fuelics

Market Applications

- Smart cities
- Road-Side parking companies

Key Advantages

- Install & Play
- Ease of installation / replacement / maintenance
- Maintenance free
- 10min auto calibration functionality
- On demand re-calibration over the air
- Agile firmware architecture
- Integrated advanced data transfer limitation functions through compression
- Integrated advanced data reduction algorithms
- Configurable data throughput
- ~6KB /Month (6 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 (on each connection):

- Battery level
- Sensor temperature
- Network signal level

Alerts:

- Low battery
- High sensor temperature

NB-IoT

Magnetic Sensor

Occupancy Monitoring

Description

A robust vertically positioned NB-IoT sensor for parking sensing of vehicles (petrol, diesel, hybrid, electrical) with auto-calibration initialization intelligence and on-demand over the air re-calibration functionality. Once positioned into ground and powered up, the highly sophisticated firmware intrinsically registers the ever fluctuating magnetic environment above and automatically sets the sensor to operation.

Measurement Features

Detection Type	Magnetometer
Detection Distance	Configurable (from 1 cm up to 5 m)
Measurement Period	default profile: every 60 second (configurable upon request)
Detection Rate	≥ 98%
Detection Time	default profile: 10 second (configurable upon request)

Approvals

RoHS Compliant / CE

Power

Battery	1 X SAFT LSH14 3.6v (Li-SOCl2) / C-size - (replaceable)
Expected Battery Life	5+ Years [or 10.800+ connection requests] (up to 6 connections (3 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. When the NB-IoT signal strength drops below -110dBm RSSI, battery life reduction can reach up to 30%.

Communication

NB-IoT Module	Quectel BC95-G	Compatibility	3GPP NB1 R13 / 3GPP NB2 R14
Sensitivity	-129dBm ±1dB		
NB-IoT Frequency Bands	B28 @H-FDD: 700MHz / B20 @H-FDD: 800MHz / B8 @H-FDD: 900MHz / B5 @H-FDD: 850MHz / B3 @H-FDD: 1800MHz		
Data Transmission Period	Irrational (connection on status change - Occupied / Free)		
SIM Formats	Nano-SIM (4FF) / eSIM*		

Operational Features

Measurements Storage Capacity	up to 1 Year of measurements (default configuration)
Operational Temperature Range	-20°C to +75°C
Protocol	IPv4 - IPv6 / UDP / COAP* / LWM2M* / MQTT-SN*
Security	AES-ECC
Sensor Management	Bi-directional communication - Remote management of operating parameters (Device Management)
	Remote calibration / recalibration
	Over The Air Firmware Upgrade. The upgrade can take place over IPv4 or IPv6 networks, it is transported encrypted and the integrity of the firmware is verified on the sensor prior to installation.

* Under Development / In Progress / In Planning

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Physical Features

Dimensions	140mm x Φ50mm
Weight	≅250g + Battery 50g (Saft LSH14)
IP Enclosure	IP 67 (operating in external environment with humidity levels 0 - 100%)
Enclosure Protection	High-Strength designed anti-vandal casing
	Specially designed tool for the closing and the opening of the sensor casing

Packing Contents

1 X	Magnetic Parking Sensor

Warranty

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

Installation

Duration	15 - 25 minutes (depending on the specifics of the installation site, including the drilling process and the sensor initialization)

Easy installation / Replacement / Maintenance

"inside" the roadway or "on" the roadway installation

Upon Request

Battery	1 X SAFT LSH14 3.6v (Li-SOCl2) / C-size - (replaceable)
Extended Battery Life - (custom casing)	1 X SAFT LSH20 3.6v (Li-SOCl2) / D-size - (replaceable) 5+ Years [or 20.000+ connection requests] (up to 10 connections (5 vehicles) per day for the transmission of the status change between Occupied [Sensor is detecting] and Free [Sensor is not detecting]) - (500pcs - MOQ Required)
Extended Battery Life - Battery Pack - (custom casing)	2 - 4 X SAFT LSH20 3.6v (Li-SOCl2) - (replaceable) 5+ Years [or 40.000+ / 80.000+ connection requests] (20+ - 40+ connections (10+ - 20+ vehicles) per day for the transmission of the status change between Occupied [Sensor is detecting] and Free [Sensor is not detecting]) - (1000pcs - MOQ Required)
Custom Casing	IP 68 (IP Enclosure)
	IK10 (Impact Protection)
NB-IoT Frequency Bands	B1 @H-FDD: 2100MHz

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