

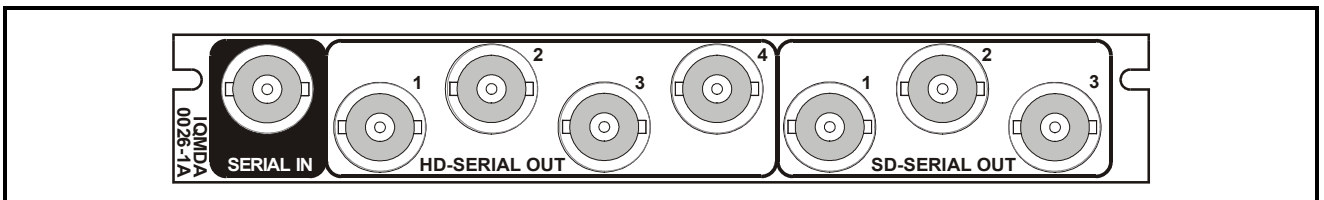
IQMDA00 HD/SD-SDI distribution amplifier and HD-SDI monitoring downconverter



Module Description

The IQMDA00 is an HD/SD-SDI distribution amplifier and HD-SDI monitoring downconverter. This module takes HD-SDI streams and produces four re-clocked HD-SDI outputs. It also converts the input signal to same frame-rate SD-SDI outputs for monitoring. Output options include 4 x HD-SDI and 3 x SD-SDI. One group of audio can also be carried through from the HD inputs to the SD outputs. This module can also be used to distribute SD-SDI signals to SMPTE 259M-C, providing 7 outputs from one input.

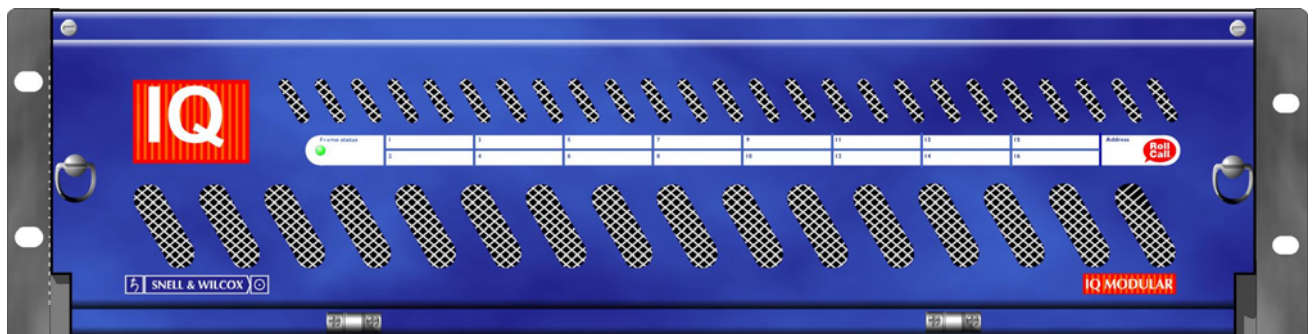
Rear Panel View



Versions of the module cards available are:

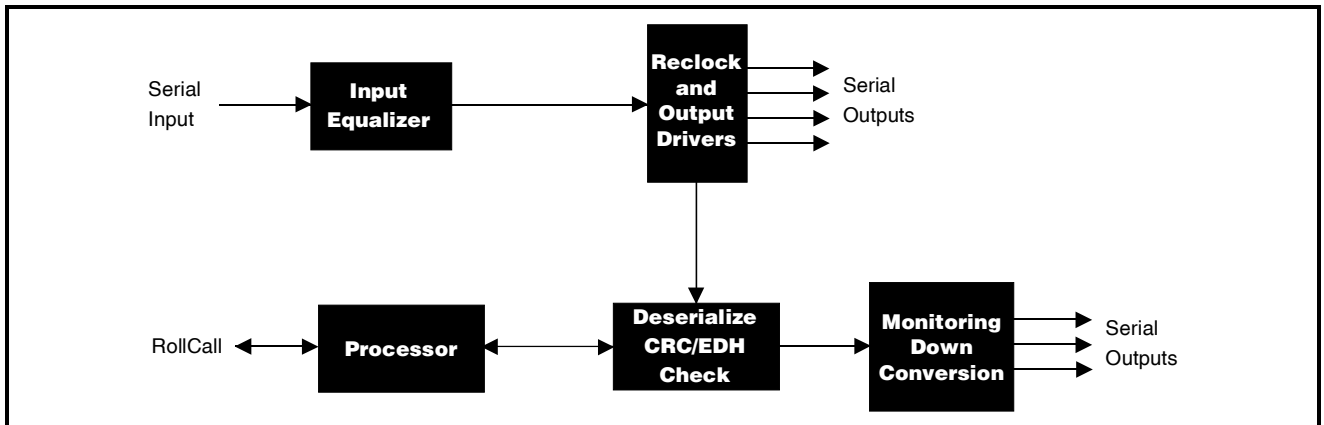
IQMDA0026-1A HD/SD-SDI DA and HD-SDI Monitoring Down-converter. 4 HD-SDI and 3 SD-SDI outputs

Note that this module can only be fitted into the 'A' Style Enclosure shown below.



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

Block Diagram



Features

- An HD-SDI monitoring down-converter to allow compact low-cost, low-power monitoring solutions for HD environments
- Standards supported:
 - ◆ HD-SDI to SMPTE292M
 - ◆ SD-SDI to SMPTE259M-C
- A distribution amplifier for HD-SDI signals with SD-SDI monitoring capability
- A distribution amplifier for SD-SDI signals with 7 x SD-SDI outputs
- Audio capability means that a complete Audio/Video monitoring solution is possible
- Supports one output group of embedded audio channels with input audio group selection
- Monitoring output aspect ratio may be set to letterbox, anamorphic or center cut out picture modes
- Signal loss detection
- Maintains the input frame-rate for the output signal
- RollCall remote control and monitoring compatible

Technical Profile

Features

Signal Input

Electrical	1.5 Gbit/s HD-SDI, SMPTE 292M 270 Mbit/s SDI, SMPTE 259M-C
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
Return loss.....	> -15 dB

Distribution Outputs

Electrical	1.5 Gbit/s HD-SDI, SMPTE 292M 270 Mbit/s SDI, SMPTE 259M-C
------------------	---

