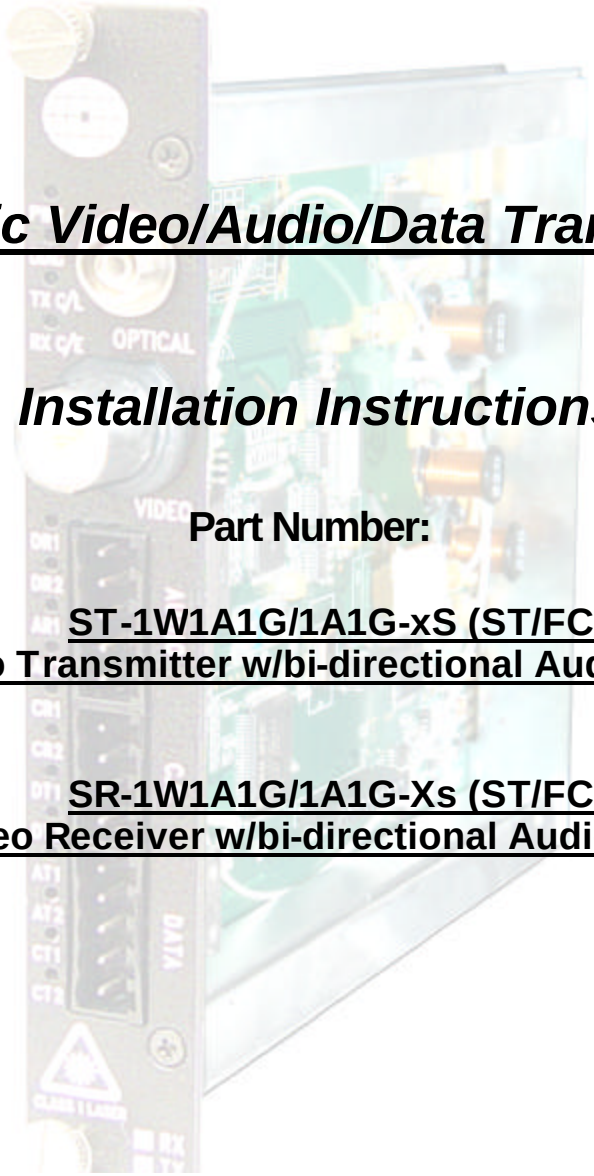

Fiber Optic Video/Audio/Data Transmission

Installation Instructions

Part Number:

ST-1W1A1G/1A1G-xS (ST/FC)
(Video Transmitter w/bi-directional Audio & Data)

SR-1W1A1G/1A1G-Xs (ST/FC)
(Video Receiver w/bi-directional Audio & Data)

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1.0 Product Description

Meridian's ST/SR-1W1A1G/1A1G-xS products are fiber optic modems that transmit one channel of uni-directional 10-bit video, one channel of bi-directional audio channel, and one channel 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-1000/S, SR-1001/S, SR-1200/S, SR-1500/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-1W1A1G/1A1G-xS products are one-slot wide cards and, as such, occupy one slot in Meridian's standard chassis (SR-500/S, SR- 1000/S, SR- 1001/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-1W1A1G/1A1G-xS series products transmit and receive the following signals:

Signal Type	Channels	Transmit	Receive
NTSC/PAL video	1	ST-1W1A1G/1A1G-X	SR-1W1A1G/1A1G-X
Audio	1	Yes	Yes
RS-232 (Tx & Rx data)	1	Yes	Yes
RS-422 (Tx & Rx data)	1	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	<0.6%
Differential Phase	$<0.3^{o}$
SNR	>67dB (weighted)
Return Loss	>30dB
Field Tilt	<0.5%
Audio	
In/Out Impedance	600 Ohm, 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
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
Audio	14 pin terminal strip (one 5 pin connectors)
Data	14 pin terminal strip (one 5 pin connectors)
Optical	Singlemode – ST or FC Multimode - ST

