QAI Co., Ltd.

Establishing and Operating Urban Edge Quantum AIDC with Integrated Cloud Services

QAI
QUANTUM AI

2026

COMPANY PROFILE

QAI – Hybrid Qauntum AI Solutions

Korea's First Hybrid Quantum-AI

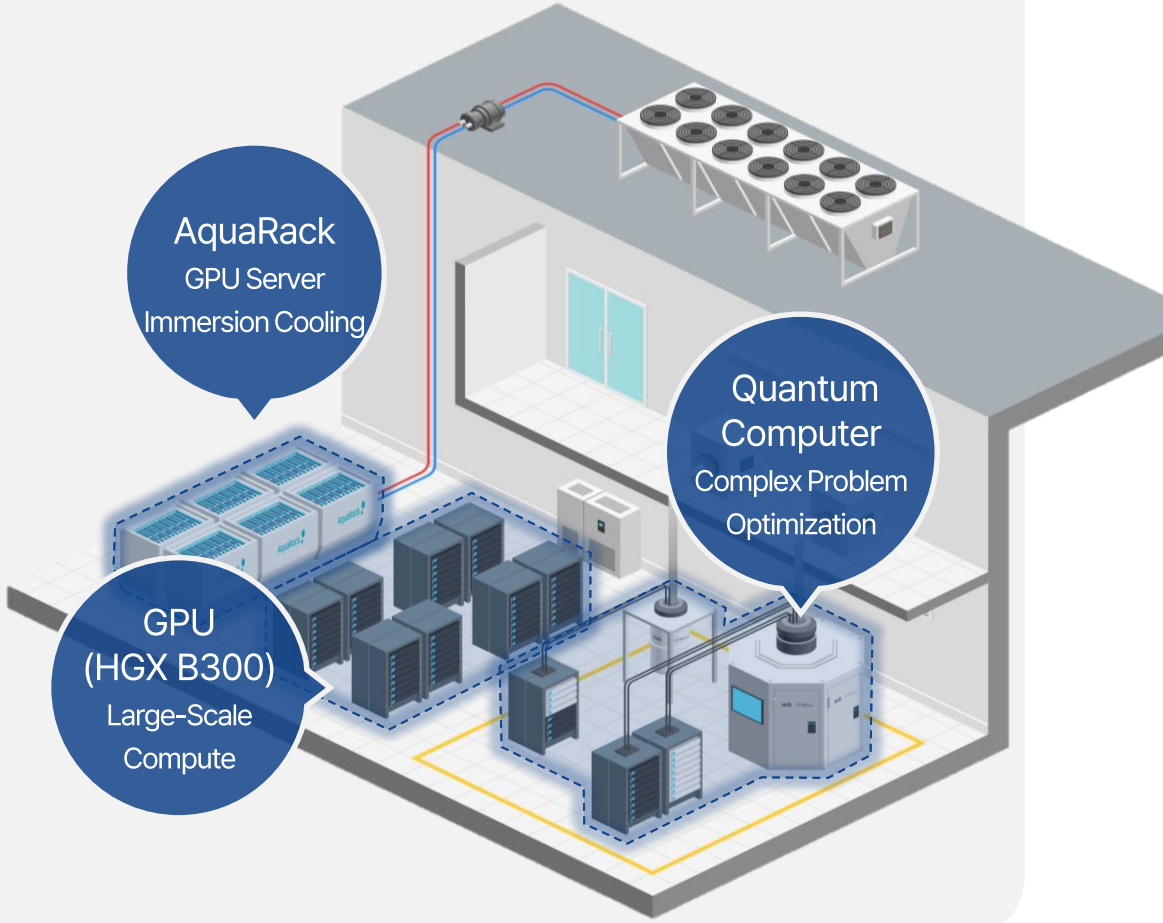
QAI is a specialized cloud infrastructure company that integrates quantum computing with ultra-high-performance AI infrastructure (HPC, NIVIDIA DGX, HGX) to deliver next-generation AI computing and inference resources at the data center level.

Capabilities include GPU-based edge data center operations and enterprise-grade AI infrastructure integration solutions, including hight-density GPU deployment and operations.

