Installation/Operation Instructions

Fiber Optic Data Transmission System

Part Number:

DX(A/B)-4D6J/4D6J-x (ST/FC)

(4-Channel RS-232 data & 6-Channel RS-485 data bi-directional Transceiver)

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1.0 Product Description

Meridian's product series DX(A/B)-4D6J-xD are fiber optic modems that transmit four channel of bi-directional RS-232 and six channel 2-wire, RS-485 data signals over one optical fiber for DXA/DXB system and two optical fiber for DX system using digital-encoding transmission technologies. This product series uses Meridian's standard 2-slot wide chassis mount card assembly and plugs into the following Meridian chassis: SR-1001/S, SR-1002/S, SR-1500/S, SR-1600/S, SR-1850, 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. These cards are available with either a one or two fiber interface. On the one fiber optical units (DXA/DXB) the optical Input/Output (TRx) connector is located on the right side of the module for both units. The two fiber units (DX) have two optical ports. The port on the left side of the front panel is the transmit port wile 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 next SIM card located in Port 2 contain the four bi-directional RS-232 data channels. The next two SIM cards in Port 3 and Port 4 contain the six bi-directional channels 2-wire, RS-485 data.

2.0 Installation

Series DX(A/B)-4D6J-xD series 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 DX(A/B)-4D6J-x series products transmit and receive the following signals:

Signal Type	Channels	Transmit	Receive
RS-232 data	4	Yes	Yes
RS-485 (2-wire) data	6	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
Bit Error Rate (BER)	Better than 10^{-9}

Data	
Formats	RS-485 (2-wire)
Date Rate (RS-485, 2-wire)	DC to 1Mb/s

Connectors	
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	-23	20	1300/850	ST	23
Singlemode (FP Laser) 9/125	-3	-23	20	1310/1550	ST, FC	23
Singlemode (DFB Laser) 9/125	+1	-26	27	1270/1610	ST, FC	24

Refer to section 7.0 for CWDM wavelength selections.

4.0 Operation

Data – Connect the RS-232 and RS-485 2-wire data for each of the data channels to the appropriate data Tx/Rx pins on the connector as shown in section 5.0

4.1 Status indicators

The front panel pinout diagrams in section 5 show the connector and LED indicator locations for the various status indicators on the unit. There are a number of diagnostic indicators on the front panel of each module. These indicators for each channel are listed below:

Transceiver DX(A/B)-4D6J-x Indicators		
Indicator	**Location**	**Function**
Power	Left side of module 1	Green – ON
Card Diagnostic	Left side of module 2	Green – OK, Red – alarm
Tx Carrier	Under optical output connector	Optical output (Green – OK, Red – error)
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)

4.2 RS-232 Data SIM Signal Assignment (Pinouts) & Indicator Lights

There is one RS-232 data SIM card in these modules located in Port 2. This data cards transmits/receives four RS-232 data channels. The data SIM has a DB9 female connector. The table below shows the appropriate pinout for port 2.

Pin #	RS-232 Data Connector Pinout Assignment DX(A/B)-4D6J (Port 2)
1	Ch 4 INPUT
2	Ch 1 OUTPUT
3	Ch 1 INPUT
4	Ch 2 INPUT
5	Gnd
6	Ch 2 OUTPUT
7	Ch 3 INPUT
8	Ch 3 OUTPUT
9	Ch 4 OUTPUT

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 and output

channel to show activity on both the input (transmit) and output (receive) pins. The table below shows the relationship between the connectors (I/O channels) and LEDs.

RS-232 Data Input/Output Status Indicators Port 2	
LED	**DX(A/B)-4D6J-x**
1	Input 1 – Green - data present
2	Output1 – Green - data present
3	Input 2 – Green - data present
4	Output2 – Green - data present
5	Input 3 – Green - data present
6	Output3 – Green - data present
7	Input 4 – Green - data present
8	Output4 – Green - data present

4.3 RS-485 2W Data SIM Signal Assignment (Pinouts) & Indicator Lights

There is one RS-485 data SIM card in these modules located in Port 3 & 4. This data cards transmits/receives six RS-485 (2-wire) data channels. The data SIM has a DB9 female connector.

RS-485 Data Connector Pinout Assignment (Port 3 & 4)		
Pin #	**Port 3**	**Port 4**
1	Ch 1 IN/OUT (+)	Ch 5 IN/OUT (+)
2	Ch 1 IN/OUT (-)	Ch 5 IN/OUT (-)
3	Ch 2 IN/OUT (+)	Ch 6 IN/OUT (+)
4	Ch 2 IN/OUT (-)	Ch 6 IN/OUT (-)
5	Gnd	Gnd
6	Ch 3 IN/OUT (+)	NA
7	Ch 3 IN/OUT (-)	NA
8	Ch 4 IN/OUT (+)	NA
9	Ch 4 IN/OUT (-)	NA

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

RS-485 Data Input/Output Status Indicators		
LED	**Port 3**	**Port 4**
1	Input 1 – Green - data present	Input 5 – Green - data present
2	Output1 – Green - data present	Output5 – Green - data present
3	Input 2 – Green - data present	Input 6 – Green - data present
4	Output2 – Green - data present	Output6 – Green - data present
5	Input 3 – Green - data present	
6	Output3 – Green - data present	
7	Input 4 – Green - data present	
8	Output4 – Green - data present	

5.0 Front Panel Diagram and Connector Pinout Assignments

The following front panel diagram shows a layout of the front panel including connector location, status indicators and connector pin-out information.

