



# **Installation/Operation Instructions**

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

**Part Number:**

**DX-4G/4G-x Series**

**(4-Channel Multi-Protocol Data Transceiver)**

Meridian Technologies, Inc.  
700 Elmont Road, Elmont NY 11003  
Telephone: 516. 285. 1000 Fax: 516. 285. 6300  
E-mail: [sales@meridian-tech.com](mailto:sales@meridian-tech.com)  
Web: [www.meridian-tech.com](http://www.meridian-tech.com)  
Document Version 1.0  
05/12/2010

## **Table of Contents**

|     |                                               |   |
|-----|-----------------------------------------------|---|
| 1.0 | Product Description .....                     | 3 |
| 2.0 | Installation .....                            | 3 |
| 3.0 | Product Signal Format & Specifications.....   | 4 |
| 4.0 | Data Status indicators .....                  | 5 |
| 5.0 | Multi-Protocol SIM Signal Assignment .....    | 6 |
| 5.1 | Changing the multi-protocol SIM jumpers ..... | 7 |
| 6.0 | Front Panel Pinout Assignment Diagram .....   | 8 |
| 7.0 | Troubleshooting .....                         | 9 |

## 1.0 Product Description

Meridian's product series DX-4G/4G-x are fiber optic modems that transmit four channels of user-selectable RS-232, RS-422 or RS-485 data channel 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-1001/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 two fiber units (DX) 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. Each of the second through fifth SIMs contains the bi-directional multi-protocol data signals.

## 2.0 Installation

Series DX-4G/4G-x product are two-slot wide cards and, as such, occupy two slots in Meridian's standard chassis (SR-1000/S, SR-1001/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 DX-4G/4G-x series products transmit and receive the following signals:

| Signal Type           | Channels | Transmit | Receive |
|-----------------------|----------|----------|---------|
| RS-232 (Tx & Rx data) | 8        | Yes      | Yes     |
| RS-422 (Tx & Rx data) | 4        | Yes      | Yes     |
| RS-485 (2 & 4-wire)   | 4        | Yes      | Yes     |

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

| 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 |                                         |
|------------|-----------------------------------------|
| Data       | DB9 Female                              |
| Optical    | Singlemode – ST or FC<br>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                   | -24                  | 21                  | 1300/850        | ST                | 24                         |
| Singlemode (FP Laser) 9/125   | -3                   | -24                  | 21                  | 1310/1 550      | ST, FC            | 24                         |
| Singlemode (DFB Laser) 9/125  | +3                   | -24                  | 27                  | 1310/1550       | ST, FC            | 24                         |

## 4.0 Data Status indicators

The figures 5.1 at the end of this document show the connector and LED indicator locations for the various data status indicators on the transceiver modules. There are a number of diagnostic indicators on the front panel of each module. Each module has various LEDs to indicate the input/output status of the optical and transmission carrier signals. These indicators are listed below:

| Optical output Indicators |                                |                                           |
|---------------------------|--------------------------------|-------------------------------------------|
| Indicator                 | Location                       | Function                                  |
| Tx carrier                | Under optical output connector | Optical output (Green – OK, Red – error)  |
| Power                     | Left side of module            | Green – ON                                |
| Diagnostic                | Under video input connectors   | Card diagnostic (Green – OK, Red – error) |

| Optical input 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                                      |

-----

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 one unit while the second LED is associated with the respective data output channel on the other unit. The table below shows the relationship between the connectors (I/O channels) and LEDs.

| Data Input/Output Status Indicators |                                 |
|-------------------------------------|---------------------------------|
| LED                                 | DX-4G/4G-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                             |

## 5.0 Multi-Protocol SIM Signal Assignment

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

RS-232      Eight full speed, 2-wire channels (Tx/Rx)  
RS-422      Four channel  
RS-485      Four channel (either 2 or 4 wire)

