

IDC'S ZigBee Wireless-Based Inventory-Stores Management System Revolutionises Stock Control for Leading Toy Retailer

IDC has scored a notable success with its Zigbee wireless –based, low cost inventory-stores management system. Working in conjunction with main contractor, Moving ITS, IDC has supplied a total of 52 of its ZB111 barcode scanners, 12 routers and 2 gateways + server software and 48 overhead monitors, for the identification and transfer of stock at the NDC of one of the world's leading retailers of toy and baby products. The barcode scanning and keypad interactions provided by IDC's mesh networking system offer the advantage of updating the 1WMS at the retailer's National Distribution Centre (NDC) in real time using IDC's 2WCS – Server software

IDC's successful strategy with this project has been to take the complexity out of handheld data transfer, and reassign it to the central server, using a low power, wireless mesh networking infrastructure. As a result, the company have been able to supply a much lower cost device, the ZB111 barcode scanner, one which is both lighter and easier to use, and offers the additional benefit of integrated RFID capability.

The ZB111 barcode reader is designed to interact with a central server, where most of the system intelligence is housed. In larger warehouses, like the NDC, the barcode reader is used in conjunction with an overhead screen to provide the maximum visibility of operations. The overhead screen also offers a major advantage, in that it is much easier to see and interact with than small LCD displays. The reading of a barcode will automatically put the details on the screen and transmit the data to the server. The server will then respond with validation of prompts on the overhead flat screen, or on the LCD of the ZB111.

"Whilst it's accepted that a handheld device, such as the ZB111, has restricted capability, we have found that, for most applications, it is all that's needed," said IDC MD Kevin Buckley; "and where product validations are required, queries can be quickly executed at a PC."

"In addition to reducing the cost of handheld devices, we have also overcome the problem of Wi-Fi being expensive to install in warehousing and logistics systems. Wi-Fi networks usually require an RF site survey costing several thousand pounds, before any equipment is installed. Then the access points cannot route data; so the network is not easily extendable. In contrast, our ZigBee network has twin gateways and twelve low cost routers, which, in addition to talking to end devices (the barcode reader), also route data to other routers and also onto the gateways. This enables the wireless network to not only be easily extended, but also increases the robustness of the network, by re-routing data in the event of a single node failure."

NDC System Operation

The entry point into IDC's system is when a trailer arrives with goods at the retailer's NDC. Usually the trailer arrives with 3 or 4 different SKU (Stock Keeping Unit) types. The first carton barcode of each SKU is scanned by the ZB111 and the following checks are performed and confirmed using the scanner keypad and LCD display. These are: UPC Verification (Unique Product Code) Quality checks: Pack size (no of items in each carton) CE Marking: Use by date (for food items) and Dimension capture.

Once stock has been unloaded it can be sent directly to the sorter, via the conveyor system, or palletised for transferring into storage, again using the ZB111 scanner. Palletised stock is allocated a transfer ID label by the WMS; a pallet of items is built and wrapped, and then the transfer label is printed, which identifies the items and quantity. Each pallet also has a unique barcode label (number plate). Once complete, the pallet number plate and stock transfer label are scanned and associated together using the ZB111. The pallet is then taken into the high bay storage area for location into the racking system.

The IDC system also handles the NDC's Repack systems, where the main carton is opened and the smaller inner cartons are sorted; or where the contents are spilt and placed into store totes for sortation (Piece/Repack). In addition, there is also a secure area for MMVG (Multimedia and Video Games), which follows the same pattern as the piece items, but with high value goods.

Traditionally the Repack process had been undertaken using a "Pick to Light" system, where the operator is guided to tote or bin locations using a light, LCD and pushbutton above each location. For an NDC distributing to hundreds of stores this can require thousands of bin locations, each requiring an LCD display and push button. In contrast, IDC's system requires only a simple barcode over each bin location.

Prior to picking, the carton will have been received and allocated a barcode label by the WMS. When the carton arrives at the picking area, the label is scanned using the ZB111. The IDC Server identifies the carton, and the keypad LCD display instructs the operator regarding the number of items to be picked and their respective locations. The operator confirms that the items have been placed in the location by scanning the barcode above it, and by confirming the quantity.

IDC Web Client.

Facilitating integration and co-ordination of the ZigBee inventory stores system, IDC's web client provides the NDC manager with a tool to allocate resources and monitor progress operation for the whole DC. An unloading team can be allocated to a bay prior to unloading - the unload time itself being determined through a specific set of rules on a web client. In addition, overall progress of the unload operation can be monitored.

The web client also provides an overview will list all the bays and deliveries that are in progress, and it delivers the ability to generate queries and deal with exceptions as a result errors in deliveries from suppliers.

1WMS – Warehouse Management System, 2WCS Warehouse Control Software

About IDC Ltd.

Intelligent Distributed Controls (IDC Ltd) is based in Derby and has a highly skilled team of dedicated hardware and software design, development and application engineers. We have specialist application knowledge of controls systems applied to warehouse distribution, logistics and manufacturing.

Our applications experience has enabled us to develop key skills in real time control, RFID and wireless technology and to develop niche products for these industries and related OEMs. Our customer base includes Toyota, ASDA George, Smiths Aerospace, Astra Zeneca and Vestas Wind Systems A/S.

For further information contact: Peter Hadley, IDC Ltd, Keynes House, Chester Park, Alfreton Road, Derby. DE21 4AS. Tel: +44 (0) 1332 604 030 Fax: +44 (0) 1332 604 031. E-mail: sales@idc.gb.com Website: www.zig-bee.co.uk
