



Installation and Operation Instructions



SX-4FX-x

1x4 All-Optical Fiber Switch

Version 1.3
08/2022

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1.0 Product Description

The SX-4FX, 4 channel fiber switch is part of Meridian's continuing expansion of fiber transport products to provide improved fiber network security and reliability. This card is designed to provide the ability to selectively switch the single-mode fiber optical input to any one or all of the switched outputs. As an all-optical switch, this device is data type and rate agnostic and can switch video, audio or data signals via input single-mode optical fiber. Each port of the switch can be controlled either locally, using the front-panel mounted DIP switch, or remotely, using the USB interface or Meridian's SpectraSmart network management system. Front panel mounted indicator lights show the status of each output port (on or off) as well indicating the mode of operation (local/remote). The switch is not latching so it will not retain its state during a loss of electrical power.

This card can also be used with bi-directional information such as camera PTZ control and video conferencing systems, but only one output port can be selected.

The functionality of this card is enhanced by its compatibility with Meridian's PC based SpectraSmart network Management and remote diagnostic software system. SpectraSmart monitors the operating parameters of the card and allows the user to remotely select the optical transmission path. See SpectraSmart brochure for additional details.

Optional GPI control port is available, by adding "J" on the end of part number.

And optional conformal coating provides an additional level of protection from environments with high humidity and condensation.

2.0 Installation

The SX-4FX series products are Meridian's standard one-slot wide, 3RU cards and occupy one slot in Meridian's standard chassis (SR-500/S, SR-1002/S, SR-1600/R and SR2001 & SR-2000 series 19" equipment chassis). To install in the chassis, orient the card with the Meridian logo at the top of the module and slide onto the top and bottom card guides in the chassis. Press securely on the top and bottom of the module to ensure that it is fully seated in the chassis so that the electrical connector mates with the chassis-mounted motherboard. Once installed, manually tighten the two thumbscrews located at the top and bottom of the card. Do not use tools to secure these and do not over tighten.

Note: A fully populated subrack should have forced-air cooling to avoid excessive heat buildup inside the chassis. A fan assembly tray (P/N FA-2000/1) with three (3) fans is available from Meridian and should be installed under the 19" SR-2000/1 whenever possible.

2.1 Fiber connections

These cards are designed for single-mode fiber and are available with either FC or ST optical connectors. See part # selection guide in appendix for ordering details.

3.0 Local/Remote Control

The card has one Optical Input and four Optical Output ports. The activity indicator LEDs associated with each output port.

The Optical Output Port Control done using five position DIP switch located on the card front panel directly below optical output connectors. The top four switches will select the input ports functions and the bottom switch is used to select the Local mode or Remote mode.

In the Local mode port functions can be controlled by front panel DIP switch, selecting the switches in positions 1 to 4. In the Remote mode port functions are control by software program via USB interface connected to PC or SpectraSmart™ network management system (SSPC).

Note: Bi-directional optical signal is achievable when only one output port is Active.

Front panel DIP switch / Remote Software via USB Interface		
SWITCH SELECTION	OFF	ON
Switch 1	Output Optic Port 1 Disabled	Output Optic Port 1 Active
Switch 2	Output Optic Port 2 Disabled	Output Optic Port 2 Active
Switch 3	Output Optic Port 3 Disabled	Output Optic Port 3 Active
Switch 4	Output Optic Port 4 Disabled	Output Optic Port 4 Active
Switch 5	Local	Remote

Optional GPI control port is available via RJ-11 connector. Five Contact Closure GPI inputs can be used to control switch by closing inputs to ground. The table below illustrates how they are configured.

Control Port RJ-11		
PIN DESCRIPTION	CONTACT OPEN	CONTACT CLOSED
Pin 1	Output Optic Port 1 Disabled	Output Optic Port 1 Active
Pin 2	Output Optic Port 2 Disabled	Output Optic Port 2 Active
Pin 3	Output Optic Port 3 Disabled	Output Optic Port 3 Active
Pin 4	Output Optic Port 4 Disabled	Output Optic Port 4 Active
Pin 5	Local	Remote

4.0 Remote Mode via USB Interface

Please use USB-mini to USB-A cable to connect Optical Fiber Switch Card to the computer via the front panel of the card (USB-mini connector).

The USB interface is USB-2.0 and USB-1.1 compatible.

The Remote Mode (USB or SpectraSmart) will be activated, when 5th position of the DIP Switch on the front panel is ON.

In the Remote Mode USB-mini card interface connection has a priority over SpectraSmart TM when USB interface between sub-rack and PC is already established (USB-A to USB-B cable).

SSPC will control interface only when USB-mini cable is disconnected.

Each optical switch representing the Optical Output ports 1,2,3,4 can be turned ON or OFF independently of the other switches.

The activity indicator LEDs associated with each output port to indicate the switch's status (ON = GREEN).

