

IQOTR00
 Single mode Fiber Optic Transceiver for HD/SD-SDI Signals

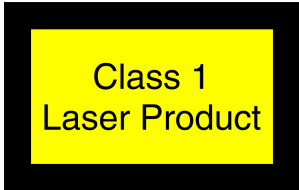


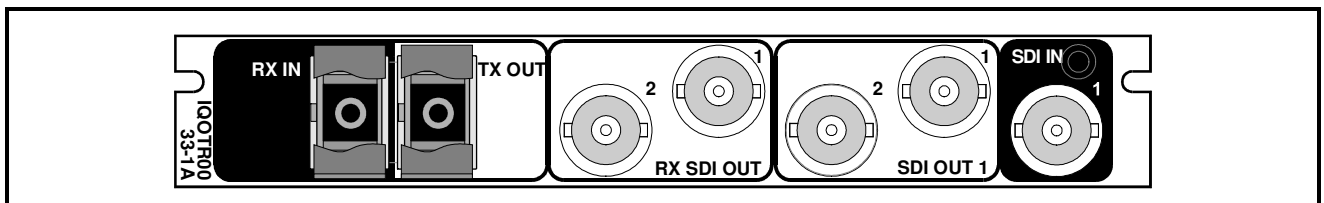
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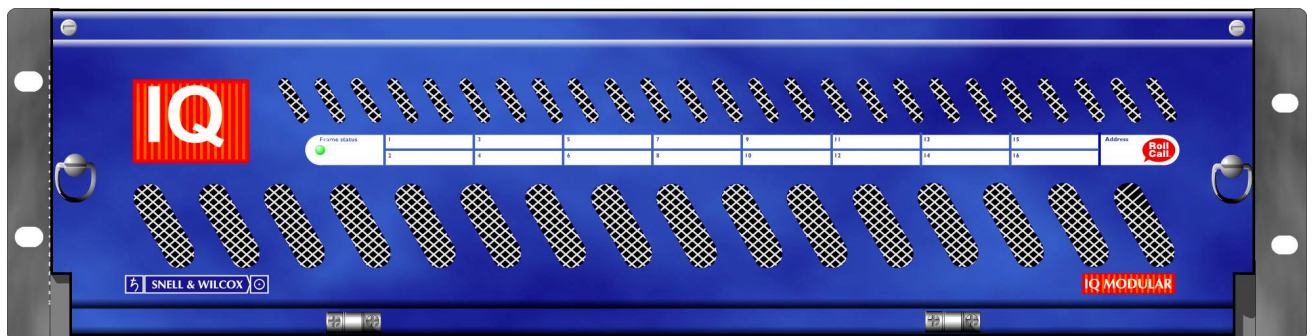
Module Description

The IQOTR00 is a fiber optic transceiver for bi-directional conversion of HD/SD-SDI signals to 1310 nm or 1550nm wavelength optical signals.

Rear Panel View



Note that these modules can only be fitted into the 'A' Style Enclosure shown below.



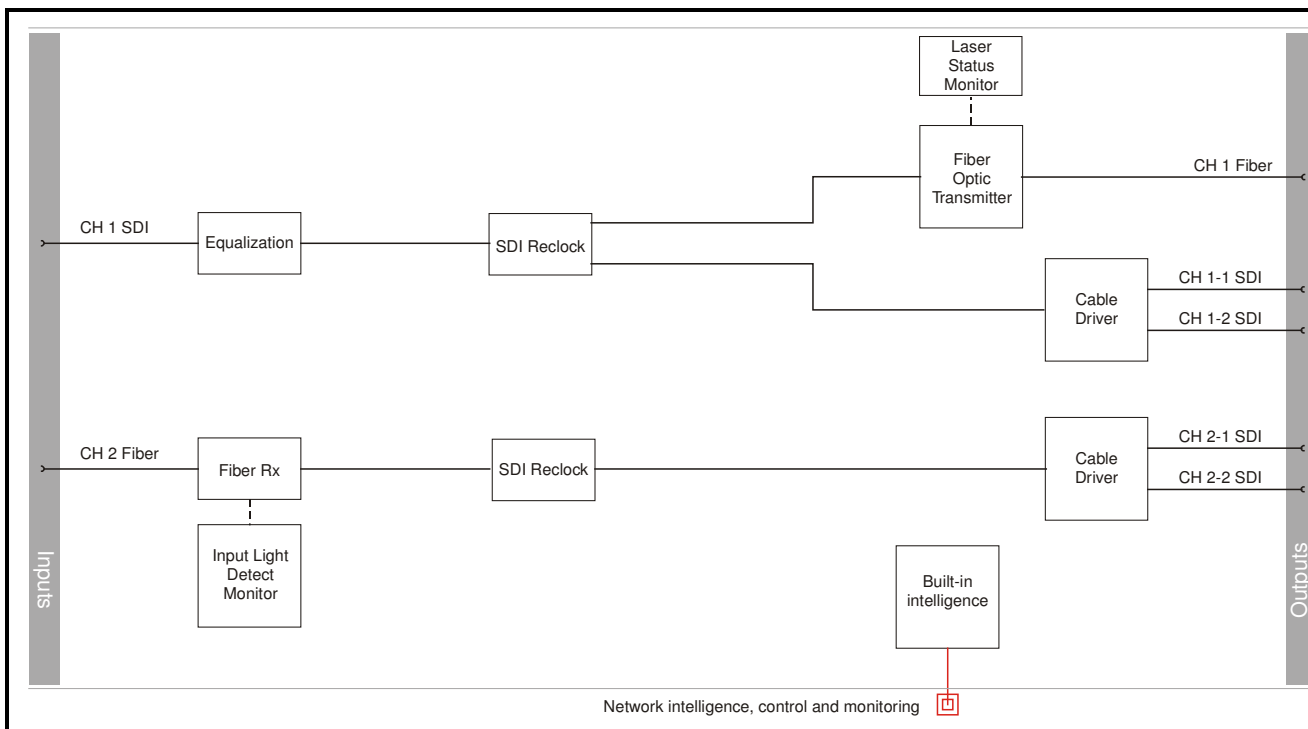
(Enclosure order codes IQH3A-E-0, IQH3A-E-P, IQH3A-0-0, IQH3A-0-P)

Versions of the module cards available are:

IQOTR0033-1A + 1 x IQHTX00 submodule and 1 x IQHRX00 submodule - Single mode fiber optic Transceiver for HD/SD-SDI. 1 x HD/SD-SDI input, 1 x optical output with additional HD/SD-SDI reclocked outputs. 1 x optical input, 2 x HD/SD-SDI outputs.