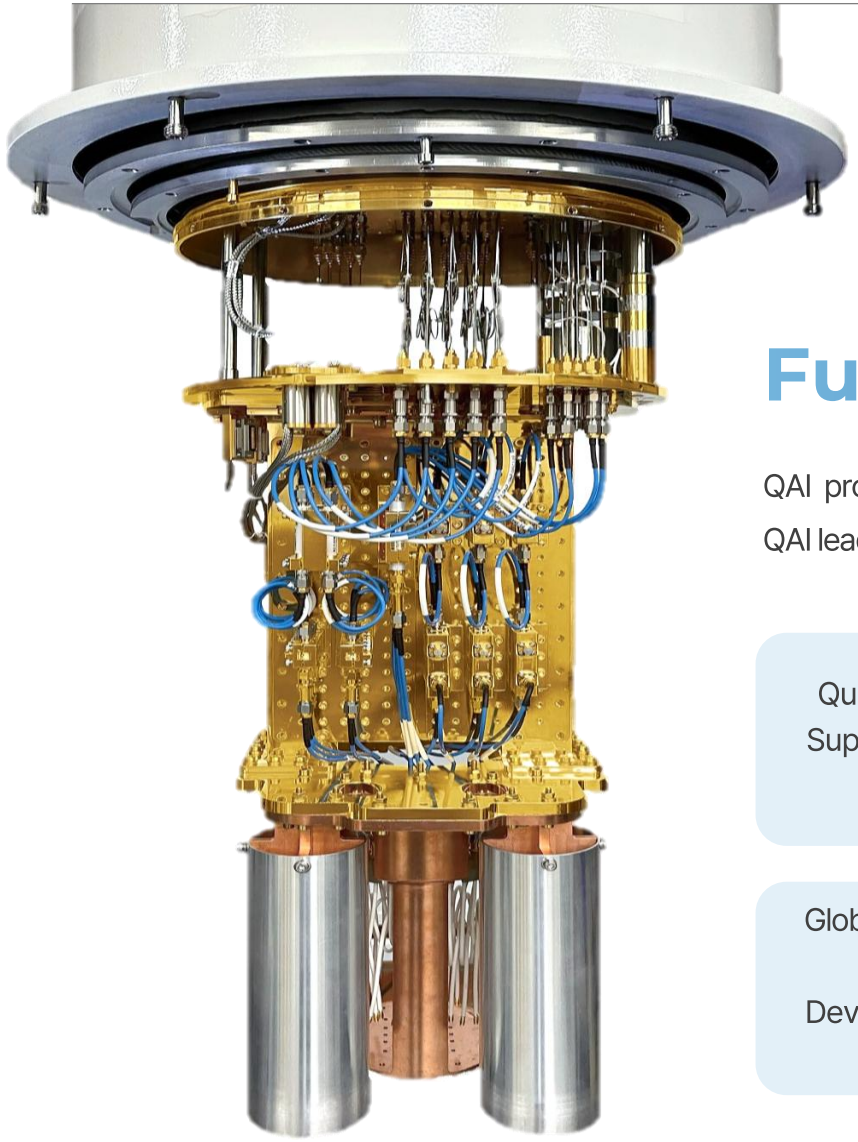
Provides, for the first time in Korea, a cloud-based Hybrid Quantum Computing Platform by deploying and integrating a 20-qubit superconducting quantum computer with NVIDIA DGX B200 servers at the data center level.

QAI pursues continuous innovation by developing interoperable integration models that support not only superconducting quantum computers, but also next-generation architectures such as ion-trap and neutral-atom systems, as well as compatibility with inference-optimized NPU devices in addition to GPUs within the NVIDIA ecosystem.

Quantum AI Computing Center System Architecture



QAI – Hybrid Qauntum AI Solutions



Full Stack Quantum - AI Solution Provider

QAI provides Korea's first full-stack, turnkey Quantum AI services.

QAI leads the development of Korea's quantum industry ecosystem through a diverse range of services.

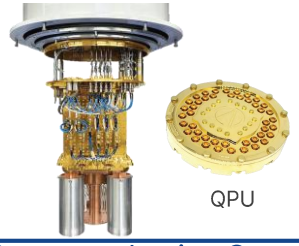
- Quantum Computer Supply & Deployment (QPU)
- GPU Product Supply & Delpoyment (GPU [DGX, HGX])
- Cloud-based Quantum & GPU Resource Provisioning
- Edge Data Center Development & Quantum AIDC Operations
- Global Quantum AI-DX Ecosystem Development & Cloud Operations
- Quantum-As-A-Service (QaaS) professional Service Operations
- GPU-As-A-Service (GPUaaS) professional Service Operations

Core Business Areas

QAI is a Full-Stack Solutions Company providing end-to-end Quantum-AIDC development, deployment, and operations across all sectors.

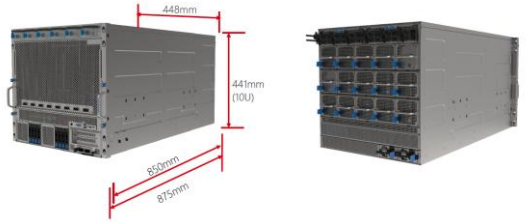
1. Quantum Computer & GPU Supply, Deployment, and Operations (20Q / 49Q Superconducting)
2. QPU+GPU-Based Hybrid Quantum-AI and GPU Data Center Development & Operations
3. QPU+GPU & GPU-Based Cloud Platform (Industry QaaS)
4. Domestic and Global Hybrid Quantum-AI Business Expansion and Advancement

Quantum AIDC Computing Equipment



Superconducting Quantum Computer

Storage & Networking Equipment



NVIDIA HGX B300 SuperPod System

Computational Limits & Pain Points of Customer Industries

GPU Limitations

- Power & Heat Constraints
- Memory & Communication Bottlenecks
- Exploding Scalability Costs
- Mismatch Between Problems & Architecture
- Multi-Node Synchronization & Recovery Issues

