

# IQDMX00/02/10/12

## 4/8 Channel AES/EBU Demultiplexer with Synchronizer



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**Module Description**

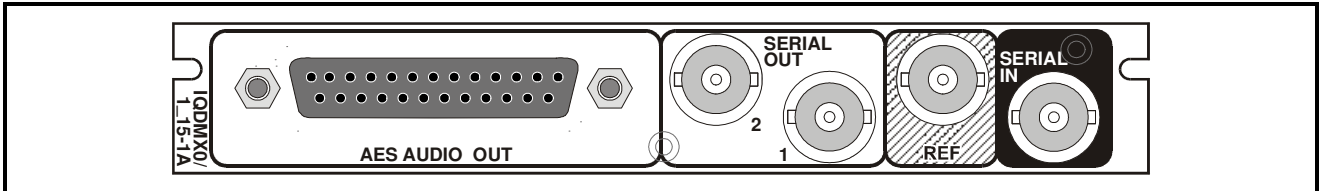
A powerful SDI video synchronizer with 2/4 x AES/EBU stream demultiplexer and advanced embedded audio handling. All audio manipulation is at the channel-level suiting discreet surround and multi-lingual use. In addition to its tracking audio delay, it also has a bulk audio delay feature. To complete the delay flexibility, it has a built-in video delay that can be used to adjust to match external audio processing such as that from a Dolby E encoder. Its firewall capability ensures continuous audio and video output even when the

input signal fails. A dual SDI input allows this synchronizer to take signals from either of two paths thus allowing split operation, with video taken from one input and embedded audio from the other.

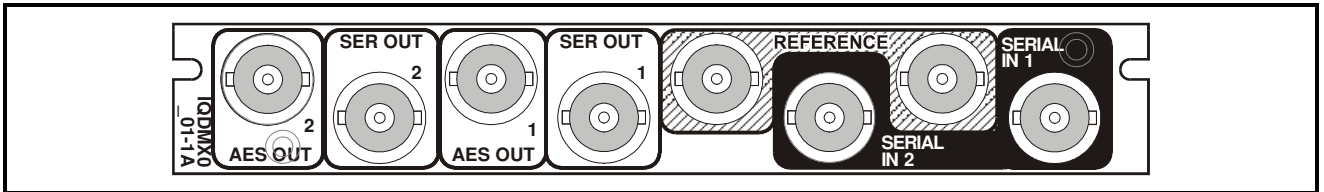
The IQDMX00 can also find use as an embedded audio processor. Its ability to re-multiplex the audio internally after channel manipulation and processing means that it can be used in this role with the AES outputs used for monitoring feeds.

**Rear Panel Views**

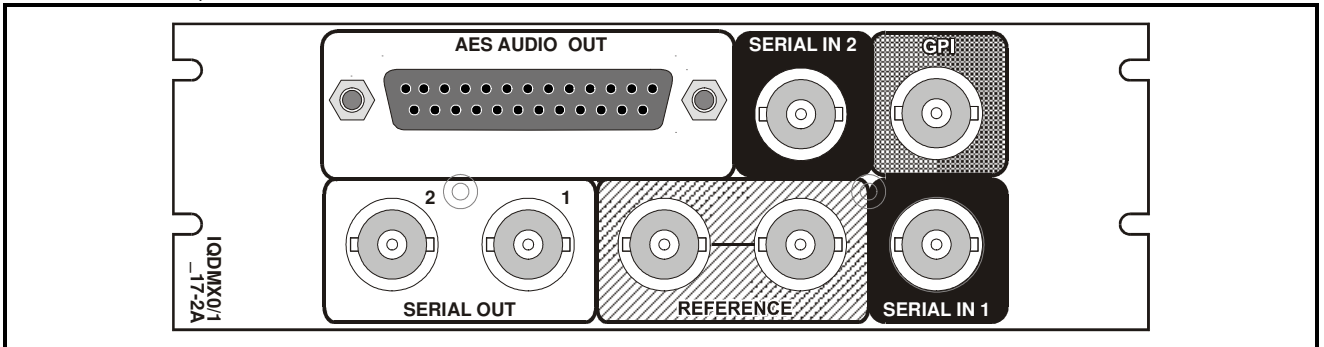
IQDMX0215-1A, IQDMX1215-1A



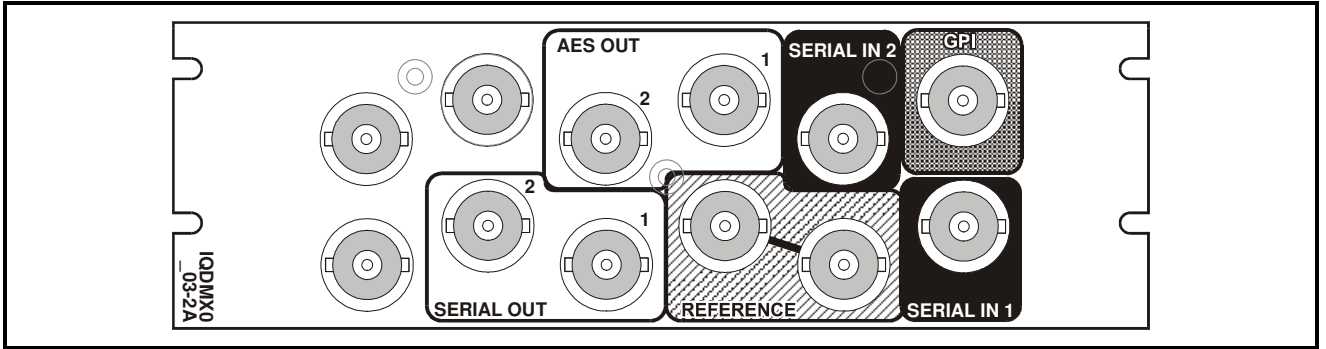
IQDMX0001-1A



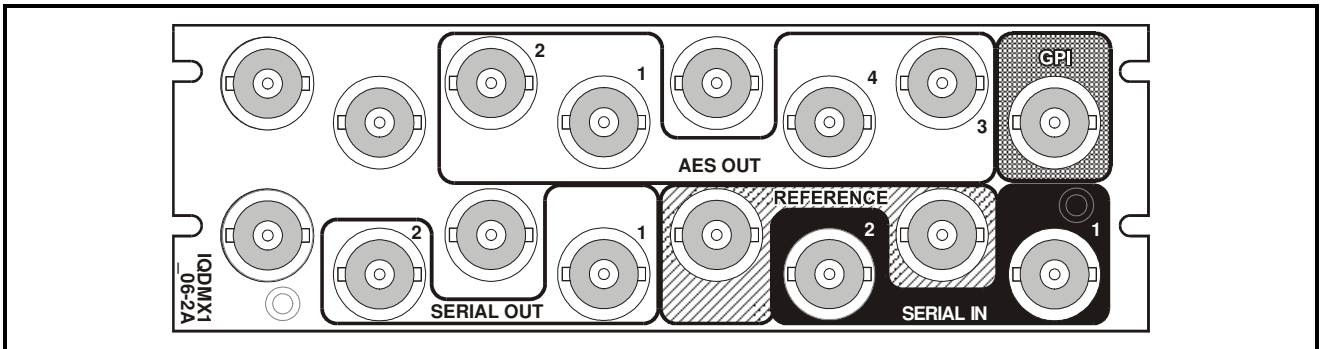
IQDMX0217-2A, IQDMX1217-2A



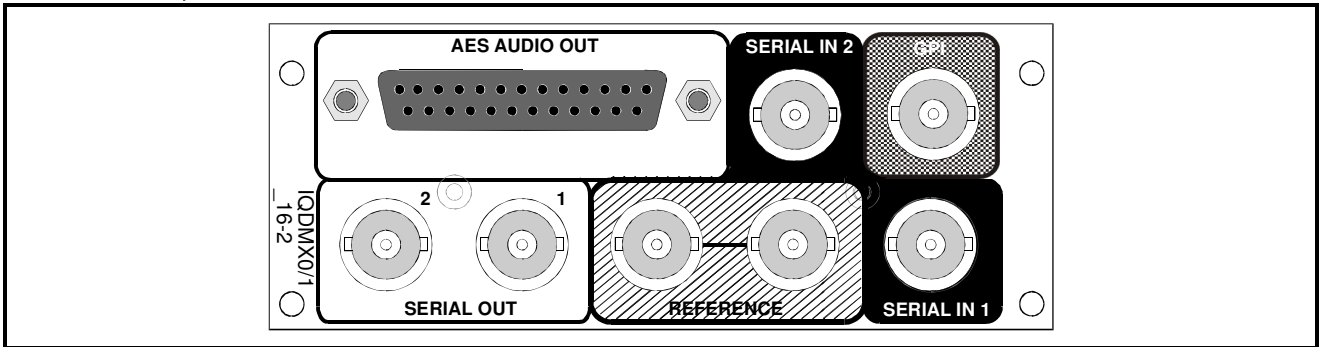
IQDMX0003-2A, IQDMX1006-2A



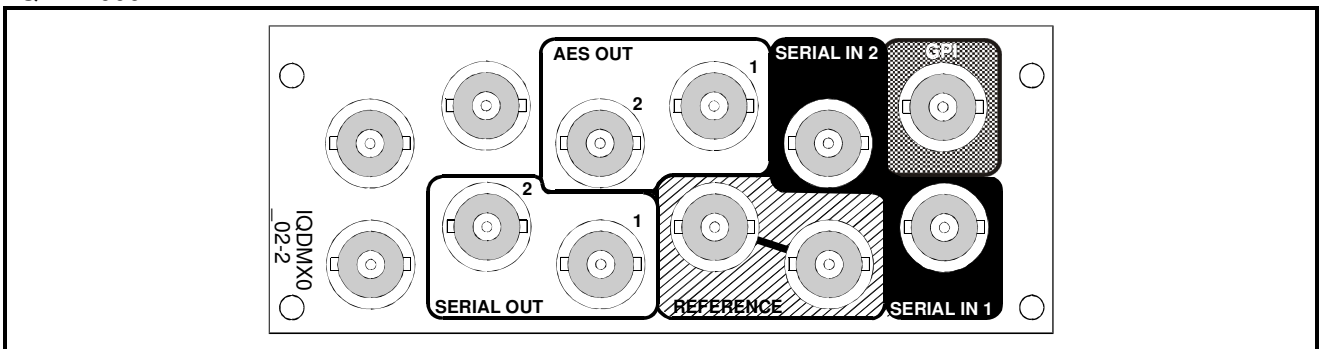
IQDMX1006-2A



IQDMX0216-2, IQDMX1216-2



IQDMX0002-2



Versions of the module cards available are:

**Order codes for IQH3A enclosures**

IQDMX0215-1A SDI and 4 channel AES demultiplexer synchronizer with extended video delay. Balanced AES connection. 1 SDI input, 2 AES outputs, 2 SDI outputs, analog reference

IQDMX1215-1A SDI and 8 channel AES demultiplexer synchronizer with extended video delay. Balanced AES connection. 1 SDI input, 4 AES outputs, 2 SDI outputs, analog reference

IQDMX0001-1A SDI and 4 channel AES de-embedder synchronizer with extended video delay. Unbalanced AES connection. 2 SDI inputs, 2 AES outputs, 2 SDI outputs, analog reference loop-through

IQDMX0217-2A SDI and 4 channel AES demultiplexer synchronizer with extended video delay. Balanced AES connection. 2 SDI inputs, 2 AES outputs, 2 SDI outputs, analog reference loop-through, 1 GPI

IQDMX1217-2A SDI and 8 channel AES demultiplexer synchronizer with extended video delay. Balanced AES connection. 2 SDI inputs, 4 AES outputs, 2 SDI outputs, analog reference loop-through, 1 GPI

IQDMX0003-2A SDI and 4 channel AES demultiplexer synchronizer with extended video delay. Unbalanced AES connection. 2 SDI inputs, 2 AES outputs, 2 SDI outputs, analog reference loop-through, 1 GPI

IQDMX1006-2A SDI and 8 channel AES demultiplexer synchronizer with extended video delay. Unbalanced AES connection. 2 SDI inputs, 4 AES outputs, 2 SDI outputs, analog reference loop-through, 1 GPI

**Order codes for other enclosures**

IQDMX0216-2 SDI and 4 channel AES demultiplexer synchronizer with extended video delay. Balanced AES connection. 2 SDI inputs, 2 AES outputs, 2 SDI outputs, analog reference loop-through, 1 GPI

IQDMX1216-2 SDI and 8 channel AES demultiplexer synchronizer with extended video delay. Balanced AES connection. 2 SDI inputs, 4 AES outputs, 2 SDI outputs, analog reference loop-through, 1 GPI

IQDMX0002-2 SDI and 4 channel AES demultiplexer synchronizer with extended video delay. Unbalanced AES connection. 2 SDI inputs, 2 AES outputs, 2 SDI outputs, analog reference loop-through, 1 GPI

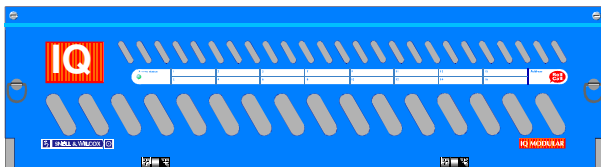
**Product Comparison**

| Product      | SDI Inputs | AES Outputs |      | SDI Outputs | GPI | Genlock      | Width & Style |
|--------------|------------|-------------|------|-------------|-----|--------------|---------------|
|              |            | Number      | Type |             |     |              |               |
| IQDMX0001-1A | 2          | 2           | U/B  | 2           |     | Loop-through | Single A      |
| IQDMX0215-1A | 1          | 2           | BAL  | 2           |     | Single       | Single A      |
| IQDMX1215-1A | 1          | 4           | BAL  | 2           |     | Single       | Single A      |
| IQDMX0003-2A | 2          | 2           | U/B  | 2           | 1   | Loop-through | Double A      |
| IQDMX1006-2A | 2          | 4           | U/B  | 2           | 1   | Loop-through | Double A      |
| IQDMX0217-2A | 2          | 2           | BAL  | 2           | 1   | Loop-through | Double A      |
| IQDMX1217-2A | 2          | 4           | BAL  | 2           | 1   | Loop-through | Double A      |
| IQDMX0002-2  | 2          | 2           | U/B  | 2           | 1   | Loop-through | Double O      |
| IQDMX0216-2  | 2          | 2           | BAL  | 2           | 1   | Loop-through | Double O      |
| IQDMX1216-2  | 2          | 4           | BAL  | 2           | 1   | Loop-through | Double O      |

**Note that there are two styles of rear panels available. They are not interchangeable between the two styles of enclosures. However, the cards may be fitted into any style of enclosure.**

**‘A’ Style Enclosure**

Rear panels **with** the suffix A may only be fitted into the ‘A’ style enclosure shown below.



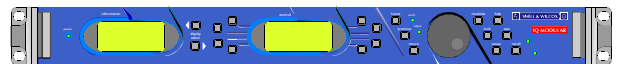
(Enclosure order codes IQH3A-E-0, IQH3A-E-P, IQH3A-0-0, IQH3A-0-P)



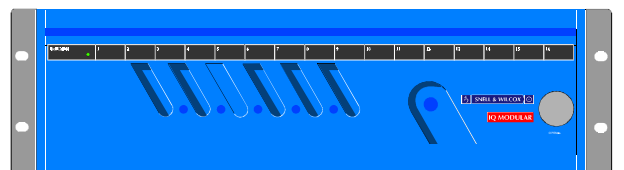
(Enclosure order codes IQH3A-S-0, IQH3A-S-P)

**‘O’ Style Enclosures**

Rear panels **without** the suffix A may only be fitted into the ‘O’ style enclosures shown below.



(Enclosure order codes IQH1S-RC-0, IQH1S-RC-AP, IQH1U-RC-0, IQH1U-RC-AP, Kudos Plus Products)

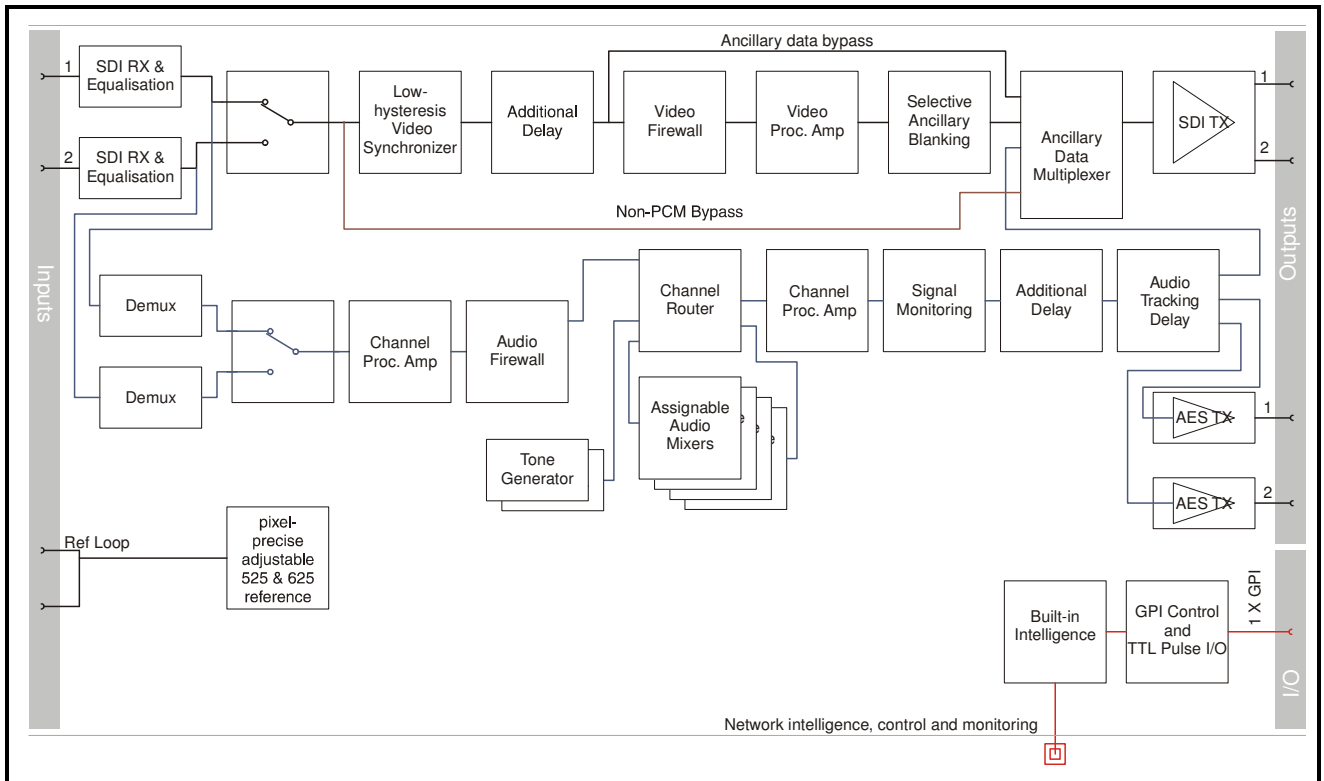


(Enclosure order codes IQH3N-0, IQH3N-P)



(Enclosure order codes IQH3U-RC-0, IQH3U-RC-P)

## Block Diagram



## Features

- SDI synchronizer and 4/8 channel AES demultiplexer
- Can demultiplex AES/EBU, AC3 and Dolby E digital audio data
- Handles up to 24 bit embedded audio present on the incoming SDI stream, and de-embeds/embeds to 20 bits
- Flexible audio delay including common fixed delay and tracking delay
- A further audio delay of up to 0.5s which seamlessly tracks the video delay or external RollTrack / GPI inputs
- Firewall for video and processed PCM audio to provide a continuous output
- Transparent to Dolby E / non-PCM audio
- Eight channel audio processor with channel level manipulation
- Channel level (Sub-frame) routing
- 4 off 4 channel audio mixers
- Video proc-amp (gain, saturation, black level)
- Video test pattern generator, 2 channel audio tone generator
- Up to 3 frames of video delay in delay mode
- RollCall control and monitoring compatible

**For more information about Firewall behavior please consult the appendix at the end of this manual.**

**Resolution of Audio Processing**

| Input Audio Format      | Output Audio Format |                   |                           |
|-------------------------|---------------------|-------------------|---------------------------|
|                         | AES                 | SDI embedded      | SDI embedded Pass-through |
| SDI embedded non-PCM 20 | 20-bit              | 20-bit            | 20-bit                    |
| SDI embedded non-PCM 24 | Not supported (1)   | Not supported (1) | 24-bit                    |
| SDI embedded PCM 20     | 20-bit              | 20-bit            | 20-bit                    |
| SDI embedded PCM 24     | 20-bit (2)          | 20-bit (2)        | 24-bit                    |

## Notes:

1. Processing input formats that are *not supported* may produce corrupted output signals.
2. For some signals the output resolution may be less than the input resolution.

## Technical Profile

### Signal Inputs

Digital Video .....2 x SDI (BNC)  
 Video Reference.....Composite video (BNC)  
 Standards.....SMPTE 259M-C-1997, SMPTE  
 272M-A-1994

### Signal Outputs

Digital Video .....SDI x 2

### Card Edge Controls

NONE

### Card Edge Indicators

SDI Input Loss.....Loss = Off, Good = Green  
 SDI Input Error.....Yellow = Unused input not at  
 current operating standard  
 Reference Loss  
 CPU running / Power.....One green LED, flashing = OK

### RollCall Functions

#### Audio Controls

Audio extraction select.....SDI input 1/2/Follow Video Control  
 Set headroom.....4 to 24 dB in 1 dB steps  
 Set audio detector thresholds  
     High and low levels, time delay  
 Input side control proc. - audio gain and polarity  
     Independent Gain, Mute, Polarity  
     control over de-embedded audio.  
     +18 dB to -18 dB in 0.1 dB steps.  
 Channel routing .....Output channels routed from test  
     tone, silence or SDI 8 embedded  
     channels from any group  
 Output side control proc. - gain and polarity  
     Independent Gain, Mute, & Polarity  
     control over embedded and AES  
     output channels. +18 dB to -18 dB  
     in 0.1 dB steps.  
 Lock.....Control to select the clock source  
     from the output side of the  
     synchronizer – Video, Input 1,  
     internal  
 Global delay offset.....up to +1.5 s in 1 ms steps, common  
     to all processed audio.  
 Variable audio delay control source  
     Up to 0.5 s from RollTrack + GPI +  
     video synchronizer  
 Tone frequency, amplitude & Ident  
     2-channel tone generator. 100 Hz  
     to 10 kHz in 100 Hz steps.

Unbalanced digital audio.... 2/4 x AES/EBU (BNC)  
 Balanced digital audio ..... 2/4 x AES/EBU (25Way D-Type)  
 Standards ..... SMPTE 259M-C-1997, SMPTE  
 272M-A-1994, AES3-1992

### Control Interface

GPI ..... 1x Closing contact I/O interface  
 (BNC)

#### Tone Setup:

Frequency..... 100 Hz to 10 kHz in 100 Hz steps  
 Channel Ident ..... 0.5 s interruption every 2 s

### Video Controls

Select primary input ..... 1/2  
 Black Level .....  $\pm 100$  mV in 0.8 mV steps  
 Y/C Timing .....  $\pm 592$  ns in 148 ns steps  
 Picture position .....  $\pm 592$  ns in 148 ns steps  
 Luminance Gain.....  $\pm 6$  dB  
 Chrominance Gain.....  $\pm 6$  dB  
 Genlock Mode ..... Free-run / Genlock / Primary SDI  
 (delay mode)  
 Genlock H Phase.....  $\pm 32$   $\mu$ s in 74 ns steps  
 Genlock V Phase.....  $\pm 262/312$  lines in 1 line steps  
 Video Horizontal Delay ..... +1 Line in 37 ns steps  
 Video Vertical Delay..... +1 Frame in 1 line steps  
 Video Delay Frames ..... 0 to +2 frames

### Other Controls

Pass vertical data ..... On/Off (lines selectable 7/11 to  
 23/21 & 320/274 to 335/283)  
 Preset Unit..... Returns all settings to default  
 Pattern Select ..... 100%/75% Bars, Multiburst, Black,  
 Animated Bars  
 User Memories ..... Name, clear, save and read 8 user  
 memories  
 Default Video Output..... pattern / freeze/ run through  
 Default Audio Output..... Silence  
 Caption Output ..... On/Off (default and pattern output  
 only)  
 Caption Generator ..... Programmable up to 19 characters  
 GPI/O set-up..... May be attached to any memory  
 function/polarity

### Reporting (\* also Logged)

EDH (for selected input)..... \*Presence, \*Error-Time, \*Error-  
 Seconds



No SDI .....\*No input present  
 No reference.....\*No reference present  
 Reference error .....Standard different to selected input  
 Input ancillary error.....ANC error, ANC error-seconds  
 Input error.....Unused input not at current  
   operating standard  
 Report Embedded Audio Data  
   Report audio data pairs on input  
   and output SDI  
 Audio Silence, High Level, Low Level, Overflow  
   For processed audio channels only

**RollTrack Input**

Delay .....Audio delay – Fixed, RollTrack +  
  fixed, Internal Sync + Fixed

**RollTrack Output**

Delay .....Current video/audio delay  
 Input state.....Selected Input: Input Present, Input  
   Missing, Standard 525, Standard  
   625  
   Input 1: Input Present, Input  
   Missing, Standard 525, Standard  
   625  
   Input 2: Input Present, Input  
   Missing, Standard 525, Standard  
   625  
   GPI 1 Low, High, Inactive  
 Reference state .....Ref Lost, Ref Present, Ref error  
   [error: different standard to input –  
   input has precedence  
 Embedded Audio state .....De-embed 1-8 Lost/Present

**Specifications**

Video Internal Processing...4:2:2 with 10 bit data paths  
 Serial Input Return Loss .....Better than 15 dB to 270 MHz  
 Maximum Input Cable length  
   > 200 m (PSF1/2 or equiv. cable)  
 Serial Output Level .....800 mV ±5%  
 Output Overshoot .....< 70 mV  
 Output Return Loss.....Better than 15 dB to 270 MHz  
 Output Jitter.....< 0.2 UI (with 10 Hz High pass filter  
   selected on 601 monitor)  
 Reference Return Loss.....Better than -35 dB to 5.8 MHz  
 Reference Input Level.....1 V p-p ± 3 dB  
 Minimum Delay .....6 µs  
 Synchronize Hysteresis Window  
   0.5 - 1 µs

Delay (Synchronize Mode). Sync delay + 0, 1 or 2 Frames  
 Delay ..... 6 µs - 3 Frames + 5.5 µs  
 THD+N ..... < -117 dB @ 700 Hz (24 bits) AES  
   to AES

**Digital Audio Output (Balanced)**

Connector/Format..... 25 W D  
 Level..... 3 V p-p typical into 110 Ohms

**Digital Audio Output (Unbalanced)**

Connector/Format..... BNC  
 Level..... 1 V p-p typical into 75 Ohms

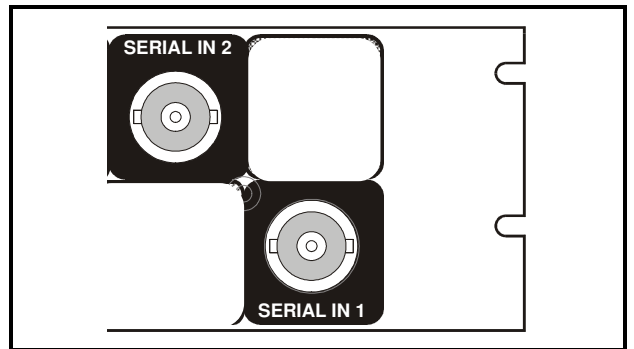
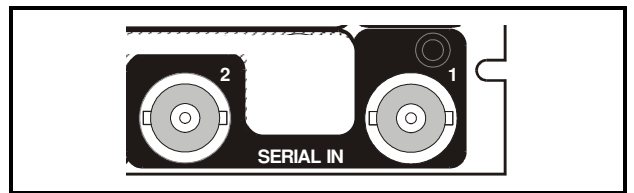
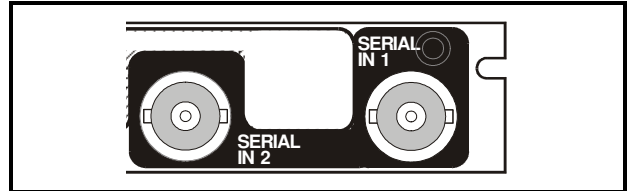
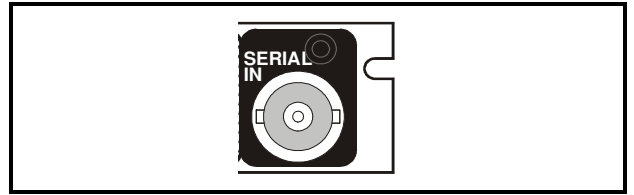
**Power Consumption**

Module Power Consumption  
   7.5 W max

INPUT CONNECTIONS

**Serial Digital Video Inputs**

Serial digital inputs are made to the unit via BNC connectors which terminate in 75 Ohms.

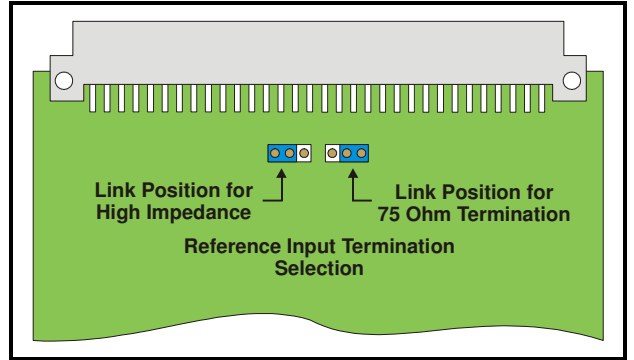
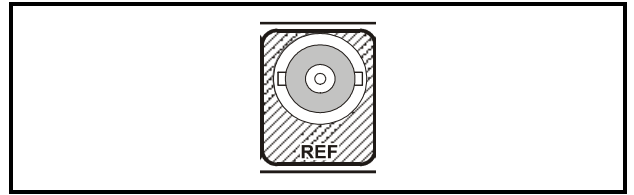


**Analog Reference Input (single input)**

The external sync input to the unit is made via a single BNC connector for 75 Ohms.

The external sync signal must be the same line standard as the D1 input.

*Note that if the reference signal needs to be terminated by this module the link should be set to the 75 Ohm terminated position.*

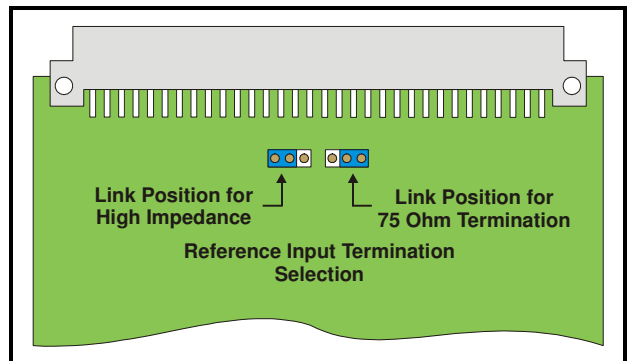
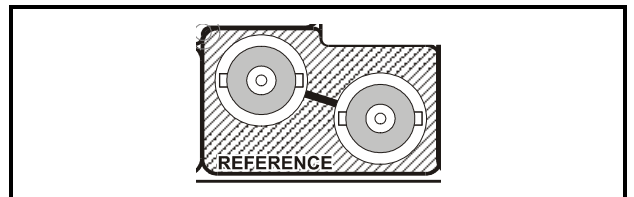
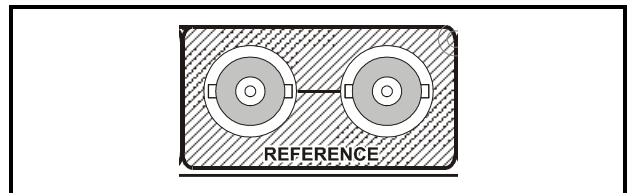
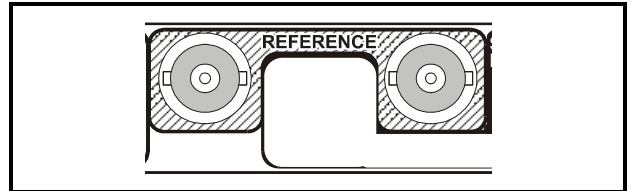


**Analog Reference Input (loop through)**

The external sync input to the unit is made via passive loop-through BNC connectors for 75 Ohms.

