Sniffer4D + AIRINS.ai - Components & Specs

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1. Sniffer4D Nano 2 Plus Base Unit Overview

- Ultra-compact design with dimensions smaller than 110 × 76 × 80 mm and a total weight of ≤ 240 g (depending on the selected module configuration).
- Operating temperature range: -20~60 °C.
- Rated IP55 for ingress protection, enabling safe short-term operation in rainy conditions without damage to the device.
- Sense up to 6 gases at a time. Available parameters include: PM 1.0, PM 2.5, PM 10, TSP / PM 100, O3, NO2, CO, TVOC, H2S, NH3, Odor, SO2, HCHO, Wind, and Temperature & Humidity. Simultaneously measuring temperature, humidity, and atmospheric pressure.
- Support direct plug-and-play connection to the E-Port of DJI Matrice 4D / 4TD & DJI Dock 3 (mounting screws included). Optional integration kits enable deployment on DJI Matrice 400, Matrice 350 / 300, Matrice 4E / 4T, Matrice 30 / 30T, non-DJI aircrafts, robotic dogs, and ground vehicle platforms.
- Active air intake system significantly reduces response time.
- Support multi-pass tunable diode laser absorption spectroscopy (MP-TDLAS) detection method for quantitative methane measurement, contact-based and sensitive to methane only.
- 6 LEDs indicating Sniffer4D Nano 2 Plus's operating status: sensor assembly, GNSS, SD card, LTE, aircraft communication, and main program. These indicators can be remotely observed through the built-

in camera stream of DJI Dock 3.

- 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.
- Real-time encrypted data transmission (1Hz) with data retrieval algorithm. The data retrieval function allows storing up to 12h of data when communication is lost, and the data can be automatically retrieved after the communication is reconnected.
- Swarm supported. One or multiple Sniffer4Ds can communicate with one or multiple visualization terminals.
- 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.
- Support integration with DJI FlightHub 2 (including the On-Premises version), enabling real-time gas data visualization and remote payload control through DJI Payload SDK (PSDK).
- Support integration with multiple software ecosystems, including AIRINS.ai software, DJI FlightHub 2, and third-party software platforms for efficient data management and analysis.
- Support mission data backup with Sniffer4D's built-in SD card (.csv format), and the stored mission data can be read and analyzed on AIRINS.ai platform.
- Sniffer4D Nano 2 Plus Built-in Temperature & Humidity Monitoring Module
  - Temperature detection range: -40~85 °C; Resolution: 0.1 °C; Accuracy: ±1 °C;
  - Humidity detection range: 0~100 %RH; Resolution: 0.1 %RH; Accuracy: ±5 %RH;
  - Pressure detection range: 300~1100 hPa;
  - Response time: 1s.

> ❗
> - *SIM card can be provided at an additional cost.*
> - *Equipped with a 32GB MicroSD card.*



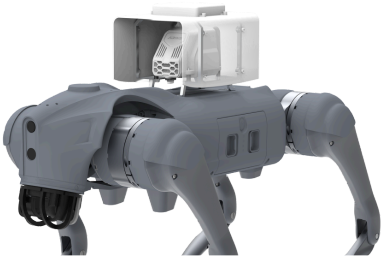
With DJI Matrice 4D / 4TD & Dock 3



With DJI Matrice 4E / 4T



With DJI Matrice 400
(Up to 2 Sniffer4D Nano 2 Plus)



Robot Dog



Ground Vehicle

2. Data Processing Platform

2.1 AIRINS.ai Software (AAI)

- Real-time Data Visualization: Enables millisecond-level data ingestion with remote mission start and stop capabilities to ensure accurate acquisition and storage. Real-time synchronized visualization includes concentration trend charts and trajectory mapping. Users can switch between point cloud, hexagonal grid, and heatmap representations. Each grid displays average and peak values. Color mapping supports AQI scales, linear gradients, and custom classification intervals for intuitive spatial distribution analysis.
- Support Automated Missions: Users can set mission start and end geofenced areas, enabling the system to automatically initiate sampling upon entering a monitoring zone and terminate data collection upon exiting the designated area. This ensures that only data from target monitoring regions is collected, enabling fully unattended operations.
- Support Historical Data Processing: Monitoring data is organized and stored by mission, with multi-criteria search and retrieval capabilities. All map layers support both 2D and 3D visualization modes and can be displayed as point clouds, hexagonal grids, or interpolated heatmaps. Synchronized timeline linkage between concentration trend charts and map layers enables precise spatiotemporal analysis.

