



# **IQOTR30**

## **Single Mode Fiber Optic Transceiver for 3G/HD/SD-SDI Signals**

### **Operator's Manual**

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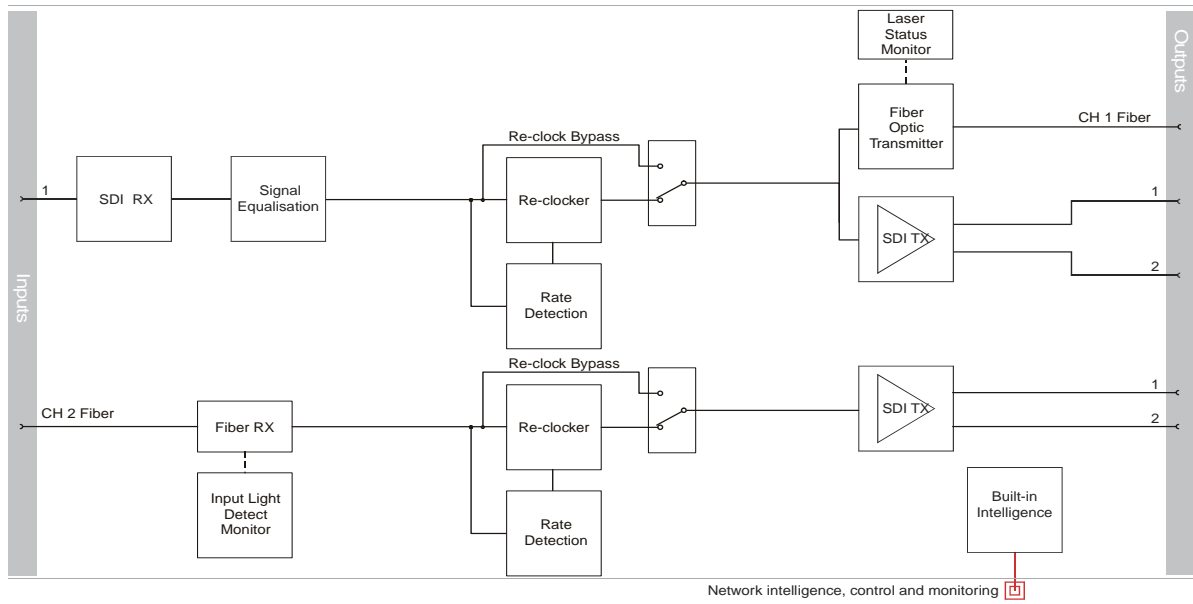
Ftp: <ftp://ftp.snellwilcox.com/support>

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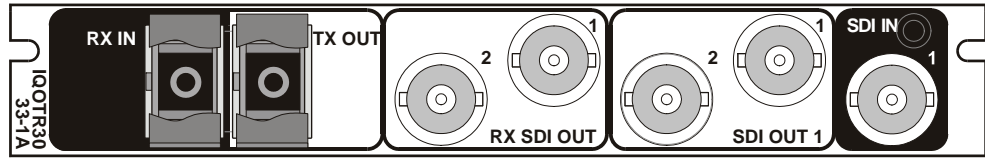
# Module Description

The IQOTR30 is a fiber optic transceiver for bi-directional conversion of 3Gbps, HD and SD-SDI signals to 1310 nm wavelength optical signals.



# Rear Panel Views

## IQOTR30 Rear Panel View

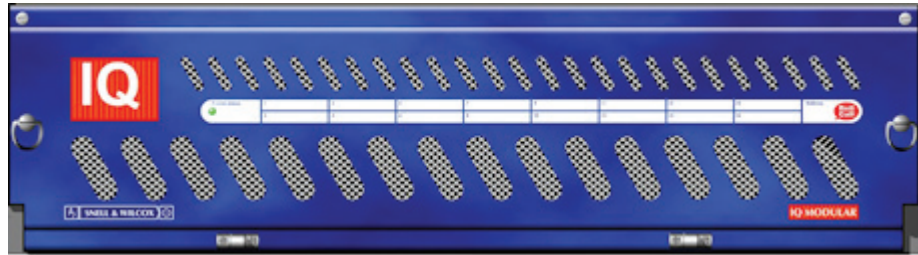


These modules can only be fitted into 'A' style enclosures as shown below.

