# DCPG

## Dirt Cheap Pulse Generator

### User Manual – January 2014

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## OVERVIEW

The DCPG is a basic pulse generator. It is intended for most applications where a positive 5V pulse of variable pulsewidth and frequency is needed for testing. It is not intended for complex pulse scheduling or multiple synchronized pulses; for variable output polarity, amplitude, or impedance; or for externally triggered pulsing. There are a number of excellent commercially available pulse generators of greater complexity (& cost) that serve these needs.

The DCPG is intended to be inexpensive, stable, reliable, and convenient and ergonomic to use. Consider buying enough for all your engineers, technicians, and test benches, so that you will never have to hunt for a pulse generator again.

## SETUP

Supply power using the enclosed USB cable. You can supply this via any available USB socket, or using the enclosed AC-USB supply. The USB cable is only used to provide power, there is no communication functionality over this cable.

Attach a BNC cable to the output connector. Pulses will be delivered with +5V polarity, through a series 50Ω resistor.

## PULSEWIDTH CONTROL

At Power-up, the pulse generator will be pulsing 1.0 µs pulses at 100 Hz (10 ms period).

***Rotate the knob*** to adjust the pulse width. The range of adjustment is from 50 ns to slightly under the current period setting, up to a maximum of 1.0 s. Monitor the output on a scope to calibrate the adjustment.

## FREQUENCY CONTROL

***Press the knob*** once (instead of turning it) – this will change the function of the knob.

***Rotate the knob*** to adjust the frequency. The range of adjustment is from 1.0 Hz to a period slightly over the current pulsewidth setting, up to a maximum of 10 MHz. Monitor the output on a scope to calibrate the adjustment.

***Press the knob*** once more – this will change the function of the knob back to pulsewidth set.

## SINGLE SHOT MODE

***Press*** the small ***blue button*** next to the knob. The DCPG will enter single-shot mode. You will generate one (and only one) pulse on every subsequent push of the blue button. Initially, these pulses will have the same pulsewidth as was set when you entered single-shot mode.

***Rotate the knob*** to adjust the pulse width. The range of adjustment is from 50 ns to 1.0 s. Monitor the output on a scope to calibrate the adjustment.

## EXIT SINGLE SHOT MODE

To exit single-shot mode, ***press the knob*** once. The DCPG will re-enter regular mode, with the knob set to adjust frequency. When exiting single-shot mode, the frequency is reset to 1.0 Hz.

## OTHER

***Polarity and amplitude*** are fixed...all pulses are positive, with +5V amplitude.

***There is no ON/OFF switch.*** Remove power to fully turn off the DCPG unit, or press the blue-button to enter single-shot mode and inhibit pulsing temporarily.

Both pulsewidth and period are selected from a table with 22 values per decade with approximately 12% step size (1.00, 1.125, 1.25, 1.366, 1.50, 1.666, 1.833, 2.00, 2.25, 2.50, 2.75, 3.00, 3.30, 3.60, 4.00, 4.50, 5.00, 5.50, 6.20, 7.00, 8.00, 9.00). The maximum interval is 1 second, and the minimum is 67 ns. All time intervals are constrained to be integer multiples of a 60 MHz clock – up to 300ns, time intervals are merely consecutive integer multiple clock ticks from 4 through 18, and the next decade or two of selectable intervals are similarly skewed.



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