



Installation/Operation Instructions

Fiber Optic Video Transmission System

Part Numbers:

SX-1HD-x (ST/FC)

(1-Channel Bi-directional HD-SDI Multi-rate Video Transceiver)

SX-1HG-x (ST/FC)

(1-Channel Bi-directional 3G-SDI Multi-rate Video Transceiver)

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Table of Contents

1.0	Product Description	3
2.0	Installation	3
3.0	Product Signal Format & Specifications	3
4.0	Front Panel Pinout Assignment Diagram	4
5.0	Signal Conditioning Switch Settings.....	6
6.0	Product Part Number Variations	8
7.0	CWDM Option.....	8
8.0	Troubleshooting	9

1.0 Product Description

Meridian's product series SX-1HD-x and SX-1HG-x are fiber optic modems that transmit one channel of bi-directional, independent real-time video SDI/HD-SDI for series SX-1HD and 3G-SDI for SX-1HG series, over two optical fibers. These are Meridian's standard 1-slot wide chassis mount card assembly and housed in the following Meridian chassis: SR-500/S, SR-1002/S, SR-1600/S, and SR-2001 & SR-2000 series 19" equipment chassis.

Both ST and FC optical connectors are supported. An ST optical interface is available for both multimode and single-mode fiber applications while the FC optical interface is available only for single-mode products. Optional conformal coating provides an additional level of protection from environments with high moisture and humidity.

2.0 Installation

Series SX-1HD-x and SX-1HG-x products are one-slot wide cards and occupy one slot in Meridian's standard 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 and 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 build-up inside the chassis. A fan assembly tray (P/N FA-2000) with three (3) fans is available and should be installed under the 19" SR-2000/1 whenever possible.

3.0 Product Signal Format & Specifications

The SX-1HD-x and SX-1HG-x series products transmit and receive the following signals:

Signal Type	Channels	Transmit	Receive
HD/3G-SDI video	1	Yes	Yes

The tables below identify the specifications for the various signals that these modems transmit/receive.

Video		
	HD-SDI	3G-SDI
Formats	19.4 Mbps (SMPTE 310M) 143 To 540 Mbps SMPTE 259M/344M 1.485 Gbps SMPTE 292M HDTV DVB-ASI at 270 Mbps SMPTE 305M SDTI Rates	19.4 Mbps (SMPTE 310M) 143 To 540 Mbps SMPTE 259M/344M 1.485 Gbps SMPTE 292M HDTV DVB-ASI at 270 Mbps 2.97 Gbps SMPTE 424M SMPTE 305M SDTI Rates
Nominal Level	0.8 Vp-p, 1.0 Vp-p (max)	0.8 Vp-p, 1.0 Vp-p (max)
Data Rate	19Mb/s - 1.5Gb/s per channel	19Mb/s - 3Gb/s per channel
Impedance	75 Ohm	75 Ohm
Gain	Unity	Unity
Input Coupling	AC	AC
Return Loss	>15dB	>15dB
Jitter (Pathological Data Pattern)	<0.2UI	<0.2UI
Cable Equalization	Automatic 0-200m @ 1.5Gb/s	Automatic 0-70m @ 3Gb/s
Bit-Error Rate (0 to -20dBm)	10 ⁻¹²	10 ⁻¹²

Connectors	
Video	75 Ohm BNC w/gold center pin
Optical	Single-mode – ST or FC Multimode – ST

Optical Specifications						
Fiber Type/Size (um)	Optical Output (dBm)	Rx Sensitivity (dBm)	Optical Budget (dB)	Wavelength (nm)	Optical connector	Optical Dynamic Range (Db)
Multimode (FP Laser) 62.5 / 125	-3	-19	16	1300	ST	20
Single-mode (FP Laser) 9 / 125	-3	-19	16	1310	ST, FC	20
Single-mode (DFB Laser) 9 / 125	+3	-19	22	1550	ST, FC	20
Single-mode (CWDM DFB Laser) 9 / 125	+1	-27	28	1270-1610	ST, FC	27

Refer to section 6.0 for CWDM wavelength selections.

