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GFT9404

PXI, 8 Channel Digital Delay Generator

Features



- Four high resolution delay channels
  - 1 ps delay resolution
  - < 25 ps RMS channel to channel jitter
  - < 50 ps RMS jitter from external trigger
  - > 20 seconds delay range
  - 2 to 5 V into 50 Ω output pulse
- Four auxiliary delay channels
  - 5 ns delay resolution
  - < 100 ps RMS jitter from external trigger
  - > 20 seconds delay range
  - 5 V into 50 Ω output pulse
  - Output to front panel or to PXI bus
- Trigger sources:
  - External, internal frequency, PXI bus trigger or soft trigger
- PXI 3U, 1 slot, compact packaging

Application

- Component test
- ATE application
- System Laser timing control
- Precision pulse
- Instrument triggering
- Multi-channel (up to 5 synchronized boards)

Description

The GFT9404 module provides precision digital delay generation on the PXI platform.

It offers four independent delay channels (T0 to T3). The delay resolution is 1 ps, and external trigger to channel jitter is less than 50 ps. SMB outputs deliver 5 V, 2 ns rise time, under 50 Ω. Amplitude and width are adjustable on each output pulse.
The GFT9404 also offers four auxiliary delay channels to the front panel (AT0 to AT3). The copy of these four channels is provided on the PXI bus (PXI trig 0 to PXI trig 3). The delay resolution is 5 ns (one-time base clock) and trigger to channel jitter is 100 ps.

One input trigger (TRIG IN), PXI STAR trigger, or internal frequency, or soft trigger is used to trigger all output channels.

The control panel software for Windows provides a simple method to configure settings for each channel (amplitude, width, trigger source, trigger mode) and to control operation.

The GFT9404 is the ideal instrument to provide precisely timed pulse, as encountered in a picosecond laser system application.

GFT9404
8 Channel Digital Delay Generator

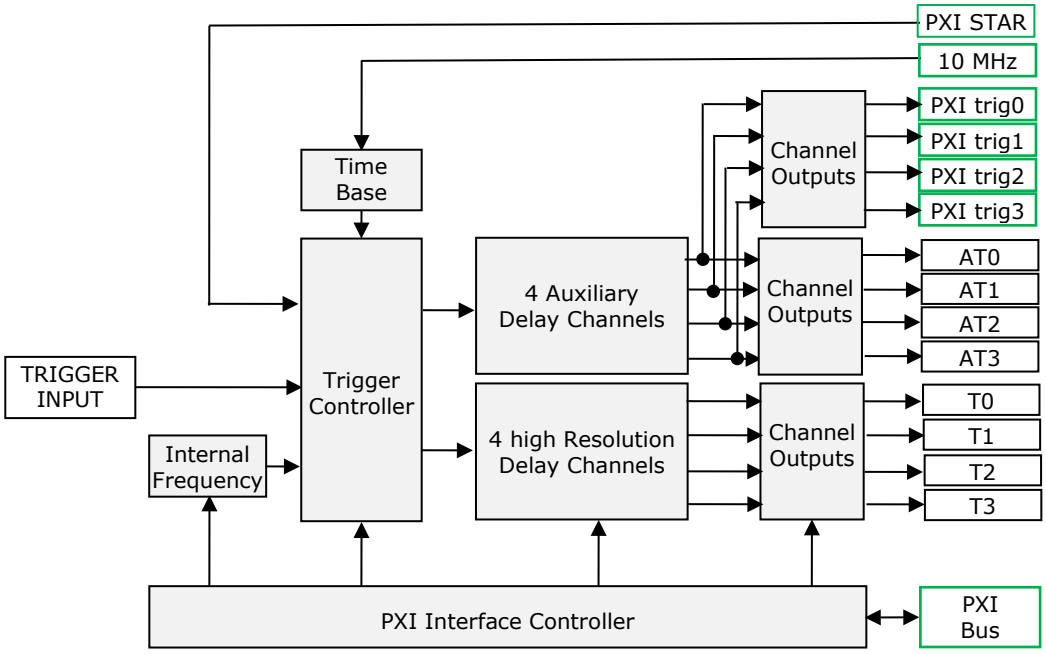
Specifications

High Resolution Delay Channel		
	Number	4 independents
	Range	0 to > 20 seconds
	Resolution	1 ps
	Jitter	25 ps RMS + delay x 10^{-7}(1) (output to any output) 50 ps RMS + delay x 10^{-7}(1) (external trigger to any output)
	Accuracy	< 250 ps + delay x 10^{-7}(1)
Auxiliary Delay Channel		
	Number	4 independents
	Range	0 to > 20 seconds
	Resolution	5 ns
	Jitter	< 100 ps RMS + delay x 10^{-7} (1) (external trigger to any output)
	Accuracy	1 ns + delay x 10^{-7} (1)
High Resolution Output T0 to T3		
	Amplitude	2 to 5 V
	Width	200 ns to 10 µs
	Load	50 Ω
	Rise time	< 2 ns
	Fall time	< 5 ns
	Connector	SMB
Auxiliary Output	**AT0 to AT3**	**PXI trig 0 to trig 3**
	Amplitude	5 V	3.3 V
	Width	200 ns	25 ns
	Load	50 Ω	HI Ω
	Rise time	< 5 ns	PXI standard
	Fall time	< 5 ns	PXI standard
	Connector	MMCX	PXI connector
Trigger		
	Internal trigger	1 Hz to 50 kHz, step of 5 ns
	External trigger	Repetition rate <50 kHz Trigger level from 0.1 To 5 V Internal load Positive or negative slope Minimum trigger delay <50 ns Single or repetitive trigger
	PXI trigger	PXI STAR from PXI bus
	Soft trigger	From PCI command
Time base		
	Frequency	200 MHz, 25 PPM (1)
	Time reference	10 MHz, 25 PPM from PXI Clk10
General specifications		
	Size	PXI, 3U, 1 slot
	Power	15 W (+ 3.3 V / + 5 V / + 12 V)
	Indicators	Red: Fault, Green: Trigger on
Software		
		Free Drivers for Windows 10 NI-VISA and LabVIEW driver Control panel software for Windows
Option		
	Option 1	5" SMB to BNC cable

