Snell
Advanced
Media

User Manual

MV-805 IP Multiviewer

Software-based Turnkey IP Multiviewer Unit

Top Level Contents

Contents

1   About this Manual

Thank you for purchasing your new MV-805 IP Multiviewer unit.

This user manual describes how to install, configure and operate the MV-805, and provides any relevant safety information. If you have any questions regarding the installation and setup of your product, please contact SAM Customer Support.

1.1   Contact Details

Customer Support

For details of our Regional Customer Support Offices and contact details please visit the SAM web site and navigate to Support/247-Support.

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

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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2 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 ⚡
RISK OF ELECTRIC SHOCK
DO NOT REMOVE COVERS
NO USER SERVICEABLE PARTS
REFER SERVICING TO QUALIFIED
PERSONNEL ONLY

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 ⚡
RISQUE DE CHOC ELECTRIQUE
NE PAS RETIRER LE COUVERCLE
NE PAS INTERVENIR SANS
L'AGREMENT DU SERVICE
QUALIFIE

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:

⚠ ATTENZIONE ⚡
RISCHIO DI SHOCK ELETTRICO
NON CERCARE DI SMONTARE
L'UNITA PER QUALSIASI TIPO DI
INTERVENTO RIVOLGERSI AL
PERSONALE QUALIFICATO
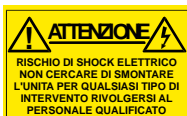
Le istruzioni relative alla manutenzione sono ad uso esclusivo del personale qualificato. E' proibito all'utente eseguire qualsiasi operazione non esplicitamente consentita nelle istruzioni. Per qualsiasi informazione rivolgersi al personale qualificato.

· **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 impiano 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

⚠ ACHTUNG ⚡
Gefahr von Elektroschocks.
Abdeckungen nicht entfernen
Keine vom Benutzer zu wartende Teile
Wenden Sie sich ausschließlich
an qualifiziertes Personal
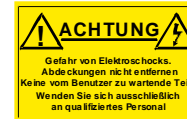
Die angeführten Service-/Reparatur-Anweisungen sind ausschließlich von qualifiziertem Service-Personal auszuführen. Um das Risiko eines lektroschocks zu reduzieren, führen Sie ausschließlich die im Benutzerhandbuch eschriebenen Anweisungen aus, es sei denn, Sie haben die entsprechende Qualifikation. 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

⚠ ADVERTENCIA ⚡
RIESGO DE CHOQUE ELECTRICO
NO QUITAR LAS PROTECCIONNES
ELEMENTOS NO ACCESIBLES AL
USUARIO
SERVICIO SOLAMENTE A PERSONAL
CUALIFICADO

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

⚠ FORSIGTIG ⚡
RISIKO FOR ELEKTRISK STØD
DÆKPLADER MÅ IKKE FJERNES
INGEN BRUGER SERVICERBARE
DELE I APPARATET MÅ KUN UDFØRES
AF FAGLÆRTE PERSONER

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

⚠ **CAUTION** ⚡

**RISK OF ELECTRIC SHOCK
DO NOT REMOVE COVERS
NO USER SERVICEABLE PARTS
REFER SERVICING TO QUALIFIED
PERSONNEL ONLY**

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

⚠ **VAROITUS** ⚡

**SÄHKÖISKUN VAARA ÄLÄ AVAA
LAITTEEN KANSIA EI SISÄLLÄ
KÄYTTÄJÄLLE HUOLLETTAVIA
OSIA HUOLTO AINOASTAAN
AMMATTILAISEN SUORITTAMANA**
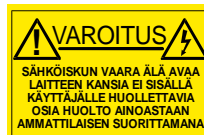
Huolto-ohjeet on tarkoitettu ainoastaan alan ammattilaisille. Älä suorita laitteelle muita toimenpiteitä, kuin mitä käyttöohjeissa on neuvottu, ellet ole asiantuntija. Voit saada sähköiskun. Jätä kaikki huoltotoimet ammattilaiselle.

· **Sähköiskujen välttämiseksi suojaa laite sateelta ja kosteudelta.**

· **Varmista, 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

⚠ **PERIGO** ⚡

**RISCO DE CHOQUE ELÉCTRICO!
NÃO RETIRAR AS PROTECÇÕES
PARTES QUE NÃO REQUEREM
INTERVENÇÃO DO UTILIZADOR!
CONTACTAR UM TÉCNICO
DEVIDAMENTE HABILITADO!**

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

⚠ **CAUTION** ⚡

**RISK OF ELECTRIC SHOCK
DO NOT REMOVE COVERS
NO USER SERVICEABLE PARTS
REFER SERVICING TO QUALIFIED
PERSONNEL ONLY**

⚠ 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.

2.1 Warnings and Precautions

2.1.1 Explanation of Safety Symbols

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

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

This symbol indicates that electrostatic handling procedures and precautions must be followed.

Third Party Items:

The Turnkey MV-805 products use third-party commercial off-the-shelf (COTS) components, including chassis and high-performance IP network card.

User documentation etc. from any COTS third-party manufacturers also applies throughout this document, including safety warnings and advice.

Note: | **Third party documentation:**

The MV-805 chassis is a third-party component and user documentation from the third party manufacturer is applicable throughout this document.

For each COTS third party manufacturer's contact details etc,
please see Section A.1 "COTS Hardware Platform for the Turnkey MV-805" on page 129 of this manual.

2.1.2 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.

CAUTION: This equipment has more than one power supply cord. To reduce the risk of electrical shock disconnect both the power supply cords before servicing.

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 are correctly made.

- This equipment has more than one power supply cord.
  To reduce the risk of electrical shock,
  disconnect all the power supply cords before servicing.

- Ensure the unit is properly shut down before disconnecting power supply cords.

- Isolate the unit from the outputs of other products before servicing.

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

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

Third Party Components:

Where this equipment uses any system components supplied by third parties, please pay attention to the respective safety information and any operating instructions relating to these component items.

2.1.3 Fiber Input/Output Modules

The MV-805 Turnkey units can be fitted with a variety of pluggable network interface modules, including optical fibre modules (QSFP28).

LASER SAFETY

CLASS 1
LASER PRODUCT

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.

2.1.4 Lithium Batteries

Battery Warning:

<div style="background-color:yellow; text-align:center;">

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

</div>
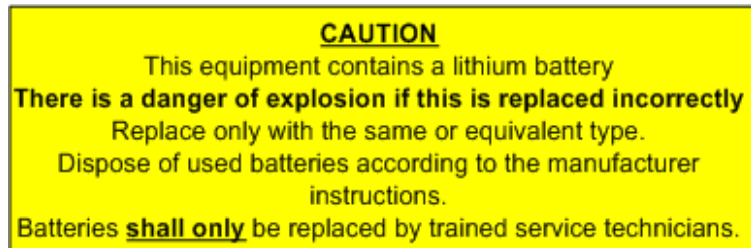
The MV-805 IP Multiviewer contains Lithium batteries to provide non-volatile memory.
Used batteries should be disposed of according to the manufacturers instruction.
Ensure that the same make and model of battery is used if replacement is required (a
manufacturer recommended equivalent may be used if the original type is not available).

The MV-805 IP Multiviewer can only be serviced by suitably qualified personnel and removal
of the battery should only be performed at a SAM service centre.

2.1.5 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.

2.1.6 Electrostatic Damage

Electrostatic Damage

Static precautions must be observed when inserting and removing cards or modules,
including Small Format Pluggable (QSFP) modules.

2.2 Power Cords

Power cords are supplied to suit the geographical region.

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

2.3 Safety and EMC Standards

Safety Standards:
Refer to Section A.5 "Regulatory Compliance" on page 130 for safety information.

EMC Standards:
Refer to Section A.5 "Regulatory Compliance" on page 130 for EMC compliance information.

EMC Performance of Cables and Connectors:

SAM 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.

3   Product Overview

The MV-805 IP Multiviewer is a software-based multiviewer unit for 'IP in' and 'IP out' applications. It provides a multiviewer capability for uncompressed, high quality video IP streams in pure IP environments. It is offered in two 1RU hardware turnkey versions.

MV-805 uses software-based processing: Multiple video IP streams are processed, video and audio status is monitored, and multiviewer video wall output image(s) are formed by the MV-805. The MV-805 provides a high-resolution display output video IP streams which contain the multiviewer video wall image(s).
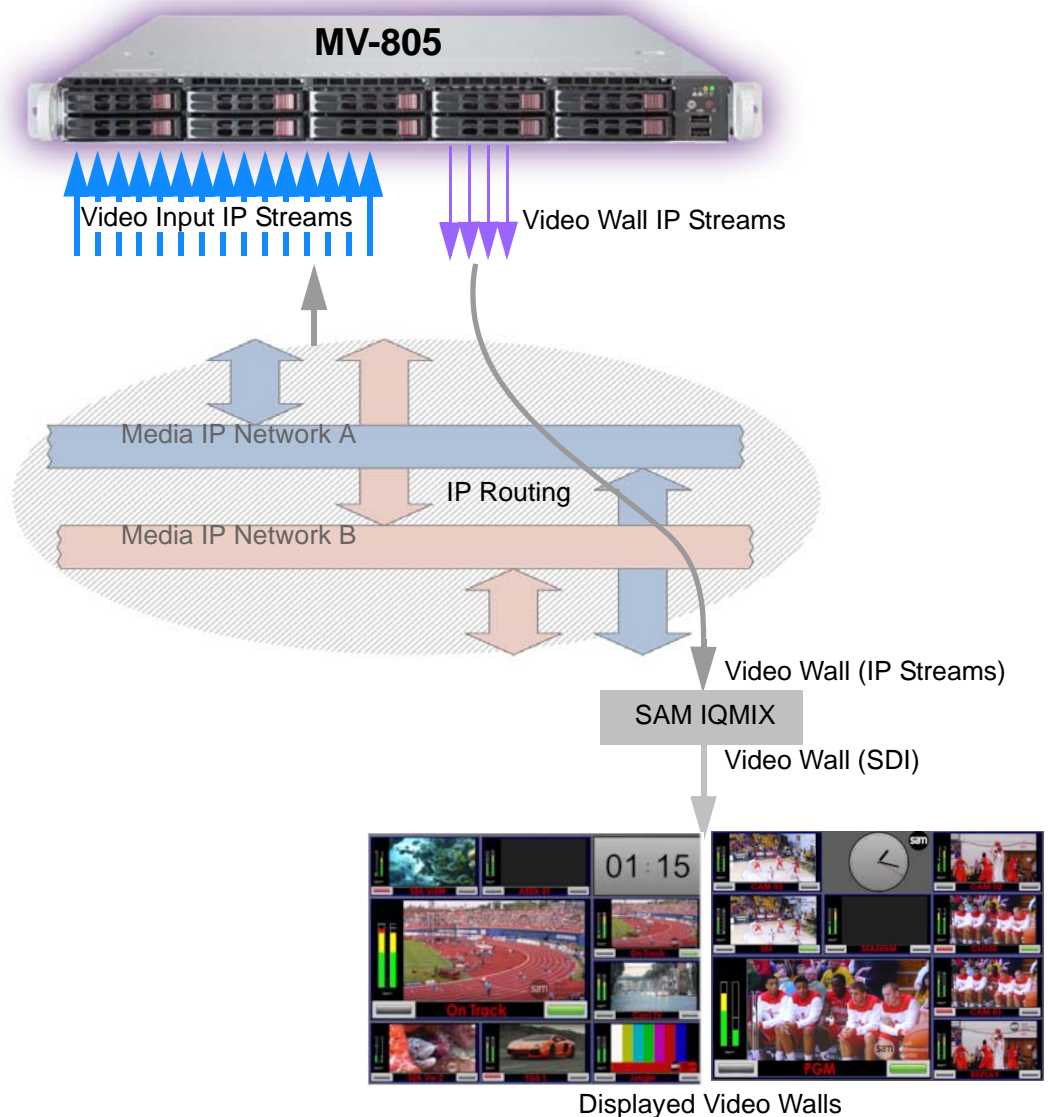
Figure 1   MV-805 IP Multiviewer

The MV-805 IP Multiviewer Series comprises:

- **MV-805-32:**   1RU Turnkey; 32 inputs, 8 display outputs.
- **MV-805-16**:   1RU Turnkey**;** 16 inputs, 4 display outputs.

The MV-805-32 and MV-805-16 1RU turnkey products use commercial off-the-shelf (COTS) hardware comprising a high-performance server PC installed with hardware-optimized SAM MV-805 IP Multiviewer software and all peripheral system components, including high-performance network adapter(s).

3.1 MV-805 Features and Benefits

Standards support for:

- 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, VC-2 compressed video.

Input IP Stream:

- Resolution 1080p/1080i/720p 50/59.94.
- 4K via "quad-link".
- Up to 32 video inputs.

Timing:

- Timing synchronization using IEEE-1588v2 (PTP), compliant with SMPTE 2059-2.

Multiviewer Video Wall Display Output:

- Up to 4x high-quality, uncompressed Video IP stream outputs.
- 1080p/4K 50/59.94/60 Hz.

Total Multiviewer Wall Layout Flexibility:

- Up to 32 video tiles per display.
- Display status and alarms from video inputs and/or external devices.
- Up to 16 channels of audio metering per video input.
- Background graphic support; Logo support, Audio meters, Clocks and Timers.
- Adjustable layering, transparencies and fine-positioning. Full-screen any input.

Alarms and Status:

- Alarms, including: Input Video Lost, Audio Lost, IP Fabric Lost
- Notifications, including:
  Border Alarm, In-Picture Message, SAM protocol.
- Status information, including:
  Input Standard, IP stream information, bit rate, IP encoding, Multicast Address.

Ethernet ports:

- Up to 4x 100Gbit ethernet ports for media IP networks
  - for all Video Input IP streams and the Multiviewer Display Output IP streams.
- 2x 1Gbit ethernet for control.
- Supports Local Link Discovery Protocol (LLDP).

Other:

- Tally support: SAM SW-P-08 protocol, and TSL 3.1 or 5.0 protocols.
- Support for SAM's IP routing solution.
- SAM hardware control panel support.

3.2 Order Codes

Order Code	Description
MV-805-32	MV-805-32 1RU Software-based Turnkey IP Multiviewer.
MV-805-16	MV-805-16 1RU Software-based Turnkey IP Multiviewer.
QSFPCOVER	QSFP cage EMI/Dust cover

Table 1   MV-805 IP Multiviewer Order Codes

3.3 Functionality Architecture and Signal Flow

A turnkey MV-805 is based on a COTS server with high-capacity IP network interfaces. A SAM IP Multiviewer software application runs on the server and is fully hardware-optimized. It is this software application that provides the MV-805 IP Multiviewer with its "multiviewer functionality".

3.3.1 Input and Output Connections

The MV-805 IP Multiviewer unit's main input/output connections (see Figure 2) comprise:

- Network Ports:
    - Up to four high-performance "Media" IP network ports.
    - Up to two "control" network ports.
- Power:
    - Up to two AC power connections.
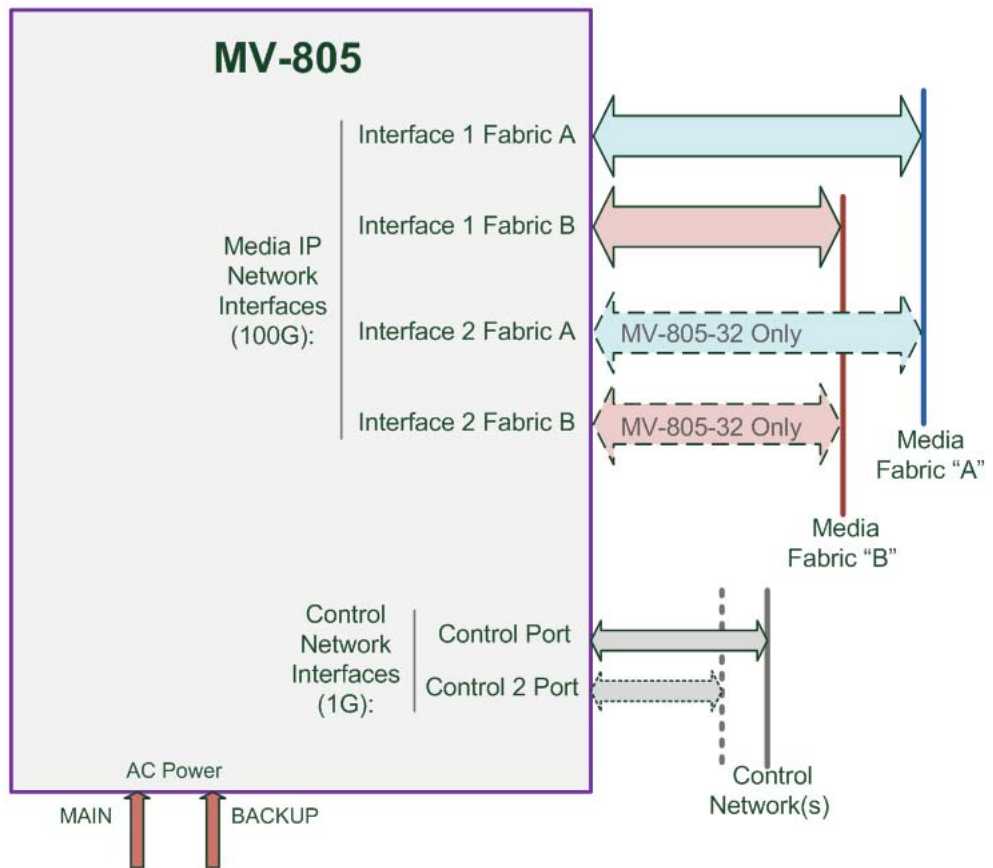
Figure 2   Main Input and Output Connections of a MV-805 Turnkey Unit

The MV-805 unit is "IP in" and "IP out" and must be connected to a media IP routing system. All the video inputs and the multiviewer video wall display output(s) are video IP stream(s) and they are carried on high-performance 100G networks, media fabrics "A" and "B".

The MV-805 generates multiviewer video wall image(s) from its input video streams. The video walls are provided as one or more video IP streams over the media IP routing system. Video wall layout information is pushed to the MV-805 from the SAM Orbit video wall design tool over a control IP network.

The two mains power supply connections provide the unit with power supply redundancy.

3.3.2 Turnkey MV-805 Hardware-Optimized Software

Inside a turnkey MV-805, a hardware-optimized SAM IP multiviewer software application implements the MV-805's "multiviewer functionality". This uses the media IP network interface(s) for *all* media IP streams (In and Out) and it uses further network port(s) for connection to a control IP network for control/servicing.

IP streams (in or out) connect to 'spigots' on the IP multiviewer software application. Each video input IP stream is taken from the media IP network interface by the software application. The final multiviewer display output image is formed and provided as a video IP stream to the media IP network interface.

Figure 3 shows the connection of the MV-805's multiviewer software application to the unit's external interfaces.
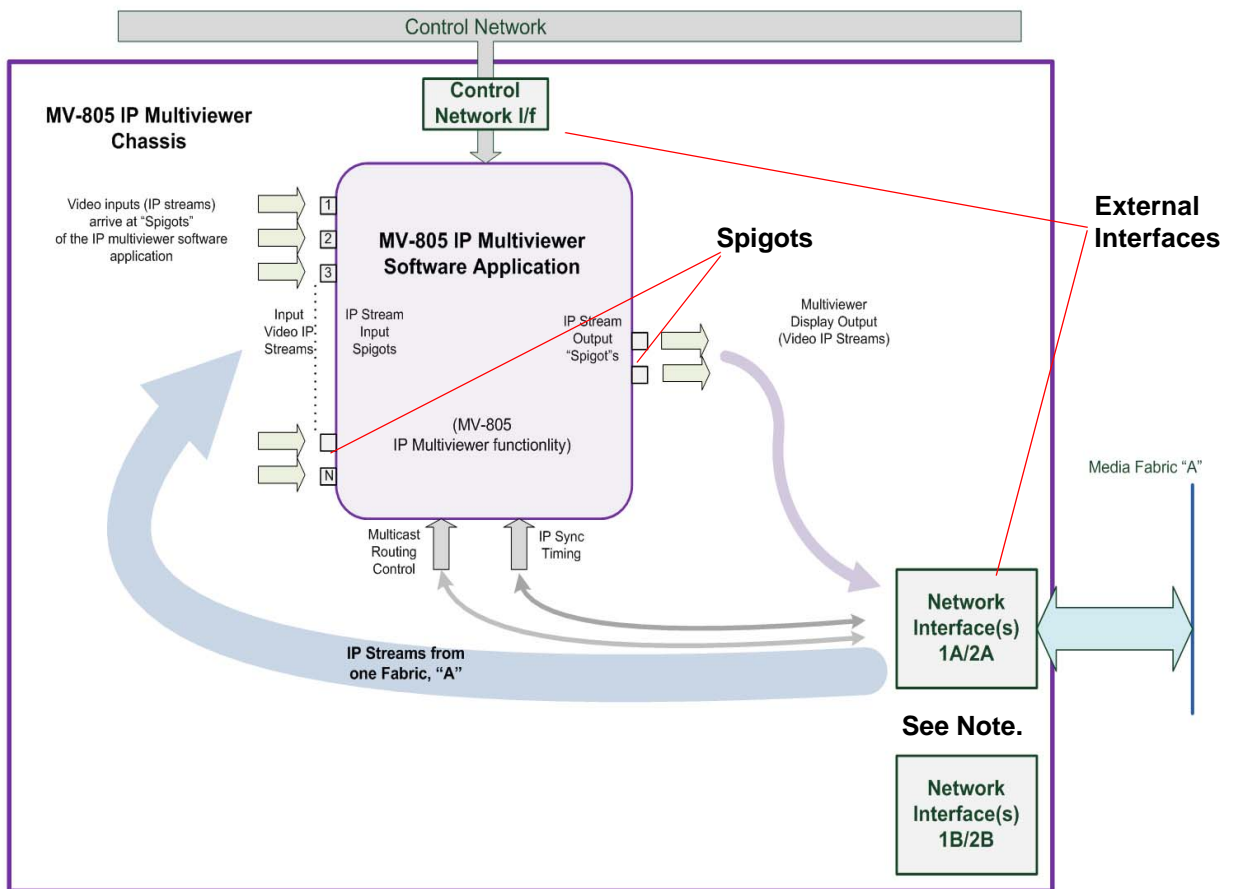
Note:
        MV-805-16 has two media network interfaces, 1A and 1B.
        MV-805-32 has four media network interfaces, 1A,1B, 2A and 2B.
        (i.e. the MV-805-32 has twice the network interface bandwidth.)

Figure 3 Internal Connections to the Hardware-Optimized IP Multiviewer Software Application

Destination Spigots:

Each input spigot of the IP multiviewer software application looks for a specific multicast IP stream from the media IP network interface(s) and takes those multicast data packets. Thus, all multiviewer video inputs are acquired by each spigot.

Source Spigots:

Each output spigot packetizes all or part of a multiviewer display output image and sources a multicast IP stream containing a video wall. This is sent out via the media IP network interface(s).

3.3.3   Network Redundancy

The MV-805 offers support for network redundancy, ensuring protection of an IP pathway from a multicast IP stream's source to the MV-805's destination spigot via second network (Fabric B), see Figure 4. Thus there are two identical Multicast IP streams available.

The receiving destination spigots use both IP streams to re-form the original IP stream, using the first data packet to arrive from fabrics "A" or "B".
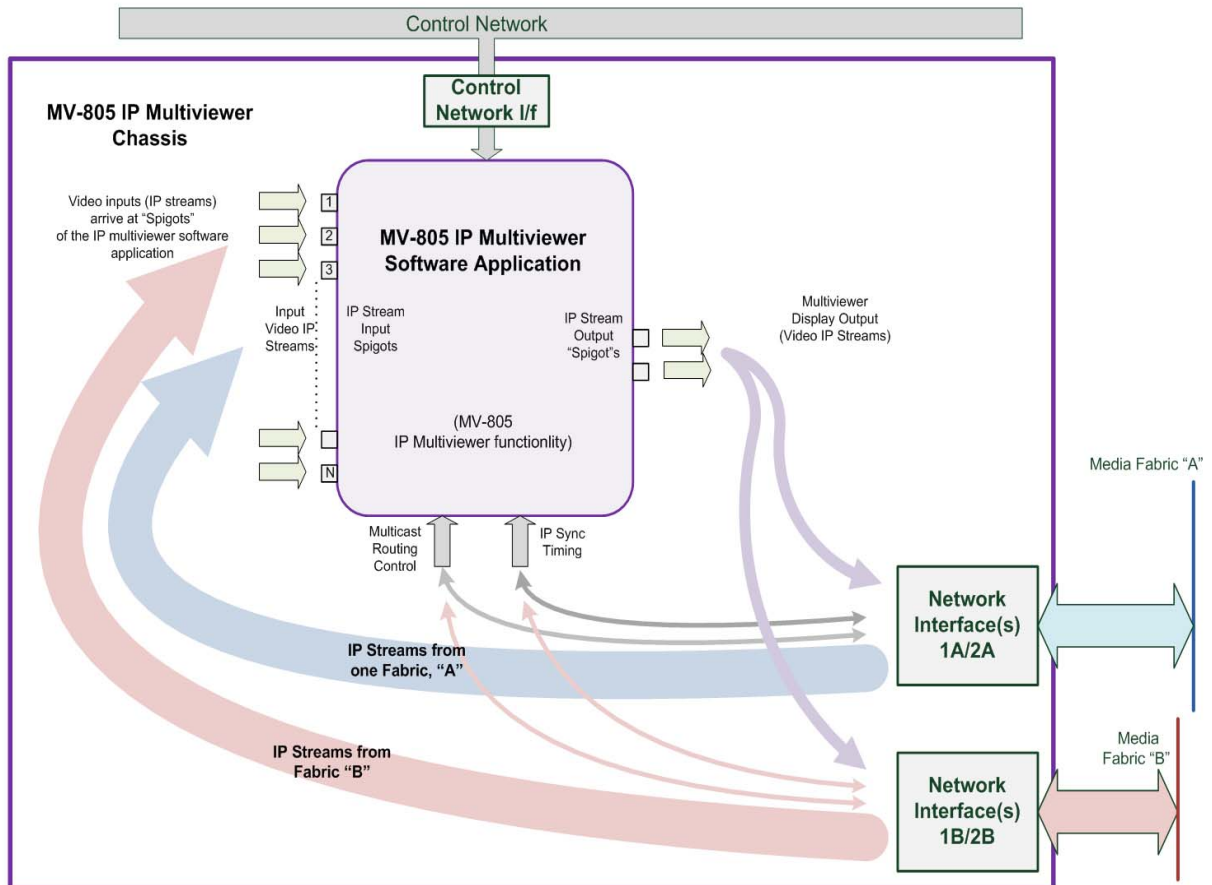
Figure 4 IP Fabrics "A" and "B" providing Redundant IP Streams

3.3.4   IP Streams and Flows

IP streams are IGMPv3 multicast IP streams.

IP streams may consist of sub-streams, or "flows" (see Figure 5). There are three media IP flows:

- Video flow - carries video image essence.

- Audio flow - carries audio essence.

- Metadata flow.

Figure 5   IP Flows comprising a Video IP Stream

3.4 Input Video Signal Selection

Generally, steps for the selection of a multiviewer input video signal:

Step 1. Send control messages to the MV-805 unit to cause an MV-805 destination spigot to look out for data packets belonging to a new multicast IP stream.

**Step 2.** Route the new multicast IP stream data packets to the MV-805 unit.

Typically, the MV-805 is connected to a SAM video IP routing system where **Steps 1** and **2** are done by the routing system; the switching over from one IP stream to another is done at the multiviewer input itself, at its destination spigot.

Switching type at MV-805 inputs is 'break-before-make'.

3.4.1 MV-805 and SAM IP Routing System

In a SAM IP routing system, **Steps 1** and **2** above are carried out automatically.

The routing of the new multicast IP stream to the MV-805 unit (i.e. step 2 above) is done automatically in the SAM IP routing system. The MV-805 unit then receives the necessary multicast IP stream and the corresponding destination spigot can then gather its new multicast data packets.

> **Note:**
>
> **SAM IP Routing System - IP Routing System Controller (IP-RSC) Unit:**
>
> *SAM* offer an *IP Routing Solution* which controls and presents an IP routing system like a traditional video router. This is done via one IP Routing System Controller unit (two units if controller redundancy is required).
>
> SAM's IP Routing System Controller unit can represent an IP routing system as a traditional video router, with simple port names and numbers for source and destination ports. Video routing control is then done from traditional video router hard/soft control panels and interfaces etc.
>
> SAM's IP Routing System Controller unit contains two functional blocks:
>
> • **IPRC**: IP Router Controller - This block connects to the external traditional video router hard/soft control panels and interfaces.
>
> • **IPRA**: IP Routing Adapter - This block connects to the IP routing devices.
>
> Traditional Video Router Control
>
> IP-RSC
>
> IPRC
>
> IPRA
>
> IP Routing System
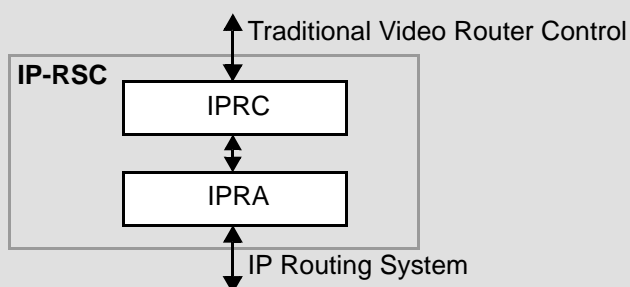
> **Note:**
>
> **SAM Orbit Software Tool:**
>
> SAM's Orbit software tool is used to prepare and configure an IP routing system for:
>
> • Real-time video routing operation.
>
> • Operation with a SAM IP Routing System Controller (IP-RSC) unit.

3.4.2 Non-SAM IP Routing

For non-SAM IP routing systems, a SAM IQTIC modular card is required by the MV-805 to translate SAM protocols into an external third-party control, SDC-01.

The user must:

1. Carry out destination spigot changes (step 1 above).

2. Route multicast streams as required (step 2 above).

3.5   Network Topologies

The 1RU turnkey MV-805 uses out-of-band control. Network topologies suitable for MV-805 include those described in Figure 6 to Figure 8.
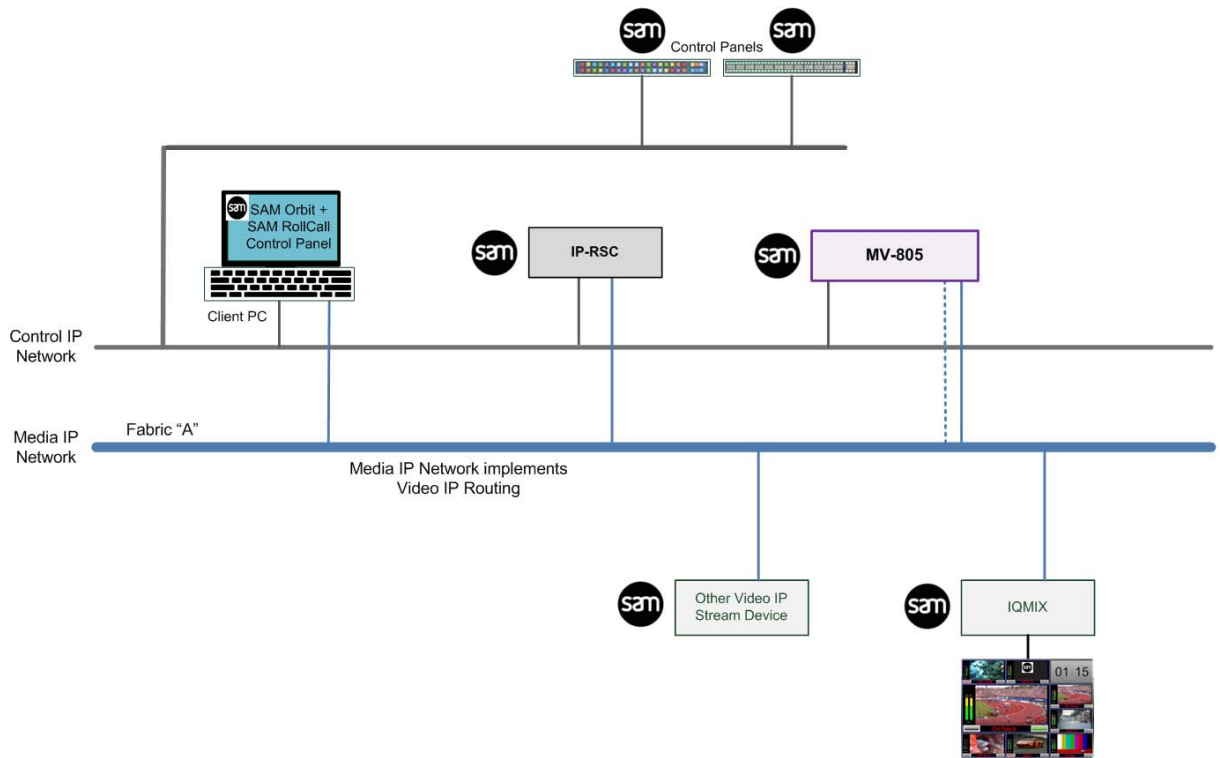
Figure 6 Network Topology - One Media IP Fabric, One Control Network.
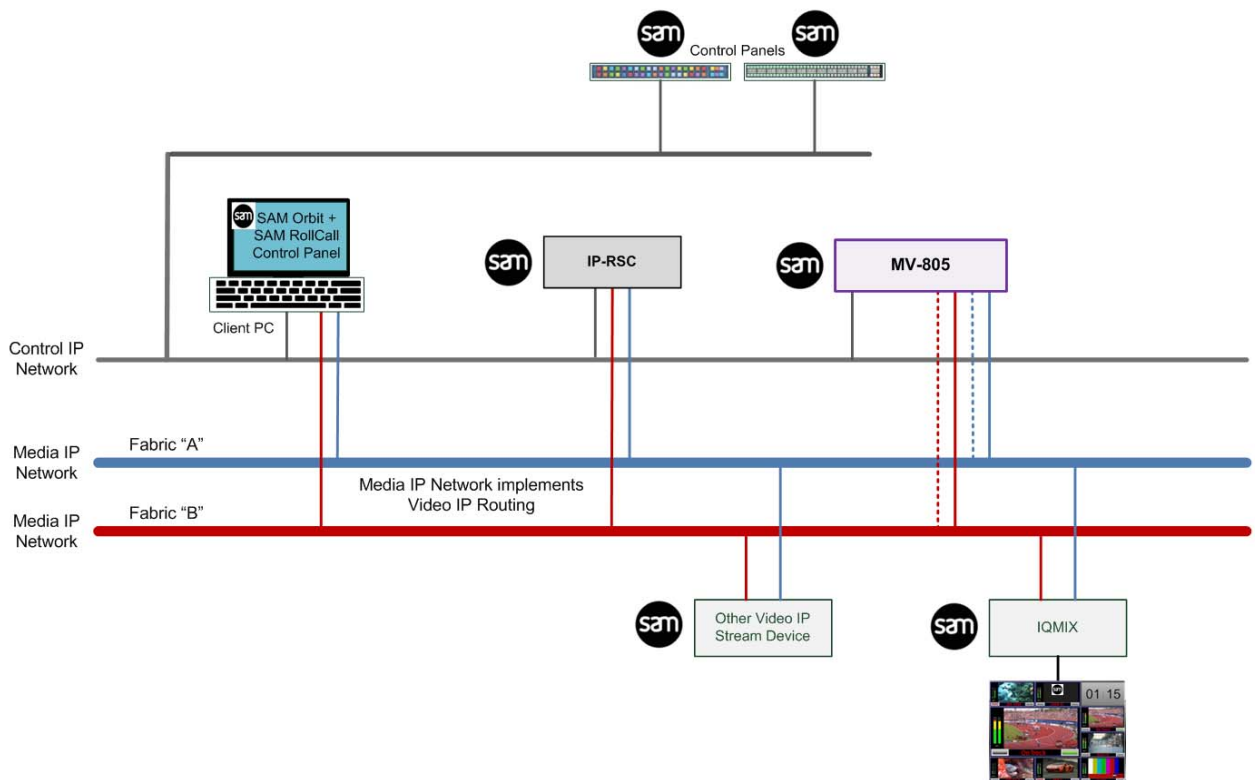
Figure 7 Network Topology - Two Media IP Fabrics (A and B), One Control Network.
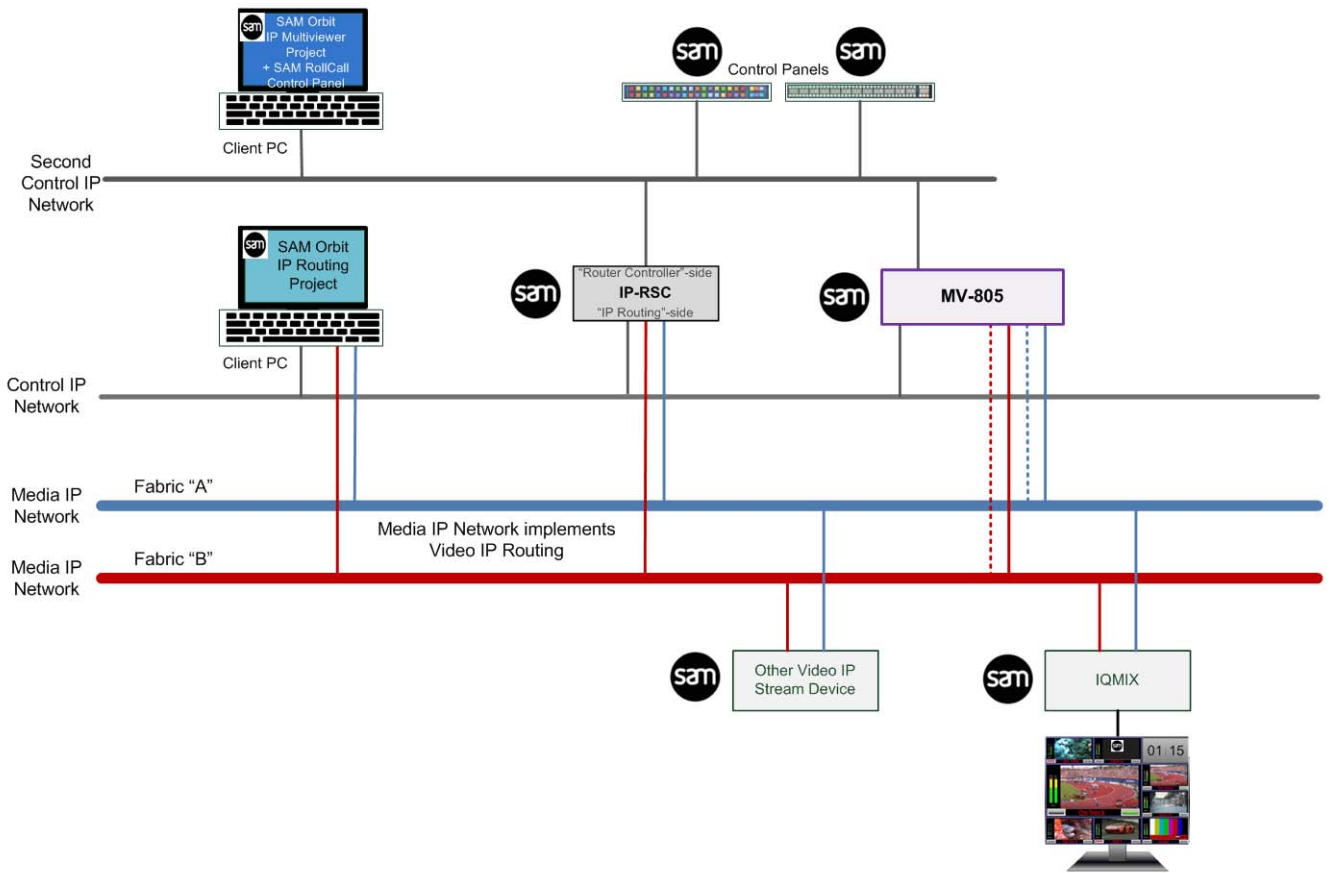
Figure 8 Network Topology - Two Media IP Fabrics (A and B), Two Control Networks.

