



Installation/Operation Instructions

Fiber Optic Data Transmission System

Part Number:

DXA/DXB-7C2J/7C2J-x (ST/FC) 1 Fiber Series

DX-7C2J/7C2J-x (ST/FC) 2 Fiber Series

***(7-Channel Contact Closure & 2-Channel RS-485 data
bi-directional Transceiver)***

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DXA/DXB-7C2J/7C2J-x Series
Fiber Optic Transmission System
Installation Instructions

1.0 Product Description

Meridian's product series DXA/DXB-7C2J/7C2J-x are fiber optic modems that transmit seven channel of bi-directional Contact Closures and two 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-1002/S, SR-1600/S, 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 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 next SIM cards located in Port 2 and 3 contains the seven bi-directional contact closure channels. The last SIM card located in Port 4 contain the two bi-directional channels 2-wire, RS-485 data.

Optional conformal coating provides an additional level of protection from environments with high humidity.

2.0 Installation

Series DX(A/B)-7C2J/7C2J-x 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)-7C2J/7C2J-x series products transmit and receive the following signals:

Signal Type	Channels	Transmit	Receive
Dry contact	7	Yes	Yes
RS-485 (2-wire) data	2	Yes	Yes

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

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

Connectors	
Contact	DB15 Female
Data RS-485	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 connect or	Optical Dynamic Range (dB)
Multimode (FP Laser) 62.5/125	-3	-24	21	850/1300	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

Refer to section 7.0 for CWDM wavelength selections.

4.0 Operating

Data – Connect the Contact closure 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)-7C2J/7C2J-xD 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 Contact Mapping External Connections Configuration

Contact closure communication between the DXA and DXB units is done in the following manner:

Inputs 1 through 7 on each contact closure SIM card–

1. Connect each contact input between the input pins (1-4, 6-7) and ground (pin 5) for each respective contact input channel.
2. The corresponding isolated contact outputs on the receive module are available on pins 1 & 2, 3 & 4, 6 & 7, 8 & 9, 10 & 11, 12 & 13 and 14 & 15 (for channels 1 through 7 respectively).
3. Note that the input/output contacts are located on the same SIM location on the DXA & DXB modules. For example, if the contact inputs are connected to the bottom SIM card on the DXA module (Port 2), the corresponding outputs on the DXB modules are located on the SIM card in the same bottom location (Port 2).

4.3 Contact Mapping Signal Assignment (Pinouts) & Indicator Lights

The DXA & DXB-7C2J/7C2J-x Contact Mapping channel connector pinouts are shown in the table below. The Contact Mapping has a DB15 female connector.

Contact Mapping Connector Pinout		
	INPUT	OUTPUT
Pin #	DXA-Port 2/ DXB-Port 3	DXA-Port 3/ DXB-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	Ch 7 Input	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	Ch 7 Output
15	NA	Ch 7 Output

The Contact Mapping boards (SIM) is inserted in the module at the (port 2 & 3). Input connections located on DXA module in port 2, on DXB module in port 3, Output connections located on DXA module in port 3, on DXB module in port 2.

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

Contact Mapping Input/Output Status indicators		
LED	DXA - Port 2/ DXB - Port 3	DXA - Port 3/ DXB - 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	Channel 7 - input present	Channel 7 - output present
8	NA	NA

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

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

Pin #	RS-485 Data Connector Pinout Assignment (Port 4)
1	Ch 1 INPUT/OUTPUT (+)
2	Ch 1 INPUT/OUTPUT (-)
3	Ch 2 INPUT/OUTPUT (+)
4	Ch 2 INPUT/OUTPUT (-)
5	GND
6	NA
7	NA
8	NA
9	NA

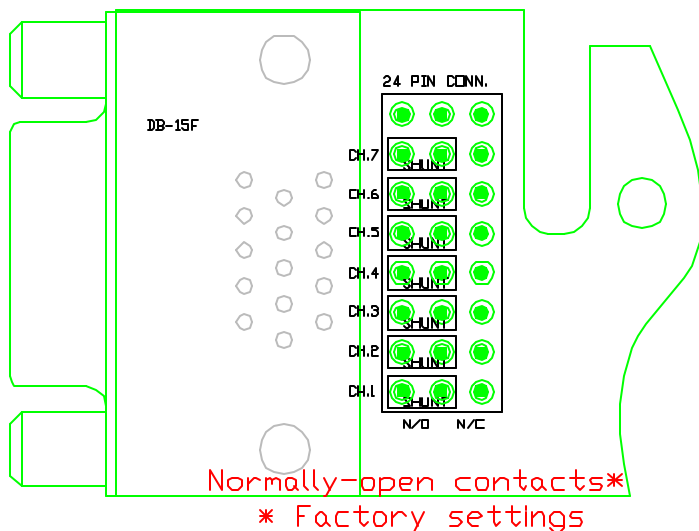
The table below shows the LED status indicators associated with this data SIM

