Time-Correlated Single-Photon Counting System

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Time-Correlated Single-Photon Counting System With One Counting Channel-ST1010

This time-correlated single photon counting product ST1010 with one counting channel is a high-precision time measurement system , which can accurately measure the relative time of signal events , and supports time tag mode , which can record the time information of detection signals in real time.

Thanks to the powerful high-speed data storage and processing capabilities, the time resolution of ST1010 can reach up to 16ps, and the saturation count rate of the channel can reach up to 100x10^6cps dead time is less than 10ns,ST1010 also supports One-Start-Multi-Stop mode.

What's more, multiple event information can be recorded in real time within the same synchronization signal period. In addition, in order to meet the needs of scientific research users in different applications, ST1010 comes with 4 marker signal interfaces and reference clock input/output interface.

Feature

- Highest time resolution 16ps
- Instantaneous saturation count rate 100 Mcps
- Dead time less than 10ns
- Support time stamp mode
- Powerful data processing software
- USB 3.0 interface

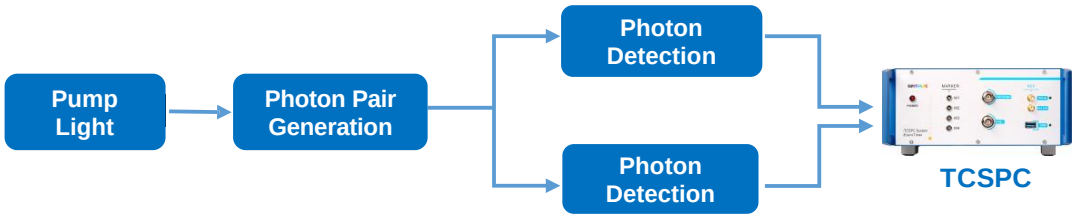
Application

- Fluorescence lifetime test
- Fluorescence correlation spectroscopy (FCS)
- Fluorescence resonance energy transfer (FRET)
- Quantum optics
- Time of flight (ToF) measurement
- Nuclear physics
- Coherent detection
- Fiber optic sensing

Typical Application

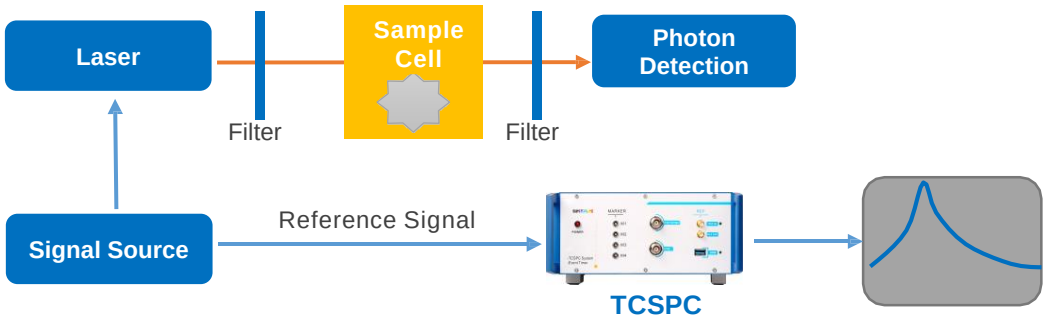
Photon Correlation Measurement

ST1010(P) can be used for the measurement of correlated photon pairs, which is an important means of quantum optics research such as quantum secure communication and single photon generation. PPLN or PPKTP crystals can be pumped by pump light to generate associated photo pairs , which are measured by single photon detectors after split by PBS or 50/50 BS and the counting signals are analyzed by TSCPS to obtain associated information.