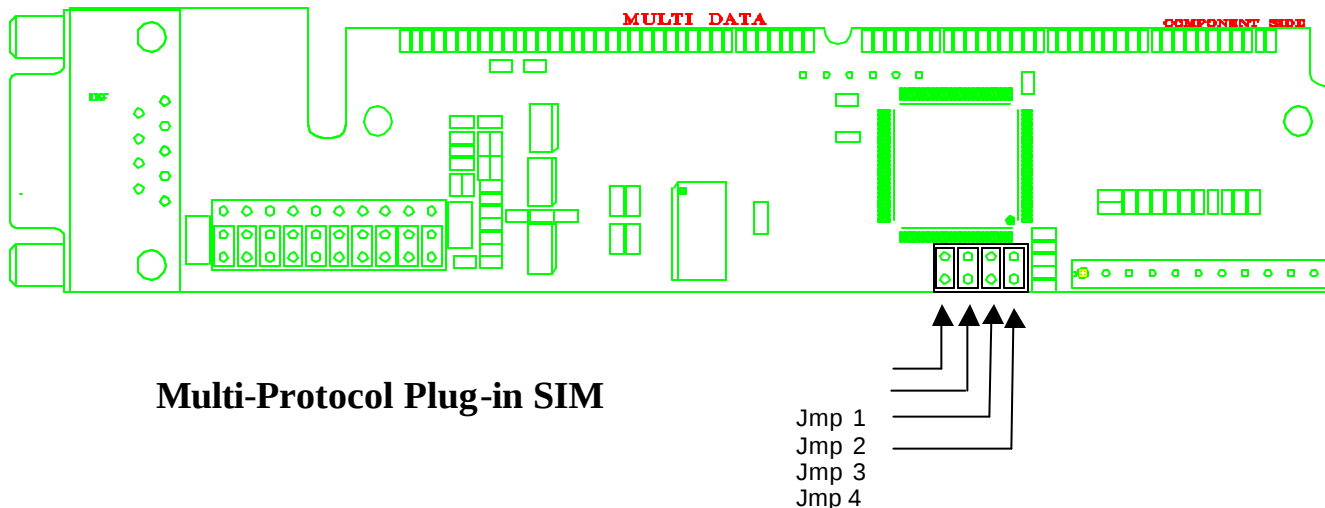
The RS-232 channels can be used either for transmitting/receiving eight channels of 2- wire RS-232 (Tx/Rx) or four channel of RS-232 (Tx/Rx) with one bi-directional handshake (e.g., RTS & CTS)

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.

| <b>Data Connector Pinout Assignment</b> |               |               |                   |                   |
|-----------------------------------------|---------------|---------------|-------------------|-------------------|
| <b>Pin #</b>                            | <b>RS-232</b> | <b>RS-422</b> | <b>RS-485 (2-</b> | <b>RS-485 (4-</b> |
| 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 the multi-protocol data SIM 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                                           | <b>ON</b> | OFF       | OFF       | OFF       |
| RS-422                                           | OFF       | <b>ON</b> | OFF       | OFF       |
| RS-485 (2-wire)                                  | OFF       | OFF       | <b>ON</b> | OFF       |
| RS-485 (4-wire)                                  | OFF       | OFF       | OFF       | <b>ON</b> |



