# Kallisto® Sensor Platform
SY021-PCB-Series

Description

The Kallisto® sensor platform is a family of ready-to-use subassembly modules which embed sensing, processing, energy management, and wireless communication on a small standard-size PCB module. A spectrum of 20 measurands can be simultaneously detected at configurable sensitivities and sampling rates and processed via its on-board ARM Cortex-M4F. Thus, the Kallisto® sensor platform can be easily tailored to any kind of Industrial IoT application through a hardware abstraction layer that allows to interact with the module and its features. Firmware can be updated over the air (OTA).
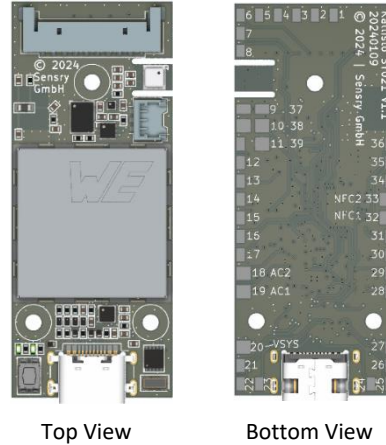
Top View   Bottom View

Features & Benefits

- Multi-sensor device for Industrial IoT
- Simultaneous detection of 20 measurands
- Connectivity via Bluetooth® LE, ZigBee, IEEE 802.15.4, 6LoWPAN, Thread, Matter, USB
- On-board 128 MB Flash Memory for Logging
- 4 high current low-side drivers
- Wireless Qi Power Receiver
- LiPo Charger

Applications

- Industrial IoT
- Predictive Maintenance
- Smart Wearables
- Building & Home Automation
- Track & Trace
- Beacons
- Works as standalone device, in mesh networks or connected to a gateway/cloud

Processor Core, Memory, Interfaces, Security and Firmware

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, Matter, IEEE 802.15.4, ANT, and 2.4 GHz proprietary stacks. Security requirements are fulfilled by an on-chip ARM TrustZone® with a CryptoCell cryptographic unit.

The SY021-PCB is equipped with a Zephyr RTOS based Kallisto® firmware, which allows to configure all sensors and their live stream data to any BLE client, a gateway, a mobile app or an IPC supporting BLE. Sensry is offering a variety of client support services like mobile Apps (Web App, iOS or Android) as well as a platform independent Python-based client library module.

Extension Interface and Ship Mode

The extension interface provides I2C, Audio PDM, UART and 2 GPIOs, is equipped with a 10-pin Molex Pico-Lock-Connector, type 504050-1091, and allows to extend the sensor module with periphery. Molex provide several cable assemblies (MOLEX 15132100x) as a board-to-board connector.

A special ship mode, designed for transportation and long-time storage, allows to switch off the device completely while the battery is still connected. It isolates the battery and reduces quiescent current.

Sensors

In its standard configuration, the Kallisto® sensor platform is equipped with a set of rigidly attached sensor components which facilitate the simultaneous detection of 20 different measurands at sampling rates which can be individually configured even after shipment.

Optionally, additional sensor components can be connected to the SY021-PCB by making use of its multiple I/O interfaces. The integration in the firmware can be purchased from Sensry GmbH. This flexibility enables a customization according to customer requirements and application needs.

	Measurands	Value Ranges	Sampling Rates / Hz
Movement	Acceleration	±4 g … ±16 g for x-, y-, z-axis	12.5 … 800
	Angular Velocity	±125 °/s … ±2,000 °/s for x-, y-, z-axis	25 … 800
	Magnetic Flux	± 50 gauss for each x-, y-, z-axis	10 … 150 Hz
	High f Vibration	±8 g … ±64 g for each x-, y-, z-axis	0.781 … 25600
Environmental Conditions	Temperature	- 40 … 85 °C	0.1 … 1
	Relative Humidity	0 … 100 %rH	0.1 … 1
	Ambient Pressure	300 … 1,100 hPa	0.1 … 1
	Light	1.2 … 10 mW/cm2 (300 … 1,000 nm)	0.1 … 8
	Sound	-135 dBFS to +3 dBFS	0.1 … 1
Air Quality	ECO2	Estimation of CO2 level (400 ppm … infinity)	0.017 … 1
	b-VOC	Estimation of breath VOC equiv. (0.5 … 1000 ppm)	0.017 … 1
	IAQ	0 … 100 (index for air quality)	0.017 … 1

Electrical Parameters

The PCB module can be powered over USB-C, Qi Charger or LiPo-battery. The board system voltage to power the SoC and periphery is 1.8V. Idle power consumption is typically below 2 mW, thus the module can run for several days on one battery charge, depending on usage pattern of the different sensors, which could also individually be deselected or put into sleep mode.

Mechanical Parameters

Parameter	Value
Board Type	LGA with Top-Side Assembly
Size (L x B x H)	54 x 22 x 5 mm³
Mounting holes	3 x M2
Battery Connector	MOLEX 78171-0003
Extension Connector	MOLEX 504050-1091
Antenna	On-board chip antenna
Power + Data	USB-C
Switch Button	Reset
LEDs	Charging + Connection

Support

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

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