grass valley
A BELDEN BRAND

MV-820 MULTIVIEWER

STAND-ALONE MULTIVIEWER

User Manual

Issue 2 Revision 3

2018-August-1

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.

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Title	MV-820 Multiviewer User Manual
Part Number	Issue 2 Revision 3
Revision	1 August 2018 11:56 am

About this Manual

Thank you for purchasing your new MV-820 Multiviewer.

This MV-820 Multiviewer User Manual describes how to install, configure and operate the MV-820 Multiviewer, and provides any relevant safety information.

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

Related Documents

The following Grass Valley manuals are related documents:

Related Document	Description
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.

Safety Information

Explanation of Safety Symbols

GB

This symbol refers the user to important information contained in the accompanying literature. Refer to manual.

This symbol indicates that hazardous voltages are present inside.
No user serviceable parts inside.
This unit should only be serviced by trained personnel.

Safety Warnings

CAUTION: These servicing instructions are for use by qualified personnel only.
To reduce 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.

- **To reduce the risk of electric shock, do not expose this appliance to rain or moisture.**
- **Always ensure that the unit is properly earthed and power connections correctly made.**
- **This equipment must be supplied from a power system providing a PROTECTIVE EARTH ⏚ connection and having a neutral connection which can be reliably identified.**
- **The power outlet supplying power to the unit should be close to the unit and easily accessible**

Légende :

F

Ce symbole indique qu'il faut prêter attention et se référer au manuel.

Ce symbole indique qu'il peut y avoir des tensions électriques à l'intérieur de l'appareil. Ne pas intervenir sans l'agrément du service qualifié.

Précaution d'emploi :

Attention: Les procédures de maintenance ne concernent que le service agréé. Afin de réduire le risque de choc électrique, il est recommandé de se limiter aux procédures d'utilisation, à moins d'en être qualifié. Pour toute maintenance, contacter le service compétent.

- **Pour réduire le risque de choc électrique, ne pas exposer l'appareil dans un milieu humide.**
- **Toujours s'assurer que l'unité est correctement alimentée, en particuliers à la liaison à la terre.**
- **La source électrique de cet équipement doit posséder une connexion à la terre ⏚, ainsi qu'une liaison « neutre » identifiable.**
- **La prise électrique qui alimente l'appareil doit être proche de celle-ci et accessible.**

Simboli di sicurezza:

I

Questo simbolo indica l'informazione importante contenuta nei manuali appartenenti all'apparecchiatura. Consultare il manuale.

Questo simbolo indica che all'interno dell'apparato sono presenti tensioni pericolose. Non cercare di smontare l'unità.
Per qualsiasi tipo di intervento rivolgersi al personale qualificato.

Attenzione:

Le istruzioni relative alla manutenzione sono ad uso esclusivo del personale qualificato. E' proibito all'utente eseguire qualsiasi operazione non esplicitamente consentita nelle istruzioni. Per qualsiasi informazione rivolgersi al personale qualificato.

- **Per prevenire il pericolo di scosse elettriche è necessario non esporre mai l'apparecchiatura alla pioggia o a qualsiasi tipo di umidità.**
- **Assicurarsi sempre, che l'unità sia propriamente messa a terra e che le connessioni elettriche siano eseguite correttamente.**
- **Questo dispositivo deve essere collegato ad un impianto elettrico dotato di un sistema di messa a terra efficace.**
- **La presa di corrente deve essere vicina all'apparecchio e facilmente accessibile.**

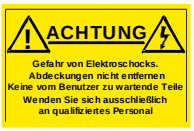
Erklärung der Sicherheitssymbole

D

Dieses Symbol weist den Benutzer auf wichtige Informationen hin, die in der begleitenden Dokumentation enthalten sind.

Dieses Symbol zeigt an, dass gefährliche Spannung vorhanden ist.
Es befinden sich keine vom Benutzer zu wartenden Teile im Geräteinneren.
Dieses Gerät sollte nur von geschultem Personal gewartet werden

Sicherheits-Warnhinweise



Die angeführten Service-/Reparatur-Anweisungen sind ausschließlich von qualifiziertem Service-Personal auszuführen. Um das Risiko eines lektroschocks zu reduzieren, führen Sie ausschließlich die im Benutzerhandbuch eschriebenen Anweisungen aus, es sei denn, Sie haben die entsprechende Qualifikation. Wenden Sie sich in allen Service-Fragen an qualifiziertes Personal.

- **Um das Risiko eines Elektroschocks zu reduzieren, setzen Sie das Gerät weder Regen noch Feuchtigkeit aus.**
- **Stellen Sie immer sicher, dass das Gerät ordnungsgemäß geerdet und verkabelt ist.**
- **Dieses Equipment muss an eine Netzsteckdose mit ⏚ Schutzleiter angeschlossen werden und einen zuverlässig identifizierbaren Nullleiter haben.**
- **Die Netzsteckdose sollte nahe beim Gerät und einfach zugänglich sein.**

Explicación de los Símbolos de Seguridad

ESP

Éste símbolo refiere al usuario información importante contenida en la literatura incluida. Referirse al manual.

Éste símbolo indica que voltajes peligrosos están presentes en el interior.
No hay elementos accesibles al usuario dentro.
Esta unidad sólo debería ser tratada por personal cualificado.

Advertencias de Seguridad

Las instrucciones de servicio cuando sean dadas, son sólo para uso de personal cualificado. Para reducir el riesgo de choque eléctrico no llevar a cabo ninguna operación de servicio aparte de las contenidas en las instrucciones de operación, a menos que se esté cualificado para realizarlas.
Referir todo el trabajo de servicio a personal cualificado.

- **Para reducir el riesgo de choque eléctrico, no exponer este equipo a la lluvia o humedad.**
- **Siempre asegurarse de que la unidad está propiamente conectada a tierra y que las conexiones de alimentación están hechas correctamente.**
- **Este equipo debe ser alimentado desde un sistema de alimentación con conexión a TIERRA ⏚ y teniendo una conexión neutra fácilmente identificable.**
- **La toma de alimentación para la unidad debe ser cercana y fácilmente accesible.**

Forklaring på sikkerhedssymboler

DK

Dette symbol gør brugeren opmærksom på vigtig information i den medfølgende manual.

Dette symbol indikerer farlig spænding inden i apparatet. Ingen bruger servicerbare dele i apparatet på brugerniveau.
Dette apparat må kun serviceres af faglærte personer..

Sikkerhedsadvarsler

Serviceinstruktioner er kun til brug for faglærte servicefolk. For at reducere risikoen for elektrisk stød må bruger kun udføre anvisninger i betjeningsmanualen.
Al service skal udføres af faglærte personer.

- **For at reducere risikoen for elektrisk stød må apparatet ikke udsættes for regn eller fugt.**
- **Sørg altid for at apparatet er korrekt tilsluttet og jordet.**
- **Dette apparat skal forbindes til en nettilslutning, der yder BESKYTTENDE JORD ⏚ og 0 forbindelse skal være tydeligt markeret.**
- **Stikkontakten, som forsyner apparatet, skal være tæt på apparatet og let tilgængelig**.

Förklaring av Säkerhetssymboler

(S)

Denna symbol hänvisar användaren till viktig information som återfinns i litteraturen som medföljer. Se manualen.

Denna symbol indikerar att livsfarlig spänning finns på insidan. Det finns inga servicevänliga delar inne i apparaten. Denna apparat få endast repareras av utbildad personal.

Säkerhetsvarningar

Serviceinstruktioner som anges avser endast kvalificerad och utbildad servicepersonal. För att minska risken för elektrisk stöt, utför ingen annan service än den som återfinns i medföljande driftinstruktionerna, om du ej är behörig. Överlåt all service till kvalificerad personal.

- **För att reducera risken för elektrisk stöt, utsätt inte apparaten för regn eller fukt.**
- **Se alltid till att apparaten är ordentligt jordad samt att strömtillförseln är korrekt utförd.**
- **Denna apparat måste bli försörjd från ett strömsystem som är försedd med jordadanslutning ⏚ samt ha en neutral anslutning som lätt identifierbar.**
- **Vägguttaget som strömförsörjer apparaten bör finnas i närheten samt vara lätttillgänglig.**

Turvamerkkien selitys

(FI)

Tämä merkki tarkoittaa, että laitteen mukana toimitettu kirjallinen materiaali sisältää tärkeitä tietoja. Lue käyttöohje.

Tämä merkki ilmoittaa, että laitteen sisällä on vaarallisen voimakas jännite. Sisäpuolella ei ole mitään osia, joita käyttäjä voisi itse huoltaa. Huollon saa suorittaa vain alan ammattilainen.

Turvaohjeita

Huolto-ohjeet on tarkoitettu ainoastaan alan ammattilaisille. Älä suorita laitteelle muita toimenpiteitä, kuin mitä käyttöohjeissa on neuvottu, ellet ole asiantuntija. Voit saada sähköiskun. Jätä kaikki huoltotoimet ammattilaiselle.

- **Sähköiskujen välttämiseksi suojaa laite sateelta ja kosteudelta.**
- **Varmistu, että laite on asianmukaisesti maadoitettu ja että sähkökytkennät on tehty oikein.**
- **Laitteelle tehoa syöttävässä järjestelmässä tulee olla SUOJAMAALIITÄNTÄ ⏚ ja nollaliitännän on oltava luotettavasti tunnistettavissa.**
- **Sähköpistorasian tulee olla laitteen lähellä ja helposti tavoitettavissa.**

Símbolos de Segurança

(P)

O símbolo triangular adverte para a necessidade de consultar o manual antes de utilizar o equipamento ou efectuar qualquer ajuste.

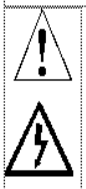
Este símbolo indica a presença de voltagens perigosas no interior do equipamento. As peças ou partes existentes no interior do equipamento não necessitam de intervenção, manutenção ou manuseamento por parte do utilizador. Reparações ou outras intervenções devem ser efectuadas apenas por técnicos devidamente habilitados.

Avisos de Segurança

As instruções de manutenção fornecidas são para utilização de técnicos qualificados. Para reduzir o risco de choque eléctrico, não devem ser realizadas intervenções no equipamento não especificadas no manual de instalações a menos que seja efectuadas por técnicos habilitados.

- **Para reduzir o risco de choque eléctrico, não expor este equipamento à chuva ou humidade.**
- **Assegurar que a unidade está sempre devidamente ligada à terra e que as ligações à alimentação estão correctas.**
- **O sistema de alimentação do equipamento deve, por razões de segurança, possuir ligação a terra de protecção ⏚ e ligação ao NEUTRO devidamente identificada.**
- **A tomada de energia à qual a unidade está ligada deve situar-se na sua proximidade e facilmente acessível.**

Επεξήγηση των Συμβόλων Ασφαλείας



Αυτό το σύμβολο παραπέμπει το χρήστη σε σημαντικές πληροφορίες που συμπεριλαμβάνονται στο συνοδευτικό εγχειρίδιο.

Αυτό το σύμβολο υποδεικνύει ότι στο εσωτερικό υφίστανται επικίνδυνες ηλεκτρικές τάσεις. Στο εσωτερικό δεν υπάρχουν επισκευάσιμα μέρη. Αυτή η μονάδα πρέπει να επισκευάζεται μόνο από ειδικά εκπαιδευμένο προσωπικό.

Προειδοποίηση Ασφαλείας

Οδηγίες επισκευής, όπου παρέχονται, αναφέρονται αποκλειστικά και μόνο σε εξειδικευμένο προσωπικό. Για να μειωθεί ο κίνδυνος ηλεκτροπληξίας, μην εκτελείτε επισκευές παρά μόνο τις συμπεριλαμβανόμενες στο εγχειρίδιο των οδηγιών, εκτός και αν έχετε τα απαραίτητα προσόντα για να το κάνετε. Όλες οι επισκευές να εκτελούνται από ειδικά εκπαιδευμένο προσωπικό.

- **Για να μειώσετε τον κίνδυνο ηλεκτροπληξίας μην εκθέτετε τη συσκευή σε βροχή ή υγρασία.**
- **Πάντα να εξασφαλίζετε τη σωστή γείωση της συσκευής και τη σωστή σύνδεση των συνδέσμων τροφοδοσίας.**
- **Ο εξοπλισμός πρέπει να τροφοδοτείται από ένα σύστημα τροφοδοσίας που να εξασφαλίζει ΠΡΟΣΤΑΤΕΥΤΙΚΗ ΓΕΙΩΣΗ ⏚ και να έχει καθορισμένες θέσεις ουδέτερου και φάσης.**
- **Ο εξοπλισμός που τροφοδοτεί τη συσκευή θα πρέπει να βρίσκεται κοντά στη συσκευή και να είναι εύκολα προσβάσιμος.**

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.

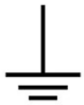
Symbols and Their Meanings

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.

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 mains voltage at either 120 V AC or 240 V AC.

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

Cautions

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:

- 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.
- These servicing instructions are for use by qualified personnel only. 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.

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

Follow static precautions at all times when handling this equipment.

Electrostatic Discharge (ESD) Protection

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

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

Battery Handling

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

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

Recycling

Visit www.grassvalley.com for recycling information.

Safety Information Continued

Safety Warnings

CAUTION: These servicing instructions are for use by qualified personnel only. To reduce 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.

WARNING:
TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO WATER OR MOISTURE

- 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 IEC power inlets are the mains disconnection devices for this unit.

Fiber Output Modules

The MV-820 unit has 'small form-factor' module cages at its rear for SFP (small form-factor pluggable) and 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

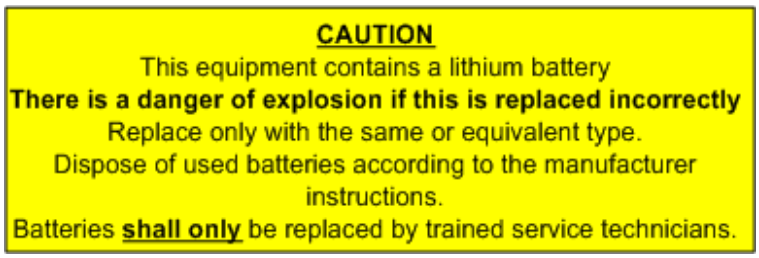
The average optical output power does not exceed 0 dBm (1mW) under normal operating conditions. Unused optical outputs should be covered to prevent direct exposure to the laser beam.

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. patch cord) 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.

Lithium Batteries

Battery Warning



The MV-820 Multiviewer contains Lithium batteries to provide non-volatile memory.

Used batteries should be disposed of according to the manufacturers instruction.

Ensure that the same make and model of battery is used if replacement is required (a manufacturer recommended equivalent may be used if the original type is not available).

The MV-820 Multiviewer can only be serviced by suitably qualified personnel and removal of the battery should only be performed at a Grass Valley service center.

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.

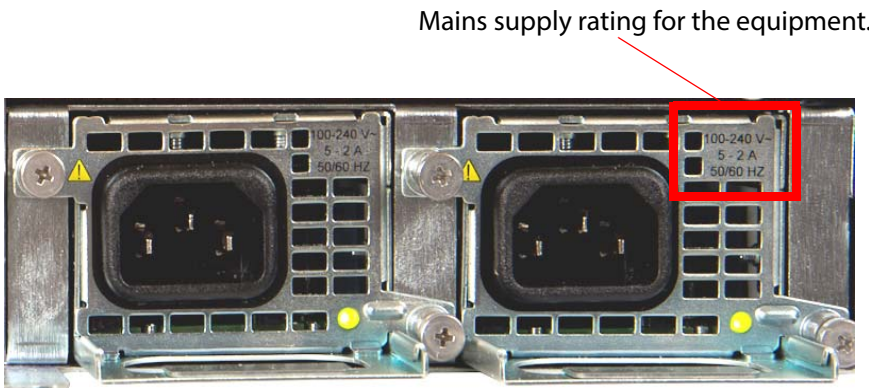


Figure 1 MV-820 Multiviewer Mains Inlets

Power Cords Supplied

Important

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)

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.

Important

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

Safety and EMC Standards

Safety Standards

This equipment complies with the following standards:

CE

EN60950-1: 2006

Safety of Information Technology Equipment Including Electrical Business Equipment.

UL1419 (4th Edition) (UL file number E193966)

Standard for Safety – Professional Video and Audio equipment.

EMC Standards

This unit conforms to the following standards:

EN 55032:2015 (Class A)

Electromagnetic Compatibility of Multimedia Equipment - Emission Requirements.

EN 55103-2:2009 (Environment E2)

Electromagnetic Compatibility, Product family standard for audio, video, audio-visual and

entertainment lighting control apparatus for professional use. Part 2. Immunity

EN 61000-3-2:2014 (Class A)

Limits for Harmonic Current Emissions.

EN 61000-3-3:2013

Limitation of Voltage Changes, Voltage Fluctuations and Flicker in Public Low-Voltage Supply Systems.

FCC / CFR 47:Part 15 (Class A)
Federal Communications Commission Rules Part 15, Subpart B, Class A.

EMC Environment

The unit(s) described in this manual conform to the EMC requirements for, and are intended for use in, commercial and light industrial environments (including, for example, theaters, and television studios which are not purpose-built studios) E2.

Warning:

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

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.

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.

FCC Compliance:

In order to comply with FCC/CFR 47: Part 15 regulations, it is necessary to use quality screened HDMI cables, with 360° shielding of the connectors.

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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 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 display outputs can be HDMI, fiber SDI or HD-BNC. Additionally, they can be video-over-IP.

Figure 1 MV-820 Multiviewer

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.

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.

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.
  - Reference Timing: Analog reference inputs.
- SDI IP Video Inputs (requires 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.

Up to 12 display outputs:

- 3G 1080p display outputs.
- 4K UHD support with four display outputs used together as a 4K quad-link.
- Four 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 (uncompressed 2022-6, MV-820-IP only)

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 acknowledgement of alarms from hardware- and soft-panels.

Streaming out of MV-820 inputs:

- Extend and expand monitoring.
- MV-820 multiviewer inputs may be compressed to create H.264-encoded copies which can then be streamed out over an IP connection.
- Viewable on a desktop PC with Grass Valley Orbit software and MV-800-DT license.

1.2 Order Codes

Table 1 Order Codes

Order Code	Description
Product versions:	
MV-820-HDBNC	MV-820 2RU standalone multiviewer, 48 video inputs via HD-BNC. Includes license for four multiviewer display outputs (1 to 4).
MV-820-DENSI	MV-820 2RU standalone multiviewer, 48 video inputs via high-density DensiShield connectors. Includes license for four multiviewer display outputs (1 to 4).
MV-820-IP	MV-820 2RU standalone multiviewer, 48 video inputs via QSFP28 video IP connections. Includes license for four multiviewer display outputs (1 to 4). **Note 1:** MV-820-IP ships with QSFP blanking plugs fitted: **Note 2:** QSFP28 modules must be ordered separately.
Additional Licenses:	A license comprises a code to enable more multiviewer display outputs.
SDI outputs:	MV-800-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. **Note:** SDI SFPs must be ordered separately.
MV-800-OP56	Upgrade to enable outputs 5 and 6.
MV-800-OP78	Upgrade to enable outputs 7 and 8.
MV-800-OP910	Upgrade to enable outputs 9 and 10.
MV-800-OP1112	Upgrade to enable outputs 11 and 12.
IP outputs:	For MV-820-IP only. MV-800-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. **Note:** QSFP28 modules for media network connections must be ordered separately.
MV-820-IPOP14	License to enable outputs 1 and 4 (factory installed on MV-820-IP by default).
MV-820-IPOP56	Password license to upgrade and enable outputs 5 and 6.
MV-820-IPOP78	Password license to upgrade and enable outputs 7 and 8.
MV-820-IPOP910	Password license to upgrade and enable outputs 9 and 10.
MV-820-IPOP1112	Password license to upgrade and enable outputs 11 and 12.
Display Output SFP Video Modules:	
	One SFP video module offers: 2-off SDI outputs (coaxial or fiber) or 1-off HDMI output.
CC-TTH-3G-N	HD-BNC coaxial dual output SFP module.
ST31ST31-3	Fiber dual output SFP module (1310 nm, single mode LC/PC).
FC1-HDMI1	HDMI single output SFP module
SFPBLANK	SFP blanking cover (dust and EMC cover).
QSFPCOVER	QSFP blanking cover (dust and EMC cover).
DS-Link Cables:	Used with MV-820-DENSI
WDS6THIN	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 Multiviewer block.

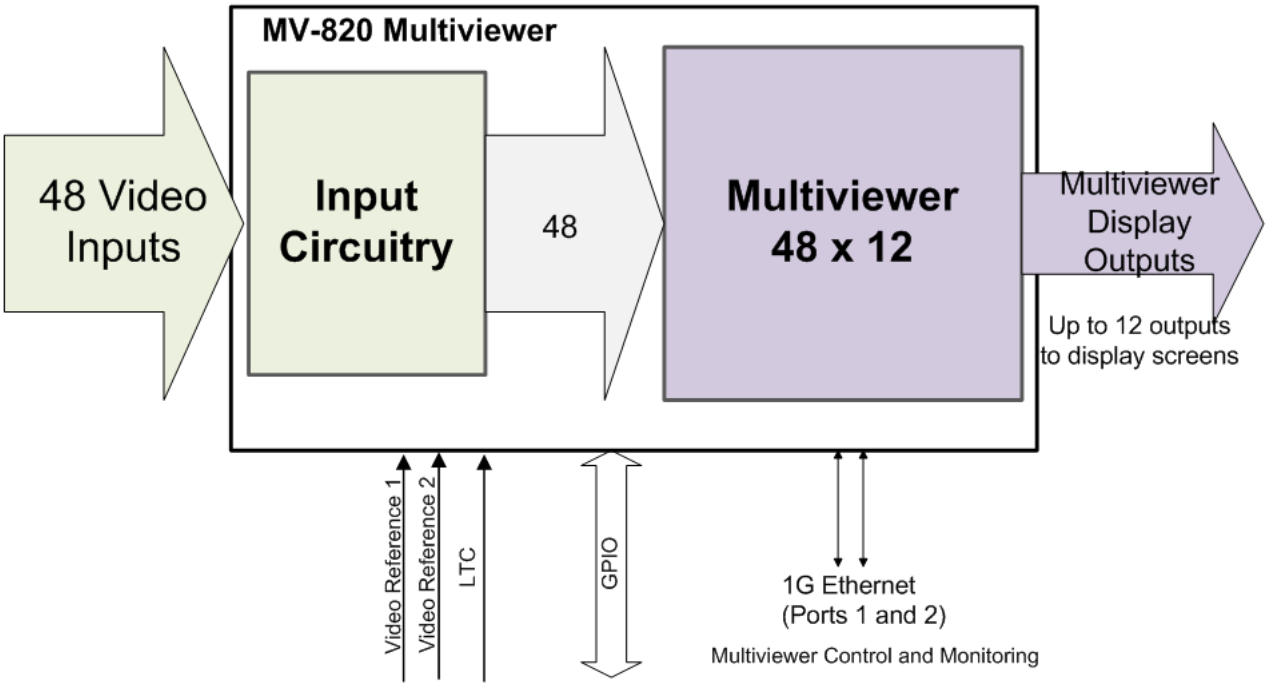


Figure 3 MV-820 Block Diagram

The main inputs and outputs comprise:

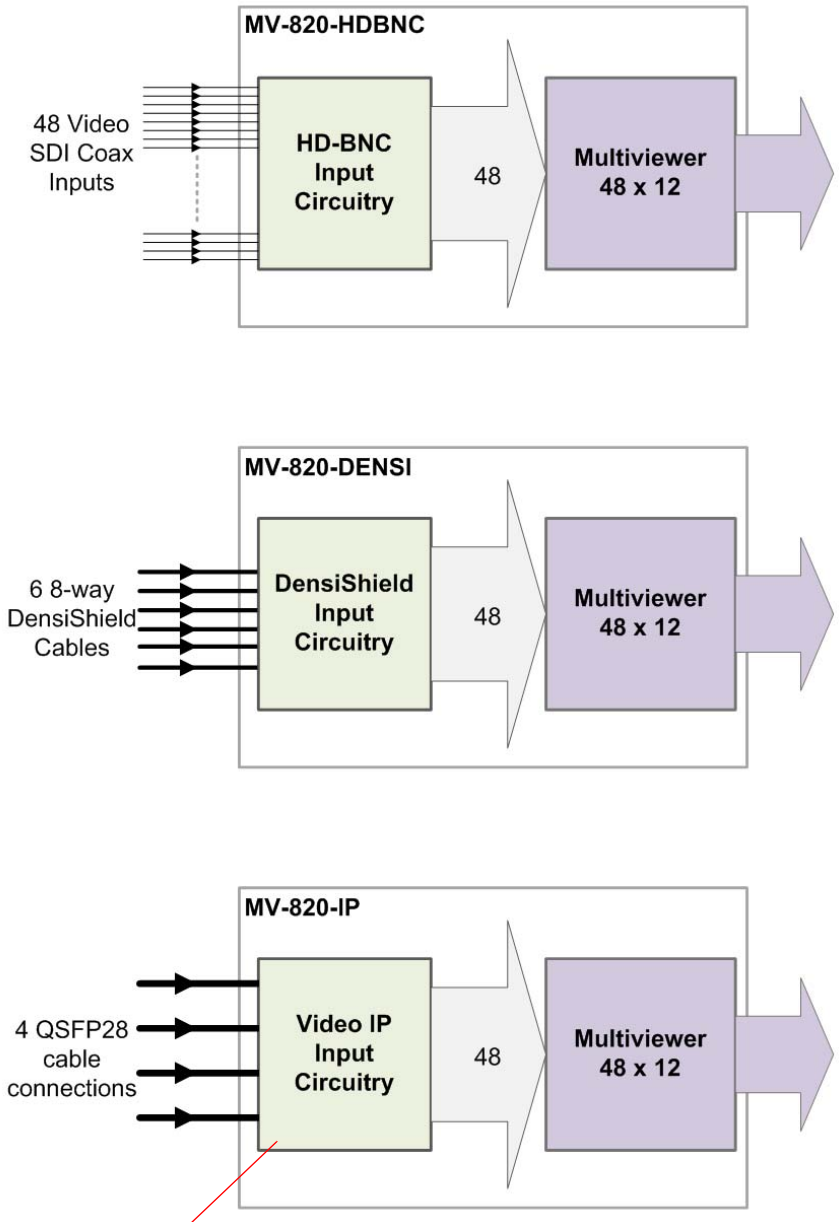
- 48 video inputs:
  - HD-BNC or DensiShield or IP stream.
  - Up to 3Gb/s SDI. 4K supported via quad-link.
- Analogue video reference inputs.
  (2-off inputs for MV-820-HDBNC and MV-820-DENSI. 1-off input for MV-820-IP.)
- Multiviewer display outputs:
  - Up to 12 outputs for monitor display screens,
    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 Section 1.3.2 "MV-820-IP: Video IP Circuitry" on page 7.

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 Section 2 "Hardware Chassis and Connectors" on page 17.

1.3.2 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.

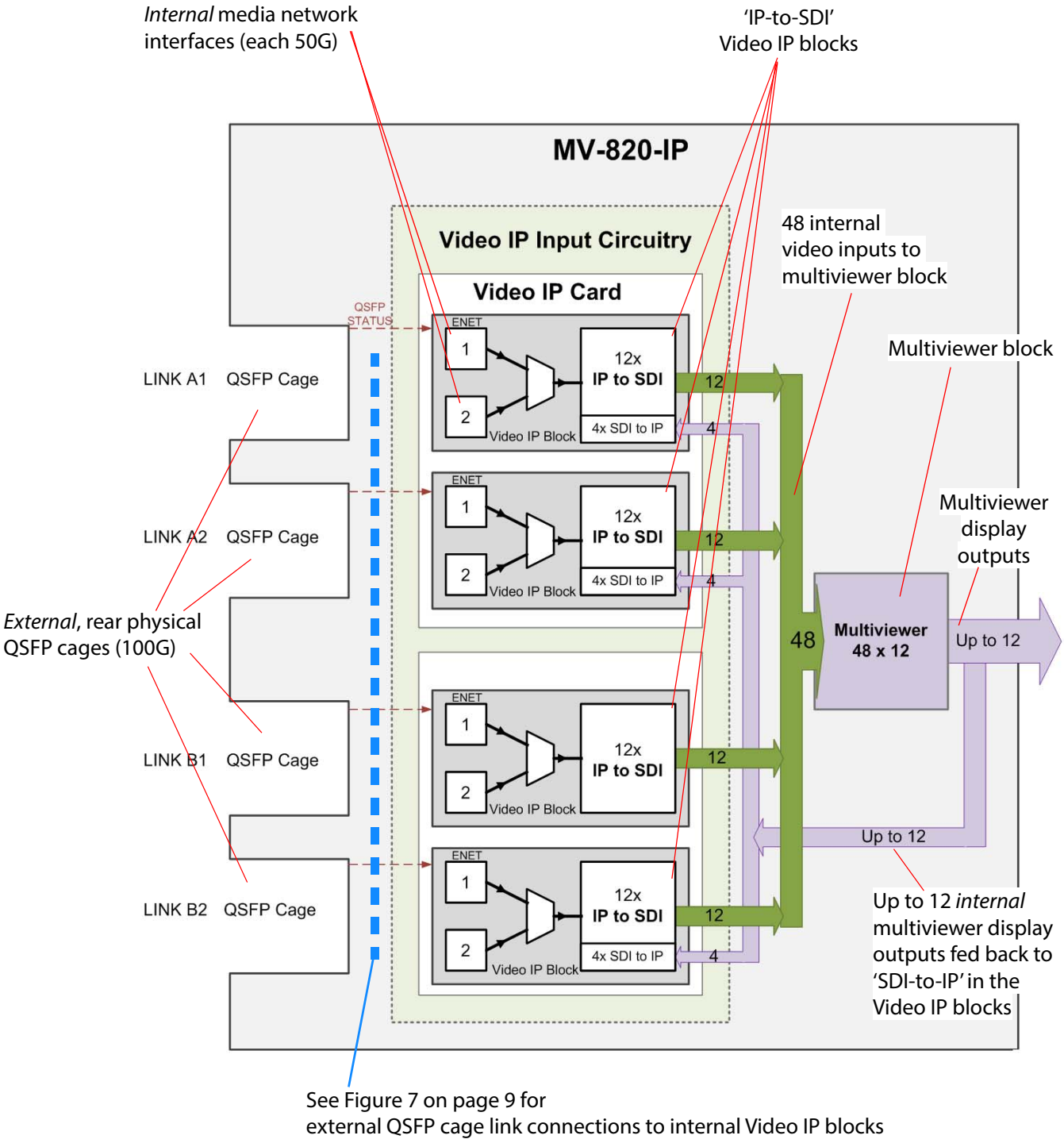


Figure 5 'IP-to-SDI' *Blocks*

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.

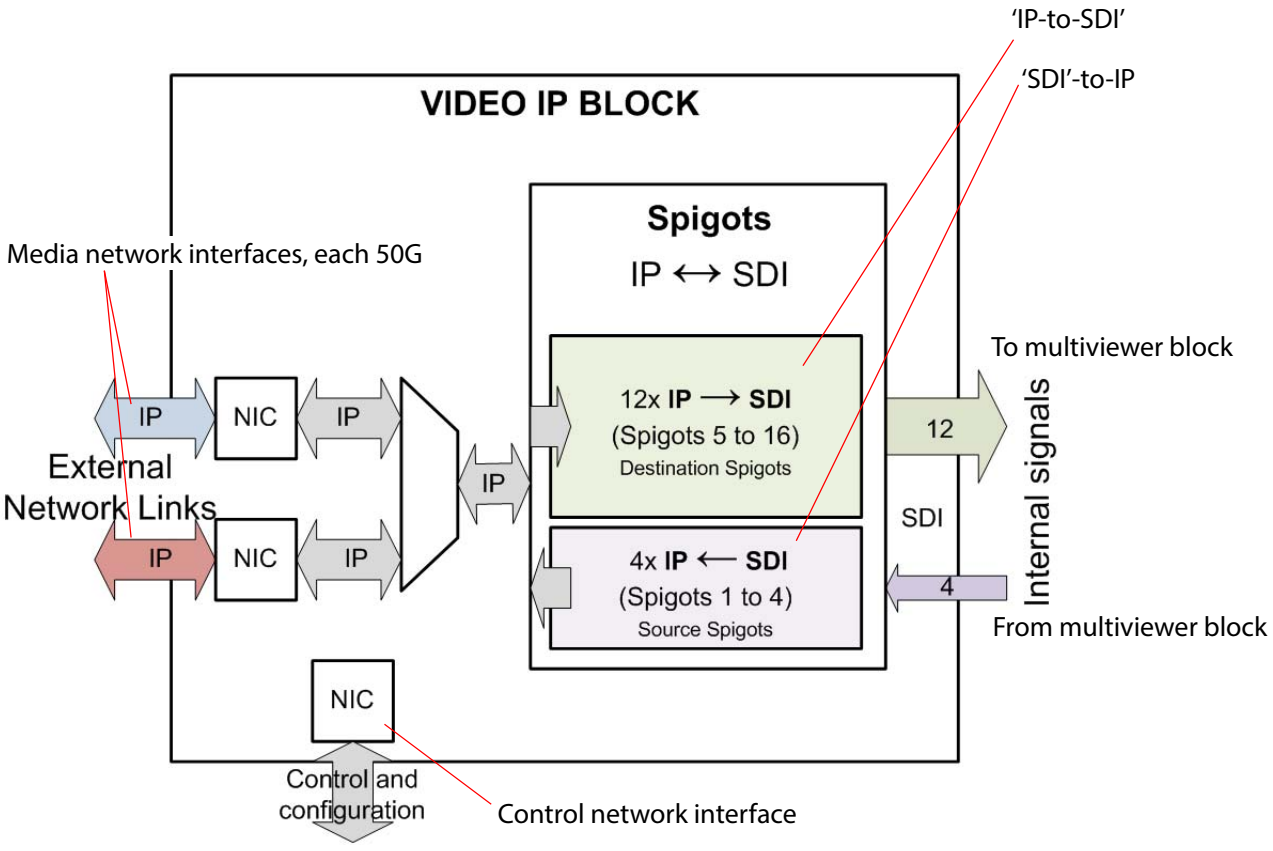


Figure 6 Video IP Block

1.3.3 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.

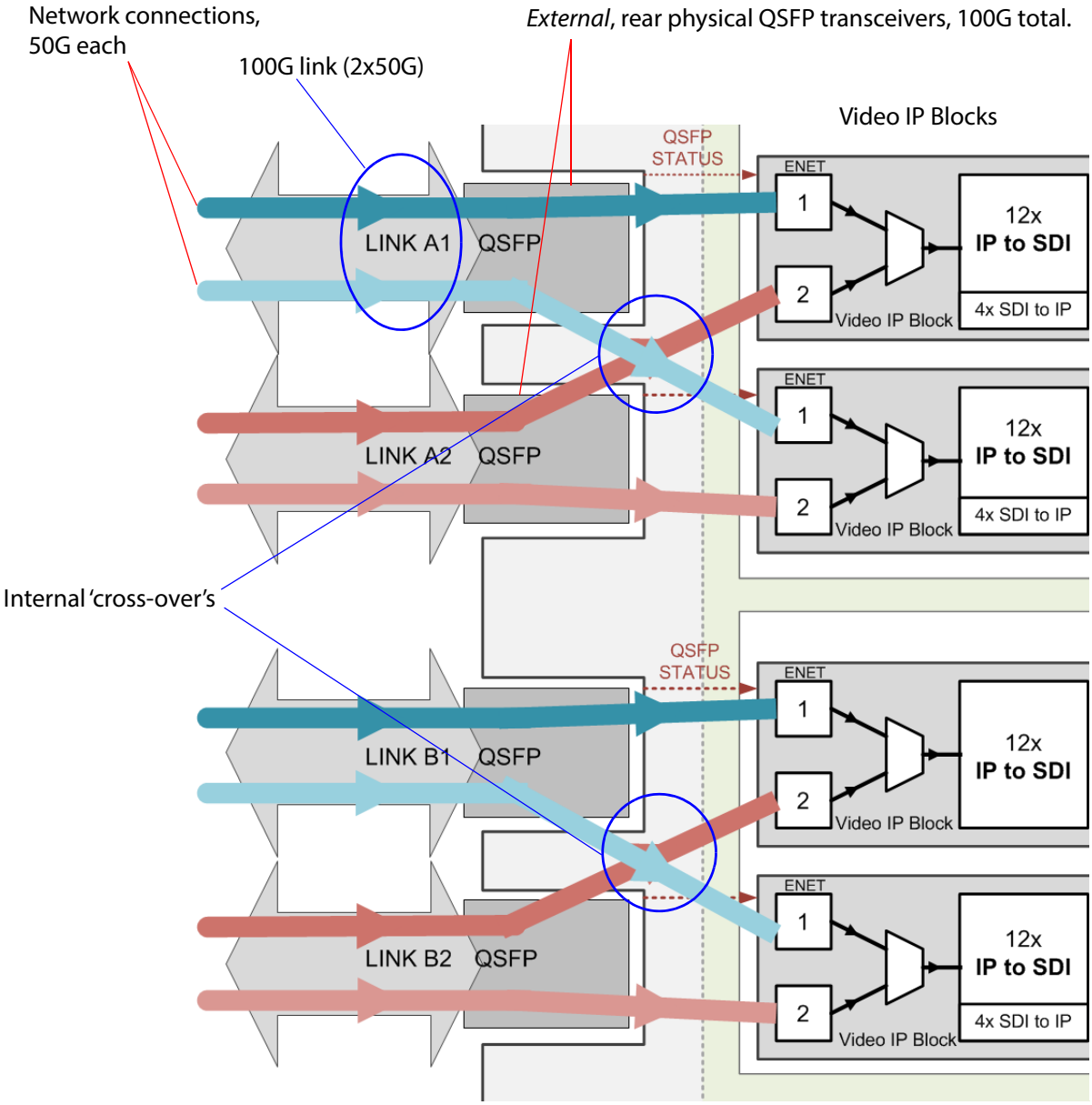


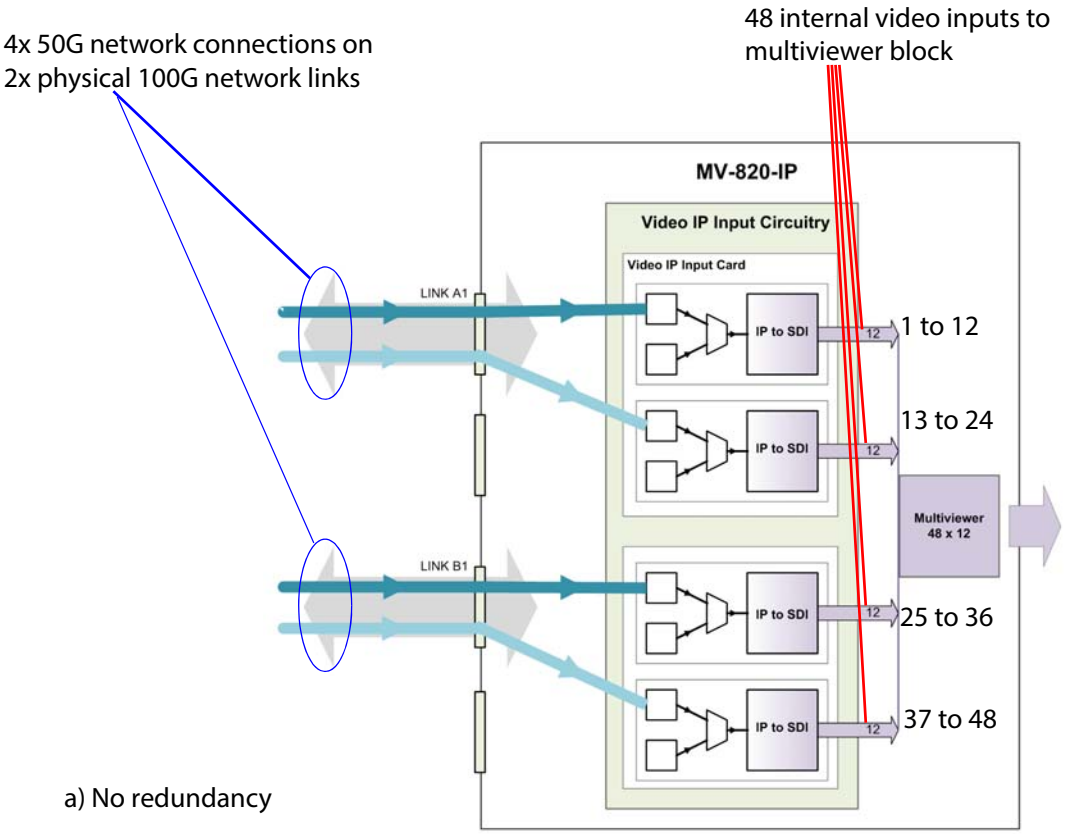
Figure 7 Video IP Block Media Network Link Connections

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.

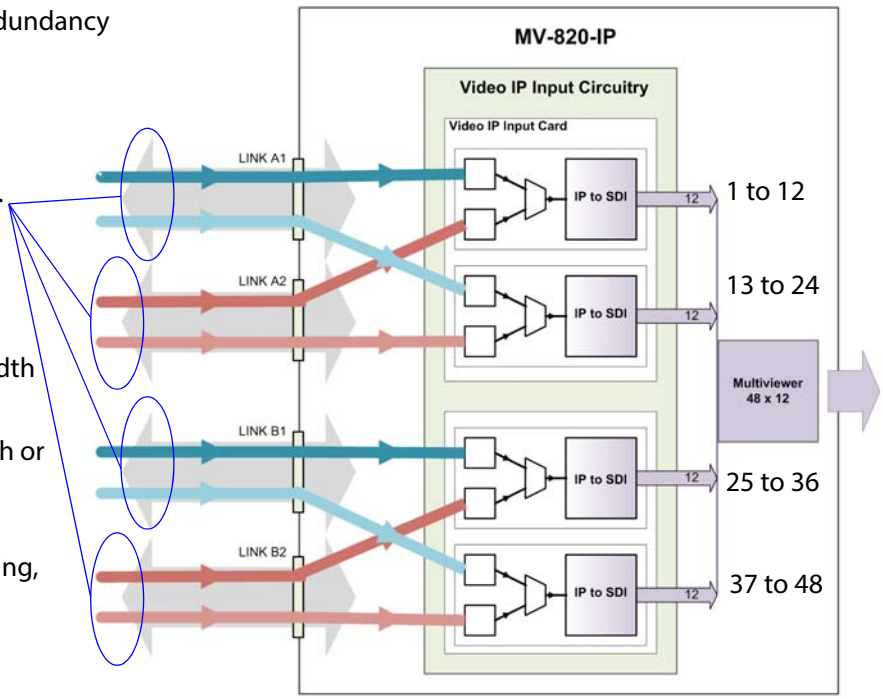
The second Video IP card is similarly connected but via 'Link B1' and Link B2', which carry the video IP streams for multiviewer video inputs 25 to 48.

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



a) No redundancy

b) With redundancy



Network redundancy with
8x 50G network connections
on 4x physical 100G network links.

Note:
Extra network connection bandwidth here provides:

- Resilience (against IP switch or link redundancy).
- Bandwidth overhead (for make-before-make switching, hitless switching).

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

1.3.4 Control Network Interface

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

1.3.4.1 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.

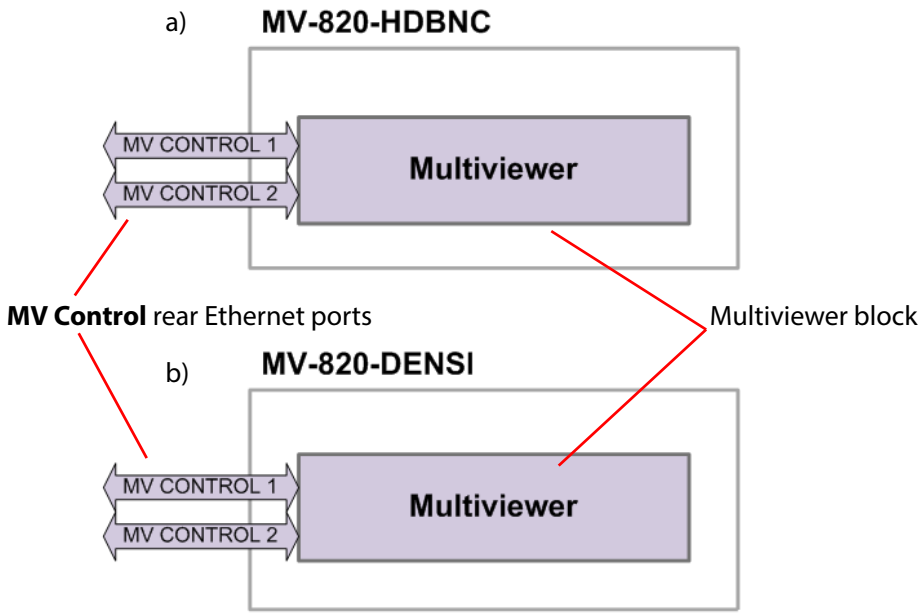


Figure 9 MV-820 - Controllable Units:
a) MV-820-HDBNC.
b) MV-820-DENSI.

1.3.4.2 MV-820-IP

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.

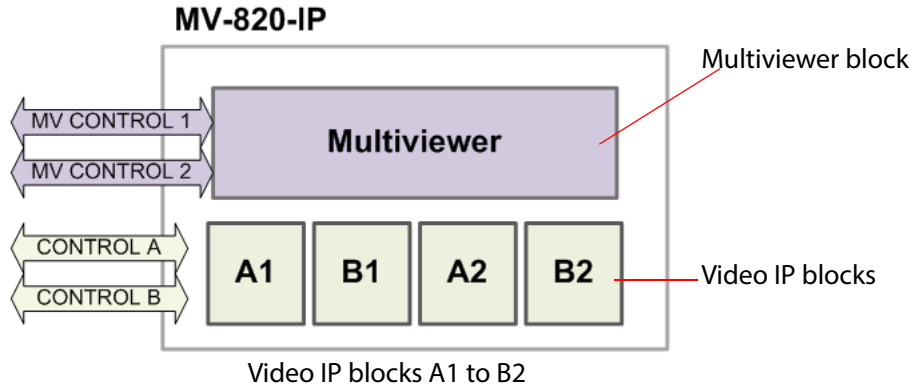


Figure 10 MV-820-IP Controllable Blocks - Multiviewer and Video IP

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.

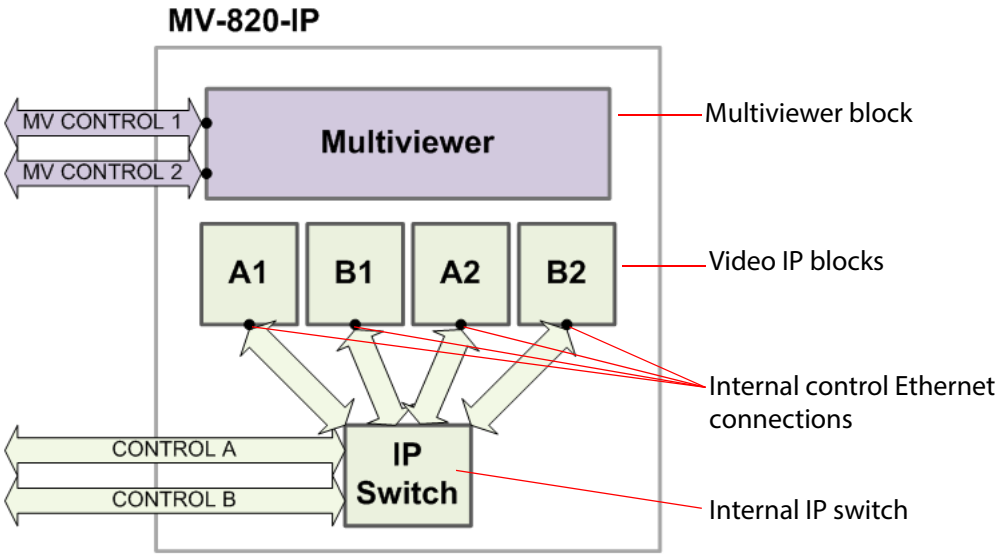


Figure 11 Control of Video IP Blocks via Internal IP Switch

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

1.4 MV-820-IP: 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) over its media network connections for display on the MV-820-IP unit's multiviewer display outputs (on a video wall).

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

Figure 12 shows the media network connections, video input IP streams and multiviewer display output IP streams for a case with no redundancy 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.

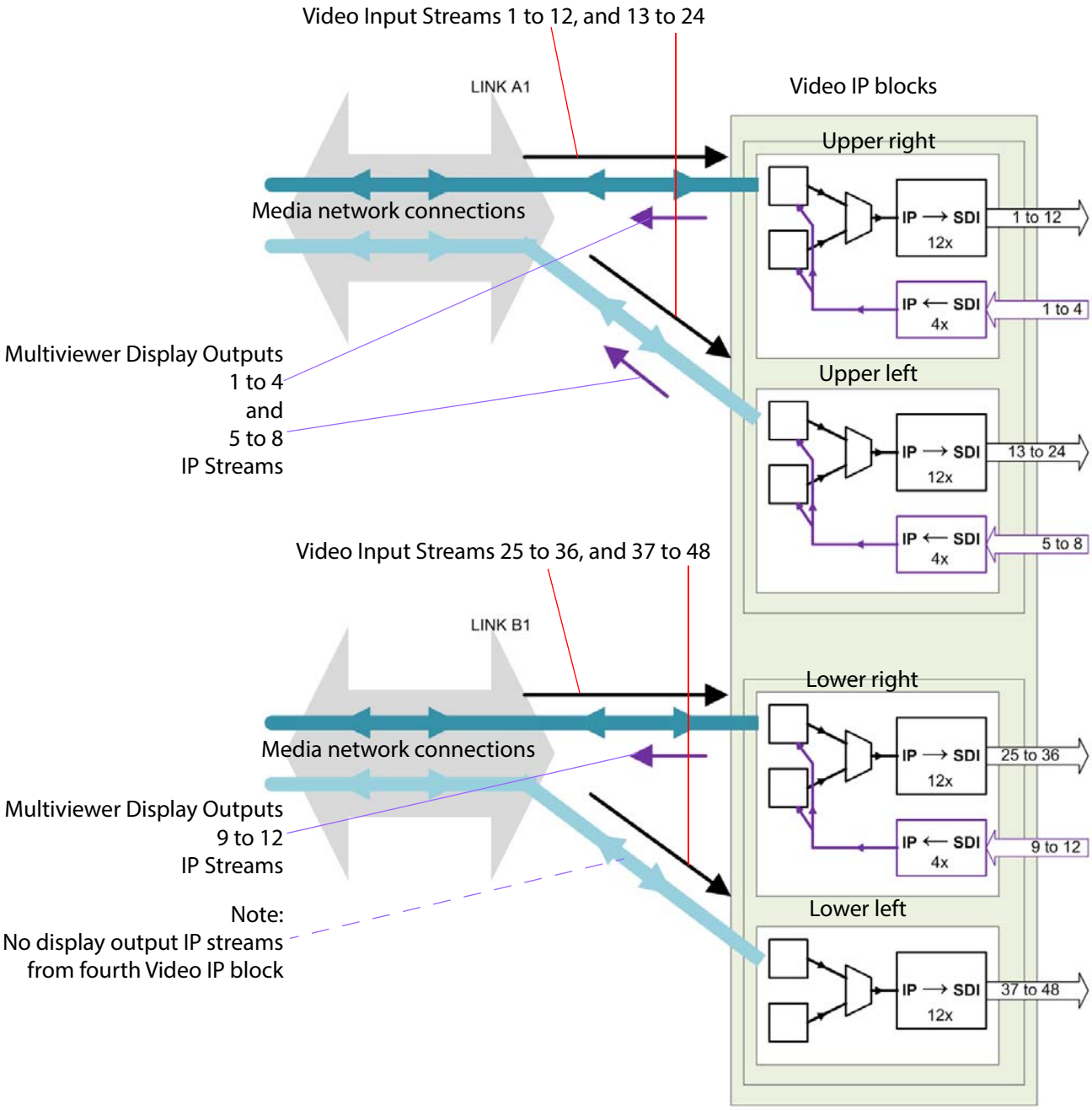


Figure 12 Video IP Blocks Sourcing Full-Resolution Multiviewer Display Outputs

1.5 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.

1.6 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.

1.7 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.

1.8 Terminology

See Section Appendix C "Multiviewer Terminology" on page 207 for some multiviewer terminology.

See Section Appendix D "IP Routing Terminology" on page 210 for some IP routing terminology.

1.9 MV-820 Set up

Hardware installation is described in Section 3 "Hardware Installation" on page 38.

Multiviewer:

Initial multiviewer configuration and set up is done via Grass Valley's RollCall Control Panel application. See Section 5 "RollCall Templates for Multiviewer Block" for details.

Video wall design and management is done via Grass Valley Orbit application software using a Grass Valley Orbit multiviewer project.

Video IP:

Initial Video IP circuitry setting up is done via Grass Valley's RollCall Control Panel application. For a description of the RollCall Video IP block templates, see Section 6 "RollCall Templates for Video IP Blocks" on page 75.
For instruction on getting started, see Section 7 "Getting Started" on page 145.

1.10 Video Wall Design

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

There are two operating modes for the Grass Valley Orbit software for multiviewer projects:

- **Design Mode** - Grass Valley Orbit is free to use in Design Mode, enabling wall designs to be generated and pushed to each multiviewer.
- **Run Mode** - Run Mode is a licensable option using the MV-800-DT license, which is purchasable from the Grass Valley store. Live video may be viewed and alarms can be monitored on a PC. This turns Grass Valley Orbit into a PC-based, streamed video monitoring wall.

Note: **Grass Valley Orbit multiviewer projects and MV-820:**

Use Orbit 'multiviewer projects' for *all* MV-820 versions, including MV-820-IP.
Push a project to a unit's multiviewer block.

Do not use Orbit '*IP* multiviewer projects'. IP multiviewer projects are not meant for MV-820-IP units.

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

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

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

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

2 Hardware Chassis and Connectors

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

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 214.

2.2 Chassis Overview

The MV-820 Multiviewer is a 2RU 19" rack-mount chassis with connectors at the rear, see Figure 13, Figure 14, and Figure 15 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 Appendix B "MV-820 Dimensions" on page 205.

