



**Fiber Optic 10/100 Base-T Ethernet**  
**Transmission System**

**Installation Instructions**

**Part Numbers:**

**MXA/MXB-1R-x (one fiber)**

**(10/100 Base-T Ethernet Extender)**

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# **MXA/MXB-1R-x**

## **10/100 Base-T Ethernet Data Transmission System**

### **Installation Instructions**

## **1.0 Product Description**

Meridian's MXA/MXB-1R-x products are 10/100 Base-T fiber optic Ethernet extender modems that transmit & receive one channel of bi-directional 10/100 Base-T Ethernet data over optical fibers using digital transmission technologies. The MXA/MXB-1R-x is the stand-alone model. This product is powered by internal switching power supply and will accept 12-24VAC or DC. (Part # WP-24A customer supplied)

Both ST and FC optical connectors are supported, depending on the part number. An ST optical interface is available for both multimode and singlemode fiber applications while the FC optical interface is available only on singlemode products. Optional conformal coating provides an additional level of protection from environments with high humidity.

## **2.0 Installation**

The MXA/MXB-1R-x is a shelf mount module and can be mounted in either a horizontal or vertical configuration. A 2-pin plug-in connector is located on the side of the module for power. Meridian recommends the WP-24A transformer for proper operation of this module.

## **3.0 Product Part Number Description**

The MXA/MXB-1R-x series products are available in one fiber version. In addition, both singlemode and multimode fiber are supported. The table below lists the various part numbers and their optical transmission characteristics:

| Module Part # |             | # Fibers | Fiber Type | Optical Connector(s) |
|---------------|-------------|----------|------------|----------------------|
| MXA-1R-2      | MXB-1R-2    | 1        | Multimode  | ST                   |
| MXA-1R-5      | MXB-1R-5    | 1        | Singlemode | FC                   |
| MXA-1R-5/ST   | MXB-1R-5/ST | 1        | Singlemode | ST                   |

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

| <b>Data</b>          |                                                                     |
|----------------------|---------------------------------------------------------------------|
| Formats              | IEEE 802.3 CSMA/CD<br>IEEE 802.3i 10Base-T<br>IEEE 802.3u 100Base-T |
| Date Rate            | 10/100 Mb/s, Auto select                                            |
| Bit Error Rate (BER) | Better than $10^{-9}$                                               |

