

# Automated Barcode Scanning & Sorting using Wireless PLC

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**Abstract**— This paper implies WI-FI technology, which is put into effect to alter extant, wired into wireless Programmable Logic Controller (PLC) and a Barcode scanner, which is used to scan the barcode and sort them according to the date, type and location. Here two Wi-Fi devices are employed as a transceiver to transmit and receives the input signal to contrive wireless PLC. The main advantage of PLC is to control the output according to the status of input. In Wi-Fi technology, the handshaking between the two Wi-Fi modules takes place, which is interfaced with a microcontroller board (Arduino board) and then to PLC such that field devices can be controlled without wire.

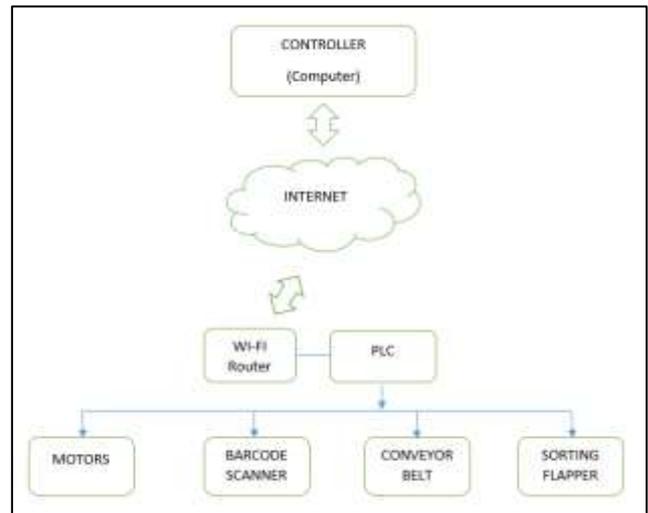
**Keywords:** Wi-Fi Module, Arduino Board, Programmable Logic Controller (PLC), Field Bus

## I. INTRODUCTION

Automation means imparting of human control functions to any technical equipment. Therefore, control panel plays a vital role in an industry; it acts as a brain of any process that commands the desired parameters according to our requirement. Inside the panel, it contains controller either Programmable logic controller (PLC) or other with switchgear etc. Programmable Logic Controller (PLC) is one of the logic controller & solid-state device, which control process or output, based on input and program logic. PLCs read the signals either in digital or analog form from different input devices (sensor, transmitter, keyboard, encoder etc.) then as per the program logic it writes it to the output module and then from it, goes to an output device (motors and solenoid valves) to perform the desired function. In industry, field network plays a major role to run any process. At the field level, I/O devices (Sensors, Motors and Valves etc.) are connected to each other with real-time control networks i.e. Fieldbus. The Fieldbus is able to transmit information related to maintenance and real-time messages, alarms.

Automated sorting systems use 1-D and 2-D codes to move and track goods through a facility. Labels—located on various sides of packages often need to be ready in rapid succession, simultaneously and from extreme angles. In addition, sorting systems must be able to identify compromised labels and quickly correct problems. Image-based barcode readers are essential for decoding information and ensuring packages are properly sorted and delivered on time. High read rates at automated sorting locations reduce labor costs and maximize productivity rates. There are many benefits to using barcodes while scanning your documents. Traditional scanning methods require you to scan your documents in pre-separated batches, then manually name, and organize the resulting files. Barcode scanning, on the other hand, allows you to scan multiple batches in a single stack and let the software automatically name and organize the files based on the embedded barcode information. All the information are scanned and processed according to the barcode program. As shown in FIGURE1.

## II. SYSTEM CONNECTIVITY NETWORK



## III. DISCUSSION ON WI-FI AND PLC

### A. Wi-Fi:

Wi-Fi is a family of wireless networking technologies, based on the IEEE 802.11 family of standards, which are commonly used for local area networking of devices and Internet access. Wi-Fi is a trademark of the non-profit Wi-Fi Alliance, which restricts the use of the term Wi-Fi Certified to products that successfully complete interoperability certification testing. As of 2010, the Wi-Fi Alliance consisted of more than 375 companies from around the world. As of 2009, Wi-Fi-integrated circuit chips shipped approximately 580 million units yearly. Devices that can use Wi-Fi technologies include desktops and laptops, smartphones and tablets, smart TVs, printers, digital audio players, digital cameras, cars and drones..

### B. Wireless Networks

Connectivity	Name	Length (m)	Data Transmission rate (Kbps)	Nodes
WIRELESS	ZigBee	100	250	260
	Bluetooth	10	1000	10
	Wi-Fi	50	5500	40

### C. PLC:

A Central Processing Unit (CPU) in technical arena is like the brain of PLC as it performs most of the calculations. As central CPU alludes to the processor, it is very complicated electronic circuitry, which performs the task of executing stored program instructions. CPU has two units: 1) The Control Unit (CU) 2) The Arithmetic Logic Unit (ALU). The control unit does not itself execute the instructions but guides the other parts of the systems in accomplishing this, whereas ALU is used for executing the logical and arithmetic instructions. Types of PLC: - Allen Bradley, Siemens, B&R, Delta & Mitsubishi.

#### IV. ALGORITHM

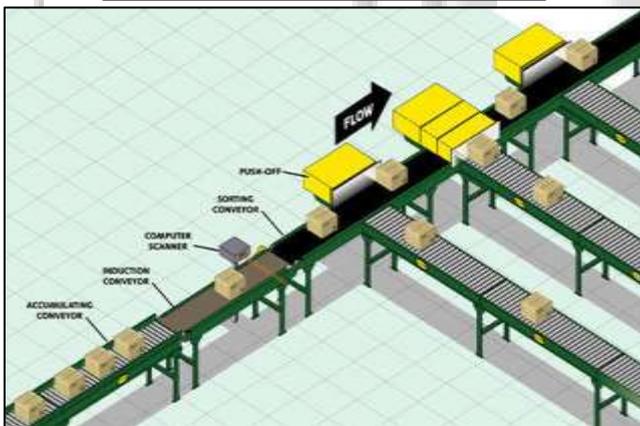
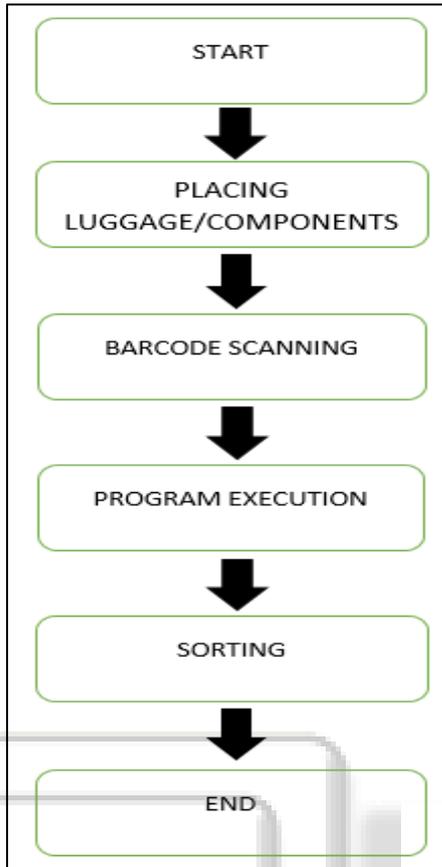


Fig. 1. Automated Barcode Scanning & Sorting Using Wireless PLC (DEMO MODEL)

#### V. CONCLUSION

In this paper, based on the WI-FI module a wireless fieldbus for PLC is designed which can be controlled without wire. And using Barcode scanner Sorting of various components and luggage is done.

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