3.6 Video Timing Reference

There is no dedicated video timing reference input. Instead, all incoming video IP streams are synchronised to a PTP timestamp (as per SMPTE-2059).

3.7 Software Compatibility Matrix

Table 2 states the SAM Orbit versions and RollCall Control Panel software releases to use with MV-805.

Software	Version
SAM Orbit software application	2.1 onwards
RollCall Software release	4.17.1

Table 2   Software Compatibility Matrix

3.8 Configuration Overview

3.8.1 Unit Settings (RollCall Templates)

The MV-805 unit's configuration settings are set up on the unit's RollCall templates, accessible via SAM's RollCall Control Panel tool or SAM's Orbit tool.

The SAM Orbit application can provide:

1.   Access to the RollCall templates.

2.   IP routing system configuration, via an Orbit IP Routing project.

3.   Multiviewer video wall layout design, via an Orbit Multiviewer project.

See Section 6 "RollCall Templates" on page 46.
See Section 7 "Getting Started 1 - Unit Settings (RollCall Template)" on page 77.

3.8.2 Unit IP Routing Settings in the IP Routing System

The SAM Orbit software application and a SAM Orbit *IP routing* project is used to prepare an IP routing system.

See Section 8 "Getting Started 2 - IP Routing (Orbit)" on page 89.

3.8.3 Design/Layout of Video Wall

The layout and style of the multiviewer video walls are designed with SAM Orbit software application and a SAM Orbit *multiviewer* project.

Multiviewer wall designs are stored as individual projects which are pushed to an MV-805 device for use. Projects should be given unique project names.

Multiple wall layout designs may be generated and stored on a PC. Different wall designs can then be pushed to the multiviewer for various different MV-805 multiviewer applications. Wall layouts can be changed on the fly.

Note:

SAM Orbit Projects:

The SAM Orbit project home screen shows the 'Project Name', which is treated as an identifier by SAM Orbit. The name may be changed with the 'Edit Name' control in the home screen.

Projects with the same name are considered to be the same and SAM Orbit warns the user if there are any differences between a project in SAM Orbit and the same-named project on a multiviewer device. Such differences must be resolved.

It is recommended to:

- Use a different and unique project name for each multiviewer.
- Rename a default project that has been pulled from a multiviewer.

3.9 Data Packets

The network interfaces of the MV-805 carry various types of data packet during configuration and operation. This is summarized in Figure 9a and b.

a) MV-805 1RU Rear Network Connections

b) Data Packet Types present on the IP Networks

Control IP Networks:

- Multiviewer Control messages.
  (RollCall+ messages on the 'Multiviewer Control' RollCall+ domain.)

- IP-RSC 'IP Routing' connection traffic.
  (RollCall+ messages on the 'IP Routing' RollCall+ domain.)

- IP-RSC 'Router Controller' connection traffic.

- RollCall (RollCallv3) message traffic.

- TSL connection traffic.

Media Fabric IP Networks:

- Media IP

- IGMPv3 Join Requests

Figure 9 IP Networks for a MV-805 Turnkey Unit:
a) Rear Network Connections.
b) Data Packet Types.

3.10 Terminology

See Section Appendix B "Terminology" on page 134.

4   Unit Hardware

This section describes the MV-805 turnkey units externally, including user controls, connections and indicators. Models covered:

- **MV-805-16:** 1RU, 16 input Multiviewer.

- **MV-805-32:** 1RU, 32 input Multiviewer.

The same chassis is used for both models. .

Note: The MV-805 chassis is a third-party component and user documentation from the third party manufacturer is applicable in this section.
Please refer to the third-party-manufacturer's information.

See Section A.1 "COTS Hardware Platform for the Turnkey MV-805" on page 129 for chassis manufacturer and model number information.

4.1 Unpacking

The MV-805 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. If there is anything incorrect notify your SAM Partner, or SAM, at once.

2. Check that the equipment has not been damaged in transit. If any damage has occurred notify your SAM Partner (or SAM 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 and the user instructions carefully, it will provide you with helpful hints and tips about care and maintenance and help you get the most out of your MV-805.

In the unlikely event of an equipment failure, contact your SAM Partner, or SAM, at once, contact details are at the start of this manual, see Section 1.1 "Contact Details" on page 6.

4.2 Unit Chassis Overview

The MV-805 turnkey unit is a 1RU 19" rack-mount chassis with the main connectors located at the rear, see Figure 10.

At the front it has an array of hard drive bays, two USB ports and a small control panel comprising some push buttons and some LED indicators. There are two drives fitted (SSDs).

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

The router chassis is air-cooled and the airflow is front-to-back. The fans are mid-mounted within the chassis. For chassis dimensions, see Section A.2 "Physical" on page 129.

MV-805-16 or MV-805-32

a) Front view

High performance network adapter cards.

MV-805-32

a) Rear views   MV-805-16
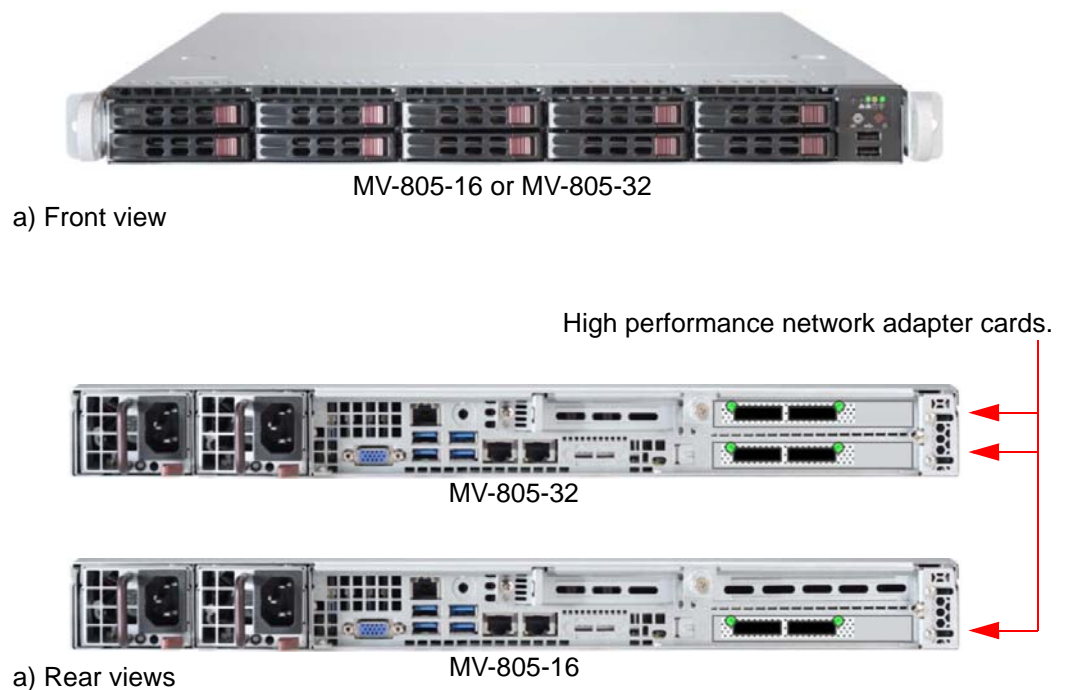
Figure 10   MV-805 Chassis:
         a) Front view.
         b) Rear views.

4.3   Unit Front Panel

The front of the MV-805 IP Multiviewer unit chassis is shown in Figure 11.

Front Control Panel, see sub-section 4.3.1

Chassis Mounting ears. (One each side)

2 SSDs fitted

Handles (One each side).

Front USB Connectors

2.5" Hard Drive Bays
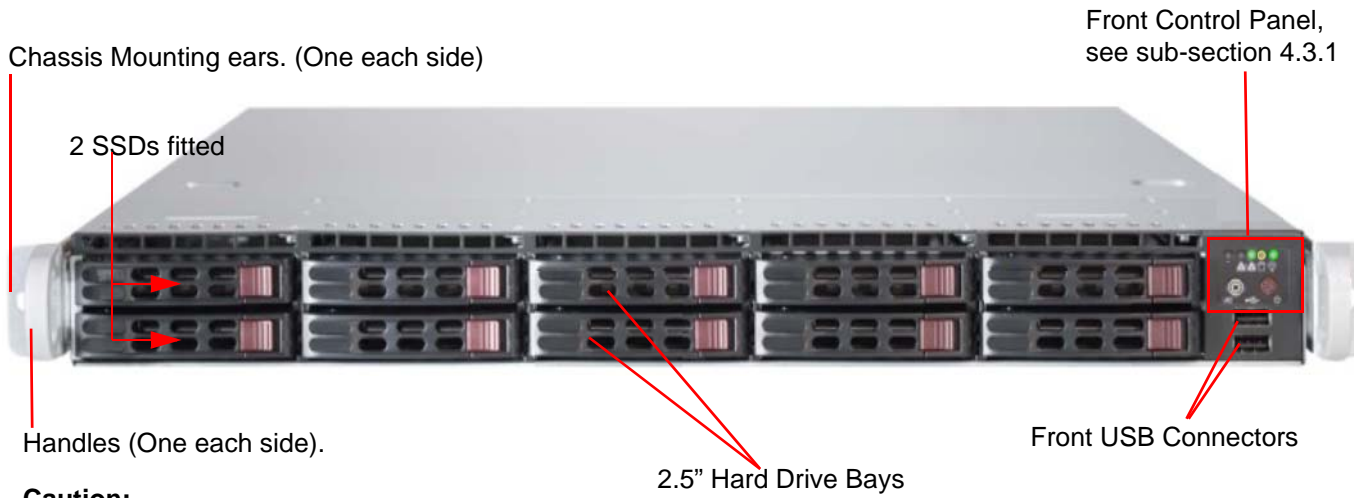
Caution:
Only use handles to *slide unit* into/out of a rack.

Figure 11 MV-805 Front View

Important:	**CAUTION:** Do Not lift unit with the side-handles.
	Only use the side-handles to *slide* the unit into or out of a rack.

4.3.1   Front Control Panel

The front indicators and controls are shown in Figure 12 and described in Table 3.

Network interface:

Control 2 "eno2"

Control "eno1"

LEDs:

UID and Information

Chassis LAN 1

Chassis LAN 2

SSD Activity

System Operating

UID Push button

Power Push button

Figure 12   MV-805 Front Control Panel

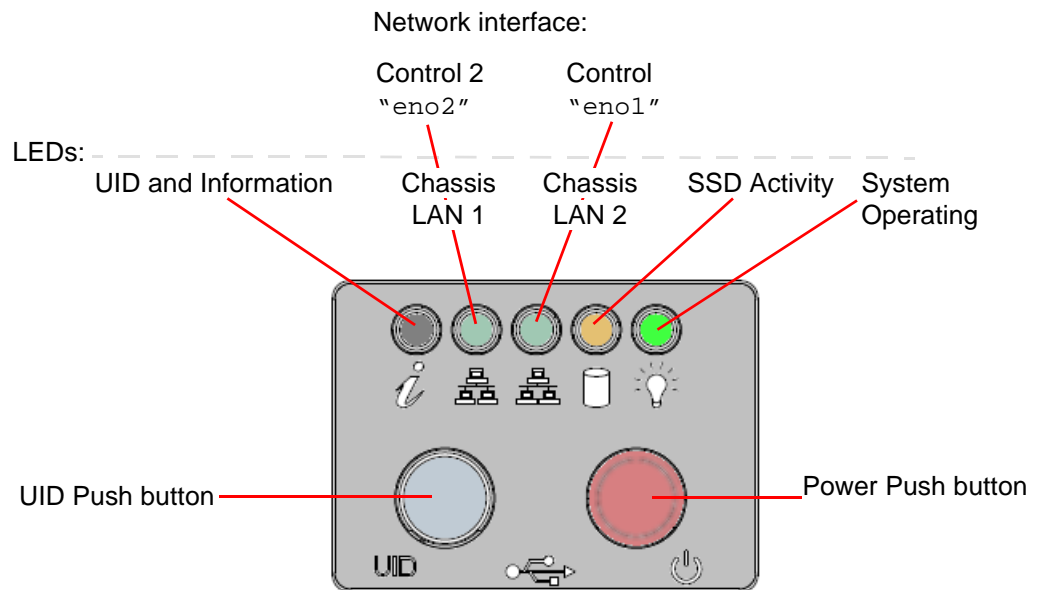| LED / Control	Indicator Color	Description
UID and Information LED		"UID" LED
	Red	On, illuminated: Overheat Condition.
	Flashing	Flash 1 Hz: Fan Failure.
	Slow Flash	Flash 0.25 Hz: Power Failure.
	Blue	On, illuminated: Local unit identification (UID) is activated. Enables user to locate the unit in a rack environment.
	Quick Flash	Flashes 3 Hz: Remote UID activated. Enables user to locate unit in a rack environment.
Chassis LAN 1 LED		Chassis ethernet LAN 1 interface. (Left-hand LED) Network interface identifier: Control 2 "eno2"
	Green	On: Network connection made. **Note:** LED is *on* if a network connection exists when unit is powered down.
	Flashing Green	Flashes on: Network activity.
Chassis LAN 2 LED		Chassis ethernet LAN 2 interface. (Right-hand LED) Network interface identifier: Control "eno1"
	Green	On: Network connection made. **Note:** LED is *on* if a network connection exists when unit is powered down.
	Flashing Green	Flashes on: Network activity.
SSD Activity LED	**Amber**	On: Flashes for SSD access activity.
System Operating LED	Green	On, illuminated: System is operating. Off: System is powered down, but power may still be applied to rear of unit. **WARNING:** Power might still be connected to the unit when LED is off.
UID Push Button	-	Unit Identification (UID) push button: • Push to illuminate the unit's front and rear blue UID LEDs. • Push again to extinguish UID LEDs. **Note:** UID LEDs and chassis locations: • At front of unit - the UID LED illuminates blue. • At rear of unit - there is a blue UID LED.

Table 3 MV-805 Front Panel LEDs and Controls

LED / Control	Indicator Color	Description
Power Push Button	-	Main chassis power switch. Removes main power from the unit but standby power is still supplied to the unit. Push button for 3 to 5 seconds to begin a power up/down of the unit. **WARNING:** Unplug BOTH mains cords before servicing the unit.

Table 3 MV-805 Front Panel LEDs and Controls (Continued)

System Operating LED

Blinking LED for "Control" network interface

Figure 13 MV-805 Unit, Front Operating View

4.3.2 Front Hard Drive Bays

The MV-805 has SSD storage fitted in the front of the chassis. The two 2.5" SSDs are fitted into removable hard drive bays, each with two status LEDs.

LED	Indicator Color	Status
Activity LED		
	Green	SSD installed.
	Flashing Green	SSD I/O Activity.
Status LED		
	Red	Failed Hard Drive.
		(For other red LED blinking conditions, refer to third-party chassis manufacturer's documentation.)

Table 4   Chassis Hard Drive Bay LEDs

Hard drive bays with SSDs fitted

Figure 14 MV-805 Unit, Hard Drive Bays

4.4   Unit Rear Panel

The MV-805 rear panel is shown in Figure 15.

MV-805-32

- MV-805-32: 2-off rear cards fitted.
- MV-805-16: 1-off rear cards fitted.

MV-805-16

a) Rear panels

High Performance IP
Network Interface Cards.

PSU Modules
and AC Power Inlets,
see 4.4.1

Server Motherboard I/O,
see 4.4.2

Expansion Slots,
see 4.4.3

Control   Media
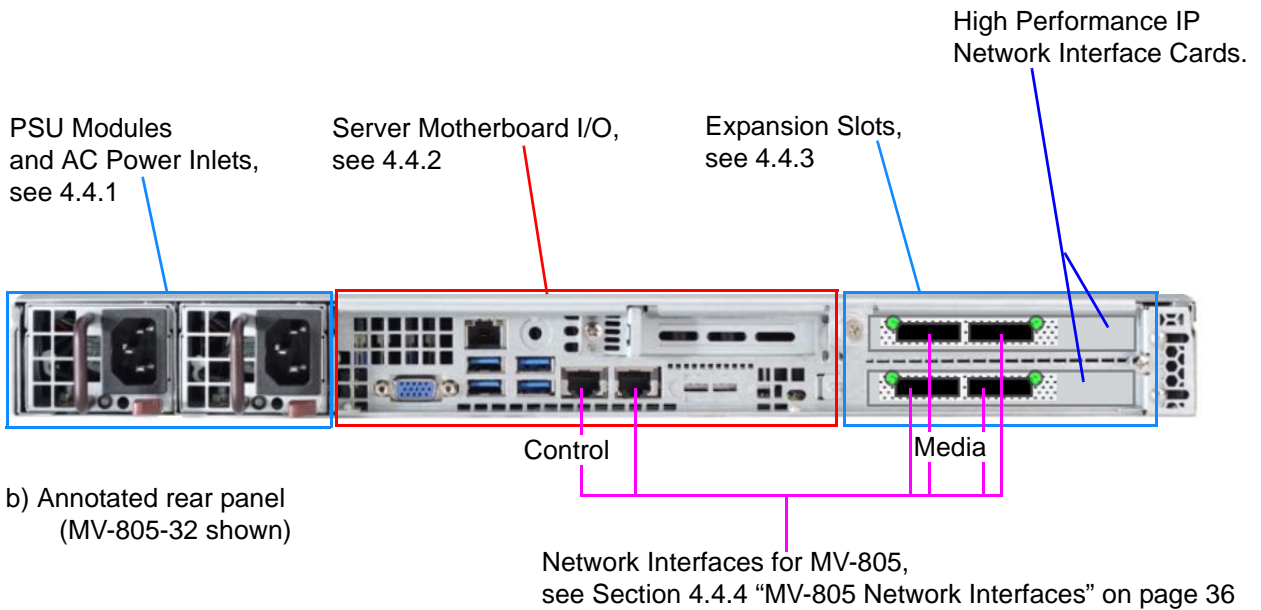
b) Annotated rear panel
    (MV-805-32 shown)

Network Interfaces for MV-805,
see Section 4.4.4 "MV-805 Network Interfaces" on page 36

Figure 15 MV-805 Rear Panel:
a) Rear Panels.
b) Annotated Rear Panel.

4.4.1 PSU Modules and AC Power Inlets

The MV-805 IP Multiviewer is powered by two redundant hot-pluggable power supply modules (PSU modules). Each PSU module has one AC mains power inlet at the rear. See Figure 16. These are auto-switching and automatically sense the mains input voltage.

Figure 16   MV-805 Rear - AC Power Inlets

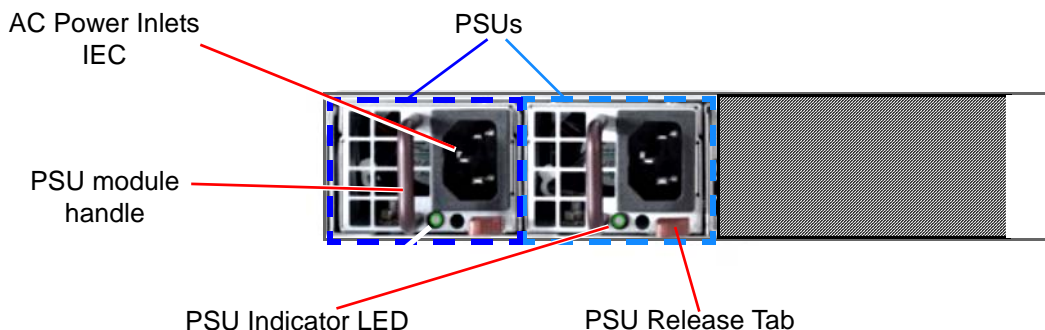| LED	Description
Green	Power Supply Unit (PSU) is on and operating.
Amber	Power Supply Unit is turned off but is connected to a live mains voltage supply.
Red	Power Supply Unit Failure.

Table 5   MV-805 PSU Indicator LED

Please refer to the chassis manufacturer's chassis User Manual for *full* information on the Power Supply Units and their removal and replacement.

⚠️ **WARNING:**

Unplug both mains power cords from the unit before servicing the unit.

Note: The MV-805's chassis is a third-party component:
User documentation from the third party manufacturer is applicable.

Please refer to the third-party-manufacturer's information. In this User Manual, see Section A.1 "COTS Hardware Platform for the Turnkey MV-805" on page 129 for chassis manufacturer and model number information.

4.4.2 Server Motherboard I/O

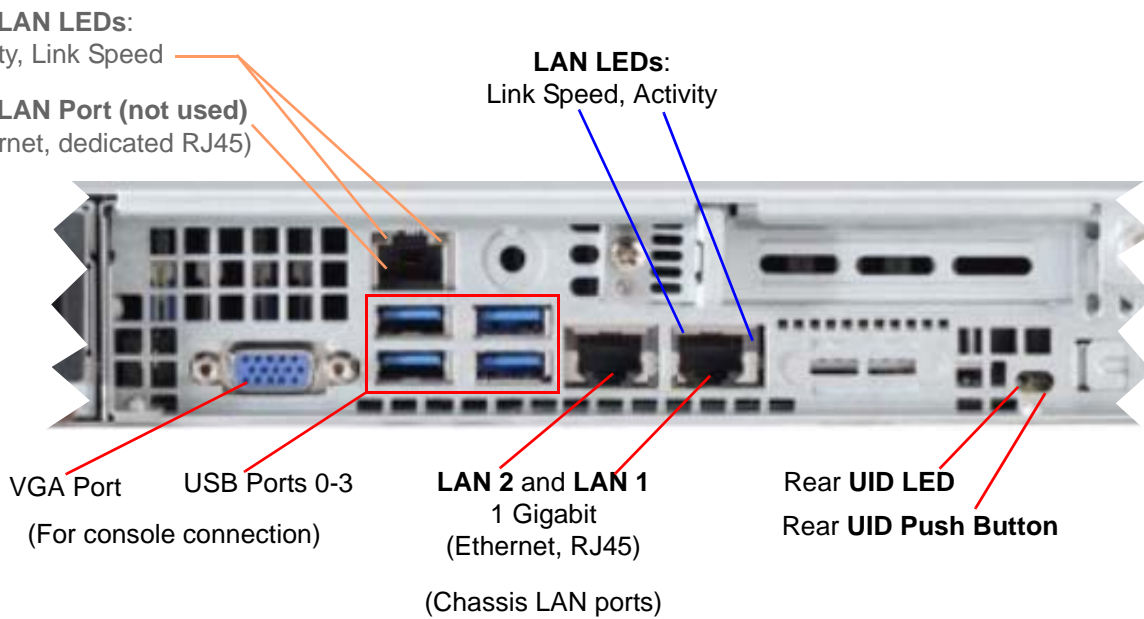The connectors and indicators relating to the MV-805 PC server inputs and outputs are shown in Figure 17.

IPMI LAN LEDs:
Activity, Link Speed

IPMI LAN Port (not used)
(Ethernet, dedicated RJ45)

LAN LEDs:
Link Speed, Activity

VGA Port

(For console connection)

USB Ports 0-3

LAN 2 and **LAN 1**
1 Gigabit
(Ethernet, RJ45)

(Chassis LAN ports)

Rear **UID LED**

Rear **UID Push Button**

Figure 17 MV-805 Rear Server I/O

Connector / Control	Type	Description
VGA Port	VGA	Not used in normal operation. Console VGA output. See **Note 1**.
USB Port 0-3	USB Type A	Not used in normal operation. USB 3.0 ports. See **Note 1**.
LAN 2	RJ45	Chassis ethernet port, LAN 2. 1Gbit ethernet. (Lower, left-most RJ45 on rear of unit.) Main network connection for control purposes. ("Control")
LAN 1	RJ45	Chassis ethernet port, LAN 1. 1Gbit ethernet. (Right-most RJ45 on rear of unit.) This used as a second control network or as an auxiliary network connection for other control or service purposes. For example, for connection to some external control system. ("Control 2")
IPMI LAN Port	RJ45	Dedicated Intelligent Platform Management Interface (IPMI) ethernet port for chassis. Not used.

Table 6   MV-805 Rear Server I/O Connectors and Controls

Connector / Control	Type	Description
UID	Push Button	Unit Identification: Push to illuminate units' blue UID LEDs. Push again to extinguish UID LEDs. UID LED locations: At front of unit - The UID Push Button illuminates blue. At rear of unit - There is a blue UID LED.
Note 1:		A direct console connection to the chassis, if required, uses the VGA output and USB outputs, for monitor, mouse and keyboard.

Table 6   MV-805 Rear Server I/O Connectors and Controls

LED	Indicator Color	Status
Server LAN Ports:		
Link Speed LED:		(Left-hand side LED)
	Off	10 Mb/s link speed established.
	Green	100 Mb/s link speed established.
	Amber	1 Gb/s link speed established.
Activity LED		(Right-hand side LED)
	Amber	Blinks on when there is activity on the link.
IPMI LAN Port:		
Activity LED	Yellow	(Left-hand side LED) Flashes on when there is activity on the link.
Link Speed LED	Green	(Right-hand side LED) 100 Mb/s link speed established.
UID LED:		
	Blue	Local UID activated. Enables user to locate the unit in a rack environment.
	Quick Flashing Blue	3 Hz. Remote UID activated. Enables user to locate unit in a rack environment.

Table 7   MV-805 Rear LEDs

4.4.3 High-Performance Network Adapter(s)

The MV-805 uses one or two high-end **Network Adapter cards** to provide high performance IP network interface, for connecting to the media fabrics "A" and "B".
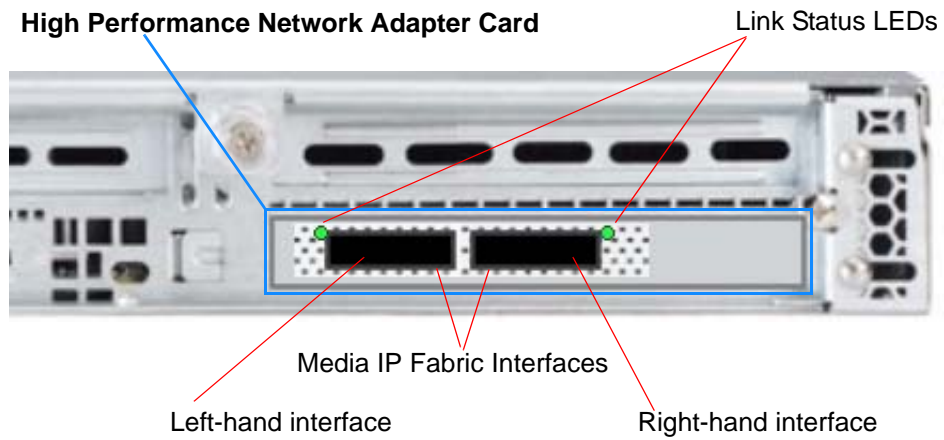
High Performance Network Adapter Card   Link Status LEDs

Media IP Fabric Interfaces

Left-hand interface   Right-hand interface

Figure 18   MV-805 Media IP Fabric Interfaces

Media IP Fabric Interface	Connector Type	Description
Left-hand and **Right-hand**	QSFP28 cage	100 Gb Ethernet. Must be fitted with a suitable QSFP28 module and connected to a Media IP Fabric. ("A" /"B".)

Table 8   MV-805 Media IP Fabric Interfaces

| LED	Indicator Color	Status
Link Status LED		
	Off	Physical link not established.
	Yellow	Physical link established.
	Blinking Yellow	There is a problem with the physical link.
	Green	Valid logical link with no active traffic.
	Blinking Green	Valid logical link with active traffic.

Table 9   MV-805 High Performance Network Adapter LEDs
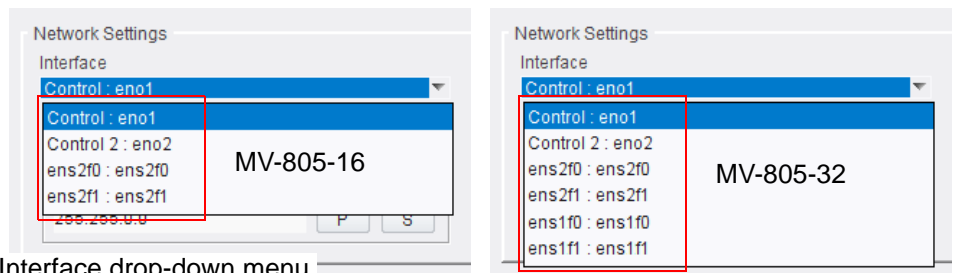
4.4.4 MV-805 Network Interfaces

The network interfaces on the MV-805 chassis that are used by the MV-805 IP Multiviewer are shown in Figure 19.

- The "Control" interface is the main network interface for control and upgrading.

- The "Control 2" interface provides an additional network interface for control /service applications, configured as required. For example, connection to a TSL device, or to an external timer controller. This interface may be left unused.

- The media IP interfaces should be connected to media IP fabrics and are used for the real-time media IP streams etc.

    - There are two media IP Fabric interfaces on an MV-805-16.

    - There are four media IP Fabric interfaces on an MV-805-32.

Each network interface has a system identifier (for example "eno1" or "ens1f0"), as shown in Figure 19. A system identifier effectively labels each physical network interface of the chassis.
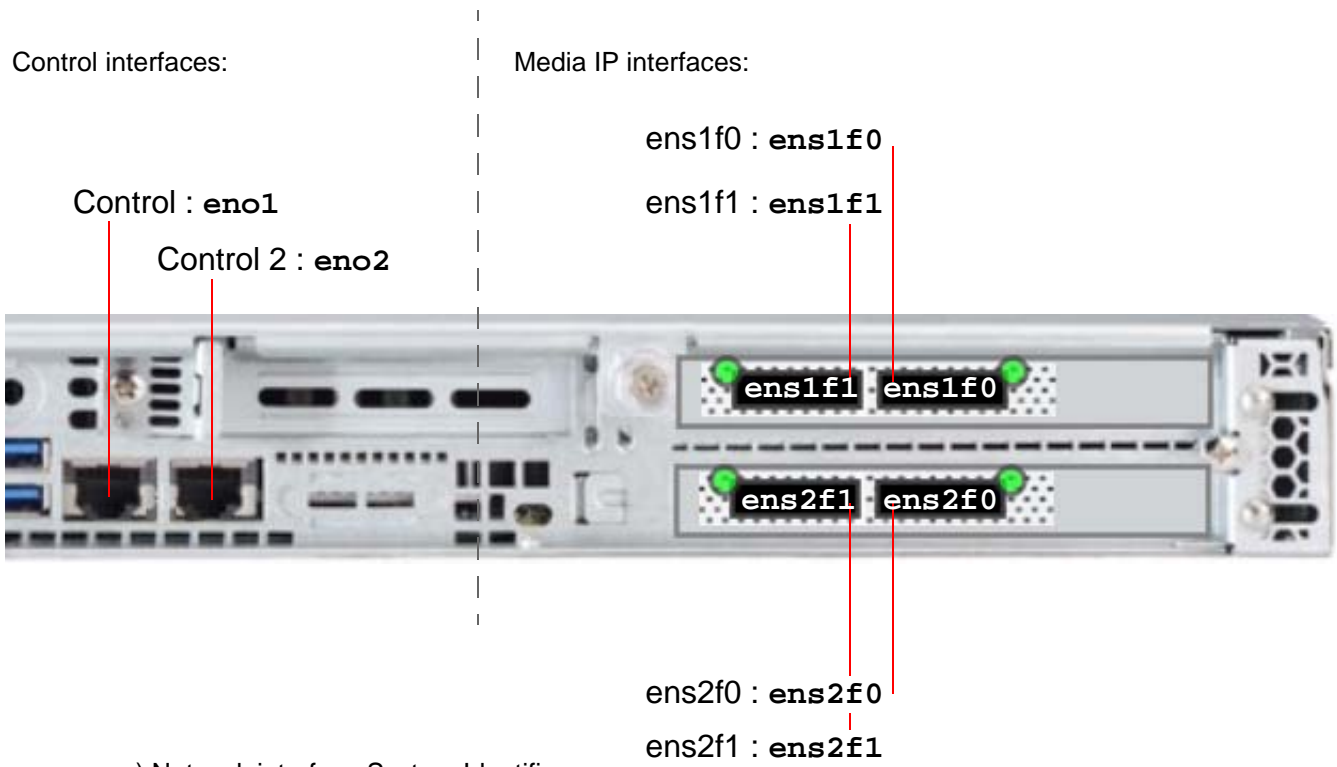
a) Network interface System Identifiers

b) Network Settings - Interface drop-down menu.

Figure 19 MV-805 Network Interfaces:
a) System Identifiers.
b) RollCall Template Network Settings - Interface drop-down menu.

Note: **Connecting up the physical media "IP Fabric" interfaces:**

During MV-805 unit configuration with the RollCall templates, external physical network interfaces can be mapped to any of the internal multiviewer's IP fabric connections.

External Physical Network Interface	Internal Multiviewer IP Fabric Connection
ens2f0	Interface 1 Fabric A
ens2f1	Interface 1 Fabric B
ens1f0	Interface 2 Fabric A
ens1f1	Interface 2 Fabric B

Note: **Connecting IP Fabric Network Interfaces:**

Network interfaces "ens2f0" and "ens2f1" must be connected to different networks; they must *not* be connected to the same network.

Similarly for network interfaces "ens1f0" and "ens1f1".

Note: **Control Network Interface Connections:**

However, control network interfaces "eno1" and "eno2" *may* be connected to the same network to provide a second IP address/IP port on the network, if required.

4.5 Power Supply Units

The MV-805 chassis has two hot-pluggable, redundant power supply modules (PSU modules).

Refer to third party manufacturer's documentation for full information on the power supply modules. See Section A.1 "COTS Hardware Platform for the Turnkey MV-805" on page 129 for third-party manufacturer information.

4.6 Fuses

There are no user-serviceable fuses in the chassis.

5   Hardware Installation

This section describes the MV-805 unit hardware installation.
Installation of the 1RU MV-805-16 and MV-805-32 models is the same.

Contents of the section:

The MV-805 chassis is 1RU a third-party item and user documentation from the third-party manufacturer is applicable in this section.

Note: **Third party chassis manufacturer:**

The MV-805 chassis is a third-party component and user documentation from the third party manufacturer is applicable in this section.

Please refer to the third-party-manufacturer's information; see Section A.1 "COTS Hardware Platform for the Turnkey MV-805" on page 129.

5.1 Environmental Considerations

The following considerations apply:

- The ambient operating temperature range for the supplied unit should not exceed the limits specified in Section A.3 "Operating Environment" on page 130.

- Install the equipment in a clean, dust-free environment that is well-ventilated.

- Avoid areas where heat, electrical noise and electromagnetic fields are generated.

- A moderate temperature and humidity will promote a long and trouble-free equipment life.

5.2   Chassis Ventilation

The MV-805 1RU chassis has front-to-back forced-air cooling. Cooling fans are mounted inside the chassis.

