



## **Installation/Operation Instructions**

### **Fiber Optic Audio Transmission System**

***DT/DR-xA Series***  
***(Multi-Channel Audio Transmitter/Receiver)***  
***(4 to 16 Channels)***

***(Multimode, singlemode, CWDM)***

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 2.0  
03/17/2010

## **Table of Contents**

1.0	Product Description.....	3
2.0	Installation .....	3
3.0	Operation .....	3
3.1	Audio Status indicators.....	3
4.0	Product Signal Format & Pinouts .....	5
5.0	Specifications.....	5
6.0	SIM Jumper Settings.....	6
7.0	Front Panel Pinout Assignment Diagram .....	7
8.0	Troubleshooting.....	9
	Appendix 1 – Applicable Product Part Number Variations .....	10

## 1.0 Product Description

Meridian's product series DT/DR-xA are fiber optic modems that transmit and receive from 4 to 16 uni-directional audio channels over one optical fiber using digital transmission technologies (the exact number of channels is determined by the part number in Appendix 1). 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 optical output (Tx) connector is located on the left side of the module while the optical input (Rx) connector is adjacent to it on the right side of the module. Each of the four remaining SIM locations contains four unidirectional audio channel interfaces for a total of 16 (4 channels per SIM card), depending on part number.

## 2.0 Installation

Series DT-xA & DR-xA products are two-slot wide cards and, as such, occupy two slots in Meridian's standard chassis (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 Operation

Connect the audio source to one of the channels' input pins as shown in section 4.0. Connect an audio output device to the associated channel's output pins on the other module. To obtain optimal performance, the audio input level should be set to 0dB. The audio output level will track the input level. Once proper operation is verified, the other channels can be connected per the pinout diagram in this manual.

### 3.1 Audio Status indicators

Each audio input/output channel has four LED status indicators located under the associated audio I/O connector. Two of the 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									
DT-xA					DR-xA				
LED	Port 1	Port 2	Port 3	Port 4	LED	Port 1	Port 2	Port 3	Port 4
1	In 1 Present	In 1 Present	In 1 Present	In 1 Present	1	Out 1 Present	Out 1 Present	Out 1 Present	Out 1 Present
2	In 1 Overload	In 1 Overload	In 1 Overload	In 1 Overload	2	Out 1 Overload	Out 1 Overload	Out 1 Overload	Out 1 Overload
3	In 2 Present	In 2 Present	In 2 Present	In 2 Present	3	Out 2 Present	Out 2 Present	Out 2 Present	Out 2 Present
4	In 2 Overload	In 2 Overload	In 2 Overload	In 2 Overload	4	Out 2 Overload	Out 2 Overload	Out 2 Overload	Out 2 Overload
5	In 3 Present	In 3 Present	In 3 Present	In 3 Present	5	Out 3 Present	Out 3 Present	Out 3 Present	Out 3 Present
6	In 3 Overload	In 3 Overload	In 3 Overload	In 3 Overload	6	Out 3 Overload	Out 3 Overload	Out 3 Overload	Out 3 Overload
7	In 4 Present	In 4 Present	In 4 Present	In 4 Present	7	Out 4 Present	Out 4 Present	Out 4 Present	Out 4 Present
8	In 4 Overload	In 4 Overload	In 4 Overload	In 4 Overload	8	Out 4 Overload	Out 4 Overload	Out 4 Overload	Out 4 Overload

Audio input PRESENT LEDs (DT-xA units) – 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 -6dB

Audio input OVERLOAD LEDs (DT-xA units) – when the audio input level of any channel exceeds +6dB, 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 (DR-xA units)– This light will turn on when the audio input on the transmit side is present, the DT & DR units are powered and the fiber is connected between the two modems.

