# Wind iris

Turbine Performance Lidar


Avent Lidar Technology is a joint investment of

NRG SYSTEMS

LEOSPHERE

avent
Lidar Technology

TURBINE-MOUNTED WIND INTELLIGENCE

# Wind measurements made profitable

You cannot control the wind, but you can control what you get from it. Knowing the real wind conditions enables you to make the right decisions to extend the reliability and economical performance of your wind farm. The Wind Iris™ provides you with this knowledge and control.

## What about Lidar assisted turbine control?

Today, optimizing static control rules and parameters with the Wind Iris will allow you to increase production potential. Along with a growing number of industry leaders, we believe that feed forward Lidar control will bring significant benefits by reducing both extreme and fatigue loads.

## Optimize and protect your asset

**Detect under performance**
Fast turbine testing, proven IEC 61400-12-1 equivalent power curves without a mast – ideal for offshore.

**Improve Annual Energy Production**
Adjust control rules: yaw alignment, flow correction factors and wind sector management.

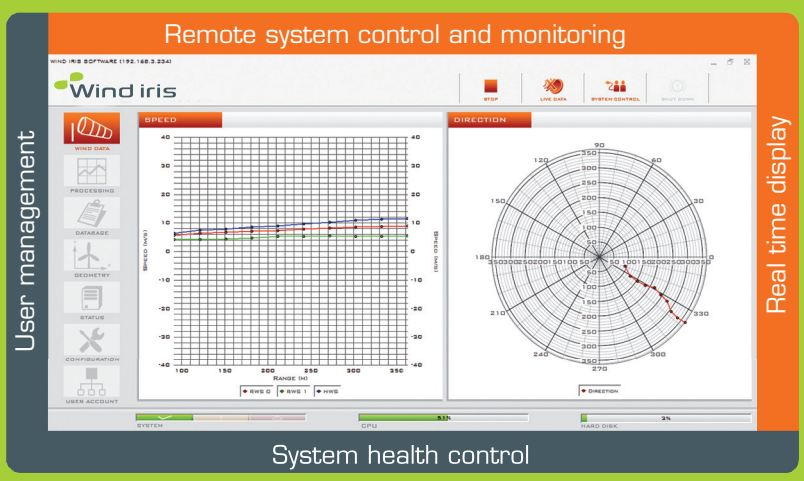
**Make better informed O&M decisions**
Plan, provision and determine your maintenance services by monitoring wind conditions.