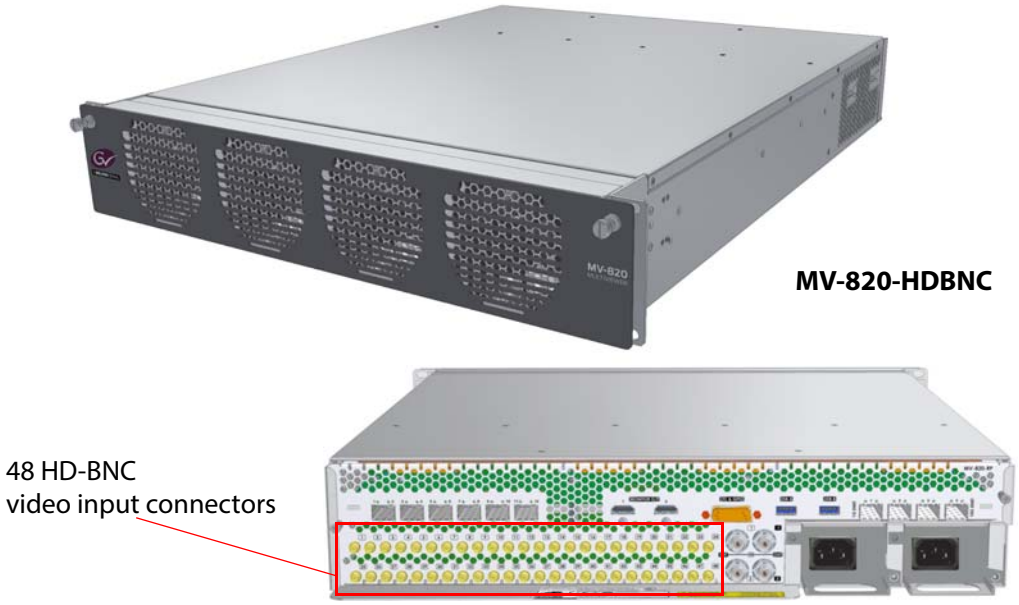


Figure 13 MV-820 Multiviewer views - MV-820-HDBNC

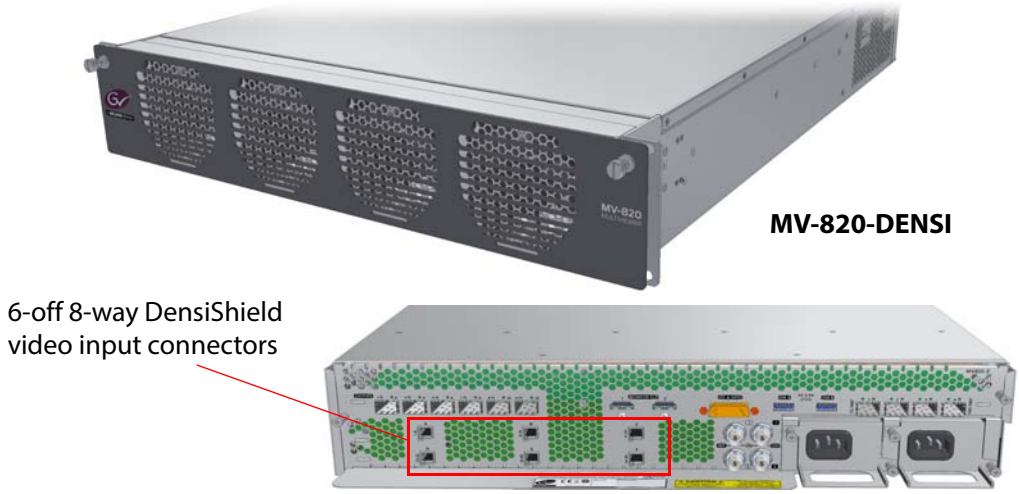


Figure 14 MV-820 Multiviewer views - MV-820-DENSI

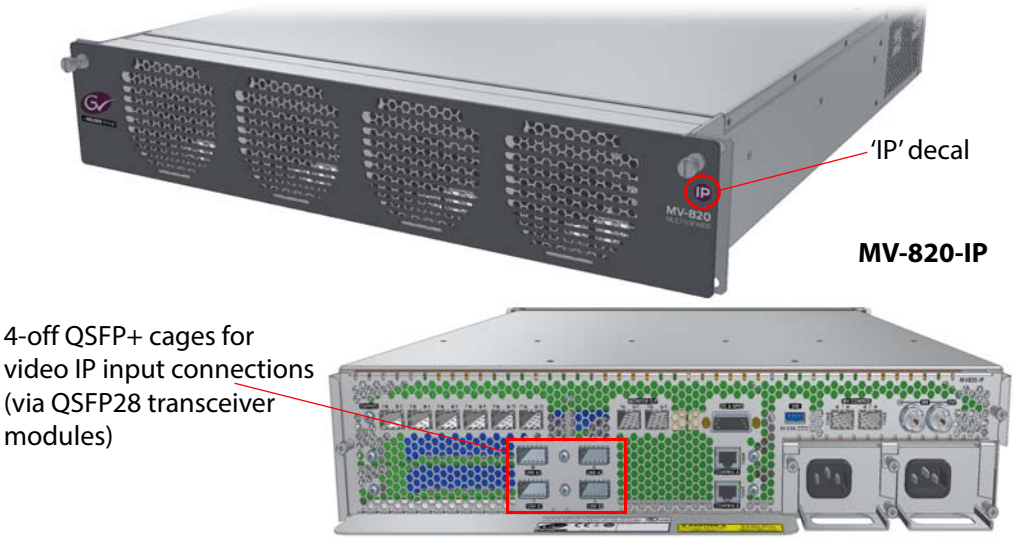


Figure 15 MV-820 Multiviewer views - MV-820-IP

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 16.

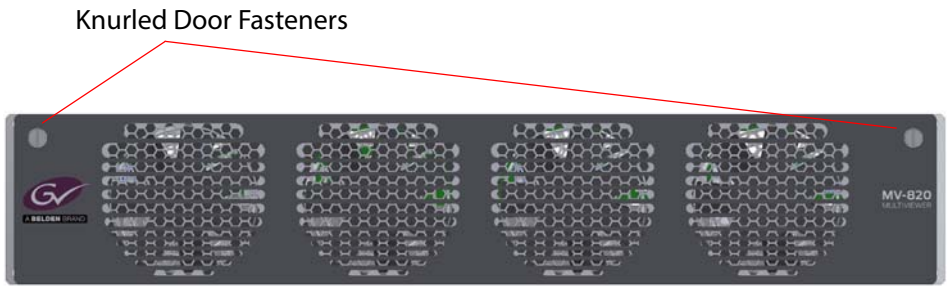


Figure 16 MV-820 Multiviewer Front View, Door Closed (MV-820-HDBNC shown)

2.3.1 To Open the Front Door

1. Unscrew the two captive knurled door fasteners, see Figure 16.
2. Pull the door outwards about 2 cm and then down.
   The door hinges along its bottom edge. See Figure 17.
   When the door is open, the door fans and the fan supply wires are visible.

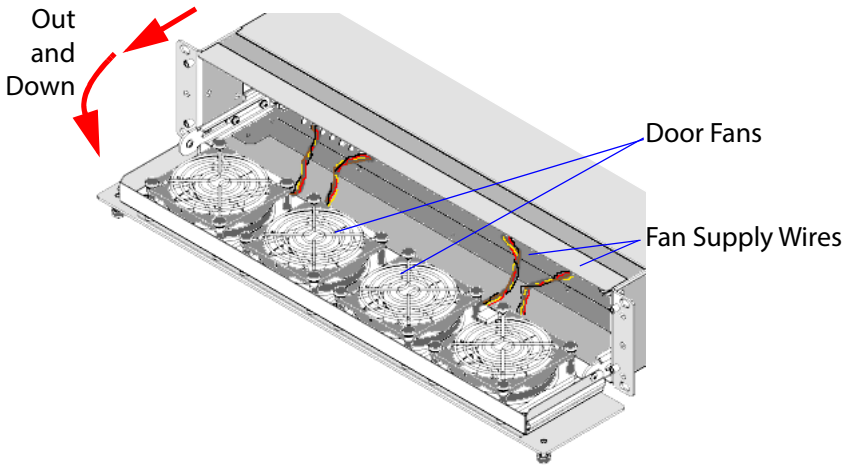


Figure 17 MV-820 Multiviewer - Front Door Open, Hinged Down

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 18.

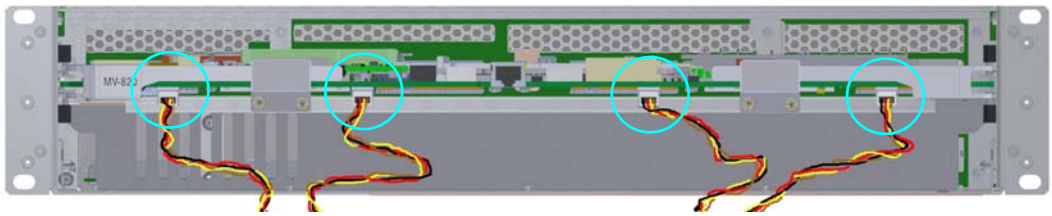


Figure 18 Fan Supply Wires Connected to front of the Main Module

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 19.

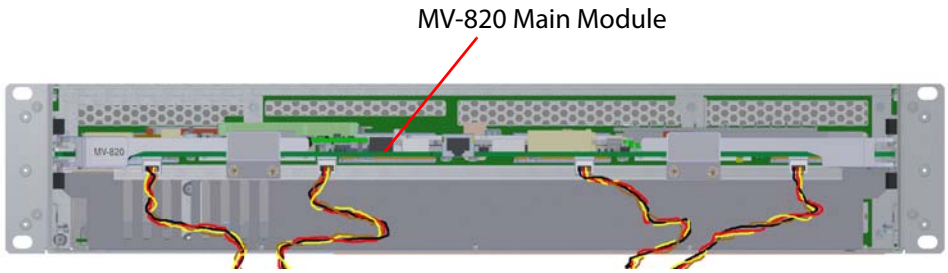


Figure 19 MV-820 Multiviewer Front View with Front Door Open

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 20 shows the front edge of the module and Table 2 lists the LED color codes for 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 20.

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

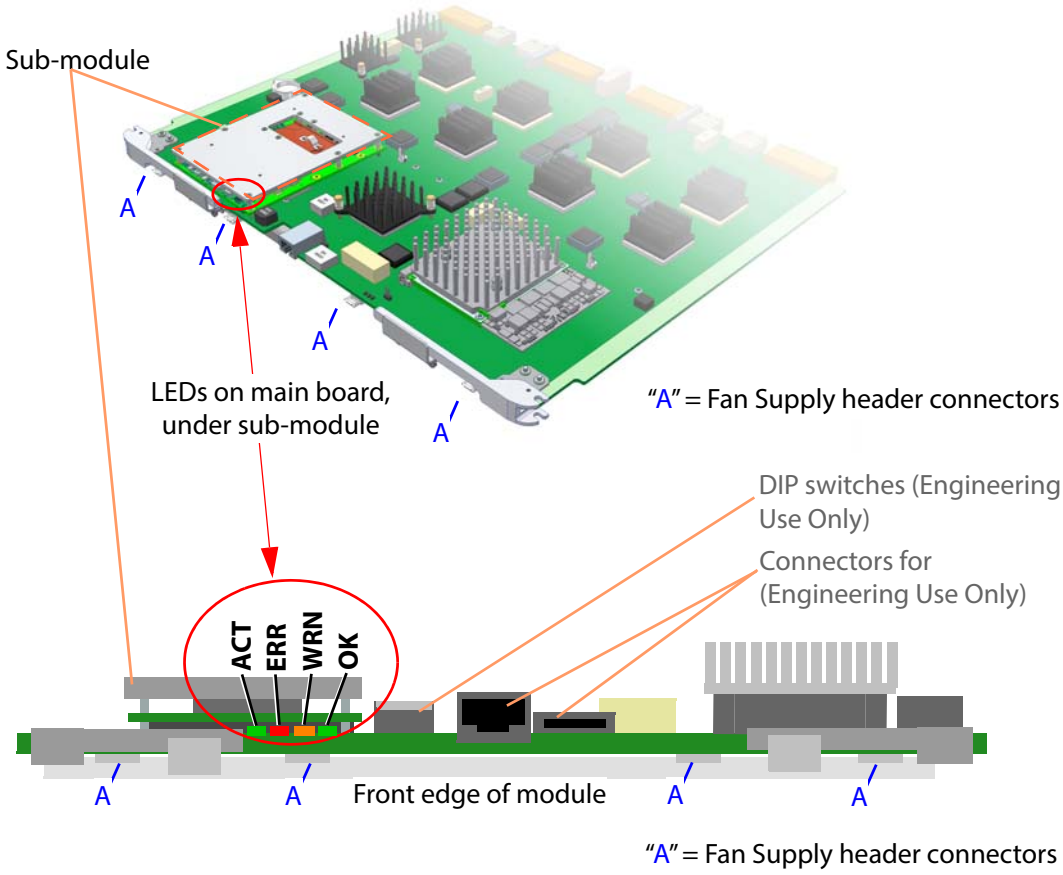


Figure 20 MV-820 Main Module - Status Indicating LEDs and Fan Supply Headers

Table 2 MV-820 Multiviewer Main Module Status LED Information

Label	LED Color	Detail	Status
ACT	**Green**	**"CPU Activity"**	**Flashing (2Hz):** CPU heartbeat, working correctly. **Solid On** or **Off:** Software fault detected. Contact Grass Valley Customer Support, see "Grass Valley Technical Support" on page 214.
ERR	**Red**	**Error**	**Off:** Working correctly. **On:** Hardware fault detected. Contact Grass Valley Customer Support, see "Grass Valley Technical Support" on page 214.
WRN	**Amber**	**Over Temperature Warning**	**Off:** Working correctly. **On:** MV-820 module overheating. Ensure the chassis front door is closed and the fans are all operating correctly.
OK	**Green**	**Hardware Communications Status**	**Solid On:** Working correctly. **Flashing (2Hz):** Hardware communications fault detected. Contact Grass Valley Customer Support, see "Grass Valley Technical Support" on page 214.

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 20. 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 21. 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.

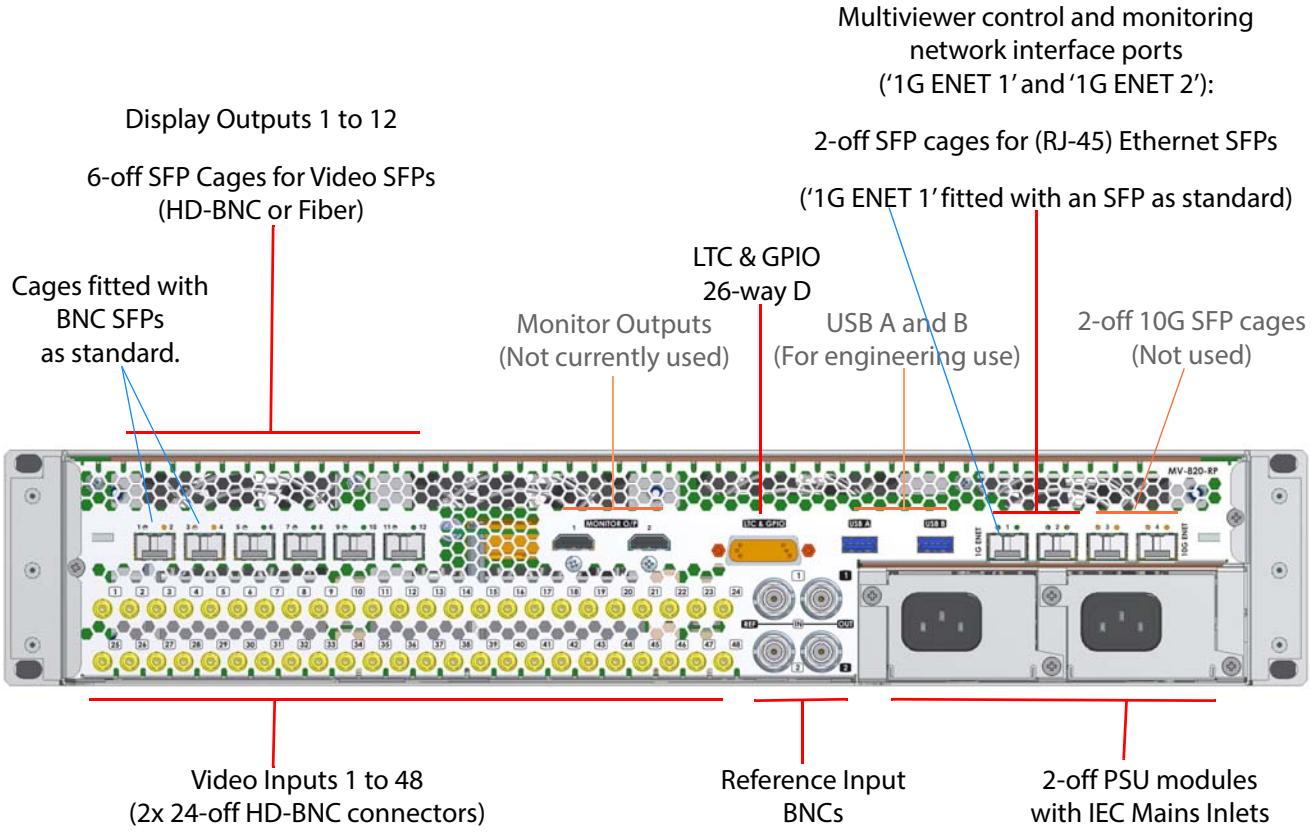


Figure 21 MV-820-HDBNC Rear Panel

Table 3 MV-820 Rear Connectors

MV-820-HDBNC Connection	Description
Video Inputs 1 to **48**	48-off HD-BNC video inputs. Two rows: Upper 1 to 24, Lower 25 to 48. (See Section 2.8.1 on page 29.)
Reference 1 and **2**	4-off BNC's. Two Analog Reference inputs, numbered 1 and 2. Ref Input BNC and Ref "Loop-through" Output BNC per Reference. (See Section 2.8.4 on page 32.)
Mains Inlets	2-off IEC mains inlets. One per PSU module.
Display Outputs 1 to **12**	Multiviewer video wall display outputs. 6-off SFP cages for outputs 1 to 12. Two dual-BNC SFPs are fitted as standard providing display outputs 1 and 2, and display outputs 3 and 4. (See Section 2.8.6 on page 33.)
Monitor Outputs 1 and **2**	2-off connectors. Not currently used
USB A and **B**	2-off USB connectors. For engineering use.
'**1G ENET 1**' and '**1G ENET 2**'	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 Section 2.8.7 in page 35.)
10G ENET SFP cages **1** to **2**	2-off 10 Gbps, RJ45. ("1G3", "1G4". For future use.)
LTC & GPIO	26 Way High Density "D" Type female connector. (See Section 2.8.8 on page 36 for more details, including pinout details.)

2.6 Rear Panel - MV-820-DENSI

The MV-820-DENSI 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.

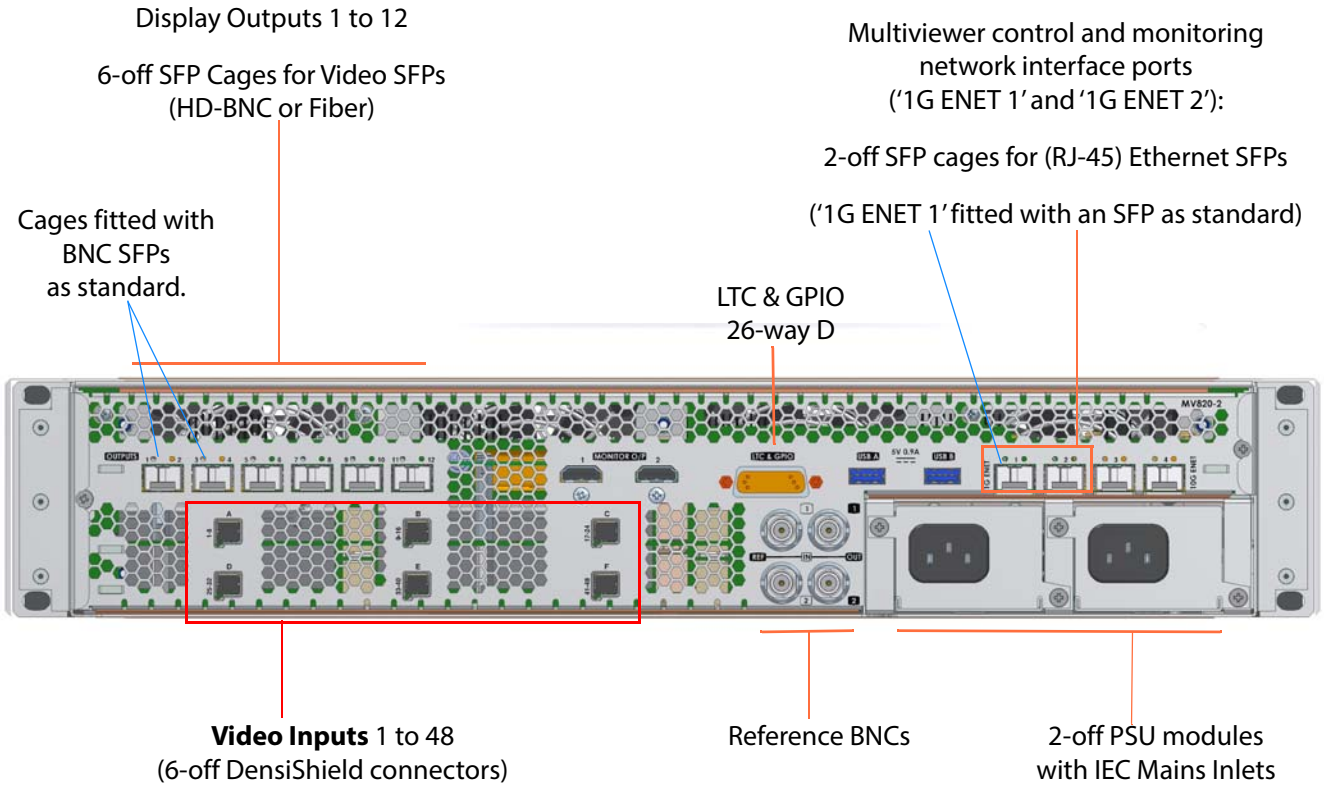


Figure 22 MV-820-DENSI Rear Panel

Table 4 MV-820-DENSI Rear Connectors

MV-820-DENSI Connection	Description
Video Inputs 1 to **48**	6-off DensiShield connectors for 48-off video inputs. (See Section 2.8.2 on page 29.)
Reference 1 and **2**	See **Note 1**. (See Section 2.8.4 on page 32.)
Mains Inlets	See **Note 1**.
Display Outputs 1 to **12**	See **Note 1**. (See Section 2.8.6 on page 33.)
'**1G ENET 1**' and '**1G ENET 2**'	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 **Note 1**. (See Section 2.8.7 in page 35.)
LTC & GPIO	See **Note 1**. (See Section 2.8.8 on page 36 for more details, including pinout details.)
Note 1: Connector(s) are common to MV-820-DENSI and MV-820-HDBNC, see Table 3 on page 25.	

2.7 Rear Panel - MV-820-IP

The MV-820-IP 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.

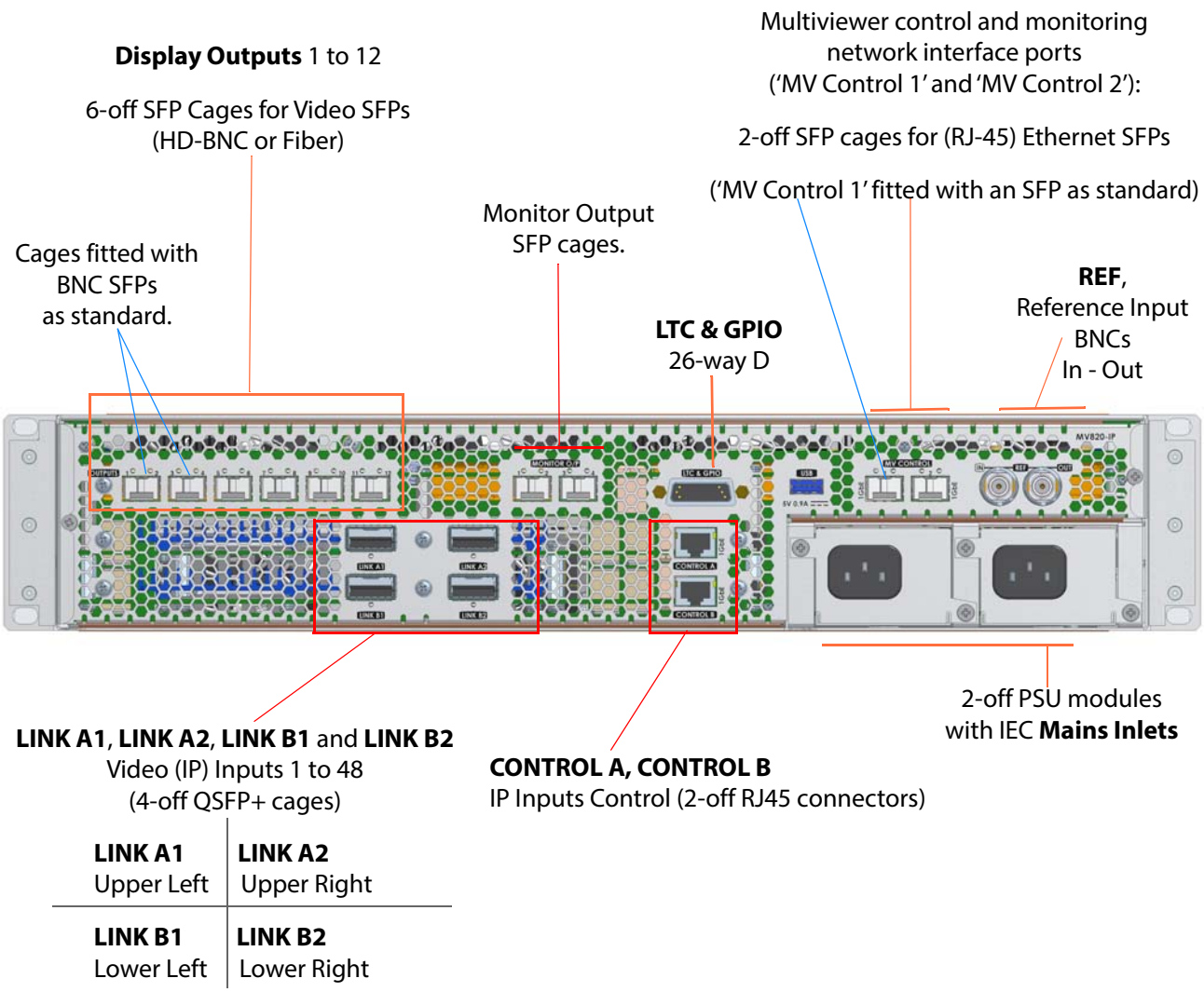


Figure 23 MV-820-IP Rear Panel

Table 5 MV-820-IP Rear Connectors

MV-820-IP Connection	Description
LINK A1, **LINK A2**, **LINK B1, LINK B2**	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. **Note:** The QSFP28 transceiver modules are not fitted as standard and must be ordered separately. (See Section 2.8.3 on page 30.)
CONTROL A, CONTROL B	IP Inputs control. 2-off RJ45 connectors for IP routing control network connections and service updates to the IP input circuitry. (See Section 2.8.3 on page 30.)
REF	Single analogue reference input and loop-thru output. See **Note 1**. (See Section 2.8.4 on page 32.)
Mains Inlets	See **Note 1**.
Display Outputs 1 to **12**	See **Note 1**. (See Section 2.8.6 on page 33.)
Monitor Outputs 1 to **2**	SFP cages for Monitor outputs, unused (for future use). (See Section 2.8.6 on page 33.)
MV Control 1, **MV Control 2**	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 **Note 1**. (See Section 2.8.7 in page 35.)
LTC & GPIO	See **Note 1**. (See Section 2.8.8 on page 36 for more details, including pinout details.)
	Note 1: Connector(s) are common to MV-820-IP and MV-820-HDBNC, see Table 3 on page 25.

2.8 Rear Panel Connectors

2.8.1 Rear Connectors - HD BNC Video Inputs

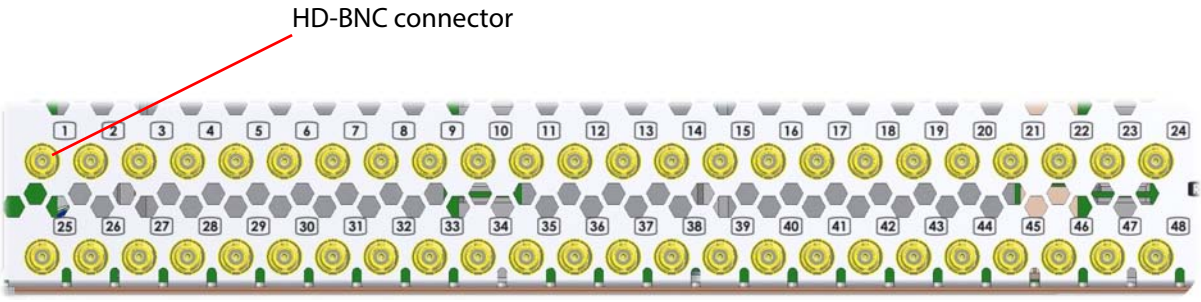


Figure 24 MV-820-HDBNC Video Input Connectors - 1 to 24, and 25 to 48

2.8.2 Rear Connectors - DensiShield, Video Inputs

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

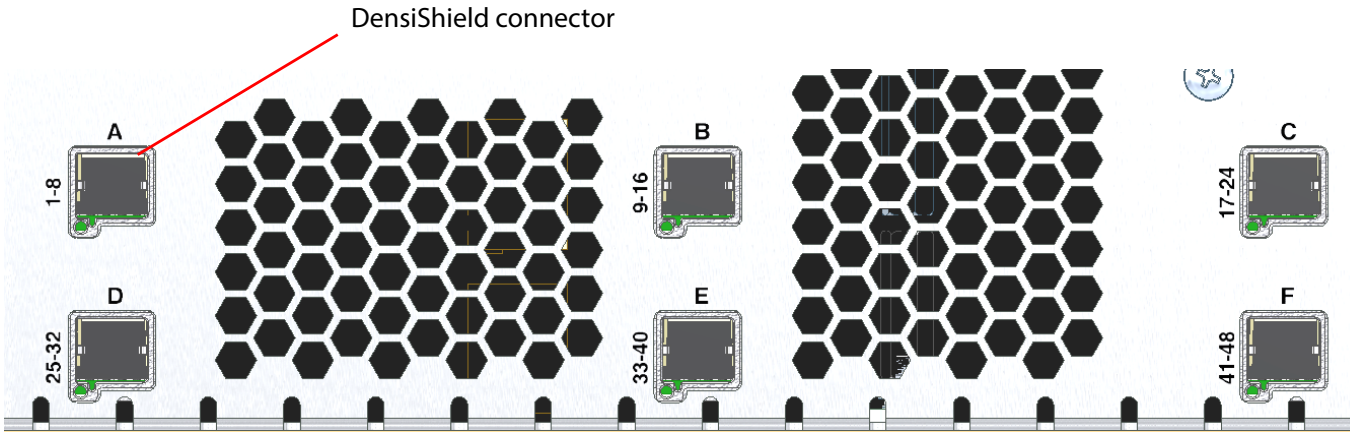


Figure 25 MV-820-DENSI Video Input Connectors A to C, and D to F

Table 6 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).

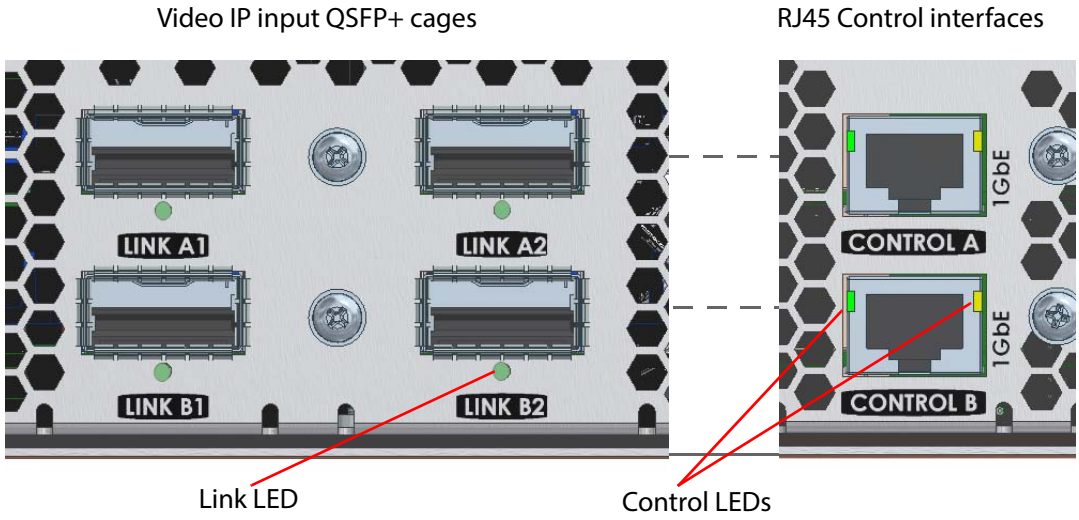


Figure 26 MV-820-IP Video Input Connectors - QSFP+ cages and RJ45 connectors

2.8.3.1 Connectors and LEDs

Table 7 Video IP Connectors

Physical Connector	Connector Type	Supported Network Connections	Comment
Link A1	QSFP+ cage	2-off 50G	Network connections for media IP streams - Video inputs 1 to 24. Use two physical connections for redundancy. **Note:** QSFP28 transceivers are required to fit the rear QSFP+ cages.
Link A2	QSFP+ cage	2-off 50G	
Control A	RJ45 Ethernet	1G	Control network connector for out-of-band control and upgrades to IP Input blocks. See Note 1.
Link B1	QSFP+ cage	2-off 50G	Similar to 'Link A1' and 'Link A2' but for video inputs 25 to 48. **Note:** QSFP28 transceivers are required to fit the rear QSFP+ cages.
Link B2	QSFP+ cage	2-off 50G	
Control 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 8 Video IP LEDs

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

LINK A1 Upper Left	**LINK A2** Upper Right
LINK B1 Lower Left	**LINK B2** Lower Right

For a functional description on these network interfaces,
see 1.3.2 "MV-820-IP: Video IP Circuitry" on page 7
and 1.3.4.2 "MV-820-IP" on page 12.

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).

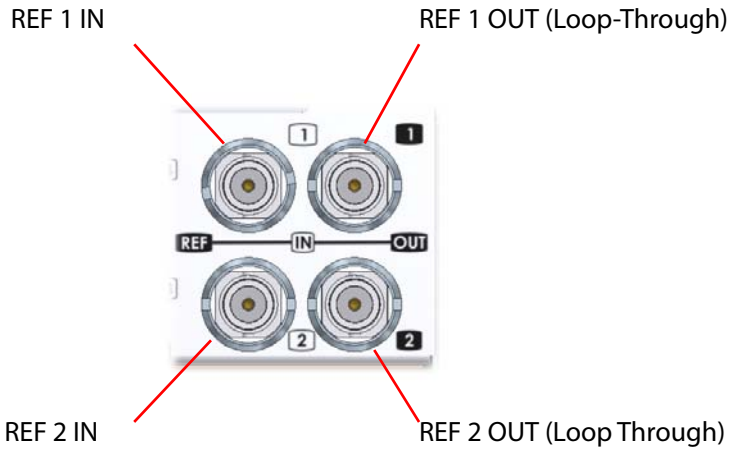


Figure 27 MV-820 Multiviewer Video Reference Connectors (MV-820-HDBNC shown)

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 9.

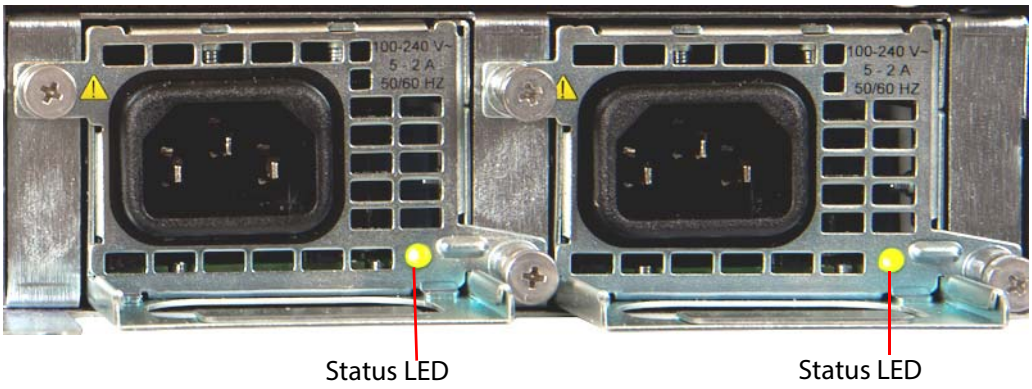


Figure 28 MV-820 Multiviewer IEC Mains Connectors

Table 9. 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 - Display Outputs

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.

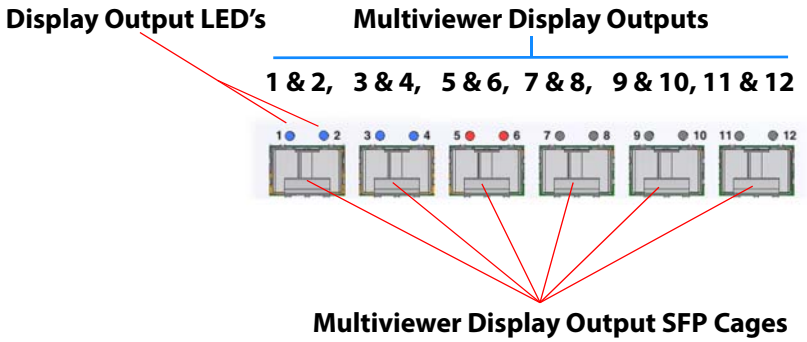


Figure 29 MV-820 Multiviewer Display Output SFP Cages

Each display output has an associated LED which indicates the output status. Table 10 describes the LED function.

Table 10 Video Display Output Status LED

LED Color	Status
Blue	Licensed Output; SFP Fitted. 1080p video output signal.
Green	Licensed Output; SFP Fitted. 720p video output signal.
Red	Licensed Output; No SFP Fitted.
Off	Unlicensed output.
Red Green Flashing	Flashes Red/Green at 1Hz *during* an internal FPGA upgrade (part of a unit software upgrade).
Red Flashing	Flashes Red/Off at 1Hz *after* a unit software upgrade if: • internal FPGA upgrading was unsuccessful; or • internal FPGAs fail to load during unit boot. **Note:** 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.

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.

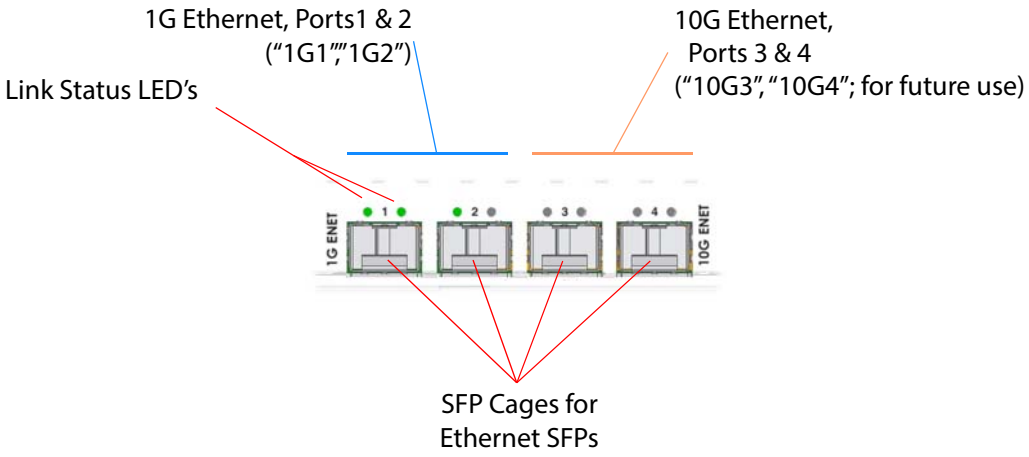


Figure 30 MV-820 Multiviewer Control and Monitoring Ethernet Port Connectors

There are 2 link status LED's associated with each Ethernet SFP module connector. Table 11 describes the LED function.

Table 11 Control and Monitoring Ethernet Port Status LEDs

Color	LEDs	Status
Green / Off	■ OFF	Ethernet link established
Green Solid / Flashing	■ * * *	Activity on Ethernet link
Off / Off	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

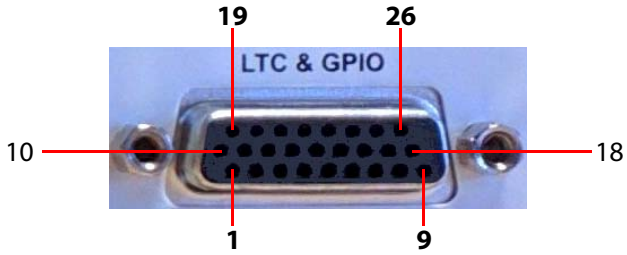


Figure 31 Female High Density 26 Way 'D' Type LTC and GPIO Connector

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

Table 12 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 37 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.

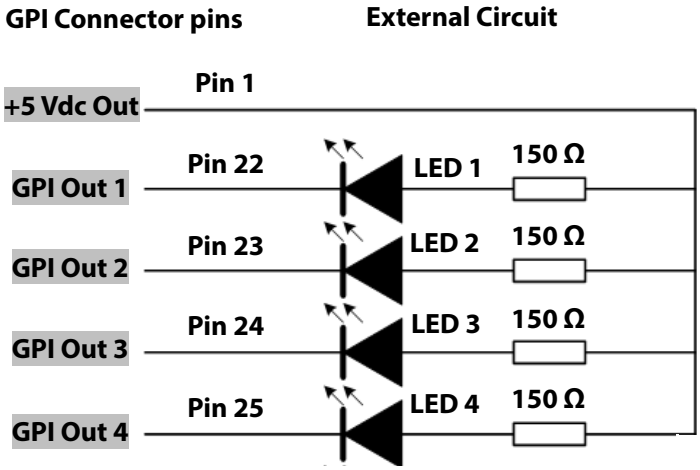


Figure 32 Connecting LEDs to GPI Outputs

3 Hardware Installation

3.1 Environmental Considerations

The ambient temperature for all the supplied equipment should not exceed the limits specified in Appendix A "Operating Environment" on page 193.

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 193.
- Appendix B "MV-820 Dimensions" on page 205 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 33 shows the external chassis air flow and air intake and exhaust holes.

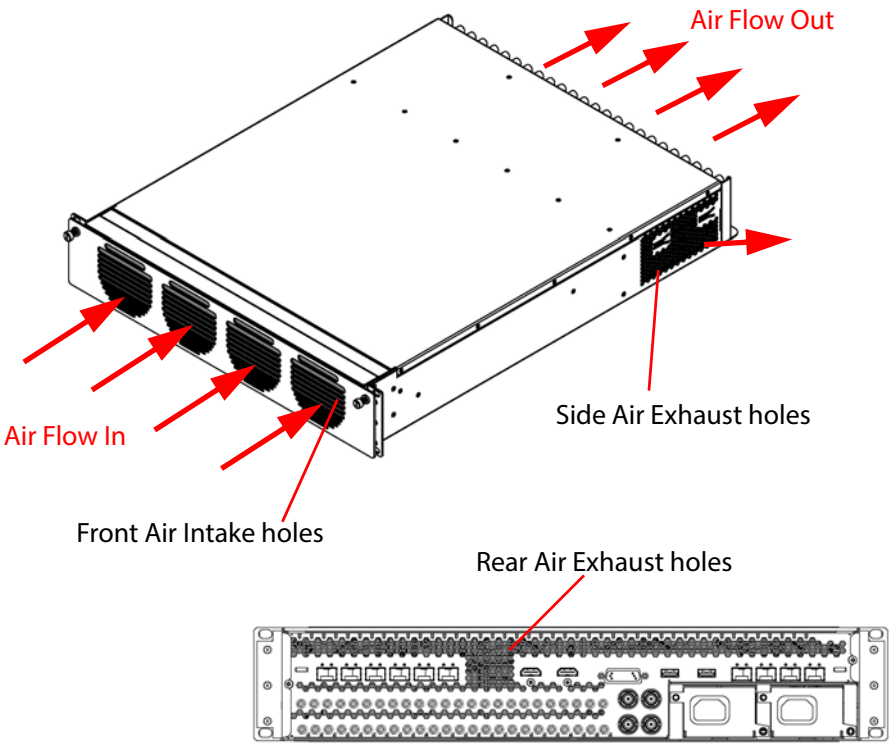


Figure 33 MV-820 Multiviewer Chassis Air Flow and Air Intake/Exhaust Holes

Important

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

Figure 34 shows the internal chassis air flow.

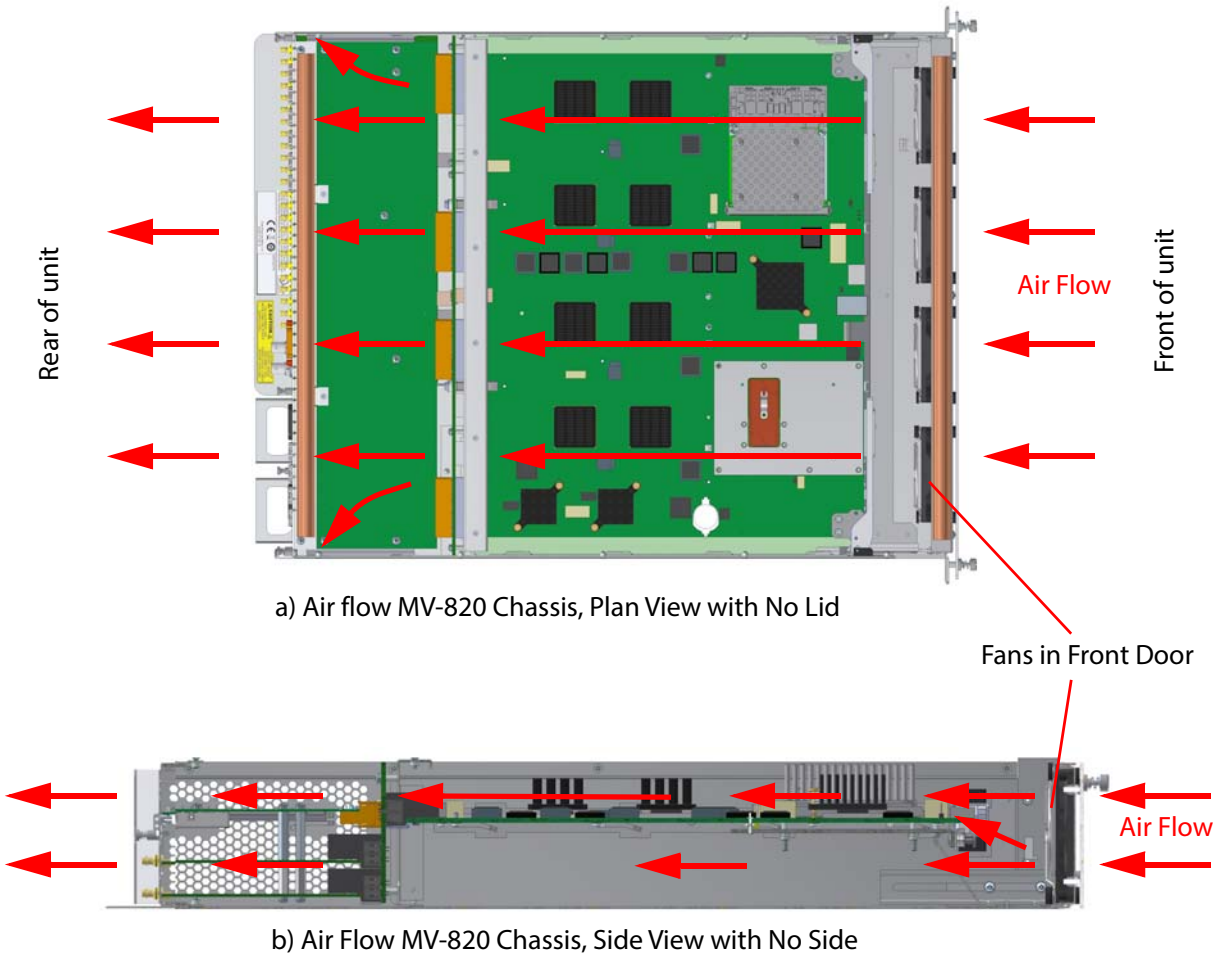


Figure 34 MV-820 Multiviewer Air Flow (MV-820-HDBNC shown)
a) Chassis Plan View with No Lid.
b) Chassis Side View with No Side.

3.3.1 Cooling Fan Failure

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.

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 2.3 "To Open the Front Door" on page 20). Four chassis rack mounting holes are revealed, two on each side. See Figure 35.

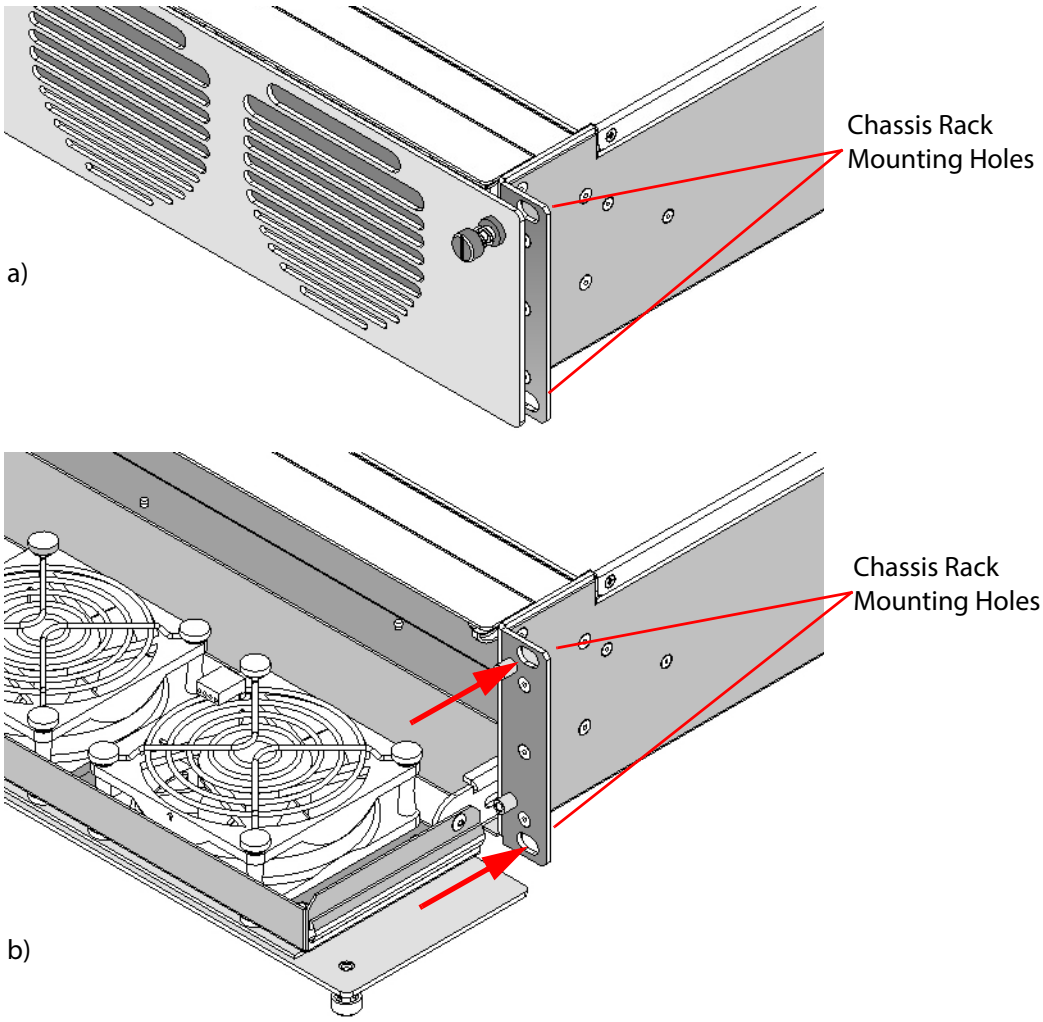


Figure 35 MV-820 Multiviewer Chassis Rack Mounting Holes
a) Front Door Closed.
b) Front Door Open, Allowing Access to Mounting Holes.

5. Secure the MV-820 Multiviewer chassis in the rack at each mounting hole using 4-off M6 (1/4 inch) screws. See Figure 36. (Screws are available from rack suppliers.)

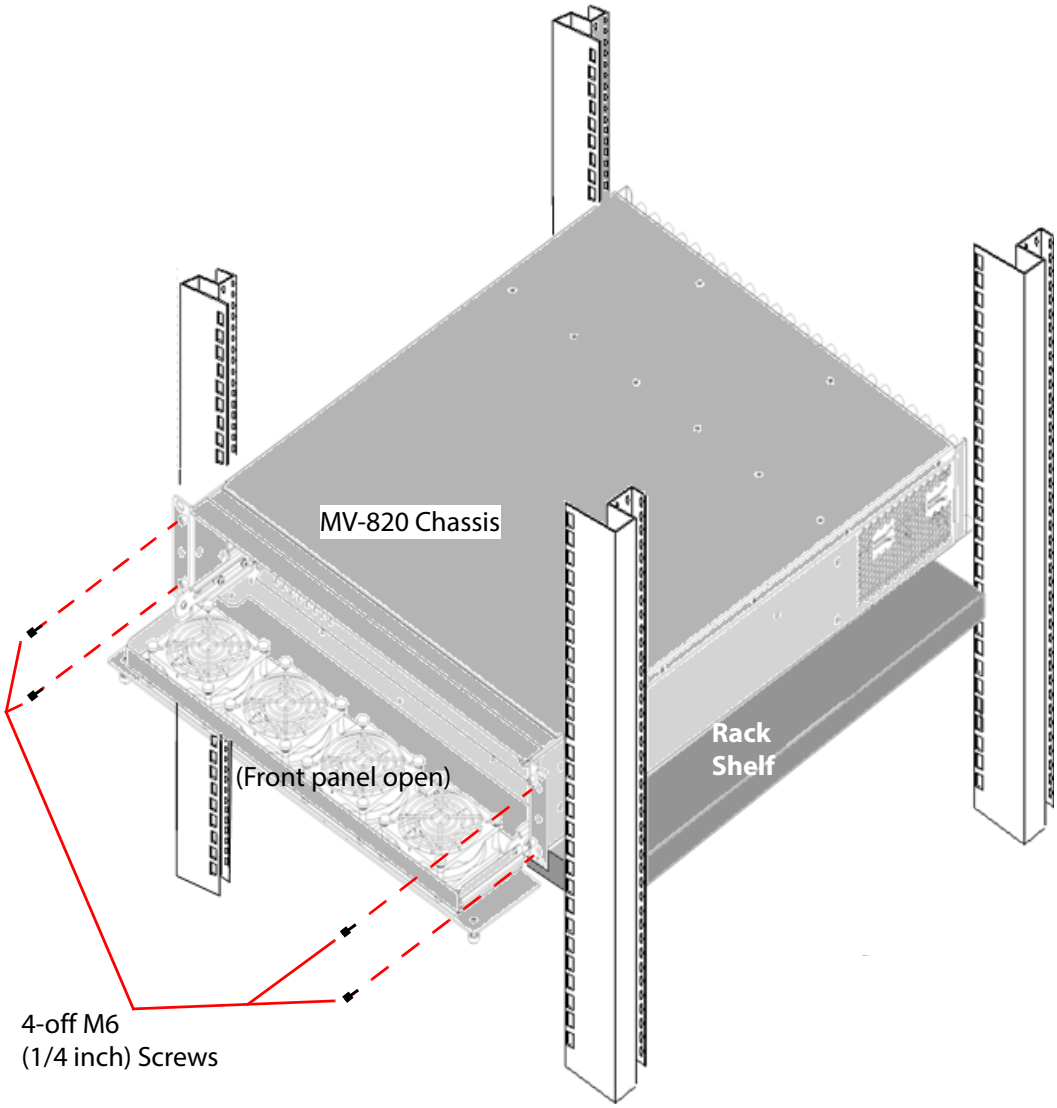


Figure 36 Rack Mounting MV-820 Multiviewer.

6. Close and secure the front door (see 2.3 "To Close the Front Door" on page 21).

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 Section 2.8 “Rear Panel Connectors” on page 29.

Cable connection examples for the MV-820 Multiviewer are shown in Figure 37, Figure 38 and Figure 39.