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

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

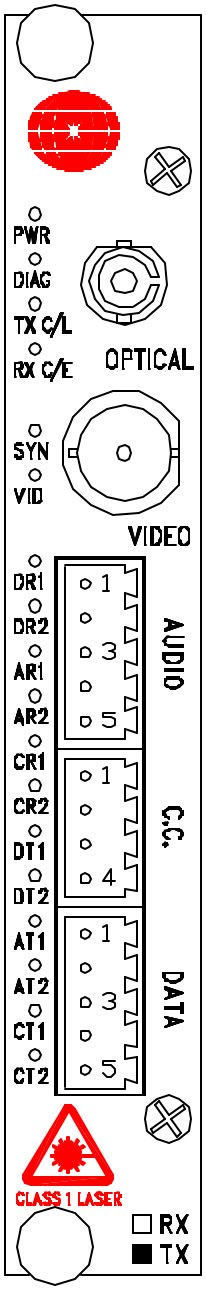
The RS-232 channel is used for transmitting/receiving one channel of 2-wire RS-232 (Tx/Rx). In addition to the RS-232, this module supports both RS-422 and 2 or 4-wire RS-485 signals. User-settable switches on the module's motherboard are used to select the appropriate data format as required.

4.0 Connector Pin Assignment

The one 14-pin screw connectors on the front of the module are used for the Audio interfaces, Contact Closure and Data. The diagrams below indicate the video, audio input/output & contact closure input/output connection terminals.

ST-1W1A1G/1A1G-X

PINOUT DIAGRAM



OPTICAL PORT (ST, FC)

STATUS INDICATORS

PWR - POWER (GREEN)
DIAG - NA
TX C/L - TX CARRIER (GREEN) / OVERLOAD (RED)
RX C/E - RX CARRIER (GREEN) / ERROR (RED)

VIDEO INPUT

STATUS INDICATORS

SYN - SYNC PRESENT (GREEN)
VID - VIDEO PRESENT (GREEN) / OVERLOAD (RED)

AUDIO INPUT/OUTPUT

1. (CH.1) AUDIO INPUT-
2. (CH.1) AUDIO INPUT+
3. (CH.1) AUDIO OUTPUT-
4. (CH.1) AUDIO OUTPUT+
5. GND

STATUS INDICATORS

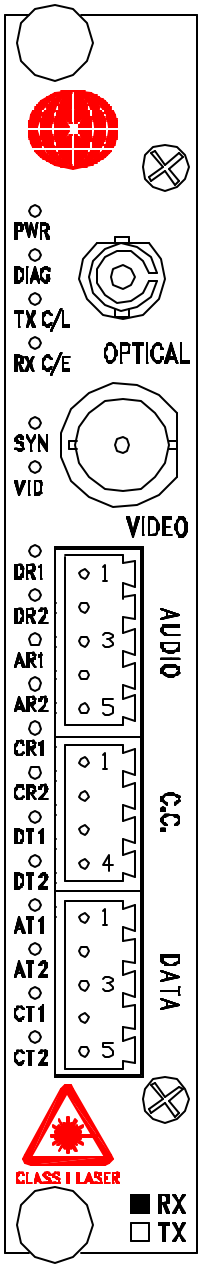
DR1 - (CH.1) DATA OUTPUT
DR2 - NA
AR1 - (CH.1) AUDIO OUTPUT
AR2 - NA
CR1 - NA
CR2 - NA
DT1 - (CH.1) DATA INPUT
DT2 - NA
AT1 - (CH.1) AUDIO INPUT
AT2 - NA
CT1 - NA
CT2 - NA

DATA MULTI PROTOCOL DIGITAL PINOUT DIAGRAM

PIN #	RS-232	RS-422	RS-485 2W	RS-485 4W
1	CH1 IN (RD)	CH1 IN-	CH1 IN/OUT-	CH1 IN-
2		CH1 IN+	CH1 IN/OUT+	CH1 IN+
3	CH1 OUT (TD)	CH1 OUT-		CH1 OUT-
4		CH1 OUT+		CH1 OUT+
5	GND	GND	GND	GND

SR-1W1A1G/1A1G-X

PINOUT DIAGRAM



STATUS INDICATORS

DR1 - (CH.1) DATA OUTPUT
DR2 - NA
AR1 - (CH.1) AUDIO OUTPUT
AR2 - NA
CR1 - NA
CR2 - NA
DT1 - (CH.1) DATA INPUT
DT2 - NA
AT1 - (CH.1) AUDIO INPUT
AT2 - NA
CT1 - NA
CT2 - NA

