Innovation in the
Multi-Screen World

User Manual

Vega Video Router

96 and 192 port fully asymmetric Video Routers

Contents

Information and Notices

About this Manual

This manual describes the Vega 2U and 4U Video Routers and the configuration of the various modules that can be added to them.

Refer to the Vega Installation Manual for details on how to unpack and install the Vega Video Routers.

Refer to the Vega Router Control manual for details on configuring the router.

If you have any questions regarding the installation and setup of your product, please refer to the following Customer Service contact details.

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

Copyright and Disclaimer

1. Safety

1.1 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
RISK OF ELECTRIC SHOCK
DO NOT REMOVE COVERS
NO USER SERVICEABLE PARTS
REFER SERVICING TO QUALIFIED
PERSONNEL ONLY

Servicing instructions where given, are for use by qualified service 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 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**

Power connection in countries other than the USA

The equipment is normally shipped with a power cable with a standard IEC moulded free socket on one end and a standard IEC moulded plug on the other. If you are required to remove the moulded mains supply plug, dispose of the plug immediately in a safe manner.

The colour code for the lead is as follows:

GREEN/YELLOW lead connected to E (Protective Earth Conductor)
BLUE lead connected to N (Neutral Conductor)
BROWN lead connected to L (Live Conductor)

Caution If the unit has two mains supply inputs ensure that both power cords are plugged into mains outlets operating from the same phase.

Erklärung der Sicherheitssymbole

D

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

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

Sicherheits-Warnhinweise

ACHTUNG
Gefahr von Elektroschocks.
Abdeckungen nicht entfernen
Keine vom Benutzer zu wartende Teile
Wenden Sie sich ausschließlich
an qualifiziertes Personal

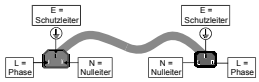
Die angeführten Service-/Reparatur-Anweisungen sind ausschließlich von qualifiziertem Service-Personal auszuführen. Um das Risiko eines lektroschocks zu reduzieren, führen Sie ausschließlich die im Benutzerhandbuch eschriebenen Anweisungen aus, es sei denn, Sie haben die entsprechende Qualifikation.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

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

Netzanschluss in anderen Ländern als der USA

Das Equipment wird im Normalfall mit einem Netzkabel mit Standard IEC Anschlussbuchse und einem Standard IEC Anschlussstecker geliefert. Sollten Sie den angeschweißten Stecker auswechseln müssen, entsorgen Sie diesen bitte umgehend. Die farbliche Belegung des Netzkabels ist wie folgt:

GRÜN GELB E = Schutzleiter ⏚
BLAU N = Nulleiter
BRAUN L = P = Phase



Achtung: Wenn das Gerät zwei Anschlussbuchsen hat, stellen Sie bitte sicher, dass beide Netzkabel mit der selben Phase in die Netzsteckdose gesteckt werden.

Légende :

F

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

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

Précaution d'emploi :

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

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.**

Câble secteur de pays autres que les Etats-Unis

L'équipement est livré avec un câble secteur au standard IEC, moulé mâle/femelle.
Si vous souhaitez changr la prise mâle de votre cordon, voici les codes couleurs des fils :

Le fil VERT/JAUNE est connecté à T (Terre)
Le fil BLEU est connecté à N (Neutre)
Le fil MARRON est connecté à P (Phase)

Attention si l'appareil a 2 alimentations, s'assurer que les cordons soient branchés sur la même phase.

Explicación de los Símbolos de Seguridad

ESP

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

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

Advertencias de Seguridad

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

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

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

Conexión de alimentación en otros países que no sean USA

El equipo es normalmente entregado con un cable de alimentación con un enchufe hembra estándar IEC en un extremo y con una clavija estándar IEC en el otro. Si se requiere eliminar la clavija para sustituirla por otra, disponer dicha clavija de una forma segura.
El código de color a emplear es como sigue:

VERDE/ AMARILLO conectado a E (Conductor de protección a Tierra -Earth en el original-)
AZUL conectado a N (Conductor Neutro -Neutral en el original-)
MARRÓN conectado a L (Conductor Fase -Live en el original-)

Advertencia Si la unidad tuviera dos tomas de alimentación, asegurarse de que ambos cables de alimentación están conectados a la misma fase.

Simboli di sicurezza: (I)

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

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

Attenzione:

ATTENZIONE
RISCHIO DI SHOCK ELETTRICO NON CERCARE DI SMONTARE L'UNITA PER QUALSIASI TIPO DI INTERVENTO RIVOLGERSI AL PERSONALE QUALIFICATO

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

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

Connessione elettrica nei paesi diversi dagli Stati Uniti

L'apparecchiatura normalmente è spedita con cavo pressofuso con la presa e spina standard IEC. Nel caso della rimozione della spina elettrica, gettarla via immediatamente osservando tutte le precauzioni del caso.
La leggenda dei cavi è la seguente:

VERDE/GIALLO cavo connesso ad "E" (terra)
BLU cavo connesso ad "N" (neutro)
MARRONE cavo connesso ad "L" (fase)

Attenzione! Nel caso in cui l'apparecchio abbia due prese di corrente, assicurarsi che i cavi non siano collegati a fasi diverse della rete elettrica.

Forklaring på sikkerhedssymboler (DK)

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

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

Sikkerhedsadvarsler

FORSIGTIG
RISIKO FOR ELEKTRISK STØD DÆKPLADER MÅ IKKE FJERNES INGEN BRUGER SERVICERBARE DELE SERVICE MÅ KUN UDFØRES AF FAGLÆRTE PERSONER

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

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

Nettilslutning i andre lande end USA

Udstyret leveres normalt med et strømkabel med et standard IEC støbt løst hunstik i den ene ende og et standard IEC støbt hanstik i den anden ende. Hvis et af de støbte stik på strømkablet er defekt, skal det straks kasseres på forsvarlig vis. Farvekoden for lederen er som følger:

GRØN/GUL leder forbundet til J (Jord)
BLÅ leder forbundet til 0
BRUN leder forbundet til F(Fase)

Forsigtig Hvis enheden har to lysnetindgange, skal der sørges for at begge ledninger tilsluttes lystnetudgange fra den samme fase.

Förklaring av Säkerhetssymboler (S)

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

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

Säkerhetsvarningar

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

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

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

Strömkontakter i länder utanför USA

Apparaten utrustas normalt med en strömkabel med standard IEC gjuten honkontakt på ena änden samt en standard IEC gjuten hankontakt på den andra änden. Om man måste avlägsna den gjutna hankontkaten, avyttra denna kontakt omedelbart på ett säkert sätt. Färgkoden för ledningen är följande:

GRÖN/GUL ledning ansluten till E (Skyddsjordad ledare)

BLÅ ledning ansluten till N (Neutral ledare)
BRUN ledning ansluten till L (Fas ledare)

Varning! Om enheten har två huvudsakliga elförsörjningar, säkerställ att båda strömkablarna som är inkopplade i enheten arbetar från samma fas.

Turvamerkkien selitys (FI)

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

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

Turvaohjeita

VAROITUS
SÄHKÖISKUN VAARA ÄLÄ AVAA LAITTEEN KANSIA EI SISÄLLÄ KÄYTTÄJÄLLE HUOLLETTAVIA OSIA HUOLTO AINOASTAAN AMMATTILAISEN SUORITTAMANA

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

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

Sähkökytkentä

Laitteen vakiovarusteena on sähköjohto, jonka toisessa päässä on muottiin valettu, IEC-standardin mukainen liitäntärasia ja toisessa päässä muottiin valettu, IEC-standardin mukainen pistoliitin. Jos pistoliitin tarvitsee poistaa, se tulee hävittää heti turvallisella tavalla. Johtimet kytketään seuraavasti:

KELTA-VIHREÄ suojamaajohdin E-napaan
SININEN nollajohdin N-napaan
RUSKEA vaihejohdin L-napaan

Huom! Jos laitteessa on kaksi verkkojännitteen tuloliitäntää, niiden johdot on liitettävä verkkopistorasioihin, joissa on sama vaiheistus.

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.**

Ligação da alimentação noutros países que não os EUA

O equipamento é, normalmente, enviado com cabo de alimentação com ficha IEC fêmea standard num extremo e uma ficha IEC macho standard no extremo oposto. Se for necessário substituir ou alterar alguma destas fichas, deverá remove-la e elimina-la imediatamente de maneira segura.
O código de cor para os condutores é o seguinte:

Condutor VERDE/AMARELO ligado a E (Terra)
Condutor AZUL ligado a N (Neutro)
Condutor CASTANHO ligado a L (Vivo).

Atenção: Se a unidade tem duas fontes de alimentação assegurar que os dois cabos de alimentação estão ligados a tomadas pertencentes à mesma fase.

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.**

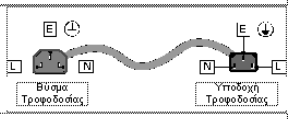
Σύνδεση τροφοδοσίας σε χώρες εκτός των ΗΠΑ

Ο εξοπλισμός συνοδεύεται συνήθως από ένα καλώδιο τροφοδοσίας με ένα σταθερό βύσμα τροφοδοσίας ρεύματος τύπου πυραμίδας στη μια άκρη του και μια σταθερή υποδοχή τροφοδοσίας ρεύματος τύπου πυραμίδας στην άλλη άκρη του. Εάν χρειαστεί να αφαιρέσετε το σταθερό βύσμα τροφοδοσίας μην το επαναχρησιμοποιείτε, θεωρείται άχρηστο. Ο χρωματικός οδηγός για το καλώδιο τροφοδοσίας είναι ο παρακάτω :

ΠΡΑΣΙΝΟΚΙΤΡΙΝΟ καλώδιο συνδέεται στο E (Προστατευτικός Αγωγός Γείωσης)

ΜΠΛΕ καλώδιο συνδέεται στο N (Ουδέτερο Αγωγό)

ΚΑΦΕ καλώδιο συνδέεται στο L (Αγωγό Φάσης)



ΠΡΟΣΟΧΗ! Αν η μονάδα έχει δύο τροφοδοτικά βεβαιωθείτε ότι και τα δύο καλώδια τροφοδοσίας είναι συνδεδεμένα σε εξόδους τροφοδοσίας που βρίσκονται στην ίδια φάση.

1.2 Mains Power Supplies

The Vega router has two IEC power sockets, one for the main and one for the redundant power supply unit.

The mains Voltage will be auto detected provided it is in the range 100 - 240 Vac and 50 - 60 Hz.

- Caution: Double Pole/Neutral Fusing.
- This equipment has more than one power supply cord. To reduce the risk of electrical shock, disconnect all the power supply cords before servicing.
- Isolate the unit from other product outputs before servicing.
- The IEC power inlets are the mains disconnection devices for this unit.
- To reduce the risk of electric shock, plug each power supply cord into separate branch circuits employing separate service grounds.
- Ensure that all of the router modules and cards are correctly installed and firmly seated before powering on the Vega router.

1.2.1 Supplied Power Cord Color Code

The equipment is shipped with a power cord with a standard molded IEC female plug on one end and a standard mains plug on the other. If you are required to remove the molded mains supply plug, dispose of the plug immediately in a safe manner. The color code for the cord is as follows:

- GREEN/YELLOW lead connected to E (Protective Earth Conductor)
- BROWN lead connected to L (Live Conductor)
- BLUE lead connected to N (Neutral Conductor)

1.3 Lithium Batteries

CAUTION

This equipment contains a lithium battery

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

The Vega Video Routers contain a Lithium battery to provide non-volatile memory.

1.4 Rack Mounting

- Do not rack-mount the Vega router using only the front rack ears.
- The Vega 2U router weighs 10 kg (22 lbs) for a full frame (without packaging). When lifting the Vega 2U router into a 19" rack use the correct local Health and Safety lifting guidelines.
- The Vega 4U router weighs 18 kg (40 lbs) for a full frame (without packaging). When lifting the Vega 4U router into a 19" rack use the correct local Health and Safety lifting guidelines.

1.4.1 Vega 2U Router Rack Mounting

When rack-mounting the Vega router place the Vega router on a suitably specified and installed rack shelf and secure the Vega router to the rack using the front ears. See the Vega Installation manual for details.

1.4.2 Vega 4U Router Rack Mounting

The Vega 4U router can be mounted on a suitably specified and installed rack shelf and secured in place using the rack ears. Alternatively it can be mounted on suitably specified and installed rack rail slides. See the Vega Installation manual for details.

1.5 Laser Safety

EN60825-1 (2001)
Safety of Laser Products

- Caution: use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure. Viewing the laser diode with the optical fiber removed and with the aid of optical magnifiers may be hazardous.
- This product is a Class 1 laser product (output power <15mW) at 1270 nm to 1610 nm with a beam divergence >30 mrad.

1.6 Front Panel Lock

The Vega routers are fitted with two captive screws (one on the left of the router and one on the right, see Figure 1). These captive screws allow the router front panel to be locked and in normal operation the router must remain locked.

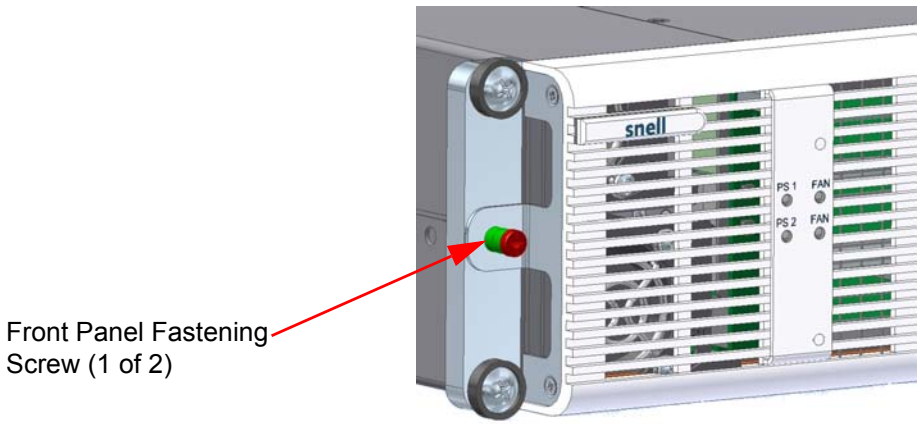


Fig 1. Front Panel Lock (Vega 2U shown)

Important:

- The router must be locked in normal operation to ensure that it complies with safety standards.
- The risk of non-compliance is with the user if the router is left unlocked in normal operation.

1.7 Transit Brackets

There are two Transit Brackets in the Vega router that restrain the crosspoint and controller cards during transit (see Figure 2). These transit brackets must be removed before the Vega router is powered on.

1. Loosen the captive front panel fastening screws on the left and right of the router (see Figure 1 on page 14 for details).
2. Open the front panel of the Vega router by pulling it outwards and swinging it down.

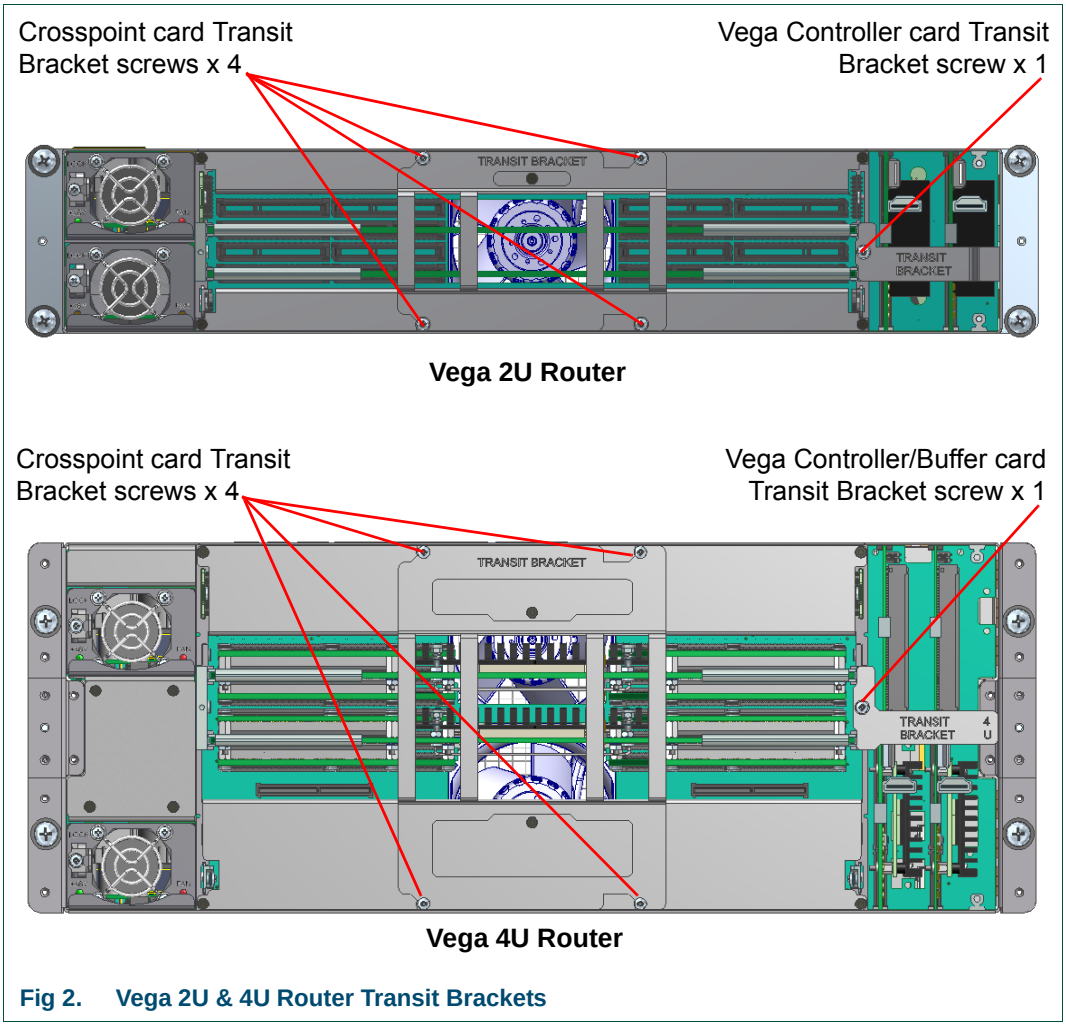
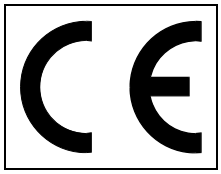


Fig 2. Vega 2U & 4U Router Transit Brackets

3. Loosen but do not remove the four Crosspoint transit bracket screws and slide the transit bracket to the right to remove it.
4. Tighten the crosspoint transit bracket screws back up again and keep the bracket somewhere safe in case the Vega router needs transporting in the future.
5. Unscrew the Vega controller card transit bracket screw and remove the transit bracket. Keep the bracket and screw with the crosspoint card transit bracket in case the Vega router needs transporting in the future.
6. Close the router front panel.
7. Tighten the captive front panel fastening screws on the left and right of the router (see Figure 1 on page page 14 for details) to lock the front panel.
8. Refitting the transit brackets for transportation is the reverse of the removal process.

1.8 Safety Standards

This equipment complies with the following standards:



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

UL1419 (3rd Edition) - UL File E193966
Standard for Safety - Professional Video and Audio equipment

1.9 EMC Standards

This unit conforms to the following standards:

EN55103-1:2009 (Environment E4)
Electromagnetic Compatibility, Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use. Part 1. Emission

EN55103-2:2009 (Environment E2)
Electromagnetic Compatibility, Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use. Part 2. Immunity

Federal Communications Commission Rules, 47 CFR: 2009, Part 15, Subpart B (Class A)

1.9.1 EMC Environment

The product(s) described in this manual conform to the EMC requirements for, and are intended for use in:

The controlled EMC environment (for example purpose-built broadcasting or recording studios), and the rural outdoor environment (far away from railways, transmitters, overhead power lines, etc.) E4

The applicable environment is stated in the Technical Profile section of the product operation manual under “EMC Performance Information/Environment.”

1.9.2 EMC Performance of Cables and Connectors

Snell 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.

1.9.2.1 Coaxial Cables

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

1.9.2.2 D-type Connectors

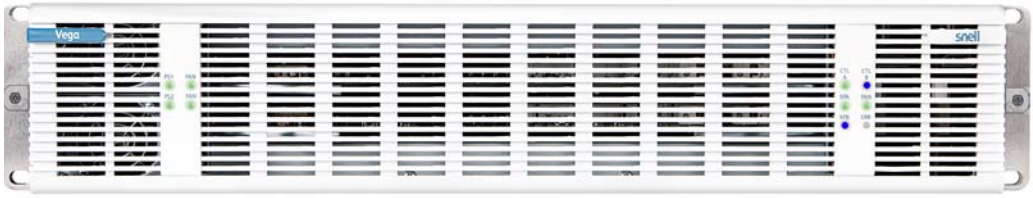
D-type connectors shall have metal shells making good RF contact with the cable screen. Connectors having “dimples” which improve the contact between the plug and socket shells are recommended.

2. Product Overview

Vega is a totally new concept in multi-standard, multi-format SDI switching routers offering a number of key new benefits. Its unique architecture enables an advanced feature set that provides much greater flexibility with real advantages over traditional routing platforms.

The Vega routers are available in either a 2U or 4U chassis. The 2U Vega router can be fitted with up to 96 asymmetric ports and the 4U router can be fitted with up to 192 asymmetric ports. Both routers are fully asymmetric with, optional, dual PSU, dual crosspoint, dual controller and dual buffer card redundancy (buffer cards in 4U router only).

The asymmetric design of the Vega makes it an extremely flexible router solution allowing for configurations from 1 input to All outputs through to All inputs to 1 output and anything in between.



Vega 2U Router

Vega 4U Router

Fig 3. Vega 2U & 4U Video Routers Front View

2.1 Features and Benefits

- Total asymmetric signal routing with each signal port independently configurable as an input or output.
    - No input/output wastage which will often negate the need for a larger router if using a symmetrical router.
- Mix and Match video signal types including; 3Gbit & 1.5Gbit HD, SD, ASI.
    - A single router copes with all of the standard video signal types.
- Coaxial Copper and/or fiber connectivity using SFP fiber and SFP coaxial HD-BNC options.
    - Mix short and very long distances, bridges all boundaries
- 12 Port bi-directional HD-BNC coaxial rear module available.
    - Lower cost giving an improved return on investment for non-fibered equipment.
- Extensive protection and redundancy options with dual crosspoints, dual controllers, dual PSUs and dual buffer cards giving a high level of protection. (buffer cards on 4U versions only)
    - No loss of revenue from ‘out of service’ or ‘down time’.

Note: **4U Vega Router Only**: Two Controller cards and two Buffer cards are required to maintain full redundancy protection of the control system should either a controller card or a buffer card fail.

- Comprehensive set of ‘soft’ and/or ‘hard’ control panel options.
    - Intuitive software-based ‘plug and play’ control and monitoring system and/or 1U and 2U control panels.
- Ultra compact router frame with up to 50% more ports than a conventional BNC router.
    - Future system expansion or simply ‘no need for a bigger router’.

2.2 Vega Order Code

- **VG-MF096H** - Vega Frame, up to 96 port input/output, 4 x HD-BNC reference inputs
- **VG-MF192H** - Vega Frame, up to 192 port input/output, 4 x HD-BNC reference inputs

2.2.1 Vega 2U Optional Redundant Parts

The Vega 2U Vega frame is supplied with 1 x PSU, 1 x crosspoint card and 1 x Vega controller card.

The accessories listed below are optional but will provide redundancy if purchased and installed. One or more of the accessories can be purchased and installed depending on the level of redundancy required.

When redundant parts are ordered with the Vega frame they will be fitted at the factory. When redundant parts are ordered separately they can be fitted by the user to the live installation.

- **VG-PSU096-A** - Power Supply Unit for the Vega 2U frame, Type A
- **VG-XPT096-A** - Crosspoint card for the Vega 2U frame, Type A
- **VG-CTL6462-A** - Vega controller card for the Vega 2U and 4U frame, Type A

2.2.2 Vega 4U Optional Redundant Parts

The Vega 4U Vega frame is supplied with 1 x PSU, 1 x crosspoint card, 1 x Vega controller card and 1 x buffer card.

The accessories listed below are optional but will provide redundancy if purchased and installed. One or more of the accessories can be purchased and installed depending on the level of redundancy required.

When redundant parts are ordered with the Vega frame they will be fitted at the factory. When redundant parts are ordered separately they can be fitted by the user to the live installation.

- **VG-PSU192-A** - Power Supply Unit for the Vega 4U frame, Type A
- **VG-XPT192-A** - Crosspoint card for the Vega 4U frame, Type A
- **VG-CTL192B1X** - Vega controller card and buffer card for the Vega 4U frame
- **VG-CTL6462-A** - Vega controller card for the Vega 2U and 4U frame, Type A
- **VG-4UBUFF-1X** - Vega buffer card for the Vega 4U frame
- **VG-RKSL192-600** - 19” Rack Mounting Slides (1 pair) - Nominal rack depth 600 mm for the Vega 4U frame only
- **VG-RKSL192-800** - 19” Rack Mounting Slides (1 pair) - Nominal rack depth 800 mm for the Vega 4U frame only

2.3 Input/Output Rear Modules

The Vega 2U video router can be fitted with up to eight 12 port input/output video modules and the Vega 4U video router can be fitted with up to sixteen 12 port input/output video modules.

Various rear connection modules are available and these are listed below. See Section 4. Input and Output Modules for full details:

- **VG-RM6SFP-SDI** - 12 port Input/Output (6 cage) SFP Rear module, Serial Digital Interface
- **SFP-BLANK** - Small Form-factor plug-in EMI & dust blanking module.

Important:

- Dust blanking plugs (SFP-Blank) must be fitted to any vacant cage on the VG-RM6SFP-SDI input/output board to ensure that the Vega Video Router continues to conform to EMC standards. Blanking plugs must also be fitted to ensure adequate cooling.
- The risk of non-compliance and overheating is with the user if these blanking plugs are not fitted.

- **VG-RM12H-SDI** - 12-Port Input/Output HD-BNC Rear Module, Serial Digital Interface
- **VG-RMBP** - Blanking Plate Rear Module.

Important:

- Blanking plates (VG-RMBP) must be fitted to any vacant slot on the rear of the Vega Video Router to ensure that the router continues to conform to EMC standards. Blanking plates must also be fitted to ensure adequate cooling.
- The risk of non-compliance and overheating is with the user if these blanking plates are not fitted.

2.4 Spares

The following items are available for purchase as spares (see section 11. for maintenance details):

2.4.1 Vega 2U

- **VG-RMFU** - Rear dual fan unit

2.4.2 Vega 4U

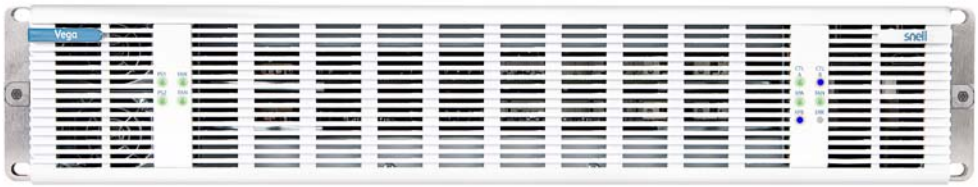
- **VG-RMFU192** - Rear fan unit

2.4.3 Vega 2U and 4U 37 Way Cable Assembly

- **VG-CA37D9-4** - Cable assembly, 37-way D-type to four 9-way D-type connectors for the auxiliary serial ports - Purchased separately.
  For details of the RS-422 pin outs from the breakout cable see Table 23. on page 88.

2.5 Front Panel LEDs

The front panel LEDs give the user a quick and simple visual check of the state of the router and its systems.



Vega 2U Router

Vega 4U Router

Fig 4. Vega 2U & 4U Asymmetric Video Router Front View

2.5.1 PSU and PSU Fan Status LEDs

The PSU and fan status LEDs are on the left of the front panel, see Figure 4 for location and Table 1. for details.

- If a PSU fails then PSU redundancy will be lost until a new PSU is fitted.

  Vega 2U replacement PSU part number = VG-PSU096-A

  Vega 4U replacement PSU part number = VG-PSU192-A

- If a power supply fan fails the Vega rear fan will increase in speed to compensate.

Status LEDs	Function
PS1 LED (upper PSU)	• **Green** = PSU 1 +48 Vdc output working • **Off** = PSU 1 not fitted • **Red** = PSU 1 +48 Vdc output not present **Possible Causes:** PSU 1 PSU board fuse(s) blown (Not user replaceable) PSU 1 mains cable not connected PSU 1 has failed
Fan (upper PSU Fan)	• **Green** = Fan running** • **Off** = PSU 1 not fitted • **Red** = Failed ****Note**: If the associated PSU has failed or has no mains signal the fan will still run from the common 48 Vdc output.

Table 1. PSU and PSU Fan Status LEDs

Status LEDs	Function
PS2 LED (lower PSU)	• **Green** = PSU 2 +48 Vdc Output Working • **Off** = PSU 2 not fitted • **Red** = PSU 2 +48 Vdc Output not present **Possible Causes**: PSU 2 PSU board fuse(s) blown (Not user replaceable) PSU 2 mains cable not connected PSU 2 has failed
Fan (lower PSU Fan)	• **Green** = Fan running** • **Off** = PSU 2 not fitted • **Red** = Failed ****Note**: If the associated PSU has failed or has no mains signal the fan will still run from the common 48 Vdc output.

Table 1. PSU and PSU Fan Status LEDs

2.5.2 Controller, Crosspoint and Rear Fan Status LEDs

The Vega router controllers, crosspoint cards and rear fan status LEDs are on the right of the front panel, see Figure 4 for location and Table 2. for details.

Status LEDs	Function
CTL A	• **Off** = Main Vega controller not fitted • **Green** = Main Vega controller OK and Active • **Blue** = Main Vega controller OK and Inactive/Standby • **Red** = Main Vega controller failed
CTL B	• **Off** = Redundant Vega controller not fitted • **Green** = Redundant Vega controller OK and Active • **Blue** = Redundant Vega controller OK and Inactive/Standby • **Red** = Redundant Vega controller failed
XPA	• **Off** = Main crosspoint card not fitted • **Green** = Main crosspoint card OK and Active • **Blue** = Main crosspoint card OK and Inactive/Standby • **Red** = Main crosspoint card failed
XPB	• **Off** = Redundant crosspoint card not fitted • **Green** = Redundant crosspoint card OK and Active • **Blue** = Redundant crosspoint card OK and Inactive/Standby • **Red** = Redundant crosspoint card failed
FAN	• **Green** = Rear fans OK • **Red** = Rear fan(s) failed If both rear fans have failed the Vega router should be shutdown to avoid damage.
ERR	• **Off** = OK • **Red** = Error The ERR LED will go Red to indicate that the router has experienced an error. See the RollCall Status page for the error details.

Table 2. Vega Controller, Crosspoint and Rear Fan Status LEDs

3. Card Locations

3.1 Front View

Opening the front door of the Vega Video Router allows access to the Power Supplies, Crosspoint cards and Controller cards.