IQOTR0033-1A + 1 x IQSTX00 submodule and 1 x IQSRX00 submodule - Single mode fiber optic Transceiver for SD-SDI. 1 x SD-SDI input, 1 x optical output with additional SD-SDI reclocked outputs. 1 x optical input, 2 x HD/SD-SDI outputs.

Block Diagram



Product Comparison

Main Module	Submodule Slot 1	Submodule Slot 2	Description	Ordering Information
IQOTR0033-1A	IQHTX00 - 1310 nm HD/SD	IQHRX00 - HD/SD	HD/SD Fiber Tranceiver (1310 nm)	IQOTR0033-1A + IQHTX00 + IQHRX00
	IQHTX01 - 1550 nm HD/SD	IQHRX00 - HD/SD	HD/SD Fiber Tranceiver (1550 nm)	IQOTR0033-1A + IQHTX01 + IQHRX00
	IQSTX00 - 1310 nm SD	IQHRX00 - HD/SD	SD Fiber Tranceiver (1310 nm)	IQOTR0033-1A + IQSTX00 + IQHRX00
	IQSTX01 - 1550 nm SD	IQHRX00 - HD/SD	SD Fiber Tranceiver (1550 nm)	IQOTR0033-1A + IQSTX01 + IQHRX00

Features

- Reclocking for 1.5 Gbit/s HD-SDI and 270 Mbit/s SDI signals, or asynchronous operation for other frequencies (input range 3 Mbit/s to 1.5 Gbit/s, suitable for AES up to HD-SDI rates)
- Single mode fiber optic Transmitter for HD/SD-SDI and DVB ASI Signals
- Output wavelengths of 1310 or 1550 nm
- Active loop-through HD/SD-SDI outputs for CH 1 SDI input, in accordance with SMPTE292M, SMPTE259M and DVB ASI
- Single mode fiber optic receiver for HD/SD-SDI and DVB ASI Signals
- Input wavelength range 1200-1600 nm
- HD/SD-SDI outputs for CH 2 optical input, in accordance with SMPTE292M, SMPTE259M and DVB ASI

Technical Profile

Signal Inputs (Tx)

Electrical 1.485 Gbit/s HD-SDI or 270 Mbit/s SD-SDI
(asynchronous operation available
at other frequencies)

Connector / FormatBNC/ 75 ohm panel jack

Conforms to:.....SMPTE 292M (HD)
SMPTE 259M-C (SD)

Inputs1

Input Cable Length140 m (HD) 350 m (SD) with
Belden 1694A

Signal Inputs (Rx)

Optical 1.485 GBit/s HD-SDI or 270 Mbit/s SD-SDI
(asynchronous operation available
at other frequencies)

Connector / Format.....SC/PC singlemode panel uniter

Inputs1

Signal Outputs (Tx)

Optical 1.485 Gbit/s HD-SDI or 270 Mbit/s SD-SDI
(asynchronous operation available
at other frequencies)

Connector / Format..... SC/PC singlemode panel uniter

Outputs..... 1

Electrical 1.485 Gbit/s HD-SDI or 270 Mbit/s SD-SDI
(asynchronous operation available
at other frequencies)

Connector / Format..... BNC/ 75 ohm panel jack

Outputs..... 2 relocked active loop through for
CH1 SDI Input

Signal Outputs (Rx)

Electrical 1.485 Gbit/s HD-SDI or 270 Mbit/s SD-SDI
(asynchronous operation available at
other frequencies)

Connector / Format..... BNC/ 75 ohm panel jack

Card Edge Controls (also available via RollCall)

None

Functions Available via RollCall™ Only

ModeHD/SD

ReclockerOn/Off

Laser DisableOn/Off

LoggingInput Status, Output Standard,
Output CRC/EDH error, Laser bias,
Optical Output Status, Input Light
Detect Status

Indicators

General

Power OK (green).....Power supplies present

CPU OK (green) CPU operating correctly

Each Channel

Error (red) Board or signal path error e.g. CRC
errors

Warning (yellow) User warning e.g. Video outputs
have been swapped

OK (green)..... Board and signal path OK

Laser bias high/disabled (Yellow)
Laser bias high due to high temp,
device ageing or laser output
disabled

Light detect (green)..... Light detected at Input

Specifications

Optical Outputs (Tx)

1310 nm Tx

Back reflection tolerance<-25 dB

Wavelength1310 nm

Spectral width (FWHM)>3 nm

Output power-3 dBm (approx)

Extinction ratio.....>5:1

Transmission distance.....>30 Km

1550 nm Tx

Back reflection tolerance<-35 dB

Wavelength1550 nm

Spectral width (FWHM)>1 nm

Output power 0 dBm (approx)

Extinction ratio >5:1

Transmission distance >30 Km

Optical Inputs (Rx)

Input wavelength range..... Min. 1200 nm
Max. 1600 nm

Optical power input range .. < -3 dBm
> - 20 dBm

Detector damage threshold +3.5 dBm

Power Consumption

Module Power Consumption
8.5 W max

Installation

Warnings

All laser transmitters used in this product are Class 1 in accordance with EN60825-1 as well as 21CFR 1040.10 and 1040.11.