RS-485 Data Input/Output Status Indicators	
LED	Port 4
1	Input 1 – Green - data present
2	Output 1 – Green - data present
3	Input 2 – Green - data present
4	Output 2 – Green - data present
5	NA
6	NA
7	NA
8	NA

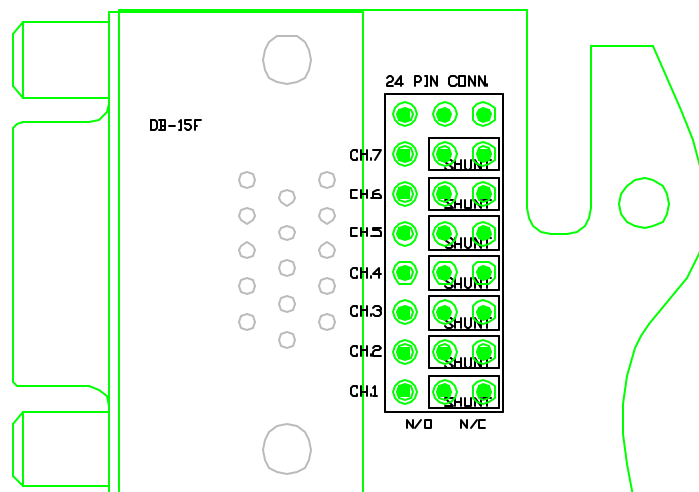
4.5 Contact Mapping SIM Jumper Settings

The RX 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:



Contact Mapping jumper settings
for Normally-Open Output
Contacts
***Factory Settings**



Contact Mapping jumper settings
for Normally-Closed Output
Contacts

4.6 Changing the SIM jumpers

The jumpers to change the data from Normally-Open to Normally-Closed 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 Contact Closure (C) card is located on the bottom of the module port 2 & 3.
4. Refer to the above drawing to locate the 7 jumpers that are located near the DB-15 connector.
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 DXA and DXB units.

5.0 Front Panel Diagram and Connector Pinout Assignment

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

DXA-7C2J/7C2J-X

(J-2 WIRE RS-485)

PINOUT DIAGRAM

STATUS INDICATORS

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

STATUS INDICATORS

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

DATA INPUT (PORT 2) (HD-15 FEMALE)

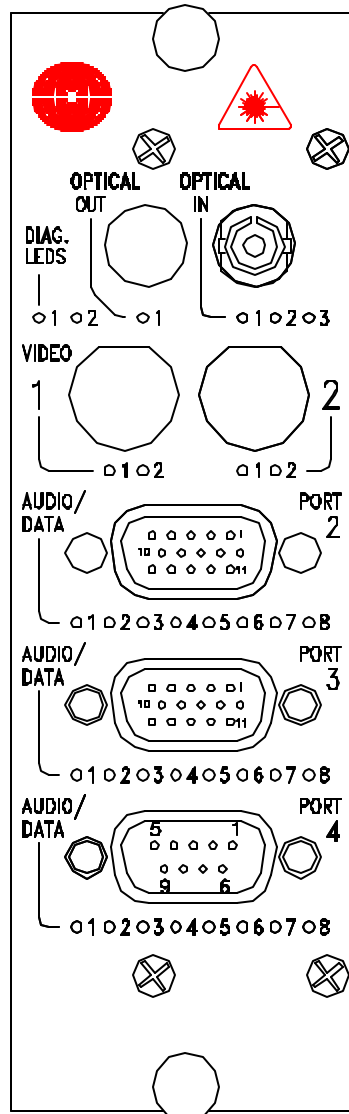
1. (CH.1) INPUT
2. (CH.2) INPUT
3. (CH.3) INPUT
4. (CH.4) INPUT
5. GND
6. (CH.5) INPUT
7. (CH.6) INPUT
8. (CH.7) INPUT
- 9.-15. NA

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. (CH.7) OUTPUT
15. (CH.7) OUTPUT

DATA RS485 IN/OUT(PORT 4) (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. NA
7. NA
8. NA
9. NA



OPTICAL PORT STATUS INDICATORS

1. NA
2. RX OPTICAL SIGNAL (GREEN)/ABSENT (RED)
3. RX CARRIER (GREEN)/ERROR (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. (CH.7) INPUT PRESENT
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. (CH.7) OUTPUT PRESENT
8. NA

STATUS INDICATORS (PORT 4)

