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TacMet® Tactical Meteorological Observation System MAWS201M

Vaisala TacMet MAWS201M is a portable weather station that offers high performance in a compact package. MAWS201M is designed to be used in various environments and in any weather.

Compact and lightweight basic system

MAWS201M measures, processes, and reports data from wind speed and direction, air temperature, relative humidity (dew point), pressure, and precipitation. The system is powered either by AC (mains) power or by an integrated solar panel. Backup batteries are available, providing a minimum of 7 days of operation without recharging.

Full aviation support with enhanced systems

MAWS201M is easily enhanced with the needed support for aviation. An additional optical sensor set enhances the basic system with sensors for cloud height and coverage, visibility, present weather, and lightning detection. Furthermore, it is possible to add a remote wind site and digital displays to the system. A freezing rain sensor option is also available.

MAWS201M includes a handheld display for setting station-specific parameters and for viewing measured and calculated parameters and system alarms.

Maximum portability and ease of use

Mechanical parts of the system are lightweight but robust, and all cables are fitted with quick-release color-coded connectors. The carrying cases are light, yet they provide excellent cushioning during transport.

Versatile reports automatically

Optionally, MAWS201M can be delivered with advanced AviMet® software that displays numerical and graphical data and codes automatically. It also issues automatic METAR and SPECI reports based on user-defined weather events. Remarks can easily be included with reports.

The software also does the archiving and transmitting for further processing.

Reliability and highest precision

MAWS201M processes statistical calculations, performs data quality control, and formats data for output. Built-in quality control software validates sensor data against user-set limits and step changes between successive measurements.

In case of unlikely malfunction, MAWS201M automatically detects failures, and the sensor can be replaced quickly on site.

Technical data

Operating environment

Operating temperature [1] [2]	−50 ... +60 °C (−58 ... +140 °F)
Storage temperature	−50 ... +70 °C (−58 ... +158 °F)
Operating humidity	0 ... 100 %RH
Maximum wind speed	35 m/s (70 kts)
Pollution degree	PD 2
Maximum operating altitude	3000 m (9843 ft)

1) For further extended range, please contact Vaisala.
2) For internal battery storage and operating temperature range, see manufacturer documentation.

Setup time

Basic system	< 15 min
With optical sensors	30 min
With remote wind site	30 min [1]

1) Total setup time depends on location and distance of additional wind sites and displays.

Inputs and outputs

AC (mains) power	100 ... 240 VAC, 50 ... 60 Hz
Solar panel	13 W
Overvoltage category	OVC II
Internal battery	
Basic system (continuous operation without AC power)	7 Ah / 12 V
With optical sensors (min. 24 h operation without AC power)	48 Ah / 12 V
With remote wind site (min. 24 h operation without AC power)	24 Ah / 12 V
Battery regulator for enhanced systems	Charge/Recharge control Temperature compensation Deep discharge protection Simultaneous inputs from solar and AC power allowed

Mechanical specifications

Tripod mast	Adjustable from 1.8 to 3.6 m (6 to 12 ft)
Optional telescopic mast	10 m (30 ft)
Weight	
Basic system	2 × carry case, 44 kg (97 lb)
Basic system and optical sensors	4 × carry case, 115 kg (253.53 lb)
Basic system, optical sensors, and remote wind site	6 × carry case, 176 kg (388.01 lb)
Optional freezing rain sensor	1 × carry case, 12 kg (26.46 lb)

Standard communication options

Wireless communication	UHF, VHF
Landline communication	RS-232

For other communication options, please contact Vaisala.

Data validation, calculations, and reports

Data collection platform	Vaisala Data Logger QML201C
MTBF	> 12 500 h (MIL-HNDB217F)
Data quality control	Upper/Lower climatological limits Step change validation Sensor status indication
Statistical calculations	Averaging over user-configurable periods Minimum/Maximum values Standard deviation Cumulative values
Other calculations	Dew point QNH, QFE, QFF, PA, DA, pressure tendency, pressure trend Gust, peak, squall Modified discomfort index
Weather data reports	METAR, SPECI

Sensor options

Sensor	Basic	Enhancement
Wind speed and direction (WMS302M)	✔	–
Atmospheric pressure (BARO-1)	✔	–
Temperature and relative humidity (HMP155)	✔	–
Rain/Precipitation (QMR101M)	✔	–
Cloud height and coverage (CL31M)	–	✔
Visibility and present weather (PWD22M)	–	✔
Wind speed and direction (WMT700)	–	✔
Freezing rain (LID330IP)	–	✔

Compliance

IP rating	IP66
EMC compliance	IEC/EN 61326-1, Industrial Environment Emissions: CISPR 32 Class B

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HydroMet™ Automatic Weather Station MAWS201

MAWS201 is a portable automatic weather station designed to be used in various environments and in any weather.

