



QCT OMNIPOD PRIVATE 5G

Solution Brochure

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QCT OmniPOD Private 5G

QCT OmniPOD Private 5G Network Solution delivers end-to-end private 5G connectivity that unifies in-house designed components, including OmniCore for 5G Core, OmniRAN for 5G RAN, and OmniView for network operations and management. With seamlessly integrated software, hardware, and services, OmniPOD empowers cross-vertical wireless communication applications with proven network reliability, efficiency, and manageability.

3GPP Release 16

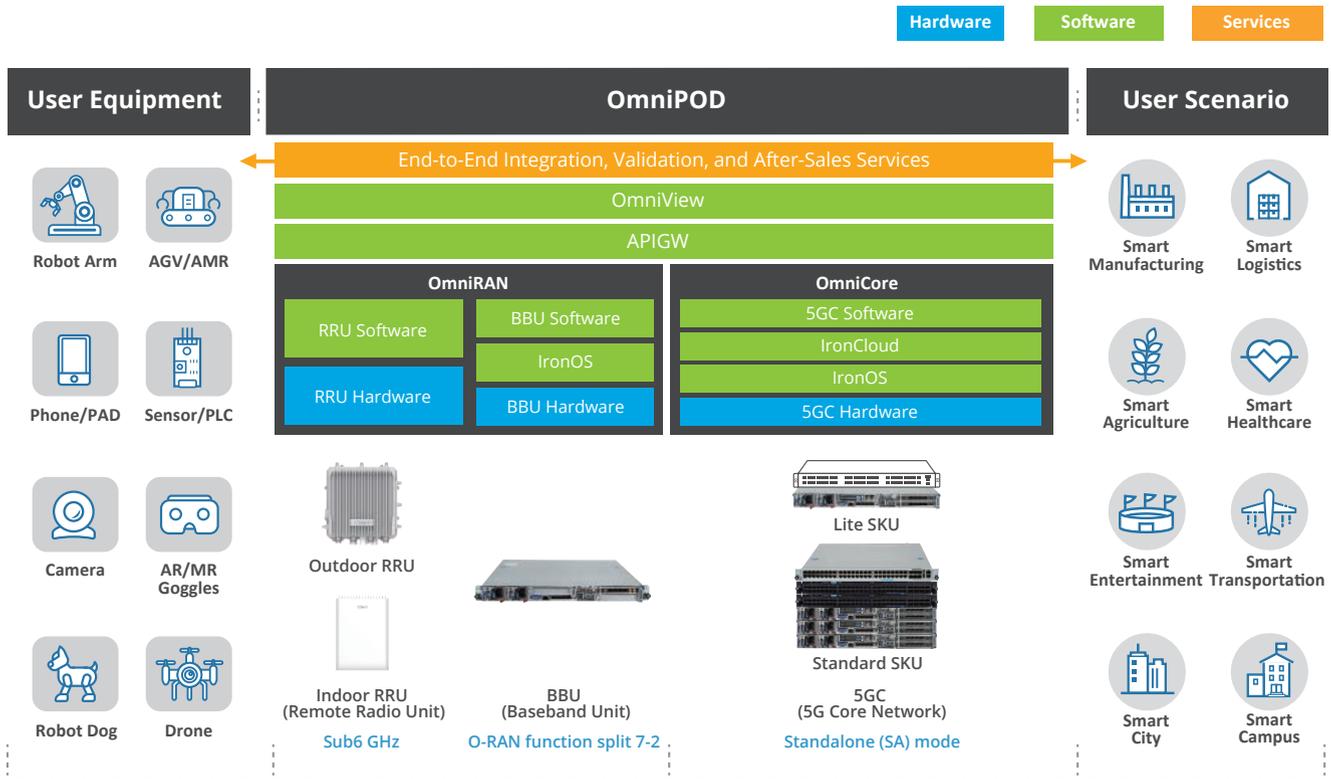
The product design and performance measurement conform to the 3GPP Release 16 standard.

5G Standalone

5G standalone (SA) architecture serves as the foundation of the future-ready 5G feature set.

Scalable SKUs

Two SKUs in Lite and Standard are available for different network sizes and TCO requirements.



Key Features



Network Slicing

Networks are configured to serve diverse service types with isolated and dedicated resources.



Cloud-Native Design

The containerized cloud-native 5G Core underpins high network resilience and operational reliability.



QoS Control

A 5QI-driven QoS framework enables precise resource prioritization and allocation to deliver effective traffic control.



