

BeSol – Product Brief



BeSol (B2-MIOT-MR) by BeWhere Inc. is part of a complete end-to-end asset tracking solution but can also be integrated via API in third-party software. Utilizing the latest in LTE-M/NB Cellular technology the **BeSol** has very low power consumption and long battery life so you can track, monitor and manage a wide variety of durable and perishable assets like never before.



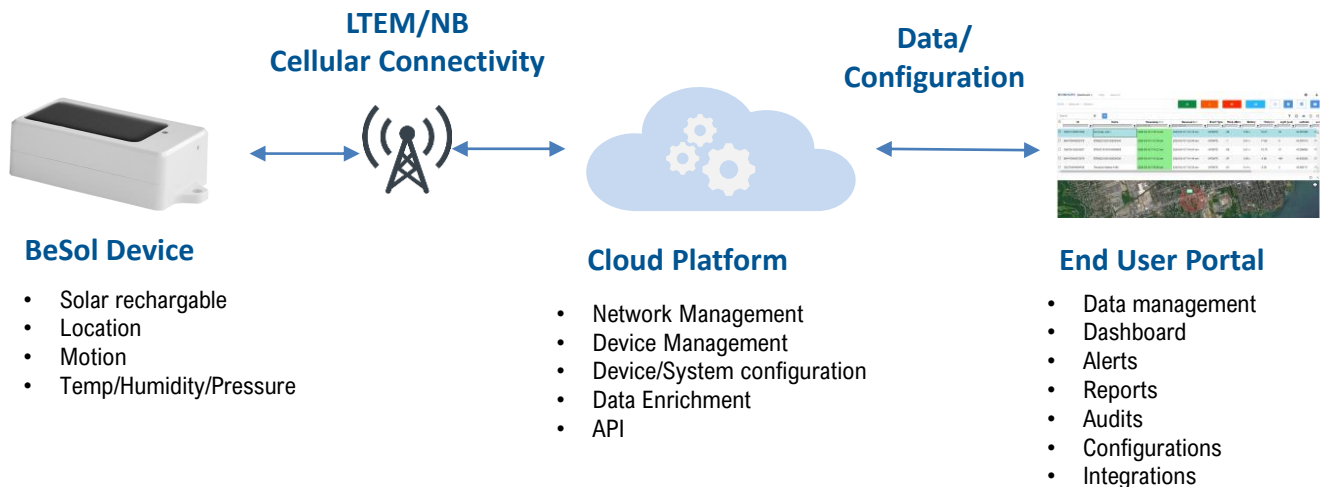
BeWhere BeSol is designed as a full stack solution and comes network and application ready. Increase your productivity, ROI, and visibility.

Features

- Available on the following Radio Access Technologies: **B2-MIOT-MR** (M1 / NB1/ NB2 / 2G)
- Off-the-shelf deployment
- Real-time tracking
- Configurable alerting
- Motion tracking, triggering updates
- Geo-Location
- GNSS: GPS / QZSS, GLONASS, Galileo enabled
- IP67 Rugged and dust / water-proof enclosure
- Temperature
- Humidity
- Pressure
- Light
- Accelerometer

Benefits

- Ultra-low power platform
- Maintenance free, Rechargeable long battery life (5+ years with higher resolution update rates, i.e., every 5–15 minutes when in motion).
- Low device cost
- Low deployment cost
- No reader needed
- Full coverage (deep indoor and rural areas)
- Support for a massive number of devices



BeSol Device

- Solar rechargeable
- Location
- Motion
- Temp/Humidity/Pressure

Cloud Platform

- Network Management
- Device Management
- Device/System configuration
- Data Enrichment
- API

End User Portal

- Data management
- Dashboard
- Alerts
- Reports
- Audits
- Configurations
- Integrations

General

Communication	LTE CAT M1 / CAT NB1/NB2 / 2G
Location Technology	High accuracy Gen9 with concurrent GNSS (GPS, GLONASS, BeiDou, Galileo and QZSS).
Solar Powered	Rechargeable Lithium-Ion battery 3.7 V nominal; 4.20±0.02V charge capacity, 2700 mAh capacity. Operating Voltage 3.5 – 4.2 V; 500 cycles, the cycle life is the cycle times when the discharge capacity is about 70% of the rated capacity.

