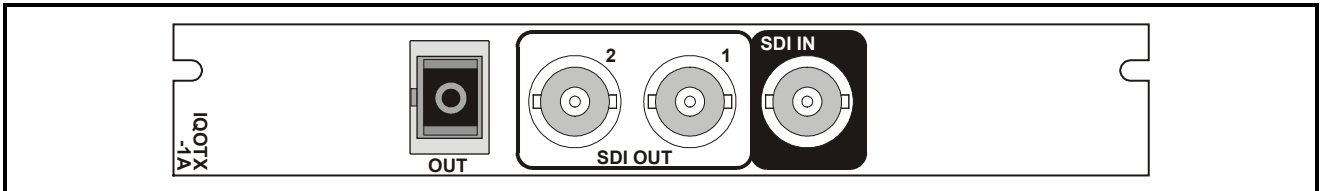
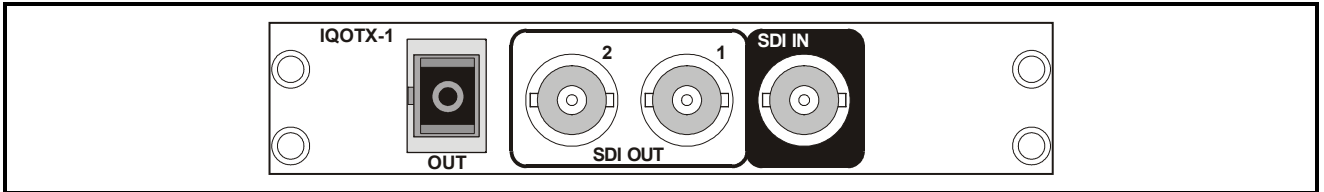


# IQOTX Single-Channel Fiber Optic Transmitter for SDI

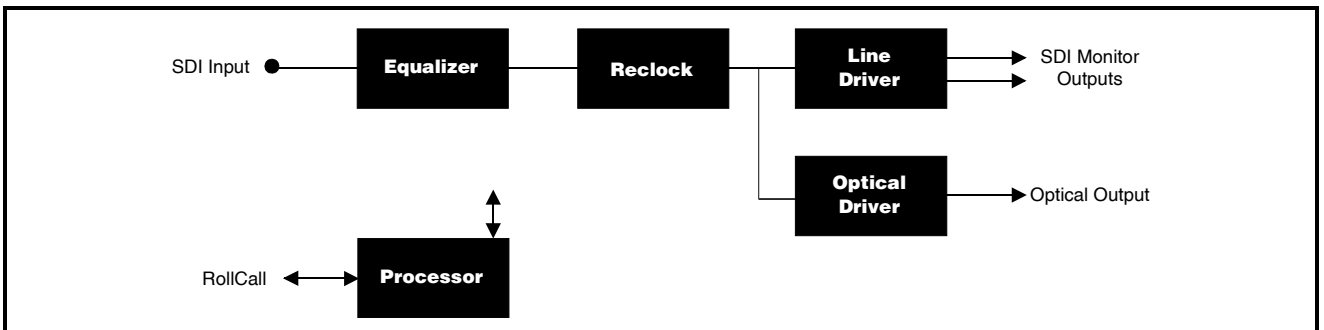
## Module Description

The IQOTX is a single channel fiber optic transmitter for SDI/ASI video signals. The unit provides a single-mode and multi-mode compatible optical output and 2 SDI outputs from the equalized and reclocked SDI input. RollCall provides remote input monitoring and unit identification.

## REAR PANEL VIEW



## BLOCK DIAGRAM



**IMPORTANT NOTICES**

**Compliance Label**

Before installing this module into the enclosure the label shown opposite must be attached to the upper outside surface of the case.

This label will be found attached to the card.

SNELL & WILCOX LTD.  
 SOUTHLEIGH PARK HOUSE  
 EASTLEIGH ROAD, HAVANT,  
 HANTS, P09 2PE.  
  
