## nemi Log

Battery powered wireless data logger with integrated sensors

## Description

nemi Log is a stand-alone wireless data logger whose battery life is maximized using the highly efficient nemi Link 2400 wireless technology. It receives data from up to three wireless sensors and stores it on a micro SD card. With the integrated 9 DoF IMU, nemi Log can also be used independently to measure accelerations, rotation rates, rotation angles, and magnetic fields.

## Key Features

- **Receiver for up to 3 sensors / telemetry modules** in the radio network nemi Link 2400
- **Data logging** on **micro SD card**
- Integrated **IMU sensor module** (ACC, GYR, MAG 3 axes each)
- Completely wireless and **maximized battery life** due to **nemi Link 2400 radio technology**
- Provision of data as CSV files with time stamps from integrated clock (RTC)
- Robust, weatherproof **IP 67 housing**
- Connection option for a **wired MEMS accelerometer**

**IMU sensor module** for measuring accelerations and rotation rates in and around all 3 axes; ACC up to 16 g; GYR up to 4000 °/s

**Internal rechargeable battery** with more than 14 days of runtime when connecting an external sensor at a sampling rate of 4 kHz and a duty cycle of 12.5 %
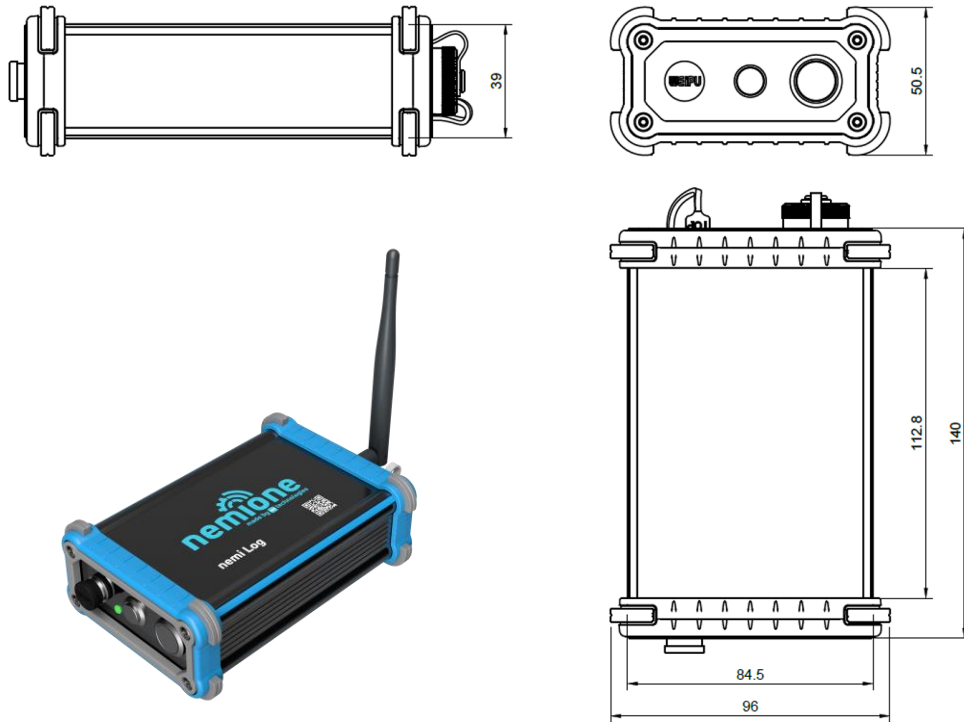
Triaxial **magnetometer**; measuring range up to 16 Gauss

