Synchronizing HD/SD-SDI Up, Down and Cross Converter

Table of Contents

Module Description ............................................. 2
Rear Panel View ................................................... 2
Block Diagram ..................................................... 3
Module Overview ................................................. 3
Features ................................................................ 4
   Input/Output Capabilities .................................... 5
Technical Profile .................................................... 6

INPUT CONNECTIONS ........................................ 10
   Serial Digital Video Inputs .................................. 10
   Reference Input .............................................. 10
   GPI ............................................................ 10

OUTPUT CONNECTIONS ...................................... 10
   Serial Outputs ............................................. 10

CARD EDGE INDICATORS ................................ 11

RollCall PC Control Panel Screens ...................... 13
   Video Input ................................................ 13
   Video Output ............................................ 14
   Picture Output .......................................... 16
   ARC Control .............................................. 19

Active Formats ................................................... 21
   Widescreen Signaling and Aspect Ratio
      Control Overview ...................................... 21
   Table B.3 Active Formats Illustrated ................. 22
   Transformation Descriptions ............................. 23
   Wide Screen Signaling ................................... 24
   Ancillary Data ............................................. 26
   Audio Processing Overview .............................. 28
   Emb(ed) Proc Amps Groups 1-2 and 3-4 .... 32
   Audio Mixer 1-4 ........................................ 33
   Embedded Routing Groups 1-2 and 3-4 ... 34
   Audio Delays ............................................. 35
   Embed On/Off ........................................... 37

Embedded I/P Setup ......................................... 38
Embedded O/P Setup ......................................... 39
Genlock & Video Delay ..................................... 40
GPIO (General Purpose Input Output) ................ 42
Define Input OK and Backup Rules
   Overview .................................................. 44
Define Input OK ............................................ 45
Backup Rules 1-3 and 4-5 ................................. 45
RollTrack ..................................................... 46
Memory ....................................................... 48
Logging ........................................................ 49
Video Input Logging ........................................ 49
In(put)1 Aud(io) Type Logging ......................... 49
In(put)1 Aud(io) State Logging ......................... 49
In(put)2 Aud(io) Type Logging ......................... 49
In(put)2 Aud(io) State Logging ......................... 50
WideScreen Logging ....................................... 50
Ref/Output Logging ........................................ 50
O/P Aud(io) Type Logging ............................... 50
O/P Aud(io) Level Logging .............................. 51
Misc Logging ................................................ 51
ROLLCALL LOG FIELDS ................................ 52
   Setup ..................................................... 56
   Diagnostics ............................................. 59

Operation from an Active Control Panel .......... 60
IQUDC00 RollCall Commands ......................... 61
Appendix 1 - Dolby E ............................................ 93
Appendix 2 – Signaling Mapping ...................... 95
Table B.3 Active Formats Illustrated ............... 98
RollTrack Audio Delay Tracking .......................... 98
Manual Revision Record ................................. 104

UDC00OPS 6-Mar-09  www.snellwilcox.com  Version 1 Issue 8  N17.1
Module Description

The IQUDC00 is a flexible up, down and cross converter with synchronizer, suitable for converting SD-SDI signals to HD-SDI or vice-versa and for transcoding HD-SDI, or SD-SDI, signals of the same frame rate. Features include a frame accurate variable aspect ratio converter with pan, tilt and zoom adjustments, and extensive metadata transcoding including CC608-708, WST and VITC data. A video proc. amp and legalizer provides complete control over the video levels, whilst a powerful enhancement feature allows picture detail to be sharpened. Both embedded PCM and non-PCM audio can be seamlessly handled, with the capability of processing up to 16 channels of embedded audio alongside the video.

Rear Panel View

Versions of the module cards available are:

IQUDC0027-2A  HD/SD Up, Down and Cross Converter. 2 SDI inputs, 4 SDI outputs, 2 GPI/Os
Double width module

These modules can only be fitted into ‘A’ style enclosures as shown below.

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

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

Enclosure order code IQH1A-S-P
The IQUDC00 flexibility in multi-rate HD and SD support means that the module can operate in a SD system today and a HD one tomorrow. 16, 20 and 24-bit audio sources can all be handled. PCM audio can be processed alongside Dolby E and other non-PCM signals with selection made on a pair-by-pair basis. Internally, the PCM audio is treated as separate channels allowing stereo, mono and discrete surround sound operation as well as multi-lingual working. Any input PCM audio channel (not just pair) can be routed to any output channel.

The sophisticated audio processing features include comprehensive audio delays, gain control, phase inversion and mixing.

The module is fully Dolby E compatible and can handle other non-PCM audio streams including Dolby AC3 (Dolby Digital) passed as AES data.

These modules also have dedicated video control features that include video ProcAmp controls. This allows the IQUDC00 to be employed as the prime control unit in a processing chain providing all audio and video controls required to prepare signals.

Delay can be inserted in the audio path to compensate for video processing. The audio delays can be both fixed and can track video synchronizers to keep sound in perfect sync with the pictures. Unlike other products which claim smooth operation but simply remove sections of audio to fit, high-quality audio synchronization circuits track the video delay without missing any of the original content as the sound is temporally compressed or stretched to fit. The audio delay capability can be used for synchronous non-PCM audio so that Dolby E sources can be delayed either to match the video or to re-time the Dolby blocks to realign with the video frames if necessary.

Dolby E and Dolby Digital are registered trademarks of Dolby Laboratories, Inc.
Features

- Selectable Up, Down and cross conversion for HD/SD-SDI inputs with clean transition between standards
- Frame synchronizer, with minimum delay mode
- HD Tri-sync / SD Bi-Level Reference Input with passive loop-through
- User variable static aspect ratio conversion with 40 programmable display memories – fixed selection, including pan, tilt and zoom functions with pixel accurate control
- Line 23 WSS and Video Index AFD and SMPTE 2016 signaling (reading and writing)
- Simultaneous metadata conversion for:
  - Closed caption passing CEA608 to/from CEA708 compatibility bytes
  - WST transcoding between ETSI 300-706 and OP-47 standards
  - SMPTE 12M VITC to/from ATC timecode transcoding
- Horizontal and vertical picture enhancement including advanced horizontal detail enhancer, with low, medium and high frequency band presets and custom gain & noise rejection controls
- Color space conversion – auto, ITU 601 and ITU 709 (SMPTE-274)
- Advanced RGB gamut legalizer with selectable RGB area masks, and video proc amp with hue control and luma clipper
- Input blanking adjustment and output color border
- 16-channel embedded audio with synchronizing and processing for PCM audio signals (gain and invert)
- Channel-level audio routing
- 4 off 4x1 assignable audio mixers
### Input/Output Capabilities

<table>
<thead>
<tr>
<th>Input</th>
<th>25</th>
<th>50</th>
<th>29.97</th>
<th>59.94</th>
</tr>
</thead>
<tbody>
<tr>
<td>576i</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>x</td>
</tr>
<tr>
<td>1080i</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>x</td>
</tr>
<tr>
<td>720P</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>x</td>
</tr>
<tr>
<td>480i</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>✓</td>
</tr>
<tr>
<td>1080i</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>✓</td>
</tr>
<tr>
<td>720P</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>✓</td>
</tr>
</tbody>
</table>

- **Map of input to output standards**
- **Output standards**: 576i, 1080i, 720P, 480i, 1080i, 720P
Technical Profile

Inputs & Outputs

Signal Inputs

Inputs 2 x SD/HD Serial Digital
Standards 1.5 Gbit/s HD-SDI, SMPTE 292M/296M, 270 Mbit/s SDI, SMPTE 259M-C
Analog Reference 1 x Analog Reference with loop through
Standards HD Tri-sync / SD Bi-sync, SMPTE 274M, RS170A

Signal Outputs

Outputs 4 x SD/HD Serial Digital
Standards 1.5 Gbit/s HD-SDI, SMPTE 292M/296M, 270 Mbit/s SDI, SMPTE 259M-C

Control Interface

GPI 2 x GPI (I/O configurable)
Electrical TTL compatible, active low driven

Map of input to output standards

<table>
<thead>
<tr>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>576i</td>
<td>576i</td>
</tr>
<tr>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>1080i</td>
<td>✓</td>
</tr>
<tr>
<td>720P</td>
<td>✓</td>
</tr>
</tbody>
</table>

Reference locking output standard map

<table>
<thead>
<tr>
<th>Reference</th>
<th>SD Bi-level</th>
<th>HD Tri-level</th>
</tr>
</thead>
<tbody>
<tr>
<td>625/50</td>
<td>525/59.94</td>
<td>50</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Output</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>576i</td>
<td>✓</td>
</tr>
<tr>
<td>1080i</td>
<td>✓</td>
</tr>
<tr>
<td>720P</td>
<td>✓</td>
</tr>
<tr>
<td>480i</td>
<td>✓</td>
</tr>
<tr>
<td>1080i</td>
<td>✓</td>
</tr>
<tr>
<td>720P</td>
<td>✓</td>
</tr>
</tbody>
</table>
Controls

Indicators

IQUDC00 Card

Power ......................................... OK (Green)
FPGA........................................ V-OK (Green)
FPGA......................................... H-OK (Green)
Fault......................................... Card Fault (Red)
Error......................................... User Error (Red)
Warning...................................... Operating Error (Yellow)
OK ........................................... Operation OK (Green)

Secondary Card

Power ......................................... OK (2 x Green)
CPU running................. OK (Green flashing)
FPGA running..................... OK (Yellow flashing)
Status ................................. OK (Green)
Warning...................................... Error (Red)
Input 1................................. Active (Green)
Input 2................................. Active (Green)
SDI error............................. Error (Red)
Reference lock ............... Card Fault (Red)
Error................................. Operating Error (Yellow)
OK ........................................... Operation OK (Green)

Controls

Audio Controls

Channel routing ................. Output channels routed from SDI
                           (16 embedded channels from any
                           group), test tone and silence
Output side control proc. - gain and polarity
Independent Gain, Mute, &
Polarity control over embedded
output channels. +12 dB to
-36 dB in 0.1 dB steps.
Mixer sources (4 sources per mixer)
Independent Gain, Mute, &
Polarity control. +12 dB to -36 dB
in 0.1 dB steps.

Channel 1 Delay sources

Manual delay offset ............ Up to +2 s in 0.25 ms steps,
                           common to any selected pairs.
Variable audio delay control source
Up to 0.5 s from RollTrack + GPI
+ Video Synchronizer Delay

Channel 2 Delay sources

Manual delay offset ............ Up to +2 s in 0.25 ms steps,
                           common to any selected pairs.
Variable audio delay control source
Up to 0.5 s from RollTrack + GPI
+ Video Synchronizer Delay

Channel Status handling and checking

Tone Setup:

Frequency ................................. 1 kHz, 2 kHz, 4 kHz, mute @
-20 dBFS or –18 dBFS

Video Controls

Select input.......................... 1, 2, Backup Enable
Define Input OK ................. 5 backup rules defining input and
GPI status
Output resolution ................. 1080I, 720p, SD
Input Standards List............. Select video standards for valid
input
Black Level ......................... ±200 mV in steps of 1 mV
Master Video Gain .............. ±6 dB in steps of 0.1 dB.
Y Gain.................................. ±6 dB in steps of 0.1 dB.
Cb/Cr Gain.......................... ±6 dB in steps of 0.1 dB.
Note: .................................. The total range of both Master + Y
                           and Master + C controls is +6 dB
to -10 dB.
YC Delay............................. SD +3 to -4 pixels
                           HD +7 to –8 pixels
RGB Legalizer ................. On/Off
RGB Legalizer Mask........... Preset 1 to 4
Pattern Select ................. 100% Color Bars, 75% Color Bars
                           SMPTE Bars, Tartan Bars, Pluge
                           Ramp, H Sweep, Pulse & Bar,
                           Burst
Caption Enable ................. Off / On
Caption Generator ............. Programmable up to 16 characters
Caption Size ........................ X-Y adjust
Caption Position............... X-Y adjust
Manual Freeze................. On/Off
Freeze ............................ Frame
Video Channel Control...... Y On/Off, C On/Off
Reference select............... External / Input Video
Default Video Output ......... Pattern / freeze field/ black / input
H and V Enhancement ......... On/Off
H and V Enhancement ...... Sharpen / Soften (+3 to –2)
H Enhance Frequency ......... Low, Medium, High, Custom
Closed Caption handling.... On, Off (Embed EIA608
                           compatibility into EIA708 and vice
                           versa (HD to NTSC line 21 CC).
                           Compatibility Bytes only)

Aspect Ratio Conversion Controls

Fixed selection .................. Full Frame
Box 16:9 top > 16:9
4:3 box 14:9 top > 16:9
Box 16:9 > 16:9
Box 4:3 > 4:3
4:3 > box 16:9
16:9 > box 4:3
4:3 box 14:9 > 16:9
16:9 box 14:9 > 4:3
Note: Terminology is (source aspect for ambiguous 14:9) (Box when present) (source AFD) > (box) (target display aspect)

ARC Display Memories ...... 40 x Save / Recall (manually or via signalling) / Rename
Size ............................... 60% to 200% in 0.1% steps.
Aspect ............................... 60% to 200% in 0.1% steps.
Pan / Tilt ............................. ±75% in 0.1% steps
(H resolution is 1/32nd of pixel)
(V resolution is 1/16th of Field Line)
Origin ............................... Top Left / Center
Input crop............................ Left / Right / Top / Bottom
Output Border ..................... Left / Right / Top / Bottom
Output Border Color ........... Red / Green / Blue

Other Controls
GPI Configuration............... Not Used / as an output / as an input.
GPI Input ............................ Activates on contact closure: - Freeze, Pattern, Black, Mono Y only, Mono CbCr only. Use reference, Memory recall ARC Recall.

GPI Output .......................... Produces an output for:
Input Loss, Reference OK
Freeze, Pattern, Black, Monochrome

User Memories ..................... 16 x Save / Recall / Rename
Input/Output Names ............ User configurable naming of the individual embedded audio and mixer channels

RollCall Features
Logging ............................... Input Status
Input Standard
Reference Status
Embedded audio status (pairs 1-8)
ANC Error
ANC Error secs
CRC
CRC Error secs

RollTrack Controls .............. Source, Address, Command, Status, Sending.
RollTrack Sources ............... Unused, Video Delay, Input Present, Input Loss, Reference Loss, Reference OK, Output Freeze, Output Unfreeze, Audio Delay, Embedded Audio (Pairs 1-8), Input Standard.
Specifications

Input / Output Standards

Upconversion
Input 480i/29....................... Output 1080i29, 720p59
Input 576i/25....................... Output 1080i25, 720p50

Down Conversion
Input 1080i29...................... Output 480i/29, 720p59
Input 1080i25...................... Output 576i/25, 720p50

Cross Conversion
Input 1080i29...................... Output 720p59, 1080i29
Input 720p59....................... Output 1080i29, 720p59
Input 1080i25...................... Output 720p50, 1080i25
Input 720p50....................... Output 1080i25, 720p50
Input 480i/29....................... Output 480i/29
Input 576i/25....................... Output 576i/25

Processing delay ................ Synchronized and Input locked: 4 to 6 fields.
Minimum Delay................. 4 Fields minus 4 lines

Synchronizer Hysteresis Window
1 Line

Reference Source............ External – HD Tri-Level / SD Bi-level / Input Video syncs

Genlock Adjustment ........... Horizontal and Vertical timing

Horizontal Timing ............... 0 to 1 output line in steps of 1 pixel.
Vertical Timing.................. 0 to 1 output frame in steps of 1 line.

Signal Inputs
Connector/Format.............. BNC/75 ohm panel jack on standard S&W connector panel

Input Cable Length............. Up to 140 m Belden 1694A @ 1.5 Gbit/s
Up to 350 m Belden 1694A @ 270 Mbit/s
Input Return loss ............... > 15 dB

Reference Input

Electrical ......................... Black (HD tri-level and SD bi-level) and Black Burst (SD bi-level)
SD bi-level – RS170A
HD Tr-level – SMPTE 240M, 274M and 296M

Connector / Format.............. BNC/75 ohm panel jack on standard S&W connector panel

Analog Reference Return Loss
SD bi-level > 40 dB to 5.5 MHz
HD tri-level > 35 dB to 30 MHz

Signal Outputs
Connector/Format.............. BNC/75 ohm panel jack on standard S&W connector panel

Output Return loss ............... > 15 dB

Embedded Audio

Embedded audio handling. HD - 24-bit synchronous 48 kHz to SMPTE 299M
SD - 20-bit synchronous 48 kHz to SMPTE 272M-A

Embedded Audio Delay....... Minimum 3 ms
Maximum 2.5 s

Power Consumption

Module Power Consumption
16 W Max
INPUT CONNECTIONS

**Serial Digital Video Inputs**

The two serial digital inputs to the unit are made via these BNC connectors that terminate in 75 Ohms.

**Reference Input**

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

It should be noted that proper operation to the full specification can only be achieved with a correctly terminated, noise-free, stable, black sync reference input. Whilst lock may be achieved with an unsuitable sync source the increased jitter evident on the SDI output will affect locking and cable length performance at the receiving equipment.

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

**GPI**

There are the two GPI connections via BNC connectors that may be configured as inputs or outputs.

OUTPUT CONNECTIONS

**Serial Outputs**

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

Note that EDH information will not be passed through to the output signal.
CARD EDGE INDICATORS

**IQUDC00 Card**

**PWR OK (Green LED)**
When illuminated, this indicates that the power supply is present.

Note that the 5 undefined green LEDs are for debug only and can be ignored.

**FPGA V-OK (Green LED)**
When illuminated, this indicates that FPGA V has configured correctly.

**FPGA H-OK (Green LED)**
When illuminated, this indicates that FPGA H has configured correctly.

**FAULT (Red LED)**
When illuminated, this indicates a board internal fault and service is required.

**ERR (Red LED)**
When illuminated, this indicates a user type error, preventing a good video output.

**WARN (Yellow LED)**
When illuminated, this indicates an operational problem, which may compromise the video output.

**OK (Green LED)**
When illuminated, this indicates that the module is operating correctly, where none of the previous 3 LEDs is lit.
Secondary Card

+Power and –Power (Green)

When illuminated these LEDs indicate that the positive and negative supplies are present.

CPU OK (Green)

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

FPGA Done (Orange)

This will flash when the FPGA is running.

IN 1, IN 2 (Green)

These LEDs indicate which input has been selected.

SDI ERROR (Red)

This will become illuminated if any CRC, EDH or TRS errors are detected on the SDI input. It is also illuminated when the input is lost.

Ref Lock (Reference Lock indicator) (Green)

This LED will be illuminated when genlock is enabled and locked.

Error (Red)

This LED indicates board fault conditions. These include:

Audio clock lock fault. Audio sub-system fails to lock to video clocks.

Serializer lock fault. Output serializer fails to lock.

SDI JTAG board fault. Internal JTAG interface is inadvertently enabled.

In all cases continuous illumination indicates a board fault and a service is required. Perform a Factory Reset and supply a valid SDI video source before calling service.

Warning (Yellow)

This indicates operational errors. These include:

Embedder Status - ANC overflow. Indicates the embedder has run out of ancillary space over quite a few lines. Due to heavy use of ancillary space on the video input, particularly in SD.

Input Video - Incompatible Frame Rate. Detected input standard is incorrect frame rate.

Input Video - SDI problem. CRC or other SDI errors detected on selected input in the last whole field.

Reference - Lock Failure. Genlock failed to lock to selected source. Will generally light up in transitional states like standard changes, but continuous illumination indicates a problem. More information is available in the status window.

OK (Green)

When illuminated this will indicate that the module is operating correctly.
RollCall PC Control Panel Screens

**Video Input**

This screen allows various settings to be applied to the video input signal.

**Input Select**

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

**Backup Enable**

When selected a predefined action happens when a chosen event occurs. For details please see page 44.

**Valid Input Standards**

This allows the unit to accept or disregard particular video input standards by checking the appropriate boxes.

- **Set All**
  When selected all standards will be checked and accepted.

- **Clear All**
  When selected all check boxes will be cleared and the required valid input standards may then be checked.

Note that if any other standards are detected, an invalid standard will be assumed and any events that depend on this will be triggered.

**YC Delay**

This allows the timing of the chrominance signal relative to the luminance signal to be adjusted, (i.e. Y to Cb/Cr timing) in pixels. By using the scroll bar the timing may be adjusted by +3 to –4 pixels (SD) +7 to –8 pixels (HD) in 1 pixel steps. Preset is to 0 pixels.

**CRC/EDH Errors**

This item provides information about the Cyclic Redundancy Checksum errors and Error Detection Handling.

- **CRC/EDH Errors**
  This will display the total CRC error count or EDH errors since the last reset.

- **Time Since Last (CRC/EDH) Error**
  This will show the time in 5 second intervals up to 1 minute then in minute intervals, since the last error was detected.

- **ANC Errors**
  This will display the total number of ANC errors since the last reset.

- **Time Since Last (ANC) Error**
  This will show the time in 5 second intervals up to 1 minute then in minute intervals, since the last error was detected.

- **Reset Counts**
  This will reset the error counters to zero.

**Time Since Reset**

This will show the time in 5 second intervals up to 1 minute then in minute intervals, since the counters were last reset.

Note that if the selected input changes, the CRC/EDH counts will be automatically reset once the software has decided that the input is correctly locked.
Video Output

This allows various settings and adjustments to be applied to the video output signal.

Output

Standard
This allows the output standard to be selected.

Options are as follows:
- 1080i
- 720p
- SD

Note that the output frequency will follow the reference or the input.

Pattern
This allows the pattern functions to be set up.

Enable When checked the output will become the pattern selected from the Pattern Type list.

H-Scroll
When checked the selected pattern will scroll from left to right at a fixed rate. This mode is useful for differentiating between an input test pattern signal that has become a frozen picture (caused by a loss of input signal) and a test pattern that has been chosen to be the output.

Pattern Type
This allows a pattern to be selected from the list. This pattern will become the output signal when Pattern/Enable is checked.

Options are as follows:
- 100% Color Bars
- 75% Color Bars
- SMPTE Bars
- Tartan Bars
- Pluge
- Ramp
- Sweep
- Pulse & Bar
- Burst
- Black

Utilities

Monochrome
This allows video channel controls to be selected.

Enable
When checked, the monochrome functions will be enabled.

Monochrome Type
This controls the monochrome output functions.

Y Only
When selected, the output picture will become monochrome using only the Y component of the signal.

C Only
When selected, the output picture will become monochrome using only the CbCr components of the signal.

Force Freeze
When checked the output will become a frozen frame picture.
Default Output
This controls the units’ response to a loss of input signal. Options are:

Freeze
When checked the output picture will freeze.

Black
When checked the output picture will cut to black.

Out Pattern
When checked the output picture will become the pattern selected via the Output/Pattern Type function.

ProcAmp
This function allows the gain and black level of the signal to be adjusted.

Master Gain
This allows the overall gain (Y and Cb/Cr) to be adjusted over a range of ±6 dB in steps of 0.1 dB. Preset value is 0.0 dB.

Y and C gain may be independently adjusted with the controls described below.

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

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

Note that the total range of both Master + Y and Master + C controls is +6 dB to -10 dB.

Black Level
This allows the black level to be adjusted by ±200 mV in steps of 1 mV. Preset value is 0.

Hue
This allows the hue to be adjusted from -45degs to +45deg. Preset is to 0degs.

User Caption
These controls allow a user caption to be displayed on the video output.

Enable
Select to enable the video caption.

Text
Enter the caption text in this field, and then click S to save. Click P to return to the default text (Captions ON). A maximum of 16 characters can be entered.

X Pos / Y Pos
Use the slider bars to position the caption along the X and Y axis.

X Size / Y Size
Use the slider bars to resize the height and width of the caption. The range of adjustment for each is 1 to 5 units.
**Picture Output**

This allows various adjustments to be made to the output picture.

**Output Border**

This allows a user-defined border to be placed around the output picture.

- **Left**
  This adjusts the size of the left-hand border. The range of adjustment will depend on the selected output standard. Control is in steps of 1 pixel and preset value is 0 pixels.

- **Right**
  This adjusts the size of the right-hand border. The range of adjustment will depend on the selected output standard. Control is in steps of 1 pixel and preset value is 0 pixels.

- **Top**
  This adjusts the size of the top border. The range of adjustment will depend on the selected output standard. Control is in steps of 1 line and preset value is 0 lines.

- **Bottom**
  This adjusts the size of the bottom border. The range of adjustment will depend on the selected output standard. Control is in steps of 1 line and preset value is 0 lines.

- **Red/Green/Blue**
  This allows the color of the border (the unused area outside the picture) to be adjusted. The level of each color may be adjusted from 0 to 255 units in steps of 1 unit. Preset levels are 127 units.

**Notes**

Borders should be measured as offsets from the extreme. For example a right border of 4 would be 4 pixels from the highest legal pixel for any video mode. An example would be where the highest legal pixel is 1920 then the border would apply at 1916. Pixels are counted with 1 as the first.

**Colorimetry**

This controls the color space conversion applied to produce the output signals.

This is intended to produce a correct Rec. ITU-R BT.601 (SD) or ITU-R BT.709 (HD) color output.

In Auto mode the best color space conversion for the signal process is selected. This is derived from the definition of the input and output video standards.

**Notes**

The conversion may cause very strong colors to extend out of range and as a result become clipped.

Processing such as the filters in the video conversion will create further edge effects (ringing), particularly for larger scaling ratios, and positive enhancement will add to this effect. Whilst there is a provision in SMPTE-274 and ITU-R BT.601 for overshoots in the -7% / +8% headroom given, measurement devices frequently report violations to much tighter limits by default. These are generally only necessary to protect downstream RGB or composite video processing when the respective coders have no internal legalization.

A simple luminance and chrominance limiter is provided in the IQUDC00 to give correction for the majority of practical cases of large signal excursion. If full legalization for RGB and/or Y+C gamut is required then it is recommended a downstream gamut legalizer is used.
Film/Video – Scaler Delay

IMPORTANT: This control will have a large effect on output video quality.

The detection algorithms have been optimized so that the maximum possible range of material can be converted in a single pass.

Auto
When set to Auto the sequence detector will automatically identify film or video and convert accordingly. An example of this use may be to guide the conversion when the input contains scenes of both film and video types. This also allows extraction of film frame and pull-down cadences without introducing any conversion artifacts and giving the best sharpness. However, any false detection caused by mixed sources could be objectionable.

It may be worth trying this conversion type when upconverting as the enhanced detail possible on film source will give a sharper output.

Normal (Video)
(Factory Preset Condition)
This setting provides the most diffuse temporal aperture.

This uses a patented 3-field conversion to maintain detail level whilst rejecting alias artifacts. It is well suited to downconversion.

It will force the detector to a video conversion mode. All inputs will be treated as video, which is a safer conversion. An example of this use may be to produce a conversion with best motion performance on material containing a mix of video and film motion types.

Drama
This setting provides an increase in the sharpness of the temporal aperture over the Normal setting. It will provide good vertical detail on stiller scenes.

Action
This setting provides a more diffuse temporal aperture than the Sports setting. It will provide good clarity when viewing fast-moving scenes.

Sports
This setting provides the sharpest temporal aperture and is optimized for reduced "bleeding" across video cuts.

This mode will also give the clearest view of very fast action scenes, but at the expense of vertical detail on stiller scenes.

Note: Care should be taken to reselect input type when starting a new conversion.

Detail
When checked this selects an alternative horizontal coefficient set for Normal or Sports modes.

Minimum Delay
When checked, the video path delay will be reduced to between two to three fields when locked to reference and two fields when locked to input (plus any H and V offset settings).

This means that there will be no 3:2 detection and processing and the output scaling will not be co-timed with WSS. The output scaling will lag WSS by one field.

