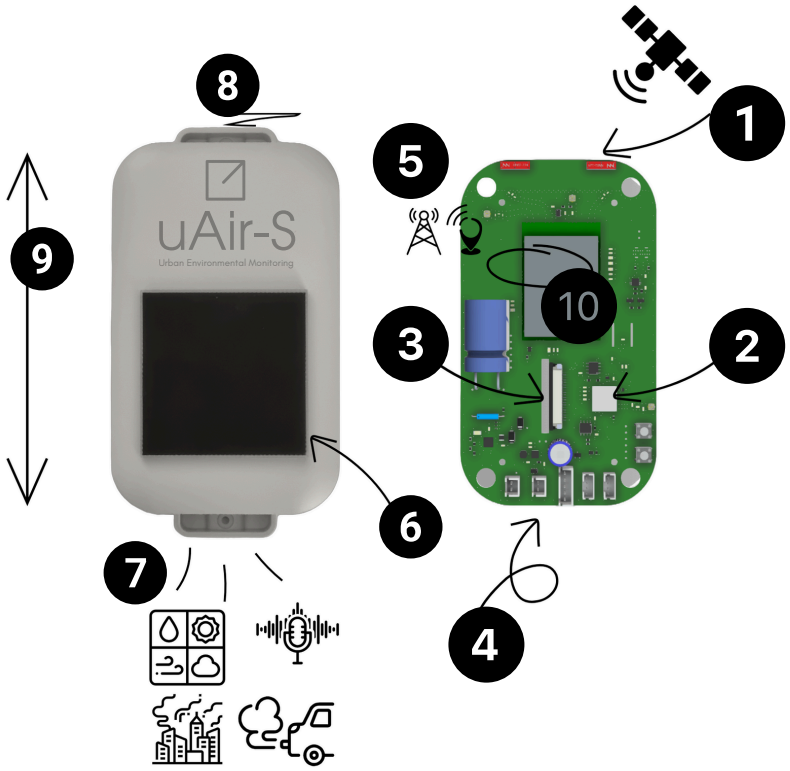
uAir-Sat

Transforming Urban Environmental Monitoring

The uAir-SaT is a next-generation IoT device designed to monitor outdoor air quality and environmental noise. Utilizing direct-to-satellite LoRaWAN communications, it ensures flexible deployment in any outdoor location, providing vital data to enhance public health and urban planning.



Device overview

1. S-Band RX/TX antennas
2. Main MCU (apps)
3. Interface for outdoor sensor module
4. Solar panel Int/ Grove / dB sound level meter
5. 868/915MHz ISM LoRaWAN | GPS / GNSS
6. High-efficiency Solar cells
7. Waterproof vents for outdoor sensor module
8. Outdoor waterproof and UV-resistant enclosure
9. 170 x 90 mm | Wall and pole mounting
10. SAT Module - EchoStar Mobile LoRa network

Technical specs[1]

- Main SOC + Aux MCU + EM Comm. module
- Solar energy harvesting
- Extended operation. Up to 10 years
- Embedded S-Band + Internal Active GPS and ISM antennas
- Designed to support LoRaWAN 1.1, FUOTA, Secure provisioning
- MEMS sensors: Outdoor AQI, O3, NO2, Temp, Hum, Pressure, PM2.5[2]
- Customizable Gas scanner
- dB sound level meter module with onboard audio spectrum analysis
- Grove UART and I2C interfaces for optional custom sensors or actuators

Empowering Cities and Communities with Real-Time Air Quality and Noise Data

Benefits

- **Enhanced Public Health**: Provides critical data to reduce pollution-related health issues
- **Enhanced Public Safety**: Real-time detection of critical sounds for quicker emergency responses
- **Urban Planning Support**: Helps design better urban environments with detailed pollution maps
- **Cost-Effective**: Low maintenance and long operational life reduce overall costs

Use Cases

- **Smart City Planning**: Create high-resolution air quality and noise pollution maps for informed urban planning
- **School Zones**: Ensure safe environments for children
- **Green Areas**: Maintain the quality of recreational spaces
- **Industrial Zones**: Track emissions and ensure regulatory compliance

Key Features

- **Dual Communication Mode**: Terrestrial and Satellite LoRaWAN
- **Maintenance-Free**: Solar-Powered for Long-Term Operation
- **Compact and Durable**: Rated for Outdoor Use
- **Advanced Sensors**: Air Quality, Noise Levels, Temperature, and Humidity

Exposure to air pollutants affects our lungs, heart, and brain, leading to diseases, lower intelligence, and respiratory problems. We can't stop breathing, but we can improve our air. Effective action requires better understanding and awareness of air quality and ways to enhance it.

Sources: Articles from World Health Organization, National Center for Biotechnology Information and National Geographic

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1 - Preliminary technical specifications. Subject to change. Some features are optional. 2 -PM2.5 module planned for Q1 2025

REV 1