Class 1
Laser Product

1. **Laser light can be damaging to the eyes. Optical fibers and Uniteres should be handled with great care.**
2. **The IQOTR00 is designed for use with Class 1 laser systems only. Ensure that all inputs do NOT exceed Class 1 as doing so will impair the safety of the system and may result in damage to the equipment.**
3. **Active fibers should not be handled unless their source can be positively identified as not exceeding Class 1 limits.**

Important: Do not disturb or handle the optical fibers



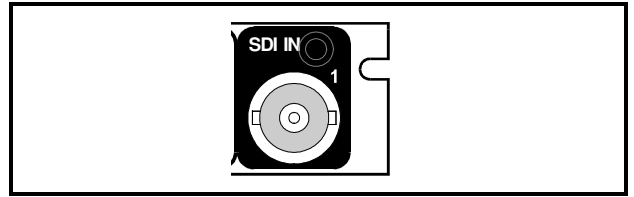
Notes...

1. Optical uniteres have shutters to prevent the ingress of dust. These shutters should only be opened when connecting optical fibers.
2. The ends of optical fibers should be cleaned with a liquid fiber cleaner, using a cotton bud, to ensure that there is no dust present, before they are plugged in (the uniter is polarised).
3. Observe the warning about not viewing live optical sources.

INPUT CONNECTIONS

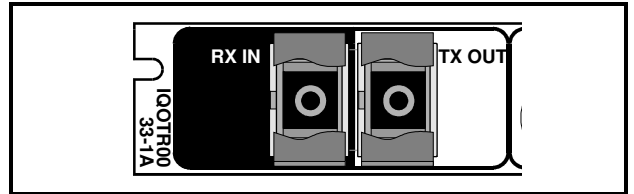
Tx Electrical SDI IN

This is the SDI input for the unit via a BNC connector that terminates in 75 Ohms.



Rx Optical IN

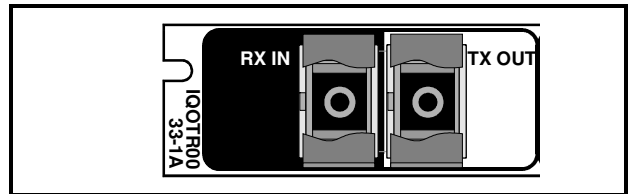
This is optical input to the unit that is made via a SC Connector with a shutter.



OUTPUT CONNECTIONS

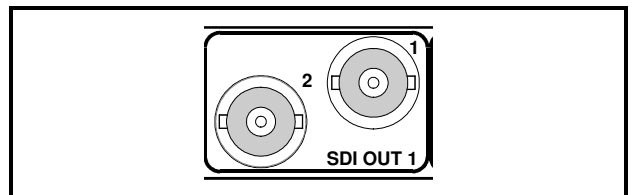
Tx Optical OUT

This is the optical output of the unit via a SC Connector with a shutter whose signal input source is derived from the SDI IN connector, via BNC connectors for 75 Ohms.



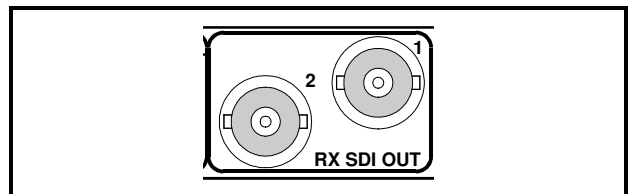
Tx Electrical SDI OUT 1 and 2

These are two Serial Digital outputs of the unit whose signal input source is derived from the SDI IN connector, via BNC connectors for 75 Ohms.

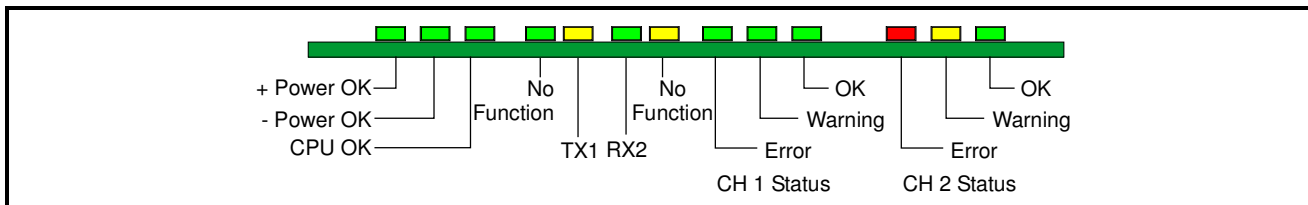


Rx Electrical SDI OUT

These are two Serial Digital outputs of the unit whose signal input source is derived from the optical signal input, via BNC connectors for 75 Ohms.



CARD EDGE INDICATORS



LED INDICATORS

+Power and -Power

When illuminated these LED's indicate that the positive and negative supplies are present.

CPU OK

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

TX 1 (Yellow)

This provides information about the optical output signal.

Under normal operating conditions it will not be illuminated.

It will be illuminated if:

- The laser has been disabled.
- or
- The laser alarm has been activated. If this occurs repeatedly please contact Snell & Wilcox Customer Care.

RX 2 (Green)

This provides information about the received optical signal.

It will be illuminated if the input power is greater than -25 dBm.

It will not be illuminated in the received input power is less than -25 dBm.

Note that the input power can drop to approximately -23 dBm before the signal cannot be recovered error free.

CH1 and CH 2 Status**Error (Red)**

When illuminated this indicates that CRC/EDH errors are being detected in one or both of the output SDI streams.

When permanently illuminated this indicates that the signal has been lost.

Warning (Yellow)

When illuminated indicates that one of the output signals is **not** being re-clocked i.e. in wideband mode. It also becomes illuminated if the inputs are swapped.

