



Installation/Operation Instructions

Fiber Optic Video & Data Transmission System

Part Number:

DV-4W(V)2G/2G-x Series

(4-Channel Video Tx/Rx & 2-Channel Multi-Protocol Data Transceiver)



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1.0 Product Description

Meridian's product series DT-4W(V)2G/2G and DR-4W(V)2G/2G are fiber optic modems that transmit four channels of uni-directional digitized video and two channels of user-selectable RS-232, RS-422 or RS-485 data signals over one optical fiber using digital transmission technologies. This product series uses Meridian's standard 2-slot wide chassis mount card assembly and plugs into the following Meridian chassis: SR-1000/S, SR-1200/S, SR-1500/S, and SR-2001 & SR-2000 series 19" equipment chassis.

The digital modules consist of various plug-in personality function cards or SIMs. The top card is the optical card that contains the fiber optic interface. The optical output (Tx) connector is located on the left side of the module while the optical input (Rx) connector is adjacent to it on the right side of the module. The second and third SIMs contains the video coaxial interface (either one or two channels of uni-directional video. The bottom two SIM cards contains the bi-directional multi-protocol data signals.

2.0 Installation

Series DT-4W(V)2G/2G and DR-4W(V)2G/2G products are two-slot wide cards and, as such, occupy two slots in Meridian's standard chassis (SR-1000/S, SR-1200/S, SR-1500/S, and SR-2001 & SR-2000 series 19" equipment chassis). To install 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 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 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 DT & DR-4W(V)2G/2G series products transmit and receive the following signals:

Signal Type	Channels	Transmit	Receive
NTSC/PAL video	4	DT-4W(V)2G/2G	DR-4W(V)2G/2G
RS-232 (Tx & Rx data)	2	Yes	Yes
RS-422 (Tx & Rx data)	2	Yes	Yes
RS-485 (2 & 4-wire)	2	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, 75Ω, 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	75Ω BNC w/gold center pin
Data	DB9 Female
Optical	Singlemode – ST or FC Multimode – ST

4.0 Multi-Protocol SIM Signal Assignment

Each of the multi-protocol SIM can transmit/receive the following data formats:

RS-232 Two full speed, 2-wire channels (Tx/Rx)

RS-422 One channel

RS-485 One channel (either 2 or 4 wire)

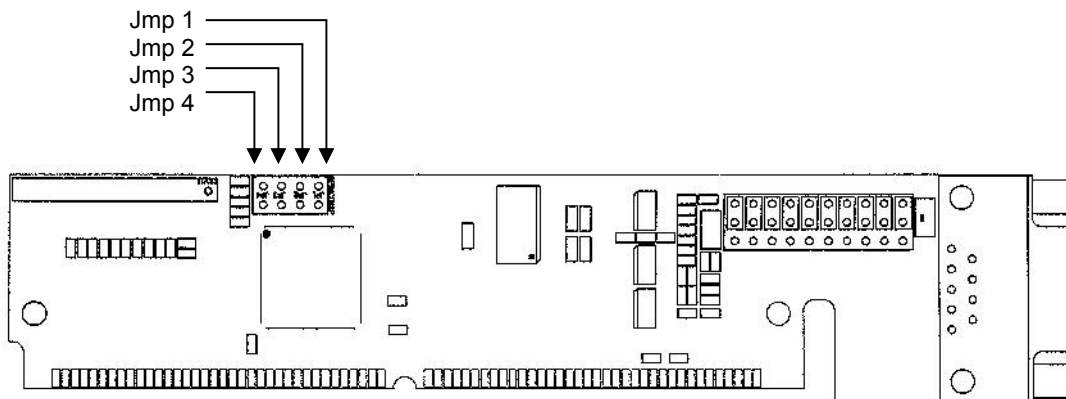
The RS-232 channels can be used either for transmitting/receiving two channels of 2-wire RS-232 (Tx/Rx) or one channel of RS-232 (Tx/Rx) with one bi-directional handshake (e.g., RTS & CTS)

In addition to the RS-232, each multi-protocol SIM can transmit/receive either RS-422 or 2 or 4-wire RS-485 signals. The signal pinouts on the female 9-pin DB9 connector are shown in the table below.

Data Connector Pinout Assignment				
Pin #	RS-232	RS-422	RS-485 (2-wire)	RS-485 (4-wire)
1	-----	Ch1 IN (+)	Ch1 IN/OUT (+)	Ch1 IN (+)
2	Ch1 OUT	-----	-----	-----
3	Ch1 IN	-----	-----	-----
4	-----	Ch1 IN (-)	Ch1 IN/OUT (-)	Ch1 IN (-)
5	Gnd	Gnd	Gnd	Gnd
6	-----	Ch1 OUT (+)	-----	Ch1 OUT (+)
7	Ch2 IN	-----	-----	-----
8	Ch2 OUT	-----	-----	-----
9	-----	Ch1 OUT (-)	-----	Ch1 OUT (-)

There are four (4) jumpers located on each of the multi-protocol data SIMs that must be set properly in order to select the appropriate data format. The figure and table below illustrates these jumper locations on the SIM and how they are configured for the proper data format options. The factory-supplied default setting is for RS-232 data (Jumper #1 ON).

