OPP-LAB

OPP-LAB-NIR800

Optical Pulse Picker LAB in the Near Infra-Red 800 nm band

The Exail OPP-LAB-NIR800 is a family of Optical Pulse Picker based on NIR-MX800 $LiNbO_3$ Mach-Zehnder modulators and proprietary bias controller. The module is available at 780 nm or 852 nm. It allows from a continuous laser source to generate an optical modulated signal, and from a pulse seeder source to pulse pick and reduce its repetition rate.
The short optical pulse generation or picking is based on a large bandwidth and high extinction ratio external $LiNbO_3$ NIR-MX800 modulator.
For superior extinction ratio above 30 dB, the OPP-LAB-NIR800 embeds cascaded modulators. An innovative automatic bias control circuitry (MBC) guarantees bias point stability over time whatever the power and the mode of the input optical signal, whether continuous or pulsed. This MBC is intended to operate at a chosen wavelength, at 780 nm or 852 nm.

FEATURES

- Turn-key optical pulse picker
- High optical stability over time
- Low rise & fall times
- Very high extinction ratio
- Proven solution

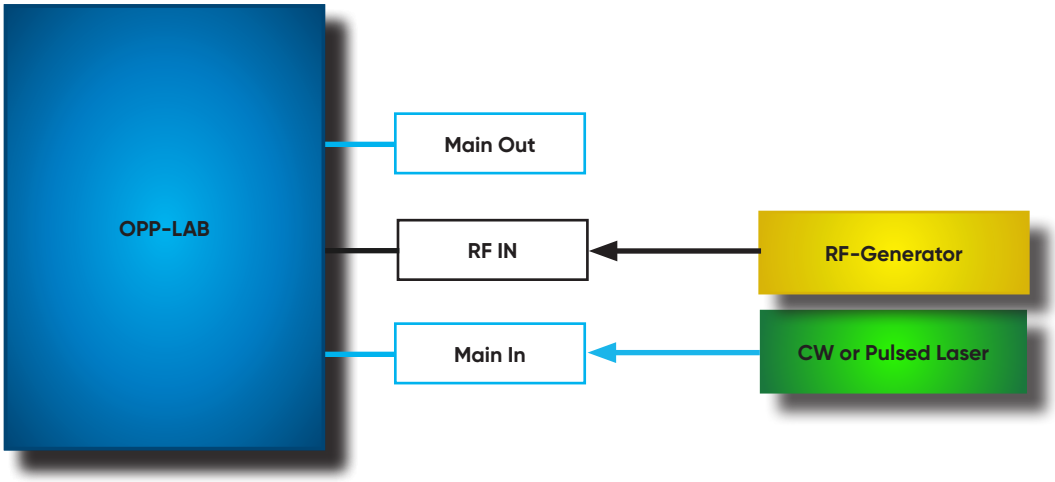
APPLICATIONS

- Pulse picking and optical modulation
- Laser operation
- Single-photon source

PERFORMANCE HIGHLIGHTS

Parameter	Nominal
Operating wavelengh	780 nm / 852 nm
Pulse contrast	30 dB / 60 dB
Insertion loss	7 dB / 13 dB

FUNCTIONAL BLOCK DIAGRAM



The OPP-LAB integrates:

- a modulator set to ensure a very high optical pulse extinction ratio and flexible pulse shaping,
- an automatic Modulator Bias Control circuitry (MBC) to guarantee high extinction ratio stability over time.

The OPP-LAB is connected to an external optical laser source and an external electrical generator.

OPP-LAB-NIR800

ELECTRICAL INPUT SPECIFICATIONS

Parameter	Symbol	Condition	Min	Typ	Max	Unit
RF signal type	-	-	-	Pulse / Other		
RF impedance	-	-	-	50	-	Ω
RF amplitude [1]	-	-	-	4	-	V
RF duty cycle	-	For maximum pulse contrast	-	-	1	%
MBC trigger voltage	-	TTL	-	-	3.3	V
MBC trigger frequency	-	-	-	-	1	kHz
Power supply	DC	-	-	12	-	V

[1] Corresponding to the modulator Vπ RF value.

OPTICAL INPUT SPECIFICATIONS

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Mode	-	-	Continuous or Pulse			
Wavelength	-	-	780	-	850	nm
Side mode suppression ratio	SMSR	-	30	-	-	dB
Polarisation	-	-	Linear and controlled			
Input power	-	Continuous or average power	0	-	100	mW

OPP-LAB OPTICAL SPECIFICATIONS

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Electro-optics bandwidth	-	-	-	20	-	GHz
Rise/Fall time	-	Achieved with fast electrical pulse	-	20	-	ps
Static extinction ratio [2]	SER	OPP-LAB-NIR800-30dB OPP-LAB-NIR800-60dB	25 50	30 60	- -	dB dB
Extinction ratio stability [3]	-	-	-	1	-	%/H
Insertion loss [4]	IL	OPP-LAB-NIR800-30dB OPP-LAB-NIR800-60dB	- -	7 13	- -	dB dB
Polarisation extenction ratio	PER	-	+20	-	-	dB
Contra-propagative signal [5]	-	-	-	-40	-	dBm
Optical return loss	ORL	-	-	-45	-40	dB
MBC dither frequency	Fdth	-	400	1000	1400	Hz

[2] Output static extinction ratio when duty-cycle < 1 % @780 nm or 852 nm.
[3] Measured over 24 hours.
[4] When the modulator is set at its maximum transmission.
[5] From input port.

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INTERFACES AND DIMENSIONS

FRONT PANEL	
RF input connector	RF In - SMA Female - 50 Ω
Optical input connector	Main In - FC/APC - PM fiber
Optical output connector	Main Out - FC/APC - PM fiber
REAR PANEL	
Power supply (12V - 2A)	DC In - Jack male 2 mm
MBC dither disable	Trig In - BNC
USB	USB - B type
Dimensions	220 mm x 220 mm x 52 mm

ENVIRONMENT

Parameter	Min	Typ	Max	Unit
Operating temperature	+15	-	+35	°C
Storage temperature	-20	-	+50	°C

ABSOLUTE MAXIMUM RATINGS

Parameter	Min	Typ	Max	Unit
Optical input power (Continuous or average)	-	-	40	mW
Electrical input power	-	-	+28	dBm

ORDERING INFORMATION

Operating wavelength: **780** (780 nm), **852** (852 nm)

Pulse contrast: **30** (30 dB), **60** (60 dB)

OPP-LAB-NIR800-□nm-□dB

Exail Photonics produces specialty optical fibers and Bragg gratings based fiber optics components and provides optical modulation solutions based on the company lithium niobate ($LiNbO_3$) modulators and RF electronic modules.
Exail Photonics serves a wide range of industries: sensing and instruments, defense, telecommunications, space and fiber lasers as well as research laboratories all over the world.

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