4.0 Front Panel Pinout Assignment Diagram

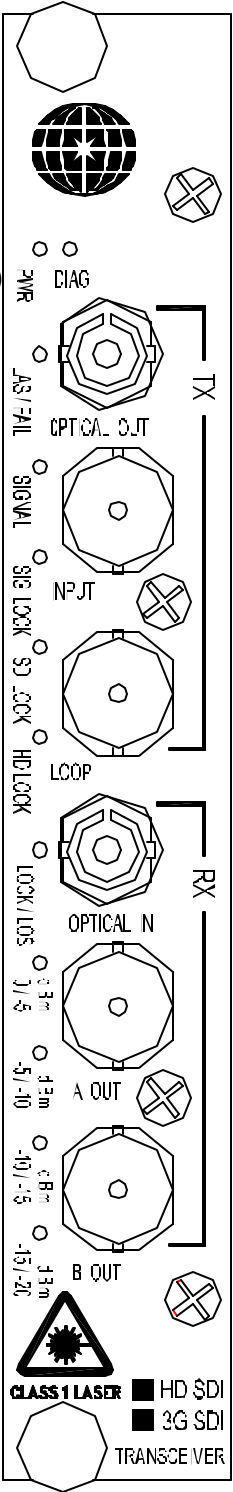
In addition, the transmitter also has a loop-thru video output to allow the user to locally monitor the signal being transmitted over the fiber link. Likewise, the receiver has an additional buffered output for local monitoring or recording of the received signal.

The receiver channel also has an LED received power meter. These LEDs will light when the appropriate amount of optical input power is detected. There are four LEDs that monitor and display the input power range (0 to -5dBm, -5 to -10dBm, -10 to -15dBm and -15 to -20dBm). Figures 4.1 below show the front panel layout, connector location and pinout assignment for both the SX-1HD-x and SX-1HG-x cards.

STATUS INDICATORS

- PWR - POWER (GREEN)
- DIAG - CARD DIAGNOSTIC (GREEN-OK/RED-ALARM)
- LAS/FAIL - TX LASER (GREEN)/ FAIL (RED)
- SIGNAL - TX SIGNAL PRESENT (GREEN)
- SIG LOCK - TX SIGNAL LOCK (GREEN)
- SD LOCK - TX SDI PRESENT (GREEN)
- HD LOCK - TX HDSDI PRESENT (GREEN)
- LOCK/LOSS - RX LOSS (RED)/ LOCK (GREEN)
- 0/-5dBm - RX LEVEL 0/-5dBm (GREEN)
- 5/-10dBm - RX LEVEL -5/-10dBm (GREEN)
- 10/-15dBm - RX LEVEL -10/-15dBm (GREEN)
- 15/-20dBm - RX LEVEL -15/-20dBm (GREEN)

Figure 4.1
SX-1HD(HG)-x Front Panel
Layout Diagram



SX-1HD-X
SX-1HG-X

PINOUT DIAGRAM

OPTICAL PORT OUT FC,ST

VIDEO INPUT

LOOP-THRU VIDEO OUTPUT

OPTICAL PORT IN FC,ST

VIDEO OUTPUT #1

VIDEO OUTPUT #2

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4.1 Operation/Front Panel LED Indicators

The front panel diagram is shown Figure 4.1 there are a number of indicator lights that provide visual operational status of the modules and link.

The function of these LED indicators is as follows:

PWR	- Green (normal) - when power is applied to the module
DIAG	- Card Diagnostic Green OK, Red alarm
LAS/FAIL	- Green TX Laser, Red Fail
SIG LOCK	- Green TX Signal Lock
SD LOCK	- Green TX SDI present
HD LOCK	- Green TX HDSDI present
SIG LOCK	- Green TX Signal Lock
LOCK/LOSS	- Green RX Lock, Red Loss
0/-5dBm	- Green RX Level 0/-5dBm
-5/-10dBm	- Green RX Level -5/-10dBm
-10/-15dBm	- Green RX Level -10/-15dBm
-15/-20dBm	- Green RX Level -15/-20dBm

5.0 Signal Conditioning Switch Settings

A group of 10 switches is located on the bottom center of the module's circuit card (see figure 5.1 below). The figure and table below illustrates these switch locations on the board and how they are configured for the proper SDI format options.

