

# NuCrypt

## Programmable Pulse Generator

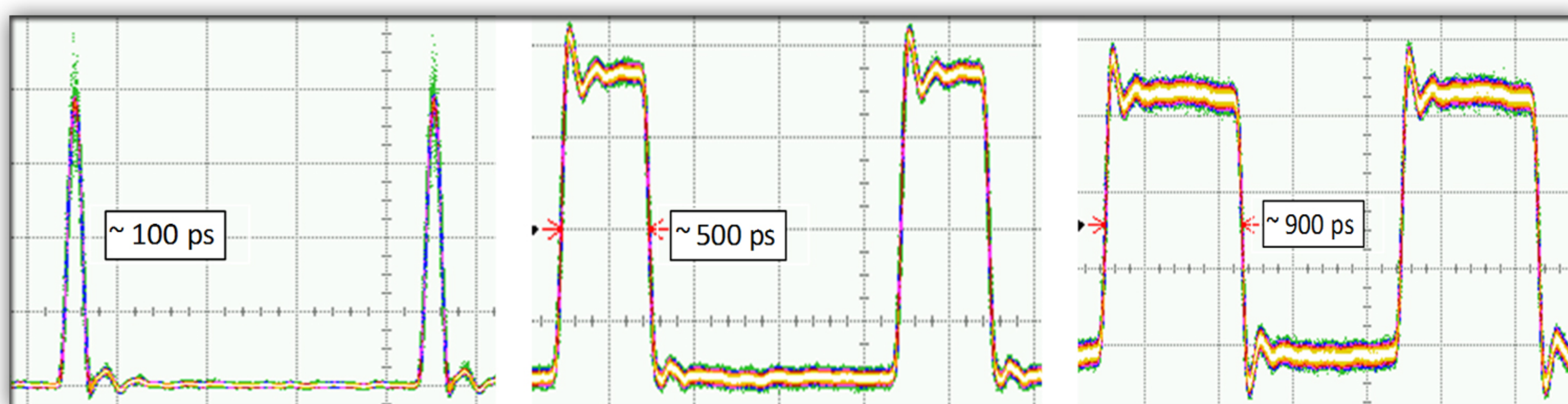


## Product Overview

## PG-100

Programmable pulse generator with an optical pulse generation option (opto-electrical pulse generator).

The PG-100 can simultaneously generate electrical and optical (-OE option) pulses with programmable pulse widths from 100 ps – 2 ns duration at pulse rates exceeding 2.5 GHz. Users can specify the pulse rate using either an external clock input or a programmable internal oscillator. The pulses can be time delayed with respect to the clock with < 100 ps resolution and up to 2 ns range. The internal oscillator has a 10 MHz reference output for phase locking to other equipment. The optical pulses are generated in a distributed feed-back (DFB) laser suitable for further external modulation. Programmable quantities can be changed via a computer interface over a USB connection, including the laser temperature, laser current, pulse-width, and internal oscillator frequency. A nonvolatile memory can store desired operating conditions. The PG-100 is a valuable laboratory tool for impulse response testing, comb generation, lidar, and nonlinear fiber optics.



Example of 500 MHz optical pulses at three different programmable pulse widths (measured using a sampling oscilloscope at 500 ps/div with a 10 GHz bandwidth photodetector).

## Basic Features

- Repetition rate: 50 MHz - 2.7 GHz
- Pulse width: <100 ps - 2 ns (both optical and electrical)
- Laser wavelength: 1550 nm (C-band ITU grid selectable,  $\pm 0.8$  nm temperature tuning)
- USB programmable: laser current and temperature, pulse width, oscillator frequency
- Use either an internal or external oscillator

### \*Product Specifications

### PG-100

Attribute	Value	Units	Comments
Repetition Rate	0.050 - 2.7	GHz	Using external clock
Pulse width	100 - 5000	ps	Programmable, <50% duty cycle
Internal Oscillator	0.14 - 2.7	GHz	1 MHz tuning resolution / 10 Mhz reference output
External clock input	200	mV <sub>pp</sub>	Low jitter sinusoid, AC coupled
Pulse Delay Control	0.1 - 2	ns	Programmable with respect to clock/oscillator <sup>1</sup>
Laser linewidth	<10	MHz	Externally modulated DFB laser
Wavelength tuning range	±0.8	nm	Temperature tuned via USB, C-band (1550 nm) selectable
Optical Extinction ratio	16	dB	
Peak optical output power	0	dBm	
Connectors			Fiber: FC/UPC   Electrical: SMA, 50 ohms
Form Factor			2U rack box (3.5" x 13" x 17")

(\* Specifications listed above are estimates subject to change without notice)  
(1. 1/2 period maximum delay)

### Options for PG-100

PG-100-[xx]-[y]-[zz]

[xx]; optical pulse option; leave blank for electrical pulse only, -OE for both optical and electrical pulse generator

[y]; electrical pulse size; leave blank for standard pulse output (~200 mV), -E for extended voltage option (~7 Vpp)

[zz]; external optical input; leave blank for standard internal laser, -XL for external laser input option (option combines external and internal laser in a PM combiner reducing optical power levels by 3dB)