

SNELL & WILCOX

Quasar Ph.C™

Motion Compensated HD Up Converter



Installation & Operator's Manual

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Explanation of Safety Symbols



- 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



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 \oplus 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.

Légende :



- 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 :



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 \oplus , 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 changer 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.

Erklärung der Sicherheitssymbole



- Dieses Symbol weist den Benutzer auf wichtige Informationen hin, die in der begleitenden Dokumentation enthalten sind.
- Dieses Symbol zeigt an, dass gefährliche Spannung vorhanden ist. Es befinden sich keine vom Benutzer zu wartenden Teile im Geräteinneren. Dieses Gerät sollte nur von geschultem Personal gewartet werden

Sicherheits-Warnhinweise



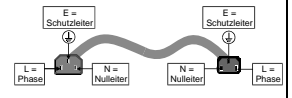
Die angeführten Service-/Reparatur-Anweisungen sind ausschließlich von qualifiziertem Service-Personal auszuführen. Um das Risiko eines Elektroschocks zu reduzieren, führen Sie ausschließlich die im Benutzerhandbuch eschriebenen Anweisungen aus, es sei denn, Sie haben die entsprechende Qualifikation. 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 \oplus 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 \oplus
- BLAU N = Nullleiter
- 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.

Explicación de los Símbolos de Seguridad



- Éste símbolo refiere al usuario información importante contenida en la literatura incluida. Referirse al manual.
- Éste símbolo indica que voltajes peligrosos están presentes en el interior. No hay elementos accesibles al usuario dentro. Esta unidad sólo debería ser tratada por personal cualificado.

Advertencias de Seguridad



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

- Para reducir el riesgo de choque eléctrico, no exponer este equipo a la lluvia o humedad.
- Siempre asegurarse de que la unidad está propiamente conectada a tierra y que las conexiones de alimentación están hechas correctamente.
- Este equipo debe ser alimentado desde un sistema de alimentación con conexión a TIERRA \oplus 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:



- ⚠ Questo simbolo indica l'informazione importante contenuta nei manuali appartenenti all'apparecchiatura. Consultare il manuale.
- ⚠ Questo simbolo indica che all'interno dell'apparato sono presenti tensioni pericolose. Non cercare di smontare l'unità. Per qualsiasi tipo di intervento rivolgersi al personale qualificato.

Attenzione:



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

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

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



- ⚠ Dette symbol gør brugeren opmærksom på vigtig information i den medfølgende manual.
- ⚠ Dette symbol indikerer farlig spænding inden i apparatet. Ingen bruger servicebare dele i apparatet på brugerniveau. Dette apparat må kun serviceres af faglærte personer..

Sikkerhedsadvarsler



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

- For at reducere risikoen for elektrisk stød må apparatet ikke udsættes for regn eller fugt.
- Sørg altid for at apparatet er korrekt tilsluttet og jordat.
- 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 ledningen 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 lysnetudgange fra den samme fase.

Förklaring av Säkerhetssymboler



- ⚠ Denna symbol hänvisar användaren till viktig information som återfinns i litteraturen som medföljer. Se manualen.
- ⚠ Denna symbol indikerar att livsfarlig spänning finns på insidan. Det finns inga servicevänliga delar inne i apparaten. Denna apparat få endast repareras av utbildad personal.

Säkerhetsvarningar



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

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

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 hankontakten, 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



- ⚠ Tämä merkki tarkoittaa, että laitteen mukana toimitettu kirjallinen materiaali sisältää tärkeitä tietoja. Lue käyttöohje.
- ⚠ Tämä merkki ilmoittaa, että laitteen sisällä on vaarallisen voimakas jännite. Sisäpuolella ei ole mitään osia, joita käyttäjä voisi itse huoltaa. Huollon saa suorittaa vain alan ammattilainen.

Turvaohjeita



Huolto-ohjeet on tarkoitettu ainoastaan alan ammattilaisille. Älä suorita laitteelle muita toimenpiteitä, kuin mitä käyttöohjeissa on neuvottu, ellei 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 SUOJAMAALIIKÄNTÄ (⊕) ja nolliiikännän on oltava luotettavasti tunnistettavissa.
- Sähköpistorasian tulee olla laitteen lähellä ja helposti tavoitettavissa.

Sähkökytkentä

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

KELTA-VIHREÄ suojamaajohtoin E-napaan
 SININEN nollijohtoin N-napaan
 RUSKEA vaihejohtoin L-napaan



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

Σύμβολα de Segurança



! O símbolo triangular avverte 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 τις απαραίτητες 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 εξασφαλίσετε 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 καθαρισμένες 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:

ΠΡΑΣΙΝΟ/ΚΙΤΡΙΝΟ καλώδιο συνδέεται στο E (Προστατευτικός Αγωγός Γείωσης)

ΜΠΛΕ καλώδιο συνδέεται στο N (Ουδέτερο Αγωγός)

ΚΑΦΕ καλώδιο συνδέεται στο L (Αγωγός Φάσης)



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

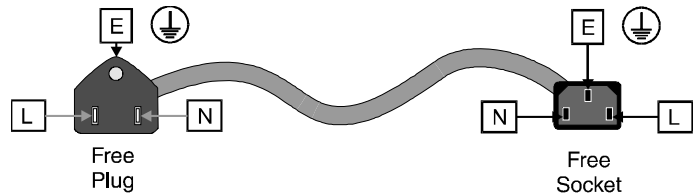
Power cable supplied for the USA

The equipment is shipped with a power cord with a standard IEC molded free socket on one end and a standard 3-pin 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 lead connected to E (Protective Earth Conductor)

BLACK lead connected to L (Live Conductor)

WHITE lead connected to N (Neutral Conductor)



For products with more than one power supply inlet

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

Rack Mounting the Enclosure



This product must not be rack mounted using only the front rack ears.



When rack-mounting the product, place the unit on a suitably specified, and installed rack shelf and secure the product to the rack via the front rack ears.

Safety Standard

This unit conforms to the following standards:



EN 60950-1: 2001. Safety of information technology equipment, including electrical business equipment.

UL 1419 (2nd Edition) Standard for safety - Professional video and Audio equipment File No. E193966

EMC Standards

This unit conforms to the following standards:

EN 55103-1 : 1996 (Environmental E4)

Electromagnetic Compatibility, Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use. Part 1. Emission

EN 55103-2 : 1996 (Environmental 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 Part 15, Class A :1998

EMC Performance of Cables and Connectors

Snell & Wilcox products are designed to meet or exceed the requirements of the appropriate European EMC standards. In order to achieve this performance in real installations it is essential to use cables and connectors with good EMC characteristics.

All signal connections (including remote control connections) shall be made with screened cables terminated in connectors having a metal shell. The cable screen shall have a large-area contact with the metal shell.

COAXIAL CABLES

Coaxial cables connections (particularly serial digital video connections) shall be made with high-quality double-screened coaxial cables such as Belden 8281 or BBC type PSF1/2M.

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.

About this Manual

This manual contains information for the installation and operation of the Quasar Ph.C unit.

Update/revision sheets should replace existing pages when supplied by the agent or Snell & Wilcox Ltd.

Packing List

The unit is supplied in a dedicated packing carton provided by the manufacturer and should not be accepted if delivered in inferior or unauthorized materials. Carefully unpack the carton and check for any shipping damage or shortages.

Any shortages or damage should be reported to the supplier immediately.

Enclosures:

- Quasar Ph.C Motion Compensated HD Upconverter
- Quasar Ph.C Installation & Operator's Manual
- Power cables 2 pieces
- Spare Fuse 2 A (T)

Software Version Amendments

Notes about Versions Fitted

Software: This Quasar Ph.C is shipped with Software version V2.0.

Manufacturers Notice

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Important Notice

No responsibility is taken by the manufacturer or supplier for any non-compliance to EMC standards due to incorrect installation.

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Product Support Procedure

If you experience any technical or operational difficulties with a Snell & Wilcox product please do not hesitate to contact us or utilize our online form to request assistance.

There is a lot of information you can give us that will enable us to diagnose your problem swiftly. Please read the following guidelines, as these suggestions will help us to help you.

Basic Information

For UnitsPlease provide the exact product Model, unit Serial Number and Software Version information.

For Cards or Modules ..Please provide the Sub-Assembly Number, card Serial Number and the Software Version information.

Basic Application

InputsPlease provide full details of the Input Signals being used including any references etc. and where they are being generated.

OutputsPlease provide full details of the Output Signals required and how they are being monitored.

SystemPlease provide a brief description of the system in which your S&W equipment is currently being used.

Basic Tests

Preset UnitPlease use the Preset Unit function to return the settings back to the factory default.

RollCallIs your unit currently connected to a RollCall capable PC? This software is obtainable for free and provides a very user friendly GUI for virtually all S&W equipment - perfect for complex products, large systems or those with passive front panels.

Card Edge Info.What is the status of the card edge LEDs or display? These can often provide information such as power status and input detection conditions.

Internal TPGMany S&W products have an internal test pattern/tone generator. Please activate this to assist you with your problem analysis.

In addition to the above, please do not forget to provide us with all of the necessary contact information:

- Names
- Telephone & Fax numbers
- e-mail addresses
- Business address

A form has been provided for this information and will be found on the next page or an on-line form is available on the Snell & Wilcox website at:

<http://www.snellwilcox.com/support/request>

Product Support Request Form

Name: *		
Company:		
Address Details: *		
Post/ZIP Code:		
Country: *		
Telephone: *		
Fax:		
Email: *		
Local S&W Center: *		
Product Name: *		
Product Type: *	Switchers (i.e. Magic DaVE, Switchpack, Kahuna)	
	File & Data Transfer Products (i.e. RollCall, Memphis & iCR)	
	Video Products (i.e. Modular, Kudos Plus and Alchemist)	
Unit Serial Number: *		
Fault/Spare Part Information: *		
(please advise us how many units show this fault and the system layout showing all other manufacturers' products)		
* Preferred Method of Contact:	e-mail	
	Phone	

- Item is required.

<p>Please mail to: Snell & Wilcox Ltd., Southleigh Park House, Eastleigh Road, Havant, Hants, PO9 2PE. United Kingdom.</p>	<p>Service Contact Information: Tel: +44 (0) 2392 489058 Fax: +44 (0) 2392 489057 http://www.snellwilcox.com/support ftp://ftp.snellwilcox.com/support</p>
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Description

Quasar Ph.C is the world's first motion compensated HDTV upconverter integrates Emmy® award winning technologies to deliver the best ever high definition pictures.

Meeting the quality demands of HDTV viewers

The growing popularity of high definition television has rapidly become one of the broadcast industry's key drivers.

To maintain revenue levels without sacrificing profitability, broadcasters must be able to deliver the high quality pictures that viewers demand, without the expense of upgrading their entire plant to HD. Upconversion is the obvious solution, but until now the choice has been limited to expensive and complex units designed primarily for post-production applications or to lower cost converters whose output does not always measure up to today's higher picture quality benchmark.

Now Quasar Ph.C, the world's first motion compensated HDTV up converter, provides the answer. Not only does it deliver stunning upconverted pictures whatever the source, it does so at a remarkably affordable price. Quasar Ph.C gives broadcasters the competitive edge by enabling them to produce the consistent, high standard, HD pictures their viewers expect, while maintaining a cost effective transition to HD. Users can continue working in standard definition, then, as they gradually migrate to full-scale HD operations, Quasar Ph.C provides the ultimate way to incorporate SD sources.

Advanced Snell & Wilcox technologies at the heart of Quasar Ph.C

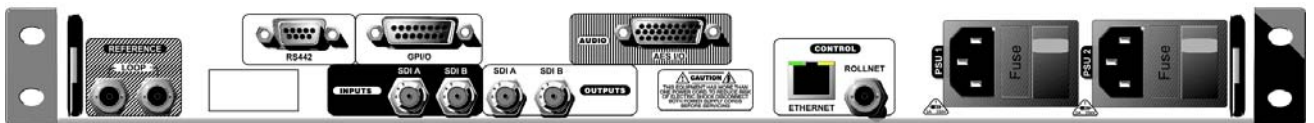
Quasar Ph.C, with its unique Format Fusion process, represents the latest generation of high definition conversion products from Snell & Wilcox, whose twenty year track record in HD signal processing conversion was recognized with an Emmy award for HDTV up and downconversion in 2000.

Quasar Ph.C's world beating performance is based on this know-how and on the integration of three other Emmy award winning Snell & Wilcox technologies. Such advanced technology has never before been available in a product in this price range.

Front View



Rear View



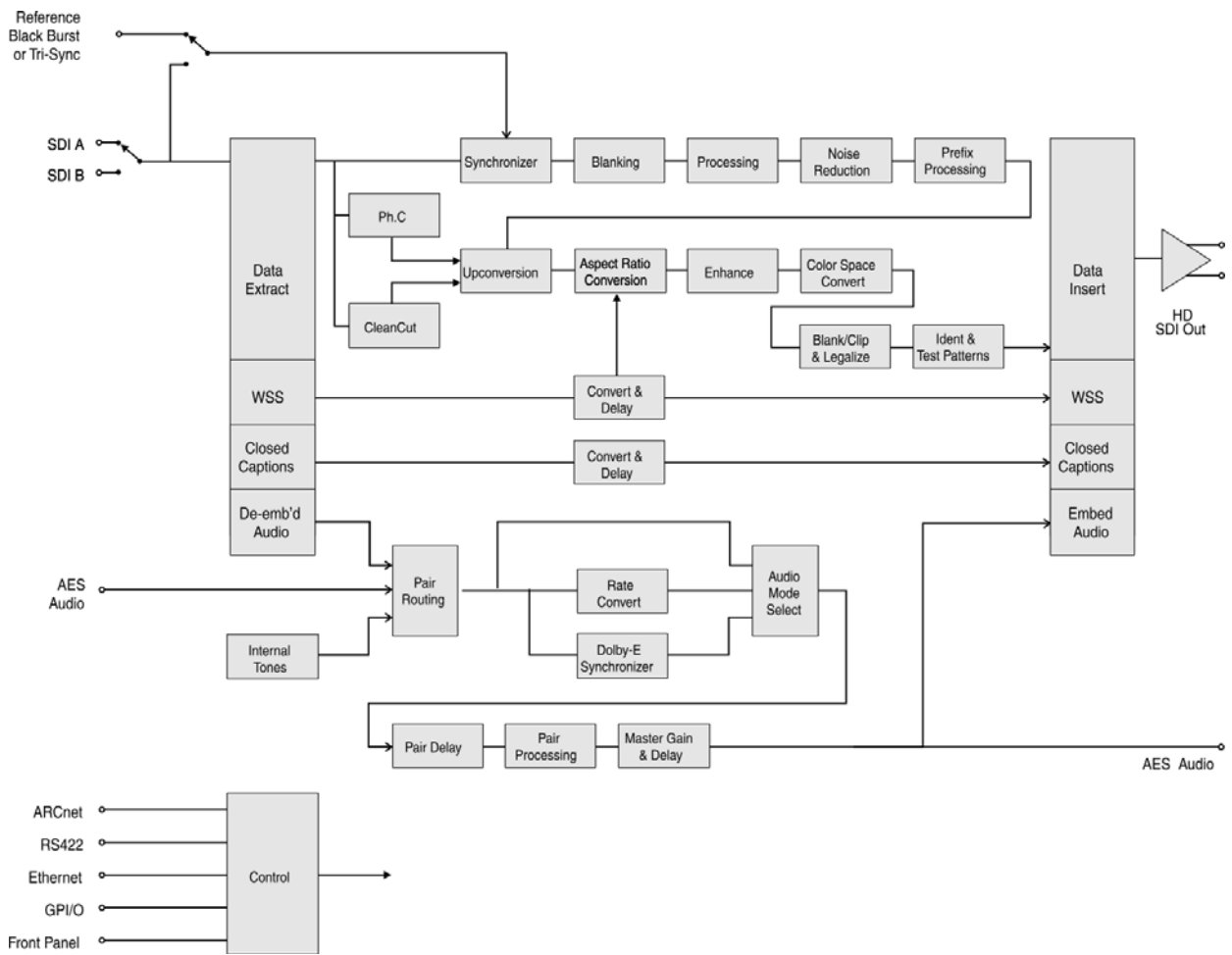
Features

- Ph.C motion estimation guarantees that the resolution of the Quasar Ph.C conversion is maximized. Its algorithm has been customized to provide the best possible results for all types of material.
- 2:3 pull down detection based on DEFT™ technology, handles the tricky frame rate issues associated with the upconversion of film originated video and mixed media.
- Prefix pre-processing applies a uniquely powerful 3D wavelet based algorithm to remove noise and other unwanted elements from the signal. This ensures that, when compressed, Quasar Ph.C's output uses the minimum valuable bandwidth, while retaining maximum fidelity and resolution.

Additional Quasar Ph.C features

- Enhancer - a sophisticated enhancement control means that even legacy formats look good in HD.
- Gamut Legalizer - guarantees that all output is within legal limits making it suitable for the broadcast signal chain.
- Color Space Converter - provides conversion from SD Rec. 601 to HD BTU709.
- Aspect Ratio Converter - Allows sources to be reformatted with the most common options available as presets. Support for widescreen signaling enables seamless integration in the playout environment.
- Closed Captions - handled and converted to ensure compliance with legal obligations.

System Block Diagram



RollCallLogging (input, reference, output, PSU, fans) RollTrack™ (audio delay, input loss, input OK, input error, input unsuitable, unit temperature)

Video Controls

Aspect Ratio Converter.....Preset:
 4:3>16:9PB, 4:3>14:9PB, 16:9FH>16:9, 16:9LB>16:9, 16:9S 0%, 16:9S 2.5%, 16:9S 5%, 16:9S 7.5%,
 16:9STR, User, WSS
 10 User definable memories re-nameable
 34 WSS memories

User controls.....Size, Pan, Asp, Position
 WSS Wide Screen Signaling

Input BlankingFull user control provided
 Left, Right, Top, Bottom

Output BlankingFull user control provided
 Left, Right, Top, Bottom

Blanking color.....Hue, Sat, Luma

Proc AmpLuma Gain, Black Level, Chroma Gain, Hue, YC Delay, Legalize

Video UtilsNoise Reduction/Split Screen
 MPEG Pre-processing
 Enhancer
 Ident

User Memories.....Name, save and recall 10 user memories

Input Loss ActionPass Video / Freeze / Pattern / Black

Default Audio Output.....Embed Input pairs 1-8

Specifications

Video Internal Processing ...4:2:2 with 10 bit data paths

Delay through the unit (Genlock Mode)

Input Locked3 Frames
 Referenced Locked.....3 Frames + Synchronizer Delay
 Free Run.....3 Frames + Synchronizer Delay

Delay through the unit (Min Delay Mode)

525 to 720p591 Frame + 62SD lines or 180HD lines (Approximately 4 ms)
 525 to 1080i291 Frame + 62SD lines or 134HD lines (Approximately 4 ms)
 625 to 720p501 Frame + 62SD lines or 150HD lines (Approximately 4 ms)
 625 to 1080i251 Frame +62SD lines or 112HD lines (Approximately 4 ms)

Electrical

Power Consumption.....Approximately 80 W
 Mains Supply100-120V/200-240V AC 50/60Hz
 RedundancyDual redundant power supplies
 Fuse Rating.....2A AT 250 V

Mechanical

Temperature Range0° to 40° C operating
 Case Type1RU rack mounting
 Dimensions482 x 543 x 44.2 w,d,h (mm)

Installation

Unpacking the Quasar Ph.C

The unit is packed in a single carton. The contents of the carton are as follows:

- 1 Quasar Ph.C unit
- 2 Power cables
- 2 Spare a.c. power fuses 2 A (T)
- 1 Quasar Ph.C Installation and Operating Manual

Unpack the carton carefully and check for any shortages or shipping damage. Immediately report any shortages or damage to Snell and Wilcox Limited.

Power Supply

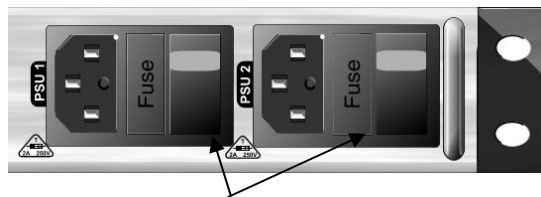
Mains power is supplied to the unit via two filtered, switched and fused IEC connectors. The fuses are rated at 2AT 250 V.



TO REDUCE THE RISK OF ELECTRIC SHOCK, PLUG EACH POWER SUPPLY INTO SEPARATE BRANCH CIRCUITS EMPLOYING SEPARATE SERVICE GROUNDS.

The mains power rating is 100-120 / 200-240 Vac 50/60 Hz at 1.5 A MAX.

The power supply ON/OFF switches are located adjacent to the IEC power connectors.



Mains Power On/Off Switches

Supply Voltage

The power supplies are designed for input voltages in the ranges of 100 V to 120 V and 200 to 240 V nominal.

No voltage adjustment procedure is required.



CAUTION: THIS UNIT MUST NOT BE OPERATED WITHOUT AN EARTH CONNECTION.

Environment

Although ruggedly constructed to meet the normal environmental requirements, it is important that there is a free flow of air at the front, left-hand side (looking from the front) and rear to dissipate the heat produced during operation. Installations should be designed to allow for this.



