Snell Advanced Media

User Instruction Manual

IQHCO30

3G/HD/SD-SDI Signal Protection Module

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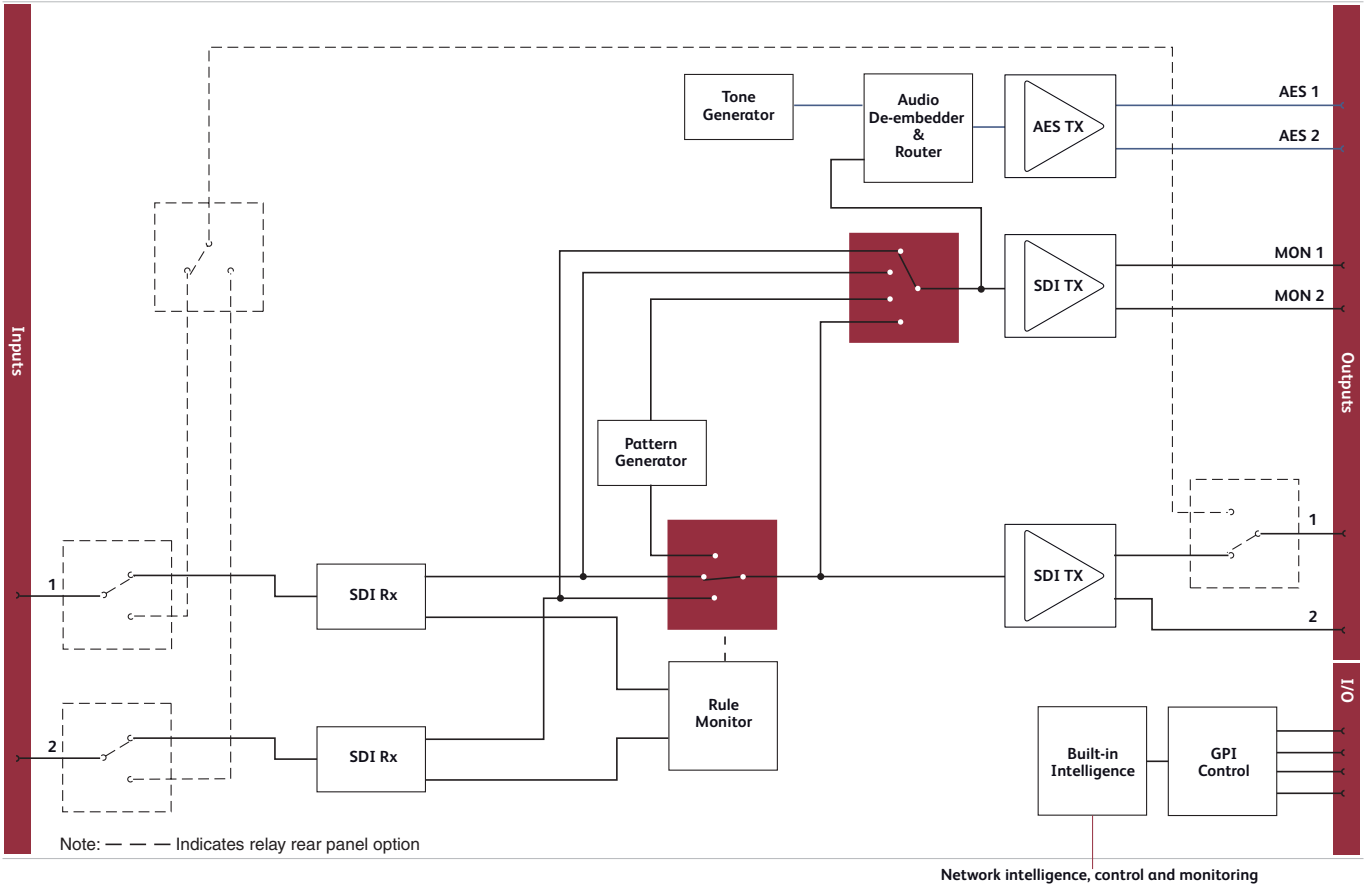
Contents

1. Introduction

1.1 Module Description

The IQHCO30 provides back up protection for SDI signal paths based on input monitoring detection of signal errors resulting in automatic change-over to a back up feed on error state detection. A powerful rules engine is available to provide logical conditions for auto-switching, whilst GPI (or RollTrack) inputs can force the unit to switch independent of signal state. Additional features include monitoring of the unselected input for video and audio signal confidence with group selectable AES audio monitoring.



1.2 Order Codes

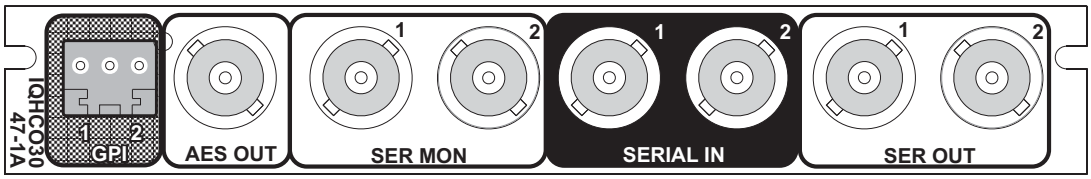
Note: Modules with “A” order codes (for example, IQHCO3047-1**A**) can be fitted into either A- or B-style enclosures. Modules with “B” order codes (for example, IQHCO3047-1**B**) can only be fitted into B-style enclosures. See page 8.

The following product order codes are covered by this manual:

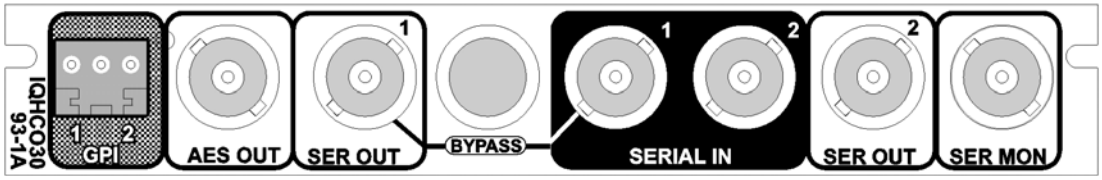
IQHCO3047-1A IQHCO3047-1B	HD/SD-SDI Video changeover switch. 2 inputs, 2 main outputs, 2 monitoring outputs, 1 AES outputs, 2 GPI/O.
IQHCO3047-1A3 IQHCO3047-1B3	Includes 3G-SDI functionality.
IQHCO3093-1A IQHCO3093-1B	HD/SD-SDI Video changeover switch. 2 inputs, 2 main outputs, 1 monitoring outputs, 1 AES output, 2 GPI/O.
IQHCO3093-1A3 IQHCO3093-1B3	Includes 3G-SDI functionality.
IQHCO3076-2A IQHCO3076-2B	HD/SD-SDI Video changeover switch. 2 inputs, 2 main outputs, 2 monitoring outputs, 2 AES outputs, 4 GPI/O.
IQHCO3076-2A3 IQHCO3076-2B3	Includes 3G-SDI functionality.
IQHCO3092-2A IQHCO3092-2B	HD/SD-SDI Video changeover switch. 2 inputs, 2 main outputs, 2 monitoring outputs, 2 AES outputs, 2 GPI/O.
IQHCO3092-2A3 IQHCO3092-2B3	Includes 3G-SDI functionality.
IQHCO30-3G	Upgrade for the IQHCO30 HD/SD-SDI signal protection module to operate with 3Gbit/s signals.

1.3 Rear Panel View

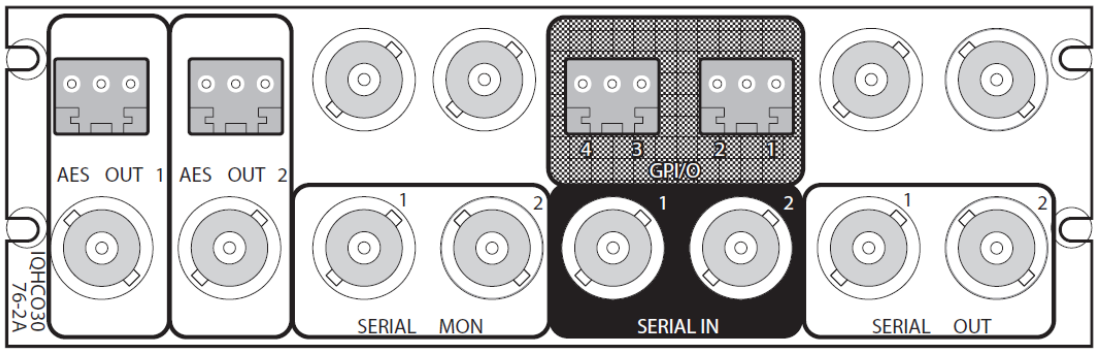
The following rear panel types are available:



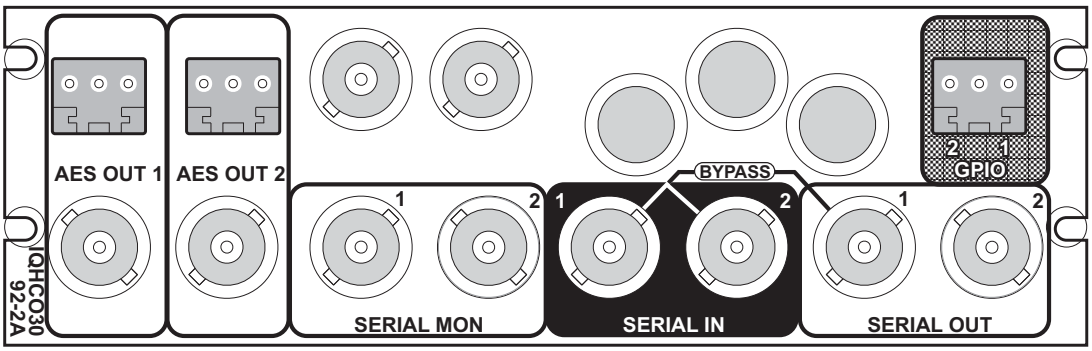
IQHCO3047-1A(B) / IQHCO3047-1A(B)3



IQHCO3093-1A(B) / IQHCO3093-1A(B)3



IQHCO3076-2A(B) / IQHCO3076-2A(B)3



IQHCO3092-2A(B)3 / IQHCO3092-2A(B)3

1.4 Enclosures

The module can be fitted into the enclosure types shown.

Important: Although IQ modules are interchangeable between enclosures, their rear panels are enclosure specific. An IQH3B enclosure accepts modules with either “A” or “B” order codes. An IQH3A or IQH1A enclosure accepts modules with “A” order codes only. See page 6.

