Baumer
Passion for Sensors

Application Report

Always keeping an eye on web edges and margins

These all-rounders are underestimated indeed: Smart 2D profile sensors are ready for use in no time and very versatile, for example in edge control.

Figure 1

Figure 1: The creators of the sandwich line by Weber Maschinenbau (from left): Marco Nichau, (Head of Product Group Automation, Software), Robin Rompf, (Software Engineer Automation), supported by the Baumer Support Team: Dennis Hentschel (Business Development Manager Smart Vision), Reinhard Wulf (Field Sales Engineer), Georgios Kovus (Applications Engineer).

What is the exact object position on the belt? What is its height? Is the edge even? In lots of automated processes, this information is required to ensure smoothly running production. Most common are optical, inductive or ultrasonic sensors sometimes also cameras are deployed to collect such data. A versatile, lesser-known alternative are smart 2D profile sensors.

Figure 2

In this report we show four examples where high-performance profile sensors from Baumer are particularly user-friendly and cost-effective solutions.

Application 1: Automatic sandwich line

What still seems exotic in our country has long been in proven practical use in the USA: a fully automatic sandwich line on which more than 70 sandwiches roll off the line every hour, perfectly topped with sausage and cheese. The line integrates several individual systems from the German company Weber Maschinenbau specializing in slicing systems for the food industry. For reliable operation of the sandwich line, the smart Baumer 2D profile sensors OXM play an important role. In individual line segments, they detect the positions of sandwich rolls and slices of sausage and cheese.

For example, the robot in the roll section needs to know roll height and center (lengthwise and crosswise), and

Figure 2: In the Weber slicers, the Baumer OX profile sensors deliver position data for precise alignment of cold cut slices for subsequent packaging.

Figure 3

whether the roll may not be properly aligned on the belt. OXM delivers all this information thanks to integrated measurement and evaluation functions. In other words, the entire measured value calculation is done in the sensor. And more to that, the smart profile sensor delivers the calculated coordinates right in the unit required, e.g. millimeters. At the mentioned sandwich line, OXM measures the bread height and every edge to calculate the bread center. This way, the suction pads can lift off the top half at the ideal point without causing damage.

In the sandwich line, OXM also determines the lateral position and height of the sausage and cheese slices on the belt allowing the gripper to position the slices accurately on the bottom half of the roll. Weber not only applies this functionality in sandwich lines but also at the slicers that cut and portion cold cut optimally prepared for packaging. Here, the Baumer OX profile sensors deliver the position data required for precisely aligned slices of salami, ham or cheese. This is essential for allowing the food to always be placed in the same position in packaging process.

Extremely easy to integrate

Why does Weber Maschinenbau rely on the smart OXM 2D profile sensors in their sandwich line? "To us, it's important that we do not need to put much effort in sensor integration. OXM transmits the position information straight to the machine control without the need for an additional controller. It is compact in size, quickly connected and easily parameterized via the intuitive web interface," says Marco Nichau, Head of Automation Product Group at Weber Maschinenbau. Furthermore, it is ideal for the sandwich line since reliable operation on any surface and not interfered ambient light, at a very good price/performance ratio in parallel. "The performance and ease of use provided by the smart profile sensors, together with the competent and responsive Baumer support were key factors in our choice," Nichau reports.

Application 2: Cutting machines

Further, OXM is a proven and quick-to-use tool for positioning tasks like edge control at webs of fabric, sheets and paper or on conveyor belts. The 2D profile sensor scores high with its compact design and Power over Ethernet (PoE) one-cable concept, especially where installation space is tight, or where a high level of design freedom is required. OXM utilizes one and the same cable for data transmission and power supply, this way cabling and connection effort are reduced to the minimum.

Figure 3: In the automatic sandwich line, smart OXM delivers the required height of the profile, here marked as a red laser line.

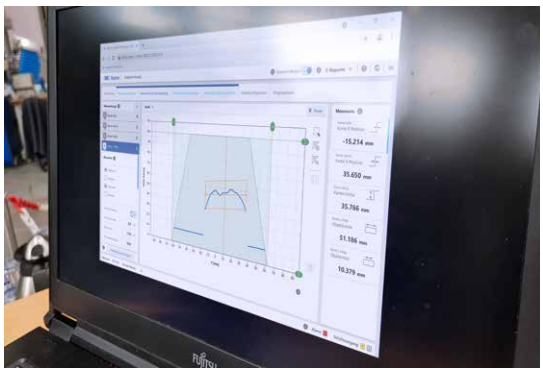

Figure 4

Figure 4: On the screen you see what the sensor is seeing. OXM enables easy parameterization via web interface.

Application 3: Position control for stacks with pinpoint accuracy

Even when applications require the highest precision and speed, the OXM delivers the required coordinates quickly and with a resolution of up to 5 micrometers, as in this example: A robot placing sheets (made of cardboard, foam, carbon or similar) from a pallet stack onto a cutting plotter. Here, they are cut to size. While doing so, it is important that the sheets position on the cutting plotter is always exactly the same. The OXM detects the sheet edges and transmits the coordinates

to the controller. Thanks to this information, the gripper is able to always place every sheet at the exact same position on the plotter belt.

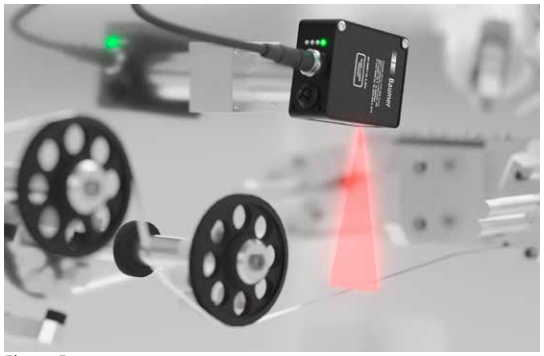

Figure 5

Application 4: Quality edge control

Smart profile sensors like OXM are also a perfect tool for edge quality checks. In one application, several OXMs detect the lateral edge profile on floor panels to identify any non-compliance of tongue and groove. For doing so, the OXMs detect the height profiles of tongue and groove to verify dimensional accuracy. In this application, there are two sensors on each side so one of them would always detect any shadowed area. To the plant manufacturer, the striking criterion in the sensor selection were the integrated evaluation functions allowing OXM to immediately provide the measurement results and that the sensor easily integrates into the machine design. Communication is via IO-Link. Edge control has a welcomed side effect: Any change in the height profile will indicate the smart sensor any tool wear at an early stage.

Further information:
www.baumer.com/OX200

Figure 5: Even reflecting surfaces, as metal film during edge control, do not impair the reliable performance of the smart 2D profile sensors from Baumer.

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