Multiple monitoring parameters can be displayed as dual / quad views. Support import and export of CSV, Shapefile, and GeoJSON formats for seamless data migration and archiving.

- Generated Report: AIRINS.ai turns each mission into a structured, actionable report. It summarizes the mission time period, location, area, and concentration information, providing interval and spatial concentration distribution at ppm levels. Reports can be exported as PDF or editable DOCX for sharing and follow-up.
- AAI MQTT Data Forwarding: Provides encrypted real-time transmission of monitoring data to third-party systems via MQTT protocol. In cases of poor connectivity, missing data packets are buffered locally and automatically retransmitted once the connection is restored. The system is built on a multi-node architecture to ensure high availability and scalability under large-scale deployments.
- AAI Webpage Embedding: Zero-development, rapid-deployment integration that allows all AIRINS.ai functionalities to be embedded directly into existing customer systems. No additional operation, maintenance, or infrastructure management is required, significantly reducing deployment complexity and long-term maintenance costs.

3. Selectable Modules

It supports simultaneous detection of up to 6 gas parameters (5 module slots) in one Sniffer4D Nano 2 Plus Multi-Gas unit. Users may select up to 5 slots according to their requirements, or alternatively select either the MP-TDLAS methane unit or the total suspended particulate (TSP / PM 100) module as a standalone configuration.

3.1 Sniffer4D Nano 2 Plus Methane (200 ppb LOD)

- Display Resolution: 100 ppb;
- Limit of Detection: 200 ppb (3x typical baseline noise 60 ppb at stable temperature);
- Linear Range: 0~11,000 ppm;
- Overall response time: 1 s;
- Repeatability: < 1 %FS;
- Detection method: Multi-pass Tunable Diode Laser Absorption Spectroscopy (Closed-path MP-TDLAS) for quantitative methane measurement, contact-based and sensitive to methane only.
- MP-TDLAS methane sensing module has excellent gas selectivity, which is only sensitive to methane. The frequency of the light source may be consistent with the absorption frequency of gas molecules.
- Compared with the Sniffer4D NDIR module, its resolution is increased by 100 times.

❗
- *For natural gas plant / landfill routine CH4 rough survey.*
- *Standalone system can not be chosen in conjunction with other modules.*

3.2 Inhalable Particulate Matter (PM 1 & 2.5 & 10) Sensing Module

- Principle: laser scattering / light scattering;
- Sense PM 1.0 (particle size 0.3~1 um), PM 2.5 (particle size 0.3~2.5 um), and PM 10 (particle size 0.3~10 um);
- Particle counting effectiveness: 50% @ 0.3 um, 98% @ > 0.5 um;
- Linear Range: 5~1000 ug/m³;
- Limit of Detection: 5 ug/m³;
- Repeatability: <2 %FS;
- Display Resolution: 1 ug/m³;
- Warm-up time from a cold start: <10 s;
- Overall response time: <10 s;
- Estimated service life: >36 months;
- On-chip proprietary humidity correction algorithm, enabling better data quality in wide humidity range.

❗ *For general environmental monitoring.*

3.3 Total Suspension Particular Matter (TSP / PM 100) Sensing Module

- Principle: light scattering;
- Sense PM 2.5 (particle size 0.3~2.5 um), PM 10 (particle size 0.3~10 um) and PM 100 (TSP) (particle size 1~100 um);
- Particle counting effectiveness: 50% @ 0.3 um, 98% @≥0.5 um;
- Linear Range: 30~3,000 μg/m³;
- Limit of Detection: 50 μg/m³
- Display Resolution: 1 ug/m³;
- Time resolution: 1 s;
- On-chip proprietary humidity correction algorithm, enabling better data quality in wide humidity range.
- Overall response time: ≤10 s;
- Estimated service life: ≥20000 h;

- Operating temperature:-30~70 °C;
- Operating humidity: 0~95 %RH (non-condensing).

