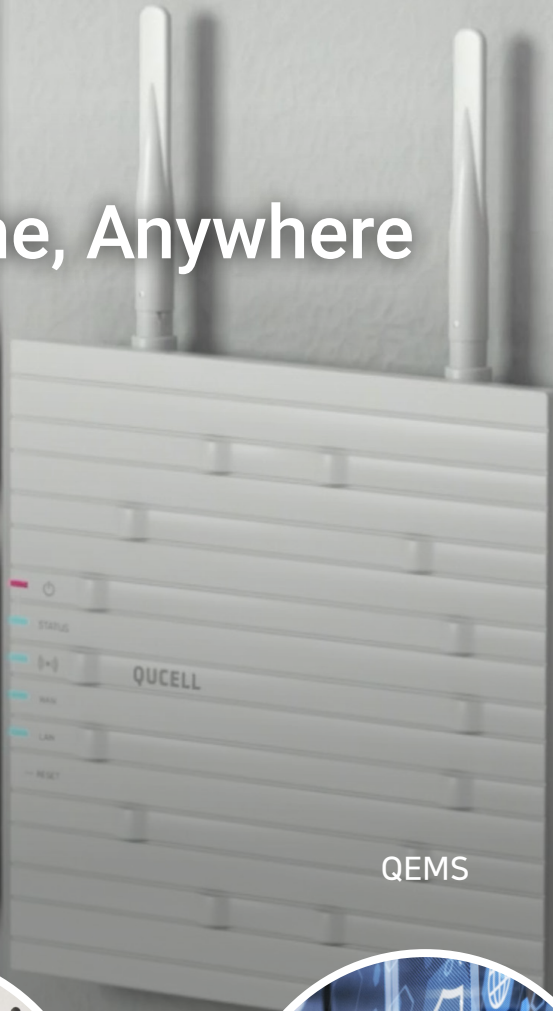


SMALL CELL SOLUTION (QUCELL®)

Experience Effortless Installation and Improved Communication Quality Anytime, Anywhere

Our Small Cell Solution minimizes shadowed areas and ensures robust data processing capacity in high-density or data-demanding indoor areas. It also complies with the customer's diverse usage, requirements, and service deployment plan.



Extend LTE and 5G NR coverage simultaneously

- 1 5G NR Sub-6
4G LTE
- 2 CU+DU+RU
DU+RU
- 3 NSA/SA

Small Cell Solution for Citizen's Broadband Radio Service (CBRS)

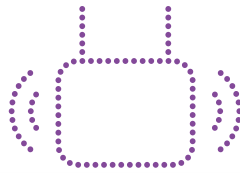
- 1 5G NR Sub-6
- 2 CU+DU+RU
DU+RU
- 3 NSA/SA

Small Cell Solution capable of establishing LTE networks in various environments with easy installation and operation

- 1 Residential/SOHO
- 2 Enterprise
- 3 Outdoor

Management Solution for Small Cell monitoring, control and operation

- 1 Quick and Easy Installation and Operation
- 2 Comprehensive monitoring through KPI tracking
- 3 Scalability



5G + LTE Combo / 5G Small Cell

CBRS Small Cell (under development)

QUCELL® 5G LTE INT

QUCELL® 5G CBRS

QUCELL® 5G LTE EXT

4G Small Cell

QEMS

QUCELL® 4G Home

QEMS

QUCELL® 4G Enterprise

QUCELL® 4G Outdoor

5G + LTE Combo Small Cell Solutions

Single box supports both LTE and NR

- The single-device installation enables both LTE and 5G NR service at the same time.

Flexible service deployment options help the service rollout plan

- Various operation modes are supported according to the service plan (LTE only, 5G NSA, 5G SA)

Offers flexibility and freedom for deployment

- 5G NR NSA to 5G NR SA mode migration via a software upgrade, no hardware change needed.

Features

- * 5G + LTE (optional)
- * All-In-One (CU+DU+RU)
- * Split Option.2 (DU+RU)
- * Plug & Play

Functions

- * 5G NR Sub-6
- * NSA, SA
- * 2x2 MIMO
- * IEEE1588v2 (PTP)

