

A solid red circle graphic.

FMU-D163752EM3D Data Sheet

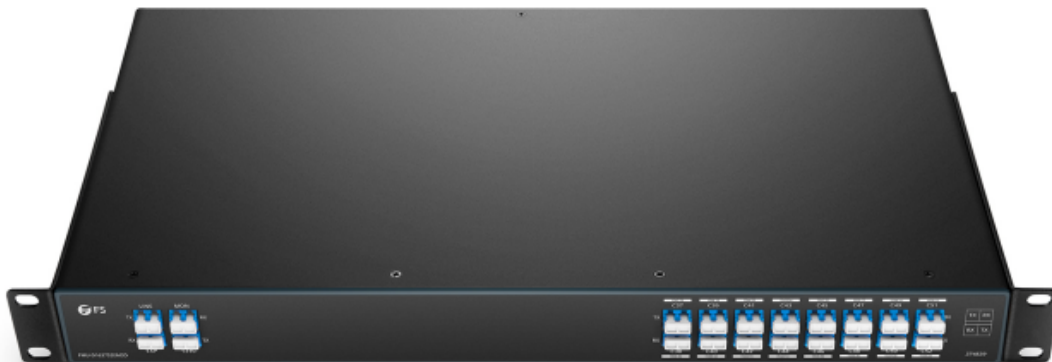
Contents

Product Overview	3
Features and Benefits	4
Front Panel and Port Description	4
Application	5
Fiber Loss	5
Technical Specification	6
ITU Channel Guiding	8
High Quality DWDM Transceivers to Build a Passive DWDM System	8
Layout and Dimension	9
Ordering Information	10

Product Overview

The 16CH Mux Demux, based on TFF (Thin Film Filter), is a passive DWDM device featuring high density, low loss, and long-haul transmission suitability. It is integrated with a monitor port, expansion and 1310nm port. The 1% monitor port allows easy troubleshooting without downtime, while the expansion and 1310nm port can be used to add additional channels, providing a cost-effective and easily expandable solution. In addition, this unit can be used as either a multiplexer or de-multiplexer (Mux/Demux). It combines 16-channel of DWDM wavelengths into a composite signal and separates the combined DWDM signal into 16-channel individual wavelengths over a pair of single-mode optical fiber. In accordance with the ITU-T G.694.1, it maximizes the capacity of the C-band range.

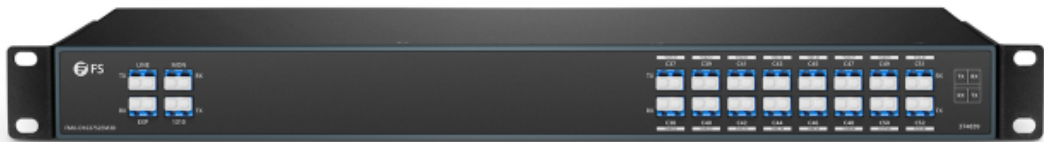
It supports 1G/10G/25G Ethernet, SDH/SONET, 1/2/4/8/16G Fiber Channel, FTTx and CATV. When deployed with FS DWDM optical transceivers, OEO, EDFA and OADM modules, the Mux Demux seamlessly enables flexible network architectures ranging from simple point-to-point connections to amplified ring configurations.



Features and Benefits

- Multiplexing of up to 16 Channels on Fiber Pair to Maximize the Using of Existing Fiber
- Compatible with ITU Grid and Interconnects with Optical Networking Products
- Monitor Port Taps off 1% of the Signal to Monitor the Channel Power Levels
- Expansion and 1310nm Port for Adding Additional Channels and Increasing Capacity
- Passive Transparent Multiplexing at Any Rate, Any Service, Including Ethernet, SDH/SONET, Fiber Channel, FTTx, and CATV
- Suitable for Long-distance Transmission, Including OTN, DCI and WAN Networks
- The Solution Can be [Customized](#) per Customer Application Requirements