Customer Challenges by Industry

Finance
Bond Price Prediction
Portfolio Optimization
Market Scenario Generation

Pharma & Bio
Electronic Structure
Protein Folding
Drug Screening

Energy & Chemicals
Grid Optimization &
Catalyst/Battery
Electronic Structure

Transport & Logistics
Routing, Dispatch &
Hub Optimization

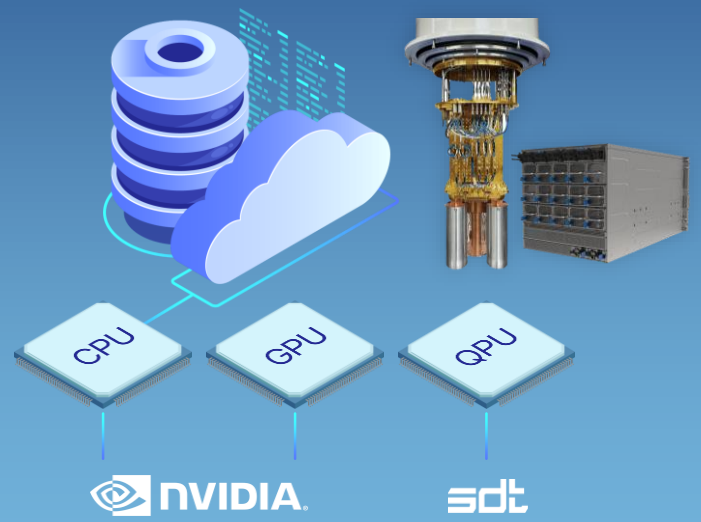
Government & Research
Simulation, Cryptography &
Resource Allocation

PROBLEM

- Limits in Speed, Cost & Time
- Rising AI Training & Inference Costs
- HPC Simulations Stall in the Face of Next-Generation Challenges

SOLUTION

Hybrid Integration of HPC & Quantum Computing



Maximized Optimization Performance & Efficiency

Quantum-AI Hybrid Computing Center: Objectives & Architecture

AI Computation

Quantum Operation Simulation

Real Quantum Operations

Upgrade Points for Existing Data Centers

- GPU Computing Speed
- Customer Revenue Model
- Data Center Competitiveness
- Securing Future Demand

NVIDIA HGX Super POD – AI Factory

- Large-Scale AI Training & Inference Acceleration
- GPU Rental & AI Services
- Improved Performance per Power
- AI Customer Acquisition

Superconducting Quantum Computer

- Specialized Computing for Combinatorial Explosion Problems (Optimization & Simulation)
- Quantum Tier Available
- More Computing with Less Power
- Hybrid PoC → Long-Term Lock-In

Expected Benefits of the Quantum AI Computing Center

Your Quantum AI Computing Center will become

Korea's first user testbed for Quantum AI computing.

01

Capture Next-Generation Demand & Secure New Revenue Streams

Secure a "Post-AI Growth Model" by Capturing Next-Generation Quantum HPC Demand

02

Long-Term Customer Lock-In & Ecosystem Development

Quantum centers secure long-term customers (3–7 year lock-in) from PoC to commercialization.

03

Premium Data Center Brand Enhancement

Data centers equipped with Quantum-AI infrastructure can command premium rack and service pricing.

01

Quantum/GPU Hardware

Full-Stack Superconducting Quantum Computer

KREO SC 20

A fully turnkey on-premise 20-qubit superconducting quantum computer combining high performance with ease of use.

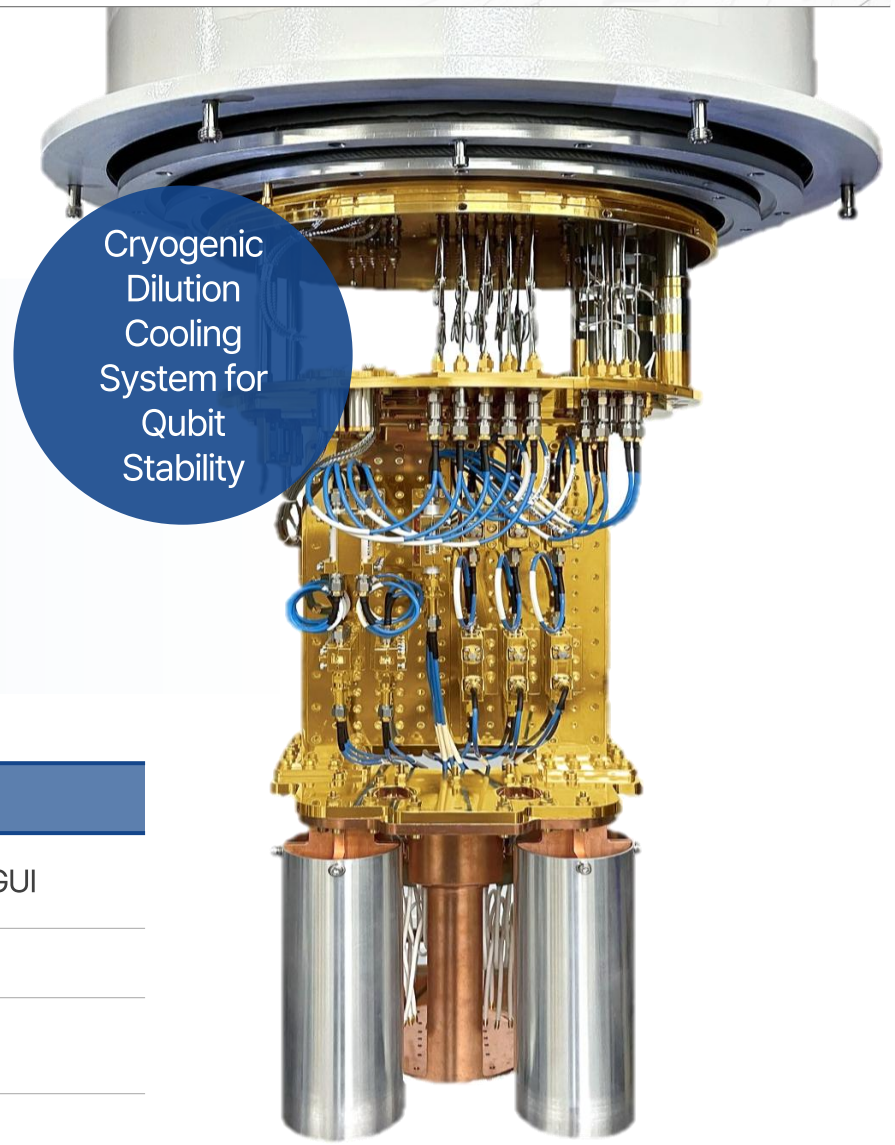
Qubit Count / Type	20 Qubits (Superconducting Transmon, Tunable Coupler)
Logical / Physical Qubits	20 Data Qubits + Coupler Qubits
Gate Fidelity	≥ 99.0%
Gate Time	60 ns
Coherence Time	Average T1: 50 μs (Maximum 100 μs) / T2 echo: 50 μs
Readout Fidelity	≥99% (up to 99.9% with error mitigation) / Single-shot readout time: 200 ns
Quantum Volume	Approx. 1,048,576 (2^20 Reference)
GHZ State Generation	Supports simultaneous GHZ state generation with up to 20 qubits
System Size	125 cm × 315 cm / Height approx. 290 cm / Total weight approx. 1,000 kg
Power Consumption	Average ~25 kW (including cryogenic system and compressors)
Footprint / Height / Weight	Approx. 130 × 526 cm / 2.9 m / 1,000 kg/m²

