

Features

- 4 or 8 independent delay channels
- 100 ps delay resolution
- 50 ps channel-to-channel RMS jitter
- Output pulse 1.5 V to 5 V at 10 mV increments into 50 Ω (3 V to 10 V in 20 mV increments into >1k Ω) with 1 ns rise time and independent control of width, polarity, amplitude, and MUX mode
- Independent trigger rate (repetitive, single, or burst) for every channel

Applications

- System Laser Timing Control
- ATE Application
- Laser Pulse Picking
- Precision Pulse Application
- Instrument Triggering
- Components Test



Model 750 Datasheet V1.2
4 or 8 Channel Mini Delay/Plus Generator

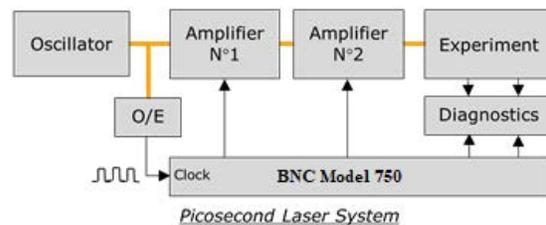
Description

The BNC Model 750 Mini Pulse & Delay Generator provides up to 4 or 8 independent delayed pulses. Delays up to 100 seconds can be programmed with 100 ps resolution and channel-to-channel jitter less than 50 ps RMS.

SMB outputs deliver 1.5 V to 5 V, at 10 mV increments into 50 Ω (3 V to 10 V in 20 mV increments into $>1k \Omega$) with 1 ns rise time pulses. Pulse amplitude, polarity, width and burst count are adjustable on each output channel.

The Model 750 offers triggering by two inputs, three internal synchronized Timers (adjustable from 0.01 Hz to 50 MHz), or software command for each selected delay channel. Any trigger rate may be set as one-shot or repetitive.

The Gate input allows you to quickly inhibit all selected channel Outputs. This input function can be selected as an additional External Trigger. The generator uses an internal 100 MHz TCXO clock reference, or an external clock (sine or square) that is user programmable from 10 MHz to 240 MHz. The Model 750's parameters can be controlled remotely via USB-to-UART or via Ethernet.



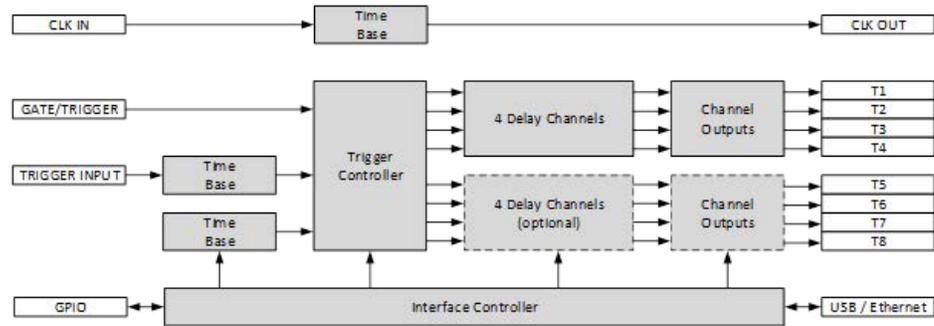
Application Example

The Model 750 can synchronize all the devices of a Picosecond Laser System with a single compact unit and GUI. The “clock input” of the 750 receives a reference signal (80 MHz e.g.) from a laser oscillator via an O/E (optical-to-electrical) converter. The 750 provides single or repetitive pulses (adjusted in delay, amplitude, polarity, and width) synchronized on the “clock input” with very low jitter. 4 GPIO under software control allow command of low frequency devices in the Laser System for security or control.

Model 750 Mini Delay/Pulse Generator

Operating Information

Block diagram of the generator



Time Base

This function provides a 200 MHz time base from an internal reference or an external 10 MHz to 240 MHz reference.

