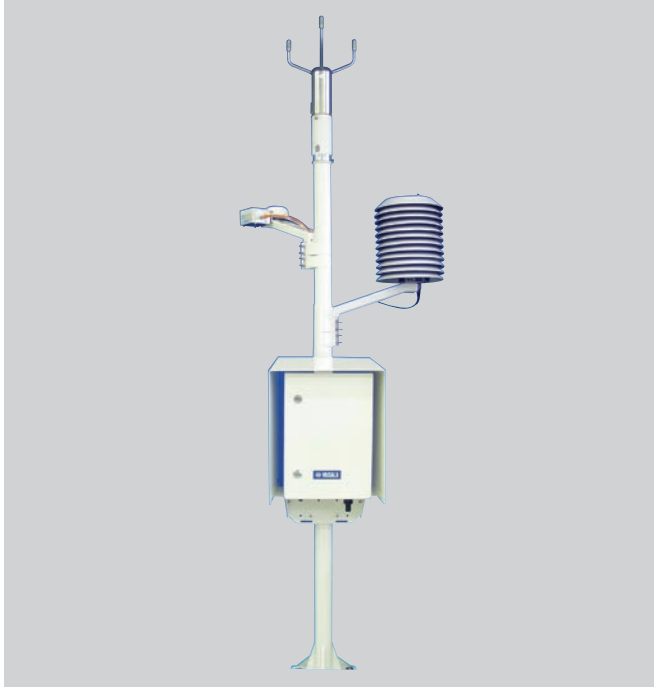


# Vaisala Maritime Observation System MAWS410



To continue the success story of Vaisala shipboard automatic weather stations the Vaisala Maritime Observation System MAWS410 is now available as a Commercial-Off-The-Shelf (COTS) product, providing easy installation and quick deployment. The hardware is specially designed to withstand the wet, salty freeze and thaw that form part of everyday life aboard ships and platforms.

## Basic measurements

The basic weather parameters measured are wind speed and direction (relative wind, true wind, upwind), atmospheric pressure (QFF, QFE, QNH, pressure tendency) and air temperature and humidity (dew point). The sensors are typically installed on a tiltable 4-meter mast. The mast can be easily tilted when maintaining or installing the sensors and other equipment on the upper mast assembly. It is also easy to add additional sensor measurements such as sea water temperature; rain & sunshine duration; global & long wave radiation; precipitation amount; cloud base & visibility.

## Accurate true wind calculation

For the most accurate true wind calculation the vessel's own gyro compass and navigation system is used providing the required heading and ship speed, direction and location information. All the requirements for data communication

## Features

- Designed specifically for VOS and VOSclim applications
- Easy installation and quick deployment
- Top-notch anti-corrosive design and EMC characteristics meeting Lloyd's Register and IEC 60945 requirements
- Built-in data validation
- Accurate true wind calculation
- Meets requirements for data communication given in NMEA 0183 and IEC 1162-1
- Supports FM 13 SHIP (FM 13 XII) SYNOP and IMMT-3 code formats augmented optionally with visual observations
- Real-time satellite communication link provided for the coded meteorological data to be sent to the global (GTS) network

given in NMEA 0183 and IEC 1162-1 are fully supported. A GPS receiver, Inmarsat-C satellite transceiver and electronic compass are also available. No matter what communication systems you use, the MAWS410 supports it – both external and on-board.

## Built-in data validation

Built-in algorithms test each measurement to ensure data quality. For each parameter, tests are carried out on the minimum, maximum and step limits, and the different parameters are crosschecked. When data is entered manually, quality checks ensure that the operator does not enter incorrect values. A built-in testing system also continuously checks the hardware, reporting immediately if a fault occurs. An expansion memory for data storage is also available if not sent to an ancillary system for further use or to be stored on the PC hard drive.

## Advanced ship weather reports

The system processes, displays, stores and transmits fully automated ship weather reports in the universal FM 13 SHIP (FM 13 XII) and IMMT-3 code formats around the globe, in real-time. These reports can be augmented with visual observations entered prior to transmission. Factors such as cloud type; past weather; weather phenomena; waves and swell; as well as sea-ice and/or ice accretion onboard are added using Vaisala Observation Console software, built to the highest standards of usability and quality control.

