



# Model 594 4/8/10Ch Digital Delay Generator

## Features

- 4 independent delay channels  
1 ps time resolution  
< 10 ps jitter for internal triggered delays  
< 25 ps jitter for external triggered delays
- Adjustable output pulse up to 10V, 1 ns rise time
- Internal or External clock up to 90 MHz
- Independent control of delay, width and amplitude
- Controlled via Ethernet, Web page and front panel
- Compact packaging 1U, 19"
- Options: Extension to 8 or 10 channels  
Output pulse: TTL level or 20V or 32 V  
Optical output pulse

## Applications

- Components Test
- ATE Application
- System Laser Timing Control
- Control flash lamps and Q-Switches
- Synch with selectable clock frequency( Mode locked laser)
- Precision Pulse Application
- Gate High Speed Cameras
- Instrument Triggering



## Description

The Model 594 Digital Delay Generator provides four independent delayed pulses on the rear panel (option for eight or ten channels as well). Delays up to 10 seconds can be programmed with 1ps resolution, and channel-to-channel jitter is less than 10 ps rms. BNC outputs deliver up to 10V, 1 ns under 50 Ohm. Pulse amplitude and width are adjustable for each output channel.

One input channel, or two synchronized timers, or software command can be used to trigger all output channels. One T0 channel is used to time reference all of the delayed output pulses.

Model 594 parameters can be locally controlled with the front panel keys and LCD display and it can be remotely controlled via Ethernet (10/100 Mb/s) or Internet (Web page from Internal Web server).

Serial n° 183

	Enable	Mode	Trig	Seq	Ref	Inh Delay	Amplitude	Width
T0	<input checked="" type="checkbox"/>	TRIG	F0	SS2	T0	0 ps	2500 mV	1200 ns
T1	<input checked="" type="checkbox"/>	TRIG	F1	SS1	T0	12345 ps	2500 mV	1000 ns
T2	<input checked="" type="checkbox"/>	TRIG	F0	SS1	T0	200000 ps	2500 mV	1100 ns
T3	<input checked="" type="checkbox"/>	SEQ	F0	SS2	T0	300000 ps	2500 mV	1200 ns
T4	<input checked="" type="checkbox"/>	TRIG	F5	SS1	T0	0 ps	5000 mV	500 ns
T5	<input checked="" type="checkbox"/>	TRIG	F5	SS1	T0	0 ps	5000 mV	500 ns
T6	<input checked="" type="checkbox"/>	TRIG	F5	SS1	T0	0 ps	5000 mV	500 ns
T7	<input checked="" type="checkbox"/>	TRIG	F5	SS1	T0	0 ps	5000 mV	500 ns
T8	<input checked="" type="checkbox"/>	TRIG	F5	SS1	T0	0 ps	5000 mV	500 ns
T9	<input checked="" type="checkbox"/>	TRIG	F5	SS1	T0	0 ps	5000 mV	500 ns
T10	<input checked="" type="checkbox"/>	TRIG	F0	SS1	T0	0 ps	2500 mV	100 ns

On Off

INTERNAL FREQUENCIES		MONITORING		STATUS	
F5	1000 Hz	+6V	5.91 V	Popt	-6.44 dBm
F6	1/15 Hz	-6V	-6.04 V	Temp	42.77 °C
		+3.3V	3.32 V	Power supply	<input checked="" type="checkbox"/>
		+1.2V	1.24 V	Reception	<input checked="" type="checkbox"/>
		+12V	12.09 V	Synchronization	<input checked="" type="checkbox"/>
				Inhibition	<input checked="" type="checkbox"/>
				Oscillator PH	<input checked="" type="checkbox"/>
				Oscillator lock	<input checked="" type="checkbox"/>

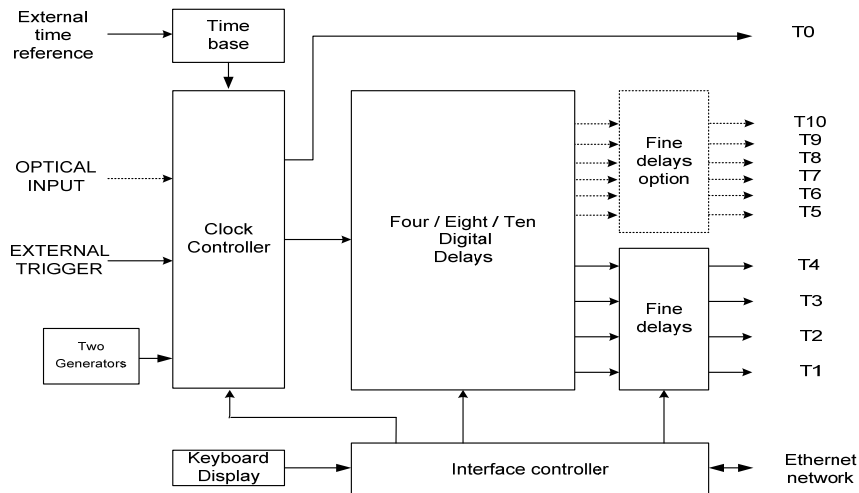
## Control Panel Web Page:

This "web page", from an embedded Web server, provides a simple method to configure settings for each output channel (delay, amplitude, width), trigger source, trigger mode. It also provides a simple method to control operation and status of the instrument.

The configuration information of the instrument is stored and saved in the Model 594.

The user can open a web page to control the 594 via Internet Explorer, Mozilla Firefox or Google Chrome.

# Model 594 Digital Delay Generator



*Block diagram of the delay generator*

## Specifications

### Delays

Channels	4 independent outputs
Range	0 to 10 seconds
Resolution	1 ps
RMS jitter	< 10 ps + delay x 10 <sup>-7</sup> (channel-to-channel in internal trigger) < 25 ps + delay x 10 <sup>-7</sup> (External trigger to any channel)
Accuracy	< 150 ps + delay x 10 <sup>-7</sup>
Trigger delay	< 100 ns (insertion delay)
Time base	0.5 ppm stability

### External Trigger input

Repetition rate	Up to 1 MHz
Trigger level	+1 V / 50Ω
Slope	positive
Connector	BNC

### Internal Trigger

Two synchronized generators	Frequency= 1 Hz to 1 MHz in step of 1 Hz
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### Output pulse T1 to T4

Amplitude	2.5 V to 10 V in step of 10 mV
Load	50 Ω
Rise/Fall time	< 1 ns / 3 ns
Width	100 ns to 10 ms in step of 6.43 ns
Connector	BNC

### External time reference

Frequency	10 MHz ( other frequencies are available up to 80 MHz)
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### Inhibition input (optional)

Trigger level	= 1 V, repetition rate < 1KHz
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### General

Software	Free Drivers for Windows7
User Interface	Front panel, Ethernet 10/100 Mb/s, Internet (Web page)
Power consumption	90 To 240 V / 50 – 60 Hz/ 0.25 A
Weight / Size	< 5 kg / 19" W X 363 mm D X 1U H

### Options

- Option 1: Extension to 8 channels
- Option 2: Optical input for timing system mode
- Option 3: Clock output
- Option 4: 32 V channel output (W=1μs, rise/fall time = 3/15ns under 50 Ω)
- Option 5: Extension to 10 channels
- Option 6: 5 V to 20 V channel output (W=0.1 to 10 μs, rise/fall time = 3/15ns under 50 Ω)
- Option 7: TTL level (2.5 to 6 V) channel output (positive or negative pulse, W=100 ns to 10 s)
- Option 8: Optical channel output