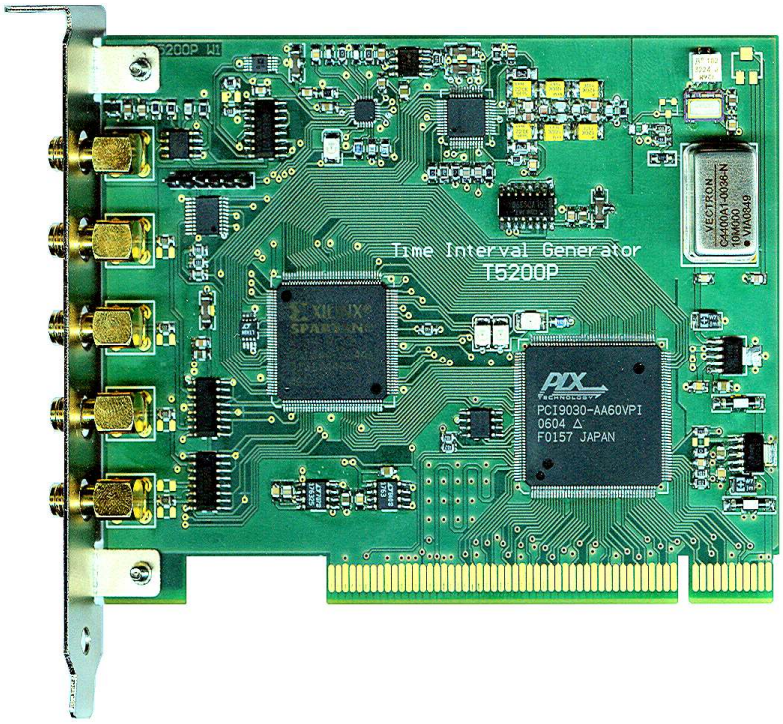
Delay/Pulse/Frequency Generator T5200(S)

High Performance Instrumentation

- Single PCI board for PC
- Precisely controlled **delay** between the leading edges of output pulses
- Precisely controlled **width** of pulses at a separate output
- Time delay/width range: **10 ns – 10 seconds**
- Time delay/width resolution: **5 ps**
- Output pulses: positive, 2 V amplitude on 50 Ω load, rise- and fall time < 600 ps, selectable width (10, 20, 50 or 100 ns) and polarity
- Jitter: **< 20 ps rms** at time delay from 0 to 10 ms (TCXO)
- Precisely controlled **frequency** of rectangular waveform at a separate output
- Internal trigger generator with variable frequency
- Clock generator: internal TCXO or **OCXO** (option S) or external 10 MHz reference clock
- User-friendly software for Windows



The T5200(S) Delay/Pulse/Frequency Generator produces precise and low-jitter time delay between the leading edges of pulses at two outputs (**A** → **B**) and simultaneously the pairs of such pulses are generated in the **Common** mode at a single output (**CW**). In the **Width** mode a pulse of width equal to preset delay is generated at the **CW** output. Both the time delay and width can easily be varied using the mouse or by writing the needed value on the virtual control panel. The T5200 can also be used as a pulse generator of variable frequency (output **F**). The generator T5200 has on-board a *Temperature-Compensated Crystal Oscillator* (**TCXO**), while the model T5200S contains an *Oven-Controlled Crystal Oscillator* (**OCXO**) which provides still higher accuracy and stability at reasonable cost. An external (for example, atomic) frequency standard can also be used (input **CK**).

The T5200 Generator occupies a single PCI slot in a PC and combines the digital control and picosecond precision of time-interval generation with affordable cost and reliability for thorough industrial and scientific applications. All instrument functions can be accessed through a simple, intuitive, and user-friendly graphic interface.

