IQDAFS D1 Frame Synchroniser

CE

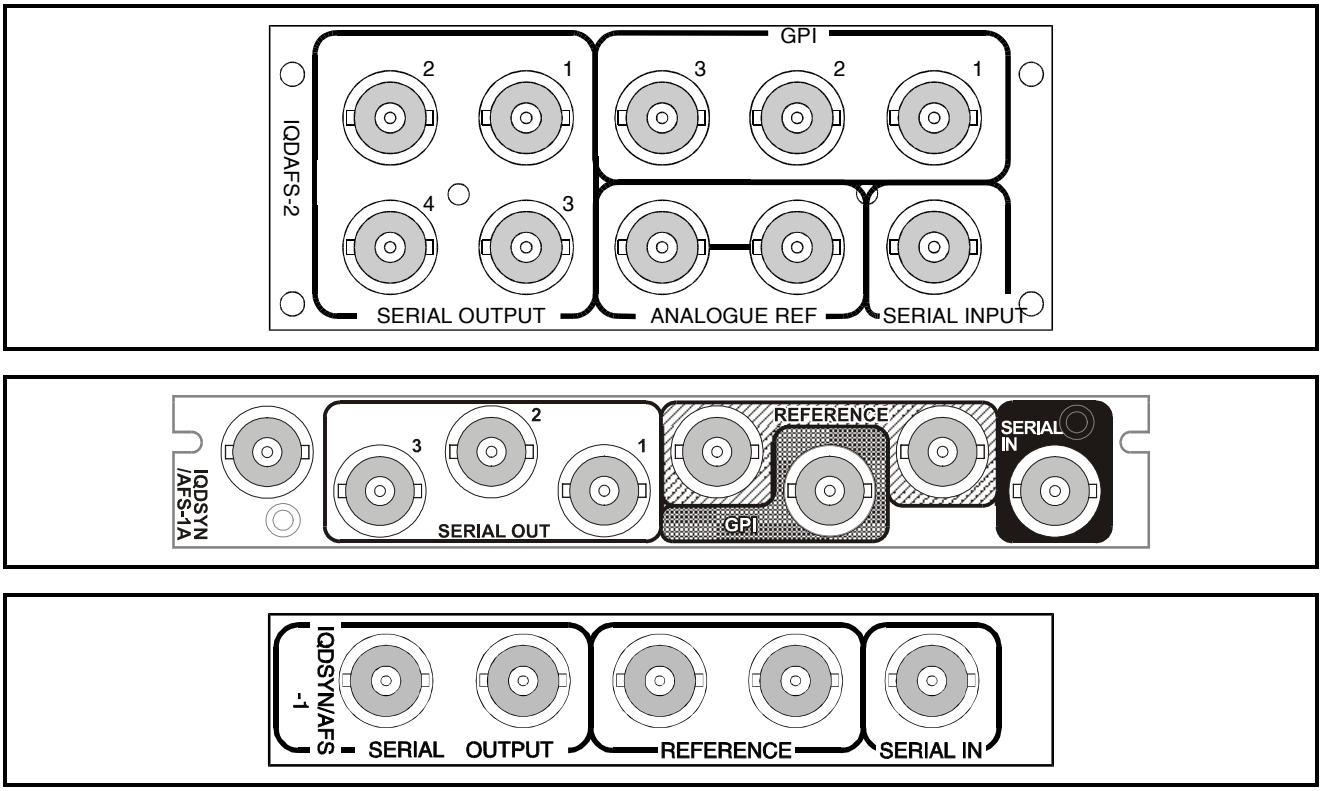
Module Description

The IQDAFS is an advanced SDI frame synchroniser with tracking embedded audio delay.
The IQDAFS is a full frame synchronizer for SDI video, capable of preserving the integrity of up to 4 embedded stereo audio channels, as well as other ancillary data. The audio processing is implemented such that delay changes are made without audible disturbance to the output audio stream. The synchronizer operation is robust to digital routers' switching according to SMPTE RP168.
The synchronizer will operate in 2 modes; first is the full synchronizer, where the output video is locked to an analog black reference input. In this mode the delay through the unit will change according to the scan positions of the input video relative to the reference input. To avoid introducing any lip-sync error the delay of the embedded audio will track precisely the delay of the video. In the event of the synchronizer dropping or repeating a frame the audio delay will be adjusted accordingly without any significant audible degradation. In the second operational mode the unit behaves as a constant, programmable delay of up to 1 frame +2 µs.

The unit has the ability to simultaneously process up to 4 audio channel-pairs for delay tracking, mute, polarity and channel shuffling. The operator can choose 4 pairs from the 8 possible embedded in the D1 stream. Selected pairs are passed to an 8x8 crosspoint switch, providing flexible subframe routing. The unit will pass all other ancillary data in the HANC region without alteration (ie audio pairs not selected for processing), however data discontinuity will occur when the synchroniser drops or repeats a frame. Ancillary packet parity and checksums are regenerated.
NOTE: Ancillary data structure and sample distributions are not altered. Only the data content within the selected audio pairs is modified. This unit can not be used to create new embedded audio pairs.

The IQDAFS unit has a suite of 'digital Proc Amp' controls. This offers control of luma and chroma gain and black level, horizontal picture position adjustment, horizontal and vertical YC delay adjustment, user adjustable clippers for both Luma and Chroma, luminance horizontal enhancement and complete control over the VANC active picture lines. Finally, a color legalizer will ensure that the output remains within the acceptable range of RGB gamut. This legalizer operates on both luminance and chrominance to provide the nearest legal color to an illegal input

REAR PANEL VIEW



Versions of the module cards available are:

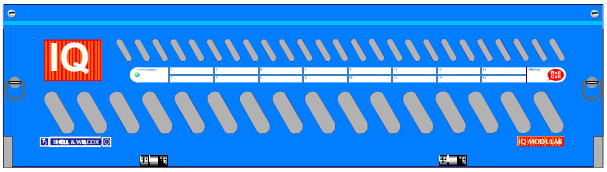
IQDAFS-2	D1 Frame Synchroniser with tracking embedded audio, 4 outputs	Double width module
IQDAFS-1	D1 Frame Synchroniser with tracking embedded audio, 2 outputs	Single width module
IQDAFS-1A	D1 Frame Synchroniser with tracking embedded audio, 3 outputs	Single width module

Note that this product is no longer available.

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

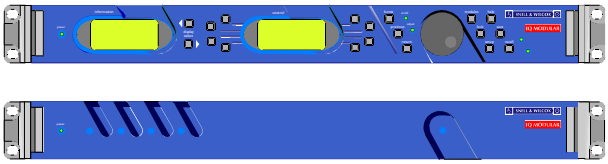
Rear panels ***with*** the suffix A may only be fitted into the 'A' style enclosure shown below.



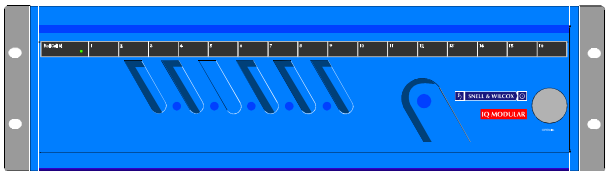
(Enclosure order codes IQH3A-E-O, IQH3A-E-P, IQH3A-N-O, IQH3A-N-P)

'O' Style Enclosures

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



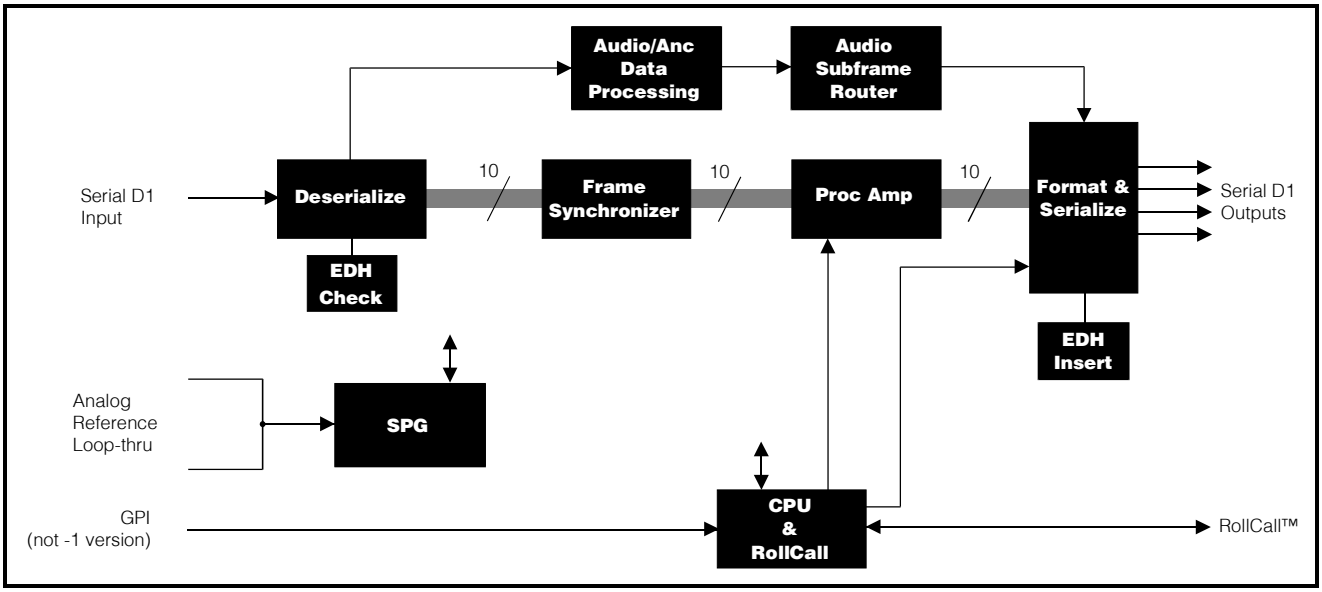
(Enclosure order codes IQH1S-RC-O, IQH1S-RC-AP, IQH1U-RC-O, IQH1U-RC-AP, Kudos Plus Products)



