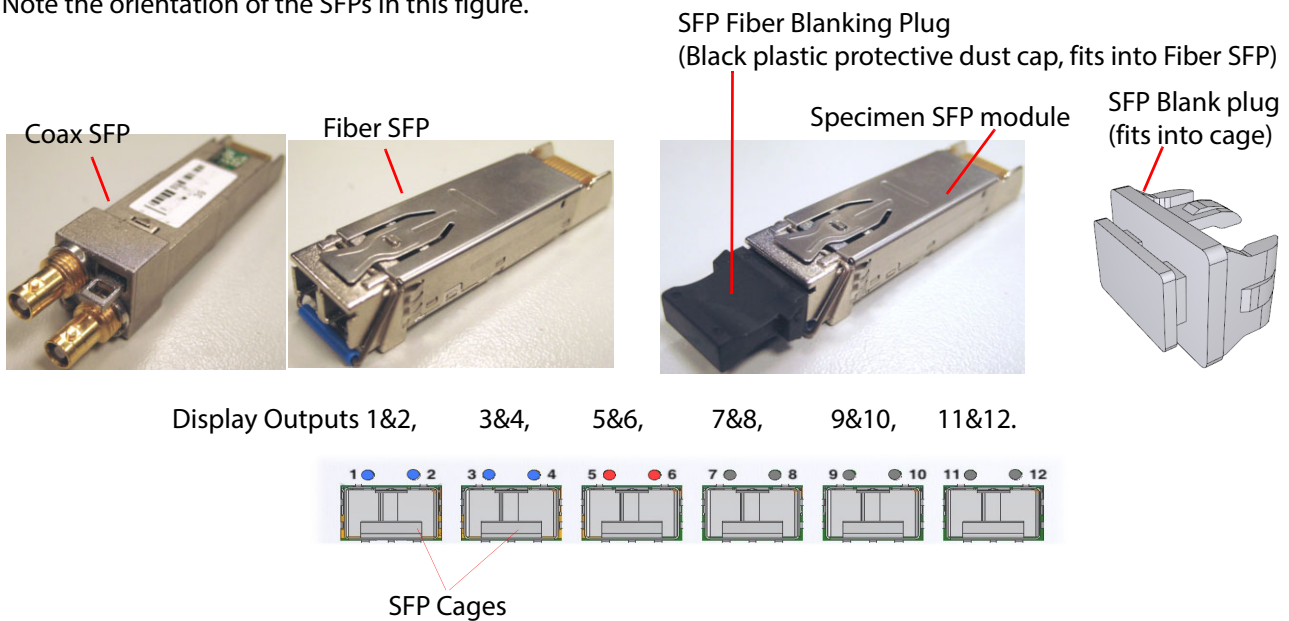


Figure 101 SFP orientation for fitting into MV-820 Rear Panel SFP cages

**Note:****SFP orientation:**

The SFP orientation in the MV-820 chassis may be different to other equipment. This is because of the internal mechanics of the MV-820 chassis.

See Figure 101 for SFP orientation.

**Inserting SFPs:**

Start by filling the SFP cage for output pair 1 & 2, then 3 & 4 etc., see Figure 101.

Procedure:

1. Insert the SFP video modules into the SFP cages on the MV-820 Rear.
2. The SFP modules slide in until there is an audible click.
3. Fill any remaining cages with SFP blanking plugs (SFP-BLANK).

**Removing SFPs:**

SFP module removal, if required, is achieved by operating a small lever or lever-bar on the SFP module before sliding the SFP video module out of its cage.

## 6.2 Fitting/Removing Video QSFP28 Transceiver Modules

QSFP28 transceiver modules may be fitted into the MV-820-IP unit in the rear QSFP+ cages, for the media IP network interface connections.

**Note:** QSFP28 modules may be hot-plugged.

The MV-820-IP unit ships with QSFP blanking covers fitted into each rear QSFP+ cage.

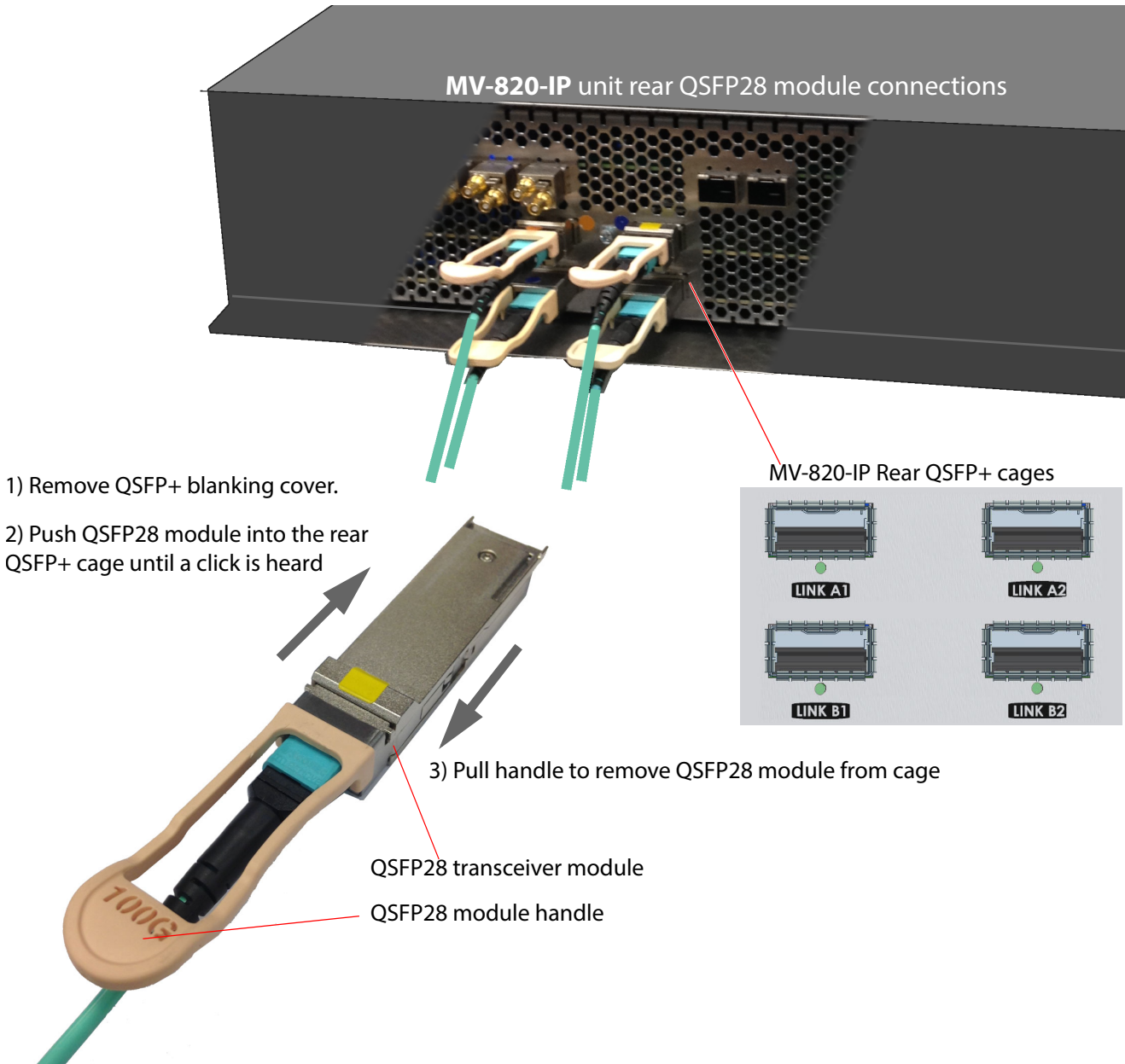


Figure 102 QSFP28 Transceivers and MV-820-IP Rear QSFP+ Cages

### 6.3 Power Supply Units



To reduce the risk of electric shock, plug each power supply cord into separate branch circuits employing separate service grounds.

The MV-820 Multiviewer has independent modular dual-redundant power supply units (PSUs). Either PSU can supply enough power to the MV-820 chassis. The units are hot-swappable.

