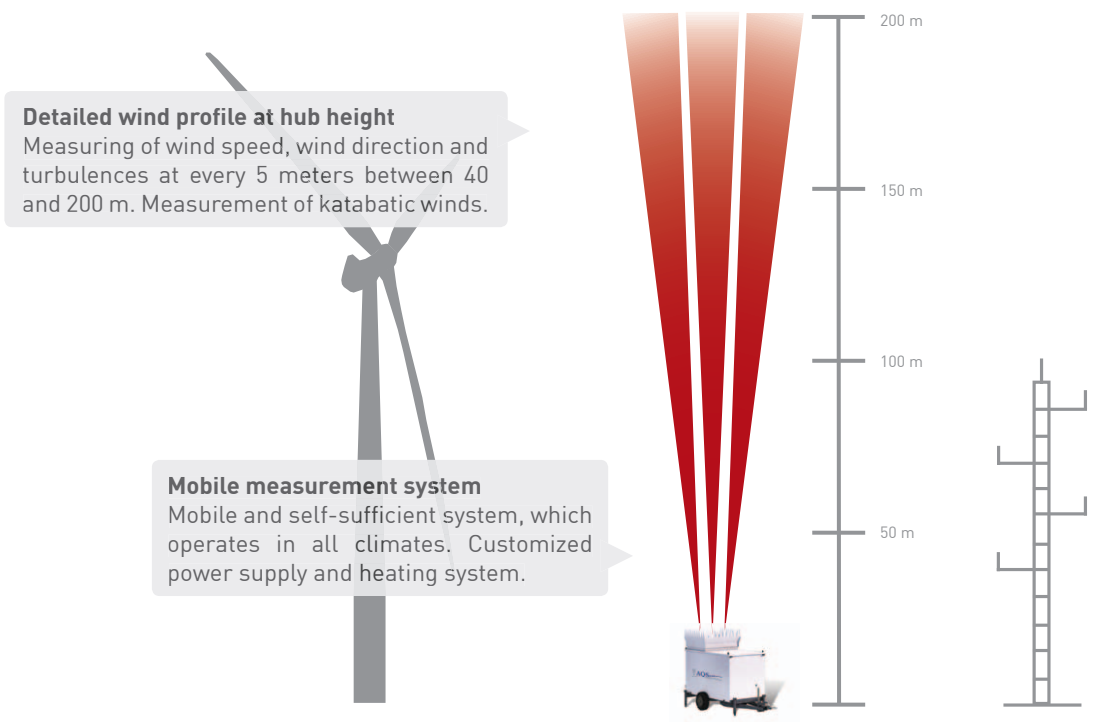
# Ammonit AQ510 windfinder for Accurate Mobile Wind Site Assessment

## Remote sensing with Ammonit Sodar instruments

Remote sensing instruments have become more and more popular in the wind industry. With the Ammonit AQ510 windfinder we offer the latest Sodar technology **validated against an IEC 61400-12-1 compliant met mast** in simple terrain. It has successfully past Milestone 1 and is considered to be in **Stage 2* according to GL Garrad Hassan**.

As a supplement to a met mast, Ammonit AQ510 windfinder is designed to measure the **complete wind profile at hub height** - up to 200 m above the ground. Our efficient Sodar system measures wind speed, wind direction and turbulences at every 5 meters between 40 and 200 meters - **in all climates**. Ammonit AQ510 windfinder supports you in finding the right place to build a profitable wind farm. You can easily deploy the **mobile self-sufficient system** to evaluate the wind conditions at your selected site. Move the system to various sites, switch it on and **collect instant wind data**. If the wind conditions are promising, a bankable wind measurement campaign can be set up.

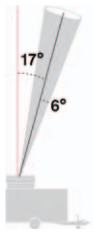
**Complete wind profiles even up to rotor blade tip-height with Ammonit AQ510 windfinder.**



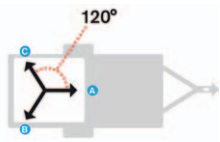
# Wind Resource Assessment with Ammonit AQ510 windfinder Sodar

## Sodar technology – Principle of operation

By using the Sodar (Sound Detection And Ranging) technology, wind profiles are measured with the help of sound. Sodar technology is comparable with radar systems. Instead of radio signals, Sodar systems send out **tone pulses** into the atmosphere. The sound is reflected by small temperature variations. The **reflected sound** has a **different frequency** than the transmitted, due to the **Doppler effect**. The difference between both frequencies is used to calculate wind speed and direction.