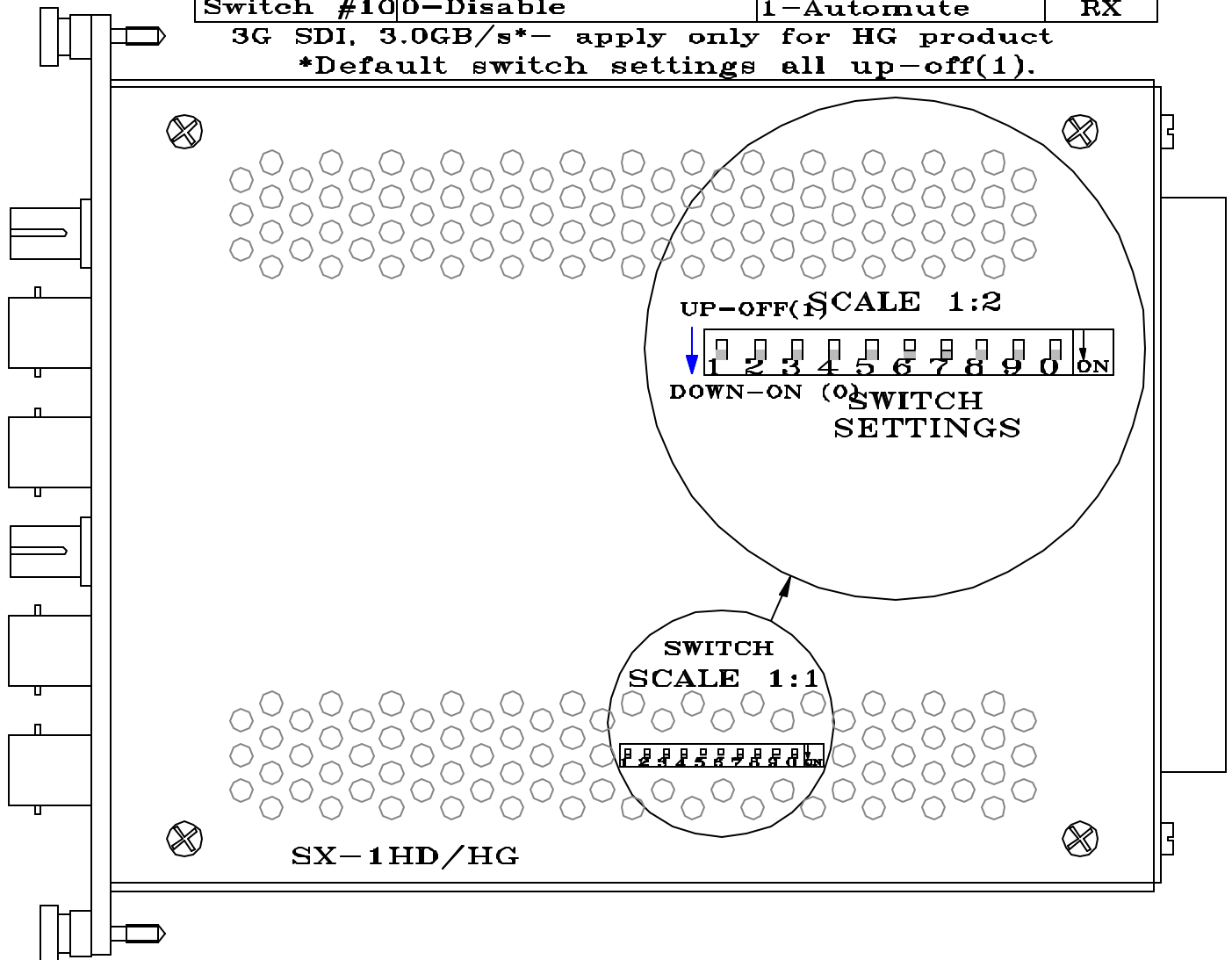
Switches #1-10 factory-supplied default settings are OFF (up).

