Emerging Technologies

# The World's
# First and Fully Digital
# Quantum Control System
# is Here

Accelerating Quantum Innovation

Streamline your quantum experiments with our new system — designed for quantum from the ground up.

Learn More

As the end of Moore's law draws near, quantum technology provides the means to achieve breakthroughs in computing. The unique properties of superposition and entanglement enable previously unimagined performance in quantum applications like computing, communications, and sensing. As quantum research enters this new phase in physics and mathematics, you can use engineering to build real systems.

## Learn About Keysight's Quantum Solutions

Quantum Computing

Qubit Types
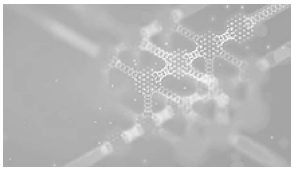
Scaling Quantum Systems

Labber Quantum

Quantum Benchmark

Quantum Communication

KEYSIGHT

# Quantum Computing

Quantum computing uses the properties of quantum superposition and entanglement to solve previously unsolvable problems. Keysight's qubit control solutions and precise measurement instrumentation enable researchers to engineer and scale superior systems.
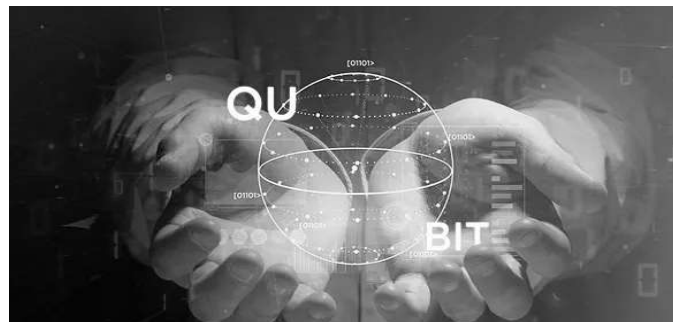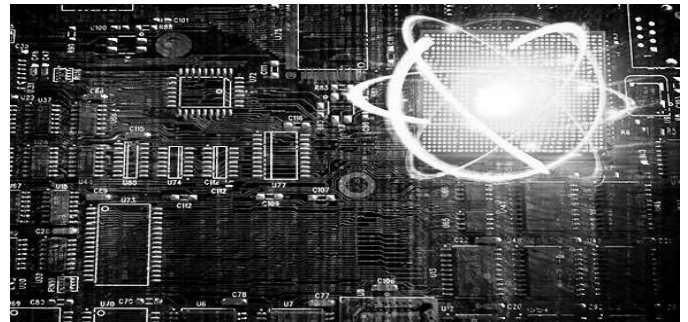
**Application Notes**

Quantum Computing

The Bluefors Dilution Refrigerator as an Integrated Quantum Measurement System

**Brochure**

HPD Superconducting and Spin Qubit Pre-Screening

# Qubit Types

Many quantum-mechanical platforms such as trapped ions, superconducting circuits, and silicon spins can physically realize a quantum two-level system, or qubit. Keysight's broad solution portfolio includes control and measurement solutions for the leading qubit technologies:

- superconducting
- silicon spin
- trapped ion

**Application Notes**

Characterizing Superconducting Qubits

Electronics for Trapped Ion Control

**Brochure**

Integrated Photonics

**More Information**

Optical and Photonic

# Scaling Quantum Systems

The complexity of synchronizing multiple control signals rises as the number of qubits increases. Leveraging an open field-programmable gate array (FPGA) architecture, Keysight's modular and scalable solutions provide flexibility and low latency while optimizing cost and space.

Contact Us

# Labber Quantum

Labber offers a complete, yet easy-to-use solution for instrument control and lab automation. Our software helps the quantum scientist or engineer maximize their experimental potential. Realize faster results with simple experimental set-up, intuitive visualization of results, and the efficient organization of collected data.

**Software**

Labber Software

# Quantum Benchmark - True-Q

Quantum Benchmark offers an essential software layer for both makers and users of quantum computers to turbocharge the runtime performance of error-prone quantum computers.

True-Q software tools deliver run-time error suppression, error-aware compilation, error diagnostics, and optimization to dramatically improve quantum hardware performance.

