

Vision Aid

KEB Automation uses WLS15 strip lights to expand its assistance system for C-parts management into an efficient and fail-safe pick-to-light solution



KEB says goodbye to printed lists on the C-parts shelf: The WLS15 strip lights indicate the compartment in which the searched for item is stored

Whether screws, washers or nuts – C-parts like these are used in a wide variety of sizes and designs in every manufacturing plant and are indispensable for the end product. The large quantity of C-parts involved means it is always difficult to keep track and find the right parts for the next assembly step, because the different designs are often hard to distinguish from each other with the naked eye, such as M4x3 and M4x3.5 threaded bolts. As the number of articles required increases, small parts shelves quickly become confusing, resulting in frequent and often tedious searches for the required item. Besides the large amount of time required, this results in a high error rate and delays in production. In

order to achieve maximum productivity and efficiency, it must be ensured that the required C-parts are not only permanently available but can also be supplied to production at any time and without delay when needed. This was the challenge facing KEB Automation when supplying material to assembly workstations for frequency converters.

Knowing where

The assembly workstations are fitted with tools and production aids. Any required C-parts are ergonomically arranged in small open front storage bins within the employee's reach. Standard labels are attached to the

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Phillip Hannesen | KEB Automation



explains Phillip Hannesen, digital transformation manager for production at the company's headquarters in Barntrup. "If you take the same screws off the shelf every day, you know which box they're in. It becomes interesting when new employees have to be trained, new devices have to be assembled, or order picking has



By scanning a QR code on the open fronted storage bin, the iCParts assistance system developed by KEB immediately guides employees to the item they are looking for via a light signal

front of each container, as well as QR codes with information about the material number, warehouse site and storage location. If a storage bin is empty, the assembler refills it at the central C-parts rack, where more than 60 items are stored in their separate containers. It was previously necessary to use a list on paper to determine which small parts were located at which position on the shelf. However, managing small parts on paper is time-consuming, because several hundred C-parts are used in the assembly of high-end frequency converters.

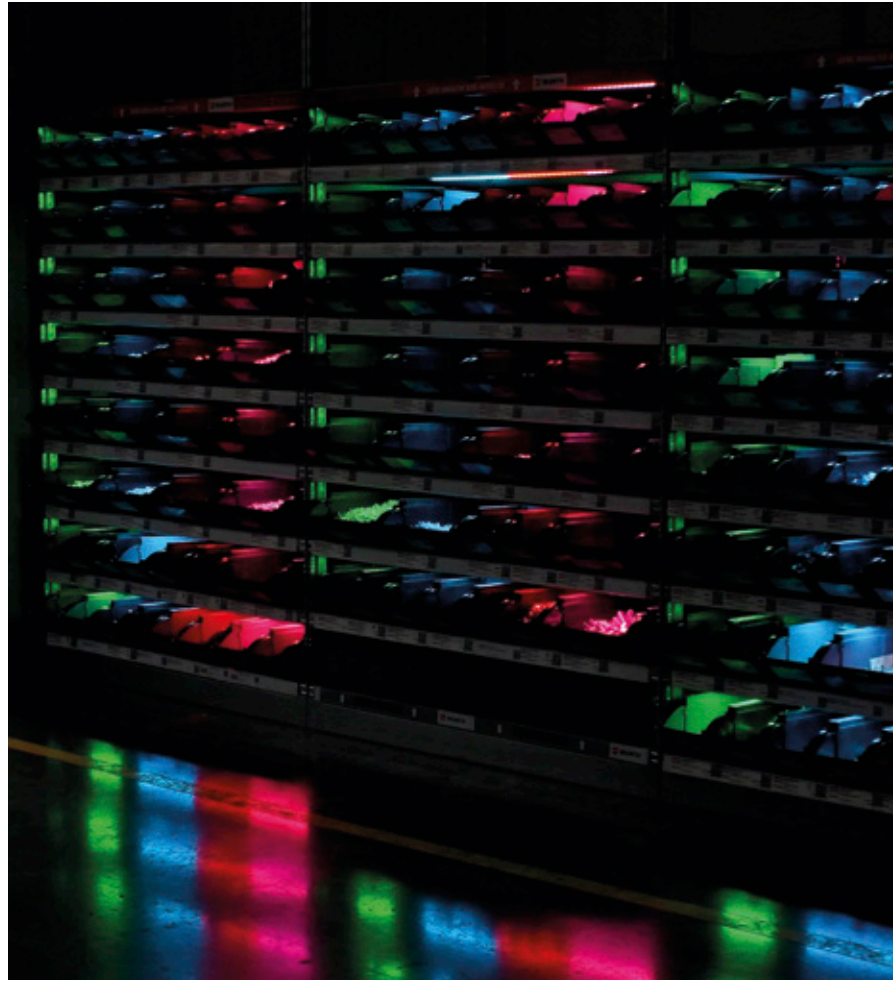
"Experienced employees who assemble a device they are familiar with don't require any support here,"

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As a specialist for drive and control technology, KEB Automation develops, produces and sells drives as well as engines, gearboxes, brakes, clutches and Industrial IoT solutions worldwide. In order to optimize material logistics for assembly, KEB Automation developed the iCParts assistance system – a pick-to-light solution with WLS15 lights from Turck's optical sensor partner Banner Engineering. iCParts shows employees at the central C-parts warehouse the shelf location at which the required screws, washers or nuts are stored. Despite the limited space available, the WLS15 strip lights impressed the company with their easy installation during operation and perfect integration.