**Data logging** on **micro SD card**

**nemi Link 2400** - i4M's robust **high-speed radio technology** in the 2.4 GHz frequency band; range up to 20 m

**nemi Link 2400 XR** - i4M's robust **high-speed radio technology** in the 2.4 GHz frequency band; range up to 300 m

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## Specifications

| General information | | |
|---|---|---|
| Dimensions<br>(without antenna and connectors) | 140 x 96 x 50,5 | mm |
| Weight | 480 | grams |
| Internal power supply | Lithium-ion battery, 2 cells | - |
| Running time with full battery | > 14<br>(when connecting an external sensor at 4 kHz sampling rate, duty cycle from 200 s active to 1600 s inactive) | days |
| Charging time (0 - 100 %) | approx. 3.5<br>(at 15 W charging power) | hours |
| External power supply | 5 (USB-C) | V |
| Data logging | on micro SD card<br>(in binary format, software for decoding to CSV format is supplied free of charge). | - |
| Temperature range permitted during operation | -20 to 60 | °C |
| Housing protection class | IP 67 | - |
| Additional integrated 9-DoF IMU<br>per 3-axis MEMS accelerometer (ACC) / gyrometer (GYR) / magnetometer (MAG) | | |
| Sampling rate | 416 / 208 / 104 | Hz |
| Selectable measuring ranges ACC | ± 16 / 8 / 4 / 2 | g |
| Selectable measuring ranges GYR | ± 4,000 / 2,000 / 1,000 / 500 / 250 / 125 | °/s |
| Selectable measuring ranges MAG | ± 16 / 12 / 8 / 4 | Gauss |
| Signal resolution | 16 | bit |

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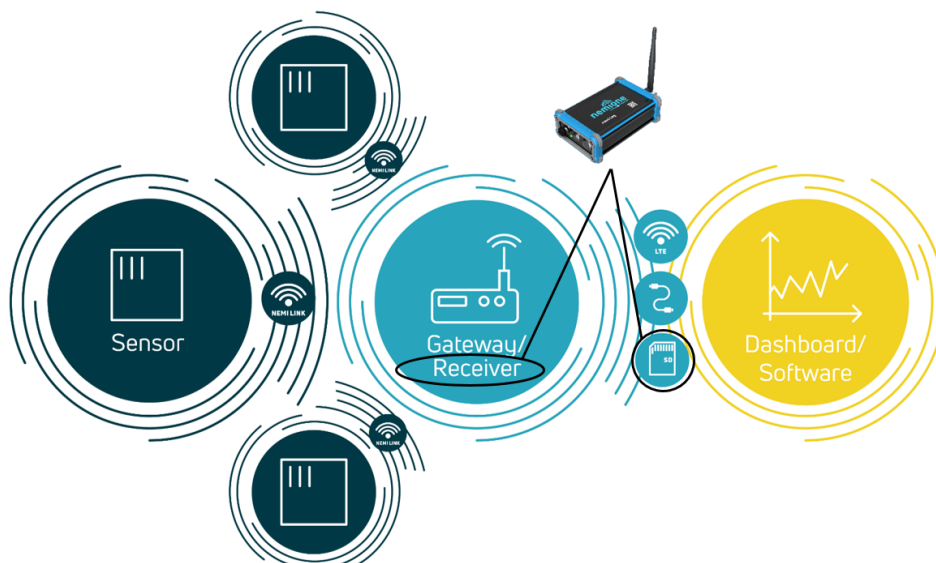mechanical systems

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## Dimensions

(All dimensions in mm)



## Data transmission

nemi Log is a data logger for storing data locally. It can be used to receive data from up to three wireless sensors / telemetry modules in the nemi Link 2400 radio network or a connected wired accelerometer. nemi Log stores the data on a SD card, which can be removed to read out the data.

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## Radio technology nemi Link 2400

### nemi Link 2400 HS (High-speed wireless network)

Our own radio technology nemi Link 2400 is a **wireless, battery-powered sensor network** in the 2.4 GHz frequency band with star topology and one receiver module. The **high efficiency** of our robust radio technology **enables very long battery runtimes** of our products. Our wireless sensors synchronize their internal clocks to the clock of the receiver module with extremely small deviations.

