

LM-DPQAM-R



Lightwave Modulator for DP-QAM

The Optilab LM-DPQAM-R is a high performance Dual Polarization Quadrature Amplitude Modulation (DP-QAM) lightwave transmitter designed for Optical Communication up to 400 Gb/s or beyond. The LM-DPQAM-R incorporates an internal laser source (DFB, tunable laser) which couples into a four IQ drive speed MZI modulator for DPQAM modulation, with four broadband modulator drivers. The LM-DPQAM-R can also be used for Quadrature Amplitude Modulation (QAM). The LM-DPQAM-R has a built-in Automatic Bias Control board which allows for stable long-term operation, with up to 4 bias operating modes. Adjustable RF gain through the front panel interface and LabVIEW software can be performed. Contact Optilab for more information.

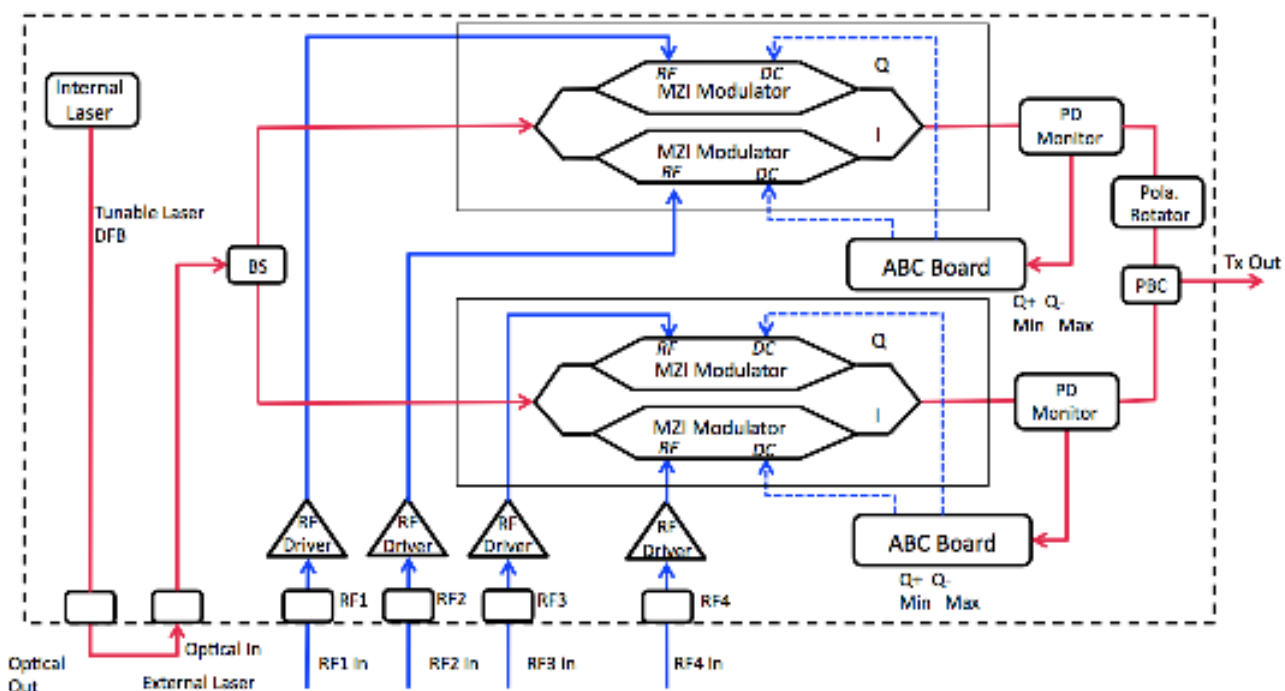
Features

- Up to 400 Gb/s bit rate
- Quadrature modulator driver
- Four auto bias modes
- Four IQ modulators
- Bandwidth options: 40/60/80 Gb/s

Applications

- Optical networks
- Coherent communication
- Research and development
- Test and measurement