 MANUFACTURED IN ENGLAND  
 AUGUST 2003  
  
 COMPLIES WITH 21 CFR 1040.10  
 AND 1040.11 EXCEPT FOR  
 DEVIATIONS PURSUANT TO  
 LASER NOTICE NO. 50, DATED  
 JULY 2001; ALSO WITH IEC  
 60825-1 (2001) AND WITH  
 EN 60825-1 (2001)

**Laser Safety**

**EN60825-1 (2001)**  
 Safety of Laser products.

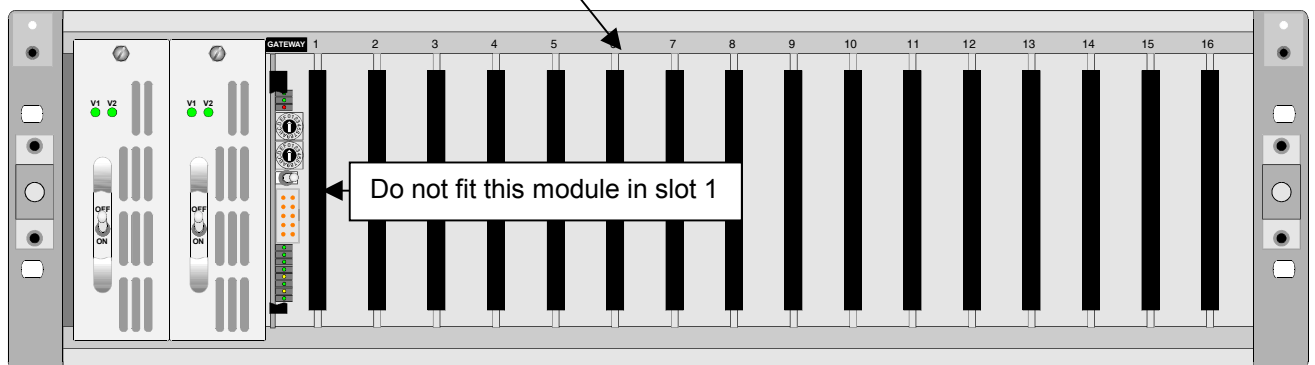
This label will be fitted in products indicating the Laser source.



**Caution – use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure. Viewing the laser diode with the optical fiber removed and with the aid of optical magnifiers may be hazardous. The IQ fiber module is a Class 1 laser product (output power <15mW) at 1310nm with a beam divergence >30mrad. The laser diode used is class 1M (output power <30mW).**

**Module Installation**

When this module is fitted into a 3U enclosure it is very important to ensure that the card-retaining bar is fitted and fully secured.



This will make sure that the fiber optic connections at the rear of the module are made correctly.

Versions of the module cards available are:

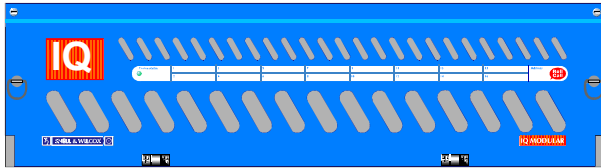
IQOTX-1	SDI single-channel fiber optic transmitter	Single width module
IQOTX-1A	SDI single-channel fiber optic transmitter	Single width module

**Note that there are two styles of rear panels available. They are not interchangeable between the two styles of enclosures. However, the cards may be fitted into any style of 3U enclosure.**

**Note also that this module (IQOTX) cannot be fitted into slot 1 of the 'O' Style Enclosures**

**'A' Style Enclosure**

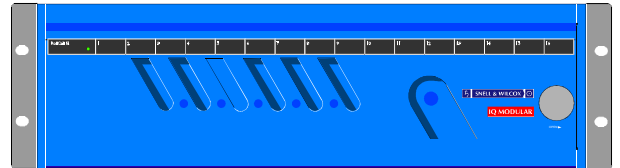
Rear panels **with** the suffix A may only be fitted into the 'A' style enclosure shown below.



(Enclosure order codes IQH3A-E-O, IQH3A-E-P, IQH3A-N-O, IQH3A-N-P)

**'O' Style Enclosures**

Rear panels **without** the suffix A may only be fitted into the 'O' style enclosures shown below.



(Enclosure order codes IQH3N-O, IQH3N-P)



(Enclosure order codes IQH3U-RC-O, IQH3U-RC-P)

## Features

- Single and multi-mode fiber optic transmitter for serial 4:2:2/ASI Signals, optical output in accordance with SMPTE 297M
- Transmission distances over 20 km for single mode fiber and up to 3.5 km for multi-mode
- 2 x serial 4:2:2 Monitor outputs
- RollCall reporting of status
- Freedom from electromagnetic interference
- Freedom from crosstalk
- Complete electrical isolation
- Absence of ground loops
- Increased bandwidth and lower losses than coaxial cables
- Lower weight and higher density compared with copper cables

