

VAISALA

Extreme performance for extreme missions

Solutions Brochure



High-quality, reliable metocean data in extreme conditions

Oceanic and atmospheric research underpins our ability to understand and protect the complex ecosystems that sustain the planet. Multipurpose oceanographic vessels—together with icebreakers and ice-capable research ships—extend this work into polar and seasonally ice-covered seas, opening safe routes, enabling year-round access and instrument deployment, and safeguarding crews and assets so critical data can be collected when it matters most.



Photo credit: Arctia

Multipurpose oceanographic research vessels and icebreakers operate in the toughest environmental conditions, from coastal areas to the most remote regions of the ocean. Researchers and ship operators depend on accurate metocean data about the sea state, wind, and all other weather conditions for everything from oceanic and atmospheric research to safe navigation.

Fortunately, you can make confident decisions with observation data from Vaisala's reliable and accurate sensors, as well as complete environmental monitoring solutions.

Research and icebreaking in the world's most challenging environments

Marine research and icebreaking vessels are custom-built for operational needs. Deployed from open oceans to polar areas, they enable hydrography, oceanography, climate and fisheries studies, and offshore exploration; icebreakers further provide ice management and escort, station resupply, and safe access for instrument deployment and data collection in ice-covered waters.

The vessels, equipment and instruments must be built to perform in the toughest environmental conditions.

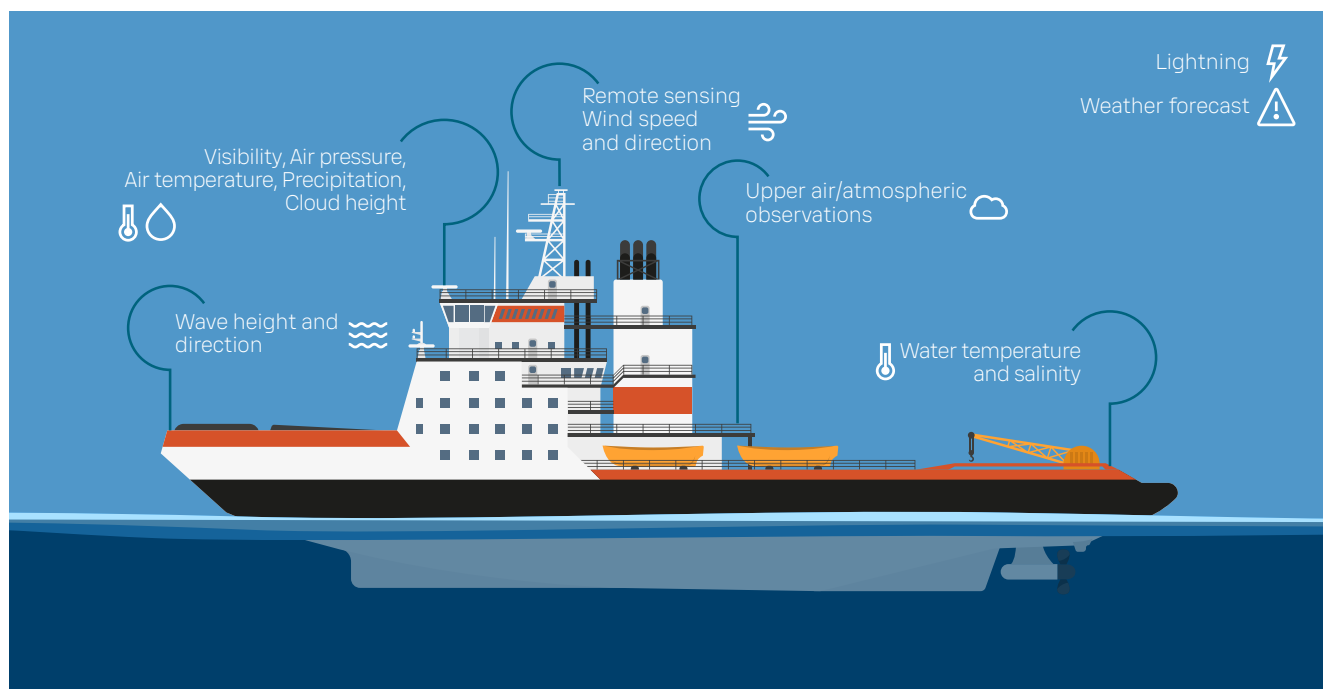
Accurate weather and environmental data for research and icebreaking missions

Dependable and accurate measurements of environmental parameters is critical for successful research and icebreaking missions.