CAUTION: THE FAN EXIT VENTILATION HOLES AT THE SIDE AND REAR OF THE UNIT MUST NOT BE OBSCURED.

Remote Control

The unit may be controlled via the RollCall remote control system from an active front panel or a PC running the RollCall Control Panel software.

Input Connections

All the connectors are mounted on the rear panel of the unit and are appropriately annotated.

SD Serial Digital Inputs

These are the two inputs (A and B) for SD SDI input signals.



Genlock Reference

External HD trisync or SD bi-sync analogue reference signals may be connected to either of these loop through BNC connectors.

Note that if one of the connectors is not used it should be fitted with a 75 Ohm BNC terminating plug.

Genlock performance may be degraded if the reference loop through connection is not terminated correctly.



AES Audio Input

This 26 way D connector provides four AES audio inputs to the unit.



Output Connections

SDI Outputs

Two BNC connectors provide identical SDI outputs.

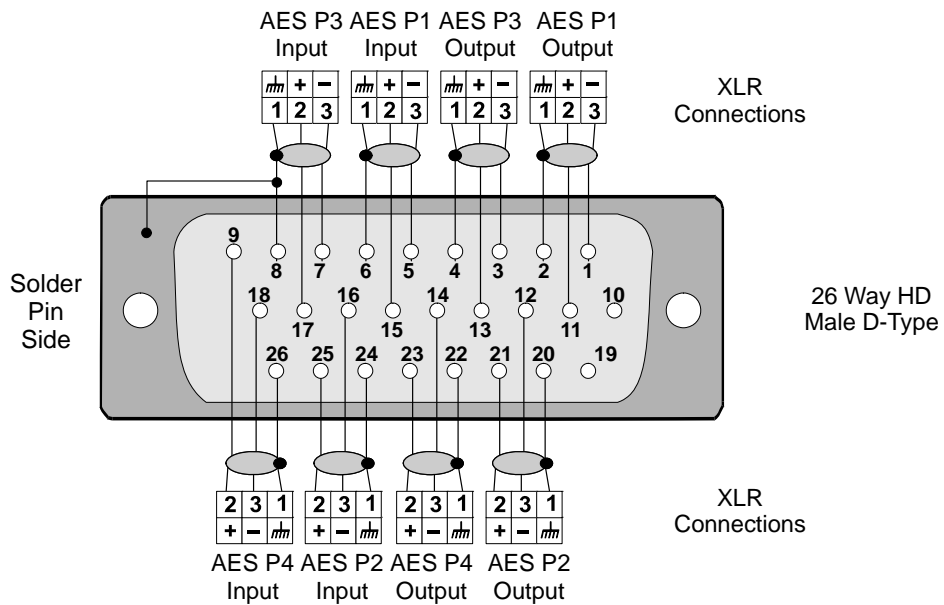


AES Audio Output

This 26 way D connector provides the four AES audio outputs from the unit.



AES Audio Connections



By Pin Number

Pin No	Description
1	AES Pair 1 Output -
2	AES Pair 1 Output Ground
3	AES Pair 3 Output -
4	AES Pair 3 Output Ground
5	AES Pair 1 Input -
6	AES Pair 1 Input ground
7	AES Pair 3 Input -
8	AES Pair 3 Input Ground
9	AES Pair 4 Input +
10	Not Used
11	AES Pair 1 Output +
12	AES Pair 2 Output -
13	AES Pair 3 Output +
14	AES Pair 4 Output -
15	AES Pair 1 Input +
16	AES Pair 2 Input-
17	AES Pair 3 Input +
18	AES Pair 4 Input -
19	Not Used
20	AES Pair 2 Output Ground
21	AES Pair 2 Output +
22	AES Pair 4 Output Ground
23	AES Pair 4 Output +
24	AES Pair 2 Input ground
25	AES Pair 2 Input +
26	AES Pair 4 Input Ground

By Function

Pin No	Description
15	AES Pair 1 Input +
5	AES Pair 1 Input-
6	AES Pair 1 Input Ground
25	AES Pair 2 Input +
16	AES Pair 2 Input-
24	AES Pair 2 Input Ground
17	AES Pair 3 Input +
7	AES Pair 3 Input -
8	AES Pair 3 Input Ground
9	AES Pair 4 Input +
18	AES Pair 4 Input -
26	AES Pair 4 Input Ground
11	AES Pair 1 Output +
1	AES Pair 1 Output -
2	AES Pair 1 Output Ground
21	AES Pair 2 Output +
12	AES Pair 2 Output -
20	AES Pair 2 Output Ground
13	AES Pair 3 Output +
3	AES Pair 3 Output -
4	AES Pair 3 Output Ground
23	AES Pair 4 Output +
14	AES Pair 4 Output -
22	AES Pair 4 Output Ground
10	Not Used
19	Not Used

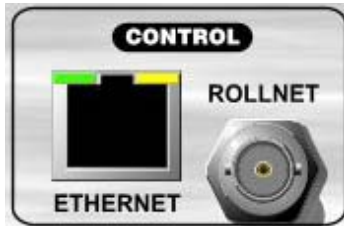
Communication Connections

RollCall

The unit can be controlled via RollCall using the BNC connector or the RS-422 9-way D-type connector.

The RollCall BNC system should be connected using 75 Ohm "T" pieces in a similar manner to an "Ethernet" system. Both extremities of the system must be terminated in 75 Ohms.

The coaxial link is bi-directional and therefore must not be passed through signal switching networks. Also, to allow hum and noise cancellation the screen of the coaxial connection must not be earthed.



RS442 Port

Pin	Function	Direction
1	Ground	
6	Tx signal common	
2	Transmit A	Quasar Ph.C → Remote
7	Transmit B	Quasar Ph.C → Remote
3	Receive B	Quasar Ph.C ← Remote
8	Receive A	Quasar Ph.C ← Remote
4	Rx signal common	
9	Ground	
5	Spare	



GPI

The General Purpose Interfaces (GPI's) are accessed via a 15 way D type female connector. In the table GPI refers to inputs and GPO refers to outputs.



The output (GPO) characteristics are as follows:

Maximum Operating Voltage	+5 V DC
Output High	+5 V from 2400 Ohms
Output Low	220 Ohm
Maximum Load current	25 mA using 5 V external supply

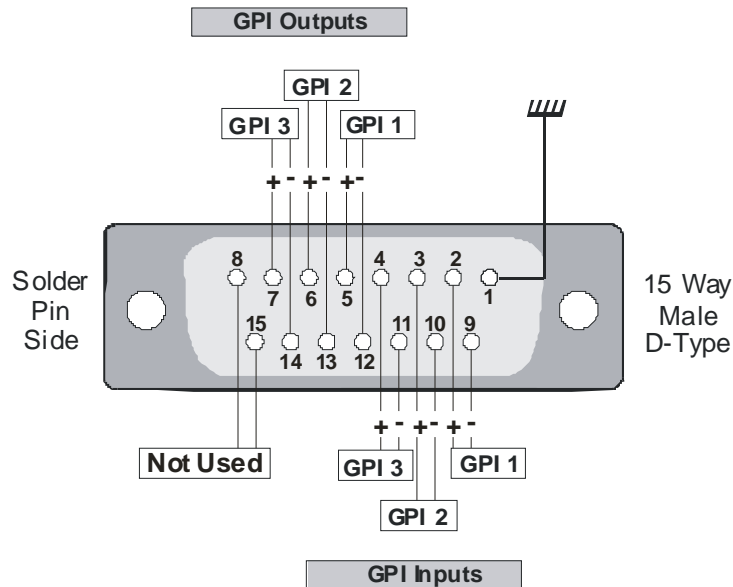
GPI Overview

- **GPI Inputs:** There are 3 GPI inputs. They are activated by a contact closure.
- **GPI Outputs:** The 3 GPI outputs provide tally outputs that can be used, via suitable circuitry, to turn on lamps etc.

The equivalent circuits of the GPI I/O are shown on the next page.

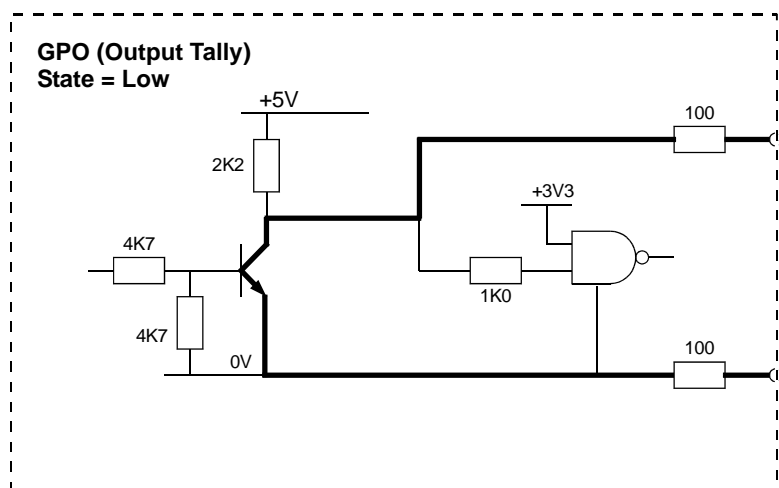
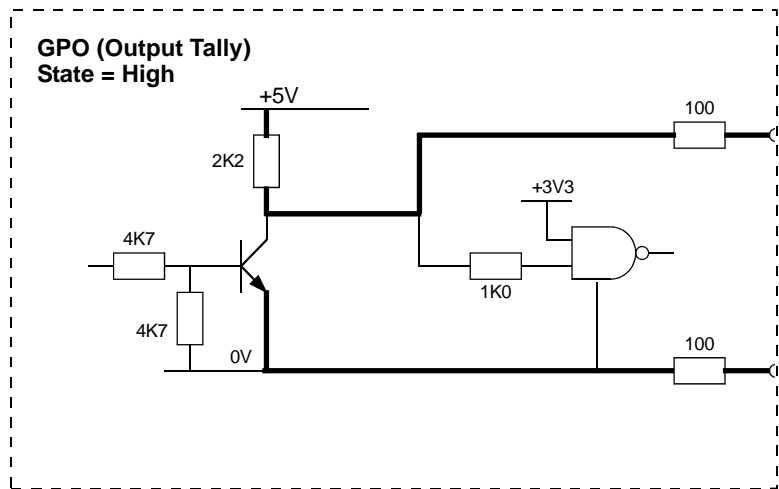
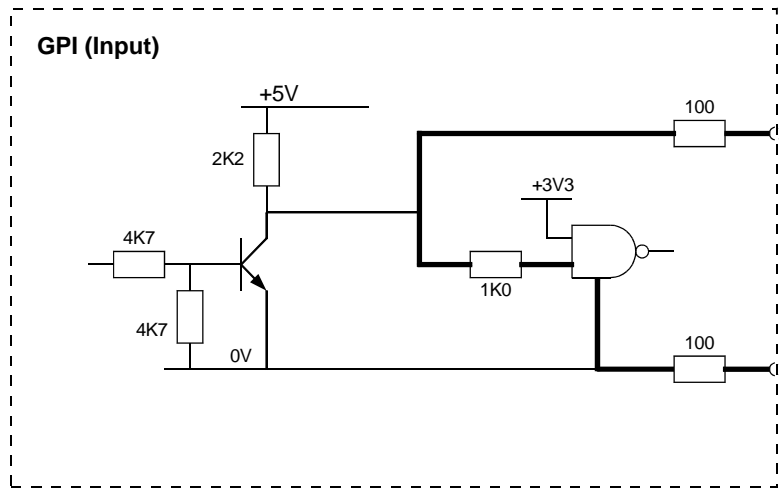
The GPI outputs are Active Low.

Pin Connections (On Connecting Plug)



D-Type Pin No	IDC Cable No	Description	Type
1	1	Ground	
9	2	GPI 1 -VE	Input
2	3	GPI 1 +VE	
10	4	GPI 2 -VE	Input
3	5	GPI 2 +VE	
11	6	GPI 3 -VE	Input
4	7	GPI 3 +VE	
12	8	GPO 1 -VE	Output
5	9	GPO 1 +VE	
13	10	GPO 2 -VE	Output
6	11	GPO 2 +VE	
14	12	GPO 3 -VE	Output
7	13	GPO 3 +VE	
15	14	Unused	
8	15	Unused	

GPI I/O Circuits

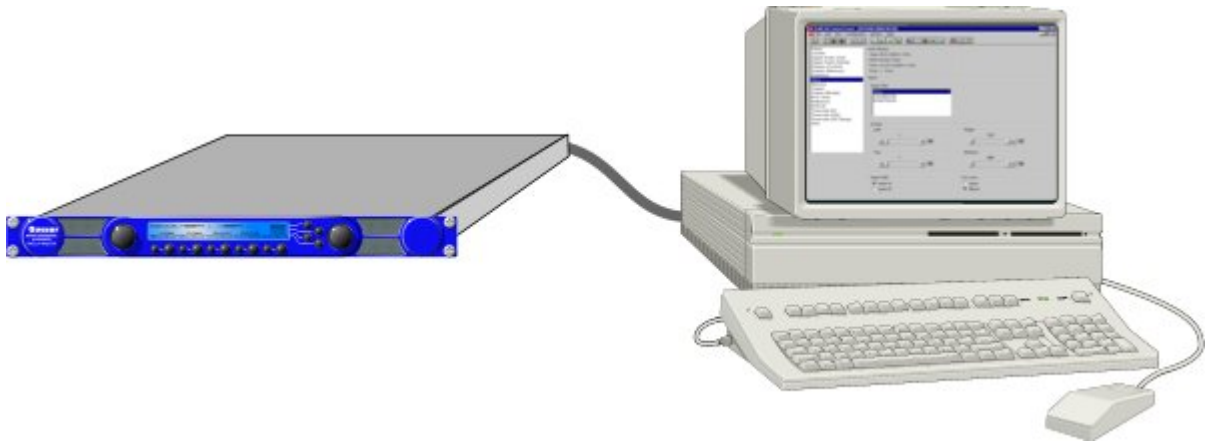


General Operating Principles

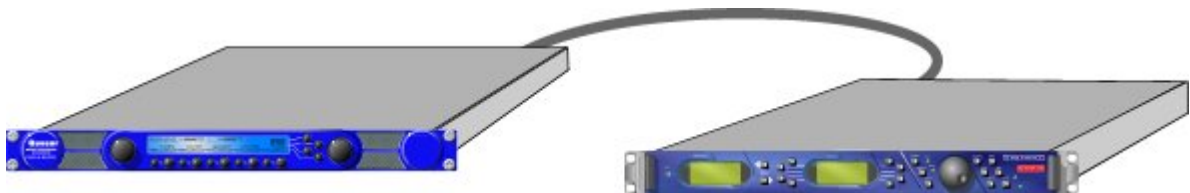


The Quasar Ph.C™ may be operated as follows:

- Using the front panel controls
- By using PC Control Panel Screens via the RollCall control system.



- RollCall via an active front panel.



- Using GPI connections to recall memory presets.

Operation Using the Front Panel Controls

Home Display



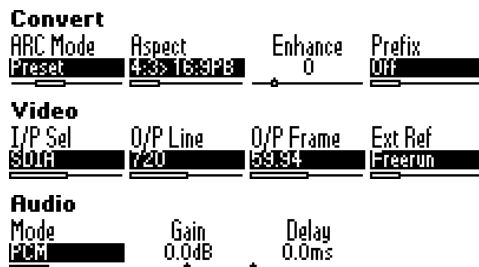
This will give basic information about the status of the unit.

- Input This shows the expected input standard followed by the signal format.
- Output This shows the output standard of the unit.
- Audio This shows the type of audio signal that the unit is processing.
- Genlock Mode This displays the unit's current genlock mode.
- ARC Mode This displays the unit's current Aspect Ratio Conversion mode, which can be either linear or stretch.

Accessing Front Panel Screens



To display the first screen in the window (**Convert**) rotate the left hand knob clockwise to the next position. Advancing the knob further will reveal the other screens as shown below:



Note that by default the display will appear in different colors for specific functions as shown in the examples opposite where the Home display is green and the Convert display is blue.

To change the color of the display, please refer to page 45.

For clarity this manual shows screens as black text on a white background.

Status Screen

The Status screen provides detailed information about Input, EDH and Audio characteristics.



Configuration Screen

The Configuration screen allows control of all parameters and duplicates some of those available via the previous screens.



Making Selections and Adjusting Values

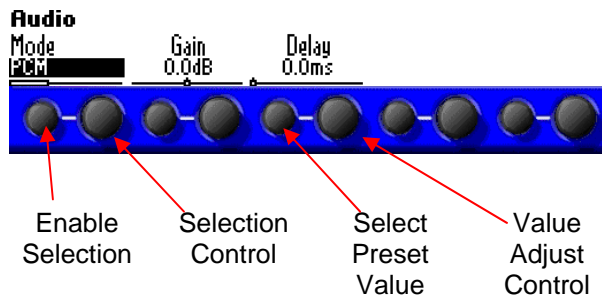
Making Selections

For items where there are selection options (in this example the Audio Mode may be selected as either PCM, Data or Dolby-E), use the **Selection Control** to display the desired option, then press the **Enable Selection** button to activate the option.

Adjusting Values

For items that may be adjusted (in this example Audio Delay), use the **Value Adjust Control** to change the value.

To return to the default setting, press the **Select Preset Value** button



Front Panel Screens

Convert



This allows conversion adjustments to be made.

Aspect

This selects the input to output aspect ratio conversion. Selections available are:

Preset

Use the **Aspect** control to select preset aspect ratio conversions

- **4:3>16:9PB:** The 4:3 input picture is fitted into a 16:9 frame at full height with black bars on the left and right sides.
- **4:3>14:9PB:** The 4:3 input picture is fitted into a 16:9 frame cropped top and bottom and with black bars on the left and right sides.
- **16:9FH>16:9:** The complete anamorphic input picture is fit into the full 16:9 output frame.
- **16:9LB>16:9:** The 4:3 input frame has a 16:9 picture, at full width, (black bars top and bottom). This is converted into a full screen 16:9 picture.
- **16:9S 0%:** The 4:3 input frame is converted to a full frame 16:9 picture with no image cropping. The horizontal resize is non-linear. The center section of the image is converted with true aspect ratio, the edges of the picture are stretched to fill the full 16:9 frame. *Please refer to Section 6: 16:9S Aspect Ratio Conversion.*
- **16:9S 2.5%:** The 4:3 input frame is converted to a full frame 16:9 picture with 2.5% crop vertically. The horizontal resize is non-linear. The center section of the image is converted with true aspect ratio, the edges of the picture are stretched to fill the full 16:9 frame. The 2.5% vertical crop increases the center area of true aspect ratio when compared to 16:9S. There is no horizontal image cropping. Please refer to Section 6: 16:9S Aspect Ratio Conversion.
- **16:9S 5%:** The 4:3 input frame is converted to a full frame 16:9 picture with 5% crop vertically. The horizontal resize is non-linear. The center section of the image is converted with true aspect ratio, the edges of the picture are stretched to fill the full 16:9 frame. The 5% vertical crop increases the center area of true aspect ratio when compared to 16:9S. There is no horizontal image cropping. Please refer to Section 6: 16:9S Aspect Ratio Conversion.
- **16:9S 7.5%:** The 4:3 input frame is converted to a full frame 16:9 picture with 7.5% crop vertically. The horizontal resize is non-linear. The center section of the image is converted with true aspect ratio, the edges of the picture are stretched to fill the full 16:9 frame. The 7.5% vertical crop increases the center area of true aspect ratio when compared to 16:9S. There is no horizontal image cropping. Please refer to Section 6: 16:9S Aspect Ratio Conversion.
- **16:9STR:** 16:9STR is an optimized non-linear aspect ratio conversion, in which the 4:3 input frame is fit into a 16:9 frame, slightly cropped at the top and bottom. The horizontal resize is non-linear, with the edges stretched to fill the frame. The center area is slightly enlarged, with true aspect ratio.

Note that these presets cannot be renamed. The non 16:9S presets are adjustable using the ARC Var controls. These changes should be stored as a 'User' memory; otherwise they will be lost when the unit is turned off.

User

This provides 10 User definable conversions. These presets may be renamed and values of Size, Position, Pan and Aspect ratio changed by the user via the Configuration/ARC VAR and stored via Configuration/ARC User.

WSS

The conversion is under the control of the WSS information on the input signal.

*Note that this action depends on the setup in the **Configuration/WSS** screen.*

Note that 16:9S is a special ARC mode known as FullScreen.

For a detailed explanation please see Section 6 'FullScreen Aspect Ratio Conversion' of this manual.

Available Aspect Ratio Conversions

4:3>16:9PB	RP186_0	ETSI0
4:3>14:9PB	RP186_1	ETSI1
16:9FH>16:9	RP186A0.0	ETSI2
16:9LB>16:9	RP186A0.1	ETSI3
16:9 S 0%	RP186A0.2	ETSI4
16:9 S 2.5%	RP186A0.3	ETSI5
16:9 S 5%	RP186A0.4	ETSI6
16:9 S 7.5%	RP186A0.5	ETSI7
16:9STR	RP186A0.6	L23A0.0
User1	RP186A0.7	L23A0.1
User2	RP186A1.0	L23A0.2
User3	RP186A1.1	L23A0.3
User4	RP186A1.2	L23A0.4
User5	RP186A1.3	L23A0.5
User6	RP186A1.4	L23A0.6
User7	RP186A1.5	L23A0.7
User8	RP186A1.6	
User9	RP186A1.7	
User10		

The aspect ratio conversion may be controlled by incoming WSS (WideScreen Signalling), for more information on the RP186,ETSI and L23 conversion please refer to the Appendix on page 88.