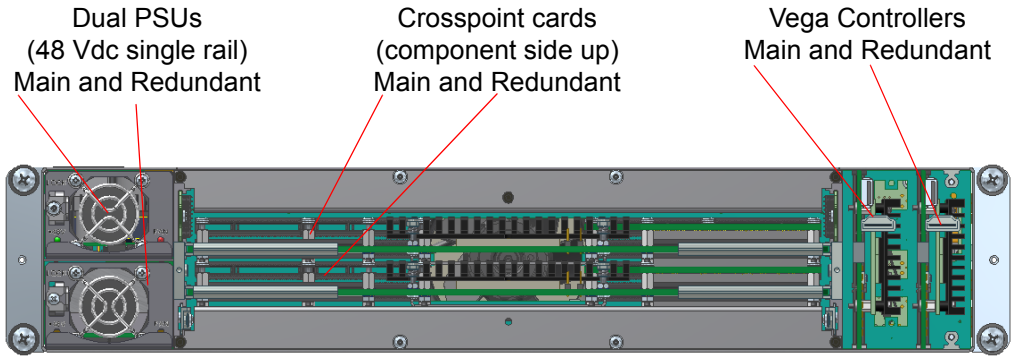


Fig 5. Vega 2U Card Positions Shown, Door Open

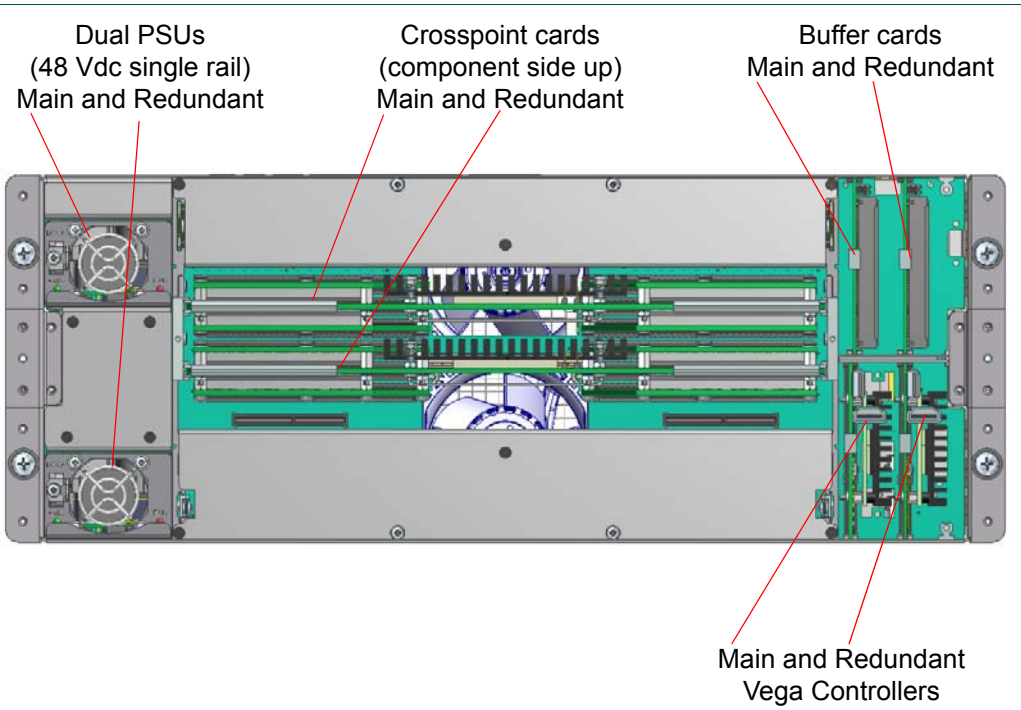


Fig 6. Vega 4U Card Positions Shown, Door Open

3.2 Rear View

The network, relay, video reference, auxiliary serial port and mains connectors are on the rear of the Vega Video Router. The input/output modules are also accessed from the rear of the Vega Video Router.

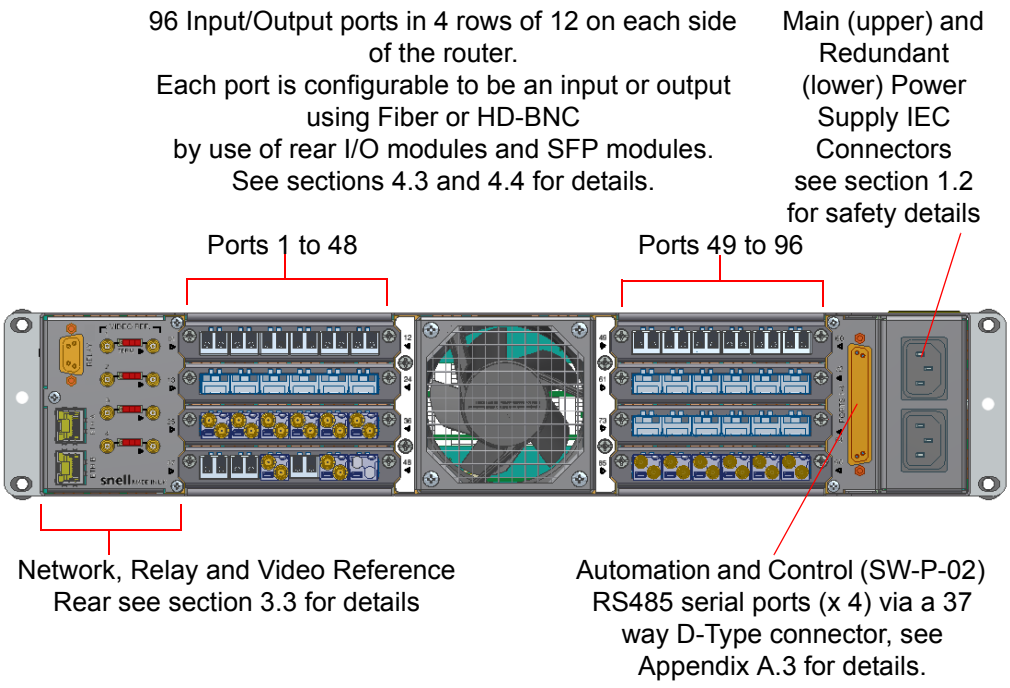


Fig 7. Vega 2U Rear Connectors

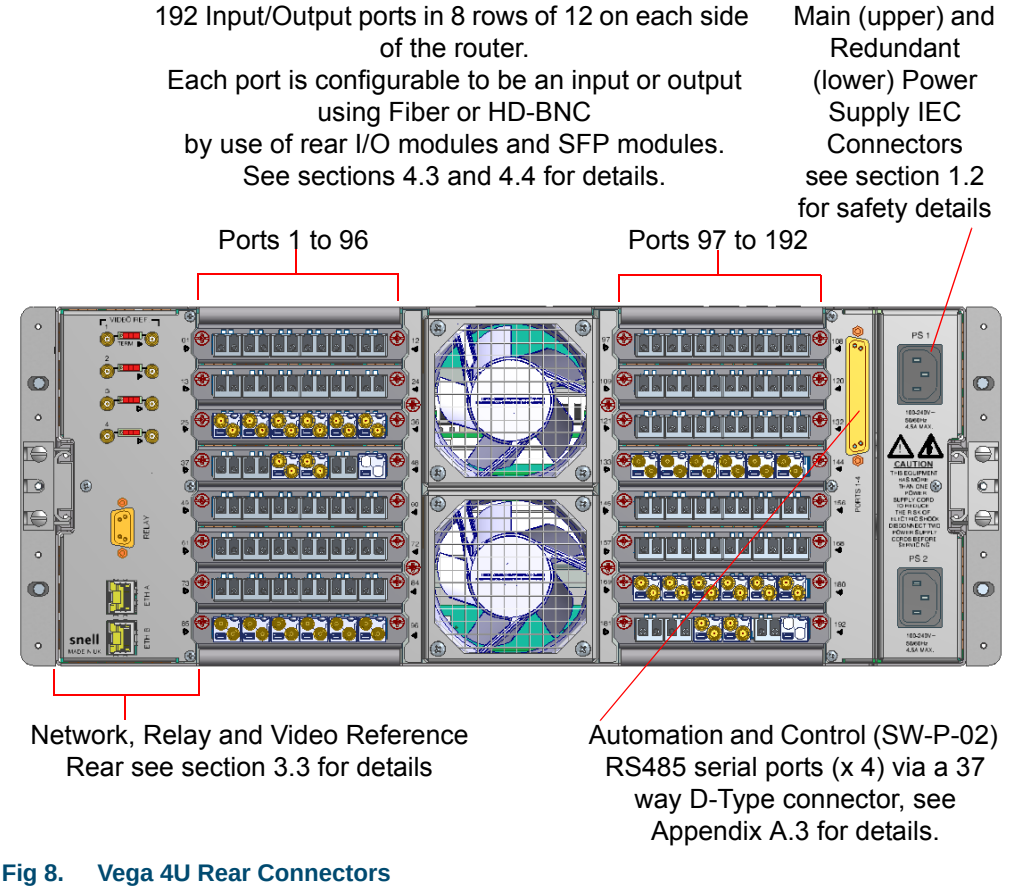


Fig 8. Vega 4U Rear Connectors

- See section 4. for details of the input/output cards.
- See section 5. for details of the crosspoint cards.
- See section 6. for details of the Vega controller cards.
- See section 7. for details of the Vega Buffer cards.
- See section 11.1 for details of the power supply units.

3.3 Network, Relay and Video Reference Rear

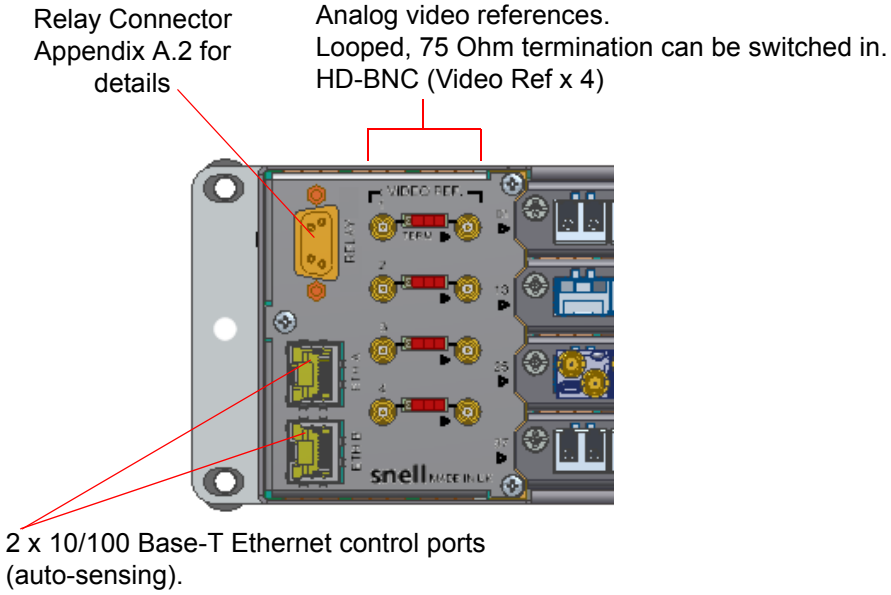


Fig 9. Vega 2U Network, Relay and Video Reference Rear Panel

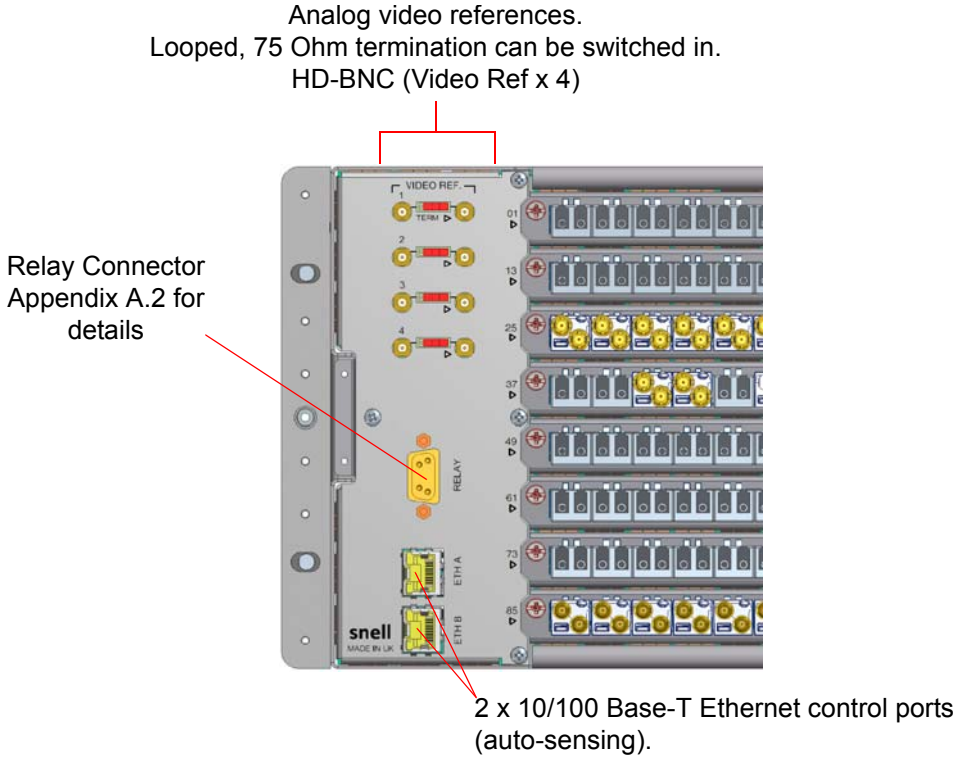


Fig 10. Vega 4U Network, Relay and Video Reference Rear Panel

3.3.1 Relay Connector

The alarm relay output are connected to the 9 way D-type relay connector. For connector wiring information see section A.2.

3.3.2 Network Connections

The COM1 and COM2 RJ45 network sockets are used to connect the Vega control cards to the IP network. External IP controllers can then connect to the Vega router (see section 8. for details).

3.3.3 Video References

The video reference signal inputs are used to ensure that the router crosspoint switch is compliant to SMPTE RP168-2009 for that video standard. The video references are Looped and a 75Ω termination can be selected by setting a separate switch (see Figure 9 or Figure 10) for each of the video references.

3.4 Video Reference Inputs

The video reference signal inputs are used to ensure that the router crosspoint switch is compliant to SMPTE RP168-2009 for that video standard. The Vega Controller automatically detects the incoming signal and therefore it can be configured to switch on a specific standard.

Video reference switch points are set for each input by clicking on **Vega** in the Network tree and then selecting the **Port Config** option for the input being set. See the Vega Router Control manual for details on configuring the switching points.

Important:

- If there is no reference signal, the router will crash switch on receiving the switch command.

The Vega Video Router router has four analogue video reference inputs:

- Analogue video, all auto sensing to 525 and 625 B&B, or HD tri-level reference

See section 3.3 for the video reference connector locations.

3.4.1 Derived Video References

Derived video references enable the router to use a reference signal standard that is not available from outside of the router frame as if it is a standard physical video reference input.

Video reference signals are derived (created) from the physical video reference inputs on the rear of the router. These derived video references can be at a higher or lower resolution than the signal on the physical reference input but they must share the same frame rate as the original reference signal they are created from.

Each router has a maximum of four references in total in any mix of Physical and Derived references.

Define the derived references by clicking on **Vega** in the Network tree and then select the **References** option. See the Vega Router Control manual for full setting details.

Example (also shown in Fig 11.)

- 525 Video Reference input 1 used directly as a video reference.
  This uses up one of the four available references.
- 625 Video Reference input 2 used to produce a 720P 50 Hz derived reference and a 1080i 50 Hz derived reference.
  This uses up two of the four available references.
- 1080P 60 Hz BNC Video Ref 3 used to produce a 720P 60 Hz derived reference.
  This uses up one of the four available references.
- BNC Video Ref 4 not available as the maximum of four references are already in use.

Note:

- A physical video reference input can be used to create between zero and four derived video reference signals for use in the router.
- Each router has a maximum of four video references in total in any mix of physical and derived references.

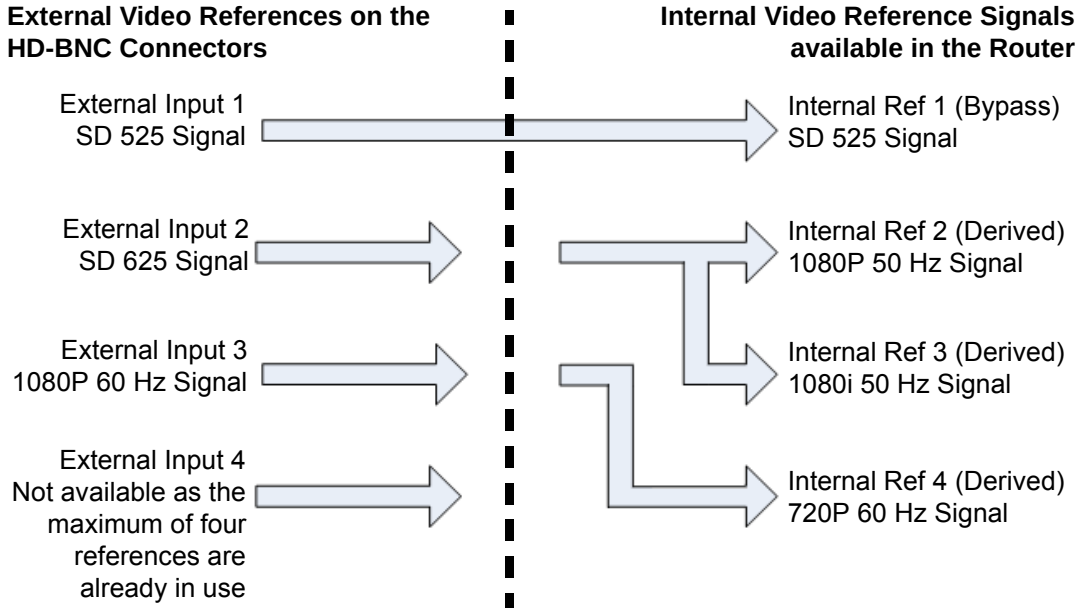


Fig 11. Derived References Example

3.4.2 Video Switching Point References

Table 3. lists the video switching point references:

Video Reference	Video Signal
Auto	Sets the reference type based on the signal type detected on the input. All inputs default to Auto unless setup differently.
Internal Ref 1 to Internal Ref 4	Overrides the Auto detection by using one of the internal references. These can be a mix of the physical reference inputs and the derived reference inputs depending on how the Vega controller is configured.
525i59	525 interlaced 59 Hz
625i50	625 interlaced 50 Hz
720p60	720 progressive 60 Hz
720p59	720 progressive 59 Hz
720p50	720 progressive 50 Hz
1080i60	1080 interlaced 60 Hz
1080i59	1080 interlaced 59 Hz
1080i50	1080 interlaced 50 Hz

Table 3. Switching Point Video References

3.4.3 Auto Selected

When Auto is selected for a signal the Vega controller will look for a reference (a physical or derived reference) that exactly matches the signal.

- If a matching reference signal (physical or derived) is present the controller will switch in accordance with SMPTE RP168.
- If a matching reference signal (physical or derived) is not present the router will crash switch.

Note:

- The Vega router cannot switch a video input signal in accordance with SMPTE RP168 until the input has been recognized by the router.
- On input signal change it can take up to 10 Seconds for the Vega router to recognize the new signal.
- If a a switch is carried out before the signal has been recognized the Vega router will crash switch.

3.4.4 Manual Reference Standard Selected

When a reference standard, such as 720p60, is selected manually the Vega controller will look for a reference (a physical or derived reference) that exactly matches the selected standard.

- If the selected standard reference signal (physical or derived) is present then the controller will switch in accordance with SMPTE RP168.
- If the selected standard reference signal (physical or derived) is not present the router will crash switch.
- If the selected standard reference signal (physical or derived) is present but different to the actual signal being switched, for example a 1080i50 reference for a 1080p50 signal, then the timing must be adjusted to make sure the switch happens at the correct point.

3.4.5 Reference Input (Physical or Derived) Selected

When a reference input is selected manually (a physical or derived reference) the Vega controller will use the specified reference input.

- If the signal on the specified reference input (physical or derived) exactly matches the signal to be switched then the router will switch in accordance with SMPTE RP168.
- If the signal on the specified reference input (physical or derived) does not exactly match the signal being switched the router will switch according to the specified reference. The timing must be adjusted to make sure the switch happens at the correct point.
- If the signal on the specified reference input (physical or derived) is not valid the router will crash switch.

4. Input and Output Modules

The Vega Video Routers can be fitted with up to eight (2U) or sixteen (4U) 12 port rear modules for video connections. Each port is configurable to be an input or output using Fiber or HD-BNC by use of SFP modules or HD-BNC dedicated rear panels. See sections 4.3 and 4.4 for details.

The input and output modules are located horizontally at the rear of the Vega Video Router (2U see Figure 12 or 4U Figure 13).

Important:

- Blanking plates (VG-RMBP) must be fitted to any vacant slot on the rear of the Vega Video Router to ensure that the Vega Video Router continues to conform to EMC standards.
- Blanking plates must also be fitted to ensure adequate cooling, see section 4.5 for details.
- Dust blanking plugs (SFP-Blank) must be fitted to any vacant cage on the VG-RM6SFP-SDI input/output board to ensure that the Vega Video Router continues to conform to EMC standards. Blanking plugs must also be fitted to ensure adequate cooling, see section 4.3.4 for details.
- The risk of non-compliance and overheating is with the user if the blanking plates and plugs are not fitted.

4.1 Rear View

For details on inserting and removing the Input/Output rear modules see section 4.2.

96 Input/Output ports in 4 rows of 12 on each side of the router.
Each port is configurable to be an input or output using Fiber or HD-BNC
by use of input/output rear modules and SFP modules.
See sections 4.3 and 4.4 for details.

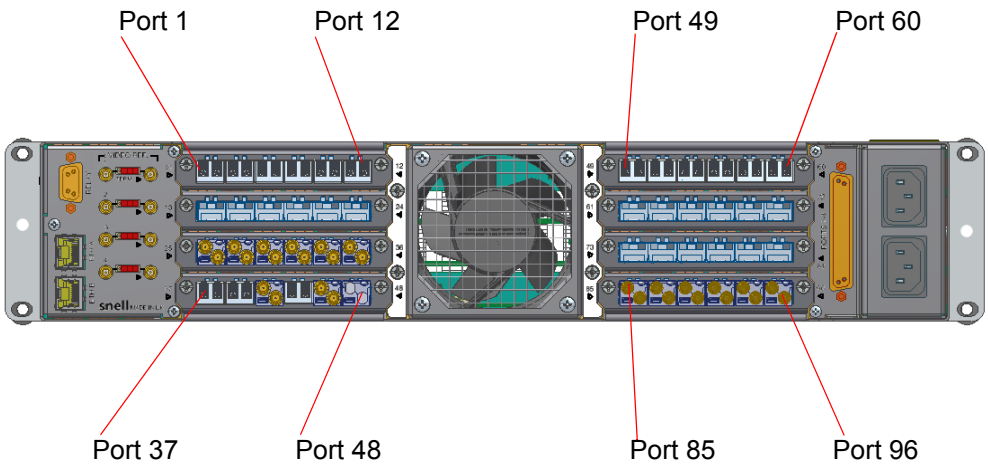


Fig 12. Vega 2U Rear View Showing the Input and Output Cards

192 Input/Output ports in 8 rows of 12 on each side of the router.
Each port is configurable to be an input or output using Fiber or HD-BNC
by use of input/output rear modules and SFP modules.
See sections 4.3 and 4.4 for details.

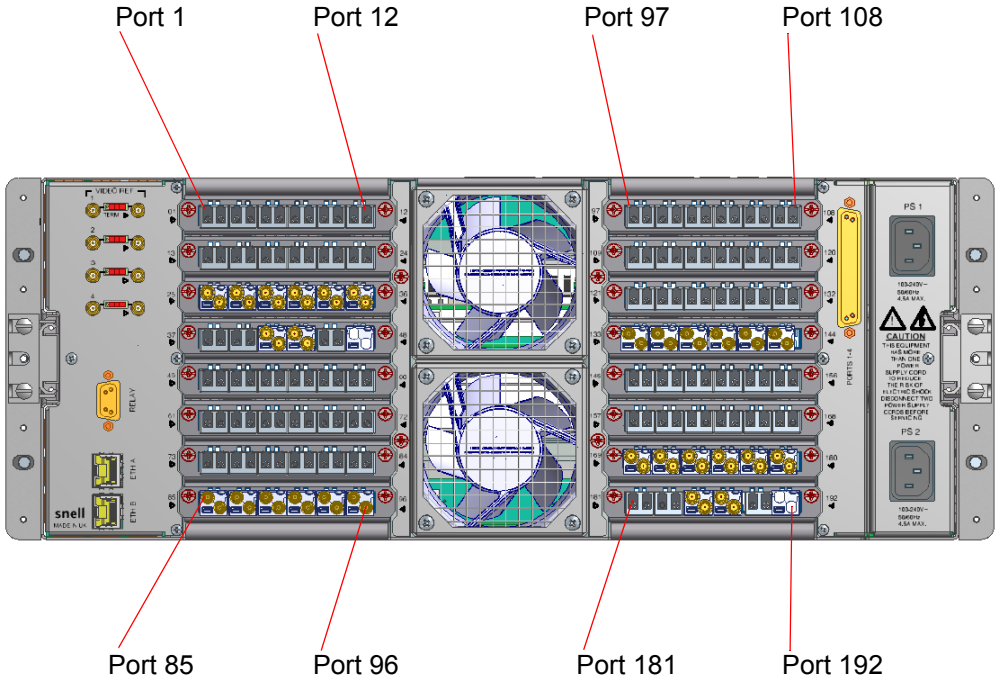


Fig 13. Vega 4U Rear View Showing the Input and Output Cards

4.2 Inserting and Removing Input and Output Modules

The input and output modules are located horizontally at the rear of the Vega Video Router (see Figure 12).

The input and output modules can be hot swapped in the Vega Video Router but if they are in use they will cease to function until they are replaced.

Electrostatic Damage

- Static precautions must be observed when inserting and removing cards.

1. To remove an input/output card from the router un-screw the captive screws at the left and right ends of the input/output card being removed.

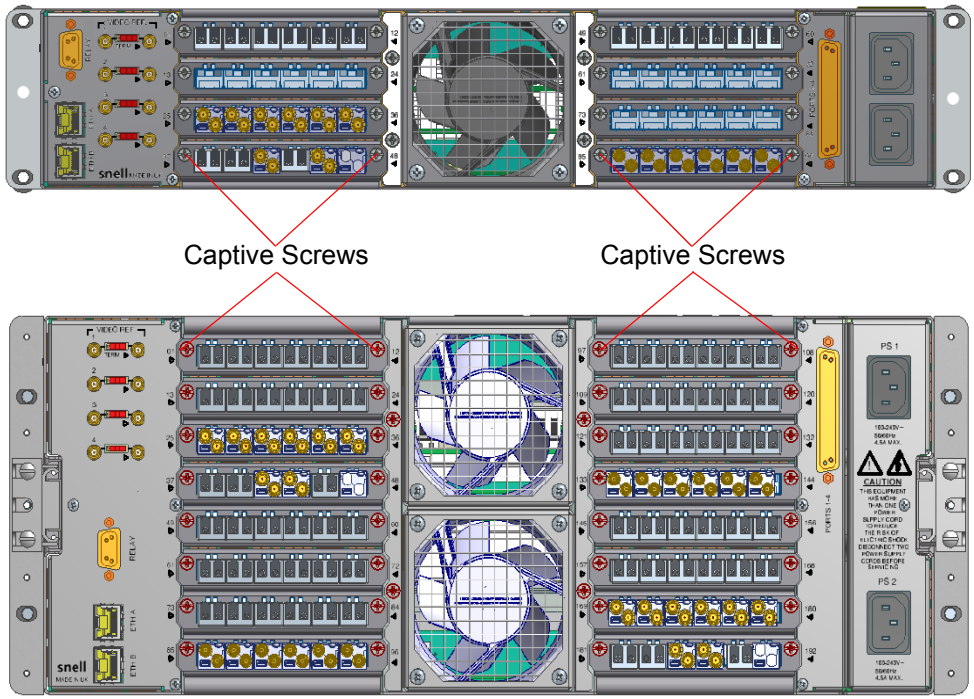


Fig 14. Vega 2U & 4U Rear Connectors

Important:

- Blanking plates (VG-RMBP) must be fitted to any vacant slot on the rear of the Vega Video Router to ensure that the Vega Video Router continues to conform to EMC standards.
- Blanking plates must also be fitted to ensure adequate cooling, see section 4.5 for details.
- The risk of non-compliance and overheating is with the user if the blanking plates are not fitted.

2. Carefully pull the card out of the frame.
3. If the module is not being replaced then a blanking plate (VG-RMBP) must be fitted.
4. To insert an input or output module locate the module in the frame slots and carefully push it in until it clicks firmly into place.
5. Tighten the captive screws.

4.3 VG-RM6SFP-SDI - 12 Port, 6 Cage Input/Output SFP Rear Panel

The VG-RM6SFP-SDI input/output rear module can be fitted with a range of dual port SFP modules for a mix of fiber or coax input or output connections. SDI re-clocking circuitry is contained in the VG-RM6SFP-SDI rear panel and all SFP modules are non reclocking.

Each of the SFP plug-in modules is capable of passing a 3Gbit & 1.5Gbit HD, SD or ASI video signal. Each of the SFP ports on a rear input/output module can pass a different video signal type if required. The rear module is made up of 6 dual port SFP cages which are compatible with the following dual port SFP modules. See Appendix C.2 for full specifications.

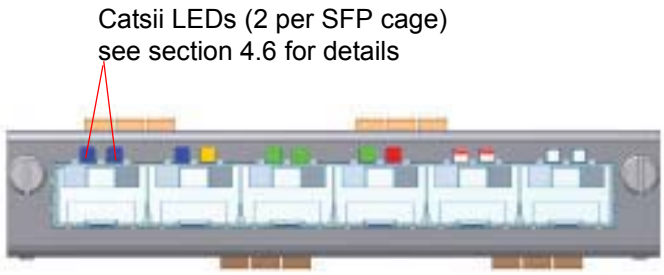


Fig 15. VG-RM6SFP-SDI - 12 Port, 6 Cage Input/Output SFP Module

4.3.1 SFP Fiber Modules

See Appendix C.4 for full specifications.

SFP Fiber Modules	Channel 1	Channel 2
SM-T31T31-3G	1310nm Tx	1310nm Tx
SM-T55T55-3G	1550nm Tx	1550nm Tx
SM-T31R-3G	1310nm Tx	1260-1620nm Rx
SM-T55R-3G	1550nm Tx	1260-1620nm Rx
SM-RR-3G	1260-1620nm Rx	1260-1620nm Rx

Table 4. SFP Fiber Modules [1]

[1] SM = Single Mode. For Multi Mode (MM) fiber applications please contact your Snell representative.