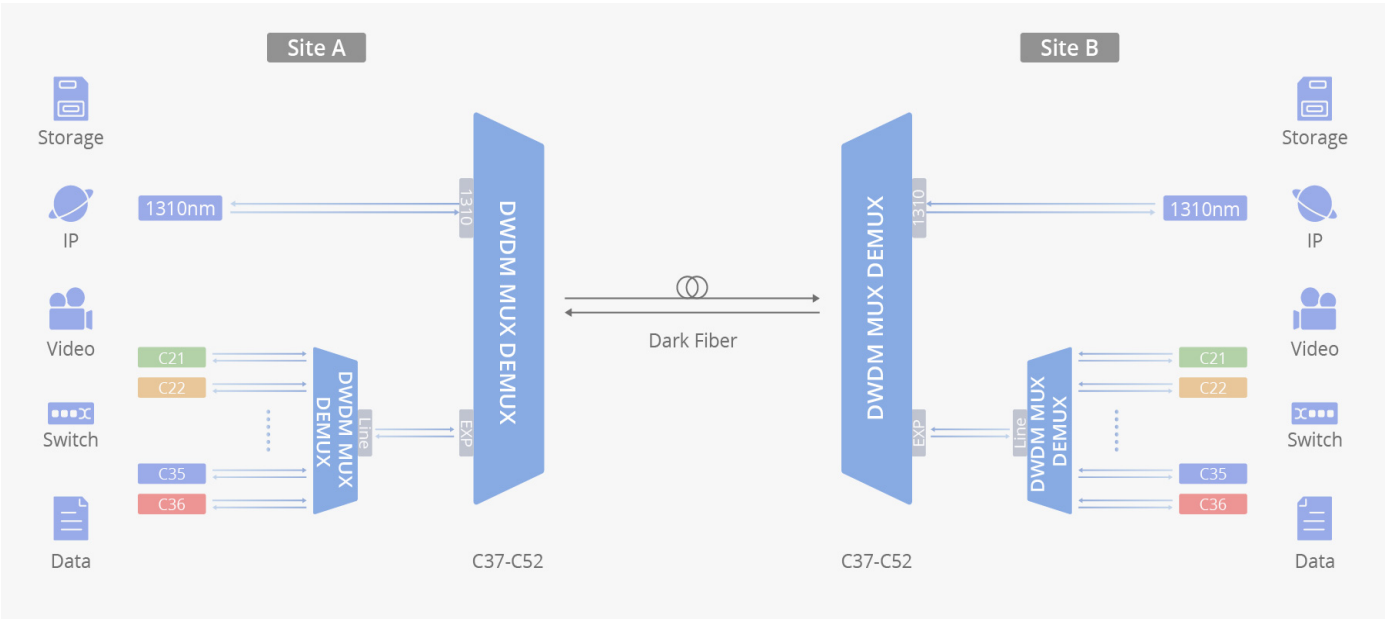
Front Panel and Port Description



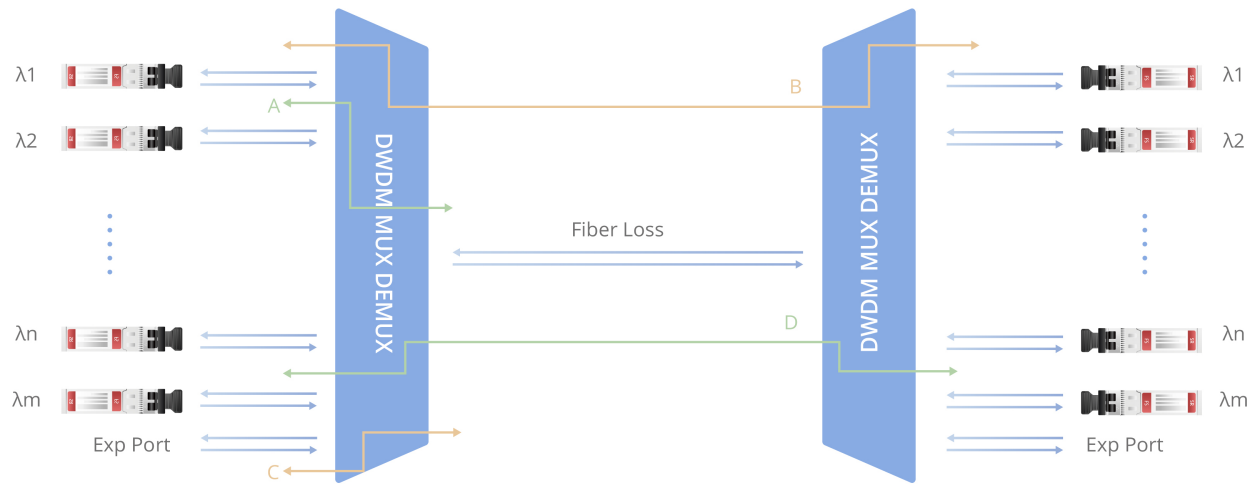
LINE	MON	EXP	1310
Line interface for common signal	1% Monitoring for easy troubleshooting	Expansion for add additional channels	Allow for existing 1310nm legacy traffic