Enhance

This control defines the amount of enhancement applied. A positive value provides enhancement, whereas a negative value provides de-enhancement – the higher the value, the greater the amount of enhancement. Too high a value is likely to result in unwanted artifacts. The range is from -5 to +20 units.

Prefix

This control allows various amounts of pre-processing to be applied to the signal that improves MPEG encoding performance.

The selections available are Off, Low, medium and High.

Video

This allows the video input and the output standard to be selected.



I/P Select

Either SDI A or SDI B may be chosen and selected by pressing the **Enable Selection** button.

O/P Line (Standard)

Either 720p or 1080i may be chosen and then selected by pressing the **Enable Selection** button.

O/P Frame (Rate)

Either 50 or 59.94 frames per second may be chosen and then selected by pressing the **Enable Selection** button.

Sync

This allows the source of genlock to be selected.

- **Freerun:** The unit is not locked to any signal.
- **External:** The unit will lock to a valid signal connected to the reference input of the unit.
- **Input:** The unit will be locked to the input signal.
- **Min Delay:** The unit will be locked to the input and process the signal with the minimum of delay.

Audio

This allows adjustments and selections to be made to the audio processing of the unit.



Mode

This selection determines whether an input audio pair should be treated as:

- **PCM:** All pairs are treated as PCM data (rate conversion).
- **Data (non-PCM audio):** All pairs are treated as data, no rate conversion. All pairs must be I/O locked, or locked to a common reference signal.
- **Dolby-E:** All pairs are treated as Dolby-E. Dolby-E frames will be dropped or repeated as necessary.
- **Mapped:** Pairs can be individually selected to be PCM, Data, or Dolby-E.

Gain (PCM Audio only)

This allows the overall audio gain of the unit to be adjusted. The range of control is ± 6 dB in 0.1 dB steps. Preset is to 0.0 dB.

Delay (PCM Audio only)

This allows the audio signal to be delayed relative to the video. The range of control is from – 20.0 ms to 2000 ms in 0.1 ms steps. Preset is to 0.0 ms.

Video Config

This allows various adjustments to be made to the video signal.



Y-Gain

This allows the Y (luminance) gain to be adjusted by ± 6 dB in steps of 0.1 dB. Preset value is 0 dB.

Y-Off (Black Level)

This allows the black level to be adjusted by ± 50 mV in steps of 0.1 mV. Preset value is 0.0 mV.

C-Gain

This allows the Cb/Cr (chrominance) gain to be adjusted by ± 6 dB in steps of 0.1 dB. Preset value is 0 dB.

Noise-R

This allows up to 10 levels of noise reduction to be applied to the video signal. Preset is off.

Audio Config 1 (PCM Audio only)

This allows the gain of the 8 individual audio output pairs (channels 1 & 2, 3 & 4, 5 & 6 and 7 & 8) to be adjusted.

Audio Config 1



Audio Config 2 (PCM Audio only)

This allows the gain of the 8 individual audio pairs (channels 9 & 10, 11 & 12, 13 & 14 and 15 & 16) to be adjusted.

Gain (PCM Audio only)

The gain of the audio pair and their associated channels, may be adjusted by ±6 dB in 0 dB steps. Preset is to 0.0 dB.

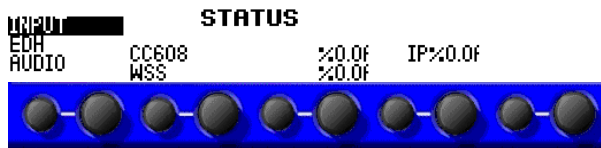
*Note that these gain settings are in addition to the master audio gain adjustments of the **Audio/Gain** function described on page 31.*

Status

This screen will show the status of the Input, EDH system, audio and system parameters.

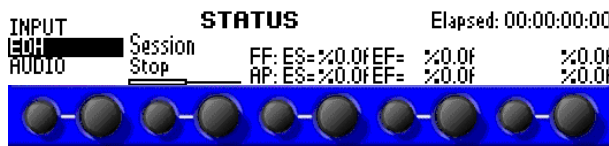
Input

The screen will display the characteristics of the input signal.



EDH

The EDH characteristics of the input signal will be displayed here.



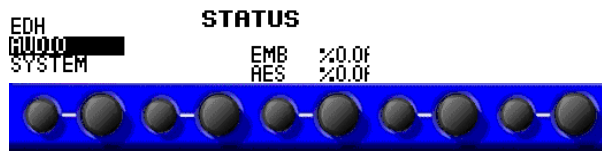
Session

This allows the EDH logging session to be either stopped or set running. **Stop** will freeze the current values; **Running** will set all counters to zero, and then enable the counters.

- **Elapsed:** This is time that the EDH logging session has been running. The format is DD (days) :HH (hours): MM (minutes): SS (seconds)
- **FF: ES** This is count of the number of one second periods that contain 1 or more errors in full frames.
- **FF: EF** This is count of the number of fields that contain 1 or more errors in full frames. These items are followed by a % figure. This is the Error fields divided by the total number of fields expressed as a percentage.
- **AP:** This shows the Active Picture area errors in a similar way to the above FF (Full Frame) errors.

Audio

The screen will display the characteristics of the audio input signals.



System

The screen will display the software release version number and the system checksum.



Configuration

This allows all parameters of the unit to be set up and configured.

ARC Mode

This allows the type of aspect ratio conversion operation to be selected.

Selections are Preset, User and WSS.



ARC Pst

This allows the selection of preset aspect ratio conversions.



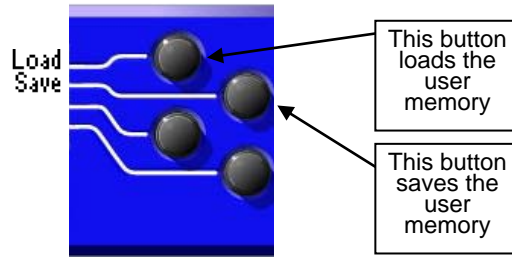
ARC User

This allows the selection of user configured aspect ratio conversions to be selected.



User 1 to 10

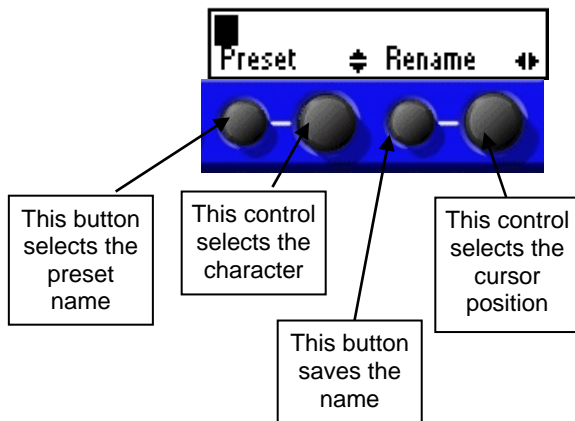
This allows the settings to be saved in 10 user memory locations. These can be saved, renamed and loaded as shown opposite.



Note that if a 'stretch' aspect ratio conversion is stored, the ARC Var controls will be grayed out.

Rename

This allows the default text (User 1, 2, 3, etc.) to be edited and saved using the buttons and control knobs as shown opposite.



ARC Var

This allows the aspect ratio conversion parameters to be manually set. Use these controls to create 'user' arc modes to store.



These controls are disabled for the 16:9S series of presets.

- **Size:** This adjusts the size of the whole image. Both vertical and horizontal size change together while maintaining the aspect ratio of the image. The range of control is from 50% to 200% in 0.1% steps and preset is 100%.
- **Pan:** This adjusts the horizontal position of the output image. The range of control is $\pm 50\%$ in 0.1% steps and preset is 0.0%.
- **Asp:** This adjusts the horizontal size of the image, allowing the shape (aspect ratio) of the output image to be changed. The range of control is from 50% to 200% in 0.1% steps and preset is 100%.
- **Pos:** Adjusts the vertical position of the output image. The range of control is $\pm 50\%$ in 0.1% steps and preset is 0.0%.

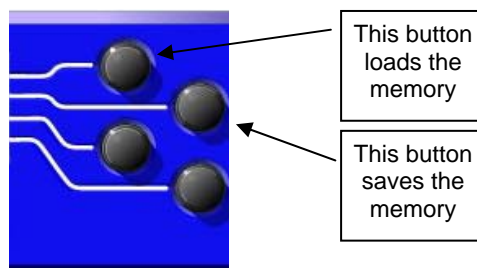
ARC WSS

The aspect ratio conversion is under the control of the WSS information on the input signal, the following conversions may be chosen automatically.



RP186_0	RP186A1.2	ETSI6
RP186_1	RP186A1.3	ETSI7
RP186A0.0	RP186A1.4	L23A0.0
RP186A0.1	RP186A1.5	L23A0.1
RP186A0.2	RP186A1.6	L23A0.2
RP186A0.3	RP186A1.7	L23A0.3
RP186A0.4	ETSI0	L23A0.4
RP186A0.5	ETSI1	L23A0.5
RP186A0.6	ETSI2	L23A0.6
RP186A0.7	ETSI3	L23A0.7
RP186A1.0	ETSI4	
RP186A1.1	ETSI5	

The parameters of these conversions may be changed, saved and recalled but they cannot be renamed.



Loss/Error

The Loss/Error control defines what the unit should do if the WSS signal is lost or corrupt. The available settings are, **No Change** or any of the WSS conversions listed above.

Aud D1-4 and Aud D5-8 (PCM Audio only)

This allows the delay of the 8 audio pairs (channels 1 to 16) to be adjusted.



The range of control is from 0 to 60 ms in steps of 0.1 ms. Preset is to 0.0 ms.

*Note that these delay settings are in addition to the master delay adjustments of the **Audio/Delay** function described on page 31.*

Aud G 1-4 and Aud G5-8 (PCM Audio only)

This allows the gain of the 8 audio pairs (channels 1 to 16) to be adjusted.



The range of control is ±6 dB in steps of 0.1 dB. Preset is to 0.0 dB.

Note that these gain controls are the same controls as those described on page 32.

Aud IV 1-4 and Aud IV 5-8 (PCM Audio only)

This allows the polarity of the 8 audio pairs (channels 1 to 16) to be inverted.



Selections are Normal or Invert.

Aud MX1-4 and Aud MX5-8 (PCM Audio only)

This mixes the inputs of the selected channels. Any of the 8 audio pairs (channels 1 to 16) may be chosen. If enabled, two identical mono outputs are created as a result of a 50:50 mix of the input pair.



Aud OP1-4 and Aud OP5-8

This allows the source of audio to be selected for embedding into the 8 audio output pairs.



Selections are as follows:

- **EmbedP1-P8:** Embedded input pairs 1 to 8.
- **AESP1-P4:** AES input pairs 1 to 4
- **Tone LL:** A 1KHz -20.0dBFS tone on both channels.
- **Tone LH:** A 1KHz -20.0dBFS tone on one channel, and 4KHz -20.0dBFS tone on the other channel.
- **Tone HL:** A 4KHz -20.0dBFS tone on one channel and a 1KHz -20.0dBFS tone on the other channel.
- **Tone HH:** A 4KHz -20.0dBFS tone on both channels.
- **Mute:** The channels are muted.
- **Off:** The channels are disabled.

Audio Master

This allows the audio configuration to be set up.



Mode

This selection determines whether an input audio pair should be treated as:

- **PCM:** All pairs are treated as PCM data (rate conversion).
- **Data (non-PCM audio):** All pairs are treated as data, no rate conversion. All pairs must be I/O locked, or locked to a common reference signal.
- **Dolby-E:** All pairs are treated as Dolby-E. Dolby-E frames will be dropped or repeated as necessary.
- **Mapped:** Pairs can be individually selected to be PCM, Data, or Dolby-E.

Note that this control is the same control as that described on page 31.

Gain (PCM Audio only)

This allows the audio gain to be adjusted. The range of control is ±6 dB in 0.1 dB steps. Preset is to 0.0 dB.

Note that this gain control is the same control as that described on page 31.

Delay (PCM Audio only)

This allows the audio signal to be delayed relative to the video. The range of control is from – 20.0 ms to 2000 ms in 0.1 ms steps. Preset is to 0.0 ms.

Note that this delay control is the same control as that described on page 31.

Slew Rate

This is the time taken for the audio signal to change to new values.

The options are:

- **Instant:** The response is immediate
- **Fast:** Change takes 25% of Slowest time
- **Medium:** Change takes 50% of Slowest time
- **Slow:** Change takes 75% of Slowest time
- **Slowest:** Change takes approximately one second

Blank IP

This function allows adjustment of input blanking.

It is used where the source video is known to have pixels/lines at the edge of the picture that are not required to be displayed. When set, the unit will blank any output data generated by the input data, regardless of the display control settings. It also provides a clean transition between blanking and the picture edge.



The settings are as follows:

- **Left:** Adjusts the left-hand edge of blanking. A setting of Off indicates that no input pixels that are normally visible should be blanked, 1 causes the first input pixel to be blanked, etc.
- **Right:** Adjusts the right-hand edge of blanking. A setting of Off indicates that no input pixels that are normally visible should be blanked, -1 causes the last input pixel to be blanked, etc.
- **Top:** Adjusts the top edge of blanking. A setting of Off indicates that no input lines that are normally visible should be blanked, 1 causes the first input line to be blanked, etc.
- **Bottom:** Adjusts the bottom edge of blanking. A setting of Off indicates that no input lines that are normally visible should be blanked, -1 causes the last input line to be blanked, etc.

Note that the preset values and the adjustment ranges will depend on the input standard

Effect of Blanking Controls



Blank OP

This allows the adjustment of output blanking.

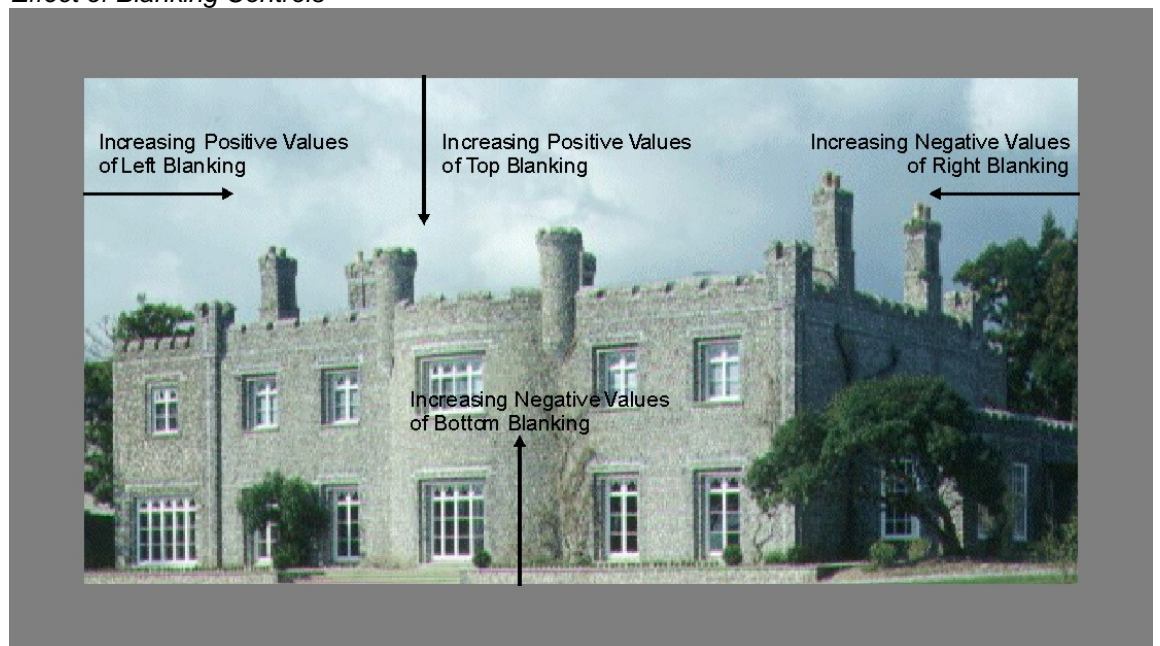
Output blanking is used when it is required that ranges of output lines or pixels are never active. For example, it is possible to impose an artificial letterbox by bringing the top output blanking down and the bottom output blanking up.



- **Left:** Adjusts the left-hand edge of blanking. A setting of Off indicates that no input pixels that are normally visible should be blanked, 1 causes the first input pixel to be blanked, etc.
- **Right:** Adjusts the right-hand edge of blanking. A setting of Off indicates that no input pixels that are normally visible should be blanked, -1 causes the last input pixel to be blanked, etc.
- **Top:** Adjusts the top edge of blanking. A setting of Off indicates that no input lines that are normally visible should be blanked, 1 causes the first input line to be blanked, etc.
- **Bottom:** Adjusts the bottom edge of blanking. A setting of Off indicates that no input lines that are normally visible should be blanked, -1 causes the last input line to be blanked, etc.

Note that the preset values and the adjustment ranges will depend on the input standard.

Effect of Blanking Controls



Blank Col

This allows the unused areas of the screen that would normally be black, to be given color, saturation and luminance values.



Hue

This control adjusts the color of the blanked area. The range is from 0° to 359° in steps of 0.1°. This uses the HLS color model to define the colors and as a guide the following values produce these colors:

- 0° Red
- 60° Yellow
- 120° Green
- 180° Cyan
- 240° Blue
- 300° Magenta

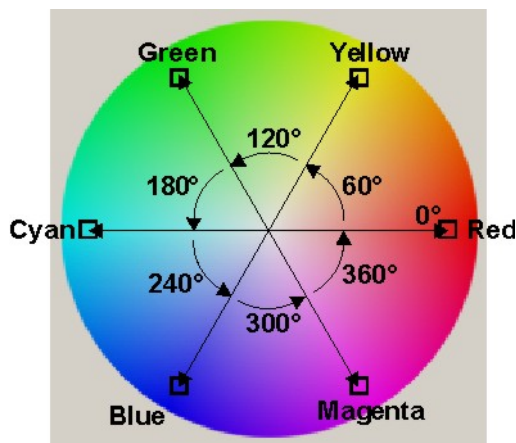
Sat

This controls how saturated the chosen color appears.

Luma

This controls how bright the color appears.

Note that for the area to appear colored, values above 0% must be entered for the Saturation and Luminance controls. To produce gray, values above 0% should be entered for the Luminance control only.



The diagram above shows the relationship between the hue angle and the color with 50% luminance and 75% saturation levels.

CC

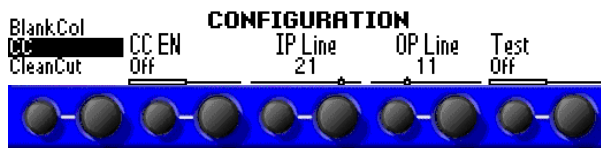
This allows the input line that contains the Closed Caption data to be chosen and for the function to be disabled.



- **CC EN:** The Closed Caption function may be enabled (On) or disabled (Off). When enabled, CEA-608-B closed captions will may be extracted from the input video, and re-inserted into the output video in accordance with CEA-708-B (NTSC handling)
- **IP Line:** This allows a particular input line to be chosen for the extraction of the CEA-608-B Closed caption data.
- **OP Line:** This allows a particular output line to be chosen for the insertion of the CEA-708-B Closed caption data.
- **Test:** This allows a test caption to be inserted.

CleanCut

This item allows CleanCut function to be turned **On** or **Off**.



CleanCut ensures no interpolation occurs between images either side of a cut. Under extreme circumstances it may be necessary to disable CleanCut under the rare circumstance of a false cut being detected.

Enhance

This control defines the amount of enhancement applied.



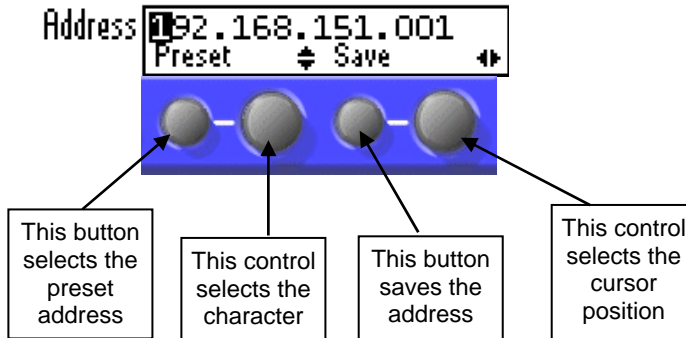
A positive value provides enhancement, whereas a negative value provides de-enhancement. The higher the value, the greater the amount of enhancement. Too high a value is likely to result in unwanted artifacts. The range is -5 to +20 units in steps of 1 unit.

Warning!

IP address, sub net mask and Default Gateway IP address should be set to addresses as required by the local IT manager and should not be altered except by qualified personnel.

Ether-1

A valid Ethernet address must be established before this unit can be remotely controlled over a TCP/IP network.



