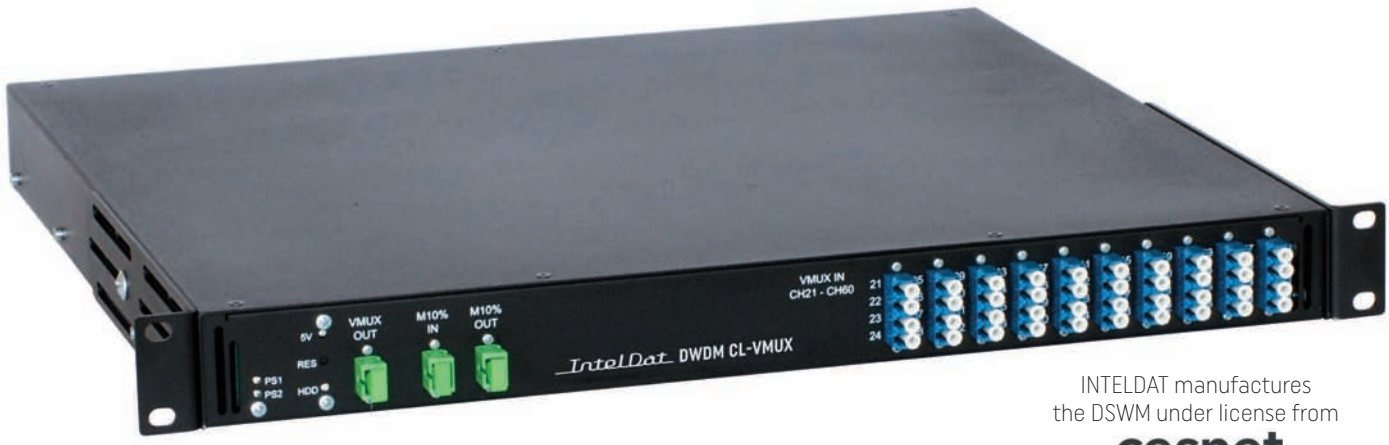
DSWM CzechLight Variable Multiplexer + 2-Channel OCM

The DSWM is designed for multiplexing optical signals in DWDM networks.

A Variable Optical Attenuator (VOA), DWDM Multiplexer, or VMUX, combines 40 individually controllable VOAs with a 40 Channel AWG Multiplexer in a single system. The VMUX is ideal for power leveling prior to amplification in DWDM systems, and can be used also in optical add/drop multiplexer configurations.

The Optical Channel Monitor (OCM) is an advanced optical subsystem that scans DWDM networks and reports the power of each 10/40/100G channel in real time. Feedback from the OCM can be used to optimize optical power levels, identify performance drift, and verify system functionality. An integrated switch allows 2 separate input ports to be monitored sequentially.

The built-in splitter for the second OCM port allows a user to monitor through external signals such as a DWDM demultiplexer or EDFAs.



INTELDAT manufactures the DSWM under license from cesnet

Features

- Multiplexing 40 channels in C band DWDM with variable attenuator VOA for each channel
- Accurate VOA control enables managed network nodes 40-channel capability 100 GHz channel spacing
- Low insertion loss and high isolation increases system margin
- High dynamic range, low PDL VOA
- Performance available in Mux and Demux configurations
- OCM is based on excellent MEMS durability, thermal stability, and repeatability
- 10/40/100 Gbit-capable (modulation is format independent)
- 100 GHz channel spacing within C band
- OCM 30 dB dynamic range
- Integrated 2-channel Optical Channel Monitor (OCM) for scanning DWDM signals of each 10/40/100 Gbit channel in real time
- The first port of OCM is used for VMUX monitoring, the second port is for optional monitoring of the power levels of EDFAs, DEMUXs, etc.
- Two integrated splitters 90 / 10 % connected to OCM ports
- Redundant power supply 230V AC and 48V DC
- Microprocessor based control board with Linux Operation System
- Remote management
  - CLI via SSH
  - SNMP package
  - E-mail critical warning messages
  - WEB based CL VMUX+OCM control and monitoring
  - Optional remote-control GSM/GPRS/UMTS/Wi-Fi
- Management control of all important parameters
  - Setting of VOA attenuator for each channel
  - Output power in each channel
  - Second OCM input pro optional monitoring DEMUX or EDFAs by 10 % splitter
  - Temperature monitoring
  - Power supply and FAN speeds monitoring
- 40 input VMUX channels, ch 21 to 60 by ITU-T
- 2x OCM monitor 10 % splitter

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Specifications

Parameters	Units	Specifications
Management interfaces		2x Ethernet 10/100 Mbit RJ45 ports
		1 x RS 232 port, 2x USB port
Monitor ports		SC/APC 1 % of power output
Power supply	W	dual PSU 100 - 230V AC and 48V DC (max 150 W)
Dimension	mm	chassis 1U 19", 435 x 415 x 44 (W x D x H)
	mm	chassis 1U max 4 x EDFA: 435 x 460 x 44 (W x D x H)
Working Temperature	°C	+5 to +60
Optical Connectors		SC/APC for inputs/outputs, LC/UPC for VMUX channels