Application

The EXP and 1310nm port support future upgrades by adding more DWDM wavelengths to increase network capacity without disruption.



Fiber Loss



Technical Specification

Parameter	Value
Channel	16 Channels
Wavelength	C37-C52
Connector	LC/UPC
Fiber Type	Dual Fiber
Insertion Loss	≤ 4.9dB, 4.5dB Typical
Insertion Loss (+1% Mon)	≤ 22dB
Passband Ripple	≤0.5dB
Channel Passband	± 0.11nm
Center Wavelength Accuracy	±0.1nm
-1 dB Channel Bandwidth	≥0.25nm
-3 dB Channel Bandwidth	≥0.6nm
Technology	TFF (Thin Film Filter)
Channel Spacing	100GHz (0.8nm)
Adjacent Channel Isolation	≥30dB
Non-adjacent Channel Isolation	≥40dB
Directivity	≥45dB

Parameter	Value
Return Loss	≥45dB
Polarization Dependent Loss	≤0.3dB
Polarization Mode Dispersion	≤0.1ps
Max Optical Power	≤500mW (27dBm)
Operating Temperature	-40 to 85°C (-40 to 185°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Dimensions	1.73"x19"x10.28" (44x482.6x261.2mm)

ITU Channel Guiding

ITU Channel (xx or yy)	21	22	23	24	25	26	27	28	29	30
Wavelength (nm)	1560.61	1559.79	1558.98	1558.17	1557.36	1556.55	1555.75	1554.94	1554.13	1553.33
ITU Channel (xx or yy)	31	32	33	34	35	36	37	38	39	40
Wavelength (nm)	1552.52	1551.72	1550.92	1550.12	1549.32	1548.51	1547.72	1546.92	1546.12	1545.32
ITU Channel (xx or yy)	41	42	43	44	45	46	47	48	49	50
Wavelength (nm)	1544.53	1543.73	1542.94	1542.14	1541.35	1540.56	1539.77	1538.98	1538.19	1537.40
ITU Channel (xx or yy)	51	52	53	54	55	56	57	58	59	60
Wavelength (nm)	1536.61	1535.82	1535.04	1534.25	1533.47	1532.68	1531.90	1531.12	1530.33	1529.55

High Quality DWDM Transceivers to Build a Passive DWDM System

FS.COM offers DWDM transceiver modules in SFP, SFP+, SFP28, 3G-SDI SFP and XFP formats. Every optics is tested in real switches and fully compatible with Cisco, Juniper, Arista, Brocade, Dell, Extreme, etc.

Transmission distances range from 10-80km, transmission data rate range from 1G-25G speeds, without the use of optical amplifiers.



DWDM-SFP10G-80



DWDM-XFP10G-80



DWDM-Tunable-XFP

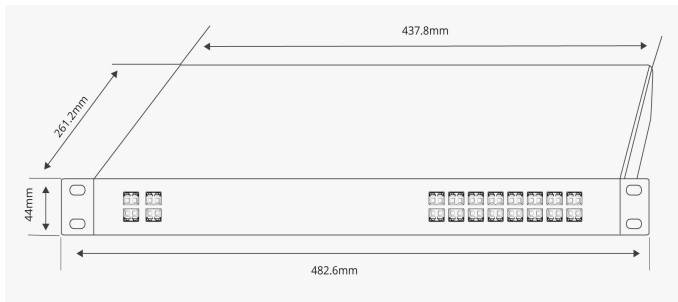


DWDM-Tunable-SFP+



DWDM-SFP1G-ZX

Layout and Dimension



Height: 1.73" (44mm)

