Snell Advanced Media

User Manual

Vega-MV Router Multiviewer

Video Routing and Multiviewer Outputs

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1 Information and Notices

1.1 Customer Support

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

www.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.

1.2 Copyright and Disclaimer

Copyright protection claimed includes all forms and matters of copyrightable material and information now allowed by statutory or judicial law or hereinafter granted, including without limitation, material generated from the software programs which are displayed on the screen such as icons, screen display looks etc.

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2 Safety

2.1 Explanation of Safety Symbols

Explanation of Safety Symbols (GB)

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

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

Safety Warnings

CAUTION: These servicing instructions are for use by qualified personnel only.
To reduce risk of electric shock do not perform any servicing other than that contained in the Operating Instructions unless you are qualified to do so.
Refer all servicing to qualified service personnel.

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

Légende : (F)

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

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

Précaution d'emploi :

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

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

Simboli di sicurezza: (I)

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

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

Attenzione:

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

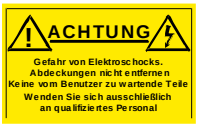
- **Per prevenire il pericolo di scosse elettriche è necessario non esporre mai l'apparecchiatura alla pioggia o a qualsiasi tipo di umidità.**
- **Assicurarsi sempre, che l'unità sia propriamente messa a terra e che le connessioni elettriche siano eseguite correttamente.**
- **Questo dispositivo deve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

Erklärung der Sicherheitssymbole (D)

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

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

Sicherheits-Warnhinweise



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

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

Explicación de los Símbolos de Seguridad (ESP)

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

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

Advertencias de Seguridad

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

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

Forklaring på sikkerhedssymboler (DK)

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

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

Sikkerhedsadvarsler

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

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

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Förklaring av Säkerhetssymboler

S

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

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

Säkerhetsvarningar

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

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

Símbolos de Segurança

P

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

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

Avisos de Segurança

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

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

Turvamerkkien selitys

FI

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

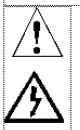
Tämä merkki ilmoittaa, että laitteen sisällä on vaarallisen voimakas jännite. Sisäpuolella ei ole mitään osia, joita käyttäjä voisi itse huoltaa. Huollon saa suorittaa vain alan ammattilainen.

Turvaohjeita

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

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

Επεξήγηση των Συμβόλων Ασφαλείας



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

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

Προειδοποίηση Ασφαλείας

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

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

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2.2 Mains Power Supply

The AC mains voltage (240/100 volts) will be auto-detected, provided it is in the range 100-240V AC 50/60Hz.

Fuses:

- **Vega-16MV, Vega-32MV:**

  A 3.15A fuse is fitted. A spare fuse is located under a pull-out flap.

- **Power Supply Shelf:**

  An 8A fuse is fitted. A spare fuse is located under each pull-out flap.

Note: A mains cable with a minimum rating of 10A, fitted with a 10A fuse is recommended.

WARNINGS:

- This equipment may have more than one power supply:
  i.e. Mains (IEC inlet) and 24V DC backup.
- The IEC power inlet is the *AC mains* disconnection device for the unit.
- Disconnect *all* the power sources to the unit before servicing, to reduce the risk of electrical shock.
- Electric shock hazards exist if conductive instruments, neck chains or fingers etc. are placed within the unit or in close proximity of the input/output terminals/connectors.

Before undertaking unit maintenance:

- Disconnect & isolate a unit from sources of power.

Thus:

- **The unit** must be disconnected & isolated from:
  - AC mains supply.
  - Any backup power supplies.
  - All other product outputs. (i.e. disconnect unit inputs.)
- **Power Supply Shelf** must be disconnected & isolated from:
  - All of its AC mains inputs.
  - Any units that the power supply shelf is powering.

2.3 Health and Safety Considerations

- The Installation and Maintenance of the unit and any associated equipment must be carried out by persons suitably qualified to work with equipment which may be connected to the mains supply.
- Incorrect installation can cause internal components to rupture and particles to be ejected from the product.
- Toxic fume hazards exist if the unit is subjected to direct flames or excessive temperature of above 100°C ambient.
- The mounting and installation of the unit must be arranged by the user to comply with all current local safety regulations.

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2.4 Lithium Batteries

The Vega-MV unit's MV-NET card contains a Lithium battery.

CAUTION

This equipment contains a lithium battery

There is a danger of explosion if this is replaced incorrectly
Replace only with the same type from the same manufacturer.
Dispose of used batteries in accordance with local
and national laws/regulations.
Batteries should only be replaced by trained service technicians

2.5 Rack Mounting

- Do not rack-mount the equipment using only the front unit rack ears.
- If installing equipment immediately above or below the equipment, it is essential to ensure that the ventilation outlets are not obstructed. For ventilation details see Section 5.1 "Ventilation" on page 50 and Section 11.3 "Ventilation" on page 196

2.6 Compliance Standards

This equipment complies with the following standards:

EN60950-1 2006
Safety of information Technology Equipment Including Electrical Business Equipment.

UL1419 (4th Edition) - UL File E193966
Standard for Safety - Professional Video and Audio equipment

2.7 EMC Standards:

This unit conforms to the following standards:

EN 55032:2012 (Class A)

EN 55103-2:2009 (Environment E2)

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

EN 61000-3-3:2013

Federal Communications Commission Rules 47 CFR, Part 15, Subpart B (Class A)

Warning:

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

Hazardous Material
UK: RoHS-6 - Complies with EU Directive.

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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.

FCC Compliance;

In order to comply with FCC/CFR47: Part 15 regulations, it is necessary to use the following specification of cable assemblies for HDMI interconnections:

- For HDMI to HDMI use a high-quality triple-screened cable assembly for optimum with integrated ferrite suppression at both ends of the cable for optimum RF/EMI integrity in compliance with HDMI specifications.

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3 Product Introduction

Vega-MV is a family of compact 1RU video routers with integrated multiviewers for small and medium scale applications. These are ideal for OB van and other space-restricted installations.

Figure 1 Vega-MV Unit

Video routing is up to 32x32, with up to 32 video inputs and 32 outputs. The unit supports up to 4K SDI video. Video inputs are auto-sensing for video sources.

All video inputs are visible on a dual-head multiviewer output. The unit is capable of driving up to two quad-split multiviewer displays. Each display output comprises an HDMI output with an copy SDI output.

The unit's multiviewer features comprehensive alarm functions, audio metering and monitoring capabilities.

Vega-MV also has a redundant/backup power supply option.

3.1 Application Areas

- OB-vans.
- Edit suites or studios.
- Other space-restricted installations.

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3.2 Features

- 1RU frame.
- Independent video routing for both SDI router outputs and multiviewer:
  - Vega-16MV**:** Fixed 16 x 16 video router
    with a second internal 16 x 16 crosspoint for multiviewer inputs.
  - Vega-32MV**:** Fixed 32 x 32 video router
    with a second internal 32 x 32 crosspoint for multiviewer inputs.
- Multi-definition capable inputs, up to 3G 1080p and 4K SDI.
  Supports dual- and quad-link.
- Auto-sensing video inputs.
- Reference input for flicker-free and full frame operation.
- Control:
  - SW-P-02 protocol
  - SW-P-08 protocol
  - RollCall Control Panel.
  - Luna hardware control panels.
- Internal router and external router multiviewer modes.
- 8 character and 32 character source names supported.
- Switching of Router outputs and Multiviewer inputs:
  - Independently controllable.
  - Multiviewer ‘follow router destination’ mode.
- Single Multiviewer, dual-headed:
  - Main outputs: 2-off 1.4a HDMI (up to 1920x1200p60).
  - Copy outputs: 2-off Quad-link SDI 3G SDI (up to 1080p50/59/60).
- HDMI outputs support HDCP encrypted signals.

Important: HDMI inputs/outputs support HDCP but this must be enabled from the **Module** menu, **Screens** tab to display HDCP encrypted sources, see section 7.3.1.2.

- Multiviewer On-Screen:
  - Teletext subtitles display (WST on SD-SDI or OP-47 on HD-SDI).
  - AFD decoding for adjusting the aspect ratio
  - D-VITC and ancillary timecode decoding and display (SD-SDI/HD-SDI sources)
  - Audio metering is supported for up to 32 mono channels per video display tile.
  - Audio metering sourced from SD-SDI/HD-SDI/3G-SDI embedded audio groups (PCM or *Dolby E metadata meter segment).
  - Audio metering of Dolby E encoded audio from any SDI embedded audio pair. Up to four Dolby E encoded pairs per SDI source. (Decoding of Dolby E audio content is not supported.)

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- Alarms for video, audio and metadata,
  with outputs to, GPI Outputs, LAN and/or SNMP traps
- Input standard decode available as on-screen caption.
- Assignable tallies
- Under Monitor Display (UMD) text entered via LAN or serial cable, supporting TSL and other protocols, including SW-P-08.
- Clock display receiving time information via NTP network protocol or LTC

- Unit:
  - Front panel mounted OLED display giving chassis and card status information.
  - Intelligent fan speed control
  - Power supply redundancy via optional external backup power supply.
  - User-friendly set-up via browser software.

3.3 Order Codes

Order Code	Description
Vega MV:	
VEGA-16MV	1RU Vega-MV Router Multiviewer, with 16 x 16 video router and dual-head multiviewer.
VEGA-32MV	1RU Vega-MV Router Multiviewer, with 32 x 32 video router and dual-head multiviewer.
Other:	
MV-EXTPSU3	1RU External Redundant/Backup Power Supply Shelf.
MV-1000PSU	Power Supply Module used in MV-EXTPSU3 and Vega-MV products.

Table 1 Vega-MV Order Codes

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3.4 Vega-MV Inputs and Outputs

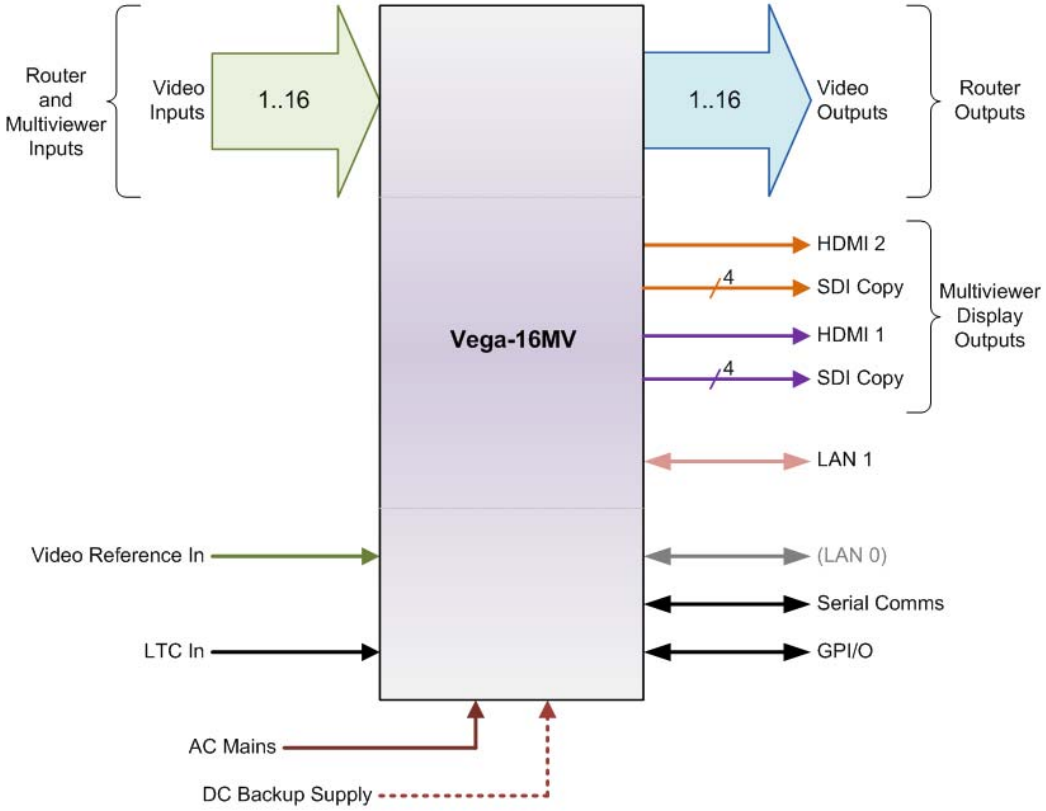

Figure 2 Vega-16MV I/O Diagram

Figure 2 shows inputs and outputs of a Vega-16MV, which contains a 16 x 16 video router.

Vega-32MV is similar to Figure 2 but has 32 video inputs and outputs with a 32 x 32 router.

Input/ Output	Description
Router:	
Video Inputs 1 to 16	Vega-16MV router and multiviewer video inputs.
Video Inputs 1 to 32	Vega-32MV router and multiviewer video inputs.
Video Outputs 1 to 16	Vega-16MV router video outputs.
Video Outputs 1 to 32	Vega-32MV router video outputs.
Multiviewer Display Outputs:	
HDMI 1 and **SDI copy**	Multiviewer display head 1: • HDMI head output. • plus quad-link SDI copy output.
HDMI 2 and SDI copy	Multiviewer display head 2: • HDMI head output. • plus quad-link SDI copy output.

Table 2 Vega-MV Inputs and Outputs

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Input/ Output	Description
Other:	
LAN 1	Network connection for Router/Multiviewer. This is the main network connection for the unit.
LAN 0	Network connection for NTP and for any firmware update of the unit's MV-NET card.
Serial Comms	RS232/422 serial comms connection.
GPI/O	GPI inputs and outputs.
Video Reference In	Video reference input for the router multiviewer unit.
LTC In	LTC input for the router multiviewer unit.
AC Mains	AC mains power supply to Vega-MV.
DC Backup Supply	Optional 24V DC backup supply to Vega-MV.

Table 2 Vega-MV Inputs and Outputs (Continued)

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3.5 Functional Description

The Vega-MV comprises a video router and a multiviewer. Figure 3 shows the system architecture.

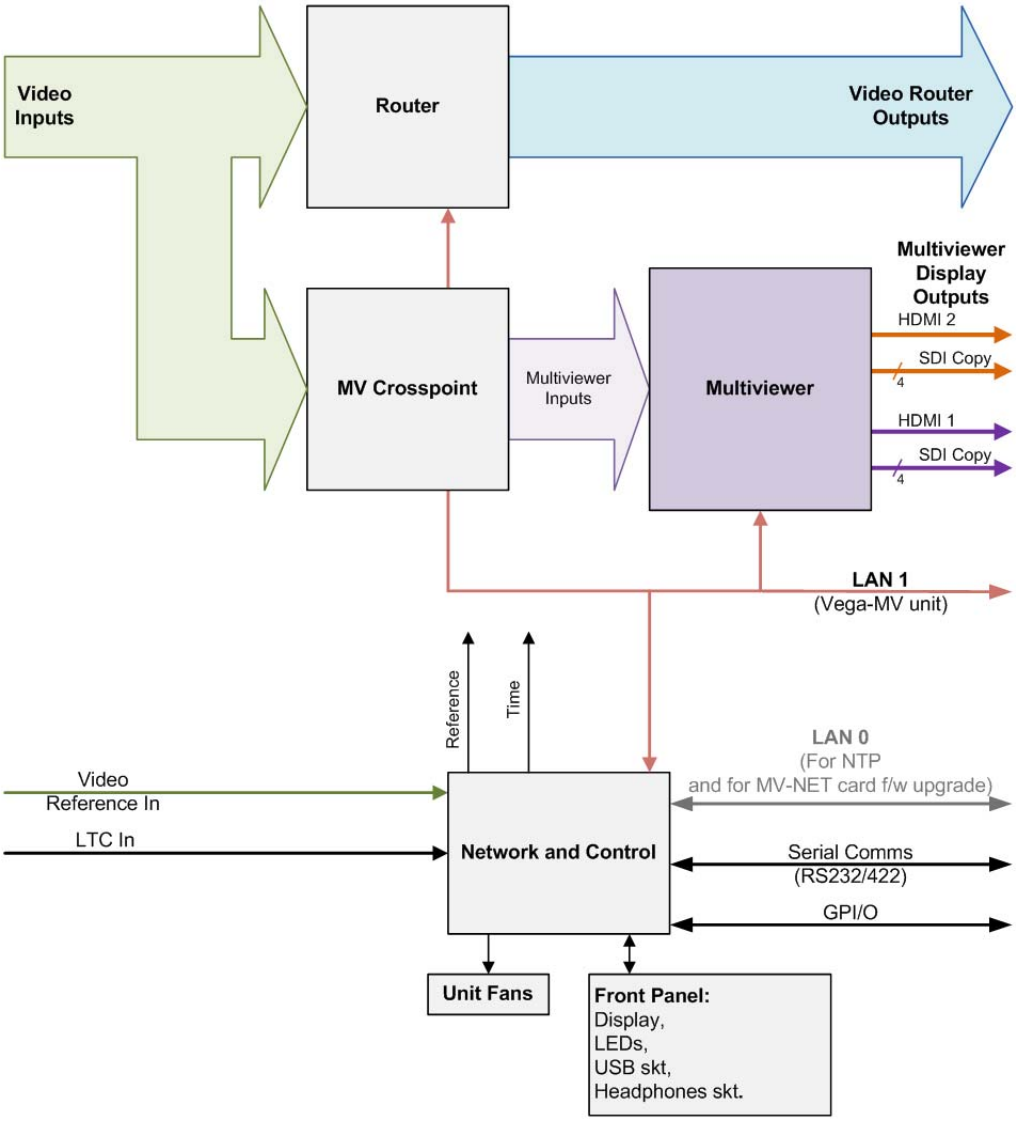

Figure 3 Vega-MV Block Diagram

The video inputs and router outputs support video standards up to 4K. The video inputs form both the router inputs and the multiviewer inputs.

Router Block:

The router block comprises an N x N router. The router is controllable from an external controller or control panel.

MV Crosspoint Block:

The MV crosspoint block comprises an N x N crosspoint switch which permits a multiviewer input to be connected to any Vega-MV video input. This allows the multiviewer to show the same video source with different on-screen scaling or to follow a destination output of the internal router.

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Multiviewer Block:

The multiviewer video inputs are routed from the Vega-MV video inputs via the MV Crosspoint block. There are no separate controls for the MV crosspoint. SDI sources from any video input can be assigned to any on-screen multiviewer tile.

The multiviewer inputs are processed by the multiviewer block. Video images are scaled and other information is extracted, including audio levels, for display on the multiviewer display outputs.

Video images are resized in scalers to form small images for video tiles; audio level and status information is added and combined with some on-screen graphics to form the different multiviewer display tiles. The tiles are arranged to form the final multiviewer display outputs. Video sources can be layered in any order and any multiviewer input can be assigned onto each display output.

There are two independent HDMI multiviewer display outputs (heads), each with a quad-link SDI copy output.

LAN 1:

A network interface for control and media, for both the router and multiviewer blocks. It is also used for firmware upgrades.

LAN 0:

A network interface for NTP connections. It is also used for firmware upgrades (upgrade of Vega-MV's MV-NET card only).

Network and Control:

The Network and Control block carries out the following functions:

- Passes video genlock information to the router and multiviewer.
- Passes LTC and NTP time information to the router and multiviewer.
- Controls the unit's GPI/O ports.
- Controls the unit's cooling fans.
- Interfaces to the unit's front panel, including:
  OLED display, control knob, status LEDs, USB port and headphones socket.

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3.5.1 Vega-MV Components

A Vega-MV unit comprises various component parts. These are listed in Table 3 and shown in Figure 4, which shows how the components are inter-connected.

Component	Description
MV-NET	“MV-NET”, Network and Control card
MV-NET Rear	MV-NET rear panel (Part MV-NRP1)
MV-CTL	“MV-CTL”, control and output card
MV-CTL Rear	MV-CTL rear panel (Part MV-RMVCS8)
MV-VIP4	“VIP4”, 4K video input card
MV-VIP4 Rear	VIP4 rear panel, 8x 4K inputs. (Part MV-RMVRO8)
Front Panel	Vega-MV unit front panel
Fans	Vega-MV unit fans, for ventilation
Midplane and Router	All Vega-MV front cards and rear panel modules plug into a midplane. The midplane houses a router block.

Table 3 Vega-MV Components

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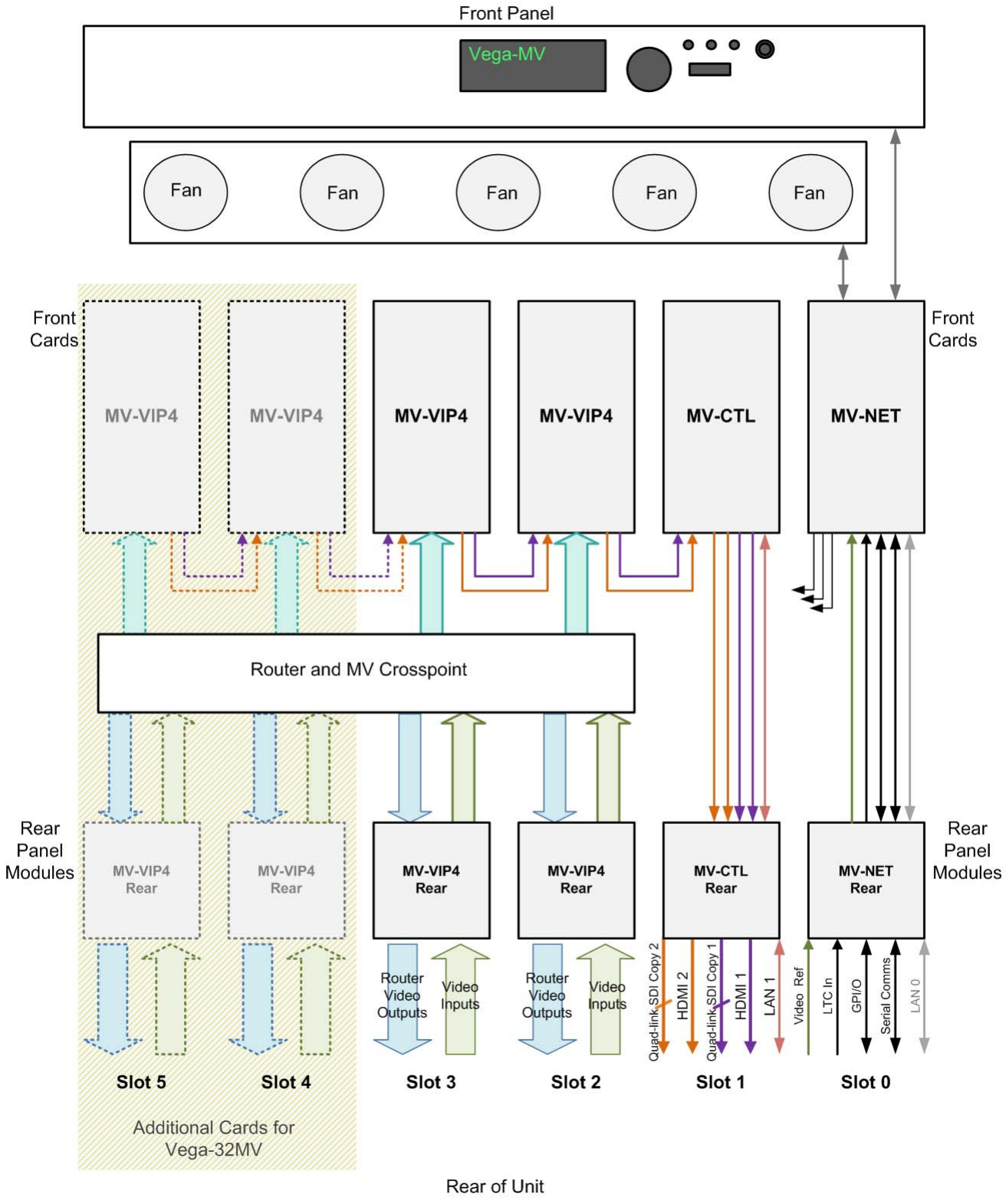

Figure 4 Vega-MV Block Diagram

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3.5.2 Using GPI I/O

Assignable GPI I/O are provided for external alarm indication and tally functions.
These are available on the MV-NET rear panel. There are 8 GPI inputs and 4 GPI outputs.

3.5.3 Genlocking and Reference

Genlocking of the unit is done to SD bi-level black and burst, or HD tri-level analogue sync signals via the video reference input. The system frame rate locks to the reference signal provided. A unit that is locked to the reference signal (genlocked) generates internal video reference timing information for the internal router to enable video switching to be synchronised with the video waveform (timed switching).

Timed switching of video inputs in the router is done using the unit's internal reference timing. This can be configured to be based on the video standard of the reference input itself or on some other video standard. Timed switching is compliant with SMPTE RP168-2009 for inputs line-synchronized to the reference input.

When a reference signal is not provided, the unit timing free-runs and inputs are crash-switched.

Video inputs of differing frame rates (for example, 50Hz and 60Hz) can be switched in the router. Video inputs with the same frame rate as the reference input can be timed-switched but video inputs with a different frame rate are crash-switched.

The video inputs of differing frame rates (for example, 50Hz and 60Hz) are supported simultaneously in the multiviewer. However, in this case, synchronisation of the 'non-system frame rate input' is achieved by frame-add and frame-drop.

3.6 On-screen Notifications

3.6.1 Powerful Alarms

Alarms may be created for video sync loss, black (loss of luminance), freeze-frame, embedded audio loss, external audio loss, over level, out of phase (of chosen pairs), teletext loss, and closed caption loss. Audio alarms can be configured to be displayed above the audio bars and/or in text boxes.

The colors used for on-screen alarms located above the audio bars are as follows:

- Audio Loss: Yellow - position (left or right) indicates channel
- Audio Over: Red - position (left or right) indicates channel
- Anti-Phase: Cyan - middle alarm
- Carrier Loss: White - middle alarm

If carrier loss occurs, only that alarm will flash, unless audio loss had already been active for the same channel.

The decoding of closed captions is available on each scaler, together with an associated alarm. WST and OP-47 teletext decoding is available for displaying.

On screen alarm indication can be a solid or flashing colored tile border. External alarm indication can be via the GPI I/O or the LAN/software application.

Optional triggering of SNMP traps for each alarm function or group is also supported.

Tiles have an optional color coded border to provide status indication, such as tally or alarms.

VITC loss is indicated by the burnt in VITC display flashing. Burnt in VITC is available from SDI sources only.

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3.6.2 Captions and UMDs

Captions or Under Monitor Display (UMD) information are generated manually using browser software operating on a remote PC. They can also be generated automatically from remote sources via the LAN or via the RS232/422 port using TSL or other protocols. Up to two lines of UMD text can be left, centre, or right justified and may be placed anywhere in the tile.

3.6.3 Using Still Images

There is storage capacity (approximately 200MB) for still images. These can be used as backgrounds, or to display station idents, etc. The picture images must be in png file format and can be uploaded to the frame via the LAN. Up to four images may be displayed at any one time.

3.6.4 Keeping Time

Clock/date display data can be derived from several sources; the system clock, NTP synchronisation, LTC, or VITC from a chosen SDI input. See section 7.3.6 for more information.

3.6.5 Bargraph Scales

The following audio scales are supported:

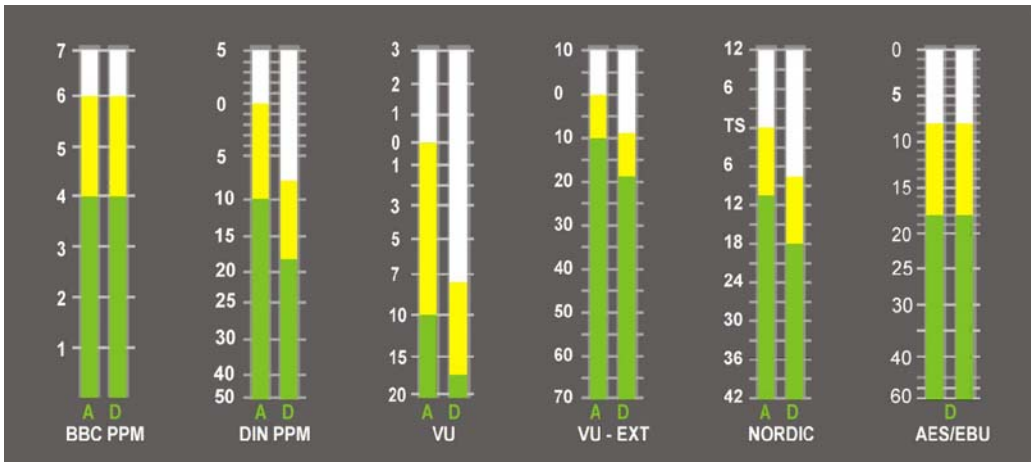

Figure 5 Available Meter Scales.

Colors used for the upper and lower ranges of each bar type can be customized to satisfy any in-house monitoring style for each of the six scale types.

Audio meters can be configured appropriately to display the levels of all channels in an embedded Dolby E stream.

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3.7 Vega-MV Monitoring and Switching Signals

The Vega-MV comprises a router and a multiviewer in one box. The multiviewer can monitor up to 32 video inputs from an external router and is able to display source names and tallies on-screen when connected to the corresponding external router controller. See Figure 6.
The *internal* router of the Vega-MV can be controlled over IP by a router controller or a remote panel. The multiviewer can show the *internal* router outputs using a 'follow router destination' mode.

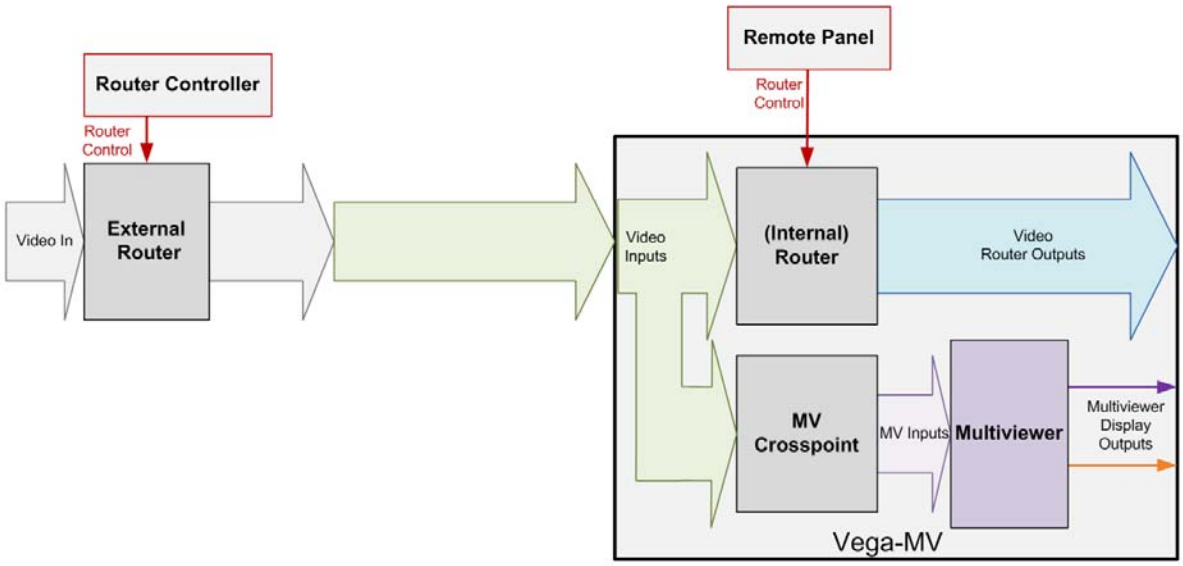

Figure 6 Vega-MV Control and Monitoring Example

Source names and tally information is obtained from the external router controller. Routing information also passes to the multiviewer from the internal router, to support the multiviewer's 'follow router destination' mode. See Figure 7.

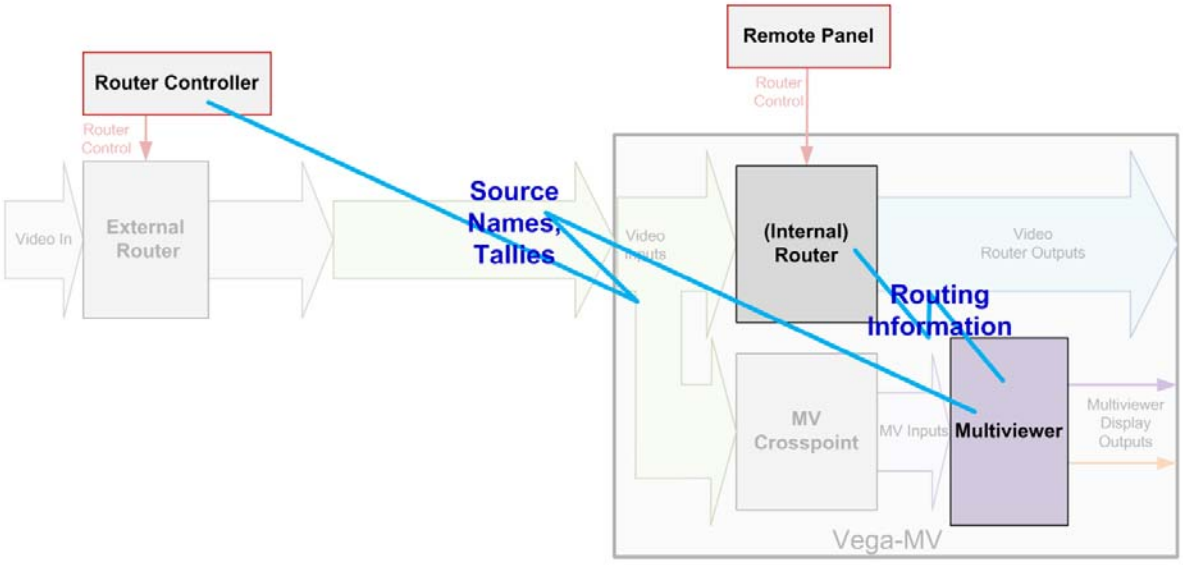

Figure 7 Signal Source Names, Tallies and Routing Information to Multiviewer

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3.8 Thermal Protection, Thermal Shutdown

The MV-NET card and the MV-1000PSU power supply module contain thermal shut down logic and protection circuits to prevent overheating.

3.8.1 MV-NET Card Thermal Protection

The MV-NET card can react with a series of initiated responses intended to reduce the temperature and then the power consumption of the rack considerably and so slow any internal temperature rise due to abnormal cooling.

The initial response of the MV-NET card to an internal temperature rise above 35ºC is to increase the fan speed in order to increase the airflow in the chassis and cool it down.
If the temperature detected in the immediate vicinity of the MV-NET card continues to rise, the temperature-dependant thermal management actions in Table 4 are taken:

Threshold	Action
Internal Temperature 35ºC	When this threshold is exceeded: The MV-NET card increases the fan speed in order to increase the airflow in the chassis and cool it down.
Warning threshold 60ºC	When this threshold is reached: An on-screen warning message appears indicating the temperature and asking the user to check the ventilation of the rack is unobstructed.
High power threshold 65ºC	If the detected temperature exceeds this threshold for more than a minute: The 'high power consumption' hardware in the video input chain are put into reset mode. The on-screen message informs the user that this happened.
Low power threshold 70ºC	Above this threshold: The video output cards are also held in reset. The on-screen multiviewer display will disappear as the video output is disabled.
Note 1:	If the detected temperature drops below the Warning threshold, all reset hardware is reactivated.

Table 4 Front Fan LED Status

Fans:

If three or more fan failures are reported, then on-screen and browser warning messages will appear indicating the failure and the thermal management actions will then be implemented as necessary.

Front Fan LED	Description
Off	All fans working correctly.
Flashing Red	One or more fan failures detected.
Solid Red	Critical Fan failure (more than two fans have failed) or Over Temperature alarm: Frame is in its thermal management state.

Table 5 Front Fan LED Status

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3.8.2 MV-1000PSU - Power Supply Module Thermal Protection

Note: The **MV-1000PSU** power supply module is fitted in the Vega-MV frame and also in the optional **MV-EXTPSU3** backup power supply shelf.

The MV-1000PSU power supply module thermal protection operates under the following conditions:

75°C ±5°C (TSW1) - temperature detection is on the heatsink of a power transistor

85°C ±5°C (TSW2) - temperature detection is on the heatsink of a power diode

Under the above conditions the output DC voltage is shutdown.

Recovery is automatic when the temperature drops.

3.9 External Power Supply Shelf, MV-EXTPSU3

A Vega-MV Router Multiviewer is supplied fitted with one internal power supply module (MV-1000PSU). An optional backup power supply is available by using an external 1RU power supply shelf (MV-EXTPSU3).

The MV-EXTPSU3 unit houses up to three independent MV-1000PSU modules and can provide redundant / backup power for up to three Vega-MV units.

Note: When fitted into an MV-EXTPSU3, each MV-1000PSU module is specifically configured to supply redundant / backup DC power to one Vega-MV unit.

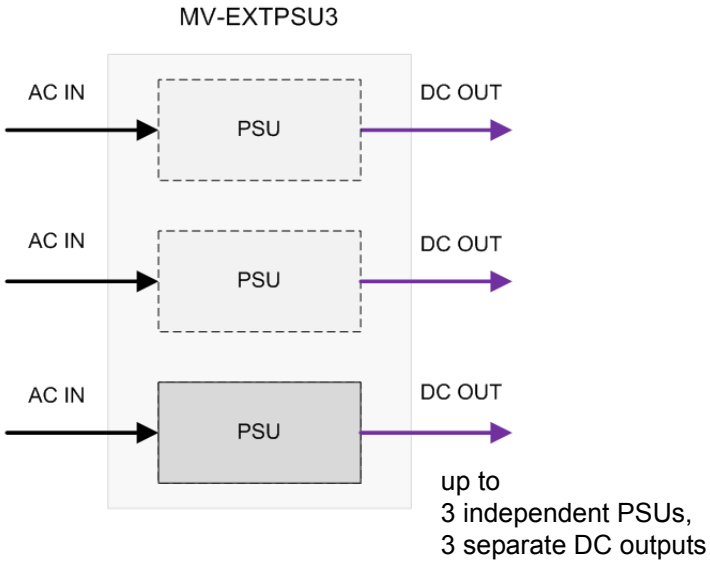

Figure 8 MV-EXTPSU3 Functional Diagram

Thus. three Vega-MV Router Multiviewer units can have power supply redundancy using just one fully-loaded MV-EXTPSU3.

An MV-EXTPSU3 provides DC power to a Vega-MV Router Multiviewer via a special DC power cable, provided with each MV-1000PSU module in an MV-EXTPSU3.

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4 Vega-MV Unit Hardware

Section contents:

4.1 Vega-MV Unit's Components page 27
4.2 Unit Front Panel page 28
4.3 Unit Rear page 31
4.4 Card Slots page 34
4.5 MV-NET Card and Rear Module - Slot 0 page 37
4.6 MV-CTL Card and Rear Module - Slot 1 page 42
4.7 MV-VIP4 Card and Rear Module - Slots 2 to 5 page 45
4.8 Dust Blanking Rear Panel (MV-BRP) page 47
4.9 Vega-MV Power Supply Connectors page 48

This section describes the Vega-MV unit and the modular cards and rear panels fitted into the unit.

4.1 Vega-MV Unit's Components

A Vega-MV unit is not a modular product; it has defined routing and multiviewer capabilities. It is shipped from the factory in a fixed configuration.

Table 6 lists the Vega-MV series components.

Component		Description	Vega-MV Quantity	
Name	Part Number		Vega-16MV	Vega-32MV
Chassis	MP-X1-R	1RU Routing Chassis	1	1
MV-NET	MV-NET	"MV-NET" Network and Control card	1	1
MV-NET Rear	MV-NRP	MV-NET rear panel	1	1
MV-CTL	MV-CTL2-SD	"MV-CTL" Control and multiviewer output card	1	1
MV-CTL Rear	MV-RMVCS8	MV-CTL rear panel	1	1
MV-VIP4	MV-VIP4SD	"VIP4" 4K video input card	2	4
MV-VIP4 Rear	MV-RMVRO8	VIP4 rear panel, 8x 4K inputs	2	4
Blanking Plate	MV-BRP	Rear Blanking Plate	2	-

Table 6 Vega-MV Components

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4.2 Unit Front Panel

The Vega-MV front panel has a display and some status/warning indicators. See Figure 9. A rotary knob and alpha-numeric OLED display is provided to access presets and unit status details. Three LED indicators report power supply and fan status.

A stereo audio headphone monitor socket (phono 6.35mm output jack socket) and a USB-2 socket are also present.

Front panel operation is described in Section 6.2 “Front Panel Operational Settings Screens” on page 61.

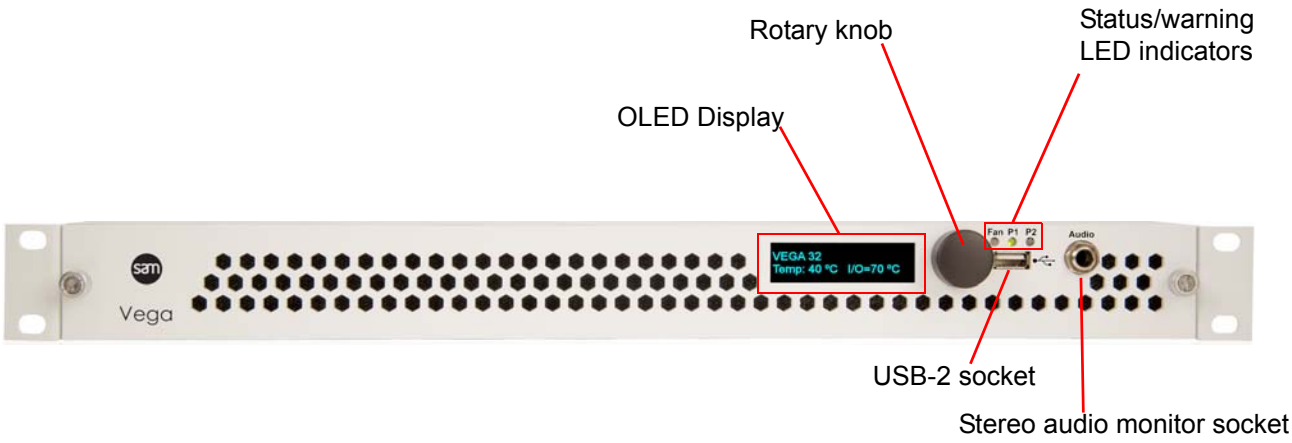

Figure 9 Vega-MV Front Panel (Vega-32MV model shown)

4.2.1 Front Panel Status LEDs

Once the Vega-MV Router Multiviewer has started up, the front panel LEDs display unit fan and PSU status as described in Table 7.The three front panel LEDs provide a quick and easy way of checking the frame’s power, voltage, fan and temperature status.

LED	Color	Description
Fan		
	Off	All fans working.
	Flashing Red	One or more fan failures detected.
	Red	Critical Fan Failure: More than two fans have failed or Over Temperature alarm.
P1		Internal Power Supply Module (MV-1000PSU):
	Off	Mains power is not connected or not working.
	Green	Mains power is connected to the internal PSU module and the PSU is working.
	Red	Power supply voltage produced by the internal PSU is outside the range 20 to 25.5 volts.

Table 7 Front Panel LED Status Display

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LED	Color	Description
	Flashing Red	One or more of the onboard power supply voltages is outside its permitted voltage range.
P2		Optional External Backup Power Supply Shelf:
	Off	External backup PSU not fitted or external PSU is not supplying 24 volt power.
	Green	External backup PSU is supplying 24 volts power.
	Red	External backup PSU supply voltage is outside the range of 20 to 25.5 volts.

Table 7 Front Panel LED Status Display (Continued)

4.2.2 Front Panel OLED Display

Once the Vega-MV unit has started up, the OLED display defaults to a general status display, The bottom OLED display line changes every few seconds and shows temperature, genlock, LTC and fan status information. See Figure 10.

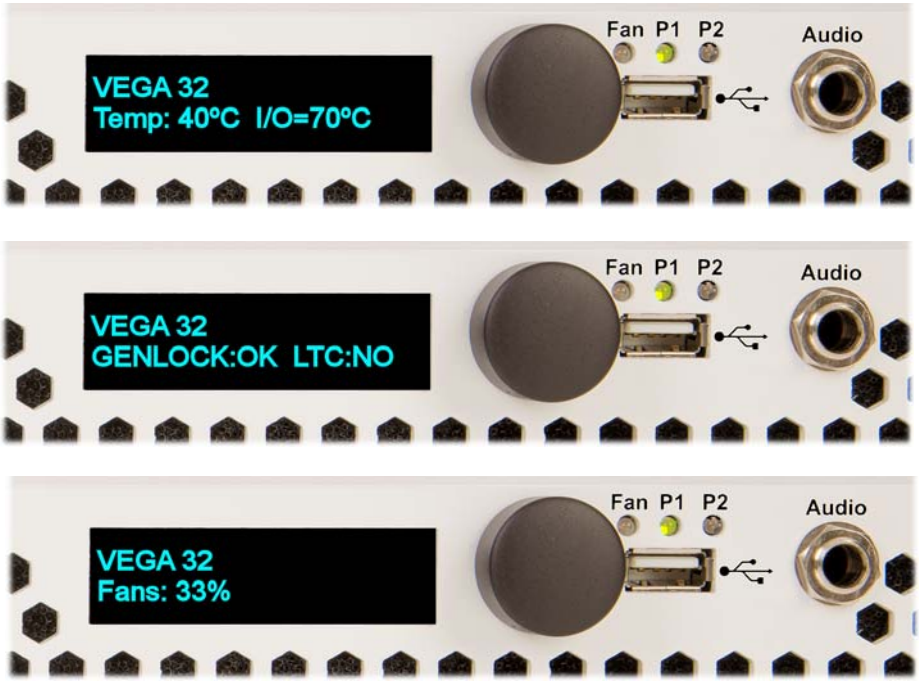

Figure 10 General Status Display on OLED Display (Vega-32MV shown)

See Section 6 “Front Panel Operation” on page 59 for more information.

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4.2.3 Unit Serial Number Label

The unit's serial number is shown on a label which is located inside of the front of the unit. The label can be viewed by removing the front panel: The label is on the inside right-hand side of the unit.

The serial number comprises a six digit number, e.g. 170311.

Front of unit with front panel removed.

Figure 11 Serial Number Label Location

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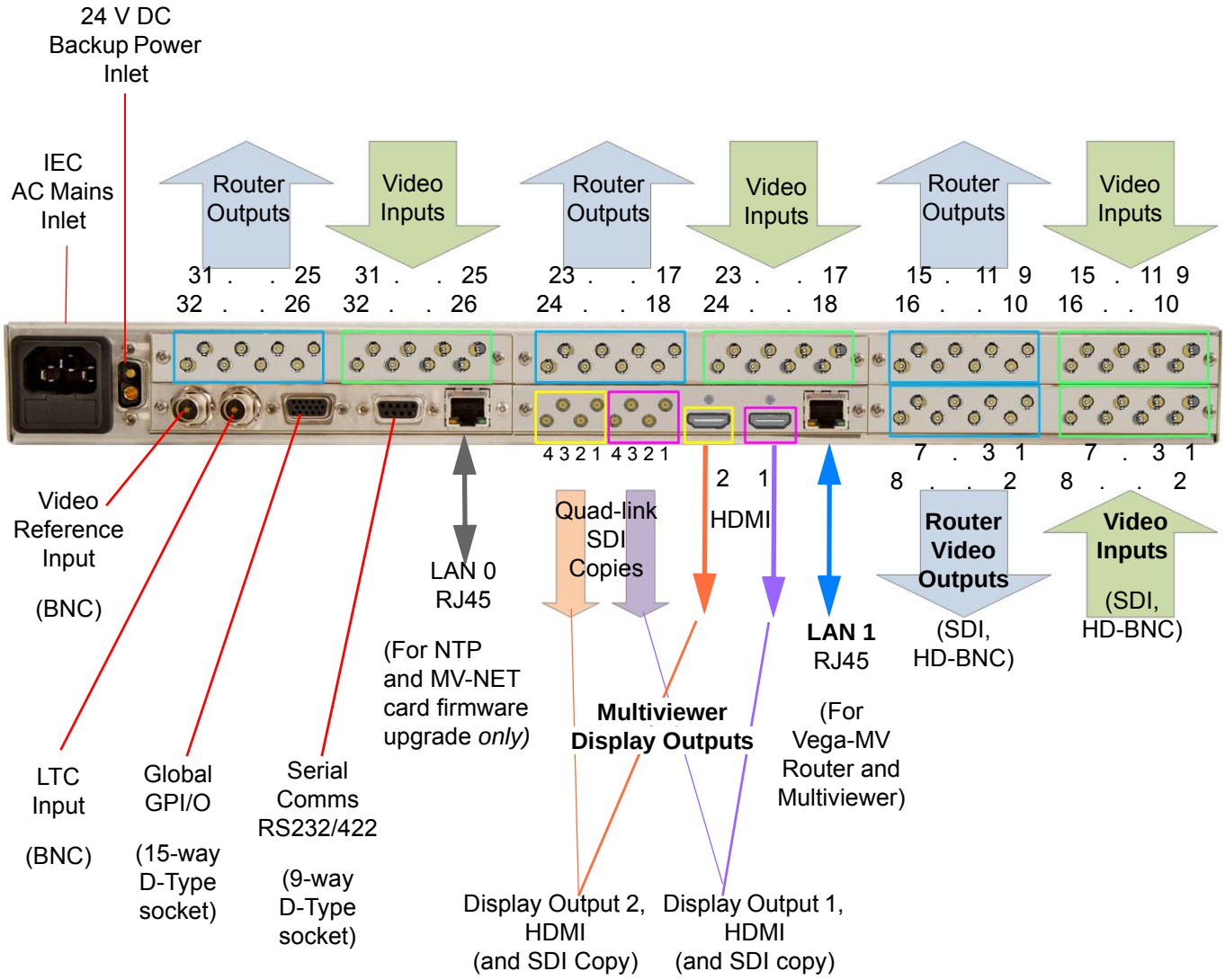
4.3 Unit Rear

A unit rear view is shown in Figure 12. Figure 12b is annotated with the rear connections, which are listed in Table 8 and described further in later sub-sections.

a) Vega-MV Router Multiviewer Rear View



b) Annotated Rear View

Figure 12 Vega-MV Rear View: a) Rear View. b) Annotated Rear View

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Connector			Description
Name	Type	Quantity	Function
MV-NET:			
Video Reference Input	BNC	1	Analogue video reference input.
LTC Input	BNC	1	LTC input.
GPI/O	15-Way D-type Socket	1	GPI inputs and outputs.
Serial Comms	9-way D-type Socket	1	RS232/422 serial comms port.
LAN 0	RJ45	1	Network connection for a network connection to an NTP server (and *for MV-NET firmware upgrade only)*.
MV-CTL:			
LAN 1	RJ45	1	Network connection for the main Vega-MV Router and Multiviewer.
Multiviewer Display Outputs:			
Display Output 1	HDMI	1	Multiviewer display output 1.
Display Output 2	HDMI	1	Multiviewer display output 2.
SDI Copy 1	HD-BNC	4	Quad-link SDI copy of multiviewer output 1.
SDI Copy 2	HD-BNC	4	Quad-link SDI copy of multiviewer output 2.
Video Inputs	HD-BNC	16 (32)	Video inputs. 16-off Vega-16MV. (32-off Vega-32MV). Numbering is from right-to-left on rear.
Router Video Outputs	HD-BNC	16 (32)	Router video outputs. 16-off Vega-16MV. (32-off Vega-32MV). Numbering is from right-to-left on rear.
24V DC Backup Power Inlet	High Power 2-pin D Type	1	Backup DC power inlet.
IEC AC Mains Inlet	IEC Socket	1	Mains inlet.

Table 8 Overview of Rear Connections

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4.3.1 LAN 0 Default IP Addresses

Note: LAN 0 is for NTP connection.

The LAN 0 default (MV-NET card) network details are:

IP Address - 192.168.0.120

Subnet Mask Address - 255.255.255.0

Gateway Address - 192.168.0.1

DNS1 Address - 0.0.0.0 (not currently used)

DNS2 Address - 0.0.0.0 (not currently used)

4.3.2 LAN 1 Default IP Addresses

Note: LAN 1 is the main LAN connection for the Vega-MV.

The LAN 1 default (MV-CTL card) network details are:

IP Address - 192.168.0.121

Subnet Mask Address - 255.255.255.0

Gateway Address - 192.168.0.1

DNS1 Address - 0.0.0.0 (not currently used)

DNS2 Address - 0.0.0.0 (not currently used)

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4.4 Card Slots

The Vega-MV chassis card slots for the Vega-MV component cards.

4.4.1 Card Slot Numbering

Front slots are numbered from 0 to 5 and their corresponding rear slots share this numbering.

Front slots are accessed from the front of the unit by opening the front panel.
(see Section 10.4 “Vega-MV Front Panel Opening” on page 188.) Figure 13 shows the front card slots.

Rear slots are shown in Figure 14 and are accessed directly from the rear.

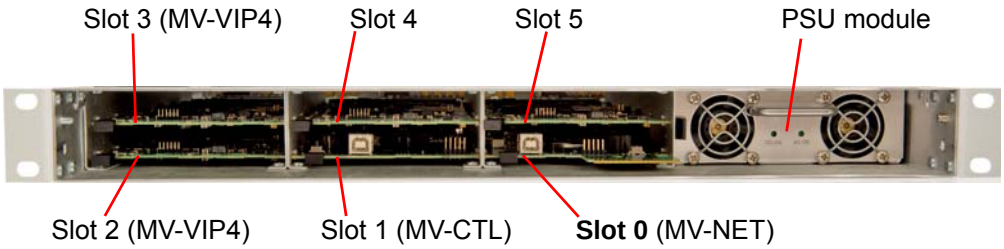

Figure 13 Vega-MV Front Card Slots (Front View, Front Door Open)

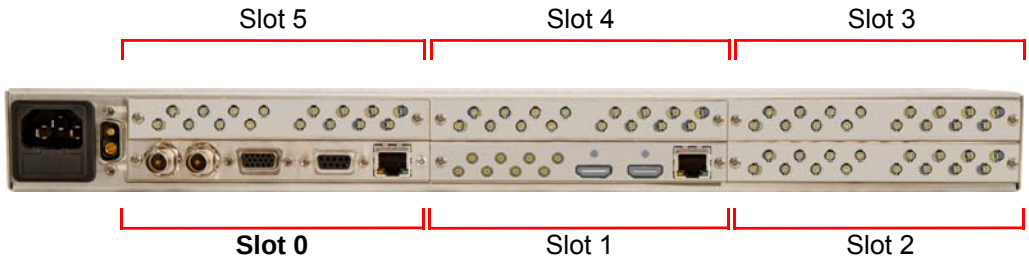

Figure 14 Vega-MV Rear Slots (Rear View)

4.4.2 Component Card Slot Locations

Table 9 lists the Vega-MV components (front cards and rear panel modules) and their designated card slots.
See Figure 15 for views of Vega-16MV cards and rear modules,
and see Figure 16 for views of Vega-32MV cards and rear modules.

Slot Number	Card Slot Location			
	Vega-16MV		Vega-32MV	
	Front Slot	Rear Slot	Front Slot	Rear Slot
Slot 0	MV-NET	MV-NET Rear	MV-NET	MV-NET Rear
Slot 1	MV-CTL	MV-CTL Rear	MV-CTL	MV-CTL Rear
Slot 2	MV-VIP4	MV-VIP4 Rear	MV-VIP4	MV-VIP4 Rear
Slot 3	MV-VIP4	MV-VIP4 Rear	MV-VIP4	MV-VIP4 Rear
Slot 4	Empty	Blanking plate	MV-VIP4	MV-VIP4 Rear
Slot 5	Empty	Blanking plate	MV-VIP4	MV-VIP4 Rear

Table 9 Vega-MV Card Slot Locations

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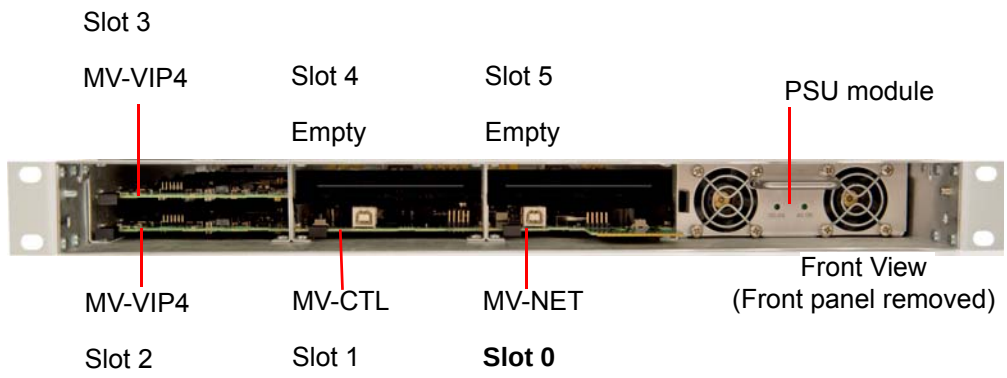


Vega-16MV

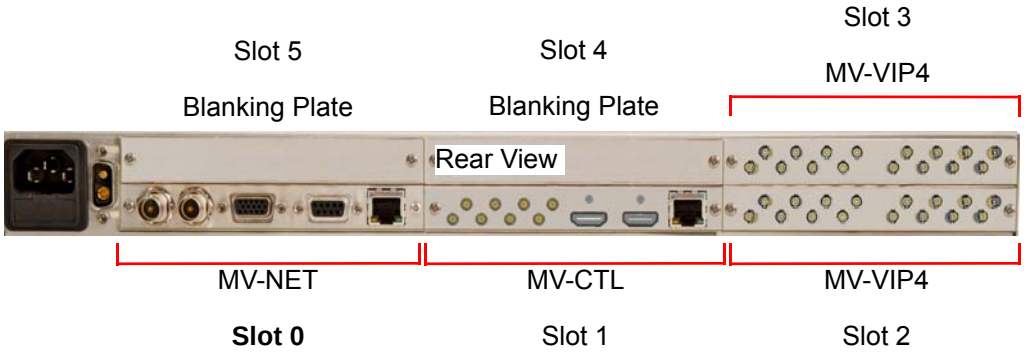
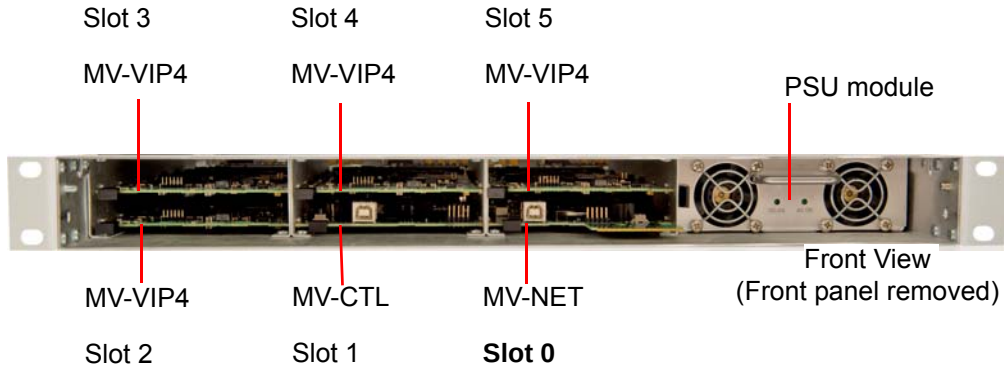


Figure 15 Vega-16MV Front Cards and Rear Panel Modules



Vega-32MV

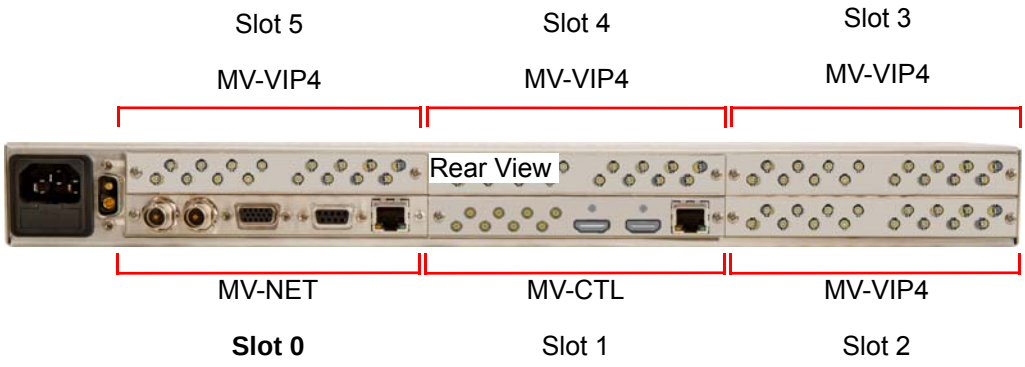


Figure 16 Vega-32MV Front Cards and Rear Panel Modules

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Note:

- See Section 10.5 “Fitting / Removing Cards and Rear Panels” on page 190 for details of how to fit or remove cards and rear panels.
- See Section 10.4 “Vega-MV Front Panel Opening” on page 188 for details on opening the frame door.

Important: To maintain adequate cooling, the Vega-MV frame must not be run for more than two minutes with the front panel open

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4.5 MV-NET Card and Rear Module - Slot 0

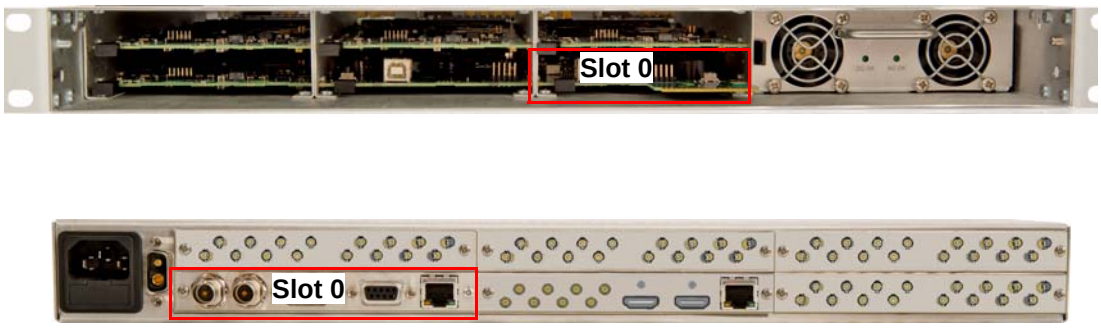

Figure 17 Vega-MV Slot 0

A Vega-MV contains one MV-NET card in front slot 0 and a MV-NET rear panel (MV-NRP) fitted at the rear.

Note:

- Vega-MV frames are supplied fitted with the MV-NET card and an MV-NRP rear panel. They are detailed here as spares items only.

4.5.1 MV-NET Front Module - Front Slot 0 only.

The MV-NET card provides the video reference, timecode input, global GPIO connection and serial port connection.
The serial port is connected to the MV-CTL card in the Vega-MV frame.
The MV-NET card also controls the front panel fans, LEDs and headphone socket.

Figure 18 MV-NET Card - Slot 0 Only

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4.5.2 MV-NET Rear Panel Module (Part MV-NRP1) - Rear Slot 0 only

The rear panel provides connections for the video reference input, timecode Input, global GPI/O and serial port connections.

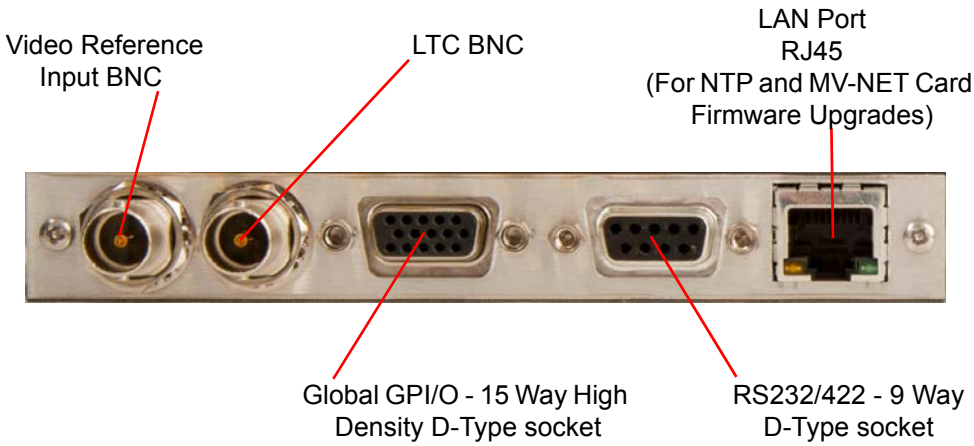

Figure 19 MV-CTL Rear Panel Connections - Slot 0 Only

Note: **Vega-MV LAN Port:**

The Vega-MV web interface is accessed via the *MV-CTL* card rear panel LAN port, see section 4.6.
The *MV-NET* rear panel LAN port is for NTP connection and also firmware upgrade to the MV-NET card.

Note: **LTC:**

The LTC input is an unbalanced input.
To use a balanced LTC input, the signal must be properly converted with a Balun in-line transformer. Grounding either of the LTC input pins will not work.

4.5.3 GPI Input/Output Connectors

The GPI/O 15 way high density D-Type socket is located on the MV-NET rear panel and provides global GPI/O connections for the Vega-MV frame.

The global GPI/Os are configured from the **Setup Module** option from the **Module** menu, see sections 7.3.1.6 and 7.3.1.7 for details.

