

NextGenXDK - Industrial Sensor Module

Universal sensor kit for IoT applications requiring sensor access authentication based on LEGIC Connect

Description

The NextGenXDK Sensor Module is a smart, ready-to-use multi-sensor device which embeds sensing, data processing and secure wireless communications in a small industry-standard IP65 enclosure. It works seamlessly with the LEGIC Connect mobile credentialing platform to enable dynamically provisioned access permissioning to sensor configurations and/or data based on Android / iOS devices.

It comes with NFC/Bluetooth® Low Energy/WiFi/Zigbee transceiver and M8 connector for power supply and optional wired data communications, programmable hidden switch, and status LED. 20 sensor outputs can be simultaneously monitored with configurable sensitivity and sampling rate. Data can be locally pre-processed and recorded in an embedded memory implementing sophisticated storage algorithms. The module firmware is based on the Zephyr Real Time Operating System (RTOS) allowing easy development of customer-specific software extensions and firmware updates over-the-air (FOTA).

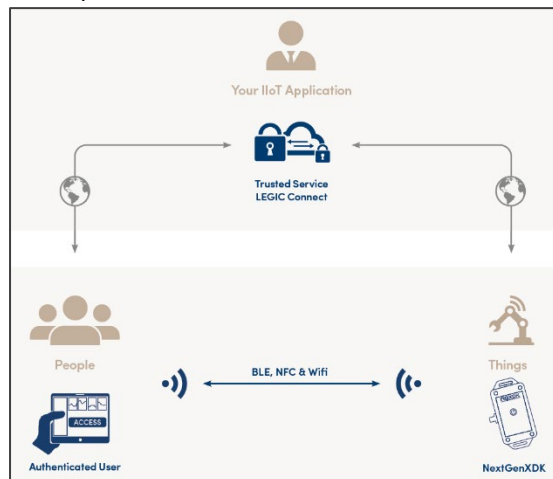


Features & Benefits

- Prototyping platform that shortens time-to-market for industrial sensor-based IoT applications
- Fully integrates with [LEGIC Connect](#) mobile security platform enabling operators to create, distribute and revoke mobile credentials as well as configure sensors and IoT devices over-the-air
- Integrated sensors monitor up to 20 environmental parameters with configurable sampling rates, intervals and pre-/postprocessing
- Embedded LEGIC SM-6300 Security Module with programmable encryption key in Secure Element enables end-to-end encryption (AES-128)
- Supports WiFi, Bluetooth® Low Energy, Zigbee, Thread, Matter, NFC, USB 2.0, and UART/RS485/Modbus (via M8), I²C, SPI (internal)
- Data access over BLE GATT or WiFi MQTT
- Secure data protocol prevents data interception, eavesdropping, tampering, and sensor spoofing
- Small form factor: length 71.1 mm x width 43.2 mm x height 26 mm
- After prototype completion, purpose-built size and cost optimized modules with only required functionality can be provided by Sensry

Application Examples

- Smart building operations & energy saving systems either new installments or easy retrofit
- Track & trace in logistics and supply chain
- Environmental sensing, including air quality
- Condition monitor, predictive maintenance
- Capturing data for digital twin installations
- Secure monitoring of critical or sensitive infrastructure such as in hospitals, power stations, public transportation, airports, and building access control systems



General Operation Parameters

Characteristics	Value
Power Supply	5 V - 24 V DC
Power Consumption	130mW - 1500mW depending on logging, WiFi and SM-6300 functionality
Connector (power supply, interface)	M8 (male), 4 pins, 2 power, 2 for RS485, UART, USB
Temperature Range	- 20 ... 70 °C
Protection Classification	IP 65
Frequency	2.4 GHz BT 5.4, 2.4/5 GHz WiFi 802.11a/b/g/n/ac/ax, 13.56 MHz NFC
Transmit Power	BT 8 dBm (max.) WiFi 16dBm (max.)
Range	BT up to 70 m, WiFi up to 50 m, NFC up to 4 cm

Sensors

The NextGenXDK Industrial Sensor Module is equipped with a standard set of rigidly attached sensor components, which facilitate the simultaneous detection of 20 different parameters at individually configurable sensitivity and sampling rates. Acceleration, angular rate, magnetic flux as well as high frequency vibrations are detected along x-, y-, and z-directions. In addition, it measures temperature, humidity, air pressure, CO₂ equivalent level, volatile organic components (VOC), air quality index (IAQ), and light intensity. Two embedded microphones allowing directional noise measurements are included as well.

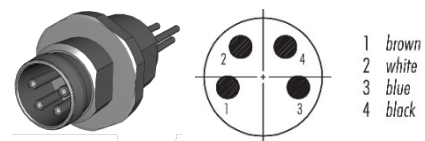
Parameter	Value Ranges	Selectable Sampling Rates / Hz
3 Acceleration	±2 g, ±4 g, ±8 g, ±8 g	12.5, 25, 50, 100, 200, 400, 800
3 Angular Velocity	±125 °/s, ±250 °/s, ±500 °/s, ±1,000 °/s ±2,000 °/s	25, 50, 100, 200, 400, 800
3 Magnetic Flux	+/- 1,300 µT for each of x- and y-axes +/- 2,500 µT for z-axis	2, 10, 20, 30, 50, 100, 150, 200
3 Vibration	±8 g, ±16 g, ±32 g, ±64 g	0.781 to 25600
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	0.033, 0.3, 1
b-VOC	Estimation breath VOC equivalents (ppm)	0.033, 0.3, 1
IAQ	0 ... 500 (index for air quality)	0.033, 0.1, 1
Light	300 ... 1,000 nm; 1.2 ... 10 mW/cm ²	1, 1.25, 2, 4, 8
Acoustic Sound	- 135 ... + 3 dBFs	1, 10

Processing Core – Processor, Memory, Interfaces, and Security

The NextGenXDK uses a 64 MHz 32-bit Cortex-M4F. It comes with 1 MB Flash, 256 kB RAM, and has protocol support for Bluetooth LE and mesh, Thread, Zigbee, 802.15.4, ANT, and 2.4 GHz proprietary stacks. End-to-end encryption (AES-128) is provided by the LEGIC Security Platform comprising the embedded SM-6300 Security Module and LEGIC Connect Trusted Service. Encryption key is stored in Hardware Secure Element.

Power Supply

Industry standard 24 V power supply is supported by a 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 can be not connected or factory configured to support RS485 (Modbus), UART or USB. It supports a power supply range from 5 to 24 V using M8 or an optional USB interface.



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 for access to our dedicated Gitlab repository, please contact our support via support@sensry.de.