**Note:** To ensure full dual redundancy, the two power supplies must be powered from independent power sources.

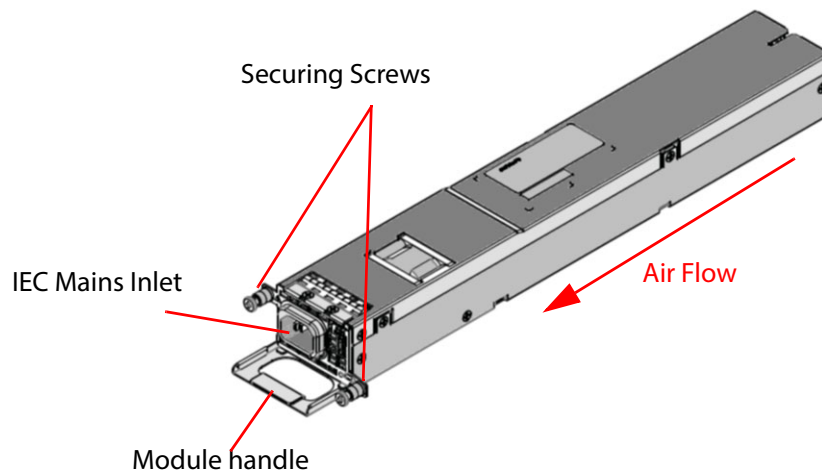


Figure 103 MV-820 Multiviewer PSU Module (Grass Valley stock code FGAMV 820-PSU)

Two PSU modules are fitted into the rear of the MV-820 chassis. Each is secured with two fixing screws, see Figure 104.

Each PSU has an IEC mains inlet and a status LED. The PSU status LEDs are described in Section [Rear Connectors - Mains Inlets](#) on page 37.

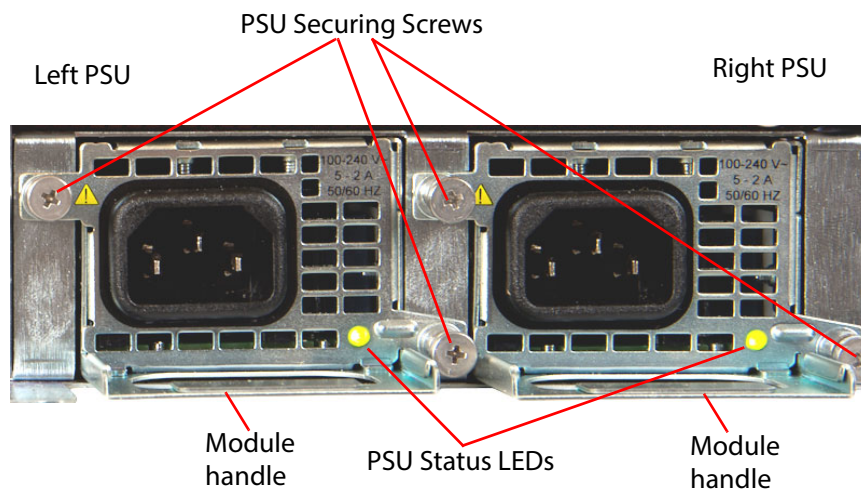



Figure 104 MV-820 Multiviewer Rear PSU modules

There are no On/Off switches for the power supplies; the MV-820 Multiviewer will power up as soon as the AC Power Cords are plugged into the IEC connectors and turned **On** at the AC mains supply.

**Important**

The PSU modules are marked with a  symbol, indicating that hazardous voltages are present inside the module.

**Important**

PSU Modules:

- Contain **No User Serviceable Parts**.
- Contain an integral fuse, which is not user replaceable.
- Should only be replaced or serviced by trained personnel.

A faulty PSU module should be replaced immediately by a trained person.

The PSU modules are hot-swappable.

The MV-820 Multiviewer may be powered on while one PSU module is removed or fitted.

### 6.3.1 PSU Module Removal

**Important**

Removal of PSU's should only be attempted by trained personnel.

A pozidriv screwdriver is required.

**To remove a PSU module:**

1. Identify the PSU module to be removed and disconnect its mains power cord. If the MV-820 Multiviewer is powered on, it should continue to operate using the second PSU module.
2. Unscrew two PSU securing screws, see Figure 104.
3. Carefully pull the PSU module out of the MV-820 chassis, using the PSU handle, see Figure 103.

### 6.3.2 PSU Module Fitting

**Important**

Fitting of PSU's should only be attempted by trained personnel.

A pozidriv screwdriver is required.

**To fit a PSU module:**

1. Note the orientation of a PSU module in the MV-820 chassis, see Figure 104.
2. Carefully insert the PSU module into the empty PSU module slot at the chassis rear. When the module is nearly fully pushed in, an increased resistance is met as the module's DC connector engages with the chassis. The module should be finally fully pushed in.
3. Tighten the two PSU securing screws, see Figure 104. Do not over-tighten the screws.
4. Connect a power cord and switch the mains supply on. The module starts up and the PSU status LED should be lit green.

The MV-820 Multiviewer operation should be uninterrupted.

The status LED is described in [Rear Connectors - Mains Inlets](#) on page 37.

## 6.4 MV-820 Main Front Module

The MV-820 main front module fits into the front of the MV-820 Multiviewer and is common to all product versions; the module is not a serviceable item and is not normally removed. The MV-820 Multiviewer does not function without the main module and the module is not hot-pluggable.

**Important**

Removal of the Main Front Module should only be attempted by trained personnel.

For front door opening instructions, see [Chassis Front](#) on page 24. With the front door open and dropped down, the front MV-820 Main Module can be seen in the top half of the chassis frame, see Figure 105.

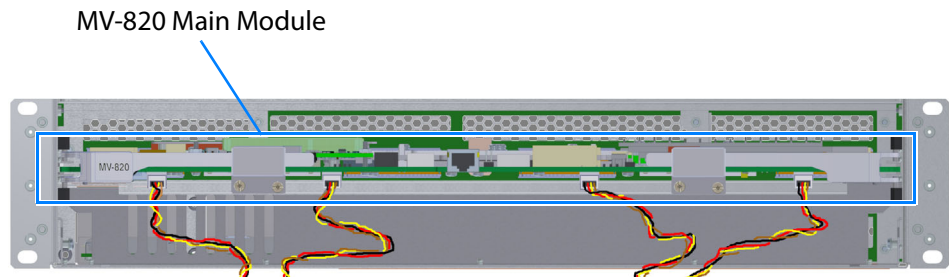


Figure 105 MV-820 Multiviewer Front View with Front Door Open

**Note:**

**Keep chassis door closed:**

The front door should not need to be opened in normal operation. The MV-820 Main Module is not a serviceable item.

Close the front door when the equipment is powered, to maintain cooling airflow.

The module is shown in Figure 106.