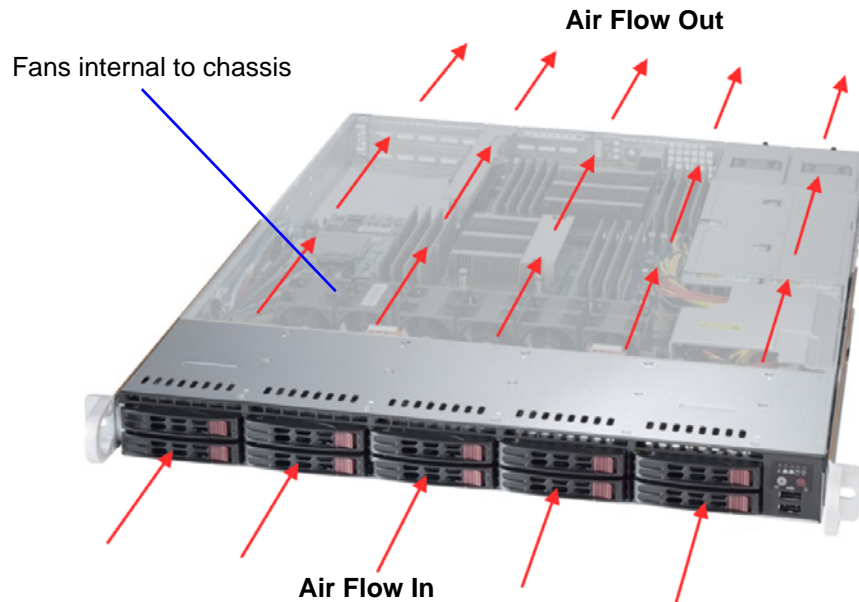| Note:	Please refer to the third-party-manufacturers for information on: Chassis ventilation and Fan maintenance.

Figure 20 shows the chassis cooling ventilation air flow.

Figure 20   MV-805 Chassis Air Flow

⚠	**Caution:**
	Do not block the MV-805 chassis air intake and exhaust holes.
	Correct ventilation airflow enables correct unit operation.

5.3   Preparing the Unit and the Rack

5.3.1   Location in Rack

The MV-805 is designed to be installed in a standard 483mm (19 inch) equipment rack for use. The unit requires a 1RU high space within a rack (see Section A.2 "Physical" on page 129 for the unit's depth dimensions).

The following precautions should be observed:

1.   Do not obstruct the front of the chassis: The whole front is a cooling air intake for the chassis.

2.   Do not obstruct the rear of the chassis: Air exhausts out of the whole rear.

Caution:

Do not obstruct the chassis front.

Do not obstruct the chassis rear.

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

Caution:

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

5.4   Rack Mounting

5.4.1   Mounting the MV-805 into a Rack

Warning:

The MV-805 is heavy, approximately 27kg (~60lb), see Section A.2 Physical,
and it 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.

The MV-805 is shipped with two sets of rack rail assemblies and mounting brackets with screws.

Note: Please refer to the third-party-manufacturer information for full installation instructions of the rack rails and the MV-805 chassis in a rack.

Preliminaries:

1.   Check that the rack is rigid enough for the unit chassis.

Note: The chassis rear will become heavier when cables are connected

Rail-mounting:

2.   Refer to the chassis User Manual for details about any mounting rails.
(See Section A.1 "COTS Hardware Platform for the Turnkey MV-805" on page 129 in this User Manual for
chassis manufacturer and model number information.)

3.   Position the unit in its rack-rails and secure it to the rails.
Use the correct lifting procedures.

4.   Secure the MV-805 chassis in the rack at each mounting hole using 2-off M6 rack mount screws. See Figure 21.

Shelf-mounting:

5.   Use a suitable rack tray in the rack to take the weight of the MV-805 IP Multiviewer**.**
The chassis rear will become heavier when cables are connected.

6.   Position the unit in the rack on a shelf or on its rack-rails.
Use the correct lifting procedures.

7.   Secure the MV-805 chassis in the rack at each mounting hole using 2-off M6 rack mount screws. See Figure 21.

Chassis rails

M6 Rack mounting screws
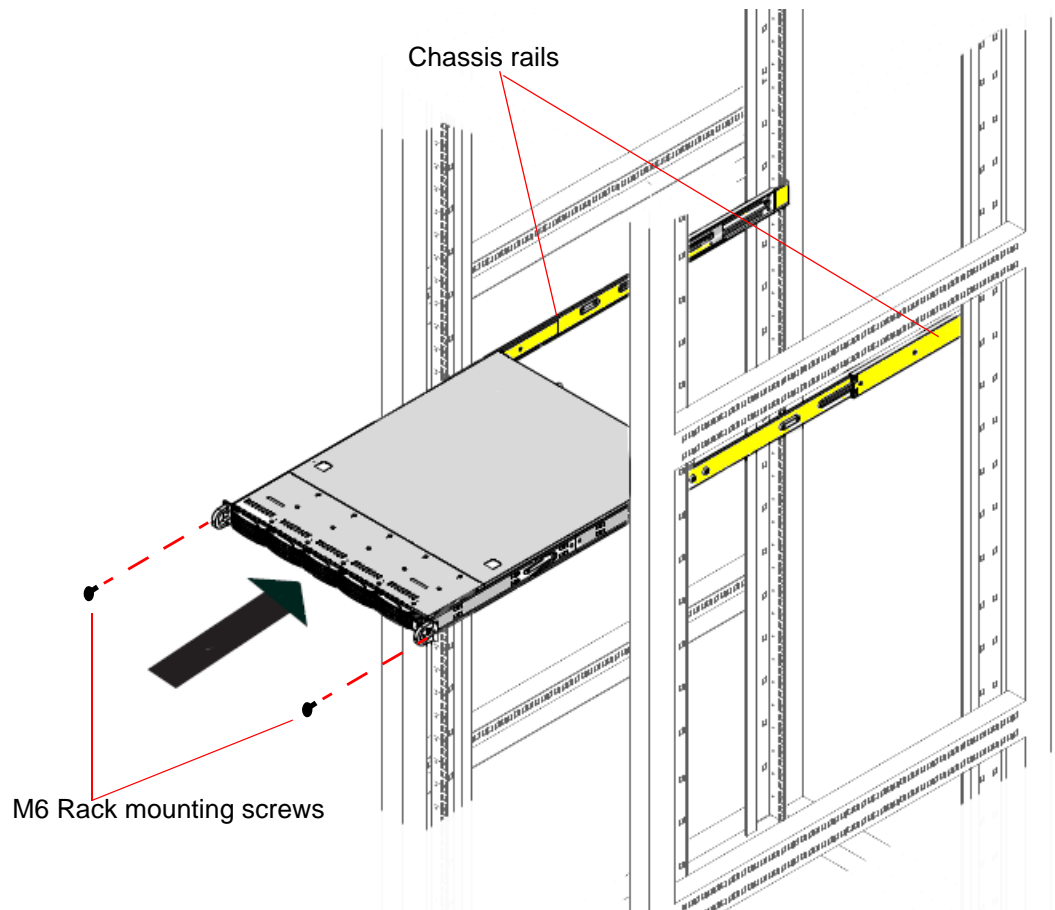
Figure 21   MV-805 Rack Mounting

5.4.2   Connecting Up in a Rack

When connecting cables to the MV-805 IP Multiviewer, it is recommended that cable supports are used (clamps and bars) to relieve the strain on rear connectors.

Connections include:

- 2-off AC Power.

- 1-off 1Gbit ethernet to the "Control" network interface.

- (Optional) 1-off 1Gbit ethernet to the "Control 2" network interface, for a second control/service network connection.

- Media network interface connections:

  - **MV-805-32:** Up to 4-off 100Gbit ethernet connections to QSFP+ cages. (2-off 100Gbit if *non*-redundant media IP fabrics).

  - **MV-805-16:** Up to 2-off 100Gbit ethernet connections to QSFP+ cages. (1-off 100Gbit if *non*-redundant media IP fabrics).

5.4.2.1   Media Network Connections

A MV-805 unit does not ship with QSFP28 modules fitted into the rear QSFP+ cages. QSFP28 modules/cables must be bought separately to suit the unit's system installation.

1. Fit any QSFP28 modules/cables into the QSFP+ cages on the rear of the unit.

2. Fit QSFP EMI/dust covers to any rear QSFP+ cages that are not connected.

Note:	**QSFP EMI/dust covers:**
	QSFP EMI/dust covers provide EMI containment and keep the QSFP+ cage interface free of contamination or debris.
	Fit QSFP EMI/dust covers to any rear QSFP+ cages that are not connected.

5.4.3 Powering

1. Connect AC power cables to the MV-805 unit.
2. Connect the power cables to an AC mains supply.
3. Turn on mains to the unit and power up the unit via the front power on push button.

    The unit starts up, see Section 5.5 "Unit Starting Up" on page 44.

Power consumption is listed in Section A.4 "Electrical" on page 130.

5.5   Unit Starting Up

The MV-805 is based on its server PC platform and the MV-805 IP Multiviewer software installed on it.

5.5.1   Starting

The MV-805 unit starting procedure is similar:

1. Push the front power button to turn on the MV-805 server unit.
   The unit starts up.
   The front 'System Operating' LED is illuminated and SSD LEDs are illuminated.

2. The server and its operating system start up. This takes a 2 to 3 minutes.

   (BIOS and Operating System start-up messages and screens will appear on any connected console monitor.)

   The unit's front panel LAN and 'SSD Activity' LEDs will begin to show activity.

3. The MV-805 multiviewer software application starts up once the OS has fully started.

5.5.2   Checking Multiviewer Output Picture

The MV-805 unit is 'IP-in' and 'IP-out'. The multiviewer display outputs contain the video wall image(s) and these are sent out in video IP streams. To view these images, some IP-to-SDI conversion facility is required (for example, via a SAM IQMIX card).

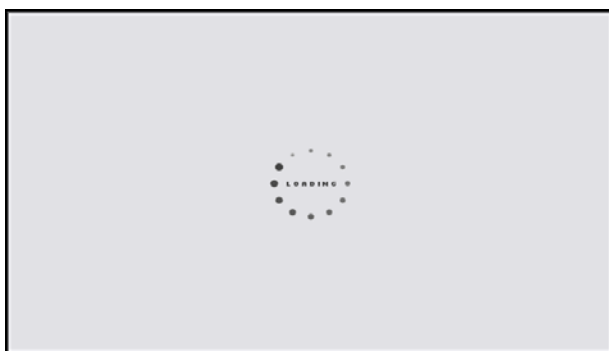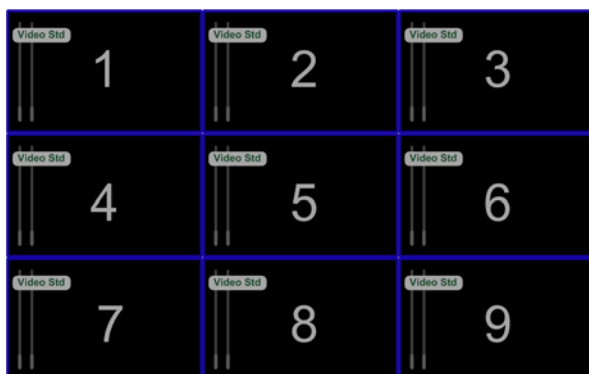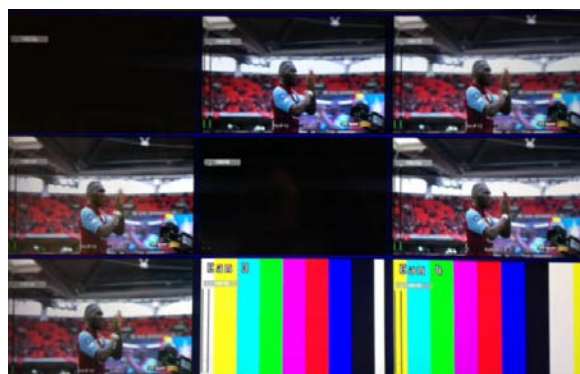During start-up, a splash screen may be shown, see Figure 22.

Figure 22   Multiviewer Display Output Start Up Splash Screen

After start-up, the multiviewer display output picture is the multiviewer video wall.
New MV-805 units show the default wall, see Figure 23,
otherwise the last SAM Orbit multiviewer project Wall is shown, for example.

a) Default video wall screen, no multiviewer inputs   b) Example multiviewer video wall screen

Figure 23 Multiviewer Display Output Examples

5.6 Unit Shutdown

5.6.1 Shutdown

MV-805 unit shutdown is carried out by shutting down the server unit from the unit's RollCall "Reset" template, via RollCall Control Panel or via SAM Orbit.

See Section 6.9 "Reset Template" on page 76.

5.6.2 Forced Shutdown

If the MV-805 unit has to be powered down immediately, it is important to carry out the correct power down procedure for the server platform. Typically, to perform a power down:

1. Push the power on/off push button for 3-5 seconds to initiate a server shutdown.
    Services are shut down as part of a server unit shutdown or restart.
    The server shutdown will take a few minutes to complete.

2. All multiviewer output IP streams will stop.

Important:	Carry out the correct shutdown procedure for the server platform.
	Do not pull out the power supply leads from the rear of the unit.
	Do not switch off the mains supply to the unit until the shutdown is complete.

5.7 Unit Configuration Stages

When the MV-805 unit is installed in its rack, configuration and setting up of the MV-805 is done in stages:

1. **Configure Unit Settings** via the unit's RollCall templates.

2. **Configure IP Routing Settings** using the SAM Orbit tool and an Orbit IP routing project.

3. **Design and Layout Multiviewer Video Wall** using the SAM Orbit tool and an Orbit multiviewer project.
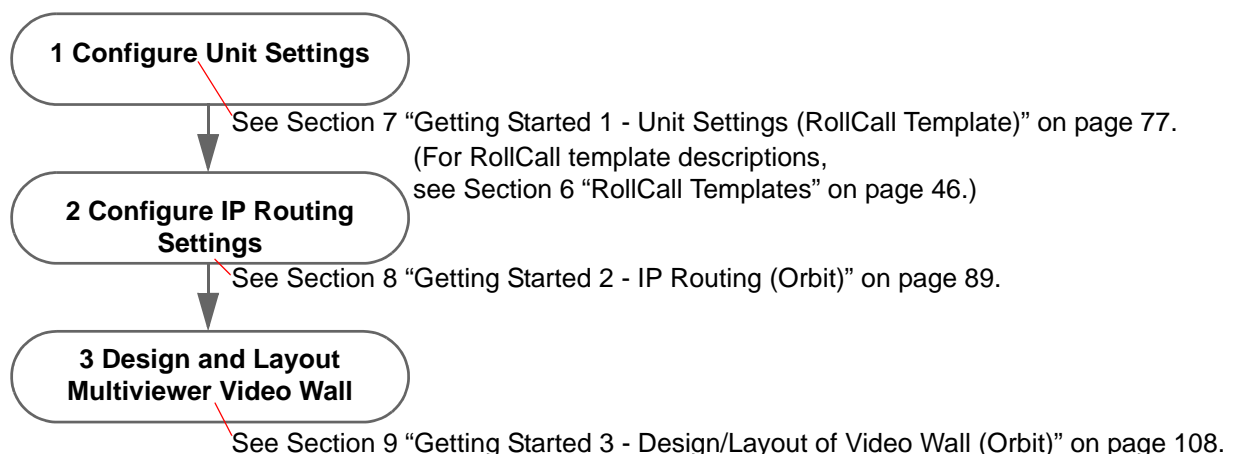
1 Configure Unit Settings

See Section 7 "Getting Started 1 - Unit Settings (RollCall Template)" on page 77.
(For RollCall template descriptions,
see Section 6 "RollCall Templates" on page 46.)

2 Configure IP Routing Settings

See Section 8 "Getting Started 2 - IP Routing (Orbit)" on page 89.

3 Design and Layout Multiviewer Video Wall

See Section 9 "Getting Started 3 - Design/Layout of Video Wall (Orbit)" on page 108.

Figure 24 Steps for Getting Going

6   RollCall Templates

The RollCall MV-805 templates described in this section are:

This section describes the MV-805 IP Multiviewer's settings which are in the MV-805 RollCall templates. The templates are viewable and editable via the SAM Orbit software tool or SAM RollCall Control Panel, which is part of the SAM RollCall Suite.
(For SAM RollCall Control Panel software installation instructions, see the "RollCall V4 Suite & RollCall Lite" manual.)

This section describes connecting RollCall Control Panel to a MV-805 and introduces the MV-805 RollCall template screens and describes each screen.

RollCall templates may be used for:

- Initial configuration.

- Configuration and control of:

    - Network interface and comms settings.(May require a MV-805 unit reset.)

    - Other unit settings.

    - Selection of video wall layouts.

    - Configuring TSL support.

    - Control of timer widgets on the video wall.

    - Shutting down, restarting.

6.1   Introduction to the RollCall MV-805 Template Screen

Note: **Connecting RollCall Control Panel to the MV-805:**

This is described in Section 7 Getting Started 1 - Unit Settings (RollCall Template), see 7.1 "How to Connect RollCall Control Panel to the MV-805 unit" on page 78.

When RollCall Control Panel has connected to the multiviewer, several multiviewer template screens are available, see Figure 25. At the top of each template is a **Template Selection** box and a **System Status** box.
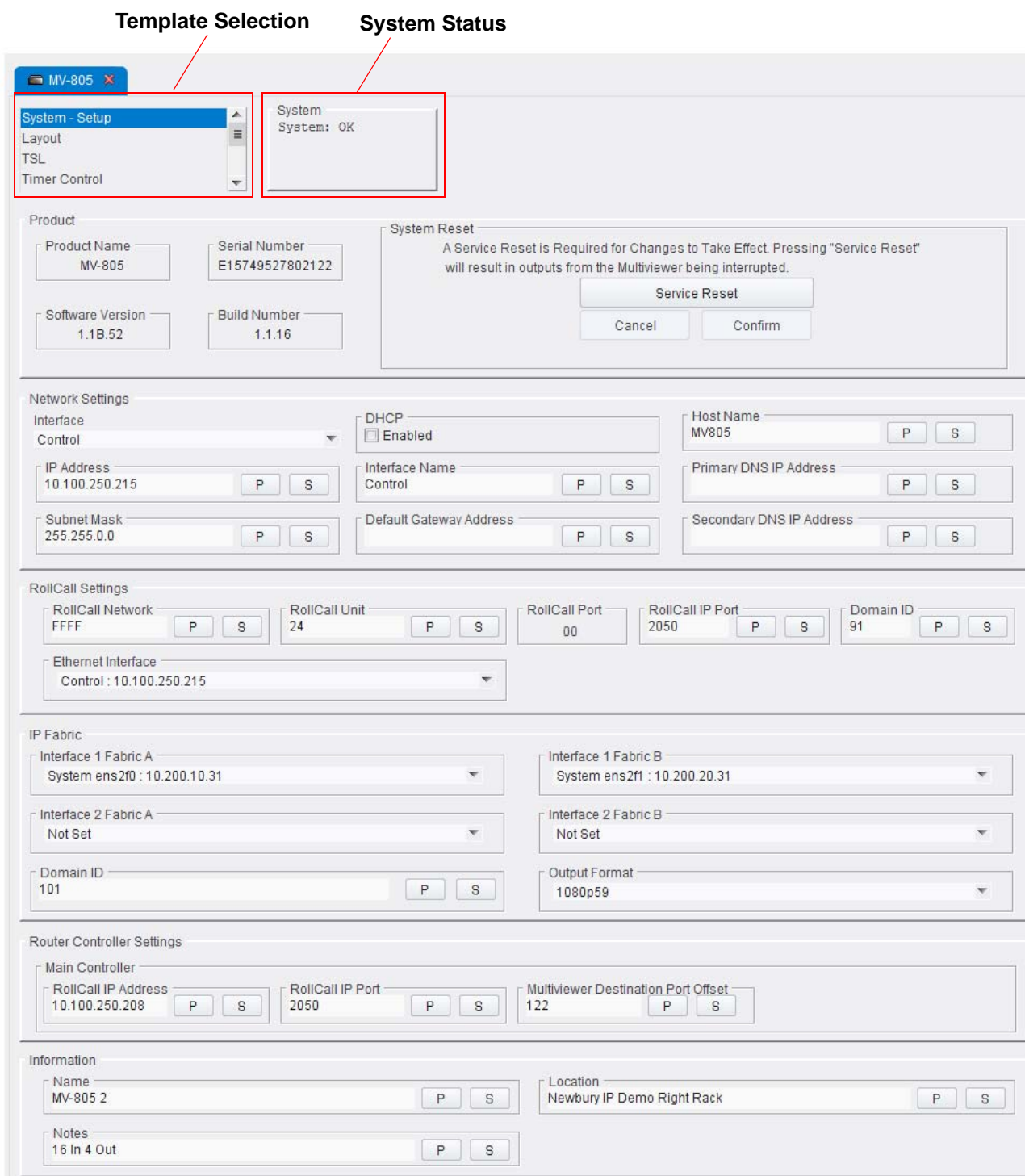
Figure 25 RollCall MV-805 Template - Initial Template, System-Setup

Template Selection:

The following MV-805 RollCall template screens may be selected in the **Template Selection** box by clicking on the template name:

- **System-Setup:**   See Section 6.2 "System-Setup Template" on page 49
- **Layout**:   See Section 6.3 "Layout Template" on page 63
- **TSL**:   See Section 6.4 "TSL Template" on page 64
- **Timer Control**:   See Section 6.5 "Timer Control Template" on page 66
- **Timer Request Protocol:** See Section 6.6 "Timer Request Protocol Template" on page 68
- **Destination Spigot:**   See Section 6.7 "Destination Spigot Template" on page 69
- **Source Spigot:**   See Section 6.8 "Source Spigot Template" on page 73
- **Reset:**   See Section 6.9 "Reset Template" on page 76

System Status:

The **System Status** box displays the multiviewer system status at the top of each template:

- OK - the multiviewer is working correctly.
- Fail - the multiviewer has a problem.
- Starting: The template is being filled out with information read from the MV-805. Wait until the message disappears before interacting with the template.
- Restart Required: This is shown after a setting has been changed on the template and the unit requires a restart to make the setting change take effect.
- System Restarting.
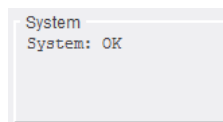
a) System is OK.
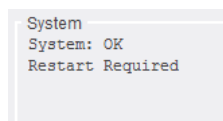
b) System is OK, but some settings changes are pending that require a system restart.
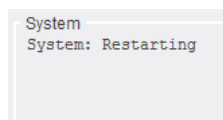
c) System is restarting.

Figure 26   Example System Status Box Messages:
a) OK.
b) OK, but settings changes are pending that require a system restart.
c) System restarting.

6.2 System-Setup Template

Note: | The multiviewer must be **System Reset** before any saved settings changes in this **System-Setup** template take effect, see Section 6.2.2 "System Reset box" on page 51

The **System-Setup** template (see Figure 27 and Figure 28) 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 system details, including: RollCall settings, Multiviewer output, Media Network Fabric interfaces, and Router controller interface.
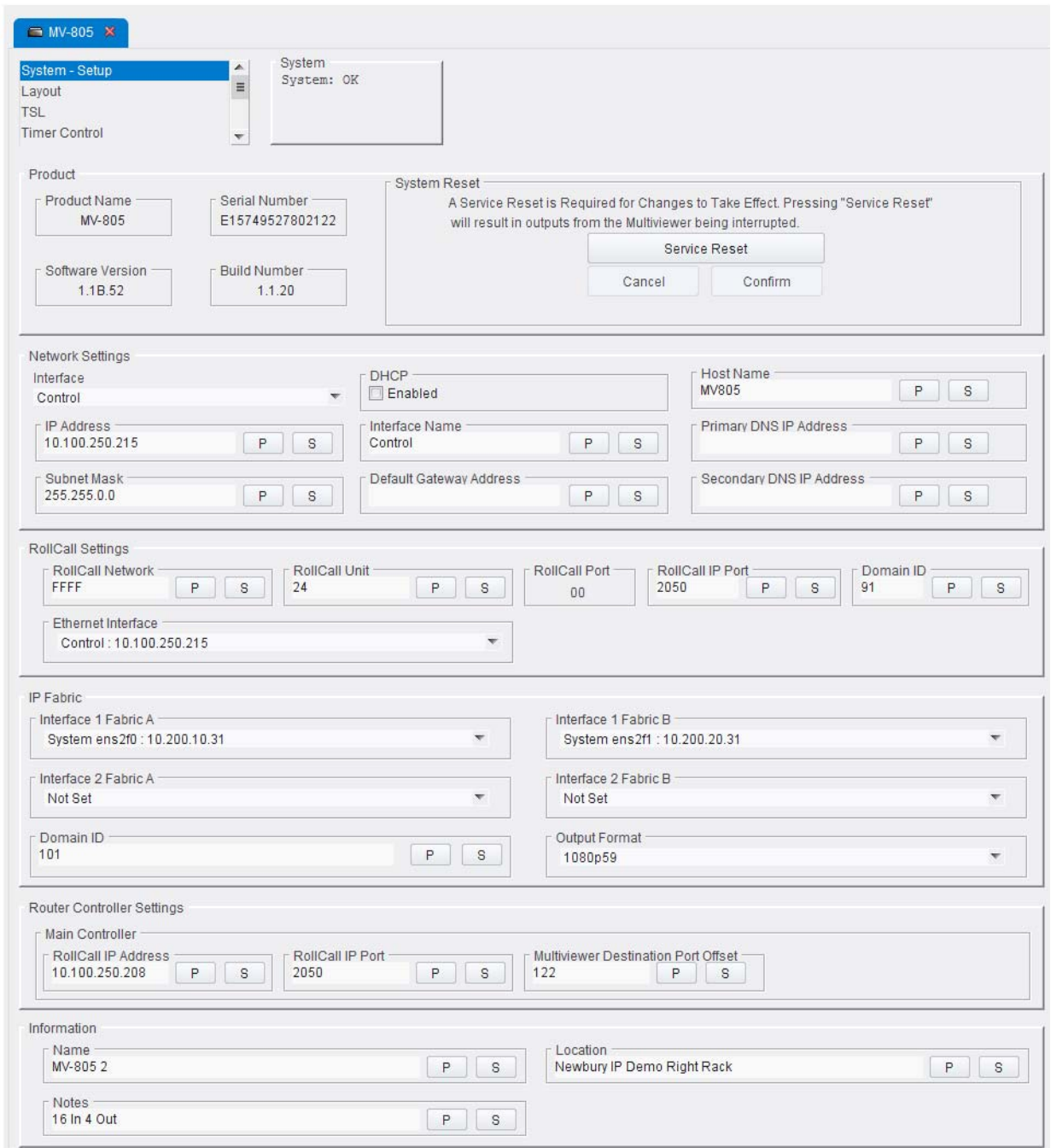
Figure 27 RollCall System-Setup Template

Figure 28 RollCall System-Setup Template (Annotated)

6.2.1 Product box

Displays multiviewer details:

- **Product Name** - The name of the module, MV-805.
- **Software Version** - The currently installed software version number.
- **Serial Number** - The serial number of the MV-805 chassis.
- **Build Number**- The currently installed software build number.

Figure 29 Product Box

6.2.2 System Reset box

The **System Reset** box on the **System-Setup** template contains a **Service Reset** button which restarts the MV-805's IP multiviewer software application.

A software restart is required to make **System-Setup** template setting changes take effect. After the reset, the MV-805 unit will use the new settings.

A **Service Reset** will produce an interruption to the multiviewer's display output IP stream (and thus a disturbance to any derived multiviewer video wall picture).

Important:	A Service Reset of the multiviewer will affect all outputs, including any IP stream outputs. This takes several minutes to complete.

Once all changes in the **System-Setup** template have been done, carry out a **Service Reset**:

1. Click the **Service Reset** button.

2. Click on the **Confirm** button to perform a service reset.
   (Or click the **Cancel** button to abort the service reset.)

   The unit restarts its software application.
   The status of the system while restarting is shown on the template. See Figure 30.
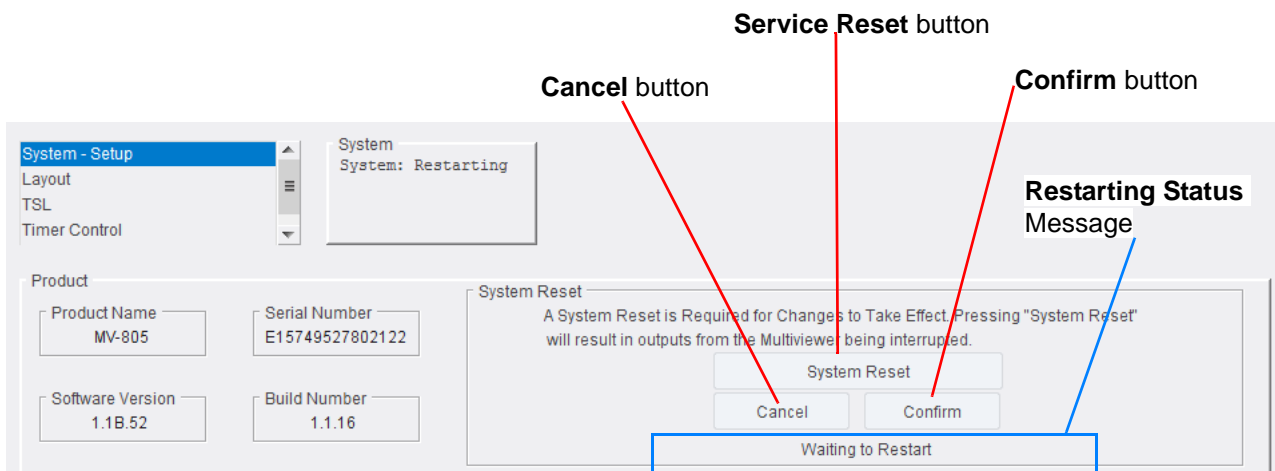

Figure 30 Service Reset Box

Once the **Service Reset** is complete, reconnect the RollCall Control Panel tool to the MV-805 unit and re-view the templates (and continue configuration, if required).

6.2.3 Network Settings box

The "Host Name" setting item applies across the entire MV-805 unit. See Table 10.

The remaining setting items apply across the selected physical network interface, selected via the **Interface** drop-down menu (see Figure 31b).

The **Network Settings** box (see Figure 31a) enables each physical network interface to be configured.

Physical network interfaces covered:

- Control /Service network interfaces.

- Media IP network interfaces. (MV-805-16: 2-off; MV-805-32: 4-off.)

Host Name, see Table 10

a) Network Settings box

MV-805-16   MV-805-32
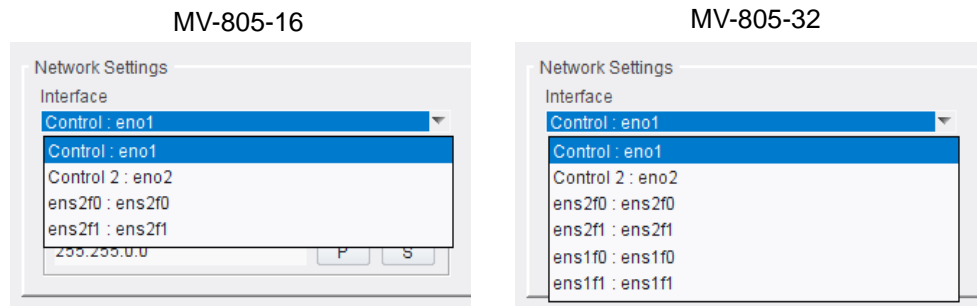
b) Interface drop-down menus.   Network interfaces - see Table 11

Figure 31 Network Settings Box:
a) Network Settings box.
b) Interface drop-down menus.

Setting	Description
Host Name	Text box. Enter host name for the unit. This setting applies across the *whole unit*, for all network interfaces. Click the **S** button to locally save the new setting.

Table 10   Host Name

Setting	Description
Interface	Drop-down menu. Select the physical network interface to configure: • Control : eno1. • Control 2 : eno2. (See **Note 1**.) • ens2f0 : ens2f0. (Media IP fabric connection) • ens2f1 : ens2f1. (Media IP fabric connection) • ens1f0 : ens1f0. (Media IP fabric connection, MV-805-32-only) • ens1f1 : ens1f1. (Media IP fabric connection, MV-805-32-only) **Note:** Each physical network interface may be renamed in the template. The name that appears in the template's drop-down menu is formed from the name and the identifier: "name : identifier". For example, "Control : eno1".
IP Address	Text box. Static IP address of the selected interface. (IPv4) Click the **S** button to locally save the new setting.
Subnet Mask	Text box. Subnet mask of the selected interface. (IPv4) Click the **S** button to locally save the new setting.
DHCP	Check box. Tick to enable dynamic host configuration protocol (DHCP) on the selected interface. Click the **S** button to locally save the new setting.
Interface Name	Text box. Enter a "friendly" name for the interface. Click the **S** button to locally save the new setting.
Default Gateway Address	Text box. Static IP address of the gateway for the selected interface to use. (IPv4) Click the **S** button to locally save the new setting.
Primary DNS IP Address	Text box. Static IP address of the primary Domain Name System (DNS) server for the selected interface to use. (IPv4) Click the **S** button to locally save the new setting.
Secondary DNS IP Address	Text box. Static IP address of the secondary DNS server for the selected interface to use. (IPv4) Click the **S** button to locally save the new setting.
Note 1: Network interface "Control 2 : eno2" (i.e. the second control network interface) may not appear in the drop-down menu unless there is a network connection to the rear of the unit.	

**Table 11 Network Interface Settings**

Note: **Media IP Fabric Interfaces and network connection:**

• 'ens2f0' and 'ens2f1' must be connected to a different IP fabrics.

• 'ens1f0' and 'ens1f1' must be connected to a different IP fabrics. (MV-805-32)

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.

6.2.4   RollCall Settings box

The **RollCall Settings** box sets up the unit as a RollCall device for a RollCall+ connection to SAM Orbit for multiviewer video wall control and monitoring. This includes defining RollCall+ communication parameters and specifying which network interface of the MV-805 unit to use.
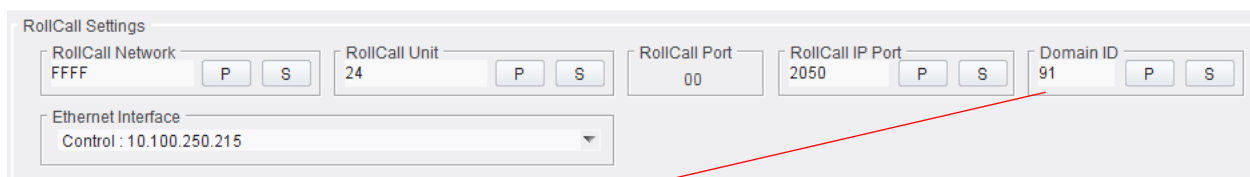
For RollCall+ connection to SAM Orbit for multiviewer control and monitoring.

Figure 32 RollCall Settings Box

Setting	Description
RollCall Network	Text box. Enter the RollCall network address. Click the **S** button to *locally* save the new setting. N**ote:** This is a RollCall address, not an IP network address. See **Note 1** and **Note 2**.
RollCall Unit	Text box. Enter the RollCall unit number. Click the **S** button to *locally* save the new setting. See **Note 2**.
RollCall Port	Displays the RollCall port number.
RollCall IP Port	Text box. IP port to use for RollCall messages. Click the **S** button to *locally* save the new setting. **Note:** This can usually be left at its displayed value (2050).

Table 12 RollCall Settings

Setting	Description
Domain ID	Text box. Enter the RollCall+ **Domain ID** number; click the **S** button to *locally* save the new setting. (A RollCall+ domain is used to segregate messages on a RollCall network. There can be more than one domain on a network.) **Multiviewer Control Message Domain ID:** This RollCall+ **Domain ID** is for multiviewer control messages: • 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** back to the default value of 100 click on the **P** button.) • SAM Orbit must use the same **Domain ID** when connecting to the MV-805 unit for SAM Orbit Multiviewer projects. See **Note 3** and **Note 4**.
Ethernet Interface	Drop down box. Set which MV-805 physical network interface to use for RollCall+ control messages etc. Each of the physical network interfaces of the MV-805 system are shown in the drop-down menu. Select the IP address of the "Control" interface. **Note:** MV-805 only supports 'out-of-band' control.

Note 1: RollCall address: The form of a RollCall address is:

NNNN:UU:PP

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

Note 2: The *combination* of **RollCall Network** and **RollCall Unit** number must be unique in a RollCall system.

Note 3: RollCall+ Domains: RollCall+ uses the concept of domains to segregate messages on a RollCall network. There can be more than one RollCall+ Domain on a network.
Only RollCall-enabled devices on the same RollCall+ Domain can communicate with each other.

Note 4: RollCall+ Domain IDs: For the **MV-805**, there are two RollCall+ domains required:

• Multiviewer control messages domain.

• IP routing messages domain.

Table 12 RollCall Settings (Continued)

6.2.5   IP Fabric box

The **IP Fabric** area of the **System - Setup** template assigns the physical media IP network interfaces of the unit to the internal 'IP multiviewer function' of the MV-805 unit. These are assigned as Fabric A or Fabric B.

Additionally, the RollCall+ Domain ID for any RollCall+ messages for IP routing is set up. (This connects to the "IP Routing" side (IPRA) of a SAM IP Routing System Controller (IP-RSC) unit, enabling destination spigot multicast IP settings to be changed from the IP-RSC.)

Finally, the output video format for multiviewer display outputs is defined.

The number of network interfaces shown depends on the MV-805 model:

- **MV-805-16** - Two interfaces are shown,
  Interface 1 Fabric A and Interface 1 Fabric B.

- **MV-805-32** - Four interfaces are shown,
  Interface 1 Fabric A and Interface 1 Fabric B;
  Interface 2 Fabric A and Interface 2 Fabric B.

For 'IP Routing' RollCall+ messages:
from the 'IP Routing' side of a SAM IP Routing System Controller unit
or
from a SAM IQTIC card.

