



AQ510 Wind Finder

Setting a New Standard!

Leading independent wind consults have evaluated AQ510 for IEC compliance and issued Final Accuracy results.

The classification results are excellent!



AQSystem AB and AQ510 Wind Finder

About AQSystem

Founded in 1989 near Stockholm, Sweden. AQSystem is Europe's leading innovator and manufacturer of advanced SoDAR based remote sensing systems.

Originally supplying the aerospace and atmospheric quality markets, since 2006 we have been primarily focused upon the wind power industry. To date approximately four hundred AQSystem SoDARs have been purchased by wind energy companies.

Our Goal

Our objective is to provide the highest quality and most accurate remote sensing solutions in a reliable and cost effective package. It is our belief that all customers are individual. As such AQSystem customers are free to choose only the hardware and service options that they require to meet their project needs and all systems are fully upgradeable to provide future proof flexibility.

Technology

The AQ510 uses a unique design based upon three powerful high quality speakers and parabolic reflectors to tightly focus acoustic impulses into the atmosphere. Sound is reflected by temperature fluctuations and turbulence. Based upon the Doppler shift of the return signal the system uses the latest data processing technology to accurately calculate wind speed, direction and turbulence intensity (TI) at 33 measurement heights from 40m to 200m. Data is communicated via GPRS or Satellite modem to AQSystem servers from which it can be viewed and downloaded, in standard format, via the AQWebviewer interface.



Picture: AQ510 Speaker and Electronic assembly

Key Features

Designed to meet the requirements of the modern wind industry the key features of the AQ510 are:

- Proven and independently verified accuracy equivalent to anemometry.
- Every system tested against an IEC compliant 100m met tower before delivery using a test process developed with and approved by DNV-GL.
- Designed for very high reliability.
- Wind speed range 0 to 30m/s.
- Exceptionally high wind and turbulence data availability, even during adverse atmospheric conditions (>98%@100m, >92%@150m, >85%@200m).
- High resolution - 33 measurement heights at 5m intervals from 40 to 200m.
- Modular construction for easy shipping and deployment.
- 100% field serviceable and repairable.
- A variety of power and heating options available to suit even the harshest of environments.
- Integrated GPS, temperature and humidity sensors.
- Communication options via GPRS/GSM or Satellite.
- All data processing is carried out internally; AQSystem carries out no post processing of data.
- Sophisticated algorithms for fixed echo removal.
- Highly competitive pricing and low cost of ownership.



Picture: AQ510 Wind Finder

Specification

Technical data

Measurement range	40 - 200m
Height resolution	5m
No. of measurement heights	33
Accuracy horizontal wind speed	±2%
Data availability	>98%@100m, >92%@150m, >85%@200m
Wind speed range	0 to 30 m/s
Vertical wind speed range	±2.2 m/s
Mean value period	10 min
Transmitting frequency	4 300 Hz
Operating temperature range	-40 to 60°C
Operating humidity range	0 to 100% RH
Data format	ASCII
Data transfer	GPRS standard, opt Satellite
Power consumption	15W

Dimension

	m	m	m	kg
AQ510 SA	1.8 (h)	1.02 (dia)		120 Weight
Warm winter kit	0.6 (h)	0.6 (w)	1.02 (l)	90 Weight
Mild winter kit	0.6 (h)	0.6 (w)	1.02 (l)	170 Weight
Cold winter kit	2 (h)	1.6 (w)	3.4 (l)	800 Weight
Trailer platform system	0.7 (h)	1.9 (w)	3 (l)	195 Weight



Picture: AQ510 MW - Mild Winter system trailerised

Versions and Power packages

There are four versions of the AQ510 Wind Finder:

- AQ510SA - Stand Alone system**
 The AQ510 SA is not supplied with any power or heating systems but is fitted with input for line in power of 12VDC or 110-240VAC. Customer is free to supply power from its own generator, grid power or other external power pack.
- AQ510WW - Warm Winter system**
 The AQ510WW is designed for use in regions with high levels of solar radiation all year round. The system is supplied with solar power package and either trailerised or free standing.
- AQ510MW - Mild Winter system**
 The AQ510MW is designed for use in regions with low solar radiation during the winter and low levels of snow or icing. The system is supplied with solar power package and methanol fuel cell package and either trailerised or free-standing.
- AQ510CW - Cold Winter system**
 The AQ510CW is designed for use in regions with significant snow or icing conditions and prolonged periods of low solar radiation. It will operate for long periods in arctic conditions as seen during northern Scandinavian winter. The system is supplied with solar package, diesel generator, diesel heater and 200L diesel tank and is fully trailerised.