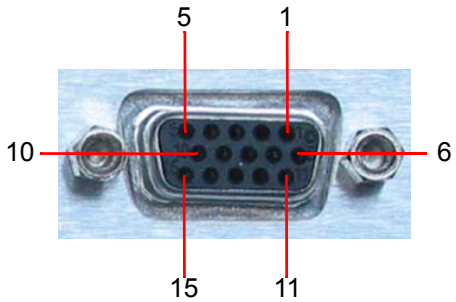

Figure 20 GPI Input/Output Connector.

Table 10 gives the pin assignments for the GPI Input/Output:

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Pin Number	Signal	Pin Number	Signal
1	GPI-In 1	9	GPI-In 8
2	GPI-In 2	10	GND
3	GPI-In 3	11	GPI-Out 1
4	GPI-In 4	12	GPI-Out 2
5	GND	13	GPI-Out 3
6	GPI-In 5	14	GPI-Out 4
7	GPI-In 6	15	GND
8	GPI-In 7		

Table 10 GPI Input/Output Connector Pin Assignments

Example: GPI Inputs

To activate a GPI input connect the GPI pin to a GND pin on the GPI connector.

For an example of how GPI inputs can be used to trigger on-screen tallies, see section 9.4.

Example: Using LEDs on the GPI Outputs

The GPI outputs are open collector drivers. An external 5V dc supply must be used to drive LEDs or relays.

The Figure 21 shows an example of the wiring needed when an LED is to be driven by each GPI output. The numbers on the left in the figure are the GPI output numbers and the pin-numbers for the outputs on the GPIO D-Type connector on the unit's rear panel.

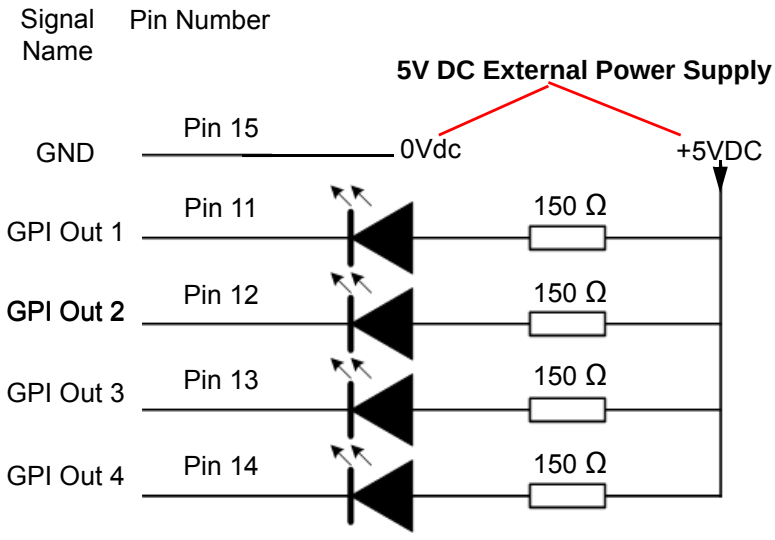

Figure 21 Wiring external LEDs on the GPI Outputs

Note:

- Vega-MV GPI outputs are open collector outputs and require external pull-up resistors of between 10kΩ and 100kΩ.
- An external 5V DC power supply is required to drive external equipment such as LEDs.

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4.5.4 Serial Comms Port Mode of Operation

The MV-NET card rear panel has a serial comms data port that can be configured for either RS232 or RS422 operation.

The serial port protocol is configured from the **Protocols** - **Serial Port** tab, see section 7.3.1.10.

The serial port's mode of operation (RS232 or RS422) is set by means of jumpers (CN8, CN9 and CN10) on the MV-NET card. Access to the jumpers requires the removal of the MV-NET card from the front of the unit.
Figure 22 shows the MV-NET card jumpers and Table 11 shows the jumper settings.

Note:

- See section 10.4 for details on opening the frame door.
- To maintain adequate cooling, the Vega-MV frame must not be run for more than two minutes with the front panel open.

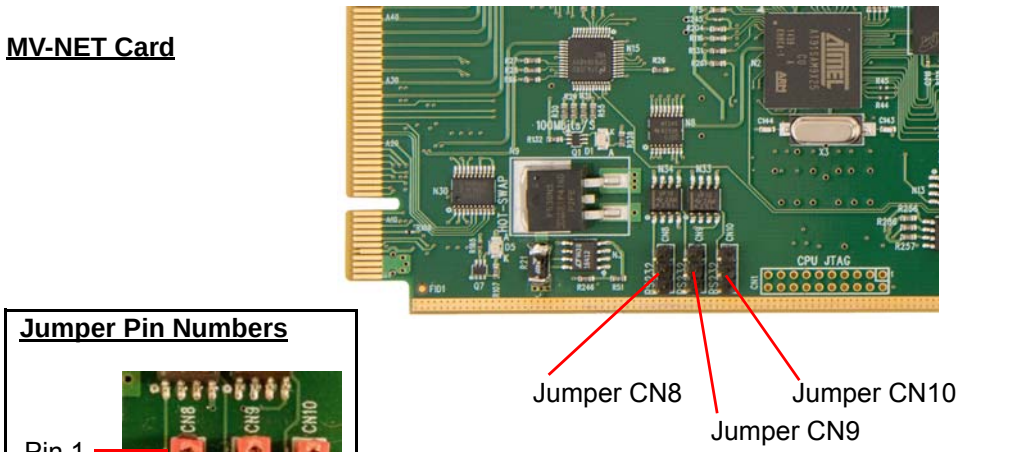

Figure 22 MV-NET Card Serial Comms Jumpers (The Jumpers Shown are set for RS232)

Jumper	Position 1-2	Position 2-3
CN8	RS232 (set in conjunction with CN9 and CN10)	RS422 (set in conjunction with CN9 and CN10)
CN9	RS232 (set in conjunction with CN8 and CN10)	RS422 (set in conjunction with CN8 and CN10)
CN10	RS232 (set in conjunction with CN8 and CN9)	RS422 (set in conjunction with CN8 and CN9)

Table 11 Network Card Jumper settings.

Important: Other MV-NET card settings and controls are for factory use only.

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4.5.5 Serial Comms Port Pin Assignments

The 9-pin serial connector on the MV-NET rear panel is configured using jumpers on the MV-NET card. See section 4.5.4 for jumper configuration details.

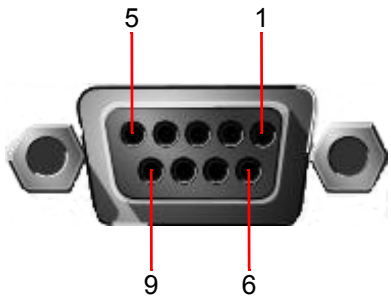

Figure 23 Serial Comms Connector

The following table gives the pin assignments for the serial comms connector for RS 232 and for RS 422 modes of operation.

Pin Number	RS232	RS422
1	-	GND
2	Tx	Rx-
3	Rx	Tx-
4	-	-
5	GND	-
6	-	-
7	-	Rx+
8	-	Tx+
9	-	-

Table 12 Serial Comms Connector Pin Assignment

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4.6 MV-CTL Card and Rear Module - Slot 1

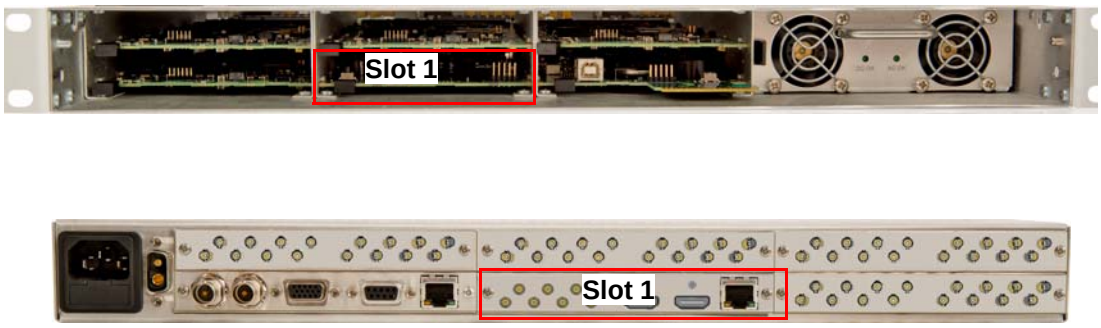

Figure 24 Vega-MV Slot 1

A Vega-MV contains one MV-CTL card in front slot 1 and a MV-CTL rear panel (MV-RMVCS8) fitted at the rear.

Note:

- Vega-MV frames are supplied fitted with the MV-CTL card and a rear panel. They are detailed here as spares items only.

4.6.1 MV-CTL Front Module - Slot 1

The MV-CTL card hosts the multiviewer control system and multiviewer video outputs. It also controls the router. The MV-CTL card is configured using a web browser via its RJ45 LAN port on the MV-CTL rear panel.

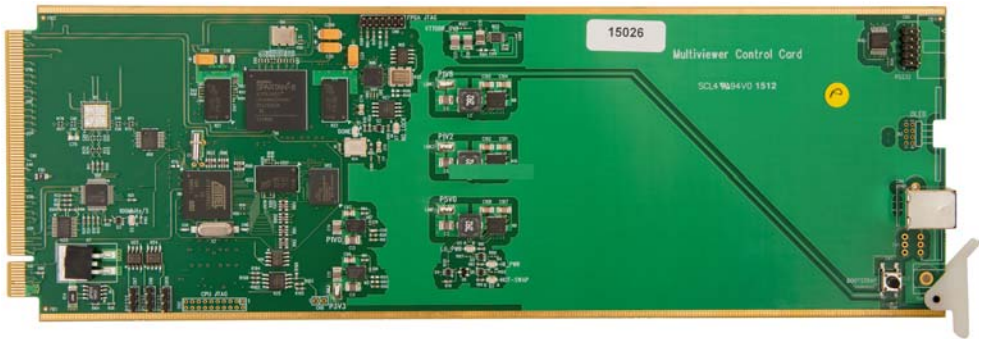

Figure 25 MV-CTL Card

4.6.2 MV-CTL Rear Panel Module (Part MV-RMVCS8) - Rear Slot 1

Each MV-CTL rear panel provides (see Figure 26):

- **Two Type-A HDMI (1.4a) outputs: (**HDMI 1 and HDMI 2)
  - For the main multiviewer displays.
  - Both HDMI outputs are independent.
  - Output resolutions supported are up to 4K60.
  - Each HDMI output carries 8 channels of audio.
- **Two 4-off HD-BNC SDI outputs:** (i.e. two quad-link, “Quad SDI Out” 1 and 2).
  - For copy multiviewer outputs.
  - Each copy output has 8 channels of embedded audio, identical to the HDMI audio channels.

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- One quad-link output is a copy of HDMI 1.
  (Four SDI HD-BNCs are “SDI Out 1-1”, “1-2”, “1-3” and “1-4”.)
- The other quad-link is a copy of HDMI 2.
  (Four SDI HD-BNCs are “SDI Out 2-1”, “2-2”, “2-3” and “2-4”.)
- Table 13 shows which SDI outputs of each group of four are active for each output standard. (For lower resolution outputs, some SDI outputs are inactive.)

- **One LAN port:**
  - For control and operation of the Vega-MV’s multiviewer and router, including the web browser control application.

Important: HDMI outputs support HDCP but this must be enabled from the **Module** menu, **Screens** tab to display HDCP encrypted sources, see section 7.3.1.2.

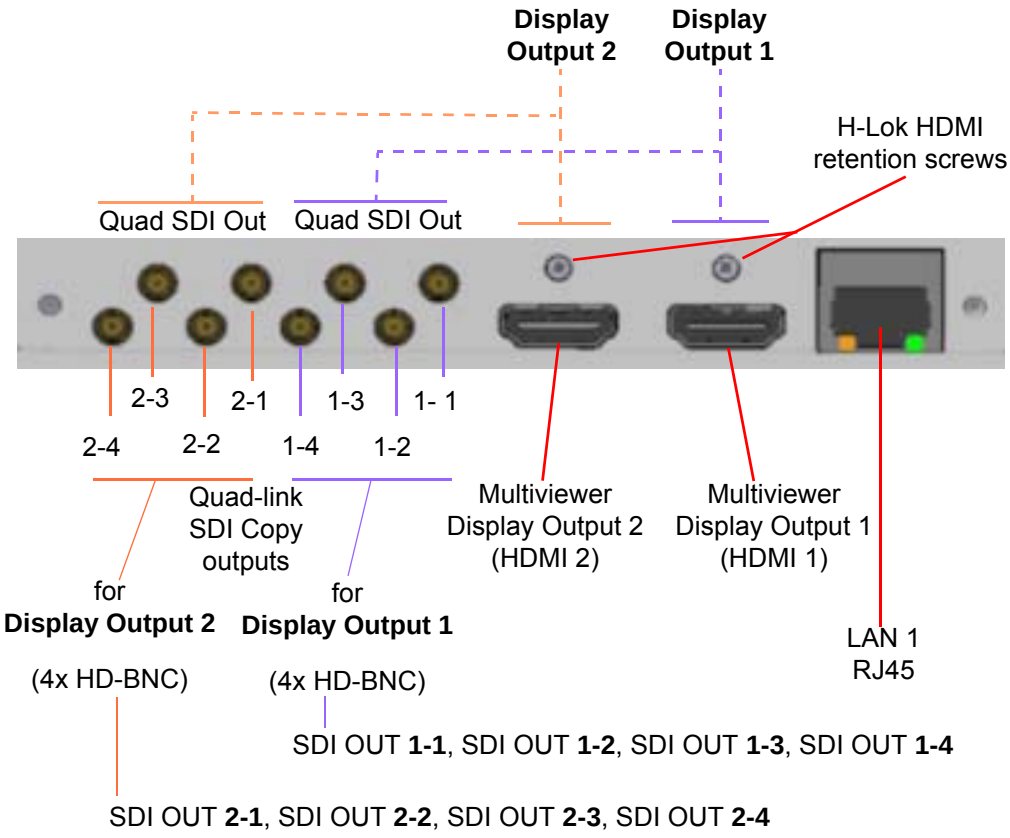

Figure 26 MV-CTL Rear Panel Module Connections

Note: HDMI Cable Retention:

See Section Section 5.4 “HDMI Cable Retention Options” on page 53 regarding safe securing of HDMI cables.

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Video Standard for Multiviewer Display	SDI Copy Output Four HD-BNC Connectors									
	Display Output 1					Display Output 2				
	HDMI 1	Quad SDI Out 1				HDMI 2	Quad SDI Out 2			
		1-1	1-2	1-3	1-4		2-1	2-2	2-3	2-4
SD or HD	Active	Active	-	-	-	Active	Active	-	-	-
1080p	Active	Active	-	-	-	Active	Active	-	-	-
XGA (1024x768@60Hz)	Active	-	-	-	-	Active	-	-	-	-
SXGA (1400x1050@60Hz)	Active	-	-	-	-	Active	-	-	-	-
UHD 4K25 RGB 4:4:4 (3840 x 2160 @ 25Hz)	Active	Active, 6G Dual-link [1]		-	-	Active	Active, 6G Dual-link [1]		-	-
UHD 4K30 RGB 4:4:4 (3840 x 2160 @ 30Hz)	Active	Active, 6G Dual-link [1]		-	-	Active	Active, 6G Dual-link [1]		-	-
UHD 4K50 YCbCr 4:2:0 (3840 x 2160 @ 50Hz)	Active	Active. 12G Quad-link [2]				Active	Active, 12G Quad-link [2]			
UHD 4K60 YCbCr 4:2:0 (3840 x 2160 @ 60Hz)	Active	Active. 12G Quad-link [2]				Active	Active, 12G Quad-link [2]			

Note 1: SMPTE ST 2081-10 6Gbps supported as dual-link.
Each dual-link lane carries the same number of audio channels as the associated HDMI output.

Note 2: SMPTE ST 2082-10 12Gbps (4:2:2) supported as quad-link.
Each quad-link lane carries the same number of audio channels as the associated HDMI output.

Table 13 Active SDI Copy Outputs

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4.7 MV-VIP4 Card and Rear Module - Slots 2 to 5

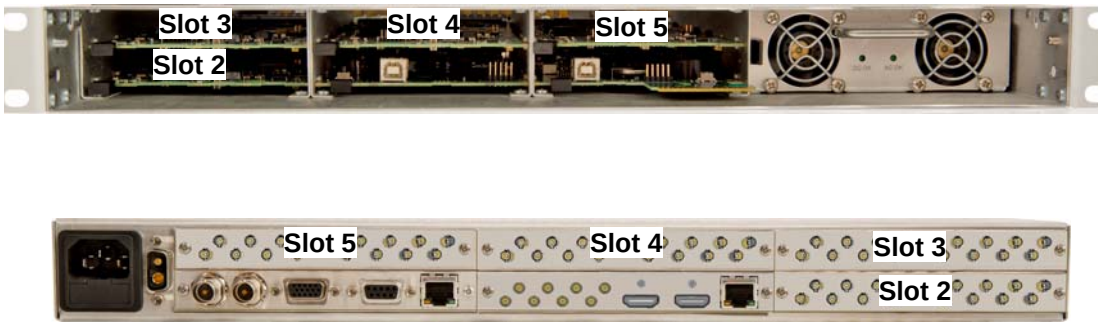

Figure 27 Vega-MV Slots 2 to 5

A Vega-MV contains two or four Video Input Processing Cards (MV-VIP4 cards) in front slots 2 to 5 and corresponding MV-VIP4 rear panel modules fitted at the rear.

Vega-16MV **contains:**

- Two MV-VIP4 cards.
- Two MV-RMVRO8 rear panel modules.

Vega-32MV **contains:**

- Four MV-VIP4 cards.
- Four MV-RMVRO8 rear panel modules.

The MV-VIP4 video processing card utilises the latest generation of scaling technology in order to be able to process inputs with up to 4K60 resolution. With the MV-VIP4 rear panel module fitted, the combinations of router video input and output types supported are:

- 8x SD/HD/3G-SDI digital video.
- 4x 4K30 6G-SDI digital video (4x dual-link 6G).
- 2x 4K60 via quad link 3G-SDI digital video (2x Quad-link 12G).
- 2x 4K60 12G-SDI digital video.

Note:

- Vega-MV cards and rear panel modules detailed here as spares items only.

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4.7.1 MV-VIP4 Front Modules - Slots 2 to 5

Note:

- MV-VIP4 cards can be hot-swapped.
- Changes to card load-out are automatically detected by the MV-CTL card.

An MV-VIP4 card is shown in Figure 28. Each MV-VIP4 card processes 8 multiviewer video inputs. Inputs are resized in scaler blocks and the overlay of audio and graphics information is performed inside each scaler. Each scaler receives real time control data from the main CPU on the MV-CTL card and from the MV-VIP4 card itself, in the case of embedded SDI audio.

To allow arbitrary layering of sources, each MV-VIP4 card has information about all of the tile positions, allowing each tile to be displayed as required and enabling picture overlay with complex borders.

Figure 28 MV-VIP4 card

Each MV-VIP4 card forms video tiles for both of the Vega-MV's multiviewer display outputs. Each card has two independent input and output cascade channels. Video tiles can be assigned to each channel according to the user multiviewer display configuration.

Two video mixers on each card combine cascaded channel inputs from an adjacent MV-VIP4 card with locally-resized video sources to produce two cascade outputs. The resulting mixed images are passed on to the next MV-VIP4 card where the process is repeated. Lastly, the cascaded outputs are passed to the MV-CTL card.

4.7.2 MV-VIP4 Rear Panel Modules (Part MV-RMVRO8) - Slots 2 to 5

The MV-VIP4 rear panel module has eight video inputs and provides eight router video outputs. These are presented on HD-BNC connectors. See Figure 29.

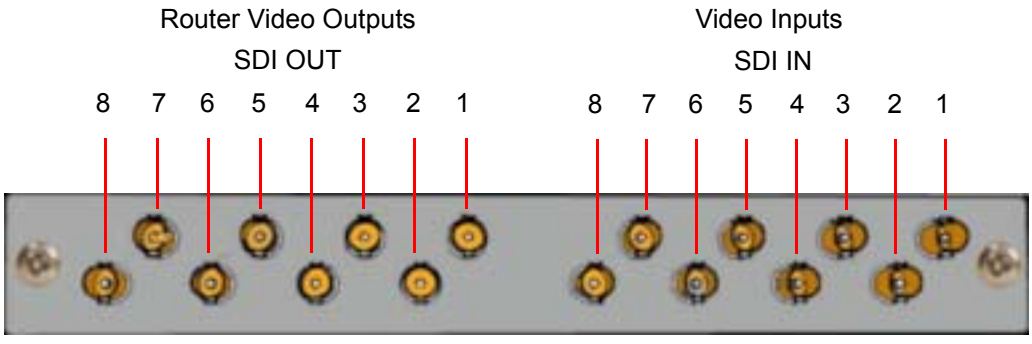

Figure 29 MV-VIP4 Rear Panel Module

Each MV-VIP4 rear panel module routes video inputs to video outputs and connects to MV-VIP4 Video Processing cards, providing multiviewer inputs.

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4.8 Dust Blanking Rear Panel (MV-BRP)

Note: Any unpopulated slots after the final card or router rear must be fitted with MV-BRP blanking plate rear panels to ensure that the Vega-MV frame continues to conform to EMC standards and to ensure adequate cooling.

Dust blanking rear panels must be fitted to any vacant slot in the frame to ensure that the Vega-MV frame continues to conform to EMC standards and to ensure adequate cooling.

Figure 30 Dust Blanking Rear Panel Connections

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4.9 Vega-MV Power Supply Connectors

- The IEC power inlet is the AC mains disconnection device for this unit.
- The frame must be disconnected and isolated from the mains input *and* from any DC backup power supply before undertaking maintenance.
- The frame must be disconnected from other product outputs before undertaking maintenance.
- Electric shock hazards exist if conductive instruments, neck chains or fingers etc. are placed within the unit or in close proximity of the input/output terminals/connectors.

4.9.1 Mains AC Supply Inlet

The Vega-MV frame has a single IEC power socket and the mains voltage (100/240 volts) will be auto-detected provided it is in the range 100-240V AC 50/60Hz.

A fuse is fitted under the pull-out flap in the IEC socket. A spare fuse is also located under the pull-out flap, see Figure 31

For UK only use,
a mains cable with a minimum rating of 10A, fitted with a 10A fuse is recommended.

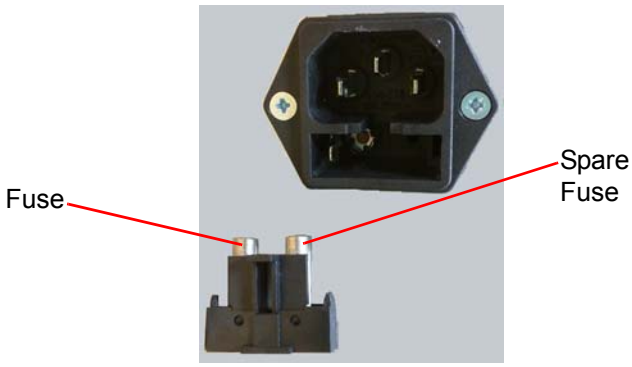

Figure 31 Vega-MV IEC Fuse Location

4.9.2 24V DC Backup Power Inlet

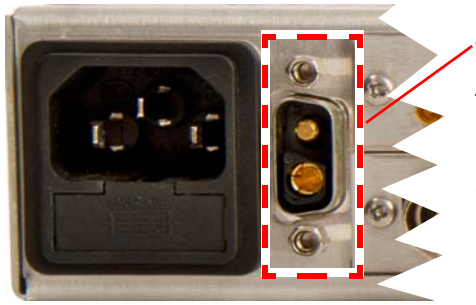

Figure 32 Vega-MV Frame Rear Panel DC Input Connector

WARNING:

Use only the MV-EXTPSU3 backup power supply and the supplied DC power cables.

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5 Vega-MV Installation

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5.7 Powering Up (Unit Start Up) page 57

- Refer to Section 2 on page 8 for safety information.
- Check that all cards and the power supply are correctly seated in the frame before connecting power to the unit.
- The installation and maintenance of the Vega-MV unit and any associated equipment must be carried out by persons suitably qualified to work with equipment which may be connected to the mains supply.
- The mounting and installation of the unit must be arranged by the user to comply with all current local safety regulations.

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5.1 Ventilation

5.1.1 Vega-MV

Ventilation is assisted by cooling fans located on the front panel of the Vega-MV unit. Figure 33 shows the locations of the fans, behind the front of the frame.

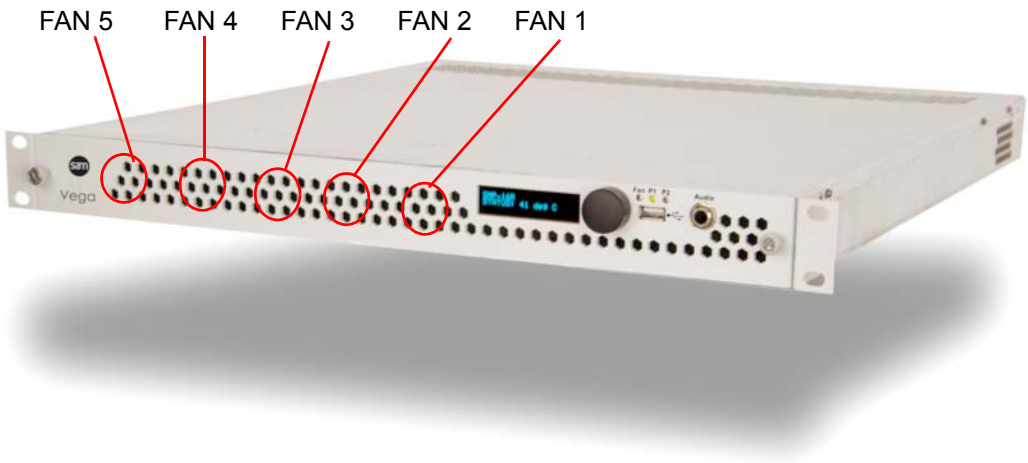

Figure 33 Cooling Fan Locations behind Frame Front Panel

- Maximum operating ambient temperature must be less than 40°C.
- The inlet and outlet vents must not be obstructed and should be periodically cleaned and kept free from the build-up of dust.
- To maintain adequate cooling, the Vega-MV frame must not be run for more than two minutes with the front panel open.
- For ventilation purposes, there must be a gap of at least 50mm (2 inches) for the front inlet fans and rear outlet grilles.

Air is pulled in through the ventilation inlets in the front panel, circulated through the unit and expelled through the rear ventilation outlets, see Figure 34.
Ventilation outlets are located on the top and left side of the unit.

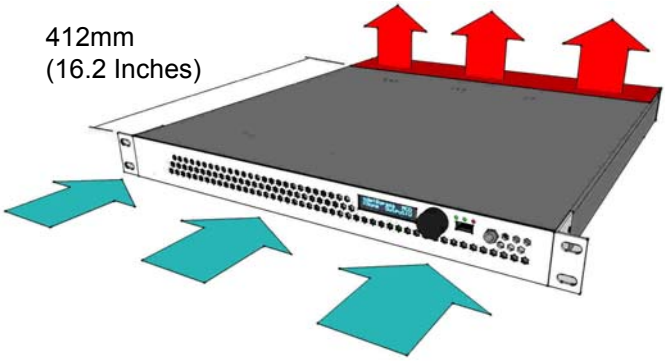

Figure 34 Vega-MV Ventilation Inlets and Outlets

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5.1.2 MV-EXTPSU3 Backup Power Supply

Ventilation air flow for the MV-EXTPSU3 backup power supply is front-to-back. See Section 11.3 “Ventilation” on page 196.

- Maximum operating ambient temperature must be less than 40°C.
- The inlet and outlet vents must not be obstructed and should be periodically cleaned and kept free from the build-up of dust.
- For ventilation purposes, there must be a gap of at least 50mm (2 inches) for the front air inlet and rear air outlet grilles.

5.2 Rack Mounting

- Do not rack-mount the Vega-MV frame using only the front rack ears.
- If installing equipment immediately above or below the Vega-MV unit it is essential to ensure that the ventilation outlets are not obstructed. For ventilation details see section 5.1.
- For ventilation purposes, there must be a gap of at least 50mm (2 inches) for the front inlet fans and rear outlet grilles.
- You must allow at least 100mm (4 inches) of space at the rear of the frame for cables and connections.

The 1U Vega-MV frames can be installed in 19” bays.

5.2.1 Before Rack Mounting

Vega-MV frame notes:

- The Vega-MV1RU frame has a depth of approximately 511mm (20.1 Inches), including connectors.
- Exhaust grilles are located on the upper and left side panels at a depth of approximately 412mm (16.2 Inches) from the front panel.
- Make sure that sufficient space is available for the 1 RU frame.
- See Section 5.1 for ventilation details.

5.2.2 Mounting in a Rack

When rack-mounting the frame:

1. Place the unit on a suitably specified and installed rack shelf.
2. Secure the unit into the rack using the front ears using the correct rack mount screws or bolts. (See Figure 35.)

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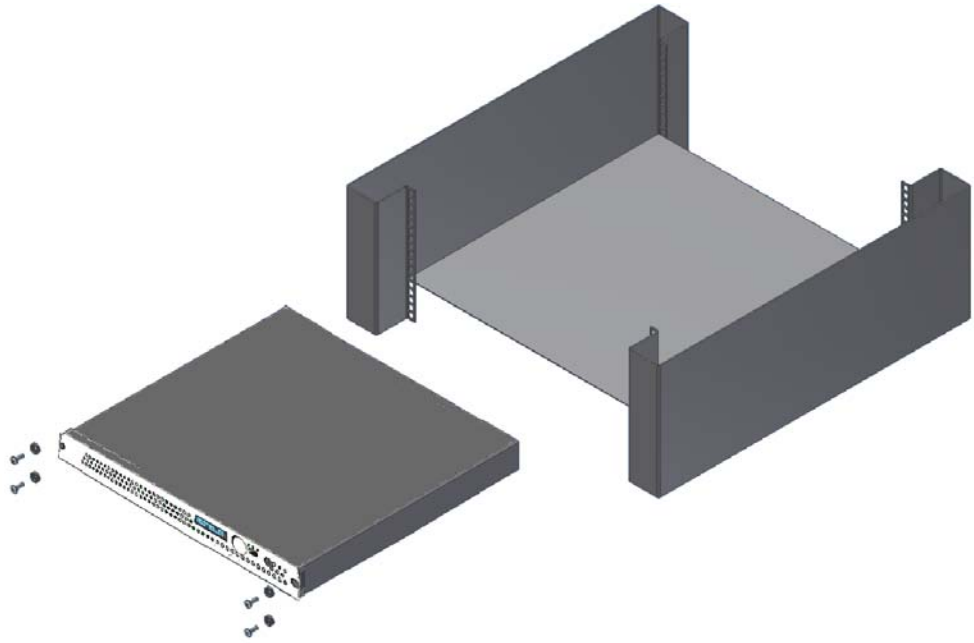

Figure 35 Mounting the Vega-MV frame in a 19” Rack

5.2.3 Before Powering

Every new Vega-MV chassis is fitted with card retaining features. These are designed to keep the cards in place, even when the chassis is subject to harsh movements. However, if these have been removed to access cards and not replaced, cards may have jumped out of their mating connectors.

Before powering-up any newly installed or recently moved frames for the first time:

1. Open the frame front panel. (See section 10.4 and for frame door instruction.)
2. Check the PSU and all cards are fully inserted.
3. Close the frame front panel.

5.3 FCC Compliance

In order to comply with FCC/CFR47: Part 15 regulations, it is necessary to use the following specification of cable assemblies for HDMI interconnections:

- For HDMI to HDMI use a high-quality triple-screened cable assembly with integrated ferrite suppression at both ends of the cable,
  for optimum RF/EMI integrity in compliance with HDMI specifications.

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5.4 HDMI Cable Retention Options

Vega-MV units are fitted with Type A HDMI sockets. Unlike BNC connectors, HDMI connectors are typically non-locking and can be easily dislodged when fitted. To overcome this problem, all Vega-MV HDMI rear connectors have a number of features designed to allow the HDMI connectors to be securely retained.

Each HDMI input/output has an M3 fixing point that secures the HDMI socket and HDMI connector to the rear panel. This ensures the sockets have high mechanical strength and are not likely to be dislodged from the PCB if the mating HDMI connector is subjected to excessive sideways force. The retention system also prevents the HDMI connector from being accidently disconnected.

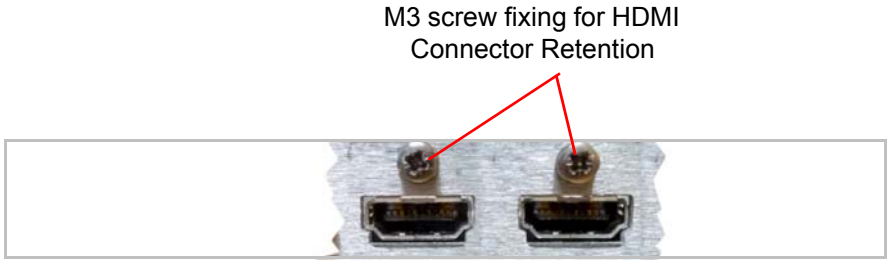

Figure 36 Example HDMI Connectors on a Rear Panel Module

5.4.1 HDMI with Integral Screw Fitting

Important:

- To use this solution the integral locking screw on the HDMI cable connector must be M3 and located 8mm (± 0.25mm) from the centre-line of the HDMI connector.

  Maximum thread length 15mm. Any longer will result in damage to the Vega-MV frame.

1. Remove the M3 screw fitted to the HDMI socket on the unit's rear.

Figure 37 Example HDMI Connector with Integral Screw Fitting

2. Plug the HDMI connector into the HDMI socket and finger tighten the thumbscrew to fasten the connector to the rear panel.

Note: The thumbscrew should only be finger tight and must not be overtightened.

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5.4.2 HDMI Connector without a Fixing System

HDMI rear panels are supplied with a bracket and cable tie for each HDMI port. The bracket is used to fasten standard HDMI connectors to the rear panel. The design of the bracket enables many different HDMI connector designs to be secured

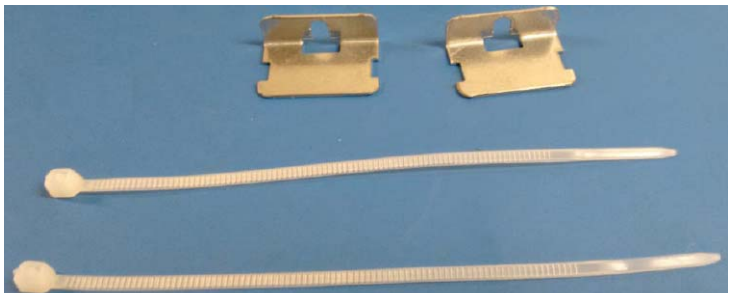

Figure 38 Brackets and Cable Ties

1. Plug the HDMI connector into the HDMI socket.
2. Loosen the M3 screw and put the bracket over the screw so that it rests lightly on the top of the HDMI connector.

Important: Always use the supplied M3 screw. If a screw is lost it can be replaced by an M3 screw with a maximum length of 15mm, Any longer will result in damage to the unit's frame.

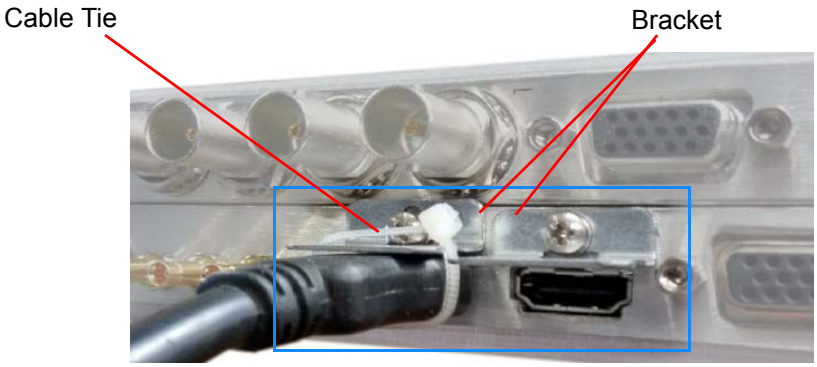

Figure 39 HDMI Connector Attached to the Bracket with a Cable Tie

3. Tighten the screw so the bracket is firmly attached to the rear panel.

Note: Do not overtighten the screw.

4. Use the cable tie to secure the HDMI connector to the bracket.

5.4.3 HDMI Connector with Friction Lock

Important: The M3 screw must remain fitted to the rear panel to ensure that the unit's frame continues to conform to EMC standards.

1. Use the friction lock as instructed by the connector supplier.

Figure 40 Example HDMI Connectors with Integral Friction Lock

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5.5 Vega-MV Power Supplies and Fuses

This equipment may have more than one power supply (AC Mains and 24V DC backup). To reduce the risk of electrical shock, disconnect all the power supply cords before servicing.

Vega-MV frames have a single IEC mains input socket on the rear panel for normal operation and a single 24V DC power connector that is connected to an MV-EXTPSU3 unit if a backup power supply is required.

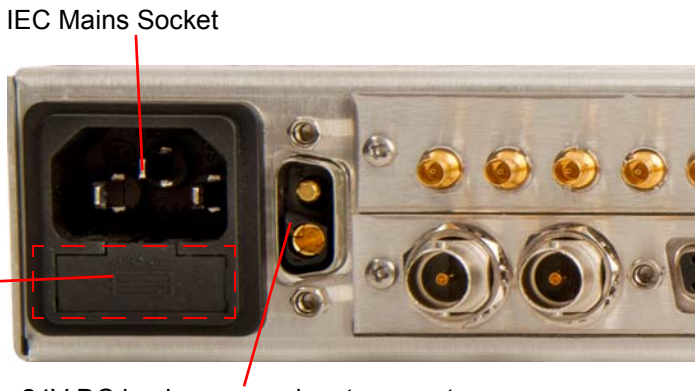

Figure 41 Vega-MV Frame Rear Panel Power Connectors

When replacing a fuse, always use the correct fuse type and value.

5.6 Vega-MV Frame Power Supplies

- The IEC power inlet is the AC mains disconnection device for this unit.
- The frame must be disconnected and isolated from the mains input *and* from any DC backup power supply before undertaking maintenance.
- The frame must be disconnected from other product outputs before undertaking maintenance.
- Electric shock hazards exist if conductive instruments, neck chains or fingers etc. are placed within the unit or in close proximity of the input/output terminals/connectors.

5.6.1 Mains AC Supply Power Socket

The Vega-MV frames have a single IEC power socket and the mains voltage (100/240 volts) will be auto detected provided it is in the range 100-240V AC 50/60Hz.

A fuse is fitted under the pull-out flap in the IEC socket. A spare fuse is also located under the pull-out flap, see Figure 42

For UK only use,
a mains cable with a minimum rating of 10A fitted with a 10A fuse is recommended.

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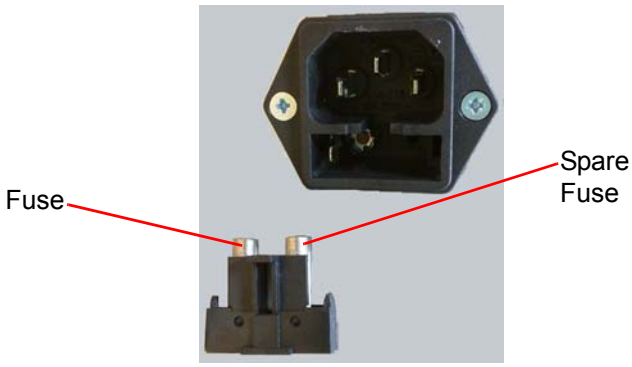

Figure 42 Vega-MV IEC Fuse Location

5.6.2 DC Backup Power Input Connector

24V DC backup power input connector for use with the MV-EXTPSU3 backup power supply.

See Section 11 “MV-EXTPSU3 External Power Supply Shelf” on page 194.

Figure 43 Vega-MV Frame Rear Panel DC Input Connector

WARNING:

Use only the MV-EXTPSU3 backup power supply and the supplied DC power cables.

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5.7 Powering Up (Unit Start Up)

After power is applied to the unit, the unit starts up and carries out a boot cycle in approximately 70 seconds.

Figure 44 Starting Booting

Front panel during unit start up:

Front panel OLED display during start up is outlined in Table 14.

	Front Panel OLED Display	Fan, P1 and P2 LEDs	Description
1.	LOADING. . .	LEDs are all On	Booting
2.	Boot complete	LEDs reflect Fan and PSU status.	Boot stage complete
3.	DETECTING HARDWARE. . . STATUS: OK	LEDs reflect Fan and PSU status.	Initializing
4.	DETECTING HARDWARE. . . XXXXXXXXX	LEDs reflect Fan and PSU status. See **Note 1**.	Initializing
5.	VEGA 16 XXXXXXXXX VEGA 32 XXXXXXXXX	LEDs reflect Fan and PSU status. See **Note 1**.	Hardware etc detected. Start up complete.

Note 1:
Where:

XXXXXXXXX is the General Status Display message, see Section 6.1.1 “General Status Display” on page 59.

Table 14 Front Panel During Unit Start Up

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HDMI Output during unit start up:

The HMDI outputs show network setting information during unit start up. See Figure 45.

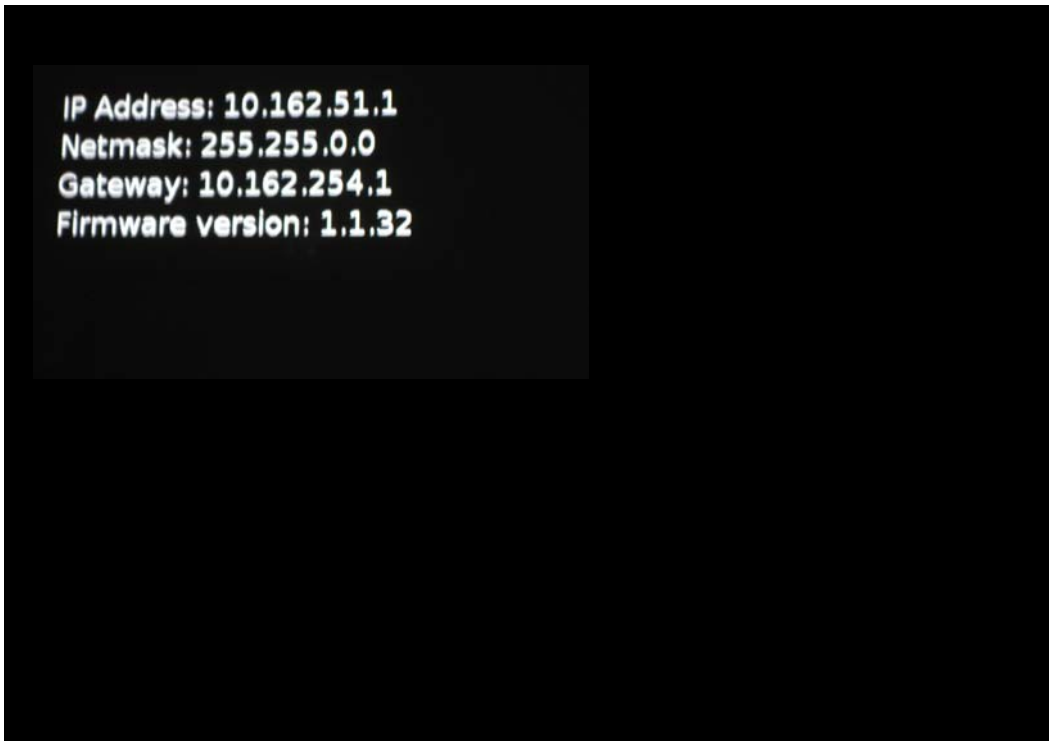

Figure 45 HDMI Output During Unit Start Up

After starting up:

After starting up, the OLED display defaults to showing a general status display, similar to that shown in Figure 46.
The bottom display line changes to show other system status. (See Section 6.1.1 “General Status Display” on page 59.)

Figure 46 Start Up Complete (Vega-32MV shown)

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6 Front Panel Operation

6.1 Front Panel

A rotary knob and alpha-numeric OLED display is provided on the Vega-MV front panel to access settings and unit status details. Three LED indicators report power supply and fan status, see Section 4.2.1 "Front Panel Status LEDs". A stereo audio headphone monitor socket (phono 6.35 mm output jack socket) and a USB-2 socket are also present.

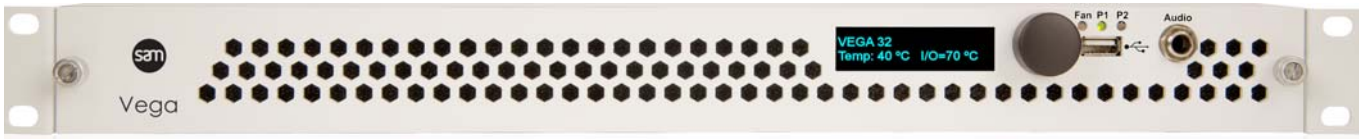

Figure 47 Vega-MV Front Panel

6.1.1 General Status Display

Once the Vega-MV unit has started up, the OLED display defaults to a general status display, The top line of the display identifies the unit model (For example “VEGA 32”).

The bottom display line changes every few seconds and shows unit temperature, genlock, LTC and fan status information. See Figure 48 and Table 15.

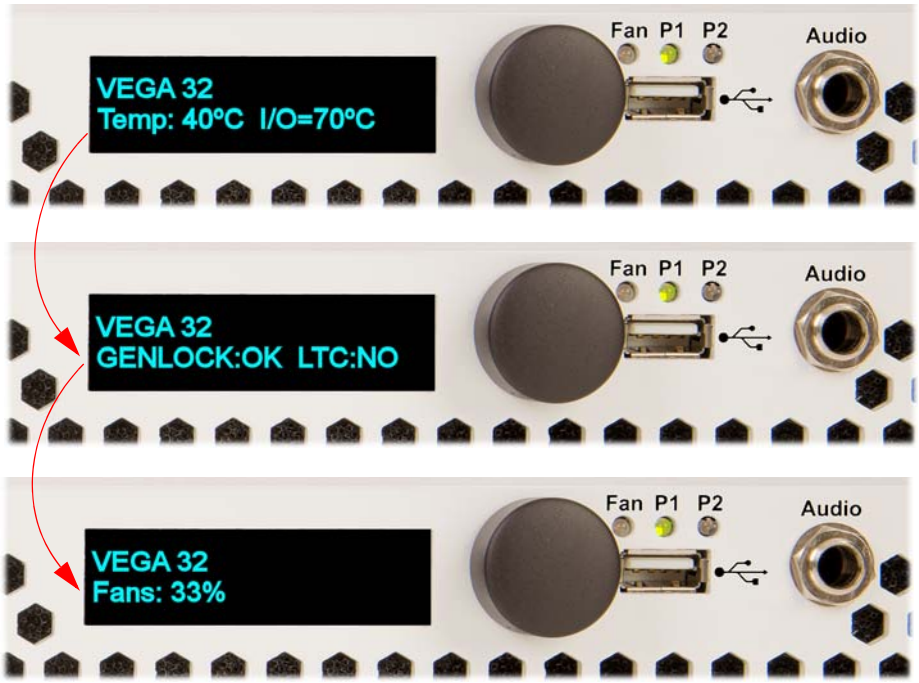

Figure 48 General Status Display on OLED Display (Vega-32MV shown)

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Display Screen: Setting	Description
Temp:	Shows the internal temperature measured within the Vega-MV unit, on the MV-NET card. (ºC) Typical value = 40ºC
I/O:	Shows the maximum value of internal temperatures measured within the Vega-MV unit, on any card. (ºC) Typical value = 75ºC
Genlock:	Unit's genlock and reference input status.
OK	Reference Input signal is present and unit's genlock is locked.
NO	Reference input not detected or unit's genlock not locked.
LTC:	Unit's LTC input status.
OK	LTC input detected and unit locked to LTC.
NO	LTC input not detected or unit not locked to LTC.
Fans:	Fans status:
Second display line, speed:	
	The speed of the fans is shown as a nominal percentage of the fan's full speed.
0%	Fans at idle speed. I.e. running with minimal air flow.
33%	Fans running at one third of full speed.
100%	Fans running at full speed.
Third display line, fault:	
	For a fan fault, the fan number is shown:
Fan N Fault	Where N is the fan number, 1 to 5. For example, "Fan 3 Fault". (See Figure 49 for fans locations.)

Table 15 General Status Display Screen - Bottom Line

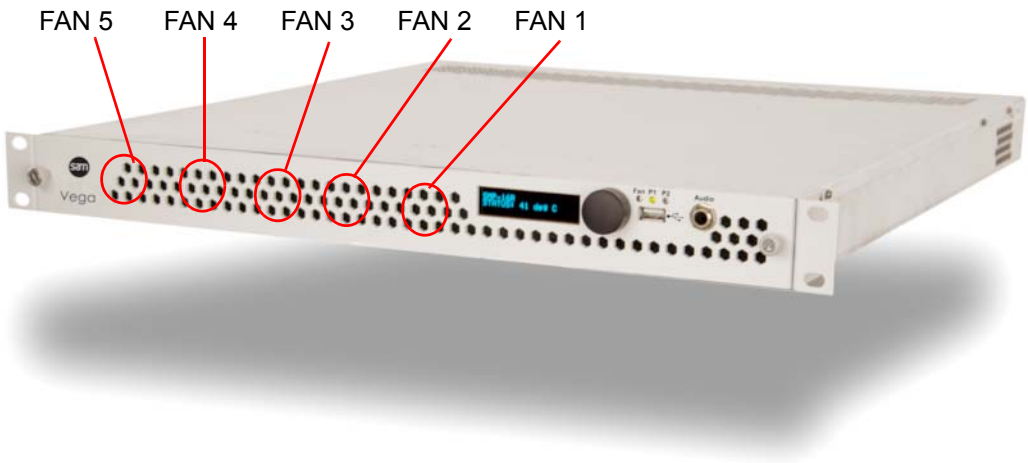

Figure 49 Fan Numbers

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6.2 Front Panel Operational Settings Screens

By default the OLED display will show the general status display, providing frame status, temperature and alarm information for the frame, see Section 6.1.1 "General Status Display" on page 59.

Figure 50 Example General Status Screen on OLED Display with Knob

6.2.1 Accessing Other Unit Operating Settings

The rotary knob is used in conjunction with the OLED display to view unit operating settings, including IP address and network settings. The screens are described below. See section 6.2.2 for information on changing IP address details using the rotary knob.

Note: When operating the display, any period of inactivity of more than 30 seconds will return the display to the general status display.

To access other display screens of information from the general status display on the OLED display:

1. When the OLED display is displaying the general status display, rotate the knob clockwise.

   This accesses another display screen.
   (After a unit start up, the screen shown is the Audio Monitoring volume level screen.)

2. Rotate the knob further clockwise or anti-clockwise to access other screens. These other display screens are cycled through.

The cyclic sequence of operating setting screens is shown in Figure 51.

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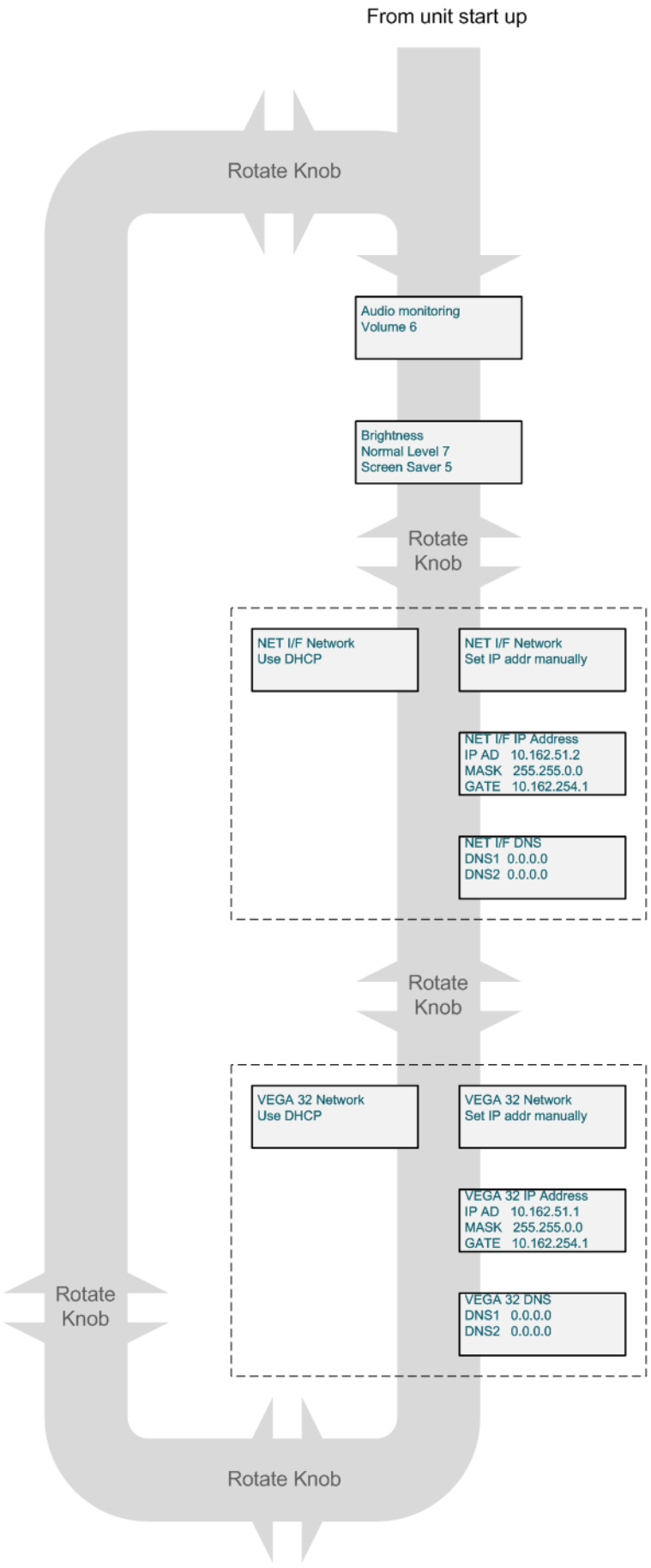

Figure 51 Cyclic Operating Setting OLED Screens

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Display Screen: Setting	Description
Audio Monitoring:	
Volume	Audio volume level at the audio monitoring socket on unit front panel.
Brightness:	
Normal Level	OLED screen brightness.
Screen Saver	OLED screen brightness in screen saver mode. Screen saver mode is entered after a few seconds of inactivity.
NET I/F Network:	Select network setting mode for the unit's MV-NET card:
Set IP addr manually	Select to enable manual setting up of the Vega-MV unit's MV-NET card network setting.
Use DHCP	Select to use DHCP for the Vega-MV unit's MV-NET card network setting.
NET I/F IP Address:	(Screen visible in NET I/F 'Set IP addr manually' mode.)
IP AD	IP address of port LAN 0.
MASK	Sub-net mask.
GATE	IP address of gateway.
NET I/F DNS:	(Screen visible in NET I/F 'Set IP addr manually' mode.)
DNS1	IP address of DNS server.
DNS2	IP address of second DNS server.
VEGA 32 Network:	Select network setting mode for the Vega-MV unit.
Set IP addr manually	Select to enable manual setting up of the Vega-MV unit's MV-NET card network setting.
Use DHCP	Select to use DHCP for the Vega-MV unit's MV-NET card network setting.
VEGA 32 IP Address:	(Screen visible in VEGA 32 'Set IP addr manually' mode.)
IP AD	IP address of port LAN 1.
MASK	Sub-net mask.
GATE	IP address of gateway.
VEGA 32 DNS:	(Screen visible in VEGA 32 'Set IP addr manually' mode.)
DNS1	IP address of DNS server.
DNS2	IP address of second DNS server.

Table 16 Operational Settings Screens

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6.2.2 Editing Settings

The rotary knob is used in conjunction with the OLED display to change a setting. The editing process is described below in Table 17.

Note: Pausing for more than 30 seconds at any point in the setting process will return the OLED display to the default general status display.

To Edit a parameter:	Example OLED Screen Text
1. Rotate the rotary knob to display the required operational setting screen.	
2. When the screen to be updated is displayed, press the rotary knob once. The first editable parameter on the screen will be selected and highlighted.	**Brightness** **Normal Level 7** **Screen Saver 4**
3. Rotate the rotary knob to move the highlighting to select and highlight the parameter to be changed.	**Brightness** **Normal Level 7** **Screen Saver 4**
4. Press the rotary knob to select the highlighted parameter for editing. The parameter value flashes to show that it can be edited.	**Brightness** **Normal Level 7** **Screen Saver 4**
5. Rotate the rotary knob to change the parameter value.	**Brightness** **Normal Level 7** **Screen Saver 5**
6. When the required value is shown, press the rotary knob to enter the new value. The parameter value stops flashing and becomes highlighted; its value has now been changed.	**Brightness** **Normal Level 7** **Screen Saver 5**
To edit another parameter on the same screen: 7. Rotate the rotary knob to highlight the next parameter to be edited on the current screen. 8. Repeat steps 4. to 6. to change the parameter.	
To move to another screen and parameter: 9. Quickly press the rotary knob twice time to exit editing mode. 10. Rotate the rotary knob to display the next required operational setting OLED screen. 11. Repeat steps 2. to 6. to change the parameter.	
To exit editing: 12. Quickly press the rotary knob a second time to exit editing mode.	**Brightness** **Normal Level 7** **Screen Saver 5**
Note: If network settings have been changed, restart the unit for new network settings to take effect.	

Table 17 Editing a Setting

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Example 1: Switching between DHCP and Manual IP setting

The following example demonstrates how to change settings from DHCP to a manual IP address.

To Switch from Using DHCP to Manual IP Settings:	Example OLED Screen Text
First change the IP address mode:	
1. Rotate the rotary knob to display the **VEGA 32 Network** operational setting screen. Note: In this case, the screen contains only one editable parameter. The (single) parameter value does not need selecting (highlighting).	**VEGA 32 Network** **Use DHCP**
2. Press the rotary knob once. The editable parameter value on the screen flashes on/off.	**VEGA 32 Network** **Use DHCP**
3. Rotate the rotary knob to change the parameter value to 'Set IP addr manually'.	**VEGA 32 Network** **Set IP addr manually**
4. Press the rotary knob to select the new value. The parameter value stops flashing.	**VEGA 32 Network** **Set IP addr manually**
5. Press the rotary knob quickly twice, to exit edit mode.	
Now edit the IP address settings:	
6. Rotate the rotary knob to display the **VEGA 32 IP Address** operational setting screen.	**VEGA 32 IP Address** **IP ADD 192.168.0.121** **MASK 255.255.255.0** **GATE 192.168.0.1**
7. Press the rotary knob once to enter select mode. The first editable parameter on the screen is highlighted.	**VEGA 32 IP Address** **IP ADD 192.168.0.121** **MASK 255.255.255.0** **GATE 10.162.254.1**
8. Press the knob to enter edit mode. The highlighted parameter flashes.	**VEGA 32 IP Address** **IP ADD 192.168.0.121** **MASK 255.255.255.0** **GATE 192.168.0.1**
9. Rotate the knob to change the parameter value. Press the knob when the required new value is shown. The parameter value stops flashing.	**VEGA 32 IP Address** **IP ADD 10.168.0.121** **MASK 255.255.255.0** **GATE 192.168.0.1**
10. Rotate the rotary knob to move the highlighting to another parameter.	**VEGA 32 IP Address** **IP ADD 10.162.0.121** **MASK 255.255.255.0** **GATE 192.168.0.1**
11. Repeat steps 8. and 9. to change the parameter value.	
Note: Restart the unit for new network settings to take effect.	

Table 18 Editing a Setting

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To Switch from Using DHCP to Manual IP Settings:	Example OLED Screen Text
12. Repeat steps 8. to 10. change other parameter settings (Eg MASK and GATE).	**VEGA 32 IP Address** **IP ADD 10.162.51.1** **MASK 255.255.0.0** **GATE 10.162.254.1**
13. Press know quickly twice to exit edit mode.	
14. Rotate knob to move on to another screen page.	
15. Change other parameters (eg DNS1 and DSN2) in a similar way.	
Note: Restart the unit for new network settings to take effect.	

Table 18 Editing a Setting

Restart the unit for new network settings to take effect. The unit will start up with the new manually IP Address settings.

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7 Web Interface

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7.1 The Web Interface

The Vega-MV unit is configured via a browser using web pages hosted by the Vega-MV unit's MV-CTL card.

Note: Java must first be installed on the PC or Mac that is to be used. This is available as a free download from: *www.java.com/en/download/manual.jsp*

Note: **Java Certificates:**

Java certificates should not need to be imported, but if the certificate is not already on the system being used, then Java will ask for permission to continue before starting the applet (the certificate required is stored in the Vega-MV unit).
If 'Run' is selected without ticking the box for 'Always trust content from this publisher', then the certificate will not be installed, but the applet will run.
It is best to tick the box so that the certificate is installed to avoid seeing the same message next time the browser is to be accessed (assuming that the same system is to be used).

Ensure that the MV-CTL card rear ethernet connector has a LAN connection (see section 4.6 for the MV-CTL RJ45 LAN connector location).

Note:

- The default IP address of the MV-CTL card fitted in the frame is 192.168.0.121.
- Depending on the system being used to access the web interface, one or more factors such as Windows security, third party security products, firewalls and browser security settings may prevent the applet loading from the Vega-MV unit. For example, if using Microsoft Internet Explorer 7, the security setting should be no higher than 'Mid'.
- If Java platform 1.7.0_21 or later is being used Java will try to connect to the internet to check if the application security certificate has been revoked. If the Vega-MV unit is not connected to the internet the check will timeout after 30 Seconds and a dialog will be displayed saying the certificate cannot be verified with an option to confirm that the application should still be run. Confirm and the Java application will be launched. See Appendix D.3 for full details and also how to avoid this delay if the Vega-MV unit is never connected to the internet.
- If the Java applet reports an error the computer may be trying to use an incompatible cached version of the MV-CTL applet.
  See "Why does the Java applet report an error or say 'Program Will Not Load' when launching the web interface?" in Appendix D.3 for the solution.

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To access the Vega-MV web interface:

1. Enter the Vega-MV unit's IP Address (i.e. the IP address configured for the unit's MV-CTL card) into a browser.
(See Section 8.3 "Initial Network Setup" on page 152 for default IP address.)

2. A large SAM logo splash screen appears and then the unit's Java application launches into a new window and the main screen of the web interface is shown. See Figure 52.

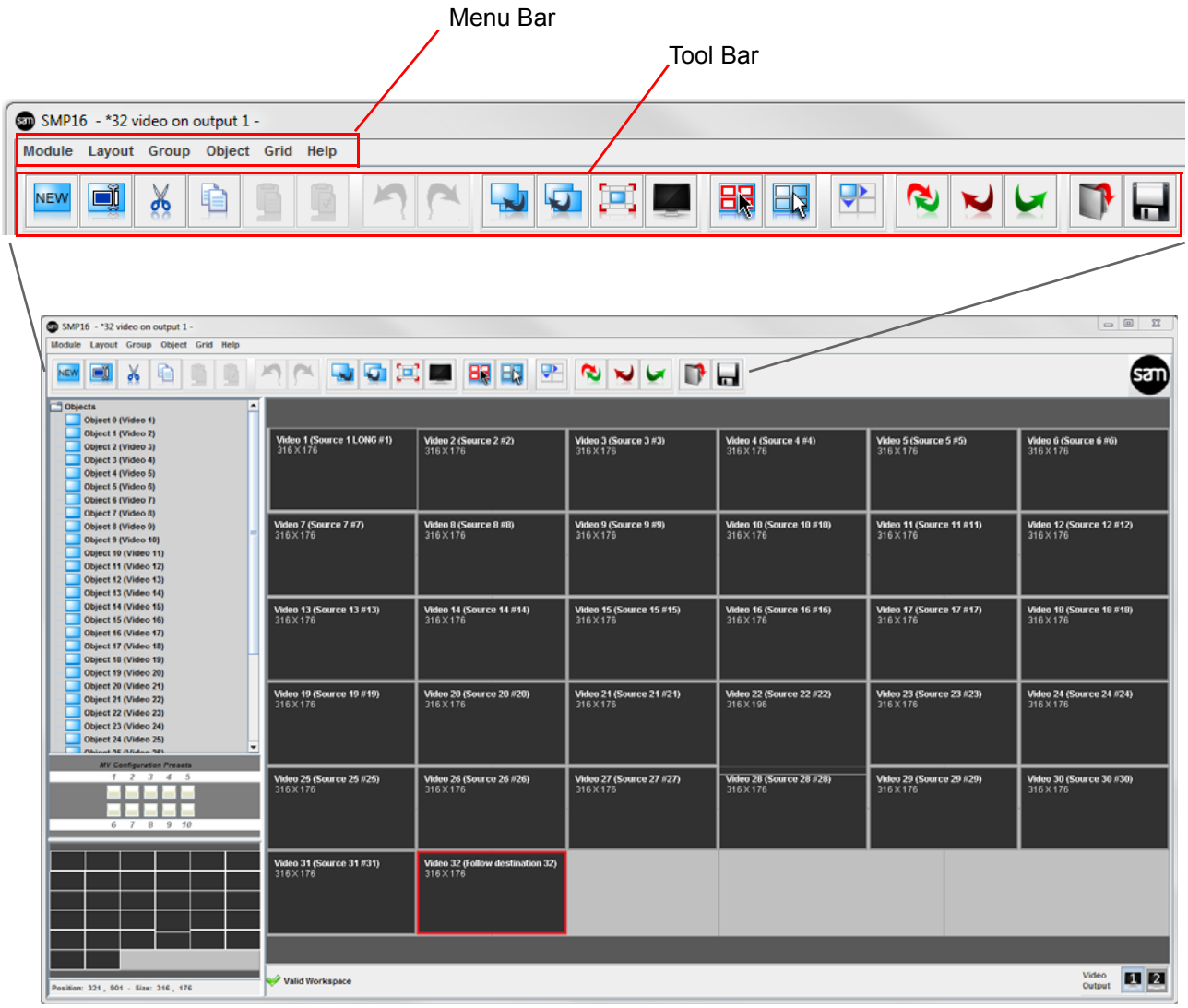

Figure 52 Vega-MV Web Interface Main Screen

The Vega-MV Web interface main screen is for multiviewer configuration and control (see Section 7.2 "Workspace and the Web Interface" on page 72).
Other functions are accessible via menu controls.

