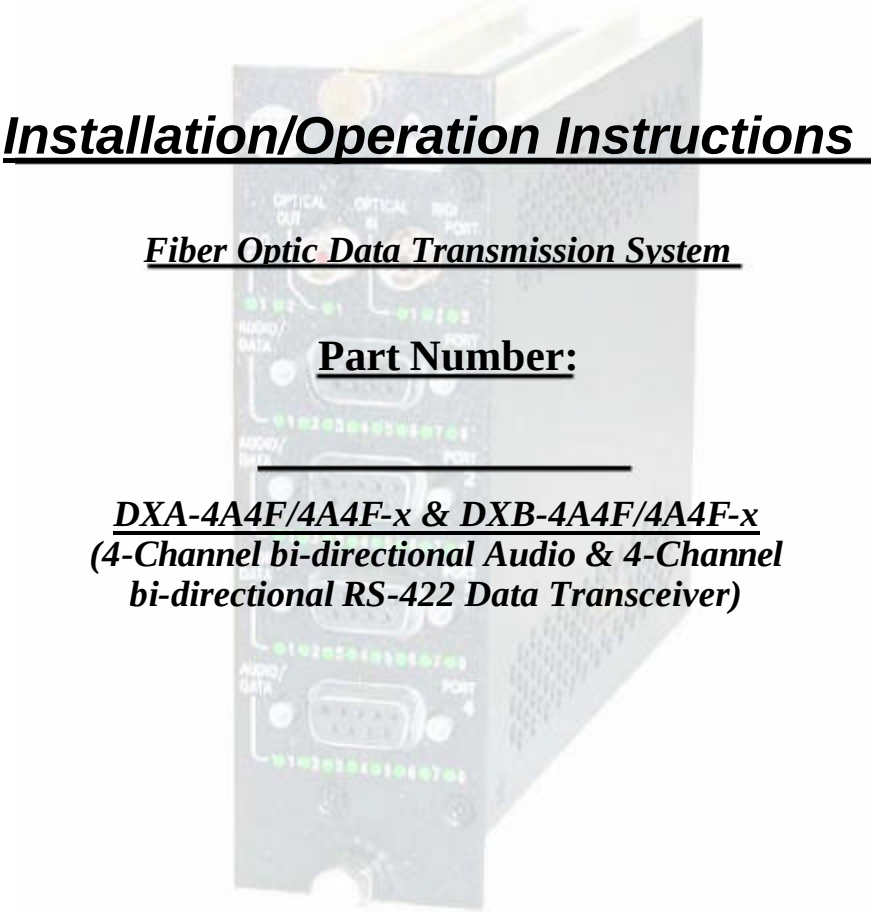
# *Installation/Operation Instructions*

***Fiber Optic Data Transmission System***

## Part Number:

***DXA-4A4F/4A4F-x & DXB-4A4F/4A4F-x***
***(4-Channel bi-directional Audio & 4-Channel bi-directional RS-422 Data Transceiver)***



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## 1.0 Product Description

Meridian's DXA/DXB-4A4F/4A4F-x product series are fiber optic modems that transmit and receive four channels of bi-directional audio and four channels of full-duplex RS-422 (4-wire) data channels 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, 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 (Rx) & output (Tx) connector is located on the right side of the module. The second & third SIM cards contains four bi-directional audio, The four & fifth SIM cards contains four bi-directional RS-422 data channels.

## 2.0 Installation

Series DXA/DXB-4A4F/4A4F-x 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 Part # Signal Format & Specifications

The DXA/DXB-4A4F/4A4F series products transmit and receive the following signals:

| RS-422 (bi-directional) Module Part #'s | | |
|---|---|---|
| Part # | Channels | Fiber type |
| DXA-4A4F/4A4F-2 & DXB-4A4F/4A4F-2 | 4 | Multimode |
| DXA-4A4F/4A4F-5 & DXB-4A4F/4A4F-5 | 4 | Singlemode |