The external sync signal must be the same line standard as the D1 input.

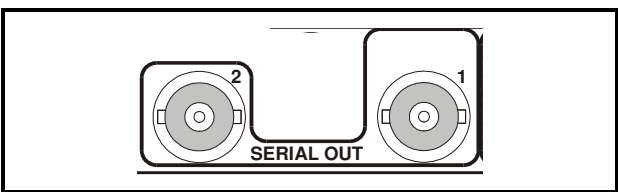
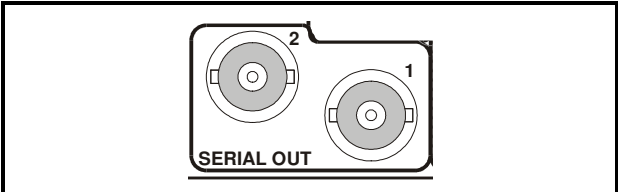
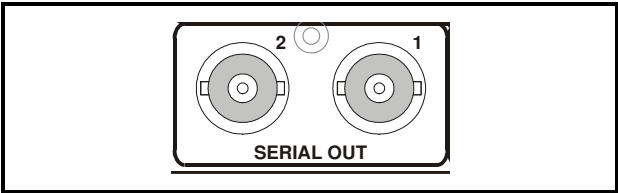
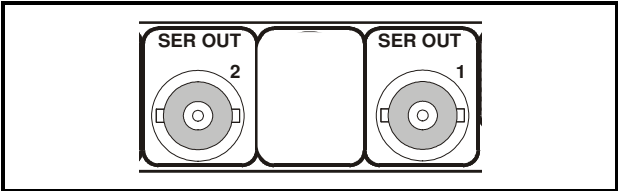
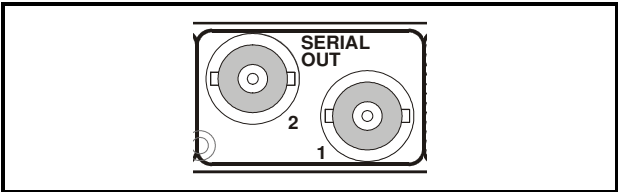
*Note that if the loop-through facility is not used the unused BNC socket must be fitted with a 75 Ohm terminator or the Reference Input Termination link on the card set to the 75 ohm terminated position.*



OUTPUTS

**Serial Digital Video Outputs**

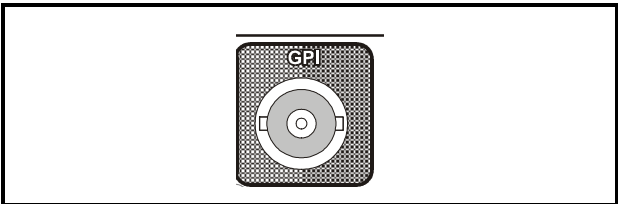
These are the Serial Digital outputs of the unit via BNC connectors for 75 Ohms.



**GPI I/O (not available on -1A versions)**

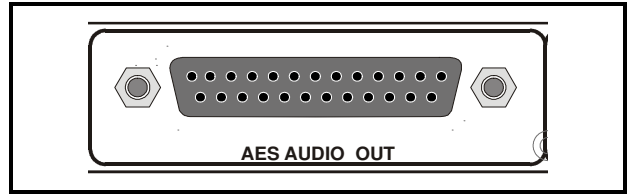
This connector is used for accepting GPI information (from mechanical switch contacts, relay contacts etc.) The resulting action that the unit takes may be programmed via RollCall.

It may also be configured as an output.

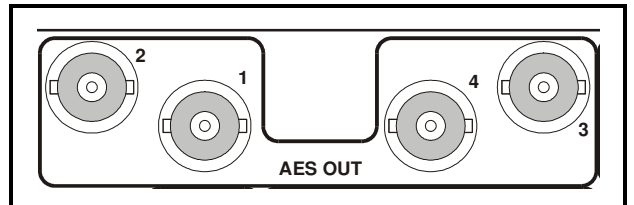
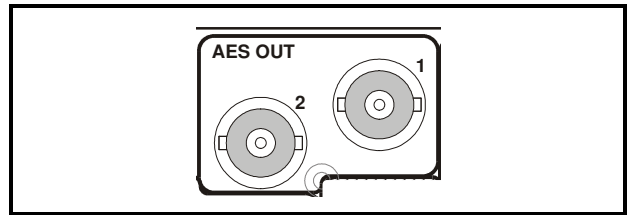
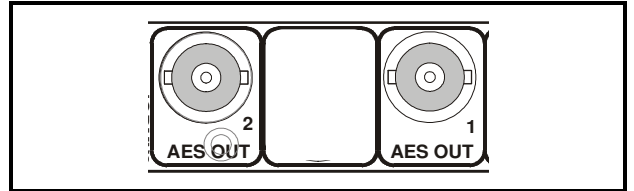


**AES Outputs**

All balanced AES outputs are available via a 25 way D type connector.



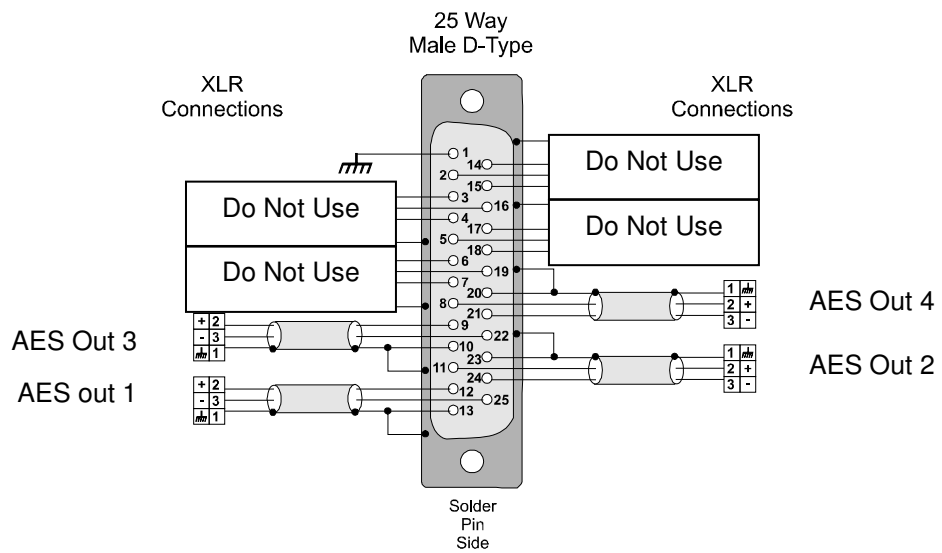
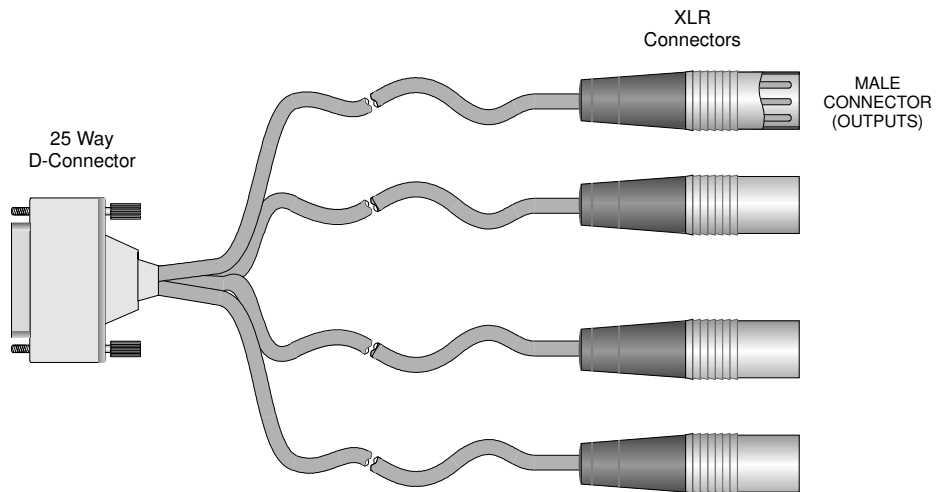
All unbalanced AES outputs are available via BNC connectors for 75 Ohms.



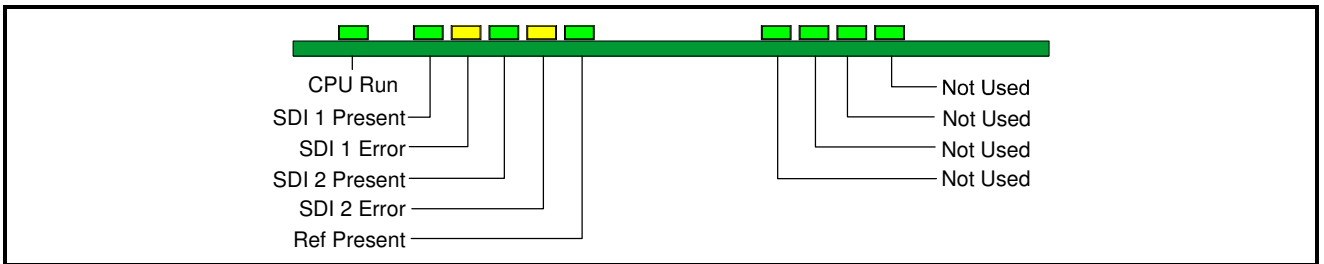
## 25 Way D Type Connection Details

| 25 Way D Connector Pin Number | AES Outputs      | Standard Pin Assignment |
|-------------------------------|------------------|-------------------------|
| 1                             |                  | CHASSIS                 |
| 14                            |                  | GND1                    |
| 2                             |                  | 1+                      |
| 15                            |                  | 1-                      |
| 3                             |                  | 2+                      |
| 16                            |                  | 2-                      |
| 4                             |                  | GND2                    |
| 17                            |                  | GND3                    |
| 5                             |                  | 3+                      |
| 18                            |                  | 3-                      |
| 6                             |                  | 4+                      |
| 19                            |                  | 4-                      |
| 7                             |                  | GND4                    |
| 20                            | AES OUT 4 Ground | GND5                    |
| 8                             | AES OUT 4 +      | 5+                      |
| 21                            | AES OUT 4 -      | 5-                      |
| 9                             | AES OUT 3 +      | 6+                      |
| 22                            | AES OUT 3 -      | 6-                      |
| 10                            | AES OUT 3 Ground | GND6                    |
| 23                            | AES OUT 2 Ground | GND7                    |
| 11                            | AES OUT 2 +      | 7+                      |
| 24                            | AES OUT 2 -      | 7-                      |
| 12                            | AES OUT 1 +      | 8+                      |
| 25                            | AES OUT 1 -      | 8-                      |
| 13                            | AES OUT 1 Ground | GND8                    |

Example of Connection Details to XLR Connectors



CARD EDGE INDICATORS



*Note that only the LED's associated with the particular version of the product will be active.*

**CPU Run (Green)**

This LED will flash to indicate that the CPU is running.

**SDI 1 Present (Green)**

When illuminated this indicates that there is a valid signal at SDI 1 input.

**SDI 1 Error (Yellow)**

When illuminated this indicates that SDI 1 input is not at the current operating standard.

**SDI 2 Present (Green)**

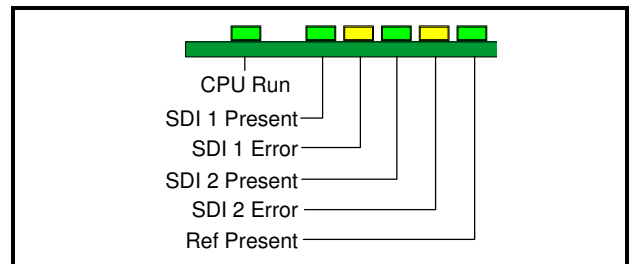
When illuminated this indicates that there is a valid signal at SDI 2 input.

**SDI 2 Error (Yellow)**

When illuminated this indicates that SDI 2 input is not at the current operating standard.

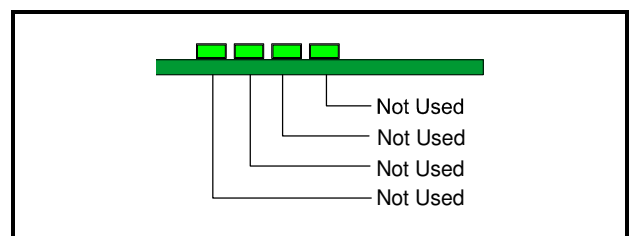
**Ref Present (Green)**

When illuminated this will indicate that a valid reference signal is present.



**Green x 4**

These LED's have no function on this unit.





## RollCall PC Control Panel Screens for the IQDMX00

### Video

#### Input Select

This allows either **Input 1** or **Input 2** to be selected for processing.

*Note that as the IQDMX0215-1A and IQDMX1215-1A versions have only one input, Input 1 SDI should always be selected. If Input 2 SDI is selected the unit will report an input loss..*

#### Input Standard

This allows **input standard** to be selected.

If only 625 is selected the unit will be forced to only accept 625 line inputs.

If only 525 is selected the unit will be forced to only accept 525 line inputs.

If 625 and 525 are selected the unit will accept both 625 and 525 line inputs.

#### DeEmbed Select

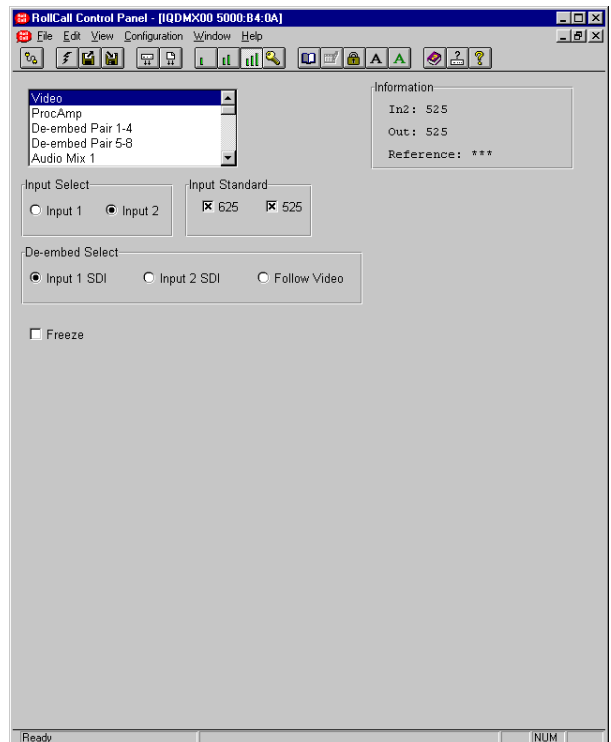
Either **Input 1 SDI** or **Input 2 SDI** may be selected for DeEmbedding. If **Follow Video** is checked the signal selected via the **Input Select** item will be DeEmbedded.

Non-PCM groups can be transparently passed but if a non-PCM group is selected for mixing or routing it will be automatically muted.

*If a Dolby header is detected in the data stream it will be processed as a non-PCM signal.*

#### Freeze

When checked the output picture will become a frozen frame.








## ProcAmp

These items allow signal levels and timings to be adjusted.

Separate adjustments may be made for the two input channels **Input 1 SDI** and **Input 2 SDI**.

*Note that for this and other screens the following applies to the scroll bars:*

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

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

## Input 1 SDI and Input 2 SDI Controls

These items allow the gain, black level and timing of both signals to be adjusted.

### ProcAmp Enable

When checked the ProcAmp will become enabled for that channel and the settings will be applied to the signal.

When unchecked the settings will revert to the preset values.

### Luma Gain

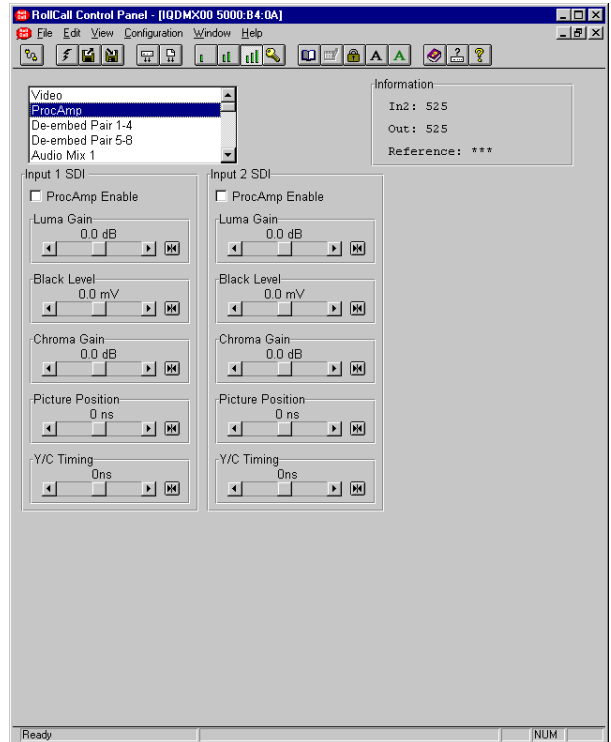
This allows the Y (luminance) gain to be adjusted by  $\pm 6$  dB in steps of 0.1 dB. Preset value is 0.0 dB.

### Black Level

This allows the black level to be adjusted by  $\pm 100$  mV in 0.8 mV steps. Preset value is 0.

### C Gain

This allows the Cb/Cr (color difference) gain to be adjusted by  $\pm 6$  dB in steps of 0.1 dB. Preset value is 0.0 dB.



### Picture Position

This item allows the timing of the picture position relative to the normal value, to be adjusted.

The timing may be adjusted by  $\pm 592$  ns in 148 ns steps.

### Y/C Timing

This item allows the timing of the chrominance signal relative to the luminance signal to be adjusted, (i.e. Y to Cb/Cr timing) in nanoseconds. The timing may be adjusted by  $\pm 592$  ns in 148 ns steps.

## De-embed Pair 1-4 and 5-8

This allows control of Gain, Mute, and Polarity over the de-embedded channel pairs.

### L and R

These scrollbars allow the gain of the Left and Right channels to adjusted over a range of  $\pm 18$  dB in 0.1dB steps. Preset is to 0 dB.

### Invert

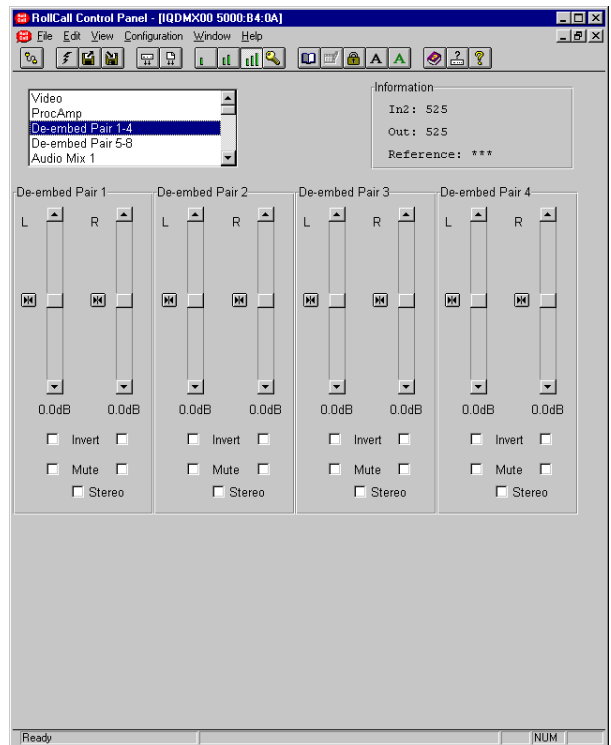
When checked the signal polarity will be inverted.

### Mute

When checked the signal will be muted.

### Stereo

When checked the left and right channels will be configured as a stereo pair and any adjustments made to one channel will automatically be applied to both channels.



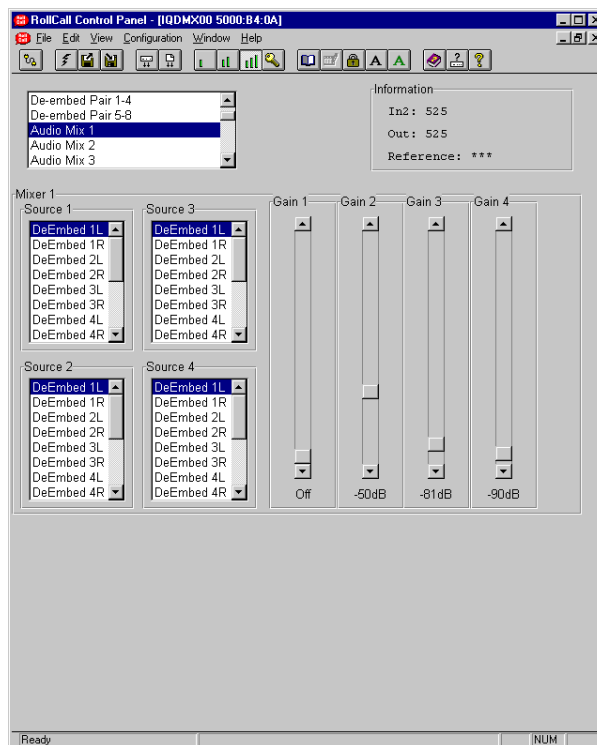
**Audio Mix 1, 2, 3 and 4**

There are four separate audio mixers Mix 1, 2, 3 and 4.

Each mixer has four inputs with individual gain controls that allow the mixing levels for each of the input signals, to be adjusted. The range of adjustment is from 0 to -90 dB and to Off. 0 to -60 dB is in steps of 1 dB, -60 dB to -90 dB is in steps of 3 dB.

The inputs can be selected from the list in the Source 1, 2, 3 and 4 items.

The outputs of these mixers provide four extra input selections for the Channel Router.



## Audio Bus A and B/Audio Bus C and D

This function allows the inputs for the four audio buses of the router to be selected.

For each bus any source may be selected from the list for the left and right channels.

### L and R

These scrollbars allow the gain to be adjusted over a range of  $\pm 18$  dB in 0.1dB steps. Preset is to 0 dB.

### Invert

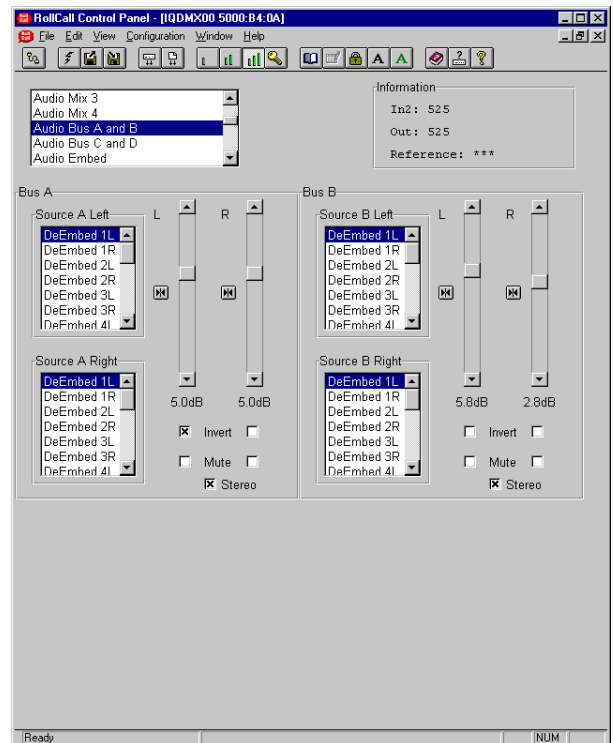
When checked the signal polarity will be inverted.

### Mute

When checked the signal will be muted.

### Stereo

When checked the left and right channels will be configured as a stereo pair and any adjustments made to one channel will automatically be applied to both channels.



## Audio Embed

This function sets up the embedder sources and destinations. Higher number embedders have priority, so if the same destination pair is selected on two embedders, the highest embedder will be the one that is active.

### Embedder 1, 2, 3, and 4

The source of the signal for the embedder may be selected from the list.

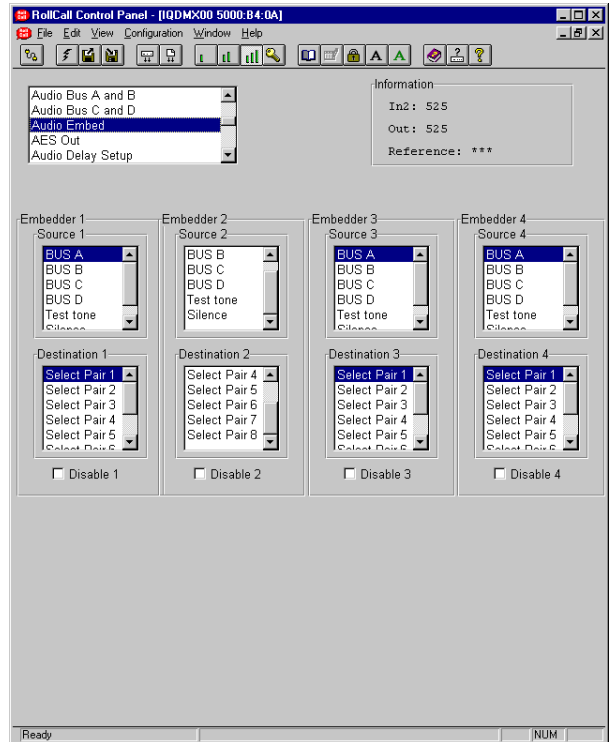
### Destination 1, 2, 3, and 4

The destination for the embedded signal may be selected from the list.

### Disable 1, 2, 3 and 4

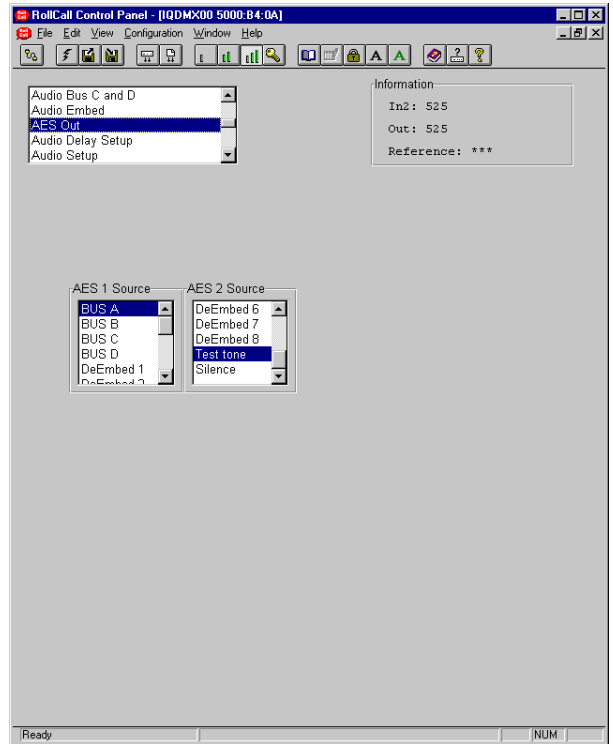
When checked the embedding will be turned off.

For details of the Audio Embedding Packet Distribution please refer to Appendix 2 on page 85.



### AES Out

This allows the signal source for the AES output to be selected from the list of items for the two AES sources. Silence and audio test tones may also be selected.



## Audio Delay Setup

This screen allows the amount of delay to be set and type of audio delay mechanism to be selected.

### Manual Delay

This will affect all processed audio signals equally.

The delay may be set to up to +1.5 s in 1ms steps.

### Delay Select

This allows the type of audio delay mechanism to be selected. One or more of the types may be checked. The amount of delay applied will be the sum of the delay from the enabled delay mechanisms.

*Note that up to 0.5 s of delay may be applied from the sum of the **Internal** + **GPI** + **RollTrack** delay inputs.*

#### Internal

When checked, an audio delay equal to the video delay in the unit will be applied.

#### Manual

When checked an audio delay set by the **Manual Delay** control will be applied.

#### GPI

When checked an audio delay will be applied that is equal to the width of the pulse arriving at the GPI connector.

*Note that an audio delay pulse of more than 500 ms, applied to the GPI Input will be treated as invalid. This will result in the GPI delay returning to zero.*

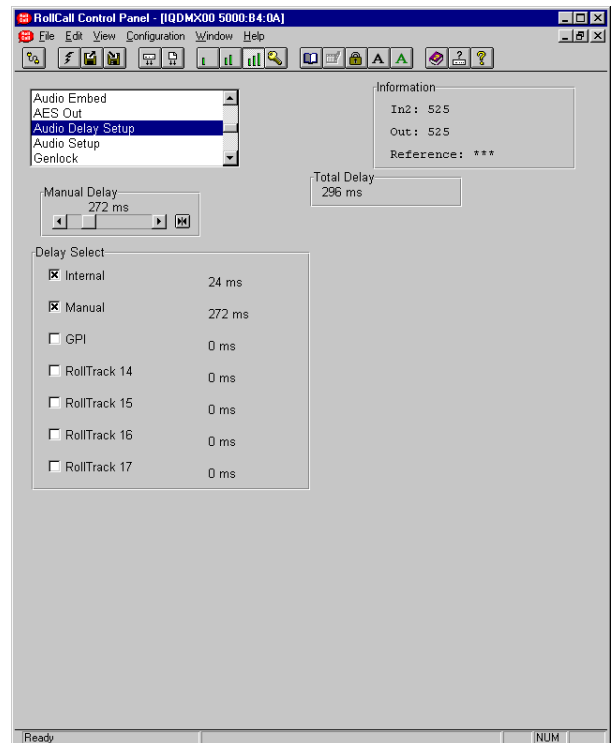
*Note that the GPI must be configured correctly for this function to operate. Please see page 31 for details.*

#### RollTrack 14, 15, 16 and 17

Then selected source(s) of the RollTrack input signal(s) will apply an audio delay.

### Total Delay

This will show the audio total delay (due to all delay mechanisms) through the unit in ms.





## Audio Setup

### Audio Monitoring

The four audio buses are monitored and level detectors provide status information and logging data.

#### Silence

The level at which the signal is considered to have dropped to silence may be set with this control.

The range is from -80 dB to 0 dB in steps of 1 dB. Preset is to -70 dB.

#### Low Level

The level at which the signal is considered to have dropped to a Low Level may be set with this control.

The range is from -80 dB to 0 dB in steps of 1 dB. Preset is to -60 dB.

#### High Level

The level at which the signal is considered to have risen to a High Level may be set with this control.

The range is from -80 dB to 0 dB in steps of 1 dB. Preset is to -10 dB.