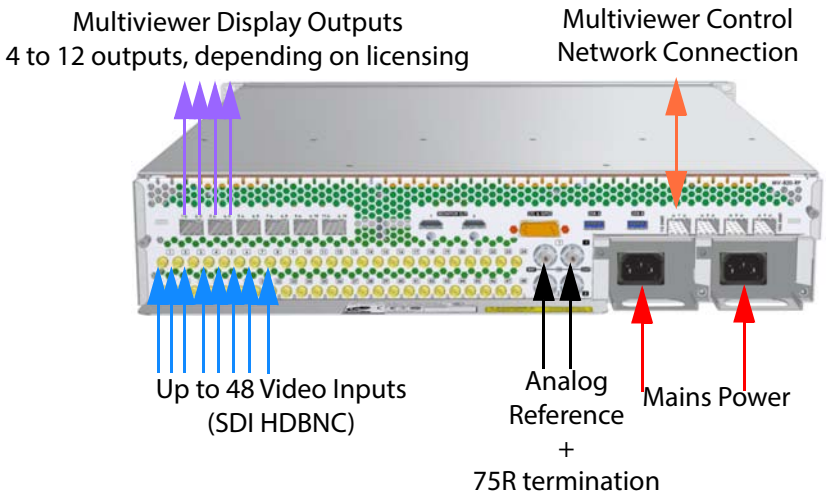


Figure 37 MV-820-HDBNC Cable Connection Example

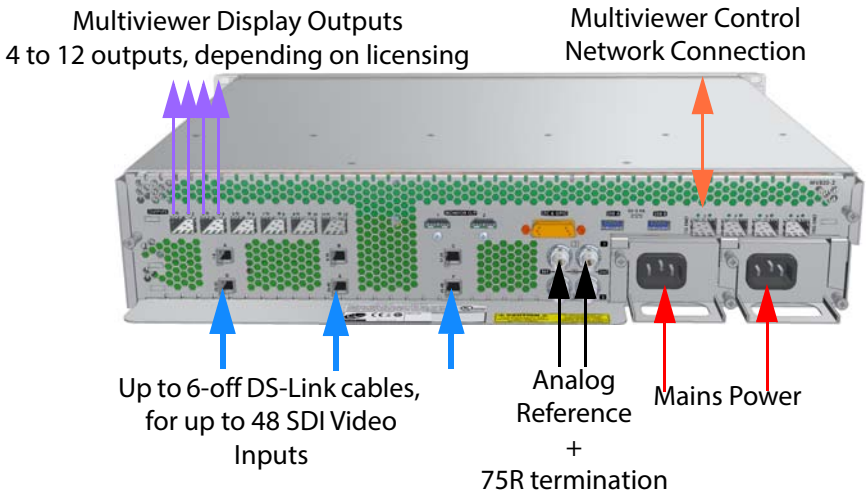


Figure 38 MV-820-DENSI Cable Connection Example

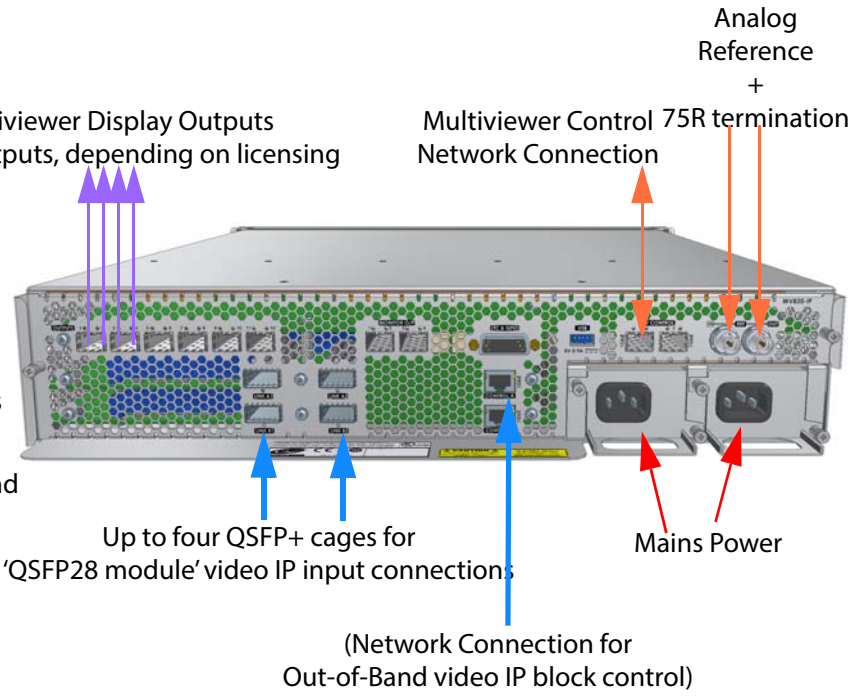


Figure 39 MV-820-IP Cable Connection Example

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 Appendix A "MV-820 Specification" on page 193.

4 Booting and Splash Screen

4.1 Booting Up

The MV-820 module boots up after power is applied or after a system reset (for example, from a Grass Valley RollCall Control Panel).

Booting takes about 1 to 2 minutes to complete. Approximately 1 minute after starting to boot up, each of the module's display outputs presents a gray start-up splash screen, see Figure 40.

Note: Initially, the first few lines of text appear on the splash screen, followed by the remaining lines of text.

Figure 40 MV-820 Multiviewer Gray Start-up Splash Screen

Table 13 Module Reboot Time

Operation	Duration
Module Reboot	Up to 3 minutes
Note: If the MV-820 front main module does not have a Flashing "CPU Heartbeat" LED when it has finished booting, contact Grass Valley Support.	

When the MV-820 has finished starting up, the start-up splash screen goes away and the green CPU Heartbeat LED on the front main module begins to flash. The unit has booted up.

4.2 The Start-up Splash Screen

The start-up splash screen shows some MV-820 information about the multiviewer unit, see Figure 41.

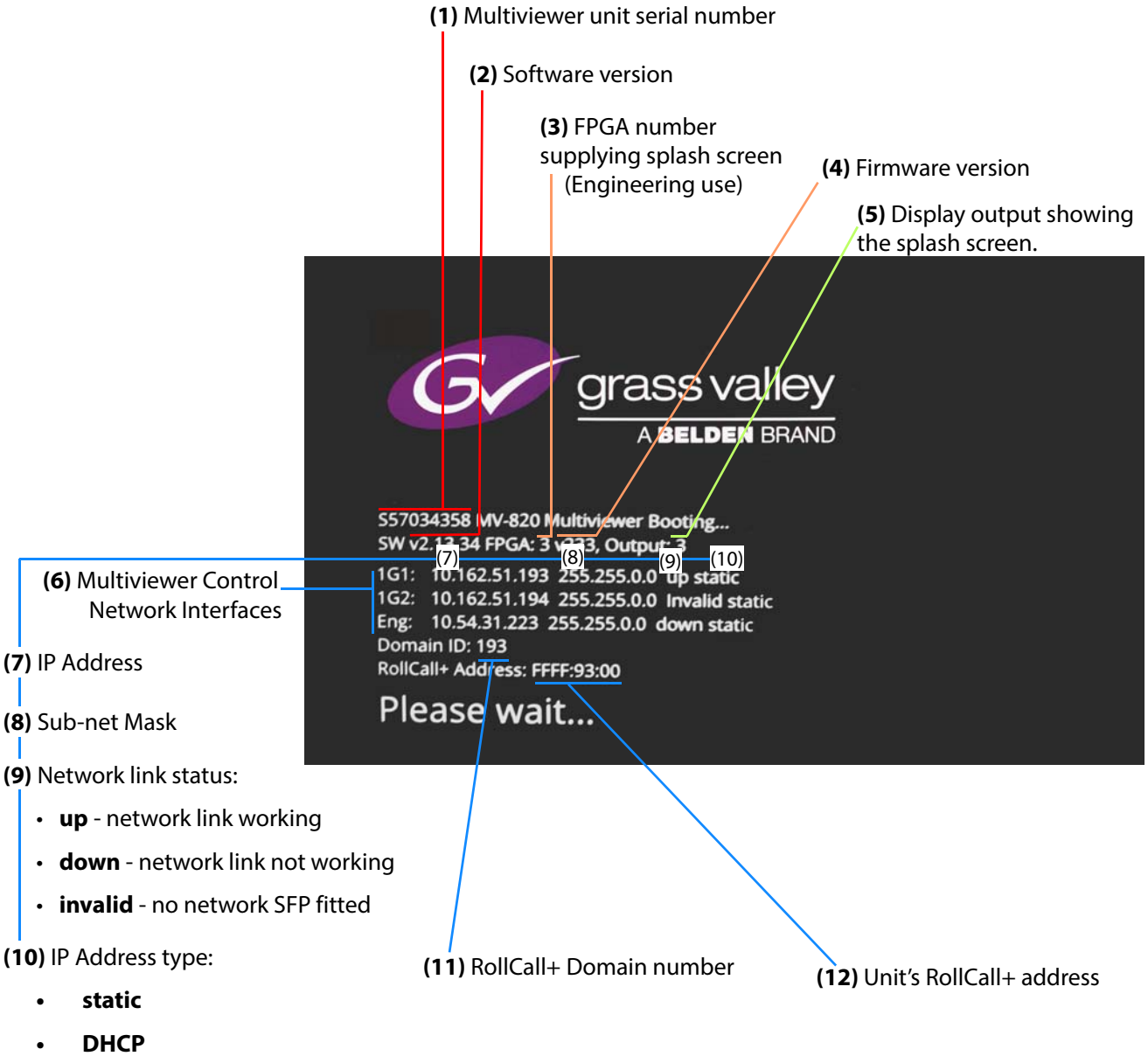


Figure 41 Example MV-820 Multiviewer Start-up Splash Screen Information

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

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

5 RollCall Templates for Multiviewer Block

This section describes configuring basic system information for the MV-820's multiviewer functional block. This MV-820 unit configuration is typically performed once after MV-820

Note:

MV-820-IP and Video IP Blocks:

The MV-820-IP unit additionally contains four Video IP blocks which require separate setting up. See Section 6 "RollCall Templates for Video IP Blocks" on page 75.

Note:

RollCall Templates:

RollCall templates are used to configure MV-820-IP settings. they may be viewed with the Grass Valley RollCall Control Panel tool or with the Grass Valley Orbit software tool.

Grass Valley Orbit:

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

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

RollCall Control Panel:

The 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.

Typically, a new MV-820 will be using a default IP address (10.54.31.221) on the 'control and monitoring' Ethernet port for the multiviewer block ("1G1"). See Table 57 on page 198 and Table 58 on page 198 for default IP addresses on all network ports.

Following the initial configuration step with RollCall Control Panel, RollCall Control Panel may then be used to control various MV-820 items, including selection of video wall layouts, monitoring alarm status, acknowledging alarms and control of timer widgets on the video wall.

Important

Ethernet connection:

Check the logical and physical connection of all 'control and monitoring' Ethernet ports on the MV-820 rear panel. This is required for optimum MV-820 performance.

Explanation:

The MV-820 has more than one control Ethernet ports "1G1" and "1G2".
However, if a port is disconnected, its IP address can still be "seen" through the other port. This means the MV-820 can still *appear* to be operating normally even with one or more unconnected control network ports. But there is an MV-820 performance penalty for operating with such an unconnected network port.

Following an initial configuration step with RollCall Control Panel, the RollCall Control Panel may then be used to configure and control various MV-820 multiviewer items, including:

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

5.1 Initial Connection and Configuration

Items required:

- A laptop, or some computer, with a RJ45 Ethernet port and with Grass Valley RollCall Control Panel installed.
- A direct CAT 5 Ethernet cable.

Initial MV-820 connection and configuration should be carried out on a separate IT network, separate from any house IT network. The initial configuration sets up MV-820 IP addresses and communication settings.

Note: Default IP Address on "1G1":

Typically, a new MV-820 will be using a default IP address (10.54.31.221) on Ethernet port 1 ("1G1").

See Appendix A Table 57 on page 198 for default IP addresses on all network ports.

To prepare a computer for initial connection:

1. Select which computer Ethernet RJ45 port to use
   ('1G ENET 1' or '1G ENET 2' for MV-820-HDBNC or MV-820-DENSI;
   'MV Control 1' or 'MV Control 2' for MV-820-IP).
   And set the port to a fixed IP address on the same network as the MV-820.

   For example, use 10.54.31.200 with the MV-820 default IP address.
   (MV-820 default IP addresses are listed in Appendix A.)
2. Disable any WiFi connections on the computer.
   (These may interfere with the wired RJ45 port.)
3. Directly connect the computer RJ45 port to Ethernet port "1G1" of the MV-820 module.

To connect RollCall Control Panel:

4. Proceed to
   Section 5.2 "RollCall Control Panel Connection to MV-820" on page 51.

To perform initial multiviewer configuration:

5. Proceed to
   Section 5.4 "Initial MV-820 Unit Configuration" on page 55.

When the MV-820 has re-booted after initial configuration, the new network settings will be adopted. The MV-820 module can then be connected to your house IT network:
All further MV-820 configuration settings can then be set up with RollCall Control Panel, see Section 5.5 "Further MV-820 Unit Configuration" on page 56.

(To configure the IP inputs of an MV-820-IP unit, see Section 6 "RollCall Templates for Video IP Blocks" on page 75.)

5.2 RollCall Control Panel Connection to MV-820

Items required:

- A laptop or desktop computer with Grass Valley RollCall Control Panel installed.
- Network access to the MV-820 module.

When connecting:

- For the first initial unit configuration,
  connect the computer directly to the MV-820 "1G1" Ethernet port.
- For further unit configuration,
  connect via your house system network to the MV-820 "1G1" Ethernet port.

To connect RollCall Control Panel to the MV-820:

1. With the computer connected to the 1G Ethernet port 1 of the MV-820 rear panel, "1G1", open the RollCall Control Panel application from:

   `Start` > `All Programs` > SAM > `RollCall` > `Control Panel`

   The RollCall application starts and the initial RollCall Control Panel screen is displayed.

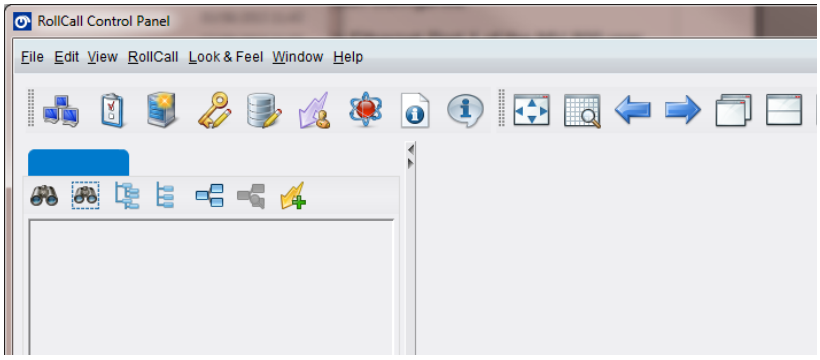


Figure 42 RollCall Control Panel Initial Screen

2. Click on the **Build Network** icon in the RollCall tool bar to display the Build Network dialog.

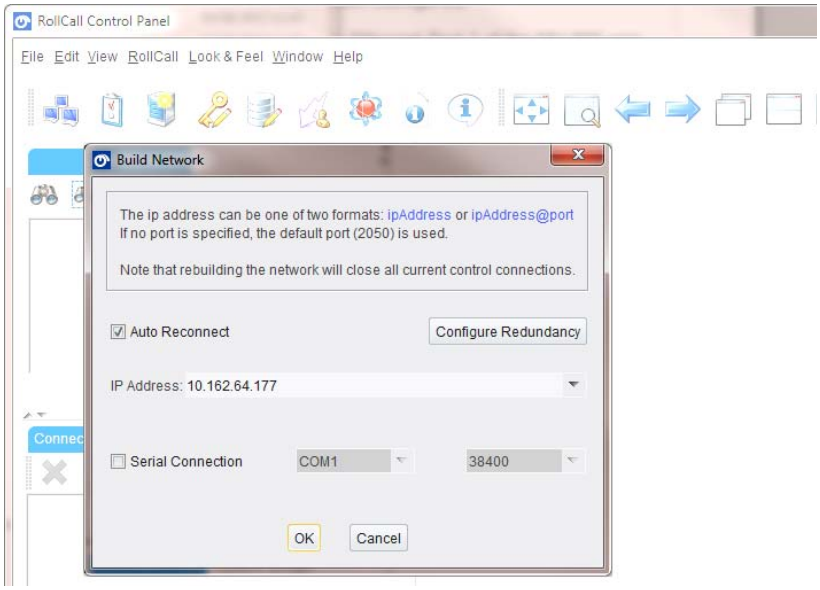


Figure 43 Build Network Dialog

3. Enter your MV-820 'control' IP address into the 'IP Address' text box and click **OK** to connect to the MV-820 module.
(see Table 57 on page 198 for the default IP addresses of network ports).

Note:

MV-820-HDBNC and MV-820-DENSI:

IP addresses given in Table 57 on page 198 are the default IP addresses of network interface ports for MV-820-HDBNC and MV-820-DENSI.

MV-820-IP:

IP addresses given in Table 58 on page 198 and in Table 59 on page 200 are the default IP addresses of network interface ports for MV-820-IP.

Note:

To find out the IP address of the MV-820 "1G1" interface (used during initial multiviewer block configuration):

- Restart the MV-820 Multiviewer by re-applying power, causing a MV-820 reboot.

  IP address information is shown in the monitor splash screen, see Section 4 "Booting and Splash Screen" on page 46 and its Figure 40.

4. After a short period displaying "Connecting", RollCall will connect to the MV-820.

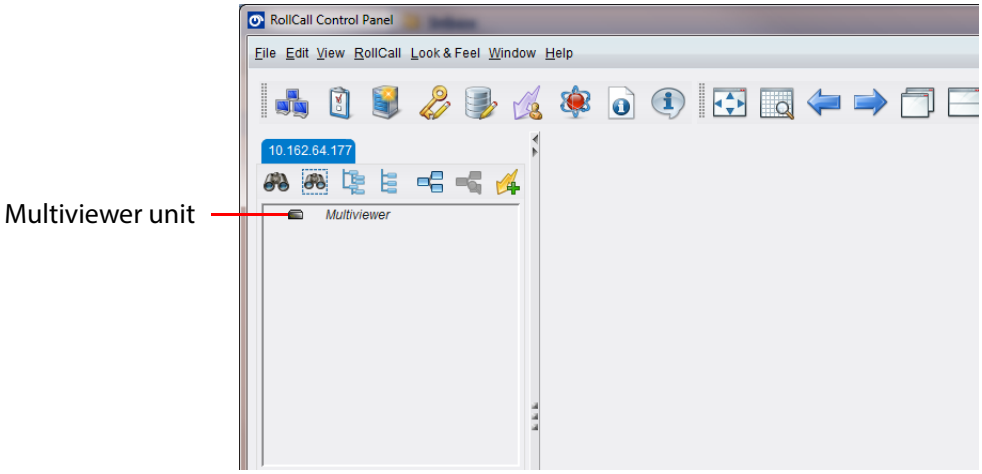


Figure 44 RollCall Connected to MV-820 Multiviewer

5. Double-click on an MV-820 unit icon or name in the left-hand pane.
(MV-820-IP shows one multiviewer block and four Video IP blocks.)
Template settings are downloaded.

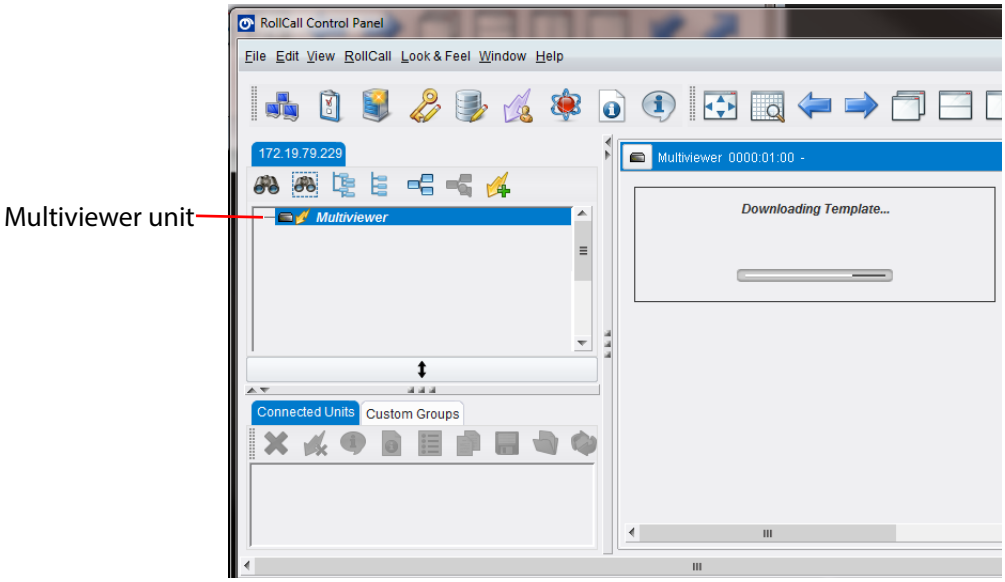


Figure 45 RollCall Template Downloading (Multiviewer Block shown)

6. The MV-820 multiviewer block Rollcall templates are automatically downloaded and the MV-820 RollCall template screens will then be displayed in the pane on the right. See Figure 46.

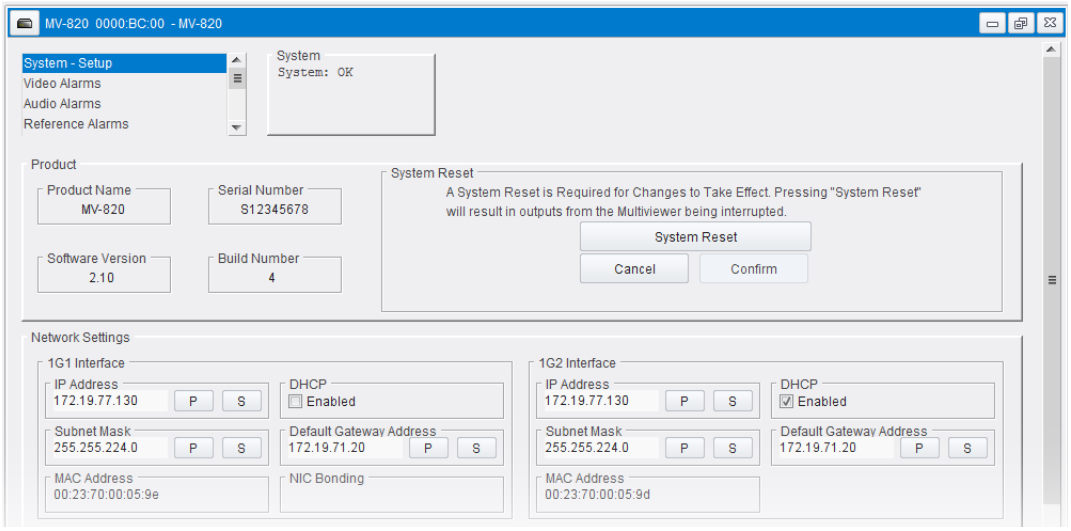


Figure 46 MV-820 Initial RollCall Template (Multiviewer Block shown)

RollCall has now connected to the unit.

5.3 Using RollCall MV-820 Multiviewer Templates

When RollCall has connected to the multiviewer, several multiviewer templates are available.

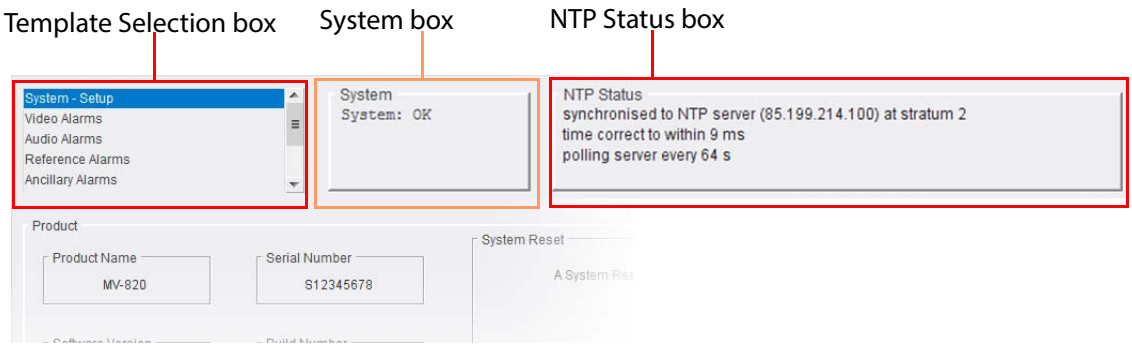


Figure 47 RollCall Template Selection Box, System Box and NTP Status Box

5.3.1 Templates Selection

The following MV-820 templates may be selected from the **Template Selection** box:

- **System - Setup:** See "RollCall System-Setup Template Screen" on page 57.
- **Video Alarms**: See "RollCall Video Alarms Screen" on page 64.
- **Audio Alarms**: See "RollCall Audio Alarms Screen" on page 65.
- **Reference Alarms**: See "RollCall Reference Alarms" on page 67.
- **Ancillary Alarms**: See "RollCall Ancillary Alarms" on page 68.
- **Layout**: See "RollCall Layout Screen" on page 69.
- **TSL**: See "RollCall TSL Screen" on page 71.
- **GPIO**: See "RollCall GPIO Screen" on page 72.
- **Timer Control**: See "RollCall Timer Control Screen" on page 73.
- **Timer Request Protocol**: See "RollCall Timer Request Protocol Screen" on page 74.

The list of templates in the **Template Selection** may be accessed fully by right-clicking anywhere in a template. This shows a full list of templates, allowing quick access to a particular template.

5.3.2 System Box

The **System box** (see Figure 47) displays the multiviewer system status at the top of each template:

- **OK** - the multiviewer is working correctly.
- **Fail** - the multiviewer has a problem.
- **Restart Required** - the application requires a restart. (This is indicated for some configuration changes to take effect.)

5.3.3 NTP Status Box

The **NTP Status box** (see Figure 47) displays the status of the multiviewer's NTP at the top of each template.

5.4 Initial MV-820 Unit Configuration

Initial configuration should be carried out on a separate IT network, separate from any house IT network.

The initial configuration sets up MV-820 IP addresses and communication settings.

After initial configuration, the MV-820 unit may be connected to the house IT network and all remaining MV-820 configuration settings can be set up, see "Further MV-820 Unit Configuration" on page 56.

The procedure for initial MV-820 configuration is:

1. Select the **System-Setup** template screen in the **Template Selection** box.
2. Change the settings in the **System-Setup** screen. (For a description of the screen, see Section 5.6 "RollCall System-Setup Template Screen" on page 57.)

    a) Under **Network Setting**,
    set up the IP network settings relevant to your house network.

    b) Under RollCall Settings, set up **Unit** number and **Domain ID**.
    (**Unit** number must be unique for each unit.
    Typically, **Domain ID** is the same for each unit.)

Once all setting changes in the **System-Setup** screen have been done:

3. Click on the **System Reset** button at the top of the **System-Setup** screen
(see Section 5.6.1 ""System Reset" box" on page 59).
Then click **Confirm** to perform a system reset.

Important

A **System Reset** of the multiviewer is required before saved settings changes in the **System-Setup** screen take effect.

Such a reset will affect all MV-820 connections, including the multiviewer monitor outputs. See Section 5.6.1.

When the MV-820 has re-booted, the new settings will be adopted. The MV-820 unit can then be connected to your house IT network.

5.5 Further MV-820 Unit Configuration

Further MV-820 configuration is done following the initial configuration step.

Further settings changes can be done at any time. But settings changes done in the **System-Setup** template screen *will* need a System Reset.

Settings changes outside of the **System-Setup** template screen do not require a system reset to be carried out. These settings include:

- **Video alarms** - See "RollCall Video Alarms Screen" on page 64.
- **Audio alarms** - See "RollCall Audio Alarms Screen" on page 65.
- **Reference alarms** - See "RollCall Reference Alarms" on page 67.
- **Ancillary data alarms** - See "RollCall Ancillary Alarms" on page 68.
- **TSL settings** - See "RollCall TSL Screen" on page 71.
- **GPIO settings** - See "RollCall GPIO Screen" on page 72.
- **Video wall timer control** - See "RollCall Timer Control Screen" on page 73.
- **Timer Request Protocol** - See "RollCall Timer Request Protocol Screen" on page 74.

Some **System-Setup** template changes may affect the MV-820 unit's network operation.

Important

A **System Reset** of the multiviewer is required after settings changes in the RollCall **System-Setup** template.

Such a reset will affect all MV-820 connections, including the multiviewer monitor outputs. See Section 5.6.1.

When the MV-820 has re-booted, the new settings will be adopted.

5.6 RollCall System-Setup Template Screen

Note: The multiviewer must be **System Reset** for any saved setting changes to take effect, Section 5.6.1 on page 59.

The **System-Setup** template screen (see Figure 48) comprises various information boxes which display basic information about the multiviewer, for example, system status, product name and software version. It is also used to setup the following system details:

- Networking.
- NTP servers.
- Router controller addresses.
- RollCall settings.
- Multiviewer monitor output format.
- Multiviewer name.
- Multiviewer Input streaming out.

Figure 48 Multiviewer RollCall System-Setup Screen

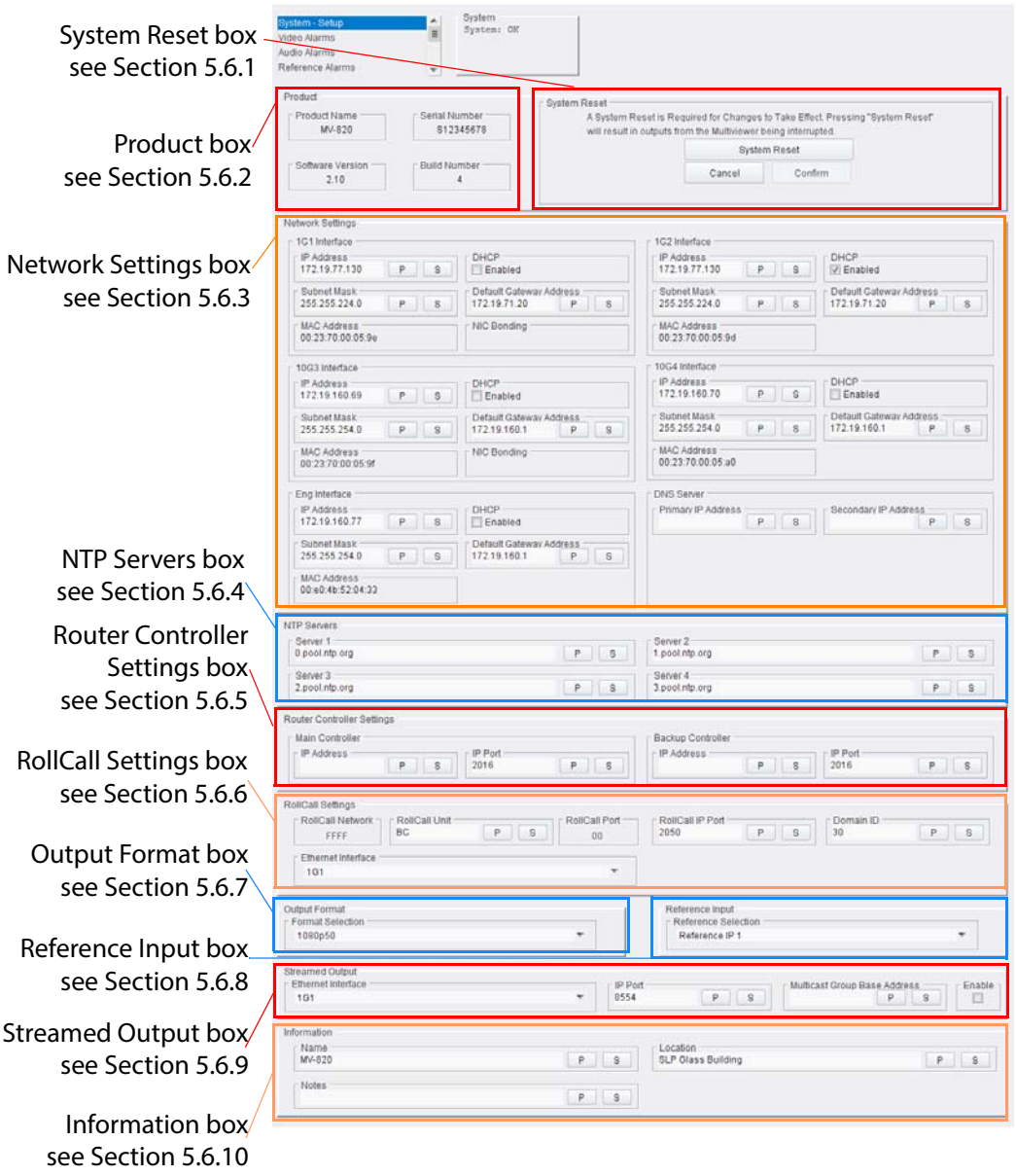


Figure 49 System-Setup Screen Boxes

5.6.1 "System Reset" box

This box contains a **System Reset** button which resets (reboots) the MV-820 Multiviewer. This is used to make any **System-Setup** screen configuration setting changes take effect. Performing a system reset makes the multiviewer use the new settings.

A system reset reboots the multiviewer by effectively powering it down and then powering it back up: This will interrupt and produce a picture disturbance on all MV-820 multiviewer outputs.

Important A system reset of the multiviewer will affect all outputs.

Once all changes in the **System-Setup** screen have been done, carry out a system reset:

1. Click on the **System Reset** button.
2. Then click on the **Confirm** button to perform a system reset.
   Or click the **Cancel** button to abort the system reset.

See Section 4 "Booting and Splash Screen" on page 46 for more information on module booting.

5.6.2 "Product" box

Displays multiviewer details:

- **Product** - The name of the module, MV-820.
- **Software Version** - The currently installed software version number.

5.6.3 "Network Settings" box

The Network Settings area of the **System - Setup** screen shows the MAC addresses and any network interface bonding status of each of the MV-820 IP network interfaces and is used to set the network details for each of the MV-820 IP interfaces.

Network interfaces covered:

- 2-off 1G Ethernet interfaces ("1G1","1G2").
  (MV-820 default IP addresses are given in Table 57 on page 198.)
- 2-off 10G Ethernet interfaces ("10G3","10G4").
  (MV-820 default IP addresses are given in Table 57 on page 198.)
- 1-off "Eng" Interface", default IP address 10.54.31.224.
  (Reserved for Grass Valley engineering use.)

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 setting value (or press "return").

"**P**" - Locally save default setting value.

Enter all the network interface details in the text boxes:

- **IP Address** - Set the interface IP Address.
- **Subnet Mask** - Set the interface Subnet Mask.
- **Default Gateway Address** - Set the interface Gateway address.
- **MAC address** - Displays the IP interface MAC address.
- **DHCP** - **Enabled** check box:
  - Select to automatically set the IP address details from the network DHCP server.
  - Leave box deselected to use the entered IP address settings.
- **DNS Server** - Set the primary and secondary DNS server IP addresses.

Note: The IP address details are only used when the corresponding "DHCP Enabled" box is deselected.

Note: At the next **System Reset**, the MV-820 will adopt all the locally saved settings.

5.6.4 "NTP Servers" box

Up to four NTP (Network Time Protocol) server URL's or IP addresses can be configured.
The NTP servers are used to synchronize clocks displayed on multiviewer video walls with the specified NTP server.

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).

- **NTP Server Address** - Enter the NTP server address in the text box and click on the **S** button to save the new setting.
  Do this for each address entered.

5.6.5 "Router Controller Settings" box

A Grass Valley router frame may provide input video to a multiviewer; the router will have a main router controller and possibly a backup controller. The IP address and IP port details of both router controllers are set up in this screen box: Port details must correspond to port settings in the router configuration.

This allows a multiviewer to display source tallies for the video inputs being displayed by the multiviewer and also to control router crosspoints when necessary.

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).

- **IP Address** - Set the router controller IP address.
- **IP Port** - Use the default controller IP port number, unless the port has been changed on the router controller.
  Click on the **P** button to return the setting to its default value, if required.

5.6.6 "RollCall Settings" box

The RollCall settings are used to allow Grass Valley Orbit software applications to control the MV-820 Multiviewer and should normally be changed if you have multiple MV-820 units on the same RollCall network.

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).

- **RollCall Network** - Displays the RollCall address, which may not be changed.
  It is not an IP network address.

Note: A RollCall address has the form: NNNN:UU:PP

where:
NNNN is the RollCall network number.
UU is the RollCall unit number.
PP is the multiviewer input number (01, 02 etc).

- **RollCall Unit** - Set the RollCall unit number. The unit number must be unique for each Multiviewer being configured. The initial default value is "01".

- **RollCall Port** - Displays the RollCall port number.
- **RollCall IP Port** - This can usually be left to its displayed value.
- **Domain ID** - RollCall+ uses the concept of domains to partition a RollCall network. Only those RollCall-enabled devices on the same RollCall Domain can communicate with one another. A domain is uniquely identified with a **Domain ID** number. **Domain ID** is also used by Orbit software when connecting to an MV-820.
    - The **Domain ID** can typically be left at its default value, 100. (This default value is reserved for multiviewer RollCall traffic.)
    - To reset the **Domain ID** to the default value of 100 click on the **P** button.
    - To set the **Domain ID**, enter the Domain ID number in the text box and click the **S** button to locally save the new setting.
- **Ethernet Interface** - Set which multiviewer IP port to use for RollCall messages. The selected interface must be connected to the network.

5.6.7 "Output Format" box

MV-820 multiviewer display outputs can be1080p or 720p.

The **Output Format** setting sets the frame rate for *all* of the multiviewer display outputs. All outputs share the same format.

Note: When driving a 4K monitor, each MV-820 multiviewer display output drives one quadrant of the 4K monitor.

Some 4K monitors have four 1080P inputs, so they can be fed from four MV-820 1080p outputs. If this is not the case, a separate adapter must be used to convert four MV-820 multiviewer display outputs to a single 4K signal suitable for the monitor.

5.6.8 "Reference Input" box

Set which router reference input is used by the MV-820 to synchronize its display outputs to. Select reference source from the drop down list. Settings choices are:

- Reference IP 1. (Rear panel analog reference input 1.)
- Reference IP 2. (Rear panel analog reference input 2.)
- Free Run.

Note: On MV-820-IP, there is only one rear analog reference input.

5.6.9 "Streamed Output" box

The **Streamed Output** settings box contains details about the streaming out of multiviewer video inputs, which are streamed out as multicast H.264-compressed copies of each multiviewer input.

- **Ethernet Interface** - Select Ethernet interface, port 1 (1G1) or port 2 (1G2). This setting must be the same as the **RollCall Ethernet Interface** setting in the RollCall box of the System-Setup screen.
- **IP Port** - Typically, use the default value.
- **Multicast Group Base Address** - A 32-bit value used to identify the IP multicast group. Typically, a multicast address is sorted out automatically: Use the default (blank) setting

in this box.
If your IP network requires a particular multicast group address, it may be set up here.

- **Enable** - Check box. Select to enable streaming out.

5.6.10 "Information" box

This box contains text fields which can be set up by the user, enabling the user to enter name, location and notes about their multiviewer unit.

To enter/modify text in the text box, type directly into the editable text field and click the **S** button. To return to the default text, click the **P** button.

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).

- **Name** - A meaningful name may be given to the multiviewer unit, making it easier to identify.
  Maximum 32 characters.
  Remember to press **S** or press **return** to save the name locally.
- **Location** - Multiviewer location details may be entered, to make it easier for the user to locate the multiviewer.
  Maximum 64 characters.
  Remember to press **S** or press **return** to save the name locally.
- **Notes** - Extra user information about the multiviewer may be entered.
  Up to 64 characters can be displayed in the notes field.
  Remember to press **S** or press **return** to save the name locally.

5.6.11 System Reset to Implement the Changes

After all **System-Setup** window settings changes have been made, an MV-820 System Reset is required. See Section 5.6.1 ""System Reset" box" on page 59.

5.7 RollCall Video Alarms Screen

The RollCall Video screen allows the user to:

- See the state of alarms related to the video picture for each MV-820 input
- Acknowledge alarms.

Note: Alarms can be viewed and acknowledged on this screen.

Multiviewer alarms are set up with Grass Valley Orbit software application.

The MV-820 input video channel is selected by the **Video Input Selection** drop-down menu box.

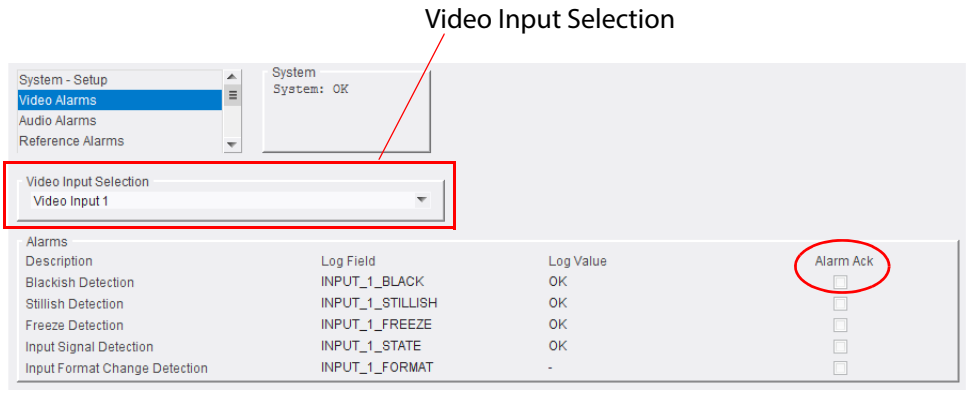


Figure 50 RollCall Video Alarms Screen

To acknowledge an alarm, select the corresponding **Alarm Ack** check box on the right-hand side of the screen.

Table 14 Video Alarms

Alarm	Description
Blackish Detection	Active when the video picture is detected to be black or nearly black.
Stillish Detection	Active when the video picture is detected to have no motion present.
Freeze Detection	Active when the video picture is frozen.
Input Signal Detection	Active when no input signal is detected.
Input Format Change Detected	Active when a change of video format is detected. For example, from 1080p to 720p.

5.8 RollCall Audio Alarms Screen

The RollCall Audio screen allows the user to:

- See the state of alarms related to embedded audio channels accompanying the video picture for each MV-820 input.
- Acknowledge alarms.

Note: Alarms can be viewed and acknowledged on this screen.

Multiviewer alarms are set up with Grass Valley Orbit software application.

Figure 51 shows the RollCall Audio Alarms screen.

The video input channel is selected by the **Video Input Selection** drop-down menu box.

There are 32 audio channels per video input, i.e. 16 channel pairs.
Audio channels, or channel pairs, are selected with the **Audio Channel Selection** pull-down box, in groups of eight (i.e. channels "1 to 8", "9 to16", "17 to 24" and "25 to32").

To acknowledge an alarm, select the corresponding **Alarm Ack** check box on the right-hand side of the screen.

Audio alarms may operate on a per audio channel or channel-pair basis.

Table 15 Audio Alarms

Alarm	Channel or Channel-pair	Description
Audio Level	per channel	The following audio level conditions are detected: Silence and Over range.
AC3 Presence	per channel	Checks for the presence of AC3 encoded compressed audio data. Use this if AC3 audio data is expected on the channel.
Dolby E Presence	per *channel-pair*	Checks for presence of Dolby E encoded compressed audio data. Use this if Dolby E audio data is expected on the channel-pair
PCM Presence	per *channel-pair*	Checks for the presence of PCM encoded (uncompressed) audio data. Use this if PCM audio data is expected on the channel-pair.
DialNorm Under	per *channel-pair*	Checks audio normalization levels.
Dolby E Config Changed	per *channel-pair*	Checks for a change in Dolby E configuration.

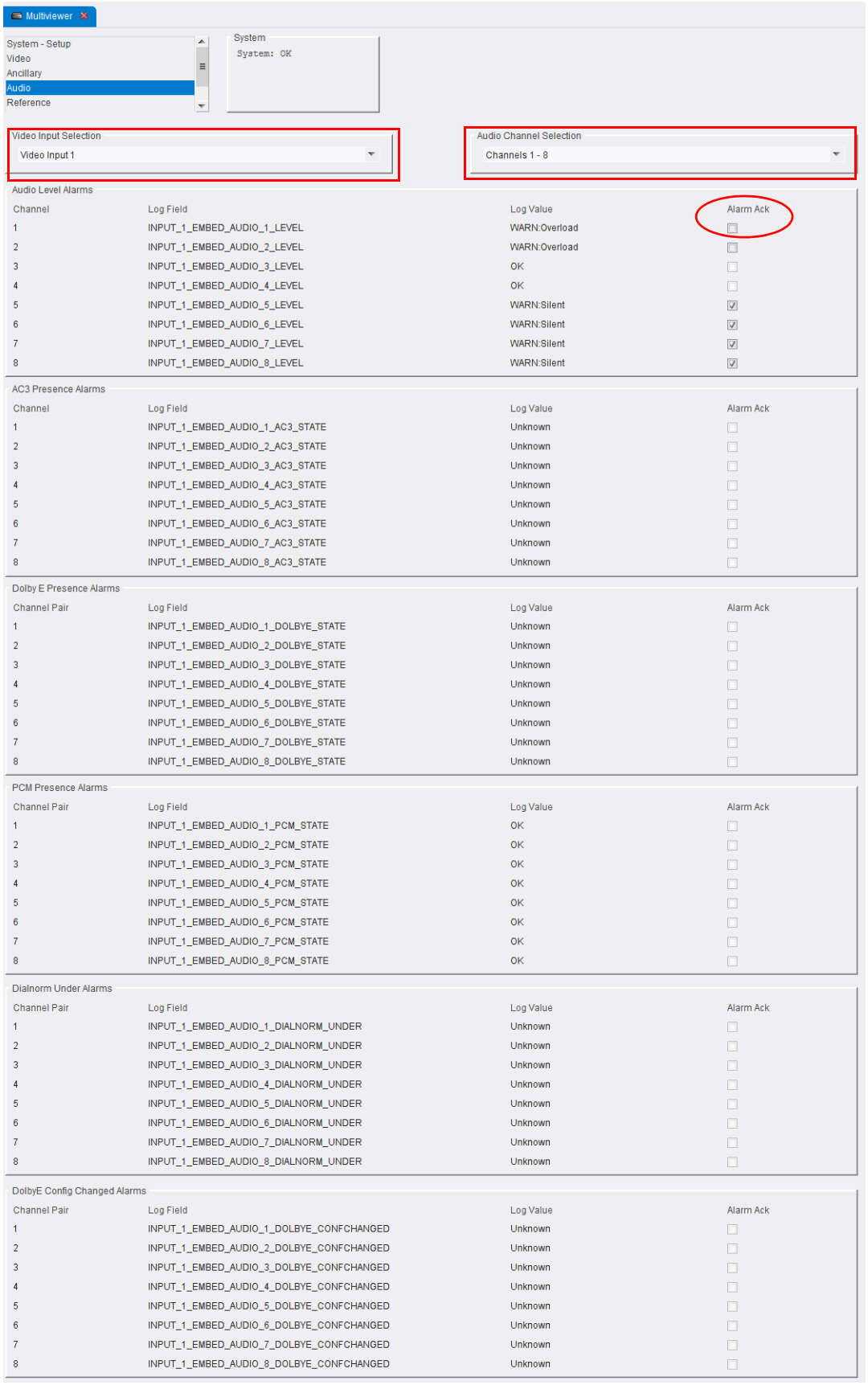


Figure 51 RollCall Audio Alarms Screen

5.9 RollCall Reference Alarms

The RollCall Reference screen allows the user to see the state of and to acknowledge MV-820 alarms relating to loss of input reference and to genlock source.

To acknowledge an alarm, select the corresponding Alarm Ack check box on the right-hand side of the screen.

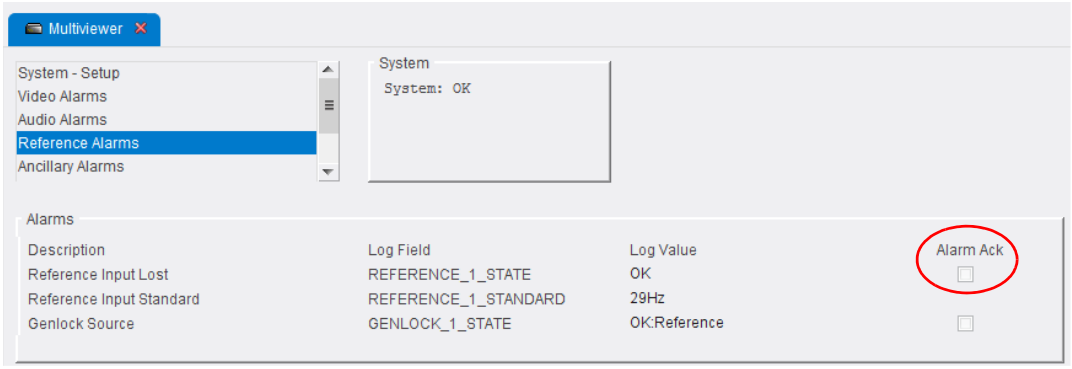


Figure 52 RollCall Reference Alarms Screen

Note: Alarms can be viewed and acknowledged on this screen.

Multiviewer alarms are set up with Grass Valley Orbit software application.

5.10 RollCall Ancillary Alarms

The RollCall Ancillary screen allows the user to see the state of alarms and to acknowledge alarms related to the ancillary data for each MV-820 input.

1. Select Video input channel being shown.

2. Acknowledge an alarm by selecting the corresponding **Alarm Ack** check box on the right-hand side of the screen.

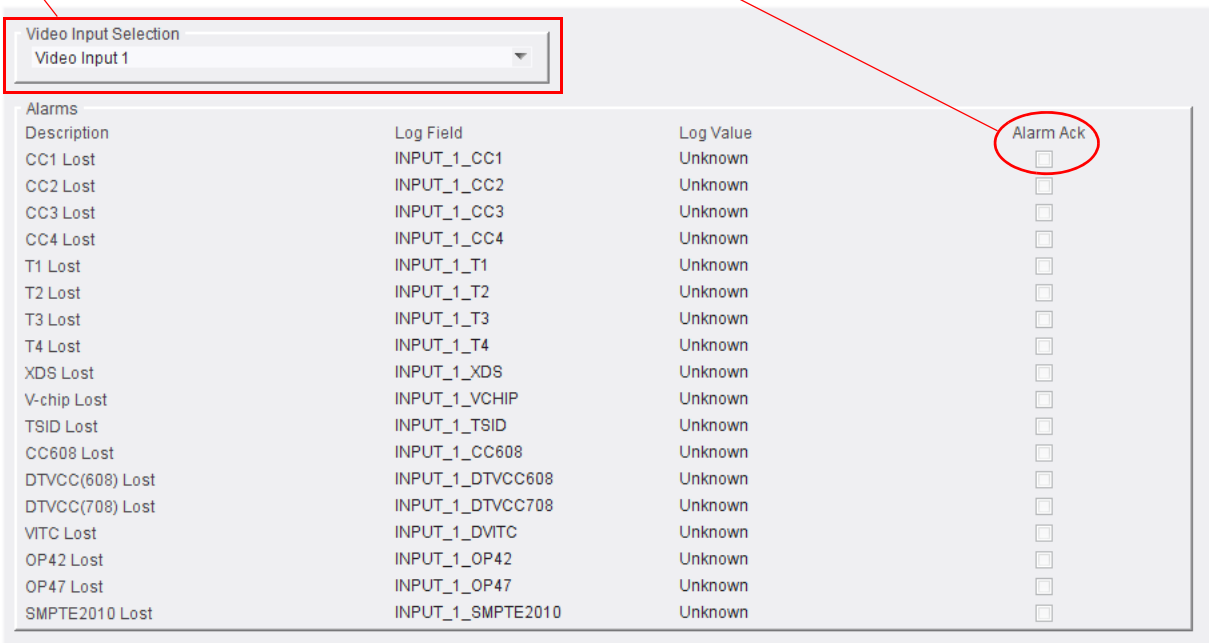


Figure 53 RollCall Ancillary Alarms Screen

Table 16 Ancillary Data Alarms

Video Alarm	Description
CC1 Lost, **CC2 Lost**, **CC3 Lost**, **CC4 Lost**	Loss of Closed Caption data
T1 Lost, **T2 Lost**, **T3 Lost**, **T4 Lost**	Loss of Teletext data.
XCS Lost	Loss of Extended Data Service information.
V-Chip Lost	Loss of V Chip content rating information.
TSID Lost	Loss of Transport Stream ID information.
CC608 Lost	Loss of Closed Caption EIA 608 information.
DTVCC(608) Lost	Loss of DTV Closed Caption EIA 608 data.
DTVCC(708) Lost	Loss of DTV Closed Caption EIA 708 data.
VITC Lost	Loss of Vertical Interval Time Code information.
OP42 Lost	Loss of OP42 Closed Caption information.
OP47 Lost	Loss of OP47 Closed Caption/Subtitling information.
SMPTE2010 Lost	Loss of SMPTE 2010 data.

Note: Alarms can be viewed and acknowledged on this screen.

Multiviewer alarms are set up with Grass Valley Orbit software application.

5.11 RollCall Layout Screen

The RollCall Layout screen allows the user to select which video wall layout to apply to each multiviewer display output. (A Grass Valley soft- or hard-panel may also select wall layout.) Additionally, the on-screen transition between one wall layout and the next can be set up.

Video walls are designed in the Grass Valley Orbit application and different wall layouts may be generated for the same wall. These are all contained within an Orbit multiviewer project which is pushed to the multiviewer unit.

In an Orbit multiviewer project:

- Each video wall has a **Name** property.
  It is set to "Wall 1", "Wall 2" etc. by default in Orbit.
  The wall name may be edited in Orbit by the user.
- Each wall layout has a **Name** property.
  This is set to "Layout1", "Layout2" etc. in Orbit and is *not* editable by the user.

Note: These names are case-sensitive.

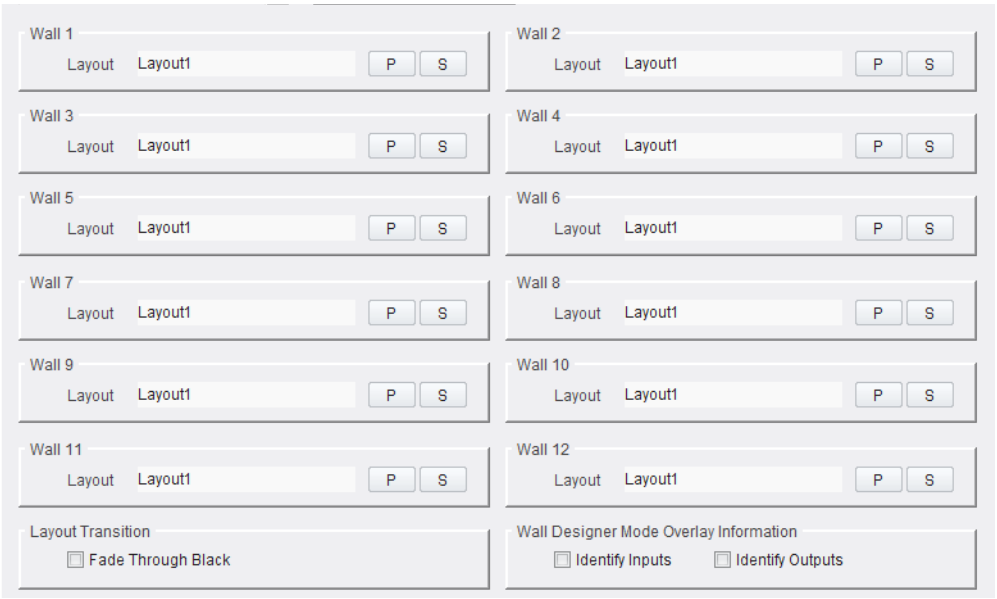


Figure 54 RollCall Layout Screen

Remember to press the **S** button to save a change.

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).

Table 17 Layout Settings

Setting	Description
Wall 1 to Wall 12:	
Layout	Text box. Enter the wall layout name to use. (Case sensitive)
Layout Transition:	
Fade Through Black	Check box. Controls the type of on-screen transition seen when changing between wall layouts.
Selected:	Fade down to black; then fade up to new wall layout.
Deselected:	Cut from current to new wall layout.
Wall Designer Mode Overlay Information:	
	Controls the display of overlay information on each multiviewer display output. See Figure 55. (Multiviewer software 2.16.16 or later.)
Identify Inputs	Check box. Select to display overlay information which identifies each video input on the display output screen.
Identify Outputs	Check box. Select to display overlay information which identifies each display output screen.