Vaisala offers specialized meteorological, hydrological and oceanographic environmental measurement solutions and engineering services for all kinds of oceanic research, multipurpose vessels and icebreakers.

We can also upgrade a Vaisala Environmental Monitoring System (EMS) to a fully compliant CAP437 Helideck Monitoring System (HMS).

Our high-quality instruments are purpose built to withstand everything from arctic conditions to high humidity and tropical weather. You can be confident they are always at work to improve your ship's safe and efficient operations and provide the highest level of support.



A comprehensive EMS with unprecedented accuracy

Building on more than 90 years of scientific innovation and measurement leadership, Vaisala has a unique understanding of weather measurement needs. Our extensive expertise and global presence – with solutions in over 170 countries – makes us your global maritime weather expert.

Our maritime instruments are designed to last with future-proof design that evolves with your needs. Moreover, we value long-term relationships with our customers and provide support throughout the entire solution's life cycle.



Photo credit: Aranda

Confidence starts with proven technology

Reliable and accurate sensors form the backbone of your marine weather system to help your vessel operate safely in all weather conditions. Vaisala weather sensors – featuring our world-class WINDCAP®, RAINCAP®, HUMICAP® and BAROCAP® technologies – are designed to stand up to whatever the weather throws at them.

Common EMS components for marine research vessels, multipurpose vessels, and icebreakers

Wind

Vaisala WINDCAP® Ultrasonic Wind Sensor WMT700

- WMO and ICAO compliant with DNV Type Examination certificate
- Heated model ensures performance in arctic weather conditions
- Maintenance free



Remote wind monitoring

Vaisala WindCube® Offshore

- Provides accurate, local wind vertical profiling up to 300m with 20 simultaneous heights measured per second
- Simple deployment with low power consumption and easy integration
- Ruggedized design that withstands harsh marine environments
- 5 years warranty and maintenance package



Pressure

Vaisala BAROCAP® Digital Barometer PTB330

- Redundant sensors ensure reliable and accurate readings
- Height and altitude-corrected pressure (QFE, QNH)
- Low hysteresis, high repeatability and long-term stability



Temperature & humidity

Vaisala HUMICAP® Humidity & Temperature Probe HMP155

- Patented warmed humidity probe technology ensures quick recovery in high-humidity marine environments
- Superior long-term stability even in gaseous chemical environments thanks to chemical purge technology



Visibility & present weather

Vaisala Visibility and Present Weather Sensor PWD20/22

- Provides superior visibility measurement and detects multiple precipitation types
- High accuracy and low maintenance in a weatherproof design
- Proven forward-scatter measurement principle measures Meteorological Optical Range (MOR)



Cloud height & coverage

Vaisala Ceilometer CL31

- Excellent cloud detection performance during precipitation
- Uses pulsed diode laser lidar (light detection and ranging) technology
- Single-lens optics enable low-cloud detection



Upper-air observations (soundings)

Vaisala Radiosonde RS41

- High-quality atmospheric sounding data for the most accurate weather forecasting
- Measures temperature, humidity, pressure, and wind speed and direction
- Streamlines launch preparations, reduces human errors, and lowers operational costs of upper-air weather observations



Waves

Oceanographic sensors with accurate data across a range of parameters and purpose

- Wave radar for wave height, period, direction, sea level, air gap and tide measurement
- Sensors for sea conductivity, temperature and salinity
- Ocean current meters and profilers
- Motion reference units



