LEOSPHERE
A VAISALA COMPANY

Product Spotlight

www.leosphere.com

WindCube Nacelle

Long-range power performance testing

The WindCube® Nacelle lidar enables operators to efficiently and accurately assess and verify performance to ensure maximum power output. It is widely accepted for contractual and operational power performance testing (PPT) and has been proven to dramatically reduce operational cost while increasing efficiency. Suitable for any turbine type and rotor diameter, WindCube Nacelle's enhanced measurement range provides a complete picture of the wind profile — with accuracy and reliability as good as or better than met masts.

With an unprecedented range of up to 700 meters, WindCube Nacelle is the only lidar on the market to reach such distances — both onshore and offshore — and meet the PPT requirements for any current and future wind turbine. Over 300 WindCube Nacelle lidars are deployed worldwide, on 100+ wind turbine models onshore and offshore.

The system's ease of deployment, universal compatibility, and simple structure make it non-intrusive and easy to integrate into existing wind energy operations.

Key Benefits

Enables quick and accurate PPT

WindCube Nacelle provides rapid data completion thanks to continuous wind direction alignment, as well as reliable contractual and operational PPT according to industry best practices and the upcoming IEC standard. The lidars are regularly designated for contractual power curve verification in Turbine Supply Agreements.

Accurate, verified data up to 700m

The system captures wind data simultaneously at 20 measurement distances and has an extremely high correlation with IEC met mast measurements — giving wind industry stakeholders the reliable data needed to make better decisions. It is also possible to integrate third-party calibrations against IEC met mast data to further reduce PPT uncertainties.

Universal compatibility and ease of use

Compatible with all current and future turbine types, simple installation, lightweight components, full integration capabilities, and straightforward configuration processes ensure fast time-to-value on any wind farm.

Outstanding reliability and support

WindCube Nacelle's reliability in the field permits a 3-year warranty period and allows for reduced OPEX by 35% over 9 years of operation. The system's onboard diagnostics and error coding ensure rapid troubleshooting and repair.

WindCube Nacelle at a glance

Applications

- PPT
- Warranty power curve
- Yaw misalignment correction
- Nacelle transfer function calibration

Key features

Two configurations available: one for temporary deployment and one for full manufacturer integration

Precise data outputs with different installation set-ups available: 4-beam and 2-beam mode — allowing for accurate measurements of wind speed, relative wind direction, shear and veer, and turbulence intensity

Powerful data analytics software that includes PPT, annual energy production (AEP), and uncertainties calculations — substantially simplifying PPT analyses

Constant accuracy from 50 to up to 700 meters with 20 configurable measurement distances

Straightforward installation with lightweight system parts, an embedded leveling and alignment system, and full integration capabilities