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



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



**Enclosure order code IQH1A-S-P**



## Order Codes

<b>IQOTR30</b>	<i>IQOTR3033-1A</i> Single mode fiber optic transceiver for HD/SD-SDI. 1 x HD/SD-SDI input, 2 x HD/SD-SDI outputs, 1 x optical output. 1 x optical input, 2 x HD/SD-SDI outputs
	<i>IQOTR3033-1A3</i> Single mode fiber optic transceiver for 3G/HD/SD-SDI. 1 x 3G/HD/SD-SDI input, 2 x 3G/HD/SD-SDI outputs, 1 x optical output. 1 x optical input, 2 x 3G/HD/SD-SDI outputs
	<i>IQOTR30-3G</i> Upgrade for IQOTR30 Single mode fiber optic transceiver to operate with 3Gbps signals

## Feature Summary

- Reclocking for 3 Gbit/s, 1.5 Gbit/s HD-SDI and 270 Mbit/s SDI signals, or asynchronous operation for other frequencies (input range 50 Mbit/s to 3 Gbit/s)
- Single mode fiber optic Transmitter for 3G/HD/SD-SDI and DVB ASI Signals
- Output wavelength of 1310 nm
- Active loop-through 3G/HD/SD-SDI outputs for each input in accordance with SMPTE424M, SMPTE292M, SMPTE259M and DVB ASI
- Single mode fiber optic receiver for 3G/HD/SD-SDI and DVB ASI Signals
- Input wavelength range 1260-1620 nm
- 3G/HD/SD-SDI outputs for CH 2 optical input, in accordance with SMPTE424M, SMPTE292M, SMPTE259M and DVB ASI

# Technical Profile

## Inputs and Outputs

### Signal Inputs (Tx)

Electrical	3 GBit/s HD-SDI, 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
Conforms to	SMPTE 424M (HD level A) SMPTE 292M (HD) SMPTE 259M-C (SD)
Inputs	1
Input Cable Length	Up to 80m Belden 1694A @ 3 Gbit/s Up to 180m Belden 1694A @ 1.5 Gbit/s Up to 350m Belden 1694A @ 270 Mbit/s

### Signal Inputs (Rx)

Optical	3 GBit/s HD-SDI, 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
Standard	SMPTE 297-2006
Input	1

### Signal Outputs (Tx)

Optical	3 GBit/s HD-SDI, 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 per channel
Conforms to	SMPTE 297-2006
Electrical	3 GBit/s HD-SDI, 1.485Gbit/s HD-SDI or 270 Mbit/s SD-SDI (asynchronous operation available at other frequencies)
Connector Format	BNC/ 75 ohm panel jack (Reclocked active loop through)
Outputs	2 reclocked active loop through for CH1 SDI Input 1 reclocked active loop through for CH2 SDI Input
Conforms to	SMPTE 424M (HD level A) SMPTE 292M (HD) SMPTE 259M-C (SD)

### Signal Outputs (Rx)

Electrical	3 GBit/s HD-SDI, 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

Conforms to	SMPTE 424M (HD level A) SMPTE 292M (HD) SMPTE 259M-C (SD) DVB/ASI (output 1 only)
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Outputs	2 outputs
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## Controls

### Card Edge Controls (also available via RollCall)

None

### Functions Available via RollCall Only

Mode	Auto, 3G, HD, SD
Reclocker	On/Off
Laser Disable	On/Off
Rx Input Status	Present, Loss/Unknown, Data Rate
Logging	Input 1 (2) Type Input 1 (2) Data Rate Input 1 (2) Present Input 1 (2) Error Input 1 (2) Loss Tx Laser Bias High Warning Tx Power Low Warning Tx Power High Warning Tx Laser Wavelength Rx Power High Warning Rx Power Low Warning Rx Power Measurement
RollTrack Controls	On/Off, Index, Source, Address, Command, Status, Sending.
RollTrack Outputs	Unused Input 1 (2) Present Input 1 (2) Rate Unknown Input 1 (2) Loss Input 1(2) 3G Input 1(2) HD Input 1(2) SD Tx Laser Bias High Warning Rx Power High Warning Rx Power Low Warning

### Indicators

Power	OK (Green)
CPU	OK (Green flashing)
Input 1 (2)	OK (Green), Bypass (Orange), Loss (Red)

## Specifications

### Optical Outputs (Tx)

1310 nm Tx

Wavelength	1310 nm
Spectral width (FWHM)	>1.5 nm (typ)
Output power	-2 dBm ( $\pm 1$ dBm)
Extinction ratio	>7.5:1 (typ)
Transmission distance	Up to 30 Km

**Optical Inputs (Rx)**

Input wavelength range	Min. 1260 nm Max. 1620 nm
Optical power input range	> -3 dBm < -18 dBm
Detector damage threshold	+3.5 dBm
Module Power Consumption	3.5W max



A rectangular label with a black border and a black background. The text "CLASS 1 LASER PRODUCT" is written in white, bold, uppercase letters.