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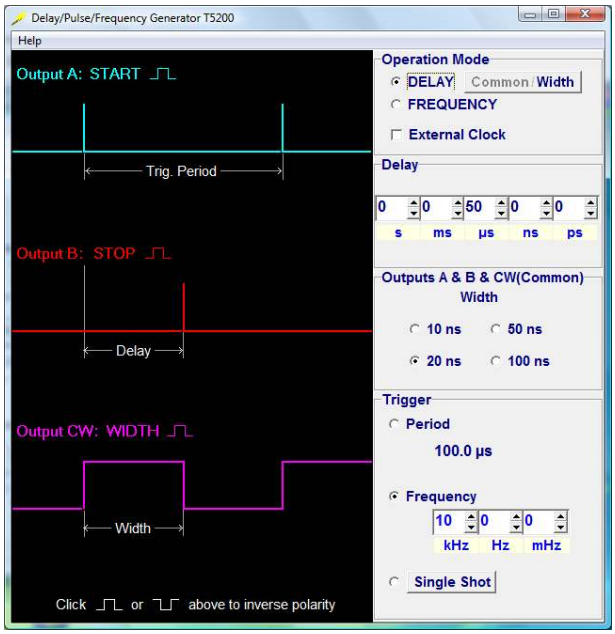

◄ **Virtual Control Panel** in DELAY/Width mode

Delay jitter - measured by
Agilent oscilloscope DSA90804A (8 GHz, 40 GS/s)
and *SRS* counter SR620 (resolution 20 ps rms)

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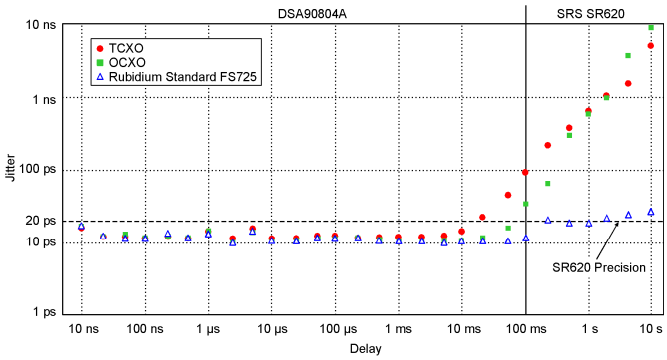

Specifications

Functions	**Time Delay** between the leading edges of two pulses appearing at the **A** and **B** outputs or between the leading edges of two pulses appearing consecutively at the **CW** output in **Common** mode **Pulse Width** at the **CW** output in **Width** mode **Frequency** of rectangular waveform generated at the **F** output
Time Delay & Width	
Range	10 ns – 1 second (Delay **A** → **B** or **CW** → **CW**, or Pulse Width (**CW**))
Incremental Resolution	5 ps
Jitter	< 20 ps rms at time delay from 10 ns to 10 ms (TCXO timebase, Model T5200) < 20 ps rms at time delay from 10 ns to 50 ms (OCXO timebase, Model T5200S) < 20 ps rms at time delay from 10 ns to 10 s (external atomic timebase)
Trigger generator	internal, with digitally variable frequency from 10 mHz to 1 MHz
Frequency	Output **F**
Range	0.1 Hz to 1 MHz with a 1 mHz step; 1 – 75 MHz with a 1 Hz step
Period jitter	< 20 ps rms from 10 kHz to 75 MHz
Outputs A, B, CW, F	
Load	50 Ω, DC coupled; SMA sockets
Amplitude	2 V referred to ground
Rise & Fall time (20 – 80 %)	< 600 ps
Polarity	selectable, positive or negative leading edge (except output **F**)
Pulse width	10, 20, 50 or 100 ns ± 0.5 ns at 1 V threshold (except outputs **F** and **CW/Width**)
Internal Clock Generator	**T5200:** 10 MHz TCXO, stability 5×10^{-7} (-40 to +85 °C), ageing 1×10^{-6}/year **T5200S:** 10 MHz OCXO, stability 1×10^{-7} (-20 to +70 °C), ageing 1×10^{-8}/day*
External Clock Generator	Input **CK** - 50 Ω, DC coupled; SMA socket 10 MHz, sine or pulse, min. 100 mV on 50 Ω input impedance
Supplied Software	for *Windows*® 98/2000/NT/XP/Vista/7, DLL file for other applications

*after 30 days of operation