WoMaster

Outdoor Environment Detection System

ES107-CO2 / ES107-PM

Integrated Outdoor Weather Station
Temperature, Humidity, Noise, Atmospheric Pressure, Wind Speed, Wind Direction CO2 or PM2/10 Sensor

The ES107 series is an integrated outdoor sensor unit for all types of environmental and weather monitoring sensors include temperature, humidity, noise, Atmospheric Pressure, wind direction, wind speed, and CO_2 or PM2.5&10. The monitored data is output through RS-485 interface by Modbus protocol. The ES107 sensor unit accepts 10~30Vdc power input voltage and is protected by the IP65 grade Anti-U/V lightweight ABS louver radiation shield. The mounting kit can be installed over pole top. With the optional NBIoT/WiFi gateway WR222, LoRa end node LC144, or outdoor SCB111-RS485 NBIoT gateway, the data can be monitor on the cloud platform. The ES107 sensor unit can be widely applied in agriculture, residential or industrial area weather and air quality monitoring, and remote weather stations.
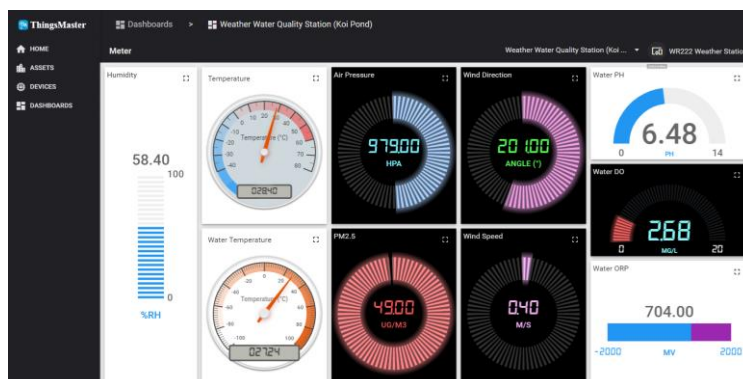
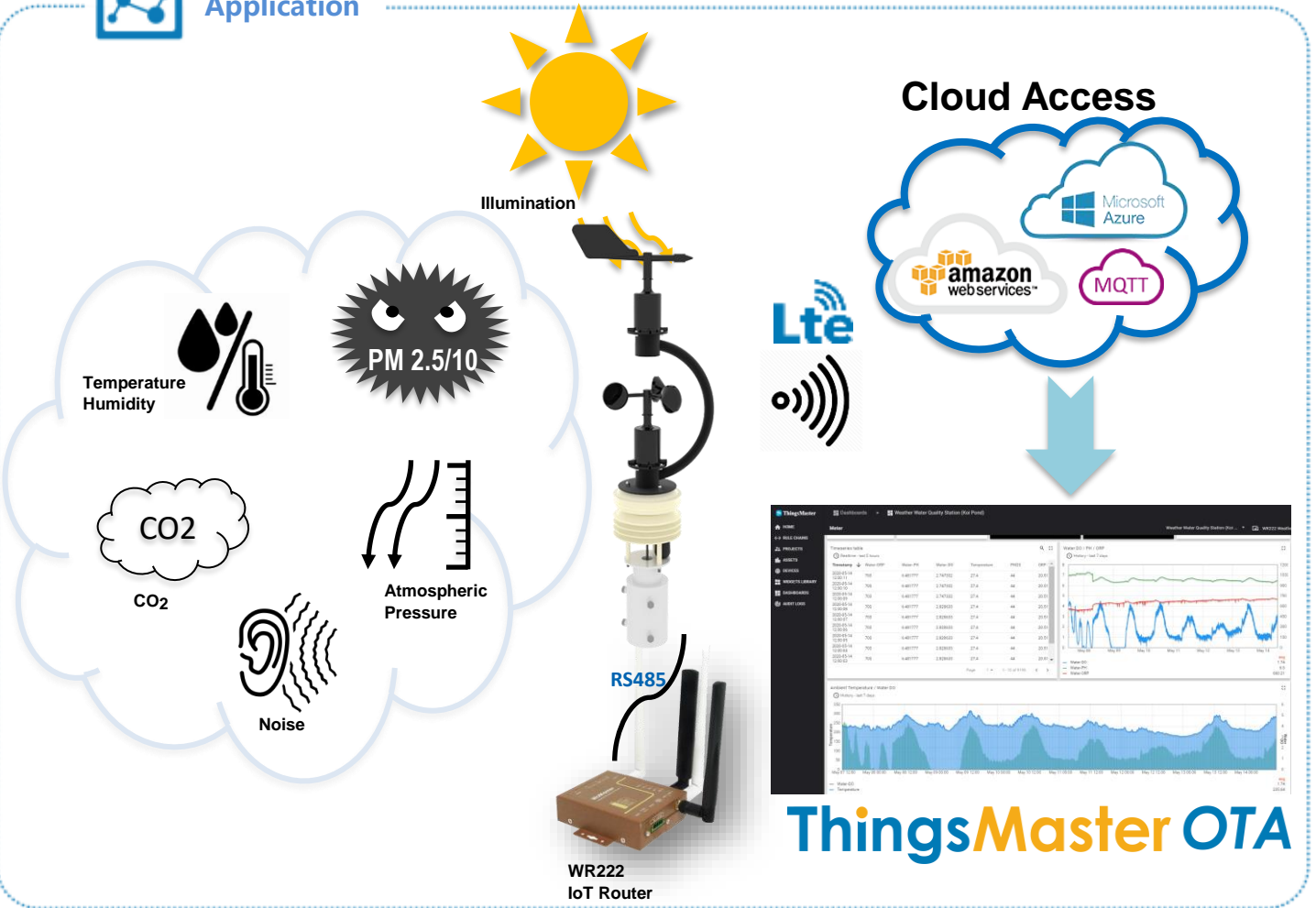|				
ℹ One-piece shutter box structure	📋 Multi-sensor set	🛟 A variety of detection options	📡 Highly sensitive easy to install	🔧 Superior performance long-term stability