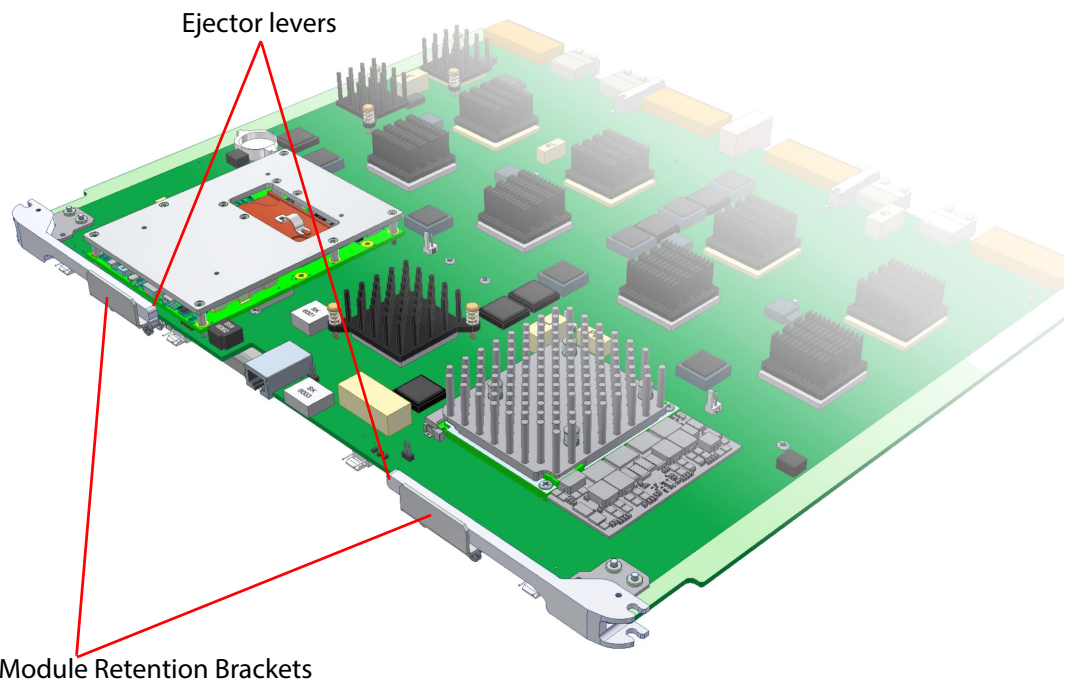


Figure 106 MV-820 Multiviewer Main Front Module

LED status indicators and connectors on the upper and lower front edge of the main module are described in [Front Controls and Indicators](#) on page 26.

The Main Module is retained in the chassis with two Retention Brackets, each attached to the module's lower Strengtheners Bar with two captive screws. See Figure 107.

**Note:** Do not remove the MV-820 top lid.  
(This photograph was only taken with the lid removed for lighting reasons.)

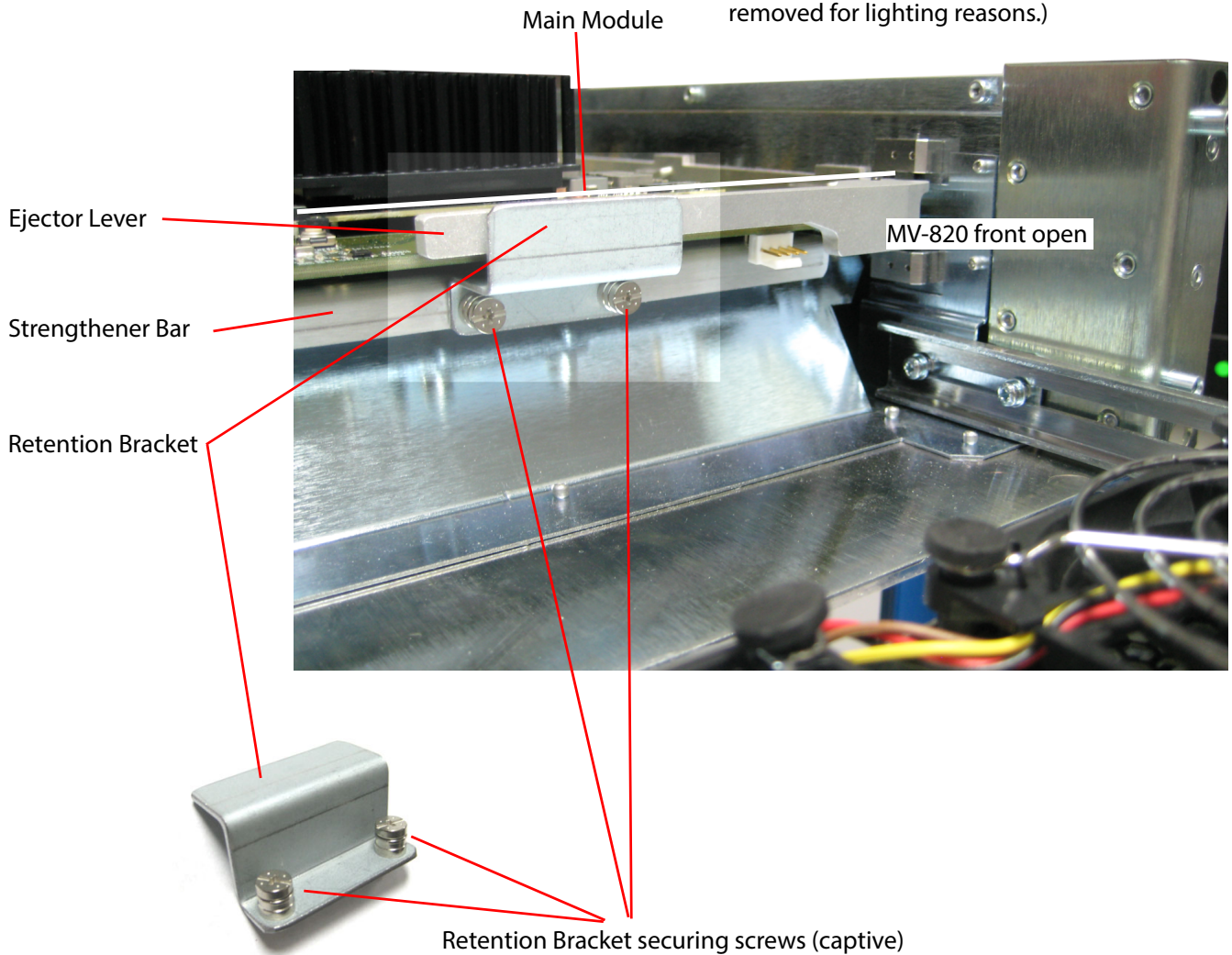


Figure 107 Main Module Retention Bracket and Strengtheners Bar

## 6.4.1 Main Front Module Removal

The MV-820 main front module is not a serviceable item and is not normally removed.

**Important**

Removal of the Main Front Module should only be attempted by trained personnel.

**Electrostatic Damage**

Static precautions must be observed when touching or handling modules.

**Note:**

When removing or fitting the main front module, the front door should be closed as soon as possible after opening. This ensures correct ventilation and operation of the router frame.

Removal of the MV-820 main front module is only required if the module were to have a fault.

**Note:**

Tools required:

- Small pozi-drive screw driver, or a flat blade screwdriver.

The MV-820 Multiviewer should be powered down for main module removal/fitting.

To remove the MV-820 main front module:

1. Disconnect both mains cords from the MV-820 Multiviewer unit.  
This powers down the unit.
2. Open the front door of the MV-820. (See [To Open the Front Door](#) on page 24.)
3. Disconnect the four door-fan supply wires from the front of the MV-820 main front module. See Figure 108.