## Technical Profile

### Features

#### Signal Inputs

SDI ..... Via BNC Connector  
 Standard ..... SMPTE 259M-C

#### Signal Outputs

Optical ..... Via SC Connector with Shutter  
 Standard ..... SMPTE 297M  
 SDI Monitor ..... Via BNC Connector  
 Standard ..... SMPTE 259M-C

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

None

#### Functions Available via RollCall™ Only

Logging ..... Input Loss

#### Indicators

Power Supplies  
 Input Loss

### Specifications

Optical Output Power ..... Less than -7.5 dBm and greater than -12 dBm

Optical Output Wavelength 1310 nm ±40 nm

SDI Output ..... 270 Mbits/s

SDI Output Return Loss ..... Better than -15 dB to 270 MHz

#### Operating Distance

Multi-mode ..... 3.5 km typical with high quality 62.5/125 µm cable.

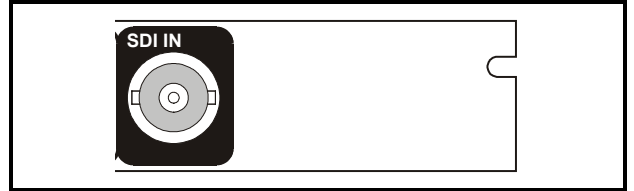
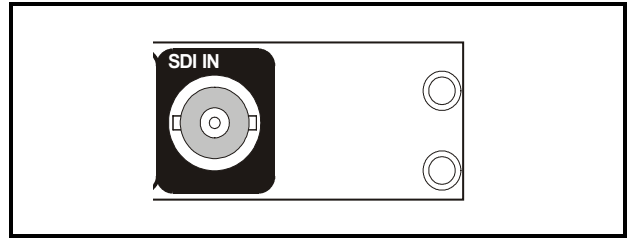
Single-mode ..... >20 km typical with high quality 62.5/125 µm cable.

For details of the operating distance please see the Appendix on page 10.

**INPUTS AND OUTPUTS**

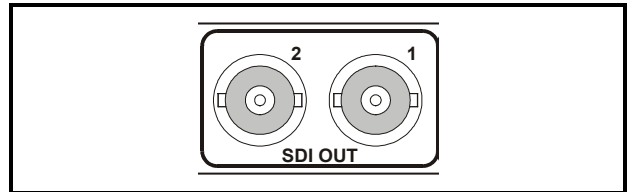
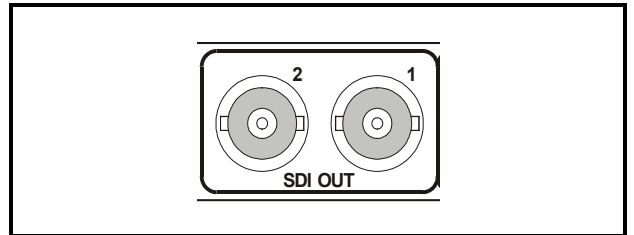
**SERIAL IN**

This is the SDI input of the unit via a BNC connector.



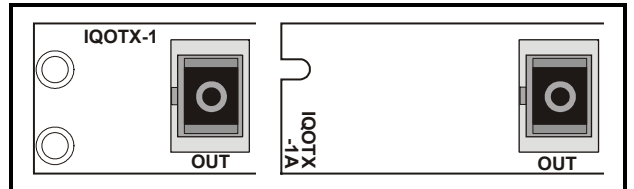
**SERIAL OUT**

These are the serial monitor outputs which provide equalized and reclocked SDI outputs of the input via BNC connectors.

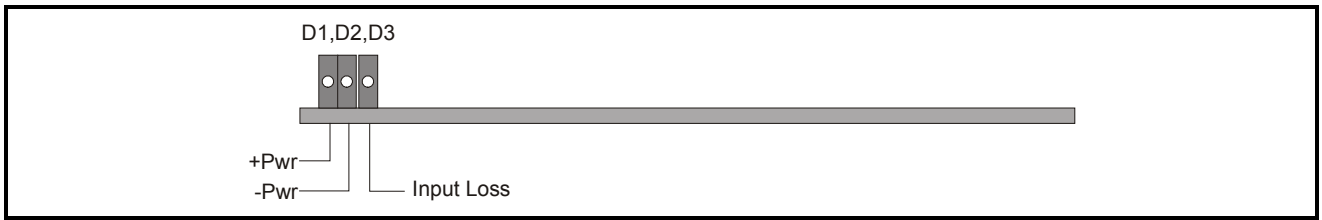


**OPTICAL OUT**

This is the optical output from the unit and is made via a SC Connector with a Shutter.