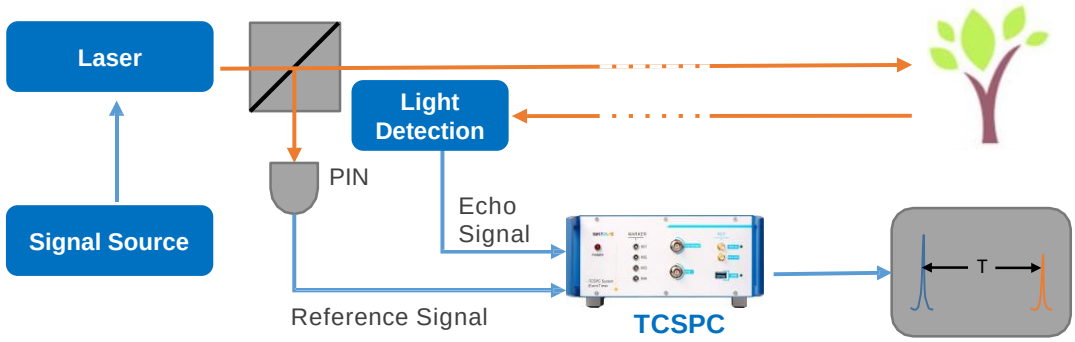
Fluorescence Lifetime Measurement

The fluorescence lifetime is usually on the order of ps~us, and TCSPC is the most mature and accurate test method for measuring such a short time. A synchronous signal source is used to drive the laser, the outgoing light pulse irradiates the sample cell and the fluorescence signal is detected by a photon detection device (mostly PMT),and each photon counting signal is in F.



TOF Application

TOF(Time of Flight) measurement refers to a means of obtaining information such as relative distance or particle mass by measuring the flight time of photons(or particles), One of its typical applications is laser ranging ,using picosecond (or femtosecond) lasers to generate light pulses and using BS to separate part of the signal at the laser exit and restore it to electrical pulses as reference signals, the light pulse is reflected at the measured object, the time difference of the reference signal and the echo signal corresponds to the distance of the measured object.



Time-Correlated Single-Photon Counting System With Four Counting Channel-ST1040

The TCSPC product ST1040 supports parallel measurement of 4 counting channels (STOP signal) at the same time under the same reference clock. ST1040 also supports time tag mode, which can record in real time the time information and channel information of collecting signal. Users can freely choose time tag mode and histogram mode according to experimental needs.

ST1040 still maintains the excellent performance of a single independent channel, each channel has 16ps time resolution, less than 10ns dead time and saturation count rate up to 100Mpcs and supports event transmission rate up to 40M Events/s.

In addition, ST1040 also supports marker signal and enable signal input and port, which can meet the applications in imaging(such as fluorescence lifetime life imaging) for scientific research users.

Feature

- Support parallel measurement of 4 counting channels
- Maximum time resolution 16ps
- Instantaneous saturation count rate 100Mcps
- Dead time less than 10ns
- Support time stamp mode
- USB 3.0 interface
- Powerful data processing software

Application

- Fluorescence lifetime test
- Fluorescence lifetime imaging (FLIM)
- Time of flight (ToF) measurement
- Nuclear physics
- Quantum optics
- Coherent detection
- Fiber optic sensing

Time-Correlated Single-Photon Counting System With Eight Counting Channel-ST1080

ST1080 is a time-correlated single-photon counting product, specially developed for the field of quantum optics. In order to meet the needs of users in coincidence counting experiments, the coincidence counting function has been expanded in ST1080 supporting software and users can freely select the channels that need to be coincident and ST1080 still supports the time tag mode, which can record the time information and channel information of the detection signal in real time for 8 counting channels.

Thanks to powerful high-speed data storage and processing capabilities, ST1080 has time resolution up to 64ps,dead time below 50ns, saturation count rate of a single channel reaching up to $20x10^6$ cps and supports a 20M Event/s total rate of event transmission.ST1080 also supports One-Start-Multi-Stop mode and more photon information can be recorded in the same synchronization signal cycle.

In addition, ST1080 also adds 4 marker signal interfaces and reference clock input /output interfaces, which can meet the needs of scientific research users in different applications.

