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IOT Based Production Industry Monitoring System

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ABSTRACT

For A solid product manufacturing company by using standardized solid inputs like Ingots in steel structure manufacturing units, it is possible to design and implement a monitoring system based on the metric of the inputs of the system and output of the systems. There by standardized the output to input ratio as a function of time. This helps a supervisor/manager in efficient use of raw materials over a unit of time. Thereby enhancing easy monitoring and facilitating the manufacturing unit. The Metrics and other data received by this controller are then processed and many processed data are given out such as Efficiency in each department, Overall work done, Lagging department along with its lagging percentage, etc.

Keywords: IOT, IR sensors, Web design and Embedded C.

1. INTRODUCTION

Managing the industry/supervising the work done by automated machines are difficult to monitor. To overcome this difficulty IR-Sensors can be employed in the automated manufacturing industries. Here the IR sensor acts as the object counters by using their property of obstacle detection. These counters can be employed on a side of rollers carrying inputs, processed inputs, final products, etc. These counts are taken into account with a function of time and viewed through a website.

2. EXPLANATION

Among the various the sensors used in industry, it is more effective to use IR sensors as object counters, over the roller carrying the input and outputs. The counts of the sensors are taken as the input along the time function by the micro controller. The processed input from controller is driven into the IOT module to connect it with internet. The final output is viewed through a website as number of inputs, etc.

3. FEASIBILITY ANALYSIS

Error detection of the final obtained product is easily determined by using simple obstacle detection methods. As the controllers are used it is easy to fix the bugs and rectify them by using the desired software. Repeated testing of the designed prototype helps in determining the error percentage. Also by using certain standardized methods the feasibility of the project can be ensured. The project is more feasible as the feasibility analysis methods for these kind of projects are standardized prior the innovations arises. And also they are really simple as compared to most feasibility analysis methods on other domains.

4. OBJECTIVES

The main aim of the project is to establish a well planned and executed monitoring system for the supervising designated people in the production industry by a single click on computer. Therefore continues effortless monitoring along with time lacking detection in a production unit is facilitated in a proper manner.

5. BLOCK DIAGRAM

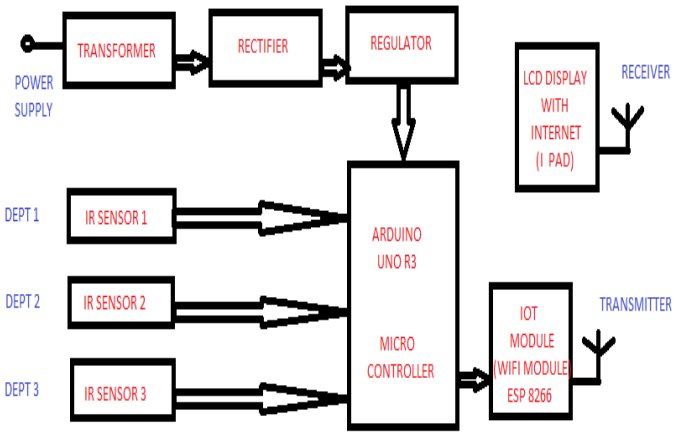

Fig.1.Block Diagram

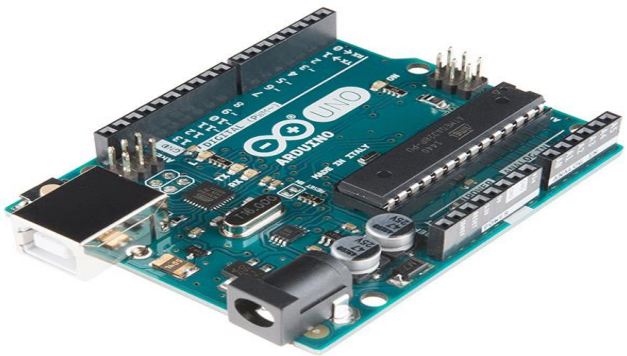

Fig.2. A view on Arduino Uno

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6. HARDWARES USED

6.1 Micro Controller-Arduino UNO

Arduino/Genuino Uno is a microcontroller board based on the ATmega328P (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with an AC-to-DC adapter or battery to get started.

6.2 IR Sensors

An infrared sensor is an electronic device that emits in order to sense some aspects of the surroundings. An IR sensor can measure the heat of an object as well as detects the motion. These types of sensors measures only infrared radiation, rather than emitting it that is called as a passive IR sensor. IR Sensors work by using a specific light sensor to detect a select light wavelength in the Infra-Red (IR) spectrum. By using an LED which produces light at the same wavelength as what the sensor is looking for, you can look at the intensity of the received light. When an object is close to the sensor, the light from the LED bounces off the object and into the light sensor. This results in a large jump in the intensity, which we already know can be detected using a threshold.