5G-EIR

Exclusive PEI-SUPI binding policies ensure the highest level of device authentication and secure UE access.



URLLC

High Reliability (> 99.999%) and consistent Low Latency (RTT < 9 ms) in two operational modes have been validated and proven to support mission-critical applications.



Multi-Cells

A gNB supports up to 4 x cells, enabling scalable capacity and seamless mobility across indoor and outdoor radio deployments.



Frame Structure Configuration

Configurable TDD slot formats for DL/UL data rates are supported to accommodate varying service demands.



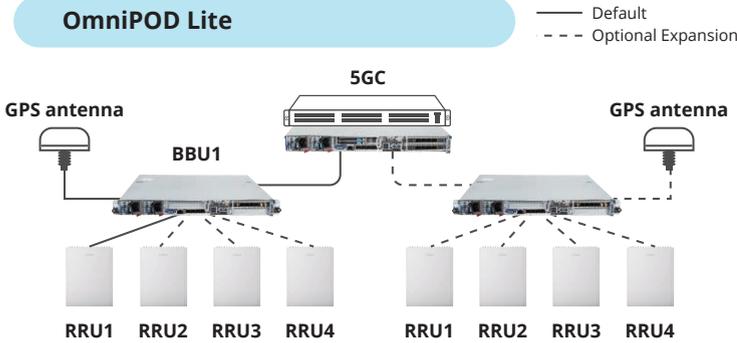
Network Management

A unified interface offers one-stop visibility with 10 essential FCAPS management functions across 5GC and RAN.

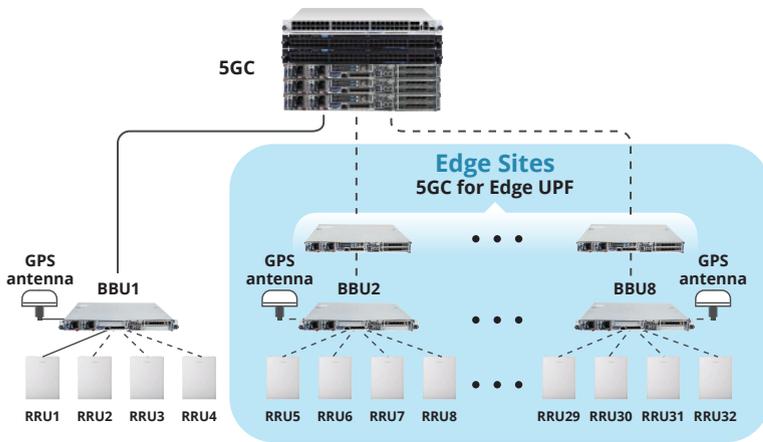
System Architecture and Tiering

QCT OmniPOD is available in two SKUs, Lite and Standard, providing flexibility to accommodate different network size requirements. The Standard SKU offers a full feature set tailored for large-scale deployments, with enhanced user capacity, scalability, and a clustered system design for redundancy, while Lite SKU provides a more compact and cost-effective option for customers seeking essential features with a competitive total cost of ownership.

OmniPOD Lite



OmniPOD Standard



	Lite	Standard
Basic Equipment Package	(1) 5GC server (1) BBU server <i>A management switch is required and customer-provided for deployment.</i>	(3) 5GC server (2) Data switch (1) Management switch (1) BBU server
RAN Scalability	(2) connected BBU (4) cells per BBU (128) active UE per cell	(8) connected BBU (4) cells per BBU (128) active UE per cell
Total Throughput	10 Gbps per 5GC	40 Gbps per 5GC
User Capacity	1,000 registered UE per 5GC	4,000 registered UE per 5GC
Edge UPF	-	Supported
Network Slicing	Supported	Supported
Service Resilience	Supported	Supported
Node Resilience	-	Supported
Port Resilience	-	Supported
Ceph-Based Storage	Supported	Supported
URLLC	Supported	Supported
Network Management GUI	Supported	Supported

System Availability

Built on a cloud-native foundation, OmniPOD delivers multi-layer system resilience to maximize system availability, with capabilities tiered by SKU. The Standard SKU ensures reliable service continuity across service, node, and port layers by combining hardware-level redundancy with cloud-native self-healing mechanisms, while the Lite SKU retains service-layer self-healing, effectively minimizing service downtime without manual intervention.

Service Resilience

Through a containerized microservice design, the system automatically performs one of the following actions to recover the failed 5GC Network Function (NF) service.