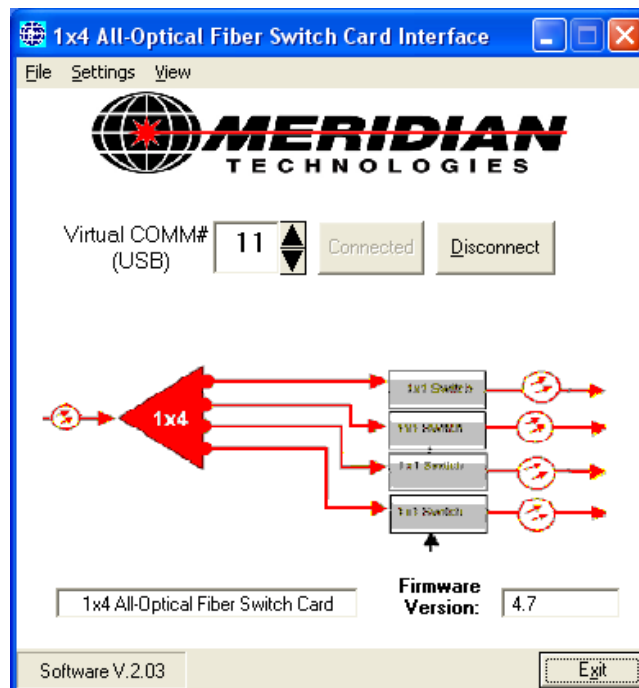
The DIP switch settings are remained set until they are changed by the software (DIP switch pos.5 in REMOTE mode) or configured manually by the front panel DIP switches (DIP switch pos.5 in LOCAL mode).

The software feature to LOCK / UNLOCK settings used to avoid accidental changes.

4.1 Remote Static Mode

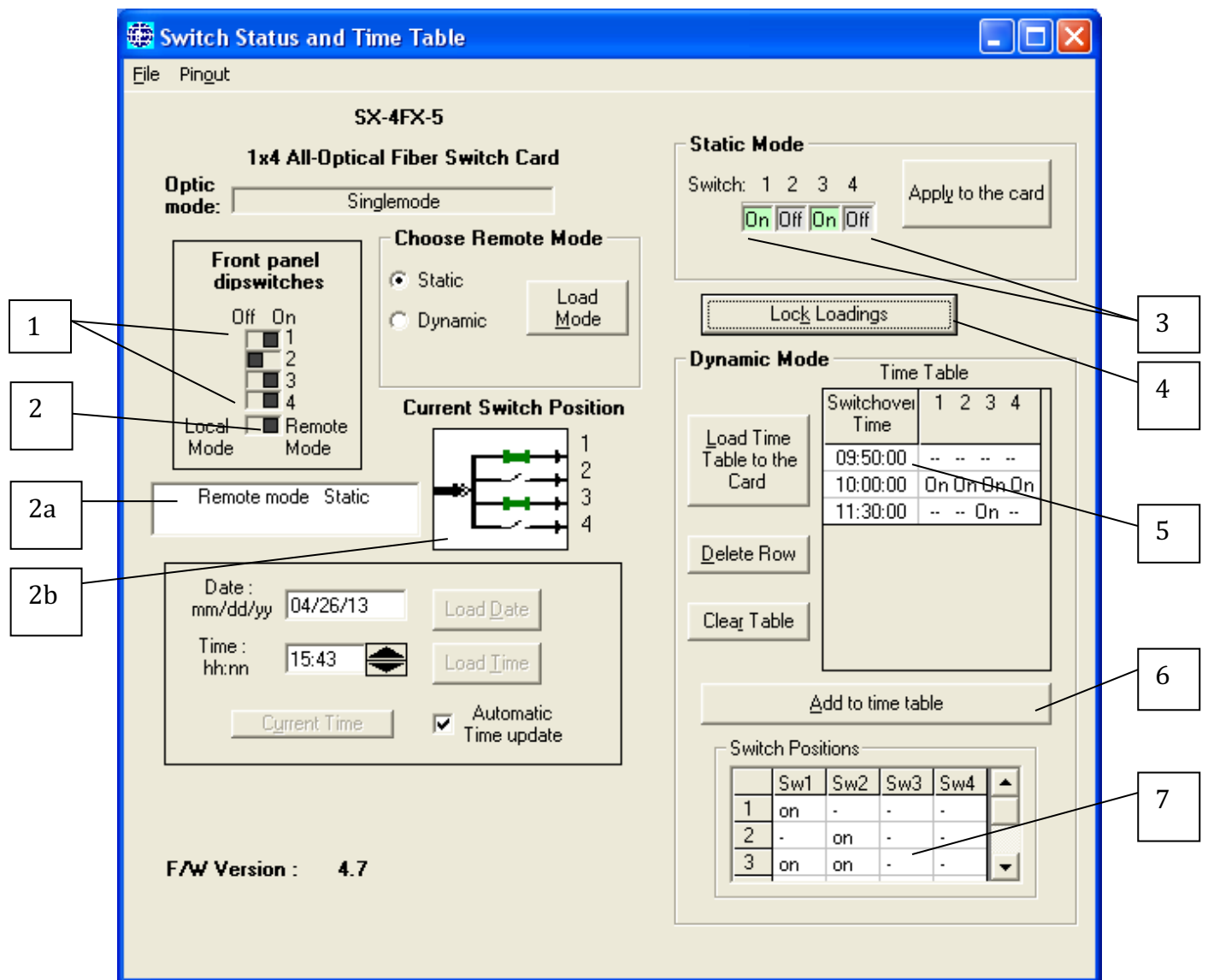
On the "Windows OS" desktop run the program by going to START → ALL PROGRAMS and selecting the program "Optical Fiber Switch 1x4" from menu.

