LambdaDriver® Passive Optical Modules

Multiplexer/ Demultiplexer

Features

○ CWDM and DWDM mix in one system

○ Flexible CWDM or DWDM channels allocation

○ Hot swappable

○ Functional in non-powered mode

Overview

The optical passive Multiplexers, Demultiplexers and Optical Add-Drop Multiplexer (OADM) devices are essential building blocks of the LambdaDriver Optical Transport System (OTS).

A Multiplexer/Demultiplexer pair aggregates several different wavelengths onto a single pair of fibers – the WDM trunk – and relay them to a remote location for distribution.

The Multiplexer/Demultiplexer and OADM devices are protocol transparent and completely passive. Since they do not require electrical supply for their operation, these modules can be used also in non-powered intermediate locations in a WDM network.

The Multiplexer/Demultiplexer pairs are mostly used in Point-to-Point applications and also in conjunction with OADMs in Linear add/drop topologies where some of the services are dropped at different locations along the line.

OADMs re-direct specified channels (wavelengths) received over the trunk connection to discrete add/drop ports and transparently pass the remaining channels.

Special OADM type of modules - the Banded OADM – are used to add/drop a predefined bundle of channels at a location where these channels will be distributed individually.

Important add-on to the Multiplexer/Demultiplexer building blocks are the Band Splitters.

The Band splitters are used to provision easy and seamless expansion of operating DWDM networks without interrupting their operation.
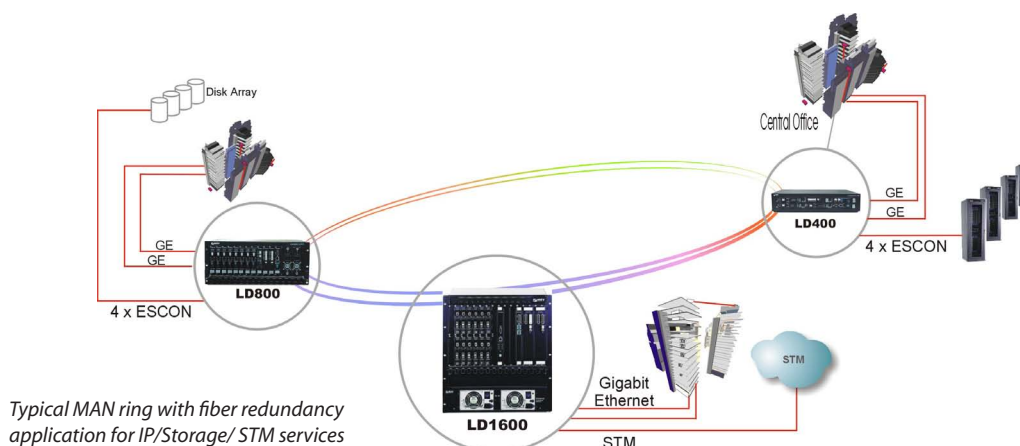
As an example, a network can be designed to start with using 16 DWDM C band RED channels and later on expand by adding 16 DWDM C band BLUE channels over the same WDM trunk through a RED/BLUE Band Splitter.

Band Splitters are available also for the C/L bands integration.

Multiplexer/Demultiplexer devices are available with 8, 16, 40, and 80 DWDM channels and for 8 and 16 CWDM channels.

OADM devices are available with 1,2,3 and 4 channels in DWDM and CWDM technologies.

8-DWDM-channels OADM modules with 8 sequential wavelengths exhibit very low pass through attenuation.
Due to their passive structure, these devices introduce optical power loss for every optical signal that passes through the device. Each port of a passive device can have different insertion loss and therefore during network designs these losses should be considered (see technical specifications table overleaf).

Typical MAN ring with fiber redundancy application for IP/Storage/ STM services

Enviromental

Operating Temperature	-5° to 65°C (23° to 149°F)
Storage Temperature	-10° to 85°C (14° to 185°F)
Relative Humidity	85% maximum, non-condensing
Dimensions (W x H x D)	Short slots: 26.93 x 130.7 x 227 mm³ (1.06 x 5.145 x 8.956 in³) Long slots: 26.93 x 263.4 x 227 mm³ (1.06 x 10.37 x 8.956 in³)/54.18 x 263.4 x 227 mm³ (2.1 x 10.37 x 8.956 in³)
Weight	EM1600 Mux/Dmux: 1.01 kg (2.24 lb) EM1600 OADM: 0.94 kg (2.02 lb) EM800 Mux/Dmux: 0.60 kg (1.15 lb) EM800 OADM: 0.63 kg (1.39 lb)
Connector	SC - WDM, MU- Internal connection
Power Consumption	0.3 Watt (all models)

