

# miro Cargo

Flexible LoRawan® tracker  
for industrial applications

Flexible multi-standard LoRaWAN®  
GPS tracker with various sensors for  
demanding industrial applications.



## Description

**miro Cargo** is a powerful and flexible GNSS tracking device that integrates a multi-standard GPS receiver with an accelerometer and optional 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.

## Features

- ▶ LoRaWAN® class A compliant device
- ▶ Supports EU868, US915, AU915, AS923
- ▶ Low power GNSS module with integrated antenna
- ▶ Stores up to 10'000 locations and transmits them when in range of a network
- ▶ Robust IP67 industrial housing
- ▶ Up to 1 year of battery lifetime (primary cell)

## Applications

- ▶ Industrial asset tracking
- ▶ Construction site management
- ▶ Fleet management

## Document Information

### About

File name	Document type	Date	Revision
DS miro Cargo	Datasheet	2023-02-09	1.2

### Revision history

Date	Release	Changes
2021-03-02	1.0	Initial Release
2022-02-21	1.1	Added additional LoRaWAN regions
2023-02-16	1.2	Added CE and UKCA, minor corrections

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## 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 allows 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 optional 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 10'000 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® downlinks.

# Technical Specifications

## Mechanical specifications

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

## Operating conditions

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

## Device power supply

Battery type	2 × AA 1.5V, alkaline standard cell
Expected battery lifetime	Up to 1 year depending on device configuration
Temperature	-20 – 70 °C

Radio / Wireless	868 MHz / 915 MHz
Wireless technology	LoRaWAN® 1.0.3
LoRaWAN® Device type	Class A
Supported LoRaWAN® features	OTAA, ADR, Adaptive Channel Setup
Sensitivity	-137 dB (SF12)
RF transmission power	14 dBm / 22 dBm (depending on region)

## Certifications

CE	RED 2014/53/EU
UKCA	Radio Equipment Regulations 2017
FCC	pending

**⚠ FCC Caution:**

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful in-terference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Antenna model 1052620001 by Molex, 1.4 dBi gain

## 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 10'000 locations

### Accelerometer

Range	$\pm 2, \pm 4, \pm 8, \pm 16$
Resolution	12 bit, 4mG
Accuracy (typ.)	$\pm 40$ mG
Axis orientation	<a href="#">see figure 1, page 6</a>

### Magnetic sensor

Detection threshold	Max. $\pm 4.8$ mT
Magnetic response	Omnipolar
Reset activation (typ.)	After 7.5 sec
Position	<a href="#">see figure 1, page 6</a>