The program finds virtual Comm port # and opens window dialog "1x4 All-Optical Fiber Switch Card Interface".



If there is no connection Window Dialog with reminder will appear. Make sure to connect the card to PC using USB-mini cable. Press "OK" when done.

Click on "Connection" button in the window dialog. Select "Settings" from the top menu and then select "Switch Status and Time Table". Window dialog "Switch Status and Time Table" will appear.



Remote Static Mode can be set by following procedure.

Click button "Unlock Loadings" (4).

Make sure to switch ON the 5th position on the front panel DIP selector (2) putting card in the Remote Mode. This will be reflected under "Front panel dipswitches" section of dialog.

Select "Static" checkbox under "Choose Remote Mode" section, then click "Load Mode" button.

Remote configuration and static mode saved to the card. Confirmation message will appear. Click "OK".

At this point the card is in "Remote Static Mode" which is reflected in the text box under "Front panel dipswitches" section (2a).

The "Current Switch Position" section shows the current position of Optic Output ports 1,2,3,4 (2b).

Select desired configuration of Optic Output ports in Static Mode section (3) by toggling on/off boxes 1, 2, 3, 4.

Then click "Apply to the card" button. Confirmation message will appear.



Click "OK".

Select "Static" checkbox under "Choose Remote Mode" section, then click "Load Mode" button.

Remote configuration and static mode saved to the card.

You can change position by toggling check boxes on/off (3) under positions 1,2,3,4 in "Static Mode" at any time and then "Apply to the card".

This information will be send to the card and stored in non-volatile memory.

Position of the switches can be reset by the clicking "Back" button.

4.2 Remote Dynamic Mode

This card is designed to use RTC (Real Time Clock) to manage time scheduling and to be able to retain it for a few weeks without external power.

This feature allows user to manage cards Optical Outputs by setting the time-table schedule in real time.

An example of this would be to setup operation center OP1 to be on-line from 6:00 to 17:00 o'clock then switching optical communications to another operation center OP2 overnight from 17:00 to 6:00 o'clock.

The RTC initial Time and Date setting can be done in two ways:

1. Automatically - by checking "Automatic time update" and getting time from PC.
2. Manually – by following next steps:
Setting Date – double click dialog box with MM/DD/YY selection, choose new Date from Calendar. To save new Date to the card click "Load Date", confirmation message will appear.
3. Setting Time - highlight hours or minutes, make changes using up/down arrows and click "Load Time". For Automatic Time update from PC mark the option "Automatic time update".

Remote Dynamic Mode can be set by following procedure.

Click “Unlock Loadings” (4).

In “Dynamic Mode” section of the dialog window switchover time can be scheduled.

In Dynamic Mode you can set up to 10 different switch combinations during the 24 hours period.

1. Select from preset switch combination in “Switch positions” table (7) and highlight this row.
2. Click “Add to time table” (6) button and this row will appear in Time Table (5).
3. Double click on the row you just added in “Switchover Time” column to set desired hours and minutes in real time by highlighting them and using up/down arrows to change. Click “OK” to confirm. Repeat procedure and schedule next switchover time on the next row. No less than 2 and no more than 10 rows have to be scheduled in the Time Table.
4. After scheduling done for 24 hours period click “Unlock Loadings” (if there is “Lock loadings” active), then “Load Time Table to the Card”.

To activate your schedule, select “Dynamic” check box from “Choose Remote Mode” section, then click “Load Mode”. Confirmation message will appear.