OPTICAL PORT (ST, FC)

STATUS INDICATORS

PWR - POWER (GREEN)
DIAG - NA
TX C/L - TX CARRIER (GREEN) / OVERLOAD (RED)
RX C/E - RX CARRIER (GREEN) / ERROR (RED)

VIDEO OUTPUT

STATUS INDICATORS

SYN - SYNC PRESENT (GREEN)
VID - VIDEO PRESENT (GREEN) / OVERLOAD (RED)

AUDIO INPUT/OUTPUT

1. (CH.1) AUDIO INPUT-
2. (CH.1) AUDIO INPUT+
3. (CH.1) AUDIO OUTPUT-
4. (CH.1) AUDIO OUTPUT+
5. GND

DATA MULTI PROTOCOL DIGITAL PINOUT DIAGRAM

PIN #	RS-232	RS-422	RS-485 2W	RS-485 4W
1	CH1 IN (RD)	CH1 IN-	CH1 IN/OUT-	CH1 IN-
2		CH1 IN+	CH1 IN/OUT+	CH1 IN+
3	CH1 OUT (TD)	CH1 OUT-		CH1 OUT-
4		CH1 OUT+		CH1 OUT+
5	GND	GND	GND	GND

5.0 Signal Conditioning Switch/Jumper Settings

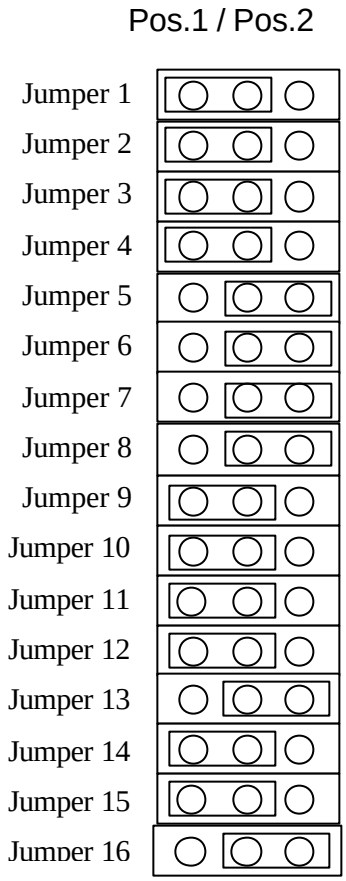
The sections below illustrate how to change the various data conditions.

5.1 Audio Impedance & 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.

There are sixteen (16) 3-pin jumpers located directly behind the 14 pin screw terminal front-panel mounted connector. The top 8 jumpers are used to select the Input/Output Audio Impedance. The 9 & 10 jumpers N/C. The bottom 6 jumpers are used for 2 & 4-wire RS-485 selection and removing the default 120Ohm 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.



