ASSEMBLY LINE

A Term Paper / Project

Report

Submitted in the partial fulfillment of the requirements for

the award of the degree of

Bachelor of Technology

in

Department of Electronics and Communication Engineering

by

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Declaration

The (Term Paper/Project) Report entitled “ASSEMBLY LINE “is a record of bonafide work of Phani gopi, vasanthi, deepika, submitted in partial fulfillment for the award of B.Tech in Department of Electronics and Communication Engineering to the K L University. The results embodied in this report have not been copied from any other departments/University/Institute.

M. Phanigopi

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Y. Deepika

Certificate

This is to certify that the (Term Paper/Project) Report entitled “ASSEMBLY LINE” is being submitted by Phanigopi, vasanthi, deepika, submitted in partial fulfillment for the award of B.Tech in Department of Electronics and Communication Engineering to the K L University is a record of bonafide work carried out under our guidance and supervision.

The results embodied in this report have not been copied from any other departments/ University/Institute.

Signature of the Co-Supervisor Signature of Supervisor

Signature of the HOD Signature of the External Examiner

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ABSTRACT

As a result of a substantial shift in focus towards a more digital industry, multiple sectors of industry are now realising the potential of Industry 4.0 and Internet of Things (IoT) technology. The manufacturing industry in particular is subject to unexpected machine downtime from component wear over an extended period. With Industrial IoT (IIoT) technology implemented, there is the potential for gathering large quantities of data, which can be used for preventative maintenance. This research article addresses some of the technological requirements for developing an IoT industrial condition monitoring network, whose composition makes use of wireless devices along with conventional software and hardware tools to enable a series of data acquisition. To provide a platform to host these operations, LabVIEW development environment is utilized in which a graphical user interface was developed to provide data acquisition visualization. The system is designed such that it resembles a real time manufacturing environment so that the paper enable connectivity of real industry hardware extending the capability of system.

With the increasing demand of the products along with competitors in market, there is need of very high rate of production which can only be possible with automation in industries.With the help of automation various problems associated like human error are avoided and there is a tremendous increase in the reliability as well as quality of the final product. This paper focuses on the construction and development of a simple low cost solution to supervise and

control automated assembly line sorting for local small scale product industry using LabVIEW software and a microcontroller which replicates the use of SCADA in major

process industries. With the help of this project, various parameters like temperature and level are measured on a real time basis. Process control is also made available by varying

parameters like motor speed and direction. With the help of LabVIEW software a complete logging of this acquired real time parameters is possible which is then stored in databases

like excel sheet where further operations can be carried or can be transferred to other systems. This project is mainly divided into hardware part and software part. Hardware part mainly

consists of a microcontroller along with various sensors necessary for detection and parameter sensing and actuators like various motors and their drivers. A dedicated printed

circuit board was specially designed for this purpose. On the other hand a VI was created in LabVIEW software through which the logic was implemented**.**

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INTODUCTION

Industry as a whole and the manufacturing industry in particular are now seeking a solution to overcome some of the modern-day problems and improvement requirements commonly required within the manufacturing industry. In spite of all the improvements made over the past two plus decades, some of the same issues continue to plague the manufacturing sector are: — Increased global competition, Increasing market demand for high quality products at lower cost ,Escalating costs, Increasingly dynamic market changes and patterns of customer demand , Shortage of appropriately skilled resources without introducing different methods and technology advancements/components, a window may open for potential competitors to overtake them in their respective market, thus highlighting the importance of innovation, where innovation can be classified as one of the primary methods for increasing/maintaining market share. Nevertheless, coming up with solutions in the modern age can be difficult, and in some situations expensive. So, the real question is how can they do it? According to Egham, U.K, 20.4 billion IoT devices will be connected globally in 2020 alone with up to half of the organisations investing in IIoT technology have already implemented a specific strategy. It is not a case of when will organisations realise the potential, but how have they already started to implement the solutions.

Literature Survey

As discussed, it is possible to gain an understanding of previous attempts to produce an industrial condition monitoring system. As described, LabVIEW was used as the graphical user interface to manipulate and analyse the raw accelerometer readings. The project designed and constructed a system using a combination of hardware components (for both the sensing element and for the exchange of the vibration data) to a host output system (laptop). The system subsequently running a LabVIEW application collected and analysed the data. The specific sensor used for detecting vibration was an IR sensor. It was interfaced to NI Mydaq which inturn is connected to LabVIEW. Data is compared and processed. A series of servo motors are arranged in the form of an arm to rearrange the items. The board arduino UNO is used in controlling the movement of the arm. The extension of this project involve in addition of data acquisition parameters such as temperature, object identification. It could also include data processing via cloud using some form of web – based communication protocol such as the hyper-text transfer-protocol (HTTP) which require addition of extra components.