Figure 33 IP Fabric Box

Setting	Description
Interface 1 Fabric A	Drop-down box. Select a physical network interface to be the Fabric "A" network connection to the internal MV-805 IP multiviewer function. (The network interface used must be one that is connected to a media IP network fabric.) Drop-down menu: Example drop-down menu, MV-805-16 **Note:** Drop-down menu item names are formed from the interface name and its IP address, in the form: "name : IP address". For example, "Media-1A : 10.200.10.31". See **Note 1.**
Interface 1 Fabric B	Drop down box. Similar to **Interface 1 Fabric A**, but for media Fabric "B". See **Note 1.**
Interface 2 Fabric A (MV-805-32-only)	Drop-down box. (For MV-805-32, there are two connections to Fabric A.) Select which physical network interface to use for the internal IP multiviewer function's *second* media Fabric "A" network connection. See **Note 1.**
Interface 2 Fabric B (MV-805-32-only)	Drop down box. (For MV-805-32, there are two connections to Fabric B, with redundancy.) Similar to **Interface 2 Fabric A**, but for media Fabric "B". See **Note 1.**

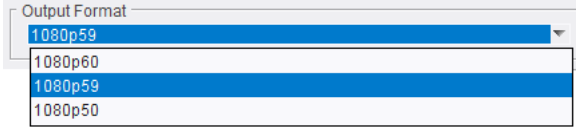**Table 13 IP Fabric Settings**

Setting	Description

Domain ID	Text box.
	Enter the **Domain ID** number for the real-time media IP stream data.
	Click the **S** button, to locally save a new setting.
	
	(A RollCall+ domain is used to segregate messages on a RollCall network.
	There can be more than one domain on a network.)
	
	IP Routing Message Domain ID:
	
	This is the RollCall+ **Domain ID** for IP Routing messages:
	
	• The **Domain ID** can typically be left at its default value, 101.
	   (This default value is used for IP Routing RollCall traffic.
	   To reset the **Domain ID** back to the default value of 101 click on the **P** button.)
	
	• SAM Orbit must use the same **Domain ID** when connecting to the MV-805 unit for SAM Orbit IP Routing projects.
	
	• If a SAM IQTIC card is used with the MV-805 unit, then it must also use the same **Domain ID**.
	
	See **Note 2**.

Output Format	Drop-down box. Select the video output format of the multiviewer display output. For example, 1080p59.

Note 1:	The selected interface must be connected to a high-performance media IP network.
Note 2:	**RollCall+ Domain IDs:** For the **MV-805**, there are two RollCall+ domains required: • Multiviewer control messages domain. • IP routing messages domain.

Table 13 IP Fabric Settings (Continued)

6.2.6 "Router Controller Settings" box

The MV-805 IP Multiviewer typically monitors video IP streams which are routed around an IP routing system which comprises a media IP network configured for video IP routing. In such a SAM IP network, the traditional video router device is replaced by a high-performance network IP switch which is under the control of a router controller device.

Information about the router controller device is set up in this **Router Controller Settings** box.

Note: **Router Controller of IP Routing System (IP-RSC):**

A Router Controller device for a SAM video IP routing network is the IP-RSC unit. It presents the IP routing network as a traditional video router to the user and to other devices. This enables the network to be controlled through traditional hard/soft control panels and control systems (via SAM's SW-P-02 and SW-P-08 protocols).

The router controller keeps a list of user-friendly video signal names.

The router controller for a video IP routing system has network interface(s):

> a   connected to control panels etc. (for control messages).

> b   connected to IP edge devices (for IP routing messages).

Note: **Multiviewer Input Spigots:**

The MV-805 IP Multiviewer's (IP) video input spigots are connected to destination ports of a video router.

- The destination port number range used by the multiviewer's input spigots must be contiguous.

- The size of the port number range is determined by the number of multiviewer video inputs.

The MV-805 IP Multiviewer can get video signal name information via its RollCall interface. The MV-805 IP Multiviewer acts like a control panel when getting signal names, as far as a router controller is concerned, and uses the SAM SW-P-08 protocol.

The **Router Controller Settings** box is shown in Figure 34 and the settings are described in Table 14.
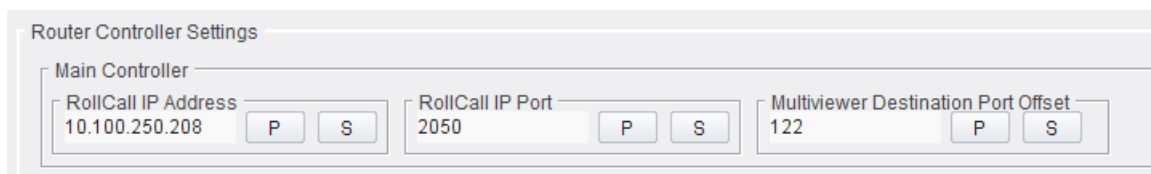
For RollCall connection to
the 'traditional video router control' side of a SAM IP Routing System Controller unit.

Figure 34 Router Controller Settings Box

Setting	Description
RollCall IP Address	Text box. Enter the static IP address of the network interface of the IP-RSC Router Controller device that is connected to control panels etc. Click the **S** button, to locally save a new setting. **Note:** Alternatively, if the TSL protocol is being used to get signal names, leave this text box blank.
RollCall IP Port	Text box. Enter the IP port number for the Router Controller device comms. Click the **S** button, to locally save a new setting.
Multiviewer Destination Port Offset	Text box. Enter the offset into the video router's destination port range which the multiviewer's input spigots use. The multiviewer obtains a full list of video router port names from the IP-RSC router controller device. The **Multiviewer Destination Port Offset** is used by the multiviewer as an offset into its full list of (destination) port names. The multiviewer can then determine the names of the signals routed to its inputs (destination spigots). The video router destination ports used by the multiviewer input spigots must be in one contiguous range. Click the **S** button, to locally save a new setting.

Table 14 Router Controller 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.

6.2.7 Information box

This box contains text fields which can be set up by the user for information only; they include:

- Name.
- Location.
- Notes about the multiviewer unit.

To enter/modify text in a text box:

1. Type directly into the editable text field.
2. Click the **S** button or press the **return** key to save the changed text locally.
3. If required, to return to the default text, click the **P** button.
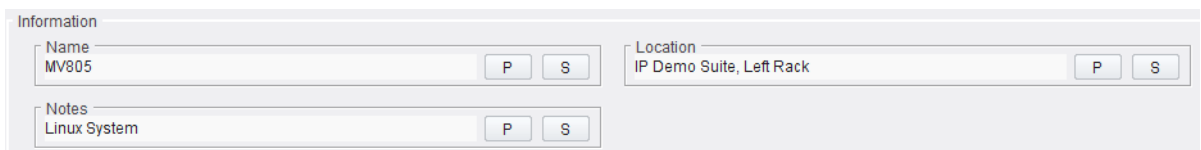

Figure 35 Information Box

Setting	Description
Name	Text box. Enter a meaningful name for the multiviewer unit, for easier identification. Maximum 50 characters. Remember to click **S** or press **return** to save the name locally.
Location	Text box. Enter a brief description of the multiviewer's location, for easier finding of the multiviewer unit. Maximum 50 characters. Remember to click **S** or press **return** to save the name locally.
Notes	Text box. Enter any extra user information about the multiviewer. Up to 63 characters can be displayed in the notes field. Remember to press **S** or press **return** to save the name locally.

Table 15 Information Box 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.

6.2.8 Service Reset to Effect Settings Changes in the System-Setup Template

After making settings changes in the **System-Setup** template, an MV-805 **Service Reset** is required and this is done from the template.

The template indicates if a **Service Reset** is required by showing a "Restart Required" message in the **System Box** at the top of each template, see Figure 36.
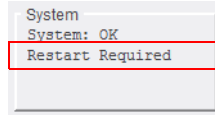

Figure 36   System Box "Restart Required" Template Message

To do a **Service Reset** from the **System-Setup** template:

1.   Click the **Service Reset** button.

2.   Click the **Confirm** button.

The unit takes 2-3 minutes to complete the reset.
See Section 6.2.2 "System Reset box" on page 51 for details about a Service Reset.

At the beginning of the **Service Reset**, the RollCall template indicates unit 'Restarting', see Figure 37.
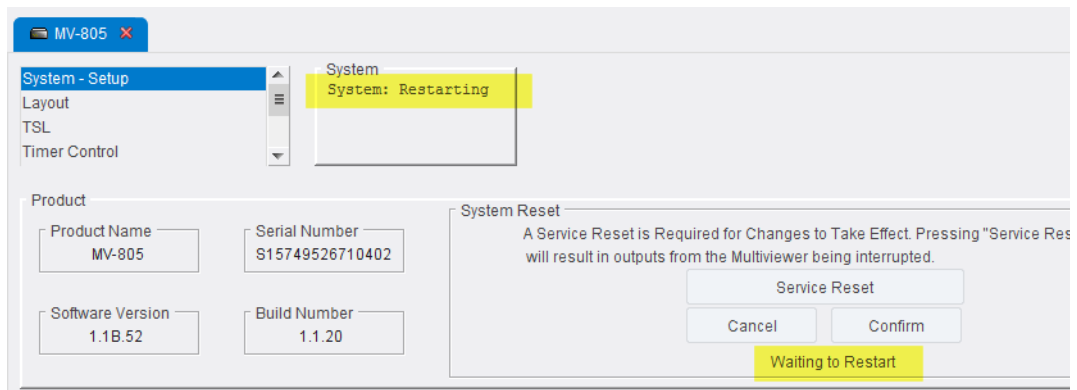
Figure 37   System Reset Starting Shown in Template

After the unit has restarted, the RollCall template can be viewed by RollCall Control Panel. While the RollCall template is being populated with information, it is all visible and the System box on the template shows a "Starting" message. See Figure 38.
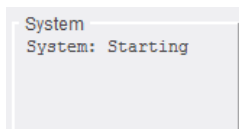

Figure 38   System Box "Starting" Message

When the template is fully ready, the System Box shows "System: OK", see Figure 39.
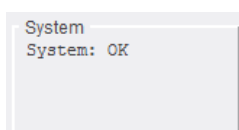

Figure 39   System Box "System: OK" - System is Ready

6.3   Layout Template

The RollCall MV-805 Layout screen allows the user to select which multiviewer video wall layout to apply to each MV-805 multiviewer display output. A user may use a RollCall soft- or hard-panel to remotely control which video wall layout is used. The on-screen transition between two wall layouts is selectable; it can be a simple cut or a fade through black.

Video walls are designed in the SAM Orbit application and different wall layouts may be generated for the same wall. These are all contained within a SAM Orbit multiviewer project.

- Each video wall in a SAM Orbit multiviewer project has a Name property, which is set to "Wall 1", "Wall 2" etc.

- Each wall layout in a SAM Orbit multiviewer project has a name set to "Layout1", "Layout2" etc.

The wall layout to be used for each wall can be selected in the respective drop-down box of the RollCall Layout screen. See Figure 40.

| Note: | Layout names are case-sensitive and are set to "Layout1", "Layout2" etc. |

Note:
MV-805-32: Eight walls are shown.
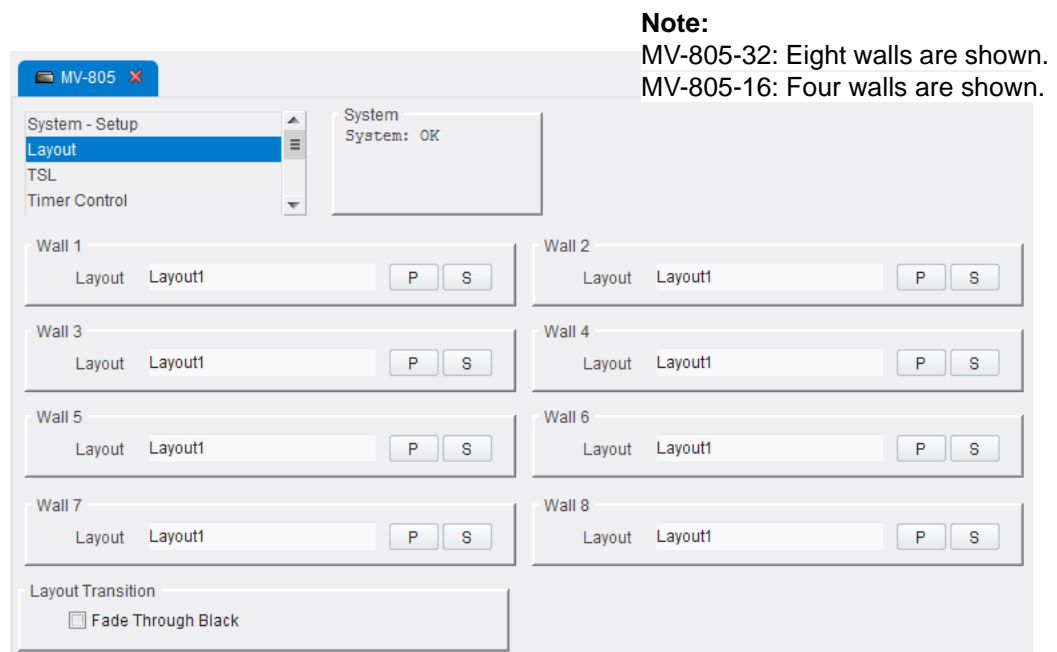MV-805-16: Four walls are shown.

Figure 40 RollCall Layout Screen

To change a wall layout:

1. Select the on-screen transition for the layout transition:
   Tick "Fade Through Black" for a fade through black, untick for an on-screen cut.

2. For the corresponding **Wall** on the **Layout** template,
   enter the name of the next wall **Layout** (case sensitive).

3. Click **S** to effect the layout change on the multiviewer.

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.

6.4   TSL Template

The RollCall TSL template allows configuration of settings related to support of the TSL protocol.
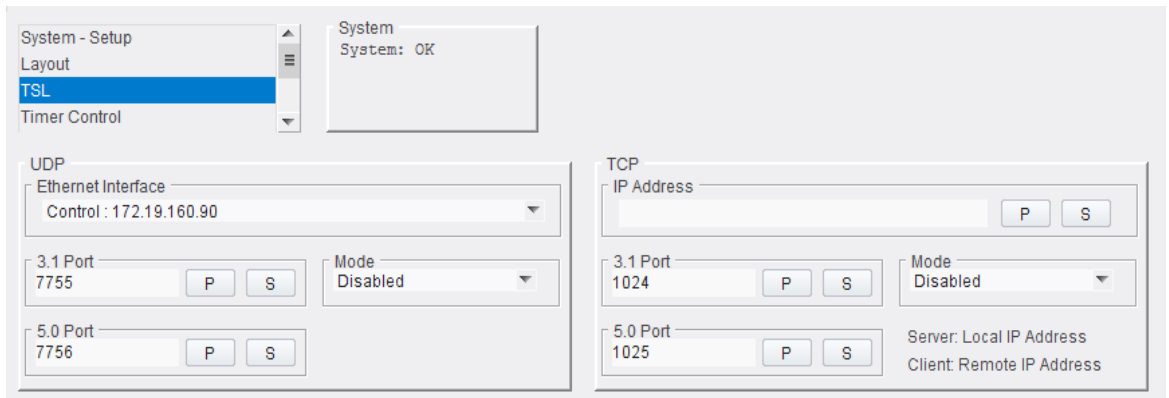

Figure 41 RollCall TSL Template

TSL protocol is supported in TSL Server Mode or TSL Client Mode.

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

Setting	Description
UDP settings:	
Ethernet Interface	Drop-down box. Select which network interface of the MV-805 unit to use.
	Note: Typically, the "Control" network interface is used and *not* a media network interface.
3.1 Port	Text box. Enter the network IP port to receive TSL 3.1 messages on.
	Remember to press the **S** button to save the change.
5.0 Port	Text box. Enter the network IP port to receive TSL 5.0 messages on.
	Remember to press the **S** button to save the change.
Mode	Drop-down box. Select **Server** mode, or 'disabled'.
TCP settings:	
IP Address	Text box.
	For **Server** Mode**:** Enter the local IP address of the MV-805 network interface connected to the TSL controller.
	For **Client** Mode**:** Enter the IP address of the TSL Controller.
	Remember to press the **S** button to save the change.

Table 16 TSL Mode Settings

Setting	Description
3.1 Port	Text box. Enter the network IP port to receive TSL 3.1 messages on. Remember to press the **S** button to save the change.
5.0 Port	Text box. Enter the network IP port to receive TSL 5.0 messages on. Remember to press the **S** button to save the change.
Mode	Drop-down box. Select **Server** Mode, **Client** Mode**,** or 'disabled'.

Table 16 TSL Mode Settings (Continued)

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.

6.5 Timer Control Template

The **Timer Control** screen allows a user to control on-screen timer widgets on a multiviewer video wall via a RollCall soft- or hard-panel. For example, to start/stop timers, or set them to count up/down. There are up to 16 on-screen timers on the video walls from a MV-805 unit.
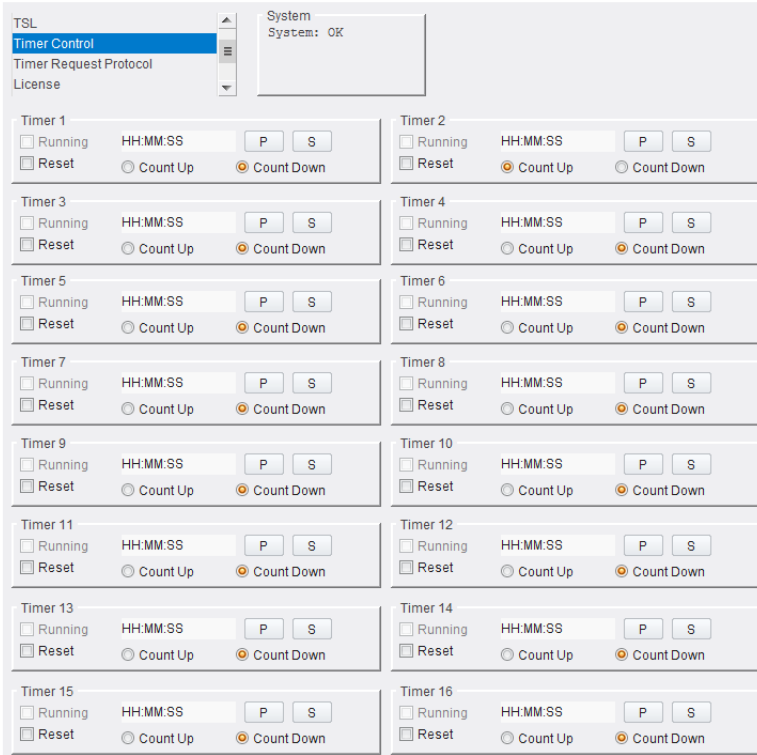
Figure 42   RollCall Timer Control Template

For each timer widget (Timer 1, Timer 2 ... Timer 16), the settings in Table 17 are available.

Setting	Description
Running	Check box. Tick to start the timer. Untick to stop. This is shown greyed out until a timer's target time has been entered (HH:MM:SS).
Reset	Check box. Tick to reset the timer. **Note:** Once the timer has reset, then the tick disappears.
HH:MM:SS	Text box. Enter the timer's target time. Target time format: HH:MM:SS, for example 02:30:00 . Remember to press the **S** button to save the change. **Note:** When the target time is changed, the timer is reset.

Table 17   Timer Control Settings (per On-screen Timer Widget)
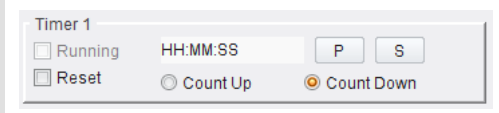
Description		
Setting		
Count Up	Radio button. Select to reset the timer and count up.	
Count Down	Radio button. Select to reset the timer and count down.	

Table 17   Timer Control Settings (per On-screen Timer Widget)

Note: | All **Timer** widget on-screen styling and any configuration of trigger points etc are set through the SAM Orbit application.

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.

6.6 Timer Request Protocol Template

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.
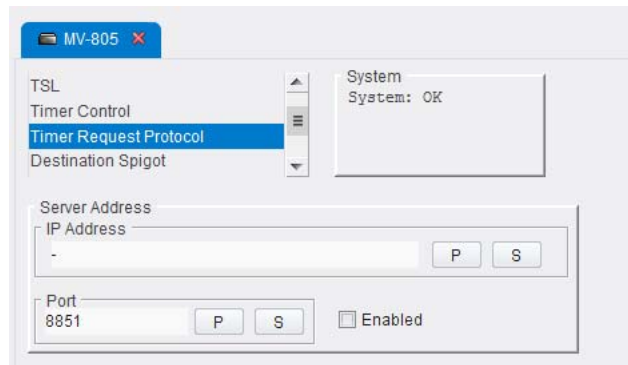
Figure 43   Timer Request Protocol Template

Setting	Description
IP Address	Text box. Enter IP Address of an 'eTimer' server device. Remember to press the **S** button to save the change.
Port	Text box. Enter IP port number to use for Timer Request Protocol messages. Remember to press the **S** button to save the change.
Enabled	Check box. Tick to enable use of Timer Request Protocol messages.

Table 18   Timer Request Protocol Settings

Note: **Configuring an eTimer:**

A Timer widget can be configured on a video wall tile in SAM Orbit to be connected to an eTimer service.

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.

6.7   Destination Spigot Template

Video routing to an MV-805 unit is normally done with a SAM video routing IP system, under the control of a router controller unit (IP-RSC). Routing is then controlled via traditional video router control methods (i.e. a hard or soft panel) and the user does not have to deal with IP addresses etc, just user-friendly router port names and numbers.

The RollCall **Destination Spigot** template allows a user to manually specify video IP stream routing to the MV-805 inputs. MV-805 input spigots are mapped to a range of 'destination ports' of an IP router that the MV-805 is connected to. The template is shown in Figure 44.
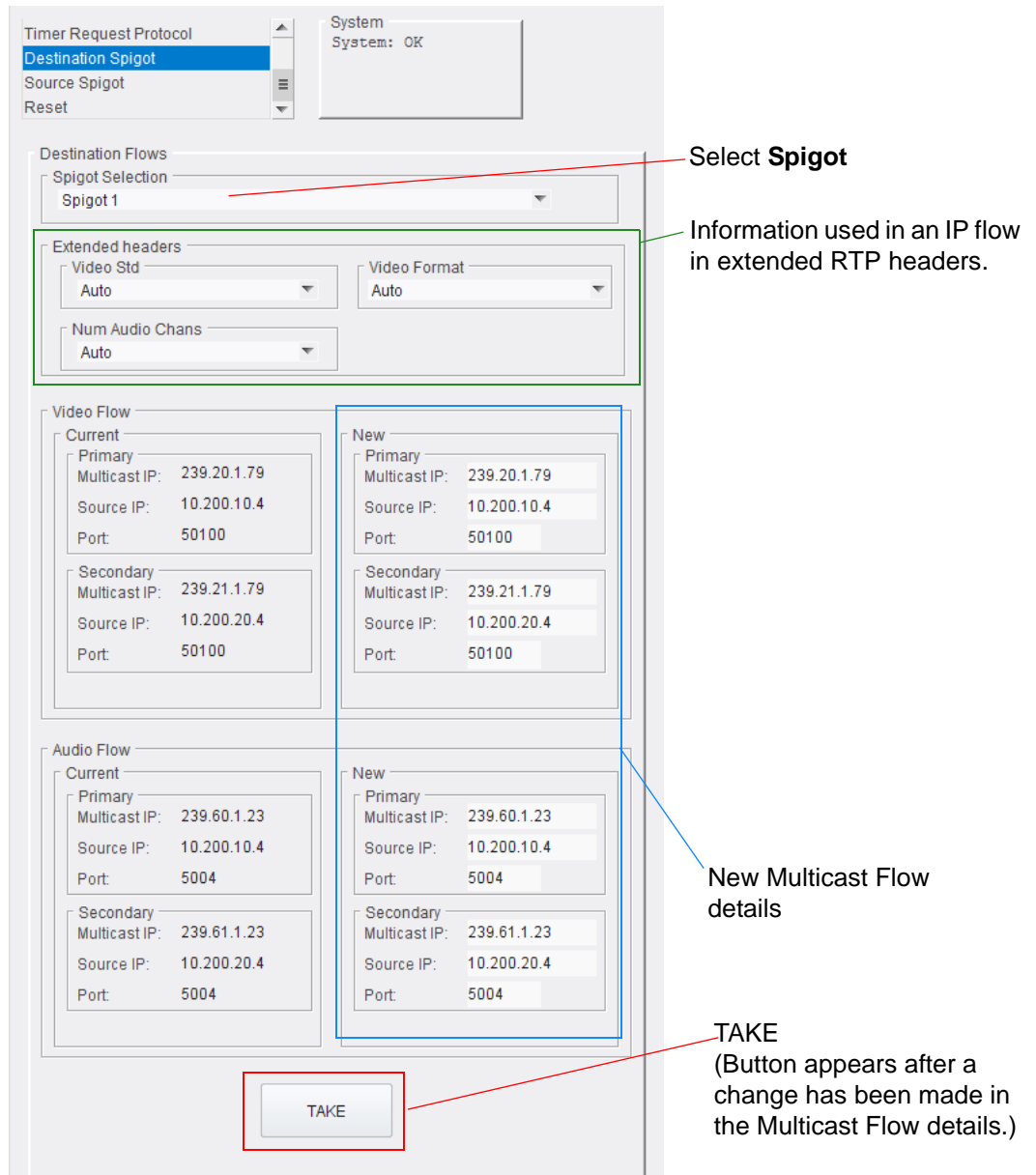
Figure 44   RollCall Destination Spigot

Destination Spigot screen items are described in Table 19, Table 20, Table 21, and Table 22.

Item	Description
Spigot Selection	Drop down box. Select which multiviewer destination spigot to show: • **MV-805-16**: Select Spigot 1 to Spigot 16. • **MV-805-32**: Select Spigot 1 to Spigot 32. (Note: Destination spigots are the MV-805 video inputs.)

Table 19   Spigot Selection (Destination Spigot Screen Item)

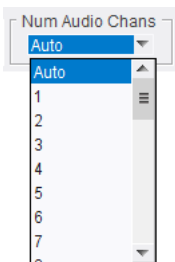| Extended Header Item	Description
Video Std	Drop-down box. Select the video standard to use at the destination spigot for the received video data. In 'Auto' mode, the destination spigot determines the video standard from data in the RTP extended header of the IP stream. Use 'Auto' when receiving IP streams from SAM IP devices.

Table 20 Extended Headers Information (Destination Spigot Screen Item)

Extended Header Item	Description
Video Format	Drop-down box. Select the IP stream video data format to use at the destination spigot. In 'Auto' mode, the destination spigot determines the video data format from data in the RTP extended header of the IP stream. Use 'Auto' when receiving IP streams from SAM IP devices.
Num Audio Chans	Drop down box. Select the number of audio channels at the destination spigot. In 'Auto' mode, the destination spigot determines the number of audio channels from data in the RTP extended header of the received IP stream. Use 'Auto' when receiving IP streams from SAM IP devices.

Table 20 Extended Headers Information (Destination Spigot Screen Item) (Continued)

New Multicast Flow Setting	Description
Flow Information:	For each of the flows for the selected spigot, the following information is presented:
Multicast IP	Text box. Enter the IP Address of the multicast stream.
Source IP	Text box. Enter the IP Address of originating source of the multicast stream.
Port	Text box. IP Port number to use for Input Flows on the multiviewer spigot.

Table 21 New Multicast Flow Settings (Destination Spigot Screen Item)

Item	Description
Take	Button. Click **Take** to make a routing to a destination spigot (MV-805 input) or apply a settings change.

Table 22   Take (Destination Spigot Screen Item)

6.7.1 Manual Setting of Multicast Flow

The **Destination Spigot** screen allows the user to manually set up which video multicast IP stream each MV-805 input (destination) spigot is subscribed to.

For each of the multiviewer's destination spigots, two flows are supported:

- **Video Flow** and **Audio Flow**.

For each flow, the template has the following sections:

- **Current:** Shows information about the current IP stream connected to the spigot.

- **New:** Allows a user to enter information about another IP stream.

Each section has a **Primary** and **Secondary** sub-section, which are for redundant flows.

Once new IP stream information is entered, a **TAKE** button appears at the bottom of the window. Click **TAKE** to make the new route.

To manually route to the multiviewer:

1. Select a spigot. (See Table 19.)

2. Enter all the new details for each flow. (See Table 21.)
   (For Video and Audio flows in Fabrics "A" and "B".)

   A TAKE button appears at the bottom of the screen.

3. Click TAKE to make the new route.

6.8 Source Spigot Template

The RollCall **Source Spigot** template (Figure 45) allows a user to manually specify the details of each video multicast IP stream *from* the MV-805 spigots (i.e. from the source spigots providing the video wall display output video IP streams).

MV-805 output (source) spigots are typically connected to 'source ports' of an IP router.

For each multiviewer source spigot, two flows are supported:

- **Video** and **Audio**.

For each flow, the template has the following sections:

- **Current:** Shows information about the current IP stream originating from the spigot.

- **New:** Allows a user to enter new IP stream details.

Each section has a **Primary** and **Secondary** sub-section, which are for redundant flows.

Once new IP stream information is entered, a **Take** button appears at the bottom of the window (see Figure 45b). Click **Take** to apply the new IP stream settings.
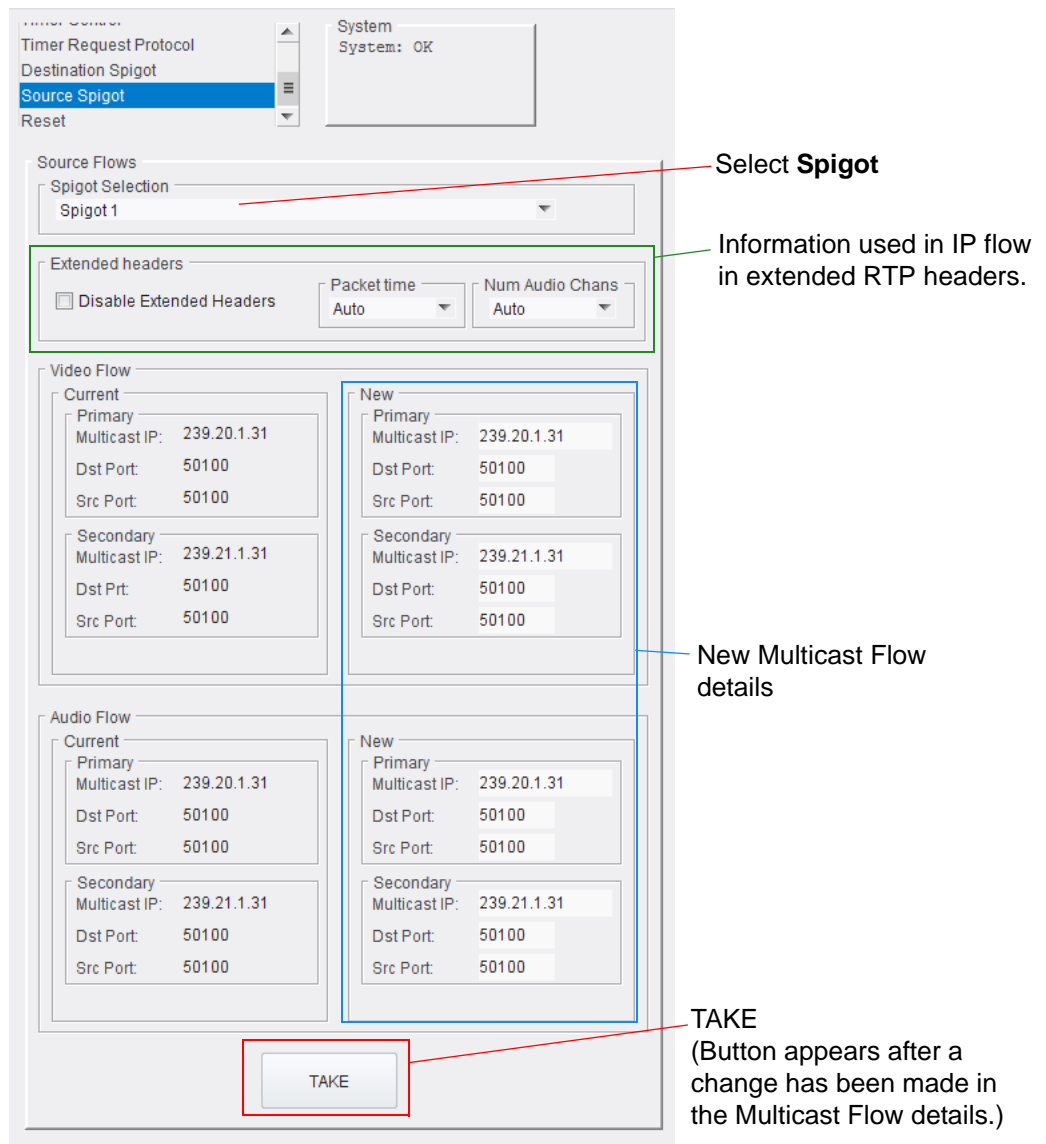
Figure 45   RollCall Source Spigot

The **Source Spigot** screen items are described in Table 23, Table 24, Table 25, and Table 26.

Setting	Description
Spigot Selection	Drop down box. Select which multiviewer source spigot to show. • **MV-805-16**: Select Spigot 1 to Spigot 4. • **MV-805-32**: Select Spigot 1 to Spigot 8. (Source spigots are the MV-805 video outputs.)

Table 23   Source Spigot Selection

Extended Header Setting	Description
Disable Extended Headers	
	Check box. Tick to disable extended RTP headers in the sourced IP flow. (For example, this may be required for TR-03/04 compatibility.)
Packet Time	Drop down box. Select the length of time represented by the media in each IP flow packet. In 'Auto' mode, the **Packet Time** is determined by the number of audio channels. If the number of audio channels is 32 or less, **Packet Time** is typically set to 250 us.
Num Audio Chans	Drop down box. Select the number of audio channels in the IP flow packets. In 'Auto' mode, the number of audio channels is determined by the number of audio channels assigned (in the edge device configuration) to the output IP stream. **Note:** The MV-805 does not currently support audio on its display outputs. Set this to 'Auto'.
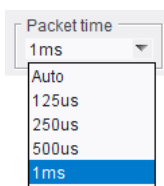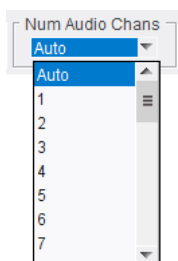
Table 24 Extended Headers Information (Source Spigot Screen Item)

New MultiCast Flow Setting	Description
Flow Information:	For each of the flows, the following information is presented:
Multicast IP	Text box. Enter the IP Address of the multicast stream.
Dst Port	Text box. IP Port number to be used by the flow's destination (i.e. the multicast stream).
Src Port	Text box. IP Port number to be used by the flow's source device (i.e. the Multiviewer).

Table 25 Multicast Flow Information for Selected Source Spigot

Item	Description
Take	Button. Click **Take** to make a routing to a source spigot (MV-805 output) or apply a settings change.

Table 26   Take (Source Spigot Screen Item)

6.8.1 Changing Source Flow

For each multiviewer source spigot, two flows are supported:

- **Video** and **Audio**.

For each flow, the template has the following sections:

- **Current:** Shows information about the current IP stream originating from the spigot.

- **New:** Allows a user to enter new IP stream details.

Each section has a **Primary** and **Secondary** sub-section, which are for redundant flows.

Once new IP stream information is entered, a **Take** button appears at the bottom of the window. Click **Take** to apply the new IP stream settings.

To change the source multiviewer output IP stream information:

1. Select a spigot. (See Table 23.)

2. Enter all the new details for each flow. (See Table 25.)
   (For Video and Audio flows in Fabrics "A" and "B".)

   A TAKE button appears at the bottom of the screen.

3. Click TAKE to apply the new multicast IP stream details.

6.9   Reset Template

There are several 'system resets' which can be carried out from the RollCall templates:

From the System-Setup template:

The **System-Setup** template offers a "Service Reset":

- **Service Reset**,
  see Section 6.2.2 "System Reset box" on page 51.
  This restarts the internal IP multiviewer software application of the MV-805.

From the Reset template:

Secondly, *this* **Reset Template** (see Figure 46) offers:

- **Restore Project** - This will revert the SAM Orbit IP multiviewer project on the MV-805 unit back to the default project that the unit was shipped with.

  Click **Restore Project**.

- **Restart Multiviewer** - This will power cycle the MV-805 unit.

  Click **Restart**.

- **Shutdown Multiviewer** - This will safely shut down the MV-805 IP multiviewer software application, the internal operating system and shut down the unit itself.

  Click **Shutdown**.
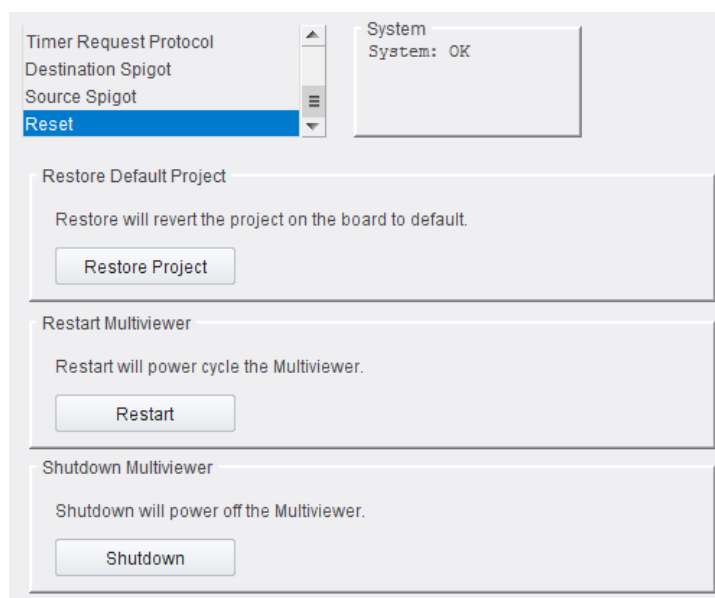
Figure 46   Reset Template

7   Getting Started 1 - Unit Settings (RollCall Template)

This section describes part of getting the MV-805 IP Multiviewer going from out-of-the-box.