DHCP

(Dynamic Host Configuration Protocol. A TCP/IP protocol that dynamically assigns an IP address to a computer). An active DHCP server must be available for this feature to operate.

This function may be enabled or disabled.

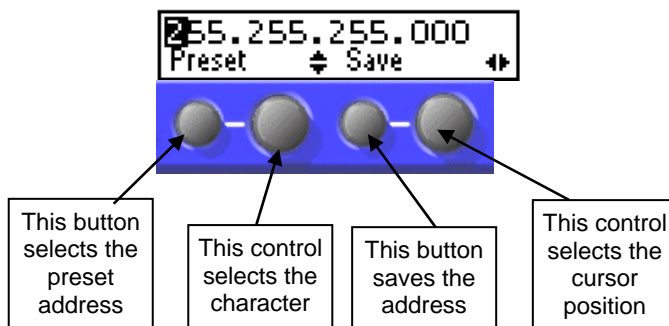
Address

If DHCP is disabled, the IP address of the unit may be set using the Address field.

Ether-2

Netmask

This allows the Subnet mask address to be entered.



More ► Gateway

This allows the Gateway address to be entered.



Ether-3



DHCP En

This will show the status of the DHCP.

Cur(rent) Addr(ess)

This will show the current unit address. This will be the Address set above, if DHCP is disabled, or the address as allocated by DHCP server.

Ether-4



Cur(rent) Mask

This will show the current netmask address.

Cur(rent) Gate(way)

This will show the current IP Gateway address.

Front Panel

This allows the color of the display panel (for all functions) to be changed.



Selections available are:

White, Blue, Magenta, Green, Cyan, Red, Yellow and Dynamic.

In the Dynamic (default Mode) mode the display will appear in different colors for specific functions as described below:

- Home: Green
- Convert: Blue
- Video: Cyan
- Audio: Magenta
- Video Config: Yellow
- Audio Config: Red
- Status: White
- Configuration: White

GPI

This screen controls the GPI functions.



Enable

This allows the GPI function to be turned On or Off.

If enabled, an active GPI will recall the appropriate GPI memory, and flag this recall on the corresponding GPO tally output.

Ident

This allows the Caption (Ident) to be enabled and the text edited.

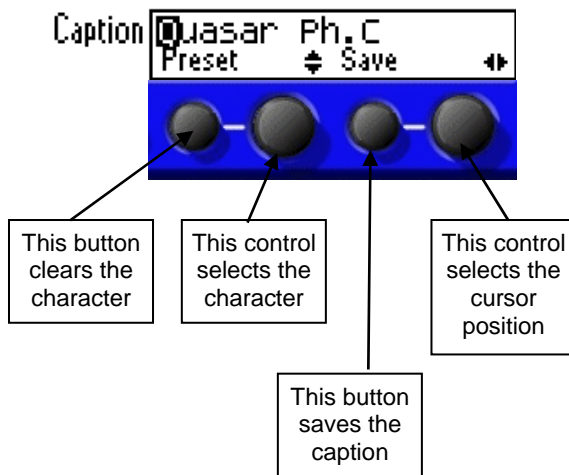


Ident

The Ident (Caption) may be turned On or Off.

Caption

This allows the default text Quasar Ph.C to be edited using the buttons and control knobs as shown opposite.



Legalize

Gamut legalization is required as all color video signals are ultimately coded as RGB for display on a picture monitor.

The legalizer ensures that the HD output of the unit meets the color gamut limits as specified and measured with a Tektronix WFM700



Selections available are:

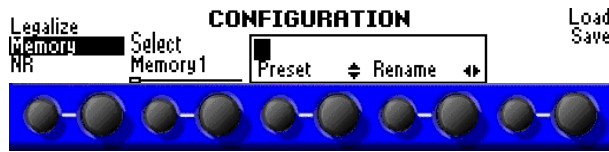
- Off: The function is disabled
- HD721mV: For domestic and professional displays. No errors will be reported with a Tektronix WFM700.
- HD700mV: Removes clipping artifacts that can arise on Plasma and LCD display devices.
- SD_Digital*: Digital limits are designed for a digital transmission path.
- SD_Analog*: Limits are set for composite transmission.

*These limits ensure that if the HD output of Quasar is subsequently downconverted, it nominally meet SD color gamut limits.

Snell and Wilcox do not guarantee that SD specs will be met, as downconversions will vary between manufactures. These modes are designed to get the signals within reasonable limits such that any clipping or limiting in SD world will have minimal effect on the picture quality.

Memory

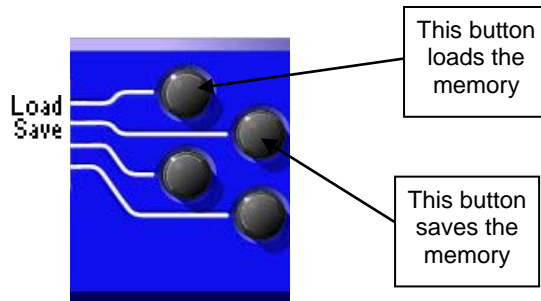
This allows the setup of the unit to be recalled from, and saved in, 10 memory locations.



Selections are:

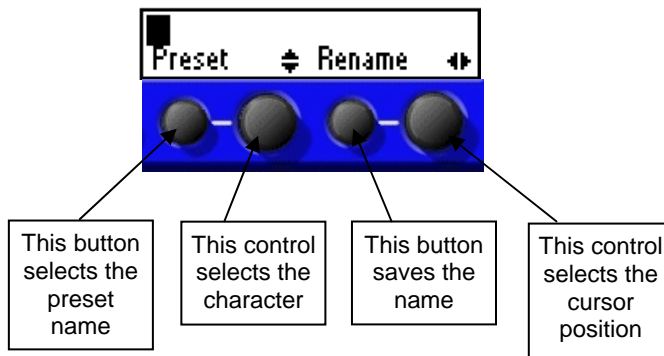
- Memory 1-10: This allows a memory location to be chosen and selected (recalled). They can be renamed and saved. The setup may be saved using the upper front panel button as shown opposite.
- GPI 1 to 3: This allows one of three GPI's to be selected. These can be renamed and saved.
- Defaults: Recalls the unit's factory settings.

Note that this **will not** reset any user memories.



Rename

This allows the memory name to be changed as shown below.



NR

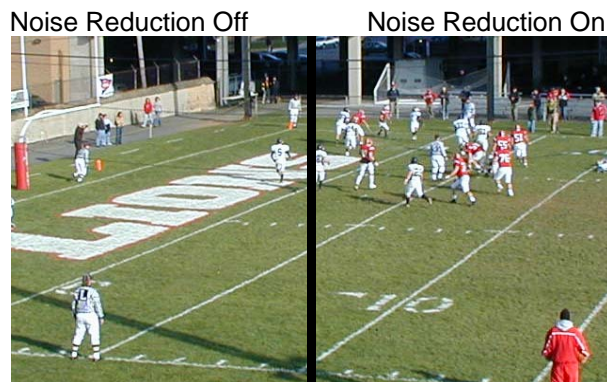
This allows various amounts of noise reduction to be applied to the signal.



The range of control is from Off to 10 levels of noise reduction. Preset is to Off (no noise reduction).

Split

When set to On the picture will be split into two halves showing the picture with and without noise reduction as demonstrated in the example opposite.



Pattern

This function allows the output picture to become a pattern.



Selections available are:

Off, 100%Bars, 75%Bars, SMPTE Bars and Black.

Prefix

This control allows various amounts of pre-processing to be applied to the signal that improves MPEG encoding performance.



The selections available are Off, Low, medium and High.

R(oll)Log

These items will allow the status of various items to be made available for logging to the Log Server. Each item may be enabled or disabled and its status displayed.

RLog Fans

When set to Enable this will log the status of the cooling fan to the selected Log Server.



RLog Inp(ut)

When set to Enable this will log the status of the input to the selected Log Server.



RLog PSU

When set to Enable this will log the status of the Power Supply Unit to the selected Log Server.



RLog Ref(erence)

When set to Enable this will log the status of the reference input to the selected Log Server.



RLog Tmp

When set to Enable this will log the temperature of the unit and the status of the temperature sensor to the selected Log Server.



RTrack-1 and Rtrack-2

The RollTrack function allows the Quasar PhC. to automatically control remote units using the RollCall system.



Audio Delay

As the delay through the Quasar PhC. varies according to the conversion mode, delay modules connected via the RollTrack system will automatically have their delay updated to match.

The delay sent out via the RollTrack system matches the internal audio delay of the Quasar.

Input Status

The status of the input signal to the Quasar Ph.C may used to control other units using the RollCall system.

There are two RollTrack devices (RTrack-1 and Rtrack-2) available that enable the same command too be sent to two different destinations or different commands to be sent to the same destination.

Select

This allows the RollTrack source to be selected.

Selections are:

- Off
- Audio Delay
- Input OK
- Input Loss
- Input Unsuitable
- Input Error

More ►

This reveals three more RollTrack screens.

Addr*ID

This allows the destination address to be entered.



Cmd*Val

This allows the command value to be entered.



Status

This item will show the status of the currently selected RollTrack index.



RollCall

This screen allows the RollCall functions to be set up.



Address

This allows the address of the unit to be set. Values can be in the range 10 Hex to FF Hex.

Note that the unit must be rebooted for a new address to be actioned. This may disrupt or prevent use by remote users.

Name

This allows the name of the unit as it appears on the network, to be changed from the default name of Quasar Ph.C.

RollLog

This screen allows the characteristics of the logging server to be specified.

Server

This allows the Logging Server to be named. Preset is to nothing.



More ►

This reveals two more RollLog screens.

Server name

This will display the Logging Server name.



Server Addr(ess)

This will display the address of the Logging Server.



Sync

This screen allows the genlock functions to be set up.



Mode

This allows the source of genlock to be selected.

- Freerun: The unit is not locked to any external signal.
- External: The unit will lock to a signal connected to the reference input of the unit.
- Input: The unit will be locked to the input signal.
- Min Delay: The unit will be locked to the input and process the signal with the minimum of delay.

H Timing

This allows the horizontal timing of the output signal with respect to the reference signal to be adjusted. The range of adjustment is one output line in steps of 1 pixel.

The preset value is 0 pixels.

V Timing

This allows the vertical timing of the output signal with respect to the reference signal to be adjusted.

The range of adjustment is one output frame in steps of 1 line. The preset value is 0 Lines.

Freerun

This allows the frequency to be adjusted over a small range. The range of adjustment is ± 60 units and preset is to 0.

Vid Proc

This allows various adjustments to be made to the video signal.



Y-Gain

This allows the Y (luminance) gain to be adjusted by ± 6 dB in steps of 0.1 dB. Preset value is 0 dB.

Y-Offset (Black Level)

This allows the black level to be adjusted by ± 50 mV in steps of 0.1 mV. Preset value is 0.0 mV.

C-Gain

This allows the Cb/Cr (chrominance) gain to be adjusted by ± 6 dB in steps of 0.1 dB. Preset value is 0 dB.

Hue

This allows the hue of the picture to be adjusted. The range of control is from -179° to $+180^\circ$

Vid YC Dly

This allows the timing between the luminance and chrominance parts of the video signal, to be adjusted.



The range of control is from -592 ns to +444 ns steps of 148 ns and preset is to 0 ns.

Video IP

This allows the video input to be selected and the output signal if the input fails, to be chosen.



Source

Either SDI A or SDI B may be chosen and selected.

IP Error

This allows the output signal to be chosen if the input signal fails or is in error.

Options available are:

- Pass Video: The incoming signal will be displayed whenever possible.
- Freeze: The output will become a frozen frame picture.
- Black: The output picture will cut to black.
- Bars: The output picture will cut to a color bar pattern.

Video OP

This allows the output line and Frame rate to be selected.



Line Rate

Either 720 or 1080 may be chosen.

Frame Rate

Either 50 or 59.94 frames per second may be chosen.

WSS

This allows the Wide Screen Signaling options to be selected.



WSS En(able)

This enables the WSS data processing mode. WSS or VI may be extracted from current IP (Input). If required, the current WSS driven aspect ratio conversion may be flagged at the OP (Output) in accordance with the proposed SMPTE2016-1 IP & OP (Input and Output) enable both features.

Type

This allows the type of WSS signal to be chosen for processing the signal.

- Options are:
- RP186: Video Index (VI)
- RP186 AFD: Video Index (VI) with Active format descriptor
- ETSI: Line 23 (625 inputs only)
- Line 23 AFD: Line 23 (625 inputs only)

IP Line

This allows the line of the input signal to be chosen for deriving the WSS data. Lines 1 to 24 may be selected.

OP Line

This allows the line of the output signal to be chosen for inserting the WSS data. Lines 1 to 30 may be selected.

Operation Using the RollCall Control Panel

The Quasar Ph.C can be operated by means of either the 16 bit or 32 bit RollCall Control Panel.

The screen captures in this manual show the 16 bit Control Panel; however, while the 32 bit Control Panel appears differently, the controls on each screen are the same.

16 Bit RollCall Control Panel

This option requires the RollCall Software to be installed on the computer to be used. For information about the 16 bit RollCall Control Panel, refer to the *RollCall™ Infrastructure Management Suite Software Installation Guide & Operational Overview*.

32 Bit RollCall Control Panel

The 32 bit Control Panel is a direct replacement for the 16 bit Control Panel. Unlike the 16 bit version, it does not require the RollCall Comms Manager (Commtrol) for its operation.

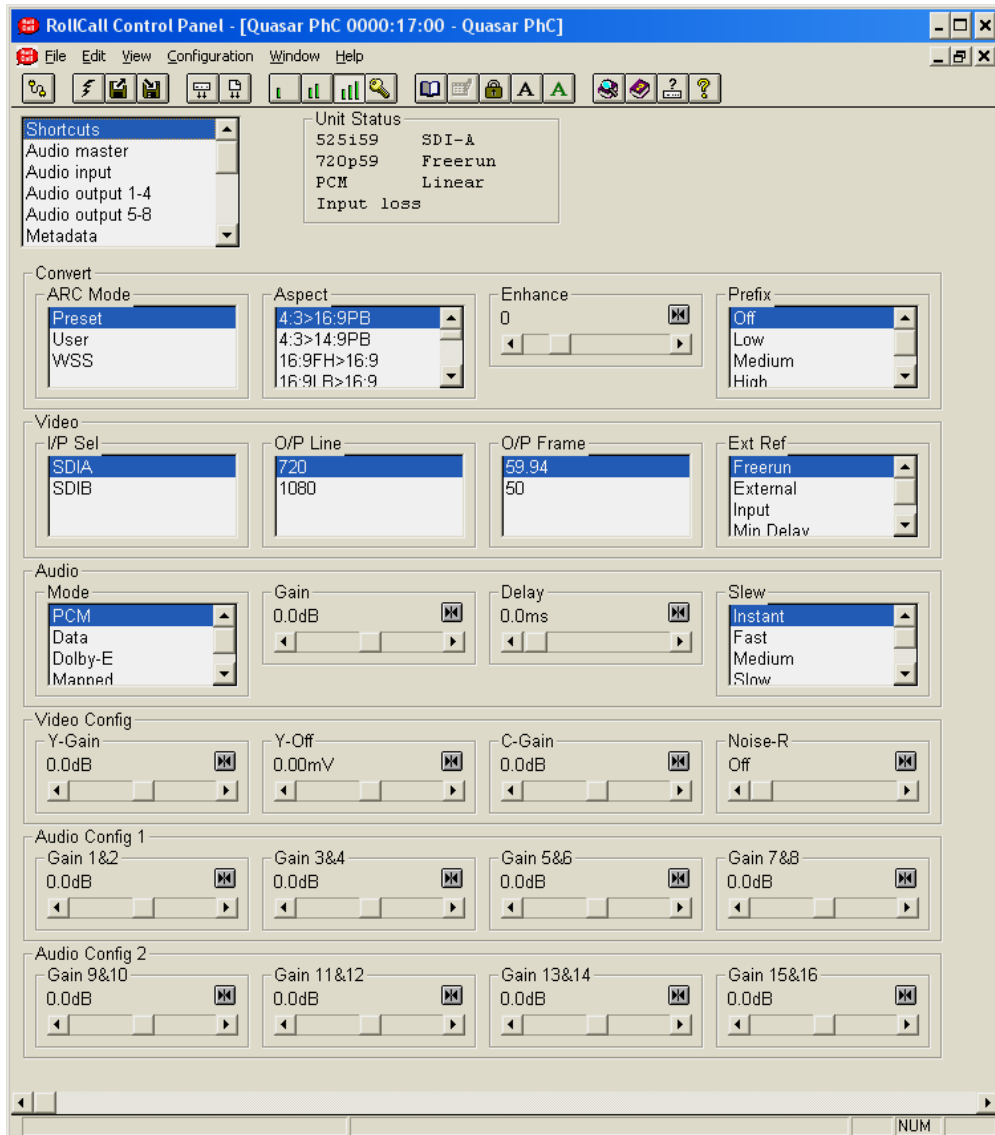
The 32 bit Control Panel is written in Java and requires the Sun Java Runtime Environment (JRE) to be installed. JRE 1.5 or later is required.

The Control Panel can be run either as an applet or as an application.





For information about the 32 bit RollCall Control Panel, refer to the *RollCall 32 Bit Control Panel User Instruction Manual*.


Shortcuts

This screen allows access to most of the control functions of the Quasar Ph.C.



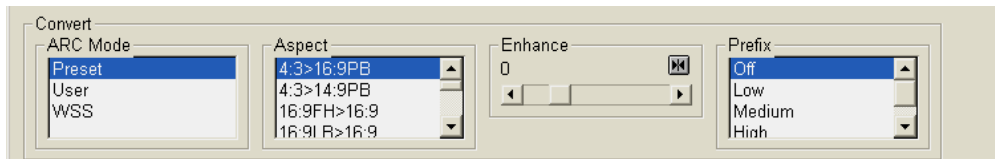
Note: For this and other screens the following applies to the scroll bars:

The   and   symbols at the ends of the scroll bar allow the value to be adjusted in discrete steps.

The numerical value will be shown next to the scroll bars and selecting Preset  will return the setting to the calibrated value for that item.

Convert

This allows conversion adjustments to be made.



ARC Mode

This allows the method of aspect ratio conversion control to be chosen.

- **Preset:** This allows the preset aspect ratio conversions to be selected using the Aspect function.
- **User:** This allows 10 User definable conversions to be selected. Values of Size, Position, Pan and Aspect ratio can be changed via the **ARC/Var** function, and then stored and renamed using the ARC/User controls.
- **WSS:** When selected the conversion is under the control of the WSS information on the input signal. *Note that this action depends on the setup in the **ARC/ARC WSS** function.*

Aspect

This allows preset aspect ratio conversions to be selected. For details of these conversions, see page 70.

Enhance

This control defines the amount of enhancement applied. A positive value provides enhancement, whereas a negative value provides de-enhancement. – The higher the value, the greater the amount of enhancement. Too high a value is likely to result in unwanted artifacts. The range is from -5 to +20 units.

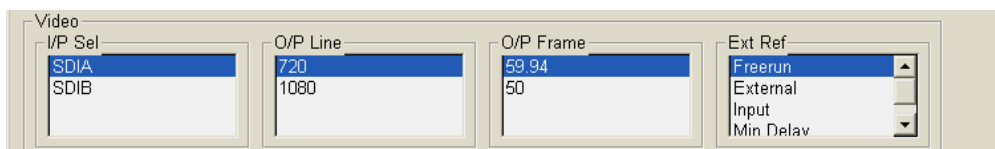
Prefix

This control allows various amounts of pre-processing to be applied to the signal that improves MPEG encoding performance.

The selections available are Off, Low, Medium and High.

Video

This allows the video input, the output standard and the genlock mode to be selected.



I/P Sel(ect)

Either the SDI A or SDI B input may be selected.

O/P Line (Standard)

The output line standard may be selected as either 720p or 1080i.

O/P Frame (Rate)

Either 50 or 59.94 frames per second may be chosen as the output frame rate.

Ext(ernal) Ref(erence)

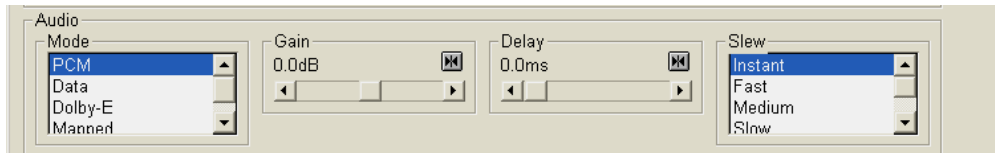
This allows the source of genlock to be selected.

- **Freerun:** The unit is not locked to any signal.
- **External:** The unit will lock to a valid signal connected to the reference input of the unit.

- Input: The unit will be locked to the input signal.
- Min Delay: The unit will be locked to the input and process the signal with the minimum of delay.

Audio

This allows adjustments and selections to be made to the audio processing of the unit.



Mode

This selection determines whether an input audio pair should be treated as:

- **PCM:** All pairs are treated as PCM data (rate conversion).
- **Data** (non-PCM audio): All pairs are treated as data, no rate conversion. All pairs must be I/O locked, or locked to a common reference signal.
- **Dolby-E:** All pairs are treated as Dolby-E. Dolby-E frames will be dropped or repeated as necessary.
- **Mapped:** Pairs can be individually selected to be PCM, Data, or Dolby-E.