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

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

BLOCK DIAGRAM



Features

- Serial 4:2:2 frame synchronizer with 10-bit data path
- Embedded audio processing, up to 4 stereo pairs (SMPTE 272M-A)
- Shuffling/routing of up to 8 channels (4 pairs) of embedded audio
- Audio delay adjustment to match video delay
- Genlock to black/composite reference or Fixed delay mode (lock to input)
- Horizontal picture position adjustment
- Vertical and horizontal Y/C timing correction
- Y black adjustment
- Y and C gain controls
- Horizontal Y enhancement
- Gamut limiter
- Y and C clippers for minimum and maximum values
- Router switching tolerant (SMPTE RP168)
- Transparent ancillary data processing
- EDH checking and insertion to (SMPTE RP165)
- Pattern generation
- Un-interrupted valid video output
- Controlled and crash freeze
- Automatic 625 and 525 operation
- RollCall remote control plus 3 configurable GPI BNCs

Technical Profile

FEATURES

Signal Inputs

Serial Input..... 1 x SDI

Standards ..... SMPTE 259M-C-1997, SMPTE 272M-A-1994

Analog Reference Input ..... Black or Composite input

GPI (not –1 version)..... Up to 3 Closing Contact style inputs

Signal Outputs

Serial ..... Up to 4 Serial Digital

Standards ..... SMPTE 259M-C-1997, SMPTE 272M-A-1994

Card Edge Controls (also available via RollCall)

Mode Select..... Synchronize/ Delay

V Genlock offset ..... ± 100 Lines

H Genlock offset ..... + 1 Lines in 37 ns steps

V Delay (Delay mode)..... 1 Line to 1 Frame + 2 µs

H Delay (Delay mode)..... 0 to 64 µs

EDH insertion..... On/ Off

Pattern ..... On/ Off

Pattern Select ..... Black; EBU Bars; 100% Bars; Multiburst; Valid Ramp; Pulse and Bar

Auto Freeze ..... Freeze on Input Loss (Default is Pattern Output)

Horizontal Picture position . ±1628 ns in 148 ns steps

Horizontal YC Adjust..... ±2960 ns in 148 ns steps

Vertical YC Adjust..... +4/-5 lines

Vertical Data ..... Pass/ Strip (Individual selection via RollCall only)

HANC Data ..... Pass/ Strip

Freeze Mode..... Frame/ Field 1/ Field 2

Y Gain Adjust..... ± 6 dB in 0.1 dB steps

C Gain Adjust..... ± 6 dB in 0.1 dB steps

Black Level Adjust ..... ±100 mV in 0.8 mV steps

Horizontal Enhancement.... High Frequency [off, low, medium, high]
Mid Frequency [off, low, medium, high]
Edge Enhancement [off, low, medium, high]

Limiter..... Limits output to standard SMPTE/EBU levels

Preset Unit ..... Returns all settings to factory defaults

Functions Available via RollCall™ Only

Audio Channel-Pair Selection for delay tracking and processing.

Other channel pairs passed unprocessed
Choose any 4 from the following:
Channels 1 & 2
Channels 3 & 4
Channels 5 & 6
Channels 7 & 8
Channels 9 & 10
Channels 11 & 12
Channels 13 & 14
Channels 15 & 16

Audio Channel shuffling .... Available within the 4 pairs selected for processing.

Vertical Data ..... Individual Line Selection of Pass/Blank or Blank/Pass all lines

Y Min/Max Clipper value..... - 48 mV to + 48 mV and 639.2 mV to 760.8 mV in 0.8 mV steps

C Min/Max Clipper value .... -397 mV to -303 mV and +306.2 mV to +393.8 mV in 0.8 mV steps

EDH logging

GPI configuration (not –1 version)
Select the function of each GPI input from a predefined list of options

RollTrack™

SPECIFICATIONS

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 ±10%

Output Overshoot..... < 70 mV

Output Return Loss..... Better than -15 dB to 270 MHz

Output Jitter ..... < 0.2UI

Reference Return Loss ..... Better than -35 dB to 5.8 MHz

Reference Input Level..... 1 V pk to pk ± 3 dB

Minimum Delay (Synchronize Mode)
31 µs

Synchronize Hysteresis..... 1 µs

Minimum Delay (Delay Mode)
1 Line

Maximum Delay (Delay Mode)
1 Frame + 2 µs

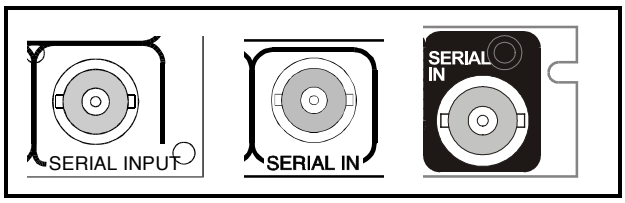
Audio - Video delay error.... < 1 ms in steady state (tracking audio channels)

Power Consumption

Module Power Consumption
9 W max

SERIAL INPUT

The serial digital input to the unit is made via this BNC connector which terminates in 75 Ohms.

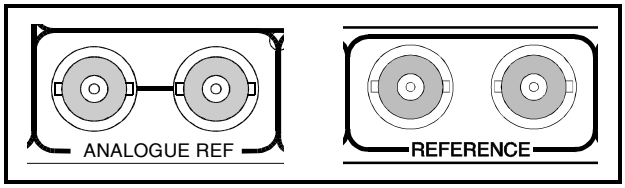


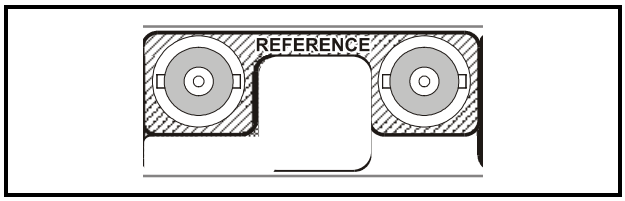
ANALOGUE REFERENCE INPUT

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

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

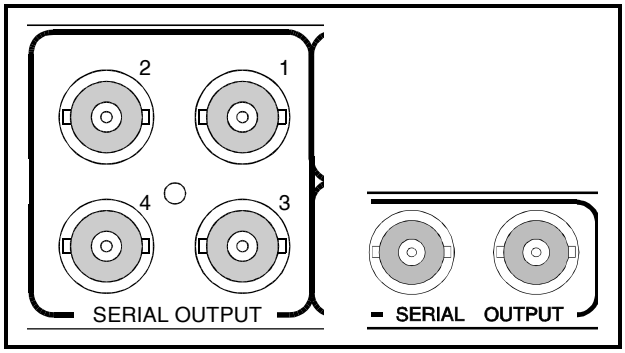
Note that if the loop-through facility is not used the unused socket must be fitted with a 75 Ohm terminator.

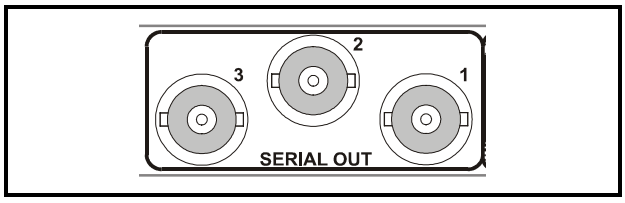




SERIAL OUTPUTS

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





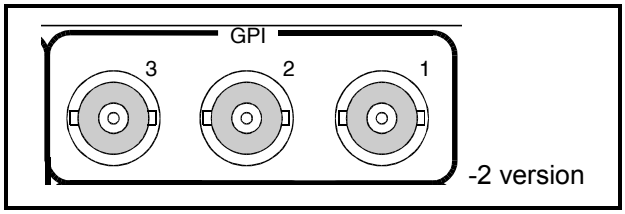
GPI (not on –1 version)

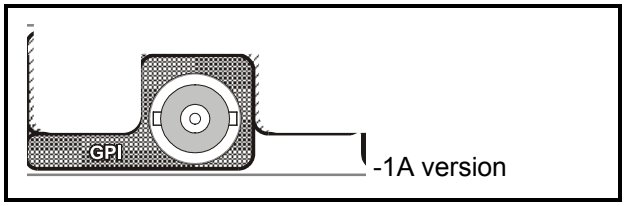
These connectors are used for accepting GPI information (from mechanical switch contacts, relay contacts etc.) The resulting action that the unit takes may be programmed via RollCall.

The GPI inputs have two user selectable modes of operation:

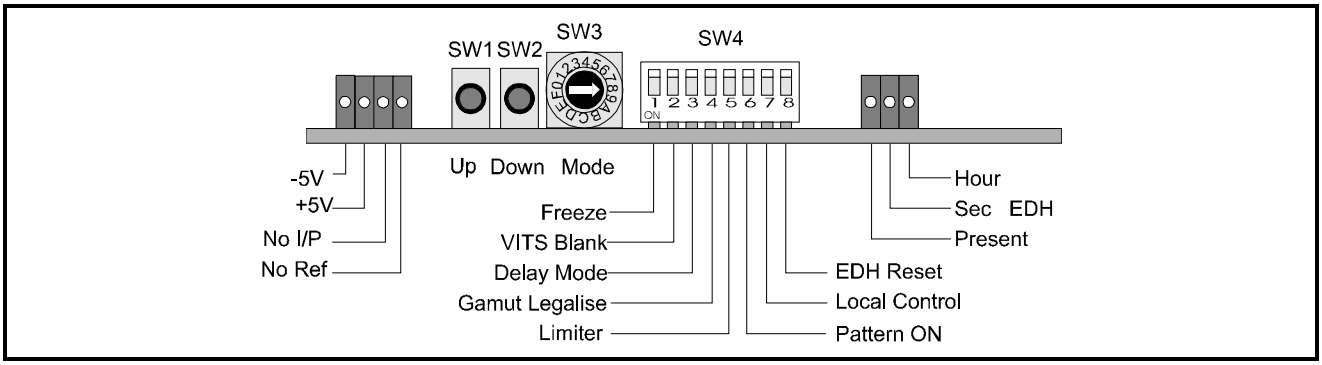
1. Latched: when the contact is closed the function is activated; when the contact is open, the function is de-activated.