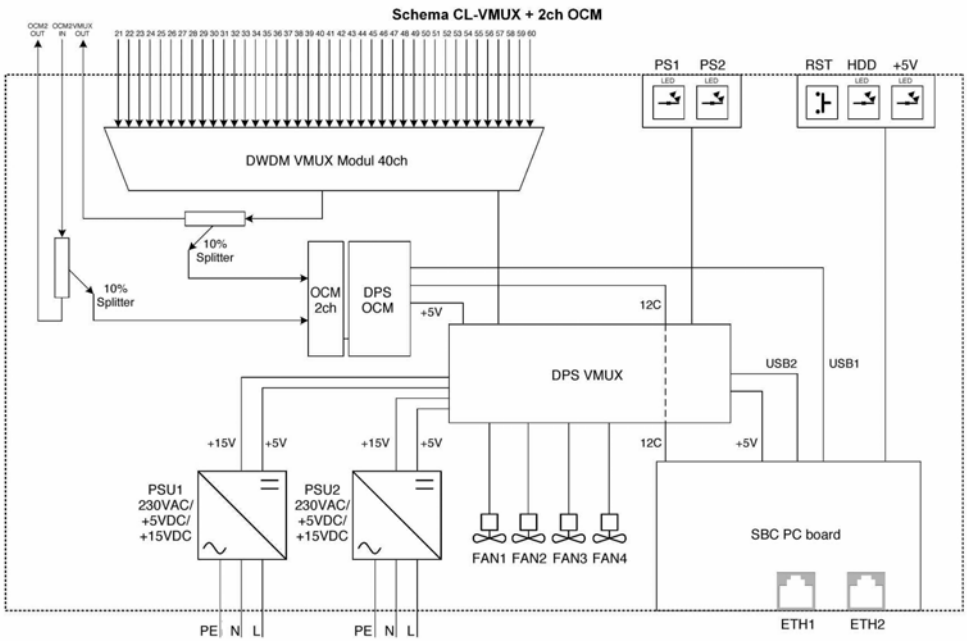
Optical Characteristic of VMUX

Parameters	Units	Specifications		
		Min	Type	Max
Signal Wavelength (40 channels, ch 21 - 60)	THz	192.100		196.000
Center Wavelength Accuracy (3 dB passband)	nm	-0.06		0.06
0.5 dB Passband Width (25 GHz)	nm	0.20		
1.0 dB Passband Width (50 GHz)	nm	0.40		
3.0 dB Passband Width (75 GHz)	nm	0.6		
Insertion Loss (Including both VOA and MUX at 0 dB attenuation)	dB			6.5
Uniformity (VOA at 0 dB attenuation)	dB			1.5
Ripple (VOA at 0 dB attenuation)	dB			0.75
Return Loss	dB	40		
Attenuation Range	dB			15
Attenuation resolution	dB	0.1		
Attenuation Accuracy (VOA 0 – 10 dB)	dB			0.5
Attenuation Accuracy (VOA 0 – 10 dB)	dB			1.2
Polarization Dependent Loss (PDL)(VOA 0 – 5 dB, 5 – 10 dB, 10 – 15 dB)	dB			0.7/0.9/1.4
Adjacent Channel Isolation(VOA at 0 dB attenuation)	dB	25		
Total Channel Isolation(VOA at dB attenuation)	dB	22		
Chromatic Dispersion (CD)	ps/nm	-20		20
Polarization Mode Dispersion (PMD)	ps			0.5
Maximum Optical Power	dBm			24

Optical Characteristic of OCM

Parameters	Units	Specifications		
		Min	Type	Max
Wavelength Range C-Band	nm	1529		1564
Channel Spacing	GHz		100	
Signal Data Rate			10/40/100 Gbit	
Per Channel Input Optical Power	dBm	-40		-10
Aggregate Input Optical Power	dBm	-40		10
Absolute Power Accuracy	dB			± 1
Aggregate Power Accuracy	dB			± 1
Channel Power Uniformity	dB			15
Optical Return Loss	dB			-40
Per Port Scanning Time	ms			500
Durability			1 billion cycles	
Operating Temp	°C	-5		75
Fiber Type	µm SM		9/125	
PORT1 OCM VMUX monitor, 10% splitter	dBm	-21		9
PORT2 OCM ext. monitor, 10% splitter	dBm	-29		1
Insertion Loss – splitter 90 %, SC/APC	dB			1.0
Insertion Loss – splitter 10 %, SC/APC	dB			11.2
Insertion Loss – VMUX + Splitter monitor	dB			7.2

Functional Block Diagram



ORDERING CODES

DSWM: CzechLight Variable Multiplexer + 2-Channel OCM

DS	WM	✓	–	21	–	60	–		–	PS1	–	PS2	
		CLVMUX						2OCM					40-Channel Mux + 2-Channel OCM
		CLVDEMUX											40-Channel Demux
Example													
DS	**WM**	**CLVMUX**	**–**	**21**	**–**	**60**	**–**	**2OCM**	**–**	**PS1**	**–**	**PS2**	INTELDAT CzechLight 40-channel multiplexer + 2-channel OCM, 21-60, 100 GHz