

# **HD5200**

## High Definition Upconverter

# Operator's Manual

© October 2006

**[www.snellwilcox.com](http://www.snellwilcox.com)**

Snell & Wilcox Ltd., Southleigh Park House, Eastleigh Road, Havant, Hants, PO9 2PE, United Kingdom.

For General Enquiry's contact: Tel: +44 (0) 2392 489000

Fax: +44 (0)23 9245 1411

For Technical assistance contact: Tel: +44 (0) 2392 489058

Fax: +44 (0) 2392 489057

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

Ftp:

<ftp://ftp.snellwilcox.com/support>

### Explanation of Safety Symbols

(GB)

- ⚠ This symbol refers the user to important information contained in the accompanying literature. Refer to manual.
- ⚠ This symbol indicates that hazardous voltages are present inside. No user serviceable parts inside. This unit should only be serviced by trained personnel.

### Safety Warnings



Service instructions where given, are for use by qualified service personnel only. To reduce risk of electric shock do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified personnel.

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

#### Power connection in countries other than the USA

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

The colour code for the lead is as follows:

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



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

### Légende :

(F)

- ⚠ Ce symbole indique qu'il faut prêter attention et se référer au manuel.
- ⚠ Ce symbole indique qu'il peut y avoir des tensions électriques à l'intérieur de l'appareil. Ne pas intervenir sans l'agrément du service qualifié.

### Précaution d'emploi :



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

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

#### Câble secteur de pays autres que les Etats-Unis

L'équipement est livré avec un câble secteur au standard IEC, moulé mâle/femelle.

Si vous souhaitez 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

(D)

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

### Sicherheits-Warnhinweise



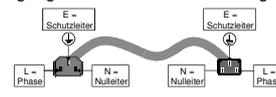
Die angeführten Service-/Reparatur-Anweisungen sind ausschließlich von qualifiziertem Service-Personal auszuführen. Um das Risiko eines lektroschocks zu reduzieren, führen Sie ausschließlich die im Benutzerhandbuch eschriebenen Anweisungen aus, es sei denn, Sie haben die entsprechende Qualifikation.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

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

#### Netzanschluss in anderen Ländern als der USA

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

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



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

### Explicación de los Símbolos de Seguridad

(ESP)

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

### Advertencias de Seguridad



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

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

#### 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 jordet.
- Dette apparat skal forbindes til en nettilslutning, der yder BESKYTTENDE JORD (⊕) og 0 forbindelse skal være tydeligt markeret.
- Stikkontakten, som forsyner apparatet, skal være tæt på apparatet og let tilgængelig.

**Nettilslutning i andre lande end USA**

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

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



- ⚠ Forsigtig Hvis enheden har to lysnetindgange, skal der sørges for at begge ledninger tilsluttes 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 försörd från ett strömssystem 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 SUOJAMAALITÄNTÄ (⊕) ja nolliilitännän on oltava luotettavasti tunnistettavissa.
- Sähköpistorasian tulee olla laitteen lähellä ja helposti tavoitettavissa.

**Sähkökytkentä**

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

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



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

**Símbolos de Segurança** P

- O símbolo triangular adverte para a necessidade de consultar o manual antes de utilizar o equipamento ou efectuar qualquer ajuste.
- Este símbolo indica a presença de voltagens perigosas no interior do equipamento. As peças ou partes existentes no interior do equipamento não necessitam de intervenção, manutenção ou manuseamento por parte do utilizador. Reparações ou outras intervenções devem ser efectuadas apenas por técnicos devidamente habilitados.

**Avisos de Segurança**

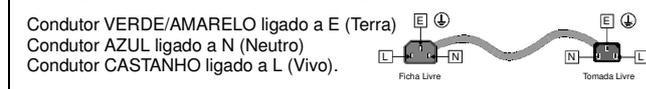


As instruções de manutenção fornecidas são para utilização de técnicos qualificados. Para reduzir o risco de choque eléctrico, não devem ser realizadas intervenções no equipamento não especificadas no manual de instalações a menos que seja efectuadas por técnicos habilitados.

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

**Ligação da alimentação noutros países que não os EUA**

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



**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** G

- 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 επισκευασικά μέρη. Αυτή η μονάδα πρέπει να επισκευάζεται μόνο από ειδικά εκπαιδευμένο προσωπικό.

**Προειδοποίηση Ασφαλείας**

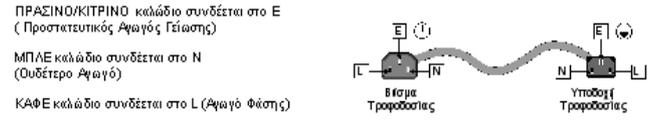


**Οδηγίες επισκευής,** όπου παρέχονται, αναφέρονται αποκλειστικά και μόνο σε εξειδικευμένο προσωπικό. Για να μειωθεί ο κίνδυνος ηλεκτροπληξίας, μην εκτελείτε επισκευές παρά μόνο τις συμπεριλαμβανόμενες στο εγχειρίδιο των οδηγιών, εκτός και αν έχετε τα απαραίτητα προσόντα για να το κάνετε. Όλες οι επισκευές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

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

**Σύνδεση τροφοδοσίας σε χώρες εκτός των ΗΠΑ**

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



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

**Products employing Lithium batteries**

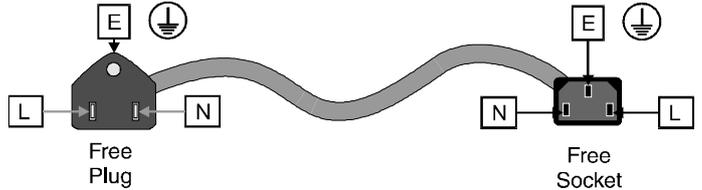
**CAUTION**

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

**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, one of the following methods of installation must be used: -

- Place the unit on a suitably specified, and installed rack shelf and secure the product to the rack via the front rack ears or,
  - Fit the unit using the rear rack mount kit available from Snell & Wilcox by quoting the order code FGACK RACK-MNT-KIT.
-

## Safety Standard

Safety standards are pending:



## EMC Standards

This unit conforms to the following standards:

### BS EN 55103-1 : 1997

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

### BS EN 55103-2 : 1997

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 Environment

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

The commercial and light industrial environment (including, for example, theatres) E2

*or*

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

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

## EMC Performance Information

Please refer to the *Technical Profile/Specifications* section of the product operation manual.

## 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 1694 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 operation of the HD5200 unit.

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

*Note that the date at the bottom of the page is the release date of the current revision.*

This manual covers the following product:

- HD5200 High Definition Upconverter

## 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 unauthorised 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:

- HD5200 High Definition Upconverter
- Power cable
- Operator's Handbook
- Spare Fuse 2 A (T)

## Software Version Amendments

### Notes about Versions Fitted

**Firmware.** This HD5200 is shipped with Master version 1.5 and Slave version 11 of the software.

## Manufacturers Notice

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

Reproduction or disassembly of embedded computer programs or algorithms prohibited.

**Copyrighted names:** Microsoft Windows™

Information in this manual and software are subject to change without notice and does not represent a commitment on the part of Snell & Wilcox Ltd. The software described in this manual is furnished under a licence agreement and may not be reproduced or copied in any manner without prior agreement with Snell & Wilcox Ltd. or their authorised agents.

*No part of this publication may be transmitted or reproduced in any form or by any means, electronic or mechanical, including photocopy, recording or any information storage and retrieval system, without permission being granted, in writing, by the publishers or their authorised agents.*

## Important Notice

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

# Table of Contents

**SECTION**

<b>1</b>	<b>Introduction</b>	
	Description.....	1.1
	Features .....	1.2
<b>2</b>	<b>Specifications</b>	
<b>3</b>	<b>Installation</b>	
	Power Connections .....	3.1
	Opening the Front Panel .....	3.2
	Connections.....	3.3
	Switching On .....	3.7
<b>4</b>	<b>Operation</b>	
	General operating principles.....	4.1
	Using the Control Push Buttons .....	4.3
	Display Buttons.....	4.3
	Input.....	4.4
	Convert.....	4.6
	Display.....	4.15
	Reference.....	4.18
	Output.....	4.19
	Audio .....	4.21
	Memory.....	4.24
	Utils.....	4.25
	Setup .....	4.28
	HD5200 Menus System Diagrams .....	4.31 to 35
	Operation from an active control panel via the RollCall remote control system .....	4.36
<b>5</b>	<b>Appendix: RollTrack Audio Delay Tracking.....</b>	<b>5.1</b>

## ***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 Units ..... Please 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**

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

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

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

### **Basic Tests**

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

RollCall ..... Is 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 TPG ..... Many 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**

<b>Name: *</b>		
<b>Company:</b>		
<b>Address Details: *</b>		
<b>Post/ZIP Code:</b>		
<b>Country: *</b>		
<b>Telephone: *</b>		
<b>Fax:</b>		
<b>Email: *</b>		
<b>Local S&amp;W Center: *</b>		
<b>Product Name: *</b>		
<b>Product Type: *</b>	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)	
<b>Unit Serial Number: *</b>		
<b>Fault/Spare Part Information: *</b>  (please advise us how many units show this fault and the system layout showing all other manufacturers' products)		
<b>* Preferred Method of Contact:</b>	e-mail	
	Phone	

- Item is required.

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



## Description

The HD5200 is a 10-bit upconverter and will upconvert 525/625 standard definition video signals to HDTV 1.48 Gbit/s output formats.

The HD5200 provides both the standards conversion and aspect ratio conversions required during the upconversion process.

The HD5200 features built-in test pattern generators, GPIs, colour space conversion and can genlock to both SD and HD references.

The converter also has optional embedded audio processing and will pass vertical interval data.

### FRONT VIEW



### REAR VIEW



## Features

- All current SMPTE 292M and ITU709 HD standards supported
- Digital color space conversion
- Aspect ratio conversion
- 2 x SD-SDI Rec. 601 in and 4 x HD-SDI out
- Powerful 3:2 detection and repair
- Image enhancer/de-enhancer
- 4 user display memories per global memory
- 2 genlock inputs with loop-through
- Comprehensive audio processing
- Closed caption transfer (to SMPTE Standard 334M)

# Technical Profile

## Features

### Signal Inputs

Serial Digital	2 x SD 10-bit serial digital inputs at 270MHz – Rec. 601 and audio embedding SMPTE 272M. Loop-through of active input.
Analogue Reference	2 x BNC HDTV Tri-syncs or SD Bi-sync for Genlock – SMPTE 240M/274M
Film Sync	1 x BNC
RS422/485	1 x Control port 9-pin D type
Network	1 x RollCall/RollNet remote via BNC
Audio Option	4 x BNC AES/EBU inputs (8 channels)

### Signal Outputs

Serial Digital	4 x BNC HDTV 10-bit serial digital outputs at 1.48GHz - SMPTE 292-1997 and audio embedding SMPTE299M
Film Sync	1 x BNC
Audio Option	1 x BNC AES/EBU programmable monitoring output
Analogue Reference	2 x loop-through

## Features

Input Standard	SD – Rec. 601 Auto, 525/59.94, 625/50, 625P/24sf, 625P/23.98sf
Output Standard	HD – SMPTE 292M, 299M 1125(1080)/29I, 1125(1080)/30I, 1125(1080)/25I, 1125(1080)/30p, 1125(1080)/29p, 1125(1080)/25p, 1125(1080)/24p, 1125(1080)/23p, 1125(1080)/30sf, 125(1080)/29sf, 1125(1080)/24sf, 125(1080)/25sf, 1125(1080)/23sf, 1125(1035)/30I, 1125(1035)/29I, 1125(480)/60p, 1125(480)59p, 750(720)/60p, 750(720)/59p, 750(480)/60p, 750(480)/59p, 750(720)/50p, 750(576)/50p
Audio Embedding Option	tone/silence, audio pass, embed audio, audio channel select
Frame Rate Conversion	Video/Film/2:2 – 3:2
Color-space conversion	SMPTE 274, 260, 240, BT709
GPI	6 inputs, 6 outputs
Display	Full height, Full width, Anamorphic, Insert, Pan, Tilt, Size, Aspect
Genlock	From input or external reference
Memory	8 machine memories. 4 display memories per machine memory

## Power

Mains Supply	115/230 V AC 50/60 Hz, Automatic Voltage Selection
Power Consumption	Max. 150 W
Inrush Current	43.4A maximum

## Mechanical

Temperature Range	0° to 40° C operating
Cooling	Axial fan
Case Type	1RU Rack Mounting
Dimensions	483 mm x 540 mm x 45 mm (w,d,h). Depth is 550mm including connectors
Weight	9.75 kg

## EMC Environment

This unit is intended for use in the commercial and light industrial environment E2.

## Installation

### Unpacking the HD5200

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

- 1 HD5200 unit
- 1 Power cable
- 2 Spare a.c. power fuses 2 A (T)
- 1 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 CONNECTIONS

#### Power Supply

Mains power is supplied to the unit via a filtered IEC connector.

The mains power fuse rating is 2 A (T) and the rated current for the unit is 0.85 A at 115 V and 0.42 A at 230 V.

The power supply ON/OFF switch is located on the front of the power supply inside the front panel.

**CAUTION: THE FAN EXIT VENTILATION HOLES AT THE LEFT SIDE OF THE UNIT (LOOKING FROM THE FRONT) MUST NOT BE OBSCURED.**

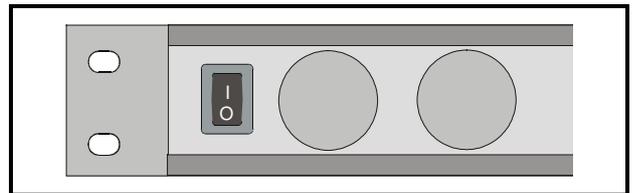
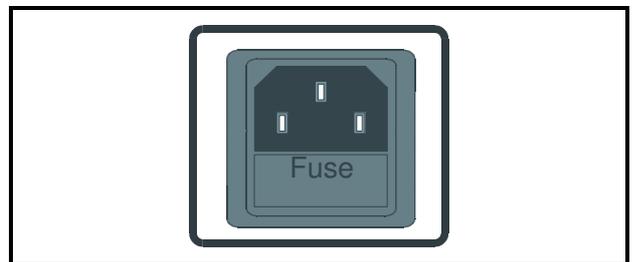
### Supply Voltage

The power supplies are auto switching for input voltages in the ranges of 100 V to 250 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 and left-hand side (looking from the front) to dissipate the heat produced during operation. Installations should be designed to allow for this.

## Remote Control

The unit may be controlled via the RollCall remote control system from an active front panel.

For details of the menu system see Section 4 page 4.22, and for details of the RollCall system consult the Modular System Operation manual.

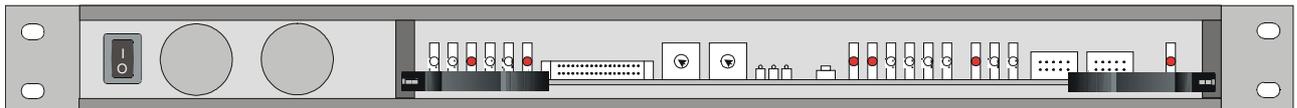
## OPENING THE FRONT PANEL

Open the front panel by grasping the panel at either end, pulling out the two black levers and easing the panel forwards.