**Data feed**
Real time or scheduled transfer

**Data logger, controller**

**Remote connection**
System monitoring, database access

SOFTWARE INTERFACE

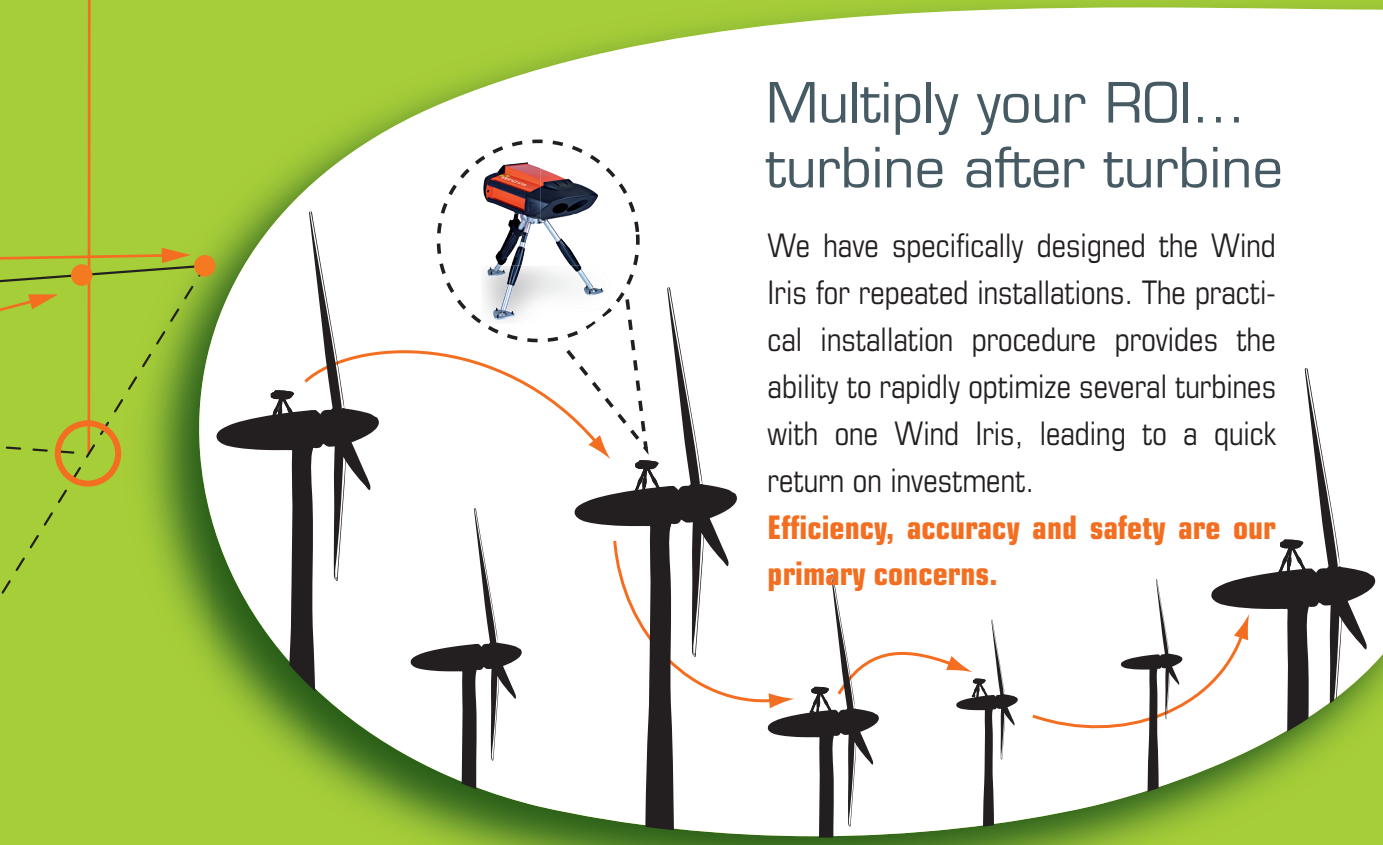


# Lidar technology, one step higher

The Wind Iris is based on Leosphere's leading WINDCUBE® pulsed Lidar technology, and is the first remote sensor dedicated to turbine-mounted measurements. It measures the horizontal wind speed and direction from 40m to 400m upwind of the turbine. Real time and average data can then be transferred automatically or stored in a data logger.

**Wind Iris data**

- Horizontal wind speed and direction
- CNR (signal to noise ratio)
- Tilt and roll angles
- Timestamp
- Radial wind speeds
- Range



## Multiply your ROI… turbine after turbine

We have specifically designed the Wind Iris for repeated installations. The practical installation procedure provides the ability to rapidly optimize several turbines with one Wind Iris, leading to a quick return on investment.

**Efficiency, accuracy and safety are our primary concerns.**

## ½ day installation in 4 steps

### 1. Lift

Compact size allows for the use of the wind turbine's crane.

### 2. Handle

Ergonomic handles and rigging points ensure safety.

### 3. Position

Flexible tripod for easy installation on any turbine.

### 4. Align

Integrated level and laser lines for precise alignment of tilt, roll and yaw.