Gain (PCM Audio only)

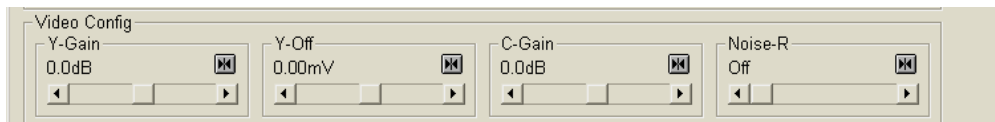
This allows the overall audio gain of the unit to be adjusted. The range of control is ± 6 dB in 0.1 dB steps. Preset is to 0.0 dB.

Delay (PCM Audio only)

This allows the audio signal to be delayed relative to the video. The range of control is from 20.0 ms to 2000 ms in 0.1 ms steps. Preset is to 0.0 ms.

Video Config

This allows various adjustments to be made to the video signal.



Y-Gain

This allows the Y (luminance) gain to be adjusted by ± 6 dB in steps of 0.1 dB. Preset value is 0 dB.

Y-Off (Black Level)

This allows the black level to be adjusted by ± 50 mV in steps of 0.1 mV. Preset value is 0.0 mV.

C-Gain

This allows the Cb/Cr (chrominance) gain to be adjusted by ± 6 dB in steps of 0.1 dB. Preset value is 0 dB.

Noise-R

This allows up to 10 levels of noise reduction to be applied to the video signal. Preset is to level 0.

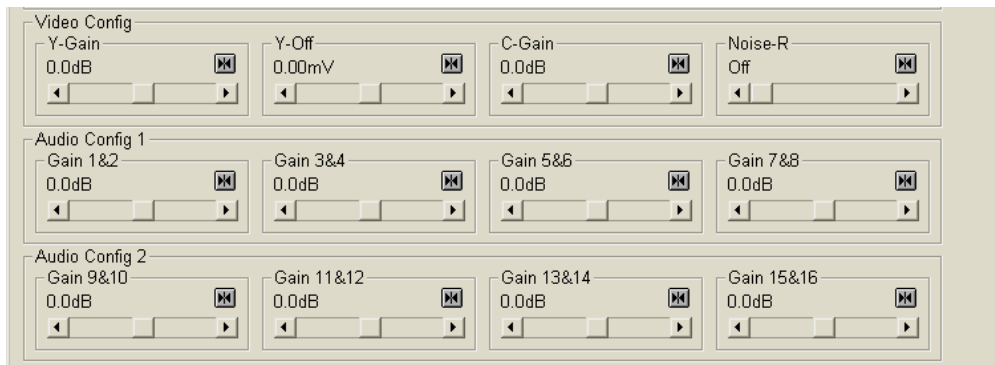
Audio Config 1 and 2

Audio Config 1 (PCM Audio only)

This allows the gain of the 8 individual audio output pairs (channels 1 & 2, 3 & 4, 5 & 6 and 7 & 8) to be adjusted.

Audio Config 2 (PCM Audio only)

This allows the gain of the 8 individual audio pairs (channels 9 & 10, 11 & 12, 13 & 14 and 15 & 16) to be adjusted.



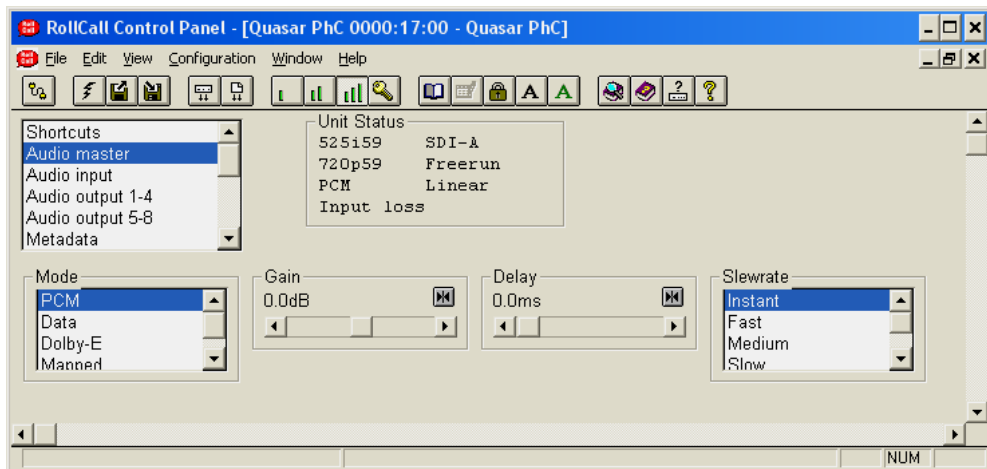
Gain (PCM Audio only)

The gain of the audio pair and their associated channels, may be adjusted by ± 6 dB in 0 dB steps. Preset is to 0.0 dB.

Note that these gain settings are in addition to the master audio gain adjustments of the **Audio/Gain** function described on page 60.

Audio Master

This allows the audio configuration to be set up.



Mode

This selection determines whether an input audio pair should be treated as:

- **PCM:** All pairs are treated as PCM data (rate conversion).
- **Data** (non-PCM audio): All pairs are treated as data, no rate conversion. All pairs must be I/O locked, or locked to a common reference signal.
- **Dolby-E:** All pairs are treated as Dolby-E. Dolby-E frames will be dropped or repeated as necessary.
- **Mapped:** Pairs can be individually selected to be PCM, Data, or Dolby-E.

Note that this control is the same control as that on the Shortcuts screen.

Gain (PCM Audio only)

This allows the audio gain to be adjusted. The range of control is ± 6 dB in 0.1 dB steps. Preset is to 0.0 dB.

Note that this gain control is the same control as that on the Shortcuts screen.

Delay (PCM Audio only)

This allows the audio signal to be delayed relative to the video. The range of control is from – 20.0 ms to 2000 ms in 0.1 ms steps. Preset is to 0.0 ms.

Note that this delay control is the same control as that on the Shortcuts screen.

Slew Rate

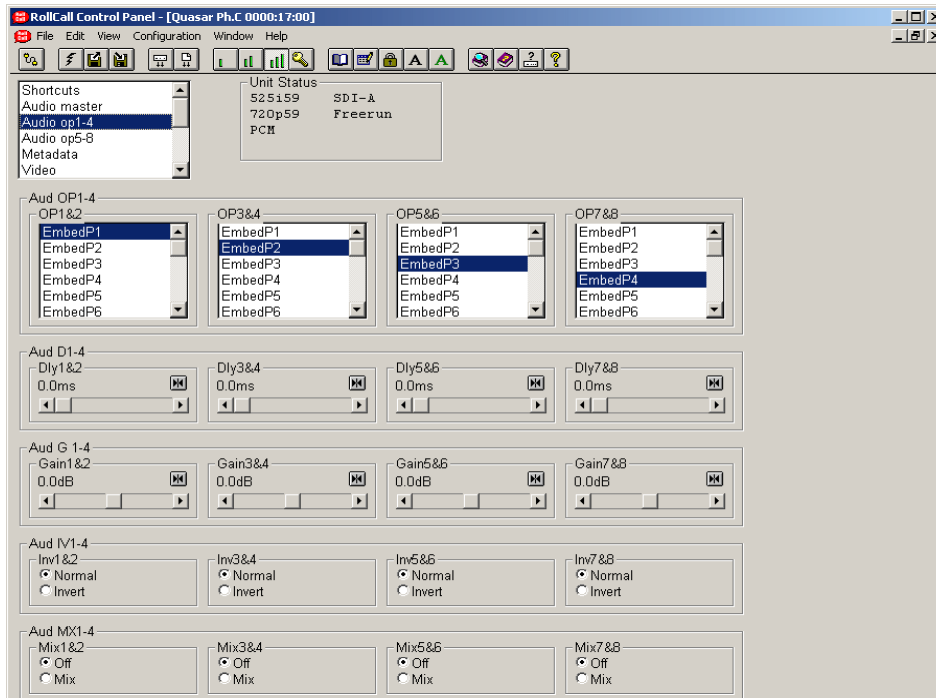
This is the time taken for the audio signal to change to new values.

The options are:

- **Instant:** The response is immediate
- **Fast:** Change takes 25% of Slowest time
- **Medium:** Change takes 50% of Slowest time
- **Slow:** Change takes 75% of Slowest time
- **Slowest:** Change takes approximately one second

Audio op 1-4 and Audio op 5-8

These screens allow selections and adjustments to be made to the audio outputs.



Audio OP 1-4 and 5-8

This allows the source of audio to be selected for embedding into the 8 audio output pairs.

Selections are as follows:

- EmbedP1-P8 Embedded input pairs 1 to 8.

- AESP1-P4 AES input pairs 1 to 4
- Tone LL A 1KHz -20.0dBFS tone on both channels.
- Tone LH A 1KHz -20.0dBFS tone on one channel, and 4KHz -20.0dBFS tone on the other channel.
- Tone HL A 4KHz -20.0dBFS tone on one channel and a 1KHz -20.0dBFS tone on the other channel.
- Tone HH A 4KHz -20.0dBFS tone on both channels.
- Mute The channels are muted.
- Off The channels are disabled.

Audio D 1-4 and 5-8

This allows the delay of the 8 audio pairs (channels 1 to 16) to be adjusted.

The range of control is from 0 to 60 ms in steps of 0.1 ms. Preset is to 0.0 ms.

Note that these delay settings are in addition to the master delay adjustments of the Audio/Delay function.

Audio G 1-4 and 5-8

This allows the gain of the 8 audio pairs (channels 1 to 16) to be adjusted.

The range of control is ±6 dB in steps of 0.1 dB. Preset is to 0.0 dB.

Audio IV 1-4 and 5-8

This allows the polarity of the 8 audio pairs (channels 1 to 16) to be inverted.

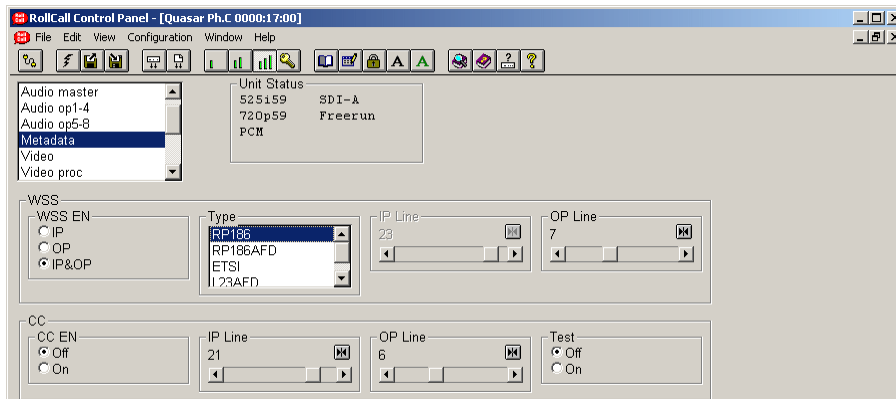
Selections are Normal or Invert.

Audio MX 1-4 and 5-8

This mixes the inputs from the selected channels. Any of the 8 audio pairs (channels 1 to 16) may be chosen. If enabled, two identical mono outputs are created as a result of a 50:50 mix of the input pair.

Metadata

This allows the Wide Screen Signaling and Closed Caption options to be selected.



WSS

WSS En(able)

This enables the WSS data processing mode. WSS or VI may be extracted from current IP (Input). If required, the current WSS driven aspect ratio conversion may be flagged at the OP (Output) in accordance with the proposed SMPTE2016-1 IP & OP (Input and Output) enable both features.

Type

This allows the type of WSS signal to be chosen for processing the signal.

Options are:

- RP186: Video Index (VI)
- RP186 AFD: Video Index (VI) with Active format descriptor
- ETSI: Line 23 (625 inputs only)
- Line 23 AFD: Line 23 (625 inputs only)

IP Line (only available for 625 inputs)

This allows the line of the input signal to be chosen for deriving the WSS data. Lines 1 to 24 may be selected.

OP Line

This allows the line of the output signal to be chosen for inserting the WSS data. Lines 1 to 30 may be selected.

CC

This allows the input line that contains the Closed Caption data to be chosen and for the function to be disabled.

CC EN

The Closed Caption function may be enabled (On) or disabled (Off). When enabled, CEA-608-B closed captions will may be extracted from the input video, and re-inserted into the output video in accordance with CEA-708-B (NTSC handling)

IP Line

This allows a particular input line to be chosen for the extraction of the CEA-608-B Closed caption data.

OP Line

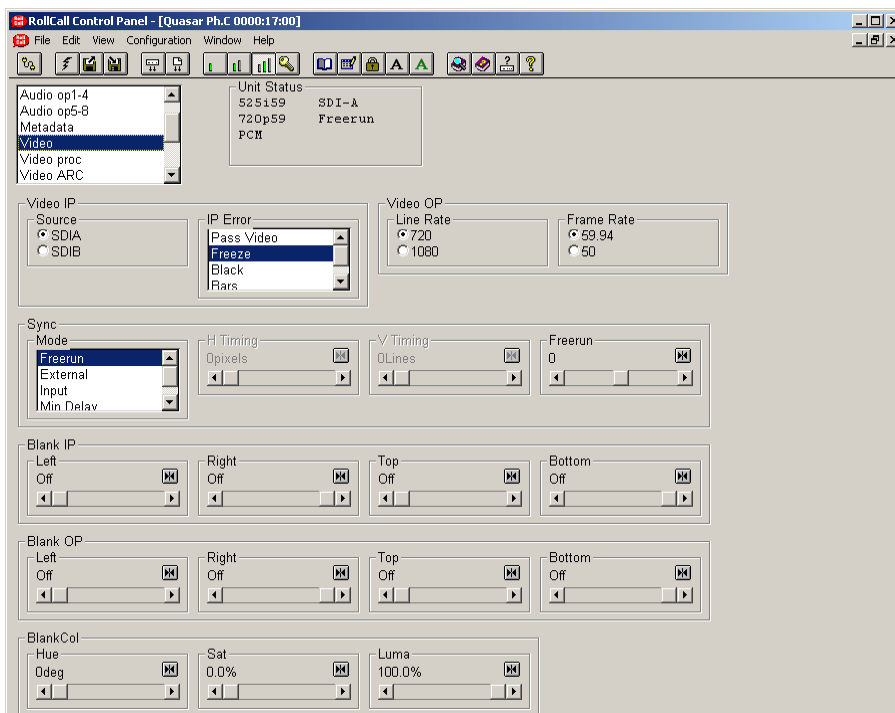
This allows a particular output line to be chosen for the insertion of the CEA-708-B Closed caption data.

Test

This allows a test caption to be inserted.

Video

This screen allows the Video, Genlock and picture blanking parameters to be configured.



Video IP

Source

This allows the source of the video input signal to be selected. Either SDI A or SDI B may be selected.

IP Error

This allows the output signal to be chosen if the input signal fails or is in error.

Options available are:

- Pass Video: The incoming signal will be displayed whenever possible.
- Freeze: The output will become a frozen frame picture.

Video OP

This allows the output line and Frame rate to be selected.

Line Rate

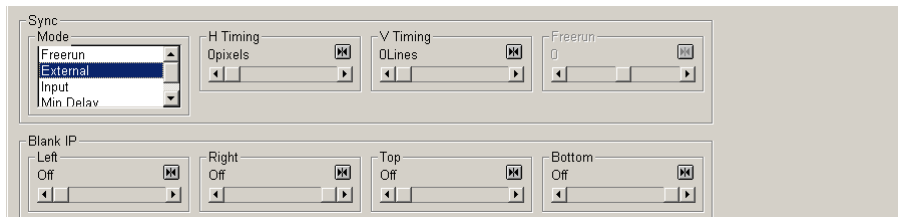
Either 720p or 1080i may be chosen.

Frame Rate

Either 50 or 59.94 frames per second may be chosen.

Sync

This function allows the genlock functions to be set up.



Mode

This allows the source of genlock to be selected.

- Freerun: The unit is not locked to any external signal.
- External: The unit will lock to a signal connected to the reference input of the unit.
- Input: The unit will be locked to the input signal.
- Min Delay: The unit will be locked to the input and process the signal with the minimum of delay.

H Timing

This allows the horizontal timing of the output signal with respect to the reference signal to be adjusted. The range of adjustment is one output line in steps of 1 pixel.

The preset value is 0 pixels.

V Timing

This allows the vertical timing of the output signal with respect to the reference signal to be adjusted.

The range of adjustment is one output frame in steps of 1 line. The preset value is 0 Lines.

Freerun

This allows the frequency to be adjusted over a small range. The range of adjustment is ± 60 units and preset is to 0.

Blank IP

This function allows adjustment of input blanking.

It is used where the source video is known to have pixels/lines at the edge of the picture that are not required to be displayed. When set, the unit will blank any output data generated by the input data, regardless of the display control settings. It also provides a clean transition between blanking and the picture edge.

The settings are as follows:

Left

Adjusts the left-hand edge of blanking. A setting of Off indicates that no input pixels that are normally visible should be blanked, 1 causes the first input pixel to be blanked, etc.

Right

Adjusts the right-hand edge of blanking. A setting of Off indicates that no input pixels that are normally visible should be blanked, -1 causes the last input pixel to be blanked, etc.

Top

Adjusts the top edge of blanking.

A setting of Off indicates that no input lines that are normally visible should be blanked, 1 causes the first input line to be blanked, etc.

Bottom

Adjusts the bottom edge of blanking.

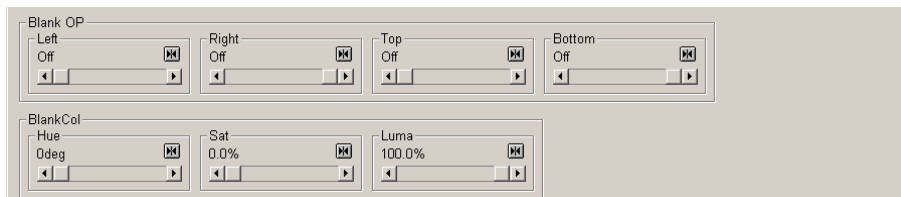
A setting of Off indicates that no input lines that are normally visible should be blanked, -1 causes the last input line to be blanked, etc.

Note that the preset values and the adjustment ranges will depend on the input standard.

For more details please refer to page 39.

Blank OP

This function allows the adjustment of output blanking.



Output blanking is used when it is required that ranges of output lines or pixels are never active. For example, it is possible to impose an artificial letterbox by bringing the top output blanking down and the bottom output blanking up.

Left

This control adjusts the left-hand edge of blanking. A setting of Off indicates that no input pixels that are normally visible should be blanked, 1 causes the first input pixel to be blanked, etc.

Right

This control adjusts the right-hand edge of blanking. A setting of Off indicates that no input pixels that are normally visible should be blanked, -1 causes the last input pixel to be blanked, etc.

Top

This control adjusts the top edge of blanking. A setting of Off indicates that no input lines that are normally visible should be blanked, 1 causes the first input line to be blanked, etc.

Bottom

This control adjusts the bottom edge of blanking. A setting of Off indicates that no input lines that are normally visible should be blanked, -1 causes the last input line to be blanked, etc.

Note that the preset values and the adjustment ranges will depend on the input standard.

For more details please refer to page 40.

Blank Col

This allows the unused areas of the screen that would normally be black, to be given color, saturation and luminance values.

Hue

This control adjusts the color of the blanked area. The range is from 0° to 359° in steps of 0.1°. This uses the HLS color model to define the colors and as a guide the following values produce these colors:

- 0° Red
- 60° Yellow
- 120° Green
- 180° Cyan
- 240° Blue
- 300° Magenta

Sat

This controls how saturated the chosen color appears.

Luma

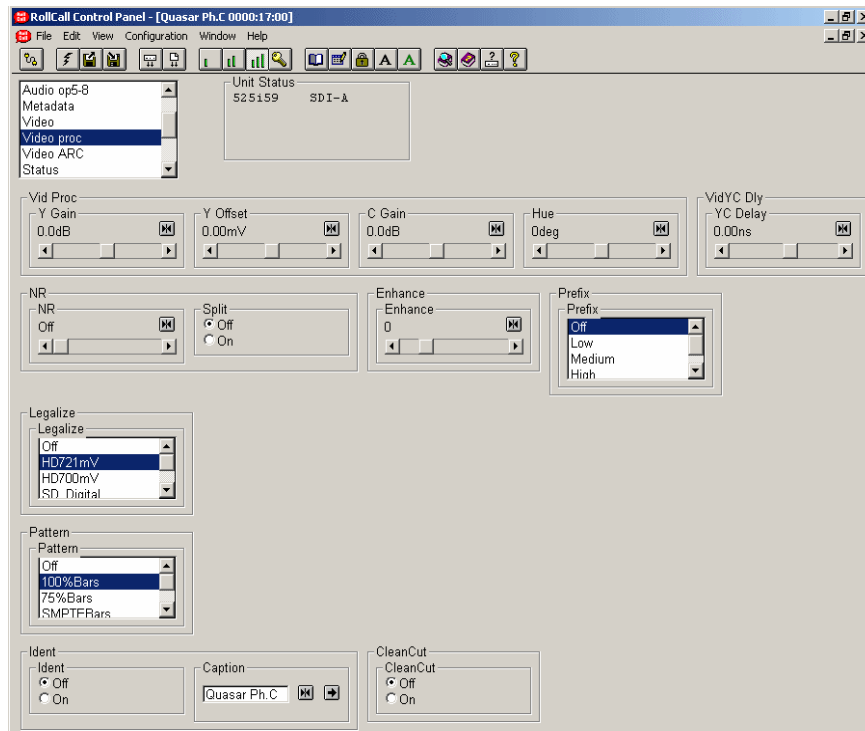
This controls how bright the color appears.