1.4.1 B-style Enclosure

Enclosure order codes: IQH3B-S-0, IQH3B-S-P

1.4.2 A-style Enclosures

Enclosure order code: IQH1A-S-P

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

1.5 Feature Summary

The IQHCO30 provides the following features:

- 3 Gbit/s SDI, HD-SDI and SD-SDI operation
- Auto change-over from either input on pre-defined error conditions
- Input signal monitoring including SDI lock, EDH/CRC error, embedded audio loss and standard mismatch
- AES monitoring outputs for embedded audio signal monitoring
- Selectable SDI and AES monitoring outputs enable either input to be monitored independent of the main signal selection
- In-built test pattern generator and AES audio tone generator
- 16x user memories, save/recall/rename
- RollCall monitoring allows all signal paths to be managed

2. Technical Specification

Inputs and Outputs	
Signal Inputs	
Primary Switch	2x SDI via BNC connectors
Signal Outputs	
Primary Switch	2x SDI via BNC connectors
Secondary Switch	2x SDI via BNC connectors
AES Audio	2x AES/EBU (BNC & ST)
Control Interface	
GPI/O	4x closing contact via Screw Terminal (ST)
Controls	
Indicators	
Power OK	OK (Green)
CPU Running	OK (Green flashing)
FPGA Done	OK (Yellow flashing)
Input Loss 1	OK (Green), Loss (Off)
Input Loss 2	OK (Green), Loss (Off)
Status	OK (Green) Warning (Yellow) Error (Red)
RollCall Controls	
Input Standard	1125(1080)/50p, 1125(1080)/59p, 1125(1080)/29i, 1125(1080)/25i, 750(720)/59p, 750(720)/50p, 525(480)/29i, 625(576)/25i
Default Video Output Type	Pattern, Black
Default Video Output Standard	Last Known Good, 1125(1080)/50p, 1125(1080)/59p, 1125(1080)/29i, 1125(1080)/25i, 750(720)/59p, 750(720)/50p, 525(480)/29i, 625(576)/25i
Main Output Switch	Rules selection, Master input, Backup input, Pattern, Caption
Monitor Output Switch	Follow Main, Master input, Backup input, Pattern, Caption
Switch Rules	Logical combinations of warnings, GPI and RollTrack triggers
Change-over Parameters	No SDI Lock, Standard mismatch, CRC (EDH) Error, Embedded audio loss, embedded audio quiet, audio overload, pair type detection (Dolby E, Data, PCM)
Switch Delay	Video 0.1 to 10 s from trigger condition(s) Audio 0 to 120 s from trigger condition(s) Audio type 0 to 10 s from trigger condition(s)
Internal Rules Preset Priorities	Master, Backup, None
GPI Rules Preset Priorities	Master, Backup, None
RollTrack Rules Preset Priorities	Master, Backup, None
AES Output Pair Select	Any pair from video monitor output Groups 1-4, Tone, Silence
GPI/O Program	TALLY any input state or warning or set as trigger
Pattern Select	Color bars, black

Caption On	On/Off
Caption Animation	Slow/Medium/Fast
Edit Caption	19 characters available
Reporting and Logging	Input Loss; Input Line Standard; EDH error; Audio & data presence, change over status, main video output
AES Tone Setup	
Frequency	100 Hz to10 kHz in 100 Hz steps
Channel Ident	On/Off
Audio Monitoring	
Silence Detect	0 to -80 dB in steps of 1 dB
Signal Overload Detect	0 to -80 dB in steps of 1 dB
Other Controls	
User Memories	16x Save, Recall, Rename
Memory Naming	User configurable naming of memories 1 – 16
Information Window	Video Input Status, Audio Input Status, Rules Status
RollTrack Index	Up to 70 RollTrack destinations
RollTrack Sources	Unused, RollTrack 1-4 True/False, Input 1-2 Loss/Present, Out Main Master/Backup/Pattern/Caption, Out Mon Master/Backup/Pattern/ Caption/Follow Main, Output Standard
Factory Default	Resets all module settings to factory specified default values and clears memories
Default Settings	Resets all module settings to factory specified defaults but does not clear memories
Restart	Software restart of the module
Module Information	Reports following module information: Software version, Serial number, Build number, KOS version, Firmware version, PCB version

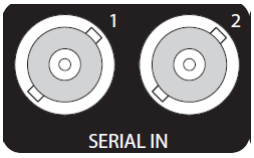
Specifications	
Electrical	3 Gbit/s SDI, SMPTE 424M, 1.5 Gbit/s HD-SDI, SMPTE 292M, 270 Mbit/s SDI, SMPTE 259M-C
Connector / Format	BNC/75 Ohm panel jack on standard IQ connector panel
Return Loss	>-15 dB (270 Mbit/s, 1.5 Gbit/s) >-10 dB (3 Gbit/s)
Output Jitter	SD-SDI 0.2 UI (10 Hz) / 0.2 UI (1 kHz) 3G/HD-SDI 1.0 UI (10 Hz) / 0.2 UI (100 kHz)
GPI I/O (x4) Characteristics	Closing Contact Type with Internal Source Input Threshold Voltage 1 V typical
Video Standards	
Standards	1125(1080)/50p (A & B), 1125(1080)/59p (A & B) 750(720)/50p, 750(720)/59p, 1125(1080)/25i, 1125(1080)/29i 625(576)/25i, 525(480)/29i
Digital Audio Output (Balanced)	
Connector / Format	Screw Terminal (ST)
Level	3 V p-p typical into 110 Ohms
Standard	AES3, SMPTE 272M A-1994, SMPTE 299M
Digital Audio Output (Unbalanced)	
Connector / Format	BNC
Level	1 V p-p typical into 75 Ohms
Standard	AES3-1992, SMPTE 272M A-1994, SMPTE 299M
Power Consumption	
Module Power Consumption	8.5 W max (A Frames) 8.5 PR (B Frames)
with Relay Rear Version	10.5 W (PR)

3. Connections

This section describes the physical input and output connections provided by the IQHCO30.

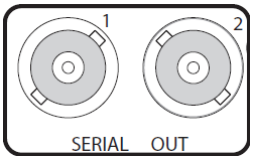
3.1 SDI Inputs

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



3.2 SDI Outputs

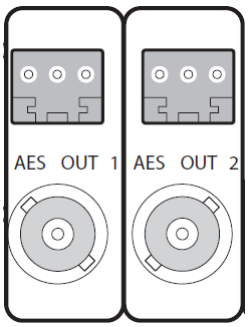
Serial digital outputs are made to the unit via BNC connectors which terminate in 75 Ohms.



3.3 AES Audio Outputs

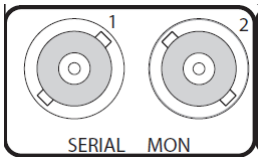
AES audio output by means of either:

- Two screw terminal connectors.
- Two BNC connectors terminated in 75 Ohms.



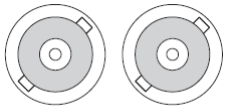
3.4 Monitoring Outputs

Monitoring outputs are made to the unit via BNC connectors which terminate in 75 Ohms.



3.5 Analog Reference Input

Analog reference inputs are made to the unit via two BNC connectors which terminate in 75 Ohms.

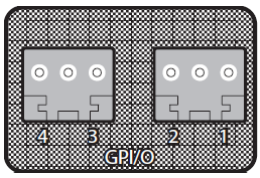


It should be noted that proper operation to the full specification can only be achieved with a correctly terminated, noise-free, stable, black sync reference input. Whilst lock may be achieved with an unsuitable sync source the increased jitter evident on the SDI output will affect locking and cable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

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

3.6 GPI

General Purpose Interface connections are made via two, 3-pin Screw Terminals (ST). A Pin 2 is ground and may be shorted to either Pin 1 or 3 to provide an input. When not shorted, the voltage measured between the pins determines the output status.



Input/Output	Status	Pin Connections		
		1	2	3
GPI 1	Low	0V		
GPI 2	Low		0V	
GPO 1	Open (high)	5V		
GPO 2	Open (high)		5V	
GPO 1	Closed (low)	<1V		
GPO 2	Closed (low)		<1V	

4. Card Edge LEDs

The LEDs on the edge of the module indicate its operating status.

LED	Color	Description
POWER +	Green	Indicates that a positive power supply is present.
POWER -	Green	Indicates that a negative power supply is present.
CPU RUNNING	Green	This LED will flash to indicate that the CPU is running.
FPGA DONE	Yellow	Flashes when the FPGA is running. When the module is booting, this LED is illuminated continuously, until the SDI is enabled.
INPUT LOSS 1, INPUT LOSS 2	Green	These LEDs are illuminated when valid input is present.
ERROR	Red	This LED indicates board fault conditions. When the module is booting, this LED is illuminated, until the SDI is enabled.
WARNING	Yellow	This LED is illuminated if one or more of the SDI inputs is not valid.
OK	Green	Indicates that the module is operating correctly.

5. Controlling the IQHCO30 from the RollCall Control Panel

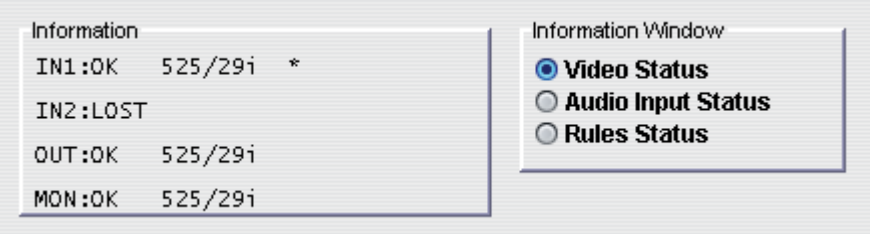
5.1 The Information Window

The information window is displayed in the upper-right corner of each screen and displays basic information about the status of the module.

Select either **Video Status**, **Audio Input Status** or **Rules Status** to display the corresponding information.

5.1.1 Video Status

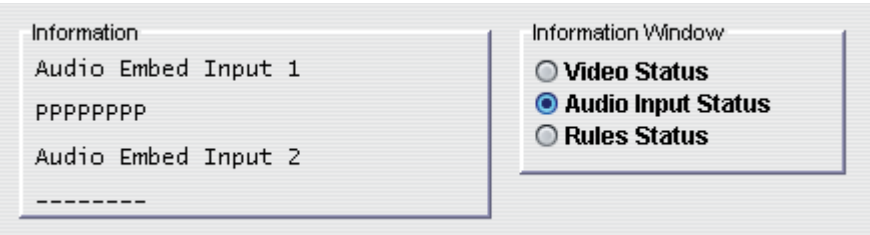
When **Video Status** is selected, the status of the input, output and monitoring ports is displayed.



Name	Status	Standard	
IN1 / IN 2:	**OK** **FAIL** **LOST**	Displays the detected video input standard. E.g. 525/29i (Blank if input lost)	A * symbol indicates that the input is selected.
OUT MON:	**OK** **BLK** **FRZ** **PAT**	Displays the selected video output standard. E.g. 525/29i	A **$** symbol indicates that the caption is enabled. (Blank if disabled)

5.1.2 Audio Input Status

When **Audio Input Status** is selected, the status of the audio input is displayed.



Name	Status	Description
Audio Embed Input 1: **--------**	**P**	Channel is a PCM audio input.
	?	No audio input is detected.
Audio Embed Input 2: **--------**	**D**	Channel is a Dolby D input.
	E	Channel is a Dolby E input.

