

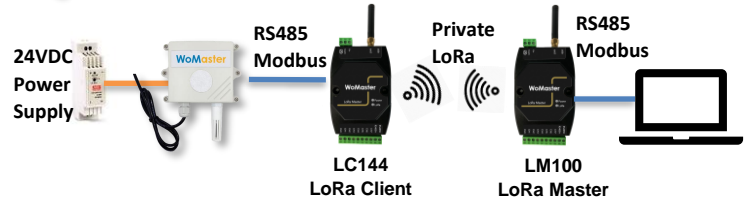
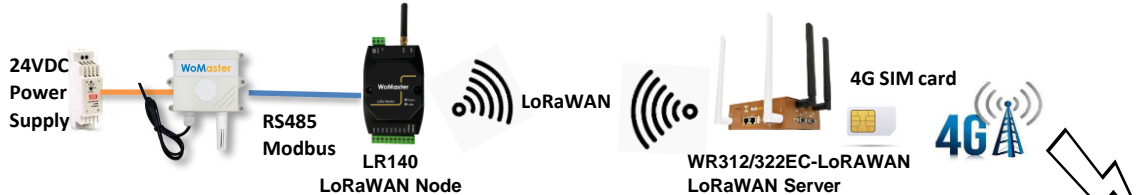
## Outdoor Air Quality Sensor

- Outdoor Protective Design against direct ultraviolet radiation
- Well ventilated for measure changes in external detection parameters
- Single or multiple parameters in small shutter, small size, light weight and easy to install
- 2-Wire RS485 Modbus output to connect to optional cellular gateway WR222 or LC144/LR140 LoRa/LoRaWAN nodes
- 24(10-30) VDC Power Input and Real-time measurement
- 4~20mA or 0~10V Output by Special Order



| Model          |   | Measurement                        | Accuracy         | Dimension     |
|----------------|---|------------------------------------|------------------|---------------|
| ES101-CO-2000  | <b>Outdoor CO Carbon Monoxide Sensor</b>                      | 0~2000ppm                          | ±3%, 1ppm        | 110x85x44(mm) |
| ES101-O3-10    | <b>Outdoor Ozon O<sup>3</sup> Sensor</b>                      | 0-10ppm                            | ±6%, 0.01ppm     | 110x85x44(mm) |
| ES101-CO2-5000 | <b>Outdoor CO<sup>2</sup> Carbon Dioxide Sensor</b>           | 0-5000ppm                          | ±40ppm +3%FS     | 110x85x44(mm) |
| ES101-CO2-HC   | <b>Outdoor CO<sup>2</sup> Carbon Dioxide Sensor</b>           | 0 ~ 100%Vol                        | ±3%FS            | 110x85x44(mm) |
| ES101-O2       | <b>Outdoor Oxygen O<sup>2</sup> Sensor</b>                    | 0~25%Vol                           | ±3%FS, 0.1%VOL   | 110x85x44(mm) |
| ES101-PM       | <b>Outdoor Air Monitor Quality Sensor (PM2.5, PM10 )</b>      | 0~1000ug/m3                        | 1ug/m3, 10%      | 110x85x44(mm) |
| ES101-TVOC     | <b>Outdoor TVOC (Total Volatile Organic Compounds) Sensor</b> | 0~60000ppb                         | 1ppb±8%FS±125ppb | 110x85x44(mm) |
| ES101-NO2-2000 | <b>Outdoor Nitrogen Dioxide NO<sup>2</sup> Sensor</b>         | 0-2000ppm                          | 0.1ppm           | 110x85x44(mm) |
| ES101-SO2-2000 | <b>Outdoor Sulphur Dioxide SO<sup>2</sup> Sensor</b>          | 0-2000ppm                          | 1ppm +3%FS       | 110x85x44(mm) |
| ES101-NH3-500  | <b>Outdoor Ammonia NH<sup>3</sup> Sensor</b>                  | 0-500ppm                           | 1ppm±20%         | 110x85x44(mm) |
| ES101-H2S-100  | <b>Outdoor Hydrogen Sulfide H2S Sensor</b>                    | 0-100ppm                           | 1ppm +3%FS       | 110x85x44(mm) |
| ES101-H2-1000  | <b>Outdoor Hydrogen H2 Sensor</b>                             | 0-1000ppm                          | 1ppm +3%FS       | 110x85x44(mm) |
| ES101-CH4      | <b>Outdoor Methane CH4 Sensor</b>                             | 0-100% Lower Explosive Limit (LEL) | 1% LEL +5%FS     | 110x85x44(mm) |