> ❗
> - *For general environmental monitoring.*
> - *Can not be chosen in conjunction with other modules.*

3.4 O3+NO2 Sensing Module

- Principle: electrochemistry;
- Sensitive to both O3 and NO2, but unable to identify individual concentrations;
- Linear Range: 0~11 ppm;
- Limit of Detection: 10 ppb;
- Repeatability: <4 %FS;
- Overall response time (t90): <45 s (0~1 ppm);
- Display Resolution: 1 ppb;
- On-chip proprietary humidity correction algorithm, enabling better data quality in wide humidity range.
- Warm-up time from a cold start: ≈2 minutes;
- Sensitivity drift: -20~-40 %/year (in laboratory environment);
- Zero drift: 0~20 ppb/year (in laboratory environment);
- Est. service life: >24 months;
- Operating temperature: -30~40 °C (Note that the module may require readjustment on its zero point due to changes in operating temperature or working environment.);
- Operating humidity: 15~85 %RH.

> ❗
> - *For general environmental monitoring.*
> - *This combination is also called "Ox", or "photochemical oxidant", which represents the oxidizing ability of the air.*
> - *Individual O3 concentration is calculated using: O3=(O3+NO2)-NO2.*

3.5 NO2 Sensing Module

- Principle: electrochemistry;
- Linear Range: 0~11 ppm;
- Limit of Detection: 10 ppb;

- Repeatability: <4 %FS;
- Overall response time (t90): <60 s (0~2 ppm);
- Display Resolution: 1 ppb;
- On-chip proprietary humidity correction algorithm, enabling better data quality in wide humidity range.
- Warm-up time from a cold start: ≈2 minutes;
- Sensitivity drift: -20~-40 %/year (in laboratory environment);
- Zero drift: 0~20 ppb/year (in laboratory environment);
- Est. service life: >24 months;
- Operating temperature: -30~40 °C (Note that the module may require readjustment on its zero point due to changes in operating temperature or working environment.);
- Operating humidity: 15~85 %RH.

> ❗ *For general environmental monitoring, HAZMAT response, and ship fuel sulfur content monitoring.*

3.6 CO Sensing Module

- Principle: electrochemistry;
- Linear Range: 0~11 ppm;
- Limit of Detection: 0.05 ppm;
- Repeatability: <4 %FS;
- Overall response time (t90): <20 s (0~10 ppm);
- Display Resolution: 0.005 ppm;
- On-chip proprietary environmental and individual difference compensation algorithms, enabling better data quality in wide temperature and humidity ranges;
- Warm-up time from a cold start: ≈2 minutes;
- Sensitivity drift: <10 %/year (in laboratory environment);
- Zero drift: <±100 ppb/year (in laboratory environment);
- Est. service life: >36 months;
- Operating temperature: -30~50 °C (Note that the module may require readjustment on its zero point due to changes in operating temperature or working environment.);
- Operating humidity: 15~90 %RH.

> ❗ *For general environmental monitoring and HAZMAT response.*

3.7 SO2 Sensing Module

- Principle: electrochemistry;
- Linear Range: 0~15 ppm;
- Limit of Detection: 0.03 ppm;
- Repeatability: <4 %FS;
- Overall response time (t90): <40 s (0~2 ppm);
- Display Resolution: 0.005 ppm;
- On-chip proprietary environmental and individual difference compensation algorithms, enabling better data quality in wide temperature and humidity ranges;
- Warm-up time from a cold start: ≈2 minutes;
- Sensitivity drift: <±15 %/year (in laboratory environment);
- Zero drift: <±20 ppb/year (in laboratory environment);
- Est. service life: >36 months;
- Operating temperature: -30~50 °C (Note that the module may require readjustment on its zero point due to changes in operating temperature or working environment.);
- Operating humidity: 15~90 %RH.

> ❗ *For general environmental monitoring, HAZMAT response, and ship fuel sulfur content monitoring.*

3.8 H2S Sensing Module

- Principle: electrochemistry;
- Linear Range: 0~90 ppm;
- Limit of Detection: 0.03 ppm;
- Repeatability: <4 %FS;
- Overall response time (t90): <55s (0~2ppm);
- Display Resolution: 0.01 ppm;
- On-chip proprietary environmental and individual difference compensation algorithms, enabling better data quality in wide temperature and humidity ranges;
- Warm-up time from a cold start: ≈3 minutes;
- Sensitivity drift: <20 %/year (in laboratory environment);
- Zero drift: <±100 ppb/year (in laboratory environment);
- Est. service life: >24 months;

- Operating temperature: -30~50 °C (Note that the module may require readjustment on its zero point due to changes in operating temperature or working environment.);
- Operating humidity: 15~90 %RH.

