



Market Applications

- Smart cities
- Electric charging stations



Key Advantages

- Install & Play using mobile app
- Ease of Installation / replacement / commissioning
- Maintenance free
- Instant auto calibration functionality
- Zero re-calibration needs (over the air or local)
- Agile firmware architecture
- Integrated advanced data transfer limitation functions through compression
- Remotely managed & updated
- Configurable data throughput
- ~30KB /Month (28 connections /Day)
- Network signal level monitoring
- Dynamic connection to the base station antenna with the best signal level
- 5+ years of battery life



Sensor (edge computing) Notifications & Alarms

Notifications (once per day):

- Battery level
- Sensor temperature
- Network signal level

Alerts:

- Low battery
- High sensor temperature



Occupancy Monitoring



Description

An intelligent and robust NB-IoT radar and magnetic sensor for vehicle parking detection (petrol, diesel, hybrid, electric). Once bolted on the ground and switched on, the highly sophisticated firmware automatically calibrates the sensor within seconds. This dual sensing (radar & magnetometer) NB-IoT sensor provides accurate detection without the need for recalibration or maintenance regardless of orientation or changes in the magnetic field at the point where it is installed. (e.g., installation next to metal structures like fire extinguishers, live electricity cables, etc.)



Measurement Features

Detection Type A	Radar
Detection Distance	Up to 2 Meters (accuracy: ± 1 cm)
Detection Type B	3 Axis Magnetometer
Detection Rate	$\geq 97\%$
Detection Time	20 seconds from the moment the sensor is covered or uncovered by a vehicle



Approvals

RoHS Compliant / CE / IP68 / IK10



Power

Battery	3.6v (Li-SOCl ₂) - (replaceable)
Expected Battery Life	5+ Years [or 50,000+ connection requests] (up to 28 connections (14 vehicles) per day for the transmission of the status change between Occupied [Sensor is detecting] and Free [Sensor is not detecting])

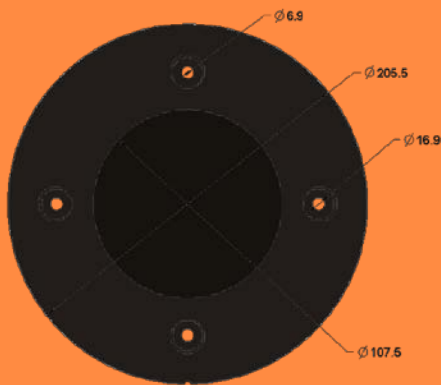
Battery life depends on NB-IoT signal strength. The abovementioned prediction of expected battery life is made with NB-IoT signal strength of -80dBm RSSI (Received Signal Strength Indicator) and 150 SNR (Signal to Noise Ratio). The sensor automatically adjusts the transmitting (TX) power depending on the NB-IoT signal level. When the NB-IoT signal strength drops below -100dBm RSSI, a battery life reduction of up to 20% is expected, respectively. When the NB-IoT signal strength drops below -110dBm RSSI, battery life reduction can reach up to 30%.



Communication

Communication Module	NB-IoT	Compatibility	3GPP NB1 R13 / 3GPP NB2 R14
Sensitivity	-129dBm ±1dB	Control via AT commands according to 3GPP TS27.005.27.007	
Available LTE Bands	B01 /B02 /B03 /B04 /B05 /B08 /B12 /B13 /B17 /B18 /B19 /B20 /B25 /B28 /B66		
Data Transmission Period	Irrational (connection on status change - Occupied / Free)		
SIM Formats	Nano-SIM (4FF) / eSIM*		

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NB-IoT Radar & Magnetic Sensor

Occupancy Monitoring



Operational Features

Measurements Storage Capacity	up to 6 months (in-sensor storage when network fails while resumes transmission when connectivity is restored)
Operational Temperature Range	-20°C to +70°C
Protocol	IPv4 - IPv6 / UDP / COAP* / LWM2M* / MQTT-SN* / DTLS
Security	AES-ECC / 256-bit 3GPP encryption
Sensor Management	Full Bi-directional communication - Remote management of operating parameters (Device Management) Over The Air Firmware Upgrade. The upgrade can take place over IPv4 or IPv6 networks. Transmission is encrypted and the integrity of the firmware is verified on the sensor prior to installation.



Physical Features

Dimensions	38mm x Φ 206mm (\pm 2mm)
Weight	\cong 780g (\pm 50g)
IP Enclosure	IP 68 (operating in external environment with humidity levels 0 - 100%)
Enclosure Protection	High-Strength anti-vandal casing design
Impact Protection	IK10
Electronics Sealing	Conformally Coated



Packing Contents

1 X	Radar/Magnetic Parking Sensor
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Warranty

24 Months	From the activation date (which should not exceed 6 months beyond the date of shipment)
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Installation

Duration	5 - 10 minutes (depending on the specifics of the installation site including the bolting process and initialization/commissioning of the sensor)
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Easy installation / Replacement / Maintenance - Bolted on the ground



Upon Request

Smart Bluetooth Tag	
Dimensions	(L) 133mm x (W) 45.5mm x (H) 31mm
Weight	\cong 100g
IP Enclosure	IP 68
Impact Protection	IK10
Installation Method	Through cable ties / self-tapping screws / high-performance adhesive, this Bluetooth smart tag is placed on the bottom of the vehicle (chassis) and as close as possible to the centre of the vehicle.
Sealing	Electronics and Battery Potting (UL94-V0 Flammability Rating)
Battery	3.6v (Li-SOCl2) - (replaceable)
Expected Battery Life	10+ Years (4 dBm Maximum Transmission, Period: 1000ms / Readings taken at 25°C)
Management	Over the Air (Firmware Upgrade, Major / Minor, Tx Power, Advertising Interval, Advertising Name)
Frequency	Proximity UUID
Security	Automated Access Password
Extended Battery Life	
Custom casing	5+ Years [or 105.000+ connection requests] (up to 60 connections (30 vehicles) per day for the transmission of the status change between Occupied [Sensor is detecting] and Free [Sensor is not detecting]) - (1000pcs - MOQ Required)

* Under Development / In Progress / In Planning

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