VAISALA

Product Spotlight

windcubelidar.com

WindCube

The industry standard lidar for accurate, bankable wind data

WindCube® is the most flexible, proven and accurate wind measurement technology available. It is well-suited for various environmental conditions and supports continuous measurement campaigns throughout all project phases. A highly refined, mature technology, WindCube provides unrivaled wind measurements and truly is a gold standard in the industry.

WindCube helps optimize financial performance, increase efficiency and maximize energy output — providing the bankable data needed for reducing measurement uncertainties in Energy Yield Assessments to secure funding while minimizing project risk. It is suitable for permanent wind monitoring or temporary applications such as Wind Resource Assessment with little or no environmental footprint and no safety risks.

WindCube goes anywhere, including offshore with the WindCube Offshore edition and complex terrain thanks to its unique, embedded Flow Complexity Recognition (FCR) or with full CFD post-processing. WindCube demonstrates the lowest uncertainty in the market when measuring at the hub height of today's modern turbines.

Backed by 20+ years of wind lidar expertise and unparalleled global service, WindCube has been third-party validated in hundreds of independent studies and across thousands of customer deployments. It is fully IEC-classified and accepted by all international standards and guidelines.

Key benefits

The leading lidar — WindCube measures accurately up to 300m, with 20 simultaneous measurement heights. Its hybrid wind reconstruction algorithm further reduces uncertainty for unrivaled measurement accuracy, reaching best in class standard uncertainty at hub height of modern turbines. This helps secure funding, reduce the cost of equity, and minimize risk.

WindCube comes with WindCube Insights — Fleet software, an easy-to-use, secure, cloud-based tool that provides real-time insights and simple management, whether you have one system or many.

Unmatched service — Flexible offerings maximize uptime and simplify campaigns, including the industry's best warranty, accelerated workshop and on-site maintenance, and the speed and responsiveness of our global network of Vaisala offices and trained local partners. With our in-depth training, unique services, and worldwide technical support, you will receive the best service and plug and play solution in the business. We ensure a smooth and reliable system installation, operations, diagnostics, troubleshooting, and data analytics.

Suitable for any terrain — The Complex Terrain Ready solution integrates a patented FCR algorithm for moderately complex terrain and enables partnerships with proven CFD providers for corrections in very complex terrains. Our Complex Terrain campaign guidelines help you plan ahead, from site setup to data post-processing. Our Complex Terrain Estimator tool advises on the best suitable lidar installation location and on the appropriate data processing possibilities.

Ultimate flexibility in all types of environments — WindCube is simple to deploy anywhere, with few permitting or regulatory hassles. Turnkey options such as a winter kit, satellite communications, 4G router and affordable power pack compatible with solar panels plus low power consumption enable deployment in the most remote areas.

WindCube IEC classification shows limited sensitivity to environmental variables, enabling reliable measurements in all types of environmental conditions.

WindCube® The gold standard

WindCube® is the iconic and trusted gold standard in wind lidar. The turnkey product suite offers innovative, reliable, and highly accurate solutions for thousands of customers across the globe. Borne from a passion to advance the field, WindCube continues to take wind energy ever higher through a commitment to four guiding principles:

- Trustworthy, superior metrology
- Innovative lidars and support from a one-stop shop
- Unrivaled thought leadership
- Easy, reliable global solution

WindCube at a glance

Applications

Supports all phases of a project lifecycle:

- Site prospection
- Wind resource assessment
- Site suitability and calibration
- Continuous wind monitoring
- Power Performance Testing (PPT)
- Grid-loss compensation
- R&D applications

Features

Includes WindCube Insights — Fleet cloud-based, customer-oriented interface to display data and monitor performance

Hybrid wind reconstruction algorithm, which combines scalar and vector data for the highest possible accuracy and reliability

Supports all terrain types using embedded FCR and industry-standard CFD modeling

Low classification uncertainty and limited sensitivity to environmental variables as per IEC 61400-12-1, Ed.2

3G or 4G router for fast in-field communications and data transfer

GPS geofencing provides security against theft

Affordable remote power pack compatible with solar panels for deployment almost anywhere

Winter kit option safeguards lidar in snowy and icy conditions, increasing uptime

Partnership with satellite solution supplier SmartGrid to get the reliable data you need even from a very remote location

Includes Vaisala PTH sensor WXT535 for accurate environmental measurements and increased reliability

Services

Golden Lidar validation by DNV included with every new WindCube

Accelerated workshop processes part of the standard service level; repair time goes from weeks to days

On-site intervention option to minimize downtime and logistic constraints

DNV pre-validated WindCube units available to accelerate deployment

Validation Continuity option saves time during maintenance

IEC compliant verifications with multiple partner consultants such as DNV, DTU, DWG and UL; also including Pavana and GEO-NET with their 200 m meteorological masts

Specifications

Wind data provided	Horizontal and vertical wind speed and wind direction
Measurement range*	40m to 300m
Simultaneous measurement heights	20 (user-defined)
Speed accuracy	0.1 m/s
Speed range	0 to 49 m/s
Speed uncertainty**	40 – 80m: 1.4% to 2.6% 80 – 120m: 0.6% to 1.4% 120 – 135m: 0.6% to 0.8%
Direction accuracy	2°
Beam geometry	4 inclined beams at 28° + 1 vertical beam
Data storage	120GB industrial disk (5+ years storage of all data); WindCube Insights secure cloud-based server
Communication	LAN, USB, 3G or 4G router (router availability depends on the region/country), Modbus RTU, Wi-Fi
Temperature range	-30°C to 50°C / -22°F to 122°F (chamber conditions)
Compliance	CE, FCC, IC
Laser safety compliance	1M Class / EN 60825-1
Data sampling rate	1Hz
Output data	1s / 1-, 2-, 5-, 10-minute averaged (user-defined) horizontal and vertical wind speed Standard deviation Wind direction CNR (carrier-to-noise ratio) GPS coordinates Data availability
Housing classification	IP66 and IP67 (inner sub-assemblies); IP54 (lidar casing)
Power consumption	45W between -5°C and 30°C (23°F and 86°F) 110W below -5°C (23°F) 55W over +30°C (86°F)
Weight	59kg (system only)
Dimensions	L55 cm, W56 cm, H55 cm
Warranty	3 years standard, extendable twice (up to 9 years) after maintenance Preventive maintenance: 3 years cycle (factory or onsite maintenance)

**Height from WindCube feet. Data availability depends on environmental factors such as visibility, type of aerosols and variation of refractive index in the atmosphere*
***For 10-min averages, as assessed by several third parties on multiple WindCube devices or in 2020 according to IEC 61400-12-1 Ed.2. Uncertainty figures are Final Accuracy Class divided by √3.*

Why Vaisala for renewable energy?

We are innovators, scientists, and discoverers who are helping fundamentally change how the world is powered. Vaisala elevates wind and solar customers around the globe so they can meet the greatest energy challenges of our time.

Our weather and environmental monitoring solutions for renewable energy are guided by several key priorities:

- Thoughtful evolution in a time of change
- Making renewable energy smarter at every stage
- Extending our legacy of leadership

Vaisala is the only company to offer 360-degree renewable energy solutions — from sensors and systems to digital services and actionable intelligence — nearly anywhere on the planet (and even on Mars). Every Vaisala solution benefits from our 85+ years of experience, pioneering deployments in 170+ countries, and unrivaled thought leadership.

Our innovation story, like the renewable energy story, continues.

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