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

Outputs 4
Return loss > -15 dB

Downconverter Outputs

Electrical	270 Mb/s SD-SDI SMPTE 259M-C including one group of embedded audio, delayed to match the HD/SD video processing delay
Connector / Format	BNC/ 75ohm panel jack on standard S&W connector panel
Outputs	3
Output Return Loss	> -15 dB

Indicators

Power	OK
CPU	OK
Status	OK (Green) Warning (Yellow) Error (Red)

Available Conversions

Input	Output
1125(1080)/29.97i or sF	525(483)/29.97i
1125(1080)/25i or sF	625(576)/25i
750(720)/59.94P	525(483)/29.97i
750(720)/50P	625(576)/25i
625(576)/25i	625(576)/25i
525(483)/29.97i	525(483)/29.97i

RollCall Control

1. Control	
2. Aspect ratio for monitoring outputs letterbox, anamorphic, center cut out	
User Memories.....	16 x Save / Recall / Rename
Input audio group selection	Groups 1 to 4
Reporting	Input format(including unknown), input loss, CRC error
Logging	Input Status Input Standard Convert CRC/EDH CRC/EDH total
RollTrack Controls.....	On/Off, Index, Source, Address, Command, Status, Sending.
RollTrack Outputs	Unused SD Output Video Delay Input Present Input Loss

Specifications

Processing	10 bit
Under/over shoot	<10%
Linearity	±1 LSB
S/N	> 65 dB
Color Space	Transmission matrix conversion from SMPTE274 to ITUR-601
Y/C delay	< 10 ns
SD Output Delay	1 output Frame 625(576)/25i = 40 ms 525(483)/29.97i = 33 ms No conversion = 0 ms With SD inputs = 1.2 µs

Horizontal Response (anamorphic)	±0.2 dB to 5.4 MHz, > 45 dB stop band attenuation
Vertical Response.....	> 40 dB stop band attenuation

Power Consumption	
Module Power Consumption	8.5 W Max

INPUTS

Serial Digital Video Input

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

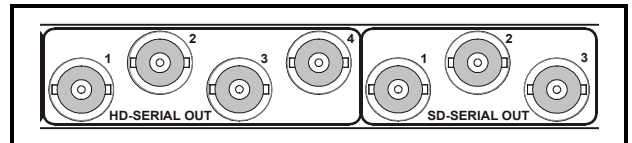


OUTPUTS

HD-Serial Out

These are the four HD distribution serial digital outputs of the unit via 75 Ohm BNC connectors.

Note that for SD serial inputs these connectors will provide four SD distribution serial digital outputs.



SD-Serial Out

These are the three downconverted HD serial digital outputs of the unit via 75 Ohm BNC connectors. These outputs also include one group of embedded audio (if present in the source signal), automatically delayed to match the HD/SD processing delay

Note that for SD serial inputs these connectors will provide three SD distribution serial digital outputs.

CARD EDGE CONTROL



LED INDICATORS

Power OK (Green)

This indicator is illuminated when the positive supply is present.

CPU OK (Green)

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

Error (Red)

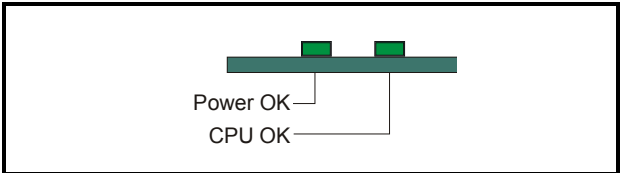
This will only become illuminated when CRC/EDH errors are being detected on the input or with no input present.

Warning (Yellow)

This will only become illuminated when the unit cannot convert the HD input to a SD output.

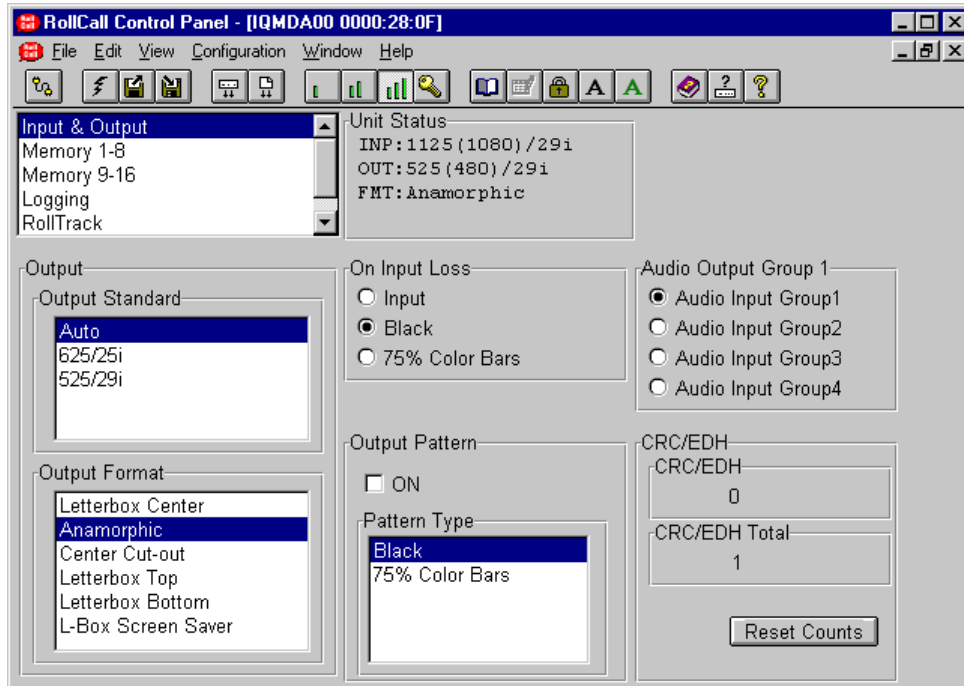
OK (Green)

When illuminated this will indicate that the module is locked to the input signal.



RollCall PC Control Panel Screens for the IQMDA00

Input & Output



This screen allows the input and output settings to be selected.

Output (Standard)

This allows the standard of the monitoring output to be selected.

Auto

When **Auto** is selected the standard of the SD monitoring output will be at the same frame-rate as the HD input signal if the conversion is valid (see the **Valid Conversions** table).