**1) Sensor Connect to PC/HMI/PLC**

**2) Sensor Connect to Private LoRa to PC/HMI/PLC**

**3) Sensor Connect to LoRaWAN Gateway**

**4) Sensor Connect to LTE NB-IoT Gateway SCB111-485-NB**

**5) Sensor Connect to WiFi + LTE Gateway WR222-WLAN+LTE**


**Optional Accessory**

| Item                          |   |
|-------------------------------|---|
| <b>MDR-40-24</b>              | Din-Rail Power Supply INPUT:85-264VAC, 120-370VDC, OUTPUT: 24VDC/1.7A, -20 ~ +70°C  |
| <b>ThingsMaster OTA-5GW</b>   | ThingsMaster OTA for 5 gateways, One Year License   |
| <b>LM100</b>                  | LoRa Master / Modbus RTU Client (Must work with LC144) (with LoRa antennas)   |
| <b>LC144</b>                  | 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) |
| <b>LR140</b>                  | 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)  |
| <b>WR322GR-EC-LTE-LORAWAN</b> | Industrial LoRaWAN Gateway, 2GbE+2COM, LTE 2SIM, (with LTE and LoRa antennas)(Must work with LR140)   |
| <b>WR312GR-EC-LORAWAN</b>     | Industrial LoRaWAN Gateway, 2GbE+2COM (Must work with LR140)  |
| <b>WR222-WLAN+LTE</b>         | Industrial Wireless IIoT Field Router, 2FE+1COM, SD, 802.11b/g/n WLAN, 1SIM (with WiFi, LTE Antennas)   |
| <b>SCB111-485-NB-DC</b>       | Outdoor Modbus RS485 to NB-IoT / LTE Cat M1 Gateway   |

# ES101CO-2000

## Outdoor CO Carbon Monoxide Sensor

### Wide Measuring Range, High Accuracy

- 1000 / 2000ppm, +/-3% Accuracy
- 1 ppm Resolution, ≤ 2% Stability

### Std. Modbus RTU RS-485, Wide Power Range

- 2-Wire RS-485
- 10~30Vdc Power Input

### High Grade Enclosure Protection

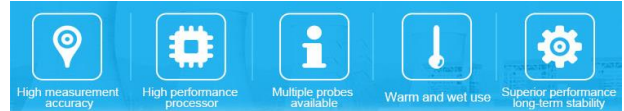
- IP54 Grade Protection, ABS Plastic, UL94V0 Anti-fire
- Water-Proof, Anti-Dust with Out-Door Shelter

### Optional IoT Router and Cloud Platform - ThingsMaster

- Support Modbus to connect optional NBIoT Gateway WR222-WLAN-NB for one or many sensors
- Real-time online monitoring, analysis, reporting
- Remote cloud security and visual management



## Features & Benefits



|                                     |                                       |
|-------------------------------------|---------------------------------------|
| <b>CO measurement range</b>         | ES101CO-2000: 0~2000ppm               |
| <b>Accuracy</b>                     | ±3%                                   |
| <b>CO resolution</b>                | 1ppm                                  |
| <b>Stability</b>                    | ≤2% Signal / Month                    |
| <b>Signal output</b>                | RS485 2-Wire output (Modbus protocol) |
| <b>Operating Voltage</b>            | 10~30VDC                              |
| <b>Working Environment</b>          | -20~+50°C , 15-90%RH                  |
| <b>Power consumption</b>            | <0.18w                                |
| <b>Response time</b>                | ≤ 3 Sec.                              |
| <b>Dimension &amp; Installation</b> | 85 x110 x 44mm; Wall Mounting         |

| Register Address | PLC or Configuration Address | Content                | Description                           |
|------------------|------------------------------|------------------------|---------------------------------------|
| 0000 H           | 40001                        | CO concentration value | Range : 0~2000ppm<br>Upload real data |
| 07D0 H           | 42001                        | Slave ID               | 1 ~ 254 (Factory Default 1)           |
| 07D1 H           | 42002                        | Baud Rate              | 0=2400 1=4800 2=9600(Default)         |



## Ordering Information

| Model Name          | Description  |
|---------------------|--|
| <b>ES101CO-2000</b> | Outdoor CO Carbon Monoxide Sensor, 0~2000ppm, RS485 Modbus, 10-30V Power |
|                     | <b>Package List</b>  |
|                     | 1 x Product Unit, 1 x Quick Installation Guide                           |
|                     | 2x Expansion plugs, 2 x Self-tapping screws                              |

\*4~20mA / 0~5V / 0~10V output by request

\*ES101CO-1000 by request

# ES101O3-10

## Outdoor Ozon O3 Sensor

### Wide Measuring Range, High Accuracy

- 10/100ppm, +/-6% Accuracy in Full Scale
- 0.01 ppm Resolution, ≤ 7% Stability/Year

### Std. Modbus RTU RS-485, Wide Power Range

- 2-Wire RS-485
- 10~30Vdc Power Input

### High Grade Enclosure Protection

- IP54 Grade Protection, ABS Plastic, UL94V0 Anti-fire
- Water-Proof, Anti-Dust with Out-Door Shelter

### Optional IoT Router and Cloud Platform - ThingsMaster

- Support Modbus to connect optional NBloT Gateway WR222-WLAN-NB for one or many sensors
- Real-time online monitoring, analysis, reporting
- Remote cloud security and visual management



