

# Light Chain

**KEB Automation optimized four workstations with an assistance system for manual order picking – intuitively guided using a ready-to-connect pick-to-light solution from Turck**

System suppliers provide their customers with complete packages from the concept to the implementation. Compared to the niche component business, this has the advantage of less dependence on other market players – end consumers in particular are also provided with a solution with perfectly matched products. If

these items are largely manufactured by the company itself and also come in a large range of variants, the system business soon becomes a challenge for the workers in assembly and logistics. A varied portfolio then involves a large number of different work steps, requiring a great deal of paperwork for orders and



KEB says goodbye to printed material lists and instructions: The pick-to-light assistance system guides employees intuitively and digitally through the packaging process



»We are now using around 250 PTL110 modules which enable us to implement everything we imagined. They are all running like they did on day one.«

Phillip Hannesen | KEB Automation

instructions. Added to this is the training of new employees, such as for the temporary workforce when employees are on vacation or ill.

This was also the case for KEB Automation, a medium-sized company and global specialist for drive and control technology. The company relies on a

comprehensive product offering – whether with controllers, HMI and frequency inverters for a mechanical engineering company or an electromagnetic system for starting, stopping and positioning wind turbines.

#### Potential analysis in Smart Factory OWL

“We are talking about several hundred device variants per workstation,” explains Phillip Hannesen, project engineer in electronics manufacturing at KEB headquarters in Barntrup. “This includes variants that are built so rarely that a new employee possibly doesn't know them at all.” Due to the large number of order lists and the sometimes long training times involved, we gradually came to the decision to introduce an assistance system for manual operations in production and packaging areas. An initial viewing example was available close by in the neighborhood: at the Smart Factory OWL demonstration platform in Lemgo. Here the KEB engineers tested an assembly station with light-controlled paperless operator guidance using pick-to-light. For Hannesen and his team this was the start signal for a pilot project that the East Westphalian experts implemented in collaboration with Turck.

#### Bus-capable system instead of cable bunches

The key requirement placed on the assistance system was a straightforward connection to the corporate SAP



## QUICK READ

In order to increase quality and efficiency with manual order picking tasks, KEB Automation tested a light-controlled assistance system on a packaging workstation. Turck provided the drive and control technology supplier with a pick-to-light solution based on the PTL110 series from its optical sensor partner Banner Engineering. The ready to connect complete package consisting of power supply, connection cables and bus-compatible PTL modules, such as lights, touch buttons or sensors impressed with its easy installation and wireless communication at selected points. At its headquarters in Barntrup, KEB is now already using the system at four packaging stations. The assembly area is the next plant section to also be optimized.

One by one: Thanks to the Modbus-compatible protocol, the PTL110 touch buttons can be cascaded easily, thus eliminating the need for labor intensive cabling



The software brings illustrated instructions onto the screen, the operation is confirmed using capacitive touch buttons



The PTL units operate at the collection points with optical detection, and just a movement of the foot underneath is needed for an acknowledgement

environment. We ultimately wanted to avoid having to maintain every change to a parts list in two databases. Thanks to their in-house expertise, KEB programmed a computer-supported user interface for touch monitors and then looked for the right pick-to-light solution with illuminated touch buttons or sensors. First results: “We definitely wanted to use bus-compatible components to reduce the installation effort at workstations with many compartments. Otherwise we would have had real bunches of cables on the shelves,” Hannesen reported. The market launch of the PTL110 series from Turck’s optoelectronics partner Banner Engineering therefore came exactly at the right time – cascadable individual devices with a multifunctional indication, optional touch button, optical sensor and alphanumeric display. The modules communicate with each other via a Modbus-compatible protocol.

Turck developed a ready-to-connect complete package for the easy onsite integration of the PTL devices, supplied by compact IP67 switched-mode power supply units and connected at both ends by pre-assembled cables plus a plug connector and Y splitter for feeding in the power supply at specific locations. An RS485-USB converter provides the connection to the computer. The new technical possibilities enabled KEB to constantly further develop the assistance system and the company’s employees were also included in the development process from the start.