The rack mount fixing “ears” are revealed when the panel is open.

Refit the front panel by pushing it back into position (the levers will click into place).

## Internal View Showing Power Supply and Card Position

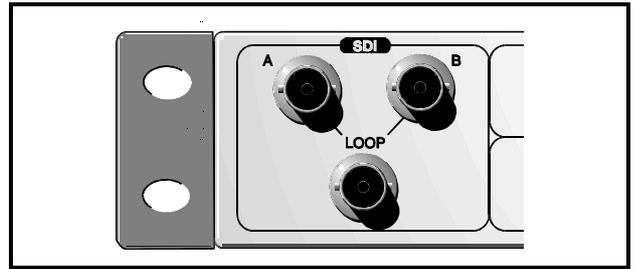


**CONNECTIONS**

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

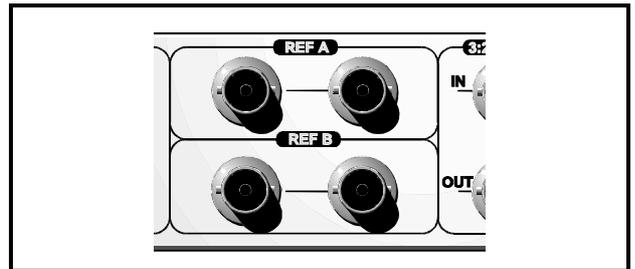
**D1 Serial Digital Input**

These are the two SDI serial digital inputs (A and B). A loop-through output is provided which follows the active input.



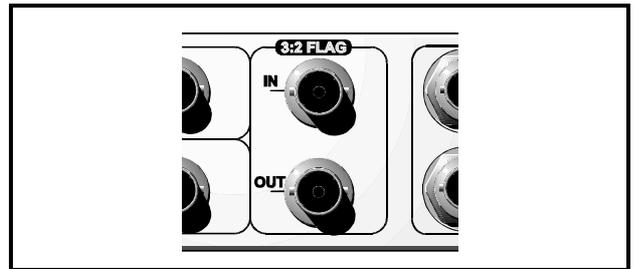
**Genlock Reference**

An external HD trisync or SD bi-sync analog reference signal may be connected to either of these two loop-through BNC connectors.



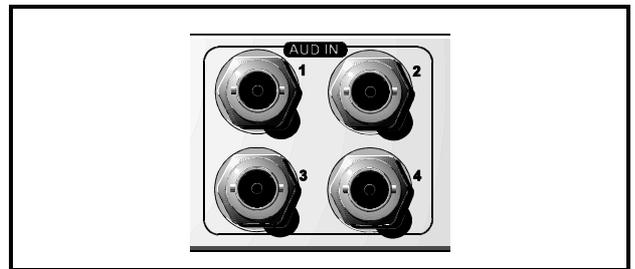
**3:2 Flag**

Processing can be controlled from an external 3:2 flag, and the HD5200 can supply a 3:2 flag for external use, using these BNC connectors.



**Audio Input**

Four external stereo channels can be input for embedding in the HD output.



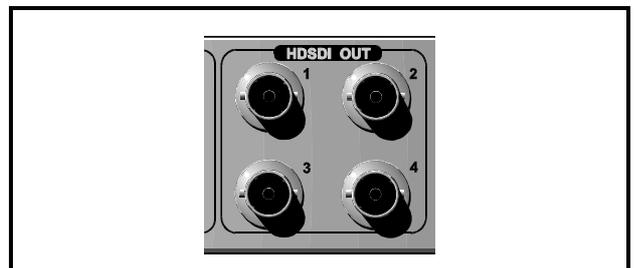
**Audio Monitor Output**

This BNC connector provides a monitoring output from any one of the audio signals (embedded or AES/EBU) being processed.



**HD SDI Output**

Four BNC connectors provide identical HD SDI outputs at 1.4 GHz.



**RollCall**

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

If the BNC connector is used, the RollCall 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.

If the RS 422 connector is used the 9 way D-type can be directly connected to a PC RS 232 serial port using an RS 232 to RS 422 level shifter.

A unique address for each unit on the RollCall system must be set by two Hex switches (SW7 and SW8) on the printed circuit board.

The addresses 00 and FF are reserved and must not be used. If the HD5200 is started with the RollCall address set to 00 or ff then the unit will not start but, it will display on the front panel the message: -

ERROR:  
Error-Code 0x0012

In this case the unit should be turned off, a valid RollCall address set on the switches and the unit restarted.

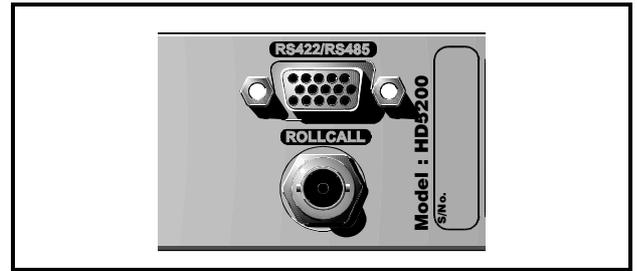
**Hex Switches**

Both of these switches are used to define the Unit Address code for the equipment. They are only read at power-up.

All positions on these switches are used to set the Unit Address code in Hex (0 to F).

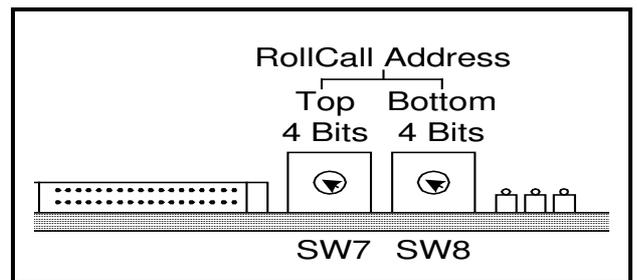
**Notes:** *In a RollCall™ segment, all units must have different unit address codes. For more information see RollCall™ section.*

*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.*



**RS-422 Port Connections**

Pin	Function	Direction
1	Ground	
6	Rx signal common	
2	Receive -	HD5200 ← Remote
7	Receive +	HD5200 ← Remote
3	Transmit +	HD5200 → Remote
8	Transmit -	HD5200 → Remote
4	Tx signal common	
9	Ground	
5	Spare	



**GPI**

The General Purpose Interfaces are accessed via a 25 way D type female connector. In the table GPI refers to inputs and GPO refers to outputs.

Pin	Function
2	GPI 0 Signal
14	GPI 0 Return
3	GPI 1 Signal
15	GPI 1 Return
4	GPI 2 Signal
16	GPI 2 Return
5	GPI 3 Signal
17	GPI 3 Return
6	GPI 4 Signal
18	GPI 4 Return
7	GPI 5 Signal
19	GPI 5 Return
8	GPO 4 Signal
20	GPO 4 Return
9	GPO 5 Signal
21	GPO 5 Return
10	GPO 0 Signal
22	GPO 0 Return
11	GPO 1 Signal
23	GPO 1 Return
12	GPO 2 Signal
24	GPO 2 Return
13	GPO 3 Signal
25	GPO 3 Return
1	Ground

*Note. For interlaced output standards the polling occurs at field rate and for progressive output standards it occurs at frame rate.*



The output (GPO) characteristics are as follows:

Operating Voltage Range	0 to $\pm 60$ V (DC/AC peak)
Maximum Load current	1.0 A (AC/DC)
Maximum On-State Resistance @ Tamb = +25 °C	500 mOhm
Minimum Off-State Resistance @ Tamb = +25 °C, V = $\pm 48$ V	100 MOhm

**GPI Overview**

The GPI provides contact closure tally outputs that can be used to turn on lamps etc.

The equivalent circuit of the GPI input is shown on the next page.

*Note. On a standard machine when delivered, GPI inputs 0 to 5 select machine memories 1 to 6 and GPI outputs 0 to 5 provide tally outputs indicating which memory is selected.*

The GPI port is polled approximately 2mS after the vertical sync group of the output video.



**SWITCHING ON**

Open the front panel. Check that power is connected to the HD5200. Set the power switch on the front of the power unit to ON (I). The opening alphanumeric display will appear on the front panel. Close the front panel.



# Operation

## GENERAL OPERATING PRINCIPLES



The HD5200 may be operated as follows:

1. By using the front panel controls
2. By using a remote control panel via the RollCall control system or RS422
3. RS422 control
4. Using GPI connections to recall memory presets.

## OPERATION USING THE FRONT PANEL CONTROLS

All operational parameters and selections may be made by pressing dedicated push buttons and selecting items from a system of menus displayed in the window.



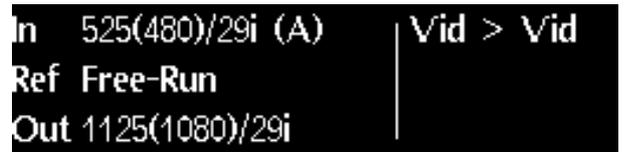
GENERAL OPERATING INFORMATION

Display Window

The control window displays all selection menus sub-menus and unit status information.

Home Display

An example of unit status is shown in this case indicating that the unit is set to accept a 525 interlaced signal (480 active lines) at 59.94Hz field rate (29.97Hz frame rate) on input A and the output signal is selected to be 1125 interlaced (1080 active lines) at the same field rate. There is no reference. The machine is set for video in to video out.



If the input is not available the words Input Loss! will be displayed and the output will be determined by the set up.

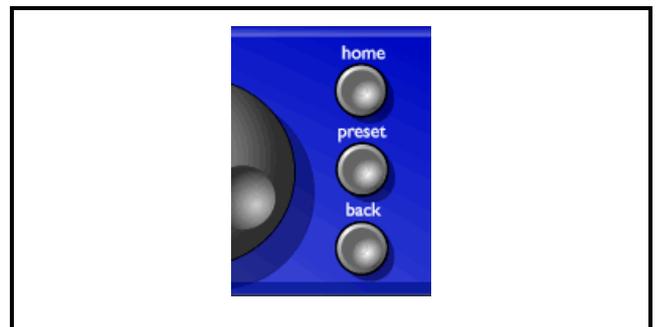
The following warning messages may appear at the bottom right-hand side: Ptn, Frz and Mno. These indicate that the Test Pattern Generator is turned On, the Output is Frozen, and the output has the Monochrome settings changed from the default values respectively.

If the Film Sequence Detector Window is set to Visible (see page 4.10) then the warning message Win will appear on the right-hand side of the Home screen.

The **Home**  button always allows a return to the home status screen in the display window from any position in the menu hierarchy.

The **Preset**  button will return all settings of the displayed menu to factory default settings.

The **Back**  button allows a return to the last menu screen that was displayed. Up to 32 menu screens may be retraced using this function.

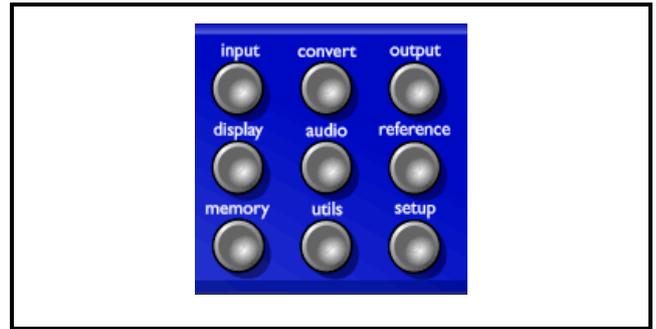


**Using The Control Push Buttons**

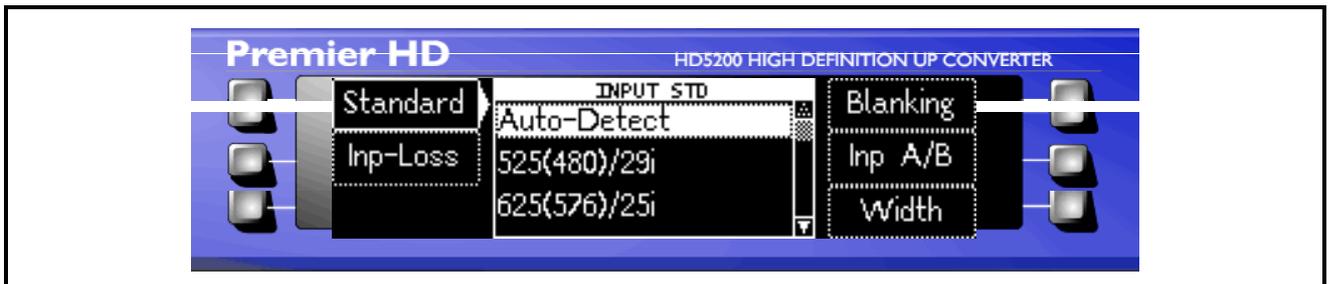


Various specific operations may be carried out by using these push buttons to access particular functions.

When pressed the relevant menu will appear in the display window and the button LED will become illuminated, indicating that the function is active.



**Display Buttons**



Pressing the button adjacent to the required item makes a selection; an arrowhead will appear next to the item when active.

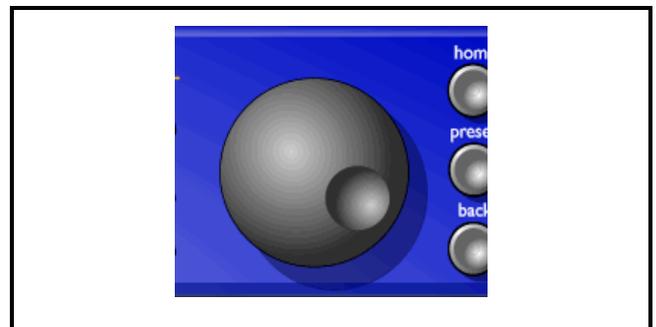
**Spinwheel**



The spinwheel allows selections to be made from the menu. In the example above, rotating the spinwheel clockwise will select the next input standard (the scroll bar shows that there are more standards to select – when the selection is at the limit of the list the appropriate arrow on the scroll bar will become dotted).

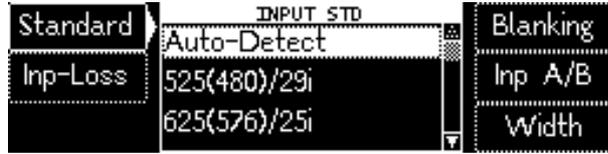
In some cases, in which a change has to be actioned, the item will be enclosed in an oblong box instead of highlighted. The user must then push the “Select” button to action.

*Note that the item last selected will be shown highlighted when the menu function is selected.*



**INPUT**

The following menu items are all related to the input signal selection and control.



