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Wireless sensor network platform for monitoring the industrial apparatus

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ABSTRACT

Wireless Sensor Networks (WSNs) are one of the fastest growing and emerging technologies in the field of Wireless networking. WSNs have a vast amount of applications including environmental monitoring, oil and gas, agriculture, inventory control, robotics and health care. This paper focuses on monitoring and protection of oil and water operations using WSNs that are optimized to decrease installation, and maintenance cost, energy requirements, increase reliability and improve communication efficiency. Such model could provide new tools for research in predictive maintenance and condition-based monitoring of factory machinery in general and for open architecture machining system in particular. Wireless sensing no longer needs to be relegated to locations where access is difficult or where cabling is not practical. In our project we are using sensor such as vibration, temperature, level sensor, weight sensor

Keywords- Wireless sensor Networks (WSNs), Microcontroller, temperature sensor, level sensor, vibration sensor, weight sensor

INTRODUCTION

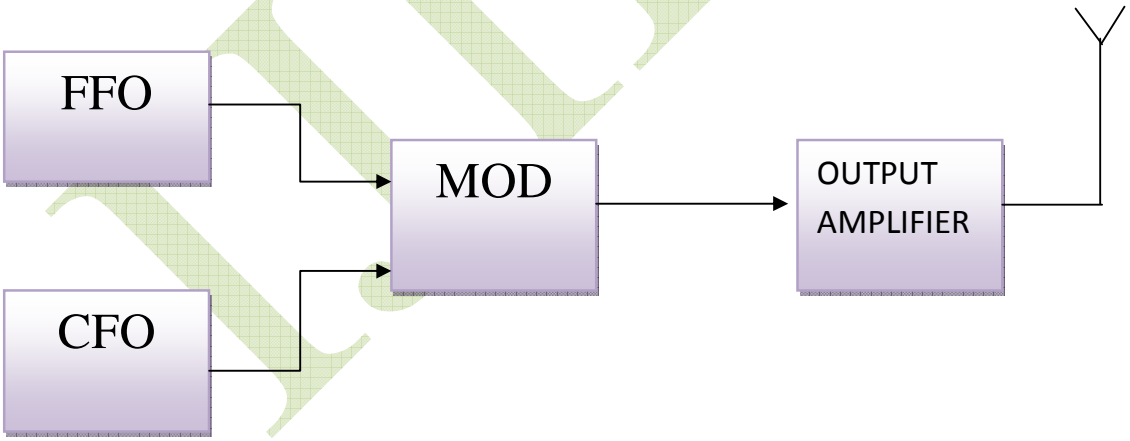
A wireless sensor network (WSN) consists of sensor nodes also called as source nodes with sensing and computing capabilities, which sense, transmit the collected data and monitor the physical parameter using wireless communication technologies. Source nodes are the nodes which cooperate with neighbouring nodes to achieve the service which they provide. Wireless sensor network technology provide less costly, faster and more convenient option to a wired sensors systems Wireless sensor network can also perform in –network processing operation such as aggregation, actuation and event detection. Wireless sensor network is also used for monitoring applications including forests, waterways, buildings, security, the battlefield and the monitoring parameters like temperature, pressure, flow. It has remarkable application in industrial automation for manufacturing and process control automation. Wireless sensor technology would have a greater influence on applications. We made a sensor platform, which is called as Sprouts. Sprout is a readily deployable, physically rugged, network standard, volumetrically miniature, modular, and easy to use platform for harsh industrial environments. The Sprouts platform is the unique WSNs in industrial environments. In the course of the above processes, there exists a need for extensive monitoring of various parameters through the aid of large number of sensors. These sensors are placed at one module with transmitter measure different data about parameter performance. Over the years, sensors have worked effectively together through wired cable links, but in this paper we used wirelessly