## Features & Benefits



|                                     |                                       |
|-------------------------------------|---------------------------------------|
| <b>O3 measurement range</b>         | ES101-O3-10: 0-10ppm                  |
| <b>O3 resolution</b>                | ES101-O3-10: 0.01ppm                  |
| <b>Accuracy</b>                     | ±6%                                   |
| <b>Stability</b>                    | <7% Signal / Year                     |
| <b>Signal output</b>                | RS485 2-wire output (Modbus protocol) |
| <b>Operating Voltage</b>            | 10~30VDC                              |
| <b>Working Environment</b>          | -10~+50°C , 15-90%RH                  |
| <b>Power consumption</b>            | <0.12w                                |
| <b>Response time</b>                | ≤35 seconds                           |
| <b>Dimension &amp; Installation</b> | 85 x110 x 44mm; Wall Mounting         |

| Register Address | PLC or Configuration Address | Content                | Description  |
|------------------|------------------------------|------------------------|--|
| 0000 H           | 40001                        | O3 concentration value | Range : 0~10ppm<br>Upload data 100 times real data |
| 07D0 H           | 42001                        | Slave ID               | 1 ~ 254 (Factory Default 1)                        |
| 07D1 H           | 42002                        | Baud Rate              | 0=2400 1=4800 2=9600(Default)                      |



## Ordering Information

| Model Name        | Description   |
|-------------------|---|
| <b>ES101O3-10</b> | Outdoor Ozon O3 Sensor, 0~10ppm, RS485 Modbus, 10-30V Power |
|                   | <b>Package List</b>   |
|                   | 1 x Product Unit  |
|                   | 2x Expansion plugs, 2 x Self-tapping screws                 |
|                   | 1 x Quick Installation Guide                                |

\*4~20mA / 0~5V / 0~10V output by request

\*ES100O3-100 by request

# ES101-CO2-5000

## Outdoor CO2 Carbon Dioxide Sensor

### Wide CO2 Measuring Range

- 5000ppm with +/- 40ppm Accuracy in full-scale
- Widely applied at Heavy Air-Pollution Area

### Std. Modbus RTU RS-485, Wide Power Range

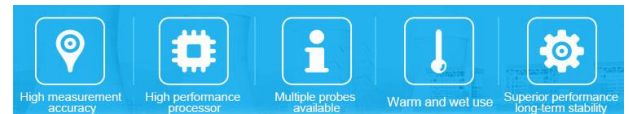
- 2-Wire RS-485
- 10~30Vdc Power Input

### High Grade Enclosure Protection

- IP54 Grade Protection, ABS Plastic, UL94V0 Anti-fire
- Water-Proof, Anti-Dust with Out-Door Shelter

### Optional IoT Router and Cloud Platform - ThingsMaster

- Support Modbus to connect optional NBIoT Gateway WR222-WLAN-NB for one or many sensors
- Real-time online monitoring, analysis, reporting
- Remote cloud security and visual management



## Features & Benefits

|                                     |                                       |
|-------------------------------------|---------------------------------------|
| <b>CO2 Measurement Range:</b>       | 0-5000ppm                             |
| <b>Digital Signal output</b>        | RS485 2-Wire output (Modbus protocol) |
| <b>Working Voltage</b>              | 10-30VDC                              |
| <b>Power consumption</b>            | < 0.4w                                |
| <b>CO2 Accuracy</b>                 | ±40ppm +3%FS (25°C)                   |
| <b>Working Environment</b>          | -10-+50°C , 0-80%RH                   |
| <b>Stability</b>                    | <2% Signal / Year                     |
| <b>Response time</b>                | ≤90s with 90% step change             |
| <b>Dimension &amp; Installation</b> | 85 x110 x 44mm; Wall Mounting         |

| Register Address | PLC or Configuration Address | Content                 | Description                           |
|------------------|------------------------------|-------------------------|---------------------------------------|
| 0002 H           | 40003                        | CO2 concentration value | Range : 0~5000ppm<br>Upload real data |
| 07D0 H           | 42001                        | Slave ID                | 1 ~ 254 (Factory Default 1)           |
| 07D1 H           | 42002                        | Baud Rate               | 0=2400 1=4800 2=9600(Default)         |



## Ordering Information

| Model Name           | Description  |
|----------------------|--|
| <b>ES101CO2-5000</b> | Outdoor CO2 Carbon Dioxide Sensor, 0~5000ppm, RS485 Modbus, 10-30V Power |
|                      | <b>Package List</b>  |
|                      | 1 x Product Unit   |
|                      | 2x Expansion plugs, 2 x Self-tapping screws                              |
|                      | 1 x Quick Installation Guide   |

\*4~20mA / 0~5V / 0~10V output by request

\*ES101CO2-10000 by request

# ES101-CO2-HC

## Outdoor CO2 Carbon Dioxide Sensor High Concentration

### Wide CO2 Measuring Range

- 0 to 100% Vol High Concentration CO2 Measurement
- Widely applied at Heavy Air-Pollution Area

### Std. Modbus RTU RS-485, Wide Power Range

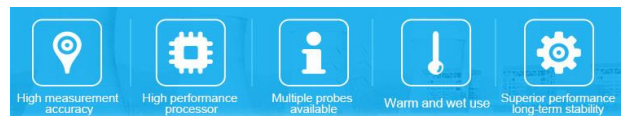
- 2-Wire RS-485
- 10~30Vdc Power Input

### High Grade Enclosure Protection

- IP65 Grade Protection, ABS Plastic, UL94V0 Anti-fire
- Water-Proof, Anti-Dust with Out-Door Shelter

### Optional IoT Router and Cloud Platform - ThingsMaster

- Support Modbus to connect optional NBloT Gateway WR222-WLAN-NB for one or many sensors
- Real-time online monitoring, analysis, reporting
- Remote cloud security and visual management



