TABOR ELECTRONICS

Simplifying
Quantum Computing

Quantum Computing is evolving into its next chapter: The Realization of Quantum Supremacy. As experiments move from single Qubits to multiple Qubits, they're evolving into commercialized products for sale to end users. This evolution must adapt around two primary challenges:

Multiple Qubits
increase experiment/product complexity

Reducing noise
requires real-time feedback systems

A 'classic' quantum experimental computer - for example, a superconducting Qubit system - usually consists of one or more qubits inside a dilution refrigerator, a series of amplifiers, a number of RF Signal Generators, Arbitrary Waveform Generators for pulse shaping, and multiple connectorized microwave components such as IQ mixers. This type of architecture creates a complex system that's hard to operate, calibrate and support, plus it is not easily scalable to the next generation. Tabor Electronics has created a commercial product to help solve these issues, simplify the experiment and help move research and quantum products forward faster.

PROTEUS
Infinite possibilities

Proteus is a new product from Tabor Electronics that offers three operation modes:

Proteus architecture in the diagram bellow provides high-fidelity waveform direct to microwave generation, combined with real-time feedback and high-speed data transfer system. This capability enhances your quantum computing application, while simplifying the design and eliminating many components such as RF signal Generators and Connectorized Components

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Since 1971, Tabor Electronics has specialized in Arbitrary Waveform Generation for the Physics community.

Transceiver Capable

the Microwave Arbitrary Waveform Generator can be enhanced with the addition of a high-speed digitizer and Programmable FPGA for real time measurement and feedback

Microwave Arbitrary Waveform Generation

up to 9GHz of high-fidelity pulse generation

Real Time Signal Streaming

Data can be streamed in and out of the instrument at 6GS/s providing real time control and analysis with Terabytes of waveforms

Multiple channels

When expanding to multiple Qubits, the Proteus system can take advantage of the PXI modular system architecture. This provides a commercial industrial standard for expansion, avoiding risks associated with custom multi-channel systems. Proteus also provides the highest channel density with multiple transceiver channels in a compact 19in rack framework.
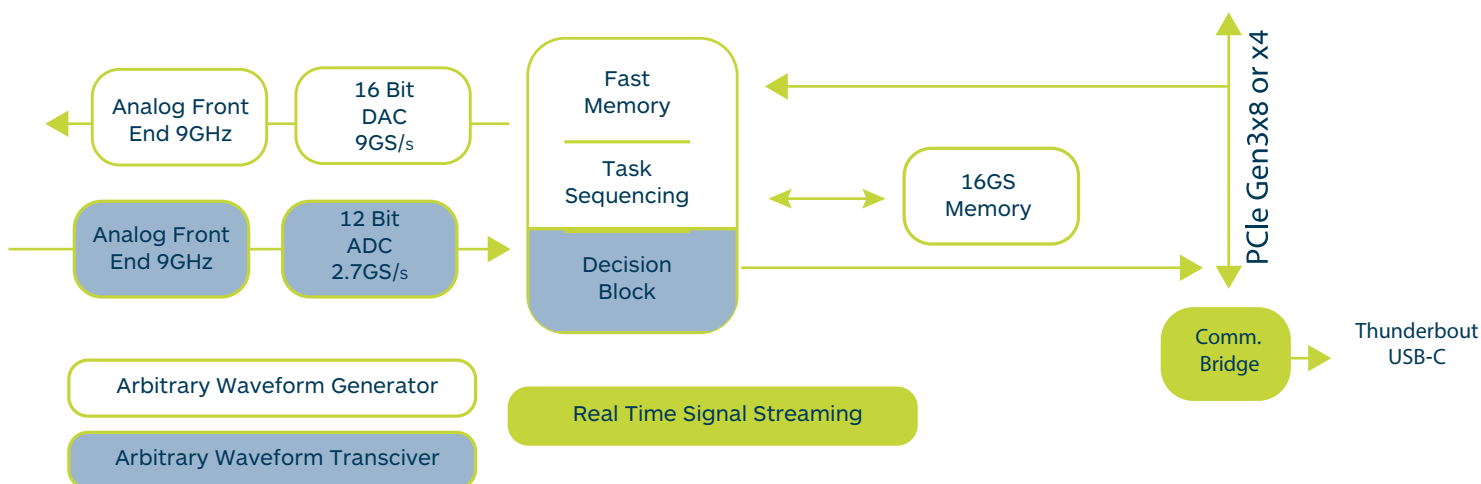
Arbitrary Waveform Generator		Digitizer	
Sample Rate	1.25GS/s, 2.5GS/s, 9GS/s	Sample Rate	2.75Gs/s
Channels	2 or 41	Channels	2
Resolution	16 bits	Resolution	12Bit
Output	14 bits	Input voltage range full scale	±500 mV / ±1 V
Analog BW (Max)	9 GHz	Analog BW (Max)	9 GHz
Memory (Max)	16Gs	FPGA	PCle Gen3x8 or x4
Markers	4, 8 or 16	Type	Kintex Ultrascale KU060
DUC	2 IQ Modulators per Channel with modulation BW up to 2.5GHz	LUT's	331,680

Additional information

Proteus series:

Arbitrary Waveform Generators

Arbitrary Waveform Transceivers

RF Arbitrary Waveform Generators

Simplify Quantum Experiments with Direct to RF Waveform Generation - video demo

Measuring Qubit Resonance - Proteus AWT – video demo

Experiment design considerations for real-time, closed-loop pulse streaming - webinar

Direct Generation/Acquisition of Microwave Signals – white paper

Effective Number of Bits for Arbitrary Waveform Generators – white