

Pick - To - Light System

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ABSTRACT

In this project a unique Pick-To-Light system will be developed. Pick-To-Light system is the system which provides an efficient picking process. It starts picking sequence at the beginning of a zone where the operator scans a bar coded address label attached to the shipping carton or tote. The display tells the operator which products to pick and how many of them to pick. The operator confirms picks via acknowledgement buttons.

Keywords: Picking; Alarming; Warehouse; Monitoring.

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I. INTRODUCTION

The innovative engineering of hardware technology provides unprecedented flexibility for variety of light directed order fulfillment solutions. Pick-To-Light system is an advanced paperless picking system providing an innovative, streamlined and cost effective solution to simplify the order fulfillment process in warehouses or distribution centers. ATOP's Pick-To-Light system uses a state-of-the-art and light-directed technology to maximize the picking productivity, speed and accuracy in different picking operation.

When Pick-To-Light system is applied to the order picking environment, it enables an order picker to quickly and easily find the correct location by means of lights and LED displays. Each tag represents a product in a storage location besides guiding the picker to the exact location, the lights also display the precised amount ordered and requires confirmation while each item is picked. A national retailer is interested in evaluating the technologies of Pick-To-Light system for possible use within a less than case quantity picking operation for one of their regional distribution centers. Order picking is the most expensive and labor intensive operation in a warehouse accounting for 50% of the warehouse labor, with some picking at 65%. Orders are becoming smaller, which increases the labor required for

processing less than case quantity orders, but expectations for order quality and accuracy are increasing. Combining technology with picking handling and storage equipments will generally increase picking throughput.

The retailer has been store picking less than case quantity items within a multi level picking module for shipment, to retail locations. The retailer has determined that the Pick-To-Light system could be the next evolution of technology to improve the less than case quantity picking application in the distribution center. The retailer is interested in determining the key criteria that should be used to evaluate the technologies. This is to be completed prior to initiating the request for information, visiting installations of other technology, or making a purchase.

II. METHODOLGY-PROPOSED SOLUTION APPROACH

Pick-To-Light system will have user interface and Trolley BIN Master Data, VIN VC data. Pick-To-Light system will receive data from Manual Entry Scanning of VIN Barcode at Store Racks. Indicating Lamp at required Bins will glow. System will cross check the correct pick acknowledge and quantity count. For multiple quantity, counter will reduce

after every acknowledgement. Alarm will be generated in case of wrong part picking. Tower lamp indication for each rack Validation of correct trolley BIN as per scheduled order at trolley Loading area.

III.SYSTEM ARCHITECHURE

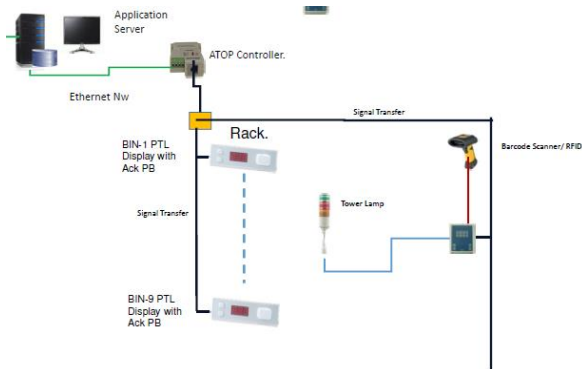


Fig. 1.1 System Architecture Diagram of Pick-To-Light System.

A. ATOP Controller

(Advance Technologies & Oceanic Procedure Controller)

AT400 is a compact TCP/IP controller which has only one output channel, connected capacity up to 30 light modules. AT400 can be powered by two ways, and one is using the standard power adapter with a specific DC jack DC 12V/5A/60W. the other way is powered by external power supply or battery with DC 12V via the 3 pin terminal block. AT400 can be considered to be the Pick-To-Light controller applied to mobile system.

The AT400 TCP/IP controller used has transmission control protocol which is used for communication purpose.