4.3.2 SFP CWDM Fiber Modules

See Appendix C.5 for full specifications.

CWDM Fiber Modules	Channel 1	Channel 2	Color Codes
SM-T59T61-3G	1591nm Tx	1611nm TX	Red/Brown
SM-T55T57-3G	1551nm Tx	1571nm Tx	Yellow/Orange
SM-T51T53-3G	1511nm Tx	1531nm Tx	Blue/Green
SM-T47T49-3G	1471nm Tx	1491nm Tx	Grey/Violet
SM-T43T45-3G	1431nm Tx	1451nm Tx	Black/Yellow Orange
SM-T39T41-3G	1391nm Tx	1411nm Tx	White/Silver
SM-T35T37-3G	1351nm Tx	1371nm Tx	Pink/Beige
SM-T31T33-3G	1311nm Tx	1331nm Tx	Yellow Green/Yellow Ocher
SM-T27T29-3G	1271nm Tx	1291nm Tx	Light Purple/Sky Blue

Table 5. SFP CWDM Fiber Modules [1]

[1] 18 CWDM Tx wavelengths available in 9 dual SFP modules conforming to ITU-T-REC-G.642.2 Clasp (Latch). Color Code is for Channel 1 CWDM wavelength

4.3.3 SFP Coaxial Copper Modules

See Appendix C.6 for full specifications.

Coaxial Copper Modules	Connector Type	Channel 1	Channel 2
CC-TTH-3G-N	HD-BNC	Tx	Tx
CC-TRH-3G-N	HD-BNC	Tx	Rx
CC-RRH-3G-N	HD-BNC	Rx	Rx

Table 6. SFP Coaxial Copper Modules [1]

[1] Coax ‘Plug-Ins’ are ‘non-reclocking’. Reclocking circuitry is included in the VG-RM6SFP-SDI module.

4.3.4 SFP-BLANK - SFP Blanking Plug

The SFP blanking plugs must be fitted to any unused SFP socket to ensure that the Vega Video Router continues to conform to EMC standards.

Important:

- Dust blanking plugs (SFP-Blank) must be fitted to any vacant cage on the VG-RM6SFP-SDI input/output board to ensure that the Vega Video Router continues to conform to EMC standards.
- Blanking plugs must also be fitted to ensure adequate cooling, see section 4.3.4 for details.
- The risk of non-compliance and overheating is with the user if the blanking plugs are not fitted.

4.4 VG-RM12H-SDI - 12 Port Input/Output HD-BNC Rear Panel

The VG-RM12H-SDI input/output rear module is equipped with 12 HD-BNC connectors that can be individually configured to give the required mix of inputs and outputs. RollCall Control Panel is used to configure the ports. SDI re-clocking circuitry is contained in the VG-RM12H-SDI rear panel.

Each of the HD-BNC ports is capable of passing a 3Gbit & 1.5Gbit HD, SD or ASI video signal. Each of the HD-BNC ports on a rear input/output module can pass a different video signal type as either an input or an output if required. For fitting information see section 4.2 and see Appendix C.7 for full specifications.

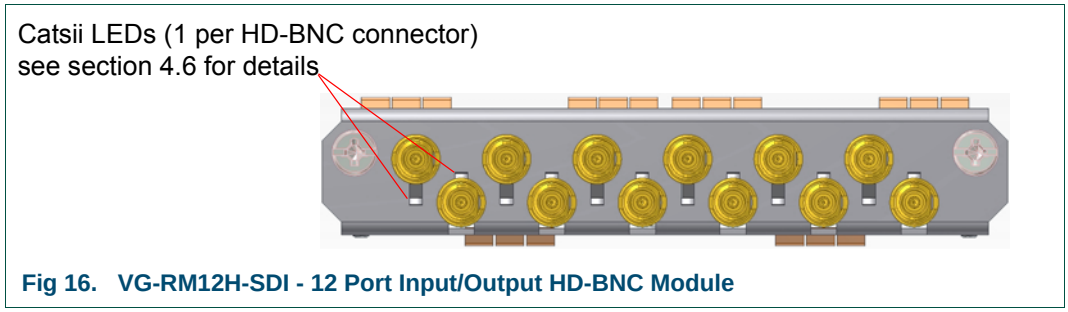


Fig 16. VG-RM12H-SDI - 12 Port Input/Output HD-BNC Module

4.5 VG-RMBP - Blanking Rear Module

The blanking plate rear module must be fitted to any unused rear module slots to ensure that the Vega Video Router continues to conform to EMC standards.

Important:

- Blanking plates (VG-RMBP) must be fitted to any vacant slot on the rear of the Vega Video Router to ensure that the Vega Video Router continues to conform to EMC standards.
- Blanking plates must also be fitted to ensure adequate cooling, see section 4.5 for details.
- The risk of non-compliance and overheating is with the user if the blanking plates are not fitted.

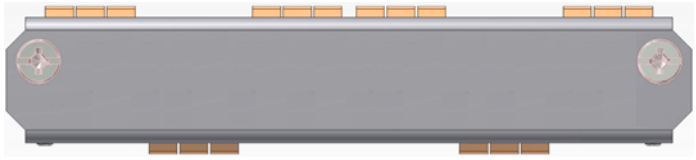


Fig 17. VG-RMBP - Blanking Plate Rear Module

4.6 Catsii LED Functionality

All of the input/output rear modules are equipped with multi-color LEDs that change color depending on their configuration and the status of the video signal they are receiving or transmitting. They can also be used in a “Cross Hair” formation to highlight and pinpoint a specific input or output or they can be switched off completely. RollCall is used to select the mode that the Catsii LEDs operate in, see section 9.3.3.4.

Catsii LED signal status is driven directly from the input and output modules, and changes quickly when a fiber or coax cable is connected to the router.This allows the user to easily find configured ports when adding more ports to the router and any problems are immediately visible when fitting a new plug in the back of a rack. The Catsii LED colors are described in the tables on page 39 and page 40.

4.6.1 Catsii LED Location

See the following rear panel sections for the Catsii LED locations:

- SFP 12 Port, 6 Cage Rear Panel - Section 4.3
- 12 Port HD-BNC Rear Panel - Section 4.4

4.6.2 Catsii Colors: Input and Output Signals

Table 7. shows the Catsii colors displayed for valid input and output signals.

The Catsii colors display; port connector type fitted, configuration, signal standard recognized/signal not present.

Vega Port Configuration	Input Port Connector Fitted				Output Port Connector Fitted			
	Valid Video Signal Detected		No Valid Video Signal Detected		Valid Video Signal Detected		No Valid Video Signal Detected	
	Long Flash	Short Flash	Long Flash	Short Flash	Long Flash	Short Flash	Long Flash	Short Flash
Off	See item 1 in Table 10.							
Input	Green		Red		See item 2 in Table 10.			
Output	See item 2 in Table 10.				Blue		Yellow	

Table 7. Catsii LED Colors

4.6.3 Catsii Colors: Port Connector Type Not Recognized

Table 8. shows the Catsii colors displayed when a port connector type cannot be recognized by the Vega router.

The Catsii colors display; configuration, signal standard recognized/signal not present.

Vega Port Configuration	Port Connector Type Not Recognized			
	Valid Video Signal Detected		No Valid Video Signal Detected	
	Long Flash	Short Flash	Long Flash	Short Flash
Off	See item 1 in Table 10.			
Input	Green	Off	Red	Off
Output	Blue	Off	Yellow	Off

Table 8. Signal Present but Not Recognized

4.6.4 Catsii Colors: Vega Port Configured but Port Connector not fitted

Table 9. shows the Catsii colors displayed when a port has been configured but no connector is currently fitted to the configured port.

The Catsii colors display; port configuration.

Vega Port Configuration	Catsii LED Color	
	Long Flash	Short Flash
Off	Off	
Input	Off	Green
Output	Off	Blue

Table 9. Vega Port Configured but Connector not fitted

4.6.5 Catsii Colors: Error Color Sequence

Table 10. shows the Catsii colors displayed when a port has an error.

The Catsii color sequence indicates the error type.

Error Description	Catsii LED Color	
	Long Flash	Short Flash
1. Vega port configured to OFF but a port connector is fitted	Red	Off
2. Vega port is configured as an Input but an Output port connector is fitted or Vega Port is configured as an Output but an Input port connector is fitted	Off	Red

Table 10. Error Color Sequence

5. Crosspoint Card

There are two versions of crosspoint card available, one for each Vega router size (see Table 11. for details).

Crosspoint Card	Router	Description
VG-XPT096-A	Vega 2U	96 crosspoints for configurations from 1 input and 95 outputs to 95 inputs and 1 output
VG-XPT192-A	Vega 4U	192 crosspoints for configurations from 1 input and 191 outputs to 191 inputs and 1 output

Table 11. Crosspoint Cards

The Vega Video Routers can be fitted with up to two crosspoint cards. Fitting a second crosspoint card gives the router crosspoint redundancy in the unlikely event of failure in the main crosspoint card.

The crosspoint cards are mounted horizontally in the front of the Vega Video Router (see Figure 5 and Figure 6 on page 25 for location details). The main crosspoint card is fitted in the upper slot and the redundant crosspoint card is fitted in the lower slot.

Note:

- Crosspoint cards must be fitted with the component side facing up.

- For details on updating the firmware in the Vega crosspoint card see “Upgrade the Vega System Software” on page 74.
- See section 5.4 for details on replacing a failed main crosspoint card.

5.1 Video Crosspoint Features

- One main and one optional, redundant crosspoint card
- Maximum configuration of 192 crosspoints (96 for the Vega 2U router) configured as a mix of inputs and outputs as required
- Failed crosspoints are automatically switched from the main to the redundant crosspoint card if fitted

5.2 Crosspoint Card LED Information

Table 12. shows the LED color code for the crosspoint card, and Fig 18. shows the LED locations on the crosspoint card.

Note:

- If the Active LED is not illuminated, it is safe to remove the crosspoint card without affecting any active routes.
- For details on physically fitting and removing crosspoint cards see section 5.5.

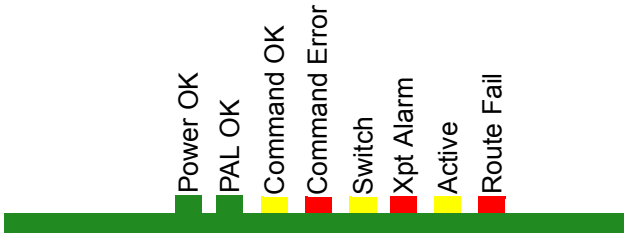


Fig 18. Crosspoint Card LEDs

LED Color	Function	Detail	Status
Green	Power OK	Power to the module	**On Solid** - Working correctly
Green	PAL OK	Indicates that the FPGA is working correctly	**Flashing** - working correctly
Yellow	Command OK	Command from the Control module	**Flashing** - receiving information and working correctly
Red	Command Error	Error in command from the Control module	**Off** - Normal state **Flashing** - Some received messages contain errors **On Solid** - No messages are being received
Yellow	Switch	Flashes on a take signal when switching a route	**Off** or **Flashes** once when a route is set.
Red	Xpt Alarm	Displays if there is a problem with the crosspoint IC	**Off** - Normal state **On Solid** - Problem communicating with the crosspoint IC **Flashing** - Crosspoint module overheating, remove module until it has cooled down
Yellow	Active	Route is active on crosspoint	**On** - At least one signal is routed through this crosspoint module **Off** - No signals are routed through this crosspoint module
Red	Route Fail	Route failure has been detected on this crosspoint module	**Off** - Normal state **On Solid** - At least one route failure has been detected on this crosspoint module

Table 12. Crosspoint Card LED Information

5.3 Redundant Video Crosspoint Operation

The redundant crosspoint design is based around protecting against the main crosspoint card failing.

In normal operation, all the routes pass through the main routing crosspoint card. The Vega controller continuously checks the main and redundant signal paths to ensure the crosspoint matrix is operating correctly.

The redundant signal path algorithm checks that the redundant crosspoint card is capable of passing the routes currently set on the main crosspoint card. Any failure with the redundant crosspoint card is reported and the crosspoint matrix loses its redundancy, but is still capable of setting all routes.

Note:

- Following a routing change it can take several seconds to check for crosspoint redundancy. It is assumed that everything is okay until the check is complete, therefore no alarm is flagged until checking is complete and the redundancy status is known.

If the redundant crosspoint checking algorithm detects a failure of any crosspoint on the main crosspoint card, it moves the failed route to the redundant crosspoint card.

At this point the router has not lost any routing capacity, but has lost its redundancy for the failed route. It is down to the operator to correct any fault in order to restore redundancy to the matrix.

Note:

- Any failure needs addressing immediately to retain crosspoint redundancy protection.
- All of the routes must be moved to the redundant crosspoint card before replacing the main crosspoint card. See Section 5.4 Replacing a Failed Main Crosspoint Card for details.
- Once the main crosspoint card has been replaced all routes must be moved back to the main crosspoint card to restore redundancy.
    - All routes must be moved back to the main crosspoint card once the fault is fixed because if a route fails on the redundant crosspoint card the failed route is not automatically moved to the main crosspoint card.

5.4 Replacing a Failed Main Crosspoint Card

1. Open a web browser on the same network as the Vega router and type: `http://xxx.xxx.xxx.xxx/index` and press the **Enter** key
where xxx.xxx.xxx.xxx is the IP address of the Vega controller. The default IP address for the primary controller is http://172.19.39.150/

2. Double click on **Vega** in the Network tree and select the **Redundancy** page.

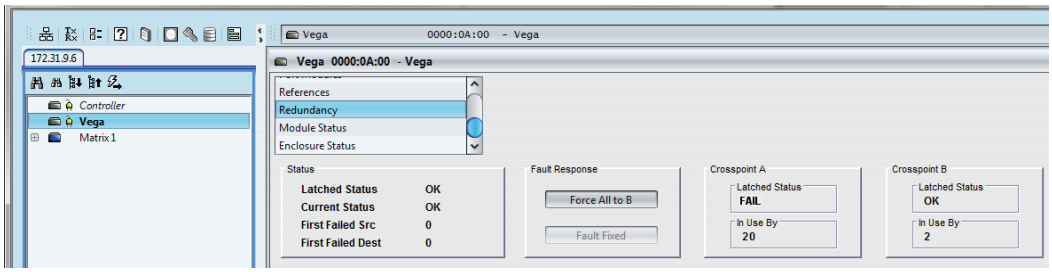


Fig 19. Crosspoint Redundancy

3. Move all of the routes to the redundant crosspoint card (Crosspoint B) by clicking on the **Force All to B** button (Figure 19.)

4. Check the **Crosspoint A** status box and when **in use by** displays zero the main crosspoint card can be removed.

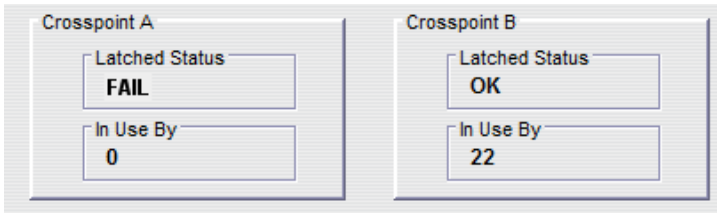


Fig 20. Crosspoint Redundancy

5. Remove the failed main crosspoint card and replace it with a working one (see section 5.5 for details).

6. Click on the **Fault Fixed** button and all of the routes will be moved back to the main crosspoint card (Crosspoint A). This reinstates crosspoint redundancy.

5.5 Inserting and Removing Crosspoint Cards

The crosspoint cards are located horizontally at the front of the Vega Video Router (see Figure 5 and Figure 6 on page 25 for location details).

The crosspoint cards can be hot swapped in the Vega Video Router but if a redundant crosspoint card is not fitted and working crosspoint functionality will be lost until the crosspoint card is replaced.

If a redundant crosspoint card is fitted and working then the router will continue to function but redundancy will be lost until both the main and redundant crosspoint cards are fitted and working.

Electrostatic Damage

- Static precautions must be observed when inserting and removing cards.

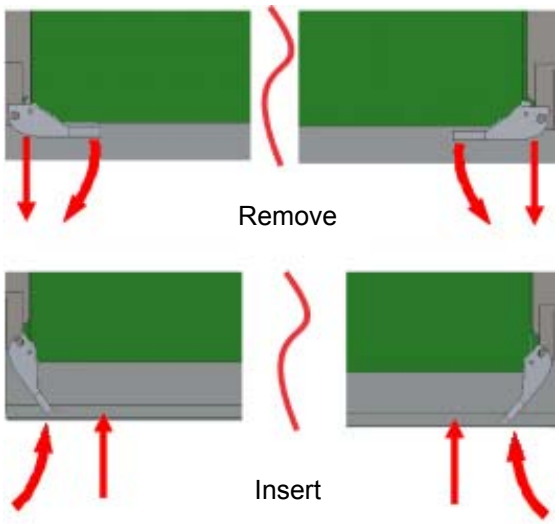


Fig 21. Inserting a Crosspoint Card

1. To remove a crosspoint card from the router, pull on the two levers, and slide the card out of the frame.
2. To insert the crosspoint card, locate the card in the frame slots with the levers pointing out from the router and the electronic components facing the top of the router.
3. Push the crosspoint card in until the levers locate in the router frame.
4. Push the levers to fully lock the crosspoint card in place.

6. Vega Controller Card

The Vega Video Router can be fitted with up to two Vega controller cards. Fitting a second controller card gives the router redundancy protection in the unlikely event of failure in the main controller card.

Note: **4U Vega Router Only**: Two Controller cards and two Buffer cards are required to maintain full redundancy protection of the control system should either a controller card or a buffer card fail.

The controller cards are mounted vertically in the front of the Vega Video Router (see Figure 5 and Figure 6 on page 25). The main controller card is fitted in the left slot and the redundant controller card is fitted in the right slot. If the router has two controllers fitted the main controller (left side) goes active first when the router is powered up.

The Vega controller is a real-time router control card which performs the following functions:

- Interfaces to all the external devices (control system, panels, etc.), through Ethernet and serial port connections
- Hosts the built-in RollCall menu and control software
- Stores the local configuration of the router
- Manages multiple video reference inputs
- Sets video crosspoints in response to external commands and responds with tally information
- Monitors the status of the system components and reports this to the external router control systems as required.

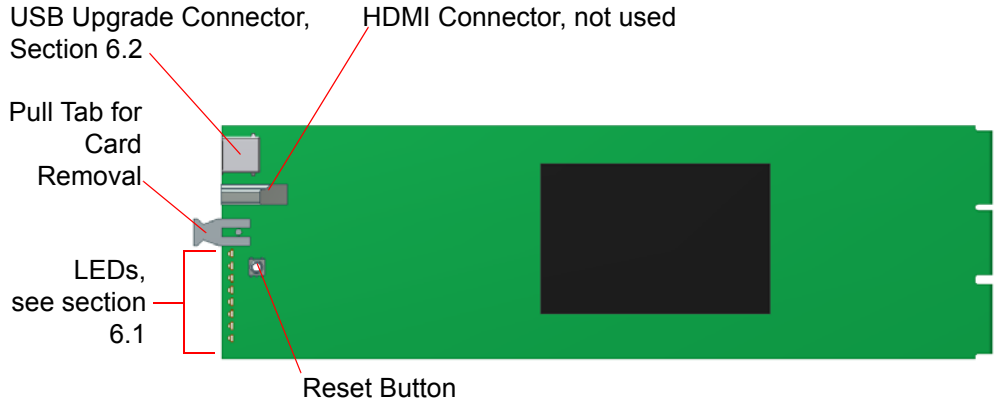


Fig 22. Vega Controller Card

- For details on changing the IP address of the Vega controller see section B.2.3.1 or section B.2.6.
- For details on updating the firmware in the Vega controller see “Vega Upgrades” on page 73.

6.1 Vega Controller LEDs

The LEDs on the controller card are shown in Fig 23. and Table 13. lists the Controller LED functions.

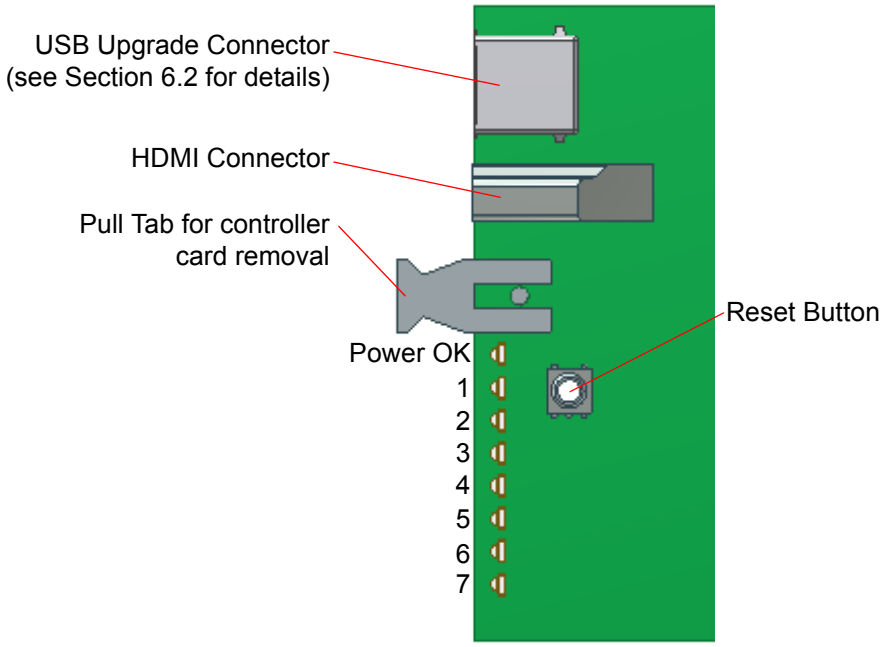


Fig 23. Vega Controller LEDs

LED	Description
Power OK	**Power OK** • Green = Power is connected and okay • Off = Power not connected or not okay
1	**Active/Idle** • Flashing Green = Active • Flashing Blue = Idle
2	**Master/Slave** • Green = Master Controller • Blue = Slave Controller
3	**Watchdog Status** • Flashing Green = Watchdog enabled and running • Flashing Orange = Watchdog disabled

Table 13. Vega Controller LEDs

LED	Description
4	**Serial Link Between Controllers** Displays the status of the serial link between the active and idle controllers. See LED 5 for further information. • Blue pulsing Green = Link okay, data is being transferred. • Green pulsing Blue = Link okay, no data is being transferred. • Magenta pulsing Blue = Link error, no connection with the other controller. Indicates; the other controller is not present/not running or the serial link is not working. • Orange Pulses = Error, received data for unconfigured device Indicates; the other controller is configured differently from the controller receiving the data or it has no configuration. • Red Pulses = Error, received data with invalid format.
5	**Serial Data Replication (Local Router Device)** The Serial Link is used to replicate LocalRouter device data between the active and idle controllers. Replicated data includes; crosspoint status, module configuration and port configuration. • Off = Active Controller • Flashing Green = Idle controller, receiving background update data. • Flashing Orange = Idle controller, data synchronisation with Active controller in progress.
6	Not used
7	Not used

Table 13. Vega Controller LEDs

6.2 USB Memory Stick

Each Vega Controller is supplied with a USB memory stick. The USB memory sticks are used to reset the Vega Controllers to a factory default condition and will erase all previous settings from the controllers and restore the default IP address.

The supplied USB stick(s) can be used to upgrade the Vega router firmware and specify IP addresses without the need to use RollCall (see Appendix B. for details) although this is for advanced users only.

6.3 Inserting and Removing Vega Controller Cards

The Vega Controller cards are located vertically in the front of the Vega Video Router (see Figure 5 or Figure 6 on page 25).

The controller cards can be hot swapped in the Vega Video Router but if a redundant controller card is not fitted and working control functionality will be lost until the controller card is replaced. Any routes already set will continue to operate.

If a redundant controller card is fitted and working then the router will continue to function but redundancy will be lost until both the main and redundant controller cards are fitted and working.

Electrostatic Damage

- Static precautions must be observed when inserting and removing cards.

1. To remove a controller card from the router hold the plastic pull tab on the front of the card (Figure 22) and carefully pull the card out of the frame.
2. To insert a controller card locate the card in the upper and lower frame slots and carefully push it in until it clicks firmly into place.

7. Vega Buffer Card (Vega 4U only)

The Vega 4U Video Router can be fitted with up to two Vega Buffer cards. Fitting a second buffer card gives the router redundancy protection in the unlikely event of failure in the main buffer card.

Note: Two Controller cards and two Buffer cards are required to maintain full redundancy protection of the control system should either a controller card or a buffer card fail.

The buffer cards are mounted vertically in the front of the Vega Video Router (see Figure 6 on page 25). The main buffer card is fitted in the left slot and the redundant buffer card is fitted in the right slot. If the router has two buffer cards fitted the main buffer card (left side) goes active first when the router is powered up.

The Vega buffer card fans out the router controller control busses throughout the router for the following:

- Control signals including system and fan control signals
- Status signals including system and fan status

Fig 24. Vega Buffer Card

7.1 Vega Buffer Card LEDs

The LEDs on the buffer card are shown in Fig 25. and Table 14. lists the Buffer card LED functions.

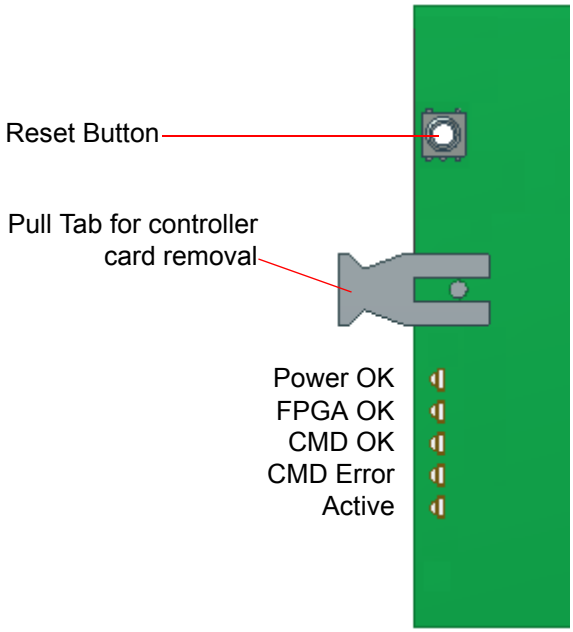


Fig 25. Vega Buffer Card LEDs

LED	Description
Power OK	• Green = Power is connected and okay • Off = Power not connected or not okay
FPGA OK	• Green Flashing = FPGA working correctly • Solid Green or LED Off = FPGA programming fault Remove card and plug back in to force a reboot.
CMD OK	• Yellow Flashing = receiving information and working correctly
CMD Error	• Off = Normal state • Flashing = the command message from the Vega controller is corrupt or hasn't been received. This communications error could be caused by a hardware failure although this is unlikely. Check that the buffer card is inserted correctly. If the "CMD Error" LED is flashing at the same time as the "CMD OK" LED is flashing it suggests a mismatch in the configuration of the Vega router controller.
Active	• Yellow = Active • Off = Idle To manually change the active buffer card to idle press the **Reset** button on the front edge of the active buffer card (see Figure 25).

Table 14. Vega 4U Buffer Card LEDs

7.2 Inserting and Removing Vega Buffer Cards

The Vega buffer cards are located vertically in the front of the Vega Video Router (see Figure 6 on page 25).

The buffer cards can be hot swapped in the Vega Video Router without loosing any functionality assuming that a second redundant buffer card is installed and working in the router. If a redundant buffer card is not fitted functionality will be lost until the buffer card is replaced (see Note).

Note:

If all of the buffer cards are removed from the router:

- The fans will run at full speed and control will be lost until at least one buffer card has been fitted.
- Any routes already set will continue to operate but no route changes can be made until at least one buffer card has been fitted in the router.

If a redundant buffer card is fitted and working then the router will continue to function but redundancy will be lost until both the main and redundant buffer cards are fitted and working.

Electrostatic Damage

- Static precautions must be observed when inserting and removing cards.

1. To remove a buffer card from the router hold the plastic pull tab on the front of the card (Figure 24) and carefully pull the card out of the frame.
2. To insert a buffer card locate the card in the upper and lower frame slots and carefully push it in until it clicks firmly into place.

8. External Control

8.1 Vega Controller Control Panels

The Vega router controllers support the following control panels:

8.1.1 6028000-RC High Density Button Panel

The 6028000-RC is configurable as a BPX or XY panel.

- 78 key High density button panel

Fig 26. 6028000-RC

8.1.2 6028251-RC LCD Panel

The 6028251-RC LCD panel is configurable as a BPX or XY panel.

- 64 x 32 pixels on each LCD key and a single rotary switch

Fig 27. 6028251-RC

These panels connect to the Vega router using an IP connection. For more details see the appropriate control panel user manual.

8.2 External control Source and Destination Mapping

The dual Vega controllers are configured with independent IP addresses that provide control for a single level of routing where the destinations are:

Vega 2U Router

- Main Video Outputs: 1 to 96

Vega 4U Router

- Main Video Outputs: 1 to 192

8.3 General Switcher (SW-P-02) Protocol

The Vega router can be controlled by external automation or control systems using the General Switcher (SW-P-02) protocol.

General Switcher (SW-P02) is a simple protocol used to control a router from an external device/control system using point to point RS-422 serial or Ethernet connection. All of the protocol commands are number based.

Up to four 9 way D-type RS-422 serial connections can be connected to the 37 way D-type connector on the rear of the router by using a breakout cable (VG-CA37D9-4) purchased from Snell. For breakout cable details see Appendix •.

The full specification for this protocol is available from the Customer Support section of the Snell web site. http://www.snellgroup.com/support/customer-support

9. Configuration

9.1 Description

The RollCall Control Panel is used to perform configuration, control, and system monitoring for a Vega Router. Ports can be added, or re-configured as inputs or outputs, and redundancy monitoring and failover control can all be set live from the control software.

9.2 Operation

1. Open a browser window and enter the IP address of the router into the address bar of the browser.
   By default the Vega controller IP address is http://172.19.39.150/

Fig 28. Snell Controller Home Page

2. Click on the **Connect** button.

   If a dialogue box displays indicating that a newer version of Java should be installed, then click the **Download** button in the browser window and a security warning screen displays.

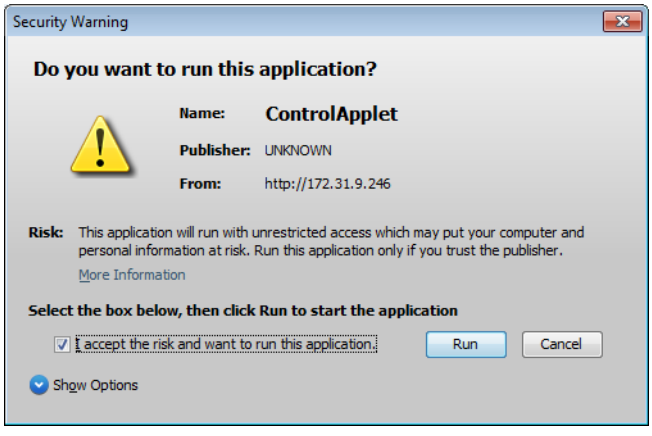


Fig 29. Security Warning

3. Check the **I accept the risk and want to run the application** check box, and click the **Run** button.

   The RollCall Control Panel opens displaying the Controller, Vega, and Matrix 1 units in the Network Browser window.

