



Installation/Operation Instructions

Fiber Optic Video Transmission System

Part Numbers:

MT/MR-1HD-x (ST/FC)

(1-Channel HD-SDI Multi-rate Video Transmitter/Receiver)

MT/MR-1HG-x (ST/FC)

(1-Channel 3G-SDI Multi-rate Video Transmitter/Receiver)



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1.0 Product Description

Meridian's product series MT/MR-1HD-x and MT/MR-1HG-x are fiber optic modems that transmit or receive one channel of real-time, uncompressed video HD-SDI for series MT/MR-1HD and 3G-SDI for MT/MR-1HG series. This product supports one channel of SMPTE 292M, 310M, 259M, 344M and 424M compliant digital video data rates, over one optical fiber using digital transmission technologies. This system is available for use with multimode or single-mode fibers and with CWDM lasers. System features Automatic Gain Control - no adjustments are required for different lengths of cables

Both ST and FC optical connectors are supported and includes dust cover with chain. 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.

Meridian also offers product series MT/MR-1HD-xK and MT/MR-1HG-xK. This module kit includes both the miniature transmitter and receiver modules and a pair of universal power supplies all housed in a handy, rugged carrying case.

2.0 Installation

The package includes modules and power supplies.

This product is powered by WP-5 power supply (100-240VAC) and will accept 5VDC power. A plug-in power connector is located on the side of the module see Figure 4.1

To install the Module, it is necessary to allow enough space to accommodate the bend radius of the optical cable connected to it. The transmitter and receiver may be connected directly to 75-Ohm cameras and monitors, or it may require BNC terminated coaxial cables to input and output the video signal, see Figure 4.1. Maximum transmitting distance is up to 60 Km.

3.0 Product Signal Format & Specifications

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	Singlemode – ST or FC Multimode – ST
Power	0.65 mm DC Power Jack

HD-SDI Optical Specifications							
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)
Multimode (FP Laser) 62.5 / 125	-3	-22	19	1300	ST	22	1.3
Single-mode (FP Laser) 9 / 125	-3	-22	19	1310	ST, FC	22	30
Single-mode (DFB Laser) 9 / 125	+1	-22	23	1270-1610	ST, FC	22	60
3G-SDI Optical Specifications							
Multimode (FP Laser) 62.5 / 125	-3	-19	16	1300	ST	19	0.65
Single-mode (FP Laser) 9 / 125	-3	-19	16	1310	ST, FC	19	30
Single-mode (DFB Laser) 9 / 125	+1	-19	20	1270-1610	ST, FC	19	57



Compliant with Class 1 Laser Safety Rating.

4.0 Module Pinout Diagram

Figure 4.1 below show the connectors and LED status indicators location for both the MT/MR-1HD-x and MT/MR-1HG-x modules.

MT-1HG-x PINOUT DIAGRAM



Figure 4.1
MT-1HD(HG)-x
Module Layout Diagram

MR-1HG-x PINOUT DIAGRAM

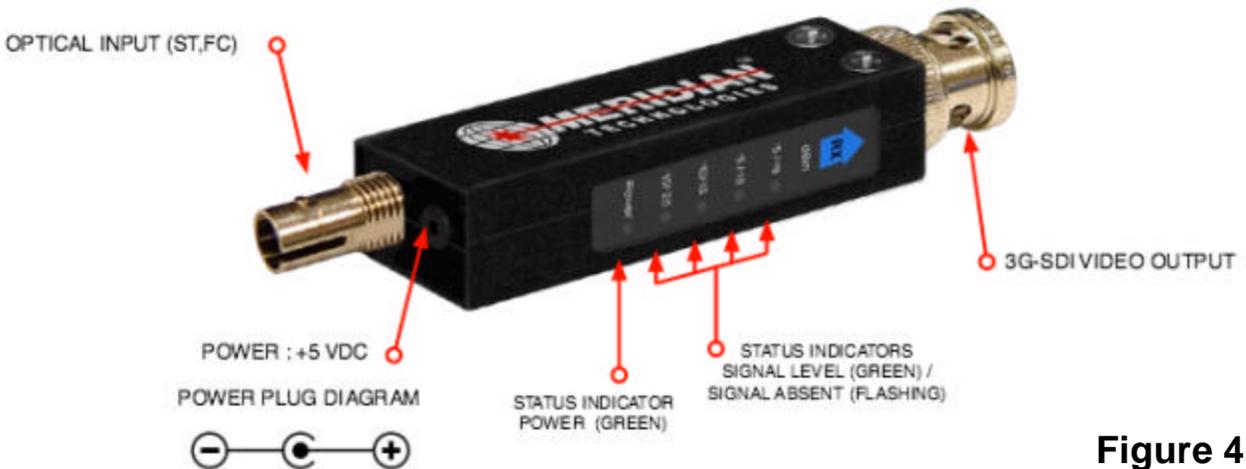


Figure 4.2
MR-1HD(HG)-x
Module Layout Diagram

4.1 Operation LED Status 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 receiver module has an LED received power meter. These LEDs will light when the appropriate amount of optical input power is detected. There are four LED that monitor and display the input power range 0 to -20dBm. The function of these LED indicators is as follows:

- PWR - Green (normal) - when power is applied to the module
- SIGNAL - Green TX SDI present
- LAS OC - Green TX Laser on, Red alarm
- 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

4.2 Connection Diagram

Figure 4.2 below show the video and fiber connections for both the MT/MR-1HD-x and MT/MR-1HG-x modules.

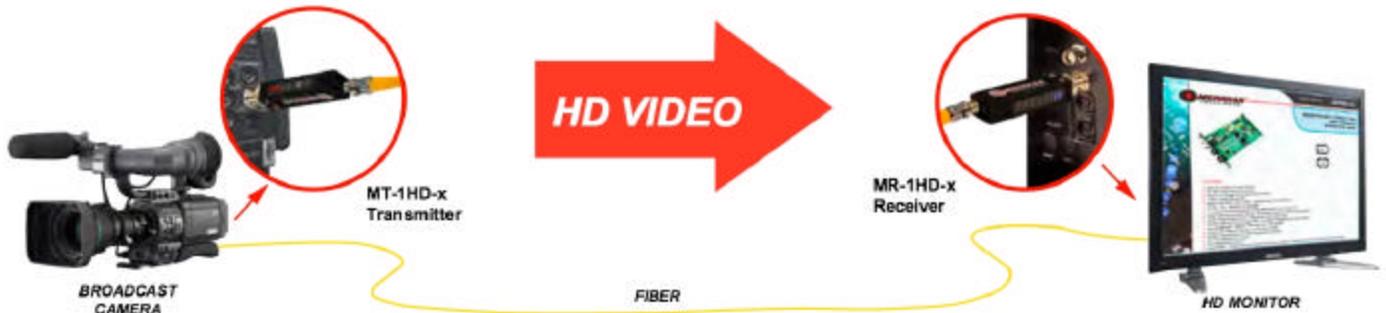
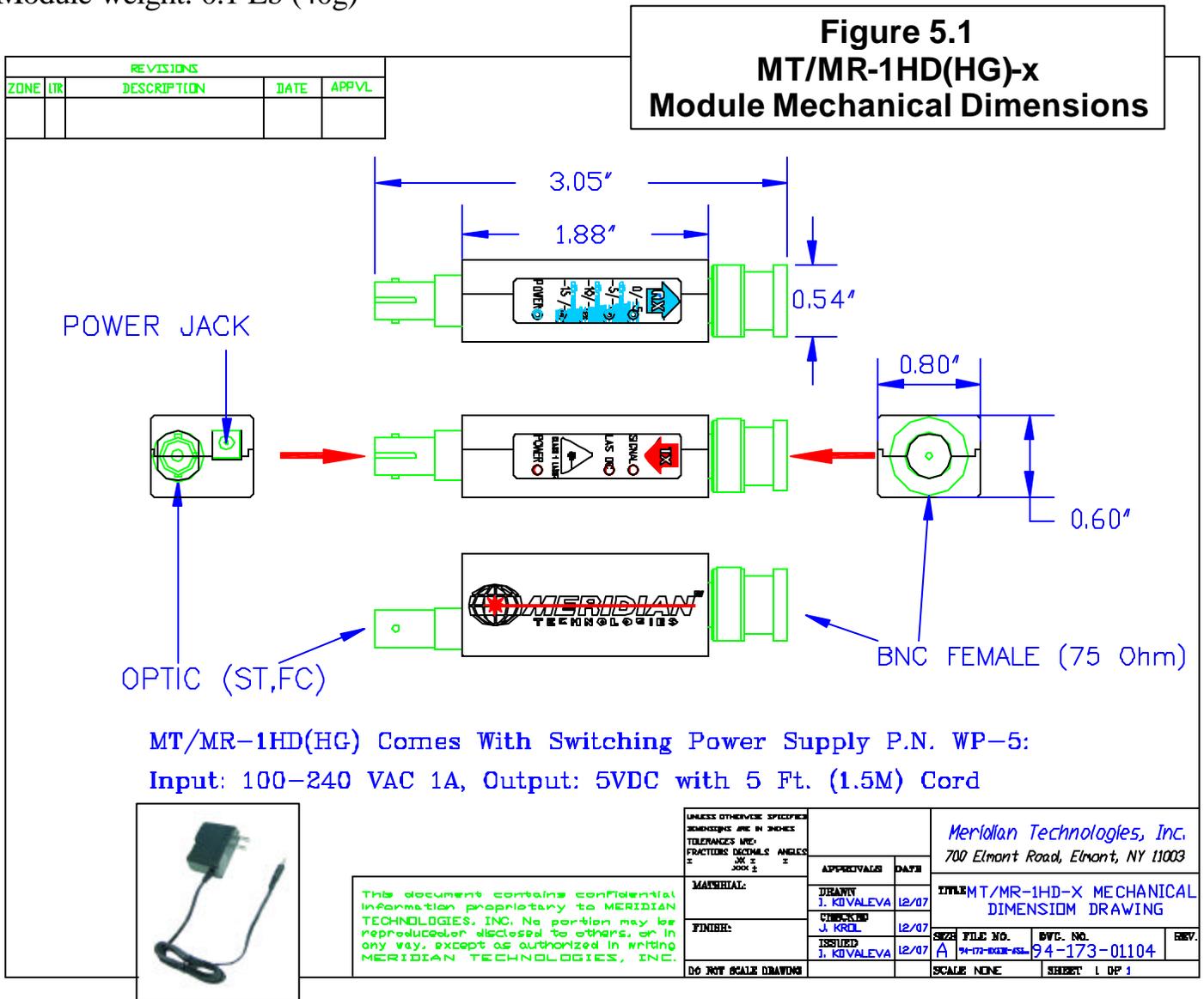


