

# Wind Farm Management Software WONDERv2

WONDERv2 is a software for effective and easy wind farm management. It provides an overview of downtimes, error prompts and yield for each turbine at a glance. It forms the foundation for the professional technical management of your wind farm.

## Three good reasons why you need WONDERv2 to manage your wind farm:

- > All important data of your wind farm at a glance
- > Manufacturer-independent
- > Access to your data via your internet browser

Our wind farm management system WONDERv2 forms the basis for the professional, technical management of your wind farm. This system is an essential part of the condition-based maintenance and provides a clearly structured platform for collecting and analyzing operational data of your wind turbines.

WONDERv2 incorporates comprehensive functions for various user groups. The system has been in successful operation for several years. We, too, use WONDERv2 in our technical management and distribute the system independently. It can be utilized for all wind turbines with a remote monitoring system - independent of the type of wind turbine and control system. It provides all information with the same graphical user interface, independent from the machine type or manufacturer.

WONDERv2 Functionality	WONDERv2 Technical Basis
<ul style="list-style-type: none"> <li>• Continuous collection, storage, analysis and digital provision of operational data</li> <li>• Evaluation of yield data and 10-minute averages</li> <li>• Error analysis and availability analysis</li> <li>• Transformation of your technical management processes in the WONDERv2 database system and integration into your quality management system</li> <li>• Automatic reporting in accordance with your specific requirements</li> </ul>	<ul style="list-style-type: none"> <li>• Automatic data acquisition by special data servers</li> <li>• Online availability of the data, i.e. flexible access via any Internet browser</li> <li>• Utilization of COTS technologies</li> <li>• No hardware installation necessary at the wind farm</li> <li>• Manufacturer-independent database structure</li> </ul>

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# Technical Inspection

Regular inspections help you keep your turbine in excellent condition, detect possible damages early and control, whether your service provider does a good job. This is essential for the safe and successful operation of your wind turbine!

## Three good reasons why we should inspect your wind turbines:

- > Prove that the condition of your wind turbine is within specifications
- > Officially accredited inspection body
- > Independent experts with extensive experience

Our independent experts evaluate wind turbines in the context of commissioning inspections, periodic inspections and warranty inspections. In addition, we offer damage assessments and inspections for condition-based maintenance that also includes vibration analysis of the entire drive train. With respect to periodic inspections, we also carry out rotor blade checks.

We offer damage appraisals and inspections for the condition-oriented maintenance that also includes vibration analysis of the complete mechanical power train.

These services are based on the "Principles for Repeated Inspections of Wind Turbines" of the expert consulting committee of the German Wind Energy Association that WindGuard is a member of.

Since we expect superior quality from others, we apply the same high standards to our work. This quality becomes evident: For a variety of "Technical inspection" services we are one of the first companies to be accredited by the DAkkS (German Accreditation Body) as an inspection body for wind turbines according to DIN EN ISO/IEC 17020:2004.



### Our Services:

- Acceptance tests and certificates
- Periodical inspections
- Warranty acceptance
- Damage expertise
- Inspections for the condition-oriented maintenance
- Vibration analysis of complete drive train

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## Rotorblade Inspection

Rotor blades need inspection to be inspected in regular intervals. Conventionally, basket-cranes are used for this task. We offer rotor blade inspections via rope access – the easiest and most cost effective way to check your blades!

### Three good reasons for rotor blade inspection via rope access:

- > **Early detection of initial damages to rotor blades**
- > **Low cost thanks to rope access technique**
- > **Can be carried out at higher wind speeds compared to basket-cranes**

Our experts are well trained in rope access techniques. For rotor blade inspections, our employees rope down from the nacelle along the blade. Thus, rotor blade inspections of wind turbines are executed quickly, flexibly and at any height. Setup times as well as costs are significantly less compared to the conventional methods using basket-cranes or lifts, especially with respect to tall wind turbines. In addition, measurements of the lightning protection system can be carried out in the context of a rotor blade inspection.

## Video Endoscopy and Oil Analysis

Video endoscopy and oil analysis offer two ways to detect possible damages to the gearbox in a very early stage – and thus spare you the costs of a transmission failure.

### Three good reasons why you should conduct video endoscopy and oil analyses:

- > **Visual inspection of bearings and gear wheels that are difficult to access**
- > **Non-contact measurement: no risk of damages!**
- > **Early damage detection**

Our comprehensive expert activities also include gearbox video endoscopies. This non-contact measurement technique can detect damages to gear components early. Resulting costly damages can often be avoided. Oil-samples of the gearbox oil can be taken and analysed in a well-known, independent laboratory. Ideally this will be combined with vibration measurement and analysis of the drive train - potential for damages to the gears or the bearings can be detected early and corrective measures can be initiated. All these methods will help in avoiding lengthy and costly downtimes.

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## Technical Management

Technical management is the basis for a successful wind farm, because only well-maintained, continuously operating wind turbines provide the projected returns to investors and banks. We know that technical management costs money. But we also know that a solid reliable technical operation management pays back!

### Three good reasons for technical management

- > **Maximizing the yields of your wind farm by optimal operation**
- > **Supervising condition-orientated maintenance for optimised availabilities**
- > **Condition monitoring, 24/7, year round**

One of the focal points of WindGuard's activities lies in the area of technical management of wind farms. This type of management represents the foundation for any successful wind energy project, since only well-maintained, continuously operating wind turbines provide the projected returns to investors and banks.

Technical management offered by WindGuard is based on the requirements of insurers to condition-oriented maintenance of wind farms. Components are thus examined closely with respect to their condition and repairs are carried out after a predefined error threshold is exceeded with the aim to be done outside periods of high wind conditions.

The customer benefits due to the reduced risk of wind turbine downtime, prolonged life-times of individual components, as well as lower repair costs! This way, we optimize the availability of your wind turbines and maximise the returns of your wind farm - 24/7/365!



In a nutshell, we offer:

- Effective remote-monitoring of wind turbine operation
- Permanent collection of incident reports via pager
- Promptly fault response
- Regular inspections with a special focus on neuralgic spots and early error detection
- Optimized maintenance and repair planning
- Control and monitoring of maintenance performed by the manufacturer
- Complete collection of operational data and logbooks
- Meaningful monthly reports

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