AQ510 – Setting a New Standard

AQ510 Wind Finder is now fully classified according to the requirements of newly published IEC Standard 61400-12-1:2017

On the 3rd of March 2017 IEC 61400-12-1:2017 was published. Copies can be obtained from the IEC Webstore at - https://webstore.iec.ch/publication/26603.

This new release of the standard covers the use of ground based remote sensing devices (RSDs), SoDARs and LiDARs, which are capable of providing accurate and consistent wind data. At AQSystem it is our belief that this will have a significant influence on future wind resource assessment methodology and the instrumentation that is chosen for different wind industry applications.

The classification process, as defined in the standard, provides a formally agreed and accepted method to assess and calculate uncertainties for remote sensing instruments thus enabling a uniform practice for using generated data in a project environment.

To classify a product per the standard it must be validated for accuracy, unit to unit consistency and in addition to this, the performance in different environmental and seasonal conditions. These test results provide the base for the calculations and ultimately resulting in the standard uncertainty that should be applied for the specific product.

AQ510 - Validation, Calibration and Classification.

Validation: An assessment of system performance to prove suitability for purpose.

AQ510 is a very well proven technology with independent validation reports from DNV-GL, Ecofys and BBB Umwelttechnik.

Calibration: A test to prove that an individual system is operating within required design parameters.

In addition to independent validations every AQSystem SoDAR is calibrated against our own 100m IEC compliant met tower in Sweden prior to delivery to a customer. AQ510 is the only SoDAR which has this level of testing before delivery. The methodology and test site used for calibration have been approved by DNV-GL. The process has been in place since 2013 and 160 units have now been calibrated. In addition to this; 53 units have been recalibrated with excellent results proving the robustness of both products and process.

To obtain a full copy of the AQ510 Wind Finder Full Classification Report please email a request to: info@aqs.se

Classification: A study to assess the impact of various environmental parameters (EPs) upon accuracy, consistency and overall system performance.

Annex L of IEC 61400-12-1:2017 specifies that a minimum of two RSDs must be tested at two separate sites for a minimum of three months so a large span of EPs can be measured. In addition to this at least one of the systems must be deployed at both sites in order to verify the reference anemometers used.

"DNV-GL strongly recommends to build a larger body of evidence similar to the remote sensing performance verifications as the classification assessment seems to be very sensitive and fragile."
– DNV-GL (GLGH, 2015)

Largely due to this statement by DNV-GL and to give greater confidence to our customers, AQSystem chose to exceed the minimum testing requirements to give a clearer understanding of the impact of various EPs. Four (4) AQ510s with six deployments were used in the classification process with a total measurement period of twenty-six months. One system covered a whole year to provide information on how EPs affect AQ510 measurements through all four seasons.

Conclusion and Results:

The large data base of over 96,000 10-min data points from the four AQ510s enables a highly robust classification. All systems show similar sensitivities to each EP and deliver a standard uncertainty close to one another, proving the robustness of AQ510 as an RSD. With longer measurements the standard uncertainty reduces further which should be considered by AQ510 users when deciding the duration of a SoDAR measurement campaign.

The results obtained have been assessed and independently verified by Uppsala University. Uppsala University of Sweden is one of Europe's leading technical universities.
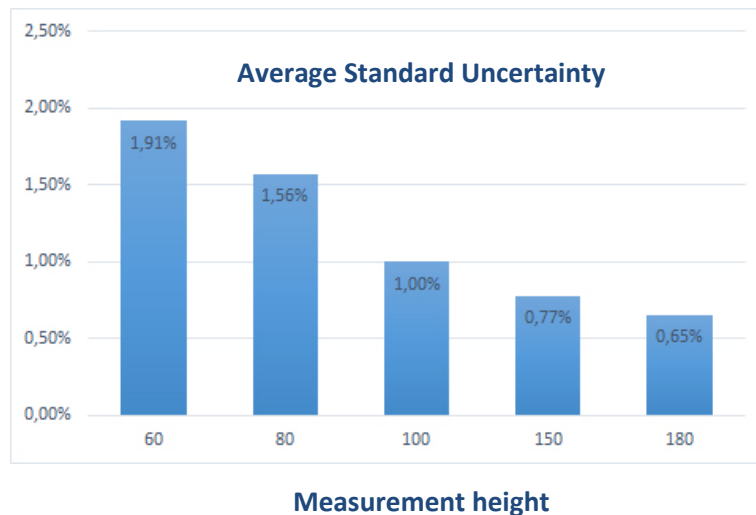
Standard uncertainty of all AQ510 in analysis with EPs according to IEC. AQ510 has been classified according to the procedure described in Annex L of the IEC guidelines, 61400-12-1, and achieved a mean standard uncertainty of 1,00% at 100m.

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