OK (Green)

When illuminated this will indicate that the module is operating correctly.

RollCall PC Control Panel Screens

Input Select

This allows the SDI and optical inputs to be configured.

Output 1 (TX OUT)

This allows the SDI input signal (SDI IN) to be configured. This signal will provide 2 buffered SDI outputs available at the SDI OUT 1 & 2 connectors and also will be converted to an optical signal available at the TX OUT connector.

Wideband (Not on SD versions)

When selected the reclocking feature of the particular output will be turned off to enable wideband signals to be passed through the unit.

Default is unselected.

Auto (Default Setting) (Not on SD versions)

When checked the unit will automatically detect the standard of the selected input signal.

When unchecked the following options will become available:

Force STD

This forces the unit to process the selected input signal as SD, HD or DVB-AS.

Disable Laser

When checked the Laser will be disabled.

Output 2 (SDI output)

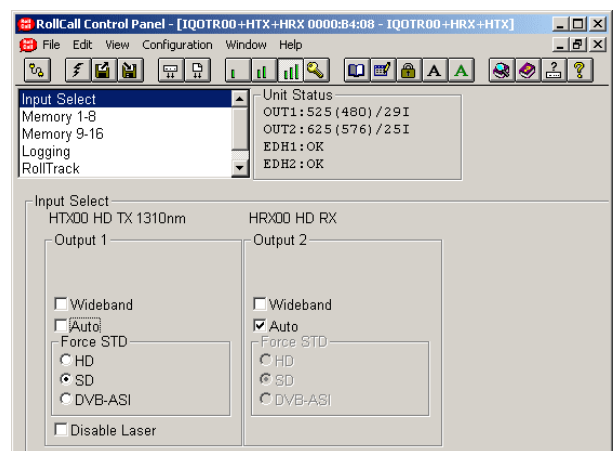
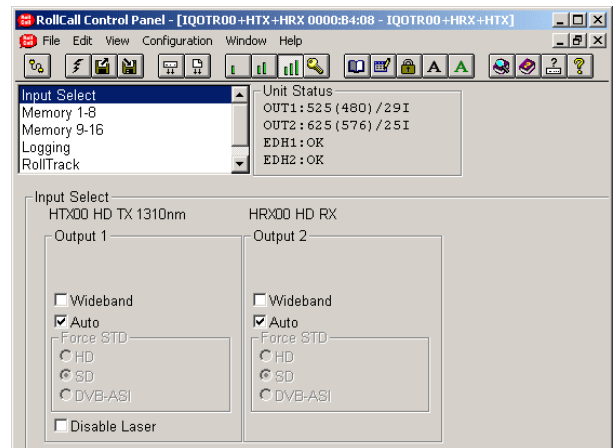
This allows the optical input signal (RX IN) to be configured.

This signal is converted to 2 x SDI outputs that are available at the RX SDI OUT 1 & 2 connectors.

Wideband

When selected the reclocking feature of the particular output will be turned off to enable wideband signals to be passed through the unit.

Default is unselected.



Auto (Default Setting)

When checked the unit will automatically detect the standard of the selected input signal.



When unchecked the following options will become available:


Force STD

This forces the unit to process the selected input signal as SD, HD or DVB-AS.

Memory 1-8 and 9-16

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

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

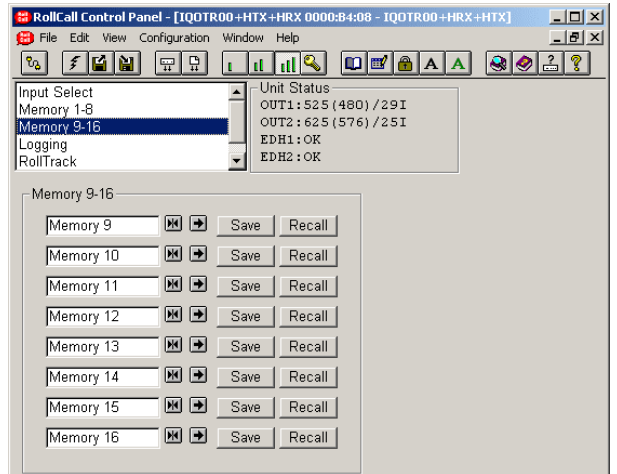
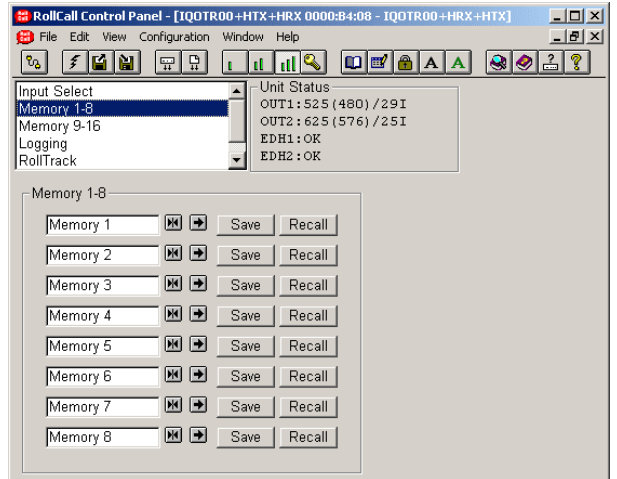
Selecting Preset  will return the text to the default name.



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



This function allows the settings saved at the memory location to be recalled. When this button is grayed out it indicates that the memory location is empty and therefore cannot be recalled. This will occur when the memory is cleared.

