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PICK-BY-INK – A PICKING SYSTEM JUST WITH CONTAINERS AND FLEXIBLE DISPLAYS

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The Fraunhofer IML in Dortmund has developed the alternative for pick by light systems using the segmented ePaper display – patent pending. The institute has previously developed digital price tags and intelligent labels in warehouses and document displays in air cargo containers (iCON) with a graphical ePaper display, these products have focus on energy emphasizing on using ultra-low power electronics, heterogeneous wireless communication and energy harvesting. With such successful products in the market, the PICK-BY-INK is a minimalistic variation envisioned exclusively for enabling KANBAN with low cost overhead and for make-shift picking systems where peaks in demand in the warehouse can be regulated with almost no overhead for setting up the system in comparison to setting up traditional pick by light systems.

KANBAN right at the epicenter

PICK-BY-INK is a self-contained module with wireless communication interface, segmented ePaper display, rechargeable battery and buttons for user input. It connects the picker in the warehouse directly to the warehouse management system (WMS) giving real-time insights on inventory and the events in the shop floor. Each module is flexible and can be inserted into a standard warehouse container for small components. The displays are flexible and robust to be used in industrial conditions with a standby up to six months per charge. They have a high quotient of contrast between the segments which is easy to read in normal industrial lighting conditions and also can act as a stimulus for the picker by animating

the background segments of the displays at high frequency creating attention. There are four buttons beneath the display embedded into the perspective of segments to create a clutter free user experience.

Ready for Industry 4.0

The devices communicate using the 868 MHz in a star network topology to central access-point. The WMS connects to the displays over an access-point using the standard web API interfaces. The displays receive events to be displayed on the flexible displays for the picker animating the 28 segments in the display. Each module is addressable and can be paired with the product or a container and can be interfaced with legacy systems using the standard web APIs to the access-point and it translates the communication from the WMS to the displays.

Product features

- Standardized size of the displays for inserting in any KANBAN containers
- Flexible, segmented ePaper display with high contrast for providing stimulus for the picker
- Customizable display layout to customer needs.
- Inductive contactless recharge (optional)
- 868MHz low power bi-directional communication interface connecting to an access-point
- Minimalistic user experience with segmented displays embedded buttons for interaction in the warehouse
- Rechargeable batteries with up to six months of standby
- Access-point with standard web APIs for integrating into any existing warehouse management system

Technical details

- 32-bit ARM Processor with threading
- Ultra-low power electronics
- 868 MHz bi-directional communication interface
- High contrast, reactive e-Ink-Display
- 4 buttons embedded into the segment perspective
- Standard size of flexible displays for industrial containers
- 6-month battery standby