



Features

- Consistent, high-quality data
- Easy to operate
- Receive data from several radiosondes simultaneously
- Long telemetry range
- Inbuilt security with regular updates
- Compact design supports portable applications

Vaisala Cirrus® Sounding System MW51 is the foundation of modern meteorological upper-air observations.

Vaisala Cirrus Sounding System MW51 processes, analyses, archives, and relays sounding data. While keeping the best qualities of its predecessors, it introduces significant improvements to radio design, usability, and reliability.

The MW51 system consists of a computer that runs DigiCORA® Software, the Sounding Processing Subsystem SPS511, the RI41 Ground Check Device for preparing RS41 radiosondes, and the UHF and GPS antennas used to receive the radiosonde signal and provide local positioning data. Together with RS41, the MW51 system brings upper-air measurements into a new era. To ensure the system meets the needs of a wide range of Vaisala Radiosonde RS41 customers, various radiosonde ground check device and antenna options are available.

Excellent radio characteristics

The new built-for-purpose Sounding Processing Subsystem SPS511 is sensitive to radiosonde signals, while also being resistant to interference near the meteorological frequency band. This allows for a steady data flow from the radiosonde to the MW51 system, resulting in an accurate atmospheric profile even in demanding radio environments.

Multisounding capability

The MW51 system is able to receive and process sounding data from several radiosondes at the same time. One SPS511 can handle data from 4 simultaneous radiosondes. You can connect multiple SPS511s to the DigiCORA software for increasing the number of radiosondes.

Sustainable security

The system is designed with security in mind. User access is controlled, while data transfer and remote control use secure communication. You can access the DigiCORA user interface from anywhere within the connected network using a standard web browser.

Regular security updates are available for both the DigiCORA application software as well as the embedded SPS511 firmware. This provides the user with additional peace of mind against security threats.

New, intuitive and visual DigiCORA Software

During a sounding, data can be visualized in a variety of views like graphs, tables and a map. With DigiCORA as a guide, preparing a radiosonde continues to require minimal effort from the user.

Configuring DigiCORA to create a wide range of meteorological messages is easy. Triggers and messages set for the sounding are displayed in a brand-new flight plan layout, which shows the main sounding events relative to the current sounding status.

Compact and portable

Variable field conditions and locations for research campaigns pose demands on the sounding system, which needs to be portable as well as efficiently built for transport. MW51 continues to support the portable antenna set CG31 with both UHF and GPS antennas, and SPS511 is notably smaller and lighter than its predecessor.

With an IP rating of IP54, SPS511 tolerates dust and moisture well. SPS511 uses conductive cooling and has no moving parts. The electronics are designed on one signal board to minimize points of failure.

Technical data

Performance

Range with Telemetry Antenna RB31	Up to 350 km (217.5 mi)
Range with Telemetry Antenna RM32	200 km (124 mi)
Range with Portable Antenna Set CG31 and Telemetry Antenna RM31N	150 km (93 mi)

System components and compatible radiosondes

Radiosondes	<ul style="list-style-type: none">• RS41-SG, RS41-SGE• RS41-SGP, RS41-SGPE
Sounding processing subsystem	SPS511
Application software	DigiCORA Software
Ground check device	RI41
Antennas	<ul style="list-style-type: none">• Telemetry Antenna RB31• Telemetry Antennas RM32 and RM31N• GPS Antennas GA31 and GA31N• Portable Antenna Set CG31

System requirements for sounding workstation

Operating system	Windows® 11 Pro Windows® 10 Pro 64-bit
Web browser	<ul style="list-style-type: none">• Microsoft Edge® latest version• Mozilla Firefox® latest version• Google Chrome™ latest version
Processor	<ul style="list-style-type: none">• 4-core CPU (recommended)• 8-core CPU (for multisounding)
Memory	<ul style="list-style-type: none">• 8 GB RAM (minimum)• 16 GB RAM (recommended)• 32 GB RAM (for multisounding)
Hard disk space	160 GB
Graphical processing unit	2 GB or more 667 MHz or faster
Display resolution	1366 × 768 (Full HD, 1920 × 1080 recommended)
USB port	For connecting the ground check device
Serial port	For optional future connection of Vaisala Automatic Weather Station. Either integrated serial port or through RS-232 converter
Network adapter	For connecting the sounding processing subsystem
Speakers	For audio notification (optional)

Operating environment

Computer and accessories

Operating temperature	+10 ... +40 °C (+50 ... +104 °F) 0 ... +45 °C (+32 ... +113 °F) with rugged laptop
Storage temperature	-40 ... +65 °C (-40 ... +149 °F)
Operating humidity	10 ... 90 %RH 10 ... 97 %RH, non-condensing with rugged laptop
Storage humidity	5 ... 95 %RH

Sounding Processing Subsystem SPS511

Operating temperature	0 ... +45 °C (+32 ... +113 °F)
Storage temperature	-50 ... +70 °C (-58 ... +158 °F)
Operating humidity	10 ... 90 %RH 5 ... 100 %RH, with IP protected power supply

IP rating	IP54
See SPS511 datasheet for powering details.	

Ground check devices

Operating temperature	+10 ... +45 °C (+50 ... +113 °F)
Storage temperature	-40 ... +65 °C (-40 ... +149 °F)
Storage humidity	5 ... 95 %RH
Operating humidity	10 ... 90 %RH

For more details, see RI41 datasheet.

Antennas

Operating temperature	-40 ... +55 °C (-40 ... +131 °F)
Storage temperature	-55 ... +100 °C (-67 ... +212 °F) -50 ... +71 °C (-58 ... +160 °F) (CG31)
Storage humidity	0 ... 100 %RH
Operating humidity	0 ... 100 %RH
Operating precipitation	Unlimited

RB31, RM32, RM31N, CG31, GA31, and GA31N. For details, see separate datasheets.

Meteorological messages

BUFR messages	3 09 050 and 3 09 051 (for PILOT data) 3 09 052 and 3 09 057 (for TEMP data) 3 09 053 and 3 09 056 (for descending sounding after balloon burst) All BUFR messages are also available as high resolution variants.
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TEMP messages	TEMP FM35-XI
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Future DigiCORA releases will have enhanced compatibility with other Vaisala products, as well as more available features and meteorological messages.

Compliance

Compliance marks

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