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# Technical specifications

## Functional

| | Accurate performance monitoring mode | High frequency turbulence and control mode |
|---|---|---|
| **Range** | 80 to 400 meters | 40 to 200 meters |
| **Probed length** | 60 meters | 30 meters |
| **Data sampling rate** | 1 - 2,5Hz | 1 - 8Hz |
| **Laser source** | Fiber pulsed laser 1,54µm | |
| **Number of measuring distances** | 10 | |
| **Speed accuracy** | 0.1m/s | |
| **Speed range** | -10 to +40m/s | |
| **Direction accuracy** | +/- 0.5° | |
| **Scanning angle** | 15°, 30° half angle (custom angles upon request) | |
| **Leveling accuracy** | +/- 0.05° | |
| **Window cleaning device** | Patented non-mechanical wiper | |

## Operational

| | | |
|---|---|---|
| **Optical Head** | L81cm, W54cm, H33cm | 30kg |
| **Processing unit** | L71cm, W33cm, H59cm | 37kg |
| **Tripod** | Hmin 68cm, Hmax 82cm | 15kg |
| **Cable length** | 7 meters | |
| **Temperature range** | -30°C to +60°C | |
| **Operation humidity** | 0 to 100% (splash water and marine environment resistant) | |
| **Power supply** | 120 - 240VAC (50/60Hz) | |
| **Power consumption** | 350 Watts | |
| **Communication ports** | CAN Bus, RJ45 | |
| **Communication protocol** | TCP/IP, CAN / CAN Open available | |
| **Data storage** | > 6 months (128 GB SSD)<br>MySQL database access | |

Contact us to discuss which configuration is best for you!

# Options

**3G Iris**

Remote access to the Wind Iris from any location

**CAN Bus / CAN Open**

Customization and other interfaces upon request

**Warranty extensions**

Up to 3 years for peace of mind

**Longer cable**

10m to provide additional flexibility for larger turbines

**Mounting bracket**

Ideal for mounting the processing unit to optimize space

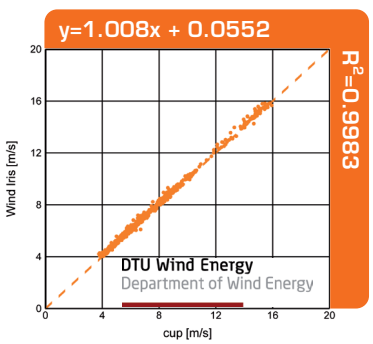
# Quality commitment

We have implemented a Quality System that documents our R&D, Manufacturing and Customer Service practices. This ensures our customers and partners that our products and services comply with international regulatory certifications and consistently meet our standards of excellence.

## Certifications

| | |
|---|---|
| Laser classification | Class 1 |
| Eye safety | IEC 60825-1 |
| Housing | IEC 60529, IP65 (optical head), IP64 (processing unit) |
| Shocks & vibrations | IEC 60068-2 |
| EMC & Lightning | IEC 61326-1, IEC 62311, IEC 61000-4, FCC part 15 |
| Electrical safety | IEC 61010-1 |
| Other tests completed | Wind tunnel test, cold temperatures, snow, freezing rain |