2. Edge-triggered: with each open-to-closed trigger the GPI function is toggled between activated and de-activated.





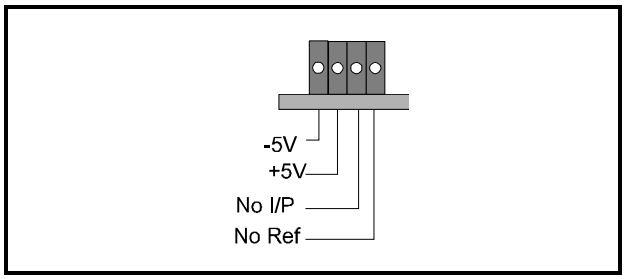
CARD EDGE CONTROLS



The unit will respond to both local and remote control, one system overriding the settings of the other. For cards using the RollCall™ remote control system, activating these switches will override the remote control settings. The RollCall™ control panel will then follow these settings.

LED INDICATORS

+5V and -5V



When illuminated these LED's indicate that the +5 V and -5 V supplies are present.

No I/P

The **No I/P** LED will be continuously illuminated when the unit is not receiving an input signal.

Note that in the **Genlock** mode this LED will flash when the input signal is of a different standard to that of the reference input. Under these conditions the output signal standard will be the same as the reference signal; the input signal will be ignored.

No Ref

When the **No Ref** LED is illuminated this indicates that the unit is not receiving a reference input signal.

*Note that when both the **No I/P** and **No Ref** LED's are flashing, this will indicate that an internal error has occurred.*

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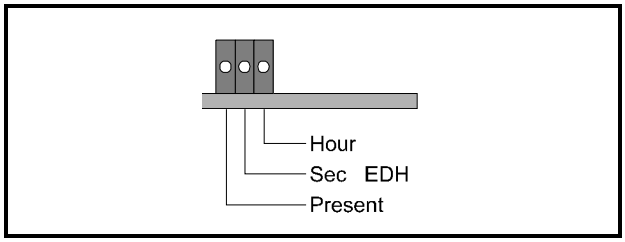
EDH Reporting



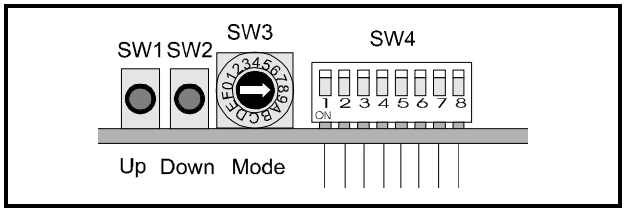
The **Present** LED will be illuminated if EDH data is present on the incoming signal.

The **Hour** LED indicates that an error has occurred in the last hour and the **Sec** LED indicates that an error has occurred in the last second.

Note that SW4/8 resets these indicators.

Adjustment of the settings of the IQDAFS is available either via card edge controls and/or via a more comprehensive remote control system using RollCall™

SWITCHES



Two push buttons, a Hex switch and a 8 way DIL switch allow various functions and modes to be set.

The DIL switch SW4 selects a particular function and the Hex switch SW3 selects a mode or variable parameter.

The push buttons SW1, SW2 allow the value of the selected function/parameter to be adjusted.

The Mode select switch may select a mode or a parameter that may be adjusted.

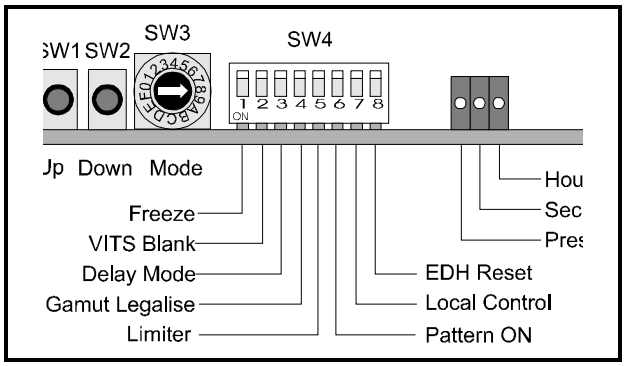
Note that to select the preset value both buttons should be pressed together.

These switches allow the module to be operated when an active front panel is not available.

More detailed information about these functions will be found under *MENU DETAILS* starting on page 11.

FUNCTION AND MODE SELECTIONS

Note that in this documentation the generic term VITS refers specifically to Vertical Interval Data carried in the luminance channel (Chroma is blanked).



DIL SWITCH FUNCTIONS SW4

By setting these switches various modes of operation may be selected.
(Down is ON and Up is OFF)

Position 1
Setting this to ON provides a **freeze** frame picture.

Position 2
Setting to ON allows the **VITS** signal to pass through the unit; in the OFF position VITS signals are blanked out.

Note that in the 525 standard VITS lines are from line 10 to 21 and 272 to 283 and in the 625 standard from line 7 to 22 and from 320 to 335 inclusive.

Position 3
Setting to ON enables the **delay mode**; OFF selects synchronise mode.

Position 4
This position allows the **Gamut legaliser** to be set ON or OFF. In the ON position the legaliser will prevent the unit from producing illegal (out of colour gamut) signals.

Position 5
Setting this to ON enables the **limiter** and the output is limited to standard levels.

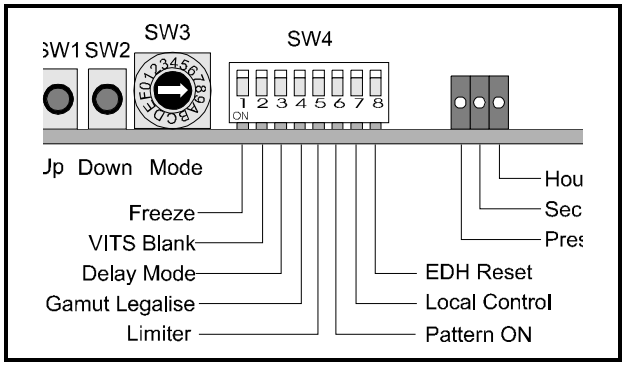
(0 V/700 mV for Y, 700 mV p-p for Pb and Pr)

Position 6
When set to ON (Down) this allows the unit to produce a **test pattern** (selected using SW3) signal as an output.

Position 7
When set to ON (Down) this allows the unit to operate under **local control**.

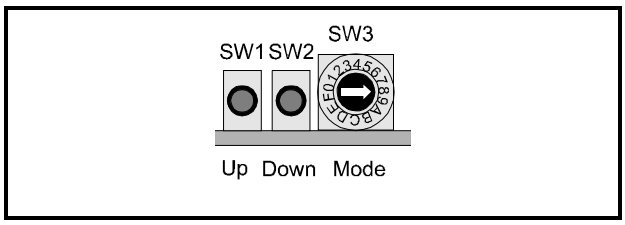
Note that in Main-frames where RollCall™ is not available this switch should be set to the ON position. This ensures that when the unit is powered-up the factory default settings of parameters not available as card edge adjustments, are loaded. When set to the UP position the card will power-up with the last settings sent by the remote control panel.

Position 8
Setting this to the ON position resets the **EDH** log indicators.



SW3

This HEX switch selects a parameter that may be adjusted with the push-buttons SW1 and SW2.
Note that SW1 increases a setting and SW2 decreases a setting. Continual pressure on the button will cause the setting to change continuously, the rate of change increasing with time. Pressing both together sets functions to their default values.



Position 0
In the Synchronise mode (set by SW4-3) this position allows the **horizontal phasing** between the external sync input and the output sync to be adjusted using SW1 and SW2. The range covers the whole line period in 37 ns steps.
Default is to 0 ns

In the Delay mode (set by SW4-3) this position allows the amount of input-to-output **horizontal delay** to be adjusted in steps of 37 ns using SW1 and SW2.
Default is to 0 ns

Position 1
In the Synchronise mode (set by SW4-3) this position allows the **vertical phasing** between the external sync input and the output sync to be adjusted in steps of 1 line using SW1 and SW2.
Default is to 0 lines

In the Delay mode (set by SW4-3) this position allows the amount of **input-to-output delay** to be adjusted in steps of 1 line using SW1 and SW2.

Minimum delay	1 line
Maximum delay	1 frame + 2 µs

Default is to 1 line

Position 2
The **horizontal position** of the picture (relative to syncs) may be adjusted by ±1628 ns in 148 ns steps using SW1 and SW2.
Default is to 0 ns

Position 3
The **horizontal chrominance delay** relative to luminance (i.e. Y to Cb/Cr timing) may be adjusted by ± 2960 ns in 148 ns steps using SW1 and SW2.
Default is to 0 ns

Position 4

The **vertical chrominance delay** relative to luminance (i.e. Y to Cb/Cr timing) may be adjusted by +4 lines to –5 lines in 1 line steps using SW1 and SW2.
Default is to 0 lines

Position 5
This allows the **luminance gain** of the unit to be adjusted.
The overall range of adjustment is ±6 dB in 0.1 dB steps.

Default setting is to the calibrated value of 0 dB.

Position 6
This allows the **chrominance gain** of the unit to be adjusted.
The overall range of adjustment is ±6 dB in 0.1 dB steps.

Default setting is to the calibrated value of 0 dB.

Position 7
This allows the **black level** of the unit to be adjusted.
The overall range of adjustment is ±100 mV in 0.8 mV steps.

Default setting is to the calibrated value of 0 mV.

Position 8
This allows a **test pattern** to be selected (in this order) from the following list:

Black
Valid Ramp
100% Bars
EBU Bars
Multiburst
Pulse and Bar

Default is to black.

Position 9
This allows **high frequency enhancement** to be applied to the processed signal. The range of adjustment is off, low, medium and high.
Default is to OFF.

Position A
This allows **medium frequency enhancement** to be applied to the processed signal. The range of adjustment is off, low, medium and high.
Default is to OFF.