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

| Audio | |
|---|---|
| In/Out Impedance | 600O, unbalanced/unbalanced |
| Frequency Response | 10Hz to 20KHz |
| SNR | >90dB (weighted) @ 1KHz |
| In/Out Level | -6 to +6dBm (4Vp-p, max) |
| THD | <0.01% @ 1KHz |
| Digitized Resolution | 24 bit |

| Data | |
|---|---|
| Formats | RS-422 (bi-directional) |
| Data Rate (RS-485) | DC to 300Kb/s |
| Bit Error Rate (BER) | Better than $10^{-9}$ |

| Connectors | |
|---|---|
| Audio | DB9 Female (2 BI-DI RS-422 channels per connector) |
| Data | DB9 Female (2 BI-DI RS-422 channels per connector) |
| Optical | Singlemode – ST or FC<br>Multimode - ST |

## 4.0 Audio SIM Signal Assignment (Pinouts) & Indicator Lights

The front panel pinout diagrams in section 5.1 show the connector and LED indicator locations for the audio & data status indicators on the unit. In addition, each of the audio/data input/output channels has indicators associated with them to provide quick visual indications of the channel activity. These indicators for each of the audio & data channels are listed below:

| Transceiver (DXA/DXB-4A4F/4A4F-x) Indicators | | |
|---|---|---|
| **Indicator** | **Location** | **Function** |
| Power | Left side of module | Green – ON |
| 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) |

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Each audio input/output channel has four LED status indicators located under the associated audio I/O connector. Two adjacent LEDs are associated with each audio input channel and two are associated with the respective audio output channel. The table below shows the relationship between the connectors (I/O channels) and LEDs.

| Audio Input/Output Status Indicators | |
|---|---|
| **LED** | **DXA/DXB-4A4F/4A4F-x** |
| 1 | Input 1 – Present |
| 2 | Input 1 – Overload |
| 3 | Input 2 – Present |
| 4 | Input 2 – Overload |
| 5 | Output 1 – Present |
| 6 | Output 1 – Overload |
| 7 | Output 2 – Present |
| 8 | Output 2 – Overload |

Audio input PRESENT LEDs – Each of the LEDs associated with a specific audio input channel will light when the audio input source is connected and has a signal level greater than -8Db.

Audio input OVERLOAD LEDs – when the audio input level of any channel exceeds +8dB, the associated audio channel input Overload LED will turn on indicating that the audio input level is too high and distortion on the output may result.

Audio output PRESENT LEDs – This light will turn on when the audio input on the transmit side is present, the DXA & DXB units are powered and the fiber in connected between the two modems.

Audio output OVERLOAD LEDs – These lights will light when the respective audio input on the transmit side is over +8dB. Since the audio output level will track the audio input level, this light should not illuminate when the audio input is below the overload condition (+8dB)

The DXA/DXB-4A4F/4A4F-x Audio channel connector pinouts are shown in the table below:

| DXA/DXB-4A4F/4A4F-x | |
|---|---|
| **Pinout** | |
| 1 | Audio Ch 1 Output (-) |
| 2 | Audio Ch 1 Output (+) |
| 3 | Audio Ch 2 Output (-) |
| 4 | Audio Ch 2 Output (+) |
| 5 | GND |
| 6 | Audio Ch 1 Input (-) |
| 7 | Audio Ch 1 Input (+) |
| 8 | Audio Ch 2 Input (-) |
| 9 | Audio Ch 2 Input (+) |

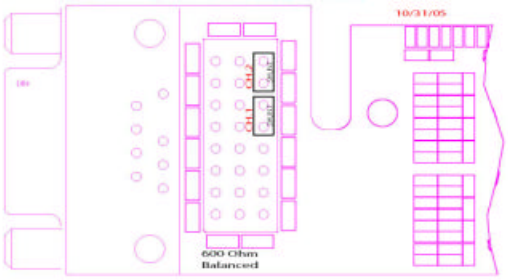
The audio board (SIM) is inserted in the module (port 1 & port 2).

**The attached figures in section 6 show the module front panel and associated connector location & pinouts**

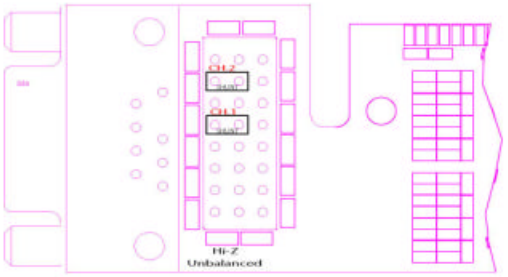
## 4.1 Audio SIM Jumper Settings

Each audio SIM has 2 jumpers on it (located directly behind the DB9 connector), one for each channel. These jumpers are used to set the input/output impedance of the audio channels. Each audio input channel can be set to either 600ohm (balanced) or 47kohm (unbalanced) input impedance. Each audio output channel's impedance can be set to either 600 ohm, balanced or low impedance. The default setting is 600 ohm, balanced.

