



SensorMine

NEXUS

Product Sheet

NEXUS



The SensorMine NEXUS IoT communications device is a secure universal wireless platform designed for robust long life sensing applications.

The NEXUS has built in capability to provide temperature, barometric air pressure readings, 3 axis vibration readings and GPS for accurate location. Battery energy is measured and tracked to have a real time measurement of battery usage and to provide the lifetime remaining in the batteries.

An external accessories connector allows the NEXUS to interface with many external sensors such as 4-20mA industrial sensors, soil moisture probes, temperature probes, weather stations, water level probes, high sensitivity equipment vibration sensors and air quality sensors. The NEXUS accessories connector supports 4-20mA, RS232, RS422, RS485, one-wire, analog and digital Inputs, regulated voltage output and can switch DC loads allowing a multitude of interface possibilities.

These external sensors can be powered from the NEXUS's internal battery to reduce setup complexity and save time.

The NEXUS can communicate over distances up to and beyond 10km via the built in LoRa transceiver. For urban versatility, the NEXUS can communicate via NB IoT on compatible 4G and 5G LTE networks. Bluetooth BLE communications are also supported and can be customised to a given application.

The NEXUS supports firmware over the air upgrades.

FEATURES

LoRaWAN long range transceiver

LTE NB IoT 4G and 5G Cellular interface

Onboard GPS

Onboard 3 axis vibration sensor

Onboard barometric pressure sensor

Connector for interfacing to external sensors

High-capacity internal Li-SOCL2 batteries

Can be powered via the Connector for mains (via adaptor) or solar applications

Accurate battery life tracking

No external antennas, all antennas are built in

Robust weatherproof IP68 housing

USES & APPLICATIONS



Asset Monitoring

Vibration analysis on rotating equipment (pumps, motors, conveyors).

Oil quality tracking in transformers or hydraulic systems.

Temperature monitoring for electrical cabinets, machinery, and bearings.

Environmental Monitoring

Borehole water level and pressure measurement for groundwater management.

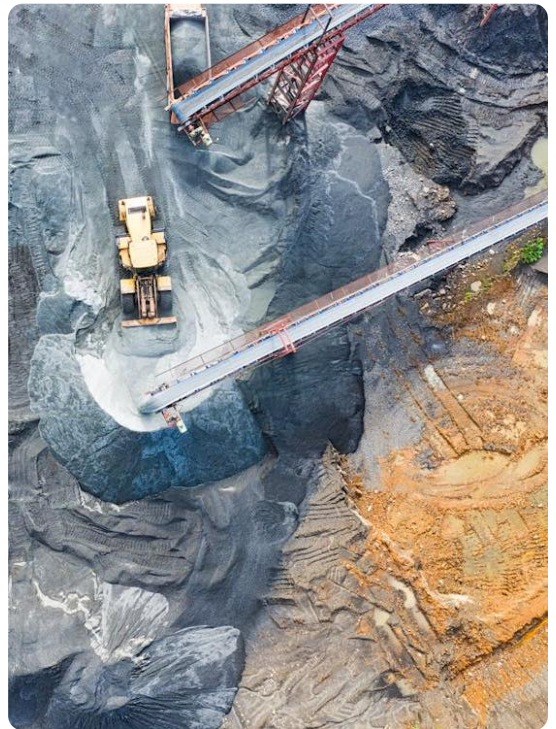
Weather station deployment for wind, rainfall, and temperature tracking.

Dust monitoring at mine sites and construction zones.

Flood detection in culverts, bridges, and low-lying corridors.

Dam stability monitoring with water level and soil moisture sensors.

Water quality sensing for pH, turbidity, and conductivity in rivers or storage.



Infrastructure Applications

Bridge condition monitoring using strain and displacement sensors.

Remote site telemetry for utilities and transport networks.

SPECIFICATIONS

Wireless Transmission

Technology: LoRaWAN

Frequency Band	AU915 & AS923 (915–928MHz)
Tx Power	+14dBm
Rx Sensitivity	-137dBm @ DR0 SF10/125kHz
Working modes	Class A, Class B, Class C
Range – open field	Up to 13km

Technology: 3GPP LTE Release 14 Cat-M1

Bands	Cat-M1: B1, B2, B3, B4, B5, B8, B12, B13, B18, B19, B20, B25, B26, B28, B66, B85
Power modes	DRX, eDRX, PSM
Tx Power	+23dBm max.
Rx Sensitivity	-108dBm (Cat M1)

Technology: 3GPP LTE Release 14 Cat-NB1 and Cat-NB2

Bands	Cat-NB1/NB2: B1, B2, B3, B4, B5, B8, B12, B13, B17, B19, B20, B25, B26, B28, B65, B66, B85
Power modes	DRX, eDRX, PSM
Tx Power	+23dBm max.
Rx Sensitivity	-107dBm

