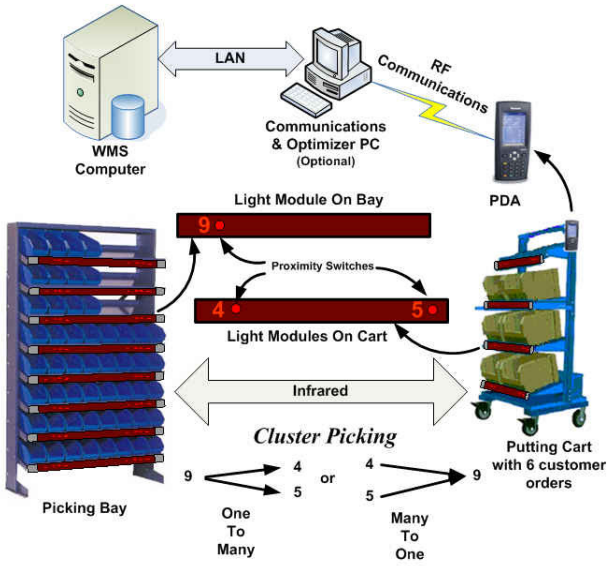
# ALEXA

## Order Fulfillment Technology

(US Patent 6,775,588)

FASTFETCH




***ALEXA** increases customer satisfaction and efficiency by innovatively combining voice, Bluetooth barcode scanning and light-directed picking to provide FAST, ACCURATE, BATCH PICKING in distribution and manufacturing environments.*

Requiring ***only a PDA*** to control lighted displays on picking bays and putting carts, Alexa enables cluster picking, reverse logistics and sequenced picking using low-cost wireless infrared communications for **light-directed picking** from storage bays and **light-directed putting** to cart locations. **Voice direction** and wireless Bluetooth **bar code scanning** confirmation is used for locations without lighted displays.

## How does it work?

**Step 1:** Order information is downloaded from a host computer, order management system or warehouse management system (WMS) into an Alexa Optimizer PC.

**Step 2:** Alexa clusters the orders by location and uses the WMS' traversal sequence to route them to the shortest path to the storage bays for picking.

**Step 3:** Alexa downloads orders to each picker's PDA.

**Step 4:** The PDA directs the picker to the storage bay locations using visual and voice commands.

**Step 5:** Using infrared communication between the PDA and controllers on the storage bays, the system alerts each picker to ***"STOP!"*** when the target picking bay is reached.

**Step 6:** LEDs are flashed and numeric displays on the storage bay (light modules) are illuminated, telling the picker the quantity of each item to pick. If a bay location is not equipped with a light module, voice commands direct the picker to the location and prompt how many items to pick.

**Step 7:** The picker confirms the right items have been picked by placing a hand in front of the flashing LEDs in the light module. When a hand is placed close to the flashing LED in the light module, a proximity switch activates, an audible "beep" is heard and the flashing LED is turned off.

For bay locations not equipped with light modules, the picker uses a Bluetooth scanner to scan the product or location barcode. When the correct barcode is scanned, the picker is verbally prompted with the quantity to be picked. After the items have been picked, one or more LEDs and numeric displays on cart light module are flashed and illuminated, depicting the cart location(s) where the picked items are to be put. Short picks are recorded using the PDA keypad and display.

**Step 8:** The picker repeats this process until all items at the bay are picked.

**Step 9:** When all picking for the bay is completed, Alexa tells the pickers to ***"MOVE ON!"*** and gives them the location of the next bay. Picking results are continually transmitted back to the host computer or uploaded to the host computer after all orders are filled.

