

IQDMSES Multi-standard Digital Encoder

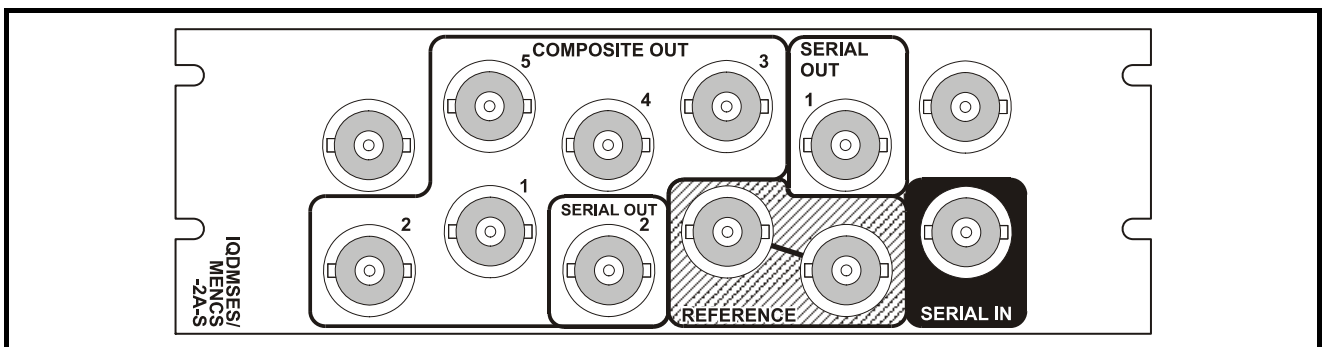
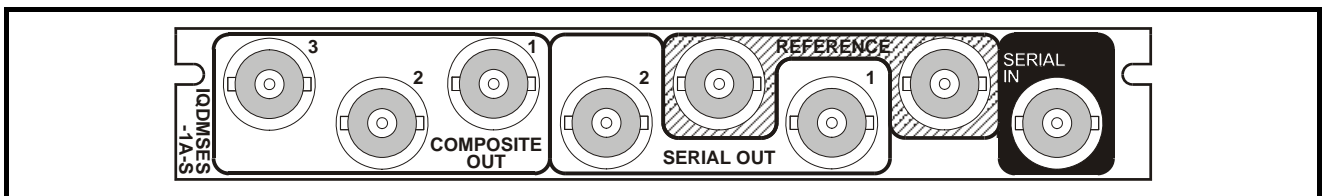
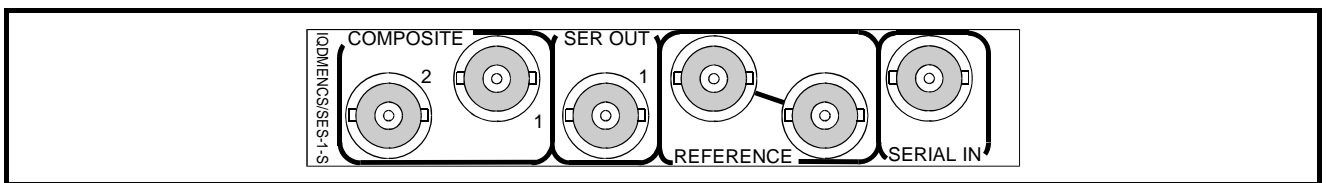


Module Description

The IQDMSES is a full broadcast quality multi-standard encoder. A 10-bit SDI input is encoded into PAL, PAL-N or SECAM for 625 line inputs and NTSC or PAL-M for 525 line inputs. A full frame synchronizer and color frame accurate genlock allows for simple installation.

Without a reference a minimum delay mode is automatically selected. For maximum signal fidelity the analog reconstruction uses a 12-bit 2 x oversampled DAC. Standard VITS may be inserted onto the output

REAR PANEL VIEW



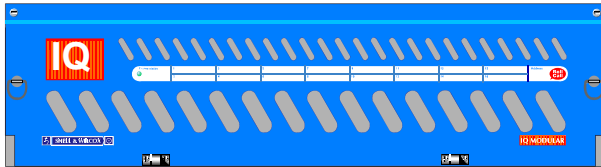
Versions of the module cards available are:

IQDMSES -1-S	Broadcast Encoder with 2 composite outputs and 1 SDI output	Single width module
IQDMSES -1A-S	Broadcast Encoder with 3 composite and 2 SDI outputs	Single width module
IQDMSES -2A-S	Broadcast Encoder with 5 composite and 2 SDI outputs	Double width module

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

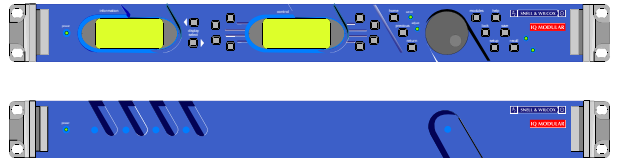
Rear panels **with** the suffix A may only be fitted into the 'A' style enclosure shown below.



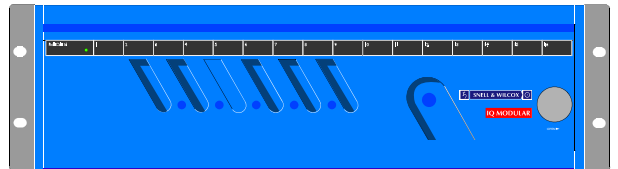
(Enclosure order codes IQH3A-E-0, IQH3A-E-P, IQH3A-0-0, IQH3A-0-P)

'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)

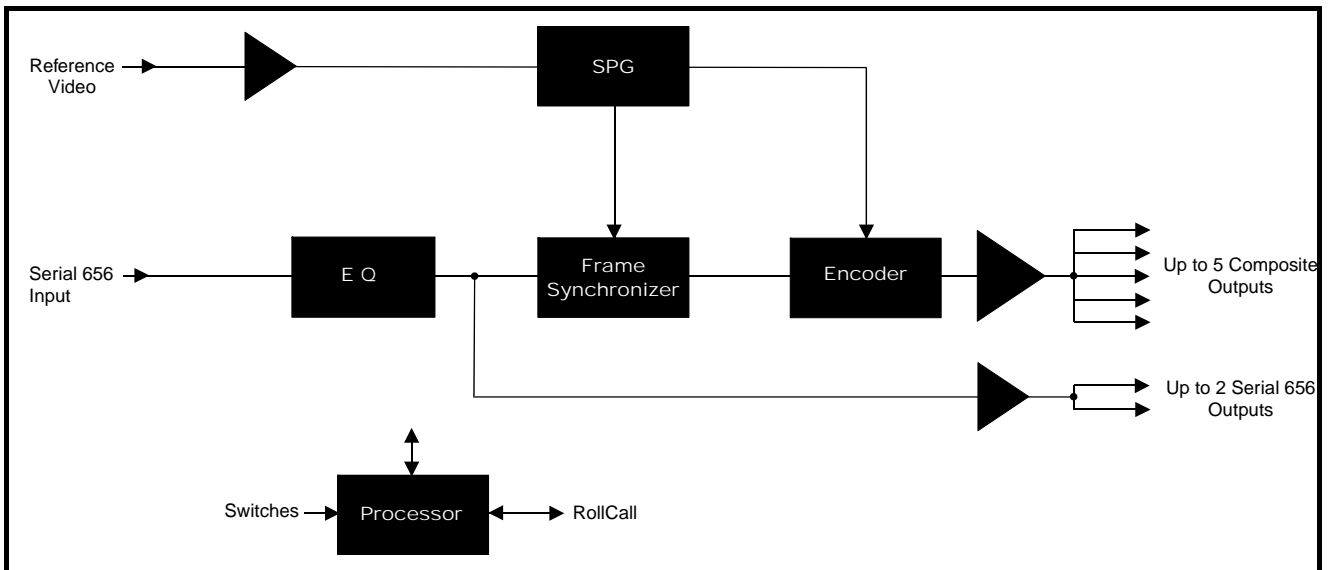


(Enclosure order codes IQH3N-0, IQH3N-P)



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

BLOCK DIAGRAM



Features

PAL/NTSC/NTSC-J/PAL-M/PAL-N/SECAM broadcast quality encoding

- 12-bit oversampled, DAC with 601 quality reconstruction
- Full genlock and minimum delay operation
- Full Frame Synchronizer
- Gamut limiting using optimal hue and intensity modification
- Internal pattern and VITS generation
- Pass or blank vertical interval data
- NTSC pedestal control
- Tolerant of SMPTE RP168 serial switching
- Selectable SECAM Bottles
- SECAM Genlock to PAL switch or SECAM
- SECAM dynamic notch
- Up to 5 x composite outputs
- Up to 2 x serial 4:2:2 relocked outputs
- EDH checking on SDI input
- RollCall™ compatible
- RollTrack™ link to tracking audio delays

Features

Signal Inputs

Serial Digital.....1 x Equalized SDI
 Standards.....SMPTE 259M-C-1997
 Reference input.....Composite or black burst

Standards.....SMPTE 259M-C-1997
 Composite.....Up to 5 x encoded outputs
 Standards.....PAL/NTSC//NTSC-J/PAL-M
 /PAL-N/SECAM

Signal Outputs

Serial Digital.....Up to 2 x relocked SDI

Card Edge Controls (also available via RollCall)

Standard -PAL/NTSC//NTSC-J/PAL-M
 /PAL-N/SECAM
 Test pattern select.....Black, Color bars, various test lines
 VITS InsertOn/Off
 Vertical Data.....Pass/Strip
 Genlock Mode.....Internal (Min Delay) lock/ Zero ScH
 Lock
 Genlock H-Phase offset±1.9 lines
 Genlock Fine H-Phase Offset
 1 cycle of subcarrier
 Genlock SC Phase Offset 360°
 SECAM Notch.....On/Off
 SECAM CarrierOn/Off
 SECAM Pre-Filter.....On/Off
 NTSC PedestalOn/Off
 Blanking WidthNormal/Legal minimum to CCIR
 624

RGB Limiter.....On/Off
 Gain.....±0.5 dB
 Preset UnitOn
 EDH.....Present : error second : error hour

Indicators

Power Supplies OK
 No Input
 No Reference
 ScH ErrorOutput or Reference ScH error
 Synchronizer DelayFlashes if >1 ms
 EDHPresent, Second Error, Hour Error.