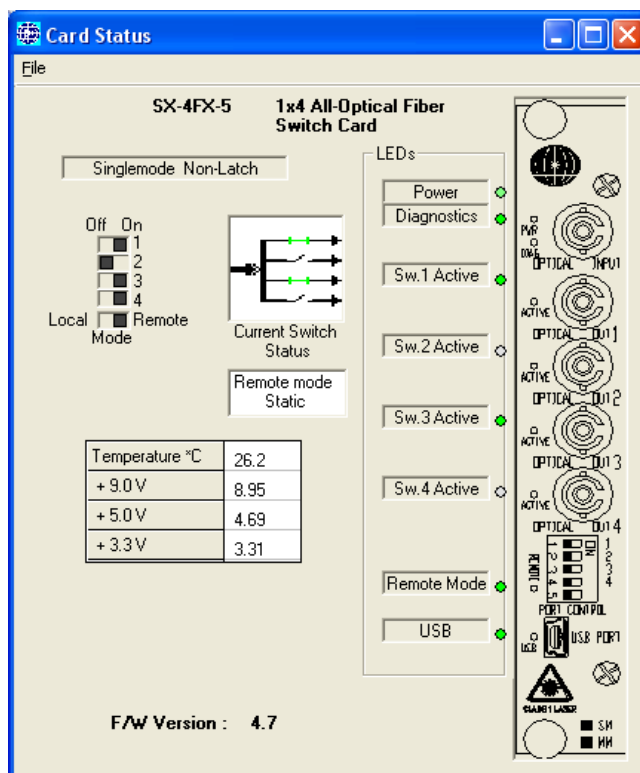
The Card is in Remote Dynamic Mode and will switch Optic Outputs according to the real time schedule.

4.3 Other features

To see Card Status info reflecting current status of the card go back to “1x4 All-Optical Fiber Switch Card Interface” dialog and select “View” → “Card Status” from top menu.