1 Self-healing

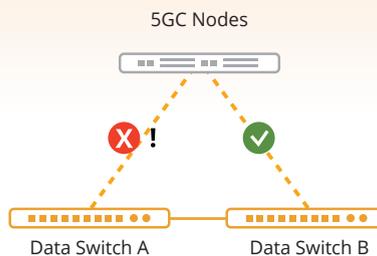


2 Replica-based failover



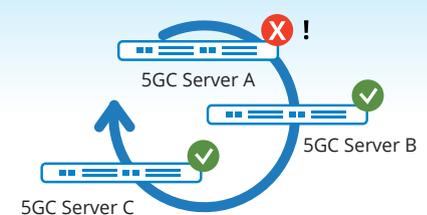
Port Resilience

With dual active paths sharing loads, the system automatically redirects critical 5GC services to a redundant port in the event of a port outage, ensuring continuous service availability.

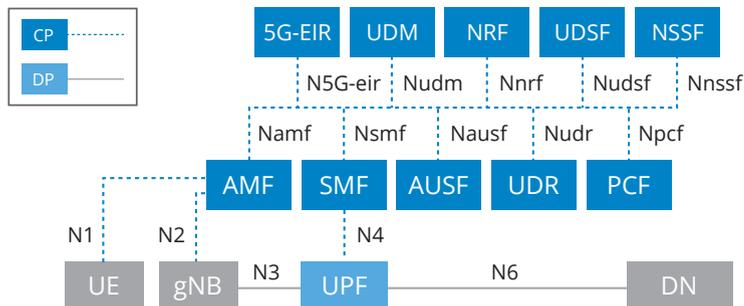


Node Resilience

Deployed in an active-active clustered architecture, failed 5GC workloads are automatically failover to other healthy nodes within the cluster, ensuring uninterrupted service operation.



QCT OmniCore is a cloud-native 5G Core (5GC) network built on IronCloud, QCT's in-house developed cloud-native platform. Featuring a containerized, service-based architecture and Control and User Plane Separation (CUPS), OmniCore enables efficient traffic handling and scalable network deployment. With an Edge UPF architecture, it supports distributed multi-site deployments while maintaining low latency and high performance at edge locations. Key 5GC functions, including subscriber authorization, SIM provisioning, QoS configuration, and security authentication, are simplified through an intuitive, visualized GUI, enabling streamlined and efficient network operations.



- ✓ 5G Standalone (SA) Mode
- ✓ Cloud-Native Platform
- ✓ Service-Based Architecture (SBA)
- ✓ Control & User Plane Separation (CUPS)
- ✓ Edge UPF

QCT OmniCore Product Specifications



5G Server



Powered by Intel® Xeon® Scalable Processors

5G Core Server	
Model Name	QuantaEdge P5GC
Processor	4th Gen Intel® Xeon® Scalable Processor
Network Functions	CP: AMF, SMF, AUSF, UDM, PCF, NRF, NSSF, UDSF, UDR, 5G-EIR UP: UPF
Reference Interface	N1, N2, N3, N4, N6, Namf, Nsmf, Nausf, Nudm, Npcf, Nnrf, Nnssf, Nudsf, Nudr, N5G-eir
Power Supply	2 x 1000 W redundant (1+1) AC PSU
Power Consumption	< 680 W
Dimension	(W) 447.8 x (H) 42.8 x (D) 400 mm
Weight	10 kg
Environment	Operating temperature: -5°C to 55°C Operating humidity: 10% to 95% RH



Data Switch

Data Switch	
Model Name	QuantaMesh T4048-IX8D (QNOS)
Port Configuration	(48) 10/25GbE SFP28 and (8) 40/100GbE QSFP28 ports
Management Port	(1) Out-of-band management port (RJ-45, 10/100/1000Base-T)
Console Port	(1) RJ-45
Layer 2 VLAN	IEEE 802.1Q Tagged Base; Port-Based; QinQ (802.1ad)
Layer 3 Static Routing	IPv4; IPv6
Power Supply	2 x 800 W redundant (1+1) AC PSU
Power Consumption	Idle mode: 226 W Typical mode: 242 W
Dimension	(W) 508 x (H) 44 x (D) 435 mm
Weight	9.35 kg
Environment	Operating temperature: 0°C to 45°C Operating humidity: < 90% RH