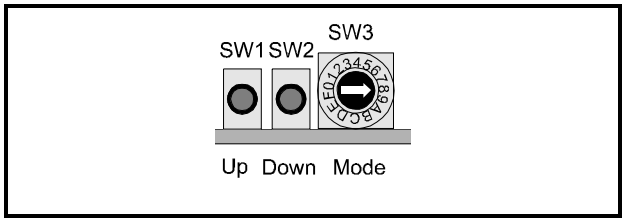
Position B
This allows **edge enhancement** to be applied to the processed signal. The range of adjustment is off, low, medium and high.
Default is to OFF.

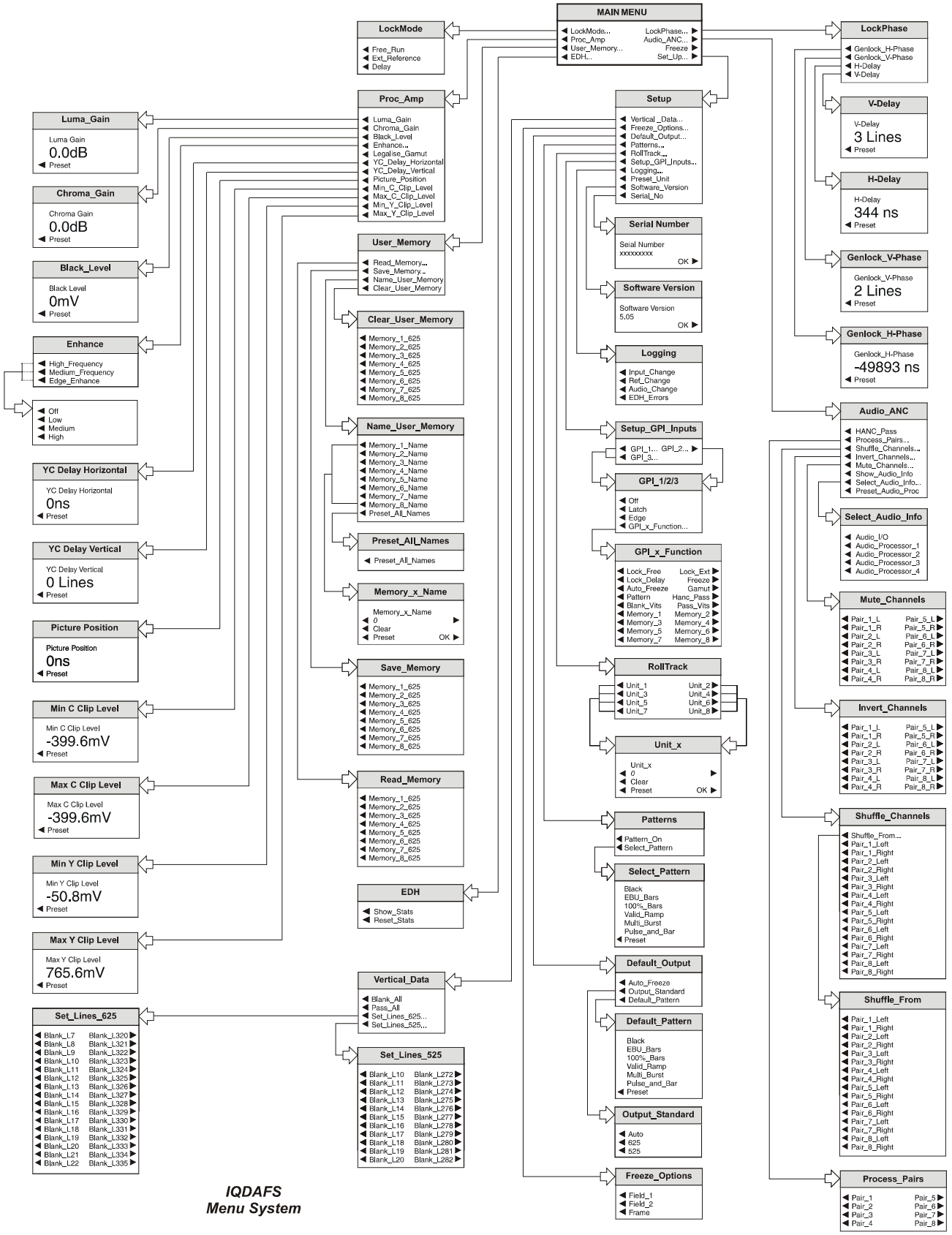
Position C
When the unit enters the **freeze mode** this position allows either a frame, field 1 or field 2 to be used as the frozen picture.
Default is to frame.

Position D
When the unit suffers a **loss of input** signal the output signal will revert to a pattern (selected only from the menu) or a frame freeze. Default pattern is to Black. In this position pressing SW1 sets the unit to the pattern and pressing SW2 sets the unit to freeze.
Note that picture corruption is possible in the freeze frame mode.
Default is to freeze.

Position E
This position allows **HANC data** to be passed through (SW2) or blanked (SW1)
Default is to pass

Position F
In this position pressing SW1 and SW2 together sets all parameters to the **default/preset** conditions.





IQDAFS
Menu System

OPERATION FROM AN ACTIVE CONTROL PANEL

The card may be operated with an active control panel via the RollCall™ network.
The menus available for this card are shown opposite and will appear in the Control display window.

Operational details for the remote control panel will be found in SECTION 1 of the Modular System Operator's Manual.

MENU DETAILS
(see IQDAFS Menu System opposite)

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.

◄ Lock_Mode…

This allows the method that the card may be locked (or not) to an external reference signal.

◄ Free_Run

In this mode the output signal will be locked to the internal clock generator.

◄ Ext_Reference

This selection locks the output signal to the signal connected to the Analogue Ref input connector.

The standard of the reference signal determines the standard of the output signal.
In the absence of a reference signal the standard of the output signal will be the same as the input signal.
If the reference signal and input signal are of different standards the output will display a pattern selected by the default pattern menu in the standard of the reference signal.

Note that to change the horizontal and vertical phasing between the external sync signal and the output signal select Lock Phase in the Main menu.

◄ Delay

When this mode is selected the output signal will appear after the input signal with a time delay. When not selected the module will operate in the synchronise mode.

Note that to change the horizontal and vertical delay between the input signal and the output signal select Lock Phase in the Main menu. This function is only available when the delay mode is selected.

Lock_Phase… ►

This menu allows various phasing/delay adjustments to be made.

Note that the H-Delay and V-Delay adjustments will only be available when the Delay selection has been made in the Lock Mode menu.

◄ Genlock_H Phase

Selecting this item reveals a display showing the horizontal timing of the output signal relative to the reference sync signal, in nanoseconds. Rotating the spin-wheel will adjust this value.

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

◄ Genlock_V Phase

Selecting this item reveals a display showing the vertical timing of the output signal relative to the reference sync signal, in TV lines. Rotating the spin-wheel will adjust this value. Range is100 lines in 1 line steps.

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

◄ H Delay

Selecting this item reveals a display showing the horizontal timing of the output signal relative to the input signal, in nanoseconds. Rotating the spin-wheel will adjust this value.
Selecting Preset returns the setting to the minimum horizontal delay.

◄ V Delay

Selecting this item reveals a display showing the vertical timing of the output signal relative to the input signal, in TV lines. Rotating the spin-wheel will adjust this value. Range is from 1 line to 624 or 525 lines in 1 line steps.

Selecting Preset returns the setting to the minimum vertical delay.

◄ Proc_Amp

This selection allows various adjustments to be made to the processed signal.

◄ Luma_Gain

This selection reveals a numerical readout display for the gain of the luminance signal.
By rotating the spinwheel the gain may be adjusted by ±6 dB in steps of 0.1 dB.

Selecting Preset returns the setting to the calibrated value of 0.

◄ Chroma_Gain

This selection reveals a numerical readout display for the gain of the chrominance signal.
By rotating the spinwheel the gain may be adjusted by ±6 dB in steps of 0.1 dB.

Selecting Preset returns the setting to the calibrated value of 0.

◄ Black_Level

This selection reveals a numerical readout display for the Y pedestal or black level.
By rotating the spinwheel the pedestal may be adjusted by ±100 mV in steps of 0.8 mV.

Selecting Preset returns the setting to the calibrated value of 0.

◄ Enhance

This allows high frequency, medium frequency and edge enhancement to be applied to the processed signal. The range of adjustment for each is off, low, medium and high.
Default is to OFF.

◄ Legalise_Gamut

This allows the **Gamut legaliser** to be set ON (text highlighted) or OFF (text normal). In the ON position the legaliser will prevent the unit from producing illegal (out of colour gamut) signals.

◄ YC_Delay_Horizontal

Selecting this item reveals a display showing the timing of the chrominance signal relative to the luminance signal, (i.e. Y to Cb/Cr timing) in nanoseconds. Rotating the spin-wheel will adjust this value.
Range is from ±2960 ns in 148 ns steps.

Selecting **Preset** returns the setting to the preset value of 0.

◄ YC_Delay_Vertical

The vertical delay of chrominance relative to luminance (i.e. Y to Cb/Cr timing) may be adjusted by +4 lines to –5 lines in 1 line steps.

Selecting **Preset** returns the setting to the preset value of 0.

◄ Picture_Position

Selecting this item reveals a display showing the timing of the picture position relative to the normal value, in nanoseconds. Rotating the spin-wheel will adjust this value.
Range is from ±1628 ns in 148 ns steps.

Selecting Preset returns the setting to the preset value of 0.

Y and C Clip Levels

These functions allow Y and C signal excursions to be limited by setting minimum and maximum clipping levels. All adjustments are made in steps of 0.8 mV.