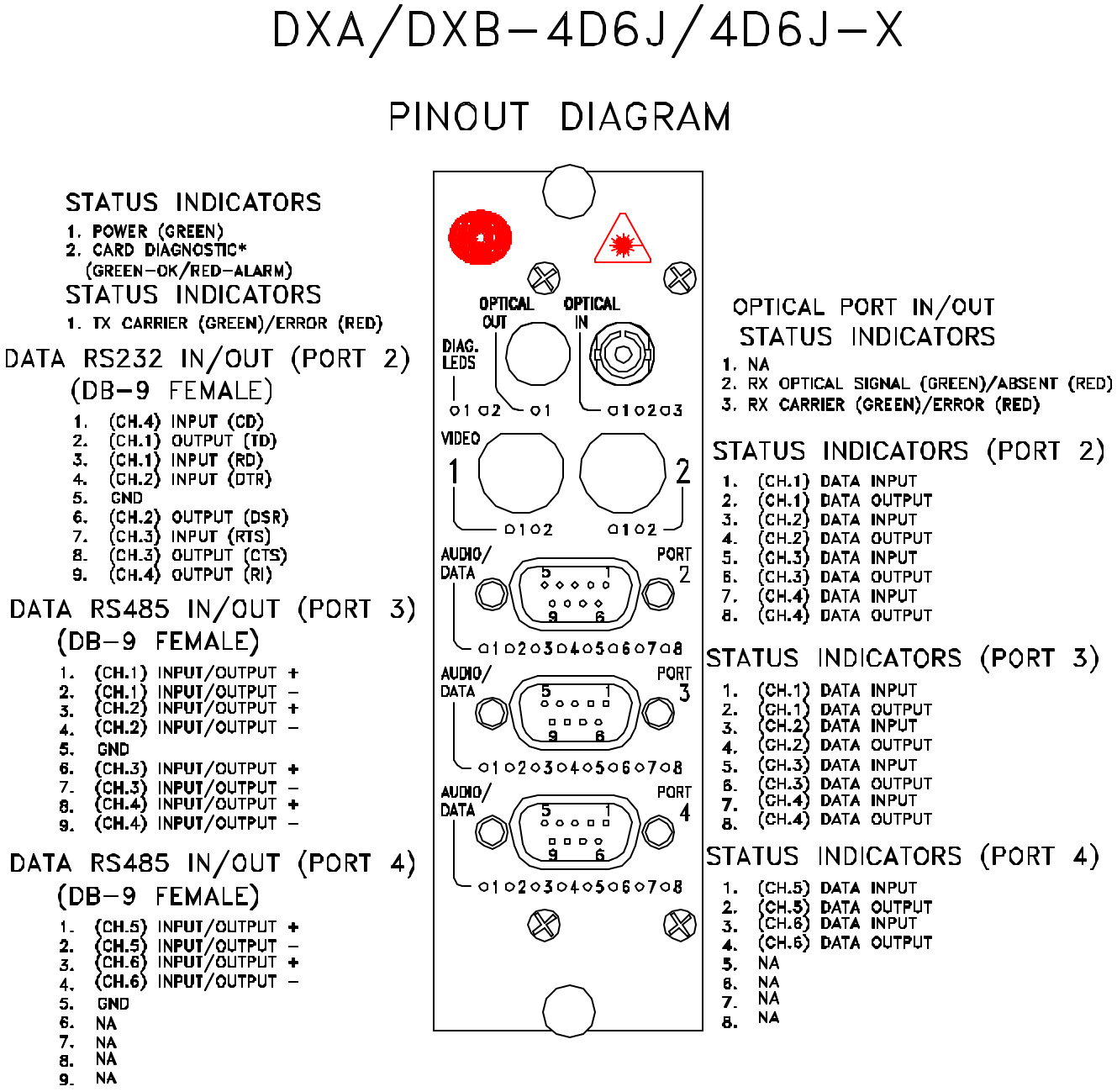


Figure 5.1
DXA/DXB-4D6J-x Front Panel Diagram For One Optical Fiber

DX-4D6J/4D6J-X

(2 FIBER)

