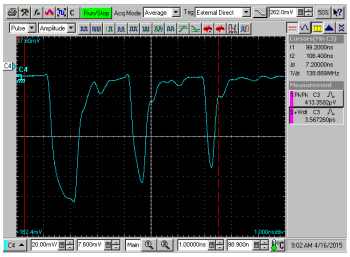
PPG 512

Programmable Pulse Generator

- Arbitrary pulse generator
- 5 GS/s, 200 ps time bins
- Record length 512 Bytes / 102.4 ns
- 8 bit resolution
- High output amplitude, up to -12 V
- Pulse width up to 4 ns

Applications

- Arbitrary waveform generation
- Excitation of quantum dots



Example of a pulse profile

The PPG 512 is based on a programmable waveform generator, that permits to generate pulse patterns in a cyclic sequence of 512 bytes. The 512 bytes are stored in a special high-speed memory that can be read out at the full speed of 5 GS/s. This results in a timing resolution of 200 ps per byte (other values possible on request). By loading a data set, arbitrary pulse sequences can be defined with an amplitude resolution of 8 bits (0 to 255). This pre-defined sequence can then be run as a gapless loop at the full speed of 5 GS/s or started and stopped by an external control signal.

Output amplitude between 0 V and -12 V
The output of the internal Digital to Analog Converter (DAC) is amplified by a broadband three-stage amplifier, which generates negative output voltages with a maximum amplitude around -12 V (into 50 Ohm). Other amplitudes are available on request. The output of the amplifier can further be superimposed by an external DC bias voltage in the range between -10 V to +10 V.

Control inputs
Additional external signal inputs are available to control the reading of the complete 512 byte sequence as well as start or stop the reading at arbitrary times.

Synchronization outputs
A synchronization signal is output by the PPG 512, that signals the full period of all 512 bytes, i.e. every 102.4 ns. An unamplified copy of the pulse pattern is also available at a separate output and can be used to, e.g., trigger other devices such as TCSPC units.

Easy programming via DLL
Programming the pulse patterns is possible via a programming library (DLL) for Windows by simply loading a suited array of 512 bytes into the onboard memory. The programmed pulse pattern is stored in the memory as long as the unit is powered on.

Specifications

Pulse pattern	
Length	512 bytes
Readout speed	5 GS/s, 200 ps time bins, other sampling rates <5 GS/s on request
Max. pulse width	approx. 4 ns (amplifier limited)
Output signals (into 50 Ohm)	
Main output	adjustable between 0 V and -12 V in 256 steps (8 bit), superimposed by DC Bias, other values on request
Aux output	attenuated main output without DC bias, max. amplitude -2 V
Sync out	+0.5 V after reading all 512 bytes, i.e. every 102.4 ns
Input signals	
DC Bias	any external voltage between -10 V and +10 V
Reset	>+3 V stops pulse pattern generation, <0.5 V restarts pattern generation
OP mode	>0.75 V and <1.1 V stops pattern generation after reading all 511 bytes <0.4 V continues pattern generation with byte 0 after reading all 511 bytes
Computer	
Operating system	Windows 7 / 8 / 10
PC interface	USB 3.0

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