Note that for the area to appear colored, values above 0% must be entered for the Saturation and Luminance controls. To produce gray, values above 0% should be entered for the Luminance control only.

For more details please refer to page 41.

Video Proc

This screen allows various adjustments to be made to the video signal.



Vid Proc

Y-Gain

This allows the Y (luminance) gain to be adjusted by ± 6 dB in steps of 0.1 dB. Preset value is 0 dB.

Y-Offset (Black Level)

This allows the black level to be adjusted by ± 50 mV in steps of 0.1 mV. Preset value is 0.0 mV.

C-Gain

This allows the Cb/Cr (chrominance) gain to be adjusted by ± 6 dB in steps of 0.1 dB. Preset value is 0 dB.

Hue

This allows the hue of the picture to be adjusted. The range of control is from -179° to $+180^\circ$.

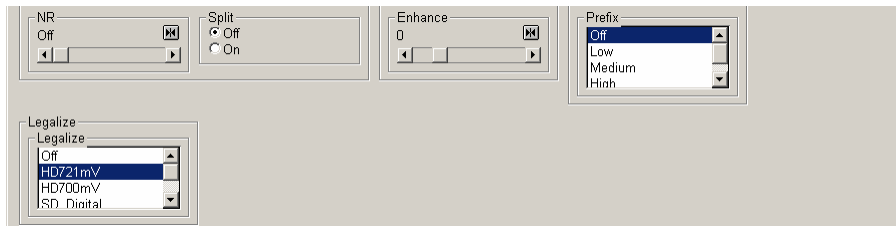
Vid YC Dly

This allows the timing between the luminance and chrominance parts of the video signal, to be adjusted.

The range of control is from -592 ns to $+444$ ns steps of 148 ns and preset is to 0 ns.

NR

This allows various amounts of noise reduction to be applied to the signal.



NR

The range of control is from Off to 10 levels of noise reduction. Preset is to Off (no noise reduction).

Split

When set to On the picture will be split into two halves showing the picture with and without noise reduction as demonstrated in the example shown on page 48.

Enhance

This control defines the amount of enhancement applied.

A positive value provides enhancement, whereas a negative value provides de-enhancement. The higher the value, the greater the amount of enhancement. Too high a value is likely to result in unwanted artifacts. The range is -5 to +20 units in steps of 1 unit.

Prefix

This control allows various amounts of pre-processing to be applied to the signal that improves MPEG encoding performance.

The selections available are Off, Low, medium and High.

Legalize

Gamut legalization is required as all color video signals are ultimately coded as RGB for display on a picture monitor.

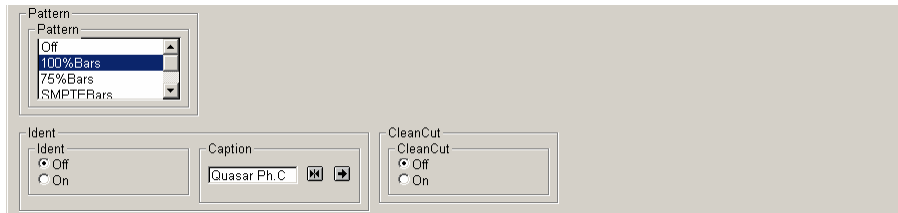
The legalizer ensures that the HD output of the unit meets the color gamut limits as specified and measured with a Tektronix WFM700

Selections available are:

- Off: The function is disabled
- HD721mV: For domestic and professional displays. No errors will be reported with a Tektronix WFM700.
- HD700mV: Removes clipping artifacts that can arise on Plasma and LCD display devices.
- SD_Digital*: Digital limits are designed for a digital transmission path.
- SD_Analog*: Limits are set for composite transmission.

*These limits ensure that if the HD output of Quasar is subsequently downconverted, it nominally meet SD color gamut limits.

Snell and Wilcox do not guarantee that SD specs will be met, as downconversions will vary between manufactures. These modes are designed to get the signals within reasonable limits such that any clipping or limiting in SD world will have minimal effect on the picture quality.



Pattern

This function allows the output picture to become a pattern.

Selections available are:

Off, 100%Bars, 75%Bars, SMPTE Bars and Black.

Ident

This allows the Caption (Ident) to be enabled and the text edited.

Ident

The Ident (Caption) may be turned On or Off.

Caption

This allows the default text (Quasar Ph.C) to be edited by typing in the text window.

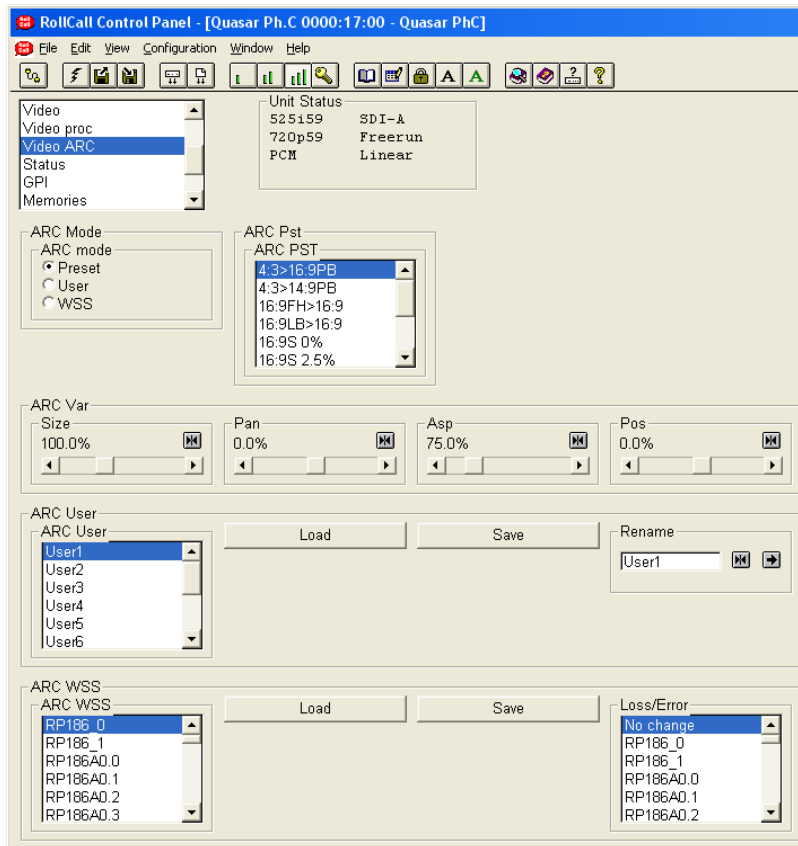
CleanCut

This item allows CleanCut function to be turned On or Off.

CleanCut ensures no interpolation occurs between images either side of a cut. Under extreme circumstances it may be necessary to disable CleanCut under the rare circumstance of a false cut being detected.

Video ARC

This screen allows the Aspect Ratio Conversion parameters to be configured.



ARC Mode

This allows the aspect ratio conversion mode for the **Convert** screen to be preselected. Selections are Preset, User and WSS.

ARC Pst

This allows the selection of 9 preset aspect ratio conversions.

Selections available are:

- 4:3>16:9PB: The 4:3 input picture is fitted into a 16:9 frame at full height with black bars on the left and right sides.
- 4:3>14:9PB: The 4:3 input picture is fitted into a 16:9 frame cropped top and bottom and with black bars on the left and right sides.
- 16:9FH>16:9: The complete anamorphic input picture is fitted into the full 16:9 output frame.
- 16:9LB>16:9: The 4:3 input frame has a 16:9 picture at full width (black bars top and bottom). This is converted into a full screen 16:9 picture.
- 16:9S 0%: The 4:3 input frame is converted to a full frame 16:9 picture with no image cropping. The horizontal resize is non-linear. The center section of the image is converted with true aspect ratio, the edges of the picture are stretched to fill the full 16:9 frame. For more information, refer to *Appendix C: FullScreen Aspect Ratio Conversion* on page 94.
- 16:9S 2.5%: The 4:3 input frame is converted to a full frame 16:9 picture with 2.5% crop vertically. The horizontal resize is non-linear. The center section of the image is converted with true aspect ratio, the edges of the picture are stretched to fill the full 16:9 frame. The 2.5% vertical crop increases the center area of true aspect ratio when compared to 16:9S. There is no horizontal image cropping. For more information, refer to *Appendix C: FullScreen Aspect Ratio Conversion* on page 94.

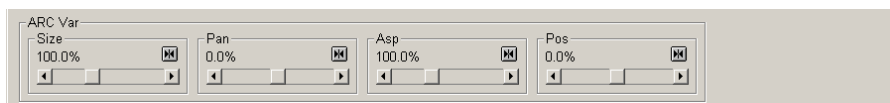
- 16:9S 5%: The 4:3 input frame is converted to a full frame 16:9 picture with 5 % crop vertically. The horizontal resize is non-linear. The center section of the image is converted with true aspect ratio, the edges of the picture are stretched to fill the full 16:9 frame. The 5% vertical crop increases the center area of true aspect ratio when compared to 16:9S. There is no horizontal image cropping. For more information, refer to *Appendix C: FullScreen Aspect Ratio Conversion* on page 94.
- 16:9S 7.5%: The 4:3 input frame is converted to a full frame 16:9 picture with 7.5% crop vertically. The horizontal resize is non-linear. The center section of the image is converted with true aspect ratio, the edges of the picture are stretched to fill the full 16:9 frame. The 7.5% vertical crop increases the center area of true aspect ratio when compared to 16:9S. There is no horizontal image cropping. For more information, refer to *Appendix C: FullScreen Aspect Ratio Conversion* on page 94.
- 16:9STR: 16:9STR is an optimized non-linear aspect ratio conversion, in which the 4:3 input frame is fit into a 16:9 frame, slightly cropped at the top and bottom. The horizontal resize is non-linear, with the edges stretched to fill the frame. The center area is slightly enlarged, with true aspect ratio. For more information, refer to *Appendix C: FullScreen Aspect Ratio Conversion* on page 94.

Note that these presets cannot be renamed. The non 16:9S presets are adjustable using the ARC Var controls. These changes should be stored as a 'User' memory, otherwise they will be lost when the unit is turned off.

- User: This provides 10 User definable conversions. These presets may be renamed and values of Size, Position, Pan and Aspect ratio changed by the user via the Configuration/ARC User

ARC Var

This allows the aspect ratio conversion parameters to be manually set. These controls are disabled for the 16:9S series of presets.



Size

This adjusts the size of the whole image. Both vertical and horizontal size change together while maintaining the aspect ratio of the image. The range of control is from 50% to 200% in 0.1% steps and preset is 100%.

Pan

This adjusts the horizontal position of the output image. The range of control is $\pm 50\%$ in 0.1% steps and preset is 0.0%.

Asp

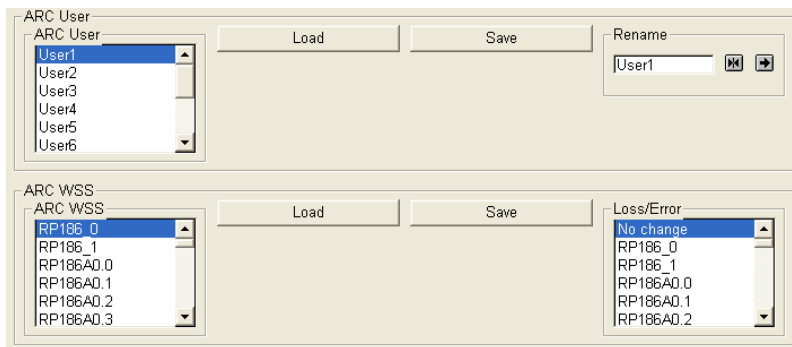
This adjusts the horizontal size of the image, allowing the shape (aspect ratio) of the output image to be changed. The range of control is from 50% to 200% in 0.1% steps and preset is 100%.

Pos

This control adjusts the vertical position of the output image. The range of control is $\pm 50\%$ in 0.1% steps and preset is 0.0%.

ARC User

This allows the selection of user configured aspect ratio conversions to be selected.



User 1 to 10

This allows the settings to be saved in 10 user memory locations. These can be saved, renamed and loaded.

Rename

This allows the default text (User 1, 2, 3, etc.) to be edited (by typing in the text window) and saved.

ARC WSS

When the aspect ratio conversion is under the control of the WSS information on the input signal, or if manual selection of WSS is enabled the following conversions may be chosen.

Available Aspect Ratio Conversions

RP186_0	RP186A1.2	ETSI5
RP186_1	RP186A1.3	ETSI6
RP186A0.0	RP186A1.4	ETSI7
RP186A0.1	RP186A1.5	L23A0.0
RP186A0.2	RP186A1.6	L23A0.1
RP186A0.3	RP186A1.7	L23A0.2
RP186A0.4	ETSI0	L23A0.3
RP186A0.5	ETSI1	L23A0.4
RP186A0.6	ETSI2	L23A0.5
RP186A0.7	ETSI3	L23A0.6
RP186A1.0	ETSI4	L23A0.7
RP186A1.1		

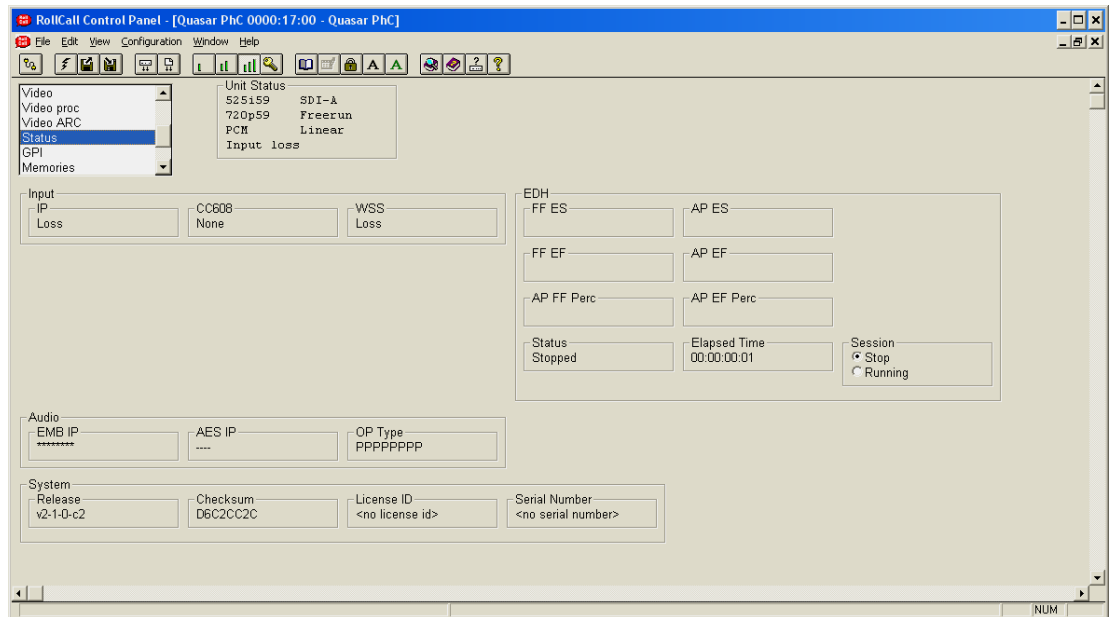
The parameters of these conversions may be changed, saved and loaded but they cannot be renamed.

Loss/Error

The Loss/Error control defines what the unit should do if the WSS signal is lost or corrupt. The available settings are, **No Change** or any of the WSS conversions listed above.

Status

This screen will show the status of the Input, EDH system, audio and system parameters.



Input

This will display the characteristics of the input signal.

IP

This will show the status of the input signal. It may show:

- Loss: A valid input signal cannot be detected.
- OK: A valid input signal has been detected.

CC608

This will show the status of the CC608 Closed Caption information on the input signal. For example, it may show:

- None: A CC608 Closed Caption signal has not been detected.

WSS

This will show the status of the WSS information on the input signal. For example, it may show:

- Loss: WSS information has not been detected.

EDH

The EDH characteristics of the input signal will be displayed here.

FF ES

This is count of the number of one second periods that contain 1 or more errors in full frames.

AP ES

This is count of the number of one second periods that contain 1 or more errors in the active picture.

FF EF

This is count of the number of fields that contain 1 or more errors in full frames. These items are followed by a % figure. This is the Error fields divided by the total number of fields expressed as a percentage.

AP EF

This is count of the number of fields that contain 1 or more errors in the active picture. These items are followed by a % figure.

AP FF Perc

This is the Error fields divided by the total number of fields expressed as a percentage.

AP EF Perc

This is the Error fields divided by the total number of fields expressed as a percentage.

Status

This will show whether the EDH logging session is either **Stopped** or **Running**.

Elapsed Time

This is time that the EDH logging session has been running. The format is DD (days): HH (hours): MM (minutes): SS (seconds).

Session

This allows the EDH logging session to be either stopped or set running. **Stop** will freeze the current values; **Running** will set all counters to zero, and then enable the counters.

Audio IP

This will display the characteristics of the audio input signals.

EMB

This shows the Embedded audio input status in the form of 1 character per input. Where:

- **P**: Indicates the channel is a PCM input.
- *****: Indicates that no input has been detected.
- **D**: Indicates that the signal is data
- **E**: Indicates that the signal is Dolby -E

AES

This shows the AES audio input status in the form of 1 character per pair where:

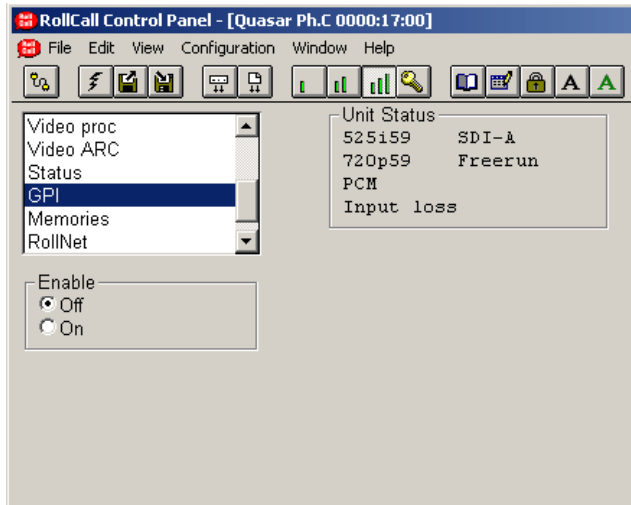
- *****: Indicates that no input has been detected.
- **P**: Indicates that an AES pair has been detected.

System

This will display the version number of the software release, and the checksum of the installed software.

GPI

This screen controls the GPI functions.



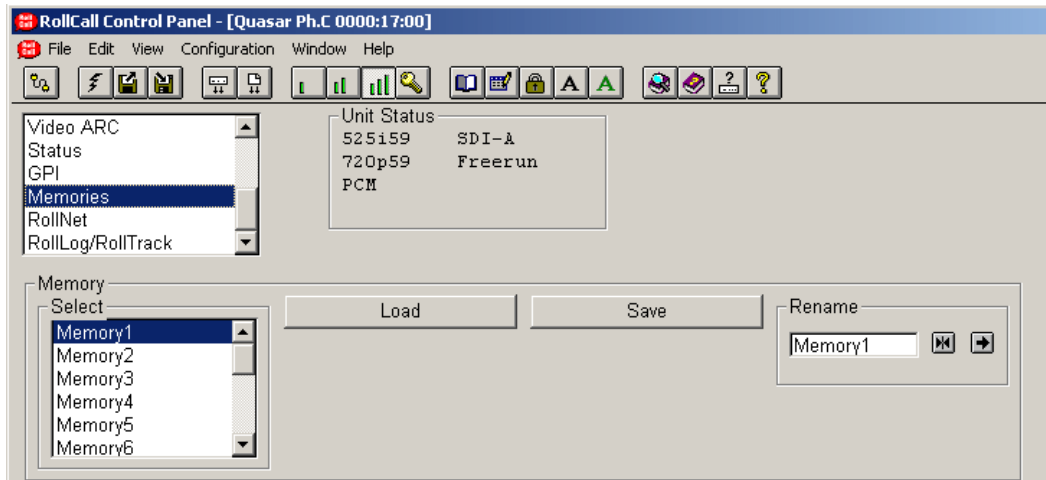
Enable

This allows the GPI function to be turned On or Off.

If enabled, a contact closure at the GPI input will recall the appropriate GPI memory and flag this recall on the corresponding GPO tally output.

Memories

This allows the setup of the unit to be recalled from, and saved in, 10 memory locations.



Memory

Select

- Memory 1-10: This allows a memory location to be selected.
- GPI 1 to 3: This allows one of three GPI memories to be selected. The settings saved in the selected GPI memory location will be applied when the GPI input is activated.
- Defaults: Recalls the units factory settings.
*Note that this **will not** reset any user memories.*

Load

This will load the settings contained in the selected memory location.