#### Overload

The level at which the signal is considered to have risen to an Overload condition may be set with this control.

The range is from -80 dB to 0 dB in steps of 1 dB. Preset is to 0 dB.

#### Warning Timer

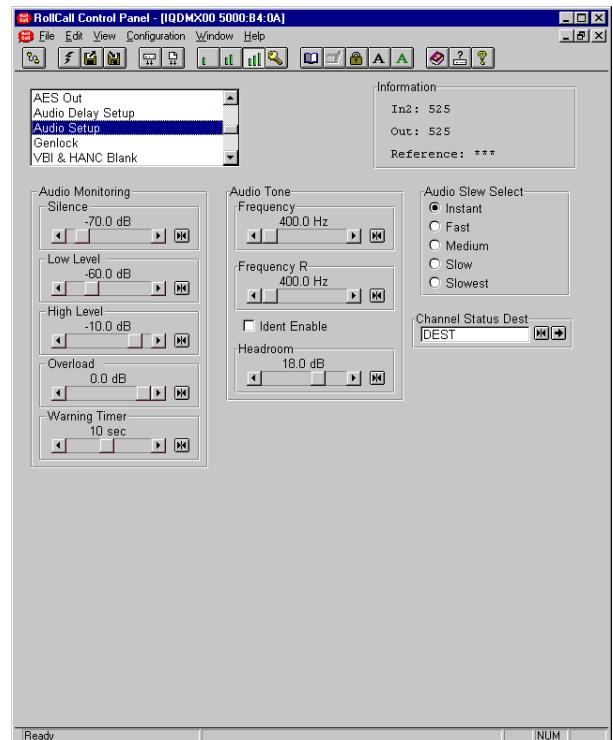
All the above monitoring facilities will only operate after a time interval set by this control. A valid signal is reported immediately. The range is from 1 to 20 seconds. Preset is to 10 seconds.

### Audio Tone

The frequency of the Audio Test Tone may be set using this control. Left and right channels may be set independently.

#### Frequency L and R

The range is from 100 Hz to 15 kHz in steps of 100 Hz. Preset is to 400 Hz.



**Audio Setup (continued)**

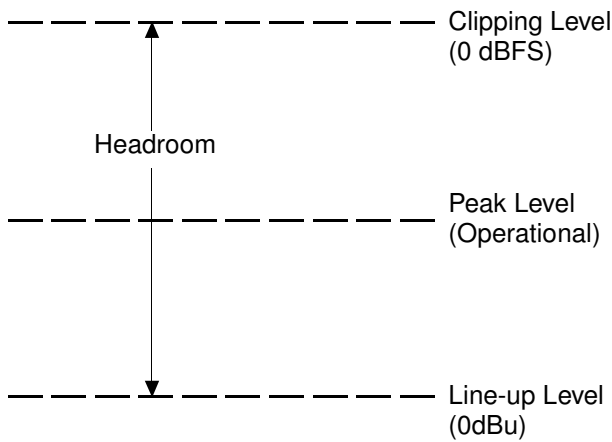
**Ident Enable**

When enabled the right channel will be identified by the signal being muted for 0.5 second every 2.5 seconds.

**Headroom**

This allows the headroom to be set. The range is from 4 dB to 24dB in 1 dB steps. Preset is to 18 dB.

Note that in this product headroom is defined as:



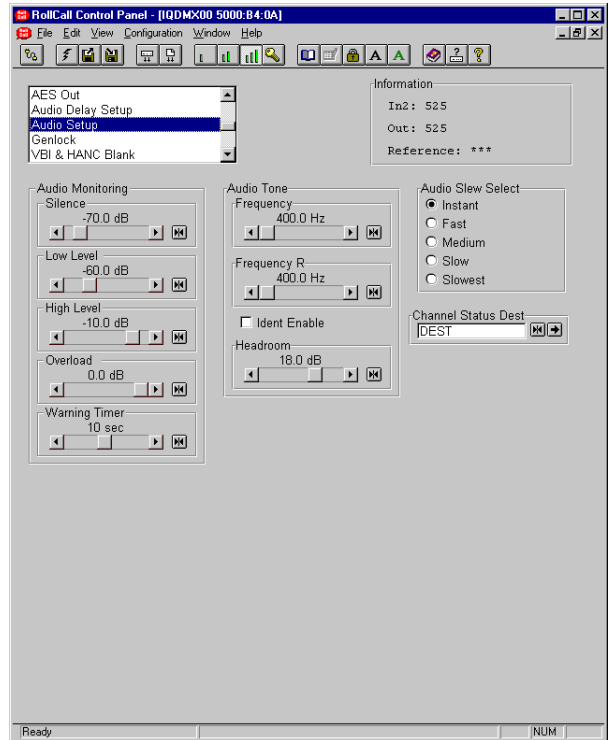
Headroom = Clipping Level – Line-up level

**Audio Slew Select**

This is the time taken for the audio to slew when the audio mixing and routing controls have changed.

The options are:

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



**Channel Status Dest(ination)**

This will set the four character name used in the destination field of the audio channel status.

To change the text, type the new text in the text area and then select (return).

Selecting Preset will return the text to the default text (DEST).

*Note that the Channel Status Origin data is automatically set by the module to DMX0 and cannot be changed.*

**Genlock**

This allows the genlock and delay options to be selected.

**Lock to Reference**

When selected and the unit will lock to the external reference signal.

**Free Run**

When selected the unit will not be locked to any input signals and the unit will free run.

**Lock to Input**

When selected and the unit will lock to the input video signal.

**H(orizontal) Phase (625/525)**

This item allows the horizontal timing of the output signal relative to the reference sync signal to be adjusted using the scrollbar by  $\pm \frac{1}{2}$  line in 37 ns steps.

*Note that picture disturbance may occur while this setting is adjusted.*

Selecting Preset returns the setting to zero. (Output coincident with reference)

**V(ertical) Phase (625/525)**

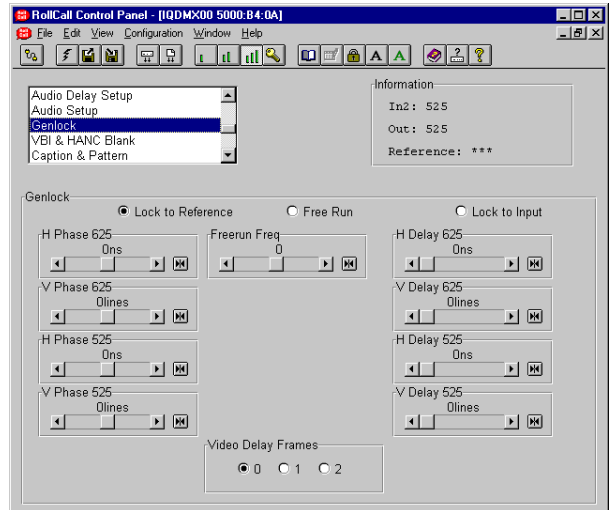
This item allows the vertical timing of the output signal relative to the reference sync signal to be adjusted, in TV lines. The scrollbar will adjust this value. Range is  $\pm 262$  lines (525 standard) or  $\pm 312$  lines (625 standard) in 1 line steps.

*Note that picture disturbance may occur while this setting is adjusted.*

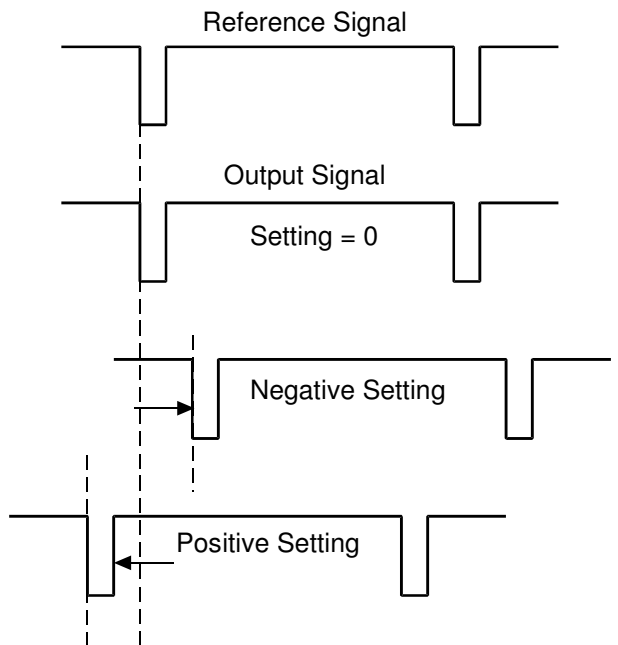
Selecting Preset returns the setting to zero. (Output coincident with reference)

**Freerun Freq(ueency)**

This allows the freerun frequency of the internal sync generator to be adjusted in steps of arbitrary units. Preset is to 0.



**Effect of Phase Adjustment**



Increasing the number (positive) moves the picture up the screen (Vertical Phasing) and to the left (Horizontal Phasing) if a monitor was externally locked to the reference.

**Genlock (continued)**

**Delay (625/525)**

When these controls are used the output signal will appear after the input signal with a time delay. When not used the module will operate in the synchronize mode.

*Note that the H and V delay functions are only active when the **Lock to Input** mode is selected.*

**H(orizontal) Delay (625/525)**

This item allows the horizontal timing of the output signal relative to the input signal to be adjusted by up to 1 line in 37 ns steps. The scrollbar will adjust this value.

Selecting Preset returns the setting to the minimum horizontal delay.

**V(ertical) Delay**

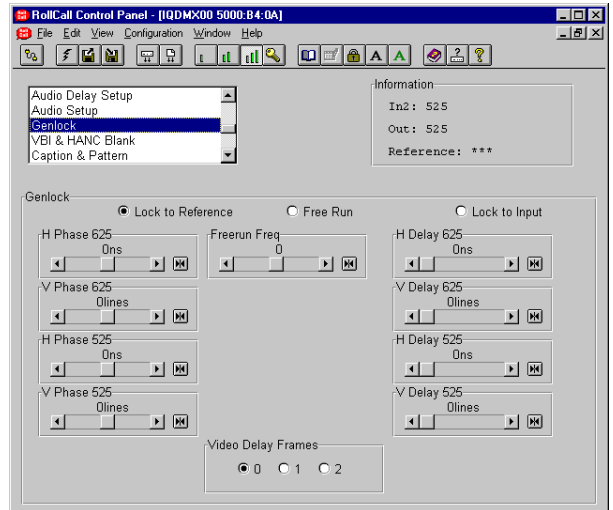
This item allows the vertical timing of the output signal relative to the input signal to be adjusted, in TV lines. The scrollbar will adjust this value. Range is from 0 to 624 or 524 lines in 1 line steps.

Selecting Preset returns the setting to the minimum vertical delay.

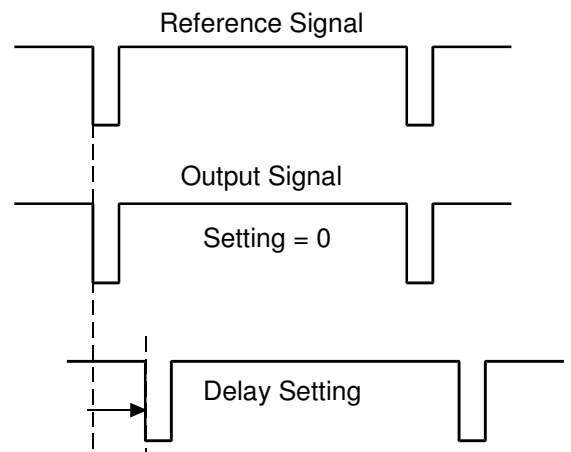
**Video Delay Frames**

The number of frames that the output signal will appear after the input signal may be set with this item.

*Note that this function is available in any genlock mode and will add to any other delay settings.*



**Effect of Delay Adjustment**



## VBI & HANC Blank(ing)

This item allows the Vertical Interval data (all or specific lines) contained in the input signal to be blanked or passed through the module.

It allows the selection of which vertical interval lines to pass through to the output and which lines to blank.

### 525 Pass

This section allows lines 11 to 21 and lines 274 to 283 of 525 line signals to be selected and passed through to the output by checking the appropriate box.

### 625 Pass

This section allows lines 7 to 23 and lines 320 to 335 of 625 line signals to be selected and passed through to the output by checking the appropriate box.

### All

This section allows all vertical interval lines to be selected and either passed to or blanked from the output signal.

Pass 525

Selecting this item will select all vertical interval lines in the 525 line list and allow them to passed through to the output.

Pass 625

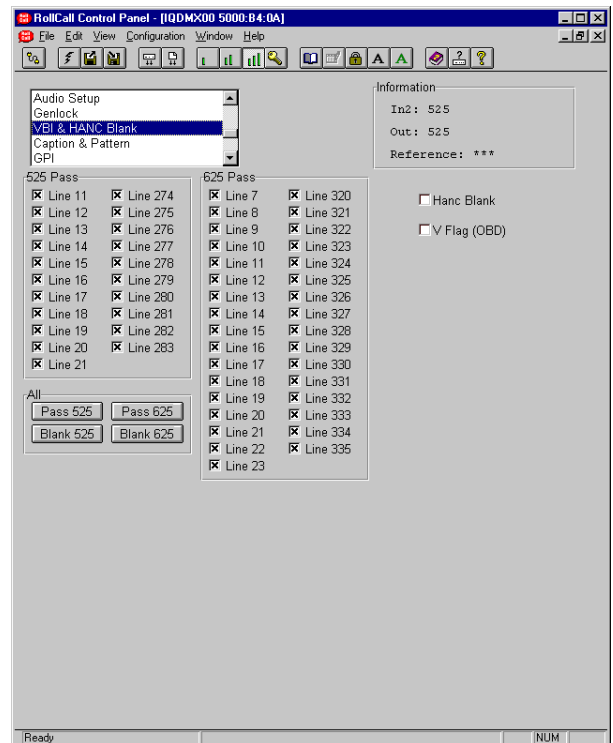
Selecting this item will select all vertical interval lines in the 625 line list and allow them to passed through to the output.

Blank 525

Selecting this item will select all vertical interval lines in the 525 line list and blank them from the output.

Blank 625

Selecting this item will select all vertical interval lines in the 625 line list and blank them from the output.



### Hanc Blank

When checked all horizontal data will be blanked, on the input. When unselected, passthrough operations will not alter audio packets for groups that the IQDMX00 has not selected for embedding. In order to allow minimum synchronization delay the created packets are output first and then the passthrough groups are placed after the created streams have been embedded. This means that passthrough is achieved without altering the input packet distribution. Passthrough operation has to take note of marked for deletion packets and these are removed where possible to ensure that one does not run out of useable ancillary space.

For details of the HANC Data Handling please refer to Appendix 2 on page 85.

### V Flag (OBD)

This control allows the V(ertical) Flag to be changed from line 10 (OVD, Optional Video Data) to line 20 (OBD, Optional Blanking Data).

Unchecked selects OVD and checked selects OBD. The default is OVD selected.

*Note that this function is only active for 525 line signals.*

**Caption & Pattern**


This function will allow a caption to be edited and selected and various patterns to be used as the output signal when the Pattern On function is selected.


**Caption**

This function allows control of the caption (white text on a black background) which may contain a maximum of 19 characters (including spaces).

The caption will appear in the lower section of the picture.

**Edit caption**

To change the caption, type the new text in the text area and then select  (return).

Selecting Preset  will return the text to the default text (IQDMX00).

**Select Caption**

- Caption Off The caption will not appear on the screen
- Caption On The caption will appear on screen

**Pattern**

- Pattern On

When selected the output will become the pattern selected from the **Pattern Select** list.

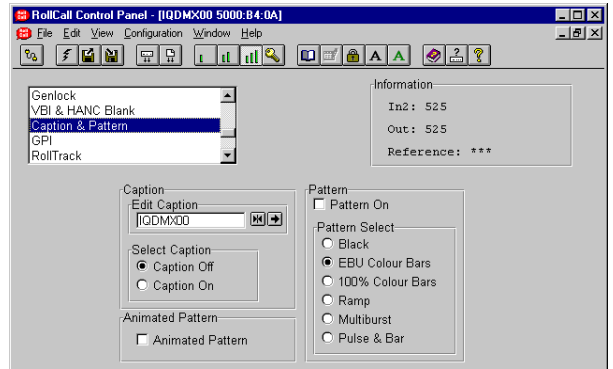
**Pattern Select**

One of the patterns (including Black) may be selected from the list.

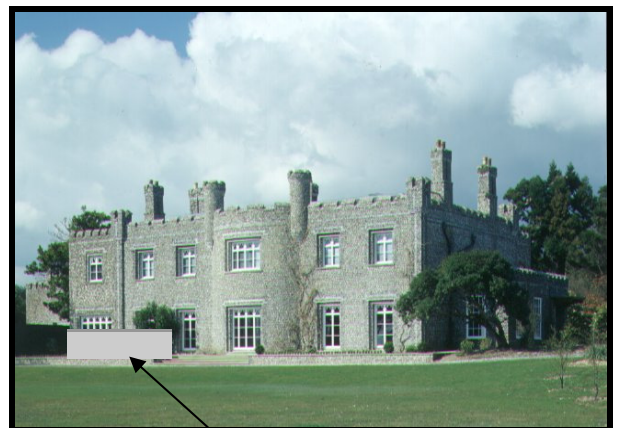
**Animated Pattern**

When selected, a monochrome rectangular area will appear on the output picture as shown opposite. The brightness of this rectangle will ramp from black, through gray to white and then directly to black over a period of about one second. This action will then be repeated continuously.

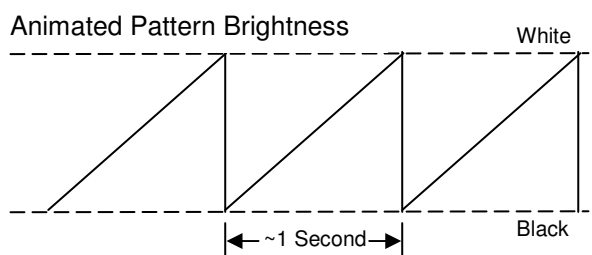
This pattern is useful for checking active video paths. Down stream equipment can see that video has not been frozen.



**Caption Text**



**Animated Pattern**



## GPI

This screen allows the GPI functions to be configured and their actions defined.

### Disable Inputs

When selected all GPI input functions will be disabled.

### Input Functions

When configured as an input the GPI connection may be used for accepting GPI information (from mechanical switch contacts, relay contacts etc.) The resulting action that the unit takes may be selected using this item.

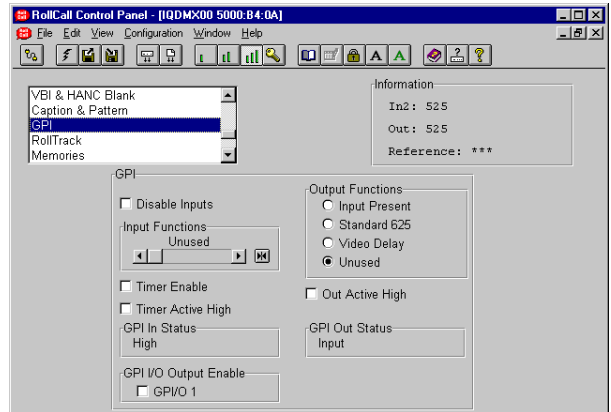
The GPI input functions that may be selected are as follows:

- |                  |  |
|------------------|--|
| Unused           | The unit will perform no function. This is also the Preset Setting.  |
| Pattern          | The unit will produce a pattern chosen from the Pattern menu when the input changes from open to closed.   |
| Memory<br>1 to 8 | The unit will use the settings in the selected memory location when the input changes from open to closed.   |
| Mem1-2           | The unit will toggle between the settings of memory locations 1 and 2.<br>Open to Closed = Memory 1 settings<br>Closed to Open = Memory 2 settings |
| Mem 3-4          | The unit will toggle between the settings of memory locations 3 and 4.<br>Open to Closed = Memory 3 settings<br>Closed to Open = Memory 4 settings |
| Mem 5-6          | The unit will toggle between the settings of memory locations 5 and 6.<br>Open to Closed = Memory 5 settings<br>Closed to Open = Memory 6 settings |
| Mem 7-8          | The unit will toggle between the settings of memory locations 7 and 8.<br>Open to Closed = Memory 7 settings<br>Closed to Open = Memory 8 settings |

### GPI In Status

This will display the current status of the selected GPI input.

This may show either High or Low. When low, the associated function will be triggered.



## GPI (continued)

### Output Functions

The GPO may be configured to produce an output corresponding to one of the following conditions:

- Input Present
- Standard 625
- Video Delay
- Unused

The preset setting for the output is to Unused.

When the condition is not true the output will float but when the condition is true the output is closed to ground via a transistor.

Note that when video delay mode is selected the output is a negative going TTL pulse. The width of the pulse represents the video delay through the unit to the nearest millisecond.

### GPI Out Status

This will display the current status of the GPI output. This may show either Unused, High, low or video delay in milliseconds.

### Timer Enable

When checked the GPI will be monitored. The width of the pulse represents the delay that can be used to control audio delays in this unit.

### Timer Active High

When checked the GPI will measure the positive going pulse. When unchecked the negative pulse is measured.

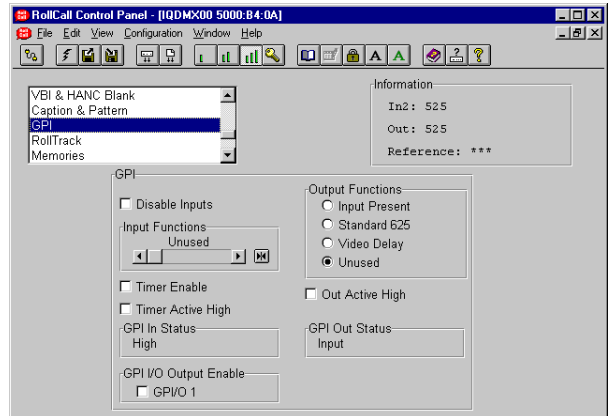
*Note that an audio delay pulse of more than 500 ms, applied to the GPI Input will be treated as invalid. This will result in the GPI delay returning to zero.*

### Out Active High

This determines the sense of the asserted GPI output signal. When checked the GPI is active the output sense is high. When unchecked the GPI is active low.

### GPI I/O Output Enable

When checked the GPI is configured as an output. When unchecked the GPI is configured as input.





**RollTrack**

This function allows information to be sent, via the RollCall™ network, to other compatible units connected on the same network.

For example, it can enable compatible audio delay units to produce an audio delay dependent on this and other similar units. The audio delay unit will dynamically follow or track the received delay-time information. This allows processed video signals to be timed correctly with audio signals. This automatic tracking system via the RollCall™ network is call **RollTrack**.

For more detailed information, see the RollTrack section (Appendix) at the end of this manual.

**RollTrack Index**

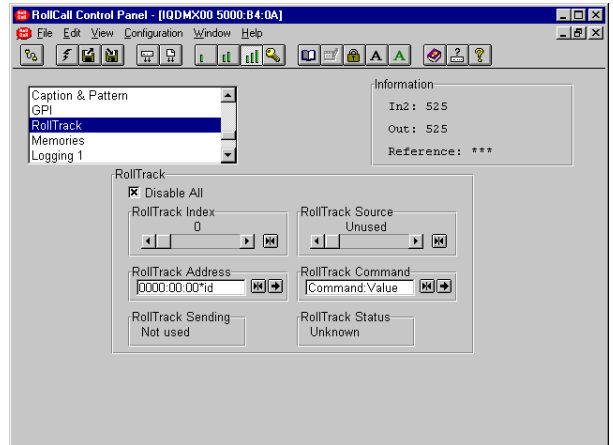
This item allows up to 70 destinations to be selected.

**RollTrack Source**

This allows the source of information that triggers the transmission of data to be selected. Options are:

|                   |                 |
|-------------------|-----------------|
| Unused (off)      | De-embed 1 Lost |
| Input Present     | De-embed 1 PCM  |
| Input Missing     | De-embed 1 NPCM |
| Standard 525      | to              |
| Standard 625      | De-embed 8 Lost |
| Input 1 Present   | De-embed 8 PCM  |
| Input 1 Missing   | De-embed 8 NPCM |
| Standard 1 525    | GPI 1 Low       |
| Standard 1 625    | GPI 1 High      |
| Input 2 Present   | GPI 1 Inactive  |
| Input 2 Missing   |                 |
| Standard 2 525    |                 |
| Standard 2 625    |                 |
| Audio Delay       |                 |
| Video Delay       |                 |
| Reference Lost    |                 |
| Reference Present |                 |
| Reference Error   |                 |


Note that the GPI RollTrack functions should not be used when **GPI Timer Enable** is selected.



The destination for the information is set by the network code address as follows:

**Network Address**

This item allows the address of the selected destination unit to be set.

To change the address, type the new destination in the text area and then select  (return)



(Preset) returns to the default destination

The full **RollTrack** address has four sets of numbers

For example: 0000:10:01\*362

The first set (0000) is the network segment code number

The second set (10) is the number identifying the (enclosure/mainframe) unit.

The third set (01) is the slot number in the unit

The Fourth Set (362)

Each RollCall unit has a unique identification embedded in the units' software. In this example 362 represents an IQDMX00, 412 would represent an IQDEC00, 161 a Mach 1 etc. Inserting this number in the RollTrack address ensures that only the correct type of unit (in this example an IQDMX00) will respond to the RollTrack command; any other unit will ignore the command.

If this number were set to 00 **any type** of unit at this location would respond to the RollTrack command, possibly causing unpredictable results.

The unit ID of a module on the RollCall network may be found under *RollCall Control Panel/RollCall Listing/Unit Information* or via the RollCall Control Panel *Help/About Current Unit* function.

**RollTrack (continued)**

**RollTrack Command**

The full **RollTrack** command has two sets of numbers

For example: 84\*156

The first set (84) is the **RollTrack** command number

*Note that only command numbers 14,15,16 and 17 should be used for audio delay*

The second set (156) is the value sent with the **RollTrack** command number

*Note that when video delay is selected as the **RollTrack** source the value sent with the **RollTrack** command is the video delay value not the value set.*

*For details of the RollCall command values for specific units please contact your local Snell & Wilcox agent.*

**Disable All**

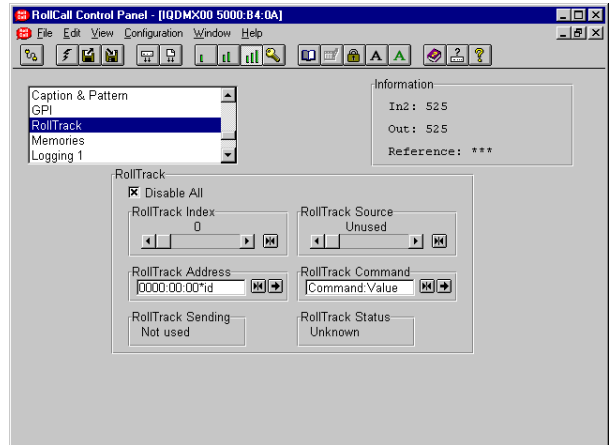
When this item is checked all RollTrack items will be disabled.

**RollTrack Sending**

This item shows when the unit is actively sending the RollTrack command.

This may show:

- String      A string value is always being sent.
- Number     A number value is always being sent.
- No          The message is not being sent.
- Yes         The message is being sent.
- Internal Type Error    Inconsistent behavior; please contact your local Snell & Wilcox agent.



**RollTrack Status**


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


This may show:

- OK            RollTrack message sent and received OK.
- Unknown     Rolltrack message has been sent but it has not yet completed.
- Timeout     RollTrack message sent but acknowledgement not received. This could be because the destination unit is not at the location specified.
- Error        This indicates a broken RollCall state.
- Bad          This indicates a broken RollCall packet.

**Memories**

This function allows a number of particular setups of the unit to be saved and recalled. There are 8 memory locations available.

To change the memory name, type the new name in the text area and then select  (return).

Selecting Preset  will return the text to the default name.



This item allows the memory location to be cleared and returned to the default (preset) setting. This empties the memory location and the Recall button will then appear grayed out.

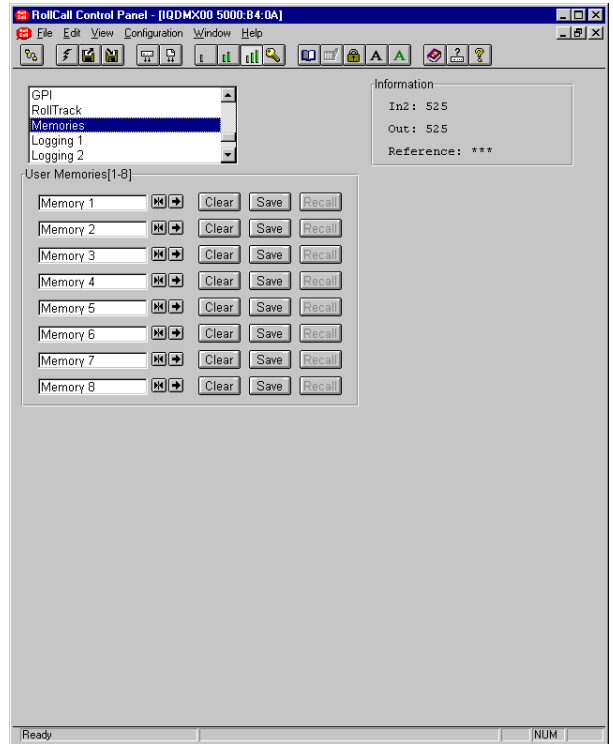


This function allows the settings of all items to be saved at the memory location.



This function allows the settings saved at the memory location to be recalled. When this button appears grayed out it indicates that the memory location is empty and therefore cannot be recalled. This will occur when the memory is cleared.