Audio output OVERLOAD LEDs (DR-xA units) – These lights will light when the respective audio input on the transmit side is over +6dB. 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 (+6dB)

## 4.0 Product Signal Format & Pinouts

The DT/DR-xA pinouts are shown in the table below:

DT-xA					DR-xA				
Pin Assignment	Port 1	Port 2	Port 3	Port 4	Pin Assignment	Port 1	Port 2	Port 3	Port 4
1	In 1 (-)	In 1 (-)	In 1 (-)	In 1 (-)	1	Out 1 (-)	Out 1 (-)	Out 1 (-)	Out 1 (-)
2	In 1 (+)	In 1 (+)	In 1 (+)	In 1 (+)	2	Out 1 (+)	Out 1 (+)	Out 1 (+)	Out 1 (+)
3	In 2 (-)	In 2 (-)	In 2 (-)	In 2 (-)	3	Out 2 (-)	Out 2 (-)	Out 2 (-)	Out 2 (-)
4	In 2 (+)	In 2 (+)	In 2 (+)	In 2 (+)	4	Out 2 (+)	Out 2 (+)	Out 2 (+)	Out 2 (+)
5	GND	GND	GND	GND	5	GND	GND	GND	GND
6	In 3 (-)	In 3 (-)	In 3 (-)	In 3 (-)	6	Out 3 (-)	Out 3 (-)	Out 3 (-)	Out 3 (-)
7	In 3 (+)	In 3 (+)	In 3 (+)	In 3 (+)	7	Out 3 (+)	Out 3 (+)	Out 3 (+)	Out 3 (+)
8	In 4 (-)	In 4 (-)	In 4 (-)	In 4 (-)	8	Out 4 (-)	Out 4 (-)	Out 4 (-)	Out 4 (-)
9	In 4 (+)	In 4 (+)	In 4 (+)	In 4 (+)	9	Out 4 (+)	Out 4 (+)	Out 4 (+)	Out 4 (+)

Each 4-channel audio board (SIM) is inserted in the module starting at the bottom (port 4). Therefore a module with 4 audio channels will have just one audio SIM installed (located in the bottom card slot). A module with 8 audio channels will have the bottom two audio SIM locations populated (ports 3 & 4). Likewise a 12-channel module will have audio SIMs in ports 2, 3 & 4 while a 16-channel audio module will have the 4-channel audio SIMs populated in all four-port locations.

The attached figures show the module front panel and associated connector location & pinouts.

## 5.0 Specifications

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

Audio	
In/Out Impedance	600 Ohm, 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

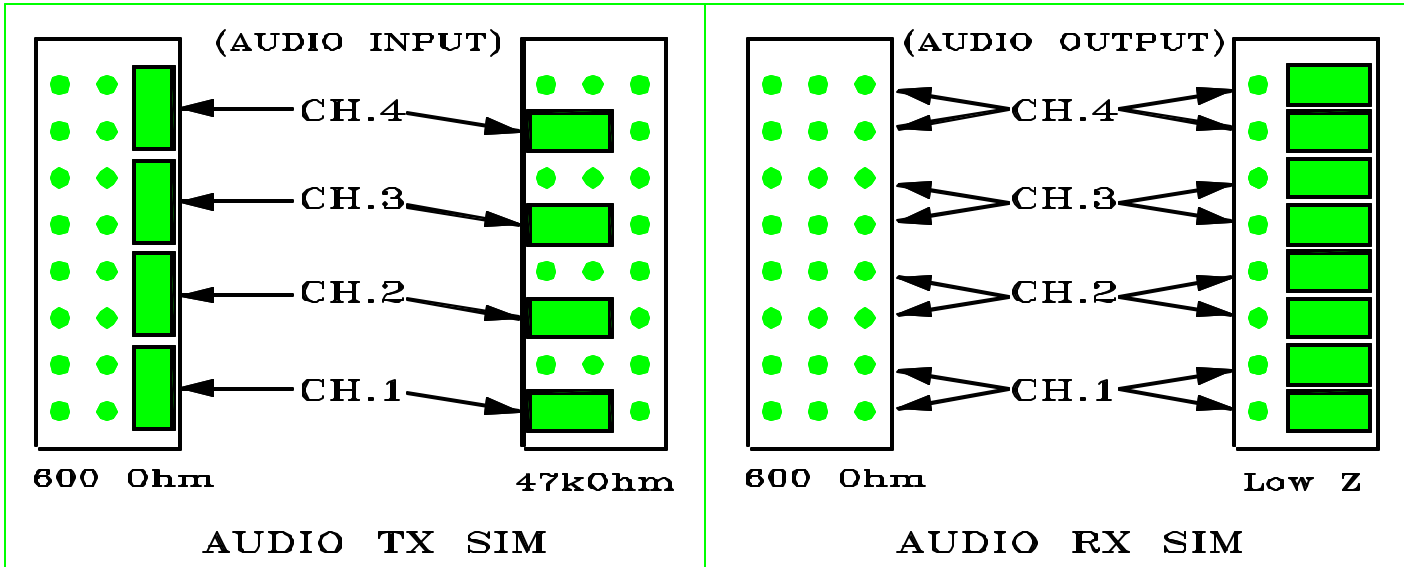
Connectors	
Audio	DB9 Female
Optical	Singlemode – ST or FC Multimode - ST