**Ammonit AQ510 wind finder**
Ammonit AQ510 is designed with a special acoustic horn system, which measures a three-dimensional wind field with high accuracy. Based on the monostatic technique, the speakers emitting the sound pulses also act as microphones to listen to the reflected sound. The system transmits short powerful tone pulses in three directions. The acoustic horn system is designed with protected speaker elements, where the sound is reflected by parabolic dishes. Thus the Sodar system can measure wind in heavy rain and snowfall with high data availability.



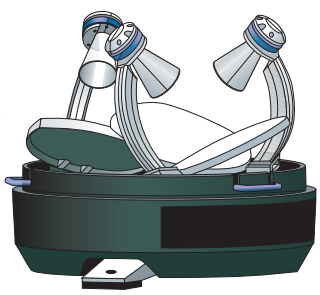

**Proven Sodar technology for your successful wind measurement campaign.**

## Advanced Sodar technology – Ammonit AQ510 windfinder

**Three-dimensional wind field**
Tone pulses are sent in three beams inclined 17° from vertical line and separated 120°.

**Weather-proof design**
Neither snow nor rain or debris can block or cause damage.

**Powerful acoustic horn system**
High frequency tone pulses with 4300 Hz reflected by parabolic dishes for more power in the returning atmospheric echo.



**Easy deployment**
Integrated tilt sensor for easy alignment. Built-in GPS module for geofencing.

**Parabolic-shaped reflectors**
Focus the returning atmospheric echos into the receiving microphones.

**Low power consumption – only 15 W**
On average only 15 W for stand-alone system. Waste heat of the diesel generator is used to melt snow on parabolic dishes.

**High turbulence data available**
Turbulence measurement on same level as horizontal wind speed. At 150 m >92% data availability; at 100 m >97%.

**Customized power and heating solutions**
Depending on the installation site, solar modules, fuel cell or diesel generator provide the system with power.

# Ammonit AQ510 windfinder – Measuring Wind Conditions at Hub Height

## Easy-to-use wind measurement system

Ammonit AQ510 windfinder has been developed for **wind site assessment** as well as **wind farm monitoring**. The Sodar system is easy to use. Conveniently position the system with the help of the **integrated tilt sensor and GPS module** at your selected site and switch it on. You instantly collect wind data. It has never been easier to measure wind.

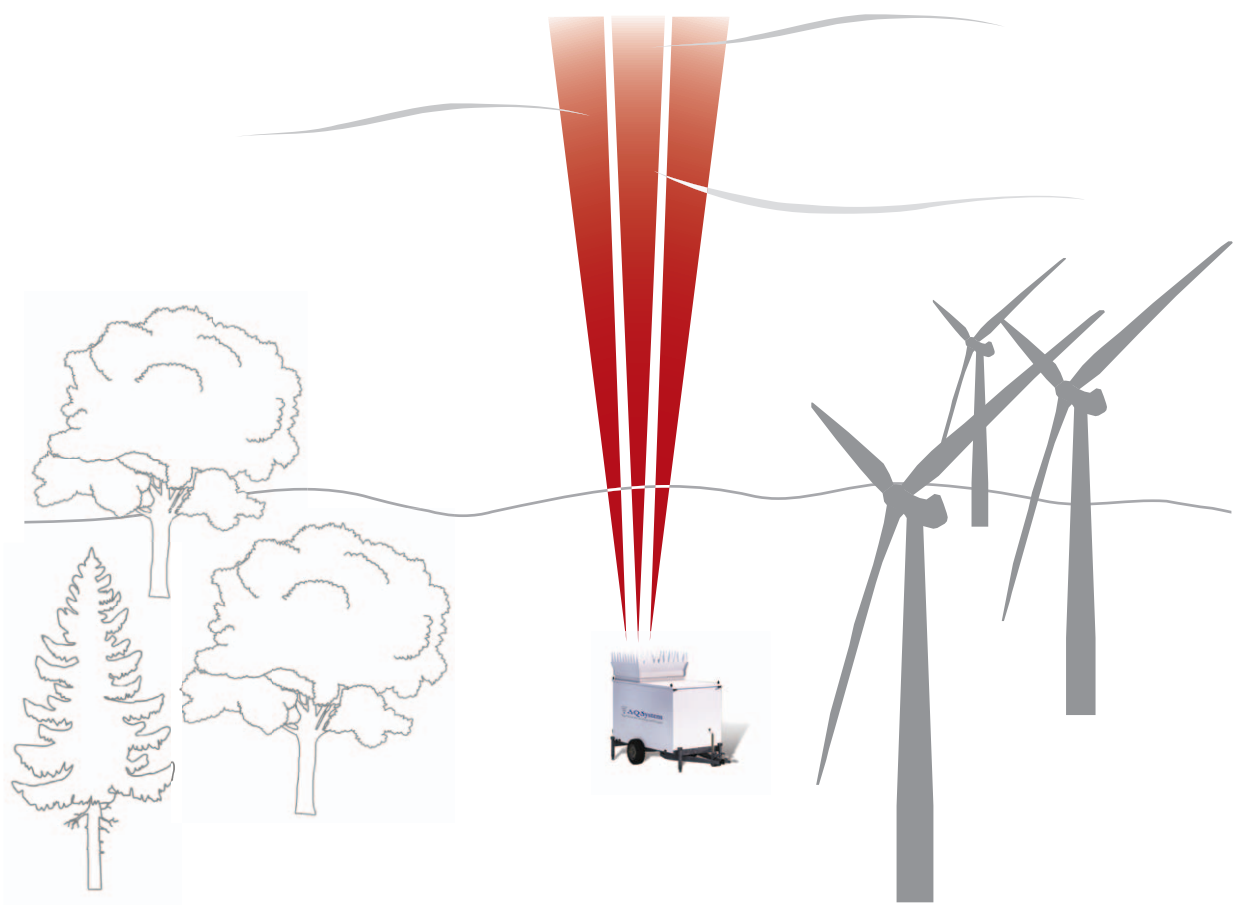
The **mobile and self-sufficient** Ammonit AQ510 windfinder can quickly be moved from site to site to **explore the wind conditions** before setting up a resource assessment campaign with a professional wind met mast. Additionally, the system can be implemented to **evaluate wind conditions** in a wind farm for **monitoring** purposes.

