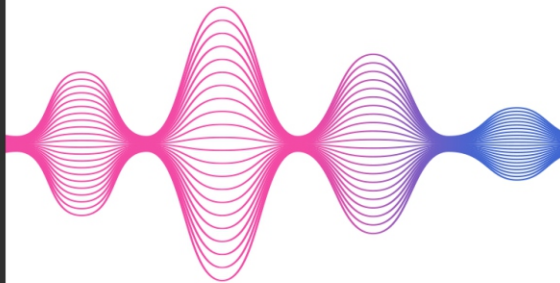




**ES80A-PDM**  
**PM2.5 Dust Monitor**



# ES80A-PDM Monitoring Elf Instruction Manual

## Background Overview 背景概述

Previous environmental monitoring systems mainly focused on fixed-point monitoring of pollution sources, with multiple online monitoring terminals set up at fixed points in the workplace. Through multi-point continuous monitoring, the environmental monitoring situation is transmitted to the data processing platform in real-time. Its advantages include continuous, stable, and accurate monitoring data, unaffected by climate changes, and the ability to monitor multiple pollution source parameters simultaneously. However, it has disadvantages such as high investment, large volume, the need for on-site installation and equipment maintenance, primarily used for monitoring large-scale environmental pollution in industrial parks.

With the rapid development of sensing technology, wireless communication technology, power management technology, display technology, big data, and related technologies, more and more intelligent devices are gradually evolving towards miniaturization and wearable designs. Wearable devices are portable devices that can be worn directly on the body or integrated into the user's clothing or accessories. It is not just a hardware device but also an integrated system that achieves powerful functions through software support, data interaction, and cloud interaction. With diverse forms and increasing functionalities, wearable devices have shown significant application potential in industries such as industrial, medical, military, and education.

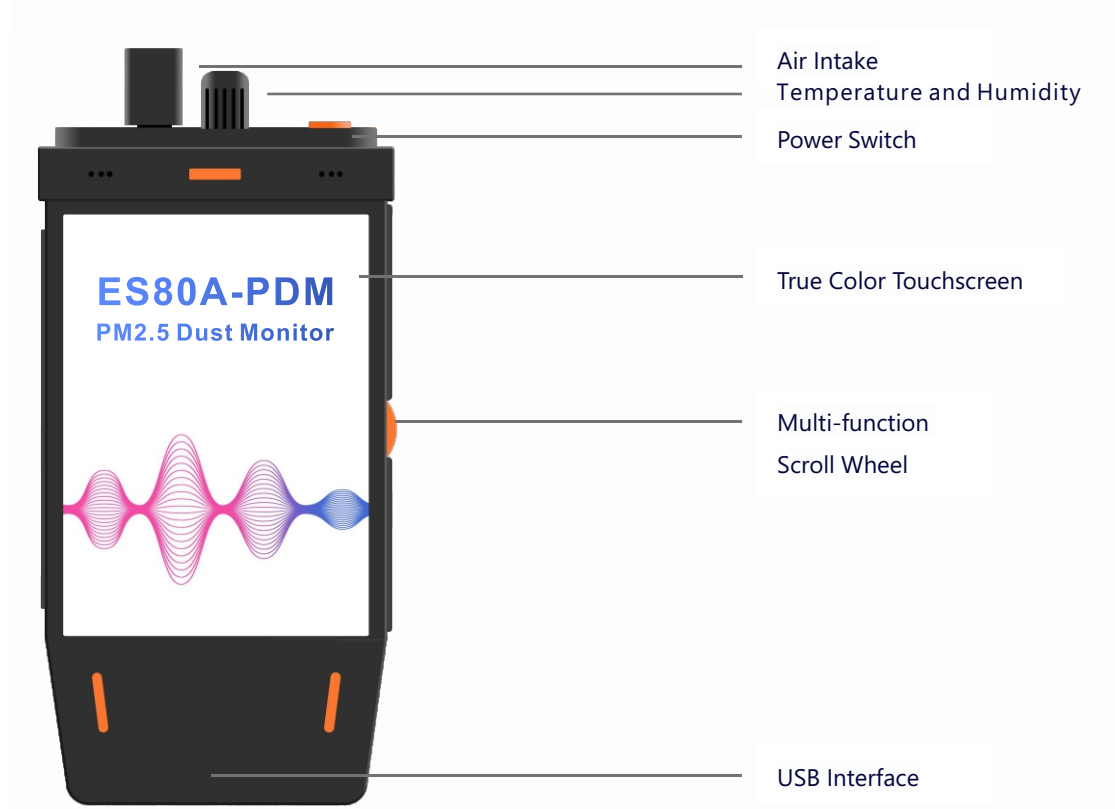
## System Introduction 系统介绍

Combining the above technological background, our company relies on its technical accumulation in the field of dust monitoring, utilizes its own patented invention technologies (ZL2021107487013, ZL2021103675403), and combines cloud interaction technology to develop the "Zhi" series "ES80A-PDM Handheld Dust Concentration Meter."

ES80A-PDM is designed to be wearable, attached to the clothing of operators through a clip. It mainly consists of components such as a dust monitoring module, environmental temperature and humidity monitoring module, LCD display module, microcontroller, power system, and wireless transmission module. It is designed to be small, lightweight, and easy to wear. With cloud interaction technology and GPRS positioning technology, it transmits the monitoring data and location information of the terminal environment to the data processing platform, displaying real-time information such as the operator's working location, working hours, short-term exposure limit (STEL) of respirable particulate matter, and time-weighted average concentration (TWA). It also provides data analysis and safety precautions based on labor hygiene requirements.