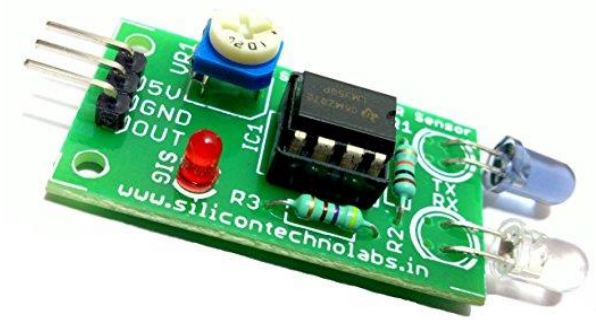

Fig.3. A View of IR Sensor

6.3 Transformer-Step Down

It is designed to reduce the voltage from the primary winding to the secondary winding. This kind of transformer “steps down” the voltage applied to it. As a step-down unit, the transformer converts high-voltage, low-current power into low-voltage, high-current power.

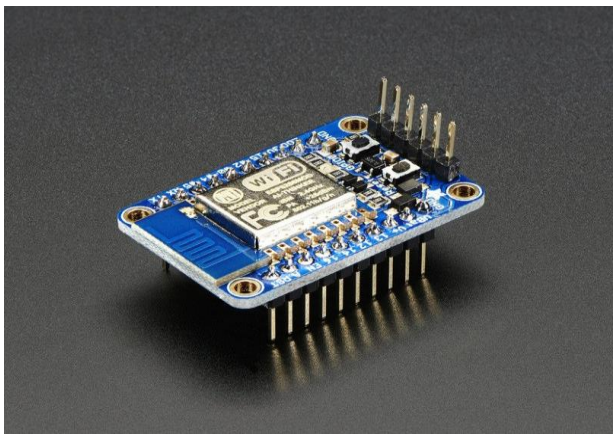

Fig.4. A View in ESP 8266

6.4 IOT Module-ESP8266

ESP8266 (presently ESP8266EX) is a chip with which manufacturers are making wirelessly networkable micro-controller modules. More specifically, ESP8266 is a system-on-a-chip (SoC) with capabilities for 2.4 GHz Wi-Fi (802.11 b/g/n, supporting WPA/WPA2), general-purpose input/output (16 GPIO), Inter-Integrated Circuit (I^2C), analog-to-digital conversion (10-bit ADC), Serial Peripheral Interface (SPI), I^2S interfaces with DMA (sharing pins with GPIO

6.5 Rectifier

A rectifier is an electrical device that converts alternating current (AC), which periodically reverses direction, to direct current (DC), which flows in only one direction. The process is known as rectification. Physically, rectifiers take a number of forms, including vacuum tube diodes, mercury-arc valves, copper and selenium oxide rectifiers, semiconductor diodes, silicon-controlled rectifiers and other silicon-based semiconductor switches.

6.6 Regulator

A voltage regulator is designed to automatically maintain a constant voltage level. A voltage regulator may be a simple "feed forward" design or may include negative feedback control loops. It may use an electromechanical mechanism, or electronic components. Here the needed power supply is +5V D.C supply.

6.7 LCD Display (I-PAD)

A liquid-crystal display (LCD) is a flat-panel display or other electronically modulated optical device that uses the light-modulating properties of liquid crystals. Liquid crystals do not emit light directly, instead using a backlight or reflector to produce images in color or monochrome.[1] LCDs are available to display arbitrary images (as in a general-purpose computer display) or fixed images with low information content, which can be displayed or hidden, such as preset words, digits, and 7-segment displays, as in a digital clock. They use the same basic technology, except that arbitrary images are made up of a large number of small pixels, while other displays have larger elements.

7. SOFTWARES USED

7.1 ARDUINO Version.1.8.1

Arduino v1.8.1 software provides a free and easier environment for the people of arduino to code its controllers and there by obtaining the task to be completed. This software of arduino is applicable to any controllers of its production. It provides an Integrated Development Environment to its users (IDE)

7.2 NOTEPAD++

Notepad++ is a text editor and source code editor for use with Microsoft Windows. It supports tabbed editing, which allows working with multiple open files in a single window. The project's name comes from the C increment operator. Notepad++ is distributed as free software. At first the project was hosted on SourceForg.net, from where it has been

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downloaded over 28 million times and twice won the Source Forge Community Choice Award for Best Developer Tool.

Table 1. Software and Languages Used

Software	Languages	Purpose
ARDUINO V1.8.1	Embedded C	To encode the Controller
NOTEPAD++	PHP, HTML	To design the Front end of the website
NOTEPAD++	SQL	To Manipulate the Web data

8. RESULT

The expected output is a view on a website, which shows the exact time from the starting of the process to that instant. The web page also contains the metrics of inputs, metrics of outcomes, metrics of processed raw materials, percentage of work done, etc. The total data viewed on the webpage are given below:

- Percentage of Efficiency
- Percentage of work done
- Time at instant
- Percentage of work lagging (if needed)

9. CONCLUSION

The Previous assumptions of total number of units to be employed in an Industry along with the total expected metrics of output forecasted as a function of time. Then by using the Metrics counted by each sensors employed on each department ,the Efficiency of each department and the percentage of work done on the whole industry as a function of time can be viewed at any time on a web page with the above given data corresponding to the instant.

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