DESIGN A CONVEYOR BASED ON SIZE AND COLOR SEPARATION OF PRODUCT USING ARDUINO UNO MICROCONTROLLER AND WIRELESS MONITORING ON LABVIEW

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Abstract:In many of the manufacturing industries, there are possibilities of having an adulterant along with the product manufactured. The adulterant can be an odd one among the same set of things or objects. If an unwanted object is mixed with a certain set of products, it will surely leads to a negative impact on an industry. Hence care need to be taken to remove the adulterant or unwanted object during manufacturing. This project is developed to build a proper, accurate control system to separate different objects with different specification to maintain them in different locations. To implement this project, the products manufactured are continuously transferred on the conveyor belt. Once the system detects smaller objects with a specified color, it automatically segregates to one particular location and similarly for other products with different color and heights. It also includes maintenance of production rate by sending the object specification and it's count accordingly to the monitoring system placed away from the manufacturing sector. This project is insisted to embed a wireless communication between the controller and monitoring system. So that the information regarding product can be sent immediately and accurately without any wire loss to the monitoring end.

***Index Terms*-Conveyor, Object separation, Monitoring, Virtual Instruments.**

I. INTRODUCTION

In manufacturing Industries, there will be a lot of products being produced every day. Lot of production without proper maintenance of records directly affects company's credit and results in adverse loss for the company and internal conflicts. The product manufactured in an industry would be of different peculiarity such as shape, color, size, etc. These products have to be separated and managed to have it in a different slots. To have a well nurtured production details one has to hire fixed labors and train them to allocate these products in their respective slots and also to keep maintaining the record of each product regarding their counts. This process kills the time and money since the training and wages need to be provided to the labors.
Hence the proposed system came up with a wonderful mechanism to convert essence of man power completely into automated one by deploying conveyor to disassociate products in respect of its color and size parallely monitoring the mechanism from the distant away from the manufacturing field.

II. PROPOSED METHODOLOGY

The design includes Hardware components such as Arduino microcontroller, Power adopter, Motor driver, DC Motors, Conveyor belt, IR sensors, Color sensors, and Zigbee Radio frequency modules**,** PC. Software tools that proposed project uses are Arduino UNO, Labview, XCTU.

The working mechanism goes like this. The controller which is centered between various sensors keeps on receiving data from both color sensor and obstacle sensor continuously. Depending on the frequency received from the color sensor controller decides the particular color. Objects are kept moving on the conveyor belt associated with three Obstacle sensors IR1, IR2 and IR3. When IR1is high, the object detected is smaller, when

both IR1 and IR2 reach high then the object detected is larger. Once the object passes near third sensor IR3, the controller gives input to the motor to run in either clockwise or anticlockwise direction to collect larger objects at left side and smaller objects at right side. The following project is implemented to separate two colors such as green and white. Once the green is detected, M1 takes control conversely when white object is detected M2 takes control to move the objects in their respective slots. The operation of the conveyor is being monitored on Labview using zigbee wireless communication. Controller transmits the data from zigbee transmitter to zigbee receiver, the received packets on com port are read through VISA resource and able to monitor the process on Labview front panel from the distant away from the Operating field.

a) Hardware block diagram:

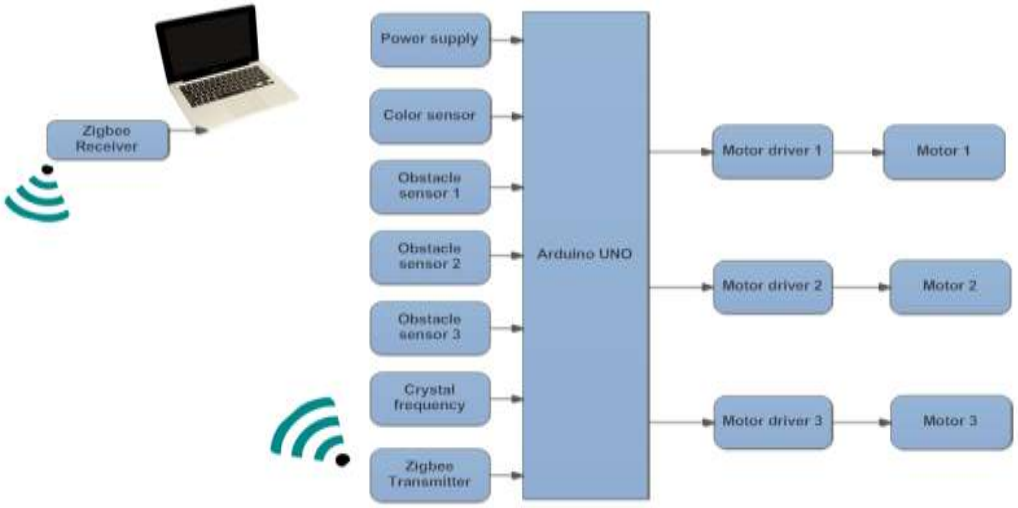

Fig.2.1 Hardware Blockdiagram

b) Software flow chart for object detection:

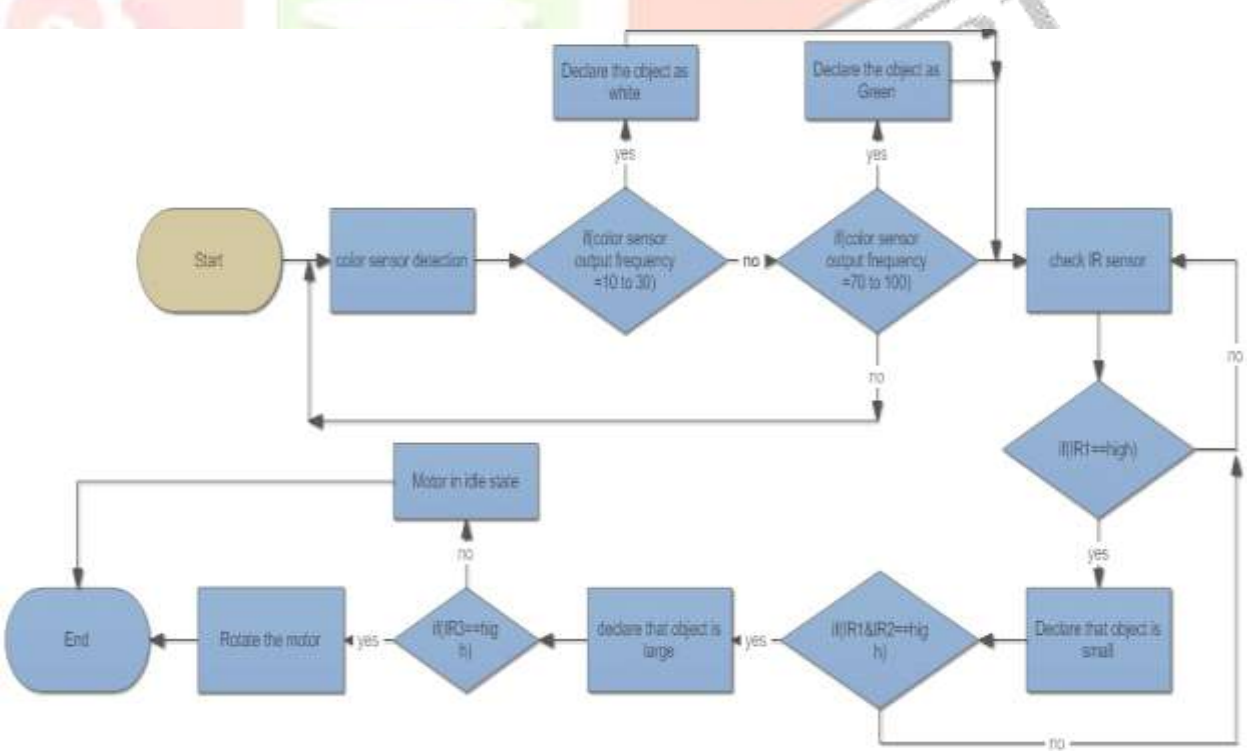

Fig. 2.2 Software flow chart for object detection

c) Software flowchart for controlling motor1 and motor2:

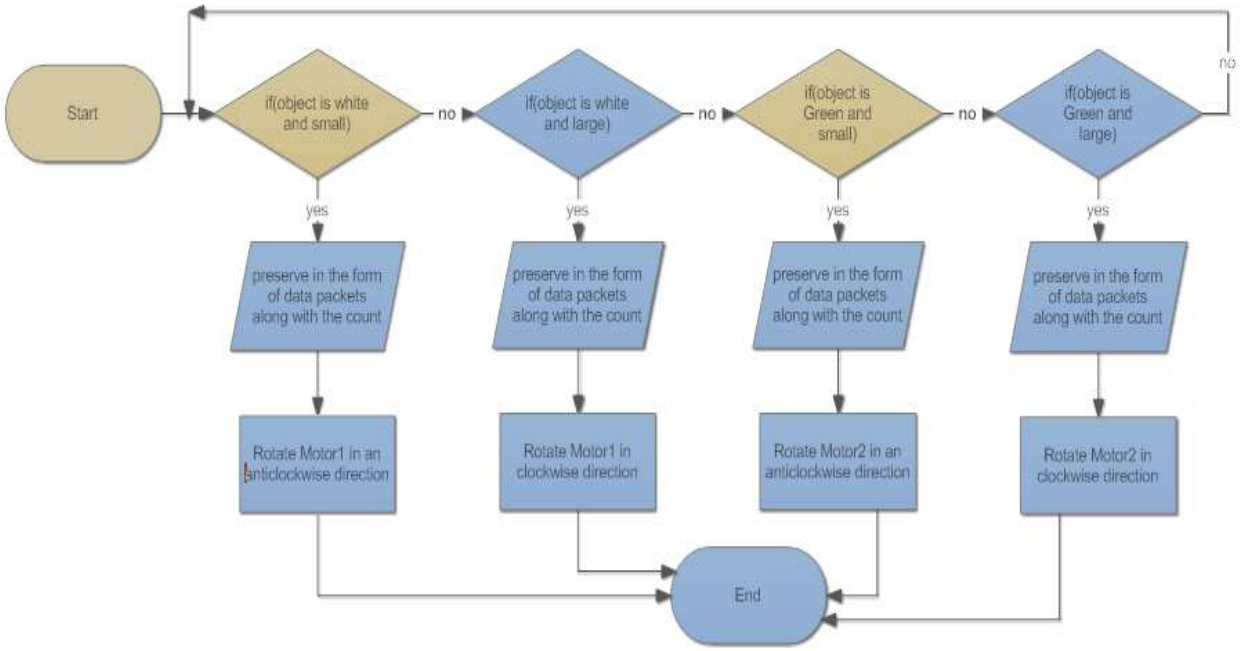

Fig. 2.3 Software flowchart for controlling motor1 and motor2

III. Experimental Results:

a) Monitoring smaller white objects on Labview

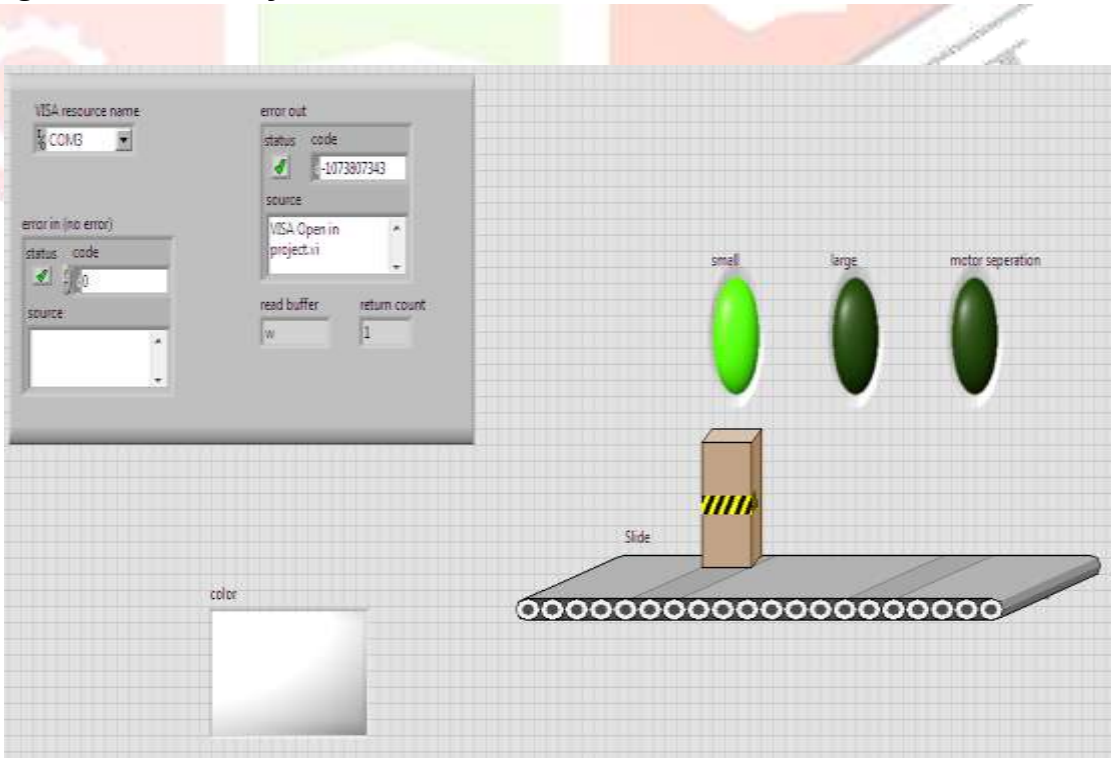

