

INDUSTRIAL POWER SUPPLY PARAMETER MONITORING AND CONTROLLING OF DEVICE USING LABVIEW

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Abstract - Monitoring of power supply parameter and control of electrical device is very important in the industrial processes. So, The aim of our design is to make Wireless Data transfer System Using Wireless sensor network, which is based on low-power ZigBee wireless communication technology. This system contains sensor, microcontroller, ZigBee devices (Transceiver unit), and PC (Lab VIEW). For making whole system wireless first we have made Wireless Sensor Network using ZigBee devices, in which the sensor sense the data and it is given to microcontroller for processing and it converts the signal from analog to digital. Then it is given to the transmitter unit that is of ZigBee device and it will transmit data to PC through ZigBee technology. Now ones the data which has been received by PC through USB Stick, tha. Now our data should be placed in particular row and column in Excel Sheet, for this purpose we have used Excel Toolkit in Lab VIEW. With the help of Excel Toolkit contained in Lab VIEW, we can store the continues data to the predefined designed Excel Template that is transmitted by the sensor. And also in labview we are going to create real time graph which plots the temperature, humidity, Voltage, Current, power, power factor etc..

Key Words: Industrial Power systems, Monitoring, Virtual instrumentation, Energy monitoring, Lab view, Zig bee, etc ...

1. INTRODUCTION:

In this project we are going to make whole industry automatic by arduino and lab-view. The automation is done with the help of sensor network, Arduino and lab view. The data from sensors is sent or received by zig bee. After receiving the data is sent to the PC. In PC lab view take the data, process it and plot the various quantity on real time graph. On the field there is one circuitry which connected with sensors, load (devices) and zig-bee. On lab-view we are going to create real time graph which plots the temperature, humidity, Voltage, Current, power, power factor etc.

1.1 problem defination:

Few years ago the industries have faces many challenges because of all work are completed manually

in industries by the workers. So the accuracy is not so much due to little errors occurs in processes. and the production is not produces more and it taking too much time . Because of manually working the time is also consumes very much in some little work. And this working condition is not safe for workers due to some big machinery are dangerous for workers. And for monitoring and controlling they required to check manually so it risky for workers. Due to this type of problems we need the invention in technology.

1.2 Solutions by this project:

- Required less time for same function monitoring and controlling of parameter.
- Elimination of setup time.
- Safer working condition.
- Better product quality.
- Higher accuracy.

2. LITURATURE SURVEY:

In the present days interfacing with the LABVIEW and monitoring the process is not available. In the present days interfacing with the LABVIEW and monitoring the process is not available.[1] This paper presents the importance of optimization of power in Industrial wireless sensor network and elaborated various methods commercially available to attain power optimization and also detailed how the power optimization can be done through the modification could be done in the components of wireless sensor networks. Also dealt the routing based methods practiced in general to reduce the power consumption. [2]In this paper a simple technique for real time remote monitoring of electrical parameters across the load that is supplied from the single phase supply is presented. The main objective of this work is to create a continuous information obtaining framework based on embedded system and to continuously share this information with the intended user on the

External server in virtual environment of LabVIEW. Therefore the front panel VI containing the recorded data values is continuously provided to the remote operator that enables him to know the real state of the electricity consumed and the power consumed in the premises.[3] To assure electric power system and used in safe state, we urgent need to monitor, analyze, and measure various electric power parameter, which can provide rectifying and reforming scheme effectively, strength preventive measures, and assure electric power operation in safety, reliable, and economic. So, electric parameter monitoring technology emerges.[4] The implementation of software for monitoring of PQ beyond the advantage of reducing cost, the monitoring is carried out remotely and by multiple users, it has the flexibility of using different methods of analysis, unlike the analysis restricted to only one method. The traditional analyzers are very powerful, expensive and designed to perform one or more specific tasks defined by the manufacturer.

