

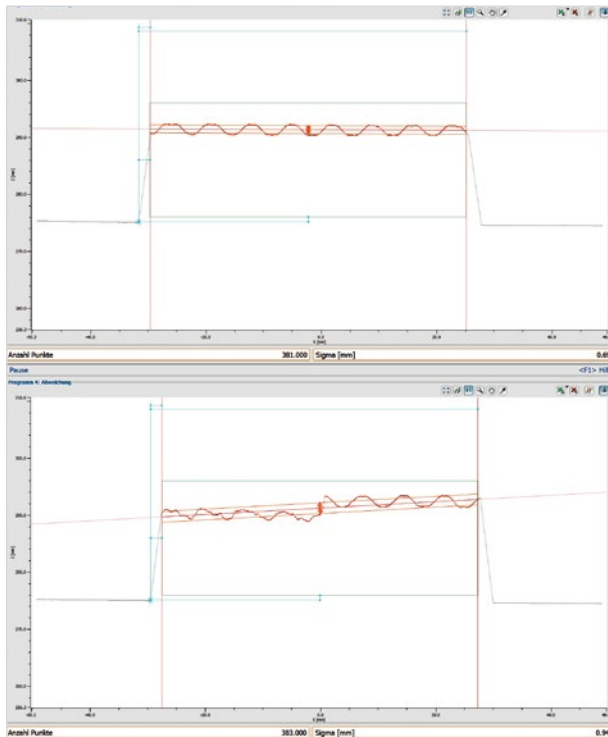
3D check of chocolate bar products

In order to check volume characteristics of bar products, Bi-Ber uses 3D systems based on, for example, a Micro Epsilon profile sensor. These laser triangulation sensors can record up to 300 profiles per second, with each profile line comprising 640 pixels. With a scan width of 100 mm, the resolution along the profile is around 0.16 mm/pixel and the height resolution is 12 µm/pixel.

Evaluation of 300 lines per second

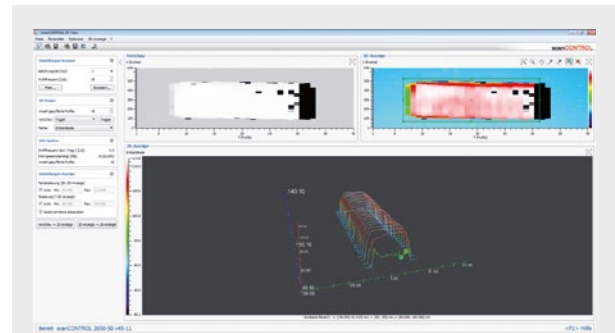
Immediately before packing, the bars move through a line laser at a speed of up to 70 m/min. The resulting laser profiles are evaluated by a camera. The evaluation takes place in several stages. First, it is determined whether the current profile belongs to a bar or not. If it is a bar profile, distinctive geometric features are searched for, they are mapped to comparable properties and compared with the product specifications. For this, the system considers, for example, **maximum dimensions, defective surfaces or missing outer contours**.

With its permanent working speed of 300 Hz the sensor continuously evaluates 300 profiles per second. Accordingly, the sample distance of the profiles on the analysed object is directly dependent on the belt speed. At 300 Hz, the exposure time can reach a high value for laser scanners.

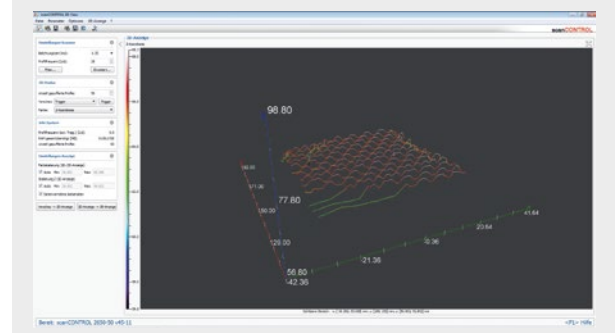


IO profile (top) and NIO profile (bottom)

The system can therefore neatly detect even very dark surfaces. Consequently, the **colour of the objects to be scanned is insignificant**. If there are geometrically different products on one and the same machine, different checking jobs for the respective products can be called up via the output unit.



GUI with result image of a good bar



Visualization of all profile lines on one product

Smart image processing

All processing takes place within the smart sensor. All output signals are then forwarded to an output unit, which communicates with the machine controller. For any 'not OK' signal the machine controller activates the corresponding rejection position for the bar and ejects it from the production line.

In addition to the evaluation of height information, another key advantage over a conventional 2D method lies in the fact that it solely relies on geometric measurements that **can not be influenced or even falsified by surface patterns or colorations**.

The system works without any additional encoder, light barrier, evaluation PC or control box, making it easy to retrofit into production lines where traditional 2D processes have not been successful.