*Note that if the conversion is not valid then **OUT: Can't Convert** will appear in the Unit Status line.*

625/25i

The standard of the SD monitoring output will be forced to 625/25i. (See the **Valid Conversions** table).

525/29i

The standard of the SD monitoring output will be forced to 525/29i. (See the **Valid Conversions** table).

Valid Conversions

Input	Output
1125(1080)/29.97i or sF	525(483)/29.97i
1125(1080)/25i or sF	625(576)/25i
750(720)/59.94P	525(483)/29.97i
750(720)/50P	625(576)/25i
625(576)/25i	625(576)/25i
525(483)/29.97i	525(483)/29.97i

On Input Loss

This controls the system response to a loss of input signal.

Input

The incoming signal will be displayed whenever possible.

Black

When an input loss is detected the output picture will cut to black.

75% Color bars

When an input loss is detected the output picture will become a 75% color bars pattern.

Input & Output (continued)

Output Format

This allows the aspect ratio of the output picture to be selected from the list as follows:

- Letterbox Center

To maintain the correct shape of objects on the 16:9 input, this displays the 16:9 picture as a strip across the center of the 4:3 display.

- Anamorphic

This setting retains all picture information from the input and passes it to fill the output image regardless of the aspect ratio conversion. This means that 16:9 to 4:3 conversions will appear squeezed horizontally.

- Center Cut-out

To maintain the correct shape of objects on the 16:9 input, this setting retains all vertical detail but crops the left and right edges of the image.

- Letterbox Top

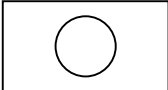
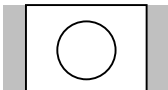
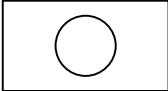

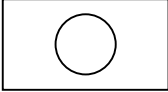

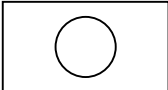
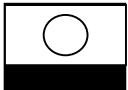
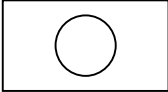
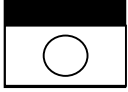
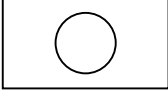

To maintain the correct shape of objects on the 16:9 input, this displays the 16:9 picture as a strip at the top of the 4:3 display.

- Letterbox Bottom

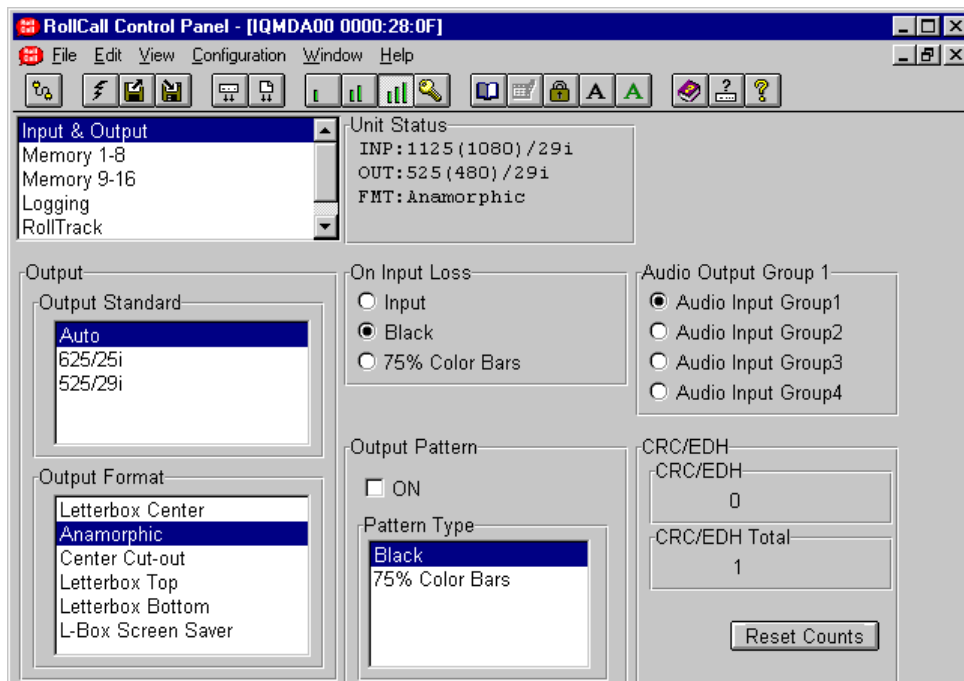
To maintain the correct shape of objects on the 16:9 input, this displays the 16:9 picture as a strip at the bottom of the 4:3 display.

- L-Box Screen Saver

In this mode the picture, in letterbox format, will slowly move up and down on the screen.

Input 16:9	Transformation	Output 4:3	
	Center Cutout		Image is side cropped
	Anamorphic		Image is squeezed horizontally
	Letterbox Center		
	Letterbox Top		
	Letterbox Bottom		
	Letterbox Screen Saver		

Input & Output (continued)

**Output Pattern**

ON

When checked the output will become the pattern selected from the **Pattern Type** item.

Pattern Type

This allows will allow either Black or 75% Color Bars to be used as the output signal when the ON item has been checked.

Audio Output Group 1

One group of audio can be carried through from the HD input to the SD outputs.

This item allows one of the input groups to be selected.

CRC/EDH

This item provides information about the Cyclic Redundancy Checksum errors or EDH errors within the input.

CRC/EDH

This will display the current CRC/EDH Error Rate.

