



Installation/Operation Instructions

Fiber Optic Video & Data Transmission System

Part Number:

DT/DR-2W(V)6C1G/6C1G-x Series

***(2-Channel Video Tx/Rx & 6-Channel bi-directional Contact Closure,
1-Channel Multi-Protocol Data Transceiver)***

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1.0 Product Description

Meridian's product series DT-2W(V)6C1G/6C1G and DR-2W(V)6C1G/6C1G are fiber optic modems that transmit two channels of uni-directional digitized video, six channels of bi-directional contact closure and one channel of user-selectable RS-232, RS-422 or RS-485 data signals over one or two optical fibers 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-1001/S, SR-1002/S, SR-1500/S, and SR-2001 & SR-2000 series 19" equipment chassis.

The units consist of various plug-in personality function cards or SIMs. The top card is the optical card that contains the fiber optic interface. The bi-directional optical input/output connector is located on the right side of both the transmitter (DT) and receiver (DR) modules. The two fiber units have two optical ports. The port on the left side of the front panel is the transmit port while the optical port on the right side of the module's front panel is the optical receive port. It is important that, when connecting these modules together, it is necessary that the transmit port of one of the modules optically connects to the receive port of other module. The second SIM contains the video coaxial interface. The third and fourth SIMs contain the bi-directional Contact Closure. The bottom SIM card contains the bi-directional multi-protocol data signals (one per SIM card).

2.0 Installation

Series DT-2W(V)6C1G/6C1G and DR-2W(V)6C1G/6C1G products are two-slot wide cards and, as such, occupy two slots in Meridian's standard 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-2W(V)6C1G/6C1G series products transmit and receive the following signals:

Signal Type	Channels	Transmit	Receive
NTSC/PAL video	2	DT-2W(V)6C1G/6C1G	DR-2W(V)6C1G/6C1G
Dry contact closure	6	Yes	Yes
RS-232 (Tx & Rx data) (or)	1 (jumper select)	Yes	Yes
RS-422 (Tx & Rx data) (or)	1 (jumper select)	Yes	Yes
RS-485 (2 & 4-wire)	1 (jumper select)	Yes	Yes

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

Video		
	8-bit	10-bit
Format	NTSC, PAL, SECAM	NTSC, PAL, SECAM
Voltage/Impedance	1Vp-p, 75 Ohm, 1.5Vp-p (max)	1Vp-p, 75 Ohm, 1.5Vp-p (max)
Differential Gain	<0.6%	<0.6%
Differential Phase	<0.3°	<0.3°
SNR	>60dB (weighted)	>67dB (weighted)
Return Loss	>30dB	>30dB
Field Tilt	<0.5%	<0.5%

Contact Mapping	
Input	Contact closure to ground
Output	Isolated contact closure outputs
Output Contact Rating	0.3A @ 30VAC/DC
Contact bounce time	5msec
Connectors	High Density DB15 Female
Data	
Formats	RS-232
Date Rate (RS-232)	DC to 1 25Kb/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
Dry contact closure	DB15 Female
Data	DB9 Female
Optical	Singlemode – ST or FC Multimode – ST

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	-27	24	1300/850	ST	24
Singlemode (FP Laser) 9/125	-3	-27	24	1310/1550	ST, FC	24
Singlemode (DFB & CWDM Lasers) 9/125	0	-27	27	1310/1550	ST, FC	24

Refer to section 7.0 for CWDM wavelength selections.

4.0 Operating

Video – Each of the two BNC video connectors accepts a standard NTSC/PAL video input signal (DT module) and transmits these signals to the receive unit (DR module). The respective video output signal is located on the same channel (location) as the input video signal. Connect the input video signal to the appropriate BNC video input connector on the transmitter module (DT-2W(V)6C1G/6C1G) and the output video connector on the associated port on the receiver module (DR-2W(V)6C1G/6C1G).

