fuelics

Market Applications

- Smart cities
- Facility management
- Fuel and water distribution companies
- Industrial level monitoring
- Public buildings & infrastructure

Key Advantages

- Install & Play using mobile app
- Ease of installation / replacement / commissioning
- Maintenance free
- Data linearization mechanism
- Agile firmware architecture
- Integrated advanced data transfer limitation functions through compression
- Remotely managed & updated
- Configurable data throughput
- ~45KB /Month
- Random connection per day algorithm
- Network signal level monitoring
- Dynamic connection to the base station antenna with the best signal level
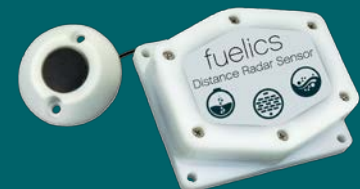- 5+ years of battery life

Sensor (edge computing) Notifications & Alerts

Notifications (once per day):
- Threshold level
- Battery level
- Network signal level

Alerts:
- Minimum capacity
- Maximum capacity
- Tilt detection
- Low battery
- High temperature

NB-IoT

Radar Sensor
Level Monitoring

Description

A robust radar sensor for level management in stationary diesel and water containers, silos, open and closed rainwater pipelines, sewage pipelines, wells and cesspools, with tilt detection capabilities for additional manhole monitoring. Powered by highly sophisticated intelligent firmware, this NB-IoT radar sensor can be installed in any type of plastic, metal or concrete tank (underground or above ground) to offer active level management with the lowest possible data throughput and battery life of 5+ years.

Measurement Features

Measurement Accuracy	± 10mm
Nominal Height	up to 7m
Measurement Period	default profile: every 15 minutes (configurable upon request)
Level Output	Distance (between sensor and the content surface)

Approvals

RoHS Compliant / CE

Power

Battery	3.6v (Li-SOCl2) - (replaceable)
Expected Battery Life	5+ Years [or 2300+ Network Connections] (default measurement profile: every 15min, 1 connection per 24h for the transmission of measurements, plus notifications/alerts)

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

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	Once per day (configurable upon request)		
SIM Formats	Nano-SIM (4FF) / eSIM*		

Operational Features

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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 +75°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.
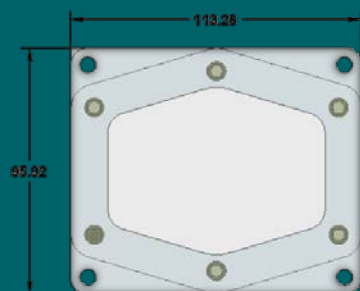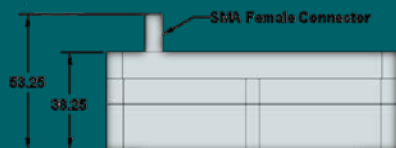
Device
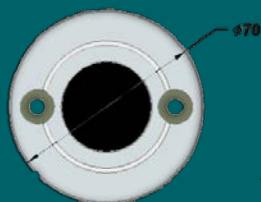
TTL Antenna and Holder

Physical Features

Sensor Dimensions	113mm (L) x 96mm (W) x 54mm (H) - (1 X Φ55mm hole on metal containers)
Antenna with Holder	70mm (Diameter) x 16mm (H) - (1 X Φ10mm hole on metal containers)
Antenna Options: • Coaxial cable quarter wave antenna (for in-container antenna installation on angle bracket) • TTL antenna (for antenna installation outside the container, through a container hole)	
Sensor Weight	≅340g (±30g)
IP Enclosure	IP 68

Packing Contents

1 X	Radar Level Sensor with Coaxial or TTL antenna (depending on installation needs)

Warranty

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

Installation

Duration	10 - 25 minutes (depending on the specifics of the installation site, including the sensor's initialization procedure)