Configuration	Components
SA	Stand Alone, Instrument only 12 VDC or 110 -240VAC
SA + WW	Stand Alone + Warm Winter kit Solar: 2 x 160W Batteries: 2 x 12v 74 Ah
SA + MW	Stand Alone + Mild Winter kit Solar: 2 x 160W Batteries: 2 x 12v, 74 Ah Fuel cell: Efoy Pro 2004 Duo Option: Diesel Heater
SA + CW	Stand Alone + Cold Winter kit Solar: 3 x 200W Batteries: 3 x 12v, 220 Ah Diesel Gen: 220 VAC, 3.3 kw



Picture: AQ510 MW - Mild Winter system trailerised



Picture: AQ510 WW - Warm Winter system

AQ510 - Setting the standard

Met mast verification included

Uniquely for a SoDAR, Every AQ510 is individually verified against a 100m IEC compliant met tower and is issued with a full verification report. The methodology and documentation were developed in conjunction with and approved by DNV-GL / Garrad Hassan.



IEC Classification & FGW TR6 Compliance

As part of our ongoing improvement and verification programme AQ510's have been undergoing independent verification and sensitivity testing by DNV GL / Garrad Hassan for compliance with power curve standard CD IEC61400-12-1, Ed.2. The classification results are reasonable and broadly within the range of other classification tested Remote Sensing devices. This is an important step towards acceptance of SoDAR based wind remote sensing in standardized applications.



Rentals and additional services

AQSystem SoDARS can be rented at highly competitive prices in many countries, either directly from AQSystem or through our regional partners. Additionally many of our partners can offer consultancy, met mast and other services to ensure that your project is fully compliant with local regulations and is of the highest possible standards.

Servicing and Maintenance

We believe in flexibility and options. AQSystem have service partnerships with companies in over 50 countries. Additionally our customers may choose to have their own technicians, or their preferred service partner, fully trained.

Also where practical, servicing and maintenance can be undertaken directly by AQSystem. There is no required annual service and support contract needed to use AQSystem remote sensors.

Data Communications

AQ510 can transmit data using either GPRS / GSM or via satellite giving our customers the flexibility to choose the most practical and cost effective solution. Data can be viewed and downloaded from the AQWebviewer secure web portal from any internet enabled device. There is no annual subscription charge for this service.



Picture: AQ510 at the verification site

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Cold Climate Capability

Developed in Sweden

The AQ510 can handle all ambient conditions, such as fog, rain, low temperatures and snow. Developed in Sweden where winter is harsh, the AQ510 is especially suitable for cold climates with excessive amounts of snow. The AQ510 can be equipped with a diesel heater and the heat is used to melt snow or ice in the SoDAR antenna.

The AQ510 antenna unit is designed with three protected speaker elements which sends and receives sound impulses that are reflected by three parabolic dishes. Thanks to this unique design neither rain or snow are an issue for the AQ510. There are no moving parts in the antenna limiting the need for maintenance. Reducing maintenance and unplanned interruptions are important for the project time plan.



Picture: AQ510 CW - Cold Winter system

User comments

Alan Derrick, Head of Technical Services, RES Group stated "The use of AQSystem SoDARS on our projects has played a significant role in our success within Scandinavia. In our experience equipment provided by AQSystem has been very reliable and the services provided to be of very high quality. Right now we are using AQSystem SoDARS on many of our projects in Norway, Sweden and Finland".



www.res-group.com/measurement

Rafael Zubiaur, CEO of Barlovento Recursos Naturales stated "We use AQSystem SoDARS in a number of projects and are impressed with the high data availability and robustness of the unit. With an average data availability of 98 % at 100m, it is the remote sensing product with the highest data availability we have ever installed".



www.res-group.com/measurement

Thomas Latacz, BBB Umwelttechnik "The AQ510 is performing very good. Up to now the AQ510 is the best SoDAR we had in a verification outperforming even some LiDAR units".



www.bbb-umwelt.com

Detlef Stein, at DNV GL / Garrad Hassan "It is very positive to see that AQSystem has launched a dedicated test site for remote sensing, potentially allowing high quality performance verifications".



www.dnvgl.com



Picture: AQ510 MW - Mild Winter system trailerised with enclosure