



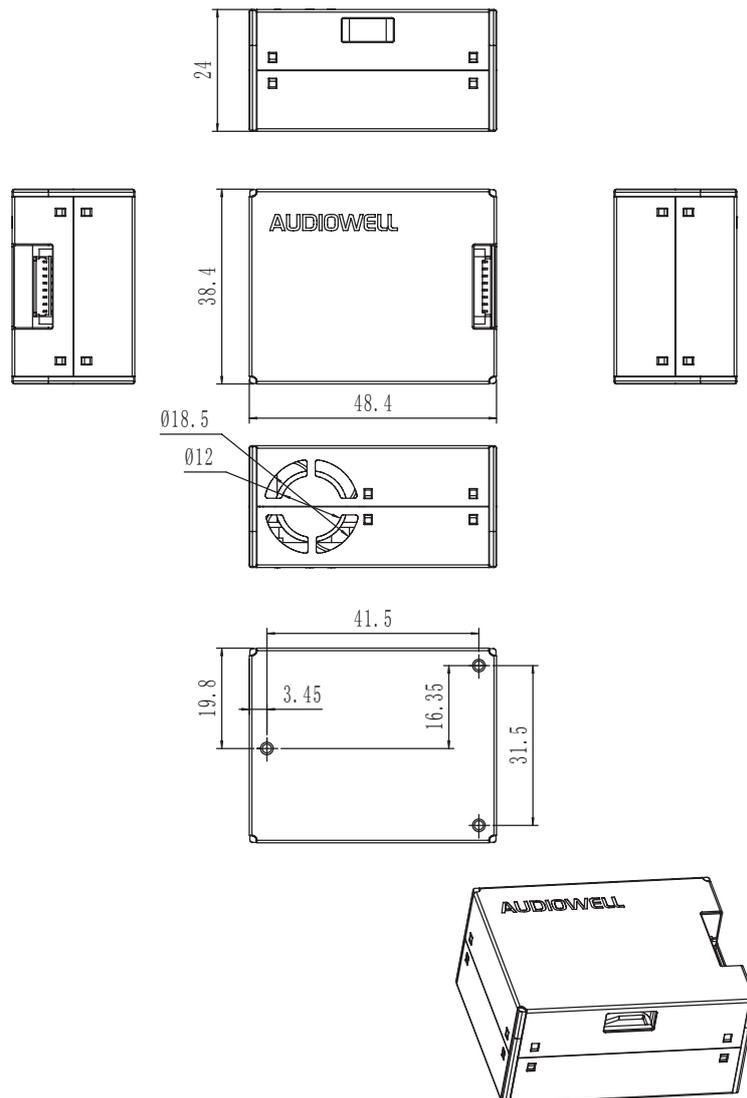
SENSOR
TECHNOLOGY

DL0001-000

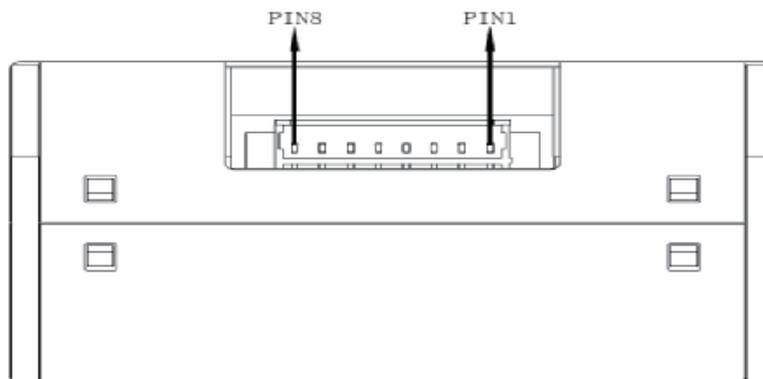
SPECIFICATIONS

■ Model:DL01-F05N-01

■ Appearance and Dimensions (mm)



■ Terminal connection



| Pin No. | Function Symbol | Illustration |
|---------|-----------------|--|
| PIN1 | VCC | Positive power supply |
| PIN2 | GND | Negative power supply |
| PIN3 | PWM | PWM output (customized) |
| PIN4 | RXD | Serial port receive/TTL level@3.3V |
| PIN5 | TXD | Serial port transmit/TTL level@3.3V |
| PIN6 | NREST | Reset signal/TTL level@3.3V low to reset |
| PIN7 | NC | No connection in normal use |
| PIN8 | NC | No connection in normal use |

■ **Technical Specifications**

| Item | Parameter | Unit | Test conditions(T=25°C) |
|--|--|-------------------|--|
| Measuring range of particles | 0.3~1.0; 1.0~2.5; 2.5~10 | µm | - |
| Effective range of particle mass concentration | 0~500 | µg/m ³ | Audiowell Laser Sensor Test System(25±5°C, 50±10%RH) |
| Maximum range of particle mass concentration | 2000 | µg/m ³ | Audiowell Laser Sensor Test System(25±5°C, 50±10%RH) |
| Resolution | 1 | µg/m ³ | - |
| Consistency (PM2.5 standard value) | 0 ~ 100 µg/m ³ : ± 10 µg/m ³ 100 ~ 500 µg/m ³ : ± 10 % | | Audiowell Laser Sensor Test System(25±5°C, 50±10%RH) |
| Single measurement response time | 1 | s | Audiowell Laser Sensor Test System(25±5°C, 50±10%RH) |
| Total response time | ≤10 | s | Audiowell Laser Sensor Test System(25±5°C, 50±10%RH) |
| DC power supply voltage | 5.0 | V | DC regulated power supply |
| Working current | ≤100 | mA | DC regulated power supply |
| Data interface level | L <0.8 @3.3 H >2.7@3.3 | V | - |
| Working temperature range | -10~+50 | °C | Test chamber of constant temperature and humidity |
| Working humidity range | 35~85% | | Test chamber of constant temperature and humidity |
| Mean time to failure | ≥3 years | | - |
| Maximum size | 50×40×25 | mm | Vernier caliper |

Remark: Effective range is the measurement range to ensure product consistency.

