WEATHER MONITORING / DATA SHEET

SS1000U-04-N01

Compact Ultrasonic Weather Station

Integrated ultrasonic weather monitoring with RS485 Modbus RTU output. Select sensing elements, housing and optional electronic compass.



Overview

- 360° ultrasonic wind speed and direction measurement.
- Multiple environmental sensing options in one unit.
- RS485 Modbus RTU; configurable address and baud rate.

Wind Speed	Wind Direction	Power Supply	Output
0–40 m/s	0–359°	DC 10–30 V	RS485

Key Advantages

- 360° wind sensing without moving cups or vanes.
- Selectable temperature, humidity, pressure and more.
- Optional optical or optical plus pulse rainfall sensing.
- Optional compass for mobile installations.
- IP54 enclosure; maximum power consumption 1.2 W.

Application Scenarios

- Environmental and weather monitoring.
- Air-quality and noise monitoring.
- Marine and vehicle applications with compass option.
- PLC and wired monitoring-system integration.

SYSTEM DATA

Technical Specifications

Item	Specification
Model	SS1000U-04-N01
Supply / maximum power	DC 10–30 V / 1.2 W
Communication	RS485; Modbus RTU; up to 2000 m as specified, subject to bus conditions
Serial format	8 data bits, no parity, 1 stop bit; CRC16; default 4800 bit/s and address 1
Ingress protection	IP54
Configuration	PC configuration software; baud rates 1200–115200 bit/s
Available sensing elements	Wind speed/direction, temperature/humidity, pressure, noise, PM2.5/PM10, CO2, illuminance, solar radiation and optional rainfall; specify configuration
Element operating temperatures	Wind, temperature/humidity, pressure, noise, illuminance and solar radiation: −40 to +80 °C; PM2.5: −20 to +60 °C; CO2: −10 to +60 °C

MEASUREMENT DATA

Measurement Ranges and Performance

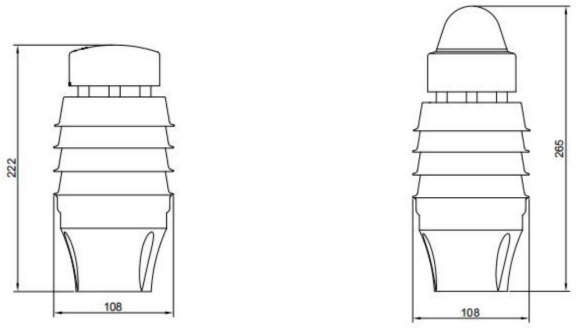
Parameter	Range / accuracy / response

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Wind speed	0–40 m/s; starting speed 0.5 m/s; accuracy ±(0.5 m/s + 2% FS), specified over 0–30 m/s at 25 °C / 60% RH; response 1 s
Wind direction	0–359°; ±3° at 25 °C / 60% RH; response 1 s
Temperature	−40 to +80 °C; ±0.5 °C at 25 °C; response ≤25 s
Humidity	0–99% RH; ±3% RH at 25 °C / 60% RH; response ≤8 s
Atmospheric pressure	0–120 kPa; ±0.15 kPa at 25 °C / 101 kPa; response ≤2 s
Noise	30–120 dB; ±0.5 dB at 94 dB / 1 kHz reference; response ≤3 s
PM2.5 / PM10	0–1000 μg/m³; PM2.5 accuracy ±3% FS at 100 μg/m³, 25 °C / 50% RH; response ≤90 s. Counting efficiency: 50% at 0.3 μm; 98% at ≥0.5 μm
CO2	0–5000 ppm; effective range 400–5000 ppm; ±(50 ppm + 3% FS) at 25 °C; response ≤90 s
Illuminance	0–200000 lx; ±7% at 25 °C; response ≤2 s
Solar radiation	0–1800 W/m²; accuracy ≤±3% at 150 W/m²; response ≤10 s
Optical rainfall option	Typical accuracy ±5%; resolution 0.1 mm; maximum instantaneous rainfall 24 mm/min; sensing diameter 6 cm
Optical plus pulse rainfall option	Typical accuracy ±4%; resolution 0.1 mm; measurement range ≤4 mm/min

Specify housing, required sensing elements, rainfall option and electronic compass when ordering SS1000U-04-N01. Performance applies to fitted elements. Rainfall accuracy is based on laboratory tests. Response times are τ 63; temperature/humidity response is specified at 1 m/s internal sensing-element airflow.