Fig. 3.1 Object detected by IR sensor 1

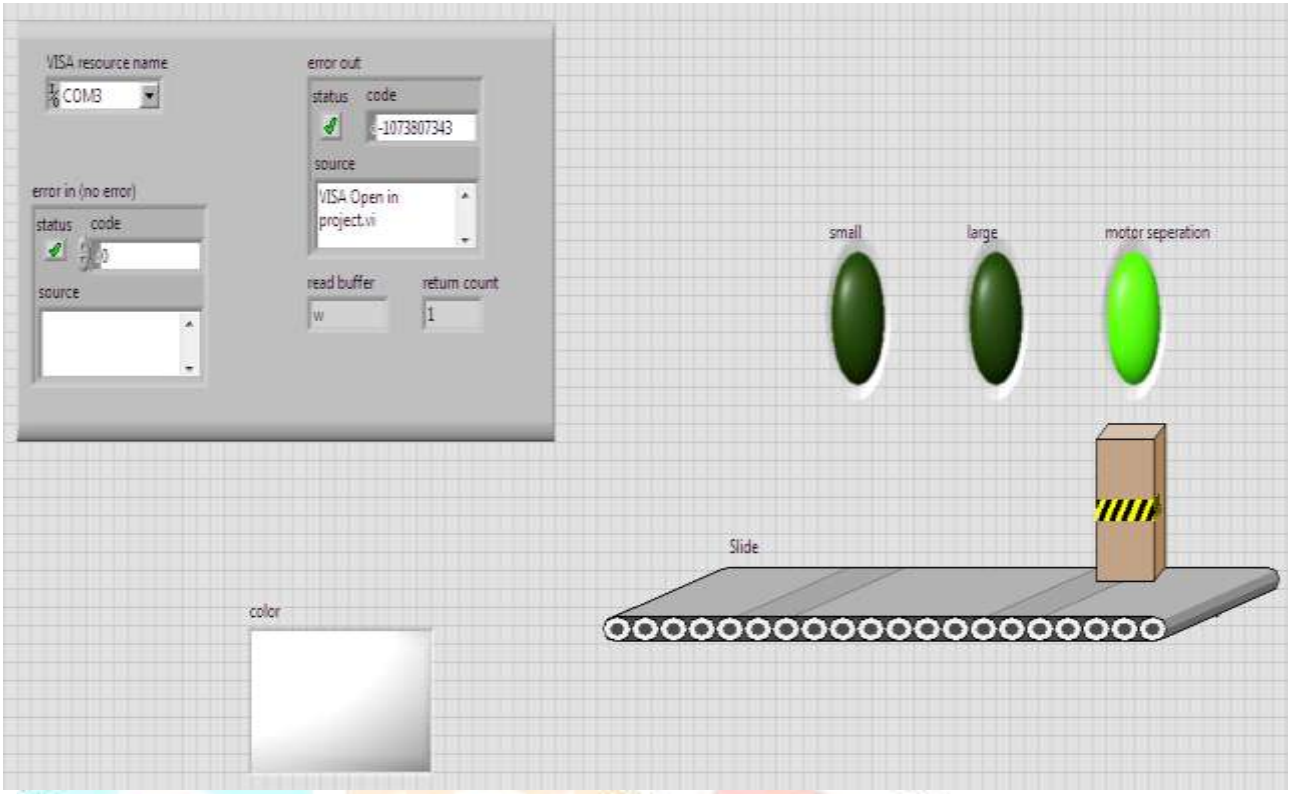

Fig. 3.2Object detected by IR sensor 3

b) Monitoring larger white objects

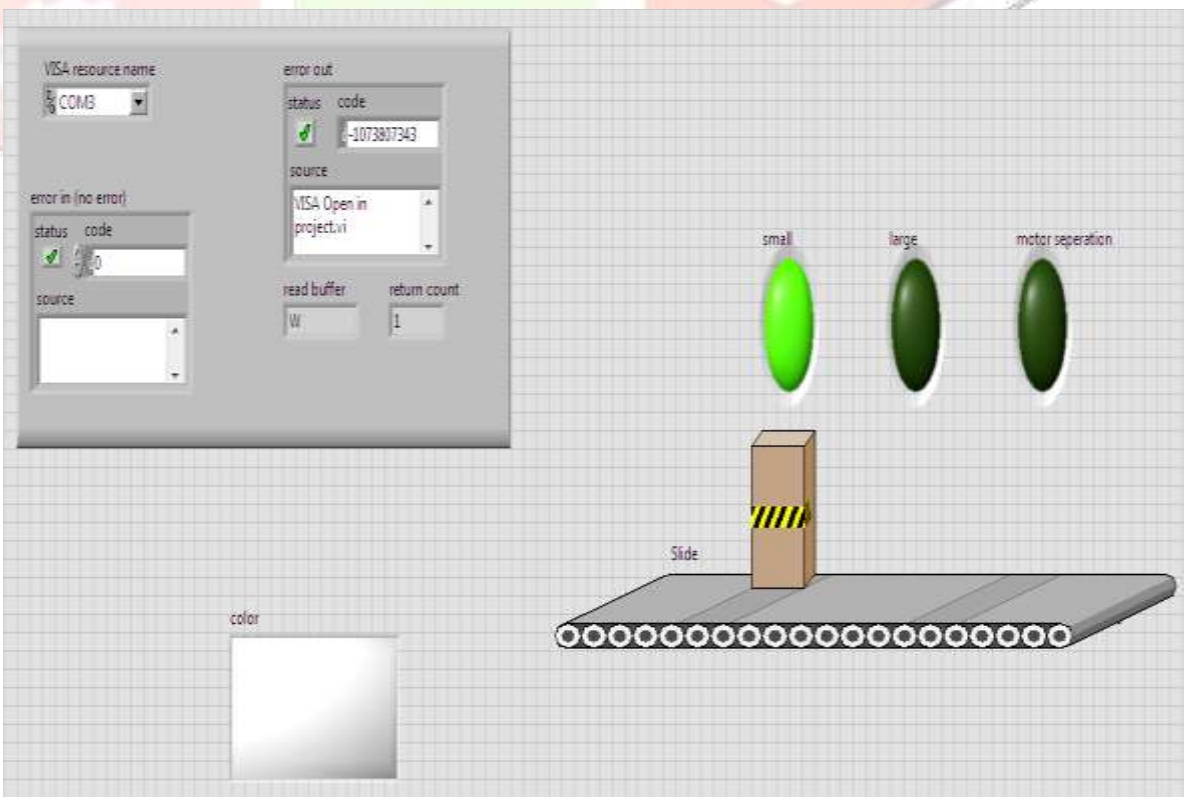

