

4 Channels Multi-Rate WDM Converter (Transponder)

Up to 11.3G Rate, 8 SFP/SFP+ Slots, Plug-in Card



4 Channels Multi-Rate WDM Converter

The optical transponder can convert 1G~11.3Gbps Ethernet signals into a corresponding wavelength in CWDM and DWDM network infrastructures. Its flexibility in terms of data rates, protocols, and wavelength-division multiplexing (WDM) options are provided by FS.COM pluggable optics.

FS WDM transponder operates as a protocol and rate-transparent device, supporting SFP/SFP+ transceivers the same wavelength reside on client and trunk sides, it's used as a 3R regenerator (re-amplification, reshaping and retiming).

Flexible WDM Transport Solution

The WDM Converter (Transponder) is a multi-rate transponder that can support an extended number of services for both coarse (CWDM) and dense wavelength division multiplexing (DWDM) transport applications. Due to its high flexibility and density, the transponder is the ideal transport solution for access and metro wavelength division multiplexing (WDM) networks.

The module has four independent transponders that can transport traffic running at different rates. The transponder can also be used as a regenerator, an optical signal received by the transponder is converted to an electrical data stream which it then processes and regenerates.

Pluggable Transceivers Providing Great Flexibility

FS.COM OEO is an 8-port 10G transponder, each transponder supports up to four CWDM or DWDM line SFP/SFP+ optics (plugged into the ports labeled “A2”, “B2”, “C2” and “D2”) as well as four client SFP/SFP+ optics (plugged in the ports labeled “A1”, “B1”, “C1” and “D1”).

The usage of pluggable transceivers (SFP/SFP+) for network facing interfaces provides a high level of flexibility since the transponders can be used in both CWDM and DWDM networks by selecting the appropriate type of SFP/SFP+.



High Integration by Pluggable Design

The transponder is available as a managed chassis pluggable card (part number: FMT04-CH1U).

Four transponder cards can coexist together in 1U managed chassis. And the transponder can coexist in the same chassis with any FS.COM FMT cards.

Highly-scalable Optical Transport Platform

1U management chassis for applications where space, power and environment are key considerations. The chassis supports both DWDM and CWDM for both dual fiber and single fiber configurations and optical amplifiers, OEO(converter), DCM and OLP modules are designed in a modular fashion to accommodate distance extension without service interruption.



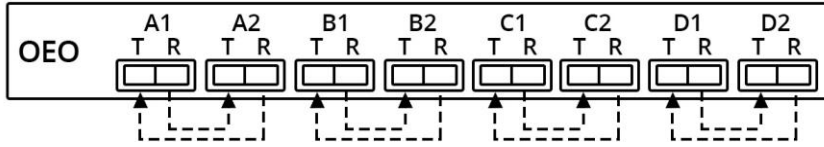
Simple and Easy to Remote Management

The FS.COM Network Management Unit(NMU/NMS) module is the central management hub of the FMT system. The transponder can be managed by Monitor Online and Simple Management tool based on the management software of Windows platform. And it can also be monitored by SNMPv1, currently, only relevant MIB library files are provided, SNMP-based management software is not provided. In addition, an “Active Alarms List” is available which shows an overview of all the critical states. All alarms are stored in an alarm history file.

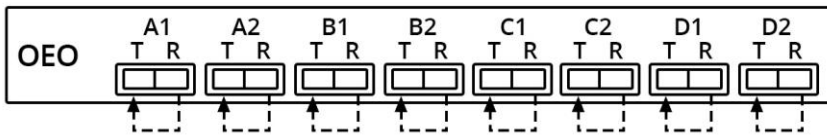


Flexible and Versatile Transponder

The OEO working mode is divided into normal mode and loopback mode according to the application scenario. It can be set to the normal mode in the normal connection. The loopback mode is mainly used for device detection and troubleshooting.



① Normal mode is used for conversion of fiber mode and wavelength and regeneration of optical signal. Ports A1&A2 are paired, the data signal entering R of port A1 and is retransmitted out T of port A2.



② Loopback mode is used for detection and troubleshooting, the data signal entering R of port A1 and is retransmitted out T of port A1.