The figures below illustrate these jumpers and how they are configured




Audio jumper settings for 600Ohm Balanced Input/Output




Audio jumper settings for Hi-Z Unbalanced Input/Output

## 5.0 Data SIM Signal Assignment (Pinouts) & Indicator Lights

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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.

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

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

| RS-422 Data Connector Pinout Assignment (each SIM identical) | | |
|---|---|---|
| **Pin #** | **DXA-4A4F/4A4F** | **DXB-4A4F/4A4F** |
| 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 1 OUT (+) | Ch1 IN (+) |
| 7 | Ch 1 OUT (-) | Ch1 IN (-) |
| 8 | Ch 2 OUT (+) | Ch2 IN (+) |
| 9 | Ch 2 OUT (-) | Ch2 IN (-) |

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

| RS-422 Data Connector Status Indicators (each SIM identical) | | |
|---|---|---|
| **LED #** | **DXA-xF** | **DXB-xF** |
| 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 | N/A | Ch1 Data Input |
| 6 | Ch 1 Data Output | N/A |
| 7 | N/A | Ch 2 Data Input |
| 8 | Ch 2 Data Output | N/A |

The data board (SIM) is inserted in the module (port 3 & port 4).

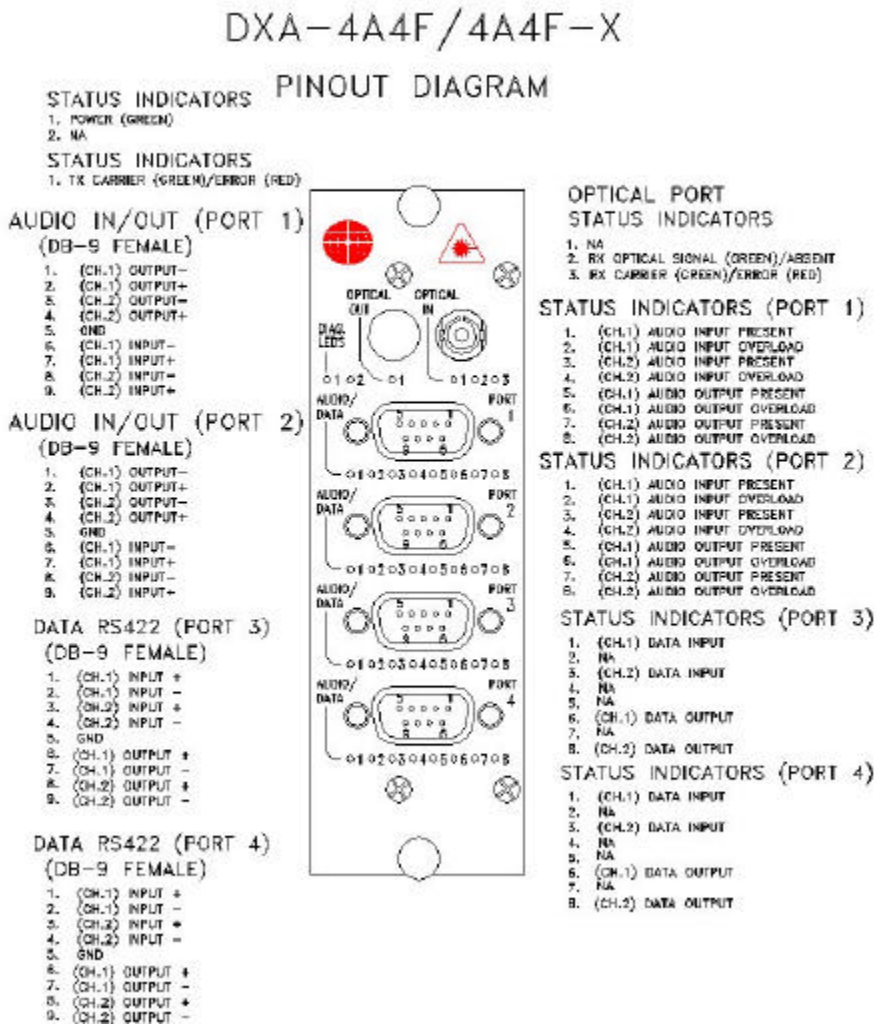


Figure 5.1
DXA-4A4F-4A4F-X Front Panel Layout/Pinout Diagrams

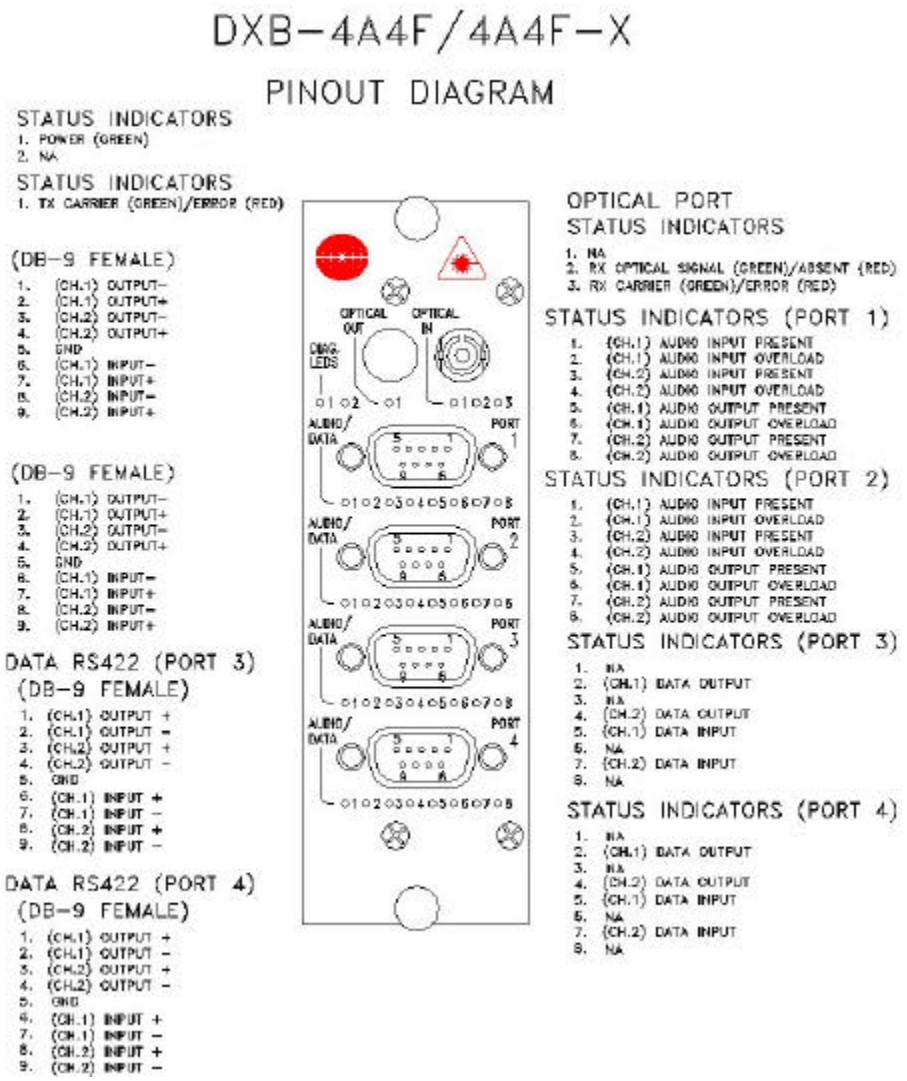


Figure 5.1
DXB-4A4F-4A4F-X Front Panel Layout/Pinout Diagrams

## 7.0 Optical Specifications

| 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 |

## 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 Audio*

**Action:** Check the audio input status indicator lights (5 & 6) on the transmit module to ensure that they are on (indicating an audio input signal). Also check the audio output status indicator lights (1 & 2) on the corresponding receiver module to ensure that the signal is being transmitted and received. If not, please check the audio input/output and fiber connections.

**Problem:** *No Data*

**Action:** Check the data input status indicator lights below data connector to ensure it is on (indicating a data input signal). Also check the associated 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).