PINOUT DIAGRAM

OPTICAL PORT OUTPUT STATUS INDICATORS

1. POWER (GREEN)
2. CARD DIAGNOSTIC*
   (GREEN-OK/RED-ALARM)

STATUS INDICATORS

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

DATA RS232 IN/OUT (PORT 2) (DB-9 FEMALE)

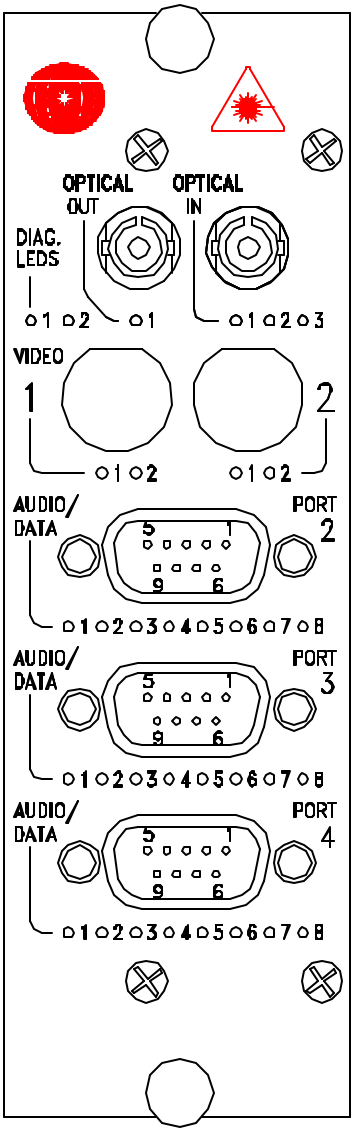
1. (CH.4) INPUT (CD)
2. (CH.1) OUTPUT (TD)
3. (CH.1) INPUT (RD)
4. (CH.2) INPUT (DTR)
5. GND
6. (CH.2) OUTPUT (DSR)
7. (CH.3) INPUT (RTS)
8. (CH.3) OUTPUT (CTS)
9. (CH.4) OUTPUT (RI)

DATA RS485 IN/OUT (PORT 3) (DB-9 FEMALE)

1. (CH.1) INPUT/OUTPUT +
2. (CH.1) INPUT/OUTPUT -
3. (CH.2) INPUT/OUTPUT +
4. (CH.2) INPUT/OUTPUT -
5. GND
6. (CH.3) INPUT/OUTPUT +
7. (CH.3) INPUT/OUTPUT -
8. (CH.4) INPUT/OUTPUT +
9. (CH.4) INPUT/OUTPUT -

DATA RS485 IN/OUT (PORT 4) (DB-9 FEMALE)

1. (CH.5) INPUT/OUTPUT +
2. (CH.5) INPUT/OUTPUT -
3. (CH.6) INPUT/OUTPUT +
4. (CH.6) INPUT/OUTPUT -
5. GND
6. NA
7. NA
8. NA
9. NA



OPTICAL PORT INPUT STATUS INDICATORS

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

STATUS INDICATORS (PORT 2)

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

STATUS INDICATORS (PORT 3)

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

STATUS INDICATORS (PORT 4)

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

Figure 5.2
DX-4D6J-x/x Front Panel Diagram For Two Optical Fibers

6.0 Product Part Number Variations

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

Basic module description:
Data: 4 channels, RS-232 bi-directional
Data: 6 channels, RS-485 2W bi-directional

Side "A"	Side "B"	# Fibers & Type	Wavelength
DXA-4D6J-2	DXB-4D6J-2	1 (MM)	1300/850nm
DXA-4D6J-5	DXB-4D6J-5	1 (SM)	1310/1550nm
DXA-4D6J-1	DXA-4D6J-1	2 (MM)	1300/1300nm
DXB-4D6J-3	DXB-4D6J-3	2 (SM)	1310/1310nm

For proper operation, it is necessary to match the side "A" unit with the associated side "B" unit.

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 DX(A) unit will transmit on one unique CWDM wavelength and receive on a 2nd wavelength while the DX(B) 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
DX-4D6J-27/3	1270nm
DX-4D6J-29/3	1290nm
DX-4D6J-31/3	1310nm
DX-4D6J-33/3	1330nm
DX-4D6J-35/3	1350nm
DX-4D6J-37/3	1370nm
DX-4D6J-39/3	1390nm
DX-4D6J-41/3	1410nm
DX-4D6J-47/3	1470nm
DX-4D6J-49/3	1490nm
DX-4D6J-51/3	1510nm
DX-4D6J-53/3	1530nm
DX-4D6J-55/3	1550nm
DX-4D6J-57/3	1570nm
DX-4D6J-59/3	1590nm
DX-4D6J-61/3	1610nm

When using in a system with a CWDM multiplexer/demultiplexer, it is essential that the specific wavelengths to and from these units are 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 Data*
Action: Check the channel data input status indicator lights on the transmit module to ensure it is on (indicating a data input signal). Also check the associated channel data output status indicator lights 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.

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

Notes:

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