Fiber Optic Video/Audio/Data Transmission System

Single-Slot Video/Audio/Data/Contact Mapping

(ST/SR-1Wxxx/xxx series)

Installation Instructions

700 Elmont Rd, Elmont, NY 11003, Tel: 516-285-1000; Fax: 516-285-6300
www.Meridian-tech.com

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1.0 Product Description

Meridian's product series ST/SR-1Wxxx/xxx are fiber optic modems that transmit & receive one uni-directional video channel and a combination of bi-directional Audio, Data and Contact Closure channels over one optical fiber using digital transmission technologies. This product series uses Meridian's standard 1-slot wide chassis mount card assembly and plugs into the following Meridian chassis: SR-500/S, SR-1000/S, SR-1200/S, SR-1500/S, and SR-2001 & SR-2000 series 19" equipment chassis.

Refer to Appendix 1 at the back of this manual for the module part numbers applicable in this manual.

Both ST and FC optical connectors are supported, depending on the part number. An ST optical interface is available for both multimode and singlemode fiber applications. The FC optical interface is available only for singlemode products. Optional conformal coating provides an additional level of protection from environments with high humidity.

2.0 Installation

Series ST/SR-1Wxxx/xxx products are one-slot wide cards and, as such, occupy one slot in Meridian's standard chassis (SR-500/S, SR-1000/S, SR-1200/S, SR-1500/S, and SR-2001 & SR-2000 series 19" equipment chassis). To install in these 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 loaded 19" 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/SR-1Wxxx/xxx series products can be configured to transmit and receive the following signals:

Signal Type	Channels
RS-232 (Tx & Rx data)	2
RS-422 (Tx & Rx data)	2
RS-485 (2 & 4-wire)	1
Audio	2
Contact Mapping	2

Again, refer to Appendix 1 for the product part number and associated functional description. The above number and type of signals will vary based on the product part number.

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

Video	
Format	NTSC, PAL, SECAM
Voltage/Impedance	1Vp-p, 75Ω, 1.5Vp-p (max)
Differential Gain	<0.6%
Differential Phase	$<0.3^{o}$
SNR	>67dB (weighted)
Return Loss	>30dB

Data	
Formats	RS-232, RS-422, RS-485, Manchester, Bi-Phase
Date Rate (RS-232)	DC to 125Kb/s
Data Rate (RS-422 & RS-485)	DC to 300Kb/s
Bit Error Rate (BER)	Better than 10^{-9}

Audio	
In/Out Impedance	600Ω, unbalanced/unbalanced
Frequency Response	10Hz to 20KHz
SNR	>90dB (weighted) @ 1KHz
In/Out Level	-8 to +8 dBm (4Vp-p, max)
THD	<0.01% @ 1KHz
Digitized Resolution	24 bit

Contact Mapping	
Contact type	Relay, normally-open, normally-closed, jumper selectable, Isolated contacts
Contact rating	0.3amps, 30 VAC/VDC
Contact bounce	5 msec
Max switching rate	10Hz

Connectors	
Video	75Ω BNC w/gold center pin
Audio/Data/Contact	DB25F (25 pin Female 'D' style connector
Optical	Singlemode – ST or FC Multimode - ST

4.0 Data Connector Pin Assignment

The 25 pin connector on the front of the module is used for all Audio & Data interfaces. Refer to the table below for the signal pinouts associated with the appropriate module part number found in Appendix 1.

User-settable switches on the module's motherboard are used to select the appropriate data format as required.