Functional Diagram



Lightwave Modulator for DP-QAM

OPTIONS

- LM-DPQAM-XX-R-YY-ZZ**
- XX Bandwidth:
See Table 1.0
- YY Laser Source:
See Table 2.0
- ZZ PM: Polarization
Maintaining Output

TECHNICAL INFO

For technical info and support:

sales@optilab.com

www.optilab.com

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Optilab Advantage

- Innovation
- Performance
- Quality
- Customization
- Warranty

General Specifications	
Bit Rate/ Bandwidth	See Table 1.0
Internal Laser Source	See Table 2.0
External Optical Input Level	+20 dBm max.
Impedance	50 Ω typ.
Optical Output Power	-1 dBm min. @ 14 dBm input
Modulator Bias Mode	Automatic bias control modes,
Input RF Voltage Range	250 mV to 750 mV typ.
Eye Crossing Adjustment	Available
Mechanical Specifications	
Operating Temperature	-10 °C to +60 °C
Storage Temperature	-50 °C to +90 °C
Power Supply Requirements	110/220 VAC, 50-60 Hz
Optical Connectors	Diamond ADT-UNI APC
Input Fiber Type	PANDA PM
Output Fiber Type	SMF-28 standard; PANDA PM optional
RF Input Connector	K type
Remote Control	USB 2.0 and LabVIEW software included
Alarm	Bias mode status, over temperature
Dimensions	1RU 482.60(L) x 470.57(W) x 44.00(H)

Table 1.0 Bandwidth Options:

Model #	Bit Rate	Analog Bandwidth
LM-DPQAM-100-R	100 Gb/s min.	15 GHz typ. for each modulator
LM-DPQAM-200-R	200 Gb/s min.	25 GHz typ. for each modulator
LM-DPQAM-400-R	400 Gb/s min.	32 GHz typ. for each modulator

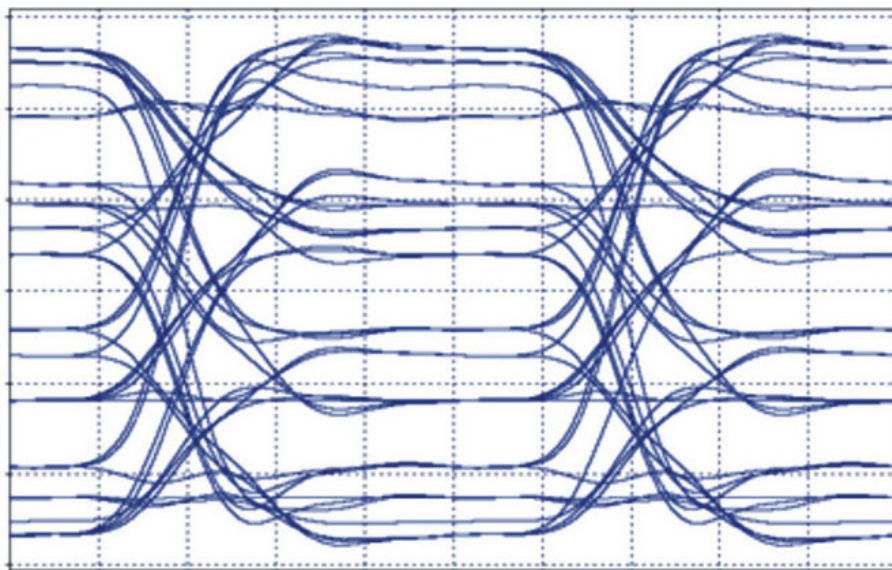
Table 2.0 Laser Source Options:

Model #	Laser Source	Wavelength	Linewidth
LM-DPQAM-R-DC	DFB C band	1550 ± 5 nm	500 kHz typ.
LM-DPQAM-R-DL	DFB L band	1580 ± 5 nm	500 kHz typ.
LM-DPQAM-R-TC	Tunable C band	1527 - 1567 nm	10 kHz typ. *
LM-DPQAM-R-TL	Tunable L band	1570 - 1608 nm	10 kHz typ. *
LM-DPQAM-R-CL	Tunable C+L band	1527 - 1608 nm	10 kHz typ. *
LM-DPQAM-R-EL	External laser	1250 - 1610 nm	

