Bell-1

QUANTUM **SERVER**

equal1

BELL-1 QUANTUM SERVER : A BREAKTHROUGH IN SILICON QUANTUM COMPUTING

Equal1 introduces Bell-1, the first-ever rack-mounted silicon quantum computer designed for High-Performance Computing (HPC) datacenters.

- Bell-1 marks the beginning of Quantum Computing 2.0 — making quantum computing more accessible than ever.
- Easily deployable in existing data centers, Bell-1 will seamlessly integrate with Artificial Intelligence (AI) and HPC systems to deliver powerful, on-demand quantum acceleration.
- Bell-1 is set to revolutionize how businesses harness quantum computing, with its compact size, energy-efficient design and cutting-edge cooling system.

Quantum computing enters a new era with the Bell-1 Quantum Server, marking a historic breakthrough in scalable, practical quantum computing.

Designed to augment, rather than replace, classical computing, Bell-1 is a 6-qubit silicon quantum computer that integrates seamlessly into existing HPC environments.

For the first time, businesses and research institutions will be able to deploy a quantum computing system as easily as a high-end CPU/GPU server, enabling businesses to offload computationally intensive problems to quantum processors.

REVOLUTIONARY DESIGN AND EFFICIENCY

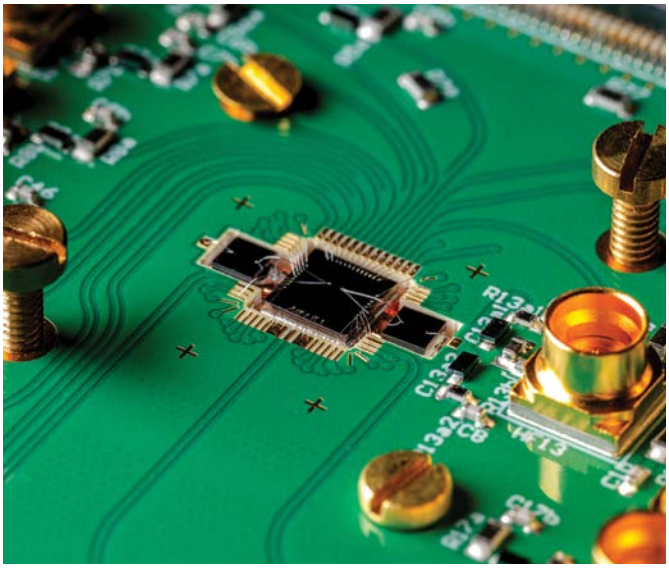
Equal1's Bell-1 Quantum Server is an extraordinary engineering feat, housing an integrated, closed cycle cryocooler within its rack-mounted enclosure.

Remarkably, it achieves an operating temperature of 0.3 Kelvin, using a self-contained proprietary system, a significant departure from quantum computers requiring large, external dilution refrigerators.

Engineered for real-world usability, Bell-1 plugs into a standard electrical power socket and consumes just 1600 W during operation — significantly less than traditional quantum systems.

The Bell-1 Quantum Server is standard sized and rack-mountable, meaning it removes the traditional obstacles of space, cooling and power consumption that have hindered adoption, making quantum computing accessible across industries and applications.

Future generations of the Bell Quantum Server family will incorporate Equal1's Quantum System on Chip (QSoC) technology, integrating control, readout and error correction on a single chip while leveraging existing semiconductor infrastructure for unprecedented scalability and reliability.



KEY DESIGN INNOVATIONS

- Standard Rack Deployment: The first rack-mounted quantum system designed for integration into HPC environments.
- Self-Contained Cryogenic Cooling: Operates at 0.3 Kelvin without requiring external dilution refrigerators.
- Enterprise-Ready Power Requirements: Runs on standard 110 V/220 V single-phase power, consuming just 1600 W—similar to a high-end GPU server.
- Future-Proofed Scalability: Designed to support QSoC-based field upgrades, ensuring long-term investment protection.

Key Specifications

6-Qubit QPU	Typical
T1 Time	380 ms
T2 Rabi Time	26 µs
T2* Time	13 µs
Single Qubit Gate Fidelity	99.40%
Single Qubit Gate Duration	84 ns
CZ Fidelity	98.40%
CZ Duration	72 ns
Readout Fidelity	>99.9%
Readout Time	10 µs

Technical Specification

Rack-mounted system with integrated cryocooler	
System Size (w x l x h)	600 mm x 1000 mm x 1600 mm
System Weight	200 kg
Cryocooler Type	Continuous cooling, sorption cooler, air-cooled system
Cooling Power	At 4.2 K: 200 mW At 0.38 K: 160 uW
Cooling Air	117 CFM
Electrical Supply	16 A single-phase, 16 amp, 60 Hz (220 V @ 50 Hz with optional invertor)
Power Consumption	1600 W
Voltage Supply	110 V / 220 V
Operational Temperature Range	-15° to +45° C
Sample Heat-Up Time (hrs)	0.3 K to 4 K: 1 h 4 K to 300 K: 36 h Total Heat-Up Time: 36 h
Sample Cooldown Time (hrs)	300 K to 4 K: 36 h 4 K to 03 K: 2 h Total cooling time: 36 h + 2 h = 38 h
Operation Time	Continuous operation at 0.3 K
Service Interval (hrs)	5,000 h

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