### Features & Benefits

|                                     |  |
|-------------------------------------|--|
| <b>CO2 Measurement Range:</b>       | 0 ~ 5%Vol : 0.5%Vol +3% current value<br>0 ~ 20%Vol : 0.5%Vol +3% current value<br>0 ~ 50%Vol : 1%Vol +3% current value<br>0 ~ 100%Vol : 1%Vol +3% current value |
| <b>Digital Signal output</b>        | RS485 2-Wire output (Modbus protocol)  |
| <b>Working Voltage</b>              | 10-30VDC   |
| <b>Power consumption</b>            | 0.14W (24VDC)  |
| <b>CO2 Accuracy</b>                 | ±3%FS (25°C)   |
| <b>Working Environment</b>          | -10-+50°C , 0-80%RH  |
| <b>Stability</b>                    | <2% Signal / Year  |
| <b>Response time</b>                | ≤90s with 90% step change  |
| <b>Dimension &amp; Installation</b> | 85 x110 x 44mm; Wall Mounting  |



### Ordering Information

| Model Name        | Description  |
|-------------------|--|
| ES101CO2-HC5VoL   | Outdoor CO2 Carbon Dioxide Sensor, High Concentration 0~5Vol, RS485 Modbus, 10-30V Power   |
| ES101CO2-HC20VoL  | Outdoor CO2 Carbon Dioxide Sensor, High Concentration 0~20Vol, RS485 Modbus, 10-30V Power  |
| ES101CO2-HC50VoL  | Outdoor CO2 Carbon Dioxide Sensor, High Concentration 0~50Vol, RS485 Modbus, 10-30V Power  |
| ES101CO2-HC100VoL | Outdoor CO2 Carbon Dioxide Sensor, High Concentration 0~100Vol, RS485 Modbus, 10-30V Power |



Ext Probe Thread: M30\*1.5

#### Package List

- 1 x Product Unit
- 2x Expansion plugs, 2 x Self-tapping screws
- 1 x Extension Probe
- 1 x Quick Installation Guide

# ES10102

## Outdoor Oxygen O2 Sensor

### Wide Measuring Range

- 0~25% VOL, +/-3% Accuracy in Full Scale
- 0.1% VOL Resolution

### Std. Modbus RTU RS-485, Wide Power Range

- 2-Wire RS-485
- 10~30Vdc Power Input

### High Grade Enclosure Protection

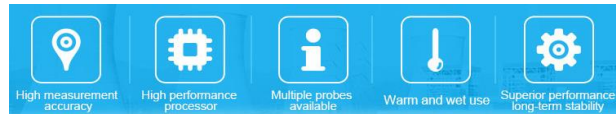
- IP54 Grade Protection, ABS Plastic, UL94V0 Anti-fire
- Water-Proof, Anti-Dust with Out-Door Shelter

### Optional IoT Router and Cloud Platform - ThingsMaster

- Support Modbus to connect optional NBloT Gateway WR222-WLAN-NB for one or many sensors
- Real-time online monitoring, analysis, reporting
- Remote cloud security and visual management



### Features & Benefits



|                                     |                                       |
|-------------------------------------|---------------------------------------|
| <b>O2 measurement range</b>         | 0~25%Vol                              |
| <b>O2 resolution</b>                | ±3%FS                                 |
| <b>Accuracy</b>                     | 0.1%VOL                               |
| <b>Signal output</b>                | RS485 2-wire output (Modbus protocol) |
| <b>Stability</b>                    | <5% Signal / Year                     |
| <b>Operating Voltage</b>            | 10~30VDC                              |
| <b>Power consumption</b>            | <0.25W                                |
| <b>Working Environment</b>          | -20~+50°C , 5-95%RH                   |
| <b>Response time</b>                | <10 seconds                           |
| <b>Pre-Heat Time</b>                | ≥ 5Min                                |
| <b>Dimension &amp; Installation</b> | 87 x117 x 44; Wall Mounting           |

| Register Address | PLC or Configuration Address | Content                  | Description                                     |
|------------------|------------------------------|--------------------------|---|
| 0000 H           | 40001                        | O2 concentration value % | Range : 0~250<br>Upload data 10 times real data |
| 07D0 H           | 42001                        | Slave ID                 | 1 ~ 254 (Factory Default 1)                     |
| 07D1 H           | 42002                        | Baud Rate                | 0=2400 1=4800 2=9600(Default)                   |



### Ordering Information

| Model Name     | Description  |
|----------------|--|
| <b>ES10102</b> | Outdoor Oxygen O2 Sensor, 0~25%Vol, RS485 Modbus, 10-30V Power |
|                | <b>Package List</b>  |
|                | 1 x Product Unit   |
|                | 2x Expansion plugs, 2 x Self-tapping screws                    |
|                | 1 x Quick Installation Guide                                   |

# ES101PM

## Outdoor Air Monitor Quality Sensor (PM2.5, PM10)

### Wide Measuring Range , High Reliability

- 1000 ug/m3 for PM2.5, PM10
- I.R. Laser Detective Technology

### Std. Modbus RTU RS-485, Wide Power Range

- 2-Wire RS-485
- 10~30Vdc Power Input

### High Grade Enclosure Protection

- IP54 Grade Protection, ABS Plastic, UL94V0 Anti-fire
- Water-Proof, Anti-Dust with Out-Door Shelter

