

INDUSTRIAL AIR MONITORING



PRODUCT DATASHEET

Fort Digital Pollution, Air Quality & Smoke Alert System

PM1.0 | PM2.5 | PM4.0 | PM10



PM1-PM10 PARTICLE MONITORING	4G LTE + Wi-Fi AUTO FAILOVER	18650 INTERNAL BACKUP BATTERY
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Live particulate readings, configurable threshold alerts, trend history and remote access for offices, factories, warehouses, schools, server rooms and other monitored spaces.

SAFETY NOTICE This product monitors airborne particulate levels and can alert on smoke-related particles. It is not a certified smoke detector, fire alarm or life-safety device and must not replace code-compliant fire detection or evacuation systems.

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1. Product Overview

The Fort Digital Pollution, Air Quality & Smoke Alert System combines a professional-grade Sensirion SPS30 particulate matter sensor with a cellular/Wi-Fi gateway, mobile app and internal rechargeable battery. It continuously measures airborne particle mass and count, presents live status remotely and sends push notifications when configured thresholds are reached.

Core Capabilities

- Live PM1.0, PM2.5, PM4.0 and PM10 mass-concentration readings.
- Particle number outputs for NC0.5, NC1.0, NC2.5, NC4.0 and NC10, plus typical particle size.
- Configurable threshold alerts with instant mobile push notifications.
- Live status, trend history, event records and CSV export from the Fort Digital Sensors app.
- Wi-Fi plus 4G LTE connectivity with automatic failover when Wi-Fi is unavailable.
- Internal rechargeable 18650 battery for temporary operation during power interruption.
- Open-air enclosure promotes ambient sampling and reduces retained heat around electronics.
- Optional custom firmware, alert logic, escalation workflow and reporting requirements.

Measured Outputs

Output group	Displayed values	Unit
Mass concentration	PM1.0, PM2.5, PM4.0, PM10	$\mu\text{g}/\text{m}^3$
Number concentration	NC0.5, NC1.0, NC2.5, NC4.0, NC10	$\#/\text{cm}^3$
Particle size	Typical particle size	μm
Air-quality interpretation	App threshold / AQI presentation where configured	Status

How It Works

1. **Sample:** The SPS30 fan draws ambient air through the optical measurement chamber.
2. **Measure:** Laser-scattered light is analysed to determine particle mass and number concentration.
3. **Transmit:** Readings are sent through Wi-Fi or 4G LTE to the Fort Digital service.
4. **Alert:** Authorised phones display live data, trends, records and threshold notifications.

NETWORK DEPENDENCY Live viewing and alerts require an active Internet connection, valid app service and, when cellular is used, an activated Nano-SIM with data service and suitable coverage.



Wi-Fi primary connection with automatic 4G LTE failover

2. Sensirion SPS30 Sensor

The SPS30 uses fan-assisted laser scattering and onboard algorithms to report calibrated particulate mass and number concentration. Sensirion's contamination-resistance design supports stable long-term operation in air-quality applications.



Sensirion SPS30 particulate matter sensor

Sensor parameter	Specification
Measurement principle	Laser scattering with integrated fan and onboard signal processing
Mass concentration range	0 to 1,000 $\mu\text{g}/\text{m}^3$
Mass size bins	PM1.0: 0.3-1.0 μm ; PM2.5: 0.3-2.5 μm ; PM4: 0.3-4.0 μm ; PM10: 0.3-10.0 μm
Number concentration range	0 to 3,000 $\#/\text{cm}^3$
Number size bins	NC0.5, NC1.0, NC2.5, NC4.0 and NC10
Sampling interval	1 $\pm$ 0.04 seconds
Typical stable start-up	Approximately 8-30 seconds, depending on particle concentration
Expected sensor lifetime	>10 years MTTF at 24-hour/day operation; actual life depends on conditions
Acoustic emission	Maximum 25 dB(A) at 0.2 m
Laser	660 nm typical; Class 1 to DIN EN 60825-1
Supply voltage	4.5 to 5.5 VDC; 5.0 VDC typical
Measurement current	55 mA typical, 65 mA maximum; 80 mA maximum during fan start
Dimensions / weight	41 x 41 x 12 mm / 26.3 $\pm$ 0.3 g
Digital interfaces	I ² C and UART