Trigger controller

This function provides 2 Trigger Modes

External Trigger Mode: In this mode, a rising edge on input "Trigger input" triggers all delay channel. On every channel, the trigger rate can be single or repetitive or inhibited.

Internal Trigger Mode: In this mode, delay channels can be triggered from 3 programmable frequency Timers. On every channel, the trigger rate can be single or repetitive or burst or inhibited.

"Gate Input" allows quick inhibition of all selected channel Outputs. This input function can be selected as a second External Trigger.

Delay Channel

There are 4 or 8 independent delay channels. The delay from any selected trigger source is programmable up to 10 seconds in 100 ps increments.

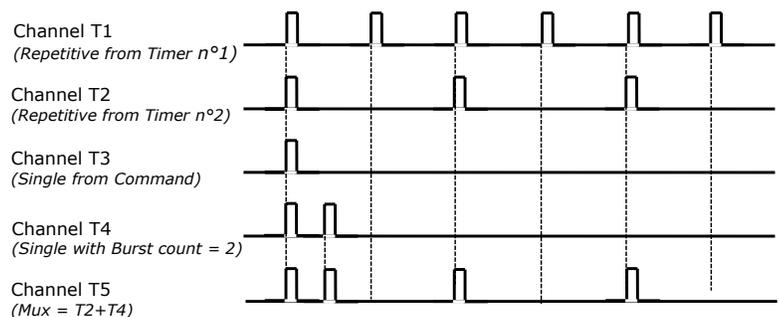
Channel Output

Each delayed output pulse (T1 to T4 or T5 to T8) can be independently adjusted in level (1.5 V to 5 V in 10 mV steps), width (10 ns to 10 s with 5 ns resolution), and polarity, and may be ORed' to all others outputs. The outputs are designed to drive 50 Ω loads. With a "High" impedance load, the output amplitude level will be doubled.

Interface Controller:

It manages internal functions and user interface. All the parameters can be remotely controlled via USB-to-UART and Ethernet (10/100 Mb/s). All parameter values are automatically saved. Four "GPIO" lines, under software command, can be used to control other devices.

Example of channel output modes:



Model 750 Mini Delay/Pulse Generator

Model 750 Specifications

Delay Channels	
Number	4 or 8 independent outputs
Range	0 to 100 seconds
Resolution	100 ps
RMS jitter	<50 ps + delay x 10 ⁻⁷ , channel to channel <1 ns, external trigger to any channel
Accuracy	<500 ps + delay x 10 ⁻⁶
Time Base	Internal 100 MHz, ±5 ppm stability
External Trigger Mode	
Input "TRIG"	Rate can be single or repetitive up to 50 MHz, with prescaler, adjustable threshold, positive slope
Trigger Delay	<85 ns (insertion delay)
Internal Trigger Mode	
Rate Repetitive	From three Timers with frequency = 0.01 Hz to 50 MHz (in step of 5 ns)
Rate Single Trigger	From "Input trigger" or soft command
Channel Output Pulse T1 to T4 (and T5 to T8)	
Amplitude	1.5 V to 5 V in steps of 10 mV into 50 Ω or 3.0 V to 10 V in steps of 20 mV into high impedance (>1 K Ω)
Rise/Fall Time	1/1 ns into 50 Ω or 2/2 ns into high impedance
Width	10 ns to 10 s with 5 ns resolution
Pulse Polarity	Active High and Active Low
Burst Mode	Burst count = 1 to 1 000 000 000, adjustable period in step of 5 ns
MUX Mode	Any channel may be O'Red' to all outputs
Connector	SMB
Pulse Polarity	Active High and Active Low
External Clock Reference	
Threshold	0 V, internal 50 Ω
Level	Min -10 dBm, typical 6 dBm
Frequency	10 MHz to 240 MHz, user programmable in steps of 0.25 MHz up to 120 MHz then user programmable in steps of 0.50 MHz
Gate or Second Trigger	
Input	Active high, adjustable threshold, positive slope, rate < 10 MHz
Function	Gate or second External Trigger
GPIO	
4 x GPIO	Input or output, 0 or 3V level, SMH-103-02-D Samtec connector
General	
Interface Control	USB to UART, Ethernet 10/100Mb/s
Software Tools	Free Drivers for Windows 10, Linux
Power Consumption	2.5 W to 15 W according to 4C or 8C configuration
Power supply	USB or External AC (80 - 264 V/47-63 Hz) to DC (5 V, 4 A)
Weight	<1 kg
Size	108 x 58.6 x 129 mm (4.25 x 2.31 x 5.10 inches)
Optional Accessories	
SMB Cable:	3" SMB to BNC cable

