

# LM-DPSK-R



## Lightwave Modulator for Dual Phase Shift Key, up to 50 Gb/s

The Optilab LM-DPSK-R is a high performance Dual Phase Shift Key (DPSK) lightwave transmitter designed for Optical Communication up to 50 Gb/s or beyond. The LM-DPSK-R incorporates an internal laser source (DFB, tunable laser) which couples into a high speed MZI modulator for DPSK modulation, with a broadband modulator driver. The LM-DPSK-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.

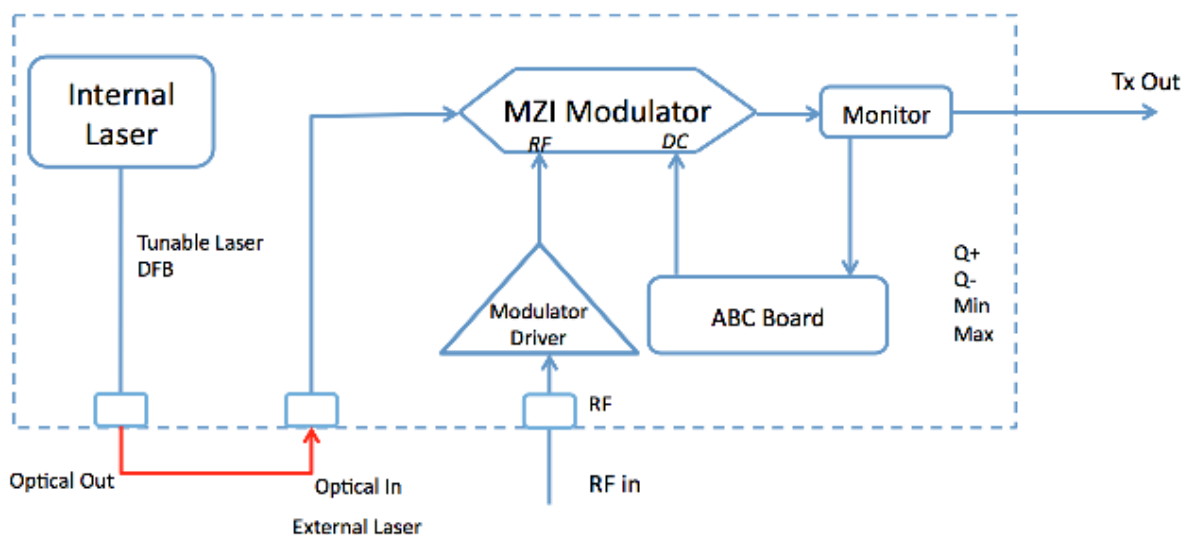
### Features

- Up to 50 Gb/s bit rate
- Integrated modulator driver
- Four auto bias modes
- Low drive modulator for  $2\pi$  modulation
- Customizable options:
  - Laser source (Tunable, DFB)
  - Bandwidth (10/20/30/40/50)
  - PM output fiber

### Applications

- Optical communications
- Analog transmission
- Picosecond pulse generation
- Research and development
- Test and measurement

### Functional Diagram



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## OPTIONS

- LM-DPSK-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](mailto:sales@optilab.com)

[www.optilab.com](http://www.optilab.com)

## WEB ORDER

To order, please click below.

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 $\Omega$ typ.
Optical Output Power	6 dB typ.
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	FC/APC, others optional
Input Fiber Type	PANDA PM
Output Fiber Type	SMF-28 standard; PANDA PM optional
RF Input Connector	See Table 1.0
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	RF Connector
LM-DPSK-10-R	12 Gb/s min.	10 GHz typ.	SMA type
LM-DPSK-20-R	20 Gb/s min.	17 GHz typ.	K type
LM-DPSK-30-R	32Gb/s min.	25 GHz typ.	K type
LM-DPSK-40-R	40 Gb/s min.	32 GHz typ.	K type
LM-DPSK-50-R	50 Gb/s min.	40 GHz typ.	V type