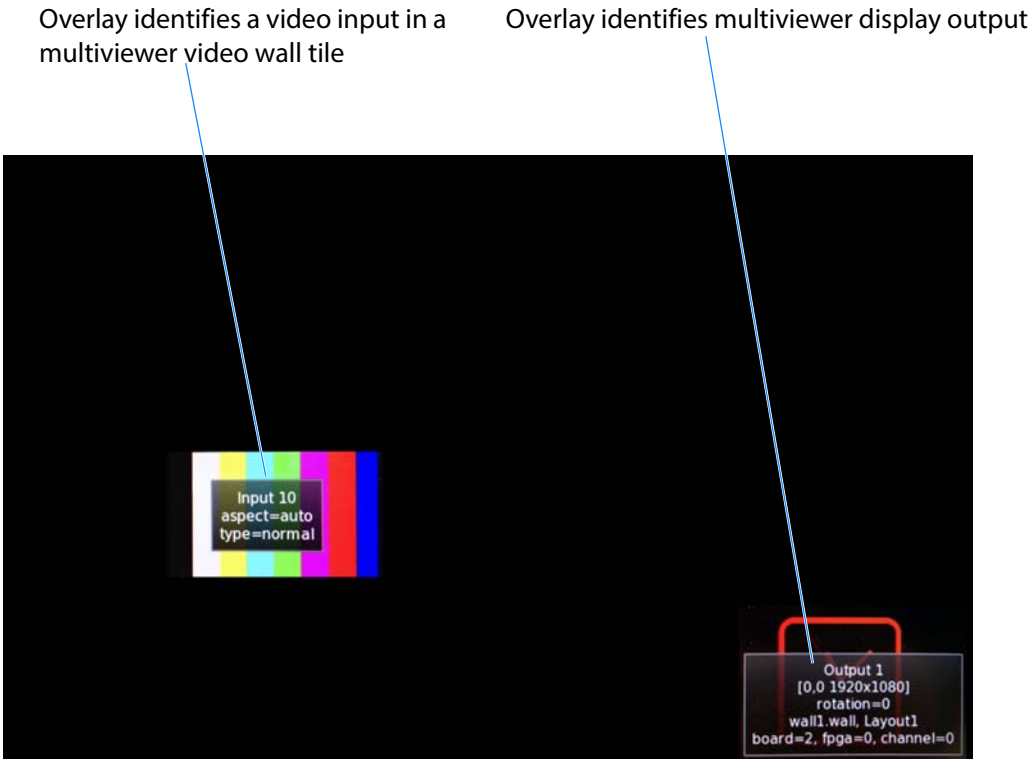


Figure 55 Multiviewer Display Output Overlay

5.12 RollCall TSL Screen

The RollCall TSL screen allows the user to select settings related to MV-820 support of the TSL protocol.

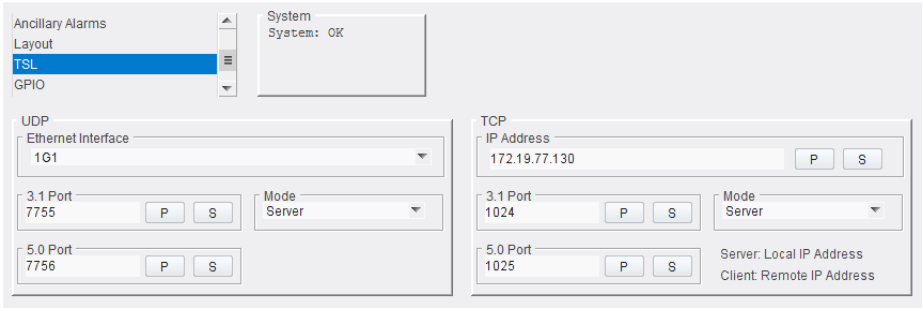


Figure 56 RollCall TSL Screen

TSL protocol is supported in TSL Server Mode or TSL Client Mode, see Section 13 Figure 116 on page 130.

For two types of Ethernet protocols (UDP and TCP), the user can separately set up IP address and network port information.

Table 18 TSL Mode Settings

Setting	Description
UDP:	
Ethernet Interface	Drop-down box. Select port 1 (1G1) or port 2 (1G2).
3.1 Port	Text box. Network port to receive TSL 3.1 messages on. Enter the network port number.
5.0 Port	Text box. Network port to receive TSL 5.0 messages on. Enter the network port number.
Mode	Drop-down box. Select 'Server' mode, or 'Disabled'.
TCP:	
IP Address	Text box. In Server Mode: Enter local IP address of the MV-820. In Client Mode: Enter IP address of TSL Controller.
3.1 Port	Text box. Network port to receive TSL 3.1 messages on. Enter the network port number.
5.0 Port	Text box. Network port to receive TSL 5.0 messages on. Enter the network port number.
Mode	Drop-down box. Select 'Server' mode, 'Client' mode or 'Disabled'.

Remember to press the **S** button.

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).

5.13 RollCall GPIO Screen

The RollCall GPIO screen allows the user to set up settings related to the MV-820 unit's GPIO interface.

There are four MV-820 GPIO ports, 1 to 4. For connector pinouts, see Section 2.8.8.

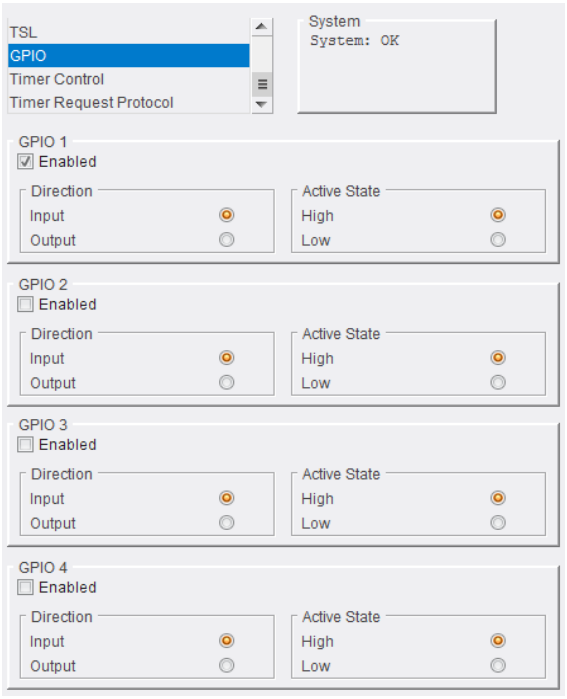


Figure 57 RollCall GPIO Screen

Table 19 GPIO port Settings.

Setting	Description
GPIO 1 to GPIO 4:	
Enabled	Check box. Select to enable the GPIO port on the MV-820 unit.
Direction	Radio buttons. Select the GPIO port to be an input or an output.
Input	selected: GPIO port is an input.
Output	selected: GPIO port is an output.
Active State	Radio buttons. Select the active state of the GPIO port.
High	selected: Active state of the port is a high voltage.
Low	selected: Active state of the port is a low voltage.

5.14 RollCall Timer Control Screen

The RollCall Timer Control screen allows a user to set up timers used in widgets on a video wall and then remotely control the timers. Timers may also then be remotely started or stopped controlled with RollCall soft-panels or hard-panels.

Note: All **Timer** widget styling and configuration of trigger points etc are set through the Grass Valley Orbit application.

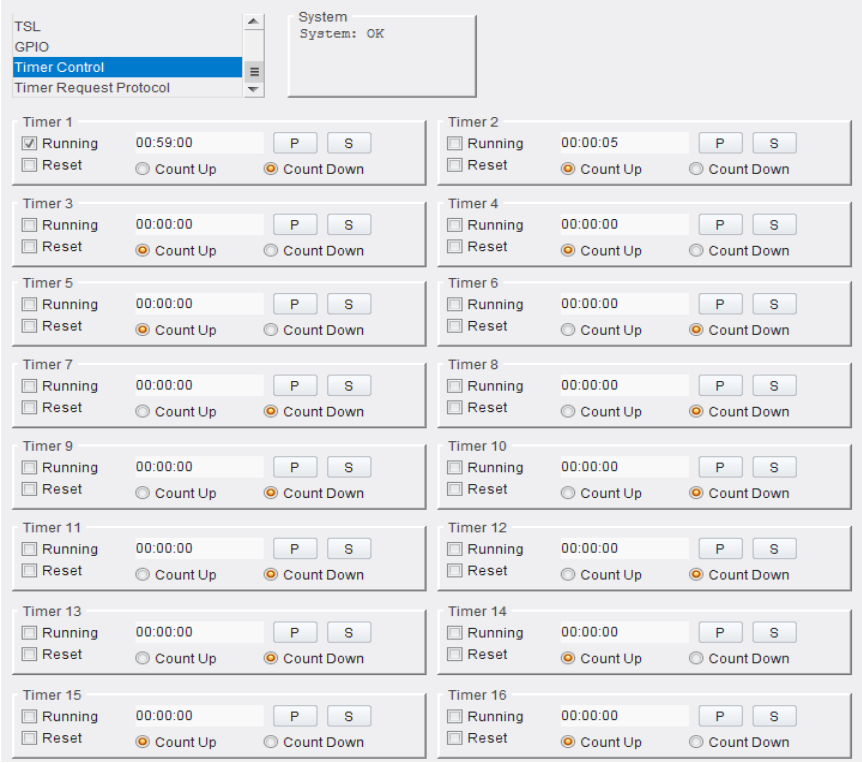


Figure 58 RollCall Timer Control Screen

Table 20 RollCall Timer Control Settings

Setting	Description
Timer 1 to Timer 16:	
Running	Check box. Select to start the timer. Deselect to stop.
Reset	Check box. Select to reset the timer. The check box automatically is deselected when the timer has reset.
Text box	Enter the timer's target time. Target time format: HH:MM:SS For example, 12:30:00 Note: When the target time is changed, the timer is reset.
Count Up	Radio button. Select to reset the timer and count up.
Count Down	Radio button. Select to reset the timer and count down.

Remember to press the **S** button.

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).

5.15 RollCall Timer Request Protocol Screen

The RollCall Timer Request Protocol template allows a user to define the IP address of an "eTimer" server device and the IP port number to use.
The protocol used is the Plura™ Timer Request Protocol.

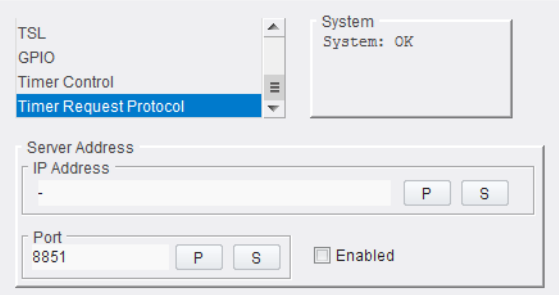


Figure 59 RollCall Timer Request Protocol Screen

Table 21 RollCall Timer Request Protocol Settings

Setting	Description
IP Address	Enter IP Address of an 'eTimer' server device.
Port	Enter IP port number to use for Timer Request Protocol messages.
Enabled	Check box. Select to enable use of Timer Request Protocol messages.

Remember to press the **S** button when changing the IP Address settings.

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 setting value (or press "return").

"P" - Locally save default setting value.

Note: **Configuring a Timer Widget for eTimer:**

A Timer widget is configured on a video wall tile with the Grass Valley Orbit application. It can be configured to be connected to an eTimer service.

6 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.

Video IP RollCall Template	Used For	See
Configuration	Basic parameters	Section 6.3 on page 83
Time Sync Configuration	Time synchronization source selection	Section 6.4 on page 85
TPG	Video test patterns on IP outputs	Section 6.5 on page 89
Counters	Clearing internal counters	Section 6.6 on page 91
FEC	Forward Error Correction control	Section 6.7 on page 92
Ethernet 1, Ethernet 2	Media network interface IP settings	Section 6.8 on page 94
Ethernet 1 RTP Sender, Ethernet 2 RTP Sender	RTP sender stats	Section 6.9 on page 98
Ethernet 1 RTP Receiver, Ethernet 2 RTP Receiver	RTP receiver stats	Section 6.10 on page 99
Ethernet RTP Receiver Video Stats	Received video flow stats	Section 6.11 on page 100
Ethernet RTP Receiver Audio Stats	Received audio flow stats	Section 6.12 on page 101
Ethernet RTP Receiver Metadata Stats	Received metadata flow stats	Section 6.13 on page 102
Link Control	4K quad-link control	Section 6.14 on page 103
Destination Timing	Received IP flow video input timing	Section 6.15 on page 104
Spigot 1, Spigot 2, ... Spigot 16	Spigot IP settings (source and destination spigots)	Section 6.16 on page 106
Logging Configuration	Configuring logging	Section 6.17 on page 120
Logging SDI Info	SDI status logging settings	Section 6.18 on page 121
Logging System	System status logging	Section 6.19 on page 122
Logging Network	Network status logging	Section 6.20 on page 125
Logging SFP	Designated QSFP28 module status logging	Section 6.21 on page 127
Logging FPGA	FPGA status information logging	Section 6.22 on page 130
Logging Spigot 1, Logging Spigot 2, ... Logging Spigot 16	Spigot name and spigot information logging. (Set multiviewer video input names.)	Section 6.23 on page 131
Logging Card Diagnostics	Video IP block diagnostics	Section 6.24 on page 134
Loopback Router	Loopback IP routing	Section 6.25 on page 135

Video IP RollCall Template	Used For	See
Setup	Display of basic information, plus 'restart' and 'default settings' buttons.	Section 6.26 on page 136
Ethernet Rear	Control interface IP settings	Section 6.27 on page 138
Interop	IP interoperability settings	Section 6.28 on page 140
SFP Configuration	Configuration of designated QSFP28 module.	Section 6.29 on page 143

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 60.

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

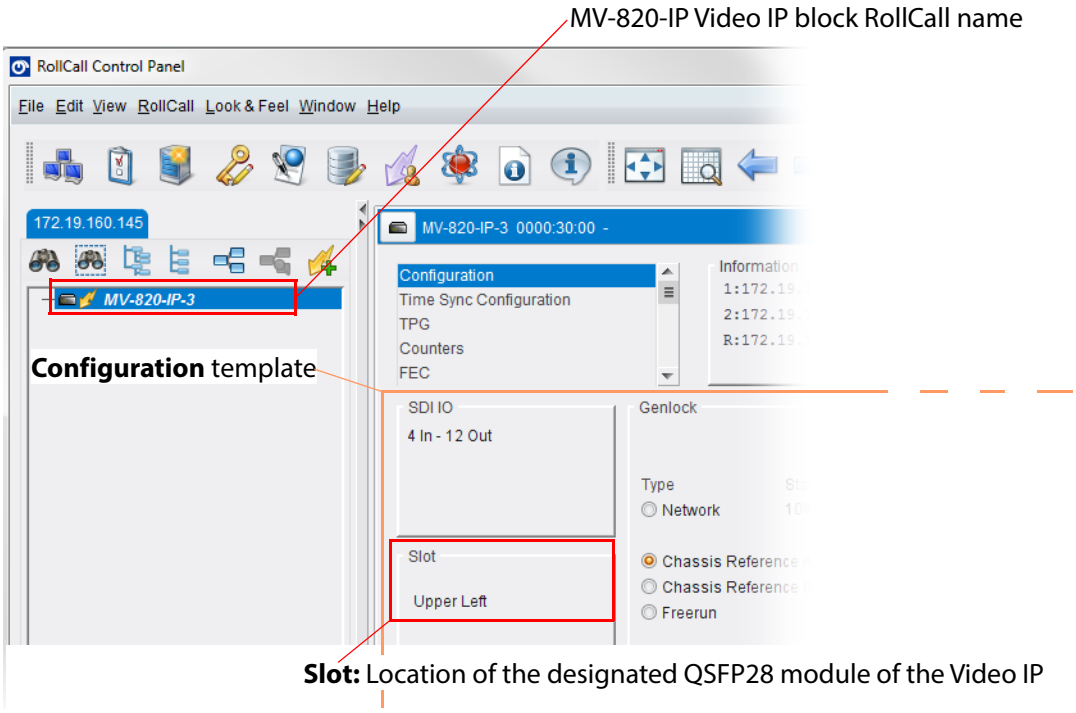


Figure 60 RollCall Initial Template Screen

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 61)
'Upper Left'	"LINK A1"
'Upper Right'	"LINK A2"
'Lower Left'	"LINK B1"
'Lower Right'	"LINK B2"

Table 22 Designated QSFPs

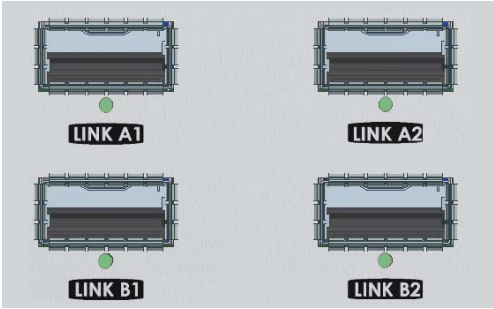


Figure 61 Rear Panel QSFP+ Cages

Note:

Tools:

Grass Valley Orbit:

The Grass Valley Orbit software tool is used to configure Grass Valley products. The RollCall 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 an Video IP block with RollCall Control Panel is described in Section 5.1 "Initial Connection and Configuration" on page 50 and Section 5.2 "RollCall Control Panel Connection to MV-820" on page 51. For default IP addresses of the control network ports, see A.11.2 "MV-820-IP" on page 198.

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 Section 1.5 on page 15.)

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).

6.1 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 62.

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.

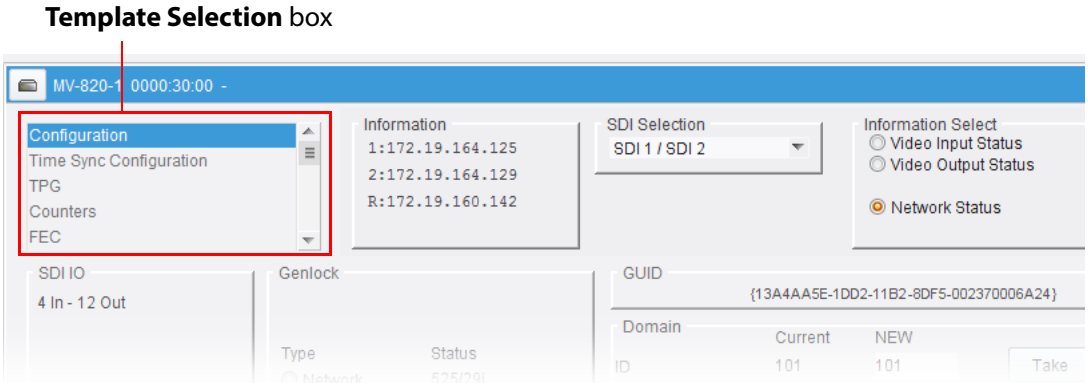


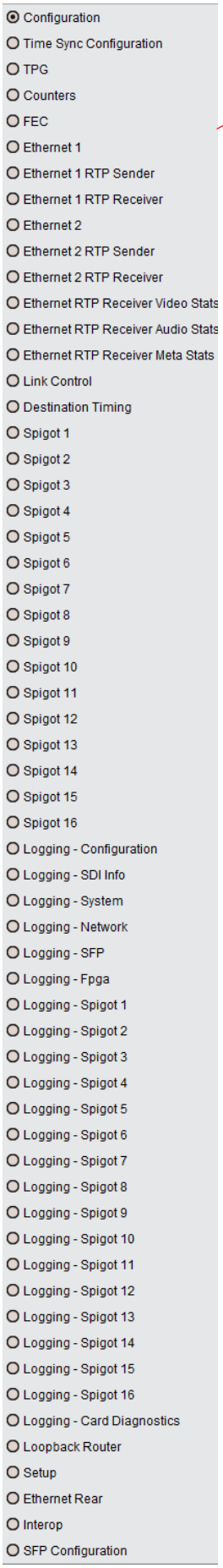
Figure 62 RollCall Initial Template Screen

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 63 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.



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 6.3 on page 83.
- **Time Sync Configuration** - see Section 6.4 on page 85.
- **TPG (Test Pattern Generator)** - see Section 6.5 on page 89.
- **Counters** - see Section 6.6 on page 91.
- **FEC** - see Section 6.7 on page 92.
- **Ethernet 1 and 2** - see Section 6.8 on page 94.
- **Ethernet 1 and 2 RTP Sender** - see Section 6.9 on page 98.
- **Ethernet 1 and 2 RTP Receiver** - see Section 6.10 on page 99.
- **Ethernet RTP Receiver Video Stats** - see Section 6.11 on page 100.
- **Ethernet RTP Receiver Audio Stats** - see Section 6.12 on page 101.
- **Ethernet RTP Receiver Metadata Stats** - see Section 6.13 on page 102.
- **Link Control** - see Section 6.14 on page 103.
- **Destination Timing** - see Section 6.15 on page 104.
- **Spigot 1 to 16** - see Section 6.16 on page 106.
- **Logging Configuration** - see Section 6.17 on page 120.
- **Logging SDI Info** - see Section 6.18 on page 121.
- **Logging System** - see Section 6.19 on page 122.
- **Logging Network** - see Section 6.20 on page 125.
- **Logging SFP** - see Section 6.21 on page 127.
- **Logging FPGA** - see Section 6.22 on page 130.
- **Logging Spigot 1 to 16** - see Section 6.23 on page 131.
- **Logging Card Diagnostics** - see Section 6.24 on page 134.
- **Loopback Router** - see Section 6.25 on page 135.
- **Setup** - see Section 6.26 on page 136.
- **Ethernet Rear** - see Section 6.27 on page 138.
- **Interop** - see Section 6.28 on page 140.
- **SFP Configuration** - see Section 6.29 on page 143.

Figure 63 Right-Click to get a List of Template Screens

6.1.1 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.

6.2 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 64.

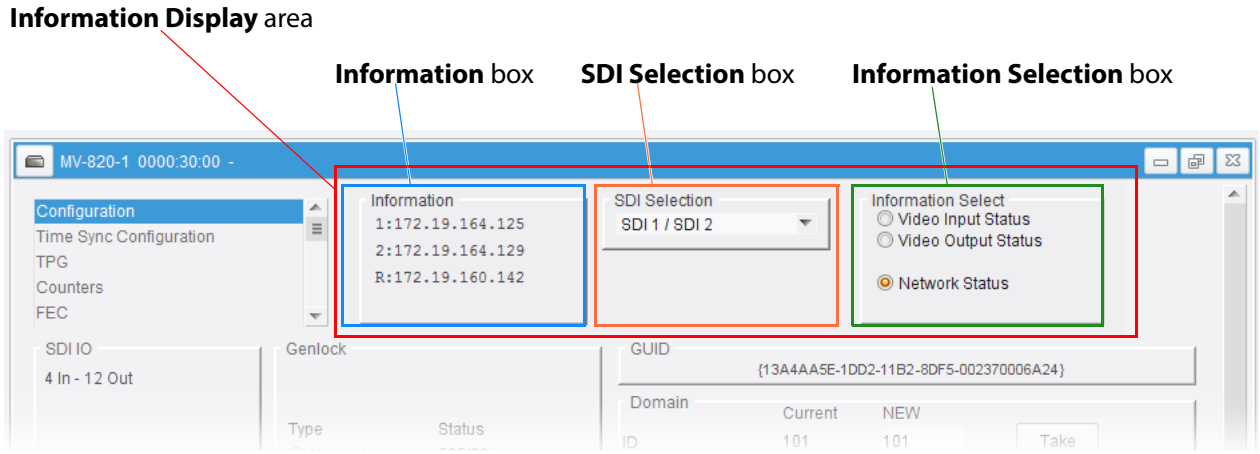
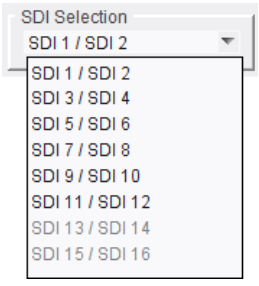


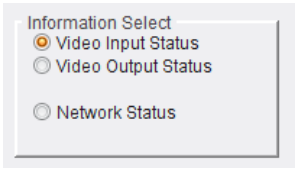
Figure 64 Information Display Area

6.2.1 Selecting the Information to Display

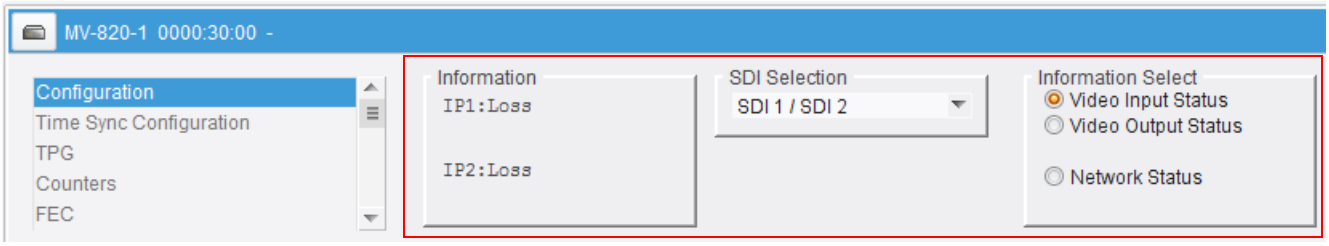
- Select the outputs to display data for from the **SDI Selection** drop-down list. (For each MV-820-IP Video IP block, select from SDI 1 to SDI 12.)



- 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 65a, Figure 65b and Figure 65c show some example **Information Display** areas.

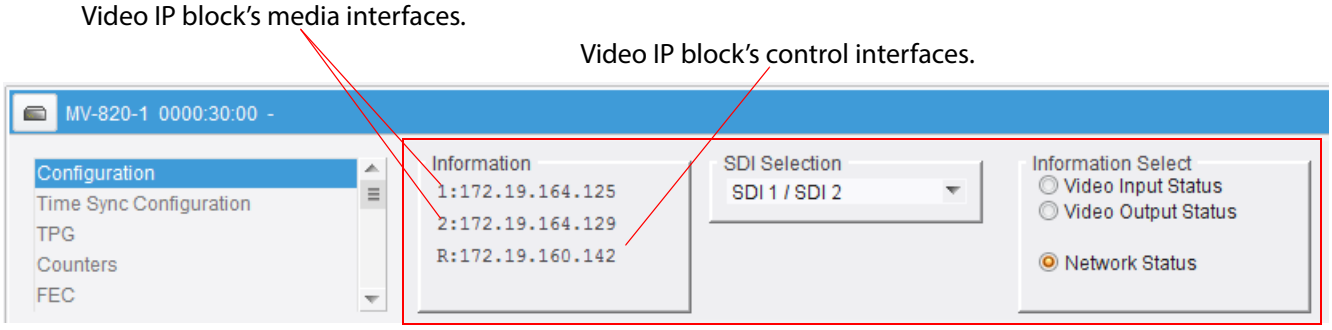


a) Video input status (for *internal* SDI 1 and SDI 2 video inputs to the Video IP block)

Note: Video IP streams *from* the MV-820-IP unit's Video IP block carry multiviewer display output pictures.
(See Section 1.5 "IP Routing Control" on page 15.)

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 1.3.2 "MV-820-IP: Video IP Circuitry" on page 7 and see Section 1.5 "IP Routing Control" on page 15)



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 Section 1.3.2 "MV-820-IP: Video IP Circuitry" on page 7 and Section 1.3.4.2 "MV-820-IP" on page 12.)

Figure 65 Example Information Display Areas:
a) Video Input Status example.
b) Video Output Status example.
c) Network Status example.

6.3 Configuration Template

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

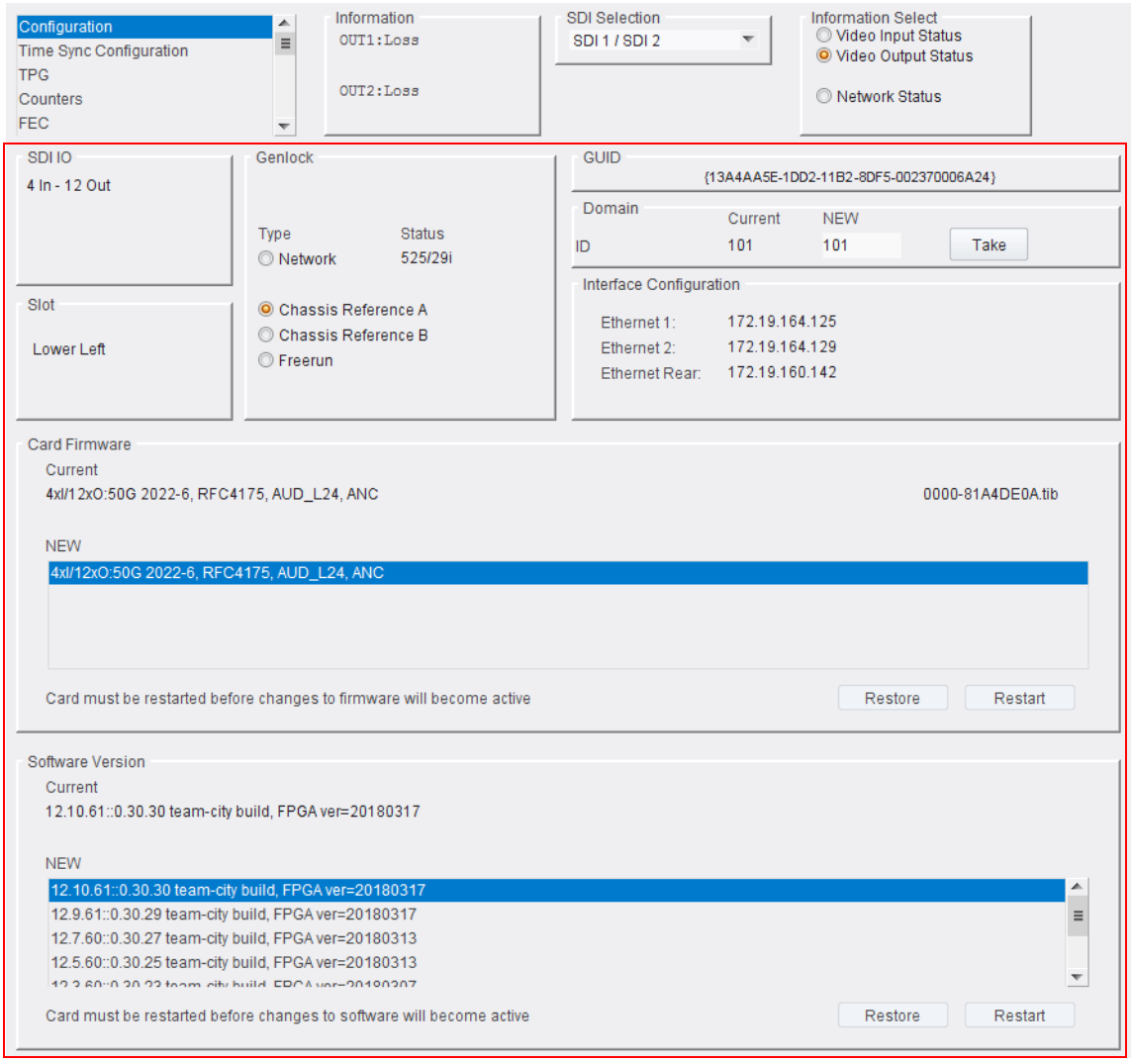


Figure 66 Configuration Template

The following facilities are available from this template:

Table 23 Configuration Template Settings

Configuration Setting	Operation
SDI IO	Displays how the source and destination spigots are currently configured.
Slot	A Video IP blocks sets up and reports the status of one QSFP28 transceiver on the unit rear. **Slot** identifies the position of the Video IP block's designated QSFP+ cage and QSFP28 transceiver on the MV-820-IP unit rear: • Lower Left, 'LINK B1' • Lower Right, 'LINK B2' • Upper Left, 'LINK A1' • Upper Right, 'LINK A2'

Table 23 Configuration Template Settings (Continued)

Configuration Setting	Operation
Genlock	Select **Genlock** type: • **Network** - click to select PTP. • **Chassis Reference A**/**B** - click to select which MV-820 external reference to use. • **Freerun** - click to allow free running.
GUID	Displays the absolute unique identifier associated with the MV-820-IP Video IP block.
Domain	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. 1. Set a new RollCall+ ID as required. 2. Press **Take** to confirm the change.
Interface Configuration	Displays the IP address for each of the network interfaces.
Card Firmware	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.
Software Version	Each software version may contain multiple firmware images. The current software version is shown.

6.3.1 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.

6.3.2 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.

6.4 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.

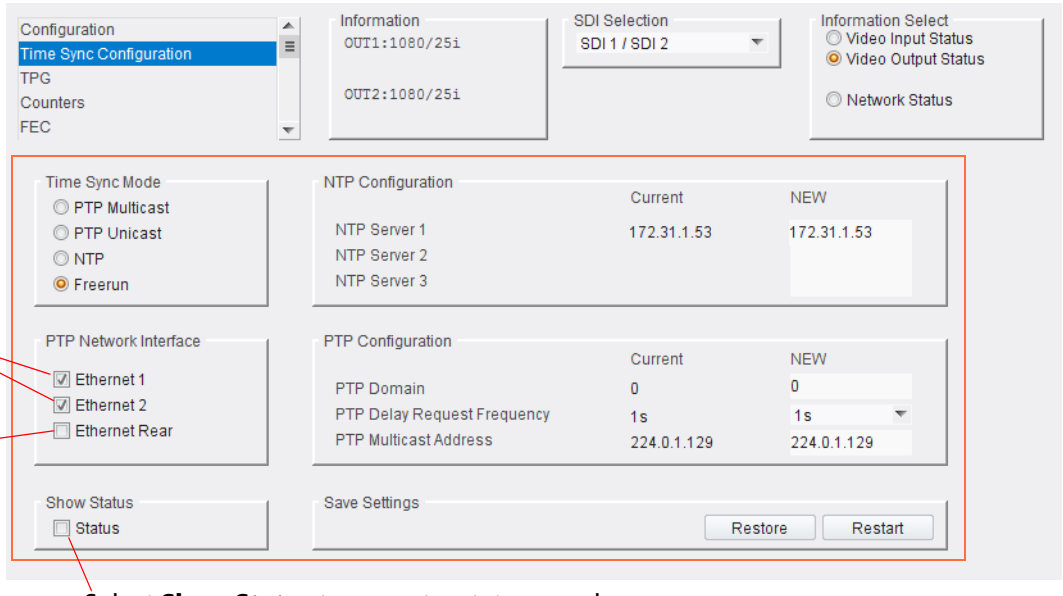


Figure 67 Time Sync Configuration Template

Table 24 Time Sync Configuration Template Settings

Time Sync Configuration Setting	Operation
Time Sync Mode	Select the required time sync mode. **Note:** PTP options require a grandmaster clock to be present in the network system.
NTP Configuration	NTP servers are listed. To add a new NTP server: • Enter server's IP address into the **New** field.
PTP Network Interface	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.
PTP Configuration	**PTP Domain:** Enter the PTP clock domain number. **PTP Delay Request Frequency**: Select the duration in the drop-down list, as required. **PTP Multicast:** Enter the appropriate IP address into the **PTP Multicast** address field.
Show Status	Select to display time sync status information in the template. See Section 6.4.1 "Time Sync Status Panel" on page 87.
Save Settings **Restore**	Displayed only if settings on this template are changed. Click **Restore** to discard the changes.

Table 24 Time Sync Configuration Template Settings (Continued)

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

6.4.1 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.

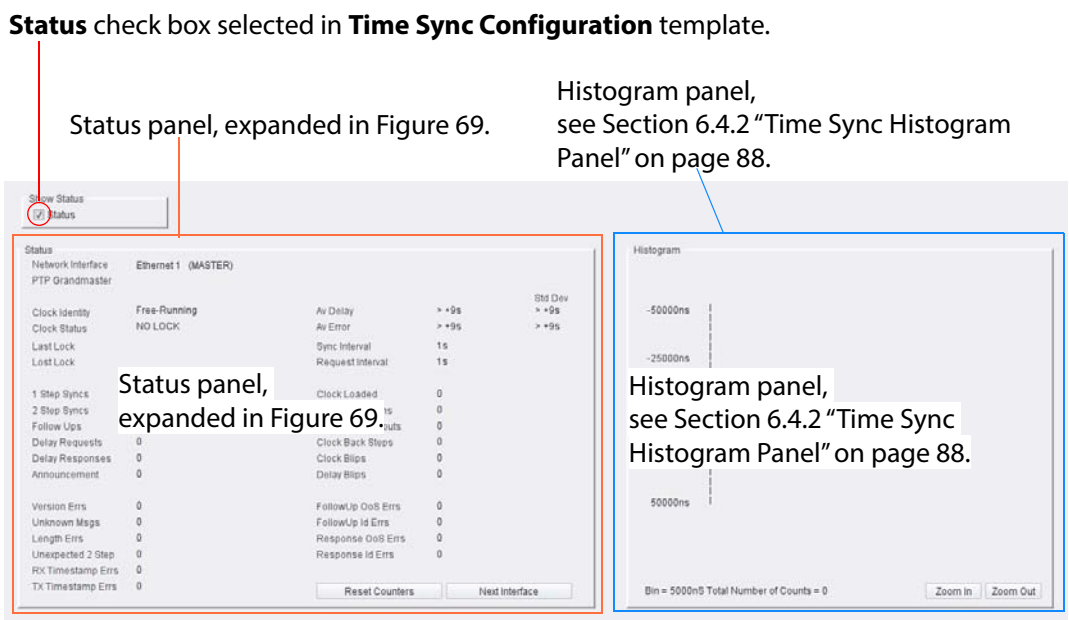


Figure 68 Time Sync Status

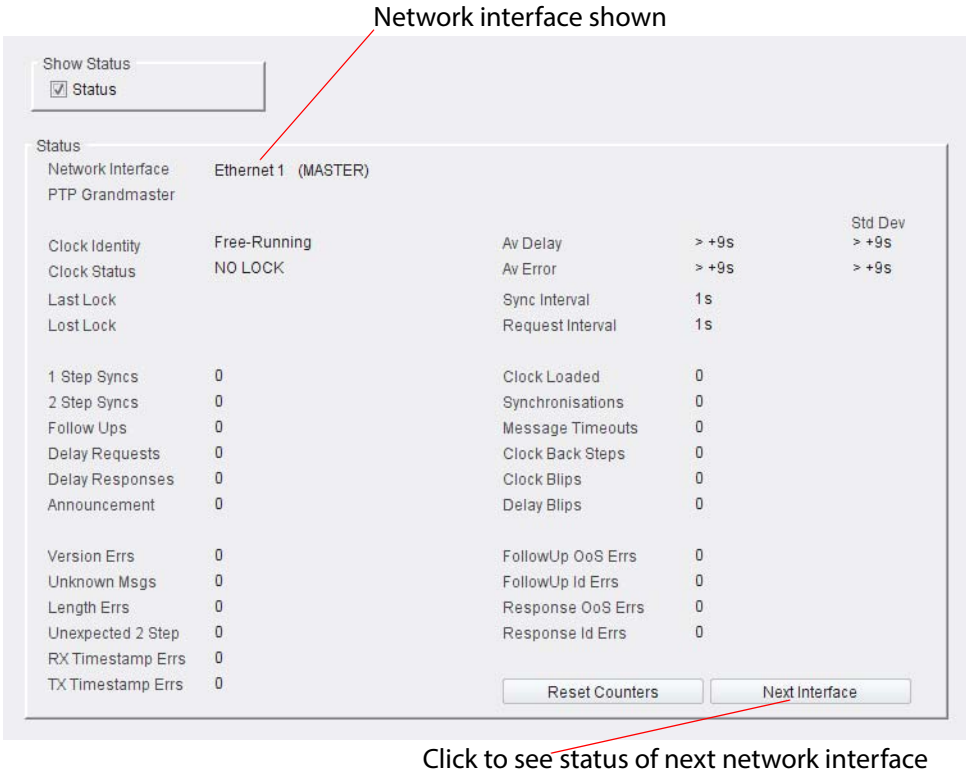


Figure 69 Time Sync - Status Panel

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.)

6.4.2 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.

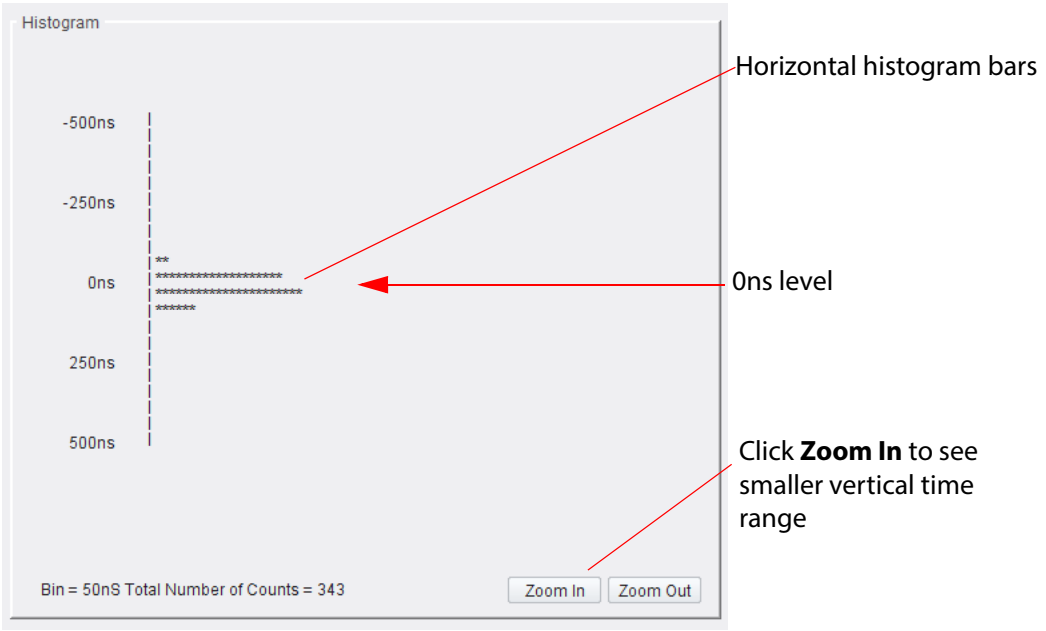


Figure 70 Time Sync Status - Histogram Panel

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.

6.5 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 71a.

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.

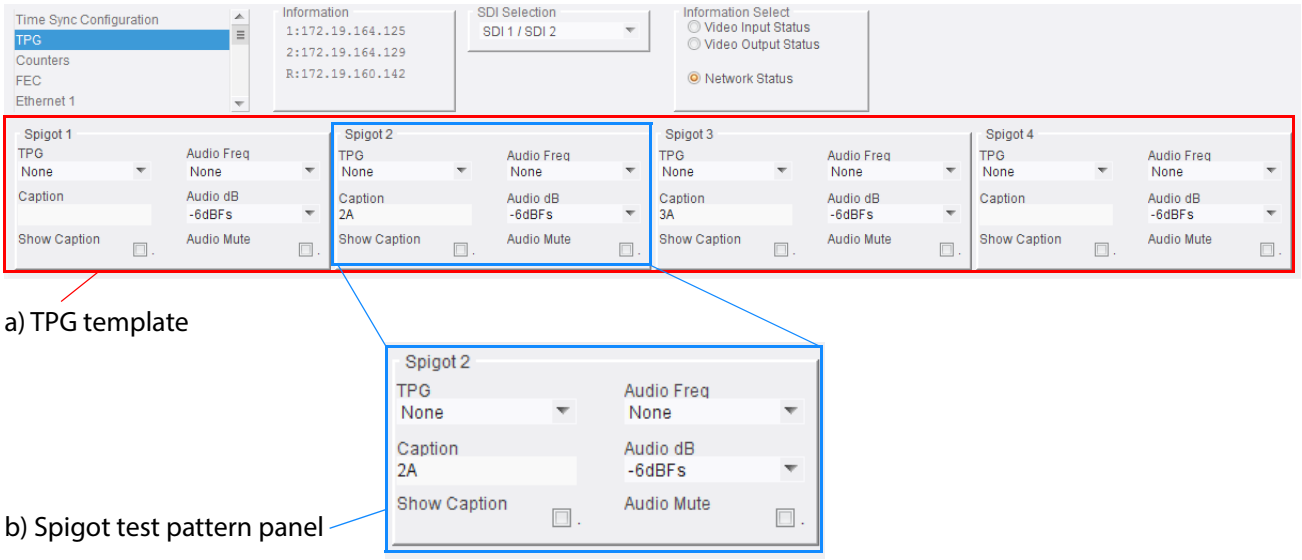


Figure 71 TPG Template and Spigot Test Pattern Panel:
a) Template.
b) Spigot Test Pattern Panel.

The following options are available for each spigot:

Table 25 Spigot Test Pattern Panel Settings

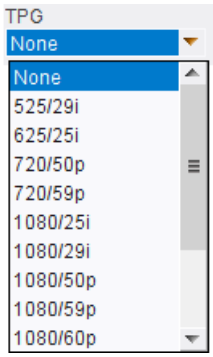
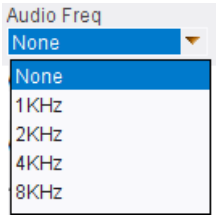
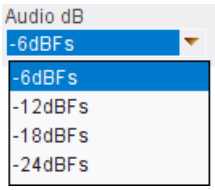
Spigot Test Pattern Setting	Operation
TPG	Select the video standard of the 'moving color bars' test pattern to apply to the spigot from the drop-down list. Select 'None' to turn off the test pattern. 

Table 25 Spigot Test Pattern Panel Settings (Continued)

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

6.6 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.

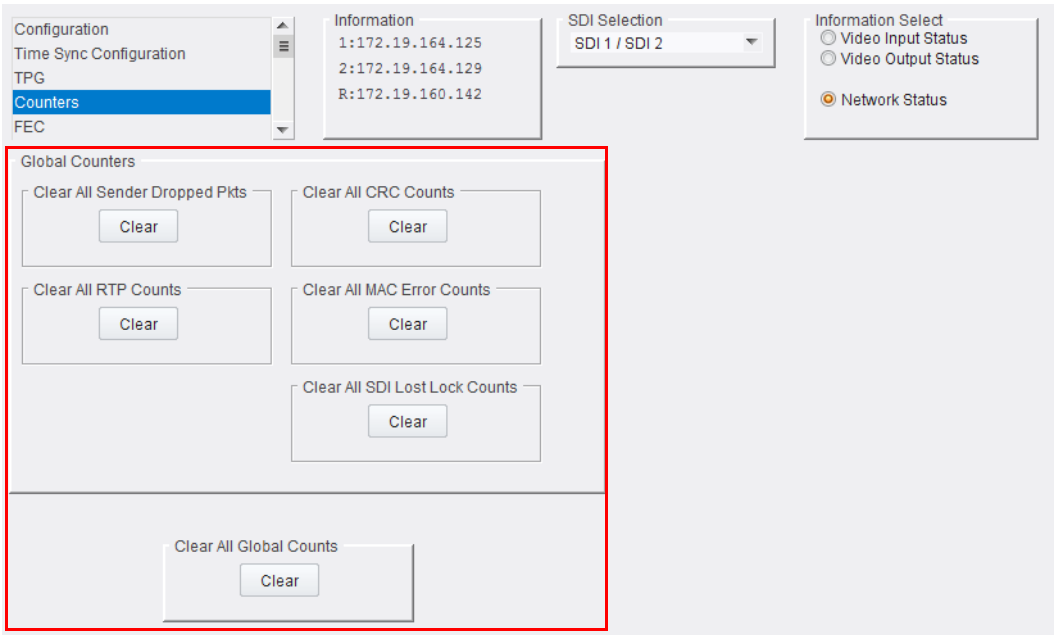


Figure 72 Counters Template

Table 26 Counters Template Settings

Control	Click to clear the counters for ...
Clear All Sender Dropped Pkts	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.
Clear All CRC Counts	CRC counters. These count any SDI video CRC errors in the *internal* multiviewer display output video signals (from the multiviewer block to the Video IP blocks).
Clear All RTP Counts	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.
Clear All MAC Error Counts	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.)
Clear All SDI Lost Lock Counts	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.
Clear All Global Counts	All the global counts.

6.7 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.

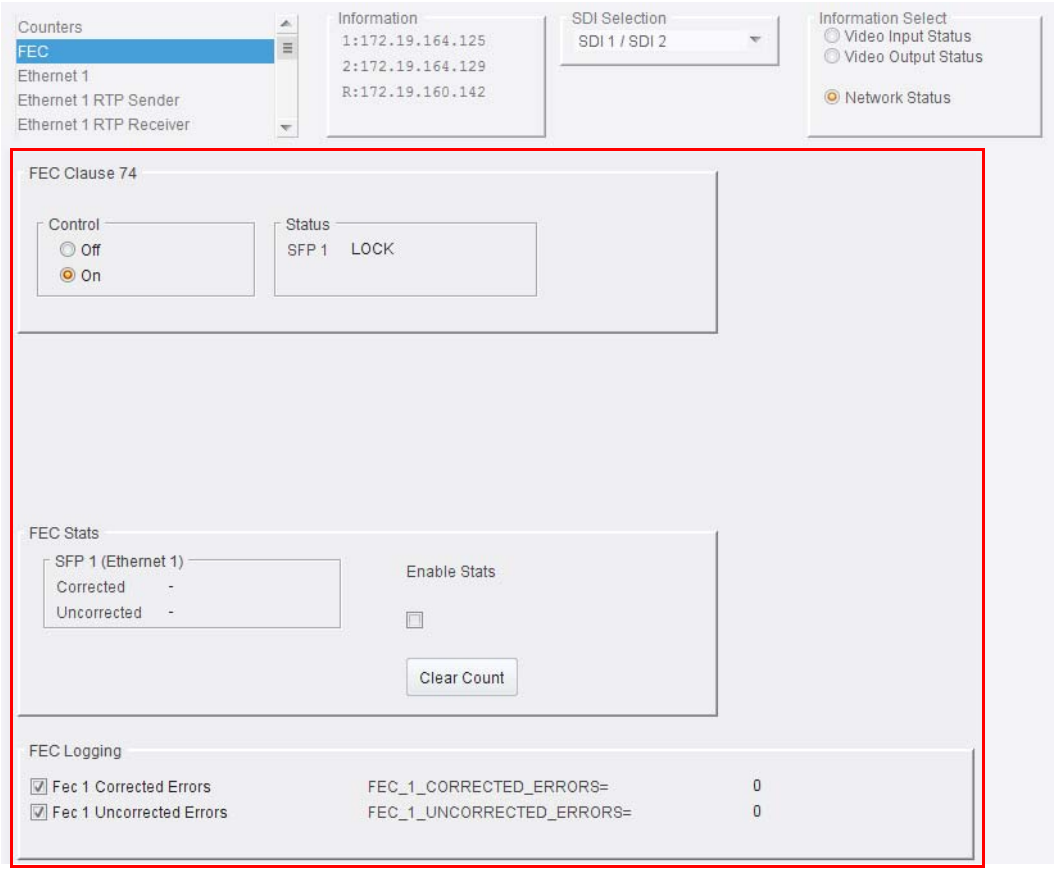


Figure 73 FEC Template

Table 27 FEC Template Settings

FEC Setting	Description
FEC Clause 74	**Allows low-latency FEC Clause 74 error correction to be used.** • Select **On** to enable FEC. • Select **Off** to disable FEC.
Status	Displays lock status for the QSFP28 of the Video IP.
FEC Stats	Displays the number of corrected and uncorrected errors received via the QSFP28 modules. • Select **Enable Stats** to activate the display. • Click **Clear Count** to clear the counters.
FEC Logging	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. Available log fields are shown in Table 28.

Table 28 FEC Log Fields

Log Field	Description
FEC_1_CORRECTED_ERRORS	Number of corrected errors for FEC 1.
FEC_1_UNCORRECTED_ERRORS	Number of uncorrected errors for FEC 1.

6.8 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 Section 1.3.2 "MV-820-IP: Video IP Circuitry" on page 7.

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.

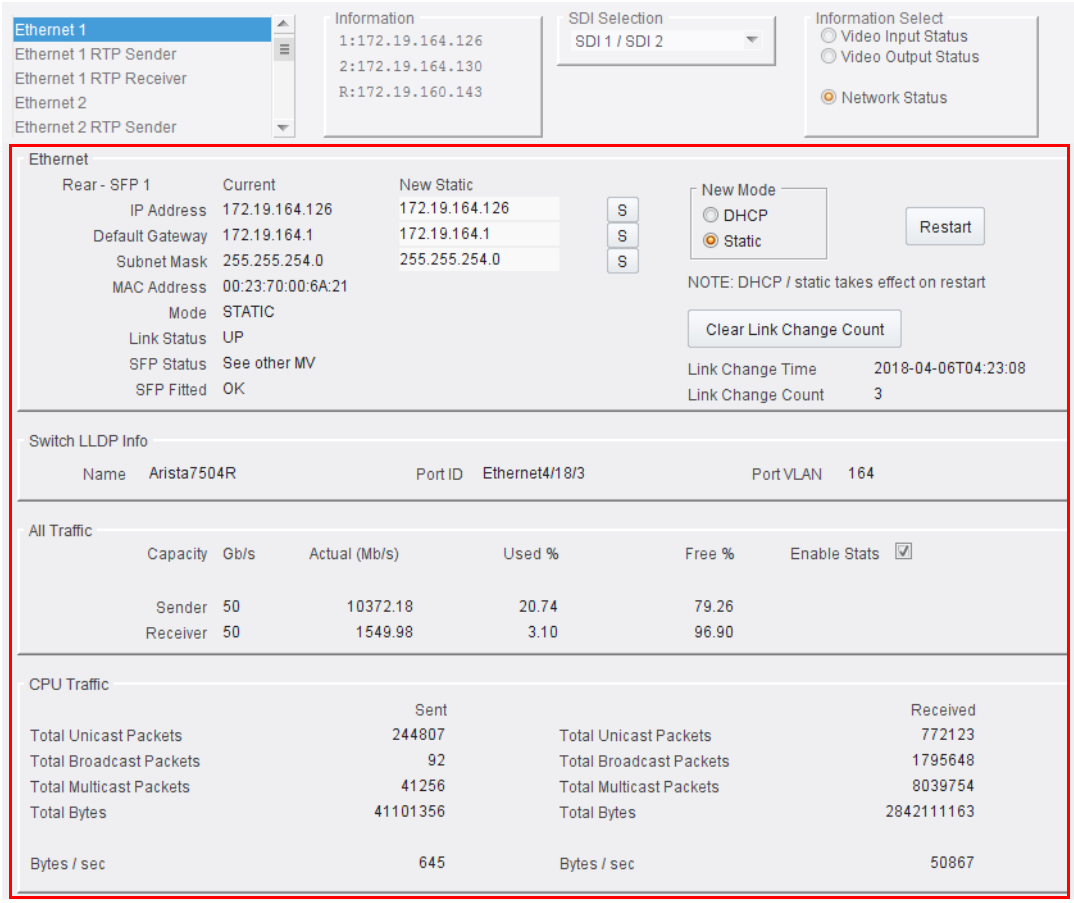


Figure 74 Ethernet 1 and Ethernet 2 Template (Ethernet 1Template shown)

The various panels in the template are described below:

- **Ethernet** panel
  - see Section 6.8.1 "Ethernet Panel" on page 95.
- **Switch LLDP Info** panel
  - see Section 6.8.2 "Switch LLDP Info Panel" on page 96.
- **All Traffic** panel
  - see Section 6.8.3 "All Traffic Panel" on page 97.
- **CPU Traffic** panel
  - see Section 6.8.4 "CPU Traffic Panel" on page 97.

6.8.1 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.

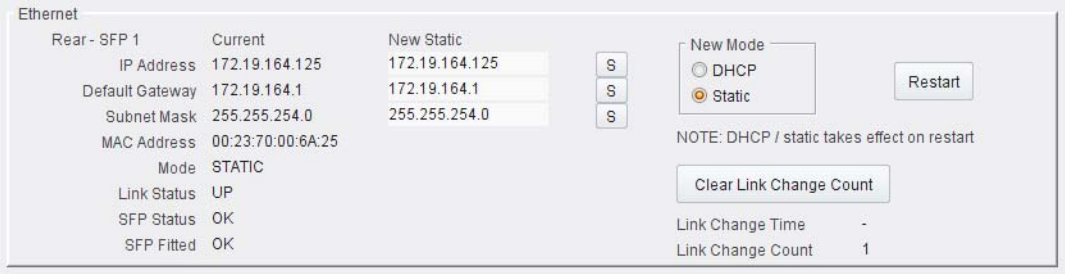


Figure 75 Ethernet Panel (of Ethernet 1 or 2 Templates)

Table 29 Ethernet Panel Settings and Controls

Ethernet Panel Item	Description
IP Address	Shows current IP address of the network interface. Allows entry of a new, static IP address. Click **S** to enter a new value into the text box.
Default Gateway	Shows current default gateway IP address. Allows entry of a new default gateway IP address.
Subnet Mask	Shows current subnet mask of the network interface. Allows entry of a new mask.
MAC Address	Shows the MAC address of the interface.
Mode	Shows the current mode of the network interface: DHCP or Static.
New Mode	Radio buttons. Note: Changes take effect after clicking Restart.
DHCP	Select for DHCP interface mode.
Static	Select for static interface mode.
Restart	Button. Click to make IP address and mode change take effect.
Link Status	Reports network link status: UP or DOWN.
SFP Status	Reports the status of the designated QSFP cage/transceiver: • OK • Fail • See other MV - Look on Video IP block's other Ethernet template (Eg. on **Ethernet 2** template instead of **Ethernet 1** template.)