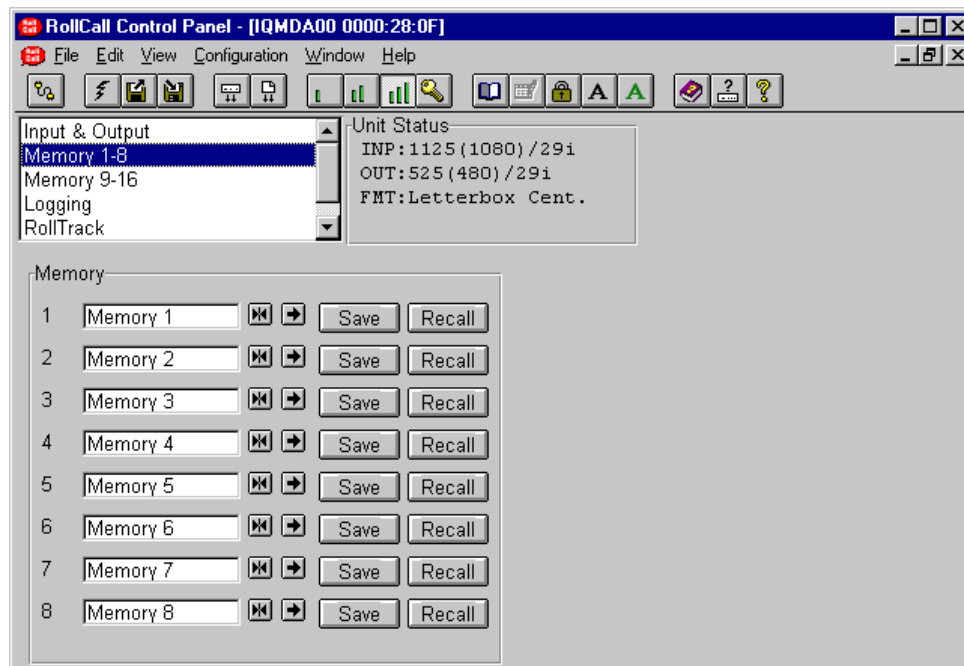
CRC/EDH Total

This will display the total CRC/EDH Error Count since the last reset.

Reset Counts

This will reset the CRC/EDH error counter to zero.

Memory 1-8 and 9-16



 **(Memory 1-8 and 9-16)**


This item will store the settings in the selected memory location.


 **(Memory 1 to 8 and 9-16)**

This item will recall the settings from the selected memory location.

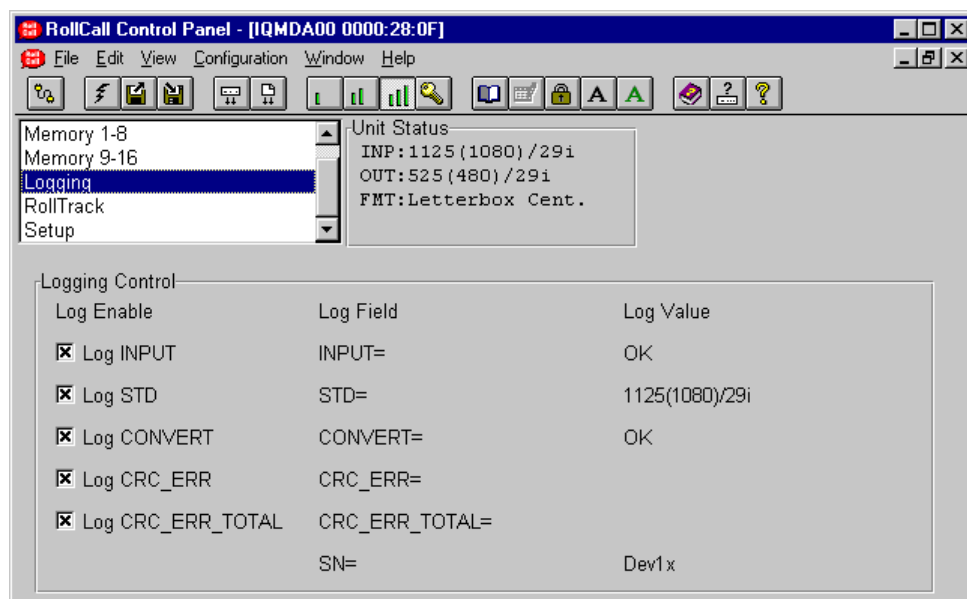
Memory 1 to 8 and 9-16

The memory location name may be renamed.

To change the memory name, type the new name in the text area and then select  (return).

Selecting Preset  will return the text to the default name (Memory 1-8 and 9-16).

Logging



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

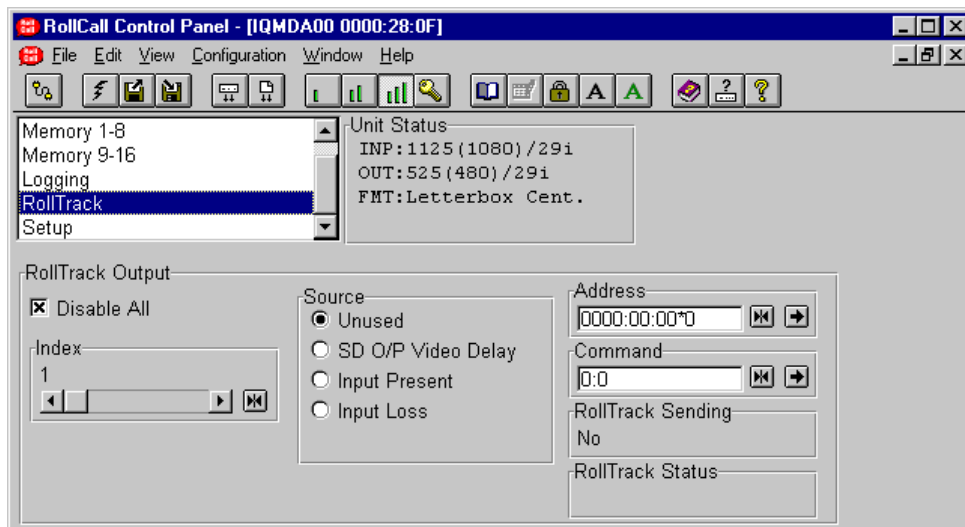
The status is shown to the right of the item.

Any of the items may be selected from the list.

ROLLCALL LOG FIELDS

Log Field	Log Value	Description
INPUT	LOST	No input present.
	OK	Input present is OK.
STD	<string>	Input standard description.
CONVERT	OK	Valid conversion available.
	NONE	No valid conversion available.
CRC_ERR	<number>	A number stating the current CRC/EDH error rate.
CRC_ERR_TOTAL	<number>	A number stating the total number of CRC/EDH errors that have been received since the last reset.
SN	<string>	Serial Number of unit.

RollTrack



This function allows information about the status of the module to be communicated to other RollTrack compatible units connected to the network. This message can then be used to cause another unit to perform a specific action. For example, it can be used to control the switching of a router or changeover module on loss of input.

