

# interface

FORCE MEASUREMENT SOLUTIONS.

## CASE STUDY

## Interface Supports Incredible Wind Energy Innovation



### About

Energy innovation, in pursuit of clean energy and sustainability, is among the most critical areas of technological and scientific change for our planet. Organizations, scientists, and engineers around the world look to solar, water, wind and other renewables to address climate change through efficient and clean energy alternatives.

Interface and our partner interfaceforce® e.K. were asked to provide force sensors to an organization in Germany for the advancement of wind energy. The customer, the Physikalisch-Technische Bundesanstalt (PTB), is the national metrology institute of the Federal Republic of Germany. As the second largest metrology institute in the world, it has earned a high international reputation in research relating to units and precise measurement. PTB is a service provider for science, business and society, and advises the German federal government on all metrology issues. Organizationally, the PTB is a departmental research facility and senior authority within the portfolio of the Federal Ministry of Economics and Climate Protection. For more than 135 years, PTB's role is making important contributions to advancing the energy transition, heat transition and climate protection with quality and speed.

Our role in the project is supplying PTB force measurement solutions to help in the construction and testing of the world's first traceable torque measurements of up to 5 MN · m. The system's goal is to make it possible to calibrate corresponding torque transfer transducers for industrial applications. In this case study, we detail PTB's needs in terms of its advanced torque measurement system, and the solutions that Interface provided to help them achieve their impressive goal.

### Challenge

PTB took on a significant project that would revolutionize wind energy competence by providing a way to reliably measure offshore wind turbines with the highest level of accuracy for the first time. The expansion of wind power can only be successful in global impact to our climate and energy needs, with ever larger wind turbines and machines capable of checking the quality of these systems.



1248 Flange Precision  
LowProfile® Load Cell



1258 Flange Precision  
LowProfile® Load Cell



1220 Universal Precision  
LowProfile® Load Cell



SM S-Type Load Cell

To achieve this, it was necessary to construct a system with highly accurate and repeatable measurement results; one that enables bending moments, axial forces and dynamic excitations of up to 3 Hz. Thereby, making it possible to realize a metrological characterization of dynamic influences in the (MN · m) torque range, as well as in the MN force range. PTB required a force measurement solutions provider with a proven history for quality, as well as significant background in the energy industry. Due to PTB's experience and knowledge of Interface's product accuracy and reliability, PTB selected Interface as the supplier of force solutions for its traceable torque measurement system.

## Interface Solutions

Working closely with PTB through Interface's German representative firm led by René Storms, Interface provided the necessary information on the specifications of multiple products to select the right solutions for its system. Interface offered several products that fit the torque measurement system's testing needs, all in off-the-shelf configurations. This included the following Interface products:

- **Model 1258 Flange Precision LowProfile® Load Cell with 2nd bridge and two moment bridges for  $M_y$  and  $M_z$**
- **Model 1248 Flange Precision LowProfile® Load Cell with 2nd bridge and two moment bridges for  $M_y$  and  $M_z$**
- **Model 1220 Universal Precision LowProfile® Load Cell**
- **Model SM Super Mini High Accuracy S-Type Load Cell**

These products are being used to calibrate and test PTB's torque measurement system, allowing the system to provide accurate and repeatable results over time.

## Results

Test and calibration on the 5 MN · m system is meeting PTB's exact needs and allowing for precise measurements. The organization is now moving towards higher levels of performance (up to 20 MN · m), in which Interface will provide solutions.

Today, the system can allow multicomponent transducers to be calibrated in a traceable and practice-oriented way for force and torque. The system is also now the world's largest machine starting up at PTB, with which the large torsional forces that occur in wind turbines can be precisely measured for the first time. This unique torque standard measuring device is an essential part of PTB's Wind Energy Competence Center. Interface and our team in Germany are proud to have provided solutions that are truly capable of changing the future for our planet and all inhabitants.



Figure 1-PTB's Torque Measurement System