Table 29 Ethernet Panel Settings and Controls (Continued)

Ethernet Panel Item	Description
SFP Fitted	Reports the fitted status of a QSFP cage/transceiver: • OK • Not Fitted
Clear Link Change Count	
	Button. Click to clear the link change count.
Link Change Time	Shows date and time of the last network link up or link down status change.
Link Change Count	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.

6.8.2 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 76.

Figure 76 IP Switch LLDP Info Panel

Table 30 IP Switch LLDP Panel Settings

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

6.8.3 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 77 (and see Figure 78).

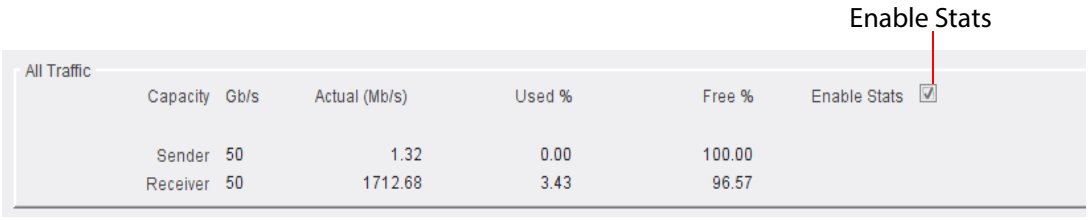


Figure 77 All Traffic Panel

6.8.4 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 78.

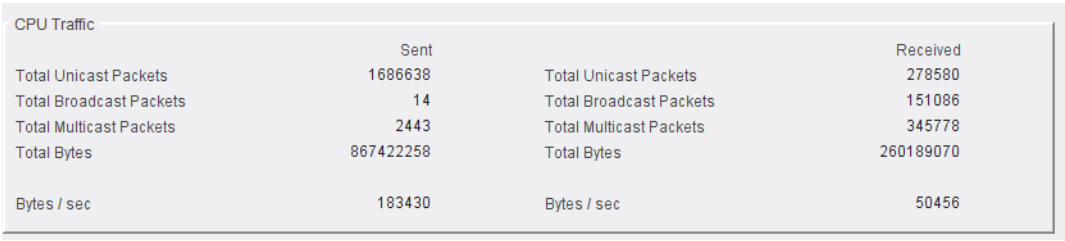


Figure 78 CPU Traffic Panel

6.9 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 79.

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

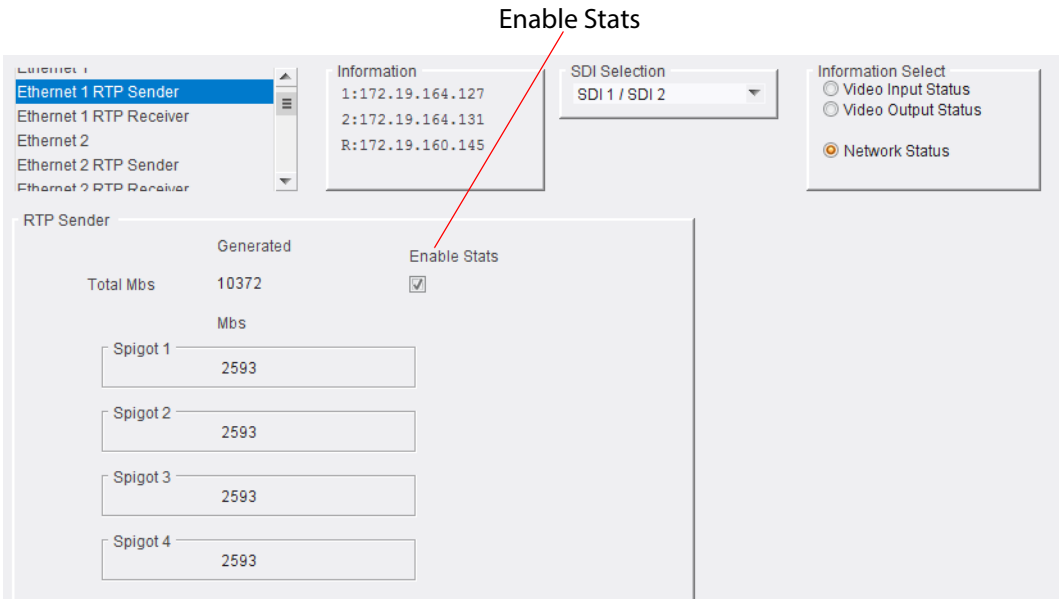


Figure 79 Ethernet RTP Sender Template

6.10 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.

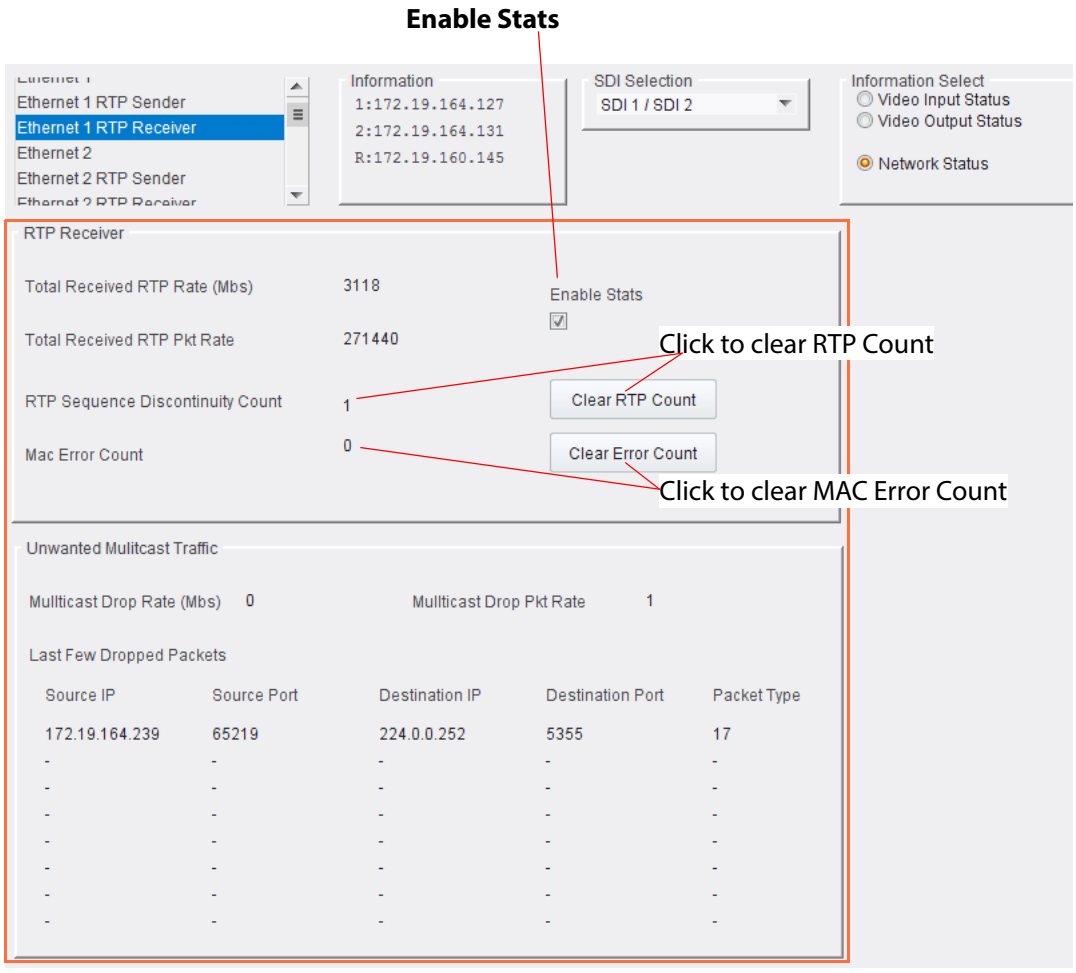


Figure 80 Ethernet RTP Receiver Template

6.11 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.

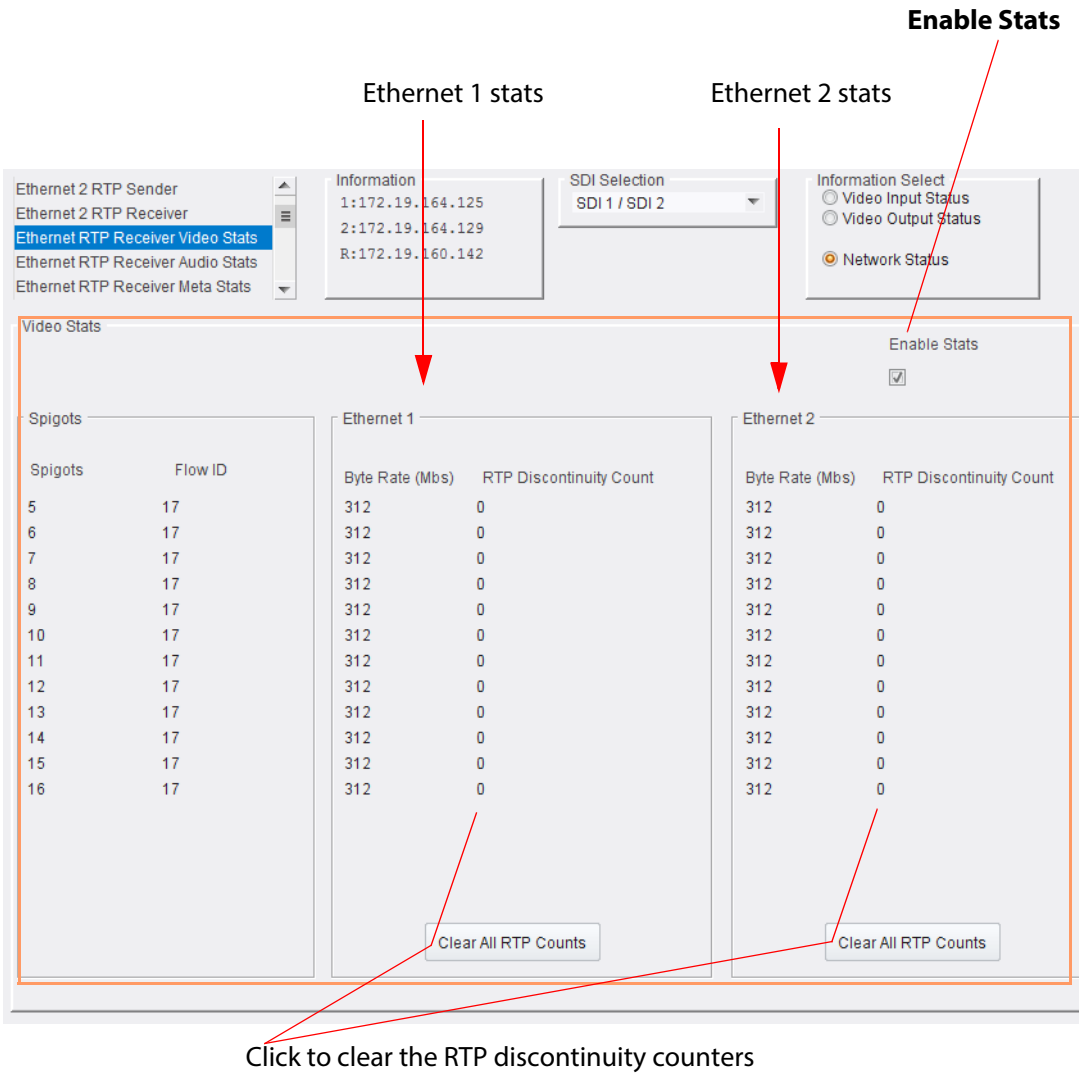


Figure 81 Ethernet RTP Receiver Video Stats Template

6.12 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.

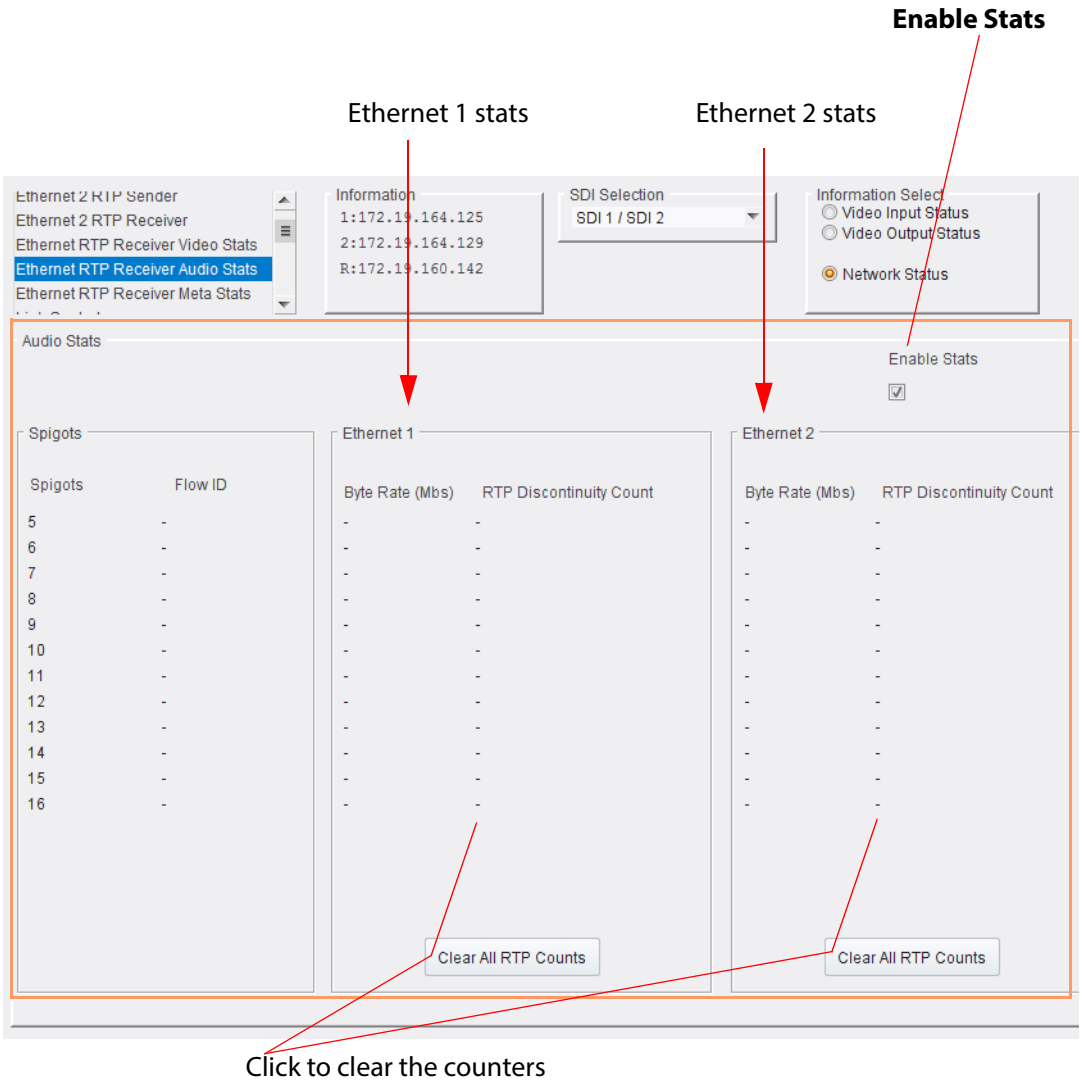


Figure 82 Ethernet RTP Receiver Audio Stats Template

6.13 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.

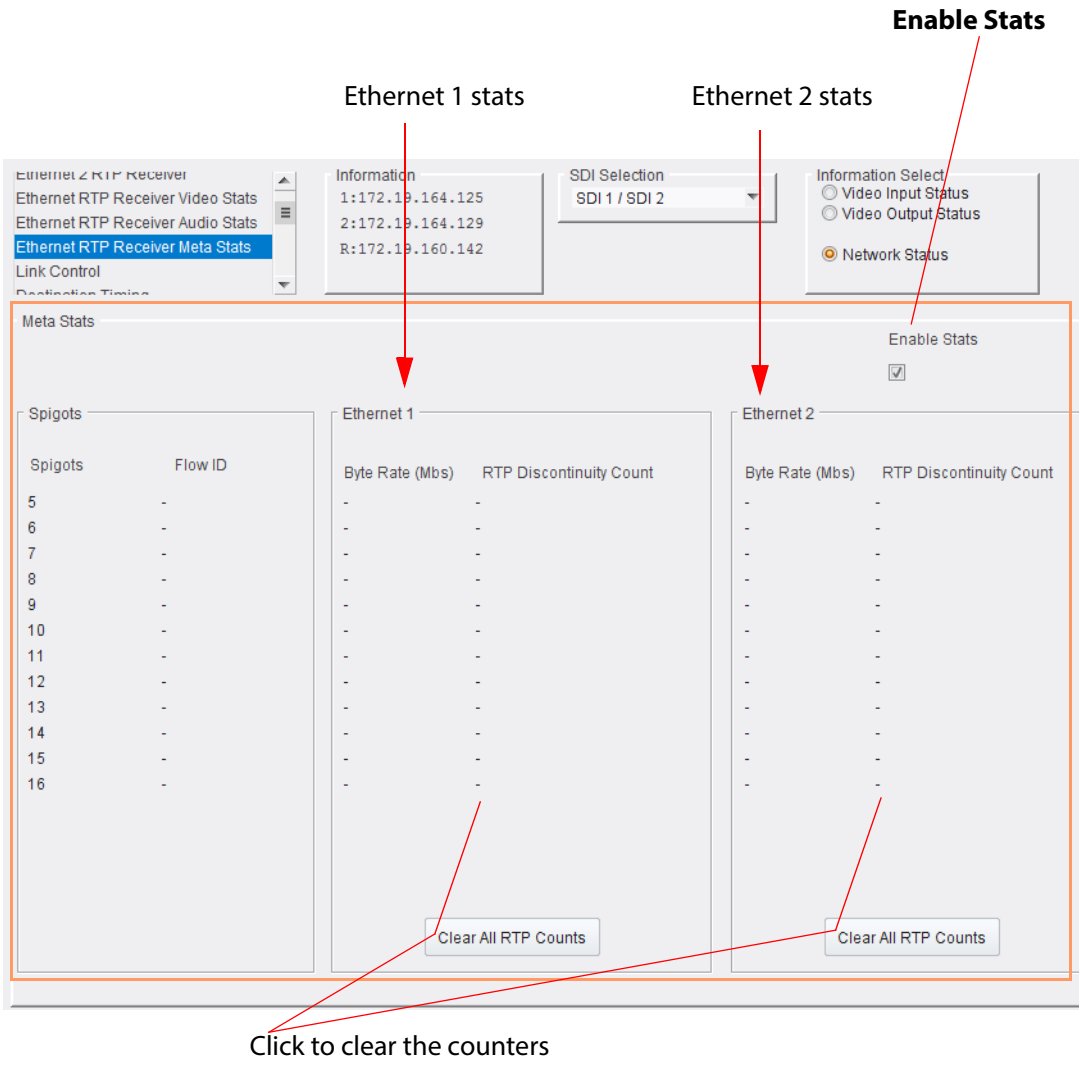


Figure 83 Ethernet RTP Receiver Meta Stats Template

6.14 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 84 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.

6.15 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).

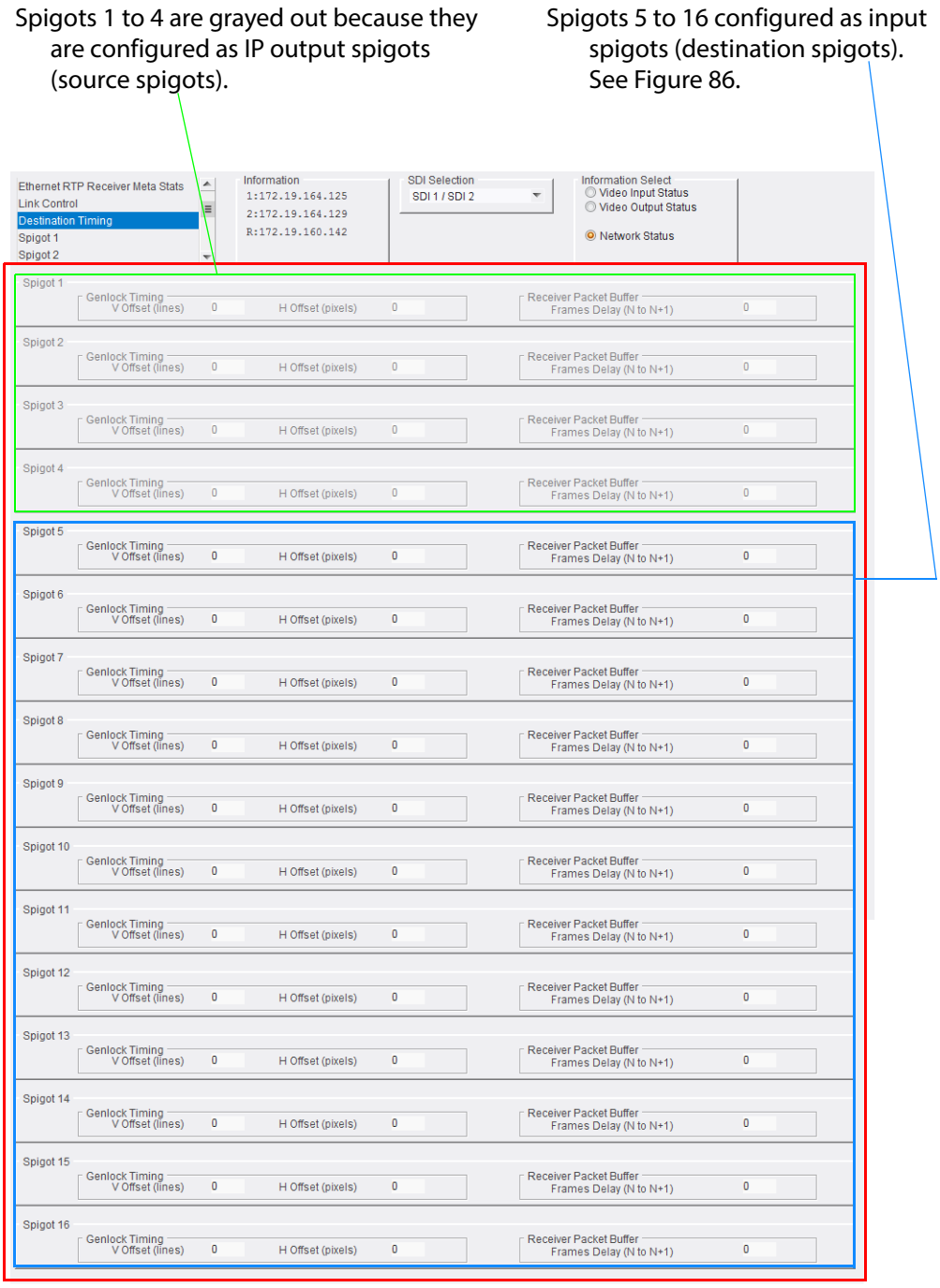


Figure 85 Destination Timing Template

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 86. A spigot panel is greed out for spigots not configured as destination spigots.

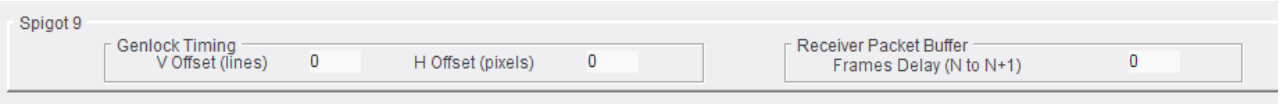


Figure 86 Destination Timing - Spigot Panel

Table 31 Destination Timing - Spigot Panel Information

Spigot Panel Item	Description
Genlock Timing:	Displays video timing with respect to the chosen video reference signal.
V Offset (lines)	Displays vertical timing offset in units of video lines.
H Offset (pixels)	Displays horizontal timing offset in units of pixels.
Receiver Packet Buffer	The receiver packet buffer can provide additional buffering to a received IP flow.
Frames Delay (N to N+1)	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.

6.16 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:

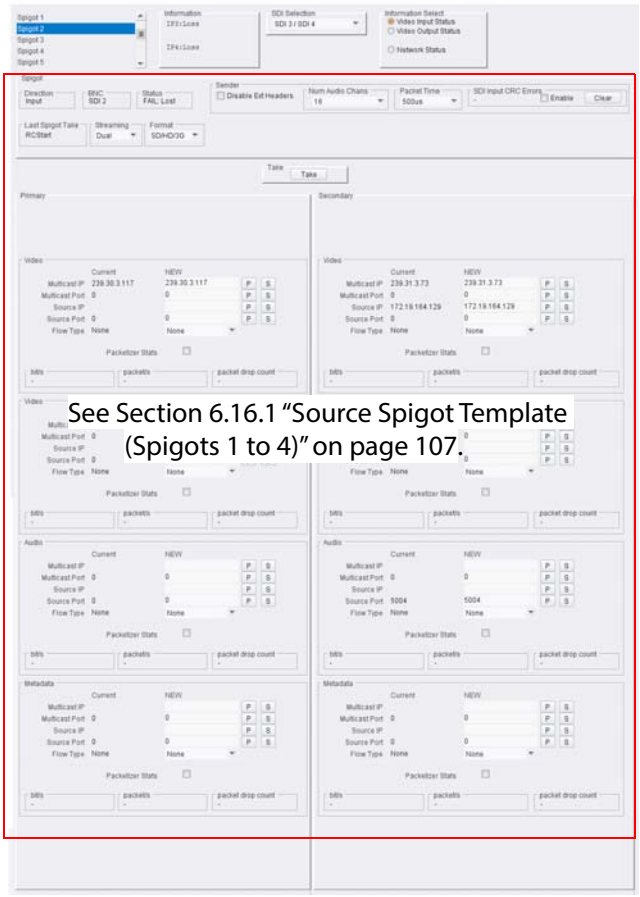
Reminder: For MV-820-IP Video IP blocks:

- **Spigots 1 to 4**: (See Section 6.16.1 on page 107.)

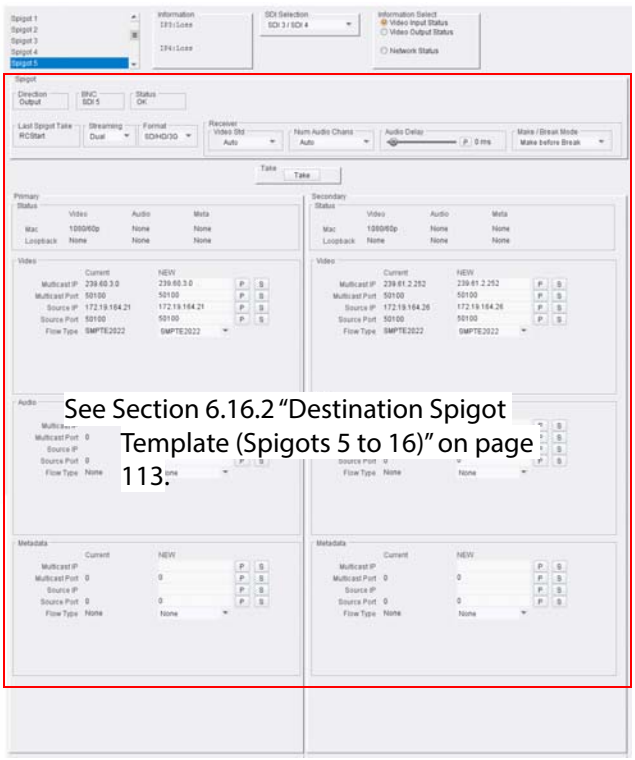
  Configured as **Source Spigots** to transmit video IP streams.

- **Spigots 5 to 16**: (See Section 6.16.2 on page 113.)

  Configured as **Destination Spigots** to receive video IP streams.



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



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

Figure 87 Spigot Template:
a) Source Spigot.
b) Destination Spigot.

6.16.1 Source Spigot Template (Spigots 1 to 4)

The **Source Spigot** template is shown in Figure 88.

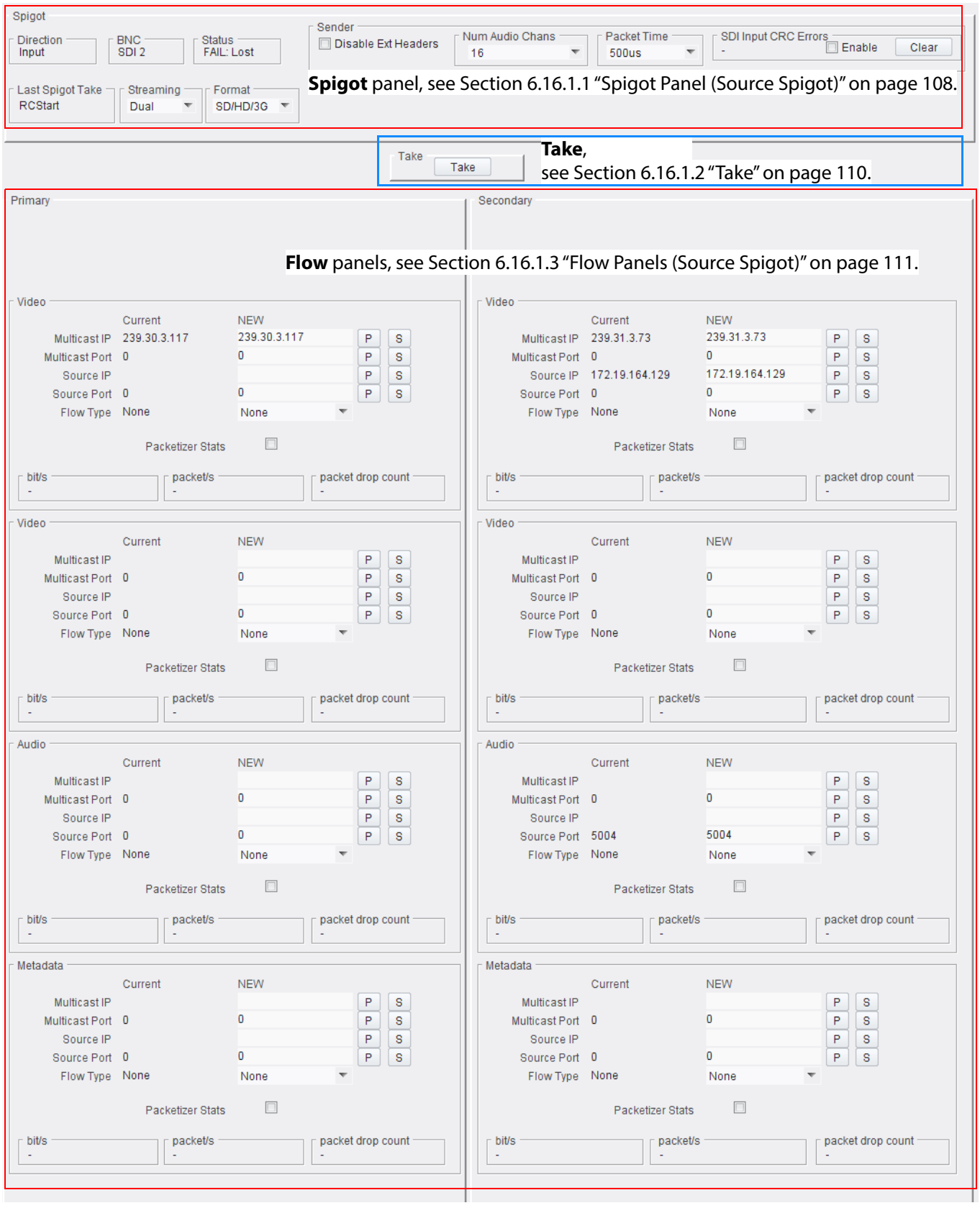


Figure 88 Source Spigot Template

6.16.1.1 Spigot Panel (Source Spigot)

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

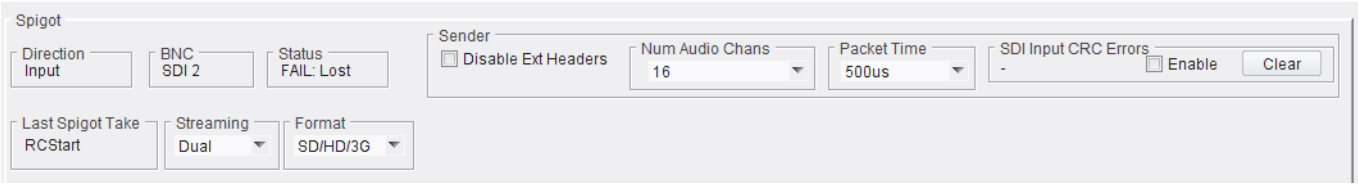


Figure 89 Spigot Panel (Source Spigot)

Table 32 Spigot Panel Information (Source Spigot)

Spigot Panel Item (Source Spigot)	Description
Direction	Shows the direction of the spigot. • 'Input': Within the MV-820-IP unit, the spigot has an SDI input and it provides a video IP output externally. • 'Output': Within the MV-820-IP unit, the spigot has an SDI output and it receives a video IP input externally.
BNC	Shows the associated (notional) SDI connector number. (Spigots 1 to 16 use notional BNC-type connectors 1 to 16 respectively.)
Status	Reports the current status of the spigot. • OK • Warn:TPG • FAIL:Lost
Last Spigot Take	Reports the 'control agency' which last performed a **Take** on the spigot. • RC - RollCall. Operation from a control panel or by an external agent, like VSM. • IPCtrl - Grass Valley Orbit.

Table 32 Spigot Panel Information (Source Spigot) (Continued)

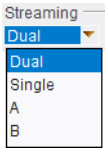
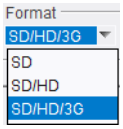
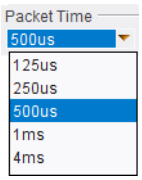
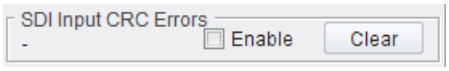
Spigot Panel Item (Source Spigot)	Description
Streaming	Drop down box. Select the Video IP block's Ethernet connections to use for this spigot. This will also determine the bandwidth to be used. Options are: • **Dual** - use both connections and all the available bandwidth. • **Single** - use either connection and half of the available bandwidth. • **A or B** - use one particular connection and half of the available bandwidth. 
Format	Drop down box. Select the video format to be used on this spigot. This will ensure that the appropriate level of bandwidth is allocated. 
Sender:	
Disable Ext Headers	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: 1. Select **Disable Extended Headers**. 2. Click **Take**.
Num Audio Chans	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.

Table 32 Spigot Panel Information (Source Spigot) (Continued)

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

6.16.1.2 Take

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

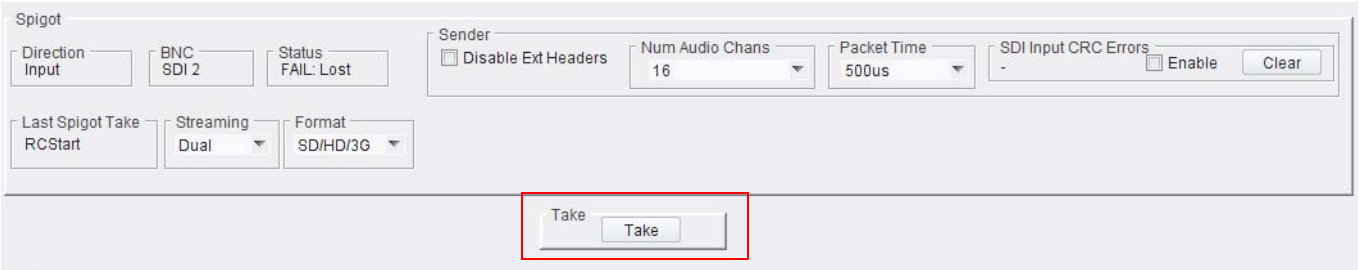


Figure 90 Take

6.16.1.3 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 91 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 33.

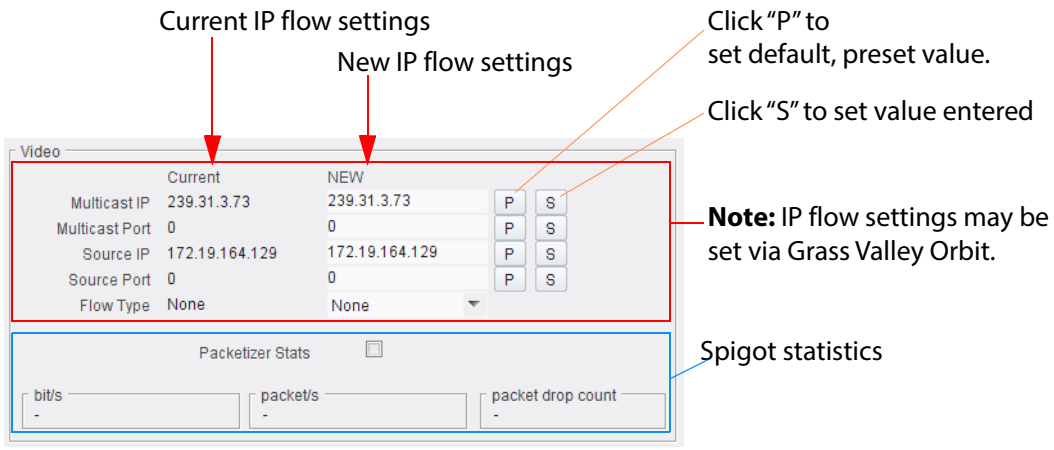


Figure 91 Flow Panel (Video Flow Example shown)

Table 33 Flow Panel Information and Settings (Source Spigot)

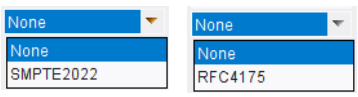
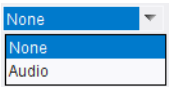
Flow Panel Item	Description	
Multicast IP	Multicast group IP address.	See **Note 1**.
Multicast Port	Multicast group IP port number.	See **Note 1**.
Source IP	Source IP address.	See **Note 1**.
Source Port	Source IP port number.	See **Note 1**.
Flow Type	Drop down box. Select the flow type. • Video flow types: (**Note:** Two simultaneous video flows are possible from the source spigot.)  • Audio flow types:  • Metadata flow types: 	See **Note 1**.

Table 33 Flow Panel Information and Settings (Source Spigot) (Continued)

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

6.16.2 Destination Spigot Template (Spigots 5 to 16)

The **Destination Spigot** template is shown in Figure 92.

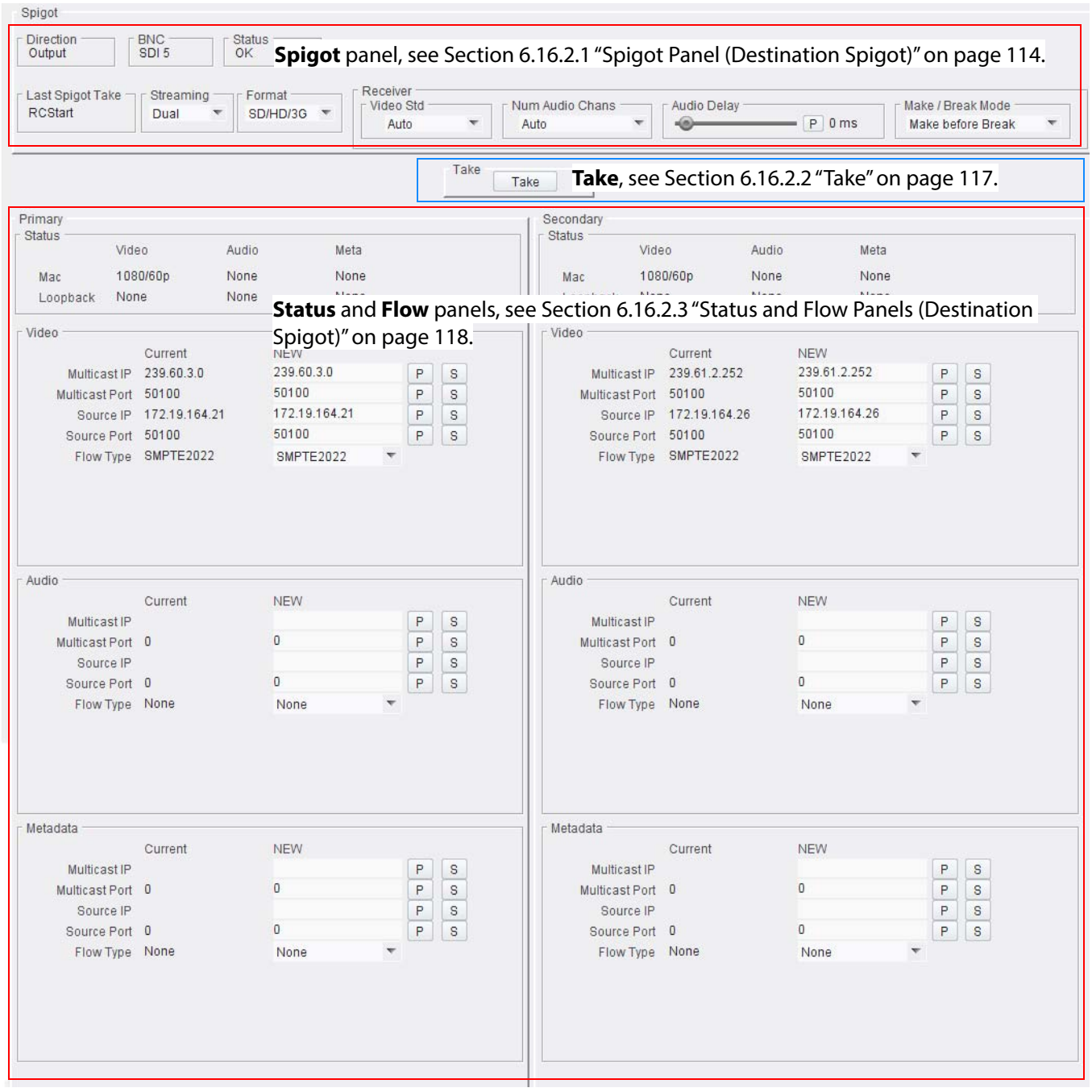


Figure 92 Destination Spigot Template

6.16.2.1 Spigot Panel (Destination Spigot)

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

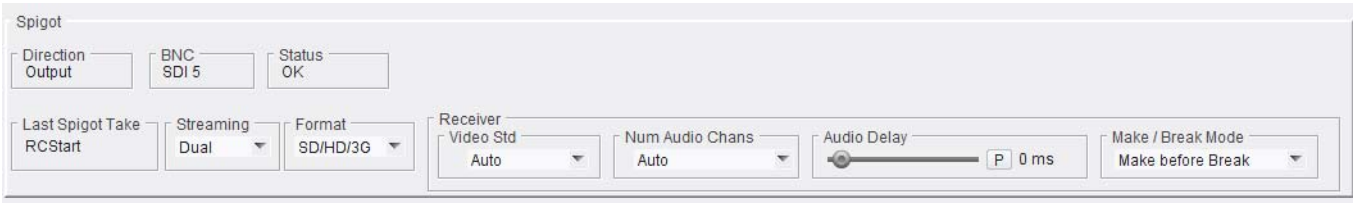


Figure 93 Spigot Panel (Destination Spigot)

Table 34 Spigot Panel Information (Destination Spigot)

Spigot Panel Item (Destination Spigot)	Description
Direction	Shows the direction of the spigot. • 'Input': Within the MV-820-IP unit, the spigot has an SDI input and it provides a video IP output externally. • 'Output': Within the MV-820-IP unit, the spigot has an SDI output and it receives a video IP input externally.
BNC	Shows the associated (notional) SDI connector number. (Spigots 1 to 16 use notional BNC-type connectors 1 to 16 respectively.)
Status	Reports the current status of the spigot. • OK • Warn:TPG • FAIL:Lost
Last Spigot Take	Reports the 'control agency' which last performed a **Take** on the spigot. • RC - RollCall. Operation from a control panel or by an external agent, like VSM. • IPCtrl - Grass Valley Orbit.

Table 34 Spigot Panel Information (Destination Spigot) (Continued)

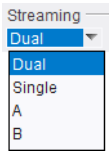
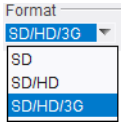
Spigot Panel Item (Destination Spigot)	Description
Streaming	Drop down box. Select the Video IP block's Ethernet connections to use for this spigot. This will also determine the bandwidth to be used. Options are: • **Dual** - use both connections and all the available bandwidth. • **Single** - use either connection and half of the available bandwidth. • **A or B** - use one particular connection and half of the available bandwidth. 
Format	Drop down box. Select the video format to be used on this spigot. This will ensure that the appropriate level of bandwidth is allocated. 

Table 34 Spigot Panel Information (Destination Spigot) (Continued)

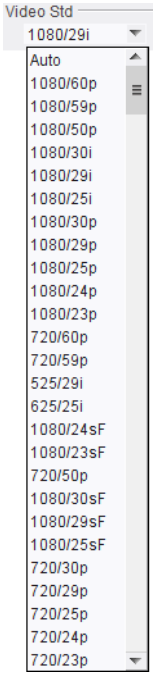
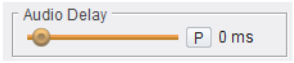
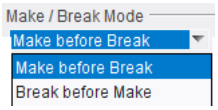
Spigot Panel Item (Destination Spigot)	Description
Receiver:	
Video Std	Drop down box. Select the video standard (resolution / frame rate) for the receiving spigot. This is the video standard output from the spigot as SDI video. 
Num Audio Chans	Drop down box. Select the number of audio channels to use. (1 to 32) 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.
Audio Delay	Slider control. Select the audio delay. (-10 ms to 255 ms) Click **P** to set the preset, default value. 

Table 34 Spigot Panel Information (Destination Spigot) (Continued)

Spigot Panel Item (Destination Spigot)	Description
Make / Break Mode	Drop down box. Select the make/break mode when changing the video IP signal to the spigot. **Make before Break** - 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. **Break before Make** - simply swaps IP data stream received at the destination spigot without buffering. 

6.16.2.2 Take

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

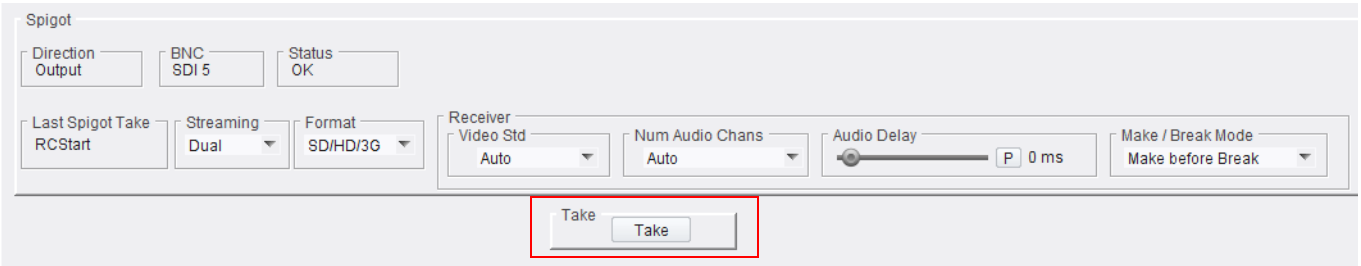


Figure 94 Take

6.16.2.3 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 95).

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:

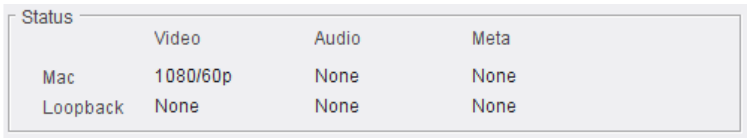


Figure 95 Status Panel

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 91 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 35.

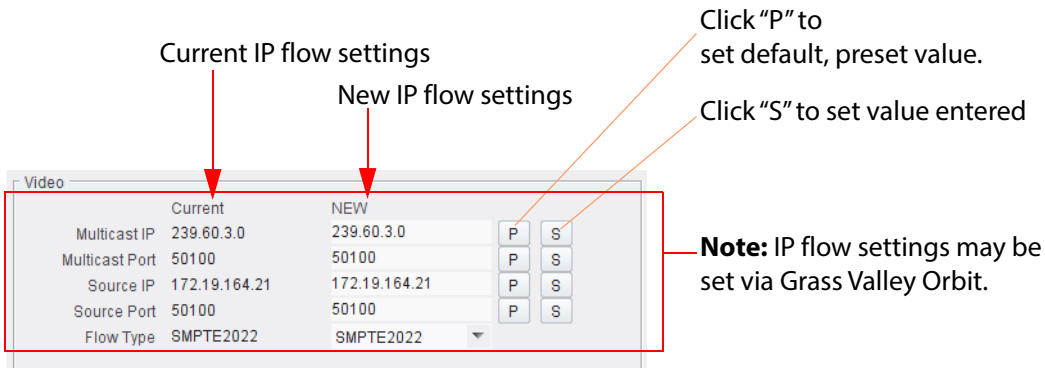
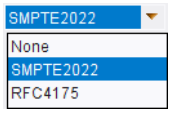
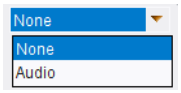
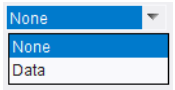


Figure 96 Flow Panel (Video Flow Example)

Table 35 Flow Panel Information and Settings (Destination Spigot)

Flow Panel Item (Destination Spigot)	Description	
Multicast IP	Multicast group IP address.	See **Note 1**.
Multicast Port	Multicast group IP port number.	See **Note 1**.
Source IP	Source IP address.	See **Note 1**.
Source Port	Source IP port number.	See **Note 1**.
Flow Type	Drop down box. Select the flow type. • Video flow types:  • Audio flow types:  • Metadata flow types: 	See **Note 1**.
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.

6.17 Logging Configuration Template

The **Logging Configuration** template configures a connection to a RollCall LogServer. Figure 97 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).

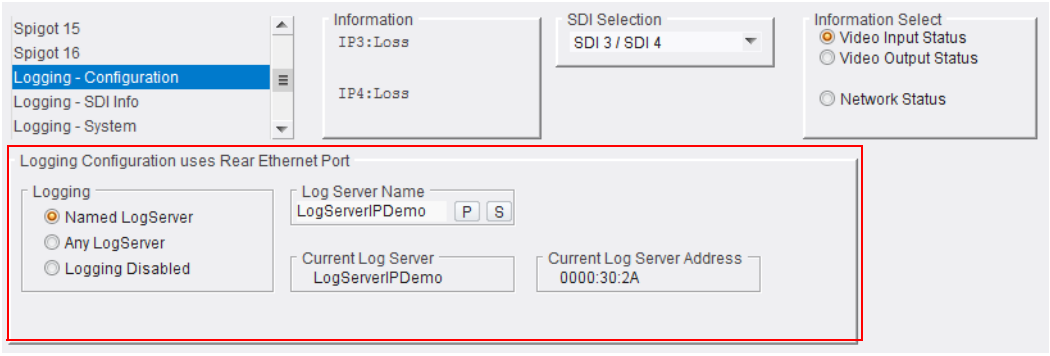


Figure 97 Logging Configuration Template

Table 36 Logging Configuration Template Settings

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

6.18 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 98 shows an example template.

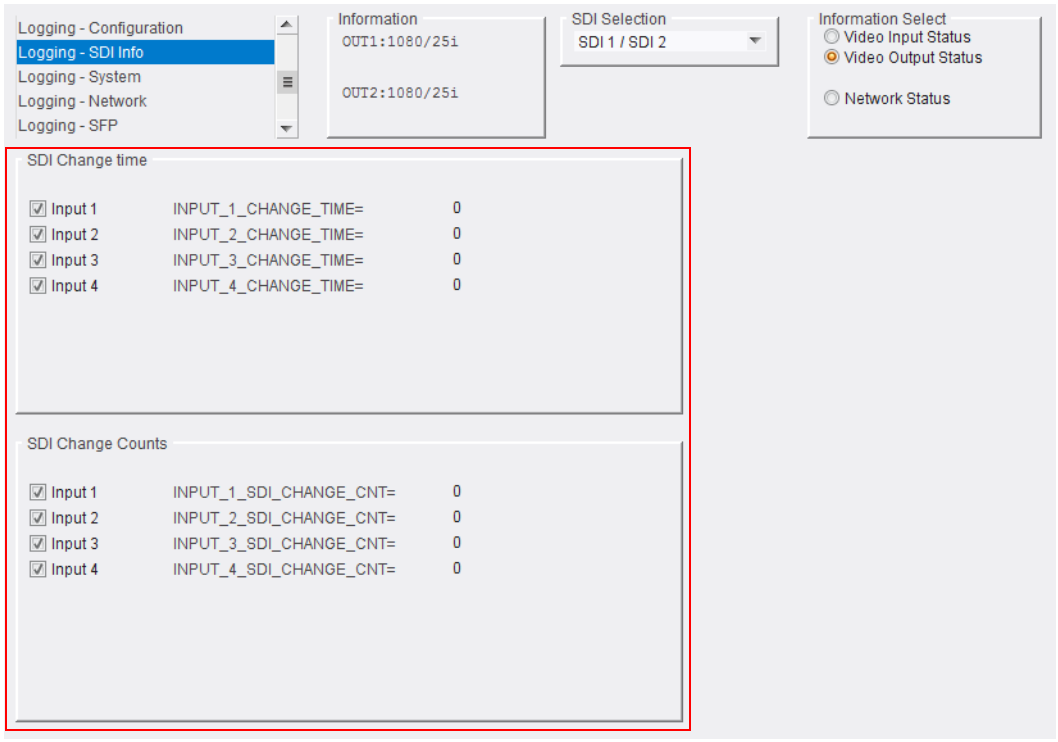


Figure 98 Logging SDI Info Template

Table 37 Logging SDI Info Template - Settings

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

6.19 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 99 shows an example template.

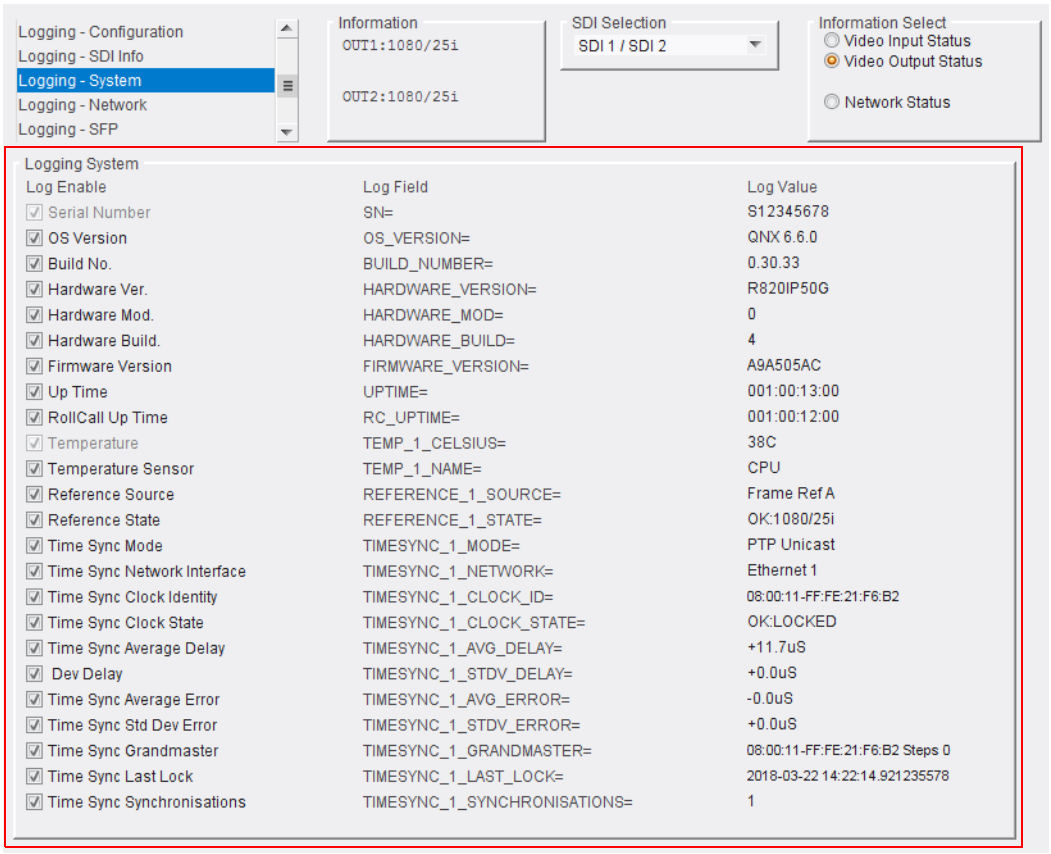


Figure 99 Logging System Template

Log fields are described in Table 38.