* Intrinsic linewidth

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Eye Diagram

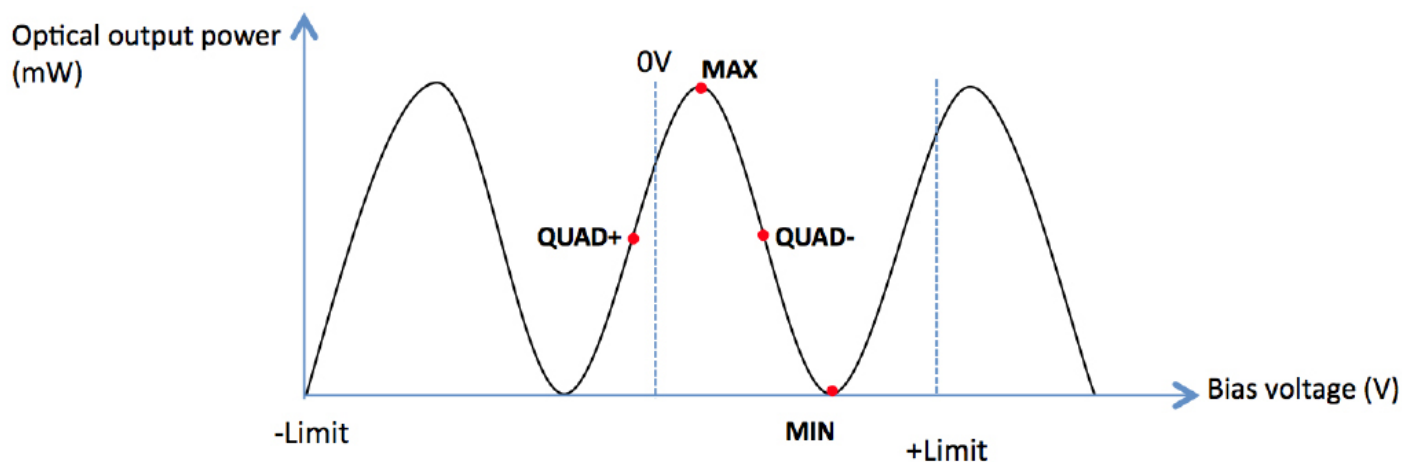


Bias Control Mode

Mode	Operation Conditions	Modulation Format
Q+	Set to quadrature point of positive slope	Analog, NRZ
Q-	Set to quadrature point of negative slope	Analog, NRZ
Min	Set to min. point of modulator curve	Pulse, RZ, BPSK
Max	Set to max. point of modulator curve	Pulse, RZ

Bias Setting Modes for LM-DPQAM-R

Based on a sophisticated phase measurement of a small dither signal, the LM-DPQAM-R provides four selectable operating modes: quadrature (Quad +), inverted quadrature (Quad -), minimum (Min), or maximum (Max) points.