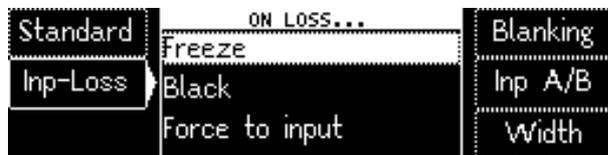
**STANDARD**

Allows the standard of the input video to be selected. The standards are named using the convention:- total number of lines (active lines)/ frame rate. The options are:

- Auto-Detect      The machine automatically determines the input video standard.
- 525(480)/29i    NTSC format (59.94Hz field rate)
- 625(576)/25i    PAL format (50Hz field rate)
- 625(576)/24sf   Slow PAL format (48Hz field rate)
- 625(576)/23sf   Slow PAL format (47.952Hz field rate)

**INPUT LOSS**

Controls the system response to a loss of input signal.



The options on loss of signal are:

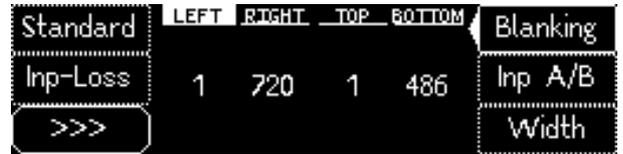
- Freeze            The output will be frozen as determined on the UTIL – FREEZE – FREEZE TYPE menu
- Black             The output will cut to black
- Force to input    The incoming signal will be displayed whenever possible.

**BLANKING**

This 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 machine will blank any output data generated by the input data, regardless of the display control settings.

*Note that the HD5200 keeps a separate record of the input blanking for 525 and 625 line inputs.*

To select each of the parameters, press the lower left hand button  adjacent to >>>.

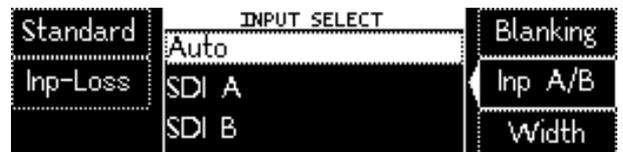


The settings are as follows:

- Left**            Adjusts the left-hand edge of blanking. A setting of 1 indicates that no input pixels that are normally visible should be blanked, 2 causes the first input pixel to be blanked, etc.
- Right**          Adjusts the right-hand edge of blanking. A setting of 720 indicates that no input pixels that are normally visible should be blanked, 719 causes the last input pixel to be blanked, etc.
- Top**             Adjusts the top edge of blanking. A setting of 1 indicates that no input lines that are normally visible should be blanked, 2 causes the first input line to be blanked, etc.
- Bottom**         Adjusts the bottom edge of blanking. For 625 line inputs a setting of 576 indicates that no input lines that are normally visible should be blanked, 575 causes the last input line to be blanked, etc. For 525 line inputs a setting of 486 indicates that no input lines that are normally visible should be blanked, 485 causes the last input line to be blanked, etc.

**INPUT A or B**

This selects the active input connector. The selected input is shown on the top line of the home screen following the input standard description.



The options are:

- Auto              The unit searches between inputs A and B until it finds a valid signal.
- SDI A            The unit only responds to input A
- SDI B            The unit only responds to input B

## WIDTH

This function allows the number of active input samples to be selected for processing during up-conversion.



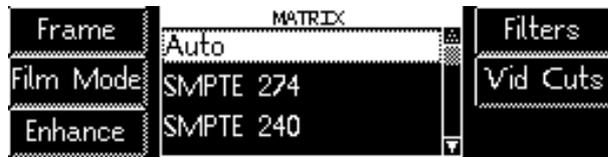
The selections are either Digital or Analogue.

**Digital** The HD5200 will process all 720 active input samples when doing its up-conversion.

**Analogue** The HD5200 will only process the pixels that are within the analogue active line length for the current input standard. For 525 line inputs this will be 714 pixels and for 625 line inputs this will be 702 pixels.

**○ CONVERT**

The following menus relate to the conversion from the input signal to the output signal.



**MATRIX**

This controls the colour space conversion applied to the signal. It defines the colour space of the output signals. The input colorimetry is assumed to be as per REC 601.

The colour correction options are:

- Auto**            The best colour space conversion for the signal process is selected. This is derived from the definition of the output video standard.
- SMPTE 274**    Colour space conversion to SMPTE 274 requirements is applied.
- SMPTE 240**    Colour space conversion to SMPTE 240 requirements is applied.
- BT 709**        Colour space conversion to SMPTE BT709 requirements is applied.
- REC 601**       No colour space conversion is applied.

**FRAME**

This controls the way the HD5200 processes incoming video or film material.

*Note that it is necessary to perform additional setups using the CONVERT-FILM MODE and CONVERT-FILTERS menus in conjunction with these menus.*

It is important when using the frame based processing modes that the correct relationship between the input field rate and the output field rate is maintained. For example, in 2:2 > 2:2 mode, if the input and output field rates are not identical then there will be periodic frame drops at the output of the HD5200. Similarly, in 2:2 > 3:2 mode it is important that the output field rate is one and a quarter times the input field rate. If it is not, a continuous 3:2 sequence will not be obtained. To make this easy, it is possible to genlock the HD5200 output to it's input (see REFERENCE-REFERENCE SRC menu).



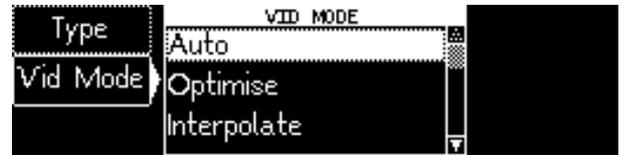
The options are:

- Auto**            The machine will try and establish the best processing mode using the selected input and output standards to make the choice.
- Video > Video**    The machine is forced to treat both the input and output as video material, i.e. with field-to-field motion.
- Video > 2:2**      The machine will convert the incoming video to a 2:2 based film structure, i.e. it will convert motion from field to frame rate (objects will only move on frame boundaries not field boundaries). This is useful when converting video material into a segmented frame format, e.g. 625(576)/48Hz video to 1125(1080)/24sf.
- Video > 3:2**      The machine will convert the incoming video to a 3:2 based film structure, i.e. it will convert motion from field to 3:2 style frame rate. This is useful when converting video material to a film look. A typical conversion would be 525(480)/59.94Hz video to 1125(1080)/29i with 3:2 motion.
- Film > Film**      The machine assumes that both the incoming and outgoing material will be film based. The input can be either 2:2 film or 3:2 film and the output will have the same frame structure as the input. The HD5200 will pair up the incoming material to form film frames before filtering. This means that if the film filter is set to Sharp (see CONVERT – FILTERS – FILM menu) the output will not be correct if video material is applied to the input. For film sequence setup menus see CONVERT – FILM MODE.
- 2:2 > 3:2**        The machine assumes that the incoming material is 2:2 film based and the output required is 3:2. This would typically be used for converting 625(576)/23sf material to 1125(1080)/29i (or any other 59.94Hz field rate output).

- 3:2 > 2:2      The machine assumes that the incoming material is 3:2 film based and the output required is 2:2. This would typically be used for converting 525(480)/29i (3:2) material to 1125(1080)/23sf (or any other 23.97Hz sf formats).
  
- 3:2 > 1:1      The machine assumes that the incoming material is 3:2 film based and the output required is 1:1, i.e. a truly progressive standard such as 1125(1080)/24P. This would typically be used for converting 525(480)/29i (3:2) material to 1125(1080)/23p (or any other 23.97Hz progressive formats).
  
- 2:2 > 1:1      The machine assumes that the incoming material is 2:2 film based and the output required is 1:1, i.e. a truly progressive standard such as 1125(1080)/24P. This would typically be used for converting 625(576)/23sf (2:2) material to 1125(1080)/23p (or any other 23.97Hz progressive formats).
  
- Film > 2:2      These modes will convert incoming film material that has discontinuous film sequence into material with continuous 2:2 and 3:2 sequence respectively. These modes are designed to fix the film sequence on material that has been edited and, at the edit points the film sequence has been disrupted. Note that they are not designed to give material that has been played back at non-standard rates (Varispeed operation) continuous sequence. This type of material will in general give poor results in these modes due to the high rate of frame repeats and drops.
- Film > 3:2

VIDEO MODE

The following menu items are all related to the temporal conversion of video (not film) based signals. The HD5200 contains a video synchroniser for conversions where the input and output field rates are not locked together. These settings also affect the way that the synchronisation is performed.



The options are as follows:

- Auto**              Selects Synchronise mode when the input and output field rates are the same and optimise mode when they are different.
  
- Optimise**          The unit operates as in the Synchronise mode but monitors the amount of slippage between the input and output timing. When the slippage exceeds a preset value the unit performs an interpolation to move to the next available minimum blur temporal position. The effect of this is to give the same high performance as the Synchronise mode but without periodically discarding a field; for example, in 59.94 to 60Hz mode only about half a second of interpolation occurs in every 16 seconds. However, because of the system used, the video delay through the machine can vary by up to plus or minus half a field.
  
- Interpolate**        The output is always interpolated from the input. This will give the smoothest output but at the expense of potential blurring of moving objects.
  
- Synchronise**      Gives the highest performance with minimum output blurring. If the input and output field rates are not identical it can cause field drops or repeats which may have the effect of causing moving objects to judder.

FILM MODE

This menu is used in conjunction with the CONVERT – FRAME menu to setup the film processing modes.



The options are:

- Free Run                      The machine generates an internal 2:2 or 3:2 pulse. See CONVERT – FILM MODE – FREE RUN menu for the pulse type and CONVERT – FILM MODE – PULSE DLY for additional setup information relating to the free run pulse.
  
- Detect Input Seq            In this mode the HD5200 uses an internal film sequence detection algorithm to establish the incoming film sequence.  
  
 Note - if the Sequence detector is selected then the delay through the HD5200 will be increased by one input frame duration to allow time for the sequence detector to operate.
  
- Prefix Packets                In this mode the HD5200 reads data packets embedded in the ancillary data space of the REC656 input video data. For this to work the input video must be passed through a Snell and Wilcox Prefix CPP100 or CPP200 noise reducer. On the Prefix the data embedding must be turned on using the ANALYSIS-FLAG OUTPUT menu. In addition, the ancillary data ident embedded by the Prefix must match the ident being read by the HD5200. The Prefix ident is set using the ANALYSIS-DATA-IDENT menu. On the HD5200 the ident is set using the UTILS-META-PREFIX-DATA ID menu. The default on both units is C0 (Hex).

VITC

In this mode the HD5200 reads VITC information on the incoming video to extract film sequence information. The HD5200 can read analogue VITC waveforms that have been digitised and placed in the REC656 input. This is as specified in SMPTE 12M, SMPTE RP 164 and SMPTE 266M.

If the incoming video is 525 line then it is assumed that the film sequence is 3:2. The timecode is assumed to be non-drop-frame. 'A' frames are inferred if the VITC frame count is zero or a multiple of five.

If the incoming video is 625 then it is assumed that the film has normal dominance so, film frames are field ones and the following field twos.

Video Index

If video index is selected as the film sequence source, then the film sequence information contained in Class 2.1 Data octet 1 of video index information in the incoming video stream is used as the source of film sequence information. (see SMPTE RP186 for details of the video index signal).

External Pulse Inp

If External pulse is selected as the source of film sequence information, then the TTL pulse input BNC on the rear panel of the HD5200 is used as the source of film sequence information. The type and timing of the incoming pulse are configured using the external pulse configuration menu items. (see below). Note that the HD5200 accepts TTL level pulses on the BNC connector.

FREE RUN

This menu is used to set up the free run pulse type.



The options are:

- Auto A 3:2 pulse is generated for 525 line inputs and a 2:2 pulse for 625 line inputs
- 2:2 A 2:2 pulse is generated for all inputs
- 3:2 A 3:2 pulse is generated for all inputs.

PULSE DELAY



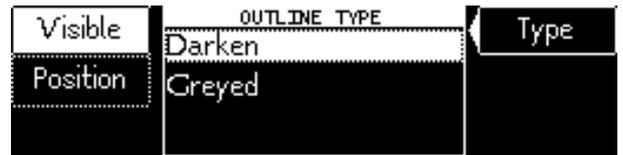
In Free Run mode the pulse delay is used to align the free running film sequence pulse with the incoming video. If the pulse is of 2:2 type then a pulse delay of zero corresponds to Normal film dominance. i.e input field ones are paired with the following field twos. If the pulse delay is set to one then this corresponds to inverted field dominance. i.e. field twos are paired with the following field ones.

SEQUENCE WINDOW

The HD5200 film sequence detection circuit operates over a windowed section of the input picture. By default the whole of the input image lies within the window. However, it may be desirable to exclude certain areas of the picture from the window. To facilitate this, the window can be made visible on the HD5200 output video so that it can easily be adjusted.

*Note, the window is applied to the HD5200 input video so it is advisable to have all of the input video visible when making the adjustment. For example, by selecting a full height display (see DISPLAY-PRESETS menu).*

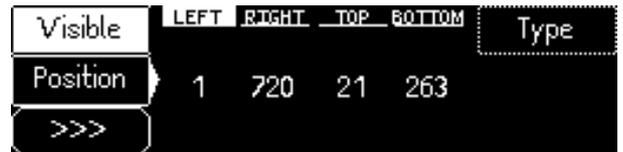
Note that the HD5200 keeps a separate record of the film sequence window for 525 and 625 line inputs.



VISIBLE

Turns the film sequence window on and off. This should be set to off, except when adjusting the sequence window, or the HD5200 output will be incorrect.

POSITION



To select each of the parameters, press the lower left hand button  adjacent to >>>.

**Left** Adjusts the left-hand edge of the window. A setting of 1 indicates that the window coincides with the left-hand edge of the picture. 2 causes the window to be inset by 1 pixel, etc.

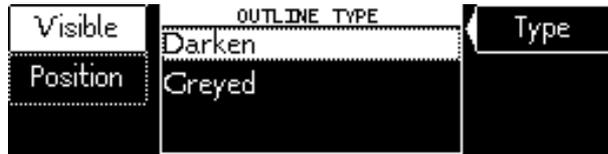
**Right** Adjusts the right-hand edge of the window. A setting of 720 indicates that the window coincides with the right-hand edge of the picture, 719 causes the window to be inset by 1 pixel, etc.

**Top** Adjusts the top edge of the window. For 625 line inputs a setting of 23 indicates that the window coincides with the top edge of the picture, 24 causes the window to be inset by 1 line, etc. For 525 line inputs a setting of 21 indicates that the window coincides with the top edge of the picture, 22 causes the window to be inset by 1 line, etc.

**Bottom** Adjusts the bottom edge of the window. For 625 line inputs a setting of 288 indicates that the window coincides with the bottom edge of the picture, 287 causes the window to be inset by 1 line, etc. For 525 line inputs a setting of 243 indicates that the window coincides with the bottom edge of the picture, 242 causes the window to be inset by 1 line, etc.

TYPE

This controls the appearance of the sequence window when it is visible.



The options are:

**Darken** The gain of video within the window is reduced.

**Greyed** The video within the window is monochrome.

EX PULSE

This menu configures input and output film sequence pulse operation.