Table 38 Logging System Log Fields

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

Table 38 Logging System Log Fields (Continued)

Log Field	Description
UPTIME	Reports the time since the last Video IP block restart in the format *ddd:hh:mm:ss*.
RC_UPTIME	Reports the time since the last RollCall logserver restart in the format *ddd:hh:mm:ss*.
TEMP_N_NAME	Temperature measurement name.
TEMP_N_CELSIUS	Reports the temperature status.
REFERENCE_N_SOURCE	Reports time reference source.
REFERENCE_N_STATE	Valid values are: • **OK: Locked** • **OK: Input** • **WARN: Freerun** • **WARN: CrossLock**
TIMESYNC_N_MODE	Valid values are: • **Free running:** Card is using its own clock with no reference to any other source**.** • **PTP Multicast:** Card is synchronizing to a PTP grandmaster clock using multicast network messages. • **PTP Unicast:** As **PTP Multicast** but using the delay request. Reply messages are unicast to minimize network traffic**.** • **NTP**: Module clock is synchronized to an NTP clock. Generally less precise than PTP.
TIMESYNC_N_NETWORK	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.
TIMESYNC_N_CLOCK_ID	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.
TIMESYNC_N_CLOCK_STATE	Valid values are: • **Free running**: Card is not being synchronized. • **No Lock**: PTP being used but clocks haven't synchronized within +/- 1mS. • **Locked**: PTP being used and clocks are within the accepted range. • **NTP**: Module using NTP to synchronize.
TIMESYNC_N_AVG_DELAY	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 38 Logging System Log Fields (Continued)

Log Field	Description
TIMESYNC_N_STDV_DELAY	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.
TIMESYNC_N_AVG_ERROR	The current difference between the cards time and the grandmaster time. Should be close to zero once card has synchronized.
TIMESYNC_N_STDV_ERROR	The standard deviation in the average error.
TIMESYNC_N_ GRANDMASTER	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.
TIMESYNC_N_LAST_LOCK	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.
TIMESYNC_N_ SYNCHRONISATIONS	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.

6.20 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 100 shows an example template.

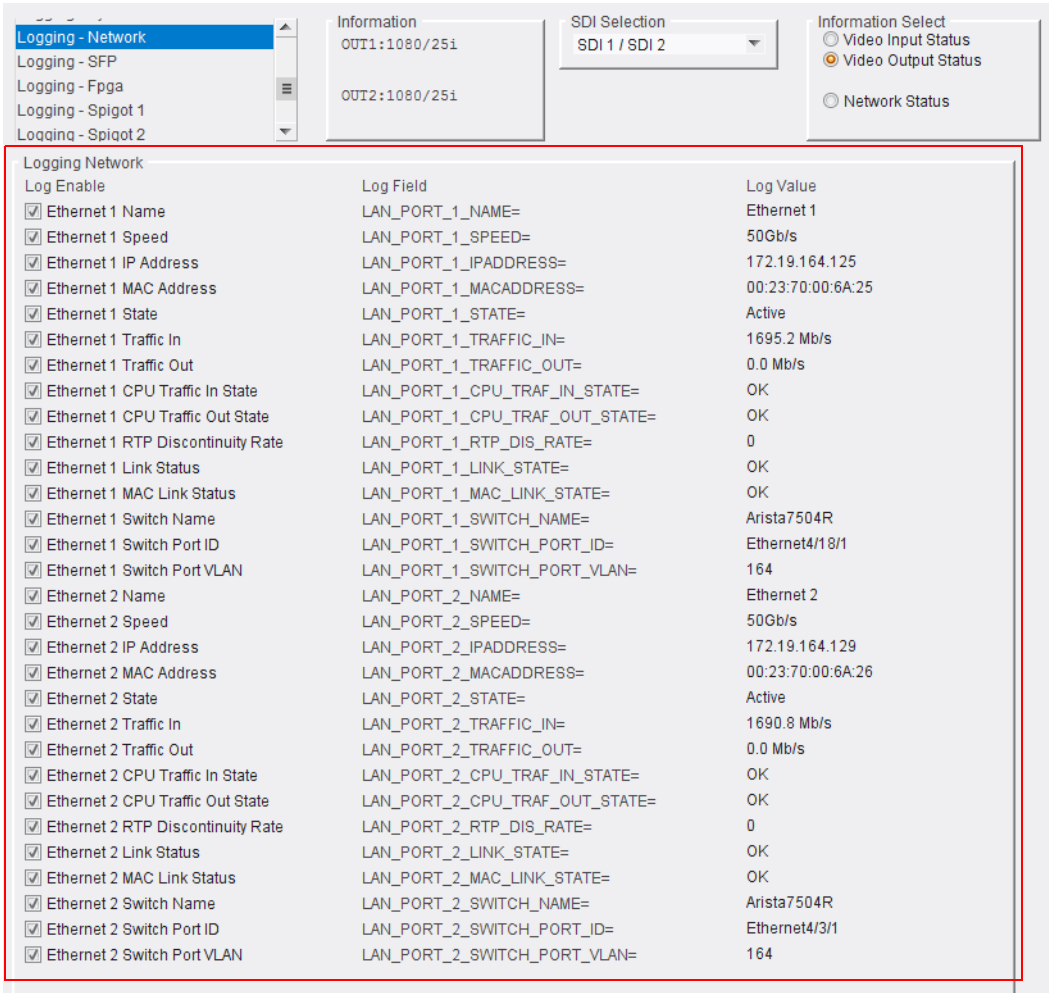


Figure 100 Logging Network Template

Table 39 Logging Network Log Fields

Log Field	Description
LAN_PORT_N_NAME	Ethernet port name as defined by the OS running on the MV-820-IP Video IP block.
LAN_PORT_N_SPEED	Ethernet connection speed. Valid values are: • **10 Mbit/s Full Duplex** • **10 Mbit/s Half Duplex** • **100 Mbit/s Full Duplex** • **100 Mbit/s Half Duplex** • **1 Gbit/s Full Duplex** • **No Link**
LAN_PORT_N_IPADDRESS	Ethernet port IP address.
LAN_PORT_N_MACADDRESS	Ethernet port MAC address.
LAN_PORT_N_STATE	Ethernet connection state. Valid values are: • **Active** • **Inactive**
LAN_PORT_N_TRAFFIC_IN	Traffic in. Valid values are: • **NNN.n kbps, Mbps, Gbps**
LAN_PORT_N_TRAFFIC_OUT	Traffic out. Valid values are: • **NNN.n kbps, Mbps, Gbps**
LAN_PORT_N_CPU_TRAF_IN_STATE	Reports whether there is an incoming control data traffic connection on port N. OK, Fail.
LAN_PORT_N_CPU_TRAF_OUT_STATE	Reports whether there is an incoming control data traffic connection on port N. OK, Fail.
LAN_PORT_N_RTP_DIS_RATE	Reports the number of RTP discontinuities on port N.
LAN_PORT_N_LINK_STATE	Reports the state of Ethernet link N. OK, FAIL:Down.
LAN_PORT_N_MAC_LINK_STATE	Reports the state of the MAC (Media Access Controller) sub-circuit. OK, FAIL:Down.
LAN_PORT_N_SWITCH_NAME	Name of IP network switch that the media network connection of the MV-820-IP Video IP block is connected to.
LAN_PORT_N_SWITCH_PORT_ID	Name of IP network switch port that the media network connection of the MV-820-IP Video IP block is connected to.
LAN_PORT_N_SWITCH_VLAN	Name of IP network switch VLAN number that the media network connection of the MV-820-IP Video IP block is connected to.

6.21 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 101 shows an example template.

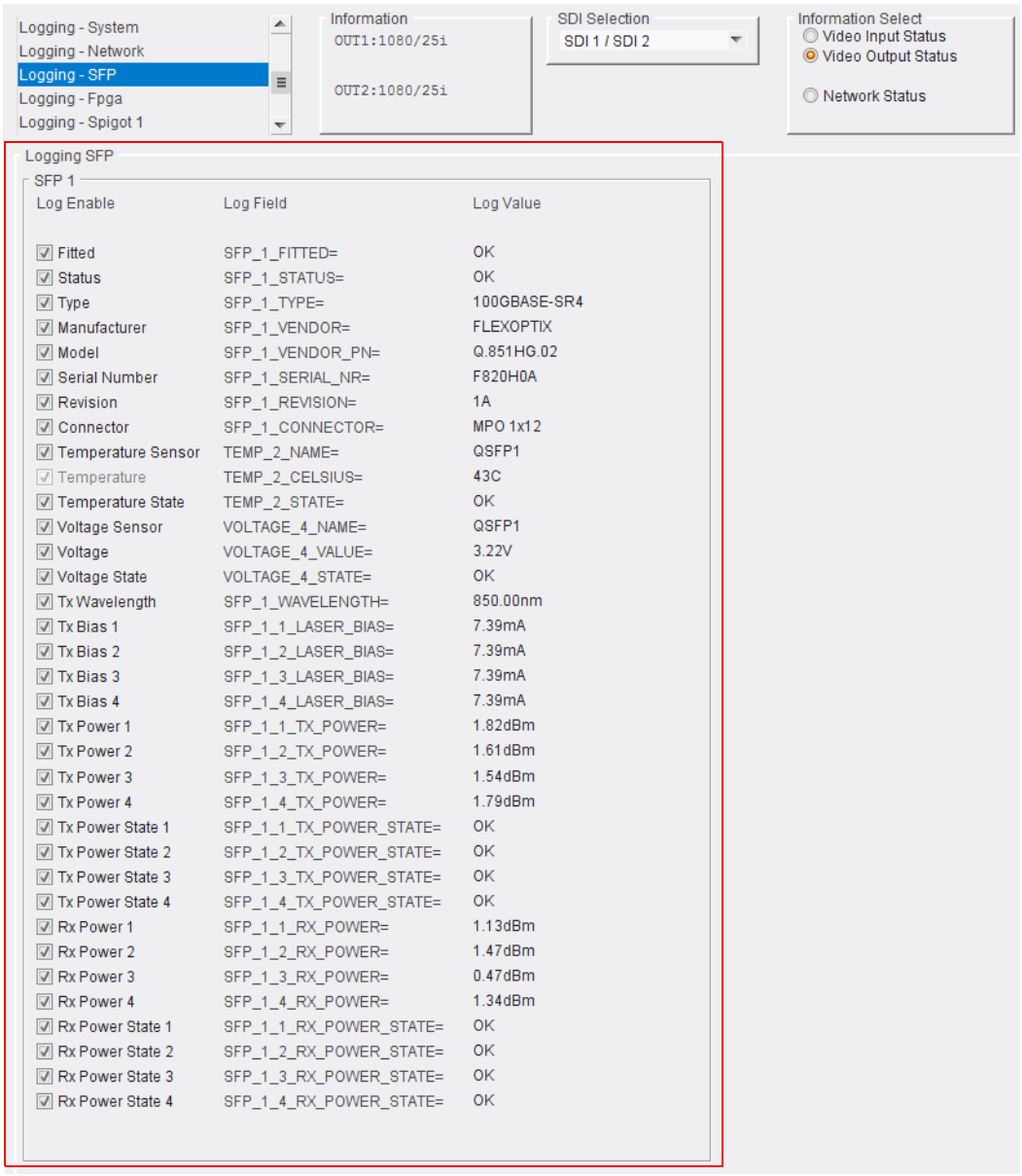


Figure 101 Logging SFP Template

Table 40 Logging SFP Log Fields

Log Field	Description
SFP_N_FITTED	Displays presence of the QSFP module. Valid values are: • **OK** • **Missing**
SFP_N_STATUS	Displays status of the QSFP module. Valid values are: • **OK** • **Fail** - 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.
SFP_N_TYPE	Displays QSFP28 identifier from device.
SFP_N_VENDOR	Displays QSFP28 manufacturer from device.
SFP_N_VENDOR_PN	Displays QSFP28 model number from device.
SFP_N_SERIAL_NR	Displays the module serial number, which consists of an S followed by eight digits.
SFP_N_REVISION	Displays manufacturer revision number.
SFP_N_CONNECTOR	Displays connector type.
TEMP_N_NAME	Displays temperature sensor name.
TEMP_N_CELSIUS	Displays current temperature sensor reading.
TEMP_N_STATE	Displays temperature sensor state. Valid values are: • **WARN: Disabled** - Temperature sensor disabled. • **WARN: Low** - Low, but in tolerance. • **WARN: High** - High, but in tolerance. • **OK.** • **FAIL: Low** - Low and out of tolerance. • **FAIL: High** - High and out of tolerance.
VOLTAGE_N_NAME	Displays voltage sensor name.
VOLTAGE_N_VALUE	Displays current voltage reading.
VOLTAGE_N_STATE	Displays temperature sensor state. Valid values are: • **OK.** • **WARN: Low** - Low, but in tolerance. • **WARN: High** - High, but in tolerance.
SFP_N_WAVELENGTH	Displays transmit wavelength in nm.
SFP_N_X_LASER_BIAS	Displays bias level in mA.
SFP_N_X_TX_POWER	Displays transmit power level in dBm.
SFP_N_X_TX_POWER_ STATE	Displays transmit power level. Valid values are: • **OK.** • **WARN: Low** - Low, but in tolerance. • **WARN: High** - High, but in tolerance. • **FAIL: Low** - Low and out of tolerance. • **FAIL: High** - High and out of tolerance.

Table 40 Logging SFP Log Fields (Continued)

Log Field	Description
SFP_N_X_RX_POWER	Reports receive power level in dBm.
SFP_N_X_RX_POWER_ STATE	Reports receive power level. Valid values are: • **OK.** • **WARN: Low** - Low, but in tolerance. • **WARN: High** - High, but in tolerance. • **FAIL: Low** - Low and out of tolerance. • **FAIL: High** - High and out of tolerance.
Where: • **N** is the input/(Q)SFP number; and • **X** is the lane number.	

6.22 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 102 shows an example template.

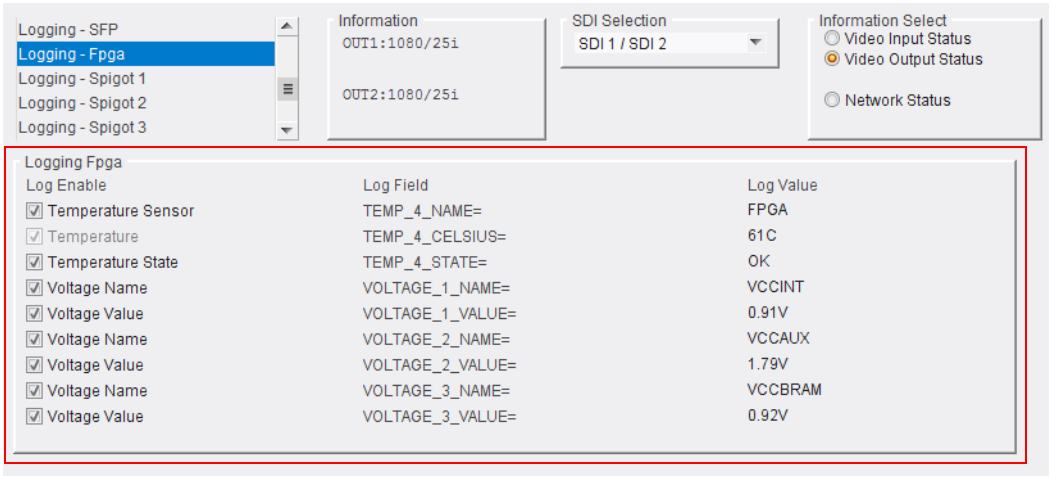


Figure 102 Logging SFP Template

Table 41 Logging SFP Log Fields

Log Field	Description
TEMP_*N*_NAME	Reports temperature sensor N name.
TEMP_*N*_CELSIUS	Reports current temperature sensor N reading.
VOLTAGE_*1*_NAME	Voltage sensor name. For example, VCCINT.
VOLTAGE_*1*_VALUE	Reports current voltage reading.
VOLTAGE_*2*_NAME	Voltage sensor name. For example, VCCAUX.
VOLTAGE_*2*_VALUE	Reports current voltage reading.
VOLTAGE_*3*_NAME	Voltage sensor name. For example, VCCBRAM.
VOLTAGE_*3*_VALUE	Reports current voltage reading.
Where: • **N** is the input number (1 to 16) for the MV-820-IP Video IP block.	

6.23 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 103 and Figure 104 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.

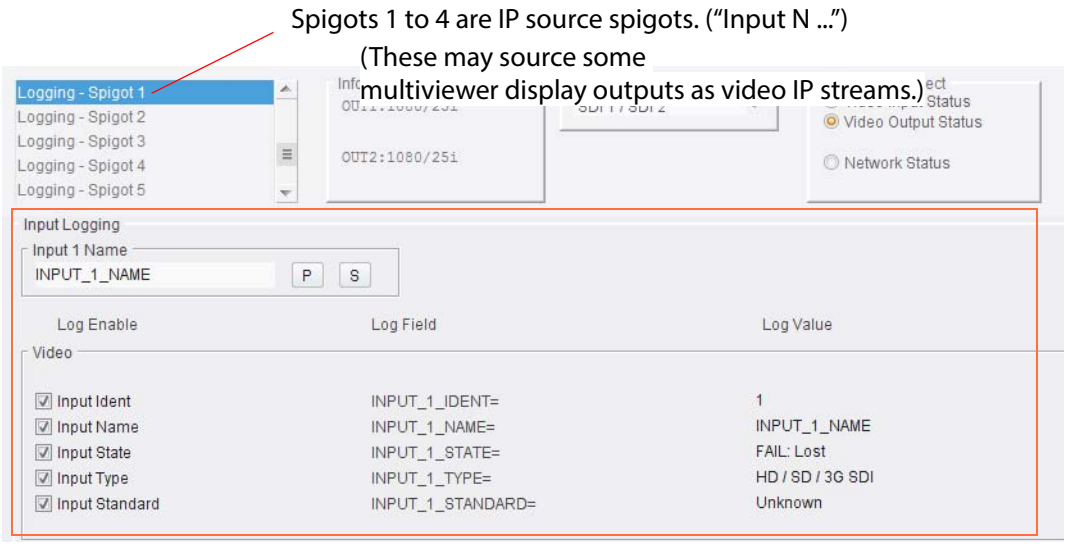


Figure 103 Logging Spigot Template (Source Spigots, Spigots 1 to 4)

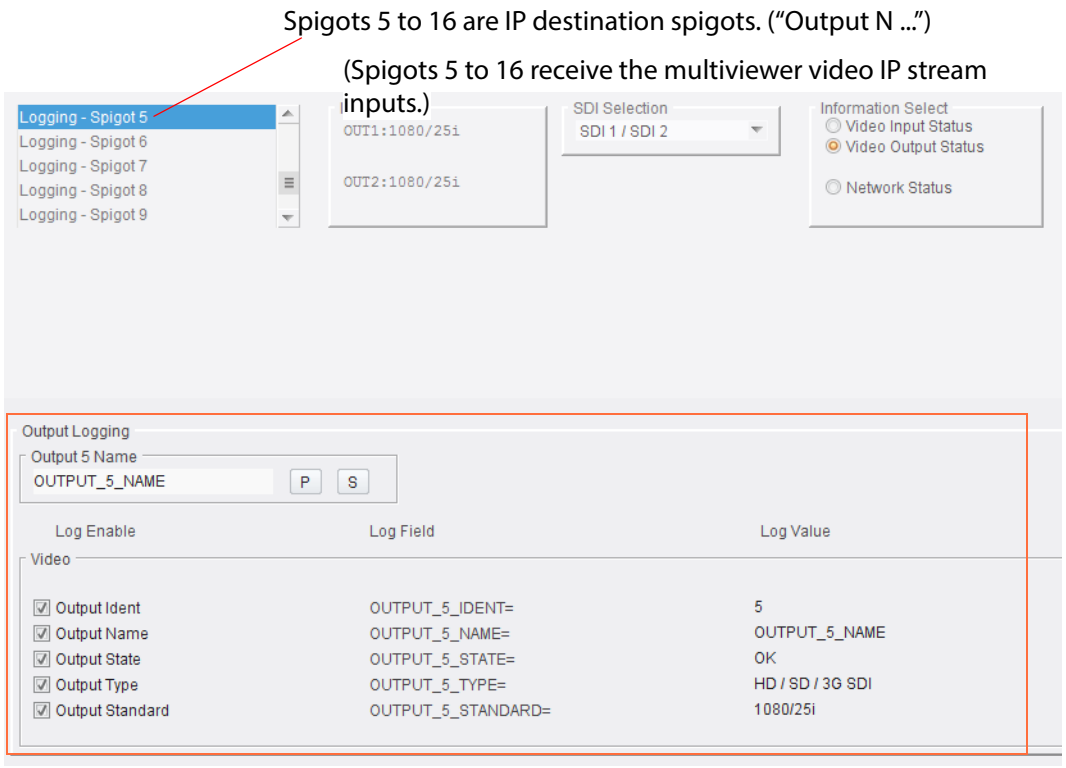


Figure 104 Logging Spigot Template (Destination Spigots, Spigots 5 to 16)

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 42 and Table 43.

Table 42 Logging Spigot 1 to 4 Templates - Log Fields

Log Field (Source Spigot)	**Description**
INPUT_*N*_IDENT	System-defined identifier for the input, based on the rear ID.
INPUT_*N*_NAME	Name of the input, as defined by the user on the **Setup** template. See section 6.26 .
INPUT_*N*_STATE	Valid values are: • **OK**: input signal good. • **FAIL**: input signal not detected.
INPUT_*N*_TYPE	HD/SD/3G SDI
INPUT_*N*_STANDARD	PAL/NTSC/625 Mono/525 Mono
Where: • **N** is the input/output spigot number (1 to 16).	

Table 43 Logging Spigot 5 to 16 Templates - Log Fields

Log Field (Destination Spigot)	Description
OUTPUT_*N*_IDENT	Name of the output as shown on the rear panel.
OUTPUT_*N*_NAME	Name of the output as defined by the user.
OUTPUT_*N*_STATE	Valid values are: • **OK** - output signal good. • **FAIL** - output signal not detected. • **WARN: Freeze** • **WARN: Pattern** • **WARN: Black**
OUTPUT_*N*_TYPE	Valid values are: • **SD SDI** • **HD SDI** • **HD/SD/3G SDI**
OUTPUT_*N*_STANDARD	Reports the output standard in the format: **<Lines>(<Active>)/<Rate><i/p/sf>** Where: • **Lines** = Total lines • **Active** = Active lines • **Rate** = Frame rate • **I** = interlaced • **P** = Progressive • **SF** = Segmented Frame For example: **1080/50p** or **1125(1080)/25i**
Where: • **N** is the input/output spigot number (1 to 16).	

6.24 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 105 shows an example template.

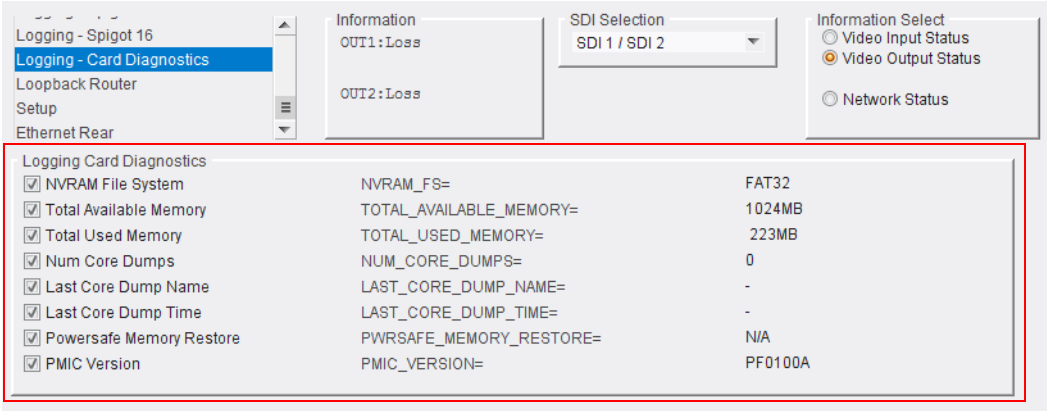


Figure 105 Logging Card Diagnostics Template

Table 44 Logging Card Diagnostics Template Log Fields

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

6.25 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 loopback routing is all local to the Video IP block.

Figure 106 shows an example template.

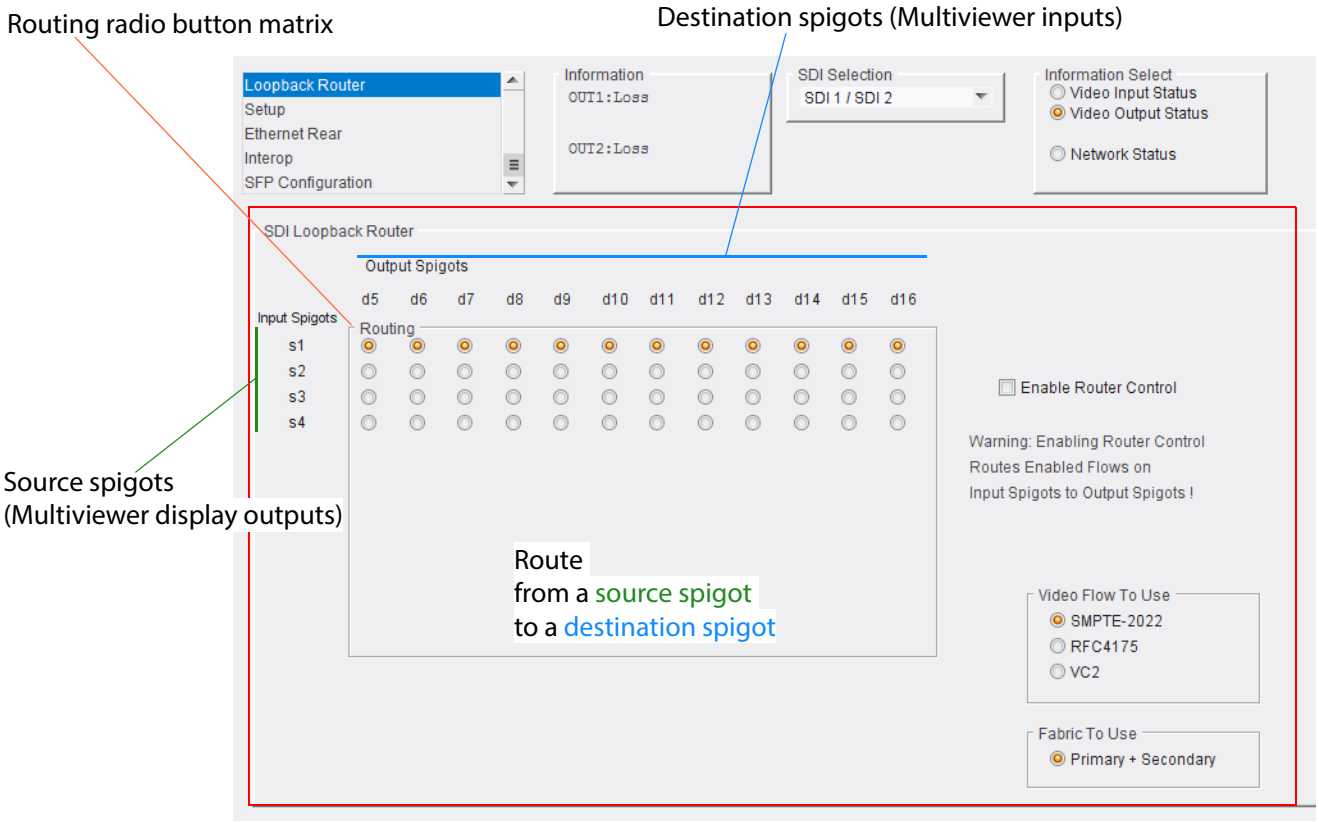


Figure 106 Loopback Router Template

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.

6.26 Setup Template

The **Setup** template (see Figure 107) 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.

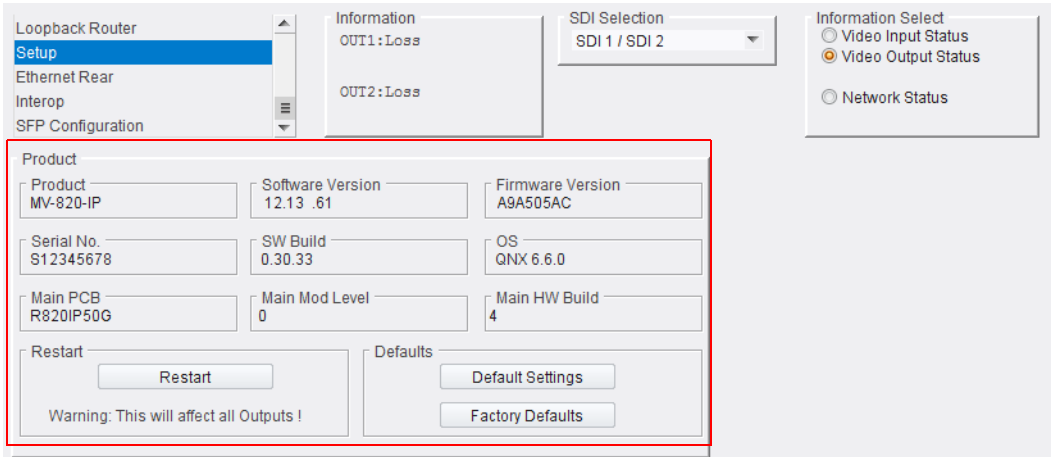


Figure 107 Setup Template

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

Table 45 Setup Template Settings and Controls

Item	Description
Product	**Name of the MV-820-IP Video IP block.**
Software Version	Currently installed software version number.
Firmware Version	Currently installed firmware version number.
Serial No.	Serial number of the MV-820-IP Video IP block.
SW Build	Factory software build number. This number identifies all parameters of the MV-820-IP Video IP block.
Main PCB	Printed Circuit Board (PCB) version number.
Main Mod Level	Main PCB modification level.
Main HW Build	Factory main hardware build number.
Restart: **Restart**	 Button. Click to restart the Video IP block. **Note: Restart** power-cycles the Video IP block, producing disturbances at the block's outputs (*internal* 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.
Defaults: **Default Settings**	Provides options to reset the module to its defaults. Button. Click to return all Video IP block settings to their default values, *except* for network configuration and IP addresses.

Table 45 Setup Template Settings and Controls (Continued)

Item	Description
Factory Defaults	Button. Click to return all Video IP block settings to their factory values, *including* network configuration and IP addresses.

6.27 Ethernet Rear Template

The **Ethernet Rear** template (see Figure 108) displays details and the status of the control network connection of the MV-820-IP Video IP block.

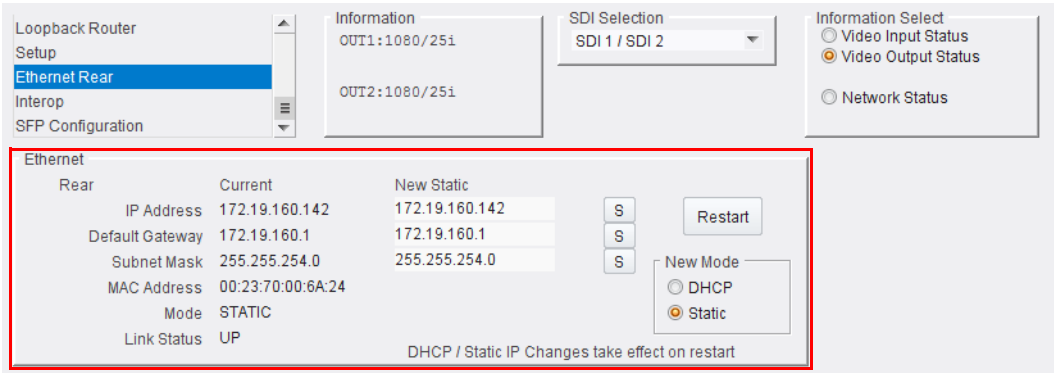


Figure 108 Ethernet Rear Template

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 46 Setup Template Settings and Controls

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

6.28 Interop Template

The **Interop** template (see Figure 109) controls various settings to enable interoperability with third parties, including disabling extended headers, and setting payload types.

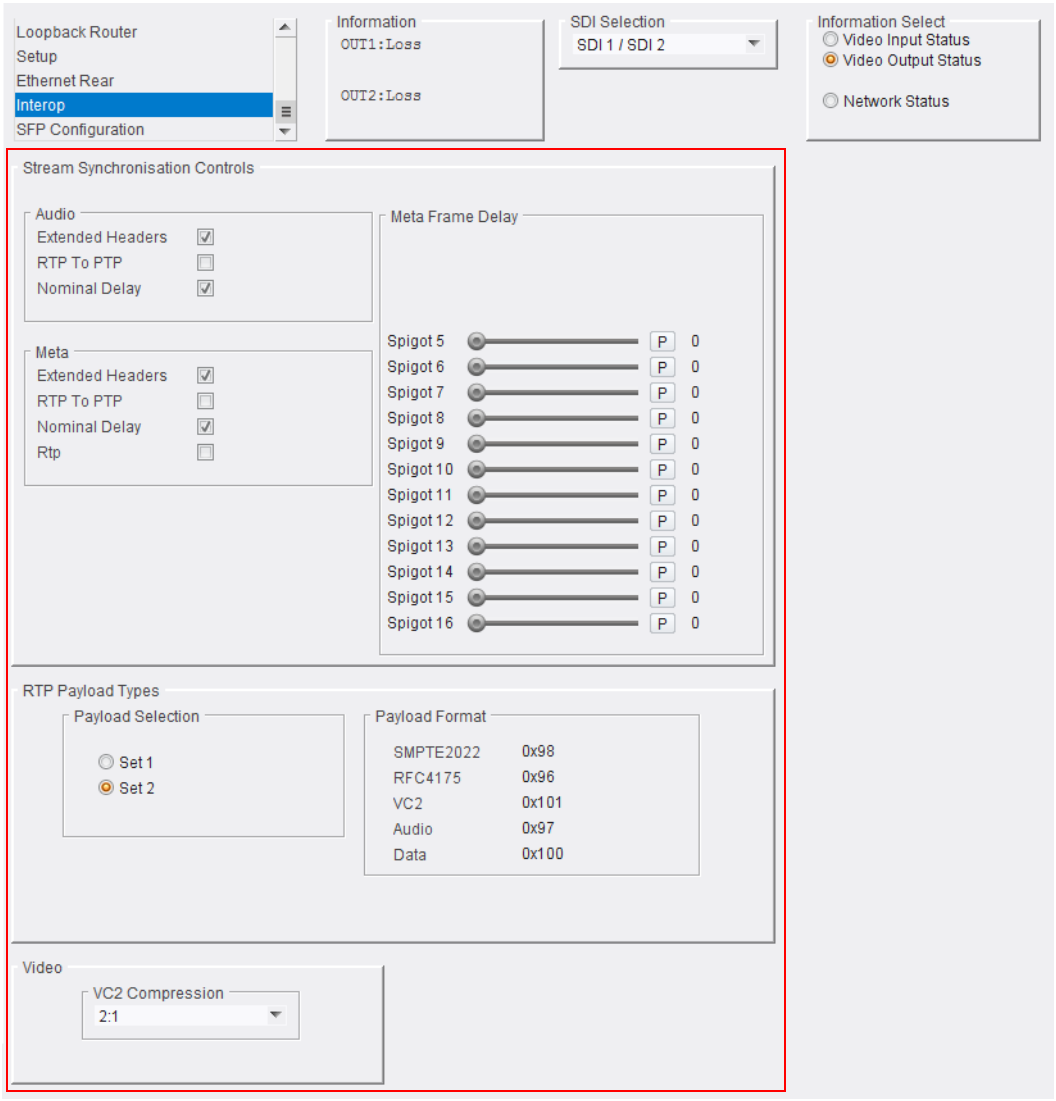


Figure 109 Interop Template

The template displays the following panels:

- Stream Synchronization Controls
- RTP Payload Types
- Video.

Table 47, Table 48 and Table 49 describe each panel.

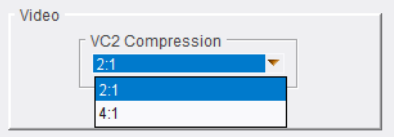
Table 47 Interop Template - Stream Synchronization Controls

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

Table 48 Interop Template - RTP Payload Types

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

Table 49 Interop Template - Video

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

6.29 SFP Configuration Template

The **SFP Configuration** template allows various QSFP28 module parameters to be adjusted, if required. See Figure 110. The QSFP28 module adjusted is the designated QSFP module for the Video IP block concerned (see Table 22 on page 77).

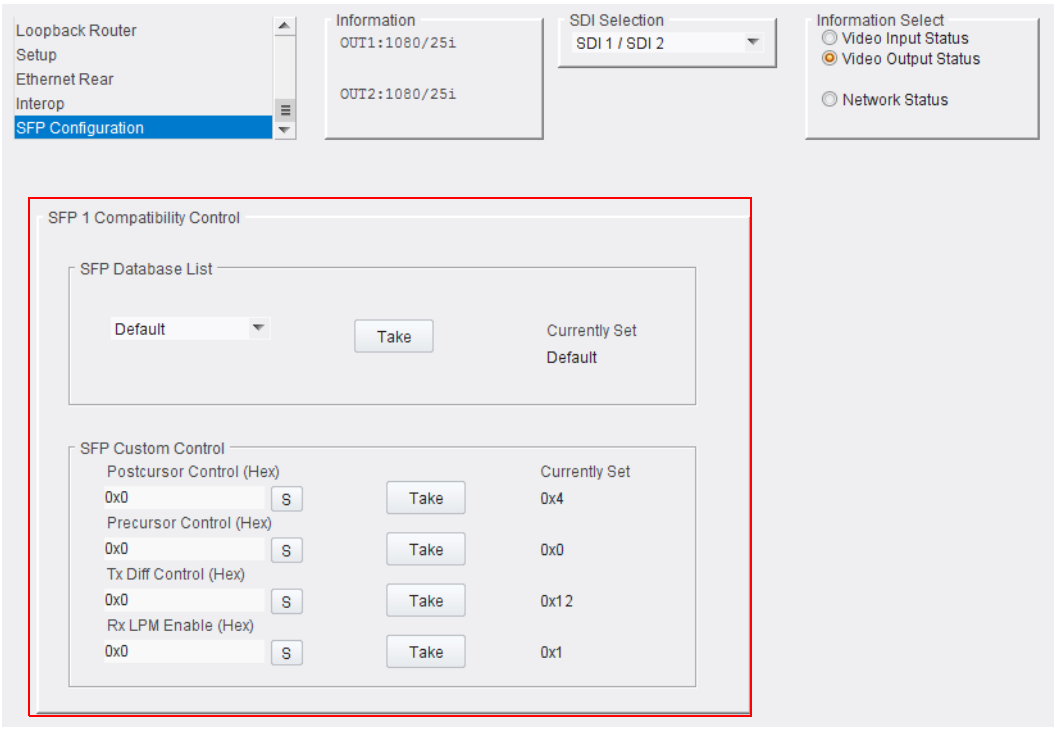


Figure 110 SFP Configuration Template

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 50 SFP Configuration Template

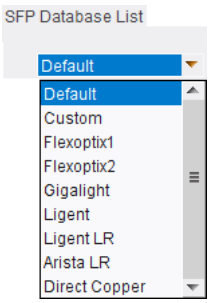
SFP Configuration Item	Description
SFP Database List:	Drop-down box: Select the SFP type from the drop-down list. 
Take	For **Custom** setting only, click to apply settings and save to memory.
Currently Set	Shows the current SFP type.

Table 50 SFP Configuration Template (Continued)

SFP Configuration Item	Description
SFP Custom Control:	Custom settings are set here. Select **Custom** in the SFP database list. Text boxes. Enter a new hexadecimal value for the Tx/Rx sub-circuits of the QSFP28 module. Parameters: • Postcursor Control (Hex) • Precursor Control (Hex) • Tx Diff Control (Hex) • Rx LPM Enable (Hex) Click **S** or press the enter key to save the value. The new value is then shown in the text box. The **Currently Set** value is also shown in the same row. Buttons. Click **Take** to change to the new value.

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 modulesettings 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.

7 Getting Started

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 51 Getting Started with MV-820

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

7.1 Multiviewer Block

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

7.1.1 Hardware Installation

1. Unpack the unit.
   (See Section 2.1 "Unpacking" on page 17.)
2. Install the unit in a rack.
   (See Section 5.1 "Initial Connection and Configuration" on page 50.)
   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.

7.1.2 Setting Up Control Network Interface

To set up the multiviewer block's control network interface:

4. Connect RollCall Control Panel to the corresponding rear control interface; use rear connector:
   - '1G ENET 1' for MV-820-HDBNC and MV-820-DENSI.
   - 'MV Control 1' for MV-820-IP.

   (See Section A.11 on page 198 for default IP addresses and see Section 5.1 "Initial Connection and Configuration" on page 50 for RollCall Control Panel connection information.)

Double-click the MV-820-IP Video IP block item to open and extract RollCall templates

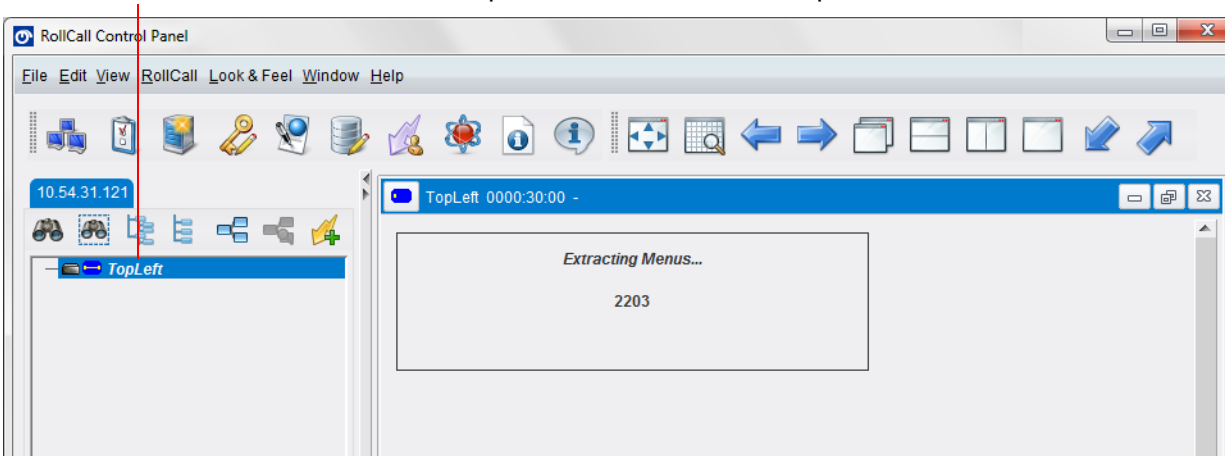


Figure 111 RollCall Control Panel Extracting Multiviewer RollCall Templates

5. Select the unit's RollCall **System-Setup** template.
6. Set the network settings of the '1G1 Interface' to suit the house IP network. See Figure 112.

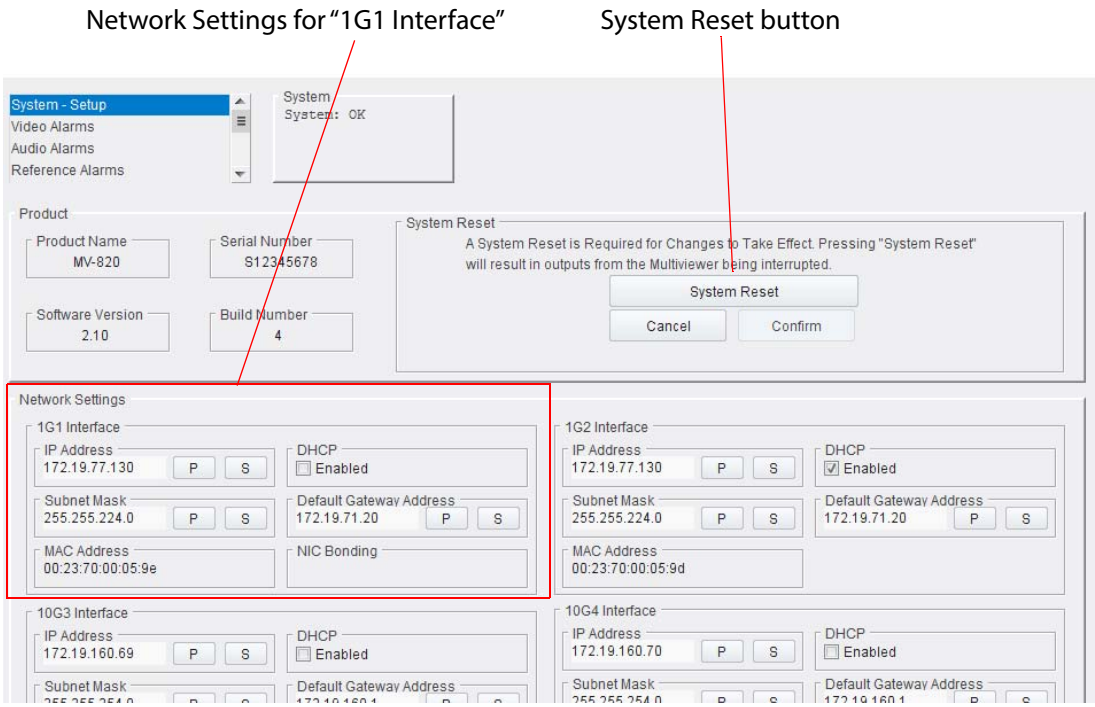


Figure 112 Multiviewer RollCall System-Setup Screen

7. Click the **System Reset** button.
   Click the **Confirm** button.

   The multiviewer block is restarted. New IP settings will be applied after the restart.

8. Connect the control network interface connector to the house IP network.

The multiviewer block within the MV-820 unit now has a basic configuration. It will display each of the 48 SDI video inputs on a default 3x4 multiviewer video wall layout on its four multiviewer display outputs. See Figure 113.

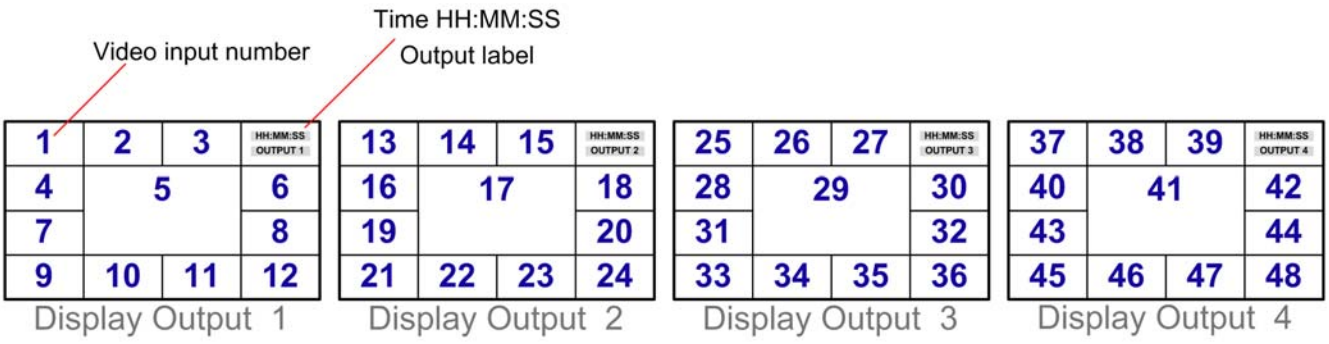


Figure 113 MV-820 Default Video Wall on Multiviewer Display Outputs 1 to 4 (Video inputs 1 to 48 are shown)

7.1.3 Multiviewer Display Output Overlay

To help with getting started and with system set up, the multiviewer can be configured to identify video inputs and outputs on each multiviewer display output. (Multiviewer software version 2.16.16 or later). It can do this regardless of whether a video input is being supplied. See Section 5.11 “RollCall Layout Screen” on page 69.

1. View the **Layout** RollCall template.
2. Use the controls to turn on/off display of an overlay. See Figure 114.

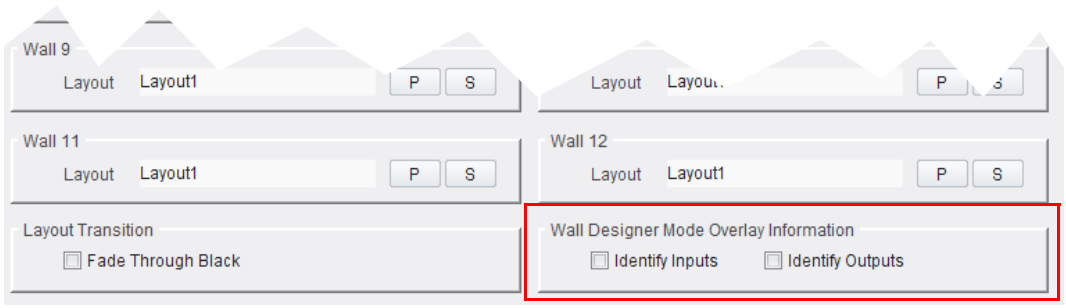


Figure 114 Layout RollCall Template - Multiviewer Display Output Overlays

7.2 Video IP Blocks

This sub-section is applicable to MV-820-IP products and should be carried out after Section 7.1 on page 146.

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 set up as per Section 7.1 on page 146, the unit's multiviewer block is configured. The next step is to configure the unit's video IP interface; 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:

- A.11.2.1 "Rear Network Connectors" on page 198;
- A.11.2.2 "Video IP Blocks" on page 200; and
- A.11.2.3 "Rear QSFP Cages" on page 201.

7.2.1 Configuring Control and Media Network Interfaces

Carry out the instructions below for each MV-820-IP Video IP block.

7.2.1.1 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** and **Link B2** for IP link redundancy.
2. Connect the QSFP cables to the house video IP network.

7.2.1.2 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 A.11.2.2 Table 59 on page 200.
   (Use a similar connection method to that described in Section 5.2 "RollCall Control Panel Connection to MV-820" on page 51.)

7.2.1.3 Configure Control Network Interface

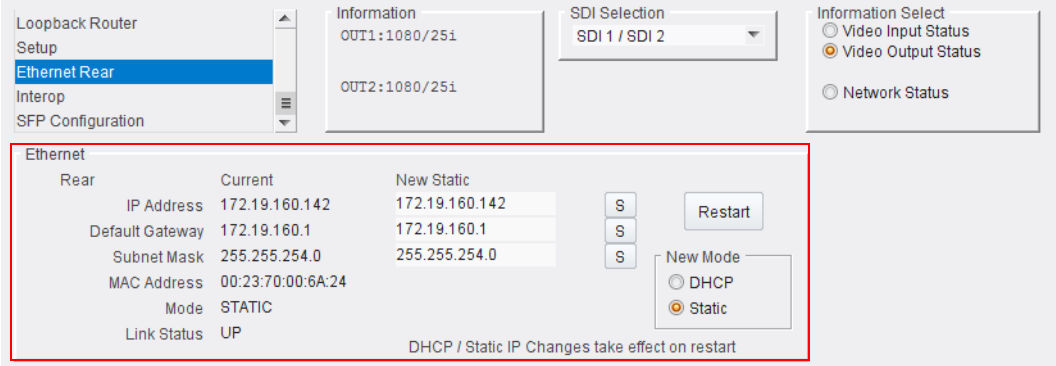


Figure 115 Ethernet Rear Template

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.

7.2.1.4 Configure Media Network Interface 1

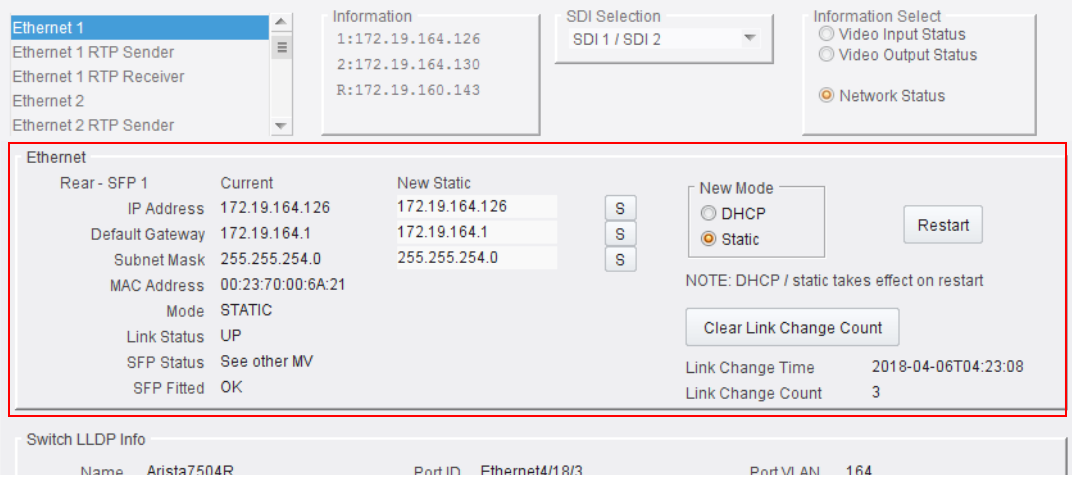


Figure 116 Ethernet 1 Template

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.

7.2.1.5 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 Section 6.29 "SFP Configuration Template" on page 142.

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

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

- QSFP fitting.
- House Video IP network.

7.2.1.6 Configure Media Network Interface 2

On the **Ethernet 2** RollCall template:

11. Repeat the actions of sub-sections 7.2.1.4 and 7.2.1.5 but for the 'Ethernet 2' network interface.

7.2.1.7 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.

7.2.1.8 Repeat for Each Video IP Block

13. For each of the MV-820-IP Video IP blocks, re-do sub-sections 7.2.1.2 to 7.2.1.7.

7.2.1.9 Lastly

When all Video IP blocks are configured, then the media IP network interfaces are 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 Section 7.2.2 on page 152 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) interfaces (for in-band control).

7.2.2 Configuring IP Flows

This sub-section is applicable to MV-820-IP products and should be carried out after Section 7.2 on page 149. A house video IP routing system is required.

After an MV-820-IP unit is set up as per Section 7.2 on page 149, 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 Section 7.2.2.1 "Setting Up with Orbit" on page 152.)

b) **Manually** (not recommended)

(See Section 7.2.2.2 "Setting Up IP Flows Manually" on page 156.)

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).

7.2.2.1 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**.

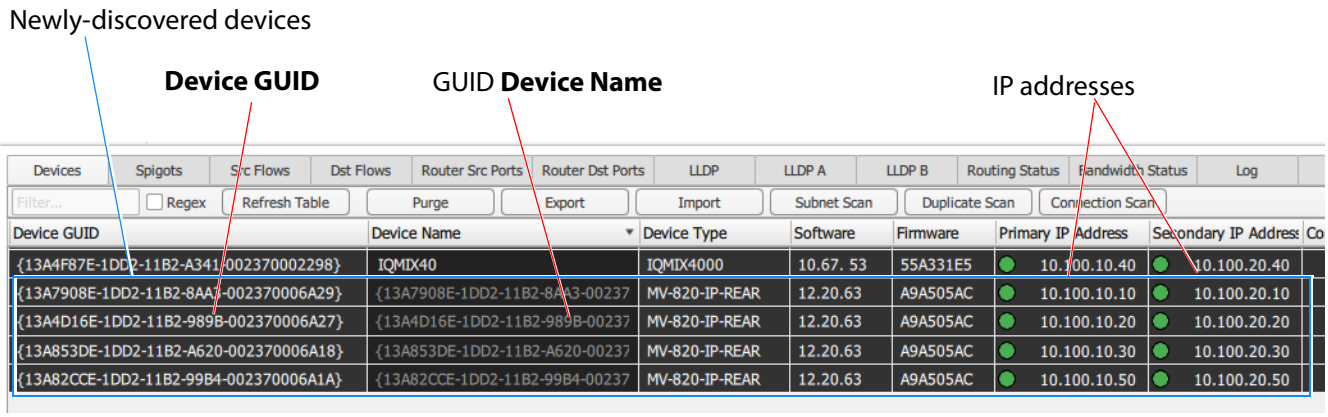


Figure 117 Discovered Devices in Orbit

2. 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.