(1): performances with 10 MHz PXI

Operating information

Block diagram of the generator



Note: Signals with green border are connected to PXI bus

Operating principle

When the module is in RUN state a rising edge on a trigger starts a delay sequence. The trigger comes from trigger input, PXI STAR, internal frequency, or software command.
When a delay sequence starts the front panel green LEDS tilt.

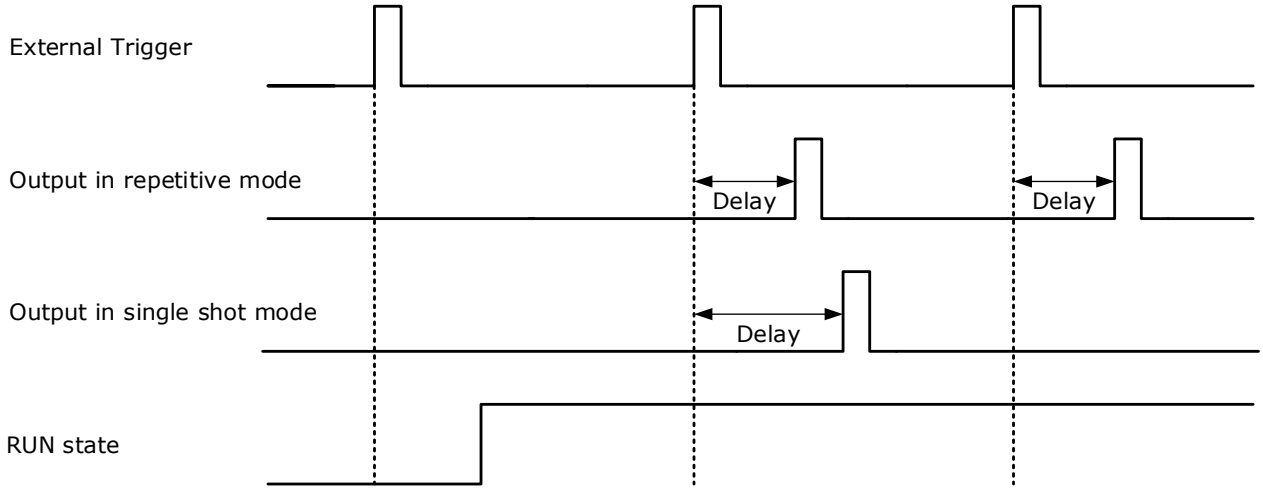
The delay sequence includes two trigger phases:

- After an insertion delay a pulse appears on each channel after a specified delay
- At the end of sequence, after the last delayed pulse, the delay generator is ready for repetitive trigger mode.

The GFT9404 must be configured (trigger source, delay, amplitude …) in the STOP state. In STOP state outputs are automatically disabled.

Timing principle using external trigger

In response to the external trigger the board can generate repetitive or single delayed output pulse if the board is in RUN state.



Control panel software for Windows

This free software provides a simple method to configure settings for each channel, trigger source, trigger mode, and to control the state of the instrument.

The control panel software allows to display and control

- RUN /STOP button
- Delay channels (ON/OFF, delay, output amplitude, output width)
- Auxiliary delay channels (ON/OFF, delay)
- Trigger (source, external slope and level, Internal frequency, manual)
- Status (fault and trigger flag)

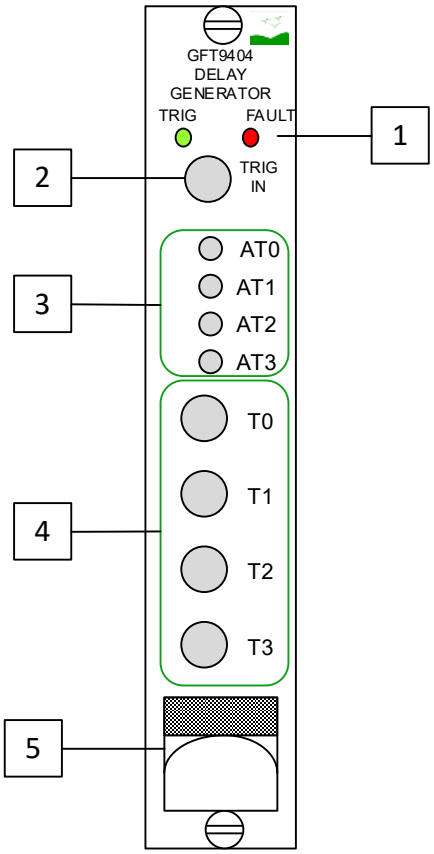
The configuration information of the instrument can be stored to file and restored.

The software is designed to allow multiple GFT9404 to be installed and operate in the same PXI chassis. Each module is specified by its serial number.



Control panel software

Front Panel



Indicator, connectors

1	Two indicators: • Green (TRIG) lights on when a trigger is detected • Red (FAULT) lights on if a defect is detected
2	External trigger input: SMB connector
3	Four auxiliary outputs: MMCX connectors
4	Four high resolution outputs: SMB connectors
5	Injector Handle to insert or eject the board

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