miro
Cargo

miromico

Ruggedized LoRaWAN GPS tracker with long battery life and various sensors for demanding industrial tracking applications

miro **Cargo** is a powerful and flexible GNSS tracking device that integrates a multi-standard GPS receiver with an accelerometer, temperature sensor, and barometer into one compact device.

The IP67-rated housing with different mounting options protects the device at operation in harsh industrial environments. If desired, the device can be activated in the field using a magnet. The highly configurable device firmware allows for fine-grained adaptation to a specific use case to optimize performance and battery lifetime.

KEY BENEFITS

- LoRaWAN® class A compliant device
- Supports EU868, US915, AU915, AS923
- Low power GNSS module with integrated antenna
- Stores 100'000 locations and transmits them when in range of a network
- Robust IP67 industrial housing
- Up to 2 years of lifetime (primary cell)

APPLICATIONS

- Industrial asset tracking
- Construction site management
- Fleet management

Document Information

ABOUT

File name	miro Cargo datasheet
Document type	Datasheet
Revision	1.1.5

REVISION HISTORY

Date	Release	Changes
2021/03/02	1.0	Initial Release
2021/05/17	1.1	Review
2021/07/26	1.2	Review

TABLE OF CONTENT

Functional Description

miro Cargo is a universal LoRaWAN® class A compliant GPS tracking device for industrial tracking and localization applications in harsh environments.

The built-in accelerometer and gyroscope allow to detect movement and trigger the acquisition of a GPS fixes when in motion, resulting in lower current consumption and extended battery lifetime. Additionally, it can also obtain fixes on regular intervals. With its additional sensing capabilities, such as temperature, barometric pressure, it is suitable for a large variety of use cases.

miro Cargo is compatible with all network providers and can detect when there is no network coverage. If no LoRaWAN® network is available, the tracker will store up to 100.000 locations in the internal flash memory and send it to the gateway along with original timestamp information once it gets back in reach of a LoRaWAN® network.

The tracker can be set up and configured to suit your application's needs using an USB to serial cable or using LoRaWAN® down-links, thanks to an extensive set of AT-commands.

Technical Specifications

MECHANICAL SPECIFICATIONS

Weight	135 g
Dimensions	89 x 79 x 33 mm
Enclosure	Plastic, ABS

OPERATING CONDITIONS

Temperature	-20 – 80 °C
Humidity	0 – 95% RH, non-condensing

DEVICE POWER SUPPLY

Battery type	2 x AA, alkaline standard cell
Expected battery lifetime	Up to 2 years depending on device configuration

RADIO / WIRELESS

Wireless technology	LoRaWAN® 1.0.3
LoRaWAN® Device type	Class A
Supported LoRaWAN® features	OTAA, ADR, Adaptive Channel Setup
Link budget	137 dB (SF7) to 151 dB (SF12)
RF transmission power	14 dBm / 20 dBm (depending on region)

Sensor
Specifications

GPS

Receiver	Quectel L86 with patch antenna
Sensitivity	-167 dBm @ Tracking, -149 dBm @ Acquisition
GNSS	GPS & GLONASS L1 band
Horizontal Position Accuracy	2.5m CEP
Internal storage	Up to 100'000 locations

ACCELEROMETER

Range	±2, ±4, ±8, ±16
Resolution	12 bit, 4mG
Accuracy (typ.)	±40 mG
Axis orientation	*see Figure 1*

TEMPERATURE

Range	-40 – 90 °C
Resolution	0.01 °C
Accuracy (typ.), *see Figure 3*	±0.2 °C

HUMIDITY

Range	0 – 100 % RH
Resolution	0.5 % RH
Accuracy (typ.), *see Figure 2*	±2 % RH

AMBIENT PRESSURE

Range	300 – 1100 hPa
Resolution	0.01 hPa
Accuracy (typ.)	±1 hPa

MAGNETIC SENSOR

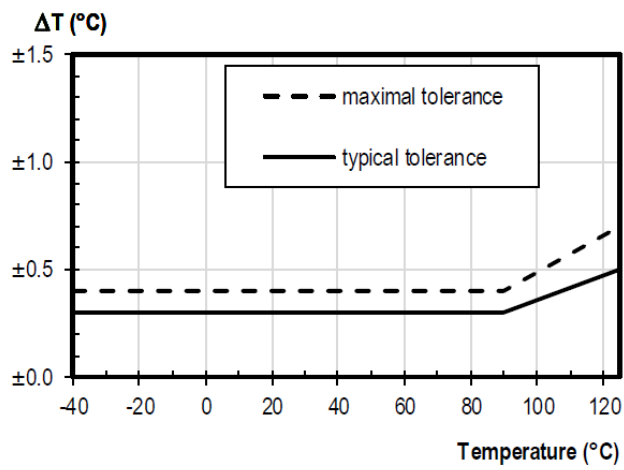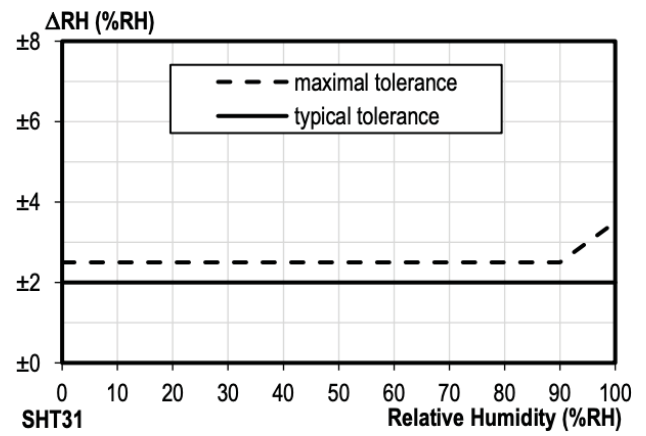|	
Detection threshold	Max. ±4.8 mT
Magnetic response	Omnipolar
Reset activation (typ.)	After 7.5 sec
Position	*see Figure 1*

Figure 3: Temperatur Sensor

Figure 2: Humidity Sensor

Magnetic Sensor

Figure 1: Device Orientation

Additional Resources

ADDITIONAL RESOURCES

CE Certification Documents	pendig
FCC Certification Documents	pendig
LoRaWAN Alliance Certification Document	pendig
Product Information Page	Product Website
Developer Resources	docs.miromico.ch
Documentation	Datasheet

Device Options

PRODUCT ID	LoRaWAN® REGION					OPTIONS
	EU868	US915	AS923	AU915	IN865	
TRACK-CARGO-LW/□	■	■	■	■		

Keep
in touch

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