Feature

- Maximum time resolution 64ps
- Saturation count rate 20Mcps
- Dead time less than 50 ns
- Support 8-channel parallel measurement
- Support time stamp mode
- Support coincidence counting function
- USB 3.0 high-speed data transferring interface

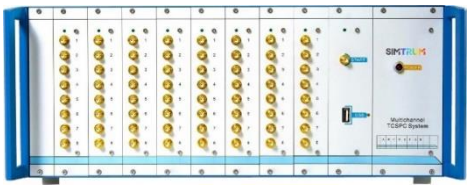
Application

- Quantum optics
- Coincidence counting
- Ghost Imaging

Multi-Channel Time-Correlated Single-Photon Counting System-SMT6420

Our multi-channel time-correlated photon counting system SMT6420 adopts a highly integrated multi-channel board design. Users can flexibly choose the number of channels according to different experimental designs.SMT6420 can support up to 64 channels, so that the parallel time interval measurement of 64 input signals can be realized under the same reference clock.

As the world's first 64-channel ultra-highly integrated TCSPC system, SMT6420 maintains the excellent performance of a single independent channel. Each channel can achieve 64ps time resolution and 20Mcps saturation count rate.



The SMT6420 is designed for applications based on multi-channel single-photon detection, such as fluorescence lifetime imaging, single-photon imaging radar etc., providing excellent solutions to meet customers' stringent requirements in terms of high performance, low power consumption, high integration and high cost performance.

Feature

- Supporting up to 64 channels
- Scalable number of channels
- Maximum time resolution 64ps
- Support time stamp mode
- Saturation count rate 20Mcps
- Support the One-Start-Multi-Stop technology

Application

- Fluorescence lifetime imaging
- Lidar imaging
- Quantum correlation imaging

Specification

Model	ST1010	ST1040	ST1080	SMT6420
Channel Characteristics				
Number of Counting Channels	1	4	8	8/16/24/32/40 /48/56/64
Synchronization Channel / Counting Channel Interface	BNC	SMA	SMA	SMA
MARKER Signal Interface	LEMO	LEMO	LEMO	SMA
Reference Clock Input / 0utput Interface	SMA	SMA	SMA	SMA
Input Signal Standard	-2V ~ +3V Threshold Adjustable		LVTTL	
Trigger Method	Rising Edge / Falling Edge Trigger (Adjustable)		Rising Edge Trigger	Rising Edge Trigger (<2 n s)
Minimum Trigger Pulse Width	0.1 ns	>0.1 ns	>0.5 ns	>0.5 ns
TDC Characteristics				
Instantaneous Saturation Count Rate	100 Mcps	100 x 10^6 cps	20 x 10^6 cps	20 x 10^6 cps
Dead Time	10 ns	<10 ns	<50 ns	<50 ns
Synchronization Signal Frequency Division	1/2/4/8	1/2/4/8	1/2/4/8	1/2/4/8
Maximum Event Transferring Rate	40M Events/s	40M Events/s	20M Events/s	40M Events/s
Adjustable Time Delay Range	-1000.0 ~ 1000.0 ns			
Pulse Width Measurement Function	Optional		/	
GPS AbsoluteTime Stamp	Optional		/	
Histogram				
Time Resolution (ps)	16/32/64/128/256/512/1024/…/33554432		64/128/256/512/1024/…/33554432	
Unit Maximum Count Value	65535			
Maximum Range	1.08 μs @16 ps			
	67.1 μs@1024 ps			
	2.19 s@ 33554432ps			
Time stamp				
Mode Selection	T2/T3			
Time Resolution (ps)	16	16	64	64
Maximum Range	Unlimited@T2			
	1.09 s@T3			
Other				
Data Interface	USB3.0			
Size	300 x 235 × 115 mm^3			
Power Access	110 ~ 230 VAC			

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