> ❗ *For general environmental monitoring, oil & gas leak detection, and HAZMAT response.*

3.9 NH3 Sensing Module

- Principle: electrochemistry;
- Linear Range: 0~100 ppm;
- Limit of Detection: 1 ppm;
- Repeatability: <2 %FS;
- Accuracy: ±5 %FS;
- Overall response time (t90): <50 s (0~50 ppm);
- Display Resolution: 0.1 ppm;
- On-chip proprietary individual difference compensation algorithms, enabling better data quality in wide temperature and humidity ranges;
- Sensitivity drift: <3 %/year (in laboratory environment);
- Zero drift: <±2 ppm/year (in laboratory environment);
- Est. service life: >24 months;
- Operating temperature: -40~50 °C (Note that the module may require readjustment on its zero point due to changes in operating temperature or working environment.);
- Operating humidity: 15~95 %RH.

> ❗ *For odor detection and HAZMAT response.*

3.10 OU Sensing Module

- Principle: electrochemistry;
- Linear Range: 0~10 ppm;
- Limit of Detection: 0.1 ppm;
- Repeatability: <5 %FS;
- Overall response time (t90): <30 s (0~10 ppm);
- Display Resolution: 0.01 ppm;

- Warm-up time from a cold start: ≈3 minutes;
- Est. service life: >36 months;
- Operating temperature: -40~55 ℃ (Note that the module may require readjustment on its zero point due to changes in operating temperature or working environment.);
- Operating humidity: 15-95 %RH (non-condensing).

> ❗ *For odor detection and general environmental monitoring.*

3.11 Volatile Organic Compounds (TVOC) Sensing Module

- Principle: photoionization detection (PID);
- Target gases: total volatile organic compounds (TVOC) with ionization potential energies <10.6eV;
- Linear Range: 0~50 ppm (isobutylene);
- Limit of Detection: 0.02 ppm;
- Repeatability: <4 %FS;
- Response time (t90): <3 s (diffusion mode);
- Display Resolution: 0.01 ppm;
- On-chip proprietary, enabling better data quality in wide temperature and humidity ranges;
- Warm-up time from a cold start: ≈5minutes;
- Estimated service life: 5000 working hours;
- Operating temperature: -40~55 °C;
- Operating humidity: 0~95 %RH;
- Humidity has almost no effect on the measurement in 0~75 %RH;
- The default target gas is isobutylene. To measure other types of VOC, users need to adjust the sensitivity correction factor of the module.

> ❗ *For general environmental monitoring, oil & gas leak detection, and HAZMAT response.*

3.12 HCHO Sensing Module

- Principle: solid-state electrochemistry;
- Linear Range: 0~100 ppm;
- Limit of Detection: 1 ppm;
- Accuracy: ±5 %FS;

- Repeatability: <2 %;
- Overall response time (t90): <3 s (0 to 50ppm);
- Display Resolution: 0.1 ppm;
- On-chip proprietary temperature compensation algorithms, enabling better data quality in wide temperature and humidity ranges;
- Warm-up time from a cold start: ≈5 minutes;
- Est. service life: >36 months;
- Operating temperature: -40~55 °C (Note that the module may require readjustment on its zero point due to changes in operating temperature or working environment.);
- Operating humidity: 15~95 %RH (non-condensing).

4. After-Sales Supports & Services

4.1 1-Year Warranty for Non-Human Damages

- For non-human damages, all repair costs (including shipping cost) are covered by AIRINS during the standard 1-year warranty period.
- Man-made damage includes, but is not limited to: damage caused by dropping, water permeating, etc.

4.2 User Training

- During warranty period, remote training & technical support are provided via phone and video conferencing.
- Face-to-face training & support can be arranged (additional cost may occur).

4.3 Warranty Extension

- Extend the default warranty for 1-2 more years. Policies need to be made case by case.
- Warranty extension needs to be purchased together with the product.

4.4 Paid Repair Service

- Paid repair is provided for man-made damages.
- You could send the broken product back to the manufacturer (AIRINS) for paid repair, or you could also ask the manufacturer (AIRINS) to provide onsite repair at additional cost.

5. Product Customization

5.1 Sniffer4D Nano 2 Plus Base Unit Surface Logo Customization

- Customize laser-engraved logo on the top surface of Sniffer4D Nano 2 Plus.
- Details about the manufacturer and the product (laser-engraved on the bottom of Sniffer4D Nano 2 Plus) may not be able to be modified due to compliance requirements.