Disable All

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

Index

There are 16 (1 to 16) RollTrack destinations available. This item is used to select which RollTrack Index is set up using the RollTrack Source, RollTrack Address and RollTrack Command functions.

Source

This selects the source of information that triggers the transmission of the RollTrack data.

Options are:

Unused (off &Preset)	
SD O/P Video Delay	
Input Present	Input signal is present
Input Loss	Input signal is lost

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

Address:ID

This item allows the address of the 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.

The third set (01) is the slot number in the enclosure.

The fourth set (99) specifies which type of unit will respond to the command. For example setting to 158 will ensure only an IQDRT8 will respond. This feature can be used to protect against a different type of unit responding incorrectly.

Setting to 00 allows any type of unit to respond to the command.

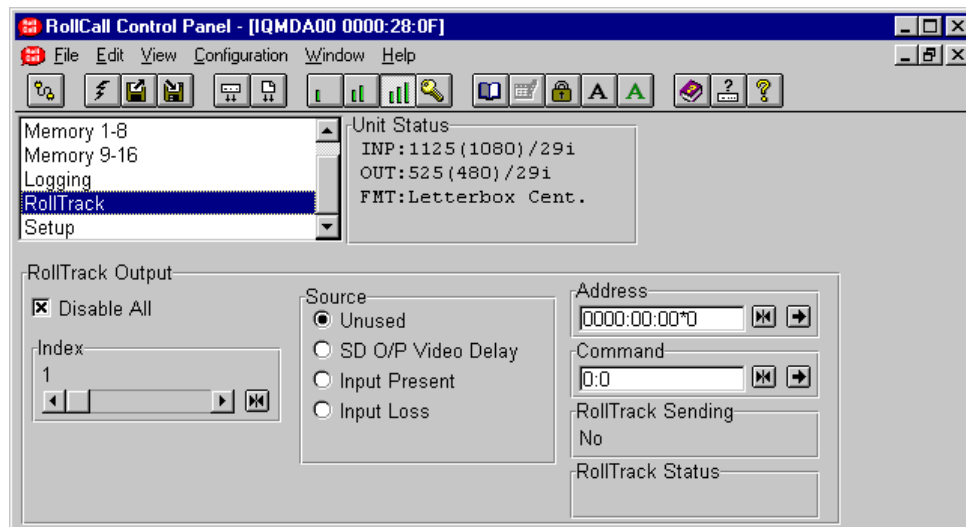
For a list of unit IDs, please contact your local Snell & Wilcox agent.

Command Value

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.

RollTrack (continued)**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

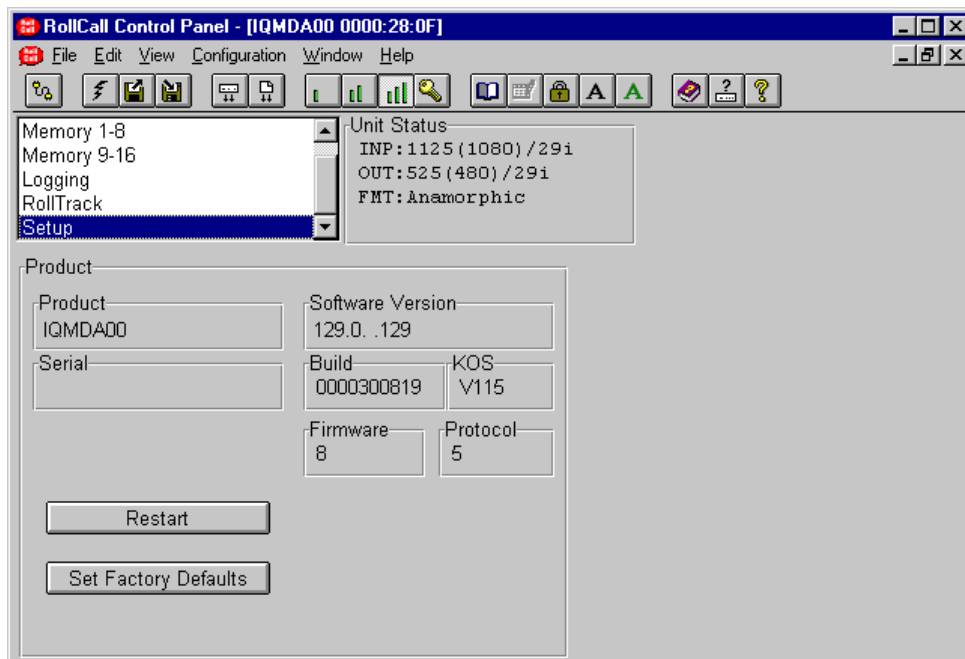
Inconsistent behavior; please contact your local Snell & Wilcox agent.

RollTrack Status

This item will show the status of the RollTrack system.

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

Setup



Product

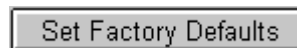
This shows the name of the unit.



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

Serial

This will show the serial number of the unit.



Software Version

This shows the software release version number.

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

Build

This will indicate the factory build number. This number defines all parameters of the unit (software versions, build level etc.) for identification purposes.

IMPORTANT NOTICE
This function will also clear all the saved memory settings and return them to the factory values.