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	-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

## 6.0 SIM Jumper Settings

Each audio SIM has 8 jumpers on it (located directly behind the DB9 connector). There are two jumpers 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 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



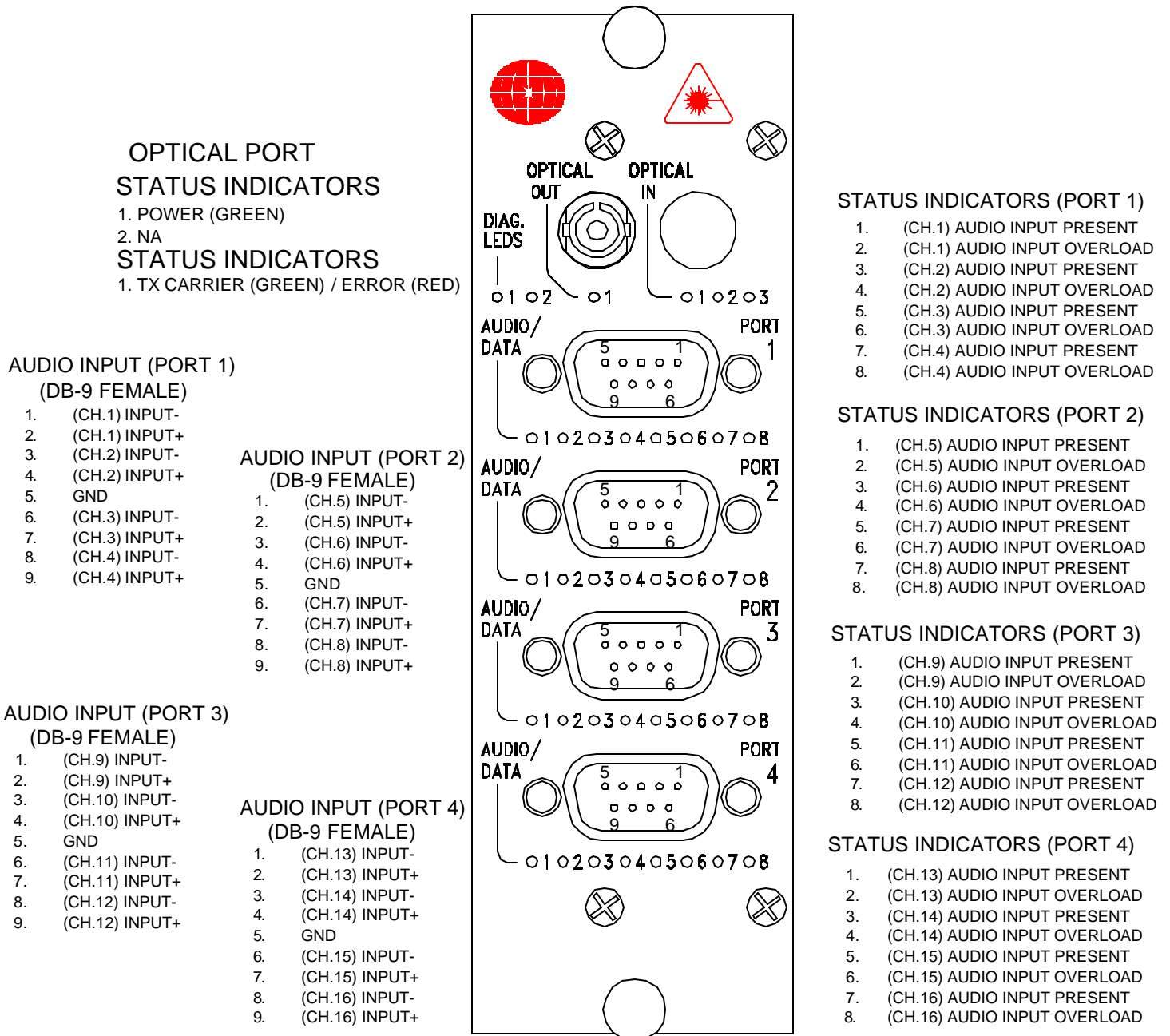
(DT-xA)  
Audio jumper settings for  
600Ohm Balanced or  
47kohm Unbalanced

(DR-xA)  
Audio jumper settings for  
600Ohm Balanced or  
Low-Z Impedance

# 7.0 Front Panel Pinout Assignment Diagram

Figures 7.1 and 7.2 below show the front panel layout, connector location and pinout assignment for both the DT & DR modules.

