ES107-CO2 / ES107-PM

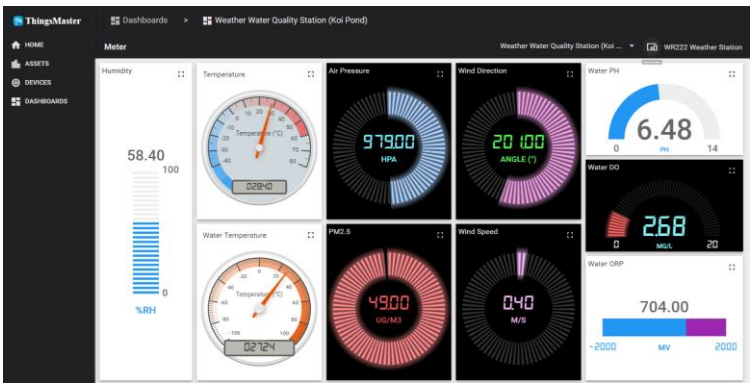
Integrated Outdoor Weather Station Temperature, Humidity, Noise, Atmospheric Pressure, Wind Speed/ Direction CO2 or PM2/10 Sensor

The **ES107 series** is an all-in-one outdoor sensor unit designed for comprehensive environmental and weather monitoring. It supports various sensing parameters, including **temperature, humidity, noise, atmospheric pressure, wind direction/speed, and CO_2 or PM2.5/PM10**. Measurement data is transmitted via an **RS-485 interface** using the **Modbus protocol**. Powered by a **10–30V DC input**, the ES107 features an **IP65-rated, UV-resistant ABS louver radiation shield** for reliable performance in harsh outdoor conditions. It includes a **pole-mount installation kit** for flexible deployment. When paired with optional gateways such as the **WR222 LTE/WiFi gateway**, **LC144/LR140 LoRa end node**, or **SCB111-RS485 NB-IoT outdoor gateway**, data can be seamlessly uploaded to the **cloud platform** for remote monitoring and analysis. Ideal for **agriculture, residential, and industrial environments**, the ES107 is perfectly suited for **weather stations, air quality networks**, and other **environmental monitoring applications**.