## CARD EDGE CONTROLS



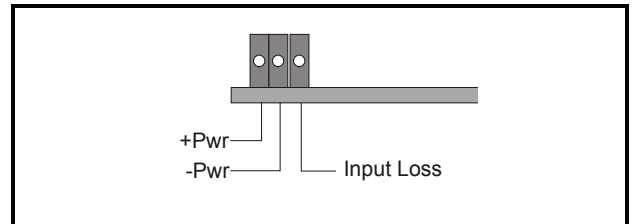
## LED INDICATORS

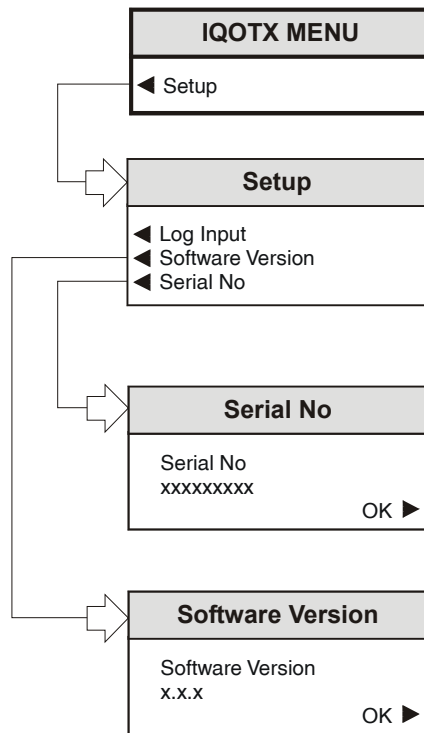
**+Pwr and -Pwr**

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

**Input Loss**

This LED will be continuously illuminated when the input is not receiving an input signal.





## ***IQOTX Menu System***

OPERATION FROM AN ACTIVE CONTROL PANEL

The card may be operated with an active control panel via the RollCall™ network. The menus available for this card are shown opposite and will appear in the Control display window.

Operational details for the remote control panel will be found in SECTION 1 of the Modular System Operator's Manual.

MENU DETAILS  
(see IQOTX 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.*

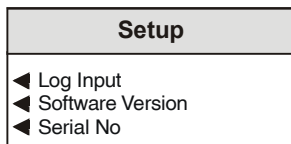
Whenever a menu item is selected the parameters of that selection will be displayed in the **Information** window of the front panel. Where the selection is purely a mode selection and does not enable a sub-menu, the text will become reversed (white-on-black) indicating that the mode is active. If the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

MAIN MENU



◀ Setup

This selection reveals a sub-menu that allows various functions to be set.



◀ Log Input

If a logging device is attached to the RollCall™ network, information about various parameters will be reported to the logging device assigned in the Remote Control Interface system.

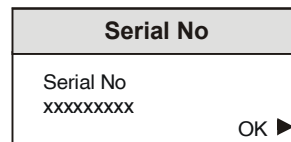
When activated, a loss of input signal condition will be available for the logging device.

◀ Software Version



Selecting this item reveals a display showing the version of the software fitted in the module. Select OK to return to the Setup Menu.

◀ Serial No



Selecting this item reveals a display showing the serial number of the module. Select OK to return to the Setup Menu.



## RollCall Control Templates for the IQOTX

There is only one screen for the IQOTX.

### Information

This area provides basic information about the status of the unit.

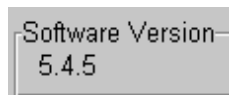
### Input

This item shows the status of the input signal.

It may show:

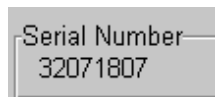
- OK     The unit is receiving a valid input signal
- \* \*     The unit is not receiving a valid input signal

### Software Version



This shows the version of the software fitted.