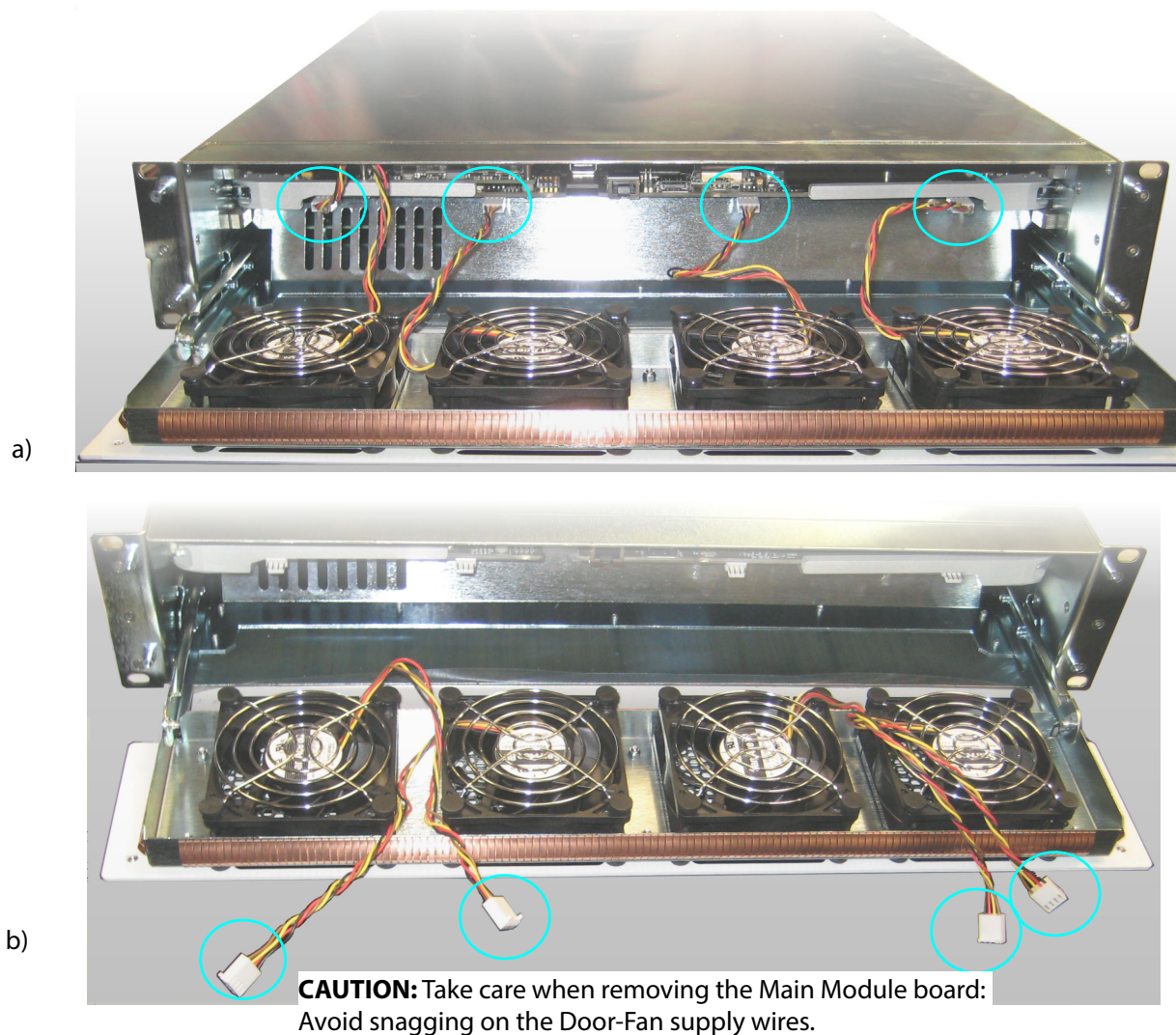
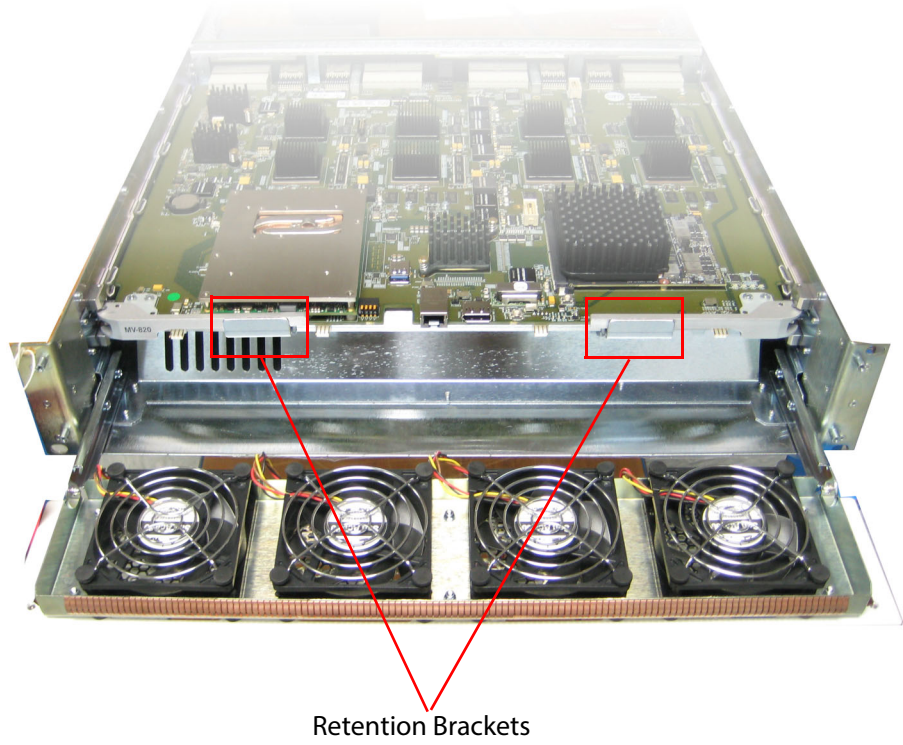


Figure 108 Door-Fan Supply Wires:

a) Fan Wires Connected to MV-820 Main Module.

b) Fan Wires Disconnected.

4. Unscrew the two captive screws securing one of the Retention Brackets. Remove the Retention Bracket and keep it aside. See Figure 107 and Figure 109. Similarly, remove the other Retention Bracket.



*Figure 109 Retention Bracket Locations*

5. Remove the front module by pulling on the two module eject levers, which hinge on the left and right. See Figure 110.  
The module disengages with the chassis and slides out.

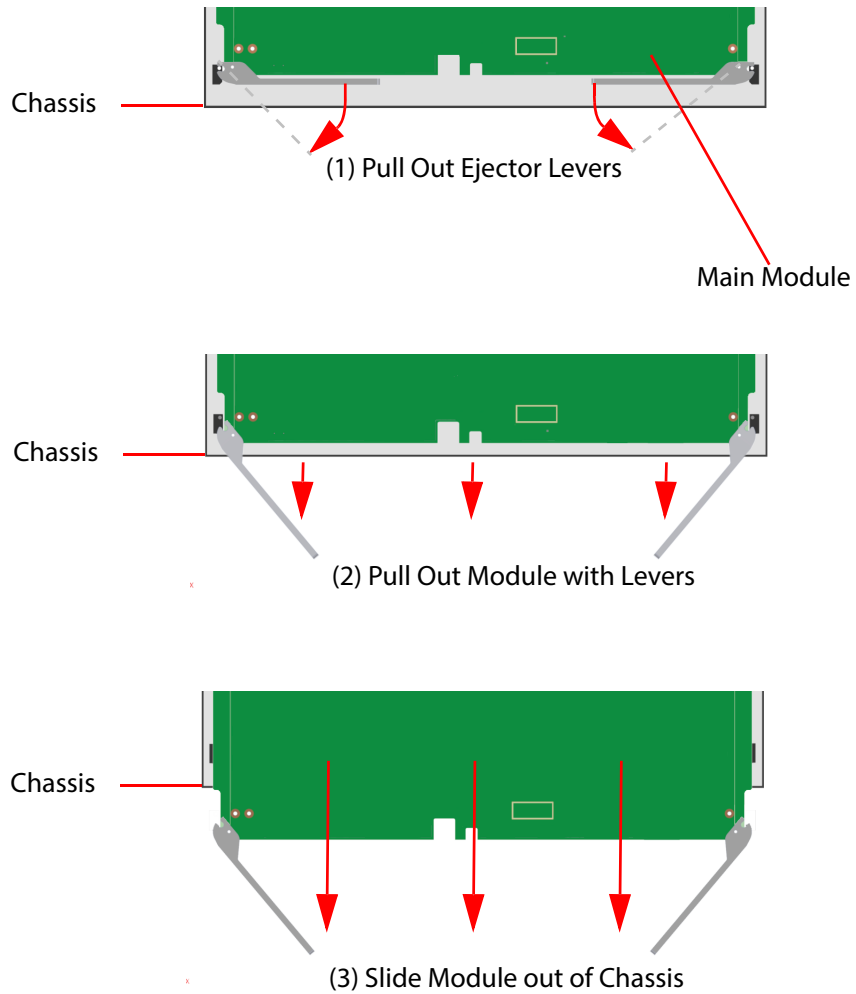


Figure 110 Removing MV-820 Multiviewer Main Module

**Important**

When removing a module - Take care not to knock high components mounted on the top- or on the bottom-side of the module.

The Main Module is now removed.

6. Proceed to fit a replacement Main Module, see [Main Module Fitting](#) on page 144.

The MV-820 will not operate without a main front module.

## 6.4.2 Main Module Fitting

The MV-820 main front module is not a serviceable item and is not normally removed/re-fitted.

**Important**

Re-fitting of the Main Front Module should only be attempted by trained personnel.