Functions Available via RollCall™ Only

LoggingInput change/EDHScH Error
 EDH Monitor.....Show/Reset Statistics
 RollTrack™ Compatible

Specifications

Reference Input Standard...525/625 (same standard as D1
 input)
 Composite or Black Burst Reference Level
 Standard level ±3 dB
 Serial Input Return Loss.....Better than -15 dB to 270 MHz
 Serial Output Return Loss...Better than -15 dB to 270 MHz
 Composite Encoding.....12-bit
 Y Frequency Response.....5.5 MHz ± 0.05 dB
 U/I and V/Q Frequency Response
 <-3 dB @ 1.3 MHz >20 dB at
 4.0 MHz
 Differential GainBetter than 0.2%
 Differential PhaseBetter than 0.2°
 ScH Phase0° ±2° (or variable in Variable ScH
 Locked Genlock mode)

Composite Output Return Loss
 Better than 35 dB to 5.8 MHz
 Delay (minimum delay mode)
 <4 µs

Power Consumption

Module Power Consumption 7.5 W max

EMC Performance Information

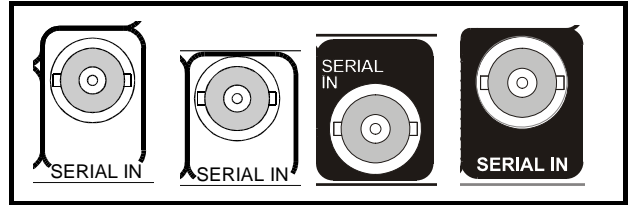
EnvironmentCommercial and light industrial E2
 Peak Mains Inrush Current
 following a 5 second mains
 interruption
 No mains input

Performance Information.....No performance degradations or
 cable length limitations

INPUTS AND OUTPUTS

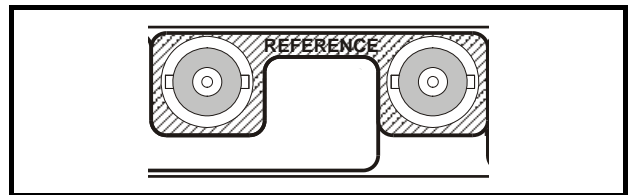
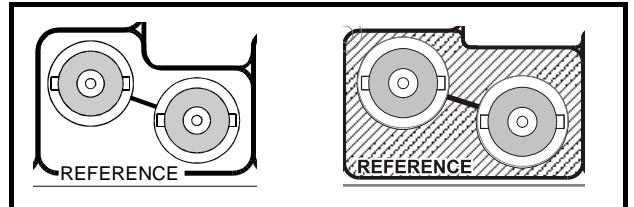
SERIAL INPUT

The connector is the serial digital video input to the encoder via a BNC connector terminated in 75 Ohms.



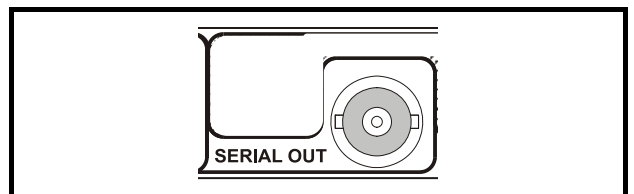
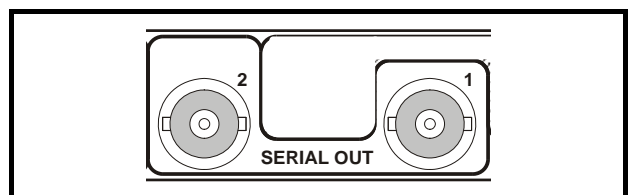
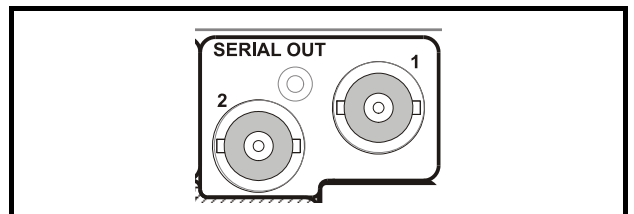
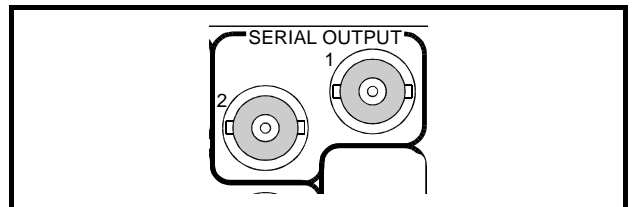
REFERENCE INPUT

These are the high impedance loop-through connections via BNC connectors for a black burst or composite video reference signal.



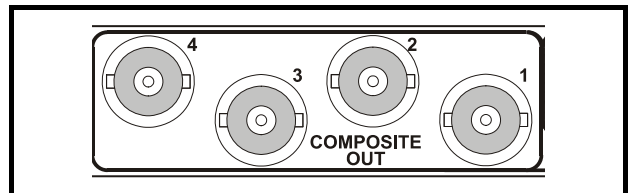
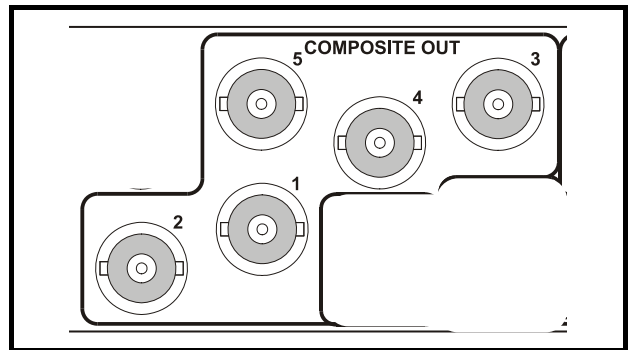
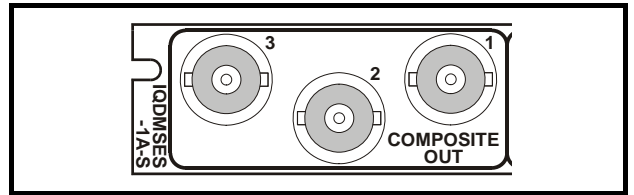
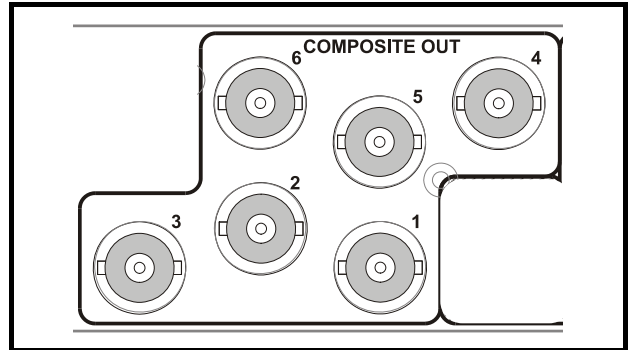
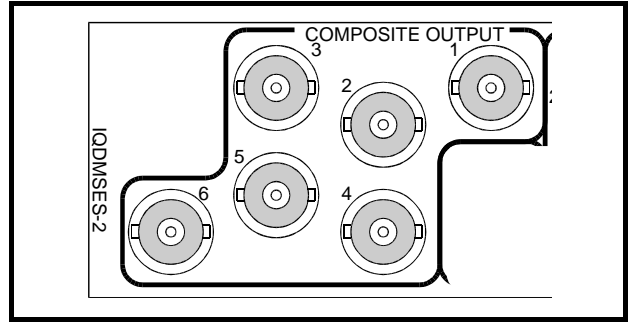
SERIAL OUTPUTS

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

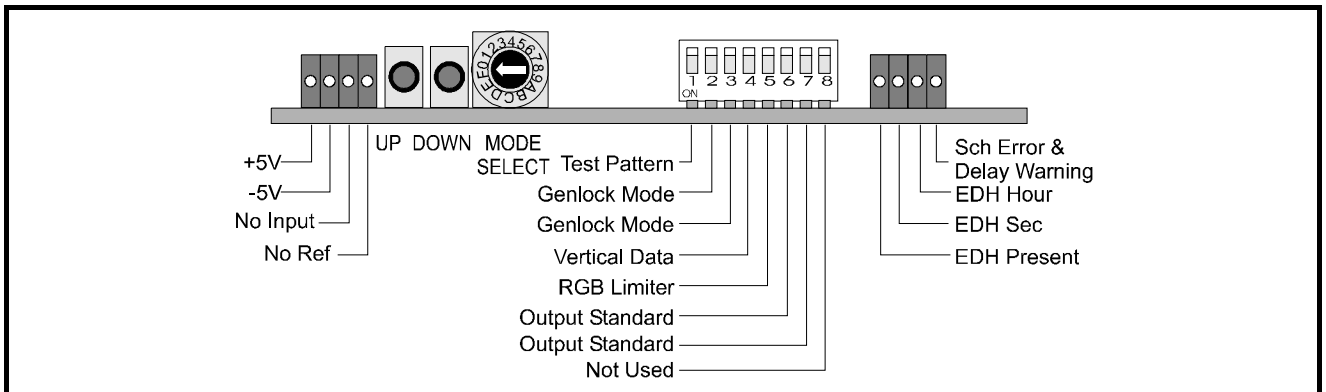


COMPOSITE OUTPUTS

These are the composite video outputs of the unit via BNC connectors.



CARD EDGE CONTROLS



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

Note that the availability of some of the card edge controls will depend on the card version; see feature table for variations.

LED INDICATORS

+5V and -5V

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

No Input

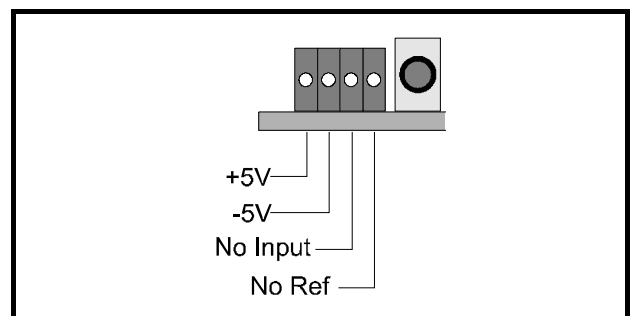
The **No Input** LED will be continuously illuminated when the unit is not receiving an input signal.

Note that in the **Genlock** mode this LED will flash when the input signal is of a different line 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 the **No Input** and **No Ref** LEDs will flash alternately when the unit is configuring or re-configuring in the event of a standard change. The message **Please wait....** will appear in the lower line of the Information window during this operation.



EDH LEDs

EDH Present

This LED will be illuminated if EDH is present on the serial input. In the event of an EDH error being detected the EDH Present LED will become extinguished and the **EDH Sec** and **EDH Hour** LEDs will become appropriately illuminated.

EDH Sec

The **EDH Sec** LED be extinguished if no errors have occurred during the previous second.

EDH Hour

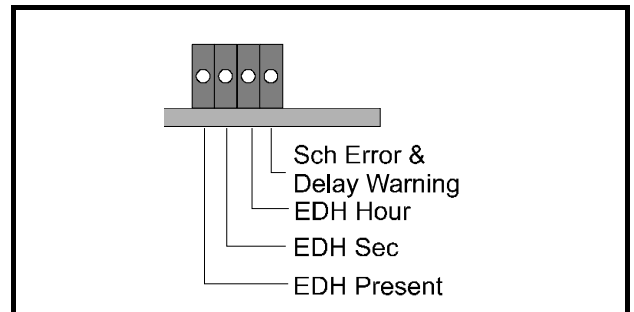
The **EDH Hour** LED be extinguished if no errors have occurred during the previous hour.

Sch Error/Delay Warning

This dual function LED warns of Genlock error conditions.

It will be illuminated if Sch errors are detected in the reference signal.