Modbus

Features & Benefits

- **High Integrated Monitoring**
    - Intergraded multiple sensors
    - Central management by sharing a signal output
    - Support Industrial Modbus RTU protocol, RS485

- **Outdoor Protective Enclosure**
    - Prevent direct ultraviolet radiation to the sensors
    - Avoid rapid aging of sensors under harsh environmental conditions such as strong winds, rain, and snow
    - The sensor parts are ventilated for truly sensing the changes in external detection parameters

- **Flexible Design**
    - Customized Shutter Height
        - Single or multiple parameters both can use small shutter, small size, light weight and easy to install
    - Customized Monitoring parameters
        - Each parameter is independent and high sensitivity, users can freely integrate monitoring parameters

- **Work with IoT Cloud Platform - ThingsMasterOTA**
    - Real-time online monitoring, analysis, reporting
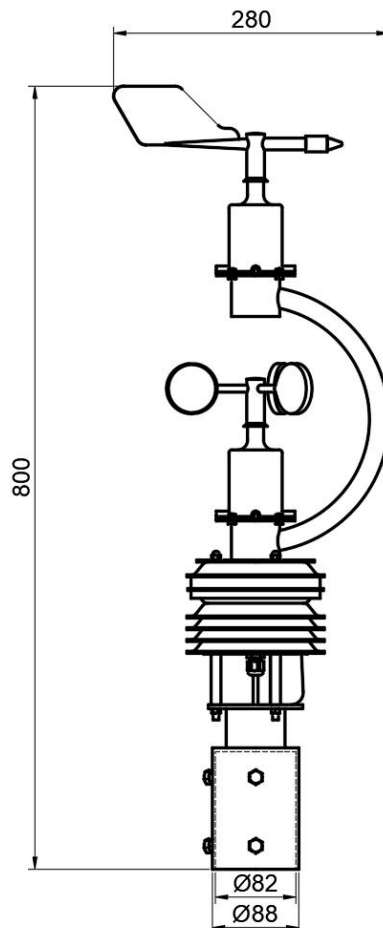   - Remote cloud security and visual management