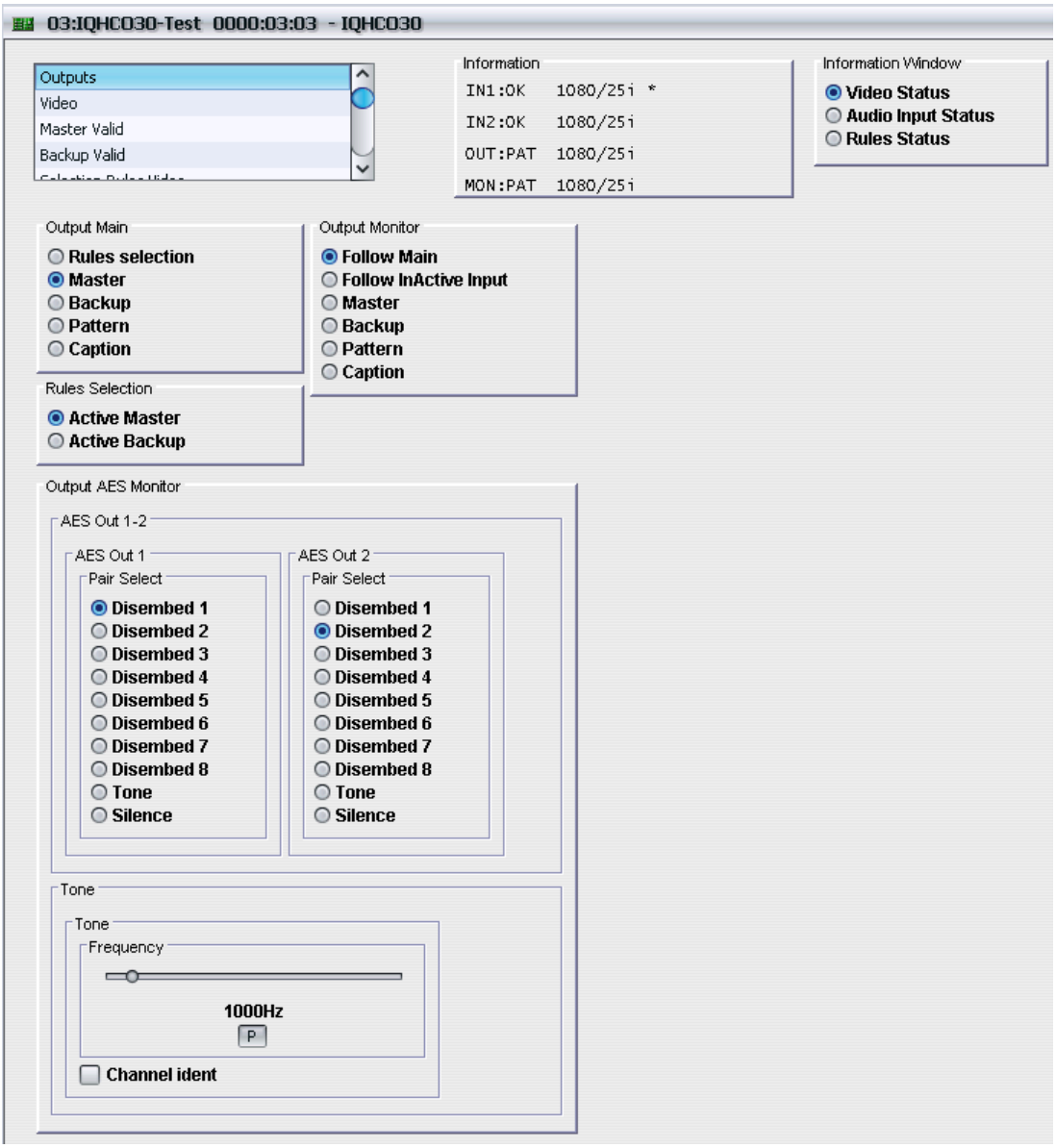
5.1.3 Rules Status

When **Rules Status** is selected, the status of the backup rules and the outputs used is displayed.

Name	Status	Description
RULES	**InActive** **Active MASTER** **Active BACKUP**	The Rules Engines configuration.
MONITOR	**FOLLOW MAIN** **MASTER** **BACKUP** **PATTERN** **CAPTION**	Output monitor selection.
INT MASTER	**OK** **FAIL**	Indicates whether a valid video signal is present on the Input.
INT BACKUP	**OK** **FAIL**	indicates whether a valid video signal is present on the Input.

5.2 Outputs

The **Outputs** screen enables you to specify the output to be used for the main output, the monitor output, and to configure the AES outputs.



5.2.1 Output Main

These radio buttons enable the main output to be specified:

- **Rules selection**: the module will use the backup rules you define to determine whether to use the Master or Backup input.
- **Master**: this forces the module to use the Master input.
- **Backup**: this forces the module to use the Backup input.
- **Pattern:** this forces the main output to use the pattern specified by the **Pattern & Caption** settings.
- **Caption:** this forces the main output to use the caption specified by the **Pattern & Caption** settings.

5.2.2 Output Monitor

These radio buttons enable the monitor output to be specified.

- **Follow main:** the monitor will be the same as the **Output Main** selection.
- **Master**: the monitor will be the Master input.
- **Backup**: the monitor will be the Backup input.
- **Pattern:** the monitor will be the pattern specified by the **Pattern & Caption** settings.
- **Caption:** the monitor will be the caption specified by the **Pattern & Caption** settings.

5.2.3 Rules Selection

Determines which of the Master or Backup Rules have precedence. This selection is only enabled when Output Main has been set to Rules Selection.

5.2.4 Output AES Monitor

These controls set up the Output AES monitor pairs.

5.2.4.1 AES Out 1 and AES Out 2

These radio buttons specify the disembedded audio pair, **Disembed 1-8**, or whether to output **Tone** or **Silence** to the AES Monitor output.

5.2.4.2 Tone

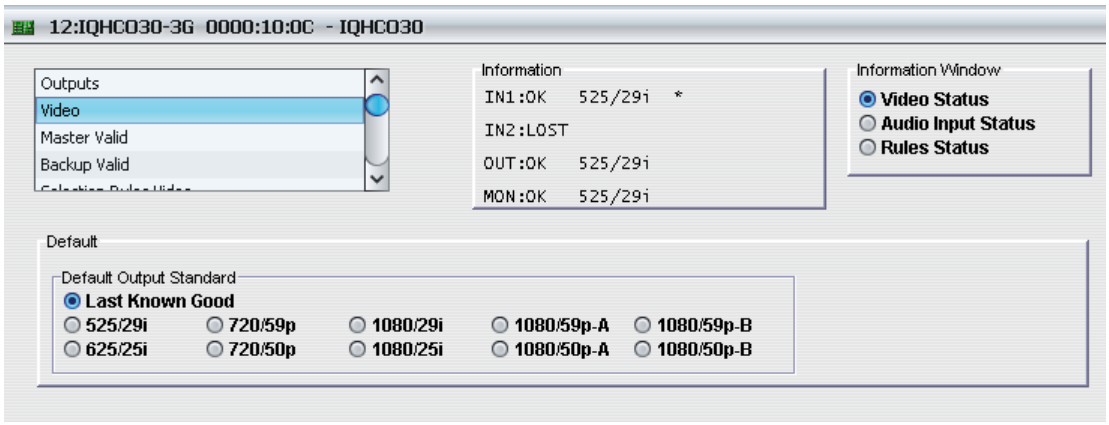
Adds an alternating tone to the Right channel of a stereo pair of the monitoring AES output/s.

These controls set the parameters of the tone:

- **Frequency:** this slider bar specifies the tone that will be output when enabled. A frequency range of 100 Hz to 100 kHz is selectable. Preset value (**P**) is 1 kHz.
- **Channel Ident:** this checkbox, when enabled, causes an alternating tone to be output on the channel for identification purposes.

5.3 Video

The **Video** screen controls enable you to configure the unit's default output standard.



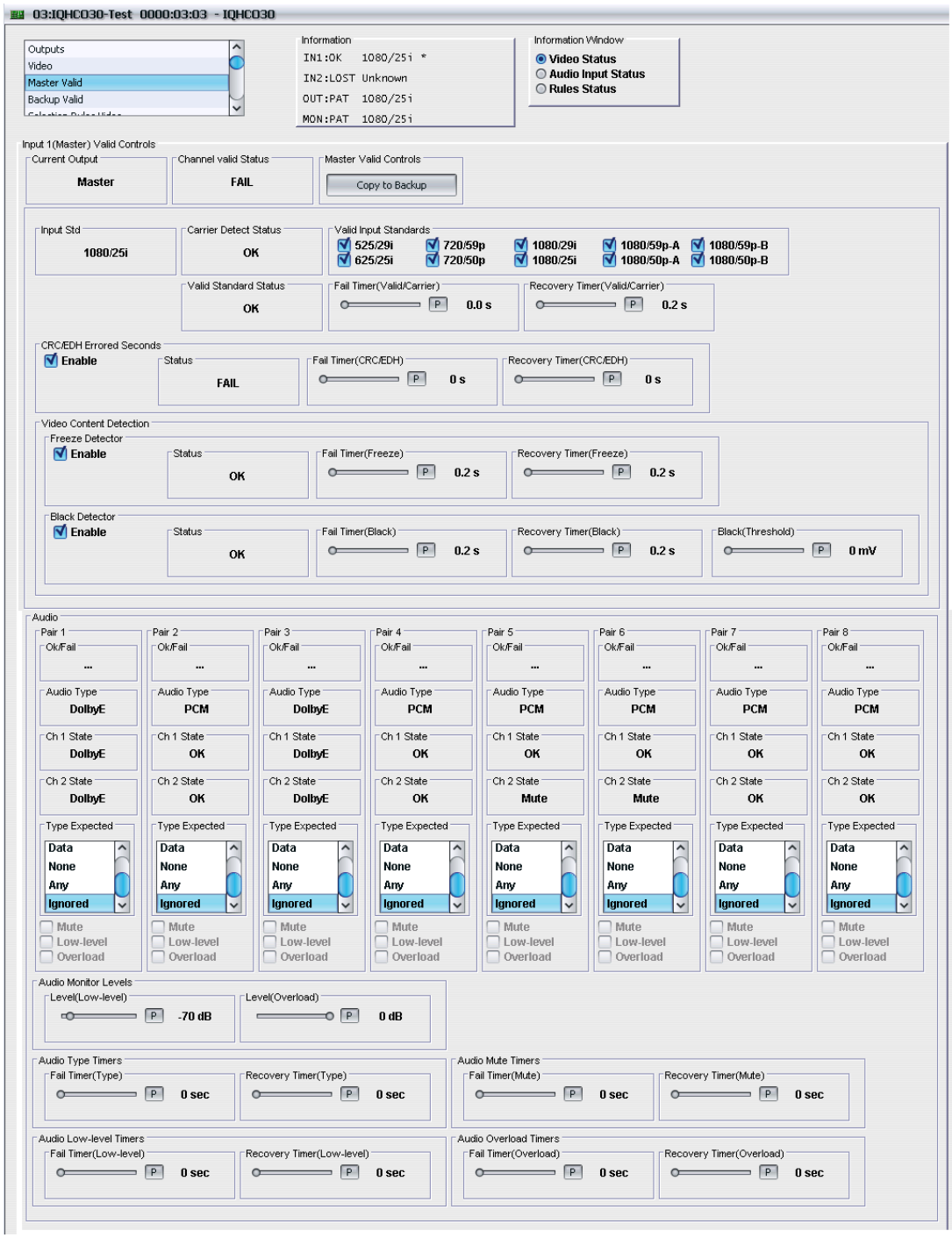
5.3.1 Default Output Standard

The Default Output Standard settings specify the output standard that the module will use if it cannot determine the correct output standard to use.

