

MOBILE WEATHER MONITORING / DATA SHEET

SS1000U-07

Vehicle-Mounted Ultrasonic Weather Station

A portable weather monitoring system combining an ultrasonic multi-parameter sensor with a 7-inch touchscreen acquisition case, configurable 4G upload and RS485 / Modbus-RTU integration.

Overview

- Designed for vehicles, ships and other mobile platforms where rapid installation and reliable field data collection are required.
- Measures wind, temperature, humidity, pressure, noise, particulate matter, CO₂, light, optical rainfall, solar radiation and altitude according to the selected configuration.
- The electronic compass removes orientation requirements; keep the station level for accurate observation.
- Magnetic-base and rack-bracket mounting options support flexible vehicle installation.



Wireless 4G upload	Sensor bus RS485 / Modbus	Display 7 in touchscreen	Storage 520,000 records
Key Advantages • Ultrasonic wind measurement has no start-up wind-speed limitation and covers 360°. • Offline storage, USB export and configurable upload / storage intervals. • 4000 mAh battery supports approximately 8–10 h operation; 6–8 h charging time.		Applications • Vehicle and ship environmental surveys. • Mobile agricultural and ecological monitoring. • Field research, emergency observation and temporary stations.	

SENSOR DATA

Ultrasonic Multi-Parameter Sensor

Measured element	Range / capability	Accuracy / response
Wind speed	0–60 m/s	±(0.2 m/s ±0.02·v) at 60%RH, 25 °C; response 1 s
Wind direction	0–359°	±3° at 60%RH, 25 °C; response 1 s
Air temperature	–40 to +80 °C	±0.5 °C at 25 °C; resolution 0.1 °C; response ≤25 s ¹
Relative humidity	0–99%RH	±3%RH at 60%RH, 25 °C; resolution 0.1%RH; response ≤8 s ¹
Atmospheric pressure	0–120 kPa	±0.15 kPa at 25 °C / 101 kPa; response ≤2 s
Noise level	30–120 dB	±0.5 dB at 94 dB / 1 kHz; response ≤3 s
PM10 / PM2.5	0–1000 μg/m ³	PM2.5 accuracy ±3%FS at 100 μg/m ³ , 25 °C, 50%RH; response ≤90 s
CO ₂	400–5000 ppm effective range	±(50 ppm + 3%FS) at 25 °C; response <180 s at 90% step
Illuminance	0–200,000 Lux	±7% at 25 °C; response ≤2 s
Total solar radiation	0–1800 W/m ²	±3% at 150 W/m ² ; response ≤10 s
Optical rainfall	0.1 mm resolution; 24 mm/min max instantaneous rate	Typical accuracy ±5% (laboratory data); sensing diameter 6 cm
Altitude	0–18,000 m	Pressure-derived value; calibrate at the installation location

¹ Temperature and humidity response times are τ_{63} values; wind-speed v is the actual wind speed at the sensing material.

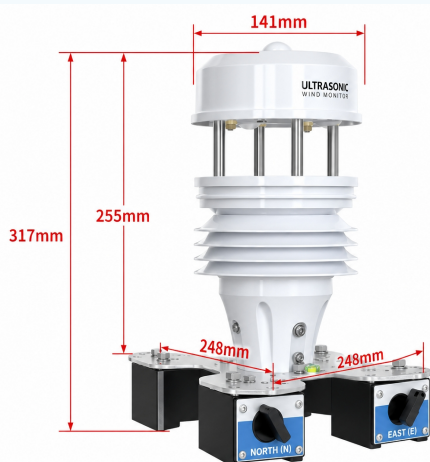
LONG-TERM STABILITY

Channel	Typical long-term stability
Temperature / humidity	$\leq 0.1^\circ\text{C}/\text{y}$ / $\leq 1\%\text{RH}/\text{y}$
Pressure / noise	$-0.1\text{ kPa}/\text{y}$ / $\leq 3\text{ dB}/\text{y}$
PM10 / PM2.5 / CO ₂	$\leq 1\%/\text{y}$ / $\leq 1\%/\text{y}$
Illuminance / solar radiation	$\leq 5\%/\text{y}$ / $\leq \pm 3\%$