In Type

This menu selects what type of pulse is being applied to the input film sequence pulse BNC.

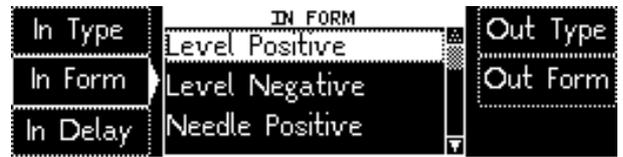


**In Type New Field**  
If New Field is selected the HD5200 expects a pulse which indicates that a new film frame has been produced by the Telecine. This is also known as a Start of Frame pulse or a Read Frame Sequence pulse.

**Repeat Field**  
If Repeat Field is selected the HD5200 expects a pulse which indicates that a repeat field has been produced by the Telecine.

In Form

This menu selects the electrical form that the input film sequence pulse takes.



**In Form Level Positive**  
Level Positive selects a pulse which is active HI during a new or repeat field.

**Level Negative**  
Level Negative selects a pulse which is active LO during a new or repeat field.

**Needle Positive**  
Needle Positive selects a pulse which goes HI for a minimum of 5µs during a new or repeat field.

**Needle Negative**  
Needle Negative selects a pulse which goes LO for a minimum of 5µs during a new or repeat field.

In Delay



This sets the number of input fields of delay that are applied to the incoming film sequence pulse. This allows the user to set the timing of the pulse so that it matches the incoming video sequence. Thus, if there is a video processing delay between the Telecine and the HD5200 then this can be compensated for with this setting. Up to 15 input fields of delay can be applied to the incoming pulse. The default delay is zero fields.

Out Type

This menu selects what type of pulse is produced by the film sequence output BNC.



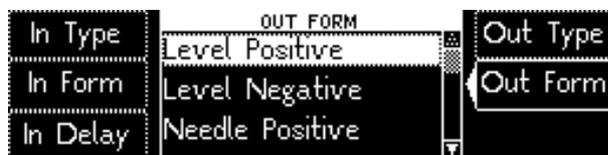
**New Field**  
If New Field is selected the HD5200 outputs a pulse which indicates that a new film frame has been produced by the HD5200.

**Repeat Field**  
If Repeat Field is selected the HD5200 outputs a pulse which indicates that a repeat field has been produced by the HD5200.

**Toggle**  
If Toggle is selected the HD5200 outputs a pulse which toggles every time a new frame is produced by the HD5200.

Out Form

This menu selects the electrical form that the output film sequence pulse takes. Note that these menu settings have no effect if the TOGGLE type output pulse is selected.



**Level Positive**  
Level Positive selects a pulse that is active HI during a new or repeat field.

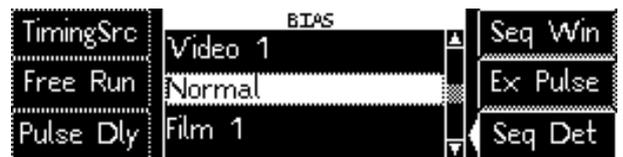
**Level Negative**  
Level Negative selects a pulse that is active LO during a new or repeat field.

**Needle Positive**  
Needle Positive selects a pulse that goes HI for one output line during a new or repeat field.

**Needle Negative**  
Needle Negative selects a pulse which goes LO for one output line during a new or repeat field.

SEQ DET

This menu adjusts the bias of the internal sequence detector.



This should not normally be necessary, the Normal setting works well on most material. However, on difficult material it can be used to steer the detector towards the correct answer.

If the bias is adjusted towards video it is more likely to detect orphan fields.

If the bias is adjusted away from video and towards film it is less likely to generate orphan fields and more likely to generate repeat fields.

This can be particularly useful on Varispeed material.

If the playback speed is high then the detector can be adjusted towards video to help find any orphan fields.

If the playback speed is low then the detector can be adjusted towards film to help find any extra repeat fields.

The default setting is Normal. Video 1 adds a small bias towards finding orphan fields.

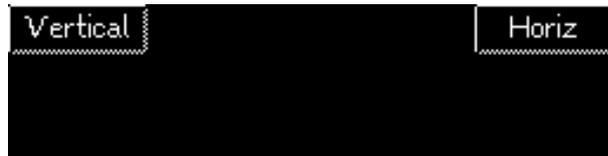
Video 2 adds a larger bias towards orphan fields.

Film 1 adds a small bias towards repeat fields.

Film 2 adds a larger bias towards repeat fields.

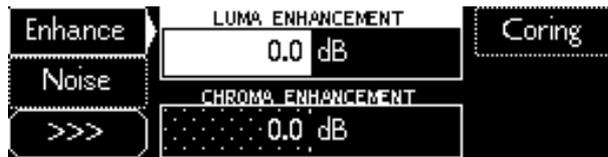
ENHANCE

Controls the amount of detail enhancement applied during the up-conversion process.



VERTICAL

This menu controls the detail processing in the vertical filters.



The enhancer adjusts the levels of high frequency vertical information to make the output pictures appear sharper or softer. The luminance and chrominance enhancement can be separately adjusted. The enhancer range is +/-6dB in 0.1dB steps and the default value is 0dB.

*Note that negative settings soften the picture while positive ones sharpen it.*

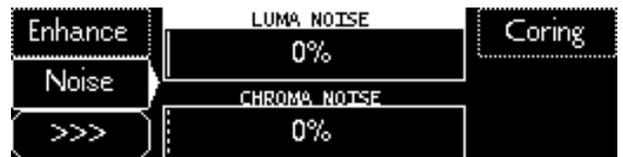
To select each of the parameters, press the lower left hand button  adjacent to >>>. The options are:

- Luma Enhancement
- Chroma Enhancement

NOISE

The noise reduction gates the high vertical frequency signal path such that high vertical frequency signals will only contribute to the output if they are above the noise threshold. Thus, small noise signals can be removed. Note that the noise reduction is only used in the direct signal path so, the enhancer path is not affected by the noise reduction.

Luminance and chrominance can be separately adjusted. The range is 0 to 100% and the default value is 0%. 0% means no noise reduction is applied while 100% means lots of noise reduction is active. When there is lots of noise reduction only very large high frequency signals will contribute to the output signal. If too much noise reduction is used then the picture can appear soft.



To select each of the parameters, press the lower left hand button  adjacent to >>>. The options are:

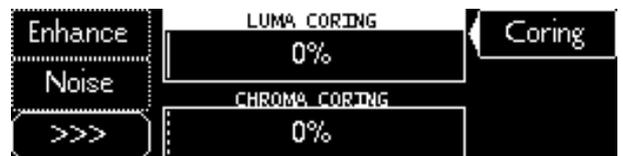
- Luma
- Chroma

CORING

This menu controls the vertical coring. The coring gates the enhancement signal (see above) such that signals will only contribute to the enhancer if they are above the coring threshold. Thus, small noise signals will not be enhanced.

*Note that the coring is only used in the enhancement path so, if the enhancer is not active the corer will have no effect.*

Luminance and chrominance coring can be separately adjusted. The coring range is 0 to 100% and the default value is 0%. 0% means no coring is applied while 100% means lots of coring is active. When there is lots of coring only very large high frequency signals will contribute to the enhancement signal.

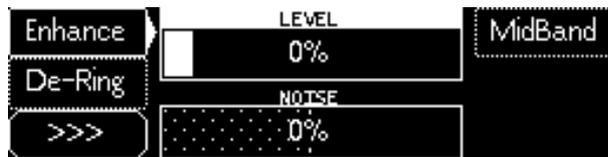


To select each of the parameters, press the lower left hand button  adjacent to >>>. The options are:

- Luma Coring
- Chroma Coring

**HORIZONTAL**

This menu controls the detail processing done in the horizontal filters.



To select each of the parameters, press the lower left hand button  adjacent to >>>.

**HORIZONTAL ENHANCE**

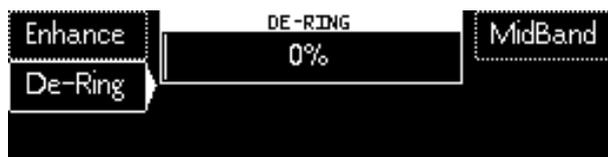
The enhancer adjusts the levels of high frequency horizontal information to make the output pictures appear sharper or softer. The enhancer range is -10% to +100% in 1% steps and the default value is 0%.

*Note that negative settings soften the picture while positive ones sharpen it.*

**HORIZONTAL NOISE**

This menu controls the level of noise reduction applied in the horizontal enhancer. Note that the noise reduction is applied using the enhancer so, if the horizontal enhancement level is set to zero, changing the noise setting will have no effect. The range is -20% to +20% in 1% steps. The default setting is 0%.

**HORIZONTAL DE-RING**



This menu controls the horizontal de-ringing filter. Often, when up-converted pictures are enhanced a substantial amount of ringing becomes visible on the output picture. Often this ringing is present on the source material but was not noticeable on a standard definition monitor. However, up-conversion and enhancement can emphasise this ringing. The HD5200 contains a special filter to minimise the amount of ringing without any softening of the picture.

The De-Ring range is 0 to 100% in 1% steps and the default value is zero.

**MIDBAND ENHANCER**



This menu controls the midband horizontal enhancer. This control boosts the frequency response in the 2 to 3 MHz region of the incoming signal.

**FILTERS**

This menu is used to select the filters used in the up-conversion process.

**VIDEO**

The video option is used to select the filters when in video processing modes.



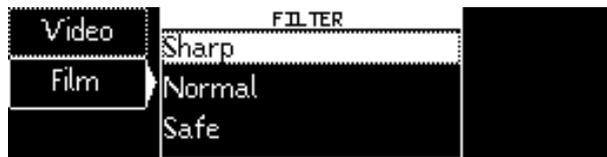
To select each of the parameters, press the lower left hand button  adjacent to >>>.

**Pair Off** A straightforward three-field aperture is used.

**Pair On** The HD5200 treats the incoming material as video. However, it modifies the way that the apertures operate. The video is paired up into a frame before a two field video aperture is applied. This is useful if all the cuts in the incoming material are on a defined field. For example, if all the cuts are on field one and the video is paired up as field ones and the following field twos, then, there will be no interpolation across the cuts. The pairing sequence can be selected from 1-2 or 2-1. This mode is also useful for material containing mixed 2:2 film and video material.

## FILM

The film option is used to select the filters when in film processing modes.



The options are:

- Sharp**    The HD5200 aims to extract the maximum possible vertical resolution from the incoming material. Film material can be up-converted to provide greater resolution than is possible with video material when the incoming material contains the extra detail. However, if video material or film with incorrect sequence information is processed using this filter then the output of the HD5200 will not be correct.
- Normal**    This aperture does not extract as much vertical resolution as the Sharp aperture. It does however still assume that the incoming material is film based and can therefore give very good results in the presence of vertical detail. Because it does not try to retain all possible detail it is much more tolerant of film sequence detection errors. As such it is suitable for all but the most demanding film applications.
- Safe**    The film frame pairing algorithms are still used. However, the filter does not try to extract as much vertical resolution from the input and the filter is tolerant of video based material.

## VIDEO CUTS

This menu turns on and off the cut detector.



This can be used when the HD5200 has a video type input signal (rather than film). When it is turned on the HD5200 adjusts its operation so that it doesn't do any processing which goes across the cut point.

Note - if the Cut detector is turned on then the delay through the HD5200 will increased by one input frame duration.

**○ DISPLAY**

This menu is used to control the size, shape and position of the output picture.



**PRESETS**

This allows selection of the preset display sizes.



The options are:

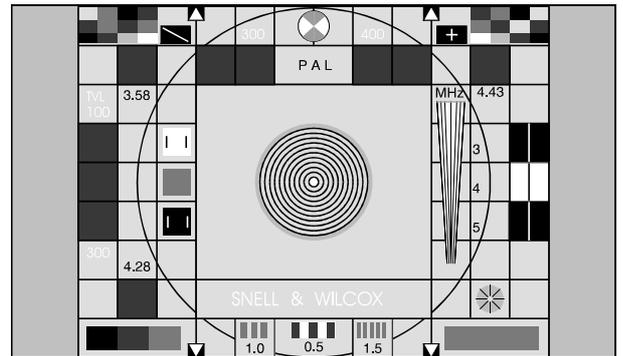
**Full Height** Produces a 4:3 output with all input picture information retained and blanked columns to the left and right of the image. Used when converting a 4:3 image to a 16:9 display when it is necessary to retain all of the input image.

**Full Width** Produces a 16:9 output. The whole output screen is filled and information at the top and bottom of the input image may be lost. Used when converting a 4:3 image to a 16:9 display when it is necessary to fill the entire output display.

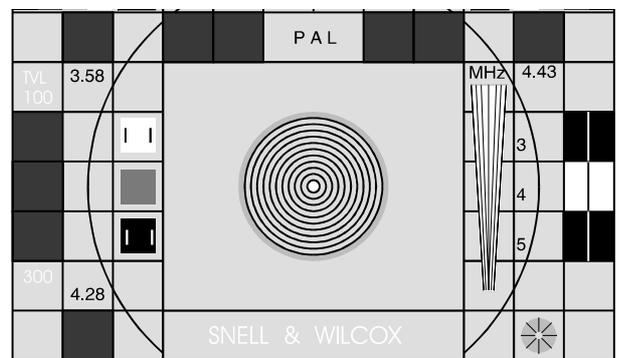
**Anamorphic** Produces a 16:9 output. The whole output screen is filled. Used when converting a 16:9 image to a 16:9 display.

**Insert** Produces a 4:3 output image in the centre of the output display. The image has the same number of active lines as the input signal and the correct number of pixels to ensure that a 4:3 input picture is correctly proportioned on the output screen.

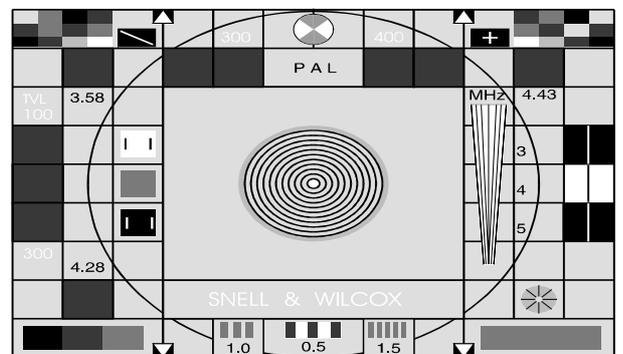
To activate the newly selected reference press the lower right button  adjacent to Select.