By default, the Last Known Good setting is selected, which uses the last valid output standard.

5.4 Master Valid

The **Master Valid** screen controls the video and audio monitoring for the master input signal.



Note: It is recommended that you use the same input standard for both master and backup. The module can operate with same frame rate input standards, e.g. 625 and 720p50, 1080i25. If the input standards differ, input switching will not be clean.

5.4.1 Current Output

This section displays the current output selection made by the Output screen.

5.4.2 Channel Valid Status

This section displays the status of the audio/video signal feeding this input.

5.4.3 Master Valid Controls

Copy to Backup: copies all rules as entered in the Master Valid control page into the Backup Valid control page.

5.4.4 Input Standard

This section, and the associated controls described below, monitors the input signal for a valid video standard and the presence of a carrier signal.

- **Input Std:** displays the detected input video standard.
- **Carrier Detect Status:** displays the status of the carrier signal at the input.
- **Valid Input Standards:** checkboxes that specify which detected input standards will be considered as a valid input.
- **Valid Standard Status:** displays the error status of the Valid/Carrier standard.
- **Fail Timer (Valid/Carrier)**: this slider sets the time in seconds that the video input signal must be invalid before the unit will consider it to have failed. The selectable range is 0.1 to 600.0 seconds in steps of 0.1s. The preset (**P**) value is 0 seconds. Use the slider bar to specify.
- **Recovery Timer (Valid/Carrier)**: this slider sets the time in seconds that the video input signal must be valid, following a failure, before the module will consider it to have recovered. The selectable range is 0.1 to 600.0 seconds in steps of 0.2s. The preset (**P**) value is 0.1 seconds.

5.4.5 CRC/EDH Errored Seconds

This section controls and monitors the errored seconds (an interval of a second during which any error whatsoever has occurred) settings for the Cyclic Redundancy Checksum (CRC) and Error Detection and Handling (EDH) errors detected in SD-SDI input signals.

- **Enable:** when this checkbox is enabled, the module will consider CRC/EDH errors in determining whether the signal in Input 1 (Master) is OK. When the check box is not selected, CRC/EDH errors are ignored.
- **Status:** displays the error status of the CRC/EDH Errored Seconds.
- **Fail Timer (CRC/EDH)**: this slider sets the time in seconds that CRC/EDH errors must be present before the unit will consider the input to have failed. The selectable range is 0 to 600 seconds in steps of 1s. The preset (**P**) value is 0 seconds.
- **Recovery Timer (CRC/EDH)**: this slider sets the time in seconds that the input signal must be error free, following a CRC/EDH failure, before the module will consider the input to have recovered. The selectable range is 0 to 600 seconds in steps of 1s. The preset (**P**) value is 0 seconds.

5.4.6 Video Content Detection

Freeze detector

- **Enable**: when this checkbox is enabled, the module will analyze the incoming video for a freeze state. When the check box is not selected, video freeze is ignored.
- **Status**: displays the freeze status of the video.
- **Fail Timer (Freeze)**: this slider sets the time in seconds that a freeze state must be present before the unit will consider the input to have failed. The selectable range is 0 to 600 seconds in steps of 0.1s. The preset (**P**) value is 0.2s.
- **Recovery Timer (Freeze)**: this slider sets the time in seconds that the input signal must not be frozen after a freeze condition, before the module will consider the input to have recovered. The selectable range is 0 to 600 seconds in steps of 0.1s. The preset (**P**) value is 0.2.

Black detector

- **Enable**: when this checkbox is enabled, the module will analyze the incoming video for a black state. When the check box is not selected, black detection is ignored.
- **Status**: displays the black status of the video.
- **Fail Timer (Black)**: this slider sets the time in seconds that a black state must be present before the unit will consider the input to have failed. The selectable range is 0 to 600 seconds in steps of 0.1s. The preset (**P**) value is 0.2s.
- **Recovery Timer (Black)**: this slider sets the time in seconds that the input signal must not be black after a black condition, before the module will consider the input to have recovered. The selectable range is 0 to 600 seconds in steps of 0.1s. The preset (**P**) value is 0.2.
- **Black (Threshold)**: this slider sets the level in mV below which the video is determined to be black. The selectable range is 0 to 153mV in steps of 1mV. The preset (**P**) value is 0mV.

5.4.7 Audio Pair 1-8

The columns in the **Audio** area enable you to specify the expected type of audio input for audio **Pair 1** to **Pair 8**.

- **Ok/Fail:** displays the status of the audio pair. Possible values are '...' (no input), Ok and Fail.
- **Audio Type:** displays the type of audio detected on the audio pair.
- **Ch 1 State:** displays the state of channel 1 in the audio pair.
- **Ch 2 State:** displays the state of channel 2 in the audio pair.
- **Type Expected:** enables the selection of the audio type expected for the audio pair. Available options are: PCM, DolbyE, Data, None, Any or Ignored.
- **Low-level:** enables a low-level threshold to be set for the audio pair. This option is only available when the **PCM** or **Any** is selected by the Type Expected list.
- **Mute**: enables a mute timer to be set for the audio pair. This option is only available when the PCM or Any is selected by the Type Expected list.
- **Overload:** enables an overload threshold to be set for the audio pair. This option is only available when the **PCM** or **Any** is selected by the Type Expected list.

5.4.8 Audio Monitor Levels

These controls enable you to set audio ‘low-level’ and ‘overload’ thresholds for the audio pairs.

- **Level (Low-level):** this slider sets the ‘low-level’ threshold for the input audio signal. The selectable range is -80 dB to 0 dB. The preset (**P**) value is -70 dB.
- **Level (Overload):** this slider sets the ‘overload’ threshold for the input audio signal. The selectable range is -80 dB to 0 dB. The preset (**P**) value is 0 dB.

5.4.9 Audio Type Timers

These controls enable you to define ‘fail’ and ‘recovery’ settings for audio type detection.

- **Fail Timer (Type):** this slider specifies the time that the audio input type must be incorrect before a failure is considered to have occurred. The selectable range is 0 to 10 seconds. The preset (**P**) value is 0 seconds.
- **Recovery Timer (Type):** this slider specifies the time that the audio must return to the expected type, following a failure, to be considered to have recovered. The selectable range is 0 to 10 seconds. The preset (**P**) value is 0 seconds.

5.4.10 Audio Mute Timers

These controls enable you to define 'fail' and 'recovery' settings for audio mute detection.

- **Fail Timer (Mute)**: this slider specifies the time that the audio input must be mute before a failure is considered to have occurred. The selectable range is 0 to 600 seconds in steps of 1s. The preset (**P**) value is 0s.
- **Recovery Timer (Mute)**: this slider specifies the time that the audio must not be muted, following a failure, to be considered to have recovered. The selectable range is 0 to 600 seconds in steps of 1s. The preset (**P**) value is 0s.

5.4.11 Audio Low-Level Timers

These controls enable you to define ‘fail’ and ‘recovery’ settings for the audio low-level threshold.

- **Fail Timer (Low-level)**: this slider specifies the time that the audio level must remain below the low-level threshold before a failure is considered to have occurred. The selectable range is 0 to 600 seconds in steps of 1s. The preset (**P**) value is 0s.
- **Recovery Timer (Low-level)**: this slider specifies the time that the audio level must remain above the low-level fail threshold, following a failure, to be considered to have recovered. The selectable range is 0 to 600 seconds in steps of 1s.
  The preset (**P**) value is 0s.

5.4.12 Audio Overload Timers

These controls enable you to define ‘fail’ and ‘recovery’ settings for the audio overload threshold.

- **Fail Timer (Overload)**: this slider specifies the time that the audio level must remain above the overload threshold before a failure is considered to have occurred. The selectable range is 0 to 600 seconds in steps of 1s. The preset (**P**) value is 0s.
- **Recovery Timer (Overload)**: this slider specifies the time that the audio level must remain below the overload threshold, following a failure, to be considered to have recovered. The selectable range is 0 to 600 seconds in steps of 1s.
  The preset (**P**) value is 0s.

5.5 Backup Valid

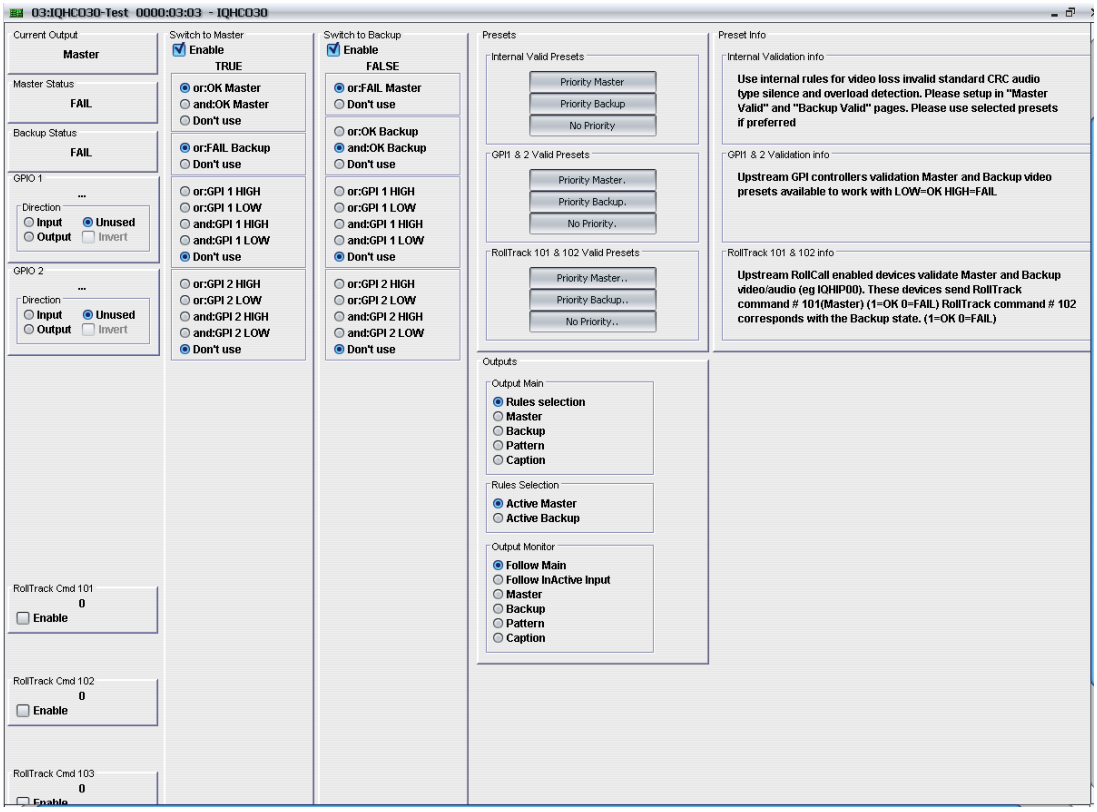
The **Backup Valid** screen controls the video and audio monitoring for the backup input signal.

