

PARAMETER MONITORING OF COLD STORAGE BASED ON EMBEDDED SYSTEM

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ABSTRACT

Proposed system describes a remote monitoring of temperature, humidity, power supply, conveyor belt mechanism, light intensity control, voltage control for cold-storage. Unfortunately, "hen an operator goes out from the cold-storage, the temperature could he changed due to the various reasons, for an example, a valve of cooler is broken.

There is the problem in the existing system that an operator always stays in the cold-storage to adjust the temperature and manage the system. To overcome the problem, we propose a remote monitoring system. The system increases the efficiency of operator.

Thus, the monitoring system to show the temperature, humidity, power supply, conveyor belt mechanism, light intensity control, voltage control is required to the operator who outside of the cold storage. Therefore, this paper describes the remote monitoring system of the temperature, humidity, power supply, conveyor belt mechanism, light intensity control, voltage control. The proposed system is expected to help the operator for the parameter monitoring of products that are required to be stored cold.

In order to balance the environmental deviation between different areas, the system used multi-channel sensors without effecting control accuracy to continuous check environment. By using the mediate filter technology and fuzzy control approach the system solved the problem that actuator shocked frequently. At the same time, the system improved relative humidity of clod store by time defrosting. Working principle of the system and design idea on hardware and software were introduced.

The system centralized on LPC2148, used sensors to gather data and regulated cold store's environment through program. The practical results show that this system is simple, stable and easy to control.

Keywords: - automatic system; communication module; control system; parameter monitoring.

1. INTRODUCTION

Parameter monitoring of cold storage systems are capable of maintaining environmental parameters of all stored items. It has been commonly used in food industries in order to maintain the freshness of food products in the latter years. The usage of automatic parameter monitoring has several advantages over non-automated systems. Savings in labor costs and floor space, increased reliability and reduced error rates are the examples of automated parameter monitoring of cold storage. Parameter monitoring system integrates device control and computer information management. It monitors temperature, humidity, power supply, conveyer belt mechanism, light intensity control, voltage control etc. in accordance with control command. It helps monitoring storage technique achieve full automation [1][2].

Management system and control system are very important parts to maintain the reliability of the product. Parameter monitoring system is designed to monitor such basic parameters as temperature and humidity of goods, obtain the storage efficiency and cooperate with control system to achieve full automatic parameter monitoring of cold storage [4].

Monitoring system is the use of control systems such as programmable logic control, numerical control and other commercial control systems reducing the need for human intervention, to control industrial machinery and processes. Automation is a step beyond mechanization in the scope of industrialization [3].

Automatic monitoring system highly decreases the need for mental requirements as well as human sensory. Monitoring systems and processes can also be automated. It leads to controlled processes and actions that allow a tight control of almost any industrial process [5].

