



Lightning Key Data[®] System

AVOID UNNECESSARY AND EXPENSIVE INSPECTIONS AND DOWNTIME



The right and accurate data on lightning strikes is the key to proper operation and maintenance of wind turbines.

Lightning Key Data[®] System is a unique measurement system developed by PolyTech.

The system measures all relevant key parameters from a lightning strike in your wind turbine. Due to the individual impact of lightning on the exposed structure, the system provides important, useful and valuable information.

Knowing the exact time, peak current, charge, specific energy, and rise time gives you a unique and accurate basis on which to make immediate and right decisions, such as whether the turbine can continue to operate safely or must be stopped immediately for inspection, thereby avoiding stopping the turbine for no reason. The system can be programmed to stop the turbine immediately to avoid consequential damages.

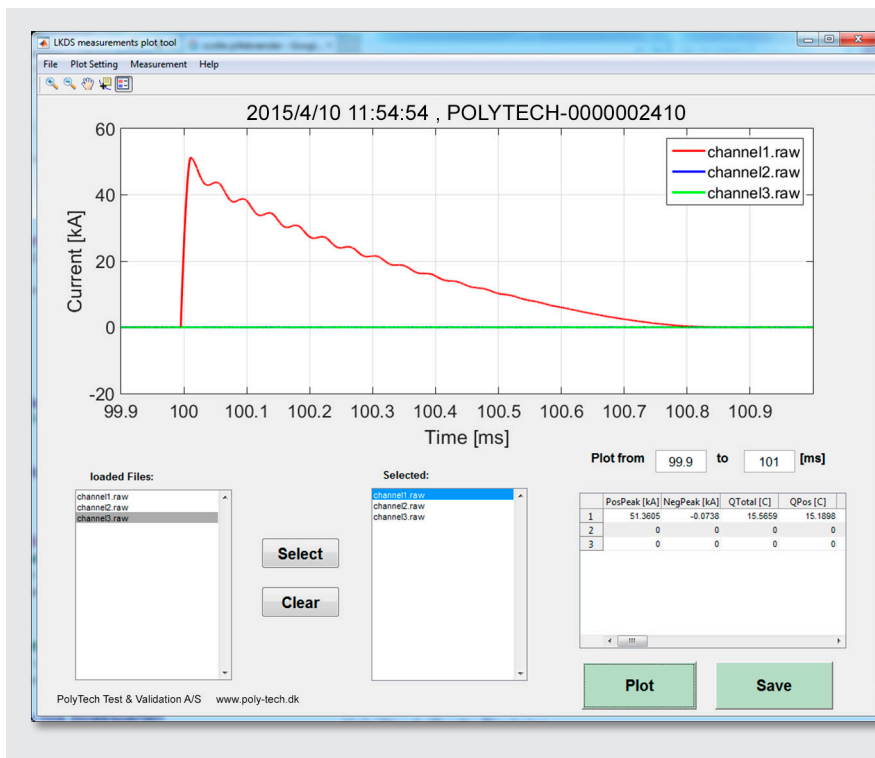
With Lightning Key Data[®] System you also avoid overlooking emerging and incipient vulnerabilities on the blade or electronics, which may have fatal consequences for the turbine if not taken care of in time.

The total picture right away

Lightning Key Data[®] System record the lightning strike in a time frame of 1.5s on each of the three channels. This ensures a measurement of the entire lightning incidence, and hence an accurate calculation of the four key parameters. Due to the system architecture, it is capable of measuring four consecutive 1.5 sec. events on each channel enabling records of even very long duration strikes.

SUMMARY OF LKDS ADVANTAGES

- ✓ Real-time measurements
- ✓ GPS synchronization
- ✓ Measures all key parameters
- ✓ Fast sampling rate
- ✓ Online communication
- ✓ Improved blade maintenance strategy
- ✓ Easy to install
- ✓ Robust design



The four key parameters

1. Peak current [kA]

The maximum value of the lightning current measured in kA. The peak current indicates the dynamic force, which can tear things apart. Standard setting is +/- 240 kA.

2. Specific energy [MJ/Ω]

A time integral of the square of the lightning current, identifying potential heating of inadequate connection components. The Specific Energy is a key parameter when conducting lightning tests.

3. Charge content [C]

The time integral of the current, also conducted for the full waveform. Charge creates wear on attachment points - and in any transfer systems, bearing components etc.

4. Maximum rise time [kA/μs]

Risetime indicates how quickly the lightning current rises from zero to peak level. Valuable knowledge to define the frequency content.

A lightning strike is powerful and complex. By installing the Lightning Key Data® System in your wind turbine, you get the individual lightning strikes registered and the lightning current waveform processed into four key parameters. The system provides you with instant access to accurate data on each parameter.

The data recording is available by ethernet communication either as the four key parameters or in full recording resolution - so you will know exactly what is going on. The system is capable of storing more than 300 events in the onboard Flash drive.

Installing Lightning Key Data® System

Lightning Key Data® System is typically installed with a sensor in each blade and the central processing unit located in the wind turbine hub.

PolyTech is adapting the lightning key data system into the specific wind turbine, including drawings, instructions and physical brackets, cable trays etc.

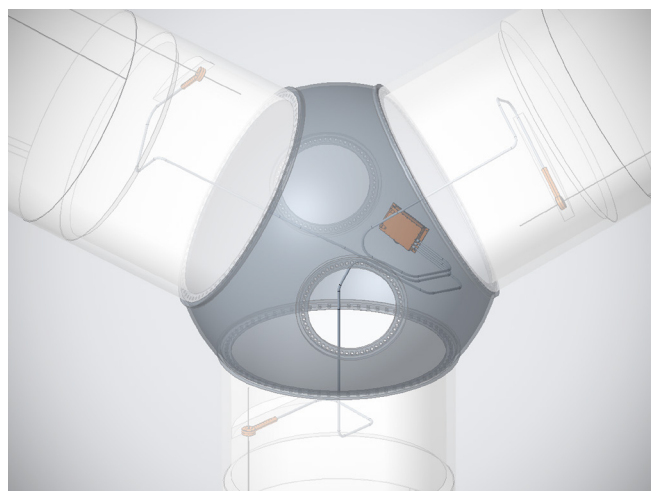
Once the system is installed and configured, it will provide valid lightning measurements.

Designed specifically for use in wind turbines

Installed in the wind turbine blades and in the hub, Lightning Key Data® System can withstand the most severe operating conditions in terms of temperature variations, humidity, vibrations, and EMI during lightning exposure.

The Lightning Key Data® System has been tested extensively in EMC, climate chambers and mechanical test rigs, and exposed to numerous lightning strike impacts in the PolyTech test facility.

Lightning Key Data® System is a reliable and robust product, which is tested to cover all environmental impacts and designed to operate under harsh conditions.



Lightning Key Data® System is designed for natural integration into the harsh environment of the wind turbine hub and blade area. One sensor in each blade gives momentary measurements of the lightning behavior during a strike.