Cryogenic Dilution Refrigerator System

CRYORACK

Next-Generation Cooling Solution for Superconducting Quantum Computing

- Stable cryogenic operation at the 10 mK level
- Extended qubit coherence time through a cryogenic environment
- Thermal load control with cooling power exceeding 400 μW at 100 mK
- Flexible expansion based on experimental requirements through a modular architecture
- Continuous operation with minimal management through an automated control system



Item	Specifications
Min. Temperature	≤ 7 mK
Cooling Capacity @ 100 mK	≥ 400 μW
Cooldown Time	≤ 20 hours
System Configuration	Main Unit + External Pump Rack

Item	Specifications
Control Software	One-Touch Automated GUI
Wiring Channels	Up to 336+ Channels
Thermal Shielding	Advanced insulation and multilayer shielding
Item	Specifications

CPU · GPU Immersion Cooling Solution

AquaRack

		AquaRack 8U	AquaRack 21U
Tank	Server capacity	8U + 2U (Sensor mounting points)	21U + 2U (Sensor mounting points)
	Supported server depth	800 mm	
	Dimensions	W690 × D852 × H1,434 mm (door included H2200 mm)	W1,380 × D852 × H1,434 mm (door included H2285 mm)
	Empty tank weight	82 kg	137 kg
	Cooling capacity	15 kW	45 kW
	Tank inlet/outlet port specifications	1" 1/4 clamp fitting (OD 50.8 mm)	
Dielectric fluid	Weight (PAO-based)	Approx 290 kg	Approx 451 kg
Cooling water	Capacity	350 L	550 L
	Flow rate	50 LPM higher	100 LPM higher
	Temperature range	20~32°C	
CDU	Dimensions	W760 × D854 × H1,253 mm (with casters H1353 mm)	
	Weight	Approx 80 kg	
	Input power	AC 220~240V, Single-phase 32A × 2 configuration(F type)	
		IEC 60309 Type 2P+E, 6h plugs	
PDU / Power connectors		IEC 60309 Type 2P+E, 32A ×4 or 50A ×2, 6h plugs	
		IEC 60320 Type F / C13 / C19 Customizable connectors	

*Product specifications are subject to change without prior notice.

AquaRack Dashboard

Core Equipment of the Quantum–AI Hybrid Center (1)

QCU Qubit Controller Unit

Input Channels	2
Output Channels	6
Signal Bandwidth	> 1 GHz
Input Frequency Range	10 MHz to 2.46 GHz
Output Frequency Range	10 MHz to 8.5 GHz
Input Power Range	-40 dBm to +5 dBm
Output Power Range	-40 dBm to +5 dBm
Input Impedance	50 Ω
Output Impedance	50 Ω
D/A Conversion Resolution	14-bit, 9.85 GSa/s
A/D Conversion Resolution	14-bit, 2.5 GSa/s
Interfaces	SMA Female on front panel for control and readout LAN/Ethernet, Gigabit USB 3.0, Maintenance USB
Power Supply	AC 100–240 V, 50/60 Hz

Key Features

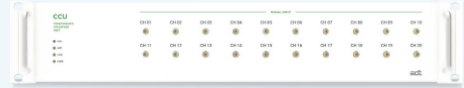
- Enables precise qubit control and measurement with up to 8.5 GHz signal bandwidth
- Supports simultaneous control and readout of up to 6 qubit channels per device
- Applicable to superconducting, neutral-atom, and diamond NV-center qubits
- Modular architecture allows easy channel expansion
- Supports cloud-based remote qubit control
- Provides a comprehensive Python library for seamless workflow integration
- Scalable and automated quantum experiment environments powered by cloud computing
- Developed with SDT's proprietary IP to deliver experiments optimized for each user's environment

Introduction

SDT's QCU is a core solution that enables stable quantum computing through precise qubit control and highly reliable measurement.
With up to 8.5 GHz of wideband signal capability, a single device can simultaneously drive and perform high-speed readout of up to six qubits, effectively supporting complex quantum algorithms and error-correction protocols.