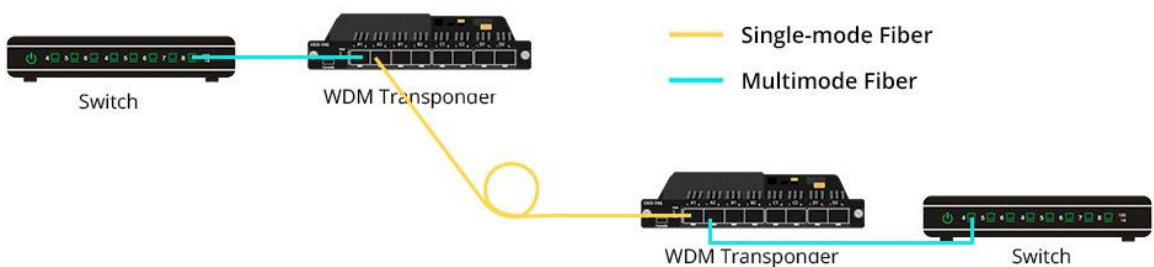
Note: On Ports A1&A2, the power values and receiving the status of the module, temperature, rate, and wavelength can be checked. But the error rate can not be checked.

Applications

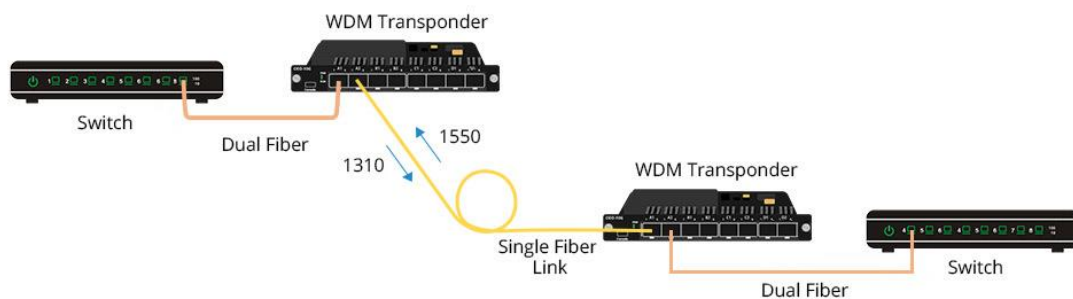
Optical transponder can be deployed in seamless integration of different fiber types by converting multimode fiber to single-mode fiber, dual fiber to single fiber.

It can also be used as a repeater to convert the weak optical signals from the fiber into electrical signals and regenerates or amplifies, then recovers them into strong optical signals for continuous transmission. Although the signal is amplified, the data rate before and after the conversion will not be changed.

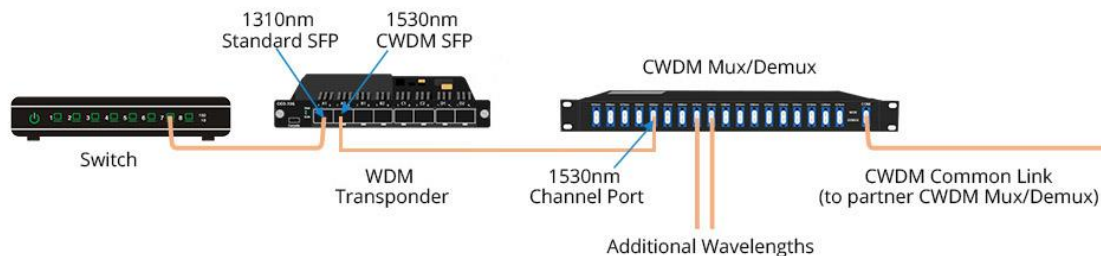
1. Multimode to Single-mode Conversion



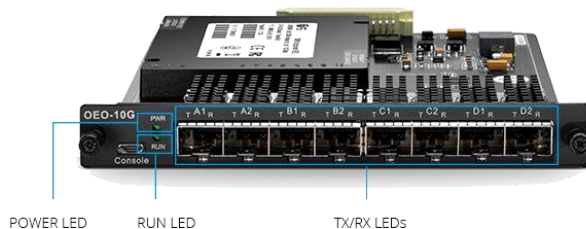
2. Dual Fiber to Single Fiber Conversion