Data – Connect the data for each of the data channels to the appropriate data Tx/Rx pins on the connector as shown in section 4.2 & 4.3

4.1 Video, Contact Mapping and Data Status indicators

The figures 5.1 & 5.2 show the connector and LED indicator locations for the various video, Contact Mapping & data status indicators on the transmitter and receiver modules. There are a number of diagnostic indicators on the front panel of each module. In addition, each of the video input/output channels has indicators associated with them to provide quick visual indications of the channel activity. These indicators for each of the video & data SIM cards are listed below:

Transmitter (DT-2W(V)6C1G/6C1G) Indicators		
Indicator	Location	Function
Tx carrier	Under optical output connector	Optical output (Green – OK, Red – error)
Power	Left side of module	Green – ON
Video #1	Under video input connectors	Green – Sync received
Video #2	Under video input connectors	Video signal – Green OK, Red – video overload

Receiver (DR-2W(V)6C1G/6C1G) Indicators		
Indicator	Location	Function
Rx Optical signal	Under optical output connector	Optical input (Green – OK, Red – error)
Rx Carrier	Under optical output connector	Optical Carrier input (Green – OK, Red – error)
Power	Left side of module	Green – ON
Video #1 (each input)	Under video input connectors	Green – Sync received
Video #2 (each input)	Under video input connectors	Video signal – Green OK, Red – video overload

The table below identifies the input/output functions LED status indicators for contact SIM card.

Contact Mapping Input/Output Status indicators		
LED	DT-Port 2/ DR-Port 3	DT-Port 3/ DR-Port 2
1	Channel 1 - input present	Channel 1 - output present
2	Channel 2 - input present	Channel 2 - output present
3	Channel 3 - input present	Channel 3 - output present
4	Channel 4 - input present	Channel 4 - output present
5	Channel 5 - input present	Channel 5 - output present
6	Channel 6 - input present	Channel 6 - output present
7	NA	NA
8	NA	NA

Each data input/output channel has two LED status indicators located under the associated data I/O connector. One LED is associated with each data input channel on the DR unit while the second LED is associated with the respective data output channel on the DT unit. The table below shows the relationship between the connectors (I/O channels) and LEDs.

Data Input/Output Status Indicators Port 4	
LED	DT/DR-2W(V)6C1G/6C1G-x
1	Input 1 – Green – data present
2	N/A
3	Output 1 – Green - data present
4	N/A
5	Input 2 – Green – data present
6	N/A
7	Output 2 – Green - data present
8	N/A

4.2 Contact Mapping Signal Connector Pinouts

The DT & DR-2W(V)6C1G/6C1G-x Contact Mapping channel connector pinouts are shown in the table below:

Contact Mapping Connector Pinout		
	INPUT	OUTPUT
Pin #	DT-Port 2/ DR-Port 3	DT-Port 3/ DR-Port 2
1	Ch 1 Input	Ch 1 Output
2	Ch 2 Input	Ch 1 Output
3	Ch 3 Input	Ch 2 Output
4	Ch 4 Input	Ch 2 Output
5	GND	GND
6	Ch 5 Input	Ch 3 Output
7	Ch 6 Input	Ch 3 Output
8	NA	Ch 4 Output
9	NA	Ch 4 Output
10	NA	Ch 5 Output
11	NA	Ch 5 Output
12	NA	Ch 6 Output
13	NA	Ch 6 Output
14	NA	NA
15	NA	NA

The Contact Mapping boards (SIM) is inserted in the module at the (port 2 & 3).

Input connections located on DT module in port 2, on DR module in port 3

Output connections located on DT module in port 3, on DR module in port 2

4.3 Multi-Protocol SIM Signal Assignment

Each of the multi-protocol SIM can be user-configured to transmit/receive one of the following data formats:

RS-232 One full speed, 2-wire channel (Tx/Rx)

RS-422 One channel

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

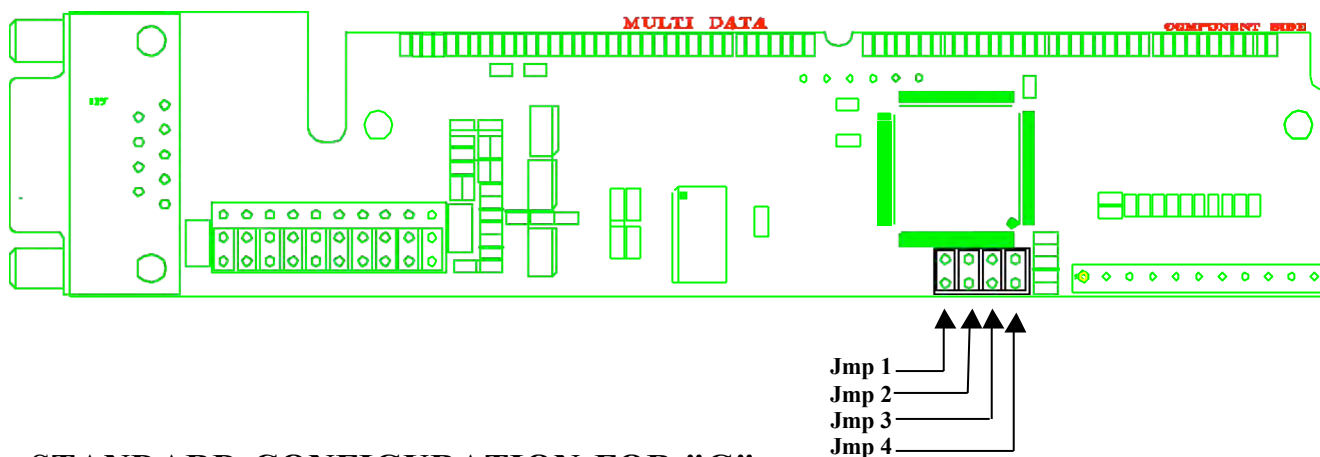
The signal pinouts on the female 9-pin DB9 connector are shown in the table below.