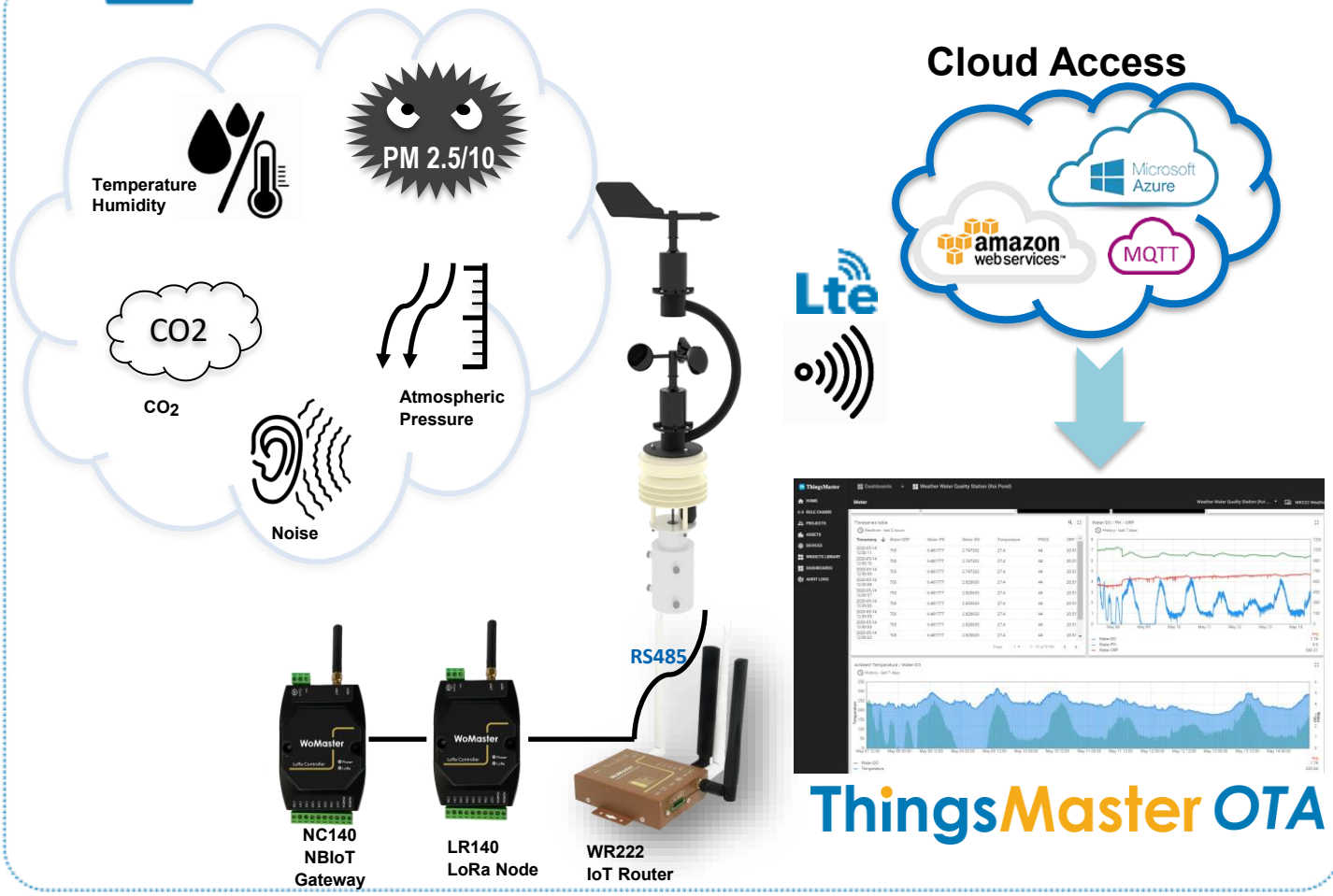
Modbus

Features & Benefits

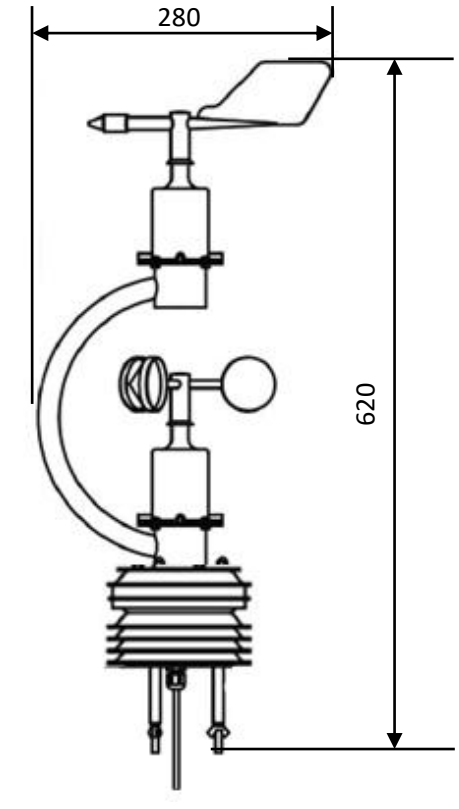
- **High Integrated Environmental Sensor**
  - Rod-Top Easy Installation
  - One Cable Communication
  - Modbus RTU Protocol RS485 2-Wire
- **Outdoor Protective Enclosure**
  - ABS Plastic Housing, Anti-U/V, UL94v0 fire against level
  - IP65 Protection Level, against Wind , Rain, Snow
  - Ventilated Shutter Housing design provides better air diffusion for the sensor detection
- **Flexible Design**
  - 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