### Serial Number



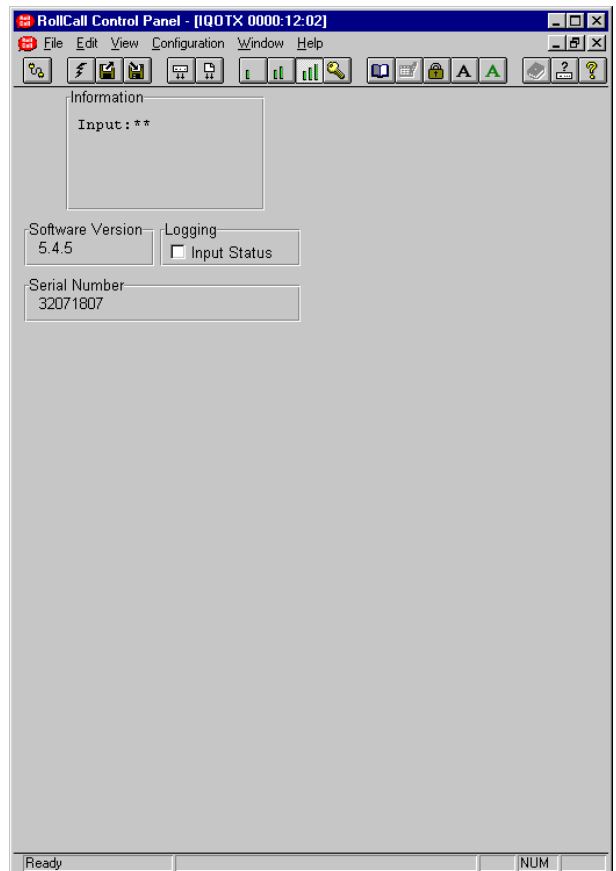
This item shows the serial number of the module.

### Logging

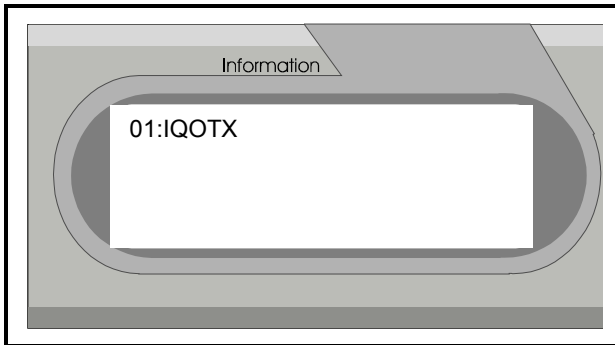
If a logging device is attached to the RollCall™ network, information about various parameters can be made available to such a device.

### Input Status

When checked this allows information about the **Input Status** to be made available for logging.



## THE INFORMATION WINDOW



The Information window has four lines of text indicating current selections and various information messages.

The first line will contain the name of the module that is currently being controlled.

The second, third and fourth lines provide specific information about the operating conditions of the module.

Example of text displayed

Line 1 01:IQOTX  
 Line 2 INPUT OK or \*\*

## Text Line Details

## Line 1

This line contains the name of the module and the slot position of the module in the enclosure.

## Line 2

This line gives information about the state of the input.

INPUT OK      *Input Signal Present*  
 or  
 INPUT \*\*      *Input Signal not Present*

## Appendix

### Operating Distance

The limiting factors for the successful transmission of digital video data include not only the reception of the specified light energy (which in turn depends on the specified link budget), but also the throughput BANDWIDTH. Hence, the choice of wideband fiber cable especially in case of the MULTIMODE FIBRE, is paramount.

The approximate minimal bandwidth could be found from a practical rule of "2 Hz per bit/s". So, for 270 Mbit/s streams the link bandwidth should be at least 135 MHz and for 360 Mbit/s it should be at least 180 MHz.

Another "rule of thumb" allows you to derive the approximate through put bandwidth from the cable length and the specified bandwidth. It says that every time you double the cable length you half the bandwidth.

Example: Suppose the selected type of 62.5/125 cable has a specified bandwidth of 800 MHz/km and a specified attenuation of 0.5 dB/km.

Suppose the link budget is equal to  $20.5 \text{ (RX)} - 7.5 \text{ (TX)} = 13 \text{ dB}$ .

Allowing about 3 dB loss on optical connectors surfaces the total cable loss could be up to  $13 - 3 = 10 \text{ dB}$ .

From this point of view the maximum cable length could be  $10/0.5 = 20 \text{ km}$ .

However, for this type of cable the bandwidth of 2 km link will be  $800/2 = 400 \text{ MHz}$ , for 4 km link it will be  $800/4 = 200 \text{ MHz}$ , and for 8 km link it will be  $800/8 = 100 \text{ MHz}$ . The last figure is far below the required value of 135 MHz, hence realistic maximum length for the cable of this type will be about 6 km.

Note that this example applies to the top-of-the-range fiber. Typical 62.5/125 cables have a specified bandwidth of 400 or 500 MHz/km.

This means that reliable transmission of 270 Mbit/s streams via fiber cables of such quality is possible only for distances up to 3.5 km.