*Note that all the above functions are a momentary action.*

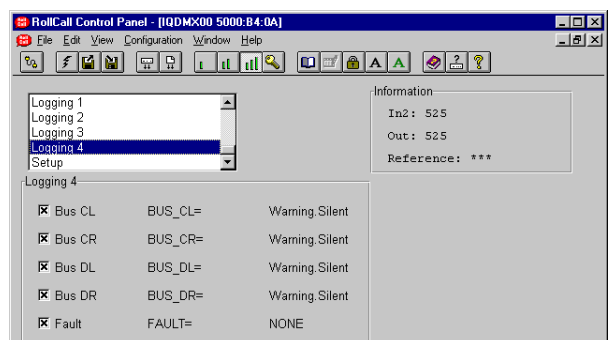
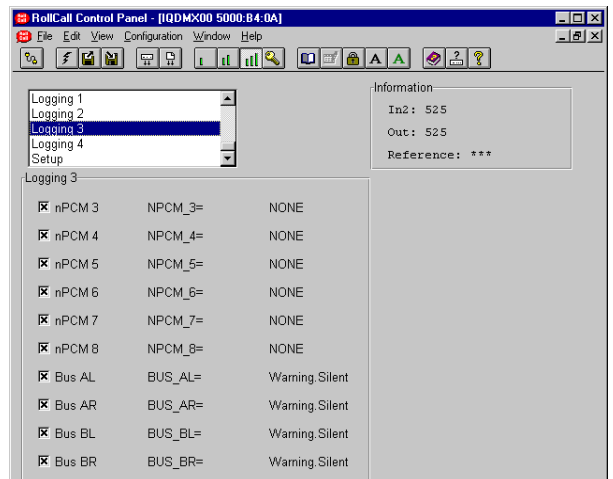
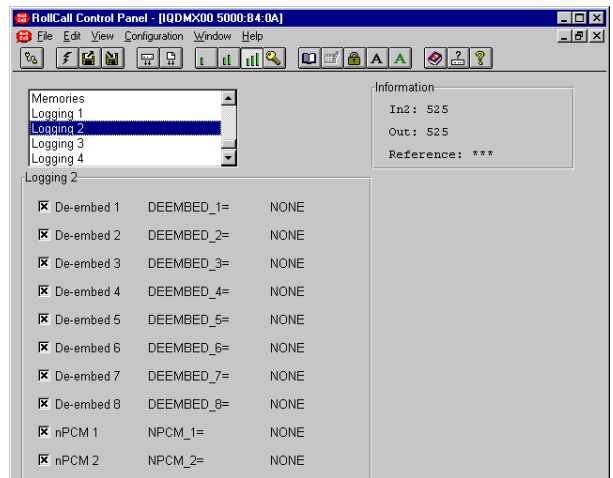
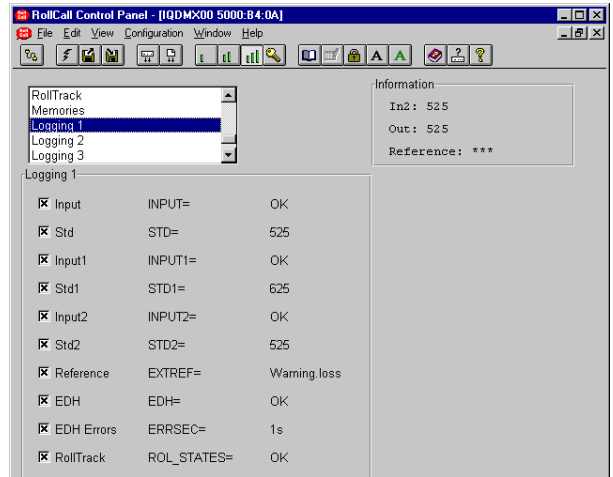


**Logging 1, 2, 3 and 4**

Information about various parameters can be made available to a logging device that is attached to the RollCall™ network by checking the appropriate box.

The status is shown to the right of the item.

Any of the items may be selected from the list.



### ROLLCALL LOG FIELDS

*\*Note that these log values are either for future use or may be logged during a transitional state whilst acquiring or loosing an input signal. It is very unlikely that these states and the associated log values will become permanent.*

| Log Field   | Log Value                              | Description  |
|-------------|--|--|
| INPUT=      | OK<br>ERR*<br>LOST                     | Valid input signal<br>Invalid input signal<br>Input signal lost  |
| STD=        | UNKNOWN*<br>STDERR<br>525<br>625       | Input signal standard not recognized or no signal<br>Not a selected input standard<br>Input standard 525<br>Input standard 625   |
| INPUT1=     | OK<br>ERR*<br>LOST                     | Valid input signal<br>Invalid input signal<br>Input signal lost  |
| STD1=       | ERR<br>525<br>625                      | Not a selected input standard<br>Input standard 525<br>Input standard 625  |
| INPUT2=     | OK<br>ERR*<br>LOST                     | Valid input signal<br>Invalid input signal<br>Input signal lost  |
| STD2=       | ERR<br>525<br>625                      | Not a selected input standard<br>Input standard 525<br>Input standard 625  |
| EXTREF=     | NONE<br>525<br>ERROR<br>WARNING<br>625 | No reference signal present<br>Valid 525 reference signal<br>Reference/Output standard mismatch<br>Reference signal available but not selected<br>Valid 625 reference signal |
| EDH=        | NONE<br>FAIL<br>OK<br>RESET            | The unit is not locked to the input signal<br>EDH errors have been found on the input signal<br>No EDH errors found on the input signal<br>EDH statistics have been reset    |
| ERRSEC=     | Runtime string                         | The time since EDH was reset in seconds  |
| ROL_STATES= | OK<br>FAIL                             | RollTrack message sent and received OK<br>RollTrack message not acknowledged   |
| DEEMBED_1=  | NONE<br>OK                             | Nothing present on pair 1<br>Embedded pair 1 present on selected SDI input   |
| DEEMBED_2=  | NONE<br>OK                             | Nothing present on pair 2<br>Embedded pair 2 present on selected SDI input   |
| DEEMBED_3=  | NONE<br>OK                             | Nothing present on pair 3<br>Embedded pair 3 present on selected SDI input   |
| DEEMBED_4=  | NONE<br>OK                             | Nothing present on pair 4<br>Embedded pair 4 present on selected SDI input   |
| DEEMBED_5=  | NONE<br>OK                             | Nothing present on pair 5<br>Embedded pair 5 present on selected SDI input   |
| DEEMBED_6=  | NONE<br>OK                             | Nothing present on pair 6<br>Embedded pair 6 present on selected SDI input   |
| DEEMBED_7=  | NONE<br>OK                             | Nothing present on pair 7<br>Embedded pair 7 present on selected SDI input   |
| DEEMBED_8=  | NONE<br>OK                             | Nothing present on pair 8<br>Embedded pair 8 present on selected SDI input   |

| Log Field | Log Value      | Description   |
|-----------|----------------|---|
| NPCM_1=   | NONE<br>OK     | Non-PCM not present on pair 1 of selected SDI input<br>Non-PCM present on pair 1 of selected SDI input  |
| NPCM_2=   | NONE<br>OK     | Non-PCM not present on pair 2 of selected SDI input<br>Non-PCM present on pair 2 of selected SDI input  |
| NPCM_3=   | NONE<br>OK     | Non-PCM not present on pair 3 of selected SDI input<br>Non-PCM present on pair 3 of selected SDI input  |
| NPCM_4=   | NONE<br>OK     | Non-PCM not present on pair 4 of selected SDI input<br>Non-PCM present on pair 4 of selected SDI input  |
| NPCM_5=   | NONE<br>OK     | Non-PCM not present on pair 5 of selected SDI input<br>Non-PCM present on pair 5 of selected SDI input  |
| NPCM_6=   | NONE<br>OK     | Non-PCM not present on pair 6 of selected SDI input<br>Non-PCM present on pair 6 of selected SDI input  |
| NPCM_7=   | NONE<br>OK     | Non-PCM not present on pair 7 of selected SDI input<br>Non-PCM present on pair 7 of selected SDI input  |
| NPCM_8=   | NONE<br>OK     | Non-PCM not present on pair 8 of selected SDI input<br>Non-PCM present on pair 8 of selected SDI input  |
| BUS_AL=   | OK<br>WARNING  | Router BUS A Left channel has valid signal selected<br>Router BUS A Left channel is receiving silence, low level, high level or overload signal   |
| BUS_AR=   | OK<br>WARNING  | Router BUS A Right channel has valid signal selected<br>Router BUS A Right channel is receiving silence, low level, high level or overload signal |
| BUS_BL=   | OK<br>WARNING  | Router BUS B Left channel has valid signal selected<br>Router BUS B Left channel is receiving silence, low level, high level or overload signal   |
| BUS_BR=   | OK<br>WARNING  | Router BUS B Right channel has valid signal selected<br>Router BUS B Right channel is receiving silence, low level, high level or overload signal |
| BUS_CL=   | OK<br>WARNING  | Router BUS C Left channel has valid signal selected<br>Router BUS C Left channel is receiving silence, low level, high level or overload signal   |
| BUS_CR=   | OK<br>WARNING  | Router BUS C Right channel has valid signal selected<br>Router BUS C Right channel is receiving silence, low level, high level or overload signal |
| BUS_DL=   | OK<br>WARNING  | Router BUS D Left channel has valid signal selected<br>Router BUS D Left channel is receiving silence, low level, high level or overload signal   |
| BUS_DR=   | OK<br>WARNING  | Router BUS D Right channel has valid signal selected<br>Router BUS D Right channel is receiving silence, low level, high level or overload signal |
| FAULT=    | NONE<br>FAIL   | No Internal errors detected<br>Internal error detected  |
| SN=       | Runtime string | Serial number of unit   |

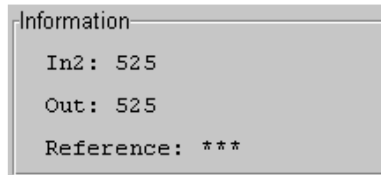
**Setup**

**Information Window**

The type of information that appears in the Information Window may be chosen with this item.

- Input Status
- EDH & ANC Status
- Audio Input Status

**Input Status**

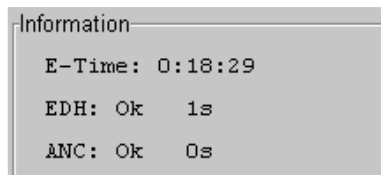


**In1: or In2:** This shows the status of the input, the line standard and which input has been selected.

**Out:** This shows the status of the output.

**Reference:** This will show the status of the reference signal.

**EDH & ANC Status**



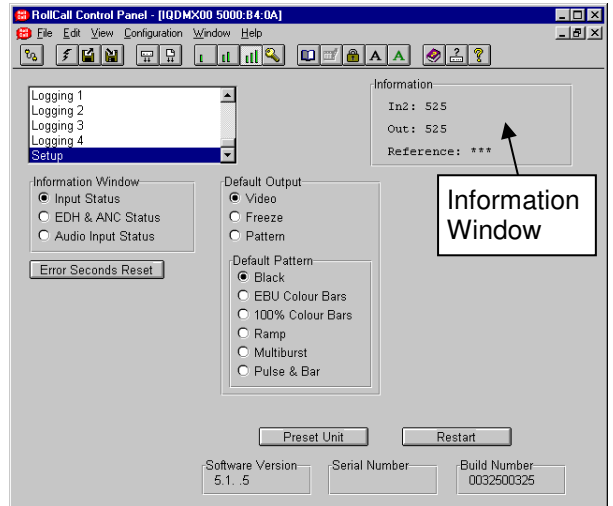
**E-Time:** This shows the time since EDH was reset in Hours:Minutes:Seconds.

**EDH:** This shows the number of EDH errors that have occurred since the last EDH reset followed by the time in seconds since the last EDH error.

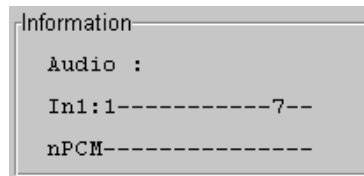
**ANC:** This shows the number of ANC errors that have occurred since the last ANC reset followed by the time in seconds since the last ANC error.



Selecting this function will reset EDH and ANC error count and the timer shown in the information window, to zero. If inputs are switched over an automatic reset occurs.



**Audio Input Status**



**Audio :** This shows the status of the selected audio input

**In1(2)** This shows the audio pairs present on the selected input as 1, 2, 3, 4, etc.

**nPCM** This shows the non-PCM audio pairs present on the selected input as 1, 2, 3, 4, etc.  
*Note that the Dolby header in the data stream is used to detect if the audio is non-PCM.*

**Setup (continued)**

**Default Output**

If the input signal fails or is of poor quality this function will determine what the output signal will become under such conditions.

**Default Pattern**

If Pattern is chosen in the **Default Output** item the output will become the pattern chosen from this list.



Selecting this item sets all adjustment functions that include a preset facility, to their preset values.

*Note that this is a momentary action.*



This will reboot the unit simulating a power-down power-up cycle restoring power-up settings.

**Software version**

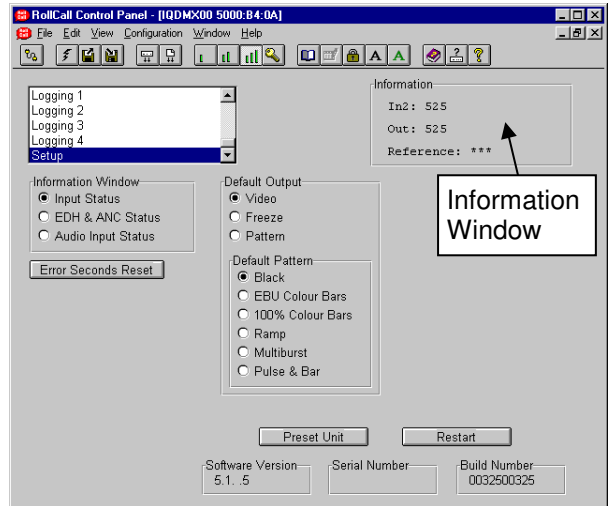
This item shows the version of the software fitted in the module.

**Serial Number**

This item shows the serial number of the module

**Build Number**

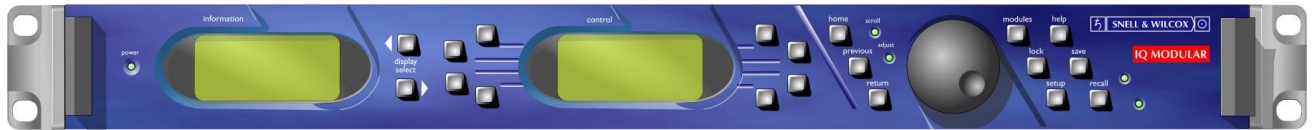
This will indicate the factory build number. This number defines all parameters of the unit (software versions, build level etc.) for identification purposes.





## Operation from an Active Control Panel

The card may be operated from an active control panel via the RollCall™ network.



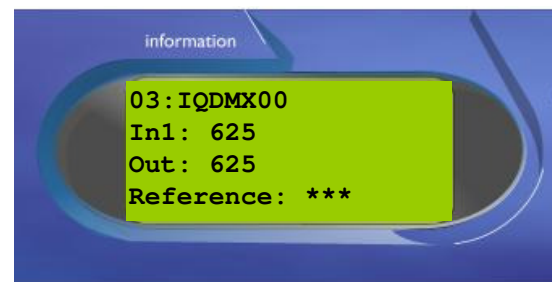
All operational parameters and selections are made using a system of menus displayed in two LCD windows.

Operational details for the remote control panel can be found in the Modular System Operator's Manual.

### Information Window

The Information window has four lines of text indicating the current state of the unit.

For details of the abbreviations used please see page 39.

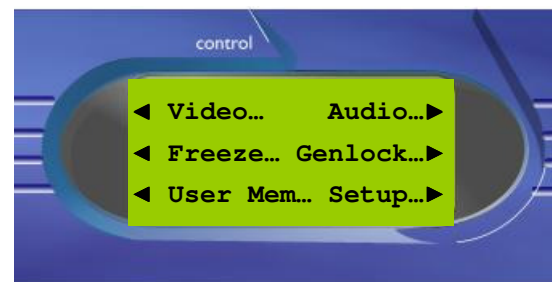


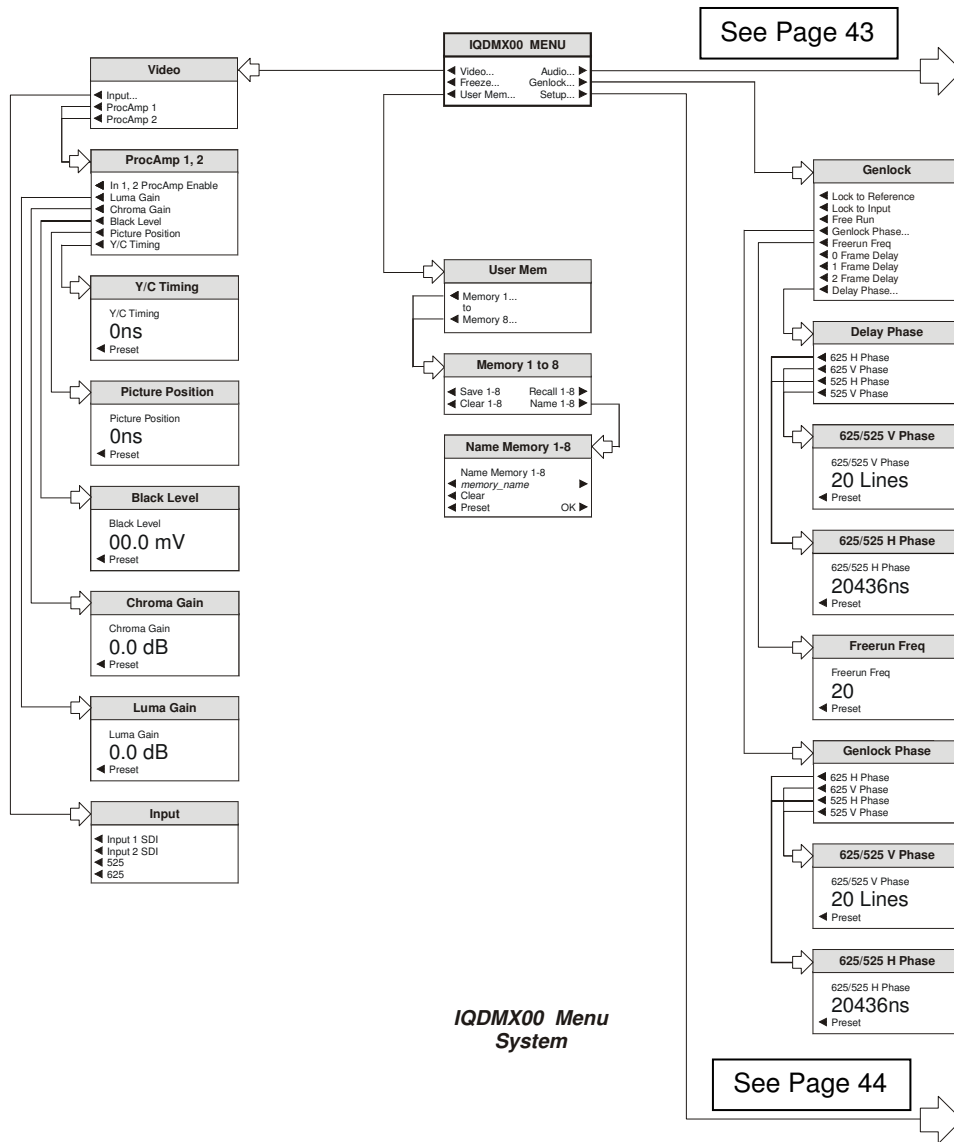
### Control Window

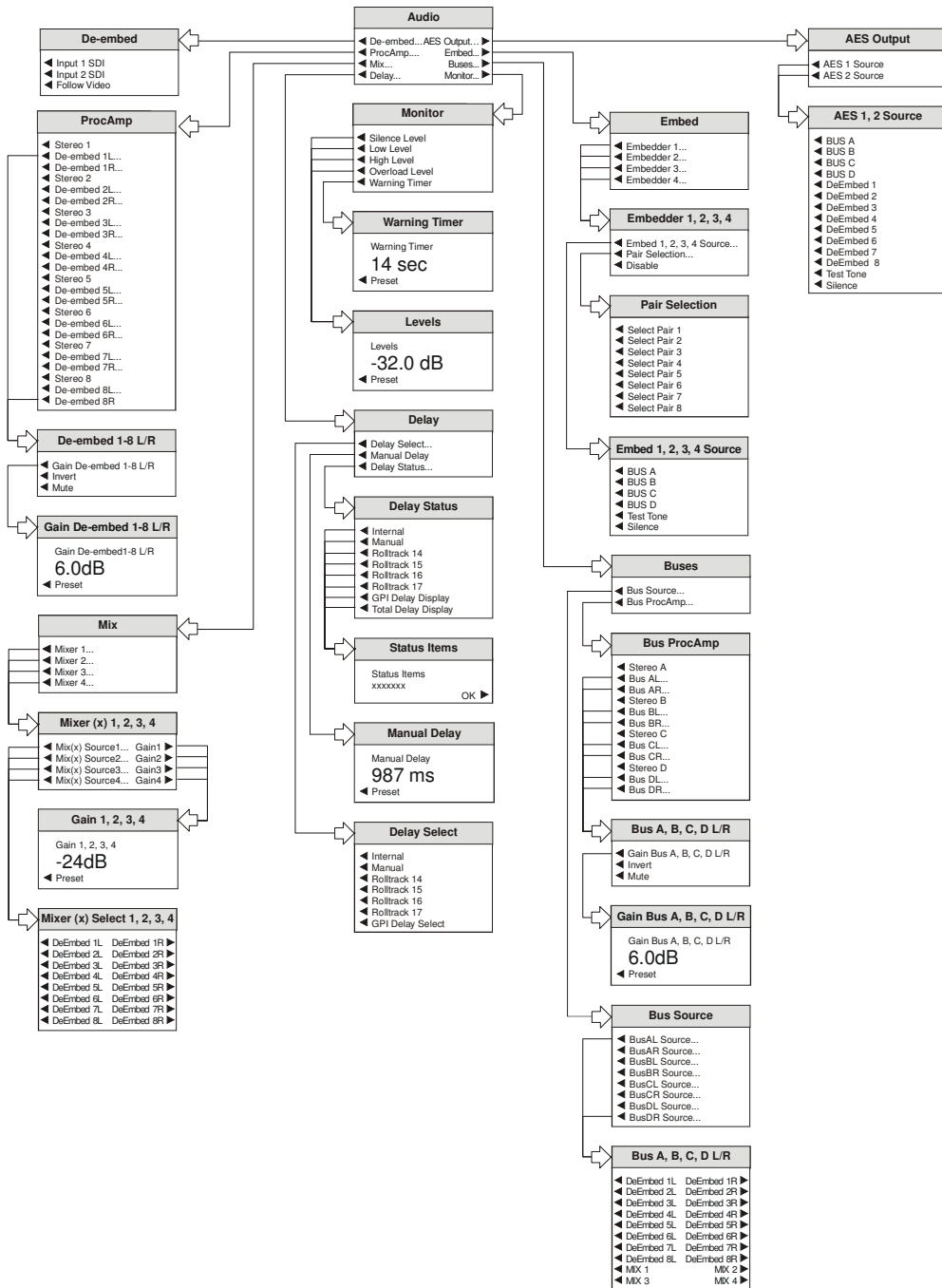
The **Control** window displays all Selection Menus and sub-menus.

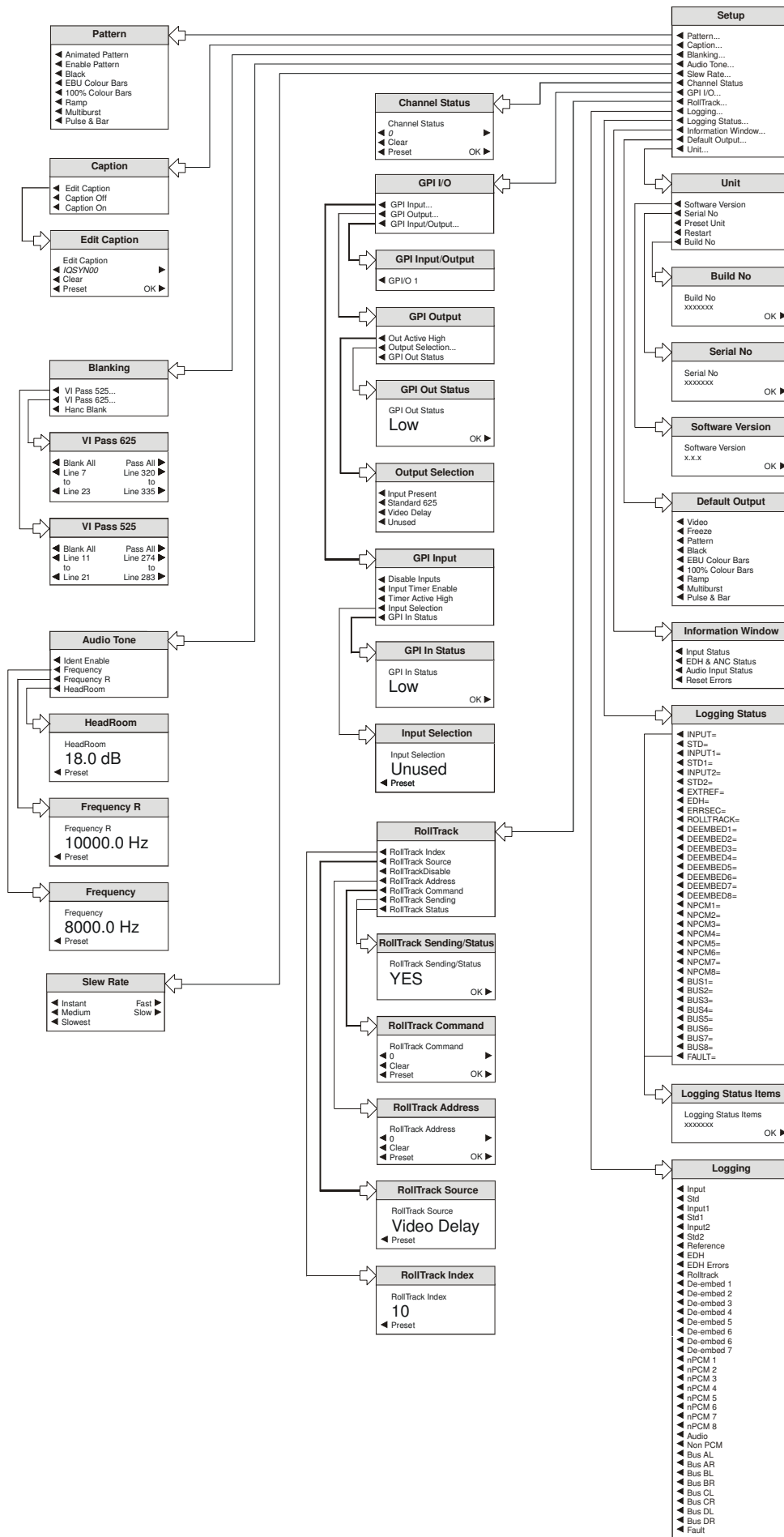
The selection is made by pressing the button adjacent to the required item.

The menu structure is detailed in the following pages.









**MENU DETAILS**

(see IQDMX00 Menu System on previous pages)

**MAIN MENU**

The main or top level menu allows various sub-menus to be selected by pressing the button adjacent to the required text line.

Note that where a menu item is followed by three dots (...) this indicates that a further sub-menu may be selected.

Whenever a menu item is selected the parameters of that selection will be displayed in the Information window of the front panel. Where the selection is purely a mode selection and does not enable a sub-menu, the text will become reversed (white-on-black) indicating that the mode is active. If the mode is not available for selection the text will remain normal.

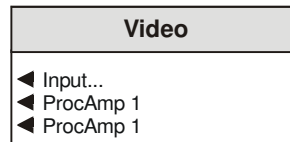
Also refer to the block diagram on page 6 for more information.

**MAIN MENU**



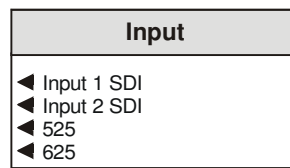
**Video**

This item allows the input signal to be selected and adjustments to be made.



**◀ Input**

This item allows the input signal and its standard to be selected.



**◀ Input 1 SDI, Input 2 SDI**

This item allows the input signal to be selected; either Input 1 SDI, Input 2 SDI or may be selected.

*Note that as the IQDMX0215-1A and IQDMX1215-1A versions have only one input, Input 1 SDI should always be selected. If Input 2 SDI is selected the unit will report an input loss.*

**◀ 525, 625**

This allows input standard to be selected.

If only 625 is selected the unit will be forced to only accept 625 line inputs.

If only 525 is selected the unit will be forced to only accept 525 line inputs.

If 625 and 525 are selected the unit will accept both 625 and 525 line inputs.

◀ ProcAmp 1, ProcAmp 2

These items allow signal levels and timings for each of the input channels to be adjusted.

| ProcAmp 1, 2  |
|---|
| <ul style="list-style-type: none"> <li>◀ In 1, 2 ProcAmp Enable</li> <li>◀ Luma Gain</li> <li>◀ Chroma Gain</li> <li>◀ Black Level</li> <li>◀ Picture Position</li> <li>◀ Y/C Timing</li> </ul> |

◀ In 1, 2, ProcAmp Enable

When selected the ProcAmp will become enabled for that channel and the settings will be applied to the signal.

When unselected the settings will revert to the preset values.

All the values below may be adjusted using the spinwheel.

◀ Luma Gain

| Luma Gain                              |
|--|
| Luma Gain<br><b>0.0 dB</b><br>◀ Preset |

This allows the Y (luminance) gain to be adjusted by ±6 dB in steps of 0.1 dB. Preset value is 0.0 dB.

◀ Chroma Gain

| Chroma Gain                              |
|--|
| Chroma Gain<br><b>0.0 dB</b><br>◀ Preset |

This allows the Cb/Cr (color difference) gain to be adjusted by ±6 dB in steps of 0.1 dB. Preset value is 0.0 dB.

◀ Black Level

| Black Level                               |
|---|
| Black Level<br><b>00.0 mV</b><br>◀ Preset |

This allows the black level to be adjusted by ±100mV in 0.8mV steps. Preset value is 0.

◀ Picture Position

| Picture Position                           |
|--|
| Picture Position<br><b>0ns</b><br>◀ Preset |

This item allows the timing of the picture position relative to the normal value, to be adjusted. The timing may be adjusted by ±592ns in 148ns steps.

◀ Y/C Timing

| Y/C Timing                           |
|--------------------------------------|
| Y/C Timing<br><b>0ns</b><br>◀ Preset |

This item allows the timing of the chrominance signal relative to the luminance signal to be adjusted, (i.e. Y to Cb/Cr timing) in nanoseconds. The timing may be adjusted by ±592ns in 148ns steps.

**Freeze**

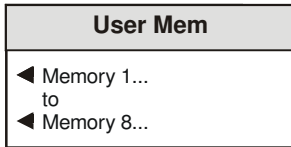
When selected the output picture will become a frozen frame.

**User Mem(ories)**

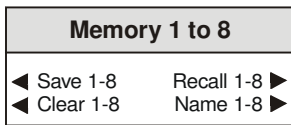
Name 1-8 ►

This function allows a number of particular setups of the IQDMX00 to be saved and recalled. There are 8 memory locations available.

This item allows any of the 8 memory locations to be selected.



◀ **Memory 1 to 8**



When a memory location has been selected this item allows it to be saved, recalled, cleared or renamed.

◀ **Save 1-8**

When selected the current settings will be saved at this location.

Recall 1-8 ►

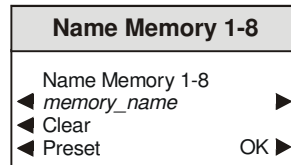
When selected the settings will be recalled from this location and applied to the unit.

◀ **Clear 1-8**

When selected the memory location will be cleared and returned to the default (preset) setting.

The selected memory location may be renamed with this function.

To compile/edit the text the right ► and left ◀ buttons adjacent to the upper text line in the menu should be used to select the character position in the text and the spinwheel used to select the character.



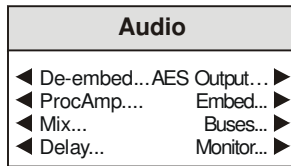
The ◀ **Clear** function blanks the selected character.

The ◀ **Preset** function loads the default text, for example, **Memory 1**.

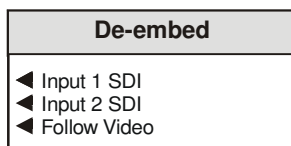
**O.K.** ► saves the memory name text and returns to the main menu.

**Audio**

This menu allows the audio processing functions to be set up.

**◀ De-embed**

This allows the audio signal to be selected for processing.

**◀ Input 1 SDI, Input 2 SDI**

This allows audio derived from either Input 1 SDI or Input 2 SDI to be selected for processing.