3. Wavelength Conversion



Product Specifications



Indicator	Notes	Normal state	Alarm or other status
PWR	Power on	Green	Off
RUN	Power run	Flashing/1s	Off or flash irregularly
A1	Module	Green	Off, module not present
A2	Module	Green	Off, module not present
B1	Module	Green	Off, module not present
B2	Module	Green	Off, module not present
C1	Module	Green	Off, module not present
C2	Module	Green	Off, module not present
D1	Module	Green	Off, module not present
D2	Module	Green	Off, module not present

Table 1 Performance Index



Parameters	Wavelength (nm)	Transmission distance(km)	Input power (dBm)	Output power (dBm)	
1.25Gbps	850	0.55	-18~-3	-9~-3	
	1310	10	-18~-3	-9~-3	
	1550/CWDM/DWDM	40	-24~-1	-5~-0	
		80	-24~-1	0~+5	
		120	-31~-9	0~+5	
2.5Gbps	1310	20	-18~0	-5~0	
	1550/CWDM/DWDM	40	-18~0	-2~+3	
		80	-28~-10	0~+5	
		DWDM	120	-30~-10	0~+5
9.95~11.3Gbps	850	0.3	-11~-1	-6~-1	
	1310	10	-14~0	-6~0	
	1550/CWDM/DWDM	40	-16~0	-1~+3	
		80	-24~-7	0~+4	

Table 2 Supported SFP/SFP+ Optics and Applications

Protocol	Bit Rate (Mbps)	Client SFP (FS PN)	CWDM Line SFP (PN)	DWDM Line SFP (PN)
SONET/SDH	2.5Gbps	SFP-2GIR-31		
		SFP-2GLR-31	CWDM-SFP2G-EX	DWDM-SFP2G-ZX
		SFP-2GLR-55	CWDM-SFP2G-ZX	DWDM-SFP2G-EZX
			CWCM-SFP2G-EZX	DWCM-SFP2G-ZX-C
		SFP-2GLR-55		DWCM-SFP2G-EZX-C
Ethernet	1000Mbps	SFP1G-SX-85		
		SFP1G-SX-31		
		SFP1G-LX-31		
		SFP1G-LH-31	CWDM-SFP1G-ZX	DWDM-SFP1G-ZX
		SFP1G-EX-55	CWDM-SFP1G-EZX	DWDM-SFP1G-EZX
		SFP1G-ZX-55		
		SFP1G-EZX-55		
Ethernet	10Gbps	SFP-10GSR-85		
		SFP-10GLRM-31	CWDM-SFP10G-10SP	
		SFP-10GLR-31	CWDM-SFP10G-10M	
		SFP-10GLR-31	CWDM-SFP10G-20SP	
		SFP-10GER-31	CWDM-SFP10G-20S	DWDM-SFP10G-40
		SFP-10GER-55	CWDM-SFP10G-20L	DWDM-SFP10G-80
		SFP-10GER-55	CWDM-SFP10G-40S	
		SFP-10GZR-55	CWDM-SFP10G-40L	
SFP-10GZRC-55	CWDM-SFP10G-80L			
FC	8.5Gbps	SFP-10GSR-85	CWDM-SFP10G-10SP	
		SFP-10GLR-31	CWDM-SFP10G-10M	
		SFP-10GLR-31	CWDM-SFP10G-20SP	
		SFP-10GER-31	CWDM-SFP10G-20S	DWDM-SFP10G-40
		SFP-10GER-55	CWDM-SFP10G-20L	DWDM-SFP10G-80
		SFP-10GZR-55	CWDM-SFP10G-40S	
SFP-10GER-55	CWDM-SFP10G-40L			
		CWDM-SFP10G-80L		