Width: 19" (482.6mm)

Depth: 10.28" (261.2mm)

Ordering Information

Mux Demux & OADM

FMU Series
CWDM Mux
Demux

[FMU-MC045561ES](#)

4 Channels CWDM Mux or Demux, 1550-1610nm, with Expansion Port, 1.5dB Typical IL, LC/UPC, Single Fiber, FMU Plug-in Module#214979

[FMU-MC163161EMS](#)

16 Channels CWDM Mux or Demux, 1310-1610nm, with Monitor and Expansion Port, 4.5dB Typical IL, LC/UPC, Single Fiber, FMU Plug-in Module#214981

[FMU-MC082759EMA](#)

8 Channels CWDM Mux Demux, 1270-1590nm, with Monitor and Expansion Port, 4.5dB Typical IL, LC/UPC, Single Fiber, Side A, FMU Plug-in Module#214983

[FMU-MC082961EMB](#)

8 Channels CWDM Mux Demux, 1290-1610nm, with Monitor and Expansion Port, 4.5dB Typical IL, LC/UPC, Single Fiber, Side B, FMU Plug-in Module#214985

[FMU-C182761M](#)

18 Channels CWDM Mux Demux, 1270-1610nm, with Monitor Port, 5.0dB Typical IL, LC/UPC, Dual Fiber, 1U Rack Mount#33489

[FMU-MC082745](#)

8 Channels CWDM Mux Demux, 1270-1450nm (Skip 1390, 1410nm), 2.5dB Typical IL, LC/UPC, Dual Fiber, FMU Plug-in Module#42937

[FMU-MC042733](#)

4 Channels CWDM Mux Demux, 1270-1330nm, 1.0dB Typical IL, LC/UPC, Dual Fiber, FMU Plug-in Module#42972

[FMU-MC09B](#)

9 Channels CWDM Mux Demux, 1290-1610nm, 2.4dB Typical IL, LC/UPC, Single Fiber, Side-B, FMU Plug-in Module#43699

[FMU-MC09A](#)

9 Channels CWDM Mux Demux, 1270-1590nm, 2.4dB Typical IL, LC/UPC, Single Fiber, Side-A, FMU Plug-in Module#43711

[FMU-MC084761EM](#)

8 Channels CWDM Mux Demux, 1470-1610nm, with Monitor and Expansion Port, 2.0dB Typical IL, LC/UPC, Dual Fiber, FMU Plug-in Module#78163

[FMU-C182761M](#)

18 Channels CWDM Mux Demux, 1270-1610nm, with Monitor Port, 2.2dB Typical IL, LC/UPC, Dual Fiber, 1U Rack Mount#123533

[FMU-D60OCMW5](#)

60 Odd Channels DWDM Mux Demux, Super C-band 100GHz 1524.50-1571.65nm, with Monitor Port, 6.0dB Typical IL, LC/UPC, Dual Fiber, 1U Rack Mount#166000

[FMU-D60ECMW5](#)

60 Even Channels DWDM Mux Demux, Super C-band 100GHz 1524.89-1572.06nm, with Monitor Port, 6.0dB Typical IL, LC/UPC, Dual Fiber, 1U Rack Mount#166001

FMU Series
DWDM Mux
Demux

[FMU-D40ODMW5](#)

40 Odd Channels Super C-band 150GHz 190.7875-196.6375THz, with Monitor Port, 5.5dB Typical IL, LC/UPC, Dual Fiber DWDM Mux Demux, 1U Rack Mount#166002

[FMU-D40 EDMW5](#)

40 Even Channels Super C-band 150GHz 190.7125-196.5625THz, with Monitor Port, 5.5dB Typical IL, LC/UPC, Dual Fiber DWDM Mux Demux, 1U Rack Mount#166003

[FMU-D64BMW5](#)