Published Precision

Output	0-100 range	100-1,000 range
PM1 / PM2.5 mass	$\pm[5 \mu\text{g}/\text{m}^3 + 5\% \text{ m.v.}]$	$\pm 10\% \text{ m.v.}$
PM4 / PM10 mass	$\pm 25 \mu\text{g}/\text{m}^3$	$\pm 25\% \text{ m.v.}$

m.v. = measured value. Default datasheet conditions apply. PM4 and PM10 values are calculated from the measured particle distribution profile.

Sensor source: Sensirion SPS30 Datasheet, Version 2.0 - D1, June 2023. <https://sensirion.com/resource/datasheet/sps30>

3. System Specifications

The integrated Main Module provides processing, wireless communications, battery backup and mobile-app connectivity for the SPS30 sensor.

Parameter	Specification
Overall enclosure size	125 mm x 90 mm x 40 mm
System weight	206 g
Input power	5 VDC through USB-C port
Supplied power cable	USB-A to USB-C, approximately 2-3 m
Enclosure	DIN-rail / PLC-style industrial plastic enclosure; open-air ventilation design
Internal battery	Rechargeable NCR 18650 Li-ion battery
SIM format	Nano-SIM; SIM card and mobile data plan are not included
Processor	Dual-core CPU, up to 240 MHz
Flash memory / PSRAM	4 MB / 8 MB
Connectivity	Wi-Fi plus 4G LTE with automatic failover from Wi-Fi to LTE
Mobile network	4G LTE Cat-1 with 2G GSM/GPRS/EDGE support
LTE FDD bands	B1 / B2 / B3 / B4 / B5 / B7 / B8 / B12 / B13 / B18 / B19 / B20 / B25 / B26 / B28 / B66
LTE TDD bands	B34 / B38 / B39 / B40 / B41
Main module environment	-10 to +70 deg C; 5% to 85% RH, non-condensing
SPS30 absolute limits	-10 to +60 deg C; 0% to 95% RH
Recommended sensor conditions	10 to 40 deg C and 20% to 80% RH for best performance
Mobile application	Fort Digital Sensors app for iOS and Android

