

packetSENSE Outdoor Air Quality

The **packetSENSE Outdoor Air Quality** with solar panel is a low-power, LoRaWAN®-enabled device designed for ongoing monitoring of key environmental parameters, including particulate matter (PM1, PM2.5, PM10), temperature, and humidity. Data is recorded at configurable intervals and can be viewed or analyzed through Packetworx's packetVIEW software or integrated with supported third-party platforms for flexible reporting and analysis.

Powered by a solar panel with a backup battery providing up to seven (7) days of operation, the device supports reliable monitoring during periods of limited sunlight. Its rugged, energy-efficient design supports easy installation and minimal maintenance. Regular inspection of air vents is recommended to prevent contamination or blockage and help maintain sensor performance.

Features

- **LoRaWAN®-compatible** for long-range, low-power data transmission
- **Optimized IoT end-node** for seamless network integration
- **Multi-parameter sensing:** temperature, humidity, and particulate matter (PM1, PM2.5, PM10)
- **Configurable** periodic updates for continuous environmental tracking
- **Built-in backup battery** for up to 7 days of operation
- **Rugged**, weatherproof design for reliable outdoor performance

Applications

- **Air quality** and environmental monitoring
- **Smart city** infrastructure and pollution control
- **Weather and climate** observation systems
- **Industrial** and process automation
- **Carbon emission** measurement and management

Technical Specification

Data Communication Supported

Technology	LoRaWAN®
Frequency	AS923-3 (915 MHz)
Tx Power	25 dBm
Class	Class A

Sensor Specifications

Temperature

Operating Mode	Dewar Capacitive Principle
Range	-40 °C to +70 °C
Accuracy	±0.8 °C (15 °C to 35 °C)
Resolution	0.1 °C
Repeatability	±1.5 °C (-10 °C to +60 °C)

Humidity

Operating Mode	Dewar Capacitive Principle
Range	0% RH to 100% RH
Accuracy	±6% RH (15 °C to 35 °C, 20% RH to 65% RH) ±9% RH (10 °C to 60 °C, 0% RH to 100% RH)
Resolution	0.1% RH
Repeatability	±0.4% RH

PM1.0

Operating Mode	Optics Principle
Range	0 µg/m³ to 1 µg/m³
Accuracy	±15%
Resolution	1 µg/m³

PM2.5 & PM10

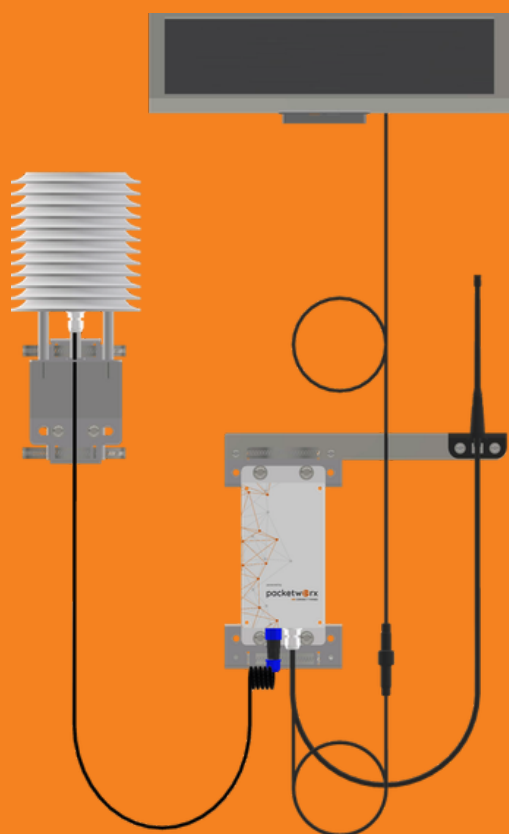
Operating Mode	Optics Principle
Range	0 µg/m³ to 1,000 µg/m³
Accuracy	±10% (100 µg/m³ to 500 µg/m³) ±10 µg/m³ (0 µg/m³ to 1,000 µg/m³)
Resolution	1 µg/m³

SO₂

Operating Mode	Electrochemical Principle
Range	0.0 ppm to 20.0 ppm
Accuracy	±0.4 ppm
Resolution	0.1 ppm

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CO₂

Operating Mode	Dewar Capacitive Principle
Range	0 ppm to 40,000 ppm
Accuracy	±(50 ppm + 5% of reading) [@ 400–2,000 ppm]
Resolution	10 ppm

CO

Operating Mode	Electrochemical Principle
Range	0.0 ppm to 500.0 ppm
Accuracy	±10.0 ppm
Resolution	0.1 ppm

O₃

Range	10 ppb to 10,000 ppb
Resolution	10 ppb

Electrical and Communication Specification

Power Supply	12 V / 24 W / 2 A Solar Panel
Battery Type and Configuration	2S3P LiFePO ₄ , 6.4 V / 19.2 Ah (61.44 Wh)
Backup Battery Capacity ¹	Up to 38 hours @ 15-minute transmission interval (SF7)
Solar Charging Capacity ²	40.17 Wh
Communication	RS485 - Modbus RTU protocol
Sensor Stabilization ³ and Response Time ⁴	Sensor Stabilization Time: 3 minutes Response Time: 15 seconds

Electrical and Communication Specification

Operating Temperature	–20 °C to +60 °C
Relative Humidity	0% RH to 90% RH (non-condensing)
Ingress Protection	IP65
Installation	Pole Mounting

Technical Specification Notes

¹ Battery backup capacity pertains to the run-hour capacity of the whole device assuming that there is no sunlight. The battery backup capacity is tested under laboratory conditions and for guidance purposes only.

² Solar Charging Capacity pertains to the estimated remaining power (Wh) the solar panel can provide to charge the battery considering 4 hours of sunlight a day while the whole system is completely operational.

³ Sensor Stabilization Time pertains to the heat up time of the sensors before any reading requests.

⁴ Response Time pertains to the ideal frequency of reading requests once sensor stabilization time passes. This ensures that each reading request is accurate.