Data Connector Pinout Assignment (Port 4)				
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



STANDARD CONFIGURATION FOR "G"
(MULTIPROTOCOL DATA) DRIVER RS-232.
TO CHANGE SETTINGS FOR RS-422 OR RS-485
PLEASE FOLLOW THE TABLE.

4.4 Changing the multi-protocol SIM jumpers

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

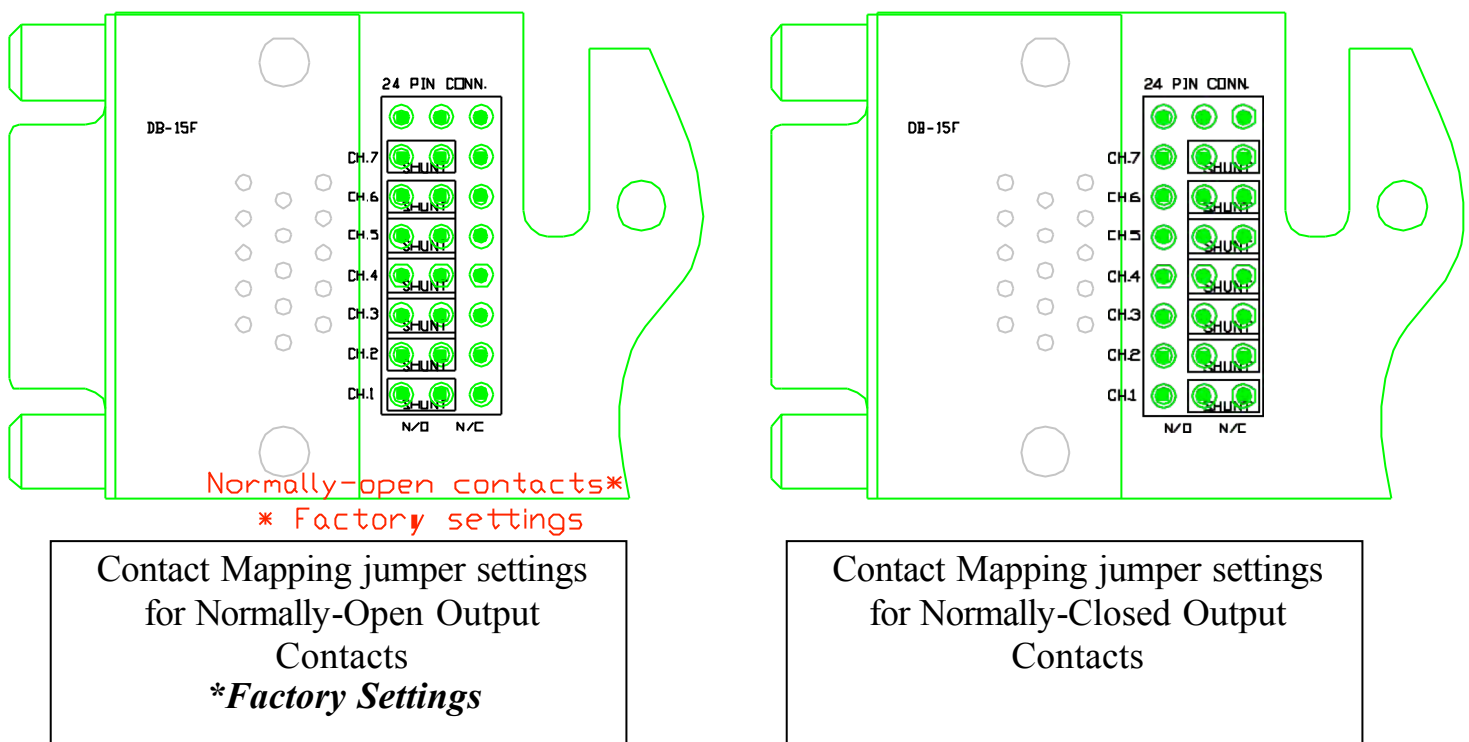
1. Lay the module on its side with the front panel facing to the left.
2. If there is a side cover on the module, remove the screws in each of the 4 corners of the side cover and carefully remove the cover.
3. The Multi-Protocol (MPS) card is located on the bottom of the module.
4. Refer to the above 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.