It will flash to warn that the delay through the synchronizer exceeds 1 ms.

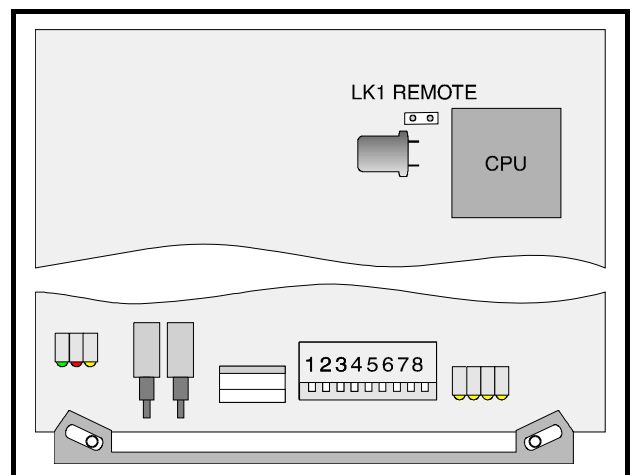


LINKS

Remote LK1

Note that 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 the switches will override the remote control settings. The RollCall™ control panel will then follow these settings.

Note that in Main-frames where RollCall™ is not available the link LK1 (Remote) should be set to the OFF (unconnected) position. This ensures that when the unit is powered-up the factory default settings of parameters not available as card edge adjustments, are loaded. With the link in the ON (connected) position card will power-up with the last settings sent by the remote control panel.



SWITCHES

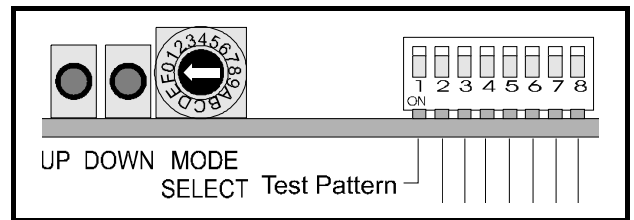
Two push buttons, a Hex switch and a 8 way DIL switch allow various functions and modes to be set.

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

The push buttons PB1, PB2 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. All functions available via an active front panel are duplicated by these switches. More detailed information about these functions will be found under MENU DETAILS starting on page 11a.9

FUNCTION AND MODE SELECTIONS

DIL SWITCH FUNCTIONS

Position 1

When set to ON (Down) This position allows the encoder to produce a **test pattern** signal as an output.

Positions 2 and 3

These positions are used to set the **Genlock Mode** as shown in the table below: (ON=Down, OFF=Up and X = don't care)

PAL/NTSC operation

Mode	Position 2	Position 3
Zero SC/H Lock	OFF	OFF
Internal Lock	X	ON

Or when SECAM operation is selected the functions become as in the table below:

Function	Position	Selection
Bottles	2	UP=Bottles ON, DOWN=Bottles OFF
Lock	3	UP=Locked to Reference DOWN=Internal Lock

For detailed information on Genlock operation see Appendix 1 on page 15

Position 4

This position allows the data in the **vertical interval** of the input signal to be either passed (OFF) to the output or blanked (ON) from the output

Position 5

This position allows the **limiter** to set ON or OFF. In the ON position the limiter will restrict the RGB signal levels.

Positions 6 and 7

These positions allows the output standard of the encoder to be set.

O/P Std.	Position 6	Position 7
PAL-N/PAL-M	ON	OFF
PAL/ NTSC	OFF	OFF
SECAM/NTSC	X	ON

The output standard will reflect the operating line standard; for example NTSC/PAL-M is only available if the operating standard is 525 line.

The operating line standard will be determined by the following detection method (in order of priority)

1. The **reference input standard** (signal input standard ignored) when in Genlock mode.
2. If there is no reference signal, by the **input signal standard**.
3. If there is no reference signal and no signal input the standard may be selected by using either the **Mode Select** switch or the **Menu system** of an active front panel.

*Note that to use this method of selection the module **must** be operating in the **Internal Lock** mode set by the DIL switch positions 2 and 3 or via the Genlock menu.*

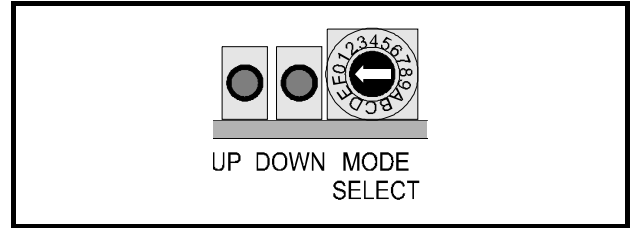
Position 8 This position has no function at present.

MODE SELECT SWITCH

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

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

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



Function	Switch	Action of PB1	Action of PB2
S/C Phase	0	Rotates vectors anticlockwise	Rotates vectors clockwise
H Phase	1	Moves output ahead of reference	Moves reference ahead of output
Pattern Select	2	Moves up through list of patterns	Moves down through list of patterns
NTSC Pedestal	3	Turns pedestal OFF	Turns pedestal ON
H Blanking	4	Selects standard composite blanking	Selects legal minimum allowed by CCIR 624
VITS Insert	5	Removes VITS	Inserts VITS
EDH Reset	6	Resets EDH statistics	Resets EDH statistics
No Function	7	N/A	N/A
DAC Gain	8	Reduces gain	Increases gain
Standard ⁽¹⁾	9	Selects 625 line standard	Selects 525 line standard
SECAM Notch	A	Turns OFF notch	Turns ON notch
SECAM Carrier	B	Turns ON carrier	Turns OFF carrier
SECAM pre-filter	C	Turns OFF pre-filter	Turns ON pre-filter
No Function	D	No Function	No Function
No Function	E	No Function	No Function
Preset Unit	F	Press together to select all preset values	

(1) Normally the standard selection is automatic. If there is no input signal and no reference signal available to determine the operating standard this switch and the DIL switch (positions 6 and 7) should be used to set the output standard. Ensure that the Genlock Mode is set to Internal Lock.

Note that the availability of some of the above functions will depend on the operating mode of the module. e.g. test patterns will be different for different line standards; availability of phasing controls will depend on the genlock mode etc.

RollCall PC Control Panel Screens for the IQDMSES

Control

This screen allows various settings to be selected.

Standard

This item allows the operating standard of the unit to be set.

The operating line standard will be determined by the following detection method (in order of priority)

1. The **reference input standard** (signal input standard ignored) when in Genlock mode
2. If there is no reference signal, by the **input signal standard**.
3. If there is no reference signal and no signal input the standard may be selected by using this menu. This allows the module to provide test signals in different standards.

*Note that to use this method of selection the module **must** be operating in the **Internal Lock** mode set in the **Genlock** menu.*

If the input standard as detected by either (1) or (2) above is 625 line this will allow PAL, PAL-N or SECAM to be selected as the output standard.

If the input standard as detected by either (1) or (2) above is 525 line this will allow either NTSC or PAL-M to be selected as the output standard.

If the signal input and reference input are of different line standards, the unit will output a black signal at the reference signal line rate.

EDH Statistics

The input stream is continuously monitored for EDH errors. Basic information on this can be monitored and/or reset here.

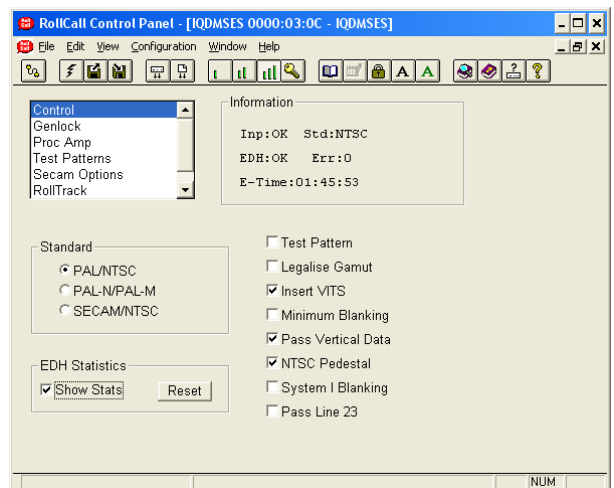
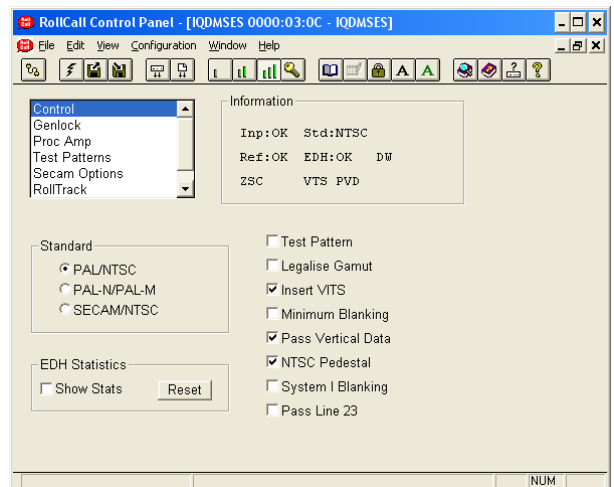
The following functions may be selected:

Show Stats

EDH errors will be displayed in the information area.

Reset

The EDH error count will be reset to zero.



Control (continued)

Test Pattern

When checked, the selected test pattern via the **Test Patterns** Screen will appear at the output.

Legalize Gamut

When checked this function prevents excessive amplitudes of chrominance (out of Gamut) being produced at the output.

This system will find the visually nearest allowed colour in all circumstances. Normally this will involve desaturation, so maintaining the same hue, but where this is not possible (e.g. >100% yellow), the luminance value will be modified to give a legal visual approximation to the illegal colour.

Note that some contouring may be visible on the corrected areas of the image.

The letters **GAM** will appear in the lower line of the control window when this is enabled.

Insert VITS

When this function is checked the four standard VITS lines are inserted in the vertical interval.

The letters **VTS** will appear in the lower line of the control window when this is enabled.

Minimum Blanking

When checked the blanking width will be reduced to the minimum allowed by CCIR 624.

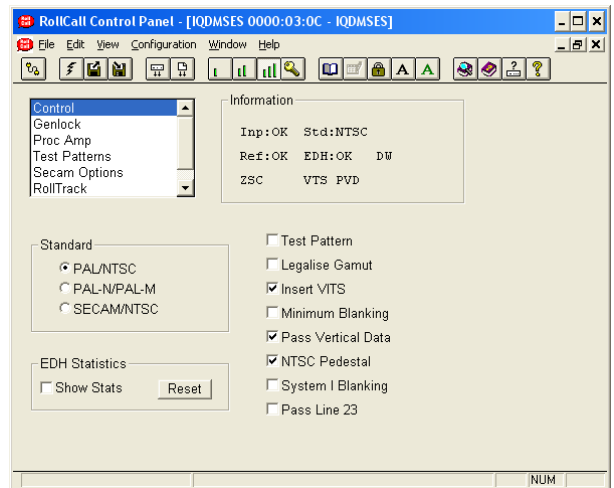
Pass Vertical_Data

When checked (text reversed) the unit will pass data (unblanked) present in the vertical interval, to the output.