This section.

Configure Unit Settings

(For RollCall template descriptions, see Section 6 "RollCall Templates" on page 46.)

Configure IP Routing Settings

See Section 8 "Getting Started 2 - IP Routing (Orbit)" on page 89.

Design and Layout Multiviewer Video Wall

See Section 9 "Getting Started 3 - Design/Layout of Video Wall (Orbit)" on page 108.

Section contents:

The section covers the configuring of initial unit settings via the unit's RollCall templates.

Required items for this section:

- Computer running RollCall Control Panel.
- IP address/port/sub-net and gateway etc. information about other IP routing system devices.

7.1 How to Connect RollCall Control Panel to the MV-805 unit

7.1.1 Preparation

Initial connection to an MV-805 unit is done with the "out-of-the-box" default settings of the MV-805. As a minimum, one network interface can be configured to be the "control" network connection, so that the unit can be subsequently connected onto a house network and the remainder of the unit then set up.

Items required:

- A Laptop, or some computer, with a RJ45 ethernet port and with SAM RollCall Control Panel installed.

- A direct CAT 5 ethernet cable.

Initial MV-805 connection and configuration should be carried out on a separate IT network, separate from any house media network. The initial configuration sets up MV-805 IP addresses and communication settings.

Note: | **Default IP Address on the "Control" network interface:**

A new MV-805 will be using a static, default IP address (10.54.31.221) on its "Control" network interface. (I.e. the **lower, left-most** RJ45 connector, when viewing the unit from the rear.)

See Appendix A.9 "Default Ethernet IP Addresses" on page 132 for default IP addresses on all network ports.

Preparing a Computer:

To prepare a computer for initial connection:

1. Select which computer ethernet RJ45 port to use.
   And set the port to a fixed, static IP address on the same network as the MV-805.

   For example, use IP address 10.54.31.228 with sub-net mask 255.255.0.0.

2. Disable any WiFi connections on the computer. (Because these may interfere with the wired RJ45 network port.)

3. Directly connect the computer RJ45 port to the "Control" network interface of the MV-805. See Figure 47.

Default IP address (10.54.31.221)
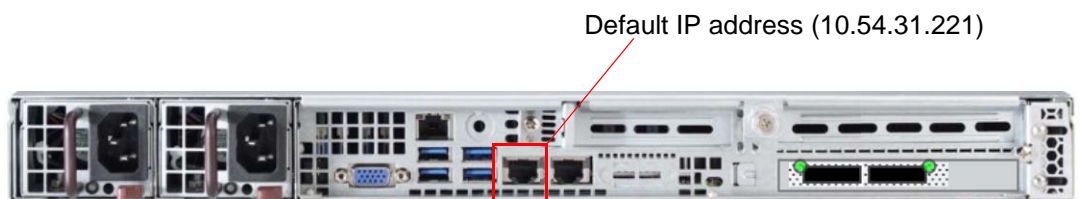
Figure 47 MV-805 Rear "Control" Network Interface

Next, connect RollCall Control Panel to the unit, see sub-section 7.1.2.

7.1.2 Connecting RollCall Control Panel

1. With the MV-805s "Control" network interface connected to a network (or directly to a computer for an initial connection),
   open the RollCall Control Panel application from:

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

   The RollCall Control Panel application starts; the initial screen is displayed. See Figure 48.
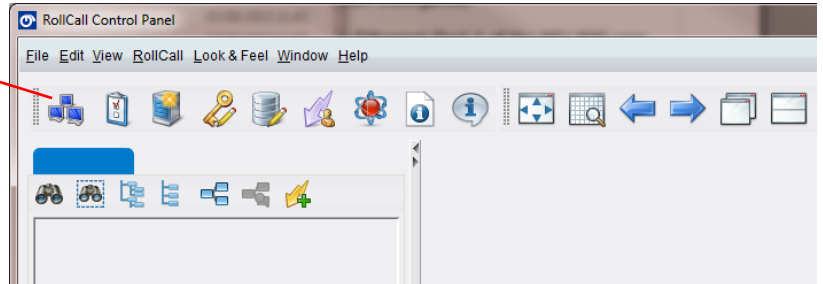
Build Network
icon

Figure 48 RollCall Control Panel Initial Screen

2. Click the **Build Network** ![icon] icon in the tool bar to display the Build Network dialog. See Figure 49.
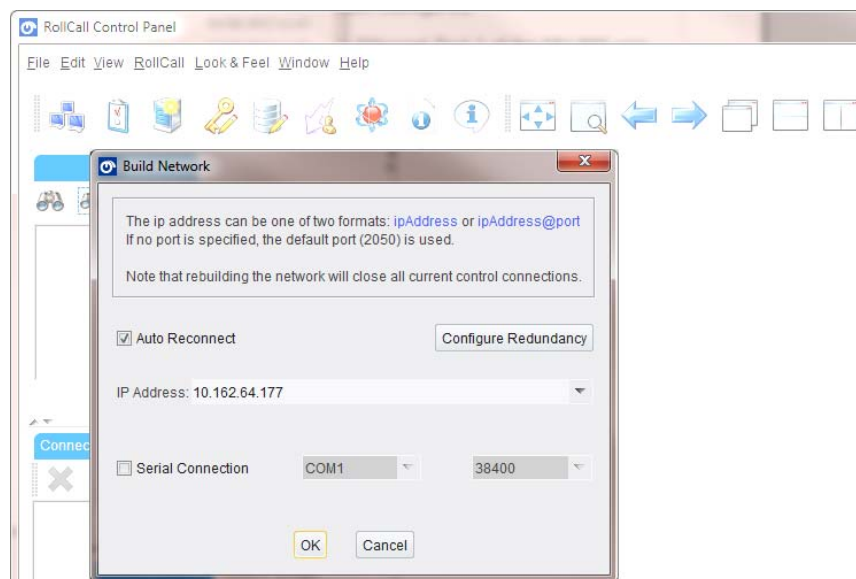

Figure 49 Build Network Dialog

3. Enter your MV-805's IP address into the 'IP Address' text box.
Click **OK** to connect to the MV-805.

4. After a short period displaying "Connecting",
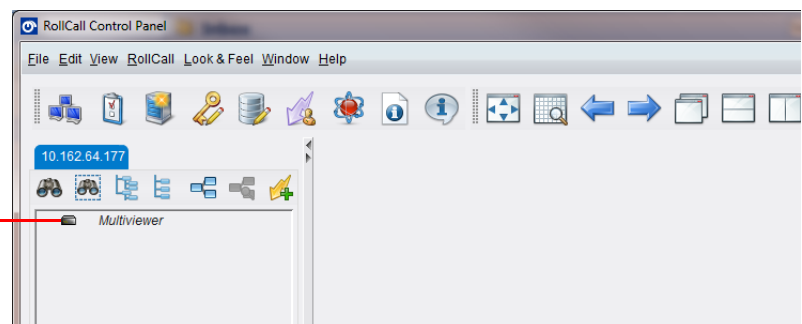RollCall Control Panel will connect to the MV-805 IP Multiviewer. See Figure 50.

Multiviewer unit
icon

Figure 50 RollCall Connected to MV-805 IP Multiviewer

5. Double-click on the Multiviewer unit icon or name in the left-hand pane.
The RollCall settings of this unit are downloaded, i.e.the RollCall template for the unit.
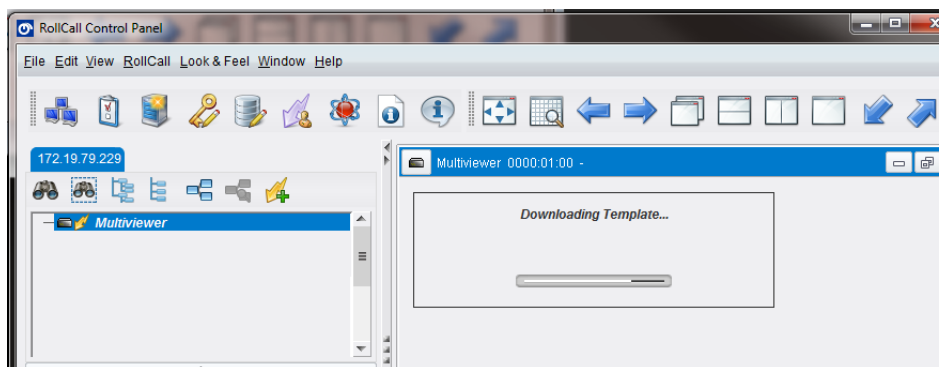
Figure 51 RollCall Multiviewer Template Downloading

6. When Rollcall template information download is complete,
   the MV-805 RollCall template screens will be displayed on the right. See Figure 52.

   RollCall has now connected to the multiviewer.
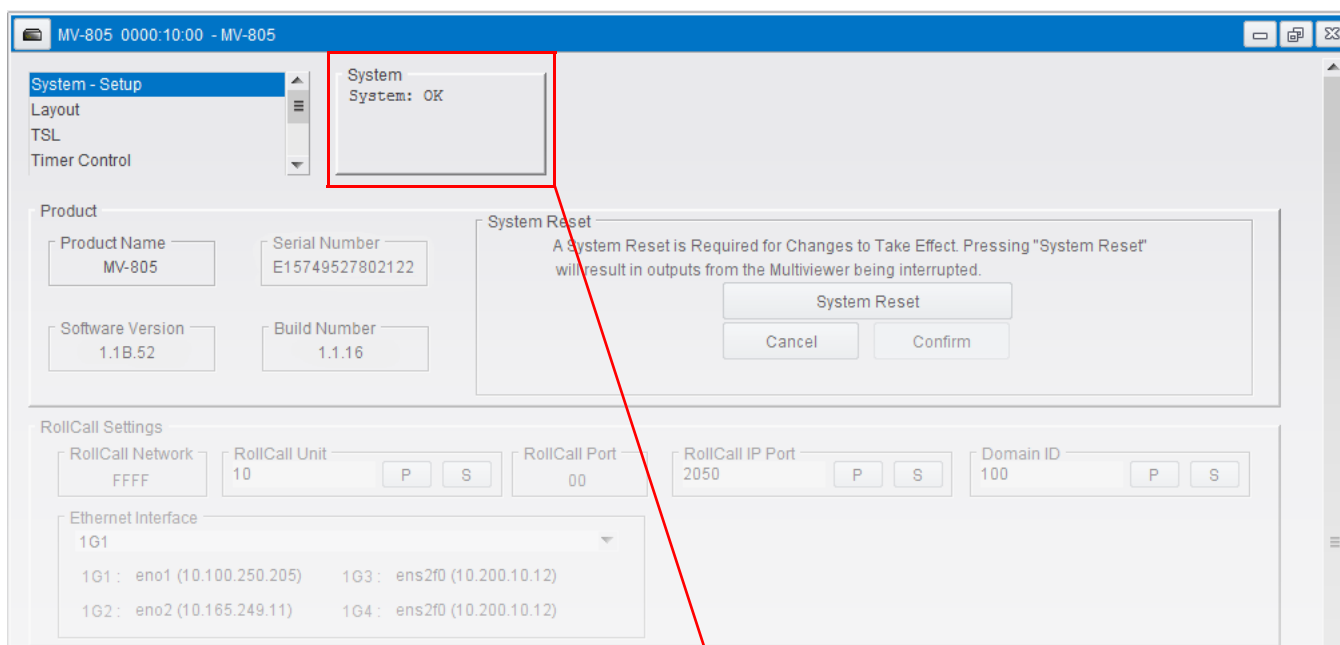
System Status box

Figure 52 MV-805 RollCall Template Screen

The **System Status** box at the top of each template displays the multiviewer system status at the top of each template:

- **OK** - the multiviewer is working correctly.

- **Fail** - the multiviewer has a problem.

- Starting: The template is being filled out with information read from the MV-805.
  Wait until the message disappears before interacting with the template.

- Restart Required: This is shown after a setting has been changed on the template and the unit requires a restart to make the setting change take effect.

- System Restarting.

7.2 Initial MV-805 Unit Configuration with RollCall

Initial unit configuration can be done with RollCall Control Panel and should be carried out on a separate IT network, separate from any house media network.

Initial unit configuration sets up MV-805 unit IP addresses and communication settings etc. to prepare the unit for connection to networks.

Finally, a unit service reset is performed from the RollCall template which restarts the unit.

Once the MV-805 has re-booted after initial configuration, the new network settings will be adopted and the unit can then be connected to your house media network and any further configuration can be done.

Note: See Section 6 "RollCall Templates" on page 46 for descriptions of settings; in particular, see Section 6.2 "System-Setup Template" on page 49.

7.2.1 Setting Up the Host Name

With RollCall Control Panel connected to the unit:

1. Select the **System-Setup** template, see Figure 53.
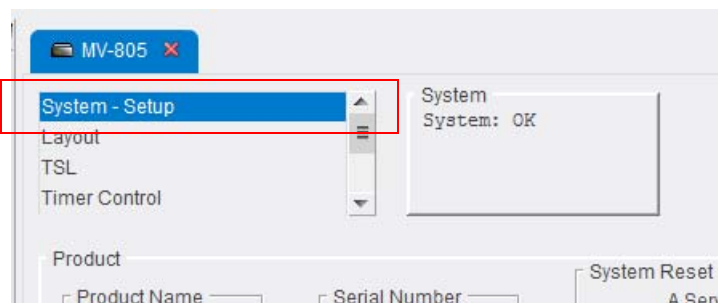
Figure 53 Select the System-Setup Template

2. Look at the **Network Settings** section of the template. See Figure 54.
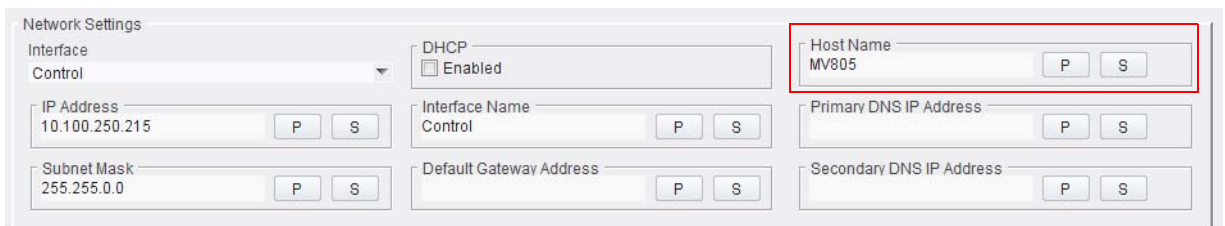
Figure 54 'Network Settings' section of System-Setup Template

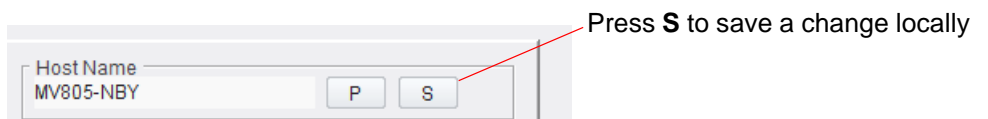3. Enter a **Host Name**. Press **S** to save the change locally.

Press **S** to save a change locally

Figure 55 Enter Host Name and Press "S" to Save Locally

Note:	**Template "S" and "P" buttons -** After entering information into 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.

7.2.2   Setting Up the Control Network Interface(s)

In the **Network Settings** section of the System-Setup template:

4.   In the **Interface** drop-down menu, select the **"Control"** network interface.
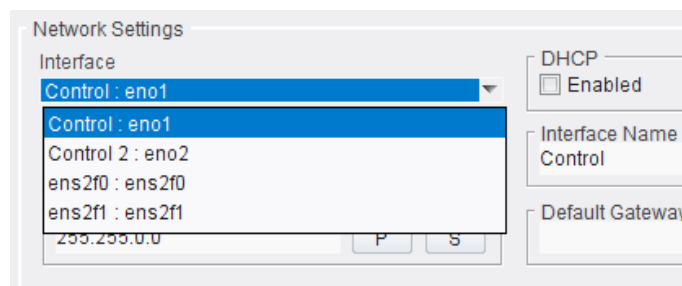
Figure 56 Select "Control" Network Interface

This has selected the "Control" network. The settings in the Network Settings section apply to the selected interface.

5.   With the "Control" network selected, enter the settings for the interface and press **S** to save each locally. Settings include:

- Static IP Address
- Subnet Mask
- Default Gateway Address
- DHCP disabled (unticked)
- Interface Name
- DNS IP Address, Primary and Secondary

Note:	**Interface Drop-down Menu Item:** Each network interface may be renamed on this template ('Interface Name'). The item name that appears in the **Interface** drop-down menu list is formed from the interface's name and its identifier: The form of this drop-down menu name is "name : identifier". For example, "Control : eno1", "Fabric-A : ens2f0", and "Fabric-B : ens2f1".

6.   If a second control interface is required,
this may be set up in a similar way. (i.e. Select "Control 2" in the Interface drop-down menu and enter settings for the interface.)

Alternatively, a second control interface can be set up later.

7.2.3 Setting Up the Media IP Fabric Network Interface(s)

Now set up each media IP Fabric network interface via the **Network Settings** section of the System-Setup template.

For each IP Fabric network interface:

7. Select each **IP Fabric** network interface in the Interface drop-down menu and enter the settings. Settings include:

- Static IP Address
- Subnet Mask
- Default Gateway Address
- DHCP disabled (unticked)
- Interface Name
- DNS IP Address, Primary and Secondary

8. Enter the settings for the interface and press **S** to save each change locally.
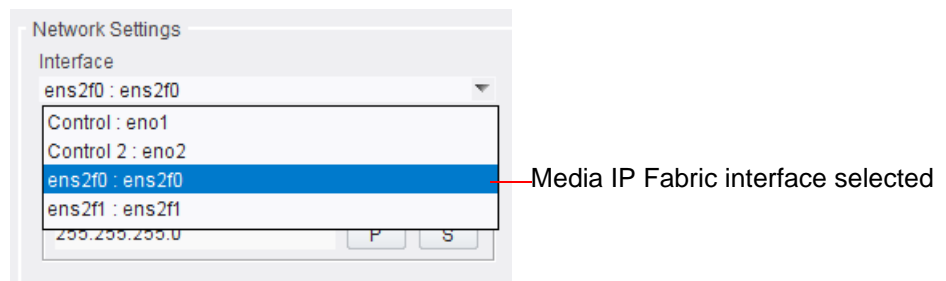
Figure 57 Select a media IP Fabric network Interface (MV-805-16 shown)

9. Enter the settings for each of the other interfaces and press **S** to save each change locally.

Note: **Number of IP Fabric Interfaces:**

- **MV-805-16:** There are 2-off interfaces (identifiers: `ens2f0` and `ens2f1`).
- **MV-805-32:** There are 4-off interfaces (identifiers: `ens2f0`, `ens2f1`, `ens1f0` and `ens1f1`.)

Note: **IP Fabric Interfaces and Network Connection:**

- '`ens2f0`' must be connected to a different IP fabric to '`ens2f1`'.
- '`ens1f0`' must be connected to a different IP fabric to '`ens1f1`' (MV-805-32).

This has configured the media IP Fabric network interfaces of the unit.

7.2.4   Setting Up the RollCall Settings

Figure 58 RollCall Settings Box

In the **RollCall Settings** section of the System-Setup template (see Figure 58):

10. Enter the following RollCall settings:

- **RollCall Network:**   RollCall network address.
- **RollCall Unit:**   RollCall unit number.
  (Must be unique for each RollCall device on the RollCall network.)
- **Domain ID:**   RollCall+ Domain ID number for multiviewer control messages.
  (The same Domain ID should be used when connecting SAM Orbit for Multiviewers to the unit.)
- **Ethernet Interface:**   Select the MV-805's control network interface.

(Enter settings and press **S** to save each change locally.)

Note:	**Multiviewer Control Messages Domain ID in "RollCall Settings":**
	The RollCall+ Domain ID used here is for multiviewer control messages. This should be the same as that used for:
	• SAM Orbit connecting to the MV-805 unit with a Multiviewer SAM Orbit project.

7.2.5   Assigning Network Interfaces as Fabric A or B

Figure 59 IP Fabric Section of System-Setup Template

In the **IP Fabric** section of the System-Setup template (see Figure 59):

11. Select a network interface to assign it to be Fabric "A" or "B" connection(s) to the internal MV-805 IP multiviewer function.
This is done via a drop-down menu. Make the following assignments:

- **Interface 1 Fabric A**   Select 'ens2f0'
- **Interface 1 Fabric B**   Select 'ens2f1'
- **Interface 2 Fabric A**   Select 'ens1f0'   (MV-805-32 only)
- **Interface 2 Fabric B**   Select 'ens1f1'   (MV-805-32 only)

| Note: | **Network Interface Names:**

Each network interface may have been re-named in the Network Settings section above.

Drop-down menu item names that appears in each drop-down menu are formed from the interface name and its IP address: "Name : IP address".
        For example, "Fabric-A : 10.100.210.30", and "Fabric-B : 10.100.220.30". |
|---|---|

12. Enter a RollCall+ **Domain ID** number. (This is the 'IP Routing' RollCall+ domain.)
    Use a RollCall+ Domain ID that is different to the Domain ID in the RollCall Settings section above.

| Note: | **'IP Routing' Domain ID:**

The Domain ID used in the IP Fabric section of the System-Setup template is for IP Routing RollCall+ messages.
This should be the same as that used for:

• A Router Controller or SAM IQTIC card connected to the MV-805 unit.

• SAM Orbit connecting to the MV-805 unit for an IP Routing project. |
|---|---|

13. Select an **Output Format** for the multiviewer display output as required.

7.2.6 Getting the Multiviewer Input Signal Names

Figure 60 Router Controller Settings Box

This is done in the **Router Controller Settings** section of the System-Setup template (see Figure 60):

14. If the names for video signals going to the multiviewer are to be obtained from a TSL server, from some other source, or they are not (yet) required,
    then enter a blank for **RollCall IP Address** etc.

However,
if names for video signals going to the multiviewer are to be obtained from a Router Controller device (via the SAM SW-P-08 protocol) then:

15. For **RollCall IP Address**,
    enter the static IP address of the Router Controller (IP-RSC) network interface that is used by control panels.

16. For **Multiviewer Destination Port Offset**,
    enter the offset into the video IP router's destination port range which is to be the beginning of the router port range used by the multiviewer inputs.

    Note: If the offset is not yet known, set it to '0' here and configure later, when known.

| Note: | **Multiviewer Destination Port Offset:**

This can be determined with SAM Orbit for IP Routing.
The value of the **Multiviewer Destination Port Offset** setting can be set up later.

(See Section 8.3 "Find which Video Router Source and Destination Ports to Use" on page 95.) |
|---|---|

7.2.7   Adding some Information Text

The items in the **Information** section of the System-Setup template (see Figure 61) are for information only:

Figure 61 Information Box

17. Enter a **Name** for the unit. This should be a 'friendly' name.

18. Enter a **Location** for the unit.

19. Enter any **Notes** for the unit.

(Remember to click the **S** button or press the **return** key to save the changed text locally.)

This has completed the initial MV-805 unit settings in the **System-Setup** template.
The following sub-section applies these setting changes to the unit.

7.2.8   Apply Initial Unit Settings (via a Service Reset)

When all configuration settings changes in the **System-Setup** template have been done:

20. Click on the **Service Reset** button at the top of the **System-Setup** screen (see Section 6.2.2 "System Reset box" on page 51).

21. Then click **Confirm** to perform a service reset.

Important:	A **Service Reset** of the MV-805 system is required before saved settings changes in the **System-Setup** template take effect.
	Such a reset will restart the IP multiviewer software on the MV-805 unit. This will affect all MV-805 network connections, including the comms and multiviewer output video IP streams.

22. When the MV-805 unit has restarted, the new settings will be adopted. The MV-805 system can then be shutdown and connected to your house media networks.

7.3 Shutting Down the Unit

After the initial unit settings have been set up, then the MV-805 unit can be shutdown ready for connection to the final control and IP fabric networks:

1. Click **Shutdown** in the **Reset** template, see Figure 62.
   The unit shuts down. This takes approximately 1 minute.
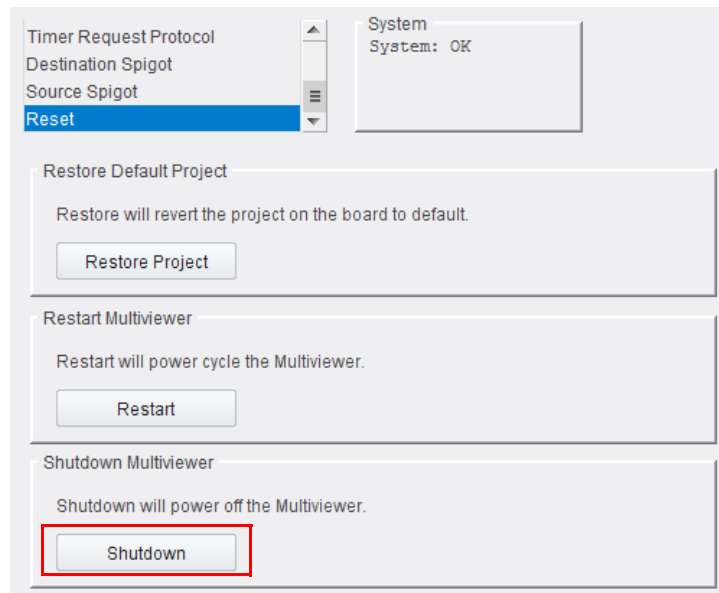
Figure 62 Reset Template

2. Wait for the front 'System Running' LED to extinguish.

3. Disconnect the MV-805 unit from the laptop or desktop computer that was used for setting up the initial settings (in Section 7.2 "Initial MV-805 Unit Configuration with RollCall" on page 81).

7.4   Connect up Network and Power onto the Unit

With the MV-805 unit shutdown, connect it to the final control and IP fabric networks:

4.   Connect the MV-805 unit to the main control network(s) and the IP media network(s) (Fabrics A and B). See Figure 63.

Note: "Control 2" may be connected to the same network as "Control".

Note: Must connect to different networks.
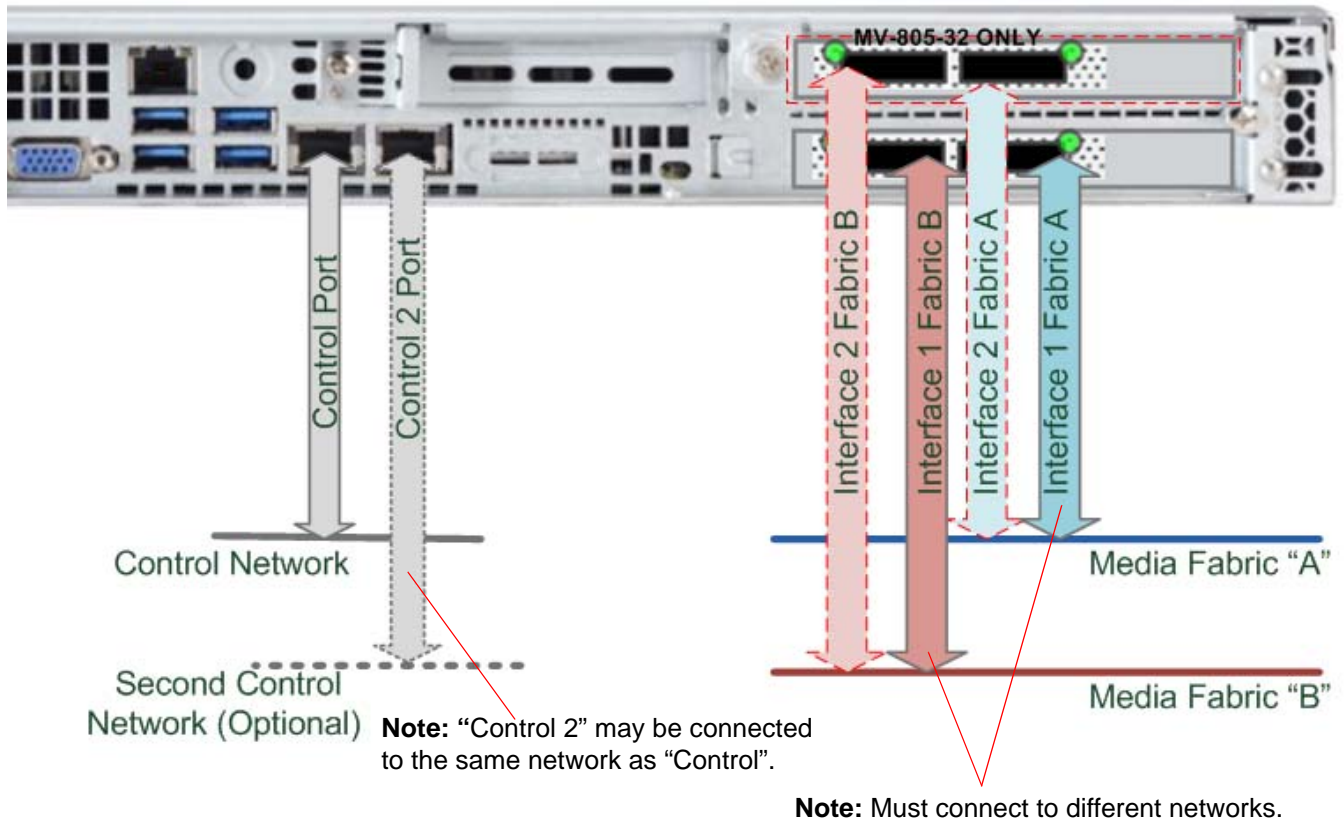
Figure 63 Network Interface Connections for a MV-805 Turnkey Unit

5.   Press the front **Power** push button (see Figure 64) for 3 to 5 seconds.
Wait for the MV-805 unit to power up. This takes 2 to 3 minutes.
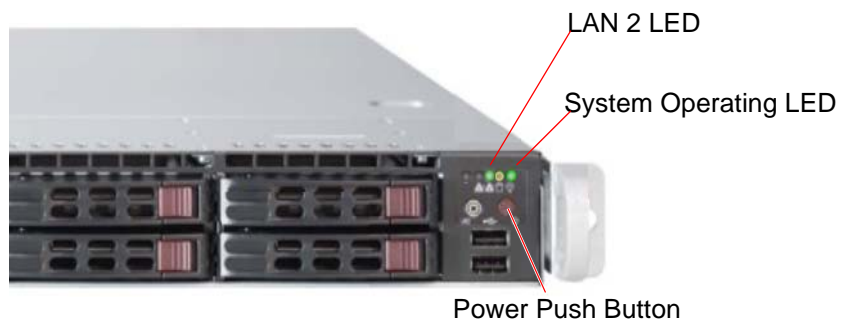
Figure 64 Power Push Button

6.   Once the MV-805 unit has started up:

•   The front 'System Operating' LED is on.

•   The front 'LAN 2' LED should show activity (on the "Control" interface).

The MV-805 unit is available for discovery by SAM Orbit in a SAM IP Routing system.

8   Getting Started 2 - IP Routing (Orbit)

This section describes part of getting the MV-805 IP Multiviewer going from out-of-the-box.

Configure Unit Settings

See Section 7 "Getting Started 1 - Unit Settings (RollCall Template)" on page 77.

(For RollCall template descriptions, see Section 6 "RollCall Templates" on page 46.)

Configure IP Routing Settings

This section.

Design and Layout Multiviewer Video Wall

See Section 9 "Getting Started 3 - Design/Layout of Video Wall (Orbit)" on page 108.

Section contents:

This section adds an MV-805 into a SAM IP routing system. The SAM Orbit IP routing project is opened and modified to add in the MV-805.

Assumptions:

- The target network IP routing topology comprises:

    - Two media IP networks (Fabrics A and B).

    - A single control IP network.

        (See Figure 7 on page 20, entitled
        "Network Topology - Two Media IP Fabrics (A and B), One Control Network."
        in Section 3.5 Network Topologies.)

- The MV-805 is being set up as part of a SAM IP Routing system which has an existing SAM Orbit IP Routing project.

- IP information about the target IP routing system is known.

- Connections to the control IP network and to both media IP Fabrics are made.

Items required:

- Client PC running SAM Orbit with an IP routing license and connected to IP networks.

- SAM IQMIX card and a picture display monitor connected to the IP routing system.

8.1 Configuring Orbit for Discovering Out-of-Band Devices

1. Run SAM Orbit on the client PC.
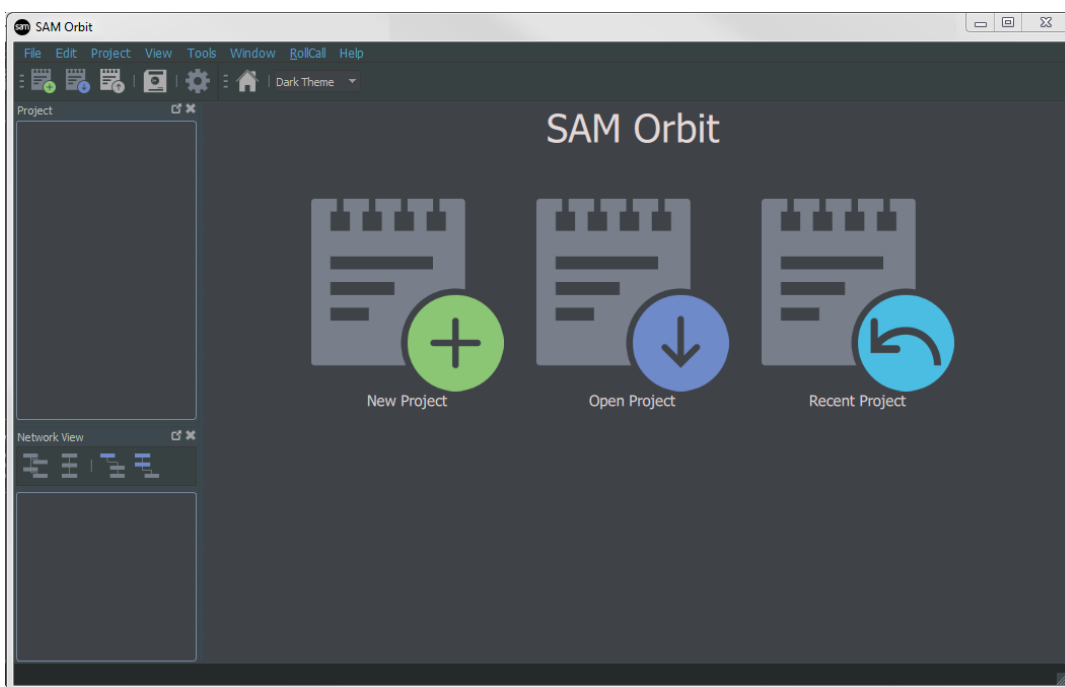
Figure 65 SAM Orbit - Initial Screen

2. Open the SAM Orbit IP Routing project for the target IP routing system.
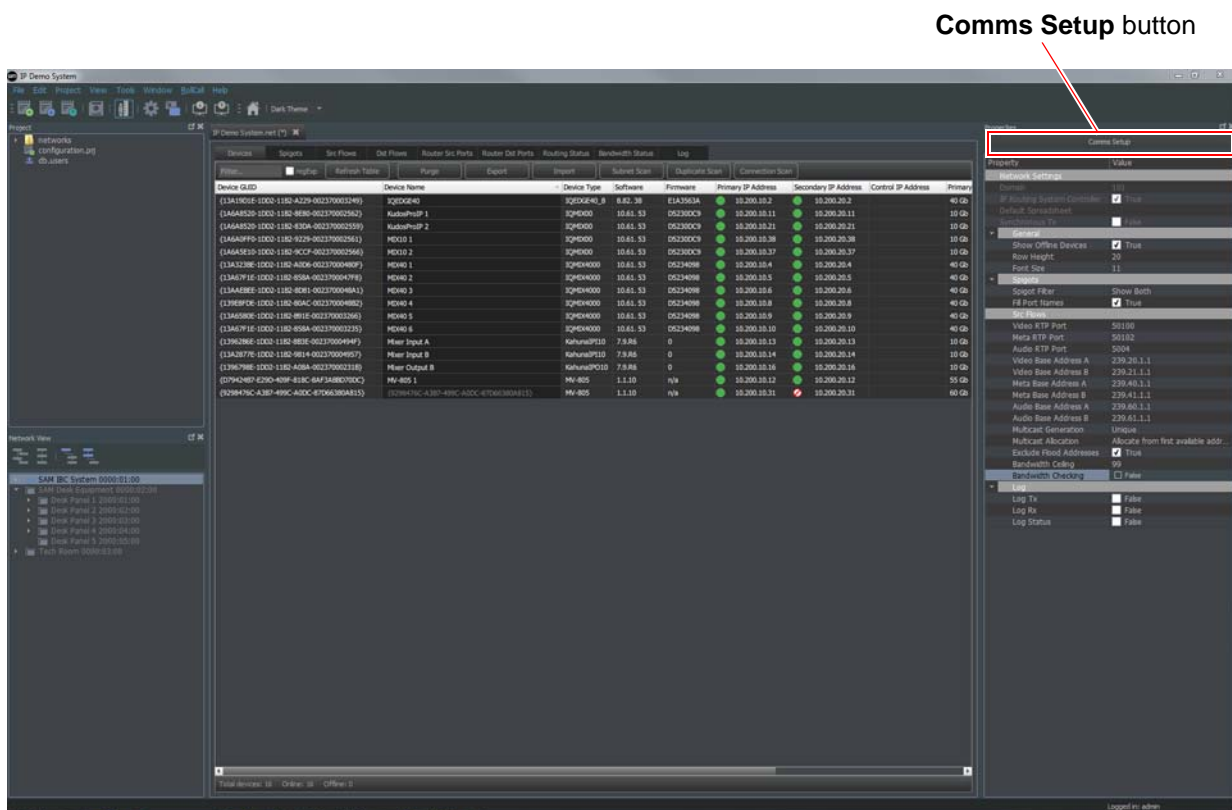
Comms Setup button

Figure 66 SAM Orbit - Initial Project Screen

To ensure that SAM Orbit is using the separate control network of the target IP routing system:

3. Click the **Comms Setup** button (top right of the Orbit project screen).
   The **Comms Setup** dialog is shown, see Figure 67.