Settings for the Vega-MV and for multiviewer on-screen objects can be accessed from the menu bar or by using the buttons on the main toolbar.

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7.1.1 Menu Bar

Menu bar items:

- **Module** - The Module Menu is used to configure global settings for the Vega-MV.
  See Section 7.3 "Module Menu" on page 78.

  The menu contains various configuration settings and actions, including:

  - **Setup Module** - Opens the Module Properties dialog of a selected tile object.
    See Section 7.3.1 "Setup Module - Module Properties Dialog" on page 80.
  - **Setup selected video source** - Opens the Source Properties dialog of a selected tile object.
    See Section 7.3.2 "Setup Selected Video Source - Source Properties Dialog" on page 102.
  - **Audio meter properties** - Opens the Audio Metering Properties dialog used to set the audio levels for audio meters.
    See Section 7.3.4 "Setup Audio Meter Properties" on page 110.
  - **SDI I/O Router** - Opens the SDI I/O Router dialog.
    See Section 7.3.5 "SDI I/O Router Dialog (for the Internal Router)" on page 111.
  - **Set Time** - Opens the Set Time dialogue to adjust the clock and date settings.
    See Section 7.3.6 "Set Time" on page 114.
- **Layout** - The Layout Menu allows multiviewer on-screen layouts to be created, saved, deleted. See Section 7.4 "Layout Menu" on page 116.
- **Group** - The Group Menu allows on-screen objects to be selected as a group.
  See Section 7.5 "Group Menu" on page 118.
- **Object** - The Object Menu allows multiviewer on-screen tile settings to be edited.
  See Section 7.6 "Object Menu" on page 119 and its various sub-sections.
- **Grid** - The Grid Menu enables a grid to be used when editing a multiviewer workspace.
  See Section 7.7 "Grid Menu" on page 147.
- **Help** - The Help Menu shows the current status and firmware revisions of the unit.
  See Section 7.8 "Help Menu" on page 148.

7.1.2 Main Tool Bar

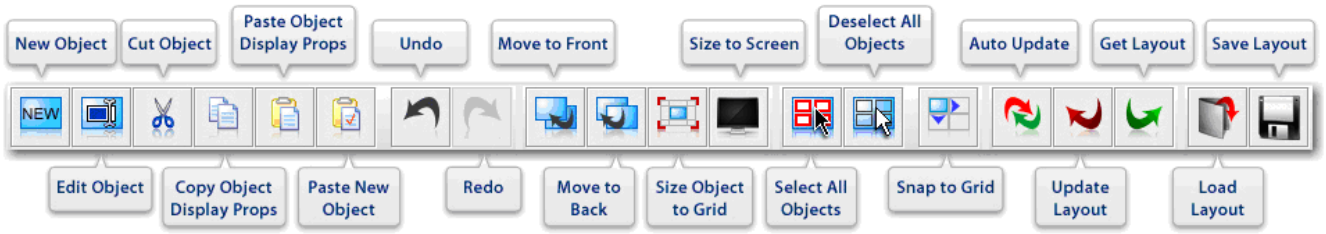

Figure 53 Toolbar with Tool tips.

Note: Some functions are only available from the toolbar.

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7.1.3 Lost Connection

During a unit restart, connection will be lost between the web interface and the unit. Figure 54 shows the message that appears at the web interface.

Figure 54 Remote Communication Error

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7.2 Workspace and the Web Interface

Figure 55 shows the key features of the main screen of the web interface.

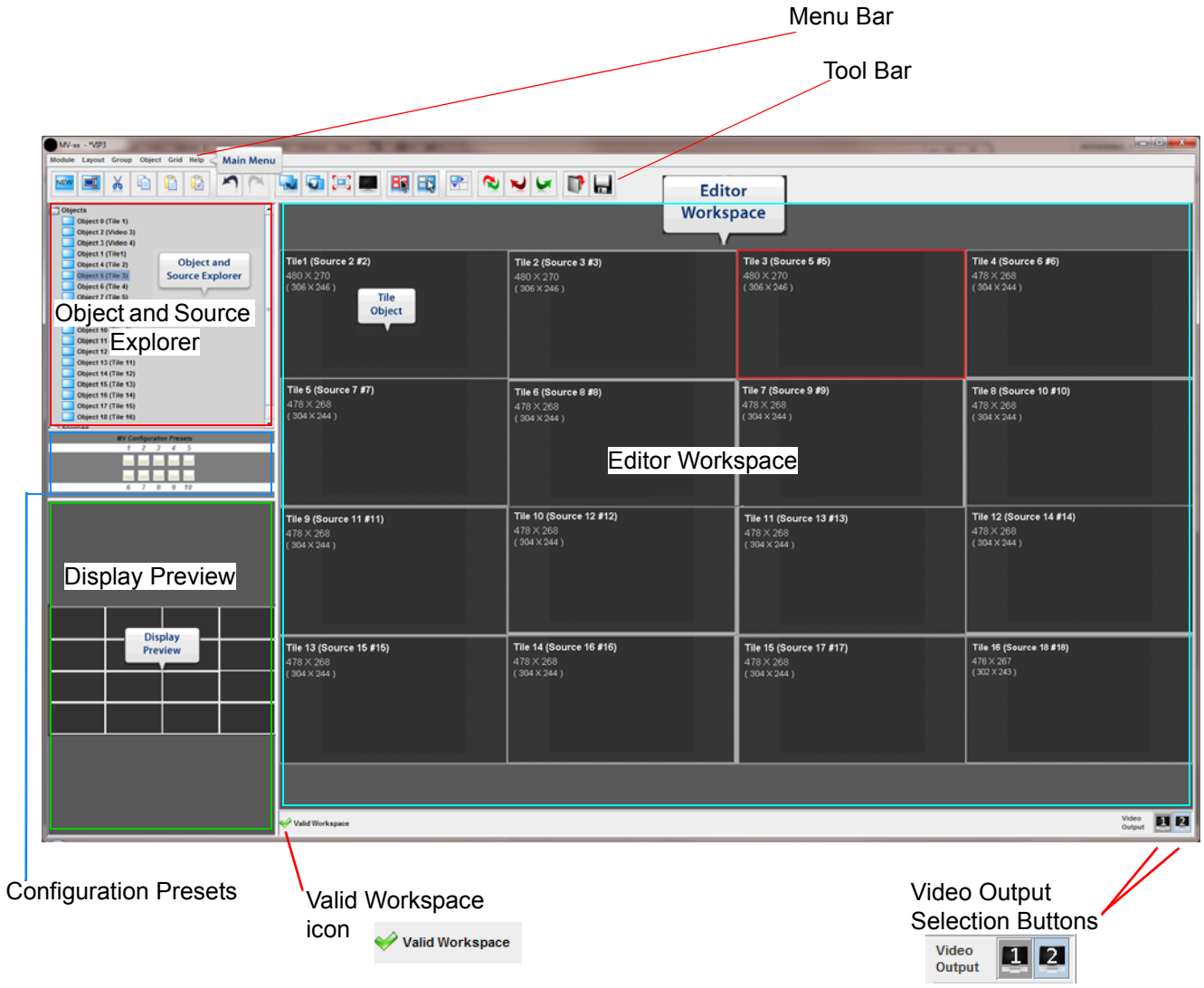

Figure 55 MV-CTL Multiviewer User Interface.

The multiviewer web interface comprises:

1. A main menu bar.
2. A tool bar.
3. Three work areas:
   a Object and Source Explorer. Access information etc about Sources, Objects and Layouts.
   b Editor Workspace, comprising Tile Objects. Edit multiviewer tile objects.
   c Display Preview. See a preview of the final multiviewer display layout.
4. Video Output selection control.
5. Valid Workspace icon.
6. Configuration Presets.

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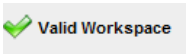
Video Output Selection:

The Video Output selection

buttons, at the bottom right of the screen, select which multiviewer display video output is to be configured.

Click “1” to show multiviewer display output 1 in the workspace editor.
Click “2” to show multiviewer display output 2 in the workspace editor.

Valid Workspace:

The Valid Workspace icon 

confirms the validity of the current configuration in the browser.

Note: The **Valid Workspace** icon (page 72, Figure 55) below the Editor Workspace confirms the validity of the configuration currently displayed in the browser. This is replaced by an error message should there be a conflicting setting. The tile(s) associated with the conflict will be outlined in red.

Important:

Resolution and Aspect Ratio:

The Resolution and Aspect Ratio should be set *before* designing any multiviewer layouts in the workspace editor. If these settings are changed after a layout has been created, any existing tiles will be scaled to suit the new output screen settings.

See section 7.3.1.2 for details on setting the output screen details.

Configuration Preset:

Up to ten unit multiviewer configurations can be saved and recalled by clicking the buttons in the MV Configuration Preset area. See Figure 56.

- **Left-click** to load a saved configuration.
- **Right-click** to save current configuration.

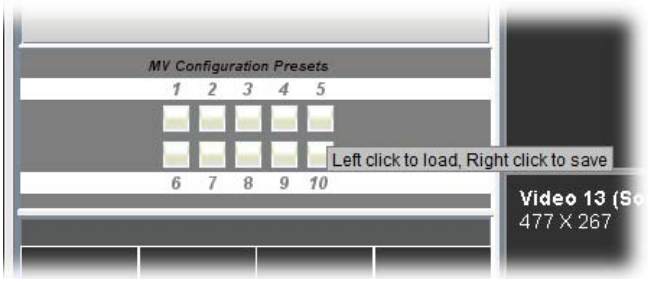


Figure 56 Example - Shaded Areas For Information Displayed Outside of The Video Area.

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7.2.1 Tile Object:

Table 19 lists the types of on-screen objects.

None
Video
Audio
Text
Logo
Clock
Timer

Table 19 Tile Object Type

The color of the tile as it appears in the Editor Workspace and in the Display Preview indicates the currently set object type, as listed in Table 20

Object Type	Tile Color
None	Grey
Video	Blue
Audio	Green
Text	Brown
Logo	Red
Clock	Dark Grey
Timer	Black

Table 20 Object Colors

Operation is designed to be simple and intuitive.
For example:

Object type can be selected by:
Double clicking on a tile,
Selecting the Type tab from the Edit Object menu
And choosing the desired tile type.

Video and audio tiles can be assigned sources by:
Double clicking on the tile,
Selecting the Properties tab from the Edit Object menu
And selecting an available source.

The currently selected tile object is highlighted with a blue border.

Tiles can be moved and resized using conventional mouse operations.
For example:

Multiple tiles may be selected for moving as a group by:
Holding the [Ctrl] key while clicking on each tile in turn.
A small square appears in the lower right corner of tiles grouped within a multiple selection.

Tile borders may appear incomplete to indicate where they lie behind other objects.

7.2.2 Video Object Tiles

If the UMD (section 7.6.5) or audio meters (section 7.6.7) are configured to display outside of the video area, the tile will be shaded to show their positions in the editor workspace. If a tile border is configured it will also be shown shaded in the editor workspace.

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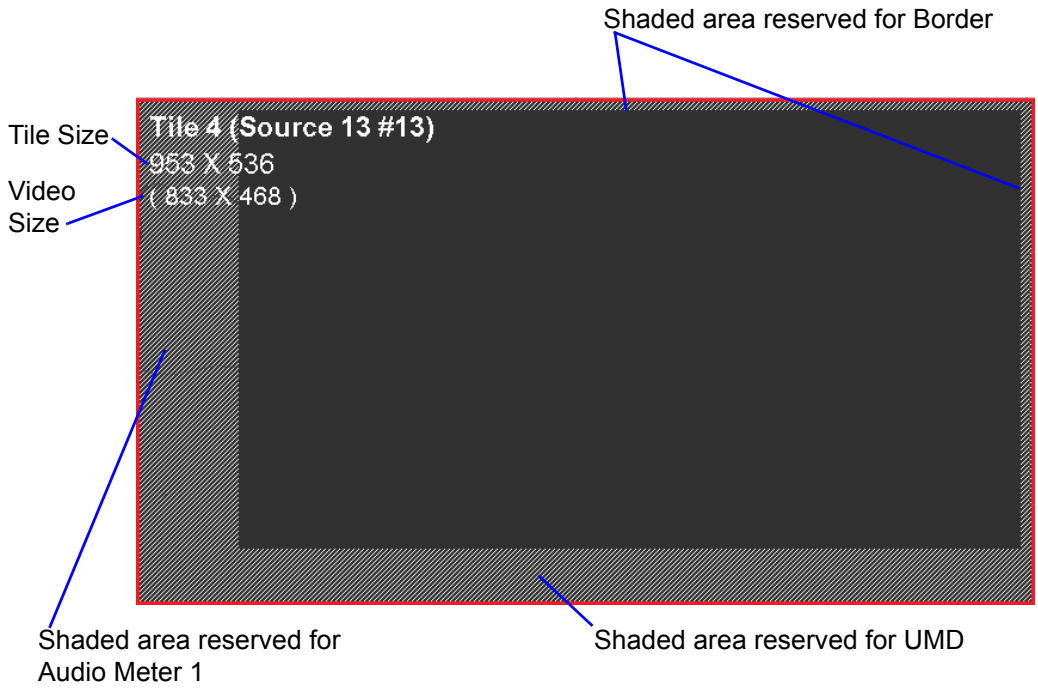

Figure 57 Example - Shaded Areas For Information Displayed Outside of The Video Area.

In the example in Figure 57,
the shaded area on the left is the area reserved for Audio meter 1
and the shaded area at the bottom is the area reserved for the UMD.
The shading at the top and right of the tile indicates area reserved for the tile border,
see section 7.6.3 for border configuration.

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7.2.3 Object and Source Explorer

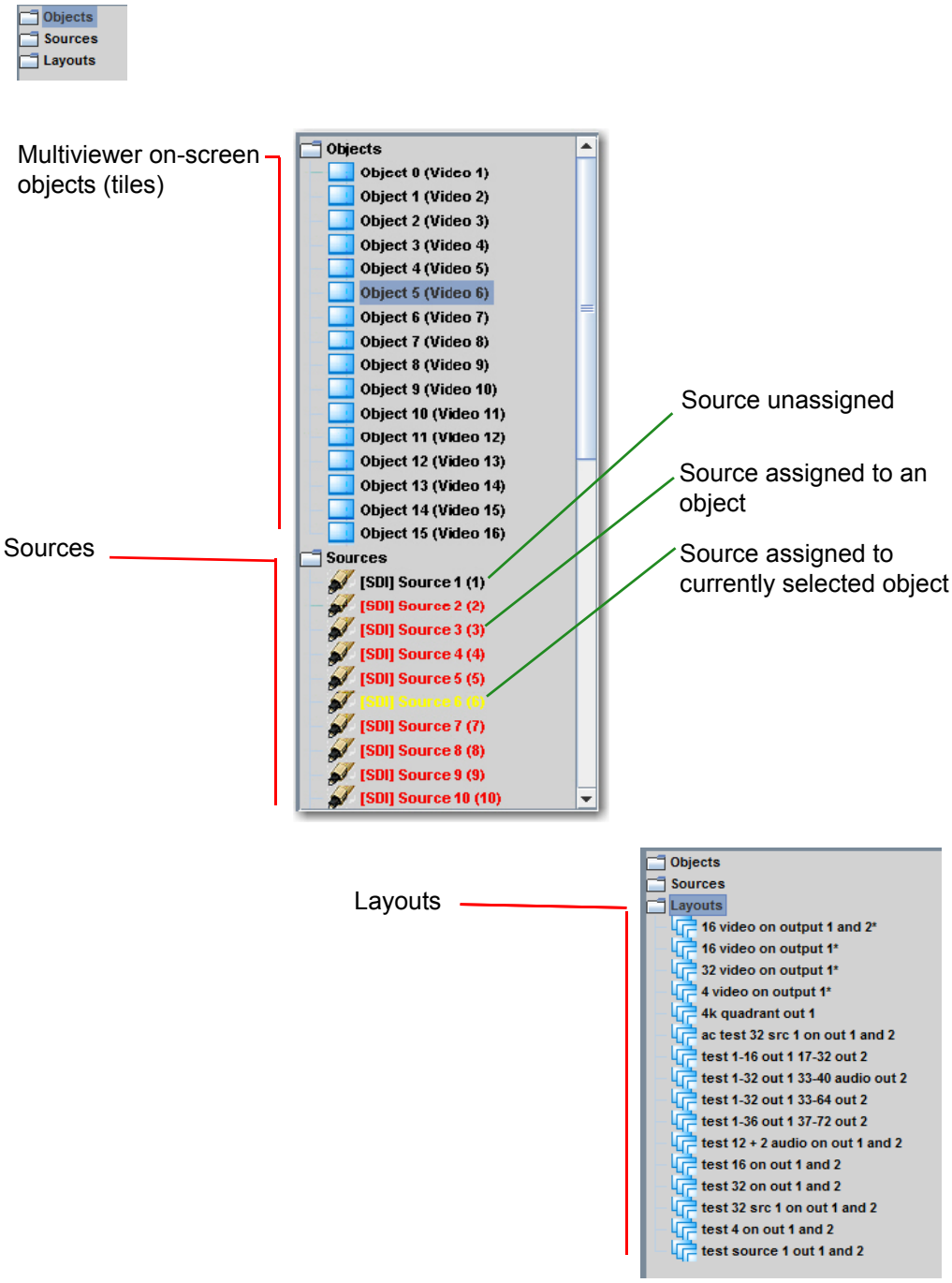

Figure 58 Object and Source Explorer

The Objects folder contains the list of current objects and each object's given name. The currently selected object in the workspace is highlighted.

The Sources folder contains the list of video and audio sources, with an indication of the source type (Figure 58):

- Sources that are currently assigned to an object appear in red,
- Sources that are currently unassigned to an object appear in black.
- A source that is assigned to the currently selected tile/object appears in yellow.

The Layouts folder contains multiviewer layout designs.

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Note: The **Valid Workspace** icon (page 72, Figure 55) below the Editor Workspace confirms the validity of the configuration currently displayed in the browser.
This is replaced by an error message should there be a conflicting setting.
The tile(s) associated with the conflict will be outlined in red.

7.2.4 Edit Object Menu

The Edit Object menu is used to configure all the attributes of an on-screen multiviewer tile.

The Edit Object menu can be displayed for a tile by:

- Go to ‘Object > Edit Object’.

Or

- Double clicking on the object in the Object Folder, in the Explorer view.

  (Audio and Alarm settings can be configured for each source by double clicking on its entry in the Source Folder in the Explorer view.)

Right-click context menus provide quick access to tile object menus and commonly used functions are presented in the top tool bar for ease of use.

Note: The browser contains an initial factory default layout.
The number of tiles indicated will reflect the number of video sources supported by the model of Vega-MV. (16 for Vega-16MV, 32 for Vega-32MV.)

The Edit Object menu is described in Section 7.6.1 "Edit Object Window" on page 120.

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7.3 Module Menu

The Module Menu is used to configure global settings for the Vega-MV unit.

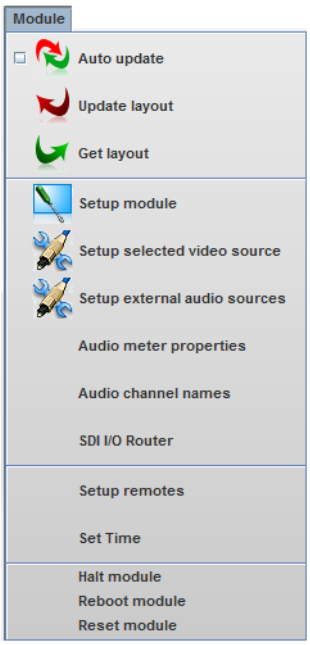

Figure 59 Module Menu.

Menu Option	Description
Auto update	Automatically update tile layout to the display output and preview every time it is changed in the edit workspace.
Update Layout	Transfer edit workspace layout to display output and preview.
Get Layout	Transfer the current display layout to the edit workspace.
Setup Module	Opens the Module Properties dialog of the currently selected tile object. See Section 7.3.1 "Setup Module - Module Properties Dialog" on page 80.
Setup selected video source	Open the Source Properties dialog of currently selected tile object. **Note**: The error message, 'Selected object has no source', will appear if the currently selected object is not an audio or video object. See Section 7.3.2 "Setup Selected Video Source - Source Properties Dialog" on page 102
Setup external audio sources	Opens the External Audio Source Properties dialog, see section 7.3.3. Note: Not applicable to Vega-MV.
Audio meter properties	Opens the Audio Metering Properties dialog used to set the audio levels that the audio meter bars change color at. See Section 7.3.4 "Setup Audio Meter Properties" on page 110
Audio channel names	Enter names for embedded audio channels in video sources up to source 32.
SDI I/O Router	Opens the SDI I/O Router dialog. See Section 7.3.5 "SDI I/O Router Dialog (for the Internal Router)" on page 111.
Setup Remotes	Not Used

Table 21 Module Menu Items

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Set Time	Opens the Set Time dialogue to adjust the clock and date settings. See Section 7.3.6 "Set Time" on page 114.
Halt, Reboot, Reset Module:	Vega-MV unit maintenance items. for shutting down, rebooting the system, or resetting input/output cards. The task that each of these execute is:
Halt	Halting the module guarantees that any files that have not been saved yet, such as layout ones, will get saved before powering off the frame. This stops the system from running. The only way to restart it is to power off and power on again.
Reboot	Rebooting the module will shut the system down and start it back up again. This can take up to 70 seconds.
Reset Module	Resetting the module leaves the CPU running, but resets and reloads the firmware into all the input/output cards.

Table 21 Module Menu Items (Continued)

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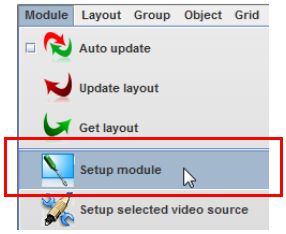
7.3.1 Setup Module - Module Properties Dialog

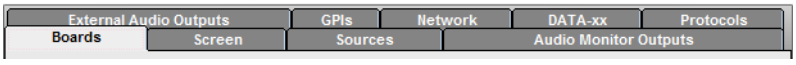


The Module Properties dialog is opened by selecting **Setup Module** from the **Module** menu.

The Module Properties dialog has tabs which cover:

- parameters common to the whole unit (e.g. IP address, global GPIs), and
- initial setup of the inputs and outputs of the unit.

The tabs are:



- **Boards**
  See Section 7.3.1.1 "Boards Tab" on page 81.
- **Screen**
  Section 7.3.1.2 "Screen Tab" on page 82.
- **Sources**
  See Section 7.3.1.3 "Sources Tab" on page 83.
- **Audio Monitor Outputs**
  See Section 7.3.1.4 "Audio Monitor Outputs Tab" on page 84.
- **External Audio Outputs** (Not applicable to Vega-MV**)**
  See Section 7.3.1.5 "External Audio Outputs Tab (Not applicable to Vega-16MV or Vega-32MV)" on page 86.
- **GPIs**
  See Section 7.3.1.6 "GPIs Tab - GPO Alarms Sub-Tab" on page 87.
  See Section 7.3.1.7 "GPIs Tab - GPI Inputs Sub-Tab" on page 88.
- **Network**
  See Section 7.3.1.8 "Network Tab" on page 89.
- **Data-xx**
  See Section 7.3.1.9 "Data-xx Tab" on page 90.
- **Protocols**
  See Section 7.3.1.10 "Protocols - Serial Port Tab" on page 90.
  See Section 7.3.1.11 "Protocols - SAM Router Network Tab (MV Connection to External Matrix)" on page 93.
  See Section 7.3.1.12 "MV Connection to External Matrix Sub-Tab - Controller Section" on page 94.
  See Section 7.3.1.13 "MV Connection to External Matrix Sub-Tab - MV Inputs Section" on page 95.
  See Section 7.3.1.14 "Protocols - SAM Router Network Tab (Internal Matrix Controller)" on page 99.
  See Section 7.3.1.15 "Protocols - TSL UMD V3.1/4.0 Tab" on page 100.

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7.3.1.1 Boards Tab

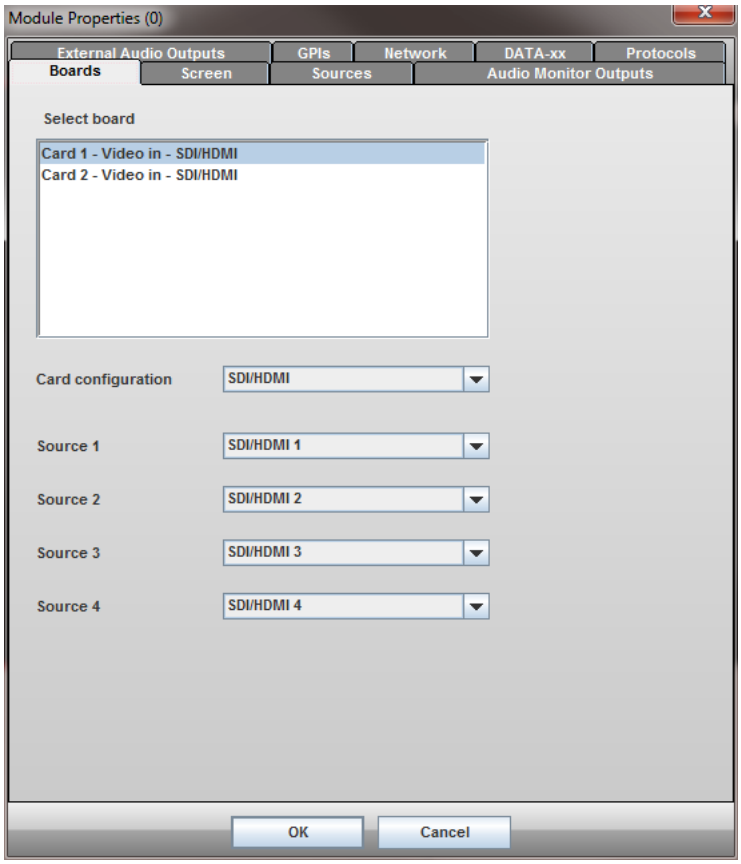

Figure 60 Module Menu - Boards Tab.

Setting	Description
Select Board	Select a board from the list to define sources.
Card Configuration	Show selected card configuration.
Source 1 to 4	Select source type from drop down list for each input.

Table 22 Module Menu - Boards Tab.

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7.3.1.2 Screen Tab

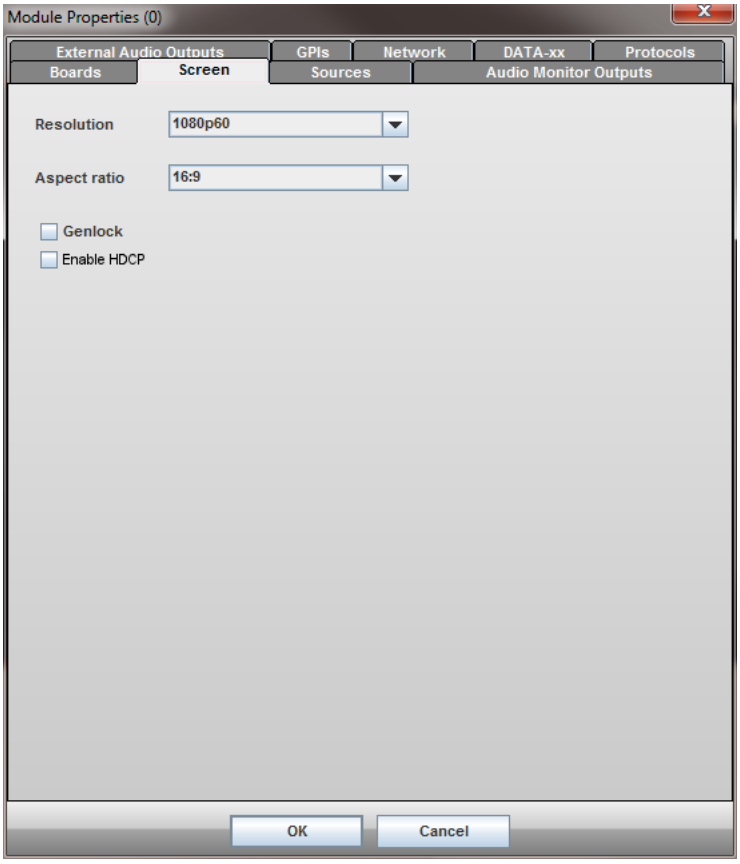

Figure 61 Module Menu - Screen Tab.

Setting	Description
Resolution	Set the display output resolution.
Aspect Ratio	Set the display output aspect ratio to match the display device.
Genlock	Lock the display output to the external reference connected to the MV-NET card, see section 4.5.
Enable HDCP	Tick to Enable HDCP on HDMI outputs.

Table 23 Module Menu - Screen Tab.

Important:

Resolution and Aspect Ratio:

The Resolution and Aspect Ratio should be set before designing any multiviewer layouts in the workspace editor. If these settings are changed after a layout has been created any existing tiles will be scaled to suit the new output screen settings.

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7.3.1.3 Sources Tab

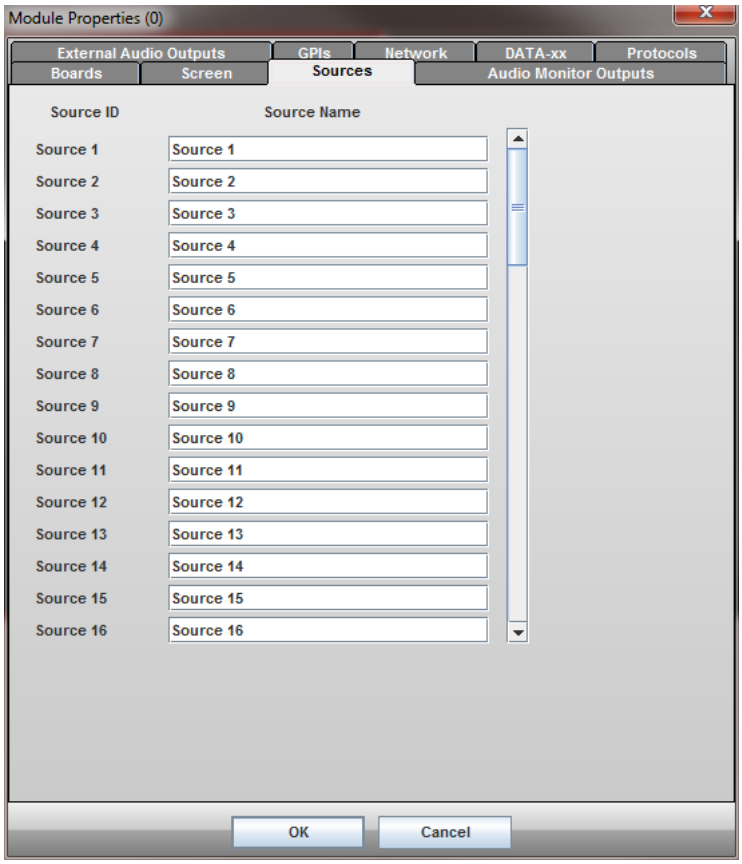

Figure 62 Module Menu - Sources Tab.

Setting	Description
Source Name	Enables the naming of sources. **Note:** These are not the names that get transferred to UMDs, they are simply user names to assist with identifying sources from within the Web interface.

Table 24 Module Menu - Sources Tab.

Note: Source names can be used to set the TSL Display Address when using the TSL protocol for controlling UMDs and Tallies. See on page 91 for details.

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7.3.1.4 Audio Monitor Outputs Tab

The Audio Monitor Outputs tab is used to select the video source audio pairs and/or external audio inputs to be monitored on the multiviewer audio stereo output jack and the SDI/HDMI multiviewer display outputs.

The selected audio is embedded on the SDI/HDMI multiviewer display video outputs and can be monitored with a suitable display or audio de-multiplexer.

Note:

- The MV-CTL card can use the multiviewer stereo output jack.
- Only PCM audio from SDI video inputs can be monitored.
- Dolby E audio cannot be decoded for monitoring, only audio level information is displayed.

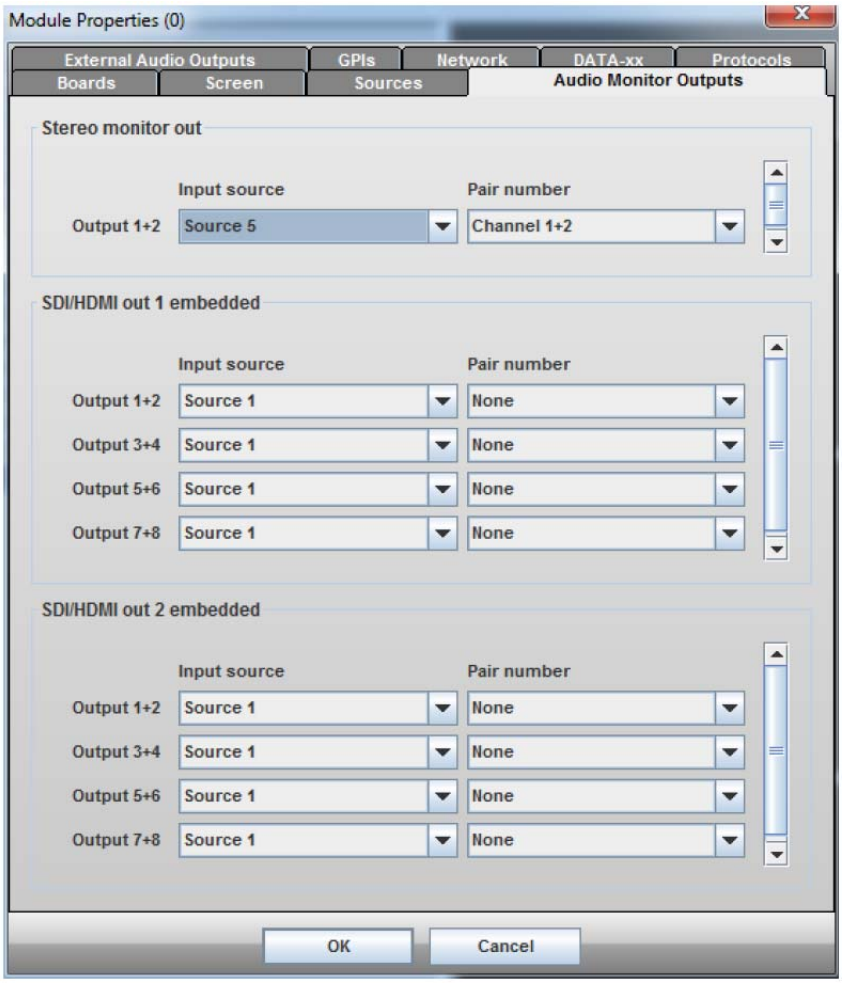

Figure 63 Module Menu - Audio Monitor Outputs Tab.

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Setting	Description
Stereo monitor out settings:	
Output 1+2	Selects the **Input Source** and **Pair Number** to be output on the stereo jack socket on the front of the Vega-MV unit frame.
Input Source	Select the Video input number for embedded audio. Select **None** if the output is not required for this MV-CTL card.
Pair Number	Select the audio pair to be monitored. • Video - 8 embedded pairs (1+2, 3+4 up to 15+16) **Note**: Although an audio pair can be selected, there maybe no audio available on that pair.
SDI/HDMI out 1 embedded settings:	
Output 1+2 to **7+8**	Select the **Input Source** and **Pair Number** for each audio pair to be embedded on SDI/HDMI output 1 of the Vega-MV unit MV-CTL card.
Input Source	Select the Video input number for embedded audio.
Pair Number	Select the audio pair to be monitored. • Video - 8 embedded pairs (1+2, 3+4 up to 15+16) **Note**: Although an audio pair can be selected there maybe no audio available on that pair.
SDI/HDMI out 2 embedded settings:	
Output 1+2 to **7+8**	Select the **Input Source** and **Pair Number** for each audio pair to be embedded on SDI/HDMI output 2 of the Vega-MV unit MV-CTL card.
Input Source	Select the Video input number for embedded audio.
Pair Number	Select the audio pair to be monitored. • Video - 8 embedded pairs (1+2, 3+4 up to 15+16) **Note**: Although an audio pair can be selected there maybe no audio available on that pair.

Table 25 Module Menu - Audio Monitor Outputs Tab

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7.3.1.5 External Audio Outputs Tab (Not applicable to Vega-16MV or Vega-32MV)

NOTE: This tab does not apply to Vega-16MV or Vega-32MV.

The External Audio Outputs tab is not applicable to the Vega-MV products.
(The tab is used for some other products on the same hardware platform as Vega-MV which have discrete audio inputs and outputs - to select source audio channels to be routed to audio output channels.)

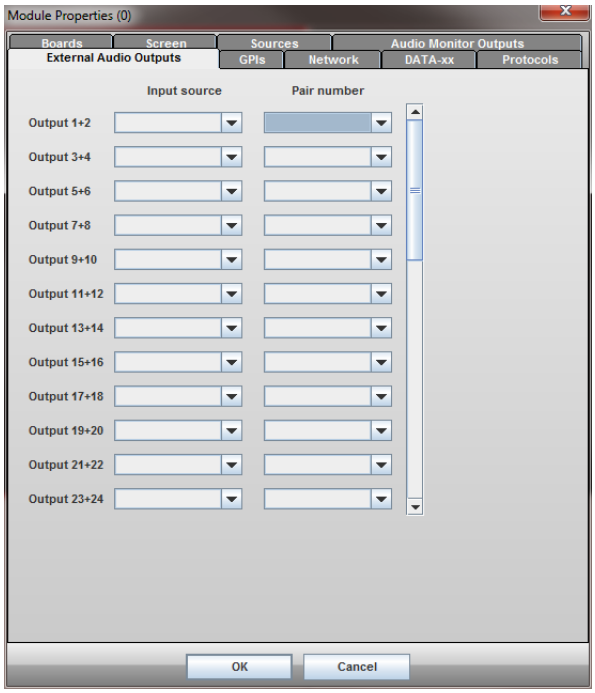

Figure 64 (Module Menu - External Audio Outputs Tab)

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7.3.1.6 GPIs Tab - GPO Alarms Sub-Tab

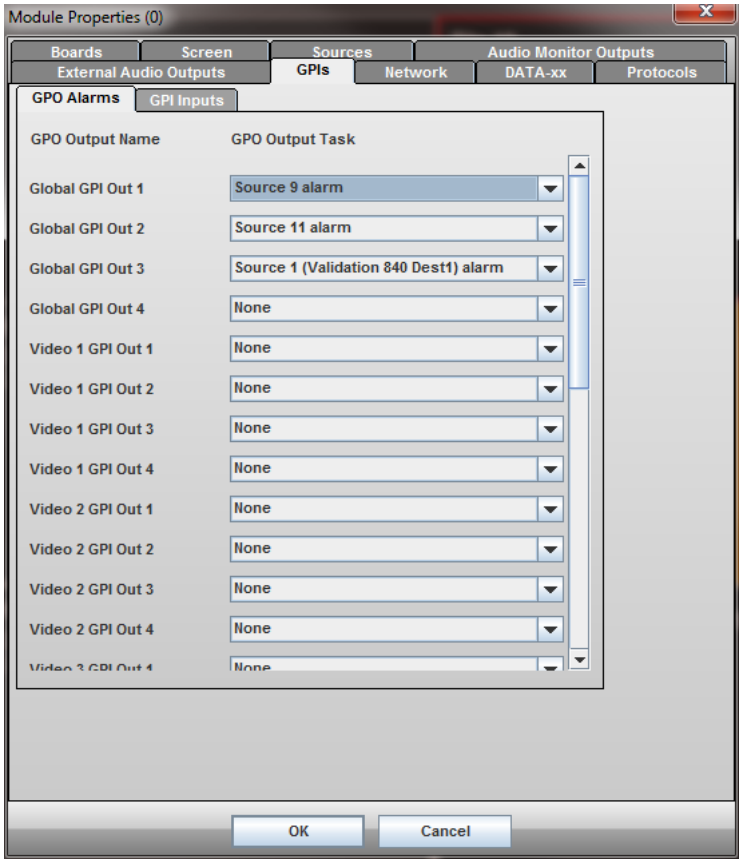

Figure 65 Module Properties - GPIs Tab - GPO Alarms Tab.

- The Global GPIs are located on the MV-NET Card GPI/O socket, 8 inputs and 4 outputs.
- Each MV-VIP4 card rear panel is fitted with a 8 video inputs and 8 router video outputs.

Setting	Description
Source GPI Out X	Select GPO alarm output source and number to assign alarm source to the selected GPO alarm output.

Table 26 Module Menu - GPO Alarms Tab.

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7.3.1.7 GPIs Tab - GPI Inputs Sub-Tab

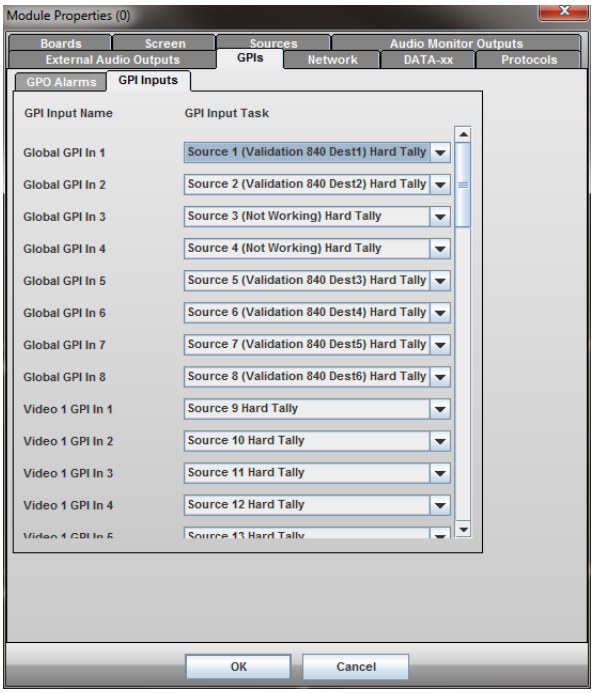

Figure 66 Module Properties - GPIs Tab - GPI Inputs Tab.

- The Global GPIs are located on the MV-NET Card GPI/O socket, 8 inputs and 4 outputs.

This sets up the task to execute on each GPI input when activated.

Level Sensitive Task Operation:

- 0 volts in = off; 5 volts in = on.

Example level-sensitive task:

Hardware Tally:

0 volts will switch the tally off.

5 volts in will switch the tally on.

Transition (Edge) Sensitive (Toggle) Task Operation:

- A transition from 0 to 5 volts will toggle the current state.

Edge sensitive tasks can be identified as the ones that have “toggle” in their name.

Example of a transition sensitive task:

Full Screen Toggle:

If the relevant window is currently at its normal size,
then a transition from 0 volts to 5 volts will switch it to full screen.

If it is at its full screen size.
then the transition will switch it back to its normal size.

Note:

- Vega-MV GPI outputs are open collector outputs and require external pull-up resistors of between 10k Ω and 100k Ω.
- An external 5V DC power supply is required to drive external equipment such as LEDs (see section 4.5.3 for details).

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7.3.1.8 Network Tab

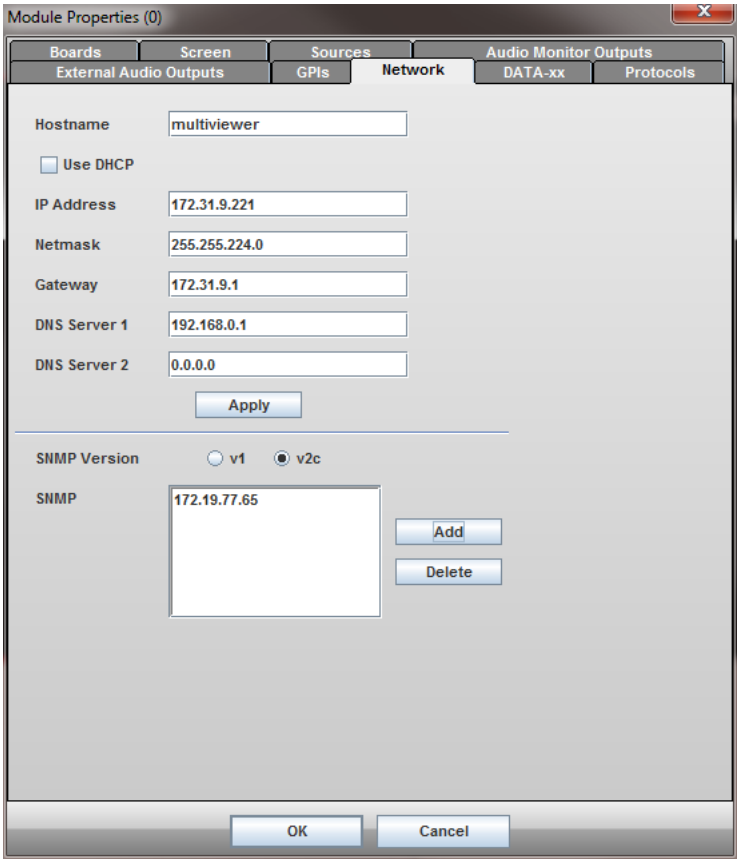

Figure 67 Module Properties - Network Tab.

Setting	Description
Hostname	Enter friendly name for Vega-MV unit MV-CTL card.
Use DHCP	Check to use DHCP for automatic acquisition of network settings. Un-check for entry of fixed network settings.
IP Address	Enter fixed IP address, if required.
Netmask	Enter network mask, if required.
Gateway	Enter gateway address, if required.
DNS Server 1	Enter DNS server address, if required.
DNS Server 2	Enter DNS server address, if required.
Apply button	Applies fixed network settings to the frame.
SNMP	Select the required SNMP version.
Add button	Opens the dialog for entering SNMP IP address and adding it to list.
Delete button	Deletes selected SNMP IP address from the list.

Table 27 Module Properties - Network Tab.

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7.3.1.9 Data-xx Tab

The Data-xx tab is not used.

7.3.1.10 Protocols - Serial Port Tab

Used to configure the RS232/422 port on the Vega-MV rear panel.

To change these settings click on the **Configure** button.
See section 9.1 for information on configuring port operation to either RS232 or RS422.

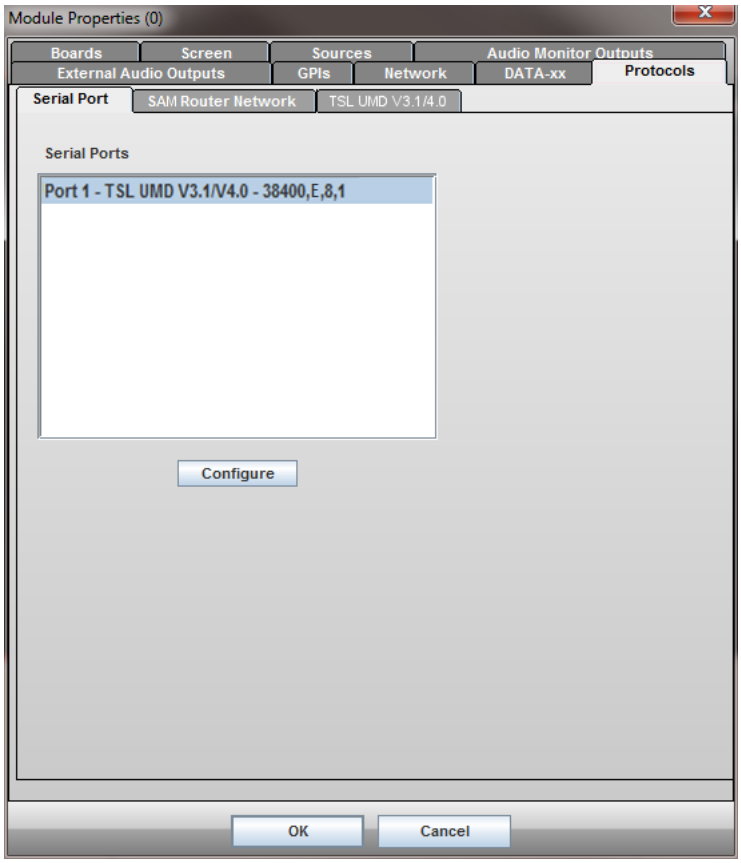

Figure 68 Module Properties - Protocols - Serial Port Tab.

Settings	Description
Configure	The Configure button is used to edit the serial port settings. **Figure 69 Serial Port Configuration, TSL Protocol Shown.**
Baud	Enter baud Rate here, if required
Data Bits	Enter Data Bits here, if required
Parity	Enter Parity here, if required
Stop Bits	Enter Stop Bits here, if required

Table 28 Serial Port Configuration

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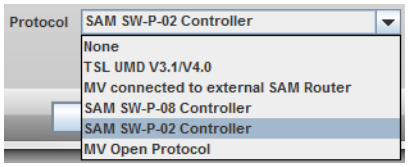
Flow Control	Select the Flow Control, if required
Protocol	For other protocols, determine what the serial port settings are for the device attached, and set them accordingly here. 
TSL UMD	For details of the TSL Protocol Options available see on page 91.
MV Connected to external SAM Router	For connection to a SAM router controller to get names and tallies.
SAM SW-P-08 Controller	To configure the Vega-MV unit for external control with the SAM SW-P-08 protocol.
SAM SW-P-02 Controller	To configure the Vega-MV unit for external control with the SAM SW-P-02 protocol.
MV Open Protocol	For a generic controller.

Table 28 Serial Port Configuration (Continued)

The settings specified for the TSL protocol are shown in the screen shot in Table 28 These can be changed if non-standard settings are being used by the TSL control unit.

For other protocols, the serial port settings can be set as required for the attached device.

TSL Protocol Options:

The TSL protocol options for TSL UMDs provide a number of ways of configuring the TSL display address (see Table 29).

TSL Protocol Option	TSL Protocol Option Description
TSL UMD address 0	Assigns display address 0 to source 1 (video input 1), display address 1 to source 2 (video input 2), etc.
TSL UMD address 32	Assigns display address 32 to source 1 (video input 1), display address 33 to source 2 (video input 2), etc.
TSL UMD address 64	Assigns display address 64 to source 1 (video input 1), display address 65 to source 2 (video input 2), etc.
TSL UMD address 96	Assigns display address 96 to source 1 (video input 1), display address 97 to source 2 (video input 2), etc.
TSL UMD address 112	Assigns display address 112 to source 1 (video input 1), display address 113 to source 2 (video input 2), etc.

Table 29 TSL Protocol Options

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TSL UMD in source name	Assigns each TSL display address based on the name of the source set in the Sources tab (see section 7.3.1.3). The source name must contain either “UMD” or “umd” followed by a number indicating the display address. **Syntax Examples:** To assign a source to TSL display address 14, any of the following will work: • Source 2 UMD14 • Source 2 umd14 • umd14 • UMD14 A source without UMD or umd followed by a number in its name will not respond to any TSL display address.

Table 29 TSL Protocol Options (Continued)

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7.3.1.11 Protocols - SAM Router Network Tab (*MV Connection to External Matrix*)

This tab is used for configuring the IP connections to SAM router controllers and the physical connections from SAM routers to the Vega-MV Router Multiviewer.

When communication with a SAM router is established, the first row of UMDs in each video tile will acquire the applicable source names of the router according to the source that is feeding the destinations connected to the Vega-MV unit. As cross-points are changed in the router, the UMDs will be updated.

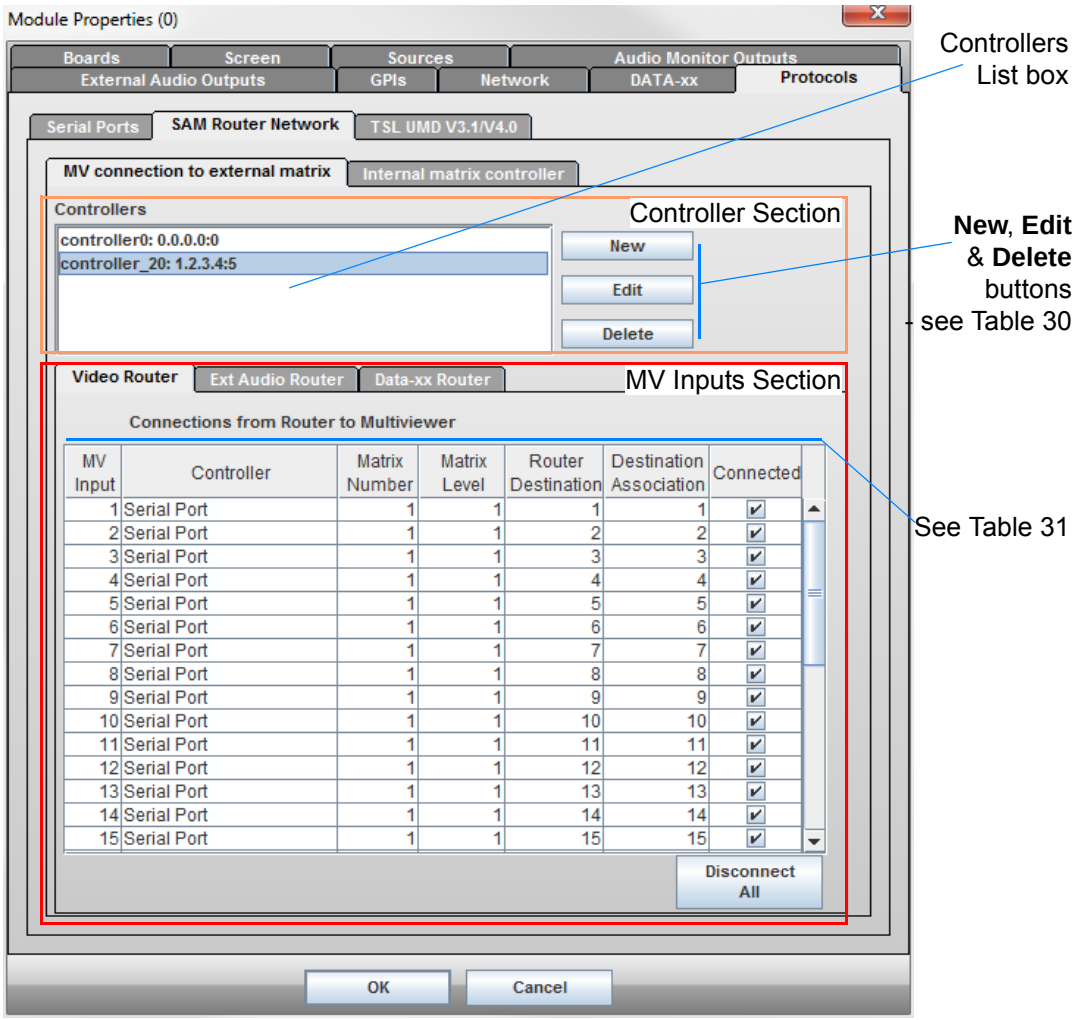

Figure 70 Module Properties - Protocols: SAM Router Network Tab - MV Connection to External Matrix Sub-Tab

The tab comprises the following sections:

- Controller section - see Section 7.3.1.12 "MV Connection to External Matrix Sub-Tab - Controller Section" on page 94.
- MV Inputs section - see Section 7.3.1.13 "MV Connection to External Matrix Sub-Tab - MV Inputs Section" on page 95

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7.3.1.12 MV Connection to External Matrix Sub-Tab - Controller Section

The Controller list box at the top of the tab displays the details of any configured routers. The **New**, **Edit** and **Delete** buttons are used to set up SAM router controllers that use an IP connection to communicate with the Vega-MV.

If the serial port is used then the SAM router protocol needs to be selected in the **Serial Ports** tab and the relevant serial port speed and settings configured there (see section 7.3.1.10).

A combination of serial port controlled and IP controlled controllers is possible. The Serial Port option is always available to select in the **Controller** column, as described on page 97 (Table 31)

Router IP Connection Setup:

To set up a new SAM router controller over IP:

- Click the **New** button.

To edit an existing network connection:

- Highlight the connection in the list box, and click on the **Edit** button.

In both cases, the settings window will be displayed:

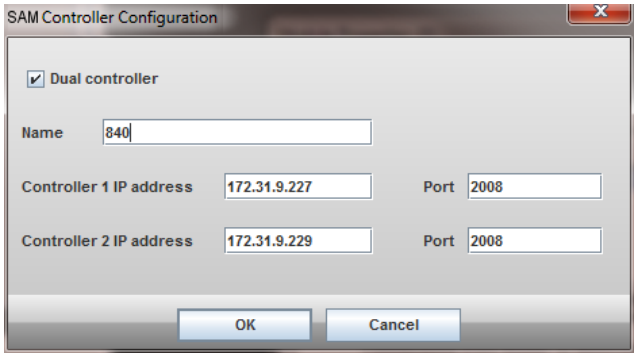
Setting	Description
Delete button	To delete a controller, select the controller to be deleted from the List box (Figure 70) and click on the **Delete** button.
New or **Edit** button	 **Figure 71** SAM **Router IP Connection Settings**
Dual Controller	Tick this box if there is a main and backup router controller available in the router. This will allow the IP addresses of both controllers to be entered.
Name	Enter a suitable name for the router. This will be the name used in the list of controllers that can be chosen when setting up the router table (Table 31).
Controller 1 IP address	Enter the IP address of the main router controller in a dual controller system or just the single controller if only one is present.
Controller 1 Port	Enter the TCP port of the main router controller in a dual controller system or just the single controller if only one is present.
Controller 2 IP address	**Dual Controller Systems only**: Enter the IP address of the backup router controller (if applicable).
Controller 2 Port	**Dual Controller Systems only**: Enter the TCP port of the backup router controller (if applicable).

Table 30 Setting or Editing Router IP Connection Details.

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7.3.1.13 MV Connection to External Matrix Sub-Tab - MV Inputs Section

Connections from the Router Controller to the Multiviewer

There is a sub-tab for each type of information source for the multiviewer (see Figure 72):

- **Video Router -** Applicable directly to the Vega-MV.
- **Ext Audio Router:** This is used if some other external equipment is sourcing information for display on the multiviewer output.
- and **Data-xx Router**: This is used if some other external equipment is sourcing information for display on the multiviewer output.

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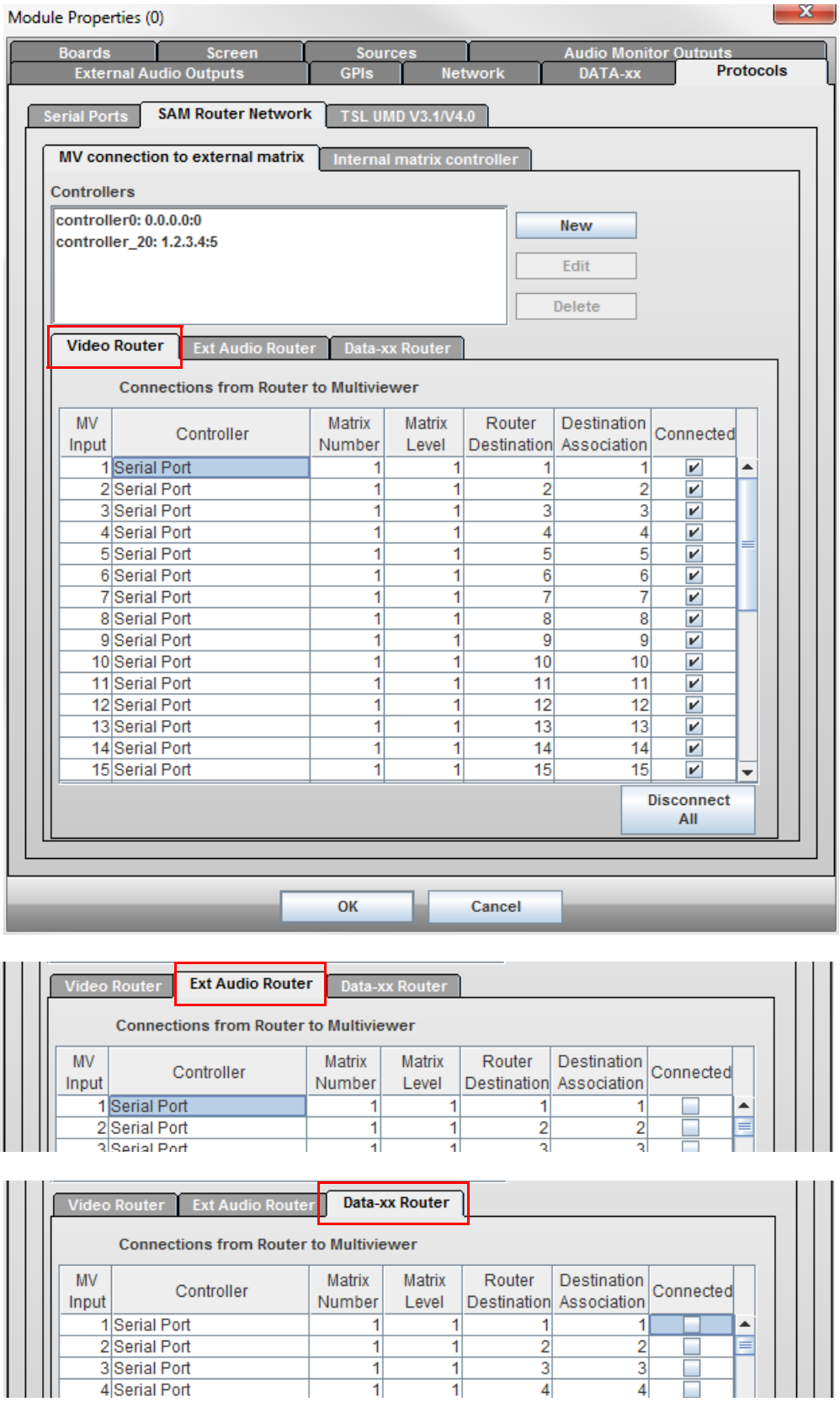

Figure 72 SAM Router Tabs: 'Video Router', 'Ext Audio Router', and 'Data-xx Router'

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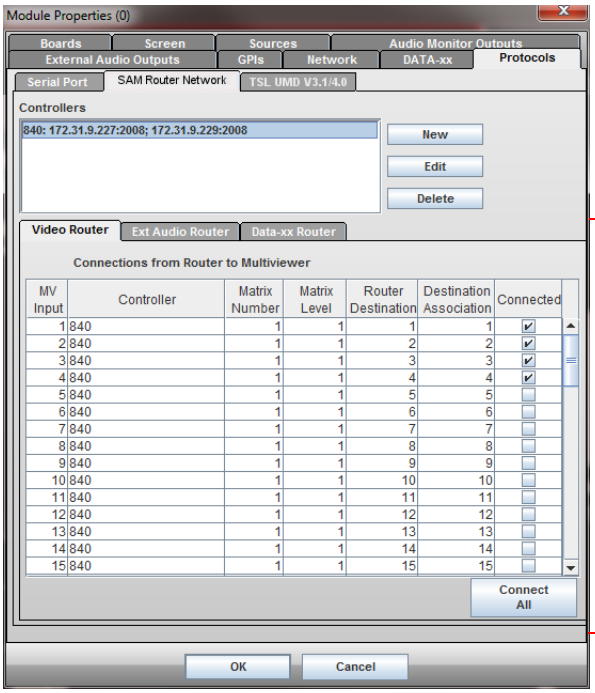
Video Router Sub-tab:



Connections from the Router Controller to the Multiviewer
- see Table 31

Figure 73 SAM Router Network Tab - Video Router Sub-tab

The settings for each multiviewer input are made in the same way as described in the following table:

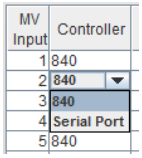
Column	Description
MV Input	This column cannot be edited – it simply displays the input number of the multiviewer input. This starts from 1 and goes up to the number of inputs present on the multiviewer.
Controller	Drop-down box. For each applicable multiviewer input, select the SAM controller that controls the router that originates the source input.  The options available from the drop down list are the **Serial Port** and the controller name(s) that have been setup in the list box.
Matrix Number	Matrix number that the router is in.
Matrix Level	Level in the router or matrix that each input is contained in.
Router Destination	Physical output number of the matrix/router connected to the multiviewer input. (I.e. Router destination that is physically connected to the MV Input.)
Destination Association	This will normally be the same as the Router Destination.

Table 31 Router/Multiviewer Mapping Sub Tabs

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Column	Description
Connected	Check box. Tick if the MV Input is connected to the router controlled by the selected router controller. This must be ticked for each multiviewer input that is sourced from the router. Any unticked inputs will not have their associated UMDs set to follow the router's source names.

Table 31 Router/Multiviewer Mapping Sub Tabs

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7.3.1.14 Protocols - SAM Router Network Tab (*Internal Matrix Controller*)

This tab is used for configuring the IP connections to a SAM router controller for control of the internal routing matrix within the Vega-MV. See Figure 74.