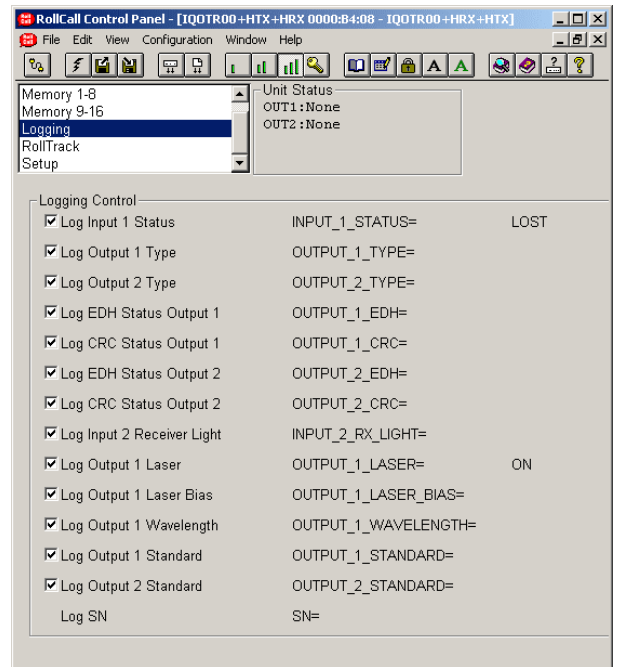


Logging

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.



RollTrack

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

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

RollTrack Index

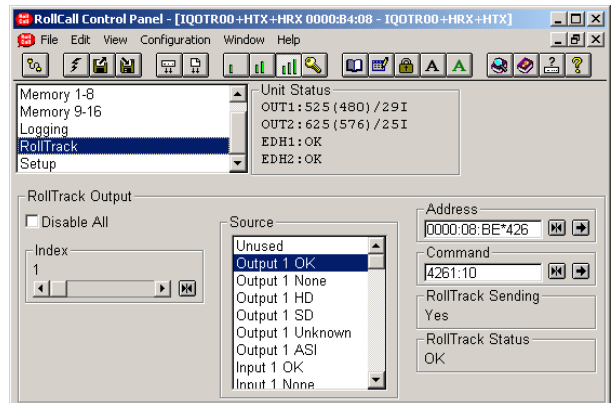
This item allows up to 16 destinations to be selected.

RollTrack Source

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

Where applicable options are:

Unused	
Output 1 OK	Output 2 OK
Output 1 None	Output 2 None
Output 1 HD	Output 2 HD
Output 1 SD	Output 2 SD
Output 1 Unknown	Output 2 Unknown
Output 1 ASI	Output 2 ASI
Input 1 OK	
Input 1 None	
OP1 1125(1035)/30i	OP2 1125(1035)/30i
OP1 1125(1035)/29i	OP2 1125(1035)/29i
OP1 1125(1080)/30i	OP2 1125(1080)/30i
OP1 1125(1080)/29i	OP2 1125(1080)/29i
OP1 1125(1080)/25i	OP2 1125(1080)/25i
OP1 1125(1080)/30p	OP2 1125(1080)/30p
OP1 1125(1080)/29p	OP2 1125(1080)/29p
OP1 1125(1080)/25p	OP2 1125(1080)/25p
OP1 1125(1080)/24p	OP2 1125(1080)/24p
OP1 1125(1080)/23p	OP2 1125(1080)/23p
OP1 750(720)/60p	OP2 750(720)/60p
OP1 750(720)/59p	OP2 750(720)/59p
OP1 525(480)/29i	OP2 525(480)/29i
OP1 625(576)/25i	OP2 625(576)/25i
OP1 1125(1080)/24sF	OP2 1125(1080)/24sF
OP1 1125(1080)/23sF	OP2 1125(1080)/23sF
OP1 750(720)/50p	OP2 750(720)/50p
OP1 750(720)/30p	OP2 750(720)/30p
OP1 750(720)/29p	OP2 750(720)/29p
OP1 750(720)/25p	OP2 750(720)/25p
OP1 750(720)/24p	OP2 750(720)/24p
OP1 750(720)/23p	OP2 750(720)/23p



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

Network Address

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

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

(Preset) returns to the default destination

The full **RollTrack** address has four sets of numbers

For example: 0000:10:01*99

The first set (0000) is the network segment code number

The second set (10) is the number identifying the (enclosure/mainframe) unit.

The third set (01) is the slot number in the unit

The Fourth Set (99)

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

If this number were set to 00 **any type** of unit at this location would respond to the RollTrack command, possibly causing unpredictable results.

RollTrack (continued)

RollTrack Command

The full **RollTrack** command has two sets of numbers

For example: 84*156

The first set (84) is the **RollTrack** command number.

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

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

Disable All

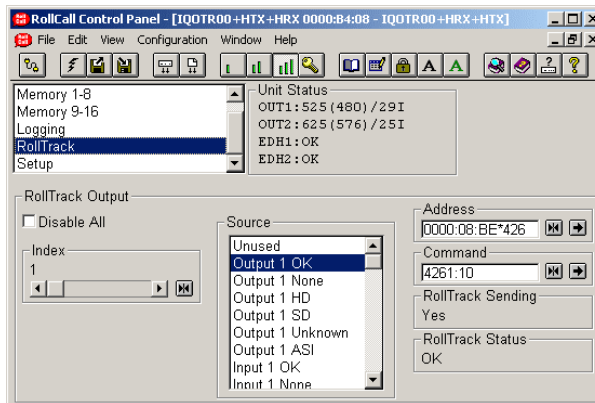
When this item is checked all RollTrack items will be disabled.

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



RollTrack Status

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

This may show:

- OK RollTrack message sent and received OK.
- Unknown Rolltrack message has been sent but it has not yet completed.
- Timeout RollTrack message sent but acknowledgement not received. This could be because the destination unit is not at the location specified.
- Error This indicates a broken RollCall state.
- Bad This indicates a broken RollCall packet.

Setup

This screen provides basic information about the module.

Product

This will show the name of the module and the options fitted.

Software version

This item shows the version of the software fitted in the module.