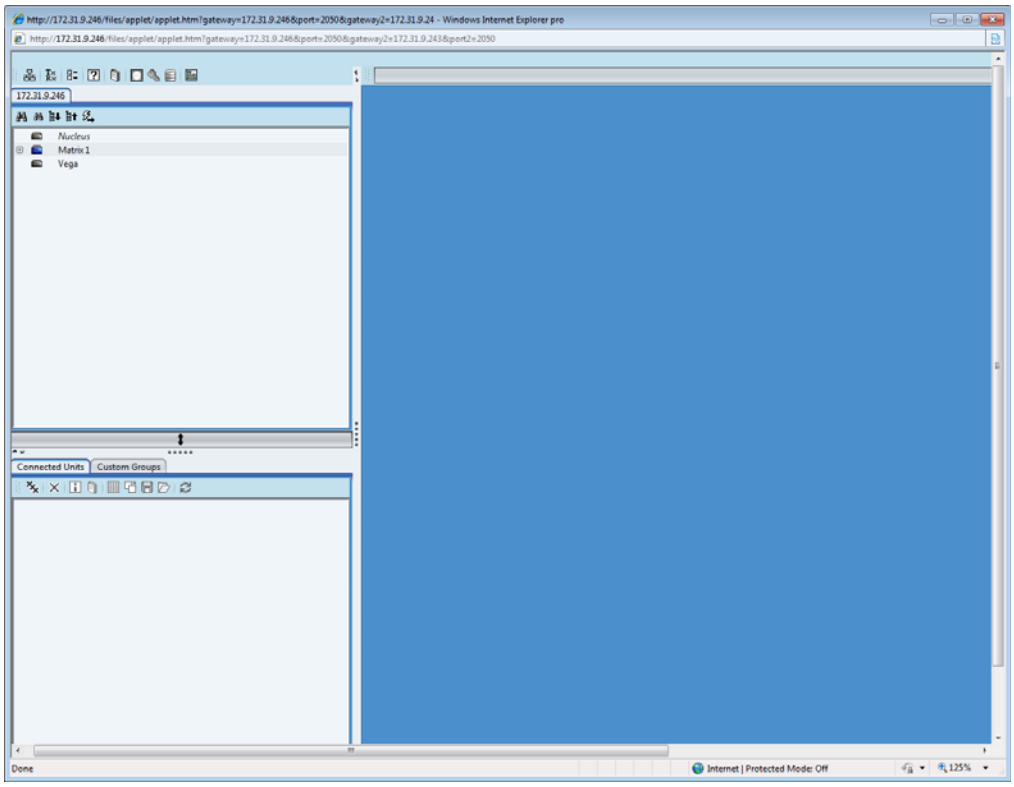


Fig 30. RollCall Control Panel Display

- Double-click on the Controller unit in the Network Browser to configure the controller, and redundant controller if fitted. See Vega Controller Setup on page 59.
- Double-click on the Vega unit in the Network browser window to open the Port Configuration template. Use this template to configure the router. See Port Configuration on page 60.
- Click on ⊞ to open the Matrix unit in the Network Browser, then double-click on the Level 1 unit to open the Routing template. Use this template to control the setting of routes via the XY panel. See Testing on page 63.

9.3 Vega Controller Setup

This section describes the basic steps required to configure and test a Vega router. If the router has been bench tested as described in the Quick Start manual packed with the router then many of these steps will already have been completed and the settings will not need to be changed again.

For detailed information on all of the setting available see the Vega Control Panel user manual which is on the CD packed with the router.

9.3.1 General Operation

- The RollCall Control Panel user manual can be accessed by clicking on the button in the toolbar at the top left of the display.
- To confirm a setting change click on the Send S button.
- To reset a setting back to it's factory default setting click on the Preset P button.

9.3.2 Comms Setup

The Comms Setup screen is used to define the communication aspects of the unit and its connections with the network.

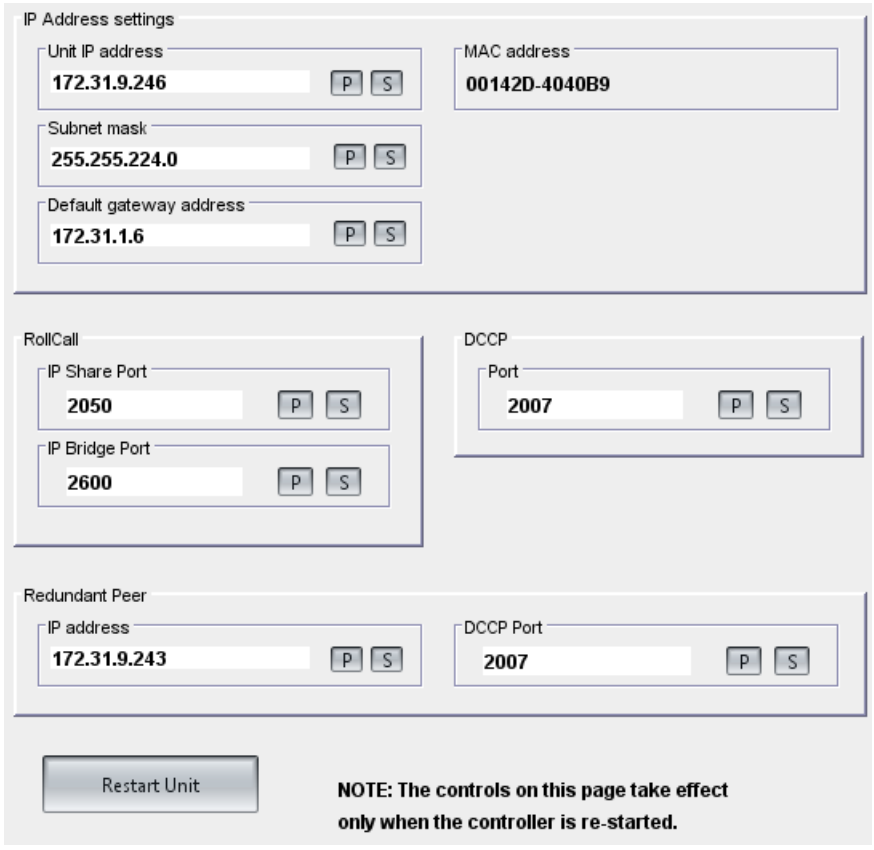


Fig 31. Comms Setup Screen

1. Enter an IP address for the main router controller, along with a subnet mask and default gateway address of the network onto which the router is attached.
2. In the Redundant peer section enter the IP address for the redundant controller, if fitted.
3. Click on the **Restart Unit** button for the entered details to take effect.

9.3.3 Port Configuration

The Port Config screens are for configuring the ports on the router. Each Port Config screen is used to configure up to 24 ports. Configuration can be done automatically, or individual ports can be manually configured. When manually configuring, select the relevant Port Config screen for the ports being configured.

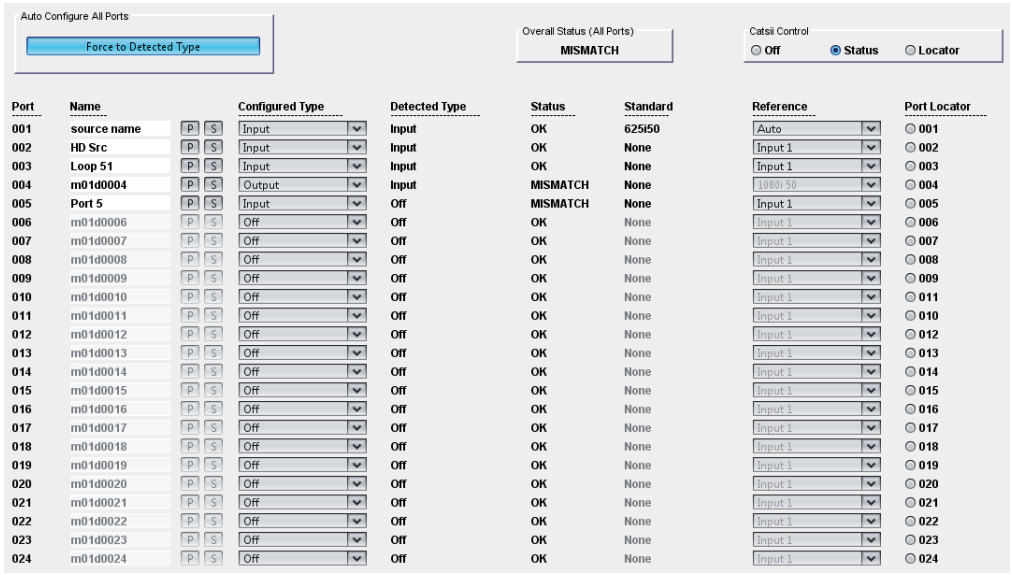


Fig 32. Port Config Screen

9.3.3.1 Automatic Configuration

To automatically configure all connected router ports, from any of the Port Config screens:

1. Click the **Force to Detected Type** button.
2. Click **Yes** to confirm, or **No** to cancel. This dialog box times out after five seconds if no response is given immediately.

Note: Automatic configuration configures all ports, not just those visible on the current Port Config screen.

The ports configure according to the modules present in the enclosure:

- Fiber ports are detected and display as either Input or Output ports.
- Electrical ports are not determined and display as Input/Output (unless they have been manually switched on the on the module using the DIP switches). These ports can be manually defined after the automatic configuration process.
- Unsupported SFP types display as Not Assigned. These can be defined manually.
- Empty module slots display as Off.

9.3.3.2 Manual Configuration

Configure each port separately.

To configure an individual port:

1. Enter a port name in the Name field.
2. From the Configured Type drop-down list, select Input, Output, Off (default).
3. From the Reference drop-down list, select the input reference (default is Auto). See Reference Signal on page 61.

Status

The status field reports the status of each port.

OK	Port is configured correctly
MISMATCH	There is conflict between the Configured Type and the Detected Type, or the SFP type is unknown

Table 15. Status

Overall Status

The overall status reports an error if one or more ports have an error status.

OK	Port is configured correctly
MISMATCH	There is conflict between the Configured Type and the Detected Type

Table 16. Overall Status

9.3.3.3 Reference Signal

A reference signal can be assigned to an input port. For output ports this feature is disabled.

To set a reference signal for a port:

- Select the signal type from the Reference Signal drop-down list.

See “Video Reference Inputs” on page 29. for more information on references.

9.3.3.4 Catsii Control

The Catsii function allows the router to display signal status, or the location of an individual port, on the router rear panel using the LEDs on the input and output modules.

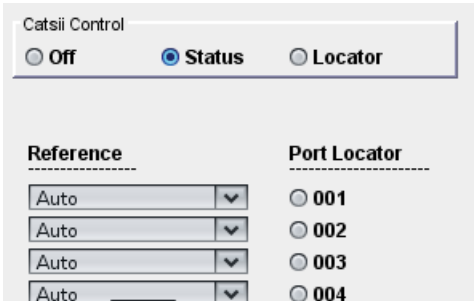


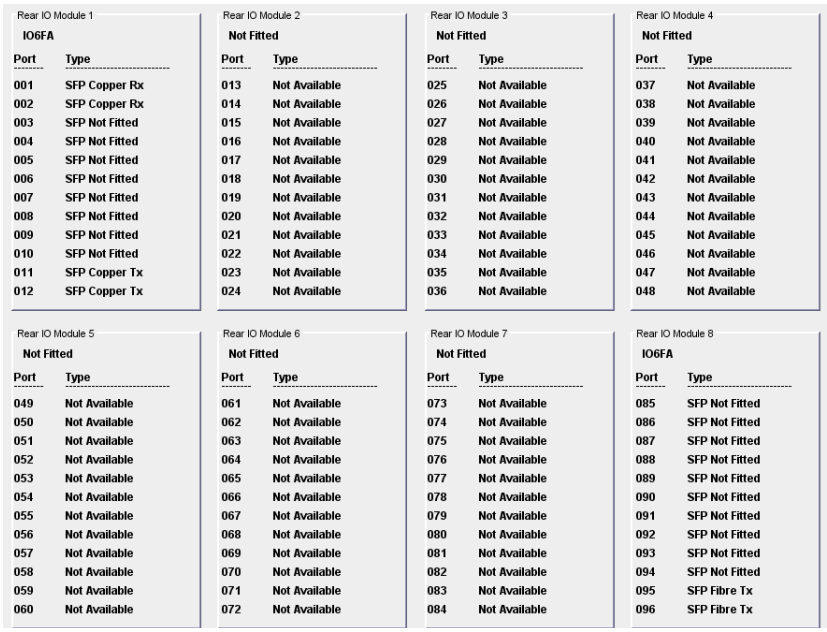
Fig 33. Catsii Control

Catsii Radio Buttons

- To switch the Catsii LEDs off click on the **Off** radio button (this is the default control setting).
- To see the status of modules on the rear of the router click the **Status** radio button. See “Catsii LED Functionality” on page 39. for details of the Catsii colors.
- To locate a port on the rear panel click on the **Locator** radio button.

9.3.4 Port Modules

The Port Modules screen gives details of the connected hardware modules and port IO types in the router.



Rear IO Module 1 — IO6FA

Port	Type
001	SFP Copper Rx
002	SFP Copper Rx
003	SFP Not Fitted
004	SFP Not Fitted
005	SFP Not Fitted
006	SFP Not Fitted
007	SFP Not Fitted
008	SFP Not Fitted
009	SFP Not Fitted
010	SFP Not Fitted
011	SFP Copper Tx
012	SFP Copper Tx

Rear IO Module 2 — Not Fitted

Port	Type
013	Not Available
014	Not Available
015	Not Available
016	Not Available
017	Not Available
018	Not Available
019	Not Available
020	Not Available
021	Not Available
022	Not Available
023	Not Available
024	Not Available

Rear IO Module 3 — Not Fitted

Port	Type
025	Not Available
026	Not Available
027	Not Available
028	Not Available
029	Not Available
030	Not Available
031	Not Available
032	Not Available
033	Not Available
034	Not Available
035	Not Available
036	Not Available

Rear IO Module 4 — Not Fitted

Port	Type
037	Not Available
038	Not Available
039	Not Available
040	Not Available
041	Not Available
042	Not Available
043	Not Available
044	Not Available
045	Not Available
046	Not Available
047	Not Available
048	Not Available

Rear IO Module 5 — Not Fitted

Port	Type
049	Not Available
050	Not Available
051	Not Available
052	Not Available
053	Not Available
054	Not Available
055	Not Available
056	Not Available
057	Not Available
058	Not Available
059	Not Available
060	Not Available

Rear IO Module 6 — Not Fitted

Port	Type
061	Not Available
062	Not Available
063	Not Available
064	Not Available
065	Not Available
066	Not Available
067	Not Available
068	Not Available
069	Not Available
070	Not Available
071	Not Available
072	Not Available

Rear IO Module 7 — Not Fitted

Port	Type
073	Not Available
074	Not Available
075	Not Available
076	Not Available
077	Not Available
078	Not Available
079	Not Available
080	Not Available
081	Not Available
082	Not Available
083	Not Available
084	Not Available

Rear IO Module 8 — IO6FA

Port	Type
085	SFP Not Fitted
086	SFP Not Fitted
087	SFP Not Fitted
088	SFP Not Fitted
089	SFP Not Fitted
090	SFP Not Fitted
091	SFP Not Fitted
092	SFP Not Fitted
093	SFP Not Fitted
094	SFP Not Fitted
095	SFP Fibre Tx
096	SFP Fibre Tx

Fig 34. Port Modules Screen

9.3.4.1 Module Types

Each module is identified by its type at the top of each Rear IO Module field:

Module Type	Description
IO6FA	12 port SFP
IO12E	12 port HD BNC
Not fitted	No module fitted into module slot

Table 17. Module Hardware Types

9.3.4.2 Port Types

Each numbered port displays the type of hardware type fitted, and whether the port is an input or output port.

Port Type	Description
SFP Fiber Rx	SFP Fiber Input Port
SFP Fiber Tx	SFP Fiber Output Port
SFP Copper Rx	SFP HD BNC Input Port
SFP Copper Tx	SFP HD BNC Output Port
Copper Rx/Tx	HD BNC fitted but port not configured
Copper Rx	Input port of an HD BNC Fixed Module
Copper Tx	Output port of an HD BNC Fixed Module
SFP Unknown	SFP fitted but type unknown
SFP Not Fitted	Empty cage in the SFP module
Not Available	No module fitted

Table 18. Port Hardware Types

10. Testing

10.1 Description

In this section the Routing panel is function is described. The XY Panel can then be used to make a route and prove that the Vega router is functioning correctly.

Select the Video Matrix from the Network Browser, and double-click on Level 1 to open the template.

The Video Routing screen displays.

At the top of the display the following pages are listed in a drop-down menu:

- XY Panel Control
- Routing

Either of these pages can be used for making routes however only the XY Panel is described in this section. For further information see the Vega Control Panel user manual.

10.2 XY Panel Control

The XY Panel Control page is the default page that displays when opening the Video Routing Screen.

The XY Panel is used to set up routes from sources to destinations.

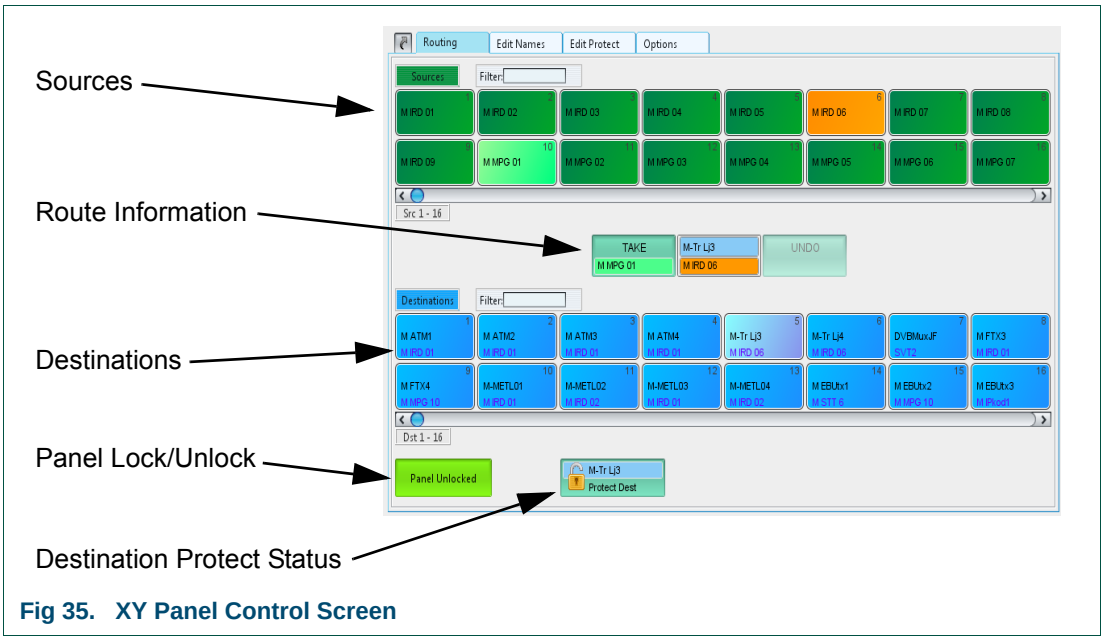


Fig 35. XY Panel Control Screen

Routes can be set up to either occur immediately as soon as the route is made, or upon the click of a **Take** button.

An **Undo** button can be added to the display so that a route may be undone. When the **Undo** button is set up an Undo Timeout is included. The timeout specifies the duration after routing in which it is still possible to revert back to the state before the route was made.

The **Undo** button is available whether routing immediately or when using a **Take** button.

10.2.1 Navigating the XY Panel

Use the slider bars under the source and destination panels to navigate forward and reverse through the pages.

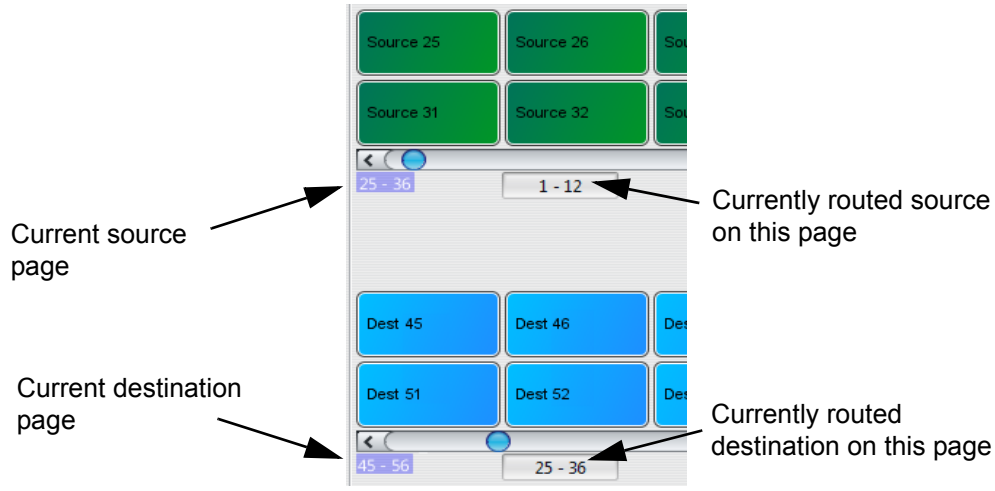


Fig 36. Panel Pages

Navigating to another page of sources or destinations, displays a button indicating on which page the currently selected source or destination is on.

- Click on the button to navigate directly to the page of the currently selected source or destination, as applicable.

10.3 Set and Test a Route

To set and test a route:

1. Ensure that a valid video source is connected to a router input and a signal analyzer to the destination that the source will be routed to.

2. Click on a destination button for the destination with the signal analyzer.

   The destination, and current source if previously set, display in the Route Information area of the screen.

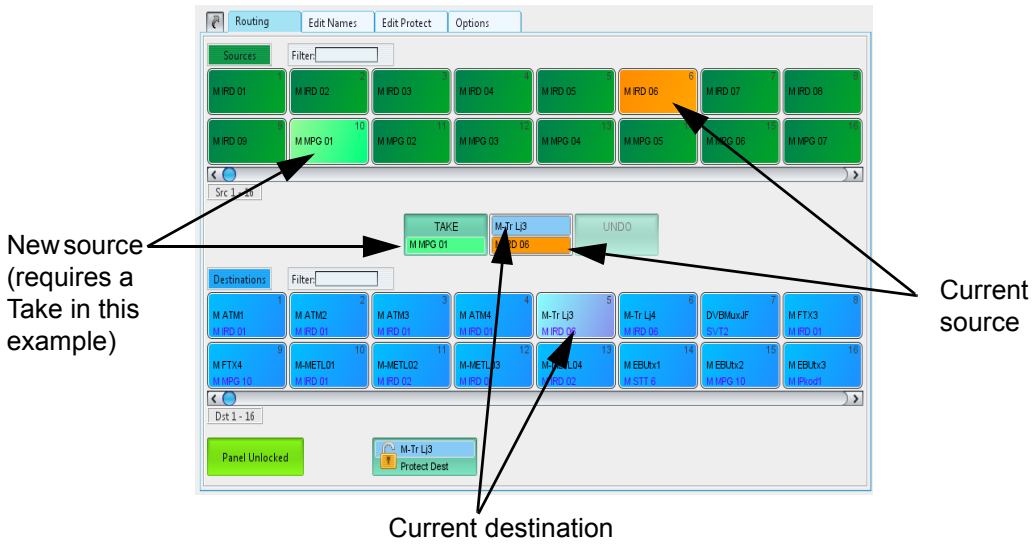


Fig 37. Route Information

3. Click on the source button for the input with the test video signal.

4. Click on the **Take** button and check that the signal has been correctly passed to the signal analyzer.

   To set another route, click on another destination button.

   Clicking on the currently selected destination deselects the destination and returns the display to the default state.

Note: Deselecting a destination does not affect its routing.

11. Maintenance

- Refer to Section 1. Safety on page 9 before working on the Vega Video Router.
- The Installation and Maintenance of the Vega router 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 safety regulations of the indigenous authority.

11.1 Power and Fuses

The mains Voltage will be automatically detected provided it is in the range of 100 - 240 Vac and 50 - 60 Hz. No voltage adjustment procedure is required.

- Caution: Double Pole/Neutral Fusing.
- Before connecting power to the router, refer to the safety warnings in section 1.
- Ensure that all of the router modules and cards are correctly installed and firmly seated before powering on the Vega router.

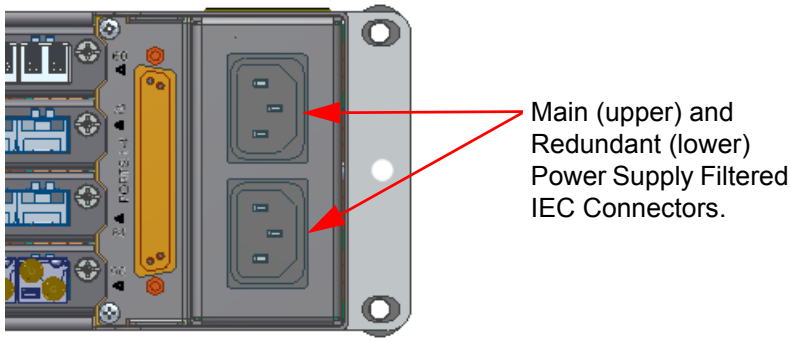


Fig 38. Vega 2U Router IEC Power Supply Connectors

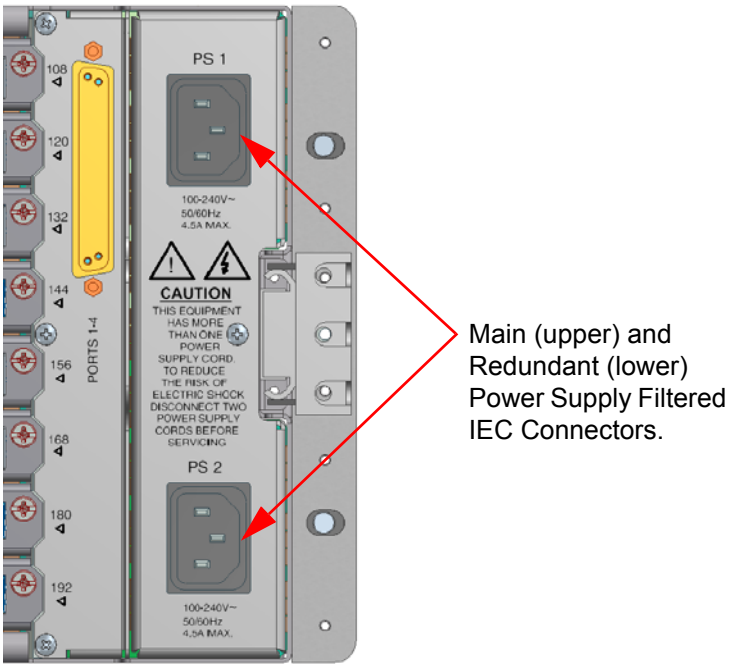


Fig 39. Vega 4U Router IEC Power Supply Connectors

Each IEC connector supplies an independent feed of power to each of the two power supply modules as shown in Figure 40. The filtered IEC320 mains power connectors are suitable for standard IEC power cables. The IEC power inlet is the mains disconnection device for this unit.

There are two 15 A fast blowing fuses inside the power supply (one in the Live and one in the Neutral line) that cannot be replaced by the user, see section 11.1.1 for details on removing a power supply.

The router supports dual power supplies for redundancy. This is an option and so there may not be a second PSU fitted to your router.

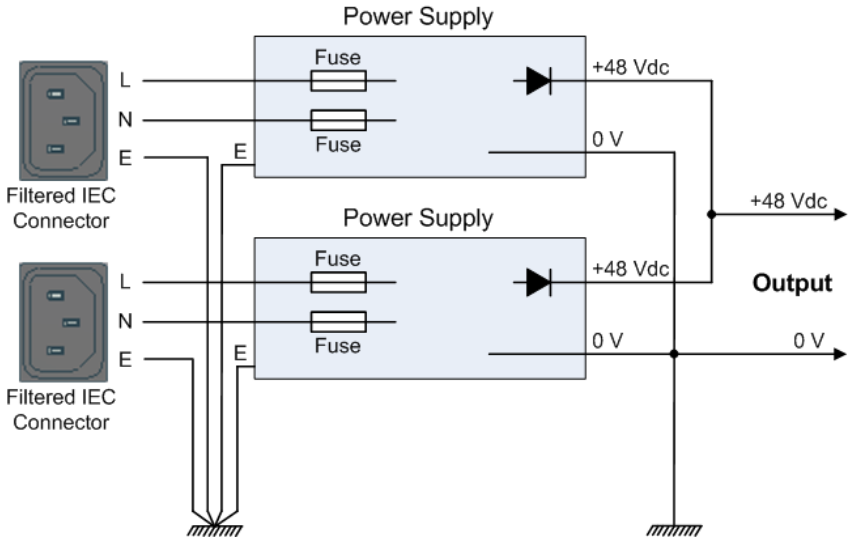


Fig 40. Vega Router IEC Power Supply Schematic

11.1.1 Power Supply Replacement

The Vega Video Router can have up to two power supplies, a main and redundant in case of PSU failure.

Power supplies can be safely hot-swapped without the need for the system to be powered down (only if two power supplies are fitted and at least one is still working).

- Caution: Double Pole/Neutral Fusing.
- Once the failed PSU has been removed PSU redundancy will be lost until a new PSU is fitted.

  Vega 2U replacement PSU part number = VG-PSU096-A

  Vega 4U replacement PSU part number = VG-PSU192-A
- If a power supply fan fails the Vega rear fan will increase in speed to compensate.
- The fan will continue to run for 10 to 20 seconds after the power supply is removed from the router as 48 Vdc remains present for a short time.

1. If a Power Supply or Power Supply fan fails on the Vega Video Router router the Status LEDs on the left of the Vega Video Router front panel will indicate which has failed (Figure 41 and Table 19.).

