

WoMaster

Quick Installation Guide

Outdoor Environment Air Quality Inspection System ES100 Series

www.womaster.eu

• Overview

ES100 is an intergraded device and designed for all types of environmental monitoring. It can be used to detect multiple parameters of temperature, humidity, PM2.5, PM10, wind speed and wind direction in the environment. Each parameter is independent and high sensitivity, users can freely integrate monitoring parameters. ES100 has the characteristics of high precision and good stability, which is suitable for various environmental monitoring.

The ES100 is equipped with a standard RS485 interface and supports the Modbus RTU protocol, which can be integrated into the Internet of Things and cloud interfaces, such as smart city boxes and wireless routers, for real-time monitoring and analysis via remote smartphones or computers.

Model	Description
ES102	Outdoor Environment Air Quality Inspection System. Integrated external Wind Direction, Wind Speed sensors, Output: RS485
ES104	Outdoor Environment Air Quality Inspection System. Integrated embedded Hum., Temp., PM2.5, PM10 sensors, Output: RS485
ES106	Outdoor Environment Air Quality Inspection System. Integrated embedded Hum., Temp., PM2.5, PM10 sensors, and external Wind Direction, Wind Speed sensors, Output: RS485

• Package Checklist

ES102

- ✓ 1 x Wind Direction Sensor (Including cable)
- ✓ 1 x Wind Speed Sensor (Including cable)
- ✓ 1 x QIG
- ✓ 2 x Mounting Bracket

ES104

- ✓ 1 x Shutter
- ✓ 1 x QIG
- ✓ 1 x Mounting Bracket

ES106

- ✓ 1 x Shutter
- ✓ 1 x Wind Direction Sensor (Including cable)
- ✓ 1 x Wind Speed Sensor (Including cable)
- ✓ 1 x QIG
- ✓ 3 x Mounting Bracket

Optional Accessory (for detailed information please refer to the Datasheet)

• ES106 Installation

Louver Box Installation

The device is equipped with three mounting screws at the bottom. The customer can use screws to install the louver box to the bracket. The schematic diagram is shown on the right.



Wind Speed and Direction Installation

Install the wind speed and direction on the mounting bracket. Four mounting holes are provided on the bracket and attach the sensor to the bracket then screw the bolts tightly on the bracket to make the whole set of the sensors are installed properly. To maintain the best level and ensuring the accuracy of the wind speed and direction data, the mounting bracket is easy to use and can withstand large pressures.



NOTE: Attention to the installation, the arrow on the device is pointing must be consistent with the north direction, so as to avoid measurement errors.



RS485 Connection

- 1) Connect the cable to the device, connect the yellow wire to RS485-A, and connect the blue wire to RS485-B.
- 2) When wiring the RS485 cable, pay attention to A/B the two lines cannot be reversed.
- 3) Make sure the addresses of multiple devices on the Modbus setting do not conflict.

***Note: RS485A line and RS485B line are strictly forbidden to contact with the power supply line, otherwise the communication of the electrode will be permanently damaged.**

Power Input Connection

- 1) Connect the power cable to the device. Brown cable is the positive pole of the power supply and black cable is the negative pole of the power supply.
- 2) Connect the power wires to suitable DC Switching type power supply. The input range is 10-30VDC.

• ES104 Installation

Louver Box Installation

The device is equipped with three mounting screws at the bottom. The customer can use screws to install the louver box to the bracket. The schematic diagram is shown on the right.



RS485 Connection

- 1) Connect the cable to the device, connect the yellow wire to RS485-A, and connect the blue wire to RS485-B.
- 2) When wiring the RS485 cable, pay attention to A/B the two lines cannot be reversed.
- 3) Make sure the addresses of multiple devices on the Modbus setting do not conflict.

***Note: RS485A line and RS485B line are strictly forbidden to contact with the power supply line, otherwise the communication of the electrode will be permanently damaged.**

Power Input Connection

- 1) Connect the power cable to the device. Brown cable is the positive pole of the power supply and black cable is the negative pole of the power supply.
- 2) Connect the power wires to suitable DC Switching type power supply. The input range is 10-30VDC.

• ES102 Installation

Install the wind speed and direction on the mounting bracket. Four mounting holes are provided on the bracket and attach the sensor to the bracket then screw the bolts tightly on the bracket to make the whole set of the sensors are installed properly. To maintain the best level and ensuring the accuracy of the wind speed and direction data, the mounting bracket is easy to use and can withstand large pressures.



NOTE: Attention to the installation, the arrow on the device is pointing must be consistent with the north direction, so as to avoid measurement errors.