Serial

This item shows the serial number of the module

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

KOS

This shows the version of the operating system.

PCB

This shows the PCB revision number.

Daughter Card 1 and 2

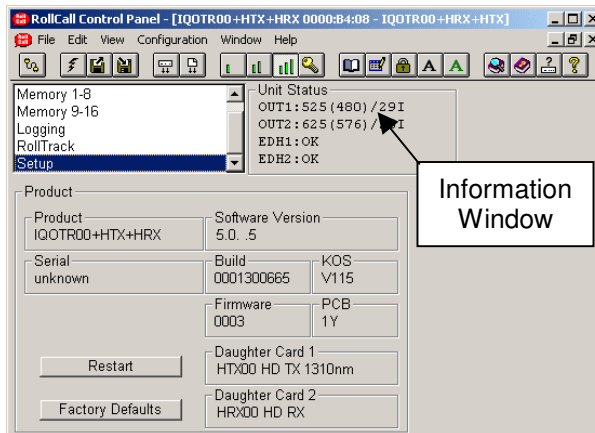
This will display details of the daughter cards fitted.



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



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



Information Window

The Information Window

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

Line 1 and 2

This displays the status of the optical (Channel 1) output and SDI output (Channel 2).

It may show:

- OUT1/2:None** No output standard or in wideband mode
- OUT1/2: 525(480)/29i** The operating standard

Line 3 and 4

This will show either any detected Cyclic Redundancy Checksum (CRC) errors for HD-SDI signals or show any detected EDH errors for SD-SDI signals.

For HD-SDI signals it may show:

- CRC: OK** No CRC errors found on the input signal
- CRC: FAIL** CRC errors have been found on the input signal
- CRC: NONE** The unit is not locked to the input signal

For SD-SDI signals it may show:

- EDH: OK** No EDH or SDI errors found on the input signal
- EDH: FAIL** EDH errors have been found on the input signal
- EDH: NONE** The unit is not locked to the input signal

Setup (continued)

Daughter Card Details

This area will show which daughter cards are fitted in the module.

Daughter Card 1 Options:

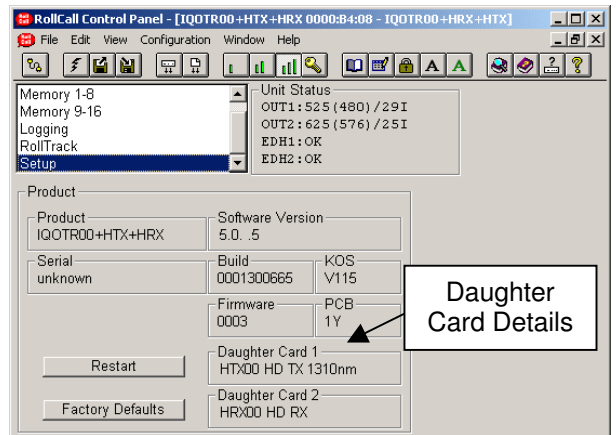
Name	Description
HTX00 HD TX 1310 nm	1310 nm wavelength HD transmitter
HTX01 HD TX 1550 nm	1550 nm wavelength HD transmitter
STX00 SD TX 1310 nm	1310 nm wavelength SD transmitter
STX01 SD TX 1550 nm	1550 nm wavelength SD transmitter

Daughter Card 2 Options:

Name	Description
HRX00 HD RX	SD/HD Receiver

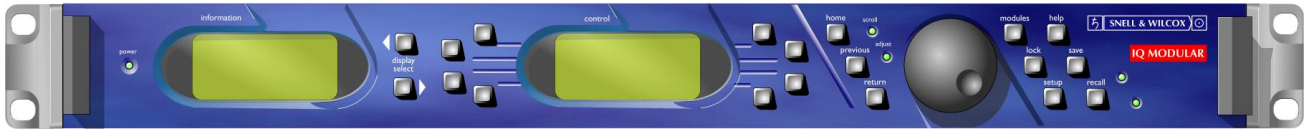
This information is also shown in abbreviated form in the screen title bar.

[IQOTR00+HTX+HRX 0000:B4:08 - IQOTR00+HRX+HTX]



Operation from an Active Control Panel

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



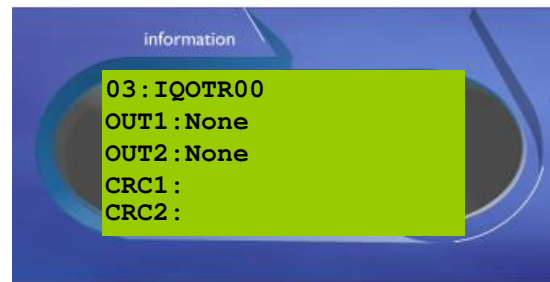
All operational parameters and selections are made using a system of menus displayed in two LCD windows.

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 13.