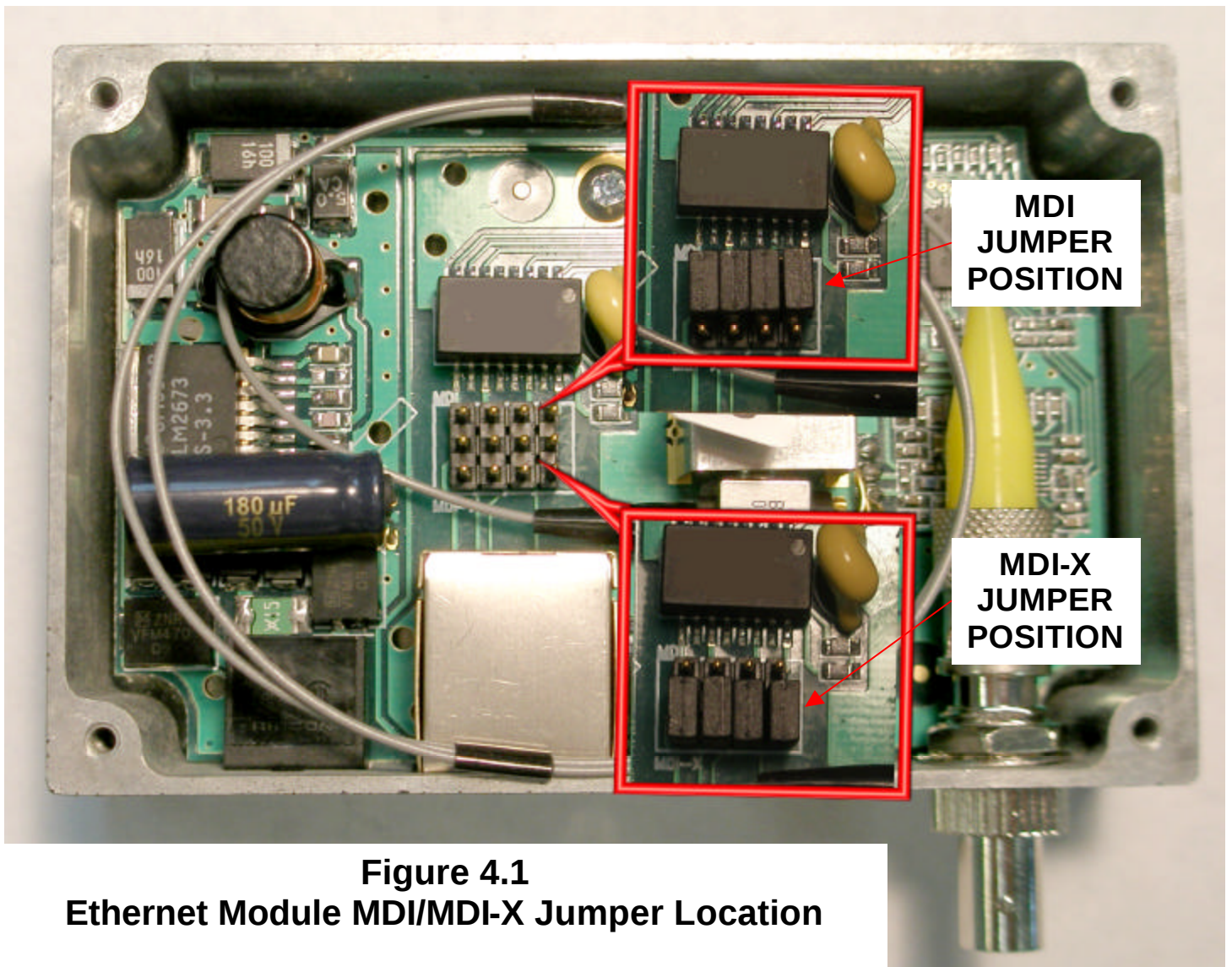
| <b>Connectors</b> |                                         |
|-------------------|-----------------------------------------|
| Data              | RJ-45                                   |
| Optical           | Singlemode – ST or FC<br>Multimode - ST |

## 4.0 Data Connector Pin Assignment & MDI/MDI-X Configuration

This product series utilizes an RJ-45 Ethernet data connector with standard pin assignments. In addition, these Meridian modems can be configured for both MDI & MDI-X (cross-connect) configurations. The table below shows these pin assignments for both MDI and MDI-X configurations.

| <b>Pin #</b> | <b>MDI Configuration</b> | <b>MDI-X Configuration</b> |
|--------------|--------------------------|----------------------------|
| 1            | Transmit (+)             | Receive (+)                |
| 2            | Transmit (-)             | Receive (-)                |
| 3            | Receive (+)              | Transmit (+)               |
| 4            | N/A                      | N/A                        |
| 5            | N/A                      | N/A                        |
| 6            | Receive (-)              | Transmit (-)               |
| 7            | N/A                      | N/A                        |
| 8            | N/A                      | N/A                        |

MXA-1R-x module come pre-configured for MDI connection that connects to LAN. And MXB-1R-x module come pre-configured for MDI-X connection that connects to Computer. Changing to an MDI or MDI-X configuration is simple. See the photograph below in Figure 4.1 for the jumper location that is used to convert the module from an MDI to and MDI-X configuration.



**Figure 4.1**  
**Ethernet Module MDI/MDI-X Jumper Location**

Directly behind the RJ-45 Ethernet connector is the four jumpers that converts the module from its MDI configuration to the MDI-X (cross connect) configuration. Follow the steps below to change connection configurations