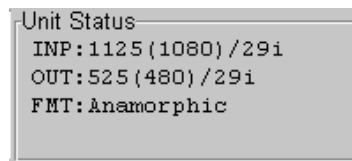
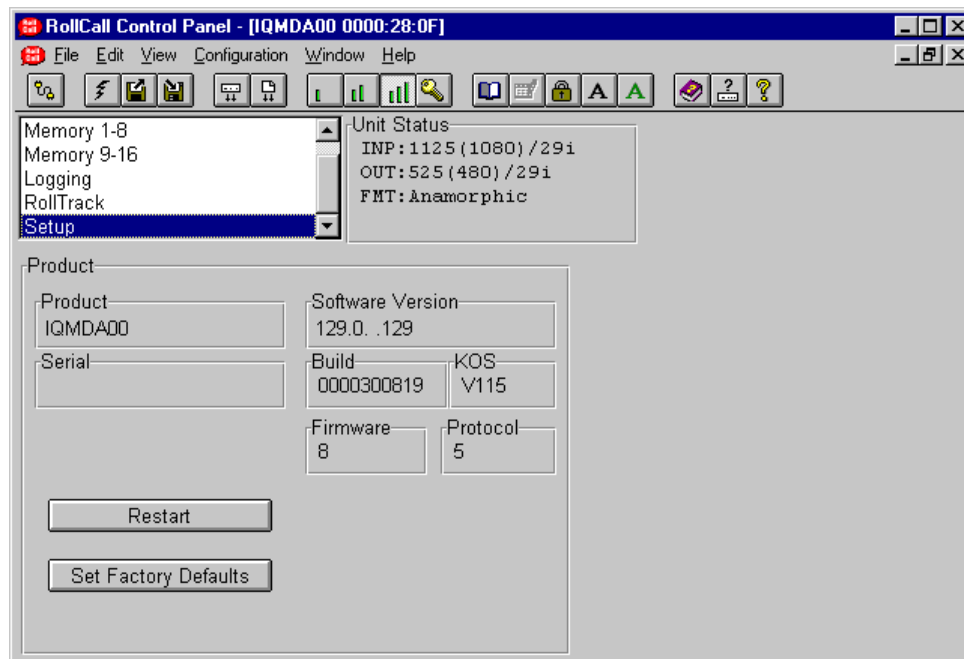
Firmware

This shows the version of the firmware system.

Protocol

This shows the protocol identification number.

Setup (continued)



The Information Window

This will show the status of the unit on four lines of text.

Line 1

This will show the status of the input signal. It may show:

INP:<Input Loss!> Loss of input signal

INP:1125(1080)/29i The Input standard

Line 2

This will show the output signal standard e.g.

OUT: 525(480)/29i

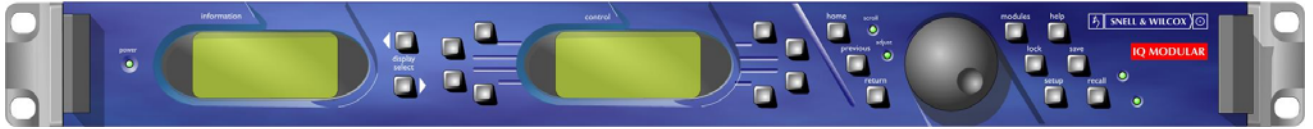
Line 3

FMT:Anamorphic

This will show the output format settings i.e. aspect ratio.

Operation from an Active Control Panel

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



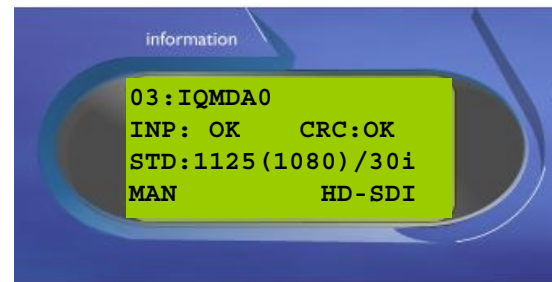
All operational parameters and selections are made using a system of menus displayed in two LCD windows.

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

Information Window

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

For details of the abbreviations used please see page 10.