## Warnings



- All lasers used in this product are Class 1, in accordance with EN60825-1 as well as 21CFR 1040.10 and 1040.11
- Laser light can be damaging to the eyes. Optical fibers and uniteres should be handled with great care.
- The IQOTR30 is designed for use with Class 1 laser systems only. Ensure that all outputs do **not** exceed Class 1 as doing so will impair the safety of the system and may result in damage to the equipment.
- Active fibers should not be handled unless thier source can positively be identified as not exceeding Class 1 limits.

## Notes

*Note:*

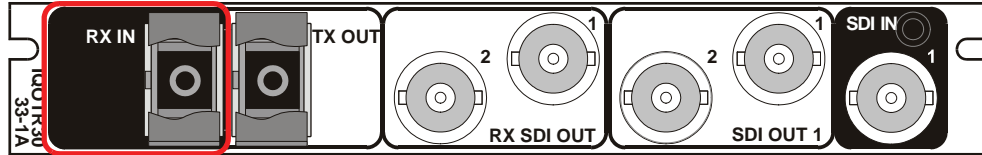
- Optical uniteres have shutters to prevent the ingress of dust. These shutters should only be opened when connecting optical fibers.
- The ends of optical fibers should be cleaned with a liquid fiber cleaner, using a cotton bud, to ensure that there is no dust present before they are plugged in (the uniter is polarized).
- Do not disturb or handle the optical fibers.

# Connections

## IQOTR30 Connections

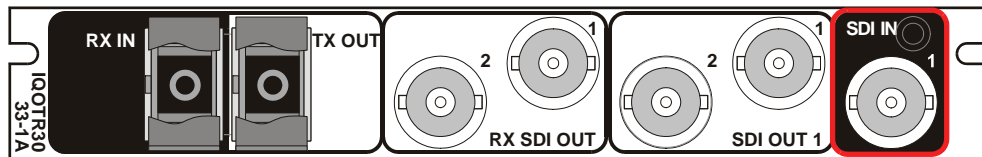
### Optical Input (RX IN)

Optical input (Rx IN) to the module is via a single SC/PC singlemode panel uniter.



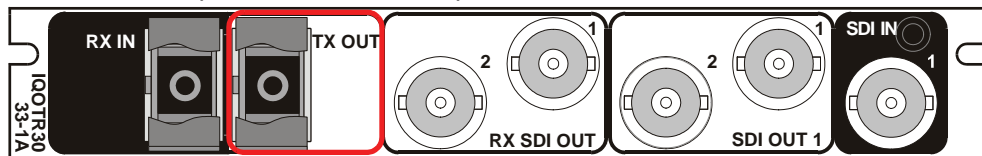
### Electrical Input (SDI IN)

Electrical input (SDI IN) to the module is via a single BNC 75 ohm panel jack connector.



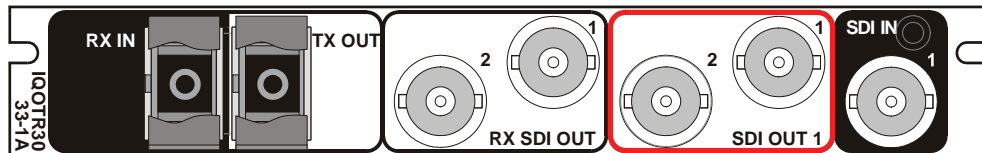
### Optical Output (TX OUT)

There is a single optical output from the unit via an SC/PC singlemode panel uniter. The input source for this output is the SDI IN connector.



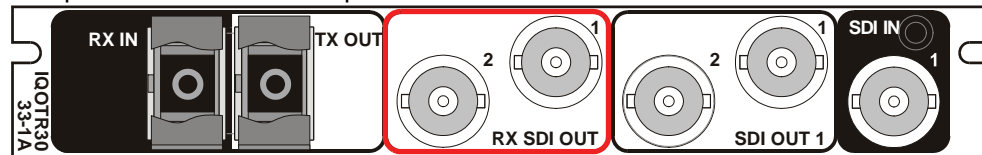
### Electrical Outputs (SDI OUT 1)

There are two serial digital outputs via BNC 75 ohm panel jack connectors. The input source for these outputs is the SDI IN connector.



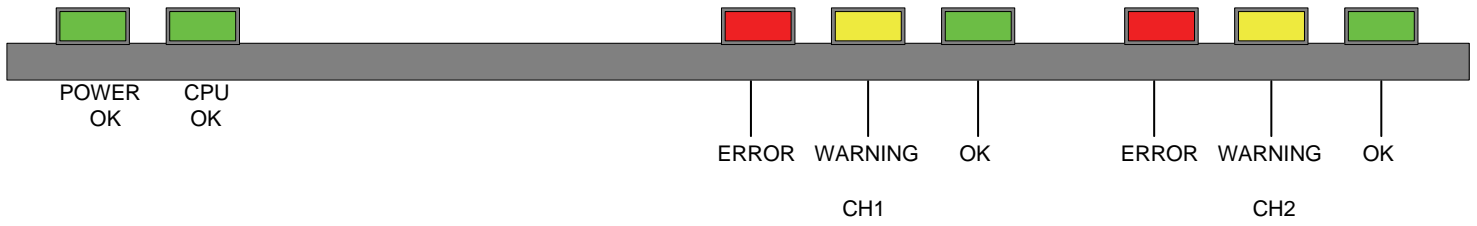
### Electrical Outputs (RX SDI OUT)

There are two serial digital outputs via BNC 75 ohm panel jack connectors. The input source for these outputs is the RX IN connector.