N/A

Audio Ch 1 (+) (OUT) – 600 Ohm / Low Z

Audio Ch 1 (-) (OUT) – 600 Ohm / Low Z

N/A

N/A

N/A

Audio Ch 1 (+) (IN) – 47KOhm / 600Ohm

Audio Ch 1 (-) (IN) – 47KOhm / 600Ohm

N/A

N/A

RS-485 (4-wire/2-wire selection) – 4-wire default

RS-485 (4-wire/2-wire selection) – 4-wire default

RS-422 Ch 1 (IN) – 120 Ohm load – ON default

Reserved

Reserved

N/A

***To convert RS-485 from 4-wire to 2-wire move Jumper 11 & Jumper 12 from Pos.1 to Pos.2**

**RS-232 FACTORY SETTINGS NOTE: This setting can be preconfigured to any data selection by customer request.

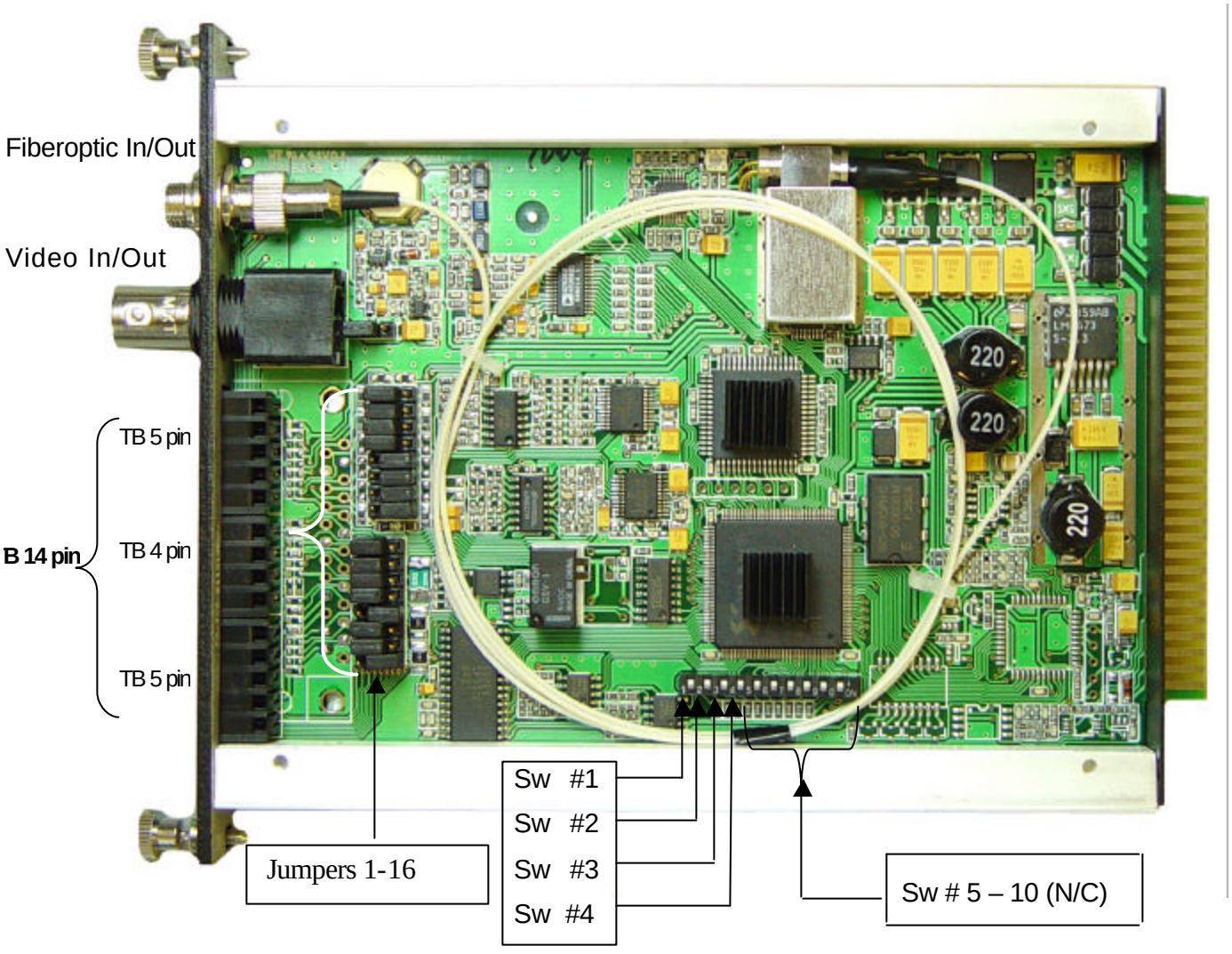
5.2 Data Format Selection

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.

1-Slot Module Data Format Selection Switch Location



6.0 SpectraView™ Network Diagnostics

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 1.0 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 units	"Fiber Broken"
Loss of video signal at CCTV (Tx) side	"Video Lost"

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.

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

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: *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 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: *No Data*
Action: Check that both the transmit and receive modules are set to transmit/receive the same data format (see section 5.0 for switch settings). Confirm that the data connections are correct (see section 4.0 for data pinout connections). Check to ensure that the data source is operating properly. .

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