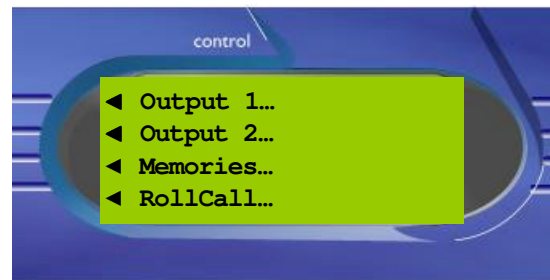


Control Window

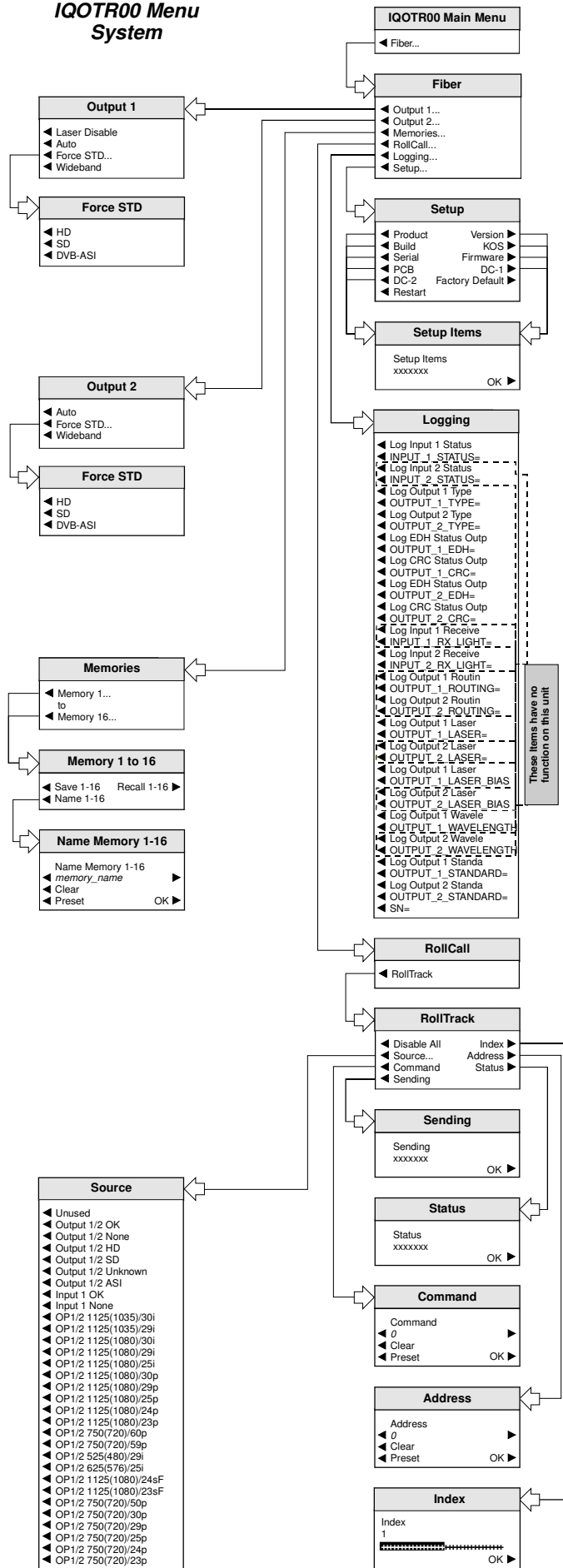
The **Control** window displays all Selection Menus and sub-menus.

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

The menu structure is detailed in the following pages.



IQOTR00 Menu System



MENU DETAILS

(see IQOTR00 Menu System on the previous pages)

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.

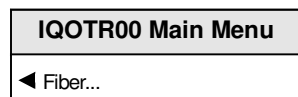
Note that where a menu item is followed by three dots (...) this indicates that a further sub-menu may be selected.

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

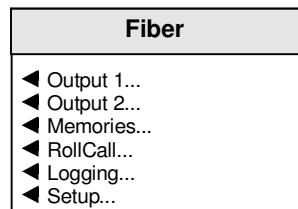
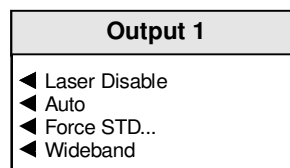
Note that this top level menu will only appear with early versions of front panel software.



With later versions of software the top level menu will be as shown below.

Fiber

This menu allows the outputs to be selected/configured and other settings setup.

**Output 1**

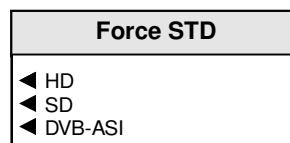
This menu allows output 1 to be configured.

Laser Disable

When checked the Laser for Output 1 will be disabled.

Auto (Default Setting) (Not on SD versions)

When selected the unit will automatically detect the standard of the selected input signal.

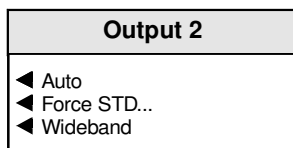
Force STD

This forces the unit to process the selected input signal as SD, HD or DVB-AS.

Wideband (Not on SD versions)

When selected the reclocking feature of the particular output will be turned off to enable wideband signals to be passed through the unit.

Output 2

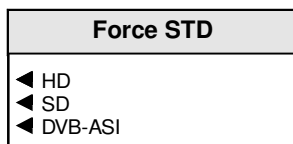


This menu allows output 2 to be configured.

Auto (Default Setting) (Not on SD versions)

When selected the unit will automatically detect the standard of the selected input signal.

Force STD



This forces the unit to process the selected input signal as SD, HD or DVB-AS.

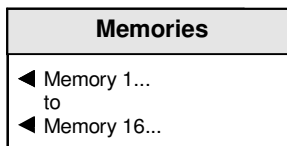
Wideband (Not on SD versions)

When selected the reclocking feature of the particular output will be turned off to enable wideband signals to be passed through the unit.

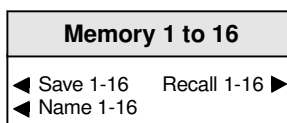
Memories

This function allows a number of particular setups of the IQOTR00 to be saved and recalled. There are 16 memory locations available.

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



Memory 1 to 16



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

Save 1-16

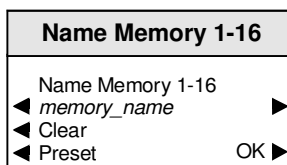
When selected the current settings will be saved at this location.

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.



To compile/edit the text the right ▶ and left buttons adjacent to the upper text line in the menu should be used to select the character position in the text and the spinwheel used to select the character.

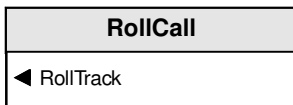
The **Clear** function blanks the selected character.