Maximum range is the maximum value of the product output data.

■ **Precautions**

1. The metal case should be connected with the internal power ground. Be careful not to short it with other external board circuits or the cases of chassis.
2. The optimal installation method is to place the plane where the air intake and outlet are located close to the air vent which connects the inner wall of the machine and outside. If this condition can not be achieved, make sure there is no obstruction within 2cm around the air

outlet. There should be a structure between the inlet and outlet to isolate the air flow in order to prevent the air flow from flowing back directly from the outlet to the inlet in the user machine.

3. The size of the vent opened in the inner wall of the user machine for the air inlet should not be smaller than the air inlet of the sensor .

4. When applying the sensor to air purifiers, avoid mounting it in the purifier’s air duct directly. If this condition cannot be achieved, the sensor should be installed in a separate structure to be isolated from the air duct of the purifier.

5. When applying the sensor to purifiers and fixed test equipment, the sensor should be placed 20cm or higher above the ground, otherwise it may be polluted by the large dust particles and even floc near the ground. In this case, which may cause the fan to stop rotating.

6. When the sensor is applied in outdoor fixed equipment, the equipment itself should have the function of defending sandstorm, rain and snow weather and catkins.

7. Do not dismantle the sensor, including the metal shield shell, in case of irreversible damage.

8. The data tends to be stable 10s after the sensor is powered up. If an intermittent operation mode is used for longer working life or other purposes, in order to ensure the accuracy of data, the working duration is recommended to be longer than 10s.

■ Appendix

Annex A: DL0001-000 Active transmission protocol

| Serial port protocol | |
|----------------------|-----------------------------|
| Baud rate | 9600 |
| Data bit | 8 |
| Check bit | None |
| Stop bit | 1 |
| Data output mode | One transmission per second |

| | | |
|---------------------------------|-------|--|
| Start symbol 1 | 0x42 | |
| Start symbol 2 | 0x4d | |
| Frame length of high eight bits | ..... | Frame length = 2 x 13 + 2 (data + check bit) |
| Frame length of low eight bits | ..... |  |
| Data 1 high eight bits | ..... | Reserve interfaces |
| Data 1 low eight bits | ..... |  |
| Data 2 high eight bits | ..... | Reserve interfaces |
| Data 2 low eight bits | ..... |  |
| Data 3 high eight bits | ..... | Reserve interfaces |
| Data 3 low eight bits | ..... |  |
| Data 4 high eight bits | ..... | Data 4 indicates PM1.0 concentration (in the atmosphere environment) unit: $\mu\text{g}/\text{m}^3$ |
| Data 4 low eight bits | ..... |  |
| Data 5 high eight bits | ..... | Data 5 indicates PM2.5 concentration (in the atmosphere environment) unit: $\mu\text{g}/\text{m}^3$ |
| Data 5 low eight bits | ..... |  |
| Data 6 high eight bits | ..... | Data 6 indicates PM10 concentration (in the atmosphere environment) unit: $\mu\text{g}/\text{m}^3$ |
| Data 6 low eight bits | ..... |  |
| Data 7 high eight bits | ..... | Reserve interfaces |
| Data 7 low eight bits | ..... |  |
| Data 8 high eight bits | ..... | Reserve interfaces |
| Data 8 low eight bits | ..... |  |
| Data 9 high eight bits | ..... | Reserve interfaces |
| Data 9 low eight bits | ..... |  |
| Data 10 high eight bits | ..... | Reserve interfaces |

| | | |
|------------------------------|-------|--|
| Data 10 low eight bits | ..... | Reserve interfaces |
| Data 11 high eight bits | ..... | Reserve interfaces |
| Data 11 low eight bits | ..... |  |
| Data 12 high eight bits | ..... | Reserve interfaces |
| Data 12 low eight bits | ..... |  |
| Data 13 high eight bits | ..... | Version number |
| Data 13 low eight bits | ..... | Error code, see Annex B for details |
| Check sum of high eight bits | ..... | Check sum=Start symbole1+Start symbole2+...+Data 13 low eight bits |
| Check sum of low eight bits | ..... |  |

Annex B: Sensor Slave machine Extension Command Protocol

1. Host communication protocol format

| Feature byte 1 | Feature byte 2 | Instruction byte | Status byte 1 | Status byte 2 | Verify byte 1 | Verify byte 2 |
|----------------|----------------|------------------|---------------|---------------|---------------|---------------|
| 0x42 | 0x4d | CMD | DATAH | DATAL | LRCH | LRCL |

2. Destination of the instruction byte and feature byte

| CMD | DATAH | DATAL | Remark |
|------|-------|-------------------------------------|-----------------|
| 0xe2 | X | X | Passive reading |
| 0xe1 | X | 00H-Passive 01H-Active | State switching |
| 0xe4 | X | 00H-Standby mode 01H-Normal mode | Standby control |

3. Instruction response

Oxe2:response 32 byte,same as the sensors specification protocol;

4. The generation of Verify byte.

All bytes are accumulate summed from the feature word (without the check word).