



# LabVIEW and Wireless Based Real Time Sensor Monitoring

<sup>#1</sup>Karan Siyal, <sup>#2</sup>Ratnaprabha Kasde.

<sup>#,\*</sup>School Of Electronics Engineering  
VIT University Chennai, Tamil Nadu, India

<sup>1</sup>karansiyal03@gmail.com

<sup>2</sup> ratnaprabha.kasde@gmail.com

**Abstract** – These days the greater part of the humidity, pollution, temperature, pressure frameworks are broadly utilized in commercial enterprises. For observing these parameters, one needs to keep an eye on state of the sensors used. Sensors state observance is important particularly in alarm or observation in mining field. The main aim of this project is to keep track on sensors using LabVIEW and wireless module. Wireless module which have used is zigbee module for transmission and receiving purpose. The proposed system is to plan a proficient framework to peruse and screen sensor's information and if any of these variables surpasses the business principles, instantly these data will show in LabVIEW. LabVIEW is a graphical user interface to the user. Results acquired demonstrate that LabVIEW project can screen the sensors state continuously and precisely.

**Keywords**—Sensors, LabVIEW, Wireless module, Zigbee, Arduino UNO

## I. INTRODUCTION

The Sensors are all over now-a-days having numerous applications in numerous fields like health and habitant checking, estimating and mining frameworks. In these popular days sensors are generally used in commercial ventures for applications continuously that are in fact and monetarily sensible. Despite the fact that the measure of mechanization increments in industry, in the meantime contamination in air because of temperature, weight, stickiness, CO<sub>2</sub> increments by undesirable gasses, hardware uncovered into the encompassing particularly in industrial zones. The observation and assessment both are used synonymously. The industrial natural condition evaluation is given by contamination administration board once it can pose as a viable rival modern quality in importance ordinary quality. The components that could have an impact on the characteristic framework furthermore on human health. The checking framework in industries is nothing but collecting different data and information through sensors and wireless module at different location in industries in defined interval and these information can be used to outline current condition and establish trends of industrial environment.

The sensors are Connect to the controller through wireless module, which is an industrial purpose most widely used. These device largely employed in real time applications. The function of sensors is to convert physical parameter into electrical output. By utilization of these sensors one can assess the level of hydrogen, weight, temperature, mugginess and carbon monoxide in nature. In the event that any of these parameters surpasses the wanted modern guidelines, it will indicate us by glowing LED in LabVIEW software. The industrial quality action is most useful for workers must be work for a considerable length of time in the plant environment and it got to be important to screen and deal with the modern parameters that cause contamination inside the exchange. LabVIEW programming bundle from NI organization is customized by visual realistic G dialect that gives parcel of instinctual and brief seeing as contrasted and conventional content. To spare bunches of overrated Data Acquisition Board quality and remote screen the sensors express, this strategy use LabVIEW interface module for correspondence in the middle of PC and SCM(Single Chip Microcomputer) that is arduino. In the paper zigbee wireless module is utilized. Information are sent and got by zigbee module all through arduino drive project running. The explained caution interface is made by LabVIEW programming. Finally program is expert by calling the LabVIEW serial port module and perusing MCU information to assess that the sensors are working legitimately or not.

## II. LITERATURE SURVEY

In this section it is reviewed different existing technologies. By using different approaches many systems are developed for air pollution monitoring. Many work have been done. The later checking framework are utilized to gauge the encompassing environment in the waterways, lakes, ground water and seas [1]. Portable GPRS sensors show used to

recognize distinctive gas levels [2]. An air contamination geo-sensor system comprising of 24 sensors and 10 switches was introduced to screen a few air toxins in [3]. The framework gives alert message relying upon the recognized contamination sorts in the field. A high-determination observation Web-cam was utilized to screen air quality through the Internet [4]. All these are basically used short ranges using wired modules. Envirobat development also a new recent work which is based on the GPRS technology. By analysing all these works we worked with wireless and LabVIEW technology to make monitoring and transmission more fast and efficient.

### III. PROPOSED WORK

The parameters which affect industrial environment will be sensed periodically from diverse sensors, Initially, to sense the different factors like pressure, humidity level, CO, pH level, smoke and Temperature. The output of sensor is in analog form, so there is use of an ADC module which is zigbee module which converts analog data into digital form which can be readable by the controller. Next step is if any of these parameters exceeds or below the par level which can be monitor through LabVIEW software. To focus the plausibility and expense of sensor checking framework. To focus the nature of administration and workplace in businesses.

