# MONITORING FIXTURES OF CNC MACHINE

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**Abstract – This paper introduce a system that used ARM basedmicrocontroller and wireless sensors to control the various devices and to monitor the information regarding the CNC machines parameter using WI-FI technology .If there is any error in machine it can't be recognized by the person sitting in the office.The existing system is difficult to maintain. This consumes lot of time on communication between technical persons. To overcome this problem we are trying to develop the system. This system will give a informatioto the respective technical person according to the error detected.**
**Keyword: ARM (Advanced RISC Machines); WI-FI(wireless fidelity)**

## I.    INRODUCTION

CNC machine is having three sections Hydraulic Section Mechanical Section and electrical section. So while working with so much of machines this EMI section gets problem. When any of the machines stop working because of any internal problem, it gives an alarm so that worker should know that there is some problem with that machine. But if worker can't recognise the problem then he should inform this to concerned technical person. But worker will inform this to all technical person from mechanical section, Hydraulic section and also to electrical section. This consume a lot of time. Vibration is one of the most concentrated problems in CNC machine tools, which can significantaly reduce the machining precision [1].This lead to decrease in production because of difficulty in tracing the error by technical person. To reduce this time delay we are implementing one system. This system help will technical person instantly as error will be introduced through the text message. This text message will include machine number and actual error occurred in that machine. And this text message will be send to only the section related that technical person. While message is sending to that respective person machine will be switched off..mesh clients, mesh routers and gateways often consist by Wireless mesh networks [3]. A WMN is offers redundancy[3].

## II.    LITRATURE SURVEY

CNC was invented by John T. Parsons while making helicopter blades for the military. His numerical control used a rudimentary computer to move the cutting spindle along the x and y axes.

The CNC machine first appeared when John Runyon managed to produce punch tapes under computer control. This showed dramatic results in terms of time, reducing the normal production duration of 8 hours to 15 minutes. the Air Force accepted the proposal to produce a generalized "programming" language for NC In June 1956..

Eventually, the Air Material Command at the Wright-Patterson Air Force Base and the Aircraft Industries Association (AIA) collaborated with MIT in 1957 to generate a fully computer controlled NC system. The CNC machines invenstion paved the way for automated tools that meant cost efficient production for manufacturers.

The computer automation of manufacturing now uses very sophisticated programs, including the original x and y grid to cut parts on several axes. CNC mills can now cut at various angles, and even have moving tables that turn the part to access areas previously impossible to reach.

## III.    SYSTEM BLOCK DIAGRAM
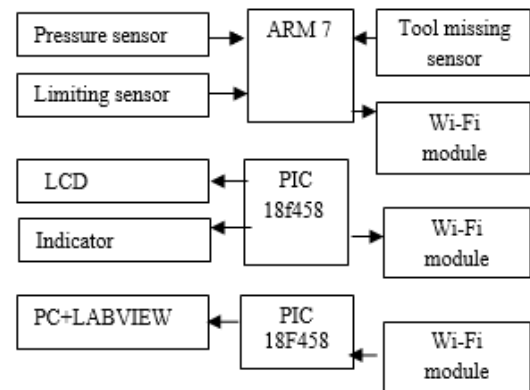


**Fig. 1:System Block diagram**

We have used a ARM7 based LPC2148 microcontroller. LPC2148 is a 16bit/32bit microcontroller with a high speed flash memory ranging from 32kbit to 512kbit. Serial communications interfaces ranging from a USB 2.0 Full-speed device, multiple UARTs, SPI, SSP to I2C-bus and on-chip SRAM of 8 kB up to 40 kB, make these devices very well suited for communication gateways and protocol converters, soft modems, voice recognition and low end imaging, providing both large buffer size and high processing power.PIC 18f458 is used outside the CNC machine PIC 18f458 is used to monitor the lcdand indicator and wi-fi module.PIC 18f458 is having 10 bit 8 channel ADC.PIC 18f458 is also used at the slav side to monitor the wi-fi module and the pc.we can see the data of CNC with the help of labview software.