GPS

Receiver	Gen9 VT of Qualcomm (GPS, GLONASS, BeiDou, Galileo and QZSS).
Sensitivity	Tracking & Navigation: –157 dBm Cold start: –146 dBm Hot start: –157 dBm
Accuracy	Position accuracy <3 m CEP-50

Cellular

Data	LTE CAT M1 Packet Data (CoAP/UDP) / CAT NB1/NB2 Packet Data CoAP/LWM2M/UDP
Operating Bands and Carriers	Multi Region Cat M1 /NB1/NB2 /2G M1: LTE-FDD: B1/B2/B3/B4/B5/B8/B12/B13/B14/B18/B19/B20/B25/B26*/B27/B28/B66/B85 NB2: LTE-FDD: B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B26*/B28/B66/B71/B85 EGPRS(2G): 850/900/1800/1900MHz(Bands 2, 3, 4, 5, 8, 12, 13, 20, 26 ,28), (AT&T, Bell, T-Mobile USA, Telus, Verizon, Telstra, Orange, KPN, Telia, DT, Cosmote, TIM Brazil)
SIM	4FF (nano SIM)

Sensor Operation Range (full accuracy)

Environmental	Temperature [-40, +85; Absolute accuracy ±0.5 °C] Humidity [Absolute accuracy ±3 %RH] Pressure [300...1100 hPa, Absolute accuracy ±1 hPa]
3-Axis Accelerometer	Motion (*shock and tilt triggers use case specific)

Certification

Certifications: CTIA(PTCRB/OTA), FCC/IC

Vibration and Shock: MIL-STD-810G

Targets: Bell, AT&T, T-Mobile USA, DT, CE, Verizon, Telefonica, Vodafone, Orange

Ingress Protection: IP67

Physical

Dimensions	(100.6 x 56.6 x 33.7) mm
Weight	0.4 lb

Environmental Operating Range

Temp	-20 to +60C (batteries, enclosure)
Humidity	95% R.H. @ 50C non-condensing

Rechargeable battery characteristics

This document describes the product specifications of rechargeable Li- polymer battery used with BeWhere's BeSol asset tracker.

Item	Spec	Remark
Nominal Capacity	2700mAh@ 0.2 C5A Discharge	Nominal capacity refers to the capacity of 0.2C5A discharge with 3.0V cut-off voltage, application cut-off voltage at 3.5V
Cycle Life	~500 Times	One cycle refer to one charge period and then one discharge period.
Standard Charge	0.2C5A	0.2C5A CC (constant current) charge to Max Charge voltage 4.2V, then CV (constant voltage 4.2V) charge current decline to $\leq 0.01C$.
Standard Discharge	0.2C5A	0.2C5A CC (constant current) discharge to discharge cut-off
Operating Temperature	Charge*: 0 °C~ +45°C Discharge**: -20°C~ +60°C	
Over Charge/Discharge Protection		The battery pack has protective circuit module to prevent over-charge/discharge for savefy purposes

Notes:

* Recharging circuit has charge-protection above 45°C for safety compliance and recharge current declines when below freezing point.

** Based on bench test /field test data and device has performed outside specifications up to -35 °C withough reducing operating performance

Rechargeable battery performance

Item	Spec	Remark
Number of messages	1500	From Max charge 4.2V to 3.5V app cut-off voltage
Charge time	60hrs	Uninterrupted bright sunlight from fully drained to be fully charged 4.2V

Field results

Sample data for a 30 days period (Jan-Feb) comparing temperature vs battery performance