WindCube Nacelle specifications

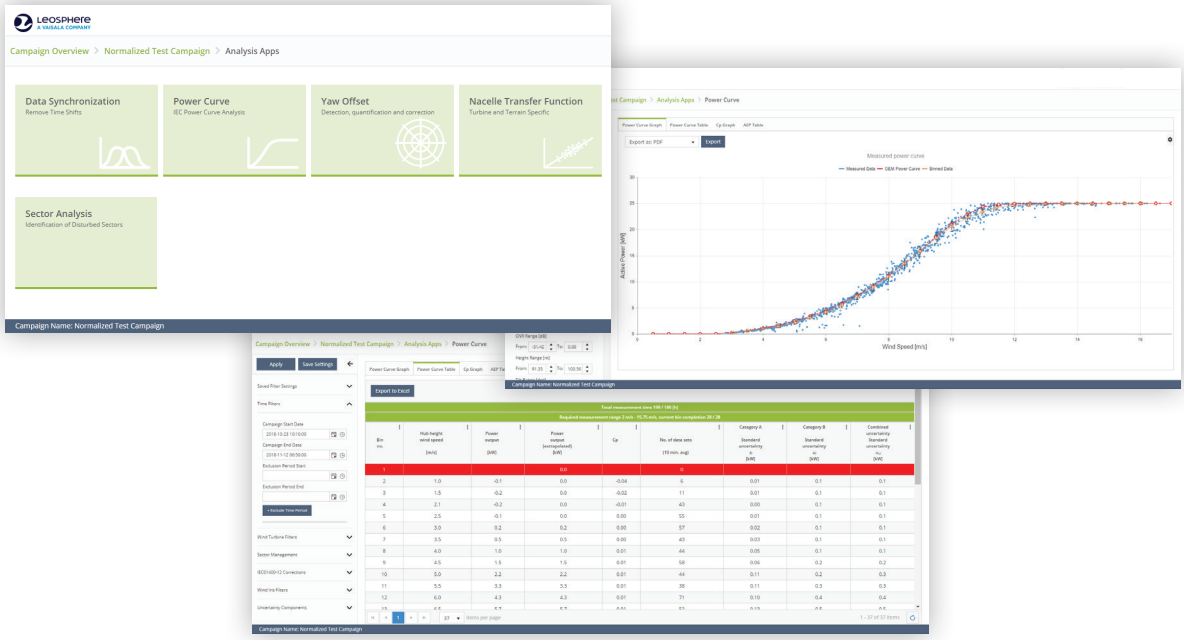
	IEC-grade PPT
Lidar type	Pulsed lidar technology
Range	50m to 700m
Beams configuration	4 beams: Horizontal opening: 30° Vertical opening: 10°
Measuring distances	20 user-defined distances simultaneously
Output data	1s raw data 10min averaged reconstructed wind data (speed, direction, shear, veer, turbulence, yaw misalignment)
Speed accuracy	0.1m/s (10min averaged)
Environment	Housing classification IP66 (OH) / IP65 (PU) Splash water and marine environment resistant Operating humidity 0 to 100% RH
Communication	Ethernet (RJ45), CAN Bus (DB9), Peripheral (USB, HDMI, RS232), optional 3G modem
Time synchronization	NTP/SNTP, GPS or local system clock
Temperature range	Operational range: -40°C/-40°F to +60°C/+140°F
Power consumption	200 W max
Weight and size	OH: 24.6kg / L x W x H = 53cm x 38cm x 36cm PU: 12.8kg / L xW x H = 50cm x 13cm x 38cm
Compliance	CE

WindCube Insights — Analytics

Robust power performance testing and analysis

Engineered specifically to support WindCube Nacelle, WindCube Insights — Analytics allows operators to perform quick, simple, and transparent PPT, with IEC-compliant filtering, AEP calculation, and uncertainties reporting. By simplifying data handling activities, users are free to focus on the most essential performance analysis and optimization work.

Since PPT is a very strict process, this tool provides users with transparent validations and even lists which IEC standards are relevant while in use. It allows for the upload of WindCube Nacelle and SCADA data with a simplified data synchronization process, and a variety of standardized lidar and turbine data filters are available and fully configurable to prepare the data set.



Key Benefits

Easy-to-use, affordable PPT analytics

WindCube Insights — Analytics is tailored for power performance calculations and data integrations — capabilities that turbine users have traditionally needed to develop in-house, often at great cost.

Adheres to accepted industry best practices

Backed by rigorous, transparent validations, the tool proactively displays which IEC paragraph/standard it is referring to while in use.

Improved data visibility and value for the whole wind farm

With its simple interface and rigorous analyses, WindCube Insights — Analytics gives users outstanding awareness of their systems, simple exporting of report tables, data-driven decision-making, and better-functioning wind farms.

Applications

- Operational and contractual PPT
- AEP calculations
- Turbine performance validation during project development
- In-depth analysis of turbine failures and under-performances due to specific wind conditions like shear, veer, turbulences, or misalignment
- Yaw offset determination
- Nacelle transfer function calibration

Key features

Outstanding data analysis and reporting capabilities that integrate both lidar and turbine data (including time synchronization) for calculations as accurate as what can be achieved using met masts

Out-of-the-box simplicity including standardized lidar and turbine data filters, simple configurability, and clear power curve analytics

Easy-to-use, cloud-based tool that can be installed and used quickly and easily, without the intense training usually needed to manage PPT

Why Leosphere, A Vaisala Company?

Leosphere WindCube lidars are the most widely used solutions in wind energy. Trusted by developers, operators, manufacturers, service providers, and many more stakeholders, they provide the reliable data and business outcomes companies need to thrive. Thousands of WindCube units are in service around the globe with some of the world's largest wind energy clients, as well as plenty of smaller, emerging ones.

Support and services you can count on

Wind energy isn't just about technology. It's about having the backing of a global partner that can directly support your business end-to-end, with complementary services, robust customer service, and consultation. Today, WindCube lidar technology is also backed by 80 years of experience and worldwide services.

LEOSPHERE
A VAISALA COMPANY

Please contact us at
www.leosphere.com/contacts

www.leosphere.com

Scan the code for more information