



Installation and Operation Instructions

Fiber Optic Video Transmission System

ST/SR-2HD1R/1R-X (ST/FC)

**Two Unidirectional Channels of Multi-rate SDI / HDSDI Video
with One Bi-directional Channel of 10/100Base-T Fast Ethernet**



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1.0 Product Description

Meridian's product series ST/SR-2HD1R/1R-x is fiber optic system that transmit & receives two channels of unidirectional, independent real-time SDI/HD-SDI video and one channel of bi-directional 10/100 Base-T Ethernet Data over one single-mode optical fiber.

The SDI/HD-SDI video is transmitted using wavelength division optical (WDM) multiplexing technologies.

The transmitter and receiver units are 2-slot wide chassis cards and fully compatible with the following Meridian chassis: SR-1002/S, SR-1600/S, and SR-2001 & SR-2000 series 19" equipment chassis.

The FC or ST optical connectors are supported. Optional conformal coating provides an additional level of protection from environments with high moisture and humidity.

2.0 Installation

Series ST/SR-2HD1R/1R-x products are two-slot wide cards and will occupy two slots in Meridian's standard chassis. To install cards 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 loaded subrack should have forced-air cooling to avoid excessive heat generation 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 ST-2HD1R/1R- x series products transmit and receive the following signals:

Signal Type	Channels	Direction	Transmitter	Receiver
HD/3G-SDI video	2	Unidirectional	ST-2HD1R/1R-x	SR-2HD1R/1R-x
10/100 Base-T Ethernet data	1	Bi-directional	ST-2HD1R/1R-x	SR-2HD1R/1R-x

The table below shows the specifications for transmitted and received signals.

Video	
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
Nominal Level	0.8 Vp-p, 1.0 Vp-p (max)
Data Rate	19Mb/s - 1.5Gb/s per channel
Impedance	75 Ohm
Gain	Unity
Input Coupling	AC
Return Loss	>15dB
Jitter (Pathological Data Pattern)	<0.2UI
Cable Equalization	Automatic 0-200m @ 1.5Gb/s
Bit-Error Rate (0 to -20dBm)	-12
Data	
Formats	IEEE 802.3 CSMA/CD IEEE 802.3i 10Base-T IEEE 802.3u 100Base-T
Date Rate	10/100 Mb/s, Auto select
Bit Error Rate (BER)	Better than 10^{-9}

Connectors	
Video	75 Ohm BNC w/gold center pin
Data	RJ-45
Optical	Single-mode – ST or FC, Multimode – ST

Optical Specifications								
Meridian Optical Code	Fiber Type/Size (um)	Optical Output (dBm)	Rx Sensitivity (dBm)	Optical Budget (dB)	Wavelength (nm)	Optical connector	Optical Dynamic Range (dB)	Approx. Maximum Distance (km)
20	Singlemode (DFB Laser) 9 / 125	+1 (per channel)	-20	21	1290, 1310, 1330, 1350	FC, ST	20	50
21	Singlemode (DFB Laser) 9 / 125	+1 (per channel)	-20	21	1510, 1530, 1550, 1570	FC, ST	20	60

For proper operation, it is necessary to match the transmitter (ST) with the associated receiver module (SR).

4.0 Ethernet Data Pin Assignment & MDI/MDI-X Configuration

This product utilizes an RJ-45 Ethernet data connector with standard pin assignments. In addition, this card can be configured for both MDI & MDI-X (cross-connect) configurations. The table below shows these pin assignments for both configurations.

Pin #	MDI Configuration	MDI-X Configuration
1	Transmit (+)	Receive (+)
2	Transmit (-)	Receive (-)
3	Receive (+)	Transmit (+)
4	N/A	N/A
5	N/A	N/A
6	Receive (-)	Transmit (-)
7	N/A	N/A
8	N/A	N/A

The ST-2HD1R/1R-x is pre-configured for to LAN connection using MDI configuration. SR-2HD1R/1R-x is pre-configured for to Computer connection using MDI-X configuration. Changing to an MDI or MDI-X configuration is simple. See the picture below in Figure 4.1 for the jumper location that is used to convert the module from an MDI to and MDI-X configuration.