**Electrostatic Damage**

Static precautions must be observed when touching or handling modules.

**Note:**

When removing or fitting the main front module, the front door should be closed as soon as possible after opening. This ensures correct ventilation and operation of the router frame.

**Note:**

When inserting a module into the front of a MV-820 Multiviewer chassis:

- Check the module is the correct one for the chassis frame.
- Check there are no obstructions or damage at the module connectors.
- Check for any high components on the module's top- or under-side. Do not knock these during fitting.
- Insert the module into the chassis module slot and slide the module into the chassis frame.
- In the last few millimeters of travel, the module connectors mate with the chassis. Some resistance will be met; ease, but do not force, the module in with the levers.
- If excessive resistance is met:
  - Remove the module and re-check that the module and slot are correct.
  - Check the slot for any obstruction.
  - Check the module connectors for any damage or foreign objects.
- In the final few millimeters of travel, the levers engage with the chassis frame, locking the module into position.

**Important**

High Components:

When inserting a module - Take care not to knock high components which are mounted on the top- or on the under-side of the module.

**Note:**

The MV-820 Main Front Module is **not** hot-pluggable.

These instructions follow on from the module removal instructions of [Main Front Module Removal](#) on page 140.

**Note:**

- Items required:
- Small pozi-drive screw driver, or a flat blade screwdriver.
  - 2-off Module Retention Brackets.

The unit should already be powered down and have no main module fitted.

**To fit a main module:**

1. If the Main Module has the Retention Brackets already fitted, then remove the brackets by unscrewing two captive screws securing each of them.
2. Open the front door of the MV-820.  
(See [To Open the Front Door](#) on page 24.)
3. Engage the MV-820 Main Module sides with the guides in the chassis.
4. Push the module levers and slide the module into the slot.  
In the final few millimeters of travel, the module connectors mate with the internal chassis motherboard and the ejector levers engage with the router frame, locking the module into position. See Figure 111.

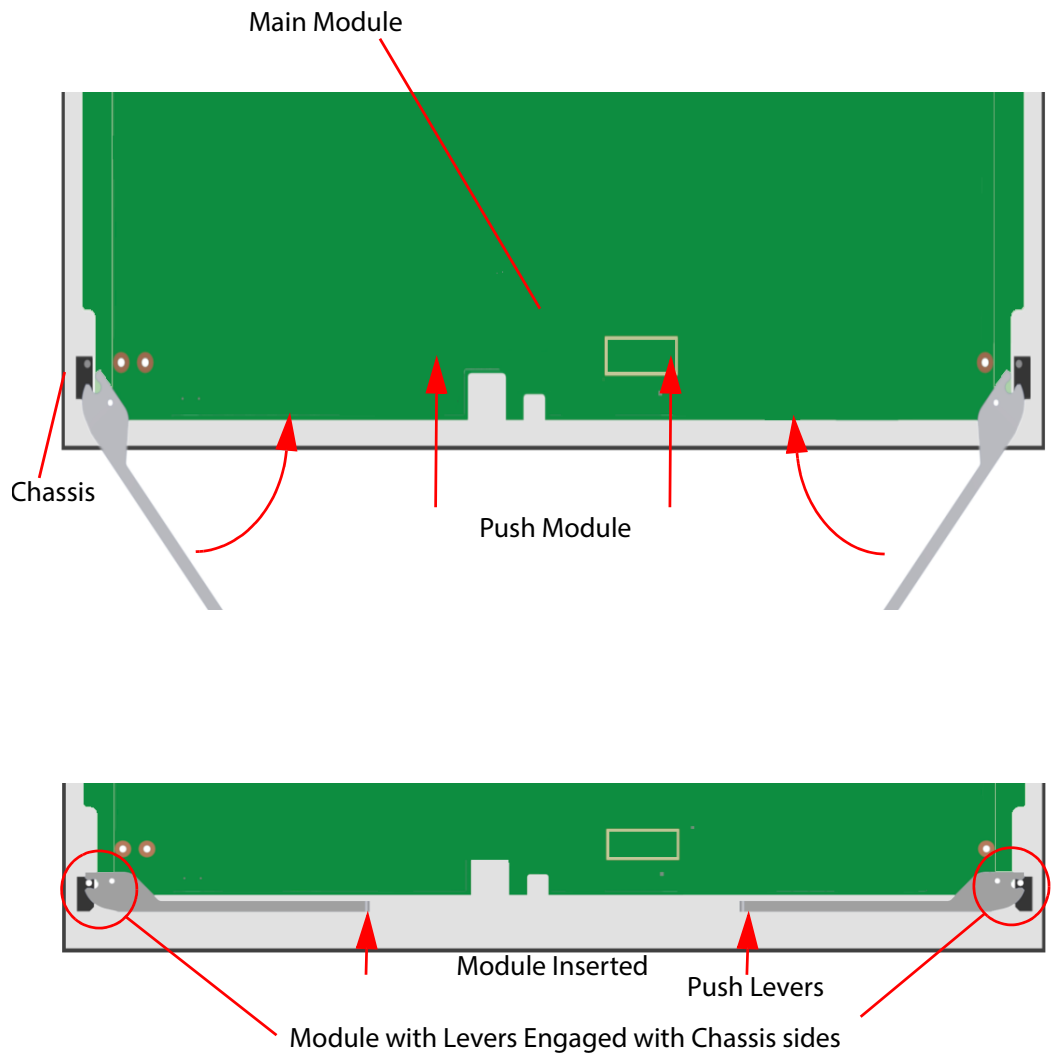


Figure 111 Inserting MV-820 Multiviewer Main Front Module

The module is inserted into the chassis. Now fit the Retention Brackets and close the front door:

5. Fit one Retention Bracket onto the module's Strengthened Bar and secure by tightening the two captive securing screws.  
See Figure 107 and Figure 109.

Similarly, fit the other Retention Bracket

6. Reconnect the four door-fan supply wires to the headers on the main front module. Check they are pushed onto the main front module headers fully and securely.  
See Figure 108.
7. Close and secure the chassis front door.  
(See [To Close the Front Door](#) on page 25.)
8. Reconnect both mains cords to the MV-820 Multiviewer unit.  
This powers the unit.
9. Check that the front door-fans are all operating.

The main module is now fitted into the MV-820 Multiviewer chassis.

When the MV-820 is powered on, the main module starts to boot up. Start-up lasts 2 to 3 minutes and a splash-screen is shown on the Display Outputs after 1 minute until booting is complete.

See the 'MV-8 Series Multiviewer' user manual for a description of the multiviewer unit start up.

# Appendix A MV-820 Specification



## A.1 Electrical/Physical

Power	
Maximum Power consumption	300 W (MV-820-HDBNC) 300 W (MV-820-DENSI) 490 W (MV-820-IP)
Inrush Current	6.5 A (MV-820-HDBNC) 6.5 A (MV-820-DENSI) 6.5 A (MV-820-IP)
Environmental	
Operating Temperature	5°C to 30°C ambient.
Relative Humidity	10 to 90% (non-condensing)
Product Weight	
MV-820-HDBNC	14 kg (~30.3 lb)
MV-820-DENSI	14 kg (~30.3 lb)
MV-820-IP	14.5 kg (~32.0 lb)

## A.2 Overall Dimensions

Dimensions	
Width	482.6 mm (~ 19 in.)
Depth	604.8 mm (~ 23.8 in.)
Height	87.0 mm (~ 3.42 in.)
<b>Note:</b>	See Appendix B "MV-820 Dimensions" on page 156 for a MV-820 dimension drawing.