Pin #	RS-232	RS-422	RS-485 (2-wire)	RS-485 (4-wire)	Audio	Contact Closures
1	GND	GND	GND	GND	GND	GND
2	Ch 2 IN	Ch 2 IN (-)	--------	--------	--------	--------
3	Ch 2 OUT	Ch 2 OUT (-)	--------	--------	--------	--------
4	Ch 1 IN	Ch 1 IN (-)	IN/OUT (-)	IN (-)	--------	--------
5	Ch 1 OUT	Ch 1 OUT (-)	--------	OUT (-)	--------	--------
6	-------	--------	--------	--------	--------	Ch 1 IN
7	GND	GND	GND	GND	GND	GND
8	--------	--------	--------	--------	--------	Ch 1 OUT
9	--------	--------	--------	--------		Ch 2 OUT
10	--------	--------	--------	--------	Ch 1 IN (+)	--------
11	--------	--------	--------	--------	Ch 2 IN (+)	--------
12	--------	--------	--------	--------	Ch 1 OUT (-)	--------
13	--------	--------	--------	--------	Ch 2 OUT (-)	--------
14	--------	Ch 2 IN (+)	--------	--------	--------	--------
15	--------	Ch 2 OUT (+)	--------	--------	--------	--------
16	--------	Ch 1 IN (+)	IN/OUT (+)	IN (+)	--------	--------
17	--------	Ch 1 OUT (+)	--------	OUT (+)	--------	--------
18	--------	--------	--------	--------	--------	Ch 2 IN
19	+ 5VDC	+ 5VDC	+ 5VDC	+ 5VDC	+5VDC	+5VDC
20	--------	--------	--------	--------	--------	Ch 1 OUT
21	--------	--------	--------	--------	--------	Ch 2 OUT
22	--------	--------	--------	--------	Ch 1 IN (-)	--------
23	--------	--------	--------	--------	Ch 2 IN (-)	--------
24	--------	--------	--------	--------	Ch 1 OUT (+)	--------
25	--------	--------	--------	--------	Ch 2 OUT (+)	--------

5.0 Signal Conditioning Switch/Jumper Settings

The sections below illustrate how to change the various data format, audio impedance and contact mapping conditions.

5.1 Data Format Selection

A group of 10 switches is located on the bottom center of the module's circuit card (see figure below). The left three (3) switches control the data format that is transmitted/received. These switches on both the ST & SR modules must be set the same in order to have proper data communications format between them. The figure and table below illustrates these switch locations on the board and how they are configured for the proper data format options. The factory-supplied default setting is for RS-232 data for both data channels (Switches #1-3 set in the UP (or "1") position).

Data Format Selection Switch Settings					
Channel 1 Channel 2	RS-232 RS-232	RS-232 RS-422	RS-422 RS-422	RS-485 (4-wire)	RS-485 (2-wire)
Switch #1	**1**	0	0	**1**	**1**
Switch #2	**1**	**1**	0	0	0
Switch #3	**1**	**1**	**1**	**1**	0
Switch #4 - #10	1	1	1	1	1

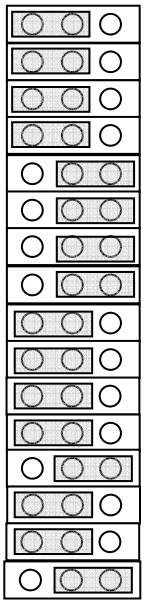
5.2 Audio Impedance, Contact Mapping and Data Selection jumpers

Audio Impedance - The input/Output impedance of each of the audio channels can be changed between 600 Ohm balanced and 47K Ohm unbalanced. The default impedance is 600 Ohm.

Contact Mapping - The output state of each of the contacts can be changed from Normally-Open (NO) to Normally-Closed (NC) by properly selecting the jumpers. A NO contact (output side) closes when the contact input on the input module's side is closed to ground. The default contact setting is NO (normally-open).

There are sixteen (16) 3-pin jumpers located directly behind the DB25 front-panel mounted connector. The top 10 jumpers are used to select the Input/Output Audio Impedance and the power-on state of the contacts (NO or NC). The bottom 6 jumpers are used for 2 & 4-wire RS-485 selection and removing the default 120 Ohm load on the RS-422 input channels.