Controls are the same as **Master Valid** (see section 5.4) except:

Backup Valid Control: **Copy from Master** will copy all rules as entered in the **Master Valid** control page into the **Backup Valid** control page.

5.6 Selection Rules Video

The **Selection Rules Video** screen enables you to specify the rules, as related to the module's internal definitions of signal validity, that the unit will use when determining which output to use.



5.6.1 Current Output

This information-only field displays the current output (Master or Backup).

5.6.2 Master Status

This information-only field displays the current status of the Input 1(Master) signal.

5.6.3 Backup Status

This information-only field displays the current status of the Input 2(Backup) signal.

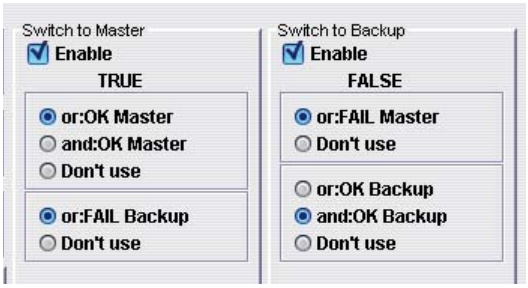
5.6.4 Switch to Master and Switch to Backup

These settings specify the conditions under which the module will switch to the Master input. Select the **Enable** check box to use the criteria in the selection process. Using the radio buttons, build the statements that will define the conditions for a switch to that input.

Example

In the example, shown below, the module will switch to the Master input when either:

- The signal on Input 1(Master) is considered valid according to the criteria specified on the Master Valid page.
- The signal on Input 2(Backup) is considered invalid according to the criteria specified on the Backup Valid page.

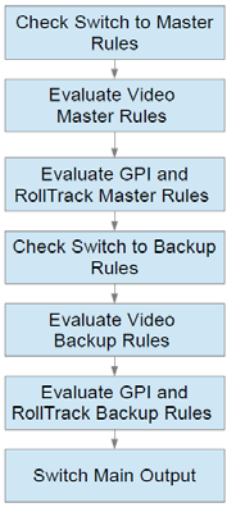


This is because both of the conditions specified use an **or** statement.

However, the module will only switch to the Backup when the Input 1(Master) signal is considered invalid **and** the Input 2(Backup) signal is considered valid.

Further rules can be added in which the state of GPI1 and GPI2, and the RollTrack status are considered in the switching decision.

The following flow chart shows the rule decision process.



To summarize the rules selection, a minimum of one of the configured “OR” rules, and ALL configured “AND” rules, must evaluate to true in order for the rule to be triggered.

Note:

- All “AND” clauses that are selected (not set to Don't use), must ALL evaluate to true in order for the rule to be actioned. If any of the configured “AND” clauses does not evaluate to true then the rule will not trigger.
- At least one (or more) of the configured “OR” clauses must also evaluate to true in order for the rule to be actioned. If ALL of the “OR” rules evaluate to false then the rule will not trigger

5.6.5 Presets

These preset options apply to the **Internal**, **GPI1 & 2** and **RollTrack 101 & 102** definitions of the conditions that constitute valid signals, and define the priority for switching to a valid signal.

- **Priority Master:** when selected, the module will always use the Master signal if it is valid. For example, if the module switches to the Backup because of a failure on the Master, when the signal on the Master once again becomes valid, the module will switch back to it.
- **Priority Backup:** when selected, the module will always use the Backup signal if it is valid. For example, if the module switches to the Master because of a failure on the Backup, when the signal on the Backup once again becomes valid, the module will switch back to it.
- **No Priority:** priority is given to neither the Master or the Backup. If a switch occurs, the module will continue to use the current output until conditions as set by the Master Valid and Backup Valid rules trigger another switch.

5.6.6 Preset Info

Displays further detailed information for the associated Presets.

5.6.7 Outputs

These controls enable you to specify the main and monitor output.

5.6.7.1 Output Main

These radio buttons enable you to specify the main output:

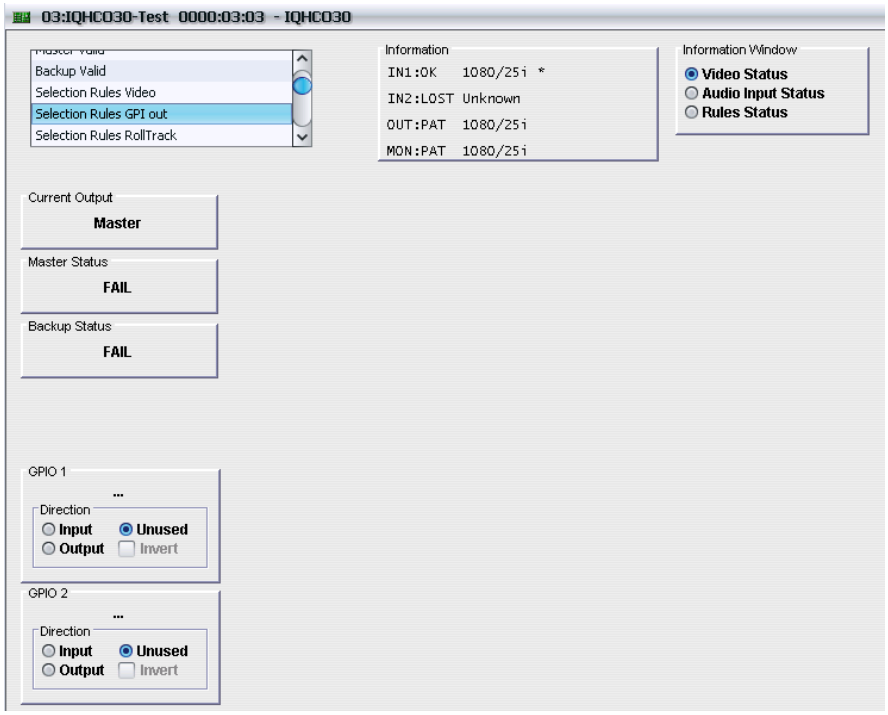
- **Rules selection:** the module will use the backup rules you define to determine whether to use the Master or Backup output.
- **Master:** forces the module to use the Master output.
- **Backup:** forces the module to use the Backup output.
- **Pattern:** forces the main output to use the pattern specified by the **Pattern & Caption** settings.
- **Caption:** forces the main output to use the caption specified by the **Pattern & Caption** settings.

5.6.7.2 Output Monitor

Use the radio buttons to specify the monitor output.

- **Follow Main:** the module will follow the selection made in the Output Main section, described above.
- **Master:** forces the module to use the Master output.
- **Backup:** forces the module to use the Backup output.
- **Pattern:** forces the main output to use the pattern specified by the **Pattern & Caption** settings.
- **Caption:** forces the main output to use the caption specified by the **Pattern & Caption** settings.

5.7 Selection Rules GPI Out



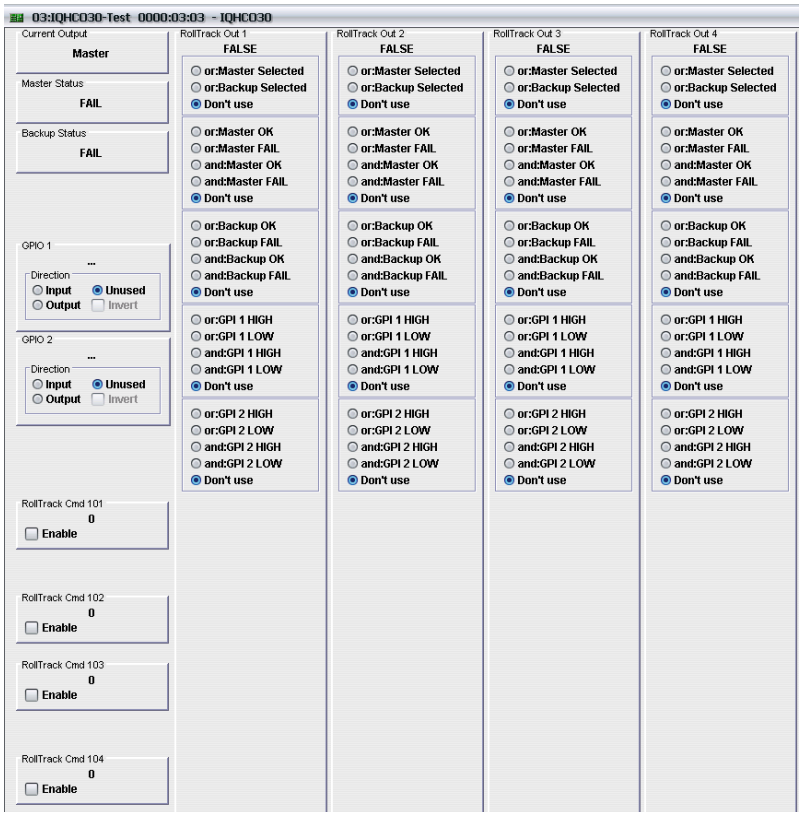
5.7.1 GPI 1 to GPI 2

The current state of the GPI is displayed.

Use of the GPI inputs within the rules processing stages is determined by the overall rules selection procedure - see section 5.6.

Select **Input**, **Output** or **Unused** to set the use of the GPI as a selection criterion.

5.8 Selection Rules RollTrack

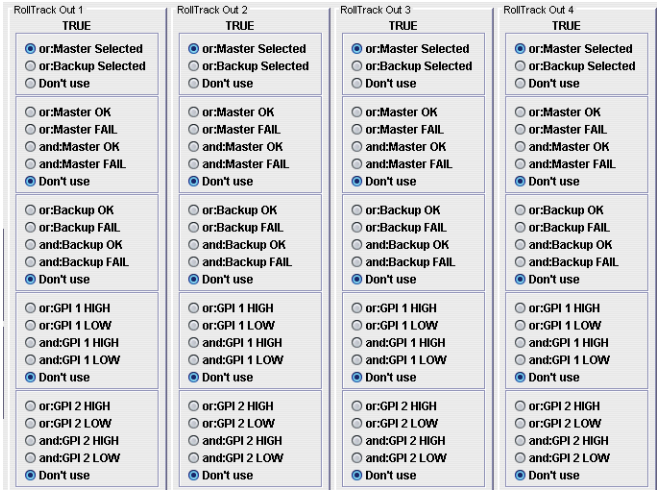


5.8.1 RollTrack Cmd 101 to RollTrack Cmd 104

The current state of RollTracks is displayed. Select **Enable** to use RollTrack commands as a selection criterion.

Use of **RollTrack Cmd 101** to **104** within the rules processing stages is determined by the overall rules selection procedure - see section 5.6.