QCU leverages cloud computing to enable remote control and flexible channel expansion, allowing scheduling and automation that significantly reduces manual operation.
Powered by SDT's proprietary patented technology, QCU delivers optimized, application-specific solutions for a wide range of quantum computing workloads.

CCU Coincidence Counting Unit



Channels	20
Max Count Rate	100MHz
Minimum Coincidence Time Window	2 ns
Input Voltage Range	+3.3 V
Interfaces	SMA Female on front panel for input channels LAN/Ethernet, Gigabit USB 2.0 Maintenance USB
Dimensions (W x H x D)	W430 X H84.2 (2U) X D318.2 mm
Power Supply	AC 100-240 V, 50/60 Hz

Key Features

- The only system available with 20 input channels
- Maximum count rate of up to 100 MHz
- Built-in internal delay block with 0.5 ns minimum step
- Minimum coincidence time window of 2 ns
- Software-based input channel multiplexing
- Python library support
- Cloud computing support
- Up to 1 Gbps data transfer via Gigabit Ethernet
- Developed with SDT's proprietary IP to deliver experiments optimized for each user's environment
  ** Patent Registration No. 10-1571133*

Introduction

SDT's CCU is an instrument that analyzes the simultaneous occurrence of two or more input signals to study quantum phenomena such as entanglement, making it essential for photon-based quantum experiments and quantum key distribution (QKD) research. As the only system in the world offering 20 input channels, the CCU supports count rates of up to 100 MHz and a minimum coincidence time window of 2 ns.

By leveraging cloud computing, the CCU integrates with other experimental equipment to enable scheduling and automation across instruments. In addition, the provided Python library allows users to conduct experiments easily, even without advanced programming expertise.

Certifications

KC Certifications (Approvals)
R-R-R-2Dt-SDT-Q-CCU

KC Certifications (Test Reports)
KES-EM240445

TTA Test Reports
TTA-22-1930

Core Equipment of the Quantum–AI Hybrid Center (2)

PGU Pulse Generator Unit

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
- Output synchronization with 10 ps resolution (2 channels)
- Generation of over 1,000 pulses at arbitrary timing
- Python library support
- Cloud computing support
- Up to 1 Gbps data transfer via Gigabit Ethernet
- Developed with SDT's proprietary IP (patent pending) to deliver experiments optimized for each user's environment

** Patent Application No. 10-2024-0061144*

Introduction

SDT's PGU generates multiple pulses required for quantum computing systems, enabling precise timing synchronization and sequence control. It produces various timing signals, including TTL signals, and distributes them synchronously to experimental instruments, serving as a central timing hub.
Built on an FPGA platform, the PGU supports up to 12 independent output channels—among the highest in its class—allowing simultaneous multi-channel output from a single trigger.

The PGU delivers synchronization with 10 ps resolution to improve experimental accuracy. Through cloud integration, it enables scheduling and automation across instruments, significantly reducing manual work, while Python library support allows easy operation without advanced programming expertise.

Certifications

KC Certifications (Approvals)
R-R-R-2Dt-SDT-Q-PG

KC Certifications (Test Reports)
KES-EM240446

TTMU Time Tagging Measurement Unit

Channels	8 (4 pairs)
Max. Event Rate	6.0 Msps (total ch)
Min. Jitter RMS	< 20.0 ps
Resolution	< 1 ps DIGITAL resolution
Dead Time	< 8 ns
Input Voltage Range	+3.3 V
Interfaces	SMA Female on front panel for input channels LAN/Ethernet, Gigabit Maintenance USB
Dimensions (W x H x D)	W430 X H84.2 (2U) X D318.2 mm

Key Features

- Four pairs of TDCs and eight input channels — the highest in its class
- Simultaneous Start–Stop signal measurement with up to four TDC pairs
- Flexible assignment of Start and Stop channels to any input channel
- Python library support
- Cloud computing support
- Up to 1 Gbps data transfer via Gigabit Ethernet
- Developed with SDT's proprietary IP to deliver experiments optimized for each user's environment

** Patent Registration Nos. 10-2767209, 10-2773773*

Introduction

SDT's TTMU precisely measures photon arrival times and time intervals to analyze light source emission and energy distribution. It is essential for NV Center Microscopy, Hong–Ou–Mandel interference, fluorescence analysis, and QKD, delivering high accuracy and scalability.

TTMU integrates with other instruments via cloud computing to enable scheduling and automation, while Python library support allows easy operation without advanced programming expertise.

Certifications

KC Certifications (Approvals)
R-R-2Dt-SDT-Q-TTMU-N

KC Certifications (Test Reports)
KES-EM240447

TTA Test Reports
TTA-23-3162

02

Quantum computing and GPU cloud software

Korea’s first hybrid quantum computing cloud service

QuREKA

All-in-One & Hybrid Quantum Platform

A unified hybrid development environment spanning CPU, GPU, and QPU

Write once, run and validate across multiple hardware platforms—simplifying complex hybrid application development and maximizing productivity.

