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User Instruction Manual

IQQMD00

Quad-link-SDI Down Converter for Ultra HD Signals

Contents

1. About this Manual

This manual describes the IQQMD00 Quad-link-SDI Down Converter for Ultra HD Signals.

If you have any questions regarding the installation and setup of your product, please refer to the Customer Service contact details (see section 1.1).

1.1 Contact Details

For details of our **Regional Customer Support Offices** please visit the Snell website and navigate to Support/Customer Support Contacts.

www.snellgroup.com/support/customer-support

Customers with a support contract should call their personalized number, which can be found in their contract, and be ready to provide their contract number and details.

1.2 Copyright and Disclaimer

2. Introduction

The IQQMD00 provides conversion for Quad-link Ultra HD SDI inputs to SDI outputs in 1080p, 1080i, 720p or SD formats. This allows Ultra High Definition signals to be integrated into existing HD/SD-SDI workflows and monitored on standard 1920 x 1080 displays removing the need for expensive Ultra HD specific equipment and monitors.

Drawing on Snell's extensive experience in conversion technology the IQQMD00 uses high quality scaling and filtering technology to down convert and align the quad-link input to provide a clean and sharp HD/SD output, ideal for monitoring and other signal distribution applications.

The video output from this module is SDI with an option to add fiber, copper or HDMI SFP module to extend the output capabilities of the IQQMD00.

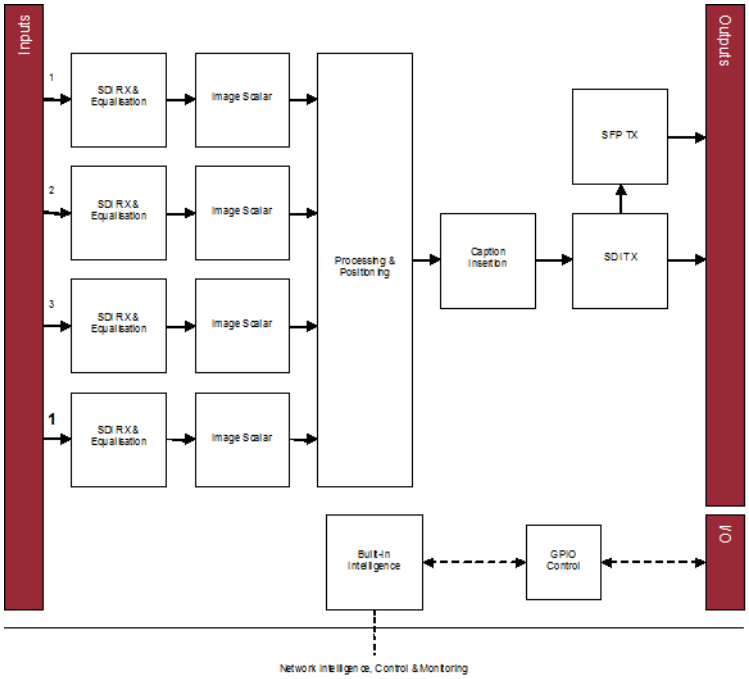

Fig 1. Block diagram

2.1 Order Codes

The following order codes are available.

IQQMD0000-2B3	3G/HD/SD-SDI Quad-link Monitoring downconverter. 4 SDI inputs, 1 SDI output, up to 2 SFP outputs, 6 GPIs.
IQQMD0001-2A3	3G/HD/SD-SDI Quad-link Monitoring downconverter. 4 SDI inputs, 1 SDI output, up to 2 SFP outputs, 6 GPIs.

2.2 Fiber SFP Options

Order codes for the SFP options:

FC1-13T1	Single 1310nm fiber Tx
FC1-13T2	Dual 1310nm fiber Tx
FC1-15T1	Single 1550nm fiber Tx
FC1-15T2	Dual 1550nm fiber Tx
FC1-HDBT2	HD-BNC Dual Tx
FC1-HDMI2	HDMI Tx with 2m cable
Fiber CWDM Tx	Wavelengths available on request

Note: Fiber SFP type must be ordered in addition to the module.

2.3 Rear Panel View

This section contains the available rear panels.

2.3.1 IQQMD0000-1A3, IQQMD0000-1B3

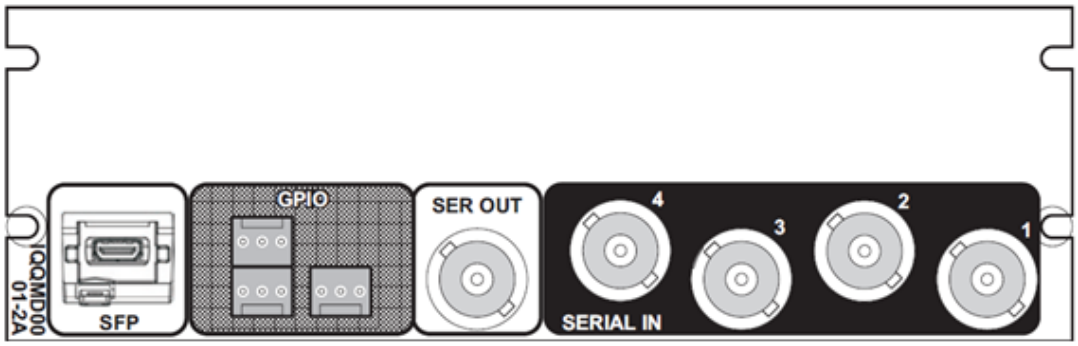

Fig 2. IQQMD0000-1A3, IQQMD0000-1B3

2.4 Enclosures

IQQMD00 can only be fitted in the following enclosures, shown below:

IQH3B-S-0, IQH3B-S-P

Fig 3. IQH3B-S-0, IQH3B-S-P

IQH1A-S-P

Fig 4. IQH1A-S-P

IQH3A-S-0, IQH3A-S-P

Fig 5. IQH3A-S-0, IQH1A-S-P

IQH3A-E-0, IQH3A-E-P, IQH3A-0-P

Fig 6. IQH3A-E-0, IQH3A-E-P, IGH3A-0-P

IQH1A-S-P

Fig 7. IQH1A-S-P

2.5 Feature Summary

The IQQMD00 Quad-link-SDI Down Converter for Ultra HD Signals provides the following features:

- Custom scaling and filtering to provide seamless reconstruction of a quad-link
- UHD input for HD single link applications
- Standards supported:
  - 3G-SDI to SMPTE 424M/425M level A compatible
  - HD-SDI to SMPTE292M/274M/296M
  - SD-SDI to SMPTE259M-C
  - 4K-UHD Quad Link to both Quadrant based and SMPTE 2036 pixel interleave
- SFP cage enables output over HDMI, fiber or additional SDI via HD-BNC
- User definable caption generator for image identification
- 16 x user memories, save/recall/rename
- Rollcall control and monitoring compatible
- Input loss detection with default captions

3. Technical Specification

This section contains technical information for the IQQMD00 module.

3.1 Inputs and Outputs

Inputs and Outputs	
Signal Inputs	
Inputs	4
Connector/Format	BNC / 75 Ohm panel jack on standard Snell connector panel
Input Cable Length	Up to 100m Belden 1694A @ 3Gbps
Return loss	>-10 dB 1.5GHz to 3GHz
Signal Outputs	
Outputs	1 x BNC & 1 x SFP monitor out dual transmitter capable
Electrical	3G/HD/SD-SDI
Connector/Format	BNC / 75 Ohm
Standards	SMPTE 424M (3G level A) SMPTE 292M (HD) SMPTE 259M-C (SD)
Control Interface	
GPI	6 (I/O configurable)
Electrical	TTL-compatible, active-low driven
Connector/Format	Molex connection

Table 1 Inputs and Outputs

3.2 Indicators

Indicators	Front Panel & Card Edge
V+	OK (Green)
V-	OK (Green)
CPU	OK (Green flashing)
Input Status	No input status (Red) 3G Input Standard Present (Blue)
Frame Reference	Not Available (Off) No input (Red) HD input (Green) SD input (Yellow)
Error	OK (Off) Booting, until SDI enabled (Red) Running, Board Fault (Red)
Warn	OK (Off or blinking yellow) Operational Error Warning (Yellow continuous)
Good	OK (Green)

Table 2 Indicators - Front Panel & Card Edge

3.3 RollCall Features

RollCall Features	
SDI Input Status	Name, Status, Presence and Standard
SDI Output Status	Standard, Status, SFP
Reference Status	State, Source and Standard
GPIO Status	State
SDI Input Control	Input Name Sony/SMPTE
Video Output Control	SDI Output Standard
Reference control	Source: Input 1-4, Reference A-B
GPIO Control	Direction: Unused, Input, Output Invert GPI Input High Action GPI Input Low Action GPO Output Source
User memories	Name, save and recall 16 user memories
Information Window	Video Input/Output Summary Video Input Status Video Output Status
Factory Defaults	Resets all of the unit's settings to their factory defaults
Default Settings	Resets all of the unit's settings to their factory defaults without clearing the User memories
Video Logging	Input Name Input State Input Standard Output Monitor Type Output Standard Output SFP Status Genlock State Reference State Reference Standard Reference Source Reference Type Frame Reference State Frame Reference Standard
System Logging	FPGA Temperature
Misc Logging	Version Numbers Uptime Rear ID Rear Status Slot Width Slot Start Power usage Module IDs Licensed Options
RollTrack Controls	On/off, Index, Source, Address, Command, Status, Sending

Table 3 RollCall Features

3.4 Specifications

Specifications	
Conversion Delay	2 input frames
Start-up Time	28 seconds
Power consumption	
Module Power Consumption	22.5W/20.5PR

Table 4 Specifications

4. Connections

This section contains information on the module connectors.