This control is also present on the Genlock and Video Delay menu. Selecting it automatically selects the Sports setting.
RGB Legaliser
RGB gamut legalization ensures that both the HD and SD outputs of the unit meet specified color limits.

Enable
Select to enable the RGB Legalizer.

Range
700mV RGB Lo 0mV, RGB Hi 700mV.
721mV RGB Lo -21mV, RGB Hi 721mV.
735mV RGB Lo -35mV, RGB Hi 735mV.

The 735mV selection should be used in conjunction with the luma clipper (set at presets) to generate images that adhere to EBU R103-200 specification.

Luma Clipper
When luminance levels are too high or too low, devices such as encoders and displays can have problems. The luma clipper is used to limit signals above and below predefined limits.

Enable
Select to enable the Luma Clipper

White Max
This sets the upper limit of the clipper. The range is minimum 90% (825 digital 10 bit value) to maximum 109% (1019) with increments of 1%. The preset value is 103%.

Black Min
This sets the lower limit of the clipper. The range is minimum -7% (4) to maximum 10% (152) with increments of 1%. The preset value is -1% (55).

Enhance
This controls the amount of detail enhancement that may be applied.

V Enhance
This adjusts the levels of high frequency vertical information to make the output pictures appear sharper. The range is –2 to +3 in unity steps and the preset value is 0.

H Enhance
This adjusts the levels of high frequency horizontal information to make the output pictures appear sharper. The range is –2 to +3 in unity steps and the preset value is 0.

Advanced H Enhance
The Advanced Horizontal Enhancer allows enhancement to be selectively applied to the low frequency band, medium frequency band, or high frequency band. Four presets are available as well as custom gain and noise rejection.

Enable
Select to enable advanced horizontal enhancement.

Freq Band
Select the frequency band to which enhancement will be applied.

Presets
- Low: Sets Gain to 2.0 and Noise Rejection to 15% for the selected frequency band.
- Medium: Sets Gain to 4.0 and Noise Rejection to 15% for the selected frequency band.
- High: Sets Gain to 6.0 and Noise Rejection to 15% for the selected frequency band.
- Custom: Allows Gain and Noise reduction to be manually adjusted.

Gain
If the Custom preset is selected, this allows the Gain to be adjusted on the selected frequency band.

Noise Rejection
If the Custom preset is selected, this allows the Noise Rejection to be adjusted on the selected frequency band.
**ARC Control**
This screen allows the aspect ratio conversion to be controlled manually including picture size and position adjustments. All parameters on this page are saved in global Display Memories.

**Display Memory**
These are user programmable memories which are used in conjunction with the automatic aspect ratio conversion (under Widescreen Signaling control) and any manual aspect conversion selections. By default they have the first nine loaded with the scaling values used for the aspect mapping, but any can be modified or overwritten for customization. In particular use of the input crop may be desirable to hide WSS (line 23) or 608 (line 21) signaling.

**Standard Presets**
To recall a setup from the list of standard presets, select a name from the list (text is highlighted, Full Frame in the example opposite) and click on Recall Preset and the new settings will be applied immediately.

**Recall Memory**
This also allows copying of individual aspect conversions back into original or new Display Memories.
To recall a setup from memory, select a name from the list (text is highlighted, Full Frame in the example opposite) and the new settings will be applied.

Adjustments may be made using the ARC controls (Size, Aspect, Pan and Tilt) and then the setup saved to a display memory location selected from the list. To save the setup select the location (text is highlighted) and click Save.

The name of the memory location may then be changed using the Save Memory Name item.

Note that if any changes are made to the ARC controls the text highlighting will disappear and an asterisk will be shown below the Recall Memory list. (The current conversion would normally be shown here).

**Default All**
Selecting this item will return all 40 display memory settings and their names to their default factory values.

For details of active formats and transform descriptions please see pages 22 and 23.

**Save Memory Name**
The display memory name may be changed with this function. This name will then appear in the Display Memory/Recall Memory list and on the Widescreen Signaling screen Display Memory lists.

Selecting Preset (P) will return the text to the default name.
ARC
This allows the size and position of the picture to adjusted.

Size
This adjusts the size of the whole image. Both vertical and horizontal size change together while maintaining the aspect ratio of the image. The range of control is from 60% to 200% in 0.1% steps. Preset value is 100%.

Aspect
This adjusts the horizontal size of the image, allowing the shape (aspect ratio) of the output image to be changed. Increasing the value will increase the width of the picture. The range of control is from 60% to 200% in 0.1% steps. Preset value is 100%.

Pan
This adjusts the horizontal position of the output image. The range of control is ±75% in 0.1% steps. Preset value is 0.0%. Note that increasing values will move the picture to the right.

Tilt
This adjusts the vertical position of the output image. The range of control is ±75% in 0.1% steps. Preset value is 0.0% Note that increasing values will move the picture down.

Origin
This defines the fixed position of the picture within the raster.

Top Left
The picture will be positioned at the top left hand corner of the raster. This allows easier support of a few picture formats where the active picture format is a partial screen contained in a larger resolution "carrier".

Center
The picture will be positioned in the center of the raster.

Input Crop
This function allows the adjustment of input blanking. It is used where the source video is known to have pixels/lines at the edge of the picture that are not required to be displayed. When set, the unit will blank any output data generated by the input data, regardless of the display control settings.

Left
This adjusts the left-hand edge of blanking. A setting of 0 (default) indicates that no input pixels are blanked, 3 cause the first 3 input pixels to be blanked, etc.

Right
This adjusts the right-hand edge of blanking. A setting of 0 (default) indicates that no input pixels are blanked, 2 cause the last 2 input pixels to be blanked, etc. e.g. pixels 1920 and 1919 from a 1080i picture.

Top
This adjusts the top edge of blanking. A setting of 0 indicates that no input lines that are normally visible should be blanked, 4 cause the first 4 input lines to be blanked, etc.

Bottom
This adjusts the bottom edge of blanking. A setting of 0 indicates that no input lines that are normally visible should be blanked, 1 cause the last input line to be blanked, etc. e.g. line 720 from a 720p picture.

Notes
Blanking should be measured as offsets from the extreme. For example a value of 4 would be 4 pixels from the highest legal pixel for any video mode. An example would be where the highest legal pixel is 1920 then blanking would apply at 1916. Pixels are counted with 1 as the first.
Active Formats

The active picture areas used in the widescreen signaling scheme for aspect ratio control are described here for reference. A basic principle of operation is that any picture can be processed from the following information:

- The whole picture aspect ratio (i.e. the target or coded screen)
- The active area used within the screen (outside is generally left black to create a letterbox in either orientation)
- How much of the active area is to be preserved (optional shoot-and-protect area indicated in the table by the circles)
- Where within the screen the active area is (optional top attribute used for extended subtitle area)

Knowing this and the output aspect ratio for conversion to, it is possible to do a mapping which will correct the aspect ratio while preserving the active picture and minimizing black bar area.

Widescreen Signaling and Aspect Ratio Control Overview

The Input signal drivers decodes and defaults selected signaling to give a valid Aspect Ratio (strictly 4:3 or 16:9) and Active Format Descriptor (AFD) (8 ARDSPEC1 entries, plus 3 extended and unknown pair). If no input signal or data is present, the aspect ratio & AFD will be "4:3 - Unknown".

These two signals are sent to the aspect mapping table (see below), which is initialized by a full set of defaults. This uses Aspect and AFD pair (24 values) to call up fixed and programmable Display memories. Display memory functions include Size, Aspect, Tilt, Pan and Input Crop Left/Right/Top/Botom.
<table>
<thead>
<tr>
<th>Active_format value</th>
<th>Description</th>
<th>Illustration of described format in 4:3 coded frame</th>
<th>Illustration of described format in 16:9 coded frame</th>
</tr>
</thead>
<tbody>
<tr>
<td>0000 - 0001</td>
<td>reserved</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0010</td>
<td>box 16:9 (top)</td>
<td><img src="image1.png" alt="Diagram" /></td>
<td><img src="image2.png" alt="Diagram" /></td>
</tr>
<tr>
<td>0011</td>
<td>box 14:9 (top)</td>
<td><img src="image3.png" alt="Diagram" /></td>
<td><img src="image4.png" alt="Diagram" /></td>
</tr>
<tr>
<td>0100</td>
<td>box &gt; 16:9 (centre)</td>
<td><img src="image5.png" alt="Diagram" /></td>
<td><img src="image6.png" alt="Diagram" /></td>
</tr>
<tr>
<td>0101 - 0111</td>
<td>reserved</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1000</td>
<td>As the coded frame</td>
<td><img src="image7.png" alt="Diagram" /></td>
<td><img src="image8.png" alt="Diagram" /></td>
</tr>
<tr>
<td>1001</td>
<td>4:3 (centre)</td>
<td><img src="image9.png" alt="Diagram" /></td>
<td><img src="image10.png" alt="Diagram" /> (see note)</td>
</tr>
<tr>
<td>1010</td>
<td>16:9 (centre)</td>
<td><img src="image11.png" alt="Diagram" /></td>
<td><img src="image12.png" alt="Diagram" /></td>
</tr>
<tr>
<td>1011</td>
<td>14:9 (centre)</td>
<td><img src="image13.png" alt="Diagram" /></td>
<td><img src="image14.png" alt="Diagram" /></td>
</tr>
<tr>
<td>1100</td>
<td>reserved</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1101</td>
<td>4:3 (with shoot &amp; protect 14:9 centre)</td>
<td><img src="image15.png" alt="Diagram" /></td>
<td><img src="image16.png" alt="Diagram" /></td>
</tr>
<tr>
<td>1110</td>
<td>16:9 (with shoot &amp; protect 14:9 centre)</td>
<td><img src="image17.png" alt="Diagram" /></td>
<td><img src="image18.png" alt="Diagram" /></td>
</tr>
<tr>
<td>1111</td>
<td>16:9 (with shoot &amp; protect 4:3 centre)</td>
<td><img src="image19.png" alt="Diagram" /></td>
<td><img src="image20.png" alt="Diagram" /></td>
</tr>
</tbody>
</table>

**NOTE:** It is recommended to use the 4:3 coded frame mode to transmit 4:3 source material rather than using a pillar box to transmit it in a 16:9 coded frame. This allows for higher horizontal resolution on both 4:3 and 16:9 sets.
## Transformation Descriptions

<table>
<thead>
<tr>
<th>Input</th>
<th>Transformation</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:3</td>
<td>(1) Description&lt;br&gt;Full Frame&lt;br&gt;Size 100% Aspect 100%</td>
<td>4:3 16:9</td>
</tr>
<tr>
<td>16:9</td>
<td>(2) Description&lt;br&gt;Box 16:9 Top &gt; 16:9&lt;br&gt;Size 133% Aspect 75%</td>
<td>4:3 16:9</td>
</tr>
<tr>
<td>(3) 4:3 Box 14:9 Top &gt; 16:9&lt;br&gt;Size 116.7% Aspect 75%</td>
<td>Tilt Down 12.5%</td>
<td>4:3 16:9</td>
</tr>
<tr>
<td>(4) Box 16:9 &gt; 16:9&lt;br&gt;Size 133.3% Aspect 75%</td>
<td>4:3 16:9</td>
<td></td>
</tr>
<tr>
<td>(5) Box 4:3 &gt; 4:3&lt;br&gt;Size 100% Aspect 133.3%</td>
<td>4:3 16:9</td>
<td></td>
</tr>
<tr>
<td>(6) 4:3 &gt; Box 16:9&lt;br&gt;Size 100% Aspect 75%</td>
<td>4:3 16:9</td>
<td></td>
</tr>
<tr>
<td>(7) 16:9 &gt; Box 4:3&lt;br&gt;Size 75% Aspect 133.3%</td>
<td>4:3 16:9</td>
<td></td>
</tr>
<tr>
<td>(8) 4:3 Box 14:9 &gt; 16:9&lt;br&gt;Size 116.7% Aspect 75%</td>
<td>4:3 16:9</td>
<td></td>
</tr>
<tr>
<td>(9) 16:9 Box 14:9 &gt; 4:3&lt;br&gt;Size 85.7% Aspect 133.3%</td>
<td>4:3 16:9</td>
<td></td>
</tr>
</tbody>
</table>

These are the Standard Presets for Display Memories (page 19) and are also copied into the first 9 user Display Memories. They are heavily used by the widescreen signaling based automatic Aspect Ratio Control functionality as the core transformations.

Transformation naming terminology (also default memory name) is:

(source aspect for ambiguous 14:9) (box when present) source AFD > (box) target display aspect.
Wide Screen Signaling

This screen allows widescreen signaling and picture aspect conversions to be set up. For more details please see page 21 and Appendix 2 on page 95.

Automatic aspect ratio control from input signaling can be done using mapping tables for aspect conversions (Display Memory recalls) and signaling to downstream devices. Use of Display Memories allows non-standard transformations & overscan preferences to be applied.

The internal format uses Aspect Ratio & Active Format (ETSI 101154) displayed as 16:9 - 4:3 in the screen shot.

Apart from enabling the desired input and output interfaces and output aspect ratio there should be no need to modify this area, since the mapping is designed to produce expected conversions from the consistent format descriptions.

Input Wide Screen Signal

This allows input signal choice for configuration of mapping tables, and forcing for previewing mappings.

Output 4:3 / Output 16:9

The four list boxes in the Output 4:3 and Output 16:9 columns constitute the mapping tables, and are modifiable at any time. They may be returned to the original state with a Factory Defaults.

A memory selection of None inhibits a load of a memory so the last aspect conversion is held.

Input active formats may include Unknown (e.g. for Video Index RP186) and a mapping to Coded Frame (i.e. full screen) is assumed though this is modifiable.

Input Signaling

The ICUDC00 can react to incoming VI or WSS signaling in the input stream.

Note that the appropriate VBI lines must be selected on the Ancillary Data screen.

- WSS ETSI: Widescreen signaling to ETS 101154 (line 23). 625/50 only.
- WSS AFD: Widescreen signaling including Active Format based on ARD Spec 1 (UK). 625/50 only.
- VI SMPTE: Video Index to SMPTE RP186 line 11/324 (625), line 14/276 (525).
- VI AFD: Video Index including Active Format based on ARD Spec 1 (UK).
- Priority: WSS / VI permits the appropriate input interface to be used when both are present to avoid any possible conflicts.

SMPTE2016

Selecting this option enables the IQUDC00 to react to incoming SMPTE2016 widescreen signaling information. It is not necessary to specify the expected input line because this is automatically detected.
Output Signaling
The IQUDC00 can be set to insert VI and/or WSS signaling in the output stream. Select the VI / WSS output coding checkboxes to enable insertion. Both WSS and VI can be inserted simultaneously.

Note that the appropriate VBI lines must be enabled for VI / WSS on the Ancillary Data Screen.

- WSS ETSI: Widescreen signaling to ETS 101154 (line 23). 625/50 only.
- WSS AFD: Widescreen signaling including Active Format based on ARD Spec 1 (UK). 625/50 only.
- VI SMPTE: Video Index to SMPTE RP186 line 11/324 (625), line 14/276 (525).
- VI AFD: Video Index including Active Format based on ARD Spec 1 (UK).

SMPTE2016
Selecting this option sets the IQUDC00 to insert SMPTE2016 widescreen signaling.

The appropriate VANC output line must be set up for SMPTE2016 on the Ancillary Data screen. In bypass mode, this can simply follow the input line. However, in up conversion mode, this line number must be set manually.

Force Input Mode
When checked, this allows previewing of the conversion mappings by forcing an equivalent input widescreen signal.

Output Aspect
This allows the output aspect ratio to be chosen. This will be the target aspect ratio choice for conversion to and for indication as the current output. As such it will direct the mapping choices. The “output aspect” setting is stored for each input wide screen signal selection.
Ancillary Data

This screen allows the line position of various signaling functions to be selected.

**SD VBI Setup**

For each SD VBI line in the range 7 – 23 (field 1), the data type / format can be selected. The options for each line are:

- **Off**: The line is not being used.
- **VI**: VideoIndex (SMPTE RP186)
- **WSS**: Widescreen signaling (ETSI 300294) – only enabled for 625.
- **VITC**: Vertical Interval Timecode (SMPTE 12M)
- **WST**: Teletext (ETSI 300706)
- **CC608**: US closed caption (CEA608)

Each SD VBI line can be used for only one data type at a time.

When both the input and output are HD, this control is grayed out.

When both input and output are SD (SD Bypass Mode), multiple lines can be enabled for WST and VITC. However, for all other data types (VI, WSS, and CC608) only one line can be active at any time.

When either the input or output is HD (i.e. when performing up conversion or down conversion), only one line can be active at any time for each data type. If changing from SD bypass mode, where multiple WST and VITC can be enabled, all but the first line will be disabled.

**HD VANC Setup**

These controls allow HD vertical ancillary data to be configured.

If both the input and output are HD (HD bypass mode), both the input and output controls will be available. As well, in this mode, the **Follow Input Line** check box will also be available. Selecting this check box will cause SMPTE2016 output data to be inserted on the same line as is specified for the input.

**ATC/VITC**

The ATC/VITC controls enable the user to monitor the input line on which the IQUDC has detected incoming ATC/VITC data, and/or on which output line the IQUDC will insert ATC/VITC data.

The Enable ATC/VITC check box must be selected in order for these controls to have any effect.

**CC708/OP47**

The CC708/OP47 controls enable the user to monitor the input line on which the IQUDC has detected incoming CC708/OP47 data, and/or on which output line the IQUDC will insert CC708/OP47 data.

The Enable CC708/OP47 check box must be selected in order for these controls to have any effect.

The moding of input and output line controls is the same as for SMPTE2016

The IQUDC automatically switches between CC708 (for 29i/59p standards), and OP47 (for 25i/50p standards).
SMPTE2016

Input Signalling
When this option is selected, the IQUDC will detect input SMPTE2016 signalling.

Output Signalling
When this option is selected, the IQUDC will insert SMPTE2016 output data.

SMPTE2016 Input Status / SMPTE2016 Output Line
The SMPTE2016 controls allow the user to monitor on which input line SMPTE2016 is detected, and to specify on which output line it is to be inserted.
Audio Processing Overview

Audio Processing Block Diagram
Audio Processing showing Control Panel Screens
SDI Demultiplexer
The audio channels are demultiplexed from the SDI signal as eight 2-channel pairs that are fed to the audio delay processor.

Note that embedded audio handling for HD is 24-bit synchronous 48 kHz to SMPTE 299M and SD is 20-bit synchronous 48 kHz to SMPTE 272M-A.

Audio Delay Processor
The Demultiplexed SDI is fed to eight separate delay blocks. Each block processes one audio pair (2 channels) at the same time, the delay time being the same for both channels.

The delay time may be set to Min (the delay will be 3 ms or 0.75 ms for data) or to a time set by one of two (A and B) Audio Delay Selectors plus Internal (if selected in addition). Internal will add an audio delay equal to the unit’s video delay.

The delay time set by each of these selectors is controlled by a combination of the following:

- Manual A delay set by the Manual Delay control will be applied.
- GPIO Input Pulse
  - The audio delay may be controlled by the width of a pulse on the GPI input.
- RollTrack
  - A delay set by external RollTrack commands will be applied.

Tone Generator
A tone generator provides the following signals to the channel router.

1kHz at 20dBFS
2kHz at 20dBFS
4kHz at 20dBFS
1kHz at 18dBFS
2kHz at 18dBFS
4kHz at 18dBFS

Note that the frequency and level of these signals is not adjustable.
Mixers 1 to 4
There are four separate 4-input, 1-output audio mixers available.

Each mixer has four inputs with individual gain controls that allow the mixing levels for each of the input signals, to be adjusted.

The inputs may be any of the following:

- Mute
- Disembed 1 to 8 Left/Right
- Tone Generator outputs
- Embeder ProcAmps

There are eight 2-channel ProcAmps that receive their inputs from the output of the channel router.

The two channels are processed as Left and Right with control of Gain, Inversion, Muting and a Stereo mode.

The outputs are configured as eight 2-channel signals in four groups and these are fed to the Multiplexer where they are embedded onto the SDI signal.

SDI TX
The embedded SDI signal is fed to two output amplifiers, each providing two SDI outputs.
**Emb(ed) Proc Amps Groups 1-2 and 3-4**

This allows the gain of the 16 embedded audio channels to be adjusted. It also allows for phase inversion and instant mute to be applied to any channel.

Note that these controls will not be available when the embedder is disabled.

Also they will not be available if a data source is embedded. This could be due to a data source being fed into the UDC or the source is marked as Data in the Embedded I/P Setup menu.

**Groups 1 to 4, Pairs 1 and 2**  
(Embed 1-8 L & R)  
This allows the channels to be controlled.

**Inv(ert)**  
When checked the signal polarity will be inverted.

**Mute**  
When checked the channel will be muted.

**Stereo**  
When checked the two channels of the pair will be linked together (configured as a stereo pair) and any adjustments made to one channel will automatically be applied to both channels. This allows rapid harmonious adjustment when audio pairs are carrying stereo signals.

**Gain Controls**  
The scrollbars allow the gain of the channel may be adjusted over a range of +12 to -36 dB in 0.1dB steps. Preset is to 0 dB.
Audio Mixer 1-4

The audio mixers can be used to create new, mixed audio feeds from the incoming audio channels. This is useful when, for example, stereo incoming feeds are required in mono or discrete surround sound feeds are required in stereo. Not only can the incoming feeds be mixed together but the exact balance can be set using the faders. This allows finer control over the resulting sound than a simple mono function. Additional applications include mixing together incoming background audio with local foreground audio such as adding commentary to a sports feed. The invert function can be applied to one of the channels being mixed to create a mix-minus channel for foldback.

A new name may be assigned to the mixers as shown opposite (Mixer 1 has been assigned the Name Sport).

To change the name, type the new text in the text area and then click S.

The new name (Sport in the example opposite) will replace the name in the mixer gain control section.

These names are used in the selection lists for the following functions:

- Monitoring Routing
- Embedded Routing

Selecting Preset (P) will return the text to the default text (Mixer 1, Mixer 2, Mixer 3 or Mixer 4).

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

Note that if Mute or one of the test tones is selected as the source (i.e. a fixed level signal source), the corresponding gain control will be grayed out and will not be adjustable.

Mixer 1, Mixer 2, Mixer 3 and Mixer 4
Each of the four mixers has four inputs with individual gain controls that allow the mixing levels for each of the input signals, to be adjusted.

The range of adjustment is from +12 dB to –36 dB in steps of 0.1 dB. Preset Is to 0.0 dB.

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

Clip Indicators
At the top of each fader the word Clip will appear briefly if the audio level reaches the 0 dBFS point, i.e. the digital limit. The fader level should be reduced to prevent this occurring.

If the output level of the mixer reaches the 0 dBFS point (due to the addition of the input signals) the word Clip will appear briefly above the four faders. The fader levels should be reduced to prevent this occurring.
Embedded Routing Groups 1-2 and 3-4

This allows the signal sources for the SDI embedder to be selected from the list. Mute and audio tones may also be selected. The channels can be selected individually for total control over the embedded audio.

Factory default routing is one-to-one e.g. Disembed 1-L to Embed 1-L, Disembed 1-R to Embed 1-R, etc.

**Link L+R**

When checked the selected source will be automatically paired with the corresponding left/right source and configured as a stereo pair.

**Notes**

A corresponding left/right source will be automatically chosen when available.

If a mixer output is selected as a source a different mixer output will be automatically chosen for the other left/right channel. Mixer 1 is paired with Mixer 2 and Mixer 3 is paired with Mixer 4.

If a tone is selected as the source the same tone will be automatically selected for the other left/right channel.

If the selected source is a data source or it has been configured as a data source in the Embedded I/P Setup menu the corresponding left/right source will automatically be chosen.
Audio Delays

The IQUDC00 has a very sophisticated delay control system that will solve almost any problem encountered in an operational environment. For best results it is important that this system be fully understood. Please refer to the Audio Delay Processing block diagram below.

Overview

There are 8 separate delay blocks. Each delay block processes a pair of PCM audio channels or one non-PCM data feed. The delay blocks can be controlled by one of two composite control feeds. Each control feed can be driven by a combination of both tracking and fixed delays. Tracking delays are those that can follow a variable timing value such as the delay through a video synchronizer.

Having two delay controls is a unique feature that allows audio to be timed to or synchronized with one of two separate timing planes. Options are having no audio delay, having all the audio delayed together, having some audio delayed and some not. Using both delay controls however (A for one and B for the other) they can even choose some audio pairs delayed by a different amount than others.

For each delay block then the delay can be derived from the following settings:

- **Min**: The delay time will be 3 ms or 0.75ms for data.
- **A**: The delay time for this audio pair is the value set by the Audio Delay Select-A control.
- **B**: The delay time for this audio pair is the value set by the Audio Delay Select-B control.
- **Internal**: An audio delay equal to the units video delay will be applied.

For the two audio delay controls (A and B) a combination of the following delay drivers are used to set the value of the delay:

- **Manual**: A delay set by the Manual Delay control will be applied.
- **GPIO Input**: The audio delay may be controlled by the width of a pulse on the GPI input.
- **RollTrack**: A delay set by external RollTrack commands will be applied.

More than one of these drivers can be enabled simultaneously. When multiple selections are made, the resulting delay is the sum of the values from all selected drivers.

Synchronizing Unevenly Distributed Embedded Audio in SD signals

In the unlikely event that samples in an embedded audio input signal are unevenly distributed within the video signal e.g., bunched near the beginning of the video field, with the rate converters active and the delay set to a low value (less than half a field, 10 ms for example), the audio could become distorted. In this case increasing the audio delay by up to 10 ms will remove the distortion.

Note that unevenly distributed samples could only occur in SD embedded audio signals; they cannot occur in HD signals.
The absolute limit for audio delay is 3ms to 2.5s (this will show up on the Total Delay figures). Though there are 2 control banks (and Min which forces minimum), each audio pair delay path is controlled individually in the hardware. These are associated with audio inputs. If the pair is selected as PCM (and not overridden by its Channel Status indication) it will have synchronization and tracking delay changes smoothly corrected while being speeded up or slowed down a small fraction. Following PCM delay changes will take some time (1 minute per 60 ms approximately). However, a Data pair cannot be filtered this way so delay errors caused by asynchronism and dropouts will accumulate. To prevent these delay errors continuing for long periods, a monitoring function is included. When the deviation in delay from the requested delay exceeds 400 ms on a PCM pair (80 ms on a Data pair) the delay channel is reset causing a loss of audio for the duration of the delay. Audio then recommences with the correct delay. This monitor will not be triggered by small changes such as synchronization frame drops/repeats, giving a smoother result. However, it may be forced by removing the input or switching to/from a large delay.

**Audio Delay Select-A/B**
This function allows two different delay times (A and B) to be set up from three sources that may then be applied to the delay processor block.

The three sources are:

- **Manual Delay**
  When checked the value of delay set by the user as the Manual Delay control will be applied. This has an adjustment range of 0 to 2000.00 ms (2 seconds) in 0.25 ms steps. The preset value is 0.00 ms.

- **RollTrack**
  RollTracks are signals sent between pieces of equipment so that they can work together in concert. For example two modules can exchange delay values through the RollTrack system. The delay used for the audio passing through this remultiplexer module could be set for example, by the delay through a video synchronizer.

  Delay values may be applied via RollTracks 14, 15, 16 and 17.

  Factory reset is to delay groups A and B with Internal and Manual (=0 ms) selected.

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

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

  Note that the GPI must be configured correctly for this function to operate. If set to Unused the delay will be zero. Please see page 42 for details.

- **Total Delay**
  This indicator shows the total delay value that the control (A or B) is currently set. Any delay block being controlled by that control (A or B) will be set to this value. It is a useful check that the right combination of delays has been applied. One of the useful features is being able to see whether tracking delays are changing their value.