Multi-Protocol SIM Signal Format Jumper Settings				
	Jumper 1	Jumper 2	Jumper 3	Jumper 4
RS-232	ON	OFF	OFF	OFF
RS-422	OFF	ON	OFF	OFF
RS-485 (2-wire)	OFF	OFF	ON	OFF
RS-485 (4-wire)	OFF	OFF	OFF	ON



Multi-Protocol Plug-in SIM

4.1 Changing the multi-protocol SIM jumpers

The jumpers to change the transmitted and received data format can be easily changed as follows:

1. Lay the module on its side with the front panel facing to the left.
2. If there is a side cover on the module, remove the screws in each of the 4 corners of the side cover and carefully remove the cover.
3. The Multi-Protocol (MPS) card is located on the bottom of the module.
4. Refer to the above drawing to locate the 4 jumpers that are located near the rear of the MPS card right at the top edge of the card.
5. Using a small tool, carefully remove the jumper and place it on the appropriate pins to properly select the data format (see table above)
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 Tx and Rx units.

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	-3	-24	21	1300/850	ST	24
Singlemode (FP Laser) 9/125	-3	-24	21	1310/1550	ST, FC	24
Singlemode (DFB Laser) 9/125	+3	-24	27	1310/1550	ST, FC	24

5.0 Front Panel Pinout Assignment Diagram

Figures 5.1 and 5.2 below show the front panel layout, connector location and pinout assignment for both the DT & DR modules.

DT-4W2G/2G-X

PINOUT DIAGRAM

MULTI PROTOCOL DIGITAL(PORT 3) PINOUT DIAGRAM

PIN #	RS-232	RS-422	RS-485 2W	RS-485 4W
1		CH1 IN+	CH1 IN/OUT+	CH1 IN+
2	CH1 OUT(TD)			
3	CH1 IN (RD)			
4		CH1 IN-	CH1 IN/OUT-	CH1 IN-
5	GND	GND	GND	GND
6		CH1 OUT+		CH1 OUT+
7	CH2 IN(RTS)			
8	CH2 OUT(CTS)			
9		CH1 OUT-		CH1 OUT-

STATUS INDICATORS (PORT 3)

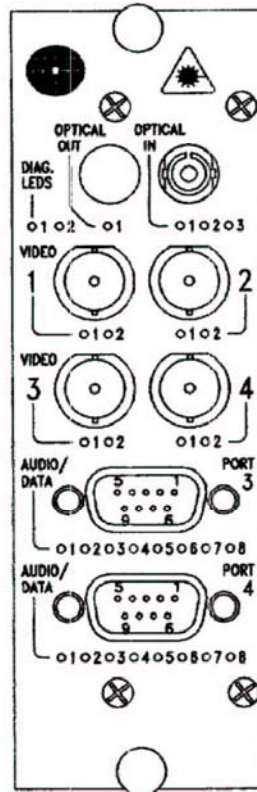
1. (CH.1) DATA INPUT
2. NA
3. (CH.1) DATA OUTPUT
4. NA
5. (CH.2) DATA INPUT
6. NA
7. (CH.2) DATA OUTPUT
8. NA

MULTI PROTOCOL DIGITAL(PORT 4) PINOUT DIAGRAM

PIN #	RS-232	RS-422	RS-485 2W	RS-485 4W
1		CH1 IN+	CH1 IN/OUT+	CH1 IN+
2	CH1 OUT(TD)			
3	CH1 IN (RD)			
4		CH1 IN-	CH1 IN/OUT-	CH1 IN-
5	GND	GND	GND	GND
6		CH1 OUT+		CH1 OUT+
7	CH2 IN(RTS)			
8	CH2 OUT(CTS)			
9		CH1 OUT-		CH1 OUT-

STATUS INDICATORS (PORT 4)

