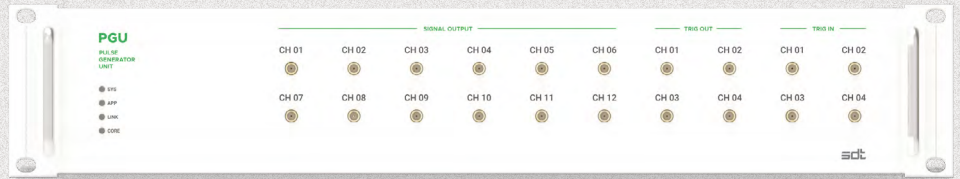


Specifications



Channels	12
Pulse Train Duration	20 ns - 20 s
Train Pulse Resolution	5 ns
Transition Points	2048 (≤ 1024 TTL pulses)
Rise / Fall Time	<1 ns
Output Voltage Range	+3.3 V
Interfaces	SMA Female on front panel for output channels LAN/Ethernet, Gigabit Maintenance USB
Dimensions (W x H x D)	W430 X H84.2 (2U) X D318.2 mm

Key Features

- 12 pulse output channels
- Minimum 10 ps resolution output synchronization (2 channels)
- Generates over 1 k pulses at arbitrary timings
- Includes Python library for easy integration
- High-speed data transmission up to 1 Gbps via Gigabit Ethernet
- Built on SDT's proprietary patented IP, this product can be tailored to customer needs

Introduction

The Pulse Generator Unit (PGU) is a high-precision timing control instrument designed to generate multiple, independently configurable pulse sequences required in quantum computing experiments. Serving as a centralized synchronization hub, the PGU delivers timing signals—such as TTL pulses—with deterministic accuracy, enabling precise temporal coordination across experimental subsystems.

Built on a field-programmable gate array (FPGA) architecture, the PGU offers up to 12 independent output channels—among the highest in its class. It supports simultaneous multi-channel pulse generation from a single trigger input, ensuring tightly synchronized signal delivery for complex experimental protocols. With a timing resolution of 10 picoseconds, the PGU enhances the temporal fidelity of quantum operations.

The PGU also integrates seamlessly with experimental systems via cloud computing, enabling automated scheduling and device synchronization to streamline research workflows. An integrated Python library provides a user-friendly interface for efficient experiment control, even without extensive programming expertise.

Certifications

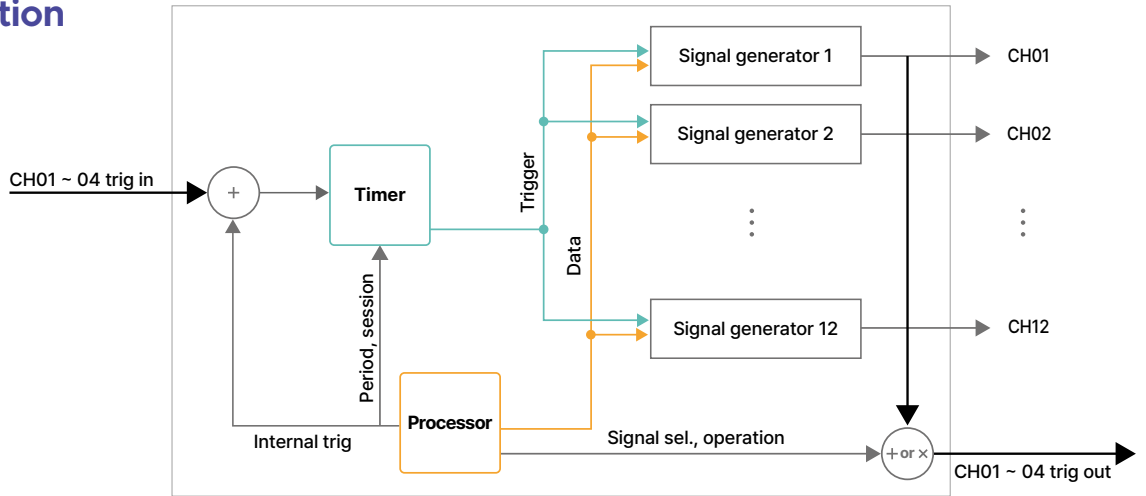


KC Certification
R-R-2Dt-SDT-Q-PGU-N



KC Test
DST-25E-1388

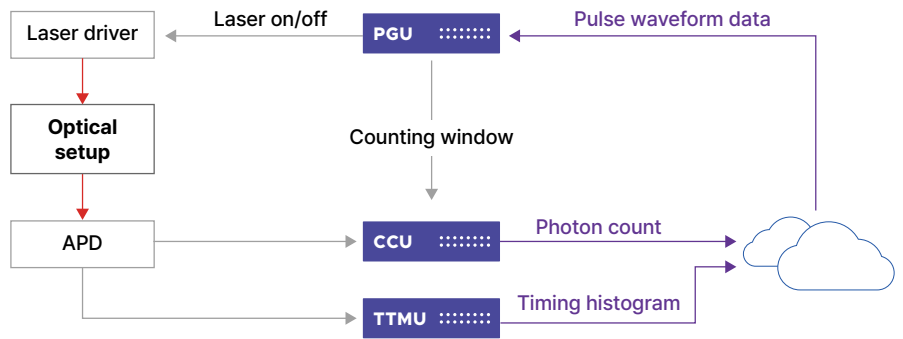
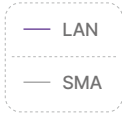
Functional Description



Applications

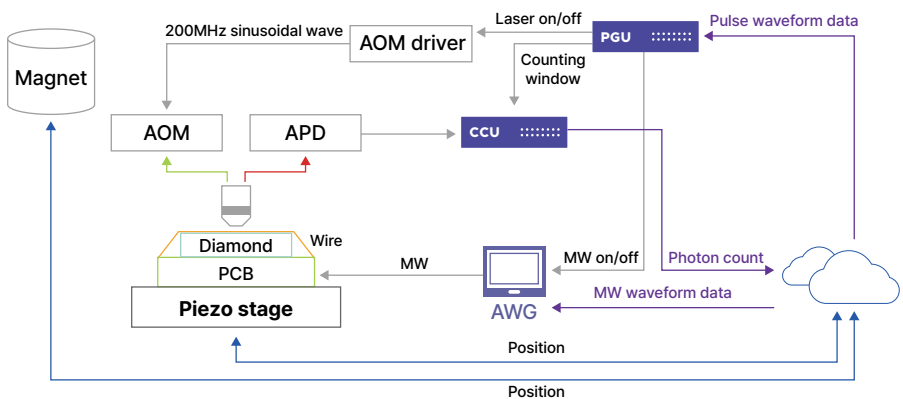
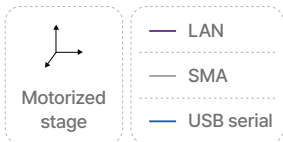
Photon-Based Quantum Experiments

The PGU generates precise synchronization pulses to ensure accurate timing alignment across devices.



Nitrogen Vacancy Quantum Computing

The PGU generates synchronization pulses essential for controlling, measuring, and detecting the quantum states of NV qubits.



Compatibility

- SDT's Qubit Controller Unit, Coincidence Counting Unit, and Time Tagging Measurement Unit

- C, C++, and Python (3.0 or higher)