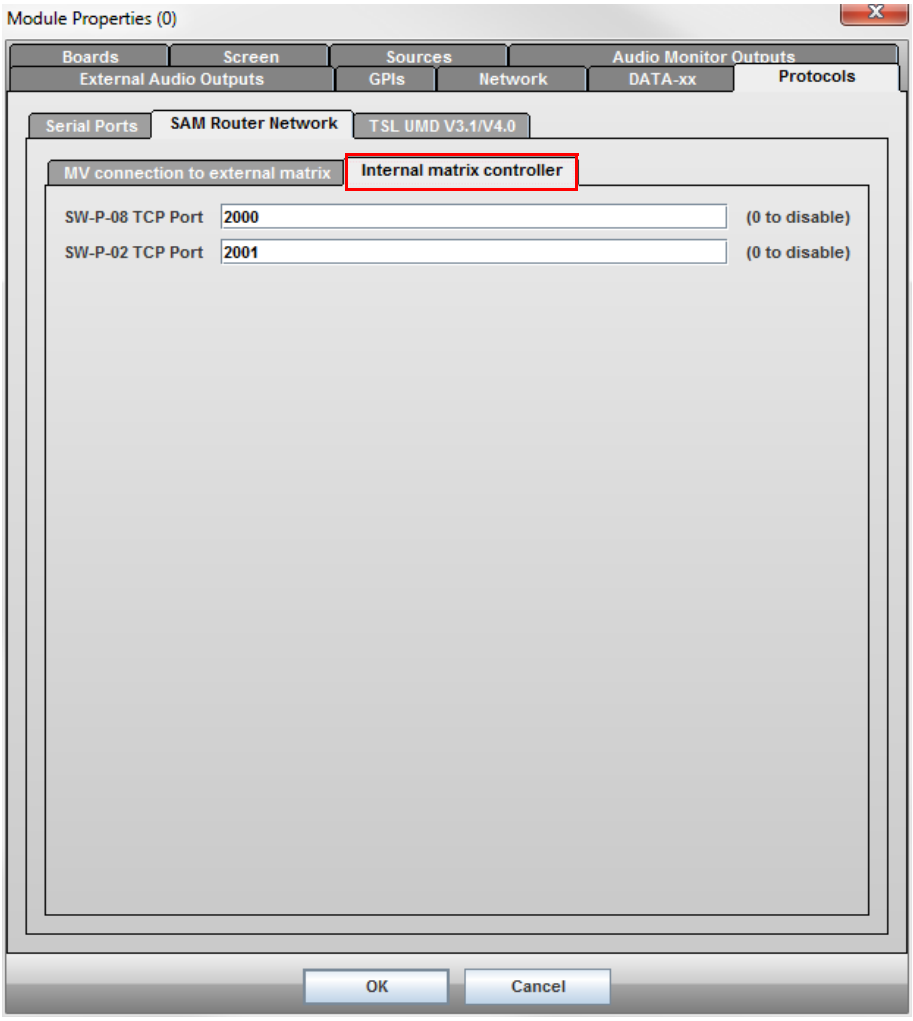

Figure 74 Module Properties - Protocols - SAM Router Network Tab (*Internal Matrix Controller*)

Set up the IP port to use for SAM SW-P-08 and SW-P-02 messages over IP.

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7.3.1.15 Protocols - TSL UMD V3.1/4.0 Tab

Use this tab to configure various methods of mapping TSL UMD addresses to sources in the MV-CTL card. It is also used to configure TSL over ethernet (UDP/IP).

The TSL addressing settings apply to both the TSL UMD serial port (if TSL UMD has been chosen as the protocol for the serial port), and the TSL over ethernet.

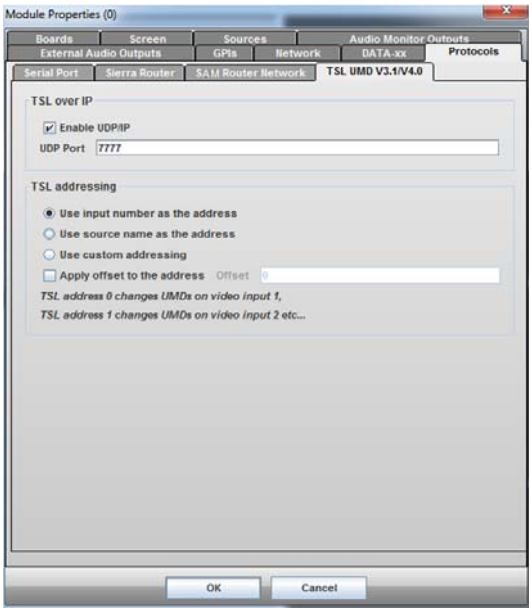

Figure 75 Module Properties - Protocols - TSL UMD V3.1/4.0 Tab.

Setting	Description
TSL over IP settings	
Enable UDP/IP	Tick to enable the TSL UMD protocol over IP.
UDP Port	Enter the UDP port to be used.
TSL addressing settings	
Use input number as the address	Maps the TSL UMD address to the multiviewer input number. **Note**: TSL UMD addresses are 0-based, so if no offset is applied then TSL UMD address 0 maps to multiviewer video source 1, TSL UMD address 1 maps to multiviewer video source 2, etc.
Use source name as the address	Allows each source to be assigned any TSL display address by editing the name of the source from the Module Properties > Sources tab. The name must contain either “UMD” or “umd” followed by a number indicating the TSL address + 1 that affects that UMD. **For example**: a source that contains in its name “UMD 1", “UMD1” or “umd 1" will be modified by TSL address 0 (if no offset is set).
Use custom addressing	When selected a table is displayed allowing each video input to be mapped to a specific TSL address. It is possible to map multiple inputs to the same TSL address if required. To disassociate an input from any TSL address enter -1 as its TSL address. **Note**: real TSL addresses range from 0 to 126.

Table 32 Module Properties - Protocols - TSL UMD V3.1/4.0 Tab

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Apply offset to the address	Tick to apply an offset to the TSL address. This configures the relationship between TSL UMD addresses and the multiviewer inputs (when using the input number as the address), or the multiviewer source names (when using source names as the address). The offset can be a positive or negative number. **Example 1**: When **Use input number as the address** is selected: If **Offset** is set to 2 then TSL address 2 changes the UMD on video input 1 (TSL address 0 and 1 do not map to any source). TSL address 3 changes the UMD on video input 2 etc. If **Offset** is set to -2 then TSL address 0 changes the UMD on video input 3 (MV inputs 1 and 2 are not mapped to any TSL address). **Example 2**: When **Use source name as the address** is selected: If **Offset** is set to 2 then TSL address 2 changes the UMDs on tiles displaying sources containing “UMD1” in their source name. If **Offset** is set to -2 then TSL address 0 changes the UMDs on tiles displaying sources containing “UMD3” in their source name.

Table 32 Module Properties - Protocols - TSL UMD V3.1/4.0 Tab (Continued)

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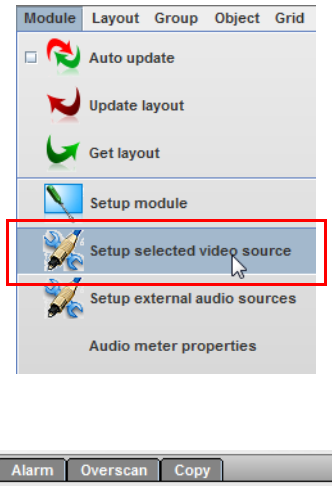
7.3.2 Setup Selected Video Source - Source Properties Dialog



7.3.2.1 Source Properties - Audio Tab

Use this tab to set up audio reference levels and audio alarms associated with a video source.

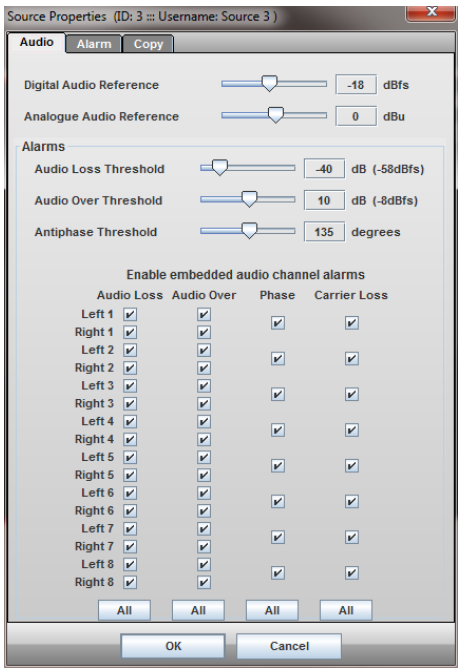


Figure 76 Source Properties - Audio Tab

Setting	Description
Digital Audio Reference	Set the analog to digital reference level when applying an analog meter scale to a digital source, or a digital meter scale to an analog source. It can be set within the range of -30 to -3 dBfs.
Analogue Audio Reference	Set the 0dB reference level with respect to analog meter scales. It can be set within the range of -12dBu to +12dBu.

Note: The Digital and Analog reference level adjustments above have no effect when digital audio is used with a digital scale.

Figure 77 Source Properties - Audio Tab.

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Alarms section	Here the thresholds for Audio Loss, Audio Over and Antiphase alarms can be set, along with the alarm enabling of individual channels. The 16 channels listed here relate to the 16 embedded audio channels. **Example**: Channels selected under **Audio Loss** will trigger an alarm when the audio level on the associated channel falls below the threshold set above.

Note:
This section only selects which channels are potentially enabled for triggering alarms. The overall alarm type also needs to be enabled in the **Alarm** tab (see next section) - for example the Audio Loss alarm needs to be enabled in the **Alarm** tab for any of the selected Audio Loss channels to trigger an alarm.

Figure 77 Source Properties - Audio Tab.

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7.3.2.2 Source Properties - Alarm Tab

The Alarm Tab allows each video and audio alarm to be configured, enabled and displayed.

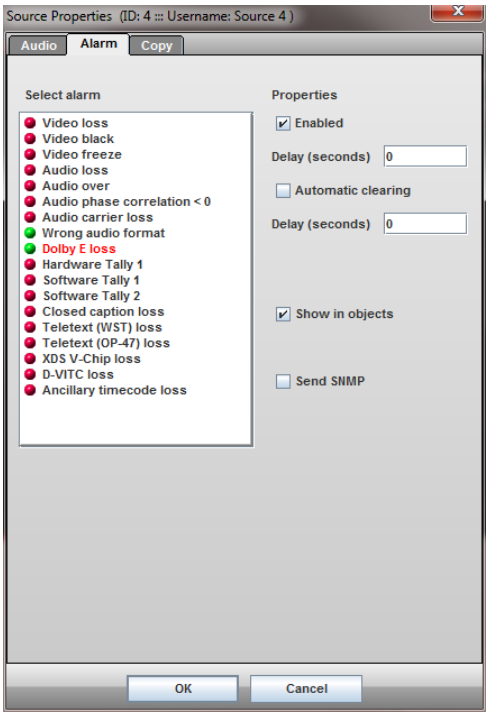

Figure 78 Source Properties - Alarm Tab.

The properties section of this window allows each alarm to be set individually for onset and auto-clear delay, logging status and visibility in objects and lists.

To select an alarm to configure, click on it in the Select Alarm list on the left on the window. The selected alarm will appear with its descriptive text highlighted in red. Choose the required properties from the right hand section of the window and check the Enabled box to activate the alarm.

Enabled alarms are shown with a green circle before the descriptive text.

Setting	Description
Select alarm	Click on one of the alarms listed to change the attributes of it using the controls listed under Properties.
Enabled	Tick this to enable the selected alarm.
Delay	Input a delay before the alarm starts.
Automatic clearing	Tick this for alarms are cleared after the Automatic clearing delay.
Automatic clearing delay	Input the automatic clearing delay in seconds.
Show in objects	Display alarms in objects.
Send SNMP	Tick to send SNMP trap in response to alarm.

Table 33 Source Properties - Alarm Tab.

Note: To setup audio alarms tick the Use audio channel alarm settings box and click on Setup Audio Alarms.

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Notes for Various Alarm Types:

Closed caption loss:

This alarm will activate if closed captions are not present on the expected teletext page or closed captioning display service.

For example: If the teletext is set up to monitor page 801 for captions, and there are no captions on this page then the alarm will activate.

Teletext (WST) loss:

This is only relevant if the source is SD-SDI, and will activate if there is no WST present at all (not just the magazine page set up to be monitored).

Teletext (OP-47) loss:

This is only relevant if the source is HD-SDI, and will activate if there is no OP-47 present at all (not just the magazine page set up to be monitored).

D-VITC loss:

This is only relevant if the sources is SD-SDI.

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7.3.2.3 Source Properties - Overscan Tab

The Overscan Tab (see Figure 79) allows adjustments to the amount of the image that is viewed in a tile when overscan is enabled within that tile. Each source can be individually adjusted.

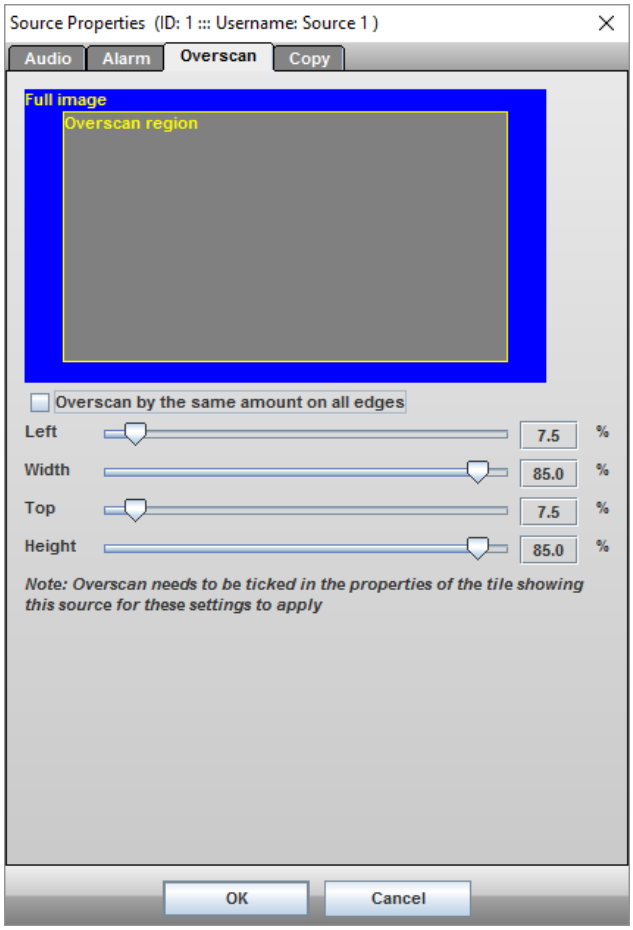

Figure 79 Source Properties - Overscan Tab

The overscan controls are shown in Table 34.

Setting	Description
Overscan by the same amount on all edges	When ticked, only one adjustment will appear in the window. This adjusts all edges of the overscan region by the same amount.
Left	Slider control. Adjusts the left-hand side of the overscan region.
Width	Slider control. Adjusts the width of the overscan region.
Top	Slider control. Adjusts the top of the overscan region.
Height	Slider control. Adjusts the height of the overscan region.

Table 34 Source Properties - Overscan Tab

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Notes for Various Alarm Types:

Closed caption loss:

This alarm will activate if closed captions are not present on the expected teletext page or closed captioning display service.

For example: If the teletext is set up to monitor page 801 for captions, and there are no captions on this page then the alarm will activate.

Teletext (WST) loss:

This is only relevant if the source is SD-SDI, and will activate if there is no WST present at all (not just the magazine page set up to be monitored).

Teletext (OP-47) loss:

This is only relevant if the source is HD-SDI, and will activate if there is no OP-47 present at all (not just the magazine page set up to be monitored).

D-VITC loss:

This is only relevant if the sources is SD-SDI.

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7.3.2.4 Source Properties - Copy Tab

This allows audio and/or alarm settings that have been configured for the current source to be copied to other sources. Select which type(s) of settings are to be copied (**Audio**/**alarm**), then select the sources from list at the right that are to be copied to. Multiple sources can be selected by holding down the [**Ctrl**] key while clicking on sources. To execute the copying, press the **Copy To** button.

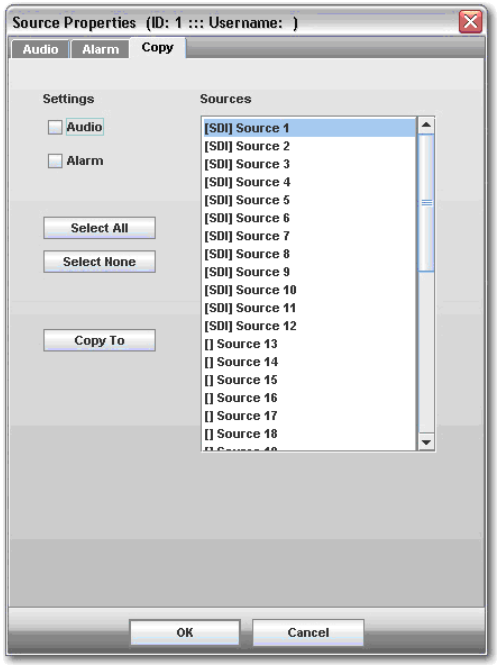

Figure 80 Source Properties - Copy Tab

Setting	Description
Audio	check to copy audio settings from selected source/s 1 to 40.
Alarm	check to copy alarm settings from selected source/s 1 to 40.
Select All button	select all sources.
Select None button	deselect currently selected sources.
Copy To button	copy settings to selected source/s.

Table 35 Source Properties - Copy Tab.

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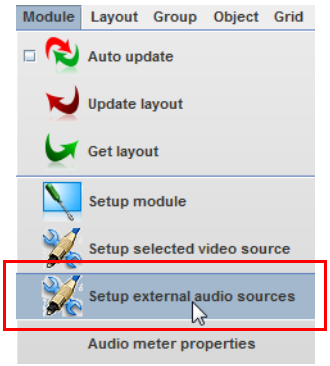
7.3.3 Ext. Audio Source Properties (*Not applicable to* Vega-MV)

NOTE: This screen does *not apply to* **Vega-16MV** *nor to* **Vega-32MV**.



The External Audio Source Properties screen is not applicable to the Vega-MV products. (The tab is used for some other products on the same hardware platform as Vega-MV which have discrete audio inputs and outputs - to configure source audio channels.)

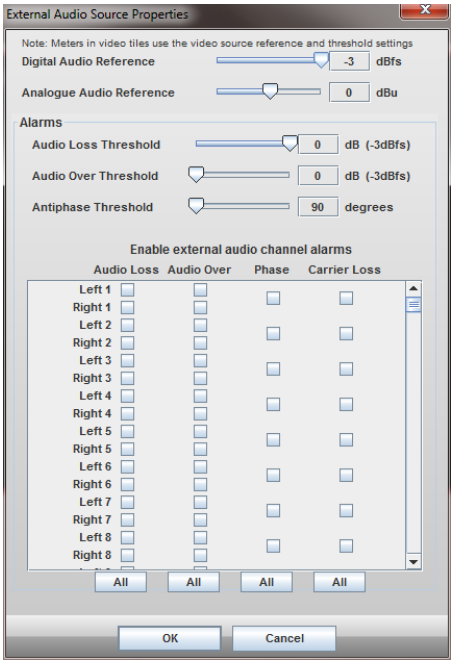


Figure 81 External Audio Source Properties Screen

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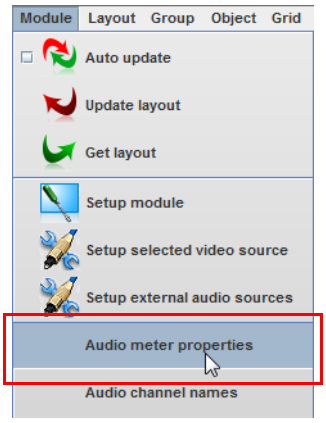
7.3.4 Setup Audio Meter Properties



This screen sets the audio levels that the audio meter bars change color at.

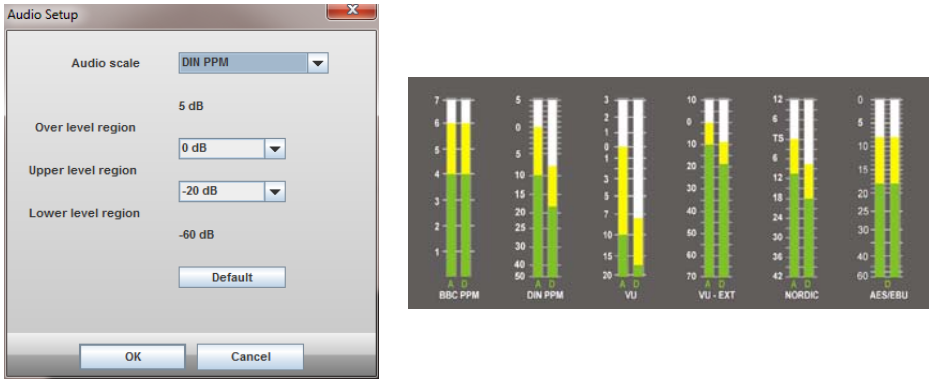


Figure 82 Set Audio Level Changeover Points.

The settings are:

Setting	Description
Audio Scale	Select the audio scale type being set. Each audio scale type is set independently.
Upper Level region to Over level region changeover level	Select the audio level that the audio meter color changes from the Upper level region color to the Over level region color, see section 7.6.7 for details on setting the audio meter bar colors.
Lower level region to Upper level region changeover level	Select the audio level that the audio meter color changes from the Lower level region color to the Upper level region color, see section 7.6.7 for details on setting the audio meter bar colors.
Default button	Click on the **Default** button to load the default levels for the selected Audio scale type.

Table 36 Setup Audio Meter Properties

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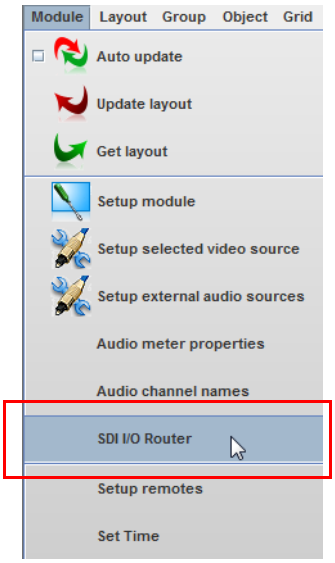
7.3.5 SDI I/O Router Dialog (for the Internal Router)



Select 'SDI IO Router' in the **Module** menu to open the SDI I/O Router dialog, see Figure 83.

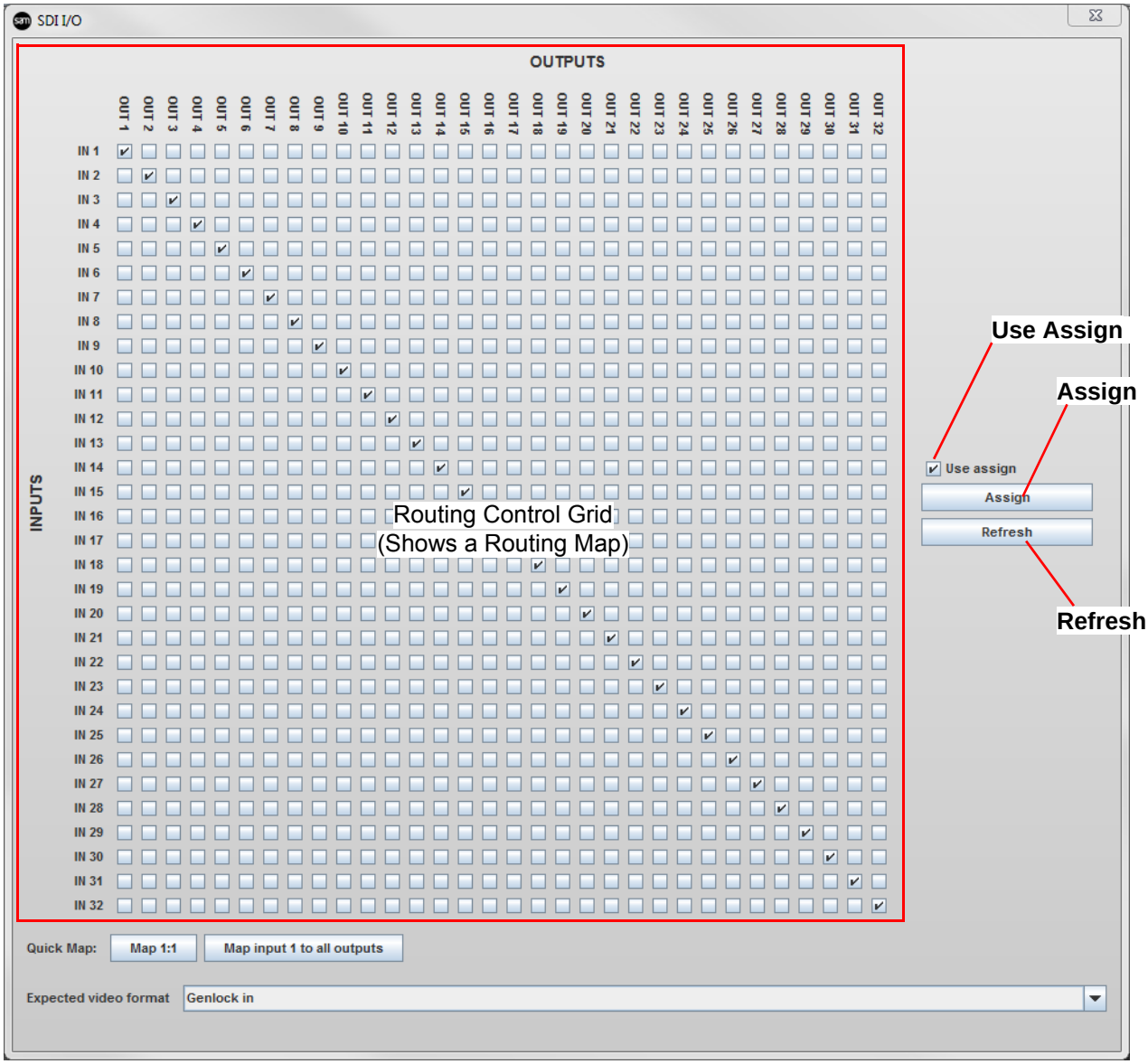


Figure 83 SDI I/O Router Dialog (32 x 32 shown)

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The routing control grid shows a routing map of the internal router. Checks (ticks) in the grid crosspoints show the currently selected routes.

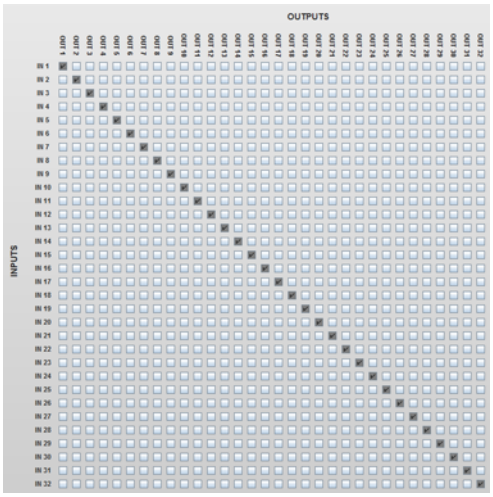
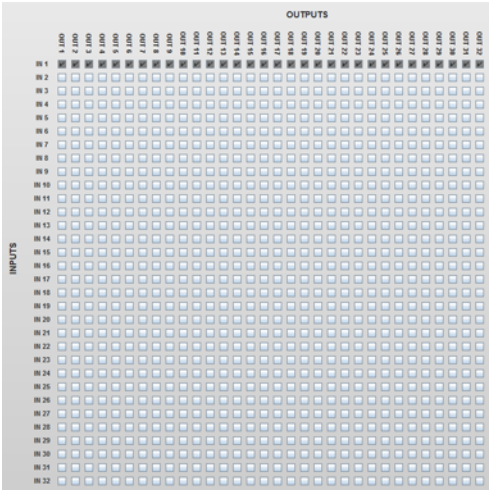
Control Item	Description
Routing Control Grid:	Shows a routing map of the Vega-MV internal router.
IN 1 to IN 16	Available router video inputs (**router sources**) are shown on the left-hand side of the grid: • 'IN 1' to 'IN 16' for a Vega-16MV • 'IN 1' to 'IN 32' for a Vega-32MV
OUT 1 to OUT 16	Available router video outputs (**router destinations**) are shown along the top of the grid: • 'OUT 1' to 'OUT 16' for a Vega-16MV • 'OUT 1' to 'OUT 32' for a Vega-32MV
Quick Map:	
Map 1:1	Button. Click to set all routes to be 1-to-1. I.e. along a diagonal of the routing grid.
	
Map Input 1 to All Destinations	Button. Click to route input 1 to all outputs (destinations) of the internal router.
	

Table 37 SDI I/O Router Dialog

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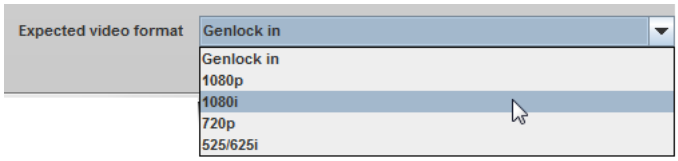
Control Item	Description
Use Assign	Check box. Tick to enable the **Assign** button.
Assign	Button. Click 'Assign' to apply any routing changes made in the routing control grid. When button is disabled (greyed out) routing changes take effect immediately.
Refresh	Button. Click **Refresh** to get current routing information from the internal router.
Expected Video Format	Drop-down box. Select the video standard to use for timed-switching in the internal router.  Note: The basic frame rate used is the same as the frame rate of the reference signal at the reference input. The options for the line timing framework are: • **Genlock In** - Use the video standard of the unit's reference input signal. • **1080p** - Use a 1080p framework. • **1080i** - Use a 1080i framework. • **720p** - Use a 720p framework. • **525i/625i** - Use an SD framework (525i59.94 or 625i50) Examples: If video inputs are of the same video standard as the reference signal, use the **Genlock In** setting. If an SD reference signal is being used and all video inputs are 1080p, then use the **1080p** setting.

Table 37 SDI I/O Router Dialog (Continued)

Make a Route:

To make a route with the router control grid:

1. Click on a different crosspoint in an OUT column of the grid to select a new source for the destination.
   - If **Use Assign** is unticked,
     then the route change takes effect immediately.
   - If **Use Assign** is ticked,
     then click the **Assign** button to make change take effect.

The route is made.

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7.3.6 Set Time

Click ‘Set Time’ in the Module menu.

The clock and date display data can be derived from several sources; the system clock, NTP synchronisation, LTC, or VITC from a chosen SDI input. The clock source is set by selecting **Set Time** in the **Module** menu.
There are two tabs, Time and Timezone.
The timezone should be set to the appropriate region before adjusting the clock.

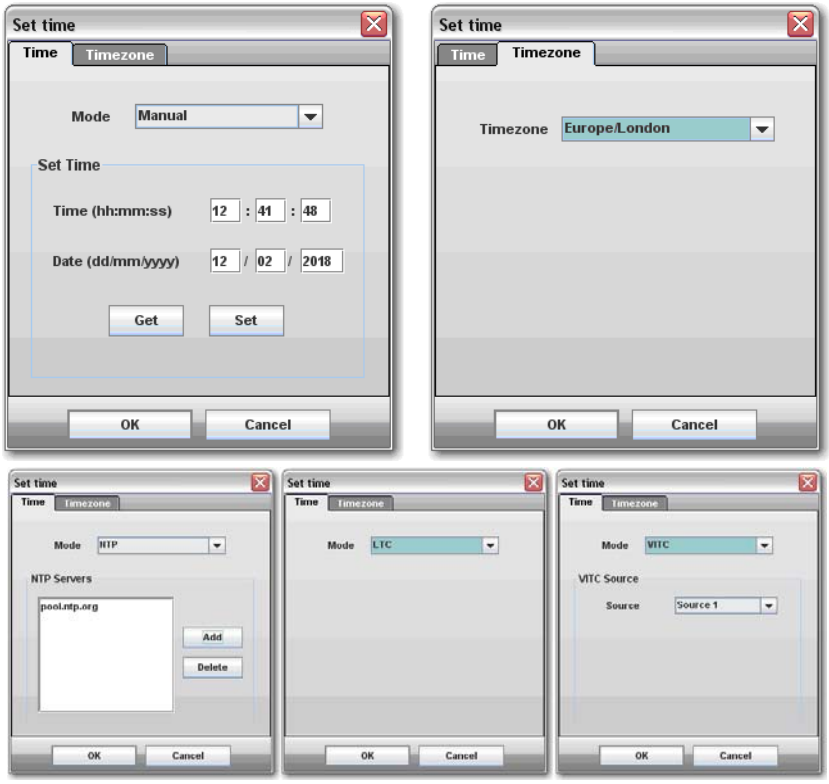

Figure 84 Set Time.

Operation:

The Timecode is displayed in a fixed position near the bottom center of the tile within the video. The display will start to be cropped when the tile is 150 pixels or less wide. For each input it is possible to display either the Ancillary Timecode or the DVITC from the video source.

Note: D-VITC is only available on SD sources as there is currently no standard for HD sources. Ancillary Timecode is available on both SD and HD sources.

If VBI data is present on a video input and the video is an SDI source then the data can be displayed on the relevant video tile (see sections 7.6.10 and 7.6.11 for setting details).

If multiple sources of timecode are present in a video source then the timecode selected for display, in order of priority is: Ancillary VITC, Ancillary LTC and D-VITC.

In the absence of any clock, the system time is used. A battery on the MV-NET card ensures that time data is retained if the unit is powered down.

LTC is applied to the frame through a BNC on at the rear panel of the MV-NET card, see section 4.5. When LTC is present this source becomes the exclusive reference for clocks.
If there is no LTC present,
the frame searches the network for an NTP Server in the nearby region (pool.ntp.org).
If a server is found, the time is taken from that.

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To set the clock source, go to the **Time** tab and select the desired source - Manual, NTP, LTC or VITC. The setup procedures for each mode are:

Setting	Description
Manual	In this mode, the time and date of the system clock will be shown and can be adjusted. Press the **Get** button to show the current time. To adjust the time, enter the new time and date in the appropriate fields and then press the **Set** button. A battery on the MV-CTL board ensures that time data is retained should the unit be powered down.
NTP	In this mode, the time is sourced from an NTP server (or multiple NTP servers can be entered). Press the **Add** button to add a new server; enter the host name or IP address of the new server.
LTC	In this mode, the time is sourced from the LTC input on the rear panel of the MV-NET card. There is nothing to setup here; there just needs to be LTC present for this to work properly. If no LTC is present then the system clock will be used. (If LTC is present but later disappears then the clock will continue advancing without any discontinuity).
VITC	Here the time can come from VITC that is present on any SDI input. Select the chosen SDI source number that contains VITC. If no VITC is present then the system clock will be used. (If VITC is present but later disappears then the clock will continue advancing without any discontinuity).

Table 38 Set Time

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7.4 Layout Menu

The layout menu allows layouts to be created, saved, loaded and deleted. Layout settings can be chosen for new layouts.

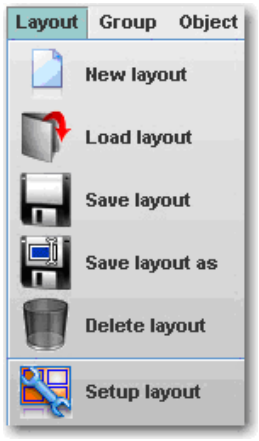

Figure 85 Layout Menu.

Setting	Description
New Layout	Offers to save the current layout before removing all objects from the editor workspace ready to create a new layout.
Load Layout	Click to display a list of available layouts. The control loads a previously saved layout into the editor workspace. Note: Click on the **Update Layout** button to transfer the layout to the multiviewer display output screen.
Save Layout	Saves current layout. A name must be given if this is the first time the layout has been saved.
Save Layout As	Saves current layout with a different name.
Delete Layout	Delete a selected layout from the saved list.
Setup Layout	Opens the Layout Properties window, see section 7.4.1. Choose background type from transparent, color or bitmap. Also choose new layout style from center, Tile or Scale.

Table 39 Layout Menu.

Predefined Layouts:

A Vega-MV unit has some pre-defined layouts set up. Typically, these layouts place all inputs onto one multiviewer display output or across both multiviewer display outputs. These layouts are shown with an asterisk at the end of the layout name (*).

A pre-defined layout can be loaded and settings modified. A pre-defined layout cannot, however, be saved and overwritten, nor deleted.

Use a pre-defined layout as the basis for a custom layout. Use **Save Layout As** to initially save the custom layout.

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7.4.1 Setup Layout

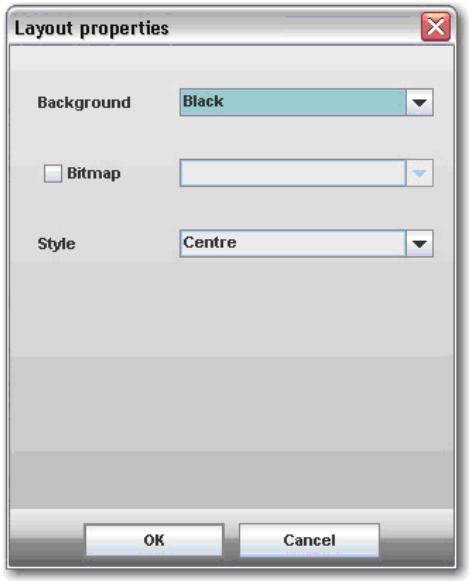

Figure 86 Layout Properties.

Setting	Description
Background	Set the display background color.
Bitmap	Tick the box and select a picture to be used as the background graphic. The picture must be in png format. See section 10.2 for details on uploading background images to the Vega-MV unit MV-CTL card.
Style	Select bitmap style: Center (centers bitmap); Tile (display bitmap in multiple tiles); or Scale (scales bitmap to fit the display background)

Table 40 Layout Properties.

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7.5 Group Menu

The group menu allows objects to be selected as a group.

Objects can be selected individually to create a group by holding the **[Ctrl]** key down before clicking on them. A small square block is displayed in the bottom right corner of each selected object.

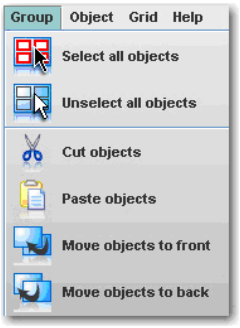

Figure 87 Group Menu.

Menu Option	Description
Select All Objects	All objects in the layout will be selected and can be operated on as a group.
Un select All Objects	Cancels group all objects command.
Cut Objects	Deletes all the tile objects in the group.
Paste Objects	Pastes the object that is on the clipboard to all objects in the group.
Move Objects to Front	Moves all tile objects in the group to the front.
Move Objects to Back	Moves all tile objects in the group to the back.

Table 41 Group Menu.

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7.6 Object Menu

The settings for the tiles can be manipulated from the object menu. This is accessed either by:

- Selecting the object and using the **Object** menu.

or

- Right-clicking on the object tile to be edited.

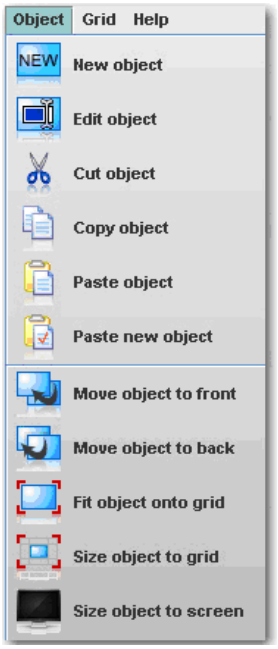

Figure 88 Object Menu.

Menu Option	Description
New Object	Creates a new object and opens the Edit Object Dialog.
Edit Object	Opens the Edit Object Dialog for the tile object that is currently selected.
Cut Object	Deletes the currently selected tile object.
Copy Object	Copies the display properties of the currently selected tile object (excludes source properties).
Paste Object	Pastes the copied display properties of the currently selected tile object.
Paste New Object	Creates a new object and pastes any previously copied display properties to it.
Move Object to Front	Moves the currently selected tile object in front of all other objects.
Move Object to Back	Moves the currently selected tile object behind all other objects.
Fit Object on to Grid	Expands all edges of the currently selected tile object to the nearest grid.
Size Object to Grid	Sets the size of the currently selected tile object to the chosen grid pitch.
Size Object to Screen	Sets the selected tile object to full-screen size.

Table 42 Object Menu

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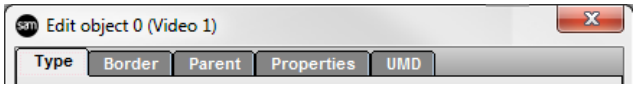
7.6.1 Edit Object Window

The Edit Object menu is used to set up all the attributes of a tile. It can be opened using two methods:

- Double-click on the object to edit.
- Go to the Object menu and select **Edit Object** or **New Object**.



The Edit Object menu comprises the following tabs:

Type - see Section 7.6.2 "Edit Object - Type" on page 121.

Border - see Section 7.6.3 "Edit Object - Border" on page 122.

Parent - see Section 7.6.4 "Edit Object - Parent" on page 122.

Properties - see:

- Section 7.6.5 "Edit Object - Properties" on page 123.
- Section 7.6.6 "Edit Object - Properties, Source (Video or Audio object)" on page 124.
- Section 7.6.7 "Edit Object - Properties, Audio (Video or Audio object)" on page 126.
- Section 7.6.8 "Edit Object - Properties, Error (Video or Audio object)" on page 132.
- Section 7.6.9 "Edit Object - Properties, Tally (Video object)" on page 133.
- Section 7.6.10 "Edit Object - Properties, VBI (Video object)" on page 134.
- Section 7.6.11 "Edit Object - Properties, WSS (Video object)" on page 136.
- Section 7.6.12 "Edit Object - Properties, SAG - Safe Area - (Video Object)" on page 137.
- Section 7.6.13 "Edit Object - Properties, Text (Text object)" on page 138.
- Section 7.6.14 "Edit Object - Properties, Logo Tab (Logo object)" on page 139.
- Section 7.6.15 "Edit Object - Properties, Clock (Clock object)" on page 140.
- Section 7.6.16 "Edit Object - Properties, Timer (Timer Object)" on page 141.

UMD - see Section 7.6.17 "Edit Object - UMD Tab" on page 146.

Some controls, such as ‘Properties’, depend on the type of tile object and can have sub-tabs.

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7.6.2 Edit Object - Type

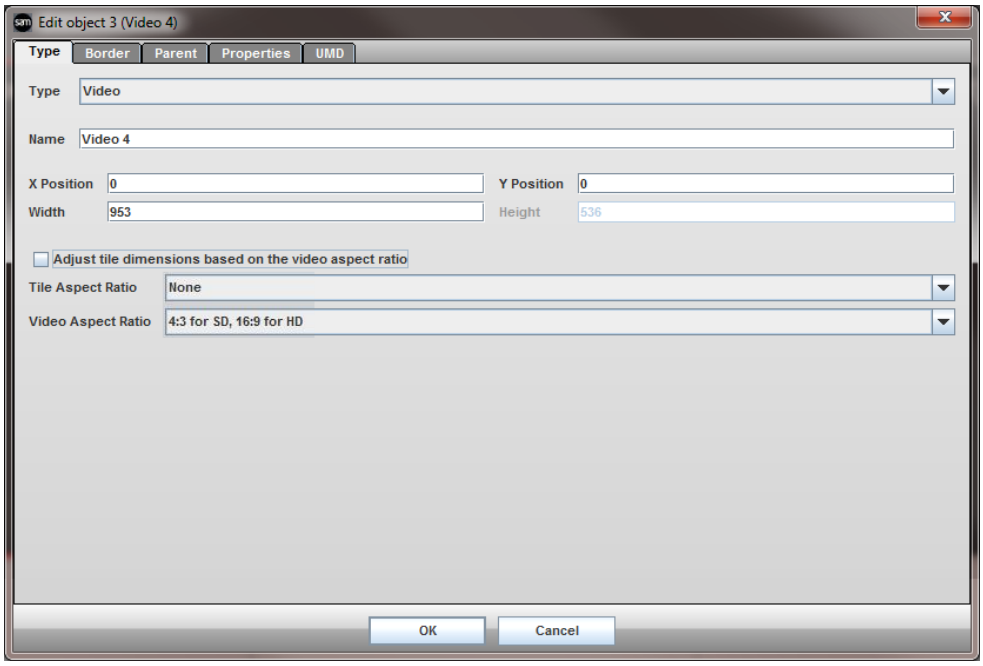

Figure 89 Edit Object - Type Tab

Setting	Description
Type	Defines object type. Choose from None, Video, Audio, Text, Logo, and Clock.
Name	Name of the tile, can be up to 40 characters long.
X, Y, Width, Height	Size and position of the tile can be altered by entering figures here, and any adjustments will be reflected in the outline of the rectangles drawn to represent the tiles. Conversely, any resizing or repositioning of the tiles done graphically will be reflected in the figures presented here.
Adjust tile dimensions based on video aspect ratio tick box	**Video Objects only** Locks the tile aspect ratio to match the **Video Aspect Ratio** setting so that no letter boxing or pillar boxing is required to maintain the correct aspect ratio. When this box is ticked **Tile Aspect Ratio** selection will be greyed out.
Setting	**Description**
Tile Aspect Ratio	The aspect ratio of the tile can be set so that as either width or height are changed, height or width, respectively, will be automatically adjusted to retain the ratio. If **None** is selected the tile can be freely resized.
Video Aspect Ratio	**Video Objects only** The video aspect ratio can be set so that as either width or height are changed, height or width, respectively, will be automatically adjusted to retain the ratio. Select **4:3 for SD, 16:9 for HD** to set the aspect ratio based on the signal resolution. If **None** is selected the tile can be freely resized.

Table 43 Edit Object - Type Tab

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7.6.3 Edit Object - Border

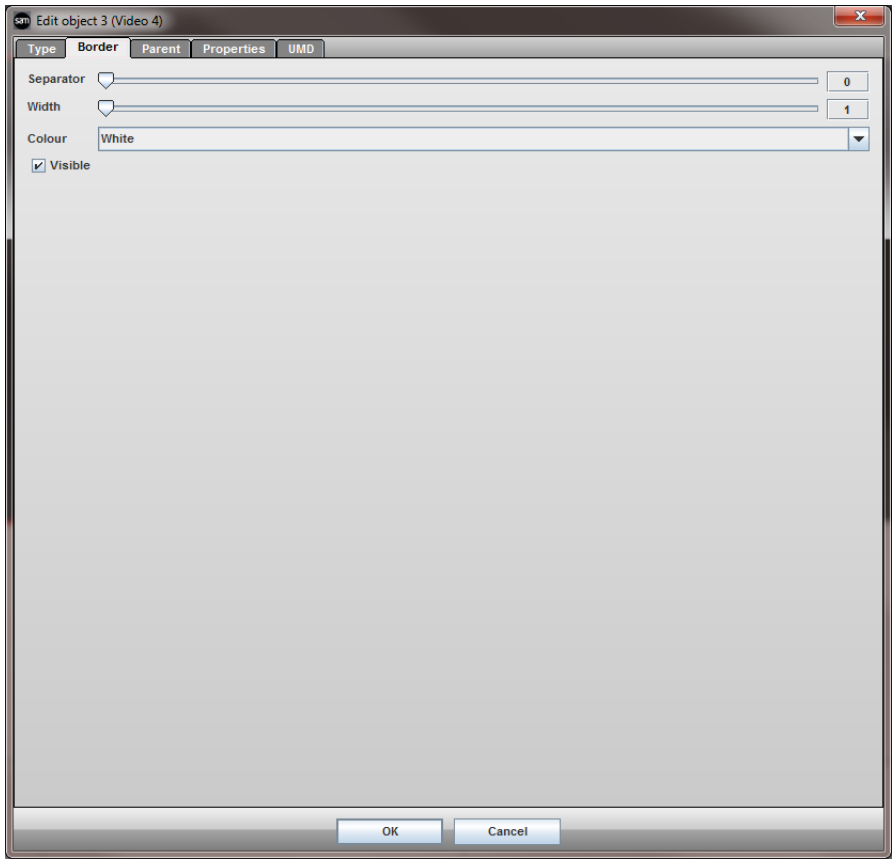

Figure 90 Edit Object - Border Tab.

Setting	Description
Separator	number of pixels separating the edge of the video content from the tile border.
Width	pixel width of the border.
Colour	color of the border.
Visible	turns the border on and off.

Table 44 Edit Object - Border Tab

Note:

- The border will be displayed as a shaded area on the video tile in the editor workspace.
- To avoid scaling issues when outputting a full screen (1:1) video signal to the multiviewer monitor the Border settings for the video object must be configured as shown below:

  - **Separator** = 0

  - **Width** = 1

  - **Colour** = Any

  - **Visible** = Ticked

7.6.4 Edit Object - Parent

Assigning a parent object to one or more tiles enables collective positioning and resizing of grouped tiles, which eases the configuration of objects that have a fixed association. Once a tile object has been assigned to a parent, it can no longer be moved independently.

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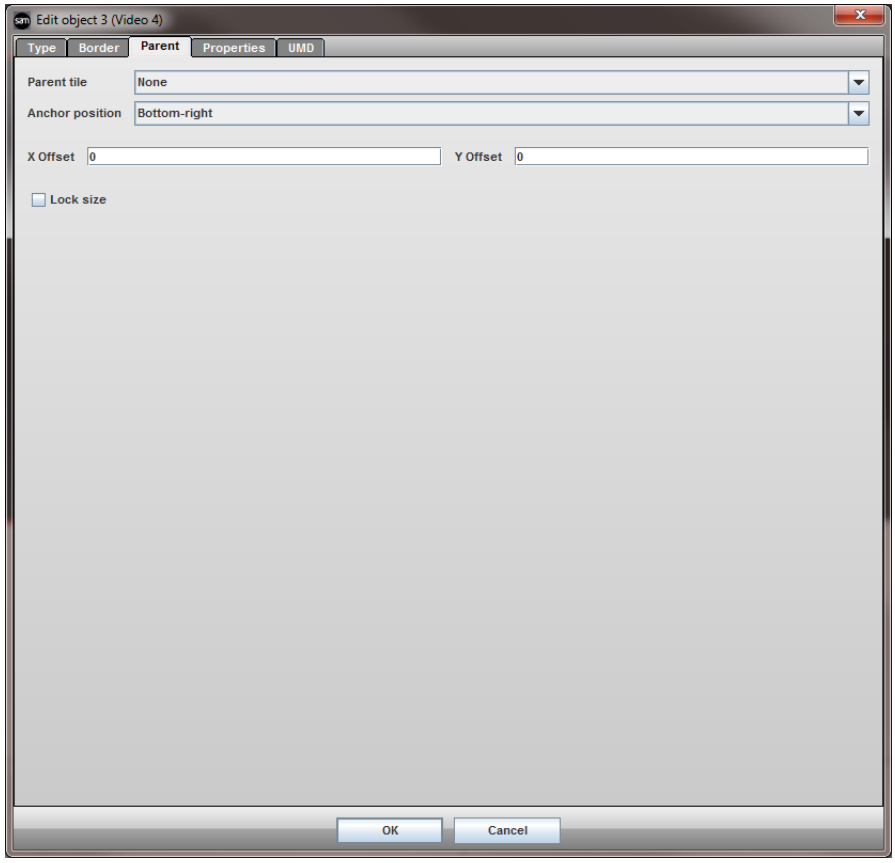

Figure 91 Edit Object - Parent Tab.

Setting	Description
Name	For the currently selected tile, select the parent object by name.
Anchor position	Set the anchor point of the currently selected tile relative to the parent object.
X Offset/Y Offset	Offset of the anchor point of the currently selected tile relative to the parent object. Note that using a zero offset value will cause the tile object to behind the parent object.
Lock size tick box	Tick to lock the scaling of the currently selected tile to that of the parent object. When this option is selected, the tile object cannot be resized independently.

Table 45 Edit Object - Parent Tab

7.6.5 Edit Object - Properties

This tab will not appear if the object type is set to 'None' in the **Type** tab.

For each of the other object type selections, a specific set of controls will appear on the Properties tab.

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7.6.6 Edit Object - Properties, Source (Video or Audio object)

This sub-tab only exists within the Properties tab of Video and Audio type tiles.

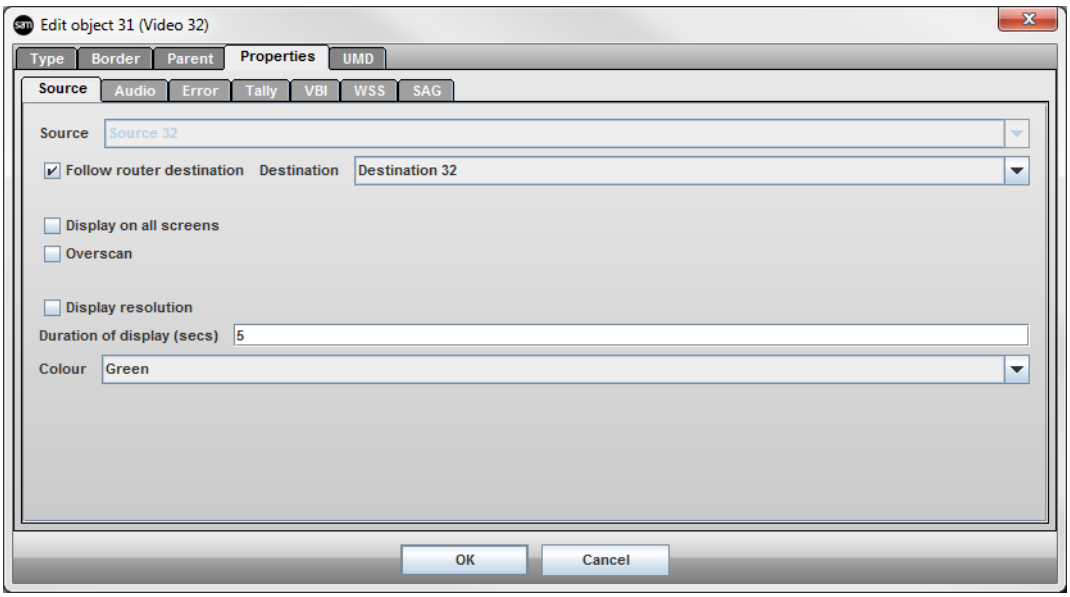

Figure 92 Edit Object - Properties - Sources Sub-Tab.

Setting	Description
Source	For a video tile, this selects the source of the video to display in the tile. For an audio tile, it selects the audio channels that have been set up to be associated with the chosen source
Follow Router Destination	Check box. Tick to select 'Follow Router Destination' mode for the object.
Destination	Drop-down box. Select (internal) router destination number for object to follow.
Display on all screens	Check box. For Vega-MV, leave this unticked. *(Ticking this control displays the same video tile on both outputs.* ***Note:** The tiles remain locked to each other on both outputs (i.e. moving the tile on one screen will also move it to the same size and position on the other screen).* ***Note:** To display the same video tile on different display outputs and at different sizes and positions, use another source and assign it to the same video input.)*
Overscan	Check box. Tick to overscan the video image by 5%.
Display resolution	Check box. This will display a message in the top left corner of the tile indicating the format and resolution of the video input.

Table 46 Edit Object - Properties - Sources Sub-Tab

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Duration of display	Text box. Enter the number of seconds that a message will be displayed after a change in the format or the resolution occurs. If **Display resolution** is ticked, then 'Duration of display' sets the number of seconds that the message will be displayed after a change in the format or resolution occurs. If no video is present then the message remains on display.
Colour	Drop-down box. if **Display resolution** is ticked, then 'Colour' sets the color of the video input format message.

Table 46 Edit Object - Properties - Sources Sub-Tab (Continued)

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7.6.7 Edit Object - Properties, Audio (Video or Audio object)

This sub-tab only exists within the Properties tab of Video and Audio type tiles. It controls the audio meters that can be displayed in each window. There can be up to 4 meters per window, each pair of meters are controlled by separate sub-tabs within this section.

The **Audio meter 1** tab is used to configure up to two meters in the left part of the tile and the **Audio meter 2** tab is used to configure up to two meters in the right part of the tile. The configuration options for both tabs is the same and so only one tab is shown here.

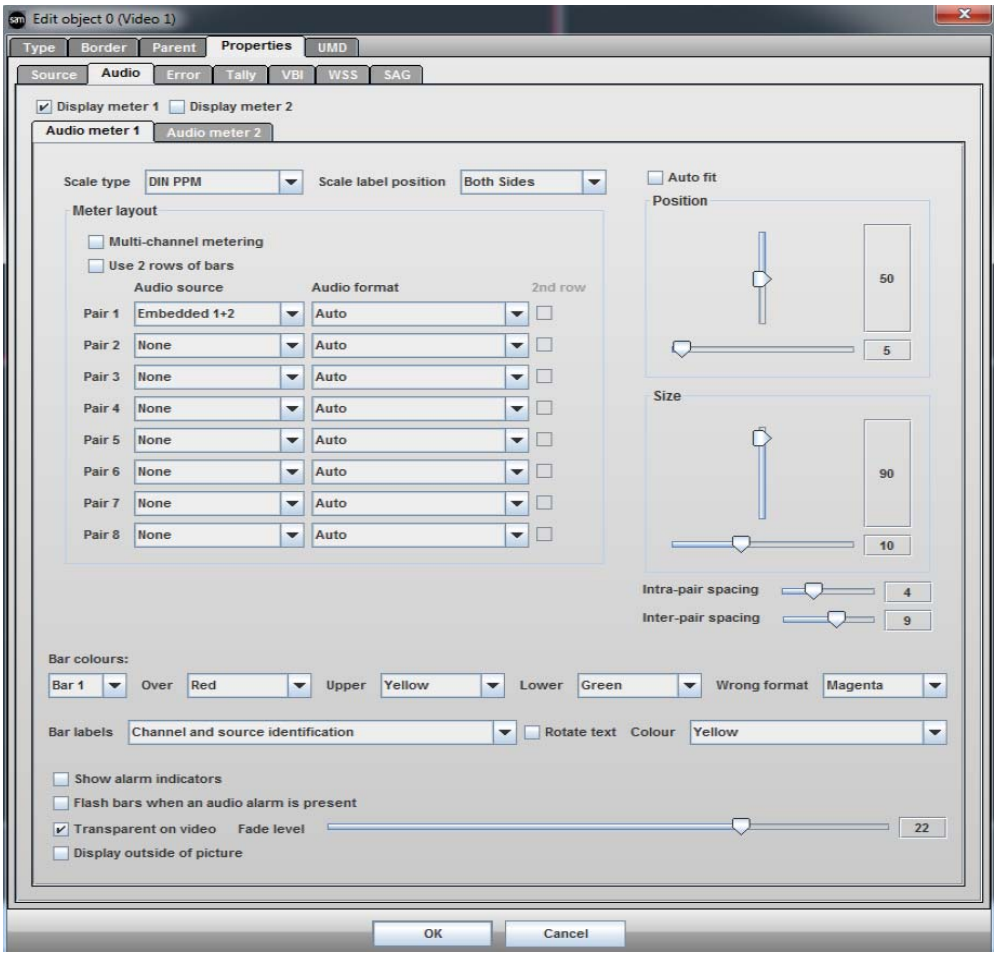

Figure 93 Edit Object - Properties - Audio Sub-Tab

Setting	Description
Display meter 1 and Display meter 2 tick boxes	Enables/disables each of the 2 audio meter groups.
Scale type	Sets the scale type of all the audio meter bars on display in this meter (including the second row if it is selected), see section 3.6.5 to see an example of each scale type. **Note**: The Scale Type selected for meter 1 is also used for meter 2 when both meters are displayed.
Scale Label Position	Sets the positioning of the scale labelling on either side of the meter.
Auto fit tick box	Tick to automatically scale the meter to fit into the whole tile. The Position and Size settings are disabled when Auto-fit is enabled.

Table 47 Edit Object - Properties - Audio Sub-Tab

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Setting	Description
Multi-channel metering tick box	The purpose of this function is to allow many audio bars to be set up quickly and it is therefore best suited to cases when you want to display many consecutive channels using the same format. When enabled the Meter layout group shown in Figure 93 is replaced, see Table 48 on page 129 for details.
Use 2 rows of bars tick box	Tick to enable the use of a second row of audio meter bars. When ticked the first row of bars is displayed in the upper part of the tile and the second row is displayed at the lower part of the tile. When unticked only one row of audio meter bars is displayed.
Audio sources	Sets the source to display in each of the 16 bars of the meter. These are configured in pairs. Set to **None** to turn a pair off, or select **Embedded** or **External** audio pair as the source.
Audio Format	Sets the audio format for each audio source pair. Select from: **Auto**, **PCM** and multiple **Dolby E** source types.
2nd row tick boxes	Tick to display the audio pair in the second row of audio meter bars. This option only available if the **Use 2 rows of bars** tick box is ticked.
Position	Sets the vertical and horizontal position of the meter within the window. **Setting examples**: • To position the top of the audio meter bars at the top of the tile set to 0 • To position the middle of audio meter bars on the horizontal centre line of the tile set to 50 • To position the bottom of audio meter bars at the bottom of the tile set to 100 If the **Use 2 rows of bars** tick box is ticked the vertical and horizontal slider settings are used for both meters.
Size	Sets the vertical and horizontal size of the meter within the window. If the **Use 2 rows of bars** tick box is ticked the vertical and horizontal slider settings are used for both meters.
Intra-pair spacing	Sets the number of pixels between the meter bars of each audio pair.
Inter-pair spacing	Sets the number of pixels between adjacent meter pairs.
Bar Colours:	Selects bar to which the color of the over, upper and lower range applies, see section 7.3.4 for details on setting the levels at which the colors change.
Over	Sets the over range color for the bar selected in the Bar Colours control.
Upper	Sets the upper range color for the bar selected in the Bar Colours control.
Lower	Sets the lower range color for the bar selected in the Bar Colours control.
Wrong format	Not applicable if Audio Format is set to **Auto**. Sets the wrong format color for the bar selected in the Bar Colours control.

Table 47 Edit Object - Properties - Audio Sub-Tab (Continued)

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Setting	Description
Bar Labels	Sets the display of the bar labels to either an enumerated format, or the labels as entered for the respective channels, or off.
Rotate text tick box	Rotates the label characters to the right by 90 degrees.
Colour	Sets the color of the bar labels.
Show Alarm Indicators tick box	Enables the alarm indicators at the top of the bars.
Flash bars when an audio alarm is present tick box	When enabled the audio bars will flash when an audio alarm is detected.
Transparent on Video tick box	Enables the transparency of the meter bars when they are on the in-picture area.
Fade Level	Sets the transparency of the audio bars when they are on the in-picture area.
Display outside of picture tick box	Reduces the width of the video portion of the tile and positions the meter against the inner edge of the tile so that it is not overlapping the video. The area reserved for the audio meter will be indicated by a shaded area on the video tile in the editor workspace (see page 75, Figure 57 for an example). **Note**: to maintain the desired aspect ratio of the video, go to the **WSS** tab, select WSS/AFD for the mode and tick Auto size video image. Set the default Video Aspect Ratio on the Edit object, **Type** tab (see section 7.6.2 for details).

Table 47 Edit Object - Properties - Audio Sub-Tab (Continued)

Note:

- The number of audio bars that actually get displayed within each meter depends on the number of channels contained in a pair. When Dolby E is the content, there may be up to eight channels to display for one source pair.
- No decoding of Dolby E audio content is carried out. Only the meter level information contained in the meter segment of a Dolby E frame is used for metering.

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Multi-channel Metering:

The purpose of the Multi-channel metering function is to allow many audio bars to be set up quickly and it is therefore best suited to cases when you want to display many consecutive channels using the same format.

See Appendix E.2 for a worked example.

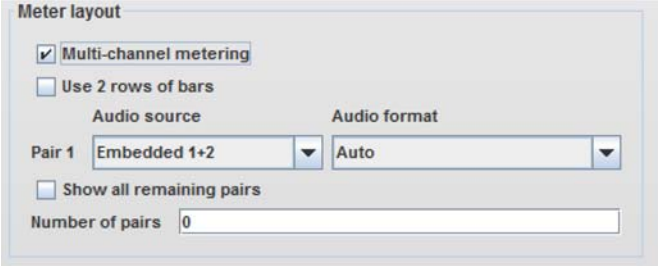
Setting	Description
Multi-channel metering tick box	Tick to enable Multi-channel metering, the Meter layout group shown in Figure 93 is replaced by the Meter layout group shown below: 
Use 2 rows of bars tick box	Tick to enable the use of a second row of audio meter bars. When ticked the first row of bars is displayed in the upper part of the tile and the second row is displayed at the lower part of the tile. When unticked only one row of audio meter bars is displayed.
Audio sources	In Multi-channel metering mode the first pair to be monitored is selected in the **Pair 1 Audio source** field. Select an **Embedded** audio pair as the source. (“**External”** audio pair is not supported on Vega-MV.)
Audio Format	Sets the audio format for audio source Pair 1. Any further pairs will be set to the same audio format as the format selected for pair 1. **Note**: If there are mixed audio formats present then Pair 1 must be set to **Auto** to ensure the audio formats are detected correctly.
Show all remaining pairs tick box	Configures the number of audio pairs displayed in the meter after Pair 1 audio source. This is selected in one of two ways depending on the tick box state: **Ticked** - All the pairs that come after the pair chosen in the Pair 1 audio source field will be displayed in the meter. **Example 1**: If Embedded 8+9 is the pair selected in **Pair 1** then embedded channels 8+9 up to channels 15+16 will be displayed in the meter. **Example 2**: If External 1+2 is the pair selected in **Pair 1** then all of the external audio channels will be displayed in the meter. **Unticked** - Enter the number of pairs manually in the **Number of pairs** box. **Example**: If Embedded 8+9 is the pair selected in **Pair 1** and the **Number of pairs** is set at 2 then embedded channels 8+9 and 10+11 will be displayed in the meter.