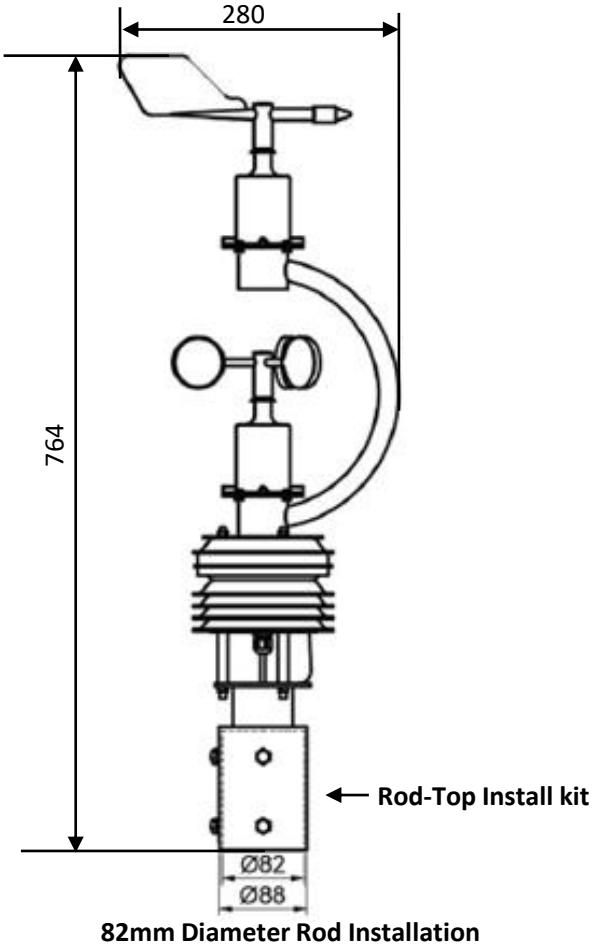
Application



Dimensions



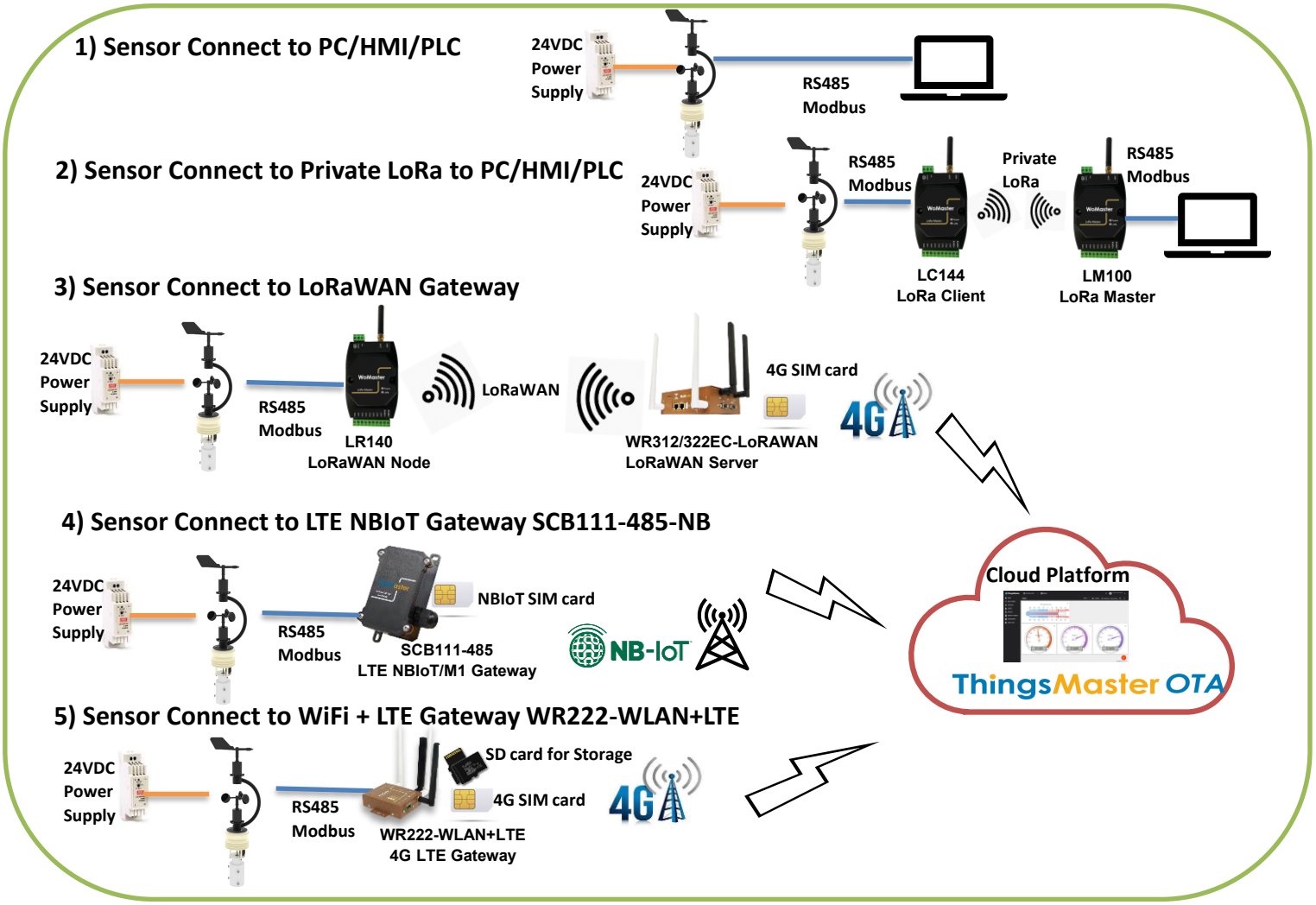
No Rod Install kit



82mm Diameter Rod Installation

(mm)