Download full studies and find out more at aventlidartechnology.com

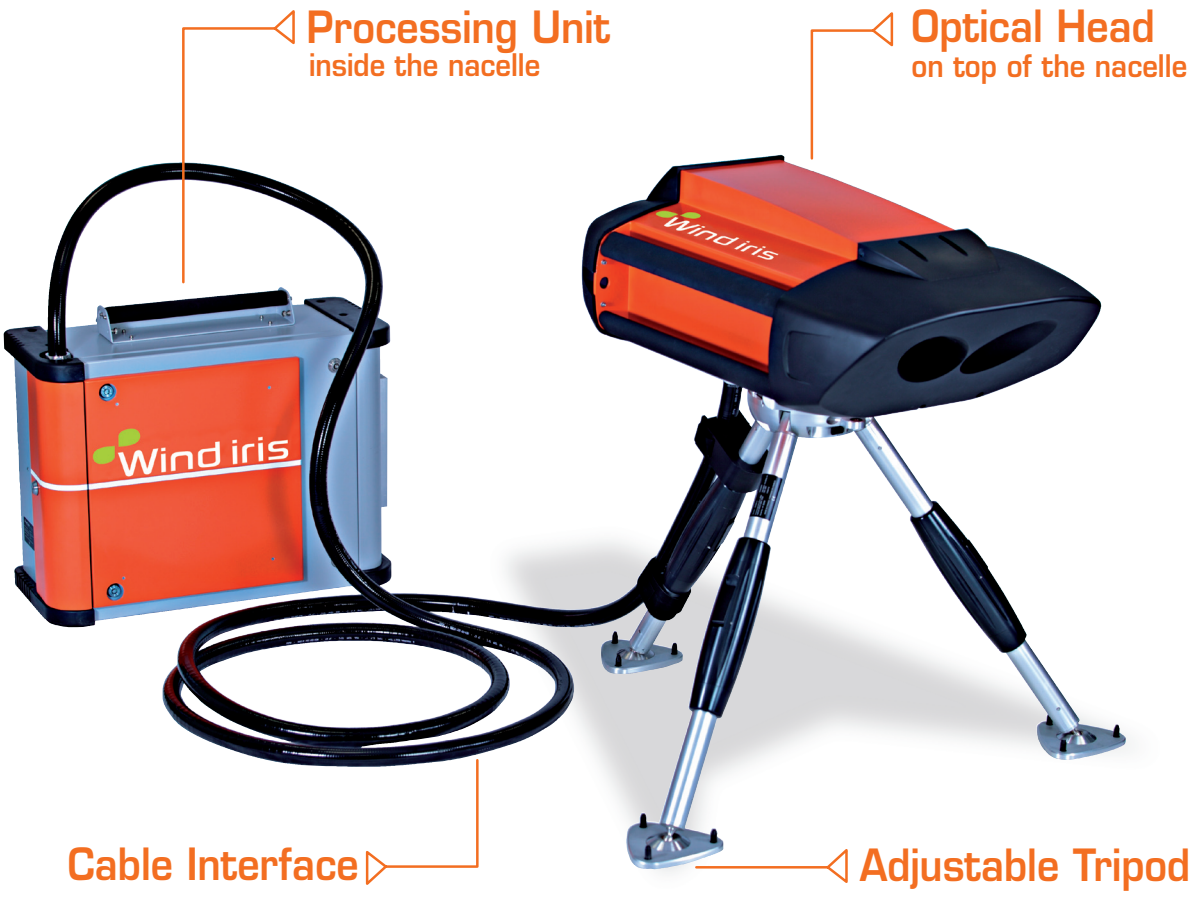



Validation of the Wind Iris against IEC 61400-12-1 met mast[1]

[1]Nacelle Lidar power performance measurement in the context of the IEC 61400-12-1 standard, R. Wagner et al., EWEA Offshore 2011.

# Key Features

- 400m range with the accuracy of a class 1 anemometer
- High reliability design with no moving parts
- ½ day installation on any turbine
- Flexible Lidar modes for every site requirement
- Reduced power curve uncertainties without a mast



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# Customer Service

Our certified engineers provide support during every step of your project: training of your team, engineering assistance on installation, remote monitoring of your fleet... We will help you define the best maintenance program for your needs.

# Our Partners

Through collaborative partnerships, we strive to advance the industry by developing innovative and dedicated solutions, from high-quality instrumentation to fully integrated systems.

ALSTOM

AREVA

DEWI

DONG energy

DTU Wind Energy
Department of Wind Energy

edp renewables
powered by nature

GL Garrad Hassan

LABORELEC
GDF SUEZ

SIEMENS

Want to know more about the Wind Iris or discuss a specific Lidar project?

**Reach us at contact@aventlidar.com or call us at +33 (0)1 81 87 07 30**

Visit : www.aventlidartechnology.com

# About us

Avent Lidar Technology is a privately held company formed to develop and manufacture Lidar-based, wind turbine-mounted systems worldwide.

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## Avent Lidar Technology is a joint investment of

LEOSPHERE
Lidar environmental observations specialists
www.leosphere.com

NRG SYSTEMS
Global leader in wind measurement technology
www.nrgsystems.com

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