

ModBox CBand Pulse

High Extinction Ratio, C-Band Pulse Generation Unit

PHOTLINE MODBOX



FEATURES

- Very high Extinction Ratio
- Fast rise & fall times
- Optical square waveform
- Low jitter
- Proven solution

OPTIONS

- High extinction ratio
- Electrical Pulse Penerator (EPG)

The Photline Modbox-Pulse-CBand is a high extinction ratio optical Pulse Generator operating in the C-Band. It allows dynamic extinction ratio from 40 dB with high stability over time, and with user adjustable optical pulse duration and optical pulse train repetition rate.

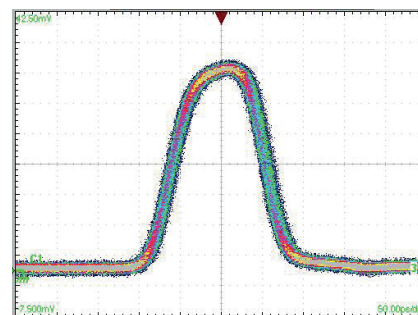
iXBlue Photonics has accumulated a strong experience in such systems and successfully installed them in many laboratories over the world.

The ModBox-Pulse provides R&D and production engineers with state of the art performance and the peace of mind of a turn-key instrument. It can be used as a reference transmitter in laboratories and production for a broad variety of applications : components and material characterization, seeder for high energy lasers, lidars...

Performance Highlights

Parameter	Min	Typ	Max
Operating wavelength		C-Band	
Pulse contrast @1550nm		> 40 dB	
Pulse waveform		Rectangular	
Pulse width		100 ps - 10 ns	
Rise / Fall times		50 ps	
Jitter		< 10 ps	

Optical Pulse Diagrams

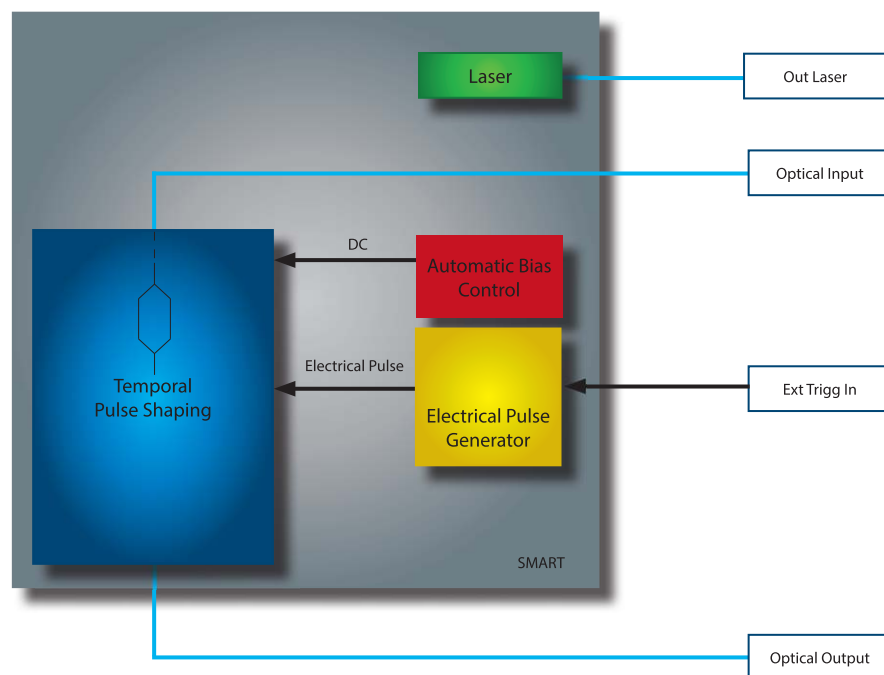


100 ps optical pulse

ModBox Pulse

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Functional Block Diagram



The ModBox Pulse integrates the new Photline Smart Interface which allows control for the full system:

- a temporal pulse block based on a modulators set to ensure a very high optical pulse extinction ratio over a large optical bandwidth,
- an automatic modulator bias control circuitry to guarantee high extinction ratio stability over long periods of time,
- the Electrical Pulse Generator with a flexible Frequency Repetition rate and Pulse Width tunability,
- a tunable laser in the C-Band. Laser power and wavelength are adjustable from the Smart Interface and provided GUI.