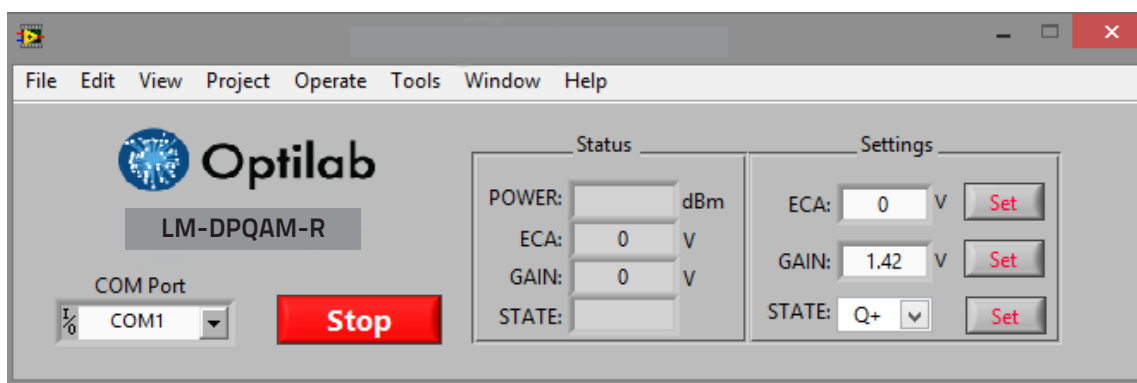
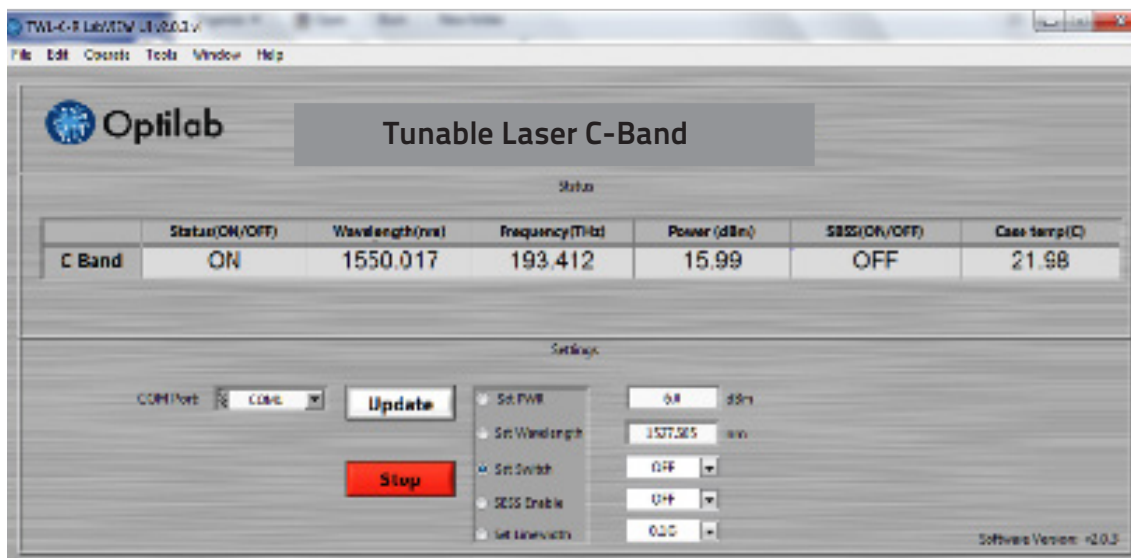
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Tunable Laser Specifications

General Specifications	C-Band	L-Band
Laser Wavelength	From 1527 to 1567 nm	From 1570 to 1607nm
Wavelength Accuracy	± 1 pm	
Wavelength Setting Resolution	1 pm (continuous)	
Wavelength Stability	± 1pm over 24 hours	
Output Power	40 mW typ.	
Output Stability	0.02 dB over 8 hours	
Linewidth (FWHM)	< 10 kHz instantaneous < 100 kHz with SBS disabled	
Carrier to Noise Ratio (CNR)	50 dBc typ. @ -5 dBm	
Side Mode Suppression Ratio	55 dB typ.	
Relative Intensity Noise (RIN)	< -157 dB/Hz @ 13 dBm	
Polarization Extinction Ratio	20 dB min.	
Optical Isolation	30 dB min.	
Fiber Type	Panda 1550 PM Fiber	

LM-DPQAM-R Remote Labview Interface

Optilab offers remote interface via Labview software for laser, modulator driver and MZI modulator parameter adjustment and status monitoring, contact Optilab for more details.



Lightwave Modulator for DP-QAM

Detailed Layout



1	USB Socket	6	RF 2
2	Laser Out	7	RF 2
3	Optical In	8	RF 4
4	Tap	9	RF Key Switch
5	RF 1		