



## **Installation/Operation Instructions**

### **Fiber Optic Video & Data Transmission System**

**Part Number:**

**DT/DR-4W(V)4F/4F-x Series**

**(4-Channel Video Tx/Rx & 4-Channel BI-DI RS-422 Data)**



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## 1.0 Product Description

Meridian's product series DT-4W(V)4F/4F and DR-4W(V)4F/4F are fiber optic modems that transmit four channels of uni-directional digitized video and four channels of uni-directional RS-422 data signals over one optical fiber using digital-encoding transmission techniques. This product series uses Meridian's standard 2-slot wide chassis mount card assembly and plugs into the following Meridian chassis: SR-1000, 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 input & output connectors are located 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 SIMs card contains the uni-directional RS-422 data signals.

## 2.0 Installation

Series -4W(V)4F/4F and DR-4W(V)4F/4F products are two-slot wide cards and, as such, occupy two slots in Meridian's standard chassis (SR-1000, 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)4F/4F-X series products transmit and receive the following signals:

| Signal Type    | Channels | DT-4W(V)4F/4F-x   | DR-4W(V)4F/4F-x   |
|----------------|----------|-------------------|-------------------|
| NTSC/PAL video | 4        | Transmit          | Receive           |
| RS-422         | 4/4      | Transmit/ Receive | Transmit/ Receive |

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

| Video              |                           |                           |
|--------------------|---------------------------|---------------------------|
|                    | 8-bit Video               | 10-bit Video              |
| Format             | NTSC, PAL, SECAM          | NTSC, PAL, SECAM          |
| Voltage/Impedance  | 1Vp-p, 75Ω, 1.5Vp-p (max) | 1Vp-p, 75Ω, 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%                     |

| Data                 |                              |
|----------------------|------------------------------|
| Formats              | RS-422                       |
| Data Rate            | DC to 300Kb/s                |
| Bit Error Rate (BER) | Better than 10 <sup>-9</sup> |

| Connectors |                                         |
|------------|-----------------------------------------|
| Video      | 75Ω BNC w/gold center pin               |
| Data       | DB9 Female                              |
| Optical    | Singlemode – ST or FC<br>Multimode – ST |

### 3.1 Video Status indicators

The figures at the end of this document show the connector and LED indicator locations for the various video & 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 channels are listed below:

| Transmitter (DT-4W(V)4F/4F-x) Indicators |                                |                                               |
|------------------------------------------|--------------------------------|-----------------------------------------------|
| Indicator                                | Location                       | Function                                      |
| Tx carrier                               | Under optical output connector | Optical output (Green – OK, Red – error)      |
| Power                                    | Left side of module            | Green – ON                                    |
| Video #1-4 (each input)                  | Under video input connectors   | Green – Sync received                         |
| Video #1-4 (each input)                  | Under video input connectors   | Video signal – Green OK, Red – video overload |

| Receiver (DR-4V(W)4F/4F-x) 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 #1-4 (each input)               | Under video input connectors   | Green – Sync received                           |
| Video #1-4 (each input)               | Under video input connectors   | Video signal – Green OK, Red – video overload   |

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.

### 4.0 RS-422 SIM Signal Assignment (Pinouts) & Indicator Lights

There is two data SIM cards, one transmits & one receives four RS-485 (4-wire) data channels. The data SIM has a DB9 female connector.

700 Elmont Rd, Elmont, NY 11003, Tel: 516-285-1000; Fax: 516-285-6300

[www.Meridian-tech.com](http://www.Meridian-tech.com)

The table below shows the appropriate pinout for each of the connectors

| RS-422 Data Connector Pinout Assignment<br>(PORT 3) |                                         |                                         |
|-----------------------------------------------------|-----------------------------------------|-----------------------------------------|
| Pin #                                               | DT-4V4F/4F(PORT 3) / DR-4V4F/4F(PORT 4) | DR-4V4F/4F(PORT 3) / DT-4V4F/4F(PORT 4) |
| 1                                                   | Ch1 IN (+)                              | Ch1 OUT (+)                             |
| 2                                                   | Ch1 IN (-)                              | Ch1 OUT (-)                             |
| 3                                                   | Ch 2 IN (+)                             | Ch2 OUT (+)                             |
| 4                                                   | Ch 2 IN (-)                             | Ch2 OUT (-)                             |
| 5                                                   | Gnd                                     | Gnd                                     |
| 6                                                   | Ch 3 IN (+)                             | Ch3 OUT (+)                             |
| 7                                                   | Ch 3 IN (-)                             | Ch3 OUT (-)                             |
| 8                                                   | Ch 4 IN (+)                             | Ch4 OUT (+)                             |
| 9                                                   | Ch 4 IN (-)                             | Ch4 OUT (-)                             |