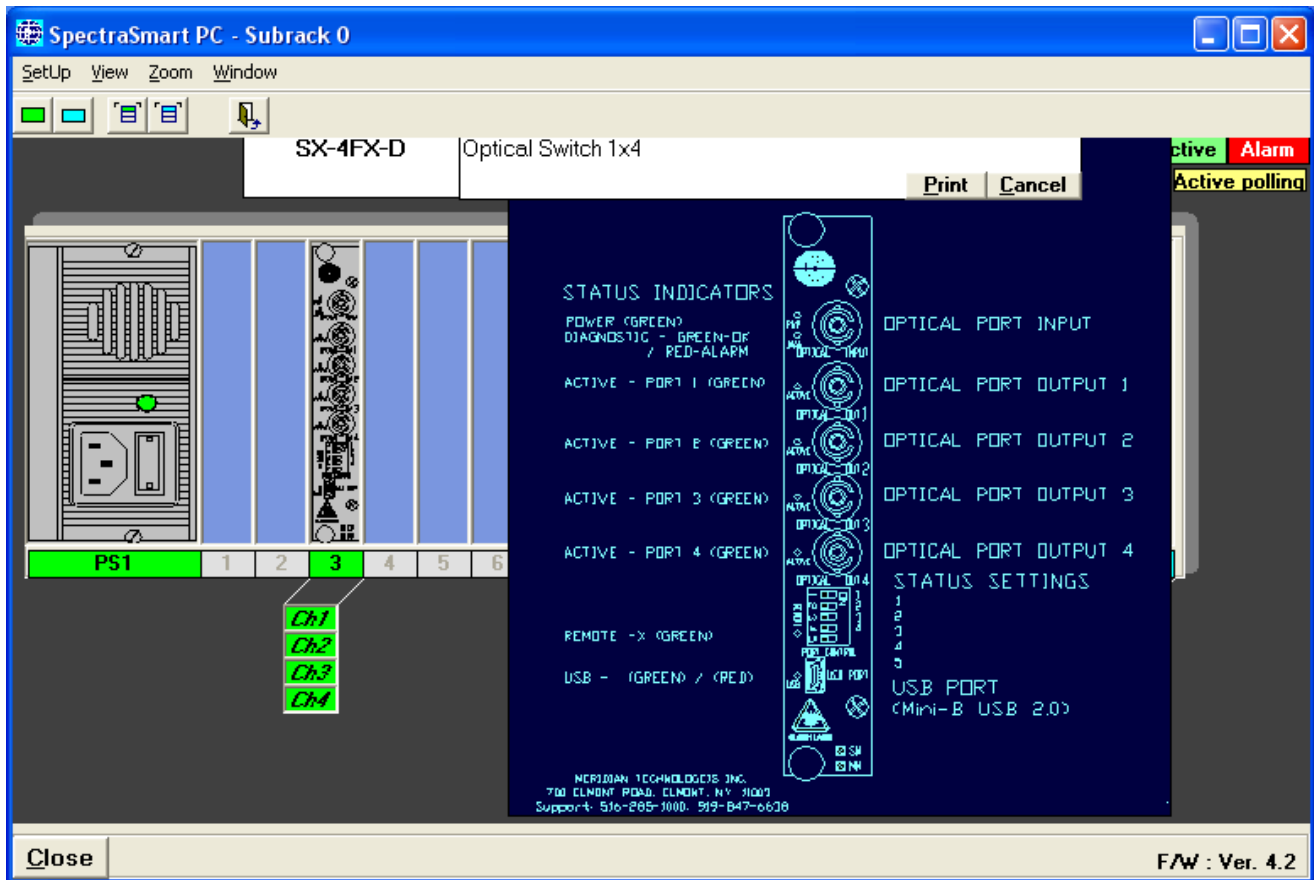
5.0 SpectraSmart™ Software Control

SpectraSmart PC is a Windows 2000/XP/Vista/7 based Link Status Monitoring and Diagnostic System. The SpectraSmart scans card parameters in sequential order, checking for levels against factory/user set threshold values. If an error or out of range condition is detected, the PC will continue to scan through system components until the error condition has been detected 3 times

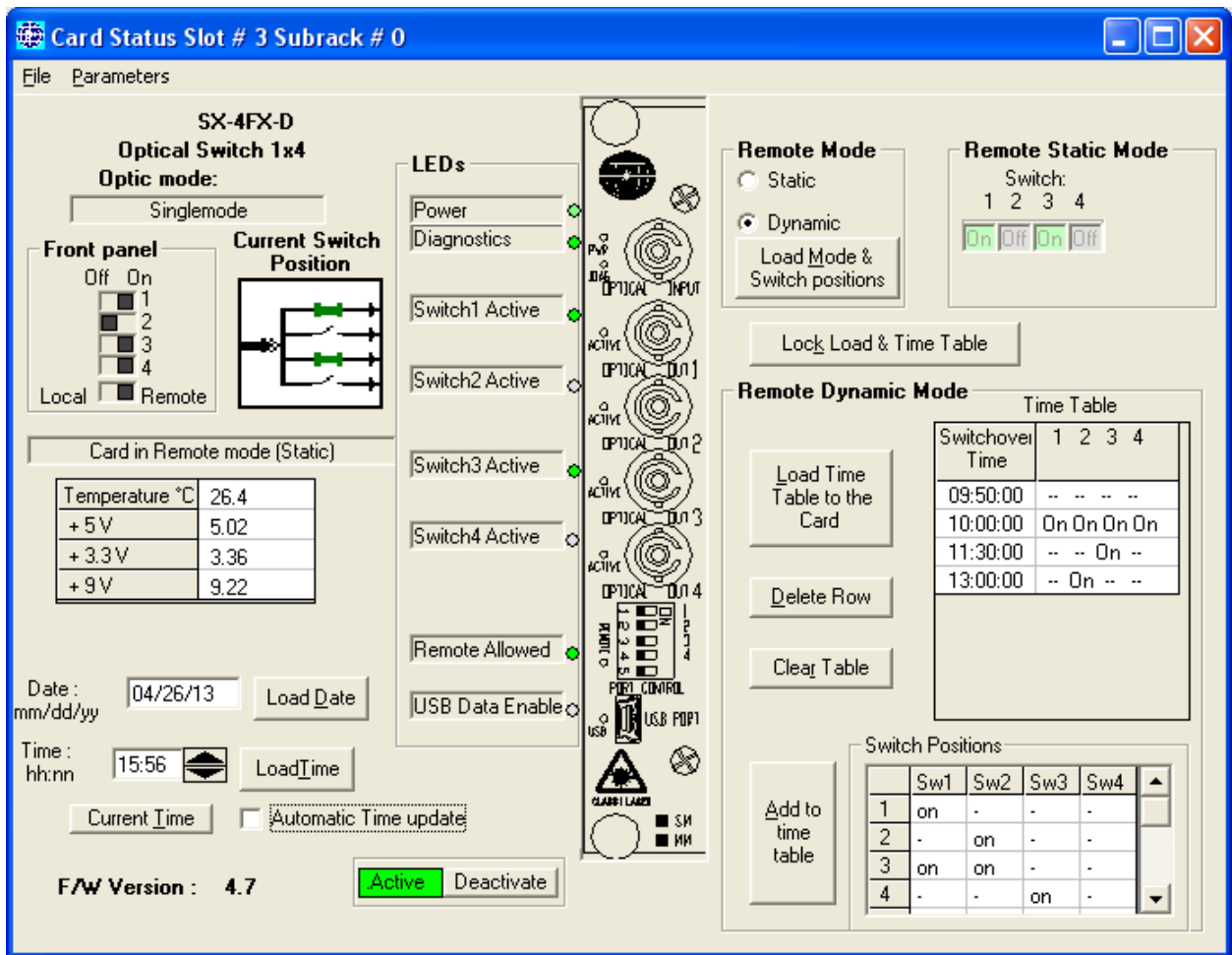


before showing an Alarm message. This helps ensure that the detected condition is an actual occurrence and not simply an anomaly.