Each of **RollTrack Out1** to **Out4** can be used to generate a rules status for a chosen combination of rules or can be used to mirror the rules engine. This enables one IQHCO30 to generate a status which can be distributed to other modules via RollTrack.

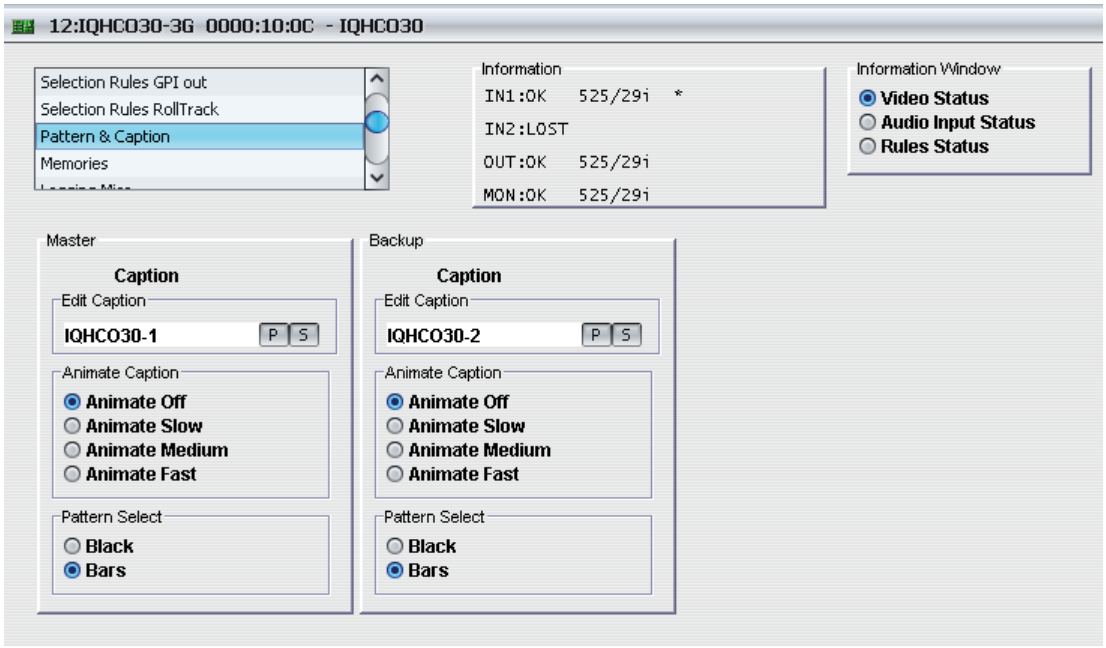


For each of RollTrack Out1 to Out4, if Output is set to Rules Selection (see section 5.2), then set **or:Master Selected**, with all other criteria set to **Don't use**, to mirror the rules engine.

Otherwise, select the required combination of rules to generate a rules status which will then be available on the appropriate RollTrack output.

5.9 Pattern & Caption

The **Pattern & Caption** screen enables you to add a caption to be displayed on the output picture and to specify pattern type preference.



5.9.1 Edit Caption

The caption text is entered in this field. Clicking **S** saves the caption text. Clicking **P** returns the field to the default text (Captions ON). A maximum of 19 characters can be entered.

5.9.2 Animate Caption

When enabled, a caption will appear as white text on a black background in the lower portion of the picture. Basic animation may also be selected, which enables a scrolling effect from right to left, also known as a ‘ticker-tape’ effect. The options are:

- **Animate Off**
- **Animate Slow**
- **Animate Medium**
- **Animate Fast**

5.9.3 Pattern Select

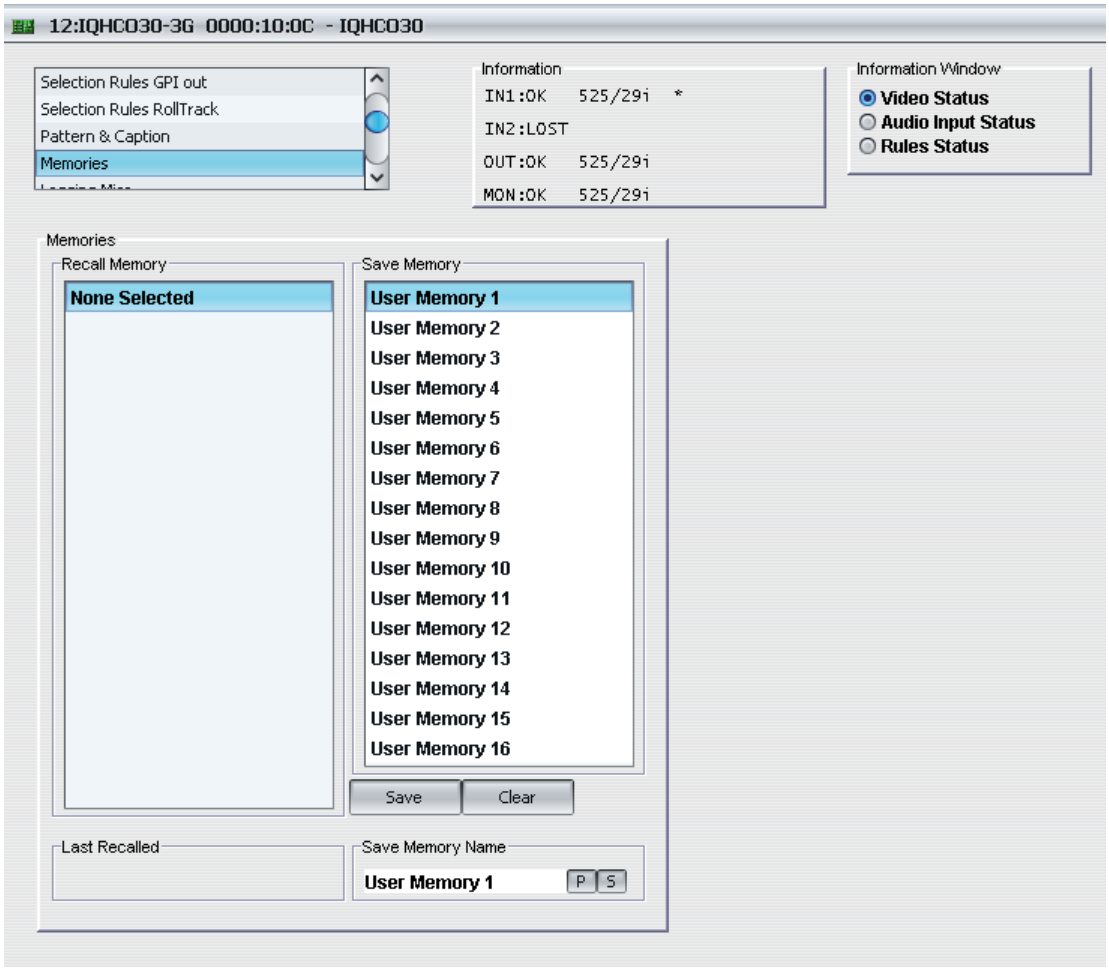
The radio buttons enable/disable pattern generation. The options are:

- **Black:** video output is a black screen
- **Bars:** video output is a color bars

5.10 Memories

The **Memories** screen enables up to 16 setups to be saved and recalled later.

Default memory names can be changed to provide more meaningful descriptions.



5.10.1 Recall Memory

This column lists the settings that have been previously saved. If no settings have been saved, **None Selected** is displayed.

To recall the settings saved in a memory:

In the **Recall Memory** column, select the memory to recall by clicking on it. The recalled settings will be applied and the memory name will appear in the **Last Recalled Memory** section.

Note: User memories do not recall log field states. I.e., whether a log value has been enabled or disabled.

5.10.2 Save Memory

This column lists the 16 pre-set memory names that are available for use.

To save settings:

In the **Save Memory** column, select a memory location, and then click **Save**. The current settings are saved and the memory appears in the **Recall Memory** column.

5.10.3 Last Recalled

The **Last Recalled** pane displays the most recently recalled memory. If any of the settings have been changed since it was recalled, an asterisk will be displayed after the memory name.

5.10.4 Save Memory Name

This option enables the pre-set memory names to be changed (to something more memorable or meaningful), if required.

To change a memory name:

In the **Save Memory Name** field, type the new memory name, and then click **S**. To return the memory to its default value, click the preset button (**P**).

5.11 Logging

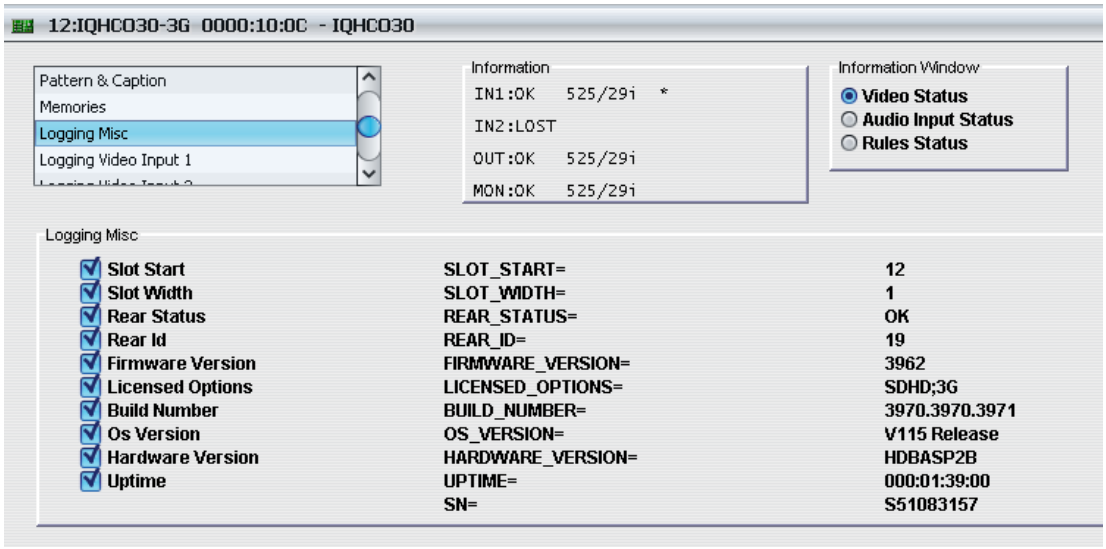
Information about several parameters can be made available to a logging device that is connected to the RollCall network.

Each logging screen comprises three columns:

- **Log Enable**: Select the check boxes that correspond to the parameters for which log information should be collected.
- **Log Field**: Displays the name of the logging field.
- **Log Value**: Displays the current log value.

5.11.1 Logging Misc

The **Logging Misc** screen displays the current log information about the module's basic parameters.