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## System Features and Benefits

- ***Fast:*** The elimination of paper pick slips or RF generated displays transforms time that was spent reading and searching into hours of increased productivity.
- ***Accurate:*** Directed picking minimizes errors and helps you deliver the "perfect order" on 99$^{+}$% of your orders. Increased accuracy improves customer satisfaction and can eliminate the need for audits after picking.
- ***Batch Order Processing for Picking and Putting:*** Pick items for as many as 255 orders on one picking trip.
- ***Distributed Operation:*** Unlike conventional pick-to-light (PTL) systems, an expensive control computer is not required to control a network of storage bay lights. Once the orders are downloaded, each cart-mounted PDA uses infrared communications to independently control the lights on the storage bay and the lights on the putting cart.
- ***Light-directed Picking and Barcode Scanning:*** Pick tickets may contain items to be picked from both lighted and non-lighted locations. LEDs tell the pickers what quantities to pick from lighted locations of high-velocity items while voice commands tell them to locate and scan low-velocity items in non-lighted locations.
- ***Optimal Warehouse Traversal***: If traversal sequence is available in your WMS, the PDA will direct the picker to proceed to the shortest path for picking- if not then traversal sequence can be defined within Alexa.
- ***Cluster Picking/Putting:*** After analyzing the orders, the PDA will direct pickers to retrieve the same item for multiple orders or multiple items for a single order, reducing walking time between carts and bays.
- ***Reverse Logistics***: Handling returns and inventory replenishment is fast, accurate and easy. Light-directed putting lets pickers take SKUs from multiple cases on a cart and put them into slots on a storage bay.
- ***Sequencing***: Increase manufacturing efficiency by picking raw material SKUs from storage bays and placing them onto carts in the order in which they will be processed through your manufacturing assembly line.
- ***Simple Interface to WMS:*** Alexa interfaces with virtually any legacy or commercially available Warehouse (or Order) Management System. Only a simple comma separated variable (CSV) file is needed to import the order data (e.g., order number, SKU, location, quantity, etc.) into the Alexa optimizer PC from a file on a host computer. The data is then downloaded to PDAs prior to picking. After picking is completed, another CSV file containing the picking results is uploaded to a directory on the host computer for subsequent processing. If real-time data updates are required, the results file can be sent to the host computer concurrent with picking.
- ***Simple Installation:*** Wiring raceways are attached to the front of picking racks with self-tapping screws. Controllers and light modules are daisy chained inside the raceways using inexpensive CAT5-type cable with RJ45 modular connectors. Transparent red acrylic covers and end caps snap onto the front and ends of the raceway to protect the electrical components from dust and physical damage. The acrylic covers require no cutting since no buttons protrudes through the cover.
- ***Minimal Training:*** The system is easy to operate, requiring only ten minutes of training for new pickers. The PDAs uses prerecorded speech to give voice commands in the preferred language of each picker.
- ***Reliable Hardware:*** The PDAs are durable industrial-strength units that are designed to be used in harsh environments. The controllers and light modules contain no moving parts, and the custom-designed proximity switches are completely contained inside the raceway, ensuring years of reliable use. Each controller continually monitors the status of the light modules under its control and reports problems to the PDAs so alternative actions (such as bar code scanning) can be directed, if needed, quickly at picking time.
- ***Reconfigurable:*** Controllers and light modules can be moved right or left inside the wiring raceways as product locations are reconfigured. New light modules can be easily added by daisy chaining them to existing modules using modular clips.
- ***Scalable:*** More storage bay lights and carts can be added as your business grows. As many as 65,534 light controllers, each with 255 lights, can be installed. And since the PDAs are the only computers controlling the lights, performance is not degraded as more carts or bays are added.
- ***Fault Tolerant:*** Alexa can continue to operate in warehouse RF dead spots since the PDA has all required picking data. If power to light modules temporarily fails, the PDAs will visually display the picking locations and verbally prompt picker concerning where and how many items to pick and automatically convert to using Bluetooth scanning.
- ***Cost Effective***: Alexa uses simple and inexpensive infrared (IR) technology, making it an affordable alternative to traditional picking systems. The total system cost is often less than 50% of other order fulfillment technologies, and ROI is typically 6 –18 months.
- ***Flexible***: The system can support several other picking methods such as store distribution and dynamic slotting.