Data gathering & processing

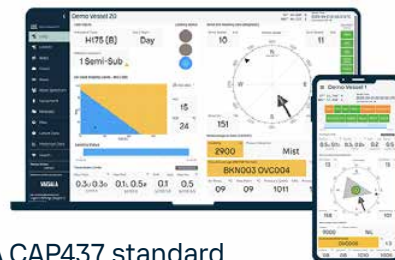
Vaisala Maritime Observation System AWS430

- Multi-sensor data gathering with possibility to add additional sensor options
- Supports all NMEA and IEC requirements for data communication
- Withstands corrosive conditions, vibrations and shocks as well as freezing conditions in extreme-weather environments
- Enclosed in a waterproof outdoor enclosure with mounting options or a 19" equipment rack unit



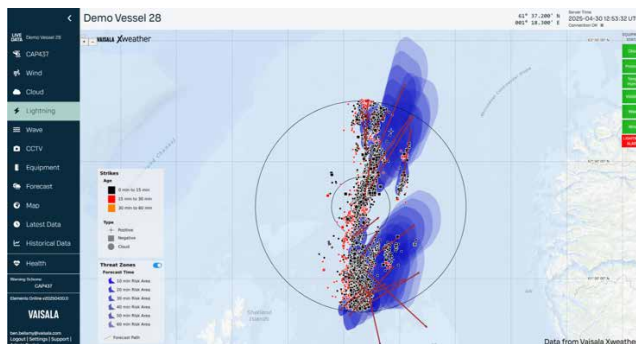
Vaisala Elements Helideck Monitoring Software

- Designed for accurate, real-time collection, processing, and dissemination of meteorological, oceanographic and helideck motion data
- Offers modern, user-friendly desktop and mobile access to real-time data display and reporting including forecasts with integrated lightning data
- Built-in critical alerts and remote access
- Complies with the latest international aviation regulations including UK CAA CAP437 standard



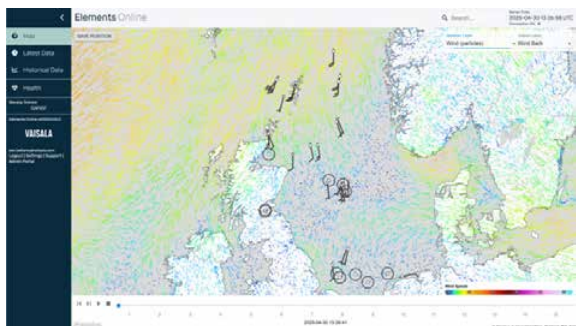
Lightning data

- Integrated global lightning data from Vaisala Xweather
- Visualizes recent lightning strikes and threat zone for the next hour
- 100 km range
- Lightning alarm can be transmitted to other systems



Weather forecast

- Integrates weather forecasts from Vaisala Xweather
- Cross-check recent measurements with forecasts
- 15-day forecast horizon
- Highlights severe conditions based on user-defined thresholds
- Animated weather layers with your own measurements



Why Vaisala?

Weather and environmental insights are the greatest catalysts for successful maritime operations. From sensors to systems and digital services, Vaisala provides actionable insights that empower stakeholders to confidently meet challenges and harness new opportunities. Our globally trusted maritime weather solutions enable remarkable efficiency gains, digital transformation, the protection of people and investments while supporting sustainable and responsible operations. We are scientists and explorers driven by passion, relentless curiosity, and the desire to create a better world. Backed by nearly 90 years of unmatched scientific leadership, our solutions increase maritime weather awareness and drive innovation.

Expertise, high quality, and support for the long term

Vaisala has the experience to help you plan, install, operate and maintain the EMS that's just right for your needs. Whether you require a complete system for turnkey delivery, an upgrade to your present capability, or just want the option of a low cost data-only service, we have the know-how to design full solutions. Every step is handled with expertise, from site surveys to determine the ideal equipment location to implementation and commissioning at research vessels, multi-purpose vessels and icebreakers.

