

Redefining Measurement

ID900 Time Controller

Timing, Delay Generation and Pattern Generation all with 20 picoseconds Precision



IDQ's Time Controller is designed for flexibility and it efficiently solves a large number of problems encountered in the laboratory. Its core consists of 4 high-speed (<20 ps precision, 100 Mcps rate, 50 Ω) inputs and 4 high-speed outputs, interconnected by reconfigurable logic. The Time Controller performs the functions of a number of devices: time-to-digital converter, coincidence counter, delay generator, pattern generator, counter and discriminator. This is complemented by a 10 Gbps link to the host computer for fast data transfers, by auxiliary analog and digital I/O for interfacing with external devices. An advanced synchronisation circuit allows for up to 16 devices to be "daisy chained" for a total of 64 fast input and output channels.

Key Features

- ▶ Timestamping and histogramming
- ▶ Delay generation with multi-hit ability
- ▶ Pattern generation
- ▶ High-speed counter
- ▶ High precision discriminator
- ▶ Synchronise devices for up to 64 channels
- ▶ 4 input channels (-3 V to +3 V in 1 mV steps)
- ▶ 4 output channels (NIM + LVTTTL)
- ▶ High timing resolution (20 ps FWHM)
- ▶ Fast data transfer to a PC (100 Mcps)
- ▶ 1 GHz counters

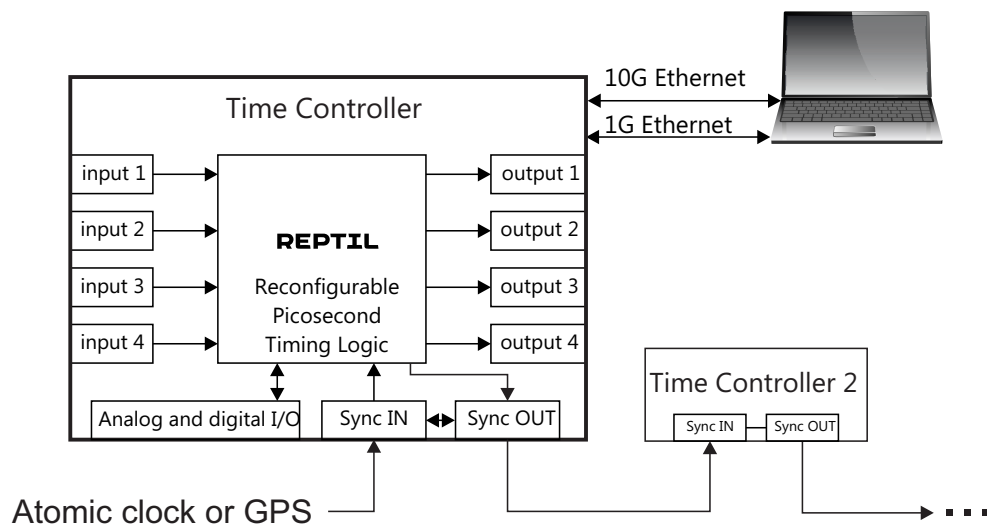
Applications

- ▶ Quantum optics
- ▶ Quantum communication
- ▶ LIDAR
- ▶ Particle physics
- ▶ Time correlated single-photon counting (TCSPC)
- ▶ Fluorescence lifetime imaging
- ▶ Fluorescence correlation spectroscopy
- ▶ Single-photon counting
- ▶ Precision time measurement
- ▶ Correlation measurement
- ▶ Optical measurement

TIME CONTROLLER

Principle of Operation

The Time Controller works by having 20 ps inputs and outputs interconnected by Reconfigurable Picosecond Timing Logic (REPTIL). This architecture allows for low-latency, high throughput, high precision input-to-output logic. Besides the ability to emulate and outperform a number of standard laboratory instruments (TDC, delay generator, discriminator, pattern generator) this architecture enables new functions, such as multi-hit delay generation, conditional pattern generation or advanced detector gating. IDQ will be happy to discuss customisation to your application.



Software

The Time Controller’s advanced functions are controlled through an intuitive graphical user interface or may be programmatically accessed through “SCPI” text commands, allowing its integration from a large number of programming languages: LabView, Python, Matlab, C/C++, etc.

