Datasheet

Caproc – RADAR

Caproc Radar is a wireless LoRaWAN sensor for measuring distance to objects in applications such as waste bin monitoring. The sensor is equipped with pulsed coherent radar module to measure distance to max 4 objects in the range. The measurement range and object reflection amplitude are configurable to filter only object types for the desired application. For example, clothes and other soft material generate low and solid materials high reflection amplitude.

The sensor also measures temperature and optionally movements and orientation with accelerometer.

The enclosure is robust and waterproof (IP67). Suitable for demanding use cases such as waste bin monitoring.

Low power consumption enables long battery lifecycle.

Features

- Wireless LoRaWAN® sensor.
- Battery powered. 1-2 pcs of 3.6V AA-lithium batteries.
- Typical battery lifecycle (2 batteries) is 6-10 years depending on measurement interval, conditions and type of batteries used.
- Sensor settings adjustable via network (downlink messages).
- Waterproof robust enclosure (IP67).
- CE-marked device. Radio Equipment Directive (RED) 2014/53/EU.

Use cases

- Waste & recycling bin filling degree monitoring.
- Tank, container and well levels.
- River, lake, and sea levels.

CAPROC

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Caproc RADAR-001

Title	Description
Manufacturer	Caproc Oy
Measurement interval	Adjustable. 10min – 24 h
Wireless technology	LoRaWAN® (EU 868 MHz)
Measurement details	Distance to objects(s) (mm) 1–4 objects in the set range Reflection amplitude for each detected object Temperature (°C) Sensor orientation (optional) Sensor movements (optional) Battery voltage (V)
Operating temperature	-40 ~ 85 °C
Antenna	Internal LoRaWAN-antenna (EU 868 MHz).
Enclosure protection	IP67 (waterproof)
Dimensions	100 x 75 x 35 mm
Weight	150 G (including 2 pcs AA-batteries)
Power supply	1–2 pcs 3.6V AA-size lithium batteries Also A-size is supported if extra capacity is required.
Expected battery life	6–10 years with 2 pcs AA-batteries (depending on configurations and environment)

Datasheet

Sensors

Title	Description
Distance	
Sensor type	60 GHz pulsed coherent radar (PCR)
Measurement absolute range	60–2000 mm (Adjustable up to 10m depending on selected use case)
Resolution	1 mm
Accuracy	1 %
Objects in range	0–4
Beam angle	20–30 degrees (not verified)
Temperature	
Operating range	-40…85 °C
Resolution	0.1
Accuracy	± 0.2%
Accelerometer (optional)	
Sensor type	Orientation, Movement
Operating range	± 2.0 g
Sensitivity	256 LSB/g
Axels	X, Y, Z

Status uplink payload

Type value	Type	Data size (bytes)	Comment
0x64	Header	1	Fixed uplink header
0x12	Temperature (°C)	2	-32765 °C–32765 °C Data conversion: (value – 32768) x 0.1
0x38	Distance 1 (mm)	2	Distance to the closest object. Value 0 if not detected.
0x39	Amplitude 1	2	Amplitude / strength of reflection from the object
0x3a	Distance 2 (mm)	2	Distance to the object 2
0x3b	Amplitude 2	2	Amplitude / strength of reflection from the object
0x3c	Distance 3 (mm)	2	Distance to the object 3
0x3d	Amplitude 3	2	Amplitude / strength of reflection from the object
0x3e	Distance 4 (mm)	2	Distance to the object 4
0x3f	Amplitude 4	2	Amplitude / strength of reflection from the object
0x63	Battery voltage	2	Conversion: value / 1000

All data MSB (most significant bit)

Enclosure dimensions