

## GREENHOUSE MONITORING / DATA SHEET

# SS209-01

## 4G Smart Greenhouse Environment Monitor

Solar-powered multi-parameter monitoring with 4G data transmission for greenhouses and controlled-environment agriculture.

### Overview

- Integrates air temperature and humidity, illuminance, atmospheric pressure and CO2 monitoring in one unit.
- Supports up to seven external RS485 soil-monitoring channels for configurable soil parameters.
- Uploads data through a 4G cellular network and supports remote parameter viewing, alarm thresholds and calibration.
- Built-in battery and top-mounted solar panel support autonomous field operation without on-site signal wiring.



| Communication<br>4G Cellular                                                                                                                                                                                                                                                                                                                                              | Power<br>Solar + Battery | Soil Inputs<br>Up to 7 RS485                                                                                                                                                                                                                              | Storage<br>65,000 Records |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| <b>Key Advantages</b> <ul style="list-style-type: none"> <li>• No field communication cabling or transmission-distance limitation.</li> <li>• Configurable upper and lower alarms with multi-parameter calibration.</li> <li>• Online real-time data and battery-level monitoring.</li> <li>• Default low-power operation with automatic data recovery upload.</li> </ul> |                          | <b>Application Scenarios</b> <ul style="list-style-type: none"> <li>• Commercial greenhouses.</li> <li>• Greenhouse flower cultivation.</li> <li>• Seedling and nursery facilities.</li> <li>• Protected agriculture and research greenhouses.</li> </ul> |                           |

### SYSTEM DATA

## Technical Specifications

| Item                       | Specification                                                                                                 |
|----------------------------|---------------------------------------------------------------------------------------------------------------|
| Power Supply               | Built-in battery with integrated solar panel                                                                  |
| Communication Interface    | 4G cellular network                                                                                           |
| Data Upload                | 20 min by default; 10 min temperature step check with immediate trigger upload; step function can be disabled |
| Air Temperature Range      | -40 to +120 °C                                                                                                |
| Air Temperature Resolution | 0.1 °C                                                                                                        |
| Air Humidity Range         | 0 to 99% RH                                                                                                   |
| Air Humidity Resolution    | 0.1% RH                                                                                                       |
| External Soil Sensors      | Compatible with RS485 soil sensors; up to 7 configurable channels                                             |
| Illuminance Range          | 0 to 200,000 lux                                                                                              |

| Item                            | Specification                                  |
|---------------------------------|------------------------------------------------|
| Illuminance Resolution          | 1 lux                                          |
| Illuminance Accuracy            | ±7% at 25 °C                                   |
| CO2 Range                       | 0 to 5000 ppm; effective range 400 to 5000 ppm |
| CO2 Resolution                  | 1 ppm                                          |
| CO2 Accuracy                    | ±(50 ppm + 3% F.S.) at 25 °C                   |
| Atmospheric Pressure Range      | 0 to 120 kPa                                   |
| Atmospheric Pressure Resolution | 0.1 kPa                                        |
| Atmospheric Pressure Accuracy   | ±0.15 kPa at 25 °C and 101 kPa                 |
| Transmitter Circuit Environment | -20 to +60 °C; 0 to 95% RH, non-condensing     |
| Data Storage                    | 65,000 records                                 |

## POWER MANAGEMENT

### Battery Runtime

| Operating Condition       | Specified Runtime                                                                                        |
|---------------------------|----------------------------------------------------------------------------------------------------------|
| 10-minute upload interval | Up to 10 days without sunlight at full charge, with full sensor configuration and a five-pin soil sensor |
| 20-minute upload interval | Up to 15 days without sunlight at full charge, with the same configuration and no step-trigger upload    |

## COMMUNICATION & DATA

### Upload Channels

| Node | Uploaded Data                | Description                                                           |
|------|------------------------------|-----------------------------------------------------------------------|
| 0    | Air temperature and humidity | Temperature and humidity values; uploaded values are multiplied by 10 |
| 1    | Atmospheric pressure         | 16-bit unsigned; uploaded value is multiplied by 10                   |
| 2    | Illuminance                  | 32-bit unsigned                                                       |
| 3    | CO2 concentration            | 16-bit unsigned                                                       |
| 4-10 | RS485 soil channels 1-7      | Data type is selected during configuration                            |