64 Channels DWDM Mux Demux, Super C-band 75GHz 1528.87-1566.62nm, with Monitor Port, 5.8dB Typical IL, LC/UPC, Dual Fiber, 1U Rack Mount#166004

[FMU-MD042023EMD](#)

4 Channels DWDM Mux Demux, 100GHz C20-C23, with Monitor and Expansion Port, 1.6dB Typical IL, LC/UPC, Dual Fiber, FMU Plug-in Module#214975

Mux Demux & OADM

FMU Series DWDM Mux Demux	FMU-D402160M3	40 Channels DWDM Mux Demux, 100GHz C21-C60, with 1310nm and Monitor Port, 3.5dB Typical IL, LC/UPC, Dual Fiber, 1U Rack Mount#35887
	FMU-D162136EM3	16 Channels DWDM Mux Demux, 100GHz C21-C36, with Monitor, Expansion and 1310nm Port, 4.4dB Typical IL, LC/UPC, Dual Fiber, 1U Rack Mount#72430
	FMU-D162136A	16 Channels DWDM Mux Demux, 100GHz C21-C36, 4.0dB Typical IL, LC/UPC, Single Fiber, Side-A, 1U Rack Mount#78535
	FMU-D164560B	16 Channels DWDM Mux Demux, 100GHz C45-C60, 4.0dB Typical IL, LC/UPC, Single Fiber, Side-B, 1U Rack Mount#78536
	FMU-FD402160M3	40 Channels DWDM Mux Demux, 100GHz C21-C60, with 1310nm Port and Monitor Port, 4.5dB Typical IL, LC/UPC, Dual Fiber, 1U Rack Mount#84492
	FMU-MD085360E	8 Channels DWDM Mux Demux, C53-C60, with Expansion Port, 2.8dB Typical IL, LC/UPC, Dual Fiber, FMU Plug-in Module, CWDM/DWDM Hybrid Solution#30568
	FMU-D402160M	40 Channels DWDM Mux Demux, 100GHz C21-C60, with Monitor Port, 3.0dB Typical IL, LC/UPC, Dual Fiber, 1U Rack Mount#33485
FMU Series OWDM Mux Demux	FMU-MD08EB	8 Channels DWDM Mux Demux, 100GHz C22-C36, with Expansion Port, 4.2dB Typical IL, LC/UPC, Single Fiber, Side-B, FMU Plug-in Module#50116
	FMU-MD08EA	8 Channels DWDM Mux Demux, 100GHz C21-C35, with Expansion Port, 4.2dB Typical IL, LC/UPC, Single Fiber, Side-A, FMU Plug-in Module#50117
	FMU-MD085360EM3	8 Channels DWDM Mux Demux, 100GHz C53-C60, with Monitor, Expansion and 1310nm Port, 3.0dB Typical IL, LC/UPC, Dual Fiber, FMU Plug-in Module, CWDM/DWDM Hybrid Solution#72433
	FMU-O162931MD	16 Channels O-band DWDM Mux Demux, 228.4-231.4THz, with Monitor Port, 5.0dB Typical IL, LC/UPC, Dual Fiber, FMU 1U Rack Mount#374863
Custom Mux Demux	MUX-DWDM	Customized Dual and Single Fiber DWDM Mux Demux#322911
	MUX-CWDM	Customized Dual and Single Fiber CWDM Mux Demux#70410
	MUX-CCWDM	Customized Dual and Single Fiber Compact CWDM Mux Demux#73961
OADM	DOADM-EAW	Customized Dual and Single Fiber DWDM OADM, East and West#70427
	DOADM-EOW	Customized Dual and Single Fiber DWDM OADM, East or West#73795
	COADM-EAW	Customized Dual and Single Fiber CWDM OADM, East and West#70425
	COADM-EOW	Customized Dual and Single Fiber CWDM OADM, East or West#73794
Chassis	FMU-1UFMX-N	FMU 2-Slot 1U 19" Rack Chassis Unloaded, Holds up to 2 Units FMU Plug-in Module#30408