◄ Minimum_C_Clip_Level

The minimum clip level for the chrominance signal may be set between –397 mV and +303 mV

Preset value is –397 mV

◄ Maximum_C_Clip_Level

The maximum clip level for the chrominance signal may be set between 393.8 mV and +306.2 mV

Preset value is +393.8 mV

◄ Minimum_Y_Clip_Level

The minimum clip level for the luminance signal may be set between –48 mV and +48 mV

Preset value is –48 mV

◄ Maximum_Y_Clip_Level

The maximum clip level for the luminance signal may be set between 639.2 mV and 760.8 mV

Preset value is 760.8 mV

Audio_ANC… ►

This item allows various audio functions to be selected.

◄ HANC_Pass

When this function is enabled the unit will pass all ancillary data in the HANC region.

Note: Normally the audio samples go through polyphase sample rate converters with the input rate and the output rate locked to preserve the delay through the audio buffer.
When there is a difference between the audio and video delays, e.g. when the synchroniser drops or repeats a frame, the rate converters' input and output rates are varied accordingly in order to smoothly track the audio delay to the video delay. Once the audio and the video delays are matched the sample rate converters resume normal operation.

◄ Process_Pairs

This function allows selection of up to four of the eight possible embedded audio pairs for processing by the sample rate converters and subframe shuffling.

◄ Shuffle_Channels

The channels within the audio pairs selected above are passed to a cross-point matrix function allowing, for example, the first channel of pair #1 to become the second channel from pair #3.

An input subframe may be routed to any number of the output subframes.

Operation is as follows:
Select the destination (output) subframe from the list, then select ◄ Shuffle_From at the top.

A new menu list will appear, from which the source (input) subframe is selected.

◄ Invert_Channels

This function allows any of the 16 channels (left and right channels of 8 pairs) to be inverted (signal polarity reversed)

◄ Mute_Channels

This function allows any of the 16 channels (left and right channels of 8 pairs) to be muted (output will be silence)

◄ Show_Audio_Info

When this function is enabled the information selected from the Select Audio Info menu will be displayed.

◄ Select_Audio_Info

When enabled this function will allow specific information to be selected and displayed when the **Show Audio Info** function is enabled. Selections available are:

◄ Audio In/Out
◄ Audio Processors 1 to 4

◄ Preset_Audio_Proc

Enabling this function will return audio processing functions to their preset (default) state

◄ User_Memory

All settings of the unit may be stored in any of 8 non-volatile memory locations. These locations may be read, saved, given a name or cleared to the preset names by selecting this function to reveal the sub-menu.

◄ Read_Memory

This will reveal a list of 8 memory locations. When a particular location is enabled, settings will be changed to the values contained in that memory location.

◄ Save_Memory

This will reveal a list of 8 memory locations. When a particular location is enabled, current settings will be saved in that memory location.

◄ Name_User_Memory

This will reveal a list of the 8 memory locations that may be given a specific name. Use the adjacent buttons to select the cursor position and the spinwheel to select the alphanumeric character.

◄ Preset_All_Names

This function will set all names to their preset (default) values.

Freeze ►

This toggle On/Off function produces a freeze-frame picture.

◄ EDH

This selection reveals a sub-menu that allows various Input or Output EDH parameters to be enabled.

◄ Show_Stats (Statistics)

When this function is enabled (text reversed) the information window will display the number of errors from the time the function was enabled. The elapsed time in hours, minutes and seconds is also displayed.

◄ Reset_Stats (Statistics)

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

Set_Up ►

This menu allows various system parameters to be set.

Note that in this documentation the generic term VITS refers specifically to Vertical Interval Data carried in the luminance channel (Chroma is blanked).

◄ Vertical_Data

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

◄ Blank_All

This function will blank (remove) all data lines.

◄ Pass_All

This function will allow all data lines to pass through the unit.

◄ Set_Lines_625/525

These sub-menus will show the lines that may be selected to be blanked from the output signal.

Note that in the 525 standard VITS lines are from line 10 to 21 and 272 to 283 and in the 625 standard from line 7 to 22 and from 320 to 335 inclusive.

◄ Freeze_Options

When the freeze mode is enabled this item allows the type of frozen picture to be selected.

Options are:

◄ Field 1 An odd field will be selected
◄ Field 2 An even field will be selected
◄ Frame A frame will be selected

◄ Default_Output

This item allows the output standard and pattern output to be selected in the event of a loss of input or a conflict of input/reference standard.

◄ Auto Freeze

When this item is active and the input signal is lost, a freeze field picture will be produced. When inactive a pattern signal (as selected from the Default Output/Default Pattern menu) will be produced under these conditions.

◄ Output_Standard

In the event of a loss of input *and* reference or a conflict of input/reference standard the output standard may be set to become:

◄ Auto The output will be in the last known standard

◄ 625 The output will be in the 625 standard

◄ 525 The output will be in the 525 standard

◄ Default_Pattern

Under the above conditions the pattern that appears at the output may be selected from the following list:

◄ Black
◄ EBU_Bars
◄ 100%_Bars
◄ Valid_Ramp
◄ Multiburst
◄ Pulse_and_Bar
◄ Preset

Preset selects Black.

◄ **Patterns**

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

◄ Pattern_On

When this item is enabled a pattern, selected from the Select_Pattern sub-Menu will become the output signal.

When this item is enabled a pattern may be selected from the list below and this become the output signal when the Pattern_On function is enabled.

Patterns available are:

◄ Black
◄ EBU Bars
◄ 100% Bars
◄ Valid Ramp
◄ Multiburst
◄ Pulse and Bar

◄ **RollTrack**

This function allows the value of the delay time produced by this module to be sent, via the RollCall™ network, to audio delay units connected on the same network. This enables 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 allowing processed video signals to be timed correctly with audio signals. This automatic tracking system via the RollCall™ network is call **RollTrack**.

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

Selecting RollTrack in the Set-up menu provides a sub-menu that allows up to 8 units (mainframes enclosures etc.) to be selected as a destination.

A further sub-menu then appears to allow the code to be set up using the adjacent push buttons to edit the text.

(The left and right hand buttons select the cursor position and the spinwheel selects the character; the clear button sets the text line to all zero's and the OK button accepts the network address)

For more detailed information see the RollTrack section, page 20, of this manual.

The full network address has four sets of numbers.

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 (14) separated by an * is the channel number.
Note that only channel numbers 14, 15, 16 & 17 should be used for audio delay cards.

Once a destination address for a unit has been set the OK function will return to the unit menu to allow another address to be set if required.

◄ **Setup_GPI_Inputs**

Note that the –2 version has 3 GPI inputs, the –1A version has 1 GPI input and the –1 version has none.

The GPI connectors are used for accepting GPI information (from mechanical switch contacts, relay contacts etc.) The resulting action that the unit takes may be selected from this menu.

The required GPI input should be selected:

◄ GPI-1 GPI-2 ►
◄ GPI-3

The GPI input has two user selectable modes of operation:

◄ Off

The function will be inactive

◄ Latch

When the contact is closed the function is activated; when the contact is open, the function is de-activated.

◄ Edge

(Edge-triggered) With each open-to-closed trigger the GPI function is toggled between activated and de-activated.

◄ GPI_x_Function

The action resulting from the selected GPI input being activated may be programmed from this list:

Setting	Action
◄ Lock_Free	Lockmode to Free_run
Lock_Ext ►	Lockmode to Ext_Reference
◄ Lock_Delay	Lockmode to Delay Mode
Freeze ►	Freezes picture
◄ Auto_Freeze	Setup/Freeze_Option to Auto_Freeze
Gamut ►	Legalise_Gamut active
◄ Pattern	Output to Pattern
Hanc_Pass ►	Audio/ANC to HANC Pass
◄ Blank_Vits	Vertical_Data to Pass_All
Pass_Vits ►	Vertical_Data to Pass_All
◄ Memory_1 to Memory_8 ►	Settings will be changed to the values contained in that memory location.

Note that in this documentation the generic term VITS refers specifically to Vertical Interval Data carried in the luminance channel (Chroma is blanked).

◄ Logging

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

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

◄ Input Change

When activated, a change of input signal condition will be available for the logging device.

◄ Ref Change

When activated, a change of External reference signal condition will be available for the logging device.

◄ Audio_Change

When activated, a change of audio settings will be available for the logging device.

◄ EDH Errors

When activated, EDH error reports will be available for the logging device.

◄ 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 and the text will not become reversed.

◄ Software Version

Selecting this item reveals a display showing the version of the software fitted in the module. Select OK to return to the Setup Menu.

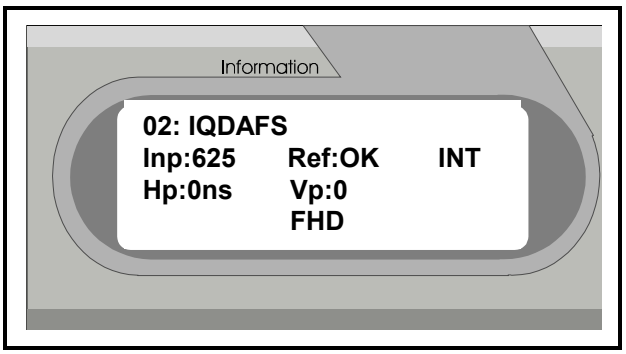
◄ Serial Number

Selecting this item reveals a display showing the serial number of the module. Select OK to return to the Setup Menu.

THE INFORMATION WINDOW

The parameters of the selected item in the Control window will be displayed in the Information window.

An example is shown below:



The first line shows the name of the module card. This name can be changed using RollCall™ and the Remote Control Interface Menu.

The second line shows that the signal input and the reference input are receiving valid signals; if there is no signal or the signal is invalid it will show Inp:** or Ref:**

This text may be followed by the following abbreviations:

FRZ Unit has been set to the Freeze mode; the output picture is frozen

AFZ Unit has lost the input signal and the Auto Freeze mode activated; output picture is frozen

PAT Unit has been set to enable the test pattern signal as the output

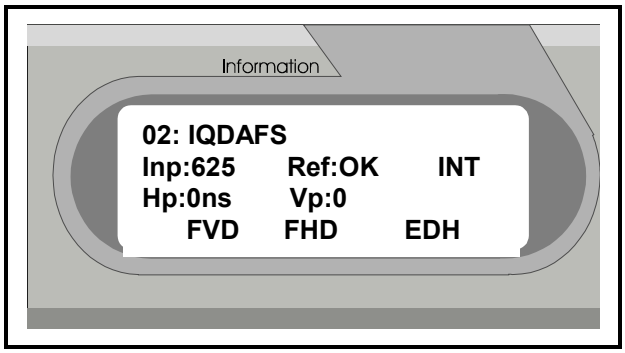
BLK Unit has lost the input signal and the Auto Freeze mode is not activated; output picture will be black

The third line shows that the module is operating in the Delay mode (could be Ext Reference lock or Internal Lock mode) and that the line standard is 625 (could be 525).