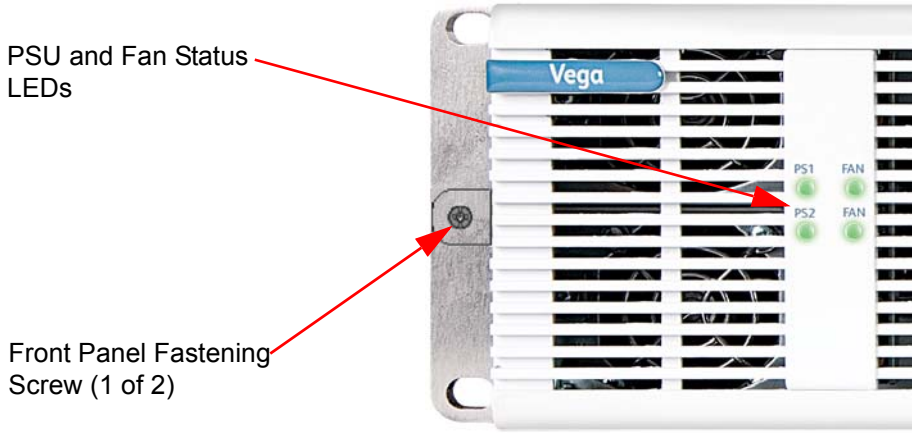


Fig 41. Router PSU Status Indication (Vega 2U shown as an example)

Status LEDs	Function
PS1 LED (upper PSU)	• **Green** = PSU 1 +48 Vdc output working • **Off** = PSU 1 not fitted • **Red** = PSU 1 +48 Vdc output not present **Possible Causes:** PSU 1 PSU board fuse(s) blown (Not user replaceable) PSU 1 mains cable not connected PSU 1 has failed
Fan (upper PSU Fan)	• **Green** = Fan running** • **Off** = PSU 1 not fitted • **Red** = Failed ****Note**: If the associated PSU has failed or has no mains signal the fan will still run from the common 48 Vdc output.

Table 19. Vega Status LEDs

Status LEDs	Function
PS2 LED (lower PSU)	• **Green** = PSU 2 +48 Vdc Output Working • **Off** = PSU 2 not fitted • **Red** = PSU 2 +48 Vdc Output not present **Possible Causes**: PSU 2 PSU board fuse(s) blown (Not user replaceable) PSU 2 mains cable not connected PSU 2 has failed
Fan (lower PSU Fan)	• **Green** = Fan running** • **Off** = PSU 2 not fitted • **Red** = Failed ****Note**: If the associated PSU has failed or has no mains signal the fan will still run from the common 48 Vdc output.

Table 19. Vega Status LEDs

2. Loosen the captive front panel fastening screws on the left and right of the router (see Figure 42).
3. Open the front door of the Vega Video Router router by pulling it outwards and swinging it down.

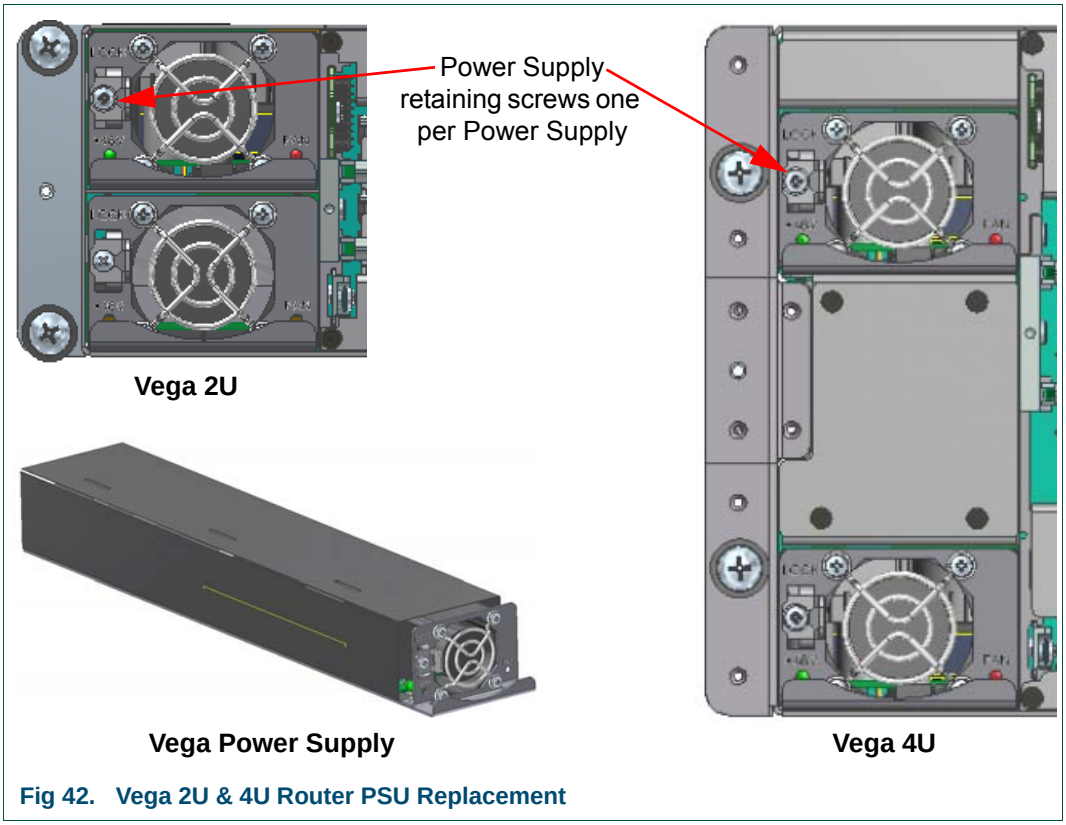


Fig 42. Vega 2U & 4U Router PSU Replacement

- Caution: Double Pole/Neutral Fusing.
- The fan will continue to run for 10 to 20 seconds after the power supply is removed from the router as 48 Vdc remains present for a short time.
- Once the Power Supply has been removed do not place your hands or any item inside the space left by the power supply as mains voltages are present inside the router.

4. Unscrew the power supply retaining screw on the failed power supply (Figure 42).
5. Slide the lock to the **Right** to release the failed power supply.Pull the failed power supply out of the Vega Video Router while supporting the power supply from underneath.
6. Slide the replacement power supply into the Vega Video Router and into the connectors at the rear of the router.
7. Slide the lock to the **Left** to lock the power supply into position.
8. Tighten the power supply retaining screw.
9. The status LEDs for the replacement power supply should now turn Green to indicate that the power supply is working correctly.
10. Close the router front panel.
11. Tighten the captive front panel fastening screws on the left and right of the router (see Figure 41) to lock the front panel.

11.2 Ventilation

The Vega 2U router has two fans at the rear (one behind the other) and the Vega 4U router has two fans at the rear (one above the other). For both routers the rear fans pull air in through the front of the unit and exhaust the air out of the rear of the router. The power supplies are also fitted with fans at the front working in the same configuration.

Note:

- For ventilation purposes, there must be a gap of at least 50 mm (2 inches) at the front of the Vega Video Router router and 100 mm (4 inches) at the rear of the router.
- Blocking the ventilation at the front or rear of the router will cause the router to overheat and the router will fail.
- The Vega router must be powered down if both rear fans fail.
- If a power supply fan fails the Vega rear fan will increase in speed to compensate.

11.2.1 Rear Fan Replacement

The rear fan assemblies can easily be replaced if required. If one fan fails in a fan assembly the fan assembly should be replaced as soon as possible to maintain the redundancy of the router rear fans.

Important: The rear fan assembly can be hot swapped but must be replaced within five minutes to ensure the Vega router doesn't overheat.

1. Before removing the fans read the following notes.

- Caution: Double Pole/Neutral Fusing.
- Ensure you have a replacement rear fan assembly before removing the old fan assembly.

  Vega 2U Fan Module assembly replacement = VG-RMFU - Rear dual fan unit.

  Vega 4U Fan Module assembly replacement = VG-RMFU192 - Rear fan unit.
- The fan blades can continue to spin for a short time after the fan assembly has been removed from the router.

2. Remove the four fan retaining screws highlighted in red in Figure 43.

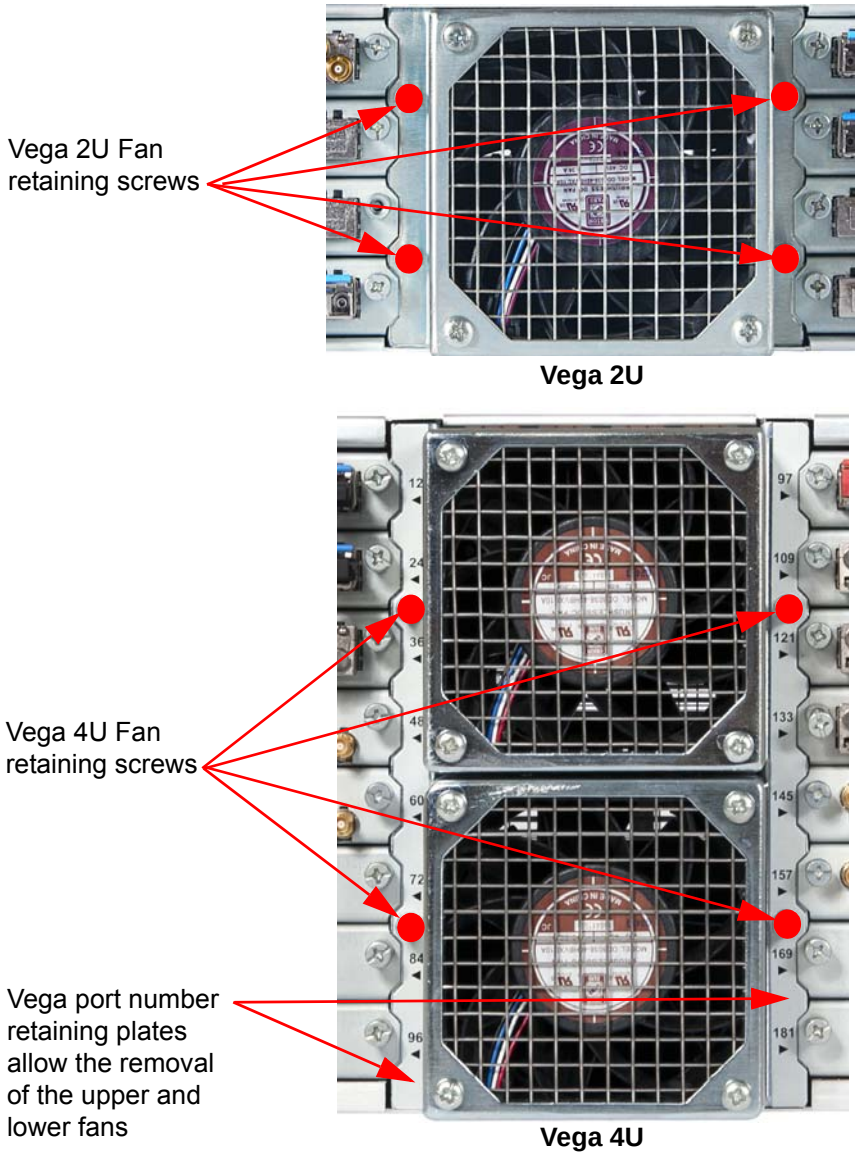


Fig 43. Vega 2U and 4U Router Rear Fans

3. **Vega 4U only**: remove the two port number retaining plates shown in Figure 43 to free the fan assemblies.

4. Pull the failed fan assembly straight back from the Vega router and support it from underneath. The entire fan assembly will slide out.

Once the fan has been removed do not place your hands or any item inside the space left by the fan as voltages are still present inside the router.

5. Support the replacement fan assembly from underneath and slide it into the router.

6. Ensure that the fan assembly is fully seated in the router. There should be no gap between the Vega rear panel and the flange of the fan assembly.

7. **Vega 4U only**: replace the two port number retaining plates shown in Figure 43.

8. Screw the fan retaining screws into the router (see Figure 43).

9. Check that the fans power up correctly. If the fans are not working repeat the fitting process.

11.3 Vega Upgrades

The Vega router software and the router controller firmware can be upgraded through the RollCall Control Panel applet. Upgrade packages are supplied by Snell in the form of a .zip file.

11.3.1 Importing Vega Software Packages

1. Save the supplied upgrade package to a folder on the PC that will be used to upgrade the router. Upgrade packages are supplied in a compressed file format (.zip) and they should not be extracted.

2. Click on the **Software Releases** button ( ) in the main toolbar (see Fig 44.).

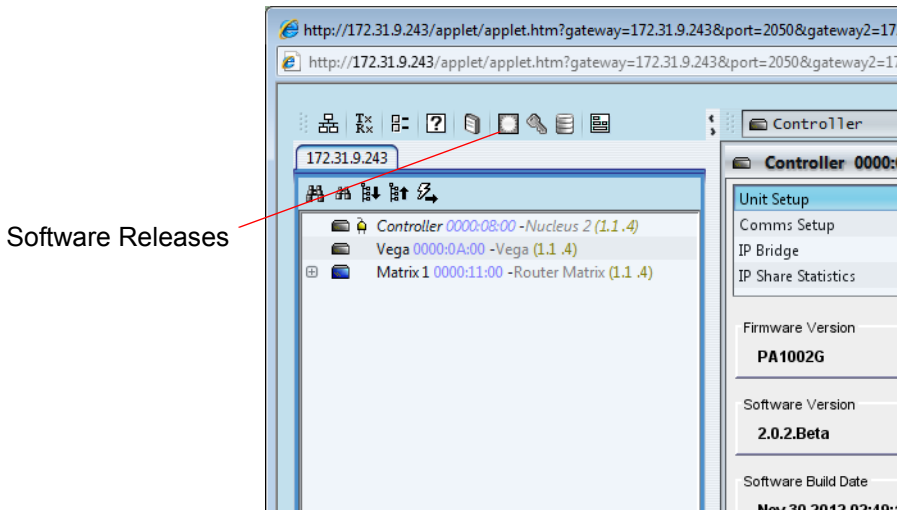


Fig 44. Software Releases

3. The Software Releases screen displays.

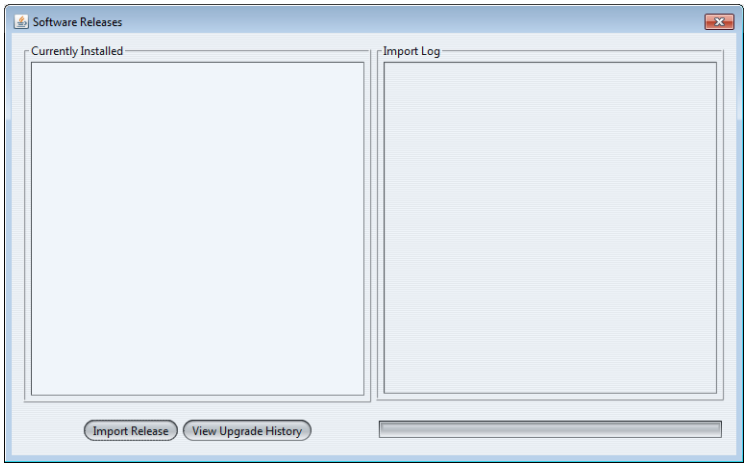


Fig 45. Software Releases Screen

4. Click on the **Import Release** button.

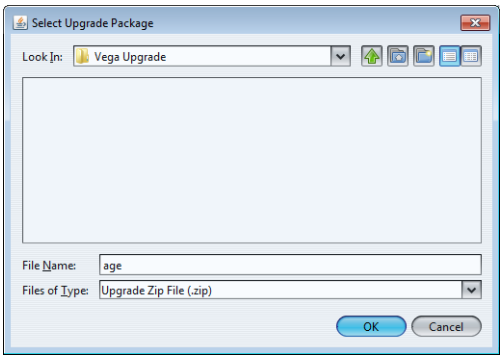


Fig 46. Select Upgrade Package Screen

5. Browse to the folder containing the upgrade package.
6. Select the upgrade package and click **OK**.
7. The upgrade package will be imported and the router can then be upgraded

   The upgrade is carried out in two stages:

   - Vega System upgrade - see section 11.3.2.
   - Controller upgrade - see section 11.3.3.

11.3.2 Upgrade the Vega System Software

The Vega System upgrade updates the following files:

- Input/Output card FPGA firmware file
- Crosspoint card FPGA firmware file
- Buffer Card FPGA firmware file

Note:

- The router must be taken Off Air while doing this upgrade.
- You must be connected to the Active controller to perform this upgrade.

Ensure the software upgrade package has been imported before performing this upgrade (see section 11.3.1 for details).

1. Right-click on **Vega** in the Network tree, and select **Unit Upgrade** from the menu.

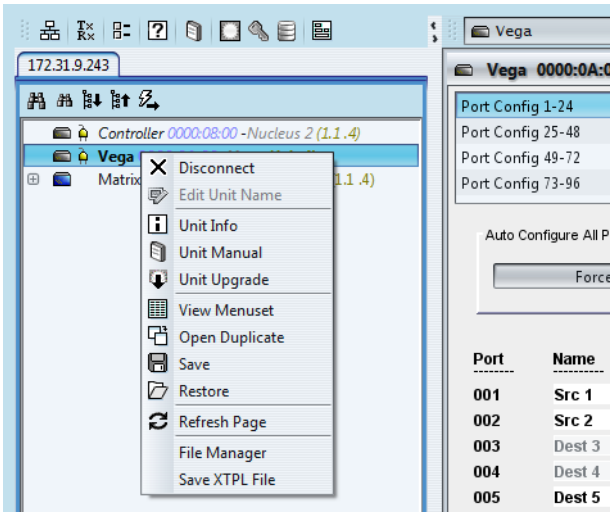


Fig 47. Network Tree

2. The Unit Upgrade screen displays, showing the current software package (pre-upgrade) that is running on the router. The actual firmware versions currently running for the crosspoint and input/output modules can be found in the Module Status and Enclosure Status screens.

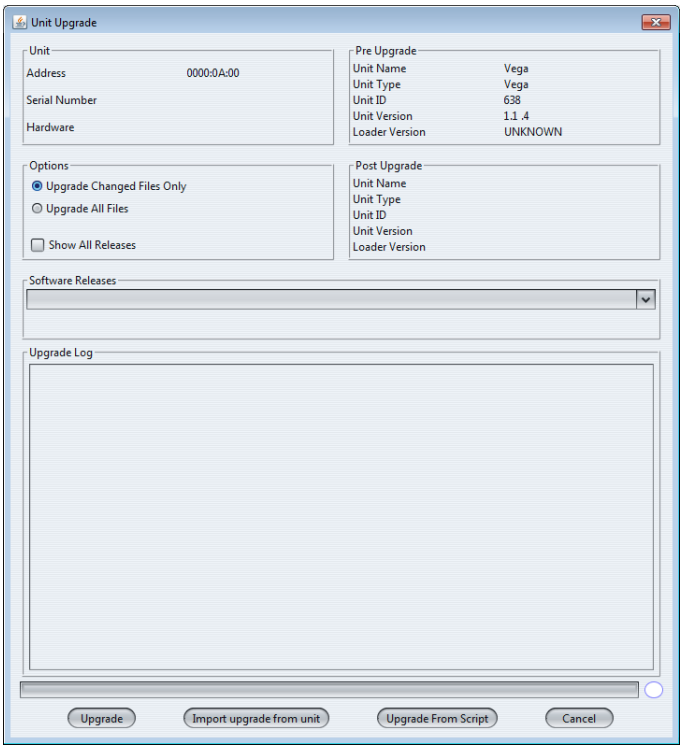


Fig 48. Vega Unit Upgrade Screen

3. Click on the Software Releases drop-down list and select the required upgrade package.
4. Make sure the **Upgrade All Files** option is set and click on the **Upgrade** button.
5. The router will now be upgraded. Follow the on screen prompts.

   Once the upgrade is complete the router is automatically restarted.
6. Confirm that the router is working correctly.

Note: The System node will continue to report the original version number until the Controller upgrade has been completed.

11.3.3 Upgrade the Vega Controller

Ensure the upgrade package has been imported before performing this upgrade (see section 11.3.1 for details).

The Vega Controller upgrade updates the following files:

- Vega Controller RTB file
- Vega Controller FPGA firmware file
- Vega Controller Fan control firmware file
- RollCall Command Set Files
- Web Content Files

Note:

- On a dual redundant controller system the router controllers can be updated while the router is on-air, if required. If the router has only a single controller the upgrade must be performed off-air, as the crosspoints cannot be switched while the controller is being updated.

- If dual controllers are fitted to the router, the inactive controller should be updated first. This can then be made the active controller, and the other controller (now inactive) can be updated.

  See Upgrade the Inactive Controller on page 76.

- If only one controller is fitted the router must be off-air.

  See Upgrade the Active Controller on page 79.

11.3.3.1 Upgrade the Inactive Controller

1. Connect to the inactive secondary controller. To do this, click on the **Build Network** button ( ) in the main toolbar.

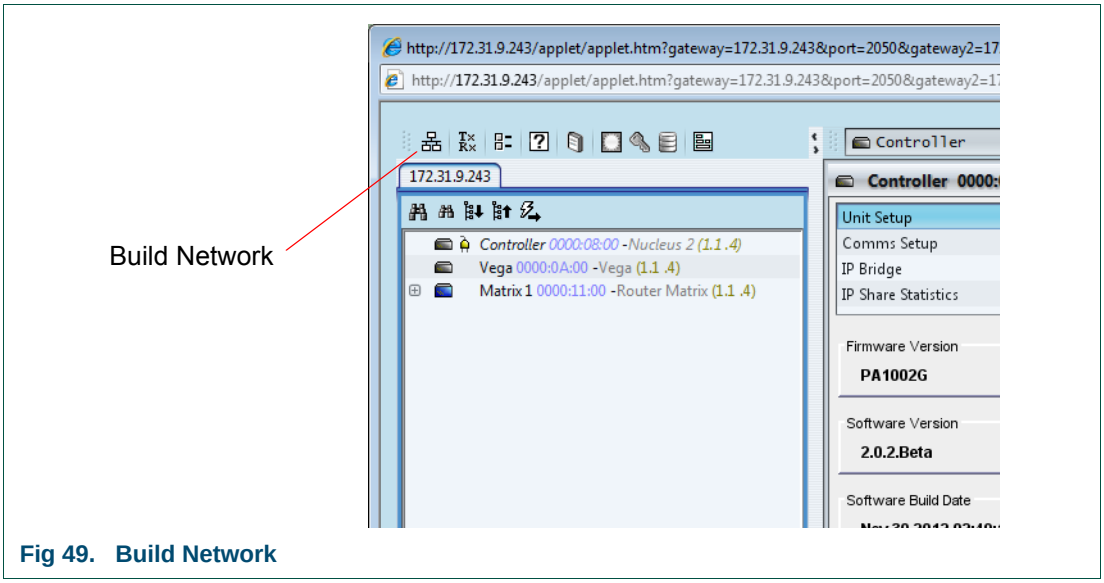


Fig 49. Build Network

2. The Build Network screen displays.

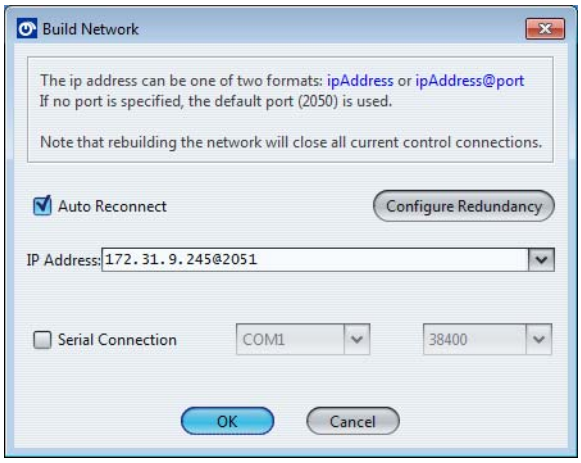


Fig 50. Build Network Screen

3. Type the IP address of the inactive controller, and append the following: @2051.

   For example, the default IP address for the controller is: 172.19.39.151@2051

4. The inactive controller displays in the network tree.

5. Right-click on the controller and select **Unit Upgrade** from the menu.

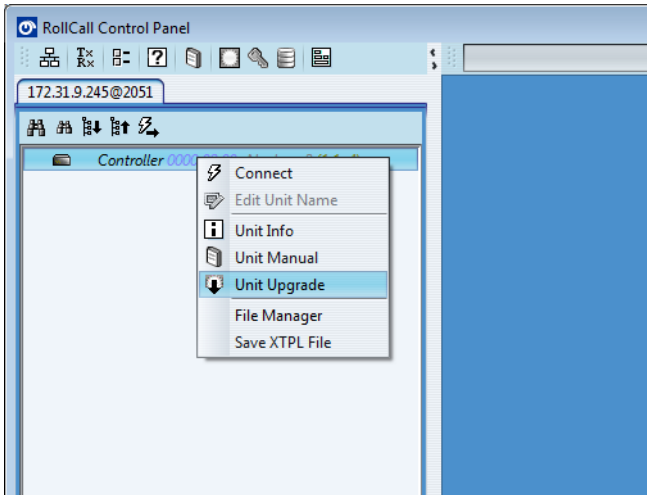


Fig 51. Network Tree

6. Click on the Software Releases drop-down list and select the required upgrade package.

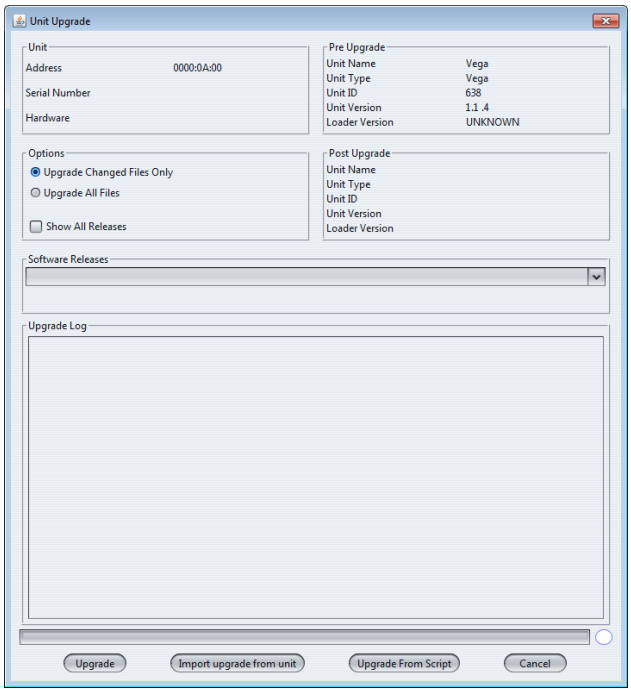


Fig 52. Controller Unit Upgrade Screen

7. Leave the options set to **Upgrade Changed Files Only**, and click on the **Upgrade** button.
8. The controller will now be upgraded. Follow the on screen prompts.

   Once the upgrade is complete the controller is automatically restarted.
9. Reset the other (active controller) making this upgraded controller active.
10. Confirm that the router is working correctly.
11. Repeat the process above for the now inactive pre-upgraded controller.

11.3.3.2 Upgrade the Active Controller

1. Right-click on **Controller** in the network tree, and select **Unit Upgrade** from the menu.

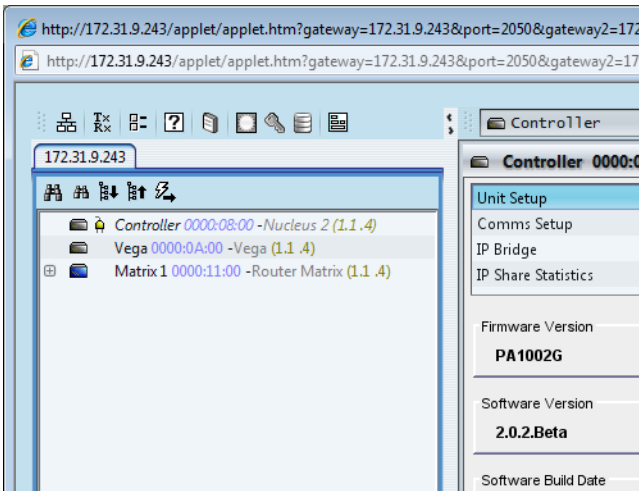


Fig 53. Network Tree

2. Click on the Software Releases drop-down list and select the required upgrade package.

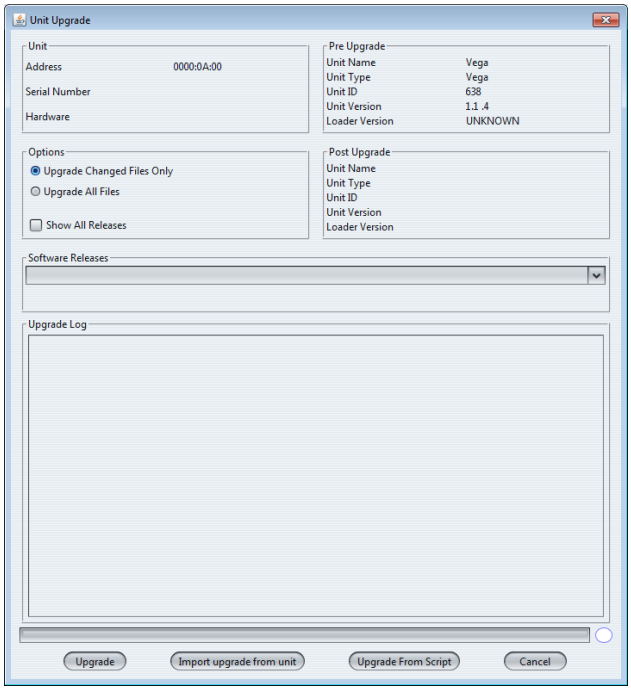


Fig 54. Controller Unit Upgrade Screen

3. Leave the options set to **Upgrade Changed Files Only**, and click on the **Upgrade** button.

Note:

- During the active controller upgrade the main fans will run at full speed. This is normal and the fan speed will return to normal once the upgrade is complete.

4. The controller will now be upgraded. Follow the on screen prompts.

   Once the upgrade is complete the controller is automatically restarted.

5. Confirm that the router is working correctly.

11.4 Upgrading the Vega Router Firmware without RollCall

The supplied USB stick(s) can be used to upgrade the Vega router firmware and specify IP addresses without the need to use RollCall (see Appendix B. for details) although this is for advanced users only.

11.5 Reset Vega Controllers to Factory Defaults

Each Vega Controller is supplied with a USB memory stick. The USB memory sticks are used to reset the Vega Controllers to a factory default condition and will erase all previous settings from the controllers and restore the default IP address.

Note:

- A factory reset should only be carried out if you are willing to loose all Vega controller settings.
- Do not attempt a factory reset if the contents of the USB Memory Stick have been modified in any way.

1. Locate the **Inactive** Vega controller, see Table 20. for LED positions:

   LED 1:
   Idle = Flashing Blue
   Active = Flashing Green

Note: If only one controller is installed there is no need to check LED 1 but remember the Controller is active and no control will be possible while the reset is in progress.

2. Check that LED 1 confirms the Vega controller is idle.
3. Insert the correct USB memory stick (Controller A or Controller B) in the USB connector on the front of the Idle Vega controller (see Table 20.).
4. Press the **Reset** button (see Table 20.).
5. The Vega controller will reboot and the Vega controller will be reset to its factory default values. See Table 20. for the LED status that is displayed when the factory reset is complete.