Technology: BLE

Frequency Range	2402MHz to 2480MHz
Channels	CH0 to CH39 with 2MHz spacing
Tx Power	-20dBm to +4dBm
Rx Sensitivity	-96dBm for BER <0.1%
Range – open field	Up to 70m

Technology: NFC

Frequency Range	13.56MHz
Type	Type 2 tag – used for provisioning

Onboard Sensors

Accelerometer: Three-Axis Linear Accelerometer

Measurement Range	±2g/±4g/±8g/±16g
Sensitivity	0.88 mg/digit
Resolution	12 bits
Frequency	1.6Hz to 1600Hz

Barometric Pressure

Measurement Range	300 to 1200mbar
Sensitivity	0.016 mbar
Resolution	24 bits

Temperature

Measurement Range	-40°C to 85°C
Sensitivity	±1°C
Resolution	0.01°C

GPS

Sensitivity	-156.5dBm (tracking)
Positional Accuracy	<3.4m (CEP 50)
Altitude	15,000m max
Velocity	183m/s

Magnetometer

Three-Axis Digital Magnetometer

Resolution	16-bit
Magnetic Range	±50 gauss magnetic dynamic range
Sampling Rates	100 kHz, 400 kHz, 1 MHz, and 3.4 MHz

SPECIFICATIONS

Physical

Operational Temperature Range	-30° to 80°C
Altitude (max)	2000m above sea level
IP Rating	IP68
Dimensions	119mm × 145mm × 56mm
Weight	525 grams
ESD Protection	±16kV air and contact discharge
Flammability	Housing: UL94 – V.0, Labels: UL94 – V.2
Case Material	30% glass filled Nylon

External Interfaces

RS232

Baud	1200bps to 1Mbps
Handshake	CTS & RTS

RS422 / RS485

Baud	1200bps to 1Mbps
Duplex	Half and full duplex

One Wire

Frequency	100kHz & 400kHz
Voltages	1.8V ±5%, 3.3V ±10%, and 5.0V ±5/10%
Pull Ups	Active pull up, supports strong pullup for parasite power

Analog Voltage Input

Voltage	0V to 3V max
Sample Rate	200ksps
Resolution	12bit

Power

Regulated Voltage Output 1 (from internal batteries or external supply)

Voltage	Software selectable 3.3V or 5V
Current	250mA

Regulated Voltage Output 2 (from internal batteries or external supply)

Voltage	12V
Current	100mA

4–20mA Input

Channels	4
Resolution	16bit

External Supply Input

Voltage	5V min to 34V max
Current	<1A

External Supply Switch

Voltage	5V min to 34V max
Current	1A max
On State Resistance	200mΩ

Internal Peripheral

8GB storage – permanently logs all device activity.
Upgradable to 2TB

Real-time clock

Battery energy monitor

36Ahr long life wide temperature range internal Li-SOCL₂ battery

SPECIFICATIONS

Battery Life

Our device features **market-leading onboard power**, with a **36Ah internal battery** that delivers exceptional endurance. This means it can **collect and transmit a very high number of sensor readings** without needing external power or frequent battery changes.

In practice, this allows long-term, reliable operation in remote or hard-to-access locations—**running for years while continuously monitoring and reporting data.**



For example:

- **Depth Probe over NB IoT 30-minutes reading AND transmission to the cloud:**
10 years
- **Radar Distance Measurement over NB IoT 60-minutes reading AND transmission to the cloud:**
10 years
- **Tilt Meter over NB IoT 60-minutes reading AND transmission to the cloud:**
12 years
- **Vibration Readings over NB IoT 60-minutes reading AND transmission to the cloud:**
11 years

Unlike many competitors who claim long lifespans by only storing data and transmitting it once a day, our approach is more transparent. We specify sampling rates that **include both data collection and real-time transmission.**

This means when we say a device samples every 30 minutes, it's actually reading, processing, and sending that data live—not just logging it for later upload. The result is more accurate reporting, faster insights, and honest performance claims you can rely on.



POWER ARRAY

Unmatched Autonomy for Remote IoT

The **SensorMine NEXUS Power Array** is the essential, high-capacity smart battery solution designed to dramatically extend the operational autonomy and capability of your SensorMine Nexus field communication devices.

Providing an immense **180 Amp-Hour (Ah)** capacity — a five-fold increase over the standard Nexus onboard battery — this significant power boost allows clients in demanding environments to run **power-intensive probes** and sensors and support **increased data collection and transmission frequency**.



Engineered for Extreme, Off-Grid Deployment

In remote, off-grid locations where site access is costly, reliable power is critical. The Power Array's massive capacity translates directly to **extended maintenance cycles and uninterrupted data flow** for months or even years, drastically reducing the need for costly manual intervention.