**STANDARD CONFIGURATION FOR "G" (MULTIPROTOCOL DATA) DRIVER RS-232.**

**TO CHANGE SETTINGS FOR RS-422 OR RS-485 PLEASE FOLLOW THE TABLE.**

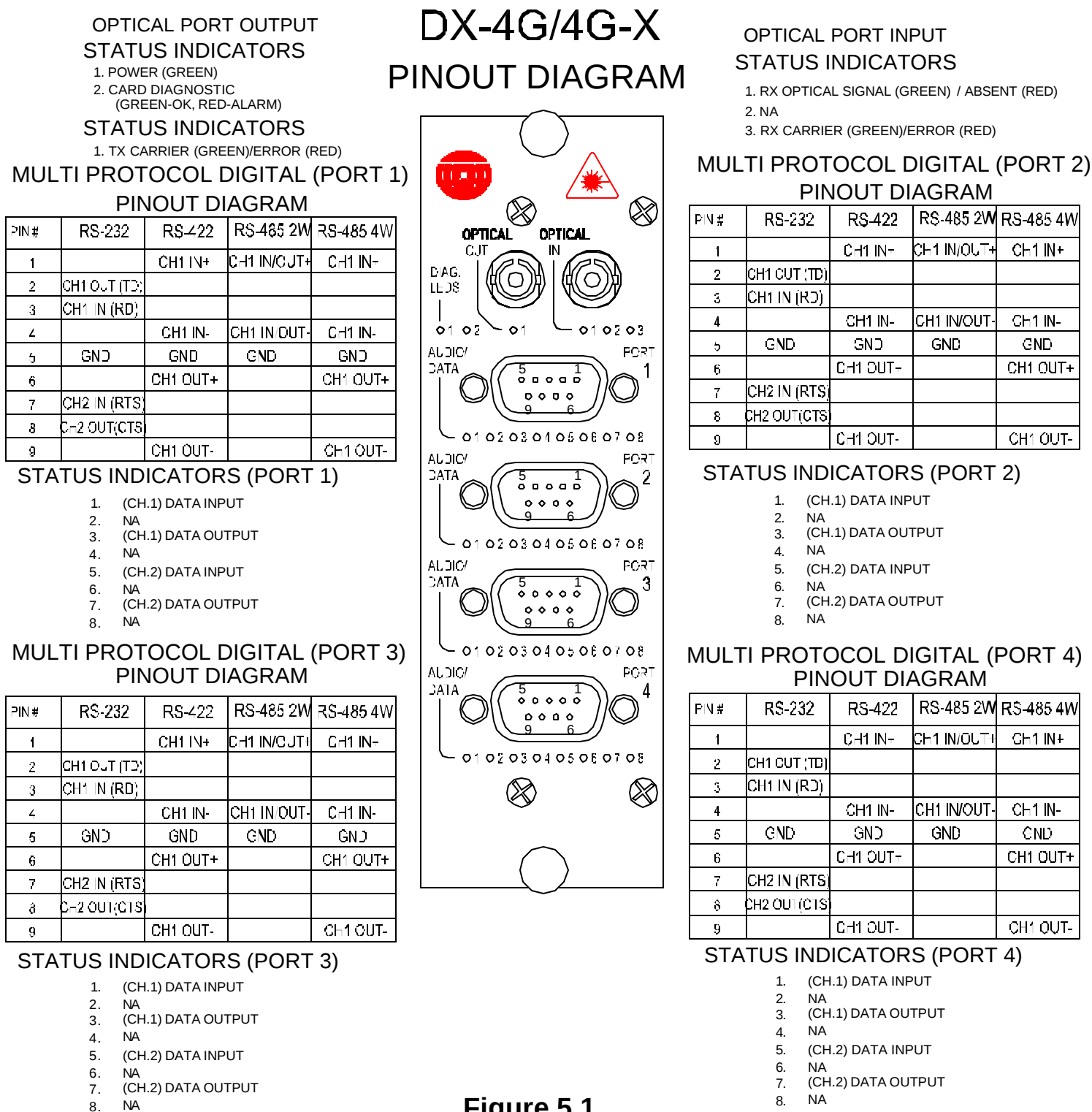
## 5.1 Changing the multi-protocol SIM jumpers

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.

## 6.0 Front Panel Pinout Assignment Diagram

Figure 5.1 below show the front panel layout, connector location and pinout assignment for the DX module.



**Figure 5.1**

**DX-4G/4G-x Front Panel Layout**

## 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 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:

[illegible]



Meridian Technologies, Inc.  
700 Elmont Road, Elmont NY 11003  
Telephone: 516-285-1000 Fax: 516-285-6300  
E-mail: [sales@meridian-tech.com](mailto:sales@meridian-tech.com)  
Web: [www.meridian-tech.com](http://www.meridian-tech.com)  
Document Version 1.0  
05/12/2010