



Fiber Optic Video/Data Transmission System

Installation Instructions

Part Numbers:

ST-1W2G/2G-xS (ST/FC)

(Video Transmitter w/bi-directional data)

SR-1W2G/2G-xS (ST/FC)

(Video Receiver w/bi-directional data)

Part Number Variations:

ST-1W2D/2D-x, SR-1W2D/2D-x

ST-1W2F/2F-x, SR-1W2F/2F-x

ST-1W1J/1J-x, SR-1W1J/1J-x

ST-1W1K/1K-x, SR-1W1K/1K-x

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1.0 Product Description

Meridian's ST/SR-1W2G/2G-xS products are fiber optic modems that transmit one channel of uni-directional 10-bit video and two bi-directional, user-selectable RS-232, RS-422 and RS-485 data signals 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-1002/S, SR-1600/S and SR-2001 & SR-2000 series equipment chassis.

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. Conformal coating provides an additional level of protection from environments with high humidity.

2.0 Installation

Series ST/SR-1W2G/2G-xS products are one-slot wide cards and, as such, occupy one slot in Meridian's standard 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-1W2G/2G-xS series products transmit and receive the following signals:

Signal Type	Channels	Transmit	Receive
NTSC/PAL video	1	ST-1W2G/2G-X	SR-1W2G/2G-X
RS-232 (Tx & Rx data)	2	Yes	Yes
RS-422 (Tx & Rx data)	2	Yes	Yes
RS-485 (2 & 4-wire)	1	Yes	Yes

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

Video	
Format	NTSC, PAL, SECAM
Voltage/Impedance	1Vp-p, 75 Ohm, 1 .5Vp-p (max)
Differential Gain	<1%
Differential Phase	<0.7°
SNR	>67dB (weighted)
Return Loss	>30dB
Field Tilt	<0.5%

Data	
Formats	RS-232
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

Connectors	
Video	75 Ohm BNC w/gold center pin
Data	14 pin terminal strip (two 5 pin connectors)
Optical	Singlemode – ST or FC Multimode - ST

3.1 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



Compliant with Class 1 Laser Safety Rating

4.0 Data Connector Pin Assignment

The 14 pin terminal block connector on the front of the module are used for all data interfaces. This module supports the following data formats:

RS-232 Two full speed (Tx/Rx)
RS-422 Two channel
RS-485 One channel (either 2 or 4 wire)

The RS-232 channel is used for transmitting/receiving two channel of 2-wire RS-232 (Tx/Rx). In addition to the RS-232, this module supports both RS-422 and 2 or 4-wire RS-485 signals. User-settable switches on the module's motherboard are used to select the appropriate data format as required.

PORT 1 Data Connector Pinout Assignment				
Pin #	RS-232	RS-422	NA	NA
1	Ch 2 IN	Ch 2 IN (-)		
2		Ch 2 IN (+)		
3	Ch 2 OUT	Ch 2 OUT (-)		
4		Ch 2 OUT (+)		
5	GND	GND		
PORT 3 Data Connector Pinout Assignment				
Pin #	RS-232	RS-422	RS-485 (2-wire)	RS-485 (4-wire)
1	Ch 1 IN	Ch 1 IN (-)	IN/OUT (-)	IN (-)
2		Ch 1 IN (+)	IN/OUT (+)	IN (+)
3	Ch 1 OUT	Ch 1 OUT (-)		OUT (-)
4		Ch 1 OUT (+)		OUT (+)
5	GND	GND	GND	GND

**RS-232 FACTORY SETTINGS

NOTE: These settings can be preconfigured to any data selection only by customer request.

4.1 Front Panel Indicator Lights

There are 18 LED indicator lights mounted on the left side of the module's front panel (see Figure 4.1 below). These indicators show the operation status of the module's power, optical carriers, video signal and the various data/audio channels. These indicators can be used for troubleshooting the module, electrical and optical connections.

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.

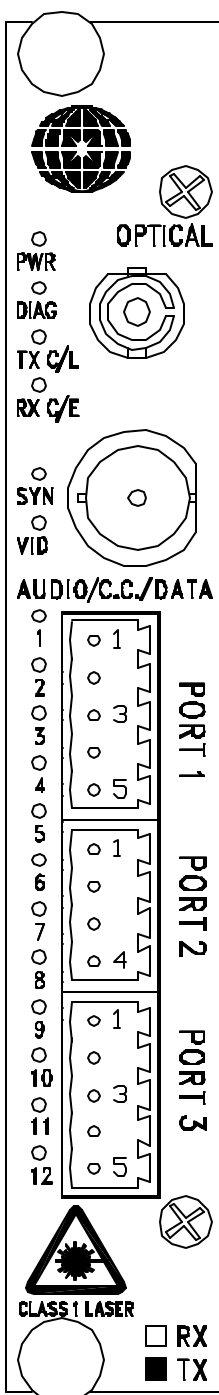
*Note: The Card Diagnostic is optional and LED present only if applied.

