The Model 765 Pulse Generator

Application Note: General Description

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Transition Time

The Model 765 Fast Rise Time Pulse Generator from Berkeley Nucleonics offers a rise/fall time of less than 70 ps (20-80%) at 5 Vpp into 50 Ω with fully adjustable output voltage.

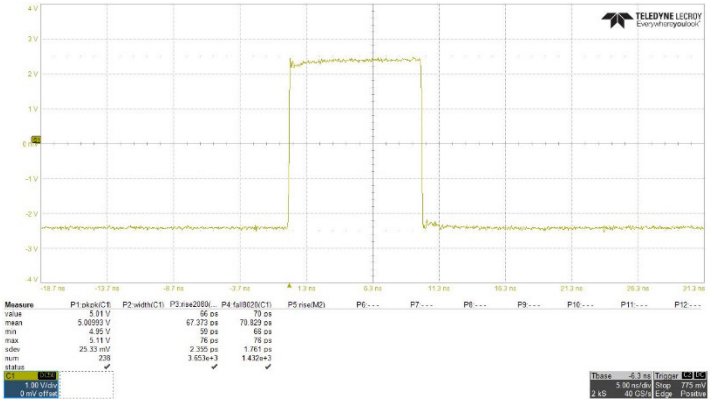

Figure 1: Rise/Fall Time

Min Pulse Width and Resolution

The pulse width can be adjusted from 300 ps to 8 s with a resolution of 10 ps accommodating the needs of a wide variety of applications.

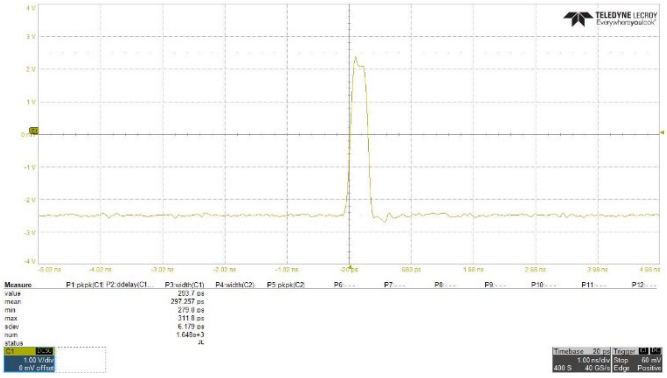

Figure 2: Minimum Pulse Width

Time Resolution

The 10 ps delay resolution allows for a very fine adjustment between the Trigger In signal and the delayed output pulses.

Jitter is an important characteristic of the pulse quality. Low jitter in a clock waveform is an important feature for reducing error in communications systems. The low jitter below 25 ps allows optimum synchronization among channels and among multiple pulses of the same channel.

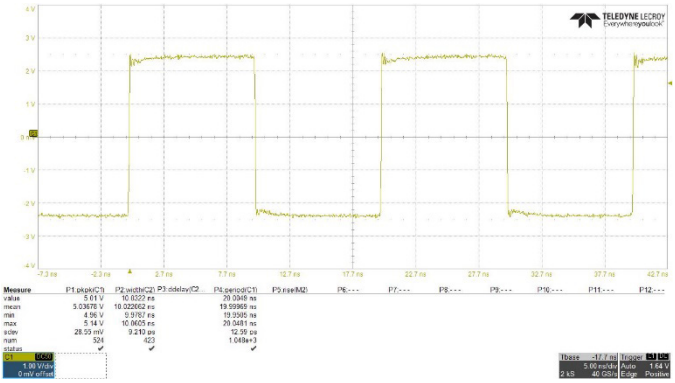

Figure 3: Jitter, < 25 ps

Trigger Mode

- Continuous: in Continuous mode, the output channel generates configured pulses at a repetition rate up to 125 MHz.
- Single: in Single mode, the output channel waits for the trigger signal, then generates the configured pulse only once.
- Burst: in Burst mode, for each trigger received, the output channel repeats the configured pulse for a programmed number of times between 1 and 4294967295.
- Gated: in Gated mode, the output channel supplies the configured pulse only when the trigger is “true”. And if the trigger becomes “false”, it continues the generation until the end of the configured pulses at which point it then stops.

External Width (square/amplify external pulse)

The External Width operation mode transmits the Trigger Input signal to the output channel. By taking advantage of Model 765’s technology, this feature allows the user to make edges steeper than those of the source.

Furthermore, it can be used to amplify/reduce the amplitude, invert, and apply an offset to the source pulses, or to generate a particular pulse pattern sequence.

