



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.

The Lightning Key Data[®] System (LKDS[®]) is a unique measurement system developed by us at 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 you important, useful, and valuable information.

Knowing the exact time, peak current, charge, specific energy, and rise time, you will get a unique and accurate insight to make immediate and right decisions on whether the turbine can continue to operate safely or must be stopped immediately for inspection. You can therefore avoid stopping the turbine for no reason.

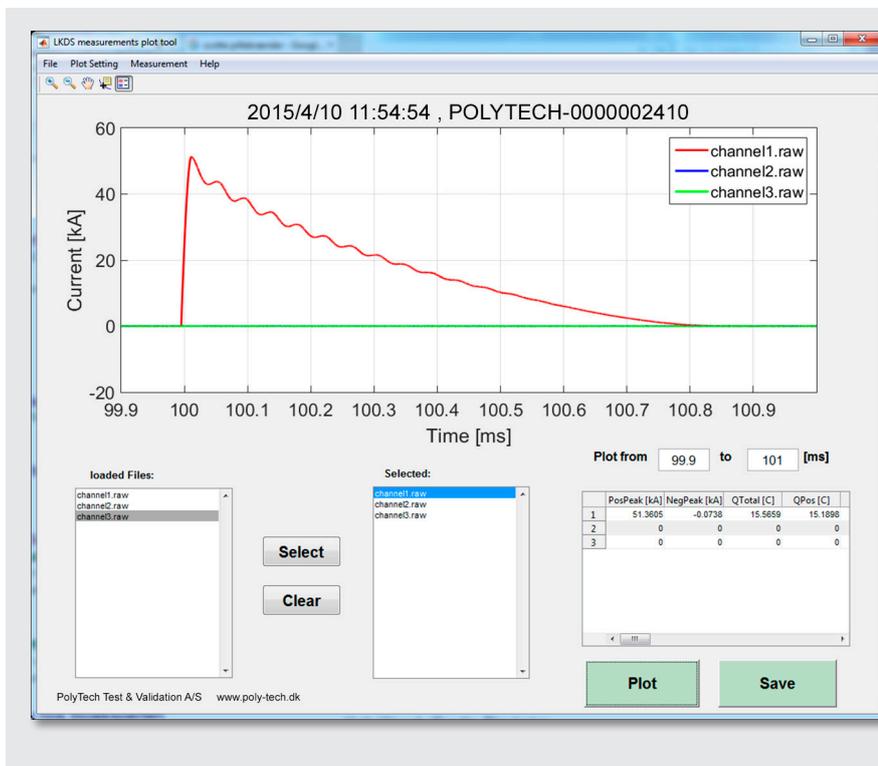
With LKDS[®], you also avoid overlooking emerging and incipient vulnerabilities on the blade or electronics, which may have fatal consequences for the turbine if not taken care of in time.

The total picture right away

LKDS[®] records 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 an accurate calculation of the four key parameters. Due to the system architecture, LKDS[®] can measure four consecutive 1.5s events on each channel, enabling recordings of very long strike durations as well.

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]

Rise time 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 can capture the characteristics of the lightning strike by processing the lightning current waveform into four key parameters. The system provides you with instant access to accurate data on each parameter.

You can access the data recording using ethernet communication either as the four key parameters or in the full recording resolution - so you will know exactly what is going on. The system can store more than 300 events in the onboard Flash drive.

Installing Lightning Key Data® System

LKDS® is typically installed with a sensor in each blade, while the central processing unit is located in the wind turbine hub.

We adapt the complete LKDS® to your specific wind turbine, including drawings, instructions, physical brackets, and cable trays.

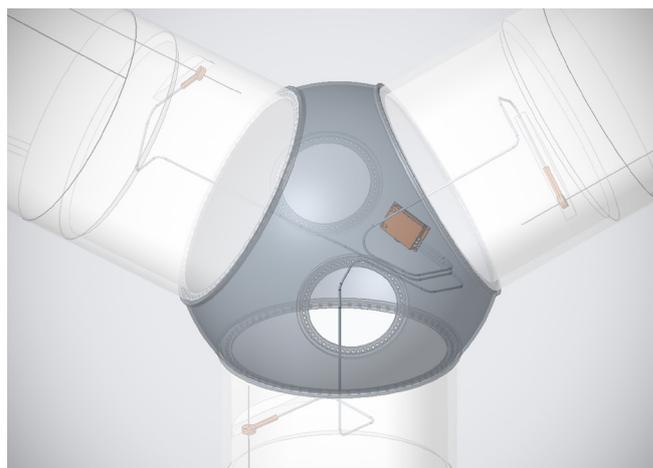
Once the system is installed and configured, it will provide valid lightning measurements.

Designed specifically for use in wind turbines

LKDS® can withstand the most severe operating conditions in terms of temperature variations, humidity, vibrations, and EMI during lightning exposure.

LKDS® has been tested extensively in EMC, climate chambers, and mechanical test rigs, and we have also exposed it to numerous lightning strike impacts at our testing facility.

LKDS® is a reliable and robust product, which has proven to withstand all environmental impacts and designed to operate under harsh conditions.



The Lightning Key Data® System is integrated in the wind turbine hub and blade area and is designed to withstand harsh environments. One sensor in each blade gives momentary measurements of the lightning behavior during a strike.