Figure 4.2
MT/MR-1HD(HG)-x
Module Connection Diagram

5.0 Mechanical Dimensions

Module physical dimensions: Length - 3”(76mm), Width - 0.8”(20mm), Height - 0.6”(15mm)
 Module weight: 0.1 Lb (40g)



6.0 CWDM Option

These modules are also available with a CWDM option. The MT unit will transmit on one unique CWDM wavelength and receive on the complementary wavelength. The table below shows these various wavelength combinations for this particular unit.

Please consult the part number for the transmitter unit to properly identify the wavelength for your specific module. Matching part number for receiver will be MR-1HD(HG)-3

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

Figure 6.1
Wavelength Configuration

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. Otherwise, the individual wavelengths will not pass through the CWDM mux/demux device.

When using higher power CWDM lasers, an external attenuator of 3dB minimum is required when performing short distance testing to eliminate optical overload at the Rx unit.

7.0 Product Part Number Variations

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

Figure 7.1

PICTURE	PART NUMBER	VIDEO TX	VIDEO RX	HD SDI	3G SDI	Wavelength (nm)	FIBER TYPE	CONNECTOR (Optional)
	MT-1HD-1	1		v		1300	MM	ST
	MR-1HD-1		1	v		1300	MM	ST
	MT-1HD-3	1		v		1310	SM	FC (ST)
	MR-1HD-3		1	v		1310	SM	FC (ST)
	MT-1HD-7	1		v		1550 DFB	SM	FC (ST)
	MT-1HD-9	1		v		1310 DFB	SM	FC (ST)
	MT-1HD-CWDM	1		v		1270-1610	SM	FC (ST)
	MT-1HG-1	1			v	1300	MM	ST
	MR-1HG-1		1		v	1300	MM	ST
	MT-1HG-3	1			v	1310	SM	FC (ST)
	MR-1HG-3		1		v	1310	SM	FC (ST)
	MT-1HG-7	1			v	1550 DFB	SM	FC (ST)
	MT-1HG-9	1			v	1310 DFB	SM	FC (ST)
	MT-1HG-CWDM	1			v	1270-1610	SM	FC (ST)
		MTMR-1HD-1K	1	1	v		1300	MM
MTMR-1HD-3K		1	1	v		1310	SM	FC (ST)
MTMR-1HG-1K		1	1		v	1300	MM	ST
MTMR-1HG-3K		1	1		v	1310	SM	FC (ST)

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

6.0 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: *Power LED does not light when power to the module is applied*

Action: Check power supply to ensure that it is plugged in. If symptom continues, move module to another power location, 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 (MR unit).

Problem: *Tx signal light off*

Action: Check SDI input signal

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.

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

Notes:



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