### Optional IoT Router and Cloud Platform - ThingsMaster

- Support Modbus to connect optional NBloT Gateway W WLAN-NB for one or many sensors
- Real-time online monitoring, analysis, reporting
- Remote cloud security and visual management



### Features & Benefits



|                                     |                                       |
|-------------------------------------|---------------------------------------|
| <b>PM2.5/10 measurement range</b>   | 0~1000ug/m3                           |
| <b>Resolution</b>                   | 1ug/m3                                |
| <b>Accuracy</b>                     | 10%                                   |
| <b>Signal output</b>                | RS485 2-wire output (Modbus protocol) |
| <b>Stability</b>                    | < 7% Signal / Year                    |
| <b>Operating Voltage</b>            | 10~30VDC                              |
| <b>Power consumption</b>            | < 1.2W                                |
| <b>Working Environment</b>          | -20~+60°C , 0-80%RH                   |
| <b>Response time</b>                | < 90 seconds                          |
| <b>System Pre-Heat Time</b>         | ≤ 2 Min.                              |
| <b>Dimension &amp; Installation</b> | 85 x110 x 44mm; Wall Mounting         |

| Register Address | PLC or Configuration Address | Content   | Description                            |
|------------------|------------------------------|-----------|--|
| 0000 H           | 40001                        | PM2.5     | Range : 0~1000ug/m3 ; Upload real data |
| 0001 H           | 40002                        | PM10      | Range : 0~1000ug/m3 ; Upload real data |
| 07D0 H           | 42001                        | Slave ID  | 1 ~ 254 (Factory Default 1)            |
| 07D1 H           | 42002                        | Baud Rate | 0=2400 1=4800 2=9600(Default)          |



### Ordering Information

| Model Name                                     | Description   |
|--|---|
| <b>ES101PM</b>                                 | Outdoor Air Monitor Quality Sensor (PM2.5, PM10 ), 0~1000ug/m3, RS485 Modbus, 10-30V Power              |
| <b>ES101PM-SH</b>                              | Outdoor Air Monitor Quality Sensor (PM2.5, PM10 ), 0~1000ug/m3, RS485 Modbus, 10-30V Power, Shutter Box |
| <b>Package List</b>                            |   |
| 1 x Product Unit, 1 x Quick Installation Guide |   |
| 2x Expansion plugs, 2 x Self-tapping screws    |   |
| *4~20mA / 0~5V / 0~10V output by request       |   |



# ES101TVOC

## Outdoor TVOC (Total Volatile Organic Compounds) Sensor

### Wide Measuring Range , High Reliability

- 0~60000ppb

### Std. Modbus RTU RS-485, Wide Power Range

- 2-Wire RS-485
- 10~30Vdc Power Input

### High Grade Enclosure Protection

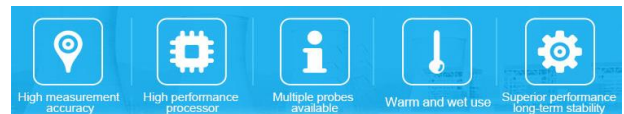
- IP54 Grade Protection, ABS Plastic, UL94V0 Anti-fire
- Water-Proof, Anti-Dust with Out-Door Shelter

### Optional IoT Router and Cloud Platform - ThingsMaster

- Support Modbus to connect optional NBloT Gateway WR222-WLAN-NB for one or many sensors
- Real-time online monitoring, analysis, reporting
- Remote cloud security and visual management



### Features & Benefits



|                                     |                                       |
|-------------------------------------|---------------------------------------|
| <b>Measurement range</b>            | 0~60000ppb                            |
| <b>Resolution</b>                   | 1ppb                                  |
| <b>Accuracy</b>                     | ±8%FS±125ppb                          |
| <b>Signal output</b>                | RS485 2-wire output (Modbus protocol) |
| <b>Stability</b>                    | < 7% Signal / Year                    |
| <b>Operating Voltage</b>            | 10~30VDC                              |
| <b>Power consumption</b>            | < 0.5W                                |
| <b>Working Environment</b>          | -40~85°C , 0-95%RH                    |
| <b>Response time</b>                | < 1 seconds                           |
| <b>Dimension &amp; Installation</b> | 85 x110 x 44mm; Wall Mounting         |

| Register Address | PLC or Configuration Address | Content    | Description                      |
|------------------|------------------------------|------------|----------------------------------|
| 0000 H           | 40001                        | TVOC (ppb) | Range: 0~60000; Upload real data |
| 07D0 H           | 42001                        | Slave ID   | 1 ~ 254 (Factory Default 1)      |
| 07D1 H           | 42002                        | Baud Rate  | 0=2400 1=4800 2=9600(Default)    |



### Ordering Information

| Model Name       | Description   |
|------------------|---|
| <b>ES101TVOC</b> | Outdoor TVOC Sensor, 0~60000ppb, RS485 Modbus, 10-30V Power |
|                  | <b>Package List</b>   |
|                  | 1 x Product Unit, 1 x Quick Installation Guide              |
|                  | 2x Expansion plugs, 2 x Self-tapping screws                 |