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

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

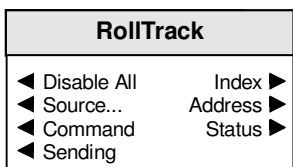
RollCall

This allows the RollCall functions to be set up.



RollTrack

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

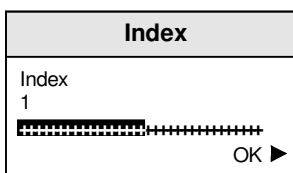


Disable All

When selected this will disable all the RollTracks being generated from this unit.

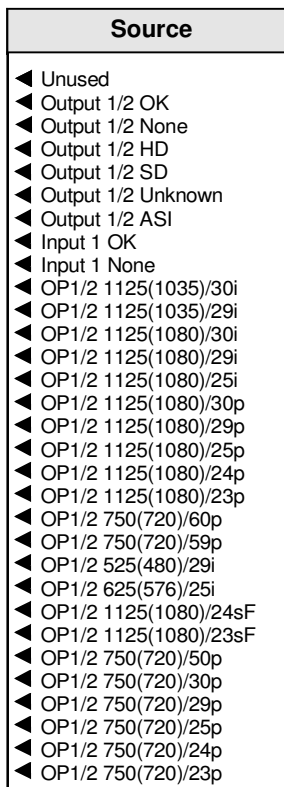
Index

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

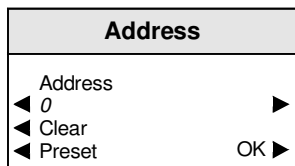


This selects the source of information that triggers the transmission of the RollTrack data.

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

Address

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



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

(The right ► and left buttons select the cursor position and the spinwheel selects the character; the clear button sets the text line to all zeros and the OK button accepts the network address)

The full **RollTrack** address has four sets of numbers

For example: 0000:10:01*99

The first set (0000) is the network segment code number

The second set (10) is the number identifying the (enclosure/mainframe) unit.

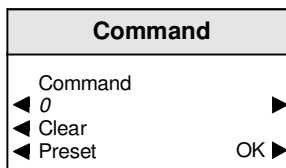
The third set (01) is the slot number in the unit

The Fourth Set (99)

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

If this number was set to 00 **any type** of unit at this location would respond to the RollTrack command, possibly causing unpredictable results.

Command



The full **RollTrack** command has two sets of numbers

For example: 84:156

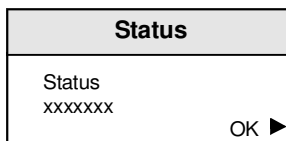
The first set (84) is the **RollTrack** command number.

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

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

Status

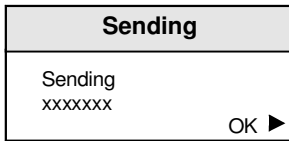
This item will show the status of the currently selected RollTrack index.



This may show:

- OK RollTrack message sent and received OK.
- Unknown Rolltrack message has been sent but it has not yet completed.
- Timeout RollTrack message sent but acknowledgement not received. This could be because the destination unit is not at the location specified.
- Error Rolltrack message has not been correctly acknowledged at the destination unit. This could be because the destination unit is not of the type specified.

Sending



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

This may show:

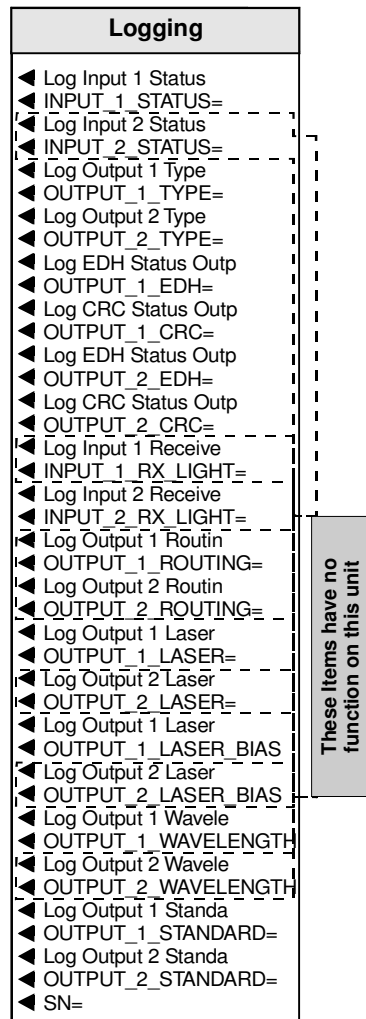
- String A string value is always being sent.
- Number A number value is always being sent.
- No The message is not being sent.
- Yes The message is being sent.
- Internal Type Error Inconsistent behavior; please contact your local Snell & Wilcox agent.

Logging

Information about various parameters can be made available to a logging device that is attached to the RollCall™ network by selecting the appropriate Log xxxxx item.

More than one item may be selected from the list.

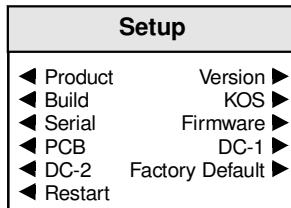
Note that some items have no function on this unit.



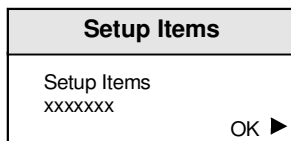
Selecting the text associated with the Log xxxxx item will display the status of the item.

Setup

This item provides information about the unit.



Information about a selected item will appear in the window.



Select OK to return to the Setup Menu.

Product

This shows the name of the unit.

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.

KOS

This shows the version of the operating system.

Serial

This will show the serial number of the unit.

Firmware

This shows the version of the firmware system

PCB

This shows the PCB revision number.

DC-1 and DC-2

This will display details of the daughter cards.

Factory Default

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

Restart

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