Table 48 Use Multi-channel Enabled

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Example Audio Meter Configuration:

Configure four audio meters on a video tile with one meter in each corner as shown below in Figure 94

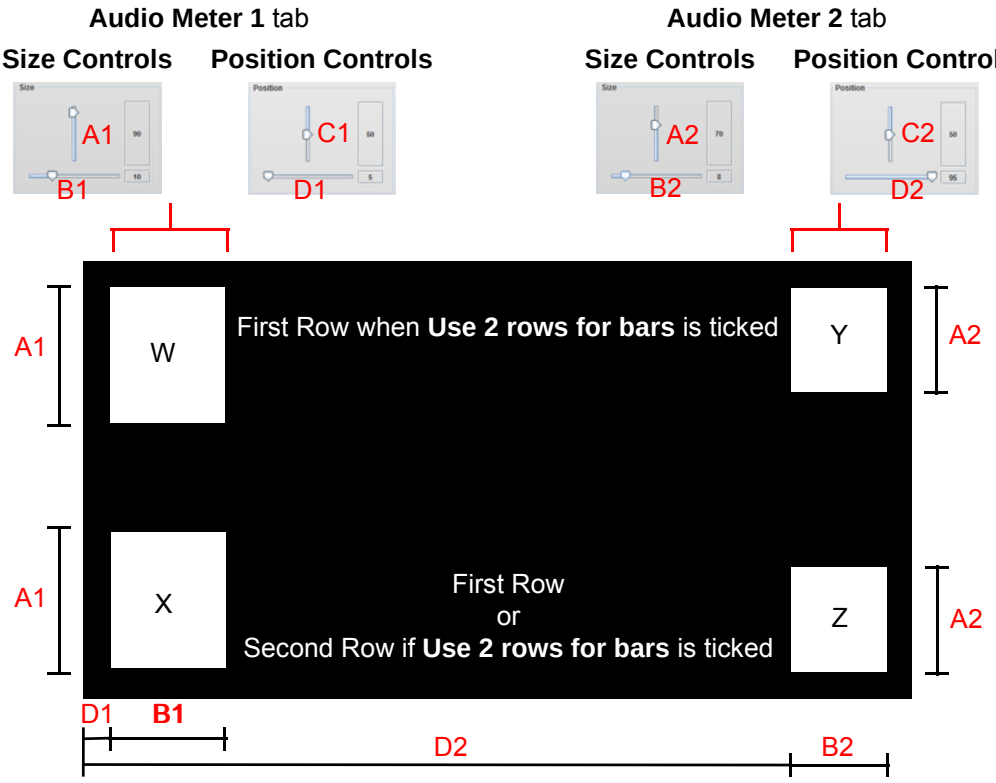

Figure 94 Example Video Tile with Audio Meters.

The following example settings are entered on the Audio tab (see Figure 93).

General Settings:

Display meter 1 tick box: Tick

Display meter 2 tick box: Tick

Audio Meter 1 tab settings for meters on the left of the video tile (Meter W & X)

Multi-channel metering tick box: Unticked.

Use 2 rows of bars tick box: Tick.

Auto fit tick box: Unticked.

Set Scale type, Scale label position, Bar colors, Bar labels, etc. as required.

Audio Meter W (first row, channels 1 to 2, top left of tile):

Pair 1, Audio Source: Embedded 1 + 2, Audio format: Dolby 5.1 and 2nd row tick box: Unticked

Audio Meter X (2nd row, channels 3 to 8, bottom left of tile):

Pair 2, Audio Source: Embedded 3 + 4, Audio format: Auto and 2nd row tick box: Ticked

Pair 3, Audio Source: Embedded 5 + 6, Audio format: PCM and 2nd row tick box: Ticked

Pair 4, Audio Source: Embedded 7 + 8, Audio format: Auto and 2nd row tick box: Ticked

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Audio Meter W and X Position and Size Configuration:

Position (vertical slider, C1): 50 and Position (horizontal slider, D1): 5

Size (vertical slider, A1): 90 and Size (horizontal slider, B1): 10

Audio Meter 2 tab settings for meters on the right of the video tile (Meter Y & Z)

Multi-channel metering tick box: Unticked.

Use 2 rows of bars tick box: Tick.

Auto fit tick box: Unticked.

Set Scale label position, Bar colors, Bar labels, etc. as required.

Note: The meter Scale Type selected for meter 1 is also used for meter 2 when both meters are displayed.

Audio Meter Y (1st row, channels 9 to 12, top right of tile):

Pair 5, Audio Source: Embedded 9 + 10, Audio format: PCM and 2nd row tick box: Unticked

Pair 6, Audio Source: Embedded 11 + 12, Audio format: Auto and 2nd row tick box: Unticked

Audio Meter Z (2nd row, channels 13 to 16, bottom right of tile):

Pair 7, Audio Source: Embedded 13 + 14, Audio format: Auto and 2nd row tick box: Ticked

Pair 8, Audio Source: Embedded 15 + 16, Audio format: Dolby 5.1 and 2nd row tick box: Ticked

Audio Meter Y and Z Position and Size Configuration:

Position (vertical slider, C2): 50 and Position (horizontal slider, D2): 95

Size (vertical slider, A2): 70 and Size (horizontal slider, B2): 8

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7.6.8 Edit Object - Properties, Error (Video or Audio object)

This sub-tab only exists within the Properties tab of Video and Audio type tiles. It determines the behavior of the tile when one of its enabled alarms gets triggered.

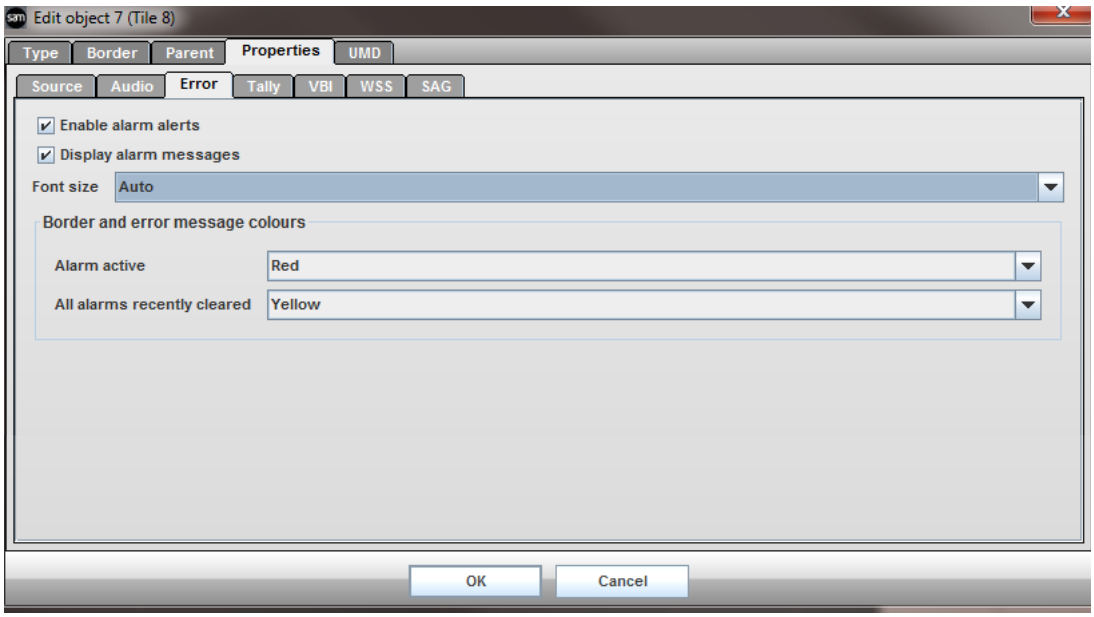

Figure 95 Edit Object - Properties - Error Sub-Tab

Setting	Description
Enable alarm alerts tick box	Must be ticked if any of the alarm indications (alarm messages or flashing border) are to be shown in the tile.
Display alarm messages tick box	When ticked, all the alarms that are currently triggered or have recently been cleared will be displayed in the tile. Only one alarm type gets displayed at a time; it will cycle through them if multiple alarms are present.
Font Size	Sets the alarm text size. If Auto is selected the alarm text is automatically sized to suit the tile it is being displayed on.
Alarm active	Sets the border color of the tile when an alarm triggers. Also applies to the color of alarm messages for alarms that are active.
All alarms recently cleared	Sets the border color of the tile when no alarms are currently triggered, but some have recently cleared but not reset yet. (See alarm section on the automatic reset timeout period). This also applies to the color of alarm messages for recently cleared alarms.

Table 49 Edit Object - Properties - Error Sub-Tab

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7.6.9 Edit Object - Properties, Tally (Video object)

This sub-tab only exists in tiles that are of Video type.

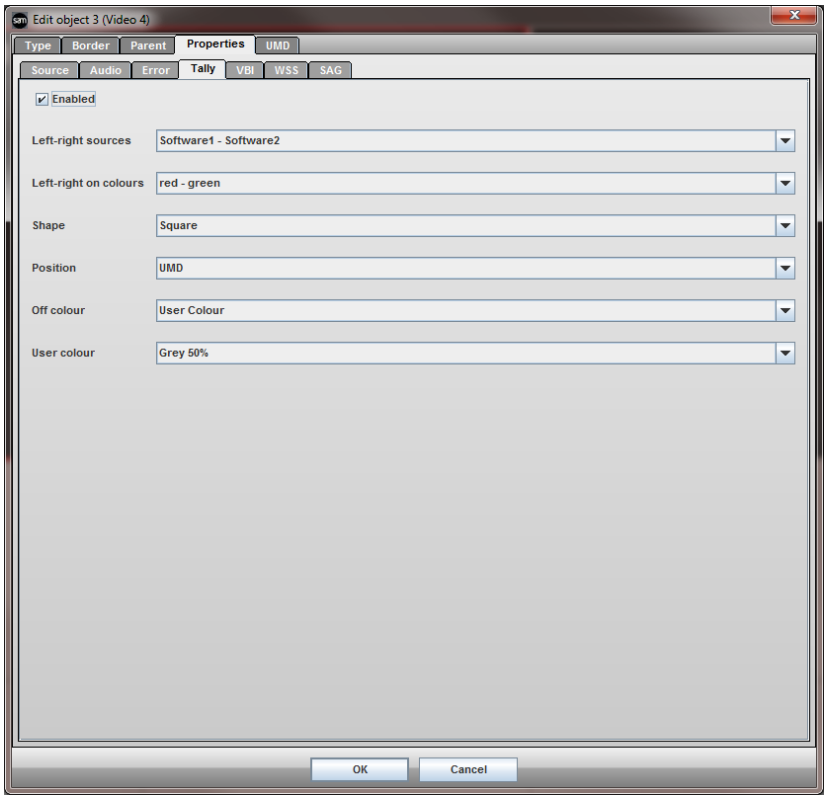

Figure 96 Edit Object - Properties - Tally Sub-Tab

Setting	Description
Enabled tick box	Turns the display of the tally on/off.
Left-right sources	Select hardware, or one of two software tallies. The hardware tally is the GPI tally that has been set up for the video source of the tile. This GPI to source assignment is configured in the GPI Inputs panel (in menu **Module > Setup Module**, then in the **Module Properties** window, in the GPIs tab, GPI Inputs tab. For each applicable GPI, select a Source … Hard Tally here). The two software tallies operate in accordance with TSL protocol. This has up to 127 display addresses; each address comprising 4 tallies and a UMD. The address assigned to a source depends on how the TSL Protocol has been configured (see section 7.3.1.10 for details of the TSL Protocol Options). Each video window can use the first 2 tallies of its display address to trigger the 2 tallies available in its UMD bar, or the border tally if set up appropriately.
Left-right on colours	Select red-green, green-red, red-red and green-green.
Shape	Select fill, square or round.
Position	Select UMD, border or UMD and border.
Off colour	Sets the off color to either default off color, UMD color, border color, or the user color set in the box below this control
User colour	Selects the off color if Off colour is set to the user-Colour.

Table 50 Edit Object - Properties - Tally Sub-Tab

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7.6.10 Edit Object - Properties, VBI (Video object)

This sub-tab only exists in tiles that are of Video type.

If VBI data is present on a video input and the video is an SDI source then the data can be displayed on the relevant video tile.

If multiple sources of timecode are present in a video source then the timecode selected for display, in order of priority is; Ancillary VITC, Ancillary LTC and D-VITC.

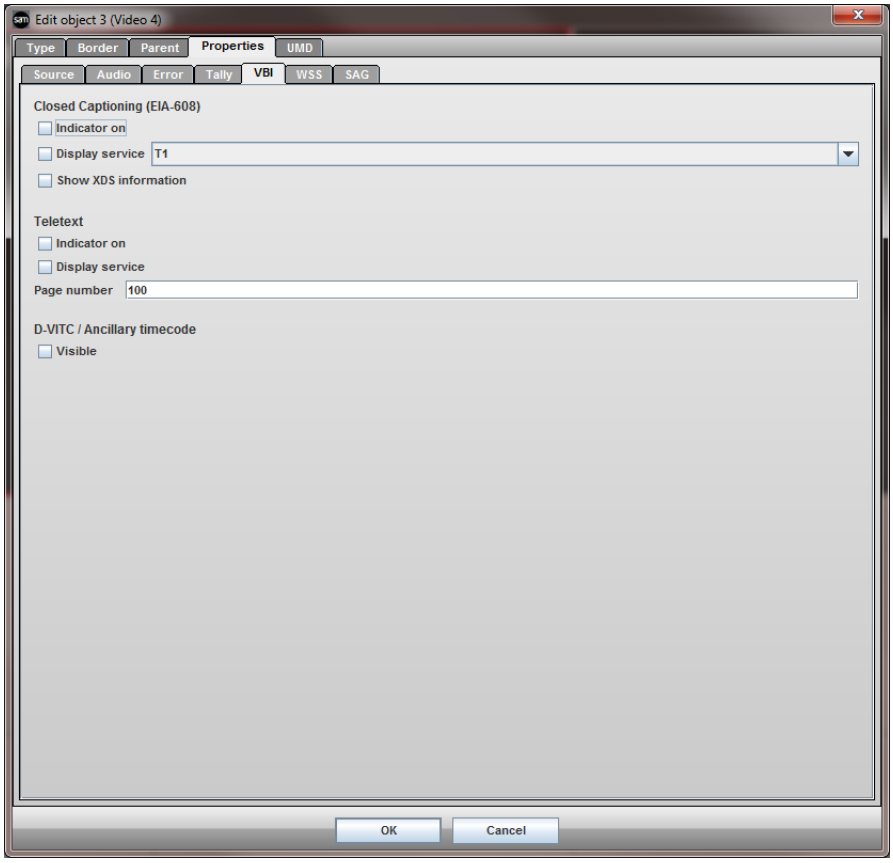

Figure 97 Edit Object - Properties - VBI Sub-Tab

Setting	Description
Closed Captioning (EIA-608):	These settings apply to composite NTSC input only (line-21 closed captions).
Indicator on tick box	Enables a “CC” indicator to be shown in the tile if the selected closed caption type is present.
Display service tick box	Displays the closed caption text in the tile if ticked, and selects the type of service to be displayed.
Show XDS information tick box	Shows the information contained in the extended data services.
Teletext:	These settings apply to composite or SDI video that contains WST subtitles, and SDI video that contains OP-47 teletext subtitles.
Indicator on tick box	Enables the indicator to be shown if teletext is present in the video. (Displays “WST” or “OP-47”, depending on the type present, or no indicator if none present).

Table 51 Edit Object - Properties - VBI Sub-Tab

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Display service tick box	Displays the teletext page or subtitles from the selected Page number in the tile if ticked.
Page number text box	Selects which teletext page is to be viewed.
D-VITC/Ancillary timecode:	
Visible tick box	Enables the display of the vertical interval timecode (D-VITC or ATC). This is only available on SDI inputs.

Table 51 Edit Object - Properties - VBI Sub-Tab (Continued)

Note:

1. D-VITC is only available on SD sources as there is currently no standard for HD sources. Ancillary Timecode is available on both SD and HD sources.
2. The Timecode is displayed in a fixed position near the bottom center of the tile within the video.
3. The display will start to be cropped when the tile is 150 pixels or less wide.
4. WST Teletext can only be decoded from Composite inputs.
5. Closed Caption pages of Teletext using the OP-47 standard can be displayed on SDI inputs.

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7.6.11 Edit Object - Properties, WSS (Video object)

This tab only exists in tiles that are of Video type.

If VBI data is present on a video input and the video is an SDI source then the WSS/AFD data can be used to control Aspect Ratio.

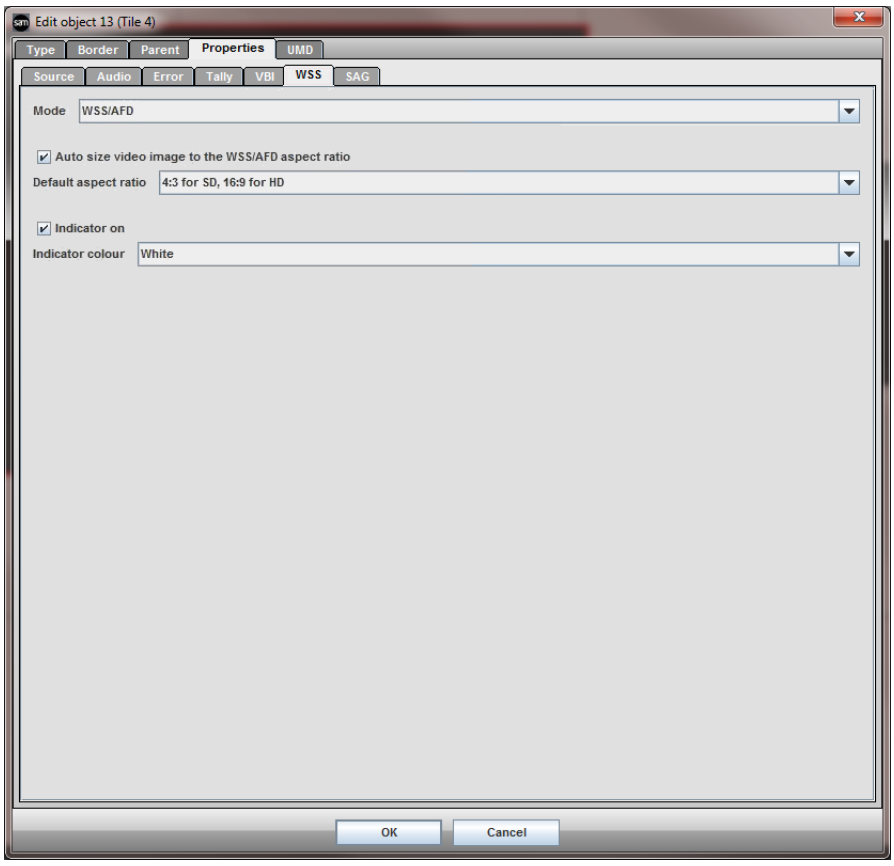

Figure 98 Edit Object - Properties, WSS Sub-Tab

Setting	Description
Mode	Selects the type of WSS/AFD to decode.
Auto Size video image to the WSS/AFD aspect ratio tick box	When ticked, the aspect ratio of the video will automatically respond to any changes in the selected WSS or AFD information. When unticked the default video size is defined by the **Video Aspect Ratio** setting on the Edit object, **Type** tab (see section 7.6.2).
Default aspect ratio	Chooses the aspect ratio to use when the correct one is unknown (for example if WSS or AFD is not present). Select **4:3 for SD, 16:9 for HD** to set the aspect ratio based on the signal resolution.
Indicator on tick box	When ticked, this will present an indicator in the tile if there is aspect ratio information available.
Indicator colour	Sets the color of the indicator text.

Table 52 Edit Object - Properties, WSS Sub-Tab

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7.6.12 Edit Object - Properties, SAG - Safe Area - (Video Object)

This sub-tab only exists in tiles that are of Video type.

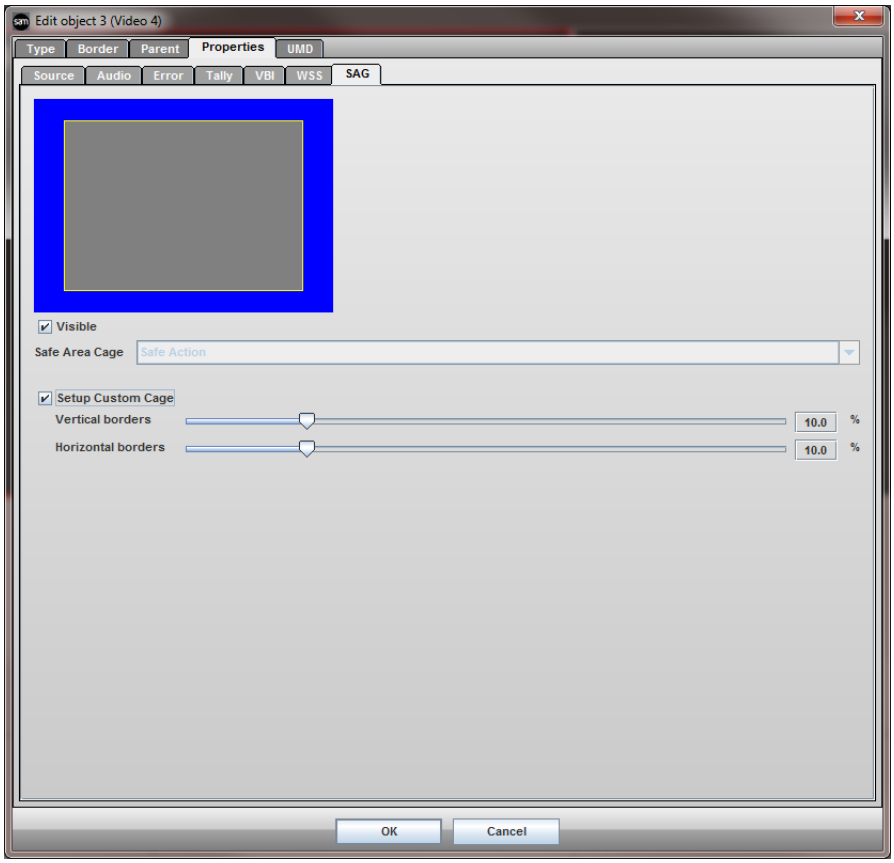

Figure 99 Edit Object - Properties - SAG Sub-Tab

Setting	Description
Visible tick box	When ticked, this will show the safe area outline in the video.
Safe Area Cage	If a preset safe area cage is to be shown then choose the appropriate one from this list.
Setup Custom Cage tick box	When ticked, a custom safe area cage can be drawn using the vertical and horizontal border controls.
Vertical Borders	Adjust the vertical borders of the safe area. The slide bar can be used, or numbers manually entered.
Horizontal Borders	Adjust the horizontal borders of the safe area. The slide bar can be used, or numbers manually entered.

Table 53 Edit Object - Properties - SAG Sub-Tab

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7.6.13 Edit Object - Properties, Text (Text object)

This sub-tab only exists in tiles that are of Text type.

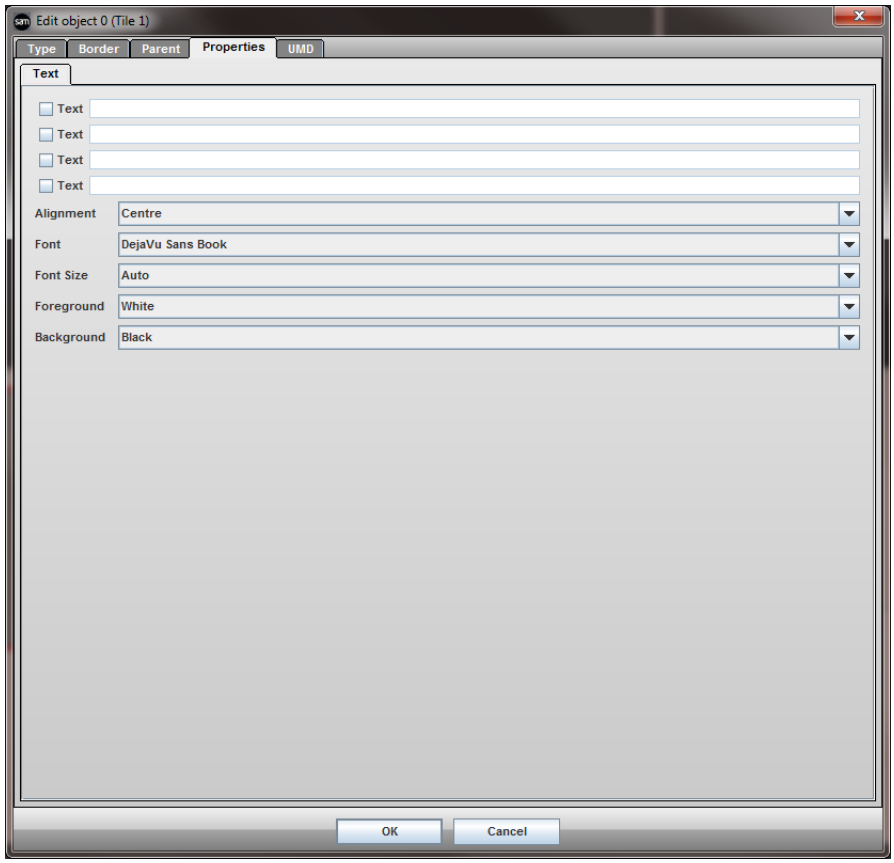

Figure 100 Edit Object - Properties - Text Sub-Tab

Setting	Description
Text	Enter up to four lines of text and set it to visible or hidden by ticking or unticking the check boxes.
Alignment	Justify text within the tile.
Font	Select font type.
Font Size	Select font point size.
Foreground	Set text color.
Background	Set text background color.

Table 54 Edit Object - Properties - Text Sub-Tab

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7.6.14 Edit Object - Properties, Logo Tab (Logo object)

This tab only exists in tiles that are of Logo type.

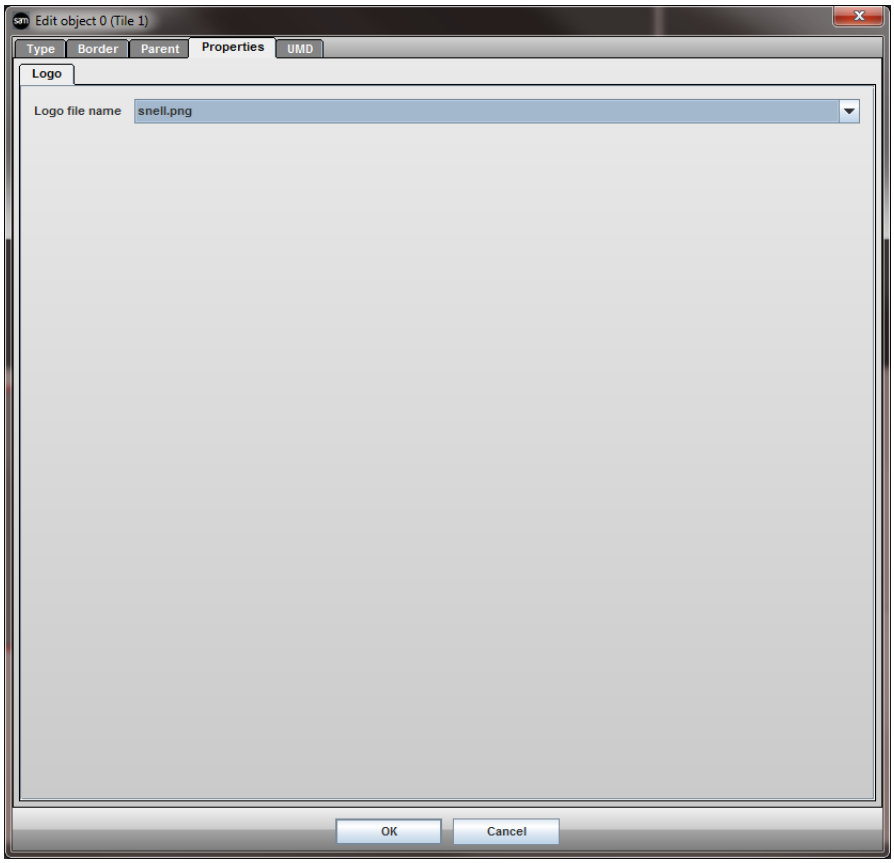

Figure 101 Edit Object - Properties - Logo Sub-Tab

Setting	Description
File name	Select one of the logo files from the drop down list. The selected logo will be scaled to fit the tile dimensions. See section 10.2 for details of uploading graphics files to the Vega-MV unit.
Notes: • Graphics files must be in png format. • There is approximately 200MB of storage available on the MV-CTL card for pictures.	

Table 55 Edit Object - Properties - Logo Sub-Tab

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7.6.15 Edit Object - Properties, Clock (Clock object)

This sub-tab only exists in tiles that are of Clock type.

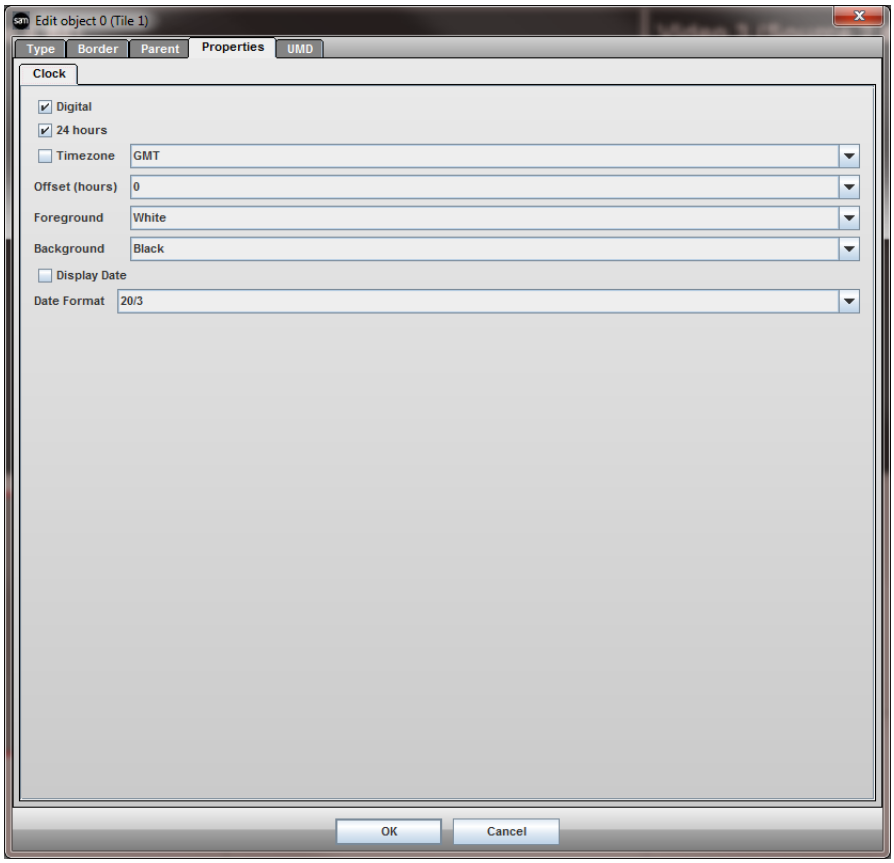

Figure 102 Edit Object - Properties - Clock Sub-Tab

Setting	Description
Digital	Tick for digital clock type, un check for analog type.
24 hours	Tick for 24 hour clock (applicable to digital clock type only).
Timezone	Tick to set the clock time to GMT, or within the range of GMT -1 to GMT +12.
Offset (hours)	Applies offset from -12 to +12 hours (works in combination with Timezone setting, if ticked).
Foreground	Set the clock color (digital clock only).
Background	Set the clock background color (digital clock only).
Display Date	Check to also display the date (applicable to digital clock type only)
Date Format	Sets the format of the date when displayed (applicable to digital clock type only)

Table 56 Edit Object - Properties - Clock Sub-Tab

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7.6.16 Edit Object - Properties, Timer (Timer Object)

This sub-tab only exists in tiles that are of Timer type.

The Timer properties tab is used to setup a timer to run based on the time of day or controlled by GPIs. The timer can be configured to count up or down depending on the requirement. When controlling the timer with GPIs the timer can also be paused and then resumed if required. The individual settings are described in Table 57 Examples of typical timer configurations are listed after the table.

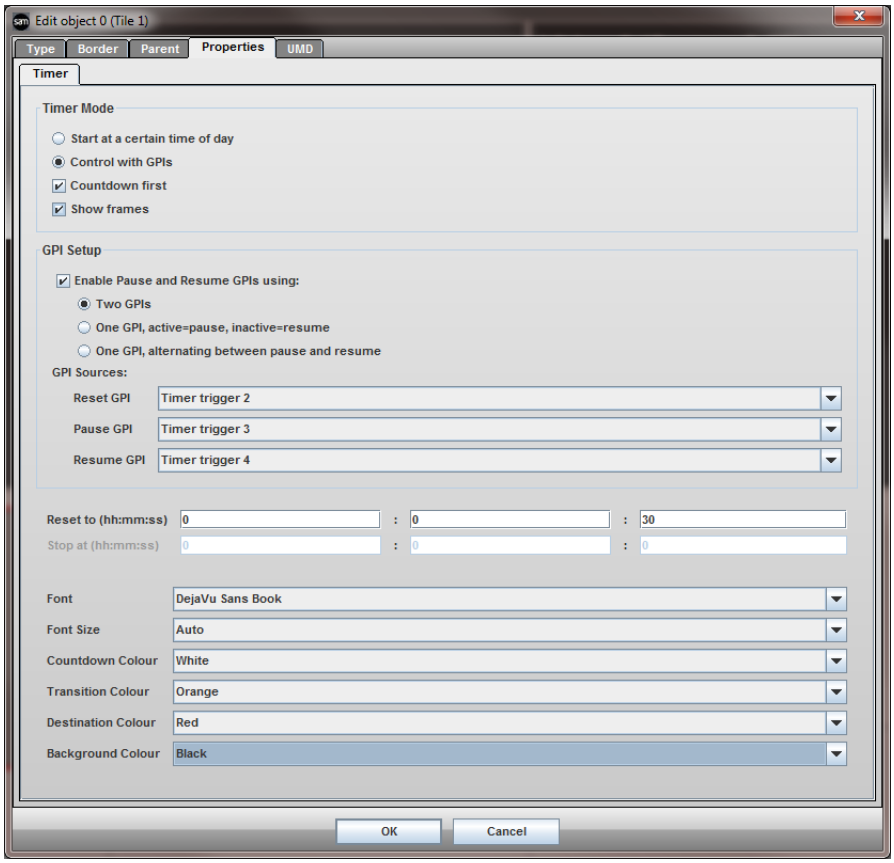

Figure 103 Edit Object - Properties - Timer Sub-Tab

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Setting	Description
Timer Mode	**Timer Mode** radio buttons: used to select which mode the timer works in. • **Start at a certain time of day** - triggers the timer at the time of day set in the **Start at** field. The **Start at** field is only available when this timer mode is selected. • **Control with GPIs** - allows the timer to be controlled by GPI inputs. The **Reset at** field is only available when this timer mode is selected. **Countdown first** tick box: used to modify the selected timer mode operation. • **Start at a certain Time of day** mode selected and **Countdown first** ticked: While the time of day is earlier than the selected **Start at** time, the timer will count down the time remaining until the **Start at** time. Once the **Start at** time is reached the timer will then count up until the **Stop at** time is reached. When the **Stop at** time is reached the timer will then commence a countdown of the time remaining until the **Start at** time. • **Start at a certain Time of day** mode selected and **Countdown first** not ticked: The timer will display 00:00:00 during the period preceding the **Start at** time and will then count up until it reaches the **Stop at** time. Once it reaches the **Stop at** time the timer will again display 00:00:00 until the **Start at** time. • **Control with GPIs** selected and **Countdown first** ticked: When the reset GPI is operated the timer will start counting down to 00:00:00 from the value entered in the **Reset to** field. When the timer reaches 00:00:00 it will then count up until it is the reset GPI is activated at which point it will count down from the value set in the **Reset to** field. The pause and resume GPI(s) are used to pause the timer count. • **Control with GPIs** selected and **Countdown first** not ticked: When the reset GPI is operated the timer will start counting up from the value set in the **Reset to** field. Operating the reset GPI again will start the count again from the value set in the **Reset to** field. The pause and resume GPI(s) are used to pause the timer count. **Show frames** tick box: used to select whether frames per second are also displayed. • **Show frames** not ticked: the display format is hh:mm:ss. • **Show frames** ticked: The display format is hh:mm:ss:ff. The frames per second count is determined by the video output frame rate. Where **hh** = Hours in 24 hour format **mm** = Minutes **ss** = Seconds ff = Frames

Table 57 Edit Object - Properties - Timer Sub-Tab

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Setting	Description

GPI Setup	Only applicable if **Control with GPIs** timer mode selected.
	
	Enable Pause and Resume GPIs using tick box:
	• **Ticked**: the timer is paused and resumed using GPI(s).
	• **Unticked**: the timer can only be started (reset) with a GPI.
	
	The following radio buttons select whether pause and resume are operated using two GPIs or one and the method if one GPI is used.
	• **Two GPIs**: In this mode two separate GPIs are used for pause and resume, one GPI for pause and one for resume.
	• **One GPI, active=pause, inactive=resume**: In this mode only one GPI is used for controlling pause and resume. When the GPI is active (switched to 5V), the timer pauses. When inactive (switched to 0V) the timer resumes.
	• **One GPI, alternating between pause and resume**: In this mode only one GPI is used for controlling pause and resume. If the timer is currently running triggering the GPI will pause the timer. If the timer is currently paused then triggering the GPI will resume the timer.
	
	GPI Sources: the drop down lists are used to select the GPI(s) used to trigger the timer. Up to 10 GPI timer triggers can be configured from the GPIs Tab (see section 7.3.1.7 for details) and are labelled **Timer Trigger 1** to **Timer Trigger 10**.
	• **Reset GPI:** Select the GPI timer trigger used to reset (start) the timer.
	• **Pause/Resume GPI:**
	  • **Two GPIs** selected: selects the GPI timer trigger used to pause the timer.
	  • Either of the **One GPI,** options selected: selects the timer trigger used to pause and resume the timer.
	• **Resume GPI:**
	  • **Two GPIs** selected: selects the GPI timer trigger used to resume the timer.
	  • Either of the **One GPI,** options selected: selection not available.

Reset to or **Start at**	This setting will be either **Reset to** or **Start at** depending on the **Timer Mode** selected at the top of the Timer tab. • Timer mode set to **Start at a certain time of day**: field labelled **Start at (hh:mm:ss)** - sets the time of day the timer starts counting up from or down to. • Timer mode set to **Control with GPIs**: field labelled **Reset to (hh:mm:ss)** - sets the time the timer is set to when the reset GPI trigger is operated. Where **hh** = Hours in 24 hour format **mm** = Minutes **ss** = Seconds

Table 57 Edit Object - Properties - Timer Sub-Tab (Continued)

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Setting	Description
Stop at	Only available if the Timer Mode is set to **Start at a certain time of day** at the top of the Timer tab. **Stop at (hh:mm:ss)** - sets the time of day the timer will stop at. Where **hh** = Hours in 24 hour format **mm** = Minutes **ss** = Seconds
Font, Font Size	The font to use for the digits. If the size is set to auto then the digits will be sized to fit in the window, up to a certain maximum font size.
Countdown Colour	**Start at a certain time of day** Timer Mode: this is the color of the timer digits before the **Start at** time is reached. **Control with GPIs** Timer Mode: this is the color of the timer digits while the GPI has not triggered the timer and while it is counting down.
Transition Colour	**Start at a certain time of day** Timer Mode: this is the color of the timer digits for the 10 seconds before the **Start at** time is reached. **Control with GPIs** Timer Mode: if the timer is only set to count up then this is not applicable. If **Countdown First** is ticked then it will change to the transition color for the 10 seconds before it reaches 00:00:00.
Destination Colour	**Start at a certain time of day** Timer Mode: this is the color of the timer digits while the time of day is in between the **Start at** time and **Stop at** time. **Control with GPIs** Timer Mode: • **Countdown first** ticked: this is the color of the timer digits after the timer has finished counting down. • **Countdown first** not ticked: this is the color that the timer changes to as soon as the GPI triggers it.
Background Colour	Color of the filled background.

Table 57 Edit Object - Properties - Timer Sub-Tab (Continued)

Example 1:

Trigger the timer to start at 10.00am, stop at 10.30am and countdown beforehand.

- Set the timer mode to **Start at a certain time of day**, set the **Start at** and **Stop at** times to 10:00:00 and 10:30:00 respectively.
- Tick the **Countdown first** box. If the current time is 9:45am then the timer will now be displaying 00:15:00, and be counting down. It will currently be white, assuming the default colors are set.
- When the time of day is 10 seconds before 10am the timer will change color to orange and be displaying 00:00:10.
- When 10am is reached it will switch to red and start counting up from 00:00:00.
- When 10:30am is reached it will be displaying 00:30:00. Immediately after that it will change back to white and start counting down from 23:30:00 - the amount of time remaining before 10am the next day.

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Example 2:

Trigger the timer by a GPI and allow it to be paused and resumed by using individual GPIs. Initially it is to countdown from 00:00:30.

- First, three GPIs have to be assigned as timer triggers; one trigger to Reset (Start) the timer, one to Pause it and one to Resume the timer. Timer Triggers are set in the **Module Menu** | **Setup Module** | **GPIs** tab | **GPI Input**s sub-tab.
  For each **Global GPI In** that is to be used click on the drop-down list and select the Timer Trigger to be assigned to it, in this example **Timer Trigger 1**, **2** and **3** will be assigned to the three physical GPIs.

Note: There are 10 timer trigger items available here - if multiple timers require triggering from different GPIs then up to 10 can be set up.

- Open the Object Properties of the Timer tile, and in the **Properties** tab:
  Select **Control with GPIs**
  Tick **Countdown first**
  Tick **Enable Pause and Resume GPIs using:**
  Select **Two GPIs**
  Set **Reset GPI** to use Timer Trigger 1
  Set **Pause/Resume GPI** to use Timer Trigger 2
  Set **Resume GPIs** to use Timer Trigger 3
  Set the **Reset to** time to 00:00:30.
- When the reset (or resume) GPI is operated the timer will start counting down from 00:00:30, and be colored white.
- When it reaches 00:00:10 it will change to orange. 10 seconds later it will reach 00:00:00, change to red, and start counting up.
- The timer continues to count up indefinitely, wrapping back to 00:00:00 after 24 hours.
- The pause and resume GPIs can be operated at anytime in the countdown or subsequent count up to pause and resume the count.
- If the reset GPI is operated while the timer is running the timer will be reset back to 00:00:30 and start counting down.
  If the reset GPI is operated while the timer is paused it will reset to 00:00:30 and remain there until the resume GPI is operated.

Note: The GPI triggering of the timer is only sensitive to positive edges. In other words, a transition from 0V to 3V or greater on the relevant GPI pin will trigger the timer. It does not have to be held above this threshold indefinitely to remain counting. It must remain asserted for at least 200ms though to trigger the timer. Any further transitions from 0V to 3V or above will re-trigger it.

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7.6.17 Edit Object - UMD Tab

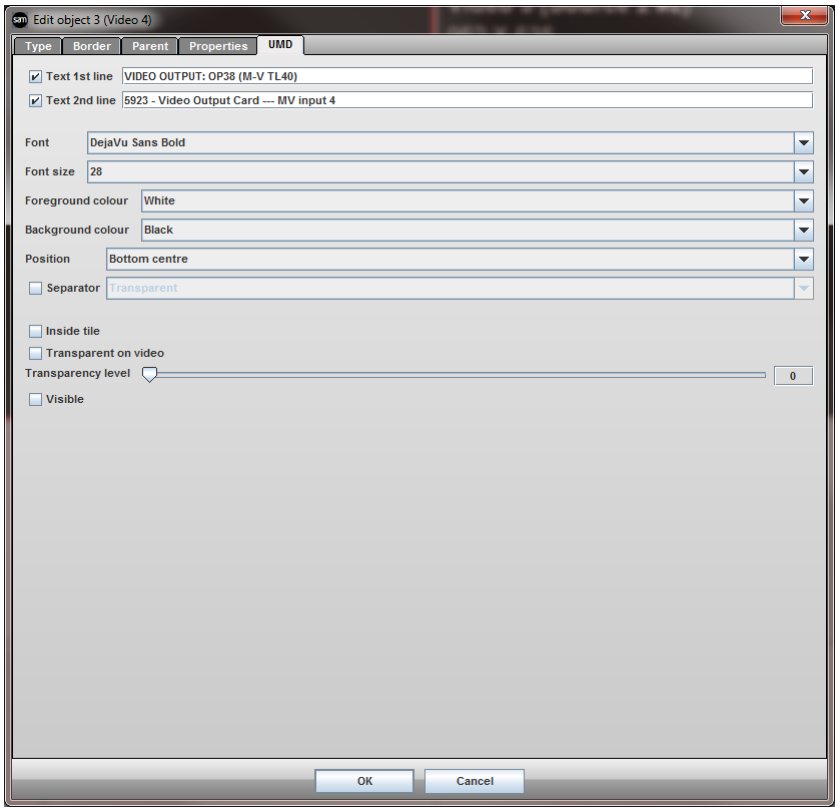

Figure 104 Edit Object - UMD Tab

Setting	Description
Text 1st line tick box and text box	Tick the box to make the UMD text for the first line visible. Enter the UMD text to be displayed on the first line.
Text 2nd line tick box and text box	Tick the box to make the UMD text for the second line visible. Enter the UMD text to be displayed on the second line.
Font	Choose font for the text.
Font Size	Choose font-size of the text.
Foreground Colour	Sets the color of the text.
Background Colour	Sets the color of the UMD background.
Position	Position of UMD relative to the tile.
Separator tick box and text box	Places a separator between the UMD, the object's image and also between each line of text. Tick the box to enable the Separator. Select the color of the separator from the drop down menu.
Inside tile tick bo	Tick the box to place the UMD bar inside the tile (within the active picture). Leave the box unticked to place the UMD within the tile but outside of the active picture, the area reserved for the UMD will be indicated by a shaded area on the video tile in the editor workspace (see page 75, Figure 57 for an example).
Transparent on video tick box	Tick the box to enable transparency of the UMD when it is in the picture area.
Transparency level	Sets the transparency of the UMD when it is in the picture area.
Visible tick box	Enables/disables the UMD.

Table 58 Edit Object - UMD Tab

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7.7 Grid Menu

The grid menu enables the Editor Workspace to be defined by a grid for ease of aligning tiles in a regular arrangement. The Size Object to Grid function in the main toolbar works in conjunction with this feature and automatically sizes the currently selected tile to the cell size of the grid that has been set.

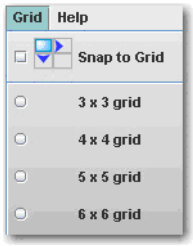

Figure 105 Grid Menu

Menu Option	Description
Snap to Grid	Tick to enable tiles to be snapped to the nearest grid position when repositioning. The top left corner of the tile is anchored to the top left corner of the grid position.
3x3 Grid	Select to define a 3x3 grid.
4x4 Grid	Select to define a 4x4 grid.
5x5 Grid	Select to define a 5x5 grid.
6x6 Grid	Select to define a 6x6 grid.

Table 59 Grid Menu

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7.8 Help Menu

The Help menu provides access to a list of the current status and firmware revisions of all cards and rears detected in the frame (**Help > About**).
There is also access to a real-time log file (**Help > Logging**).

7.8.1 Help > About

This screen provides current status information for the Browser, Network card and scaler firmware versions.
Status information is provided in ascending frame slot number order (slot0, slot 1, slot 2 etc.).
For example, see Figure 106.

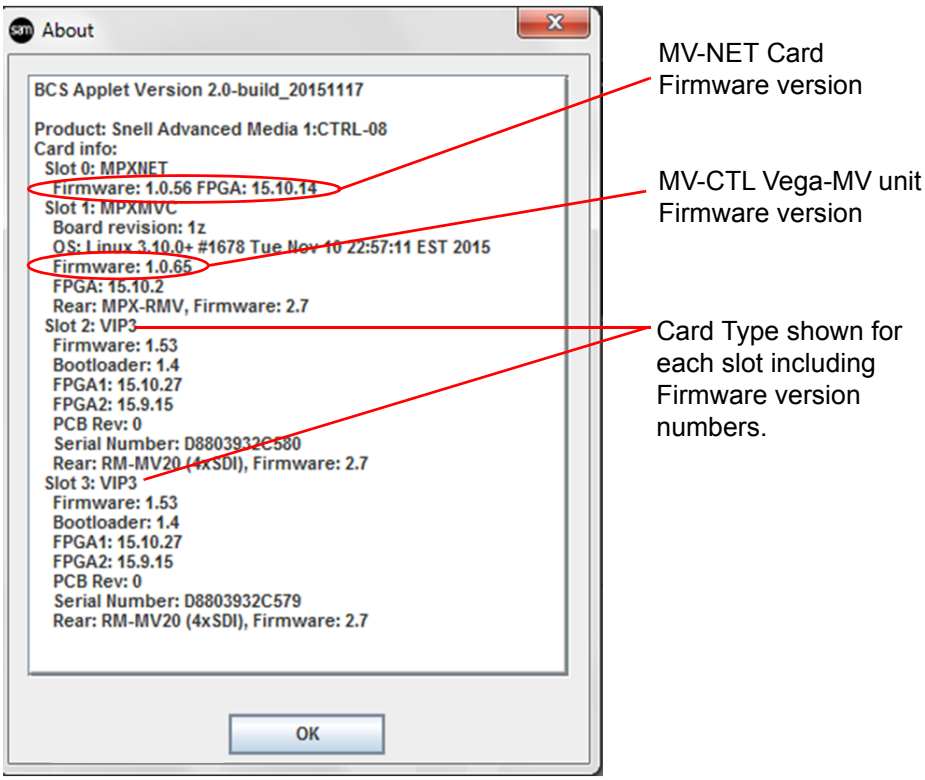

Figure 106 Help Menu - About Dialog.

To view all the cards in the frame, it may be necessary to use the **About** dialog's scroll bar to scroll down the dialog window.

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7.8.2 Help > Logging

This screen provides logging information on the System, the MV-CTL card and MV-VIP4 cards. For example, see Figure 107.

A comprehensive log of the activities of the complete chassis is kept. This is accessible via the System tab.

A log is kept of each detected card and can be viewed independently by clicking on the tab above the corresponding card.

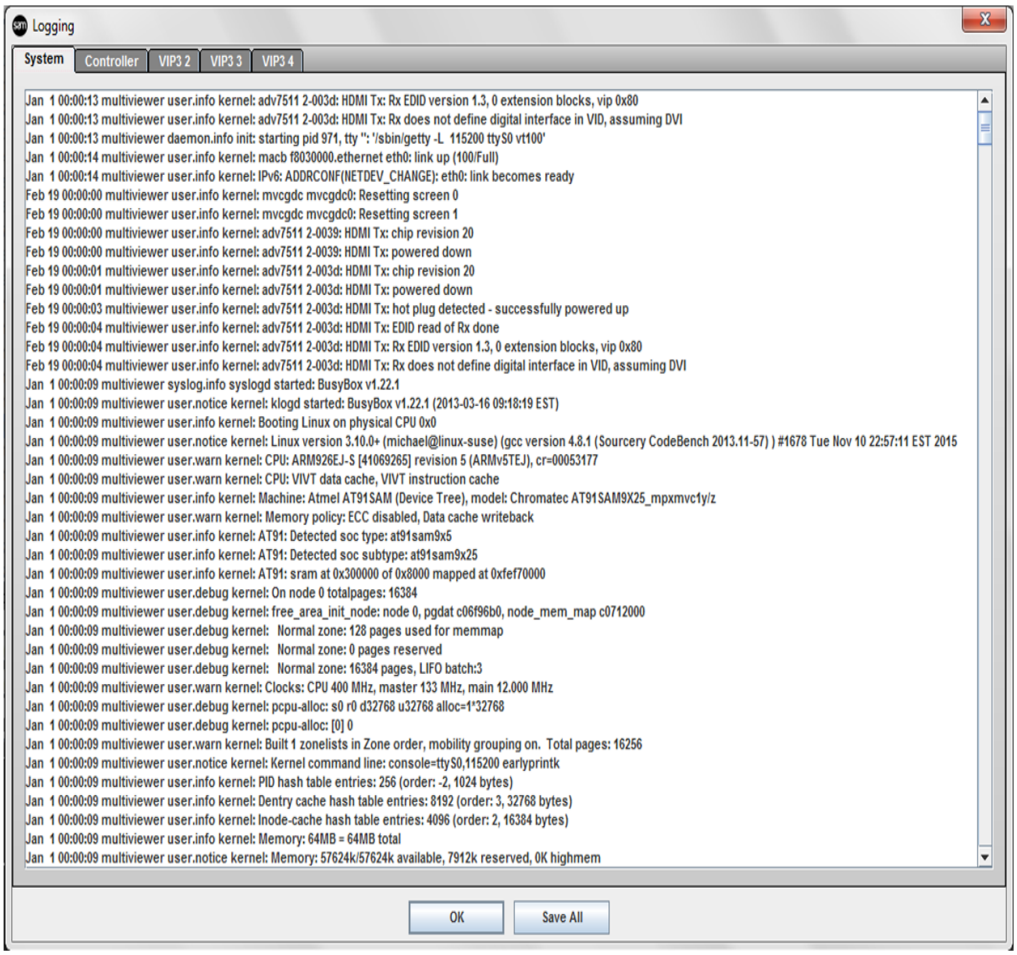

Figure 107 Help Menu - Logging Dialog.

This log information is intended for use by the SAM support staff.
The log information can be saved as a file by clicking on the **Save All** button.
The resulting file can be emailed to SAM support if requested.

Note: The **Help > About** screen information and the **Logging** log file are typically sent to SAM support as key information for any customer issues.

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8 Getting Started

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8.3 Initial Network Setup page 152

8.4 Initial Unit Connections page 153

8.5 Set up Reference Input Format and Router Outputs page 154

8.6 Set Up Internal Router page 154

8.7 Set Up Multiviewer Output Format page 154

8.8 Set Up Multiviewer Layout page 154

8.9 Initial Basic Checks page 155

This section guides the user through the initial steps required to quickly route signals and view signals with a Vega-MV Router Multiviewer and perform some initial basic checks.

(See Appendix D “Trouble Shooting” on page 226 for answers to some issues that may be met while getting started.).

8.1 Unpacking

1. The product is supplied in dedicated packaging provided by SAM;
   it should not be accepted if delivered in inferior or unauthorized materials.
2. Unpack the Vega-MV Router Multiviewer product carefully and check components against your order.
   If anything is incorrect, please notify your SAM Partner or notify SAM directly (*www.s-a-m.com/support/247-support-contact-details/*).

   Vega’s shipping carton includes:

   - The Vega-MV unit with a Power Supply Module.
   - IEC mains cord.
3. Check all components have not been damaged in transit.
   If any damage has occurred, notify your SAM Partner (or SAM directly) and the carrier immediately. Have your order details ready.
4. Retain the original packing materials. They could be useful for future transporting or shipping.
5. Unpack the Vega-MV unit and place it on a suitable flat surface for preliminary inspection and configuration.

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8.2 Checking Internal Cards

Before powering up the unit, check that all the internal cards are properly seated:

1. Pull the two knurled knobs on either side of the front panel and pull the front panel out approximately 25 mm (1 inch). See Figure 108.
2. Gently squeeze both metal inside side-rails together (See Figure 108) and remove the front panel.

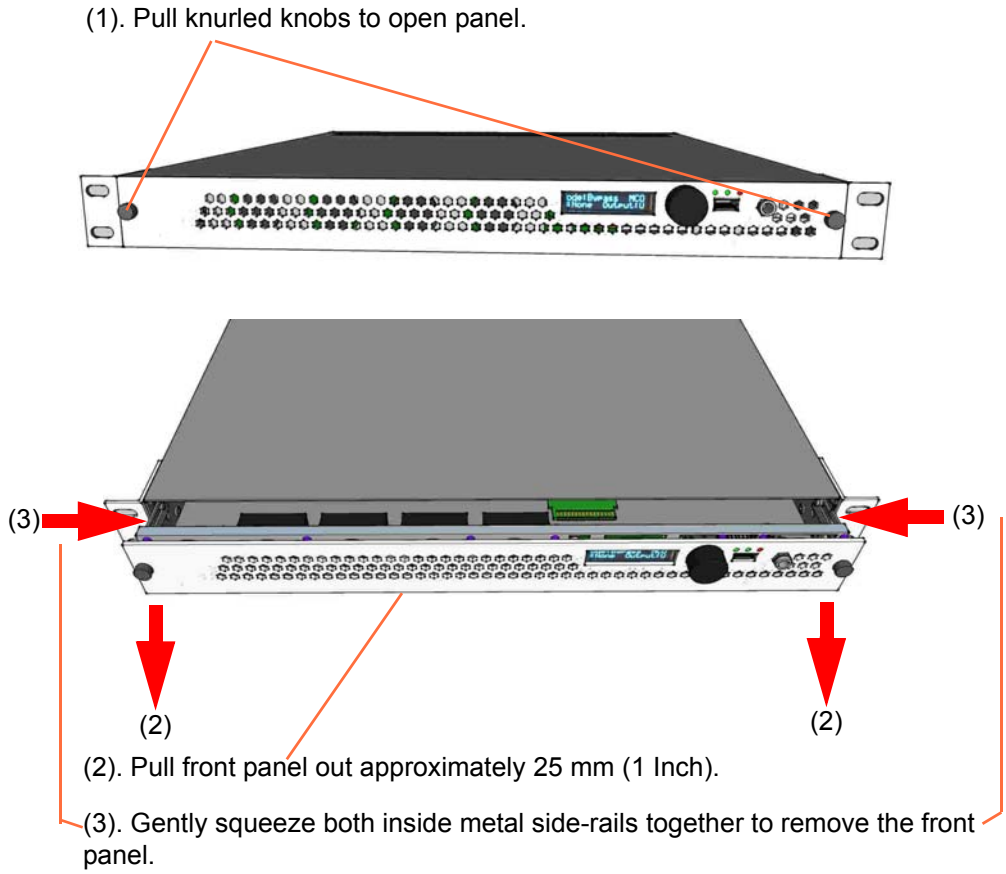

Figure 108 Front Panel Open/Close

3. Check that each internal front card is securely pushed into its slot and has not moved or become dislodged in transit. (See Figure 109.)

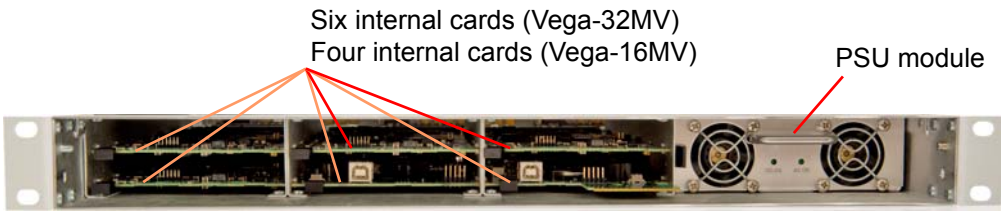

Figure 109 Front Cards (Front Door Open)

Close front panel:

4. Offer the front panel up to the frame, engage with the front edge connector and insert the front panel. Push the panel home to close the front panel.

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Important: The front panel assembly includes cooling fans for the frame.
To maintain adequate cooling, the Vega-MV frame must not be run for more than two minutes with the front panel open.

To maintain adequate cooling, the Vega-MV frame must not be run for more than two minutes with the front panel open.

8.3 Initial Network Setup

The Vega-MV unit is configured and controlled using web browser software on a PC, via the unit's 'LAN 1' network connection, see Figure 110 (and also see Section 4.2.1 "Front Panel Status LEDs" on page 28 for more information).

Figure 110 Vega-MV LAN 1 Network Connector

The Vega-MV unit's 'LAN 1' default network details are listed in Table 99 in Section B.8 "Network Defaults" on page 222.

The currently set IP address is always indicated on the multiviewer display output during the boot cycle (see Figure 45 in Section 5.7 "Powering Up (Unit Start Up)" on page 57). However, the display output may not be visible if the multiviewer resolution setting does not match that of the display device at that time.

8.3.1 Network Settings

If the settings are set up to use DHCP, then no manual setting up of network settings is required.

These settings only need to be manually entered if DHCP is not used and if static IP addresses etc are to be set up. Manual set up would be required for a network that uses fixed IP addresses and does not rely on a DHCP server to allocate them automatically.

IP address details can be entered using any one of the following methods:

- From the front OLED display and rotary knob, see section 6.2.
- From the SAM PC utility see Appendix D.2.
- From the Vega-MV web interface provided by the MV-CTL card, using a web browser on a PC or MAC, see section .

Note: The IP address must be unique on the network. Please see your system administrator if these details are required.

Setting a New Fixed IP Address using the Vega-MV **Web Interface**

IP settings can be configured manually via the unit's multiviewer web interface by using a PC or Mac connected directly or via a LAN. Direct connection is generally easier, since the default IP address of the Vega-MV unit (i.e. that of the unit's MV-CTL card) may not match the current LAN settings (refer to the section Section 7 "Web Interface" on page 67 for details on Using the web interface).

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Once your browser has loaded the unit's configuration screen:

1. Select **Setup Module** from the **Module** menu.
2. Select the **Network** tab, enter the correct IP settings.
3. And press the **Apply** button (see section 7.3.1.8 for further details).

The Vega-MV will then close the configuration window and restart with a new IP address.

You will need to enter this new IP address into your web browser to re-load the configuration screen and continue with the configuration of the unit.

After changing network settings, restart the unit for new network settings to take effect.

8.4 Initial Unit Connections

Make the following few connections to the unit to get going:

- AC Power.
- LAN 1 network connection.
- LAN 0 network connection for NTP time (if required).
- Video Reference Input.
- Video Inputs 1 and 2 (and 17 and 18 for Vega-32MV).
  From SDI signal sources.
- Router Video Outputs 1 and 2 (and 17 and 18 for Vega-32MV).
  To SDI monitors.
- HDMI outputs 1 and 2.
  To HDMI input monitors, to view multiviewer video wall display outputs

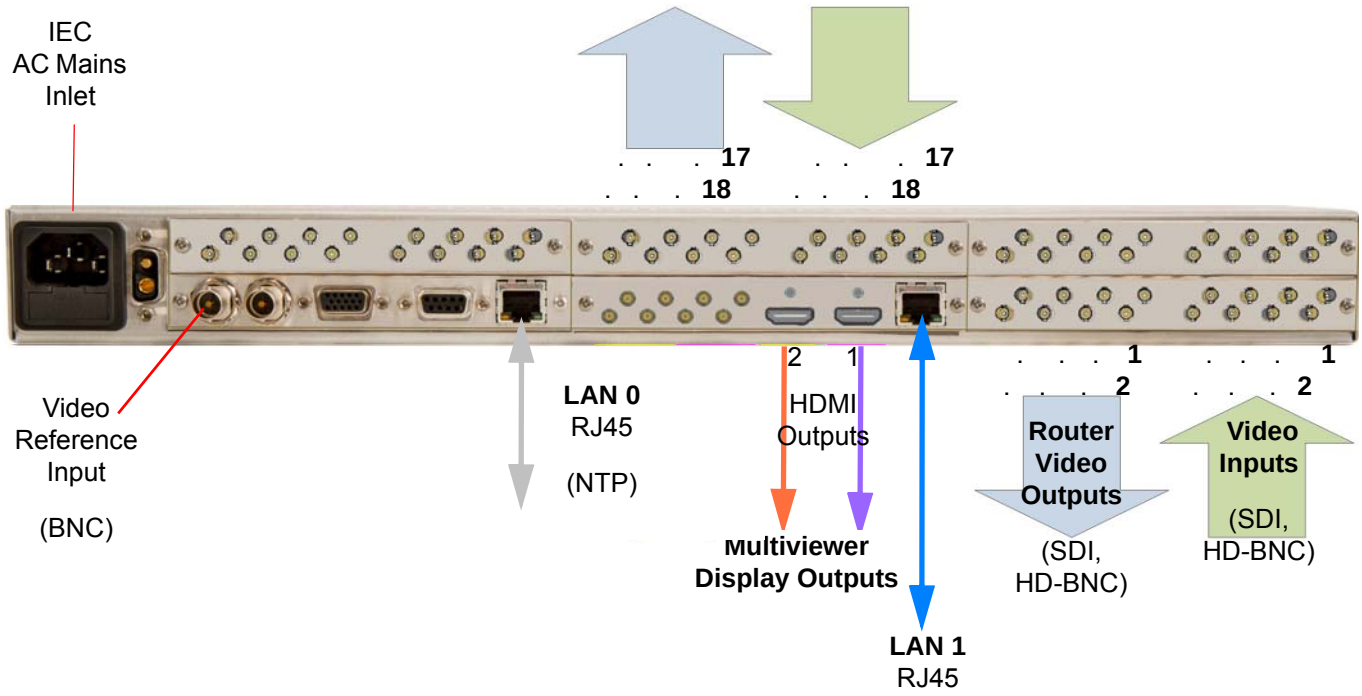

Figure 111 Vega-MV Initial Rear Connections

 © 2017 SAM

8.5 Set up Reference Input Format and Router Outputs

1. Show the unit's web interface.
2. Go to the **Module > SDI I/O Router** page.
3. Set the **Expected Video Format** to 'Genlock In'.
   If the video inputs are of a different video standard to the reference signal, then set **Expected Video Format** to reflect the video input standard.
4. Click the Update Layout icon, , to push the change to the unit.