3. BLOCK DIAGRAM:

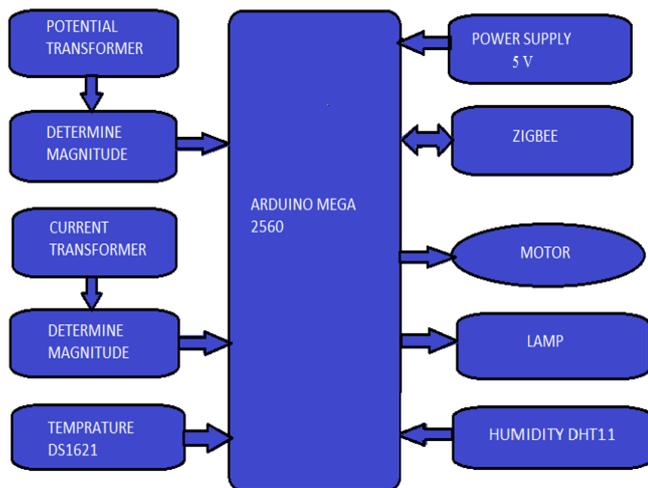


Fig. 1 : Transmitting Side

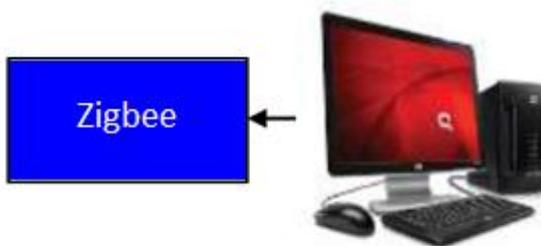


Fig.2 Receiving side

3.1 Components Description:

- **Step down Transformer:**

When AC is applied to the primary winding of the power transformer it can either be stepped down or up depending on the value of DC needed. In this circuit the transformer of 230V/12-0-12V is used to perform the step down operation where a 230V AC appears as 12V AC across the secondary winding. One alteration of input causes the top of the transformer to be positive and the bottom negative. The next alteration will temporarily cause the reverse. The current rating of the transformer used in this project is 500mA. Apart from stepping down AC voltages, it gives isolation between the power source and power supply circuits.

- **Bridge 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. A bridge rectifier makes use of four diodes in a bridge arrangement to achieve full-wave rectification. This is a widely used configuration, both with individual diodes wired as shown and with single component bridges where the diode bridge is wired internally.

- **Current Transformer:**

Instrument transformers (ITs) are designed to transform voltage or current from the high values in the transmission and distribution systems to the low values that can be utilized by low voltage metering devices. There are three primary applications for which ITs are used: metering (for energy billing and transaction purposes); protection control (for system protection and protective relaying purposes); and load survey (for economic management of industrial loads. Generally, the metering ITs require high accuracy in the range of normal operating voltage and current. Protection ITs require linearity in wide range of voltages and currents. During a disturbance, such as system fault or overvoltage transients, the output of the IT is used by a protective relay to initiate an appropriate action (open or close a breaker, reconfigure the system, etc.) to mitigate the disturbance and protect the rest of the power system.

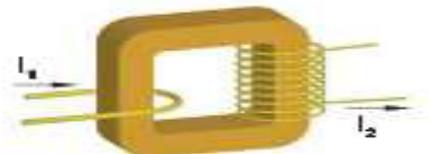


Fig.3 Current Transformer

• **Relay :**

A relay is an electrically operated switch. Current flowing through the coil of the relay creates a magnetic field which attracts a lever and changes the switch contacts. The coil current can be on or off so relays have two switch positions and they are double throw (changeover) switches. Relays allow one circuit to switch a second circuit which can be completely separate from the first. For example a low voltage battery circuit can use a relay to switch a 230V AC mains circuit. There is no electrical connection inside the relay between the two circuits; the link is magnetic and mechanical.

• **Zigbee:**

The technology defined by the ZigBee specification is intended to be simpler and less expensive than other wireless personal area networks (WPANs), such as Bluetooth or Wi-Fi. Applications include wireless light switches, electrical meters with in-home-displays, traffic management systems, and other consumer and industrial equipment that require short-range low-rate wireless data transfer.

Its low power consumption limits transmission distances to 10–100 meters line-of-sight, depending on power output and environmental characteristics. ZigBee devices can transmit data over long distances by passing data through a mesh network of intermediate devices to reach more distant ones. ZigBee is typically used in low data rate applications that require long battery life and secure networking (ZigBee networks are secured by 128 bit symmetric encryption keys.) ZigBee has a defined rate of 250 kbit/s, best suited for intermittent data transmissions from a sensor or input device.