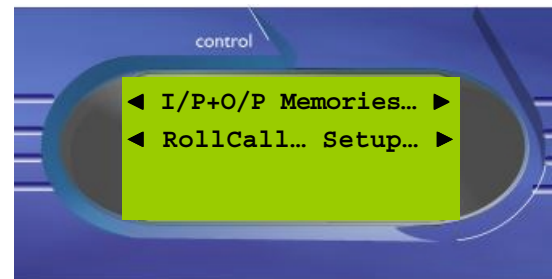


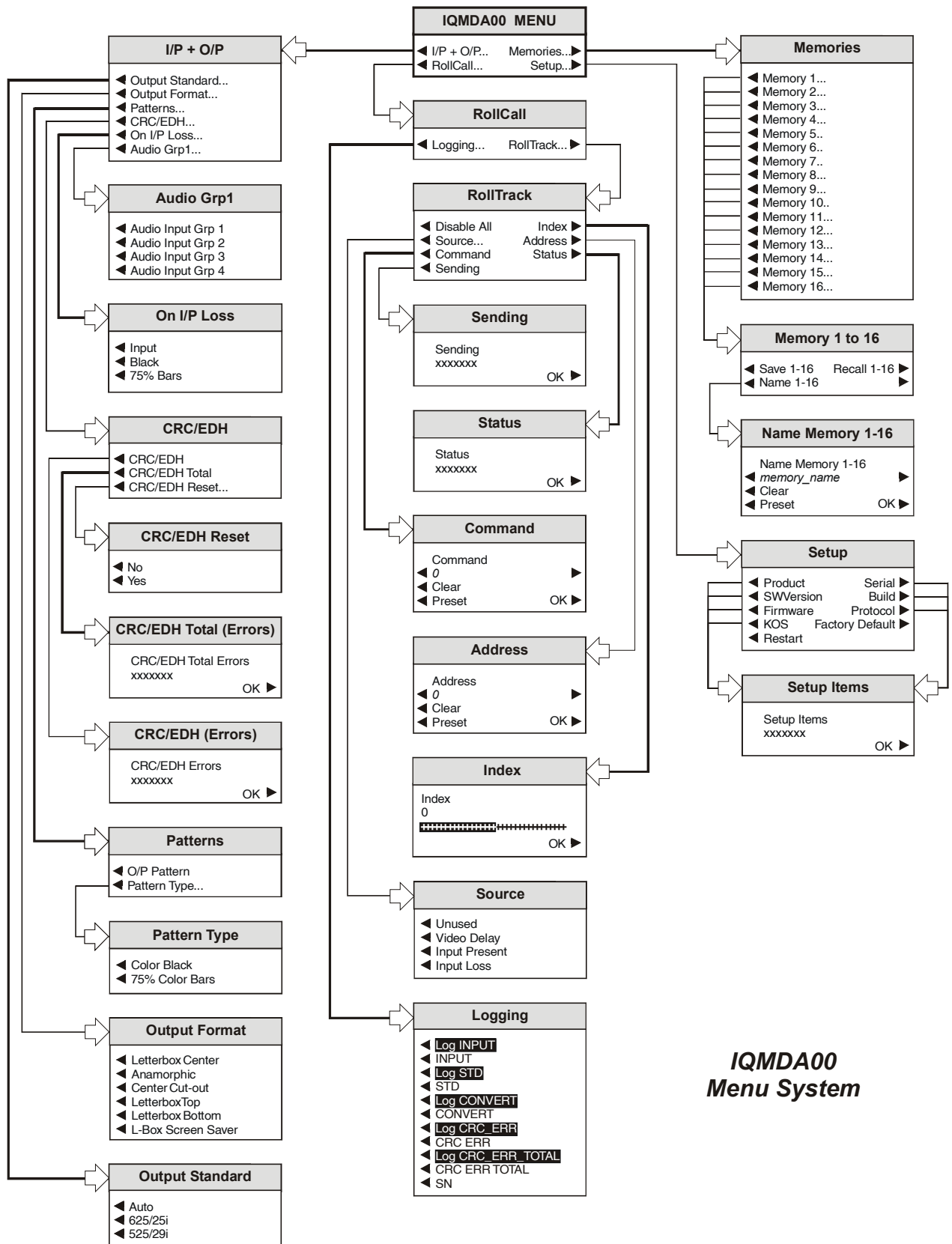
Control Window

The **Control** window displays all Selection Menus and sub-menus.

The selection is made by pressing the button adjacent to the required item.

The menu structure is detailed in the following pages.





***IQMDA00
Menu System***

MENU DETAILS

(see IQMDA0 Menu System on previous page)

MAIN MENU

The main or top level menu allows various sub-menus to be selected by pressing the button adjacent to the required text line.

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.

Also refer to the block diagram on page 3 for more information.

MAIN MENU

IQMDA00 MENU	
◀ I/P + O/P...	Memories...▶
◀ RollCall...	Setup...▶

◀ I/P + O/P

This item allows the input and output settings to be selected.

I/P + O/P
◀ Output Standard...
◀ Output Format...
◀ Patterns...
◀ CRC/EDH...
◀ On I/P Loss...
◀ Audio Grp1...

◀ Output Standard

This allows the standard of the monitoring output to be selected.

Output Standard
◀ Auto
◀ 625/25i
◀ 525/29i

◀ Auto

When **Auto** is selected the standard of the SD monitoring output will be at the same frame-rate as the HD input signal if the conversion is valid (see the **Valid Conversions** table below).

*Note that if the conversion is not valid then **OUT: Can't Convert** will appear in the Unit Status line.*

◀ 625/25i

The standard of the SD monitoring output will be forced to 625/25i. (See the **Valid Conversions** table below).

◀ 525/29i

The standard of the SD monitoring output will be forced to 525/29i. (See the **Valid Conversions** table below).

Valid Conversions

Input	Output
1125(1080)/29.97I or sF	525(483)/29.97i
1125(1080)/25I or sF	625(576)/25i
750(720)/59.94P	525(483)/29.97i
750(720)/50P	625(576)/25i
625(576)/25i	625(576)/25i
525(483)/29.97i	525(483)/29.97i

◀ **Output Format**

This allows the aspect ratio of the output picture to be selected from the list.

Output Format
◀ Letterbox Center
◀ Anamorphic
◀ Center Cut-out
◀ Letterbox Top
◀ Letterbox Bottom
◀ L-Box Screen Saver

◀ **Letterbox Center**

To maintain the correct shape of objects on the 16:9 input, this displays the 16:9 picture as a strip across the center of the 4:3 display.

◀ **Anamorphic**

This setting retains all picture information from the input and passes it to fill the output image regardless of the aspect ratio conversion. This means that 16:9 to 4:3 conversions will appear squeezed horizontally.

◀ **Center Cut-out**

To maintain the correct shape of objects on the 16:9 input, this setting retains all vertical detail but crops the left and right edges of the image.

◀ **Letterbox Top**

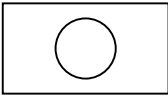
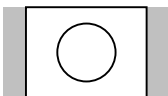
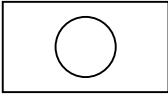
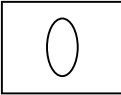
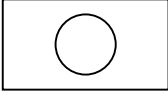
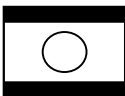
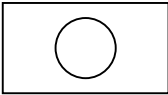
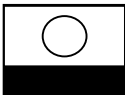
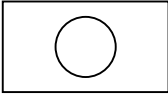
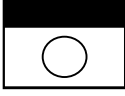
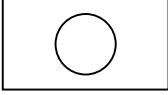

To maintain the correct shape of objects on the 16:9 input, this displays the 16:9 picture as a strip at the top of the 4:3 display.

◀ **Letterbox Bottom**

To maintain the correct shape of objects on the 16:9 input, this displays the 16:9 picture as a strip at the bottom of the 4:3 display.

◀ **L-Box Screen Saver**

In this mode the picture, in letterbox format, will slowly move up and down on the screen.

Input 16:9	Transformation	Output 4:3	
	Center Cutout		Image is side cropped
	Anamorphic		Image is squeezed horizontally
	Letterbox Center		
	Letterbox Top		
	Letterbox Bottom		
	Letterbox Screen Saver		

◀ **Patterns**

This allows a pattern to chosen for the output.

Patterns
◀ O/P Pattern ◀ Pattern Type...

◀ O/P Pattern

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

◀ Pattern Type

Pattern Type
◀ Color Black ◀ 75% Color Bars

This allows will allow either Black or 75% Color Bars to be used as the output signal when the **O/P Pattern** item has been selected.

◀ **CRC/EDH**

This menu provides information about the Cyclic Redundancy Checksum errors or EDH errors within the input.

CRC/EDH
◀ CRC/EDH ◀ CRC/EDH Total ◀ CRC/EDH Reset...

◀ CRC/EDH

CRC/EDH (Errors)
CRC/EDH Errors xxxxxxx OK ▶

This will display the current CRC/EDH Error Rate.

◀ CRC/EDH Total

CRC/EDH Total (Errors)
CRC/EDH Total Errors xxxxxxx OK ▶

This will display the total CRC/EDH Error Count since the last reset.

◀ CRC/EDH Reset

CRC/EDH Reset
◀ No ◀ Yes

Selecting **Yes** will reset the CRC/EDH error counter to zero.

◀ **On I/P (Input) Loss**

This controls the system response to a loss of input signal.