## Optilab Advantage

- Innovation
- Performance
- Quality
- Customization
- Warranty

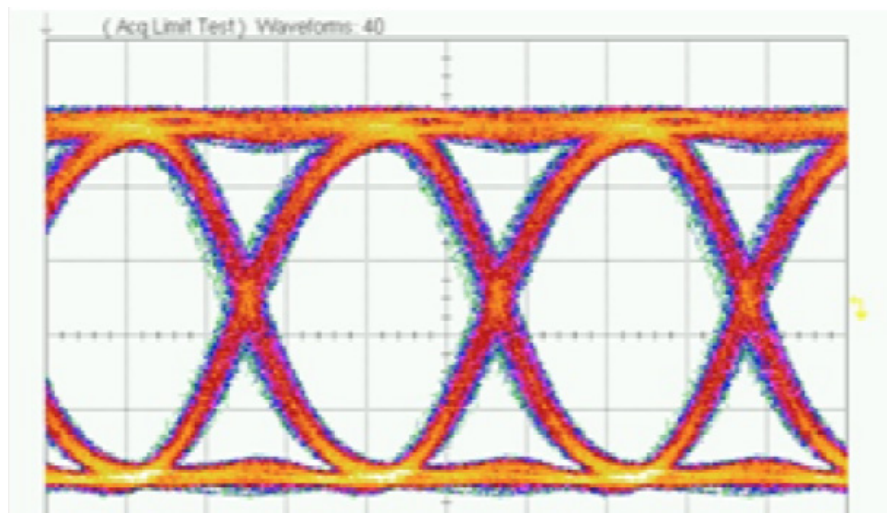
Table 2.0 Laser Source Options:

Model #	Laser Source	Wavelength	Linewidth
LM-DPSK-R-DO	DFB O band	1310 $\pm$ 5 nm	1 MHz typ.
LM-DPSK-R-DC	DFB C band	1550 $\pm$ 5 nm	500 kHz typ.
LM-DPSK-R-DL	DFB L band	1580 $\pm$ 5 nm	500 kHz typ.
LM-DPSK-R-TC	Tunable C band	1527 - 1567 nm	10 kHz typ. *
LM-DPSK-R-TL	Tunable L band	1570 - 1608 nm	10 kHz typ. *
LM-DPSK-R-CL	Tunable C+L band	1527 - 1608 nm	10 kHz typ. *

