

# PG-100 (Opto)-Electrical Programmable Pulse Generator

## Product Overview

The PG-100 is a programmable pulse generator with an optional optical output. Pulse widths of <100 ps to 2 ns duration can be programmed at rates from 10 MHz to >2 GHz, and the pulses can be programmed to shift in phase (time) and amplitude. The optical pulses are generated using external modulators, are optionally wide-band wavelength tunable, and can be ordered with an integrated optical amplifier and tracking filters to enable wavelength-dynamic pulse generation with up to 100's of mW of peak power.

The system can optionally be configured as an **optical pulse picker** to divide the pulse rate of an input optical pulse sequence by a programmable integer number. Here the user supplies their own optical input pulse sequence and electrical clock, and the pulse picker can select a down-counted pulse rate and shift the pulse-picking window to overlap with the arriving pulses.

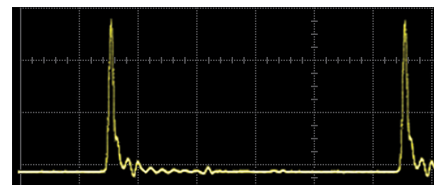
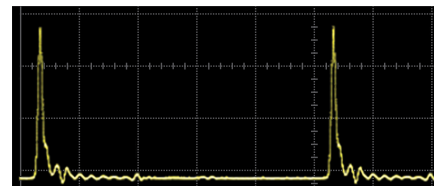
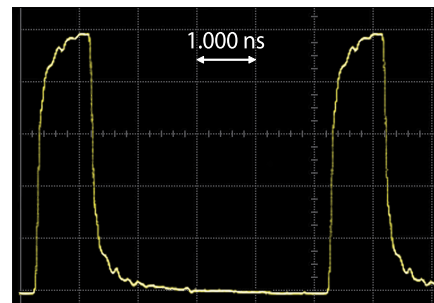
This valuable laboratory tool can be used for a wide variety of purposes, such as impulse response testing, comb generation, lidar, frequency conversion via nonlinear crystals, and nonlinear fiber optics.

## Basic Features

- Variable pulse width, phase (delay), and repetition rate (variable amplitude optional)
- <100 ps minimum pulse width
- Order with internal 1550 nm tunable laser, or use a user-supplied light source
- Optional optical amplification with tracking ASE filter
- USB computer control

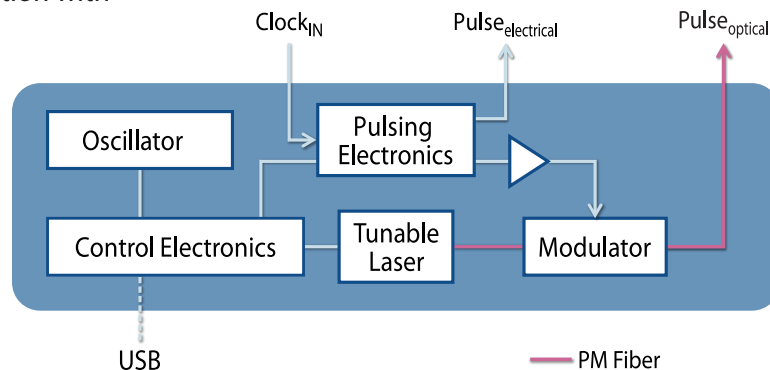
## Typical Applications

- Generate optical pulses for nonlinear optics (e.g. frequency conversion)
- Pulse-picking (optical pulse down-counting)
- Impulse response testing
- Simplified pulse temporal alignment



Reduce Pulse Width

Shift Pulse Phase



## Programmable Pulse Generator

### Product Specifications

Attribute	Value/Units	Comments
Pulse Repetition rate	0.01 – 2 GHz	Achievable with external clock
Internal oscillator	0.14 – 2 GHz	
External clock output	50 – 250 mVpp	
Pulse delay control range	4 ns	Programmable with respect to clock
Pulse delay resolution	20 ps	
Laser linewidth	<20 kHz	
Wavelength tuning range	35 nm	C-band: 1530 – 1565 nm (L-band: 1570 – 1608 nm)
Peak optical power	2 (400) mW	No EDFA (with EDFA: average power 6 dBm, e.g. 200 ps pulse width, 25 MHz rep rate)
Pulse width ( $\tau$ )	0.05 – 2 ns	Optical and electrical outputs, <50% duty cycle
Electrical pulse size	160 mVpp	
Form Factor	2 U	rackbox standard 3.5"x13"x17"

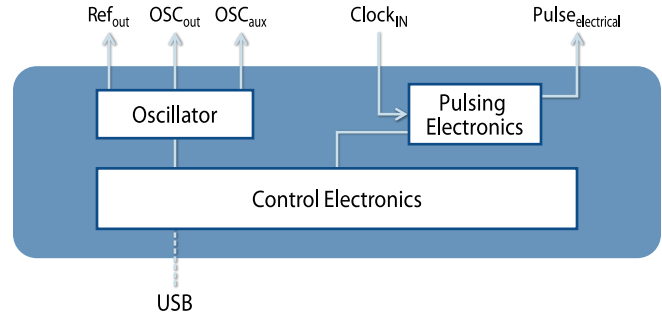
### Specifying Product Options

#### PG - 100 - [OE] - [L] - [A] - [V] - [PP]

To specify optional optical output, or configure as an optical pulse picker, add the appropriate following identifier(s)

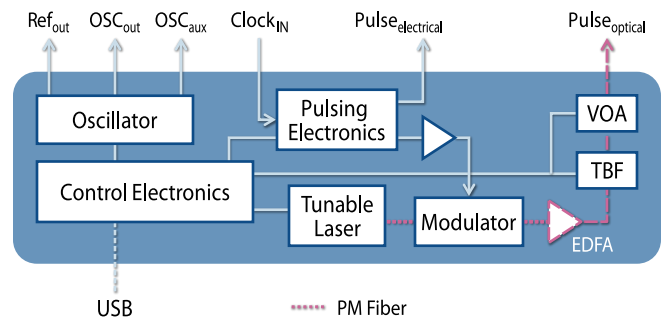
[OE] Optical Pulse	Generate both optical and electrical pulses
[L] Tunable Laser	Integrated internal laser
[A] Optical Amplifier	Integrated amplifier/tracking filter <i>Note: Amplifier output is standard fiber (not PM).</i>
[V] Variable Optical Attenuator	Integrated variable attenuator <i>Note: If option [A] also selected, then standard fiber output, else if not, PM fiber output.</i>
[PP] Pulse-Picker	Pulse-picker configuration <i>Note: Optical input and output with PM fiber FC/UPC connections</i>

### Electrical Pulser (PG-100) Diagram



### OE Pulser (PG-100-OE-L-A-V) Diagram

Shown with tunable laser and EDFA options



- ..... PM Fiber
- (optional) SM Fiber
- EDFA: Erbium Doped Fiber Amplifier
- TBF: Tunable Bandpass Filter
- VOA: Variable Optical Attenuator

### OE Pulse-Picker (PG-100-OE-PP) Diagram