Technical specifications

WDM grid	DWDM: ITU - T - G.694.1 CWDM: ITU - T - G.694.2						
CWDM OADM	**Dual Fiber**	**In to Drop or ADD to Out (Max loss dB)**	**Max. Add-Drop loss (db)**	**Comm - Exp loss (db)**	**Single Fiber**	**In to Drop or ADD to Out (Max loss dB)**	**Max. Add-Drop loss (db)**
	ADCDxx*	1.2	1.6	0.7	ADCxx*	0.8	0.8
	ADCDxx/yy*	1.5	1.9	1.0	ADCxx/yy*	1.2	2.0
	ADCDxx/yy/zz*	1.8	2.2	1.2	ADCxx/yy/zz*	1.6	2.4
	ADCDxx/yy/zz/ww*	2.1	2.8	1.4	ADCxx/yy/zz/ww*	2.0	2.8
DWDM OADM	ADDDxx*	1.3	2.6	1.0	ADDxx*	1.4	2.1
	ADDDxx/yy*	1.6	2.9	1.3	ADDxx/yy*	2.0	2.7
	ADDDxx/yy/zz*	1.9	3.2	1.7	ADDxx/yy/zz*	2.6	3.3
	ADDDxx/yy/zz/ww*	2.2	3.5	2.0	ADDxx/yy/zz/ww*	3.2	3.9
	ADDD8/xx	3.5	5.3	0.8*			

CWDM Mux/DeMux	**Type**	**Channel insertion loss (db)**	**Band Splitter insertion loss(db)**
	EM1600-MUX16C / EM1600-DMUX16C	3.5	
	EM800-MUX8C / EM800-DMUX8C	2.8	
	EM800-MDMUX8C		
DWDM Mux/DeMux	EM1600-MUX80 / EM1600- DMUX80	6.0	
	EM1600-MUX40 / EM1600- DMUX40	4.5	
	EM800/1600-MUX16R / EM800/1600- DMUX16R	3.9	
	EM800/1600-MUX16B / EM800/1600- DMUX16B	3.9	1.2

Ordering Information		
LD1600 CWDM Mux/DeMux modules		
EM1600-MUX16C / EM1600-DMUX16C	16 wavelengths (1310 - 1610nm) CWDM Multiplexer/Demultiplexer module for LD1600
LD1600 DWDM Mux/DeMux modules	
EM1600-MUX80 / EM1600- DMUX80	80 50GHz spacing C-band (Ch20.5 - Ch60) DWDM Multiplexer / Demultiplexer module for LD1600
EM1600-MUX40 / EM1600- DMUX40	40 100GHz spacing C-band (Ch21 - Ch59) DWDM Multiplexer / Demultiplexer module for LD1600
EM1600-MUX16R / EM1600-DMUX16R	16 100GHz spacing (Ch21 - Ch35) DWDM Multiplexer / Demultiplexer module for LD1600
EM1600-MUX16B / EM1600-DMUX16B	16 100GHz spacing (Ch43 - Ch58) DWDM Multiplexer / Demultiplexer with band splitter module for LD1600
LD800 DWDM Mux/DeMux modules	
EM800-MUX16B / EM800-DMUX16B	16 100GHz spacing (Ch43 - Ch58) DWDM Multiplexer / Demultiplexer with band splitter module for LD800
EM800-MUX16R / EM800-DMUX16R	16 100GHz spacing (Ch21 - Ch35) DWDM Multiplexer / Demultiplexer module for LD800
LD800 CWDM Mux/DeMux modules	
EM800-MUX16/CW - EM800-DMUX16/CW	16 wavelengths (1310 - 1610nm) CWDM Multiplexer/Demultiplexer module for LD800
EM800-MUX8/CW - EM800-DMUX8/CW	8 wavelengths (1470 - 1610nm) CWDM Multiplexer/Demultiplexer module for LD800
EM800-MDUX8/CW	8 wavelengths (1470 - 1610nm) CWDM Mux/DeMux module for LD800
LD1600 CWDM DF OADM modules	
A6CDxx	1 wavelength CWDM DF OADM module for LD1600
A6CDxx/yy	2 wavelengths CWDM DF OADM module for LD1600
A6CDxx/yy/zz	3 wavelengths CWDM DF OADM module for LD1600
A6CDxx/yy/zz/ww	4 wavelengths CWDM DF OADM module for LD1600
LD1600 DWDM DF OADM modules	
A6DD8xx	8 Sequential wavelengths DWDM DF OADM module for LD1600 with xx=starting channel (xx=20, 21, 22)
A6DDxx	1 wavelengths DWDM DF OADM module for LD1600
A6DDxx/yy	2 wavelengths DWDM DF OADM module for LD1600
A6DDxx/yy/zz	3 wavelengths DWDM DF OADM module for LD1600
A6DDxx/yy/zz/ww	4 wavelengths DWDM DF OADM module for LD1600
LD800 Dual fiber DWDM OADM modules	
ADDDxx/yy/zz/ww*	4 wavelengths DWDM DF OADM module for LD800 /LD400
ADDDxx/yy/zz*	3 wavelengths DWDM DF OADM module for LD800/LD400
ADDDxx/yy*	2 wavelengths DWDM DF OADM module for LD800/LD400
ADDDxx*	1 wavelength DWDM DF OADM module for LD800/LD400
ADDD8/xx	8 Sequential wavelengths DWDM DF OADM module for LD1600 with xx=starting channel (xx=20, 21, 22)
LD800 Dual fiber CWDM OADM modules	
ADCDxx/yy/zz/ww*	4 wavelengths CWDM DF OADM module for LD800/LD400
ADCDxx/yy/zz*	3 wavelengths CWDM DF OADM module for LD800/LD400
ADCDxx/yy*	2 wavelengths CWDM DF OADM module for LD800/LD400
ADCDxx*	1 wavelength CWDM DF OADM module for LD800/LD400