AIRINS Meteorological System - Basic Specs

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1. System Overview

- Dimensions: approximately 600 × 126 × 100 mm; weight ≤ 630 g (varies depending on selected configuration).
- Operating temperature: -20~60 °C; relative humidity: 0~100 %RH (non-condensing).
- Capable of simultaneously monitoring 5 meteorological parameters, including wind speed, wind direction, atmospheric pressure, temperature, and humidity.
- Wind speed, direction, and aircraft motion data are updated at 10 Hz with continuous, low-latency data output, ensuring real-time data acquisition for high-frequency monitoring applications.
- The system features a high-strength aluminum alloy enclosure and 22 mm carbon fiber tubes, providing an optimal balance of lightweight design and structural rigidity.
- Integration with the aircraft requires only four mounting screws and a single cable, enabling fast and simple installation.

- The SD card records comprehensive aircraft flight data (including horizontal speed, vertical speed, heading, etc.) together with meteorological data for post-flight analysis.
- The system connects to the DJI Matrice 400 via a dedicated adapter cable from the PSDK port to the aircraft E-Port V2. It can also be mounted on a ground-based tripod for stationary monitoring.
- The temperature and humidity sensor is equipped with an active air intake fan significantly reduces response time.
- Special structural design minimizes the downwash effect and thermal radiation under strong sunlight conditions.
- No mechanical moving parts and no inertial measurement components; capable of capturing high-frequency gust components.
- LEDs indicating operation status: sensor assembly, GNSS, SD card, LTE, aircraft communication, and main program.
- Fully support DJI Payload SDK (PSDK). The user can view Sniffer4D Nano 2 Plus's real-time data or control Sniffer4D using the DJI Pilot 2 App running on the DJI remote controller.
- Built-in LTE connectivity with no external antenna. Support global 4G, 3G, EDGE, and GPRS networks. A SIM card with cellular data needs to be provided by the user or purchased separately from AIRINS. Then set the proper APN in the Config file of the SD card.
- Equipped with an additional Type-C interface (built-in TTL serial port) for external device expansion (custom development required; external devices must support TTL communication).
- Standard configuration includes a 32 GB industrial-grade MicroSD card.

2. Sensor Specifications

2.1 Wind Speed & Wind Direction Sensor (Standard)

- Principle: ultrasonic sensing
- Response time: 1 s
- Sampling frequency: 10 Hz
- Wind Speed
  - Resolution: 0.01 m/s
  - Measurement range: 0~50 m/s
  - Accuracy: ±0.2 m/s (0~10 m/s), ±2% (11~30 m/s), ±4% (31~50 m/s)
- Wind Direction
  - Resolution (u/v/w): 1.0°

- Measurement range (u/v): 0~359°
- Accuracy (u/v): ±1.0°
- Measurement range (w): ±15° relative to sensor horizontal plane

- Atmospheric Pressure
  - Resolution: 0.01 hPa
  - Measurement range: 500~1150 hPa
  - Accuracy: ±1.0%

2.2 Temperature & Humidity Sensor (Optional)

- Temperature
  - Resolution: 0.1 °C
  - Measurement range: -40~80 °C
  - Accuracy:
    - ±0.1 °C (15~25 °C)
    - ±0.15 °C (0~15 °C , 25~40 °C)
    - ±0.4 °C (-40~0 °C , 40~80 °C)
- Humidity
  - Resolution: 0.1 %RH
  - Measurement range: 0~100 %RH
  - Accuracy:
    - ±1.5 %RH (0~40 °C , 0~90 %RH)
    - ±2.5 %RH (0~40 °C , 90~100 %RH)
    - ±3.0 %RH (-40~0 °C , 40~80 °C, 0~90 %RH)
    - ±4.0 %RH (-40~0 °C , 40~80 °C, 90~100 %RH)