CWDM MUX and DEMUX Modules and Frame

Guide to Installation and Operation

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1.1 Introduction

The Miranda CWDM MUX and DEMUX modules are passive optical multiplexers and demultiplexers, allowing multiple optical signals at different wavelengths to pass through a single optical fiber.

The product is designed to integrate conveniently with Miranda's FIO-series of optical/electrical converters, but is equally useful with other products working at the same wavelengths.

1.2 Features

- 1 RU mounting frame holds up to 4 modules
- MUX and DEMUX modules available with 16 and 18 inputs/outputs
- Completely passive – no power required
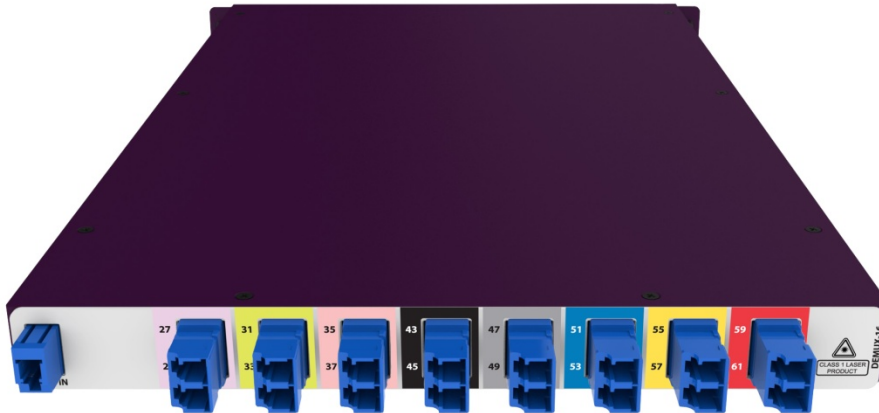
1.3 Description

Front Panel Appearance

There are no controls or status indicators on the front panel of the MUX or DEMUX modules.

Rear Panel Appearance

The rear panel configuration is determined by the module type (MUX or DEMUX) and the number of inputs or outputs.

MUX modules have multiple inputs and a single output.

The inputs are paired, according to the pairs of optical frequencies/wavelengths supplied by standard SFP modules. This allows easy use of duplex patch cords between the unit and the SFP transmitters. The input pairs are color coded, as shown in the following chart, to match the color coding on the clasp handles of the associated SFP-TT modules.

The optical wavelengths conform to ITU-T Rec. G.694.2 (12/2003).

- Note that the wavelengths have been offset by I nm relative to the former revision of the standard.

SFP Module Type Feeding Input	Optical Signal Wavelengths	Label on Panel	Clasp Color Code	16 Ch	18 Ch
SFP-TT-C27C29-LC	1271 / 1291 nm	27 29	Light Purple	X	X
SFP-TT-C31C33-LC	1311 / 1331 nm	31 33	Yellow Green	X	X
SFP-TT-C35C37-LC	1351 / 1371 nm	35 37	Pink	X	X
SFP-TT-C39C41-LC	1391 / 1411 nm	39 41	White		X
SFP-TT-C43C45-LC	1431 / 1451 nm	43 45	Black	X	X
SFP-TT-C47C49-LC	1471 / 1491 nm	47 49	Gray	X	X
SFP-TT-C51C53-LC	1511 / 1531 nm	51 53	Blue	X	X
SFP-TT-C55C57-LC	1551 / 1571 nm	55 57	Yellow	X	X
SFP-TT-C59C61-LC	1591 / 1611 nm	59 61	Red	X	X

DEMUX modules have a single input and multiple outputs.

The outputs are paired, according to the pairs of optical frequencies/wavelengths supplied by standard SFP modules. This allows easy use of duplex patch cords between the unit and the SFP receivers. The output pairs are color coded, as shown in the following chart, to match the color coding on the clasp handles of the associated SFP-TT modules. The SFP-RR receiver, however, is universal and accepts all frequencies that can be carried by this Miranda CWDM system

