REMOTE MONITORING AND DIAGNOSIS SYSTEM FOR WIND TURBINE USING IOT

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ABSTRACT: this paper presents wind energy is used as an alternate form of energy to meet the increasing energy crisis. Wind farms are set up in highly exposed sites. Wind is fluctuating in nature and hence a continuous monitoring system is needed. The wind turbine is used for converting wind energy into a useful form of energy. In this project the various parameters of wind are measured and monitored by setting up an instrumentation system. Due to environmental conditions, the remote location of wind farms, and the vertical height of the nacelle, it is expensive to physically visit wind turbines for maintenance and repair. So, we proposed the system to monitor the status of wind turbine from anywhere in the world using Internet of Things (IoT) technology. In our present work, it is declared that the system with IoT and PC to monitor and diagnose the problem in the wind turbine application. The work deals with the data transmission between two units in the exact time without any disturbance.

I. INTRODUCTION: Day by day there is very much increase in the electrical power generation it automatically increases in the use of wind turbine. wind energy is also termed nonconventional energy, renewable energy and clean energy. It one of major source for generating power. Major arguments of nonconventional energy usage are, the pollution at the atmospheric level as zero, Green house effect is not there.

Wind energy is the form of solar energy wind is used to generate the electricity, and wind energy is form of clean, free, and readily available in nature. Solar energy irradiating the earth from the air in motion by the wind results in the gradient of pressure is caused by the solar energy. By the motion virtue the energy is possessed by wind. To convert that wind and make it useful any device which is capable of moving can extract air is a part of energy. wind power are generated by using group of wind turbines.

Through the rotor it is possible to obtain 100% of air efficiency by preventing and halting the air through the passage. The available wind energy can be converted to mechanical energy by which we can convert 100% efficient wind generator to maximum of 60% can made usage. The efficiency of generation of power can be decreased to 30% in which loosed incurred by the generator can be added.

II. PROBLEM STATEMENT: Over a considerable area from one place to another distribution of uniform elements the pollutants and micro particles can be transported which are generated from industries and other resources.With the atmospheric air all the various locally generated air has been mixed for example by the wind blow the green places are mixed by the plant kingdom in the forest and other places where the oxygen is generated.

In significantly large number of including protected birds death of bats and birds are being more in wind turbine and also creation of soil erosion. Localized generation of air bome, dust. Plant communities should be remembered for advancement of civilization that some tolerable factor compromising the alternation and degradation of plant communities.

III. LITERATURE SURVEY:
3.1 EXISTING SYSTEM:

In the present world the main wind power system used for generation is the wind turbines. Outside countries for the eco friendly image also promotes the wind turbines, however less than 1% of the production of total electricity is inefficient collection of wind and wind turbines which are being considered as low cost. Noise pollution is also caused, in Europe for their daily maintenance the large scale wind farms are being used instead of wind turbines but it is difficult there for trouble shooting because it is costly to cease their operation causing some of them to be prevalent.

3.2 PROPOSED SYSTEM:

Using IOT we can design a multi wind generation of power system which is the main objective of the project. By making use of power generator modules the system can be implemented in which it is difficult to monitor all the wind mills manually where the collected air is sent to domestic and industries areas in return the systems will also be connected with DC generator and power supply but this will work in priority only when the wind system is demand of the wind energy. It is difficult to identify and diagnose the system which is not working properly this can be made standalone and grid connected nodes.

IV. LIST OF COMPONENTS:
4.1Hardware Requirements:
1.   ARDUINO
2.   LCD Display
3.   Power Supply unit
4.   Wind mill module
5.   Connecting wires

4.2. Software Requirements:
1. Operating System: Windows 7
2. Tool: ARDUINO
3. Compiler: ARDUINO

V. COMPONENT DESCRIPTION:

5.1 ARDUINO: It is a microcontroller board and is built on AT mega328. The board mainly consists of

- 16MHZ quartz crystal
- 14 digital input and output pins out of which 6 pins are configured and used as PWM outputs,
- power jacks
- USB ASSEMBLY
- ICSP header and a reset button
- 6 analog input pins

To start with the arduino we need to power it with a AC to DC adapter or a battery. The arduino board can be connected to the personal computer via USB cable. We can work and program the arduino without worrying too much about erroneous conditions as we can replace the chip just for a few bucks to start programming from the beginning.

The arduino is also called as Genuino Uno where in the word "UNO" is an Italian word which signifies "ONE". It is the primary key version for many series of arduino boards and as well as for the orientation model of arduino platform.