In 525 line standards all vertical interval lines from 11 and 274 onwards are unblanked with the exception of the half lines 263 and 283. In 625 line standards all vertical interval lines from 7 and 320 onwards are unblanked with the exception of the half lines 23 and 623."

When unchecked (text normal) all data in the vertical interval will be blanked.

When this item is checked the word PVD will appear on the bottom line in the information window.



NTSC Pedestal (for NTSC output only)

This function allows the pedestal to be ON (included) or OFF (removed) from the output signal.

When checked the output standard will be shown as NTSC; when unselected it will show NTSC-J, the version of NTSC used in Japan.

Note that after changing the NTSC_Pedestal selection the output signal will be blanked for about 5 seconds to allow for reconfiguration.

System I Blanking (PAL Output Standard only)

When this item is checked blanking will conform to the System-I standard.

Pass Line 23

When checked the unit will pass the whole of line 23 (WSS line) in PAL & PAL-N standards.





When inactive only half of line 23 is passed in accordance with CCIR-624.


Note that this control has no effect on 525 line standards.

Genlock

This screen allows various modes of genlock to be enabled.

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 bars and selecting Preset  will return the setting to the calibrated value for that item.

Genlock Modes

Internal

When this function is checked the output signal will be locked to the serial input (if available) or free-running if no serial input is available.

In this mode the frequency accuracy will be ± 10 ppm

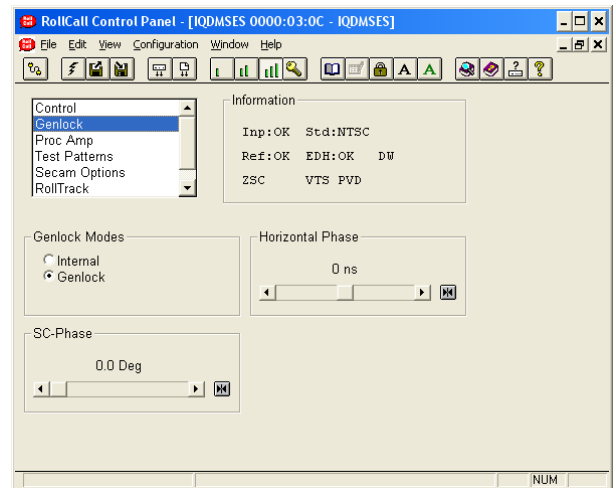
Notes:

1. This mode will be automatically enabled if the signal input and reference input are of different line standards and the output will default to black burst in the reference standard.
2. This mode should be selected if test patterns of a particular line standard (and different to the reference input) are required at the output.

Zero SC/H Lock

In this mode the module locks to the reference subcarrier and will always produce a zero ScH (Subcarrier phase to H-Phase) output. The output H timing will be maintained as close as possible to the reference H timing in the correct colour frame. The ScH warning LED will light if the ScH error of the reference is $> 20^\circ$ (approx.), indicating that the colour framing will be lost should the reference ScH error increase.

Note that the output will always be 0° ScH phase regardless of the reference ScH phase.



SC Phase

This function allows the relative phasing between the reference subcarrier and the output signal subcarrier to be adjusted. Rotating the spin-wheel will adjust this value and the numerical display shows the phasing in degrees.

The range of adjustment is 359.9° (continuously adjustable) in steps of 0.1° and the preset value is 0° (Output coincident with reference)

Horizontal 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.

The range is approximately ± 1.9 lines in steps of one cycle of subcarrier. (This ensures the correct SC/H timing is maintained)

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

SECAM Genlock

For SECAM the output will H phase to a PAL black or black-burst reference; Db/Dr phase is such that if the reference has a PAL burst, a V-Switch (Phase = 135°) of burst on Line 1, Field 1 will produce a Dr line in the encoded output.

If a SECAM reference signal is used the output Db/Dr sequence will be locked to that of the reference signal.

Proc Amp

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

Y (Luminance) 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.

Black Level

This selection reveals a numerical readout display for the Y pedestal or black level.

The range of adjustment from standard level is +127 to -128 arbitrary units.

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

C (Chrominance) 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.

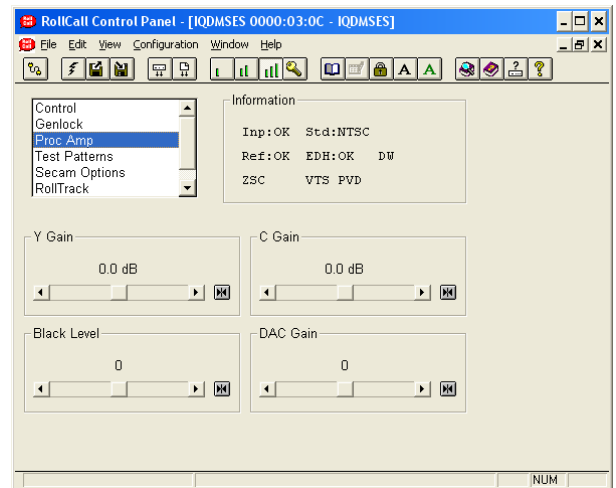
Selecting Preset returns the setting to the calibrated value of 0.

DAC Gain

This selection reveals a bargraph readout display for the DAC gain. The overall output signal level may be adjusted with this function.

The range of adjustment from standard level is +127 to -128 arbitrary units.

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



Test Patterns

This screen allows the unit to output test pattern signals.

This function is enabled by checking the **Test Pattern** item. The following signals will then be available for selection:

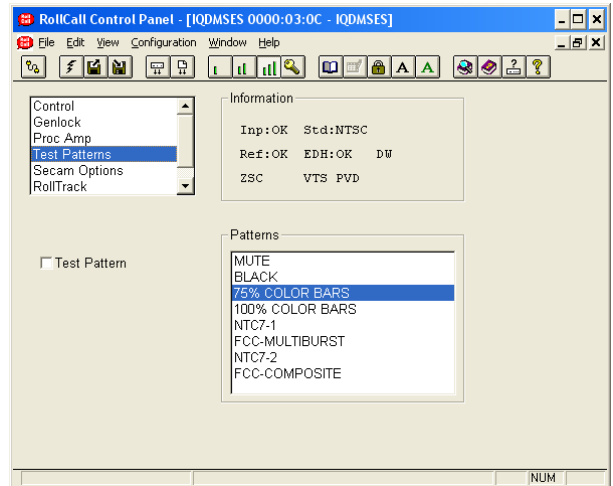
Patterns PAL
MUTE
BLACK
75%COLOUR BARS
100%COLOUR BARS
VITS-17
VITS-18
VITS-330
VITS-331

Patterns NTSC
MUTE
BLACK
75%COLOUR BARS
100%COLOUR BARS
NTC7-1
FCC-MULTIBURST
NTC7-2
FCC-COMPOSITE

Patterns SECAM
MUTE
BLACK
75%COLOUR BARS
100%COLOUR BARS

MUTE

When activated the unit will not produce a signal of any kind.



SECAM Options

Notch Filter

When checked (text highlighted) the SECAM luminance notch filter will be enabled.

Preset is to notch filter ON.

Bottles

This function allows the SECAM-V color ident signal (Bottles) to be switched ON or OFF.

Preset is to Bottles OFF.

Carrier Off

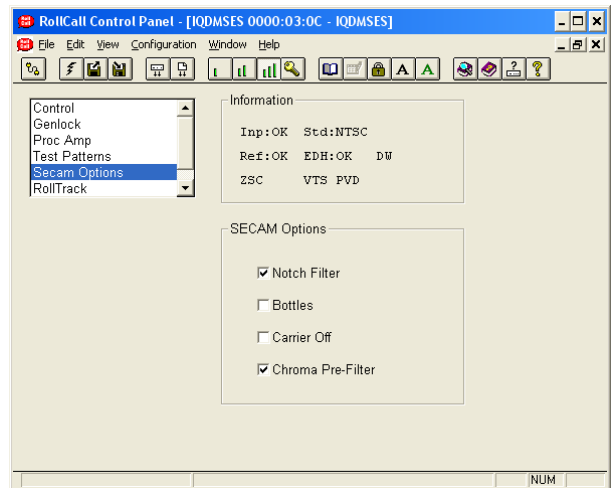
This function allows the chrominance carrier to be switched ON or OFF.

Preset is to ON.

Chroma Pre Filter

This function allows the chrominance filter to be switched ON or OFF.

Preset is to ON.



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 called **RollTrack**.


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

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

RollTrack allows up to 8 audio delays to be selected as a destination.

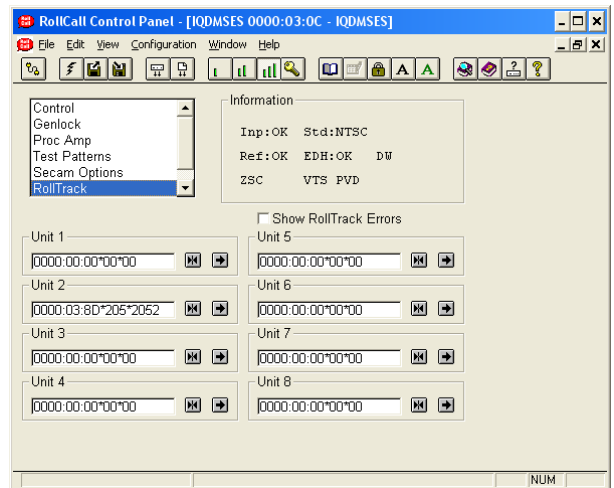
Unit 1	Unit 2
Unit 3	Unit 4
Unit 5	Unit 6
Unit 7	Unit 8

The address of the selected destination unit may be set by editing the text line.

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



(Preset) returns to the default destination.



The full network address has five sets of numbers.

For example: 0000:10:01*14*51

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.

The fifth set (51) is the board type identification.

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.

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

Setup

Preset Unit

Selecting this function presets various functions such that some sort of signal is produced at the output even though some settings may be inappropriate for the input signal. This is useful if many settings have been set in error such that no output signal is being produced.

Logging

If a logging device is attached to the RollCall™ network, information about various parameters will be reported to the logging device assigned in the Remote Control Interface system. (See Section 1) The RCIF Menu System can be made available to such a device.

Input / Standard Change

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

Reference Status

When activated the reference signal condition will be notified to any logging device.

EDH Errors

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

Default Output

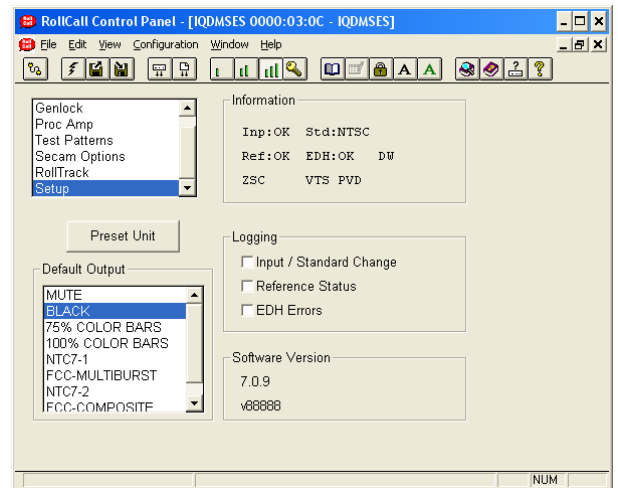
If the input signal fails or is of poor quality the selected pattern will become the output signal.