ACQUISITION UNIT

Portable Collector and Data Handling

Item	Specification
Power	4000 mAh lithium battery; 10–20 VDC wide-voltage input
Display	7-inch LCD touchscreen with live element view and status pages
Data capacity	Up to 520,000 records; USB flash-drive export
Upload	4G upload interval 20–65535 s, default 300 s
Storage interval	20–65535 s, default 60 s
Operating environment	-20 to $+60^\circ\text{C}$; 0–95%RH, non-condensing
Runtime / charging	Approximately 8–10 h / 6–8 h



Sensor assembly: approx. 317 mm overall
141 mm head width • 248–249 mm base span

Mounting Options

- Magnetic base for rapid placement on a suitable ferromagnetic surface.
- I-frame rack mounting with M8 fasteners and a roof-rack clamp.
- Level after mounting; the electronic compass removes directional alignment.
- Keep magnetic-base vertical load below 200 N.

DIMENSIONS & PACKAGE

Case, Connections and Standard Package

Assembly	Approx. specification	Notes
Acquisition case	360 × 220 × 125 mm	Portable 7-inch touchscreen collector
Sensor connection	RS485 / Modbus-RTU	Default address 0x01; default baud 4800 bit/s
Standard cable	3 m plug-to-plug cable or 2 m male cable	Selection-dependent connection option

Assembly	Approx. specification	Notes
Included / Option-Dependent • Sensor, support bracket, screws, silicone pad and warranty / certificate documents. • Power adapter, carrying case, 4G antenna, USB drive and vehicle cigarette-lighter lead when selected.		Selectable Elements • Wind, air temperature / humidity, pressure, noise, PM2.5 / PM10, CO₂, illuminance, rainfall, solar radiation and altitude. • PM and CO₂ are mutually exclusive in the stated selection scheme.

COMMUNICATION

RS485 / Modbus-RTU Interface

Parameter	Setting
Encoding / data	8-bit binary; 8 data bits; no parity; 1 stop bit
Error check	CRC-16
Address / baud	Default address 0x01; 1200–115200 bit/s selectable; default 4800 bit/s
Frame	Address + function + register start + register length + data + CRC
Register group	Data mapping
500–503	Wind speed ×100; wind force; 0–7 direction; 0–360° direction
504–506	Humidity ×10; temperature ×10; noise ×10
507–509	PM2.5; PM10; pressure ×10
510–515	Illuminance high / low words and 100-Lux units; optical rainfall ×10; total solar radiation

Software & Cloud • Use the Bluetooth parameter app to configure the acquisition case and selected elements. • View live values, two-hour minute-level precipitation prediction and 24-hour weather trends. • Connect to a configured 4G platform for online monitoring, historical data and alarms.	Screen & Export • The touchscreen provides status, parameter configuration and data-export pages. • Set upload, storage and screen timeout intervals; choose which elements are displayed. • Insert a USB drive to export stored records; altitude and compass calibration are available on screen.
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CALIBRATION

Altitude and Electronic Compass

Altitude • Enter the local elevation after installation or relocation. • Use the calibrated value for short-term reliable altitude readings.	Electronic Compass • Point the sensor “N” mark north and set the compensation toward 0° / 360°. • Rotate the level station slowly for approximately 2 minutes without switching off power.
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SERVICE

Installation and Care

Confirm the sensor and acquisition case are firmly connected before powering on. Keep the sensor level, avoid unstable mounting and inspect cables, magnetic bases and clamps before each mobile deployment. The product is not a safety or emergency-stop device; use it only within the stated environmental and mechanical limits. Avoid volatile organic compounds around the capacitive humidity sensor.

CONTACT / SUPPORT

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