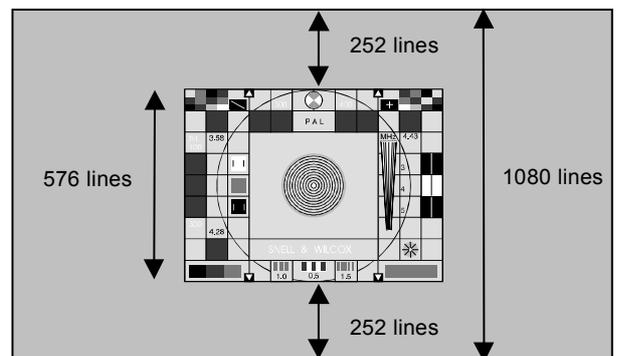
*Full Height*



*Full Width*



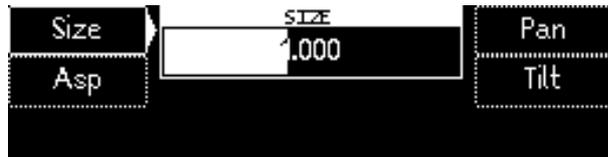
*Anamorphic*



*Insert*

VAR

Allows the picture size, shape and position to be adjusted to meet custom requirements.



The options are:

- Size Adjusts the size of the whole image. Both vertical and horizontal size change together while maintaining the aspect ratio of the image.
- Asp Adjusts the horizontal size of the image, allowing the shape (aspect ratio) of the output image to be changed.
- Pan Adjusts the horizontal position of the output image.
- Tilt Adjusts the vertical position of the output image.

SLEW

Controls the method and the timing of a picture size change



TRANSITION TYPE

Selects the type of transition that will be performed. Options are:

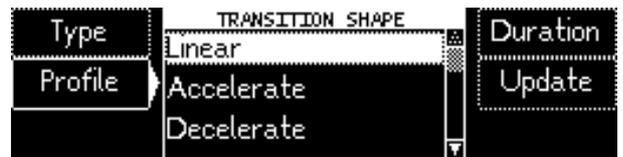
- Immediate Transition from one picture size to another is instantaneous.
- Slew Transition from one picture size to the next occurs at a speed set by the DISPLAY-SLEW-DURATION menu and follows a profile set by the DISPLAY-SLEW-PROFILE menu.
- Trigger Transition from one picture size to the next only occurs when a trigger command is sent down one of the remote control channels. Multiple picture parameters can be set in advance and then activated using a single trigger command. Note that if trigger mode is selected then adjusting the picture size, shape or position from the front or remote control panel will have no effect unless a trigger command is received. Trigger mode causes an immediate transition to the next picture size.

Trigger Slew

Trigger Slew works the same as Trigger mode (above) but, instead of an immediate transition to the next picture size the transition is slewed at a speed set by the DISPLAY-SLEW-DURATION menu.

PROFILE

Selects the "shape" of the transition.



The options are:

- Linear The rate of change of the picture parameters is constant throughout the transition.
- Accelerate The rate of change of the picture parameters increases throughout the transition.
- Decelerate The rate of change of the picture parameters decreases throughout the transition.
- S-Curve The rate of change increases and then decreases as the transition progresses.

DURATION

Sets the duration of the transition in fields or frames. If the output is of interlaced or segmented frame type the duration is in fields if the DISPLAY-SLEW-UPDATE menu has been set to F1 and F2 and in frames if the update has been set to frame rate.

*Note that if the output standard is truly progressive then the DISPLAY-SLEW-UPDATE menu should be left on F1 and F2 and the duration will then be in frames.*



UPDATE

Sets the rate at which the transition is updated.



The update rate options are:

- F1 and F2 If the output is of interlaced or segmented frame type the picture parameters are updated every field. If the output is progressive the picture parameters are updated at frame rate.
- F1 only If the output is of interlaced or segmented frame type the picture parameters are only updated every output field one. If the output is progressive the picture parameters are updated at half frame rate.
- F2 only If the output is of interlaced or segmented frame type the picture parameters are only updated every output field two. If the output is progressive the picture parameters are updated at half frame rate.

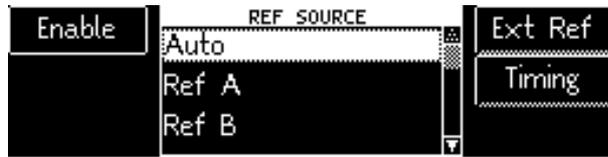
MEMORY

This menu is used to store and recall the various User Display memories. There are four User Display memories available in each of the eight machine memories. Each User Display memory contains the Size, Aspect ratio, Pan and Tilt parameters of the image.



**REFERENCE**

This menu is used to control the genlocking functions of the HD5200.



**ENABLE**

Toggles between genlocking on and genlocking off.

**REFERENCE SOURCE**

Selects the source of the reference signal. Options are:

**Auto** The HD5200 will scan the Reference-A input, the Reference-B input and the Input video until it finds a suitable reference signal.

*Note that the external references take priority over the input video so, if the unit is locked to the input video and an external reference is then applied the HD5200 will switch to the external reference.*

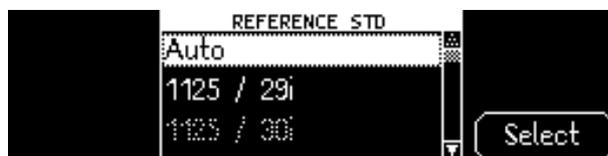
**Ref A** Forces the HD5200 to operate from the external reference A input.

**Ref B** Forces the HD5200 to operate from the external reference B input.

**Input** Forces the HD5200 to lock to the video input.

**EXTERNAL REFERENCE**

Sets the reference standard: To activate the newly selected reference press the lower right button  adjacent to Select.



In Auto mode the HD5200 will measure the selected reference signal and automatically choose the reference standard. The selected standard will appear on the second line of the Home screen.

Alternatively, the user can force the reference standard to the correct value.

*Note that certain combinations of output standard and reference standard are not possible. Thus, for any given output standard, a number of the possible reference standard menu items will be greyed out so that they cannot be chosen.*

The full range of references is as follows:

- Auto
- 1125 / 29i
- 1125 / 30i
- 1125 / 25i
- 1125 / 30p
- 1125 / 29p
- 1125 / 25p
- 1125 / 24p
- 1125 / 23p
- 1125 / 30sf
- 1125 / 29sf
- 1125 / /25sf
- 1125 / 24sf
- 1125 / 23sf
- 720p / 60p
- 720p / 59p
- 720p / 50p
- 525/29i
- 625 / 25i
- 625 / 24sf
- 625 / 23sf

**TIMING**

This menu allows the adjustment of the genlock timing with respect to the selected reference signal.

*Note that the HD5200 keeps a separate record of genlock timing for each distinct output standard raster size.*



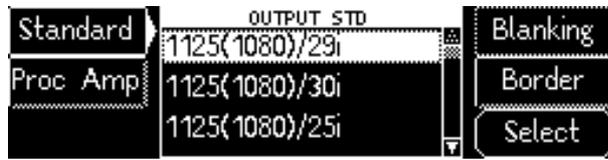
To select each of the parameters, press the lower left hand button  adjacent to >>>. The options are:

**Horizontal Timing** Adjusts horizontal genlock timing. Range is zero to one output line in steps of one output pixel.

**Vertical Timing** Adjusts vertical genlock timing. Range is zero to one output frame in steps of one output line.

**OUTPUT**

The following menu items are all related to the output signal standard and control.



**STANDARD**

This allows selection of the output video standard. The standards are named using the following convention: total number of lines, (active lines), frame rate. Options are:

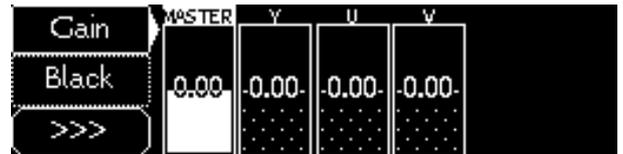
- 1125(1080)/29i
- 1125(1080)/30i
- 1125(1080)/25i
- 1125(1080)/30p
- 1125(1080)/29p
- 1125(1080)/25p
- 1125(1080)/24p
- 1125(1080)/23p
- 1125(1080)/30sf
- 1125(1080)/29sf
- 1125(1080)/25sf
- 1125(1080)/24sf
- 1125(1080)/23sf
- 1125(1035)/30i
- 1125(1035)/29i
- 1125(480)/60p
- 1125(480)/59p
- 750(720)/60p
- 750(720)/59p
- 750(480)/60p
- 750(480)/59p
- 750(720)/50p
- 750(576)/50p

**PROCESSING AMPLIFIERS**

Allows adjustment of the gain and black level of the output video.

**GAIN**

These menu items allow the user to adjust the gain of the luminance (Y), blue colour difference channel (U) and the red colour difference channel (V). The Master gain is applied to all three channels simultaneously while the Y, U and V gains are only applied to the selected channel. Thus, the overall gain of any channel is the product of the master gain and the individual gain. The gain controls have a range of  $\pm 6\text{dB}$  with a preset value of 0dB.

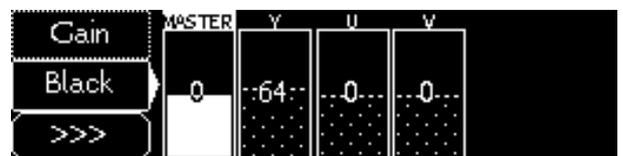


To select each of the parameters, press the lower left hand button  adjacent to >>>. The options are:

- Master
- Y
- U
- V

**BLACK**

These menu items allow the user to adjust the black level of the luminance (Y), blue colour difference channel (U) and the red colour difference channel (V). The Master Black is applied to all three channels simultaneously while the Y, U and V Blacks are only applied to the selected channel. Thus, the overall black level of any channel is the sum of the master Black and the individual Black. The controls are shown in 10-Bit digital video levels. All Black controls have a range of  $-512$  to  $+511$ . The preset values of the Master, U and V Black is 0 while the preset value of the Luminance Black is 64.



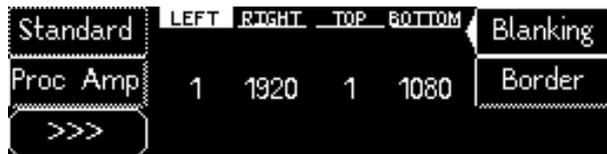
To select each of the parameters, press the lower left hand button  adjacent to >>>. The options are:

- Master
- Y
- U
- V

**BLANKING**

Allows the user to adjust the 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.

*Note that the HD5200 keeps a separate record of output blanking for each distinct output active picture raster.*



To select each of the parameters, press the lower left hand button  adjacent to >>>. The options are:

**Left** Adjusts the left-hand edge of output blanking. A setting of 1 indicates that no output pixels that are normally visible should be blanked, 2 causes the first output pixel to be blanked, etc.

**Right** Adjusts the right-hand edge of blanking. For example, 1920 indicates that no output pixels that are normally visible should be blanked in the 1125(1080)/29i output standard. 1919 causes the last output pixel to be blanked, etc.

*Note that the preset value will vary with the output standard as it is equal to the number of active pixels per line.*

**Top** Adjusts the top edge of output blanking. A setting of 1 indicates that no output lines that are normally visible should be blanked, 2 causes the first output line to be blanked, etc.

**Bottom** Adjusts the bottom edge of blanking. For example 1080 indicates that no output lines that are normally visible in the 1125(1080)/29i output standard should be blanked, 1079 causes the last output line to be blanked, etc.

*Note that the preset value will vary with the output standard as it is equal to the number of active lines per frame.*

**BORDER**

These menu items allow the user to adjust the appearance of any blanking border around the active picture. By default, the colour of any border around the active picture is black. However, the user can adjust this to any desired colour.

The border colour is controlled by adjusting the amount of Red (R), Green (G) and Blue (B) in the border. The RGB values are displayed as 10-Bit digital video levels.

*Note that they change in steps of four as the border colour is specified to 8-Bit video level accuracy. The default value for all the border colours is 64 which produces a black border.*

*Note also that when the border is enabled and its colour adjusted away from black then there is often a black band between the active picture and the colour border. This occurs when the active picture does not completely fill the digital active line length of the input standard (720 pixels). To remove this black band the input blanking should be adjusted via the INPUT-BLANKING menus to match the blanking of the incoming programme material.*



**ENABLE**

This menu item turns the border on and off. If the border is not enabled then it will appear black regardless of the settings of the red, green and blue border values.

**FULL COLOUR**

This menu controls the behaviour of the colour border for output standards which do not fill the entire raster. Currently these are 1125(480)/60p, 1125(480)/59p, 750(480)/60p, 750(480)/59p and 750(576)/50p. In these cases the active picture is transported within a larger raster corresponding to a different output standard. In this instance, if the colour border is turned on then by default it only extends to the edge of the largest possible active picture for the given output standard. This means that there will be a large black border around the picture (from the edge of the active picture to the edge of the transporting raster). If Full Colour is enabled the colour border will be extended to the edges of the transporting raster.

To select each of the parameters, press the lower left hand button  adjacent to >>>. The options are:

**Red** Adjusts the amount of Red in the border.

**Green** Adjusts the amount of Green in the border.

**Blue** Adjusts the amount of Blue in the border.

**AUDIO**

This menu is used to control all the HD5200 functions related to the audio processing channel.

*Note, if the HD5200 has been purchased without the audio option then the audio menus will be disabled.*

The HD5200 has four audio processing channels (A,B,C and D). Each channel can handle a stereo pair. There are twelve possible sources of audio data each of which can be routed into the four audio processing channels. The twelve sources are four AES/EBU audio inputs and eight embedded channels where the audio data is embedded in the input serial video stream. There are eight destinations for each of the four audio processing channels. These are the eight embedded audio channels contained in the output HD serial data stream. Thus, the user needs to select an audio source for each of the four audio processing channels and, then a destination in the output data stream. As well as the audio inputs the audio processing channels may be muted or set to a 4.8kHz test tone.

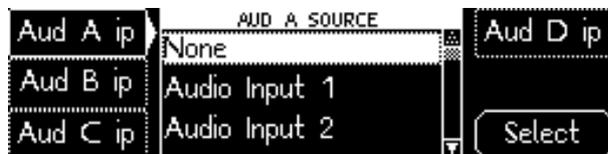
In addition, the HD5200 has an AES/EBU audio monitoring output and this can be switched to the output of any of the four audio processing channels.

The HD5200 contains an internal audio delay to compensate for the video processing delay. These menus also contain the audio delay controls.

**AUDIO IN**

Used to select the audio source for the four audio processing channels.

*Note that Audio Input 1 refers to AES/EBU input 1, Audio Input 2 refers to AES/EBU input 2 etc.*



Each source has identical audio input options, as follows:

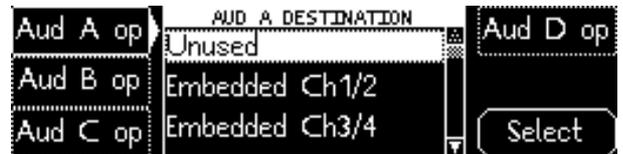
- None
- Audio Input 1
- Audio Input 2
- Audio Input 3
- Audio Input 4
- Embedded Ch1/2
- Embedded Ch3/4

- Embedded Ch5/6
- Embedded Ch7/8
- Embedded Ch9/10
- Embedded Ch11/12
- Embedded Ch13/14
- Embedded Ch15/16
- Test Tone 4.8kHz
- Mute

A change of input does not become active until the lower right-hand button  adjacent to "Select" is pressed.