STATUS INDICATORS

PWR - POWER (GREEN)
 DIAG - CARD DIAGNOSTIC*
 (GREEN-OK, RED-ALARM)
 TX C/L - TX CARRIER (GREEN)
 /OVERLOAD (RED)
 RX C/E - RX CARRIER (GREEN)
 /ERROR (RED)
 SYN - SYNC PRESENT (GREEN)
 VID - VIDEO PRESENT (GREEN)
 /OVERLOAD (RED)

STATUS INDICATORS

1 - (CH.1) DATA OUTPUT
 2 - (CH.2) DATA OUTPUT
 3 - NA
 4 - NA
 5 - NA
 6 - NA
 7 - (CH.1) DATA INPUT
 8 - (CH.2) DATA INPUT
 9 - NA
 10 - NA
 11 - NA
 12 - NA



ST-1W2G/2G-X

PINOUT DIAGRAM

OPTICAL PORT (ST, FC)

VIDEO INPUT

DATA INPUT/OUTPUT PORT 1

1. (CH.2) RS232 INPUT / RS422 INPUT-
2. (CH.2) RS422 INPUT+
3. (CH.2) RS232 OUTPUT / RS422 OUTPUT-
4. (CH.2) RS422 OUTPUT+
5. GND

PORT 2 N/A

DATA INPUT/OUTPUT PORT 3

1. (CH.1) RS232 INPUT / RS422 INPUT-
/ RS485 (4W) INPUT-
/ RS485 (2W) INPUT/OUTPUT-
2. (CH.1) RS422 INPUT+ / RS485 (4W) INPUT+
/ RS485 (2W) INPUT/OUTPUT+
3. (CH.1) RS232 OUTPUT / RS422 OUTPUT-
/ RS485 (4W) OUTPUT-
4. (CH.1) RS422 OUTPUT+ / RS485 (4W) OUTPUT+
5. GND

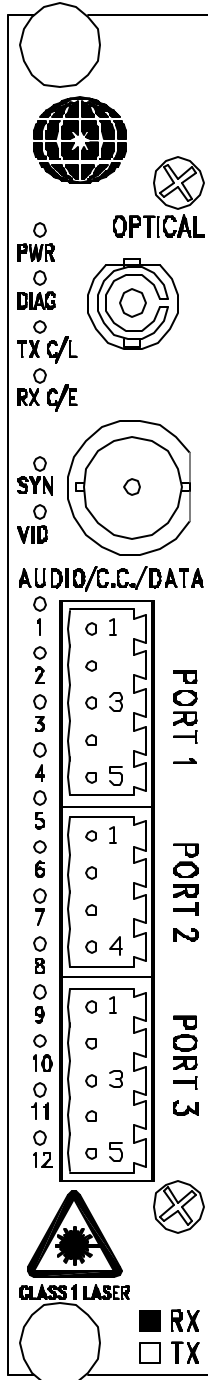
Figure 4.1
ST-1W2G/2G-x Card Front Panel

STATUS INDICATORS

PWR - POWER (GREEN)
 DIAG - CARD DIAGNOSTIC*
 (GREEN-OK, RED-ALARM)
 TX C/L - TX CARRIER (GREEN)
 /OVERLOAD (RED)
 RX C/E - RX CARRIER (GREEN)
 /ERROR (RED)
 SYN - SYNC PRESENT (GREEN)
 VID - VIDEO PRESENT (GREEN)
 /OVERLOAD (RED)

STATUS INDICATORS

1 - (CH.1) DATA OUTPUT
 2 - (CH.2) DATA OUTPUT
 3 - NA
 4 - NA
 5 - NA
 6 - NA
 7 - (CH.1) DATA INPUT
 8 - (CH.2) DATA INPUT
 9 - NA
 10 - NA
 11 - NA
 12 - NA



SR-1W2G/2G-X

PINOUT DIAGRAM

OPTICAL PORT (ST, FC)