- **Delay 1 to 8**
  This displays the controls for each of the 8 delay blocks.
  - **Min:** When checked the delay will be 3 ms or 0.75ms for data.
  - **A:** When checked the delay time value for the audio pair is set by the Audio Delay Select-A control.
  - **B:** When checked the delay time value for the audio pair is set by the Audio Delay Select-B control.

  Factory reset is All pairs selecting delay A.

  **Internal**
  When checked, an audio delay equal to the video delay will be applied.
Embed On/Off

This allows the embedding function to be turned on or off. In the normal operation, audio is de-embedded from the incoming HD-SDI or SD-SDI stream. A new set of 16 channels of audio are then embedded at the output of the module.

If the user has chosen to simply to pass the embedded audio from input to output, the channels are still extracted and embedded in this way.

There are three levels of control. The top level control sets whether any embedding will be performed or not. The second level controls embedding of an individual group. The third level controls each audio channel.

If the group is defined as inactive, then the individual channel selections for that group are disabled.

Embedded Audio

This control can be useful for testing when looking for technical issues with the system. In pass mode all the audio is left completely untouched by the module.

Off
When selected, no audio is embedded.

Embed
When checked, all activated audio groups and channels will be embedded onto the SDI video.

Factory reset is to all groups/channels enabled.

Group/Channel Active

This allows the embedding of four channels of the two pairs in each of the four groups to be activated or deactivated.

Group 1 to Group 4
This allows the selection of channels for embedding within a particular group.

Group 1 to 4 Active
When checked the group will embedded. When unchecked the group will not be embedded.

Pair 1 to 8 Left/Right Active
When an item is checked the channel becomes active and will be available for embedding. When unchecked the channel will not be available for embedding.

Factory reset is to Embed On and all groups/channels enabled.
Embedded I/P Setup

This allows the user to determine whether an input audio pair should be treated as PCM audio or non-PCM audio - data. It also allows the names of the disembedded audio inputs to be changed from the default names (Disembed 1-L etc.).

Embedded audio is a pair-based system. This means that they carry the sound as two channels and it is not possible to carry just one channel. Of course, the IQUDC00 can pass and process either channel as well as both. This is because the module is channel-based internally. When an embedded feed is used to carry non-PCM data then the whole data space is allocated to that function. In this mode the feed has to be treated together, it has to be treated as the equivalent of a pair. For example a non-PCM feed at the input will occupy the same space as two audio channels and must be passed to the output as two channels-worth of data.

This function allows the module to treat the feed as data and to keep all the data together.

If the user sets the type to data then the pair will be treated as a non-PCM data feed through the circuitry within the module. This mode also protects the feed from PCM audio-specific operations such as gain and tracking delay. It also ensures that the audio is routed as a pair.

Note that non-PCM sources are automatically treated as data sources, even when data isn't selected.

Data

When selected as data the corresponding stream is treated as a non-PCM signal. The module then protects this stream from processing that would damage the data. One stream is equivalent to two PCM audio channels so in this mode there are no operations that can split the data. This mode is suitable for processing Dolby E and Dolby AC3 (Dolby Digital) data.

Embedded Audio Input Names

In the example above Disembed 1-L has been changed to English and Disembed 1-R to French.

Disembed 2-L has been designated as a stereo signal, paired with Disembed 2-R and renamed as Music 1.

Note that when a channel has been designated as a stereo signal the corresponding left/right channel will not appear on the screen.

These names are used in the lists for the following functions:

- Audio Mixer routing
- Embedded Routing

Note that names are stored as part of the Memory function so that a new set of names can be recalled by a memory.
Embedded O/P Setup

This allows the names of the embedded audio outputs to be changed from the default names (Embed 1-L etc.) and be designated as a stereo pair.

Note that names are stored as part of the Memory function so that a new set of names can be recalled by a memory.

Embedded Audio Output Names
In the example opposite Embed 1-L has been changed to Dutch and Embed 1-R to German.

Embed 2-L has been designated as a stereo signal, paired with Embed 2-R and renamed as Song 1.

These names will appear in the Embed Proc Amps screen.

Stereo
This allows the left and right channels to be designated as a stereo pair.

Note that when a channel has been designated as a stereo signal the corresponding left/right channel will not appear on the screen.
**Genlock & Video Delay**

This screen is used to select the genlocking and delay functions of the synchronizer.

**Genlock**
This allows the genlock options to be selected.

**Lock to Reference**
When selected the unit will lock to an external black (burst) reference signal. In this mode the Reference Status item will display the amplitude of the reference sync signal.

A reference input of a frame rate different to the output (mismatched), will force an input fail condition, resulting in the selection of the default output.

<table>
<thead>
<tr>
<th>Reference locking output standard map</th>
<th>Reference</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SD Bi-level</td>
<td>HD Tri-level</td>
</tr>
<tr>
<td>625/50</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>525/59.94</td>
<td>✔️</td>
<td>✔️</td>
</tr>
</tbody>
</table>

**Lock to Ref (Input if fail)**
When selected the unit will lock to the incoming reference if present but if no reference is present it will lock to the input.

**Input – Manual H and V**
The unit locks to the input and the H & V sliders are enabled to adjust delay. (The ms slider disabled).

This allows the adjustment of the delay by changing the vertical and horizontal timing.

When a delay is required to be defined in terms of video lines, maybe to round up to the next frame boundary, this mode can be used. However, it may introduce complications on changes of video standard, and the minimum delay can go below the 0.75 ms audio minimum delay that would prevent delay matching.

**Vertical Timing**
This allows the vertical timing to be adjusted. The range of adjustment is 0 to (output standard lines per frame – 1) lines in steps of 1 line. The preset value is 0 lines.

**Horizontal Timing**
This allows the horizontal timing to be adjusted. The range of adjustment is 0 to (output standard pixels per line -1) pixels in steps of 1 pixel. The preset value is 0 pixels.

The total delay is the sum of Vertical Timing + Horizontal timing. The sum of horizontal and vertical timing is post-limited to be between 0 and 1 frame of the current standard.
**Input – Manual ms**

When selected the unit locks to the input and the ms slider is enabled to adjust delay. The range of control is 0 to output standard frame ms in steps of 0.01ms. The preset value is 0ms.

When a delay is required to be defined in terms of time, maybe to suit an audio or mixed interlace / progressive multi-standard environment, this mode can be used. When selected the Vertical and Horizontal controls will be unavailable (grayed out).

The total delay (in normal mode, not minimum delay mode) will be the sum of four interlaced fields or four progressive frames + scroll bar value.

Note that the Vertical and Horizontal Timing controls (even though they are grayed out) will report this value (numerically in lines and pixels) when this control is adjusted.

**Scaler**

**Minimum Delay**

When checked, the video path delay will be reduced to between two to three fields when locked to reference and two fields when locked to input (plus any H and V offset settings).

When Minimum Delay mode is selected, the output scaling will remain co-timed with the output widescreen signalling (WSS/VI/SMPTE2016), but changes will be one frame late relative to the input signalling/video.

This control is also present on the Picture Output menu, selecting it automatically selects the Sports setting on that menu.

**Internal Delay**

This displays the value of the current delay in milliseconds. This is useful to check that a suitable delay has been set.

This is the total delay through the unit and is made up of:

- The fixed scaler delay (4 interlaced fields/progressive frames in normal mode, 2 in low delay)
- The genlock control set by the user (h and V timing, or ms)
- Any offset between reference and input signalling timing, when genlock locked to ref.

**Dolby E Timing**

An indication of Dolby E header phasing at the outputs helps making corrections and avoids clicking or other corruption on downstream switching due to the 5% inter-frame guard band being misaligned with the video switch point.

Each of the 8 output embedded pairs (including passed input audio groups) may be selected for display & logging. It will report a line offset or indicate a missing Dolby E header (maybe indicating PCM audio).

**Audio Pair**

This control allows the selection of one of the eight embedded audio pairs (two for each of the 4 groups) for measurement. The number of the selected pair is numerically displayed.

**Relative Timing**

This will display the relative time delay (time of the embedded Dolby E reference with respect to its normal line position after the video frame switch point) in milliseconds (negative for late or higher line count).

An out of limit flag (Timing Error Flag) is also displayed.

**Timing Error flag**

- **NONE**: No Dolby E header found. This may be because the pair is PCM or muted.
- **OK**: Close to normal line.
- **Early or Late**: Shown when out of safe range (outside +150 / -1250 us in 25 Hz, +150 / -1000 us in 29.97 Hz rates).

**Ambiguity flag**

- **Frame?** When the output standard is 720P this indicates Dolby E packets straddle 2 frames so no correct phasing is possible.
- **Early or Late**: Shown when out of safe range (outside +150 / -1250 us in 25 Hz, +150 / -1000 us in 29.97 Hz rates).

**Line Number**

This will report the line number in which the Dolby E reference point is found.

**Dolby E Logging**

Dolby E position will be reported Early, Late or OK with the limits for each output standard as below:

<table>
<thead>
<tr>
<th>Standard</th>
<th>Switch Point</th>
<th>Early Line</th>
<th>Normal Line</th>
<th>Late Line</th>
</tr>
</thead>
<tbody>
<tr>
<td>625/25i</td>
<td>6</td>
<td>&lt;9</td>
<td>11</td>
<td>&gt;30</td>
</tr>
<tr>
<td>525/29.97i</td>
<td>10</td>
<td>&lt;12</td>
<td>14</td>
<td>&gt;29</td>
</tr>
<tr>
<td>1080/25i</td>
<td>7</td>
<td>&lt;15</td>
<td>19</td>
<td>&gt;54</td>
</tr>
<tr>
<td>1080/29.97i</td>
<td>7</td>
<td>&lt;17</td>
<td>22</td>
<td>&gt;55</td>
</tr>
<tr>
<td>720/50p</td>
<td>7</td>
<td>&lt;20</td>
<td>25</td>
<td>&gt;71</td>
</tr>
<tr>
<td>720/59.94p</td>
<td>7</td>
<td>&lt;23</td>
<td>29</td>
<td>&gt;73</td>
</tr>
</tbody>
</table>

Note that all HD standards use line 7 for the frame switching line. Unsupported frame rates are: 23.98, 24, 30, 60 in i or p or sf types.
GPIO (General Purpose Input Output)

This screen allows the GPI functions to be configured.

GPI/O 1 and GPI/O 2
This allows GPI to be configured in the following ways:

- **Unused**: GPI is inactive.
- **Input**: GPI is configured as an input.
- **Output**: GPI is configured as an output.

GPI 1 (Input) or GPI 2 (Input)
When the GPI is configured as an input, this item allows an action to be chosen that will occur when the GPI input is grounded or, if the Invert function is selected, becomes open.

Each of the following options is initial edge triggered. Once this has taken place, the option will be selected until some other process, or (where applicable) the returning edge, deems otherwise.

The options are as follows:

- **Freeze**
  The output picture will be frozen. When released (input open) the output picture will be unfrozen.

- **Pattern**
  The output picture will become the selected pattern. When released (input open) the output picture will revert to normal.

- **Black**
  The output picture will cut to black. When released (input open) the output picture will revert to normal.

- **MonoChrm Y Only**
  The output picture will become monochrome using only the Y component of the signal. When released (input open) the picture will revert to normal color.

- **MonoChrm CbCr Only**
  The output picture will become monochrome using only the CbCr components of the signal. When released (input open) the picture will revert to normal color.

- **Use I/P Ref (SDI)**
  When initiated, the unit will lock to the video input. When released (input open) this state will remain; i.e. it will not revert to the previous state.

- **Use Ext Ref (Analog)**
  When initiated, the unit will lock to the reference signal. When released (input open) this state will remain; i.e. it will not revert to the previous state.

Select Inp 1, Select Inp 2
Input 1 or Input 2 will be selected.

Select Input
This is a toggle function that selects between Input 1 (inactive) and Input 2 (active).

Select Backup
This will enable the Backup Rules function.

Memory 1 to 16
The unit will revert to the setup stored in the selected memory location. When released (input open) this state will remain; i.e. it will not revert to the previous state.

Notes

GPI Input Edge Switching Operation

With the exception of Memory Recalls 1-16 and reference actions the GPI input will switch on both edges, hence the switch to the inactive state will perform the reverse function. This may obviously override any other control operations performed while the GPI was active.
GPI 1 (Output) and GPI 2 (Output)

When the GPI is configured as an output, this item allows an action to be chosen that will produce an output signal at the GPI connector. The GPI output will be driven to ground or, if the Invert function is selected, becomes open.

The options are as follows:

Input 1 (or 2) OK
An output signal will be produced if the HD SDI input is present and OK.

Reference OK
An output signal will be produced if the reference signal is present and OK.

Freeze
An output signal will be produced when freeze is selected.

Pattern
An output signal will be produced when patterns are enabled.

Black
An output signal will be produced if the picture has become cut to black.

Monochrome
An output signal will be produced if the picture has become a monochrome picture.

GPIO Input Pulse Width Timer

The audio delay may be controlled by the width of a pulse on the GPI input.

Options are:

- Unused: The function is not active
- GPI-1: Function is active on GPI 1 port
- GPI-2: Function is active on GPI 2 port

Active High
- Checked: Delay time while input is high
- Unchecked: Delay time while input is low
Define Input OK and Backup Rules Overview

In this mode the Rules have not been enabled and inputs are selected directly.

X Backup Enable

To Processor

Input 1

To Processor

Input 2

X Input Select 1

Input Select 2

X OK when Present and

OK when Present and

Valid i/p Std
EDH/CRC is OK
Audio Pair 1 present
Audio Pair 2 present
Audio Pair 3 present
Audio Pair 4 present
Audio Pair 5 present
Audio Pair 6 present
Audio Pair 7 present
Audio Pair 8 present

In this mode the Rules have been enabled and in this example the switch will be activated by the following sequence of events:

Evaluate Rule 1
If Input 1 is in error for a time greater than the delay (i.e. does not comply with the defined conditions), select Input 2

Evaluate Rule 2
If Input 1 is OK for a time greater than the delay (i.e. complies with the defined conditions), select Input 1

Ignore Rules 3 to 5 as they are turned Off
Evaluate Rule 1
Evaluate Rule 2 etc.

Switch activated by first valid rule. Rules are evaluated in this order: 1, 2, 3, 4, and 5

Define Rule 1

Action
Input Select 1
X Input Select 2

Action

Off
Input 1 is OK
Input 2 is OK
Input 1 in Error
GPI 1 Open
GPI 1 Closed
GPI 2 Open
GPI 2 Closed

X OK when Present and

Valid i/p Std
EDH/CRC is OK
Audio Pair 1 present
Audio Pair 2 present
Audio Pair 3 present
Audio Pair 4 present
Audio Pair 5 present
Audio Pair 6 present
Audio Pair 7 present
Audio Pair 8 present

Define Rule 2

Action
Input Select 1
X Input Select 2

Action

Off
Input 1 is OK
Input 2 is OK
Input 1 in Error
GPI 1 Open
GPI 1 Closed
GPI 2 Open
GPI 2 Closed

Define Rule 3

Action
Input Select 1
X Input Select 2

Action

Off
Input 1 is OK
Input 2 is OK
Input 1 in Error
GPI 1 Open
GPI 1 Closed
GPI 2 Open
GPI 2 Closed

Define Rule 4

Action
Input Select 1
X Input Select 2

Action

Off
Input 1 is OK
Input 2 is OK
Input 1 in Error
GPI 1 Open
GPI 1 Closed
GPI 2 Open
GPI 2 Closed

Define Rule 5

Action
Input Select 1
X Input Select 2

Action

Off
Input 1 is OK
Input 2 is OK
Input 1 in Error
GPI 1 Open
GPI 1 Closed
GPI 2 Open
GPI 2 Closed
Define Input OK

This defines what is considered as Input 1 (and 2) is OK when Present and conforms to any of the parameters selected from the following list.

Valid i/p Standard
EDH/CRC is OK
Audio Pair 1 present
Audio Pair 2 present
Audio Pair 3 present
Audio Pair 4 present
Audio Pair 5 present
Audio Pair 6 present
Audio Pair 7 present
Audio Pair 8 present

Backup Rules 1-3 and 4-5

Define Rule 1-3 and 4-5

This defines what action is taken when a chosen event occurs.

Action
Either Select Input 1 or Select Input 2 may be chosen as the action taken when an event chosen from the following list, occurs.

Off (function is not available)
Input 1 is OK
Input 2 is OK
Input 1 in Error
Input 2 in Error
GPI 1 Open
GPI 1 Closed
GPI 2 Open
GPI 2 Closed

Time Delay
For each rule it is possible to set a time delay. This is the length of time that the rule must be evaluated as true for before activating the action. If the rule is evaluated as false before the set time expires the action will be prevented and the time reset.

In the example opposite Input 1 will be selected if the rule is evaluated as true (i.e. GPI 1 has become open) for over 5.1 seconds.

Each rule is evaluated in turn with Rule 1 taking the highest priority. If the rule is evaluated as true then the selected action will take place – the actions available are to Select Input 1 or Select Input 2.
### RollTrack

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

#### Disable All

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

#### Index

This item allows up to 16 RollTrack outputs to be setup.

#### Source

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

Options are:
- Unused AFD - Coded Frame
- Video Delay AFD - 4:3
- Input Present AFD - 16:9
- Input Loss AFD - 14:9
- Reference OK AFD - 4:3 SP 14:9
- Reference Lost AFD - 16:9 SP 14:9
- O/p Freeze AFD - 16:9 SP 4:3
- O/p UnFreeze AFD - box 16:9 top
- GPI 1 High AFD - box 14:9 top
- GPI 1 Low AFD - box>16:9 ctr
- GPI 1 InActive 4:3 - Coded Frame
- GPI 2 High 4:3 - 4:3
- GPI 2 Low 4:3 - 16:9
- GPI 2 InActive 4:3 - 14:9
- De-embed 1 Present 4:3 - 4:3 SP 14:9
- De-embed 1 Lost 4:3 - 16:9 SP 14:9
- De-embed 2 Present 4:3 - 16:9 SP 4:3
- De-embed 2 Lost 4:3 - box 16:9 top
- De-embed 3 Present 4:3 - box 14:9 top
- De-embed 3 Lost 4:3 - box>16:9 ctr
- De-embed 4 Present 4:3 - Unknown
- De-embed 4 Lost 16:9 - Coded Frame
- De-embed 5 Present 16:9 - 4:3
- De-embed 5 Lost 16:9 - 16:9
- De-embed 6 Present 16:9 - 14:9
- De-embed 6 Lost 16:9 - 4:3 SP 14:9
- De-embed 7 Present 16:9 - 16:9 SP 14:9
- De-embed 7 Lost 16:9 - 16:9 SP 4:3
- De-embed 8 Present 16:9 - box 16:9 top
- De-embed 8 Lost 16:9 - box 14:9 top
- Input Std - 525 16:9 - box>16:9 ctr
- Input Std - 625 16:9 - Unknown
- Input Std - 720/59
- Input Std - 720/50
- Input Std - 1080/29
- Input Std - 1080/25
- Input 4:3
- Input 16:9

---

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

#### Address

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

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

(Preset) returns to the default destination

The full RollTrack address has four sets of numbers

For example: 0000:10:01*99

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 (99) is the unit ID

Each RollCall unit has a unique identification embedded in the units' software. In this example 99 represents an IQBAXR, 142 would represent an IQDAMDD, 255 a TBS100D etc. Inserting this number in the RollTrack address ensures that only the correct type of unit (in this example an IQBAXR) will respond to the RollTrack command; any other unit will ignore the command.

If this number was set to 00 any type of unit at this location would respond to the RollTrack command, possibly causing unpredictable results.
Command
The full RollTrack command has two sets of numbers

For example: 84:156

The first set (84) is the RollTrack command number

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

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

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

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

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

This may show:
- OK: RollTrack message sent and received OK.
- Unknown: Rolltrack message has been sent but it has not yet completed.
- Timeout: RollTrack message sent but acknowledgement not received. This could be because the destination unit is not at the location specified.
- Bad: RollTrack message has not been correctly acknowledged at the destination unit. This could be because the destination unit is not of the type specified.
- Disabled: RollTrack sending is disabled.
Memory

This function allows a number of particular setups of the unit to be saved and recalled. There are 16 memory locations available.

The user memory function does not include display memories. For information about display memory, see page 24.

Recall Memory
This function allows the settings saved at a memory location to be recalled.

To recall the settings select a memory location (text is highlighted, Memory 5 in the example opposite) and the new settings will be applied.

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

To save the settings select a memory location (text is highlighted, Memory 7 in the example opposite) and click on the Save button.

Save Memory Name
To change the memory name, type the new name in the text area and click S.

Selecting Preset (P) will return the text to the default name.
Logging

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

**Video Input Logging**

This allows the status of the Video inputs to be logged.

**In(put)1 Aud(io) Type Logging**

This allows the type of Audio embedded on input1 to be logged.

**In(put)1 Aud(io) State Logging**

This allows the status of Audio embedded on input1 to be logged.

**In(put)2 Aud(io) Type Logging**

This allows the type of Audio embedded on input 2 to be logged.
**In(put)2 Aud(io) State Logging**

This allows the status of Audio embedded on input 2 to be logged.

**WideScreen Logging**

This allows the widescreen parameters of the inputs and outputs to be logged.

**Ref/Output Logging**

This allows the status of the reference and the video output signal to be logged.

**O/P Aud(io) Type Logging**

This allows the type of the Audio embedded on the output to be logged.
Output Audio State Logging

This allows the status of the audio embedded on the output to be logged.

Misc Logging

Various items of information may be logged using this screen.

O/P Audio Level Logging

This allows the level of the Audio output to be logged.