Model 750 Mini Delay/Pulse Generator

Control and software tools

There are two ways to control the generator

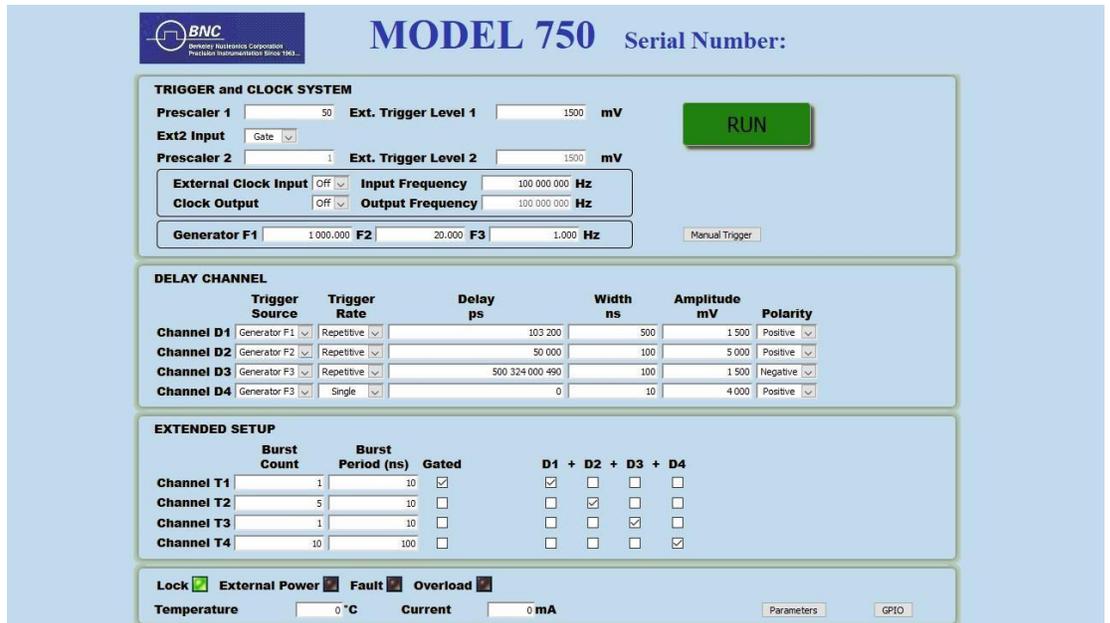
Easy remote way via Internet and control panel web pages.

Web page, from embedded Web server, provides an easy method to configure settings. A Main menu allows for the display and control.

- Trigger and clock system (trigger level, prescaler, Clock input/output, trigger generators F1 to F3 and RUN / STOP triggers)
- Delay channel (Trigger source, trigger rate, delay, amplitude / width/polarity of channel output pulse)
- Extended delay channel settings (burst mode, gate, and MUX mode)

The configuration information (all the settings) of the instrument is stored and saved on the Model 750.

The web page can be opened via Internet Explorer, Mozilla Firefox or Chrome. After connecting a cable from the Model 750's Ethernet port to your computer network, enter the unit's IP address into your PC's browser (the IP address can be identified in User's manual). The browser will automatically open the control panel web page on your PC.