4.1 SDI Inputs

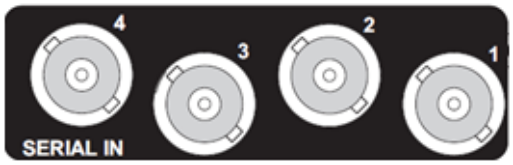

Fig 8. SDI Output

4.2 SDI Output

Fig 9. SDI Input

4.3 GPIO

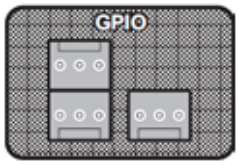

Fig 10. GPIO

4.4 SFP

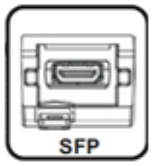

Fig 11. SFP

5. Card Edge LEDs

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

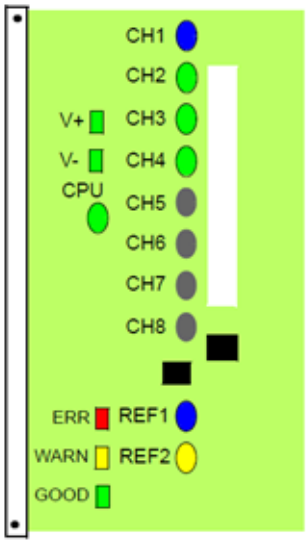

Fig 12. Card Edge LEDs

LED	Color	Description
CH1	No Input Present (Red)	SDI input 1 to 4 respectively. These LEDs are illuminated when a valid input is present at the Serial Data Inputs.
CH2	3G Present (Blue)	
CH3	HD Present (Green)	
CH4	SD Present (Yellow)	
CH5-CH8	Not used	
REF1 REF2	Not Available (Off)	Frame References 1 and 2 respectively. These LEDs indicate that a reference signal is present.
	No Input (Red)	
	HD Input (Green)	
	SD Input (Yellow)	
The module must be mounted in a B-style frame and one or more frame reference signal must be connected to use frame references.		
V+	OK (Green)	Indicates that the respective power supply is present.
V-	OK (Green)	Indicates that the respective power supply is present.
CPU	OK (Green)	Flashes to indicate that the CPU is working/active.

Table 5 Card Edge LEDs

LED	Color	Description
ERR	OK (Off) Board Fault (Red)	This LED indicates board fault conditions. When the unit is booting, this LED is illuminated until the SDI is enabled. Board fault errors include: • Serializer lock fault. Output serializer fails to lock. • SDI JTAG board fault. Internal JTAG interface is inadvertently enabled. 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.
WARN	OK (Off or Blinking Yellow) Operational Error Warning (Yellow Continuous)	This LED indicates operational errors. Operational errors include: • Input Video -Incompatible input standard - Detected input standard is invalid. • 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. This LED is briefly illuminated in transitional states like standard changes.
GOOD	OK (Green)	Indicates that the module is operating correctly.

Table 5 Card Edge LEDs

6. RollCall Control Panel

This section contains information on using the IQQMDOO module with RollCall.

6.1 Information Window

The **Information Window** appears in the upper-right corner of each screen and enables you to select the basic information (Input or Output) to display in the **Information** pane. The **Information** pane displays the status of video inputs and outputs.

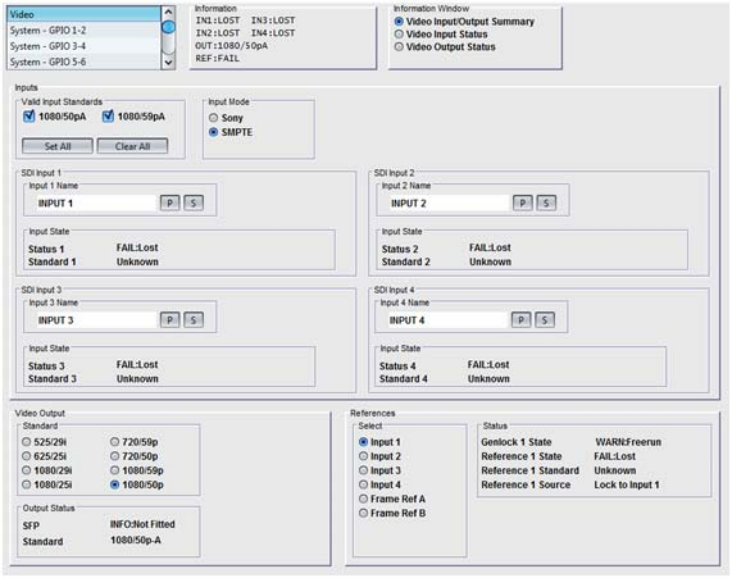

Fig 13. Video input and output status

6.1.1 Video Input / Output Summary

Selecting this option on the **Information Window** pane displays the following video Inputs, Output and Reference information on the **Information** pane as shown below:

Fig 14. Video input and output summary

The following information is available:

Name	Status	Description
IN1	LOST	No status present
IN2	1080/50p	
IN3	1080/59p	
IN4		
OUT	525/29i, 625/25i, 1080/29i, 1080/25i, 720/59p, 720/50p, 1080/59pA, 1080/50pA	Selected output standard. Post fixed with an A to indicate Level-A.
REF	OK FAIL	If the Reference is OK, displays state OK and the Standard (for example, 1080/59pA) of the reference

Table 6 Video input and output summary

6.1.2 Video Input Status

Selecting this option on the **Information Window** pane displays the following video Inputs, Output and Reference information on the **Information** pane as shown below:

Fig 15. Video input status

The following information is available:

Name	Status	Description
IN1	LOST	No input present
IN2	1080/50A OK	Detected standard of input signal. Valid input signal received
IN3	1080/59A OK	
IN4		

Table 7 Video input status

6.1.3 Video Output Status

Selecting this option on the **Information Window** pane displays the following video Inputs, Output and Reference information on the **Information** pane as shown below:

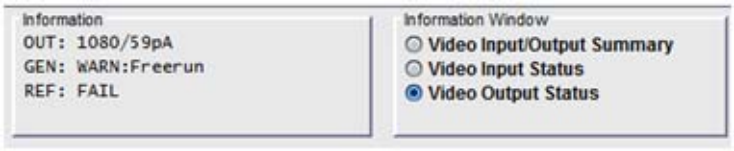

Fig 16. Video output status

The following information is available:

Name	Status	Description
OUT	525/29i, 625/25i, 1080/29i, 1080/25i, 720/59p, 720/50p, 1080/59pA, 1080/50pA	Selected output standard Post fixed with an A to indicate Level-A
GEN	WARN:FreeRun	Selected reference source or freerun (No Reference Lock)
REF	OK FAIL	No reference present or OK_(Ref standard)

Table 8 Video output status

6.2 Video

The Video pane enables you to specify and view the settings and status for all the video inputs, video output, monitor output and reference.