VIDEO OUTPUT

DATA INPUT/OUTPUT PORT 1

1. (CH.2) RS232 INPUT / RS422 INPUT-
2. (CH.2) RS422 INPUT+
3. (CH.2) RS232 OUTPUT / RS422 OUTPUT-
4. (CH.2) RS422 OUTPUT+
5. GND

PORT 2 N/A

DATA INPUT/OUTPUT PORT 3

1. (CH.1) RS232 INPUT / RS422 INPUT-
/ RS485 (4W) INPUT-
2. (CH.1) RS422 INPUT+ / RS485 (4W) INPUT+
/ RS485 (2W) INPUT/OUTPUT+
3. (CH.1) RS232 OUTPUT / RS422 OUTPUT-
/ RS485 (4W) OUTPUT-
4. (CH.1) RS422 OUTPUT+ / RS485 (4W) OUTPUT+
5. GND

Figure 4.2
SR-1W2G/2G-x Card Front Panel

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 four (4) of these switches control the data format that is transmitted/received. These switches on both the transmitter and receiver 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 (Switch #1-4 OFF (up)).

Data Format Selection Switch Settings				
	Switch #1	Switch #2	Switch #3	Switch #4
RS-232	OFF (up)	OFF (up)	OFF (up)	OFF (up)
RS-422	ON (down)	ON (down)	OFF (up)	OFF (up)
RS-485 (2-wire)	OFF (up)	ON (down)	ON (down)	OFF (up)
RS-485 (4-wire)	OFF (up)	ON (down)	OFF (up)	OFF (up)

The remaining Switches 5 through 10 should be in the OFF (up) position.

5.2 Data Selection jumpers

There are sixteen (16) 3-pin jumpers located directly behind the screw terminal front-panel mounted connector. The top 10 jumpers are not applicable for this system. 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.

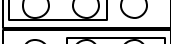
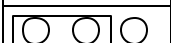
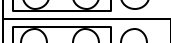
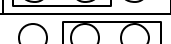
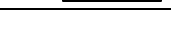
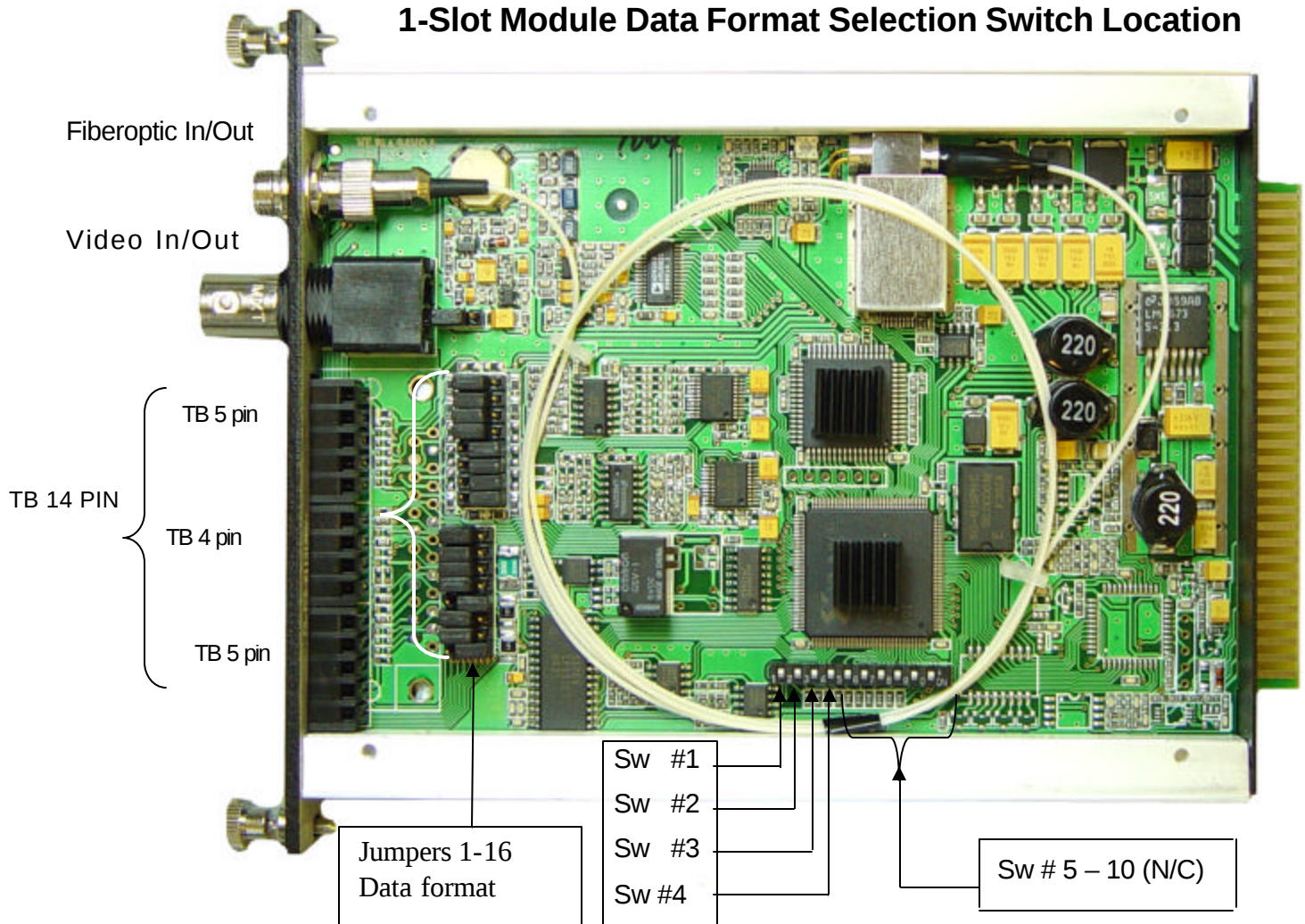
Jumper 1		N/C
Jumper 2		N/C
Jumper 3		N/C
Jumper 4		N/C
Jumper 5		N/C
Jumper 6		N/C
Jumper 7		N/C
Jumper 8		N/C
Jumper 9		N/C
Jumper 10		N/C
Jumper 11		N/C
Jumper 12		RS-485 (4-wire/2-wire selection) – 4-wire default*
Jumper 13		RS-485 (4-wire/2-wire selection) – 4-wire default*
Jumper 14		RS-422 Ch 1 (IN) – 120 Ohm load – ON default
Jumper 15		Reserved
		Reserved