The monitoring data from the terminal can be uploaded to the cloud via wireless transmission technology and received and analyzed by the data processing platform. It allows real-time viewing, storage, and analysis of monitoring data, forming curves and reports. Data analysis can be used to track and statistically analyze the working locations and labor intensity of workers. The supporting monitoring system software can integrate with the plant map, link with dust reduction equipment, quickly reduce dust and improve pollution exceedance situations.

This system not only has labor safety protection functions but also serves as a mobile monitoring station for environmental pollution in the plant area. It can also collect and analyze data on the working location and duration of personnel, facilitating comprehensive and detailed management of workplace hygiene, labor conditions, production equipment leaks, and the effectiveness of protective measures. It is a highly practical professional monitoring device.



#### Functional Characteristics 功能特点

1. Contains two invention patents and a measurement instrument license, leading in technology.
2. Simultaneous multi-parameter measurement of dust, temperature, and humidity, with 4G transmission for real-time data reading and transmission.
3. 3.5-inch full-color touchscreen with clear display and easy operation.
4. Imported CPU for high accuracy and stability.
5. Mimics human respiratory flow, providing data within 10 seconds.
6. The product design is delicate and lightweight, with a standard back clip for easy shoulder or arm attachment.
7. On-site display combined with remote data transmission, enabling simultaneous viewing both on-site and remotely.
8. More humanized designs, see the actual device for details.

| Technical Specifications 技术参数                 |                                                |
|-----------------------------------------------|------------------------------------------------|
| Principle of Action                           | Laser Dynamic Scattering                       |
| Measuring Range (for PM10 particle size dust) | (0.001~30) mg/m <sup>3</sup>                   |
| Measurement Accuracy                          | 0.001 mg/m <sup>3</sup>                        |
| Measurable Parameters                         | Dust (PM10, PM2.5, TSP), Temperature, Humidity |
| Measurement Repeatability                     | Better than 2%                                 |
| Flow Rate                                     | 0.5 L/min                                      |
| Relative Error                                | ≤10%                                           |
| Data Storage                                  | 100,000 records locally                        |
| Measurement Mode                              | Environmental Monitoring, Occupational Hygiene |
| Operation Mode                                | Touchscreen or Scroll Wheel Buttons            |
| Screen                                        | 3.5-inch Color Touchscreen                     |
| Dimensions                                    | 144×69×35 (mm)                                 |
| Weight                                        | 205 grams                                      |
| Power Supply                                  | 5VDC Type-C Charging Port                      |
| Standard Communication Output                 | Type-C Output                                  |
|                                               |                                                |
| Optional Accessory                            | Zero Calibrator                                |

**Basic Operating Steps** 产品使用

Press the power switch lightly to turn on the dust meter. Press and hold the power switch for 3 seconds to turn it off.

**Operating Interface** 产品操作

The machine adopts a 3.5-inch capacitive touchscreen, which can be operated directly by tapping. The machine can also be operated using the multi-function scroll wheel. Scroll up or down to change the current focus. Press the scroll wheel to execute the confirmation command.

### Charging and Data Cable Connection 充电和连接

There is a USB Type-C interface at the bottom of the device for connecting to a PC for parameter settings and data storage operations. It can also be connected to a 5VDC power adapter to charge the device.

### Maintenance and Repair 维护修理

The air intake should be cleaned regularly based on the dust pollution level in the workplace.

Unplug the power adapter when the instrument is not in use.

When the battery power is less than 20%, it should be charged promptly as over-discharging can reduce battery life.

The laser used in this device meets Class 3B laser safety standards. Do not shine it directly into the eyes.

**Please do not attempt to open the internal parts of the instrument. For repairs, please contact our company.**

### Common Fault Handling 故障处理

| Fault                                      | Cause                                                                                                                  | Solution                                                                                                                                                 |
|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Display does not turn on after powering on | ① Display screen failure; ② Power adapter failure.                                                                     | ① Contact the manufacturer for repair or replacement of the display screen; ② Replace the power adapter.                                                 |
| Abnormal measurement values                | ① Obstruction in the air intake; ② Laser tube damage; ③ Internal contamination of the instrument, reduced sensitivity. | ① Clean the air intake of the instrument; ② Contact the manufacturer for repair; ③ Contact the manufacturer for cleaning the interior of the instrument. |
| Abnormal air pump sound                    | ① Obstruction in the air path; ② Air pump failure.                                                                     | ③ Clean the air intake and air outlet, or contact the manufacturer for cleaning; ④ Contact the manufacturer for repair.                                  |

### After-Sales Service 售后服务

Thank you for purchasing our product. Please use it according to the operating manual.

Under the condition that the user complies with the storage and usage rules, a new instrument will be replaced free of charge if there are quality issues within 30 days.

The instrument is covered by free maintenance and replacement of parts within 12 months from the date of purchase. After one year, only the cost of parts will be charged, and lifetime after-sales service is provided.

Users can call our after-sales service hotline at+86-0755-27239077 (during working hours) or+8613316879240 (on holidays) to enjoy reliable after-sales service, ensuring that user maintenance inquiries are responded to within 24 hours.

We assist users in operating the instrument, provide training and debugging services according to user needs, and can provide national standards and verification procedures upon request.

Consumables and faults caused by the following situations are not covered by the warranty:

Faults caused by improper operation, use, and storage by the user;

Faults caused by repair, disassembly, and modification by non-company personnel;

Use in special occasions without consultation with the company;

Faults caused by natural disasters and other irresistible reasons.

### **Shenzhen Safewill Co., Ltd**

Address: 17G, Kechuang Building, Shajing Street, Baoan District, Shenzhen, China