The screen shots below illustrate what the computer displays when the SpectraSmart software is operated. This first screen shows a display of the card's front panel layout and identifies the various indicators and associated input/output interfaces. When an valid alarm is generated and identified the 2nd alarm display will be shown on the screen indicating what card generated the alarm as well as the cause of the alarm. When triggered, the "Suggestion" button will suggest appropriate corrective action to be taken to correct the alarm.



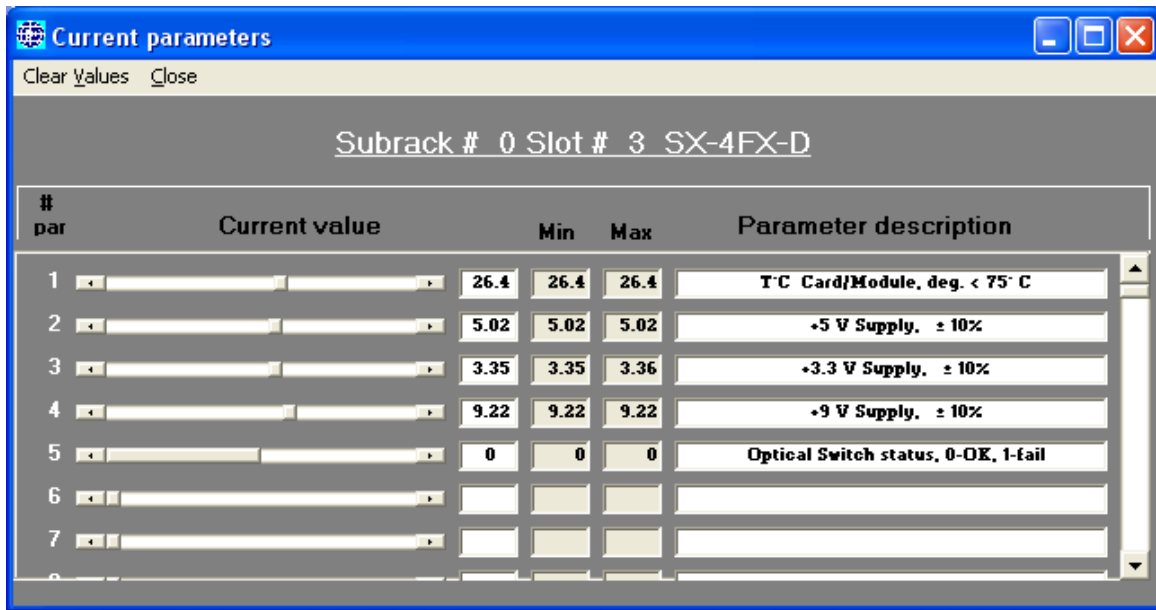
This card has additional features that can be monitored using SpectraSmart by right clicking on the image of the card and then selecting "Card Status" from dropdown menu. See the Card Status screen shown below.



When the front DIP switch in position 5 is ON – remote mode (SpectraSmart control enable) the user can set ports active status to the card. This information will be sent to the card and stored in non-volatile memory.

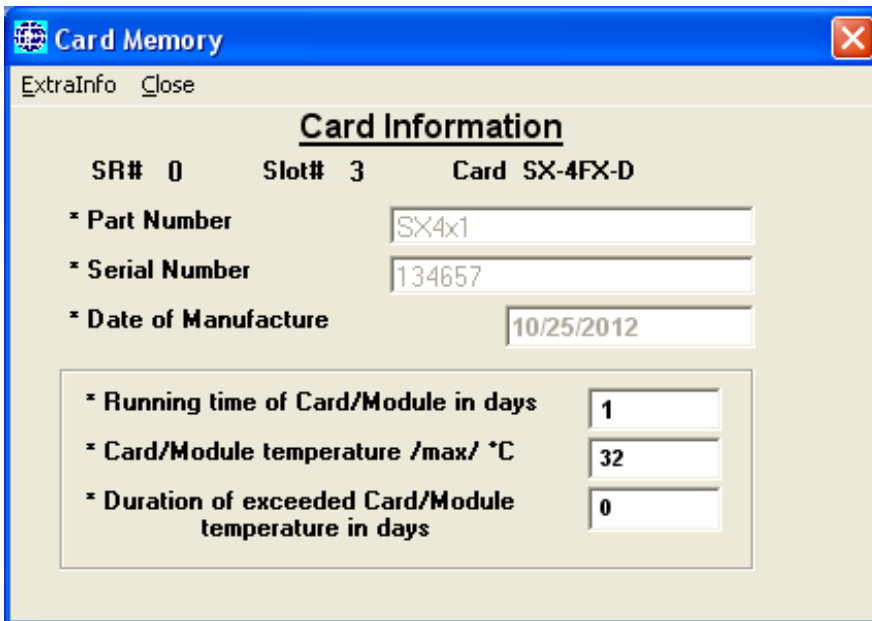
In order to check detailed info, click the right mouse button on the front panel image of the card and select “Parameters” from the dropdown menu. This will display these various card parameters for viewing and modification.