**Previous works**

Previously papers has been published similar to what is proposed within the current research project. Instead of monitoring machine condition parameters, the project was more concerned with environmental monitoring. The overall topology has utilized communication protocols, and a GSM module to communicate the LabVIEW application with a mobile phone. As a result, the user could gather data from the system by simply reviewing the alert file sent from the user interface in the form of an SMS text message.

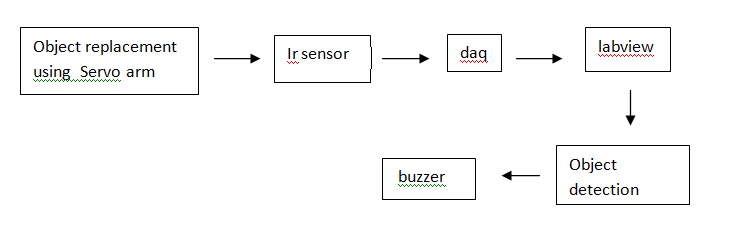
Some other works involve in utilization of the LabVIEW software to monitor the condition of PV solar cells. An array of four PV solar panels interfaced with a bespoke LabVIEW application, which communicated to a web server through a raspberry Pi, acting as a gateway. The general parameters this system monitored included maximum power, voltage, current, efficiency, irradiance, temperature and so forth. Like the alerting mechanism in the current project, if any of the above parameters exceeded the allowable tolerances alert was activated.

Works that give earthquake early warning system that utilized accelerometers and ZigBee modules to wirelessly transfer vibration data to a host LabVIEW application has been produced. From this, the operator was able to monitor seismic activity using sensors and provided with both numerical and graphical representations of the data collected.

Theoretical Analysis

The entire network is combination of labview arduino and NI Mydaq along with series of sensors for data acquisition and a servo arm for object replacement. The whole flow of process can be visualized on labview software.

Block diagram



**Hardware :**

**IR sensors**

An infrared (IR) sensor is an electronic device that measures and detects infrared radiation in its surrounding environment. Infrared radiation was accidentally discovered by an astronomer named William Herchel in 1800. While measuring the temperature of each color of light (separated by a prism), he noticed that the temperature just beyond the red light was highest. IR is invisible to the human eye, as its wavelength is longer than that of visible light (though it is still on the same electromagnetic spectrum). Anything that emits heat (everything that has a temperature above around five degrees Kelvin) gives off infrared radiation.

**Arduino UNO**

Arduino 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 ceramic resonator (CSTCE16M0V53-R0), 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 a AC-to-DC adapter or battery to get started.. You can tinker with your Uno without worrying too much about doing something wrong, worst case scenario you can replace the chip for a few dollars and start over again.

**Servo motors**

Micro Servo Motor SG90 is a tiny and lightweight server motor with high output power. Servo can rotate approximately 180 degrees (90 in each direction), and works just like the standard kinds but smaller. You can use any servo code, hardware or library to control these servos. Good for beginners who want to make stuff move without building a motor controller with feedback & gear box, especially since it will fit in small places. It comes with a 3 horns (arms) and hardware.

**NI MyDaq**

NI myDAQ is a low-cost portable data acquisition (DAQ) device that uses NI LabVIEW-based software instruments, allowing students to measure and analyze real-world signals. NI myDAQ is ideal for exploring electronics and taking sensor measurements. Combined with NI LabVIEW on the PC, students can analyze and process acquired signals and control simple processes anytime, anywhere.

**Buzzer**

The Passive Buzzer is the slightly shorter one, with the electronics exposed on the bottom. You have to send it an AC "sound signal" via the Arduino. The Arduino needs to generate the "tone". Can create music. It takes processor-time to generate the sound so other processes might slow down.

**Software :**

**LabVIEW**

LabVIEW, short for Laboratory Virtual Instrument Engineering Workbench, is a programming environment in which you create programs using a graphical notation (connecting functional nodes via wires through which data flows); LabVIEW is much more than a programming language. It is an interactive program development and execution system designed for people, like scientists and engineers, who need to program as part of their jobs.