

The cartons move on the conveyor belt past the camera, which controls the print quality

Pass Control

The PALC unit image processing systems from ISW use Turck's Codesys programmable BL20 gateway to check data matrix codes and plain text

Imagine that you have a headache, and so you take a conventional acetylsalicylic acid (aspirin) pill, which helps ease the pain. With the aspirin pack in your hand, you could use the data matrix code printed on it and the relevant databases of the manufacturer to find out who was involved in producing your pack, and thank everyone involved personally.

Who supplied the required chemicals and primary products? Who put the pallet with your pack into the warehouse? Which transport company picked up the

pack and when, and what time it arrived at your drugstore? Clearly the possibility to say "thank you" was not a major priority in implementing the comprehensive traceability of medicine, but it really is fascinating nevertheless.

Transparency in the entire process

There are few sectors in which the processes have the same degree of transparency and traceability as the pharmaceutical sector. As in the food industry, this is

primarily due to the health relevance of the products concerned. People have to eat food and take pharmaceutical products. The comprehensive transparency of the process ensures absolutely fault-free production and thus keeps the risk to consumers down to a minimum.

In the pharmaceutical industry, traceable production is also a requirement of brand protection. The ability to trace every single pack from the drugstore back to the production plant makes the work of any product pirate more difficult. Suppliers selling the goods can be prosecuted more easily. As it stands, most major manufacturers have already implemented security systems for the traceability of their products. The EU Falsified Medicines Directive 2011/62/EC (FMD) requires all pharmaceutical companies in the EU to have implemented the full traceability of their products by the second quarter of 2018.

If a drug company wishes to set up a transparent and traceable production system at the last minute, it may possibly come across Industrielle Sensorysysteme Wichmann GmbH (ISW), a company based in Kölln-Reisiek near Elmshorn. With around twenty employees, the company has grown to become a specialist in optical identification systems. ISW started out as an integration partner focusing on image processing systems and has since developed into a manufacturer of special machines and plants, mostly with image processing solutions as a central task. "ISW customers appreciate the fact that we offer more flexibility than some major companies, and nevertheless still offer an all-round carefree package of image processing machines together with the integration in production as well as in the customer's ERP and MES systems," explained Tobias Wichmann, authorized representative for sales and application.

QUICK READ

The advanced image processing systems manufactured by the German company Industrielle Sensorysysteme Wichmann GmbH (ISW) are used in all sectors of industry. In the machines of the PALC unit series, Turck's Codesys-programmable BL20 gateway processes the signals of different sensors and devices, operating as a PLC and coordinating the functions of the subsystems. The simple programming and optimum dimensions for this application were some of the key factors in choosing the BL20 system.

Individual testing systems

The solutions address the needs of the pharmaceutical sector but also other sectors such as the packaging and automotive industry. ISW has in its portfolio a number of standard machines for identification solutions which are adapted to the specific requirements of the customer. These include solutions that offer more than track and trace functionality. For example, systems are available for visually inspecting the workmanship and quality of motor parts.

The PALC unit is mostly used in the pharmaceutical sector, and PALC unit stands for Package Aggregation Line Controller. In its standard application, the machine marks a folded box with a unique serial number, product specific data and a data matrix code. It then checks the quality of the print. This is necessary to guarantee readability at the end customer (i.e., in the drugstore). In extreme cases, illegible medicine packs cannot be sold. The system is designed in different modules for the particular customer in order to



This photoelectric sensor at the reject area of the PALC unit is used to verify the rejection