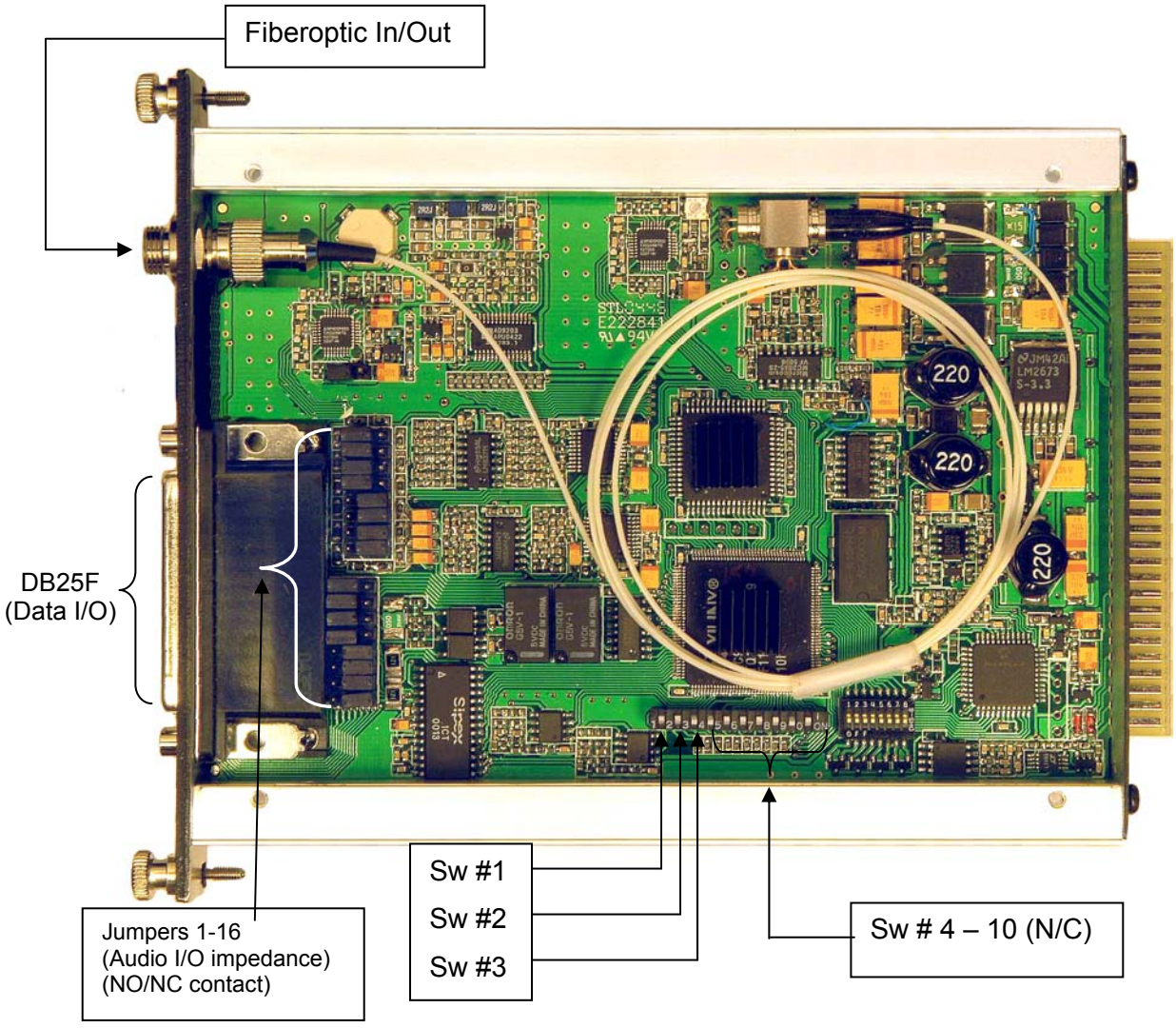
The illustration below describes the function of each of these 16 jumpers. The jumpers are shown in their default condition.