Management Switch

Management Switch	
Model Name	QuantaMesh T1048-LYB (SONiC)
Port Configuration	(48) 10/100/1000 BASE-T and (6) 1/10GbE SFP+ ports
Management Port	(1) Out-of-band management port (RJ-45, 10/100/1000Base-T)
Console Port	(1) RJ-45
Layer 2 VLAN	IEEE 802.1Q Tagged Base; Port-Based
Layer 3 Static Routing	IPv4; IPv6
Power Supply	2 x 120 W redundant (1+1) AC PSU
Power Consumption	107 W
Dimension	(W) 439 x (H) 43.4 x (D) 393.7 mm
Weight	6.4 kg
Environment	Operating temperature: 0°C to 45°C Operating humidity: 5% to 95% RH

QCT OmniRAN is an O-RAN compliant radio access network (RAN) built with standardized CU/DU and RU protocol stacks. It delivers validated over-the-air (OTA) performance and broad interoperability across a wide range of user devices, ensuring reliable and consistent radio performance in real-world deployments. A single base station supports up to 4 cells, enabling flexible and scalable deployments with independent cell activation and deactivation. In addition, indoor and outdoor radios can be seamlessly mixed under the same base station, allowing operators to adapt radio coverage to diverse environments with maximum deployment flexibility.

QCT OmniRAN Product Specifications



BBU Server



Powered by Intel® Xeon® Scalable Processors

BBU Server	
Model Name	QuantaEdge P5GBBU
Processor	4th Gen Intel® Xeon® Scalable Processor
User Capacity	4 cells per BBU 128 active UE per cell
Bandwidth	n78: 50/100 MHz per cell n79: 50/100 MHz per cell n48: 10/20/40/100 MHz per cell
MIMO	Downlink: 4 layers SU-MIMO Uplink: 2 layers SU-MIMO
Modulation	Downlink: QPSK, 16QAM, 64QAM, 256QAM Uplink: QPSK, 16QAM, 64QAM
Synchronization	O-RAN LLS C1; IEEE 1588
Frame Structure	General: DL-Heavy: DDDSU DDSUU UL-Heavy: DSUUU DL/UL-Balanced: DDSUU Configuration for Japan's TDD bands: TDD Sync: DDDSUU DDDD TDD Semi Sync: DDDSUU DSUU TDD Semi Sync-2: DDSUUU DSUU TDD Semi Sync-3: DSUUUU DSUU Configuration for URLLC: URLLC Pattern: SU
Power Supply	2 x 1000 W redundant (1+1) AC PSU
Power Consumption	< 260 W (4 cells in operation)
Dimension	(W) 447.8 x (H) 42.8 x (D) 400 mm
Weight	10 kg
Environment	Operating temperature: -5°C to 55°C Operating humidity: 5% to 85% RH



Indoor RRU

Indoor RRU	
Model Name	IronRAN RUI4-21
Band	n78 (3300–3800 MHz) n79 (4600–4900 MHz) n48 (3550–3700 MHz)
Bandwidth	Up to 100 MHz
Carrier Aggregation	Up to 2CC
MIMO	4T4R
Maximum Output Power	4 x 250 mW
Synchronization	IEEE 1588v2; SyncE
Functional Split	O-RAN option 7-2a
Power Supply	100–240 V (AC adapter); DC +12 V; PoE++
Power Consumption	< 40 W
Dimension	(W) 220 x (H) 285 x (D) 65 mm
Weight	< 3 kg
Installation	Wall-mount and ceiling-mount
Environment	Operating temperature: -5°C to 45°C Operating humidity: 5% to 95% RH
Ingress Protection	IP30
Fan	Fanless design



Outdoor RRU

Outdoor RRU	
Model Name	IronRAN RUMO4-11
Band	n78 (3300–3800 MHz) n79 (4600–4900 MHz) n48 (3550–3700 MHz)
Bandwidth	Up to 100 MHz
Carrier Aggregation	Up to 4CC
MIMO	4T4R
Maximum Output Power	4 x 5 W
Synchronization	IEEE 1588v2; SyncE
Functional Split	O-RAN option 7-2a
Power Supply	100–240 V (AC adapter); DC -48 V
Power Consumption	100 W
Dimension	(W) 220 x (H) 223 x (D) 88 mm
Weight	5.2 kg
Installation	Wall-mount and pole-mount
Environment	Operating temperature: -40°C to 55°C Operating humidity: 5% to 95% RH
Ingress Protection	IP67
Fan	Fanless design

QCT OmniView is QCT's in-house developed Network Management System (NMS) built for OmniPOD, providing unified, one-stop management for both the 5G Core and RAN. Built around a comprehensive FCAPS framework with 10 key management functions, OmniView delivers intuitive, visualized, and graphically driven interfaces that simplify network monitoring and operations. Beyond standard management capabilities, OmniView offers differentiated features such as network slicing management, QoS configuration, per-UE management, and 5G-EIR security control, enabling efficient and secure operations for OmniPOD private 5G networks.