SFP Module Type Fed by Output	Optical Signal Wavelengths	Label on Panel	Clasp Color Code	16 Ch	18 Ch
SFP-RR-LC (1260-1620 nm)	1271 / 1291 nm	27 29	Light Purple	X	X
SFP-RR-LC (1260-1620 nm)	1311 / 1331 nm	31 33	Yellow Green	X	X
SFP-RR-LC (1260-1620 nm)	1351 / 1371 nm	35 37	Pink	X	X
SFP-RR-LC (1260-1620 nm)	1391 / 1411 nm	39 41	White		X
SFP-RR-LC (1260-1620 nm)	1431 / 1451 nm	43 45	Black	X	X
SFP-RR-LC (1260-1620 nm)	1471 / 1491 nm	47 49	Gray	X	X
SFP-RR-LC (1260-1620 nm)	1511 / 1531 nm	51 53	Blue	X	X
SFP-RR-LC (1260-1620 nm)	1551 / 1571 nm	55 57	Yellow	X	X
SFP-RR-LC (1260-1620 nm)	1591 / 1611 nm	59 61	Red	X	X

2 Installation

FRAME – The CWDM frame assembly consists of four parts:

    Tray
    Mounting flange brackets (2)
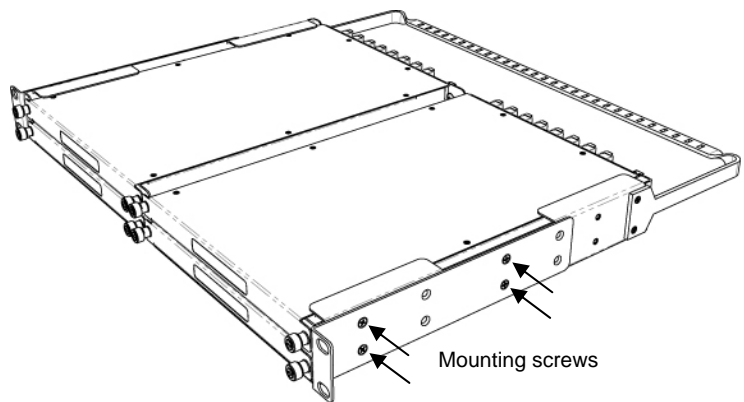   Support Bracket

The two mounting flange brackets attach, one to each side of the tray, with four screws (provided). They may be installed in any of three positions, depending on the requirements of the user.

Front position:

The rack mounting ears are flush with the front of the tray.

In this configuration, the modules should be installed with the optical connectors on the rear, and the support bracket should be used.
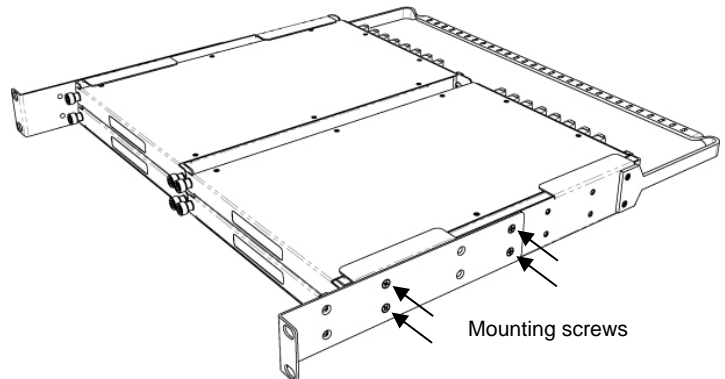
The unit is shipped assembled in this configuration

Mid position:

The rack mounting ears project two inches in front of the edge of the tray.

In this configuration, the modules could be installed with the optical connectors facing the front or the rear (preferred), and the support bracket should be installed in the latter case.

Rear position:

The rack mounting ears project four inches in front of the tray.

In this configuration, the modules can be installed with their optical connectors facing the front of the rack, and used in a "patch panel" type of operation. The support bracket will not fit in this configuration – see the note below.

