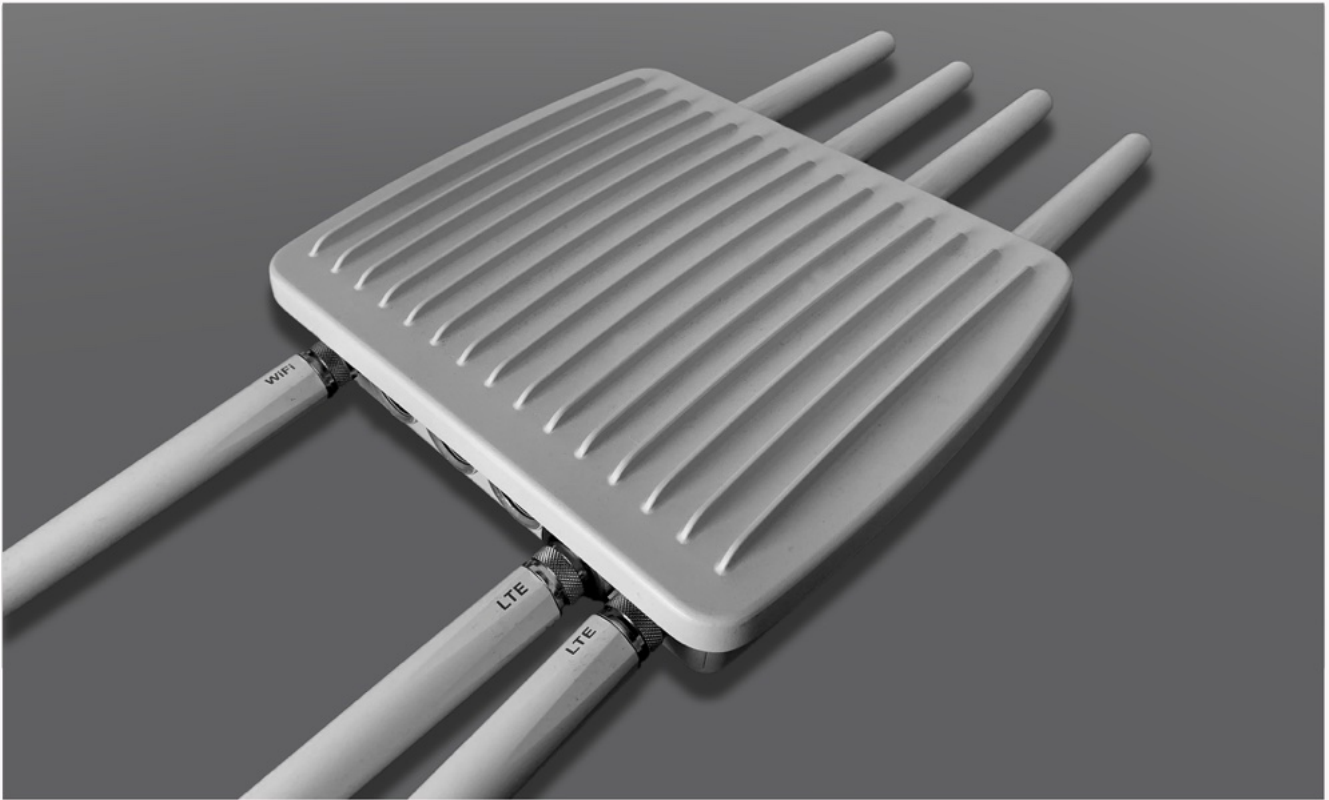


## Albeego-Rugged

The Albeego-Rugged is a compact, IP67, next generation smart bonded edge appliance that provides a powerful IoT or industrial edge application computer platform.



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01/07

# Bonded Edge IoT Computing



The Albeego-Rugged is a compact, IP67, next generation smart bonded edge appliance that provides a powerful IoT or industrial edge application computer platform. With the added advantage of instantly available, fast, stable, and secure broadband connectivity to the cloud or core.

Specifically designed to be a powerful bonded IoT or industrial edge appliance, the wide temperature, ruggedised router can be pole or wall mounted in harsh environments. The Albeego-Rugged can also be remoted up to 100m away from power and LAN systems using 802.11 af power over ethernet port.