Feature Highlights



Dashboard

Centralized dashboard provides a real-time view of network usage, performance, and fault status at a glance.



Per-UE Monitoring

Fine-grained network management provides micro-level visibility by monitoring each individual UE.



North-Bound Interface

Open NBI enables seamless integration with broader management and operational ecosystems.

QCT OmniView Management Functions



Topology

Visualize 5G network function connectivity, 5GC and RAN nodes, associated alarms, and cloud platform port status.



Fault

Monitor and manage system alarms, including active alarms and historical alarms incurred by the 5G software and hardware.



Core

Provide centralized management of 5GC performance, configuration, network slicing, license, and connected gNB visibility.



RAN

Monitor RAN's key performance trends, including DL/UL throughput per cell, numbers of active UE per cell, and BBU power consumption.



Cloud

Monitor the cloud-native platform's health status and resource utilization, including the compute, memory, storage, and network traffic.



Subscriber

Manage SUPI-based user identity profiles, access control, subscription provisioning, and per-subscriber monitoring.



Account

Manage system access by configuring user accounts, user groups, and passwords, and control login and logout activities.



System

View NTP server information and configure system settings, including backup scheduling, ACLs, SMTP server setting, and SSL certificate management.



Reporting

Generate system reports for system alarms, performance, and logs through manual execution or scheduled tasks.



Log

Record user operation activities, login and logout attempts, and system logs across all system components, with support for log download.

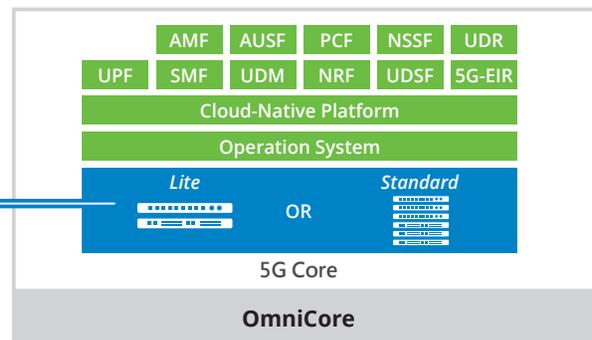
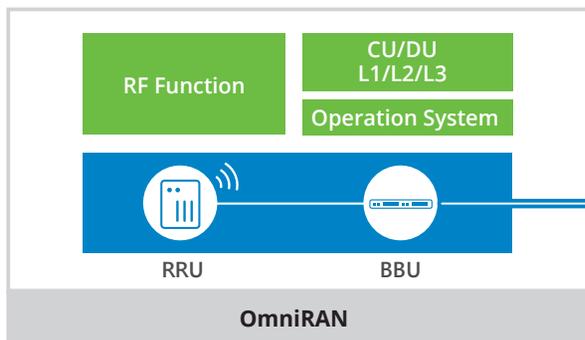


10 essential FCAPS management functions across 5G Core and RAN



Software

Hardware



Use Cases

With purpose-built designs, QCT OmniPOD is positioned as an enabler for next-generation 5G use cases by addressing user scenarios where legacy networks fall short, including large-scale deployments with seamless mobility, mission-critical applications requiring highly reliable network operations, zero-latency user experiences enabled by instant responsiveness, real-time edge AI-driven operations, diverse applications with differentiated network SLA requirements, and flexible coverage beyond the reach of wired networks. Powered by cutting-edge 5G capabilities, OmniPOD unlocks a new era of intelligent, real-time connectivity.