Mounting screws
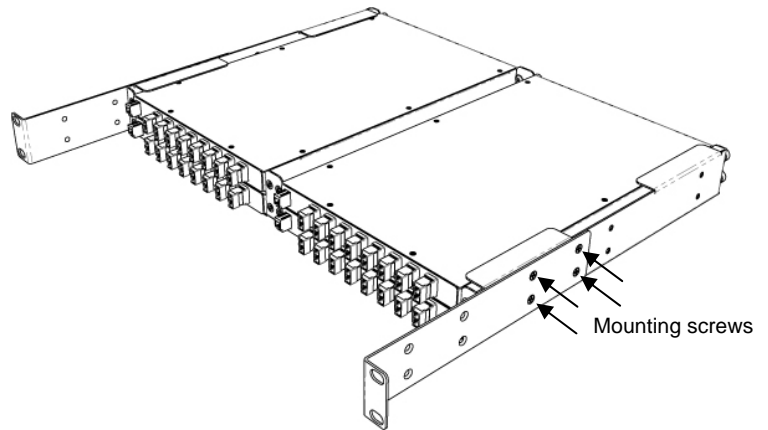
Note that the spacing of the screw holes on the sides of the tray unit is not symmetrical. The flange brackets are mounted at one end of the tray for *Front Position* and *Mid Position* use, and at the other end for *Rear Position* use. When they are installed in the Rear Position, there are no holes available to install the support bracket.

The assembled CWDM frame should be installed directly into a standard 19" rack using 4 standard rack-mounting screws through the four holes in the corners of the front mounting flanges.

MODULES – The CWDM frame can hold up to four modules. The modules can be positioned with the connector panel facing the front or the rear of the rack.

- See the description of the frame assembly configurations above
- When installed with the connectors on the rear, the support bracket provides physical support for the fiber cables, minimizing strain on the connectors.

Slide the module into the selected frame bay, and secure it in position with the two captive screws on the front flanges.

3 Operation

There are no operating controls or adjustments on this product.

Plug the LC connector on the end of the fiber cable into the appropriate connector on the CWDM module. Be sure to match the wavelength of the input signals arriving on the fiber cable to the wavelength specified for the input on the MUX module. Mismatched signals will not pass through the system.

- Remove any dust plugs from the connectors on the fiber and CWDM module
- Push the fiber connector straight into the module socket until it clicks into place

To disconnect a fiber from the module:

- NEVER pull on the cable itself to disconnect a fiber; ALWAYS grip the connector, push in the release tab and pull straight out
- ALWAYS place a plug into any unused fiber ports, to keep out dust and debris

The figure illustrates a typical 16-channel MUX-DEMUX connection scenario.
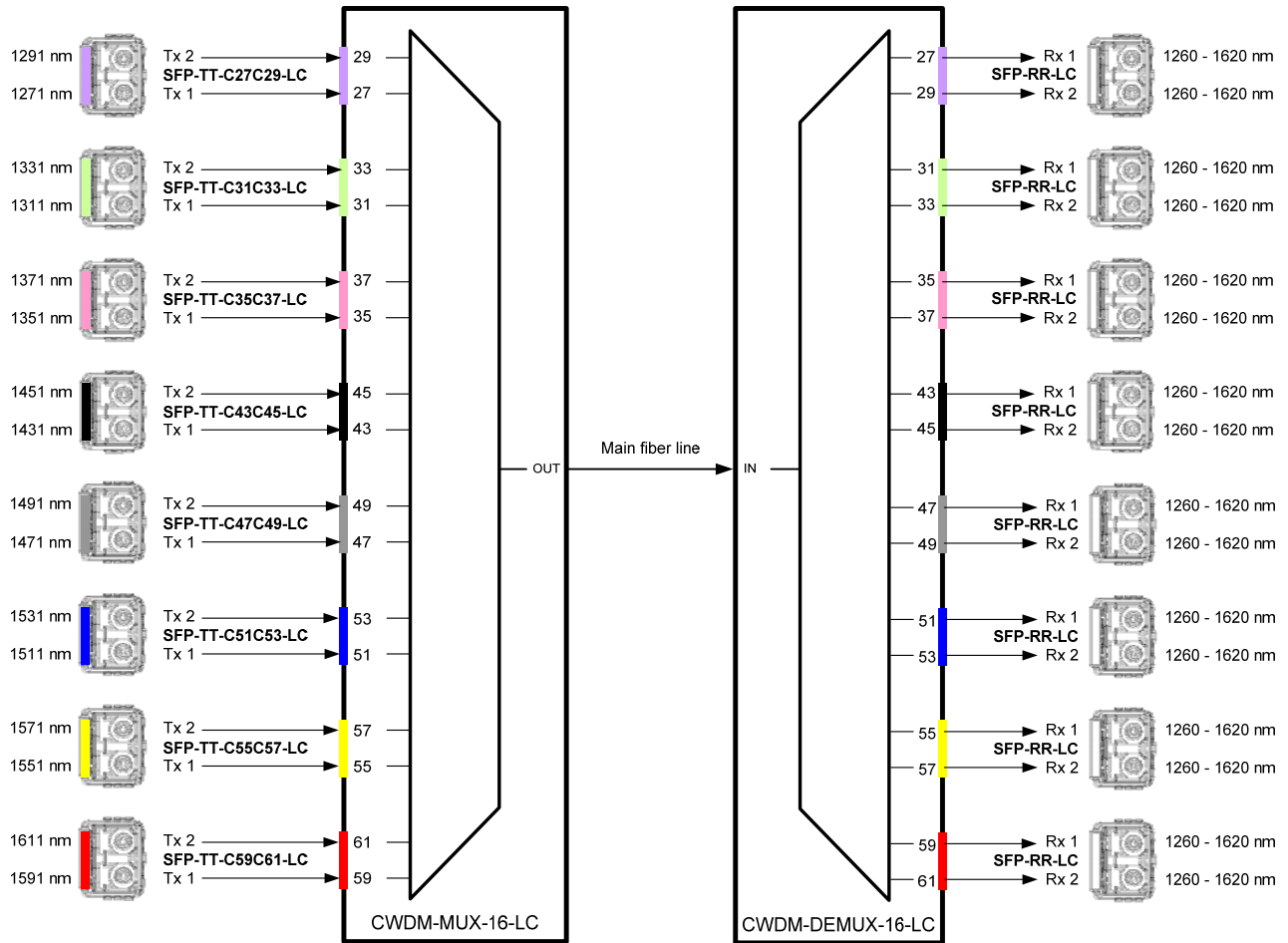
4 Specifications