4.5 Contact Mapping SIM Jumper Settings

The Contact Closure SIM has 7 jumpers on it (located directly behind the DB15 connector), one for each channel. These jumpers are used to set the output Contact Mapping settings for Normally-Open or Normally-Close contacts.

The default setting is Normally-Open.

The figures below illustrate these jumpers and how they are configured:



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-2W6C1G/6C1G-X

PINOUT DIAGRAM

STATUS INDICATORS

1. POWER (GREEN)
2. NA

STATUS INDICATORS

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

VIDEO INPUT (CH.1)

STATUS INDICATORS

1. SYNC PRESENT (GREEN)
2. VIDEO PRESENT (GREEN)/OVERLOAD (RED)

DATA INPUT (PORT 2)

HD-15 FEMALE

1. (CH.1) INPUT
2. (CH.2) INPUT
3. (CH.3) INPUT
4. (CH.4) INPUT
5. GND
6. (CH.5) INPUT
7. (CH.6) INPUT
- 8.-15. NA

DATA OUTPUT (PORT 3)

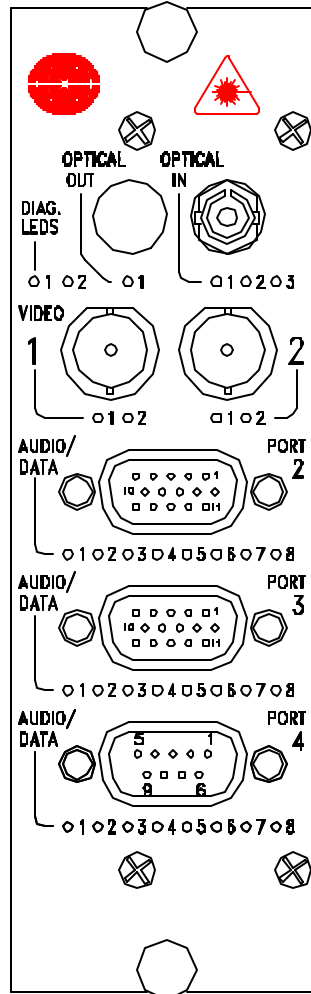
HD-15 FEMALE

1. (CH.1) OUTPUT
2. (CH.1) OUTPUT
3. (CH.2) OUTPUT
4. (CH.2) OUTPUT
5. GND
6. (CH.3) OUTPUT
7. (CH.3) OUTPUT
8. (CH.4) OUTPUT
9. (CH.4) OUTPUT
10. (CH.5) OUTPUT
11. (CH.5) OUTPUT
12. (CH.6) OUTPUT
13. (CH.6) OUTPUT
- 14.-15. 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-



OPTICAL PORT

STATUS INDICATORS

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

VIDEO INPUT (CH.2)

STATUS INDICATORS

1. SYNC PRESENT (GREEN)
2. VIDEO PRESENT (GREEN)/OVERLOAD (RED)

STATUS INDICATORS (PORT 2)

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

STATUS INDICATORS (PORT 3)

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

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

INTERNAL JUMPER SETTINGS

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

*FACTORY SETTINGS

Figure 5.1

DT-2W(V)6C1G/6C1G -x Front Panel Layout Diagrams

DR-2W6C1G/6C1G-X

PINOUT DIAGRAM

STATUS INDICATORS

1. POWER (GREEN)
2. NA

STATUS INDICATORS

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

VIDEO OUTPUT (CH.1)

STATUS INDICATORS

1. SYNC PRESENT (GREEN)
2. VIDEO PRESENT (GREEN)/OVERLOAD (RED)

DATA OUTPUT (PORT 2)

HD-15 FEMALE

1. (CH.1) OUTPUT
2. (CH.1) OUTPUT
3. (CH.2) OUTPUT
4. (CH.2) OUTPUT
5. GND
6. (CH.3) OUTPUT
7. (CH.3) OUTPUT
8. (CH.4) OUTPUT
9. (CH.4) OUTPUT
10. (CH.5) OUTPUT
11. (CH.5) OUTPUT
12. (CH.6) OUTPUT
13. (CH.6) OUTPUT
- 14.-15. NA