Case Study

Unmanned Seaport



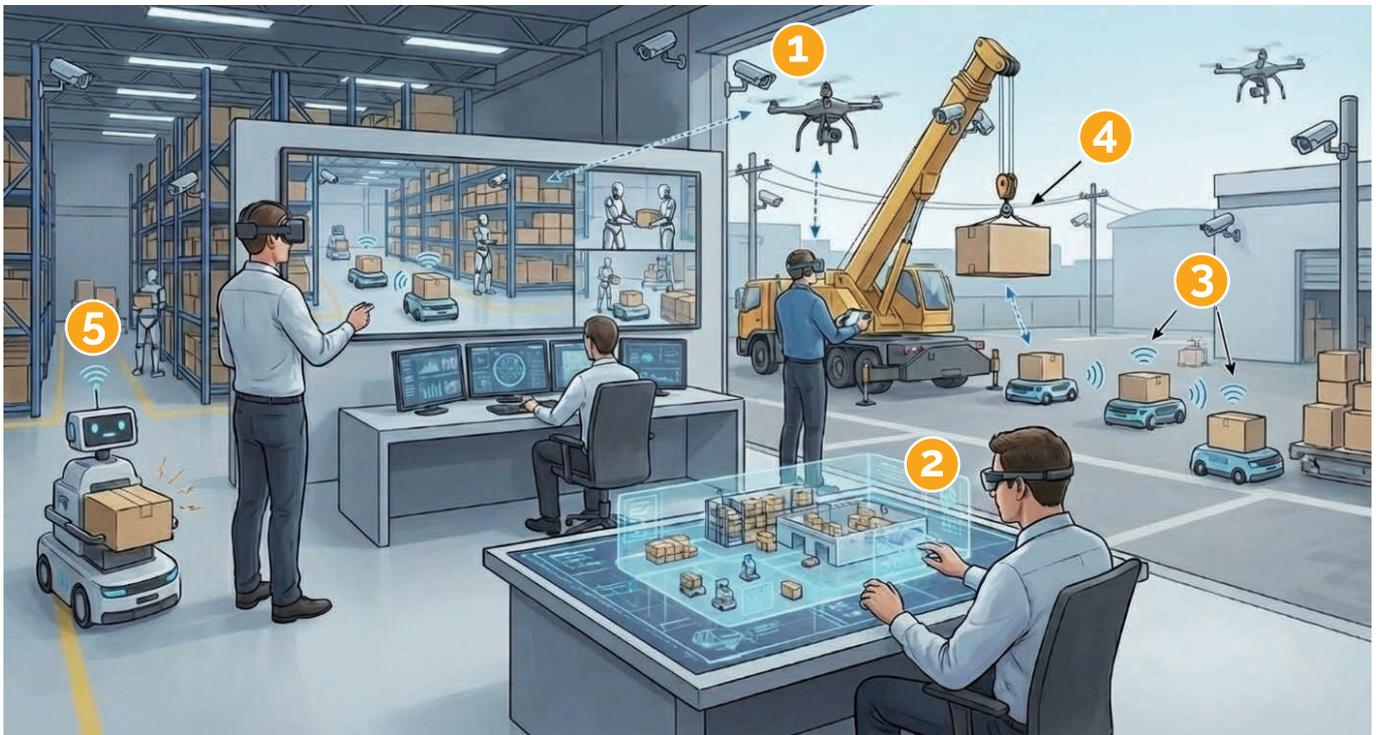
Virtual Factory



Intelligent Warehouse



Immersive Streaming



1 High-Quality Video Streaming

OmniPOD's high-bandwidth, reliable uplink connectivity with seamless mobility enables drones to stream real-time HD video to the central command center, supporting remote inspection and safety monitoring across large sites.

2 AR Digital Twin

With low latency and minimal jitter, OmniPOD enables smooth AR digital twin visuals, providing users with a consistently high-quality, immersive experience into remote operations.

3 Multi-Agent Coordination

OmniPOD delivers low-latency and reliable communication between multiple robots, enabling coordinated actions, task sharing, and safe collaboration in dynamic logistics environments.

4 Teleoperation

Using OmniPOD Network Slicing, eMBB and URLLC traffic are delivered over dedicated slices, ensuring high-quality video streaming and reliable remote control to guarantee safe, precise remote crane operations.

5 Vision AI at the Edge

By integrating OmniPOD with edge-deployed Vision AI models, the solution enables massive-channel visual intelligence and autonomous logistics operations with real-time decision-making and adaptive routing.

About QCT

Quanta Cloud Technology (QCT) is a global data center solution provider. We combine the efficiency of hyperscale hardware with infrastructure software from a diversity of industry leaders to solve next-generation data center design and operation challenges. QCT serves cloud service providers, telecoms and enterprises running public, hybrid and private clouds.

Product lines include hyper-converged and software-defined data center solutions as well as servers, storage, switches, integrated racks with a diverse ecosystem of hardware component and software partners. QCT designs, manufactures, integrates and services cutting edge offerings via its own global network. The parent company of QCT is Quanta Computer, Inc., a Fortune Global 500 corporation.

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QCT OmniPOD
Private 5G



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