The KEB controller developed in-house, runs on a Windows tablet attached to the shelf



The WLS15 strip lights provide extensive control of LED color indication

to be carried out by employees from other departments. In these cases, there is a lot of searching required at the shelf." By using the iCParts assistance system, every employee should now be able to find the required item immediately without a lengthy search. In this way, the material flow of C-parts in internal logistics is optimized and the manufacturing process becomes leaner and more efficient.

The challenge of limited space

The space between the shelf levels is very restricted in the central C-parts shelf and provides just enough space for the open front storage bins. There is no room for a sensor and the associated cabling. "We thought about how this kind of system could even be implemented on this shelf," says Viktor Derksen, head of production equipment engineering at KEB, describing the initial situation. "A system was needed here that is either positioned externally or concealed within the shelf. These are requirements that we couldn't implement with the components we were using previously."

The launch of the WLS15 strip lights from Turck's optoelectronics partner Banner Engineering was consequently very timely. The WLS15 units are very flat and cascable LED strip lights that can be installed in tight spaces in an instant, so to speak, with magnetic mounting brackets. The 64 LEDs of each light can be controlled individually as desired. With their 15 mm profile, they are ideal for illuminating areas with limited

space. The installation takes place within minutes without any restrictions during operation.

Perfect integration

The in-house KEB control system and software has been optimized for the standard components in production and has already proven itself in other Turck solutions so that it can obviously be used in material logistics. The standard environment, developed in-house, runs on a Windows tablet attached to the shelf. All the required access points already exist in this environment, which is why it is possible to build on what is already in place. "After programming the necessary drivers, the strip lights can be controlled via Modbus RTU 485. The connection to the tablet is provided by a Banner RS485/USB converter on the shelf levels," Derksen explains. The LED lights are each coupled using T splitters and connection cables. This allows the power supply and communication to be daisy chained from light to light. "The WLS15 strip lights were an elegant and cost-effective solution for us," Hannesen said. "They are located behind the shelf plate, while the wiring is organized through the back. This allows the assistance system to be perfectly integrated into the standard C-parts shelf and is practically invisible."

Ensuring an efficient workflow

The iCParts assistance system optimizes material supply and ensures efficient workflow. When employees need

more supplies, they take their empty storage bin to the central C-parts shelf, where they scan the QR code of the container. The assistance system then detects which material has been requested and controls the corresponding area of the WLS15 strip lights. In this way, iCParts guides each employee directly to the desired item. Without wasting time, they can now refill their empty container.

Replenishment control using RFID technology

The automated reordering of removed C-parts is managed by an RFID-supported Kanban system of the C-part supplier installed in the C-part shelf. Kanban is a process control method that is based on the real consumption of C-parts. The reordering here is triggered by radio in real time. In the shelf itself, the parts are stored in standard KLT boxes. These boxes, as well as the top shelf, are fitted with RFID. Depending on the type of material, there are at least two to three KLT boxes per article in the shelf, so that a full box always follows when an empty box is removed.

Placing the empty KLT box on the top shelf initiates the transfer of the article and container data to the supplier's central warehouse, which triggers the



The required C-parts are illuminated and can be taken immediately, the WLS15 strip lights are mounted behind the fold of the shelf plate

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Viktor Derksen | KEB Automation



reordering of a new box with the corresponding C-parts. In this way, early detection of demand is guaranteed and the required parts are automatically reordered. The WLS15 strip lights could be easily and quickly integrated into the central small parts shelf despite the limited space available and complement the existing system. This ensures the optimum material flow of C-parts in internal logistics.

Further application possibilities examined

The WLS15 lights were initially implemented in Barntrup. The fitting out of other storage sites in the plants on site, but also at other sites, is planned and being expedited. "I see the great strength of the assistance system particularly in training activities," says Hanesen. "There is also potential for other types of systems with the WLS15 lights. The lights are available in different lengths and can be mounted in a variety of applications."

Another assistance system based on the WLS15 strip lights is already being developed and additional scenarios for their use are being tested. "An assistance system based on the Banner PTL110 series already supports our employees with the assembly of frequency converters. Together with the WLS15 pick-to-light system at the C-parts shelf, we have an overall process where picking for assembly as well as the replenishing of C-parts is efficiently supported via our assistance systems with Turck components."

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