Table 3 Product Specifications

Configuration	Parameter	Specification
	Bit rate	1Gbps to 11.3Gbps
	Signal mode	SM/MM
	Interface type	SFP/SFP+
	Optical transceiver slot numbers	8
	Service channel numbers	4
Performance	Dithering performance	Conform ITU-T G.825 (2000)
	Consumption	<20W
	Consumption/channel	3R
	Regeneration	≤5W
	Transmission distance	Up to 80km
	Client protocols	SONET/SDH, Ethernet, FC
	Number of supply voltage	Single/Dual power
Electrical	Supply voltage	100V-240VAC/36V-72VDC
	Max power consumption	20W
Mechanical	FMT Chassis Dimensions (H x W x D):	1.75"x19"x11.81" (44.5x483.6x300mm)
	Operating temperature	-40 ~ 85° C
Environment	Storage temperature	-10 ~ 70° C

Ordering Information

Mux Demux & OADM		
	FMU-D402160M3	40 Channels 100GHz C21-C60, with 1310nm and Monitor Port, 3.5dB Typical IL, LC/UPC, Dual Fiber DWDM Mux Demux, 1U Rack Mount #35887
DWDM MUX DEMUX	M6200-D2160M	40 Channels 100GHz C21-C60 Dual Fiber DWDM Mux and Demux with Monitor Port, Pluggable Module, LC/UPC, Integrated with M6200 Series Managed Chassis #120424
	FMU-D162136EM3	16 Channels 100GHz C21-C36, with Monitor, Expansion and 1310nm Port, LC/UPC, Dual Fiber DWDM Mux Demux, 1U Rack Mount #72430
	FMU-MD085360EM3	CWDM/DWDM Hybrid Solution, 8 Channels 100GHz C53-C60, with Monitor, Expansion and 1310nm Port, LC/UPC, Dual Fiber DWDM Mux Demux, FMU Plug-in Module #72433
CWDM MUX DEMUX	FMU-C182761M	18 Channels 1270-1610nm, with Monitor Port, LC/UPC, Dual Fiber CWDM Mux Demux, 1U Rack Mount #33489
	FMU-MC084761EM	8 Channels 1470-1610nm, with Monitor and Expansion Port, LC/UPC, Dual Fiber, Low Insertion Loss CWDM Mux Demux, FMU Plug-in Module #78163
LWDM MUX DEMUX	ABS-L042930A	4 Channels 1295.56-1309.14nm, Single Fiber LAN-WDM Mux Demux, Side-A, ABS Pigtailed Module, LC/UPC #97782
	ABS-C062737A	6 Channels 1271-1371nm, Single Fiber CWDM Mux Demux, Side-A, ABS Pigtailed Module, LC/UPC #97784
OADM	DOADM-DF	Customized Dual Fiber & Single Fiber DWDM OADM #70427
	COADM-DF	Customized Dual Fiber & Single Fiber CWDM OADM #70425
Chassis	FMU-1UFMX-N	FMU 2-Slot 1U 19" Rack Chassis Unloaded, holds up to 2 Units FMU Plug-in Module #30408
	FUD-1UFMX-N	FUD 4-Slot 1U 19" Rack Chassis Unloaded, holds up to 4 Units FUD Plug-in Module #106578
TRANSPONDERS & MUXPONDERS		
25G	FMT4DL-OEO25GSFP28	4 Channels 25G WDM Transponder (Converter), 8 SFP28/SFP+ Slots#92056
10G	FMT4DL-OEO10GSFP	4 Channels WDM Transponder (Converter), 8 SFP/SFP+ Slots#30515
Chassis	FMT04-CH1U	1U Managed Chassis Unloaded Platform, Supports up to 4x EDFA/OEO/OLP Card with Accessories #39214
	FMT-CH	Customized 1U/2U/4U Managed Chassis Unloaded, Supports up to 16x Multiplexer/EDFA/OEO/OLP Module with Accessories #70413

