Turbine Integrity Control

Structural damage is a threat to your turbine investment and can lead to unscheduled outages. The measurement of important strain and displacement data can help to predict load-related failures many years before they actually occur. With innovative blade load measurement, critical system loads can be continuously measured from the blade root to the blade tip. Overload events can be automatically detected and the rotor blade can be protected from damage.

The gathered data is used for:
- Deformation of the rotor blade
- Identification of strain patterns
- Damage prognosis
- Early warning for structural issues
- Active load reduction
- Flutter and vibration control
- Fieldbus and IIoT interfaces

The Blade Physics Library translates the fiber-optic measured variables into easily usable physical quantities. The measurement data are finally translated by the Blade Physics Library into real-time data for the customer. The Blade Physics Library is a software library for post-processing and analyzing data from fiber-optic sensors. It is a powerful tool for analyzing the data and can be used to identify critical system loads and to optimize the performance of the turbine.

Applications
- Turbine Integrity Control
- Turbine Load Control
- Turbine Blade R&D

fos4Blade R&D

The extension of the serial hardware for the collection of additional measurement variables for extensive prototype tests as well as IEC certifications.

fos4Blade sensor platform

The sensor platform is designed to offer new and innovative solutions for the detection and analysis of blade and tower vibrations and accelerations. The sensor platform can be customized according to the customer's needs in order to gather additional measurement variables for extensive prototype tests as well as IEC certifications.

Innovative Fiber Bragg Grating (FBG) measurement technology

The advantages of fiber-optic measurement technology:
- Insensitivity to lightning and electromagnetic interference
- Large measuring range
- High overload capacity and with its unique robustness in the industrial environment.

We are revolutionizing fiber-optic measurement thanks to innovative sensor technology. The advantages of fos4X sensor technology based on the fiber optic measurement technology.

The fos4Blade sensor platform is designed to offer new and innovative solutions for the detection and analysis of blade and tower vibrations and accelerations. The sensor platform can be customized according to the customer's needs in order to gather additional measurement variables for extensive prototype tests as well as IEC certifications.

Fiber-optic sensors in EVERY ROTOR BLADE
We provide sensors and solutions to drive smart wind energy

Fiber-optic strain sensors not affected by electromagnetic interference
- Longer life-cycles and larger measurement range than conventional strain sensors
- Temperature compensating design
- Realtime data processing (for control systems)
- Framework for customer specific algorithms
- Webserver for configuration and visualization
- Internal SSD storage (up to 1TB)

Fiber-optic torsion sensors not affected by electromagnetic interference
- Relative measurement of the torsion angle
- Measurement at any radius and along the entire blade length possible
- Optimizes the operation of wind turbines
- With safety-relevant stop and certified, automatic re-start, additional income of more than € 10,000 per winter is generated.
- Control of blade anti ice heating is optimized

The PolyTech sensor platform is a modular system of hardware components with open interfaces as the basis for various solutions for yield optimization

We support the development of customer-specific equipment such as control cabinets, optical cables or blade hub connections as well as data processing.

As an extension to the standard platform for the measurement of mechanical loads, strains and vibrations of a rotor blade, there is also the possibility of individual design of the measuring system according to the customer specific requirements

Our series solutions for yield optimization, cost reduction and increased safety standards at turbine level, as well as park level and cloud level.

Fiber-optic acceleration sensors not affected by electromagnetic interference
- Enables acceleration measurements at the tip of the blade
- Does not affect the blade lightning protection system
- Ethernet, CAN & CANopen, PROFINET, Modbus, TCP/IP
- Fast implementation of customer specific interfaces
- Supports standard IIoT protocols

Fiber-optic temperature sensors not affected by electromagnetic interference
- Longer service life
- High signal to noise ratio
- Protects your wind turbine against overloads
- Optimizes the energy yield within the load envelope
- Determines the fatigue life of your system

Fiber-optic measurement device for dynamic measurements
- 1 kHz sampling rate – 1 sensor per channel, up to 16 measurement channels
- Standardized measurement in accordance with IEC 61400-13