The “Current parameters” screen below shows the various card parameters and operating condition settings. The center numbers show the actual (real-time) value as well as min and max values that SpectraSmart has measured for each.



Click the right mouse button on the front panel image of the card and choose “Card memory” from the dropdown menu the user can read the card’s information including the part number, date of manufacture, working (operational) days, and maximum operating temperature of the card.

You can control activity all port in static or dynamic modes like it discribe in USB Interface Control.



6.0 Front Panel Pinout Assignment Diagram

Figure below shows the front panel layout, connector location, indicator location and pinout assignment for the SX-4FX-x module.

SX-4FX-X PINOUT DIAGRAM

STATUS INDICATORS

POWER (GREEN)
DIAGNOSTIC - GREEN-OK
/ RED-ALARM

ACTIVE - PORT 1 (GREEN)

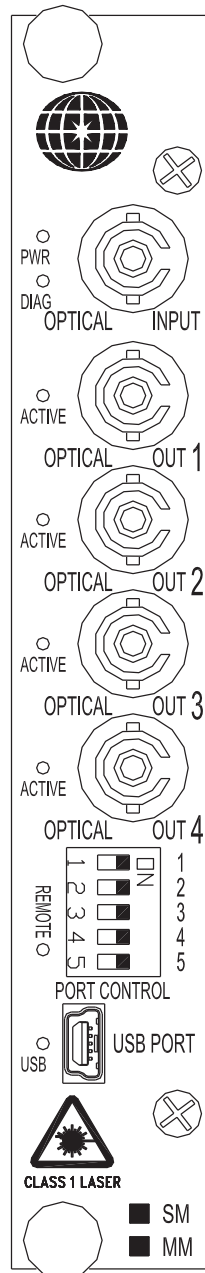
ACTIVE - PORT 2 (GREEN)

ACTIVE - PORT 3 (GREEN)

ACTIVE - PORT 4 (GREEN)

REMOTE -X (GREEN)

USB - ACTIVE (GREEN/RED)



OPTICAL PORT INPUT

OPTICAL PORT OUTPUT 1

OPTICAL PORT OUTPUT 2

OPTICAL PORT OUTPUT 3

OPTICAL PORT OUTPUT 4

STATUS SETTINGS

- 1 -OUTPUT 1 ACTIVE ON
- 2 -OUTPUT 2 ACTIVE ON
- 3 -OUTPUT 3 ACTIVE ON
- 4 -OUTPUT 4 ACTIVE ON
- 5 -LOCAL OFF / REMOTE ON

USB PORT
(Mini-B USB 2.0)