**AUDIO OUT**

Used to select the destinations for the four audio processing channels (A to D).



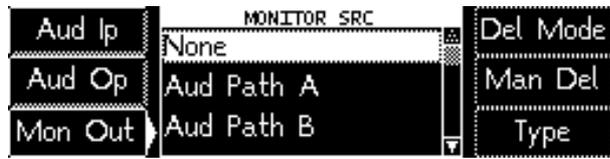
The destination (in the output serial stream) for the audio processing channels have identical options, as follows:

- Unused
- Embedded Ch1/2
- Embedded Ch3/4
- Embedded Ch5/6
- Embedded Ch7/8
- Embedded Ch9/10
- Embedded Ch11/12
- Embedded Ch13/14
- Embedded Ch15/16

A change of destination does not become active until the lower right-hand button  adjacent to "Select" is pressed.

**MONITOR OUT**

This routes one of the four audio processing channels to the AES/EBU monitoring output connector.



The options are:

None

Aud Path A

Aud Path B

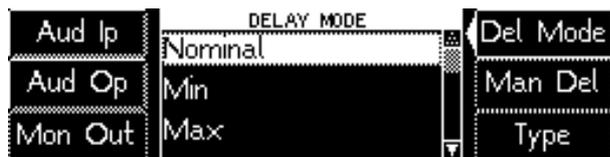
Aud Path C

Aud Path D

A change of source does not become active until the lower right-hand button  adjacent to "Select" is pressed.

**DELAY MODE**

This menu is used to control the delay applied to the audio as it passes through the HD5200. The audio delay applied is comprised of two components. Firstly, the HD5200 automatic delay. This is designed to compensate for the video processing delay. Secondly, the user can apply an additional delay so that the HD5200 audio delay can compensate for up-stream or downstream video processing delays.



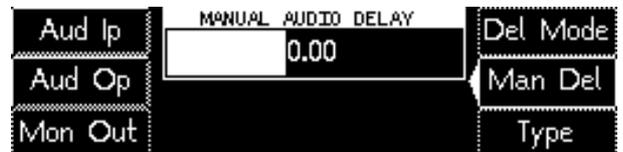
This menu is used to control the way in which the HD5200 automatic audio delay works. The video delay through the HD5200 depends upon many variables. If the unit is not running with its input and output locked together then the processing delay may be variable – if the unit is in Synchronise or Optimise mode. This menu allows the user to change the way that the automatic audio delay is applied.

The options are as follows:

- Nominal** The automatic audio delay is set to the nominal value for the conversion being undertaken. This is the average video delay that can be incurred. This will be the same as the actual video delay for up-conversions that have the input and output frame rates locked together and, the vertical genlock timing set so that the output and input vertical syncs are roughly co-timed.
- Min** The audio delay is set to the minimum video processing delay that can be incurred for the conversion being undertaken.
- Max** The audio delay is set to the maximum video processing delay that can be incurred for the conversion being undertaken.
- Zero** The audio delay is set to zero and the user can set the entire audio delay using the AUDIO - DEL OFFSET menu

**MANUAL DELAY**

This allows the user to apply a manual offset to the audio delay setting. This offset can be positive or negative, thus allowing the user to increase or decrease the audio delay as required. The audio delay offset is added to the HD5200 automatic audio delay to provide the total audio delay.



The manual audio delay range when the automatic audio delay mode is set to ZERO is 0 to 170ms. The actual audio delay applied is the sum of the automatic delay and the manual delay. For example, if the automatic delay works out to be 64ms the manual delay range will be -64ms to 106ms.

## TYPE



Type selects the data format of the incoming audio channels on both AES and embedded audio inputs.

PCM - this is the normal audio format. If PCM is selected the audio is passed through the audio rate converters. This means that the input audio can be asynchronous to the output audio. This mode should be used unless the incoming audio is compressed such that it cannot be rate converted.

Data - in this case the audio is treated as a datastream that cannot be rate converted. This is useful if the audio is a compressed format such as Dolby-E. Because the audio is not rate converted this mode will only work if the input and output audio clocks are locked together. This is most easily achieved if the HD5200 is genlocked to its video input and, the incoming data stream is also locked to the video input. This can also be done by locking the HD5200 to an external reference which also drives the audio source. Note that if the embedded audio input channels are being used, the embedded audio must also be synchronised to the input video. If the AES audio inputs are in use, the input audio need not be locked to the input video but, it must be locked to the HD5200 output video.

If the audio contains a mix of PCM and Data channels then the HD5200 should be put into data mode, and, both the data and PCM audio input channels should have their audio clocks locked to the HD5200 output.

**MEMORY**

This menu is used to store and recall the various machine Memories. There are eight machine memories available. Each memory contains a complete record of the machine settings (including the display memory settings).



**STORE**

Stores the machine settings in the memory selected.

**RECALL**

Changes the machine settings to those stored in the memory selected.

The default memory options are:

- Memory 1
- Memory 2
- Memory 3
- Memory 4
- Memory 5
- Memory 6
- Memory 7
- Memory 8

**FACTORY**

This allows the machine to be set back to the factory defaults state. In this case all settings are put back to their factory preset values. This function requires the user to hit the confirm button to ensure that it is not accidentally pressed.



**RENAME**



This rename menu allows one to change the name of the eight system memories.

The operation of the dialog boxes is described in the System Name section on page 4.28.

**UTILS**

Controls the various utility functions the HD5200 provides. The menu functions are shown below:



**PATTERN TYPE**

Used to control the internal test pattern generator.



The selected pattern is only active when Pattern is highlighted by pressing the upper left-hand button  (toggle action).

The test pattern options are:

- 100% Colour Bars
- 75% Colour Bars
- SMPTE Bars
- Tartan
- Pluge
- Ramp
- Sweep
- P and B
- Burst

**PATT TONE**

When selected (Patt Tone highlighted), a 4.8kHz tone accompanies the pattern output instead of picture audio. The upper right-hand button  has a toggle action.

**MONOCHROME**

Controls the monochrome output functions.

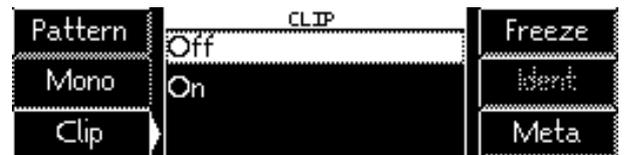


The menu allows selection of the type of monochrome function applied. It allows the user to select which of the 3 video channels are turned on at the HD5200 output. The three channels available are luminance (Y), the blue colour difference signal (Cb) and the red colour difference signal (Cr). The default setting is All which turns on all three video channels.

- All
- Y only
- CbCr only
- YCb only
- YCr only
- Cb only
- Cr only

**CLIP**

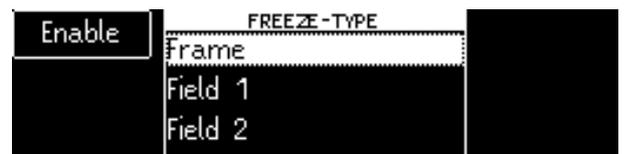
Used to turn on and off the output clipper function. When the clipper is turned on, the output digital video levels are clipped to a maximum of 940 and a minimum of 64. Both these figures are 10 bit video levels.



The Clip options are Off or On.

**FREEZE**

Used to control the HD5200 picture freeze function.



The types of freeze available are:

- Frame
- Field 1
- Field 2

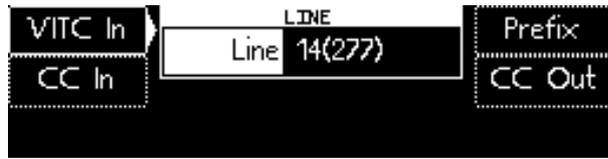
A change of freeze type does not become active until the upper left-hand button  adjacent to "Enable" is pressed.

**IDENT**

This menu item has no function at the moment.

**META**

This menu is used to set up meta-data functions.



**VITC IN**

LINE sets the line number that the input video VITC will be read from. The VITC will be read from fields one and two with field two line number being derived from the field one line number.

If the input video is 625 then the VITC can be read from lines 6 to 22.

If the input video is 525 then the VITC can be read from lines 10 to 20.



**PREFIX**

DATA ID sets the Data ID of film sequence flags embedded by a Snell and Wilcox CPP100 or CPP200 noise reducer. See the CONVERT-FILM MODE-TIMING SRC menu for further details.

**CC In**

This menu controls the processing of closed captioning information on lines 21 and 284 of incoming 525 line video signals.



**CC Present**

**None**

If None is selected, Lines 21 and 284 are treated as part of the active video signal.

**L21 Only**

If L21 Only is selected, Line 21 is considered to be a closed captioning signal. This line is not used to build the output picture and the input picture is rescaled to allow for the reduced number of input lines.

Note, in this mode, the Input-Blanking-Top setting does not affect the output picture until it is set to be greater than two.

**L21 & L284**

If L21 & L284 is selected, Lines 21 and 284 are considered to be closed captioning signals. These lines are not used to build the output picture and the input picture is rescaled to allow for the reduced number of input lines.

Note, in this mode, the Input-Blanking-Top setting does not affect the output picture until it is set to be greater than three.

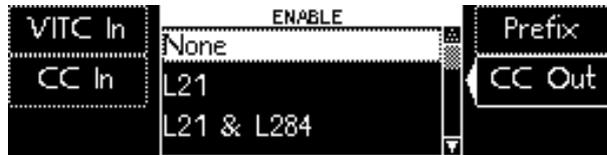
**L21 & L284 & L22**

If L21 & L284 & L22 is selected, Lines 21, 284 and 22 are considered to be closed captioning or data signals. These lines are not used to build the output picture and the input picture is rescaled to allow for the reduced number of input lines.

Note, in this mode, the Input-Blanking-Top setting does not affect the output picture until it is set to be greater than four.

## CC Out

This menu controls the insertion of closed captioning information into the output HD serial stream.



The incoming closed caption data on line 21 and line 284 is decoded by an internal closed caption reader. If a character cannot be read or, the signal is missing, NULL characters are substituted. NULL characters are also substituted if the incoming signal is lost unless, the HD5200 has been put in the force input mode under Input loss condition.

The decoded characters are delayed by an amount approximately equal to the HD5200 video processing delay before they are inserted in the output data stream.

The delayed closed captioning data is inserted into the HDSDI stream as ancillary data packets in the active line portion of the output that is two lines after the line specified for switching.

For all current HD Standards this corresponds to insertion on line 9 and 571 (where appropriate). The packet format follows that described in SMPTE 334M.

If NONE is selected, no closed caption data is inserted.

If L21 is selected, closed caption data from input line 21 is inserted.

If L21 & L284 is selected, closed caption data from input lines 21 and 284 is inserted.

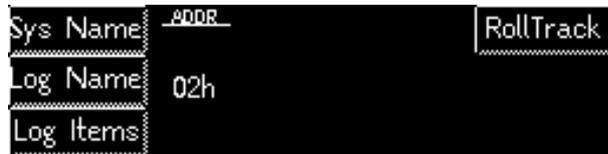
If L284 is selected, closed caption data from input line 284 is inserted.

**○ SETUP**

Provides additional machine setup items.

**ROLLCALL**

Allows the unit name and logging information to be set. The current RollCall address (in Hex) is displayed when RollCall is selected.



*Note that this address must be set using switches on the main board (see Section 3, under RollCall) and this menu can only display the address, not change it.*

**SYSTEM NAME**

Sets the RollCall unit name. The default is 'HD5200'. The character selected for editing will be highlighted.



To edit a different character press either the upper left-hand button  adjacent to '<<<' or the upper right-hand button  adjacent to '>>>'. Once the character is selected turning the front panel knob changes the character.

Pressing the middle left-hand button  adjacent to 'Insert' adds a space character to the name at the highlight position. Pressing the middle right-hand button  adjacent to 'Delete' removes a character from the name at the highlight position.

Pressing the bottom left-hand button  adjacent to 'Undo' returns the name to its value when the Sys Name menu was last entered. Pressing the bottom right-hand button  adjacent to 'Accept' makes the changes active.

**LOG NAME**

If the HD5200 is attached to a RollCall network with a logging device, information about various parameters can be made available to the logging device.



If the Log Name is blank (obtained by pressing PRESET) and the cursor is at the left (no spaces), logging information is available to all logging devices on the RollCall network. If Log Name is set to the name of a particular logging device, only that device will receive information. The log name can be edited as described in the Sys Name section above.

**LOG ITEMS**

Selecting this item reveals a display that allows information about five parameters to be made available for logging.

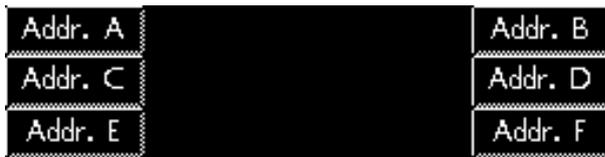


The Log Items are:

- Input Status** When activated, a loss of input signal condition will be indicated to the logging device.
- Input Standard** When activated, the current input standard will be available to the logging device.
- Reference Status** When activated, a loss of reference signal condition will be indicated to the logging device.
- Output Standard** When activated, the current output standard will be available to the logging device.
- Picture** When activated, the current state of the output picture (i.e. pattern, normal, frozen) will be available for the logging device.

Select the parameter to be changed using the front panel knob. Pressing the bottom right-hand button  adjacent to 'Select' toggles the status of the selected parameter. Enabled parameters will be marked.

ROLLTRACK



The RollTrack function allows the HD5200 to automatically control remote audio/video delay modules using the RollCall system.

As the delay through the HD5200 varies according to the up-conversion underway, 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 HD5200. Thus, it will be equal to the sum of the automatic internal delay and the user controlled manual delay setting (see audio setup section). For more detailed information, see Section 5 the RollTrack System Appendix.

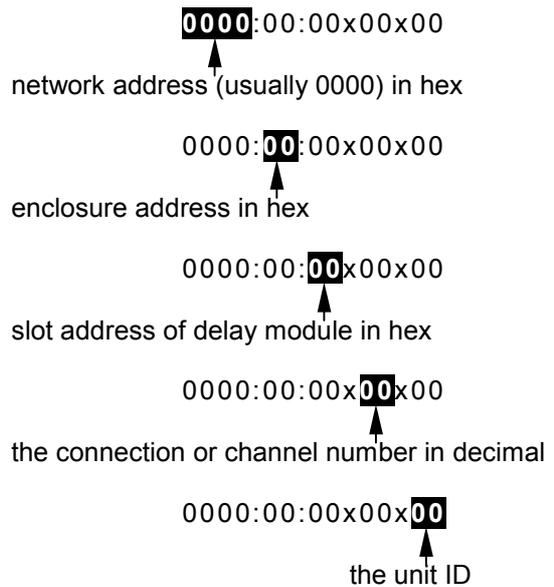
The destination for the delay information is set from the RollTrack address as follows:

Selecting RollTrack provides a sub-menu that allows up to 6 audio delays to be selected as a destination. Selecting any of the 6 Address buttons produces an address editing menu as shown below.