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Tobias Wichmann | ISW

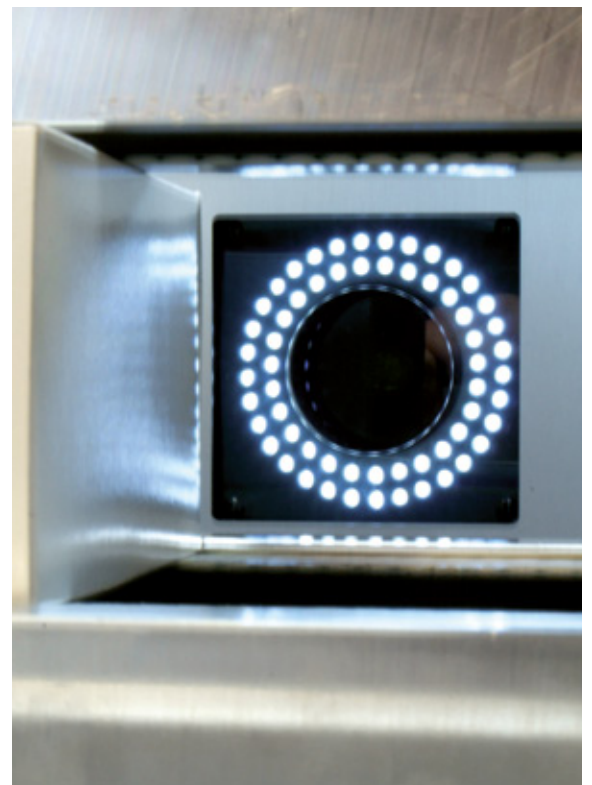
optimize connections at the specific production lines, or to meet the requirements of the different marking processes.

The PALC unit consists of a conveyor belt which feeds the folded boxes to a camera with a lighting system. The read process of the camera is triggered by a reflex sensor. The camera checks the quality of the print on the basis of parameters taught. If the print result does match the target values, a compressed air nozzle blows this folded box from the conveyor belt to a reject chute. All other folded boxes are transported further in the process and if necessary fed to a connected packaging unit. The PALC unit is parameterized via an HMI, which shows a graphical user interface. If production changes to a different box size, this can be changed via the HMI.

Codesys gateway as PLC

“The PLC is the core of the system,” says ISW representative Wichmann. In this case, it’s the programmable BL20 gateway from Turck that handles the control task. “All signals come together on the PLC and are processed: the signals of the IPC, the sensors, trigger signals, signals of the camera inspection and compressed air monitor and more,” Wichmann continues. “Turck’s Codesys programmable BL20 gateway has exactly the right dimensions for this task. Naturally, the PLCs of major manufacturers could also handle this task but would be unnecessarily expensive and complex. Another benefit was the fact that we already had experience with Codesys in the company and could program our solution quickly with the BL20. The choice of a suitable controller for the PALC was

ISW programmed the control of the entire PALC on the BL20 gateway with Codesys



The camera checks the quality of the print



therefore easy to make."The communication between the industrial PC and the gateway is implemented via a TCP/IP Ethernet connection.

Easy handling

A photoelectric sensor at the entry initiates a start trigger for the printing and measuring process. This is combined with another signal from a rotary encoder at the motor, which triggers the printer and camera at the right time. A photoelectric sensor triggers the compressed air nozzle to blow the bad boxes (NOK) from the belt into the reject chute. Both photoelectric sensors are from Banner Engineering, Turck's partner for optoelectronic solutions. The simplicity of the system is also its strength: "We didn't have to teach the system or do anything similar. The photoelectric sensor is fitted with a reflector to act as a reflex sensor. Any foreground or background rejection is unnecessary here," Wichmann says. The Turck compressed air sensor (M12E-VP44X-H1141), which is located at the maintenance unit of the compressed air nozzle and monitors the compressed air present as required, also offers easy handling.

ISW also uses another Turck product in the PALC unit: The end of the reject chute is monitored with an inductive proximity switch from Turck. The BL20 then processes the signal indicating whether the chute is closed or open. The conveyor belt is stopped if the chute is not opened. "The excellent support from Turck sales was also an important factor in choosing the Turck products," Wichmann says.

The PALC unit marks a folded box with a serial number, product specific data and a data matrix code, and then checks the quality of the print

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COMPONENTS USED

Programmable gateway	BL20-PG-EN
I/O Module, analog outputs	BL20-E-4AO-U/I
I/O Module, digital inputs	BL20-E-16DI-24VDC-P
I/O Module, digital outputs	BL20-E-16DO-24VDC-0.5A-P
Light barrier	Q20PLP-Q7
Pressure sensor	PK010R-P13-2UP8X-V1141
Proximity switch	BI4U-M12E-VP44X-H1141