**◀ Follow Video**

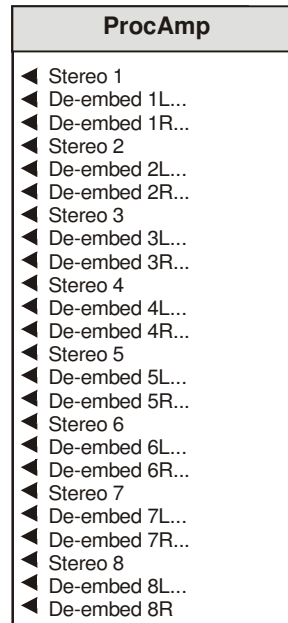
When selected the audio will be derived from the video input signal that has been selected for processing.

Non-PCM groups can be transparently passed but if a non-PCM group is selected for mixing or routing it will be automatically muted.

*If a Dolby header is detected in the data stream it will be processed as a non-PCM signal.*

**ProcAmp ▶**

This allows the control of Gain, Mute, and Polarity of de-embedded channels.

**◀ Stereo (1, 2, 3, 4, 5, 6, 7, 8)**

When selected the left and right channels will be configured as a stereo pair and any adjustments made to one channel will automatically be applied to both channels.

**◀ De-embed 1-8 L/R**

This allows the bus signals to be adjusted and configured.

**◀ Gain De-embed (1-8) Left/Right**

This allows the gain of the selected de-embedded signal to be adjusted.

The gain may be adjusted over a range of  $\pm 18$  dB in 0.1 dB steps. Preset is to 0 dB.

**◀ Invert**

When selected the signal polarity of the selected bus signal will be inverted.

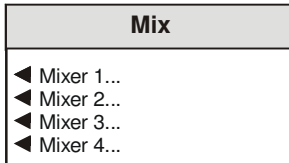
**◀ Mute**

When selected the selected bus signal will be muted.



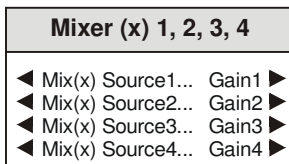
**Mix ▶**

There are four separate audio mixers Mix 1, 2, 3 and 4. The outputs of these mixers provide four extra input selections for the Channel Router. This menu allows each of the mixers to be selected and configured.



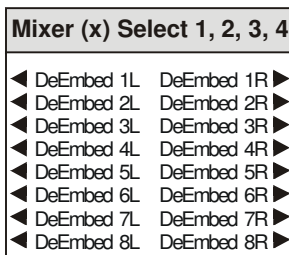
◀ Mixer 1, 2, 3 and 4

Each mixer has four inputs and this item allows the mixer input to be selected and the gain of that channel adjusted.



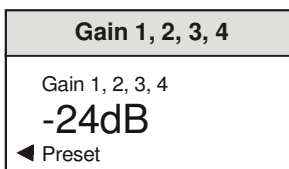
◀ Mixer 1, 2, 3 and 4 Source 1-4 (inputs)

This allows the signal source for the selected input of the selected mixer, to be chosen.



**Gain 1-4 ▶**

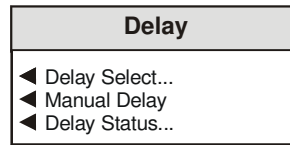
These are the individual gain controls that allow the mixing levels for each of the input signals, to be adjusted.



The range of adjustment is from 0 to -90 dB and to Off. 0 to -60 dB is in steps of 1 dB; -60 dB to -90 dB is in steps of 3 dB.

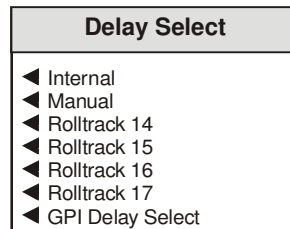
**Delay ▶**

This menu allows the amount of delay to be set and type of audio delay mechanism to be selected.



◀ Delay Select

This allows the type of audio delay mechanism to be selected. One or more of the types may be checked. The amount of delay applied will be the sum of the delay from the enabled delay mechanisms.



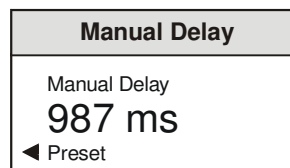
*Note that up to 0.5 s of delay may be applied from the sum of the **Internal + GPI + RollTrack** delay inputs.*

◀ Internal

When selected, an audio delay equal to the video delay in the unit will be applied.

◀ Manual

When selected an audio delay set by the **Manual Delay** control will be applied, immediately.



◀ RollTrack 14, 15, 16 and 17

The selected source(s) of the RollTrack input signal(s) will apply an audio delay, smoothly compensating.

Also see page 62.

◀ GPI Delay Select

When selected an audio delay will be applied that is equal to the width of the pulse arriving at the GPI connector.

*Note that an audio delay pulse of more than 500 ms, applied to the GPI Input will be treated as invalid. This will result in the GPI delay returning to zero.*

*Note that the GPI must be configured correctly for this function to operate. Please see page 60 for details.*

◀ Delay Status

The status (and amount) of delay produced by each of the delay methods may be chosen from this menu.

| Delay Status   |
|--|
| <ul style="list-style-type: none"> <li>◀ Internal</li> <li>◀ Manual</li> <li>◀ Rolltrack 14</li> <li>◀ Rolltrack 15</li> <li>◀ Rolltrack 16</li> <li>◀ Rolltrack 17</li> <li>◀ GPI Delay Display</li> <li>◀ Total Delay Display</li> </ul> |

◀ Status Items

The status (and amount) of delay of the chosen item will be displayed in this window.

| Status Items             |
|--------------------------|
| Status Items<br>xxxxxxxx |
| OK ▶                     |

**AES Output ▶**

This allows the AES signal source for the AES output to be selected.

| AES Output   |
|--|
| <ul style="list-style-type: none"> <li>◀ AES 1 Source</li> <li>◀ AES 2 Source</li> </ul> |

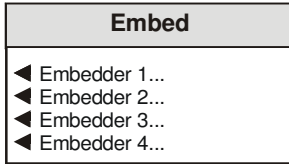
◀ AES 1 and 2 Source

This allows the signal from the AES source to be selected. Silence and audio test tones may also be selected.

| AES 1, 2 Source  |
|--|
| <ul style="list-style-type: none"> <li>◀ BUS A</li> <li>◀ BUS B</li> <li>◀ BUS C</li> <li>◀ BUS D</li> <li>◀ DeEmbed 1</li> <li>◀ DeEmbed 2</li> <li>◀ DeEmbed 3</li> <li>◀ DeEmbed 4</li> <li>◀ DeEmbed 5</li> <li>◀ DeEmbed 6</li> <li>◀ DeEmbed 7</li> <li>◀ DeEmbed 8</li> <li>◀ Test Tone</li> <li>◀ Silence</li> </ul> |

◀ **Embed**

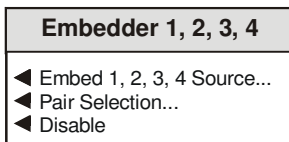
There are four embedders. This function sets up the embedder sources and destinations to be selected for each of these embedders.



This allows each of the embedders to be selected.

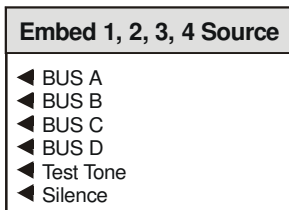
◀ **Embedder 1, 2, 3 and 4**

This allows the embedder functions to be selected.



◀ **Embed 1, 2, 3, and 4 Source**

This allows the source for the embedder to be selected.



◀ **BUS A, B, C and D**

The source may be derived from one of the three busses.

◀ **Test Tone**

The source will be a test tone derived from the **Setup/Audio Tone** menu.

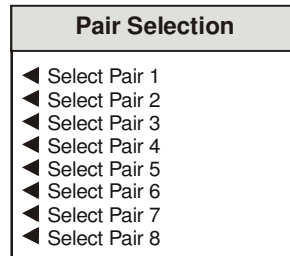
◀ **Silence**

The source will be silence.

For details of the Audio Embedding Packet Distribution please refer to Appendix 2 on page 85.

◀ **Pair Selection**

The destination for the embedded signal may be selected from the list.

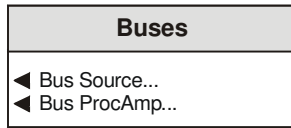


◀ **Disable**

When selected the embedder will be turned off, (for this embedder).

◀ **Buses**

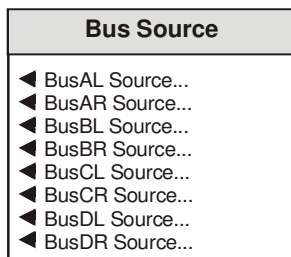
This function allows the inputs for the four audio buses of the router to be selected and adjusted.



For each bus any source may be for the left and right channels.

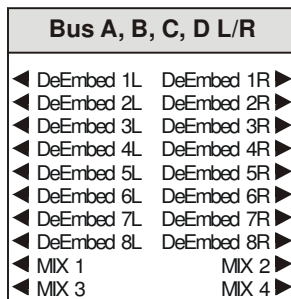
◀ **Bus Source**

This allows the bus source to be selected.



◀ **Bus (A-D) L/R Source**

This allows the audio source for the left and right channels of the bus to be selected.

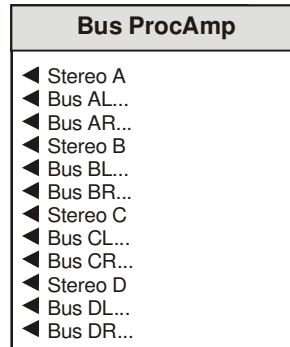


◀ **DeEmbed (1-8) L/R**

The audio source for the left and right channels of the bus may be selected from the De-Embedded signals or the output of one four mixers.

◀ **Bus ProcAmp**

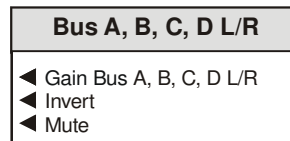
This allows the bus signals to be configured and adjusted.



◀ **Stereo (A, B, C, D)**

When selected the left and right channels will be configured as a stereo pair and any adjustments made to one channel will automatically be applied to both channels.

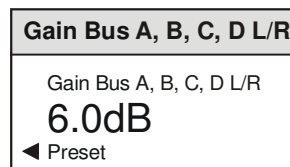
◀ **Bus (A, B, C, D) Left/Right**



This allows the bus signals to be adjusted and configured.

◀ **Gain Bus (A, B, C, D) Left/Right**

This allows the gain of the selected bus signal channel to be adjusted.



The gain may be adjusted over a range of ±18 dB in 0.1 dB steps. Preset is to 0 dB.

◀ **Invert**

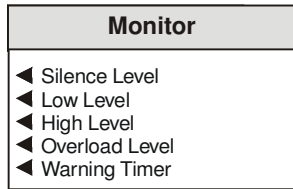
When selected the signal polarity of the selected bus signal will be inverted.

◀ **Mute**

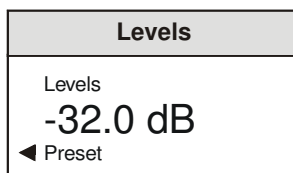
When selected the selected bus signal will be muted.

### ◀ Monitor

The four audio buses are monitored and level detectors provide status information and logging data.



### Levels



These levels may be adjusted by rotating the spinwheel.

### ◀ Silence Level

The level at which the signal is considered to have dropped to silence may be set with this control.

The range is from -80 dB to 0 dB in steps of 1 dB. Preset is to -70 dB.

### ◀ Low Level

The level at which the signal is considered to have dropped to a Low Level may be set with this control.

The range is from -80 dB to 0 dB in steps of 1 dB. Preset is to -60 dB.

### ◀ High Level

The level at which the signal is considered to have risen to a High Level may be set with this control.

The range is from -80 dB to 0 dB in steps of 1 dB. Preset is to -10 dB.

### ◀ Overload

The level at which the signal is considered to have risen to an Overload condition may be set with this control.

The range is from -80 dB to 0 dB in steps of 1 dB. Preset is to 0 dB.

### ◀ Warning Timer

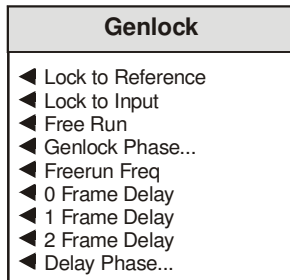
All the above monitoring facilities will only operate after a time interval set by this control. When OK it will operate immediately.



The range is from 1 to 20 seconds. Preset is to 10 seconds.

## Genlock

This allows the genlock and delay options to be selected.



### ◀ Lock to Reference

When selected and the unit will lock to the external reference signal.

### ◀ Lock to Input

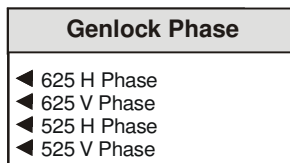
When selected and the unit will lock to the input video signal.

### ◀ Free Run

When selected the unit will not be locked to any input signals and the unit will free run.

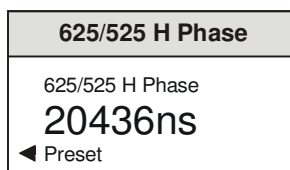
### ◀ Genlock Phase

This item allows the timing of the output signal relative to the reference sync signal to be adjusted



### ◀ 625/525 H(Horizontal) Phase

This item allows the horizontal timing of the output signal relative to the reference sync signal to be adjusted using the spinwheel by  $\pm \frac{1}{2}$  line in 37 ns steps.

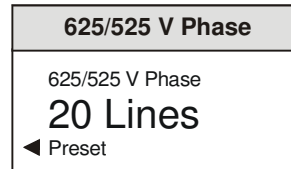


*Note that picture disturbance may occur while this setting is adjusted.*

Selecting Preset returns the setting to zero. (Output coincident with reference)

### ◀ 625/525 V(Vertical) Phase

This item allows the vertical timing of the output signal relative to the reference sync signal to be adjusted, in TV lines.

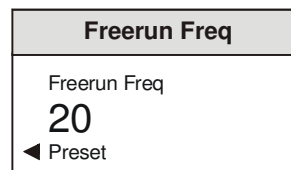


The spinwheel will adjust this value. Range is  $\pm 262$  lines (525 standard) or  $\pm 312$  lines (625 standard) in 1 line steps.

*Note that picture disturbance may occur while this setting is adjusted.*

Selecting Preset returns the setting to zero. (Output coincident with reference)

### ◀ Freerun Freq(ueency)



This allows the freerun frequency of the internal sync generator to be adjusted in steps of arbitrary units. Preset is to 0.

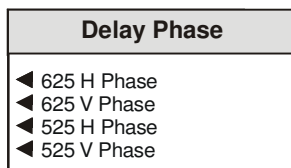
### ◀ 0, 1, 2 Frame Delay

The number of frames that the output signal will appear after the input signal may be set with these items.

*Note that this function is available in any genlock mode and will add to any other delay settings.*

### ◀ Delay Phase

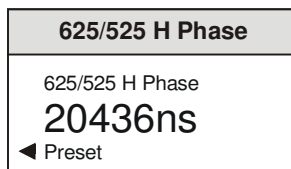
When these controls are used the output signal will appear after the input signal with a time delay. When not used the module will operate in the synchronize mode.



*Note that the delay functions are only active when the **Lock to Input** mode is selected.*

### ◀ 625/525 H(Horizontal) Phase

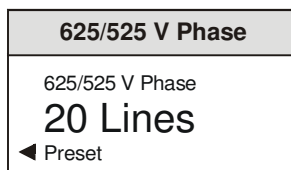
This item allows the horizontal timing of the output signal relative to the input signal to be adjusted by up to 1 line in 37 ns steps. The spinwheel will adjust this value.



Selecting Preset returns the setting to the minimum horizontal delay.

### ◀ 625/525 V(Vertical) Phase

This item allows the vertical timing of the output signal relative to the input signal to be adjusted, in TV lines. The spinwheel will adjust this value. Range is from 0 to 624 or 524 lines in 1 line steps.



Selecting Preset returns the setting to the minimum vertical delay.

**Setup**

◀ **Pattern**

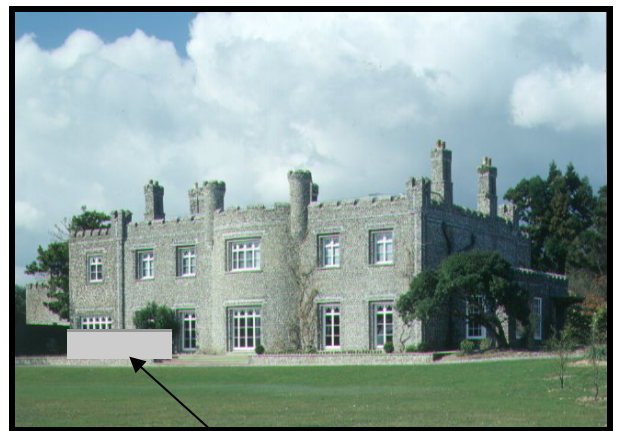
This function will allow various patterns to be used as the output signal.

| Pattern            |
|--------------------|
| ◀ Animated Pattern |
| ◀ Enable Pattern   |
| ◀ Black            |
| ◀ EBU Colour Bars  |
| ◀ 100% Colour Bars |
| ◀ Ramp             |
| ◀ Multiburst       |
| ◀ Pulse & Bar      |

◀ **Animated Pattern**

When selected, a monochrome rectangular area will appear on the output picture as shown opposite. The brightness of this rectangle will ramp from black, through gray to white and then directly to black over a period of about one second. This action will then be repeated continuously.

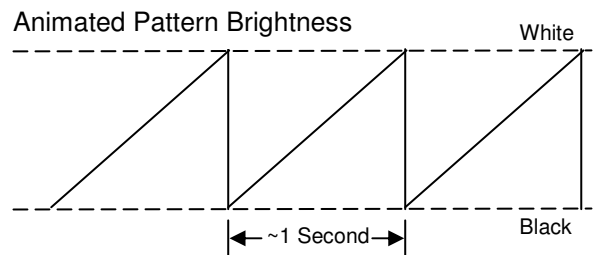
This pattern is useful for checking active video paths. Down stream equipment can see that video has not been frozen.



**Animated Pattern**

◀ **Enable Pattern**

When selected the output will become the pattern highlighted in the Pattern list.

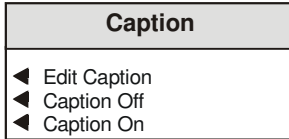




◀ **Caption**

This function allows control of the caption which may contain a maximum of 19 characters (white text on a black background).

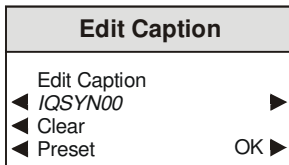
The caption will appear in the lower section of the picture.



**Caption Text**

◀ **Edit Caption**

This allows a caption to be edited.



To compile/edit the text the right ▶ and left ◀ buttons adjacent to the upper text line in the menu should be used to select the character position in the text and the spinwheel used to select the character.

The ◀ **Clear** function blanks the selected character.

The ◀ **Preset** function loads the default text, for example, **IQDMX00**.

**O.K.** ▶ saves the memory name text and returns to the main menu.

◀ **Caption Off**

When selected the caption will be turned off.

◀ **Caption On**

When selected the caption will be turned on.

◀ **Blanking**

Pass All ▶

This item allows the Vertical Interval data (all or specific lines) contained in the input signal to be blanked or passed through the module.

Selecting this item will select all vertical interval lines in the 625 line list and allow them to passed through to the output.

| Blanking         |  |
|------------------|--|
| ◀ VI Pass 525... |  |
| ◀ VI Pass 625... |  |
| ◀ Hanc Blank     |  |
| ◀ V Flag (OBD)   |  |

◀ Hanc Blank

When checked all horizontal data will be blanked, on the input. When unselected, passthrough operations will not alter audio packets for groups that the IQDMX00 has not selected for embedding. In order to allow minimum synchronization delay the created packets are output first and then the passthrough groups are placed after the created streams have been embedded. This means that passthrough is achieved without altering the input packet distribution. Passthrough operation has to take note of marked for deletion packets and these are removed where possible to ensure that one does not run out of useable ancillary space.

◀ VI Pass 525

This item allows lines 11 to 21 and lines 274 to 283 of 525 line signals to be selected and either passed (highlighted) to the output or blanked from the output.

For details of the HANC Data Handling please refer to Appendix 2 on page 85.

| VI Pass 525 |            |
|-------------|------------|
| ◀ Blank All | Pass All ▶ |
| ◀ Line 11   | Line 274 ▶ |
| to          | to         |
| ◀ Line 21   | Line 283 ▶ |

◀ V Flag (OBD)

This control allows the V(ertical) Flag to be changed from line 10 (OVD, Optional Video Data) to line 20 (OBD, Optional Blanking Data).

◀ Blank All

Selecting this item will select all vertical interval lines in the 525 line list and blank them from the output.

Pass All ▶

Un-highlighted selects OVD and highlighted selects OBD. The default is OVD selected.

Selecting this item will select all vertical interval lines in the 525 line list and allow them to passed through to the output.

*Note that this function is only active for 525 line signals.*

| VI Pass 625 |            |
|-------------|------------|
| ◀ Blank All | Pass All ▶ |
| ◀ Line 7    | Line 320 ▶ |
| to          | to         |
| ◀ Line 23   | Line 335 ▶ |

◀ VI Pass 625

This section allows lines 7 to 23 and lines 320 to 335 of 625 line signals to be selected and either passed (highlighted) to the output or blanked from the output.

◀ Blank All

Selecting this item will select all vertical interval lines in the 625 line list and blank them from the output.

◀ **Audio Tone**

The frequency of the Audio Test Tone may be set using this control. Left and right channels may be set to frequencys.

| Audio Tone   |
|--|
| ◀ Ident Enable<br>◀ Frequency<br>◀ Frequency R<br>◀ HeadRoom |

◀ **Ident Enable**

When selected the right channel will be identified by the signal being muted for 0.5 second every 2.5 seconds.

◀ **Frequency**

This adjusts the frequency of the test tone for both left and right channels.

| Frequency                                 |
|---|
| Frequency<br><b>8000.0 Hz</b><br>◀ Preset |

The range is from 100 Hz to 15 kHz in steps of 100 Hz. Preset is to 400 Hz.

◀ **Frequency R**

This adjusts the frequency of the test tone for the right channel only.

| Frequency R                                  |
|--|
| Frequency R<br><b>10000.0 Hz</b><br>◀ Preset |

The range is from 100 Hz to 15 kHz in steps of 100 Hz. Preset is to 400 Hz.

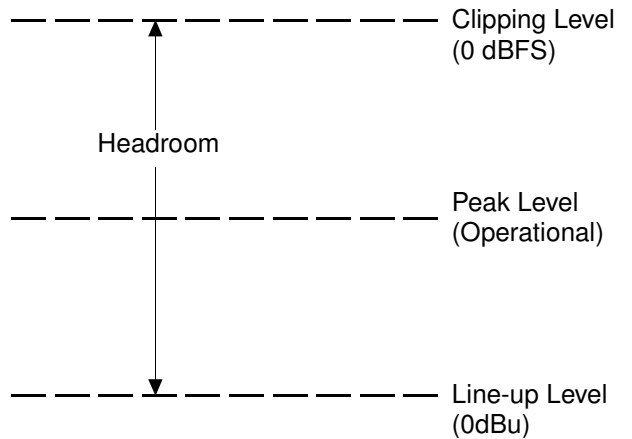
◀ **Headroom**

This allows the headroom to be set.

| HeadRoom                               |
|--|
| HeadRoom<br><b>18.0 dB</b><br>◀ Preset |

The range is from 4 dB to 24dB in 1 dB steps. Preset is to 18 dB.

*Note that in this product headroom is defined as:*



Headroom = Clipping Level – Line-up level

◀ **Slew Rate**

This is the time taken for the audio to slew when the audio mixing and routing controls have changed.

| Slew Rate  |
|--|
| ◀ Instant                      Fast ▶<br>◀ Medium                      Slow ▶<br>◀ Slowest |

The options are:

Instant ... The response is immediate

Slowest . Change takes approximately one second

Slow ..... Change takes 75% of Slowest time

Medium . Change takes 50% of Slowest time

Fast ..... Change takes 25% of Slowest time

◀ **Channel Status**

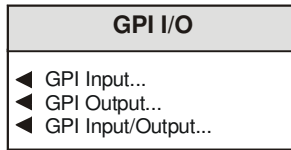
| Channel Status  |
|---|
| Channel Status<br>◀ 0 ▶<br>◀ Clear                      ▶<br>◀ Preset                      OK ▶ |

This will set the four character name used in the destination field of the audio channel status.

*Note that the Channel Status Origin data is automatically set by the module to DMX0 and cannot be changed.*

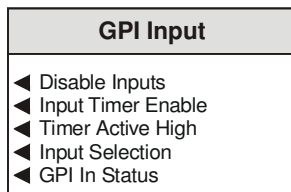
◀ **GPI/O**

This function allows the GPI functions to be configured and their actions defined.



◀ **GPI Input**

This item allows the GPI input functions to be configured.



◀ **Disable Inputs**

When selected all GPI input functions will be disabled.

◀ **Timer Enable**

When checked the GPI will be monitored. The width of the pulse represents the delay that can be used to control audio delays in this unit.

*Note that an audio delay pulse of more than 500 ms, applied to the GPI Input will be treated as invalid. This will result in the GPI delay returning to zero.*

◀ **Timer Active High**

When checked the GPI will measure the positive going pulse. When unchecked the negative pulse is measured.

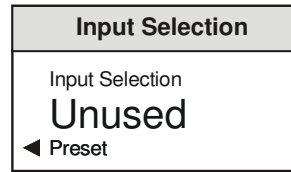
◀ **Out Active High**

Determines the sense of the asserted GPI output signal. When checked GPI is active the output sense is high. When unchecked the GPI is active low.

◀ **Input Selection**

When configured as an input the GPI connection may be used for accepting GPI information (from mechanical switch contacts, relay contacts etc.)

The resulting action that the unit takes may be selected using this item.

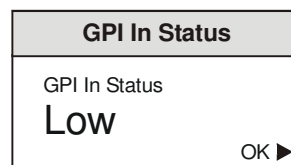


The GPI input functions that may be selected are as follows:

- Unused**      The unit will perform no function. This is also the Preset Setting.
- Pattern**      The unit will produce a pattern chosen from the Pattern menu when the input changes from open to closed.
- Memory 1 to 8**      The unit will use the settings in the selected memory location when the input changes from open to closed.
- Mem1-2**      The unit will toggle between the settings of memory locations 1 and 2. Open to Closed = Memory 1 settings. Closed to Open = Memory 2 settings
- Mem 3-4**      The unit will toggle between the settings of memory locations 3 and 4. Open to Closed = Memory 3 settings. Closed to Open = Memory 4 settings
- Mem 5-6**      The unit will toggle between the settings of memory locations 5 and 6. Open to Closed = Memory 5 settings. Closed to Open = Memory 6 settings
- Mem 7-8**      The unit will toggle between the settings of memory locations 7 and 8. Open to Closed = Memory 7 settings. Closed to Open = Memory 8 settings

◀ **GPI In Status**

This will display the current status of the selected GPI input.



This may show either High or Low. When low, the associated function will be triggered. On a transition, the associated function will be triggered.

### ◀ GPI Output

This item allows the GPI output functions to be configured.

| GPI Output   |
|--|
| <ul style="list-style-type: none"> <li>◀ Out Active High</li> <li>◀ Output Selection...</li> <li>◀ GPI Out Status</li> </ul> |

### ◀ Out Active High

This determines the sense of the asserted GPI output signal.

When selected the GPI is active the output sense is high. When unchecked the GPI is active low.

### ◀ Output Selection

The GPO may be configured to produce an output corresponding to one of the conditions highlighted in the list.

| Output Selection   |
|--|
| <ul style="list-style-type: none"> <li>◀ Input Present</li> <li>◀ Standard 625</li> <li>◀ Video Delay</li> <li>◀ Unused</li> </ul> |

The preset setting for the output is Unused.

When the condition is not true the output will float but when the condition is true the output is closed to ground via a transistor.

*Note that when video delay mode is selected the output is a negative going TTL pulse. The width of the pulse represents the video delay through the unit to the nearest millisecond.*

### ◀ GPI Out Status

This will display the current status of the GPI output.

| GPI Out Status                       |
|--------------------------------------|
| GPI Out Status<br><b>LOW</b><br>OK ► |

This may show either Unused, High, low or video delay in milliseconds.

### ◀ GPI I Input/Output

This allows the GPI port to be configured as an input or an output.

| GPI Input/Output |
|------------------|
| ◀ GPI/O 1        |

When selected the GPI is configured as an output. When unselected the GPI is configured as an input.

◀ RollTrack

This function allows information to be sent, via the RollCall™ network, to other compatible units connected on the same network. For example, it can enable compatible audio delay units to produce an audio delay dependent on this and other similar units. The audio delay unit will dynamically follow or track the received delay-time information. This allows processed video signals to be timed correctly with audio signals. This automatic tracking system via the RollCall™ network is call **RollTrack**.

| RollTrack           |
|---------------------|
| ◀ RollTrack Index   |
| ◀ RollTrack Source  |
| ◀ RollTrackDisable  |
| ◀ RollTrack Address |
| ◀ RollTrack Command |
| ◀ RollTrack Sending |
| ◀ RollTrack Status  |

For more detailed information, see the RollTrack section (Appendix) at the end of this manual.

◀ RollTrack Index

| RollTrack Index |
|-----------------|
| RollTrack Index |
| <b>10</b>       |
| ◀ Preset        |

This item is used to select which RollTrack Index is set up using the RollTrack Source, RollTrack Address and RollTrack Command functions. It allows up to 70 destinations to be selected.

◀ RollTrack Source

| RollTrack Source   |
|--------------------|
| RollTrack Source   |
| <b>Video Delay</b> |
| ◀ Preset           |

This allows the source of information that triggers the transmission of data to be selected.

Options are:

|                   |                 |
|-------------------|-----------------|
| Unused (off)      | De-embed 1 Lost |
| Input Present     | De-embed 1 PCM  |
| Input Missing     | De-embed 1 NPCM |
| Standard 525      | to              |
| Standard 625      | De-embed 8 Lost |
| Input 1 Present   | De-embed 8 PCM  |
| Input 1 Missing   | De-embed 8 NPCM |
| Standard 1 525    | GPI 1 Low       |
| Standard 1 625    | GPI 1 High      |
| Input 2 Present   | GPI 1 Inactive  |
| Input 2 Missing   |                 |
| Standard 2 525    |                 |
| Standard 2 625    |                 |
| Audio Delay       |                 |
| Video Delay       |                 |
| Reference Lost    |                 |
| Reference Present |                 |
| Reference Error   |                 |

Note that the GPI RollTrack functions should not be used when **GPI Timer Enable** is selected.

The destination for the information is set by the network code address.

### ◀ RollTrack Disable

When this item is selected all RollTrack items will be disabled.

### ◀ RollTrack Address

This item allows the address of the selected destination unit to be set.

| RollTrack Address |      |
|-------------------|------|
| RollTrack Address |      |
| ◀ 0 ▶             |      |
| ◀ Clear ▶         |      |
| ◀ Preset ▶        | OK ▶ |

To compile/edit the text the right ▶ and left ◀ buttons adjacent to the upper text line in the menu should be used to select the character position in the text and the spinwheel used to select the character.

The ◀ **Clear** function blanks the selected character.

The ◀ **Preset** function loads the default address. **O.K.** saves the address and returns to the main menu.

The full **RollTrack** address has four sets of numbers

For example: 0000:10:01\*362

The first set (0000) is the network segment code number

The second set (10) is the number identifying the (enclosure/mainframe) unit.