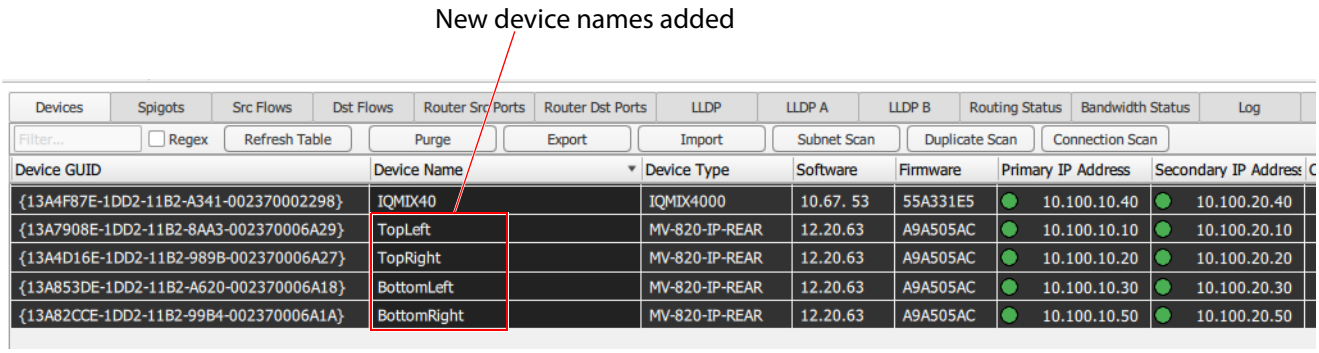


Figure 118 New Device Names Added

To check IP link connection from Orbit to the devices:

3. 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.

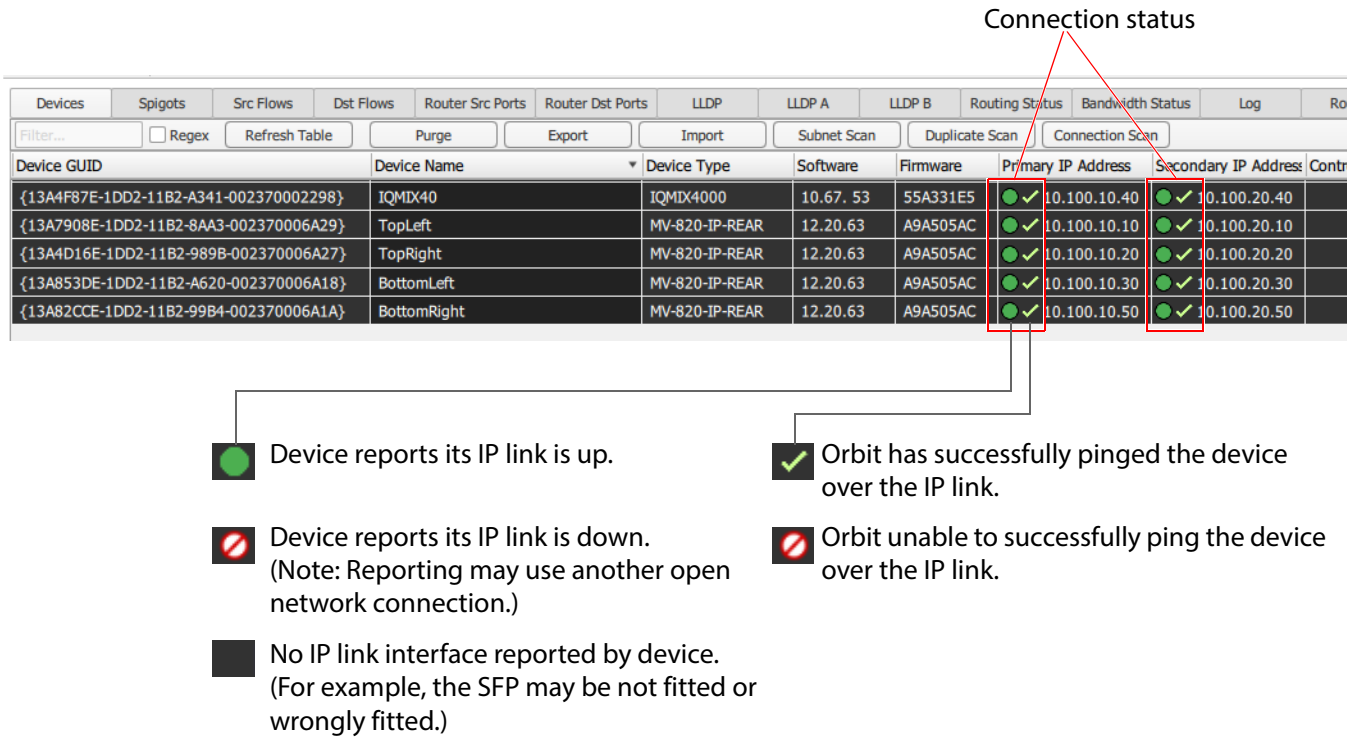


Figure 119 Connection Status

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.

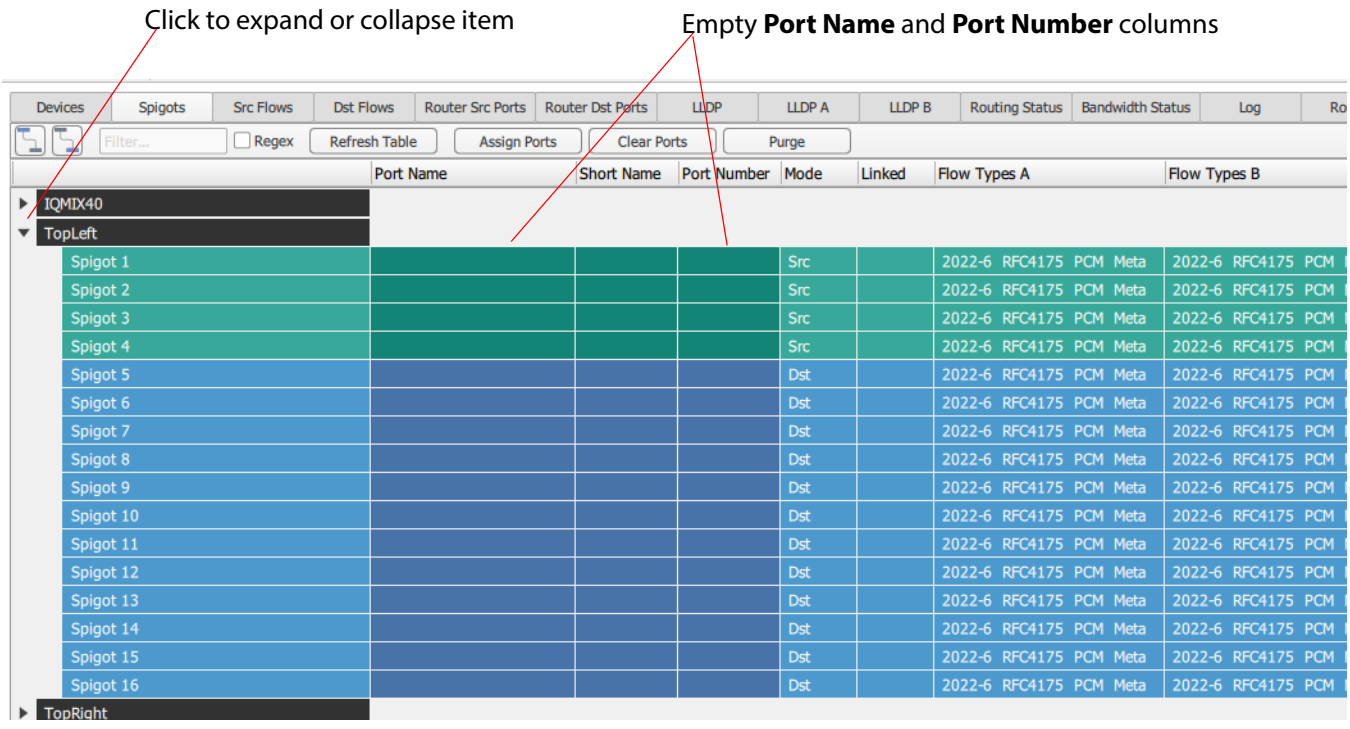


Figure 120 Expanded Device to Show Spigots in Spigots Tab

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 121.

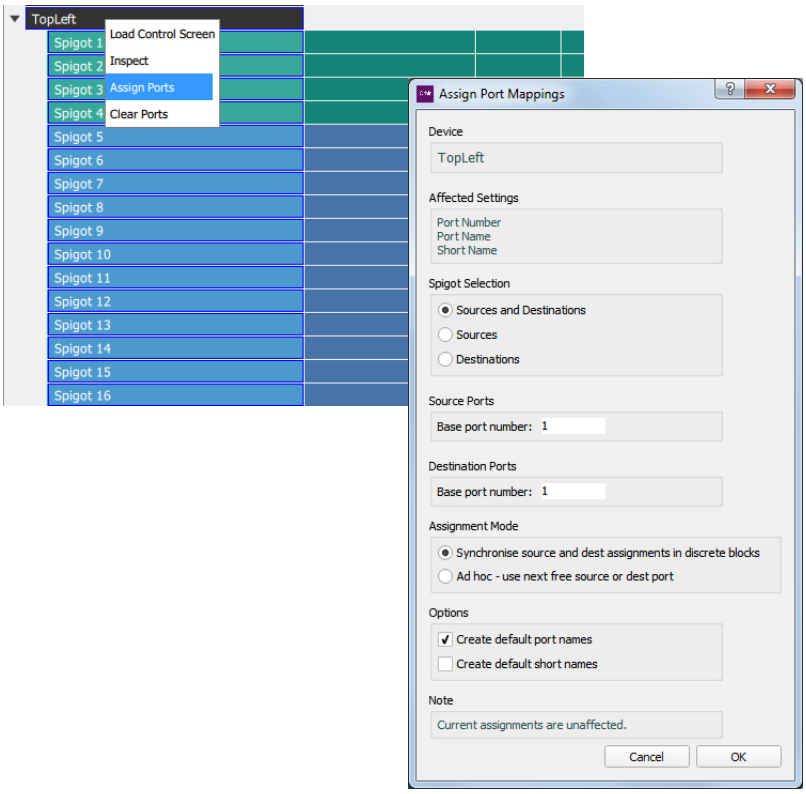


Figure 121 Assign Port Mappings Dialog

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.

7.2.2.2 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.

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 122 shows a Spigot template.)

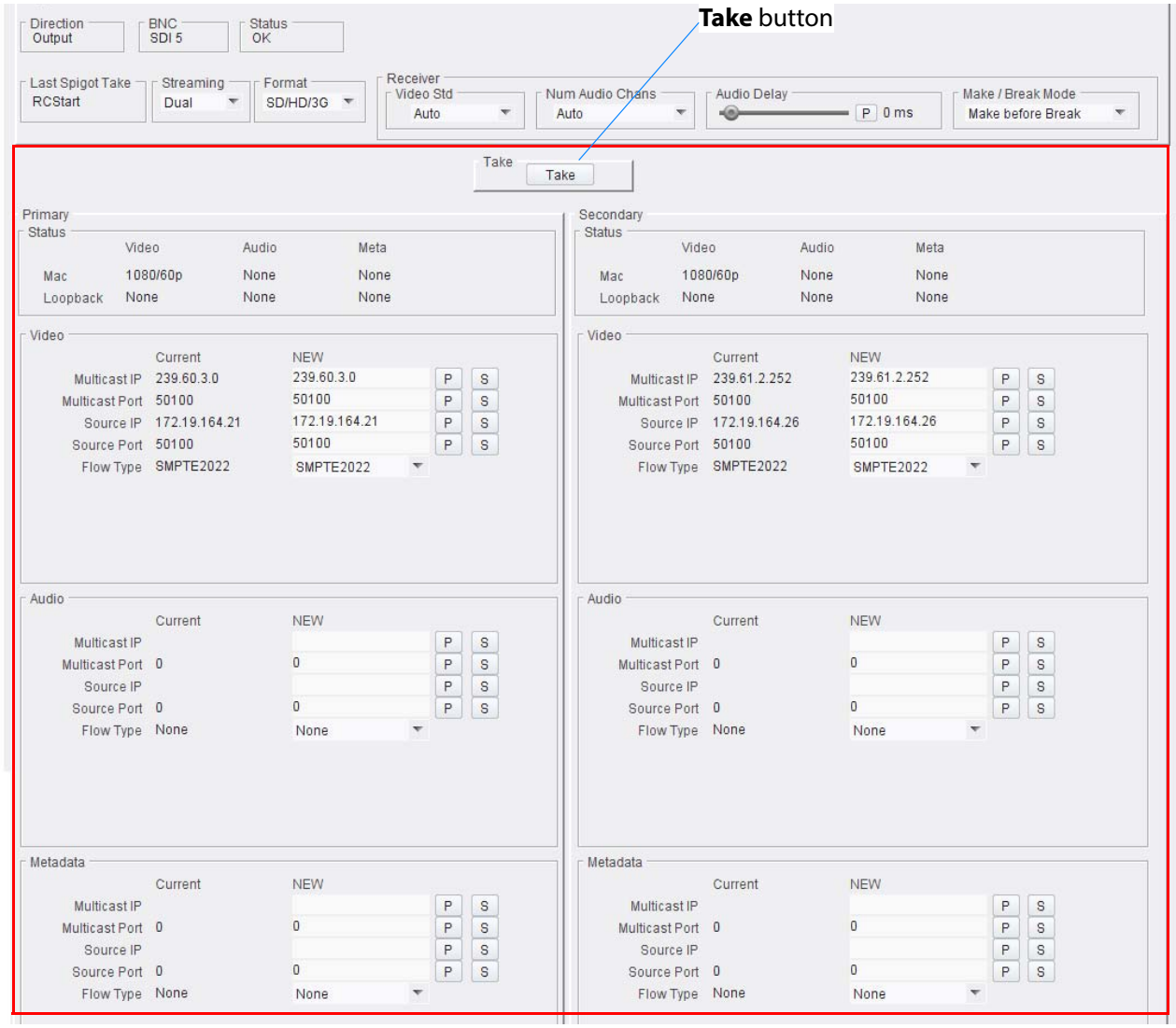


Figure 122 Spigot Template

2. Type new parameter values into the template's data fields for the following settings, shown in Table 52 (click **S** each time to enter the value into the field):

Table 52 Destination Spigot IP Flow Parameters

Template Panel		Multicast IP address	Multicast IP port	Source IP address	Source IP port	Flow Type
Primary	**Video**	✓	✓	✓	✓	✓
	Audio	✓	✓	✓	✓	✓
	Metadata	✓	✓	✓	✓	✓
Secondary (redundancy)	**Video**	✓	✓	✓	✓	✓
	Audio	✓	✓	✓	✓	✓
	Metadata	✓	✓	✓	✓	✓

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. But only if they are presented on the corresponding rear media IP interfaces of the MV-820-IP - i.e. the multicast IP flows must be routed to the corresponding MV-820-IP media network interfaces.

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.

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 123 shows a source spigot template.)

2. Enter new parameter values in the template's data fields for the following settings in Table 53 (click **S** each time to enter the value into the field):

Table 53 Destination Spigot IP Flow Parameters

Template Panel		Multicast IP address	Multicast IP port	Source IP address	Source IP port	Flow Type
Primary	**Video**	✓	✓	✓	✓	✓
	(Video†)	(✓)	(✓)	(✓)	(✓)	(✓)
	Audio	✓	✓	✓	✓	✓
	Metadata	✓	✓	✓	✓	✓
Secondary (redundancy)	**Video**	✓	✓	✓	✓	✓
	(Video†)	(✓)	(✓)	(✓)	(✓)	(✓)
	Audio	✓	✓	✓	✓	✓
	Metadata	✓	✓	✓	✓	✓

† 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.

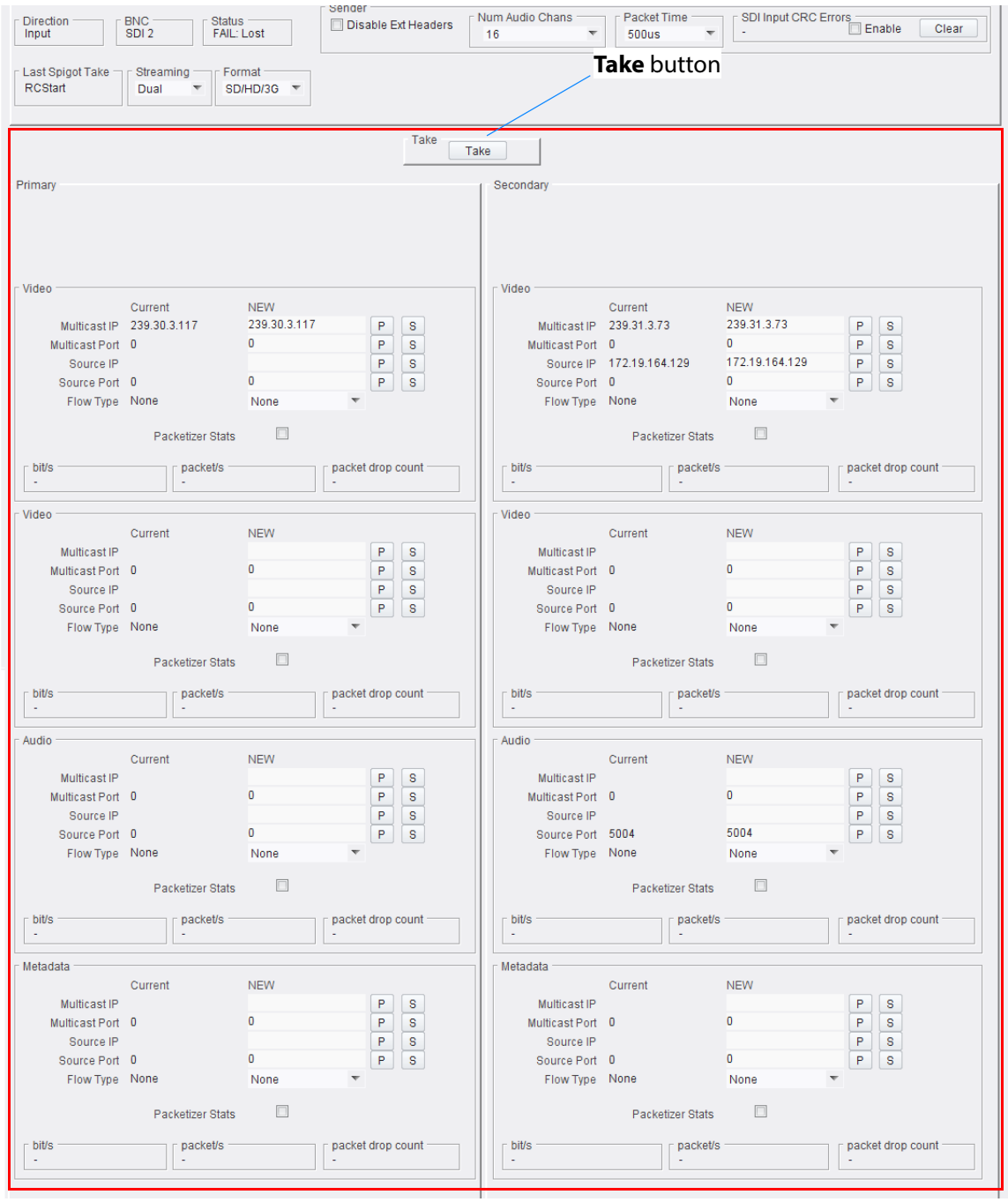


Figure 123 Source Spigot Template

7.3 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.

(Section A.11.2.2 on page 200 defines which blocks source display outputs and Section A.11.2.3 on page 201 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.

7.4 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 Section 6.25 "Loopback Router Template" on page 134.)

8 Multiviewer Video Wall

Multiviewer video wall layouts are designed and managed with the Grass Valley Orbit application.

Please refer to the published Orbit documentation for instruction about how to use Orbit in multiviewer applications.

This manual assumes the reader is familiar with the Orbit software and only outline information is given.

Section contents:

8.1 Basic Video Wall

Multiviewer monitor wall layouts are designed with the Grass Valley Orbit application and are called 'Orbit projects'. These multiviewer projects can be pushed to a multiviewer to be deployed and the video wall can be viewed on monitor displays.

Additionally, video wall layouts can be pulled from a multiviewer device and modified. Also, graphical control and monitoring screens can be designed in Orbit.

The form and appearance of a video wall design on a multiviewer device may be changed through layouts and themes.

Procedure:

The procedure for video wall design and deployment is similar for Grass Valley's MV-8 Series of multiviewers. A 'basic video wall' is described in the Orbit documentation and includes:

- **Default Wall** The MV-820 Multiviewer's default video wall.
- **Initial Screen** Orbit Initial screen.
- **New Project** Creating a new project:
  - Multiviewer Project
  - Connected Multiviewer Project
- **Existing Project** Opening an existing project.
- **Recent Projects** Opening a recent Orbit project.
- **Project Home Screen** The Orbit project home screen.
- **Basic Wall** Using Orbit to create a basic video wall layout for an MV-820 Multiviewer.
- **Wall Layouts** Demonstration of different wall layouts within the same Orbit multiviewer project.
- **Wall Themes** Demonstration of applying different themes to the same wall layout.

For further Orbit instruction and details on using Orbit for multiviewer wall layouts, see the published "Orbit - Introduction" and "Orbit for Multiviewers" user manuals.

8.2 Configuring Alarms

Alarms can be configured on multiviewer inputs and for the multiviewer unit itself. Alarms are set up using the Grass Valley Orbit software. When a multiviewer project is open in Orbit, Alarms can be set up via the Multiviewer menu bar item.

8.2.1 Unit Alarms

Unit alarms are not related to any one multiviewer input. The configuration dialog is accessed in the following way:

1. Click **Multiviewer > Unit Alarms**.
   A dialog box, Figure 124, shows the possible unit alarms, see Table 54.
2. Click on an alarm name in the **Select Alarm** box, to select an alarm.
   The corresponding properties are shown.
3. Unit alarm properties are described in Table 55.

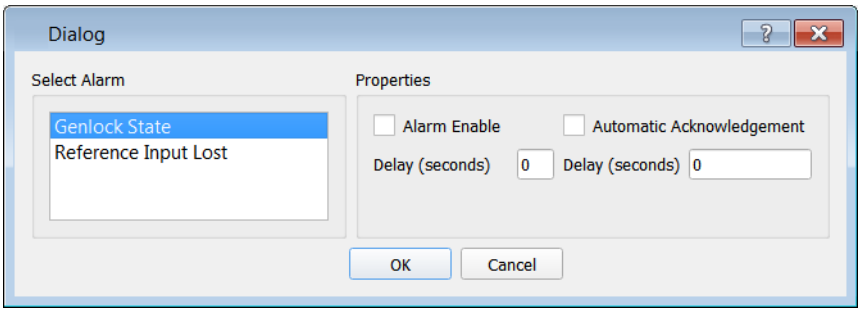


Figure 124 Grass Valley Orbit - Multiviewer Units Alarms

Table 54 Unit Alarms

Alarm	Description
Genlock State	Detects unlocked multiviewer genlock.
Reference Input Lost	Detects a lost reference signal.

Table 55 Unit Alarms Properties

Alarm Property	Description
Alarm Enable	Check box. Select to enable the alarm.
Delay (seconds)	The time in seconds from when a fault is detected to when the alarm is displayed on the multiviewer video wall. Setting a small delay will prevent transient alarms being displayed, filtering out transient alarms.
Automatic Acknowledgement	Check box. Select to enable automatic acknowledgment by the multiviewer system. Deselect to manually acknowledge the alarm. Alarms will have to be acknowledged by the user, to stop an alarm flashing.
Delay (seconds)	The time in seconds from when the alarm occurs to when it is automatically acknowledged by the multiviewer system. Setting a delay here allows an alarm to flash and be displayed for a short time before being automatically acknowledged.

Note: Each alarm has its own 'Alarm Enable' and 'Automatic Acknowledge' properties.

8.2.2 Input Alarms

Various alarms can be set up for each multiviewer input. It is possible to set up alarms on one input and then to copy those alarm settings to other inputs.

1. Click **Multiviewer > Input Alarms**.
   The **Alarms** window is shown.
2. Set **Selected Input** to 'Input 1'.
   Select the **Alarm** tab.

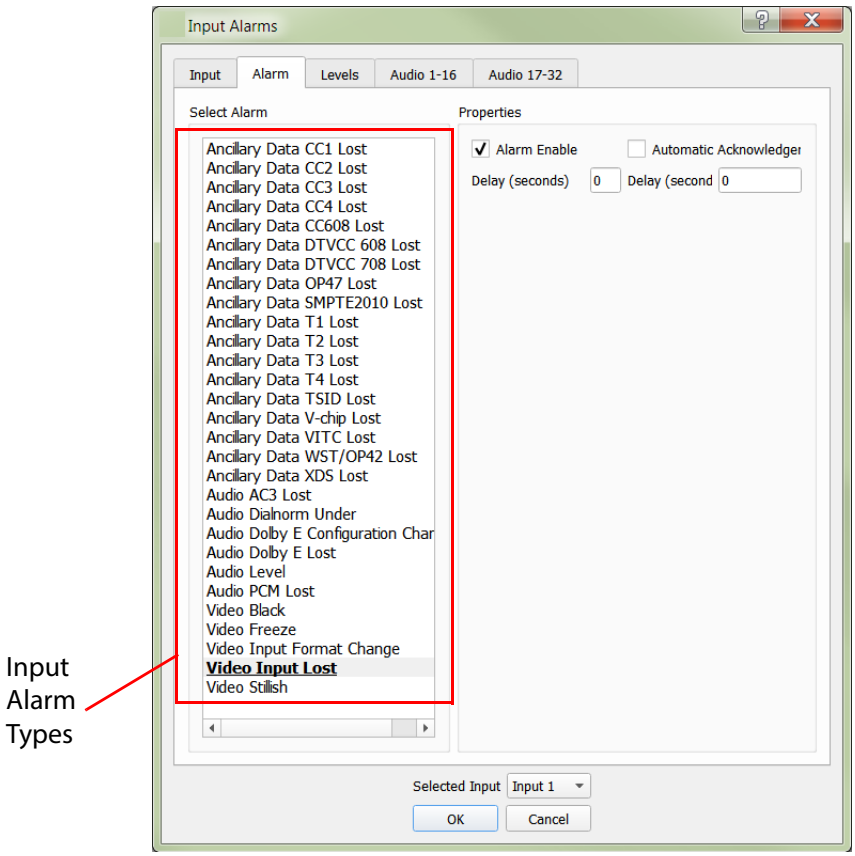


Figure 125 Grass Valley Orbit - Multiviewer Alarms window, Alarm tab.

Figure 125 lists the input alarm types.

3. Click on the **Video Input Lost** alarm name to select it.
   The alarm properties appear in the Properties box.
4. Select **Alarm Enable**.
   The alarm name (Video Input Lost) is shown **underlined and bold** in the list of alarm types, indicating the alarm is enabled on the selected input.

Note: Each alarm has its own 'Alarm Enable' and 'Automatic Acknowledge' properties.

Note: Some alarms have further settings and parameters; this is indicated by text in the properties box.

For example,
for the Audio Level alarm, the properties box text indicates that configuring of levels and channel alarms is done in separate tabs.

5. Select the **Audio Level** alarm.
   Select **Alarm Enable**.

6. Click on the **Levels** tab.
   The Levels tab allows setting up of some audio levels. See Figure 126.

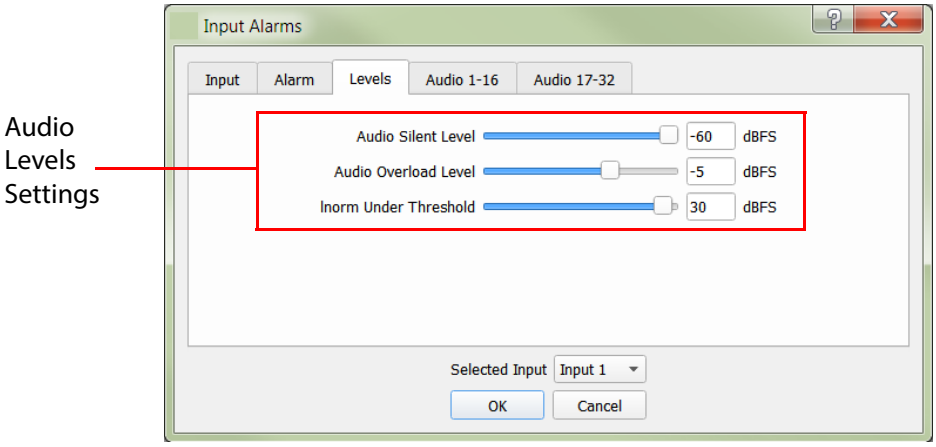


Figure 126 Orbit - Multiviewer Input Alarms window, Levels tab.

7. Click on the **Audio 1-16** tab or the **Audio 17-32** tab.
   The Audio Channels tabs (**Audio 1-16** and **Audio 17-32**) allow various audio alarms to be enabled on individual audio channels (audio channels 1 to 32 inclusive) relating to the multiviewer video input selected. See Figure 127.

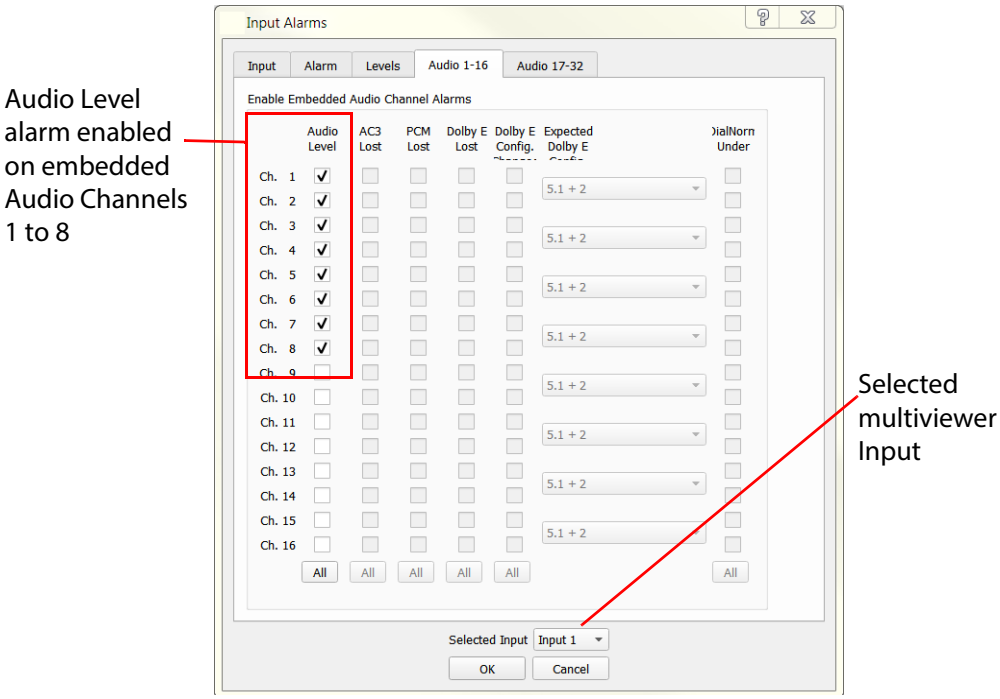


Figure 127 Orbit - Multiviewer Alarms window, 'Audio 1 - 16' tab.

Alarms have now been set up for Multiviewer Input 1 (the **Selected Input**).

8. Click on the **Input** tab.
   The **Input** tab screen is shown.

9. Click **Copy All**.
   The alarm settings of Input 1 have been applied to all multiviewer inputs.

10. Click **OK**.
    The **Alarm**s window closes.
11. Click the **File > Save Project**, to save the Orbit project so far.

Note:

MV-820-IP Alarms:

The MV-820-IP multiviewer project presents the same alarms as other MV-820 products.

The MV-820-IP multiviewer project itself does not present any IP network alarms relating to the video IP inputs.

For IP network alarms relating to video IP inputs, access video IP stream and IP network status information via RollCall log messages from the MV-820-IPs 'Video IP' block.

8.3 TSL Support

8.3.1 TSL Protocol Tally Settings

TSL protocols are used widely throughout the industry for communication between a TSL Tally controller and Under Monitor Displays (UMD's). The protocol enables tally lamp control and text label data to be carried to each UMD device.

A TSL Tally controller handles the tally data in a video system and provides TSL Tally control information to each UMD.The MV-820 Multiviewer supports two TSL protocols: TSL 3.1 and TSL 5.0. Initial TSL support settings are described here.

Setting up the multiviewer to work with a TSL tally-based system involves the following steps:

- Specify how the multiviewer gets the TSL Tally message information.
  See Section 8.3.2 "Specifying Multiviewer TSL Tally Mode" on page 167.
- Specify index parameters for each UMD on the video wall.
  See Section 8.3.3 "Specifying Index Parameters for each UMD" on page 168.

8.3.2 Specifying Multiviewer TSL Tally Mode

The multiviewer may get its TSL Tally information in one of two modes:

a) **Server Mode** - MV-820 listens for Tally messages.
Specify the MV-820 IP address and network port to receive Tally messages on.

b) **Client Mode** - MV-820 reads Tally messages from a Tally controller.
Specify the IP address and network port number of the Tally controller.

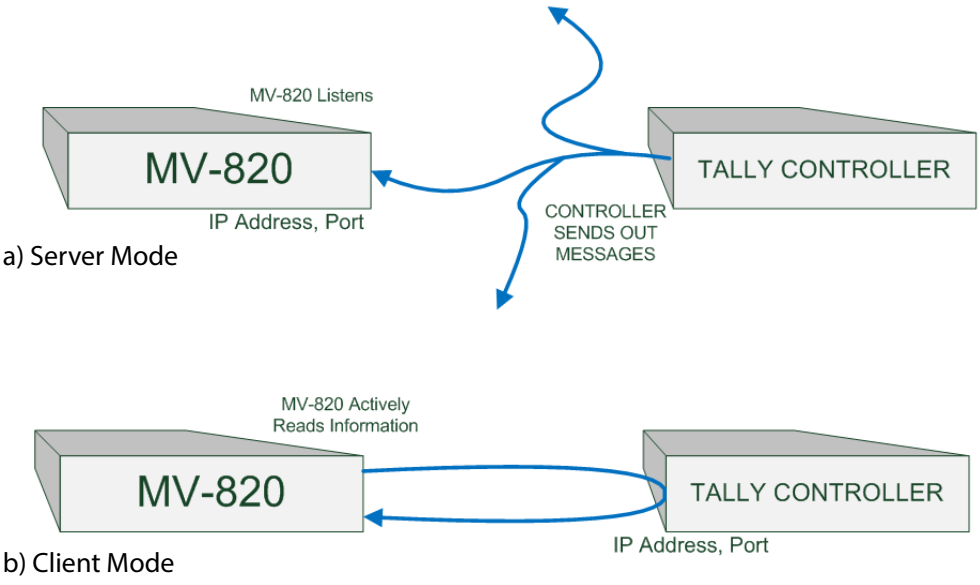


Figure 128 TSL Protocol Operating Modes: (MV-850 shown)
a) Server Mode
b) Client Mode

The Grass Valley RollCall Control Panel application is used to configure the settings for a MV-820 multiviewer in the RollCall TSL screen; see Section 5.12 "RollCall TSL Screen" on page 71.

8.3.3 Specifying Index Parameters for each UMD

Use the Grass Valley Orbit application to set the properties of each UMD in a video tile on the video wall layout. The properties differ between TSL Protocol 3.1 and 5.0.

The style of the UMD widget can be selected with the **Preferences > UMD Style** property.

The index parameters used by each UMD are specifiable in the UMD properties. Values can be set manually or values can be automatically assigned as part of assigning inputs to video tiles. (Refer to Orbit documentation.)

8.3.3.1 UMD Properties - TSL Protocol Version 3.1

TSL Protocol 3.1 is the original TSL protocol for sending data over a serial comms connection or via Ethernet. The multiviewer supports an Ethernet connection.

Each multiviewer monitor screen is addressed with a Display address. Each UMD associated with a video tile must have its **3.1 Display Address** property set up.

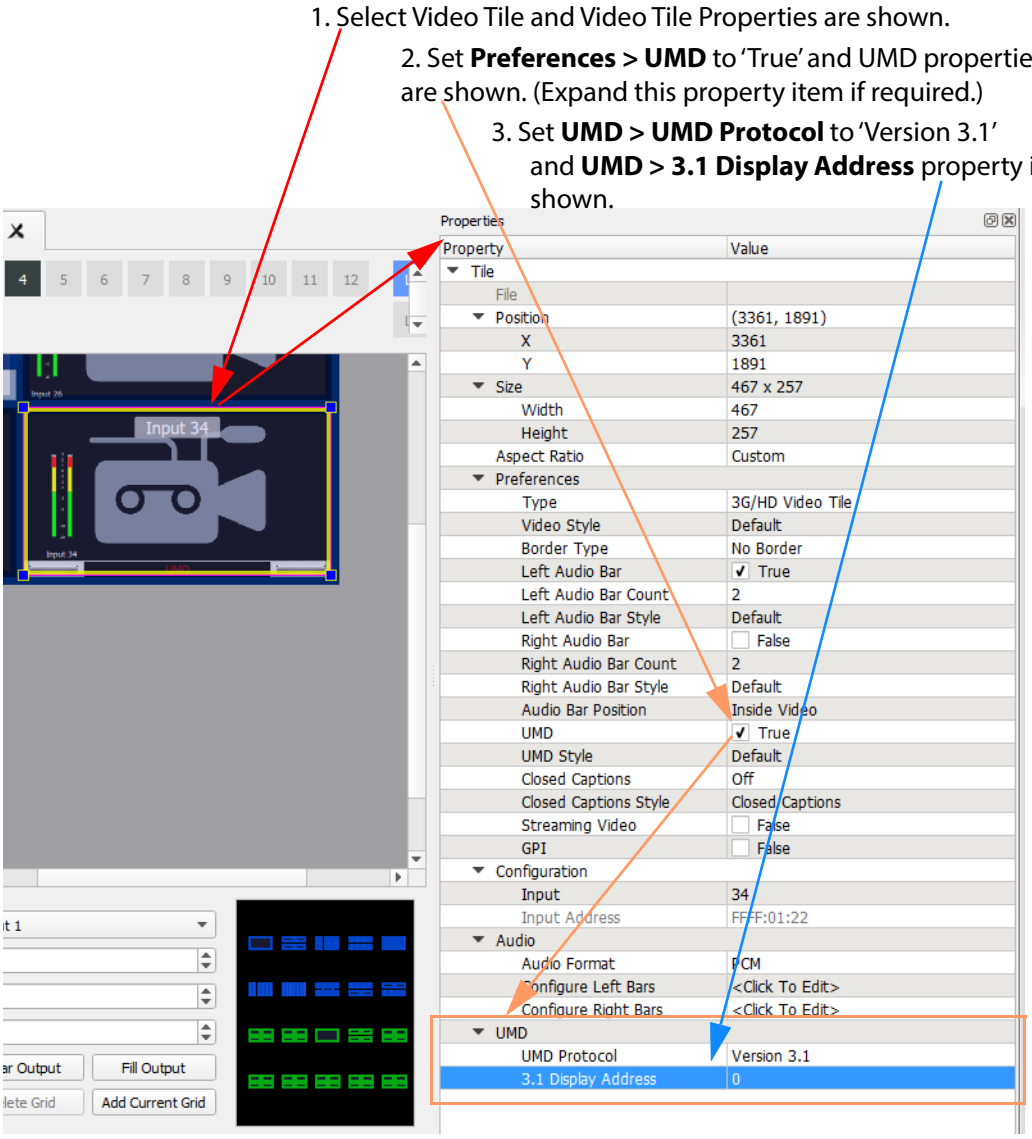


Figure 129 Orbit - Video Tile - UMD TSL 3.1 Properties

8.3.3.2 UMD Properties - TSL Protocol Version 5.0

TSL Protocol 5.0 is a 16-bit protocol, introduced to handle multiviewer display devices over Ethernet. It supports ASCII or Unicode character sets, and data is sent as UDP or TCP/IP over Ethernet.

Each multiviewer monitor screen is addressed by a Screen Index and each UMD within it by a Display Index. Each UMD associated with a video tile must have two parameters set up:

- **5.0 Screen Index** - Index number (address) of each display monitor.
  (16-bit, $FFFF reserved. 0 = not used.)
- **5.0 Display Index** - Index number for each UMD in a display.
  (16-bit, $FFFF reserved. 0-based.)

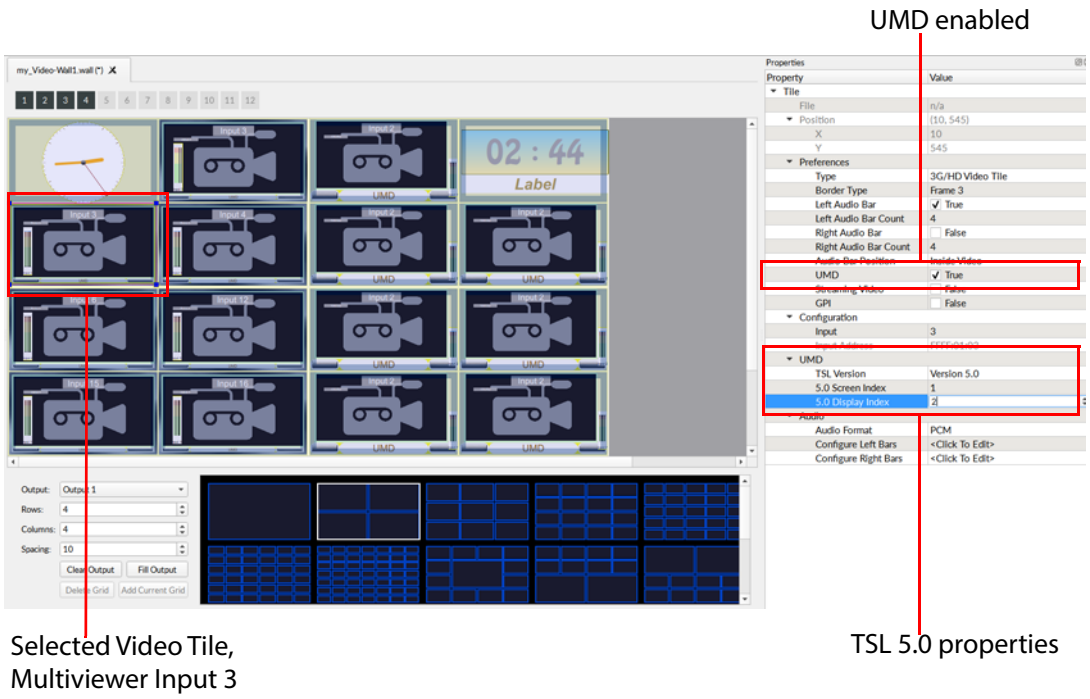


Figure 130 Orbit - Video Tile - UMD TSL 5.0 Properties

9 Maintenance - Software

This section describes various software maintenance operations for the MV-820.

As described in Section 1.3.4 "Control Network Interface" on page 11, an MV-820 unit comprises one or more functional blocks that are controlled, configured and upgraded separately. In particular, the MV-820-IP product comprises one multiviewer block and four Video IP blocks which must be controlled/ configured and upgraded separately. See Table 56.

Table 56 Network Connections to use for Control/ Configuration/ Upgrade

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

Information about a MV-820's:

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

9.1 Licensing

Licenses give access additional MV-820 features (for example, extra MV-820 display outputs).

9.1.1 License Files

The license files for the MV-820 are supplied upon purchasing a license from Grass Valley. They are small .zip files.

The license key within the file is tied to the **Serial Number** of a particular MV-820 unit. Some licenses use a password.

9.1.2 License Installation Procedure

The process of adding a license to an MV-820 block follows the standard process for a hardware module with licenses administered by Grass Valley RollCall.

For more details, please see the Grass Valley RollCall Control Panel User Manual or the Grass Valley RollMechanic Operator's Manual.

For RollCall Control panel, license installation is a two-stage process:

- **Stage 1**: Add the license file to RollCall Control Panel.
- **Stage 2**: Install license on the MV-820.

These are described in the sub-sections below.

9.1.2.1 Stage 1: Add License to RollCall Control Panel

The example below uses RollCall Control Panel.
From RollCall Control Panel:

1. Connect to a MV-820 multiviewer block.
2. Click the **Edit Licenses** icon  or click **Edit > Licenses**.
   The **License Viewer** window is displayed.
   Click on the relevant tab (for example **Multiviewer** tab).
   Available licenses in RollCall are listed.
3. Click **Import Licenses**.
   Navigate to the license file and **select** the file name.
   Click **OK**.
   The imported license is added to the listed licenses. See Figure 135.

The license is now added to RollCall Control Panel.

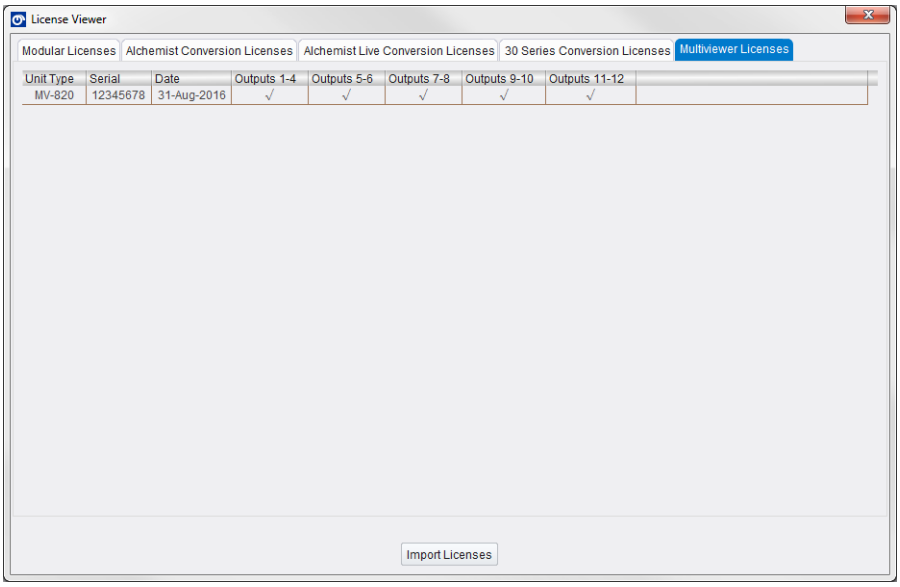


Figure 131 Sample License Viewer Window

9.1.2.2 Stage 2: Install License on the MV-820

The next stage is to install the license on the MV-820 multiviewer block or on an MV-820 video IP block, as required.

4. Right-click on the connected Multiviewer block in the left-hand pane of the RollCall Control Panel screen.
   Click **Unit License**.

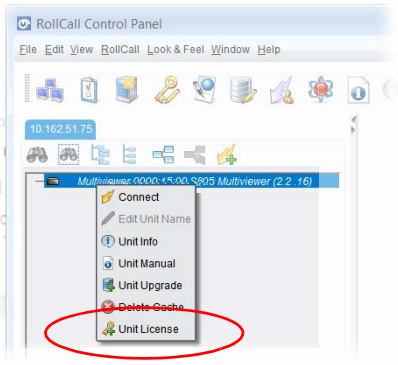


Figure 132 Right-Click Menu

5. The **Unit License** window shows current licenses and available licenses. See Figure 133.

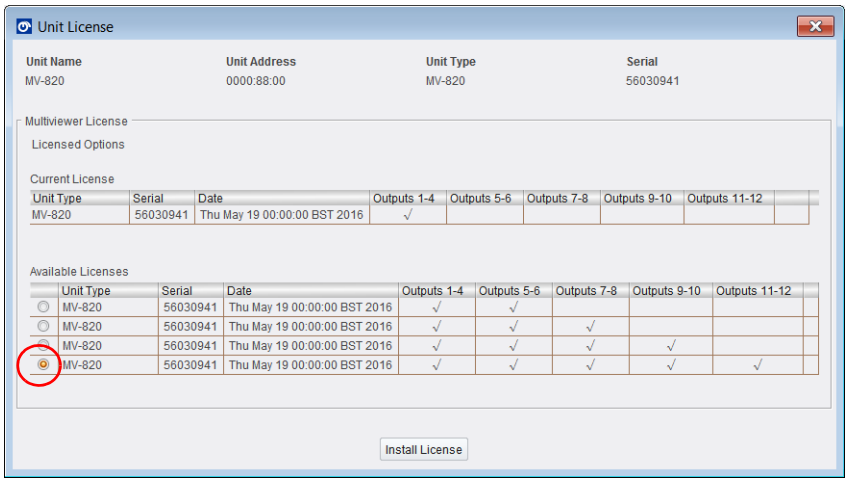


Figure 133 Selected License

6. Select the available license to be installed. Click **Install License**
7. Click **Yes** to install the license.
   The license is installed on the multiviewer and the multiviewer restarts (reboots). Click **OK**.
8. Rebooting takes approximately 4 minutes.

When the multiviewer finishes rebooting, it is operating with the newly-installed license.

9.2 Software Upgrade

9.2.1 Software Upgrade Package

Important

Before carrying out an MV-820 multiviewer software upgrade, please ask Grass Valley support for advice and inform Grass Valley support of the software versions you have for:

- MV-820 multiviewers.
- Any other Grass Valley MV-8xx multiviewers.
- Grass Valley Orbit software application.

A software upgrade package from Grass Valley is supplied by Grass Valley Support and comprises a set of data and installer files, typically approximately 100M bytes in size. The package is associated with a MV-820 software version number, for example, 2.1.16.

9.2.2 Software Upgrade Procedure

The MV-820 multiviewer block or video IP block software upgrading process follows the standard process for module upgrades with Grass Valley RollCall Control Panel. For more details, please see the Grass Valley RollCall Control Panel User Manual or the Grass Valley RollMechanic Operator's Manual.

For RollCall Control panel, upgrade installation is a two-stage process:

- **Stage 1:** Add the upgrade package to RollCall Control Panel.
  See "Stage 1: Add Upgrade Package to RollCall" on page 174.
- **Stage 2:** Install the upgrade on the MV-820.
  See "Stage 2: Install the Upgrade on the MV-820 Unit" on page 176.

These are described in the sub-sections below.

Note:

MV-820 software downgrades may also be carried out with the same procedure.

9.2.2.1 Stage 1: Add Upgrade Package to RollCall

This stage is applicable to an MV-820 multiviewer block or to a video IP block.

From RollCall Control Panel:

1. Connect to the MV-820 unit block as required (multiviewer block or a video IP block).
2. Click the **Import New Upgrade** icon, see Figure 134.
   The **RollCall Upgrade Packages** window is displayed.

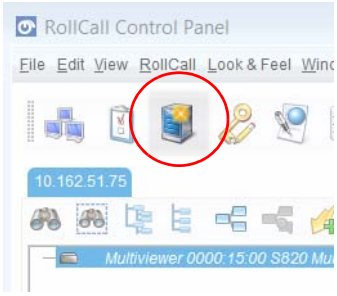


Figure 134 Import New Upgrade Icon

3. Click **Import Upgrade Package**.
   Navigate to the folder containing the upgrade package.
   Click on the .zip file name (see Figure 135).
   Click **OK**.

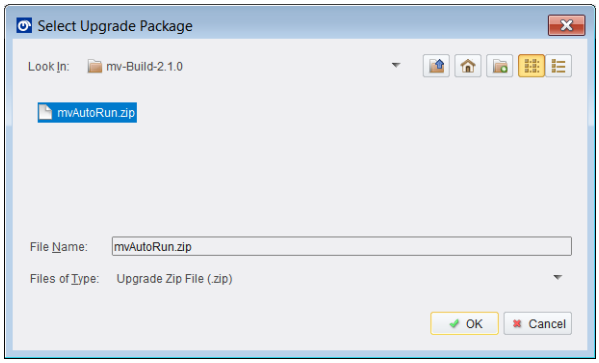


Figure 135 Select Upgrade Package Window

4. A progress bar at the bottom of the **RollCall Upgrade Packages** window shows the upgrade package import progress.
   Import completion is reported in the Import Log pane. See Figure 136.

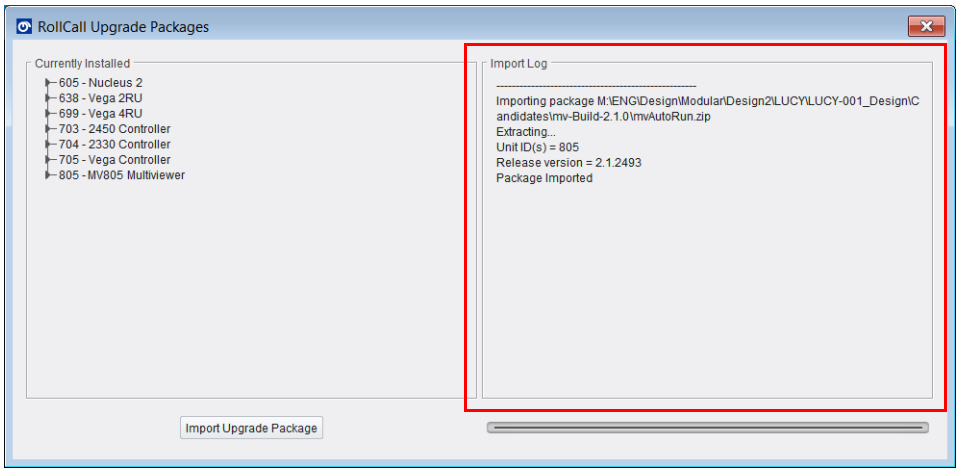


Figure 136 Import Log Pane Example

The upgrade package has been added to RollCall Control Panel.

9.2.2.2 Stage 2: Install the Upgrade on the MV-820 Unit

This stage is applicable to an MV-820 multiviewer block or to a video IP block.

Next, upgrade the MV-820:

5. Right-click on the connected Multiviewer name in the RollCall window. See Figure 137.

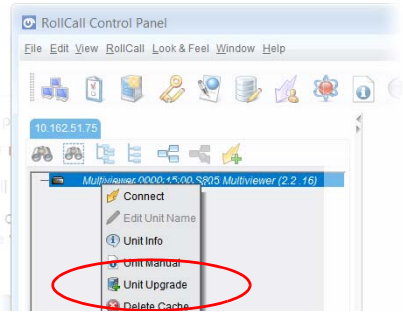


Figure 137 Right-Click Menu

Click **Unit Upgrade**. RollCall's **Unit Upgrade** window is displayed.

6. Select the **Software Release** required for installation in the Software Releases pull-down menu.
For example, select 2.1.2493, software release version 2.1, build number 2493.
Click **Upgrade**.
7. Click **OK** to upgrade.
8. Click **No** in response to the question:
"*Do you wish to save the current version before upgrading?*" (Figure 138).

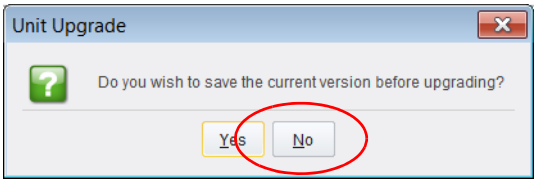


Figure 138 Click No to the question "Do you wish to save the current...?"

Note: The MV-820 does not support saving of current software version.
Click **No** in response to the message box shown in Figure 138.

The upgrade file is then sent to the MV-820 and the unit then starts to install the upgrade.

Important For **MV-820** multiviewer software versions **earlier than 2.8.17:**

Wait for the unit being upgraded to be ready for use.
And ignore "Upgrade Complete" messages in RollCall Control Panel's **Unit Upgrade** window (the message **does not** indicate that the unit's upgrade is complete).

For **MV-820** multiviewer software versions **2.8.17 onwards:**

The "Upgrade Complete" message in RollCall Control Panel's **Unit Upgrade** window does indicate that the unit has been upgraded.