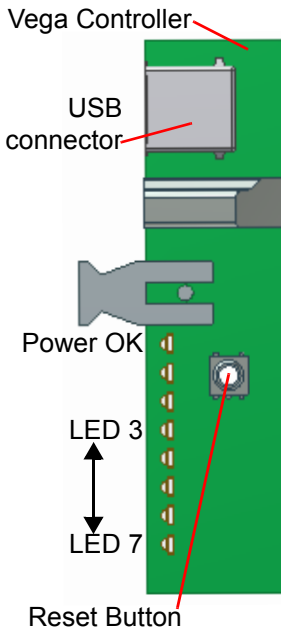
LED 3 to 7 Status	Description	LED Location
Flashing Green	When LEDs 3 to 7 continuously flash Green the factory reset has been successfully carried out and it is safe to remove the USB memory stick and re-start the controller. See step 6.	
Fault Conditions		
Flashing Orange	If LEDs 3 to 7 continuously flash Orange there has been a minor error during the factory reset.	
Flashing Red	If LEDs 3 to 7 continuously flash Red there has been a major error during the factory reset.	
In the Event of one or more Errors The most likely cause of an error is that the contents of the USB stick have been modified. Details of the fault will be recorded on the USB memory stick in the RunLog.txt log file. It's best to start at the bottom of the RunLog.txt file and work up as this is usually the quickest way to find the problem. If further help is required please contact Customer Support (see "Customer Support" on page 7 for contact details).		

Table 20. Controller LED Status After Software Update

6. When LEDs 3 to 7 (see Table 20.) on the controller flash green the process is complete.
7. Remove the USB memory stick and press the reset button to reboot the Vega controller.
8. The Vega controller will be rebooted.

11.11.6 Reset the Second Vega Controller to Factory Defaults

1. If the second Vega controller remains active press its reset button (see Table 20.). The Active and Idle Vega controllers will swap over.
2. Repeat the procedure from step 2. on page 80 to step 7. on page 81 for the second Vega controller.

Important: Remove the USB memory stick before shutting the Vega Video Router front panel. Leaving the USB memory stick in the Vega controller will result in damage to the USB memory stick and the Vega controller.

11.7 Backup and Restore

The Vega router and Level configuration settings can be saved (backed up) once you are happy with the router configuration. Any number of different configurations can be backed up making it possible to revert to previously saved configurations if required.

11.7.1 Vega Router Backup

Saves the details configured from the **Vega** section of the network tree such as; Port configuration and References.

1. Right-click on **Vega** in the Network tree, and select **Save** from the menu.

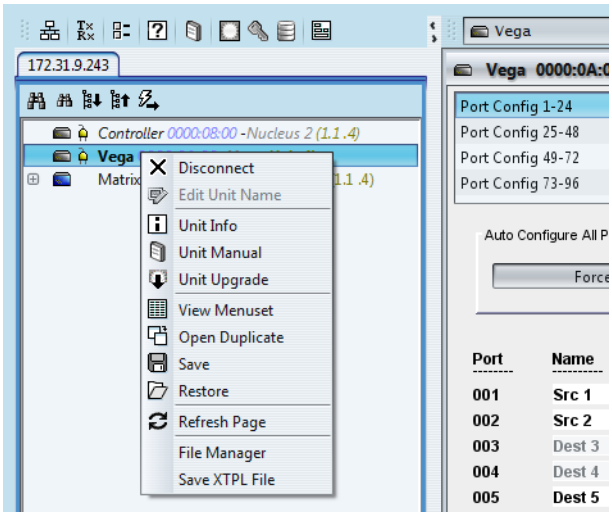


Fig 55. Network Tree

2. Browse a location and save the Vega backup file.

11.7.2 Vega Router Restore

Writes the previously saved **Vega** configuration to the Vega router. Includes; Port configuration and References.

Note: This will completely overwrite all of the configuration settings in the Vega router. If you need to keep the current settings then make sure you back them up before restoring the Vega router (see section 11.7.1).

1. Right-click on **Vega** in the Network tree, and select **Restore** from the menu.

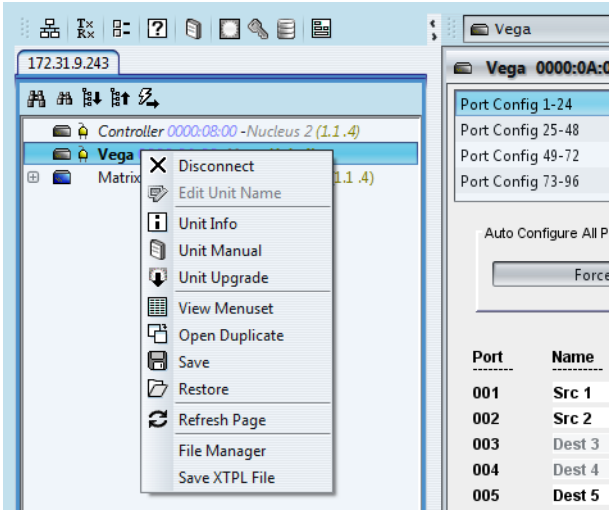


Fig 56. Network Tree

2. Browse to the location of the Vega backup file and follow the on screen instructions to restore the backup file to the Vega router.

11.7.3 Vega Level Backup

Saves the Crosspoint Routes and Name information from the **Level 1** section of the network tree.

1. Right-click on **Level 1** in the Network tree, and select **Save** from the menu.

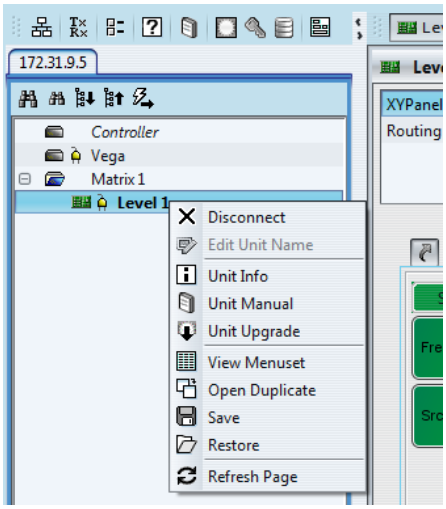


Fig 57. Network Tree

2. Browse a location and save the Level 1 backup file.

11.7.4 Vega Level Restore

Writes the previously saved Crosspoint Routes and Name information to the **Level 1** section of the network tree.

Note: This will completely overwrite all of the settings in the Level 1 section of the Vega router. If you need to keep the current settings then make sure you back them up before restoring the Vega router (see section 11.7.3).

1. Right-click on **Vega** in the Network tree, and select **Restore** from the menu.

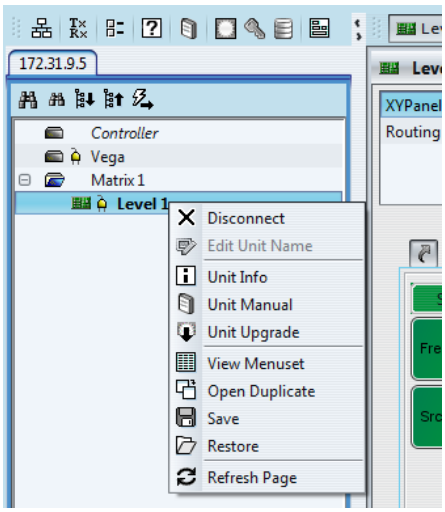


Fig 58. Network Tree

2. Browse to the location of the Level 1 backup file and follow the on screen instructions to restore the backup file to the Vega router.

Appendix A. Connectors

- Refer to Section 1. Safety on page 9 before connecting power to the unit
- The Installation and Maintenance of the Vega router 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 safety regulations of the indigenous authority.

Caution: Double Pole/Neutral Fusing.

A.1 Rear View

Figure 59 shows the location of the connectors detailed in this section.

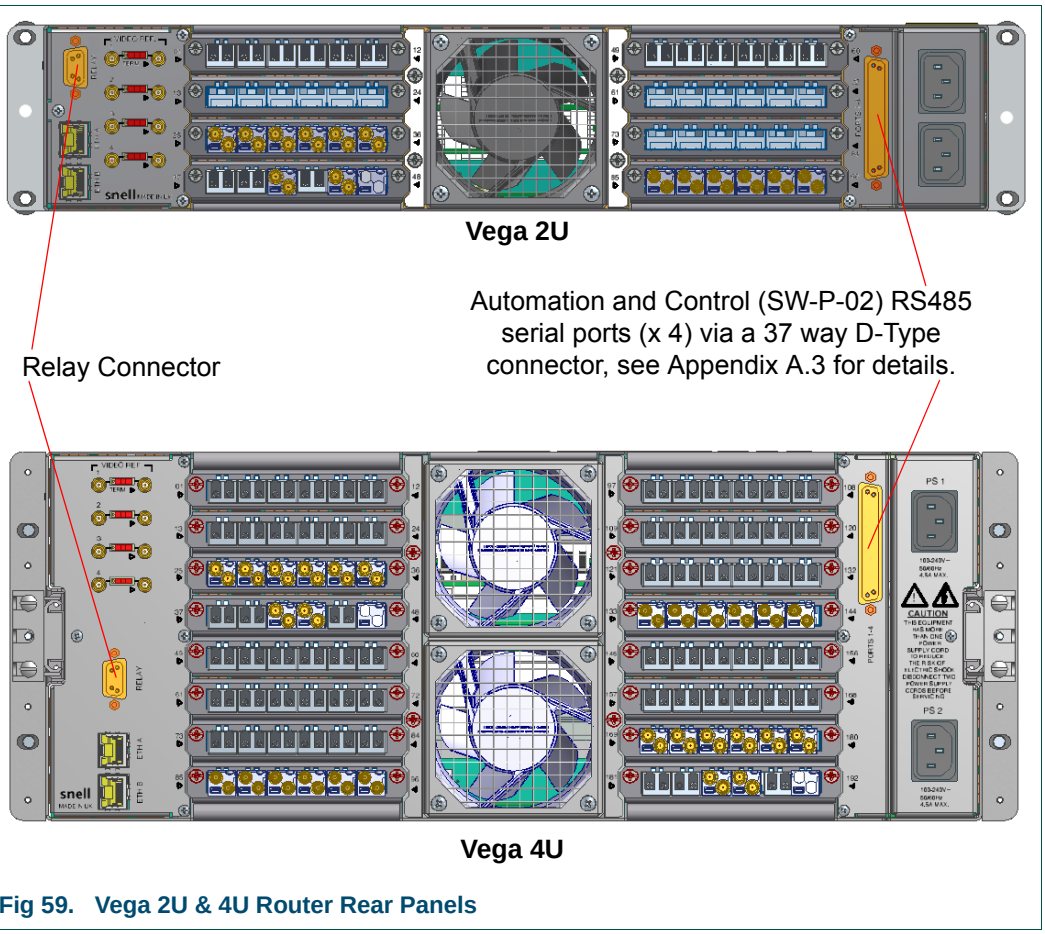
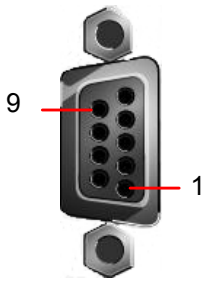


Fig 59. Vega 2U & 4U Router Rear Panels

A.2 Relay 9 Way Female D-Type Connector

The alarm relay contacts allow an external device to become a status monitor for the router. Under normal operating conditions where everything is working correctly, the relay contacts are in the normally-closed position. When there is an alarm condition on the Vega router the relay contacts will switch.



Pins	Signals
1	GND
2	Relay Common
3	GND
4	Not connected
5	Not connected
6	Relay Normally Closed
7	Relay Normally Open
8	Not connected
9	Not connected

Table 21. Relay 9 Way Female D-Type Connector Details

A.3 37 Way Female D-Type Connector

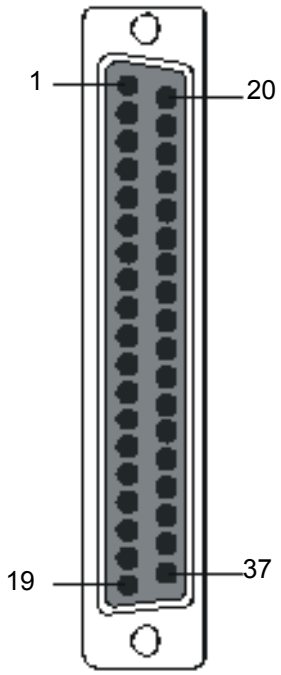
A 37 way D-type to four 9 way D-type breakout cable is available to purchase from Snell and gives access to the four serial (RS-422) ports on the rear of the Vega router.

These RS-422 ports can be connected to external automation or control systems running the General Switcher (SW-P-02) protocol (see section 8.3 for details of the SW-P-02 protocol).

- **VG-MC37D** - 37 way D-type connector and shell (solder bucket and screw locks). Used for assembling a breakout cable for the four auxiliary serial ports - Requires assembly.
- **VG-CA37D9-4** - Pre-assembled cable assembly, 37-way D to four 9-way D-type connectors for the auxiliary serial ports (For details of the RS-422 pin outs from the breakout cable see Table 23.) - Purchased separately.

Note:

- The VG-MC37D must be assembled and wired before it can be used.
- The VG-CA37D9-4 must be purchased separately if required.

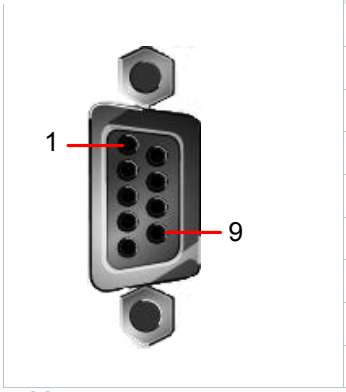


37 Way Pin Outs	Function	9 Way Pin Outs	37 Way Pin Outs	Function	9 Way Pin Outs
1	Not connected		20	Port 1 GND	9
2	Not connected		21	Port 3 TX-	8
3	Not connected		22	Port 3 RX-	2
4	Port 3 GND	6	23	Not connected	
5	Port 3 RX+	7	24	Port 3 TX+	3
6	Not connected		25	Port 3 GND	9
7	Port 4 TX-	8	26	Not connected	
8	Port 4 RX-	2	27	Port 4 GND	6
9	Not connected		28	Port 4 RX+	7
10	Port 4 TX+	3	29	Not connected	
11	Port 4 GND	9	30	Port 2 TX-	8
12	Not connected		31	Port 2 RX-	2
13	Port 2 GND	6	32	Port 2 GND	9
14	Port 2 RX+	7	33	Port 2 TX+	3
15	Not connected		34	Not connected	
16	Port 1 TX-	8	35	Not connected	
17	Port 1 RX-	2	36	Not connected	
18	Port 1 GND	6	37	Port 1 RX+	7
19	Port 1 TX+	3			

Table 22. 37 Way Female D-type Auxiliary Serial Port Connections

A.3.1 RS422 9 Way Female D-Type Connectors

The RS-422 pin outs for Vega serial ports 1 to 4 are shown in Table 23.



Pins	General Switcher (SW-P-02) Protocol
1	Chassis
2	Tx-
3	Rx+
4	0V
5	N/C
6	0V
7	Tx+
8	Rx-
9	Chassis

Table 23. RS422 9 Way D-Type Female Connector

Appendix B. Vega Controller Advanced Operations

B.1 Overview

RollCall is almost always used to upgrade the firmware in the Vega Controllers, Input/Output cards, Buffer cards (Vega 4U only) and Crosspoint cards as this is the easiest and safest method of doing so.

See the following manual sections for details on using RollCall to upgrade the Vega router:

- Section 11.3.2 - Vega System upgrade updates the following files:
  - Input/Output card FPGA firmware file
  - Crosspoint card FPGA firmware file
  - Buffer Card FPGA firmware file
- Section 11.3.3 - Vega Controller upgrade updates the following files:
  - Vega Controller RTB file
  - Vega Controller FPGA firmware file
  - Vega Controller Fan control firmware file
  - RollCall Command Set Files
  - Web Content Files

If you have no PC access to the Vega Router it is possible to carry out these tasks as well as some others directly on the router by using a suitably programmed USB memory stick. Appendix B contains the instructions for doing this.

Important:

- The procedures described in Appendix B should only be carried out by advanced users and only when no PC connection is available. If a PC connection is available it should be used. See the Vega Router Control manual for details.

B.2 Update Vega Controller Software Using Pbak Deploy

The Pbak Deploy tool is part of the Centra Workbench installation. It makes it possible to transfer RTB files to a bootable USB memory stick. The RTB file is the operating system file for the Vega controller.

Note:

- This procedure should only be carried out by advanced users and only when no PC connection is available. If a PC connection is available it should be used see section 11.3 on page 73 for details.
- A bootable USB memory stick formatted with the FAT file system (not FAT 32) is required for this process. Each Vega controller is supplied with a USB memory stick that is pre-formatted for this purpose.
- If you need to create the bootable USB memory stick see section B.2.6.
- The **Dat** and **On Time** tools are not required for the Vega Video Router.

Because other Snell products use the Pbak Deploy tool, the **Dat** and **On Time** tools are not required on the Vega Video Router.

To open Pbak Deploy Tool, from the Windows Start menu browse to:

Start | All Programs | Snell | MCM | Utilities | Pbak Deploy Tool

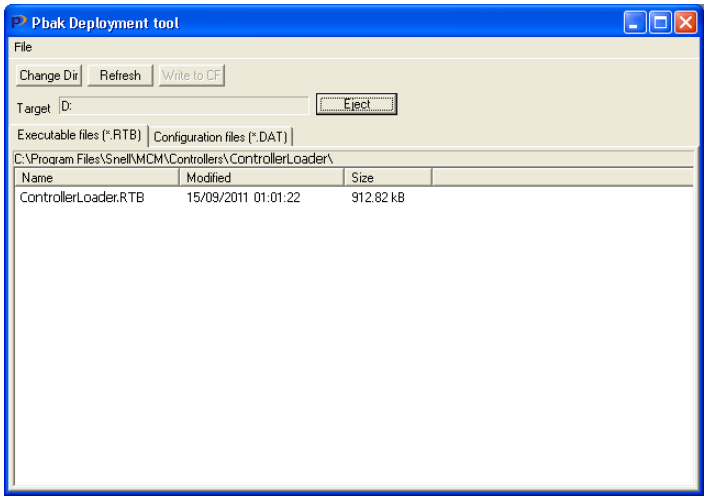


Fig 60. Pbak Deploy Tool

B.2.1 Writing the RTB files to the USB Memory Stick

A bootable USB memory stick is required for this process.

Note:

- Each Vega controller is supplied with a suitably formatted USB memory stick and this should be used if possible.

If you need to create the bootable USB memory stick see section B.2.6. Once created this bootable USB memory stick should be labeled and kept for future use.

1. Insert the bootable USB memory stick in the computer running Pbak Deploy.
2. Start Pbak Deploy and select **File | Configuration**.
3. Select the USB memory stick as the **Target Drive** from the drop-down list.

4. Select the **RTB directory** on your computer. If you installed to the default folders, browse to the RTB folder located in:

   C:\Program Files\Snell\MCM\Controllers\ControllerLoader

Note:

- If Centra Workbench is installed in the default location on a 64 bit Windows 7 computer then it will be located in the “Program Files (X86)” folder.
- The **Dat directory** and **on time tools directory** are not required for Vega controller configuration.

5. Click **OK**.
6. Select the **ControllerLoader.RTB** file from the list and click the **Write to CF** button.
7. Wait for Pbak Deploy to finish writing files to the USB memory stick.
8. Close Pbak Deploy.
9. If the Vega controller software needs updating manually copy the **CentraController.RTB** file from C:\Program Files\Snell\MCM\Controllers\Centra\ to the USB memory stick using Microsoft Windows Explorer.
10. See Table 24. for details of other files that need to be manually added to the USB memory stick.

B.2.2 USB Memory Stick Files

The USB memory stick contains a number of files that are automatically created by Pbak Deploy and a number of files that are created by the user and manually copied on to the USB memory stick.

Important:

- Do not leave the USB memory stick in a computer while the computer is being rebooted as this can cause the computer to malfunction.
- For this reason it is also recommended that the USB memory stick is removed from the computer when not in use in case the computer is rebooted accidentally, due to a power failure or due to automatic updates being installed.

Table 24. lists the USB memory stick files:

Filename	Description
Actions.txt	**Mandatory**: The Actions.txt file contains any actions that need to be carried out on one or more Vega router controllers. The text file can be created and edited in any pure text editor, for example Microsoft Notepad. The Actions.txt file can be created from new or based on the example Actions.txt files stored in `C:\Program Files\Snell\MCM\Controllers\ControllerLoader` (assuming Centra is installed in the default location). **Note**: If Centra Workbench is installed in the default location on a 64 bit Windows computer then it will be located in the “Program Files (x86)” directory. See section B.2.3 for details of the commands available and examples of Actions.txt files.
ControllerLoader.rta	**Mandatory system file**: The ControllerLoader application runs the commands in the Actions.txt file when the Vega router controller boots from the USB memory stick. **Note**: the ControllerLoader application is updated with each new version of Centra Workbench so ensure you have the latest version on the USB memory stick. The file is extracted from ControllerLoader.rtb and written to the USB memory stick by Pbak Deploy Tool with an rta file extension (see section B.2 for details). This is a system file and must be on the USB memory stick. Do not edit or delete this file.
boot.ini	**Mandatory System file**: This file is automatically written to the USB memory stick by Pbak Deploy Tool. This is a system file and must be on the USB memory stick. Do not edit or delete this file.
BOOTSECT.RTT	**Mandatory System file**: This file is automatically written to the USB memory stick by Pbak Deploy Tool. This is a system file and must be on the USB memory stick. Do not edit or delete this file.

Table 24. USB Memory Stick Files

Filename	Description
ConfigTemplate.xml	**Optional**: The ConfigTemplate.xml file is used to create or update the config.xml file on the controller. The `UPDATE-CONFIG-XML` action in the Actions.txt file tells the ControllerLoader application to use the ConfigTemplate.xml file on the USB memory stick to create or overwrite the Config.xml file on the Vega controller (see Table 25. for details). The ConfigTemplate.xml file can be edited to create a different default configuration for the controller. An example ConfigTemplate.xml file can be found at: `C:\Program Files\Snell\MCM\Controllers \ControllerLoader\` (assuming Centra is installed in the default location). **Notes:** • If Centra Workbench is installed in the default location on a 64 bit Windows computer then it will be located in the “Program Files (x86)” directory. • Do not change the IP address section between **<IP>** and **</IP>** as the ControllerLoader application uses this to populate the controller IP Address details from the IP.list.txt file. 

```
- <Config>
  - <IP>
    - <Adapter>
        <Number>0</Number>
        <DHCP>false</DHCP>
        <Address>__IP_ADDRESS__</Address>
        <SubNetMask>__SUBNET_ADDRESS__</SubNetMask>
        <DefaultGateway>__GATEWAY_ADDRESS__</DefaultGateway>
      </Adapter>
    </IP>
  - <Clock>
      <!-- PAL configuration -->
      <Format>NonDropFrame</Format>
      <FrameRate>Pal</FrameRate>
      <VitcLine1>19</VitcLine1>
      <VitcLine2>21</VitcLine2>
      <GenerateVitc>false</GenerateVitc>
      <BurnInColumn>100</BurnInColumn>
      <BurnInLine>50</BurnInLine>
      <SyncLine>7</SyncLine>
    </Clock>
  </Config>
```

Table 24. USB Memory Stick Files

Filename	Description

IP.list.txt	**Optional**: The IP.list.txt file is used to set the IP address details for one or more Vega controllers. The IP address details in this file are the ones used when using the `SET-IP-ADDRESS` or `UPDATE-CONFIG-XML` action in the Actions.txt file.
	
	The text file can be created in any pure text editor such as Microsoft Notepad. The file can contain multiple lines with one for each Vega controller and is in the following format:
	
	`IP_ADDRESS/SUBNET_ADDRESS:DEFAULT_GATEWAY`
	
	If the default gateway address is unknown or is not required enter 0.0.0
	
	Example IP.list.txt file for six Vega controllers:
	
	`192.168.1.2/255.255.255.0:192.168.1.1`
	`192.168.1.3/255.255.255.0:192.168.1.1`
	`192.168.1.4/255.255.255.0:192.168.1.1`
	`192.168.1.5/255.255.255.0:192.168.1.1`
	`192.168.1.6/255.255.255.0:192.168.1.1`
	`192.168.1.7/255.255.255.0:192.168.1.1`
	
	The ControllerLoader application uses the IP Address details in the first line of the text file for the first controller. The line is then automatically commented out with the # symbol when the Vega controller is successfully updated so that the next line is then available for the next controller to be updated.

CentraController.rtb	**Optional**: The CentraController.rtb file contains the software for the Vega controller. This file is only required if the software on a Vega controller needs updating. The CentraController.rtb file can be found at: `C:\Program Files\Snell\MCM\Controllers\Centra\` (assuming Centra Workbench is installed in the default location). **Note**: If Centra Workbench is installed in the default location on a 64 bit Windows computer then it will be located in the “Program Files (x86)” directory. The Vega controller software will only be updated if the `DEPLOY-RTB` action is included in the Actions.txt file (see section B.2.3 for details).
PA1002.bin	**Optional**: The PA1002.bin file contains the firmware for the Vega controller. This file is only required if the firmware on the Vega controller needs updating. By default the firmware is located in: `C:\Program Files\Snell\MCM\Controllers\RollCall Templates\Vega\FPGA\` (assuming Centra Workbench was installed in the default directory) **Note**: If Centra Workbench is installed in the default location on a 64 bit Windows computer then it will be located in the “Program Files (x86)” directory. The Vega controller firmware will only be updated if the `PROG-FPGA` action is included in the Actions.txt file (see section B.2.3.4 for details).

Table 24. USB Memory Stick Files

Filename	Description
RollCall Command Set Files	**Optional**: The RollCall command set files are installed on the Vega controller by default and are required when using RollCall to connect to the Vega router. The RollCall Command Set files only need to be added to the USB memory stick when a newer version is released. The most recent RollCall template files are stored in the following directory (assuming Centra Workbench is installed in the default directory). `C:\Program Files\Snell\MCM\Controllers\RollCall Templates\Vega\` **Note**: If Centra Workbench is installed in the default location on a 64 bit Windows computer then it will be located in the “Program Files (x86)” directory. Manually copy the files from the PC directory into a directory named “RollCall” on the USB memory stick. See Section B.2.3.9 for details on updating the RollCall Command Set files.
Web Content Files	**Optional**: The Web Content files are installed on the Vega controller by default and are required when using a web browser to connect to the Vega router. When installed a web browser can be used to update the Vega RTB file and to connect to the router using RollCall. A Diagnostics tab is also available for use by Snell customer support. The Web Content files only need to be updated when a newer version is released. The most recent Web Content files are stored in the following directory (assuming Workbench was installed to the default directory): `C:\Program Files\Snell\MCM\Controllers\ WebContent\Vega\` **Note**: If Centra Workbench is installed in the default location on a 64 bit Windows computer then it will be located in the “Program Files (x86)” directory. Manually copy the files from the PC directory into a directory named “WebContent” on the USB memory stick. See Section B.2.3.10 for details on updating the Web Content files.
RunLog.txt	**Automatic**: If this file does not exist it will be created by the ControllerLoader application when it starts up. The RunLog.txt text file logs the actions the ControllerLoader application carries out each time it’s run. Each log entry is pre-fixed with the Run Number taken from the RunNo.dat file to make the logs easier to interpret. The Run Number starts at 1. If a problem occurs and you need to check the RunLog.txt file it is best to start at the bottom of the file and work up as this is usually the quickest way to find the problem. Do not edit or delete this file unless you need to remove all of the previous log file details.

Table 24. USB Memory Stick Files

Filename	Description
RunNo.dat	**Automatic**: If this file does not exist it will be created by the ControllerLoader application when it starts up. The RunNo.dat file keeps track of the how many times the ControllerLoader application has been run and is used in the RunLog.txt log file reports. The Run Number starts at 1. Do not edit or delete this file unless you need to reset the Run Number to 1.

Table 24. USB Memory Stick Files

B.2.3 ControllerLoader Application Actions

The Actions.txt file contains the actions that are to be carried out on one or more Vega router controller. The Actions.txt file must be present on the USB memory stick so that the ControllerLoader application can work.

Important:

- Do not leave the USB memory stick in a computer while the computer is being rebooted as this can cause the computer to malfunction.
- For this reason it is also recommended that the USB memory stick is removed from the computer when not in use in case the computer is rebooted accidentally, due to a power failure or due to automatic updates being installed.

The Actions.txt file can be created and edited in any pure text editor, for example Microsoft Notepad. The file can be created as a new file or based on the example Actions.txt file stored in
`C:\Program Files\Snell\MCM\Controllers\ControllerLoader\`
(assuming Centra is installed in the default location).

General Information

- Adding `NON-FATAL` as the last parameter of any action means that if that action fails the ControllerLoader application will carry on running and will record the result, including the error, in the RunLog.txt file.
- If `NON-FATAL` is not the last parameter of an action and that action fails the ControllerLoader application will stop and will record the error in the RunLog.txt file.
- The # character is used at the start of a line to comment the contents of that line out so that the ControllerLoader application does not try and action it. A comment cannot be added to the end of an action line.
- The USB memory stick drive letter is D: when plugged in to the Vega controller.
- The Vega controller drive letter is C:
- Empty lines are allowed in the Actions.txt file but lines with just a space or other white-space characters will be processed and rejected.

A simple example of an Actions.txt file is shown in Fig 61. For details on the actions available and how they are used see Table 25.

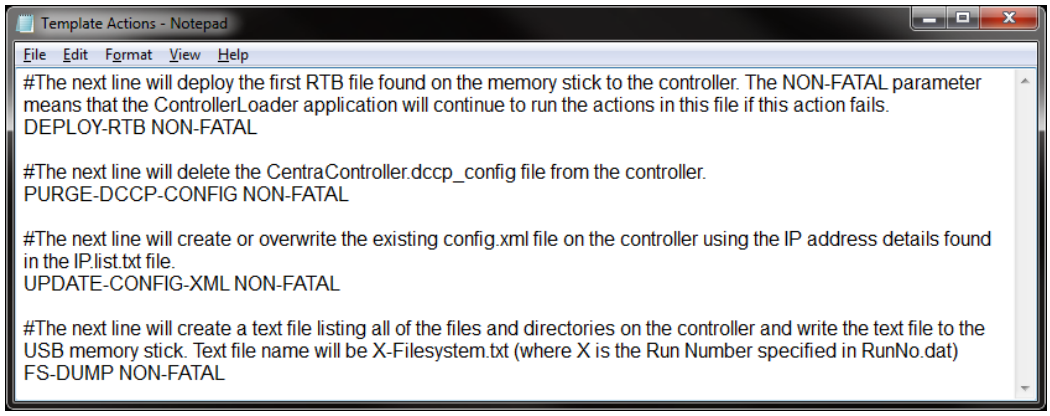


Fig 61. Example of an Actions.txt text File

Action	Description
DEPLOY-RTB	Used to load the RTB file on the USB memory stick on to the Vega controller. With no additional parameters the ControllerLoader application will deploy the first file it finds with an rtb extension to the Vega controller. **Optional parameter:** `D:\xxxxxxx.rtb` Used to specify a particular rtb file if the USB memory stick contains more than one rtb file. The drive letter must be included. If the filename includes any spaces the entire filepath must be enclosed in quotation marks. **Optional parameter:** `NON-FATAL` **Example:** `DEPLOY-RTB D:\NewCentraController.rtb NON-FATAL`
PURGE-DCCP-CONFIG	Used to delete the CentraController.dccp_config file from the Vega controller. If the CentraController.dccp_config file is not present this action will still report success in the RunLog.txt text file. **Optional parameter:** `NON-FATAL` **Example:** `PURGE-DCCP-CONFIG NON-FATAL`
PURGE-CONFIG-XML	Used to delete the config.xml file from the Vega controller. If the config.xml file is not present this action will still report success in the RunLog.txt text file. **Optional parameter:** `NON-FATAL` **Example:** `PURGE-CONFIG-XML NON-FATAL`

Table 25. Actions and Parameters

Action	Description
UPDATE-CONFIG-XML	Used to create or overwrite the existing config.xml file on the Vega controller using the IP address details from the IP.list.txt file and the configuration details from the ConfigTemplate.xml file. See section B.2.2 for details of the IP.list.txt and ConfigTemplate.xml files. **Optional parameter:** `NON-FATAL` **Example:** `UPDATE-CONFIG-XML NON-FATAL`
PURGE-PERSISTED-DATA	Used to delete the persistance.dccp file from the Vega controller. If the persistance.dccp file is not present this action will still report success in the RunLog.txt text file. **Optional parameter:** `NON-FATAL` **Example:** `PURGE-PERSISTED-DATA NON-FATAL`
DELETE-FILE	Used to delete a specified file from the Vega controller (drive C:). **Mandatory parameter:** `C:\Directoryname\Filename.xxx` Specifies the file to be deleted. The parameter must contain the complete path and filename of the file being deleted (if the path or filename contains any spaces enclose the entire path in quotation marks). **Optional parameter:** `NON-FATAL` **Example:** `DELETE-FILE C:\testdir\testfile.txt NON-FATAL`

COPY-FILE	Used to copy a file from the USB memory stick (drive D:) to the Vega controller (drive C:).
	