Fig. 1. Sprout platform

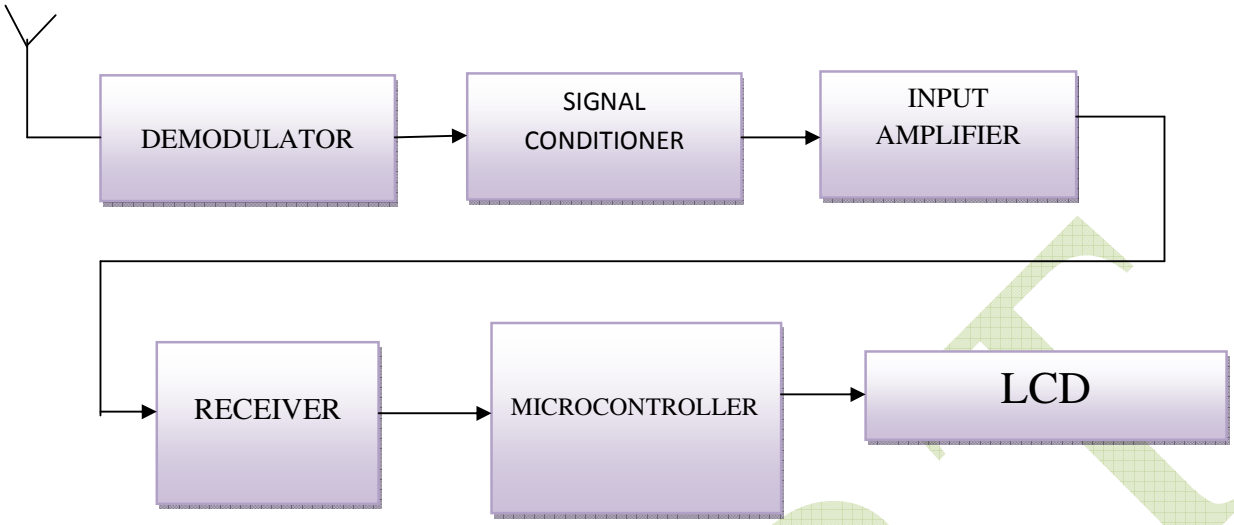
METHODOLOGY

In this paper there is transmitter and receiver part as shown in fig.
Design of the system:-

Block diagram of transmitter



Block diagram of receiver



In this system when oil and water is poured in a container they are purified and then by using temperature sensor which is also called as thermostat. The amount by which the resistance decrease as the temperature decreases is not constant. It varies with temperature. A formula can be used to calculate the resistance of the thermostat at any given temperature, the temperature of oil is measured whether it is high or low, level sensor will detect the level of water in the container ,it measure the level within a specified range and also plays very important role in industrial application. The weight sensor will measure the weight of the sprout platform and the vibration sensor detects the problems of machine and repairs before the event of machine failure. It will detect the condition of the sprout platform, vibration measurement allows industrial plants to increase efficiency and save money, and all these sensors are connected with the transmitter. Transmitter, local receiver and the receiver all these are communicated with each other wirelessly. The local receiver will receive the data from the transmitter and that data will be displayed on the receiver which placed far away from transmitter and local receiver module.

TECHNIQUES USED

The technique used for system is wireless sensor and embedded c. As the name suggests wireless sensor network, it means all the sensors are connected without any use of wires in the different modules .Example Transmitter and receiver. All the components of the modules are interfaced with each other. For interfacing the embedded c software used, it is set of language extension of the c language which is further extended by embedded system and became the embedded c. The syntax and other functions used in the embedded c is same as the standard c. Example loops, arrays and strings ,condition statements and main( ) function etc.
All the components which are on the transmitter part are interfaced with main field where DC transformer used as the supply then the transformer will transfer the data to the receiver where microcontroller is connected and the component which are there on the receiver are interfaced with it and at the end of the main receiver which is available at long distance from the receiver and will receive the data from the microcontroller and parameter reading will be shown at the LCD display.

CONCLUSION

As we have discussed throughout the paper, we have used various sensors to measure the temperature, vibration, weight, and level of the equipments by using the concept WSN which is applied in oil refineries and petroleum production etc. The above sensors like temperature sensor is used for measuring the temperature of oil and water, vibration sensor will detect the vibrations of the mesh, level sensor is used for measuring the

level of oil and water and lastly the weight also called as strain gauge for measuring the weight of mesh so that it could not get overweight.
The main Moto of this project is to communicate from the long distance and that to wirelessly.

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