O/P Dolby-E Logging

This allows Dolby-E
# ROLLCALL LOG FIELDS

<table>
<thead>
<tr>
<th>Log Field</th>
<th>Type</th>
<th>Log Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>INPUT_1_TYPE</td>
<td>FIXED</td>
<td>HD SDI</td>
</tr>
<tr>
<td>INPUT_1_STATE</td>
<td>ENUM</td>
<td>FAIL:Lost, OK, FAIL:Error</td>
</tr>
<tr>
<td>INPUT_1_STANDARD</td>
<td>STRING</td>
<td></td>
</tr>
<tr>
<td>INPUT_1_SDI_ERRS</td>
<td>ENUM</td>
<td>NONE, OK, WARN</td>
</tr>
<tr>
<td>INPUT_1_SDI_ERRSEC</td>
<td>NUM</td>
<td></td>
</tr>
<tr>
<td>INPUT_1_SDI_ANC_ERRS</td>
<td>ENUM</td>
<td>NONE, OK, WARN</td>
</tr>
<tr>
<td>INPUT_1_EMBEDDED_AUDIO_1_TYPE</td>
<td>ENUM</td>
<td>PCM, NONPCM, Unknown, WARN: No Input</td>
</tr>
<tr>
<td>INPUT_1_EMBEDDED_AUDIO_2_TYPE</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>INPUT_1_EMBEDDED_AUDIO_3_TYPE</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>INPUT_1_EMBEDDED_AUDIO_4_TYPE</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>INPUT_1_EMBEDDED_AUDIO_5_TYPE</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>INPUT_1_EMBEDDED_AUDIO_6_TYPE</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>INPUT_1_EMBEDDED_AUDIO_7_TYPE</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>INPUT_1_EMBEDDED_AUDIO_8_TYPE</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>INPUT_1_EMBEDDED_AUDIO_1_STATE</td>
<td>ENUM</td>
<td>FAIL:Lost, OK, LOST, Unknown</td>
</tr>
<tr>
<td>INPUT_1_EMBEDDED_AUDIO_2_STATE</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>INPUT_1_EMBEDDED_AUDIO_3_STATE</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>INPUT_1_EMBEDDED_AUDIO_4_STATE</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>INPUT_1_EMBEDDED_AUDIO_5_STATE</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>INPUT_1_EMBEDDED_AUDIO_6_STATE</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>INPUT_1_EMBEDDED_AUDIO_7_STATE</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>INPUT_1_EMBEDDED_AUDIO_8_STATE</td>
<td>ENUM</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Log Field</th>
<th>Type</th>
<th>Log Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>INPUT_2_TYPE</td>
<td>FIXED</td>
<td>HD SDI</td>
</tr>
<tr>
<td>INPUT_2_STATE</td>
<td>ENUM</td>
<td>FAIL:Lost, OK, FAIL:Error</td>
</tr>
<tr>
<td>INPUT_2_STANDARD</td>
<td>STRING</td>
<td></td>
</tr>
<tr>
<td>INPUT_2_SDI_ERRS</td>
<td>ENUM</td>
<td>NONE, OK, WARN</td>
</tr>
<tr>
<td>INPUT_2_SDI_ERRSEC</td>
<td>NUM</td>
<td></td>
</tr>
<tr>
<td>INPUT_2_SDI_ANC_ERRS</td>
<td>ENUM</td>
<td>NONE, OK, WARN</td>
</tr>
<tr>
<td>INPUT_2_EMBEDDED_AUDIO_1_TYPE</td>
<td>ENUM</td>
<td>PCM, NONPCM, Unknown, WARN: No Input</td>
</tr>
<tr>
<td>INPUT_2_EMBEDDED_AUDIO_2_TYPE</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>INPUT_2_EMBEDDED_AUDIO_3_TYPE</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>INPUT_2_EMBEDDED_AUDIO_4_TYPE</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>INPUT_2_EMBEDDED_AUDIO_5_TYPE</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>INPUT_2_EMBEDDED_AUDIO_6_TYPE</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>INPUT_2_EMBEDDED_AUDIO_7_TYPE</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>INPUT_2_EMBEDDED_AUDIO_8_TYPE</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>INPUT_2_EMBEDDED_AUDIO_1_STATE</td>
<td>ENUM</td>
<td>FAIL:Lost, OK, LOST, Unknown</td>
</tr>
<tr>
<td>INPUT_2_EMBEDDED_AUDIO_2_STATE</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>INPUT_2_EMBEDDED_AUDIO_3_STATE</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>INPUT_2_EMBEDDED_AUDIO_4_STATE</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>INPUT_2_EMBEDDED_AUDIO_5_STATE</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>INPUT_2_EMBEDDED_AUDIO_6_STATE</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>INPUT_2_EMBEDDED_AUDIO_7_STATE</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>INPUT_2_EMBEDDED_AUDIO_8_STATE</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>Log Field</td>
<td>Type</td>
<td>Log Value</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>-------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td>INPUT_2_EMBEDDED_AUDIO_1_TYPE</td>
<td>ENUM</td>
<td>PCM, NONPCM, Unknown, WARN: No Input</td>
</tr>
<tr>
<td>INPUT_2_EMBEDDED_AUDIO_2_TYPE</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>INPUT_2_EMBEDDED_AUDIO_3_TYPE</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>INPUT_2_EMBEDDED_AUDIO_4_TYPE</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>INPUT_2_EMBEDDED_AUDIO_5_TYPE</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>INPUT_2_EMBEDDED_AUDIO_6_TYPE</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>INPUT_2_EMBEDDED_AUDIO_7_TYPE</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>INPUT_2_EMBEDDED_AUDIO_8_TYPE</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>OUTPUT_1_EMBEDDED_AUDIO_1_STAT</td>
<td>ENUM</td>
<td>FAIL: Lost, OK, LOST, Unknown</td>
</tr>
<tr>
<td>OUTPUT_1_EMBEDDED_AUDIO_2_STAT</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>OUTPUT_1_EMBEDDED_AUDIO_3_STAT</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>OUTPUT_1_EMBEDDED_AUDIO_4_STAT</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>OUTPUT_1_EMBEDDED_AUDIO_5_STAT</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>OUTPUT_1_EMBEDDED_AUDIO_6_STAT</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>OUTPUT_1_EMBEDDED_AUDIO_7_STAT</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>OUTPUT_1_EMBEDDED_AUDIO_8_STAT</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>OUTPUT_1_EMBEDDED_AUDIO_1_TYPE</td>
<td>ENUM</td>
<td>PCM, NONPCM, Unknown, WARN: No Input</td>
</tr>
<tr>
<td>OUTPUT_1_EMBEDDED_AUDIO_2_TYPE</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>OUTPUT_1_EMBEDDED_AUDIO_3_TYPE</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>OUTPUT_1_EMBEDDED_AUDIO_4_TYPE</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>OUTPUT_1_EMBEDDED_AUDIO_5_TYPE</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>OUTPUT_1_EMBEDDED_AUDIO_6_TYPE</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>OUTPUT_1_EMBEDDED_AUDIO_7_TYPE</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>OUTPUT_1_EMBEDDED_AUDIO_8_TYPE</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>OUTPUT_1_EMBEDDED_AUDIO_1_1_LEVEL</td>
<td>ENUM</td>
<td>WARN: Silent, WARN: Quiet, OK, WARN: Loud, WARN: Overflow</td>
</tr>
<tr>
<td>OUTPUT_1_EMBEDDED_AUDIO_1_2_LEVEL</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>OUTPUT_1_EMBEDDED_AUDIO_2_1_LEVEL</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>OUTPUT_1_EMBEDDED_AUDIO_2_2_LEVEL</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>OUTPUT_1_EMBEDDED_AUDIO_3_1_LEVEL</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>OUTPUT_1_EMBEDDED_AUDIO_3_2_LEVEL</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>OUTPUT_1_EMBEDDED_AUDIO_4_1_LEVEL</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>OUTPUT_1_EMBEDDED_AUDIO_4_2_LEVEL</td>
<td>ENUM</td>
<td></td>
</tr>
<tr>
<td>Log Field</td>
<td>Type</td>
<td>Log Value</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td>---------------</td>
<td>------------------------------------------------</td>
</tr>
<tr>
<td>OUTPUT_1_EMBEDDED_AUDIO_5_1_LEVEL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OUTPUT_1_EMBEDDED_AUDIO_5_2_LEVEL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OUTPUT_1_EMBEDDED_AUDIO_6_1_LEVEL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OUTPUT_1_EMBEDDED_AUDIO_6_2_LEVEL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OUTPUT_1_EMBEDDED_AUDIO_7_1_LEVEL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OUTPUT_1_EMBEDDED_AUDIO_7_2_LEVEL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OUTPUT_1_EMBEDDED_AUDIO_8_1_LEVEL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OUTPUT_1_EMBEDDED_AUDIO_8_2_LEVEL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OUTPUT_1_STATE</td>
<td>FIXED</td>
<td>OK</td>
</tr>
<tr>
<td>OUTPUT_1_TYPE</td>
<td>FIXED</td>
<td>HD SDI</td>
</tr>
<tr>
<td>OUTPUT_1_STANDARD</td>
<td>STRING</td>
<td></td>
</tr>
<tr>
<td>OUTPUT_1</td>
<td>STRING</td>
<td></td>
</tr>
<tr>
<td>REFERENCE_1_TYPE</td>
<td>FIXED</td>
<td>Tri Level</td>
</tr>
<tr>
<td>REFERENCE_1_STATE</td>
<td>ENUM</td>
<td>FAIL:Lost, OK, FAIL:Error</td>
</tr>
<tr>
<td>REFERENCE_1_STANDARD</td>
<td>STRING</td>
<td></td>
</tr>
<tr>
<td>SN</td>
<td>STRING</td>
<td></td>
</tr>
<tr>
<td>OS_VERSION</td>
<td>STRING</td>
<td></td>
</tr>
<tr>
<td>BUILD_NUMBER</td>
<td>STRING</td>
<td></td>
</tr>
<tr>
<td>HARDWARE_VERSION</td>
<td>STRING</td>
<td></td>
</tr>
<tr>
<td>FIRMWARE_VERSION</td>
<td>STRING</td>
<td></td>
</tr>
<tr>
<td>UPTIME</td>
<td>STRING</td>
<td></td>
</tr>
<tr>
<td>INPUT_1_WSS</td>
<td>NONE</td>
<td>No signaling detected. Error found in signaling. Valid signaling</td>
</tr>
<tr>
<td>INPUT_2_WSS</td>
<td>WARN</td>
<td></td>
</tr>
<tr>
<td>INPUT_1_VI</td>
<td>NONE</td>
<td>No signaling detected. Valid signaling.</td>
</tr>
<tr>
<td>INPUT_2_VI</td>
<td>OK</td>
<td></td>
</tr>
<tr>
<td>INPUT_ASPECT</td>
<td>4/3 16/9</td>
<td>4:3 coded aspect ratio 16:9 coded aspect ratio</td>
</tr>
<tr>
<td>INPUT_AFD</td>
<td>Coded Frame</td>
<td>Coded Frame active format. 4:3 centre active format. 16:9 centre active format. 4:3 shoot-and-protect 14:9 active format. 16:9 shoot-and-protect 14:9 active format. 16:9 shoot-and-protect 4:3 active format. Box 16:9 top active format.</td>
</tr>
<tr>
<td></td>
<td>4/3 16/9 14/9</td>
<td>4:3 centre active format. 14:9 centre active format. 4:3 shoot-and-protect 14:9 active format. 16:9 shoot-and-protect 14:9 active format. 16:9 shoot-and-protect 4:3 active format. Box 16:9 top active format.</td>
</tr>
<tr>
<td></td>
<td>4/3 16/9 14/9</td>
<td>4:3 centre active format. 14:9 centre active format. 4:3 shoot-and-protect 14:9 active format. 16:9 shoot-and-protect 14:9 active format. 16:9 shoot-and-protect 4:3 active format. Box 16:9 top active format.</td>
</tr>
<tr>
<td>Log Field</td>
<td>Type</td>
<td>Log Value</td>
</tr>
<tr>
<td>--------------------</td>
<td>---------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>Box &gt;16/9 ctr</td>
<td>Box &gt;16:9 centre active format.</td>
</tr>
<tr>
<td></td>
<td>Unknown</td>
<td>Unknown active format.</td>
</tr>
<tr>
<td>OUTPUT_ASPECT</td>
<td>4/3</td>
<td>4:3 coded aspect ratio</td>
</tr>
<tr>
<td></td>
<td>16/9</td>
<td>16:9 coded aspect ratio</td>
</tr>
<tr>
<td>OUTPUT_AFD</td>
<td>Coded Frame</td>
<td>Coded Frame active format.</td>
</tr>
<tr>
<td></td>
<td>4/3</td>
<td>4:3 centre active format.</td>
</tr>
<tr>
<td></td>
<td>16/9</td>
<td>16:9 centre active format.</td>
</tr>
<tr>
<td></td>
<td>14/9</td>
<td>14:9 centre active format.</td>
</tr>
<tr>
<td></td>
<td>4/3 SP 14/9</td>
<td>4:3 shoot-and-protect 14:9 active format.</td>
</tr>
<tr>
<td></td>
<td>16/9 SP 14/9</td>
<td>16:9 shoot-and-protect 14:9 active format.</td>
</tr>
<tr>
<td></td>
<td>16/9 SP 4/3</td>
<td>16:9 shoot-and-protect 4:3 active format.</td>
</tr>
<tr>
<td></td>
<td>Box 16/9 top</td>
<td>Box 16:9 top active format.</td>
</tr>
<tr>
<td></td>
<td>Box 14/9 top</td>
<td>Box 14:9 top active format.</td>
</tr>
<tr>
<td></td>
<td>Box &gt;16/9 ctr</td>
<td>Box &gt;16:9 centre active format.</td>
</tr>
<tr>
<td></td>
<td>Unknown</td>
<td>Unknown active format.</td>
</tr>
</tbody>
</table>
Setup
This screen provides basic information about the module.

Product
This will show the name of the module.

Serial
This item shows the serial number of the module.

Software Version
This item shows the version of software installed in the module.

Build
This will indicate the factory build number of the software installed and is for identification purposes.

KOS
This shows the version of the KOS operating system that is installed.

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

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

PCB
This shows the PCB revision number.

MIO, MV, MH
These are FPGA firmware version numbers.
Information Window
This allows the type of information to be selected for display in the Unit Status area.

Video, Wide Screen Signal or Audio Status may be selected.

**Video Status**

**Line 1**
This shows the status of the video input followed by the standard of the input or the last valid signal.

It may show:

- **INP:OK** The unit is receiving a valid input signal of a recognized standard
- **INP:LOST** The unit has lost a valid input signal
- **INP:FAIL** The unit is receiving an invalid input signal

**Line 2**
This shows the operating standard of the unit.

It may show:

- **OUT:1080/25i** The operating standard
- **REF:OK-F 1080/29i** Free run
- **REF: LOCK 1080/25i** Valid reference and unit genlocked.
- **REF: LCK-F** Valid reference but ambiguous field type
- **REF: LOST** No reference signal found
- **REF: FAIL** Genlock not possible.
- **REF: FAIL INP** Failed to Genlock to Input
- **REF: LOCK INP** Genlocked to Input Video

**Line 3**
This shows the status of the Genlock selection.

This will toggle between showing the standard of the connected analog reference signal (when not in Input Video lock mode) and the status of the reference signal.

- **REF:OK** The unit is receiving a valid reference signal
- **REF: LOST** No reference signal found
- **REF: FAIL** Genlock not possible.
- **REF: FAIL INP** Failed to Genlock to Input
- **REF: LOCK INP** Genlocked to Input Video

**Line 4**
This will give abbreviated information about the status of the unit. It may show:

- **FRZ** The unit is in freeze mode
- **MON** The unit is in monochrome mode
- **PAT** The output signal is a pattern
- **ANC** Ancillary data is passed and operating normally
- **BLK** The output signal is black
**Metadata Status**

This will show the Wide Screen characteristics of the input and output signals

**Line 1**

This indicates the presence of signalling, timecode, or closed caption metadata in the input.

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>Indicates SMPTE2016 signalling data.</td>
</tr>
<tr>
<td>WSS</td>
<td>Indicates WSS signalling data.</td>
</tr>
<tr>
<td>VI</td>
<td>Indicates VI signalling data.</td>
</tr>
<tr>
<td>ATC</td>
<td>Indicates ATC timecode data.</td>
</tr>
<tr>
<td>VITC</td>
<td>Indicates VITC timecode data.</td>
</tr>
<tr>
<td>OP47</td>
<td>Indicates OP47 closed caption data.</td>
</tr>
<tr>
<td>608</td>
<td>Indicates CC608 closed caption data.</td>
</tr>
<tr>
<td>708</td>
<td>Indicates CC708 closed caption data.</td>
</tr>
</tbody>
</table>

**Line 2**

The first set of figures (4:3) shows the input aspect ratio. The second set (4:3 SP 14:9) describes the input picture format. Note that if all items in the **Input Wide Screen Signal** control are unchecked the second set of figures will show <Disabled> as in the screen opposite.

**Line 3**

This indicates the presence of signalling, timecode, or closed caption metadata in the output.

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>Indicates SMPTE2016 signalling data.</td>
</tr>
<tr>
<td>WSS</td>
<td>Indicates WSS signalling data.</td>
</tr>
<tr>
<td>VI</td>
<td>Indicates VI signalling data.</td>
</tr>
<tr>
<td>ATC</td>
<td>Indicates ATC timecode data.</td>
</tr>
<tr>
<td>VITC</td>
<td>Indicates VITC timecode data.</td>
</tr>
<tr>
<td>OP47</td>
<td>Indicates OP47 closed caption data.</td>
</tr>
<tr>
<td>608</td>
<td>Indicates CC608 closed caption data.</td>
</tr>
<tr>
<td>708</td>
<td>Indicates CC708 closed caption data.</td>
</tr>
</tbody>
</table>

**Line 4**

The first set of figures (16:9) shows the output aspect ratio. The second set (4:3 SP 14:9) describes the output picture format. Note that if all items in the **Output Interface** control are unchecked the second set of figures will show <Disabled>> as in the screen opposite.

**Audio Status**

Lines 2 and 3

This shows the status of the embedded audio input.

**Line 3**

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

**Where:**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>Indicates the channel is a PCM input.</td>
</tr>
<tr>
<td>_</td>
<td>Indicates that no input is detected.</td>
</tr>
<tr>
<td>D</td>
<td>Indicates that the signal is data (non-pcm, Dolby etc.)</td>
</tr>
</tbody>
</table>
Diagnostics

This function allows various self-tests to be carried out.

Warning: Running these tests WILL affect the video output signal.

All Tests
This mode has no function at this operating level.

Loop Count
This will display the number of loop tests that have been completed.

STOP TESTS
When selected, all tests will end.

Diagnostic tests
This allows particular tests to be selected and run either as a single test (Run Test) or continuously in a loop (Loop Test).

Note that only one test may run at a time. When running a particular test the other test selections will be grayed out and cannot be selected.

The number of errors will be shown in the adjacent Errors box.

GPI/O Test
This will test the GPIO input/output path when connected together.

Video Memory Test
This will test the video memory.

SDI o/p i/p tests
This will test the input/output path when connected together.

Sample Rate Converter Test
This will show that the Sample Rate Converter is connected and working.

LVDS interface test
This will test the LVDS (Low Voltage Differential Signaling) data communication connection between the two cards.

Current Test
This will show the name of the current test.

Last Error
This will show the last error found.
Operation from an Active Control Panel

The module can be operated from an active control panel via the RollCall™ network.
All operational parameters and selections described in the previous section are made using a system of menus displayed in the two LCD windows – the Information window and the Control window.

Information Window
The information window contains text indicating the current state of the unit.

Control Window
The Control window displays all selection menus and sub-menus.
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.
## IQUDC00 RollCall Commands

### Supervisor Level

<table>
<thead>
<tr>
<th>Command Name</th>
<th>Command No.</th>
<th>Hex</th>
<th>Dec</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>User Memories</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_AUDIO_EMBED</td>
<td>9236</td>
<td>37430</td>
<td></td>
<td>Enable audio embedding on output</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Default=1 Off=0 Embed=1</td>
</tr>
<tr>
<td>COM_AUDIO_GAIN_GRP1_PAIR_1L</td>
<td>91c8</td>
<td>37320</td>
<td></td>
<td>Embedded audio gain</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Default=0 Min=-360 Max=120 Divisor=10</td>
</tr>
<tr>
<td>COM_AUDIO_GAIN_GRP1_PAIR_1R</td>
<td>91c9</td>
<td>37321</td>
<td></td>
<td>Embedded audio gain</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Default=0 Min=-360 Max=120 Divisor=10</td>
</tr>
<tr>
<td>COM_AUDIO_GAIN_GRP1_PAIR_2L</td>
<td>91ca</td>
<td>37322</td>
<td></td>
<td>Embedded audio gain</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Default=0 Min=-360 Max=120 Divisor=10</td>
</tr>
<tr>
<td>COM_AUDIO_GAIN_GRP1_PAIR_2R</td>
<td>91cb</td>
<td>37323</td>
<td></td>
<td>Embedded audio gain</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Default=0 Min=-360 Max=120 Divisor=10</td>
</tr>
<tr>
<td>COM_AUDIO_GAIN_GRP2_PAIR_1L</td>
<td>91cc</td>
<td>37324</td>
<td></td>
<td>Embedded audio gain</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Default=0 Min=-360 Max=120 Divisor=10</td>
</tr>
<tr>
<td>COM_AUDIO_GAIN_GRP2_PAIR_1R</td>
<td>91cd</td>
<td>37325</td>
<td></td>
<td>Embedded audio gain</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Default=0 Min=-360 Max=120 Divisor=10</td>
</tr>
<tr>
<td>COM_AUDIO_GAIN_GRP2_PAIR_2L</td>
<td>91ce</td>
<td>37326</td>
<td></td>
<td>Embedded audio gain</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Default=0 Min=-360 Max=120 Divisor=10</td>
</tr>
<tr>
<td>COM_AUDIO_GAIN_GRP2_PAIR_2R</td>
<td>91cf</td>
<td>37327</td>
<td></td>
<td>Embedded audio gain</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Default=0 Min=-360 Max=120 Divisor=10</td>
</tr>
<tr>
<td>COM_AUDIO_GAIN_GRP3_PAIR_1L</td>
<td>91d0</td>
<td>37328</td>
<td></td>
<td>Embedded audio gain</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Default=0 Min=-360 Max=120 Divisor=10</td>
</tr>
<tr>
<td>COM_AUDIO_GAIN_GRP3_PAIR_1R</td>
<td>91d1</td>
<td>37329</td>
<td></td>
<td>Embedded audio gain</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Default=0 Min=-360 Max=120 Divisor=10</td>
</tr>
<tr>
<td>COM_AUDIO_GAIN_GRP3_PAIR_2L</td>
<td>91d2</td>
<td>37330</td>
<td></td>
<td>Embedded audio gain</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Default=0 Min=-360 Max=120 Divisor=10</td>
</tr>
<tr>
<td>COM_AUDIO_GAIN_GRP3_PAIR_2R</td>
<td>91d3</td>
<td>37331</td>
<td></td>
<td>Embedded audio gain</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Default=0 Min=-360 Max=120 Divisor=10</td>
</tr>
<tr>
<td>COM_AUDIO_GAIN_GRP4_PAIR_1L</td>
<td>91d4</td>
<td>37332</td>
<td></td>
<td>Embedded audio gain</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Default=0 Min=-360 Max=120 Divisor=10</td>
</tr>
<tr>
<td>COM_AUDIO_GAIN_GRP4_PAIR_1R</td>
<td>91d5</td>
<td>37333</td>
<td></td>
<td>Embedded audio gain</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Default=0 Min=-360 Max=120 Divisor=10</td>
</tr>
<tr>
<td>COM_AUDIO_GAIN_GRP4_PAIR_2L</td>
<td>91d6</td>
<td>37334</td>
<td></td>
<td>Embedded audio gain</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Default=0 Min=-360 Max=120 Divisor=10</td>
</tr>
<tr>
<td>COM_AUDIO_GAIN_GRP4_PAIR_2R</td>
<td>91d7</td>
<td>37335</td>
<td></td>
<td>Embedded audio gain</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Default=0 Min=-360 Max=120 Divisor=10</td>
</tr>
<tr>
<td>COM_AUDIO_LINK_GRP1_PAIR_1</td>
<td>9204</td>
<td>37380</td>
<td></td>
<td>Embedded audio stereo link gain controls</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Default=0</td>
</tr>
<tr>
<td>COM_AUDIO_LINK_GRP1_PAIR_2</td>
<td>9205</td>
<td>37381</td>
<td></td>
<td>Embedded audio stereo link gain controls</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Default=0</td>
</tr>
<tr>
<td>COM_AUDIO_LINK_GRP2_PAIR_1</td>
<td>9206</td>
<td>37382</td>
<td></td>
<td>Embedded audio stereo link gain controls</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Default=0</td>
</tr>
<tr>
<td>COM_AUDIO_LINK_GRP2_PAIR_2</td>
<td>9207</td>
<td>37383</td>
<td></td>
<td>Embedded audio stereo link gain controls</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Default=0</td>
</tr>
<tr>
<td>COM_AUDIO_LINK_GRP3_PAIR_1</td>
<td>9208</td>
<td>37384</td>
<td></td>
<td>Embedded audio stereo link gain controls</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Default=0</td>
</tr>
<tr>
<td>COM_AUDIO_LINK_GRP3_PAIR_2</td>
<td>9209</td>
<td>37385</td>
<td></td>
<td>Embedded audio stereo link gain controls</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Default=0</td>
</tr>
<tr>
<td>COM_AUDIO_LINK_GRP4_PAIR_1</td>
<td>920a</td>
<td>37386</td>
<td></td>
<td>Embedded audio stereo link gain controls</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Default=0</td>
</tr>
<tr>
<td>COM_AUDIO_LINK_GRP4_PAIR_2</td>
<td>920b</td>
<td>37387</td>
<td></td>
<td>Embedded audio stereo link gain controls</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Default=0</td>
</tr>
<tr>
<td>COM_AUDIO_MUTE_GRP1_PAIR_1L</td>
<td>91dc</td>
<td>37340</td>
<td></td>
<td>Embedded audio mute</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Default=0</td>
</tr>
<tr>
<td>Configuration</td>
<td>Value</td>
<td>Description</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------</td>
<td>-------</td>
<td>-------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_AUDIO_MUTE_GRP1_PAIR_1R 91dd</td>
<td>37341 Embedded audio mute</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_AUDIO_MUTE_GRP1_PAIR_2L 91de</td>
<td>37342 Embedded audio mute</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_AUDIO_MUTE_GRP1_PAIR_2R 91df</td>
<td>37343 Embedded audio mute</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_AUDIO_MUTE_GRP2_PAIR_1L 91e0</td>
<td>37344 Embedded audio mute</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_AUDIO_MUTE_GRP2_PAIR_1R 91e1</td>
<td>37345 Embedded audio mute</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_AUDIO_MUTE_GRP2_PAIR_2L 91e2</td>
<td>37346 Embedded audio mute</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_AUDIO_MUTE_GRP2_PAIR_2R 91e3</td>
<td>37347 Embedded audio mute</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_AUDIO_MUTE_GRP3_PAIR_1L 91e4</td>
<td>37348 Embedded audio mute</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Property</td>
<td>Code</td>
<td>Description</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------------</td>
<td>--------</td>
<td>-----------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_AUDIO_MUTE_GRP3_PAIreon 1R</td>
<td>91e5</td>
<td>Embedded audio mute</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_AUDIO_MUTE_GRP3_PAIreon 2L</td>
<td>91e6</td>
<td>Embedded audio mute</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_AUDIO_MUTE_GRP3_PAIreon 2R</td>
<td>91e7</td>
<td>Embedded audio mute</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_AUDIO_MUTE_GRP4_PAIreon 1L</td>
<td>91e8</td>
<td>Embedded audio mute</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_AUDIO_MUTE_GRP4_PAIreon 1R</td>
<td>91e9</td>
<td>Embedded audio mute</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_AUDIO_MUTE_GRP4_PAIreon 2L</td>
<td>91ea</td>
<td>Embedded audio mute</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_AUDIO_MUTE_GRP4_PAIreon 2R</td>
<td>91eb</td>
<td>Embedded audio mute</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_AUDIO_PHASE_GRP1_PAIreon 1L</td>
<td>91f0</td>
<td>Embedded audio phase invert</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_AUDIO_PHASE_GRP1_PAIreon 1R</td>
<td>91f1</td>
<td>Embedded audio phase invert</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_AUDIO_PHASE_GRP1_PAIreon 2L</td>
<td>91f2</td>
<td>Embedded audio phase invert</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_AUDIO_PHASE_GRP1_PAIreon 2R</td>
<td>91f3</td>
<td>Embedded audio phase invert</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_AUDIO_PHASE_GRP2_PAIreon 1L</td>
<td>91f4</td>
<td>Embedded audio phase invert</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_AUDIO_PHASE_GRP2_PAIreon 1R</td>
<td>91f5</td>
<td>Embedded audio phase invert</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_AUDIO_PHASE_GRP2_PAIreon 2L</td>
<td>91f6</td>
<td>Embedded audio phase invert</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_AUDIO_PHASE_GRP2_PAIreon 2R</td>
<td>91f7</td>
<td>Embedded audio phase invert</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_AUDIO_PHASE_GRP3_PAIreon 1L</td>
<td>91f8</td>
<td>Embedded audio phase invert</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_AUDIO_PHASE_GRP3_PAIreon 1R</td>
<td>91f9</td>
<td>Embedded audio phase invert</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_AUDIO_PHASE_GRP3_PAIreon 2L</td>
<td>91fa</td>
<td>Embedded audio phase invert</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_AUDIO_PHASE_GRP3_PAIreon 2R</td>
<td>91fb</td>
<td>Embedded audio phase invert</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_AUDIO_PHASE_GRP4_PAIreon 1L</td>
<td>91fc</td>
<td>Embedded audio phase invert</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_AUDIO_PHASE_GRP4_PAIreon 1R</td>
<td>91fd</td>
<td>Embedded audio phase invert</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_AUDIO_PHASE_GRP4_PAIreon 2L</td>
<td>91fe</td>
<td>Embedded audio phase invert</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_AUDIO_PHASE_GRP4_PAIreon 2R</td>
<td>91ff</td>
<td>Embedded audio phase invert</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_AUDIO_SEL_LINK_GRP1_PAIreon 1</td>
<td>920e</td>
<td>Embedded audio stereo link source</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_AUDIO_SEL_LINK_GRP1_PAIreon 2</td>
<td>920f</td>
<td>Embedded audio stereo link source</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_AUDIO_SEL_LINK_GRP2_PAIreon 1</td>
<td>9210</td>
<td>Embedded audio stereo link source</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_AUDIO_SEL_LINK_GRP2_PAIreon 2</td>
<td>9211</td>
<td>Embedded audio stereo link source</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_AUDIO_SEL_LINK_GRP3_PAIreon 1</td>
<td>9212</td>
<td>Embedded audio stereo link source</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
COM_AUDIO_SEL_LINK_GRP3_PAIR_2 9213 37395 Embedded audio stereo link source
Default=0

COM_AUDIO_SEL_LINK_GRP4_PAIR_1 9214 37396 Embedded audio stereo link source
Default=0

COM_AUDIO_SEL_LINK_GRP4_PAIR_2 9215 37397 Embedded audio stereo link source
Default=0

COM_AUDIO_SOURCE_GRP1_PAIR_1L 91b4 37300 Embedded audio source select
Default=1 Mute=-1 Disembed 1-L=1
Disembed 1-R=2 Disembed 2-L=3
Disembed 2-R=4 Disembed 3-L=5
Disembed 3-R=6 Disembed 4-L=7
Disembed 4-R=8 Disembed 5-L=9
Disembed 5-R=10 Disembed 6-L=11
Disembed 6-R=12 Disembed 7-L=13
Disembed 7-R=14 Disembed 8-L=15
Disembed 8-R=16 Mixer 1 o/p=23 Mixer 2 o/p=24
Mixer 3 o/p=25 Mixer 4 o/p=26
1kHz -20dBFS Tone=17 2kHz -20dBFS Tone=18
4kHz -20dBFS Tone=19 1kHz -18dBFS Tone=20
2kHz -18dBFS Tone=21 4kHz -18dBFS Tone=22
COM_AUDIO_SOURCE_GRP1_PAIR_1R 91b5 37301 Embedded audio source select
Default=2 Mute=-1 Disembed 1-L=1
Disembed 1-R=2 Disembed 2-L=3
Disembed 2-R=4 Disembed 3-L=5
Disembed 3-R=6 Disembed 4-L=7
Disembed 4-R=8 Disembed 5-L=9
Disembed 5-R=10 Disembed 6-L=11
Disembed 6-R=12 Disembed 7-L=13
Disembed 7-R=14 Disembed 8-L=15
Disembed 8-R=16 Mixer 1 o/p=23 Mixer 2 o/p=24
Mixer 3 o/p=25 Mixer 4 o/p=26
1kHz -20dBFS Tone=172kHz -20dBFS Tone=18
4kHz -20dBFS Tone=191kHz -18dBFS Tone=20
2kHz -18dBFS Tone=214kHz -18dBFS Tone=22

COM_AUDIO_SOURCE_GRP1_PAIR_2L 91b6 37302 Embedded audio source select
Default=3 Mute=-1 Disembed 1-L=1
Disembed 1-R=2 Disembed 2-L=3
Disembed 2-R=4 Disembed 3-L=5
Disembed 3-R=6 Disembed 4-L=7
Disembed 4-R=8 Disembed 5-L=9
Disembed 5-R=10 Disembed 6-L=11
Disembed 6-R=12 Disembed 7-L=13
Disembed 7-R=14 Disembed 8-L=15
Disembed 8-R=16 Mixer 1 o/p=23 Mixer 2 o/p=24
Mixer 3 o/p=25 Mixer 4 o/p=26
1kHz -20dBFS Tone=172kHz -20dBFS Tone=18
4kHz -20dBFS Tone=191kHz -18dBFS Tone=20
2kHz -18dBFS Tone=214kHz -18dBFS Tone=22