## A.3 Video Inputs

Signal	
<b>Video Inputs</b>	48-off video inputs. Tri-standard, SD-SDI/ HD-SDI/ 3G-SDI each on video input.
MV-820-HDBNC	48-off HD-BNCs. 75 ohm.
MV-820-DENSI	6-off 8-way high-speed, high-density DensiShield connectors. Proprietary connector format, mates with Grass Valley DS-Link cables.  (16-pin connector for 8-off 100 ohm differential pair input signals.)
MV-820-IP	48-off video inputs via rear IP media network connections.
<b>Video Standards</b>	<ul style="list-style-type: none"> <li>• SD-SDI 525/59.94 and 625/50</li> <li>• HD-SDI 720p (50,59.94, 60 frames/s)</li> <li>• HD-SDI 1080i (25, 29.97 and 30 frames/s)</li> <li>• 3G-SDI 1080p (50, 59.94 and 60 frames/s)</li> </ul>

## A.4 Analog Reference

Signal	
<b>Reference Connection</b>	Input + Loop-through Output  2-off (MV-820-HDBNC)  2-off (MV-820-DENSI)  1-off (MV-820-IP)
<b>Connector</b>	BNC 75 ohm connector, unterminated.
<b>Video Standard</b>	±300mV tri-level HD sync or 300mV SD sync with burst according to system standard



## A.5 TV Standards

Video Standard			
<b>3G-SDI: 2.97Gbps</b>	1080p	59.94Hz	SMPTE 424M/Level A
	1080p	59.94Hz	SMPTE 424M/Level B
	1080p	60Hz	SMPTE 424M/Level A
	1080p	60Hz	SMPTE 424M/Level B
	1080p	50Hz	SMPTE 424M/Level A
	1080p	50Hz	SMPTE 424M/Level B
<b>HD-SDI: 1.485 Gbps</b>	1080i	60Hz	(ANSI/SMPTE-274M(4), -292M(D))
	1080i	59.94Hz	(ANSI/SMPTE-274M(5), -292M(E))
	1080i	50Hz	(ANSI/SMPTE-274M(6), -292M(F))
	1035i	60Hz	(ANSI/SMPTE-260M, -292M(A))
	1035i	59.94Hz	(ANSI/SMPTE-260M, -292M(B))
	1080p	30Hz sF	(ANSI/SMPTE-274M(12) as per RP211)
	1080p	29.97Hz sF	(ANSI/SMPTE-274M(13) as per RP211)
	1080p	25Hz sF	(ANSI/SMPTE-274M(14) as per RP211)
	1080p	24Hz sF	(ANSI/SMPTE-274M(15) as per RP211)
	1080p	23.976Hz sF	(ANSI/SMPTE-274M(16) as per RP211)
	1080p	30Hz	(ANSI/SMPTE-274M(7)-292M(G))
	1080p	29.97Hz	(ANSI/SMPTE-274M(8)-292M(H))
	1080p	25Hz	(ANSI/SMPTE-274M(9)-292M(I))
	1080p	24Hz	(ANSI/SMPTE-274M(10)-292M(J))
	1080p	23.976Hz	(ANSI/SMPTE-274M(11)-292M(K))
	720p	60Hz	(ANSI/SMPTE-296M(1)-292M(L))
720p	59.94Hz	(ANSI/SMPTE-296M(2)-292M(M))	
720p	50Hz	(ANSI/SMPTE-296M(2)-292M(M))	
<b>SD Video Standards</b>	525	60Hz/ 59.94Hz 4:3/16:9	(ITU-R BT.601-5, ANSI/SMPTE-259M(2))
	625	50Hz 4:3/16:9	(ITU-R BT.601-5, ANSI/SMPTE-259M(2))
<b>Video IP Stream Inputs</b>	Unicast and IGMPv3 source-specific multicast SMPTE 2022-6/7 SMPTE 2110 RFC 4175 SMPTE-291M /IETF RTP Payload for Ancillary Data SMPTE 2042 (VC-2, future)		
<b>IP Stream Timing and Synchronization</b>	IEEE-1588v2 (PTP) compliant with SMPTE-2059-2		

## A.6 Outputs

Display Outputs	
<b>SDI</b>	<p>From 4 up to 12 SDI video outputs. HD-BNC Coax or Fiber.</p> <ul style="list-style-type: none"> <li>• Outputs 1 to 4 on standard MV-820.</li> <li>• Outputs 5 to 12 with MV-820 licenses.</li> </ul> <p>Optional SFPs:</p> <ul style="list-style-type: none"> <li>• Dual coax SFP</li> <li>• Dual Fiber SFP</li> <li>• Single HDMI SFPs. (Up to 6 x HDMI outputs, 1080p)</li> </ul>
<b>Reference</b>	<p>One reference for outputs. Display Outputs lock, according to the multiviewer reference setting, to:</p> <ul style="list-style-type: none"> <li>• External Reference.</li> <li>• Internal Reference (free running).</li> </ul>
<b>Video Standard</b>	<p>Video Standard on display outputs:</p> <ul style="list-style-type: none"> <li>• 3G 1080p, or 720p</li> <li>• 50, 59.94 &amp; 60 frames/s.</li> </ul>
<b>Delay</b>	<p>Latency:</p> <p>Progressive: 1 input frame + (1 to 3) output frames.</p> <p>Interlaced: 1 input field + (1 to 3) output frames.</p>
<b>Streaming</b>	<p>MV-820-IP only. Display outputs can be streamed out of rear media network connections. Links A1 to B2.</p> <ul style="list-style-type: none"> <li>• SMPTE 2022-6/-7</li> <li>• SMPTE 2110</li> </ul>
Streaming Out of Video Inputs	
<b>Output Streams</b>	<p>Up to 48-off streamed outputs - scaled copies of the multiviewer inputs.</p> <p>Each multiviewer input is H.264 encoded to create streamed copies of the 48 inputs.</p> <p><b>Note:</b> The H.264 streams do not function for the following slower-frame-rate HD standards:</p> <ul style="list-style-type: none"> <li>• 1080p30 (and slower frame rates); and</li> <li>• 720p30 (and slower frame rates).</li> </ul>
<b>Ethernet Port</b>	<p>Streamed out over multiviewer block control and monitoring Ethernet ports ('MV Control 1' and 'MV Control 2').</p> <p>These can be viewed on desktop PCs via the Grass Valley Orbit MV-800-DT option. Applications include: confidence monitoring, compliance monitoring.</p>

## A.7 GPI and LTC

GPI	
<b>Connector</b>	26 Way High Density D-Type female connector.  Programmable GPIO Tally with TTL-level/contact-closure inputs for GPI  See Section 2.8.8 "Rear Connectors - LTC and GPI" on page 40 for wiring details and pinout.

## A.8 Power Supplies

Connectors	
<b>Redundancy</b>	Two fully independent hot-swappable PSU modules.  Dual PSU redundancy requires two PSU modules.
<b>Voltage</b>	100V - 240 V 50/60Hz, 2 to 5 A
<b>Maximum Output Power</b>	400 Watts
<b>PSU module weight</b>	~ 1 kg
<b>PSU module dimensions</b>	2.15" x 13.67" x 1.58" (54.5 mm x 347.2 mm x 40.2 mm)
<b>PSU module overall length</b>	14.97" (380.2 mm) includes handle

## A.9 Ethernet Rear Panel Connectors

### A.9.1 MV-820-HDBNC and MV-820-DENSI Ethernet Connectors

Table 47 MV-820-HDBNC and MV-820-DENSI Rear Panel Ethernet Connector Interfaces

Connector	RollCall Control Panel Template Reference	Interface Type	Default IP Address	Comment
<b>1G ENET Port 1</b>	1G1	1G Ethernet	<b>10.54.31.221</b>	SFP+ cage for Ethernet SFP. Typically RJ45 Ethernet socket fitted. Used for control and monitoring of the MV-820 multiviewer block.
<b>1G ENET Port 2</b>	1G2	1G Ethernet	<b>10.54.31.222</b>	
Unused:				
10G ENET Port 3	10G1	10G Ethernet	10.54.31.223	SFP+ cage. (MV-820-HDBNC / MV-820-DENSI only)
10G ENET Port 4	10G2	10G Ethernet	10.54.31.224	