Figure 5.1
SX-1HD(HG)-x Switch Settings

SDI Test Signal			
	Down Position	Up Position	
Switch #1	0-Bypass	1-Reclock	TX/RX
Switch #2	0-Reclock	1-Auto Bypass	TX/RX
Switch #3	0-Low BW	1-Hi PLL BW	TX/RX
Switch #4	0-SDI, 270MB/s	1-Auto Rate	TX/RX
Switch #5	0-HD SDI, 1.5GB/s	1-Auto Rate	TX/RX
Switch #6	0-3G SDI, 3.0GB/s*	1-Auto Rate	TX/RX
Switch #7	0-CLK Out	1-Data Out	RX
Switch #8	0-Flash Enable	1-Flash Disable	TX
Switch #9	0-Disable	1-EQ	TX
Switch #10	0-Disable	1-Automute	RX

3G SDI, 3.0GB/s*- apply only for HG product

*Default switch settings all up-off(1).



6.0 Product Part Number Variations

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

Part Number	Fiber Interface	Video type	Wavelength	Optical Connector
SX-1HD-1	Multimode	HD-SDI	1300nm	ST
SX-1HD-3	Single-mode	HD-SDI	1310nm	FC
SX-1HD-3ST	Single-mode	HD-SDI	1310nm	ST
SX-1HG-1	Multimode	3G-SDI	1300nm	ST
SX-1HG-3	Single-mode	3G -SDI	1310nm	FC
SX-1HG-3ST	Single-mode	3G -SDI	1310nm	ST

7.0 CWDM Option

These cards are also available with a single-mode CWDM laser/wavelength for the transmit channel. In this configuration, 1 fiber on each unit is used for transmission of the uni-directional signals. One of the 2-fiber SX cards will incorporate one of the CWDM wavelengths while the complementary SX card will use a different CWDM wavelength in its transmit channel. Since the receiver portion of the card is wavelength agnostic, it is not necessary to specify the wavelength of the receive channel. This receive channel will receive any wavelength from 1270nm to 1625nm.

The table below shows these various wavelength options available for this particular unit. Please consult the part number label on the rear of the unit to properly identify the wavelengths for your specific cards.

Part #	Transmit Wavelength
SX-1HG-27	1270nm
SX-1HG-29	1290nm
SX-1HG-31	1310nm
SX-1HG-33	1330nm
SX-1HG-35	1350nm
SX-1HG-37	1370nm
SX-1HG-39	1390nm
SX-1HG-41	1410nm
SX-1HG-47	1470nm
SX-1HG-49	1490nm
SX-1HG-51	1510nm
SX-1HG-53	1530nm
SX-1HG-55	1550nm
SX-1HG-57	1570nm
SX-1HG-59	1590nm
SX-1HG-61	1610nm

When using in a system with a CWDM multiplexer/demultiplexer, it is essential that the specific wavelengths to and from these units be connected to the corresponding input/output wavelengths on the CWDM mux/demux units.

When using higher power CWDM lasers, an external attenuator of 5dB minimum is required when performing short distance testing to eliminate optical overload at the Rx card.

8.0 Troubleshooting

Below is a listing of several problems 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 chassis slots*

Action: Check module orientation. Meridian “Globe” must be oriented on the top left hand side of the module
Make sure the card guides in the chassis are aligned with the extrusion on the module

Problem: *Card power LED does not light when power to the module/subrack is applied*

Action: Check power supply to ensure that it is plugged in and turned on. If symptom continues, move module to another chassis or location in the same chassis, if available.

Problem: *No video at output of module*

Action: Check to ensure that the monitor is ON and the video cable is connected to the correct video port on the Rx module. Check to ensure that video input to the channels is working and that you have the associated receive channel is being monitored. With an optical power meter, verify that the wavelength for the suspect optical channel is working properly at the input to the receiver unit.

Problem: *Tx Laser light off*

Action: Optical module is defective, return to factory for repair.

Problem: *Rx Level off*

Action: Received optical signal absent or low. Check fiber connection and optical power at receiver.

Problem: *Tx signal light off*

Action: Check SDI input signal

If the problem still persists after reviewing the above items, please contact Meridian technical support (516-285-1000)

Notes:



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