## DT-xA-x PINOUT DIAGRAM



**Figure 7.1  
DT-xA Front Panel Diagram**

# DR-xA-x PINOUT DIAGRAM

## STATUS INDICATORS

1. POWER (GREEN)
2. NA

## AUDIO OUTPUT (PORT 1) (DB-9 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+

## AUDIO OUTPUT (PORT 2) (DB-9 FEMALE)

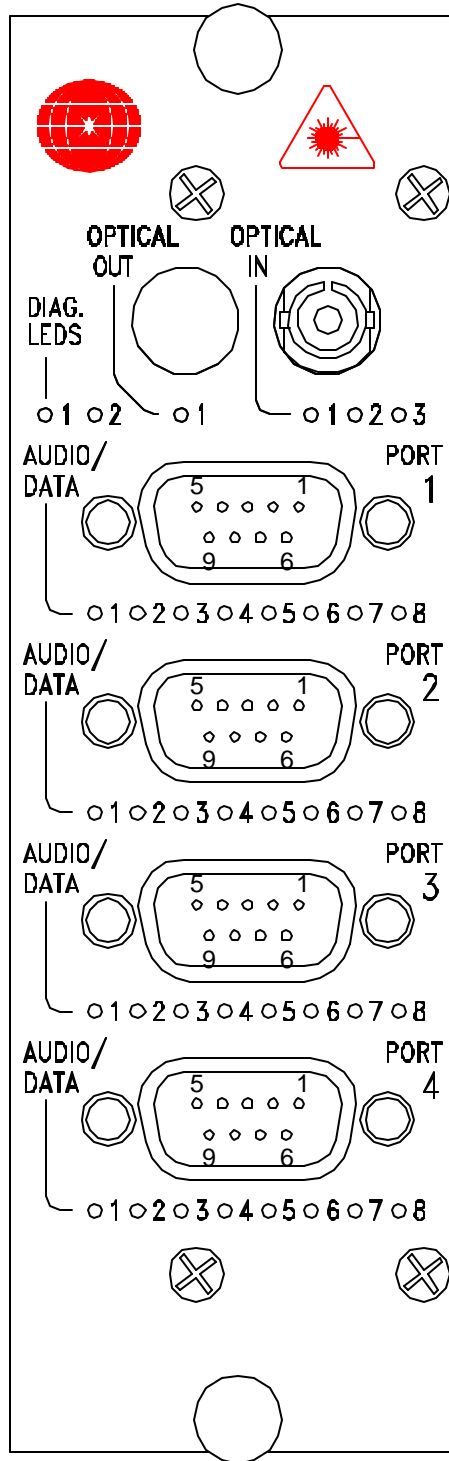
1. (CH.5) OUTPUT-
2. (CH.5) OUTPUT+
3. (CH.6) OUTPUT-
4. (CH.6) OUTPUT+
5. GND
6. (CH.7) OUTPUT-
7. (CH.7) OUTPUT+
8. (CH.8) OUTPUT-
9. (CH.8) OUTPUT+

## AUDIO OUTPUT (PORT 3) (DB-9 FEMALE)

1. (CH.9) OUTPUT-
2. (CH.9) OUTPUT+
3. (CH.10) OUTPUT-
4. (CH.10) OUTPUT+
5. GND
6. (CH.11) OUTPUT-
7. (CH.11) OUTPUT+
8. (CH.12) OUTPUT-
9. (CH.12) OUTPUT+

## AUDIO OUTPUT (PORT 4) (DB-9 FEMALE)

1. (CH.13) OUTPUT-
2. (CH.13) OUTPUT+
3. (CH.14) OUTPUT-
4. (CH.14) OUTPUT+
5. GND
6. (CH.15) OUTPUT-
7. (CH.15) OUTPUT+
8. (CH.16) OUTPUT-
9. (CH.16) OUTPUT+