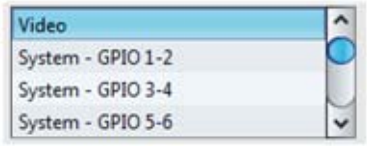

Fig 17. Video

6.2.1 Inputs

The following information is provided:

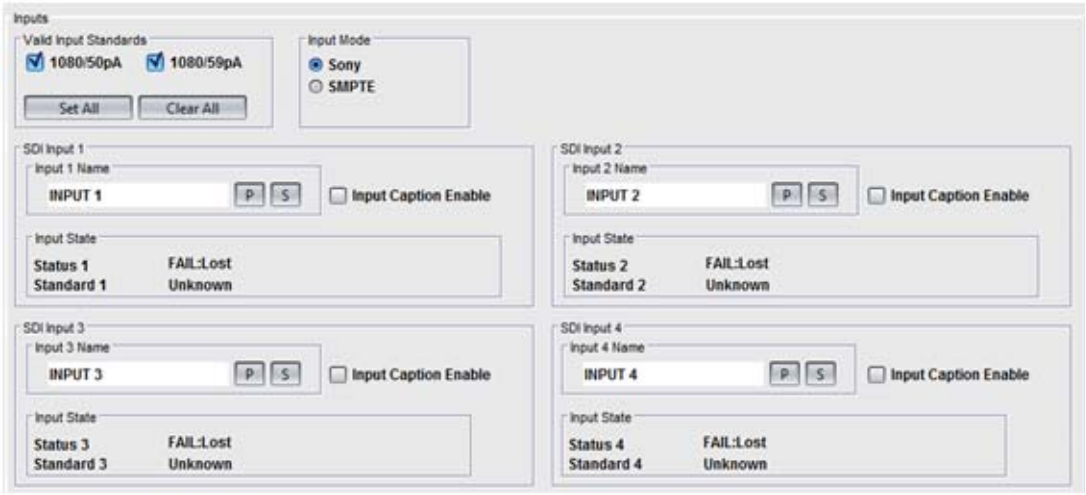

Fig 18. Inputs

Name	Description
Valid Input Standards	The Valid Input Formats check boxes specify the video input standards that the module will accept. The module will automatically detect the standard of the received input and indicate any signal that does not comply with the selected video formats as INVALID.
Input Mode	Selects either Sony or SMPTE pixel interleave standard for the 4K-UHD input signal. In **Sony** mode, the inputs are discreet 4k images and are displayed one per quadrant. Normally, each input would be ¼ of the image and would combine to be a single picture. If you emulate it by providing 4 ordinary 4k pictures, they appear 1 per quadrant. In **SMPTE** mode, each input is pixel multiplexed so if you present the same ordinary 4k signal into each input, it always appears as a single picture.

Table 9 Inputs

Name	Description
Input Caption Enable	Only available for the Sony standard. These are the input names displayed in Logging Inputs and presented on the output as UMD captions along with the inputs video image. To change the name of Input 1 or Input 2, type the name in the text field and click S. To return the name to its factory default, click P.
Input State	Displays the status and video standard of the input.

Table 9 Inputs

6.2.2 Outputs

The following information is provided:

Fig 19. Outputs

Name	Description
Standard	Select the required SDI output video standard.
Output status	Displays the status and video standard of the video outputs.

Table 10 Outputs

6.2.3 References

The following options enable you to control and monitor the reference inputs:

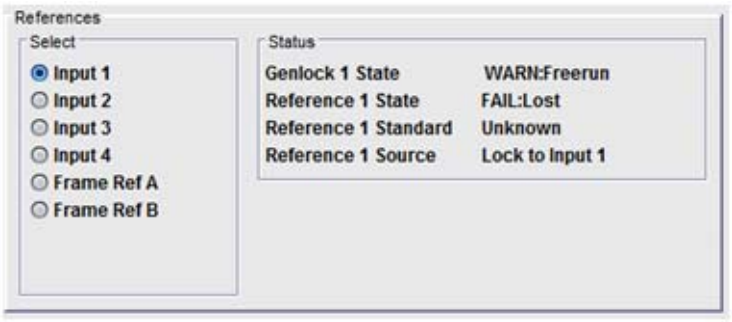

Fig 20. References

Name	Description
Select	Select the required reference standard.
Status	Displays the status and video standard of the video outputs as follows: • **Genlock 1 State** - WARN:Freerun or OK:Input / OK:Reference • **Reference 1 State** - FAIL:Lost or OK • **Reference 1 Standard** - Unknown / 525/29i / 625/25i / 1080/29i / 1080/25i / 720/59p / 720/50p / 1080/59pA / 1080/50pA • **Reference 1 Source** - Lock to Input 1 / Lock to Input 2 / Lock to Input 3 / Lock to Input 4 / Frame Ref A / Frame Ref B

Table 11 References

6.3 System GPIO

The GPIO controls are used to configure the six General Purpose Input / Output (GPIO) connector functionality.

Fig 21. System GPIO

6.3.1 GPIO 1, 2, 3, 4, 5 & 6

The following options enable you to control and monitor the GPIOs.