Control network selected.   List of all of the network interfaces of the client PC.
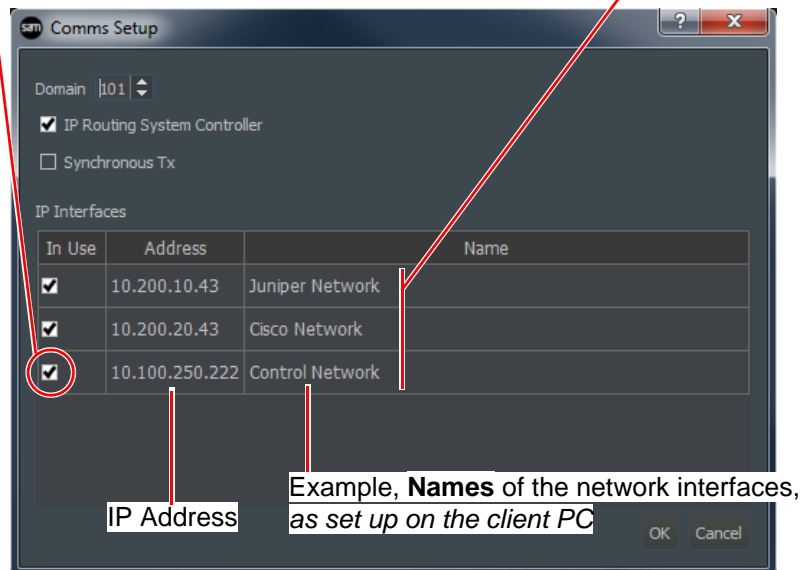
Figure 67 SAM Orbit - Comms Setup Dialog (Example)

4. Select the IP Address of the client PC's network interface that is connected to the control IP network of the target IP routing system.
   (The IP address may already be selected.)

   Note: The **Names** listed in the **Comms Setup** dialog are determined by the client PC's network settings.

Orbit will now additionally use the client PC network interface. This will enable Orbit to detect out-of-band video IP devices connected to the control IP network, such as the MV-805.

8.2 Set the MV-805 'Device Name'

1. View Orbit's **Devices Tab**. See Figure 68.

Devices Tab selected

Figure 68   SAM Orbit - Devices Tab

The **Devices Tab** screen lists all the discovered devices in the target IP routing system.

Note: Devices listed in the **Devices Tab** include:

- All devices discovered in the target IP routing system.

- Any new devices that have been discovered.

- Any devices that may have once been in the system but are currently unavailable. (For example, a device may be switched off, or may have been removed for repair.) These are shown with a red background.

Note: The **Device Name** for new devices is set to be the same as the **Device GUID**.

2. Locate the new MV-805 device in the list.
   IP address and other information is presented.

   Figure 69 shows an example MV-805 item.

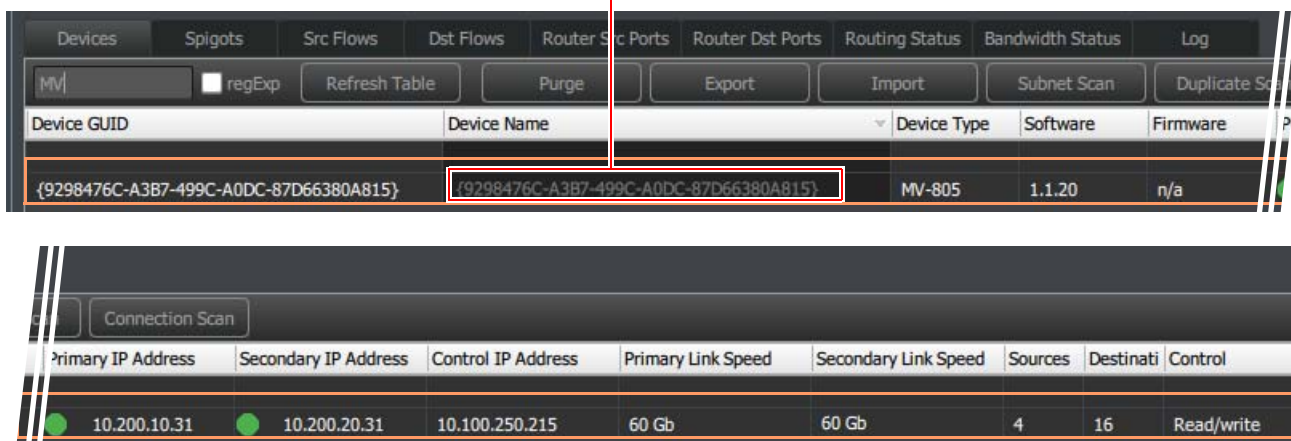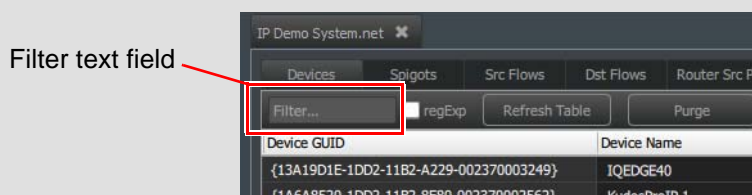**Device Name** is the **Device GUID** for new devices.

Figure 69 New MV-805 Device Item

| Note: | **Tip:** |

Tip:

To filter out unwanted devices in the list,
enter the first few characters of the **Device Type** (for example, 'MV' for MV-805)
into the **Filter** text field, at the top-left of the **Devices Tab** screen.

Filter text field

Note: When a **Device Name** has been set up, the **Device Name** may also be filtered on.

3.   Hover the cursor over the **Device Name** cell.
      A pencil icon appears in the cell, indicating that this cell is editable. See Figure 70.
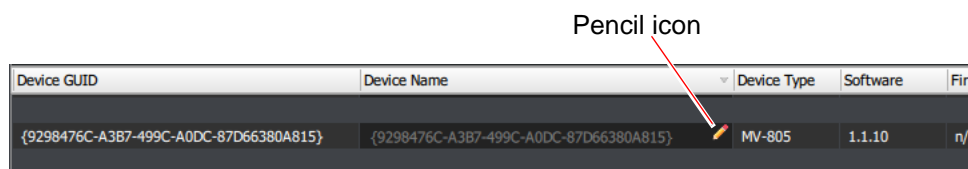
Pencil icon

Figure 70 Device Name Cell - Pencil Icon

4.   Click in the **Device Name** cell
      and enter a **Device Name**, for example "MV-805 2", see Figure 71.
      Lastly, press the **Enter** key on the keyboard to enter the new name.

Entering a **Device Name**

Figure 71 Enter a Device Item

New **Device Name** "MV-805 2" entered

Figure 72 New MV-805 Device Name

The new MV-805 now has a "user-friendly" device name.

Note: | **Devices Tab - Connection Status Icons:**

Each **Device** IP address is shown with some small, adjacent status icons which indicate the status of Orbit's connection to the device.

See Figure 73 below.

Connection status examples:

Reported Link Status	Device Reachable
No link	Not applicable
Link up	Not known
Link down	Not known
No link status	Reachable
No link status	Not reachable
Link up	Reachable
Link up	Not reachable

✓   Orbit has successfully pinged the device over the IP link.
Note: This is the status of the last, recent Orbit **Connection Scan** operation.

🚫   Orbit unable to successfully ping the device over the IP link.

🟢   Edge device reports its IP link is up.

🚫   Edge device reports its IP link is down.
(Note: Reporting may be done over another open connection.)

⬛   No IP link interface reported by edge device.
(For example, the SFP may be not fitted or wrongly fitted.)

Figure 73   Connection Status Icons

8.3 Find which Video Router Source and Destination Ports to Use

A SAM IP routing system is presented as a traditional video router to the user, with source and destination ports; these router ports have numbers and user-friendly names.

A range of source ports and a range of destination ports is required for the MV-805 to use:

- **MV-805 multiviewer display outputs** (source spigots):

  These need to be assigned to be source ports of the video router.
  A contiguous range of source ports is required (i.e. 4 ports for MV-805-16**,** 8 for MV-805-32).

- MV-805 **multiviewer video inputs** (destination spigots):

  These need to be assigned to be destination ports of the video router.
  A contiguous range of destination ports is needed (i.e. 16 ports for MV-805-16**,** 32 for MV-805-32).

If port ranges are not known, they can be found by inspecting the list of router source and destination ports which is available in SAM Orbit.

8.3.1 To Find Used Router Source Ports

1. View the **Router Src Ports Tab** (for example, see Figure 74)
   and inspect the list of router source ports for a suitably-sized gap in the port numbering.

Router Source Ports listed   **Router Src Ports Tab** selected

Gap in port numbering, 114 to 207 inclusive (in this figure example).
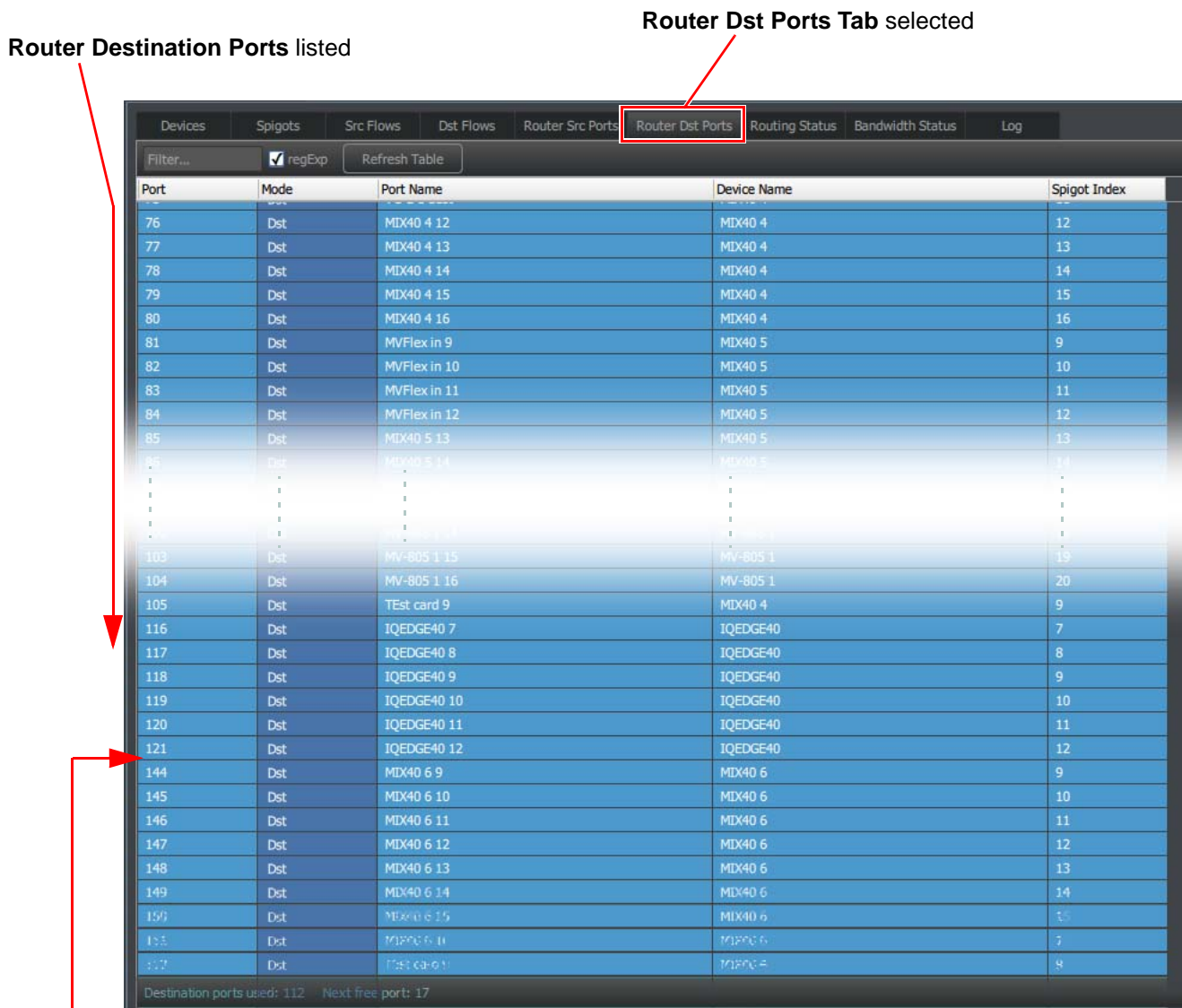
Figure 74 SAM Orbit - Router Src Ports Tab

2. In Figure 74, a gap in the **Router Source Port** numbering has been found:

   - **Router Source Ports** 114 to 207 inclusive are unused and available for the new MV-805 to use.

This has identified candidate router source port numbers to use for the new MV-805.

8.3.2 To Find Used Router Destination Ports

3. View the **Router Dst Ports Tab** (for example, see Figure 75)
    and inspect the list of router destination ports for a suitably-sized gap in the port
    numbering.

Router Dst Ports Tab selected

Router Destination Ports listed

Gap in port numbering, 122 to 143 inclusive (in this figure example).

Figure 75 SAM Orbit - Router Dst Ports Tab

4. In Figure 75, a gap in the **Router Destination Port** numbering has been found:

*   **Router Destination Ports** 122 to 143 inclusive are unused and are available for
    the new MV-805 to use.

This has identified unused and available **Router Destination Port** numbers.

8.3.3 Establish Port Number Ranges for the MV-805

5. From the available ports, determine contiguous ranges to use for the new MV-805 to use:

a   MV-805 **display outputs:**
A range of router source port numbers (for MV-805 source spigots).

b   MV-805 **video inputs:**
A range of router destination port numbers (for MV-805 destination spigots).

6. Enter the start and end port numbers for each identified range in Table 27.

	Port Range for...		**Port Number range**	
			Starting Number	**End Number**
			(Base Port Number)	(inclusive)
a	**MV-805 Display Outputs**	Source Ports	to	See **Note 1**
b	**MV-805 Video Inputs**	Destination Ports	to	See **Note 2**
	Note 1: Length of source ports range:			
	• For MV-805-16, must be 4.			
	• For MV-805-32, must be 8.			
	Note 2: Length of destination ports range:			
	• For MV-805-16, must be 16.			
	• For MV-805-32, must be 32.			

Table 27 Router Port Number Ranges for New MV-805

8.4 Assign Router Ports to the MV-805

1. View the **Spigots Tab**.

2. Select the new MV-805 item and expand it.
    All the device's spigots are listed:

    •   **MV-805-16:** 4 Source and 16 Destination Spigots. (For example, see Figure 76.)

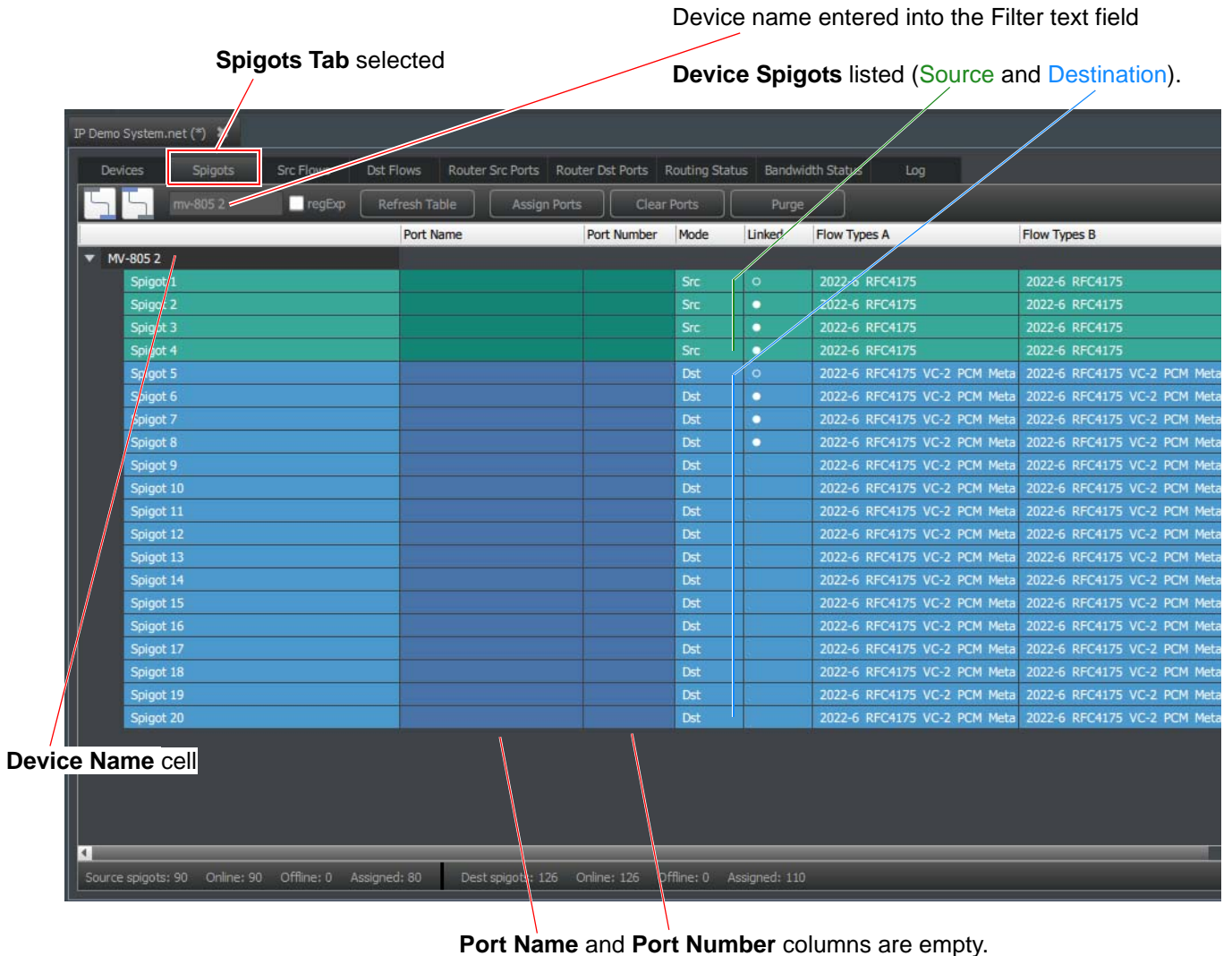   •   **MV-805-32:** 8 Source and 32 Destination Spigots.

Device name entered into the Filter text field

Spigots Tab selected

Device Spigots listed (Source and Destination).

Device Name cell

Port Name and Port Number columns are empty.

Figure 76 SAM Orbit - Spigots Tab
(MV-805-16 shown, 4 source spigots and 16 destination spigots)

Note: The **Port Name** and **Port Number** columns are empty for this new MV-805 device.

3. Right-click in the **Device Name** cell
    and select **Assign Ports** in the pop-up menu. See Figure 77.
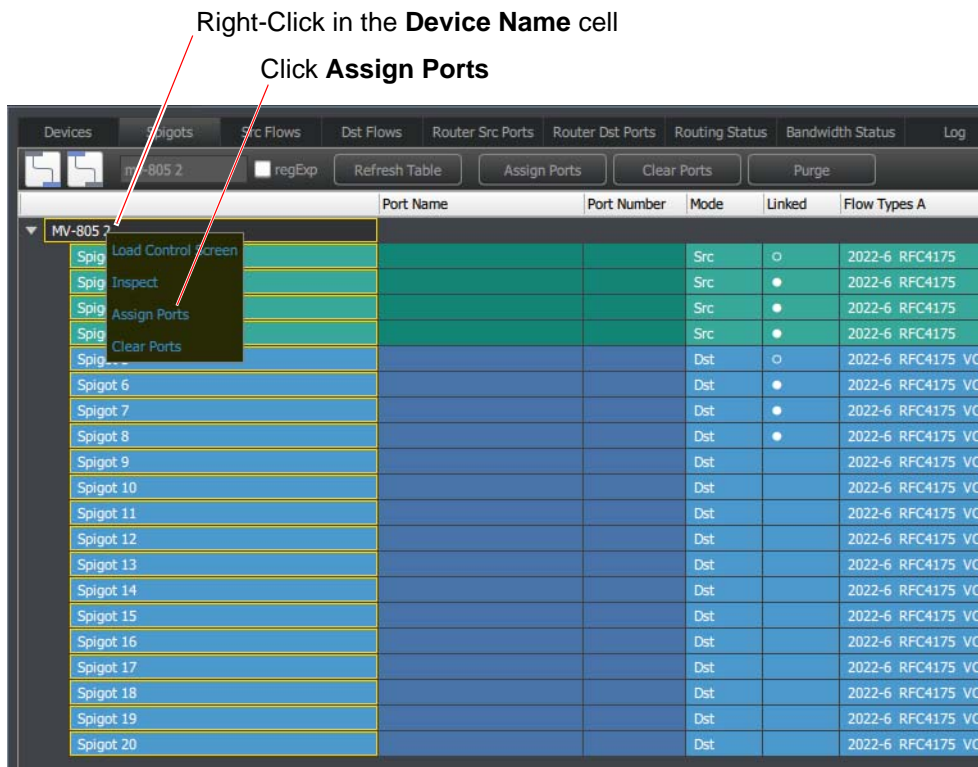   An **Assign Port Mappings** dialog appears, see Figure 78.

Right-Click in the **Device Name** cell

Click **Assign Ports**

Figure 77 Right-Click and Assign Ports

Select 'Sources and Destinations'

Enter the **Source** Ports starting (Base) port number

Enter the **Destination** Ports starting (Base) port number
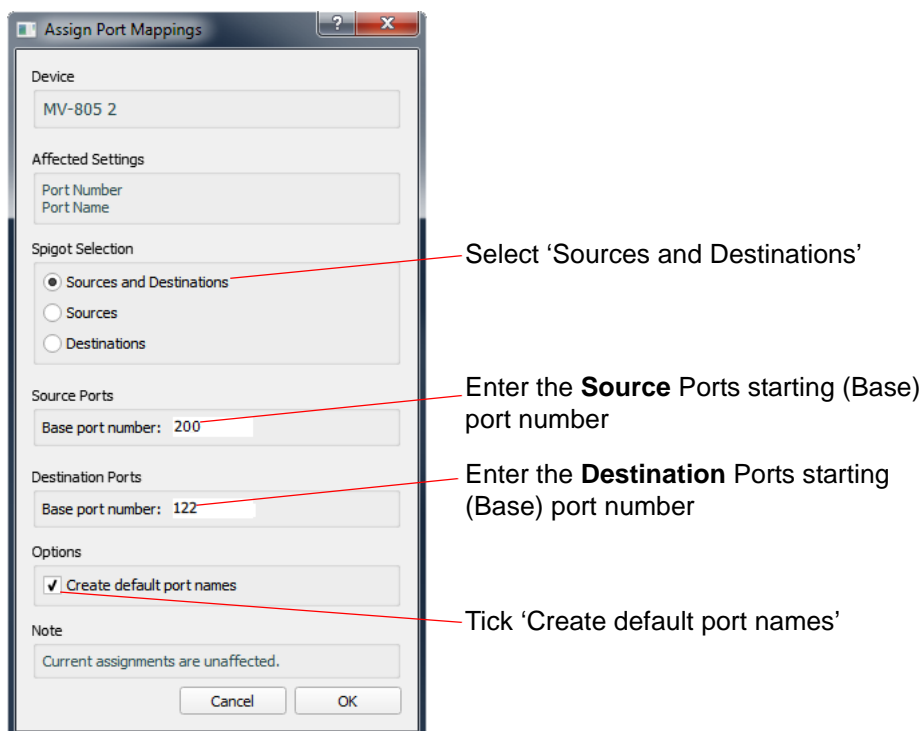
Tick 'Create default port names'

Figure 78 Assign Port Mappings Dialog (Example)

In the **Assign Port Mappings** dialog:

4. Select the 'Sources and Destinations' spigot selection.

5. In the **Source Ports** '**Base port number**' text field,
    enter the starting source port number (from the entry in Table 27 on page 97).

Note: In the example of Figure 78, '200' is used here, based on Figure 74.

6. In the **Destination Ports** '**Base port number**' text field,
enter the starting destination port number (from the entry in Table 27 on page 97).

Note: In the example of Figure 78, '122' is used here, based on Figure 75.

7. Tick the '**Create default port names**' option.

8. Click **OK**.

This will assign MV-805 source and destination spigots to router ports and generate some automatic port names. See the example result in Figure 79.

Example:
Source spigots assigned to source ports: 200, 201, 202 and 203
Destination spigots assigned to destination ports: 122 to 137

Port Numbers assigned

Port Names generated automatically

MV-805-16 example:
Source port names: <device name> 1 to <device name> 4

Destination port names: <device name> 1 to <device name> 16

Figure 79 Assigned Ports Example

Note: | **Port Names:**

Port names can be edited manually by clicking in the cell.

Port names can be edited in a spreadsheet by using the Export/Import facility of SAM Orbit:

- 1) **Export** *all* settings to a spreadsheet.
- 2) **Edit** the port names in the spreadsheet.
- 3) **Import** *all* the settings from the edited spreadsheet.

8.5 Set Up Multiviewer Display Outputs (Source Flows)

For a new MV-805, its multiviewer display outputs are disabled and not yet set up with any video IP multicast flows. To set up and enable these outputs:

1. View the **Src Flows Tab**.

2. Expand the new MV-805 item to see source flows for each spigot (see Figure 80).

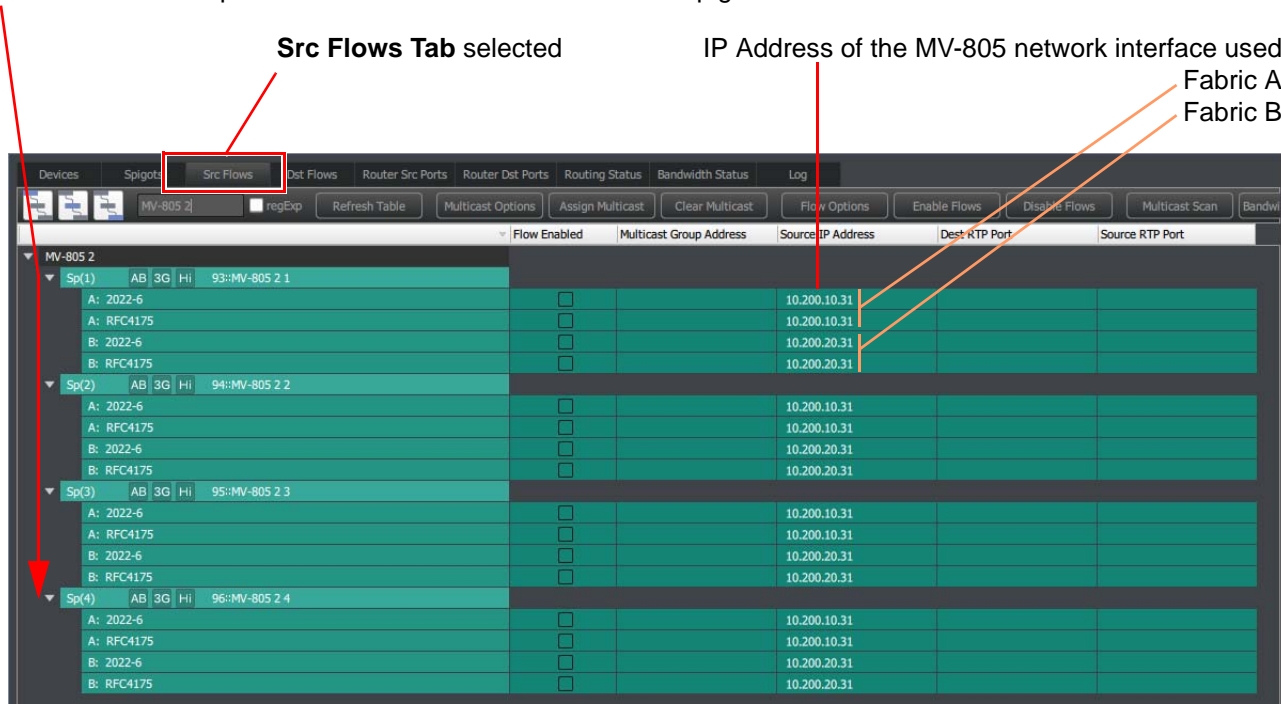New MV-805 item expanded and flows from MV-805 source spigots listed

Src Flows Tab selected   IP Address of the MV-805 network interface used

Fabric A
Fabric B

Figure 80 SAM Orbit - Src Flows Tab (MV-805-16 shown)

3. Right-click in the device name cell
   and select **Enable Flows** in the pop-up menu. See Figure 81.

   The **Enable Flows** dialog is shown, see Figure 82.

Right-Click in the device name cell

Select **Enable Flows**

Figure 81 Select 'Enable Flows'

Select 'RFC4175'

Select 'Link A + Link B'

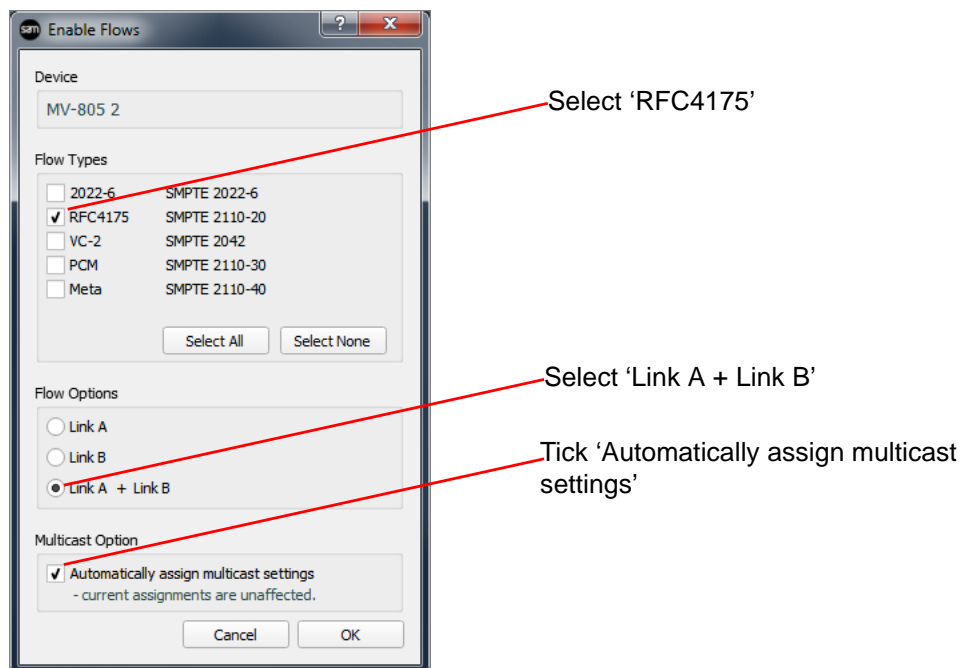Tick 'Automatically assign multicast settings'

Figure 82 'Enable Flows' Dialog

In the **Enable Flows** dialog:

4. **Flow Type**: Select   'RFC4175'   ('SMPTE 2110-20').

> Note: **Recommended Flow Type:**
>
> The 'RFC4175' ('SMPTE 2110-20') flow type has less processing overhead than '2022-6' and is recommended for the multiviewer display outputs.

> Note: **Same Source Flow Type:**
>
> Use the same flow type for all the MV-805 source spigots.
>
> The MV-805 does not support mixed flow types at its multiviewer display outputs.

5. **Flow Options**: Select   'Link A + Link B'.

6. **MultiCast Option**: Tick 'Automatically assign multicast settings'.

7. Click **OK**.

   Multicast IP Addresses are assigned to each spigot and flows from each are enabled. This is reflected in the **Src Flows Tab**, see Figure 83.

Flows enabled   Multicast IP Addresses   IP Port numbers

	Flow Enabled	Multicast Group Address	Source IP Address	Dest RTP Port	Source RTP Port
MV-805 2					
Sp(1) AB 3G Hi 122::MV-805 2 1					
A: 2022-6	☐		10.200.10.31		
A: RFC4175	☑	239.20.1.107	10.200.10.31	50100	50100
B: 2022-6	☐		10.200.20.31		
B: RFC4175	☑	239.21.1.108	10.200.20.31	50100	50100
Sp(2) AB 3G Hi 123::MV-805 2 2					
A: 2022-6	☐		10.200.10.31		
A: RFC4175	☑	239.20.1.109	10.200.10.31	50100	50100
B: 2022-6	☐		10.200.20.31		
B: RFC4175	☑	239.21.1.110	10.200.20.31	50100	50100
Sp(3) AB 3G Hi 124::MV-805 2 3					
A: 2022-6	☐		10.200.10.31		
A: RFC4175	☑	239.20.1.111	10.200.10.31	50100	50100
B: 2022-6	☐		10.200.20.31		
B: RFC4175	☑	239.21.1.112	10.200.20.31	50100	50100
Sp(4) AB 3G Hi 125::MV-805 2 4					
A: 2022-6	☐		10.200.10.31		
A: RFC4175	☑	239.20.1.113	10.200.10.31	50100	50100
B: 2022-6	☐		10.200.20.31		
B: RFC4175	☑	239.21.1.114	10.200.20.31	50100	50100

Figure 83 Src Flows Multicast IP Addresses Set Up and Enabled (MV-805-16 shown)

This has set up the multiviewer display outputs from the MV-805 unit.

8.6 Multiviewer Display Output

8.6.1 Default Multiviewer Display Output

A new MV-805 has a default multiviewer layout (i.e. a default SAM Orbit IP multiviewer project). The default project:

- Uses just one multiviewer display output (i.e. MV-805 spigot 1).

- Shows the first nine multiviewer inputs in a 3x3 video tile arrangement
(i.e. video from the first nine MV-805 destination spigots).

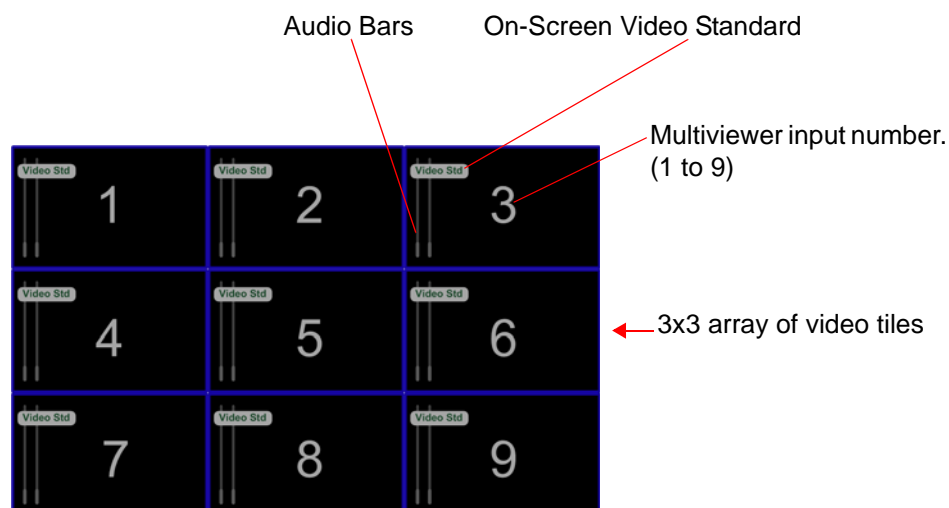This is shown in diagram form in Figure 84.

Figure 84   Default Multiviewer Display Output (on Spigot 1)

8.6.2 Viewing Multiviewer Output

An MV-805 unit is 'IP in' and 'IP out'. To view the multiviewer output display image, a video monitor with a video IP stream input must be used. For a SAM IP routing solution, a SAM IQMIX card can be used with one or more display monitor(s).

For each MV-805 source spigot:

1. Route the video IP stream from the source spigot
    to an IQMIX card destination spigot.

    (For a brief description of making a route,
    see Section 8.7 "Making Routes in a SAM IP Routing System" on page 106.)

This connects the multiviewer outputs to display monitor(s) for viewing. The multiviewer video wall can be seen, although no video content is present in the video tiles until video sources are routed to the multiviewer inputs.

8.6.3 Connecting Multiviewer Inputs

In order to see video in each video tile on the video wall, multicast video IP streams must be routed to the MV-805 unit.

For each multiviewer input (destination spigot):

2. Route a multicast stream to the multiviewer spigot.

    (For a brief description of making a route,
    see Section 8.7 "Making Routes in a SAM IP Routing System" on page 106.)