\*4~20mA / 0~5V / 0~10V output by request

# ES101NO2-2000

## Outdoor Nitrogen Dioxide NO<sub>2</sub> Sensor

### Wide Measuring Range

- 2000ppm – ES101-NO2-2000
- 20ppm- ES101-NO2-20

### Std. Modbus RTU RS-485, Wide Power Range

- 2-Wire RS-485
- 10~30Vdc Power Input

### High Grade Enclosure Protection

- IP54 Grade Protection, ABS Plastic, UL94V0 Anti-fire
- Water-Proof, Anti-Dust with Out-Door Shelter

### Optional IoT Router and Cloud Platform - ThingsMaster

- Support Modbus to connect optional NBloT Gateway WR222-WLAN-NB for one or many sensors
- Real-time online monitoring, analysis, reporting
- Remote cloud security and visual management



### Features & Benefits



|   |  |
|---|--|
| <b>NO<sub>2</sub> measurement range</b> | 0-2000ppm (ES101-NO2-2000)                 |
| <b>NO<sub>2</sub> resolution</b>        | 0.1ppm(ES101-NO2-2000)                     |
| <b>Signal output</b>                    | RS485 2-wire output (Modbus protocol)      |
| <b>Stability</b>                        | <2% Signal / Month                         |
| <b>Operating Voltage</b>                | 10~30VDC                                   |
| <b>Power consumption</b>                | <0.18W                                     |
| <b>Working Environment</b>              | -20~+50°C , 15-90%RH                       |
| <b>Response time</b>                    | 90% step change is generally less than 90s |
| <b>Dimension &amp; Installation</b>     | 87 x117 x 44; Wall Mounting                |

| Register Address | PLC or Configuration Address | Content                             | Description                           |
|------------------|------------------------------|-------------------------------------|---------------------------------------|
| 0000 H           | 40001                        | NO <sub>2</sub> concentration value | Range : 0~2000ppm<br>Upload real data |
| 07D0 H           | 42001                        | Slave ID                            | 1 ~ 254 (Factory Default 1)           |
| 07D1 H           | 42002                        | Baud Rate                           | 0=2400 1=4800 2=9600(Default)         |



### Ordering Information

| Model Name           | Description  |
|----------------------|--|
| <b>ES101NO2-2000</b> | Outdoor Nitric Dioxide NO <sub>2</sub> Sensor, 0~2000ppm, RS485 Modbus, 10-30V Power |
|                      | <b>Package List</b>  |
|                      | 1 x Product Unit   |
|                      | 2x Expansion plugs, 2 x Self-tapping screws  |
|                      | 1 x Quick Installation Guide   |

\*4~20mA / 0~5V / 0~10V output by request

\*ES101-NO2-20 by request

# ES101SO2-2000

## Outdoor Sulphur Dioxide SO<sub>2</sub> Sensor

### Wide Measuring Range

- 2000ppm , +/-3% Accuracy in Full Scale
- 1ppm Resolution

### Std. Modbus RTU RS-485, Wide Power Range

- 2-Wire RS-485
- 10~30Vdc Power Input

### High Grade Enclosure Protection

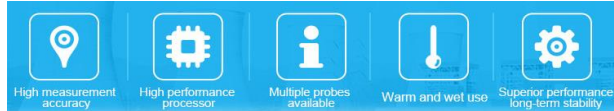
- IP54 Grade Protection, ABS Plastic, UL94V0 Anti-fire
- Water-Proof, Anti-Dust with Out-Door Shelter

### Optional IoT Router and Cloud Platform - ThingsMaster

- Support Modbus to connect optional NBIoT Gateway WR222-WLAN-NB for one or many sensors
- Real-time online monitoring, analysis, reporting
- Remote cloud security and visual management



### Features & Benefits



|                                   |                                       |
|-----------------------------------|---------------------------------------|
| SO <sub>2</sub> measurement range | 0-2000ppm                             |
| SO <sub>2</sub> resolution        | 1ppm                                  |
| Accuracy                          | +/- 3% in Full Scale                  |
| Signal output                     | RS485 2-wire output (Modbus protocol) |
| Stability                         | <7% Signal / Year                     |
| Operating Voltage                 | 10~30VDC                              |
| Power consumption                 | <0.18W                                |
| Working Environment               | -20~+50°C , 15-90%RH                  |
| Response time                     | <70 seconds                           |
| Pre-Heat Time                     | ≥5Min.                                |
| Dimension & Installation          | 87 x117 x 44; Wall Mounting           |

| Register Address | PLC or Configuration Address | Content                             | Description                           |
|------------------|------------------------------|-------------------------------------|---------------------------------------|
| 0000 H           | 40001                        | SO <sub>2</sub> concentration value | Range : 0~2000ppm<br>Upload real data |
| 07D0 H           | 42001                        | Slave ID                            | 1 ~ 254 (Factory Default 1)           |
| 07D1 H           | 42002                        | Baud Rate                           | 0=2400 1=4800 2=9600(Default)         |



### Ordering Information

| Model Name    | Description   |
|---------------|---|
| ES101SO2-2000 | Outdoor Sulphur Dioxide SO <sub>2</sub> Sensor, 0~2000ppm, RS485 Modbus, 10-30V Power |
|               | <b>Package List</b>   |
|               | 1 x Product Unit  |
|               | 2x Expansion plugs, 2 x Self-tapping screws   |
|               | 1 x Quick Installation Guide  |