## A.9.2 MV-820-IP Ethernet Connector Interfaces

Table 48 MV-820-IP: Rear Panel Ethernet Connector Interfaces

Connector	RollCall Control Panel Template Reference	Interface Type	Default IP Address	Comment
Multiviewer block:				
<b>MV CONTROL 1</b>	1G1	1G Ethernet	<b>10.54.31.221</b>	SFP+ cage for Ethernet SFP. Typically RJ45 fitted. Used for control and monitoring of the MV-820 multiviewer block.
<b>MV CONTROL 2</b>	1G2	1G Ethernet	<b>10.54.31.222</b>	
Video IP blocks:				
<b>CONTROL A</b>	-	1G Ethernet	Not applicable, no default IP address for connections CONTROL A/B. See Note 1	RJ45 connected to internal IP switch. Used for Video IP block control and monitoring. See Table 49.
<b>CONTROL B</b>	-	1G Ethernet		
<b>LINK A1</b>	Ethernet 1 and Ethernet 2	100G Ethernet (2x50G)	Media IP links are not configured with default settings for shipping. See <b>Note 2</b>	Media IP links use a QSFP+ cage for video media IP network physical connections via QSFP28 modules/cables. Media IP links are 100G per physical connection. And each physical connection works as 2x 50G links. Each 50G link carries up to 12-off video IP streams. See <b>Note 3</b> .
<b>LINK B1</b>	Ethernet 1 and Ethernet 2	100G Ethernet (2x50G)		
<b>LINK A2</b>	Ethernet 1 and Ethernet 2	100G Ethernet (2x50G)		
<b>LINK B2</b>	Ethernet 1 and Ethernet 2	100G Ethernet (2x50G)		

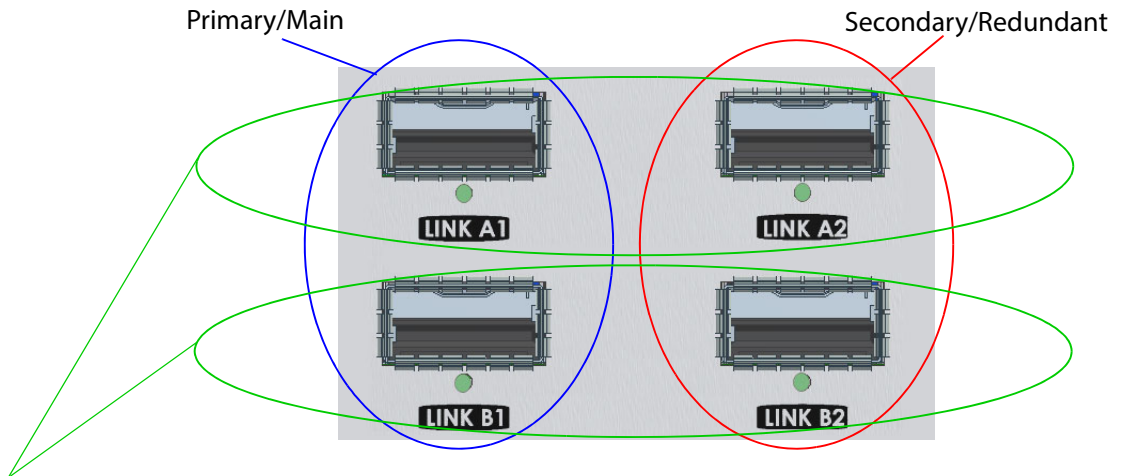
**Note 1:** **Control A** and **Control B** are connected to an internal IP switch which allows access to the internal control Ethernet ports of each Video IP block. It is these internal control Ethernet ports which have default IP addresses set. See Table 49.

**Note 2:** Media IP connections are not configured for shipping and there is no default IP address. The Video IP block media IP links must be configured as part of configuration of the Video IP blocks.

**Note 3:** SMPTE 2110-21 RTP stream sender and receiver buffer types:

- Media IP link inputs: 'Wide'.
- Media IP link outputs: 'Narrow'.

### A.9.3 Rear QSFP Cages - Media Network Interfaces



For details of which video input IP streams and multiviewer head display output video IP streams appear at these QSFP cages, see “MV-820-IP: Input Video IP Streams and Head Output IP Streams” on page 14.

Figure 112 Four Rear Panel QSFP Cages

### A.9.4 Video IP Blocks - Ethernet Control Interface Information

Use control interface connectors ‘Control A’ or ‘Control B’ rear connectors to access the 1G Ethernet internal control port of each Video IP block.

Table 49 lists the default control IP address for each of the four internal Video IP blocks of an MV-820-IP unit. The table also shows which Video IP Input streams and which Head Display Output streams are associated with each block.

Table 49 Default Control IP Addresses for Video IP Blocks of an MV-820-IP Unit

Internal Video IP block location (from rear of unit)	Video IP Block for...		Default Control Interface IP Address
	Video IP Inputs	Head Display Outputs	
Top left	1 to 12	5 to 8	10.54.31.121
Top Right	13 to 24	1 to 4	10.54.31.122
Bottom Left	25 to 36	N/A, see Note 1	10.54.31.123
Bottom Right	37 to 48	9 to 12	10.54.31.124
<p><b>Note 1:</b> Only three of the four video IP blocks within an MV-820-IP unit source Head Display Output IP streams (12 streams in total). Additionally, any video IP block (including the <b>Bottom Left</b> block) may be configured to source a video test pattern on each of its source spigots. (See “TPG (Test Pattern Generator) Template” on page 65 for configuration information.)</p>			

## A.10 Unused Rear Panel Connectors

Connectors	
<b>Monitor O/P</b>	2-off. Not currently used.
<b>USB</b>	2-off (1-off for MV-820-IP): For engineering use.
<b>10G Ethernet</b>	2-off. Not currently used. (MV-820-HDBNC and MV-820-DENSI only)

## A.11 Software Versions

Tool	Version
<b>RollCall Control Panel</b>	4.18.17 or later
<b>Grass Valley Orbit</b>	3.0.10 or later
<b>Multiviewer</b>	3.0.13 or later

**Note:**

**For future releases:**

Please refer to software release notes for compatibility information.

# Appendix B MV-820 Dimensions



Chassis dimensions are shown in Figure 113.



