AirU Pro

Datasheet

+1 (801) 410-0240 TELLUSENSORS.COM SALES@TELLUSENSORS.COM

Introducing the AirU Pro

Built on a scalable platform, TELLUS devices are **designed to adapt to meet your specific air quality measurement requirements**. With its expandable circuit board, the AirU Pro can be personalized to deliver highly accurate measurements of the air pollutants you care about helping you gain insights to **reduce air pollution exposure and make data-driven decisions.**

The AirU Pro is powered by a 5VDC USB-C cable, and can easily connect to a local Wi-Fi network or cellular network (with the provided sim card), using the secure TELLUS AirView app. Once connected, the AirU Pro will periodically collect air quality data and securely upload it to the TELLUS server. Users have multiple options to view their air quality data, including through the AirView dashboard on any computer or smartphone, directly from the API, and from the onboard SD card. This flexibility allows for easy access and analysis of air quality data.

Low Barrier to Entry

- Start with the Wi-Fi or Cellular base model and customize your AirU Pro by adding sensors as needed, at any time.
- Include existing third-party monitors and air quality data sources to your TELLUS air quality sensor network and reduce capital equipment costs.

Modular Sensor Platform

- Build the perfect air quality monitor for your project.
- Add up to 2 VOC sensors, a dedicated PM10 (Dust) sensor, a noise sensor, and up to 4 additional gas sensors that are specifically related to your project requirements.
- Only pay for what you need.

Completely Wireless Options

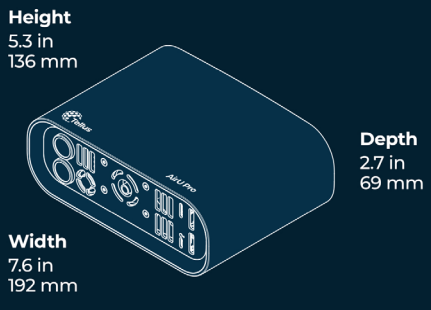
- Choose between Wi-Fi or Cellular network communication methods.
- Add rechargeable IoT batteries for short-term remote projects.
- Add solar power supply for long-term remote projects.

Find Accessories & More for Your AirU at

tellusensors.com/shop

Contribute to the solution, ***help create a safer tomorrow*** by expanding the TELLUS sensor network

tellusensors.com/airview



Fine Particle ($PM_{2.5}$) Sensor

- Independent PM_1, $PM_{2.5}$, PM_{10} concentrations
- Sample rate: ~1/second (+/- 20%)
- Particle range: 0.3 to 1.0, 1.0 to 2.5, 2.5 to 10 (µm)
- Size categorization: 24 software bins
- Sampling interval: 1 to 30 seconds
- Total flow rate (typical): 1.0 L/min
- Sample flow rate (typical): 100 mL/min
- Particle effective range ($PM_{2.5}$): 1 to 500 µm/m^3

Wi-Fi & Bluetooth MCU

- Wi-Fi: 802.11 b/g/n (Wi-Fi model only)
- Bandwidth: 2.4 GHz (Wi-Fi model only)
- Bluetooth: v4.2 BR/EDR and Bluetooth LE

Wi-Fi Model	LTE Model
GPS • Latitude, Longitude, Elevation • Wi-Fi: 802.11 b/g/n • Bandwidth: 2.4 GHz • Bluetooth: v4.2 BR/EDR & Bluetooth LE	GNSS • Latitude, Longitude, Elevation • 4G LTE • SIM Card: Hologram IO • Range: ~60 miles • Bandwidth: 1.4 MHz • Bluetooth: v4.2 BR/EDR & Bluetooth LE

Micro-SD Card

- 32 GB FLASH
- 1-Channel SPI Interface
- Data collection stored locally
- Error logs stored locally

Carbon Monoxide (CO) & Hydrogen Sulphide Sensor (H_2S)

- Sensitivity: 50 to 100 nA/ppm in 400ppm CO
- Response time: < 35 t90 (s) from zero to 400ppm CO
- Zero current: -3 to +3.5 ppm equivalent in zero air
- Resolution: < 0.5 rms noise (ppm equivalent)
- Range: 1,000 ppm CO limit of performance warranty
- Linearity: 10 to 40 ppm error at full scale, linear at zero and 400 ppm CO
- Overgas limit: 5,000 maximum CO for stable response to gas pulse