Jumper 1	Audio Ch 2 (-) (OUT) – 600 Ohm / Low Z
Jumper 2	Audio Ch 1 (+) (OUT) – 600 Ohm / Low Z
Jumper 3	Audio Ch 1 (-) (OUT) – 600 Ohm / Low Z
Jumper 4	Audio Ch 2 (+) (OUT) – 600 Ohm / Low Z
Jumper 5	Audio Ch 2 (+) (IN) – 47KOhm / 600Ohm
Jumper 6	Audio Ch 2 (-) (IN) – 47KOhm / 600Ohm
Jumper 7	Audio Ch 1 (+) (IN) – 47KOhm / 600Ohm
Jumper 8	Audio Ch 1 (-) (IN) – 47KOhm / 600Ohm
Jumper 9	Contact Ch 2 (OUT) – Normally Open (NO) - default
Jumper 10	Contact Ch 1 (OUT) – Normally Open (NO) - default
Jumper 11	RS-485 (4-wire/2-wire selection) – 4-wire default
Jumper 12	RS-485 (4-wire/2-wire selection) – 4-wire default
Jumper 13	RS-422 Ch 1 (IN) – 120 Ohm load – ON default
Jumper 14	Reserved
Jumper 15	Reserved
Jumper 16	RS-422 Ch 2 (IN) – 120 Ohm Load – ON default

Jumper Settings

RS-485 (2-wire & 4-wire) selection – In addition to selecting the proper switch position for conversion from 4-wire RS-485 to 2-wire Rs-485 (see Section 5.1), jumpers 11 & 12 (as shown above) must be moved to the position as indicated. The default position of these jumpers is for 4-wire RS-485.



1-Slot Module Data Format Selection Switch & Jumper Location

6.0 Front Panel Indicator Lights

There are 18 LED indicator lights mounted on the left side of the module's front panel (see Figure 6.1 below). These indicators show the operation status of the module's power, optical carriers, video signal and the various data/audio channels. Not all of the LEDs apply to all versions of these modules. Please refer to the module's part number for the appropriate signals, description.

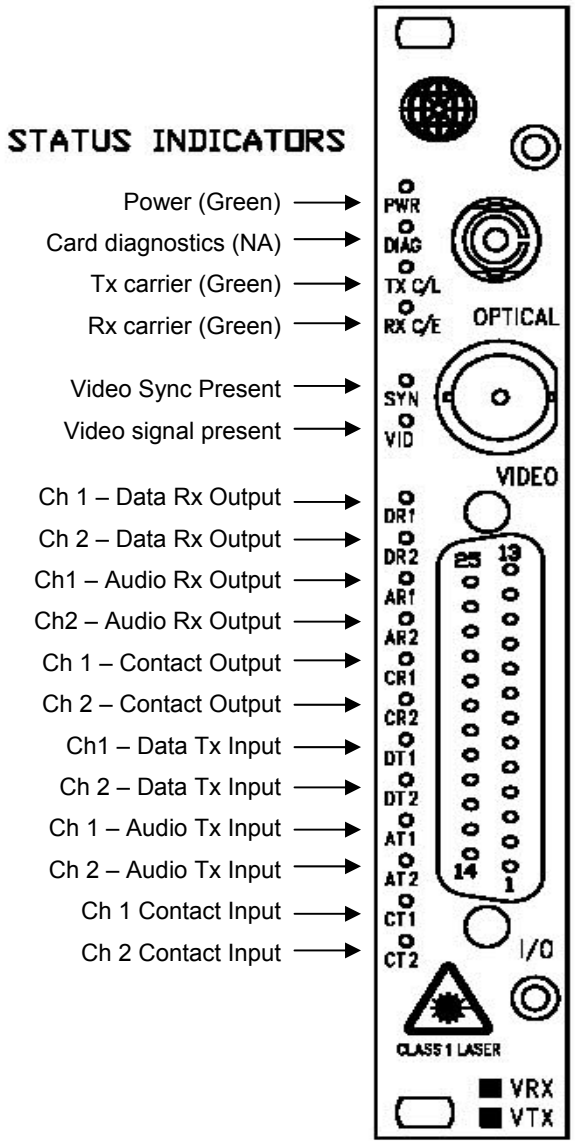


Figure 6.1
Module LED Status Indicators

Each of the indicator lights will light when activity is detected for that particular input or output channel. These indicators can be used for troubleshooting the module, electrical and optical connections. Please note that not all lights are active for a given product model number. Please refer to the functional description of the module for the indicators that pertain to that specific product.