Illumination

Temperature
Humidity

PM 2.5/10

CO2

CO2

Atmospheric
Pressure

Noise

Cloud Access

Microsoft Azure

amazon webservices

MQTT

Lte

RS485

WR222
IoT Router

ThingsMaster OTA

Dimensions

280

800

Ø82

Ø88

(mm)

⚙ Specifications

Temperature & Humidity

Measuring Range	Temperature: -40-120 °C (Sensor Measuring Range)
	Humidity: 0%RH-100%RH
Accuracy	Temperauture±0.5°C (25°C) Humidity:±3%RH (5%-95% RH, 25°C)
Long term stability	Temperature ≤0.1°C/year Humidity ≤1%RH/year
Response time	<15/Sec (at 1m/s wind speed)

CO2 (Either CO_2 or PM2.5/PM10)

Measuring Range	0~5000ppm
Accuracy	±40ppm +3%FS (25°C)
Long term stability	≤30ppm/year
Response time	<10/S (1m/s wind speed)

PM2.5/PM10 (Either CO2 or PM2.5/PM10)

Measuring Range	0~1000ug/m3
Resolution	1ug/m3
Accuracy	±10%
Response time	<90 Sec.
Sensor Operating	Temperature -20-60°C Humidity:0%-80%RH, No Condensing

Atmospheric Pressure

Measuring Range	0~120Kpa
Accuracy	±1.5Kpa (25°C)
Long term stability	0.1Kpa/Year
Response time	≤1 Sec.
Sensor Operating	Temperature -20-60°C Humidity:0%-80%RH, No Condensing

Noise

Measuring Range	30dB~120dB
Frequency Range	20Hz~12.5Hz
Accuracy	±0.5dB
Long term stability	<2%
Response time	≤3 seconds
Sensor Operating	Temperature -20 ~ 60°C Humidity:0%~80%RH

Wind Speed

Housing Material	Polycarbonate
Wind measurement range	0~70Meters/Second
Resolution	0.1Meter/Second

Wind Direction	
Wind measurement range	Compass , 360 degree
Accuracy	1 degree
Resolution	1 degree

System Parameters	
Power Range	DC 10~30V, 0.8W Power consumption
Enclosure Material	Shelter Box, Plastic ABS, Anti-U/V, UL94 V0
Enclosure Protection	IP65 Protection Level
Enclosure Dimension	140mm (Diameter) x 114mm (High)
Communication	Modbus RTU protocol, 2-Wire RS-485 RS485 Modbus RTU Pulling & Waiting Time ≥ 200mS
Op. Temperature	-40 ~ 60°C, 0~80% Humidity, No Condensing

Modbus Register Information			
Parameters Function	Register Add. (HEX / DEC)	PLC Add. (Index Number)	Note
Device ID Storage Add.	07D0H / 2000	2001	R/W , System Factory Default ID: 1
Serial Baud Rate Add.	07D1H / 2001	2002	R/W , Default: 2 2(9600), 0(2400), 1(4800)
Humidity	01F4H / 500	501	R/O , Real Value = Read Value/10
Temperature	01F5H / 501	502	R/O ,Real Value = Read Value/10
Noise	01F6H / 502	503	R/O , Real Value = Read Value/10
CO2 or PM2.5	01F7H / 503	504	R/O. CO2 /PM2.5 Real Value = Read Value
PM10	01F8H / 504	505	R/O, Real Value = Read Value, (Available on ES105-PM)
Atmospheric Pressure	01F9H / 505	506	R/O, Real Value = Read Value x10
			R/W: Read & Write, R/O: Read Only

Ordering Information

Model	Description
ES107-PM	High Integrated Environmental Sensor Shelter Box, Temperature, Humidity, PM2.5/10, Illumination, Noise, Wind Speed, Wind Direction, Modbus RTU protocol, 2-wire RS-485 , 10~30VDC
ES107-CO$_2$	High Integrated Environmental Sensor Shelter Box, Temperature, Humidity, CO$_2$, Illumination, Noise, Wind Speed, Wind Direction, Modbus RTU protocol, 2-wire RS-485, 10~30VDC
	Package List
	1 x Multiple Sensor Shelter Box
	1 x Pole Mounting Kit