8.6 Set Up Internal Router

1. Show the unit's web interface.
2. Go to the **Module > SDI I/O Router** page.
3. Click Quick Map "**Map 1:1**" to make 1 to 1 routes in the internal routing matrix.
4. Select the **Expected Video Format** to be the same as the reference input signal.
5. Click the Update Layout icon, , to push the change to the unit.

8.7 Set Up Multiviewer Output Format

1. Show the unit's web interface.
2. Go to the **Module > Set Up Module > Screen** page.
3. Select the **Resolution** of the target monitor screen for the Multiviewer Display Output.
4. Select the **Aspect Ratio**.
5. Click the Update Layout icon, , to push the change to the unit.

8.8 Set Up Multiviewer Layout

1. Show the unit's web interface.
2. Go to the **Layout > Load Layout** page.
3. Select a layout which shows all inputs on one or both display outputs.
   (This will be one of the pre-defined layout, listed with an asterisk suffix (*).)
4. Load this into the web interface.
5. Click the Update Layout icon, , to push the layout to the unit.

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8.9 Initial Basic Checks

1. Check tiles 1 and 2 (HDMI output 1) show video from inputs 1 and 2.
2. Additionally for Vega-32MV,
   check tiles 17 and 18 (HDMI output 2) show video from inputs 17 and 18.
3. Check that Router outputs 1 and 2 show video inputs 1 and 2 respectively.
4. Additionally for Vega-32MV,
   check that Router outputs 17 and 18 show video inputs 17 and 18 respectively.
5. On the main web page,
   double-click on tile 3 on display output 1.

   The Edit Object page opens.
6. Select type “clock”.
   Click OK.
7. Click the Update Layout icon, , to push the layout change to the unit.
8. Check that tile 3 now shows a clock display.

Basic checks are now complete.

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9 Connection to Other Equipment

Section contents:

9.1	RS232/RS422 Serial Port	page 156
9.2	Controlling LEDs from a GPI Output	page 158
9.3	Configuring Vega-MV for TSL UMD Protocol	page 159
9.4	Example: Setting up GPI input as a Tally	page 161
9.5	Example: Interfacing with Kahuna 360 or 360 Compact	page 163
9.6	Connecting to Nucleus/2460/Nebula/Aurora	page 172
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9.8	Configuring Serial Port Connections to SAM Router Controllers	page 179
9.9	Configuring Each Multiviewer Input with a Router Controller	page 181

The hardware interfaces are located on the back of Vega-MV frame. Connectors on the rear of the Vega-MV frame are mounted horizontally. Settings are accessible via the unit's web interface.

9.1 RS232/RS422 Serial Port

The MV-NET card rear panel has a serial data port that can be configured for either RS232 or RS422 operation.

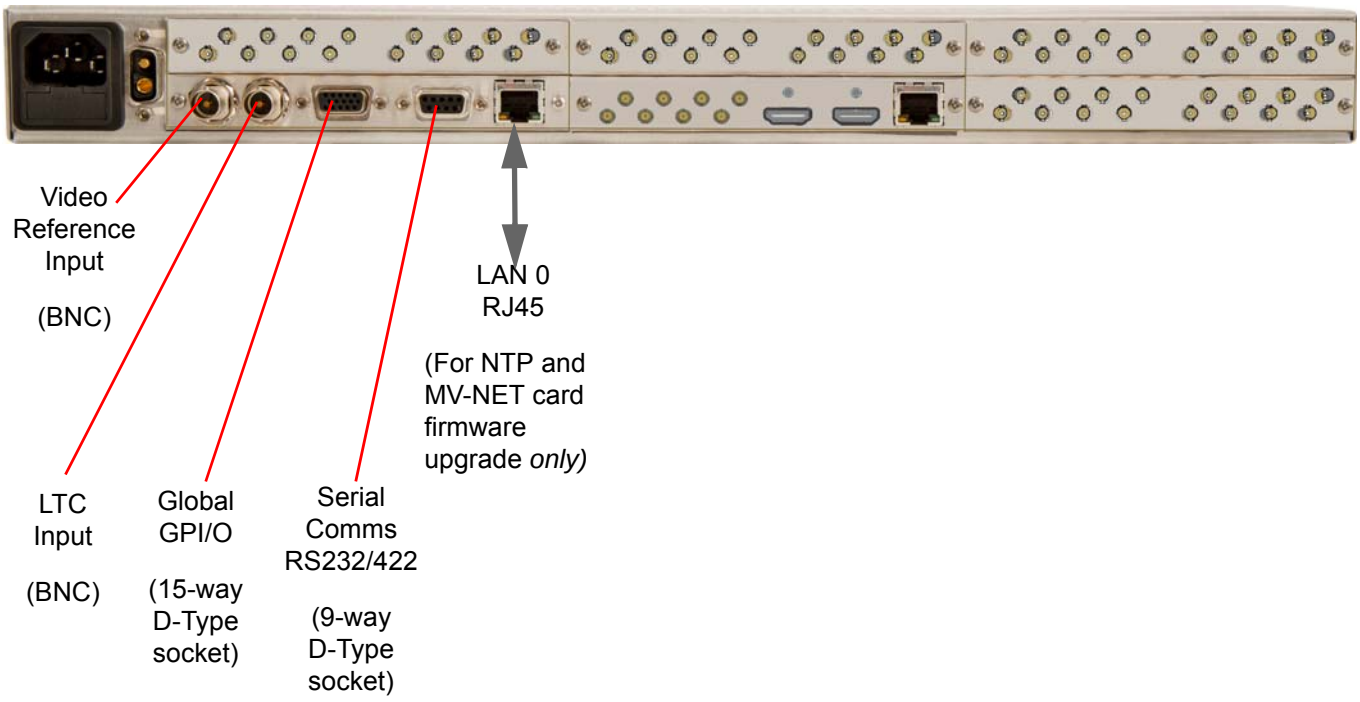

Figure 112 Vega-MV Rear View: MV-NET Card

The serial port protocol is configured from the **Protocols** - **Serial Port** tab, see section 7.3.1.10. The serial port is used by the MV-NET card.

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The mode of operation is set by means of jumpers (CN8, CN9 and CN10) on the MV-NET card. For card location see section 4.5. The pin assignment of the connector is given in section 9.1.1.

Jumpers CN8, CN9 and CN10 are located on the MV-NET card. Access requires the removal of the MV-NET card from the front of the unit. Figure 113 shows the MV-NET card jumpers and Table 60 shows the jumper settings.

Note: See section 10.4 for details on opening the frame door.

To maintain adequate cooling, the Vega-MV frame must not be run for more than two minutes with the front panel open.

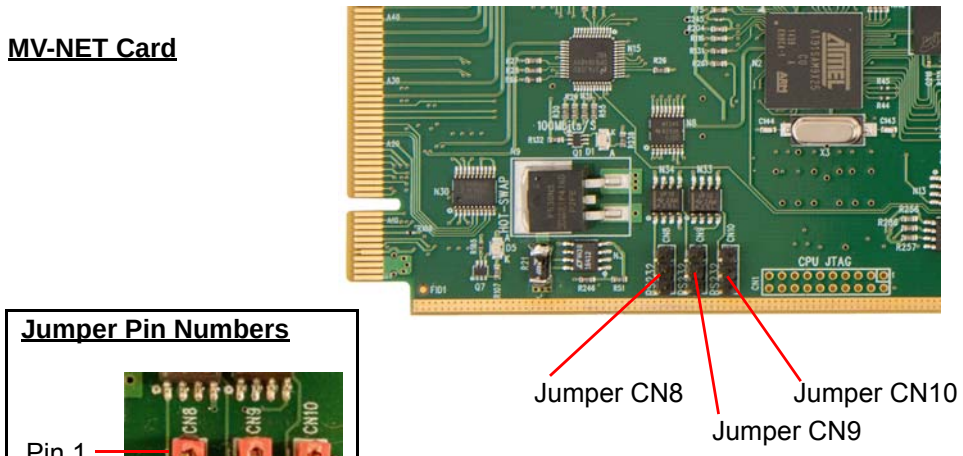

Figure 113 MV-NET Card, Jumpers Shown Set for RS232

Jumper	Position 1/2	Position 2/3
CN8	RS232 (set in conjunction with CN9 and CN10)	RS422 (set in conjunction with CN9 and CN10)
CN9	RS232 (set in conjunction with CN8 and CN10)	RS422 (set in conjunction with CN8 and CN10)
CN10	RS232 (set in conjunction with CN8 and CN9)	RS422 (set in conjunction with CN8 and CN9)

Table 60 MV-NET Card Jumper settings.

Important: Other MV-NET card settings and controls are for factory use only.

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9.1.1 D-sub 9 serial interface, RS232/RS422

The serial connector on the MV-NRP is configured using jumpers on the MV-NET card. See section 9.1 for jumper configuration details.

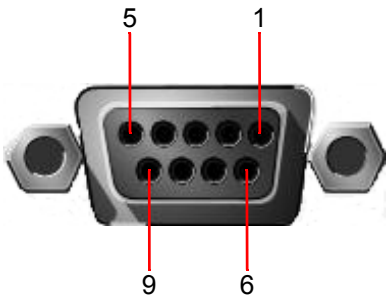

Figure 114 RS232 and RS422 Connector.

The following table gives the pin assignments for the RS 232, RS 422 D-sub 9 serial interface.

Pin Number	RS232	RS422
1	-	GND
2	Tx	Rx-
3	Rx	Tx-
4	-	-
5	GND	-
6	-	-
7	-	Rx+
8	-	Tx+
9	-	-

Table 61 RS232 and RS422 Connector.

9.2 Controlling LEDs from a GPI Output

See Section 4.5.3 “GPI Input/Output Connectors” on page 38 for an example of controlling an LED from a GPI output.

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9.3 Configuring Vega-MV for TSL UMD Protocol

This section describes the procedure for configuring UMDs. The steps repeat some information that is in other sections of this manual.

The TSL protocol uses display addressing to select the UMD to update. In the multiviewer, a display address refers to an input number. TSL address 0 refers to MV input 1, TSL address 1 refers to MV input 2 etc.

The software settings that are essential for getting the UMD working are:

- Putting the serial port into TSL UMD mode and setting its baud rate
- Ensuring that line 1 is turned on for the UMDs

1. Check that the multiviewer matches the TSL controller serial port type.
   Use the Vega-MV jumpers to set the serial port to either RS232 or RS422 to match the TSL controller. See section 9.1 for information on the Vega-MV jumper settings.
2. Set up the serial port to use the TSL UMD protocol with the appropriate port settings in the **Module > Setup** menu.

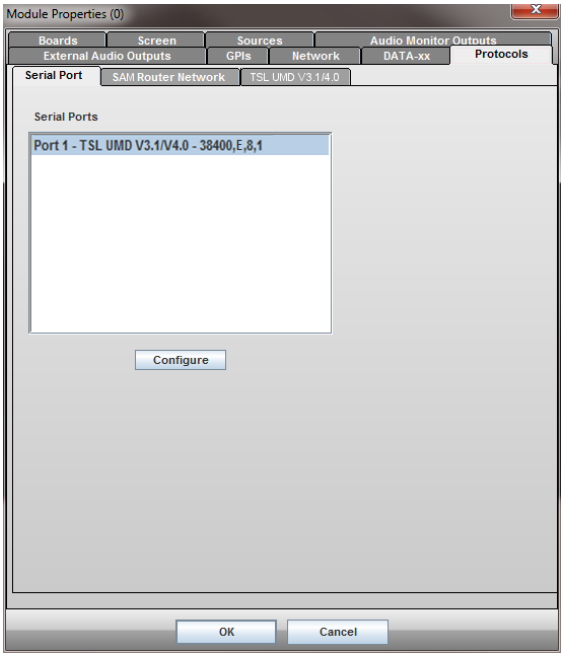

Figure 115 Module Properties - Protocols - Serial Ports Tab.

3. This step is not essential and is only required if you want the tallies in the UMDs to work as well.

   a For each tile that you want the TSL to control the tallies in, double click on the tile to open the Edit Object dialog and go to the Properties > Tally tab (see section 7.6.9).

   b Click the Visible box. In the Tally field select the Software1 - Software2 option. (Software X - Software Y refers to the left and right tallies on the UMD. e.g. If you select Software1 - Software1 then both the left and right tallies are turned on when the TSL sets the left tally flag.

   c If you select Software1 - Software2 then the left tally is switched on when the TSL sets the left tally flag, and the right tally is switched on when the TSL sets the right tally flag).

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4. Only the first line in the UMD gets updated by the TSL, so make sure it is the one switched on by ticking the “Text 1st line” in the UMD tab of the object properties (see section 7.6.5).

5. The TSL manager you are using needs to be set up to address the multiviewer inputs by their input number (or input number minus 1, depending on how it is set up in the manager).

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9.4 Example: Setting up GPI input as a Tally

In this example the first GPI input on the first rear video card is to be setup as the tally source for Source 2. It is assumed that Source 2 is the source for the second tile.

Step 1 - Setup the second tile to get its tally from the hardware input:

1. Double click on the second tile to open the Object Properties.
2. Go to the Properties tab, within this go to the Tally sub-tab.
3. Tick the Enabled check box.
4. Set the Left-Right sources to Hardware1-Hardware1.
5. The setup should now appear as shown in Figure 116

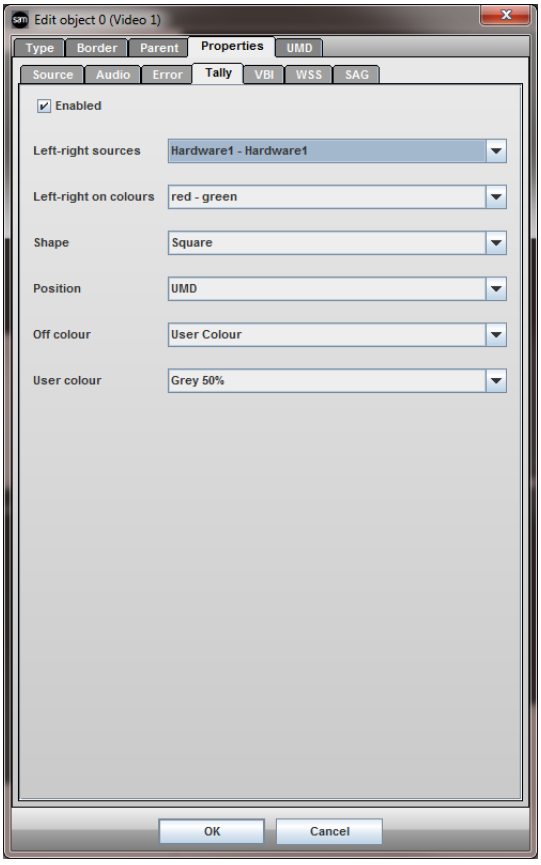

Figure 116 Tile set up to use the Hardware as its Tally Source.

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Step 2 - Select the GPI to use as the tally source

1. Go to the module properties (Module > Setup Module menu).
2. Select the GPIs tab, followed by the GPI Inputs sub tab.
3. Scroll down to the Video 1 GPI In 1 item and select Src 2 Hard Tally here.
4. This should now appear as shown in Figure 117
5. Press OK, and upload the changes to the Vega-MV unit (Press the red arrow - update layout - in the toolbar.

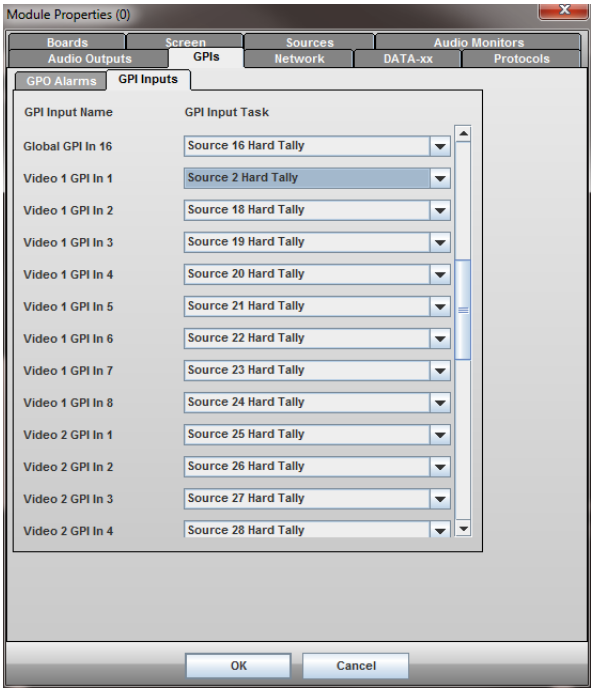

Figure 117 Selecting GPI Sources for Tallies.

Step 3 - Hardware configuration

The tally that has been setup will now activate when the GPI pin is momentarily connected to an external positive voltage of between 3 and 9 Volts using a switch.
The external voltage source's negative terminal is permanently connected to a GND pin on the GPI connector (see section for pinout).

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9.5 Example: Interfacing with Kahuna 360 or 360 Compact

This example describes how Kahuna 360 and Kahuna 360 Compact use the TSL UMD (Output Only) Tally protocol to connect to and communicate with the Vega-MV.

Note: Only one MV-CTL card can use the MV-NET serial port. If more than one MV-CTL card is configured to use the serial port only the card fitted in the lowest frame slot number will actually use the port.

The TSL UMD protocol allows Kahuna 360 to tally the PGM and PVW outputs which place a ***Red*** or a ***Green*** border around the selected output source when viewed on a monitor via the Vega-MV:

- ***Red*** border indicates a PGM output and
- ***Green*** border indicates a PVW output and source information in the Vega-MV displays.

This example assumes that you are familiar with operating the Kahuna 360 and Kahuna 360 Compact switchers.

9.5.1 Connect the Kahuna 360 Mainframe to the Vega-MV unit

The Vega-MV is connected to the Kahuna 360 mainframe using an RS 422 lead, see Figure 118

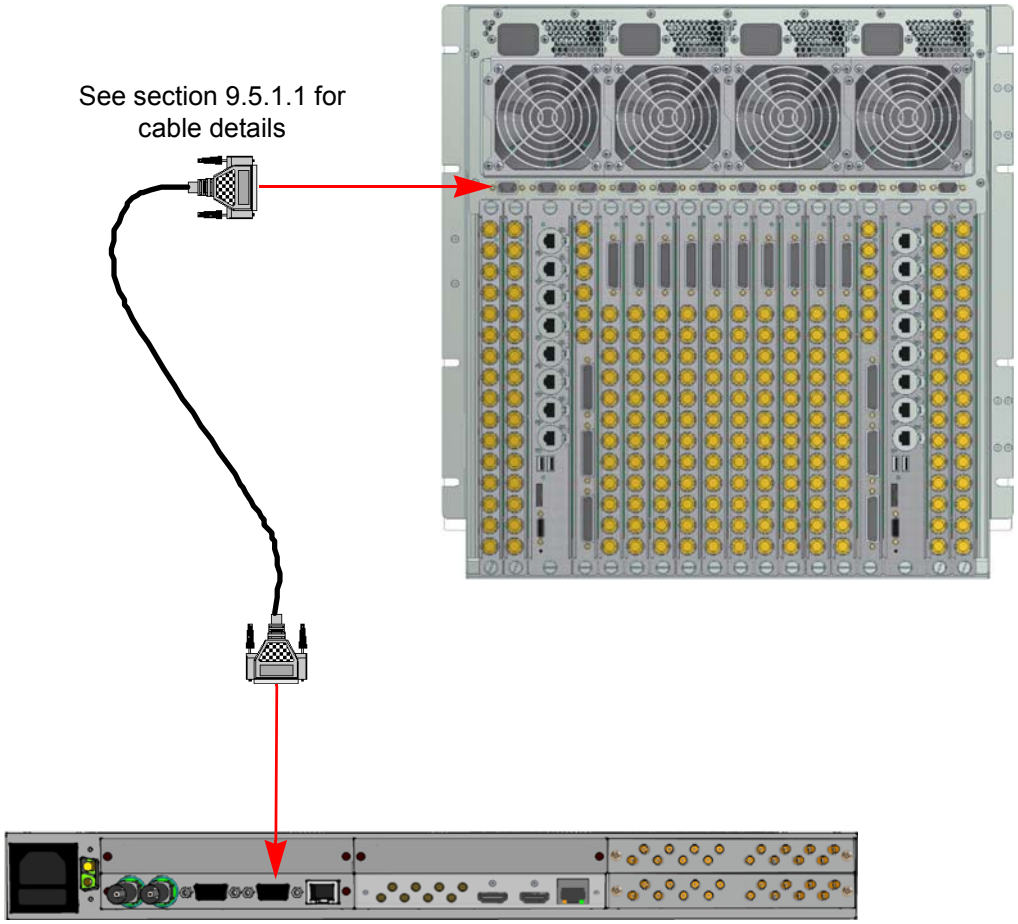

Figure 118 Example: Vega-16MV Connected to a Kahuna 360 Using an RS422 Cable

 © 2017 SAM

9.5.1.1 RS422 Vega-MV to Kahuna 360 Connection Cable

Figure 119 RS422 Connector as seen from the rear of the Vega-MV and Kahuna 360

Use a pin to pin RS422 cable, with a DE-9 male connector at each end, to connect the Vega-MV unit to the Kahuna 360.

Note: The pin outs shown in Figure 120 are the default pin outs for the Kahuna 360. The Kahuna 360 operates as a controlling device when the TSL UMD protocol is selected. When operating in this mode the Kahuna 360 controls the actual pins used to receive and transmit data.

The following table details the pin assignments for the RS422 D-sub DE-9 connectors.

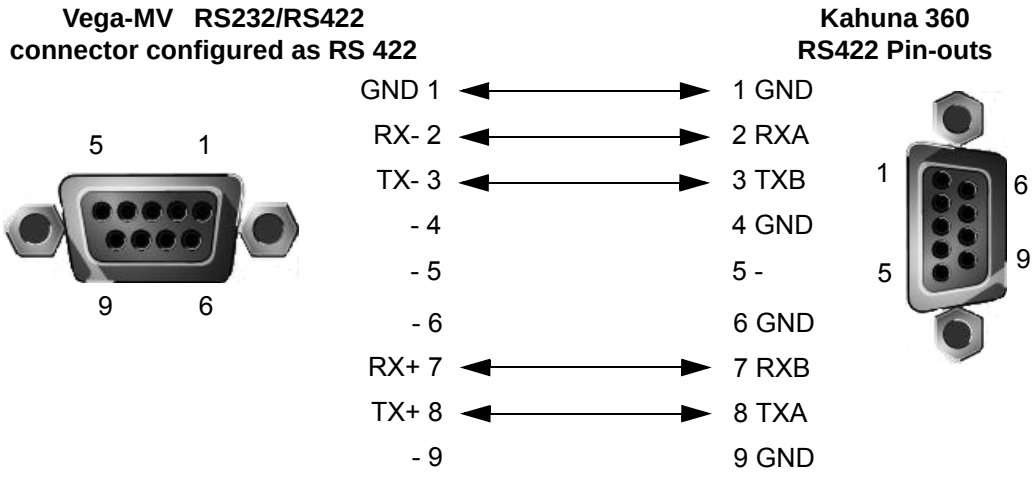

Figure 120 Vega-MV Connections to Kahuna 360

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9.5.2 Setup the Kahuna 360 Protocol

The Kahuna 360 TSL UMD (output only) protocol is setup in the **Engineering Configuration – Protocols** menu.

1. Use the **Loaded Protocols** parameter to select a free slot in the table, then use the **Protocol Type** parameter to select "**Tally & UMD"**. Use the **Available Protocols** parameter to select **TSL UMD (Output Only)** and then touch the {**Load**} button (Figure 121).

Figure 121 Engineering Configuration - Protocols Menu

2. To select an RS422 port on the Kahuna 360 mainframe, touch the {**Configure…**} button on the **Engineering Config - Protocols** menu (Figure 121).

3. The **Engineering Config - Protocol Config** menu is displayed (Figure 122). Touch the **Serial Port** attacher and then select which port you wish to use on the mainframe and touch the {**Apply**} button.

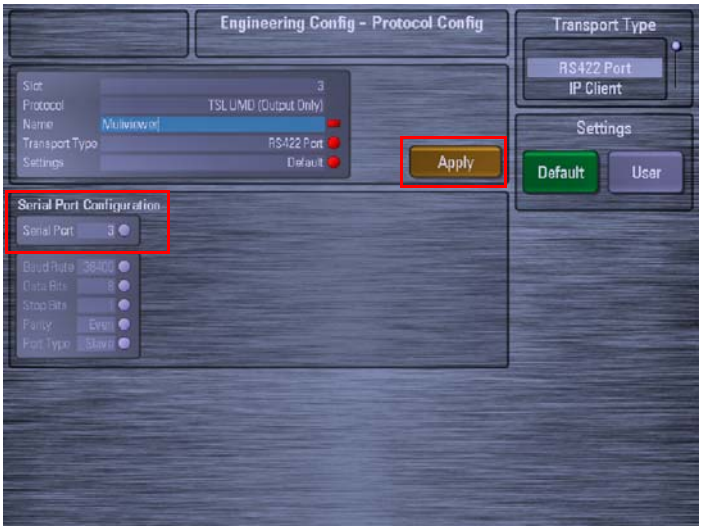

Figure 122 Select RS422 Serial Port

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4. Once you are happy with the setup, touch the {**Activate**} button on the **Engineering Config - Protocols** menu to activate the protocol (Figure 123).

Figure 123 Engineering Configuration - Protocols Menu

9.5.3 Kahuna 360 Peripherals Setup

The peripherals menu is used to configure the way the Vega-MV unit operates with the Kahuna 360.

1. Touch the [**PERIPH**] button on the GUI, and then touch the {**TSL UMD Out…**} button (Figure 124).

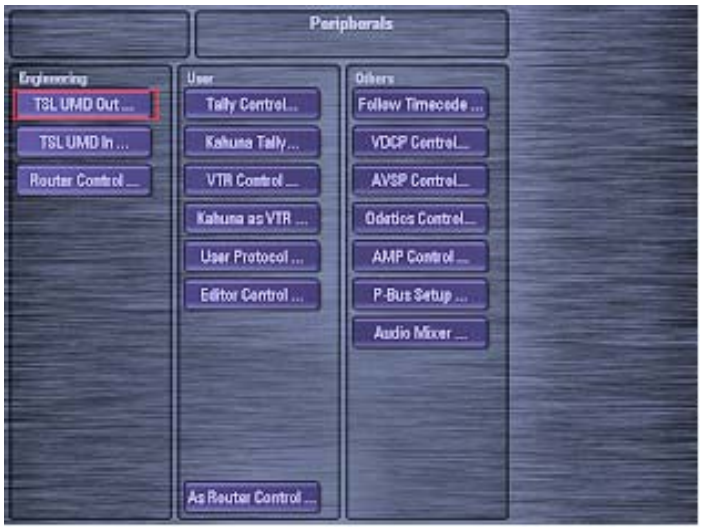

Figure 124 Peripherals Menu

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2. Setup the **BNC Output** from the Kahuna 360 mainframe that is connected to each of the Sources on the Vega-MV and set the **UMD Address** to **On**.

3. If **Display BNC Name** is set to **Yes** the name given to the **Physical Output BNC** will be displayed. If **Display BNC Name** is set to **No** then the name of the source is displayed.

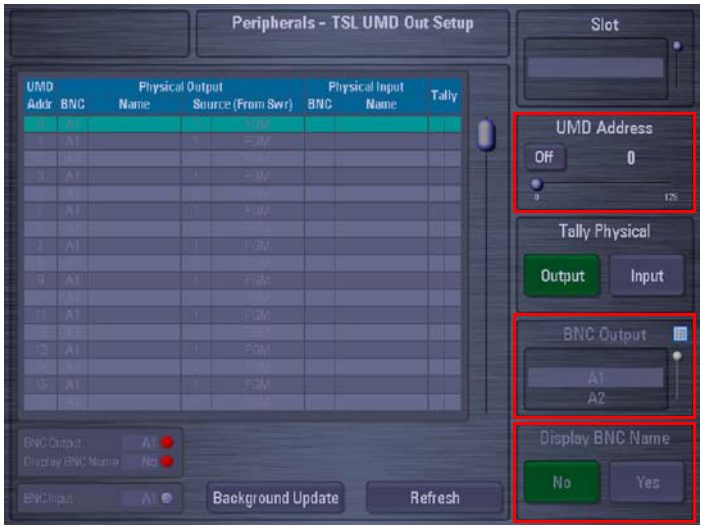


Figure 125 Peripherals Menu - TSL UMD Out Setup

9.5.4 MV-NET Serial Port Setup

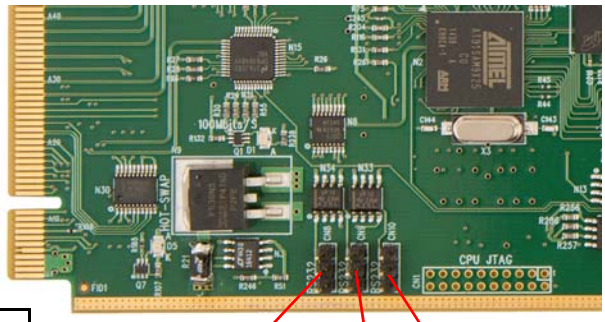
Make sure the jumpers on the MV-NET card are set correctly.

Important:

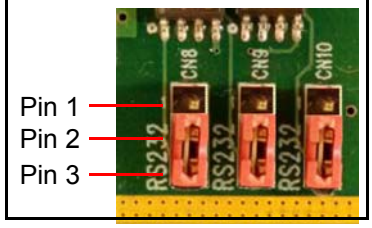
- Access requires the removal of the MV-NET card from the front of the unit. See section 10.4 for details on opening the frame door. To maintain adequate cooling, the Vega-MV frame must not be run for more than two minutes with the front panel open.

- **Links set as follows**: CN8, CN9 and CN10 all set to Position 2/3 to configure the serial port to RS422.

MV-NET Card



Jumper Pin Numbers



Jumper CN8 Jumper CN10

Jumper CN9

Note: The “RS232” printing on the PCB only indicates that the jumpers configure the serial port. See the text above this figure for jumper positions.

Figure 126 MV-NET Card, Jumpers Shown Set for RS422

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1. The IP Address of the Vega-MV is shown on the Boot-up Screen.
2. Use a web browser to connect to the Vega-MV and enter set-up (see section Section 7 “Web Interface” on page 67 for more details).
3. Module Properties are opened from the **Module** → **Setup Module** menu.
4. Select the **Protocols** tab and then select the **Serial Ports** tab (Figure 127).

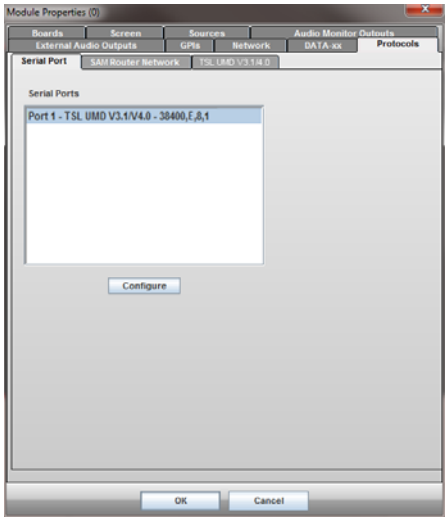

Figure 127 Module Properties - Protocols Tab - Serial Ports Tab

5. Click on the **Configure** button and set the Vega-MV **Protocol** to be **TSL UMD**.

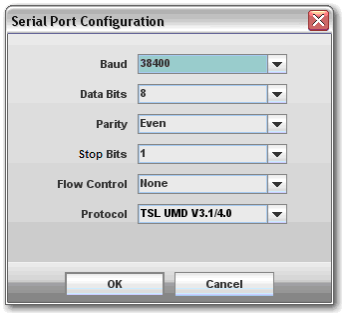

Figure 128 Serial Port Configuration

6. Click on the **OK** button to save the configuration.

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7. Select the **Screen** tab to set the output screen **Resolution** and **Aspect ratio**.

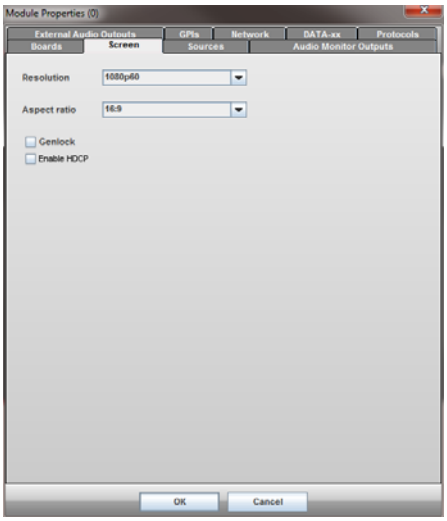

Figure 129 Module Properties - Screen Tab

8. Select the **Boards** tab to check the Sources (inputs) to the Vega-MV. For example to make sure they are SDI/HDMI.

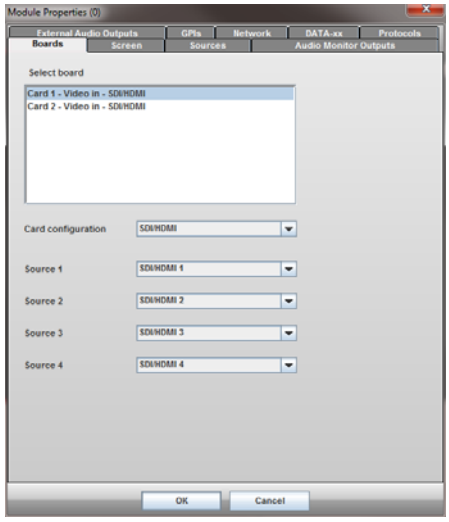

Figure 130 Module Properties - Boards Tab

9. Click on the **OK** button to save the changes.

10. Once you have a Vega-MV on-screen layout setup, double click the screen to be edited. The **Edit Objects** dialog for that screen is displayed.

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11. From this screen select the **Properties** tab and then select the **Tally** tab
    Settings should be as shown in Figure 131

Figure 131 Edit Object - Properties Tab - Tally Tab

12. The Font, Font Size, UMD Position, etc. is set from the **UMD** tab.

Note: If you want the UMD to be under the screen then, you need to un-tick the **Inside Tile Box**. You will then need to set the desired font size and return to the screen layout to make the screen vertical size larger so the Picture is 16:9 and then the UMD will be under the picture (If this is not done the picture will be squashed vertically).
Set the video aspect to **None** in the tile set-up.

Figure 132 Edit Object - UMD Tab.

13. Click on the **OK** button to save the changes.

14. The Sources on the Vega-MV are UMD addresses 0,1,2,3, etc.

    Source 1 = UMD Address 0
    Source 2 = UMD Address 1
    Source 3 = UMD Address 2

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15. Finally, return to the **Engineering Config - Protocols** menu on the Kahuna 360.

16. Select the “TSL_UMD (Output Only)” entry in the **Loaded Protocols** list and touch the {**Unload}** button followed by the {**Load**} button.

Figure 133 Engineering Configuration - Protocols Menu

17. You should now have a Vega-MV layout on the monitor with UMD and Red/Green Box Tallies.

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9.6 Connecting to Nucleus/2460/Nebula/Aurora

The Vega-MV accepts fixed or dynamic UMD (Under Monitor Display) names.

The Vega-MV can display dynamic UMD tallies of the source names when it is connected to a Nucleus or Nebula controller. The controller provides the UMD source names to the Vega-MV unit when they are connected together. As the sources change the UMDs will dynamically change to match the correct source name without any intervention from the user.

This section describes how to connect the Vega-MV to a Nucleus, 2460, Nebula or Aurora controller.

Note:

- The source names are limited to 8 characters.
- TCP/IP connection to the Vega-MV is not supported by Nebula/Aurora controllers.

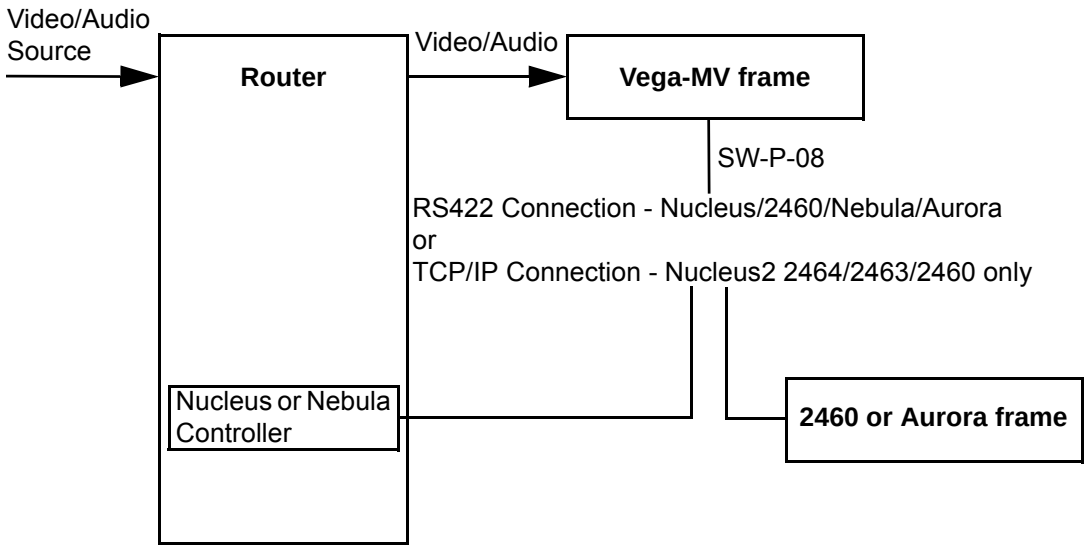

Figure 134 System Diagram.

RS 422 Connection (section 9.6.1)

- See section 9.6.1.1 for Vega-MV serial link configuration.
- See section 9.6.1.2 for cable wiring connections to the Nucleus/2460/Nebula/Aurora controller.
- See section 9.6.1.3 for Nucleus/2460 controller serial link configuration.
- See section 9.6.1.4 for Nebula/Aurora controller serial link configuration.
- See section 9.6.3 for Vega-MV input configuration.

TCP/IP Connection (section 9.6.2)

- See section 9.6.2.1 for Nucleus2 2464/2463/2460 controller TCP/IP link configuration.
- See section 9.6.2.2 for Vega-MV TCP/IP link configuration.
- See section 9.6.3 for Vega-MV input configuration.

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9.6.1 RS 422 Connection

9.6.1.1 Vega-MV Settings

- Configure serial port as RS422 (see section 9.1 for jumper settings).
- Configure serial port details
  (Setup Module > Protocols Tab > Serial Ports Tab > Configure)

Baud Rate	Data Bits	Parity	Stop Bit	Flow Control	Protocol
38400	8	None	1	None	Snell Router

Table 62 Vega-MV Serial Port Settings.

9.6.1.2 Vega-MV Wiring Connections to Nucleus/2460/Nebula/Aurora Controller

The cable wiring connections for Nucleus/2460/Nebula/Aurora are shown in Figure 135

Note:
- The connections shown in Figure 135 are not pin to pin.

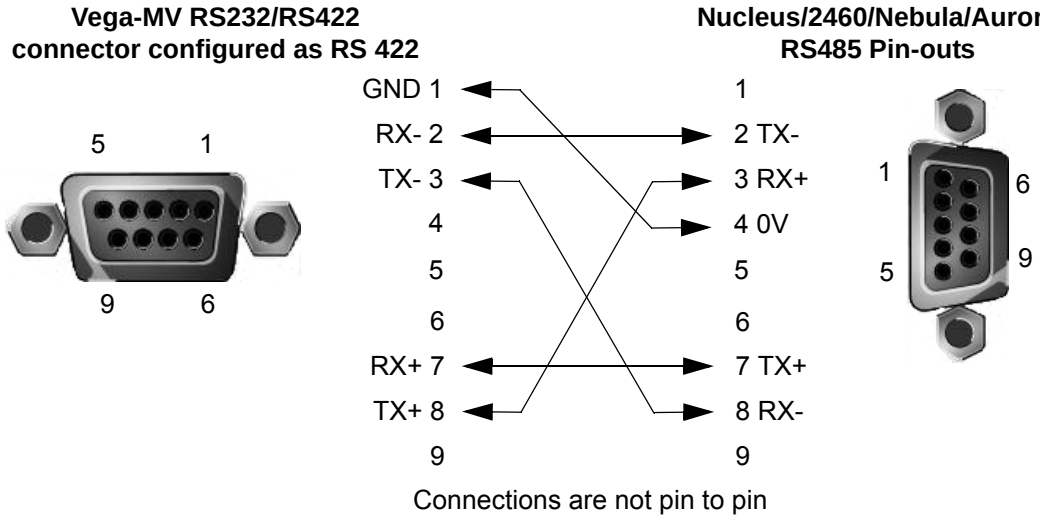

Figure 135 Vega-MV Connections to Nucleus/2460/Nebula/Aurora Controller

9.6.1.3 Nucleus Settings

Changes made to the Nucleus router control module database configuration must be pushed from Workbench to the router controller to make the controller use the new configuration. In a dual controller router changes must be copied to the second controller and the database must be pushed to both controllers (idle controller first, see the router manual for full details).

Nucleus2 2464/2463/2460:

- Use Workbench to configure the Nucleus2 2464/2463/2460 serial port.
  (Routers > Port Configuration button > New Serial Port button)

Baud Rate	Data Bits	Parity	Stop Bit	Flow Control	Protocol
38400	8	None	1	None	General Remote In (SW-P-08)

Table 63 Nucleus2 2464/2463/2460 Serial Port Configuration

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Nucleus 2450:

- Use Workbench to configure the Nucleus 2450 serial port as **ptGeneralRemotein**.

Baud Rate	Data Bits	Parity	Stop Bit	Flow Control	Protocol
38400	8	None	1	None	Snell Router

Table 64 Nucleus 2450 Serial Port Configuration

9.6.1.4 Nebula Settings

- Use the Nebula editor to configure the Nebula RS485-1 or RS485-2 serial port.

Protocol	Baud Rate	Data Bits	Parity	Stop Bit
General Remote	38400	8	None	1

Table 65 Nebula Serial Port Configuration

9.6.1.5 Aurora

The Vega-MV RS422 port is connected to one of the two Aurora dedicated Remote ports, labelled “Remote 1” and “Remote 2” on the Aurora rear panel. Alternatively the Vega-MV can be connected to an Aurora port configured as Remote, using the Aurora configuration switches. See the Aurora manual for details.

9.6.2 TCP/IP Network Connection

9.6.2.1 Nucleus2 2464/2463/2460 Settings

Changes made to the Nucleus2 2464/2463/2460 control module database configuration must be pushed from Workbench to the controller to make the controller use the new configuration. In a dual controller system changes must be copied to the second controller and the database must be pushed to both controllers (idle controller first, see the router manual for full details).

Use Workbench to configure an IP port on the Nucleus2 2464/2463/2460 controller. (Routers > Port Configuration button > New IP Port button)

Port Type	Protocol	IP Port
IP	General Remote In (SW-P-08)	Default Port number (The default port number is unused by the controller and should not be changed)

Table 66 Nucleus2 2464/2463/2460 IP Port Configuration.

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9.6.2.2 Vega-MV Settings

- Configure the router controller network details
  (Setup Module > Protocols Tab > SAM Router Network Tab > New Button)

Setting	Description
Dual Controller	Tick this box if there is a main and backup router controller available in the router. This will allow the IP addresses of both controllers to be entered.
Name	Enter a suitable name for the router. This will be the name used in the list of controllers that can be chosen when setting up the router table (see section 7.3.1.11).
Controller 1 IP address	Enter the IP address of the main router controller in a dual controller system or just the single controller if only one is present.
Controller 1 Port	Enter the TCP port of the main router controller in a dual controller system or just the single controller if only one is present. Use the Default Port Number as configured, see Section 9.6.2.1
Controller 2 IP address	**Dual Controller Systems only**: Enter the IP address of the backup router controller (if applicable).
Controller 2 Port	**Dual Controller Systems only**: Enter the TCP port of the backup router controller (if applicable). Use the Default Port Number as configured, see Section 9.6.2.1

Table 67 Vega-MV Controller Network Settings.

9.6.3 Vega-MV Settings for RS 422 and TCP/IP Connections

- Configure the Vega-MV inputs in the SAM Router Network tab (see section 7.3.1.11):
  (Setup Module > Protocols tab > SAM Router Network tab > Video Router tab)

MV Inputs	Matrix Nº.	Matrix Level	Router Destination	Router Association	Connected Tick Box
MV BNC Input	1	1	As required. Destinations start at 1	As required. Destinations start at 1	Tick to enable polling of Router designations for status changes or background updates if connection is lost
MV BNC Input	1	1	As required. Destinations start at 1	As required. Destinations start at 1	
MV BNC Input	1	1	As required. Destinations start at 1	As required. Destinations start at 1	

Table 68 Vega-MV Video Router Tab Settings.

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9.7 Configuring IP Connections to SAM Router Controllers

SAM router controllers may interface with the Vega-MV to provide source name and tally information. This is done via a communications port which is configured to talk to the router controller device. Each video source shown on the multiviewer display output is then configured to its obtain source name and tally information from a such a configured port.

Once IP settings have been set up, other settings can be reviewed and/or edited via the unit's web interface.

This section is for configuring Vega-MV IP connections to a SAM router controller.

When Vega-MV communication with a SAM router is established, the first row of multiviewer tile UMDs in each video window will acquire the corresponding source names from the router. Subsequently, as signal routes are made in the router, the UMDs will be updated.

Procedure:

1. View the Vega-MV Web interface main screen.
2. Go to the 'Module Properties' dialog (Module > Setup Module).
3. Go to the Protocols tab and click on the 'SAM Router Network' tab (i.e. Protocols > SAM Router Network). See Figure 136.

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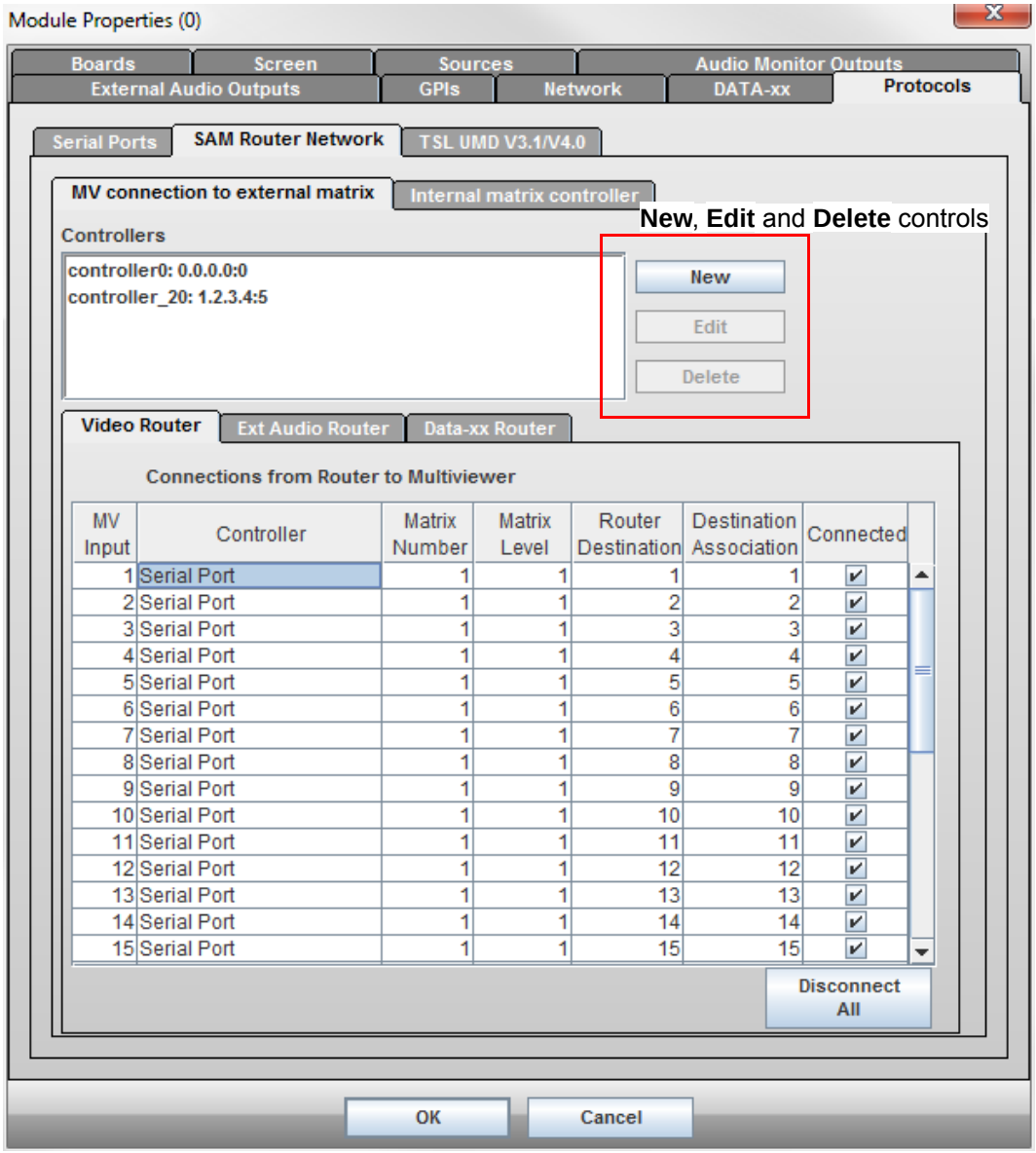

Figure 136 SAM Router Network Tab

The **New**, **Edit**, and **Delete** buttons in the 'SAM Router Network' tab are for setting up SAM router controllers for use with the Vega-MV over IP.

4. Click **New**.
   A SAM Controller Configuration dialog is displayed. See Figure 137 and Table 69.

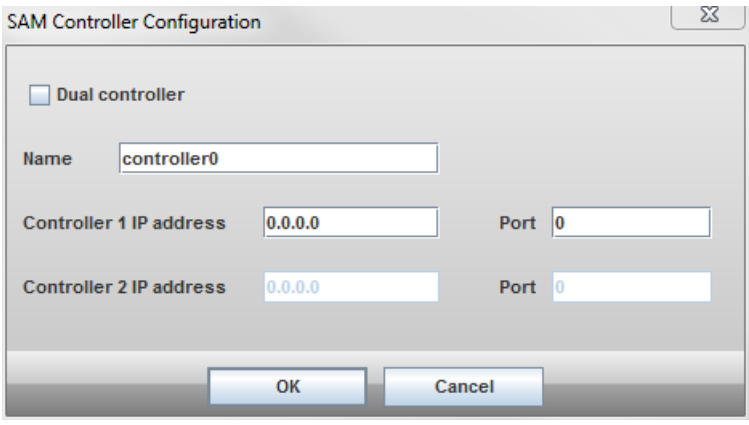

Figure 137 SAM Router Controller Configuration Dialog

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Item	Description
Dual Controller	Check box. Tick if there is a second, backup router controller in the system.
Name	Text box. Enter a name for the controller. This will be the name used in the list of all controllers when setting up the router table.
Controller 1	First controller.
IP Address	IP address of controller 1.
Port	IP port to use for controller 1.
Controller 2	Backup, second controller (if applicable)
IP Address	IP address of controller 2.
Port	IP port to use for controller 2.

Table 69SAM Router Controller Configuration Dialog Items

5. Enter IP address information and port details for the SAM router controllers.
6. Click OK.

This has created an interface to a SAM controller over IP for the Vega-MV.

Other controllers can be created similarly.

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9.8 Configuring Serial Port Connections to SAM Router Controllers

SAM router controllers may interface with the Vega-MV to provide source name and tally information. This is done via a communications port which is configured to talk to the router controller device. Each video source shown on the multiviewer display output is then configured to its obtain source name and tally information from a such a configured port.

If a serial port is to be used for communication with a SAM router controller, then the SAM router protocol must be set up:

1. View the Vega-MV Web interface main screen.
2. Go to the 'Module Properties' dialog (Module > Setup Module)
3. Go to the Protocols tab and click on the 'Serial Ports' tab, see Figure 138.
4. Enter the appropriate protocol and serial port speed, parity etc settings in the configuration dialog, see Figure 139.

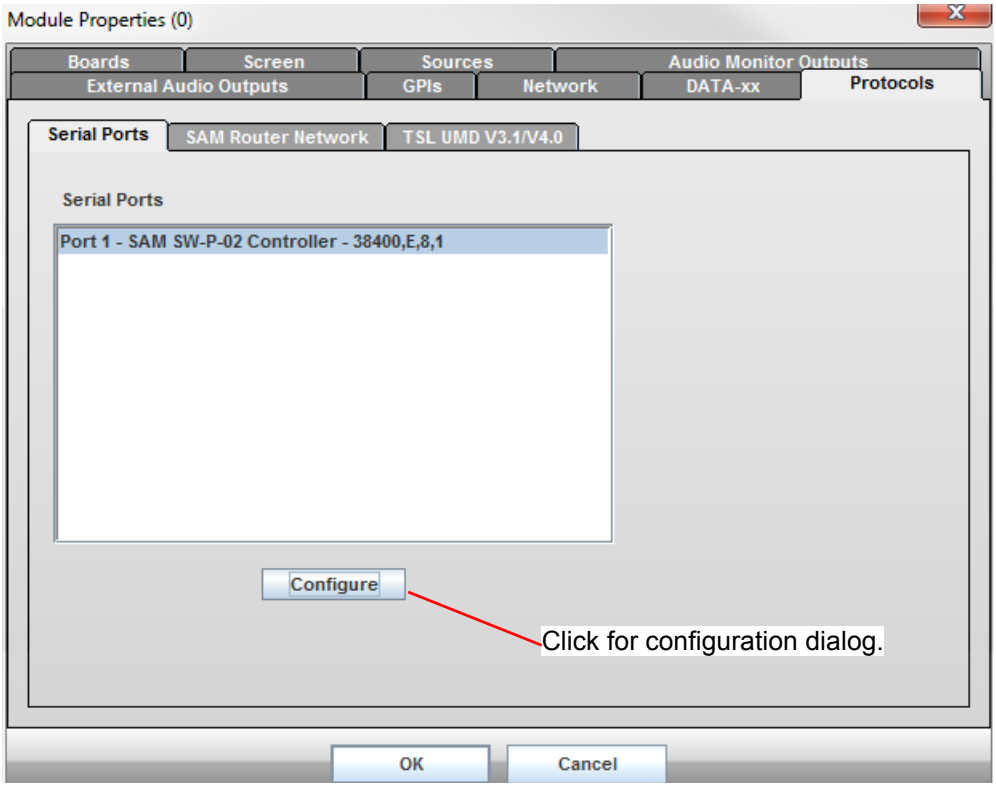

Figure 138 Serial Ports Tab

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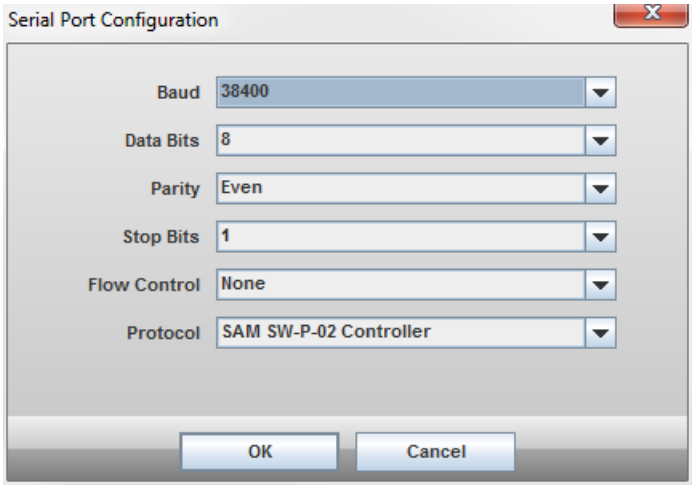

Figure 139 Serial Ports Configuration Dialog

This has created a SAM controller over a serial port connection for the Vega-MV. Other controllers can be created similarly.

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9.9 Configuring Each Multiviewer Input with a Router Controller

After each router controller has been set up on the Vega-MV, then each Vega-MV multiviewer input can be configured to get information from a router. This is done on the SAM Router Network tab (Module > Setup Module > Protocols > SAM Router Network), in the 'Video Router' tab. See Figure 140.

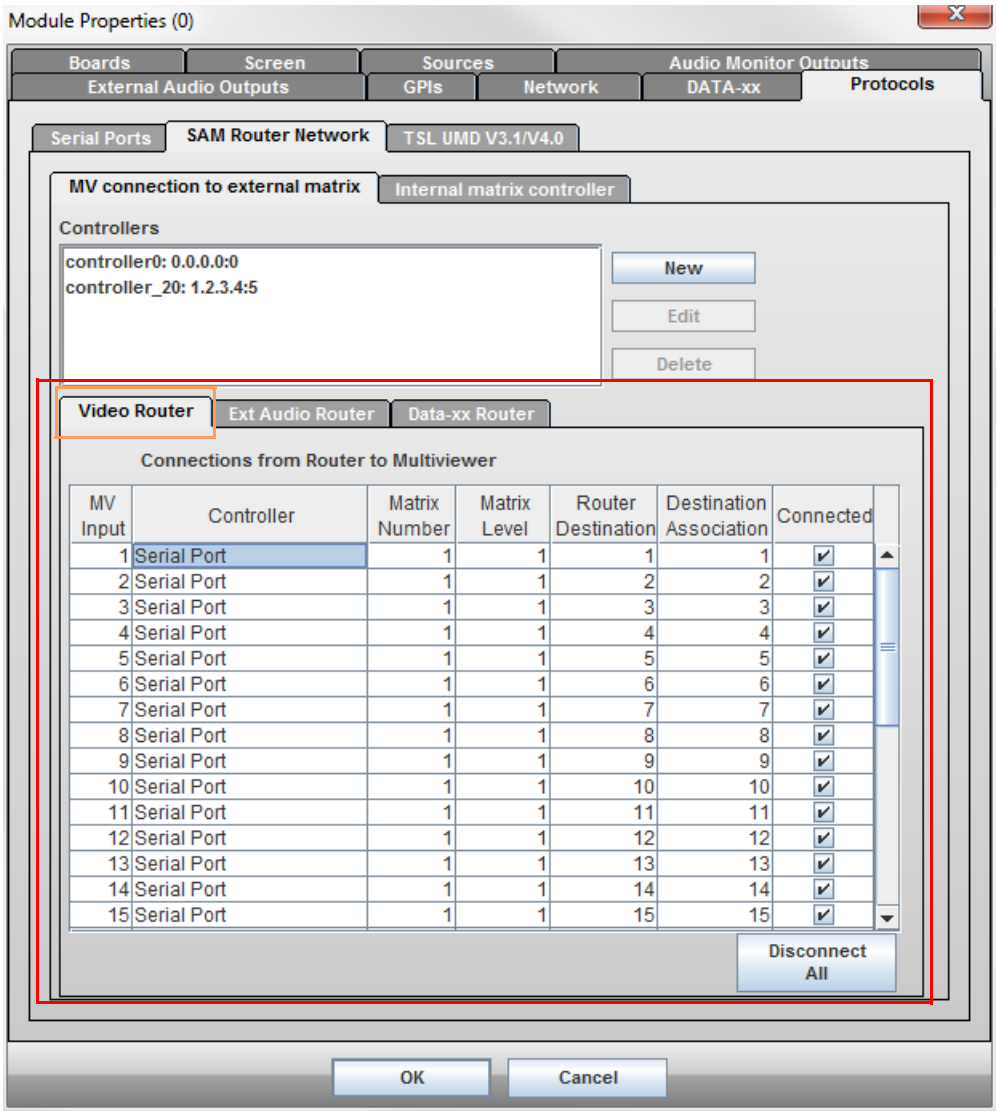

Figure 140 SAM Router Tabs: 'Video Router', 'Ext Audio Router', and 'Data-xx Router' Tabs

These tabs comprise a table of multiviewer inputs (rows) and router controller connection parameters (columns). See Table 70.

Column Item	Description
MV Input	Column is not editable. Input number of the Vega-MV unit. Numbered from 1 to 16 (Vega-16MV) and 1 to 32 (Vega-32MV).
Controller	Drop-down box. Select the router controller which is controlling the source of this MV Input.

Table 70 Columns of 'Video Router' Tab

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Column Item	Description
Matrix Number	Matrix number of the router controlled by the selected controller.
Matrix Level	Matrix level of source signal in router.
Router Destination	Router destination that is physically connected to the MV Input.
Destination Association	Normally the same as Router Destination.
Connected	Check box. Tick if the MV Input is connected to the router controlled by the selected router controller.

Table 70 Columns of 'Video Router' Tab (Continued)

For example,
multiviewer input 1 (MV Input 1 on the tab) can be set up to get video tally information from a certain router controller. See Figure 141.

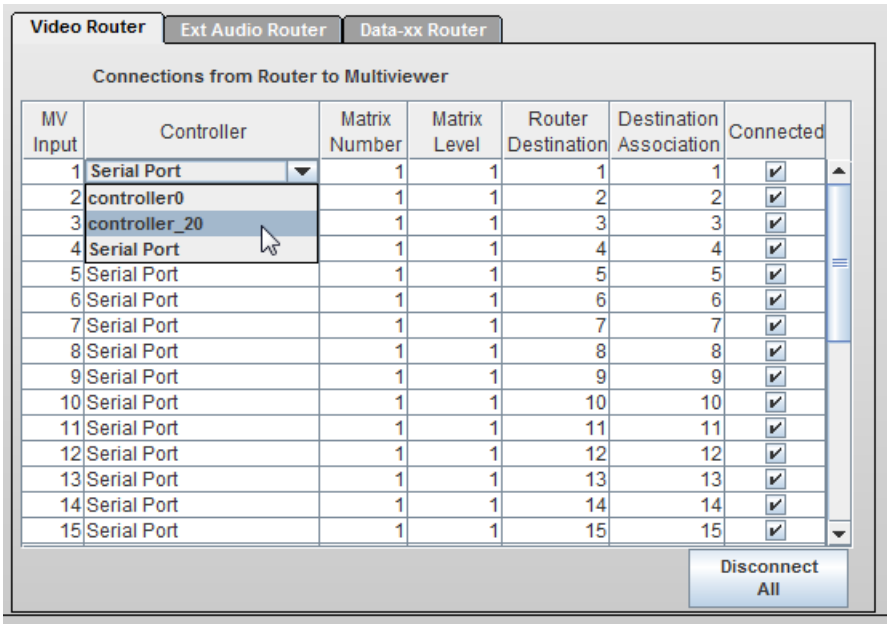

Figure 141 'Video Router' Tab Controller Selection

All 'Connected' (ticked) MV Inputs will have the UMD on their multiviewer tile show the name of the source signal monitored on the tile and any tally information shown. A combination of controllers is possible.

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10 Maintenance Tasks

Section contents:

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10.4	Vega-MV Front Panel Opening	page 188
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10.6	Replacing a PSU module	page 193

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10.1 Upgrading MV-CTL and MV-NET Firmware

From time to time, firmware updates may be made available. The current firmware version of the Vega-MV unit can be checked in the browser interface **Help > About** menu, see section 7.8.

The firmware is supplied as a single compressed file that contains the firmware and software for all of the cards fitted in the Vega-MV Router Multiviewer. Firmware has the firmware version number as part of the filename (see below for example filenames):

Example: MV-CTL Firmware version 1.0.58 (end of filename indicates firmware version):
`mpxmvc-inst-sam-mv-1.0.58.tar.bz2`

Example: MV-NET Firmware version 1.0.55 (end of filename indicates firmware version):
`mpxnet-inst-sam-1.0.55.tar.bz2`

Important:

- The IP addresses of the MV-CTL/MV-NET and the PC must be in the same range. If necessary, the IP address of the frame can be changed using the setup utility.
- The MV-NET card and the MV-CTL card must be rebooted to complete the upgrade. All of the cards can be updated at the same time by simply power cycling the frame.

1. Use a client FTP program such as “FileZilla” or “SmartFTP” to open an FTP connection to the MV-CTL or MV-NET card.

   Username: root
   Password: smv
2. Copy the compressed firmware file to the root folder of the card. The file transfer will begin.
3. When the upload is complete wait for at least 10 seconds before moving on to the next step.

Important: Failure to wait 10 seconds means that the update file will not have time to be fully saved to the card which means the update will not take place when the card reboots.

4. MV-CTL cards can be rebooted individually by selecting the **Reboot** option from the Module menu of the MV-CTL card.
   If the MV-NET card has been updated the Vega-MV unit frame must be power cycled to complete the update.
5. The OLED screen and monitor output will indicate that the update is in progress. The update will take several minutes to complete, depending on the nature of the updates.
6. Once the firmware update is complete the previous multiviewer display will return and the update messages will no longer be displayed.
7. The firmware version numbers of all the cards fitted in the frame can be checked from the About option of the Help menu, see section 7.8.