COM_AUDIO_SOURCE_GRP1_PAIR_2R 91b7 37303 Embedded audio source select
Default=4 Mute=-1 Disembed 1-L=1
Disembed 1-R=2 Disembed 2-L=3
Disembed 2-R=4 Disembed 3-L=5
Disembed 3-R=6 Disembed 4-L=7
Disembed 4-R=8 Disembed 5-L=9
Disembed 5-R=10 Disembed 6-L=11
Disembed 6-R=12 Disembed 7-L=13
Disembed 7-R=14 Disembed 8-L=15
Disembed 8-R=16 Mixer 1 o/p=23 Mixer 2 o/p=24
Mixer 3 o/p=25 Mixer 4 o/p=26
1kHz -20dBFS Tone=172kHz -20dBFS Tone=18
4kHz -20dBFS Tone=191kHz -18dBFS Tone=20
2kHz -18dBFS Tone=214kHz -18dBFS Tone=22

COM_AUDIO_SOURCE_GRP2_PAIR_1L 91b8 37304 Embedded audio source select
Default=5 Mute=-1 Disembed 1-L=1
Disembed 1-R=2 Disembed 2-L=3
Disembed 2-R=4 Disembed 3-L=5
Disembed 3-R=6 Disembed 4-L=7
Disembed 4-R=8 Disembed 5-L=9
Disembed 5-R=10 Disembed 6-L=11
Disembed 6-R=12 Disembed 7-L=13
Disembed 7-R=14 Disembed 8-L=15
Disembed 8-R=16 Mixer 1 o/p=23 Mixer 2 o/p=24
Mixer 3 o/p=25 Mixer 4 o/p=26
1kHz -20dBFS Tone=172kHz -20dBFS Tone=18
4kHz -20dBFS Tone=191kHz -18dBFS Tone=20
2kHz -18dBFS Tone=214kHz -18dBFS Tone=22

COM_AUDIO_SOURCE_GRP2_PAIR_1R 91b9 37305 Embedded audio source select
Default=6 Mute=-1 Disembed 1-L=1
Disembed 1-R=2 Disembed 2-L=3
Disembed 2-R=4 Disembed 3-L=5
Disembed 3-R=6 Disembed 4-L=7
Disembed 4-R=8 Disembed 5-L=9
Disembed 5-R=10 Disembed 6-L=11

Disembed 6-R=12    Disembed 7-L=13
Disembed 7-R=14    Disembed 8-L=15
Disembed 8-R=16    Mixer 1 o/p=23  Mixer 2 o/p=24
Mixer 3 o/p=25    Mixer 4 o/p=26
1kHz -20dBFS Tone=17 2kHz -20dBFS Tone=18
4kHz -20dBFS Tone=19 1kHz -18dBFS Tone=20
2kHz -18dBFS Tone=21 4kHz -18dBFS Tone=22
| Group 2 Pair | Default | Mute | Disembed 1-L | Disembed 1-R | Disembed 2-L | Disembed 2-R | Disembed 3-L | Disembed 3-R | Disembed 4-L | Disembed 4-R | Disembed 5-L | Disembed 5-R | Disembed 6-L | Disembed 6-R | Disembed 7-L | Disembed 7-R | Disembed 8-L | Disembed 8-R | Mixer 1 o/p | Mixer 2 o/p | Mixer 3 o/p | Mixer 4 o/p | 1kHz Tone | 2kHz Tone | 4kHz Tone |
|-------------|---------|------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 2L          | 7       | -1   | 1           | 2           | 3           | 4           | 5           | 6           | 7           | 8           | 9           | 10          | 11          | 12          | 13          | 14          | 15          | 16          | 23          | 24          | 25          | 26          | -20dBFS    | -18dBFS    | -18dBFS    |
| 2R          | 8       | -1   | 1           | 2           | 3           | 4           | 5           | 6           | 7           | 8           | 9           | 10          | 11          | 12          | 13          | 14          | 15          | 16          | 23          | 24          | 25          | 26          | -20dBFS    | -18dBFS    | -18dBFS    |
| 1L          | 9       | -1   | 1           | 2           | 3           | 4           | 5           | 6           | 7           | 8           | 9           | 10          | 11          | 12          | 13          | 14          | 15          | 16          | 23          | 24          | 25          | 26          | -20dBFS    | -18dBFS    | -18dBFS    |
| 1R          | 10      | -1   | 1           | 2           | 3           | 4           | 5           | 6           | 7           | 8           | 9           | 10          | 11          | 12          | 13          | 14          | 15          | 16          | 23          | 24          | 25          | 26          | -20dBFS    | -18dBFS    | -18dBFS    |
| 2L          | 11      | -1   | 1           | 2           | 3           | 4           | 5           | 6           | 7           | 8           | 9           | 10          | 11          | 12          | 13          | 14          | 15          | 16          | 23          | 24          | 25          | 26          | -20dBFS    | -18dBFS    | -18dBFS    |

1kHz -20dBFS Tone=172kHz -20dBFS Tone=18
4kHz -20dBFS Tone=191kHz -18dBFS Tone=20
2kHz -18dBFS Tone=214kHz -18dBFS Tone=22
Disembed 6-R=12 Disembed 7-L=13
Disembed 7-R=14 Disembed 8-L=15
Disembed 8-R=16 Mixer 1 o/p=23 Mixer 2 o/p=24
Mixer 3 o/p=25 Mixer 4 o/p=26
1kHz -20dBFS Tone=17 2kHz -20dBFS Tone=18
4kHz -20dBFS Tone=19 1kHz -18dBFS Tone=20
2kHz -18dBFS Tone=21 4kHz -18dBFS Tone=22
COM_AUDIO_SOURCE_GRP3_PAIR_2R 91bf 37311 Embedded audio source select
  Default=12 Mute=-1 Disembed 1-L=1
  Disembed 1-R=2 Disembed 2-L=3
  Disembed 2-R=4 Disembed 3-L=5
  Disembed 3-R=6 Disembed 4-L=7
  Disembed 4-R=8 Disembed 5-L=9
  Disembed 5-R=10 Disembed 6-L=11
  Disembed 6-R=12 Disembed 7-L=13
  Disembed 7-R=14 Disembed 8-L=15
  Disembed 8-R=16 Mixer 1 o/p=23 Mixer 2 o/p=24
  Mixer 3 o/p=25 Mixer 4 o/p=26
  1kHz -20dBFS Tone=172kHz -20dBFS Tone=18
  4kHz -20dBFS Tone=191kHz -18dBFS Tone=20
  2kHz -18dBFS Tone=214kHz -18dBFS Tone=22

COM_AUDIO_SOURCE_GRP4_PAIR_1L 91c0 37312 Embedded audio source select
  Default=13 Mute=-1 Disembed 1-L=1
  Disembed 1-R=2 Disembed 2-L=3
  Disembed 2-R=4 Disembed 3-L=5
  Disembed 3-R=6 Disembed 4-L=7
  Disembed 4-R=8 Disembed 5-L=9
  Disembed 5-R=10 Disembed 6-L=11
  Disembed 6-R=12 Disembed 7-L=13
  Disembed 7-R=14 Disembed 8-L=15
  Disembed 8-R=16 Mixer 1 o/p=23 Mixer 2 o/p=24
  Mixer 3 o/p=25 Mixer 4 o/p=26
  1kHz -20dBFS Tone=172kHz -20dBFS Tone=18
  4kHz -20dBFS Tone=191kHz -18dBFS Tone=20
  2kHz -18dBFS Tone=214kHz -18dBFS Tone=22

COM_AUDIO_SOURCE_GRP4_PAIR_1R 91c1 37313 Embedded audio source select
  Default=14 Mute=-1 Disembed 1-L=1
  Disembed 1-R=2 Disembed 2-L=3
  Disembed 2-R=4 Disembed 3-L=5
  Disembed 3-R=6 Disembed 4-L=7
  Disembed 4-R=8 Disembed 5-L=9
  Disembed 5-R=10 Disembed 6-L=11
  Disembed 6-R=12 Disembed 7-L=13
  Disembed 7-R=14 Disembed 8-L=15
  Disembed 8-R=16 Mixer 1 o/p=23 Mixer 2 o/p=24
  Mixer 3 o/p=25 Mixer 4 o/p=26
  1kHz -20dBFS Tone=172kHz -20dBFS Tone=18
  4kHz -20dBFS Tone=191kHz -18dBFS Tone=20
  2kHz -18dBFS Tone=214kHz -18dBFS Tone=22

COM_AUDIO_SOURCE_GRP4_PAIR_2L 91c2 37314 Embedded audio source select
  Default=15 Mute=-1 Disembed 1-L=1
  Disembed 1-R=2 Disembed 2-L=3
  Disembed 2-R=4 Disembed 3-L=5
  Disembed 3-R=6 Disembed 4-L=7
  Disembed 4-R=8 Disembed 5-L=9
  Disembed 5-R=10 Disembed 6-L=11
  Disembed 6-R=12 Disembed 7-L=13
  Disembed 7-R=14 Disembed 8-L=15
  Disembed 8-R=16 Mixer 1 o/p=23 Mixer 2 o/p=24
  Mixer 3 o/p=25 Mixer 4 o/p=26
  1kHz -20dBFS Tone=172kHz -20dBFS Tone=18
  4kHz -20dBFS Tone=191kHz -18dBFS Tone=20
  2kHz -18dBFS Tone=214kHz -18dBFS Tone=22

COM_AUDIO_SOURCE_GRP4_PAIR_2R 91c3 37315 Embedded audio source select
  Default=16 Mute=-1 Disembed 1-L=1
  Disembed 1-R=2 Disembed 2-L=3
  Disembed 2-R=4 Disembed 3-L=5
  Disembed 3-R=6 Disembed 4-L=7
  Disembed 4-R=8 Disembed 5-L=9
  Disembed 5-R=10 Disembed 6-L=11
  Mixer 1 o/p=23 Mixer 2 o/p=24
  Mixer 3 o/p=25 Mixer 4 o/p=26
  1kHz -20dBFS Tone=172kHz -20dBFS Tone=18
  4kHz -20dBFS Tone=191kHz -18dBFS Tone=20
  2kHz -18dBFS Tone=214kHz -18dBFS Tone=22
<table>
<thead>
<tr>
<th>Disembed 6-R=12</th>
<th>Disembed 7-L=13</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disembed 7-R=14</td>
<td>Disembed 8-L=15</td>
</tr>
<tr>
<td>Disembed 8-R=16</td>
<td>Mixer 1 o/p=23</td>
</tr>
<tr>
<td></td>
<td>Mixer 2 o/p=24</td>
</tr>
<tr>
<td>Mixer 3 o/p=25</td>
<td>Mixer 4 o/p=26</td>
</tr>
<tr>
<td>1kHz -20dBFS Tone=172kHz -20dBFS Tone=18</td>
<td></td>
</tr>
<tr>
<td>4kHz -20dBFS Tone=191kHz -18dBFS Tone=20</td>
<td></td>
</tr>
<tr>
<td>2kHz -18dBFS Tone=214kHz -18dBFS Tone=22</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>COM_CHAN_ACTIVE_1</th>
<th>9237</th>
<th>37431</th>
<th>Embedded output audio channel enabled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_CHAN_ACTIVE_10</td>
<td>9240</td>
<td>37440</td>
<td>Embedded output audio channel enabled</td>
</tr>
<tr>
<td>Default</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_CHAN_ACTIVE_11</td>
<td>9241</td>
<td>37441</td>
<td>Embedded output audio channel enabled</td>
</tr>
<tr>
<td>Default</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_CHAN_ACTIVE_12</td>
<td>9242</td>
<td>37442</td>
<td>Embedded output audio channel enabled</td>
</tr>
<tr>
<td>Default</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_CHAN_ACTIVE_13</td>
<td>9243</td>
<td>37443</td>
<td>Embedded output audio channel enabled</td>
</tr>
<tr>
<td>Default</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_CHAN_ACTIVE_14</td>
<td>9244</td>
<td>37444</td>
<td>Embedded output audio channel enabled</td>
</tr>
<tr>
<td>Default</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_CHAN_ACTIVE_15</td>
<td>9245</td>
<td>37445</td>
<td>Embedded output audio channel enabled</td>
</tr>
<tr>
<td>Default</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_CHAN_ACTIVE_16</td>
<td>9246</td>
<td>37446</td>
<td>Embedded output audio channel enabled</td>
</tr>
<tr>
<td>Default</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_CHAN_ACTIVE_2</td>
<td>9238</td>
<td>37432</td>
<td>Embedded output audio channel enabled</td>
</tr>
<tr>
<td>Default</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_CHAN_ACTIVE_3</td>
<td>9239</td>
<td>37433</td>
<td>Embedded output audio channel enabled</td>
</tr>
<tr>
<td>Default</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_CHAN_ACTIVE_4</td>
<td>923a</td>
<td>37434</td>
<td>Embedded output audio channel enabled</td>
</tr>
<tr>
<td>Default</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_CHAN_ACTIVE_5</td>
<td>923b</td>
<td>37435</td>
<td>Embedded output audio channel enabled</td>
</tr>
<tr>
<td>Default</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_CHAN_ACTIVE_6</td>
<td>923c</td>
<td>37436</td>
<td>Embedded output audio channel enabled</td>
</tr>
<tr>
<td>Default</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_CHAN_ACTIVE_7</td>
<td>923d</td>
<td>37437</td>
<td>Embedded output audio channel enabled</td>
</tr>
<tr>
<td>Default</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_CHAN_ACTIVE_8</td>
<td>923e</td>
<td>37438</td>
<td>Embedded output audio channel enabled</td>
</tr>
<tr>
<td>Default</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_CHAN_ACTIVE_9</td>
<td>923f</td>
<td>37439</td>
<td>Embedded output audio channel enabled</td>
</tr>
<tr>
<td>Default</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_DELAY_FRAMES</td>
<td>8100</td>
<td>33024</td>
<td>Set video delay in frames</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>COM_EMB_INP_RENAME1L</th>
<th>927c</th>
<th>37500</th>
<th>Embedded audio input name</th>
</tr>
</thead>
<tbody>
<tr>
<td>COM_EMB_INP_RENAME1R</td>
<td>927d</td>
<td>37501</td>
<td>Embedded audio input name</td>
</tr>
<tr>
<td>COM_EMB_INP_RENAME2L</td>
<td>927e</td>
<td>37502</td>
<td>Embedded audio input name</td>
</tr>
<tr>
<td>COM_EMB_INP_RENAME2R</td>
<td>927f</td>
<td>37503</td>
<td>Embedded audio input name</td>
</tr>
<tr>
<td>COM_EMB_INP_RENAME3L</td>
<td>9280</td>
<td>37504</td>
<td>Embedded audio input name</td>
</tr>
<tr>
<td>COM_EMB_INP_RENAME3R</td>
<td>9281</td>
<td>37505</td>
<td>Embedded audio input name</td>
</tr>
<tr>
<td>COM_EMB_INP_RENAME4L</td>
<td>9282</td>
<td>37506</td>
<td>Embedded audio input name</td>
</tr>
<tr>
<td>COM_EMB_INP_RENAME4R</td>
<td>9283</td>
<td>37507</td>
<td>Embedded audio input name</td>
</tr>
<tr>
<td>COM_EMB_INP_RENAME5L</td>
<td>9284</td>
<td>37508</td>
<td>Embedded audio input name</td>
</tr>
<tr>
<td>COM_EMB_INP_RENAME5R</td>
<td>9285</td>
<td>37509</td>
<td>Embedded audio input name</td>
</tr>
<tr>
<td>COM_EMB_INP_RENAME6L</td>
<td>9286</td>
<td>37510</td>
<td>Embedded audio input name</td>
</tr>
<tr>
<td>Parameter</td>
<td>Value 1</td>
<td>Value 2</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------------</td>
<td>---------</td>
<td>---------</td>
<td>-------------------------------------------------------</td>
</tr>
<tr>
<td>COM_EMB_INP_RENAME6R</td>
<td>9287</td>
<td>37511</td>
<td>Embedded audio input name</td>
</tr>
<tr>
<td>COM_EMB_INP_RENAME7L</td>
<td>9288</td>
<td>37512</td>
<td>Embedded audio input name</td>
</tr>
<tr>
<td>COM_EMB_INP_RENAME7R</td>
<td>9289</td>
<td>37513</td>
<td>Embedded audio input name</td>
</tr>
<tr>
<td>COM_EMB_INP_RENAME8L</td>
<td>928a</td>
<td>37514</td>
<td>Embedded audio input name</td>
</tr>
<tr>
<td>COM_EMB_INP_RENAME8R</td>
<td>928b</td>
<td>37515</td>
<td>Embedded audio input name</td>
</tr>
<tr>
<td>COM_EMB_OUT_RENAME1L</td>
<td>9290</td>
<td>37520</td>
<td>Embedded audio output name</td>
</tr>
<tr>
<td>COM_EMB_OUT_RENAME1R</td>
<td>9291</td>
<td>37521</td>
<td>Embedded audio output name</td>
</tr>
<tr>
<td>COM_EMB_OUT_RENAME2L</td>
<td>9292</td>
<td>37522</td>
<td>Embedded audio output name</td>
</tr>
<tr>
<td>COM_EMB_OUT_RENAME2R</td>
<td>9293</td>
<td>37523</td>
<td>Embedded audio output name</td>
</tr>
<tr>
<td>COM_EMB_OUT_RENAME3L</td>
<td>9294</td>
<td>37524</td>
<td>Embedded audio output name</td>
</tr>
<tr>
<td>COM_EMB_OUT_RENAME3R</td>
<td>9295</td>
<td>37525</td>
<td>Embedded audio output name</td>
</tr>
<tr>
<td>COM_EMB_OUT_RENAME4L</td>
<td>9296</td>
<td>37526</td>
<td>Embedded audio output name</td>
</tr>
<tr>
<td>COM_EMB_OUT_RENAME4R</td>
<td>9297</td>
<td>37527</td>
<td>Embedded audio output name</td>
</tr>
<tr>
<td>COM_EMB_OUT_RENAME5L</td>
<td>9298</td>
<td>37528</td>
<td>Embedded audio output name</td>
</tr>
<tr>
<td>COM_EMB_OUT_RENAME5R</td>
<td>9299</td>
<td>37529</td>
<td>Embedded audio output name</td>
</tr>
<tr>
<td>COM_EMB_OUT_RENAME6L</td>
<td>929a</td>
<td>37530</td>
<td>Embedded audio output name</td>
</tr>
<tr>
<td>COM_EMB_OUT_RENAME6R</td>
<td>929b</td>
<td>37531</td>
<td>Embedded audio output name</td>
</tr>
<tr>
<td>COM_EMB_OUT_RENAME7L</td>
<td>929c</td>
<td>37532</td>
<td>Embedded audio output name</td>
</tr>
<tr>
<td>COM_EMB_OUT_RENAME7R</td>
<td>929d</td>
<td>37533</td>
<td>Embedded audio output name</td>
</tr>
<tr>
<td>COM_EMB_OUT_RENAME8L</td>
<td>929e</td>
<td>37534</td>
<td>Embedded audio output name</td>
</tr>
<tr>
<td>COM_EMB_OUT_RENAME8R</td>
<td>929f</td>
<td>37535</td>
<td>Embedded audio output name</td>
</tr>
<tr>
<td>COM_EMB_SRC_BYPASS_1</td>
<td>922c</td>
<td>37420</td>
<td>Sample rate converter bypass (Data mode)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Default=0</td>
</tr>
<tr>
<td>COM_EMB_SRC_BYPASS_2</td>
<td>922d</td>
<td>37421</td>
<td>Sample rate converter bypass (Data mode)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Default=0</td>
</tr>
<tr>
<td>COM_EMB_SRC_BYPASS_3</td>
<td>922e</td>
<td>37422</td>
<td>Sample rate converter bypass (Data mode)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Default=0</td>
</tr>
<tr>
<td>COM_EMB_SRC_BYPASS_4</td>
<td>922f</td>
<td>37423</td>
<td>Sample rate converter bypass (Data mode)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Default=0</td>
</tr>
<tr>
<td>COM_EMB_SRC_BYPASS_5</td>
<td>9230</td>
<td>37424</td>
<td>Sample rate converter bypass (Data mode)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Default=0</td>
</tr>
<tr>
<td>COM_EMB_SRC_BYPASS_6</td>
<td>9231</td>
<td>37425</td>
<td>Sample rate converter bypass (Data mode)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Default=0</td>
</tr>
<tr>
<td>COM_EMB_SRC_BYPASS_7</td>
<td>9232</td>
<td>37426</td>
<td>Sample rate converter bypass (Data mode)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Default=0</td>
</tr>
<tr>
<td>COM_EMB_SRC_BYPASS_8</td>
<td>9233</td>
<td>37427</td>
<td>Sample rate converter bypass (Data mode)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Default=0</td>
</tr>
<tr>
<td>COM_FOLLOW_STD</td>
<td>80f3</td>
<td>33011</td>
<td>Output follows std: Man/Input/Ext.Reference</td>
</tr>
<tr>
<td>COM_FRZ_ENB</td>
<td>8108</td>
<td>33032</td>
<td>Freeze output picture</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Default=0</td>
</tr>
</tbody>
</table>
COM_FRZ_TYPE 8109 33033 Type of Frozen output: Frame/Field

COM_GPIO_TIMER 8d1c 36124 Default=0 Off=0 GPI 1=1 GPI 2=2
COM_GRP_ACTIVE_1 924a 37450 Embedded output audio group enabled
Default=1
COM_GRP_ACTIVE_2 924b 37451 Embedded output audio group enabled
Default=1
COM_GRP_ACTIVE_3 924c 37452 Embedded output audio group enabled
Default=1
COM_GRP_ACTIVE_4 924d 37453 Embedded output audio group enabled
Default=1
COM_INP_SEL 80a2 32930 Select video input
Default=1 Input 1=1 Input 2=2
COM_MIXER_RENAME1L 93b2 37810 Mixer names
COM_MIXER_RENAME1R 93b3 37811 Mixer names
COM_MIXER_RENAME2L 93b4 37812 Mixer names
COM_MIXER_RENAME2R 93b5 37813 Mixer names

COM_MIXER1_SOURCE1 92e0 37600 Mixer sources
Default=-1 Mute=-1 Disembed 1-L=1
Disembed 1-R=2 Disembed 2-L=3
Disembed 2-R=4 Disembed 3-L=5
Disembed 3-R=6 Disembed 4-L=7
Disembed 4-R=8 Disembed 5-L=9
Disembed 5-R=10 Disembed 6-L=11
Disembed 6-R=12 Disembed 7-L=13
Disembed 7-R=14 Disembed 8-L=15
Disembed 8-R=16
1kHz -20dBFS Tone=17 2kHz -20dBFS Tone=18
4kHz -20dBFS Tone=19 1kHz -18dBFS Tone=20
2kHz -18dBFS Tone=21 4kHz -18dBFS Tone=22

COM_MIXER1_SOURCE1_GAIN 9308 37640 Mixer source gain
Default=0 Min=-360 Max=120 Divisor=10

COM_MIXER1_SOURCE1_MUTE 9330 37680 Mixer source mutes
Default=0

COM_MIXER1_SOURCE1_PHASE 9358 37720 Mixer source phase invert
Default=0
COM_MIXER1_SOURCE2 92e1 37601 Mixer sources
Default=-1 Mute=-1 Disembed 1-L=1 Disembed 1-R=2 Disembed 2-L=3
Disembed 2-R=4 Disembed 3-L=5 Disembed 3-R=6 Disembed 4-L=7
Disembed 4-R=8 Disembed 5-L=9 Disembed 5-R=10 Disembed 6-L=11
Disembed 6-R=12 Disembed 7-L=13 Disembed 7-R=14 Disembed 8-L=15
Disembed 8-R=16 1kHz -20dBFS Tone=172kHz -20dBFS Tone=184kHz -20dBFS Tone=19
1kHz -18dBFS Tone=20kHz -18dBFS Tone=21kHz -18dBFS Tone=22
COM_MIXER1_SOURCE2_GAIN 9309 37641 Mixer source gain
Default=0 Min=-360 Max=120 Divisor=10
COM_MIXER1_SOURCE2_MUTE 9331 37681 Mixer source mutes
Default=0
COM_MIXER1_SOURCE2_PHASE 9359 37721 Mixer source phase invert
Default=0

COM_MIXER1_SOURCE3 92e2 37602 Mixer sources
Default=-1 Mute=-1 Disembed 1-L=1
Disembed 1-R=2 Disembed 2-L=3
Disembed 2-R=4 Disembed 3-L=5
Disembed 3-R=6 Disembed 4-L=7
Disembed 4-R=8 Disembed 5-L=9
Disembed 5-R=10 Disembed 6-L=11
Disembed 6-R=12 Disembed 7-L=13
Disembed 7-R=14 Disembed 8-L=15
Disembed 8-R=16
1kHz -20dBFS Tone=172kHz -20dBFS Tone=184kHz -20dBFS Tone=191kHz -18dBFS Tone=202kHz -
18dBFS Tone=21 4kHz -18dBFS Tone=22
COM_MIXER1_SOURCE3_GAIN 930a 37642 Mixer source gain
Default=0 Min=-360 Max=120 Divisor=10
COM_MIXER1_SOURCE3_MUTE 9332 37682 Mixer source mutes
Default=0
COM_MIXER1_SOURCE3_PHASE 935a 37722 Mixer source phase invert
Default=0

COM_MIXER1_SOURCE4 92e3 37603 Mixer sources
Default=-1 Mute=-1 Disembed 1-L=1
Disembed 1-R=2 Disembed 2-L=3
Disembed 2-R=4 Disembed 3-L=5
Disembed 3-R=6 Disembed 4-L=7
Disembed 4-R=8 Disembed 5-L=9
Disembed 5-R=10 Disembed 6-L=11
Disembed 6-R=12 Disembed 7-L=13
Disembed 7-R=14 Disembed 8-L=15
Disembed 8-R=16
1kHz -20dBFS Tone=172kHz -20dBFS Tone=184kHz -20dBFS Tone=191kHz -18dBFS Tone=202kHz -
18dBFS Tone=21 4kHz -18dBFS Tone=22
COM_MIXER1_SOURCE4_GAIN 930b 37643 Mixer source gain
Default=0 Min=-360 Max=120 Divisor=10
COM_MIXER1_SOURCE4_MUTE 9333 37683 Mixer source mutes
Default=0
COM_MIXER1_SOURCE4_PHASE 935b 37723 Mixer source phase invert
Default=0

