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AUTO WEIGHING CONTROL SYSTEM USING PROGRAMMABLE LOGIC CONTROLLER

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Abstract—A simple and systematic method is designed auto weighing control system using Programmable Logic Controller (PLC). The purpose of this project to measure the weight of particular job using load cell. In our project we are using solenoid valves, sensors, load cell, motor, conveyor, pneumatic cylinder and scada software to design Auto Weighing Control system using PLC. Our project will not only measure weight of the object but also sort out the specific weighted object. The present invention provides an automated system for industry requirement i.e. to move a seale. Final product from one place to another, sorting out the underweight and overweight items along the way.
Index Terms—Load Cell, PLC, Pneumatic Cylinder.

I. INTRODUCTION

Rising labor costs across the world automation of repetitive manual tasks is inevitable. Automation increases productivity, precision and speed of such tasks. A typically industrial weighing system operates on manual mode and requires a large time. Also some human mistakes occur, hence the production of material is less? And also one problem occurs in the handling of these objects for example, some chemical industries manufacture products which are toxic to humans. In such cases, safety of people in the plant is top priority, so humans cannot directly handle toxic materials. Such handling is to be done by conveyor system, which is automated. Separation and sorting can be done by a weight of the product. Load cell can be used for measuring weight of objects. The rest of paper is organized as follows. System description is explained in section II. Flowchart of the system is in section III. Component Description IV. Concluding remarks are given in section V.

II. SYSTEM DESCRIPTION

The block diagram of the system is indicated as shown in figure1. When any product is ready for selling, before that the weight of that product should be measured. Above block diagram consist of a weight controller, load cell, pneumatic cylinder, solenoid valve, conveyor, PLC, proximity sensor, display, etc. When an object is running on the conveyor belt, then the proximity sensor detects the object. When object is detected. This object move on the load cell platform by using pneumatic cylinder.

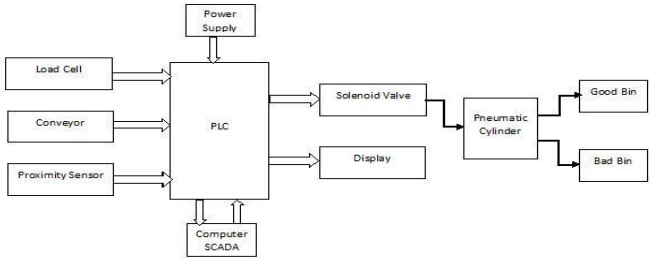
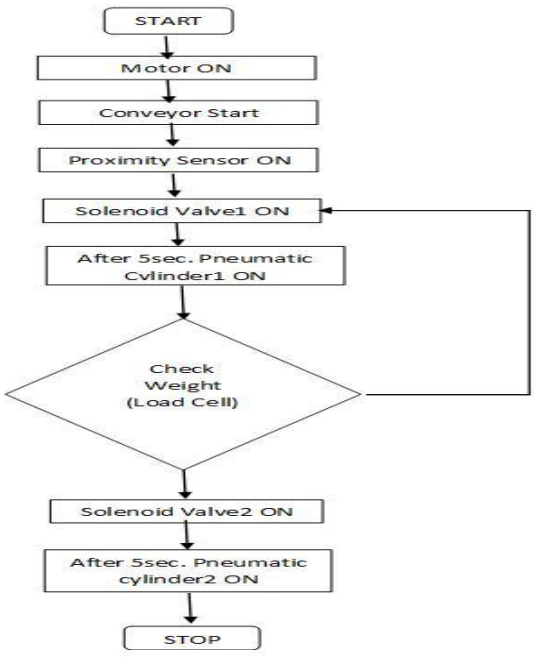


Fig. 1. Block Diagram

programming of the project. The object weight is compared to range of specific weight. This range is feed in PLC. If the object weight is between the range of specific weight then object moves to the good bin otherwise moves to the bad bin. All movements are operated with the help of pneumatic cylinder. This all operation is controlled by PLC.

III. FLOWCHART



IV. COMPONENT DESCRIPTION

All major components must be described.

A. Load Cell

A load cell is a "load transducer" which converts the weight or load acting on it into electrical signals. Principle of load cell is when a weight is applied, which portions of the bridge become distorted? Distortion appears to be greatest at the four thinnest points. When needles are positioned at these thinner points, they indicate that tension bears upon certain points while other points experience compression. The weight applied to the load cell can be measured by the degree of distortion.

B. Inductive Proximity Sensor

Inductive proximity sensors are the Eddy Current Killed Oscillator (ECKO) type. This type of sensor sense the metal object. It contains four basic elements. These are coil, oscillator, trigger circuit output switching device.

C. Pneumatic Cylinder

Pneumatic cylinders are available in a number of types, including single-acting, double-acting, and double-acting with piston rod attachments on both ends of the cylinder.

D. Double-Acting Cylinders

Double-acting cylinders apply pneumatic pressure to both sides of the piston alternately for back-and-forth actuation in such devices as reciprocating pumps, reciprocating saws or presses, or part insert/remove mechanisms. They perform work in both directions of movement. These cylinders do not require a return spring unless a specific rest position is required whenever the device is not powered.

D. PLC

The PLC controls the final control elements. The main function of the PLC is acquire the digital and analog data from input module and vary the output of the system as the input conditions change, this is necessary as the system designed is a real time system. The PLC is programmed such that it will vary the output of the system if there is any change in the input quantity.

V. CONCLUSION

In large industries, their outcomes (i.e. final products) are in very large amounts and so they have to be conveyed or transport quickly and efficiently. These products may be like personal care products, dry fruits, cold drink stationary, etc. For the sake of reliability and also to reduces time. Sorting out the underweight and overweight items along the way.

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