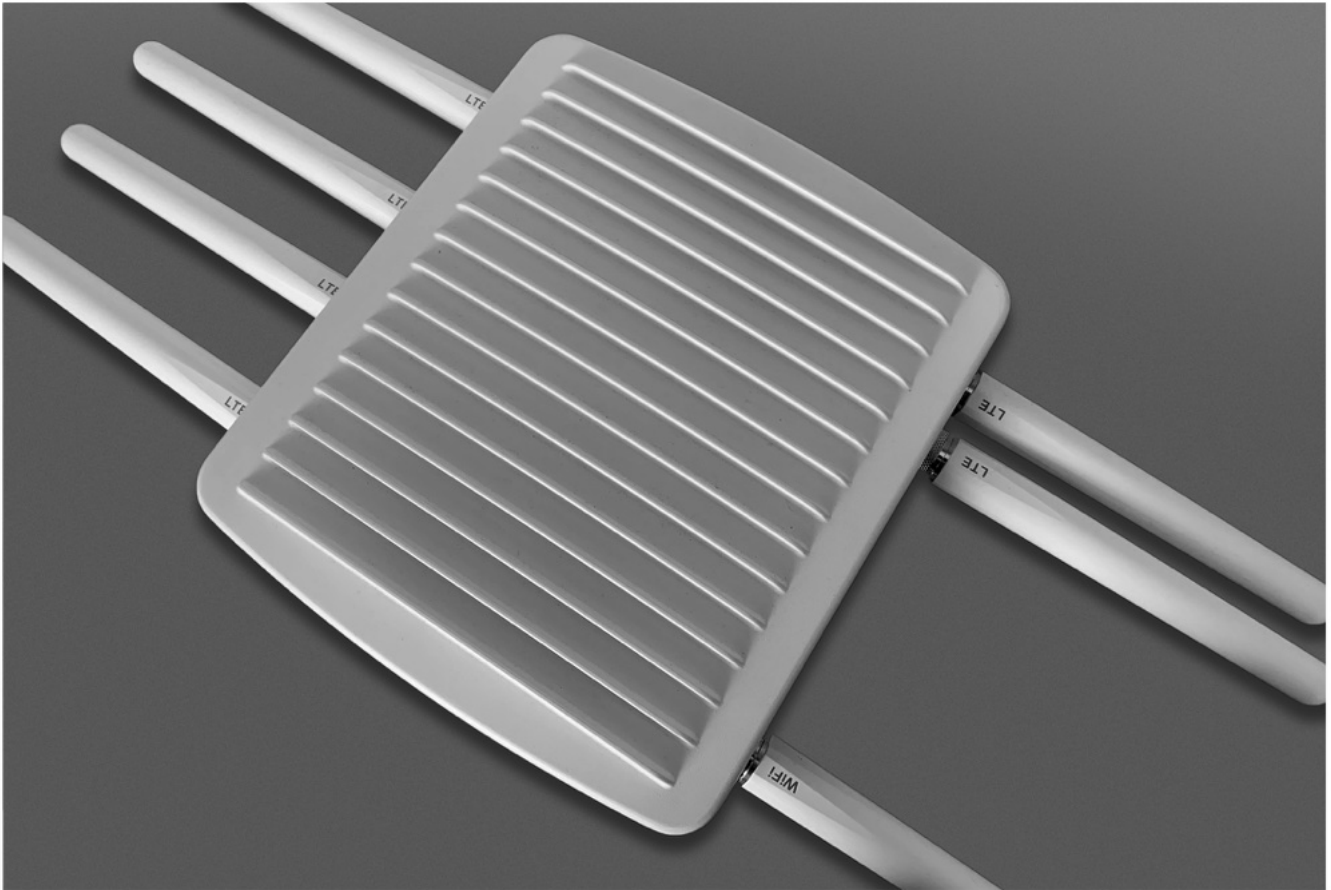
The Albeego-Rugged bonds multiple 3G, 4G, LTE or 5G connections together to form a stable and secure broadband connection. Bonding at layer 3 allows QoS and traffic shaping to be applied across the bonded group.

Designed for simple, rapid deployment, Albeego-Rugged is a self-optimising system requiring no user configuration or training. It uses the latest in IPsec VPN technology to enable highly encrypted bonding at layer 3 and incorporates patented active counter cyber and connection optimisation features.

Designed to actively auto optimise how it connects to the local mobile networks to maximise connected performance.

The system also protects user anonymity using multiple obfuscation features.

Providing an instantly available and powerful edge IoT or industrial computer platform for IoT, smart/connected utilities, smart oil fields and many more industrial and commercial applications.



## Key Features

- 4G/LTE/5G connectivity, seamlessly switching between networks as availability dictates
- Enables QoS and traffic shaping to be applied across the bonded group.
- Zero touch system with no training required enabling quick and simple deployment.
- Optimised for harsh and austere operational environments
- Smart power management for maximum battery life and uses standard, off-the-shelf chargers
- Identifies, avoids, counters and reports cyber attacks
- Hardware agnostic, open interfaces, evergreen technology to avoid vendor lock-in and technology obsolescence

## Special Features

- Provided as a fully supported and managed service
- Zero touch operation, switch on and connect
- Incorporating BeeSIM, a fully managed roaming SIM service
- Over the Air (OtA) SIM provisioning for local IMSI operation.
- Powerful edge appliance capable of running multiple VM based IoT or industrial edge applications
- On board battery for tetherless operation
- PoE remote charging