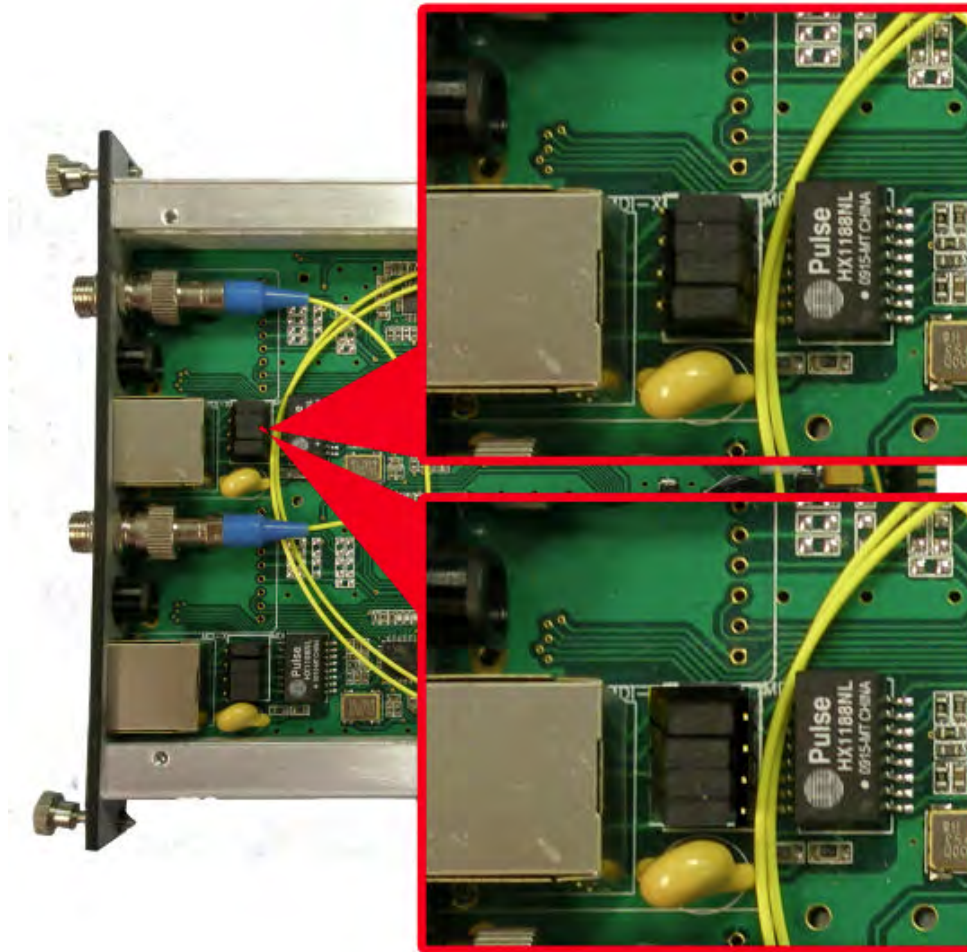


Figure 4.1
Ethernet Module MDI/MDI-X Jumper Locations

Directly behind the RJ-45 Ethernet connector is the jumper, that convert the module from its normal MDI configuration to the MDI-X (cross connect) configuration. Follow the steps below to change connection configuration

1. Position the module as shown in the above photograph and remove the top cover by removing 4 screws. (Flat cover w / perforated holes)
2. Locate the 4 Jumper (shunts) inline. This will be directly behind the RJ-45 connector. Lift all four shunts directly upward (away from the circuit board) being careful not to bend the pins on the circuit board.