RS485 Connection

- 1) Connect the cable to the device, connect the yellow wire to RS485-A, and connect the blue wire to RS485-B.
- 2) When wiring the RS485 cable, pay attention to A/B the two lines cannot be reversed.
- 3) Make sure the addresses of multiple devices on the Modbus setting do not conflict.

***Note: RS485A line and RS485B line are strictly forbidden to contact with the power supply line, otherwise the communication of the electrode will be permanently damaged.**

Power Input Connection

- 1) Connect the power cable to the device. Brown cable is the positive pole of the power supply and black cable is the negative pole of the power supply.
- 2) Connect the power wires to suitable DC Switching type power supply. The input range is 10-30VDC.

• Appearance

Louwer Box



Wind Speed Sensor



Wind Direction Sensor



• Protocol

• Basic Parameter

Parameter	Description
Protocol	Modbus RTU
Data Bits	8 bit
Parity Bit	No
Stop Bit	1
Error Detection Code	CRC
Baud Rate	2400bps/4800bps/9600bps, default setting is 9600bps

• Data Format Definition

Adopt Modbus-RTU communication protocol, the format is as follows:

Initial structure ≥ 4 bytes of time

Address code = 1 byte

Function code = 1 byte

Data area = N bytes

Error check = 16-bit CRC code

End structure ≥ 4 bytes of time

Address code: for the function indication of the transmitter, this transmitter only uses the function

Code 0x03 (read register data).

Data area: The data area is a specific address and is unique in the communication network.

(Factory default 0x01).

Function code: command communication data sent by the host, pay attention to 16bits data high

The byte is in front!

CRC code: Two-byte check code.

• Inquiry Frame

Adr.	Func.	Register Start Adr.	Length	Low Checksum	High Checksum
1 byte	1 byte	2 byte	2 byte	1 byte	1 byte

• Response Frame

Adr.	Func.	Effective Number	First Data Area	Second Data Area	...	N Data Area	Low Checksum	High Checksum
1 byte	1 byte	1 byte	2 byte	2 byte	...	2 byte	1 byte	1 byte

• Device Stack List

Slave ID	Register Address	PLC or Configurati on Address	Content	Desc.
1	01F4 H	40501	Humidity	Range: 0-100.0%RH; Upload data 10 times real data
1	01F5 H	40502	Temperature	Range: -40-80°C; Upload data 10 times real data
1	01F7 H	40504	PM2.5	Range: 0-1000ug/m3; Uploaded data is actual value
1	01F8 H	40505	PM10	Range: 0-1000ug/m3; Uploaded data is actual value
2	0000 H	40001	Instantaneous Wind Speed	Range: 0 ~ 70m/s Upload data 10 times real data
3	0001 H	40002	Wind Direction	Integer angle value (0-359) Uploaded data is actual value
	07D0 H	42001	Slave ID	1 ~ 254 (Factory Default 1)
	07D1 H	42002	Baud Rate	0=2400 1=4800 2=9600(Default)

• Safety Precaution

- The equipment should be placed horizontally as much as possible to ensure that the installation is perpendicular to the horizontal plane.
- Try to stay away from high-power interference equipment to avoid inaccurate measurement, such as inverters, motors, etc.
- Before connecting the DC power module to the device, make sure all connections are established and then turn on the DC power.

• Support

At WoMaster, you can use the online service forms to **request the support**. The submitted forms are stored in server for WoMaster team member to assign tasks and monitor the status of your service. Please feel free to write to help@womaster.eu if you encounter any problems.

• Warranty

1-year Global warranties are available for WoMaster products assuring our customers that the products shall remain free from defects in workmanship or materials and conform in all material respects to WoMaster specifications, or Purchaser's supplied and accepted specifications. The warranty is limited to the repair and/or replacement, at WoMaster' sole discretion, of the defective product during its warranty period. The customer must obtain a **Return Merchandise Authorization (RMA)** approval code prior to returning the defective Product to WoMaster for service. The customer agrees to prepay shipping charges, to use the original shipping container or equivalent, and to insure the Product or assume the risk of loss or damage in transit. Repaired or replaced products are warranted for ninety (90) days from the date of repair or replacement, or for the remainder of the original product's warranty period, whichever is longer.

• Disclaimer

WoMaster reserves the right to make changes to this QIG or to the product hardware at any time without notice. It is the user's responsibility to determine whether there have been any such updates or amendments herein.

Defects, malfunctions, or failures of the warranted Product(s) caused by damage resulting from unforeseeable incidents (such as lightings, floods, fire, etc.), environmental and atmospheric disturbances, other external forces such as power line disturbances and surge, host computer malfunction and virus, incorrect power input, or incorrect cabling, incorrect grounding and damages caused by misuse, abuse and unauthorized alteration or repair are not warranted.