On I/P Loss
◀ Input ◀ Black ◀ 75% Bars

◀ Input

The incoming signal will be displayed whenever possible.

◀ Black

When an input loss is detected the output picture will cut to black.

◀ 75% Color bars

When an input loss is detected the output picture will become a 75% color bars pattern.

◀ **Audio Grp (Group) 1**

One group of audio can be carried through from the HD inputs to the SD outputs.

Audio Grp1
◀ Audio Input Grp 1 ◀ Audio Input Grp 2 ◀ Audio Input Grp 3 ◀ Audio Input Grp 4

This item allows one of the groups to be selected.

Memories ►

This function allows a number of particular setups of the IQMDA00 to be saved and recalled. There are 16 memory locations available.

This item allows any of the 16 memory locations to be selected.

Memories
◀ Memory 1...
◀ Memory 2...
◀ Memory 3...
◀ Memory 4...
◀ Memory 5...
◀ Memory 6...
◀ Memory 7...
◀ Memory 8...
◀ Memory 9...
◀ Memory 10...
◀ Memory 11...
◀ Memory 12...
◀ Memory 13...
◀ Memory 14...
◀ Memory 15...
◀ Memory 16...

◀ Memory 1 to 16

Memory 1 to 16
◀ Save 1-16 Recall 1-16 ►
◀ Name 1-16

When a memory location has been selected this item allows it to be saved, recalled or renamed.

◀ Save 1-16

When selected the current settings will be saved at this location.

Recall 1-16 ►

When selected the settings will be recalled from this location and applied to the unit.

◀ Name 1-16

The selected memory location may be renamed with this function.

Name Memory 1-16
Name Memory 1-16
◀ <i>memory_name</i> ►
◀ Clear
◀ Preset OK ►

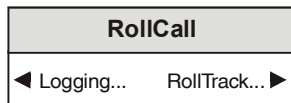
The **◀ Clear** function blanks the selected character.

The **◀ Preset** function loads the default text, for example, **Memory 1**.

O.K. ► saves the memory name text and returns to the main menu.

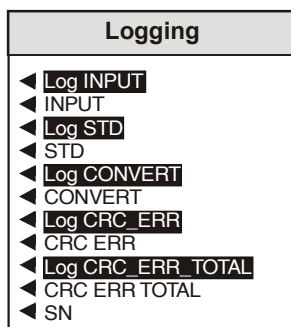
◀ RollCall...

This allows the RollCall functions to be set up.



◀ Logging

Information about various parameters can be made available to a logging device that is attached to the RollCall™ network by selecting the appropriate item or items (text highlighted).



Selecting the other (not highlighted) items will show their status.

ROLLCALL LOG FIELDS

Log Field	Log Value	Description
INPUT	LOST	No input present.
	OK	Input present is OK.
STD	<string>	Input standard description.
CONVERT	OK	Valid conversion available.
	NONE	No valid conversion available.
CRC_ERR	<number>	A number stating the current CRC/EDH error rate.
CRC_ERR_TOTAL	<number>	A number stating the total number of CRC/EDH errors that have been received since the last reset.
SN	<string>	Serial Number of unit.

RollTrack ▶

RollTrack	
◀ Disable All	Index ▶
◀ Source...	Address ▶
◀ Command	Status ▶
◀ Sending	

This function allows information about the status of the module to be communicated to other RollTrack compatible units connected to the network. This message can then be used to cause another unit to perform a specific action. For example, it can be used to control the switching of a router or changeover module on loss of input.

◀ Disable All

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

◀ Source

This selects the source of information that triggers the transmission of the RollTrack data.

Source
◀ Unused
◀ Video Delay
◀ Input Present
◀ Input Loss

Options are:

Unused	Off &Preset
Video Delay	SD O/P Video Delay
Input Present	Input signal is present
Input Loss	Input signal is lost

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

◀ Command

Command Value
0:0
◀ Clear ▶
◀ Preset ▶
OK ▶

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.

◀ Sending

This will show whether or not RollTrack is sending messages.

RollTrack Sending
RollTrack Sending Yes
OK ▶

It may show either Yes or No.

Index ▶

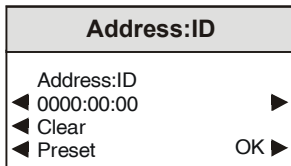
There are 16 (1 to 16) RollTrack destinations available.

Index
Index 0
◀ [Progress Bar] ▶
OK ▶

This item is used to select which RollTrack Index is set up using the RollTrack Source, RollTrack Address and RollTrack Command functions.

Address ►

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



To edit the address, use the left ◀ and right ► buttons to change the position of the cursor, and the spin wheel to select the character.

The ◀ **Clear** function blanks the selected character.

The ◀ **Preset** function loads the default address.

O.K. ► saves the memory name text and returns to the main menu.

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.

The third set (01) is the slot number in the enclosure.

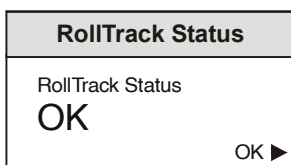
The fourth set (99) specifies which type of unit will respond to the command. For example setting to 158 will ensure only an IQDRT8 will respond. This feature can be used to protect against a different type of unit responding incorrectly.

Setting to 00 allows any type of unit to respond to the command.

For a list of unit IDs, please contact your local Snell & Wilcox agent.

Status ►

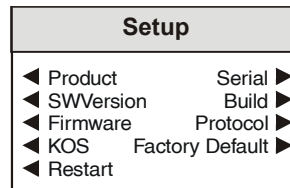
This item displays the status of the RollTrack system.



It can show OK, Bad, Unknown, Timeout or Error.

Setup ►

This item provides information about the unit.



◀ Product

This shows the name of the unit.

◀ Serial

This will show the serial number of the unit.

◀ SW Version

This shows the software release identification.

◀ Build

This will indicate the factory build number. This number defines all parameters of the unit (software versions, build level etc.) for identification purposes.

◀ Firmware

This shows the version of the firmware system

◀ Protocol

This shows the protocol identification number.

◀ KOS

This shows the version of the operating system.

◀ Factory Default

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

◀ Restart

This function allows the unit to reboot and all power-up settings to be enabled.

This is an easier method than switching the mains power off and on.