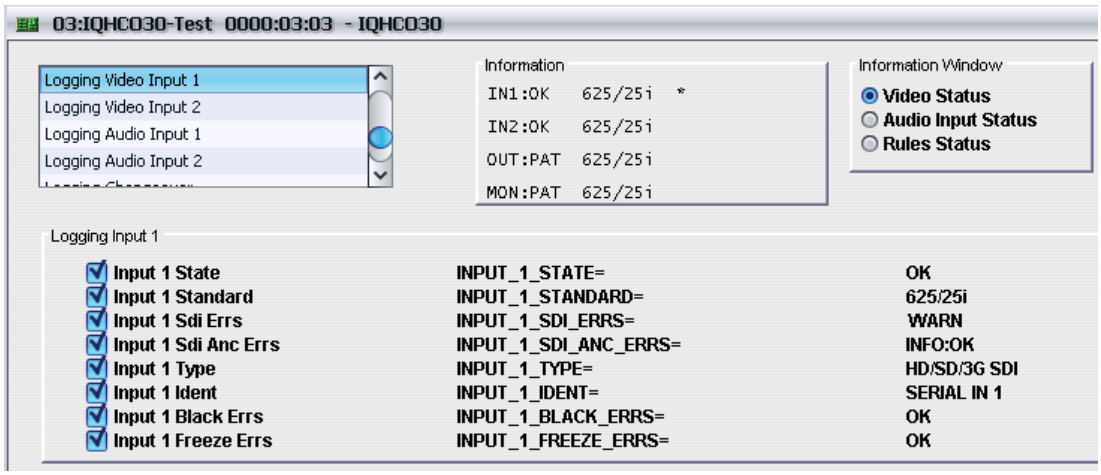


Log Field	Description
SLOT_START=	Displays the rear panel slot start (boot-up) number.
SLOT_WIDTH=	Displays the rear panel slot width. For example, 1 or 2.
REAR_STATUS=	Display the status of the rear panel. Valid values are: • OK • FAIL:Lost
REAR_ID=	Displays a rear panel identifier number.
FIRMWARE_VERSION=	Displays the FPGA version.
LICENSED_OPTIONS=	Displays any specially licensed options, if applicable. Valid values are: • SDHD • SDHD;3G • FAIL:Bad File • WARN:NONE • FAIL:No File
BUILD_NUMBER=	Displays the build number.
OS_VERSION=	Displays the operating system name and version. For example, KOS V115.
HARDWARE_VERSION=	Displays the hardware version number.
UPTIME=	Displays the time since the last restart in the format ddd:hh:mm:ss.

Log Field	Description
SN=	Displays the module serial number, which consists of an S followed by eight digits.

5.11.2 Logging Video Input 1 / 2

The **Logging Video Input 1** / **2** screens display the current log information for the relevant video inputs.

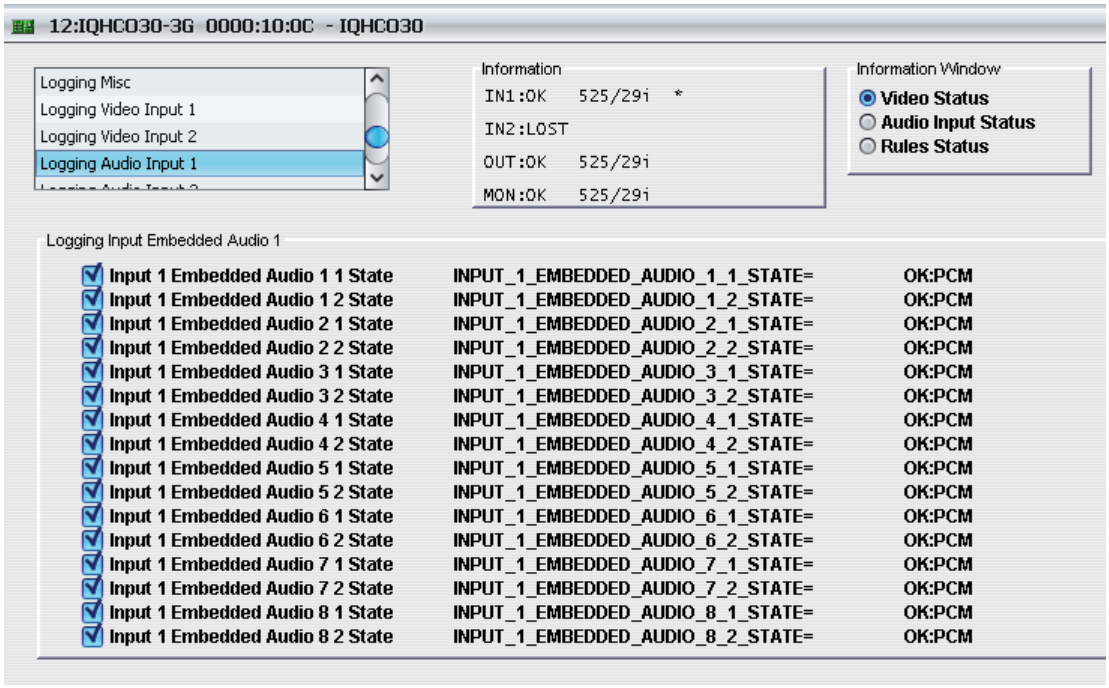


Log Field	Description
INPUT_N_STATE=	Displays the current input state. Valid values are: • OK • WARN:Mismatch • FAIL:Lost • WARN:Invalid **Note:** WARN:Mismatch indicates that the input and output standards are not the same.
INPUT_N_STANDARD=	This displays the current input signal standard. For example, 1080/29i. If no signal is present, the field will display LOST. If the input standard is not recognized or supported the field will display: WARN:Unknown.
INPUT_N_SDI_ERRS=	Displays SDI errors that have occurred in a one second period. Valid values are: • OK • WARN
INPUT_N_SDI_ANC_ERRS=	Displays ANC errors that have occurred in a one second period. Valid values are: • OK • WARN
INPUT_N_TYPE=	This displays the type of input as specified by the module's configuration. Valid values are 3G / HD /SD SDI.
INPUT_N_BLACK_ERRS=	Displays Black status errors that have occurred in a one second period. Valid values are: • OK • WARN

Log Field	Description
INPUT_N_FREEZE_ERRS=	Displays Freeze status errors that have occurred in a one second period. Valid values are: • OK • WARN

5.11.3 Logging Audio Input 1/2

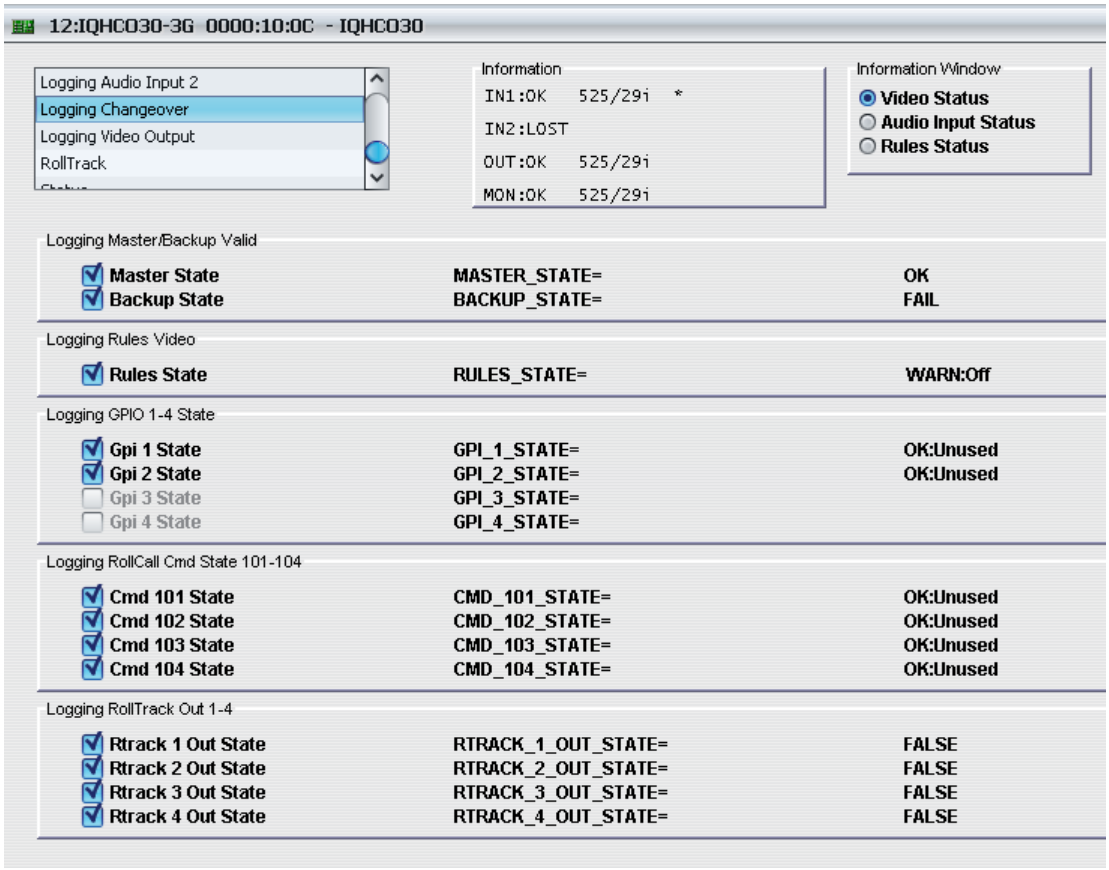
The **Logging Audio Input 1/2** screens display the current log values for the eight audio pairs for each channel.



Log Field	Description
INPUT_1_EMBEDDED_AUDIO_1_1_STATE= to INPUT_1_EMBEDDED_AUDIO_8_2_STATE= ---------- INPUT_2_EMBEDDED_AUDIO_1_1_STATE= to INPUT_2_EMBEDDED_AUDIO_8_2_STATE=	These fields display the current embedded input audio state. Valid values are: • OK:PCM • OK:Data • OK:DolbyE • WARN:No Input • FAIL:Lost

5.11.4 Logging Changeover

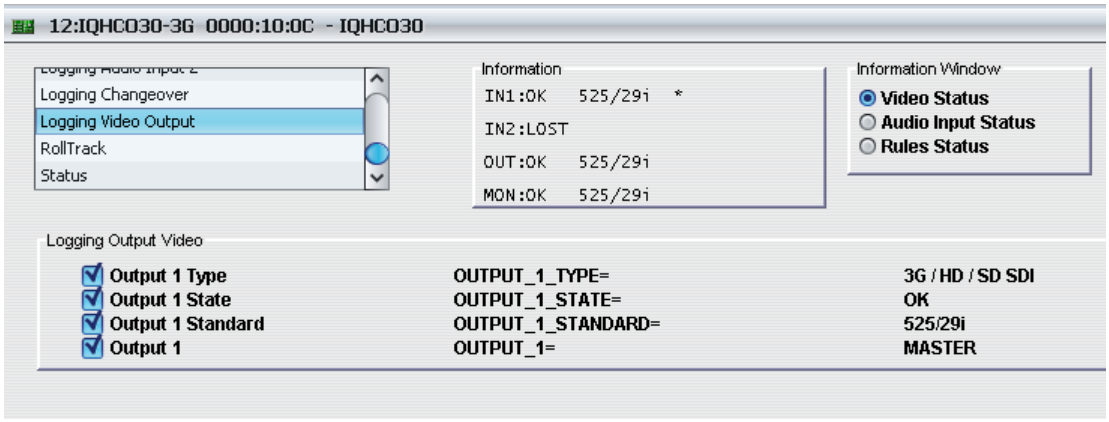
The **Logging Changeover** screen displays the current log values for the state of the outputs controlled by the changeover rules.