COM_MIXER2_SOURCE1 92e4 37604 Mixer sources
Default=-1 Mute=-1 Disembed 1-L=1
Disembed 1-R=2 Disembed 2-L=3
Disembed 2-R=4 Disembed 3-L=5
Disembed 3-R=6 Disembed 4-L=7
Disembed 4-R=8 Disembed 5-L=9
Disembed 5-R=10 Disembed 6-L=11
Disembed 6-R=12 Disembed 7-L=13
Disembed 7-R=14 Disembed 8-L=15
Disembed 8-R=16
1kHz -20dBFS Tone=172kHz -20dBFS Tone=184kHz -20dBFS Tone=191kHz -18dBFS Tone=202kHz -
18dBFS Tone=21 4kHz -18dBFS Tone=22
COM_MIXER2_SOURCE1_GAIN 930c 37644 Mixer source gain
Default=0 Min=-360 Max=120 Divisor=10
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value 1</th>
<th>Value 2</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>COM_MIXER2_SOURCE1_MUTE</td>
<td>9334</td>
<td>37684</td>
<td>Mixer source mutes</td>
</tr>
<tr>
<td></td>
<td>Default=0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_MIXER2_SOURCE1_PHASE</td>
<td>935c</td>
<td>37724</td>
<td>Mixer source phase invert</td>
</tr>
<tr>
<td></td>
<td>Default=0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**COM_MIXER2_SOURCE2** 92e5 37605 Mixer sources
Default=-1 Mute=-1 Disembed 1-L=1
Disembed 1-R=2 Disembed 2-L=3
Disembed 2-R=4 Disembed 3-L=5
Disembed 3-R=6 Disembed 4-L=7
Disembed 4-R=8 Disembed 5-L=9
Disembed 5-R=10 Disembed 6-L=11
Disembed 6-R=12 Disembed 7-L=13
Disembed 7-R=14 Disembed 8-L=15
Disembed 8-R=16
1kHz -20dBFS Tone=172kHz -20dBFS Tone=184kHz -20dBFS Tone=191kHz -18dBFS Tone=202kHz -18dBFS Tone=21 4kHz -18dBFS Tone=22
COM_MIXER2_SOURCE2_GAIN 930d 37645 Mixer source gain
Default=0 Min=-360 Max=120 Divisor=10
COM_MIXER2_SOURCE2_MUTE 9335 37685 Mixer source mutes
Default=0
COM_MIXER2_SOURCE2_PHASE 935d 37725 Mixer source phase invert
Default=0

**COM_MIXER2_SOURCE3** 92e6 37606 Mixer sources
Default=-1 Mute=-1 Disembed 1-L=1
Disembed 1-R=2 Disembed 2-L=3
Disembed 2-R=4 Disembed 3-L=5
Disembed 3-R=6 Disembed 4-L=7
Disembed 4-R=8 Disembed 5-L=9
Disembed 5-R=10 Disembed 6-L=11
Disembed 6-R=12 Disembed 7-L=13
Disembed 7-R=14 Disembed 8-L=15
Disembed 8-R=16
1kHz -20dBFS Tone=172kHz -20dBFS Tone=184kHz -20dBFS Tone=191kHz -18dBFS Tone=202kHz -18dBFS Tone=21 4kHz -18dBFS Tone=22
COM_MIXER2_SOURCE3_GAIN 930e 37646 Mixer source gain
Default=0 Min=-360 Max=120 Divisor=10
COM_MIXER2_SOURCE3_MUTE 9336 37686 Mixer source mutes
Default=0
COM_MIXER2_SOURCE3_PHASE 935e 37726 Mixer source phase invert
Default=0

**COM_MIXER2_SOURCE4** 92e7 37607 Mixer sources
Default=-1 Mute=-1 Disembed 1-L=1
Disembed 1-R=2 Disembed 2-L=3
Disembed 2-R=4 Disembed 3-L=5
Disembed 3-R=6 Disembed 4-L=7
Disembed 4-R=8 Disembed 5-L=9
Disembed 5-R=10 Disembed 6-L=11
Disembed 6-R=12 Disembed 7-L=13
Disembed 7-R=14 Disembed 8-L=15
Disembed 8-R=16
1kHz -20dBFS Tone=172kHz -20dBFS Tone=184kHz -20dBFS Tone=191kHz -18dBFS Tone=202kHz -18dBFS Tone=21 4kHz -18dBFS Tone=22
COM_MIXER2_SOURCE4_GAIN 930f 37647 Mixer source gain
Default=0 Min=-360 Max=120 Divisor=10
COM_MIXER2_SOURCE4_MUTE 9337 37687 Mixer source mutes
Default=0
COM_MIXER2_SOURCE4_PHASE 935f 37727 Mixer source phase invert
Default=0

**COM_MIXER3_SOURCE1** 92e8 37608 Mixer sources
Default=-1 Mute=-1 Disembed 1-L=1
Disembed 1-R=2 Disembed 2-L=3
Disembed 2-R=4 Disembed 3-L=5
Disembed 3-R=6 Disembed 4-L=7
Disembed 4-R=8 Disembed 5-L=9
Disembed 5-R=10 Disembed 6-L=11
Disembed 6-R=12 Disembed 7-L=13
Disembed 7-R=14 Disembed 8-L=15
Disembed 8-R=16
1kHz -20dBFS Tone=172kHz -20dBFS Tone=184kHz -20dBFS Tone=191kHz -18dBFS Tone=202kHz -18dBFS Tone=21 4kHz -18dBFS Tone=22
COM_MIXER3_SOURCE1_GAIN 9310 37648 Mixer source gain
Default=0 Min=-360 Max=120 Divisor=10
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value1</th>
<th>Value2</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>COM_MIXER3_SOURCE1_MUTE</td>
<td>9338</td>
<td>37688</td>
<td>Mixer source mutes</td>
</tr>
<tr>
<td></td>
<td>Default=0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_MIXER3_SOURCE1_PHASE</td>
<td>9360</td>
<td>37728</td>
<td>Mixer source phase invert</td>
</tr>
<tr>
<td></td>
<td>Default=0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
COM_MIXER3_SOURCE2 92e9 37609 Mixer sources
Default=-1 Mute=-1 Disembed 1-L=1
Disembed 1-R=2 Disembed 2-L=3
Disembed 2-R=4 Disembed 3-L=5
Disembed 3-R=6 Disembed 4-L=7
Disembed 4-R=8 Disembed 5-L=9
Disembed 5-R=10 Disembed 6-L=11
Disembed 6-R=12 Disembed 7-L=13
Disembed 7-R=14 Disembed 8-L=15
Disembed 8-R=16
1kHz -20dBFS Tone=172kHz -20dBFS Tone=184kHz -20dBFS Tone=191kHz -18dBFS Tone=202kHz -
18dBFS Tone=21 4kHz -18dBFS Tone=22
COM_MIXER3_SOURCE2_GAIN 9311 37649 Mixer source gain
Default=0 Min=-360 Max=120 Divisor=10
COM_MIXER3_SOURCE2_MUTE 9339 37689 Mixer source mutes
Default=0
COM_MIXER3_SOURCE2_PHASE 9361 37729 Mixer source phase invert
Default=0

COM_MIXER3_SOURCE3 92ea 37610 Mixer sources
Default=-1 Mute=-1 Disembed 1-L=1
Disembed 1-R=2 Disembed 2-L=3
Disembed 2-R=4 Disembed 3-L=5
Disembed 3-R=6 Disembed 4-L=7
Disembed 4-R=8 Disembed 5-L=9
Disembed 5-R=10 Disembed 6-L=11
Disembed 6-R=12 Disembed 7-L=13
Disembed 7-R=14 Disembed 8-L=15
Disembed 8-R=16
1kHz -20dBFS Tone=172kHz -20dBFS Tone=184kHz -20dBFS Tone=191kHz -18dBFS Tone=202kHz -
18dBFS Tone=21 4kHz -18dBFS Tone=22
COM_MIXER3_SOURCE3_GAIN 9312 37650 Mixer source gain
Default=0 Min=-360 Max=120 Divisor=10
COM_MIXER3_SOURCE3_MUTE 933a 37690 Mixer source mutes
Default=0
COM_MIXER3_SOURCE3_PHASE 9362 37730 Mixer source phase invert
Default=0

COM_MIXER3_SOURCE4 92eb 37611 Mixer sources
Default=-1 Mute=-1 Disembed 1-L=1
Disembed 1-R=2 Disembed 2-L=3
Disembed 2-R=4 Disembed 3-L=5
Disembed 3-R=6 Disembed 4-L=7
Disembed 4-R=8 Disembed 5-L=9
Disembed 5-R=10 Disembed 6-L=11
Disembed 6-R=12 Disembed 7-L=13
Disembed 7-R=14 Disembed 8-L=15
Disembed 8-R=16
1kHz -20dBFS Tone=172kHz -20dBFS Tone=184kHz -20dBFS Tone=191kHz -18dBFS Tone=202kHz -
18dBFS Tone=21 4kHz -18dBFS Tone=22
COM_MIXER3_SOURCE4_GAIN 9313 37651 Mixer source gain
Default=0 Min=-360 Max=120 Divisor=10
COM_MIXER3_SOURCE4_MUTE 933b 37691 Mixer source mutes
Default=0
COM_MIXER3_SOURCE4_PHASE 9363 37731 Mixer source phase invert
Default=0

COM_MIXER4_SOURCE1 92ec 37612 Mixer sources
Default=-1 Mute=-1 Disembed 1-L=1
Disembed 1-R=2 Disembed 2-L=3
Disembed 2-R=4 Disembed 3-L=5
Disembed 3-R=6 Disembed 4-L=7
Disembed 4-R=8 Disembed 5-L=9
Disembed 5-R=10 Disembed 6-L=11
Disembed 6-R=12 Disembed 7-L=13
Disembed 7-R=14 Disembed 8-L=15
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value 1</th>
<th>Value 2</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>COM_MIXER4_SOURCE1_GAIN</td>
<td>9314</td>
<td>37652</td>
<td>Mixer source gain</td>
</tr>
<tr>
<td>Default</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>-360</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td>120</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Divisor</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_MIXER4_SOURCE1_MUTE</td>
<td>933c</td>
<td>37692</td>
<td>Mixer source mutes</td>
</tr>
<tr>
<td>Default</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_MIXER4_SOURCE1_PHASE</td>
<td>9364</td>
<td>37732</td>
<td>Mixer source phase invert</td>
</tr>
<tr>
<td>Default</td>
<td>0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
COM_MIXER4_SOURCE2 92ed 37613 Mixer sources
Default=-1 Mute=-1 Disembed 1-L=1
Disembed 1-R=2 Disembed 2-L=3
Disembed 2-R=4 Disembed 3-L=5
Disembed 3-R=6 Disembed 4-L=7
Disembed 4-R=8 Disembed 5-L=9
Disembed 5-R=10 Disembed 6-L=11
Disembed 6-R=12 Disembed 7-L=13
Disembed 7-R=14 Disembed 8-L=15
Disembed 8-R=16
1kHz -20dBFS Tone=172kHz -20dBFS Tone=184kHz -20dBFS Tone=191kHz -18dBFS Tone=202kHz -
18dBFS Tone=21 4kHz -18dBFS Tone=22
COM_MIXER4_SOURCE2_GAIN 9315 37653 Mixer source gain
Default=0 Min=-360 Max=120 Divisor=10
COM_MIXER4_SOURCE2_MUTE 933d 37693 Mixer source mutes
Default=0
COM_MIXER4_SOURCE2_PHASE 9365 37733 Mixer source phase invert
Default=0

COM_MIXER4_SOURCE3 92ee 37614 Mixer sources
Default=-1 Mute=-1 Disembed 1-L=1
Disembed 1-R=2 Disembed 2-L=3
Disembed 2-R=4 Disembed 3-L=5
Disembed 3-R=6 Disembed 4-L=7
Disembed 4-R=8 Disembed 5-L=9
Disembed 5-R=10 Disembed 6-L=11
Disembed 6-R=12 Disembed 7-L=13
Disembed 7-R=14 Disembed 8-L=15
Disembed 8-R=16
1kHz -20dBFS Tone=172kHz -20dBFS Tone=184kHz -20dBFS Tone=191kHz -18dBFS Tone=202kHz -
18dBFS Tone=21 4kHz -18dBFS Tone=22
COM_MIXER4_SOURCE3_GAIN 9316 37654 Mixer source gain
Default=0 Min=-360 Max=120 Divisor=10
COM_MIXER4_SOURCE3_MUTE 933e 37694 Mixer source mutes
Default=0
COM_MIXER4_SOURCE3_PHASE 9366 37734 Mixer source phase invert
Default=0

COM_MIXER4_SOURCE4 92ef 37615 Mixer sources
Default=-1 Mute=-1 Disembed 1-L=1
Disembed 1-R=2 Disembed 2-L=3
Disembed 2-R=4 Disembed 3-L=5
Disembed 3-R=6 Disembed 4-L=7
Disembed 4-R=8 Disembed 5-L=9
Disembed 5-R=10 Disembed 6-L=11
Disembed 6-R=12 Disembed 7-L=13
Disembed 7-R=14 Disembed 8-L=15
Disembed 8-R=16
1kHz -20dBFS Tone=172kHz -20dBFS Tone=184kHz -20dBFS Tone=191kHz -18dBFS Tone=202kHz -
18dBFS Tone=21 4kHz -18dBFS Tone=22
COM_MIXER4_SOURCE4_GAIN 9317 37655 Mixer source gain
Default=0 Min=-360 Max=120 Divisor=10
COM_MIXER4_SOURCE4_MUTE 933f 37695 Mixer source mutes
Default=0
COM_MIXER4_SOURCE4_PHASE 9367 37735 Mixer source phase invert
Default=0

COM.MONO_ENB 810a 33034 Monochrome enable
Default=0
COM_MONO_TYPE 810b 33035 Type of Monochrome output
Default=0 Y only=0 C only=1
COM_OUT_GAINCBCR 80eb 33003 Video CbCr Gain
Default=0 Min=-600 Max=600 Divisor=100
COM_OUT_GAINM 80e8 33000 Video Master Gain
Default=0 Min=-600 Max=600 Divisor=100
<table>
<thead>
<tr>
<th>Variable</th>
<th>Value</th>
<th>Default</th>
<th>Min</th>
<th>Max</th>
<th>Divisor</th>
</tr>
</thead>
<tbody>
<tr>
<td>COM_OUT_GAINY</td>
<td>80e9</td>
<td>33001</td>
<td>Video Luminance gain</td>
<td>0</td>
<td>600</td>
</tr>
<tr>
<td>COM_OUT_OFFY</td>
<td>80ea</td>
<td>33002</td>
<td>Video Black Level</td>
<td>0</td>
<td>200</td>
</tr>
<tr>
<td>COM_OUT_STD</td>
<td>80f2</td>
<td>33010</td>
<td>Select output standard</td>
<td>80</td>
<td>0</td>
</tr>
<tr>
<td>COM_PAT_ENB</td>
<td>810e</td>
<td>33038</td>
<td>TPG pattern enable</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>COM_PAT_TYPE</td>
<td>810f</td>
<td>33039</td>
<td>TPG pattern type</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>COM_PATTERN_SCROLL</td>
<td>8110</td>
<td>33040</td>
<td>Scroll test pattern horizontally</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>COM_STEREO_IP_NAME_1</td>
<td>9218</td>
<td>37400</td>
<td>Embedded input pair names are stereo</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>COM_STEREO_IP_NAME_2</td>
<td>9219</td>
<td>37401</td>
<td>Embedded input pair names are stereo</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>COM_STEREO_IP_NAME_3</td>
<td>921a</td>
<td>37402</td>
<td>Embedded input pair names are stereo</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>COM_STEREO_IP_NAME_4</td>
<td>921b</td>
<td>37403</td>
<td>Embedded input pair names are stereo</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>COM_STEREO_IP_NAME_5</td>
<td>921c</td>
<td>37404</td>
<td>Embedded input pair names are stereo</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>COM_STEREO_IP_NAME_6</td>
<td>921d</td>
<td>37405</td>
<td>Embedded input pair names are stereo</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>COM_STEREO_IP_NAME_7</td>
<td>921e</td>
<td>37406</td>
<td>Embedded input pair names are stereo</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>COM_STEREO_IP_NAME_8</td>
<td>921f</td>
<td>37407</td>
<td>Embedded input pair names are stereo</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>COM_STEREO_OP_NAME_1</td>
<td>9222</td>
<td>37410</td>
<td>Embedded output pair names are stereo</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>COM_STEREO_OP_NAME_2</td>
<td>9223</td>
<td>37411</td>
<td>Embedded output pair names are stereo</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>COM_STEREO_OP_NAME_3</td>
<td>9224</td>
<td>37412</td>
<td>Embedded output pair names are stereo</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>COM_STEREO_OP_NAME_4</td>
<td>9225</td>
<td>37413</td>
<td>Embedded output pair names are stereo</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>COM_STEREO_OP_NAME_5</td>
<td>9226</td>
<td>37414</td>
<td>Embedded output pair names are stereo</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>COM_STEREO_OP_NAME_6</td>
<td>9227</td>
<td>37415</td>
<td>Embedded output pair names are stereo</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>COM_STEREO_OP_NAME_7</td>
<td>9228</td>
<td>37416</td>
<td>Embedded output pair names are stereo</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>COM_STEREO_OP_NAME_8</td>
<td>9229</td>
<td>37417</td>
<td>Embedded output pair names are stereo</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>COM_AUDIO_DELAY_A_SET</td>
<td>949b</td>
<td>38043</td>
<td>Set Manual delay</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>COM_AUDIO_DELAY_A_TRACK14</td>
<td>949c</td>
<td>38044</td>
<td>Use rolltrack14 data for delay</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>COM_AUDIO_DELAY_A_TRACK15</td>
<td>949d</td>
<td>38045</td>
<td>Use rolltrack15 data for delay</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>COM_AUDIO_DELAY_A_TRACK16</td>
<td>949e</td>
<td>38046</td>
<td>Use rolltrack16 data for delay</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>COM_AUDIO_DELAY_A_TRACK17</td>
<td>949f</td>
<td>38047</td>
<td>Use rolltrack17 data for delay</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>COM_AUDIO_DELAY_A_INT</td>
<td>9498</td>
<td>38048</td>
<td>Use internal video delay</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>COM_AUDIO_DELAY_A_MAN</td>
<td>9499</td>
<td>38049</td>
<td>Use manual delay select</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>COM_AUDIO_DELAY_A_PWM</td>
<td>949a</td>
<td>38050</td>
<td>Use GPIO PWM for delay</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>COM_AUDIO_DELAY_B_SET</td>
<td>94af</td>
<td>38063</td>
<td>Set Manual delay</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Parameter Name</td>
<td>Value</td>
<td>Description</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------------------</td>
<td>--------</td>
<td>--------------------------------------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_AUDIO_DELAY_B_TRACK14</td>
<td>94b0</td>
<td>Use rolltrack14 data for delay</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default=0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_AUDIO_DELAY_B_TRACK15</td>
<td>94b1</td>
<td>Use rolltrack15 data for delay</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default=0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_AUDIO_DELAY_B_TRACK16</td>
<td>94b2</td>
<td>Use rolltrack16 data for delay</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default=0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_AUDIO_DELAY_B_TRACK17</td>
<td>94b3</td>
<td>Use rolltrack17 data for delay</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default=0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_AUDIO_DELAY_B_INT</td>
<td>94ac</td>
<td>Use internal video delay</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_AUDIO_DELAY_B_MAN</td>
<td>94ad</td>
<td>Use manual delay select</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_AUDIO_DELAY_B_PWM</td>
<td>94ae</td>
<td>Use GPIO PWM for delay</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default=0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_DELAY_01_SEL</td>
<td>94c0</td>
<td>Embedded audio delay A/B/Off</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td>Delay A=1  Delay B=2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_DELAY_02_SEL</td>
<td>94c1</td>
<td>Embedded audio delay A/B/Off</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td>Delay A=1  Delay B=2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_DELAY_03_SEL</td>
<td>94c2</td>
<td>Embedded audio delay A/B/Off</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td>Delay A=1  Delay B=2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_DELAY_04_SEL</td>
<td>94c3</td>
<td>Embedded audio delay A/B/Off</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td>Delay A=1  Delay B=2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_DELAY_05_SEL</td>
<td>94c4</td>
<td>Embedded audio delay A/B/Off</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td>Delay A=1  Delay B=2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_DELAY_06_SEL</td>
<td>94c5</td>
<td>Embedded audio delay A/B/Off</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td>Delay A=1  Delay B=2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_DELAY_07_SEL</td>
<td>94c6</td>
<td>Embedded audio delay A/B/Off</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td>Delay A=1  Delay B=2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_DELAY_08_SEL</td>
<td>94c7</td>
<td>Embedded audio delay A/B/Off</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td>Delay A=1  Delay B=2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_BACKUP_INPUT_A_AUDIO_PAIR_1</td>
<td>940e</td>
<td>Require Embedded audio present</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_BACKUP_INPUT_A_AUDIO_PAIR_2</td>
<td>940f</td>
<td>Require Embedded audio present</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_BACKUP_INPUT_A_AUDIO_PAIR_3</td>
<td>9410</td>
<td>Require Embedded audio present</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_BACKUP_INPUT_A_AUDIO_PAIR_4</td>
<td>9411</td>
<td>Require Embedded audio present</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_BACKUP_INPUT_A_AUDIO_PAIR_5</td>
<td>9412</td>
<td>Require Embedded audio present</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_BACKUP_INPUT_A_AUDIO_PAIR_6</td>
<td>9413</td>
<td>Require Embedded audio present</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_BACKUP_INPUT_A_AUDIO_PAIR_7</td>
<td>9414</td>
<td>Require Embedded audio present</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_BACKUP_INPUT_A_AUDIO_PAIR_8</td>
<td>9415</td>
<td>Require Embedded audio present</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_BACKUP_INPUT_A_ERR_OK</td>
<td>940c</td>
<td>Require no CRC/EDH errors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_BACKUP_INPUT_A_STD_OK</td>
<td>940d</td>
<td>Require valid input standard</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_BACKUP_INPUT_B_AUDIO_PAIR_1</td>
<td>9418</td>
<td>Require Embedded audio present</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_BACKUP_INPUT_B_AUDIO_PAIR_2</td>
<td>9419</td>
<td>Require Embedded audio present</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_BACKUP_INPUT_B_AUDIO_PAIR_3</td>
<td>941a</td>
<td>Require Embedded audio present</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_BACKUP_INPUT_B_AUDIO_PAIR_4</td>
<td>941b</td>
<td>Require Embedded audio present</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_BACKUP_INPUT_B_AUDIO_PAIR_5</td>
<td>941c</td>
<td>Require Embedded audio present</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_BACKUP_INPUT_B_AUDIO_PAIR_6</td>
<td>941d</td>
<td>Require Embedded audio present</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parameter</td>
<td>Offset</td>
<td>Unit</td>
<td>Description</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>--------</td>
<td>------</td>
<td>-----------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_BACKUP_INPUT_B_AUDIO_PAIR_7</td>
<td>941e</td>
<td></td>
<td>Require Embedded audio present</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_BACKUP_INPUT_B_AUDIO_PAIR_8</td>
<td>941f</td>
<td></td>
<td>Require Embedded audio present</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_BACKUP_INPUT_B_ERR_OK</td>
<td>9416</td>
<td></td>
<td>Require no CRC/EDH errors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_BACKUP_INPUT_B_STD_OK</td>
<td>9417</td>
<td></td>
<td>Require valid input standard</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_INP_BACKUP_ENABLE</td>
<td>80a3</td>
<td>32931</td>
<td>Enable video input auto-backup</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_HD_CC_FOLLOW_DEC</td>
<td>1fc6</td>
<td>08134</td>
<td>Default=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_ANIMATED.Caption</td>
<td>8022</td>
<td>32802</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM.Caption.Enable</td>
<td>8020</td>
<td>32800</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM.Caption.Mode</td>
<td>8021</td>
<td>32801</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM.Caption.Text</td>
<td>8023</td>
<td>32803</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_POSITION_HD_CC_OUT</td>
<td>203c</td>
<td></td>
<td>Default=0 Min=0 Max=1023 Divisor=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_OUT_STD2</td>
<td>80ec</td>
<td>33004</td>
<td>Out Std</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Default=1 1080i=1 720p=2 SD=3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM.OUT_RATE</td>
<td>80f4</td>
<td>33012</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_YC_DELAY</td>
<td>80ed</td>
<td>33005</td>
<td>YC Delay</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Default=0 Min=-10 Max=10 Divisor=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_ENABLE_CAPTIONS</td>
<td>2039</td>
<td>08249</td>
<td>Default=0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM.VI.AFD_IN_ENABLE</td>
<td>954f</td>
<td>38223</td>
<td>Default=0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM.VI.AFD_OUT_ENABLE</td>
<td>9559</td>
<td>38233</td>
<td>Default=0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM.VI.SMPTE_IN_ENABLE</td>
<td>954e</td>
<td>38222</td>
<td>Default=0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM.VI.SMPTE_OUT_ENABLE</td>
<td>9558</td>
<td>38232</td>
<td>Default=0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM.WSS_AFD_IN_ENABLE</td>
<td>954d</td>
<td>38221</td>
<td>Default=0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM.WSS.AFD_OUT_ENABLE</td>
<td>9557</td>
<td>38231</td>
<td>Default=0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM.WSS.AUTO.MODIFY_ENABLE</td>
<td>9567</td>
<td>38247</td>
<td>Default=0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM.WSS.ETSI_IN_ENABLE</td>
<td>954c</td>
<td>38220</td>
<td>Default=0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM.WSS.ETSI_OUT_ENABLE</td>
<td>9556</td>
<td>38230</td>
<td>Default=0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
IQUDC00

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>COM_WSS_AFD_16_9_OUTPUT</td>
<td>9566</td>
<td>38246</td>
<td>Default=8 16:9 - Coded Frame=8</td>
</tr>
<tr>
<td>COM_WSS_VI_PRIORITY</td>
<td>956a</td>
<td>38250</td>
<td>Default=0 WSS=0 VI=1</td>
</tr>
<tr>
<td>COM_WSS_OUT_ASPECT</td>
<td>956b</td>
<td>38251</td>
<td>Default=0 Output 4:3=0 Output 16:9=1</td>
</tr>
<tr>
<td>COM_SD_CC_FOLLOW_DEC</td>
<td>1fc7</td>
<td>08135</td>
<td>Default=1</td>
</tr>
<tr>
<td>COM_POSITION_SD_CC_OUT</td>
<td>203d</td>
<td>08253</td>
<td>Default=21 Min=7 Max=23 Divisor=1</td>
</tr>
<tr>
<td>COM_POSITION_SD_CC_IN</td>
<td>203e</td>
<td>08254</td>
<td>Default=21 Min=7 Max=23 Divisor=1</td>
</tr>
<tr>
<td>COM_LOG_DISPLAY_INPUT_1_AFD</td>
<td>8cbb</td>
<td>36027</td>
<td>Default=0 Divisor=1</td>
</tr>
<tr>
<td>COM_LOG_DISPLAY_INPUT_1_ASPECT</td>
<td>8cba</td>
<td>36026</td>
<td>Default=0 Divisor=1</td>
</tr>
<tr>
<td>COM_LOG_DISPLAY_INPUT_2_AFD</td>
<td>8cd9</td>
<td>36057</td>
<td>Default=0 Divisor=1</td>
</tr>
<tr>
<td>COM_LOG_DISPLAY_INPUT_2_ASPECT</td>
<td>8cd8</td>
<td>36056</td>
<td>Default=0 Divisor=1</td>
</tr>
<tr>
<td>COM_LOG_DISPLAY_OUTPUT_1_AFD</td>
<td>9051</td>
<td>36945</td>
<td>Default=0 Divisor=1</td>
</tr>
<tr>
<td>COM_LOG_DISPLAY_OUTPUT_1_ASPECT</td>
<td>9050</td>
<td>36944</td>
<td>Default=0 Divisor=1</td>
</tr>
<tr>
<td>COM_LOG_ENABLE_INPUT_2_AFD</td>
<td>88f1</td>
<td>35057</td>
<td>Default=1</td>
</tr>
<tr>
<td>COM_LOG_ENABLE_INPUT_2_ASPECT</td>
<td>88f0</td>
<td>35056</td>
<td>Default=1</td>
</tr>
<tr>
<td>COM_LOG_ENABLE_OUTPUT_1_AFD</td>
<td>8c69</td>
<td>35945</td>
<td>Default=1</td>
</tr>
<tr>
<td>COM_LOG_ENABLE_OUTPUT_1_ASPECT</td>
<td>8c68</td>
<td>35944</td>
<td>Default=1</td>
</tr>
</tbody>
</table>
System Memories