\*4~20mA / 0~5V / 0~10V output by request

# ES101NH3-500

## Outdoor Ammonia NH<sub>3</sub> Sensor

### Multiple Measuring Range

- 50ppm, 100ppm, 500ppm
- +/-20%, +/-2% Accuracy
- 0.1 ppm /1ppm Resolution

### Std. Modbus RTU RS-485, Wide Power Range

- 2-Wire RS-485
- 10~30Vdc Power Input

### High Grade Enclosure Protection

- IP54 Grade Protection, ABS Plastic, UL94V0 Anti-fire
- Water-Proof, Anti-Dust with Out-Door Shelter

### Optional IoT Router and Cloud Platform - ThingsMaster

- Support Modbus to connect optional NBloT Gateway WR222-WLAN-NB for one or many sensors
- Real-time online monitoring, analysis, reporting
- Remote cloud security and visual management



## Features & Benefits



|   |                                       |
|---|---------------------------------------|
| <b>NH<sub>3</sub> measurement range</b> | 0-500ppm                              |
| <b>NH<sub>3</sub> resolution</b>        | 1ppm                                  |
| <b>Accuracy</b>                         | ±20% in Full Scale Oxygen : ≥18%VOL   |
| <b>Signal output</b>                    | RS485 2-wire output (Modbus protocol) |
| <b>Stability</b>                        | <2% Signal / Month                    |
| <b>Operating Voltage</b>                | 10~30VDC                              |
| <b>Power consumption</b>                | 0.9W                                  |
| <b>Working Environment</b>              | -20~+50°C , 15-90%RH                  |
| <b>Response Time</b>                    | ≤25Sec.                               |
| <b>Pre-Heat Time</b>                    | ≥ 48Hours                             |
| <b>Dimension &amp; Installation</b>     | 87 x117 x 44; Wall Mounting           |

| Register Address | PLC or Configuration Address | Content                             | Description                          |
|------------------|------------------------------|-------------------------------------|--------------------------------------|
| 0000 H           | 40001                        | NH <sub>3</sub> concentration value | Range : 0~500ppm<br>Upload real data |
| 07D0 H           | 42001                        | Slave ID                            | 1 ~ 254 (Factory Default 1)          |
| 07D1 H           | 42002                        | Baud Rate                           | 0=2400 1=4800 2=9600(Default)        |



## Ordering Information

| Model Name          | Description  |
|---------------------|--|
| <b>ES101NH3-500</b> | Outdoor NH <sub>3</sub> Sensor, 500ppm, RS485 Modbus, 10-30V Power |
|                     | <b>Package List</b>  |
|                     | 1 x Product Unit   |
|                     | 2x Expansion plugs, 2 x Self-tapping screws                        |
|                     | 1 x Quick Installation Guide                                       |

# ES101H2S-100

## Outdoor Hydrogen Sulfide H2S Sensor

### Multiple Measuring Range

- 0~100ppm, ±3%FS
- 1ppm Resolution

### Std. Modbus RTU RS-485, Wide Power Range

- 2-Wire RS-485
- 10~30Vdc Power Input

### High Grade Enclosure Protection

- IP54 Grade Protection, ABS Plastic, UL94V0 Anti-fire
- Water-Proof, Anti-Dust with Out-Door Shelter

### Optional IoT Router and Cloud Platform - ThingsMaster

- Support Modbus to connect optional NBIoT Gateway WR222-WLAN-NB for one or many sensors
- Real-time online monitoring, analysis, reporting
- Remote cloud security and visual management



### Features & Benefits



|                                     |                                       |
|-------------------------------------|---------------------------------------|
| <b>H2S measurement range</b>        | 0-100ppm                              |
| <b>H2S resolution</b>               | 1ppm                                  |
| <b>Accuracy</b>                     | ±3% in Full Scale                     |
| <b>Signal output</b>                | RS485 2-wire output (Modbus protocol) |
| <b>Stability</b>                    | <2% Signal / Month                    |
| <b>Operating Voltage</b>            | 10~30VDC                              |
| <b>Power consumption</b>            | 0.12W                                 |
| <b>Working Environment</b>          | -20~+50°C , 15-90%RH                  |
| <b>Response Time</b>                | ≤35Sec.                               |
| <b>Pre-Heat Time</b>                | ≥ 5Min                                |
| <b>Dimension &amp; Installation</b> | 85 x110 x 44; Wall Mounting           |

| Register Address | PLC or Configuration Address | Content                 | Description                          |
|------------------|------------------------------|-------------------------|--------------------------------------|
| 0000 H           | 40001                        | H2S concentration value | Range : 0~100ppm<br>Upload real data |
| 07D0 H           | 42001                        | Slave ID                | 1 ~ 254 (Factory Default 1)          |
| 07D1 H           | 42002                        | Baud Rate               | 0=2400 1=4800 2=9600(Default)        |



### Ordering Information

| Model Name          | Description   |
|---------------------|---|
| <b>ES101H2S-100</b> | Outdoor H2S Sensor,0~100ppm, RS485 Modbus, 10-30V Power |
|                     | <b>Package List</b>                                     |
|                     | 1 x Product Unit  |
|                     | 2x Expansion plugs, 2 x Self-tapping screws             |
|                     | 1 x Quick Installation Guide                            |

