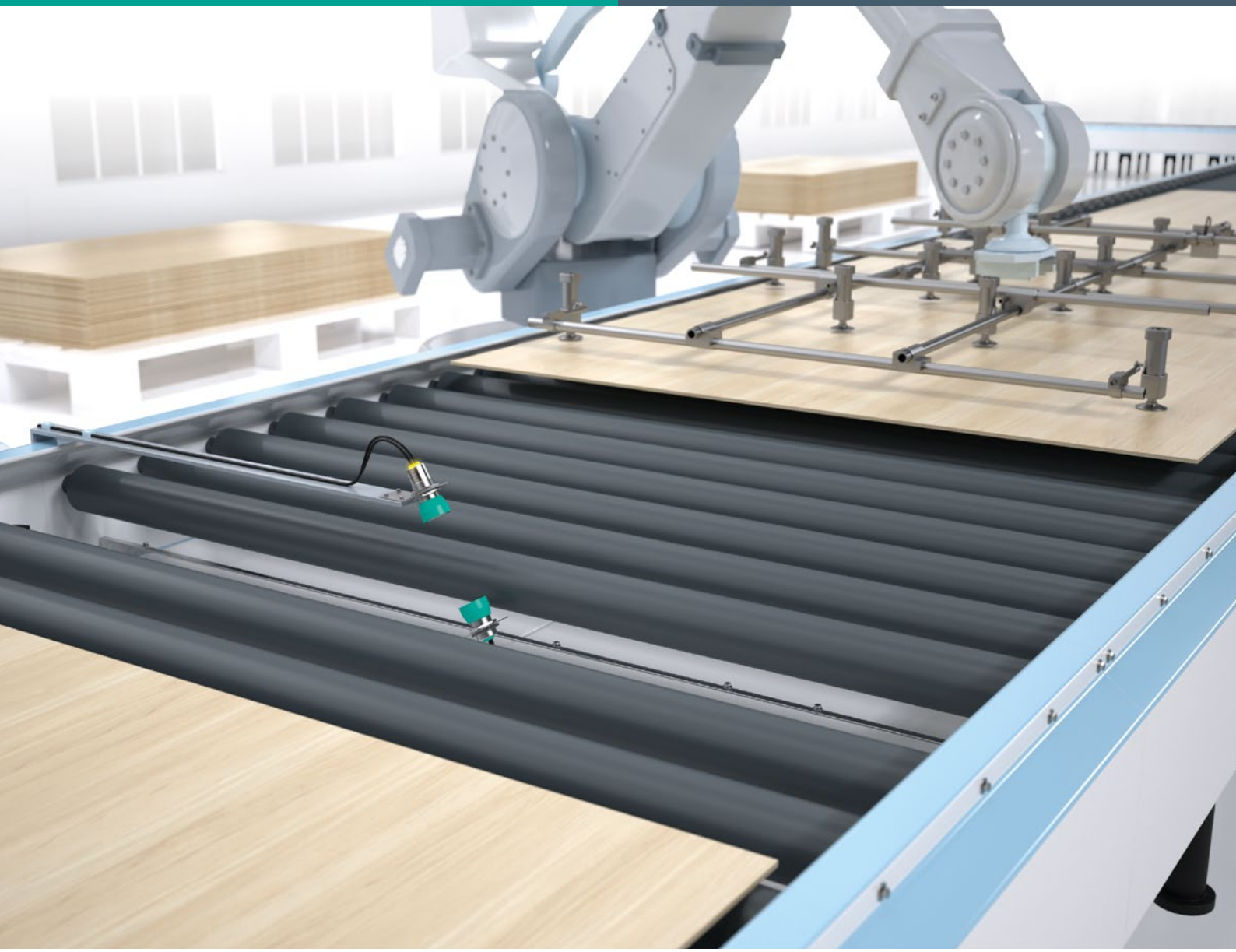
Reliable Layer Detection for Sheet Materials

Double Sheet Sensor Ensures Correct Infeed of Sheets into Machines

At a Glance

- Noncontact detection with a single setting for a very wide range of materials
- If necessary, individual configuration of the device for specific requirements via teach-in
- Sheets can be detected during material movement
- Measurement independent of the optical characteristics of the material
- Sensor functionality is not affected by dust, humidity, or adhering contaminants



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The Application

In many industries, precursors are processed in sheets that can consist of materials such as glued and laminated wood, OSB panels and chipboard, laminates, and sheet metal. Usually, the sheet to be processed is lifted from the material stack by a robot arm with a suction gripper and is placed in the feed of the processing machine. This is followed by steps such as sawing, milling, punching, laminating, coating, painting, and hot gluing. The environment is often dusty, very warm, and humid. Since the sheets lie flat on top of each other in the stack, two or more layers may stick together when picked up by the gripper and may therefore both go into the machine. Sheets that stick together can fall while the robot arm is moving. This causes additional problems or even a hazard for the operating personnel.

The Goal

Regardless of the processing operation, only one sheet must enter the machine at a time. Two or more sheets entering the machine can result in quality problems, damage to the tool or machine, and plant down time. The same applies if a sheet is erroneously not fed into the machine. It must be possible to reliably prevent sheets from being incorrectly fed into a machine. The detection process must not be impaired by the color, shape, or characteristics of the material or by external influences such as heat, vapor, dust, or adhering contaminants. To prevent any damage to the material, noncontact detection is required. Ideally, reparameterization should not be necessary when a material is changed.

The Solution

A single ultrasonic double sheet sensor is sufficient for detecting layers at the material feed. Without contact, the sensor detects and sends a valid signal to the controller without the need for further signal processing or value calculation steps. Color, imprints, material properties, and environmental influences do not limit the detection process. A universal setting covers a very wide range of sheet materials and layer thicknesses. This means that it is usually not necessary to adjust the threshold values when the material is changed. At the same time, dynamic switching between different threshold settings is easily possible.

The Benefits

Optical sensors for such applications are much more expensive and must be cleaned regularly. Measurement sensors require contact and extensive teaching in. Ultrasonic double sheet sensors offer a simple, cost-effective, and flexible solution. They can be mounted so that sheet detection takes place while the robot arm is moving and incorrect feed-in can be stopped at an early stage. Different sheet materials and layer thicknesses can be taught in via the teach-in function. Automatic synchronization allows several sensors to operate in a confined space. The MH-UDB02 mounting aid enables easy mounting and the perfect alignment of emitter and receiver elements. The integrated IO-Link interface ensures access to all parameters along with process and diagnostic data.

Technical Features

- Noncontact ultrasonic double sheet detection
- Emitter/receiver distance: 50 mm to 150 mm
- Very short response time of just 30 ms
- Interface: IO-Link 1.1 (spec. 1.1.3)
- Degree of protection: IP65
- Temperature range: 0 °C to 60 °C
- MH-UDB02 mounting aid for easy mounting and perfect alignment

For more information, visit: **pepperl-fuchs.com/px-M18-M30**