The way that the string editing buttons work is described already in the manual on page 4.28 under the System Name menu item.

The menu provides a string that looks like this:



A more detailed description of these items is given in the RollTrack section (Appendix) at the end of this manual.

In a typical setup, the network address will be 0000, the enclosure and slot address would match those of the destination module, and the channel number would be one of 14,15,16 or 17 and the unit ID would be left at 00.

The HD5200 RollTrack output becomes active as soon as the enclosure address is set to be non-zero and the Accept button is pressed. Note that if the Accept button is not pressed at the end of editing the string, the changes will not take effect.

INFO

Displays the version numbers of the software and hardware in the HD5200.



The items displayed are:

Board: 1Y

Master: 1.5

Slave: 11

OS: V112 Release

Option: 0 (indicates the hardware options fitted)

*The version numbers are examples only.*

GPI

Determines whether the General Purpose Interface is active or not. There are two positions, GPI disabled and GPI enabled. A change does not become active until the lower right-hand button

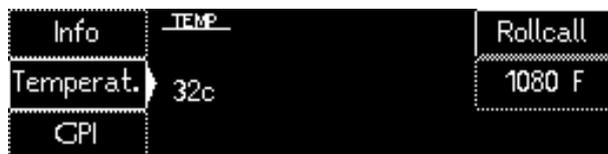
adjacent to "Select" is pressed.

*Note that this menu item is not stored in the HD5200 machine memories. This prevents the GPI from disabling itself when a GPI memory recall is undertaken.*



TEMPERATURE

Displays the current temperature of the main printed circuit board.



1080 F

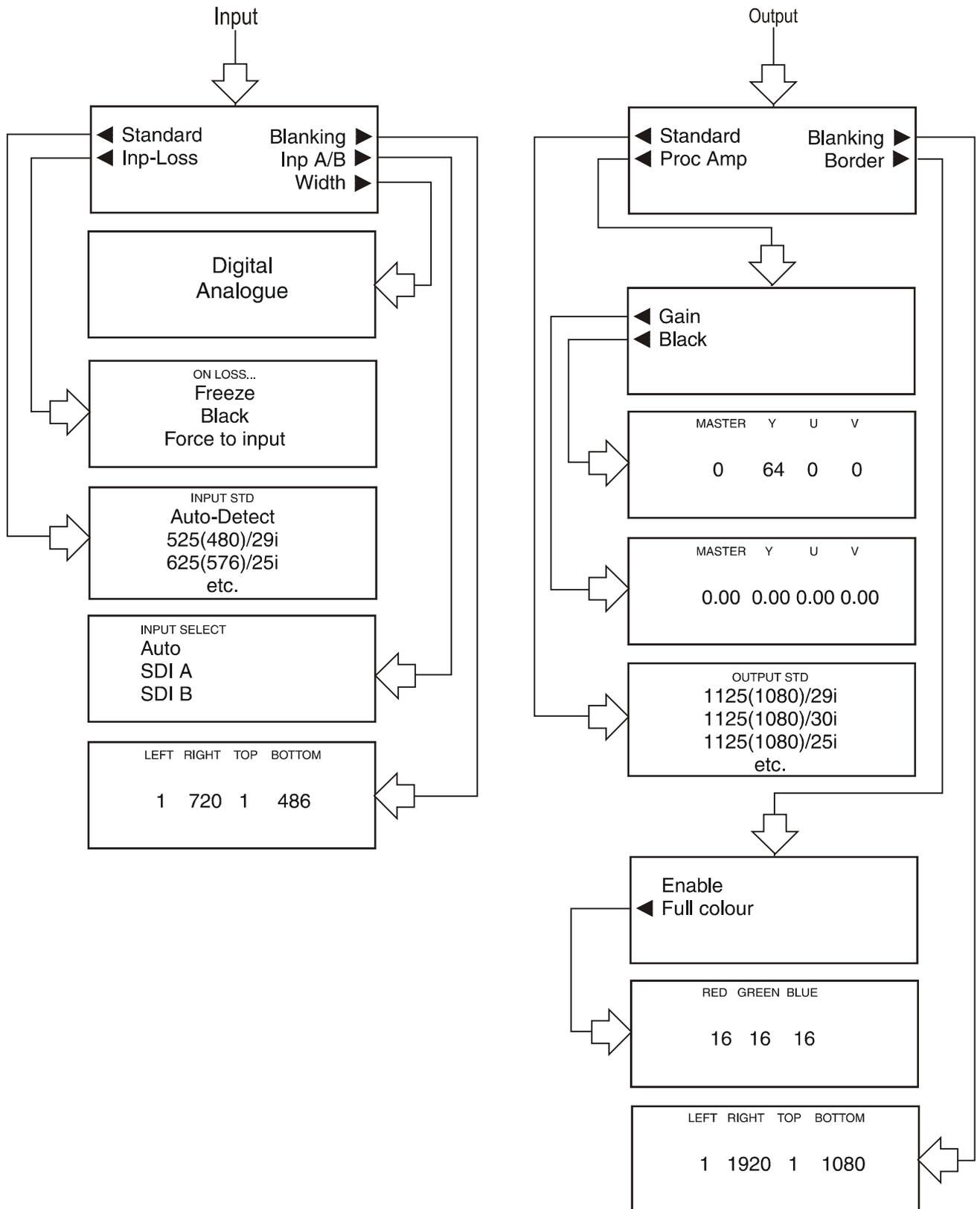
Allows a change of format of the embedded syncs in the HD serial output data stream. This is because some older HD equipment (particularly monitors) expect the embedded syncs to be different to the form specified in SMPTE-274. This is only for 1125(1080) style output formats.

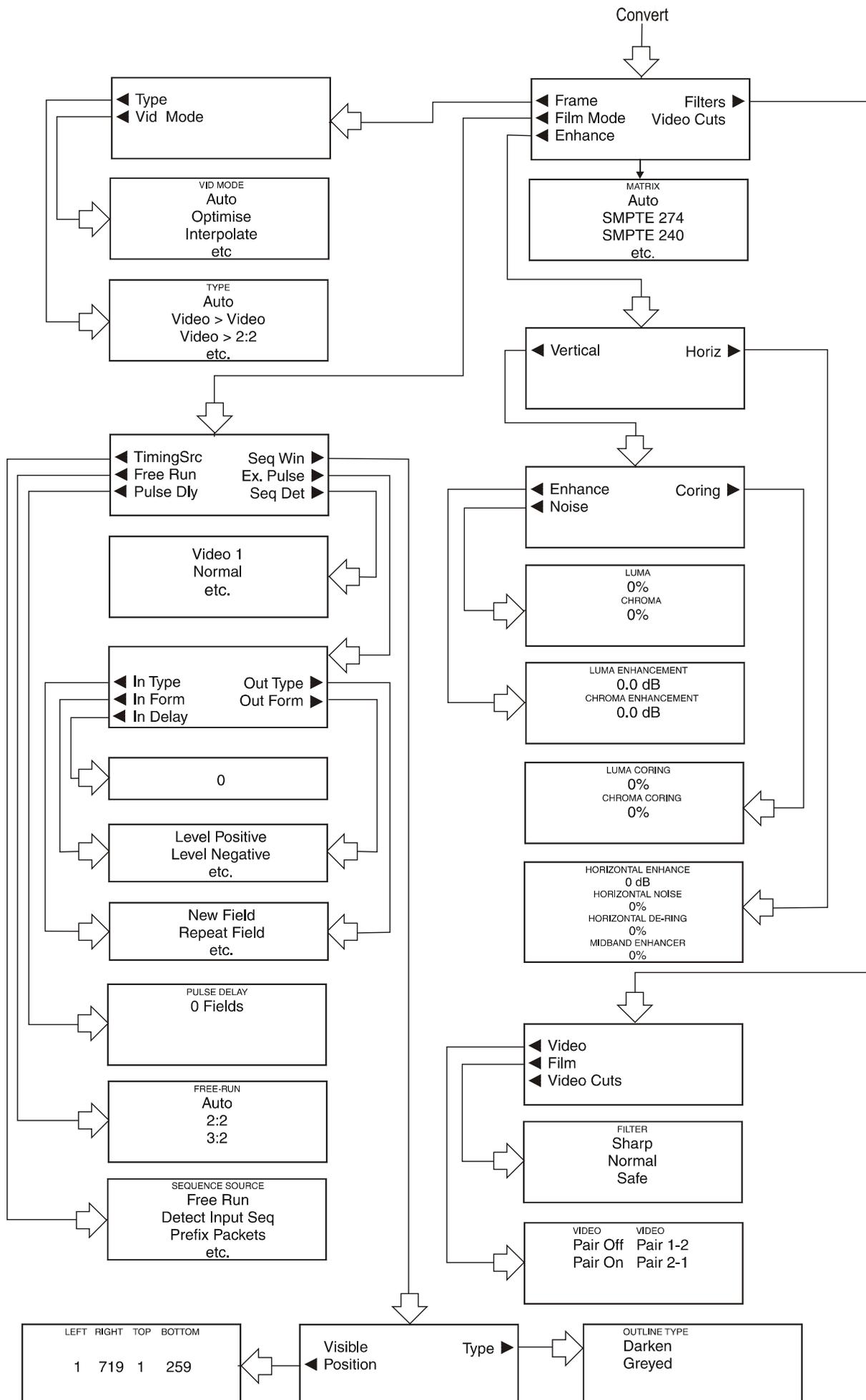


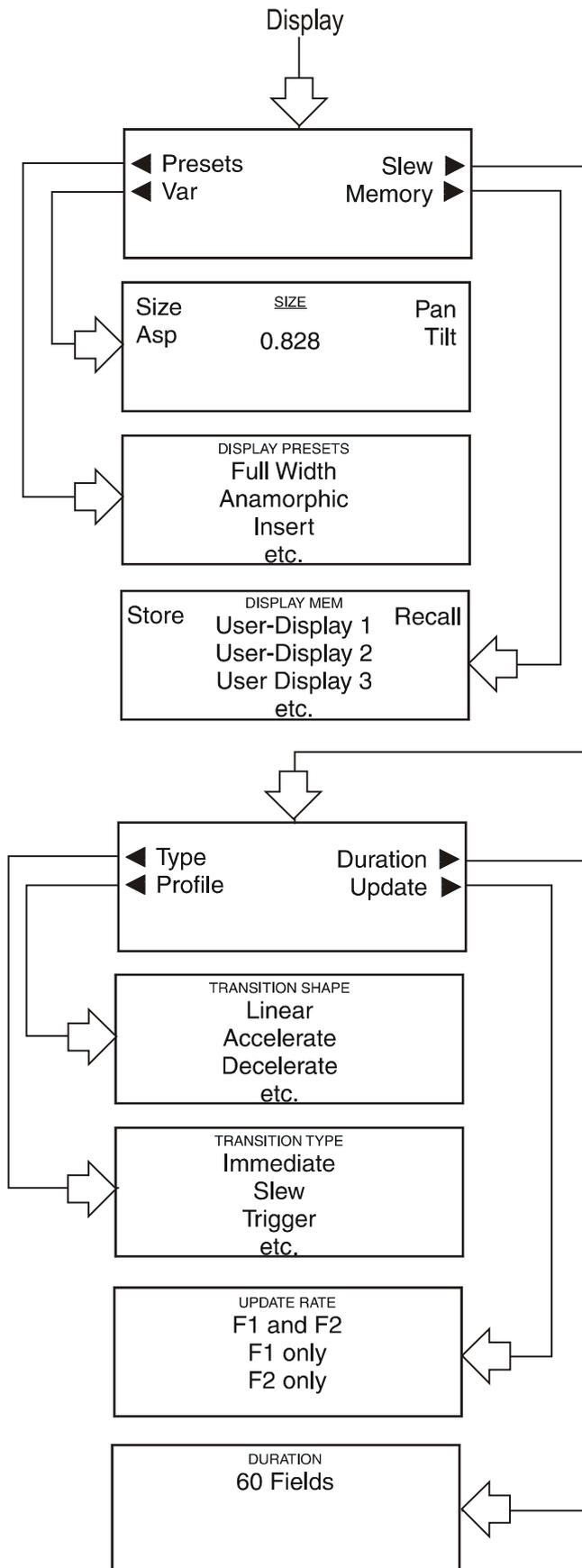
It is not recommended that this setting be changed from NORMAL unless absolutely necessary as this will cause the HD5200 to make non-standard signals.

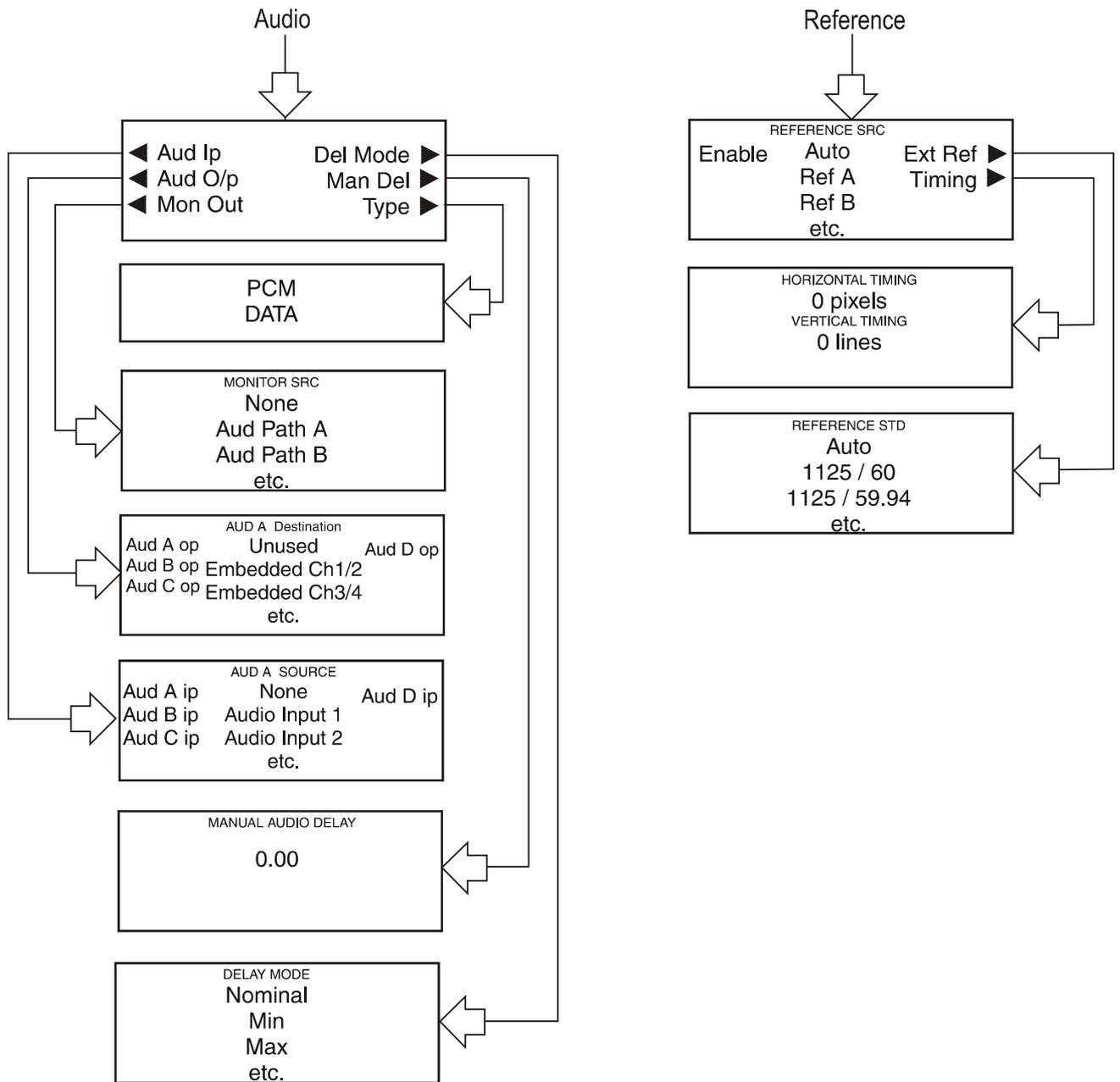
The options are Normal and Non-Std. A change does not become active until the lower right-hand button  adjacent to "Select" is pressed.