8.6.4 Default Multiviewer Video Wall with Video on Video Tiles

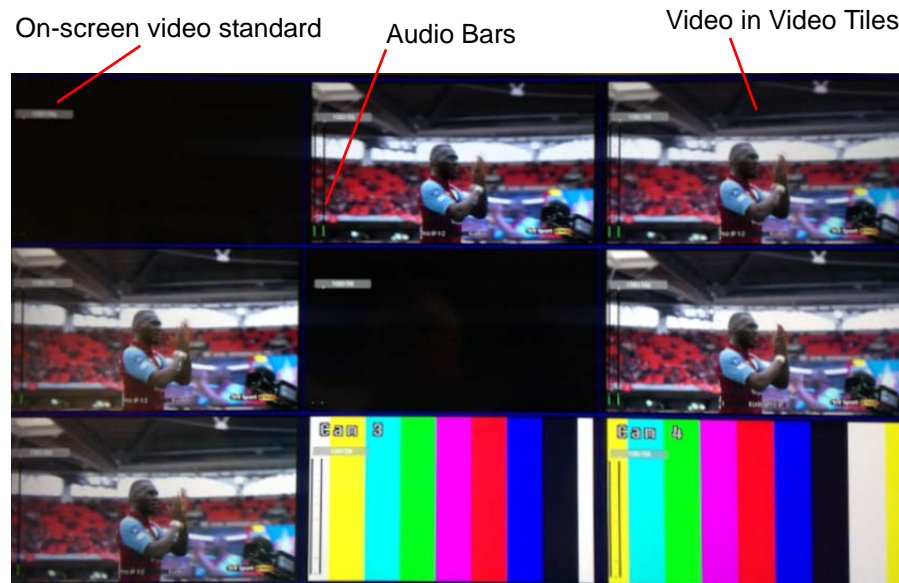Figure 85 shows an example of a default video wall showing some video inputs on-screen.

On-screen video standard   Audio Bars   Video in Video Tiles

Figure 85   Default Multiviewer Video Wall with Video Inputs

8.6.5 Orbit IP Multiviewer Projects

The multiviewer project on the MV-805 unit can be read from the unit ("pulled"), edited and put back onto the unit ("pushed") with SAM Orbit. If the default project is pulled from the multiviewer, it is recommended that the project is re-named in SAM Orbit before being pushed back to the unit. Also, a new IP multiviewer project can be created with SAM Orbit.

(See the SAM Orbit for Multiviewers User Manual for instructions on using SAM Orbit for Multiviewers.)

Note:

Restoring the default SAM Orbit IP multiviewer project:

The default multiviewer layout can be restored to a MV-805 unit by clicking the **Restore Project** button in the unit's RollCall **Reset** template. The current multiviewer layout will be overwritten.

Note:

SAM Orbit Projects:

The SAM Orbit project home screen shows the 'Project Name', which is treated as an identifier by SAM Orbit. The name may be changed with the 'Edit Name' control in the home screen.

Projects with the same name are considered to be the same and SAM Orbit warns the user if there are any differences between a project in SAM Orbit and the same-named project on a multiviewer device. Such differences must be resolved.

It is recommended to:

- Use a different and unique project name for each multiviewer.

- Rename a default project that has been pulled from a multiviewer.

8.7 Making Routes in a SAM IP Routing System

In a SAM IP Routing System, video signal routing is carried out in the same way as for traditional video routers: A router destination port is connected to a source port by making a route. A route can be made with a hard or soft control panel, or via the RollCall Control Panel application.

(Router port names and numbers are listed in the **Router Src Ports** and **Router Dst Ports** tabs of SAM Orbit when the IP Routing project is open.)

A SAM IP Routing System contains one or more IP Routing System Controller (IP-RSC) units.

Example, to make a route:

1. Run RollCall Control Panel on a client PC.

2. Connect to the "IPRC" function of the IP-RSC unit.

    And open the template for its video routing matrix.

3. View the **XY Panel Control** template. See Figure 86.

4. Click a Destination, to select it.

5. Click on a Source.

    A route is then made from the source to the destination; the routing is made in the IP Routing system.
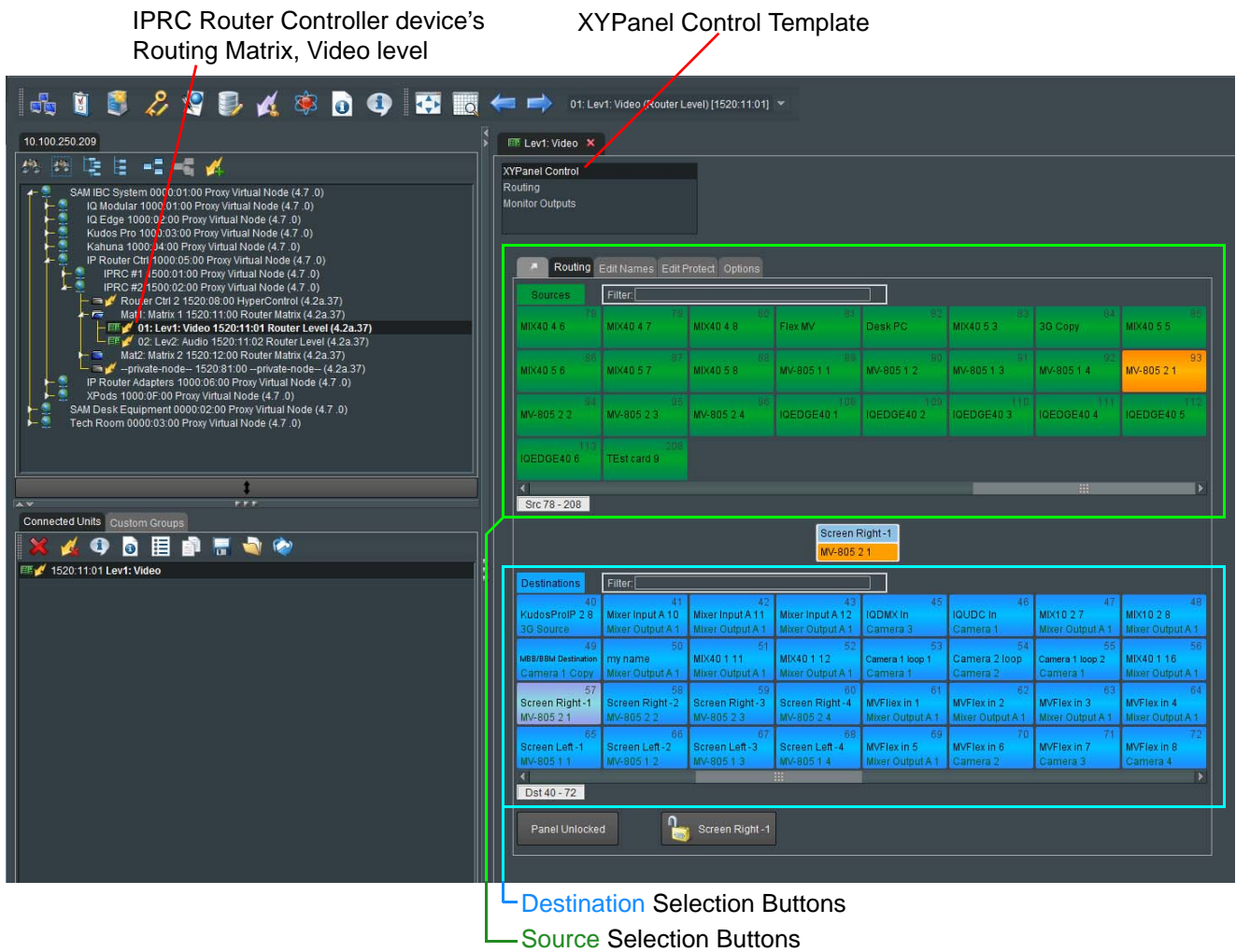
IPRC Router Controller device's
Routing Matrix, Video level

XYPanel Control Template

Figure 86 XY Panel Routing Control Template

Figure 87 shows the XY Panel for the routing of an MV-805 multiviewer display output (source spigot) to a display monitor (destination spigot).

Figure 88 shows the XY Panel for the routing of a multicast video IP stream source to an MV-805 multiviewer input (destination spigot).
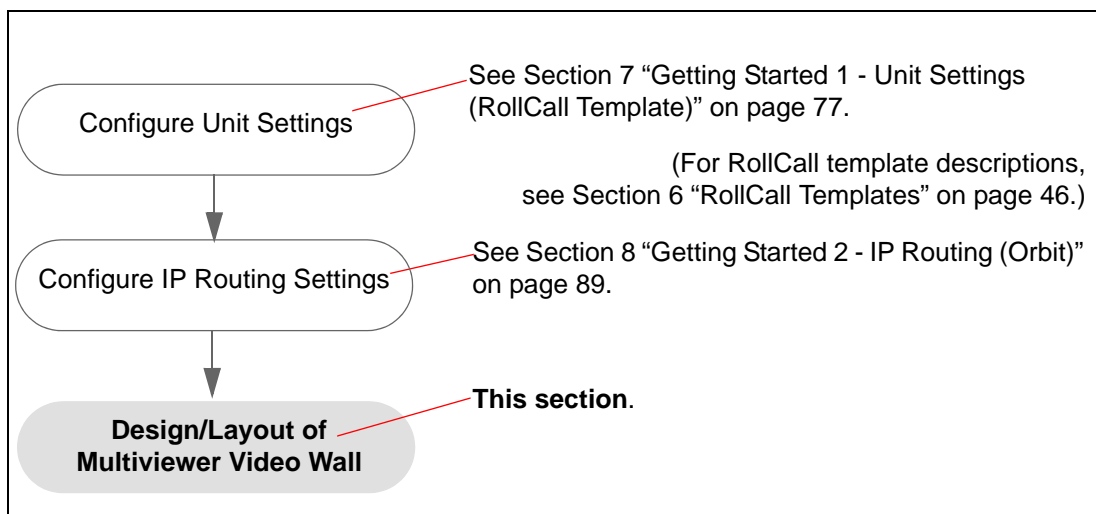

Figure 87   MV-805 Display Output Routed to a Display Monitor

Figure 88   Multicast Video IP Stream Routed to an MV-805 Multiviewer Input

9   Getting Started 3 - Design/Layout of Video Wall (Orbit)

Configure Unit Settings

See Section 7 "Getting Started 1 - Unit Settings (RollCall Template)" on page 77.

(For RollCall template descriptions, see Section 6 "RollCall Templates" on page 46.)

Configure IP Routing Settings

See Section 8 "Getting Started 2 - IP Routing (Orbit)" on page 89.

Design/Layout of Multiviewer Video Wall

This section.

The MV-805 is an MV-8 series SAM multiviewer. The graphical design and layout of the multiviewer video wall is carried out in the SAM Orbit tool with an IP multiviewer project.

Please refer to the 'SAM Orbit for Multiviewers User Manual' for instructions on using Orbit for multiviewers, including:

- Creating basic video walls.

- Pushing wall designs to multiviewer devices.

- Advanced on-screen features
  (For example: UMDs, border tallies and on-screen input status).

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

9.1   Orbit IP Multiviewer Projects

An Orbit 'IP multiviewer' project is similar to an Orbit 'non-IP' multiviewer project. There are a few differences in some settings and options between IP multiviewer and normal, non-IP multiviewer projects in Orbit. Otherwise, operation of the Orbit tool is exactly the same. When the design of the video wall is complete, the IP multiviewer project is then pushed to the MV-805 unit to be deployed.

Some points for IP multiviewer projects are highlighted in the following sub-sections.

9.1.1   Number of and Type of Multiviewer Inputs and Outputs

An IP multiviewer unit has a different number of inputs and outputs compared to other MV-8 series units.

An IP multiviewer inputs and outputs are video IP streams, not SDI video signals.

9.1.2   Creating a New Project

9.1.2.1   New IP Multiviewer Project

A new IP multiviewer project can be created from scratch in Orbit:

- Click **IP Multiviewer Project** in the **New Project** dialog.

9.1.2.2   New Project from a MV-805 Unit (New Connected Project)

A new IP multiviewer project can be created from an IP multiviewer unit that Orbit is connected to.

- Click **Connected Multiviewer Project** in the **New Project** dialog.

9.1.2.3   Do NOT Copy 'non-IP' Multiviewer Projects

Do NOT copy a non-IP multiviewer project folder to start an IP multiviewer project.
Use 'Import' instead (see below).

9.1.2.4   Import Resources From Other Projects

Project resources (from an IP or from a 'non-IP' multiviewer project) can be imported into an IP multiviewer project.

- For example,
  tiles and walls from a Multiviewer project can be imported
  and re-used in an IP Multiviewer project.

9.1.3   Main Menu - Multiviewer Drop-Down Menu Items

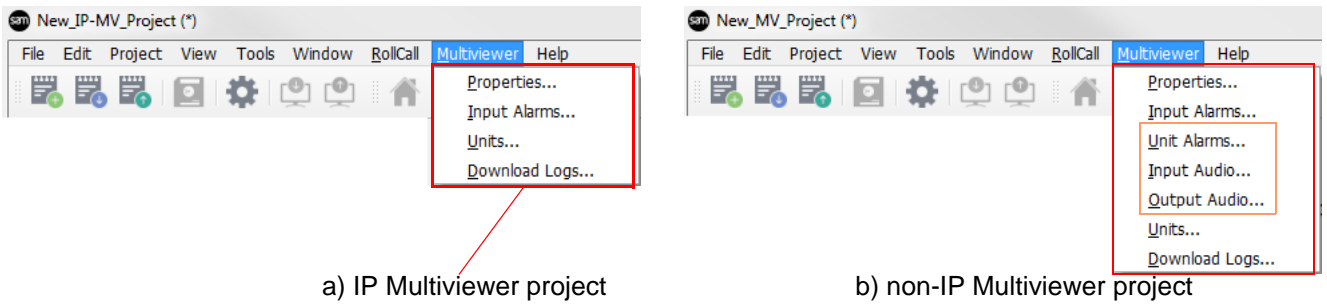The multiviewer drop down menu has fewer menu items in it, see Figure 89a.

a) IP Multiviewer project   b) non-IP Multiviewer project

Figure 89 SAM Orbit - Multiviewer Drop-Down Menu

9.1.3.1   Properties Dialog - No Streamed Outputs

The MV-805 unit does not support streaming out of scaled-down, H.264-encoded versions of its multiviewer inputs.
Consequently, there is no Streamed Output settings section in this dialog for MV-805.

9.1.3.2   Input Alarms Dialog - Different Alarms Available

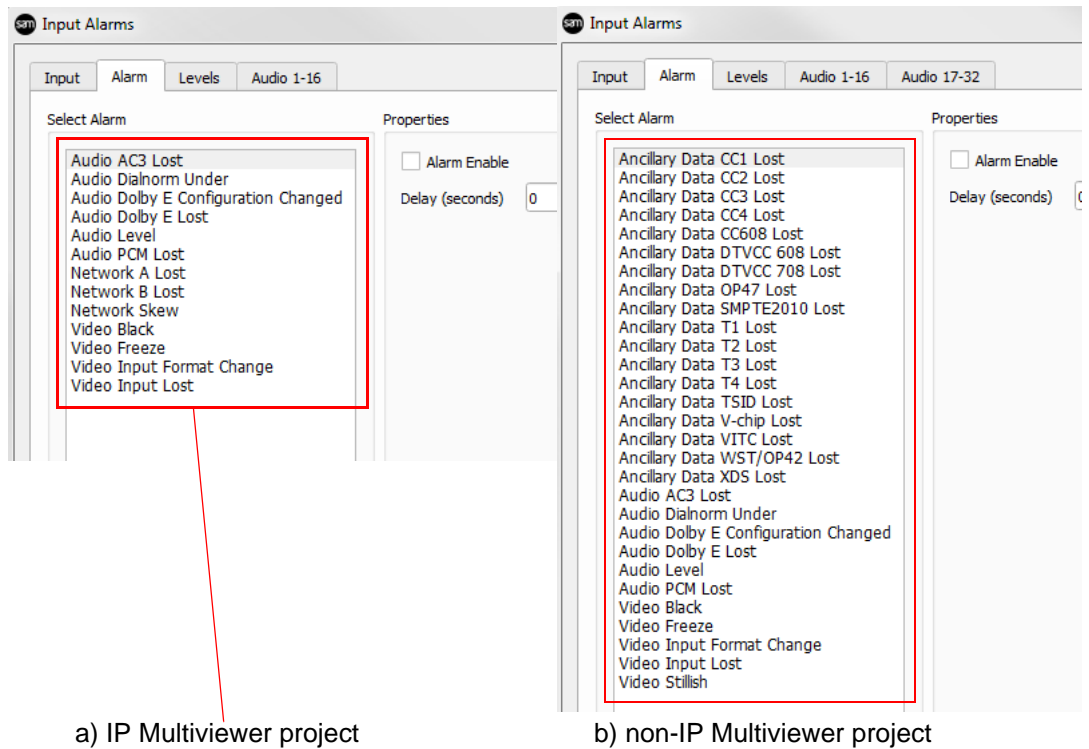MV-805 units have different input alarms available, see Figure 90a.

a) IP Multiviewer project   b) non-IP Multiviewer project

Figure 90   Multiviewer - Input Alarms

9.1.3.3   Input Alarms Dialog - Fewer (16) Audio Channels Supported

MV-805 units support 16 channels of audio in each multiviewer input.

9.1.4   Tools Menu - Remotes Dialog - No 'Restore'

The MV-805 menu does not have a 'Multiviewer Restore' section.

A MV-805 unit's IP multiviewer project may be restored via the RollCall Reset template:

- Click the **Restore Project** button on the RollCall Reset template.

(See Section 6.9 "Reset Template" on page 76.)

9.2 Basic Video Wall

Multiviewer display monitor wall layouts are designed with the SAM Orbit application and are called 'SAM 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.

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 SAM's MV-8 Series of multiviewers. A 'basic video wall' is described in the SAM Orbit documentation and includes:

Initial Screen	SAM 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 SAM Orbit project.
Project Home Screen	The SAM Orbit project home screen.
Basic Wall	Using SAM Orbit to create a basic video wall layout for an MV-805 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.
Graphical Widgets	Configuring custom functionality.

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

9.3   Configuring Alarms

Alarms can be configured on IP multiviewer inputs. Alarms are set up using the SAM Orbit software with an IP multiviewer project is open.

9.3.1   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.
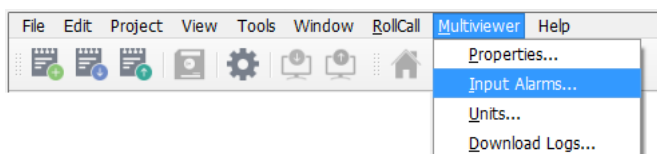

Figure 91   Accessing Input Alarm Configuration - via the Multiviewer Main Menu Item

1. Click **Multiviewer > Input Alarms**.
   The **Input Alarms** window is shown.

2. In the **Input** tab, set **Selected Input** to 'Input 1'.

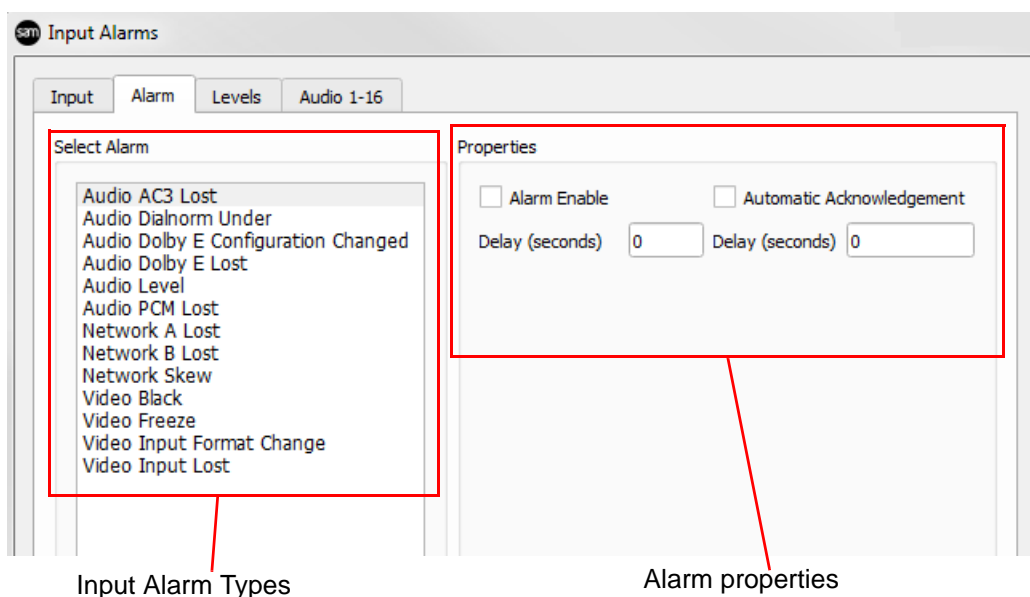3. Select the **Alarm** tab. See Figure 92.

Figure 92 Orbit Alarm tab.

Figure 92 lists the input alarm types.

4. Click on the **Video Input Lost** alarm name to select it.
   The alarm properties appear in the Properties box and are described in Table 28.

Alarm Property	Description
Alarm Enable	Tick box. Tick 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	Tick box. Tick to enable automatic acknowledgement by the multiviewer system. Untick 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.

Table 28 Unit Alarms Properties

5. Tick **Alarm Enable**.
   The alarm name (Video Input Lost) is shown <u>**underlined and bold**</u> 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.

6. Click on the **Network A Lost** alarm.

7. Tick **Alarm Enable**.

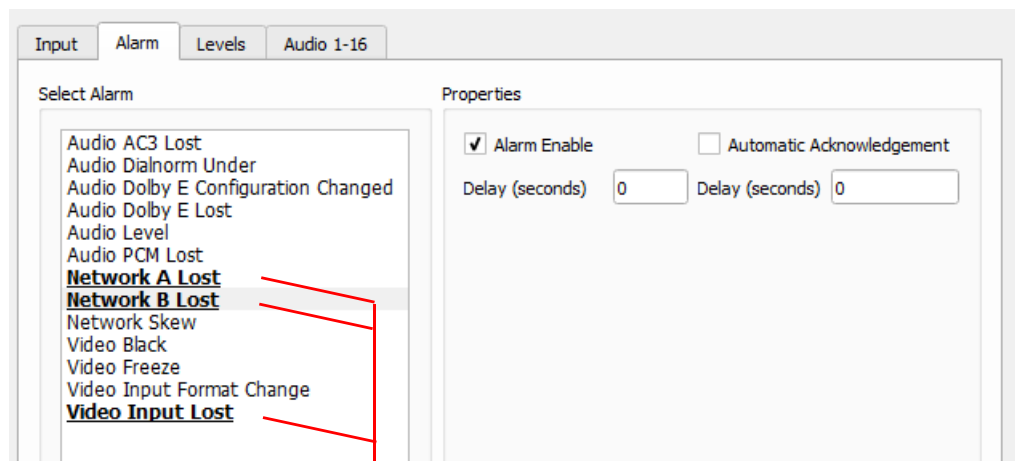8. Click on the **Network B Lost** alarm.

9. Tick **Alarm Enable**.

Figure 93 Enabled Alarms

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.

Adding an audio level alarm:
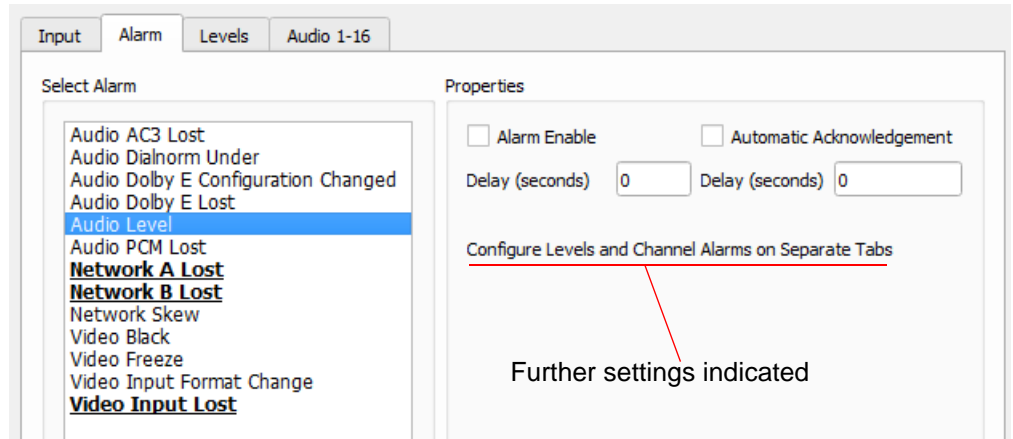
10. Select the **Audio Level** alarm.

Figure 94 Enabled Alarms

11. Tick **Alarm Enable**.

12. Click on the **Levels** tab.
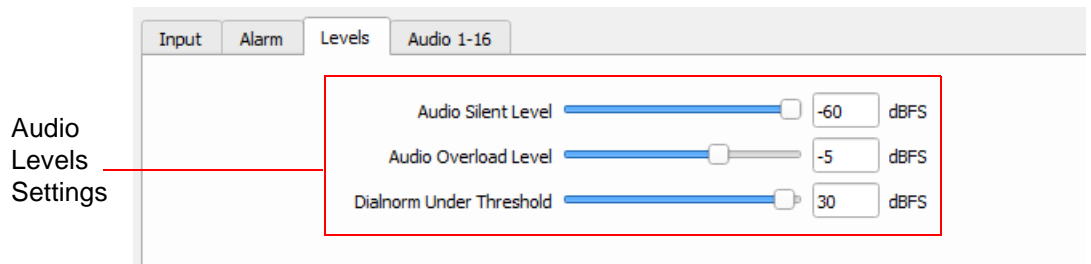The **Levels** tab allows setting up of some audio levels. See Figure 95.

Figure 95 Orbit Levels tab.

13. Click on the **Audio 1-16** tab.
The **Audio Channels** tab is shown, which allows the audio alarm to be applied to selected audio channels of the input.

14. Select audio channels 1 to 8 in the 'Audio Level' column, see Figure 96.

Figure 96 Orbit Audio Channels tab.

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

- Audio Level on audio channels 1 to 8.

- Network A Lost.

- Network B Lost.

- Video Input Lost.

Copying alarm settings of one input:

This alarm configuration for input 1 can be copied to all other inputs:

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

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

17. Click **OK**.
The **Alarm**s window closes.

Alarm settings for Input 1 have now been applied to all other video inputs.

Save this settings change:

18. Click the **File > Save Project**, to save the Alarm settings (and the SAM Orbit project so far).

9.4 TSL Support

9.4.1 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-805 IP Multiviewer supports two TSL protocols: TSL 3.1 and TSL 5.0.

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.
- Specify index parameters for each UMD on the video wall.

9.4.2 Specifying Multiviewer TSL Tally Mode

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

a) **Server Mode** - MV-805 listens for Tally messages.
   Specify the MV-805 IP address and control network port to receive Tally messages on.

b) **Client Mode** - MV-805 reads Tally messages from a Tally controller.
   Specify the IP address and control network port number of the Tally controller.

a) Server Mode
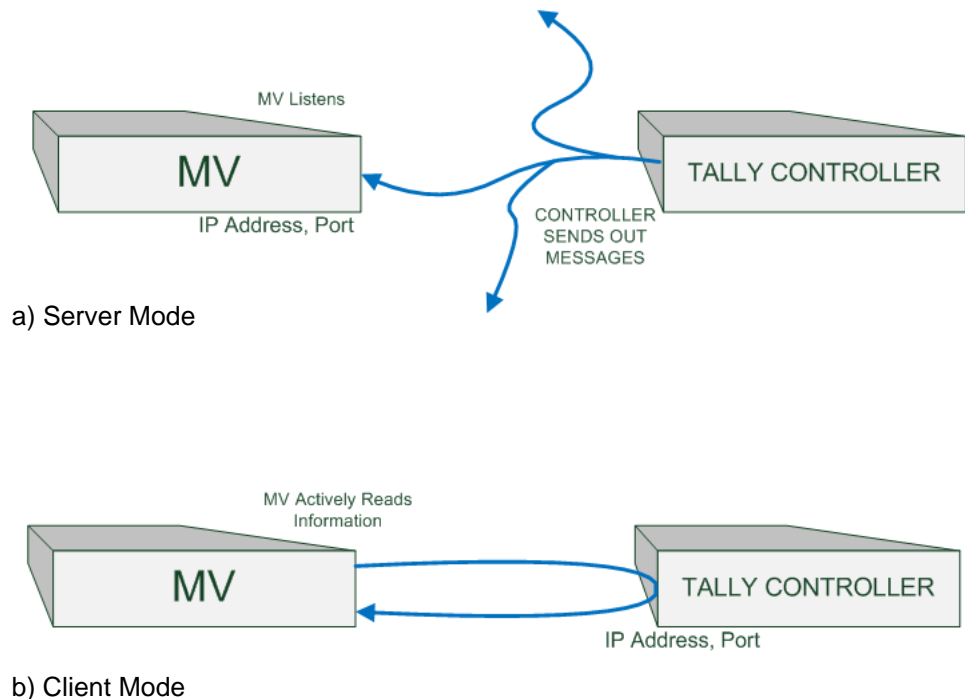
b) Client Mode

Figure 97   TSL Protocol Operating Modes:
a) Server Mode
b) Client Mode

The SAM RollCall Control Panel application is used to configure the settings for a MV-805 multiviewer in the RollCall TSL template; see section 6.4 "TSL Template" on page 64.

9.4.3   Specifying Index Parameters for each UMD

Use the SAM 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 SAM Orbit documentation.)

9.4.3.1   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.

1. Select Video Tile and Video Tile Properties are shown.

2. Set **Preferences > UMD** to 'True' and UMD properties are shown. (Expand this property item if required.)

3. Set **UMD > UMD Protocol** to 'Version 3.1' and **UMD > 3.1 Display Address** property is shown.
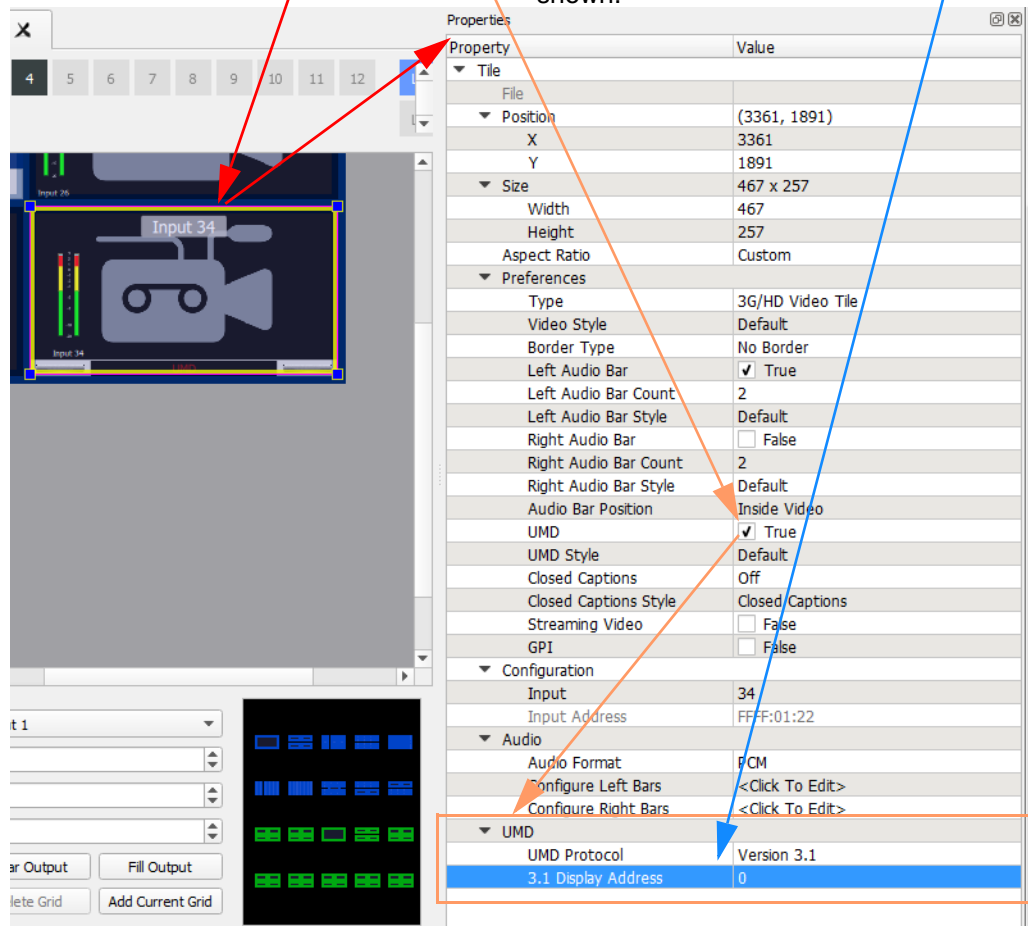
Figure 98 SAM Orbit - Video Tile - UMD TSL 3.1 Properties

9.4.3.2   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.)
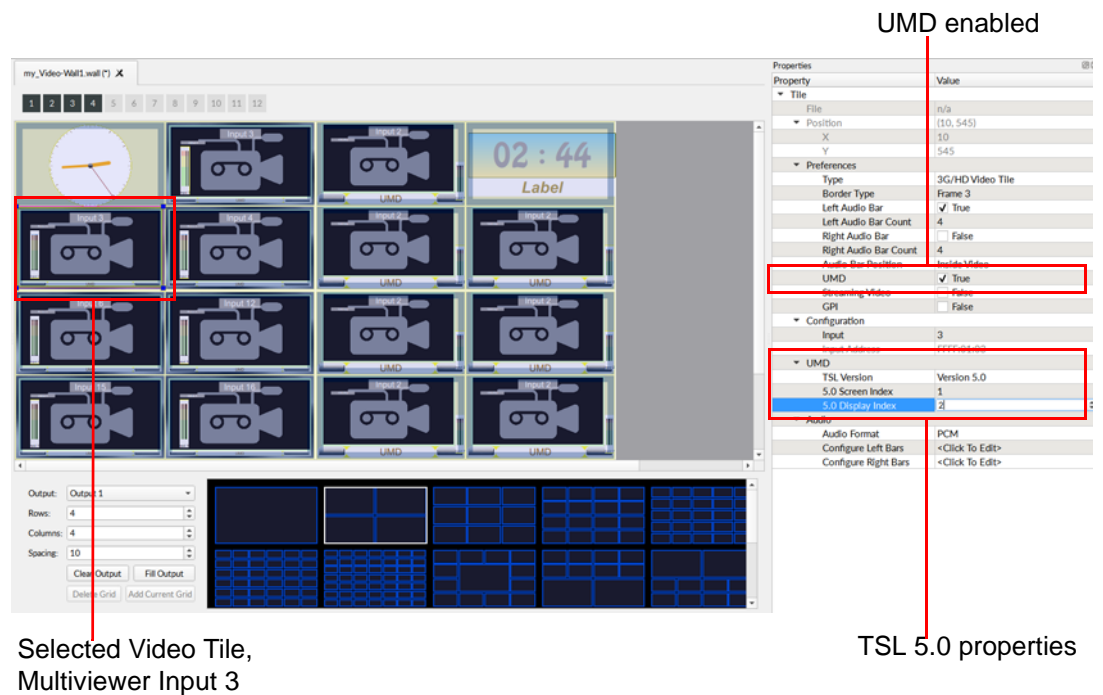
Figure 99 SAM Orbit - Video Tile - UMD TSL 5.0 Properties

9.5 On-screen Input Status Information Lines

It can be useful to see video input status shown on each video tile of a video wall. See Figure 100. This can be set up with SAM Orbit by enabling the display of lines of information on a video widget and specifying the information source for each line. See the Orbit for Multiviewers User Manual, Section 11.3 "On-Screen Video Input Status".

On-screen Input Status information

Figure 100 On-screen Input Status Information

Various status information can be displayed. In Figure 100, the lines of status information show information about the video input:

- Video resolution standard.
- Video IP flow type.
- Bit rate.
- IP address of the edge device sourcing the IP stream.
- IP address of the multicast video IP stream.
- IP port number of the MV-805 input (i.e. the destination device).

10 Maintenance

The maintenance operations described in this section are:

10.1 Software Upgrade

This section describes upgrading the MV-805 IP Multiviewer unit's software over the network from a laptop or desktop computer.

10.1.1 The Upgrade Package

A software upgrade package from SAM is supplied by SAM Support and it comprises a set of data and installer files, approximately 120Mbytes bytes in size.
The upgrade package typically contains a new software release.

10.1.2 Upgrade Procedure

The MV-805 software upgrading process follows the standard process for unit upgrades with SAM RollCall Control Panel. For more details, please see the RollCall Control Panel User Manual.

Note: Use RollCall Control Panel version 4.16.11 or later.

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 122.

- **Stage 2:** Install the software release on the MV-805.
  See "Stage 2: Install the Software Release on the Multiviewer Unit" on page 124.

These are described in the sub-sections below.

Note: MV-805 software downgrades may also be carried out with the same procedure.

10.1.3 Stage 1: Add Upgrade Package to RollCall

From RollCall Control Panel running on a laptop or desktop computer:

1. Put the upgrade package .zip file into a folder on the laptop or desktop computer being used. (If the .zip file is on a USB stick, plug it into a spare USB socket on the computer.)