5.2 LCD

There are many sources kinds of displays in electronics, one of the commonly used for prototyping is liquid crystal display. Most commonly used input devices is LCD is 16x2 display, these is a basic module that is used in every basic prototype.LCD modules are alternative for light emitting diode 7-segment modules. The reason preferred is, LCD is more accurate and easy for debugging. The cost of lcd is very much inexpensive.LCD do not only print the character but also can program special character and user defines custom made characters like smiles etc.

5.3 WIND MILL

wind mill basically converts the kinetic energy into electrical energy by using electric generator attached to wind mill fan. There   are types of generator in motor used for wind power generation. Fixed rotational speed generators and variable speed generators both are advantages in there own way depending the types of are there installed.

It is important to know how formed, that is due to variation of heat in the layers of atmosphere where the heat is produced from sun. where earth rotates heat various at these point wind is generated. The of wind depends on amount of sun lights ,the lesser the sun light, more the wind with less heat. The flow of wind will completely depends on the type of area, the types of land and the amount of plants are there in that region. Usually hill region produces lot of wind since its peak is high and now obstacles.

VI. BLOCK DIAGRAM:

fig 1: block diagram
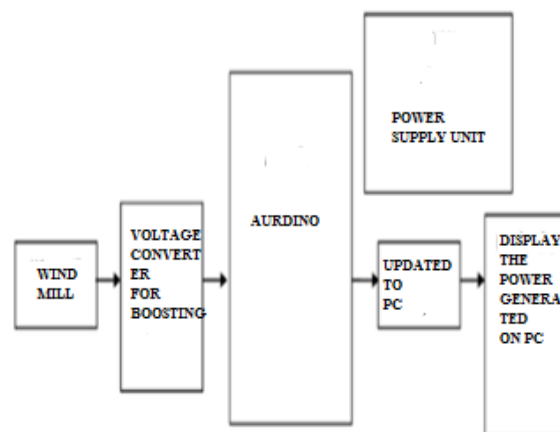
VII. METHODOLOGY:

- Wind power has boomed in the development of new energy. The wind power has boomed with the.low cost and resources which are clean and the supply in the operation of national electric grid is due the wind parks proliferation. Based on the controlling and monitoring of remote the establishment and maintenance of proactive wind turbine machines has been increased. In the wireless communication of offshore and inaccessible locations the wired method has flaws that are necessary for the real-time.

- To increased the productivity and lifetime of any wind turbine this is the main objective. The wind turbine this is the main object. The wind turbine parks for monitoring system and remote control hardware has been design need Through computers machine sensors collect.

➢   In the long term reserves of exhaustion to search a different substitution kind of energy the energy fossil fuels prices rise against the demand of energy in the world in front of the huge increase .The research of other gases has lead the government to readuce the green house effect of the commitment feature more.

➢   The resources are safe, natural, clean and economic because it offers encouraged development of this alternatives. In the recent year the wind energy has increased numerously one compare to all the other renewable energies.A considerable production of energy which of electrical with less expensive a part from the budget of construction and maintenances.the multiplication of wind park capacities has numerously increase the find energy investment in the recent days .

VIII. FUTURE WORK

In future with internet in additional we used GPS and GSM we track the exact location of windmill and take necessary control action on failures. Also, we can increase parameter for monitoring and controlling by increase sensors.

When we consider the different forms of alternative energy available to us, wind power is probably one of the most cost effective and efficient methods of power generation. Wind energy is available without any cost and it does not emit any greenhouse gases. This makes it a great source of energy production for any developing state.

XI. CONCLUSION

Fig:9.1 final project model

Wind-generated electricity is becoming more important as a pillar of the energy transaction Onshore Wind turbines are one of the primary electric power generators nowadays, although offshore wind turbines offer the greatest potential in growth of the energy market.

A step-by-step approach in designing the microcontroller based system for wind turbine monitoring in of the four essential parameters to monitor speed, current, vibration, has been followed. The results obtained from the measurement have shown that the system performance is quite reliable and accurate. The system has successfully overcome quite a few shortcomings of the existing systems by reducing the power consumption, maintenance and complexity, at the same time providing a flexible and precise from of securing the wind monitoring.

Wind power has boomed. It is due to the proliferation of wind parks and their operation in supplying the national electric grid with low cost and clean resources. Hence, there is an increased need to establish a proactive maintenance for wind turbine machines based on remote control and monitoring. That is necessary with a real-time wireless connection in offshore or inaccessible locations while the wired method has many flaws. The objective of this strategy is to prolong wind turbine lifetime and to increase productivity. The hardware of a remote control and monitoring system for wind turbine parks is designed. It takes advantage of wireless module to collect data measurements from different wind machine sensors through Computer.

X. REFERENCES:

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