7.0 Optical Specifications

The table below lists the optical specifications for both singlemode and multimode fiber applications.

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	-5	-26	21	1300/850	ST	24
Singlemode (FP Laser) 9/125	-5	-26	21	1310/1550	ST, FC	24

8.0 Product Part Numbers

See Appendix 1 for a listing of the product part numbers and their description that pertain to this document.

9.0 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 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 chassis or location in the same chassis, if available.

Problem: *No video at output of module*
Action: Check the SpectraView display on the monitor for an indication of what the problem may be. Also, check to ensure that the video channel-specific LEDs are on (Green). Also, check to ensure that the optical LEDs are ON. If no video is still present, check to ensure that the monitor is ON and the video cable is connected to the correct video port on the Rx module.

Problem: *Video image is dark*
Action: Check the iris control on the camera to ensure that it is open to the proper amount for the conditions

Problem: *Video image is too bright and appears overexposed*
Action: Check the Video overload indicator on the Rx module. If it is Red, the video signal level is too high and the CCTV iris should be checked to ensure that it is open properly for the conditions.

Problem: *No Data*

Action: Check that both the transmit and receive modules are set to transmit/receive the same data format and that the data connections are correct. Check to ensure that the data source is operating properly.

Problem: *No or distorted Audio*

Action: Check to ensure that the audio input/output connections are correct and that the Input/Output impedance jumpers are set correctly. The I/O impedance of each audio channel can be set independently so be sure to check that the appropriate channel is configured properly.

Problem: *Contact closure not working*

Action: Input side – Ensure that the input contact is connected between the appropriate input connection and ground

Output side – Ensure that the terminal device is connected to the proper output contact pinouts and that the individual contact channel jumpers are set to the appropriate normally-open or normally-closed position

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

Appendix 1 – Applicable Part Number Variations

The table below indicates the part numbers and product description that are included in this manual. The pinout diagram in section 4.0 shows the connector pinouts (input/output connections) for the all-inclusive product. The appropriate modules consist of 1-channel of uni-directional video and various combinations of bi-directional (symmetric) Audio, Data and Contact Closures. Please use this table to determine the exact pinout of the particular model of interest. Note that where there is only one audio, data or contact closure channel, the pinouts for "Ch1" are used. The "Ch2" connector pinout assignments are only used when two channels of that particular signal are present.

Part Numbers	Description
ST/SR-1W2G/2G-x	Video w/2-ch bi-directional Data
ST/SR-1W2A/2A-x	Video w/2-ch bi-directional Audio
ST/SR-1W2C/2C-x	Video w/2-ch bi-directional Contact Closure
ST/SR-1W1A1G/1A1G-x	Video w/1-ch bi-directional Data & Audio
ST/SR-1W2A2G/2A2G-x	Video w/2-ch bi-directional Data & Audio
ST/SR-1W1A1C1G/1A1C1G-x	Video w/1-ch bi-directional Data & Audio & Contact Closure
ST/SR-1W2A2C2G/2A2C2G-x	Video w/2-ch bi-directional Data & Audio & Contact Closure
ST/SR-1W1A1C/1A1C-x	Video w/1-ch bi-directional Audio & Contact Closure
ST/SR-1W2A2C/2A2C-x	Video w/2-ch bi-directional Audio & Contact Closure
ST/SR-1W1C1G/1C1G-x	Video w/1-ch bi-directional Contact Closure & Data
ST/SR-1W2C2G/2C2G-x	Video w/2-ch bi-directional Contact Closure & Data