Precision up to the second decimal place

Accurate guiding of label webs during the cutting process

Label webs are guided through the cutting process at a speed of up to 200 meters per minute, which is far beyond the operator's ability to capture any detail or to carry out corrections if necessary. Here, automated image processing and the Baumer digital industrial cameras provide reliable and efficient solutions by optical inspection systems, such as the ELCAM „Cut-to-Mark" system developed by Erhardt+Leimer.

Labels have become indispensable in present-day world of products. To have them accurately positioned on the final product, precise guiding of the label web in the cutting process is a prerequisite. Particularly conceived for such applications is the new ELCAM "Cut-to-Mark" inspection system developed by Erhardt+Leimer, a worldwide leading manufacturer of control, guiding and inspection systems for the textile, paper, film and printing industry and specialist in system solutions

and automation technology on running webs and belts. Worldwide, 30 systems are already deployed in different applications and industries. "Most applications can be found in the label producing industry, like label and packaging printing plants or even producers of security papers", explains Jürgen Bräu, Head of Inspection Technology at Erhardt+Leimer.

The essential: Accurate positioning

Most label printing processes require the printing position precisely aligned to the longitudinal cut along the label web. To detect the printing or cutting contour or the dieline, ELCAM is positioned at the finishing machine, after the longitudinal cut of the label web. The measured results in absolute position and distances are compared to the target values specified in the system to indicate any potential deviation. To avoid production defects, in the event of excess tolerance via a trigger device with 8 digital outputs can be given

visual and acoustic alarms to slow down or even stop the whole system and to channel out the defective labels. Besides precise web guiding in the cutting process, measuring the print position in relation to the dieline can be done in parallel. „This will ensure the print at the correct position within the label contour", explains Jürgen Bräu. Capable of frame rates of up to 60 fps and a precision within 0.02 mm the system is operating reliably both in free image sequence and in trigger mode. „Continuous materials without a repeat, i.e. without repeating patterns are generally inspected at the maximum frame rate without external trigger signal. Repeating patterns enable convenient control in trigger mode by an external trigger signal provided by the application or by a print mark sensor", says Jürgen Bräu. The signal is directly applied at the trigger device input and can be dragged at any specified distance by incremental encoder signal evaluation. „This will ensure that with every image acquisition the web is precisely positioned underneath the camera", adds Jürgen Bräu.

Implementation and operation: Easy and intuitive

ELCAM with high-precision, robust defect tracking algorithms particularly conceived for complex repeating patterns in fast running webs ensures reliable and efficient inspection. For maximum system availability in industrial applications, every software product is subject to numerous test cycles prior to be released for the customer application. The structured touchscreen interface will ease editing and support the operator in his daily work. „In terms of software, we particularly focused on a clear, graphical user interface intuitive to operate and with self-explaining icons", says Jürgen Bräu. Furthermore, ELCAM is compatible to every digital Erhardt+Leimer


Photo: Erhardt+Leimer GmbH

The ELCAM „Cut-to-Mark" system makes sure the label web is precisely guided in the cutting process.

web guiding system to ensure precise web guiding in every production stage. Used in conjunction with the „Missing Label Detection" system, the whole web can be inspected to trace missing labels or punching residues for enhanced process safety in web guiding, control and monitoring.

It's all about the matching components

Running webs and belts place particular demands on the deployed system components. Influencing factors such as changing lighting conditions, reflecting surfaces or electrostatic charge must be considered. To acquire high-quality images at high process speed, the automation experts at Erhardt+Leimer utilize the Baumer GigE cameras of the TX series. „We can trust in excellent image quality, easy software implementation and the comprehensive Baumer product portfolio since every project requires an application-specific solution by the individually matching camera" explains Jürgen Bräu. Which resolution and frame rate to use, whether a monochrome or color camera would do — every application requires reviewing these factors in terms of the required measuring accuracy and web speed. The TX series includes a wide choice of compact, high-performance industrial cameras with excellent image quality and resolutions ranging from VGA to 5 megapixels. Besides the camera, the ELCAM "Cut-to-Mark" system by Erhardt+Leimer

Pattern Guiding System

Photo: Erhardt+Leimer GmbH
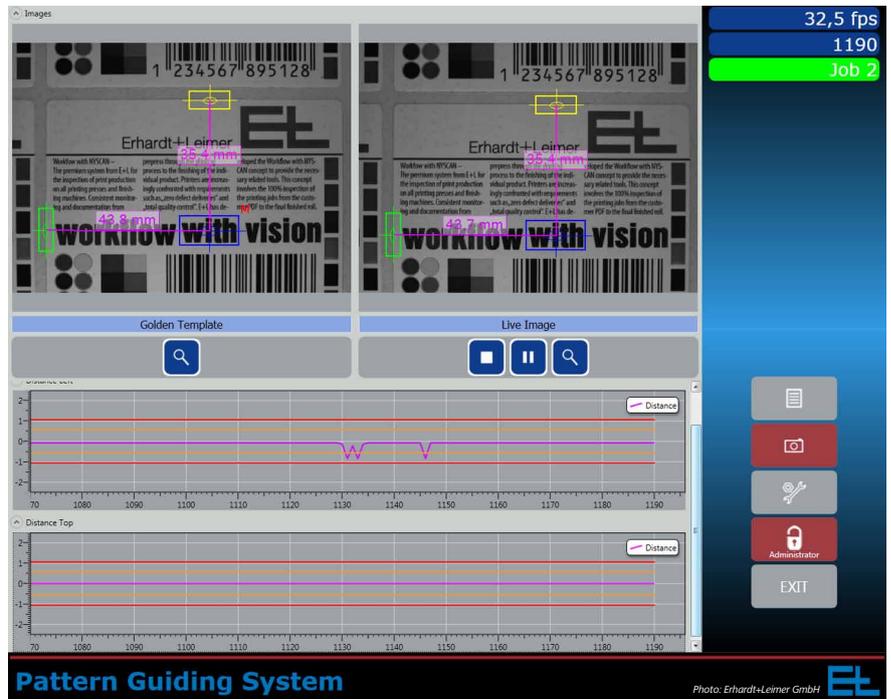
In the running process, the ELCAM user interface provides on screen both the live image (top at right) and reference image (top at left). The two diagrams below visualize the inspection results, for example any divergence in the inspected position versus target position.

incorporates also the Baumer Trigger Device. „This way, we got all purchase parts from a single source for a solution that is individually adapted to the camera", explains Jürgen Bräu. With network components like Trigger Device or Switch especially conceived for industrial image processing, Baumer provides one-stop solutions by GigE Vision compatible components.

Photo: Baumer

The GigE Vision cameras of the TX series and the network components such as the Baumer Trigger Device optimally match each other for easy and reliable system integration.

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