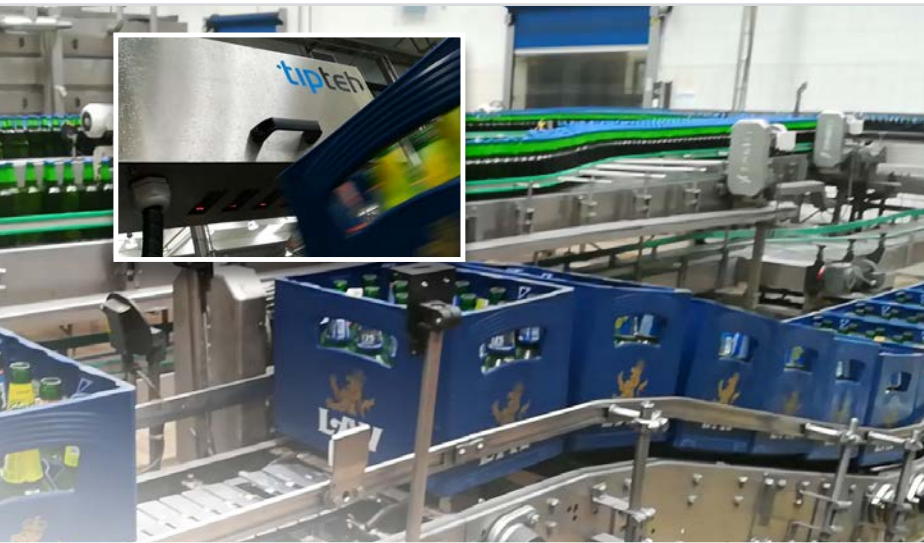




Presence monitoring and identification of bottles

Laser scanners from Micro-Epsilon are used for high speed and fully automatic inspection of empty containers at bottlers and breweries. For this application, the Micro-Epsilon agent Tipteh has designed a test system based on laser line triangulation, which is used when the bottle crates are received. This inline system is equipped with five scanCONTROL 2900-50 laser line triangulation sensors from Micro-Epsilon. The crates are conveyed on a belt and scanned from above. Each scanner measures a row of bottles in the crates. Presence monitoring is carried out at conveyor speeds of up to 850 mm/s. The scanner uses the respective bottle height to determine whether the correct type of bottle is in the crate. The bottle height must not deviate more than 3 mm from the target height of the respective bottle type.

Compared with a solution based on conventional image processing systems, laser scanners from Micro-Epsilon not only monitor bottle presence but also bottle height. In addition, logged data for subsequent statistics, evaluations and process optimization can be acquired. The measured values are evaluated directly inline. Via GigE Vision, raw data is integrated into image processing software and then evaluated. The PLC receives the result of the evaluation as an "OK" or "not OK" value, whereby any faulty crates can be removed directly. The user can also output the measured results via an integrated display on the control unit.

The challenges of this measurement task primarily lie in the different reflective properties of the bottles. These vary due to different glass colors (mainly green and brown tones) and because bottles come with or without a lid. Furthermore, the bottles are constantly vibrating and shaking while being transported on the endless conveyor belt. Micro-Epsilon laser scanners overcome these challenges and constantly deliver accurate measurement results.

Requirements for the measurement system

- Measuring on different glass colors
- Inline measurement with conveyor speeds up to 850 mm/s
- Different bottle heights from 3 mm

Ambient conditions

- Production plant
- Vibrations (bottles are shaking)
- Temperature fluctuations and high air humidity

System design

Sensors: 5 x LLT 2900-50

Software: Integration into image processing system via GigE Vision

Advantages

- Space-saving solution: compact sensors with integrated controller
- Comprehensive software for reliable identification and evaluation
- Prompt intervention due to fully automatic inspection

