Berkeley Nucleonics provides board level digital delay pulse generators. The 588 series board products retain all functionality of the standard pulse generators in an easy to integrate package. These boards provide a cost-effective method to create and synchronize multiple sequences, delayed triggering, or any precisely timed series of events. We offer computer interfaces for ease of programming and full integration support.

Key Features
- Board Level Product for Easy Integration
- 1 ns or 250 ps Timing Resolution Available
- 2, 4 or 8 Fully Independent Channel Outputs
- Full Integration Support
- 2 Year Warranty
588-OEM-1ns
Pulse Generator Boards

Key Features
• 1 ns timing resolution
• < 400 ps channel to channel RMS jitter
• Independent control of width and delay on 2, 4 or 8 channels
• Standard RS232, GPIB & USB communication interfaces
• Advanced programming - multiplexing, channel referencing, burst, wait, duty cycle.

The Model 588-OEM-1ns Board Level Pulse Generator comes with 2, 4 or 8 independent outputs and is designed to provide cutting edge, cost-effective solutions to generate and synchronize multiple pulses for a variety of applications. The delay and pulse width for each channel are independent and digitally controlled which makes the instrument ideal for situations that require synchronizing a number of different timed events. Flexible operating modes allow complete control of pulse outputs, including continuous, duty cycle, burst and single shot with external trigger/gate. More advanced features such as multiplexing allow the timing of all or several channels to be combined for complex pulse patterns. Control of the instrument is provided through the standard RS232, USB and GPIB Interfaces.

588-OEM-250ps
Board Level Pulse Generator

Key Features
• 250 ps timing resolution
• < 50 ps channel to channel RMS jitter
• 4 or 8 independent channel outputs
• Internal rate generator 10 ns period resolution over entire frequency range (10 MHz)
• Standard Computer Interfaces RS232, USB and Ethernet
• Dual inputs (gate and trigger)

The Model Model 588-OEM-250ps Board Level Digital Delay Pulse Generator represents the latest in timing and synchronizing capabilities. This 588 comes with four or eight independent outputs, dual trigger / gate inputs and external clock reference input, making it ideal for laser system timing applications. The system can directly phase lock to an external timebase up to 100 MHz in frequency and down to 20 mV in amplitude. This allows synching directly to a laser photodiode signal, which provides complete system timing relative to the laser with low jitter. The unit also provides a clock output that is capable of driving a 50 ohm load and can be used to provide a master timebase to other delay generators or equipment.
# SPECIFICATIONS

**588-OEM-1ns**

**MODELS**
- 588-2C-OEM-1NS : 2 independent channel outputs  
  Communications: RS232, GPIB & USB Ports
- 588-4C-OEM-1NS : 4 independent channel outputs  
  Configuration Storage: 12 memory slots
- 588-8C-OEM-1NS : 8 independent channel outputs

## PULSE GENERATION
- **Channel modes**: single shot, burst, normal, duty cycle
- **Delay**: 0 to 1000 s
- **Negative delay**: 0 to -1000 s
- **Pulsewidth**: 10 ns to 1000 s
- **Resolution**: 1 ns
- **Accuracy**: 1.5 ns + 0.0001 delay
- **Time base**: 50 MHz, 25 PPM crystal oscillator
- **RMS jitter**: < 400 ps channel to channel
- **Burst mode**: 1 to 1,000,000

## EXTERNAL TRIGGER/GATE
- **Rate**: DC to 5 MHz
- **Threshold**: 500 mV to 15 V
- **Input range**: 0 - 200 mV
- **Trigger slope**: rising or falling edge
- **RMS jitter**: < 5 ns
- **Insertion delay**: < 150 ns

## INTERNAL RATE GENERATOR
- **System modes**: single shot, burst, continuous, duty cycle
- **Rate (T₀, period)**: 200 ns to 5000 sec. (0.0002 Hz to 5 MHz)
- **Resolution**: 10 ns
- **Accuracy**: 5 ns + 0.0001 x period
- **RMS jitter**: < 400 ps channel to channel
- **Burst mode**: 1 to 1,000,000 pulses

## OUTPUTS
- **Outputs**: TTL/CMOS, adjustable 2 - 20 V
- **Impedance**: 50 ohms
- **Slew rate**: > 0.5 V/ns
- **Overshoot**: < 100 mV + 10% of pulse amplitude

## OPTIONS
- **I - Incrementing** (provides automatic high speed incrementing/decrementing of delay and/or pulsewidth for each channel)
- **PS - Power Supply**

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**BNC**

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Web: www.berkeleynucleonics.com
# SPECIFICATIONS