# Card Edge Controls

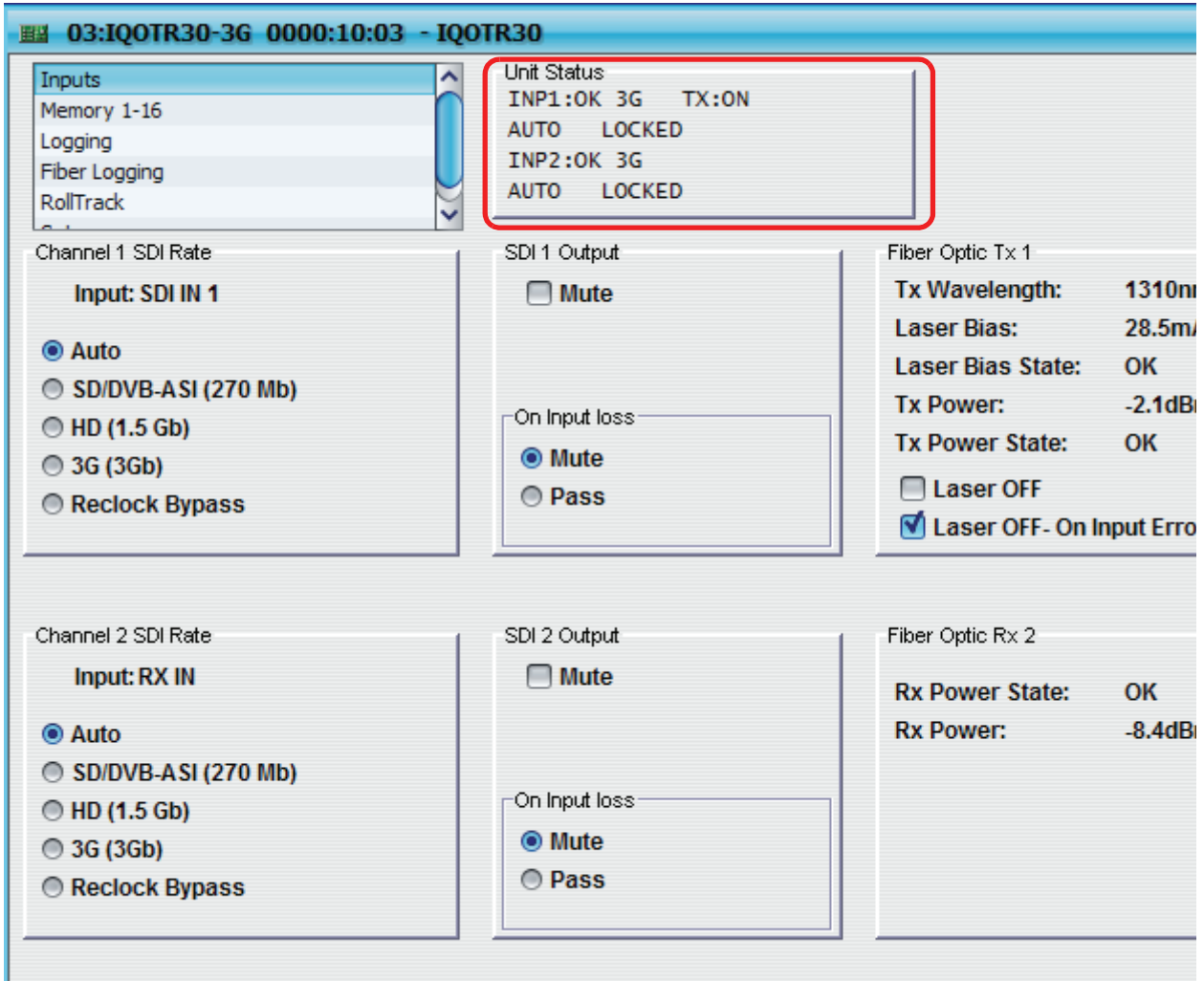
## IQOTR30



# Controlling the IQOTR30 from the RollCall Control Panel

## Unit Status

Information about the status of the unit is displayed in the Unit Status section on each RollCall Control Panel screen.