API Key Unified Management

A single API key provides seamless access to multiple quantum devices—including simulators and QPUs—delivering convenience and operational efficiency for users.

Support for multiple types of quantum simulators

QuREKA provides multiple quantum simulation methods, including State Vector and Tensor Network, allowing users to select the most suitable approach for their development needs.

CUDA-Q: Flexible development environment with exceptional acceleration performance

CUDA-Q enables hardware-agnostic flexibility using familiar Python and C++, while delivering high performance powered by NVIDIA GPUs to optimize hybrid algorithm development.

A fully managed development environment

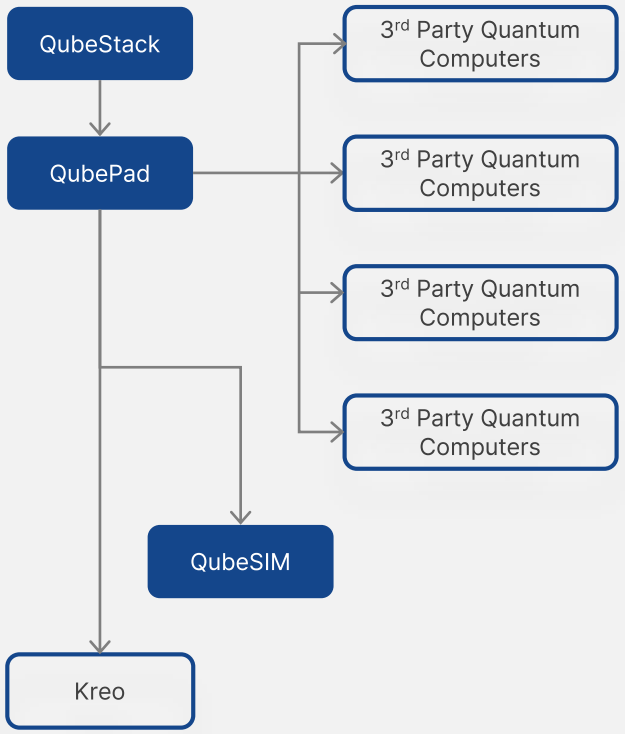
Develop and troubleshoot algorithms in a stable, reliable platform without worrying about complex quantum infrastructure.

An intuitive console and user-friendly development environment

By combining notebook- and GUI-based interfaces, the platform maximizes developer productivity and operational efficiency.

Quantum Software Overview

QuREKA Environment



Qube Stack

Hybrid quantum computing platform solution for QCaaS deployment and operations

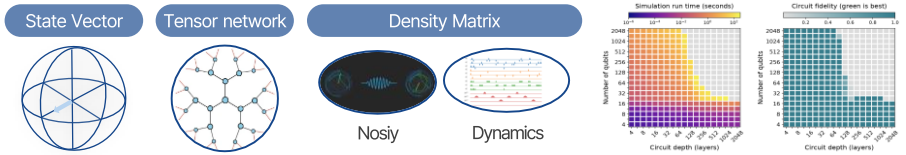
- Rapid platform deployment and operations management
- Integrated quantum circuit simulators
- Optimized execution of hybrid quantum–classical applications

Qube SIM

High-performance, high-efficiency quantum circuit simulator solution

- Support for multiple qubit simulation methods (State Vector, Tensor Network, etc.)
- Multi-CPU/GPU architecture supporting quantum algorithms and circuit structures
- Real-time monitoring for troubleshooting and performance management

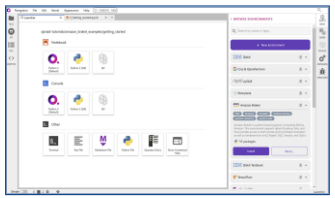
State Vector | Tensor network | Density Matrix



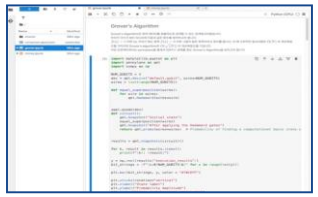
Qube Pad

Integrated Development Environment (IDE) for Hybrid Quantum Programming

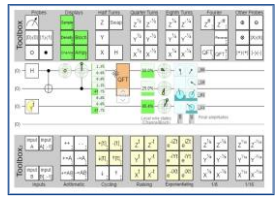
- Web-based development tools for quantum programming
- Visualization of quantum circuits and execution results



QubePad



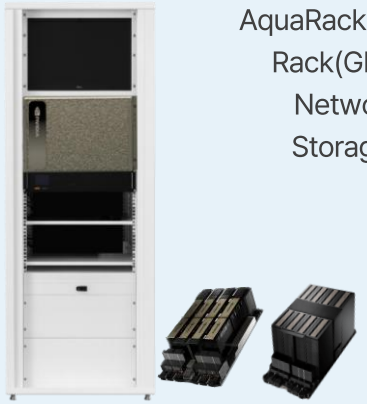
JupyterLab-style notebook environment



Composer-based IDE for visual circuit design

Quantum–AI Hybrid Computing Architecture

Quantum–AI Hybrid Computing Architecture

Services	QuREKA(Cloud Services)		Quantum Computers	KREO (SDT Quantum Computers)
Software	GPUaaS Solutions NeuroPad NeuroStack	QCaaS Solutions QubePad QubeSIM QubeStack	Software	QubeGate (Quantum gateway Solution)
Hardware	 AquaRack(CPU Servers) Rack(GPU Servers) Network switch Storage System 		Hardware	CPU Servers QCU CryoRack QPU 
Infrastructure	Land, Buildings, Power Infrastructure			