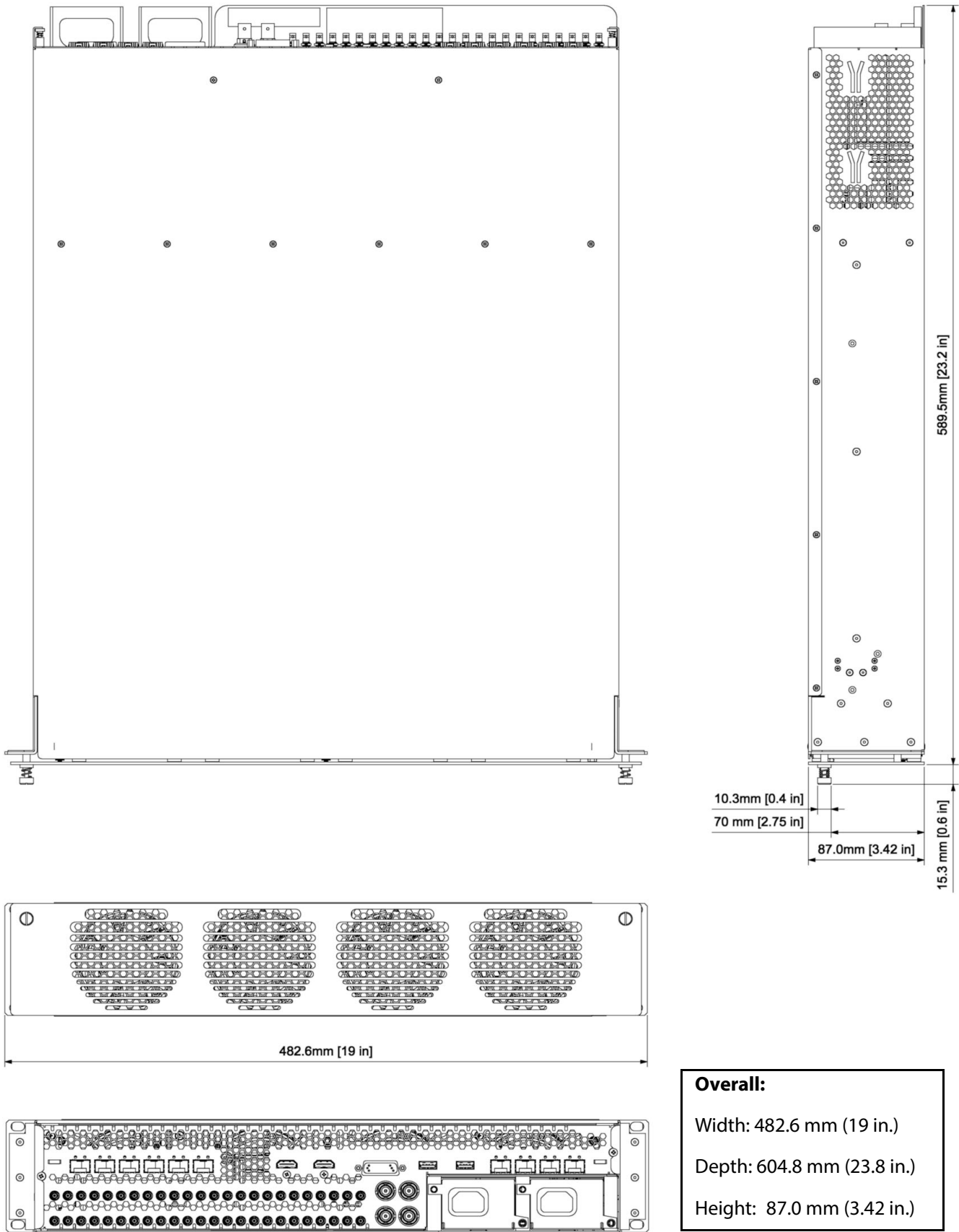


Figure 113 MV-820 Multiviewer Dimensions

# Appendix C IP Routing Terminology



Table 50 Glossary of IP Routing Terms

<b>Control network</b>	Typically an Ethernet network dedicated for device control.
<b>COTS</b>	Commercial Off-The-Shelf. Refers to hardware that is not specific to an industry, but is generic and readily available. In this case, it is high-performance IT switching equipment.
<b>Destination</b>	Receiver of one or more flows. Destination spigot.
<b>Essence</b>	A general term used to describe a component of a media signal. Video, Audio and Metadata are all essences.
<b>Fabric</b>	Term for the networks that can make up a redundant network system, Fabric "A" and Fabric "B".
<b>FEC</b>	Forward Error Correction.  A technique for controlling errors in data transmission where the sender encodes message in a redundant way by using an error-correcting code. The redundancy allows the receiver to detect and correct errors.
<b>Flow</b>	Another term for an elementary IP stream, usually a sequence of real-time data sent as an RTP IP data stream.  For example, TR-03 describes how a media stream (e.g. an original SDI stream) may be sent as three flows: Video, Audio and Ancillary essence data.
<b>IEEE 1588</b>	A Precision Time Protocol (PTP) to synchronize distributed clocks to within 1 microsecond via Ethernet networks.  PTP runs on IP networks, transferring precision time to slave devices via a 1 GHz virtual clock (time base). It is used to synchronize TR-03 elementary streams.
<b>IGMPv3</b>	Internet Group Management Protocol. Communications protocol used in IP multicasting by client IP devices and an IP router to establish multicast group membership.  The routing function of a traditional video router can be replicated with a IP Network Router Controller deice and a COTS IP Switch which supports the IGMPv3 protocol.
<b>In-Band Control</b>	Sending control messages for an IP routing system in the media IP network fabric.
<b>IP Stream</b>	Real-time data (for example, video and/or audio) sent over a network.
<b>IP Flow</b>	Flows form a stream. There may be Video and Audio IP flows in an IP stream.

Table 50 Glossary of IP Routing Terms (continued)

<b>IP Router</b>	A device that connects networks together.
<b>IP Switch</b>	A device that connects many network lines together. Many users can communicate and more than one transaction can occur at a time on network.
<b>IP-RSC</b>	IP Routing System Controller (IP-RSC). A unit used in a Grass Valley video IP routing system. The unit controls a high-performance IP network to form a (real-time) video IP routing system. It presents the system as a traditional video router to the outside world, so that existing router control methods can be used to control an IP Routing-based video router.
<b>IPRA</b>	IP Router Adapter, a functional block within an IP-RSC. The IPRA interfaces to the IP Routing system.
<b>IPRC</b>	IP Router Controller, a functional block within an IP-RSC. The IPRC presents the IP routing system as a traditional video router to the outside world.
<b>LLDP</b>	Link Layer Discovery Protocol (LLDP).  This is an open IP protocol used in IEEE 802.1ab to discover a network device's identity and abilities, and to make physical network topology information available. Information is readable via standard network management protocols, such as SNMP.
<b>MAC Address</b>	Media Access Control (MAC) address is a unique 48-bit identifier assigned to a network interface connection of a network device.  For example: 5C-26-0A-39-21-EE.
<b>Media network</b>	A high-capacity network dedicated to carrying high bit rate media.
<b>Multicast Stream</b>	A one-to-many IP stream. Devices receiving the stream subscribe to the multicast stream's IP address.
<b>Network</b>	A group of two or more ethernet-enabled systems linked together via IP.  In the case of broadcast video IP network, a local area network optimized for the transfer and broadcast of real-time, high bandwidth video IP streams
<b>Northbound</b>	Describes Control network data packet traffic.
<b>Out-of-Band Control</b>	Method of sending control messages for an IP routing system in a separate control network.
<b>RFC-4175</b>	TR-03 uses Internet Engineering Task Force's (IETF) RFC-4175 to pack (uncompressed) active video lines into an RTP IP stream.
<b>RollCall</b>	Grass Valley control and monitoring system.
<b>RollCallv3</b>	Traditional Grass Valley RollCall messages in the Grass Valley RollCall control and monitoring system product.
<b>RollCall+</b>	New extension to Grass Valley RollCall.  Uses RollCall+ Domains to separate data flow types.  Used in MV-8 series Multiviewers and in IP Routing control and configuration.

Table 50 Glossary of IP Routing Terms (continued)

<b>RTP</b>	Real-time Transport Protocol. An IP standard which specifies a way to manage the real-time transmission of multimedia data over a network.
<b>SDI</b>	Serial Digital Interface.  A method for packing real-time media (uncompressed video, audio and metadata essences) into a digital serial bit stream and sending it over a low-latency, point-to-point electrical link (typically a coaxial cable).
<b>SMPTE 2022-6</b>	A transport protocol for the real time transport of high bit-rate video/audio data over IP networks, where the entire payload of the SDI signal is encapsulated as one IP stream.  Designed to be applied to television transport for broadcast production and is not intended for emission purposes.
<b>SMPTE 2022-7</b>	A standard for the seamless reconstruction of a stream from the transmission of two streams of identical content over potentially diverse paths.  Enables cost-effective redundant network operation. Two network are used and a full stream is sent on each network. A receiving device can switch between two received streams and recover the content of the original full stream.
<b>SMPTE 2110</b>	A standard for an extensible RTP IP streams (essence streams, including uncompressed video) referenced to a common clock. Includes support for a variable raster size (up to 32Kx32K pixels), HDR, and a variety of color sampling schemes, bit depths and frame-rates.
<b>Source</b>	Originator of one or more flows. Source spigot.
<b>Southbound</b>	Describes Media network data packet traffic.
<b>Spigot</b>	A generic term for a source or a destination of one or more flows.
<b>Stream</b>	Term usually associated with delivery of constant, real-time media (e.g. Audio, Video) over IP networks with a stream of data packets.
<b>TR-03</b>	A Video Services Forum (VSF) Technical Recommendation concerning the transport of time-related uncompressed media over IP.  Carriage of video, audio and ancillary data in separate elementary streams to provide greater flexibility in the production of media.
<b>TR-04</b>	A Video Services Forum (VSF) Technical Recommendation concerning the transport of media streams and elementary streams over a network.
<b>VC-2</b>	Also known as Dirac Pro, this is an open source video codec technology developed by the BBC and standardized by SMPTE.  An intra-frame compression scheme aimed at professional production and post production. Compression ratios are in the range 2:1 to 16:1. It can provide near lossless compression.

**User Notes:**

# Contact Us

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Customers with a support contract should call their personalized number, which can be found in their contract, and be ready to provide their contract number and details.

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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](http://www.grassvalley.com)).

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

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