The first two lines of the Unit Status display the input status, detected rate, and input selection method for Input 1.

The third and fourth lines of the Unit Status display the same information for Input 2.

## Input

The input screen enables the type of input signal to be selected.

### Input 1 SDI Rate (SDI IN 1) / Input 2 SDI Rate (RX IN 2)

- Auto:** When selected, the unit will automatically detect and reclock any valid input signal, and the detected rate will be displayed in the Unit Status.  
 If anything else is detected, the output will not be reclocked. If the **On Input Loss / Mute** option is selected, the output will be muted; or, if the **On Input Loss / Pass** option is selected, the output will be passed through.
- SD/DVB-ASI (270 Mb):** When selected, the unit will reclock only SD/DVB-ASI (270 Mb) signals.  
 When selected, the **On Input Loss** controls are greyed out and are inactive. If any other standard is applied to the unit, the output will be muted.
- HD (1.5 Gb):** When selected, the unit will reclock only HD (1.5 Gb) signals.  
 When selected, the **On Input Loss** controls are greyed out and are inactive. If any other standard is applied to the unit, the output will be muted.
- 3G (3 Gb):** When selected, the unit will reclock only 3G (3 Gb) signals.  
 When selected, the **On Input Loss** controls are greyed out and are inactive. If any other standard is applied to the unit, the output will be muted.

- **Reclock Bypass:** When selected, the unit will not reclock the input signal. If a supported rate is detected, the Unit Status will display the detected rate, otherwise, \*\*\* will be displayed.

If the **On Input Loss / Mute** option is selected, the output will be muted whenever a recognized rate is not detected; or, if the **On Input Loss / Pass** option is selected, any signal standard, frequency, etc... will pass through.

#### Output 1 / Output 2

- **Mute:** When selected, this option applies a mute on the output
- **On Input loss / Mute:** When selected, if the Input signal is lost, the output signal will be muted.
- **On Input loss / Pass:** When selected, if the input signal is lost, it will be passed unchanged.

**Note:**

*These controls only apply to the SDI outputs on the BNC. The laser output is controlled by the Laser OFF and Laser OFF - On Input Loss controls.*

#### Fiber Optic Tx 1

This section displays the following information about the fiber optic output signal:

- Tx Wavelength
- Laser Bias
- Laser Bias State
- Tx Power
- Tx Power State
- **Laser OFF:** Selecting this option disables the laser.
- **Laser OFF - On Input Loss:** Selecting this option disables the laser if the input signal is lost.

**Note:**

*These controls only apply to the fiber optic output signal. The SDI outputs on the BNC are controlled by the Mute and On Input Loss - Mute controls.*

*When the unit is forced to a particular standard, the laser controls are not grayed out, and the laser will still be active if an incorrect standard is applied unless **Laser OFF - On Input Loss** is selected.*

#### Fiber Optic Rx 2

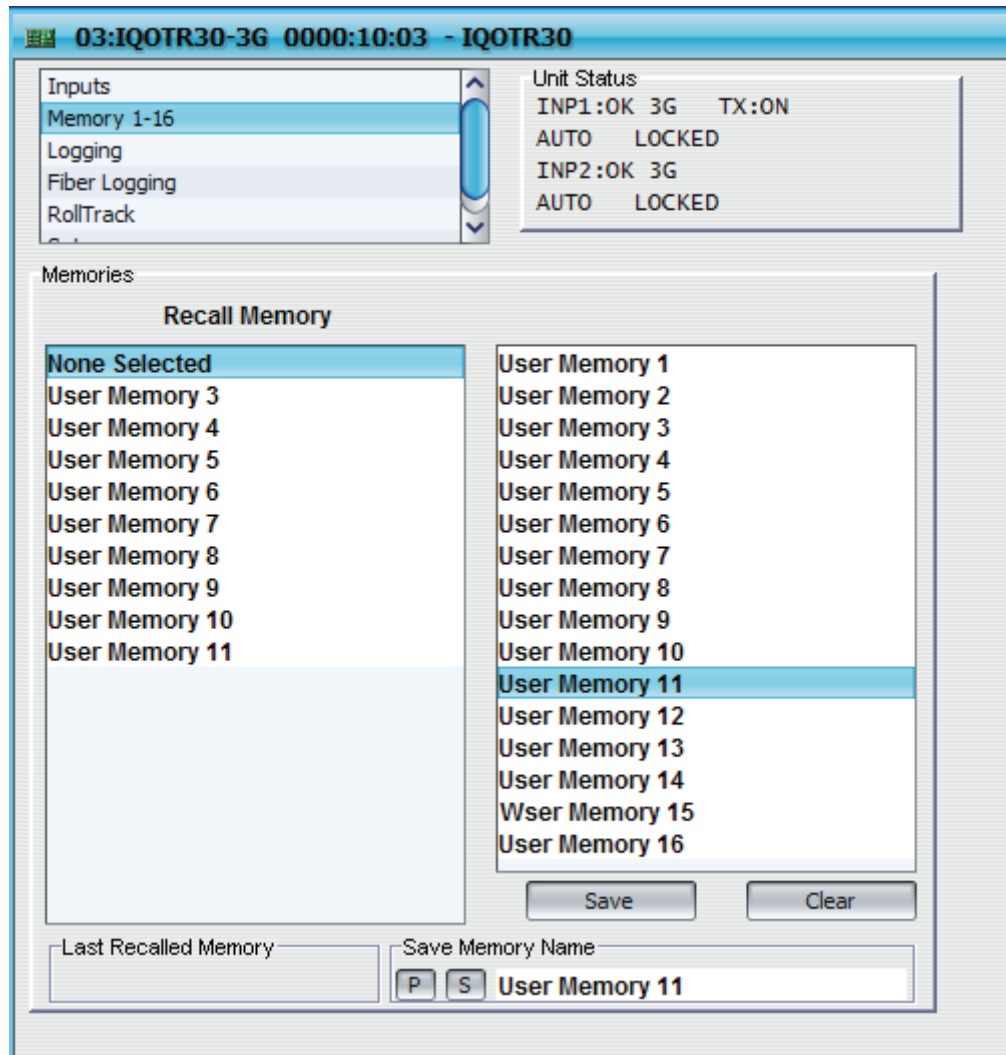
This section displays the following information about the fiber optic input signal:

- Rx Power
- Rx Power State

## Memory 1-16

Use the Memory function to save up to 16 setups to be recalled later.

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



To save settings:

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

To change a memory name:

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

Use the **Recall Memory** function to recall the settings saved in a memory location. **Last Recalled Memory** displays the most recently recalled memory. An asterisk next to the name displayed in the Last Recalled Memory field indicates that one or more controls has been changed since the memory was recalled.

To recall a memory:

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

## Logging

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

03:IQOTR30-3G 0000:10:03 - IQOTR30

<ul style="list-style-type: none"> <li>Memory 1-16</li> <li style="background-color: #00a0e3; color: white;">Logging</li> <li>Fiber Logging</li> <li>RollTrack</li> <li>Setup</li> </ul>	<div style="border: 1px solid black; padding: 5px;">           Unit Status            INP1:OK 3G TX:ON            AUTO LOCKED            INP2:OK 3G            AUTO LOCKED         </div>
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Logging Misc		
Log Enable	Log Field	Log Value
<input checked="" type="checkbox"/> OS Version	SN=	S38111997
<input checked="" type="checkbox"/> Build No.	OS_VERSION=	V115 Release
<input checked="" type="checkbox"/> Hardware Ver.	BUILD_NUMBER=	0000300924
<input checked="" type="checkbox"/> Up Time	HARDWARE_VERSION=	RD3FDC1X
<input checked="" type="checkbox"/> Licensed Options	UPTIME=	000:02:46:00
	LICENSED_OPTIONS=	SDHD;3G

Logging Input 1		
Log Enable	Log Field	Log Value
<input checked="" type="checkbox"/> Input Ident	INPUT_1_IDENT=	SDI IN 1
<input checked="" type="checkbox"/> Input Name	INPUT_1_NAME=	TX 1
<input checked="" type="checkbox"/> Input Type	INPUT_1_TYPE=	HD/SD/3G SDI
<input checked="" type="checkbox"/> Input State	INPUT_1_STATE=	OK
<input checked="" type="checkbox"/> Input SDI Bitrate	INPUT_1_SDIRATE=	3.0Gb/s

Logging Input 2		
Log Enable	Log Field	Log Value
<input checked="" type="checkbox"/> Input Ident	INPUT_2_IDENT=	RX IN
<input checked="" type="checkbox"/> Input Name	INPUT_2_NAME=	RX 2
<input checked="" type="checkbox"/> Input Type	INPUT_2_TYPE=	HD/SD/3G SDI
<input checked="" type="checkbox"/> Input State	INPUT_2_STATE=	OK
<input checked="" type="checkbox"/> Input SDI Bitrate	INPUT_2_SDIRATE=	3.0Gb/s