Figure 5.1

1-Slot Module Data Format Selection Switch Location



5.3 Changing default jumpers settings

The jumpers to change the data format (from RS-232 to RS-422/485) can be easily changed as follows:

1. Lay the module on its side with the front panel facing to the left.
2. Remove the screws in each of the 4 corners of the top cover and carefully remove the cover.
3. The Jumpers (1-16) are located on the top two connectors of the module.
4. Refer to the above drawing to locate the 16 jumpers that are located near the Screw Terminal connector.
5. Using a small tool, carefully remove the jumper and place it on the appropriate pins to properly select the data format (see Figure 5.2)
6. Carefully replace the side cover and secure with the screws.
7. Repeat this process for the other module. The jumper selection needs to be the same for both the ST and SR units.

6.0 SpectraView™ Monitoring System

This module series is equipped with Meridian's SpectraView network diagnostics that continuously monitors the fiber system and associated equipment to provide real-time information regarding the integrity of the system.

SpectraView supports the following diagnostic functions:

1. Fiber continuity
2. Presence/loss of video

Notification and identification of faults for the above conditions is automatically displayed on the monitor connected to the video output on the receiver module.

The table below lists the detected faults and associated alert messages that are displayed on the monitor:

Fault	Video Display Message
Broken optical fiber between Tx & Rx	8 vertical gray-scale bars across the monitor screen
Loss of video signal at CCTV (Tx) side	4 vertical gray-scale bars across the monitor screen

In addition to the loss of video on the monitor, these messages alert the operator as to the cause of the associated video loss. Upon receiving one of these messages, the operator should inform their technical service center to remedy the situation.

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 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: *Tx signal light*

Action: Red - Check fiber connection

Problem: *Rx signal light*

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

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 transmitter and receiver modules is set to transmit/receive the same data format (see section 5.0 for switch settings).

Verify that the PWR, Tx C/L and Rx C/L lights on both modems are on GREEN. Confirm that the data connections are correct (see section 4.0 for data pinout connections).

Confirm the internal DIP switch and jumpers are set correctly for the data protocol. Verify that the TX Data light flashes when transmitting data and that the corresponding RX Data light on the other modem is flashing.

Confirm that the data connections are correct (Check to ensure that the data source is operating properly). The front panel lights located next to the 14 pin connector should be flashing as data is being sent to the transmit side. Check to ensure that data is being transmitted to the unit.

If the problem still persists after reviewing the above items, please contact Meridian technical support (+1-516- 285-1000).



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