The third set (01) is the slot number in the unit

The Fourth Set (362)

Each RollCall unit has a unique identification embedded in the units' software. In this example 362 represents an IQDMX00, 412 would represent an IQDEC00, 161 a Mach 1 etc. Inserting this number in the RollTrack address ensures that only the correct type of unit (in this example an IQDMX00) will respond to the RollTrack command; any other unit will ignore the command.

If this number were set to 00 **any type** of unit at this location would respond to the RollTrack command, possibly causing unpredictable results.

The unit ID of a module on the RollCall network may be found under *RollCall Control Panel/RollCall Listing/Unit Information* or via the *RollCall Control Panel Help/About Current Unit* function.

### ◀ RollTrack Command

| RollTrack Command |      |
|-------------------|------|
| RollTrack Command |      |
| ◀ 0 ▶             |      |
| ◀ Clear ▶         |      |
| ◀ Preset ▶        | OK ▶ |

The full **RollTrack** command has two sets of numbers

For example: 84\*156

The first set (84) is the **RollTrack** command number

*Note that only command numbers 14, 15, 16 and 17 should be used for audio delay*

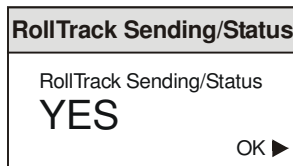
The second set (156) is the value sent with the **RollTrack** command number.

*Note that when video delay or audio delay is selected as the **RollTrack** source the value sent with the **RollTrack** command is the video delay value not the value set.*

*For details of the RollCall command values for specific units please contact your local Snell & Wilcox agent.*

#### ◀ RollTrack Sending

This item shows when the unit is actively sending the RollTrack command.



This may show:

|                     |  |
|---------------------|--|
| String              | A string value is always being sent.                                   |
| Number              | A number value is always being sent.                                   |
| No                  | The message is not being sent.   |
| Yes                 | The message is being sent.   |
| Internal Type Error | Inconsistent behavior; please contact your local Snell & Wilcox agent. |

#### ◀ RollTrack Status

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

This may show:

|         |   |
|---------|---|
| OK      | RollTrack message sent and received OK.   |
| Unknown | Rolltrack message has been sent but it has not yet completed.   |
| Timeout | RollTrack message sent but acknowledgement not received. This could be because the destination unit is not at the location specified.                   |
| Error   | Rolltrack message has not been correctly acknowledged at the destination unit. This could be because the destination unit is not of the type specified. |



◀ Logging

Information about up to 25 parameters can be made available to a logging device that is attached to the RollCall™ network by selecting the appropriate item.

| Logging      |
|--------------|
| ◀ Input      |
| ◀ Std        |
| ◀ Input1     |
| ◀ Std1       |
| ◀ Input2     |
| ◀ Std2       |
| ◀ Reference  |
| ◀ EDH        |
| ◀ EDH Errors |
| ◀ Rolltrack  |
| ◀ De-embed 1 |
| ◀ De-embed 2 |
| ◀ De-embed 3 |
| ◀ De-embed 4 |
| ◀ De-embed 5 |
| ◀ De-embed 6 |
| ◀ De-embed 6 |
| ◀ De-embed 7 |
| ◀ nPCM 1     |
| ◀ nPCM 2     |
| ◀ nPCM 3     |
| ◀ nPCM 4     |
| ◀ nPCM 5     |
| ◀ nPCM 6     |
| ◀ nPCM 7     |
| ◀ nPCM 8     |
| ◀ Audio      |
| ◀ Non PCM    |
| ◀ Bus AL     |
| ◀ Bus AR     |
| ◀ Bus BL     |
| ◀ Bus BR     |
| ◀ Bus CL     |
| ◀ Bus CR     |
| ◀ Bus DL     |
| ◀ Bus DR     |
| ◀ Fault      |

Any of the items may be selected from the list.

◀ Logging Status

| Logging Status |
|----------------|
| ◀ INPUT=       |
| ◀ STD=         |
| ◀ INPUT1=      |
| ◀ STD1=        |
| ◀ INPUT2=      |
| ◀ STD2=        |
| ◀ EXTREF=      |
| ◀ EDH=         |
| ◀ ERRSEC=      |
| ◀ ROLLTRACK=   |
| ◀ DEEMBED1=    |
| ◀ DEEMBED2=    |
| ◀ DEEMBED3=    |
| ◀ DEEMBED4=    |
| ◀ DEEMBED5=    |
| ◀ DEEMBED6=    |
| ◀ DEEMBED7=    |
| ◀ DEEMBED8=    |
| ◀ NPCM1=       |
| ◀ NPCM2=       |
| ◀ NPCM3=       |
| ◀ NPCM4=       |
| ◀ NPCM5=       |
| ◀ NPCM6=       |
| ◀ NPCM7=       |
| ◀ NPCM8=       |
| ◀ BUS1=        |
| ◀ BUS2=        |
| ◀ BUS3=        |
| ◀ BUS4=        |
| ◀ BUS5=        |
| ◀ BUS6=        |
| ◀ BUS7=        |
| ◀ BUS8=        |
| ◀ FAULT=       |

This will show the status of the selected item.

| Logging Status Items             |
|----------------------------------|
| Logging Status Items<br>xxxxxxxx |
| OK ▶                             |

### ROLLCALL LOG FIELDS

*\*Note that these log values are either for future use or may be logged during a transitional state whilst acquiring or loosing an input signal. It is very unlikely that these states and the associated log values will become permanent.*

| Log Field   | Log Value                              | Description  |
|-------------|--|--|
| INPUT=      | OK<br>ERR*<br>LOST                     | Valid input signal<br>Invalid input signal<br>Input signal lost  |
| STD=        | UNKNOWN*<br>STDERR<br>525<br>625       | Input signal standard not recognized or no signal<br>Not a selected input standard<br>Input standard 525<br>Input standard 625   |
| INPUT1=     | OK<br>ERR*<br>LOST                     | Valid input signal<br>Invalid input signal<br>Input signal lost  |
| STD1=       | ERR<br>525<br>625                      | Not a selected input standard<br>Input standard 525<br>Input standard 625  |
| INPUT2=     | OK<br>ERR*<br>LOST                     | Valid input signal<br>Invalid input signal<br>Input signal lost  |
| STD2=       | ERR<br>525<br>625                      | Not a selected input standard<br>Input standard 525<br>Input standard 625  |
| EXTREF=     | NONE<br>525<br>ERROR<br>WARNING<br>625 | No reference signal present<br>Valid 525 reference signal<br>Reference/Output standard mismatch<br>Reference signal available but not selected<br>Valid 625 reference signal |
| EDH=        | NONE<br>FAIL<br>OK<br>RESET            | The unit is not locked to the input signal<br>EDH errors have been found on the input signal<br>No EDH errors found on the input signal<br>EDH statistics have been reset    |
| ERRSEC=     | Runtime string                         | The time since EDH was reset in seconds  |
| ROL_STATES= | OK<br>FAIL                             | RollTrack message sent and received OK<br>RollTrack message not acknowledged   |
| DEEMBED_1=  | NONE<br>OK                             | Nothing present on pair 1<br>Embedded pair 1 present on selected SDI input   |
| DEEMBED_2=  | NONE<br>OK                             | Nothing present on pair 2<br>Embedded pair 2 present on selected SDI input   |
| DEEMBED_3=  | NONE<br>OK                             | Nothing present on pair 3<br>Embedded pair 3 present on selected SDI input   |
| DEEMBED_4=  | NONE<br>OK                             | Nothing present on pair 4<br>Embedded pair 4 present on selected SDI input   |
| DEEMBED_5=  | NONE<br>OK                             | Nothing present on pair 5<br>Embedded pair 5 present on selected SDI input   |
| DEEMBED_6=  | NONE<br>OK                             | Nothing present on pair 6<br>Embedded pair 6 present on selected SDI input   |
| DEEMBED_7=  | NONE<br>OK                             | Nothing present on pair 7<br>Embedded pair 7 present on selected SDI input   |
| DEEMBED_8=  | NONE<br>OK                             | Nothing present on pair 8<br>Embedded pair 8 present on selected SDI input   |

| Log Field | Log Value      | Description   |
|-----------|----------------|---|
| NPCM_1=   | NONE<br>OK     | Non-PCM not present on pair 1 of selected SDI input<br>Non-PCM present on pair 1 of selected SDI input  |
| NPCM_2=   | NONE<br>OK     | Non-PCM not present on pair 2 of selected SDI input<br>Non-PCM present on pair 2 of selected SDI input  |
| NPCM_3=   | NONE<br>OK     | Non-PCM not present on pair 3 of selected SDI input<br>Non-PCM present on pair 3 of selected SDI input  |
| NPCM_4=   | NONE<br>OK     | Non-PCM not present on pair 4 of selected SDI input<br>Non-PCM present on pair 4 of selected SDI input  |
| NPCM_5=   | NONE<br>OK     | Non-PCM not present on pair 5 of selected SDI input<br>Non-PCM present on pair 5 of selected SDI input  |
| NPCM_6=   | NONE<br>OK     | Non-PCM not present on pair 6 of selected SDI input<br>Non-PCM present on pair 6 of selected SDI input  |
| NPCM_7=   | NONE<br>OK     | Non-PCM not present on pair 7 of selected SDI input<br>Non-PCM present on pair 7 of selected SDI input  |
| NPCM_8=   | NONE<br>OK     | Non-PCM not present on pair 8 of selected SDI input<br>Non-PCM present on pair 8 of selected SDI input  |
| BUS_AL=   | OK<br>WARNING  | Router BUS A Left channel has valid signal selected<br>Router BUS A Left channel is receiving silence, low level, high level or overload signal   |
| BUS_AR=   | OK<br>WARNING  | Router BUS A Right channel has valid signal selected<br>Router BUS A Right channel is receiving silence, low level, high level or overload signal |
| BUS_BL=   | OK<br>WARNING  | Router BUS B Left channel has valid signal selected<br>Router BUS B Left channel is receiving silence, low level, high level or overload signal   |
| BUS_BR=   | OK<br>WARNING  | Router BUS B Right channel has valid signal selected<br>Router BUS B Right channel is receiving silence, low level, high level or overload signal |
| BUS_CL=   | OK<br>WARNING  | Router BUS C Left channel has valid signal selected<br>Router BUS C Left channel is receiving silence, low level, high level or overload signal   |
| BUS_CR=   | OK<br>WARNING  | Router BUS C Right channel has valid signal selected<br>Router BUS C Right channel is receiving silence, low level, high level or overload signal |
| BUS_DL=   | OK<br>WARNING  | Router BUS D Left channel has valid signal selected<br>Router BUS D Left channel is receiving silence, low level, high level or overload signal   |
| BUS_DR=   | OK<br>WARNING  | Router BUS D Right channel has valid signal selected<br>Router BUS D Right channel is receiving silence, low level, high level or overload signal |
| FAULT=    | NONE<br>FAIL   | No Internal errors detected<br>Internal error detected  |
| SN=       | Runtime string | Serial number of unit   |

### ◀ Information Window

| Information Window   |
|----------------------|
| ◀ Input Status       |
| ◀ EDH & ANC Status   |
| ◀ Audio Input Status |
| ◀ Reset Errors       |

The type of information that appears in the Information Window may be chosen with this item.

### ◀ Reset Errors

Selecting this function will reset the EDH error count and the timer shown in the information window, to zero.

### ◀ Default Output

If the input signal fails or is of poor quality this function will determine what the output signal will become under such conditions.

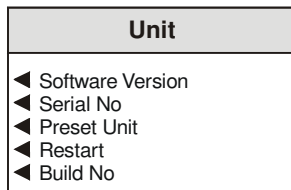
| Default Output     |
|--------------------|
| ◀ Video            |
| ◀ Freeze           |
| ◀ Pattern          |
| ◀ Black            |
| ◀ EBU Colour Bars  |
| ◀ 100% Colour Bars |
| ◀ Ramp             |
| ◀ Multiburst       |
| ◀ Pulse & Bar      |

### ◀ Pattern

If Pattern is chosen in the **Default Output** menu the output will become the pattern chosen from the list.

**◀ Unit**

This provides various items of information about the unit.

**◀ Software Version**

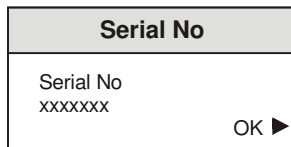
This item reveals a display showing the version of the software fitted in the module.



Select OK to return to the Unit Menu.

**◀ Serial No**

This item reveals a display showing the serial number of the module.



Select OK to return to the Unit Menu.

**◀ Preset Unit**

Selecting this item sets all adjustment functions that include a preset facility, to their preset values.

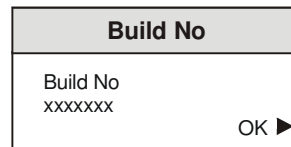
*Note that this is a momentary action.*

**◀ Restart**

This will reboot the unit simulating a power-down power-up cycle restoring power-up settings.

**◀ Build No**

This will indicate the factory build number. This number defines all parameters of the unit (software versions, build level etc.) for identification purposes.



Select OK to return to the Unit Menu.

I

## IQDMX00 RollCall Commands

## Supervisor Level

| Command No. |      | Command Name     | Values   |
|-------------|------|------------------|--|
| Hex         | Dec  |                  |  |
| 0001        | 1    | Serial No        | Static Display (no control)  |
| 0002        | 2    | Software Version | Static Display (no control)  |
| 0003        | 3    | <RETURN>         | 1=Preset Unit  |
| 0004        | 4    | <RETURN>         | 1=Restart  |
| 0005        | 5    | Build No         | Static Display (no control)  |
| 000E        | 14   | Rolltrack 14     | Static Display (no control)  |
| 000F        | 15   | Rolltrack 15     | Static Display (no control)  |
| 0010        | 16   | Rolltrack 16     | Static Display (no control)  |
| 0011        | 17   | Rolltrack 17     | Static Display (no control)  |
| 040B        | 1035 | Enable Pattern   | clear=0 set=1 (toggle=2)   |
| 040C        | 1036 | <RETURN>         | 0=Black 1=EBU Colour Bars 2=100%<br>Colour Bars 3=Ramp<br>4=Multiburst 5=Pulse & Bar |
| 040D        | 1037 | <RETURN>         | 0=Caption Off 1=Caption On   |
| 040E        | 1038 | <RETURN>         | 0=Black 1=EBU Colour Bars 2=100%<br>Colour Bars 3=Ramp<br>4=Multiburst 5=Pulse & Bar |
| 0411        | 1041 | Edit Caption     | Edit String  |
| 0419        | 1049 | <RETURN>         | 0=Lock to Reference 1=Lock to Input 2=Free<br>Run                                    |
| 041A        | 1050 | 625 H Phase      | min=-31999968 max=31962931 Step=37037 Div=1000                                       |
| 041B        | 1051 | 625 V Phase      | min=-312 max=312 Step=1  |
| 041C        | 1052 | 525 H Phase      | min=-31777746 max=31740709 Step=37037 Div=1000                                       |
| 041D        | 1053 | 525 V Phase      | min=-262 max=262 Step=1  |
| 0424        | 1060 | Input            | clear=0 set=1 (toggle=2)   |
| 0425        | 1061 | Std              | clear=0 set=1 (toggle=2)   |
| 0426        | 1062 | Reference        | clear=0 set=1 (toggle=2)   |
| 0428        | 1064 | EDH              | clear=0 set=1 (toggle=2)   |
| 042D        | 1069 | Fault            | clear=0 set=1 (toggle=2)   |
| 042E        | 1070 | EDH Errors       | clear=0 set=1 (toggle=2)   |
| 0446        | 1094 | Input1           | clear=0 set=1 (toggle=2)   |
| 0447        | 1095 | Input2           | clear=0 set=1 (toggle=2)   |
| 0449        | 1097 | Std1             | clear=0 set=1 (toggle=2)   |
| 044A        | 1098 | Std2             | clear=0 set=1 (toggle=2)   |
| 0452        | 1106 | RollTrack        | clear=0 set=1 (toggle=2)   |
| 0458        | 1112 | Bus AL           | clear=0 set=1 (toggle=2)   |
| 0459        | 1113 | Bus AR           | clear=0 set=1 (toggle=2)   |
| 045A        | 1114 | Bus BL           | clear=0 set=1 (toggle=2)   |
| 045B        | 1115 | Bus BR           | clear=0 set=1 (toggle=2)   |
| 045C        | 1116 | Bus CL           | clear=0 set=1 (toggle=2)   |
| 045D        | 1117 | Bus CR           | clear=0 set=1 (toggle=2)   |
| 045E        | 1118 | Bus DL           | clear=0 set=1 (toggle=2)   |
| 045F        | 1119 | Bus DR           | clear=0 set=1 (toggle=2)   |
| 0460        | 1120 | De-embed 1       | clear=0 set=1 (toggle=2)   |
| 0461        | 1121 | De-embed 2       | clear=0 set=1 (toggle=2)   |
| 0462        | 1122 | De-embed 3       | clear=0 set=1 (toggle=2)   |
| 0463        | 1123 | De-embed 4       | clear=0 set=1 (toggle=2)   |
| 0464        | 1124 | De-embed 5       | clear=0 set=1 (toggle=2)   |
| 0465        | 1125 | De-embed 6       | clear=0 set=1 (toggle=2)   |
| 0466        | 1126 | De-embed 7       | clear=0 set=1 (toggle=2)   |
| 0467        | 1127 | De-embed 8       | clear=0 set=1 (toggle=2)   |
| 0468        | 1128 | nPCM 1           | clear=0 set=1 (toggle=2)   |
| 0469        | 1129 | nPCM 2           | clear=0 set=1 (toggle=2)   |
| 046A        | 1130 | nPCM 3           | clear=0 set=1 (toggle=2)   |
| 046B        | 1131 | nPCM 4           | clear=0 set=1 (toggle=2)   |
| 046C        | 1132 | nPCM 5           | clear=0 set=1 (toggle=2)   |
| 046D        | 1133 | nPCM 6           | clear=0 set=1 (toggle=2)   |
| 046E        | 1134 | nPCM 7           | clear=0 set=1 (toggle=2)   |
| 046F        | 1135 | nPCM 8           | clear=0 set=1 (toggle=2)   |
| 04B2        | 1202 | <RETURN>         | 1=Video 2=Freeze 3=Pattern   |
| 04B8        | 1208 | Freeze           | clear=0 set=1 (toggle=2)   |
| 04BB        | 1211 | Line 11          | clear=0 set=1 (toggle=2)   |
| 04BC        | 1212 | Line 12          | clear=0 set=1 (toggle=2)   |
| 04BD        | 1213 | Line 13          | clear=0 set=1 (toggle=2)   |
| 04BE        | 1214 | Line 14          | clear=0 set=1 (toggle=2)   |
| 04BF        | 1215 | Line 15          | clear=0 set=1 (toggle=2)   |
| 04C0        | 1216 | Line 16          | clear=0 set=1 (toggle=2)   |
| 04C1        | 1217 | Line 17          | clear=0 set=1 (toggle=2)   |
| 04C2        | 1218 | Line 18          | clear=0 set=1 (toggle=2)   |
| 04C3        | 1219 | Line 19          | clear=0 set=1 (toggle=2)   |
| 04C4        | 1220 | Line 20          | clear=0 set=1 (toggle=2)   |
| 04C5        | 1221 | Line 21          | clear=0 set=1 (toggle=2)   |

|      |      |                   |                             |
|------|------|-------------------|-----------------------------|
| 04CF | 1231 | Line 274          | clear=0 set=1 (toggle=2)    |
| 04D0 | 1232 | Line 275          | clear=0 set=1 (toggle=2)    |
| 04D1 | 1233 | Line 276          | clear=0 set=1 (toggle=2)    |
| 04D2 | 1234 | Line 277          | clear=0 set=1 (toggle=2)    |
| 04D3 | 1235 | Line 278          | clear=0 set=1 (toggle=2)    |
| 04D4 | 1236 | Line 279          | clear=0 set=1 (toggle=2)    |
| 04D5 | 1237 | Line 280          | clear=0 set=1 (toggle=2)    |
| 04D6 | 1238 | Line 281          | clear=0 set=1 (toggle=2)    |
| 04D7 | 1239 | Line 282          | clear=0 set=1 (toggle=2)    |
| 04D8 | 1240 | Line 283          | clear=0 set=1 (toggle=2)    |
| 04E3 | 1251 | Line 7            | clear=0 set=1 (toggle=2)    |
| 04E4 | 1252 | Line 8            | clear=0 set=1 (toggle=2)    |
| 04E5 | 1253 | Line 9            | clear=0 set=1 (toggle=2)    |
| 04E6 | 1254 | Line 10           | clear=0 set=1 (toggle=2)    |
| 04E7 | 1255 | Line 11           | clear=0 set=1 (toggle=2)    |
| 04E8 | 1256 | Line 12           | clear=0 set=1 (toggle=2)    |
| 04E9 | 1257 | Line 13           | clear=0 set=1 (toggle=2)    |
| 04EA | 1258 | Line 14           | clear=0 set=1 (toggle=2)    |
| 04EB | 1259 | Line 15           | clear=0 set=1 (toggle=2)    |
| 04EC | 1260 | Line 16           | clear=0 set=1 (toggle=2)    |
| 04ED | 1261 | Line 17           | clear=0 set=1 (toggle=2)    |
| 04EE | 1262 | Line 18           | clear=0 set=1 (toggle=2)    |
| 04EF | 1263 | Line 19           | clear=0 set=1 (toggle=2)    |
| 04F0 | 1264 | Line 20           | clear=0 set=1 (toggle=2)    |
| 04F1 | 1265 | Line 21           | clear=0 set=1 (toggle=2)    |
| 04F2 | 1266 | Line 22           | clear=0 set=1 (toggle=2)    |
| 04F3 | 1267 | Line 23           | clear=0 set=1 (toggle=2)    |
| 04F8 | 1272 | Line 320          | clear=0 set=1 (toggle=2)    |
| 04F9 | 1273 | Line 321          | clear=0 set=1 (toggle=2)    |
| 04FA | 1274 | Line 322          | clear=0 set=1 (toggle=2)    |
| 04FB | 1275 | Line 323          | clear=0 set=1 (toggle=2)    |
| 04FC | 1276 | Line 324          | clear=0 set=1 (toggle=2)    |
| 04FD | 1277 | Line 325          | clear=0 set=1 (toggle=2)    |
| 04FE | 1278 | Line 326          | clear=0 set=1 (toggle=2)    |
| 04FF | 1279 | Line 327          | clear=0 set=1 (toggle=2)    |
| 0500 | 1280 | Line 328          | clear=0 set=1 (toggle=2)    |
| 0501 | 1281 | Line 329          | clear=0 set=1 (toggle=2)    |
| 0502 | 1282 | Line 330          | clear=0 set=1 (toggle=2)    |
| 0503 | 1283 | Line 331          | clear=0 set=1 (toggle=2)    |
| 0504 | 1284 | Line 332          | clear=0 set=1 (toggle=2)    |
| 0505 | 1285 | Line 333          | clear=0 set=1 (toggle=2)    |
| 0506 | 1286 | Line 334          | clear=0 set=1 (toggle=2)    |
| 0507 | 1287 | Line 335          | clear=0 set=1 (toggle=2)    |
| 050F | 1295 | <VI Pass 625>     | 1=Pass All                  |
| 0510 | 1296 | <VI Pass 625>     | 1=Blank All                 |
| 0511 | 1297 | <VI Pass 525>     | 1=Pass All                  |
| 0512 | 1298 | <VI Pass 525>     | 1=Blank All                 |
| 057D | 1405 | 525               | clear=0 set=1 (toggle=2)    |
| 057E | 1406 | 625               | clear=0 set=1 (toggle=2)    |
| 05D7 | 1495 | RollTrack Index   | min=0 max=15 Step=1         |
| 05D8 | 1496 | RollTrack Source  | min=-1 max=8 Step=1         |
| 05D9 | 1497 | RollTrack Address | Edit String                 |
| 05DA | 1498 | RollTrack Command | Edit String                 |
| 05E7 | 1511 | RollTrack Status  | Static Display (no control) |
| 05E9 | 1513 | RollTrack Disable | clear=0 set=1 (toggle=2)    |
| 05EA | 1514 | RollTrack Sending | Static Display (no control) |
| 0640 | 1600 | <Memory 1>        | 1=Save 1                    |
| 0641 | 1601 | <Memory 1>        | 1=Recall 1                  |
| 0642 | 1602 | <Memory 1>        | 1=Clear 1                   |
| 0643 | 1603 | Name 1            | Edit String                 |
| 0644 | 1604 | <Memory 2>        | 1=Save 2                    |
| 0645 | 1605 | <Memory 2>        | 1=Recall 2                  |
| 0646 | 1606 | <Memory 2>        | 1=Clear 2                   |
| 0647 | 1607 | Name 2            | Edit String                 |
| 0648 | 1608 | <Memory 3>        | 1=Save 3                    |
| 0649 | 1609 | <Memory 3>        | 1=Recall 3                  |
| 064A | 1610 | <Memory 3>        | 1=Clear 3                   |
| 064B | 1611 | Name 3            | Edit String                 |
| 064C | 1612 | <Memory 4>        | 1=Save 4                    |
| 064D | 1613 | <Memory 4>        | 1=Recall 4                  |
| 064E | 1614 | <Memory 4>        | 1=Clear 4                   |
| 064F | 1615 | Name 4            | Edit String                 |
| 0650 | 1616 | <Memory 5>        | 1=Save 5                    |
| 0651 | 1617 | <Memory 5>        | 1=Recall 5                  |
| 0652 | 1618 | <Memory 5>        | 1=Clear 5                   |
| 0653 | 1619 | Name 5            | Edit String                 |
| 0654 | 1620 | <Memory 6>        | 1=Save 6                    |
| 0655 | 1621 | <Memory 6>        | 1=Recall 6                  |
| 0656 | 1622 | <Memory 6>        | 1=Clear 6                   |
| 0657 | 1623 | Name 6            | Edit String                 |
| 0658 | 1624 | <Memory 7>        | 1=Save 7                    |

```

0659 1625 <Memory 7>          1=Recall 7
065A 1626 <Memory 7>          1=Clear 7
065B 1627 Name 7              Edit String
065C 1628 <Memory 8>          1=Save 8
065D 1629 <Memory 8>          1=Recall 8
065E 1630 <Memory 8>          1=Clear 8
065F 1631 Name 8              Edit String
077B 1915 <RETURN>           0=Input Status      1=EDH & ANC Status    2=Audio
                                Input Status
07DB 2011 Input Selection      min=-1      max=12      Step=1
07DD 2013 <Output Selection>   0=Input Present    1=Standard 625      2=Video
                                Delay        3=Unused
07DE 2014 GPI/O 1             clear=0 set=1 (toggle=2)
0800 2048 GPI In Status        Static Display (no control)
0801 2049 GPI Out Status       Static Display (no control)
08CB 2251 <RETURN>           0=Input 1 SDI      1=Input 2 SDI
0991 2449 Freerun Freq         min=-60      max=60      Step=1
09B7 2487 Frequency           min=100     max=15000   Step=100
09B8 2488 Frequency R         min=100     max=15000   Step=100
09B9 2489 Ident Enable        clear=0 set=1 (toggle=2)
09D5 2517 Low Level           min=-96     max=0       Step=1
09D6 2518 Warning Timer       min=1       max=20      Step=1
09E3 2531 <Pair Selection>     0=Select Pair 1    1=Select Pair 2      2=Select
                                Pair 3          3=Select Pair 4
                                4=Select Pair 5    5=Select Pair 6      6=Select
09E4 2532 <Pair Selection>     0=Select Pair 1    1=Select Pair 2      2=Select
                                Pair 3          3=Select Pair 4
                                4=Select Pair 5    5=Select Pair 6      6=Select
09E5 2533 <Pair Selection>     0=Select Pair 1    1=Select Pair 2      2=Select
                                Pair 3          3=Select Pair 4
                                4=Select Pair 5    5=Select Pair 6      6=Select
09E6 2534 <Pair Selection>     0=Select Pair 1    1=Select Pair 2      2=Select
                                Pair 3          3=Select Pair 4
                                4=Select Pair 5    5=Select Pair 6      6=Select
09ED 2541 Disable              clear=0 set=1 (toggle=2)
09EE 2542 Disable              clear=0 set=1 (toggle=2)
09EF 2543 Disable              clear=0 set=1 (toggle=2)
09F0 2544 Disable              clear=0 set=1 (toggle=2)
0A07 2567 Internal            clear=0 set=1 (toggle=2)
0A08 2568 Manual              clear=0 set=1 (toggle=2)
0A09 2569 Rolltrack 14        clear=0 set=1 (toggle=2)
0A0A 2570 Rolltrack 15        clear=0 set=1 (toggle=2)
0A0B 2571 Rolltrack 16        clear=0 set=1 (toggle=2)
0A0C 2572 Rolltrack 17        clear=0 set=1 (toggle=2)
0A0D 2573 Manual Delay        min=-40     max=1500    Step=1
0A0D 2573 Manual              Static Display (no control)
0A0E 2574 Internal            Static Display (no control)
0A2D 2605 Disable Inputs      clear=0 set=1 (toggle=2)
0A92 2706 Chroma Gain         min=-60     max=60      Step=1      Div=10 Units=dB
0A93 2707 Luma Gain           min=-60     max=60      Step=1      Div=10 Units=dB
0A94 2708 Black Level         min=-1000   max=1000    Step=8      Div=10 Units=mV
0A95 2709 Picture Position    min=-592    max=592     Step=148
0A96 2710 Chroma Gain         min=-60     max=60      Step=1      Div=10 Units=dB
0A97 2711 Luma Gain           min=-60     max=60      Step=1      Div=10 Units=dB
0A98 2712 Black Level         min=-1000   max=1000    Step=8      Div=10 Units=mV
0A99 2713 Picture Position    min=-592    max=592     Step=148
0B30 2864 In1 ProcAmp Enable   clear=0 set=1 (toggle=2)
0B31 2865 In2 ProcAmp Enable   clear=0 set=1 (toggle=2)
0B36 2870 RollTrack Index     min=0       max=15      Step=1
0B37 2871 RollTrack Source     min=-1      max=8       Step=1
0B38 2872 RollTrack Address    Edit String
0B39 2873 RollTrack Command    Edit String
0B3B 2875 Input Selection      min=-1      max=12      Step=1
0B3D 2877 <Output Selection>   0=Input Present    1=Standard 625      2=Video
                                Delay        3=Unused
0B6B 2923 <RETURN>           0=Input 1 SDI      1=Input 2 SDI      2=Follow Video
0B6C 2924 Y/C Timing           min=-592    max=592     Step=148
0B6D 2925 Y/C Timing           min=-592    max=592     Step=148
0B7C 2940 Animated Pattern     clear=0 set=1 (toggle=2)
0B7D 2941 <Embed 1 Source>     0=BUS A          1=BUS B          2=BUS C
                                3=BUS D
                                4=Test tone      5=Silence
0B7E 2942 <Embed 2 Source>     0=BUS A          1=BUS B          2=BUS C
                                3=BUS D
                                4=Test tone      5=Silence
0B7F 2943 <Embed 3 Source>     0=BUS A          1=BUS B          2=BUS C
                                3=BUS D