The table below shows the LED status indicators associated with each data SIM

| RS-422 Data Connector Status Indicators<br>(PORT 3) |                                         |                                         |
|-----------------------------------------------------|-----------------------------------------|-----------------------------------------|
| LED #                                               | DT-4V4F/4F(PORT 3) / DR-4V4F/4F(PORT 4) | DR-4V4F/4F(PORT 3) / DT-4V4F/4F(PORT 4) |
| 1                                                   | Ch1 Data Input                          | N/A                                     |
| 2                                                   | N/A                                     | Ch 1 Data Output                        |
| 3                                                   | Ch 2 Data Input                         | N/A                                     |
| 4                                                   | N/A                                     | Ch 2 Data Output                        |
| 5                                                   | Ch 3 Data Input                         | N/A                                     |
| 6                                                   | N/A                                     | Ch 3 Data Output                        |
| 7                                                   | Ch 4 Data Input                         | N/A                                     |
| 8                                                   | N/A                                     | Ch 4 Data Output                        |

The data SIM can transmit or receive 4 channels of RS-422 data. The pinouts are shown in the table below:

There are no jumpers or switches for the user to configure for this data card.

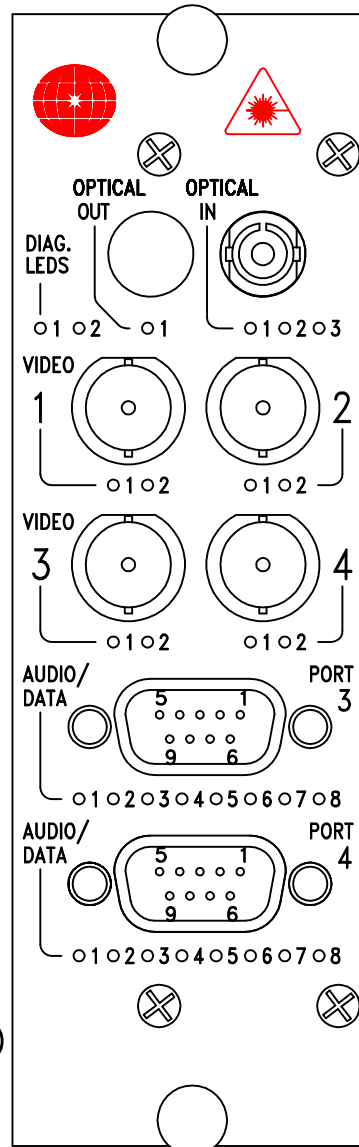
| Optical Specifications           |                      |                      |                     |                 |                   |                            |
|----------------------------------|----------------------|----------------------|---------------------|-----------------|-------------------|----------------------------|
| Fiber Type/Size (um)             | Optical Output (dBm) | Rx Sensitivity (dBm) | Optical Budget (dB) | Wavelength (nm) | Optical connector | Optical Dynamic Range (dB) |
| Multimode (FP Laser)<br>62.5/125 | -3                   | -24                  | 21                  | 1300/850        | ST                | 24                         |
| Singlemode (FP Laser)<br>9/125   | -3                   | -24                  | 21                  | 1310/1550       | ST, FC            | 24                         |
| Singlemode (DFB Laser)<br>9/125  | +3                   | -24                  | 27                  | 1310/1550       | ST, FC            | 24                         |

## 5.0 Front Panel Pinout Assignment Diagram

# DT-4V\*4F/4F-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)
- VIDEO INPUT (CH.3)**  
**STATUS INDICATORS**  
 1. SYNC PRESENT (GREEN)  
 2. VIDEO PRESENT (GREEN)/OVERLOAD (RED)
- DATA RS422 INPUT (PORT 3)**  
 (DB-9 FEMALE)  
 1. (CH.1) INPUT  
 2. (CH.1) INPUT  
 3. (CH.2) INPUT  
 4. (CH.2) INPUT  
 5. GND  
 6. (CH.3) INPUT  
 7. (CH.3) INPUT  
 8. (CH.4) INPUT  
 9. (CH.4) INPUT
- DATA RS422 OUTPUT (PORT 4)**  
 (DB-9 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