### A.   Hall Effect Sensor:

HALL EFECT SENSOR is a device which converts magnetic or magnetically encoded information into electrical signals is called. A Hall Effect device/sensor is a solid state device that is becoming more and more popular because of its many uses in different types of applications this devices are immune to vibration, dust and water.TheBasic Principle of Hall Effectis the activation by an external magnetic field. As we are familiar that there are two important characteristics of a magnetic field.Viz.Flux density, (B) and polarity (North & South Poles).the HallVoltage,VH produces When the magnetic flux density around the sensor exceeds a certain preset threshold, the sensor detects it and generates an output voltage [6]

Certified product can use any brand of access point with any other brand of client hardware that is also "Wi-Fi Certified". Products that pass this certification are required to carry an identifying seal on their packaging that states "Wi-Fi Certified" and indicates the radio frequency band used (2.5GHz for 802.11b, 802.11g, or 802.11n, and 5GHz for 802.11a).[3]
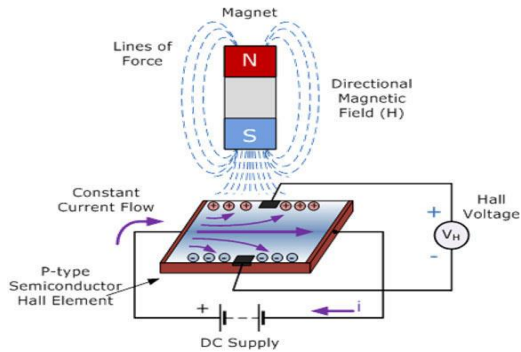
### D. *Liquid Crystal Display:*

LCD is used in a project to visualize the output of the application. We have used 16x2 lcd which indicates 16 columns and 2 rows. So, we can write 16 characters in each line. So, total 32 characters we can display on 16x2 lcd.

LCD can also used in a project to check the output of different modules interfaced with the microcontroller. Thus lcd plays a vital role in a project to see the output and to debug the system module wise in case of system failure in order to rectify the problem.

### E. *PC:*

PC is used to analysis the various parameters of CNC machine using a labview software developed window. Using pc we can analysis the intensity of errors happened and the necessary solution can be started well on time.

## IV. CONCLUSION

In this paper, we can use this system in various industries. This system will definitely help us to remove errors as early as possible. So, because of this system production rate of the industry will increase. As human communication errors are removed, communication between worker and technical person will be very fine. This system will also keep record of errors and technical person dealing with that error. So, this will be helpful for company while analysis.

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**Fig2: Working of Hall Effect**

### B. *Limit switch*

An electromechanical device that consists of an actuator mechanically linked to a set of contacts is called as limit switch .When an object comes into contact with the actuator, the device operates the contacts to make or break an electrical connection.It can determine the presence or absence of an object. It was first used to define the limit of travel of an object; hence the name "Limit Switch."

**Actuator:** The portion of the switch that comes in contact with the object being sensed.

**Head:** It is the mechanism that translates actuator movement into contact movement. When the actuator is moved as intended, the mechanism operates the switch contacts.

**Contact Block:** It is the electrical contact elements of the switch. It typically contains either two or four contact pairs.

**Terminal Block:** It contains the screw terminations. This is where the electrical (wire) connection between the switch and the rest of the control circuit is made.

**Switch Body:** The switch body is the contact block in a plug-in switch. It and terminal block in the nonplug-in switch.

**Base:** The base is the terminal block in a plug-in switch do not have a separate base[5]
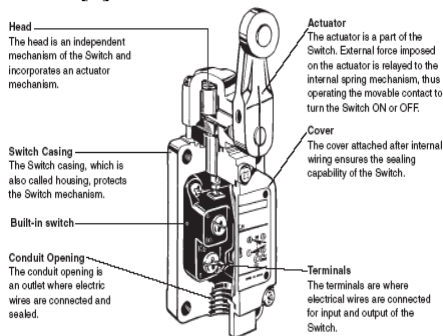

**Fig3: limit switch**

### C. *Wi-Fi module*:

Wi-Fi provide wireless high-speed Internet and network connections this is the popular wireless networking technology that uses radio waves. Wi-Fi is supported by many applications including video game consoles, home networks, PDAs, mobile phones, major operating systems, and other types of consumer electronics. Any products that are tested and approved as "Wi-Fi Certified" (a registered trademark) by the Wi-Fi Alliance are certified as interoperable with each other, even if they are from different manufacturers. For example, a user with a Wi-Fi