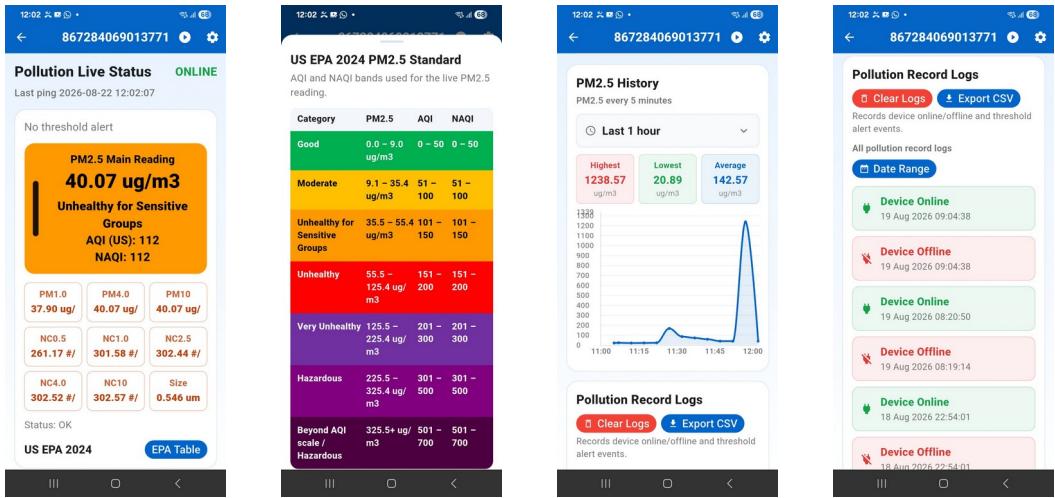
Power, Battery and Installation Notes

- Use the most restrictive environmental rating of any system component; avoid condensation, direct rain, oil mist and corrosive or explosive atmospheres.
- Battery operating time varies with battery condition, temperature, signal strength, network activity and configuration; test backup operation periodically.
- Install with unobstructed air inlet/outlet paths so the sensor samples representative ambient air.
- Avoid locations immediately beside steam, aerosols, exhaust outlets or strong airflow unless that source is intentionally being monitored.
- Band support does not guarantee service on every operator; confirm SIM activation, APN settings, coverage and local carrier compatibility.

BATTERY SAFETY Use only the specified battery type and supplied or approved charging equipment. Do not short-circuit, crush, puncture, expose to fire or replace the battery while external power is connected.

4. Mobile App, Applications and Supply

Live Monitoring and Records



Live readings | Reference table | Trend history | Event records

- Live PM mass, particle-count and typical-size readings
- Configurable threshold status and mobile push notifications
- PM2.5 trend history with highest, lowest and average values
- Online/offline and threshold event records with CSV export
- Remote viewing from authorised iOS and Android devices

Typical Applications

Environment	Monitoring purpose
Factories and workshops	Airborne dust, process particles and smoke-related events
Warehouses and logistics	Ambient particulate trends and unusual smoke/particle increases
Offices, schools and homes	Indoor PM trends and ventilation awareness
Server and equipment rooms	Remote environmental visibility and abnormal particle alerts
Construction and temporary sites	Mobile-network-connected particulate monitoring

Standard Package

Qty	Item	Notes
1	Fort Digital Main Module with SPS30 sensor	Includes internal rechargeable NCR 18650 battery
1	USB-C charging cable	Approximately 2-3 m
1	5 V Safety Mark adaptor	For Main Module charging / operation
-	Fort Digital Sensors mobile app	Service terms according to quotation or subscription

Not included: Nano-SIM card, mobile data plan, Wi-Fi service, mounting hardware and installation materials unless stated in the quotation.

5. Deployment and Maintenance

Commission the monitor at its final installation point so airflow, connectivity, thresholds, notifications and backup operation can be verified under representative site conditions.

Quick Deployment

Step	Action	Commissioning guidance
1	Connect	Insert an activated Nano-SIM if cellular backup is required, then connect approved 5 V USB power.
2	Register	Install the app, scan the device QR code and enter the supplied PIN.
3	Configure	Set Wi-Fi, alert thresholds, recipients and notification rules.
4	Commission	Confirm readings, alerts, Wi-Fi/LTE failover and battery operation at the installation point.

Commissioning Checklist

- Air inlet and outlet paths are open and the unit samples representative ambient air.
- Live PM values update in the app and the device reports online status.
- Configured thresholds generate the expected phone notification.
- Wi-Fi interruption causes successful 4G LTE failover where cellular service is configured.
- External power interruption is detected and battery-backed monitoring continues for the tested period.
- All authorised recipients can access the device, history and event records.

Routine Maintenance

- Keep ventilation openings clear; remove surface dust without forcing debris into the sensor.
- Periodically test notification delivery, Wi-Fi/LTE failover and backup-battery operation.
- Review logs for repeated offline events, unusual drift or persistent threshold alarms.
- Inspect the power cable, adaptor, enclosure and mounting; replace damaged parts promptly.

IMPORTANT Specifications may change without notice. Final configuration, accessories, subscription, warranty and support scope are governed by the accepted quotation and Fort Digital terms and conditions.



SCAN TO DOWNLOAD THE FORT DIGITAL SENSORS APP

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