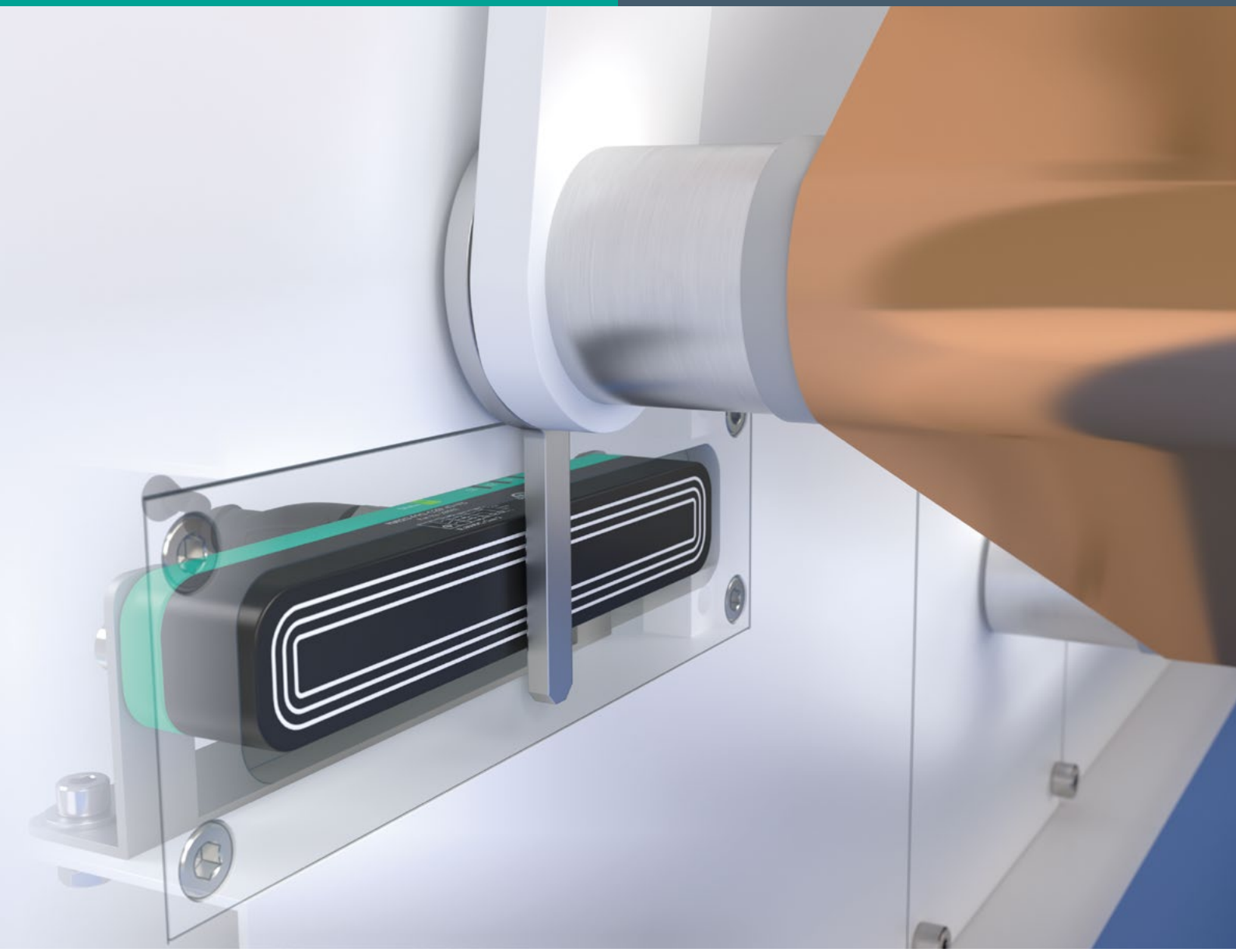
Precise Dancer Control in Battery Cell Manufacturing

Inductive Positioning System Provides Continuous Noncontact Measurement

At a Glance

- Precise, continuous measurement of the dancer position
- Sensor with no moving parts for noncontact and wear-free measurement
- Resistant to vibration and contamination
- Optional IO-Link for simple parameterization and continuous diagnostics



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The Application

The electrode and separator films are wound on rollers and are assembled via calendering during the production of battery cells. This is a high-speed and intermittent operation that requires precise interaction between each component. This process requires the tension of the film web to be as constant as possible. A guide roller with a spring mechanism, known as a dancer, compensates for fluctuations and helps to maintain the web tension. The dancer's movement should be as smooth as possible around a central position. Continuous measurement of the dancer position provides important data about the process and the potential need for corrections or maintenance.

The Goal

The dancer's movement is measured continuously and at a high resolution. The measurement is noncontact and has a high level of reliability. The strength and frequency of fluctuations, and any deviation from the average center position, is accurately recorded.

The Solution

A metal pin is attached to the dancer. It acts as a damping element that moves along the PMI120-F90 inductive positioning system. The sensor detects these movements in a noncontact manner and with a high degree of precision. This accurately measures the dancer's movement within 0.1 millimeter, and outputs the current position in real time.

The Benefits

The PMI120-F90 inductive positioning system has no moving parts and is therefore wear-free. It is resistant to contamination and vibration. The device is available with IO-Link interface as an option. IO-Link communication allows for especially easy parameterization; in addition to the highly accurate measured values, data can be called up for use in integrated diagnostics and process optimization.

Technical Features

- Parameterizable measuring range 0 ... 120 mm
- Switch point parameterization via IO-Link
- Versions with analog output and up to three switching outputs
- Repeat accuracy ± 0.1 mm
- Resolution: 50 µm
- Degree of protection: IP67/IP69K

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