Application



Optional Accessory

Item	
MDR-40-24	Din-Rail Power Supply INPUT:85-264VAC, 120-370VDC, OUTPUT: 24VDC/1.7A, -20 ~ +70℃
ThingsMaster OTA-5GW	ThingsMaster OTA for 5 gateways, One Year License
LM100	LoRa Master / Modbus RTU Client (Must work with LC144) (with LoRa antennas)
LC144	LoRa End-Node, 8CH AIO, 1 Modbus RTU 485 2-wire, 2 x 0~10V input, 2 x 4~20mA input, 1 x 0~10V Output, Open Collect (O.C.), 1 x 4~20mA Output, 1 x PWM Output (0~5V), 1 x PWM (0~10V), Open Collect (O.C.) Type, 1 x SMA /LoRa Antenna (Must work with LM100 or LM200)
LR140	LoRa WAN End-Node, 4CH AI, 1 Modbus RTU 485 Host, 1 x RS485 Host, 2-wire, 1 x SMA /LoRa Antenna Connector (with LoRa antennas)
WR322GR-EC-LTE-LORAWAN	Industrial LoRaWAN Gateway, 2GbE+2COM, LTE 2SIM, (with LTE and LoRa antennas)(Must work with LR140)
WR312GR-EC-LORAWAN	Industrial LoRaWAN Gateway, 2GbE+2COM (Must work with LR140)
WR222-WLAN+LTE	Industrial Wireless IIoT Field Router, 2FE+1COM, SD, 802.11b/g/n WLAN, 1SIM (with WiFi, LTE Antennas)
SCB111-485-NB-DC	Outdoor Modbus RS485 to NB-IoT / LTE Cat M1 Gateway

Specifications

Temperature & Humidity	
Measuring Range	Temperature: -40 ~ 120 ˚C (Sensor Measuring Range)
	Humidity: 0 -100%RH
Accuracy	Temperature: ±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	≤ 1 Sec.
CO2	
Measuring Range	0~5000ppm
Accuracy	±40ppm +3%FS (25˚C)
Long term stability	≤ 1% / Year
Response time	≤ 90Sec.
PM2.5/PM10	
Measuring Range	0~1000ug/m3 for PM2.5 and PM10
Resolution	1ug/m3
Accuracy	±10% (25˚C)
Response time	≤ 90 Sec.
Long term stability	≤ 1% / Year
Sensor Operating	Temperature: -20 ~ 60˚C Humidity:0%-80%RH, No Condensing
Atmospheric Pressure	
Measuring Range	0~120Kpa
Accuracy	±1.5Kpa (75kpa, 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	±3 dB
Long term stability	≤ 3 dB/ Year
Response time	≤ 1 seconds
Sensor Operating	Temperature -20 ~ 60˚C Humidity:0%~80%RH
Wind Speed	
Housing Material	Polycarbonate
Wind measurement range	0~60Meters/Second
Resolution	0.1Meter/Second
Response Time	≤ 0.5 Sec.

Wind Direction	
Wind measurement range	8 Directions
Response Time	≤ 0.5Sec.

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	280 mm (Diameter) x 764mm (High) with Rod Install Kit (-R model) 280 mm (Diameter) x 620mm (High) without Rod install kit Rod Specification: 82mm diameter
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. (Modbus Add.)**	**Note**
Device ID Storage Add.	07D0H / 2000	2001 (42001)	R/W , System Default Device ID: 1
Serial Baud Rate Add.	07D1H / 2001	2002 (42002)	R/W , Default: 2 2(9600), 0(2400), 1(4800)
Wind Speed	01F4H / 500	501 (40501)	R/O , Real Value = Read Value / 10
Wind Power Scale	01F5H / 501	502 (40502)	R/O ,Real Value = Read Value
Wind Direction (8-Direction)	01F6H / 502	503 (40503)	R/O , Wind Direction in 0~7 (0: North, 2: East, 4: South, 6: West)
Humidity	01F8H / 504	505(40505)	R/O, Real Value = Read Value /10
Temperature	01F9H / 505	506(40506)	R/O, Real Value = Read Value /10
Noise Level	01FAH / 506	507(40507)	R/O, Real Value = Read Value /10
PM2.5 / CO2 (-CO2)	01FBH / 507	508(40508)	R/O, Real Value = Read Value
PM10	01FCH/ 508	509 (40509)	R/O, Real Value = Read Value
Atmospheric Pressure	01FDH/ 509	510 (40510)	R/O, Real Value = Read Value / 10
			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,Noise, Wind Speed, Wind Direction, Modbus RTU protocol, 2-wire RS-485 , 10~30VDC
ES107-CO2	High Integrated Environmental Sensor Shelter Box, Temperature, Humidity, CO_2, Noise, Wind Speed, Wind Direction, Modbus RTU protocol, 2-wire RS-485, 10~30VDC
	Package List
	1 x Device , 1 x QIG

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