Note that RM will follow this text if the unit is in the Roll mode.

The fourth line shows that in the Delay mode the Vertical Delay is 1 Line (could be Vp, the genlock vertical phase in synchronise mode) and that the Horizontal Delay is 2047 ns (could be Hp, the genlock horizontal phase).

In the next example the module is receiving a 625 input signal, a reference signal is present, Lock mode is internal, H phase=0 and V phase=0.



IQDAFS Menu Command Set						
Command Name	**Value**	**Type**	**Parameter or Min**	**Max or Action**	**Selection or Step**	**Comment**
Genlock H-Phase	6	Number	-63936	63936	37	in ns
Genlock V-Phase	7	Number	-100	100	1	in lines
H-Delay	8	Number	0	63936	37	in ns
V-Delay	9	Number	1	625	1	in lines
Luma Gain	13	Number	-60	60	1	Divide by 10 to give dB
Chroma Gain	14	Number	-60	60	1	Divide by 10 to give dB
Black Level	15	Number	-1000	1000	8	Divide by 10 to give mV
YC Delay Horizontal	16	Number	-2960	2960	148	in ns
YC Delay Vertical	17	Number	-5	4	1	in Lines
Picture Position	18	Number	-1628	1628	148	in ns
Min C Clip Level	76	Number	-399600	-300400	800	Divide by 1000 to give mV
Max C Clip Level	77	Number	300400	399600	800	Divide by 1000 to give mV
Min Y Clip Level	78	Number	-50800	50800	800	Divide by 1000 to give mV
Max Y Clip Level	79	Number	634400	765600	800	Divide by 1000 to give mV
Freeze	10	Checkbox	1	to set		
Auto Freeze	12	Checkbox	1	to set		
Legalise Gamut	19	Checkbox	1	to set		
Pattern On	20	Checkbox	1	to set		Enable Test Patterns
Blank L7	22	Checkbox	1	to set		
Blank L320	23	Checkbox	1	to set		
Blank L8	24	Checkbox	1	to set		
Blank L321	25	Checkbox	1	to set		
Blank L9	26	Checkbox	1	to set		
Blank L322	27	Checkbox	1	to set		
Blank L10	28	Checkbox	1	to set		
Blank L323	29	Checkbox	1	to set		
Blank L11	30	Checkbox	1	to set		
Blank L324	31	Checkbox	1	to set		
Blank L12	32	Checkbox	1	to set		
Blank L325	33	Checkbox	1	to set		
Blank L13	34	Checkbox	1	to set		
Blank L326	35	Checkbox	1	to set		
Blank L14	36	Checkbox	1	to set		
Blank L327	37	Checkbox	1	to set		
Blank L15	38	Checkbox	1	to set		
Blank L328	39	Checkbox	1	to set		
Blank L16	40	Checkbox	1	to set		
Blank L329	41	Checkbox	1	to set		
Blank L17	42	Checkbox	1	to set		
Blank L330	43	Checkbox	1	to set		
Blank L18	44	Checkbox	1	to set		
Blank L331	45	Checkbox	1	to set		
Blank L19	46	Checkbox	1	to set		
Blank L332	47	Checkbox	1	to set		
Blank L20	48	Checkbox	1	to set		
Blank L333	49	Checkbox	1	to set		
Blank L21	50	Checkbox	1	to set		
Blank L334	51	Checkbox	1	to set		

Chan 1 2	53	Checkbox	1	to set		Audio Channel Select
Chan 3 4	54	Checkbox	1	to set		Audio Channel Select
Chan 5 6	55	Checkbox	1	to set		Audio Channel Select
Chan 7 8	56	Checkbox	1	to set		Audio Channel Select
Chan 9 10	57	Checkbox	1	to set		Audio Channel Select
Chan 11 12	58	Checkbox	1	to set		Audio Channel Select
Chan 13 14	59	Checkbox	1	to set		Audio Channel Select
Chan 15 16	60	Checkbox	1	to set		Audio Channel Select
Show Stats	61	Checkbox	1	to set		EDH
Enable Output	63	Checkbox	1	to set		EDH
HANC Pass	64	Checkbox	1	to set		
Input Change	73	Checkbox	1	to set		Logging
Ref Change	74	Checkbox	1	to set		Logging
EDH Errors	75	Checkbox	1	to set		Logging
Show Audio I/O	80	Checkbox	1	to set		
Blank L22	84	Checkbox	1	to set		
Blank L335	85	Checkbox	1	to set		
Blank L10	89	Checkbox	1	to set		
Blank L272	90	Checkbox	1	to set		
Blank L11	91	Checkbox	1	to set		
Blank L273	92	Checkbox	1	to set		
Blank L12	93	Checkbox	1	to set		
Blank L274	94	Checkbox	1	to set		
Blank L13	95	Checkbox	1	to set		
Blank L275	96	Checkbox	1	to set		
Blank L14	97	Checkbox	1	to set		
Blank L276	98	Checkbox	1	to set		
Blank L15	99	Checkbox	1	to set		
Blank L277	100	Checkbox	1	to set		
Blank L16	101	Checkbox	1	to set		
Blank L278	102	Checkbox	1	to set		
Blank L17	103	Checkbox	1	to set		
Blank L279	104	Checkbox	1	to set		
Blank L18	105	Checkbox	1	to set		
Blank L280	106	Checkbox	1	to set		
Blank L19	107	Checkbox	1	to set		
Blank L281	108	Checkbox	1	to set		
Blank L20	109	Checkbox	1	to set		
Blank L282	110	Checkbox	1	to set		
Setup	3	Button	1	to select	Preset Unit	
LockMode	5	Button	0	to select	Free Run	
LockMode	5	Button	1	to select	Ext Reference	
LockMode	5	Button	2	to select	Delay	

Freeze Options	11	Button	0	to select	Field 1	
Freeze Options	11	Button	1	to select	Field 2	
Freeze Options	11	Button	2	to select	Frame	
Patterns	21	Button	0	to select	Black	
Patterns	21	Button	1	to select	Valid Ramp	
Patterns	21	Button	2	to select	100% Bars	
Patterns	21	Button	3	to select	EBU Bars	
Patterns	21	Button	4	to select	Multi Burst	
Patterns	21	Button	5	to select	Pulse and Bar	
Vertical Data	52	Button	0	to select	Blank All	
Vertical Data	52	Button	1	to select	Pass All	
Vertical Data	52	Button	2	to select	User Select	
EDH	62	Button	1	to select	Reset Stats	
High Frequency	81	Button	0	to select	Off	
High Frequency	81	Button	1	to select	Low	
High Frequency	81	Button	2	to select	Medium	
High Frequency	81	Button	3	to select	High	
Medium Frequency	82	Button	0	to select	Off	
Medium Frequency	82	Button	1	to select	Low	
Medium Frequency	82	Button	2	to select	Medium	
Medium Frequency	82	Button	3	to select	High	
Edge Enhance	83	Button	0	to select	Off	
Edge Enhance	83	Button	1	to select	Low	
Edge Enhance	83	Button	2	to select	Medium	
Edge Enhance	83	Button	3	to select	High	
Read Memory	86	Button	0	to select	Memory 1	
Read Memory	86	Button	1	to select	Memory 2	
Read Memory	86	Button	2	to select	Memory 3	
Read Memory	86	Button	3	to select	Memory 4	
Read Memory	86	Button	4	to select	Memory 5	
Read Memory	86	Button	5	to select	Memory 6	
Read Memory	86	Button	6	to select	Memory 7	
Read Memory	86	Button	7	to select	Memory 8	
Save Memory	87	Button	0	to select	Memory 1	
Save Memory	87	Button	1	to select	Memory 2	
Save Memory	87	Button	2	to select	Memory 3	
Save Memory	87	Button	3	to select	Memory 4	
Save Memory	87	Button	4	to select	Memory 5	
Save Memory	87	Button	5	to select	Memory 6	
Save Memory	87	Button	6	to select	Memory 7	
Save Memory	87	Button	7	to select	Memory 8	
Clear User Memory	88	Button	1	to select	Clear Memory	

Output Standard	111	Button	0	to select	Auto	
Output Standard	111	Button	1	to select	625	
Output Standard	111	Button	2	to select	525	
Default Pattern	112	Button	0	to select	Black	
Default Pattern	112	Button	1	to select	Valid Ramp	
Default Pattern	112	Button	2	to select	100% Bars	
Default Pattern	112	Button	3	to select	EBU Bars	
Default Pattern	112	Button	4	to select	Multi Burst	
Default Pattern	112	Button	5	to select	Pulse and Bar	
Preset All Names	121	Button	1	to select	Preset All Names	
GPI 1	124	Button	0	to select	Latch	
GPI 1	124	Button	1	to select	Edge	
GPI 2	125	Button	0	to select	Latch	
GPI 2	125	Button	1	to select	Edge	
GPI 3	126	Button	0	to select	Latch	
GPI 3	126	Button	1	to select	Edge	
Memory 1 Name	113	String				
Memory 2 Name	114	String				
Memory 3 Name	115	String				
Memory 4 Name	116	String				
Memory 5 Name	117	String				
Memory 6 Name	118	String				
Memory 7 Name	119	String				
Memory 8 Name	120	String				
Serial No	1	Display				
Software Version	2	Display				

