



## Wind Solutions

### **BLADEcontrol®** condition monitoring

#### Ice detection system – turnover optimization during wintertime

Rotor blade icing can have a significant impact on wind park profitability. It not only affects turbine performance, it also increases the loads on mechanical components, thus negatively influencing the remaining useful lifetime of the wind turbine itself. In many regions of the world, ice detectors are required in order to guarantee the safety of personnel and equipment. The DNV-certified BLADEcontrol® ice detection system sends a signal to the turbine controller to reliably stop the turbine when ice accumulation is detected on the rotor blades.

However, the real key to power production optimization in cold climates is the automatic re-start of the turbine as soon as the ice has thawed to an acceptable level – either due to a blade heating system or to a rise in the ambient temperature to above 0° C. Even during turbine standstill, BLADEcontrol® can successfully detect when it is safe to initiate an automatic re-start of the turbine.

#### Advantages at a glance

- Ice detection in the millimeter range during operation and standstill
- Automatic stop in case of ice accumulation
- Automatic re-start when blades are ice-free per threshold definition
- Yield maximization through less downtime
- Installation in any type of wind turbine
- Optimization of rotor blade heating systems
- Support from knowledgeable specialists
- Icing status, data visualization in graphic user interface WebVis
- Tested and certified since 2008



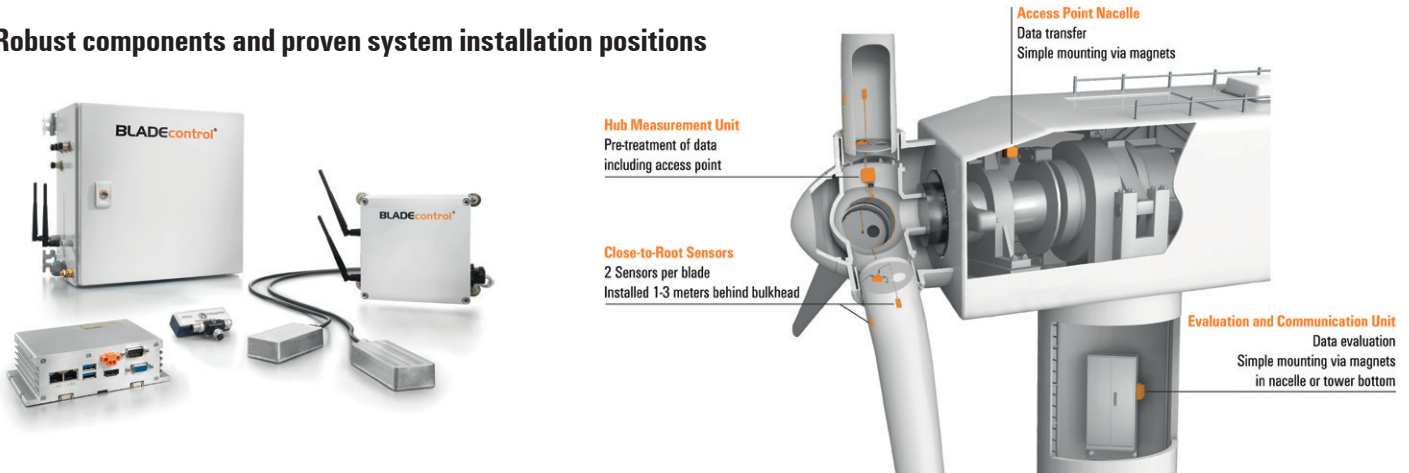
More information on our Website:

[www.weidmuller.com/en/company/markets\\_industries/wind/bladecontrol/index.jsp](http://www.weidmuller.com/en/company/markets_industries/wind/bladecontrol/index.jsp)

## Why detect ice on rotor blades?

The BLADEcontrol® ice detection system provides a stop signal to the turbine controller when – and only when – a specified safety-relevant ice thickness is present on the blades. As soon as the ice level is below this threshold value, the turbine can re-start power production without delay. Depending on the climate at the wind park site, such ice events may occur multiple times per year resulting in significant downtime. Automatic re-start as soon as it is safely possible fulfills local regulations, or contract requirements, while optimizing the revenues of turbines operating in cold climates. This is a unique feature of the BLADEcontrol® ice detection system, which was developed to help our customers enhance the profitability of their wind park projects.

## Robust components and proven system installation positions



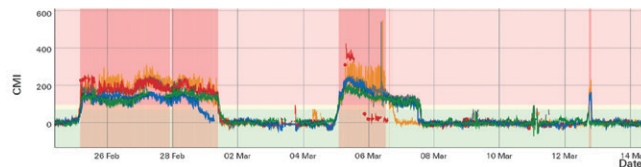
There are two BLADEcontrol® ice detection system variants available: one variant employs the same acceleration sensors used in the BLADEcontrol® condition monitoring system to detect ice formation and can be upgraded at any time to also detect blade damage. Another variant uses close-to-root strain sensors for ice detection only. Regardless of the type of wind turbines in your wind park, either of these BLADEcontrol® system variants can be installed in about one day per turbine. Stakeholders, such as owners, operators or independent service providers, can then access WebVis, a web-based, graphic user interface with definable user management, to view the current condition and icing state of their wind turbines equipped with BLADEcontrol®.

## A business case that makes sense

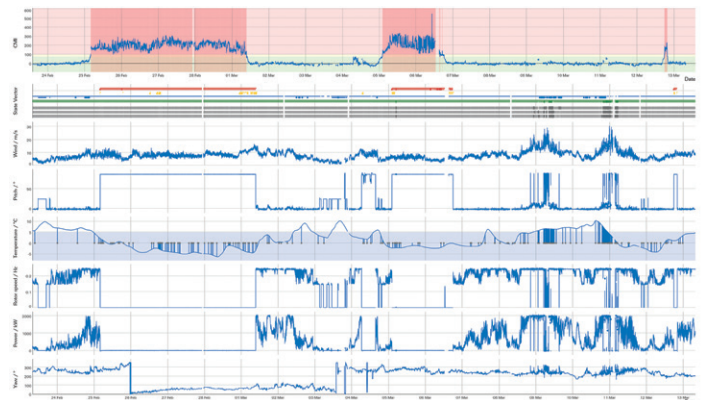
In wind parks subject to cold climates, wind turbines will be stopped five to ten times per year due to icing events. The BLADEcontrol® ice detection system reduces the downtime of the wind turbine per icing event thanks to its highly precise, automatic re-start functionality. Without this feature, such icing events could lead to reduced revenues and increased personnel costs ranging from \$10,000 to \$30,000 per year and turbine.

## Examples of Ice Detection in WebVis

The red shaded sections in the CMI (Condition Monitoring Index) graph at the top shows when the turbine was stopped due to icing. This corresponds to the pitch angle, temperature, rotor speed and power output shown in the graphs on the right.



CMI for different wind turbines in the same wind park



Typical icing event as shown in WebVis

## Weidmüller, Inc

821 Southlake Blvd., Richmond, Virginia 23236  
Telephone: (800) 849-9343, Facsimile: (804) 379-2593  
Email: [info@weidmuller.com](mailto:info@weidmuller.com), Website: [www.weidmuller.com](http://www.weidmuller.com)