MUTE

When activated the unit will not produce a signal of any kind.

Software Version

Selecting this item reveals a display showing the version of the software fitted in the module followed by the serial number of the unit.



THE INFORMATION WINDOW

The Information window has four lines of text indicating current selections and various information messages.

Note that in a RollCall™ system some units will overwrite the information window indication with their own messages. Under these conditions the control panel will only be able to write to the information window when the unit has been disconnected.

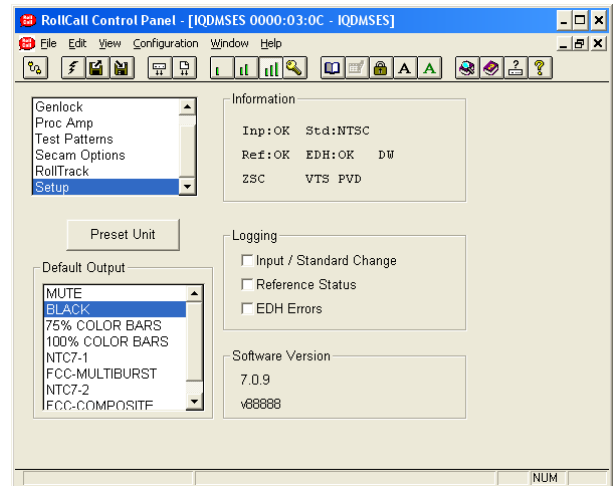
These lines provide specific information about the operating conditions of the module.

Example of text displayed

Line 1	Inp:OK		Std:PAL		
Line 2	Ref:OK		EDH:	DW	
Line 3	ZSC	GAM	VTS	PVD	PAT

Text Line Details

- Line 1 This line gives information about the state of the video input and the output standard.
Input state may be OK, ERR (input error detected) or ***(no signal connected)
Output standard may be PAL, NTSC, or NTSC-J.
- Line 2 This line gives information about the state of the reference input.
Reference may be OK, ***(no signal connected) or SCE (an *input* subcarrier error detected. e.g. a Sch error of >60°)
It will also show EDH statistics(NONE, Fail or OK) and whether the synchroniser delay has exceeded 1 ms (DW = Delay Warning)



Line 4

This will display setup messages.

ZSC Genlock Zero SC/H Lock enabled

If the text is static (not flashing) this indicates that the unit has successfully genlocked to the reference source.

If the text is flashing this indicates that the unit is attempting to genlock to the reference source.

GEN SECAM Genlock

GAM RGB Limiter enabled

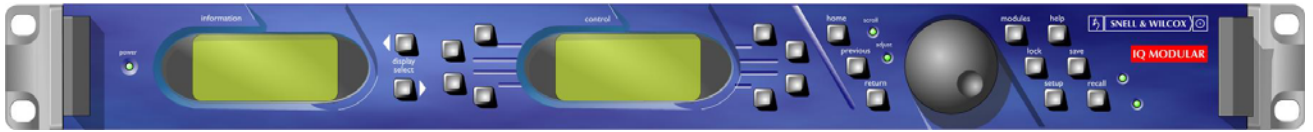
VTS Insert VITS enabled

PVD Pass Vertical Data enabled

PAT Pattern ON enabled

Operation from an Active Control Panel

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

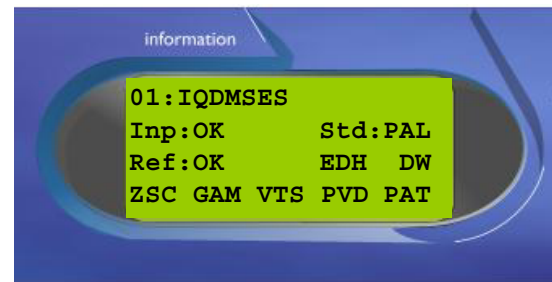


All operational parameters and selections are made using a system of menus displayed in two LCD windows.

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

Information Window

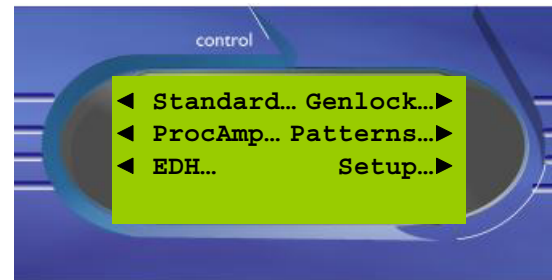
The Information window has four lines of text indicating the current state of the unit.



For details of the abbreviations used please see page 31.

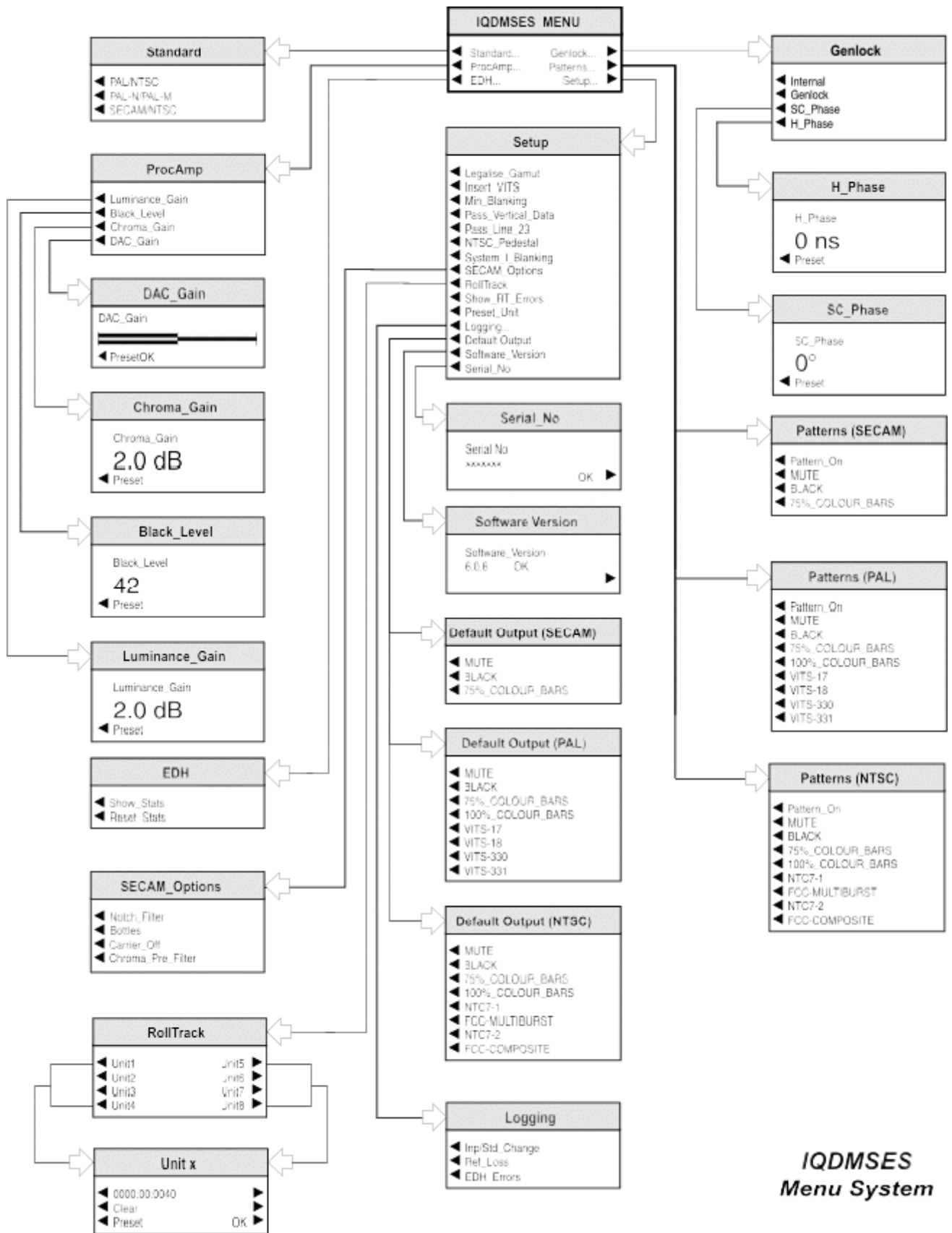
Control Window

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.



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 on the previous page 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 IQDMSES Menu System on previous page)

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.

IQDMSES MENU	
◀ Standard...	Genlock... ▶
◀ ProcAmp...	Patterns... ▶
◀ EDH...	Setup... ▶

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.

◀ Standard...

This menu selection allows the operating standard of the unit to be set.

Standard
◀ PAL/NTSC
◀ PAL-N/PAL-M
◀ SECAM/NTSC

The operating line standard will be determined by the following detection method (in order of priority)

1. The **reference input standard** (signal input standard ignored) when in Genlock mode
2. If there is no reference signal, by the **input signal standard**.
3. If there is no reference signal and no signal input the standard may be selected by using this menu. This allows the module to provide test signals in different standards.

*Note that to use this method of selection the module **must** be operating in the **Internal Lock** mode set in the **Genlock** menu.*

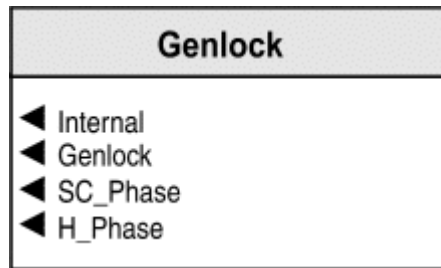
If the input standard as detected by either (1) or (2) above is 625 line this will allow PAL, PAL-N or SECAM to be selected as the output standard.

If the input standard as detected by either (1) or (2) above is 525 line this will allow either NTSC or PAL-M to be selected as the output standard.

If the signal input and reference input are of different line standards, the unit will output a black signal at the reference signal line rate.

Genlock...▶

This sub-menu allows various modes of genlock to be enabled.



◀ Internal

When this function is enabled the output signal will be locked to the serial input (if available) or free-running if no serial input is available.

In this mode the frequency accuracy will be ± 10 ppm

Notes:

1. This mode will be automatically enabled if the signal input and reference input are of different line standards and the output will default to black burst in the reference standard.
2. This mode should be selected if test patterns of a particular line standard (and different to the reference input) are required at the output.

◀ Genlock

In this mode the module locks to the reference subcarrier and will always produce a zero ScH (Subcarrier phase to H-Phase) output. The output H timing will be maintained as close as possible to the reference H timing in the correct colour frame. The ScH warning LED will light if the ScH error of the reference is $> 20^\circ$ (approx.), indicating that the colour framing will be lost should the reference ScH error increase.