Built for the **harshest conditions**, its features include a **solid aluminium** construction, an IP68 rating for protection against dust and water, and a functional temperature range of **-30 to 80° celcius**.



Consistent Power and Seamless Platform Integration

The NEXUS Power Array provides a reliable, **low-maintenance** power source, bypassing the inherent vulnerabilities of intermittent energy harvesting methods like solar power, which are easily impacted by local conditions such as shade, dust, and weather. This guarantees **consistent, sustained power** regardless of the environment.

Crucially, the Power Array is designed for **seamless, integrated operation** with the Nexus device, offering full **remote monitoring and device management capabilities** directly within the SensorMine platform. This ensures you can track its health and consumption with complete confidence, leveraging all platform insights without power-related risk.

POWER ARRAY

SPECIFICATIONS

Capacity	180 Ah	5x the capacity of the standard SensorMine Nexus battery.
Construction	Solid Aluminium	Rugged, durable housing for field use.
Ingress Protection (IP)	IP68	Dust-tight and protected against long-term water immersion.
Operating Temperature	-30° to 80° C	Ensures reliability in extreme climates.
System Integration	Seamless with SensorMine NEXUS	Direct connectivity for enhanced field operation.
Platform Monitoring	Full Remote Management	Real-time health and consumption reporting within SensorMine.
Use Case	Increased transmission frequency and/or power for intensive sensors.	Designed to maximise device activity and data capture.

PRE-INTEGRATED PROBES

SensorMine NEXUS is a highly versatile unit designed to accommodate a wide variety of sensor probes for industrial and environmental monitoring. To accelerate deployment, SensorMine offers a comprehensive range of pre-integrated probes, each selected for reliability, accuracy, and seamless compatibility with the SensorMine platform.



Compact Ultrasonic Weather Station

Complete weather monitoring solution with ultrasonic technology

- Multi-parameter measurement
- Ultrasonic technology
- Compact design



DS18B20 Temperature Sensor

Digital temperature sensor with high accuracy

- $\pm 0.5^{\circ}\text{C}$ Accuracy
- Waterproof
- -55°C to $+125^{\circ}\text{C}$ range



QM30VT1 Vibration / Temperature Sensor

Combined vibration and temperature monitoring

- Dual measurement
- Industrial grade
- Real-time monitoring



HR200 80GHz High Accuracy Radar Level Sensor

High-frequency radar level measurement

- 80GHz frequency
- High accuracy
- Non-contact measurement



HPT613-S Submersible Ceramic Capacitance Level Sensor

Ceramic capacitive level measurement

- Ceramic membrane
- High stability
- Chemical resistant



VEGABAR 82 Pressure Transmitter

Universal pressure measurement

- Ceramic measuring cell
- Wide application range
- High reliability

PRE-INTEGRATED PROBES



WearDetect Oil Debris Sensor

Oil condition monitoring

- Real-time monitoring
- Early failure detection
- Maintenance optimization



HPT604-GT Fuel Level Sensor for Generator Lower Fuel Tanks

Digital temperature sensor with high accuracy

- Generator-specific design
- Reliable measurement
- Low maintenance



Multicomp Pro Float Switch, NC, Vertical

Simple level detection

- Normally closed
- Vertical mounting
- Reliable operation



Honeywell Air Quality Sensor

Dust/particulate detection

- PM2.5, PM10 output (standard); PM1.0, PM2.5, PM4.0, Co2
- EMC: Heavy industrial level IEC61000
- Maintenance optimization



Honeywell Gas Detectors

Gas detection for Carbon Logging/Hazard detection

- carbon monoxide
- hydrogen sulfide
- oxygen
- sulfur dioxide
- combustible gases



Air Speed/Flow Measurement

Air Flow/Speed and Direction

- No Moving Parts
- 0-45m/s
- Uses Doppler Effect

Bring Your Own Sensors

Our flexible platform allows for seamless integration of a wide range of sensors. Let us know about your specific requirements, and we'll work with you to ensure your sensors are fully compatible with SensorMine. We support multiple interface standards—RS232, RS485, and OneWire—enabling fast integration with virtually any third-party probe.

END TO END SOLUTIONS



We provide complete end-to-end solutions.

All brackets, wiring looms, deployment instructions, and commissioning guides are fully supplied and commissioned by us. This ensures our customers receive a fully functional system without needing to coordinate multiple suppliers.

Our ready-to-deploy kits include proven configurations for flood monitoring, borehole level monitoring, and a wide range of other environmental and operational scenarios.

Each kit is designed for rapid installation, reliable performance, and seamless integration into your existing monitoring network.

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