**03:IQOTR30-3G 0000:10:03 - IQOTR30**

Unit Status  
 INP1:OK 3G TX:ON  
 AUTO LOCKED  
 INP2:OK 3G  
 AUTO LOCKED

Logging Output Tx 1

Log Enable	Log Field	Log Value
<input checked="" type="checkbox"/> Laser Bias State	OUTPUT_1_LASER_BIAS_STATE=	OK
<input checked="" type="checkbox"/> Laser Bias Current	OUTPUT_1_LASER_BIAS=	28.5mA
<input checked="" type="checkbox"/> Tx Power State	OUTPUT_1_TX_POWER_STATE=	OK
<input checked="" type="checkbox"/> Tx Power	OUTPUT_1_TX_POWER=	-2.0dBm
<input checked="" type="checkbox"/> Wavelength	OUTPUT_1_WAVELENGTH=	1310nm

Logging Input Rx 2

Log Enable	Log Field	Log Value
<input checked="" type="checkbox"/> RX Power State	INPUT_2_RX_POWER_STATE=	OK
<input checked="" type="checkbox"/> RX Power	INPUT_2_RX_POWER=	-8.4dBm

Each logging screen comprises three columns:

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

#### RollCall Log Fields

Log Field	Log Value
SN=	<Serial number>
OS_VERSION=	<Operating system version>
BUILD_NUMBER=	<Software build number>
HARDWARE_VERSION=	<Hardware version number>
UPTIME=	<Time since last restart>
LICENSED_OPTIONS=	<Currently licensed options>
INPUT_N_IDENT=	<Input ident>
INPUT_N_NAME=	<Input name>
INPUT_N_TYPE=	<Input type>
INPUT_N_STATE=	OK, WARN, FAIL
INPUT_N_SDIRATE=	<Input bitrate>
OUTPUT_1_LASER_BIAS_STATE=	OK, WARN, FAIL

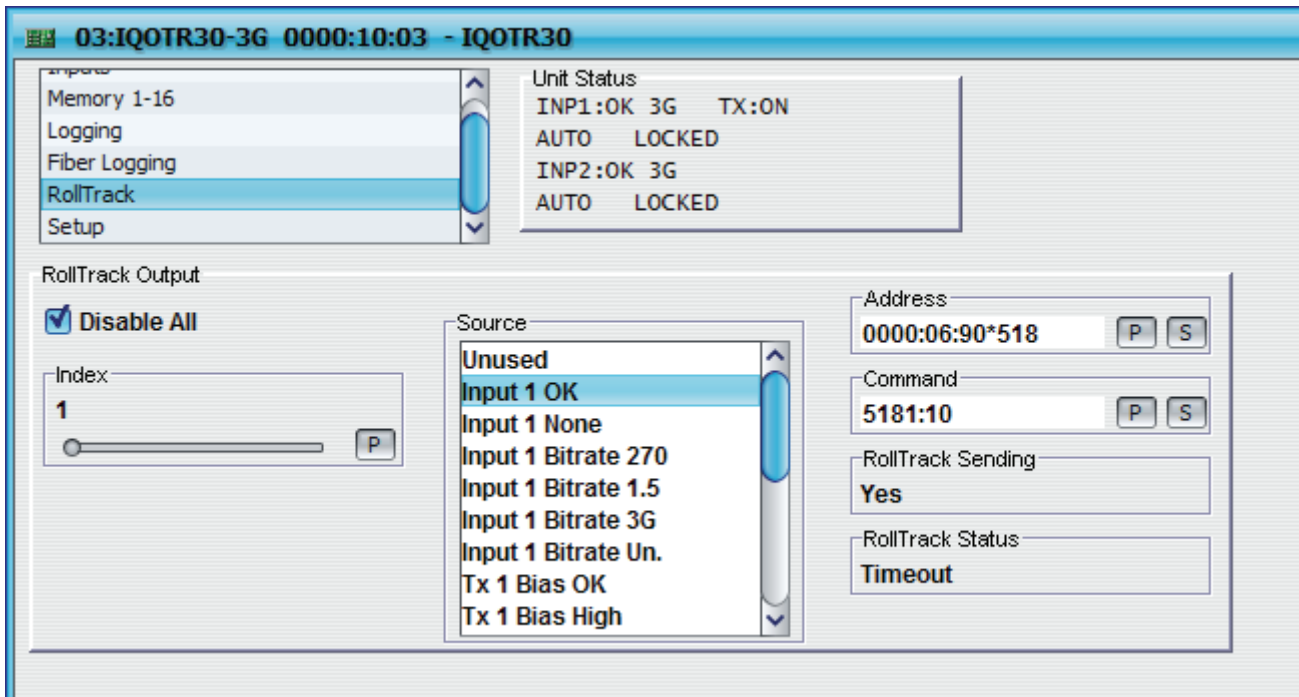
OUTPUT_1_LASER_BIAS=	<Current Laser Bias in mA>
OUTPUT_1_TX_POWER_STATE=	OK, WARN, FAIL
OUTPUT_1_TX_POWER=	<Tx Power in dbm>
OUTPUT_1_WAVELNGTH=	<Wavelegth in nm>
INPUT_N_RX_POWER_STATE=	OK, WARN, FAIL
INPUT_N_RX_POWER=	<Rx power measurement>

## RollTrack

The RollTrack settings allow information to be sent, by means of the RollCall network, to other compatible units on the same network.