Item	QUCELL® 5G + LTE Combo INT	QUCELL® 5G + LTE Combo EXT
Product		
Technologies	5G NR Sub-6 4G LTE	5G NR Sub-6 4G LTE
Max. TX Power	5G: 24dBm / path (Max.) 4G: 20dBm / path (Max.)	5G: 21dBm / path (Max.) 4G: 18dBm / path (Max.)
Bandwidth	5G: up to 100MHz 4G: up to 20MHz	5G: up to 100MHz 4G: up to 20MHz
RF Antenna	Internal antennas	External antennas
Cell Capacity/Layers	2T x 2R	2T x 2R
Max. Modulation	5G: DL(256QAM), UL(64QAM) 4G: DL(64QAM), UL(64QAM)	5G: DL(256QAM), UL(64QAM) 4G: DL(64QAM), UL(64QAM)
Synchronization	5G: IEEE1588v2 (PTP), SyncE 4G: NTP, PTP	5G: IEEE1588v2 (PTP), GPS 4G: NL, NTP, GPS
Interface	<ul style="list-style-type: none"> ▪ Backhaul (Internet) : 1G/2.5Gbps Ethernet x 1 ▪ Management : 1Gbps Ethernet x 1 ▪ Reset Pin Hole 	<ul style="list-style-type: none"> ▪ Backhaul (Internet) : 1G/2.5Gbps Ethernet x 1 ▪ Management : 1Gbps Ethernet x 1 ▪ GPS Antenna Port : SMA Female x 1 ▪ Reset Pin Hole
Power Input	PoE++	External 24V DC
Power Consumption	< 65W	< 65W
Size / Weight	260 x 260 x 55 (mm, w/o mount bracket) / <2.7Kg	254 x 254 x 54 (mm, w/o mount bracket) / <2.8Kg
Environmental	<ul style="list-style-type: none"> ▪ Operating : -5 ~ 40°C, 10 ~ 95%RH ▪ Storage : -20 ~ 70°C, 10 ~ 95%RH 	<ul style="list-style-type: none"> ▪ Operating : -5 ~ 40°C, 10 ~ 95%RH ▪ Storage : -20 ~ 70°C, 10 ~ 95%RH
IP Grade	IP30	IP30
Mount Type	Wall, Ceiling	Wall

4G Small Cell Solutions

QUCELL 4G Small Cells deliver a comprehensive solution for various customers. For home users, it provides clear voice call and better security than Wi-Fi. Automated, self-configuring Small Cell installation provides full bar LTE signal inside of homes and LTE shadow areas.

It also ideal for enterprises to use high-speed, full bar LTE signal and reliable wireless service and the total cost of operation for enterprises can be reduced. QUCELL 4G Small Cells enhance service improvement and offer considerable savings in urban areas and rural areas that require extend service coverage and offloading traffic.




Features

- * Verified performance by global commercialization
- * Build a stable and secure LTE network
- * Plug & Play
- * Build LTE network in various environment (Home, Enterprise, Outdoor, etc.)

Functions

- * LTE TDD/FDD support
- * TR-069 Interface
- * 2 x 2 MIMO
- * VoLTE support



Item	QUCELL® 4G Home	QUCELL® 4G Enterprise	QUCELL® 4G Outdoor
Product			
Max. TX Power	~ 100 mW	~200 mW	20W / 40W
Bandwidth	Max. 20MHz	Max. 20MHz	Max. 20MHz
MIMO	2 x 2 MIMO	2 x 2 MIMO	2 x 2 MIMO
Max. Active Users	8/16	16/32	32/64 (Roadmap)
Interface	RJ-45 1 port (WAN-backhaul)	RJ-45 1 port (WAN-backhaul)	Optic / RJ-45 (WAN-backhaul)
Power Input	DC12V (External AC-DC Adaptor)	DC12V (External AC-DC Adaptor)	AC100~220V

CBRS 5G Small Cell Solutions

CBRS(Citizens Broadband Radio System) uses 5G NR to provide data service in shared spectrum of 3.5GHz (3550MHz to 3700MHz). The process of assigning spectrum is automated, with SAS(Spectrum Allocation Servers) coordinating the scheme. QUCELL CBRS Total Solutions are ideal for Internet Service Providers, Neutral Host Providers and Industrial IoT.

It offers secure Private 5G network and enhance the connectivity in a various venues including manufacturers, offices and so on. CBRS FWA will be cost-effective, easy and fast solution than traditional wireless solution.

Features

- * 5G service by using CBRS(Citizen Broadband Radio System) band
- * All-in-One type (CU+DU+RU or DU+RU)
- * Installation cost reduction by PoE++
- * Easy installation with built-in Antenna
- * Plug & Play (with QEMS)

Functions

- * 5G support
- * CBRS Category A
- * 2 x 2 MIMO
- * PoE++ Support
- * SAS interworking
- * Domain IP Protocol support