COM_DISPLAY_TYPE  8005  32773  Select Info display to show
Default=0  Video Status=0

Wide Screen Signal=2  Audio Status=1

COM_GPI1_ACT  8d19  36121  GPI-1 Input action
Default=0  Freeze=0  Pattern=1  Black=2  MonoChrm Y Only=4  MonoChrm CbCr Only=5

Use I/P Ref=6  Use Ext Ref=7  Select Inp 1=8  Select Inp 2=9  Select Input=26  Select Backup=27

Memory 1=10  Memory 2=11  Memory 3=12  Memory 4=13  Memory 5=14  Memory 6=15
Memory 7=16  Memory 8=17  Memory 9=18  Memory 10=19  Memory 11=20  Memory 12=21
Memory 13=22  Memory 14=23  Memory 15=24  Memory 16=25

COM_GPI2_ACT  8d23  36131  GPI-2 Input action
Default=0  Freeze=0  Pattern=1  Black=2

MonoChrm Y Only=4
MonoChrm CbCr Only=5  Use I/P Ref=6

Use Ext Ref=7  Select Inp 1=8
Select Inp 2=9  Select Input=26
Select Backup=27  Memory 1=10
Memory 2=11  Memory 3=12
Memory 4=13  Memory 5=14
Memory 6=15  Memory 7=16
Memory 8=17  Memory 9=18
Memory 10=19  Memory 11=20
Memory 12=21  Memory 13=22
Memory 14=23  Memory 15=24
Memory 16=25

COM_GPIO_TIMER_ACTIVE_HIGH  8d1d  36125  GPI PWM Timer Active High
Default=1

COM_GPIO1_INVERT  8d1b  36123  GPI-1 Port Invert
Default=0

COM_GPIO1_IO  8d18  36120  GPIO-1 Input/Output
Input (GPI1)=1  Output (GPO1)=2
Default=0  Unused=0

COM_GPIO2_INVERT  8d25  36133  GPI-2 Port Invert
Default=0

COM_GPIO2_IO  8d22  36130  GPIO-2 Input/Output
Input (GPI2)=1  Output (GPO2)=2
Default=0  Unused=0

COM_GPO1_ACT  8d1a  36122  GPI-1 Output action
Default=0  Input 1 OK=0  Input 2 OK=1  Reference OK=2
Black=5  Monochrome=6

COM_GPO2_ACT  8d24  36132  GPI-2 Output action
Default=0  Input 1 OK=0  Input 2 OK=1  Reference OK=2
Black=5  Monochrome=6

COM_MEM_RENAME1  9092  37010  Set name for a memory

COM_MEM_RENAME10  909b  37019  Set name for a memory
COM_MEM_RENAME11  909c  37020  Set name for a memory
COM_MEM_RENAME12  909d  37021  Set name for a memory
COM_MEM_RENAME13  909e  37022  Set name for a memory
COM_MEM_RENAME14  909f  37023  Set name for a memory
COM_MEM_RENAME15  90a0  37024  Set name for a memory
COM_MEM_RENAME16  90a1  37025  Set name for a memory
COM_MEM_RENAME2  9093  37011  Set name for a memory
COM_MEM_RENAME3  9094  37012  Set name for a memory
COM_MEM_RENAME4  9095  37013  Set name for a memory
IQUDC00

COM_MEM_RENAME5 9096 37014 Set name for a memory
COM_MEM_RENAME6 9097 37015 Set name for a memory
COM_MEM_RENAME7 9098 37016 Set name for a memory
COM_MEM_RENAME8 9099 37017 Set name for a memory
COM_MEM_RENAME9 909a 37018 Set name for a memory

COM_ON_LOSS 8107 33031 What to do on input loss
Default=2 Freeze Field=5 Black=2
Input=3 Out Pattern=4

COM_REF_HTIM 80fd 33021 Reference horizontal timing
Default=0 Min=0 Max=5000 Divisor=1

COM_REF_SRC 80fc 33020 Reference source: Free/Ext/Input
Default=2 Lock to Reference=1
Lock to Ref.(Mis=I/P)=3 Lock to Input=2

COM_REF_VTIM 80fe 33022 Reference vertical timing
Default=0 Min=0 Max=1500 Divisor=1

COM_RT_DISABLED 8d08 36104 Disable all rolltrack outputs
Default=1

COM_VALID_1080_25I 808e 32910 Select valid input standards
Default=1

COM_VALID_1080_29I 8097 32919 Select valid input standards
Default=1

COM_VALID_525_29I 809e 32926 Select valid input standards
Default=1

COM_VALID_625_25I 809d 32925 Select valid input standards
Default=1

COM_VALID_720_50P 809a 32922 Select valid input standards
Default=1

COM_VALID_720_59P 809c 32924 Select valid input standards
Default=1

COM_BACKUP_RULE_1_DELAY 9470 38000 Delay before rule activated
Default=0 Min=0 Max=100 Divisor=10

COM_BACKUP_RULE_1_MODE 947a 38010 Backup mode for rule
Default=0

COM_BACKUP_RULE_1_SEL_INPUT 9484 38020 Input selected by rule
Default=1 Input 1=1 Input 2=2

COM_BACKUP_RULE_2_DELAY 9471 38001 Delay before rule activated
Default=0 Min=0 Max=100 Divisor=10

COM_BACKUP_RULE_2_MODE 947b 38011 Backup mode for rule
Default=0

COM_BACKUP_RULE_2_SEL_INPUT 9485 38021 Input selected by rule
Default=1 Input 1=1 Input 2=2

COM_BACKUP_RULE_3_DELAY 9472 38002 Delay before rule activated
Default=0 Min=0 Max=100 Divisor=10

COM_BACKUP_RULE_3_MODE 947c 38012 Backup mode for rule
Default=0

COM_BACKUP_RULE_3_SEL_INPUT 9486 38022 Input selected by rule
Default=1 Input 1=1 Input 2=2
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value 1</th>
<th>Value 2</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>COM_BACKUP_RULE_3_SEL_INPUT</td>
<td></td>
<td></td>
<td>Input selected by rule</td>
</tr>
<tr>
<td>Default</td>
<td></td>
<td></td>
<td>Input 1 = 1, Input 2 = 2</td>
</tr>
<tr>
<td>COM_BACKUP_RULE_4_DELAY</td>
<td></td>
<td></td>
<td>Delay before rule activated</td>
</tr>
<tr>
<td>Default</td>
<td></td>
<td></td>
<td>Min = 0, Max = 100, Divisor = 10</td>
</tr>
<tr>
<td>COM_BACKUP_RULE_4_MODE</td>
<td></td>
<td></td>
<td>Backup mode for rule</td>
</tr>
<tr>
<td>Default</td>
<td></td>
<td></td>
<td>Off = 0, Input 1 is OK = 1, Input 2 is OK = 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Input 1 in Error = 3, Input 2 in Error = 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>GPI 1 Open = 5, GPI 2 Open = 7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>GPI 1 Closed = 6, GPI 2 Closed = 8</td>
</tr>
<tr>
<td>COM_BACKUP_RULE_4_SEL_INPUT</td>
<td></td>
<td></td>
<td>Input selected by rule</td>
</tr>
<tr>
<td>Default</td>
<td></td>
<td></td>
<td>Input 1 = 1, Input 2 = 2</td>
</tr>
<tr>
<td>COM_BACKUP_RULE_5_DELAY</td>
<td></td>
<td></td>
<td>Delay before rule activated</td>
</tr>
<tr>
<td>Default</td>
<td></td>
<td></td>
<td>Min = 0, Max = 100, Divisor = 10</td>
</tr>
</tbody>
</table>
### COM_BACKUP_RULE_5_MODE

- **Default=0**
- **Off=0**
- **Input 1 is OK=1**
- **Input 2 is OK=2**
- **Input 1 in Error=3**
- **Input 2 in Error=4**
- **GPI 1 Open=5**
- **GPI 1 Closed=6**
- **GPI 2 Open=7**
- **GPI 2 Closed=8**

### COM_BACKUP_RULE_5_SEL_INPUT

- **Default=1**
- **Input 1=1**
- **Input 2=2**

### COM_SCALER_SIZE

- **Default=1000**
- **Min=600**
- **Max=2000**
- **Divisor=10**

### COM_SCALER_ARC

- **Default=1000**
- **Min=600**
- **Max=2000**
- **Divisor=10**

### COM_SCALER_TILT

- **Default=0**
- **Min=-750**
- **Max=750**
- **Divisor=10**

### COM_SCALER_PAN

- **Default=0**
- **Min=-750**
- **Max=750**
- **Divisor=10**

### COM_SCALER_ORIGIN

- **Default=1**
- **Top Left=0**
- **Center=1**

### COM_SCALER_CROPL

- **Default=0**
- **Min=0**
- **Max=4095**
- **Divisor=1**

### COM_SCALER_CROPR

- **Default=0**
- **Min=0**
- **Max=4095**
- **Divisor=1**

### COM_SCALER_CROPT

- **Default=0**
- **Min=0**
- **Max=2047**
- **Divisor=1**

### COM_SCALER_CROPB

- **Default=0**
- **Min=0**
- **Max=2047**
- **Divisor=1**

### COM_SCALER_BORDERL

- **Default=0**
- **Min=0**
- **Max=4095**
- **Divisor=1**

### COM_SCALER_BORDERR

- **Default=0**
- **Min=0**
- **Max=4095**
- **Divisor=1**

### COM_SCALER_BORDERT

- **Default=0**
- **Min=0**
- **Max=2047**
- **Divisor=1**

### COM_SCALER_BORDERB

- **Default=0**
- **Min=0**
- **Max=2047**
- **Divisor=1**

### COM_SCALER_BORDERRD

- **Default=127**
- **Min=0**
- **Max=255**
- **Divisor=1**

### COM_SCALER_BORDERGR

- **Default=127**
- **Min=0**
- **Max=255**
- **Divisor=1**

### COM_SCALER_BORDERBL

- **Default=127**
- **Min=0**
- **Max=255**
- **Divisor=1**

### COM_SCALER_ARC_NAME1

- **Default=1**

### COM_SCALER_ARC_NAME2

- **Default=1**

### COM_SCALER_ARC_NAME3

- **Default=1**

### COM_SCALER_ARC_NAME4

- **Default=1**

### COM_SCALER_ARC_NAME5

- **Default=1**

### COM_SCALER_ARC_NAME6

- **Default=1**

### COM_SCALER_ARC_NAME7

- **Default=1**

### COM_SCALER_ARC_NAME8

- **Default=1**

### COM_SCALER_ARC_NAME9

- **Default=1**

### COM_SCALER_SEL_ARC_PRESETS

- **Default=1**
- **Display Memory 1=1**
- **Display Memory 2=2**
- **Display Memory 3=3**
- **Display Memory 4=4**
- **Display Memory 5=5**
- **Display Memory 6=6**
- **Display Memory 7=7**
- **Display Memory 8=8**
- **Display Memory 9=9**
- **Display Memory 10=10**
- **Display Memory 11=11**
- **Display Memory 12=12**
- **Display Memory 13=13**
- **Display Memory 14=14**
- **Display Memory 15=15**
- **Display Memory 16=16**
- **Display Memory 17=17**
- **Display Memory 18=18**
- **Display Memory 19=19**
- **Display Memory 20=20**
- **Display Memory 21=21**
- **Display Memory 22=22**
- **Display Memory 23=23**
- **Display Memory 24=24**
- **Display Memory 25=25**
- **Display Memory 26=26**
- **Display Memory 27=27**
- **Display Memory 28=28**
- **Display Memory 29=29**
- **Display Memory 30=30**
- **Display Memory 31=31**
- **Display Memory 32=32**
- **Display Memory 33=33**
- **Display Memory 34=34**
- **Display Memory 35=35**
- **Display Memory 36=36**
- **Display Memory 37=37**
- **Display Memory 38=38**
- **Display Memory 39=39**
- **Display Memory 40=40**

### COM_SCALER_FILT_ENHV

- **Default=0**
- **Min=0**
- **Max=3**
- **Divisor=1**

### COM_SCALER_FILT_ENHH

- **Default=0**
- **Min=0**
- **Max=3**
- **Divisor=1**

### COM_SCALAR_COLOR_COR

- **Default=0**
- **Auto=0**
- **None=1**
- **SD to HD=2**
- **HD to SD=3**

### COM_SCALER_FILM_VIDEO

- **Default=1**
- **Auto=0**
- **Normal (Video)=1**
- **Sports=2**

### COM_SCALER_SOFT_SYNC

- **Minimum Delay=3**

### COM_ENABLE_608

- **Default=1**

### COM_ENABLE_708

- **Default=1**

### COM_ENABLE_608

- **Default=1**

### COM_ENABLE_708

- **Default=1**

---

**UDC00OPS 6-Mar-09 www.snellwilcox.com Version 1 Issue 8 N17.87**
COM_REF_FREE_RUN_FREQ 80ab 32939
COM_LOG_ENABLE_INPUT_1_TYPE 88c9 35017 Enable/Disable logging for Input 1 Type
   Default=1
COM_LOG_ENABLE_INPUT_1_STANDARD 88c8 35016 Enable/Disable logging for Input 1 Std.
   Default=1
COM_LOG_ENABLE_INPUT_1_SDI_ERRS 88ba 35002 Enable/Disable logging for Input 1 Errors
   Default=1
COM_LOG_ENABLE_INPUT_1_SDI_ERRSEC 88bb 35003 Enable/Disable logging for Input 1 ErrSecs
ANC Errors
   Default=1
COM_LOG_ENABLE_INPUT_1_SDI_ANC_ERRS 88b8 35000 Enable/Disable logging for Input 1 ANC Errors
   Default=1
COM_LOG_ENABLE_INPUT_1_SDI_ANC_ERRSECS 88b9 35001 Enable/Disable logging for Input 1 ANC ErrSecs
   Default=1
COM_LOG_ENABLE_INPUT_1_STATE 88bd 35005 Enable/Disable logging for Input 1 Status
   Default=1
COM_LOG_ENABLE_INPUT_1_EMBEDDED_AUDIO_1_STATE 88be 35006 Enable/Disable logging for Input 1 Emb.Pair 1 state
   Default=1
COM_LOG_ENABLE_INPUT_1_EMBEDDED_AUDIO_2_STATE 88bf 35007 Enable/Disable logging for Input 1 Emb.Pair 2 state
   Default=1
COM_LOG_ENABLE_INPUT_1_EMBEDDED_AUDIO_3_STATE 88c0 35008 Enable/Disable logging for Input 1 Emb.Pair 3 state
   Default=1
COM_LOG_ENABLE_INPUT_1_EMBEDDED_AUDIO_4_STATE 88c1 35009 Enable/Disable logging for Input 1 Emb.Pair 4 state
   Default=1
COM_LOG_ENABLE_INPUT_1_EMBEDDED_AUDIO_5_STATE 88c2 35010 Enable/Disable logging for Input 1 Emb.Pair 5 state
   Default=1
COM_LOG_ENABLE_INPUT_1_EMBEDDED_AUDIO_6_STATE 88c3 35011 Enable/Disable logging for Input 1 Emb.Pair 6 state
   Default=1
COM_LOG_ENABLE_INPUT_1_EMBEDDED_AUDIO_7_STATE 88c4 35012 Enable/Disable logging for Input 1 Emb.Pair 7 state
   Default=1
COM_LOG_ENABLE_INPUT_1_EMBEDDED_AUDIO_8_STATE 88c5 35013 Enable/Disable logging for Input 1 Emb.Pair 8 state
   Default=1
COM_LOG_ENABLE_INPUT_2_EMBEDDED_AUDIO_1_STATE 88dc 35036 Enable/Disable logging for Input 2 Emb.Pair 1 state
   Default=1
COM_LOG_ENABLE_INPUT_2_EMBEDDED_AUDIO_2_STATE 88dd 35037 Enable/Disable logging for Input 2 Emb.Pair 2 state
   Default=1
COM_LOG_ENABLE_INPUT_2_EMBEDDED_AUDIO_3_STATE 88de 35038 Enable/Disable logging for Input 2 Emb.Pair 3 state
Default=1

COM_LOG_ENABLE_INPUT_2_EMBEDDED_AUDIO_4_STATE 88df 35039 Enable/Disable logging for Input 2 Emb.Pair 4 state
Default=1

COM_LOG_ENABLE_INPUT_2_EMBEDDED_AUDIO_5_STATE 88e0 35040 Enable/Disable logging for Input 2 Emb.Pair 5 state
Default=1

COM_LOG_ENABLE_INPUT_2_EMBEDDED_AUDIO_6_STATE 88e1 35041 Enable/Disable logging for Input 2 Emb.Pair 6 state
Default=1

COM_LOG_ENABLE_INPUT_2_EMBEDDED_AUDIO_7_STATE 88e2 35042 Enable/Disable logging for Input 2 Emb.Pair 7 state
Default=1

COM_LOG_ENABLE_INPUT_2_EMBEDDED_AUDIO_8_STATE 88e3 35043 Enable/Disable logging for Input 2 Emb.Pair 8 state
Default=1

COM_LOG_ENABLE_INPUT_1_EMBEDDED_AUDIO_1_TYPE 88ca 35018 Enable/Disable logging for Input 1 Emb.Pair 1 type
Default=1

COM_LOG_ENABLE_INPUT_1_EMBEDDED_AUDIO_2_TYPE 88cb 35019 Enable/Disable logging for Input 1 Emb.Pair 2 type
Default=1

COM_LOG_ENABLE_INPUT_1_EMBEDDED_AUDIO_3_TYPE 88cc 35020 Enable/Disable logging for Input 1 Emb.Pair 3 type
Default=1

COM_LOG_ENABLE_INPUT_1_EMBEDDED_AUDIO_4_TYPE 88cd 35021 Enable/Disable logging for Input 1 Emb.Pair 4 type
Default=1

COM_LOG_ENABLE_INPUT_1_EMBEDDED_AUDIO_5_TYPE 88ce 35022 Enable/Disable logging for Input 1 Emb.Pair 5 type
Default=1

COM_LOG_ENABLE_INPUT_1_EMBEDDED_AUDIO_6_TYPE 88cf 35023 Enable/Disable logging for Input 1 Emb.Pair 6 type
Default=1

COM_LOG_ENABLE_INPUT_1_EMBEDDED_AUDIO_7_TYPE 88d0 35024 Enable/Disable logging for Input 1 Emb.Pair 7 type
Default=1

COM_LOG_ENABLE_INPUT_1_EMBEDDED_AUDIO_8_TYPE 88d1 35025 Enable/Disable logging for Input 1 Emb.Pair 8 type
Default=1

COM_LOG_ENABLE_INPUT_2_EMBEDDED_AUDIO_1_TYPE 88e8 35048 Enable/Disable logging for Input 2 Emb.Pair 1 type
Default=1

COM_LOG_ENABLE_INPUT_2_EMBEDDED_AUDIO_2_TYPE 88e9 35049 Enable/Disable logging for Input 2 Emb.Pair 2 type
Default=1

COM_LOG_ENABLE_INPUT_2_EMBEDDED_AUDIO_3_TYPE 88ea 35050 Enable/Disable logging for Input 2 Emb.Pair 3 type
Default=1

COM_LOG_ENABLE_INPUT_2_EMBEDDED_AUDIO_4_TYPE 88eb 35051 Enable/Disable logging for Input 2 Emb.Pair 4 type
Default=1

COM_LOG_ENABLE_INPUT_2_EMBEDDED_AUDIO_5_TYPE 88ec 35052 Enable/Disable logging for Input 2 Emb.Pair 5 type
Default=1

COM_LOG_ENABLE_INPUT_2_EMBEDDED_AUDIO_6_TYPE 88ed 35053 Enable/Disable logging for Input 2 Emb.Pair 6 type
Default=1

COM_LOG_ENABLE_INPUT_2_EMBEDDED_AUDIO_7_TYPE 88ee 35054 Enable/Disable logging for Input 2 Emb.Pair 7 type
Default=1
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>COM_LOG_ENABLE_INPUT_2_EMBEDDED_AUDIO_8_TYPE</td>
<td>88ef</td>
<td>Enable/Disable logging for Input 2 Emb.Pair 8 type</td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_OUTPUT_1_EMBEDDED_AUDIO_1_STATE</td>
<td>8c50</td>
<td>Enable/Disable logging for Output Emb.Pair 1 state</td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_OUTPUT_1_EMBEDDED_AUDIO_2_STATE</td>
<td>8c51</td>
<td>Enable/Disable logging for Output Emb.Pair 2 state</td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_OUTPUT_1_EMBEDDED_AUDIO_3_STATE</td>
<td>8c52</td>
<td>Enable/Disable logging for Output Emb.Pair 3 state</td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_OUTPUT_1_EMBEDDED_AUDIO_4_STATE</td>
<td>8c53</td>
<td>Enable/Disable logging for Output Emb.Pair 4 state</td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_OUTPUT_1_EMBEDDED_AUDIO_5_STATE</td>
<td>8c54</td>
<td>Enable/Disable logging for Output Emb.Pair 5 state</td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_OUTPUT_1_EMBEDDED_AUDIO_6_STATE</td>
<td>8c55</td>
<td>Enable/Disable logging for Output Emb.Pair 6 state</td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_OUTPUT_1_EMBEDDED_AUDIO_7_STATE</td>
<td>8c56</td>
<td>Enable/Disable logging for Output Emb.Pair 7 state</td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_OUTPUT_1_EMBEDDED_AUDIO_8_STATE</td>
<td>8c57</td>
<td>Enable/Disable logging for Output Emb.Pair 8 state</td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_OUTPUT_1_EMBEDDED_AUDIO_1_TYPE</td>
<td>8c5a</td>
<td>Enable/Disable logging for Output Emb.Audio 1-L Level</td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_OUTPUT_1_EMBEDDED_AUDIO_2_TYPE</td>
<td>8c5b</td>
<td>Enable/Disable logging for Output Emb.Audio 1-R Level</td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_OUTPUT_1_EMBEDDED_AUDIO_3_TYPE</td>
<td>8c5c</td>
<td>Enable/Disable logging for Output Emb.Audio 2-L Level</td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_OUTPUT_1_EMBEDDED_AUDIO_4_TYPE</td>
<td>8c5d</td>
<td>Enable/Disable logging for Output Emb.Audio 2-R Level</td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_OUTPUT_1_EMBEDDED_AUDIO_5_TYPE</td>
<td>8c5e</td>
<td>Enable/Disable logging for Output Emb.Audio 3-L Level</td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_OUTPUT_1_EMBEDDED_AUDIO_6_TYPE</td>
<td>8c5f</td>
<td>Enable/Disable logging for Output Emb.Audio 3-R Level</td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_OUTPUT_1_EMBEDDED_AUDIO_7_TYPE</td>
<td>8c60</td>
<td>Enable/Disable logging for Output Emb.Audio 4-L Level</td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_OUTPUT_1_EMBEDDED_AUDIO_8_TYPE</td>
<td>8c61</td>
<td>Enable/Disable logging for Output Emb.Audio 4-R Level</td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_OUTPUT_1_EMBEDDED_AUDIO_1_1_LEVEL</td>
<td>8c3c</td>
<td>Enable/Disable logging for Output Emb.Audio 1-L Level</td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_OUTPUT_1_EMBEDDED_AUDIO_1_2_LEVEL</td>
<td>8c3d</td>
<td>Enable/Disable logging for Output Emb.Audio 1-R Level</td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_OUTPUT_1_EMBEDDED_AUDIO_2_1_LEVEL</td>
<td>8c3e</td>
<td>Enable/Disable logging for Output Emb.Audio 2-L Level</td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_OUTPUT_1_EMBEDDED_AUDIO_2_2_LEVEL</td>
<td>8c3f</td>
<td>Enable/Disable logging for Output Emb.Audio 2-R Level</td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Field Name</td>
<td>Code</td>
<td>Value</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>-------</td>
<td>--------</td>
</tr>
<tr>
<td>COM_LOG_ENABLE_OUTPUT_1_EMBEDDED_AUDIO_3_1_LEVEL</td>
<td>8c40</td>
<td>35904</td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_OUTPUT_1_EMBEDDED_AUDIO_3_2_LEVEL</td>
<td>8c41</td>
<td>35905</td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_OUTPUT_1_EMBEDDED_AUDIO_4_1_LEVEL</td>
<td>8c42</td>
<td>35906</td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_OUTPUT_1_EMBEDDED_AUDIO_4_2_LEVEL</td>
<td>8c43</td>
<td>35907</td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_OUTPUT_1_EMBEDDED_AUDIO_5_1_LEVEL</td>
<td>8c44</td>
<td>35908</td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_OUTPUT_1_EMBEDDED_AUDIO_5_2_LEVEL</td>
<td>8c45</td>
<td>35909</td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_OUTPUT_1_EMBEDDED_AUDIO_6_1_LEVEL</td>
<td>8c46</td>
<td>35910</td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_OUTPUT_1_EMBEDDED_AUDIO_6_2_LEVEL</td>
<td>8c47</td>
<td>35911</td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_OUTPUT_1_EMBEDDED_AUDIO_7_1_LEVEL</td>
<td>8c48</td>
<td>35912</td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_OUTPUT_1_EMBEDDED_AUDIO_7_2_LEVEL</td>
<td>8c49</td>
<td>35913</td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_OUTPUT_1_EMBEDDED_AUDIO_8_1_LEVEL</td>
<td>8c4a</td>
<td>35914</td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_OUTPUT_1_EMBEDDED_AUDIO_8_2_LEVEL</td>
<td>8c4b</td>
<td>35915</td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_OUTPUT_1_STATE</td>
<td>8c65</td>
<td>35941</td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_OUTPUT_1_TYPE</td>
<td>8c66</td>
<td>35942</td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_OUTPUT_1_STANDARD</td>
<td>8c64</td>
<td>35940</td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_OUTPUT_1</td>
<td>8c67</td>
<td>35943</td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_REFERENCE_1_TYPE</td>
<td>8c9b</td>
<td>35995</td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_REFERENCE_1_STATE</td>
<td>88bc</td>
<td>35004</td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_REFERENCE_1_STANDARD</td>
<td>88c6</td>
<td>35014</td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_OS_VERSION</td>
<td>8c99</td>
<td>35993</td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_BUILD_NUMBER</td>
<td>8c96</td>
<td>35990</td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_HARDWARE_VERSION</td>
<td>8c98</td>
<td>35992</td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_FIRMWARE_VERSION</td>
<td>8c97</td>
<td>35991</td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_UPTIME</td>
<td>8c9a</td>
<td>35994</td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_SN</td>
<td>88c7</td>
<td>35015</td>
</tr>
<tr>
<td>Default=1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parameter</td>
<td>Value</td>
<td>Default</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>COM_WSS_AFD_INPUT 9560 38240</td>
<td></td>
<td>Default=8</td>
</tr>
<tr>
<td>4:3 - 4:3=9 4:3 - 16:9=10 4:3 - 14:9=114:3 reserved=12 4:3 - 4:3 SP 14:9=13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4:3 - 16:9 SP 14:9=14 4:3 - 16:9 SP 4:3=15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4:3 - box 16:9 top=2 4:3 - box 14:9 top=3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4:3 - box&gt;16:9 ctr=4 4:3 - Unknown=16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16:9 - Coded Frame=136 16:9 - 4:3=137</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16:9 - 16:9=138 16:9 - 14:9=139</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16:9 reserved=140 16:9 - 4:3 SP 14:9=141</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16:9 - 16:9 SP 14:9=142 16:9 - 16:9 SP 4:3=143</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16:9 - box 16:9 top=130 16:9 - box 14:9 top=131</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16:9 - box&gt;16:9 ctr=132 16:9 - Unknown=144</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_POSITION_VI_FOLLOW_IN 956c 38252</td>
<td></td>
<td>Default=1</td>
</tr>
<tr>
<td>COM_POSITION_VI_IN 956d 38253</td>
<td></td>
<td>Default=11</td>
</tr>
<tr>
<td>COM_POSITION_VI_OUT 956e 38254</td>
<td></td>
<td>Default=11</td>
</tr>
<tr>
<td>COM_POSITION_WSS_FOLLOW_IN 956f 38255</td>
<td></td>
<td>Default=1</td>
</tr>
<tr>
<td>COM_POSITION_WSS_IN 9570 38256</td>
<td></td>
<td>Default=23</td>
</tr>
<tr>
<td>COM_POSITION_WSS_OUT 9571 38257</td>
<td></td>
<td>Default=23</td>
</tr>
<tr>
<td>COM_ARC_LAST_DISP_MEMORY 953e 38206</td>
<td></td>
<td>Default=0</td>
</tr>
<tr>
<td>COM_LAST_MEMORY 90f0 37104</td>
<td></td>
<td>Default=0</td>
</tr>
<tr>
<td>COM_SEL_MEMORY 90ed 37101</td>
<td></td>
<td>Default=1</td>
</tr>
<tr>
<td>COM_LOG_ENABLE_INPUT_1_ASDPECT 88d2 35026</td>
<td></td>
<td>Enable/Disable logging for Input 1 Aspect</td>
</tr>
<tr>
<td>COM_LOG_ENABLE_INPUT_1_AFD 88d3 35027</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_INPUT_1_WSS 88f3 35059</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_INPUT_1_VI 88f2 35058</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_INPUT_2_WSS 88d5 35029</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COM_LOG_ENABLE_INPUT_2_VI 88d4 35028</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix 1 - Dolby E

What is Dolby E?