The screenshot shows the control panel web page for the Model 750. It includes sections for TRIGGER and CLOCK SYSTEM, DELAY CHANNEL, and EXTENDED SETUP. The TRIGGER and CLOCK SYSTEM section has fields for Prescaler 1 (50), Ext. Trigger Level 1 (1500 mV), Prescaler 2 (1), Ext. Trigger Level 2 (1500 mV), External Clock Input (Off), Input Frequency (100 000 000 Hz), Clock Output (Off), and Output Frequency (100 000 000 Hz). The DELAY CHANNEL section has a table with columns for Trigger Source, Trigger Rate, Delay ps, Width ns, Amplitude mV, and Polarity. The EXTENDED SETUP section has a table with columns for Burst Count, Burst Period (ms), Gated, and D1 + D2 + D3 + D4. The bottom section has checkboxes for Lock, External Power, Fault, and Overload, and fields for Temperature (0 °C) and Current (0 mA).

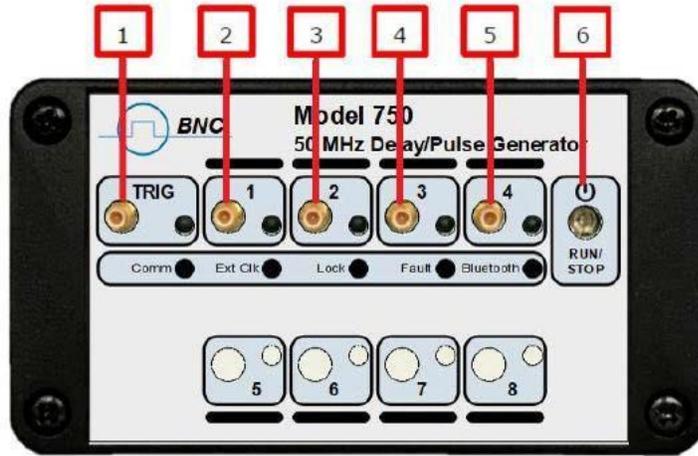
Control panel web page

General remote way via Ethernet or USB and software application (see examples in the User's manual).

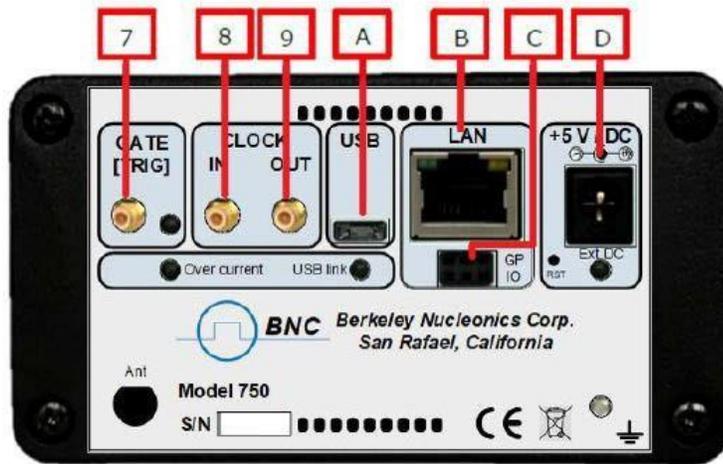
Model 750 Mini Delay/Pulse Generator

MODEL 750

Front and Rear Panel



Front panel



Rear panel

Connectors, Switch

Front Panel		Rear Panel	
	• Connector		• Connector
1	Trigger input: SMB connector	7	Gate input: SMB connector
2	T1 channel output: SMB connector	8	Clock input: SMB connector
3	T2 channel output: SMB connector	9	Clock output: SMB connector
4	T3 channel output: SMB connector	A	USB connection: micro AB connector
5	T4 channel output: SMB connector	B	LAN connection: RJ45 connector
	• Switch	C	GPIO: SHM-103 Samtec connector
6	Power On/Off or Run/Stop triggers	D	+5V DC power plug: Jack 2.10 mm