Features

- Cost-effective, quickly deployable, and portable automatic weather station
- For a variety of applications: meteorological research, environmental impact studies, emergency response, waste management
- Compact, robust, and lightweight
- Low power consumption
- Field-proven reliability and accuracy
- Wide selection of sensors and options
- Extensive calculation and data logging capacity

Easy to Set Up and Configure

MAWS201 is easy to set up. Every sensor is supplied with a cable and connectors for easy installation. All components fit together easily and no special tools are required.

Vaisala Lizard Setup Software simplifies the configuration of sensor measurements, calculations, data logging schedules, and data transmissions. There are templates to guide you through the initial setup, and a large number of further options if you want to customize the settings further.

Accurate Sensors

The basic sensor suite measures wind speed and direction, atmospheric pressure, air temperature, relative humidity, and precipitation. Optional sensors can be added to measure, for example, soil/water temperature, global and net solar radiation, soil moisture, and water level. The performance of the sensors has been proven in the field in a wide range of environments.

Reliable in All Weather

MAWS201 operates reliably in all weather: its corrosion-resistant, anodized aluminum construction is rugged and weatherproof. The cables are made of high-quality polyurethane with moulded, watertight connectors that fulfill the requirements of the IP68 standard. All the inputs are surge-protected.

The quality control software checks the sensor data against the user-set climatological limits, as well as the step changes between successive measurements. Each statistical calculation has its own, user-configurable validation routine.

Statistical Calculations

The statistical calculations include minimum, maximum, average, standard deviation, and cumulative values. All are calculated over user-defined intervals. All extreme values can be timestamped.

In addition, a library of calculations is available. These include, for example, unit conversions, dew point, frost point, QNH, QFF, QFE, evapotranspiration, sunshine duration, forest fire index, wind chill, and heat stress.

Versatile Data Outputs

The user can freely configure the data output formats. Several ready-made templates make configuration easy.

The alarm module notifies the user when a measured or calculated value exceeds the set threshold values. The alarm module can be configured, for example, to send an alarm message, to change timing intervals, to log data, and to set an excitation voltage for controlling an external device.

Technical Data

Operating Environment

Operating temperature	−40 ... +60 °C (−40 ... +140 °F)
Storage temperature	−50 ... +70 °C (−58 ... +158 °C)
Operating humidity	0 ... 100 %RH

Mechanical Specifications

Weight Example

Portable system with 3 m (9 ft 10 in) tripod (pressure, temperature/humidity, and wind sensors)	15 kg (33.07 lb)

Basic Enclosure

Dimensions (H × Ø)	420 × 120 mm (16.54 × 4.72 in)
Weight	3 kg (6.61 lb)
Materials	Anodized aluminum
IP rating	NEMA 4X, IP66

Sensors

Wind	QMW102/WMS302, WXT530
Pressure	BARO-1QML
Air temperature, relative humidity	HMP155
Solar radiation	QMS101/SP Lite2, QMS102/CMP3, QMN101/NR Lite2
Precipitation	QMR101, QMR102
Soil/Water temperature	QMT103, QMT107, QMT110
Soil moisture	ML2x

Options and Accessories

Communication modules	DSU232, DSI486
Mains power supply	QMP213
Solar/Mains power supply	QMP201C
Carrying cases for MAWS201	QMM110, QMM120
UHF radio modem set	SATEL3ASET-M2

Compliance

Emissions	CISPR 32 Class B (EN 55032)
ESD immunity	IEC 61326-1 (EN 61326-1)
RF field immunity	IEC 61000-4-3
EFT immunity	IEC 61000-4-4
Surge (lightning pulse)	IEC 61000-4-5
Conducted RF immunity	IEC 61000-4-6

QML201C Inputs and Outputs

Processor	33 MHz, 32-bit Motorola
A/D conversion	24-bit
Memory	4 MB RAM and 4 MB program
Data logging memory	3.3 MB internal Flash memory
External memory card capacity	2 GB on CompactFlash card
Sensor inputs	10 analog inputs (20 single-ended inputs) 2 counter/frequency inputs Internal channel for pressure sensor BARO-1
Voltage (external powering)	8 ... 30 VDC
Power consumption	< 10 mA / 12 V (typically with basic 5 sensors)

QML201C Communication Specifications

Serial

Standard	RS-232 and 2-wire RS-485; SDI-12
Optional	2 optional plug-in slots for communication modules to increase the number of the serial I/O channels up to 8 pcs Fast serial expansion bus for connecting digital I/O module, for example
Speed	300 ... 38 400 bps
Configurable parameters	Speed, start bits, data bits, stop bits, parity, XON/XOFF, and checksum

Ethernet

Standard	IEE 802.3 2 plug-in slots for Ethernet modules DSE101

QML201C Powering Specifications

Mains power QMP213	85 ... 264 VAC
Mains power QMP201C [1]	85 ... 264 VAC

1) *With 12 W solar panel and 7 Ah backup battery.*

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