10.1.1 Updating the Video Input Cards

The input/output cards are automatically updated by the MV-CTL firmware if updates are required.

If the MV-CTL firmware update includes an update for the cards they will be automatically updated. The display will indicate the card update progress as a percentage along with a slot number. The slot number can be ignored as all of the cards are updated at the same time.

If one or more cards fail to update correctly the first time the MV-CTL card will automatically repeat the update process for the card(s) that failed to update correctly.

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10.2 Uploading Graphics Files

Graphics files may be uploaded to the Vega-MV unit MV-CTL card and assigned as logo tile objects and backgrounds for display.

Note:

- Graphics files must be in png format.
- There is approximately 200MB of storage available on the MV-CTL card for pictures.

Uploading the files is performed using a PC connected to the Vega-MV unit's MV-CTL LAN port(s) directly, or over a network.

1. Use a client FTP program such as "FileZilla" or "SmartFTP" to open an FTP connection to the Vega-MV unit.

   Username: root

   Password: smv

2. Open the **Logos** directory and copy the graphics file to the **Logos** directory.
3. The file transfer will begin.
4. When the upload is complete, restart the Java applet to update the Logo file list.

Note: The IP addresses of the MV-CTL card(s) and the PC must be in the same range. If necessary, the IP address of the frame can be changed using the setup utility.

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10.3 Multiviewer Layout Files

The Multiviewer layout settings for an MV-CTL card are stored in XML format on the MV-CTL card; it can be backed up and restored to the Multiviewer if required. The layout can also be used on a different MV-CTL multiviewer, if required.
See section 7.4 for details on saving, loading and deleting multiviewer layouts.

Note: System parameters configured on the following **Module Properties** tabs and sub-tabs are not saved as part of a XML layout file. These must be setup manually if moving a layout XML file to another multiviewer:

- **Screen** tab (see section 7.3.1.2)
- **Network** tab (see section 7.3.1.8)
- **GPIs** tab
  - **GPO Alarms** sub tab (see section 7.3.1.6)
  - **GPI Inputs** sub tab (see section 7.3.1.7)
- **Protocols** tab
  - **Serial Ports** sub tab (see section 7.3.1.10)
  - **SAM Router Network** sub tab (see section 7.3.1.11)

10.3.1 Backing Up a Multiviewer XML Layout File

1. Use a client FTP program such as “FileZilla” or “SmartFTP” to open an FTP connection to an MV-CTL card.

   Enter the IP address of the MV-CTL card in your FTP program.

   Username: root

   Password: smv

2. From the **Layouts** directory (located in the **Root** directory), select the .XML layout file and copy it to the PC desktop or wherever the file is to be stored.
3. The file transfer will begin.
4. When the download is complete close FTP program.

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10.3.2 Restoring an XML Layout file to a Multiviewer

1. Use a client FTP program such as “FileZilla” or “SmartFTP” to open an FTP connection to an MV-CTL output controller card.
2. Enter the IP address of the MV-CTL card in your FTP program.

   Username: root

   Password: smv
3. Open the **Layouts** directory (located in the **Root** directory) and copy the .XML layout file to the **Layouts** directory.
4. The file transfer will begin.
5. When the file transfer is complete, the uploaded XML layout file will be available to use in the **Load Layout** list.
6. Click on the **Load Layout** button, select the uploaded layout and click on the **OK** button. The layout will be loaded.
7. At this point the layout has only been loaded into the Java applet and will not be displayed on the multiviewer output screen.
8. Click on the **Update Layout** button to transfer the layout to the multiviewer display output screen.

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10.4 Vega-MV Front Panel Opening

Important: To maintain adequate cooling, the Vega-MV frame must not be run for more than two minutes with the front panel open.

The front panel is mounted on an assembly that is fitted with a pair of short side-rails on either side. Each rail engages a small pivot on the main chassis that retains the front panel after it has been pulled out 25 mm.

The front panel assembly includes cooling fans for the frame.
To maintain adequate cooling, the Vega-MV frame must not be run for more than two minutes with the front panel open.

The front panel assembly, when securely closed, also retains the frame's cards in their slots; there are card retaining brackets fitted to the back of some of the front panel fans, see Figure 142.

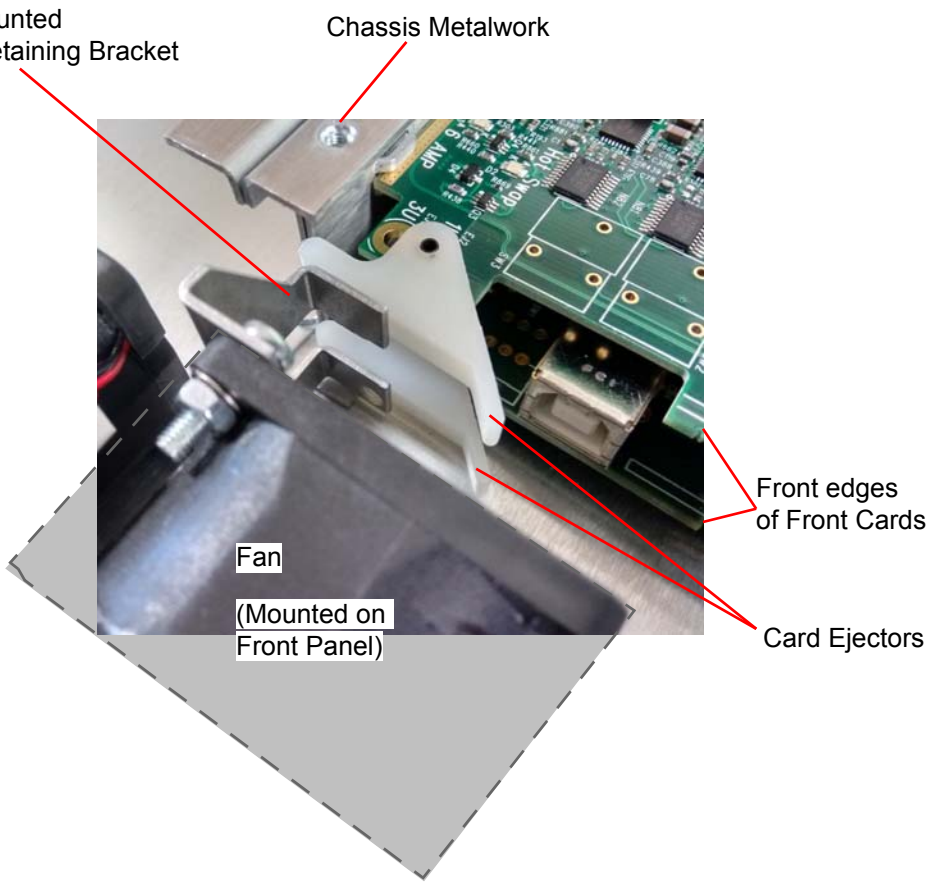

Figure 142 Card Retaining Bracket - on Vega-MV Front

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To open the front panel:

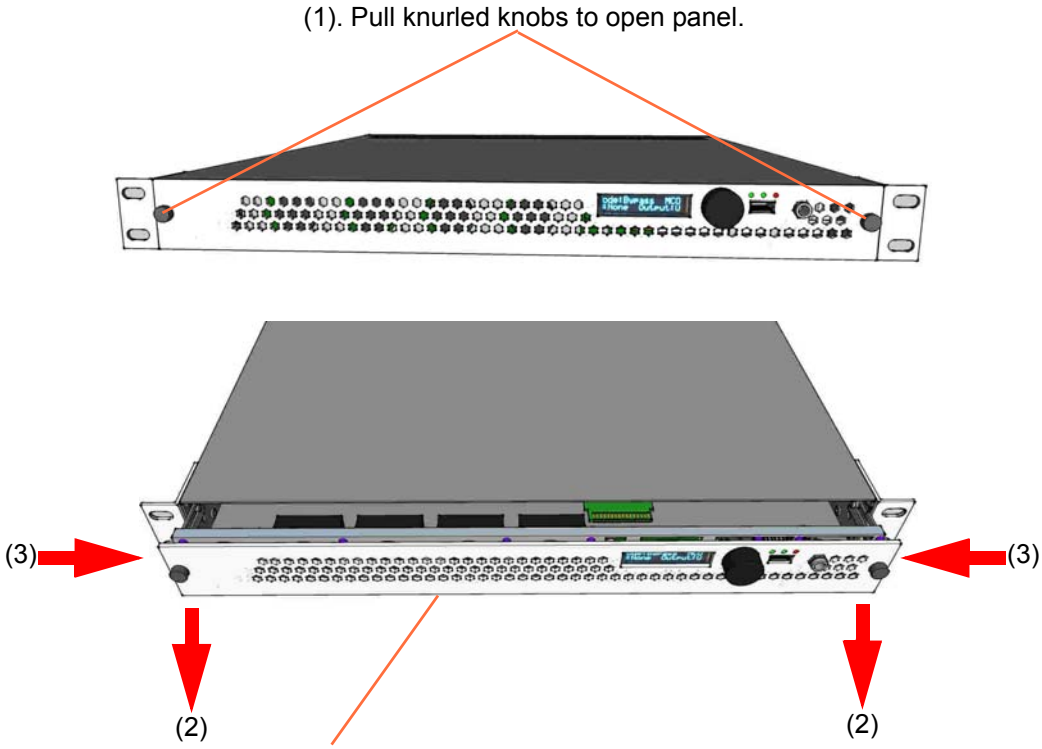
1. Pull the two knurled knobs on either side of the front panel.
2. Pull the front panel out approximately 25mm (1 inch)
3. Gently squeeze both side-rails together and remove the front panel, to gain access to the cards.

   As the front panel is removed from the frame, the front panel disengages from an edge connector which supplies power and signals to the front panel circuitry, including the OLED display and fans.

To close the front panel:

The front panel circuitry gets power and signals from the frame via an edge connector which protrudes from the MV-NET card in the frame.

4. Offer the front panel up to the frame and engage with the edge connector.
5. Insert the front panel.
6. Closing the front panel is the reverse of opening it.



(2). Pull front panel out approximately 25mm (1 Inch).

(3). Gently squeeze both side-rails together to remove the front panel and gain access to the cards.

Figure 143 Vega-MV Front Panel Opening

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10.5 Fitting / Removing Cards and Rear Panels

A Vega-MV unit is not a modular product; it has defined routing and multiviewer capabilities and is shipped from the factory in a fixed configuration. The fitting and removal of front cards and rear panels is not an operational procedure. And it may only be required as part of a fault-finding process to resolve a Vega-MV unit problem.

Important: Before attempting any fitting or removal of cards or rear panels, please refer to Appendix D “Trouble Shooting” on page 226 for fault-finding guidance and/or contact SAM customer support.

When fitting and/or removing cards and rear panels, the cards must be fitted into their respective slot locations, see Section 4.4.1 "Card Slot Numbering" on page 34.
Vega-MV video routing and multiviewer system functions may be affected, see sub-sections below.

Note:

- All cards and rears can be hot-swapped.
- If a card is removed and not replaced with another card, the existing rear panel should be removed and replaced with a blanking rear panel must be fitted.
- Changes to card load-out are automatically detected by the associated Vega-MV unit MV-CTL card.
- Input cards can be hot swapped so there is no need to power down the frame when installing or removing them.

To assist with card removal and insertion, each card has a card ejector on its front edge, see Figure 144.

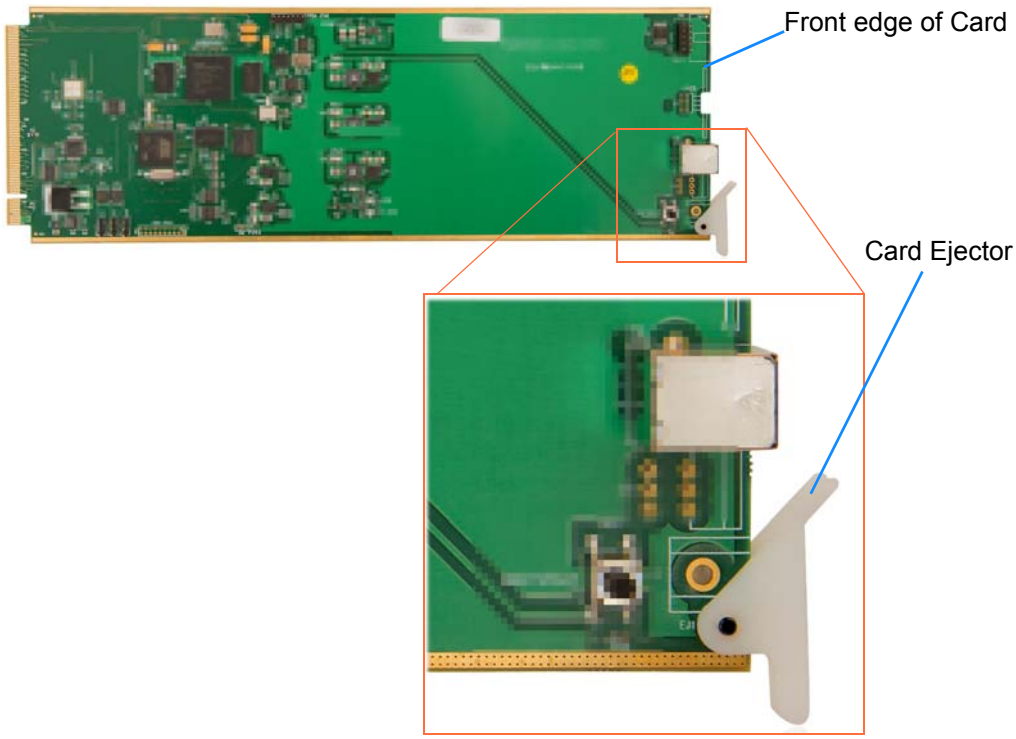

Figure 144 Card Ejector

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10.5.1 Vega-MV - Removing Cards

Important: To maintain adequate cooling, the Vega-MV frame must not be run for more than two minutes with the front panel door open.

All cards are hot-swappable. Table 71 lists the effect of card removal on Vega-MV operation.

Slot	Card Removed	Impact on	
		Multiviewer Screen	Routed Video Signals
0	MV-NET	Blank	Unaffected
1	MV-CTL	Blank	Unaffected
2	MV-VIP4	Multiviewer tile layout visible, but no video showing in any tiles.	Inputs from all slots with rears fitted remain routed and are routable.
3	MV-VIP4	Tile layout visible, but only video from slot 2 showing.	
4	MV-VIP4	Tile layout visible, but only video from slots 2 and 3 showing.	
5	MV-VIP4	Tile layout visible, but only video from slots 2, 3 and 4 showing.	
Note: Removed MV-VIP4 rear panel(s): Only video inputs and outputs using the removed rear panel(s) are affected.			

Table 71 Card Removal Impact on Operation

To remove a card:

1. Open the front panel door, see Section 10.4.
2. Pull the card ejector to free the card and then use the card ejector to pull the card completely out of the frame.
3. When the card is removed from the frame, close the frame door.

Note: If a MV-VIP4 card has been removed, wait 20 seconds before fitting another MV-VIP4 card.

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10.5.2 Vega-MV - Fitting Cards

Important: To maintain adequate cooling, the Vega-MV frame must not be run for more than two minutes with the front panel door open.

All cards are hot-swappable. Table 72 lists the effect of card insertion on Vega-MV operation.

Slot	Card Inserted	Impact on	
		Multiviewer Screen	Routed Video Signals
0	MV-NET	Multiviewer screen visible within 45 seconds.	Momentary disruption during the card start-up. Reverts back to how it was.
1	MV-CTL		
2	MV-VIP4	Video shown within 20 seconds.	Inputs from all slots with rears fitted remain routed and are routable.
3	MV-VIP4	Within 20 seconds, video from slot 3 onwards is shown.	
4	MV-VIP4	Within 20 seconds, video from slot 4 onwards is shown.	
5	MV-VIP4	Within 20 seconds, video from slot 5 is shown.	

Table 72 Card Insertion Impact on Operation

To fit a card:

1. Open the front panel door, see Section 10.4.
2. Locate the card slot where the card is to be fitted.
3. Carefully locate the card into the slot guides.
   And push the card gently but firmly into the frame until it is fully inserted.
4. Close the frame door.

After fitting a MV-NET or MV-CTL card,
wait approximately 45 seconds for the Vega-MV unit to fully start up.

10.5.3 Adding and Removing Rear Panels

All rears are hot-swappable.

If, for some reason, a rear panel is being removed completely, fit a blanking panel in its place.

1. Use a small crosshead screwdriver to remove the two screws on the rear panel or blanking plate.
2. Pull the rear panel out.
3. Fitting a rear panel or blanking plate is the reverse of this process.

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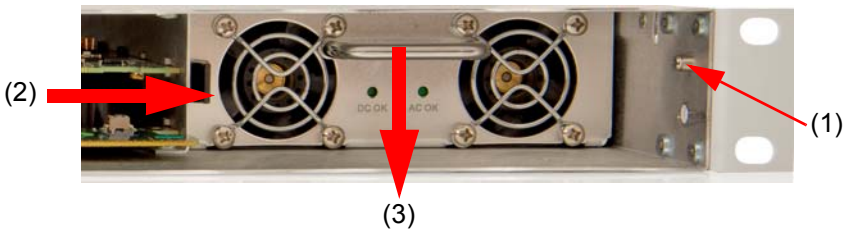
10.6 Replacing a PSU module

Important: To maintain adequate cooling, the Vega-MV frame must not be run for more than two minutes with the front panel open.

The MV-1000PSU PSU module is fitted in the Vega-MV frame and also in the optional external 24 volt backup power supply (MV-EXTPSU3). This section describes how to change a PSU module in the event of a failure.

1. Remove the frame front door as described in section 10.4.



(1). Carefully undo and remove the door locating screw and pillar spacer using a small flat head screwdriver.

(2). Push the PSU tab to the right to release the fixing latch.

(3). Gently pull the PSU module out using the handle.

Figure 145 1RU frame Vega-MV - PSU Removal and Refitting

2. Carefully undo and remove the locating screw and pillar spacer (see (1) in Figure 145) using a small flat head screwdriver. Keep the screw and pillar spacer.
3. Push the PSU tab (see (2) in Figure 145) to the right to release the fixing latch and pull the PSU module out (see (3) in Figure 145).
4. Fit the new PSU module in the frame and push it in until a click is heard this indicates that the PSU latch is engaged.
5. Refit the door locating pillar spacer and screw.
6. Refit the frame front door as described in section 10.4.

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11 MV-EXTPSU3 External Power Supply Shelf

An optional 1RU external power supply shelf, MV-EXTPSU3, is available to provide redundant / backup power for up to three Vega-MV units.

An MV-EXTPSU3 houses up to three independent PSUs (see block diagram in Figure 146) for powering to up to three Vega-MV units.

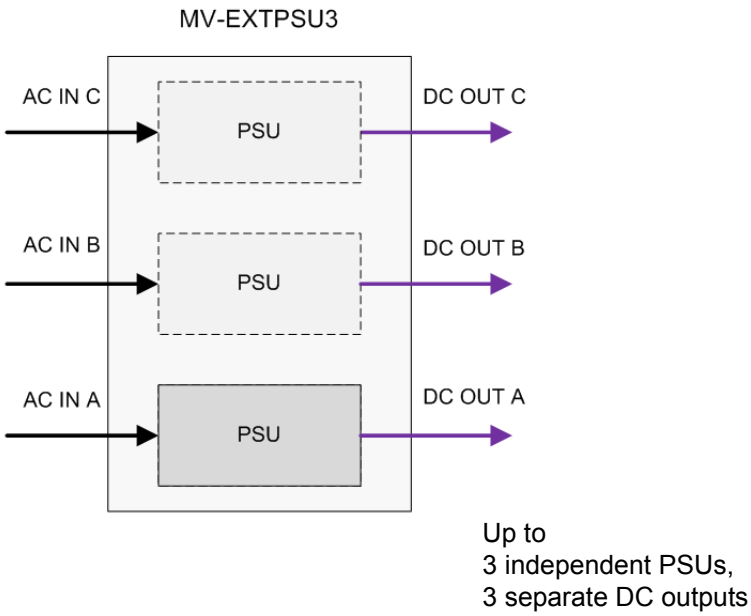

Figure 146 MV-EXTPSU3 Block Diagram

11.1 Front and Rear Views

The MV-EXTPSU3 power supply shelf is a 1RU rack unit. It is shown in Figure 147 and Figure 148. It contains up to three hot-pluggable power supply modules, MV-1000PSU, which are removable from the front of the unit. (The MV-1000PSU modules are also used in the Vega-MV Router Multiviewer frames.)

Cooling air-flow is front-to-back. Each power supply module has its own integral cooling fans.

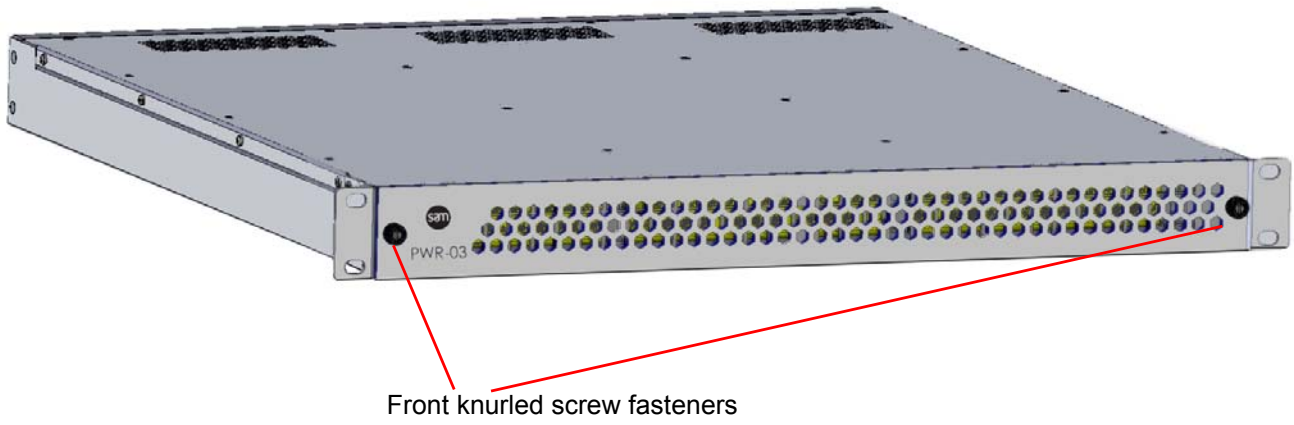

Figure 147 MV-EXTPSU3 Unit Front

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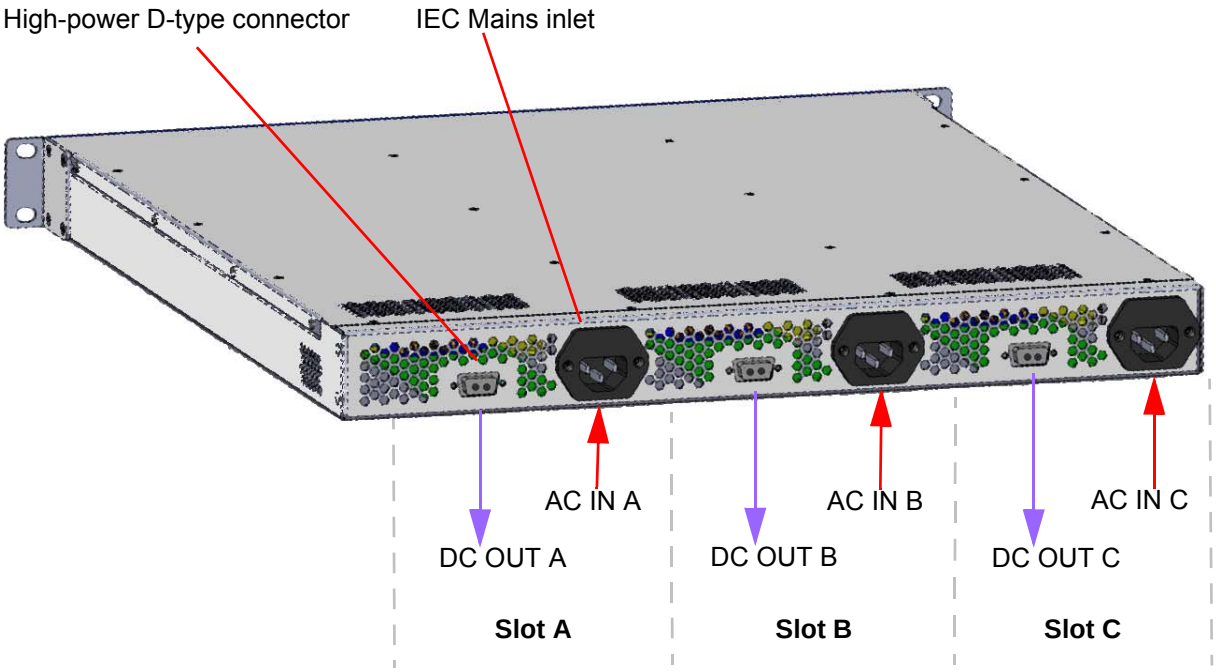

Figure 148 MV-EXTPSU3 Unit Rear

11.2 Connectors

There is a mains inlet and a DC output associated with each of the three internal power supply module bays. The connectors are described in Table 73.

Connector Type	Description
IEC	Mains Inlet. 3-off One per internal power supply module bay.
High-power D-Type (2 pins) (See Figure 149)	DC Output 3-off One per internal power supply module bay.

Table 73 MV-EXTPSU3 Rear Connectors

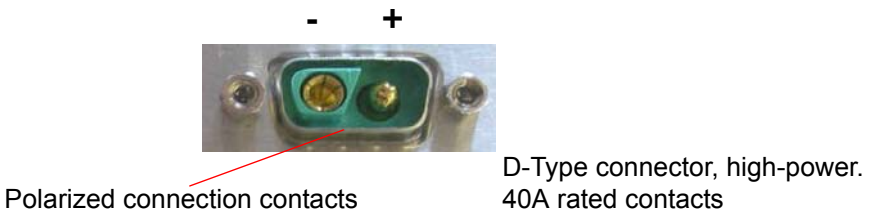

Figure 149 MV-EXTPSU3 DC Power Connector

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11.3 Ventilation

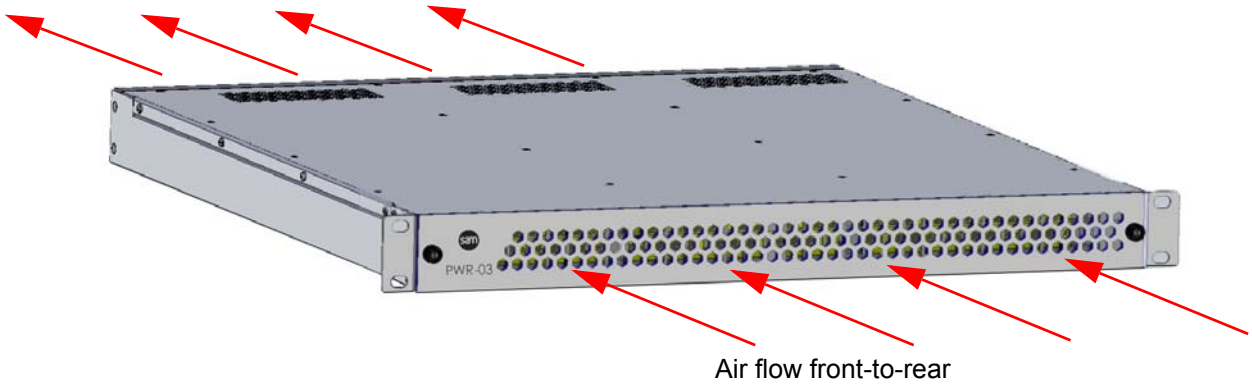

Figure 150 MV-EXTPSU3 AIr-Flow

11.4 Internal Modules

The unit front may be removed once the two front knurled screw fasteners have been undone. Figure 151 shows the view with the front down. Up to three power supply modules may be visible.

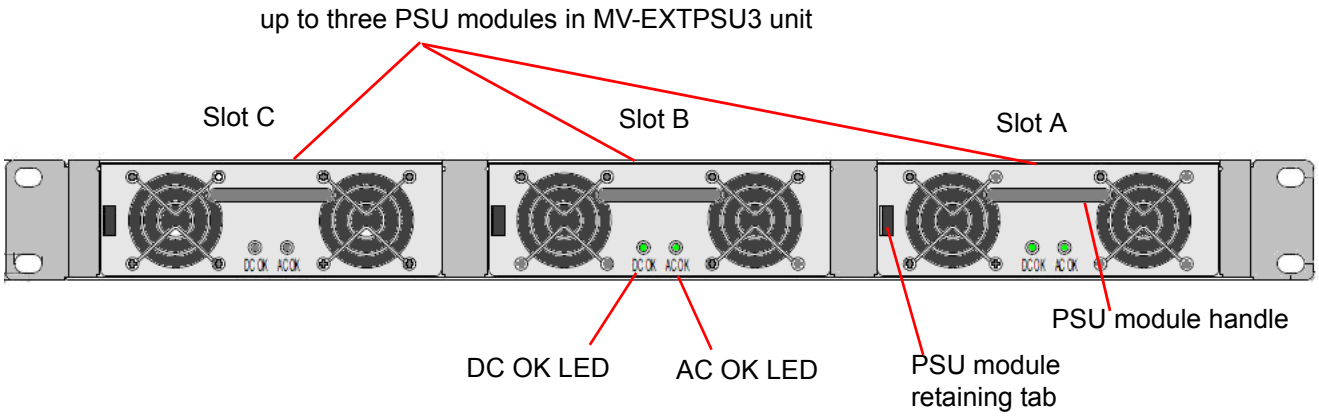

Figure 151 MV-EXTPSU3 Unit Front View with Front Removed

11.5 LED Indicators

Each power supply module has two LED indicators, described in Table 74.

LED	State	Description
DC OK	**GREEN**	PSU DC output is OK.
	OFF	PSU DC output is less than approximately 18 VDC.)
AC OK	**GREEN**	PSU AC input is OK.
	OFF	Mains AC Supply is not present or Mains AC voltage less than approximately 82 V.

Table 74 PSU Module LEDs

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11.6 Cabling

The unit may be ordered with one, two or three power supply modules fitted: A DC power cable is supplied with each power supply module.

The cables are terminated in high-power D-sub connectors which are polarized to prevent incorrect insertion. The cables are approximately 1 m in length.

WARNING:

Use only the MV-EXTPSU3 backup power supply and the supplied DC power cables.

Do not use any other interconnecting cables.

11.7 Specification

See Appendix C “MV-EXTPSU3 Specification” on page 225 for the technical specification data for MV-EXTPSU3.

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12 MV-EXTPSU3 Installation

Installation of Backup Optional Power Supply MV-EXTPSU3:

WARNING:

Check which external power supply shelf type you have:

- **MV-EXTPSU3** (new type).

or

- **MV-EXTPSU** (old type).

Note:

MV-EXTPSU information (older backup supply unit):

For information on the *old* **MV-EXTPSU**, please refer to the SAM “MV-Flex 1U and 3U Multiviewers User Manual” Issue 1 Revision 3.

12.1 Fuse location

A fuse and a spare are located in the pull-out flap of each IEC inlet connector, see Figure 152.

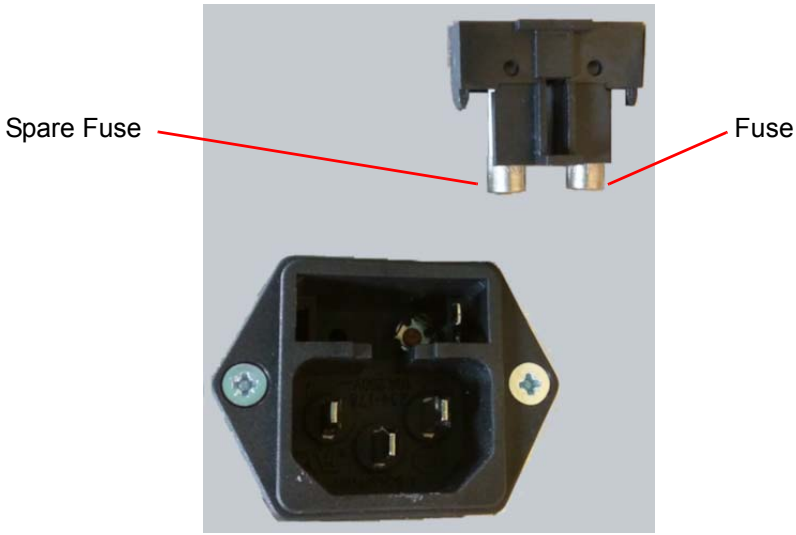

Figure 152 MV-EXTPSU3 IEC Fuse Location

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12.2 Installation

The installation instructions below are for a MV-EXTPSU3 unit.

- Do not rack-mount the 1RU MV-EXTPSU3 unit using only the front rack ears. Use a rack shelf.
- If installing equipment immediately above or below the unit it is essential to ensure that the ventilation outlets are not obstructed.
  For ventilation details Section 11.3 .
- For ventilation purposes, there must be a gap of at least 50 mm (2 inches) for the front air inlet and rear air outlet grilles.
- You must allow at least 100mm (4 inches) of space at the rear of the frame for cables and connections.
- Use only the supplied DC power cables to connect MV-EXTPSU3 to an Vega-MV Router Multiviewer.

The 1RU MV-EXTPSU3 unit can be installed in 19” rack bays. The unit must be installed close to the Vega-MV frame that is will power.

When rack-mounting the frame, place it on a suitably specified and installed rack shelf and secure the unit to the rack using the front ears using the correct rack mount screws or bolts.

See Section 11.3 for ventilation details for the 1RU MV-EXTPSU3.

MV-EXTPSU3 1RU Frame:

- The MV-EXTPSU3 frame has a depth of approximately 500mm, including connectors.
- Exhaust grilles are located on the side, upper and rear of the unit
- Make sure that sufficient space is available for the 1RU frame.

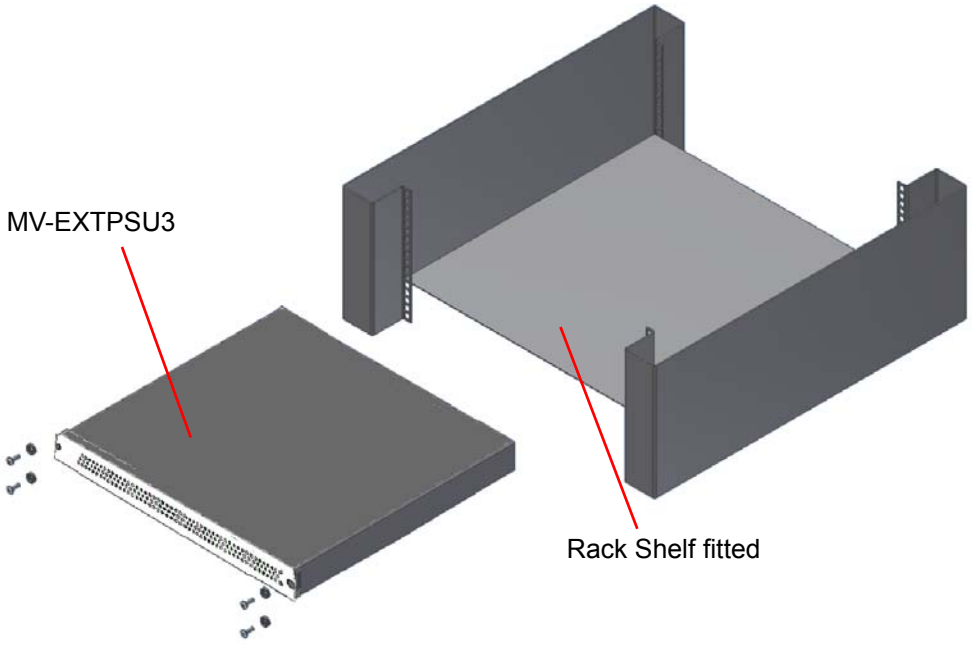

Figure 153 Mounting the MV-EXTPSU3 1RU frame in a 19” Rack

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12.3 Connecting MV-EXTPSU3 to an Vega-MV Unit

The MV-EXTPSU3 external power supply is capable of supplying up to 24A DC from each of its fitted MV-1000PSU PSU modules. Each DC output can power only one Vega-MV frame.

WARNING:

Each MV-EXTPSU3 DC output can provide up 24A DC.

Connection to an Vega-MV frame is made using the supplied DC power cable.

Important: Only use the supplied DC power cable when connecting a MV-EXTPSU3.

The MV-EXTPSU3 unit has three power supply module slots. The procedure to connect up one slot is given below.

Preliminaries:

Before connecting an MV-EXTPSU3 to a Vega-MV unit:

1. Identify which Vega-MV unit in the rack is to be powered by the MV-EXTPSU3.
2. Verify the DC power cable will reach between the MV-EXTPSU3 and Vega-MV unit.
3. Identify which MV-EXTPSU3 power supply module slot is to be used and its corresponding rear connectors (IEC Mains and DC output).

Procedure:

4. Unplug the MV-EXTPSU3 slot from its mains supply.

Fit a power supply module into the slot (if one is not already fitted):

5. Remove the MV-EXTPSU3 unit front by undoing the knurled screw fasteners and removing the front.
6. Insert a MV-1000PSU module into the MV-EXTPSU3 slot.
7. Lock the module in place by ensuring the retaining tab is in its “home” position.
8. Refit the MV-EXTPSU3 unit front by replacing the front and tightening the knurled screw fasteners.

Connecting up the DC power cable:

9. Connect the cable to the corresponding MV-EXTPSU3 high-power DC output D-Type connector.
10. Secure the cable connection by tightening the jack screws on the cable’s connector back shell.
11. Connect the cable to the target Vega-MV frame.
12. Secure the cable connection by tightening the jack screws on the cable’s connector back shell.

This has made the cable connection.

13. Plug the MV-EXTPSU3 slot into its mains supply and power the MV-EXTPSU3 slot.

The MV-EXTPSU3 power supply frame is now connected to a Vega-MV Router Multiviewer

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12.4 Disconnecting MV-EXTPSU3 from a Vega-MV Router Multiviewer

WARNING:

Each MV-EXTPSU3 DC output can provide up 24 A DC.

There are three power supply module slots in a MV-EXTPSU3. To disconnect a whole MV-EXTPSU3 unit, do the following procedure for each slot.

Preliminaries:

Before disconnecting an MV-EXTPSU3 slot from an Vega-MV unit:

1. Identify the Vega-MV unit in the rack.
2. Identify the MV-EXTPSU3 power supply module slot and its corresponding rear connectors (IEC Mains and DC output).

Procedure:

3. Unplug the MV-EXTPSU3 slot from its mains supply.
4. Disconnect the DC power cable at the target Vega-MV frame.
5. Disconnect the cable at the corresponding MV-EXTPSU3 high-power DC output D-Type connector.

This has disconnected the Vega-MV unit from the MV-EXTPSU3 slot.

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13 MV-EXTPSU3 Maintenance Tasks

MV-EXTPSU3 External Backup Power Supply Frame:

Up to three MV-1000PSU power supply modules can be fitted in an MV-EXTPSU3 frame. They are all removed and fitted in the same way.

13.1 Removing a Power Supply Module

The procedure to remove an MV-1000PSU module into an MV-EXTPSU3 slot is:

1. Disconnect the MV-EXTPSU3 slot from any Vega-MV unit. (See section 12.4)
2. Remove the MV-EXTPSU3 unit front by undoing the knurled screw fasteners and removing the front.
3. Push the module retaining tab to the right to release the module's retaining latch. See Figure 154.

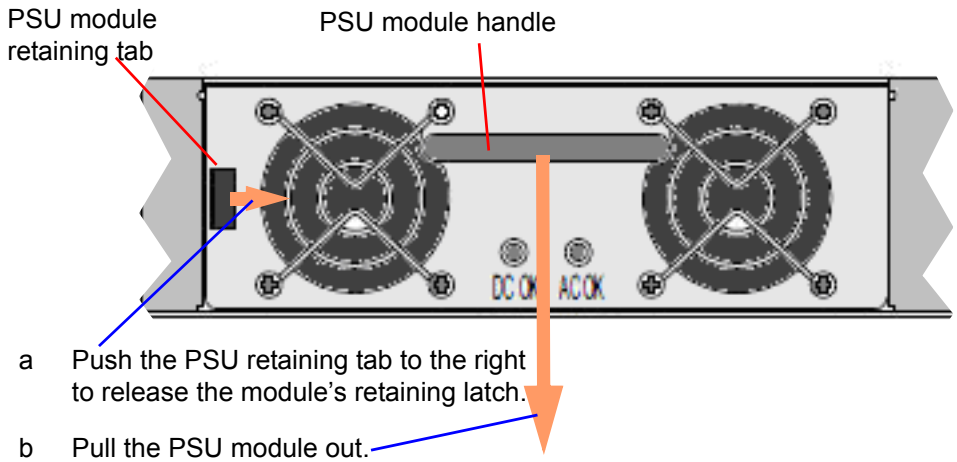

Figure 154 MV-EXTPSU3 Unit with Front Removed

4. Pull the module from the MV-EXTPSU3 slot.
5. Refit the MV-EXTPSU3 front panel and tighten the knurled front fasteners.

A MV-1000PSU has been removed from an MV-EXTPSU3 power supply frame.

13.2 Fitting a Power Supply Module

The procedure to fit an MV-1000PSU power supply module into an MV-EXTPSU3 slot is:

1. Disconnect the MV-EXTPSU3 slot from any Vega-MV unit. (See section 12.4)
2. Remove the MV-EXTPSU3 unit front by undoing the knurled screw fasteners and removing the front.
3. Insert a MV-1000PSU module into the MV-EXTPSU3 slot and push it in. A slight resistance is met when the module's connector mates with the frame.
4. Lock the module in place by ensuring the retaining tab is in its "home" position.
5. Refit the MV-EXTPSU3 unit front by replacing the front and tightening the knurled screw fasteners.
6. Refit the MV-EXTPSU3 front panel and tighten the knurled front fasteners.

A MV-1000PSU has been fitted to an MV-EXTPSU3 power supply frame.

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Appendix A Hydra Open Protocol

A.1 Introduction

The Vega-MV contains a selection of the commands defined in the Barco Hydra Open Protocol. They have been adapted to control the Vega-MV in as close as possible way as they would control a Hydra, with the aim being to enable existing scripts already used with a Hydra to be utilized. This protocol uses XML to control certain features of the Vega-MV in a user-friendly way on a LAN or through the serial port.

A.2 Formatting

All messages sent to and received from the Vega-MV use XML formatting, with each message enclosed in the tag XML. The first element inside the XML tag is always PACKET. The structure is always of the format:

```
<XML>
<PACKET MODULE=”MV” VERSION=”1.0”>
…
</PACKET>
</XML>
```

The `MODULE` and `VERSION` attributes in the `PACKET` element are not essential - they are simply there to comply with the Hydra Open Protocol, but are ignored. The response to this will be the same.

A.3 Connections

The Hydra Open Protocol has two types of connections - one for transactions and one for event handling. However, the Vega-MV currently only supports transaction types. The normal procedure for sending transactions is:

- Connect using TCP port 8881 to the Vega-MV.
- Send a transaction as XML formatted text.
- Receive the result of this transaction as XML formatted text.
- Repeat this procedure for further transactions. The connection can be kept open for as long as necessary.
- Close the socket when finished.

The procedure for sending transactions using the serial port is the same, except that the TCP socket connection is not applicable.

If the serial port is to be used, then the MV-NET card serial port needs to be configured to use the Hydra Open Protocol option in the **Module menu > Setup Module > Protocols** tab. For controlling over ethernet, no configuration needs to be done, because the Vega-MV is always listening on ethernet port 8881 for a connection to be established.

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A.4 Transactions

A transaction contains a number of commands to be executed by the Vega-MV. It sits inside a `PACKET` tag and has the following format:

```
<TRANSACTION SERIAL=”serial” MODE=”mode”>
…
</TRANSACTION>
```

Where “serial” is a unique string to identify each transaction. The Vega-MV uses it in the reply to the transaction. mode is ignored by the Vega-MV and is not essential (it is just present to comply with the format of the Hydra Open Protocol).

The result of a transaction is always sent with the following tag:

```
<TRANSACTIONRESULT SERIAL=”serial” ERROR=”error”>
```

“serial” is the same string that was used in the TRANSACTION's SERIAL attribute, that was originally sent to the Vega-MV,
and “error” is the number of commands that have failed due to errors in the command sent. Within this transaction response, the command results are stored in the same order that they sent in the original transaction.

A.5 Commands

Each command sits inside a `TRANSACTION` tag and is of the following format:

```
<COMMAND ID=”name” SERIAL=”serial”>
…
</COMMAND>
```

name is the name of the command and serial is a unique string that the Vega-MV uses in the command's transaction result. The result of a command sits inside a `TRANSACTIONRESULT` tag and is of the following format:

```
<COMMANDRESULT SERIAL=”serial” ERROR=”error”>
…
</COMMANDRESULT>
```

error is 0 if the command was successful, non zero if not successful. serial is the serial string that was supplied in the original `COMMAND` transaction.

In summary, the complete format of a command transaction XML document is:

```
<XML>
<PACKET MODULE=”MV” VERSION=”1.0”>
<TRANSACTION SERIAL=”serial” MODE=”mode”>
<COMMAND ID=”name” SERIAL=”serial”>
…
</COMMAND>
```

…more <`COMMAND`> and `</COMMAND>` tags if more than one command is to be sent

```
</TRANSACTION>
</PACKET>
</XML>
```

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…and the complete response is:

```
<XML>
<PACKET MODULE=”MV” VERSION=”1.0”>
<TRANSACTIONRESULT SERIAL=”serial” ERROR=”error”>
<COMMANDRESULT SERIAL=”serial” ERROR=”error”>
…
</COMMAND>
```

…more <COMMANDRESULT> and </COMMANDRESULT> tags if more than one command was sent

```
</TRANSACTIONRESULT>
</PACKET>
</XML>
```

A.5.1 Commands - Summary

The commands currently available are listed in the table below.

Command	Description
adjustumd	Updates the UMD text in an object
adjustborder	Updates the border of an object
adjustbackground	Updates the background of a text object
adjusttext	Updates the lines in a text object
hidetext	Hides a text object
getsourcetally	Gets the state of a tally for a source
getversion	Gets the version of firmware running
loadlayoutandupdate	Load a layout and send it to the screen
setaudiomonitorsource	Set the source of an audio monitor output
setaudioembeddedsource	Set the source of embedded audio for the SDI/HDMI outputs.
sethdcp	Enables/disables HDCP on HDMI inputs and outputs.
setobjectsource	Set the source of a video object
setsourcename	Sets the name (UMD) for a source
setsourcetally	Sets the state of a tally for a source

Table 75 Available Commands

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A.5.2 Object related commands

These commands adjust the settings of objects (tiles). In general, an object is referenced by its username. i.e. In the examples given below, a line such as:

<OBJECT ID=”object1”>

is referencing the object(s) that has the username “object1”.

A.5.2.1 Adjust UMD

Adjust the UMD text of an object

Send/Receive	Description
Send	<COMMAND ID=”adjustumd” SERIAL=”example”> <MODULE ID=”module1”> <OBJECT ID=”object1”> <LINE ID=”0”>Line1</LINE> <LINE ID=”1”>Line2</LINE> </OBJECT> <OBJECT ID=”object2”> <LINE ID=”1”>Text</LINE> </OBJECT> </MODULE> </COMMAND>
Receive	<COMMANDRESULT SERIAL=”example” ERROR=”0”> </COMMANDRESULT>

Table 76 Adjust UMD

For each object, specify the module name (currently ignored by the Vega-MV), object name (the username given to the object), line number in the UMD (0 or 1), and text for the UMD line. It is volatile, meaning that it only remains applied to the UMD while the current layout remains on screen. Uploading a new layout or even uploading the current layout again will overwrite the UMD with the text stored in the layout.

A.5.2.2 Adjust Border

Adjust the border color an object

Send/Receive	Description
Send	<COMMAND ID=”adjustborder” SERIAL=”example”> <MODULE ID=”module1”> <OBJECT ID=”object1”>green</OBJECT> <OBJECT ID=”object2”>yellow</OBJECT> </MODULE> </COMMAND>
Receive	<COMMANDRESULT SERIAL=”example” ERROR=”0”> </COMMANDRESULT>

Table 77 Adjust Border

For each object, specify the color of the border. See section A.6.1 on Parameter Colors for the list of colors available.

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A.5.2.3 Adjust Background

Adjust the background color a text object

Send/Receive	Description
Send	<COMMAND ID="adjustbackground" SERIAL="example"> <MODULE ID="module1"> <OBJECT ID="text1">green</OBJECT> </MODULE> </COMMAND>
Receive	<COMMANDRESULT SERIAL="example" ERROR="0"> </COMMANDRESULT>

Table 78 Adjust Background

For each text object, specify the color of the background. See section A.6.1 on Parameter Colors for the list of colors available.

A.5.2.4 Adjust Text

Adjust the lines of text in a text object

Send/Receive	Description
Send	<COMMAND ID=”adjusttext” SERIAL=”example”> <MODULE ID=”module1”> <OBJECT ID=”text1”> <LINE ID=”0”>Line 1</LINE> <LINE ID=”2”>Text</LINE> </OBJECT> <OBJECT ID=”text2”> <LINE ID=”1”>Line 2</LINE> </OBJECT> </MODULE> </COMMAND>
Receive	<COMMANDRESULT SERIAL=”example” ERROR=”0”> </COMMANDRESULT>

Table 79 Adjust Text

For each object, specify the line numbers to update and the text to apply.

Note: This does not alter the on/off state of a line of text. For changes made using this command to be visible, the associated lines of text need to be turned on in the Object Properties of the text object in the current layout.

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A.5.2.5 Hide Text

Hide a text object

Send/Receive	Description
Send	<COMMAND ID=”hidetext” SERIAL=”example”> <MODULE ID=”module1”> <OBJECT ID=”text1”>1</OBJECT> <OBJECT ID=”text2”>0</OBJECT> </MODULE> </COMMAND>
Receive	<COMMANDRESULT SERIAL=”example” ERROR=”0”> </COMMANDRESULT>

Table 80 Hide Text

For each text object stated, use 0 in the character data to make the object visible, 1 to hide it.

A.5.2.6 Set the source of a video object

Updates the video source of a video object

Send/Receive	Description
Send	<COMMAND ID=”setobjectsource” SERIAL=”example”> <MODULE ID=”module1”> <OBJECT ID=”object1”>2</OBJECT> <OBJECT ID=”object2”>1</OBJECT> </MODULE> </COMMAND>
Receive	<COMMANDRESULT SERIAL=”example” ERROR=”0”> </COMMANDRESULT>

Table 81 Set the source of a video object

For each object that is to have its source changed, specify the 0-based source number in the character data section of the OBJECT element.

Note:

Routing of Sources:

In other words, only eight video tiles can be sourced from each MV-VIP4 card.
If the assignment of sources to video objects exceeds this, then the object that was most recently assigned the source wins. The other object(s) with the same source will display black.

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A.5.3 Source related commands

Note: Source numbers are 0 based and therefore start a 0.

A.5.3.1 Set Source Name

Set the UMD text for a source

Send/Receive	Description
Send	<COMMAND ID="setsourcename" SERIAL="example"> <MODULE ID="module1"> <SOURCE ID="5"> <NAME>Source5</NAME> </SOURCE> <SOURCE ID="11"> <NAME>Source11</NAME> </SOURCE> </MODULE> <MODULE ID="module2"> <SOURCE ID="8"> <NAME>Source8</NAME> </SOURCE> </MODULE> </COMMAND>
Receive	<COMMANDRESULT SERIAL="example" ERROR="0"> </COMMANDRESULT>

Table 82 Set Source Name

For each source, specify the:

- Module name (currently ignored by the Vega-MV).
- Source number (0 to n).
- Name of the source.

The name given will be applied to the first line of the UMD in any objects displaying this source. It is volatile, meaning that it only remains applied to the UMD while the current layout remains on screen. Uploading a new layout or even uploading the current layout again will overwrite the UMD with the text stored in the layout.

A.5.3.2 Set Source Tally

Set the tallies for a source

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Send/Receive	Description
Send	<COMMAND ID=”setsourcetally” SERIAL=”example”> <MODULE ID=”module2”> <SOURCE ID=”8”> <TALLY ID=”1”> <STATE>0</STATE> </TALLY> <TALLY ID=”2”> <STATE>1</STATE> </TALLY> </SOURCE> </MODULE> </COMMAND>
Receive	<COMMANDRESULT SERIAL=”example” ERROR=”0”> </COMMANDRESULT>

Table 83 Set Source Tally

For each source, specify the source number (0 to n), tally number (0 to 2), and tally state (0 or 1).

Tally numbers 0 and 1 are the two software tallies - the tallies need to be set as software ones in the tally properties of the object(s) displaying this source for the tallies to be affected by this command.

Tally 2 is a hardware output tally (GPI) - the source needs to have a GPI output assigned as a tally output to this source for tally 2 to have any affect. (These are set in the **Module Properties > GPIs > GPO Alarms** tab - tally outputs are assigned here by selecting a “Source x tally output” option from the list).

A.5.3.3 Get Source Tally

Get the tallies for a source

Send/Receive	Description
Send	<COMMAND ID=”getsourcetally” SERIAL=”example”> <MODULE ID=”module2”> <SOURCE ID=”9”> <TALLY ID=”0”></TALLY> <TALLY ID=”1”></TALLY> <TALLY ID=”2”></TALLY> </SOURCE> <SOURCE ID=”18”> <TALLY ID=”1”></TALLY> </SOURCE> </MODULE> </COMMAND>

Table 84 Get Source Tally

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Send/Receive	Description
Receive	<COMMANDRESULT SERIAL=”example” ERROR=”0”> <MODULE ID=”module2”> <SOURCE ID=”9”> <TALLY ID=”0”> <STATE>0</STATE> </TALLY> <TALLY ID=”1”> <STATE>1</STATE> </TALLY> <TALLY ID=”2”> <STATE>0</STATE> </TALLY> </SOURCE> <SOURCE ID=”18”> <TALLY ID=”1”> <STATE>1</STATE> </TALLY> </SOURCE> </MODULE> </COMMANDRESULT>

Table 84 Get Source Tally

For each source, specify the source number (0 to n), and tally number (0 to 2).

Tallies 0 and 1 refer to the two software tallies and return their current on/off state as set by the setsourcetally command or other sources that can control the tallies by software such as the TSL UMD protocol.

Tally 2 is the state of the hardware tally input (GPI) that is assigned to the source. These are configured in the Module Properties > GPIs > GPI Inputs tab.

Note: A single source can have more than one GPI input assigned as an input tally. If a source does have multiple input tallies then the getsourcetally will indicate a state of 1 if any of these assigned tallies are currently asserted. Otherwise the state will be 0

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A.5.4 Module related commands

A.5.4.1 Load a layout

Load a layout and send it to the screen

Send/Receive	Description
Send	<COMMAND ID=”loadlayoutandupdate” SERIAL=”example”> <MODULE ID=”module1”> <LAYOUT ID=”test”> </LAYOUT </MODULE> </COMMAND>
Receive	<COMMANDRESULT SERIAL=”example” ERROR=”0”> </COMMANDRESULT>

Table 85 Load a Layout

In the LAYOUT tag, in the ID attribute, specify the name of the layout file to load and send to the screen.

A.5.4.2 Get Firmware Version

Get the version of firmware running on the system

Send/Receive	Description
Send	<COMMAND ID=”getversion” SERIAL=”example”> </COMMAND>
Receive	<COMMANDRESULT SERIAL=”example” ERROR=”0”> <VERSION ID=”FIRMWARE”>2.0.84</VERSION> <VERSION ID=”OS”>2.6.22.1.151</VERSION> </COMMANDRESULT>

Table 86 Get Firmware Version

The VERSION tag with the ID attribute set to FIRMWARE contains the version of the Vega-MV unit application running. The VERSION tag with the ID attribute set to OS indicates the version of Linux running on the system.

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A.5.4.3 Set audio monitor output

Set the source of an audio monitor output channel.

There are two variations of this command.

Variant 1: Set the source of the audio monitor output to an SDI embedded input.

Send/Receive	Description
Send	<COMMAND ID=”setaudiomonitorsource” SERIAL=”example”> <MODULE ID=”module1”> <OUTPUT ID=”2”> <EMBEDDED SRC=”1” PAIR=”1”/> <DISABLELOCAL ID=”1”/> </OUTPUT> </MODULE> </COMMAND>
Receive	<COMMANDRESULT SERIAL=”example” ERROR=”0”> </COMMANDRESULT>

The OUTPUT ID number can only be 1 (the one and only stereo output).

The EMBEDDED SRC ranges from 1 to 64, selecting the SDI video input number.

The EMBEDDED PAIR ranges from 1 to 8, selecting the SDI embedded audio pair number.

If DISABLELOCAL ID is set to 1 then the monitor output that is being set cannot be changed in the GUI until DISABLELOCAL ID is set back to 0.

Variant 2: Set the source of the audio monitor output to an external audio input.

Send/Receive	Description
Send	<COMMAND ID=”setaudiomonitorsource” SERIAL=”example”> <MODULE ID=”module1”> <OUTPUT ID=”2”> <EXTERNAL PAIR=”1”/> <DISABLELOCAL ID=”1”/> </OUTPUT> </MODULE> </COMMAND>
Receive	<COMMANDRESULT SERIAL=”example” ERROR=”0”> </COMMANDRESULT>

The OUTPUT ID number can only be 1 (the one and only stereo output).

The EXTERNAL PAIR ranges from 1 to the number of available external audio input pairs, selecting the external audio pair number.

If DISABLELOCAL ID is set to 1 then the monitor output that is being set cannot be changed in the GUI until DISABLELOCAL ID is set back to 0.

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A.5.4.4 Set the source of embedded audio outputs on the SDI/HDMI video outputs

There are two variations of this command.

Variant 1: Set the source of the audio monitor output to an SDI embedded input.

Send/Receive	Description
Send	<COMMAND ID=”setaudioembeddedsource” SERIAL=”example”> <MODULE ID=”module1”> <OUTPUT VID=”1” PAIR+”1”> <EMBEDDED SRC=”1” PAIR=”1”/> <DISABLELOCAL ID=”1”/> </OUTPUT> </MODULE> </COMMAND>
Receive	<COMMANDRESULT SERIAL=”example” ERROR=”0”> </COMMANDRESULT>

The OUTPUT VID number indicates the video output number and can only be 1 or 2.

The OUTPUT PAIR number indicates the embedded pair number on the video output. It can range from 1 to 4 (there are only 4 output pairs available on the embedded out. On SDI out it is the first 4 pairs that get used; HDMI out only allows 4 pairs anyway).

The EMBEDDED SRC ranges from 1 to 64, selecting the SDI video input number.

The EMBEDDED PAIR ranges from 1 to 8, selecting the SDI embedded audio pair number of the input.

If DISABLELOCAL ID is set to 1 then the output pair that is being set cannot be changed in the GUI until DISABLELOCAL ID is set back to 0.

Variant 2: Set the source of the embedded audio output pair to an external audio input.

Send/Receive	Description
Send	<COMMAND ID=”setaudioembeddedsource” SERIAL=”example”> <MODULE ID=”module1”> <OUTPUT VID=”1” PAIR+”1”> <EXTERNAL PAIR=”1”/> <DISABLELOCAL ID=”1”/> </OUTPUT> </MODULE> </COMMAND>
Receive	<COMMANDRESULT SERIAL=”example” ERROR=”0”> </COMMANDRESULT>

The OUTPUT VID number indicates the video output number and can only be 1 or 2.

The OUTPUT PAIR number indicates the embedded pair number on the video output. It can range from 1 to 4 (there are only 4 output pairs available on the embedded out. On SDI out it is the first 4 pairs that get used; HDMI out only allows 4 pairs anyway).

The EXTERNAL PAIR ranges from 1 to the number of available external audio input pairs, selecting the external audio pair number.

If DISABLELOCAL ID is set to 1 then the monitor output that is being set cannot be changed in the GUI until DISABLELOCAL ID is set back to 0.

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A.5.4.5 Enable/Disable HDCP

This enables/disables HDCP on HDMI inputs and outputs.

Send/Receive	Description
Send	<COMMAND ID=”sethdcp” SERIAL=”example”> <MODULE ID=”module1”> <STATE>0</STATE> </MODULE> </COMMAND>
Receive	<COMMANDRESULT SERIAL=”example” ERROR=”0”> </COMMANDRESULT>

Set the STATE tag's character data to 0 to disable HDCP or 1 to enable it.

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A.6 Parameter Values

Some of the values applied are text values relating to a particular attribute of an object. For example colors are set using color names. The text values available are listed here.

A.6.1 Color Values

Colors available for setting objects that can have their color attribute set are:

Available Color Values	Available Color Values
transparent	grey50
black	grey25
blue	grey15
red	darkblue
green	darkred
magenta	darkgreen
cyan	darkmagenta
yellow	darkcyan
white	darkyellow
grey75	

Table 87 Available Color Values

The text values used are not case sensitive.

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Appendix B Technical Specification

This chapter provides tabular overviews about the technical details of a Vega-MV Router Multiviewer, the components and their interfaces.

The following table contains data relating to the Vega-MV Router Multiviewer.

B.1 Physical

Physical Specification	
Mechanical	19" Rack Mounting Frame with removable front panel, temperature controlled fan assisted ventilation, six card slots, separate rear connector modules and power supply/fan status indicators.
Mounting height	1RU
Dimensions	Width: 445 mm (17.5 Inches) Depth: 511 mm (20 Inches) including rear connectors Height: 44 mm (1.7 Inches)
Weight	6 kg (13 lb) maximum, fully loaded
Environmental	
Operating temp	0°C to 40°C
Relative Humidity	70% max. non-condensing
Ventilation	Fan assisted. Front inlet, rear exhaust

Table 88 Physical Specifications

B.2 Electrical

Power	
Connector	Single IEC Mains Socket
Voltage	1 kW auto-sensing 100 - 240 V AC, 50/60Hz switch mode internal power supply 24V DC Input Maximum power consumption 204 W when fitted with: four video cards, one MV-NET Card and one MV-CTL card.
Input Current Rating	2.5 A AC, 8.5 A DC
Inrush Current	19.8 A
Fusing	One 3.15 A (5 x 20 mm HBC, Time Delay) fuse inside the IEC socket. Spare fuse located in the IEC socket under the pull-out flap.

Table 89 Electrical Specifications

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B.3 Inputs

Signal Inputs	
Video MV-VIP4:	
SDI Video Inputs:	8 video inputs per MV-VIP4 card:
SDI Input Standards:	**SD-SDI (SMPTE259M 270Mb):** 525/60, 625/60 **HD-SDI (SMPTE292M, 1.5Gbps)** **3G-SDI (SMPTE424M Level A Mapping, 3Gbps)** **6G-SDI (SMPTE ST-2081 6Gbps):** On a pair of 3G inputs. **12G-SDI (SMPTE ST-2082 12Gbps):** Using quad-link 3G.
Reference Input:	Analogue video input. 75 R terminated. 1 V peak to peak. SD bi-level sync or HD tri-level sync.
LTC:	SMPTE-12M unbalanced >0.5Vpp

Table 90 Signal Inputs

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B.4 Outputs

Router Outputs	
SDI Video Router Outputs:	8 video outputs per MV-VIP4 card. Video standards supported: See SDI Video Inputs.

Table 91 Router Signal Outputs

Multiviewer Display Outputs	
Outputs	MV-CTL Card: • **Main outputs:** 2x Type A HDMI (1.4a). • **Copy SDI outputs:** 2x quad-link SDI outputs. **Important Note**: HDMI outputs support HDCP but this must be enabled from the **Module** menu, **Screens** tab to display HDCP encrypted sources, see section 7.3.1.2. Standards supported see Table 93.
Processing Delay	Processing delay varies: • 2-3 fields for interlaced video inputs. • 2-3 frames for progressive video inputs. depending on timing relationship between the input and output.
Embedded Audio	8 channels, embedded audio derived from: • SDI (up to 16 channels per source). • Dolby E meter segment metadata level metering.

Table 92 Signal Outputs

Multiviewer Display Output Resolution		HDMI Output	Slaved copy SDI Outputs Quad-link/Dual-Link
UHD 4K25 RGB 4:4:4	(3840x2160 @25Hz)	Yes, with embedded audio	Yes, with embedded audio see **Note 1**
UHD 4K30 RGB 4:4:4	(3840x2160 @30Hz)	Yes, with embedded audio	Yes, with embedded audio see **Note 1**
UHD 4K50 YCbCr 4:2:0	(3840x2160 @50Hz)	Yes, with embedded audio	Yes, with embedded audio see **Note 2**
UHD 4K60 YCbCr 4:2:0	(3840x2160 @60Hz)	Yes, with embedded audio	Yes, with embedded audio see **Note 2**
Note 1: Dual-link SMPTE ST 2081-10 6Gbps supported **Note 2:** Quad-link SMPTE ST 2082-10 12 Gbps supported.			

Table 93 Multiviewer Display Output Standards

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B.5 Router Switching Timing

Video line switching timing according to SMPTE RP168-2009.