# ES101H2-1000

## Outdoor Hydrogen H2 Sensor

### High Accuracy

- 0~1000ppm, ±3%FS

### Std. Modbus RTU RS-485, Wide Power Range

- 2-Wire RS-485
- 10~30Vdc Power Input

### High Grade Enclosure Protection

- IP54 Grade Protection, ABS Plastic, UL94V0 Anti-fire
- Water-Proof, Anti-Dust with Out-Door Shelter

### Optional IoT Router and Cloud Platform - ThingsMaster

- Support Modbus to connect optional NBloT Gateway WR222-WLAN-NB for one or many sensors
- Real-time online monitoring, analysis, reporting
- Remote cloud security and visual management



## Features & Benefits



|                                     |                                       |
|-------------------------------------|---------------------------------------|
| <b>H2 measurement range</b>         | 0-1000ppm                             |
| <b>H2 resolution</b>                | 1ppm                                  |
| <b>Accuracy</b>                     | ±3% in Full Scale                     |
| <b>Signal output</b>                | RS485 2-wire output (Modbus protocol) |
| <b>Stability</b>                    | <2% Signal / Month                    |
| <b>Operating Voltage</b>            | 10~30VDC                              |
| <b>Power consumption</b>            | 0.9W                                  |
| <b>Working Environment</b>          | -20~+50°C , 15-90%RH                  |
| <b>Response Time</b>                | ≤70Sec.                               |
| <b>Pre-Heat Time</b>                | ≥ 5Min                                |
| <b>Dimension &amp; Installation</b> | 85 x110 x 44; Wall Mounting           |

| Register Address | PLC or Configuration Address | Content                | Description                           |
|------------------|------------------------------|------------------------|---------------------------------------|
| 0000 H           | 40001                        | H2 concentration value | Range : 0~1000ppm<br>Upload real data |
| 07D0 H           | 42001                        | Slave ID               | 1 ~ 254 (Factory Default 1)           |
| 07D1 H           | 42002                        | Baud Rate              | 0=2400 1=4800 2=9600(Default)         |



## Ordering Information

| Model Name          | Description  |
|---------------------|--|
| <b>ES101H2-1000</b> | Outdoor H2 Sensor, 0-1000PPM, RS485 Modbus, 10-30V Power |
|                     | <b>Package List</b>                                      |
|                     | 1 x Product Unit   |
|                     | 2x Expansion plugs, 2 x Self-tapping screws              |
|                     | 1 x Quick Installation Guide                             |

# ES101CH4

## Outdoor Methane CH4 Sensor

### High Accuracy

- ExdIMb grade
- 0~100%LEL

### Std. Modbus RTU RS-485, Wide Power Range

- 2-Wire RS-485
- 10~30Vdc Power Input

### High Grade Enclosure Protection

- IP54 Grade Protection, ABS Plastic, UL94V0 Anti-fire
- Water-Proof, Anti-Dust with Out-Door Shelter

### Optional IoT Router and Cloud Platform - ThingsMaster

- Support Modbus to connect optional NBIoT Gateway WR222-WLAN-NB for one or many sensors
- Real-time online monitoring, analysis, reporting
- Remote cloud security and visual management



## Features & Benefits



|                                     |   |
|-------------------------------------|---|
| <b>CH4 measurement range</b>        | 0-100% Lower Explosive Limit (LEL)        |
| <b>CH4 resolution</b>               | 1% LEL                                    |
| <b>Accuracy</b>                     | ±5% in Full Scale, No Less than 5% Oxygen |
| <b>Signal output</b>                | RS485 2-wire output (Modbus protocol)     |
| <b>Stability</b>                    | <7% Signal / Year                         |
| <b>Operating Voltage</b>            | 10~30VDC                                  |
| <b>Power consumption</b>            | 0.9W                                      |
| <b>Working Environment</b>          | -20~+40°C , 0-95%RH                       |
| <b>Response Time</b>                | ≤15Sec.                                   |
| <b>Pre-Heat Time</b>                | ≥ 5Min                                    |
| <b>Dimension &amp; Installation</b> | 85 x110 x 44; Wall Mounting               |

| Register Address | PLC or Configuration Address | Content                 | Description                          |
|------------------|------------------------------|-------------------------|--------------------------------------|
| 0000 H           | 40001                        | CH4 concentration value | Range : 0-100% LEL; Upload real data |
| 07D0 H           | 42001                        | Slave ID                | 1 ~ 254 (Factory Default 1)          |
| 07D1 H           | 42002                        | Baud Rate               | 0=2400 1=4800 2=9600(Default)        |



## Ordering Information

| Model Name      | Description   |
|-----------------|---|
| <b>ES101CH4</b> | Outdoor CH4 Sensor, 0-100%LEL, RS485 Modbus, 10-30V Power |
|                 | <b>Package List</b>                                       |
|                 | 1 x Product Unit  |
|                 | 2x Expansion plugs, 2 x Self-tapping screws               |
|                 | 1 x Quick Installation Guide                              |

\*4~20mA / 0~5V / 0~10V output by request