Fig 22. GPIO 1-2

Name	Description
GPIO	The options are: • **Unused** - When the GPIO is inactive • **Input** - Configures the GPI as an input. This enables you to choose what action occurs when the GPI input receives a driven state High (>2Volts) or Low (<0.8Volts) • **Output** - Configures the GPI as an output. This enables you to choose what trigger occurs to produce an output signal at the GPI connector when the GPI output is driven Low (+0.5V typical) or, if the Invert function is selected, Driving the GPI output High (+5V typical)
Status	Displays the GPIO status.
Invert	Configure the GPI to be active low when it is an Output.

Table 12 GPIO configuration

6.3.2 GPI

The following options enable you to control the General Purpose Inputs when active HIGH or active LOW.

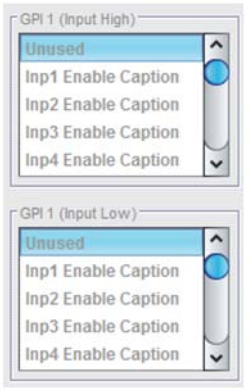

Fig 23. GPI

Name	Description
Unused	No action is taken.
Inp [1-4] Enable Caption	Enables the display of the UMD caption on the output for the selected input.
Inp [1-4] Disable Caption	Disables the display of the UMD caption on the output for the selected input.
Inp [1-4] is Reference	Selects the input as the output's Genlock reference.
Use Frame Ref [A-B]	Selects one of the frame reference sources as the output's Genlock reference (if available in the installed frame type).
Monitor out HDMI	Configures the Monitor output to be in HDMI mode (If suitable SFP is fitted).
Monitor out DVI	Configures the Monitor output to be in HDMI mode (If suitable SFP is fitted).

Table 13 GPI

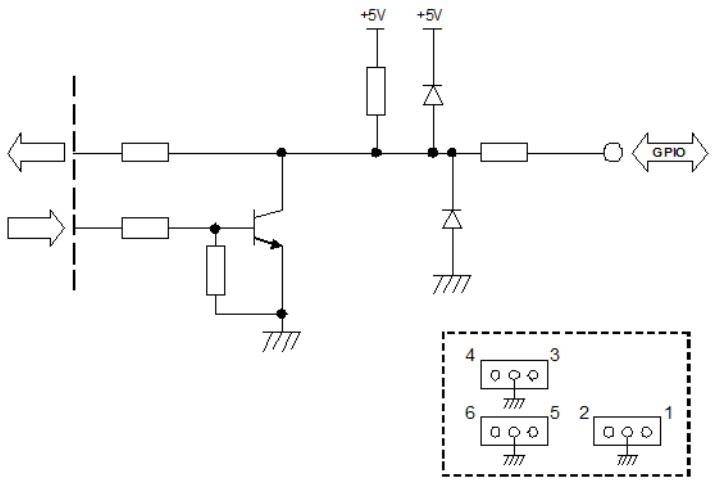

Fig 24. Electrical interface

6.3.3 GPO

The following options enable you to control the General Purpose Outputs:

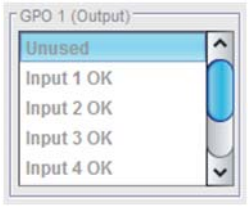

Fig 25. GPO

Name	Description
Used	Configure the GPI to be active HIGH when it is an Output.
Input [1-4] OK	Operates when the selected Input has a valid video signal.
All 4 Inputs OK	Operates when all the Inputs have valid video signals.
Selected Ref OK	Operates when the Reference status is good.
No User Mem Sel'd	Operates to warn that no User Memory has been selected.

Table 14 GPO

Note: The GPI outputs have one configuration box. If you select Unused, the GPI output is inactive.

6.4 Memories

The Memory screen enables up to 16 setups to be saved and recalled later. Default memory names can be changed to provide more meaningful descriptions.

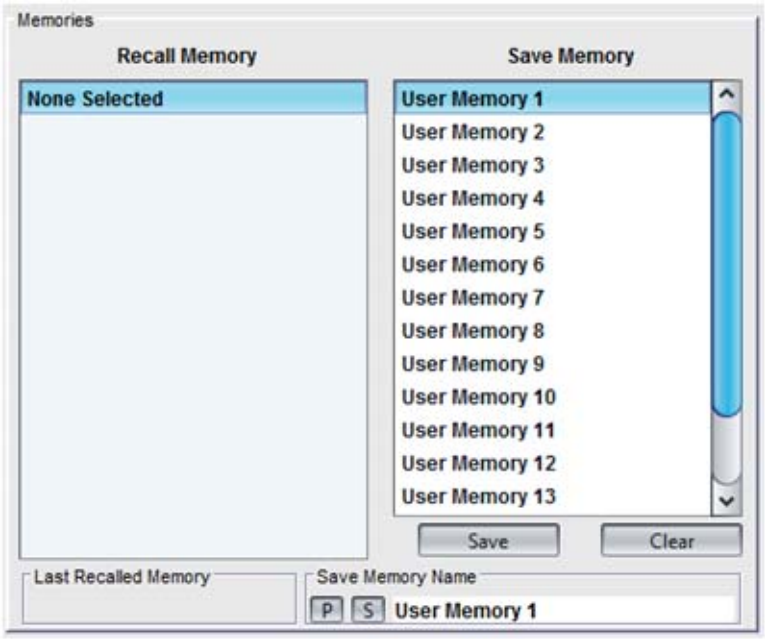

Fig 26. Memories

6.4.1 Saving Memory Settings

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

6.4.2 Changing a Memory Name

In the Save Memory Name field, type the new memory name and click S. To return the memory to its default name, click P.