MECHANICAL DATA

Dimensions and Installation



Housing dimensions in millimetres: advanced housing Ø108 × 222; advanced housing with optical rainfall Ø108 × 265; optical plus tipping-bucket rainfall housing Ø108 × 343. Standard housing Ø108.4 × 204.76; standard housing with optical rainfall Ø108.4 × 230.68.

Install securely and horizontally. Without the electronic compass, align the N arrow to true north. With the compass option, no azimuth alignment is required, but level installation is essential. Keep metal, motors and magnets away; recalibrate the compass on site if necessary. Optical plus tipping-bucket rainfall installations must be level.

ELECTRICAL CONNECTION

Power Wiring and Commissioning

Connection	Instruction
Brown wire	DC 10–30 V positive
Black wire	Power negative

Connection	Instruction
RS485 data	Yellow or green: RS485 A; blue: RS485 B. Use unique device addresses on a shared bus.

COMMUNICATION DATA

RS485 Configuration and Modbus Registers

Configure one station at a time via a PC RS485 adapter. Defaults: 4800 bit/s, address 1, 8N1. Supported rates: 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 bit/s. Data is high-byte first; temperature is signed 16-bit two's complement. Set polling interval and response timeout above 200 ms.

Read registers with 0x03 / 0x04 (decimal addresses): 500 wind speed /10; 501 wind force; 502 direction index; 503 direction degrees; 504 humidity /10; 505 signed temperature /10; 506 noise /10; 507 PM2.5 or CO2; 508 PM10 or CO2; 509 pressure /10 kPa; 510 / 511 illuminance high / low words in lx; 512 illuminance in 100 lx units; 513 rainfall /10 mm; 514 compass /100 degrees; 515 solar radiation. PLC references: 40501–40516. Direction: north 0°, east 90°; index north 0, east 2.

Write calibration controls with 0x06 (hex addresses): 0x6000 direction offset, 0 normal / 1 rotated 180°; 0x6001 wind zero, write 0xAA and wait 10 s; 0x6002 rainfall zero, write 0x5A; 0x6003 optical rainfall sensitivity, default 0x11, lower values increase sensitivity. Check wiring, serial settings and driver for communication faults; long buses may need local power, a repeater and 120 Ω termination.

MAINTENANCE & RELIABILITY

Cleaning Stability and Warranty

Clean the lower surface of the measurement zone regularly and remove dust or foreign material. Avoid volatile organic compounds around the capacitive humidity sensor. Do not use the station as a safety or emergency-stop device, or where failure could cause personal injury. Read the operating instructions before installation or servicing.

Long-term stability: temperature ≤0.1 °C/year; humidity ≤1%/year; pressure −0.1 kPa/year as listed in the source; noise ≤3 dB/year; PM2.5/PM10 and CO2 ≤1%/year; illuminance ≤5%/year; solar radiation ≤±3%.

Package: station, certificate, warranty card and 70 cm waterproof mating cable. Standard housing accessories: two white support plates, two M4 × 10 screws/nuts and three M5 × 14 hex-head screws. Advanced and optical plus tipping-bucket housings include a hex key.

Warranty under normal use and maintenance: circuit section 24 months; PM / CO2 sensing section 12 months. Damage from incorrect installation, unauthorized modifications, liquid ingress, accidents or operation outside specified limits is excluded. Repair service is available after warranty.

CONTACT / SUPPORT

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