Figure 6.1
SX-4FX-x
Front Panel Layout Diagram

SX-4FX-xJ

PINOUT DIAGRAM

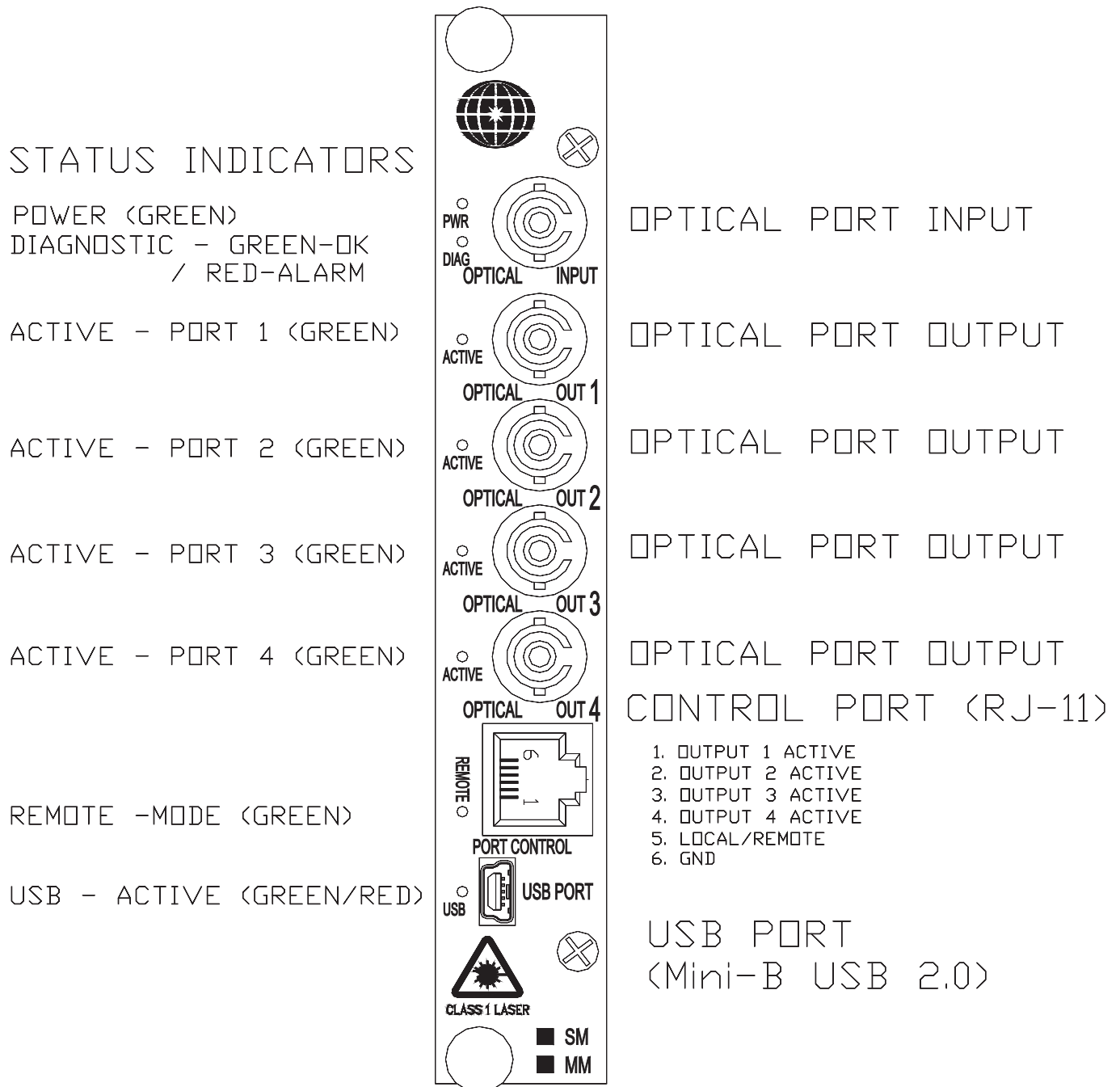


Figure 6.2
SX-4FX-xJ
Front Panel Layout Diagram

7.0 Status Indicators

The above front panel layout diagram also list and describe the function of the various LED indicators. The front panel mounted indicators show provide visual indication of the operational status of the card. The function of these LED indicators is as follows:

Power	Green (on)
Diagnostic*	Green (ok), Red (alarm)
Port 1	Green (active)
Port 2	Green (active)
Port 3	Green (active)
Port 4	Green (active)
Mode	Green (remote)
USB	Green/Red (active)

*Note: The Card Diagnostic is optional and LED present only if applied.

8.0 Specifications

Optical	
Wavelength range	1260nm to 1610nm
Insertion loss	7.5dB(typical) 8.5dB (max)
Return loss	50dB
Channel isolation	55dB
Repeatability	+/- 0.02dB (typical)
Polarization dependent loss (PDL)	0.1dB
Switching speed	5 msec (typical), 10msec (max)
Switching lifetime	10 million cycles
Optical input range	-50dBm to +10dBm

Connectors	
Optical	FC or ST
USB	Mini-B USB 2.0
Status Port	Switch(default), RJ-11(optional)
Power	See SR Series Chassis for Details

Quality	
MTBF	>120,000 hours @Ground Fix 35°C per MIL217F

Physical	
Dimensions (Card)	160mm (6.3") L, 127mm (5") H, 20mm(0.80")W
Weight (Card)	450 gms (16 Oz)
No. of Slots	1
Module	See SR-500 Brochure

Environmental	
Operating Temperature	0°C to +70°C
Storage Temperature	-55°C to +85°C
Relative Humidity	0 to 95% Non-condensing

9.0 Troubleshooting

Below is a listing of several problem that may arise during the installation & operation of the modules. If you are having difficulty installing or operating the modules please refer to this list below.

- Problem:** Module does not fit in chasses slots
Action: Check module orientation. Meridian “Globe” must be oriented on the top of the card. Make sure the card guides in the chasses are aligned with the extrusion on the module.
- Problem:** Card power LED does not light when power to the module/subrack is applied or power indicator turns on and off
Action: Check power supply to ensure that it is plugged in and turned on. If flashing continues, move module to another chasses or location in the same chasses, if available.

If the problem still persists after reviewing the above items, please contact Meridian technical support (+1-516-285-0570, support@meridian-tech.com)

10. Product Part Numbers

The table below lists the various part numbers and description that are available for this series of product.

Product Part Number Guide				
Part Number	Fiber Interface	Optical Connector	GPI Control	Wavelength
SX-4FX-5	Single-mode	FC	NO	1310/1550nm
SX-4FX-5/ST	Single-mode	ST	NO	1310/1550nm
SX-4FX-5J	Single-mode	FC	YES	1310/1550nm
SX-4FX-5J/ST	Single-mode	ST	YES	1310/1550nm