	Mandatory Source parameter:
	`Driveletter:\Directoryname\Filename.xxx`
	Specifies the source path and filename (if the path or filename contains any spaces enclose the entire path in quotation marks, see example below).
	
	Mandatory Destination parameter:
	`Driveletter:\Directoryname\Filename.xxx`
	specifies the destination path and filename (no spaces).
	
	Optional parameter: `TRUE`
	Overwrite file if present - Default if parameter not used.
	or
	Optional parameter: `FALSE`
	Don’t overwrite file if present.
	
	Optional parameter: `NON-FATAL`
	
	Example:
	`COPY-FILE “D:\testing\info\test file1.txt” C:\testdir\testfile.txt FALSE NON-FATAL`

Table 25. Actions and Parameters

Action	Description

COPY-DIR	Only available when running ControllerLoader.rta from Centra Workbench 3.14.2 and later.
	
	Used to copy a directory (including files and sub-directories) from the USB memory stick (drive D:) to the Vega controller (drive C:).
	
	Mandatory Source parameter:
	`Driveletter:\Directoryname`
	Specifies the source path and directory (if the path contains any spaces enclose the entire path in quotation marks, see example below).
	
	Mandatory Destination parameter:
	`Driveletter:\Directoryname`
	specifies the destination path and directory.
	
	Optional parameter: `TRUE`
	Overwrite directory (including files and sub-directories) if present - Default if parameter not used.
	or
	Optional parameter: `FALSE`
	Don't overwrite directory (including files and sub-directories) if present.
	
	Optional parameter: `NON-FATAL`
	
	Example:
	`COPY-DIR "D:\testing\info\test directory" "C:\testdir\test directory" FALSE NON-FATAL`

FS-DUMP	Used to create a text file on the USB memory stick that lists all of the files and directories on the Vega controller. **Optional parameter:** `D:\Directoryname\Filename.xxx` Specifies the path and filename for the text file (if the path contains any spaces enclose the entire path in quotation marks). If the parameter is not used the file is written to the root of the USB memory stick as `X-Filesystem.txt` where X = the Run Number stored in the RunNo.dat file (see Table 24. for details). **Optional parameter:** `NON-FATAL` **Example:** `FS-DUMP D:\Info\controller1FS.txt NON-FATAL`
SET-REPLICATED-PEER	Used to update or remove the Replicated Peer settings for the controller from the Config.xml file. To clear the replicated peer settings from the config.xml just omit all the parameters. **Optional Parameter**: `IP` Specifies the IP address of the replicated peer controller. **Optional Parameter**: `Port` Specifies the Port of the replicated peer controller. **Example**: `SET-REPLICATED-PEER 123.456.78.9 2007 NON-FATAL`

Table 25. Actions and Parameters

Action	Description

SET-IP-ADDRESS	Used to update the IP address of the controller using details supplied in the command line or from the IP.list.txt file if no details are entered in the command line.
	
	Optional Parameter: `IP Address`
	Specifies the IP address to be used for the controller.
	This parameter is used in conjunction with the `Subnet` parameter and optionally the `Gateway` parameter.
	If no `Gateway` parameter is specified then 0.0.0.0 will be used.
	
	Optional Parameter: `Subnet`
	Specifies the subnet mask to be used for the controller.
	This parameter used in conjunction with the `IP Address` parameter and optionally the `Gateway` parameter.
	If no Gateway parameter is specified then 0.0.0.0 will be used.
	
	Optional Parameter: `Gateway`
	
	Specifies the Gateway IP Address to be used for the controller
	This parameter cannot be used on its own and must be used in conjunction with the `IP Address` parameter and the `Subnet` parameter.
	If this is left blank the Gateway will default to 0.0.0.0.
	
	Example:
	`SET-IP-ADDRESS 123.456.78.9 255.255.255.0 123.456.78.1 NON-FATAL`
	Uses the IP Address details specified
	or
	`SET-IP-ADDRESS 123.456.78.9 255.255.255.0 NON-FATAL`
	Uses the IP Address and Subnet specified and uses 0.0.0.0 for the Gateway address
	or
	`SET-IP-ADDRESS NON-FATAL`
	Uses the next available address in the IP.list.txt file
	If no valid IP Address details are available in the IP.list.txt file the action will fail

ENABLE-WATCHDOG	Used to enable the Watchdog on the Vega Controller. **Optional Parameter**: `NON-FATAL` **Example**: `ENABLE-WATCHDOG NON-FATAL`
DISABLE-WATCHDOG	Used to disable the Watchdog on the Vega Controller. **Optional Parameter**: `NON-FATAL` **Example**: `DISABLE-WATCHDOG NON-FATAL`

Table 25. Actions and Parameters

Action	Description
PULL-LOGS	Only available when running ControllerLoader.rta from Centra Workbench 3.14.2 and later Used to move all of the controller logs from the Vega controller (drive C:) to the USB memory stick (drive D:). **Note**: This command deletes the current log files from the Vega controller once they have been moved to the USB memory stick. **Optional parameter:** `D:\Directoryname\` Specifies the directory path name to move the controller logs to (no spaces). If the parameter is not used the log files are written to `D:\logs\` **Optional parameter:** `NON-FATAL` **Example:** `PULL-LOGS D:\logs_from_controller\ NON-FATAL`
PROG-FPGA	Used to upgrade the firmware in the serial EEPROM which loads code into the FPGA. You should only upgrade the firmware if instructed to do so by a Snell representative who will then supply you with the latest version of the Bin file. See section B.2.3.4 for details on running this upgrade. **Note**: when running the ControllerLoader.rta from Centra Workbench 3.14.2 (and later) this action will be run first no matter what position it is in the Actions.txt file. **Optional parameter:** `NON-FATAL` **Example:** `PROG-FPGA d:\pa1002.bin NON-FATAL`
PROG-FAN-FPGA	Used to program the fan control serial EEPROM which loads code into the fan control FPGA. You should only upgrade the firmware if instructed to do so by a Snell representative who will then supply you with the latest version of the Bin file. See section B.2.3.5 for details on running this upgrade. **Note**: when running the ControllerLoader.rta from Centra Workbench 3.14.2 (and later) this action will be run after PROG-FPGA but before any other actions no matter what position it is in the Actions.txt file. **Optional parameter:** `NON-FATAL` **Example:** `PROG-FAN-FPGA d:\CTLFAN.BIN NON-FATAL`

Table 25. Actions and Parameters

Action	Description
PROG-BUFFER-FPGA	**Vega 4U only**: Used to upgrade the firmware in the serial EEPROM which loads code into the FPGA Buffer card. You should only upgrade the firmware if instructed to do so by a Snell representative who will then supply you with the latest version of the Bin file. See section B.2.3.6 for details on running this upgrade. **Note**: when running the ControllerLoader.rta from Centra Workbench 3.14.2 (and later) this action will be run after PROG-FAN-FPGA but before any other actions no matter what position it is in the Actions.txt file. **Optional parameter:** `NON-FATAL` **Example:** `PROG-BUFFER-FPGA d:\BUFFER.BIN NON-FATAL`
PROG-XPNT-FPGA	Used to program the serial EEPROM which loads code into the FPGA on the crosspoint modules in a Vega frame. You should only upgrade the firmware if instructed to do so by a Snell representative who will then supply you with the latest version of the Bin file. See section B.2.3.7 for details on running this upgrade. **Notes**: • **Vega 2U**: when running the ControllerLoader.rta from Centra Workbench 3.14.2 (and later) this action will be run after PROG-FAN-FPGA but before any other actions no matter what position it is in the Actions.txt file. • **Vega 4U**: when running the ControllerLoader.rta from Centra Workbench 3.14.2 (and later) this action will be run after PROG-BUFFER-FPGA but before any other actions no matter what position it is in the Actions.txt file. **Optional parameter:** `NON-FATAL` **Example:** `PROG-XPNT-FPGA d:\FCP_XPT_CTL.rtb NON-FATAL`

Table 25. Actions and Parameters

Action	Description
PROG-IO-FPGA	Used to program the serial EEPROM which loads code into the FPGA on the IO modules in a Vega frame. You should only upgrade the firmware if instructed to do so by a Snell representative who will then supply you with the latest version of the Bin file. See section B.2.3.8 for details on running this upgrade. **Note**: • **Vega 2U**: when running the ControllerLoader.rta from Centra Workbench 3.14.2 (and later) this action will be run after PROG-FAN-FPGA (or after PROG-XPNT-FPGA if present) but before any other actions no matter what position it is in the Actions.txt file. • **Vega 4U**: when running the ControllerLoader.rta from Centra Workbench 3.14.2 (and later) this action will be run after PROG-BUFFER-FPGA (or after PROG-XPNT-FPGA if present) but before any other actions no matter what position it is in the Actions.txt file. **Optional parameter:** `NON-FATAL` **Example:** `PROG-IO-FPGA d:\IOxxxx.bin NON-FATAL`

Table 25. Actions and Parameters

B.2.3.1 Example: Updating the IP Address of a Vega Controller

Important:

- If you know the Vega IP address you can easily change the IP addresses from RollCall. See the Vega Router Control manual for details.

The IP address of a Vega controller can be set using the bootable USB memory stick. To create the bootable USB memory stick see section B.2.6.

1. To set the IP address on a Vega controller the following files must be on the USB memory stick:
   - **Actions.txt** - Edit the Acions.txt file so that the only action is `SET-IP-ADDRESS` (see Fig 62.)
   - **IP.list.txt** - Edit the IP.list.txt file so that the correct IP address details are in the file (see Fig 63.)
   - **ControllerLoader.rta** - Added by PBak Deploy (see B.2).

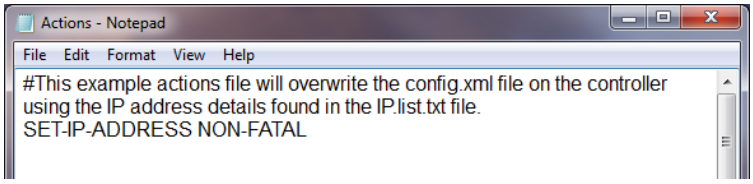


Fig 62. Example Actions.txt File to Change the Controller IP Address

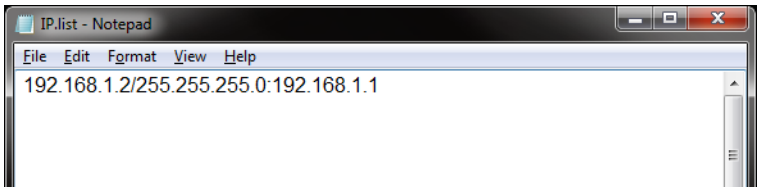


Fig 63. Example IP.list.txt Text File

2. Update the Vega controller as described in section B.2.4.
3. When the Vega controller has been reset it will have the new IP address.

B.2.3.2 Example: Deleting the DCCP Configuration in a Vega Controller

The CentraController.DCCP-CONFIG file in the Vega controller can be deleted using the bootable USB memory stick. To create the bootable USB memory stick see section B.2.6.

1. To delete the CentraController.DCCP-Config file in the Vega controller the following files must be on the USB memory stick:
   - **Actions.txt** - Edit the Acions.txt file so that the only action is `PURGE-DCCP-CONFIG` (see Fig 64.).
   - **ControllerLoader.rta** - Added by PBak Deploy (see B.2).

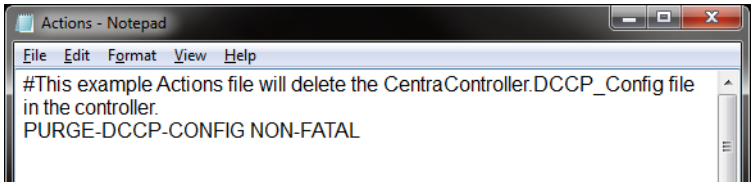


Fig 64. Example Actions.txt File to Delete the CentraControlle.DCCP_Config File

2. Update the Vega controller as described in section B.2.4.
3. When the Vega controller has been reset it will restart without a DCCP configuration. A new DCCP configuration must be pushed to it from Centra Workbench (see the Centra Workbench manual for details).

B.2.3.3 Example: Updating Vega Controller Software

Important:

- If you know the Vega IP address you can easily update the Vega controller firmware from RollCall see section 11.3 for details.

The Vega controller software is updated using the bootable USB memory stick. To create the bootable USB memory stick see section B.2.6.

1. To update the Vega controller software the following files must be on the USB memory stick:
   - **Actions.txt** - Edit the Acions.txt file so that the only action is `DEPLOY-RTB` (see Fig 65.)
   - **CentraController.rtb** - Ensure you have the correct Vega controller rtb file. This is written to the USB memory stick using PBak Deploy (see section B.2).
   - **ControllerLoader.rta** - Added by PBak Deploy (see B.2).

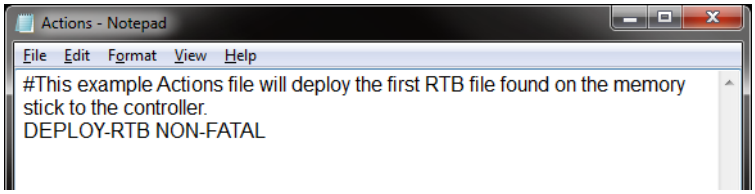


Fig 65. Example Actions.txt File to Update the Controller Software

2. Update the Vega controller as described in section B.2.4.
3. When the Vega controller has reset it will be running the new software.
4. If two Vega controllers are installed they must both be running the same version of software so the second Vega controller will also need updating.

B.2.3.4 Example: Updating The Vega Controller FPGA

Important:

- If you know the Vega IP address you can easily update the Vega controller firmware from RollCall see section 11.3 for details.

The EEPROM firmware in the Vega controller can be upgraded using the bootable USB memory stick. To create the bootable USB memory stick see section B.2.6.

Important:

- It is strongly recommended that the Vega controller, Fan controller, Buffer, Crosspoint and Input/Output module FPGAs are programmed as individual operations. This simplifies the individual FPGA programming tasks.
- It is not recommended but if necessary the Vega controller, Fan controller, Buffer, Crosspoint and Input/Output module FPGAs can be programmed one after the other from the same Actions.txt file. However if this is required then it is important that the commands are entered in the Actions.txt file in the following order:
  PROG-FPGA - see section B.2.3.4
  PROG-FAN-FPGA - see section B.2.3.5
  PROG-BUFFER (Vega 4U only) - see section B.2.3.6
  PROG-XPNT-FPGA - see section B.2.3.7
  PROG-IO-FPGA - see section B.2.3.8
  This order is automatically enforced when running ControllerLoader.rta from Centra Workbench 3.14.2 and later.

1. To upgrade the controller and fan controller EEPROM firmware in the Vega controller the following files must be on the USB memory stick:
   - **Actions.txt** - Edit the Acions.txt file so that the only action is `PROG-FPGA` (see Fig 66.).
   - **pa1002.bin** - where pa1002.bin is the correct binary file for the Vega controller. Manually copied to the root of the bootable USB memory stick

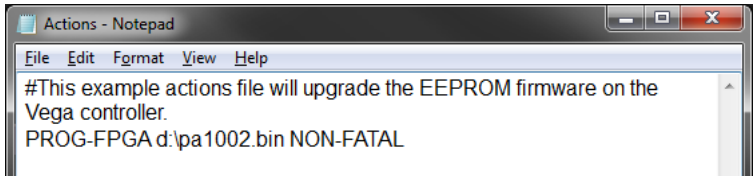


Fig 66. Example Actions.txt File to Upgrade the Vega Controller

2. Update the Vega controller as described in section B.2.4 up to step 7. on page 112.

Important:

- Leave the USB stick in the controller until step 4. on page 106 has been completed.
- If a video display is connected to the controller card being updated the video display will lose its video signal part way through the update as the controller automatically reboots. This is normal and part of the update process, it does not mean that the process is complete.

3. The LEDs will now go off and stay off while the controller performs and automatic reset and reboots.
4. When the LEDs on the controller flash green the Vega controller upgrade process is complete.
5. Remove the USB memory stick and press the **Reset** button to reboot the controller.

Note:

- The RunLog.txt file will contain multiple entries as each entry is associated with a controller reboot.

6. When the Vega controller has reset it will be running the new FPGA firmware.

7. If two Vega controllers are installed they must both be running the same version of FPGA firmware so the second Vega controller will also need updating.

B.2.3.5 Example: Updating the Fan Controller FPGA

Important:

- If you know the Vega IP address you can easily update the Vega controller firmware from RollCall see section 11.3 for details.

The Vega Fan controller software is updated on the Vega controller using the bootable USB memory stick. To create the bootable USB memory stick see section B.2.6.

Important:

- Ensure the Vega controller FPGA is updated before updating the Fan controller FPGA - see section B.2.3.4.
- It is strongly recommended that the Vega controller, Fan controller, Buffer, Crosspoint and Input/Output module FPGAs are programmed as individual operations. This simplifies the individual FPGA programming tasks.
- It is not recommended but if necessary the Vega controller, Fan controller, Buffer, Crosspoint and Input/Output module FPGAs can be programmed one after the other from the same Actions.txt file. However if this is required then it is important that the commands are entered in the Actions.txt file in the following order:
  PROG-FPGA - see section B.2.3.4
  PROG-FAN-FPGA - see section B.2.3.5
  PROG-BUFFER (Vega 4U only) - see section B.2.3.6
  PROG-XPNT-FPGA - see section B.2.3.7
  PROG-IO-FPGA - see section B.2.3.8
  This order is automatically enforced when running ControllerLoader.rta from Centra Workbench 3.14.2 and later.

1. To update the Vega Fan controller software the following files must be on the USB memory stick:
   - **Actions.txt** - Edit the Acions.txt file so that the only action is `PROG-FAN-FPGA` (see Fig 67.).
   - **CTLFAN.bin** - where CTLFAN.bin is the correct binary file for the Vega Fan controller. Manually copied to the root of the bootable USB memory stick.

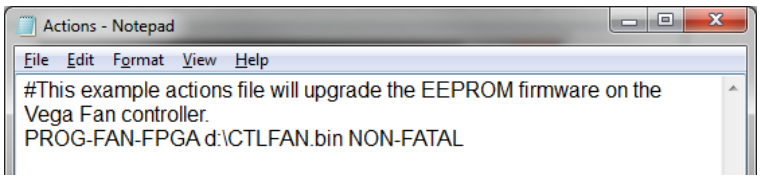


Fig 67. Example Actions.txt File to Update the Controller Software

2. Update the Vega Fan controller as described in section B.2.4.
3. When the Vega controller has reset it will be running the new Fan controller software.
4. If two Vega controllers are installed they must both be running the same version of Fan controller software so the second Vega controller will also need updating.

B.2.3.6 Example: Updating the Buffer Card FPGA (Vega 4U only)

Important:

- If you know the Vega IP address you can easily update the Vega controller firmware from RollCall see section 11.3 for details.

The Vega Buffer card software is updated on the Vega controller using the bootable USB memory stick. To create the bootable USB memory stick see section B.2.6.

Important:

- Ensure the Vega controller FPGA is updated before updating the Buffer FPGA - see section B.2.3.4.
- It is strongly recommended that the Vega controller, Fan controller, Buffer, Crosspoint and Input/Output module FPGAs are programmed as individual operations. This simplifies the individual FPGA programming tasks.
- It is not recommended but if necessary the Vega controller, Fan controller, Buffer, Crosspoint and Input/Output module FPGAs can be programmed one after the other from the same Actions.txt file. However if this is required then it is important that the commands are entered in the Actions.txt file in the following order:
  PROG-FPGA - see section B.2.3.4
  PROG-FAN-FPGA - see section B.2.3.5
  PROG-BUFFER (Vega 4U only) - see section B.2.3.6
  PROG-XPNT-FPGA - see section B.2.3.7
  PROG-IO-FPGA - see section B.2.3.8
  This order is automatically enforced when running ControllerLoader.rta from Centra Workbench 3.14.2 and later.

1. To update the Vega Fan controller software the following files must be on the USB memory stick:
   - **Actions.txt** - Edit the Acions.txt file so that the only action is `PROG-FAN-FPGA` (see Fig 67.).
   - **buffer.bin** - where buffer.bin is the correct binary file for the Vega buffer card. Manually copied to the root of the bootable USB memory stick.

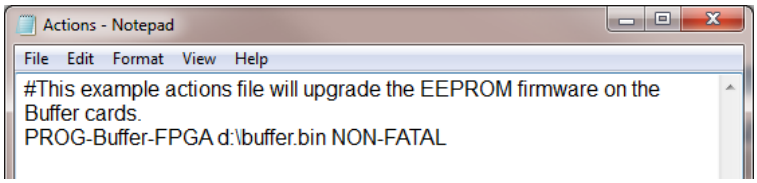


Fig 68. Example Actions.txt File to Update the Buffer Software

2. Update the Buffer card as described in section B.2.4.
3. When the Buffer cards have reset they will be running the new buffer software.

B.2.3.7 Example: Updating the Crosspoint FPGA

Important:

- If you know the Vega IP address you can easily update the Vega controller firmware from RollCall see section 11.3.2 for details.

The Crosspoint card software is updated using the bootable USB memory stick. To create the bootable USB memory stick see section B.2.6.

Important:

- It is strongly recommended that the Vega controller, Fan controller, Buffer, Crosspoint and Input/Output module FPGAs are programmed as individual operations. This simplifies the individual FPGA programming tasks.
- It is not recommended but if necessary the Vega controller, Fan controller, Buffer, Crosspoint and Input/Output module FPGAs can be programmed one after the other from the same Actions.txt file. However if this is required then it is important that the commands are entered in the Actions.txt file in the following order:
  PROG-FPGA - see section B.2.3.4
  PROG-FAN-FPGA - see section B.2.3.5
  PROG-BUFFER (Vega 4U only) - see section B.2.3.6
  PROG-XPNT-FPGA - see section B.2.3.7
  PROG-IO-FPGA - see section B.2.3.8
  This order is automatically enforced when running ControllerLoader.rta from Centra Workbench 3.14.2 and later.

1. The following files must be on the USB memory stick:
   - **Actions.txt** - Edit the Acions.txt file so that the only action is `PROG-XPNT-FPGA` (see Fig 67.).
   - **FCP_XPT_CTL.rtb** - where FCP_XPT_CTL.rtb is the correct binary file for the Crosspoint card(s). Manually copied to the root of the bootable USB memory stick.

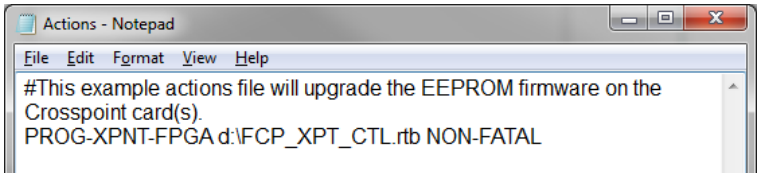


Fig 69. Example Actions.txt File to Update the Crosspoint Software

2. Update the Crosspoint card(s) as described in section B.2.4.
3. When the Crosspoint card(s) have reset they will be running the new software.

B.2.3.8 Example: Updating the Input/Output Module FPGAs

Important:

- If you know the Vega IP address you can easily update the Vega Input/Output module firmware from RollCall see section 11.3.2 for details.

The Input/Output module software is updated using the bootable USB memory stick. To create the bootable USB memory stick see section B.2.6.

Important:

- It is strongly recommended that the Vega controller, Fan controller, Buffer, Crosspoint and Input/Output module FPGAs are programmed as individual operations. This simplifies the individual FPGA programming tasks.
- It is not recommended but if necessary the Vega controller, Fan controller, Buffer, Crosspoint and Input/Output module FPGAs can be programmed one after the other from the same Actions.txt file. However if this is required then it is important that the commands are entered in the Actions.txt file in the following order:
  PROG-FPGA - see section B.2.3.4
  PROG-FAN-FPGA - see section B.2.3.5
  PROG-BUFFER (Vega 4U only) - see section B.2.3.6
  PROG-XPNT-FPGA - see section B.2.3.7
  PROG-IO-FPGA - see section B.2.3.8
  This order is automatically enforced when running ControllerLoader.rta from Centra Workbench 3.14.2 and later.

1. The following files must be on the USB memory stick:
   - **Actions.txt** - Edit the Acions.txt file so that the only action is `PROG-IO-FPGA` (see Fig 70.).
   - **IOxxxx.bin** - where IOxxxx.bin is the correct binary file for the Input/Output module. Manually copied to the root of the bootable USB memory stick.

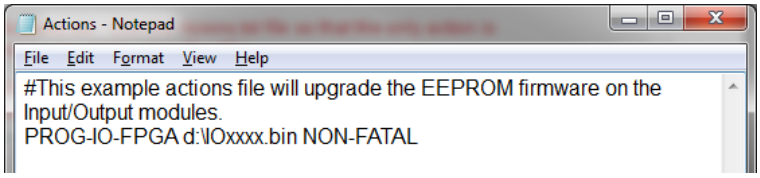


Fig 70. Example Actions.txt File to Update the Crosspoint Software

2. Update the Input/Output module(s) as described in section B.2.4.
3. When the Input/Output module(s) have reset they will be running the new software.

B.2.3.9 Example: Updating the RollCall Files in a Vega Controller

The RollCall command set files are installed on the Vega controller by default and are required when using RollCall to connect to the Vega router. The RollCall Command Set files only need to be added to the USB memory stick when a newer version is released.

The RollCall Command Set files in the Vega controller can be updated using a bootable USB memory stick. To create the bootable USB memory stick see section B.2.6.

Note:

- The following instructions assume Centra Workbench is installed in the default directory.
- If Centra Workbench is installed in the default location on a 64 bit Windows computer then it will be located in the “Program Files (x86)” directory.

1. To update the RollCall Command Set files in the Vega controller the following files must be on the USB memory stick:
   - **Actions.txt** - Copy the “Actions - RollCall - Vega.txt” file from: C:\Program Files\Snell\MCM\Controllers\ControllerLoader\ to the USB memory stick and rename it “Actions.txt”
   - **RollCall Command Set files** - Create a directory on the USB memory stick called “RollCall” and copy the files in the `C:\Program Files\Snell\MCM\Controllers\RollCall Templates\Vega\` directory to it.
   - **ControllerLoader.rta** - Added by PBak Deploy (see B.2).
2. Update the Vega controller as described in section B.2.4.
3. When the Vega controller has been reset it will restart with the new RollCall Command Set files.

B.2.3.10 Example: Updating the Web Content Files in a Vega Controller

The Web Content files are installed on the Vega controller by default and are required when using a web browser to connect to the Vega router. When installed a web browser can be used to update the Vega software (.RTB file) and to connect to the router using RollCall. A Diagnostics tab is also available for use by Snell customer support. The Web Content files only need to be updated when a newer version is released.

The Web Content files in the Vega controller can be updated using a bootable USB memory stick. To create the bootable USB memory stick see section B.2.6.

Note:

- The following instructions assume Centra Workbench is installed in the default directory.
- If Centra Workbench is installed in the default location on a 64 bit Windows computer then it will be located in the “Program Files (x86)” directory.

1. To update the Web Content files in the Vega controller the following files must be on the USB memory stick:
   - **Actions.txt** - Copy the “Actions - WebContent - Vega.txt” file from: C:\Program Files\Snell\MCM\Controllers\ControllerLoader\ to the USB memory stick and rename it “Actions.txt”.
   - **Web Content files** - Create a directory on the USB memory stick called “WebContent” and copy the files in the C:\Program Files\Snell\MCM\Controllers\Webcontent\Vega\ directory to it.
   - **ControllerLoader.rta** - Added by PBak Deploy (see B.2).
2. Update the Vega controller as described in section B.2.4.
3. When the Vega controller has been reset it will restart with the new Web Content files.

B.2.4 Updating the Software in the Vega Controller

Note: Ensure that all of the required files are on the bootable USB memory stick and that the Actions.txt file contains the correct actions for the Vega controller update. For details see sections B.2.2 and B.2.3.

1. Eject the bootable USB memory stick from the computer.
2. Locate the **Idle** Vega controller, see Table 26. for LED positions:

   LED 1:
   Idle = Flashing Blue
   Active = Flashing Green
3. Check that the LED 1 confirms the Vega controller is idle.
4. Insert the USB memory stick in the USB connector on the front of the Idle Vega controller (see Table 26.).
5. Press the **Reset** button (see Table 26.).
6. The Vega controller will reboot and the new software will be copied to the Vega controller. See Table 26. for the LED status that is displayed when the update is complete.

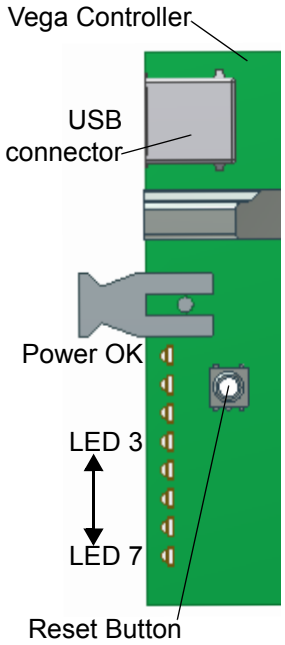
LED 3 to 7 Status	Description	LED Location
Flashing Green	When LEDs 3 to 7 continuously flash Green the actions have been successfully carried out and it is safe to remove the USB memory stick and re-start the controller. See step 7.	
Fault Conditions		
Flashing Orange	If LEDs 3 to 7 continuously flash Orange there has been a minor error or an action marked as NON-FATAL has failed during the update.	
Flashing Red	If LEDs 3 to 7 continuously flash Red it indicates that an action marked as FATAL has failed to complete and therefore the rest of the actions were not processed.	
In the Event of one or more Errors Plug the memory stick into a PC and check the **RunLog.txt** file for errors. It's best to start at the bottom of the **RunLog.txt** file and work up as this is usually the quickest way to find the problem. Typical errors will be missing files on the memory stick and incorrectly spelt Actions.txt commands. Correct any errors found and press the **Reset** button to re-run the update if required.		