Video Standard	Switching Line	
SD 50 Hz field rate	Line 10	(525 line)
SD 59.94 Hz field rate	Line 6	(625 line)
HD	Line 7	
UHD	Line 7	

Table 94 Router Switching

B.6 Control

Switching of router outputs and multiviewer inputs is independently controllable.

Controlled via:

- SAM RollCall Control Panel.
- SAM Luna panels.

Control interfaces:

- Serial Port
- IP over a network

SAM Protocol	
SW-P-02	Set routes.
SW-P-08	Set routes and extract names.

Table 95 Router Switching Protocols

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B.7 Connections

Front & Rear Panels	
Front Panel	• Power supply and fan failure LED indicators on front panel • 1 x OLED display and rotary control knob • 1 x USB-2 type A port - Not currently used • 1 x 6.35mm stereo audio socket - used to monitor up to two audio channels. Only one MV-CTL card can use the 6.35mm phono socket, see section 7.3.1.2
Rear Panel	**Vega-MV** frame: • 1 x IEC AC power socket • 1 x 2-pole 24 V DC backup power socket **MV-NET Card** - 1 per frame. Rear panel: • 1 x BNC for video sync input • 1 x BNC for LTC input • 1 x Global GPI/O 15 Way High Density D-Type socket (8 in & 4 out) • 1 x 9 Way D-Type socket RS232/RS422 port for UMD tally via TSL, Image Video or other protocols. Only one MV-CTL card can use the serial port, see section 7.3.1.10. • 1 x RJ45 connector - Firmware updates only **MV-CTL Card -** 1 per frame. Rear panel: • 2 x Quad-link SDI (4-off SDI) monitor output display ports • 2 x Type A HDMI (1.4A) copy monitor output display ports • 1 x RJ45 connector - Ethernet (LAN) for browser, NTP clock update and firmware updates.

Table 96 Connections

GPI/O	
MV-NET Global Port	8 inputs/4 output per Vega-MV frame (assignable)

Table 97 GPIO

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B.8 Network Defaults

B.8.1 LAN 0 Defaults

LAN 0 Network Settings	Default
IP Address	192.168.0.120
Subnet Mask Address	255.255.255.0
Gateway Address	192.168.0.1
DNS1 Address	0.0.0.0
DNS2 Address	0.0.0.0

Table 98 LAN 0 Default Network Details

B.8.2 LAN 1 Defaults

LAN 1 Network Settings	Default
IP Address	192.168.0.121
Subnet Mask Address	255.255.255.0
Gateway Address	192.168.0.1
DNS1 Address	0.0.0.0
DNS2 Address	0.0.0.0

Table 99 LAN 1 Default Network Details

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B.9 Multiviewer

Alarms	
Video Inputs	Loss of sync, loss of luminance, freeze frame
Audio Inputs	Loss of embedded or external audio, over-level, out of phase channel pairs
Metadata Inputs	Loss of VITC (SDI only), loss of V-Chip (composite only), Teletext (analog only), subtitles, video non-sync detection
Alarm Indication	Visual (in display), GPI, LAN, SNMP traps
Metadata	
Decoding/Monitoring	• Teletext (WST) subtitles (ITU-R BT.653-3) SD-SDI only • OP-47 subtitles, SD- HD- 3G-SDI • AFD driving aspect ratio (SMPTE 2016-2007), SD-SDI, HD-SDI, 3G-SDI • WSS driving aspect ratio (ETSI EN 300 294), composite only • D-VITC timecode display (SMPTE-12M-2008 VITC), SD-SDI only • ATC timecode display (SMPTE-12M-2008 ATC), SD-SDI, HD-SDI, 3G-SDI • Embedded audio metering (SMPTE-272M-1994, SMPTE-299M-1997) • TSL V3.1 (serial RS232/RS422 version) supported • TSL V4.0 (IP and serial RS232/RS422 versions) supported
Audio Meter Scales and Ballistics	
NORDIC	Overall dynamic range: 54 dB (+12 to -42 dB) Attack time: 10 mSec Decay time: 1.7 Sec per 20 dB decay
DIN/PPM	Overall dynamic range: 55 dB (+5 to -50 dB) Attack time: 10 mSec Decay time: 1.5 Sec per 20 dB decay
BBC PPM	Overall dynamic range: 24 dB +3 dB down “Mark 1" (+12 to -12 dB) Attack time: 10 mSec Decay time: 2.8 Sec per 24 dB decay (from “Mark 7" to “Mark 1")
VU	Overall dynamic range: 23 dB (+3 to -20 dB) Attack time: 300 mSec Decay time: 300 mSec per 20 dB decay
VU EXT	Overall dynamic range: 60 dB (+10 to -50 dB) Attack time: 300 mSec Decay time: 300 mSec per 20 dB decay
AES/EBU	Overall dynamic range: 60 dB (0 to -60 dB) Attack time: < 5 ms Decay time: 1.5 Sec per 20 dB decay
Audio Phase Correlation For Alarms	
	Attack time: 0.4 Sec for zero to ± deviation Decay time: 0.4 Sec for ± to zero deviation Input dynamic range: 45 dB Minimum input level: -45 dBu

Table 100 Alarms, Metadata, GPIO, Audio Scales and Ballistics

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B.10 Software

Switching of router outputs and multiviewer inputs is independently controllable.

Controlled via:

- SAM RollCall Control Panel.
- SAM Luna panels

Vega-MV Router Multiviewer Software	
Version	1.1.21 or later

Table 101 Vega-MV Router Multiviewer Software

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Appendix C MV-EXTPSU3 Specification

This chapter provides tabular overviews about the technical details of a MV-EXTPSU3 Power Supply Shelf.

C.1 Mechanical

Item	Description
Rack height	1RU
Dimensions	445 mm (W) x 500 mm (D) x 45 mm (H)
Weight	Frame with three power supply modules: 7.75 kg

C.2 Electrical

Item	Description
AC Input Voltage	Up to 3x Auto-sensing 100 to 240 V AC, 50/60 Hz
AC Input Current	Up to 3x 7 A (max)
Inrush Current	22.4 A per AC input.

Item	Description
DC Output Power	Up to 3x 576 W (maximum)
DC Output Voltage	Up to 3x 24 V DC (maximum)
DC Output Current	Up to 3x 24 A (maximum)

C.3 Controls, Connections and Indicators

Location on Frame	Control, Connector and Indicator Description
Front	No controls / indicators on front.
Front, front removed	Up to 3x power supply modules. Each module fitted has: • 1x Green LED indicator for presence of AC input • 1x Green LED indicator for DC output OK
Rear	3x 2-pole DC high-power outlet 3x IEC AC power inlet

C.4 Features

Item	Description
Overload	Constant current limiting. Recovers automatically after fault condition is removed.
Over Voltage	Shutdown output voltage. Re-power on to recover.
Over Temperature	Shutdown output voltage. Recovers automatically after temperature reduces.

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Appendix D Trouble Shooting

This appendix contains the following sub-sections:

D.1	Problem solving	page 226
D.2	Changing IP Address of an MV-CTL Card (Vega-MV unit CPU)	page 228
D.3	Java Issues	page 229
D.4	Other Common Issues and Solutions	page 231
D.5	Fault Identification and Basic Problem Solving	page 235
D.5.1	Types of Issue	page 235
D.5.2	User Fault Report Form	page 235
D.5.3	First Stage - “Other Common Issues and Solutions”	page 236
D.5.4	2nd Stage, Fault Identification - Power Supplies	page 236
D.5.5	3rd Stage, Fault Identification - Firmware Revisions	page 245
D.5.6	Last Stage - Reporting A Fault	page 248

D.1 Problem solving

The P1 power LED will illuminate green whenever mains power is supplied to the internal PSU of the frame and the internal PSU is working correctly (see Appendix D.1.1 for full LED status information).

The P2 power LED will be illuminated when 24 volts DC power is being supplied to the frame by an optional MV-EXTPSU3 external power supply frame (see section for details on the MV-EXTPSU3 power supply frame).

Always ensure that power is connected and check the OLED display for error messages before using the problem solving guide.

A spare fuse is supplied in a space provided in the rear IEC mains connector before the unit leaves the factory. Always replace the fuse with one of the correct value as shown in the Vega-MV Installation section, Section 5.5 “Vega-MV Power Supplies and Fuses”.

In the event of a power supply failure, the optional external backup PSU is able to sustain operation of the unit while the internal PSU (MV-1000PSU) is replaced.

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D.1.1 Front Panel LED Status Display

Once the Vega-MV unit has booted the front panel LEDs will display fan and PSU status as described in Table 102.

The time taken to complete the boot cycle will depend principally on the number of video cards fitted. For example, a frame fitted with four video input cards takes about 70 seconds to boot. Each additional video card adds about 5 seconds to the boot cycle.

LED		Description
Fan	**Off**	All fans working.
	Flashing Red	One or more fan failures detected.
	Red	Critical Fan Failure: More than two fans have failed. or Over Temperature alarm.
P1		**Internal Power Supply Module** (MV-1000PSU):
	Off	Mains power is not connected or not working.
	Green	Mains power is connected to the internal PSU module and the PSU is working.
	Red	Power supply voltage produced by the internal PSU is outside the range 20 to 25.5 volts.
	Flashing Red	One or more of the onboard power supply voltages is outside its permitted voltage range.
P2		**Optional External Backup Power Supply Shelf:**
	Off	External backup PSU not fitted or external PSU is not supplying 24 volt power.
	Green	External backup PSU is supplying 24 volts power.
	Red	External backup PSU supply voltage is outside the range of 20 to 25.5 volts.

Table 102 Front Panel LED Status Display

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D.2 Changing IP Address of an MV-CTL Card (Vega-MV unit CPU)

A simple PC utility is available from SAM Customer Support to enable a Vega-MV unit's MV-CTL IP addresses (LAN 1) to be found and edited, see page 7 for contact details.

If an MV-CTL card is currently set to an IP address that cannot be reached by a computer's current network settings, the MV-Setup utility can be run and used to change/confirm the IP address. This allows any MV-CTL-equipped Vega-MV unit with any IP address to be found on the network and have its network settings configured.

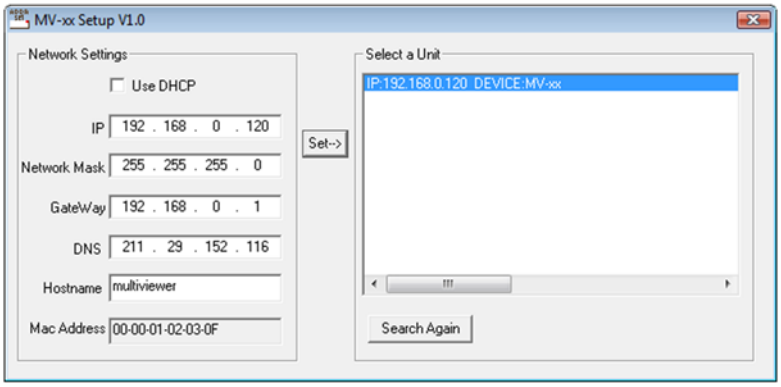

Figure 155 Vega-MV Setup Utility

1. Double click on the Setup utility icon and any MV-CTL cards connected to the network will be displayed, see Figure 155.
2. The **Search Again** button can be used if the MV-CTL cards are started after the utility.
3. Select the MV-CTL card to be configured in the list box on the right of the utility. Enter the new network settings on the left.

Important: The IP Address that is set up must be unique for the network that the MV-CTL card is connected to.

4. Press the **Set-->** button and you will be asked for a password:

   Default Password = `smv`

5. Enter the password and the updated MV-CTL card IP details will be set.

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D.3 Java Issues

D.3.1 Java applet:
Takes a long time to launch from the browser
or **Will not launch due to security issues**
or **Will not launch after an update to the latest Java release**

1. If the PC running the browser application has recently had a Java update and the Vega-MV web pages no longer run any more in the browser, then please refer to Appendix F for a work-round.
2. However, if the PC has not been used to browse Vega-MV web pages before, then please read the following, before looking at Appendix F.

Security issues only apply to Java platforms 1.7.0_21 and above

Java platforms 1.7.0_21 and above have extra security measures to prevent untrusted Java applications from running.

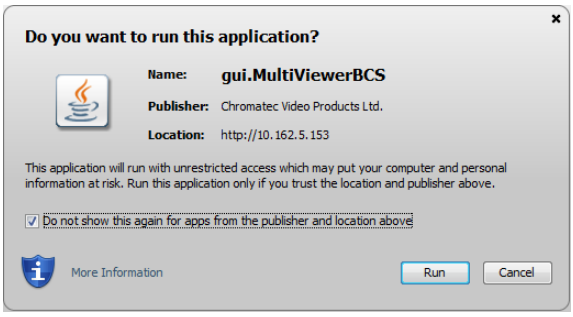
All Vega-MV Router Multiviewer firmware versions have a certificate to assist with the security checks that Java carries out.

However there can still be some issues depending on:

- The Java security settings.
- Whether or not the PC has access to the internet.

On a PC with access to the Internet:

If the application has never been launched on the PC before then the first time it is launched the following message will appear. It is asking for permission to install the security certificate. Tick the “Do not show this again…” box so that you do not have to acknowledge this every time the application needs to launch.



As long as the PC has access to the Internet then there should be no further issues when Java checks that the security certificate has not been revoked.

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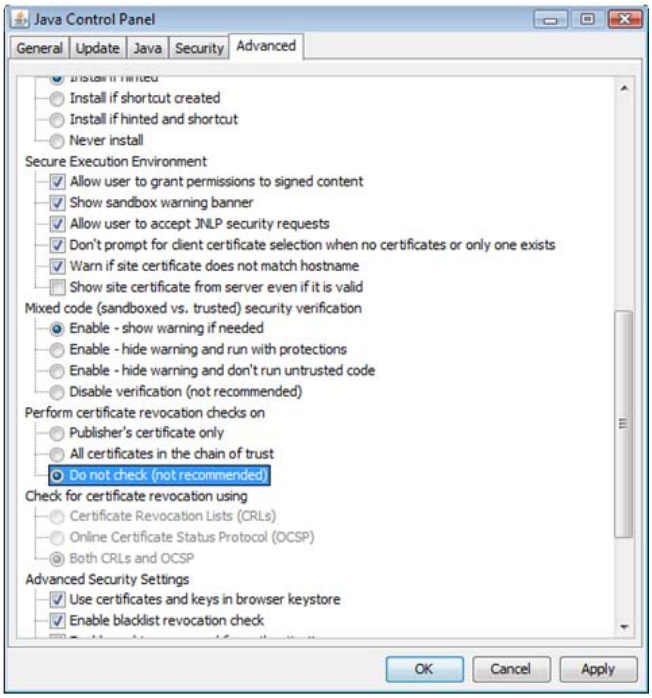
On a PC without access to the internet:

With Java's default security settings, when an application is launched from a browser it tries to check whether the application's certificate has been revoked. After failing to connect to the internet (about 30 seconds), it asks whether you want to run the application or not, indicating that it was unable to check the certificate.

To avoid this message and the delay in starting the application, the certificate revocation needs to be disabled in the Java Control Panel. This is in the advanced tab, as shown below.



D.3.2 Why does the Java applet: Report an error or Say 'Program Will Not Load' when launching the web interface?

This can be caused by the caching of an incompatible version of the Java applet.

1. Locate the Java control panel by searching for “Java” from the **Windows Start** menu **Search** box.
2. Open the Java control panel, select **View** from the **Temporary Internet Settings** section on the **General** tab and ensure that **Applications** is selected from the **Show** drop down list.
3. Delete any entries titled “Multiviewer Browser Control System” and try connecting to the Vega-MV unit again.

The Java applet will be reinstalled automatically.

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D.4 Other Common Issues and Solutions

This section lists some common operating issues and their solutions.

Initially, check that your Vega-MV has:

- Powered up correctly.
- Is fitted with the latest firmware revision.

If the unit is not operating correctly, review the common issues listed here.

D.4.1 No Video Output

There is no video output

- Check that there is power to the Vega-MV frame (P1 and/or P2 LEDs are lit green).
- Check the front panel OLED for warning messages.
- Check that the video output resolution is not beyond the capability of the display monitor. (See the answer to the issue below).

An output should be seen once the unit has booted.

D.4.2 Fuzzy Image

The image appears fuzzy or is lacking clarity

- Check that the output resolution of the MV-CTL card is set to the native resolution of the monitor. This will avoid forcing the LCD/Plasma screen to rescale the image.
  Most LCD/Plasma screens produce artifacts when their internal scalers are active.
- Display output resolution is set from the **Screen** tab which is accessed from **Setup module** in the **Module** menu. (**Module > Setup Module > Screen**)

D.4.3 Image Off-center

The image is not centered in the screen

- Use the monitor controls on the display monitor to align the image.
- If an analog LCD screen is connected, use the auto-adjust facility.

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D.4.4 Command Response Issue

Unit fails to respond correctly to commands

- The following commands in the **Module Menu** can be used to try and rectify an unresponsive unit:
  - **Halt** – This will ensure that all files are saved before powering off the frame. This stops the system from running.
    The only way to restart it is to power cycle the frame.
  - **Reboot** - This will shut the system down and start it back up again.
    This can take up to 70 seconds.
  - **Reset** - This leaves the CPU running, but resets and reloads the firmware into all the input/output cards.
- Power cycle the unit.
- And/or perform a Master Reset.
  A Master Reset will restore all settings to the factory default.

(A Master Reset is performed by connecting a keyboard to the front panel USB port and using the command Ctrl-Alt-Del.
Note that the IP address will also default to 192.168.0.120.)

D.4.5 RS232/422 Options

What are the RS232/RS422 options?

RS232 or RS422 operation can be selected via jumpers on the MV-NET card, see section 9.1.

Only one MV-CTL card can use the MV-NET serial port. If more than one MV-CTL card is configured to use the serial port only the card fitted in the lowest frame slot number will actually use the port.

D.4.6 Loss of Clock/Date at Frame Power Cycle

Why are time clock/date settings lost when the frame is power cycled?

This data is normally maintained by a rechargeable battery situated on the MV-NET card. The battery has a typical life of 6+ years. Loss of data indicates that the battery requires replacement. Please contact your SAM dealer.

If the time source is NTP or LTC, then the unit's real-time clock will return to the correct time once the NTP/LTC source is ready.

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D.4.7 ‘Program Will Not Load’ Message

Why does the message ‘Program Will Not Load’ appear when launching the web interface?

The web interface use Java. This message is issued by the Java application and is caused by the caching of an incompatible version of the applet.

If using Windows:

1. Open Control Panel and click on the Java icon.
2. Within the Temporary Internet Files section, select View.
3. Within the Show drop-down menu, select Resources.
4. Click on the URL heading bar to sort the view by URLs,
5. Scroll down to the folder/file 192.168.0.120:80/Applet.jar (or the appropriate IP address for the frame),
6. Delete the file.

The applet should now load correctly after restarting the browser.

D.4.8 Single Tally Working on a Tile

Only single tally is visible, or appears to work, on a tile.

Each tile has the potential for up to two tallies (i.e. Tally 0 and Tally 1 in TSL terms).

In order to use both tallies, the tally shape has to be set to ‘Square’.
The two tallies will then appear as two squares, left and right of the UMD.
(See the Tally tab in the Edit Object window for details on setting tally properties.)

If the tally shape has been set to ‘Fill’, then this is interpreted as
'fill the UMD background when a tally is on' and only one tally will be supported.

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D.4.9 Digital Audio and Analogue Bar Graphs

Can I use analog bar graphs for digital inputs?

Yes.

The range colors, break points and level references are set for the scale type and NOT for the source assigned.

For example, assuming the following settings:

- Analog scale type: AES/EBU
- Analog/Digital scale reference: -18dBfs
- Analog 0dB reference: 0dBu
- Digital upper range point: -18dBfs
- Digital lower range point: -40dBfs

Feeding in analog 0dBu will produce a level of -18dBfs, with the color changes occurring at -40dBfs and -18dBfs.
Changing the analog 0dB reference to +4dBu will produce a level of -22dBfs, with the color changes unaltered.
Changing the Analog/Digital reference to -20dBfs (with the analog ref still at +4dBu) will produce a level of -24dBfs, with color changes unaltered.

The same applies to displaying digital channels on an analog scale; the color changes will adhere to the analog upper and lower settings.

D.4.10 Audio Bar Color and Dolby E

Audio bar color selection with Dolby E sources.

For each audio meter, only two bar colors can be allocated to the pair of audio sources that the meter is displaying. Therefore, when metering a stereo PCM pair, the left and right channel bars can each be allocated a different color.

However, when Dolby E metadata is decoded, the meter can need to display up to eight bars (depending on the original Dolby E mix). Normally, the color selected for the first bar will apply to the 'left' channels, and the color selected for the second bar will apply to the 'right' channels. E.g. in the case of a 5.1+ downmix, the color selected for the first bar will apply to L, C, Ls and Ldownmix, and the color selected for the second bar will apply to R, LFE, Rs and Rdownmix.

D.4.11 Fixing NTP Time Discrepancies

NTP time discrepancies.

For NTP to work reliably, the Vega-MV unit’s MV-NET card must also be connected to the LAN.

This is particularly required to synchronize the time displayed when more than one Vega-MV is working in a system.

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D.5 Fault Identification and Basic Problem Solving

The Vega-MV products are designed for robust operation in TV studio and OB van production conditions. However, issues can still arise and this sub-section is designed to help identify and solve any problems, when possible resolving them on-site.

If it is not possible to resolve an issue on-site, the correct procedure for reporting a fault is detailed here, along with instructions for carrying out more advanced fault finding.

D.5.1 Types of Issue

Typically, there are two types of issue:

1. **Hardware** based failures.

   For example: A simple blown fuse, or a board-level device failure.

2. **Firmware incompatibility** issues.

   For example: An issue arising from recent updates or the addition of new cards to an existing set-up.

Either of these issue types can result in a performance degradation that ranges from nuisance level bugs to complete shutdown of the frame.
This underlines the need for quick fault identification and basic problem solving.

D.5.2 User Fault Report Form

Note: Appendix G on page 254 contains a **User Fault Report** form.

Use this fault report to record information about an issue and any associated fault-finding.

The form provides all the information required for remote fault diagnosis, if this becomes necessary.

The **User Fault Report** form at the end of this document (Appendix G on page 254) is the best way of recording any fault finding and provides all the information required for remote fault diagnosis if this becomes necessary.

Important: Before beginning any fault diagnosis,
please copy or print out the “**User Fault Report**” in Appendix G on page 254.

Important: Submitting a filled out **User Fault Report** is the best way of providing information about an issue and getting resolution as soon as possible.

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D.5.3 First Stage - “Other Common Issues and Solutions”

The first stage when facing an issue is:

- Section D.4 “Other Common Issues and Solutions” on page 231.
  Review the information in this section which lists some common issues and provides solutions.
  This may resolve your issue.
- If this does not resolve your issue,
  then proceed with the guidance provided in the following sub-sections, see section D.5.4 “2nd Stage, Fault Identification - Power Supplies” on page 236 onwards.

D.5.4 2nd Stage, Fault Identification - Power Supplies

The Vega-MV frame is designed to operate with a nominal 24VDC internal supply and will operate over a range of DC supply voltages.

However, if the DC supply voltage drops too low, the first effect will be to stop the fan system operating over its full range. If the Vega-MV’s thermal monitoring system detects any resulting overheating it will send out alarm messages and begin a phased shut-down of the chassis. This will affect the normal operation of the chassis.

Resilient MV-NET card processor:

The processor on the MV-NET card has been designed to be resilient and still operate at a very low DC supply voltage. Thus the processor can provide front panel LED, OLED and on-screen-display (OSD) indications of any detected fault conditions.

There are two procedures presented in the document:

- Section D.5.4.1 “Procedure 1 - Checking Status LEDs” on page 237
- Section D.5.4.3 “Procedure 2 - Front Panel P1 LED is RED or Flashing” on page 243

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D.5.4.1 Procedure 1 - Checking Status LEDs

The first thing to check with any fault scenario is correct power supply operation. This includes:

- An adequate mains supply.
- Presence of all locally generated chassis voltages.
- Operation of sufficient cooling fans.

The three front panel status LEDs should be inspected to ascertain correct power supply operation:

1. Check the Vega-MV front panel's three status LEDs, see Figure 156.
2. Look up the LED status using Table 103.

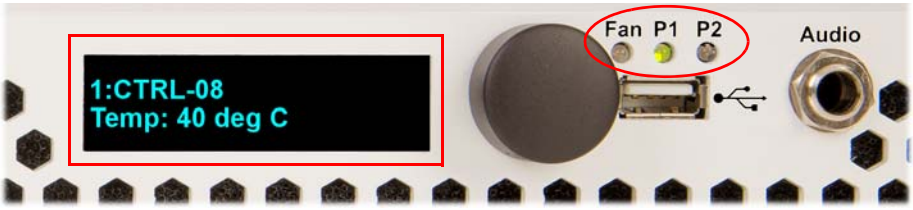

Figure 156 Vega-MV Front Panel OLED Display and 3 Status LEDs

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LED	State	Description
Fan	**OFF**	All fans working.
	FLASH RED	One or more fan failures detected. (See **Note 1** below.)
	RED	Critical fan failure (i.e. more than 2 fans failed) or Over Temperature. (See **Note 1** and **Note 2** below.)
P1	**GREEN**	Internal frame DC supply voltage is present and within the range 20 V to 25.5 V.
	RED	Internal frame DC supply voltage is not within range. (See **Note 3** below.)
	FLASHING	Internal, on-board power supplies not within their permitted range. (See **Note 3** below.)
	OFF	No internal frame DC supply available.
P2	**GREEN**	24 V DC backup supply present and within range 20 V to 25.5 V.
	RED	24 V DC backup supply is outside range 20 V to 25.5 V.
	OFF	MV-EXTPSU3 24 V DC backup supply not connected.

Note 1: For **Fan LED** flashing Red:

Front Panel OLED display will identify which fans are detected as faulty.
(For fan locations, see **Figure 33** in Section 5.1 “Ventilation” on page 50.)

Put the details of which fans have failed in a **User Fault Report** form and contact your dealer or SAM support.

Note 2: For **Fan LED** Red:

Front Panel OLED display will identify which fans are detected as faulty, until any thermal shutdown shuts down the display mechanism.

Note: A Critical Fan Failure or an Over Temperature warning will start a phased shut down of the chassis (thermal shutdown),
see 3.8 “Thermal Protection, Thermal Shutdown” on page 25.

Note 3: For **P1 LED** red or flashing:

Refer to **Procedure 2 - Front Panel P1 LED is RED or Flashing** on page 243.

Table 103 Frame Front Panel Status LEDs

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D.5.4.2 More Diagnoses

Using a known working MV-EXTPSU3 unit:

The external power supply frame, MV-EXTPSU3, may power a Vega-MV frame which has a faulty internal PSU or no internal PSU fitted.

If a known working MV-EXTPSU3 is used and is connected to a Vega-MV frame, then the **P1** LED should be lit Green.

If the **P1** LED is OFF in this case, then the MV-NET card may not be reporting a valid internal frame DC supply, for some reason. For example, there may be a be short-circuit on the card or in the frame, or the MV-NET card itself may be faulty.

Fill out a **User Fault Report** and contact your dealer or SAM Support for details on how to proceed.

Unit Failure to Power up or to Power cycle or Unit shuts down:

If the **P1 LED** is OFF, and the Vega-MV unit fails to power up or power cycle or the unit completely shuts down during operation, the most likely reasons are:

- Mains cable not present or accidentally removed or not properly connected or faulty.
- Power supply (PSU) not fully inserted.
- Blown mains cable fuse (e.g. UK mains plug).
- Blown chassis fuse.
- Power supply (PSU) in safety shutdown state.
- PSU failure.
- MV-NET card short detection or fault.

Identifying the possible cause of the fault:

Follow steps a) to h) below to identify the possible cause of the fault:

a) Open the front panel.
Check the two PSU status LEDs, see Figure 157.
The two LEDs should be lit, see Table 104.

Figure 157 PSU Status LEDs

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LED	State	Description
DC OK	**GREEN**	PSU DC output is OK.
	OFF	PSU DC output is less than approximately 18 VDC. (See **Note 1**.)
AC OK	**GREEN**	PSU AC OK.
	OFF	Mains AC Supply is not present (Most likely) or Mains AC voltage less than approximately 82 V. (See **Note 2.**)

Note 1: **DC OK** LED **Off**:

If **AC OK** LED is Lit, this indicates that either:

1. The frame's internal DC supply is not present and has failed. Then the front panel **P1** LED will also be Off and the chassis will not power up without an External DC power supply (e.g. MV-EXTPSU3).
   - Replace the frame's PSU. (See Section 10.6 "Replacing a PSU module" on page 193.)

or,

2. The frame's internal DC supply has dropped out of range. Then the front panel **P1** LED should be RED.
   - Proceed to **Procedure 2 - Front Panel P1 LED is RED or Flashing** on page 243.

Note 2: **AC OK** LED **Off:**

Follow **steps b) to e)** below,
to check some likely fault causes and to try to restore AC Mains to the unit.

Table 104 PSU Status LEDs

Steps b) to e) below check the mains supply, cable and fuses:

b) Check that a mains cable rated to 13A is fitted and it is plugged into an **active** AC mains supply (**100-240V AC 50/60Hz**).

Important: Replace cable with a 13A rated cable as a matter of urgency, if cable is not 13A rated or if cable rating cannot be verified.

c) Check the frame's internal PSU is fully inserted by pushing on the handle. If a distinct 'click' is heard when pushing, then the PSU was not seated correctly. (It has a spring-loaded locking tab which only engages in the chassis when the PSU is fully seated.)

d) Check the mains plug fuse, where fitted (e.g. UK mains plugs) is 13A.

Important: Replace mains plug fuse with a 13A fuse, if the original fuse is blown or if it is of a lower rating.

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e) Check chassis fuse is the correct rating. (See 5.5 “Vega-MV Power Supplies and Fuses” on page 55 for fuse types).
Replace the chassis fuse if the original is blown or if it is not the correct rating.

Steps b) to e) above have checked the mains supply, cable and fuses.
The following steps assume that the AC mains supply, cable and fuses are all OK:

If the AC mains supply, cable and all fuses are OK, then continue with the following steps:

f) If the **AC OK** LED is still OFF, then power cycle the unit a further two times.
(Do this by removing the mains cable and plugging it back in.)

After this, if the frame PSU still does not work, then
replace the PSU. (See Section 10.6 “Replacing a PSU module” on page 193.)

Note:

PSU protection:

The PSU has internal protection circuits which protect against: short circuit, current overload, over-voltage and over-temperature.
None of these protection circuits should activate during normal operation.

For all conditions except over-voltage, the PSU recovers automatically when any fault condition is removed.
For over-voltage, the PSU must be power-cycled in order to recover.

g) If the frame enters a repeating power-up/shutdown cycle,
then the frame’s PSU is probably entering some protection mode.

Look for any obvious causes, for example, blocked cooling vents.
If the cause is not apparent,
fill out a **User Fault Report** and contact your dealer or SAM Support for details on how to proceed.

Important:

DO NOT quickly resort to replacing a PSU.

The PSU units are very robust and are unlikely to fail in a power-on/power-off cycle.
It is most likely that the PSU has entered a protection mode for some reason.
The underlying reason needs to be investigated.

h) If the PSU’s **AC OK** and **DC OK** LEDs are lit
and the front panel **P1** LED is Off:
Open the front panel; check the MV-NET card’s 'Hot swap’ LED (LED **D5**) is lit.
(See the note below about “Locating MV-NET card’s **D5** LED”.)

Note:

Locating MV-NET card’s **D5** LED:

Look from the front of the chassis, back along the component side of the MV-NET card.
LED **D5** will just be visible towards the rear of the card, see **Figure 158**.

Record the **D5** LED status (Lit or Off) and fill out a **User Fault Report** and contact your dealer or SAM Support for details on how to proceed.

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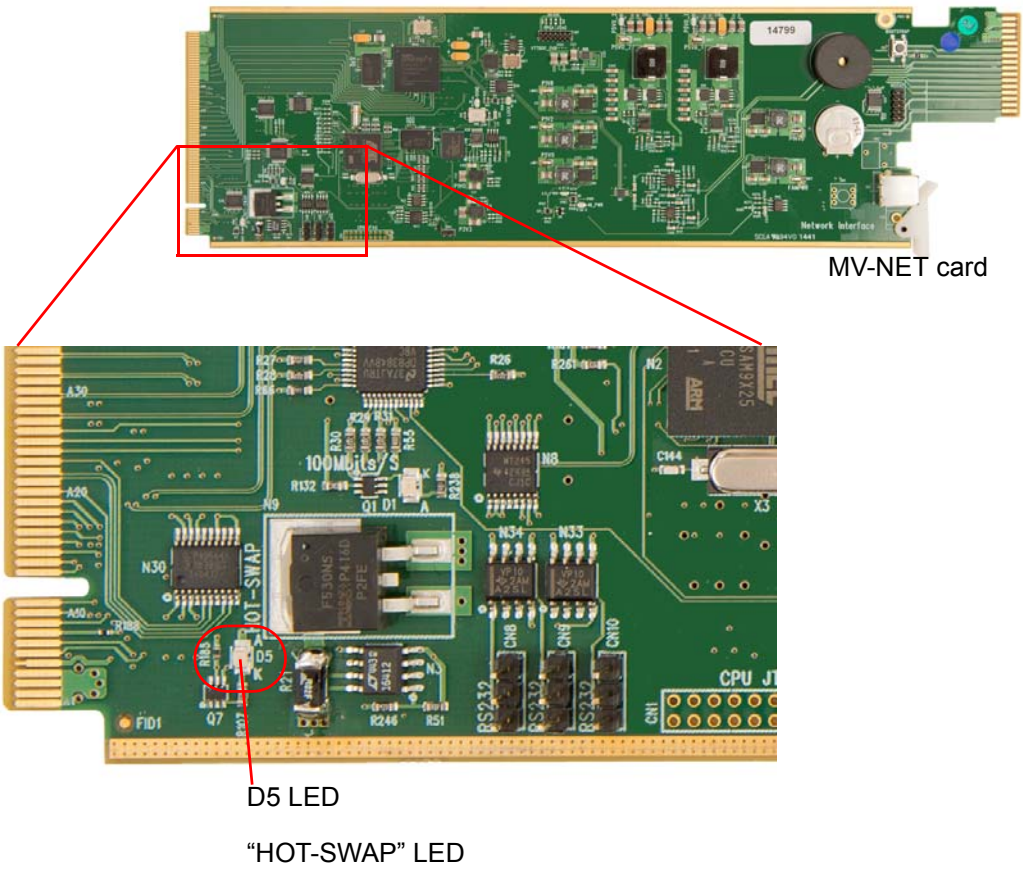

Figure 158 Locating MV-NET card’s D5 LED;
1U chassis: (horizontally-mounted MV-NET card) D5 towards rear left-hand side;
3U chassis: (vertically-mounted card) D5 towards rear bottom.

Note:

Explanation of diagnosis:

If the PSU’s **AC OK** and **DC OK** LEDs are both lit,
then the PSU is receiving the correct AC mains and providing a ~24VDC frame supply.

And if the front panel **P1** LED is Off, it means the MV-NET card is not receiving 24VDC internally; because either:

- The MV-NET card has detected a short on its 24VDC input and is in some protection mode
- Or the MV-NET card itself is potentially faulty.

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D.5.4.3 Procedure 2 - Front Panel P1 LED is RED or Flashing

The first indication of DC power supply problems will be via the front panel **P1** LED which operates as follows:

- **P1** LED should always be on if the frame's internal 24 V DC is available.
- It will be lit Green if the detected voltage supplied is within the range of 20 V - 25.5 V.
- It will be lit Red if outside of this range.
- It will flash on and off if any on-board power supplies are outside their permitted ranges then the LED will flash on and off.
- If it is Off, then there is no frame DC supply or it is out of range.
  See "2nd Stage, Fault Identification - Power Supplies" on page 236.

P1 LED Red:

If **P1** LED is lit Red, the most likely reason is a degraded DC output from PSU.:

1. Open the front panel and check the two LEDs on the front of the PSU.
   The **AC OK** LED on should be lit.
2. If the **DC OK** LED is lit,
   then frame's DC supply voltage detected by the MV-NET card is in the range ~18 to 20 V DC.
3. If **DC OK** LED is Off,
   then this indicates the DC output from the PSU is less than ~18VDC.

Note: A "Low DC voltage" warning message will be displayed on the front panel OLED display, while the DC supply voltage is high enough to power the front panel OLED display.

A PSU providing a degraded DC voltage, even where the chassis appears to function normally, will need to be swapped out as soon as possible.

Note: It is recommended that an MV-EXTPSU3 unit is plugged in to provide a secure supply for the Vega-MV unit until the faulty PSU has been changed.

P1 LED flashing:

If the **P1** LED is flashing, the most likely reason is that one or more of the on-board voltage regulators of the MV-NET card has failed.

Note: The MV-NET card houses a range of voltage regulators which provide DC power for distribution around the chassis. For example, to power the fans, the OLED display, the rears as well as MV-NET card functions.

In the unlikely event of any of these failing, the chassis will attempt to keep functioning, the level of functionality dictated by which voltage regulator has failed.

If the front panel OLED display is still active,
details about which voltages have dropped or failed will be displayed.

If the OLED is not working:

1. Open the front panel;
   check LED lit status for the MV-NET card's 'Hi-power' LED (**D6, "HI_PWR"**) and

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'Low-power' LED (**D7, "LO_PWR"**).
(See "Locating MV-NET card's D6 and D7 LEDs" in the note below.)

Note:

Locating MV-NET card's **D6** and **D7** LEDs:

Look from the front of the chassis, back along the component side of the MV-NET card. LED **D6** and **D7** will be visible towards the middle of the card, see Figure 159.

2. Record the **D6** and **D7** LED status (Lit or Off) and fill out a **User Fault Report** and contact your dealer or SAM Support for details on how to proceed.

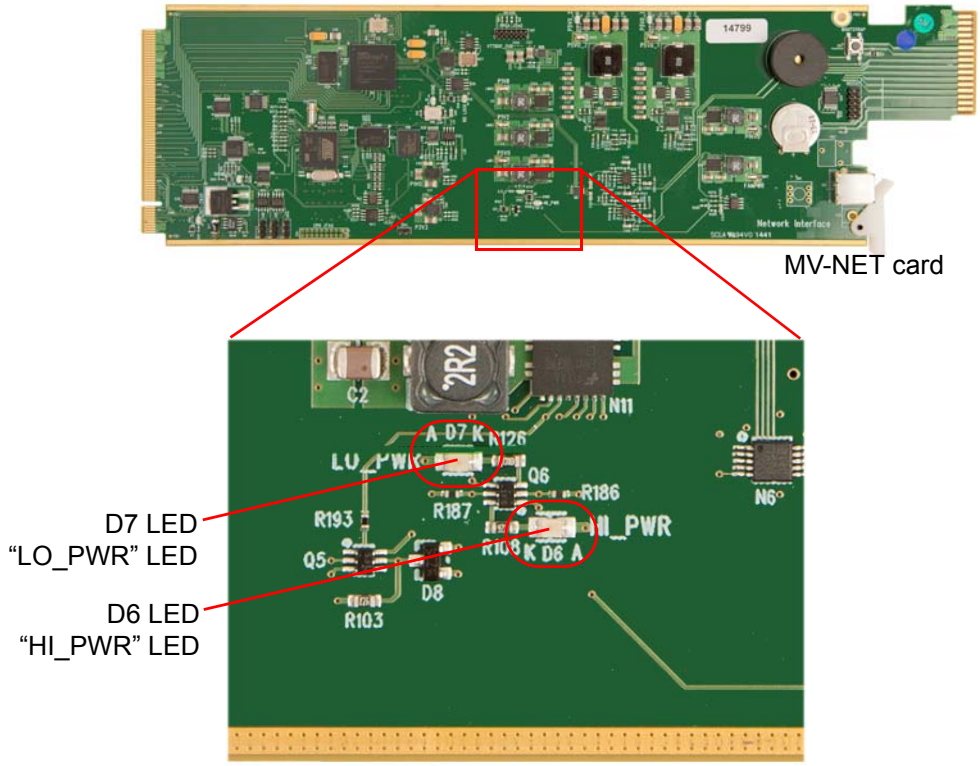

Figure 159 Locating MV-NET card's D6 and D7 LEDs;
1U chassis: (horizontal card), D6 and D7 are half-way along on left-hand side;
3U chassis: (vertically-mounted card), D6 and D7 tare half-way along bottom.

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D.5.5 3rd Stage, Fault Identification - Firmware Revisions

Following D.5.4 “2nd Stage, Fault Identification - Power Supplies” on page 236 above, if all power supplies appear to be OK,
the two most likely causes of a malfunctioning chassis are:

- Incompatible firmware revisions.
- Faulty card.

Carry out the following steps. These will provide more detailed information about the chassis status and help to identify the cause of any issue.
Add this information to any **User Fault Report**.

The steps below assume access to the Vega-MV’s web browser interface.

Step 1. Capture the About tab

1.1) In the Vega-MV’s web browser interface, go to: **Help** > **About**
An **About** window appears.

1.2) The latest firmware versions running on each card and rear are shown in the **About** window. For example, Figure 160 shows that the **MV-CTL** and **MV-NET** cards are both running **Firmware: 1.0.38**.

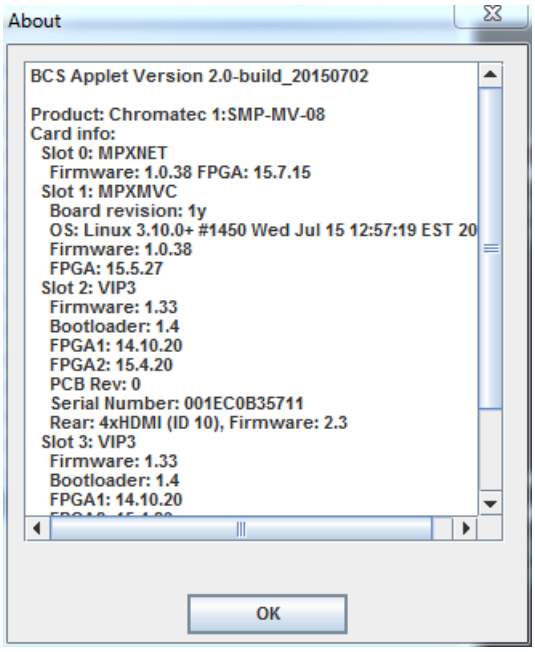

Figure 160 About Window

1.3) The easiest way to record the information in the **About** window is to capture a screenshot of the *entire* window.

Important: When capturing an **About** window, capture the *entire* window with all the information in it.

Note: Installing Firmware Updates:

Firmware updates may be required for both the MV-NET and MV-CTL cards; for example, to add features or bug fixes.

Detailed instructions for updating firmware are can be found in 10.1 “Upgrading MV-CTL and MV-NET Firmware” on page 184.

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Note:

Firmware Updates and Java Updates:

There have been instances of the MV browser interface not working after a new firmware update. This is due to problems with a recent Java update carried out on the browsing PC. (This is especially the case when Java updates are set to be carried out automatically on a PC and so the user can unaware that they have occurred).

If you suspect this may be the case, please contact SAM Support as soon as possible with filled out a **User Fault Report**, include details of:

- The browser and Java revisions you are running.
- A brief summary of the problem.

A temporary work around is shown in Appendix F “Work-round for Java Update Issues” on page 252.

Step 2. Save the Logging File:

2.1) Go to the **Help > Logging** in the Vega-MV’s browser interface.
Logging information is shown in a window, showing real time low-level events.
See Figure 161 for an example logging information window.

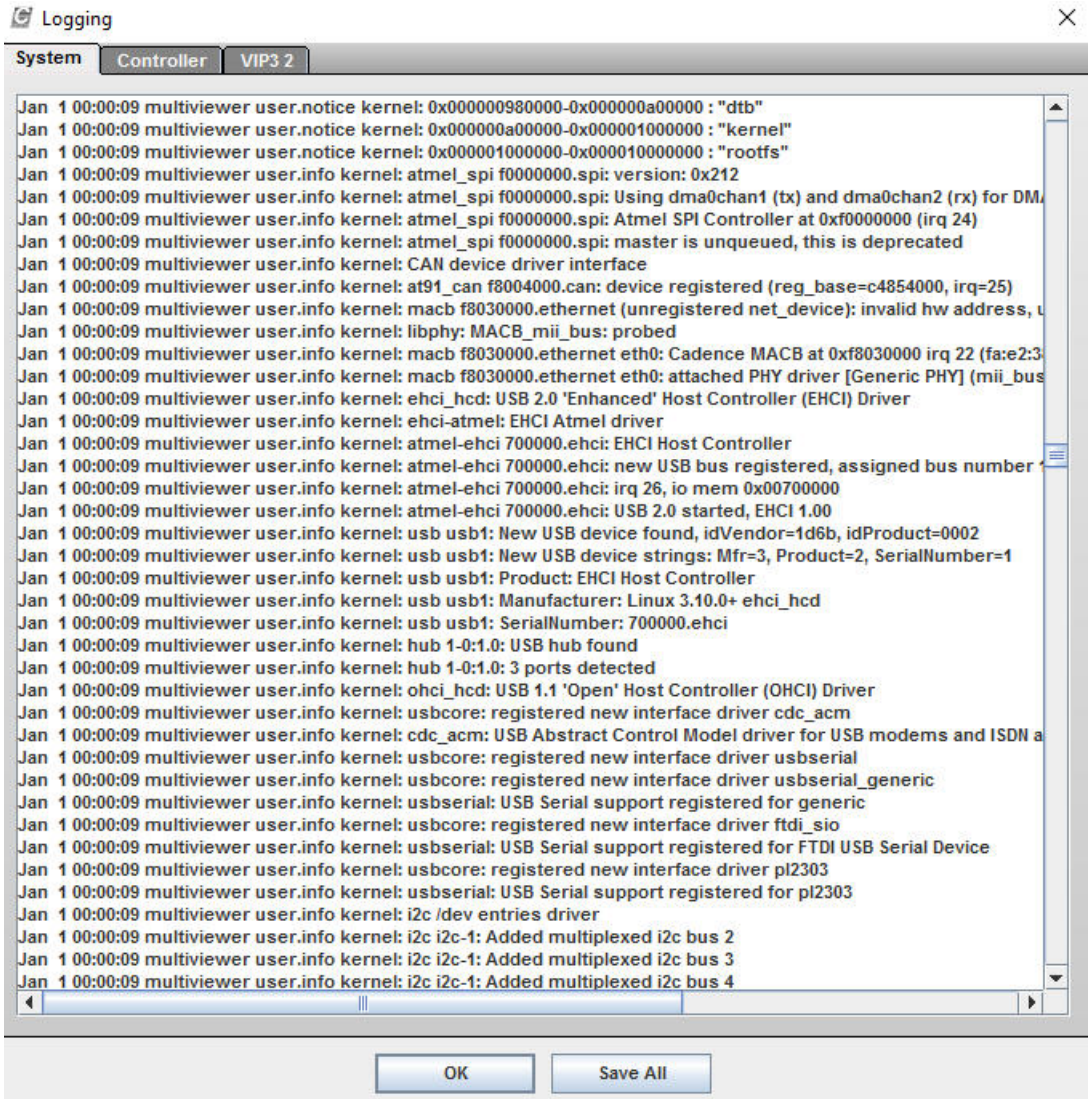

Figure 161 Logging Window

A log is kept on **each** card in the frame.

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2.2) Click on **Save All**.
A Log file Save window appears, see Figure 162.
Enter a file name for the log file. Browse to a directory to save the Log file.

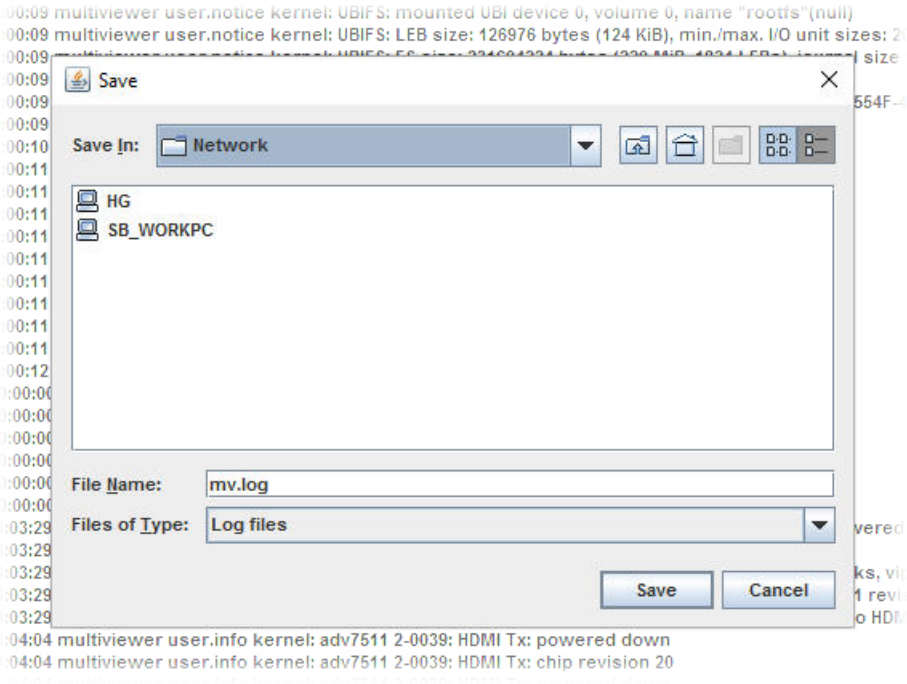

Figure 162 Log file Save Window

After capturing the **About** listing (**Step 1**) and saving the **log** file (**Step 2**),
the final step involves saving the layout file being used when faults are observed:

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Step 3. Save the Layout file:

3.1) Go to **Layout** > **Save layout** (or **Save layout as**).
Layouts are saved as .XML files and can be accessed by using Windows Explorer or an FTP client, such as FileZilla.
The procedure for doing this is the same as for uploading new firmware,
see Section 10.1 “Upgrading MV-CTL and MV-NET Firmware” on page 184.

D.5.6 Last Stage - Reporting A Fault

Report the fault and forward:

- The completed User Fault Report
- Screen capture from **Help > About**
- Log file from **Help < Logging**
- And Layout .XML files

to SAM Support.

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Appendix E Audio Input Channel Numbering

E.1 Audio Input Channel Numbering

Audio enters a Vega-MV as embedded audio. Each router video input can carry sixteen embedded channels of audio, 1-16 for video input 1, 17-32 for video input 2 etc.
An MV-VIP4 rear panel has eight video inputs. There are up to four MV-VIP4 rear panels.

The audio channel input numbering is:

- 1 to128 for rear slot 2.
- 129 to 256 for rear slot 3.
- 257 to 384 for rear slot 4 (Vega-32MV only).
- 385 to 512 for rear slot 5 (Vega-32MV only).

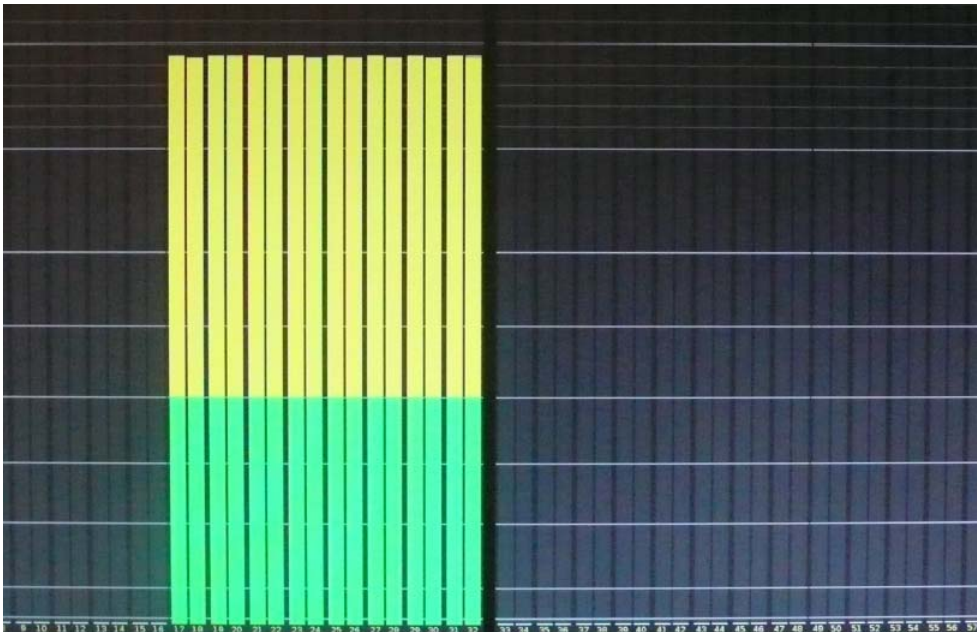

Figure 163 MV-AIP32D Metering Showing Pairs 9 to 16 Active

The user is then able to allocate sub-blocks of the 64 available meters for each card

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E.2 Configuring Audio Metering

This section describes configuring audio metering for a Vega-MV Router Multiviewer.

To create a layout that only contains the channels that exist (1-32 and 65-96), the fastest method is to edit the tile and use the Multi-channel metering option as shown below. This will create a single audio tile displaying all the audio channels that exist in the system.

1. Select the tile to be edited.
2. Right click on the tile, select **Edit Object** > **Properties** tab > **Audio** sub tab.

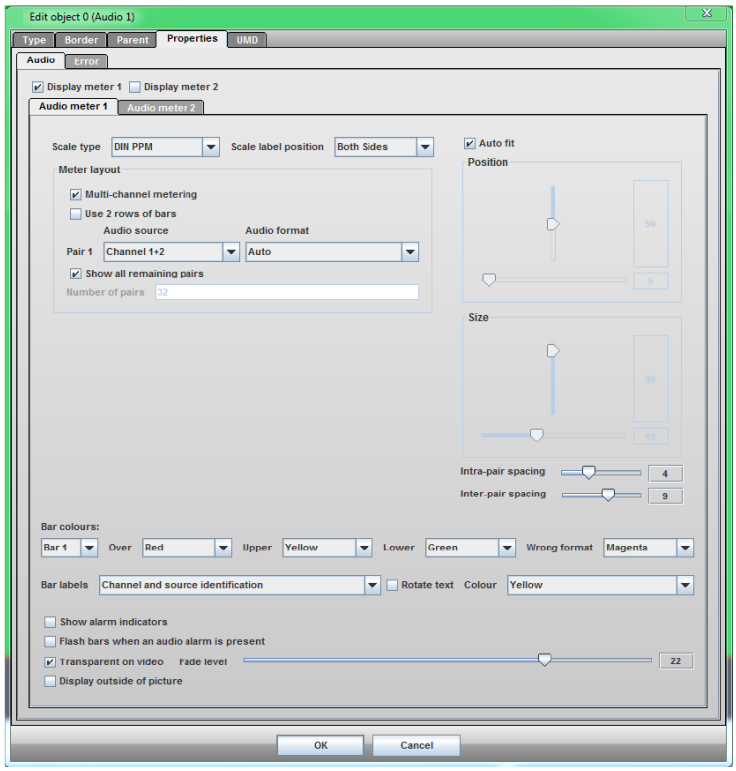

Figure 164 Multi-Channel metering

3. Tick the **Multi-channel metering** tick box and select **Pair 1 Audio source** as Channel 1+2 as shown in the previous figure.
4. Tick **Show all remaining pairs** to show all of the audio channels present in the system.

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5. Though you cannot edit actual channel numbers, there is a facility to add custom names to each audio channel.
From the Main menu select **Module** > **Audio channel names** > **External audio channels** tab.

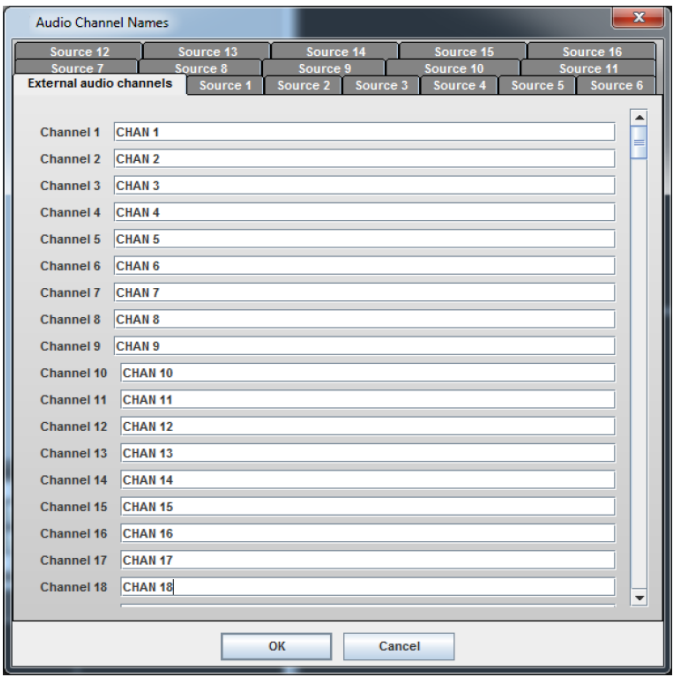

Figure 165 External Audio Channels tab

6. Here the name of each audio channel can be edited. The names entered here will be displayed below the meter bars if the labelling for the meter is set to Text in the Edit Object Properties of the tile that the meter is in.

7. The External audio channels tab is for entering all the names of the channels on external audio input cards.
The Source 1, Source 2, etc. tabs are for entering the names of the embedded audio input channels for each SDI/HDMI video input present.

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Appendix F Work-round for Java Update Issues

Every effort is made to ensure compatibility between the Vega-MV web interface and the latest Java release. However, occasionally, a new release of Java can cause problems, for example not being able to browse the Vega-MV web pages.

Note: If problems occur, contact SAM support or your dealer as soon as possible and provide:

- Details of the Vega-MV, web browser and Java revisions that you are running.
- A brief summary of the problem.

This appendix provides a work-round for Java problems while a fix is being found, enabling you to get operational again.

F.1 Work-round

While waiting for a fix to a Java issue, the quickest way to get operational again is to:

Either

- Use a PC with an earlier version of Java.

Or

- Revert to a previous version of Java.
  (i.e. Uninstall the current version of Java on the existing PC
  and re-install the previous Java version.)

Note: To revert to a previous version of Java, then you **MUST** uninstall the current version, otherwise the PC will not use the previous version.

F.1.1 Getting the Previous Version of Java

To download and install the previous version of Java:

1. Go to web page: https://java.com/en/download/faq/other_jreversions.xml
2. Click the link to **Java Archive Download Page**, located under the How can I download an older version of Java? section of the web page.
   (If the above link does not work then try Googling "earlier versions of java".)
3. Once you are in the **Java Archive** page,
   then click the **Java SE 8** link, located in the **Java SE** section of the web page.
4. Click the **Java SE Runtime Environment 8u77** link.
   (Note: **NOT** the Development Kit link, and **NOT** the Server link)
   You will now see a web page showing a table like in Figure 166.

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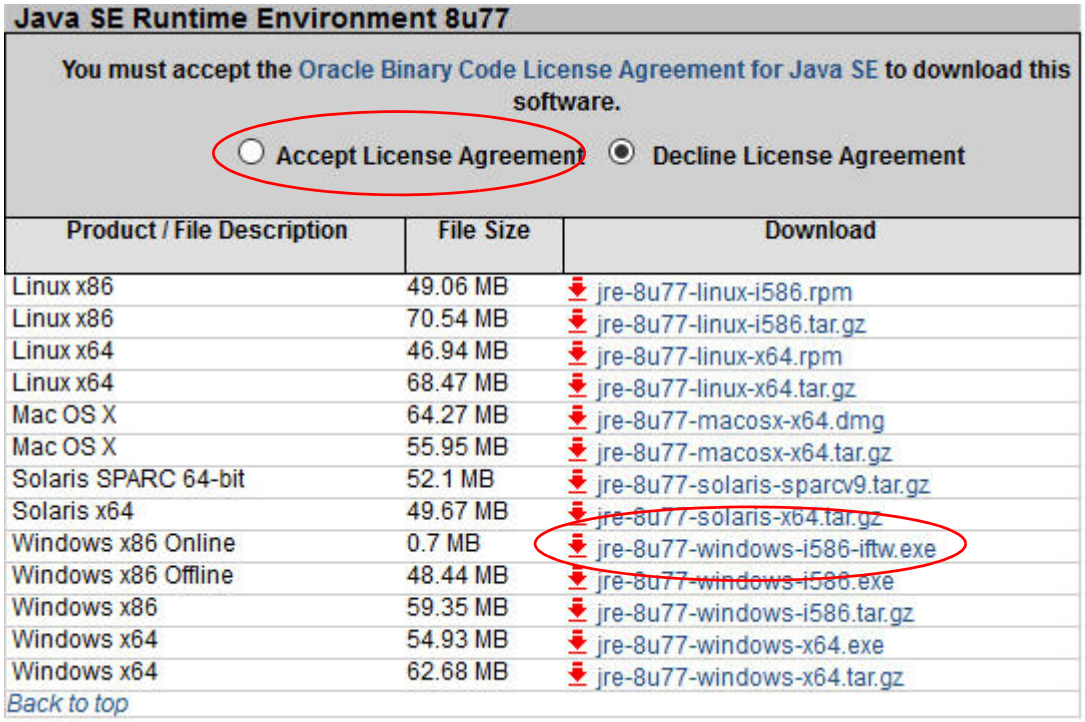

Java SE Runtime Environment 8u77

You must accept the Oracle Binary Code License Agreement for Java SE to download this software.

○ Accept License Agreement ◉ Decline License Agreement

Product / File Description	File Size	Download
Linux x86	49.06 MB	jre-8u77-linux-i586.rpm
Linux x86	70.54 MB	jre-8u77-linux-i586.tar.gz
Linux x64	46.94 MB	jre-8u77-linux-x64.rpm
Linux x64	68.47 MB	jre-8u77-linux-x64.tar.gz
Mac OS X	64.27 MB	jre-8u77-macosx-x64.dmg
Mac OS X	55.95 MB	jre-8u77-macosx-x64.tar.gz
Solaris SPARC 64-bit	52.1 MB	jre-8u77-solaris-sparcv9.tar.gz
Solaris x64	49.67 MB	jre-8u77-solaris-x64.tar.gz
Windows x86 Online	0.7 MB	jre-8u77-windows-i586-iftw.exe
Windows x86 Offline	48.44 MB	jre-8u77-windows-i586.exe
Windows x86	59.35 MB	jre-8u77-windows-i586.tar.gz
Windows x64	54.93 MB	jre-8u77-windows-x64.exe
Windows x64	62.68 MB	jre-8u77-windows-x64.tar.gz

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Figure 166 Previous Java SE Runtime Environment 8u77 versions

5. Click on the **Accept License Agreement** radio button at the top of the page to accept the license agreement (see Figure 166).
   And click the link to the right of "**Windows x86 Online**" (see Figure 166) to download and install the previous version of Java.

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Appendix G User Fault Report

This appendix contains a User Fault Report to be used in the case of a fault with a Vega-MV unit.

The User Fault Report should be filled in by the user if a fault is observed.

The report aims to:

1. Record information about a fault.
2. Help with providing extra information and diagnosis.
3. Provide key information for speedier fault resolution.

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Vega-MV User Fault Report

Customer:	**Report No:**
Date:	**Time:**
Product:	
Serial Number:	**Fault Severity Level (1 to 5, see below):**

Fault Severity Level Descriptions

Severity 1 – Product is not operational or, if operational, there is serious risk to on-air performance.

Severity 2 – Product is operational; but a major subsystem or component is not operational, or there is an infrequently-occurring issue that creates a serious risk to on-air performance.

Severity 3 – Product is operational, but a minor feature or functionality is operating incorrectly.

Severity 4 – Product is operational but nuisance-level inconsistencies exist. For example, documentation errors or inconvenient work-rounds.

Severity 5 – For record keeping: A defect is reported, but, in fact, no fault exists.

Description of Fault

Summary of fault:

(Please answer the following questions as fully as possible:)

Q1. How long had the unit been functioning before the fault developed?

Q2. Under what conditions did the fault manifest itself? For example, particular settings or inputs?

Q3. Were there any changes to the hardware that may have introduced the fault? For example, additional cards or firmware upgrades?

Q4. Remedial action taken? For example, after the fault was detected did you re-seat the card, reboot the system or upgrade the firmware? And, if so, what were the results?

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Hardware serial numbers/ Description

Card TYPE:	Serial No:

OTHER:

Please indicate other hardware and/or serial numbers: (if not applicable strike through)

Power Supply:	Serial No:
Power Supply:	Serial No:
Fan(s):	
Other:	

Further Investigation/Fault Diagnosis Instructions

Any Other Information on the Fault to Report

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Remedial Action and Fault Report	
Customer:	**Report No:**
Date:	**Time:**
Product:	
Serial Number:	**Severity Level:**
RMA No:	**Return Unit for repair:**
	Return Component for repair:
Remedial Action Required:	

Replacement Hardware serial numbers/ Description	
ITEM (PCB, Power Supply etc):	**Serial No:**

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Engineering Report:

Charges	Parts	Labour	Carriage	Total

Warranty Repair? Y/N:	
Charge to Customer? Y/N:	

Report closed by Service Dept.	**Date:**	**Closed By:**
Report closed by customer	**Date:**	**Closed By:**

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Notes

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User Manual

Vega-MV Router Multiviewer

Video Routing and Multiviewer Outputs

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