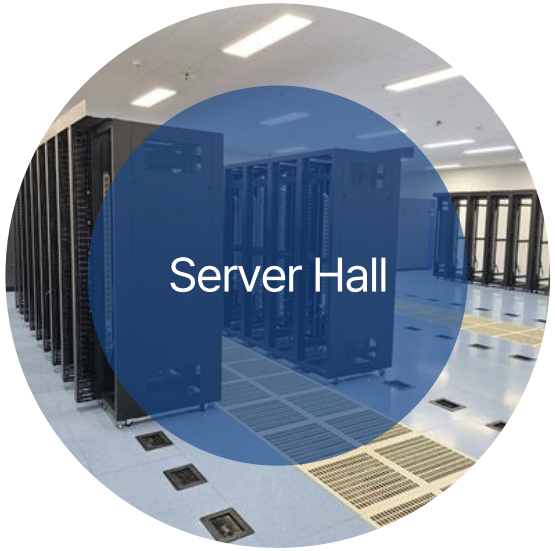
External Channels
High-Performance Simulators
Superconducting Quantum Computers
Ion-Trap Quantum Computers
Neutral-Atom Quantum Computers

03

Current Status of Quantum AI-DC Business

| Gangnam, Magok, Dangjin Hyper Scale

Gangnam AI Cloud Data Center



A Quantum–AI integrated R&D and DGX PoC Edge Data Center located on Dosan-daero, Cheongdam

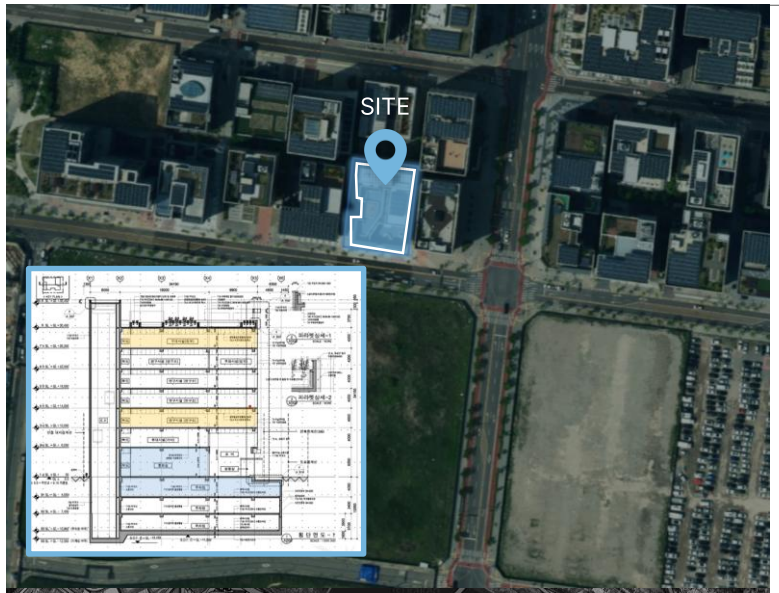
1.5 MW GPU–Quantum high-density hybrid computing infrastructure

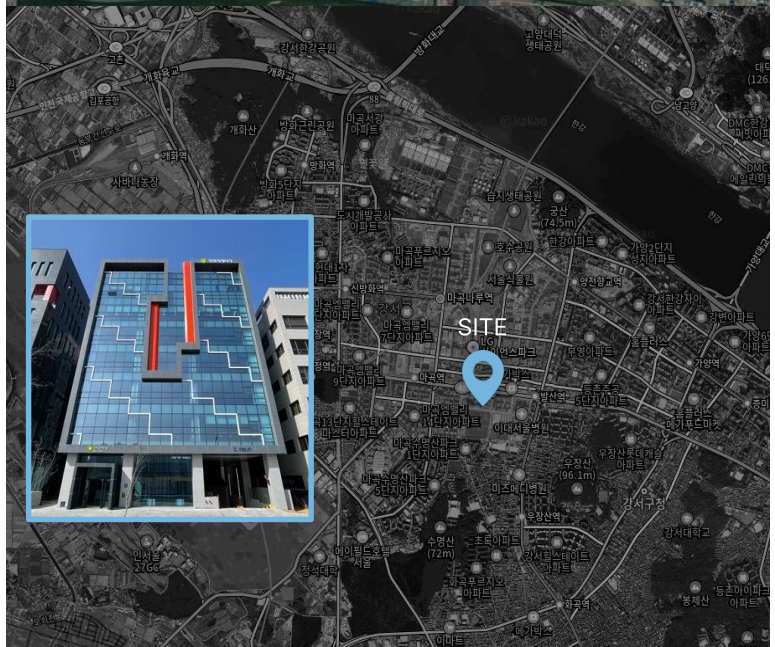
Enterprise-grade infrastructure with immersion cooling, precision HVAC, and redundant power systems

Optimized energy and operational efficiency through integrated building, power, and HVAC design

Full-scope AI and cloud data center development capabilities spanning planning, design, permitting, construction, and operations