Use the settings on the **RollTrack** screen to:

- Enable or disable the RollTrack functions.
- Configure up to 16 RollTrack outputs.
- Specify the conditions that trigger RollTrack data transmission.
- Set RollTrack destinations.
- Specify the RollTrack commands to be sent.



### RollTrack Sources

The RollTrack Source specifies the source of the information that triggers the transmission of data.

### RollTrack Addresses

The full RollTrack Address comprises four sets of numbers. For example, 0000:10:01\*99.

The first set, 0000 in the example, is the network segment code number.

The second set, 10 in the example, identifies the (enclosure/mainframe) unit.

The third set, 01 in the example, identifies the slot number in the unit.

The fourth set, 99 in the example, is the RollCall ID of the destination unit - a user-configured number that uniquely identifies the destination unit in a multi-unit system. If it is set to anything other than 00 the unit will respond to RollTrack commands. If left at 00, an incorrectly fitted unit may respond inappropriately.

### RollTrack Commands

Each RollTrack command comprises two sets of numbers, for example, 33039:3.

The first set, 33039 in the example, is the RollTrack command number, which identifies the command.

The second set, 3 in the example, is the value that is sent with the command.

### Using RollTracks

To enable or disable RollTrack functions:

- To enable the RollTrack functions, clear the **Disable All** check box.

- To disable RollTrack functions, select the **Disable All** check box.

To configure a RollTrack action:

1. Select the **Index** number. This identifies the RollTrack action being configured. Up to 16 RollTrack actions can be created.
2. From the **Source** list, select the source of the information that will trigger RollTrack transmission.
3. Enter the RollTrack **Address** and click **S**. To return the address to its default value, click the preset button (**P**).
4. Enter the RollTrack **Command** and click **S**. To return the value to its default, click the preset button (**P**).

#### **Viewing RollTrack Information**

**RollTrack Sending** and **RollTrack Status** display information about the status of RollTracks.

**RollTrack Sending** displays the information when the unit is actively sending a RollTrack command:

- **No**: The command is not being sent.
- **Yes**: The command is being sent.

**RollTrack Status** displays the status of the currently selected RollTrack Index:

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

## Setup

The **Setup** screen displays basic information about the unit. Use the functions on the screen to restart the unit, return all settings to their factory defaults, and to change the names of the inputs.

On the **Setup** screen, the following information is displayed:

- **Product:** This displays the name of the module.
- **Software Version:** This displays the currently installed software version number.
- **Serial No:** This displays the unit's serial number.
- **Build:** This displays the factory build number. This number identifies all parameters of the unit.
- **KOS:** This displays the operating system version number.
- **PCB:** This displays the PCB revision number.
- **Licensed Options:** This displays the unit's currently licensed options.

To reboot the unit, simulating a power-up/power-down cycle, click **Restart**.

To reset all of the unit's settings to their factory defaults, click **Factory Defaults**.

**Note:**

*Resetting the unit to its **factory defaults** will also clear all the saved memory settings*

To reset all of the unit's settings to their factory defaults, leaving user memories intact, click **Default Settings**.

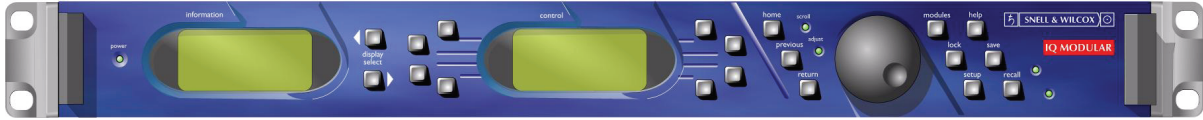
**Input 1 Name and Input 2 Name**

These are the input names displayed in logging. 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**.

## Operation from an Active Control Panel

The module can be operated from an active control panel via the RollCall™ network.

All operational parameters and selections described in the previous section are made using a system of menus displayed in the two LCD windows – the Information window and the Control window.



### Information Window

The information window contains four lines of text indicating the current state of the unit.

### Control Window

The Control window displays all selection menus and sub-menus.

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

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

Whenever a menu item is selected the parameters of that selection will be displayed in the Information window of the front panel. Where the selection is purely a mode selection and does not enable a sub-menu, the text will become reversed (white-on-black) indicating that the mode is active. If the mode is not available for selection the text will remain normal.

# Manual Revision Record

Date	Version	Issue	Change	Comments
12/05/09	1	1		First Issue.