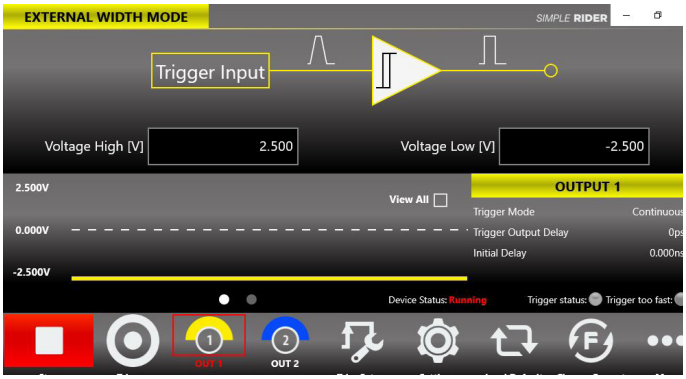

Figure 4: External Width Mode UI Settings

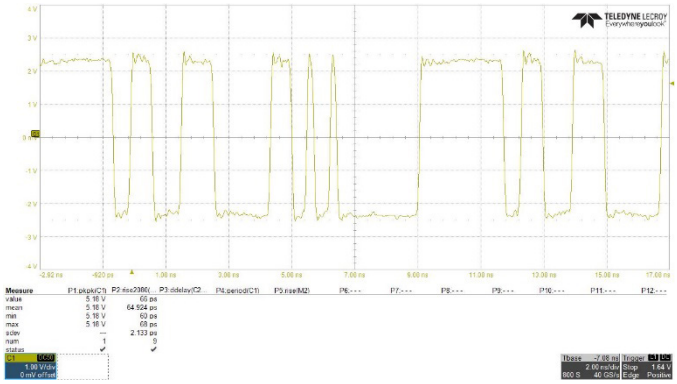

Figure 5: PRBS sequence through External Width mode

Pulse Combination

Using the multiple Pulse Combination to generate Quadruple Pulses, it is possible to reach an output signal frequency of 800 MHz that can be used to supply a clock.

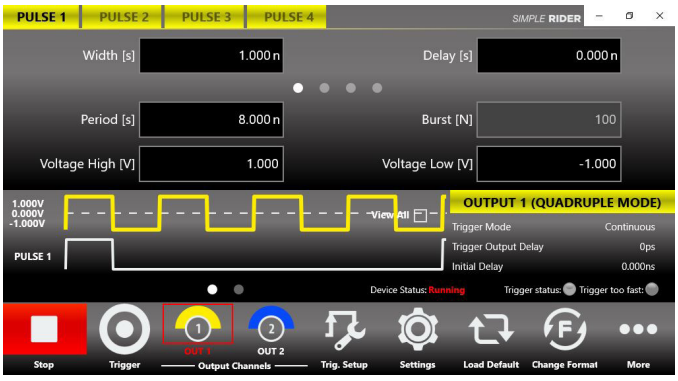

Figure 6: Quadruple Pulse Mode

Figure 7: 500 MHz clock generated by using the Quadruple Pulse mode

Skew Between Channels

Every pulse can be delayed up to 1 s with a resolution of 10ps from the trigger signal by setting the channel delay and the pulse delay parameters. The total delay of a pulse is: output N delay + pulse P delay + fixed delay.

This skill allows the user to produce an accurate skew to synchronize other test equipment, thus compensating for instrumentation skew, or to test the response of a digital asynchronous system at the arrival of non-synchronized pulses.

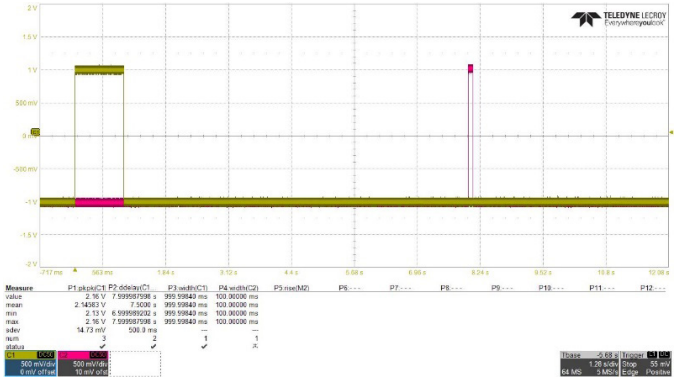

Figure 8: Maximum skew between CH1 and CH2

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Single Ended / Differential

By using one channel as an opposite of another, it is possible to obtain the Differential operation mode.

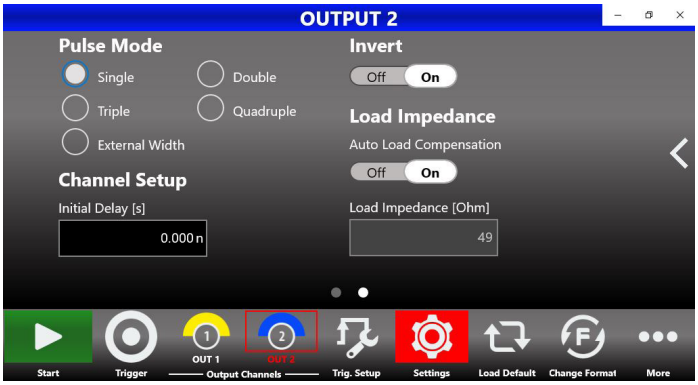

Figure 9: Invert Output

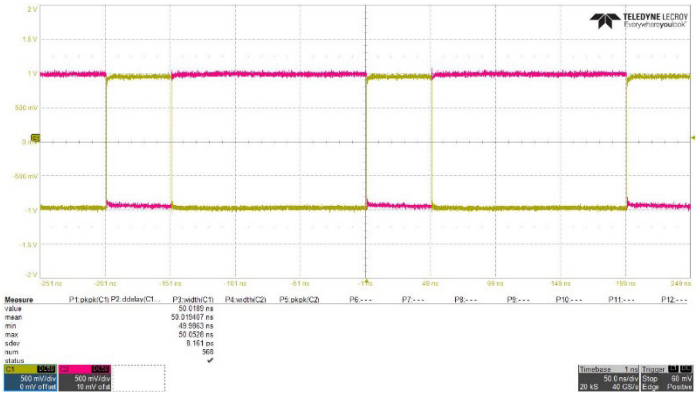

Figure 10: Differential signal using CH1 and CH2 inverted

About Berkeley Nucleonics Corporation

Berkeley Nucleonics Corporation (BNC) is a leading manufacturer of precision electronic instrumentation for test, measurement, and nuclear research. Our corporate headquarters are in San Rafael, California, with additional manufacturing facilities and sales offices located throughout the United States.

Learn more about us:

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