# Software Features

Feature	Release A (Current)	Release B (Q2 2024)	Release C (Q4 2024)
Bonding capacity	150 Mbps	800 Mbps	800 Mbps
Layer 3 bonding client allowing QoS and traffic prioritisation	●	●	●
Online and tele Network Operations Centre access	●	●	●
Online and tele Security Operations Centre access	●	●	●
Private Cloud Network or Public Cloud integration options	●	●	●
Cloud or bare metal server configuration	●	●	●
Dynamic global exit node orchestration	●	●	●
Multi Network SIM compliant	●	●	●
Choice of radio technology and category (LTE Cat 6 standard)	●	●	●
Up to 400 Mbps DL 120 Mbps UL (network dependant)	●	●	●
Ethernet, VSAT, Wi-Fi WAN bonding	●	●	●
10,200 mAh internal battery pack	●	●	●
USB C charging (phone charging)	●	●	●
Integrated UPS	●	●	●
BeeSIM - eSIM/eUICC Over the Air roaming option	×	●	●
BeeSIM - Agile SIM technology	×	●	●
Mobile network intelligence enabled	×	●	●
Automated mobile connection optimisation	×	●	●
AlbeeSmart Cloud based GNI access	×	×	●
Automated DoS threat detection	×	×	●
Active counter cyber response, DoS recovery	×	×	●
Forced mobility mode	×	×	●
IMSI cycling, anonymity protection	×	×	●
Mobile network black/whitelisting	×	×	●
Dynamic Exit Node deployment	×	×	●

# Hardware Technical Specifications 0.1

## System Core

System on a Chip (SOC)	Quad Core Intel Atom® E3900 Series Processor
Memory	4GB (standard) Up to 8GB DDR3L on request
Storage capacity	64 GB eMMC (standard) up to 4TB on request

## I/O Interface

Ethernet	2x GB Ethernet (full speed) RJ-45. (standard), additional integrated 4 port PoE switch available
RTC	Yes
Camera interface	CSI (4 mega pixel) (internal)
USB 3.1	2 x UB3.0
USB 2.1 (internal)	1 x UB2.0
Video and AV	HDMI 1.4b I2S audio port (internal)
Graphics	Intel® HD 400 graphics ,12 EU GEN 8, up to 500MHz support DX*11.1/12, open GL*4.2, open CL*1.2 OGL ES3.0, H.264, HEVC(decode), VP8
Display interface	DSI / eDP internal I/O
Expansion	12 pin general purpose bus, supported by Altera Max V. ADC 8- bit@188ksos (internal)

## Software

Operating systems	Linux (Ubilinux, Ubuntu, Yocto), SE Linux compliant
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## Power Supply

DC input	USB C-5VDC@4A or PoE 802.1AF
Battery	Internal 3.6V, 10.2Ah with integrated charging
Certification	UN38.3 certified for safe transport
Charging	USB C charging using phone/tablet charging cable or Ethernet via PoE

# Hardware Technical Specifications 0.2

## Physical

Dimensions	250mm x 220mm x 55mm
Weight	2.4kg (including battery)
Mounting	Pole, wall, or vehicle fit

## Environmental

Operating temperature	-40°C to 85°C
Storage temperature	-40°C to 85°C
Humidity	5% to 90% RH operating, non-condensing
Certification	CE/FCC Class A, RoHS compliant Microsoft Azure certified, REACH

## Signal/Power Distribution

AlbeePinion ®	5G Bonded Edge Compute Board with integrated USB hub, UPS and charging circuits.
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## 3G/4G/LTE/LTE(A) Radio Systems

Options	Default option is 4G/LTE Cat 6, higher 5G and lower 4G/LTE Cat 4 options available
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## Default Mobile Network Modem Configuration

Radios	3xQuectel EP06 STANDARD, 3xSierra Wireless® AirPrime® EM Series 7455 available on request
Category and rates	Cat 6 – 3 x 300Mbps DL/ 50Mbps UL
4G LTE (A) frequency bands	B1-B5, B7, B12, B13, B20, B25, B26, B29, B30, B41, 5G on request
3G frequency bands	B1, B2, B3, B4, B5, B8
2G frequency bands	2G working inhibited due to poor 2G security
Satellite location	GPS, Glonass, Beidou, Galileo
Regulatory approvals	CE, FCC, GCF, IC, NCC, PTCRB
Carrier approvals	AT&T, Bell, Rogers, Sprint, Telus, US Cellular, Verizon, Vodafone

# Hardware Technical Specifications O.3

## Default Wi-Fi Access Point

Radio	MQ AX210 WiFi Module, 2.4G/5G/6G Tri Band Network card
Standards	802.11 A/B/G/N/AC/AX
Max data rate	5374Mbps

## Security as per latest NCSC guideline - Prime Cryptographic Profile

Encryption	AES 256 CBC
Pseudo-random function	HMAC-SHA-256 (RFC4868)
Diffie-Hellman group	256bit random ECP (RFC5903) group 19
Authentication	ECDSA-256 with SHA256 on P-256 curve
Management	Dedicated zero tier management network