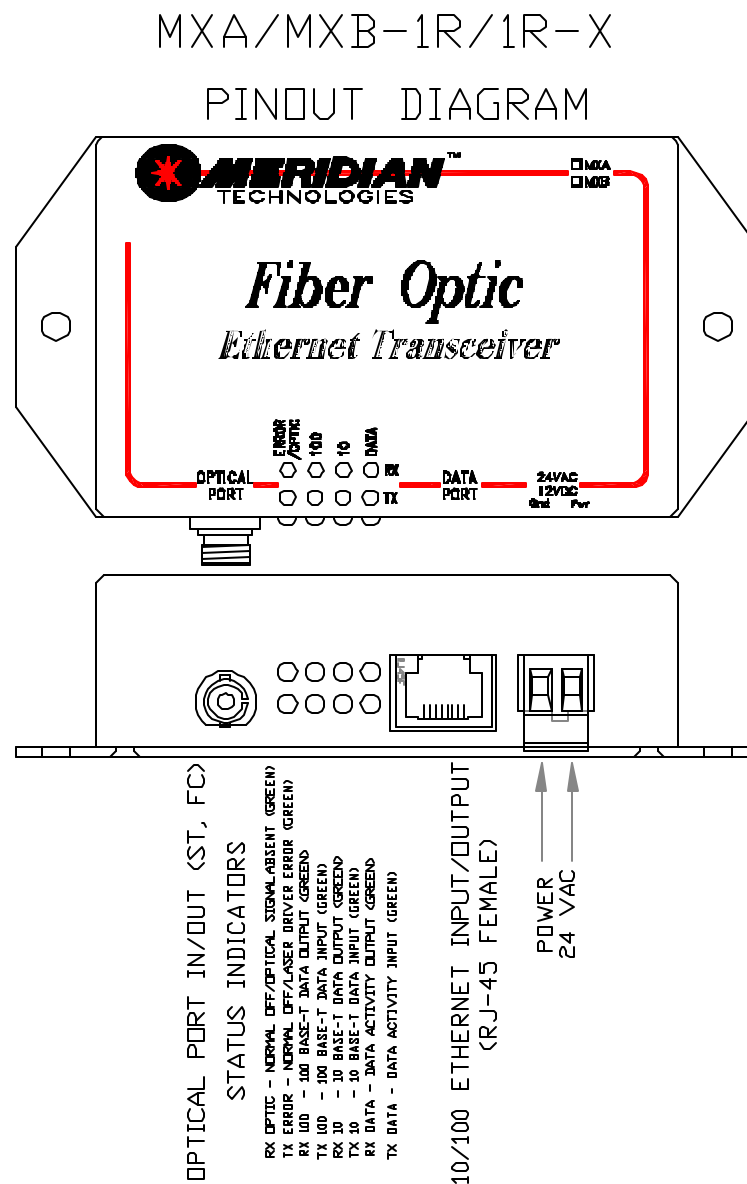
1. Position the module as shown in the above photograph and remove the side cover by removing the 4 screws in the corners of the side cover.
2. Locate the jumpers on it. This will be directly behind the RJ-45 connector and pull directly upwards (away from the circuit board) being careful not to bend the pins on the circuit board.
3. Move the jumpers toward the RJ-45 connector and place back on the header, being careful not to bend the jumper leads on the circuit board. Seat firmly on the leads.
4. Replace side cover and secure with the 4 screws.
5. Repeat, as required, with the other unit.

## 5.0 Operation/Front Panel LED Indicators

The front panel diagrams shown below. There are a number of indicator lights that provide visual operational status of the modules and link.

The function of these LED indicators is as follows:

- Rx Optic - Off (normal), Green – Optical signal absent
- Tx Error - Off (normal), Green - Laser driver error
- RX 100 - Green – when receiving 100 Base-T data
- TX 100 - Green – when transmitting 100 Base-T data
- RX 10 - Green – when receiving 10 Base-T data
- TX 10 - Green – when transmitting 10 Base-T data
- RX Data - Green flashing (normal) when data is being received into module
- TX Data - Green flashing (normal) when data is being transmitted out of module



**Figure 5.1**  
**10/100 Ethernet Module Pinout**

## 6.0 Optical Specifications

The table below lists the optical specifications for both singlemode and multimode fiber applications.

| 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 | -6                   | -27                  | 21                  | 1300/850        | ST                | 24                         |
| Singlemode (FP Laser)<br>9/125   | -6                   | -27                  | 21                  | 1310/1550       | ST, FC            | 24                         |

## 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:** *No Data*

**Action:** 1 – One fiber units (MXA/MXB) – Check to ensure that an MXA unit is optically connected to an MXB unit. An MXA or an MXB will not communicate with a module of the same type MXA or MXB.  
2 - Check that both of the modules have the MDI/MDI-X jumpers set correctly for the application.

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

### Notes:

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