Magok AI Cloud Data Center





Data Hall Area
539.25 m²

Design IT Load
1.5MW

Separate Quantum and GPU Zones
Cluster Operations Plan

IT Details

Data Hall Area	539.25m²(3F,Data Hall) + 80.33m²(2F,Quantum Computing Area)	
	• 3F,Data Hall 539.25m²	• 2F,Quantum Computing Area 80.33m²
IT Load per Rack	• Air-Cooled High-Density Racks	• Quantum System with Immersion Cooling
Data Hall – Rack	Up to 180 Racks Total	
	• 3F Server Room 1: Up to 162 Racks	• 3F Server Room 2: Up to 18 Racks
Data Hall – IT Load	1.5 MW (Total IT Load : 1 Quantum System + GPU)	
Data Hall – Floor Height	4m(Clear Height Under Beam 3.2m)	
UPS	UPS 1,200kVA x 2ea (Parallel Operation)	
Battery	Lithium-Ion (LFP) Batteries, 1,200 kVA × 2 Sets (10-Minute Backup)	
Electrical Room	22.9kV/380-220kV TR 3,000kVA x 2ea (1 Active, 1 Standby) Transformers Designed with Integrated IT and UT Loads	
Emergency Generator	Gas Turbine Generator 2,600kW / 3,250kVA x 1ea	
Fuel Tank	5,000L Less than 1 Unit	
Cooling Source	CRAC + Water-Cooled Chillers (2F)	
Data Hall Cooling	• Server Room1 (GPU) FWU 16EA • Indoor Exposed Type	• Server Room2(In-row cooling)
UT Cooling	3F, Data Hall : Air-Cooled Air con	
Circulation Method	Front Discharge, Top Return	
Containment / Isolation	HAC (Hot Aisle Containment)	

Alarm and Event Management

Visualizing power consumption trends to improve energy efficiency and enable optimized resource allocation

Temperature and Cooling Monitoring

Monitoring temperatures through sensors across the data center to evaluate cooling system efficiency

Power and Energy Management

Real-time alerts to responsible personnel when issues are detected in power, temperature, cooling, or network systems

Dangjin Hyper-Scale Integrated AI Cloud Data Center

1 Eco-Friendly Hyper-Scale AI Data Center Powered by Renewable Energy

- Building Dangjin Seokmun into a leading AI infrastructure hub
- Korea's first eco-friendly AI data center powered by 80 MW of KEPCO electricity (with an additional 40 MW under negotiation), fuel cells, and LNG-based cooling

2 State-of-the-Art AI-Optimized Data Center

- Advanced Cooling Architecture Optimized for Next-Generation AI GPU Operations
- Establishing a dedicated facility for domestic GPU development and operations to support the growth of Korea's AI industry

3 Excellent Accessibility

- Located 70 km from the Seoul Metropolitan Data Center Cluster
- Direct access to six-lane and four-lane highways, ensuring optimal connectivity for power, communications, and logistics
- Excellent transportation network supported by the Second Seohae Bridge, the Daesan–Dangjin Expressway, and the upcoming Seokmun rail connection

04

QAI Technology Partners and Strategic Collaborators

QAI Technology Partners and Strategic Collaborators

Data Center Design Division

Structural Load and Safety Review for Quantum Computer and Immersion Cooling Zones

Review of IT Load Power Redundancy Design and UPS Capacity Sizing

Specialized Professionals

- Data Center Facility Architect
- Structural Engineer

heerim Architects & Planners

Quantum Computing HW/ SW Division

Review of Installation Requirements for Qubit Control Equipment and Dilution Refrigerators

Optimization of Quantum Algorithm Execution and Related Solutions

sdt

- Quantum Physics Engineer
- Quantum Solution Architect

Specialized Professionals

Air-Cooled and Liquid-Cooled Infrastructure Division

Specialized Professionals

- Cooling Systems Engineer
- HVAC Engineer

SCS STANDARD COOLING SYSTEMS

Cooling Capacity Calculation and Chiller System Optimization Review

Design of Cooling Water Supply and Return Systems and Leak Prevention Policies

AI Factory Cloud Division

FPT

- AI / MLOps Engineer
- Data Platform Architect

Specialized Professionals

Advisory on the Deployment and Functional Review of the AI Model Development Platform

Advisory on Resource Scheduling Optimization for AI Workloads

QAI Technology Partners and Strategic Collaborators

Cloud Technology Division

Review of Cloud Architecture Design and Configuration Plan

Review of Service Stability Based on Virtualized and Containerized Environments

Specialized Professionals

- Cloud Architecture
- Dev Ops Engineer

INNOGRID

GPU / HPC Systems Division

Advisory on GPU Cluster System Configuration and Cabinet Layout Design

Analysis of Per-Rack Power Density and Performance Forecasting for Workloads

xFUSION

- Solution Architect

Specialized Professionals

Network Communications Division

Specialized Professionals

- Network Architecture Engineer

진인프라

Review of Low-Latency Network Topology Optimization

Review of Network Segmentation Strategy by Zone

Server Systems Configuration Division

SNA

- Server Storage Engineer
- Systems Integration Engineer

Specialized Professionals

Advisory on High-Performance Storage Solutions (Parallel File Systems)

Server System Design, Deployment, and Maintenance

Thank You

QAI
QUANTUM AI