Fig.4 Zigbee module

4. SIMULATION:

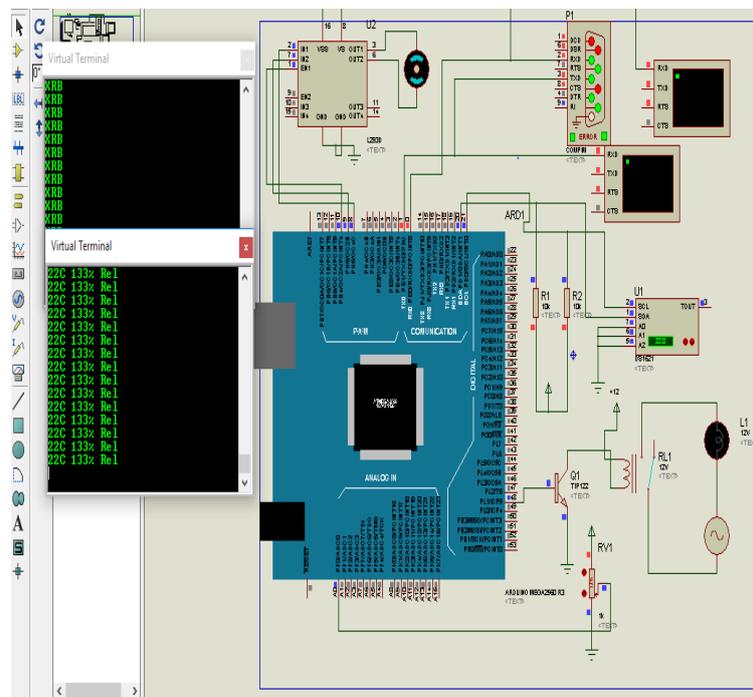


Fig. 5 protius design

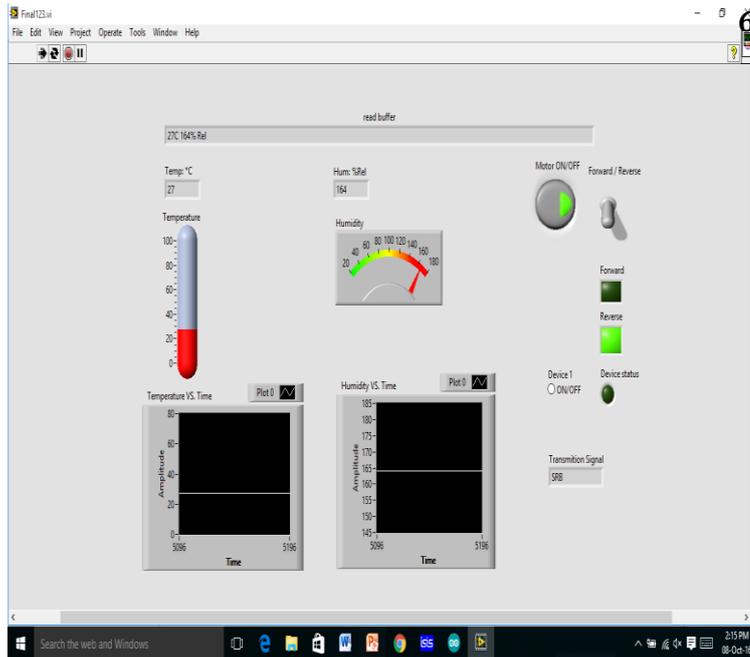


Fig.6 output in Labview

5. Hardware section:

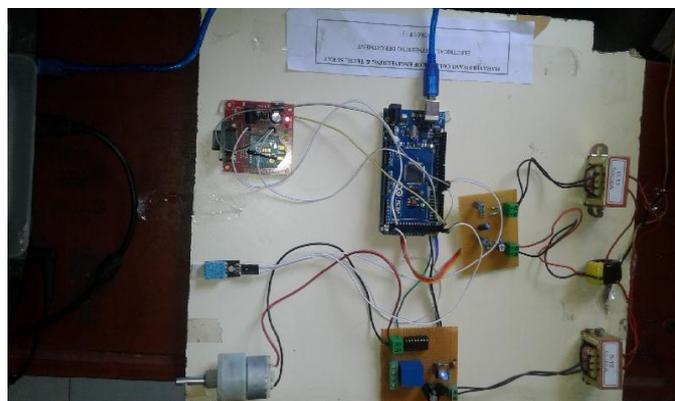


Fig.7 Transmitting section

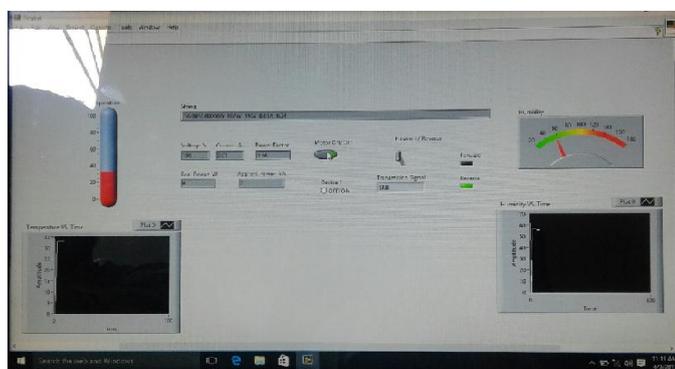


Fig.8 Receiving section

6. Advantages, Application and Future scope:

• Advantages :

1. This project controls the on-off action of the motor in the field.
2. Low cost and easy to implement.
3. Can cover maximum area in a field.
4. Can control electrical equipment in industry from any place in the industries..
5. The system is more compact compared to the existing ones, hence is easily portable.
6. Labour saving.

• Application :

- 1.Used in coal mine, bio gas manufacturing centers.
- 2.Used in power plant generation.
- 3.Agriculture field monitoring.
- 4.Home automation.
- 5.Industrial purpose.

• Future scope :

We improve this project by implementing this project to add more sensors and make it more accurate and cheaper by using the web based system.

7. Conclusion :

In this competitive world of industrial sectors all factories have been modernized using automation the industrial automation has played an important role in biogas manufacturing centers in our projects we have suggested an innovation proposal which will take automation in industries .The proposed model of lab view has several distinct advantage over the existing technology . The large amount of data and monitor to whole power consumption and also monitors and control the all power supply parameters like humidity, temperature, voltage and current with the help of zigbee network along with the sensor network and arduino mega also play an important role in the system. And zigbee also creates the network with sensors and the results which we get from the sensor data are shown in lab view software. The software

shows the result in a graph form of various power supply parameters.

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