OPEN LINE SYSTEM

Amplifiers	FMT26PA-EDFA	26dB Gain DWDM EDFA Pre-Amplifier, 16dBm Output#36524
	FMT20PA-EDFA	20dB Gain DWDM EDFA Pre-Amplifier, 13dBm Output#72284
	FMT17BA-EDFA	17dBm Output DWDM EDFA Booster Amplifier, 17dB Gain #72283
	FMT-LA	In-Line EDFA for DWDM Solution#35924
Dispersion Compensation	FMT40-DCM	40KM DCF-based Passive Dispersion Compensation Module#65781
	FMT80-DCM	80KM DCF-based Passive Dispersion Compensation Module#65779
	FS-TDCM	C-band Tunable Dispersion Compensation Module (TDCM)#72427
Line Protection	FMT-OLP2	1+1 Optical Line Protection Switch (OLP)#66010
	FMT-BDOLP	FMT-BDOLP, Optical Line Protection Switch (OLP)#72700
	FMT-BDSplitter	FMT-BDSplitter, Optical Splitter#73324
Red/Blue Filter	FMT-RB	1x2 Single Fiber DWDM Splitter Red/Blue C Band Filter#65981
	FMT-OPD	4 Channels 1550nm Optical Power Detection OPD (AIU)#78568
Fiber Monitoring	FMT-OPM	Optical Performance Monitoring (OPM)#71586
	FMT-OSW	1x16 Multi-Channel Opto-Mechanical Optical Switches with Adjustable Channels Control#73287
	FMT-OTDR	Optical Time Domain Reflectometer (OTDR)#73281
	FMT-LSU	LSU Light Source Unit, Pluggable Module for FMT Multi-Service Transport Platform#78469
VOA Units	FS-VOA-C	Variable Optical Attenuator, 0~15dB, Pluggable Module, LC/UPC#65271
	AT-M-LCU	Fixed Fiber Optic Attenuators #70009
Chassis	FMT04-CH1U	1U Managed Chassis Unloaded Platform, Supports up to 4x EDFA/OEO/OLP Card with Accessories #39214
	FMT-CH	Customized 1U/2U/4U Managed Chassis Unloaded, Supports up to 16x Multiplexer/EDFA/OEO/OLP Module with Accessories #70413

WDM TRANSCEIVERS

	DWDM-SFP25G-10	25G DWDM SFP28 100GHz 1563.86nm 10km DOM LC SMF Optical Transceiver Module #87000
25G SFP28	CWDM-SFP25G-40S	25G 1270nm CWDM SFP28 40km DOM LC SMF Optical Transceiver Module #100112
	CWDM-SFP25G-10SP	25G 1270nm CWDM SFP28 10km DOM LC SMF Optical Transceiver Module #76003
	LWDM-SFP25G-40	25G LWDM SFP28 1286.66nm 40km DOM LC SMF Optical Transceiver Module #93786
16G/8G FC	DWDM-SFP16G-40	Customized 16G DWDM SFP+ C20-C61 100GHz 40km DDM LC SMF Transceiver Module#73084
	DWDM-SFP16GH-40	Customized 16G DWDM SFP+ 50GHz 40km DDM LC SMF Transceiver Module #73085
	CWDM-SFP16G-40	Customized 16G Fiber Channel CWDM SFP+ 1470-1610nm 40km DDM LC SMF Transceiver Module #80765
10G SFP+	DWDM-SFP10G-80	10G DWDM SFP+ 1559.79nm 80km DOM LC SMF Transceiver Module, Commercial Temperature#31237, Industrial Temperature#113562
	DWDM-SFP10G-40	10G DWDM SFP+ 1560.61nm 40km DOM LC SMF Transceiver Module, Commercial Temperature#38731, Industrial Temperature#113511
	DWDM-SFP10G-C	10G DWDM C-band Tunable SFP+ 50GHz 80km DOM LC SMF Transceiver Module #69267
	CWDM-SFP10G-80L	10G CWDM SFP+ 1470nm 80km DOM LC SMF Transceiver Module #19367
	CWDM-SFP10G-40S	10G CWDM SFP+ 1270nm 40km DOM LC SMF Transceiver Module, Commercial Temperature#22168, Industrial Temperature#112392
1G SFP	DWDM-SFP1G-EZX	1000BASE-DWDM SFP 100GHz 1563.86nm 100km DOM LC SMF Transceiver Module #54150
	DWDM-SFP1G-ZX	1000BASE-DWDM SFP 1563.86nm 80km DOM LC SMF Transceiver Module #47697
	CWDM-SFP1G-EZX	1000BASE-CWDM SFP 1270nm 120km DOM LC SMF Transceiver Module #102776
	CWDM-SFP1G-ZX	1000BASE-CWDM SFP 1270nm 80km DOM LC SMF Transceiver Module #33234



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