2. Connect RollCall Control Panel to the multiviewer unit.

3. Click the **Import New Upgrade** icon, see Figure 101.
   The **RollCall Upgrade Packages** dialog is then displayed, see Figure 102.
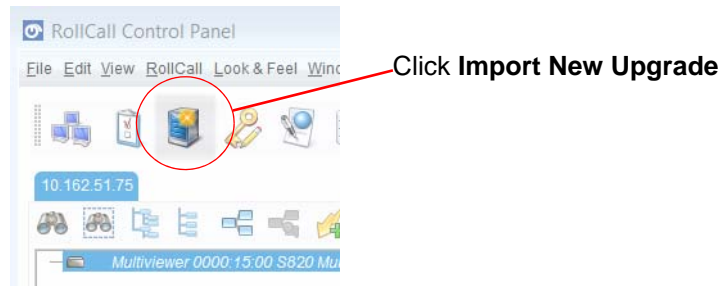
Figure 101 Import New Upgrade Icon
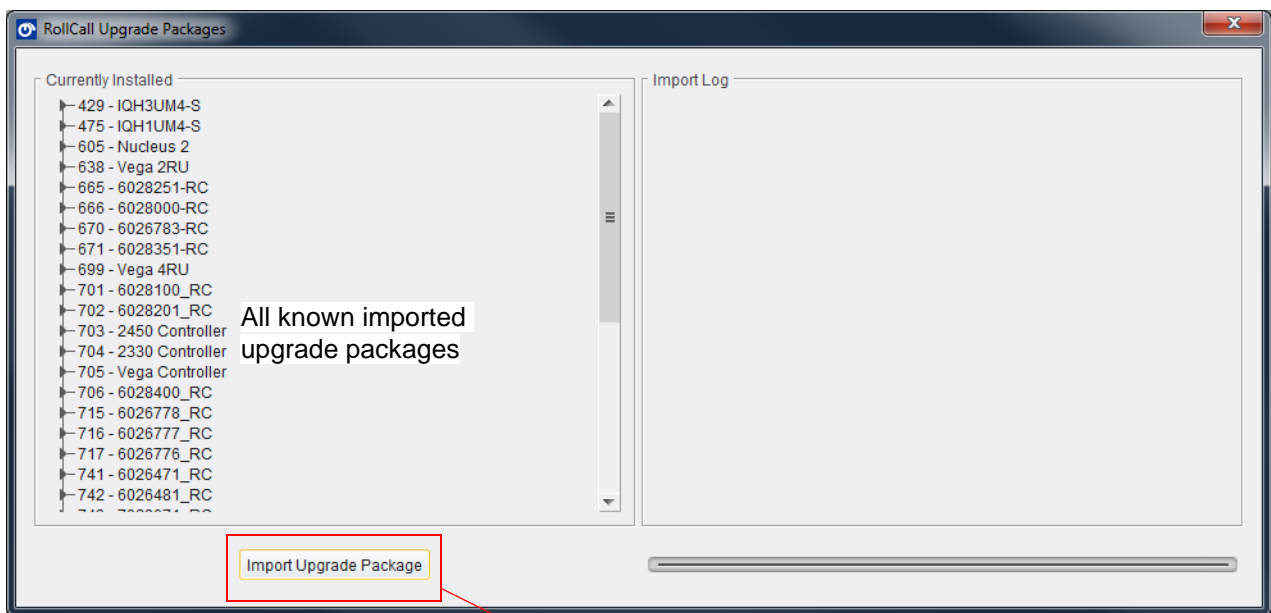
.

Figure 102 RollCall Upgrade Packages Dialog

The **RollCall Upgrade Packages** dialog shows all of the upgrade packages that are known by that RollCall Control Panel. The upgrade package needs to be imported to be shown in the dialog.

4. Click **Import Upgrade Package** in the RollCall Upgrade Packages dialog and navigate to the folder containing the upgrade package.

5. Select the upgrade package .zip file (see Figure 103) and click **OK**.

   The upgrade package is imported into RollCall Control Panel.
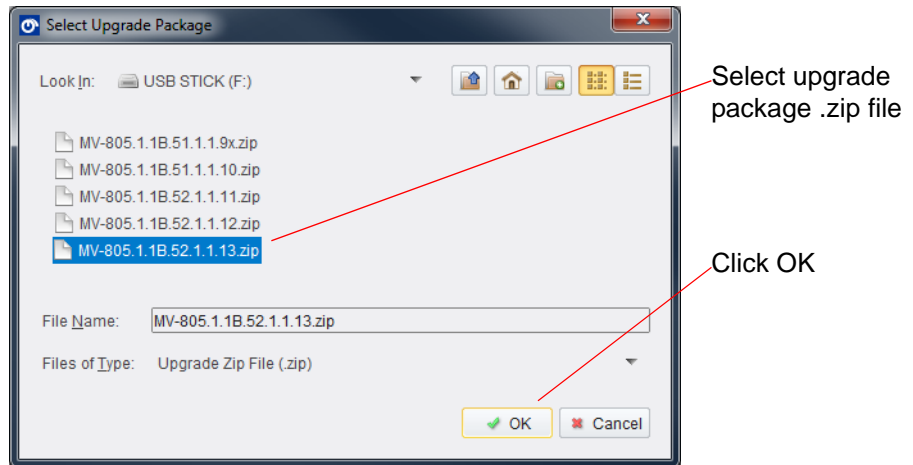
Figure 103 Select Upgrade Package Dialog

A progress bar on the **RollCall Upgrade Packages** dialog shows import progress.
Log messages for the import process are shown in the **Import Log** pane of the dialog. See Figure 104.
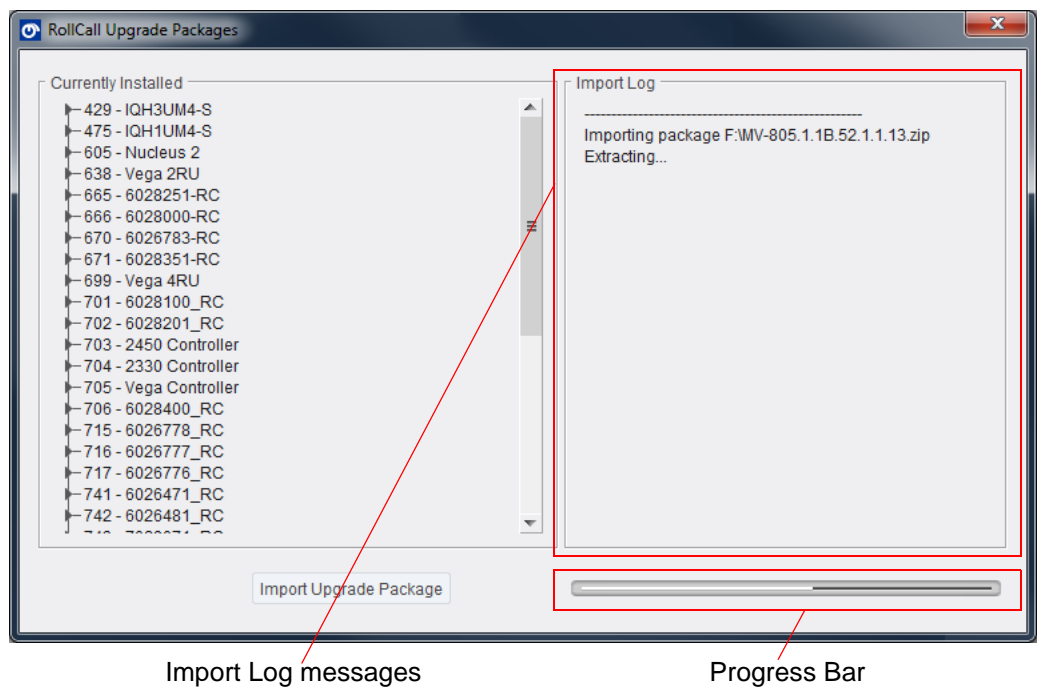
Figure 104 Import Log Pane and Progress Bar Example

6.   Wait for the "Package imported" message in the Import Log pane. See Figure 105.
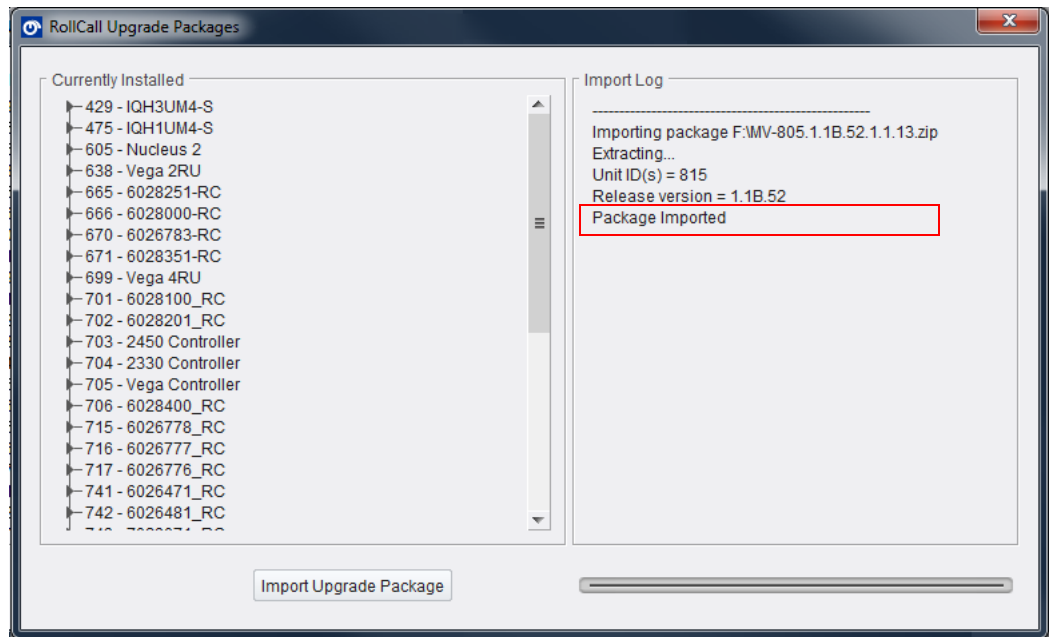
Figure 105 Import Log Pane - Package Imported

The upgrade package, containing a new MV-805 software release, has been added into RollCall Control Panel.

Proceed to Stage 2.

10.1.4   Stage 2: Install the Software Release on the Multiviewer Unit

Next, upgrading the multiviewer unit:

7.   Right-click on the connected Multiviewer name in the RollCall window. See Figure 106.
And click **Unit Upgrade**.
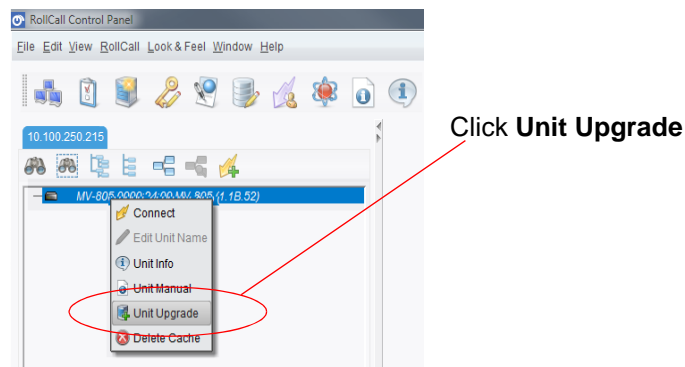
Figure 106 Right-Click Menu

RollCall's **Unit Upgrade** window is displayed. See Figure 107.

Use Fast Upgrade check box

Select the software release
(contained in the upgrade
package)
with the **Software Releases**
drop-down menu.
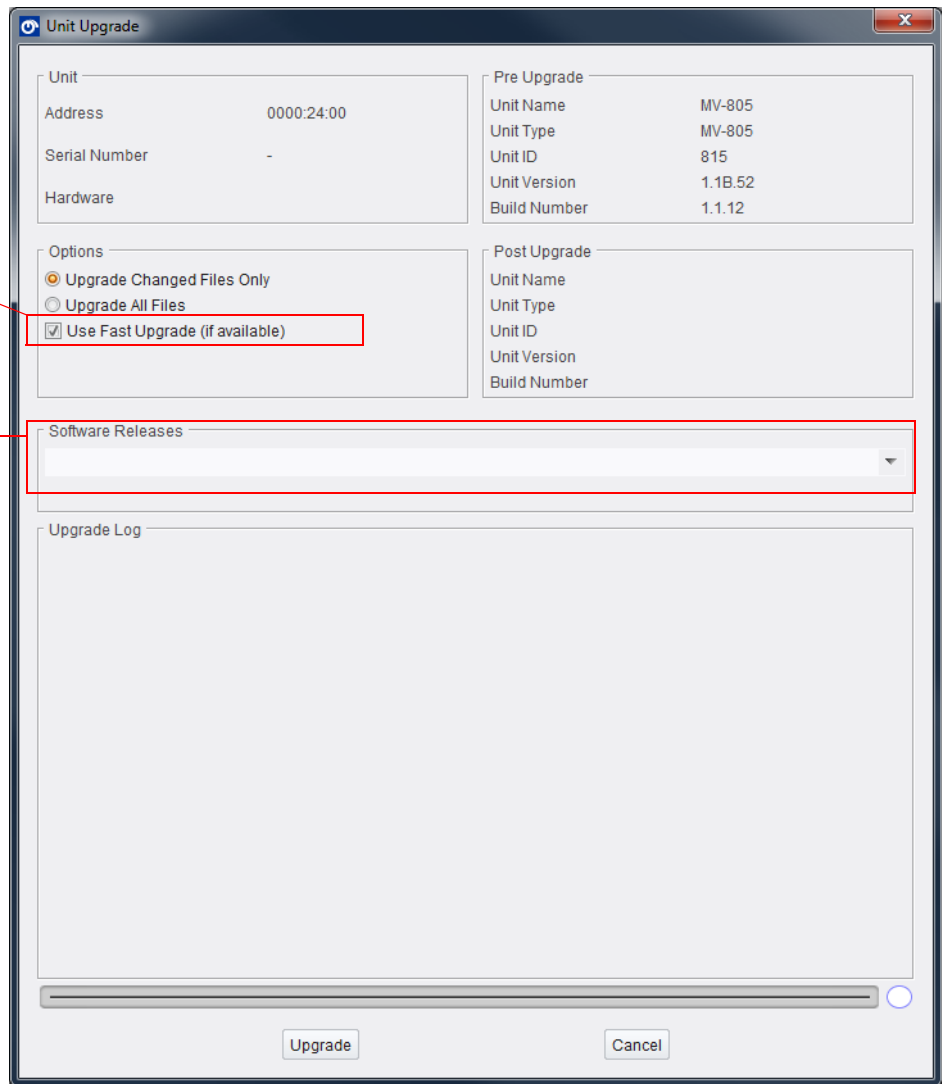
Figure 107 Unit Upgrade Dialog

8. Ensure the **Use Fast Upgrade** (if available) check box is ticked.
    (This will speed up the upgrade, using FTP to send upgrade-data to the unit.)

9. Select the **Software Release** required for installation with the **Software Releases**
    pull-down menu. See Figure 108.
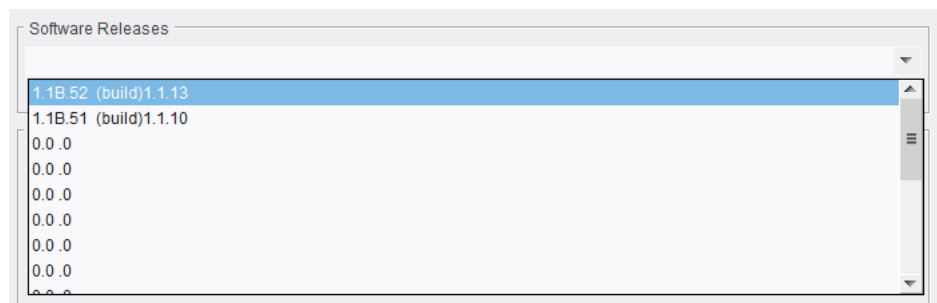
Figure 108 Select a Software Release

10. With a software release now selected,
    click **Upgrade** and then click **OK** to start to install the software release.

The software release is then sent to the MV-805 unit which begins to install the software.

11. Software upgrade progress is shown at the bottom of the dialog and upgrade log messages appear in the Upgrade Log pane. See Figure 109.

Upgrade log messages —

Progress bar indicator —

Progress "clock" indicator —
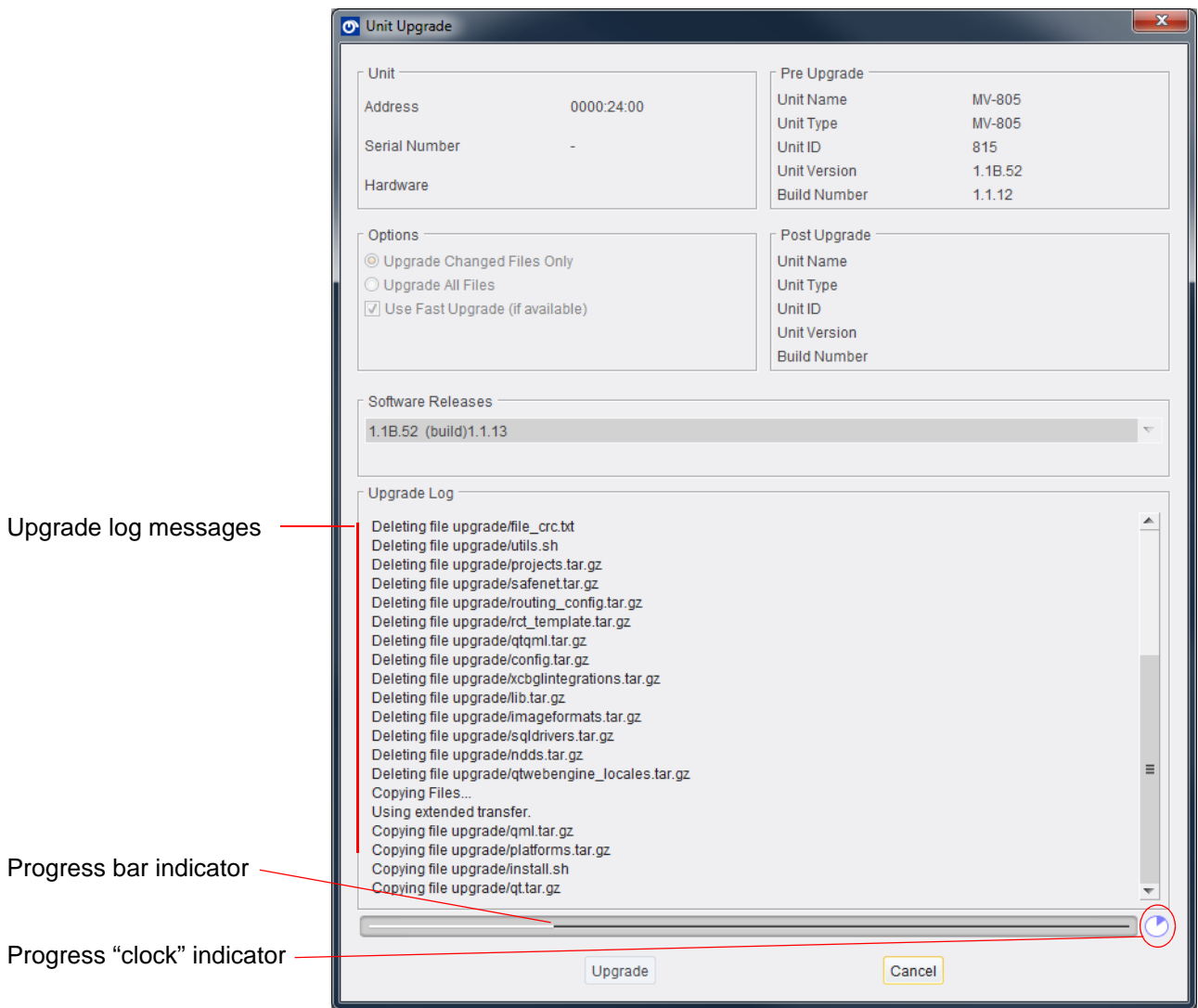
Figure 109 Software Upgrade Progresses

12. When all data has been transferred to the unit, the upgrade process enters a "Finalizing" stage. See Figure 110.

    Wait for the upgrade to finalize.
    Note: The unit may restart as part of this step.
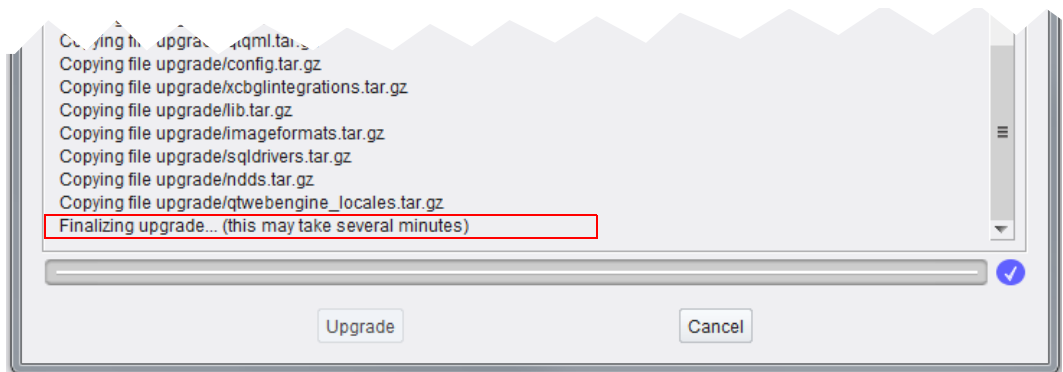
Figure 110 Software Upgrade Finalizing (Wait)

13. The software upgrade is done when the Upgrade log messages say "Upgrade Complete", see Figure 111. This will take 2 to 3 minutes.
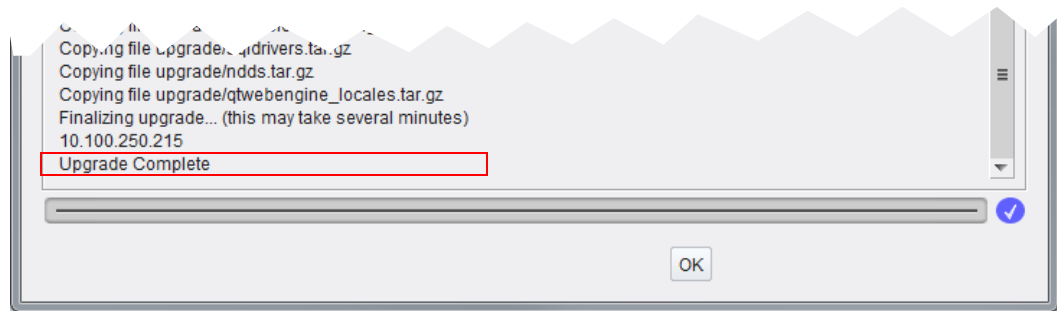
Figure 111 Software Upgrade Complete

14. After:

- the module has rebooted,

- and the upgrade is complete,

- and SAM RollCall Control Panel has reconnected to the unit,

then the RollCall **System-Setup** template can be displayed and it will now show the new upgraded software version number, see Figure 112.
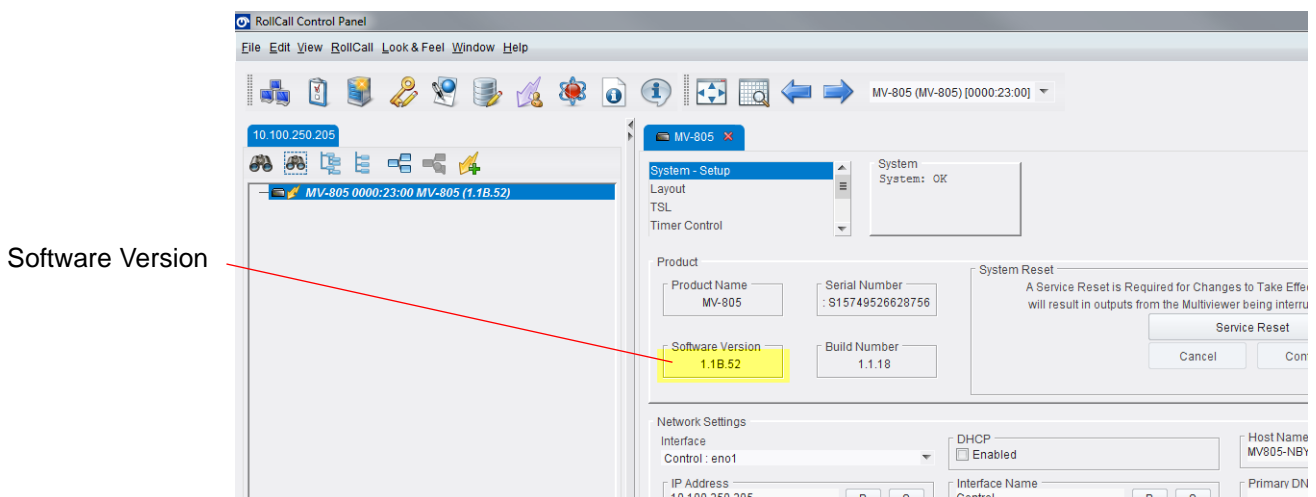
Figure 112 Software Version on System-Setup Template

10.2   PSU Module Replacement

One PSU module can be replaced while the MV-805 unit is running.

Note: Please refer to the third-party-manufacturer server chassis manual for full information on the removal and re-fitting of a PSU module.

Overview of PSU module removal:

1. Push the PSU Release tab, see Figure 113.
2. Pull out the PSU module using the handle.
3. Remove the module from the PSU module bay of the MV-805 chassis.

Overview of fitting a new PSU module:

4. Check that the new PSU module is the same type as the old one.
5. Push the new module into the PSU module bay of the MV-805 chassis.
6. Push the module fully in. A click is heard as the module locks into position.
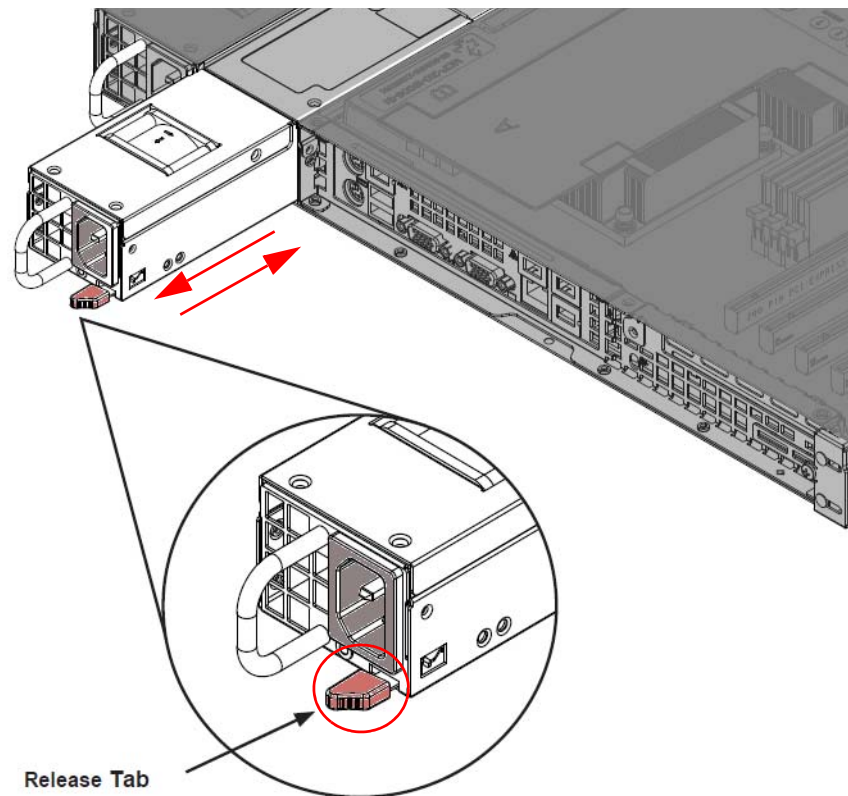
Figure 113 PSU Module Replacement

10.3   SSD Replacement

Note: Please refer to the third-party-manufacturer information on SSD removal and refitting.

10.4   Cooling Fan Replacement

⚠ **Caution:**

If the cooling fans on the MV-805 IP Multiviewer stop for any reason, then the unit should be switched off immediately. Otherwise, permanent damage may result.

Note: Please refer to the third-party-manufacturer information on Fan removal and refitting.

Appendix A Specification for Turnkey MV-805

The turnkey MV-805 IP Multiviewer Series comprises:

- 1RU MV-805-16, 16 input Multiviewer.
- 1RU MV-805-32, 32 input Multiviewer.

These units are built on a third-party server PC hardware platform.

| Note: | Please refer to the third-party manufacturer's data for full information on the MV-805 COTS hardware platform and its components. |

A.1 COTS Hardware Platform for the Turnkey MV-805

Hardware	Qty	Part/Component
System Reference		January 2018: System builder = Boston Limited, (*www.boston.co.uk*)
MV-805-16		MLTVR-1UDV4B-M
MV-805-32		MLTVR-1UDV4B-H
Basic Server Chassis	1	SYS-1028R-WTR, (*www.supermicro.com*)
		Server chassis system web page.
		Server chassis system manual.
PSU	2	PWS-706P-1R (*www.supermicro.com*)
Motherboard	1	X10DRW-1 (*www.supermicro.com*)
Processor	2	Xeon E5-2640 V4 2.4GHz
Memory	8	8GB DDR4-2400
SSD Storage	2	240GB SSD SM863a

A.2 Physical

Physical	
Unit rack height	1RU
Dimensions (W x H x D):	437mm x 43mm x 597mm
	17.2" x 1.7" x 23.5"
Weight	27kg (~60lb)

A.3 Operating Environment

Operating Environment	
Operating temp	0°C to +50°C
Storage temp	-40°C to +60°C
Operating Relative Humidity	8% to 90% (non-condensing)
Storage Relative Humidity	5% to 95% (non-condensing)
Ventilation	Fan assisted. Front inlet, rear exhaust.

A.4 Electrical

Mains Power Inlet per PSU Module	
Connector	IEC
AC Input Voltage	100 to 140 V AC, 50 to 60 Hz 200 to 240 V AC, 50 to 60 Hz
Rated Input Current	8.0 to 6.0 A (100 to 140 V AC) 4.3 to 3.8 A (200 to 240 V AC)
Rated Output Power	700 W max. (100-140 V AC) 750 W max. (200-240 V AC)
Fuses	
	No user serviceable fuses.

A.5 Regulatory Compliance

Refer to third party manufacturer's regulatory compliance statements.

Item	Compliance
Electromagnetic Emissions	FCC Class A
	EN 55022 Class A
	EN 61000-3-2/-3-3
	CISPR 22 Class A
Electromagnetic Immunity	EN 55024/CISPR 24
	(EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11)
Safety	CSA/EN/IEC/UL 60950-1 Compliant
	UL or CSA Listed (USA and Canada)
	CE Marking (Europe)
	California Best Management Practices Regulations for Perchlorate Materials. (See 3rd party manufacturer's documentation.)
Hazardous Material	RoHS compliant.

A.6 Inputs

Video/Audio IP Streams	
Standards	SMPTE 2110-20/30; SMPTE 2022-6/7
	TR03/ 05
	AES67
	RFC4175

A.7 Outputs

Multiviewer Video Wall IP Streams	
Standards	SMPTE 2110-20/30; SMPTE 2022-6/7
	TR03/ 05
	AES67
	RFC4175

A.8   Network Connections

Network Interfaces	
"Control" (Chassis **LAN 2**)	1x RJ45 1G ethernet (*Lower, left-most* RJ45 connector, when viewing unit from the rear.)
Protocol:	RollCallv3, RollCall+; TSL 3.1, 5.0 Plura^{TM} Timer Request Protocol 2.3
"Control 2" (Chassis **LAN 1**)	1x RJ45 1G ethernet (Lower, r*ight-most* RJ45 connector on rear)
Protocol:	RollCall; TSL 3.1, 5.0 Plura^{TM} Timer Request Protocol 2.3
"System"	Up to 4-off Media Network Interfaces. Each interface:

Each interface:

- 100Gb/s QSFP28 cages.
  Compatible with MSA-compliant QSFP pluggable modules:

  - 2-off QSFP28 cages (MV-805-16)

  - 4-off QSFP28 cages (MV-805-32)

Note: QSFP28 pluggable modules are NOT fitted to shipping MV-805s. They must be bought separately.

A.9   Default Ethernet IP Addresses

Control/Service Network Interfaces:		
"Control"	10.54.31.221	(`eno1`)
"Control 2"	None. (This interface has no set default value for its IP address.)	(`eno2`)
System Media Network Interfaces:		
"System"	10.54.31.222	(`ens2f0`)
"System"	10.54.31.223	(`ens2f1`)
"System"	10.54.31.224	(`ens1f0`)
"System"	10.54.31.225	(`ens1f1`)

A.10 On-Screen Monitoring

Multiviewer Video Wall	
Video input	Scaled to any size, any position.
	Up to 32 video tiles.
Scalers	Unique and independent scalers:
	• MV-805-32: 32-off
	• MV-805-16: 16-off
	• MV-805-4: 4-off
Audio Channels	Up to 16 per video input.
Audio Level Meter Bars	Can be positioned outside or overlaid within the video tile area.
Layering	Any object/video.
Transparency	Any object/video.
UMD	Source names over IP via:
	• SAM General Remote Protocol SW-P-08.
	• TSL 3.1 or 5.0 protocol.
Alarm Control	Notification via border color or Tally alarm indications.
	Configurable:
	• Threshold.
	• Trigger delays.
	• Auto clear after preset delay.
	Acknowledge from hard- and soft-panels via RollCall interface.
Alarms	AC3 lost
	Dialnorm Under
	Dolby E$^{®}$ Configuration change; Dolby E$^{®}$ lost
	PCM lost
	Network Fabric A lost; Network Fabric B lost
	Network Skew
	Video Black; Video Freeze
	Video Input format change
	Video Input lost
Status Indicators	Input Standard
	Source ID

Appendix B Terminology

B.1   IP Routing Terminology

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".
Flow	Another term for an elementary IP stream, usually a sequence of real-time data. 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.
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 SAM 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.

Table 29   Glossary of IP Routing Terms

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	Local Link Discovery Protocol: An open IP protocol used to advertise an edge device's identity, capabilities, and other connected devices within the same IP network.
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	SAM control and monitoring system.
RollCallv3	Traditional SAM RollCall messages in the SAM RollCall control and monitoring system product.
RollCall+	New extension to SAM RollCall. Uses RollCall+ Domains to separate data flow types. Used in MV-8 series Multiviewers and in IP Routing control and configuration.
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.

Table 29   Glossary of IP Routing Terms (Continued)

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. |

Table 29   Glossary of IP Routing Terms (Continued)

B.2   Multiviewer Video Walls

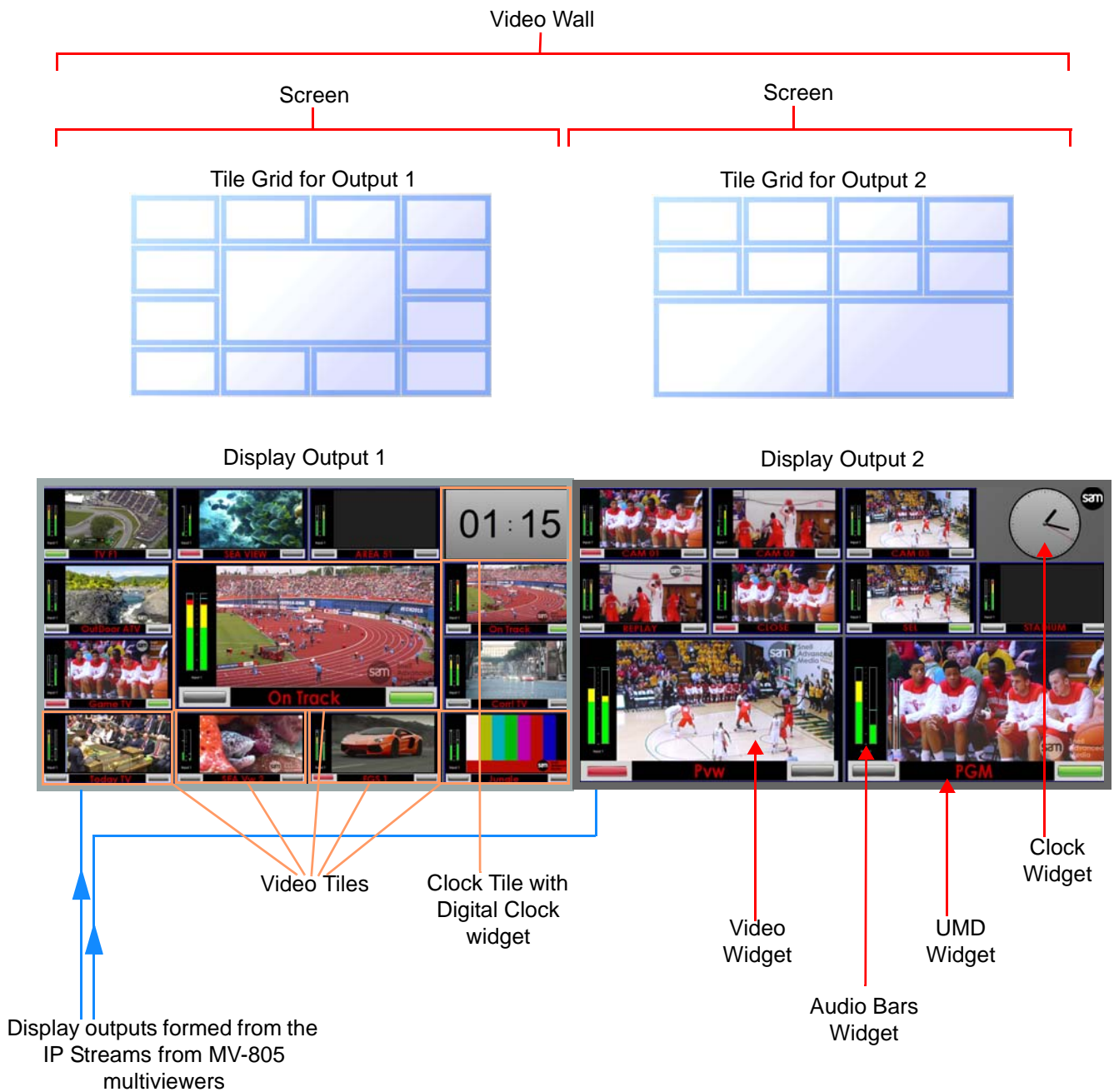Some video wall terminology used in the manual is shown in Figure 114.

Figure 114 Example Video Wall

User Notes:

User Manual

MV-805

Last page.