Note that the output will always be 0° ScH phase regardless of the reference ScH phase.

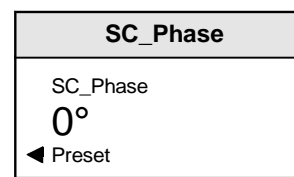
SECAM Genlock

For SECAM the output will H phase to a PAL black or black-burst reference; Db/Dr phase is such that if the reference has a PAL burst, a V-Switch (Phase = 135°) of burst on Line 1, Field 1 will produce a Dr line in the encoded output.

If a SECAM reference signal is used the output Db/Dr sequence will be locked to that of the reference signal.

◀ SC_Phase

This function allows the relative phasing between the reference subcarrier and the output signal subcarrier to be adjusted.

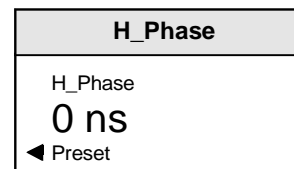


Rotating the spin-wheel will adjust this value and the numerical display shows the phasing in degrees.

The range of adjustment is 359.9° (continuously adjustable) in steps of 0.1° and the preset value is 0° (Output coincident with reference)

◀ H_Phase

Selecting this item reveals a display showing the horizontal timing of the output signal relative to the reference sync signal, in nanoseconds.



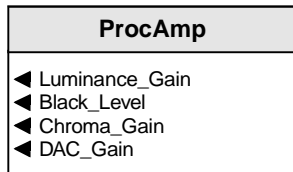
Rotating the spin-wheel will adjust this value.

The range is approximately ± 1.9 lines in steps of one cycle of subcarrier. (This ensures the correct SC/H timing is maintained)

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

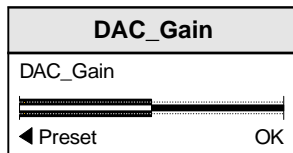
◀ ProcAmp...

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



◀ DAC_Gain

This selection reveals a bargraph readout display for the DAC gain. The overall output signal level may be adjusted with this function.

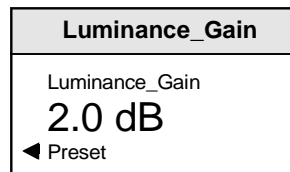


The range of adjustment from standard level is +127 to -128 arbitrary units.

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

◀ Luminance_Gain

This selection reveals a numerical readout display for the gain of the luminance signal.

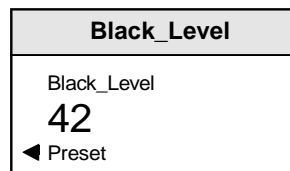


By rotating the spinwheel the gain may be adjusted by ±6 dB in steps of 0.1 dB.

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

◀ Black_Level

This selection reveals a numerical readout display for the Y pedestal or black level.

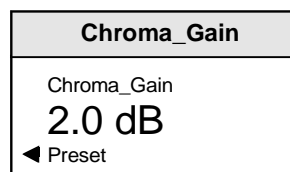


The range of adjustment from standard level is +127 to -128 arbitrary units.

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.

Patterns... ▶

This menu selection allows the unit to output test pattern signals. This function is enabled by selecting ◀ **Pattern_On** and the following signals will then be available for selection:

Patterns (PAL)
◀ Pattern_On
◀ MUTE
◀ BLACK
◀ 75%_COLOUR_BARS
◀ 100%_COLOUR_BARS
◀ VITS-17
◀ VITS-18
◀ VITS-330
◀ VITS-331

Patterns (NTSC)
◀ Pattern_On
◀ MUTE
◀ BLACK
◀ 75%_COLOUR_BARS
◀ 100%_COLOUR_BARS
◀ NTC7-1
◀ FCC-MULTIBURST
◀ NTC7-2
◀ FCC-COMPOSITE

Patterns (SECAM)
◀ Pattern_On
◀ MUTE
◀ BLACK
◀ 75%_COLOUR_BARS

MUTE

When activated the unit will not produce a signal of any kind.

◀ EDH...

The input stream is continuously monitored for EDH errors. Basic information on this can be monitored and/or reset here.

EDH
◀ Show_Stats
◀ Reset_Stats

The following functions may be selected:

- ◀ **Show_Stats** The information will be displayed in the LCD window
- ◀ **Reset_Stats** Data will be reset

Setup... ▶

This selection reveals a sub-menu that allows the following functions to be set up:

Setup
◀ Legalise_Gamut
◀ Insert_VITS
◀ Min_Blanking
◀ Pass_Vertical_Data
◀ Pass_Line_23
◀ NTSC_Pedestal
◀ System_I_Blanking
◀ SECAM_Options
◀ RollTrack
◀ Show_RT_Errors
◀ Preset_Unit
◀ Logging...
◀ Default Output
◀ Software_Version
◀ Serial_No

◀ Limit_Gamut

When enabled this function prevents excessive amplitudes of chrominance (out of Gamut) being produced at the output.

This system will find the visually nearest allowed colour in all circumstances. Normally this will involve desaturation, so maintaining the same hue, but where this is not possible (e.g. >100% yellow), the luminance value will be modified to give a legal visual approximation to the illegal colour.

Note that some contouring may be visible on the corrected areas of the image.

The letters **GAM** will appear in the lower line of the control window when this is enabled.

◀ Insert_VITS

When this function is selected the four standard VITS lines are inserted in the vertical interval.

The letters **VTS** will appear in the lower line of the control window when this is enabled.

◀ Min_Blanking

When selected the blanking width will be reduced to the minimum allowed by CCIR 624.

◀ Pass_Vertical_Data

When selected (text reversed) the unit will pass data (unblanked) present in the vertical interval, to the output.

In 525 line standards all vertical interval lines from 11 and 274 onwards are unblanked with the exception of the half lines 263 and 283. In 625 line standards all vertical interval lines from 7 and 320 onwards are unblanked with the exception of the half lines 23 and 623."

When de-selected (text normal) all data in the vertical interval will be blanked.

When this item is selected the word PVD will appear on the bottom line in the information window.

◀ Pass_Line_23

When selected the unit will pass the whole of line 23 (WSS line) in PAL & PAL-N standards.

When inactive only half of line 23 is passed in accordance with CCIR-624.

Note that this control has no effect on 525 line standards.

◀ NTSC_Pedestal (for NTSC output only)

This toggle ON/OFF function allows the pedestal to be ON (included) or OFF (removed) from the output signal.

When selected the output standard will be shown as NTSC; when unselected it will show NTSC-J, the version of NTSC used in Japan.

Note that after changing the NTSC_Pedestal selection the output signal will be blanked for about 5 seconds to allow for reconfiguration.

◀ System_I_Blanking (PAL Output Standard only)

When this item is enabled blanking will conform to the System-I standard.

◀ SECAM_Options

SECAM_Options
◀ Notch_Filter
◀ Bottles
◀ Carrier_Off
◀ Chroma_Pre_Filter

◀ Notch_Filter

When selected (text highlighted) the SECAM luminance notch filter will be enabled.

Preset is to notch filter ON.

◀ Bottles

This function allows the SECAM-V colour ident signal (Bottles) to be switched ON (text highlighted) or OFF.

Preset is to Bottles OFF.

◀ Carrier_Off

This function allows the chrominance carrier to be switched ON or OFF (text highlighted)

Preset is to ON.

◀ Chroma_Pre_Filter

This function allows the chrominance filter to be switched ON (text highlighted) or OFF.

Preset is to ON.

◀ 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**.

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

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

Selecting **RollTrack** provides a sub-menu that allows up to 8 audio delays to be selected as a destination.

RollTrack	
◀ Unit1	Unit5 ▶
◀ Unit2	Unit6 ▶
◀ Unit3	Unit7 ▶
◀ Unit4	Unit8 ▶

When a unit is selected a further sub-menu then appears to allow the code to be set up.

To edit the text the buttons adjacent to the upper text line in the menu are used to select the character position in the text and the spinwheel used to select the character.

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

Unit x	
◀ 0000:00:0040	▶
◀ Clear	▶
◀ Preset	OK ▶

(The right ▶ and left ◀ 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)

The full network address has five sets of numbers.

For example: 0000:10:01*14*51

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.

The fifth set (51) is the board type identification.

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.

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

◀ Show_RT_Errors

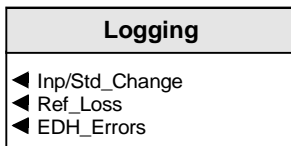
Selecting this item will display any RollTrack messages/errors in the Information window.

◀ Preset_Unit

Selecting this function presets various functions such that some sort of signal is produced at the output even though some settings may be inappropriate for the input signal. This is useful if many settings have been set in error such that no output signal is being produced.

◀ Logging

If a logging device is attached to the RollCall™ network, information about various parameters will be reported to the logging device assigned in the Remote Control Interface system. (See Section 1)



The RCIF Menu System can be made available to such a device.

◀ Inp/Std_Change

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

◀ Ref_Loss

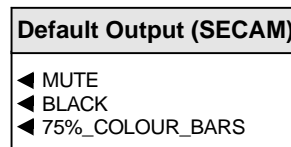
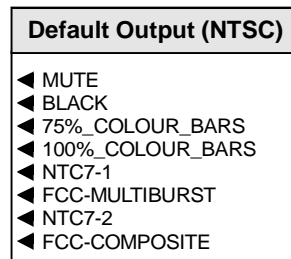
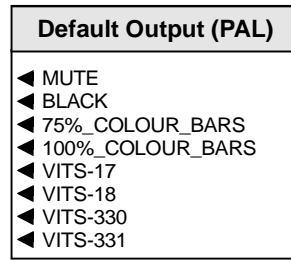
When activated a loss of reference signal condition will be notified to any logging device.

◀ EDH_Errors

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

Default Output

If the input signal fails or is of poor quality the selected pattern will become the output signal.

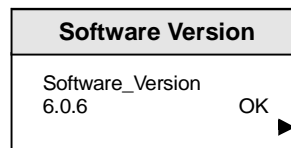


MUTE

When activated the unit will not produce a signal of any kind.

◀ Software_Version

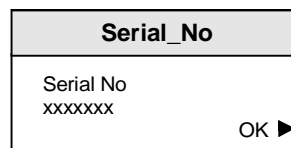
Selecting this item reveals a display showing the version of the software fitted in the module.



Select OK to return to the Setup Menu.

◀ Serial No

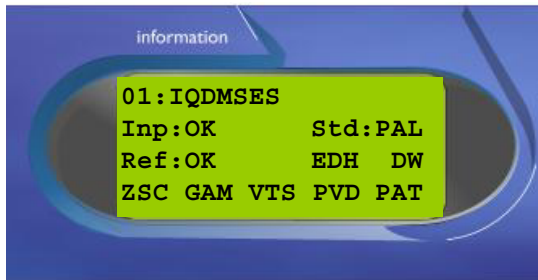
This displays the serial number of the unit.



Select OK to return to the setup menu.

THE INFORMATION WINDOW

The Information window has four lines of text indicating current selections and various information messages.



