

Kallisto® Industrial Sensor Module

SY020-MOD02-CM8

Description

The Kallisto® Industrial Sensor Module is a ready-to-use multi-sensor device which embeds sensing, data processing, energy management, and wireless Bluetooth communication in a size-optimized industry-standard IP65 enclosure. This module is based on the product Kallisto® SY020-PCB-B-x-IMEALD, which is specifically extended by a programmable status LED, a programmable switch, an M8 connector and an enclosure as depicted on the right. A spectrum of 16 measurands can be simultaneously detected at configurable sampling rates and processed via its on-board ARM Cortex-M4F. The Kallisto® Industrial Sensor Module can be easily adopted to any kind of Industrial IoT application through a hardware abstraction layer that allows to interact with the module and its features. Customer-specific application software can be programmed by using specifically provided Kallisto® API libraries. Firmware can be updated over the air (OTA).



Features & Benefits

- Multi-sensor device for Industrial IoT
- Simultaneous detection of 16 measurands
- Configurable detection sampling rates
- API for data streaming via Bluetooth® LE
- Compact and ruggedized IP 65 enclosure
- Ready for 24 V industrial power supply

Applications

- Condition Monitoring
- Predictive Maintenance
- Retrofitting for Digitization
- Smart Building
- Track & Trace
- Digital Twin

General Operation Parameters

Characteristics	Value
Power Supply	24 V DC
Power Consumption	< 100 mW (all sensors in use, @ 24 V DC)
Connector (power supply, interface)	M8 (male), 4 pins
Temperature Range	- 20 ... 70 °C
Protection Classification	IP 65
Frequency	2.4 GHz Bluetooth 5 (compatible to BT 4.x)
Power	0 dBm (default)
Range	up to 70 m
Declaration of Conformity	CE

Sensors

The Kallisto® Industrial Sensor Module is equipped with a standard set of rigidly attached sensor components which facilitate the simultaneous detection of 16 different measurands at sampling rates which can be individually configured even after shipment. Acceleration, angular rate and magnetic flux are detected along the x-, y-, and z-directions in space (cartesian coordinates) resulting in a 9 degrees of freedom (9 DGF) inertial measurement. In addition, the environmental measurands temperature, humidity, pressure, CO₂ level, volatile organic components (VOC), air quality index (IAQ), light, and noise can be recorded as well.

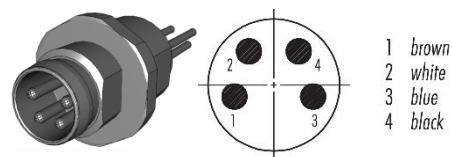
Measurands	Value Ranges	Selectable Sampling Rates / Hz
Acceleration	+/- 4 g for each of x-, y-, z-axes	12.5, 25, 50, 100, 200, 400, 800
Angular Velocity	+/- 2,000 °/s for each of x-, y-, z-axes	25, 50, 100, 200, 400, 800
Magnetic Flux	+/- 1,300 µT for each of x- and y-axes +/- 2,500 µT for z-axis	2, 10, 20, 30, 50, 100, 150, 200
Temperature	- 20 ... 70 °C	0.1, 0.2, 1, 2, 4, 10, 20, 40
Relative Humidity	0 ... 100 %	0.1, 0.2, 1, 2, 4, 10, 20, 40
Ambient Pressure	300 ... 1,000 hPa	0.1, 0.2, 1, 2, 4, 10, 20, 40
ECO2	Estimation of CO ₂ level in ppm	0.017, 0.1, 1
b-VOC	Estimation of breath VOC equivalents in ppm	0.017, 0.1, 1
IAQ	0 ... 500 (index for air quality)	0.017, 0.1, 1
Light	300 ... 1,000 nm 1.2 ... 10 mW/cm ²	0.019, 0.022, 0.026, 0.033, 0.043, 0.063, 0.12, 1
Acoustic Sound	- 135 ... + 3 dBFS	1, 10

Processing Core – Processor, Memory, Interfaces, and Security

The Kallisto® Industrial Sensor Module uses a 64 MHz 32-bit Cortex-M4F. It comes with 1 MB Flash and 256 kB RAM, and has protocol support for Bluetooth LE and mesh, Thread, Zigbee, 802.15.4, ANT, and 2.4 GHz proprietary stacks. Security requirements are fulfilled by an on-chip ARM TrustZone® CryptoCell cryptographic unit.

Power Supply

The industry standard 24 V power supply is supported by an M8 male panel mount connector with 4 contacts. The pin-out is VDD (+) at pin 1 and GND (-) at pin 3. Pins 2 and 4 are not connected. However, the standard Kallisto® Industrial Sensor Module supports a power supply range from 6 to 48 V. If needed, a battery-powered version can be derived upon individual request.



Enclosure

An enclosure with wall brackets and lid fixing from the top is used. It is made from flame-resistant and self-extinguishing material (PC V-0), suitable for outdoor use and f1-listed according to UL 746C. Its protection class is IP 65. The mechanical dimensions are 71.1 x 43.2 x 26 mm.

Support

For further questions, development and programming support, and access to our dedicated Gitlab repository, please contact our support via support@sensry.de.