RollTrack Audio Delay Tracking

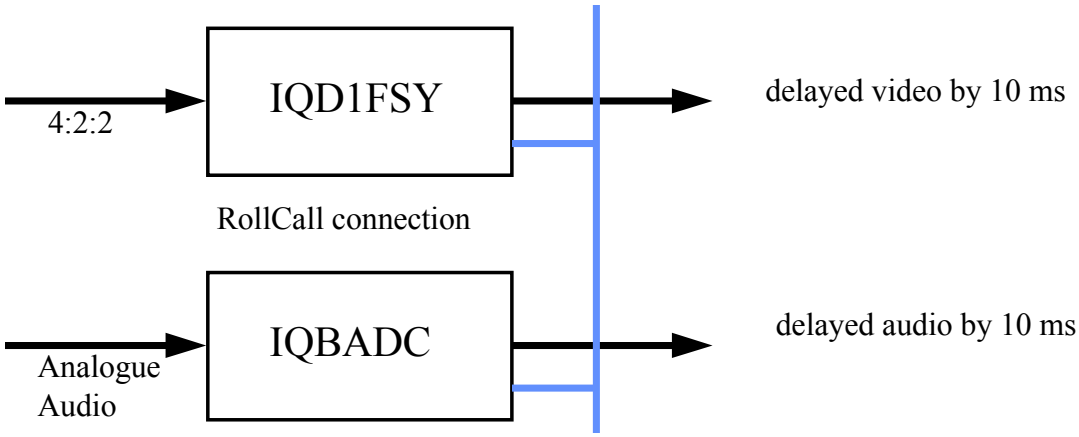
RollTrack is a feature of RollCall™ (Snell & Wilcox's proprietary remote control system), that allows devices to communicate across the RollCall network with no direct user intervention.

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

The current products that implement RollTrack Audio Delay Tracking are:

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

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



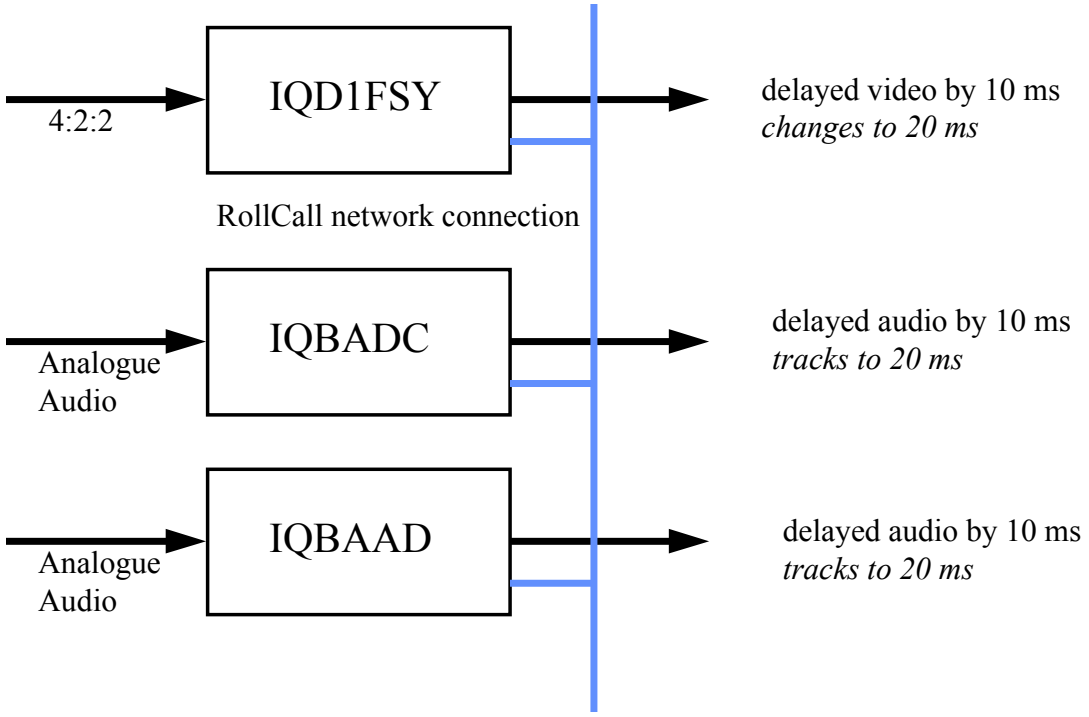
The next level of configuration is where there are multiple Frame Synchronizers (for example) each connected through RollCall™ to their own tracking Audio Delay. (It is worth stating that the synchronizers and audio delays do not have to be in the same enclosure; the addressing scheme, discussed later,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

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

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

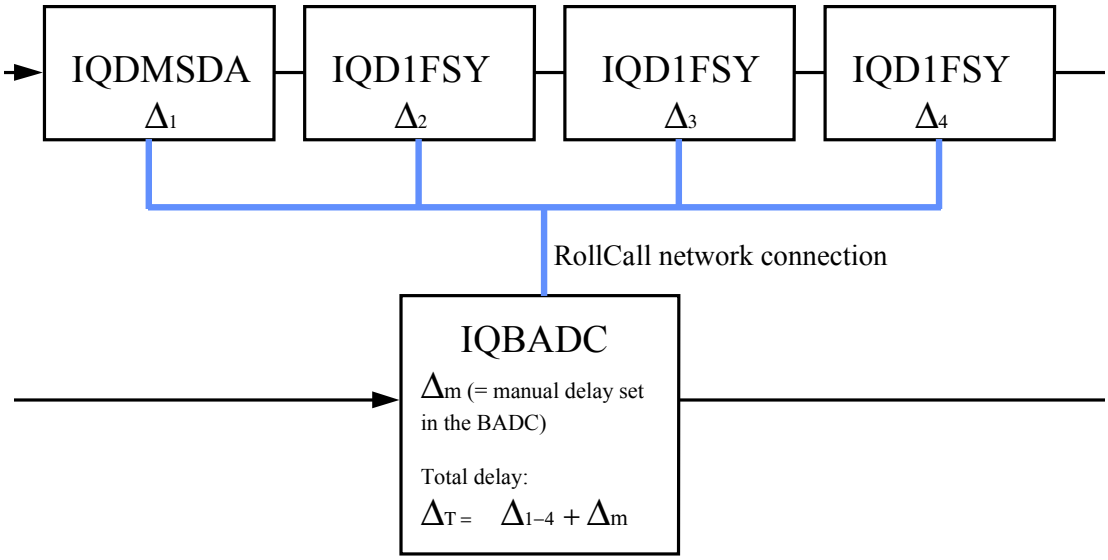
Module	ID
IQBADC	51
IQBDAC	52
IQBAAD	53
IQBDAD	54
IQBSYN	89
IQBADCD	107

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



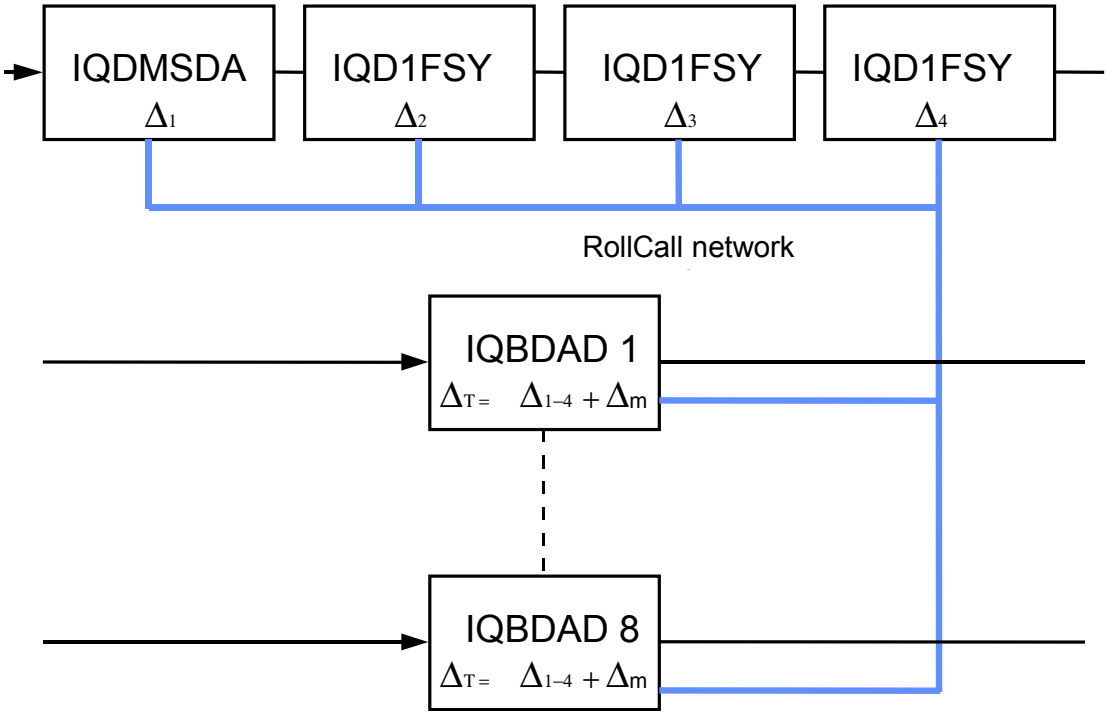
From one to eight audio delay products can be connected via RollCall™ to a single frame synchronizer, for example. If the synchronizer delay changes, then however many audio delays are connected will track the delay. The audio delays can also have a manual delay which will be added to the RollTrack delay.

