



quTAG

The Time Tagger that grows with your needs



Two variants available

The quTAG is available in two variants:

- quTAG standard: This is the device that meets all specifications below and features a rich software solution.
- quTAG basic: this device aims at the cost-sensitive customers that do not need all extensions right now - an upgrade is always possible.

quTAG Specifications

Inputs

number of channels	standard: 4 stop and 1 start basic: 2 stop and 1 start
timing jitter, FWHM	< 25 ps
timing jitter, RMS	< 10 ps
digital resolution	1 ps
signal levels (threshold comparator)	-3 ... +3 V e.g. LVTTTL, NIM
threshold level resolution	1.46 mV
edge	rising, falling
min. input pulse width	300 ps
termination	50 Ohms
min. pulse to pulse separation	40 ns
max. event rate per channel	25 Mcps 200 MHz periodic*
divider	on start input**
DNL / INL	<1 %
delay range	-100 ... +100 ns
delay resolution	1 ps
input connectors	SMA
max. input level	±3.3V

All Time Tag / Stop channels

max. event rate	100 Mcps
max. acquisition time	13 days

Applications

- Time-correlated Single Photon Counting (TCSPC)
- Quantum Optics / Information / Communication
- Fluorescence / Phosphorescence Lifetime Imaging (FLIM)
- Fluorescence Correlation Spectroscopy (FCS)
- Stimulated Emission Depletion Microscopy (STED)
- Foerster Resonance Energy Transfer (FRET)
- Single Photon Emitter Characterization
- LIDAR

Clock Input (standard only)

frequency	10 MHz***
signal levels (threshold)	-5 ... +5 V
signal form	sinusoidal square wave
termination	50 Ohms
input connector	SMA

Synchronisation (standard only)

number of synchronisable quTAGs	4
number of synchronised channels	16

Software

operating systems	Windows, Linux
supplied software	GUI / DLL / LabView / Python / command line

Physical characteristics

dimensions (in mm)	440 x 330 x 50
weight	4 kg
interface	USB 3.0

* with divider enabled **for stop channels optional *** other frequencies optional

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Available Extensions

Extension	quTAG standard	quTAG basic
Lifetime software extension		
Cross-correlation software extension		
Input channels		
Clock input		
Synchronization of devices		
Marker inputs		
Virtual channels		
User-defined Clock frequency		
Start-Channel as input		
Divider for stop channels		
	included	upgradeable
Lifetime software extension		This software addon enables the user to analyze lifetime measurements on the fly. The software calculates the required histograms, fits exponential decreases and takes response functions of the system into account.
Cross-correlation software extension		This software extension is intended for calculating the correlation function, as needed for example in Hanbury Brown-Twiss experiments or fluorescence correlation spectroscopy. Standard functions can be fitted to assess the relevant parameters.
Input channels		The quTAG features up to two more flexible stop channels that can be enabled.
Clock input		The quTAG can be synchronized to an external clock of 10 MHz, to allow more precise long-term accuracy.
Synchronization of devices		This extension allows you to synchronize up to 4 devices. By this, up to 16 equal stop channels are offered – all sharing the same clock input and time base.
Marker inputs		In addition to the 4+1 channel input, the device features marker inputs that insert marker timestamps in your timeline. You can connect these inputs e.g. to your pixel clock or line clock. This helps you to sort the timestamps to the correct pixel in your FLIM setup.
Virtual channels		The device allows to enable user-defined filters or virtual channels. This filtering happens inside the device so that you save bandwidth on your USB connection.
User-defined Clock frequency		Allow to use any frequency between 1 – 100 MHz as a clock input for long-term accuracy.
Start-Channel as input		The Start channel can be converted to another stop channel, allowing the device to have 5 completely equal input channels.
Divider for stop channels		This option allows you to enable the divider on all stop channels. This allows higher frequency periodic signals to be recorded.

Customized solutions, e.g. output channels, are available on request. Please contact us for details.

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