DATA INPUT (PORT 3)

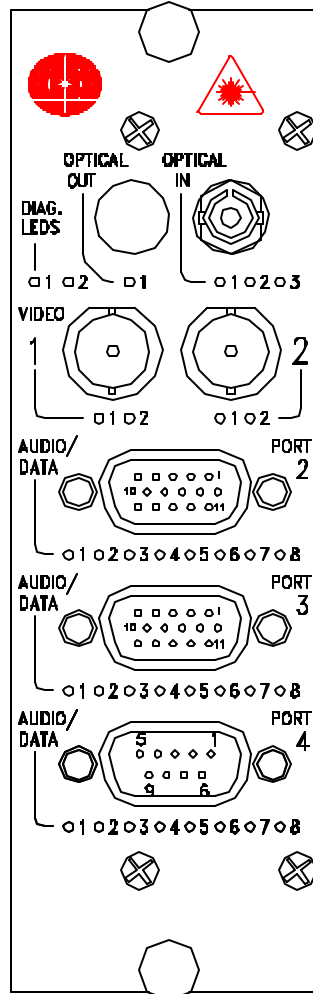
HD-15 FEMALE

1. (CH.1) INPUT
2. (CH.2) INPUT
3. (CH.3) INPUT
4. (CH.4) INPUT
5. GND
6. (CH.5) INPUT
7. (CH.6) INPUT
- 8.-15. 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-



OPTICAL PORT

STATUS INDICATORS

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

VIDEO OUTPUT (CH.2)

STATUS INDICATORS

1. SYNC PRESENT (GREEN)
2. VIDEO PRESENT (GREEN)/OVERLOAD (RED)

STATUS INDICATORS (PORT 2)

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

STATUS INDICATORS (PORT3)

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

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

INTERNAL JUMPER SETTINGS

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

* FACTORY SETTINGS

Figure 5.2

Dr-2W(V)6C1G/6C1G -x 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: 2-channels, one way (8 or 10-bit digital encoding)

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

Transmitter	Receiver	Video Resolution	# Fibers & Type	Wavelength
DT-2W6C1G/6C1G-2	DR-2W6C1G/6C1G-2	10-bit	1 (MM)	1310/850nm
DT-2W6C1G/6C1G -5	DR-2W6C1G/6C1G-5	10-bit	1 (SM)	1310/1550nm
DT-2V6C1G/6C1G-2	DR-2V6C1G/6C1G-2	8-bit	1 (MM)	1310/850nm
DT-2V6C1G/6C1G-5	DR-2V6C1G/6C1G-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 2-Fiber, CWDM Option

These cards are also available with a 2-fiber, CWDM option. In this configuration, 2 fibers on each unit are used for transmission of the bi-directional signals. The DT unit will transmit on one unique CWDM wavelength and receive on a 2nd wavelength while the DR unit transmits and receives on the complementary wavelengths. The table below shows these various wavelength combinations for this particular unit.

Please consult the part number label on the rear of the unit to properly identify the wavelengths for your specific cards.

Part #	Transmit Wavelength	Receive Wavelength
DT-2W(V)6C1G/6C1G-47/49	1470nm	1490nm
DR-2W(V)6C1G/6C1G-49/47	1490nm	1470nm
DT-2W(V)6C1G/6C1G-51/53	1510nm	1530nm
DR-2W(V)6C1G/6C1G-53/51	1530nm	1510nm
DT-2W(V)6C1G/6C1G-55/57	1550nm	1570nm
DR-2W(V)6C1G/6C1G-57/55	1570nm	1550nm
DT-2W(V)6C1G/6C1G-59/61	1590nm	1610nm
DR-2W(V)6C1G/6C1G-61/59	1610nm	1590nm

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 CWMD mux/demux device.

When using higher power CWDM lasers, an external attenuator of 5dB minimum is required when performing short distance testing to eliminate optical overload at the Rx card.

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 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 Contact Closure transmission*

Action: Check the individual contact closure channel input status indicator lights #1 through 4 to ensure that the lights toggle on and off as the contact is closed and opened. These lights are located below the corresponding DB15. Also check the corresponding contact closure output lights (#1 through 4) on the receiver module to see if the corresponding lights are activated when the corresponding input contact is closed. If not, please check the data input/output and fiber connections.

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).

Notes:



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