Note that in a RollCall™ system some units will overwrite the information window indication with their own messages. Under these conditions the control panel will only be able to write to the information window when the unit has been disconnected.

The first line will contain the name of the module which is currently being controlled.

The second, third and fourth lines provide specific information about the operating conditions of the module.

Example of text displayed

Line 1	01:IQDMSES
Line 2	Inp:OK Std:PAL
Line 3	Ref:OK EDH: DW
Line 4	ZSC GAM VTS PVD PAT

Text Line Details

- Line 1** This line contains the name of the module and Gateway code data.
- Line 2** This line gives information about the state of the video input and the output standard. Input state may be OK, ERR (input error detected) or *** (no signal connected) Output standard may be PAL, NTSC, or NTSC-J.
- Line 3** This line gives information about the state of the reference input. Reference may be OK, *** (no signal connected) or SCE (an *input* subcarrier error detected. e.g. a ScH error of >60°) It will also show EDH statistics (NONE, Fail or OK) and whether the synchroniser delay has exceeded 1 ms (DW = Delay Warning) This will display setup messages.

ZSC Genlock Zero SC/H Lock enabled

If the text is static (not flashing) this indicates that the unit has successfully genlocked to the reference source.

If the text is flashing this indicates that the unit is attempting to genlock to the reference source.

GEN SECAM Genlock

GAM RGB Limiter enabled

VTS Insert VITS enabled

PVD Pass Vertical Data enabled

PAT Pattern ON enabled

Appendix 1

GENLOCK

To cater for all preferences the genlock will operate in one of two modes. The default mode (switches off), locks to the reference subcarrier and will always produce a zero ScH output. The output H timing will be maintained as close as possible to the reference H timing in the correct colour frame.

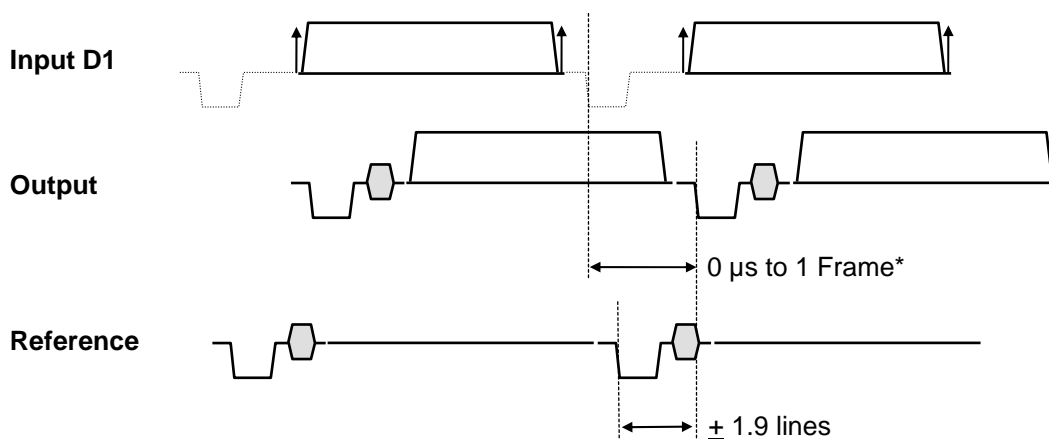
The ScH warning LED will light if the ScH of the reference is $> \pm 20^\circ$ (approx.), indicating that colour framing may be lost should the reference ScH error increase.

With no reference applied or internal lock selected the output will lock to the input D1 with the buffer delay set to a minimum. Incoming jitter will be suppressed and the output ScH is guaranteed to be zero.

In the event of conflicting standards being applied to the reference and the D1 input the output will default to black burst in the reference standard. With no input or reference the output will also be black burst (or any available pattern) in a user selectable standard. In this mode the frequency accuracy will be $\pm 10\text{ppm}$.

In reference genlock modes the subcarrier may be offset by up to 360° . H phase offset is limited to approx. ± 1.9 lines.

Genlock and delay limits:



*An input to output delay of less than $3\ \mu\text{s}$ will result in a frame of delay being inserted. The output will still be valid but audio delay compensation may be required. The delay warning (DW) message will appear if the overall input to output delay is between 1 ms and 1 frame.

RollTrack Audio Delay Tracking

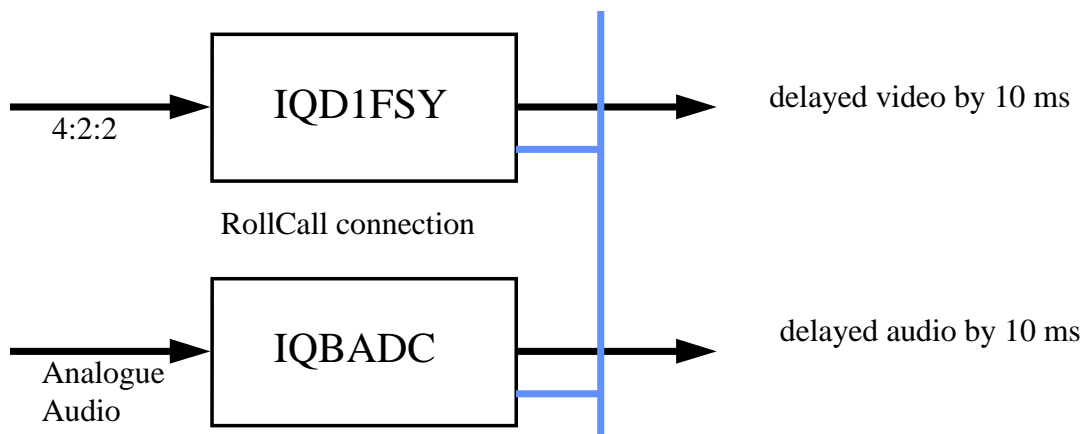
RollTrack is a feature of RollCall™ (Snell & Wilcox's proprietary remote control system), that allows devices to communicate across the RollCall network with no direct user intervention.

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.



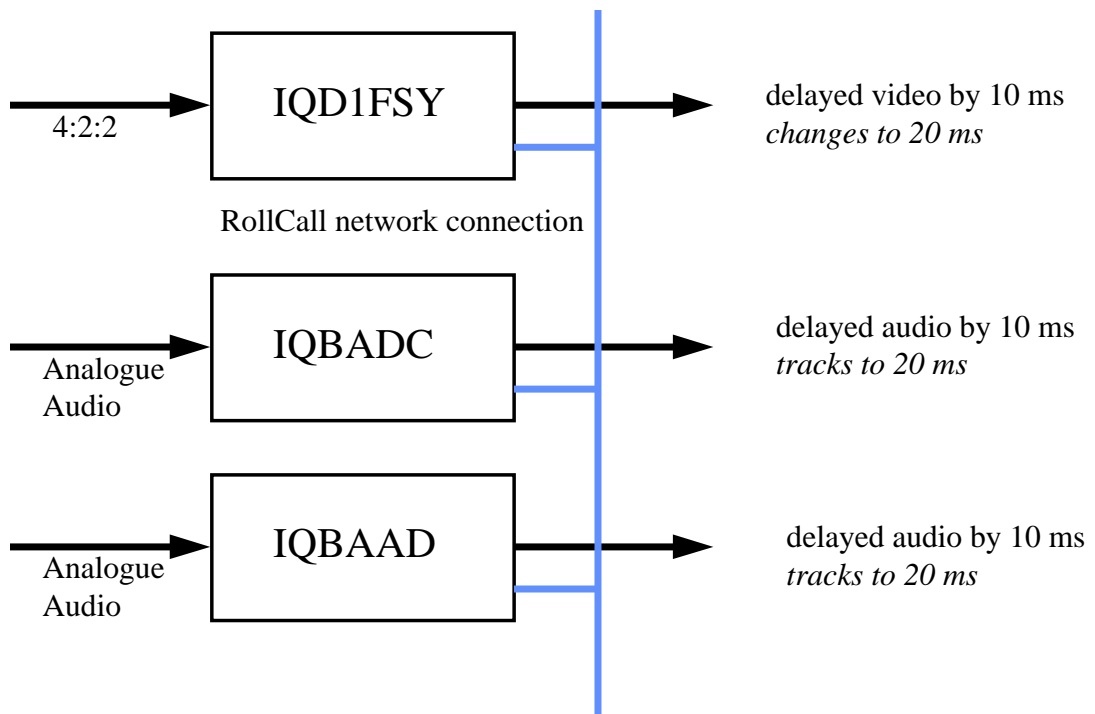
The next level of configuration is where there are multiple Frame Synchronizers (for example) each connected through RollCall™ to their own tracking Audio Delay. (It is worth stating that the synchronizers and audio delays do not have to be in the same enclosure; the addressing scheme, discussed later,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

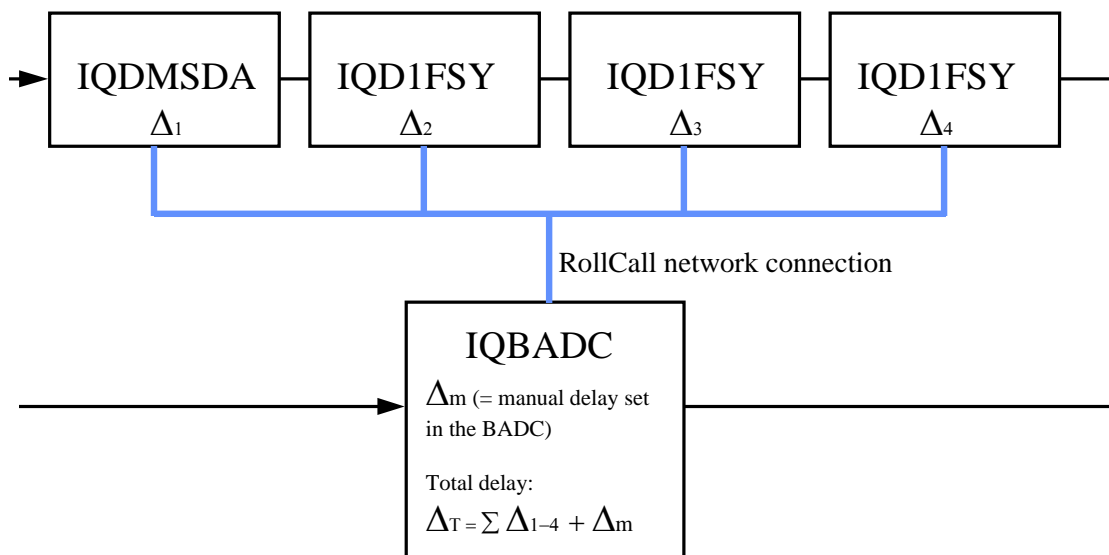
Module	ID
IQBADC	51
IQBDAC	52
IQBAAD	53
IQBDAD	54
IQBSYN	89
IQBADCD	107

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.