Save

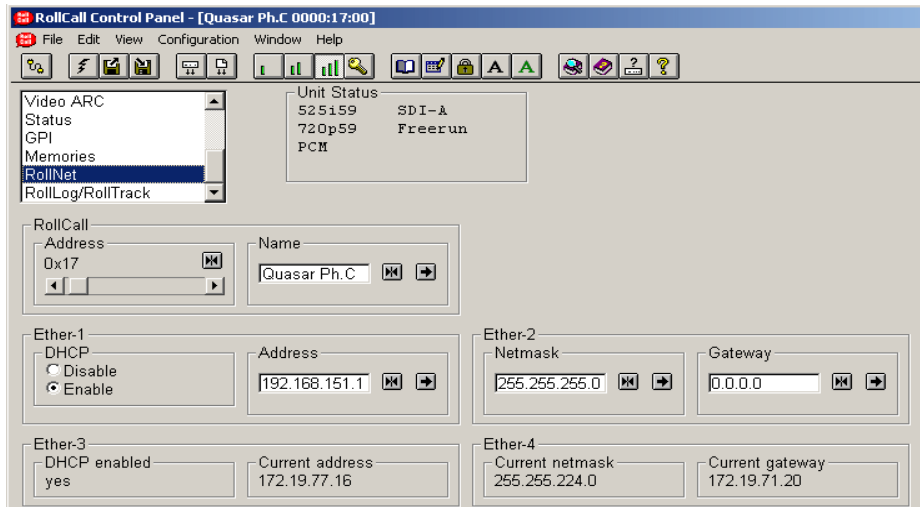
This will save the settings to the selected memory location.

Rename

This allows the memory name to be changed by saving the edited the text. Preset loads the default names, Memory 1, 2 etc.

RollNet

This screen allows RollNet functions to be configured.



RollCall

This allows the RollCall functions to be set up.

Address

This allows the address of the unit to be set. Values can be in the range 10 Hex to FF Hex.

Note that the unit must be rebooted for a new address to be actioned. This may disrupt or prevent use by remote users.

Name

This allows the name of the unit as it appears on the network, to be changed from the default name of Quasar Ph.C.

Warning!

IP address, sub net mask and Default Gateway IP address should be set to addresses as required by the local IT manager and should not be altered except by qualified personnel.

Ether-1

A valid Ethernet address must be established before this unit can be remotely controlled over a TCP/IP network.

DHCP

(Dynamic Host Configuration Protocol. A TCP/IP protocol that dynamically assigns an IP address to a computer). An active DHCP server must be available for this feature to operate.

This function may be enabled or disabled.

Address

If DHCP is disabled, the IP address of the unit may be set using the Address field.

Ether-2

Netmask

This allows the Subnet mask address to be entered.

Ether-3

DHCP En

This will show the status of the DHCP.

Cur(rent) Addr(ess)

This will show the current unit address. This will be the Address set above, if DHCP is disabled, or the address as allocated by DHCP server.

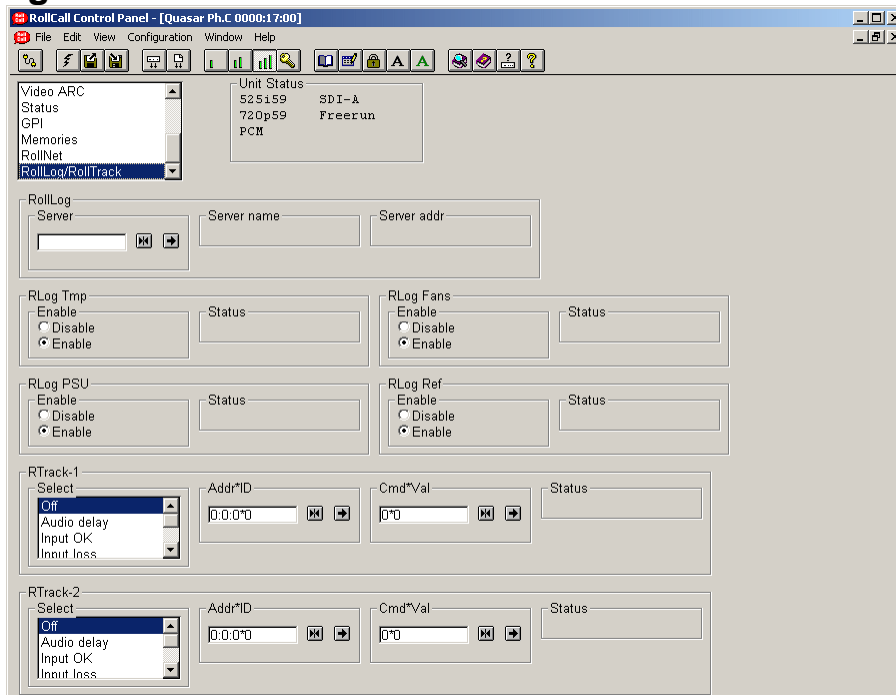
Ether-4*Cur(rent) Mask*

This will show the current netmask address.

Cur(rent) Gate(way)

This will show the current IP Gateway address.

RollLog/RollTrack



RollLog

This allows the characteristics of the logging server to be specified.

Server

This allows the Logging Server to be named by typing in the text window. Preset is to nothing.

Server name

This will display the Logging Server name.

Server Addr(ess)

This will display the address of the Logging Server.

RollLog Tmp

When enabled this allows the temperature of the unit to be logged to the log server. The value will be shown in the **Status** window.

RollLog Fans

When enabled this allows the status of the fans to be logged to the log server. The value will be shown in the **Status** window.

RollLog PSU

When enabled this allows the status of the Power Supply Units to be logged to the log server. The value will be shown in the **Status** window.

RollLog Ref

When enabled this allows the status of the reference signal to be logged to the log server. The value will be shown in the **Status** window.

RollTrack-1 and -2

The RollTrack function allows the Quasar PhC. to automatically control remote units using the RollCall system.

There are two RollTrack devices (RTrack-1 and Rtrack-2) available that enable the same command too be sent to two different destinations or different commands to be sent to the same destination.

Select

This allows the RollTrack source to be selected.

Selections are:

- Off
- Audio Delay
- Input OK
- Input Loss
- Input Unsuitable
- Input Error.

Audio Delay

As the delay through the Quasar PhC. varies according to the conversion mode, delay modules connected via the RollTrack system will automatically have their delay updated to match.

The delay sent out via the RollTrack system matches the internal audio delay of the Quasar.

Input Status

The status of the input signal to the Quasar Ph.C may used to control other units using the RollCall system.

*Addr*ID*

This allows the destination address to be entered.

*Cmd*Val*

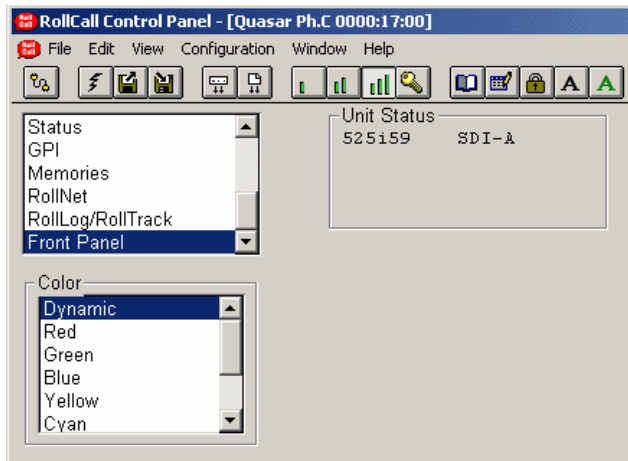
This allows the command value to be entered.

Status

This item will show the status of the currently selected RollTrack index.

Front Panel

This allows the color of the front panel display (for all functions) to be changed.



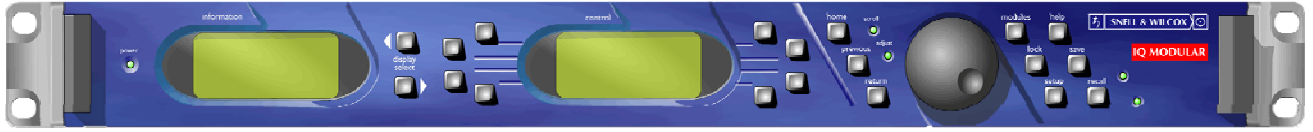
Selections available are:

Dynamic, Red, Green, Blue, Yellow, Cyan, Magenta, and White.

In the Dynamic (default Mode) mode the display will appear in different colors for specific functions as described below:

- Home: Green
- Convert: Blue
- Video: Cyan
- Audio: Magenta
- Video Config: Yellow
- Audio Config: Red
- Status: White
- Configuration: White

Operation using an Active Control Panel via the Rollcall Remote Control System



All operational parameters and selections are made using a system of menus displayed in two LCD windows.

Menus are selected by push buttons adjacent to the display windows and further menu selections made by pressing a push button.

The spinwheel also allows continuously variable parameters, (where applicable) to be adjusted and the settings seen in the LCD window.

Various specific operations may be achieved by operating dedicated push buttons.

The system may be considered structured as a set of menus and sub-menus that are displayed in the windows. The windows will display the current status of the controlled module and other information messages. (e.g. error comments, warnings etc.) and the names of the lower-level menus which may be scrolled through using the spinwheel.

A new menu may be selected by pressing the appropriate dedicated function button.

For specific operational details of the active front panel consult the operating manual supplied with the active front panel.

Appendix A: RollTrack Audio Delay Tracking

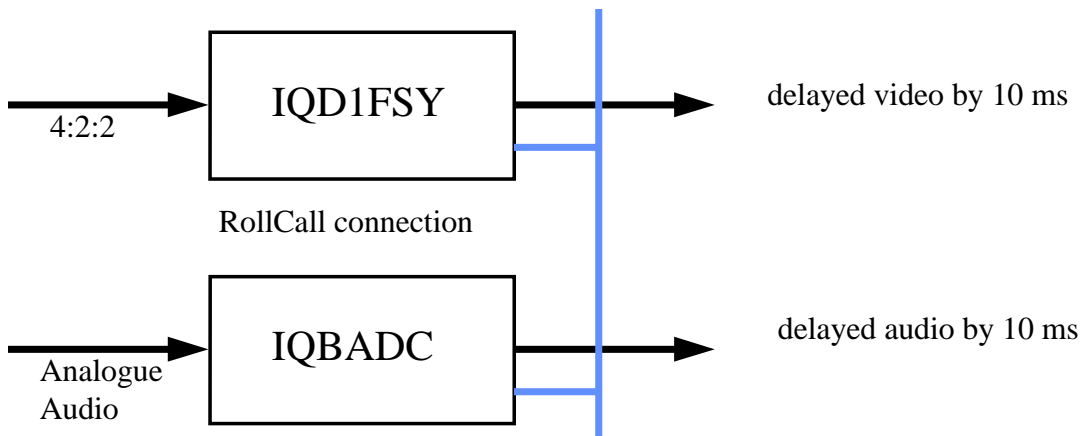
RollTrack is a feature of RollCall™ (Snell & Wilcox’s proprietary remote control system), that allows devices to communicate across the RollCall network with no direct user intervention.

RollTrack Audio Delay Tracking enables Snell & Wilcox RollCall™ compatible audio delay products to track delay introduced by RollCall™ compatible video processing products.

The current products that implement RollTrack Audio Delay Tracking are:

Audio Delay Modules	Video Modules	Other Products	
IQBAAD	IQD1FSY	ALCHEMIST	MDD3000
IQBADC	IQDMSDS	CPP100	MDD550
IQBDAC	IQDAFS	CPP200	MDD560
IQBDAD	IQDMSDS	NRS500	MDD570
IQBSYN	IQDMSDP	HD5050	MDD2000
IQBADCD	IQDSYN		

The simplest configuration is a single video unit and a single audio delay in a RollCall™ system. The audio delay will have the same delay as through the video path. If the delay changes the audio delay will track.



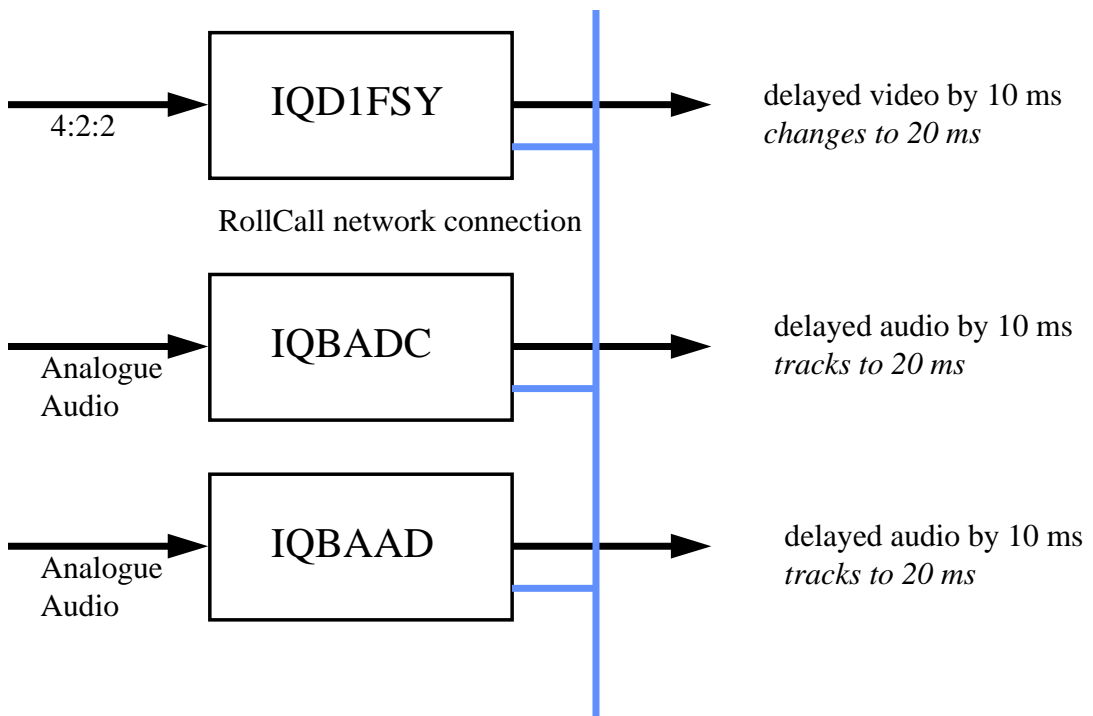
The next level of configuration is where there are multiple Frame Synchronizers (for example) each connected through RollCall™ to their own tracking Audio Delay. (It is worth stating that the synchronizers and audio delays do not have to be in the same enclosure; the addressing scheme, discussed later, allows for the units to be positioned anywhere in the RollCall™ domain.)

The maximum number of video units and audio delays in a RollCall™ system is set by the maximum limit of the number of modules in a RollCall™ network and is currently 3840 on a single network without bridges.

The unique identification of the destination unit (a decimal number) for various modules is as follows:

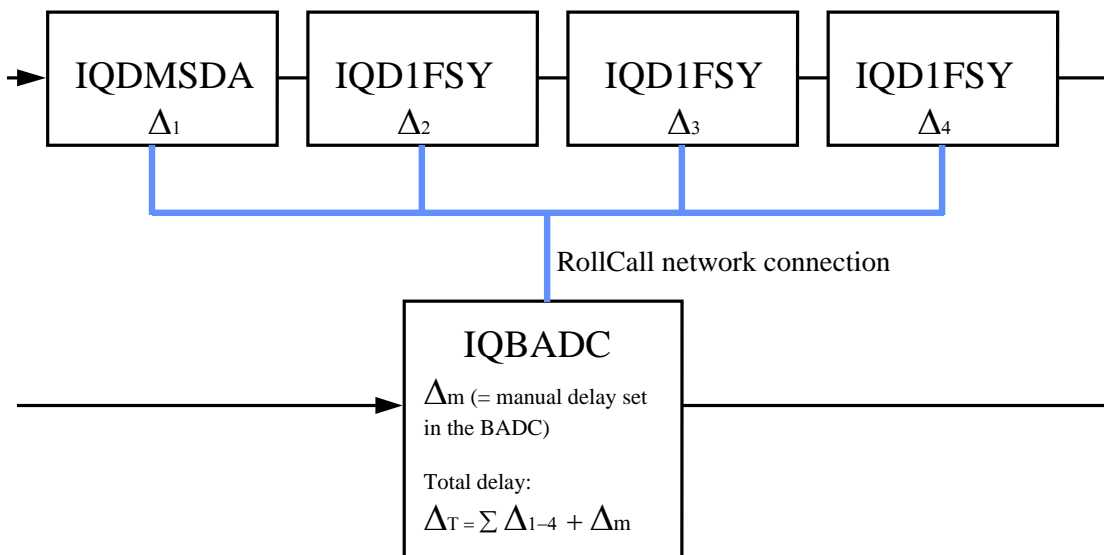
Module	ID
IQBADC	51
IQBDAC	52
IQBAAD	53
IQBDAD	54
IQBSYN	89
IQBADCD	107

The next level of complexity is a *vertical delay cluster* where a video unit can have up to eight audio delays tracking - of the same or different types.



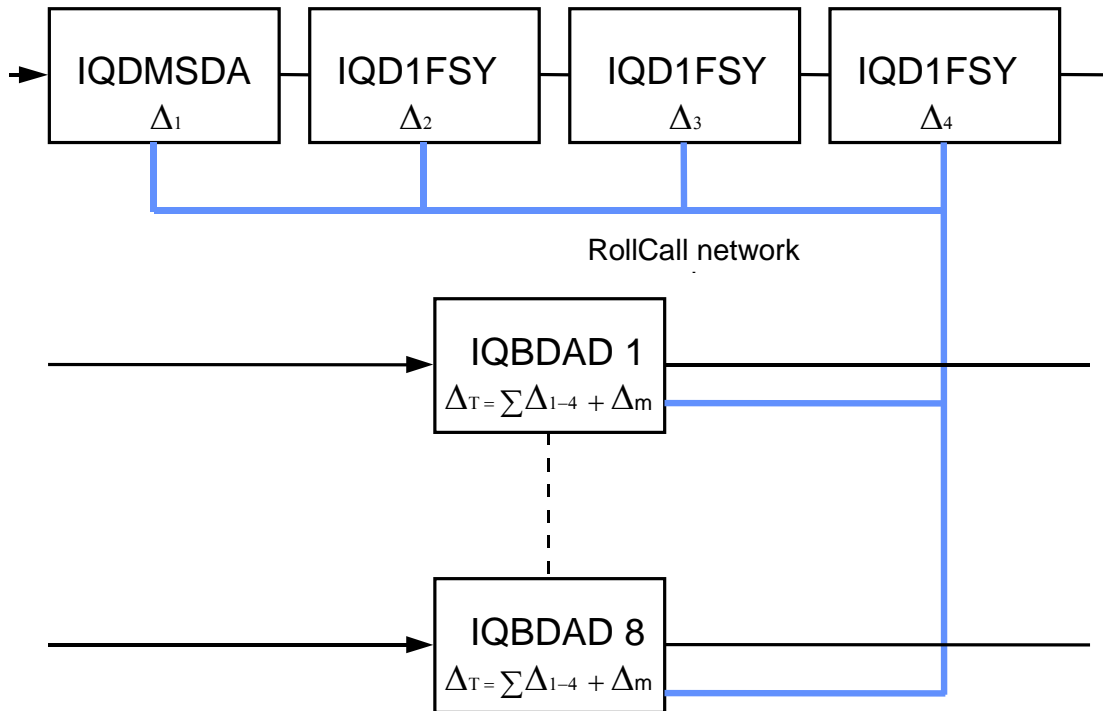
From one to eight audio delay products can be connected via RollCall™ to a single frame synchronizer, for example. If the synchronizer delay changes, then however many audio delays are connected will track the delay. The audio delays can also have a manual delay which will be added to the RollTrack delay.

The next level of complexity is a *horizontal delay cluster* where an audio delay can track up to four video units.



The total delay time through the audio delay is then the sum of the individual delays introduced by the video units plus the manual delay of the audio unit. The manual delay can be set to compensate for any fixed propagation delay in the video path or may be set to zero.

The next level of complexity is a *matrix delay cluster* where each audio delay (up to eight) can track up to four video units. This configuration is in effect a four by eight matrix of video units and audio delay units. The total delay time through the audio delay units is then the sum of the individual delays introduced by the video units plus the manual delay of the audio unit.