Log Field	Description
MASTER_STATE=	Displays Master input state.
BACKUP_STATE=	Displays Backup input state.
RULES_STATE=	Displays video rules state.
GPI_1_STATE to GPI_4_STATE=	Displays the state of GPI 1 to GPI 4.
CMD_101_STATE= to CMD_104_STATE=	Displays the state of incoming RollTracks.
RTRACK_1_OUT_STATE= to RTRACK_4_OUT_STATE=	Displays the state of outgoing RollTracks.

5.11.5 Logging Video Output

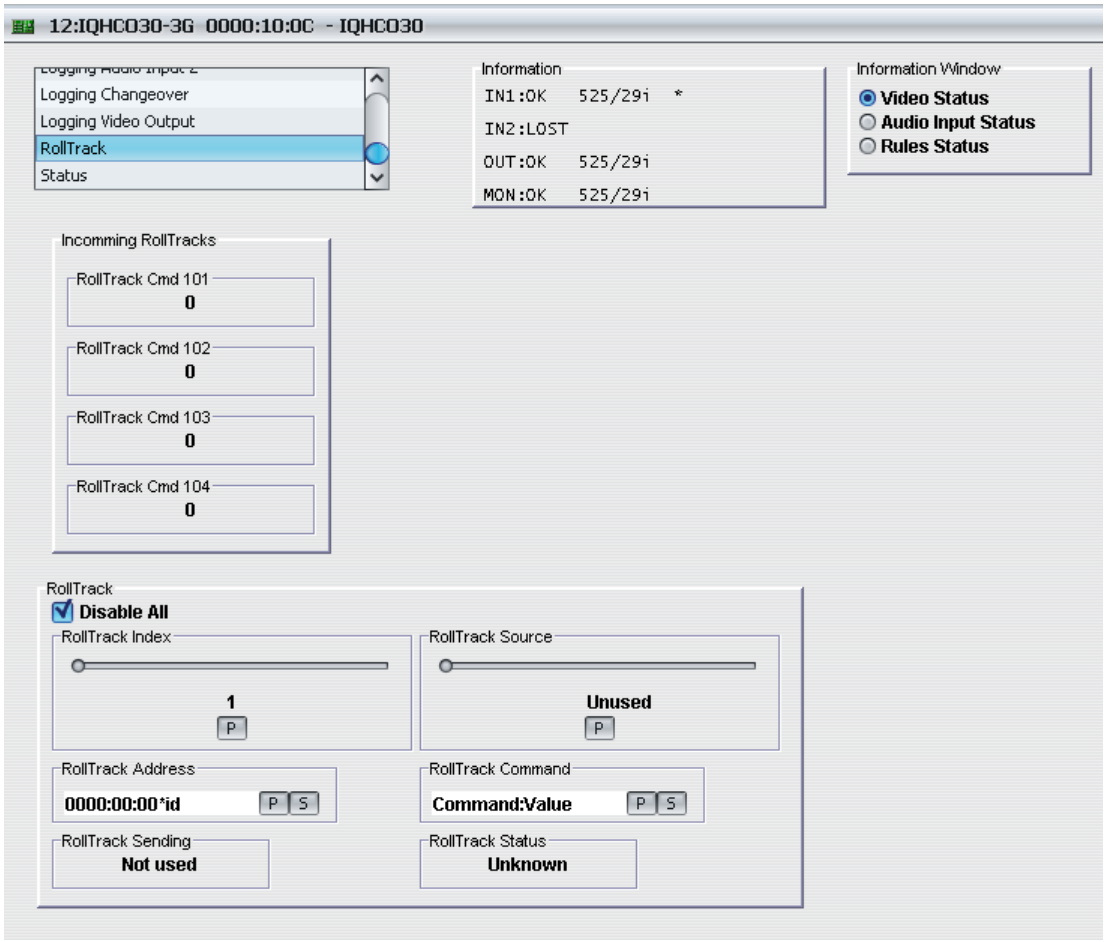
The **Logging Video Output** screen displays the current log values for the video output signal.



Log Field	Description
OUTPUT_1_TYPE=	Displays the output type.
OUTPUT_*N*_STATE=	• Displays the output state. Valid values are: • OK • WARN:Pattern • WARN:Black • WARN:Freeze
OUTPUT_*N*_STANDARD=	Displays the current output video standard.
OUTPUT_*N*=	Displays the relevant input source for the output video, MASTER or BACKUP.

5.12 RollTrack

The **RollTrack** screen controls display the values of the current incoming RollTrack and enable you to configure the modules outgoing RollTracks.



5.12.1 Incoming RollTracks

This section displays the value of the incoming RollTrack commands - either 1 or 0.

This relates to the **Selection Rules RollTrack** page, with regards to the RollTrack Rules 1 to 4. Rules can be set up to respond to the received states of these four commands. This may be used in conjunction with an IQHIP00 upstream module for a more complex self-automated quality control of audio and video status.

5.12.2 RollTrack

5.12.2.1 Disable All

When checked, all RollTrack items are disabled.

5.12.2.2 RollTrack Index

The RollTrack Index identifies the RollTrack action being configured. Up to 70 RollTrack actions can be created. Dragging the slider selects the RollTrack Index number, displayed below the slider. Clicking the **P** button selects the default preset value.

5.12.2.3 RollTrack Sources

This slider enables the source of information that triggers the transmission of data to be selected. Dragging the slider selects the RollTrack source, displayed below the slider. Clicking the **P** button selects the default preset value. When no source is selected, **Unused** is displayed. The available RollTrack sources are:

Unused	ROLLTRACK1FALSE	ROLLTRACK1TRUE
ROLLTRACK2FALSE	ROLLTRACK2TRUE	ROLLTRACK3FALSE
ROLLTRACK3TRUE	ROLLTRACK4FALSE	ROLLTRACK4TRUE
Input1Present	Input1Lost	Input2Present
Input2Lost	OutMainMaster	OutMainBackup
OutMainPattern	OutMainCaption	OutMainRules
OutMonMaster	OutMonBackup	OutMonPattern
OutMonCaption	OutMonFollowMain	Output525
Output625	Output720	output1080i
output1080p		

5.12.2.4 RollTrack Addresses

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

The address may be changed by typing the new destination in the text area and then selecting the **S** button to save the selection. Clicking the **P** button returns to the default preset destination.

The RollTrack address consists of 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 a user-settable number that is a unique identification number for the destination unit in a multi-unit system. This ensures that only the correct unit will respond to the command. If left at 00 an incorrectly fitted unit may respond inappropriately.

5.12.2.5 RollTrack Commands

This item enables a command to be sent to the selected destination unit.

The command may be changed by typing a code in the text area and then selecting the **S** button to save the selection. Clicking the **P** button returns to the default preset command.

The RollTrack command consists of two sets of numbers, for example: **84:156**.

- The first number (**84**) is the actual RollTrack command.
- The second number (**156**) is the value sent with the RollTrack command.

5.12.2.6 RollTrack Sending

A message is displayed here when the unit is actively sending a RollTrack command. Possible RollTrack Sending messages are:

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 SAM agent.

5.12.2.7 RollTrack Status

A message is displayed here to indicate the status of the currently selected RollTrack index. Possible RollTrack Status messages are:

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.

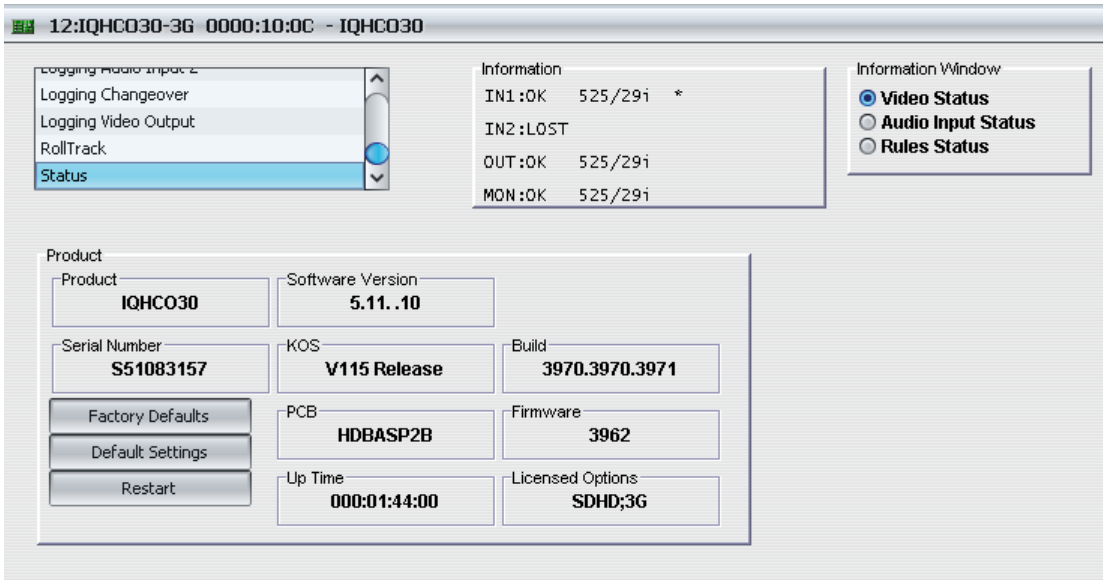
5.12.2.8 Using RollTracks

To configure a RollTrack action:

1. Select the Index number. This identifies the RollTrack action being configured. Up to 70 RollTrack actions can be created.
2. Using the slider bar, select the source of the information that will trigger RollTrack transmission.
3. Enter the RollTrack Address and click **S**. To return the address to its default value, click P.
4. Enter the RollTrack Command and click **S**. To return the value to its default, click **P**.

5.13 Status

The **Status** screen displays basic information about the module, such as the serial number and software versions. Use the functions on the screen to restart the module or return all settings to their factory or default settings.



- **Product:** The name of the module.
- **Software Version:** The currently installed software version number.
- **Serial No:** The module serial number.
- **KOS:** The operating system version number.
- **Build:** The factory build number. This number identifies all parameters of the module.
- **PCB:** The Printed Circuit Board revision number.
- **Firmware:** The module firmware revision number.
- **Up Time:** The time since the module was last started.
- **Licensed Options:** The currently installed licensed options associated with the module.

5.13.1 Factory Defaults

The **Factory Defaults** button enables the module settings to be reset to their factory defaults.

Note: Resetting the module to its factory defaults also clears all the saved memory settings.

5.13.2 Default Settings

The **Default Settings** button enables module settings to be reset to their factory defaults, leaving user memories intact.

5.13.3 Restart

The **Restart** button enables the module to be rebooted, simulating a power-up/power-down cycle.

