

## WindCube

The industry standard lidar for accurate, bankable wind data



WindCube® is the most flexible and accurate wind measurement technology available, for both onshore and offshore projects. It is well-suited for all turbine types and supports continuous measurement campaigns throughout all project phases. A highly refined, mature technology, WindCube provides unrivaled wind measurement capabilities and services for simplifying operations and maximizing operational continuity in all terrain types.

During the development phase, WindCube provides the bankable data needed to secure funding while minimizing risk; it also provides precise measurements for energy yield assessment. Operators often rely on WindCube for performance verification, since it is validated by Deutsche WindGuard® and is fully IEC-classified.

WindCube can be positioned almost anywhere (even offshore with the WindCube Offshore edition) and covers the rotor sweep of even the largest turbines now and in the future, including emerging offshore technologies. It is suitable for permanent or temporary applications with little or no environmental disruption, while increasing worker safety.

WindCube data has been validated by hundreds of independent studies and is accepted by all international standards and guidelines. It also uses turnkey Flow Complexity Recognition (FCR) for complex terrain and is compatible with CFD post-processing solutions for more complex sites.

Wherever it is located, WindCube helps users optimize financial performance, increase efficiency, and maximize energy output.

### 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 IEC classification. 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.

IEC-compliant DNV pre-validated lidar units are available to accelerate deployment by up to two months, and a validation continuity option saves time in case of maintenance events.


**Unmatched service** — Flexible offerings maximize uptime and simplify campaigns. They include the industry's best warranty, accelerated workshop and on-site maintenance, and the assurance and speed of our global network.

**Suitable for any terrain** — The Complex Terrain Ready solution uses a patented FCR algorithm and integrates proven CFD solutions. Our Complex Terrain campaign guidelines help you plan ahead, from site setup to data post-processing.

**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 enable deployment in the most remote areas.

# 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 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

**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

**IEC compliance** for contractual performance testing (IEC 61400-12-1 ed2)

**Includes WindCube Insights — Fleet** cloud-based data management system

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

**Affordable remote power pack** 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

**IEC compliant verifications** with multiple partner consultants such as DNV, DTU, DWG and UL; also including Pavana with their new 200 m meteorological mast



## Specifications

Wind data provided	Horizontal and vertical wind speed, standard deviation, direction, carrier-to-noise ratio (CNR), GPS coordinates, data availability
Range	40m to 300m
Simultaneous measurement heights	20
Speed accuracy	0.1 m/s
Speed range	0 to 60 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, 4G router, Modbus RTU, Wi-Fi
Temperature range	-30°C to 50°C / -22°F to 122°F
Compliance	CE, FCC, IC
Data sampling rate	1Hz; 1s/1, 2, 5, 10min averaged (user-defined)
Housing classification	IP66 and IP67 (inner sub-assemblies); IP54 (lidar casing)
Power consumption	45W nominal - between -5°C and +30°C
Weight	59kg
Dimensions	L55 cm, W56cm, H55 cm

\*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  $\sqrt{3}$ .

## 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.

# VAISALA

windcubelidar.com



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