# Ganymed Starter Kit
SY120-SK

Description

The Sensry Ganymed® Starter Kit aims at development evaluations at advanced stages of application and solution developments. It embeds sensing, processing, energy management and radio communications in one monolithic PCB module. This PCB module also provides multiple sensors and power management add-ons to enable the development of a huge variety of IoT, IIoT and AIoT applications and solutions. The Sensry Ganymed® ecosystem provides a hardware abstraction layer that allows developers to seamlessly interact with the module and its features to reduce the development time. A software development kit (SDK) and various application programming interfaces (API) are available for the Ganymed® platform to facilitate entry and application-specific implementation of Ganymed® products.
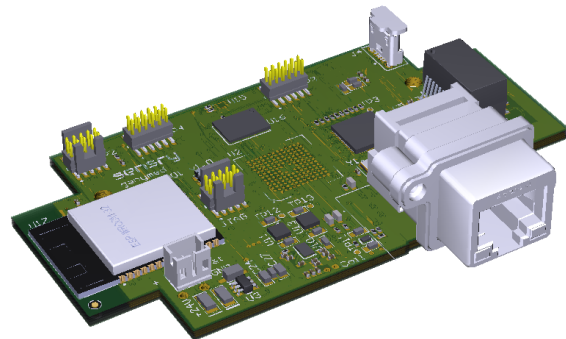
Features & Benefits

- Multi-sensor device for IoT, IIoT and AIoT
- On-board Hardware Abstraction Layer interface for easy programming
- 12 V power supply

Applications

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

General Operation Parameters

Characteristics	Value
Power Supply	12 V DC
Connector (power supply, interface)	M8 (male), 4 pins
Temperature Range	0 … 60 °C
Protection Classification	IP 40, opt. IP 65
Wireless Interface[1]	2.4 GHz WiFi Interface 802.11 b/g/n Bluetooth v4.2 BR/EDR and LE specification
Ethernet Interface (wired)	IEEE 802.3 10/100/1000 Mbps with Time Synchronization (IEEE 802.1AS), Traffic shaping & scheduling (IEEE 802.1Qav, IEEE 802.1Qbv)
Declaration of Conformity	None (evaluation purpose; engineering device)

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[1] Bandwidth limited to 2 Mbps for WiFi, Bluetooth and combination (incl. protocol overheads)

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Processing Core – Processor, Memory, Interfaces, and Security

The Ganymed® Starter Kit runs on a proprietary system-on-chip circuit which contains nine RISC-V cores out of which one core serves as a data acquisition unit which acquires the output signals of the sensor components connected. The remaining eight cores, arranged in a cluster, independently serve as data processing units. Each core runs at a maximum of 400 MHz. They are supplemented by 4 MB global and 64 kB secure SRAM as well as 512 kB global and 512 kB secure MRAM. Due to its integrated security features, like the secure RAM, non-volatile memory, AES support, random number generator, e-fuses and OTP memory, the Ganymed® modules can be operated as a real "Root-of-Trust" nodes with the IoT, IIoT and AIoT.

Sensors

The Ganymed® Starter Kit is equipped with a set of rigidly attached sensor components which facilitate the simultaneous detection of 4 different measurands at sampling rates which can be individually configured even after shipment. Vibration is detected along the x-, y-, and z-directions in space (cartesian coordinates). In addition, acoustic sound can be recorded as well.

Optionally, the amount of measurands can be extended using either an additional internal printed circuit board equipped with further sensor components, e. g. acceleration, angular velocity, magnetic flux, temperature, ambient pressure, relative humidity etc., or external sensor components specifically connected to the Starter Kit's IO ports.

Measurands	Value Ranges	Interface
Vibration	+/- 16 g for each of x-, y-, z-axes	I^2C1
Acoustic Sound	Stereo microphone data	I^2S0

Power Supply

The Ganymed® Starter Kit can be powered between 12 and 24 V_{dc} applied via 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.


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1  brown
2  white
3  blue
4  black
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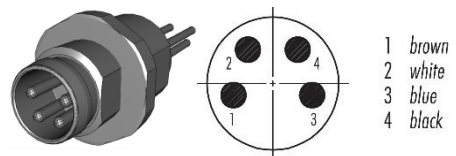
Enclosure

An enclosure with mounting flange and lid fixing from the bottom is used. Its protection class is IP 40, but can be upgraded to IP 65. The mechanical dimensions are 121 x 62 x 31 mm.

Memory Extension (optional)

The Ganymed® Starter Kit is equipped with an interface for micro SD cards which can be addressed via SPI (SPI5). Optionally, the Starter Kit can be ordered with a pre-installed SD card. Its bandwidth is limited to 50 Mbps.

Support, Ordering

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