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

Figure 5.1

DXA-7C2J/7C2J-x Front Panel Diagram For One Optical Fiber

DXB-7C2J/7C2J-X

(J-2 WIRE RS-485)

PINOUT DIAGRAM

STATUS INDICATORS

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

STATUS INDICATORS

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

DATA OUTPUT (PORT 2) (HD-15 FEMALE)

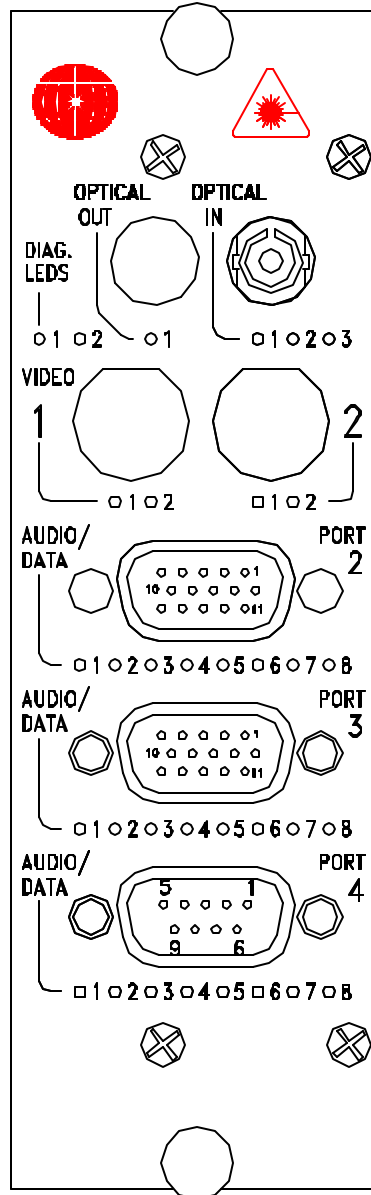
1. (CH.1) OUTPUT
2. (CH.1) OUTPUT
3. (CH.2) OUTPUT
4. (CH.2) OUTPUT
5. GND
6. (CH.3) OUTPUT
7. (CH.3) OUTPUT
8. (CH.4) OUTPUT
9. (CH.4) OUTPUT
10. (CH.5) OUTPUT
11. (CH.5) OUTPUT
12. (CH.6) OUTPUT
13. (CH.6) OUTPUT
14. (CH.7) OUTPUT
15. (CH.7) OUTPUT

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. (CH.7) INPUT
- 9.-15. NA

DATA RS485 IN/OUT(PORT 4) (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. NA
7. NA
8. NA
9. NA



OPTICAL PORT STATUS INDICATORS

1. NA
2. RX OPTICAL SIGNAL (GREEN)/ABSENT (RED)
3. RX CARRIER (GREEN)/ERROR (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. (CH.7) OUTPUT PRESENT
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. (CH.7) INPUT PRESENT
8. NA

STATUS INDICATORS (PORT 4)

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

Figure 5.2

DXB-7C2J/7C2J-x Front Panel Diagram For One Optical Fiber

6.0 Product Part Number Variations

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

Basic module description:

Data: 7 channels, Contact closure bi-directional

Data: 2 channels, RS-485 2W bi-directional

Side "A"	Side "B"	# Fibers & Type	Wavelength	Optical Connector
DXA-7C2J/7C2J-2	DXB-7C2J/7C2J-2	1 (MM)	850/1300nm	ST
DXA-7C2J/7C2J-5	DXB-7C2J/7C2J-5	1 (SM)	1310/1550nm	FC
DXA-7C2J/7C2J-5ST	DXB-7C2J/7C2J-5ST	1 (SM)	1310/1550nm	ST

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-7C2J/7C2J-27/3	1270nm
DX-7C2J/7C2J-29/3	1290nm
DX-7C2J/7C2J-31/3	1310nm
DX-7C2J/7C2J-33/3	1330nm
DX-7C2J/7C2J-35/3	1350nm
DX-7C2J/7C2J-37/3	1370nm
DX-7C2J/7C2J-39/3	1390nm
DX-7C2J/7C2J-41/3	1410nm
DX-7C2J/7C2J-47/3	1470nm
DX-7C2J/7C2J-49/3	1490nm
DX-7C2J/7C2J-51/3	1510nm
DX-7C2J/7C2J-53/3	1530nm
DX-7C2J/7C2J-55/3	1550nm
DX-7C2J/7C2J-57/3	1570nm
DX-7C2J/7C2J-59/3	1590nm
DX-7C2J/7C2J-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 Contact Closure transmission*

Action: Check the individual contact closure channel input status indicator lights # 1, 3, 5, 7 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 (# 2, 4, 6, 8) on the other 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 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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