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Optical Input Specifications

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Operating wavelength	λ	-	C-Band			
Line-width	$\Delta\lambda$	-	-	1	-	MHz
Optical input power	OP_{in}	-	10	-	60	mW

Optional C-Band Tunable Laser Specifications

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Optical wavelength range	$\lambda_{C\text{-band}}$	C-band version	1527.60	-	1565.50	nm
Optical output power	P_{CW}	CW	5	-	35	mW
Wavelength accuracy	$\Delta\lambda_{acc}$	-	-1.5	-	1.5	GHz
Spectrum linewidth	$\Delta\lambda$	FWHM @-3 dB, instantaneous	-	-	100	kHz
Side Mode Suppression Ratio	SMSR	-	40	55	-	dB
RIN	RIN_7	For 7 dBm output power	-	-	-140	dB/Hz

Electrical Input Specifications

Parameter	Symbol	Condition	Min	Typ	Max	Unit
External trigger input	-	50 Ω with positive slope	-2	-	2	V
	-	-	-	-	20	MHz

Optical Output Specifications

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Output pulse shapes	-	-	Rectangular			-
Pulse width	PW	Remotly adjustable	100 p	-	25 n	s
		Best optimization	-	5	-	ns
Frequency repetition rate	FRR	Adjustable by the trigger frequency	0	-	20	MHz
		Best optimization	5	-	10	kHz
Rise time / Fall time	t_r/t_f	20 % - 80 %	-	50	60	ps
Pulse extinction ratio	SER	@1550nm ⁽¹⁾	40	43	-	dB
Extinction ratio stability	ΔSER	Over 12 hours	-	-	1	%rms
RMS jitter	J_{RMS}	-	-	-	10	ps
Polarisation extinction ratio	PER	-	15	20	-	dB
Insertion loss	IL	-	-	5	6	dB
Optical return loss	ORL	-	40	-	-	dB

⁽¹⁾: The highest Extinction ratio is given at 1550nm, and can be degraded of other wavelengths from the C-Band

ModBox Pulse

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Panels

Parameter	Condition	Min	Typ	Max	Unit
Front panel					
Interface	Pulse generator, MBC	LCD interface with keypad			
Optical ports	Main & Monitor	FC/APC			
Optical fiber	-	Polarization maintaining fiber, Corning PM 98-U25A			
Trigger input connector	RF In port	BNC			



Parameter	Condition	Min	Typ	Max	Unit
Rear Panel					
Remote control connector	Smart (EPG, automatic bias controller, Tunable Laser)	USB			

Dimensions - Compliance

Parameter	Condition	Min	Typ	Max	Unit
Size		19 inches 3U			
Weight		5 kg			
Power supply		100 - 120 V / 220 - 240 V automatic switch, 50 - 60 Hz			
Compliance					
Safety		EN 60625-1			
Marking		CE			

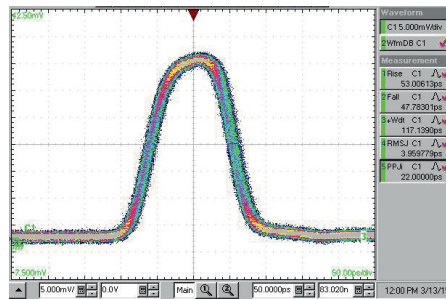
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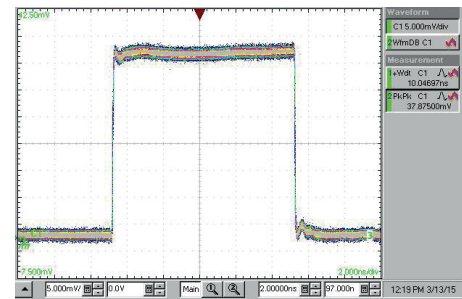
ModBox Electrical and Optical Outputs

The following equipment was used to obtain below results :

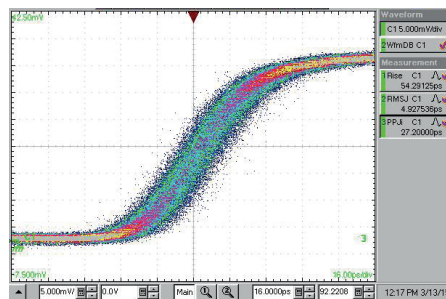
- ModBox-Pulse with built-in Pulse generator
- Oscilloscope Agilent 86100B
- Tektronix CSA 8000 oscilloscope



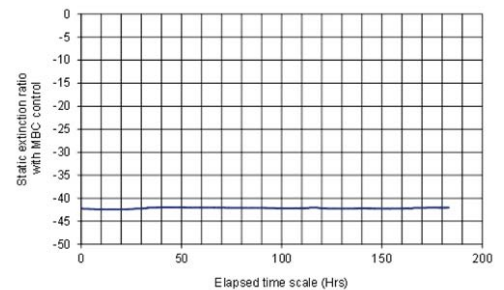
100 ps optical square pulse



10 ns optical square pulse



Rise time



SER stability from ModBox-Pulse-CBand -40dB

About us

iXBlue Photonics includes iXBlue iXFiber brand that produces specialty optical fibers and Bragg gratings based fiber optics components and iXBlue Photline brand that provides optical modulation solutions based on the company lithium niobate (LiNbO₃) modulators and RF electronic modules.

iXBlue 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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