6.4.3 Recalling a Memory

The Recall Memory list recalls the settings saved in a memory location. The Last Recalled Memory box shows the most recently recalled memory. If you change a control after recall in a memory, Last Recalled Memory displays a * behind the memory name.

To recall a memory in the Recall Memory column, select the memory to recall. The recalled settings are applied and the memory name appears under Last Recalled Memory.

Note: Memories do not recall RollTracks, GPIO's or log field states, for example, whether a log value is enabled or disabled.

6.5 Savesets

Savesets enable the user to save predetermined RollCall products fields settings to file that can then be used to either transfer the settings to another card, or used as a backup of the settings for that card.

6.5.1 Saving a saveset

The Saveset feature is available from the RollCall Control Panel client.

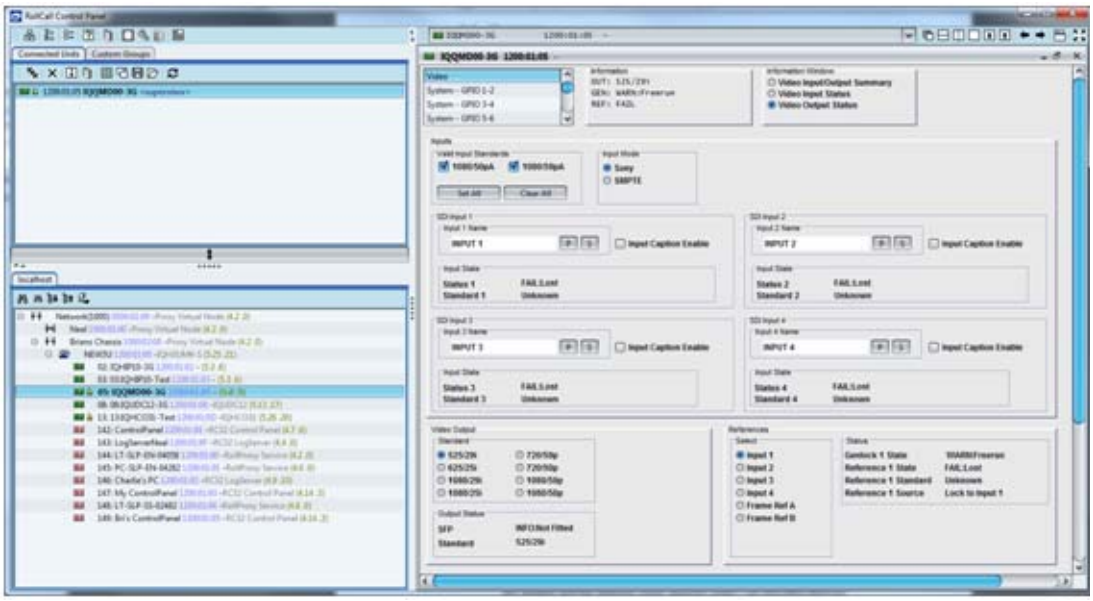

Fig 27. Savesets

From the Connected Units pane shown above, select the disk icon (7th from the left).

Fig 28. Saving a saveset

The user is then prompted to either save to a file or save to local Saveset.

6.5.2 Restoring a saveset

To restore a file, from the Connected Units pane, select the folder icon (8th from the left).

Fig 29. Restoring a saveset

The user is then prompted to either select a local Saveset or a previously saved file.

6.6 Logging

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

6.6.1 Logging - Video

The Logging Video screen is used to select which fields should be enabled for Video related log fields.

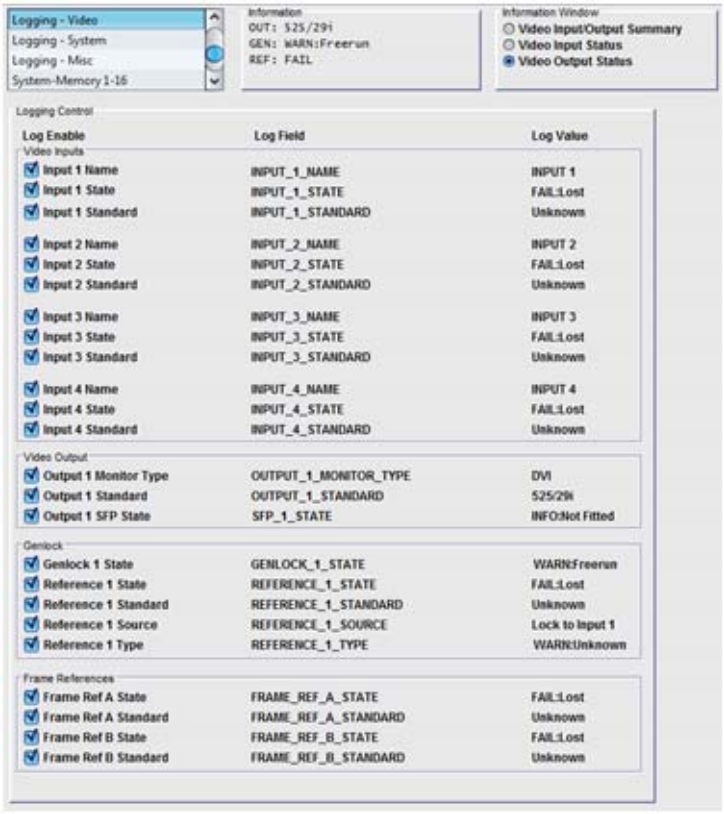

Fig 30. Logging - Video

The following fields are available:

Name	Description
INPUT_N_NAME *Where N is the input number*	The name of the input as defined by the user.
INPUT_N_STATE *Where N is the input number*	OK - The input signal is good. LOST - The input signal is not detected. INVALID - The input standard in invalid.
INPUT_N_STANDARD	The detected input standard
OUTPUT_1_MONITOR_TYPE	The type of output video signal
OUTPUT_1_STANDARD	The selected output standard
SFP_1_STATE	Reports the presence of the SFP

Table 15 Logging - Video

Name	Description
GENLOCK_1_STATE	Reports the state of the Genlock function and warns if there is a cross-lock situation due to an invalid reference standard for the selected output standard.
REFERENCE_1_STATE	The video signal selected as reference 3G/HDSD SDI and its presence, for example, LOST
REFERENCE_1_STANDARD	Reference video standard
REFERENCE_1_SOURCE	
REFERENCE_1_TYPE	
FRAME_REF_A_STATE	
REFERENCE_A_STATE	
REFERENCE_A_STANDARD	
REFERENCE_A_SOURCE	

Table 15 Logging - Video

6.6.2 Logging - System

The Logging - System screen enables the user to select the fields for the system related log.

Fig 31. Logging - System

The following field is available:

Name	Description
PROCCARD_TEMPERATURE_FPGA	OK:xxC - where xx is the temperature in °C

Table 16 Logging - System

6.6.3 Logging Misc

The Logging Misc screen enables the user to select the fields for miscellaneous items.

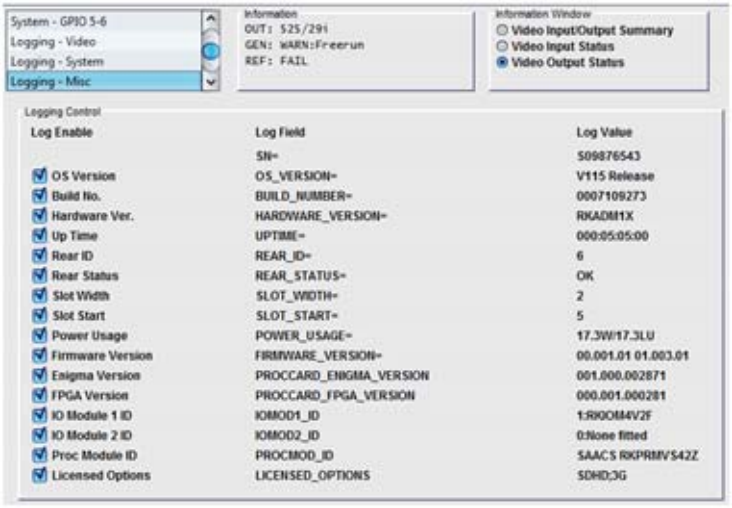

Fig 32. Logging - Misc

The following fields are available:

Name	Description
SN=	Displays the module serial number, which consists of an S followed by eight digits. This field cannot be deselected.
OS_VERSION=	Displays the operating system name and version. For example, KOS V115
BUILD_NUMBER=	Displays the build number
HARDWARE_VERSION=	Displays the hardware version number
UPTIME=	Displays the time since the last restart in the format ddd:hh:mm:ss
REAR_ID=	Displays the rear panel type number
REAR_STATUS=	Displays the status of the rear panel
SLOT_WIDTH=	Displays the slot width
SLOT_START=	Displays the slot start number
POWER_USAGE=	Displays the power rating for the module. Note this is a maximum rating. not a live power reading
FIRMWARE_VERSION=	Displays the ASI controller firmware version
PROCCARD_ENIGMA_VERSION=	Displays the software driver version number
PROCCARD_FPGA_VERSION=	Displays the firmware version number
IOMOD1_ID=	Displays the primary IO module ID
IOMOD2_ID=	Not relevant for this product
PROCMOD_ID=	Displays the processing card ID
LICENSED_OPTIONS=	Displays the options included in the license

Table 17 Logging - Misc

6.7 RollTrack

The RollTrack screen allows information to be sent via the RollCall™ network, to other compatible units connected on the same network.

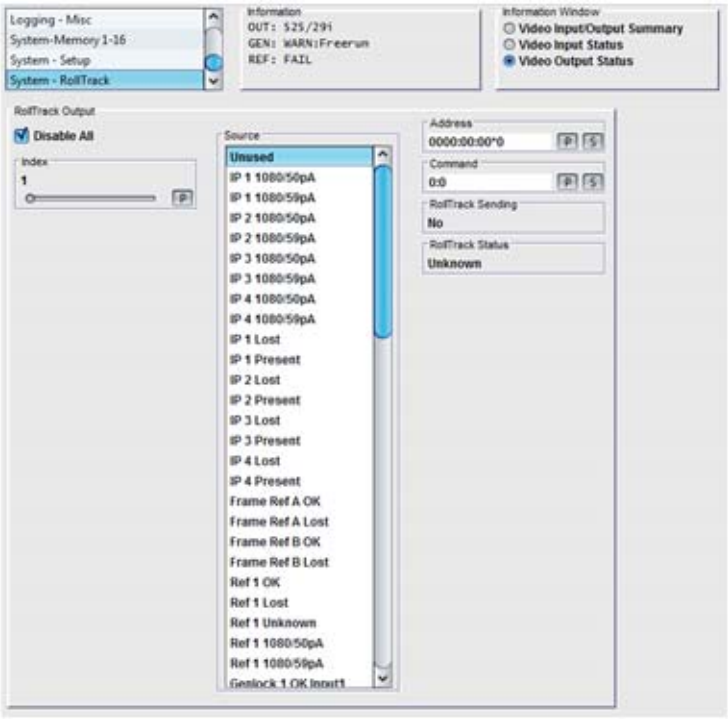

Fig 33. RollTrack

6.7.1 Disable All

When checked, all RollTrack items are disabled (checked by default).