3. Move the 4 jumpers to connect center pins to pins closest to RJ-45 connector.
Please be careful not to bend the jumper leads on the circuit board.
Seat jumpers firmly on the leads.
4. Place side cover back and secure with 4 screws.

CAUTION: All 4 jumpers (shunts) MUST be on the same side.
Example: All 4 jumpers must be on the LEFT or on the RIGHT.

5.0 Operation/Front Panel LED Indicators

The front panel diagram for STSR-2HD1R/1R-x is shown below. There are a number of indicator lights that provide visual operational status of the cards.
The functions of these LED indicators is as follows:

Power Indicator - PWR - Green (normal) - when power is applied to the module

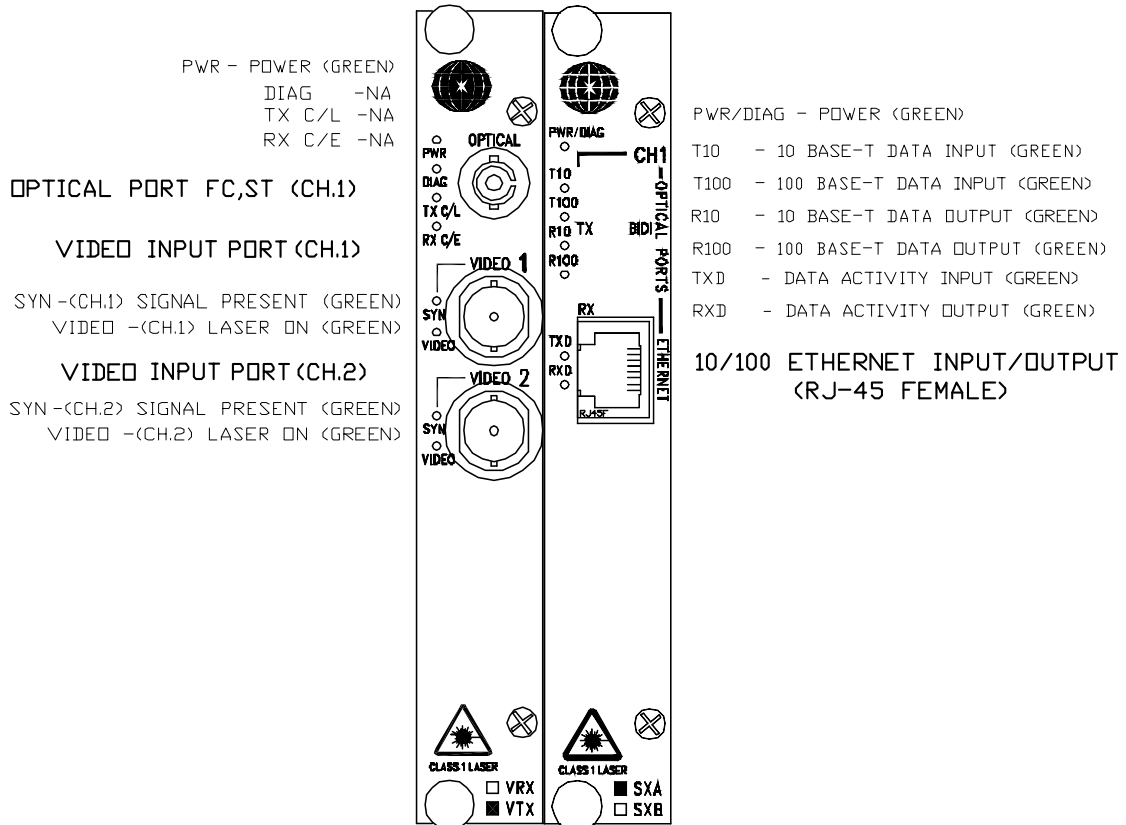
Video Indicators	Ethernet Indicators
Laser On (TX only) – Green (1per channel) Signal Present (TX only) - Green (1per channel) Signal Power Level (RX only) - Green (2per channel)	DIAG - Green flash (normal)! Red (error) - module is in self-diagnostic mode T 10 - Green – when transmitting 10 Base-T data T 100 - Green – when transmitting 100 Base-T data R 10 - Green – when receiving 10 Base-T data R 100 - Green – when receiving 100 Base-T data TX D - Green flashing (normal) when data is being transmitted out of module RX D - Green flashing (normal) when data is being received into module

6.0 Front Panel Pin-out Assignment Diagram

Figures below show the front panel layout, connector location and pin-out assignment for Transmitter and Receiver cards.