Table 26. Controller LED Status After Software Update

7. When LEDs 3 to 7 (see Table 26.) on the controller flash green the process is complete.
8. Remove the USB memory stick and press the reset button to reboot the Vega controller.
9. The Vega controller will be rebooted.

B.2.5 Updating the Software in the Second Vega Controller

1. If the second Vega controller remains active press its reset button (see Table 26.). The Active and Idle Vega controllers will swap over.
2. Repeat the procedure from step 2. on page 112 to step 8. on page 112 for the second Vega controller.

Important:

- Remove the USB memory stick before shutting the Vega Video Router front panel. Leaving the USB memory stick in the Vega controller will result in damage to the USB memory stick and the Vega controller.

B.2.6 Creating a Bootable USB Memory Stick

Note:

- Each Vega controller is supplied with a suitably formatted USB memory stick and this should be used if possible.

These instructions enable you to create a bootable USB memory stick that can be used for updating controllers.

Important:

- The USB memory stick must be a minimum of 512 Mb in size.
- The contents of the USB memory stick will be completely overwritten.
- If the USB memory stick contains any information that you want to keep back it up before proceeding.

1. Format the USB memory stick from Microsoft Windows Explorer using the **Quick Format** option and selecting the **FAT** file system (not FAT 32 or NTFS).
2. Now use Pbak Deploy in the normal way (see section B.2).
3. If the Vega controller fails to boot from the USB memory stick you will need to format another USB memory stick or use the advanced formatting option detailed in Appendix B.2.6.1.

B.2.6.1 If the USB Memory Stick Doesn't Work

Note:

- Each Vega controller is supplied with a suitably formatted USB memory stick and this should be used if possible.

This process is for advanced Microsoft Windows users only and should only be carried out if the process in Appendix B.2.6 fails to create a working USB memory stick for the Vega controller.

If this process is carried out incorrectly you could potentially format the wrong disk drive which would lead to data loss and possibly make your computer unusable. If you are unsure then it is best not to proceed.

Important:

- You must be using Microsoft Vista or Microsoft Windows 7 to create a bootable USB memory stick. It is not possible using Microsoft Windows XP.
- This process is for advanced Microsoft Windows users only as, if it is carried out incorrectly, could potentially format the wrong disk drive which would lead to data loss and possibly make your computer unusable.
  If you are unsure then it is best not to proceed.

1. Plug a USB memory stick into the computer.
2. Open the command prompt by clicking the **Start** button and typing "cmd" into the **Search** box. Select **cmd.exe** from the results window and the command window will open.

3. Type “diskpart” followed by the **Return** key.
   If a UAC (User Access Control) message is displayed click on **Yes** to proceed.
4. The Diskpart> prompt will be displayed.
5. At the Diskpart> prompt type “list disk” followed by the **Return** key to display the disks available on the PC. For an example see Fig 71.
6. Make a note of the Disk number that matches the USB drive that is being made bootable.
   In the example shown in Fig 71. Disk 2 is a 2 Gb USB memory stick.

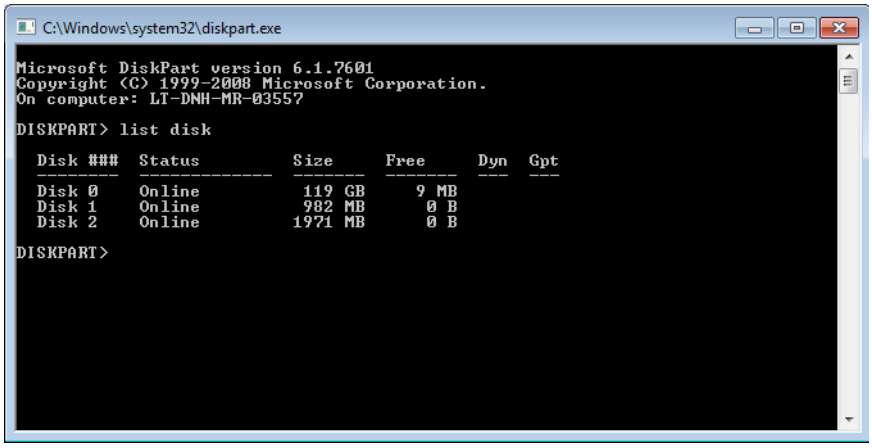


Fig 71. DiskPart List Disks Example

Important:

- It is extremely important that the correct disk number is identified at this point to avoid formatting the wrong disk drive.
  If you are unsure then it is best not to proceed beyond this point.

7. At the Diskpart> prompt type “select disk X” (where X is the Disk Number of the USB memory stick to be made bootable) followed by the **Return** key. The following commands are carried out on this disk.
8. At the Diskpart> prompt type “clean” followed by the **Return** key.
9. At the Diskpart> prompt type “create partition primary” followed by the **Return** key.
10. At the Diskpart> prompt type “active” followed by the **Return** key. This sets the flag that will make the USB memory stick bootable.
11. At the Diskpart> prompt type “format fs=FAT32 quick” followed by the **Return** key. This formats the USB memory stick.
12. At the Diskpart> prompt type “assign” followed by the **Return** key.
13. At the Diskpart> prompt type “exit” followed by the **Return** key. This closes the DiskPart tool.
14. When a drive letter prompt is displayed you can exit the command window in the usual way by clicking on the X in the top right of the window.
15. The USB memory stick will now be bootable.

Important:

- Do not leave the USB memory stick in a computer while the computer is being rebooted as this can cause the computer to malfunction.
- For this reason it is also recommended that the USB memory stick is removed from the computer when not in use in case the computer is rebooted accidentally, due to a power failure or due to automatic updates being installed.

16. See Appendix B.2 for details on how to copy files to the bootable USB memory stick which files need to be present and how to update the software on a controller.

B.2.7 Creating and Restoring an Image of a Bootable USB Memory Stick

Once you have created a bootable USB memory stick (see section B.2.6) it is a good idea to make a backup image of it. If the original bootable USB memory stick is lost or corrupted the backup image can be used to quickly create a new bootable memory stick.

Creating a Backup Image

1. There are many free imaging tools available for download. Two of the more popular tools are:
   - http://osforensics.com/tools/write-usb-images.html
   - https://launchpad.net/win32-image-writer
2. These tools only need to be copied to your computer and don't need any kind of installation.
3. Plug the bootable USB memory stick to be imaged into your computer.
4. Follow the instructions for your chosen Imaging tool and store the image on your computer for future use.

Restoring a Backup Image

Important:

- Restoring an image to a USB memory stick will delete all information on that memory stick and the data cannot be recovered.
- The image can only be restored by the program tool that created the image.
- An image is an exact bit for bit copy (including Boot sectors) of the original memory stick. An image can only be restored to a USB memory stick of the same size or larger than the original USB memory stick.
- Don't rely on the marked size of the memory stick, check the actual memory stick size in Microsoft Window.
- Images restored to a memory stick with a larger capacity than the original memory stick will reduce the capacity of the new memory stick to the size of the original memory stick image. Any lost space can be recovered by formatting the memory stick when you have finished using it.

Follow the instructions for your chosen Imaging tool to restore the image to the USB memory stick.

Appendix C. Specifications

C.1 Physical

Physical	
Mounting height	**Vega 2U**: 2RU **Vega 4U**: 4RU
Dimensions	**Vega 2U**: See “Vega 2U Dimensions” on page 124 **Vega 4U**: See “Vega 4U Dimensions” on page 125
Weight	**Vega 2U**: 10 kg (22 lb) maximum, fully loaded (all options) **Vega 4U**: 18 kg (40 lbs) maximum, fully loaded (all options)
Power	
Connector	IEC (x 2 – dual redundant power supplies)
Voltage	100 to 240 Vac, 50 to 60 Hz **Vega 2U**: 2.8 A max (8 A max inrush current) **Vega 4U**: 4.5 A max (8 A max inrush current)
AC input power	**Vega 2U**: 230 W max. (Includes all redundancy options) **Vega 4U**: 384 W max. (Includes all redundancy options)
Fusing	Two 15 A fast blowing fuses inside each power supply. One fuse on the Live and one on the Neutral line. The power supply is a sealed unit and the fuses are not user replaceable. **Note**: • Caution: Double Pole/Neutral Fusing.
Environmental	
Operating temp	5°C to 40°C
Maintained spec	0°C to 30°C
Storage temp	-20 to +80°C
Relative Humidity	5% to 95% non-condensing
Ventilation	Fan assisted. Front inlet, rear exhaust
Compliance	
EMC - Emissions	EN55103-1 (EU), FCC Part 15 (USA)
EMC - Immunity	EN55103-2 (EU)
Safety	EN60950 (EU), UL1419 (USA)
Hazardous Material	RoHS-6 (UK) – Complies with EU Directive

Table 27. Physical Specifications

C.2 VG-RM6SFP-SDI - 12 Port 6 Cage Input/Output SFP Rear Panel

VG-RM6SFP-SDI - 12 Port, 6 Cage Input/Output SFP Rear Panel	
Number of SFP ports	6 x cages (12 x SDI signal ports)
Data Rates	2.970 Gb/s, 2.970/1.001 Gb/s, 1.485 Gb/s, 1.485/1.001 Gb/s, 270 Mb/s
Signal Standards	SMPTE 424M/292M/259M (Re-clocked – 'Bypass' option) ASI-DVB (Non re-clocked)
Re-clocking	SDI re-clocking circuitry is contained in the VG-RM6SFP-SDI rear panel. All SFP modules are non re-clocking.

Table 28. VG-RM6SFP-SDI Specifications

C.3 SFP Fiber Modules - General Specification

The general information in Table 29. applies to both the standard SFP Fiber modules and the CWDM SFP Fiber modules.

SFP Fiber Modules - General	
Receptacle	LC Duplex Port FOCIS-10-A-2-1-2 (FOCIS = Fiber Optic Connector Intermateability Standard). Re: ANSI/TIA/EIA 604-10 (FOCIS 10).
Mating Plugs	LC/PC Simplex (x 2) FOCIS-3P-0-1-1-1-0 (Single mode) or LC/PC Duplex FOCIS-10-P-2-2-1-1-0 (Single mode)
Data Rates	2.970 Gb/s, 2.970/1.001 Gb/s, 1.485 Gb/s, 1.485/1.001 Gb/s, 270 Mb/s
Signal Standards	SMPTE 424M/292M/259M, DVB-ASI

Table 29. SFP Fiber General Specifications

C.4 Standard SFP Fiber Modules

C.4.1 Transmitter Specification

The information given in Table 30. and Table 31. only applies to the transmitting part of the SFP module.

All single mode TX modules are Class 1 laser products. They comply with IEC-60825 and FDA 21 CFR 1040.10 and 1040.11.

SM-T31T31-3G (2 x Transmitters) **& SM-T31R-3G** (1 x Transmitter, 1 x Receiver)	
Laser(s)	FP (Fabry Pérot)
Wavelength	1310 nm (±30 nm)
Power	-2 dBm typical (-5 dBm minimum, 0 dBm maximum)
Extinction Ratio	7 dB minimum
Link Distance	Up to 30 km @ 2.97 Gb/s
Worst Case	10 km maximum @ 2.97 Gb/s Test Pattern: SDI Pathological Matrix

Table 30. Standard SFP Fiber Module Transmitter Specifications

SM-T55T55-3G (2 x Transmitters) & **SM-T55R-3G** (1 x Transmitter, 1 x Receiver)	
Laser(s)	DFB (Distributed Feedback)
Wavelength	1550 nm (±30 nm)
Power	-2 dBm typical (-5 dBm minimum, 0 dBm maximum)
Extinction Ratio	7 dB minimum
Link Distance	Up to 45 km @ 2.97 Gb/s
Worst Case	15 km maximum @ 2.97 Gb/s Test Pattern: SDI Pathological Matrix

Table 31. Standard SFP Fiber Module Transmitter Specifications

C.4.2 Receiver Specification

The information given in Table 32. only applies to the receiving part of the SFP module.

SM-T31R-3G (1 x Transmitter, 1 x Receiver) **SM-T55R-3G** (1 x Transmitter, 1 x Receiver) **& SM-RR-3G** (2 x Receivers)	
Receiver)	PIN + TIA
Wavelength	1260 - 1620 nm
Sensitivity	-25 dBm typical (-21 dBm maximum
Overload	0 dB maximum
Link Distance	See transmitter module data in Table 30. or Table 31.depending on wavelength.

Table 32. Standard SFP Fiber Module Receiver Specifications

C.5 CWDM SFP Fiber Modules

C.5.1 Transmitter Specification

All single mode TX modules are Class 1 laser products. They comply with IEC-60825 and FDA 21 CFR 1040.10 and 1040.11. See “Laser Safety” on page 13 for further safety details.

Note:

- The CWDM link distance depends on MUX/DeMUX attenuations.
- Only the CWDM channel 1 wavelength color is marked on the clasp (latch).

SM-T59T61-3G (2 x Transmitters)	
Laser(s)	DFB (Distributed Feedback)
Wavelength 1	1591 nm (±6.5 nm) Red - shown on clasp
Wavelength 2	1611 nm (±6.5 nm) Brown - not shown on clasp
Power (each laser)	-2 dBm typical (-5 dBm minimum, 0 dBm maximum)
Extinction Ratio	7 dB typical

Table 33. CWDM SFP Fiber Module Transmitter Specifications

SM-T55T57-3G (2 x Transmitters)	
Laser(s)	DFB (Distributed Feedback)
Wavelength 1	1551 nm (±6.5 nm) Yellow - shown on clasp
Wavelength 2	1571 nm (±6.5 nm) Orange - not shown on clasp
Power (each laser)	-2 dBm typical (-5 dBm minimum, 0 dBm maximum)
Extinction Ratio	7 dB typical

Table 34. CWDM SFP Fiber Module Transmitter Specifications

SM-T51T53-3G (2 x Transmitters)	
Laser(s)	DFB (Distributed Feedback)
Wavelength 1	1511 nm (±6.5 nm) Blue - shown on clasp
Wavelength 2	1531 nm (±6.5 nm) Green - not shown on clasp
Power (each laser)	-2 dBm typical (-5 dBm minimum, 0 dBm maximum)
Extinction Ratio	7 dB typical

Table 35. CWDM SFP Fiber Module Transmitter Specifications

SM-T47T49-3G (2 x Transmitters)	
Laser(s)	DFB (Distributed Feedback)
Wavelength 1	1471 nm (±6.5 nm) Grey - shown on clasp
Wavelength 2	1491 nm (±6.5 nm) Violet - not shown on clasp
Power (each laser)	-2 dBm typical (-5 dBm minimum, 0 dBm maximum)
Extinction Ratio	7 dB typical

Table 36. CWDM SFP Fiber Module Transmitter Specifications

SM-T43T45-3G (2 x Transmitters)	
Laser(s)	DFB (Distributed Feedback)
Wavelength 1	1431 nm (±6.5 nm) Black - shown on clasp
Wavelength 2	1451 nm (±6.5 nm) Yellow/Orange - not shown on clasp
Power (each laser)	-2 dBm typical (-5 dBm minimum, 0 dBm maximum)
Extinction Ratio	7 dB typical

Table 37. CWDM SFP Fiber Module Transmitter Specifications

SM-T39T41-3G (2 x Transmitters)	
Laser(s)	DFB (Distributed Feedback)
Wavelength 1	1391 nm (±6.5 nm) White - shown on clasp
Wavelength 2	1411 nm (±6.5 nm) Silver - not shown on clasp
Power (each laser)	-2 dBm typical (-5 dBm minimum, 0 dBm maximum)
Extinction Ratio	7 dB typical

Table 38. CWDM SFP Fiber Module Transmitter Specifications

SM-T35T37-3G (2 x Transmitters)	
Laser(s)	DFB (Distributed Feedback)
Wavelength 1	1351 nm (±6.5 nm) Pink - shown on clasp
Wavelength 2	1371 nm (±6.5 nm) Beige - not shown on clasp
Power (each laser)	-2 dBm typical (-5 dBm minimum, 0 dBm maximum)
Extinction Ratio	7 dB typical

Table 39. CWDM SFP Fiber Module Transmitter Specifications

SM-T31T33-3G (2 x Transmitters)	
Laser(s)	DFB (Distributed Feedback)
Wavelength 1	1311 nm (±6.5 nm) Yellow Green - shown on clasp
Wavelength 2	1331 nm (±6.5 nm) Yellow Ocher - not shown on clasp
Power (each laser)	-2 dBm typical (-5 dBm minimum, 0 dBm maximum)
Extinction Ratio	7 dB typical

Table 40. CWDM SFP Fiber Module Transmitter Specifications

SM-T27T29-3G (2 x Transmitters)	
Laser(s)	DFB (Distributed Feedback)
Wavelength 1	1271 nm (±6.5 nm) Light Purple - shown on clasp
Wavelength 2	1291 nm (±6.5 nm) Sky Blue- not shown on clasp
Power (each laser)	-2 dBm typical (-5 dBm minimum, 0 dBm maximum)
Extinction Ratio	7 dB typical

Table 41. CWDM SFP Fiber Module Transmitter Specifications

C.6 Coaxial Copper SFP Modules - General Specification

The general information in Table 42. applies to the HD BNC SFP Coaxial modules.

Coaxial Copper SFP Modules - General	
SDI Signal Ports	2
Connectors	Amphenol RF HD-BNC (Jack) - SMPTE 292M & 424M - H
Impedance	75Ω (±0.1%)
Return Loss	<-15 dB 270 MHz to 1.5 GHz, <-10 dB @ 3 GHz
Data Rates	2.970 Gb/s, 2.970/1.001 Gb/s, 1.485 Gb/s, 1.485/1.001 Gb/s, 270 Mb/s
Signal Standards	SMPTE 424M/292M/259M, DVB-ASI

Table 42. SFP Coaxial Copper Module General Specifications

C.6.1 Transmitter Specification

The information given in Table 43. only applies to the transmitting part of the SFP module.

CC-TTH-3G-N (2 x Transmitters) & **CC-TRH-3G-N** (1 x Transmitter, 1 x Receiver)	
Signal Amplitude	800 mV pk-pk (750 mV minimum, 850 mV maximum)
Rise & Fall Time	130 ps maximum @ 2.97 Gb/s & 1.485 Gb/s 800 ps maximum @ 270 Mb/s
DC Offset	0 V ±0.5 V

Table 43. SFP Coaxial Copper Module Transmitter Specifications

C.6.2 Receiver Specification

The information given in Table 44. only applies to the receiving part of the SFP module.

CC-TRH-3G-N (1 x Transmitter, 1 x Receiver)	
Signal Amplitude	950 mV pk-pk maximum.
Cable Equalization (Belden 1694A)	120 m (365 ft) @ 2.97 Gb/s 200 m (655 ft) @ 1.485 Gb/s 400 m (1310 ft) @ 270 Mb/s

Table 44. SFP Coaxial Copper Module Receiver Specifications

C.6.3 Coaxial Copper SFP Module Part Numbers

Coaxial Copper SFP Modules	
CC-TTH-3G-N	Transmitter + Transmitter - HD-BNC - 3 Gb/s SDI - Non Re-clocking
CC-TRH-3G-N	Transmitter + Receiver - HD-BNC - 3 Gb/s SDI - Non Re-clocking
CC-RRH-3G-N	Receiver + Receiver - HD-BNC - 3 Gb/s SDI - Non Re-clocking

Table 45. SFP Coaxial Copper Module Part Numbers

C.7 Dedicated Coaxial Copper Rear Modules

The general information in Table 46. applies to the dedicated HD BNC Coaxial rear module (VG-RM12H-SDI).

Coaxial Copper SFP Modules - General	
SDI Signal Ports	12 (each port can be individually configured, by the user, as an input or output port).
Connectors	Amphenol RF HD-BNC (Jack) - SMPTE 292M & 424M - H
Impedance	75Ω (±0.1%)
Return Loss	<-15 dB 270 MHz to 1.5 GHz, <-10 dB @ 3 GHz
Data Rates	2.970 Gb/s, 2.970/1.001 Gb/s, 1.485 Gb/s, 1.485/1.001 Gb/s, 270 Mb/s
Signal Standards	SMPTE 424M/292M/259M (Re-clocked – 'Bypass' option) DVB-ASI (Non re-clocked)

Table 46. Dedicated Coaxial Copper Module General Specifications

C.7.1 Transmitter Specification

The information given in Table 47. only applies when a port is configured as a Transmitter.

HD-BNC Port Configured as a Transmitter	
Signal Amplitude	800 mV pk-pk (750 mV minimum, 850 mV maximum)
Rise & Fall Time	130 ps maximum @ 2.97 Gb/s & 1.485 Gb/s 800 ps maximum @ 270 Mb/s
DC Offset	0 V ±0.5 V

Table 47. Dedicated Coaxial Copper Module Transmitter Specifications

C.7.2 Receiver Specification

The information given in Table 48. only applies when a port is configured as a Receiver.

HD-BNC Port Configured as a Receiver	
Signal Amplitude	950mV pk-pk max.
Cable Equalization (Belden 1694A)	120 m (365 ft) @ 2.97 Gb/s 200 m (655 ft) @ 1.485 Gb/s 400 m (1310 ft) @ 270 Mb/s

Table 48. Dedicated Coaxial Copper Module Receiver Specifications

C.8 Reference Inputs

Reference Inputs	
Number and Type	4 looped HD-BNC
Impedance	75Ω ±0.1% or high Impedance (switched on rear panel)
Return Loss	> 28 dB (0 - 10 MHz)
Signals	1 V pk - pk Analog Video/Syncs/Tri-level HD Syncs
Switching Lines	Line 10 (525), Line 6 (625), Line 7 (HD)

Table 49. Reference Input Specifications

C.9 Control and Status

Control and Status	
Serial Connection	
Connector Types	4 x RS422 on 37 way female D type with screw lock by use of breakout cable purchased separately from Snell. See Appendix A.3 for RS422 pin out details.
Breakout cable length	270 mm (10.5 inches) approximately
Protocol	Support for General Switcher (SW-P-02) protocol (see section 8.3 for details)
Baud Rate	Default 38400 baud
Ethernet Connection	
Ethernet Connectors	2 x RJ45 (dual redundant controllers, 1 per controller) 10/100 Base-T autosense
Protocol	SW-P-02 over Ethernet support (see section 8.3 for details)
Alarm Relay Output	
Connector Type	9 way female D-type connector with screw lock
Contact Type	Single Pole Double Throw (SPDT)
Load	Resistive load (CosΦ = 1)
Rated Load	0.5 A at 125 Vac; 1 A at 24 Vdc
Rated Carry Current	2 A
Maximum Switching Voltages	125 Vac, 60 Vdc
Maximum Switching Current	1 A
Maximum Switching Power	62.5 VA, 30 W

Table 50. Control and Status Specifications

C.10 Vega 2U Dimensions

Important:

- For ventilation purposes, there must be a gap of at least 50 mm (2 inches) at the front of the Vega Video Router router.
- You must allow at least 100 mm (4 inches) of space at the rear of the router for cables, connections and ventilation.

The router dimensions are as follows:

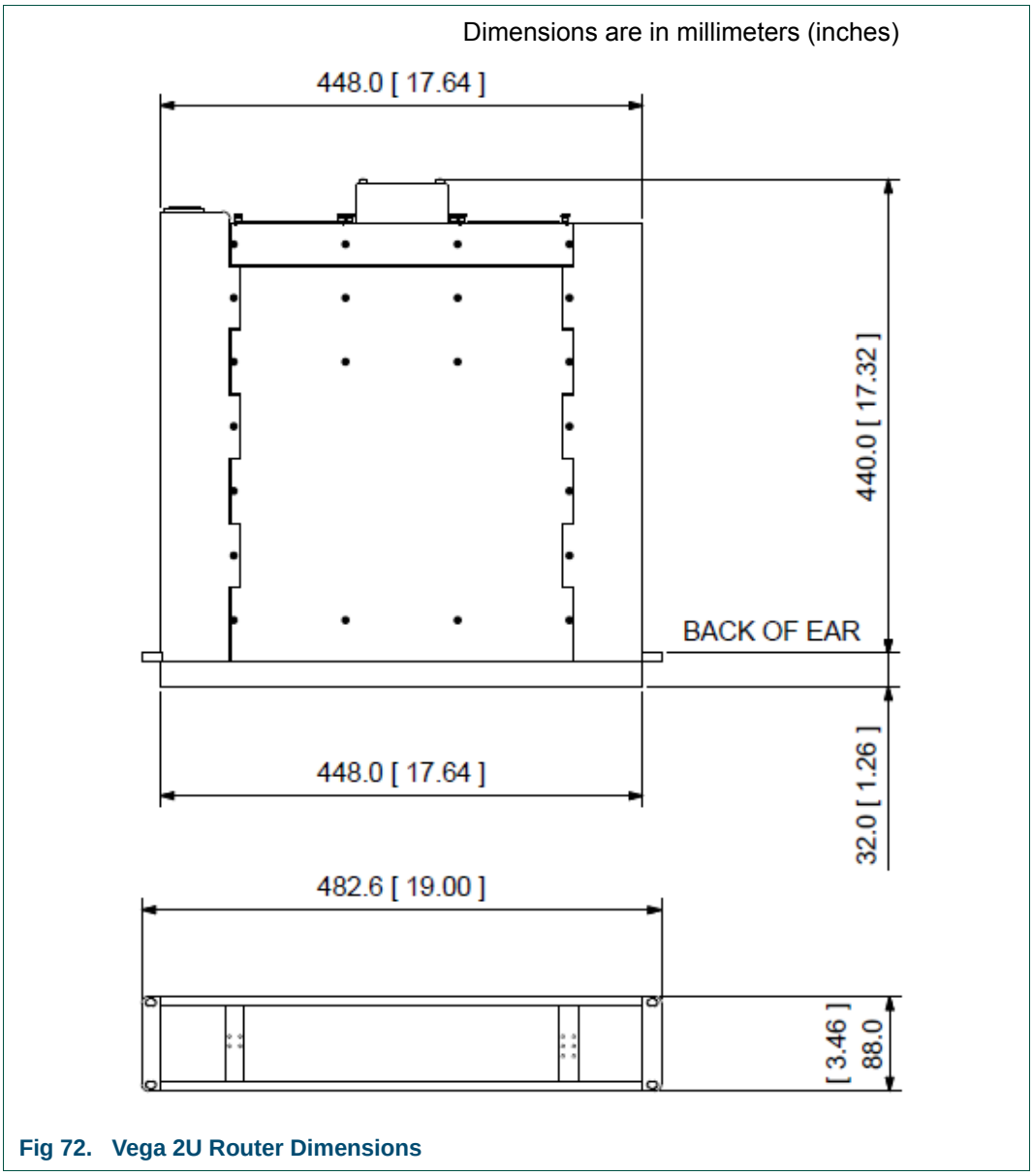


Fig 72. Vega 2U Router Dimensions

C.11 Vega 4U Dimensions

Important:

- For ventilation purposes, there must be a gap of at least 50 mm (2 inches) at the front of the Vega Video Router router.
- You must allow at least 100 mm (4 inches) of space at the rear of the router for cables, connections and ventilation.

The router dimensions are as follows:

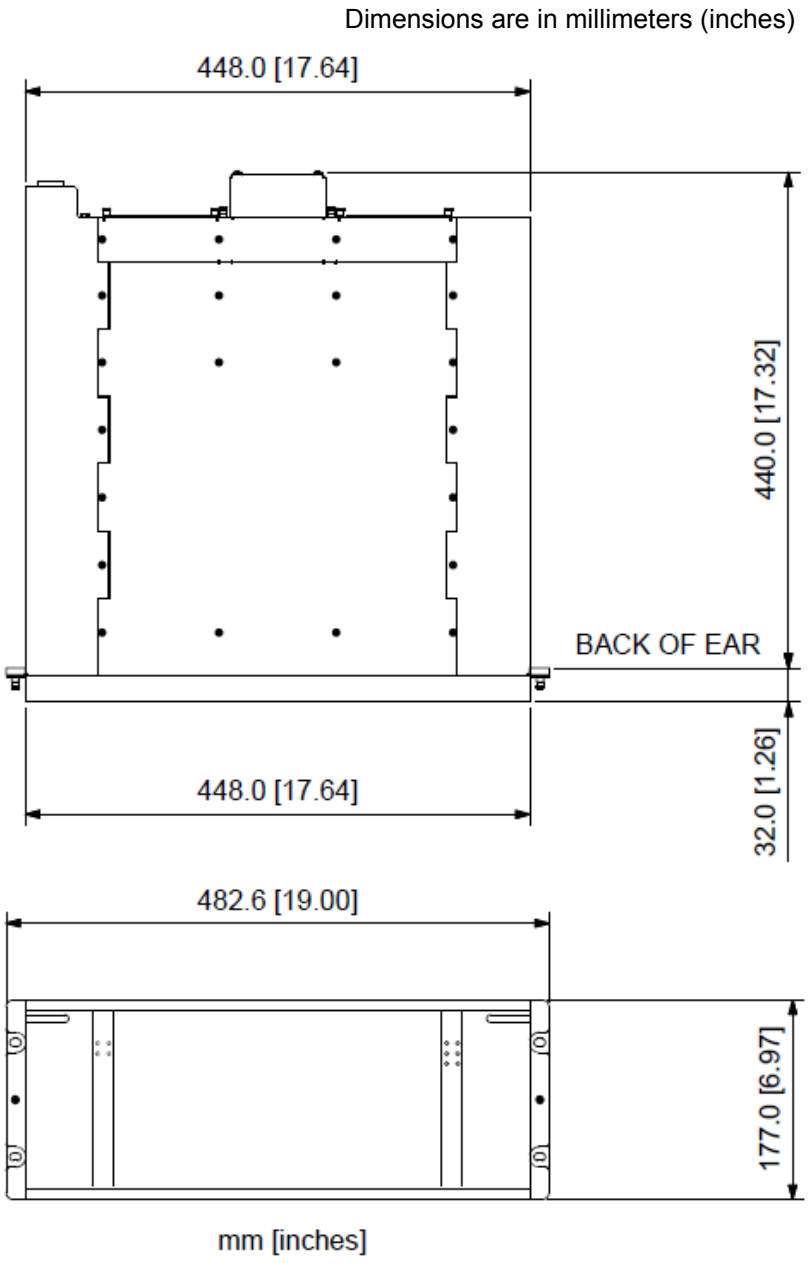


Fig 73. Vega 4U Router Dimensions