| Radio technology nemi Link 2400 | | |
|---|---|---|
| Radio channel | between 2,402 – 2,478 (adjustable in 1 MHz steps) | MHz |
| Time synchronization deviation | < 100 | µs |
| Radio range | up to 20 (indoor) up to 300 (outside line of sight) | m |
| Max. sum sampling rate at 24 bits per sample | approx. 36,000 | Hz |
| Sensor nodes per receiver module | 3 | - |

### nemi Link 2400 XR (Extended Range wireless network)

To provide a compromise between our high-speed network nemi Link 2400 and our long- range network nemi Link 868 we developed our new network nemi Link 2400 XR. In comparison to nemi Link 2400 it has an extended range, lower data rates and still enables long battery life. It is using the 2.4 GHz frequency band and is available as firmware upgrade. nemi Link 2400 XR can be used with our standard nemione® products.

| Radio technology nemi Link 2400 XR | | |
|---|---|---|
| Radio channel | between 2,402 – 2,478 (adjustable in 1 MHz steps) | MHz |
| Time synchronization deviation | < 100 | µs |
| Radio range | up to 300 (urban environment) up to 1.800 (theoretical) | m |
| Max. sum sampling rate at 24 bits per sample | 500 - 1500 | Hz |
| Sensor nodes per receiver module | 8 | - |

In addition, **other modes** are available with sampling rates and ranges between the high-speed mode and the extended range mode. Please get in contact for further information: info@nemi.one

## Compatible sensor and telemetry modules in the nemi Link 2400 wireless network

nemi Log is compatible with all sensor and telemetry modules in i4M's nemi Link 2400 network. The following products are available under the nemione® trademark:



nemi G+                                nemi DAQ                            nemi DAQ nano

## Connection option for wired MEMS accelerometer

nemi Log not only offers the option to measure accelerations through the integrated IMU or through wirelessly connected sensors in the nemi Link 2400 network. It has an additional connection for a wired MEMS accelerometer.



Picture: former version of i4M logger with wired MEMS accelerometer

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| General information | | |
|---|---|---|
| Dimensions of the sensor (Plug included) | 30 x 30 x 40 | mm |
| Weight | approx. 60 | Gram |
| Cable length | max. 1.5 | m |
| Temperature range permitted during operation | -20 till 80 | °C |
| Housing protection class | IP 67 | - |
| Main sensor device (MEMS accelerometer) | | |
| Selectable sampling rates | 4000 / 2000 / 1000 / 500 / 250 / 125 | Hz |
| Realizable signal bandwidths (-2 dB) | 1000 / 500 / 250 / 125 / 62,5 / 31,25 | Hz |
| Selectable measuring ranges Variant A Variant B | ± 8, 4, 2 ± 40, 20, 10 | g g |
| Sensor resonance frequency Variant A Variant B | 2.400 5.500 | Hz Hz |
| Signal resolution | 20 | bit |
| Non-linearity (related to measuring range) | 0,1 | % |
| Cross-sensitivity | 1,0 | % |

The wired sensor cannot be used simultaneously with wirelessly connected sensors. The integrated IMU in nemi Log can be used in parallel with both variants, the wireless sensors and the wired sensor.

## Application

nemi Log is particularly suitable for temporary offline applications, where the data can be read out from an SD card. Since it can be mounted very easily and flexibly, it is also often used in rotating and moving applications.

Download use case:

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## Data Analysis

Upon request, we will be happy to support you with data analysis. The data analyses can be performed directly in the sensor or in the gateway by edge analytics as well as on the server or measuring computer. A great advantage of edge analytics is the **reduction of the transmitted data to the essentials** ("smart data"). This **reduces storage space** and **increases battery runtimes**.

Based on our knowledge from a multitude of previous projects, we have developed **algorithms for data evaluation** to generate **maximum added value** for our customers. We will gladly advise you on this. In addition to our existing algorithms we create **individualized scripts** upon request.

At the same time, the **data remains your capital**: We do not rely on big cloud providers but **keep the data in your IT ecosystem**. Alternatively, you can rely on our nemione® cloud solutions - hosted in the European Union.

## Contact

nemione® is a trademark of

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