### IV. METHODOLOGY

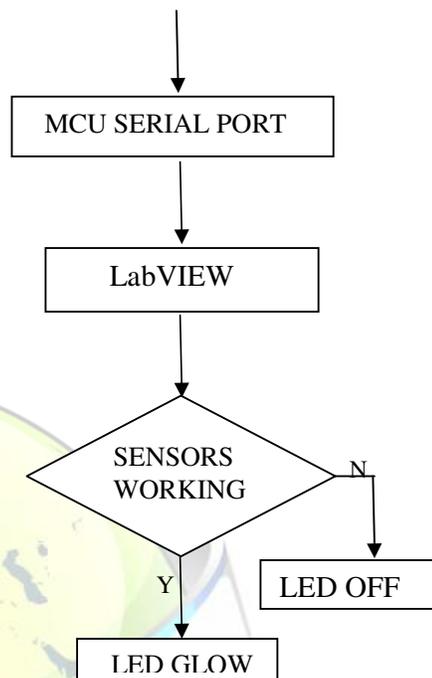
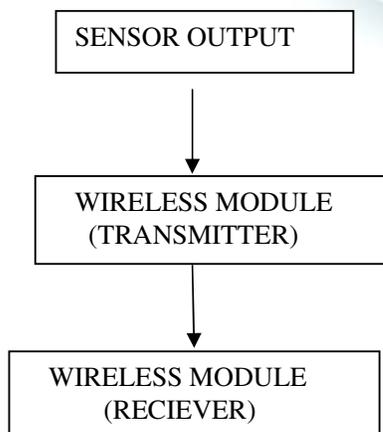


Fig.(1) Block diagram.

The block diagram of sensor state checking framework is demonstrated in Fig.(1). It fundamentally comprise of sensors for the specific purpose, wireless transreciever module i.e. zigbee, Arduino UNO controller board, and LabVIEW. Sensors which are placed in the industrial or mining area senses the temperature or pressure and the output of the sensor value is given to the transmitter part of zigbee wireless module. Information are sent and got by zigbee wireless module amid single chip microcomputer commute project running. The data received is then given to the arduino controller board. It is interfaced with LabVIEW software. At last, program is proficient by calling the LabVIEW serial port module and perusing MCU information through serial interface to judge that the sensors work accurately or not. If sensors are working properly then it will display through LED using LabVIEW if not, LED's will not glow.

### V. SYSTEM REQUIREMENTS

To obtain the desired results we require a system which is reliable, secure and efficient also. The framework's prerequisites are as per the following. A framework must-

- support real-time continuous and exact data collection.
- need to store the information precisely.
- support mobility.
- Minimum power consumption and 24/7 accessibility.
- compact, fast and field configurable.

- use off-the-shelf components, devices, and standards.
- easy to use and deploy.

**Hardware Architecture-** Our design uses basically 3 components as explained below, Arduino, zigbee module, sensors.

**Arduino:** The Arduino Uno pack is a microcontroller board in light of the ATmega328. It contains 14 advanced digital I/O pins ( 6 pins can be utilized as PWM yields), 6 analog inputs, a USB association, an ICSP header, a 16 MHz precious crystal oscillator, a force jack and a reset catch. Arduino has everything needed to backing the microcontroller; it just needs to associate it to a PC utilizing a USB link or force it with AC-to-DC connector or battery to begin. The Uno board is not quite the same as all other going before boards in which it doesn't utilize the FTDI USB to serial driver chip.



Fig.(2) Arduino Uno Board

**Zigbee:** Zigbee is a wireless transceiver module. It is low power consumption device and having transmission distance upto 100 meters. ZigBee has a characterized rate of 250 kbit/s, ideally equipped for irregular information transmissions from a sensor or data gadget. Zigbee gadgets decreases normal current on account of low inactivity. Zigbee chips are incorporated with microcontroller and radios that have between 60 to 256KB flash memories. Zigbee works in ISM band of 2.4GHz.