TRANSPONDERS & MUXPONDERS

	FMT4DL-OEO25GSFP28	FMT4DL-OEO25GSFP28, 4 Channels 25G WDM Transponder (Converter) for FMT Managed Chassis, 8 SFP28/SFP+ Slots#92056
10G	FMT4DL-OEO10GSFP	FMT4DL-OEO10GSFP, 4 Channels WDM Transponder (Converter) for FMT Managed Chassis, 8 SFP/SFP+ Slots#30515
Chassis	FMT04-CH1U	FMT04-CH1U, 4 Slots 1U Managed Chassis Unloaded Platform, Redundant AC PSUs, Support SNMP V1 Network Management#39214

WDM TRANSCEIVERS

100G/200G CFP2	CFP2-DCO-200G-M	C14 1566.31nm CFP2-DCO 100G/200G DWDM C-band Tunable 96Chs ITU CH13-CH60 50GHz 80km DOM Duplex LC/UPC SMF Optical Transceiver Module for Transmission#120128
25G SFP28	DW-SFP25G10-17	Cisco C17 DWDM-SFP25G-63.86 Compatible SFP28 25G DWDM 1563.86nm 100GHz 10km DOM Duplex LC/UPC SMF Optical Transceiver Module for Transmission#87000
	CW-SFP25G30-27	Cisco CWDM-SFP25G-1270-30 Compatible SFP28 25G CWDM 1270nm 30km DOM Duplex LC/UPC SMF Optical Transceiver Module for Transmission#100112
	CW-SFP25G10-27	Cisco CWDM-SFP25G-1270-10 Compatible SFP28 25G CWDM 1270nm 10km DOM Duplex LC/UPC SMF Optical Transceiver Module for Transmission#76003
10G SFP+	LW-SFP25G40-86	Cisco LWDM-SFP25G-86.66 Compatible SFP28 25G LWDM 1286.66nm 40km DOM Duplex LC/UPC SMF Optical Transceiver Module for Transmission#93786
	DW-SFP10G80-21-I	Cisco C21 DWDM-SFP10G-60.61-I Compatible SFP+ 10G DWDM 1560.61nm 100GHz 80km DOM Duplex LC/UPC SMF Optical Transceiver Module for Transmission (Industrial)#113562
	DW-SFP10G40-21-I	Cisco C21 DWDM-SFP10G-60.61-I Compatible SFP+ 10G DWDM 1560.61nm 100GHz 40km DOM Duplex LC/UPC SMF Optical Transceiver Module for Transmission (Industrial)#113511
1GSFP	CW-SFP10G80-47	Cisco CWDM-SFP10G-1470 Compatible SFP+ 10G CWDM 1470nm 80km DOM Duplex LC/UPC SMF Optical Transceiver Module for Transmission#19367
	CW-SFP10G40-27-I	Cisco CWDM-SFP10G-1270-I Compatible SFP+ 10G CWDM 1270nm 40km DOM Duplex LC/UPC SMF Optical Transceiver Module for Transmission (Industrial)#112392
	DWDM-SFP1G-EZX	Cisco C17 DWDM-SFP-6386 Compatible SFP 1000BASE-DWDM 1563.86nm 100GHz 100km DOM Duplex LC/UPC SMF Optical Transceiver Module for Transmission#54150
	DWDM-SFP1G-ZX	Cisco C17 DWDM-SFP-6386-80 Compatible SFP 1000BASE-DWDM 1563.86nm 100GHz 80km DOM Duplex LC/UPC SMF Optical Transceiver Module for Transmission#47697
	CWDM-SFP1G-ZX	Cisco CWDM-SFP-1270 Compatible SFP 1000BASE-CWDM 1270nm 80km DOM Duplex LC/UPC SMF Optical Transceiver Module for Transmission#33234
	DWDM-SFP1G-ZX	Cisco C17 DWDM-SFP-6386-80 Compatible SFP 1000BASE-DWDM 1563.86nm 100GHz 80km DOM Duplex LC/UPC SMF Optical Transceiver Module for Transmission#47697
	CWDM-SFP1G-ZX	Cisco CWDM-SFP-1270 Compatible SFP 1000BASE-CWDM 1270nm 80km DOM Duplex LC/UPC SMF Optical Transceiver Module for Transmission#33234

*Standard products are listed above. Customized specifications are available upon request.



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