Features:

- i. Maximum connected lamp: 30.
- ii. Ethernet TCP/IP protocol: 100Mbps.
- iii. Power requirement: 12v dc/5A.
- iv. Size: 108mm(L)*132mm(W)*33mm(H).
- v. Operating temperature: 0-50 degree Celsius.

B. LED Display

A 7-segment LED display is used to display the picking quantity of the items. Used for projecting the visualization of output of the application. 3 digits tag is being used. From left the first number indicates the trolley number where the picked item is to be place and the other two that is second and third number indicates the number of items to be picked. 2 directional illuminated arrow buttons are used-up arrow indicating red and down arrow indicating green. 1 illuminated confirmation button with 3 colors is used (Red, Green, Orange).

Features:

- i. Power requirement: 12V DC/100mA.
- ii. Size: 148mm(L)*46mm(W)*30mm(H).

C. Barcode Scanner

A barcode scanner is an electronic device that can be read and output printed to a computer. All barcode scanner contains decoder circuitry analyzing the barcode image data

provided by the sensor and sending the barcodes content to the scanners output port. A 'Scanner LS4208' barcode scanner is used.

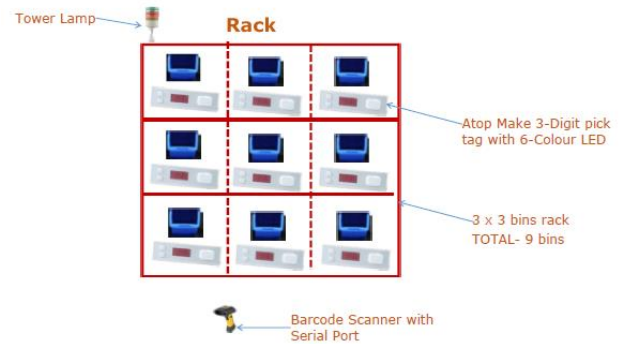


Fig. 1.2. Component Rack Layout.

Algorithm:

1. Initially give input to barcode scanner.
2. Connect the server with .NET based application and SQL database to ATOP controller.
3. Indicate the operator with required rack with count to be picked.
4. As the operator work completes press the acknowledgement button.
5. Display count will be decreased after every pick. Database to be updated.
6. Tower lamp indication for work complete.
7. Repeat from step 1 for continuous picking.

IV.ADVANCE FEATURES

1. Ethernet architecture.
2. Cable is designed for easy installation and highest flexibility in location arrangement on shelf.
3. Versatility in different operating modes configuration.
4. Wide operating temperature range (-25°C to 40°C).
5. Paperless picking and streamlined order fulfillment process.
6. Accuracy assured, virtually eliminate picking error below 0.1%.
7. Strengthen management control: online picking data control, easy to prompt the material storage.

V. CONCLUSION

To provide a Pick-To-Light system for advance picking system providing an innovative, streamlined and cost effective solution to simplify the order fulfillment process in warehouses or distribution centers.

REFERENCES

1. Mrs.feng tian "Design and implementetation of electronic tag picking system" collage of automation , Shenyang aerospace university, Shenyang,vol:6,no.5(2013)
2. Mrs.Girishpatil"SIFT Based Approach:object Recognition and localization for pick and place system" vol:3,issue3,3 march 2013

3. Ramaa.A RVCEImpact Warehouse Management system is a supply chain “Dept.of industrial Engg. & management, RVCE, B’lore,international journal of computer applications (0975-8887)volume54-No.1,September2012
4. Ashayeri,J.,and Goetschalckx,M.(1988),Analysis and design of order pick systems,In 9th International Conference on Automation in Warehousing,125-135
5. Azadivar,F(1989), Optimum allocation of resources between the random access and rack storage spaces in an automated warehousing system, International Journal of Production Research27(1),119-131
6. Bachers,R.,Dangelmaier W.,and Warnecke H.J.(1988),Selection and use of orderpicking strategies in a high-bay warehouse,Material Flow5,233-24