Ammonit AQ510 windfinder is robust and can be used in **all climates**. It accurately measures the wind characteristics in arctic climate as well as in hot summers. Due to the clever design of Ammonit AQ510 windfinder neither snow nor rain or debris can affect the measurement.

**Use Ammonit AQ510 windfinder to evaluate:**

- Accuracy of extrapolation from met mast data
- Wind speed and directions up to hub-height - even up to rotor blade tip-height
- Shear coefficients to be used with met mast data
- Wind resource variability across the site

**Easy-to-use, self-sufficient and mobile systems to conveniently explore wind conditions at your selected sites.**



# Ammonit AQ510 windfinder

## Specifications

| Characteristic | Description |
|---|---|
| Measurement range | 40 ... 200 m |
| Height resolution | 5 m |
| Accuracy horizontal wind speed | ± 2%<br>(for wind speeds above 4 m/s compared to a cup anemometer in flat terrain with homogenous vegetation and after correction for vector-scalar average difference) |
| Accuracy wind direction | < 5° |
| Availability of high turbulence data | > 92% at 150 m; > 97% at 100 m |
| Wind speed range | 0 ... 30 m/s |
| Vertical wind speed range | ± 2.2 m/s |
| Mean value period | 10 min |
| Transmitting frequency | 4300 Hz |
| Zenith angle | 17° |
| Pulse power | max. 250 W |
| Acoustic power | 17 W |
| Operating temperature range | -40 ... 60 °C |
| Operating humidity range | 0 ... 100% RH |
| Interface | AQWebviewer |
| Data transfer | GPRS (omni-direction antenna included) |
| Data format | ASCII |
| Power consumption | 15 W |
| Dimension [m] / Weight (acoustic system) | 1.6 (height) x 1.0 (diameter) / approx. 92 kg |
| | |
| **Available power supply solutions** | |
| Grid connection | 120 ... 240 VAC or 12 VDC |
| Solar module | 200 W / 12 VDC x 2 (totally 400 W / 12 VDC) |
| Fuel cell | 110 W / 12 VDC (included only in mild winter kit) |
| Diesel generator | 3.2 kW / 230 VAC / single phase (included only in cold winter kit) |

| AQ510 windfinder | AQ510 only | Warm winter solution | Mild winter solution | Cold winter solution |
|---|---|---|---|---|
| Order No. | S91110 | S91410 | S91420 | S91430 |
| Grid connection | x | - | - | - |
| Solar module | - | x | x | x |
| Fuel cell | - | - | x | - |
| Diesel generator | - | - | - | x (200 l tank) |
| Dimension [m] | 1.6 (height) x 1.0 (diameter) | 2.2 (height) x 1.5 (width) x 1.5 (length) | 2.2 (height) x 1.5 (width) x 2.1 (length) | 2.2 (height) x 1.5 (width) x 3.0 (length) |
| Weight | approx. 92 kg | approx. 140 kg | approx. 290 kg | approx. 620 kg |

*Increasing range of site measurements made under a range of meteorological characteristics, moving to formal wind speed and energy assessments being provided based in part on data from the device, but only with site-specific validations against conventional anemometry.



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