- 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)
- VIDEO INPUT (CH.4)**  
**STATUS INDICATORS**  
 1. SYNC PRESENT (GREEN)  
 2. VIDEO PRESENT (GREEN)/OVERLOAD (RED)
- STATUS INDICATORS (PORT 3)**  
 1. (CH.1) DATA INPUT  
 2. (CH.1) NA  
 3. (CH.2) DATA INPUT  
 4. (CH.2) NA  
 5. (CH.3) DATA INPUT  
 6. (CH.3) NA  
 7. (CH.4) DATA INPUT  
 8. (CH.4) NA
- STATUS INDICATORS (PORT 4)**  
 1. (CH.1) NA  
 2. (CH.1) DATA OUTPUT  
 3. (CH.2) NA  
 4. (CH.2) DATA OUTPUT  
 5. (CH.3) NA  
 6. (CH.3) DATA OUTPUT  
 7. (CH.4) NA  
 8. (CH.4) DATA OUTPUT

\*U-10MHz, 10 BIT VIDEO  
 \*V-8 BIT VIDEO  
 \*W-10 BIT VIDEO

# DR-4V\*4F/4F-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)

### VIDEO OUTPUT (CH.3)

#### STATUS INDICATORS

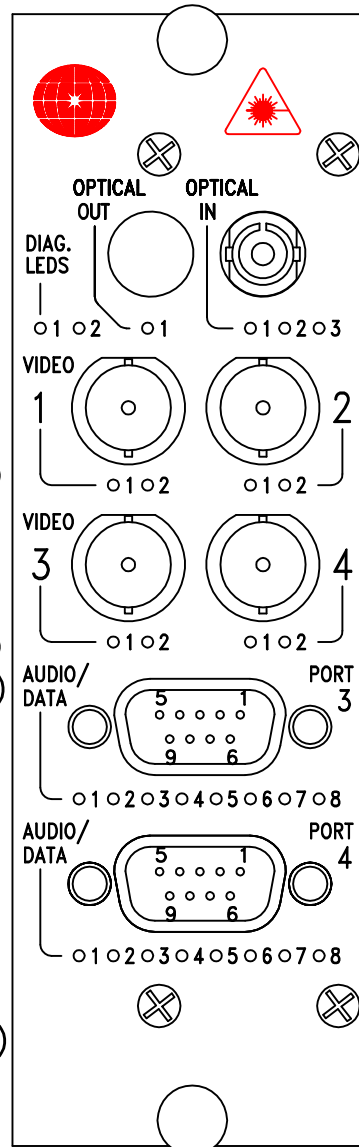
1. SYNC PRESENT (GREEN)
2. VIDEO PRESENT (GREEN)/OVERLOAD (RED)

### DATA RS422 OUTPUT (PORT 3) (DB-9 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

### DATA RS422 INPUT (PORT 4) (DB-9 FEMALE)

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



### 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)

### VIDEO OUTPUT (CH.4)

#### STATUS INDICATORS

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

### STATUS INDICATORS (PORT 3)

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

### STATUS INDICATORS (PORT 4)

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

\*U-10MHz, 10 BIT VIDEO  
 \*V-8 BIT VIDEO  
 \*W-10 BIT VIDEO

## 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: 4-channels, bi-directional RS-422 data

| Transmitter   | Receiver      | Video Resolution | # Fibers & Type | Wavelength  |
|---------------|---------------|------------------|-----------------|-------------|
| DT-4W4F/4F-2  | DR-4W4F/4F -2 | 10-bit           | 1 (MM)          | 1310/850nm  |
| DT-4W4F/4F -5 | DR-4W4F/4F 5  | 10-bit           | 1 (SM)          | 1310/1550nm |
| DT-4V4F/4F -2 | DR-4V4F/4F -2 | 8-bit            | 1 (MM)          | 1310/850nm  |
| DT-4V4F/4F -5 | DR-4V4F/4F -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).