## CONFIGURATION

### Device and Data Settings

|                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>4G and Monitoring Settings</b> <ul style="list-style-type: none"> <li>• GPRS/4G upload interval: 1200 s by default; minimum 600 s.</li> <li>• Configurable target URL and target port.</li> <li>• Configurable upper and lower alarm thresholds for monitored parameters.</li> <li>• Calibration values available for temperature, humidity, pressure, illuminance and CO2.</li> </ul> | <b>RS485 and Storage Settings</b> <ul style="list-style-type: none"> <li>• Enable or disable each of seven Modbus slave slots.</li> <li>• Configure slave address, function code 03/04, start register and data format.</li> <li>• Normal and alarm record intervals are independently configurable.</li> <li>• Storage modes: Off, On or Auto; stored data can upload automatically after communication</li> </ul> |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

- Status nodes report the power source (10000), remaining battery level (10001) and base-station information (10003).

recovery.

### STEP-TRIGGER UPLOAD

When enabled, the monitor compares the current temperature with the value from 10 minutes earlier. If the difference exceeds the configured step value, one data record is uploaded immediately. The default step value is 0.5 °C.

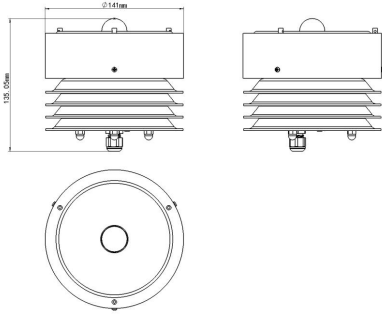
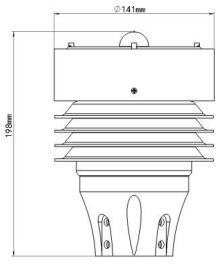
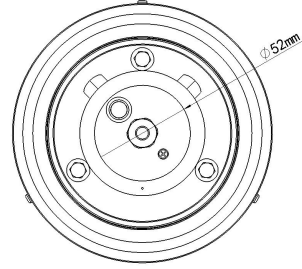
## ORDERING INFORMATION

### Mounting Options

| Code       | Description                                                                                |
|------------|--------------------------------------------------------------------------------------------|
| SS209-01-1 | Lanyard mounting version; supplied with three 1 m lanyards, one hook and three cable locks |
| SS209-01-2 | Clamp/post mounting version; supplied with four M6 × 14 set screws and a hex key           |

## MECHANICAL DATA

### Outline Dimensions

|                                                                                                                                        |                                                                                                                                          |                                                                                                                               |
|----------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
|  <p><b>Lanyard version</b><br/>Ø141 × 135.05 mm</p> |  <p><b>Post-mounted version</b><br/>Ø141 × 198 mm</p> |  <p><b>Post interface</b><br/>Ø52 mm</p> |
|----------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|

## INSTALLATION & OPERATION

### Installation Notes

- Install the monitor in an unobstructed, sunlit location so the top solar panel can receive sufficient sunlight.
- For the lanyard version, route the three lanyards through the top mounting holes, secure them with the cable locks and suspend the unit from the hook.
- For the post-mounted version, place the unit over the mounting post and tighten the set screws evenly with the supplied hex key.
- Use the corresponding soil-sensor instructions for optional external soil probes.
- Press the bottom switch to power on the unit. For a restart, power off for 30 seconds before switching it on again.
- The indicator flashes rapidly during startup.

## APPLICATION

### Greenhouse Monitoring



SS209-01 greenhouse installation

### Configuration & Support Summary

- 4G transmission supports remote data upload without on-site communication wiring.
- Integrated monitoring covers air temperature and humidity, illuminance, pressure and CO<sub>2</sub>.
- Seven configurable RS485 channels support optional soil sensors.
- Solar charging, battery operation and local data storage support unattended operation.
- Engineering support is available for selection, configuration and system integration.

## CONTACT / SUPPORT

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