**Sensors:** LM-35 temperature sensor is utilized. The LM35 IC is exactness incorporated circuit temperature sensor, output voltage is straightforwardly corresponding to the Celsius temperature. Hence it has preference that client does not require to subtract an extensive consistent voltage from the output to get Centi-grade esteem. It gives common correctness's of  $\pm 1/4^{\circ}\text{C}$  at room temperature and  $\pm 3/4^{\circ}\text{C}$  over a full  $-55$  to  $+150^{\circ}\text{C}$  temperature range.

MPL 500 pressure sensor offer pressure, vacuum, and differential detecting, delicate to as low as 0.10 in/ H<sub>2</sub>O. Their precision and dependability offers us a great broadly useful low weight to electric interface for checking and control applications. It has Miniature size and cost. It has operating temperature of  $-40$  to  $120$  degree Celsius. It has

Fixed & Adjustable Set Points and Variable Port Configuration.

**Software Requirement:** We have used XCTU for configuring the zigbee modules provided by xbee ltd. Arduino IDE is used to program Arduino UNO board.

The tool used creating the module is LabVIEW by National Instrumentation. It is visual or graphical programming tool for creating program. It is very powerful and generic programming language which creates VI i.e. virtual instrument and can be called in other VI as sub VI for ease of programming.

## VI. RESULT

LabVIEW calls information from arduino by utilizing a serial port module. The working state of serial parameters must be the same as the microcontroller system. A visual interface is made to convenient demonstrate each sensor state.

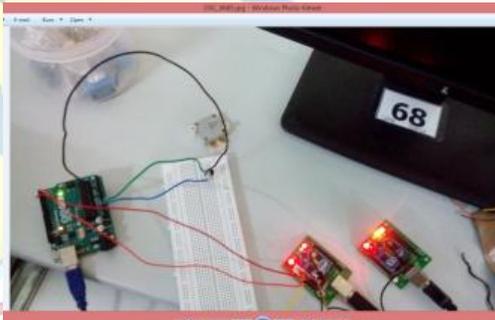


Fig.(3) Hardware circuit

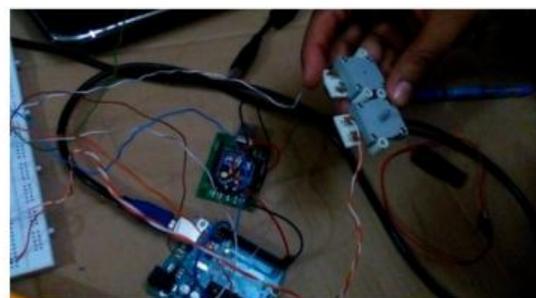


Fig.(4) Circuit using sensor

Figures (3) and (4) shows the hardware circuitry which is used to make this project. In this initializing of circuit is done by perusing serial port and serial information from microcontroller.

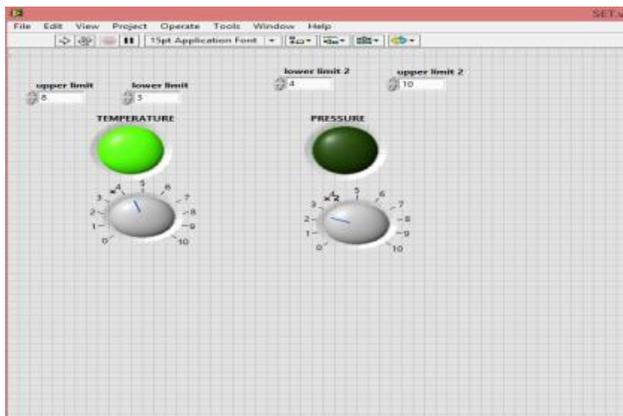


Fig.(5) Front Panel

Fig.(5) is the observing interface and the lights demonstrate that sensors states opportune. In the event that sensors work ordinarily, the lights are lit, otherwise go out.

## VII. CONCLUSION

This paper puts forward a new route of sensors states checking construct in light of LabVIEW and remote hubs. Remote module transmits information, then remote station by microcontroller gathers information and sends them to the wireless terminal. It is more temperate that LabVIEW can read information by a serial port than the customary data acquisition card. Test results demonstrate that the framework is dependable and precise, so it can be connected in numerous fields, for example, blast confirmation execution prerequisites higher or remote caution framework and alarm systems.

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