```



|      |      |                     |   |                            |                             |
|------|------|---------------------|---|----------------------------|-----------------------------|
| 0B80 | 2944 | <Embed 4 Source>    | 4=Test tone<br>0=BUS A<br>3=BUS D                         | 5=Silence<br>1=BUS B       | 2=BUS C                     |
| 0B87 | 2951 | <AES 1 Source>      | 4=Test tone<br>0=BUS A<br>3=BUS D                         | 5=Silence<br>1=BUS B       | 2=BUS C                     |
|      |      |                     | 4=DeEmbed 1<br>7=DeEmbed 4<br>8=DeEmbed 5<br>11=DeEmbed 8 | 5=DeEmbed 2<br>9=DeEmbed 6 | 6=DeEmbed 3<br>10=DeEmbed 7 |
| 0B88 | 2952 | <AES 2 Source>      | 12=Test tone<br>0=BUS A<br>3=BUS D                        | 13=Silence<br>1=BUS B      | 2=BUS C                     |
|      |      |                     | 4=DeEmbed 1<br>7=DeEmbed 4<br>8=DeEmbed 5<br>11=DeEmbed 8 | 5=DeEmbed 2<br>9=DeEmbed 6 | 6=DeEmbed 3<br>10=DeEmbed 7 |
| 0B9B | 2971 | Hanc Blank          | 12=Test tone  | 13=Silence                 |                             |
| 0B9C | 2972 | <Slew Rate>         | clear=0 set=1 (toggle=2)<br>0=Instant<br>3=Slow           | 1=Fast                     | 2=Medium                    |
|      |      |                     | 4=Slowest   |                            |                             |
| 0B9D | 2973 | <Genlock Phase>     | 0=0 Frame Delay   | 1=1 Frame Delay            | 2=2 Frame Delay             |
| 0B9E | 2974 | 625 H Phase         | min=0   | max=63962899               | Step=37037 Div=1000         |
| 0B9F | 2975 | 625 V Phase         | min=0   | max=624                    | Step=1                      |
| 0BA0 | 2976 | 525 H Phase         | min=0   | max=63518455               | Step=37037 Div=1000         |
| 0BA1 | 2977 | 525 V Phase         | min=0   | max=524                    | Step=1                      |
| 0BA2 | 2978 | <RETURN>            | 1=Reset Errors  |                            |                             |
| 0BA3 | 2979 | Total Delay Display | Static Display (no control)                               |                            |                             |
| 0BA4 | 2980 | INPUT=              | Static Display (no control)                               |                            |                             |
| 0BA5 | 2981 | STD=                | Static Display (no control)                               |                            |                             |
| 0BA6 | 2982 | INPUT1=             | Static Display (no control)                               |                            |                             |
| 0BA7 | 2983 | STD1=               | Static Display (no control)                               |                            |                             |
| 0BA8 | 2984 | INPUT2=             | Static Display (no control)                               |                            |                             |
| 0BA9 | 2985 | STD2=               | Static Display (no control)                               |                            |                             |
| 0BAA | 2986 | EXTREF=             | Static Display (no control)                               |                            |                             |
| 0BAB | 2987 | EDH=                | Static Display (no control)                               |                            |                             |
| 0BAC | 2988 | ERRSEC=             | Static Display (no control)                               |                            |                             |
| 0BAD | 2989 | ROLLTRACK=          | Static Display (no control)                               |                            |                             |
| 0BAE | 2990 | FAULT=              | Static Display (no control)                               |                            |                             |
| 0BB6 | 2998 | BUSAL=              | Static Display (no control)                               |                            |                             |
| 0BB7 | 2999 | BUSAR=              | Static Display (no control)                               |                            |                             |
| 0BB8 | 3000 | BUSBL=              | Static Display (no control)                               |                            |                             |
| 0BB9 | 3001 | BUSBR=              | Static Display (no control)                               |                            |                             |
| 0BBA | 3002 | BUSCL=              | Static Display (no control)                               |                            |                             |
| 0BBB | 3003 | BUSCR=              | Static Display (no control)                               |                            |                             |
| 0BBC | 3004 | BUSDL=              | Static Display (no control)                               |                            |                             |
| 0BBD | 3005 | BUSDR=              | Static Display (no control)                               |                            |                             |
| 0BC6 | 3014 | DEEMBED1=           | Static Display (no control)                               |                            |                             |
| 0BC7 | 3015 | DEEMBED2=           | Static Display (no control)                               |                            |                             |
| 0BC8 | 3016 | DEEMBED3=           | Static Display (no control)                               |                            |                             |
| 0BC9 | 3017 | DEEMBED4=           | Static Display (no control)                               |                            |                             |
| 0BCA | 3018 | DEEMBED5=           | Static Display (no control)                               |                            |                             |
| 0BCB | 3019 | DEEMBED6=           | Static Display (no control)                               |                            |                             |
| 0BCC | 3020 | DEEMBED7=           | Static Display (no control)                               |                            |                             |
| 0BCD | 3021 | DEEMBED8=           | Static Display (no control)                               |                            |                             |
| 0BCE | 3022 | NPCM1=              | Static Display (no control)                               |                            |                             |
| 0BCF | 3023 | NPCM2=              | Static Display (no control)                               |                            |                             |
| 0BD0 | 3024 | NPCM3=              | Static Display (no control)                               |                            |                             |
| 0BD1 | 3025 | NPCM4=              | Static Display (no control)                               |                            |                             |
| 0BD2 | 3026 | NPCM5=              | Static Display (no control)                               |                            |                             |
| 0BD3 | 3027 | NPCM6=              | Static Display (no control)                               |                            |                             |
| 0BD4 | 3028 | NPCM7=              | Static Display (no control)                               |                            |                             |
| 0BD5 | 3029 | NPCM8=              | Static Display (no control)                               |                            |                             |
| 0BEB | 3051 | GPI Delay Select    | clear=0 set=1 (toggle=2)                                  |                            |                             |
| 0BEC | 3052 | GPI Delay Display   | Static Display (no control)                               |                            |                             |
| 0BED | 3053 | InputTimer Enable   | clear=0 set=1 (toggle=2)                                  |                            |                             |
| 0BEE | 3054 | TimerActive High    | clear=0 set=1 (toggle=2)                                  |                            |                             |
| 0BEF | 3055 | HeadRoom            | min=4   | max=24                     | Step=1                      |
| 0BF0 | 3056 | Silence Level       | min=-96   | max=0                      | Step=1                      |
| 0BF1 | 3057 | High Level          | min=-96   | max=0                      | Step=1                      |
| 0BF2 | 3058 | Overload Level      | min=-96   | max=0                      | Step=1                      |
| 0BF4 | 3060 | Channel Status      | Edit String   |                            |                             |
| 0C08 | 3080 | Gain Bus AL         | min=-180  | max=180                    | Step=1 Div=10               |
| 0C09 | 3081 | Gain Bus AR         | min=-180  | max=180                    | Step=1 Div=10               |
| 0C0A | 3082 | Gain Bus BL         | min=-180  | max=180                    | Step=1 Div=10               |
| 0C0B | 3083 | Gain Bus BR         | min=-180  | max=180                    | Step=1 Div=10               |
| 0C0C | 3084 | Gain Bus CL         | min=-180  | max=180                    | Step=1 Div=10               |
| 0C0D | 3085 | Gain Bus CR         | min=-180  | max=180                    | Step=1 Div=10               |
| 0C0E | 3086 | Gain Bus DL         | min=-180  | max=180                    | Step=1 Div=10               |

|      |      |                  |          |         |            |        |
|------|------|------------------|----------|---------|------------|--------|
| 0C0F | 3087 | Gain Bus DR      | min=-180 | max=180 | Step=1     | Div=10 |
| 0C10 | 3088 | Gain De-embed 1L | min=-180 | max=180 | Step=1     | Div=10 |
| 0C11 | 3089 | Gain De-embed 1R | min=-180 | max=180 | Step=1     | Div=10 |
| 0C12 | 3090 | Gain De-embed 2L | min=-180 | max=180 | Step=1     | Div=10 |
| 0C13 | 3091 | Gain De-embed 2R | min=-180 | max=180 | Step=1     | Div=10 |
| 0C14 | 3092 | Gain De-embed 3L | min=-180 | max=180 | Step=1     | Div=10 |
| 0C15 | 3093 | Gain De-embed 3R | min=-180 | max=180 | Step=1     | Div=10 |
| 0C16 | 3094 | Gain De-embed 4L | min=-180 | max=180 | Step=1     | Div=10 |
| 0C17 | 3095 | Gain De-embed 4R | min=-180 | max=180 | Step=1     | Div=10 |
| 0C18 | 3096 | Gain De-embed 5L | min=-180 | max=180 | Step=1     | Div=10 |
| 0C19 | 3097 | Gain De-embed 5R | min=-180 | max=180 | Step=1     | Div=10 |
| 0C1A | 3098 | Gain De-embed 6L | min=-180 | max=180 | Step=1     | Div=10 |
| 0C1B | 3099 | Gain De-embed 6R | min=-180 | max=180 | Step=1     | Div=10 |
| 0C1C | 3100 | Gain De-embed 7L | min=-180 | max=180 | Step=1     | Div=10 |
| 0C1D | 3101 | Gain De-embed 7R | min=-180 | max=180 | Step=1     | Div=10 |
| 0C1E | 3102 | Gain De-embed 8L | min=-180 | max=180 | Step=1     | Div=10 |
| 0C1F | 3103 | Gain De-embed 8R | min=-180 | max=180 | Step=1     | Div=10 |
| 0C58 | 3160 | Invert           | clear=0  | set=1   | (toggle=2) |        |
| 0C59 | 3161 | Invert           | clear=0  | set=1   | (toggle=2) |        |
| 0C5A | 3162 | Invert           | clear=0  | set=1   | (toggle=2) |        |
| 0C5B | 3163 | Invert           | clear=0  | set=1   | (toggle=2) |        |
| 0C5C | 3164 | Invert           | clear=0  | set=1   | (toggle=2) |        |
| 0C5D | 3165 | Invert           | clear=0  | set=1   | (toggle=2) |        |
| 0C5E | 3166 | Invert           | clear=0  | set=1   | (toggle=2) |        |
| 0C5F | 3167 | Invert           | clear=0  | set=1   | (toggle=2) |        |
| 0C60 | 3168 | Invert           | clear=0  | set=1   | (toggle=2) |        |
| 0C61 | 3169 | Invert           | clear=0  | set=1   | (toggle=2) |        |
| 0C62 | 3170 | Invert           | clear=0  | set=1   | (toggle=2) |        |
| 0C63 | 3171 | Invert           | clear=0  | set=1   | (toggle=2) |        |
| 0C64 | 3172 | Invert           | clear=0  | set=1   | (toggle=2) |        |
| 0C65 | 3173 | Invert           | clear=0  | set=1   | (toggle=2) |        |
| 0C66 | 3174 | Invert           | clear=0  | set=1   | (toggle=2) |        |
| 0C67 | 3175 | Invert           | clear=0  | set=1   | (toggle=2) |        |
| 0C68 | 3176 | Invert           | clear=0  | set=1   | (toggle=2) |        |
| 0C69 | 3177 | Invert           | clear=0  | set=1   | (toggle=2) |        |
| 0C6A | 3178 | Invert           | clear=0  | set=1   | (toggle=2) |        |
| 0C6B | 3179 | Invert           | clear=0  | set=1   | (toggle=2) |        |
| 0C6C | 3180 | Invert           | clear=0  | set=1   | (toggle=2) |        |
| 0C6D | 3181 | Invert           | clear=0  | set=1   | (toggle=2) |        |
| 0C6E | 3182 | Invert           | clear=0  | set=1   | (toggle=2) |        |
| 0C6F | 3183 | Invert           | clear=0  | set=1   | (toggle=2) |        |
| 0CA8 | 3240 | Mute             | clear=0  | set=1   | (toggle=2) |        |
| 0CA9 | 3241 | Mute             | clear=0  | set=1   | (toggle=2) |        |
| 0CAA | 3242 | Mute             | clear=0  | set=1   | (toggle=2) |        |
| 0CAB | 3243 | Mute             | clear=0  | set=1   | (toggle=2) |        |
| 0CAC | 3244 | Mute             | clear=0  | set=1   | (toggle=2) |        |
| 0CAD | 3245 | Mute             | clear=0  | set=1   | (toggle=2) |        |
| 0CAE | 3246 | Mute             | clear=0  | set=1   | (toggle=2) |        |
| 0CAF | 3247 | Mute             | clear=0  | set=1   | (toggle=2) |        |
| 0CB0 | 3248 | Mute             | clear=0  | set=1   | (toggle=2) |        |
| 0CB1 | 3249 | Mute             | clear=0  | set=1   | (toggle=2) |        |
| 0CB2 | 3250 | Mute             | clear=0  | set=1   | (toggle=2) |        |
| 0CB3 | 3251 | Mute             | clear=0  | set=1   | (toggle=2) |        |
| 0CB4 | 3252 | Mute             | clear=0  | set=1   | (toggle=2) |        |
| 0CB5 | 3253 | Mute             | clear=0  | set=1   | (toggle=2) |        |
| 0CB6 | 3254 | Mute             | clear=0  | set=1   | (toggle=2) |        |
| 0CB7 | 3255 | Mute             | clear=0  | set=1   | (toggle=2) |        |
| 0CB8 | 3256 | Mute             | clear=0  | set=1   | (toggle=2) |        |
| 0CB9 | 3257 | Mute             | clear=0  | set=1   | (toggle=2) |        |
| 0CBA | 3258 | Mute             | clear=0  | set=1   | (toggle=2) |        |
| 0CBB | 3259 | Mute             | clear=0  | set=1   | (toggle=2) |        |
| 0CBC | 3260 | Mute             | clear=0  | set=1   | (toggle=2) |        |
| 0CBD | 3261 | Mute             | clear=0  | set=1   | (toggle=2) |        |
| 0CBE | 3262 | Mute             | clear=0  | set=1   | (toggle=2) |        |
| 0CBF | 3263 | Mute             | clear=0  | set=1   | (toggle=2) |        |
| 0CF8 | 3320 | Stereo A         | clear=0  | set=1   | (toggle=2) |        |
| 0CF9 | 3321 | Stereo B         | clear=0  | set=1   | (toggle=2) |        |
| 0CFA | 3322 | Stereo C         | clear=0  | set=1   | (toggle=2) |        |
| 0CFB | 3323 | Stereo D         | clear=0  | set=1   | (toggle=2) |        |
| 0CFC | 3324 | Stereo 1         | clear=0  | set=1   | (toggle=2) |        |
| 0CFD | 3325 | Stereo 2         | clear=0  | set=1   | (toggle=2) |        |
| 0CFE | 3326 | Stereo 3         | clear=0  | set=1   | (toggle=2) |        |
| 0CFF | 3327 | Stereo 4         | clear=0  | set=1   | (toggle=2) |        |
| 0D00 | 3328 | Stereo 5         | clear=0  | set=1   | (toggle=2) |        |
| 0D01 | 3329 | Stereo 6         | clear=0  | set=1   | (toggle=2) |        |
| 0D02 | 3330 | Stereo 7         | clear=0  | set=1   | (toggle=2) |        |
| 0D03 | 3331 | Stereo 8         | clear=0  | set=1   | (toggle=2) |        |
| 0D20 | 3360 | Gain1            | min=-71  | max=0   | Step=1     |        |
| 0D21 | 3361 | Gain2            | min=-71  | max=0   | Step=1     |        |
| 0D22 | 3362 | Gain3            | min=-71  | max=0   | Step=1     |        |
| 0D23 | 3363 | Gain4            | min=-71  | max=0   | Step=1     |        |

|      |      |          |            |       |            |    |            |    |
|------|------|----------|------------|-------|------------|----|------------|----|
| 0D24 | 3364 | Gain1    | min=-71    | max=0 | Step=1     |    |            |    |
| 0D25 | 3365 | Gain2    | min=-71    | max=0 | Step=1     |    |            |    |
| 0D26 | 3366 | Gain3    | min=-71    | max=0 | Step=1     |    |            |    |
| 0D27 | 3367 | Gain4    | min=-71    | max=0 | Step=1     |    |            |    |
| 0D28 | 3368 | Gain1    | min=-71    | max=0 | Step=1     |    |            |    |
| 0D29 | 3369 | Gain2    | min=-71    | max=0 | Step=1     |    |            |    |
| 0D2A | 3370 | Gain3    | min=-71    | max=0 | Step=1     |    |            |    |
| 0D2B | 3371 | Gain4    | min=-71    | max=0 | Step=1     |    |            |    |
| 0D2C | 3372 | Gain1    | min=-71    | max=0 | Step=1     |    |            |    |
| 0D2D | 3373 | Gain2    | min=-71    | max=0 | Step=1     |    |            |    |
| 0D2E | 3374 | Gain3    | min=-71    | max=0 | Step=1     |    |            |    |
| 0D2F | 3375 | Gain4    | min=-71    | max=0 | Step=1     |    |            |    |
| 0D70 | 3440 | <RETURN> | 0=DeEmbed  | 1L    | 1=DeEmbed  | 1R | 2=DeEmbed  | 2L |
|      |      |          | 3=DeEmbed  | 2R    |            |    |            |    |
|      |      |          | 4=DeEmbed  | 3L    | 5=DeEmbed  | 3R | 6=DeEmbed  | 4L |
|      |      |          | 7=DeEmbed  | 4R    |            |    |            |    |
|      |      |          | 8=DeEmbed  | 5L    | 9=DeEmbed  | 5R | 10=DeEmbed | 6L |
|      |      |          | 11=DeEmbed | 6R    |            |    |            |    |
|      |      |          | 12=DeEmbed | 7L    | 13=DeEmbed | 7R | 14=DeEmbed | 8L |
|      |      |          | 15=DeEmbed | 8R    |            |    |            |    |
| 0D71 | 3441 | <RETURN> | 0=DeEmbed  | 1L    | 1=DeEmbed  | 1R | 2=DeEmbed  | 2L |
|      |      |          | 3=DeEmbed  | 2R    |            |    |            |    |
|      |      |          | 4=DeEmbed  | 3L    | 5=DeEmbed  | 3R | 6=DeEmbed  | 4L |
|      |      |          | 7=DeEmbed  | 4R    |            |    |            |    |
|      |      |          | 8=DeEmbed  | 5L    | 9=DeEmbed  | 5R | 10=DeEmbed | 6L |
|      |      |          | 11=DeEmbed | 6R    |            |    |            |    |
|      |      |          | 12=DeEmbed | 7L    | 13=DeEmbed | 7R | 14=DeEmbed | 8L |
|      |      |          | 15=DeEmbed | 8R    |            |    |            |    |
| 0D72 | 3442 | <RETURN> | 0=DeEmbed  | 1L    | 1=DeEmbed  | 1R | 2=DeEmbed  | 2L |
|      |      |          | 3=DeEmbed  | 2R    |            |    |            |    |
|      |      |          | 4=DeEmbed  | 3L    | 5=DeEmbed  | 3R | 6=DeEmbed  | 4L |
|      |      |          | 7=DeEmbed  | 4R    |            |    |            |    |
|      |      |          | 8=DeEmbed  | 5L    | 9=DeEmbed  | 5R | 10=DeEmbed | 6L |
|      |      |          | 11=DeEmbed | 6R    |            |    |            |    |
|      |      |          | 12=DeEmbed | 7L    | 13=DeEmbed | 7R | 14=DeEmbed | 8L |
|      |      |          | 15=DeEmbed | 8R    |            |    |            |    |
| 0D73 | 3443 | <RETURN> | 0=DeEmbed  | 1L    | 1=DeEmbed  | 1R | 2=DeEmbed  | 2L |
|      |      |          | 3=DeEmbed  | 2R    |            |    |            |    |
|      |      |          | 4=DeEmbed  | 3L    | 5=DeEmbed  | 3R | 6=DeEmbed  | 4L |
|      |      |          | 7=DeEmbed  | 4R    |            |    |            |    |
|      |      |          | 8=DeEmbed  | 5L    | 9=DeEmbed  | 5R | 10=DeEmbed | 6L |
|      |      |          | 11=DeEmbed | 6R    |            |    |            |    |
|      |      |          | 12=DeEmbed | 7L    | 13=DeEmbed | 7R | 14=DeEmbed | 8L |
|      |      |          | 15=DeEmbed | 8R    |            |    |            |    |
| 0D74 | 3444 | <RETURN> | 0=DeEmbed  | 1L    | 1=DeEmbed  | 1R | 2=DeEmbed  | 2L |
|      |      |          | 3=DeEmbed  | 2R    |            |    |            |    |
|      |      |          | 4=DeEmbed  | 3L    | 5=DeEmbed  | 3R | 6=DeEmbed  | 4L |
|      |      |          | 7=DeEmbed  | 4R    |            |    |            |    |
|      |      |          | 8=DeEmbed  | 5L    | 9=DeEmbed  | 5R | 10=DeEmbed | 6L |
|      |      |          | 11=DeEmbed | 6R    |            |    |            |    |
|      |      |          | 12=DeEmbed | 7L    | 13=DeEmbed | 7R | 14=DeEmbed | 8L |
|      |      |          | 15=DeEmbed | 8R    |            |    |            |    |
| 0D75 | 3445 | <RETURN> | 0=DeEmbed  | 1L    | 1=DeEmbed  | 1R | 2=DeEmbed  | 2L |
|      |      |          | 3=DeEmbed  | 2R    |            |    |            |    |
|      |      |          | 4=DeEmbed  | 3L    | 5=DeEmbed  | 3R | 6=DeEmbed  | 4L |
|      |      |          | 7=DeEmbed  | 4R    |            |    |            |    |
|      |      |          | 8=DeEmbed  | 5L    | 9=DeEmbed  | 5R | 10=DeEmbed | 6L |
|      |      |          | 11=DeEmbed | 6R    |            |    |            |    |
|      |      |          | 12=DeEmbed | 7L    | 13=DeEmbed | 7R | 14=DeEmbed | 8L |
|      |      |          | 15=DeEmbed | 8R    |            |    |            |    |
| 0D76 | 3446 | <RETURN> | 0=DeEmbed  | 1L    | 1=DeEmbed  | 1R | 2=DeEmbed  | 2L |
|      |      |          | 3=DeEmbed  | 2R    |            |    |            |    |
|      |      |          | 4=DeEmbed  | 3L    | 5=DeEmbed  | 3R | 6=DeEmbed  | 4L |
|      |      |          | 7=DeEmbed  | 4R    |            |    |            |    |
|      |      |          | 8=DeEmbed  | 5L    | 9=DeEmbed  | 5R | 10=DeEmbed | 6L |
|      |      |          | 11=DeEmbed | 6R    |            |    |            |    |
|      |      |          | 12=DeEmbed | 7L    | 13=DeEmbed | 7R | 14=DeEmbed | 8L |
|      |      |          | 15=DeEmbed | 8R    |            |    |            |    |
| 0D77 | 3447 | <RETURN> | 0=DeEmbed  | 1L    | 1=DeEmbed  | 1R | 2=DeEmbed  | 2L |
|      |      |          | 3=DeEmbed  | 2R    |            |    |            |    |
|      |      |          | 4=DeEmbed  | 3L    | 5=DeEmbed  | 3R | 6=DeEmbed  | 4L |
|      |      |          | 7=DeEmbed  | 4R    |            |    |            |    |
|      |      |          | 8=DeEmbed  | 5L    | 9=DeEmbed  | 5R | 10=DeEmbed | 6L |
|      |      |          | 11=DeEmbed | 6R    |            |    |            |    |
|      |      |          | 12=DeEmbed | 7L    | 13=DeEmbed | 7R | 14=DeEmbed | 8L |
|      |      |          | 15=DeEmbed | 8R    |            |    |            |    |
| 0D78 | 3448 | <RETURN> | 0=DeEmbed  | 1L    | 1=DeEmbed  | 1R | 2=DeEmbed  | 2L |
|      |      |          | 3=DeEmbed  | 2R    |            |    |            |    |
|      |      |          | 4=DeEmbed  | 3L    | 5=DeEmbed  | 3R | 6=DeEmbed  | 4L |
|      |      |          | 7=DeEmbed  | 4R    |            |    |            |    |

|      |      |          |               |               |               |
|------|------|----------|---------------|---------------|---------------|
|      |      |          | 8=DeEmbed 5L  | 9=DeEmbed 5R  | 10=DeEmbed 6L |
|      |      |          | 11=DeEmbed 6R |               |               |
|      |      |          | 12=DeEmbed 7L | 13=DeEmbed 7R | 14=DeEmbed 8L |
|      |      |          | 15=DeEmbed 8R |               |               |
| 0D79 | 3449 | <RETURN> | 0=DeEmbed 1L  | 1=DeEmbed 1R  | 2=DeEmbed 2L  |
|      |      |          | 3=DeEmbed 2R  |               |               |
|      |      |          | 4=DeEmbed 3L  | 5=DeEmbed 3R  | 6=DeEmbed 4L  |
|      |      |          | 7=DeEmbed 4R  |               |               |
|      |      |          | 8=DeEmbed 5L  | 9=DeEmbed 5R  | 10=DeEmbed 6L |
|      |      |          | 11=DeEmbed 6R |               |               |
|      |      |          | 12=DeEmbed 7L | 13=DeEmbed 7R | 14=DeEmbed 8L |
|      |      |          | 15=DeEmbed 8R |               |               |
| 0D7A | 3450 | <RETURN> | 0=DeEmbed 1L  | 1=DeEmbed 1R  | 2=DeEmbed 2L  |
|      |      |          | 3=DeEmbed 2R  |               |               |
|      |      |          | 4=DeEmbed 3L  | 5=DeEmbed 3R  | 6=DeEmbed 4L  |
|      |      |          | 7=DeEmbed 4R  |               |               |
|      |      |          | 8=DeEmbed 5L  | 9=DeEmbed 5R  | 10=DeEmbed 6L |
|      |      |          | 11=DeEmbed 6R |               |               |
|      |      |          | 12=DeEmbed 7L | 13=DeEmbed 7R | 14=DeEmbed 8L |
|      |      |          | 15=DeEmbed 8R |               |               |
| 0D7B | 3451 | <RETURN> | 0=DeEmbed 1L  | 1=DeEmbed 1R  | 2=DeEmbed 2L  |
|      |      |          | 3=DeEmbed 2R  |               |               |
|      |      |          | 4=DeEmbed 3L  | 5=DeEmbed 3R  | 6=DeEmbed 4L  |
|      |      |          | 7=DeEmbed 4R  |               |               |
|      |      |          | 8=DeEmbed 5L  | 9=DeEmbed 5R  | 10=DeEmbed 6L |
|      |      |          | 11=DeEmbed 6R |               |               |
|      |      |          | 12=DeEmbed 7L | 13=DeEmbed 7R | 14=DeEmbed 8L |
|      |      |          | 15=DeEmbed 8R |               |               |
| 0D7C | 3452 | <RETURN> | 0=DeEmbed 1L  | 1=DeEmbed 1R  | 2=DeEmbed 2L  |
|      |      |          | 3=DeEmbed 2R  |               |               |
|      |      |          | 4=DeEmbed 3L  | 5=DeEmbed 3R  | 6=DeEmbed 4L  |
|      |      |          | 7=DeEmbed 4R  |               |               |
|      |      |          | 8=DeEmbed 5L  | 9=DeEmbed 5R  | 10=DeEmbed 6L |
|      |      |          | 11=DeEmbed 6R |               |               |
|      |      |          | 12=DeEmbed 7L | 13=DeEmbed 7R | 14=DeEmbed 8L |
|      |      |          | 15=DeEmbed 8R |               |               |
| 0D7D | 3453 | <RETURN> | 0=DeEmbed 1L  | 1=DeEmbed 1R  | 2=DeEmbed 2L  |
|      |      |          | 3=DeEmbed 2R  |               |               |
|      |      |          | 4=DeEmbed 3L  | 5=DeEmbed 3R  | 6=DeEmbed 4L  |
|      |      |          | 7=DeEmbed 4R  |               |               |
|      |      |          | 8=DeEmbed 5L  | 9=DeEmbed 5R  | 10=DeEmbed 6L |
|      |      |          | 11=DeEmbed 6R |               |               |
|      |      |          | 12=DeEmbed 7L | 13=DeEmbed 7R | 14=DeEmbed 8L |
|      |      |          | 15=DeEmbed 8R |               |               |
| 0D7E | 3454 | <RETURN> | 0=DeEmbed 1L  | 1=DeEmbed 1R  | 2=DeEmbed 2L  |
|      |      |          | 3=DeEmbed 2R  |               |               |
|      |      |          | 4=DeEmbed 3L  | 5=DeEmbed 3R  | 6=DeEmbed 4L  |
|      |      |          | 7=DeEmbed 4R  |               |               |
|      |      |          | 8=DeEmbed 5L  | 9=DeEmbed 5R  | 10=DeEmbed 6L |
|      |      |          | 11=DeEmbed 6R |               |               |
|      |      |          | 12=DeEmbed 7L | 13=DeEmbed 7R | 14=DeEmbed 8L |
|      |      |          | 15=DeEmbed 8R |               |               |
| 0D7F | 3455 | <RETURN> | 0=DeEmbed 1L  | 1=DeEmbed 1R  | 2=DeEmbed 2L  |
|      |      |          | 3=DeEmbed 2R  |               |               |
|      |      |          | 4=DeEmbed 3L  | 5=DeEmbed 3R  | 6=DeEmbed 4L  |
|      |      |          | 7=DeEmbed 4R  |               |               |
|      |      |          | 8=DeEmbed 5L  | 9=DeEmbed 5R  | 10=DeEmbed 6L |
|      |      |          | 11=DeEmbed 6R |               |               |
|      |      |          | 12=DeEmbed 7L | 13=DeEmbed 7R | 14=DeEmbed 8L |
|      |      |          | 15=DeEmbed 8R |               |               |
| 0DC0 | 3520 | <RETURN> | 0=DeEmbed 1L  | 1=DeEmbed 1R  | 2=DeEmbed 2L  |
|      |      |          | 3=DeEmbed 2R  |               |               |
|      |      |          | 4=DeEmbed 3L  | 5=DeEmbed 3R  | 6=DeEmbed 4L  |
|      |      |          | 7=DeEmbed 4R  |               |               |
|      |      |          | 8=DeEmbed 5L  | 9=DeEmbed 5R  | 10=DeEmbed 6L |
|      |      |          | 11=DeEmbed 6R |               |               |
|      |      |          | 12=DeEmbed 7L | 13=DeEmbed 7R | 14=DeEmbed 8L |
|      |      |          | 15=DeEmbed 8R |               |               |
|      |      |          | 16=MIX 1      | 17=MIX 2      | 18=MIX 3      |
|      |      |          | 19=MIX 4      |               |               |
| 0DC1 | 3521 | <RETURN> | 0=DeEmbed 1L  | 1=DeEmbed 1R  | 2=DeEmbed 2L  |
|      |      |          | 3=DeEmbed 2R  |               |               |
|      |      |          | 4=DeEmbed 3L  | 5=DeEmbed 3R  | 6=DeEmbed 4L  |
|      |      |          | 7=DeEmbed 4R  |               |               |
|      |      |          | 8=DeEmbed 5L  | 9=DeEmbed 5R  | 10=DeEmbed 6L |
|      |      |          | 11=DeEmbed 6R |               |               |
|      |      |          | 12=DeEmbed 7L | 13=DeEmbed 7R | 14=DeEmbed 8L |
|      |      |          | 15=DeEmbed 8R |               |               |
|      |      |          | 16=MIX 1      | 17=MIX 2      | 18=MIX 3      |
|      |      |          | 19=MIX 4      |               |               |