Dolby E is a digital audio technology optimized for the distribution of surround and multichannel audio through digital two-channel postproduction and broadcasting infrastructures. The Dolby E signal does not reach viewers at home. It is decoded back to baseband audio just prior to the final DTV transmission and then re-encoded into the final audio format specified by the various DTV emission systems (for example, Dolby Digital in ATSC, DVB, satellite, and cable systems; and AAC for ISDB in Japan).

With Dolby E, up to eight channels of audio, plus consumer and professional metadata, can be distributed via any stereo (AES/EBU) channel or recorded onto two audio tracks of conventional digital video tapes, video servers, communication links, switchers, and routers. Because the frame rate of Dolby E matches that of the video it accompanies, programs can be effortlessly switched, edited, and successfully encoded and decoded many times throughout the various stages of the broadcast chain. Audio/video synchronization is also simplified, with exactly one frame of delay added per Dolby E encode or decode stage.

Dolby E and Metadata

Metadata allows content providers unprecedented control over how a program will be reproduced in the home. Dolby E conveniently transports both consumer and professional metadata created during program production. Consumer parameters (transferred as a serial data stream from Dolby E to Dolby Digital codecs during the final audio encode, just prior to multiplexing with the digital video for final DTV transmission) are carried in both the Dolby E and the Dolby Digital bitstreams, while professional parameters are carried only in Dolby E and never reach viewers. All metadata parameters can pass unchanged through the various broadcast distribution stages.

Dolby E Partner Program

The Dolby E Partner Program provides broadcasters and systems designers with information about Dolby E compatibility of professional broadcast products. This information will help you plan your product purchase and system design decisions to create a clear path in your facility for the benefits and advantages of Dolby E technology.

© 2005 Dolby Laboratories, Inc. All rights reserved
16 and 20-bit Dolby E

And any signal path that can carry a 16- or 20-bit audio signal, SMPTE 302M compatible, can carry Dolby E.

If the supported word length is 16 bits, the two channels together will offer a bandwidth of 1.536 Mbps, which Dolby E can use to carry six discrete audio channels plus metadata (descriptive and playback-control data related to the audio).

If 20-bit word length is available, the two channels will yield a combined bit rate of 1.92 Mbps, which Dolby E uses to carry up to eight channels (perhaps a 6-channel surround mix plus a separate stereo mix), as well as metadata. A 24-bit mode is also specified for the Dolby E format but not yet implemented in encoders and decoders.

Dolby Digital and AC3

Also known as AC-3, Dolby Digital delivers up to 5.1 discrete channels of surround sound and is applied to the final broadcast transmission signal, just prior to multiplexing with the digital video. It is used extensively today on digital satellite (DBS), cable, and DTV and HDTV terrestrial services (including ATSC and DVB).

The flexibility of Dolby Digital enables broadcasters to deliver any number of audio channels, from all encompassing 5.1 surround sound down to mono audio, plus multiple-language programs and other specialized services. In the home, the Dolby Digital signal adapts to the viewer's playback system, delivering the best possible sound to all viewers, regardless of their equipment.

To enjoy the full 5.1 surround experience, viewers simply connect any DTV set-top box with a Dolby Digital output to a Dolby Digital home theater receiver.

Metadata

The key to the adaptability of Dolby Digital is metadata, "data about the audio data." Metadata is created during the production of DTV programming and is carried in the Dolby Digital bitstream. Metadata parameters maintain the "vision" of the audio created by a program's producer, make life easier for broadcasters, and give viewers the best audio DTV has to offer, whether viewers own mono, stereo, or 5.1-channel audio systems.
**Appendix 2 – Signaling Mapping**

Mapping of external signaling to internal states

Signaling supports WSS ETSI 300294 (Line 23), Video Index (SMPTE RP186), and the ARD Spec versions of both these interface formats. These are all translated into an internal Aspect Ratio & ETSI 101154 AFD format for use in the mapping tables and error handling to allow a consistent view.

This table shows how WSS ETSI (Line 23) is mapped into the internal format. Where a resulting conversion cannot be turned back into an ETSI signal the WSS output will be disabled.

ARD Spec formats directly map onto the unshaded formats. Both Video Index SMPTE and the ARD Spec variants provide for unknown active formats so a valid output signal can always be maintained. Note that ARD Spec codes are 0 to 7 rather than the AFD range of 8 upwards. Code (12) Reserved is supported in case customized legacy schemes make use of it.

<table>
<thead>
<tr>
<th>WSS ETSI Coded Aspect In</th>
<th>Internal Coded Aspect &amp; Active Format (AFD)</th>
<th>WSS ETSI Coded Aspect Out</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4:3 &amp; Unknown</td>
<td>(0) Full format 4:3</td>
</tr>
<tr>
<td></td>
<td>16:9 &amp; Unknown</td>
<td>(7) Full format 16:9</td>
</tr>
<tr>
<td>(4) Box 16:9 top</td>
<td>4:3 &amp; (2) Box 16:9 top</td>
<td>(4) Box 16:9 top</td>
</tr>
<tr>
<td></td>
<td>16:9 &amp; (2) Box 16:9 top</td>
<td>No signal</td>
</tr>
<tr>
<td>(2) Box 14:9 top</td>
<td>4:3 &amp; (3) Box 14:9 top</td>
<td>(2) Box 14:9 top</td>
</tr>
<tr>
<td></td>
<td>16:9 &amp; (3) Box 14:9 top</td>
<td>No signal</td>
</tr>
<tr>
<td>(5) Box &gt; 16:9 centre</td>
<td>4:3 &amp; (4) Box &gt;16:9 centre</td>
<td>(5) Box &gt; 16:9 centre</td>
</tr>
<tr>
<td></td>
<td>16:9 &amp; (4) Box &gt;16:9 centre</td>
<td>No signal</td>
</tr>
<tr>
<td>(0) Full format 4:3</td>
<td>4:3 &amp; (8) As coded frame</td>
<td>(0) Full format 4:3</td>
</tr>
<tr>
<td>(7) Full format 16:9</td>
<td>16:9 &amp; (8) As coded frame</td>
<td>(7) Full format 16:9</td>
</tr>
<tr>
<td></td>
<td>16:9 &amp; (9) 4:3 centre</td>
<td>(0) Full format 4:3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No signal</td>
</tr>
<tr>
<td>(3) Box 16:9 centre</td>
<td>4:3 &amp; (10) 16:9 centre</td>
<td>(3) Box 16:9 centre</td>
</tr>
<tr>
<td></td>
<td>16:9 &amp; (10) 16:9 centre</td>
<td>(7) Full format 16:9</td>
</tr>
<tr>
<td>(1) Box 14:9 centre</td>
<td>4:3 &amp; (11) 14:9 centre</td>
<td>(1) Box 14:9 centre</td>
</tr>
<tr>
<td></td>
<td>16:9 &amp; (11) 14:9 centre</td>
<td>No signal</td>
</tr>
<tr>
<td></td>
<td>4:3 &amp; (12) Reserved</td>
<td>No signal</td>
</tr>
<tr>
<td></td>
<td>16:9 &amp; (12) Reserved</td>
<td>No signal</td>
</tr>
<tr>
<td>(6) Full 4:3 shoot-and-protect 14:9 centre</td>
<td>4:3 &amp; (13) 4:3 shoot-and-protect 14:9 centre</td>
<td>(6) Full 4:3 shoot-and-protect 14:9 centre</td>
</tr>
<tr>
<td></td>
<td>16:9 &amp; (13) 4:3 shoot-and-protect 14:9 centre</td>
<td>No signal</td>
</tr>
<tr>
<td></td>
<td>4:3 &amp; (14) 16:9 shoot-and-protect 14:9 centre</td>
<td>No signal</td>
</tr>
<tr>
<td></td>
<td>16:9 &amp; (14) 16:9 shoot-and-protect 14:9 centre</td>
<td>No signal</td>
</tr>
<tr>
<td></td>
<td>4:3 &amp; (15) 16:9 shoot-and-protect 4:3 centre</td>
<td>No signal</td>
</tr>
<tr>
<td></td>
<td>16:9 &amp; (15) 16:9 shoot-and-protect 4:3 centre</td>
<td>No signal</td>
</tr>
</tbody>
</table>

Notes:

- Numbers in brackets in this column indicate ETSII line 23 codes
- Numbers in brackets in this column indicate Active Format Codes
- Numbers in brackets in this column indicate ETSII line 23 codes
### 4:3 Target Aspect Default Mapping

<table>
<thead>
<tr>
<th>Source Coded Aspect &amp; AFD</th>
<th>Default Display Memory</th>
<th>Default Target Coded Aspect &amp; AFD</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:3 - Unknown</td>
<td>&lt;none&gt;</td>
<td>4:3 - (8) As coded frame</td>
</tr>
<tr>
<td>16:9 - Unknown</td>
<td>&lt;none&gt;</td>
<td>4:3 - (8) As coded frame</td>
</tr>
<tr>
<td>4:3 - (2) Box 16:9 top</td>
<td>Full frame</td>
<td>4:3 - (2) Box 16:9 top</td>
</tr>
<tr>
<td>16:9 - (2) Box 16:9 top</td>
<td>16:9 &gt; box 4:3</td>
<td>4:3 - (10) 16:9 centre</td>
</tr>
<tr>
<td>4:3 - (3) Box 14:9 top</td>
<td>Full frame</td>
<td>4:3 - (3) Box 14:9 top</td>
</tr>
<tr>
<td>16:9 - (3) Box 14:9 top</td>
<td>16:9 box 14:9 &gt; 4:3</td>
<td>4:3 - (11) 14:9 centre</td>
</tr>
<tr>
<td>4:3 - (4) Box &gt;16:9 centre</td>
<td>Full frame</td>
<td>4:3 - (4) Box &gt;16:9 centre</td>
</tr>
<tr>
<td>16:9 - (4) Box &gt;16:9 centre</td>
<td>16:9 &gt; box 4:3</td>
<td>4:3 - (4) Box &gt;16:9 centre</td>
</tr>
<tr>
<td>4:3 - (8) As coded frame</td>
<td>Full frame</td>
<td>4:3 - (8) As coded frame</td>
</tr>
<tr>
<td>16:9 - (8) As coded frame</td>
<td>16:9 &gt; box 4:3</td>
<td>4:3 - (10) 16:9 centre</td>
</tr>
<tr>
<td>4:3 - (9) 4:3 centre</td>
<td>Full frame</td>
<td>4:3 - (9) 4:3 centre</td>
</tr>
<tr>
<td>4:3 - (10) 16:9 centre</td>
<td>Box 4:3 &gt; 4:3</td>
<td>4:3 - (10) 16:9 centre</td>
</tr>
<tr>
<td>16:9 - (10) 16:9 centre</td>
<td>Full frame</td>
<td>4:3 - (10) 16:9 centre</td>
</tr>
<tr>
<td>4:3 - (11) 14:9 centre</td>
<td>Full frame</td>
<td>4:3 - (11) 14:9 centre</td>
</tr>
<tr>
<td>16:9 - (11) 14:9 centre</td>
<td>16:9 box 14:9 &gt; 4:3</td>
<td>4:3 - (11) 14:9 centre</td>
</tr>
<tr>
<td>4:3 - (12) reserved</td>
<td>&lt;none&gt;</td>
<td>4:3 - (12) reserved</td>
</tr>
<tr>
<td>16:9 - (12) reserved</td>
<td>&lt;none&gt;</td>
<td>4:3 - (12) reserved</td>
</tr>
<tr>
<td>4:3 - (13) 4:3 shoot-and-protect 14:9 centre</td>
<td>Full frame</td>
<td>4:3 - (13) 4:3 shoot-and-protect 14:9 centre</td>
</tr>
<tr>
<td>16:9 - (13) 4:3 shoot-and-protect 14:9 centre</td>
<td>Box 4:3 &gt; 4:3</td>
<td>4:3 - (13) 4:3 shoot-and-protect 14:9 centre</td>
</tr>
<tr>
<td>4:3 - (14) 16:9 shoot-and-protect 14:9 centre</td>
<td>Full frame</td>
<td>4:3 - (14) 16:9 shoot-and-protect 14:9 centre</td>
</tr>
<tr>
<td>16:9 - (14) 16:9 shoot-and-protect 14:9 centre</td>
<td>16:9 &gt; box 4:3</td>
<td>4:3 - (14) 16:9 shoot-and-protect 14:9 centre</td>
</tr>
<tr>
<td>4:3 - (15) 16:9 shoot-and-protect 4:3 centre</td>
<td>Full frame</td>
<td>4:3 - (15) 16:9 shoot-and-protect 4:3 centre</td>
</tr>
<tr>
<td>16:9 - (15) 16:9 shoot-and-protect 4:3 centre</td>
<td>16:9 &gt; box 4:3</td>
<td>4:3 - (15) 16:9 shoot-and-protect 4:3 centre</td>
</tr>
</tbody>
</table>
### 16:9 Target Aspect Default Mapping

<table>
<thead>
<tr>
<th>Source Coded Aspect &amp; AFD</th>
<th>Default Display Memory</th>
<th>Default Target Coded Aspect &amp; AFD</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:3 - Unknown</td>
<td>&lt;none&gt;</td>
<td>16:9 - (8) As coded frame</td>
</tr>
<tr>
<td>16:9 - Unknown</td>
<td>&lt;none&gt;</td>
<td>16:9 - (8) As coded frame</td>
</tr>
<tr>
<td>4:3 - (2) Box 16:9 top</td>
<td>Box 16:9 top &gt; 16:9</td>
<td>16:9 - (8) As coded frame</td>
</tr>
<tr>
<td>16:9 - (2) Box 16:9 top</td>
<td>Full frame</td>
<td>16:9 - (2) Box 16:9 top</td>
</tr>
<tr>
<td>4:3 - (3) Box 14:9 top</td>
<td>4:3 box 14:9 top &gt; 16:9</td>
<td>16:9 - (3) Box 14:9 centre</td>
</tr>
<tr>
<td>16:9 - (3) Box 14:9 top</td>
<td>Full frame</td>
<td>16:9 - (3) Box 14:9 top</td>
</tr>
<tr>
<td>4:3 - (4) Box &gt;16:9 centre</td>
<td>Box 16:9 &gt; 16:9</td>
<td>16:9 - (4) Box &gt;16:9 centre</td>
</tr>
<tr>
<td>16:9 - (4) Box &gt;16:9 centre</td>
<td>Full frame</td>
<td>16:9 - (4) Box &gt;16:9 centre</td>
</tr>
<tr>
<td>4:3 - (8) As coded frame</td>
<td>4:3 &gt; box 16:9</td>
<td>16:9 - (9) 4:3 centre</td>
</tr>
<tr>
<td>4:3 - (9) 4:3 centre</td>
<td>4:3 &gt; box 16:9</td>
<td>16:9 - (9) 4:3 centre</td>
</tr>
<tr>
<td>16:9 - (9) 4:3 centre</td>
<td>Full frame</td>
<td>16:9 - (9) 4:3 centre</td>
</tr>
<tr>
<td>4:3 - (10) 16:9 centre</td>
<td>Box 16:9 &gt; 16:9</td>
<td>16:9 - (10) 16:9 centre</td>
</tr>
<tr>
<td>16:9 - (10) 16:9 centre</td>
<td>Full frame</td>
<td>16:9 - (10) 16:9 centre</td>
</tr>
<tr>
<td>4:3 - (11) 14:9 centre</td>
<td>4:3 box 14:9 &gt; 16:9</td>
<td>16:9 - (11) 14:9 centre</td>
</tr>
<tr>
<td>16:9 - (11) 14:9 centre</td>
<td>Full frame</td>
<td>16:9 - (11) 14:9 centre</td>
</tr>
<tr>
<td>4:3 - (12) reserved</td>
<td>&lt;none&gt;</td>
<td>16:9 - (12) reserved</td>
</tr>
<tr>
<td>16:9 - (12) reserved</td>
<td>&lt;none&gt;</td>
<td>16:9 - (12) reserved</td>
</tr>
<tr>
<td>4:3 - (13) 4:3 shoot-and-protect</td>
<td>4:3 &gt; box 16:9</td>
<td>16:9 - (13) 4:3 shoot-and-protect 14:9 centre</td>
</tr>
<tr>
<td>14:9 centre</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16:9 - (13) 4:3 shoot-and-protect</td>
<td>Full frame</td>
<td>16:9 - (13) 4:3 shoot-and-protect 14:9 centre</td>
</tr>
<tr>
<td>14:9 centre</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4:3 - (14) 16:9 shoot-and-protect</td>
<td>Box 16:9 &gt; 16:9</td>
<td>16:9 - (14) 16:9 shoot-and-protect 14:9 centre</td>
</tr>
<tr>
<td>14:9 centre</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16:9 - (14) 16:9 shoot-and-protect</td>
<td>Full frame</td>
<td>16:9 - (14) 16:9 shoot-and-protect 14:9 centre</td>
</tr>
<tr>
<td>14:9 centre</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4:3 - (15) 16:9 shoot-and-protect</td>
<td>Box 16:9 &gt; 16:9</td>
<td>16:9 - (15) 16:9 shoot-and-protect 4:3 centre</td>
</tr>
<tr>
<td>4:3 centre</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16:9 - (15) 16:9 shoot-and-protect</td>
<td>Full frame</td>
<td>16:9 - (15) 16:9 shoot-and-protect 4:3 centre</td>
</tr>
<tr>
<td>4:3 centre</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Italics in the above table indicate input signalling value combinations that make limited sense.
### Table B.3: Active Formats Illustrated

<table>
<thead>
<tr>
<th>Active_format</th>
<th>Illustration of described format</th>
<th>in 4:3 coded frame</th>
<th>in 16:9 coded frame</th>
</tr>
</thead>
<tbody>
<tr>
<td>0000 - 0001</td>
<td>reserved</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0010</td>
<td>box 16:9 (top)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0011</td>
<td>box 14:9 (top)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0100</td>
<td>box &gt; 16:9 (centre)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0101 - 0111</td>
<td>reserved</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1000</td>
<td>As the coded frame</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1001</td>
<td>4:3 (centre)</td>
<td>(see note)</td>
<td></td>
</tr>
<tr>
<td>1010</td>
<td>16:9 (centre)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1011</td>
<td>14:9 (centre)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1100</td>
<td>reserved</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1101</td>
<td>4:3 (with shoot &amp; protect 14:9 centre)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1110</td>
<td>16:9 (with shoot &amp; protect 14:9 centre)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>1111</td>
<td>16:9 (with shoot &amp; protect 4:3 centre)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:** It is recommended to use the 4:3 coded frame mode to transmit 4:3 source material rather than using a pillar box to transmit it in a 16:9 coded frame. This allows for higher horizontal resolution on both 4:3 and 16:9 sets.
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:

<table>
<thead>
<tr>
<th>Audio Delay Modules</th>
<th>Video Modules</th>
<th>Other Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>IQBAAD</td>
<td>IQD1FSY</td>
<td>ALCHEMIST MDD3000</td>
</tr>
<tr>
<td>IQBADC</td>
<td>IQDMSDS</td>
<td>CPP100 MDD550</td>
</tr>
<tr>
<td>IQBDAC</td>
<td>IQDAFS</td>
<td>CPP200 MDD560</td>
</tr>
<tr>
<td>IQBDAD</td>
<td>IQDMSDS</td>
<td>NRS500 MDD570</td>
</tr>
<tr>
<td>IQBSYN</td>
<td>IQDMSDP</td>
<td>HD5050 MDD2000</td>
</tr>
<tr>
<td>IQBADCD</td>
<td>IQDSYN</td>
<td></td>
</tr>
</tbody>
</table>

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.

- **IQD1FSY**
  - 4:2:2 RollCall connection
  - Analogue Audio
  - Delayed video by 10 ms
  - Delayed audio by 10 ms

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:

<table>
<thead>
<tr>
<th>Module</th>
<th>ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>IQBADC</td>
<td>51</td>
</tr>
<tr>
<td>IQBDAC</td>
<td>52</td>
</tr>
<tr>
<td>IQBAAD</td>
<td>53</td>
</tr>
<tr>
<td>IQBDAD</td>
<td>54</td>
</tr>
<tr>
<td>IQBSYN</td>
<td>89</td>
</tr>
<tr>
<td>IQBADCD</td>
<td>107</td>
</tr>
</tbody>
</table>
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, say, an IQD1FSY to an IQBDAD by:

1. Selecting the Setup... Menu of the IQD1FSY
2. Then selecting the Audio_Delay... Menu
3. Then choosing from Unit_1 to Unit_8
4. 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
5. Then selecting the Delay... Menu of the IQBDAD
6. Then selecting RollTrack

Example of Network Addresses with Channel Numbers and ID Numbers

<table>
<thead>
<tr>
<th>Audio delay 1</th>
<th>D1FSY 1</th>
<th>D1FSY 2</th>
<th>D1FSY 3</th>
<th>D1FSY 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>0000:10:01<em>14</em>54</td>
<td>0000:10:01<em>15</em>54</td>
<td>0000:10:01<em>16</em>54</td>
<td>0000:10:01<em>17</em>54</td>
<td></td>
</tr>
<tr>
<td>0000:10:03<em>14</em>54</td>
<td>0000:10:03<em>15</em>54</td>
<td>0000:10:03<em>16</em>54</td>
<td>0000:10:03<em>17</em>54</td>
<td></td>
</tr>
<tr>
<td>0000:10:05<em>14</em>54</td>
<td>0000:10:05<em>15</em>54</td>
<td>0000:10:05<em>16</em>54</td>
<td>0000:10:05<em>17</em>54</td>
<td></td>
</tr>
<tr>
<td>0000:10:07<em>14</em>54</td>
<td>0000:10:07<em>15</em>54</td>
<td>0000:10:07<em>16</em>54</td>
<td>0000:10:07<em>17</em>54</td>
<td></td>
</tr>
<tr>
<td>0000:10:09<em>14</em>54</td>
<td>0000:10:09<em>15</em>54</td>
<td>0000:10:09<em>16</em>54</td>
<td>0000:10:09<em>17</em>54</td>
<td></td>
</tr>
<tr>
<td>0000:10:0B<em>14</em>54</td>
<td>0000:10:0B<em>15</em>54</td>
<td>0000:10:0B<em>16</em>54</td>
<td>0000:10:0B<em>17</em>54</td>
<td></td>
</tr>
<tr>
<td>0000:10:0D<em>14</em>54</td>
<td>0000:10:0D<em>15</em>54</td>
<td>0000:10:0D<em>16</em>54</td>
<td>0000:10:0D<em>17</em>54</td>
<td></td>
</tr>
<tr>
<td>0000:10:0F<em>14</em>54</td>
<td>0000:10:0F<em>15</em>54</td>
<td>0000:10:0F<em>16</em>54</td>
<td>0000:10:0F<em>17</em>54</td>
<td></td>
</tr>
</tbody>
</table>
The most complex system would be an array of matrix delay clusters.
RollTrack Audio/Video Tracking System

Example showing a single IQD1FSY unit controlling a
eight Audio delay modules

8 Channels of
Audio Input

Network Code
This is the network segment address (in Hex code)
in FHD cases (000)

Unit Code
This is a number (in Hex code) identifying the specific FZ endpoints

Slot Number
This is the slot number allocation (in Hex code)
in the endpoint (i.e., 1 to 5 in a 5U chassis)
1 to 16 in a 3U chassis

Channel Number
Use
:
Not. 14, 15, 16 and 17 for Audio Delay Cards

12885
12884
12883
12882

Destination Address 0000:10:06(01...0F)14
Modules might e.g. 12885, 12884, 12883, 12882 etc.

IQD1FSY....1
Delay = 10 ms

Set Destination: Roll/Call
address (Network Code,
Unit Code,
Slot Location &
Channel Allocation Number)

Setup Menu
Audio Delay

Audio Delay Slot 1
Audio Delay Slot 3
Audio Delay Slot 5
Audio Delay Slot 15

Audio Delay Slot

Unit 1

Audio Delay

Unit 1

This is the unique
identification of the
destination unit
(in decimal number)

IQD1FSY....1
Delay = 10 ms

Set Destination: Roll/Call
address (Network Code,
Unit Code,
Slot Location &
Channel Allocation Number)

Setup Menu
Audio Delay

Audio Delay Slot 1
Audio Delay Slot 3
Audio Delay Slot 5
Audio Delay Slot 15

Audio Delay Slot

Unit 1

Audio Delay

Unit 1

This is the unique
identification of the
destination unit
(in decimal number)

IQD1FSY....1
Delay = 10 ms

Set Destination: Roll/Call
address (Network Code,
Unit Code,
Slot Location &
Channel Allocation Number)
## Manual Revision Record

<table>
<thead>
<tr>
<th>Date</th>
<th>Version No.</th>
<th>Issue No.</th>
<th>Change</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>9-Dec-05</td>
<td>1</td>
<td>1</td>
<td></td>
<td>First issue released</td>
</tr>
<tr>
<td>2-Jun-06</td>
<td>1</td>
<td>2</td>
<td>WSS added and ARC information</td>
<td>New issue released</td>
</tr>
<tr>
<td>28-Jun-07</td>
<td>1</td>
<td>3</td>
<td>For software V10.0...12</td>
<td>New issue released</td>
</tr>
<tr>
<td>16-Jul-07</td>
<td>1</td>
<td>4</td>
<td>Correction to memory section</td>
<td>New issue released</td>
</tr>
<tr>
<td>29-Mar-08</td>
<td>1</td>
<td>5</td>
<td>Updated power consumption</td>
<td>New issue released</td>
</tr>
<tr>
<td>11-Oct-08</td>
<td>1</td>
<td>6</td>
<td>Changes to WSS and Ancillary Data menus</td>
<td>New issue released</td>
</tr>
<tr>
<td>11-Nov-08</td>
<td>1</td>
<td>7</td>
<td>Corrected technical specification</td>
<td>New issue released</td>
</tr>
<tr>
<td>06-Mar-09</td>
<td>1</td>
<td>8</td>
<td>For software V10.6</td>
<td>New issue</td>
</tr>
</tbody>
</table>