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



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

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



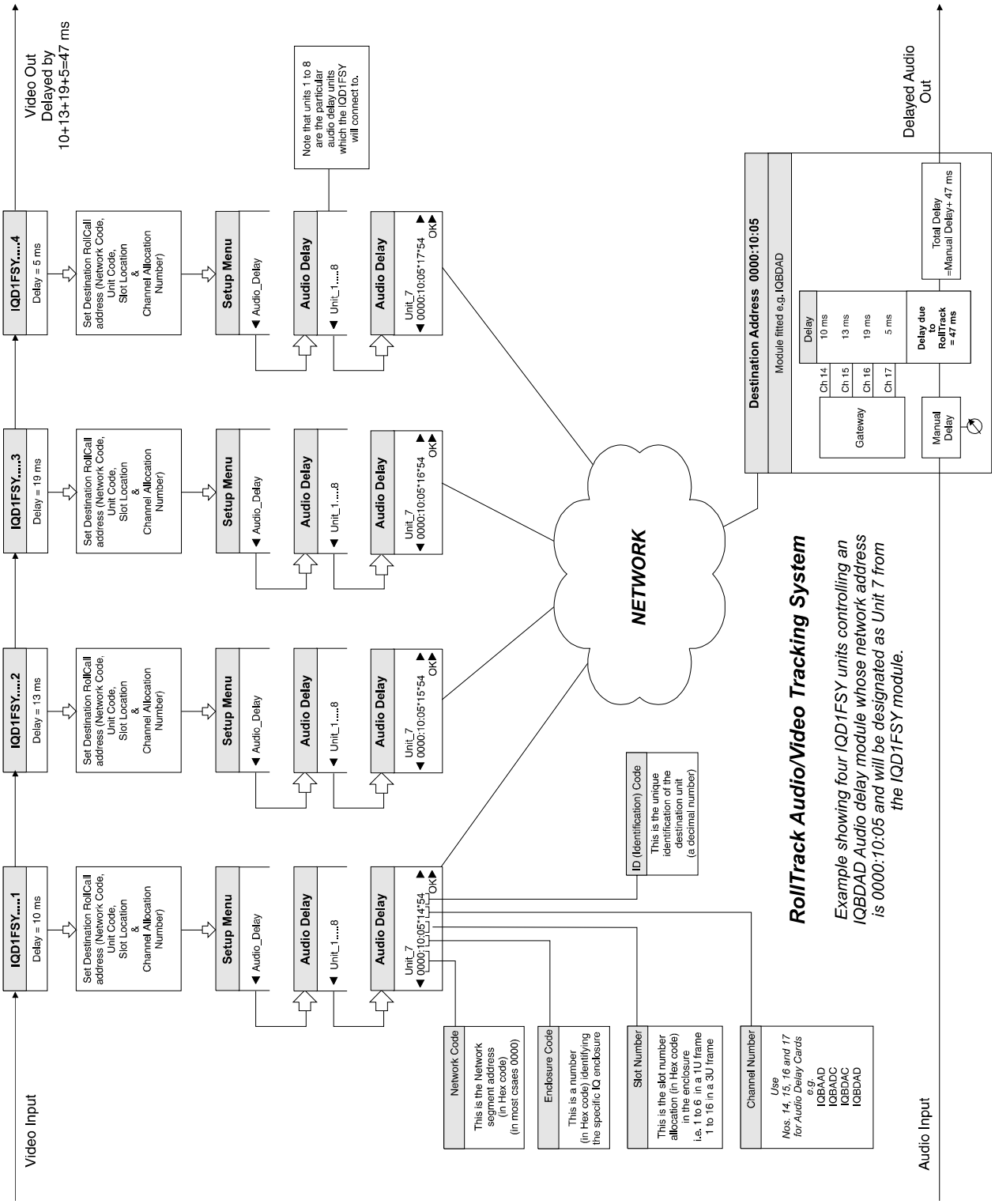
As any of the delay times change in the video path so will the audio delay time track this delay.
A virtual connection is made between from, say, an IQD1FSY to an IQBDAD by:

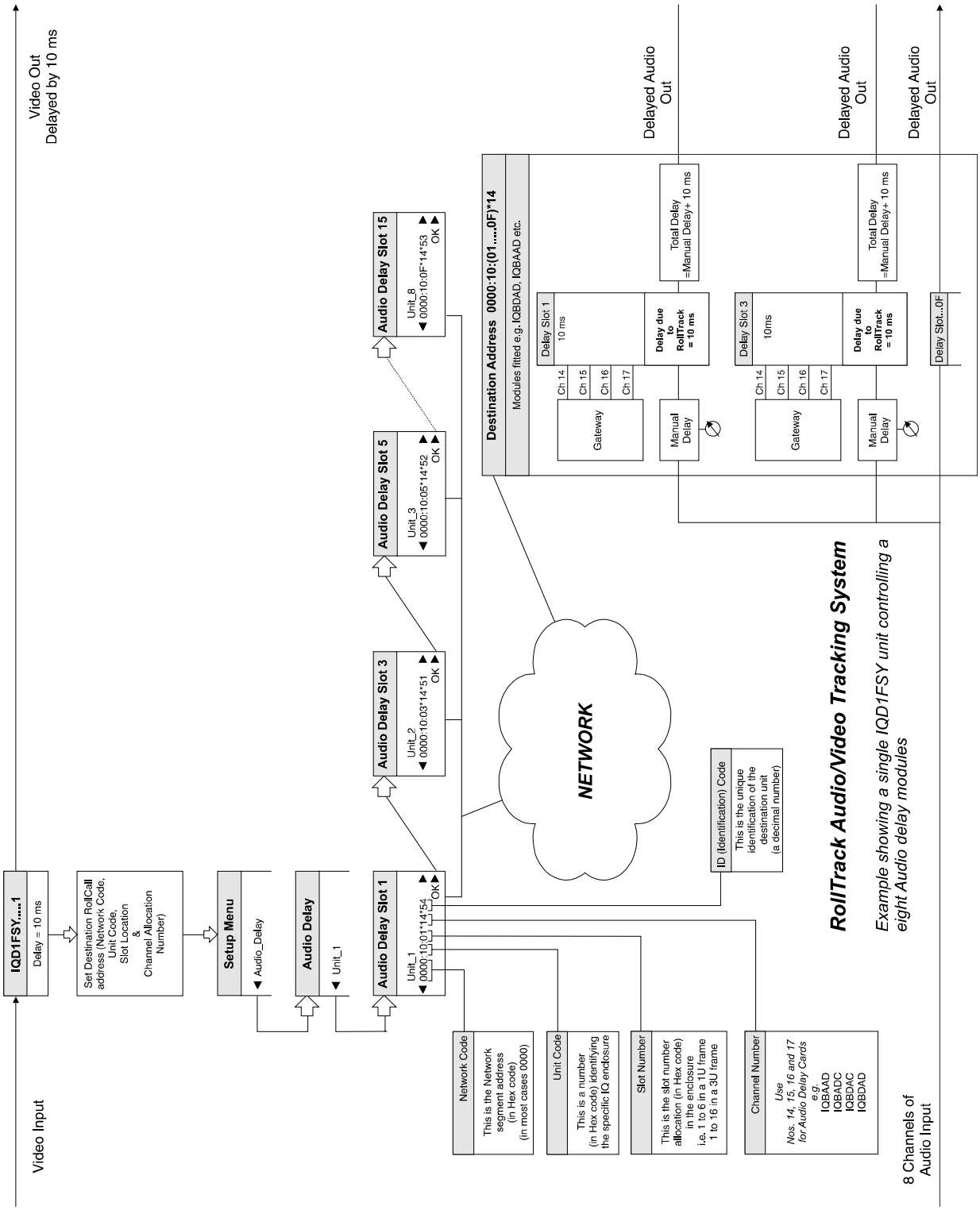
selecting the *Setup...* Menu of the IQD1FSY
then selecting the *Audio_Delay...* Menu
then choosing from *Unit_1* to *Unit_8*
then entering the unique network address of the IQBDAD in the form *nnnn:xx:yy*z*d*
where *nnnn* = network address and in most cases will be 0000(hex);
xx = IQ enclosure address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

Example of Network Addresses with Channel Numbers and ID Numbers

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

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




Video Out
Delayed by 10 ms
IQD1FSY.....1
Delay = 10 ms
Set Destination RollCall address (Network Code, Unit Code, Slot Location & Channel Allocation Number)
Setup Menu
Audio_Delay
Audio Delay
Unit_1
Audio Delay Slot 1
Unit_1
0000:10:01*14*54
OK
Audio Delay Slot 3
Unit_2
0000:10:03*14*51
OK
Audio Delay Slot 5
Unit_3
0000:10:05*14*52
OK
Audio Delay Slot 15
Unit_8
0000:10:0F*14*53
OK
NETWORK
Destination Address 0000:10:(01.....0F)*14
Modules fitted e.g. IQBDAD, IQBAAD etc.
Delay Slot 1
10 ms
Ch 14
Ch 15
Ch 16
Ch 17
Gateway
Delay due to RollTrack = 10 ms
Manual Delay
Total Delay =Manual Delay+ 10 ms
Delay Slot 3
10ms
Delay Slot..0F
Delayed Audio Out
Delayed Audio Out
Delayed Audio Out
ID (Identification) Code
This is the unique identification of the destination unit (a decimal number)
Network Code
This is the Network segment address (in Hex code) (in most cases 0000)
Unit Code
This is a number (in Hex code) identifying the specific IQ enclosure
Slot Number
This is the slot number allocation (in Hex code) in the enclosure i.e. 1 to 6 in a 1U frame 1 to 16 in a 3U frame
Channel Number
Use Nos. 14, 15, 16 and 17 for Audio Delay Cards e.g. IQBAAD IQBADC IQBDAC IQBDAD
RollTrack Audio/Video Tracking System
Example showing a single IQD1FSY unit controlling a eight Audio delay modules
Video Input
8 Channels of Audio Input

Manual Revision Record

Date	Version No.	Issue No.	Change	Comments
010598	1	1		First Issue
010399	1	2	Setup, memory, GPI, Audio ANC menus changed Pages 4 (sp), 14 text added	New manual issued
220402	1	3	Now includes information for the 3A enclosure modules	New manual issued
200802	1	4	-1 rear panel added, VITS note added and *video* added to un-interruptible valid output	New manual issued
240203	1	5	To description, block & tech spec	New manual issued
080403	1	6	Power consumption added to techspec	New manual issued
240205	1	7	Not available note added	New manual issued