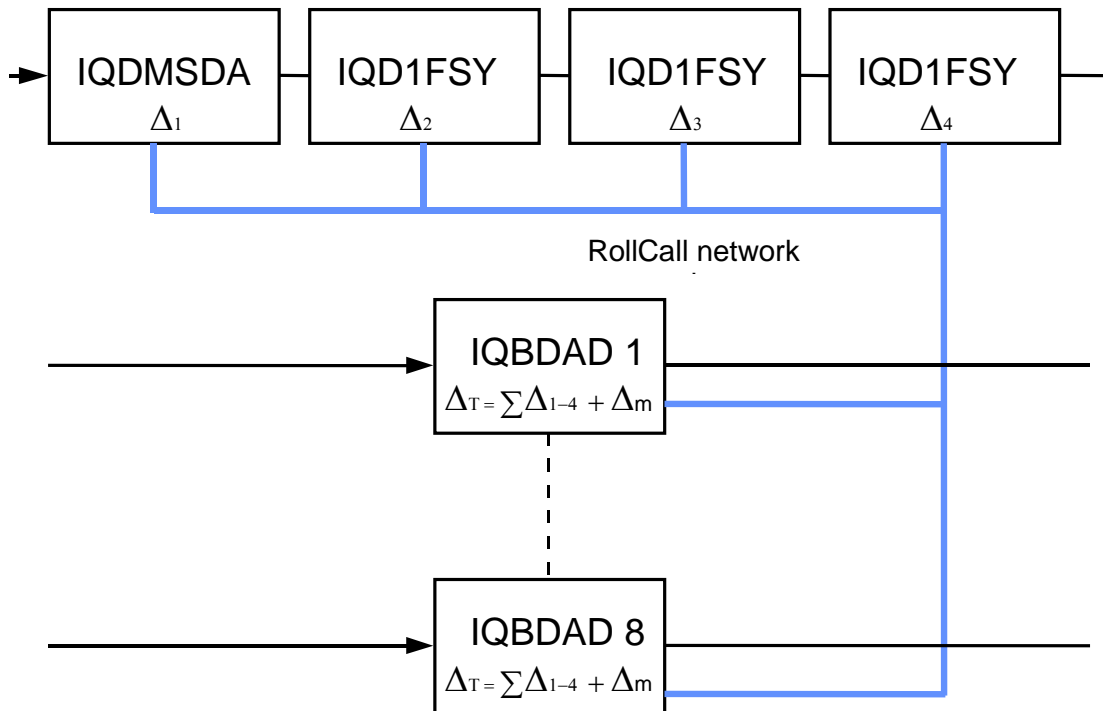
From one to eight audio delay products can be connected via RollCall™ to a single frame synchronizer, for example. If the synchronizer delay changes, then however many audio delays are connected will track the delay. The audio delays can also have a manual delay which will be added to the RollTrack delay.

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

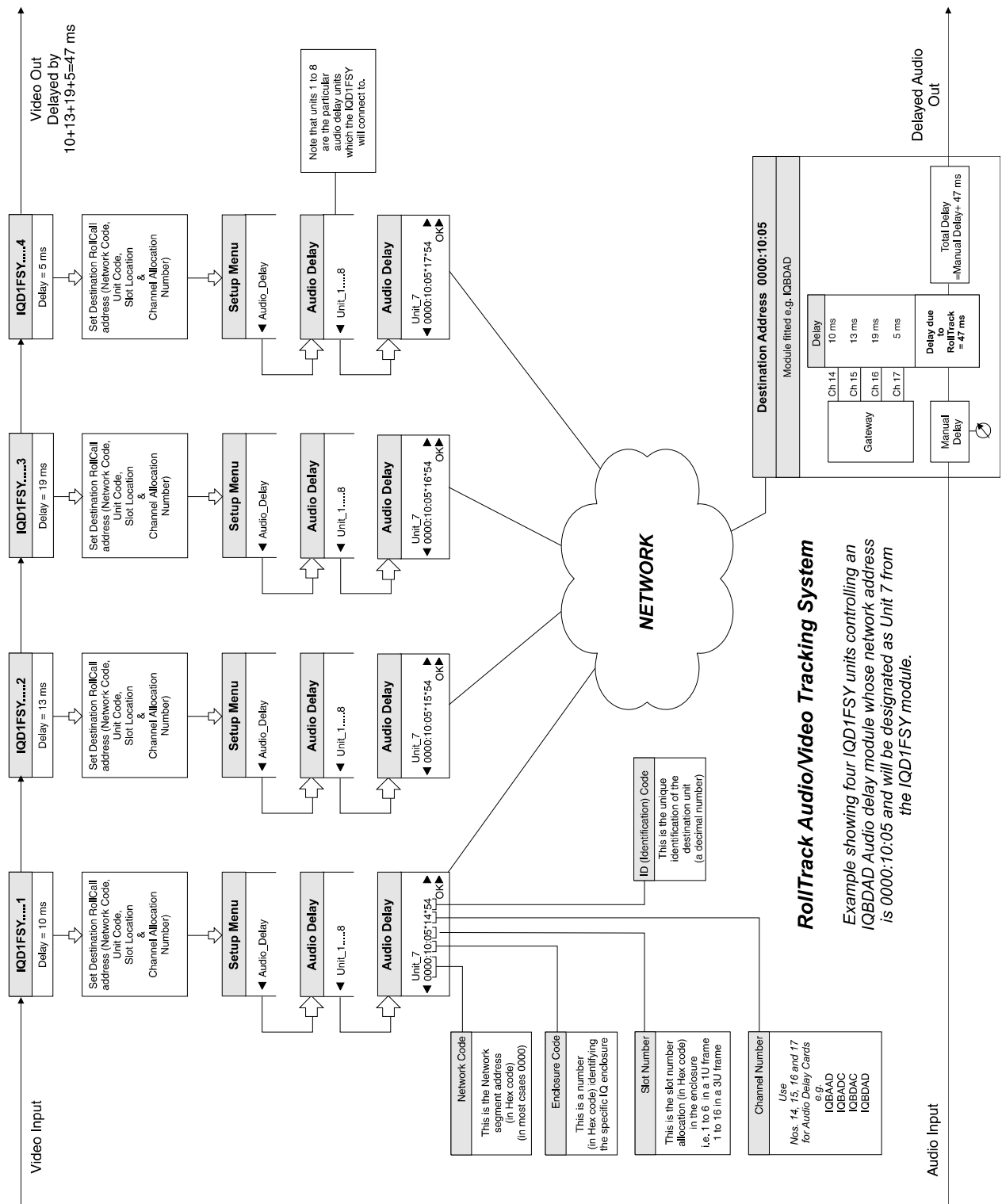
receiving units own ID or else the command will be ignored. If the ID value is set to 00, the receiving unit does not perform an ID match and will always accept the incoming command

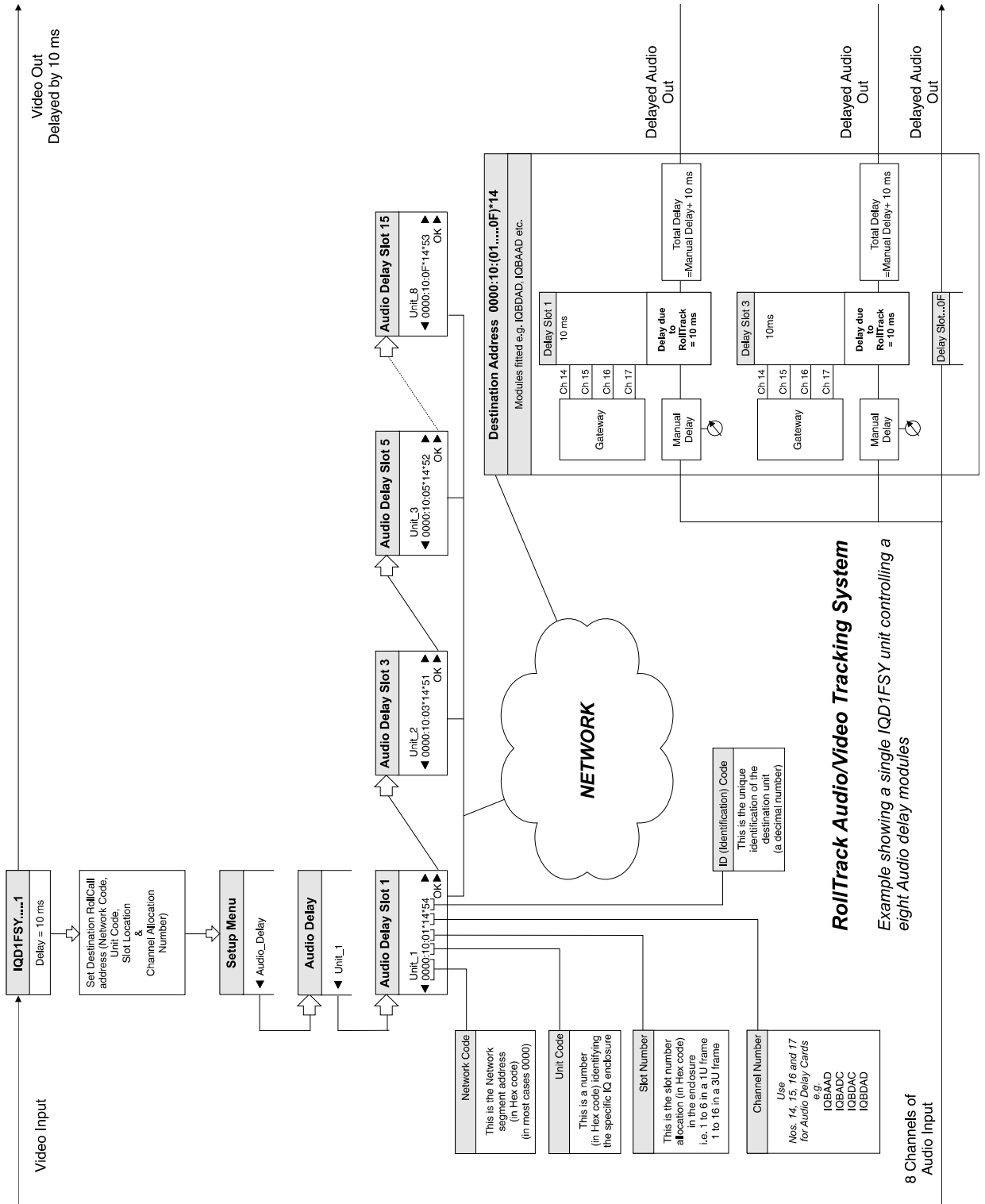
- then selecting the *Delay...* Menu of the IQBDAD
- then selecting *RollTrack*

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





Manual Revision Record

Date	Version No.	Issue No.	Change	Comments
030400	1	1		New version of IQDMSE
251000	1	2	Pass_Line_23 added in Setup	New issue released
011100	1	3	Proc amp controls added	New issue released
150402	1	4	Now includes information for the 3A enclosure modules	New manual issued
271102	1	5	-1A and -2A-S rear panels added	New manual issued
110403	1	6	Power consumption added to techspec	New manual issued
100205	1	7	Mute function added and manual generally updated	New manual issued
090108	1	8	For software version 7.0.9	New manual