Fig. 3.3Object detected by IR sensor 1

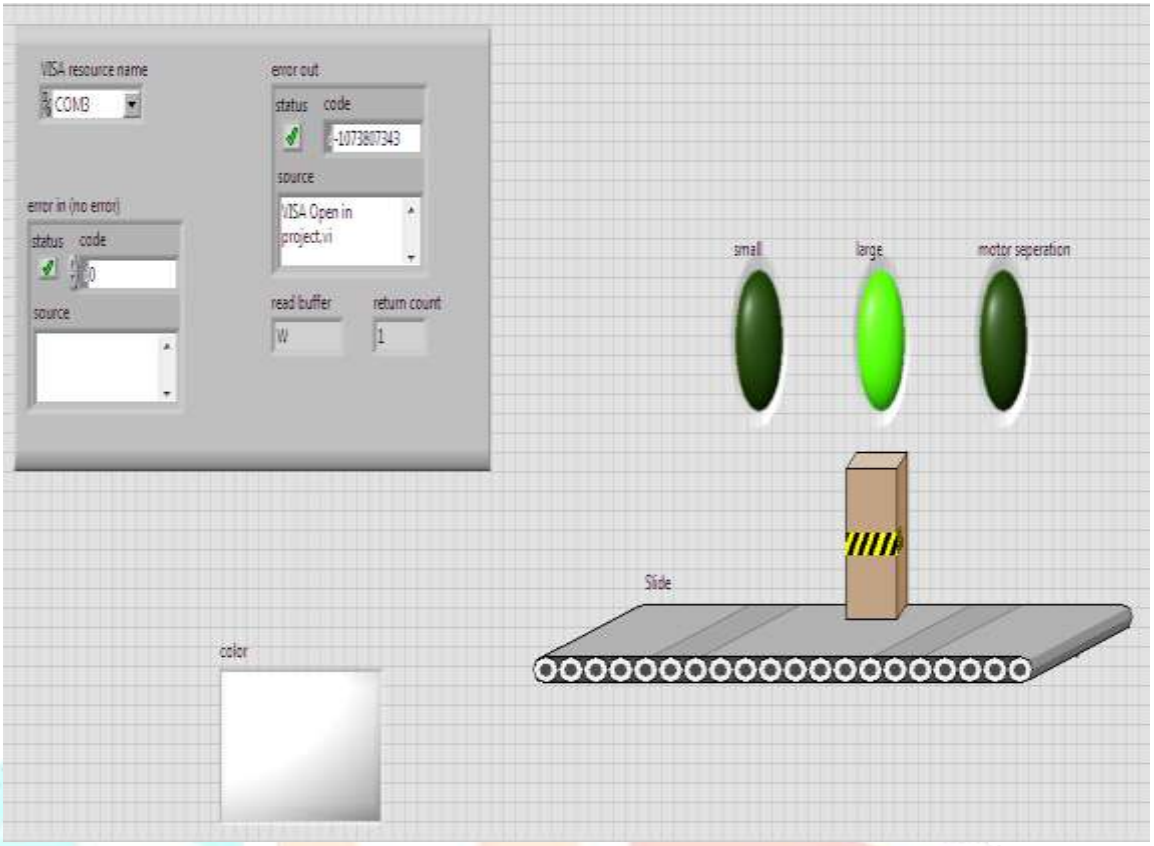

Fig. 3.4Object detected by IR sensor 2

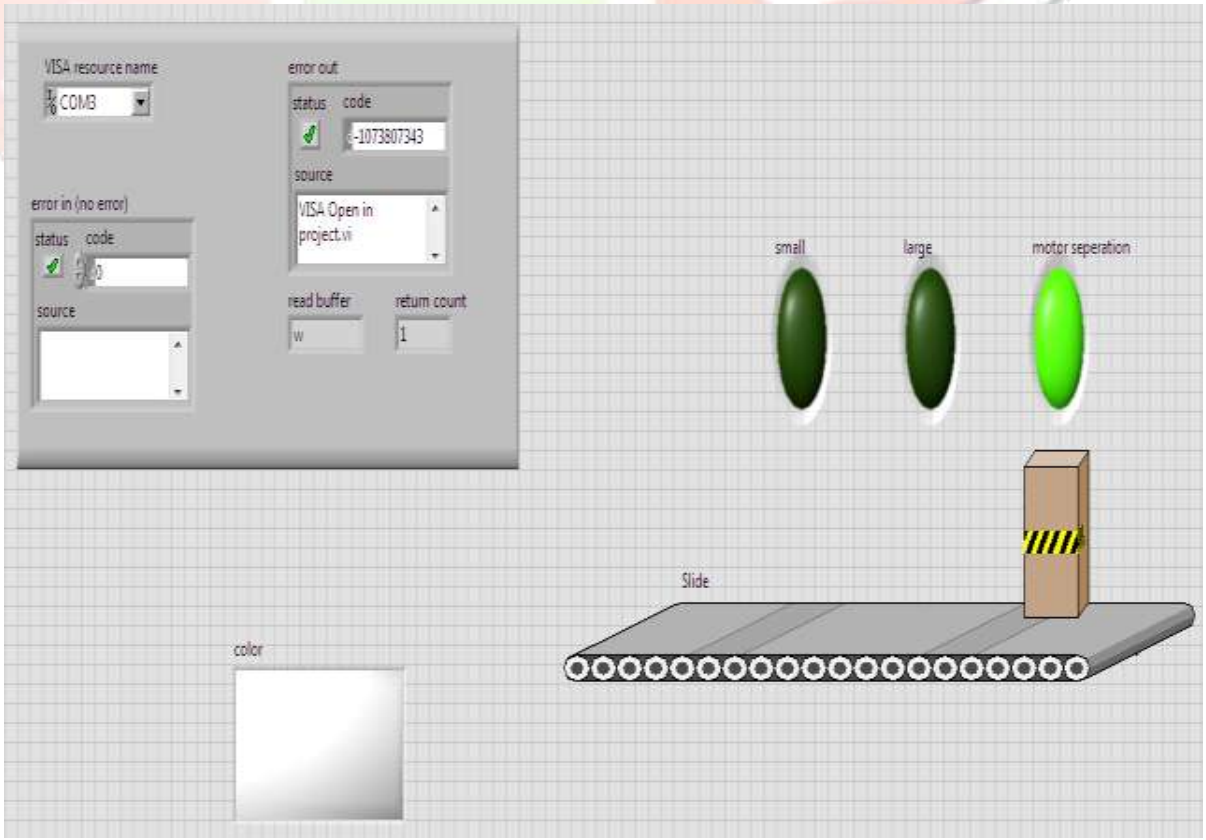

Fig. 3.5Object detected by IR sensor 3

C) Monitoring larger green objects:

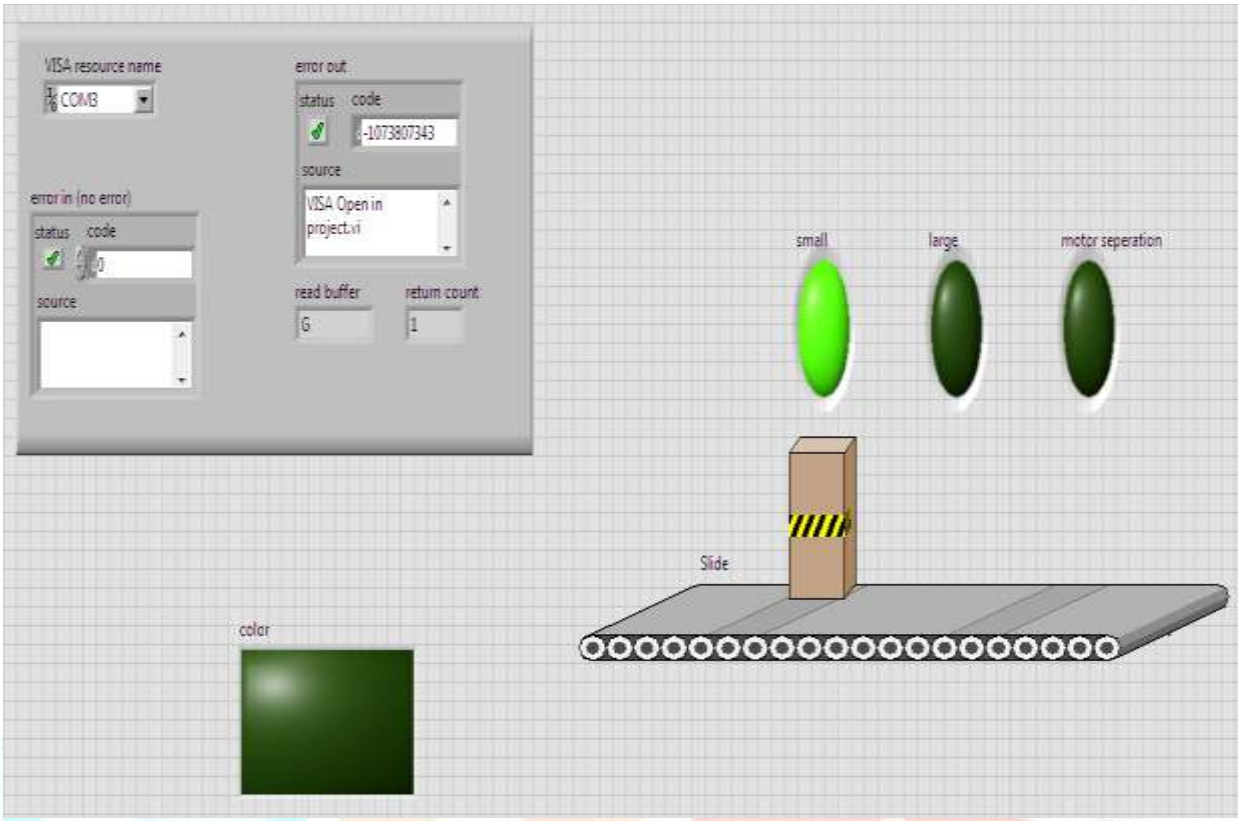

Fig. 3.6Object detected by IR sensor 1

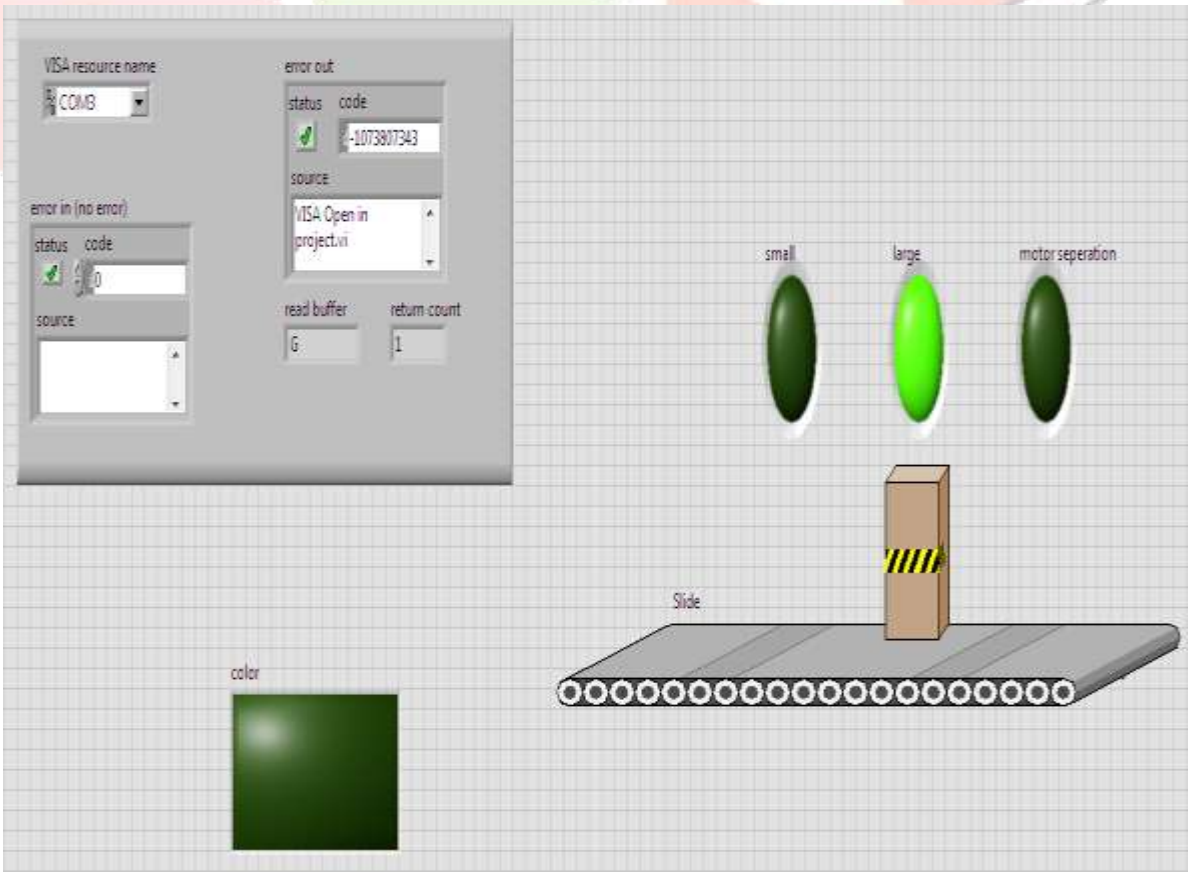