The software solves the mission-critical challenge of confirming if quantum hardware will execute a user-supplied algorithm to a user-specified precision, delivering quantum advantage to its users. Quantum Benchmark builds proprietary technology based on years of research by several of the world's leading experts in quantum computing.

**Software**

Quantum Benchmark Software
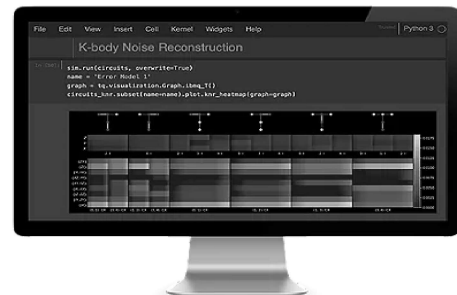
# Quantum Communication

Quantum Communication is a method of transmitting information using quantum mechanics principles. One of the key features of quantum communication is that it allows for the secure transmission of information. This is because any attempt to intercept or eavesdrop on the transmission would cause the quantum state to collapse, alerting both the sender and receiver to the breach in security.

Quantum communication can be achieved through various methods including quantum key distribution (QKD), quantum teleportation, and quantum entanglement. These techniques have potential in areas such as cryptography, secure communication, and quantum internet.

**Pages**
Optical Component Test Products
Integrated Photonics Test Products
M8100 Series Arbitrary Waveform Generators
N4391B Optical Modulation Analyzer
Quantum Communication
Quantum Key Distribution Test Bed

# Quantum Sensing

Quantum Sensing refers to using quantum mechanics principles to detect and measure physical properties with high precision and sensitivity. This is achieved using quantum systems, such as superconducting circuits, trapped ions, or nitrogen-vacancy centers in diamonds, which can exhibit quantum effects like entanglement or coherence. Quantum sensing has potential applications in fields such as metrology, navigation, and medical imaging.

**More Information**
Quantum Sensing Course (Keysight University)
Quantum Sensing
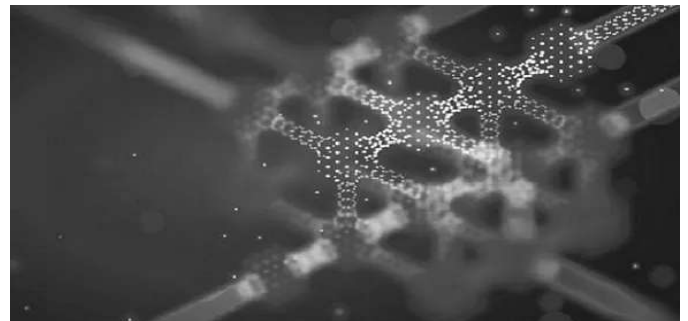
# Quantum EDA

Keysight EDA tools enable your team of quantum hardware engineers to streamline their workflow and accelerate the development of quantum chips using a cost-effective electromagnetic simulation approach based on the method of moments.

**Pages**
Quantum Electronics Design Software

# Quantum Education

Quantum Science is no longer a niche research area. Billions of dollars are being invested worldwide to harness the potential of the technology to solve hard problems. This explosive growth fuels the need for a trained workforce of scientists, engineers, and technicians. As universities ramp up quantum courses, Keysight brings e-learning courses designed for engineers tasked with solving the challenges of quantum systems.

Keysight University offers classes focused on designing large quantum systems and solutions that solve the most common problems.

**Keysight University**
Quantum Education Series

# Events

Keysight Quantum Engineering Solutions offers world-wide opportunities to connect and accelerate your quantum innovations.

View full events listing of all upcoming conferences, tradeshows and webinars.

> View All Keysight Quantum Engineering Events and Webinars

# Related Products

| M3201A PXIe AWG | PNA Network Analyzers | M3102A PXIe Digitizer | PXIe DC Sources | M3202A PXIe AW( |

"My collaboration with Keysight and the Boulder Cryogenic Quantum Testbed has been instrumental in understanding the precision of microwave measurements at millikelvin temperatures. In just a little over a

"All qua
rea
advanc

year, we've built a very effective collaboration at bringing high precision test and measurement techniques and calibrations to superconducting quantum systems."

Josh Mutus, Sr. Research Scientist, Google AI Quantum

best at
Keysigh
gene

Prof. Mich

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## Want help or have questions?

Contact Us