## Device Orientation

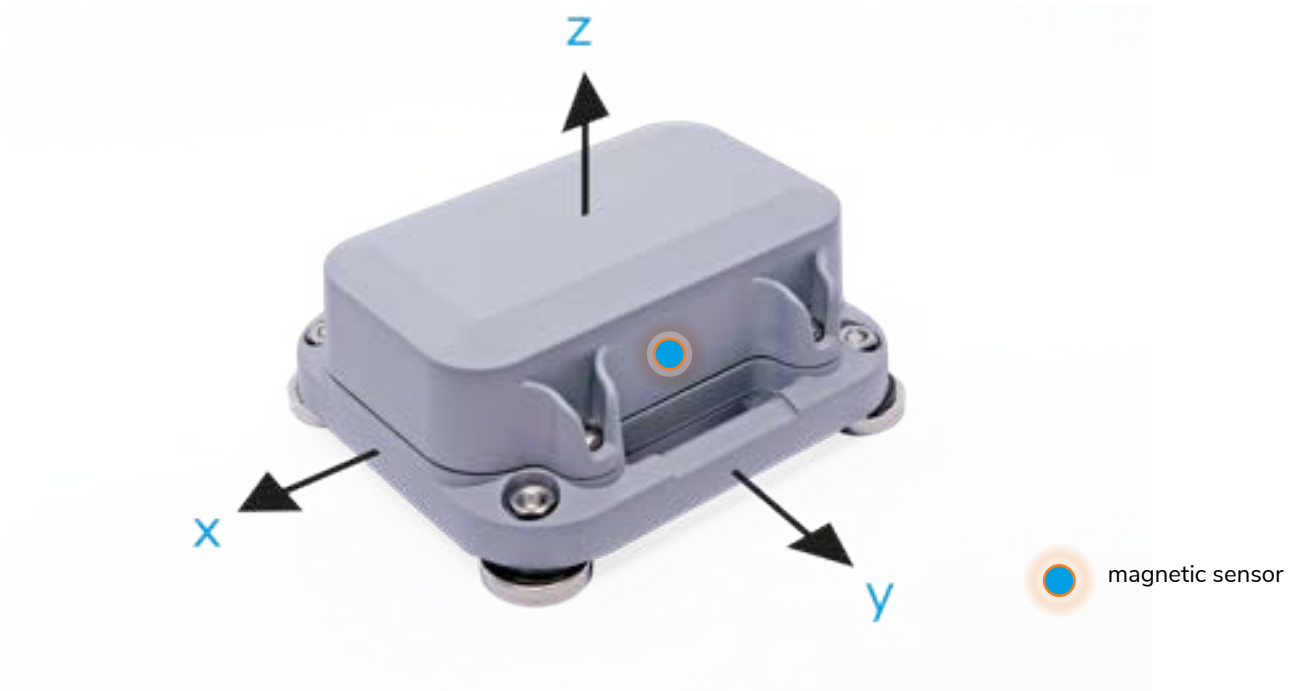


Figure 1: Axis Orientation

## Mechanical Dimensions

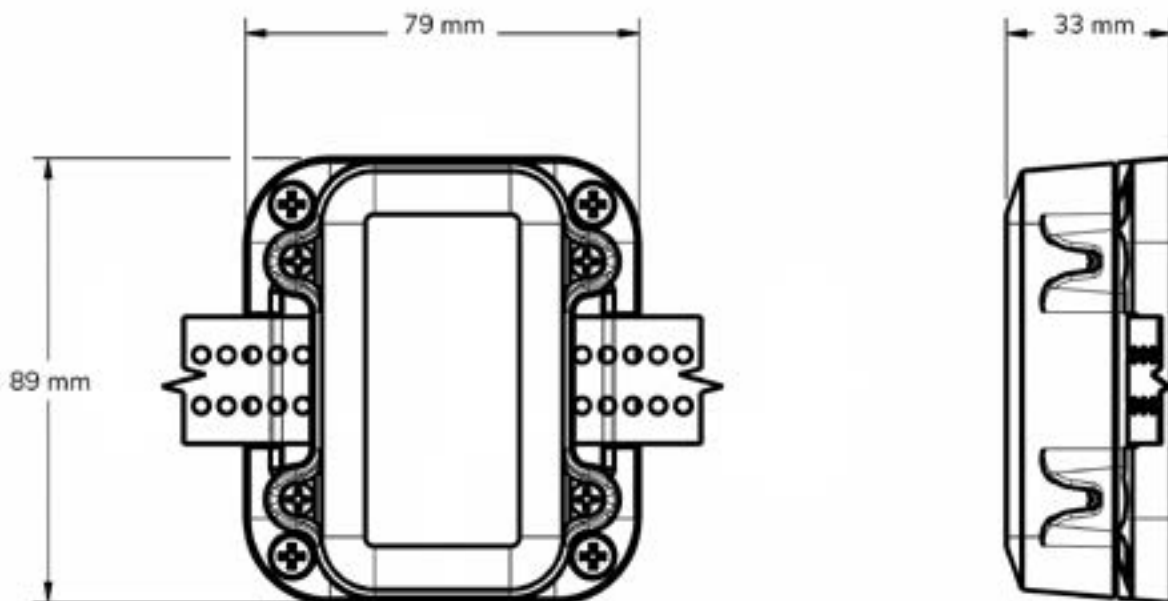


Figure 2: Mechanical Dimensions in mm

## Additional Documentation

### Additional Resources

Product Information Page [miromico.ch/miro-cargo](https://miromico.ch/miro-cargo)

Technical Documentation [docs.miromico.ch/datasheets/tracker.html](https://docs.miromico.ch/datasheets/tracker.html)

## Device Options

Product ID	LoRaWAN <sup>®</sup> region						Options
	EU868	US915	AS923	AU915	IN865	2.4 GHz	
TRACK-CARGO-LW/*	✓	✓	✓	✓			

\* LoRaWAN<sup>®</sup> region (e.g. EU868)

## Keep in touch

Miromico AG  
Gallusstrasse 4  
CH-8006 Zürich  
Switzerland

[info@miromico.ch](mailto:info@miromico.ch)  
[www.miromico.ch](http://www.miromico.ch)

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