Fig. 3.7Object detected by IR sensor 2

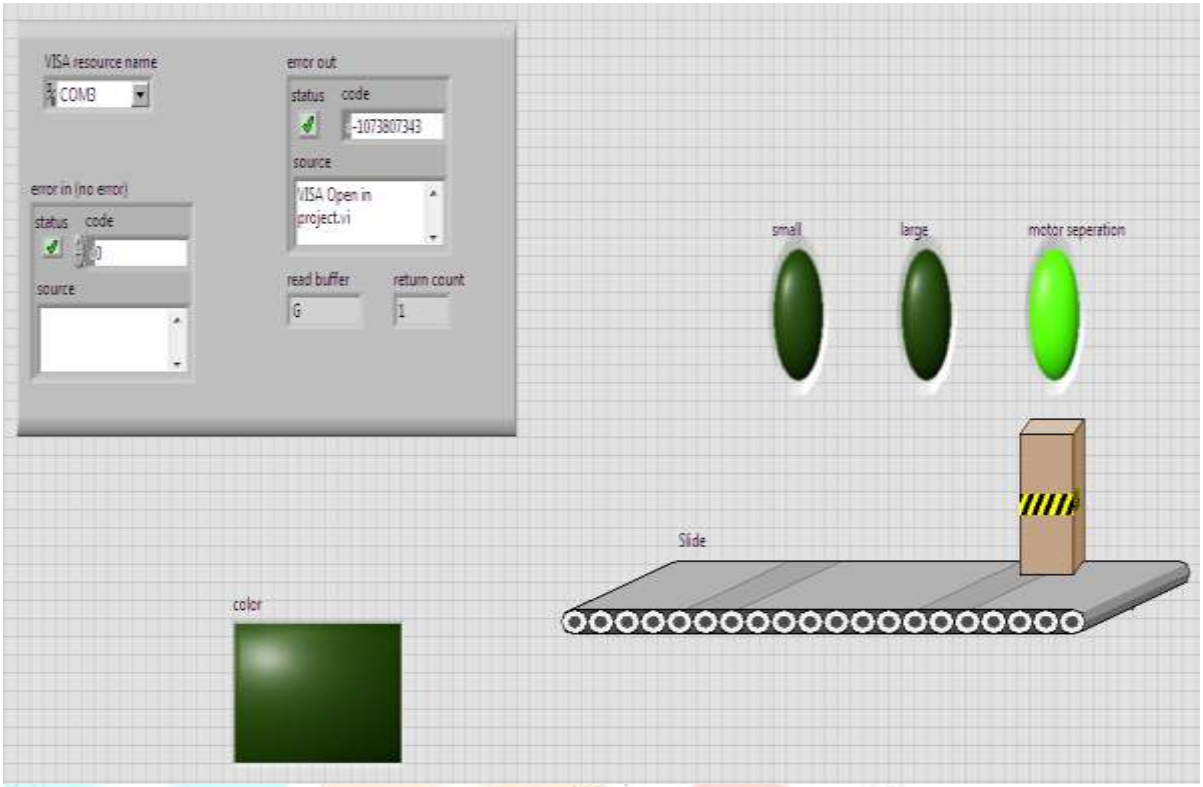

Fig. 3.8Object detected by IR sensor 3

d) Monitoring smaller green objects:

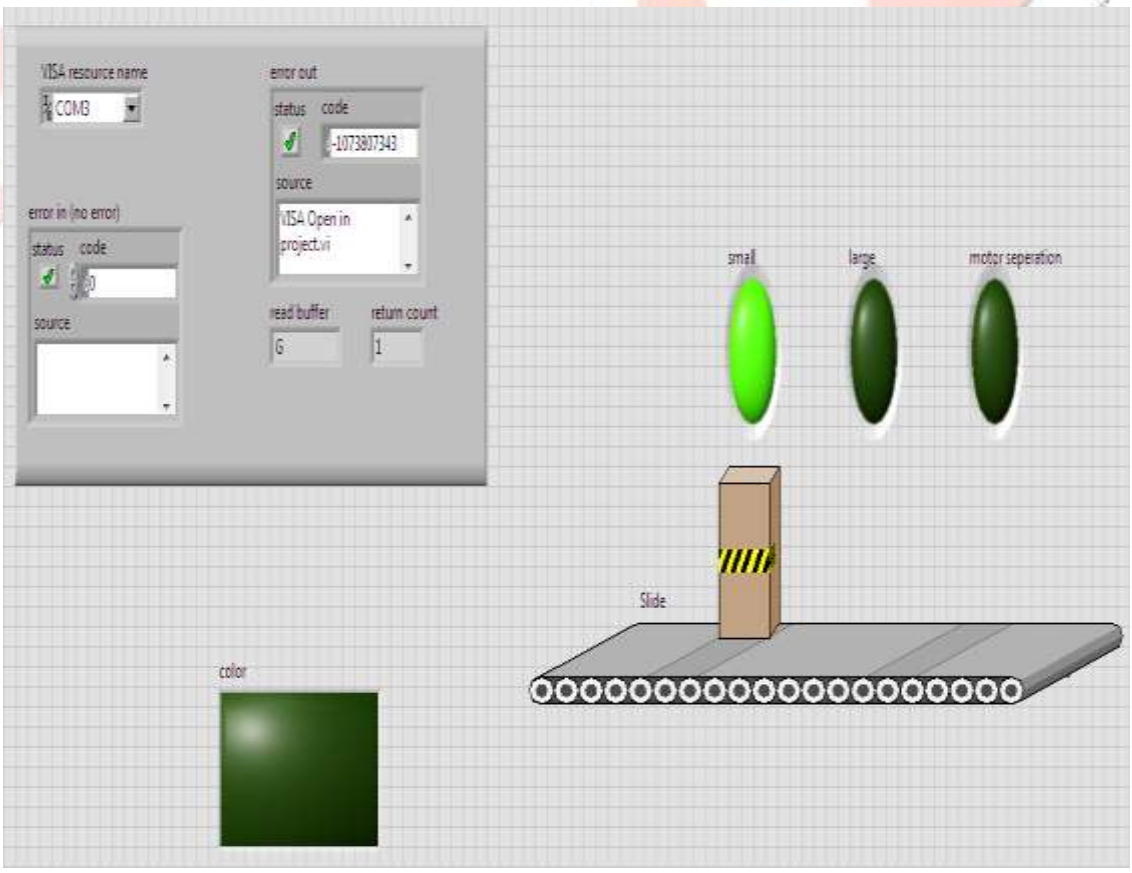

Fig. 3.9Object detected by IR sensor 1

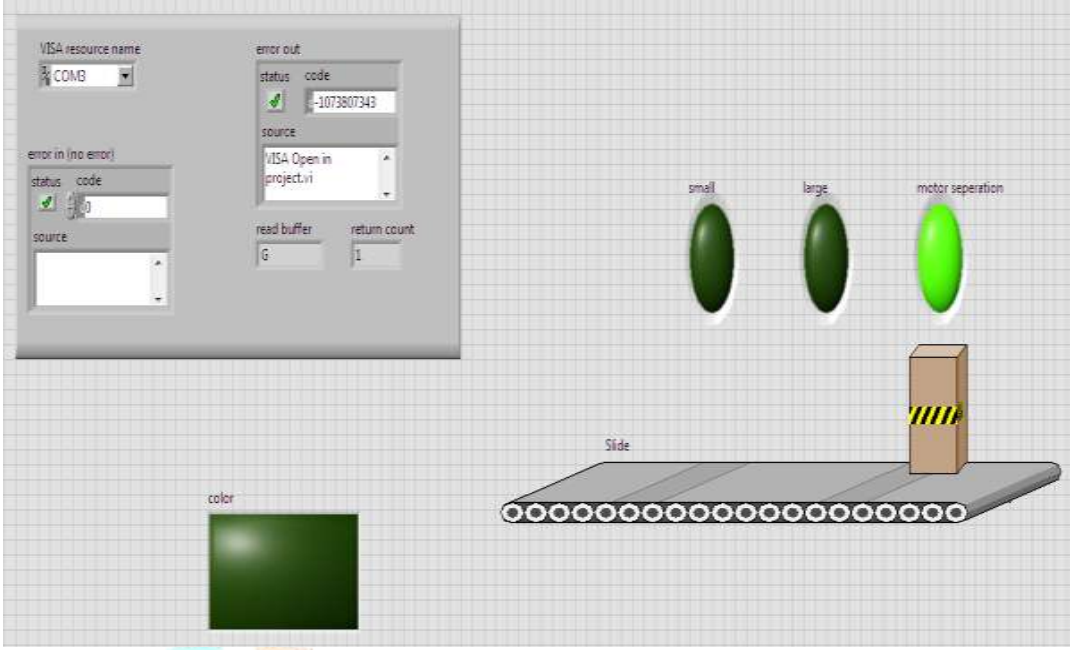

Fig. 3.10Object detected by IR sensor 3

IV. Conclusion

The proposed system proves that it is easy to implement, low cost. Since it turns an human handling process into complete automation finds an adverse application in huge manufacturing industries. Most reliable and efficient. It helps in maintaining production rate. Since it includes wireless communication helps in achieving accuracy in data transferring and receiving. The process is faster.

V. Acknowledgment

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References

[1]. Sanjay Prakash Dabadea , Rohan Prakash Chumble, " Automatic Sorting Machine Using Conveyor Belt" International Journal of Innovative and Emerging Research in Engineering Volume 2, Issue 5, 2015.
[2]. N. Aarathi, P. V.Sitaramaih, M. Indu Vardhani, N. Ranjith kumar, D. Suneel Varma "Automatic Object sorting using Raspberry pi", IOSR Journal of Electronics and Communication Engineering (IOSR-JECE) e-ISSN: 2278-2834,p- ISSN: 2278-8735.Volume 11, Issue 1, Ver. IV (Jan. - Feb .2016), PP 29-36.
[3]. N.I. Giannoccaro, L. Spedicato, A. Lay-Ekuakille, "Sorting of objects based on color, weight, and type on a conveyer line using PLC", IOSR Journal of Mechanical and Civil Engineering (IOSR-JMCE) e-ISSN: 2278-1684,p-ISSN: 2320-334X PP. 04-07.
[4]. Amir Deshmukh, Mahesh Nagane, "Design and development of automatic conveyer controlling system for sorting of component on color basis", International Journal of Science and Research (IJSR) ISSN (Online): 2319-7064 Index Copernicus Value (2013): 6.14 | Impact Factor (2014): 5.61.
[5]. Ajay Sawant, Dhanashree Rane, Gufran Shaikh, Mohit Sethi, Ashwini Jayawant, "Development of good's sorting system based on color".