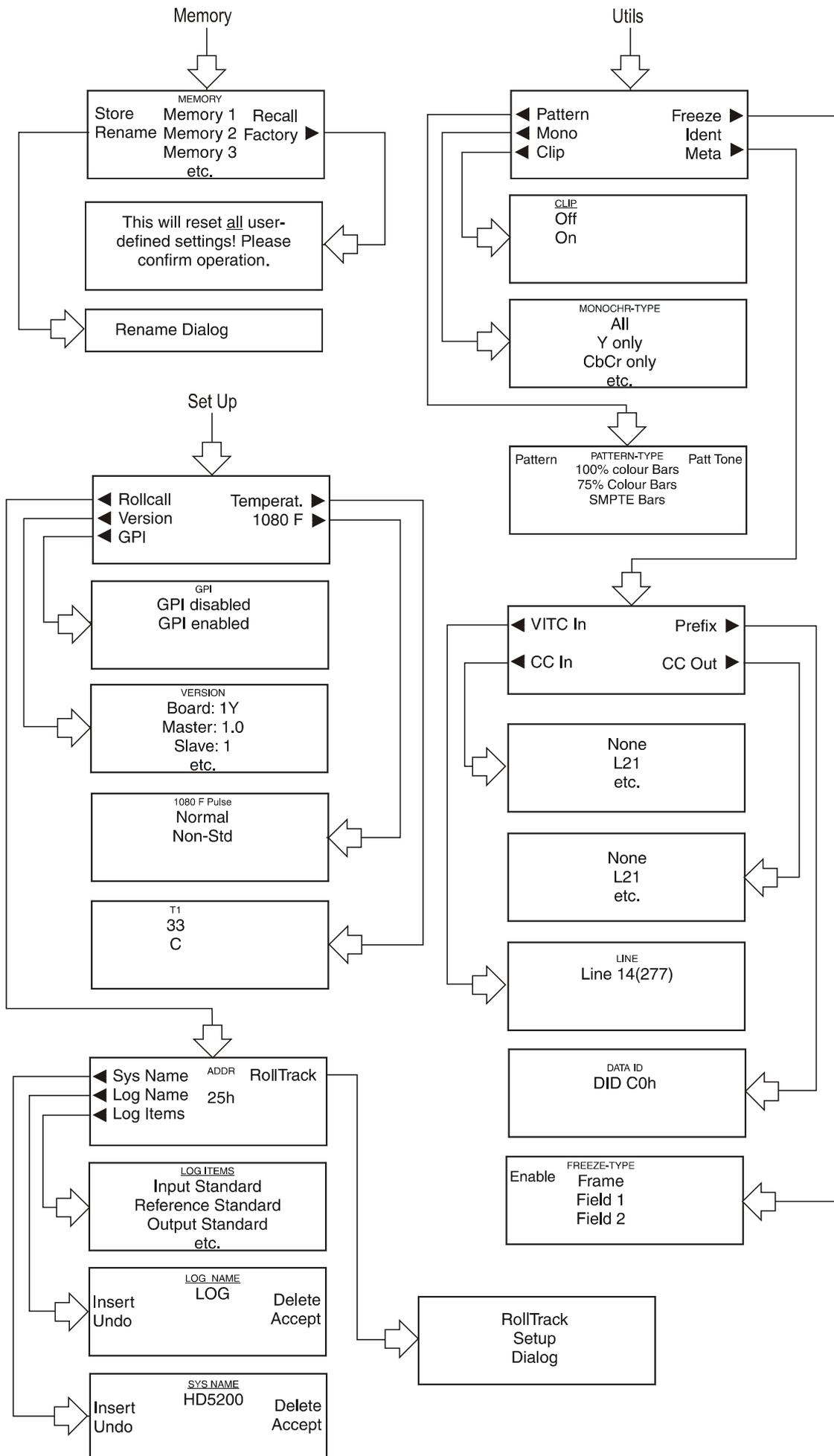
HD5200 Menu Structure











## OPERATING THE HD5200 FROM AN ACTIVE CONTROL PANEL VIA THE ROLLCALL REMOTE CONTROL SYSTEM

### **The Menu System**

(See Menu system diagram on previous pages)

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 menu and sub-menu which 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 menu 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.***

The menu items shown on the system diagram will have the same functions and ranges as those displayed on the main unit front panel.

## RollTrack Audio Delay Tracking

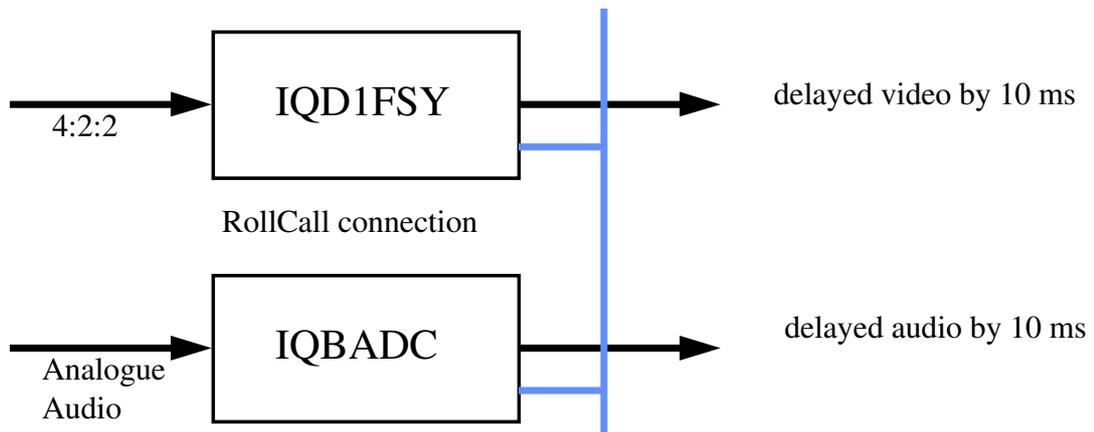
RollTrack is a feature of RollCall™ (Snell & Wilcox’s proprietary remote control system), that allows devices to communicate across the RollCall network with no direct user intervention.

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.



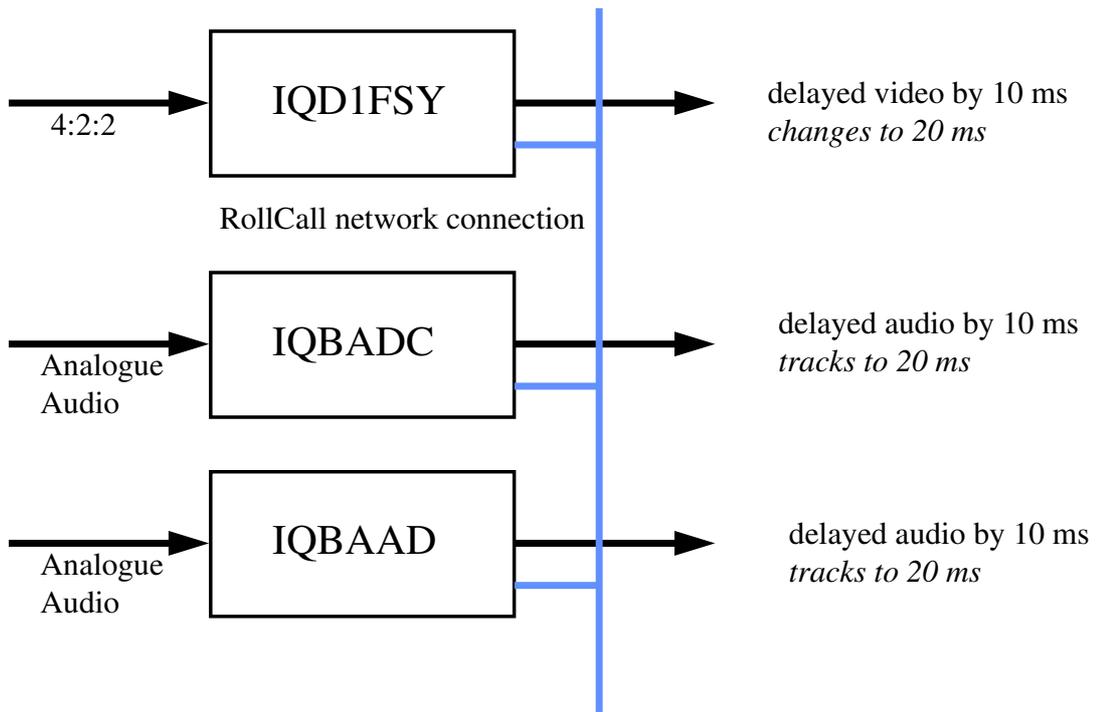
The next level of configuration is where there are multiple Frame Synchronizers (for example) each connected through RollCall™ to their own tracking Audio Delay. (It is worth stating that the synchronizers and audio delays do not have to be in the same enclosure; the addressing scheme, discussed later,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

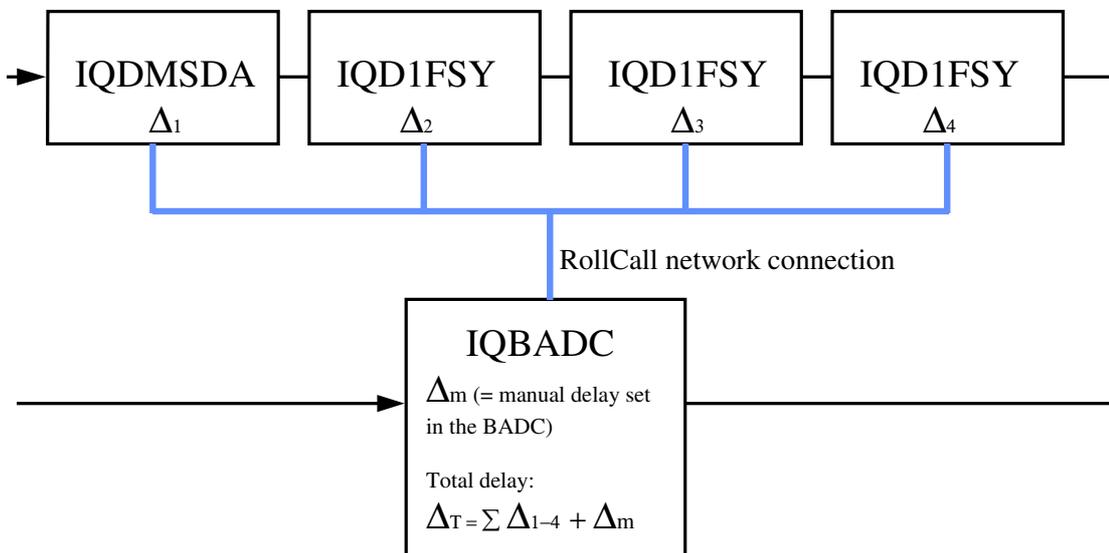
Module	ID
IQBADC	51
IQBDAC	52
IQBAAD	53
IQBDAD	54
IQBSYN	89
IQBADCD	107

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.



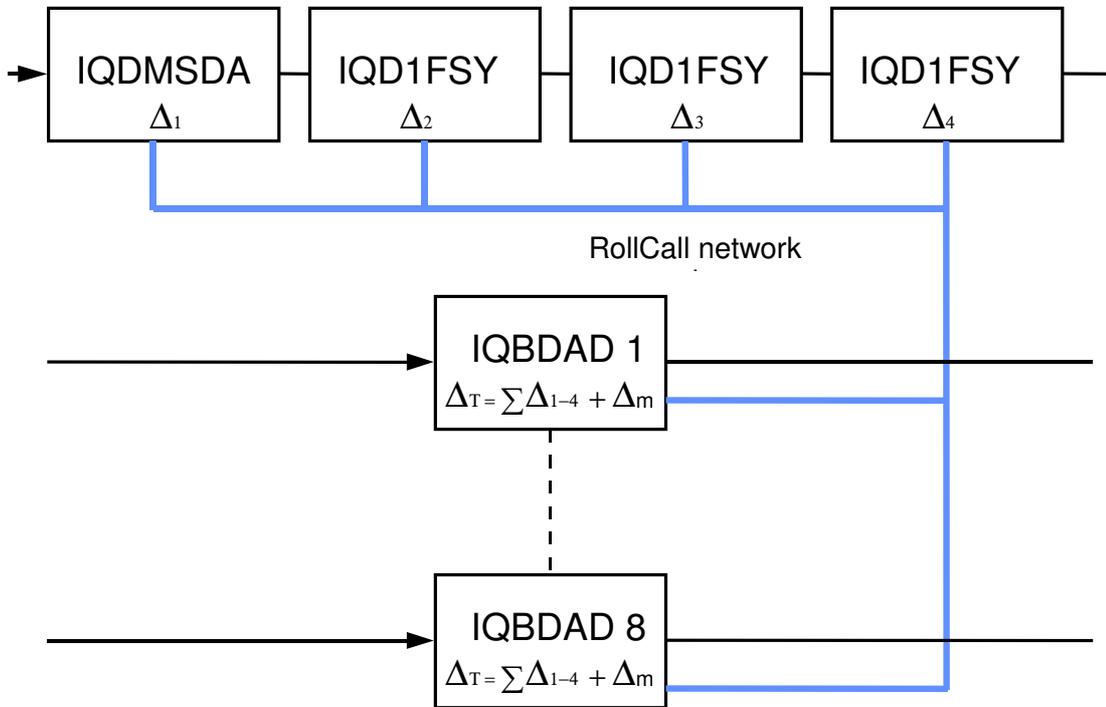
From one to eight audio delay products can be connected via RollCall™ to a single frame synchronizer, for example. If the synchronizer delay changes, then however many audio delays are connected will track the delay. The audio delays can also have a manual delay which will be added to the RollTrack delay.

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