\* Intrinsic linewidth

# Lightwave Modulator for Dual Phase Shift Key, up to 50 Gb/s

## Eye Diagram



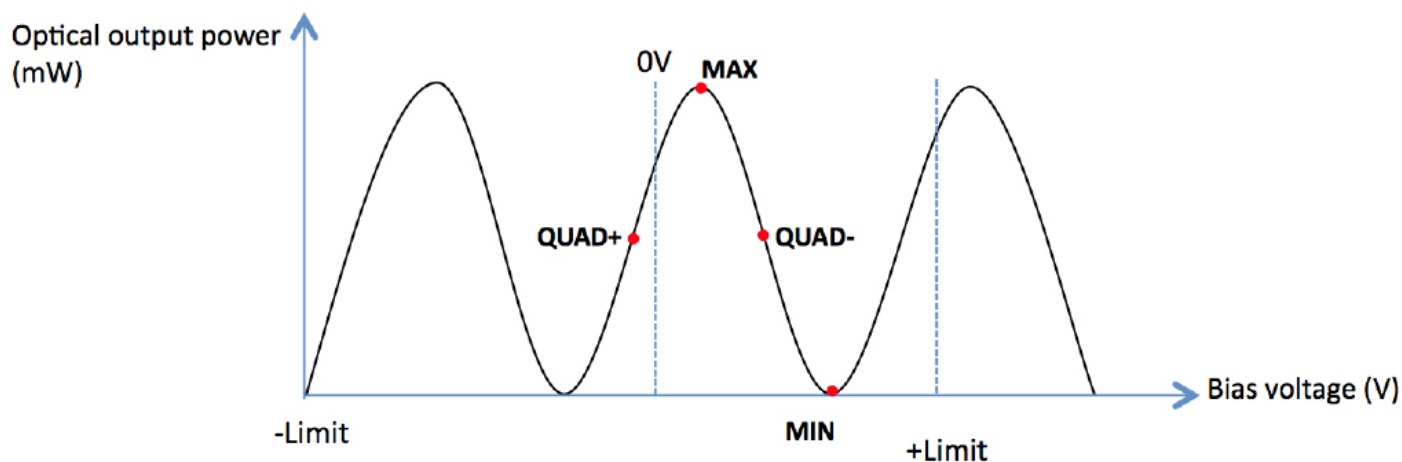
12 Gb/s Example

## 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-DPSK-R

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



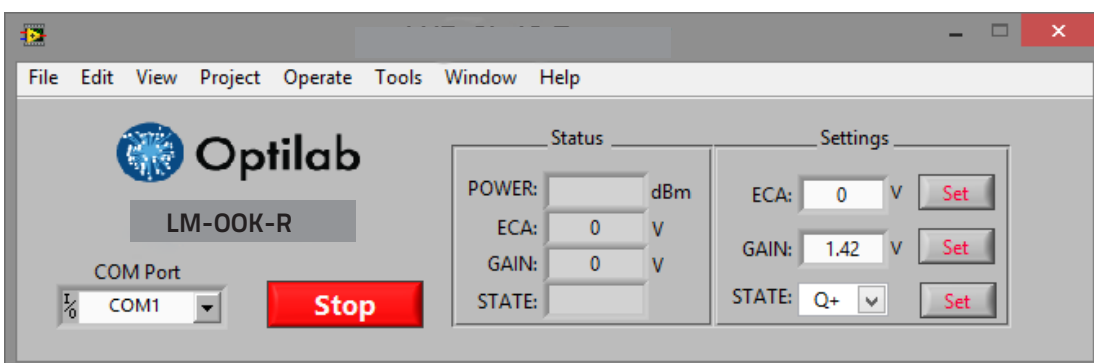
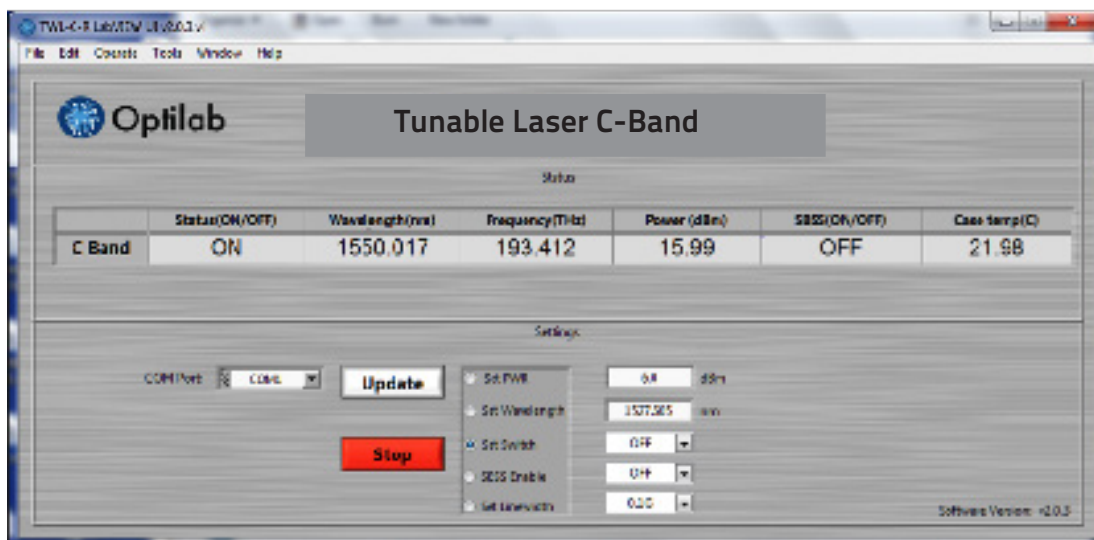
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## Tunable Laser Specifications

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 w/o dither < 100 kHz with SBS disabled < 750 MHz w/ SBS enabled	
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	

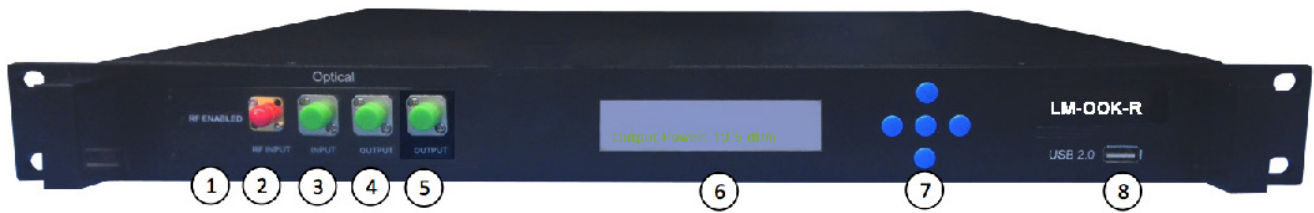
## LM-DPSK-R Remote Labview Interface

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



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## Detailed Layout



1	RF Power Indicator	5	Optical Out
2	RF In	6	LCD Display
3	Laser In	7	Interface Buttons
4	Laser Out	8	USB Socket

## Mechanical Drawing