**Cascading of 115 PTL modules**

A packaging workstation was used first of all as a test environment in the pilot project before being integrated in more complex manufacturing areas. Employees took over here the final assembly operations on large devices in shifts and for example fastened housing

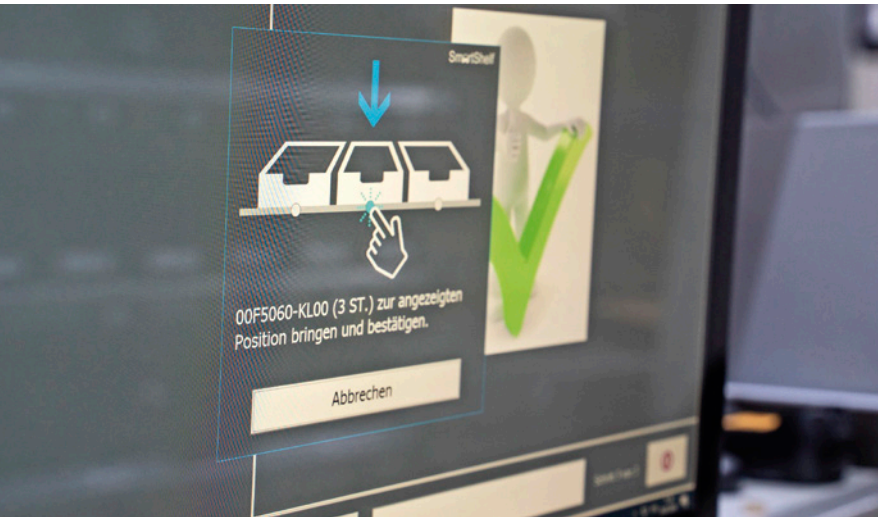
covers or type labels. Accessories were also picked for orders from shelf boxes and packed together in a carton. To increase quality and efficiency KEB initially installed 115 pick-to-light units. These are not only positioned above the shelf boxes but are also used to confirm operating steps on the monitors or to report to the system that a carton with its product and accessories has been moved to one of the loading areas.

**Acknowledgement by touch or optical sensor**

Employees start an operation by scanning in a device serial number. The associated SAP work plan appears automatically on the screens, and a type label is likewise printed automatically and the material list called. While the monitors show illustrated instructions, a PTL110 module indicates the route to the corresponding removal point. In this case, it lights up in green with a momentary yellow flashing as soon as the pick is acknowledged via the capacitive touch button. Different processes take place in the loading zone, where pallets are placed on low stands and the PTL devices are not therefore mounted at head height. “We got the idea from the fact that the tailgates of several cars can be opened with a foot movement,” Hannesen recalls. KEB engineers therefore chose PTL modules with contactless detection for the collection points. Employees now carefully put down the packages with both hands and just have to place a foot underneath the optical sensor as an acknowledgement.

**Put-to-light on the short term shelf**

When working on the pilot project, Hannesen and the KEB equipment construction department focused less on responding to the company’s needs but rather on



The user interface of the program provides employees with precise instructions about the next work step



The PTL110 modules in remote loading areas are connected wirelessly to the overall system

Devices like these frequency inverters are packed at KEB with the help of specific material plans

finding out all the possibilities of the new assistance system. "We therefore intentionally chose the full range of PTL110 devices," says Hannesen. This meant additionally: Lights with 14 different colors and with an animation function if needed. This proved to be worthwhile on one special shelf section, which stores material that is rarely required. KEB calls this system the "Smart Shelf", by which the computer automatically requests a material compartment from the high-bay warehouse which then temporarily has to be made available at the packaging workstation. Employees place the box required in the specified short term area, which in this case is indicated by a blue light, since it is a put-to-light operation. The system sends an instruction as soon as the compartment is no longer needed.

#### Wireless communication for remote areas

Workstations can be very extensive, particularly in goods packaging areas, due for example to the long conveyor belts, different shelf areas or remotely located loading areas. The pilot project implemented the use of a forklift truck route to cover the distance between core work zones and other locations for goods ready for shipment. Instead of the labor-intensive cabling of the PTL modules over several meters, the East Westphalian specialists used a wireless connection with Banner's DX80 wireless system. Transmitter and receiver were installed within 30 minutes. "Plug and play" was the answer here, Hannesen explained. The wireless solution has already

made an impression with KEB colleagues in the USA, who tested a mobile order picking station with 60 pick-to-light modules. Wireless communication would also be considered in future for combining an assistance system and intralogistic factory vehicles.

#### Other workstations fitted

"First packaging and then assembly" - this was KEB's schedule for developing the assistance system. Status review after almost a year: In Barntrup alone, the company with 1,500 employees installed four packaging workstations using pick-to-light and put-to-light technology, and involving the installation of more than 250 of the PTL110 devices. The transition on two assembly stations is currently in preparation. "Our exchange with Turck gave us many good ideas, and everyone who participated demonstrated a great deal of interest and ambition," Hannesen stated. The assistance system would now have to be advanced once more for use in production. This will also make use of other slaves as well as the PTL modules, including smart assembly units for screw operations and cameras that check whether components or cables are correctly positioned.

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