9. Wait for the unit to reboot and for the unit's display outputs to re-show a video wall layout. This means the unit has is completed its upgrade installation.

Important

Wait for the MV-820 module unit to finish installing:

After the upgrade file is received by the unit from the RollCall control panel, the unit begins to install the upgrade. The unit can take 15 to 20 minutes to do this.

The unit is then only fully ready for use:

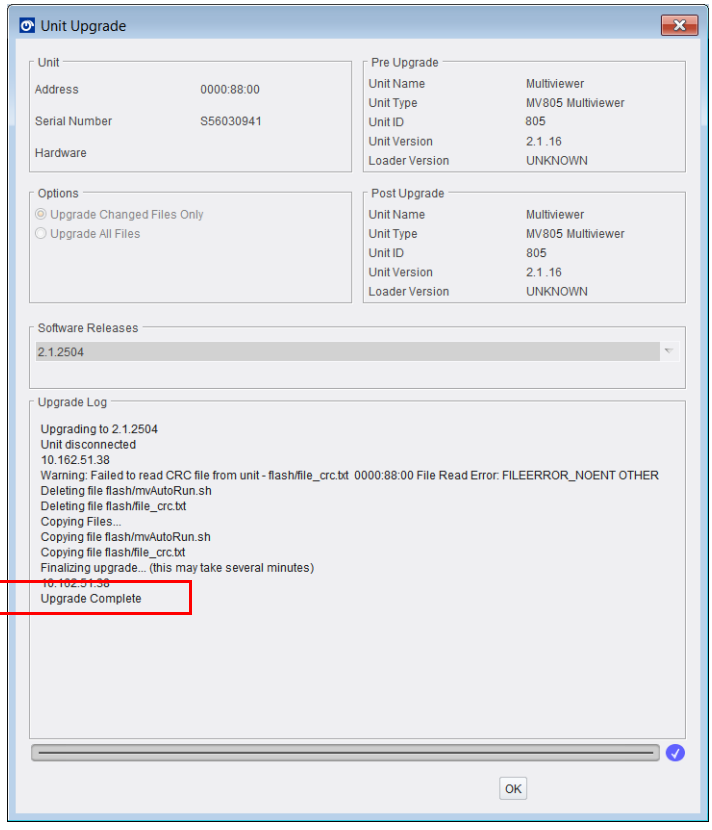
- After it has restarted (i.e. after a reboot, "Booting and Splash Screen" on page 46).

And

- When the unit's display outputs are re-showing a video wall layout.

10. Check that the MV-820 front module has a flashing green CPU Heartbeat LED. This means the multiviewer unit restarted and is running. If this is not the case, contact Grass Valley Support.

When the module has rebooted and the Grass Valley RollCall Control Panel has reconnected to the unit, the RollCall template for the corresponding multiviewer block or Video IP block shows the upgraded software version. See Figure 139 for typical **Update Log** messages.



Upgrade Complete

Important:

For Multiviewer software versions **before 2.8.17**:

Ignore any "Upgrade Complete" messages in RollCall Control Panel's **Unit Upgrade** window.

Figure 139 Typical Upgrade Log Messages

10 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.

10.1 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*.

10.1.1 Ethernet SFPs (Multiviewer Control and Monitoring Interface)

Ethernet SFP modules are already fitted to the MV-820 unit. They are not interchangeable with video SFP modules. However, fitting and removal instructions are similar to video SFPs.

10.1.2 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 140.

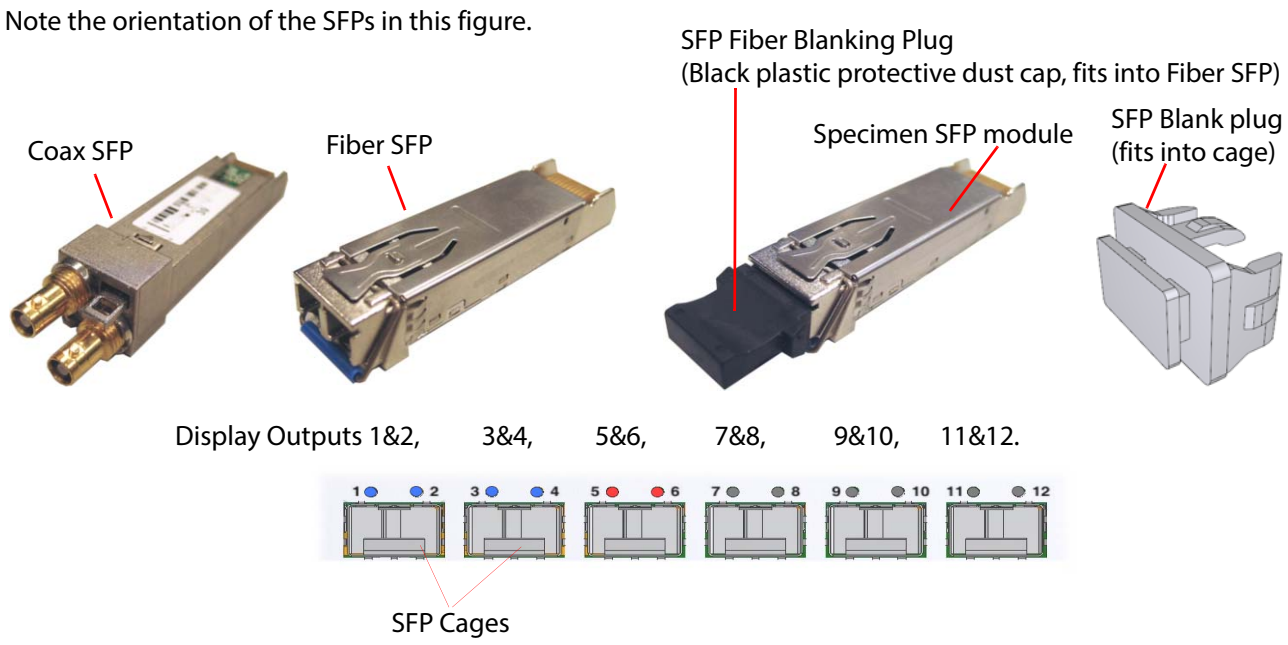


Figure 140 SFP orientation for fitting into MV-820 Rear Panel SFP cages

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 140 for SFP orientation.

Inserting SFPs:

Start by filling the SFP cage for output pair 1 & 2, then 3 & 4 etc., see Figure 140.

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.

10.2 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.

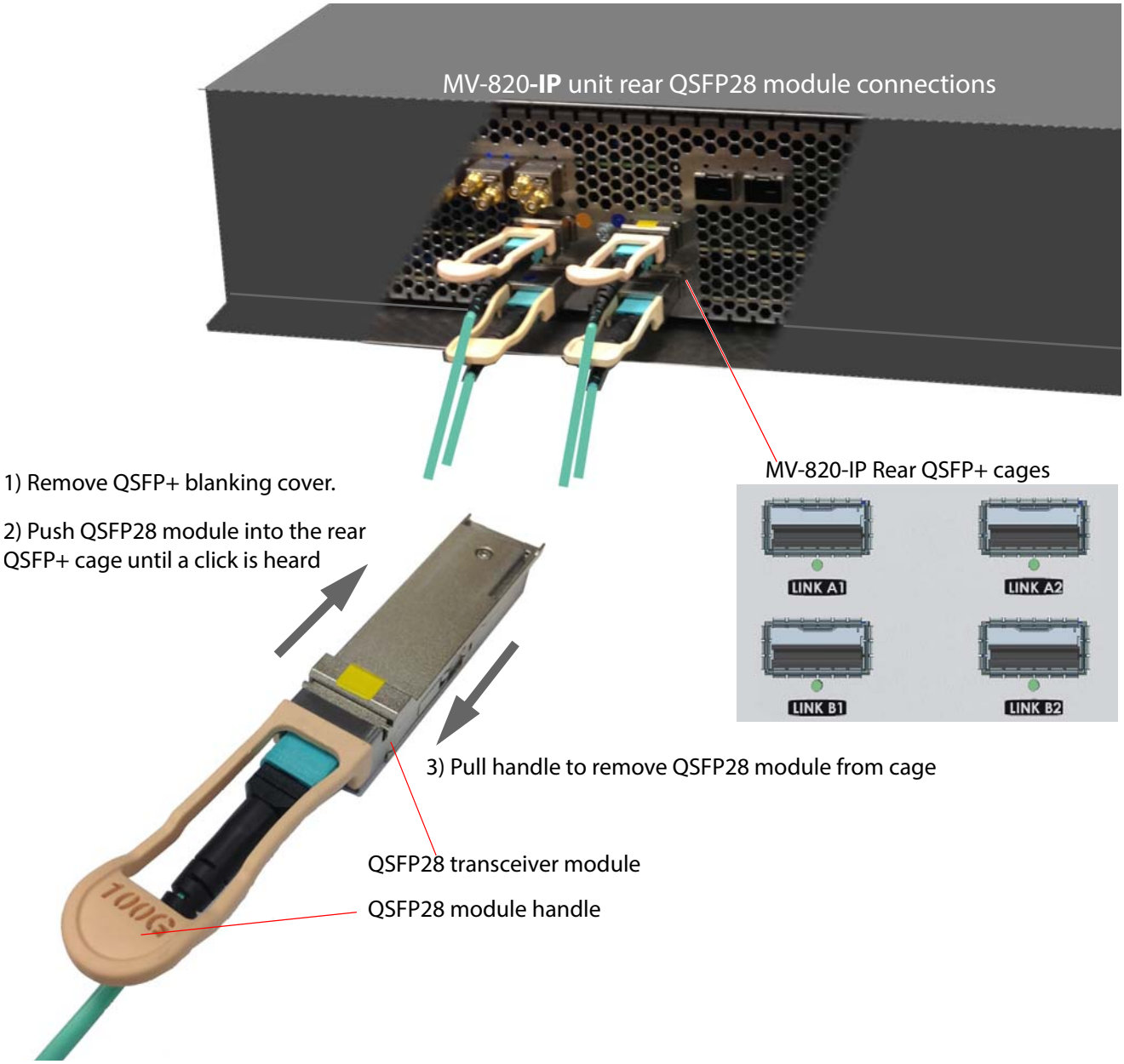


Figure 141 QSFP28 Transceivers and MV-820-IP Rear QSFP+ Cages

10.3 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.

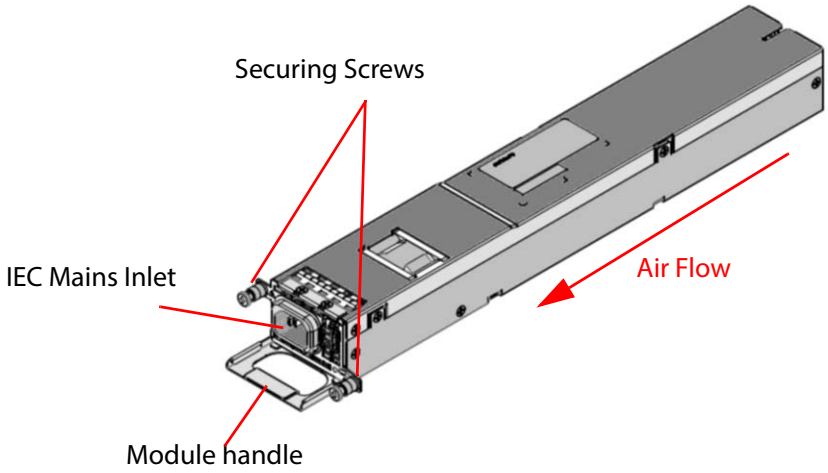


Figure 142 MV-820 Multiviewer PSU Module (Grass Valley stock code FGAMV 820-PSU)

Two PSU modules are fitted into the rear of the MV-820 chassis. Each is secured with two fixing screws, see Figure 143.

Each PSU has an IEC mains inlet and a status LED. The PSU status LEDs are described in Section 2.8.5 “Rear Connectors - Mains Inlets” on page 33.

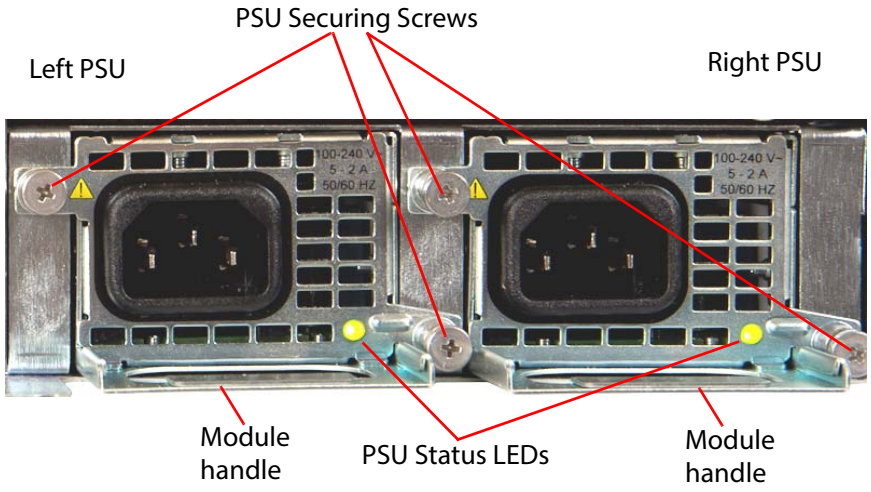


Figure 143 MV-820 Multiviewer Rear PSU modules

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.

10.3.1 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 143.
3. Carefully pull the PSU module out of the MV-820 chassis, using the PSU handle, see Figure 142.

10.3.2 PSU Module Fitting

Important

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

A pozi-driv screwdriver is required.

To fit a PSU module:

1. Note the orientation of a PSU module in the MV-820 chassis, see Figure 143.
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 143.
   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 Section 2.8.5 "Rear Connectors - Mains Inlets" on page 33.

10.4 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 Section 2.3 “Chassis Front” on page 20.
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 144.

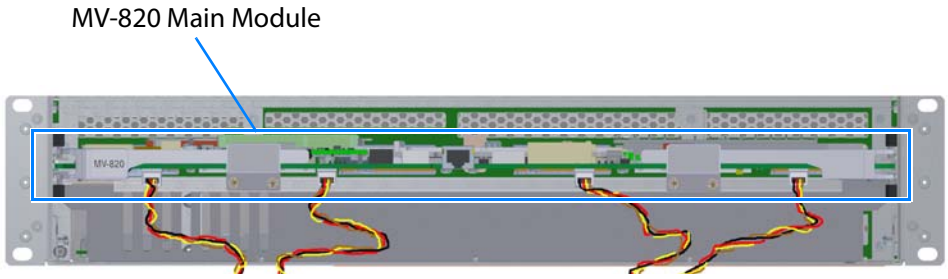


Figure 144 MV-820 Multiviewer Front View with Front Door Open

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 145.

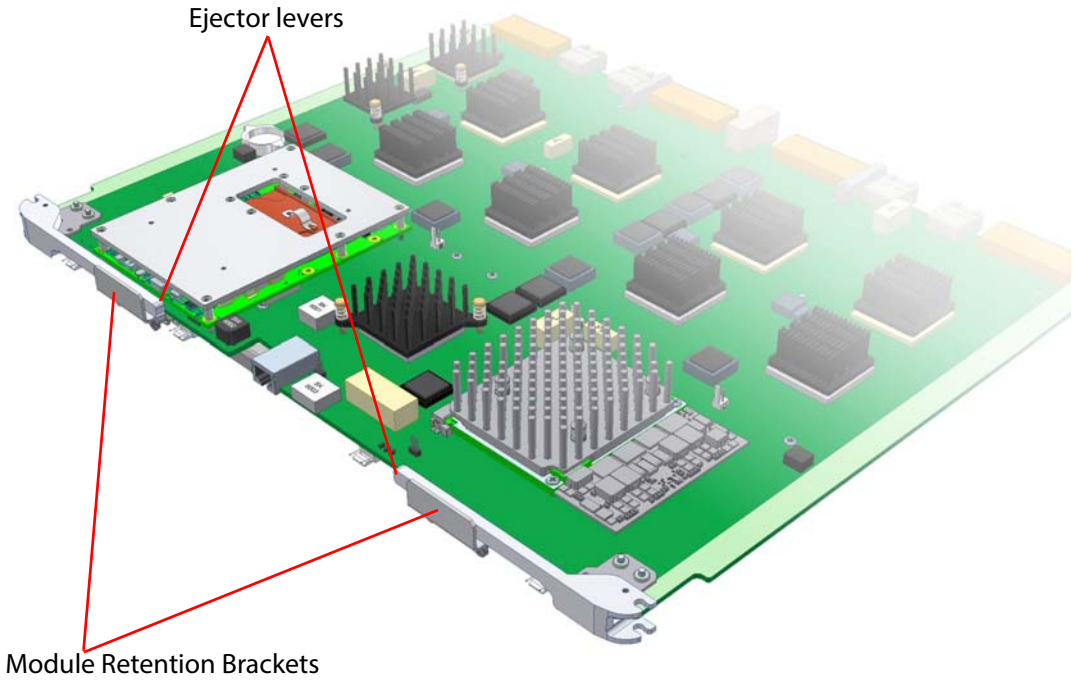


Figure 145 MV-820 Multiviewer Main Front Module

LED status indicators and connectors on the upper and lower front edge of the main module are described in Section 2.4 “Front Controls and Indicators” on page 22.

The Main Module is retained in the chassis with two Retention Brackets, each attached to the module’s lower Strengthener Bar with two captive screws. See Figure 146.

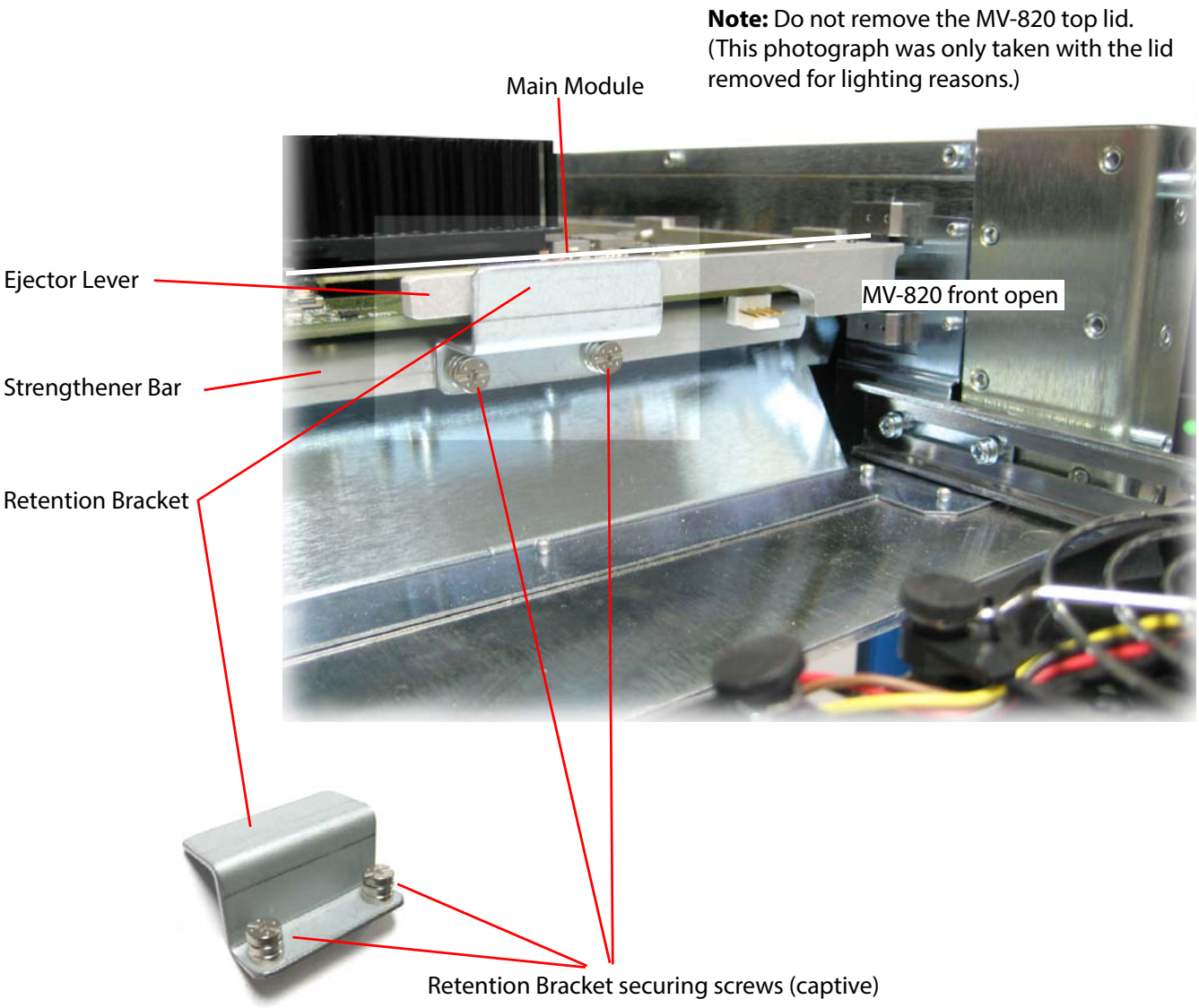


Figure 146 Main Module Retention Bracket and Strengthener Bar

10.4.1 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:

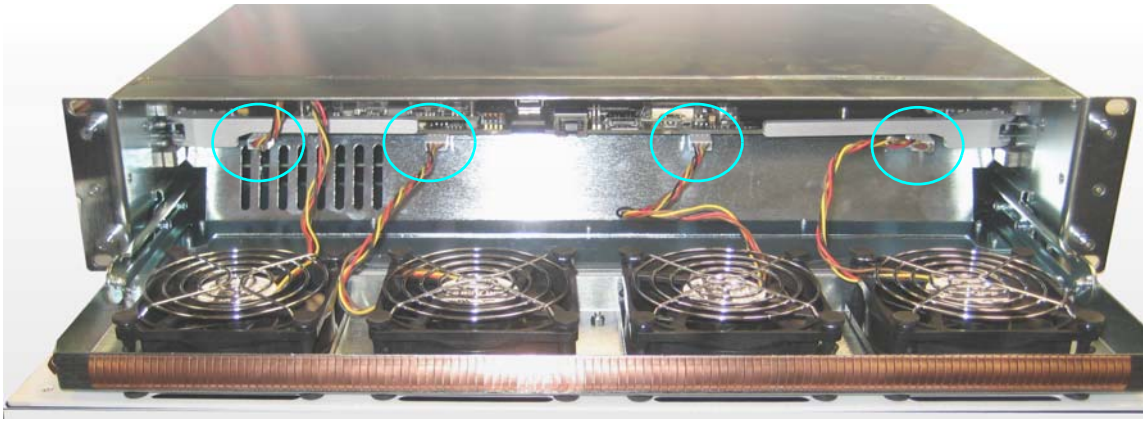
- Small pozi-drive screw driver, or a flat blade screwdriver.

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 Section 2.3.1 “To Open the Front Door” on page 20.)
3. Disconnect the four door-fan supply wires from the front of the MV-820 main front module. See Figure 147.

a)



b)

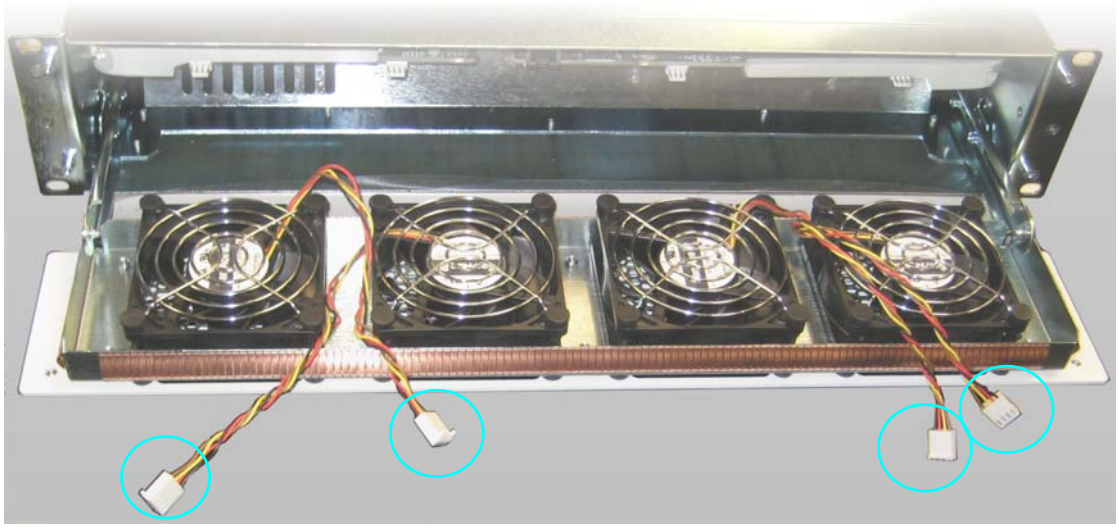


Figure 147 Door-Fan Supply Wires:
a) Fan Wires Connected to MV-820 Main Module.
b) Fan Wires Disconnected.

4. Unscrew the two captive screws securing one of the Retention Brackets.
   Remove the Retention Bracket and keep it aside. See Figure 146 and Figure 148.

   Similarly, remove the other Retention Bracket.

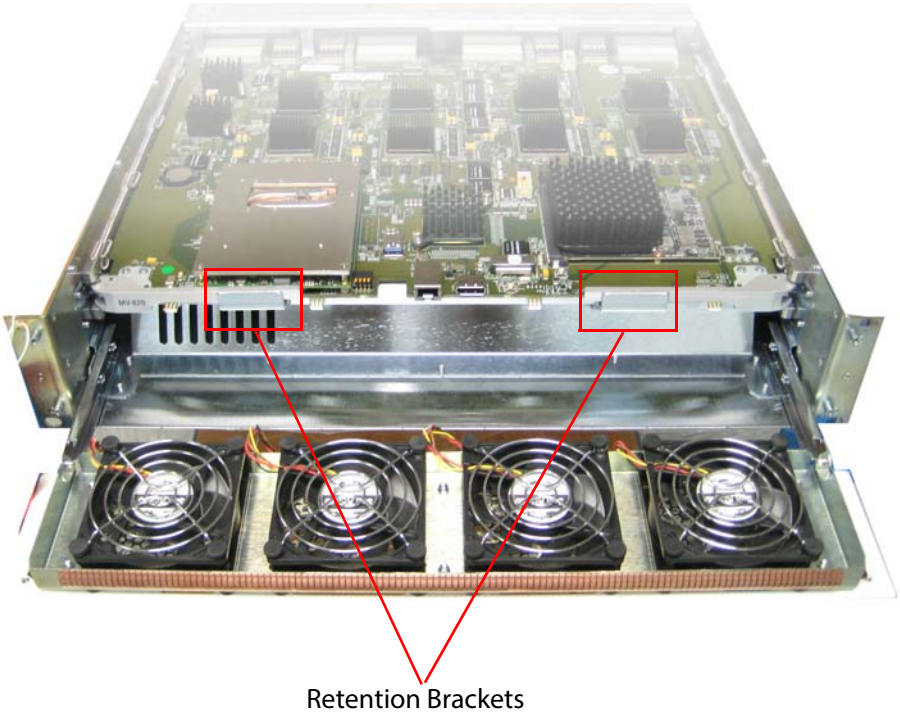


Figure 148 Retention Bracket Locations

5. Remove the front module by pulling on the two module eject levers, which hinge on the left and right. See Figure 149.
   The module disengages with the chassis and slides out.

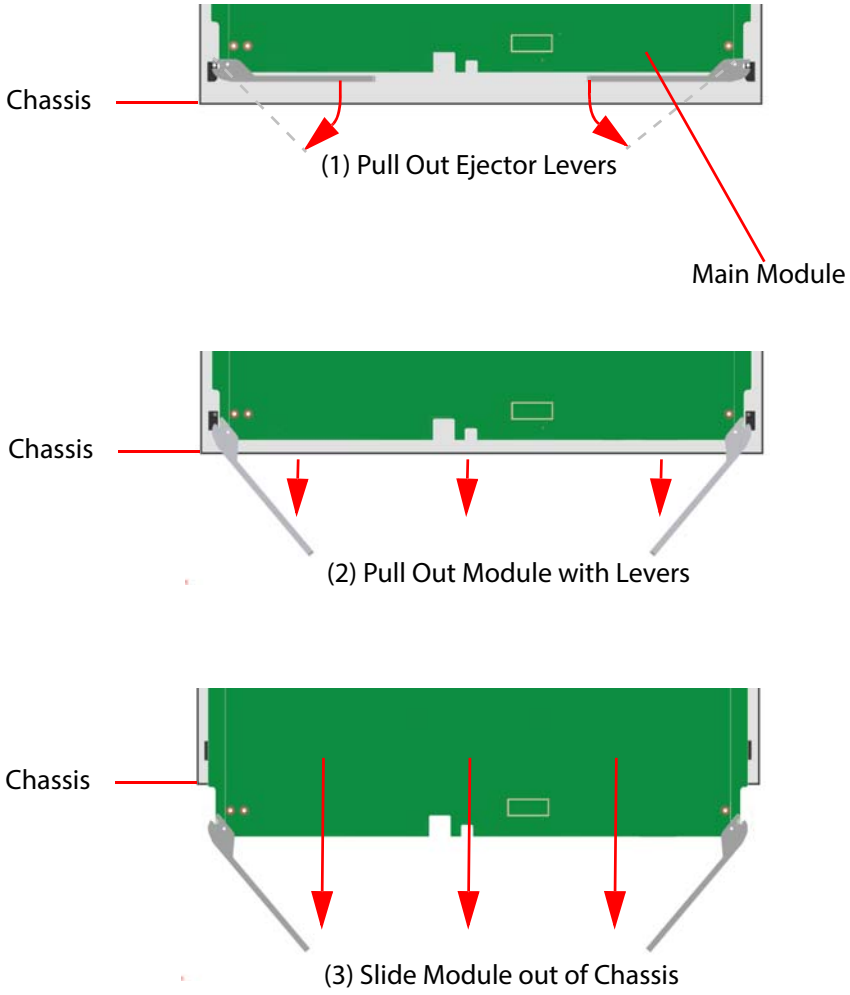


Figure 149 Removing MV-820 Multiviewer Main Module

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 190.

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

10.4.2 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 Section 10.4.1 "Main Front Module Removal" on page 186.

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 Section 2.3.1 "To Open the Front Door" on page 20.)
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 150.

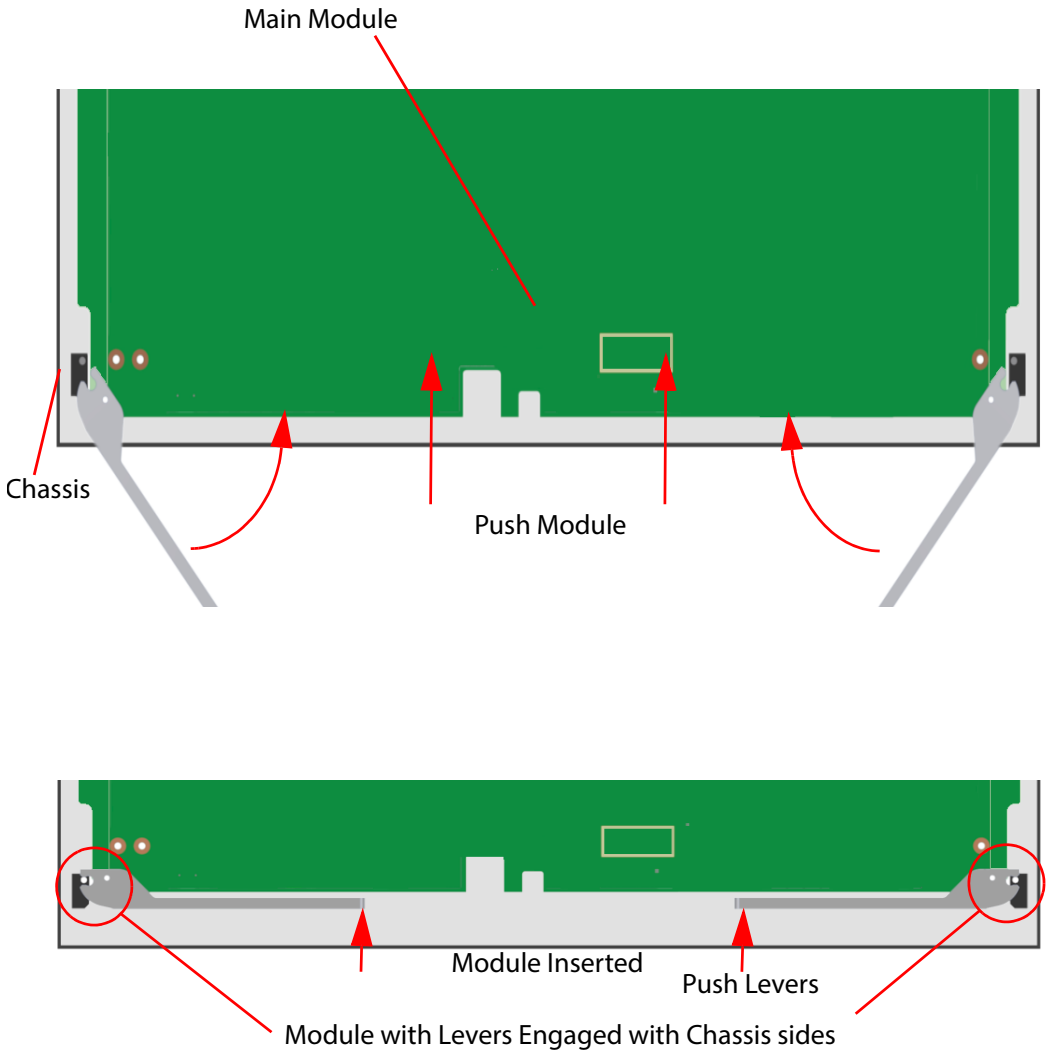


Figure 150 Inserting MV-820 Multiviewer Main Front Module

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 Strengthener Bar and secure by tightening the two captive securing screws.
   See Figure 146 and Figure 148.

   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 147.
7. Close and secure the chassis front door.
   (See Section 2.3.2 "To Close the Front Door" on page 21.)
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 Section 4 "Booting and Splash Screen" on page 46 for a description of the unit start up.

Appendix A MV-820 Specification

A.1 Power

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)

A.2 Operating Environment

Environmental	
Operating Temperature	5°C to 30°C ambient.
Relative Humidity	10 to 90% (non-condensing)

A.3 Weight

Product	
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.4 Overall Dimensions

Dimensions	
Width	482.6 mm (~ 19 in.)
Depth	604.8 mm (~ 23.8 in.)
Height	87.0 mm (~ 3.42 in.)
Note:	See Appendix B "MV-820 Dimensions" on page 205 for a MV-820 dimension drawing.

A.5 Video Inputs

Signal	
Video Inputs	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.
Video Standards	• SD-SDI 525/59.94 and 625/50 • HD-SDI 720p (50,59.94, 60 frames/s) • HD-SDI 1080i (25, 29.97 and 30 frames/s) • 3G-SDI 1080p (50, 59.94 and 60 frames/s)

A.6 Analog Reference

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

A.7 TV Standards

Video Standard			
3G-SDI: 2.97Gbps	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
HD-SDI: 1.485 Gbps	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))
SD Video Standards	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)
Video IP Stream Inputs			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)
IP Stream Timing and Synchronization			IEEE-1588v2 (PTP) compliant with SMPTE-2059-2

A.8 Outputs

Display Outputs	
SDI	From 4 up to 12 SDI video outputs. HD-BNC Coax or Fiber. • Outputs 1 to 4 on standard MV-820. • Outputs 5 to 12 with MV-820 licenses. Optional SFPs: • Dual coax SFP • Dual Fiber SFP • Single HDMI SFPs. (Up to 6 x HDMI outputs, 1080p)
Reference	Display Outputs locked to: • External Reference. • Or Internal Reference (free running).
Video Standard	Video Standard on display outputs: • 3G 1080p, or 720p • 50, 59.94 & 60 frames/s.
Delay	Latency: 3 fields (interlaced), 3 frames (progressive)
Streaming	MV-820-IP only. Display outputs can be streamed out of rear media network connections. Links A1 to B2. 2022-6.
Streaming Out Video Inputs	
Output Streams	Up to 48-off streamed outputs - scaled copies of the multiviewer inputs. Each multiviewer input is H.264 encoded to create streamed copies of the 48 inputs. **Note:** The H.264 streams do not function for the following slower-frame-rate HD standards: • 1080p30 (and slower frame rates); and • 720p30 (and slower frame rates).
Port	Streamed out over multiviewer block control and monitoring Ethernet ports ('MV Control 1' and 'MV Control 2'). These can be viewed on desktop PCs via the Grass Valley Orbit MV-800-DT option. Applications include: confidence monitoring, compliance monitoring.

A.9 GPI and LTC

GPI	
Connector	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 36 for wiring details and pinout.

A.10 Power Supplies

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

A.11 Ethernet Rear Panel Connectors

A.11.1 MV-820-HDBNC and MV-820-DENSI

Table 57 MV-820-HDBNC and MV-820-DENSI Rear Panel Ethernet Connectors

Connector	RollCall Control Panel Template Reference	Interface Type	Default IP Address	Comment
1G ENET Port 1	1G1	1G Ethernet	**10.54.31.221**	SFP+ cage for Ethernet SFP. Typically RJ45 Ethernet socket fitted. Used for control and monitoring of the MV-820 multiviewer block.
1G ENET Port 2	1G2	1G Ethernet	**10.54.31.222**	
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.11.2 MV-820-IP

A.11.2.1 Rear Network Connectors

Table 58 MV-820-IP: Rear Panel Ethernet Connectors

Connector	RollCall Control Panel Template Reference	Interface Type	Default IP Address	Comment
Multiviewer block:				
MV CONTROL 1	1G1	1G Ethernet	**10.54.31.221**	SFP+ cage for Ethernet SFP. Typically RJ45 fitted. Used for control and monitoring of the MV-820 multiviewer block.
MV CONTROL 2	1G2	1G Ethernet	**10.54.31.222**	
Video IP blocks:				
CONTROL A	-	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 59.
CONTROL B	-	1G Ethernet		

Table 58 MV-820-IP: Rear Panel Ethernet Connectors

Connector	RollCall Control Panel Template Reference	Interface Type	Default IP Address	Comment
LINK A1	Ethernet 1 and Ethernet 2	100G Ethernet (2x50G)	Media IP links are not configured with default settings for shipping. See **Note 2**	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 **Note 3**.
LINK B1	Ethernet 1 and Ethernet 2	100G Ethernet (2x50G)		
LINK A2	Ethernet 1 and Ethernet 2	100G Ethernet (2x50G)		
LINK B2	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 59.

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.11.2.2 Video IP Blocks

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 59 lists information about each of the four Video IP blocks.

Table 59 Four Video IP Blocks of an MV-820-IP Unit

Upper Left Block	
Slot	Upper Left
Video Inputs	1 to 12
Display Outputs	5 to 8
Default Control Interface IP Address	10.54.31.121

Upper Right Block	
Slot	Upper Right
Video Inputs	13 to 24
Display Outputs	1 to 4
Default Control Interface IP Address	10.54.31.122

Lower Left Block	
Slot	Lower Left
Video Inputs	25 to 36
Display Outputs	None
Default Control Interface IP Address	10.54.31.123

Lower Right Block	
Slot	Lower Right
Video Inputs	37 to 48
Display Outputs	9 to 12
Default Control Interface IP Address	10.54.31.124

A.11.2.3 Rear QSFP Cages

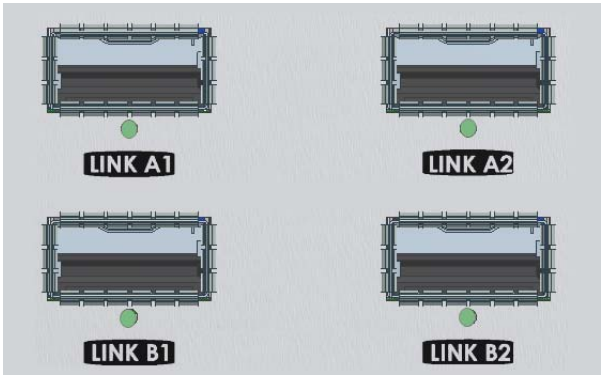


Figure 151 Four Rear Panel QSFP Cages

Table 60 list some information about each rear QSFP cage.

Table 60 Four QSFP Cages on Rear of MV-820-IP Unit

Upper Left	
Label	**LINK A1**
Video Inputs	1 to 12, 13 to 24
Display Outputs	1 to 4, 5 to 8

Upper Right	
Label	**LINK A2**
Video Inputs	1 to 12, 13 to 24
Display Outputs	1 to 4, 5 to 8

Lower Left	
Label	**LINK B1**
Video Inputs	25 to 36, 37 to 48
Display Outputs	9 to 12

Lower Right	
Label	**LINK B2**
Video Inputs	25 to 36, 37 to 48
Display Outputs	9 to 12

A.12 Unused Rear Panel Connectors

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

A.13 Multiviewer Monitoring and Alarms

Monitoring and Alarms	
Video:	
On-Screen Monitoring:	Fully flexible layouts: • Any object can be any size, in any position. • Adjustable layering and transparency of objects over video or other objects or background. • Display up to 48 video tiles on a single screen. • Any router input can be assigned to any screen. • WSS/AFD flags.
Alarms:	• Video Input signal loss • Video black • Picture freeze or still • Video Input format change.
Audio:	
On-Screen Monitoring:	• Metering of AES embedded audio: • VU, extended VU, DIN, BBC, and Nordic scales • Up to 32 audio channels per video signal • Bars outside or overlaid on picture • Audio meter scales on/off • Programmable color & alarm thresholds

Alarms:	• Loss of:
	  • AC3 encoded audio data,
	  • Dolby E encoded audio data.
	• DialNorm under preset threshold.
	• Dolby E configuration change.
	• Audio Level:
	  • Loss of audio.
	  • Audio level low/high.

Metadata and Control Monitoring:	
On-Screen Monitoring:	• Closed Caption & Subtitle detection • V chip detection • Display UMD router source names via General Remote protocol SW-P-08 over IP

Monitoring and Alarms	
Alarms:	Loss of: • Teletext. • Closed Caption (CC). • TS ID. • V-chip. • VITC. • Extended Data Services (XDS).
Alarm Control:	Controls and features for: • Configurable alarms trigger delays • Alarm acknowledge/clear/previous fault indication (border color or tally alarm box) • Alarm acknowledge from hardware or soft panels via Rollcall interface • Layout recalls from hardware or soft panels, on-screen message boxes via Rollcall • Alarm auto-clear after configurable period of time.

A.14 Video Wall Screen Display

Screen Display	
Screen Design	Facilities: • Drag and drop objects on screen • Configurable grid • Snap to grid • Object grouping and re-sizing • Fixed/adjustable video tile aspect ratios
Time code	Time code: • Display time code extracted from video and from multiviewer time code input
Time	Time: • Multiple clock display – lock to NTP, VITC or LTC, with time zone offsets • Generate real-time clocks and timers with count up/down capability
Miscellaneous	Control direct from mouse on screen. TSL tally display. Graphics / Images: • Add graphics files to display labels and channel logos, etc • Programmable background color or image

A.15 Software Versions

Tool	Version
RollCall Control Panel	4.18.17 or later
Grass Valley Orbit	2.4.23 or later
Multiviewer	2.16.16 or later

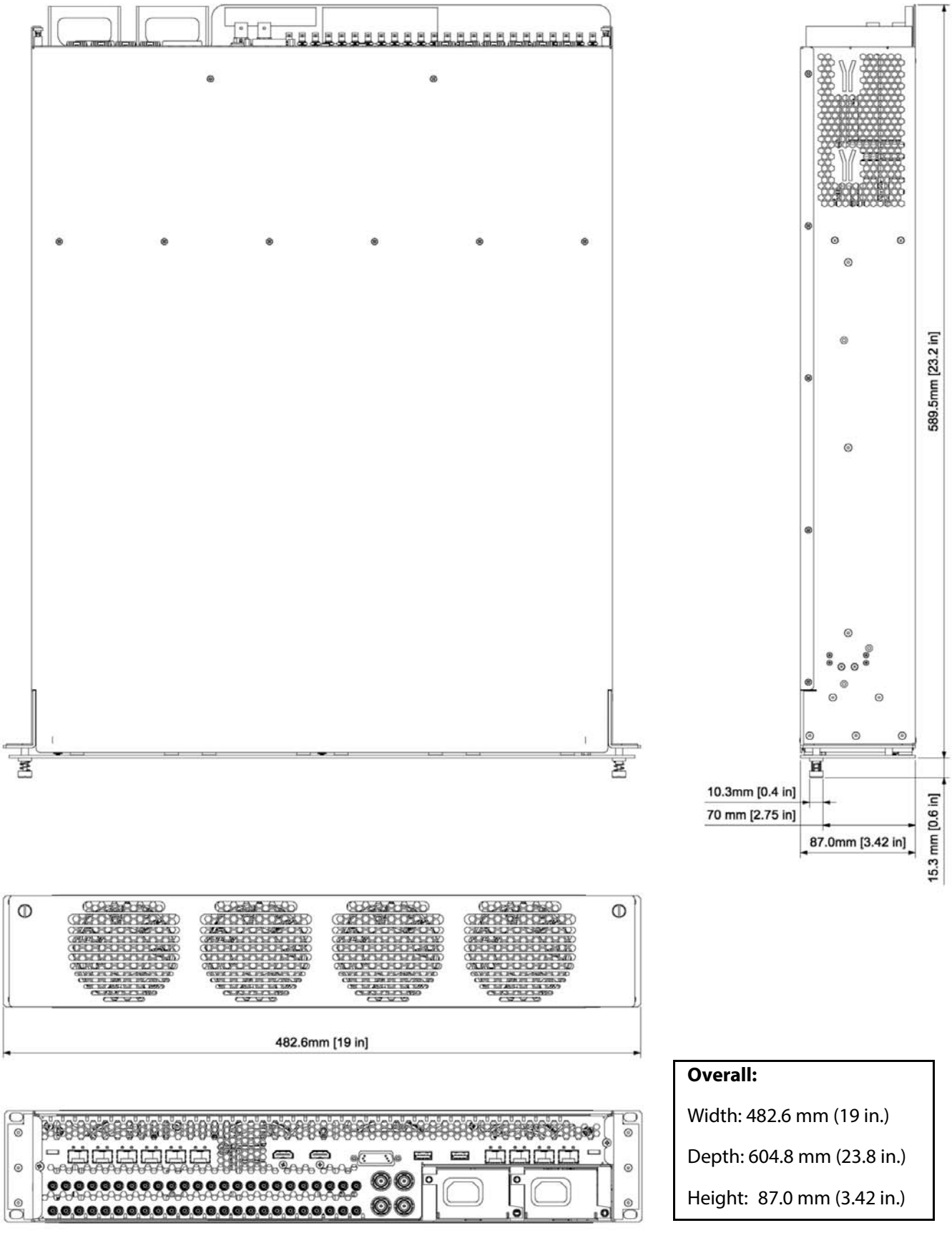
Note: **For future releases:**

Please refer to software release notes for compatibility information.

Appendix B MV-820 Dimensions

Chassis dimensions are shown in Figure 152.

.



Overall:

Width: 482.6 mm (19 in.)

Depth: 604.8 mm (23.8 in.)

Height: 87.0 mm (3.42 in.)

Figure 152 MV-820 Multiviewer Dimensions

Appendix C Multiviewer Terminology

This section describes some of the multiviewer terminology used in the manual and should be read alongside the example dual-screen video wall illustration shown in Figure 153.

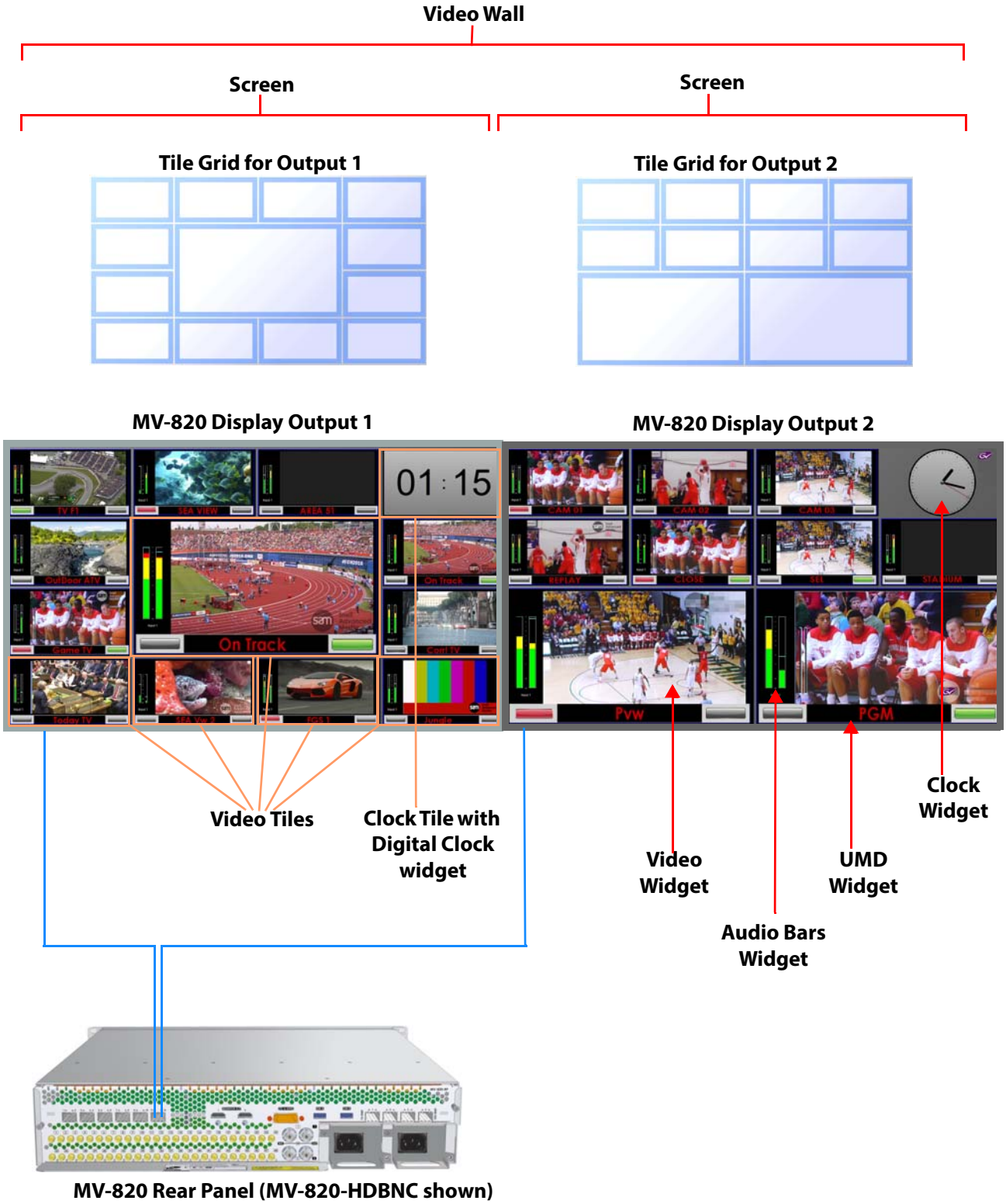


Figure 153 Example Video Wall of Two Monitor Display Screens

Table 61 Definition of Terms

Term	Definition
Wall, Video Wall	One or more monitor display screens configured to form one large screen.
Screen	Display area of one individual monitor/display device.
Theme	The style and appearance of the video wall and its screen elements. A Theme is a set of widget styles which can be applied to a project. Each widget may have one or more specific styles. Using themes, a video wall may be tailored to conform to a house style.
Style	Each Widget can have several appearances, styles. Styles are changes to a widget's appearance and do not affect its function. Styles can be grouped under themes.
Tile	A rectangular area on a video wall screen, usually displaying video inputs and other supporting information. For example, a tile may display a video picture with audio level and other related status information. Other information may be displayed in tiles, for example, time, images, labels and/or text.
Tile Grid	A multiviewer video wall screen is divided up into rectangular areas; various sizes and arrangements are possible. A tile grid can be used in Grass Valley Orbit for quick-positioning of tile arrangements on a wall.
Fine Grid	A fine grid on a Grass Valley Orbit screen is used for the fine-positioning of graphical elements. For example, for positioning Tiles on a wall or Widgets on a tile.
Widget	On-screen graphical elements used to display information on tiles. There are one or more widgets on a tile. Displayed information includes: Audio sound level, Time, Text labels. Widget types include: Audio bars, Clocks, Images, Labels, Lines, Tally LEDs, Timers, UMD's, Video and Web sources.
Display Output	A 1080P or 720P output from the MV-820 Multiviewer; this can be SDI (Coax or Fiber) or HDMI, or video-over-IP. There are up to 12 display outputs from an MV-820. Connection is via Coax, Fiber or HDMI SFP transceiver module(s), or via QSFP transceiver module(s) for video-over-IP (MV-820-IP). Each display output is then typically connected to a monitor display that forms all or part of a multiviewer video wall.
Video Input	One of 48 video inputs to the MV-820 unit.
Multiviewer Input	One of 48 video inputs to the multiviewer block within the MV-820 unit. On the basic MV-820, each video input is directly connected to one multiviewer input.
Streamed Video	Multiviewer inputs are streamed out from the MV-820 as H.264 compressed IP steams. These are outputs from the multiviewer. They can be streamed from the "1G1" and "1G2" Ethernet ports. They are available for viewing on a PC desktop (via stream viewing software, for example, Grass Valley Orbit with a MV-800-DT license option).

Appendix D IP Routing Terminology

Table 62 Glossary of IP Routing Terms

Control network	Typically an Ethernet network dedicated for device control.
COTS	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,.
Destination	Receiver of one or more flows. Destination spigot.
Essence	A general term used to describe a component of a media signal. Video, Audio and Metadata are all essences.
Fabric	Term for the networks that can make up a redundant network system, Fabric "A" and Fabric "B".
FEC	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.
Flow	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.
IEEE 1588	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.
IGMPv3	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.
In-Band Control	Sending control messages for an IP routing system in the media IP network fabric.
IP Stream	Real-time data (for example, video and/or audio) sent over a network.
IP Flow	Flows form a stream. There may be Video and Audio IP flows in an IP stream.

Table 62 Glossary of IP Routing Terms (Continued)

IP Router	A device that connects networks together.
IP Switch	A device that connects many network lines together. Many users can communicate and more than one transaction can occur at a time on network.
IP-RSC	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.
IPRA	IP Router Adapter, a functional block within an IP-RSC. The IPRA interfaces to the IP Routing system.
IPRC	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.
LLDP	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.
MAC Address	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.
Media network	A high-capacity network dedicated to carrying high bit rate media.
Multicast Stream	A one-to-many IP stream. Devices receiving the stream subscribe to the multicast stream's IP address.
Network	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
Northbound	Describes Control network data packet traffic.
Out-of-Band Control	Method of sending control messages for an IP routing system in a separate control network.
RFC-4175	TR-03 uses Internet Engineering Task Force's (IETF) RFC-4175 to pack (uncompressed) active video lines into an RTP IP stream.
RollCall	Grass Valley control and monitoring system.
RollCallv3	Traditional Grass Valley RollCall messages in the Grass Valley RollCall control and monitoring system product.
RollCall+	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 62 Glossary of IP Routing Terms (Continued)

RTP	Real-time Transport Protocol. An IP standard which specifies a way to manage the real-time transmission of multimedia data over a network.
SDI	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).
SMPTE 2022-6	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.
SMPTE 2022-7	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.
SMPTE 2110	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.
Source	Originator of one or more flows. Source spigot.
Southbound	Describes Media network data packet traffic.
Spigot	A generic term for a source or a destination of one or more flows.
Stream	Term usually associated with delivery of constant, real-time media (e.g. Audio, Video) over IP networks with a stream of data packets.
TR-03	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.
TR-04	A Video Services Forum (VSF) Technical Recommendation concerning the transport of media streams and elementary streams over a network.
VC-2	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

Grass Valley Technical Support

For details of our Regional Customer Support Offices please visit the SAM web site and navigate to Support/Customer Support Contacts.

https://s-a-m.com/support/247-support/

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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