|      |      |                              |  |               |               |
|------|------|------------------------------|--|---------------|---------------|
| 0DC2 | 3522 | <RETURN>                     | 0=DeEmbed 1L                                   | 1=DeEmbed 1R  | 2=DeEmbed 2L  |
|      |      |                              | 3=DeEmbed 2R                                   |               |               |
|      |      |                              | 4=DeEmbed 3L                                   | 5=DeEmbed 3R  | 6=DeEmbed 4L  |
|      |      |                              | 7=DeEmbed 4R                                   |               |               |
|      |      |                              | 8=DeEmbed 5L                                   | 9=DeEmbed 5R  | 10=DeEmbed 6L |
|      |      |                              | 11=DeEmbed 6R                                  |               |               |
|      |      |                              | 12=DeEmbed 7L                                  | 13=DeEmbed 7R | 14=DeEmbed 8L |
|      |      |                              | 15=DeEmbed 8R                                  |               |               |
|      |      |                              | 16=MIX 1                                       | 17=MIX 2      | 18=MIX 3      |
|      |      |                              | 19=MIX 4                                       |               |               |
| 0DC3 | 3523 | <RETURN>                     | 0=DeEmbed 1L                                   | 1=DeEmbed 1R  | 2=DeEmbed 2L  |
|      |      |                              | 3=DeEmbed 2R                                   |               |               |
|      |      |                              | 4=DeEmbed 3L                                   | 5=DeEmbed 3R  | 6=DeEmbed 4L  |
|      |      |                              | 7=DeEmbed 4R                                   |               |               |
|      |      |                              | 8=DeEmbed 5L                                   | 9=DeEmbed 5R  | 10=DeEmbed 6L |
|      |      |                              | 11=DeEmbed 6R                                  |               |               |
|      |      |                              | 12=DeEmbed 7L                                  | 13=DeEmbed 7R | 14=DeEmbed 8L |
|      |      |                              | 15=DeEmbed 8R                                  |               |               |
|      |      |                              | 16=MIX 1                                       | 17=MIX 2      | 18=MIX 3      |
|      |      |                              | 19=MIX 4                                       |               |               |
| 0DC4 | 3524 | <RETURN>                     | 0=DeEmbed 1L                                   | 1=DeEmbed 1R  | 2=DeEmbed 2L  |
|      |      |                              | 3=DeEmbed 2R                                   |               |               |
|      |      |                              | 4=DeEmbed 3L                                   | 5=DeEmbed 3R  | 6=DeEmbed 4L  |
|      |      |                              | 7=DeEmbed 4R                                   |               |               |
|      |      |                              | 8=DeEmbed 5L                                   | 9=DeEmbed 5R  | 10=DeEmbed 6L |
|      |      |                              | 11=DeEmbed 6R                                  |               |               |
|      |      |                              | 12=DeEmbed 7L                                  | 13=DeEmbed 7R | 14=DeEmbed 8L |
|      |      |                              | 15=DeEmbed 8R                                  |               |               |
|      |      |                              | 16=MIX 1                                       | 17=MIX 2      | 18=MIX 3      |
|      |      |                              | 19=MIX 4                                       |               |               |
| 0DC5 | 3525 | <RETURN>                     | 0=DeEmbed 1L                                   | 1=DeEmbed 1R  | 2=DeEmbed 2L  |
|      |      |                              | 3=DeEmbed 2R                                   |               |               |
|      |      |                              | 4=DeEmbed 3L                                   | 5=DeEmbed 3R  | 6=DeEmbed 4L  |
|      |      |                              | 7=DeEmbed 4R                                   |               |               |
|      |      |                              | 8=DeEmbed 5L                                   | 9=DeEmbed 5R  | 10=DeEmbed 6L |
|      |      |                              | 11=DeEmbed 6R                                  |               |               |
|      |      |                              | 12=DeEmbed 7L                                  | 13=DeEmbed 7R | 14=DeEmbed 8L |
|      |      |                              | 15=DeEmbed 8R                                  |               |               |
|      |      |                              | 16=MIX 1                                       | 17=MIX 2      | 18=MIX 3      |
|      |      |                              | 19=MIX 4                                       |               |               |
| 0DC6 | 3526 | <RETURN>                     | 0=DeEmbed 1L                                   | 1=DeEmbed 1R  | 2=DeEmbed 2L  |
|      |      |                              | 3=DeEmbed 2R                                   |               |               |
|      |      |                              | 4=DeEmbed 3L                                   | 5=DeEmbed 3R  | 6=DeEmbed 4L  |
|      |      |                              | 7=DeEmbed 4R                                   |               |               |
|      |      |                              | 8=DeEmbed 5L                                   | 9=DeEmbed 5R  | 10=DeEmbed 6L |
|      |      |                              | 11=DeEmbed 6R                                  |               |               |
|      |      |                              | 12=DeEmbed 7L                                  | 13=DeEmbed 7R | 14=DeEmbed 8L |
|      |      |                              | 15=DeEmbed 8R                                  |               |               |
|      |      |                              | 16=MIX 1                                       | 17=MIX 2      | 18=MIX 3      |
|      |      |                              | 19=MIX 4                                       |               |               |
| 0DC7 | 3527 | <RETURN>                     | 0=DeEmbed 1L                                   | 1=DeEmbed 1R  | 2=DeEmbed 2L  |
|      |      |                              | 3=DeEmbed 2R                                   |               |               |
|      |      |                              | 4=DeEmbed 3L                                   | 5=DeEmbed 3R  | 6=DeEmbed 4L  |
|      |      |                              | 7=DeEmbed 4R                                   |               |               |
|      |      |                              | 8=DeEmbed 5L                                   | 9=DeEmbed 5R  | 10=DeEmbed 6L |
|      |      |                              | 11=DeEmbed 6R                                  |               |               |
|      |      |                              | 12=DeEmbed 7L                                  | 13=DeEmbed 7R | 14=DeEmbed 8L |
|      |      |                              | 15=DeEmbed 8R                                  |               |               |
|      |      |                              | 16=MIX 1                                       | 17=MIX 2      | 18=MIX 3      |
|      |      |                              | 19=MIX 4                                       |               |               |
| 0DD4 | 3540 | Out Active High              | clear=0 set=1 (toggle=2)                       |               |               |
| 0E06 | 3590 | VFLAG Optional Blanking Data | 1=Optional Blanking Data 0=Optional Video Data |               |               |

## RollTrack Audio Delay Tracking

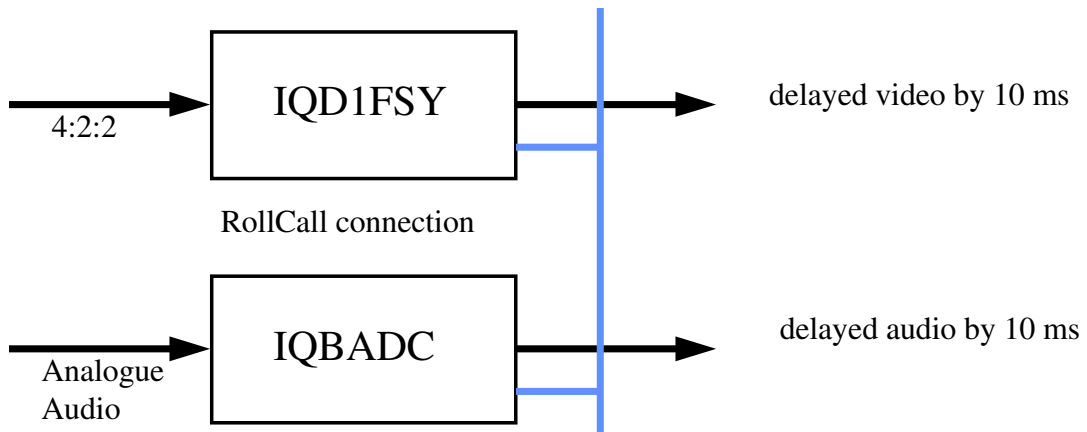
RollTrack is a feature of RollCall™ (Snell & Wilcox's proprietary remote control system), that allows devices to communicate across the RollCall network with no direct user intervention.

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.



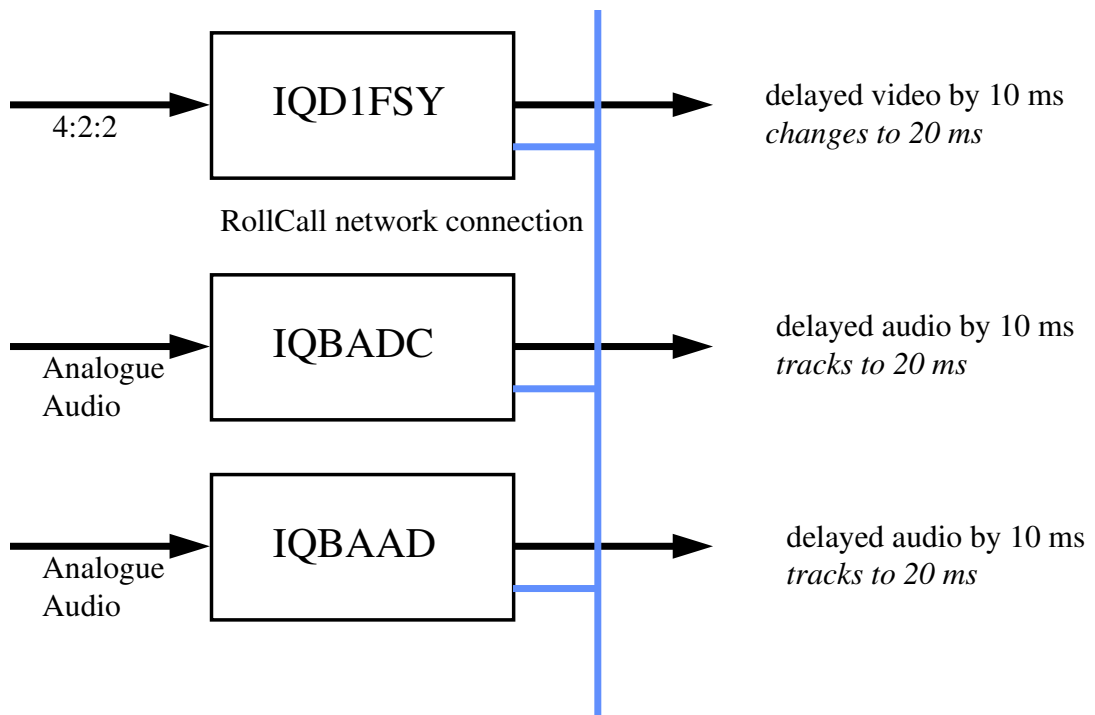
The next level of configuration is where there are multiple Frame Synchronizers (for example) each connected through RollCall™ to their own tracking Audio Delay. (It is worth stating that the synchronizers and audio delays do not have to be in the same enclosure; the addressing scheme, discussed later,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

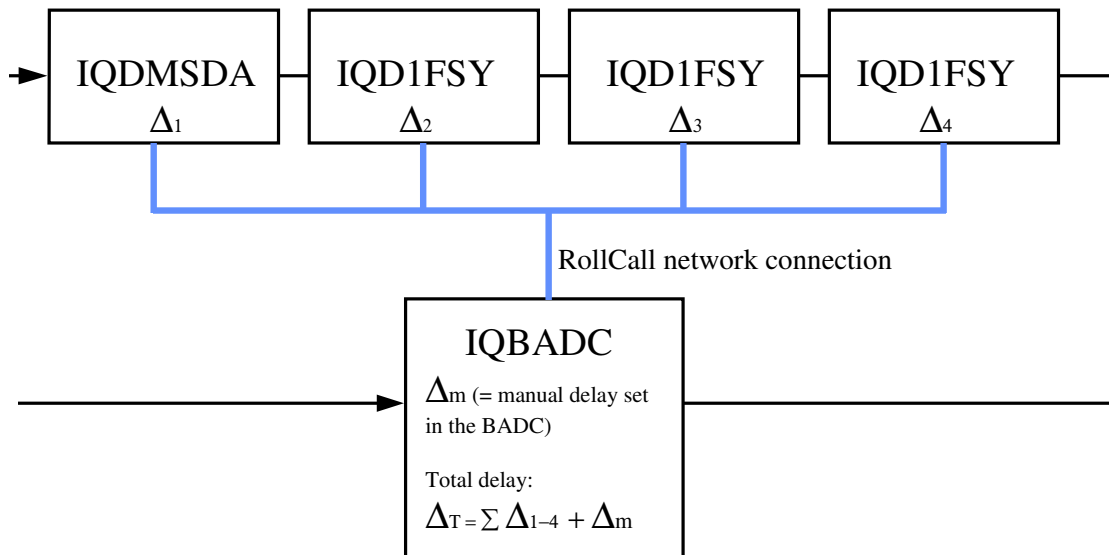
| Module  | ID  |
|---------|-----|
| IQBADC  | 51  |
| IQBDAC  | 52  |
| IQBAAD  | 53  |
| IQBDAD  | 54  |
| IQBSYN  | 89  |
| IQBADCD | 107 |

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.



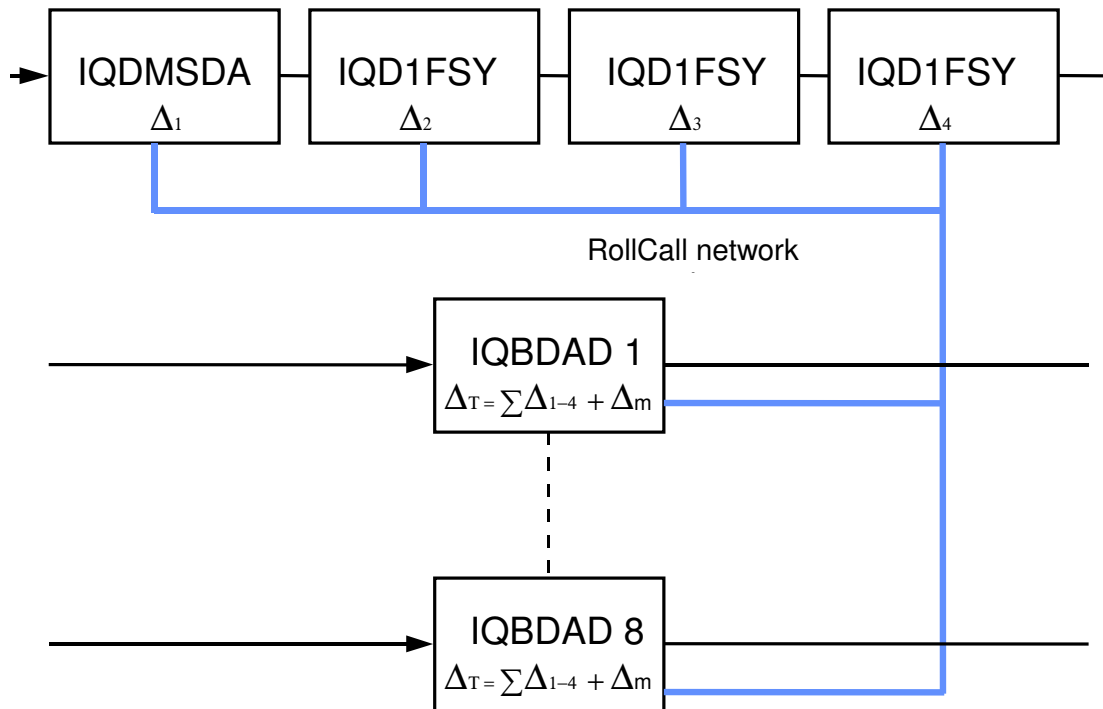
From one to eight audio delay products can be connected via RollCall™ to a single frame synchronizer, for example. If the synchronizer delay changes, then however many audio delays are connected will track the delay. The audio delays can also have a manual delay which will be added to the RollTrack delay.

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:

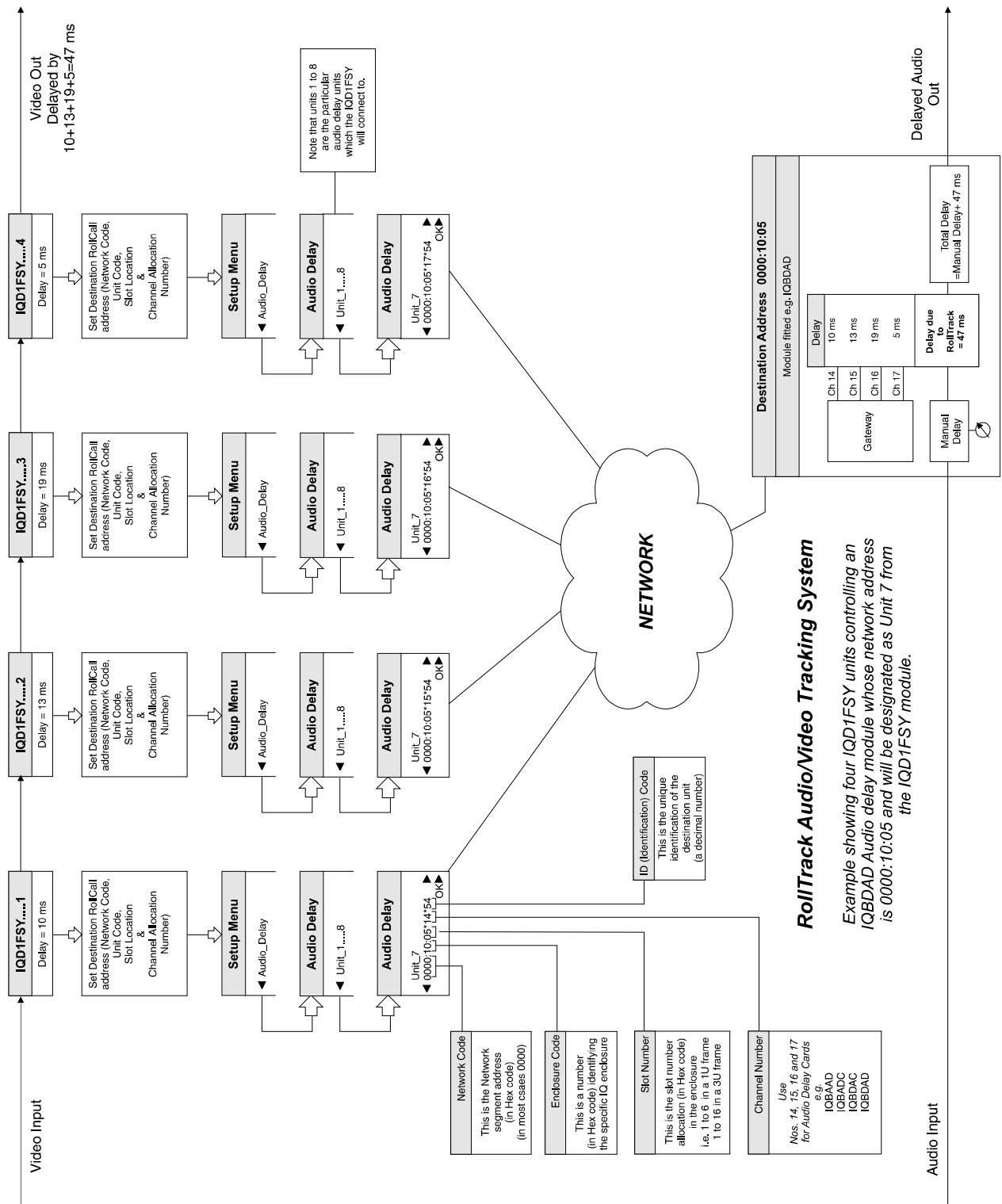
selecting the *Setup...* Menu of the IQD1FSY  
 then selecting the *Audio\_Delay...* Menu  
 then choosing from *Unit\_1* to *Unit\_8*  
 then entering the unique network address of the IQBDAD in the form  $nnnn:xx:yy*z*d$   
 where  $nnnn$  = network address and in most cases will be 0000(hex);  
 $xx$  = 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*

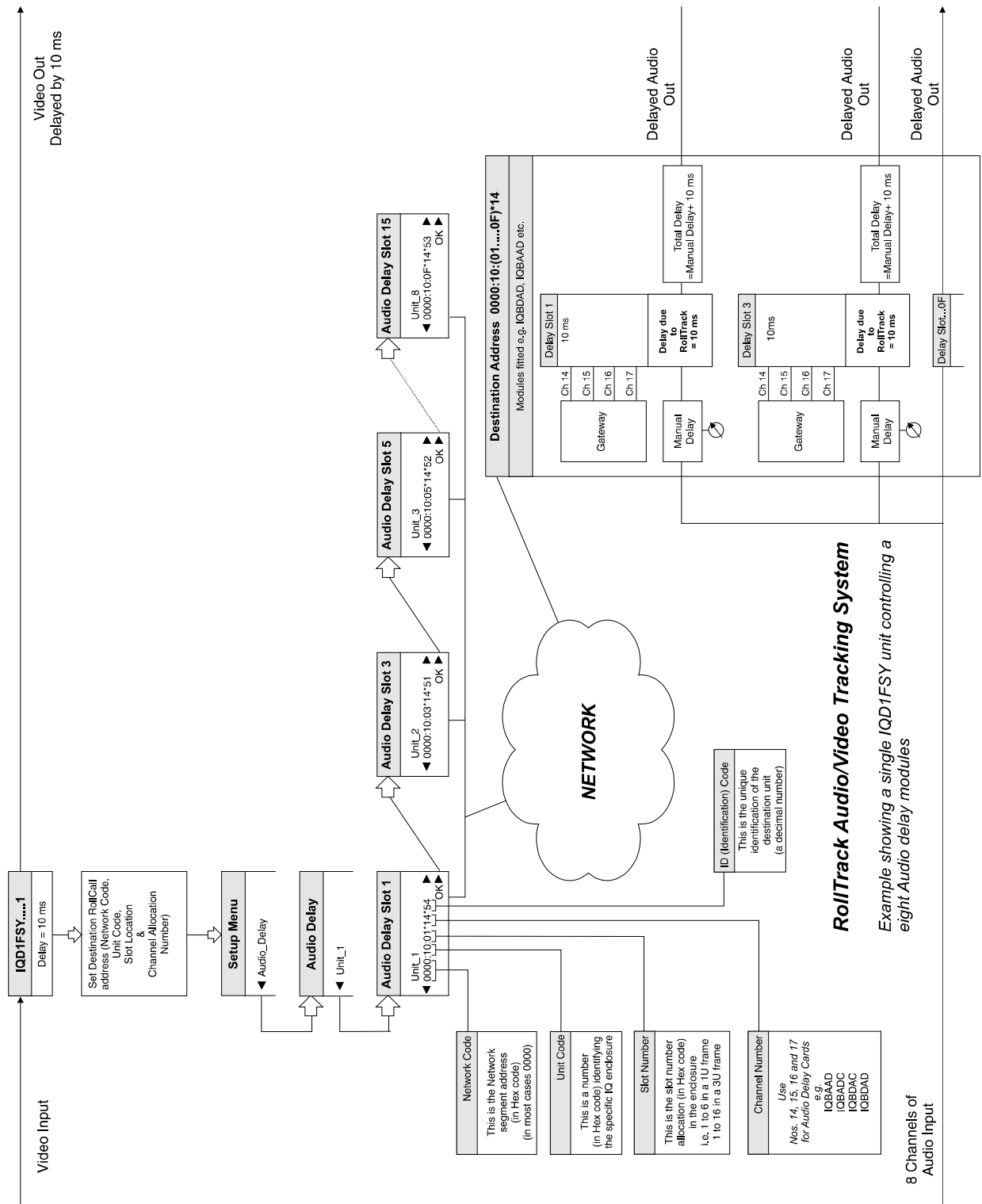
Example of Network Addresses with Channel Numbers and ID Numbers

|                      | 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 |



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





## Appendix 1

## The Firewall

### What is the function of a firewall?

The firewall protects a digital signal output against propagation of errors or disruptions in the input signal. It ensures that the signal stream at that output is continuously valid no matter what happens at the input. If the input suffers any dropout, loss of data, or break or discontinuity in the carrier then this will not be reflected in the output. Default valid data will be used to pad the output stream such as video black, a freeze, or audio silence.

The firewall does not ensure the pictures or the audio is what you want to see or hear of course, a corrupted signal can lead to loss of original content. It will ensure that whatever valid content you have it will get through however. In short it ensures the integrity, not the content, of the digital stream.

### How a firewall equipped product behaves

The essential behavior of a system containing a firewall is that:

*The input to the unit containing the firewall can be removed and later replaced with another signal and during this sequence the unit following the one with the firewall will see no disturbance at its input.*

### Why use a firewall?

Any equipment downstream of a Snell & Wilcox product with firewall protection can expect to be fed with a continuous input stream. Dropouts in the signal, disturbances due to switching and errors in the composition of the signal will not penetrate the firewall and will therefore not corrupt operations downstream. The examples below illustrate where firewalls are of most benefit.

### At the beginning of a chain

They are excellent for use at the beginning of a chain. Traditionally a damaged signal would be passed by all equipment in a chain. This meant that each unit would lose lock on the digital signal it was passing. The damage in the signal would immediately appear at the input to every device all the way through to the last point in the chain. When the signal was restored, each unit in the chain might take a few seconds to recover. The next unit would not start recovery until the previous unit had locked to the signal again. The effect could be a huge delay in restoring the signal by the end of the chain as each unit recovered one by one. A minor flaw in the input signal such as a tiny break in the carrier could lead to several seconds of disruption on the output.

### To protect MPEG encoders

Many people have found to their regret that MPEG encoders do not survive a break in the integrity of their input signal. They often corrupt their output and take a long time to recover. Video synchronizers can help but they only protect the video. Loss of the audio would prove terminal even though the integrity of the video was maintained. For transmission encoders this could mean a break in the output. For recording encoders such as those in a video server this often meant the recording was lost. Placing a Snell & Wilcox firewall product in front of any such encoders will ensure that they never get disrupted in this way even though there may be a break in the incoming content.

### How a firewall is tested

A variety of equipment is used to test the firewall behavior. The test consists of analyzing the data downstream of the firewall product looking for discontinuities in the signal stream. While it is intended that all products fed by a firewall equipped unit will accept the signal as uninterrupted, it is accepted that there is a wide variety of real-world performances. Therefore the reference product used to test whether the output streams are continuous is the Snell & Wilcox IQMUX01 for both AES and SDI signals.

### Performance of firewall equipped products versus genlock mode

The tables below summarize the behavior of products for different genlock modes:

| Synchronizer Mode |                 |                    |                 |
|-------------------|-----------------|--------------------|-----------------|
|                   | Referenced      | Input locked       | Free run        |
| SDI Video         | <i>Firewall</i> | <i>No firewall</i> | <i>Firewall</i> |
| AES               | <i>Firewall</i> | <i>Firewall</i>    | <i>Firewall</i> |

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**When Firewall Protection is not provided****Video**

The firewall protects against disruption or illegal signals at the input and not against corrupt or illegal reference provision. The user should also note that when changing genlock mode, the firewall is not maintained for the video output during the change. Examples would include changing from free-running mode to referenced mode or when the reference is adjusted or interrupted.

**Embedded audio**

Embedded audio firewall protection follows the video behavior. When the video is protected then the embedded audio is also protected. See all the information relating to video firewall protection.

**AES Audio**

AES outputs will generally always maintain a firewall with the exceptions noted below. Unlike the video signal, most reference changes do not disrupt the AES firewall.

**Exceptions**

AES outputs on audio products will normally maintain a firewall for PCM audio except when switching to or from AES1 as a reference.

Only PCM signals are protected by the firewall. The non-PCM direct paths for audio do not have firewall protection.

## Appendix 2

## HANC & Embedding

### HANC Data Handling and Embedding Functionality

#### Audio Embedding Packet Distribution

##### 625

Lines 5, 7, 318, 320  
Have no introduced samples on them

Lines 4, 6, 9,10, 11,13, 26, 39, 52, 65, 78, 91, 104, 117, 130, 143, 156, 169, 182, 195, 208, 221, 234, 247, 260, 273, 286, 299, 317, 319, 322, 323, 324, 325, 338, 351, 364, 377, 390, 403, 416, 429, 442, 455, 468, 481, 494, 507, 520, 533, 546, 559, 572, 585, 598, 611, 624  
Have four introduced samples on them  
All other lines have three samples

##### 525

Lines 9, 11, 272, 274  
Have no introduced samples on them.

Lines 3, 10, 33, 48, 78, 83, 108, 123, 138, 153, 168, 183, 198, 213, 228, 243, 258, 265, 273, 288, 303, 318, 333, 348, 363, 378, 393, 408, 423, 408, 438, 453, 468, 483, 498, 513  
Line 18 has either 3 sample for frames 2 and 4 or 4 samples for frames 1, 3 or 5  
All other lines have three samples.

**Firewall** See Appendix 1

#### Hanc Blanking Control.

When “Hanc Blank” is enabled the HANC space is cleared of all incoming packets. In this case the non-PCM and non-audio data is removed. If pass HANC control is disabled then the incoming non-audio packets are inserted following the packets created by this unit. Bypassing will leave all non-audio packets intact. Any audio group that is to be embedded; will remove any packet from the incoming stream from the same group.

#### HANC Overflow Condition

The card assumes that the incoming HANC is SMTE291 compliant. If there is data embedded in the HANC space that is non-compliant then it would be outside of the unit’s handling capability.

#### Alternate HANC Packet Specification

Only audio packet types are validated and with the exception of packets that are of the “Marked for deletion” type, all packets are passed as they are.

“Marked for deletion packets” are removed if they can be while maintaining continuity. Checksum calculation is done on generated packets but not on passed through packets.

If an audio packet has gone through the bypass process then the packet is not changed. If the audio has been processed and embedded then packet parity is calculated for the generated packets.

If pre-existing embedded audio is not valid due to not having enough samples then in bypass mode the same data is passed to the output. If this type of broken input is extracted then the unit will try to sample rate convert (SRC) to the correct 48kHz sample rate. The SRC’d drops or holds will be more or less audible depending on how broken the incoming audio packets are.

#### Recognize Audio Data Packet Identifiers

Recognize:(DID)

|     |     |     |     |                |
|-----|-----|-----|-----|----------------|
| 2FF | 1FD | 1FB | 2F9 | Audio Group    |
| 1FE | 2FC | 2FA | 1F8 | Extended Audio |
| 1EF | 2EE | 2ED | 1EC | Control Packet |

### Manual Revision Record

| Date   | Version No. | Issue No. | Change   | Comments             |
|--------|-------------|-----------|--|----------------------|
| 210904 | 1           | 1         |  | First issue released |
| 300904 | 1           | 2         | RollCall command set and log fields added  | New issue released   |
| 291004 | 1           | 3         | Tech spec corrected  | New issue released   |
| 241104 | 1           | 4         | RollTrack items added  | New issue released   |
| 250105 | 1           | 5         | Tech spec to 0.1 dB steps  | New issue released   |
| 210205 | 1           | 6         | Firewall appendix added  | New issue released   |
| 090305 | 1           | 7         | 25 way and LED data corrected  | New issue released   |
| 070405 | 1           | 8         | Tech spec Video Delay added, slew rate description extended                                | New issue released   |
| 170505 | 1           | 9         | More RollTrack Source items  | New issue released   |
| 310505 | 1           | 10        | Log Fields note, + product codes   | New issue released   |
| 290705 | 1           | 11        | Silence etc. ranges, RollTrack text clarified, Audio delay pulse note added and TOC added. | New issue released   |
| 240706 | 1           | 12        | Appendix 2 HANC/Embed added  | New issue released   |
| 050407 | 1           | 13        | XLR gender data added  | New issue released   |
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