CONNECTORS

LC/UPC female housing

OPTICAL

Mux

Parameter	16 Channel	18 Channel
Operating Wavelength (*Note)	1271,1291,1311, 1331,1351,1371, 1431,1451,1471, 1491,1511,1531, 1551,1571,1591, 1611	1271,1291,1311, 1331,1351,1371, 1391,1411,1431, 1451,1471,1491, 1511,1531,1551, 1571,1591,1611
Channel Spacing	20nm	
Channel Passband	CW +/-7nm	
Maximum Insertion Loss	5.2 dB	6.0 dB
Minimum Adjacent Channel Isolation	12 dB	
Minimum Non-adjacent Channel Isolation	12 dB	
Minimum Directivity	50 dB	
Minimum Return Loss	45 dB	
Maximum Passband Ripple	0.5 dB	

Demux

Parameter	16 Channel	18 Channel
Operating Wavelength (*Note)	1271,1291,1311, 1331,1351,1371, 1431,1451,1471, 1491,1511,1531, 1551,1571,1591, 1611	1271,1291,1311, 1331,1351,1371, 1391,1411,1431, 1451,1471,1491, 1511,1531,1551, 1571,1591,1611
Channel Spacing	20nm	
Channel Passband	CW +/-7nm	
Maximum Insertion Loss	5.5 dB	6.5 dB
Minimum Adjacent Channel Isolation	30 dB	
Minimum Non-adjacent Channel Isolation	40 dB	
Minimum Directivity	60 dB	55 dB
Minimum Return Loss	45 dB	
Maximum Passband Ripple	0.5 dB	

*Note: Use of wavelengths in the vicinity of 1380 nm requires the use of Zero Water Peak Fiber cable, i.e. conforming to Rec. ITU-T G.652 (11/2009), C or D attributes.

End-to-end Mux/Demux insertion loss: 16 wavelengths: <7 dB
18 wavelengths: <8 dB

MECHANICAL

Dimensions:

Rack	Length:	12.029" Front position, without support bracket
		16.523" Front position, with support bracket
		15.900" Rear position, no support bracket
	Width:	17.120" tray
		18.660" tray plus rack mount brackets
	Height:	1.728"
Modules	Length:	12.049" module body
		13.177" including connectors and mounting screws
	Width:	7.5" module body
		8.367" including mounting ears
	Height:	0.757"
Weight:		1.53 lb (694.91 g)

ENVIRONMENTAL

Operating Temperature range	0°C~70°C
Storage Temperature range	-40°C~85°C