6.7.2 RollTrack Index

This slider enables up to 32 distinct RollTrack outputs to be set up. Dragging the slider selects the RollTrack Index number, displayed below the slider. Clicking the P button selects the default preset value.

6.7.3 RollTrack Source

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

The following fields are available:

Name	Description
Unused	No RollTracks sent
IP N ####_##P/I	Present line and frame rate standard on input
IP N Lost	Input is not present
IP N Present	Input is present
Frame Ref N OK	Frame reference is OK
Frame Ref N Lost	Frame reference is Lost
Ref 1 OK	Reference is OK
Ref 1 Lost	Reference is Lost
Ref N ####_##P/I	Present line and frame rate standard on reference

Table 18 RollTrack Source

Name	Description
Genlock N OK Input N	Selected reference for Genlock is an input
Genlock N OK Frame N	Selected reference for Genlock is frame referenced
Genlock N WRN Freer	Genlock is in Cross lock mode where the selected reference is incompatible with the selected output standard and the reference selection is forced to Freerun
OP N ####_##P/I	Present line and frame rate standard on the output
GPI N Low / High / Inactive	General purpose input state
GPO N Low / High / Inactive	General purpose output state

Table 18 RollTrack Source

Where N is the input / source number

6.7.4 RollTrack Address

This option sets the address of the selected destination unit.

To change the address, type the new destination into the text area and then select 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-configurable number that is a unique identification number for the destination unit in a multi-unit system (the ID number of the IQ module intended to be the destination of the RollTrack command). This unique ID ensures that only the correct unit responds to the command. If left at 00, an incorrectly fitted unit may respond inappropriately.

6.7.5 RollTrack Command

This option sends a command to the selected destination unit.

To change a command, type a code into the text area and then select 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.

6.7.6 RollTrack Sending

A message appears here when the unit is actively sending a RollTrack command.

The following messages can appear:

Message	Description
No	The message is not being sent.
Yes	The message is being sent.

Table 19 RollTrack Sending

6.7.7 RollTrack Status

A message appears here to indicate the status of the currently selected RollTrack index.

The following messages can appear:

Message	Description
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.

Table 20 RollTrack Status

6.8 Setup

The Setup screen displays basic information about the module, for example, 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.

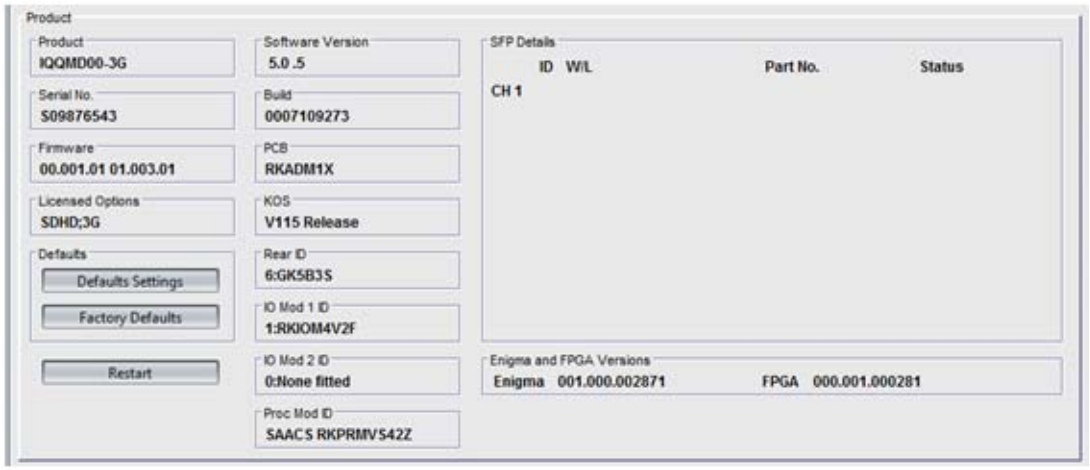

Fig 34. Setup

The following fields are available:

Message	Description
Product	The name of the module
Software Version	The currently installed software version number
Serial No	The module serial number
Build	The factory build number. This number identifies all parameters of the module.
Firmware	Firmware version number
PCB	The Printed Circuit Board revision number
Licensed Options	Installed license options
KOS	The operating system version number
Rear ID	The rear panel ID
IO Mod 1 ID	IO module Mod strike and Part Number
IO Mod 1 ID	IO module Mod strike and Part Number
Proc Mod ID	Proc module Mod strike and Part Number
SFP Details	SFP details
Enigma and FPGA Versions	Enigma and FPGA version numbers

Table 21 Setup

6.8.1 Factory Settings

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

6.8.2 Default Settings

The Default Settings button enables the module settings to be reset to their factory defaults but does not affect the user memories.

6.8.3 Restart

The Restart button enables the module to be rebooted.