**588-OEM-250ps**

**MODELS**
- 588-4C-OEM-250PS: 4 independent channel outputs
- 588-8C-OEM-250PS: 8 independent channel outputs

**Communications:** USB, RS232 & Ethernet Ports  
**Configuration Storage:** 12 memory slots

## PROGRAMMABLE TIMING GENERATOR

<table>
<thead>
<tr>
<th>Channel modes</th>
<th>Single shot, burst, normal, duty cycle.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control modes</td>
<td>Internally triggered, externally triggered and external gate</td>
</tr>
<tr>
<td>Output multiplexer</td>
<td>Any/all channels may be multiplexed to any/all outputs</td>
</tr>
<tr>
<td>Delayed output</td>
<td>0 to 9,999,999 pulses</td>
</tr>
<tr>
<td>Timebase</td>
<td>Same as internal rate generator</td>
</tr>
</tbody>
</table>

## DELAYS

<table>
<thead>
<tr>
<th>Range</th>
<th>0 - 1000 s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuracy</td>
<td>1.5 ns + 0.0001 delay</td>
</tr>
<tr>
<td>Resolution</td>
<td>250 ps</td>
</tr>
<tr>
<td>RMS Jitter</td>
<td>&lt; 400 ps</td>
</tr>
<tr>
<td>Pulse inhibit delay/output inhibit delay</td>
<td>120 ns / 50 ns</td>
</tr>
</tbody>
</table>

## INTERNAL RATE GENERATOR

<table>
<thead>
<tr>
<th>Timebase</th>
<th>100 MHz, low jitter PLL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate</td>
<td>0.0002 Hz to 10.000 MHz</td>
</tr>
<tr>
<td>Resolution</td>
<td>10 ns</td>
</tr>
<tr>
<td>Accuracy</td>
<td>Same as timebase</td>
</tr>
<tr>
<td>RMS Jitter</td>
<td>50 ps</td>
</tr>
<tr>
<td>Burst mode</td>
<td>1 to 9,999,999 pulses</td>
</tr>
<tr>
<td>Oscillator</td>
<td>50 MHz, 25 ppm</td>
</tr>
</tbody>
</table>

## TTL /ADJUSTABLE CHANNEL OUTPUT IMPEDANCE

<table>
<thead>
<tr>
<th>TTL /CMOS Mode</th>
<th>50 ohm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Level</td>
<td>4.0 V typ into 1 kohm</td>
</tr>
<tr>
<td>Rise time</td>
<td>3 ns typical</td>
</tr>
<tr>
<td>Slew rate</td>
<td>&gt; 0.5 V/ns</td>
</tr>
<tr>
<td>Jitter</td>
<td>50 ps RMS</td>
</tr>
</tbody>
</table>

## ADJUSTABLE MODE

<table>
<thead>
<tr>
<th>Output level</th>
<th>2.0 to 20 VDC into 1 kohm, 1.0 to 10 VDC into 50 ohms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output resolution</td>
<td>10 mV</td>
</tr>
<tr>
<td>Current</td>
<td>200 mA typical, 400 mA max (short pulses)</td>
</tr>
<tr>
<td>Slew rate</td>
<td>&gt; 0.1 V/ns</td>
</tr>
<tr>
<td>Overshoot</td>
<td>&lt; 100 mV + 10% of pulse amplitude</td>
</tr>
</tbody>
</table>

## TRIGGER/GATE DUAL INPUT MODULE (standard)

Standard dual channel input, providing one trigger input and one gate input. May be used with the dual trigger firmware option to provide two independent trigger sources.

<table>
<thead>
<tr>
<th>Threshold</th>
<th>0.2 to 15 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum input voltage</td>
<td>60 V peak</td>
</tr>
<tr>
<td>Resolution</td>
<td>10 mV</td>
</tr>
<tr>
<td>Input impedance</td>
<td>1 Mohm + 40 pF or 50 ohm</td>
</tr>
<tr>
<td>Trigger insertion delay</td>
<td>&lt; 180 ns</td>
</tr>
<tr>
<td>Trigger jitter</td>
<td>&lt; 800 ps RMS</td>
</tr>
<tr>
<td>External clock in/out</td>
<td>10 MHz - 100 MHz</td>
</tr>
</tbody>
</table>

## OPTIONS

- **I** - Incrementing  (provides automatic high speed incrementing/decrementing of delay and/or pulsewidth for each channel)
- **TZ50** - Quad Channel, High Current TTL/CMOS (for driving 50 ohm loads) & Adjustable Output Module
- **DT15**  - Dual Trigger Logic – provides additional trigger via gate input
- **PS** - Power Supply

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