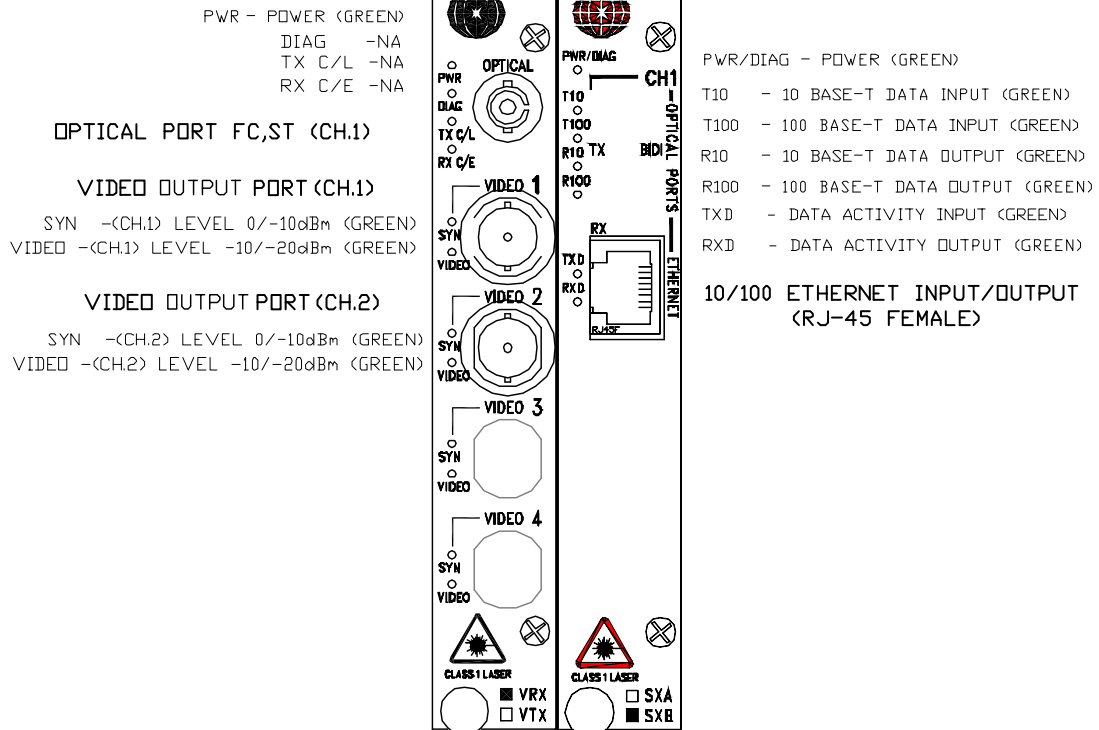
ST-2HD1R/1R-x

PINOUT DIAGRAM



SR-2HD1R/1R-x

PINOUT DIAGRAM



7.0 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 cards please refer to this list below.

Problem: *Module does not fit in chassis slots*

Action: Check card orientation. Make sure the card guides in the chassis are aligned with the extrusion on the card.

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 symptoms continue, move module to other location in the same chassis or another chassis, if available.

Problem: *No video on the Receiver side*

Action: Check to ensure that the video monitor is powered ON and the video cable is connected to the correct video port on the Rx module.

Check to ensure that video input on the Tx side is working and that you have the correct receiver channel monitored. Using optical power meter, verify that the suspect optical channel is working on the correct wavelength.

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)



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