Met Office Ocean Data Acquisition System

For more than 15 years the Met Office has been at the forefront of Marine Automatic Weather Stations (MAWS) development. MAWS are designed to provide continuous observations from specified locations in the data-sparse oceanic and coastal regions. The current network extends from the north west of Scotland to the Bay of Biscay. Although the network existed prior to the Great Storm of 1987, it was primarily developed and extended after this.

Data from these systems are not only used in routine forecasting and model simulation to monitor developing weather conditions, but also provide information on the climatology of oceanic and coastal areas and ground truth for satellites.

The ODAS Buoys measure a range of meteorological parameters with a required accuracy that often exceeds the standards set for similar Automatic Weather Stations (AWS). All observations are compared with the UKMO fine resolution model which provides an estimation of the predicted weather conditions. The accuracy of the observations and the comparisons can be validated against a second independent set of sensors on each system.

Buoys are deployed for 2 years with a routine annual sensor change and mooring inspection. On all servicing visits observations from the MAWS are validated against at least 2 hourly manual observations taken on board ship to ensure integrity.

The Buoys are designed to operate in the extreme environment of the North Eastern Atlantic. In winter storms they have recorded gusts in excess of 100Kts and average wave heights of 22m (the max our current wave sensor can record). During these occasions the Buoys continue to transmit hourly synoptic data back to the mainland.

UK ODAS Buoy Specifications

- The Buoy contains two modular Automatic Weather Stations (AWS) based around a Campbell Scientific CR10x data logger and a PC42 microcontroller.
- Data are transmitted back to Exeter every hour via twin onboard Meteosat satellite transmittersThe AWS's are contained in a sealed enclosure within the hull along with the batteries.
- They are solar powered using twin panels and 400Ah of reserve capacity for each AWS.
- In the event of a total failure of the solar panels the AWS will run for approx 3 months on batteries alone.
- Out of water a Buoy is 6m tall, 3m diameter and weighs 4.5T with a full payload.

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Parameters measured

Observations	***Sensor Accuracy***	***Units***
Wind Speed	Kn	0.2
Max. Gust	Kn	0.2
Wind Direction	°T	1.0
Barometric Pressure	hPa	0.2
Air Temp	°C	0.1
Sea Temp	°C	0.1
Dew Point Temp	°C	Calculated
Relative Humidity	%	0.06
Visibility	Km	0.1
Sig. Wave Height	m	0.1
Wave Period	Sec	0.1

Buoy Physical Specification

Air temp height:	2 m above sea level
Anemometer height:	3 m above sea level
Barometer elevation:	1.75 m above sea level
Sea temp depth:	1m below sea level
Water depth:	50 - 5000m (depends on location)
Watch circle radius:	approx 1 Nautical Mile