As any of the delay times change in the video path so will the audio delay time track this delay. A virtual connection is made between from, say, an IQD1FSY to an IQBDAD by:

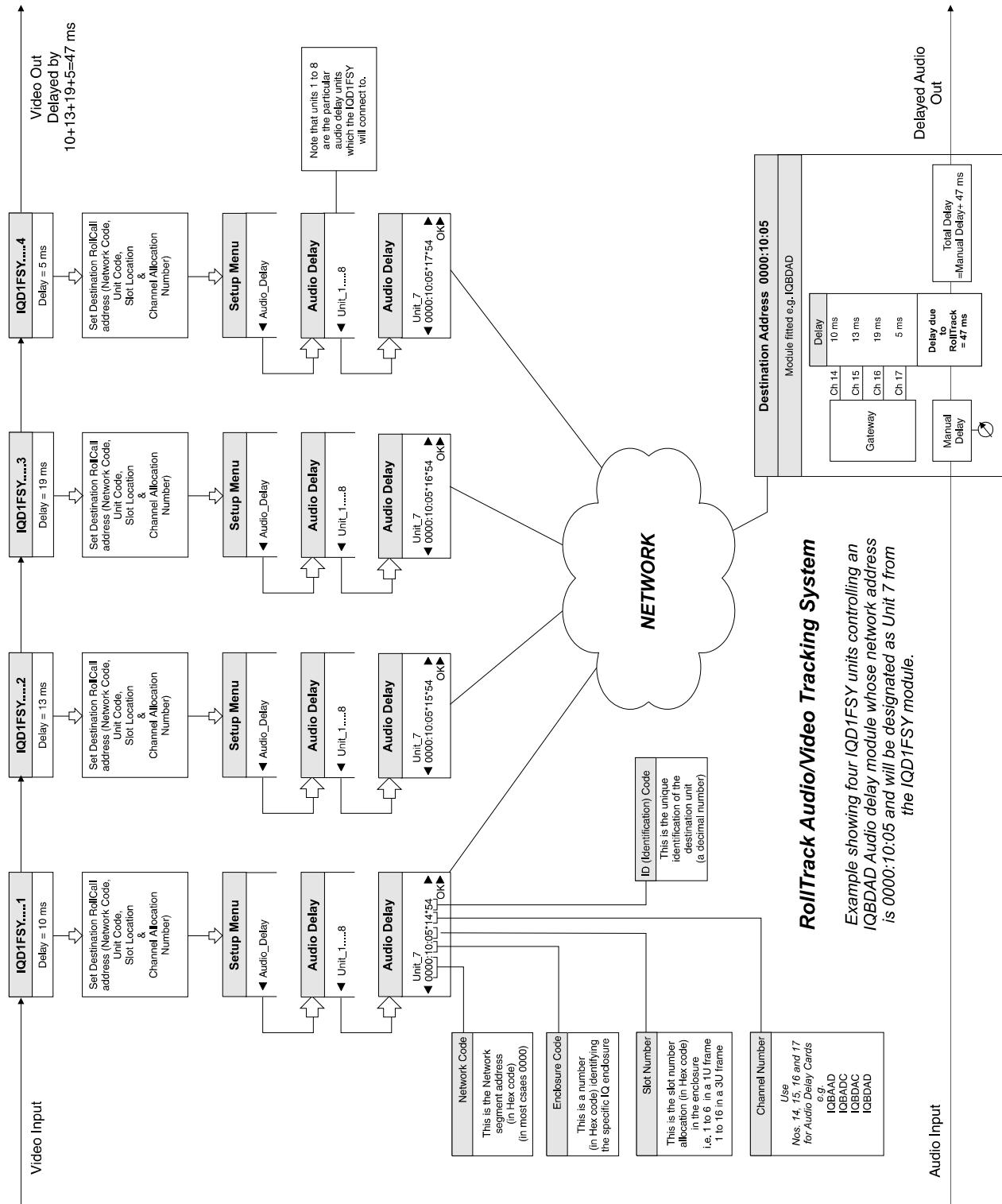
- selecting the *Setup...* Menu of the IQD1FSY
- then selecting the *Audio_Delay...* Menu
- then choosing from *Unit_1* to *Unit_8*
- then entering the unique network address of the IQBDAD in the form *nnnn:xx:yy*z*d* where
 - nnnn* = network address and in most cases will be 0000(hex);
 - xx* = IQ enclosure address (hex);
 - yy* = slot address of the IQBDAD (hex)
 - z* = the connection (or channel) number (decimal) - see table below.
 - d* = the unique identification of the destination unit (decimal) The ID entered must match the receiving units own ID or else the command will be ignored. If the ID value is set to 00, the receiving unit does not perform an ID match and will always accept the incoming command

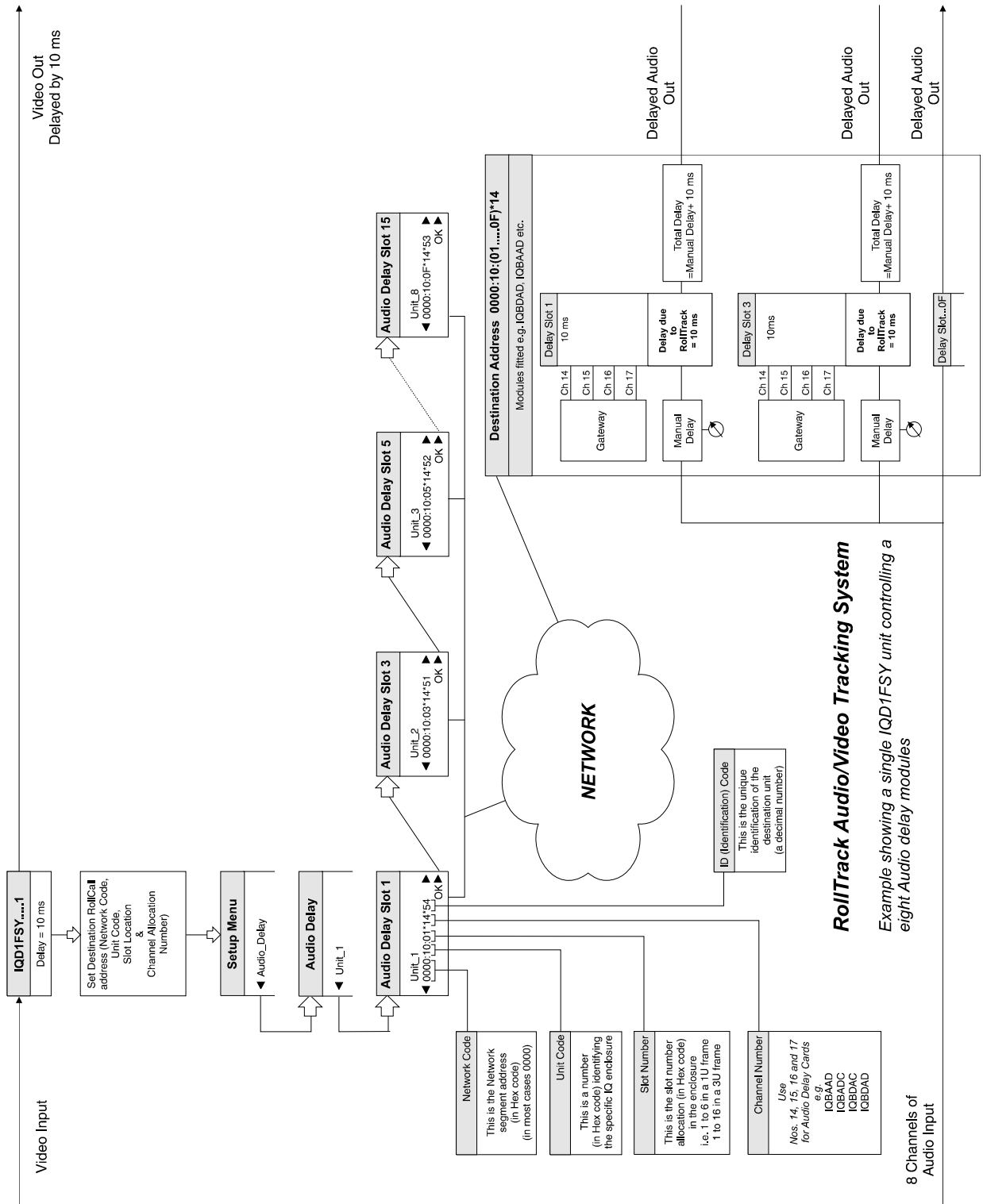
- then selecting the *Delay...* Menu of the IQBDAD
- then selecting *RollTrack*

Example of Network Addresses with Channel Numbers and ID Numbers

	D1FSY 1	D1FSY 2	D1FSY 3	D1FSY 4
Audio delay 1	0000:10:01*14*54	0000:10:01*15*54	0000:10:01*16*54	0000:10:01*17*54
Audio delay 2	0000:10:03*14*54	0000:10:03*15*54	0000:10:03*16*54	0000:10:03*17*54
Audio delay 3	0000:10:05*14*54	0000:10:05*15*54	0000:10:05*16*54	0000:10:05*17*54
Audio delay 4	0000:10:07*14*54	0000:10:07*15*54	0000:10:07*16*54	0000:10:07*17*54
Audio delay 5	0000:10:09*14*54	0000:10:09*15*54	0000:10:09*16*54	0000:10:09*17*54
Audio delay 6	0000:10:0B*14*54	0000:10:0B*15*54	0000:10:0B*16*54	0000:10:0B*17*54
Audio delay 7	0000:10:0D*14*54	0000:10:0D*15*54	0000:10:0D*16*54	0000:10:0D*17*54
Audio delay 8	0000:10:0F*14*54	0000:10:0F*15*54	0000:10:0F*16*54	0000:10:0F*17*54

The most complex system would be an array of matrix delay clusters





Appendix B: WideScreen Signaling

Background

There are up to four components to widescreen signaling. The four elements are:

- The coded frame descriptor
- The active format descriptor (AFD)
- BAR data
- Pan scan data

Quasar Ph.C only supports “The coded frame descriptor” and “The active format descriptor(AFD).

The coded frame descriptor

This is a 1 bit flag that describes if the coded frame is 4:3 or 16:9. It does not describe the active area, it only describes the aspect ratio of the signal. This is supported by RP186, SMPTE 2016-1, Line 23(AFD)

The active format descriptor (AFD)

The AFD can describe where a 4:3, 14:9 or 16:9 image is within the coded frame, e.g. it describes size and position of a letterbox signal. The full version consists of a 4 bit number, this common between ETSI ETR 154 and SMPTE 2016-1. A three bit version is used with RP 186.

Normally the AFD does not describe the aspect ratio of the coded frame, the exception is Line 23 -ETSI EN 300294 where the AFD and Coded frame descriptor are combined as a 3 bit number.

Bar data

The BAR data is part of the proposed SMPTE 2016-1. It is designed to get around the limitation of the AFD. The 4 bit AFD can only describe 4:3, 14:9 and 16:9 active areas. BAR data enables non-standard letterbox/pillar box formats by describing the precise unused areas of an image raster. For example, bar data could be used to describe widescreen cinema material carried letter boxed in a frame with bars top and bottom.

NOTE: Bar data does not effect the aspect ratio of the signal, this is described by the coded frame descriptor and can only be 4:3 or 16:9.

Pan scan data

This is part of the proposed SMPTE 2016-1. it enables the aspect ratio functions to dynamically change based on the desired view point of the image.

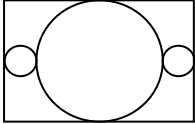
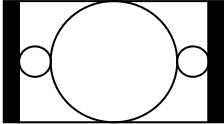
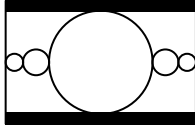
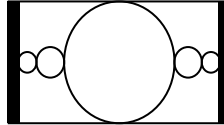
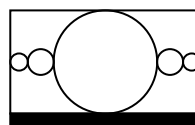
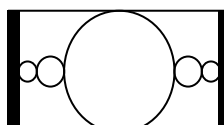
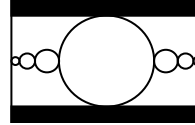
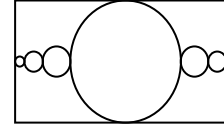

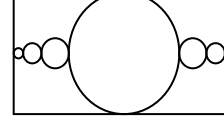
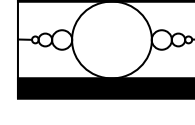
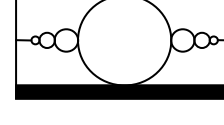
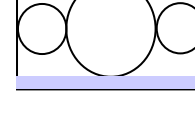
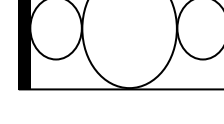


AFD - Active format descriptors: SMPTE 2016-1, 4:3 coded frame

	4:3 coded frame	Quasar Output	
AFD=0010 Box 16:9(top)			AFD=1000 Box 16:9(top)
AFD=0011 Box 14:9(top)			AFD=1011 14:9(centre)
AFD=0100 Box >16:9(centre)			AFD=0100 Box >16:9(centre)
AFD=1000 Full frame			AFD=1001 4:3(centre)
AFD=1001 4:3(centre)			AFD=1001 4:3(centre)
AFD=1010 16:9(centre)			AFD=1000 Full frame
AFD=1011 14:9(centre)			AFD=1011 14:9(centre)
AFD=1101 4:3 with shoot and protect 14:9 centre			AFD=1011 14:9(centre)
AFD=1110 16:9 with shoot and protect 14:9 centre			AFD=1110 16:9 with shoot and protect 14:9 centre
AFD=1111 16:9 with shoot and protect 4:3 centre			AFD=1111 16:9 with shoot and protect 4:3 centre

AFD - Active format descriptors: SMPTE 2016-1, 16:9 coded frame

	16:9 coded frame	Quasar Output	
AFD=0010 Box 16:9(top)			AFD=1000 Full frame
AFD=0011 Box 14:9(top)			AFD=1011 14:9(centre)
AFD=0100 Box >16:9(centre)			AFD=0100 Box >16:9(centre)
AFD=1000 Full frame			AFD=1000 Full frame
AFD=1001 4:3(centre)			AFD=1001 4:3(centre)
AFD=1010 16:9(centre)			AFD=1000 Full frame
AFD=1011 14:9(centre)			AFD=1011 14:9(centre)
AFD=1101 4:3 with shoot and protect 14:9 centre			AFD=1011 14:9(centre)
AFD=1110 16:9 with shoot and protect 14:9 centre			AFD=1110 16:9 with shoot and protect 14:9 centre
AFD=1111 16:9 with shoot and protect 4:3 centre			AFD=1111 16:9 with shoot and protect 4:3 centre

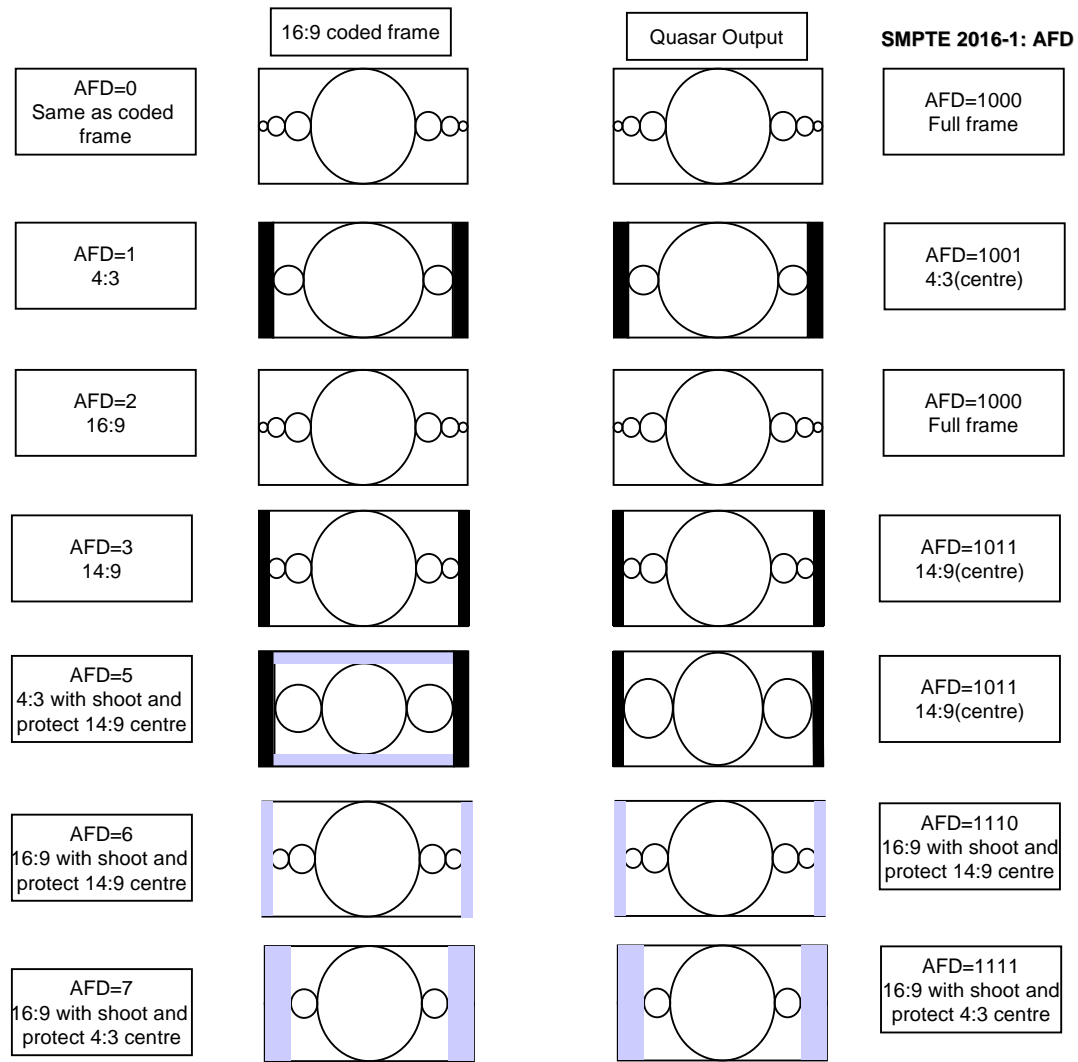
AFD - Active format descriptors: ETSI TS 101 154

		Quasar Output	
ETSI Format = 0 Full format 4:3			AFD=1001 4:3(centre)
ETSI Format = 1 Box 14:9 centre			AFD=1011 14:9(centre)
ETSI Format = 2 Box 14:9 top			AFD=1011 14:9(centre)
ETSI Format = 3 Box 16:9(centre)			AFD=1000 Full frame
ETSI Format = 4 Box 16:9 top			AFD=1000 Full frame
ETSI Format = 5 Box >16:9(centre)			AFD=0100 Box >16:9(centre)
ETSI Format = 6 4:3 with shoot and protect 14:9 centre			AFD=1011 14:9(centre)
ETSI Format = 7 Full 16:9 (anamorphic)			AFD=1000 Full frame

AFD - Active format descriptors: ARDSPEC on L23 and VI, 4:3 coded frame

	4:3 coded frame	Quasar Output	SMPTE 2016-1: AFD
AFD=0 Active region same as coded frame			AFD=1001 4:3(centre)
AFD=1 4:3			AFD=1001 4:3(centre)
AFD=2 16:9			AFD=1000 Full frame
AFD=3 14:9			AFD=1011 14:9(centre)
AFD=5 4:3 with shoot and protect 14:9 centre			AFD=1011 14:9(centre)
AFD=6 16:9 with shoot and protect 14:9 centre			AFD=1110 16:9 with shoot and protect 14:9 centre
AFD=7 16:9 with shoot and protect 4:3 centre			AFD=1111 16:9 with shoot and protect 4:3 centre

AFD - Active format descriptors: ARDSPEC on L23 and VI, 16:9 coded frame






Appendix C: FullScreen Aspect Ratio Conversion

Summary

Quasar Ph.C provides the finest HDTV upconversion, enabling standard definition programming to meet the quality standards required for HDTV transmissions. However the big give away to the viewer in the home is the pillar-box (those side black bars) that is introduced when 4:3 standard definition source is upconverted.





To address this problem Snell & Wilcox have develop FullScreen ARC mode, a non linear aspect ratio conversion technique that enables 4:3 sources to fit the full 16:9 display area with the minimum distortion and cropping. FullScreen enables 4:3 standard definition sources to be seamlessly integrated into HDTV 16:9 programming.

4:3 SD source	16:9 HD output with pillar box	16:9 HD output with FullScreen conversion
		

Why is FullScreen needed?

The majority of standard definition sources, both current and archive are in 4:3 aspect ratio, HDTV is always in 16:9 aspect ratio. Traditionally there were a number of techniques that enable 4:3 sources to be used in a 16:9 environment. None of the traditional approaches provided a satisfactory solution.

The table below compares the traditional aspect ratio conversion techniques to FullScreen and highlights the strengths of the FullScreen ARC technique.

Aspect Ratio Mode	Output Picture	Fills 16:9 screen	True aspect ratio in "action area"	Full image area
Pillar box		X	√	√
Full width		√	√	X
Anamorphic full width		√	X	√
FullScreen		√	√	√

FullScreen is the only aspect ratio mode that provides near seamless upconversion of 4:3 SD sources to 16:9 HDTV format. Ensuring that the full screen area is filled, the action area has correct aspect ratio and ensures that full image area is unconverted with no cropping.

How does FullScreen work ?

FullScreen exploits the property of most 4:3 sources in that the main area of interest is in the center of the picture. This is referred to as the “action area”. FullScreen ARC mode re-sizes the “action area” with correct aspect ratio, eliminating the telltale “fat head” syndrome associated with an anamorphic stretch. To fill the full active area of the picture, FullScreen employs increasing amounts of image stretch towards the edges of the pictures. The increasing amounts of stretch are achieved using smooth Gaussian profiled interpolation techniques.