1. (CH.1) DATA INPUT
2. NA
3. (CH.1) DATA OUTPUT
4. NA
5. (CH.2) DATA INPUT
6. NA
7. (CH.2) DATA OUTPUT
8. NA



OPTICAL PORT STATUS INDICATORS

1. NA
2. RX OPTICAL SIGNAL (GREEN)
3. RX CARRIER (GREEN)/ERROR (RED)

STATUS INDICATORS

1. TX CARRIER (GREEN)/ERROR (RED)

STATUS INDICATORS

1. POWER (GREEN)
2. NA

VIDEO INPUT (CH.1) STATUS INDICATORS

1. SYNC PRESENT (green)
2. VIDEO CH.1 (green)/OVERLOAD (red)

VIDEO INPUT (CH.2) STATUS INDICATORS

1. SYNC PRESENT (green)
2. VIDEO CH.1 (green)/OVERLOAD (red)

VIDEO INPUT (CH.3) STATUS INDICATORS

1. SYNC PRESENT (green)
2. VIDEO CH.1 (green)/OVERLOAD (red)

VIDEO INPUT (CH.4) STATUS INDICATORS

1. SYNC PRESENT (green)
2. VIDEO CH.1 (green)/OVERLOAD (red)

INTERNAL JUMPER SETTINGS

1	2	3	4
RS-232	RS-422	RS-485 2W	RS-485 4W

* FACTORY SETTINGS

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08/11/05

Figure 5.1
DT-4W(V)2G/2G Front Panel Layout Diagrams

DR-4W2G/2G-X

PINOUT DIAGRAM

MULTI PROTOCOL DIGITAL(PORT 3) PINOUT DIAGRAM

PIN #	RS-232	RS-422	RS-485 2W	RS-485 4W
1		CH1 IN+	CH1 IN/OUT+	CH1 IN+
2	CH1 OUT(TD)			
3	CH1 IN (RD)			
4		CH1 IN-	CH1 IN/OUT-	CH1 IN-
5	GND	GND	GND	GND
6		CH1 OUT+		CH1 OUT+
7	CH2 IN(RTS)			
8	CH2 OUT(CTS)			
9		CH1 OUT-		CH1 OUT-

STATUS INDICATORS (PORT 3)

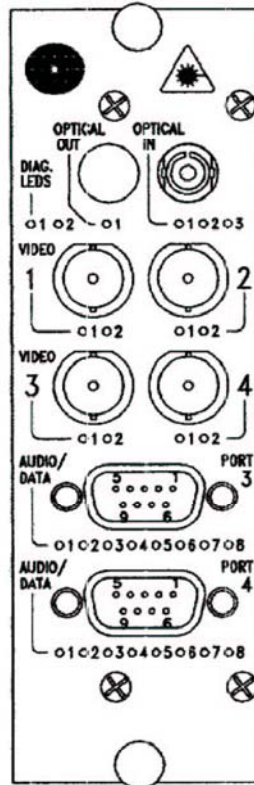
1. (CH.1) DATA INPUT
2. NA
3. (CH.1) DATA OUTPUT
4. NA
5. (CH.2) DATA INPUT
6. NA
7. (CH.2) DATA OUTPUT
8. NA

MULTI PROTOCOL DIGITAL(PORT 4) PINOUT DIAGRAM

PIN #	RS-232	RS-422	RS-485 2W	RS-485 4W
1		CH1 IN+	CH1 IN/OUT+	CH1 IN+
2	CH1 OUT(TD)			
3	CH1 IN (RD)			
4		CH1 IN-	CH1 IN/OUT-	CH1 IN-
5	GND	GND	GND	GND
6		CH1 OUT+		CH1 OUT+
7	CH2 IN(RTS)			
8	CH2 OUT(CTS)			
9		CH1 OUT-		CH1 OUT-

STATUS INDICATORS (PORT 4)

1. (CH.1) DATA INPUT
2. NA
3. (CH.1) DATA OUTPUT
4. NA
5. (CH.2) DATA INPUT
6. NA
7. (CH.2) DATA OUTPUT
8. NA



OPTICAL PORT STATUS INDICATORS

1. NA
2. RX OPTICAL SIGNAL (GREEN)
3. RX CARRIER (GREEN)/ERROR (RED)

STATUS INDICATORS

1. TX CARRIER (GREEN)/ERROR(RED)

STATUS INDICATORS

1. POWER (GREEN)
2. NA

VIDEO OUTPUT (CH.1)

STATUS INDICATORS

1. SYNC PRESENT (green)
2. VIDEO CH.1 (green)/OVERLOAD (red)

VIDEO OUTPUT (CH.2)

STATUS INDICATORS

1. SYNC PRESENT (green)
2. VIDEO CH.1 (green)/OVERLOAD (red)

VIDEO OUTPUT (CH.3)

STATUS INDICATORS

1. SYNC PRESENT (green)
2. VIDEO CH.1 (green)/OVERLOAD (red)

VIDEO OUTPUT (CH.4)

STATUS INDICATORS

1. SYNC PRESENT (green)
2. VIDEO CH.1 (green)/OVERLOAD (red)

INTERNAL JUMPER SETTINGS

1*	2	3	4
RS-232	RS-422	RS-485 2W	RS-485 4W

*FACTORY SETTINGS

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Figure 5.2
DR-4W(V)2G/2G Front Panel Layout Diagrams

6.0 Product Part Number Variations

The table below lists the various part numbers associated with different module types:

Basic module description:

Video: 4-channels, one way

Data: 2-channels, bi-directional, multi-protocol

Transmitter	Receiver	Video Resolution	# Fibers & Type	Wavelength
DT-4W2G/2G-2	DR-4W2G/2G-2	10-bit	1 (MM)	1310/850nm
DT-4W2G/2G-5	DR-4W2G/2G-5	10-bit	1 (SM)	1310/1550nm
DT-4V2G/2G-2	DR-4VG/2G-2	8-bit	1 (MM)	1310/850nm
DT-4V2G/2G-5	DR-4V2G/2G-5	8-bit	1 (SM)	1310/1550nm

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

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 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 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 the data input status indicator light #1 on the transmit module to ensure it is on (indicating a data input signal). Also check the data output status indicator light #2 on the corresponding receiver module to ensure that the signal is being transmitted and received. If not, please check the data input/output and fiber connections. Ensure that the jumpers on the data Multi-protocol SIM are programmed properly to match the data format

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