Temperature, Pressure, & Humidity Sensor

- Digital temperature and humidity sensor
- Sampling rate: same as upload period
- Temperature in Degrees Celsius
- Relative Humidity (%)
- Barometric Pressure (bar)

Formaldehyde Sensor (CH_20)

- Measurement range: 0 - 1000 ppb
- Accuracy: +/-20 ppb or +/-20% m.v. Sensor output
- Formaldehyde concentration in ppb, RH, T
- Cross sensitivity to ethanol: < 0.5%
- Limit of detection: < 20 ppb

Coarse Particle (PM_{10}) Sensor

- Independent PM1, PM2.5, PM10 concentrations
- Sample Rate: ~1/second (+/- 20%)
- Particle range**: 0.35 to 40 µm spherical equivalent size (based on RI of 1.5)
- Size categorization: 24 software bins
- Sampling interval: 1 to 30 seconds
- Total flow rate (typical): 5.5 L/min
- Sample flow rate (typical): 280 mL/min
- Max particle count rate: 10,000 particles/second

Max coincidence probability:

- 0.84 %concentration at 10^6 particles/L
- 0.24 %concentration at 500 particles/L

Volatile Organic Compounds (VOCs) Sensor

- Target gases: VOCs w/ionization potentials < 10.6 eV
- Minimum Detection Level: 1 ppb
- Linear Range: 40 ppm
- Overrange: 40 ppm
- Sensitivity Minimum range*: 25 mV/ppm
- Sensitivity Typical range*: 50 mV/ppm
- Full stabilization time: 5 minutes
- Warm up time: 5 seconds
- Offset Voltage: 40 mV to 75 mV
- Response Time t90 (s): 2 seconds
- Power consuption: 80 mW - 200 mW
- Supply Voltage: 3.2 to 5.5 VDC
- Signal: 0.040 to 2.85 V
- Relative Humidity Range: 0 to 95% non-condensing
- Humidity Sensitivity: Near zero (to 75%RH)

Decibel (Noise) Sensor

- Extended frequency response from 50 Hz to >20 kHz
- Fourth-order Σ-Δ modulator
- Digital pulse density modulation (PDM) output
- Sensitivity: -26 dB FS +/- 1 dB
- SNR: 64 dBA
- Current: 430 µA
- Acoustic Overload Point: 120 dB SPL

Sulfur Dioxide Sensor (SO_2)

- Sensitivity: 300 to 550 nA/ppm in 10ppm SO_2
- Response time: < 35 t90 (s) from zero to 10ppm SO_2
- Zero current: -< +/- 0.6 ppm equivalent in zero air
- Resolution: < 0.1 rms noise (ppm equivalent)
- Range: 50 ppm limit of performance warranty
- Linearity: < +/- 0.3 ppm error at full scale, linear and 10 ppm
- Overgas limit: 75 maximum ppm for stable response to gas pulse

Nitrogen (NO_2) Dioxide Sensor

- Sensitivity: -175 to -500 nA/ppm at 2ppm NO_2
- Response time: < 80 t90 (s) from zero to 2ppm NO_2
- Zero Current: -70 to +70 nA in zero air at 20˚C
- Noise*: 15 +/-2 standard deviations (ppb equivalent)
- Range: 20 ppm NO_2 limit of performance warranty
- Linearity: < +/- 0.5 ppm error at full scale, linear at zero and 20ppm
- Overgas limit: NO_2 maximum 50 ppm for stable response to gas pulse

Ozone (O_3) Sensor

- Sensitivity: -200 to -650 nA/ppm at 1ppm O_3
- Response time: < 80 t90 (s) from zero to 1ppm O_3
- Zero Current: -70 to +70 nA in zero air at 20˚C
- Noise*: 15 +/-2 standard deviations (ppb equivalent)
- Range: 20 ppm O_3 limit of performance warranty
- Linearity: < +/- 0.5 ppm error at full scale, linear at zero and 20ppm
- Overgas limit: maximum 50 ppm for stable response to gas pulse

Bold border - Default component

*** - Tested with AirU low-noise circuit**
**** - Based on 100% detection efficiency at 0.35 µm, 50% at 0.3µm**

Operation Characteristics

Operating Temperature: -10˚ to 45˚C
Power Requirement: 5V/2A (USB-C)

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