

Wind Energy Reliability Solutions

TIMKEN
Where You Turn

Wind energy reliability solutions from Timken

The technical expertise required to perform condition monitoring in extreme applications would blow most companies away. Turn to Timken for a comprehensive wind turbine service platform that includes our online monitoring systems and a service engineering organization with over 100 years experience in bearings and power transmission.

With operating conditions that change as frequently as the wind, your equipment faces variable speeds, loads, temperatures, and more. These fluctuating conditions make it extremely difficult to consistently and accurately monitor, while also exposing your turbine components to an extreme range of potentially damaging vibration.

The Timken Online Intelligence System has been designed to handle these changing conditions by incorporating intelligent hardware and software that allows you to customize measurement configurations and techniques to meet your specific equipment operations. Our wind monitoring solution can be set up so that readings are only stored when conditions or triggers meet your defined parameters. This flexibility ensures you only get quality, repeatable data from operating conditions that allow for proper analysis and alarming. This logic based approach allows for true condition based alarms that are real and usable.

Then when a problem is detected, Timken has the trained and certified reliability engineers to analyze the data, conduct on-site testing for balancing, alignment, looseness and more using the latest technologies.

Timken is where you turn for a comprehensive wind solution to help ensure your gearboxes, generator or shaft bearings keep your business in motion. With a combination of shock-pulse, vibration analysis and more, we can provide early detection of potential bearing and gear problems. The early detection of mechanical problems allows for better maintenance planning, reduced downtime and increased cost savings.

Creating reliability solutions to blow away your expectations

Timken's range of services and Online Intelligence System can be combined in a variety of ways to meet your needs.

Whether you've got a complete reliability team capable of interpreting data collected from our monitoring system or you're looking to fully outsource your reliability program, we adjust to fit your needs.

Timken wind monitoring system

Timken's unique wind solution is designed to capture quality repeatable data in even the most dynamic conditions, including:

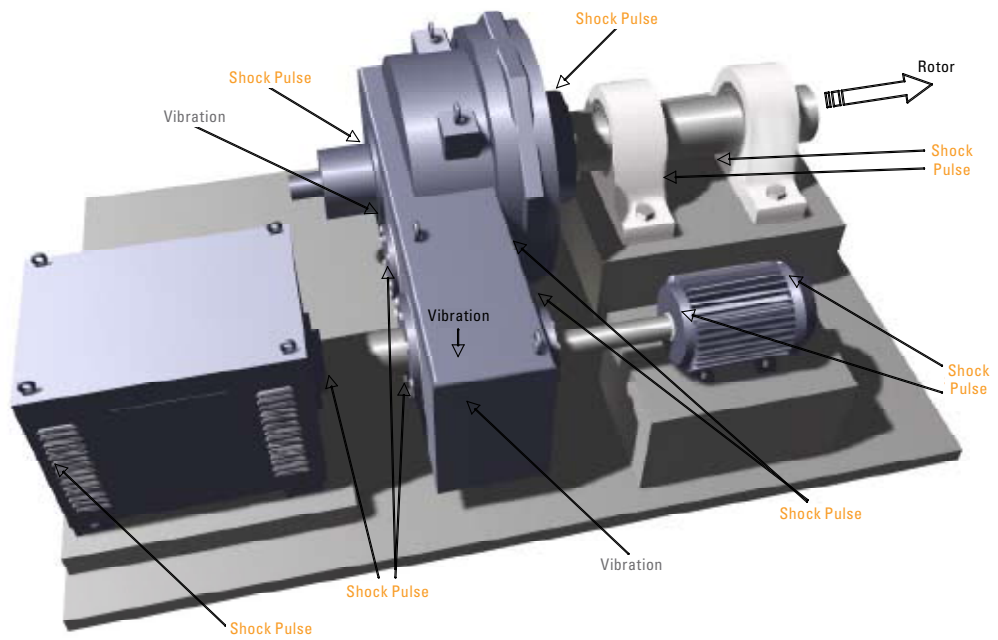
- *Variable Speeds and Loads → Triggered Data Collection*
- *Short Steady State Window → Powerful Highspeed Data Collection*
- *Transient Vibration → Intelligent Alarming/Filtering*
- *Communications → Ethernet/Wireless Ready*

The wind monitoring system uses a powerful signal processor to allow for high levels of accuracy and repeatability even while making extremely fast measurements.





The Commander Unit allows for the control and communication with the monitoring units. The unit includes accommodations for up to 32 channels of shock pulse, 4-20 mA inputs from other sensors, or vibration analysis. The equipment comes standard with four RPM inputs and four digital status outputs but can also monitor units for analog signals and analog output.



The systems communication software controls and filters data while handling messages between multiple Commander Units and the central database. In addition, the service software offers top-of-the-line alarming and analysis capabilities in an easy to use graphical interface.

The Timken Online Intelligence System utilizes OPC™ Data Access, a worldwide standard for exchanging process control data. With the OPC standards, data can be transferred from any source to any other OPC compliant application. Using this client-server architecture, OPC creates a plug-and-play solution for system interconnectivity.

The system's modular design allows for a broad combination of different measuring techniques as required to meet your needs, including:

- *Bearing Monitoring measures shock pulses for early detection of bearing damage and marginal lube conditions.*
- *Vibration Monitoring supports broad band measurement according to ISO 2372 and ISO 10816, as well as full waveform and spectral analysis.*

- *Analog Input and Output is used to monitor a broad variety of process signals, including speed, temperature, load, amperage, or any other 4-20 mA analog signals for use by DCS, SCADA or other process control (PLC) systems.*

Timken reliability services

With over 20 years of experience in providing reliability services to a range of industries, Timken is uniquely qualified to offer a complete predictive maintenance solution for all of your needs. Timken's reliability services team can monitor your equipment, thereby helping you increase uptime and improve profitability.

While our services apply across many markets, we have worked to tailor these solutions to the unique demands of wind turbines and also to compliment the technology of our wind monitoring system. These services include:

- *Vibration analysis*
- *Infrared thermography*
- *Oil analysis*
- *Video imaging*

- *Ultrasonic testing*
- *Balancing and alignment*
- *Root cause failure analysis*
- *RCM facilitation*
- *Asset prioritization*
- *Criticality analysis*
- *Remote monitoring services*
- *Mentoring programs & training*

This combination of monitoring technology and services are the key to Timken's proven award-winning method of managing a program's data and delivering tangible results.

TIMKEN

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Bearings • Steel •
Precision Components • Lubrication •
Seals • Remanufacture and Repair •
Industrial Services
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