## OPTICAL PORT

### STATUS INDICATORS

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

### STATUS INDICATORS (PORT 1)

1. (CH.1) AUDIO OUTPUT PRESENT
2. (CH.1) AUDIO OUTPUT OVERLOAD
3. (CH.2) AUDIO OUTPUT PRESENT
4. (CH.2) AUDIO OUTPUT OVERLOAD
5. (CH.3) AUDIO OUTPUT PRESENT
6. (CH.3) AUDIO OUTPUT OVERLOAD
7. (CH.4) AUDIO OUTPUT PRESENT
8. (CH.4) AUDIO OUTPUT OVERLOAD

### STATUS INDICATORS (PORT 2)

1. (CH.5) AUDIO OUTPUT PRESENT
2. (CH.5) AUDIO OUTPUT OVERLOAD
3. (CH.6) AUDIO OUTPUT PRESENT
4. (CH.6) AUDIO OUTPUT OVERLOAD
5. (CH.7) AUDIO OUTPUT PRESENT
6. (CH.7) AUDIO OUTPUT OVERLOAD
7. (CH.8) AUDIO OUTPUT PRESENT
8. (CH.8) AUDIO OUTPUT OVERLOAD

### STATUS INDICATORS (PORT 3)

1. (CH.9) AUDIO OUTPUT PRESENT
2. (CH.9) AUDIO OUTPUT OVERLOAD
3. (CH.10) AUDIO OUTPUT PRESENT
4. (CH.10) AUDIO OUTPUT OVERLOAD
5. (CH.11) AUDIO OUTPUT PRESENT
6. (CH.11) AUDIO OUTPUT OVERLOAD
7. (CH.12) AUDIO OUTPUT PRESENT
8. (CH.12) AUDIO OUTPUT OVERLOAD

### STATUS INDICATORS (PORT 4)

1. (CH.13) AUDIO OUTPUT PRESENT
2. (CH.13) AUDIO OUTPUT OVERLOAD
3. (CH.14) AUDIO OUTPUT PRESENT
4. (CH.14) AUDIO OUTPUT OVERLOAD
5. (CH.15) AUDIO OUTPUT PRESENT
6. (CH.15) AUDIO OUTPUT OVERLOAD
7. (CH.16) AUDIO OUTPUT PRESENT
8. (CH.16) AUDIO OUTPUT OVERLOAD

**Figure 7.1  
DR-xA Front Panel Diagram**

## 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 on the transmit module to ensure that they are on (indicating an audio input signal). Also check the audio output status indicator lights 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:** *Low Audio output*

**Action:** Check to ensure that the input/output impedance properly matches the impedance of the audio input source and output device.

**Problem:** *Audio distortion on output*

**Action:** Check the status of the associated channel input/output Overload LEDs. If they are on, reduce the audio input level at the source to bring it below the overload condition. This should resolve problem.

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

## Appendix 1 – Applicable Product Part Number Variations

The table below indicates the part numbers and product description that are included in this manual. The pinout diagram in section 4.0 shows the connector pinouts (input/output connections) for the all-inclusive product. The appropriate modules consist of various combinations of uni-directional Audio channels (4, 8, 12 or 16). Please use this table to determine the exact pinout and port location of the particular model of interest.

<b>Part Numbers</b>	<b># Audio Channels</b>	<b>Type of Fiber</b>
DT/DR-4A-1	4	Multimode
DT/DR-4A-3	4	Singlemode
DT/DR-8A-1	8	Multimode
DT/DR-8A-3	8	Singlemode
DT/DR-12A-1	12	Multimode
DT/DR-12A-3	12	Singlemode
DT/DR-16A-1	16	Multimode
DT/DR-16A-3	16	Singlemode
DT-xA-47	4 to 16 (x)	Singlemode, CWDM 1470nm
DT-xA-49	4 to 16 (x)	Singlemode, CWDM 1490nm
DT-xA-51	4 to 16 (x)	Singlemode, CWDM 1510nm
DT-xA-53	4 to 16 (x)	Singlemode, CWDM 1530nm
DT-xA-55	4 to 16 (x)	Singlemode, CWDM 1550nm
DT-xA-57	4 to 16 (x)	Singlemode, CWDM 1570nm
DT-xA-59	4 to 16 (x)	Singlemode, CWDM 1590nm
DT-xA-61	4 to 16 (x)	Singlemode, CWDM 1610nm





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 2.0  
03/17/2010