Item	QUCELL® CBRS
Product	
Frequency Band	n48 TDD (3550 MHz ~ 3700 MHz)
Bandwidth	Up to 40 MHz1 (100 MHz TBD)
CBSD Category	Category A
Maximum Tx Power	* Internal: 24 dBm / path (EIRP ≤ 33 dBm) * External: 21 dBm / path (TBD)
MIMO	2T x 2R
# of UEs	32 UEs
Modulation	DL 256 QAM, UL 64 QAM
RF Antenna	2 Antennas (internal or external)
Synchronization	GPS, PTP (IEEE1588v2)
Interface	* Backhaul: 1 G / 2.5 Gbps Ethernet x 1 (w/ PoE++) * Backhaul (Optic): SFP+ 10 Gbps Cage x 1 * Management: 1 Gbps Ethernet x 1 * GNSS: SMA Female x 1
Power Input	PoE++ (IEEE802.3bt) or AC-DC Adapter 24 VDC / 2.5 A
Size / Weight	< 51 W
IP Grade	260 x 260 x 55 (mm) / 2.5 kg
IP Grade	IP30
Mount Type	Wall, Ceiling

QEMS (Qucell EMS)

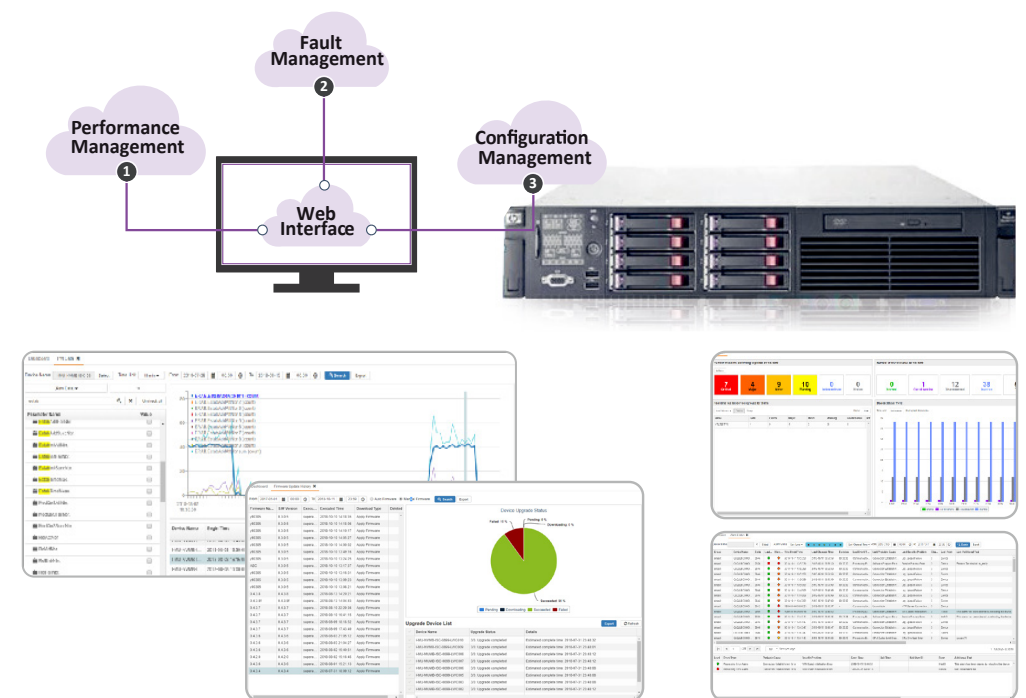
QEMS is a user-friendly software solution that simplifies the monitoring and management of QUCELL Small Cells. With its intuitive web interface, operators can efficiently handle Small Cell operations in real time. QEMS offers Performance Management (PM), Fault Management (FM), and Configuration Management (CM), enabling easy installation and delivering cost savings in terms of CAPEX and OPEX.

Features

- * Intuitive interface for monitoring, managing small cells
- * Large scale real-time data logging for big data analytics
- * Easy configuration parameter management
- * Comprehensive auditing through KPI tracking
- * Scalability to meet customer requirements
- * Charts and graphs support

Functions

- * User interface based on the latest web technology
 - * CM/FM/PM function
 - * Firmware and security management
- [5G]**
Data model
: O-RAN WG 01 standard
: NETCONF/YANG standard
- [LTE data model]**
Data model
: TR-069 standard
: TR-181/TR196 standard



Item	Functions
Configuration Management (CM)	<ul style="list-style-type: none"> - Configuration profile import/export - Auto configuration and provisioning - SW/FW file management and diagnosis - Read and write parameters related to the 5G/LTE stack [5G] gNodeB configuration through the O-RAN WG1 O1 interface [LTE] eNB configuration through the TR-069 RPC
Fault Management (FM)	<ul style="list-style-type: none"> Store all alarms in the database Alarm event filtering/view [5G] Real-time alarm monitoring through the O-RAN WG1 O1 interface [LTE] Real-time alarm monitoring through the TR-069 RPC
Performance Management (PM)	<ul style="list-style-type: none"> Instant view of key statistics through the GUI Line, bar, and pie chart support Export operator-selected statistics in Excel format
Security Management (SM)	<ul style="list-style-type: none"> Protection of sensitive information through encryption Comply with operator's security policy Store all user activity history