# Technical Data

## General

Data Collection Platform	Vaisala Data Logger QML201A
Temperature	
Operating *)	-50 ... +60 °C (-58 ... 140 °F)
Storage	-50... +70 °C (-58 ... 158 °F)
Humidity	0 ... 100 % RH

In compliance with Lloyd's Register (LR) Type Approval System, Test Specification Number 1; 2002, Performance and Environmental Test Specification for the Environmentally Tested Products used in Marine and Offshore Applications, and IEC 60945 International Standard, 4th edition, 2002-08, Maritime Navigation and Radiocommunication Equipment and Systems - General Requirements Methods of Testing and Required Test Results, as follows:

Vibration	IEC 60068-2-6 / IEC 60945
Shock	MIL-STD-202G, Method 213B, cond. J
Earthquake	NEBS / Bellcore GR-63-CORE, risk-zone 4
Dry heat	IEC 60068-2-2 / IEC 60068-2-48
Damp heat	IEC 60068-2-30, Test Db
Extreme conditions	IEC 60068-2-3, Test Ca
Low temperature	IEC 60068-2-1 Test Ab/Ad
Rain & spray	IEC 60529 / IEC 60945
Corrosion & salt mist	IEC 60068-2-52, Test Kb
Conducted LF immunity	IEC 61000-4-16
Conducted RF immunity	IEC 61000-4-6
EFT immunity	IEC 61000-4-4
Surge immunity	IEC 61000-4-5
ESD immunity	IEC 61000-4-2
Dielectric tests	IEC 60947-2
Conducted emissions	CISPR 22 **)
Radiated emissions	CISPR 22 **)
RF field immunity	IEC 61000-4-3
Insulation resistance	IEC 60092-504
Power supply short term variation immunity	IEC 61000-4-11
Power supply failure immunity	IEC 61000-4-11 / IEC 60092-504
Compass safe distance	ISO 694 and IEC 61000-4-8

Materials	Acid-proof stainless steel
	Anodized sea aluminium
	Plastic

Mast ***)	Tiltable 2/3/4 m pole mast
Enclosure	400(H) x 300 (W) x 200 (D) mm
Weight	Enclosure approx 10 kg
	Mast with sensors approx 20... 30 kg

Powering ***)	90 ... 264 VAC, 45 ... 65 Hz 8 ... 14 VDC recommended (30 VDC max.)
Internal battery	7 Ah / 12 V
Battery regulator	Charge/recharge control Temperature compensation Deep discharge protection
Simultaneous inputs from solar and AC power allowed	

## Data validation, calculations and reports

### DATA QUALITY CONTROL

Upper / lower climatological limits	Step change validation Sensor status indication Cross check
Statistical calculations	Averaging over user set periods Minimum / maximum values Standard deviation Cumulative values
Other calculations	Dew point QNH, QFE, QFF, pressure tendency True & relative wind, wind selection (upwind) Corrections for elevation & magnetic variation

### Message inputs / outputs

	NMEA 0183 MVW / XDR message output NMEA 0183 HDT / RMC / VTG / GLL message input
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### Weather data reports (w/ Vaisala Observation Console sw)

	WMO FM 13 WMO IMMT-3 Custom reports
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## Standard sensor options \*\*\*)

Wind speed & direction	WINDSONIC, WMT50, WS425
Atmospheric pressure	PMT16A
Air temperature, relative humidity & dew point	QMH102, HMT220
Rain / precipitation	Model 50202, DRD11A
Water temperature	DTS12W
Solar radiation / sun duration	CMP3, CMP6, CMP11, CUV4, SD4
Digital compass	QCO201
Position and time	GPS-17-HVS

## Standard communication options \*\*\*)

Satellite communication	Iridium, Inmarsat-C, Argos / SCD
Wireless communication	UHF, VHF, GSM, GPRS
Landline communication	RS232, RS485 bus, PSTN,
	Fixed line, LAN, Optical fibre
Data displays	DD50, WD30(TU), WD50,
	Pocket / Laptop / Tabletop PC

\*) for further extended range, please contact Vaisala

\*\*) limits according to IEC 60945

\*\*\*) for other mast, solar powering, sensor and communication options, please contact Vaisala



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