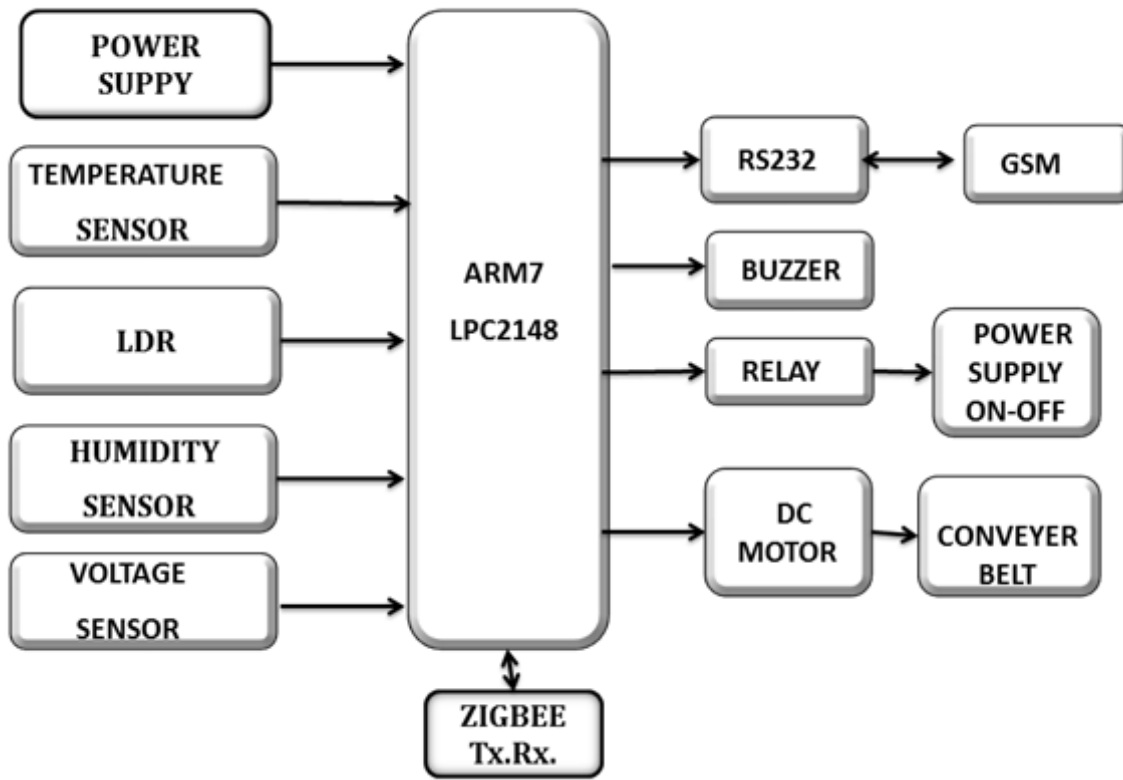


Fig-1. Block Diagram of Transmitter Section

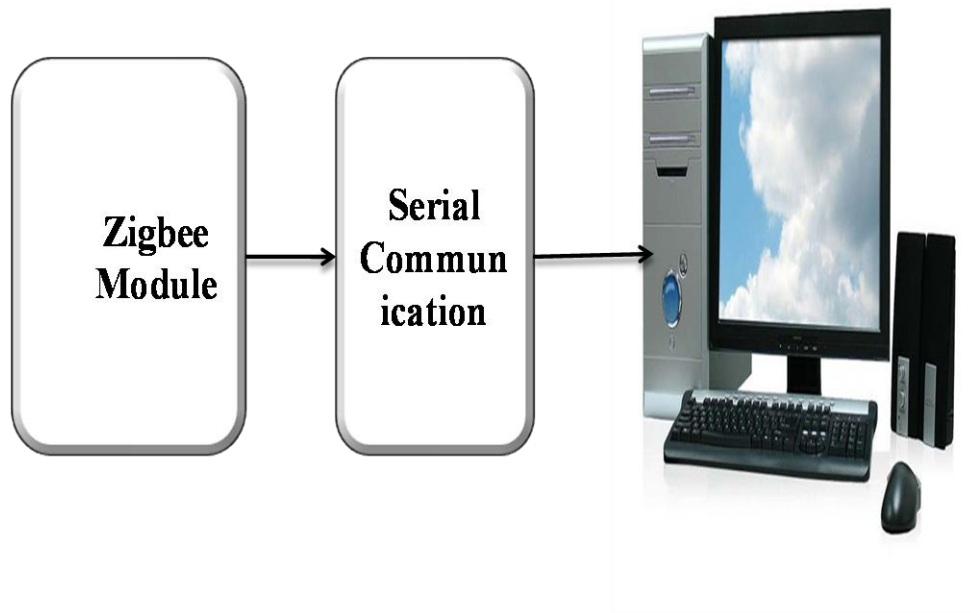


Fig-2. Block Diagram of Receiver Section

1.1 TEMPERATURE SENSOR

The LM35 series are the temperature sensors, whose output voltage is linearly proportional to the Celsius (Centigrade) temperature and it is precision integrated circuits. They are better than the linear temperature sensors. In LM35 it is not required to subtract a large constant voltage from its output to obtain convenient Centigrade scaling. The LM35 thus has an advantage over linear temperature sensors.

To provide typical accuracies 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 the LM35 does not require any trimming or external calibration. By trimming and calibration at the wafer level, lost cost is assured. The LM35's low output impedance, linear output and precise inherent calibration make interconnecting to control circuitry is very easy.

1.2 HUMIDITY SENSOR

In various applications such as instrumentation, automated systems, agriculture humidity measurement is significant issue. The aim of this review is to provide categorization between art humidity sensor types, sensing substances, principle of work, production technologies and transducer mechanism. It provides advantages over other technologies in terms of the selection of shape and size of the sensor structure. It is known that humidity plays a important role in every part of the Earth in automated industrial processes and biology. It is essential to monitor, detect and control the ambient humidity to have a desirable surrounding atmosphere under different conditions ranging from low temperature to high. It needs better transducer performance for humidity sensor.

Humidity sensors are designed for cost efficient and high volume applications such as corporate automation, automotive chamber air control, industrial process control systems and home appliances. Where humidity compensation is needed, in that case humidity sensors are useful.

1.3 SERIAL COMMUNICATION – RS232

Protocols RS232 are used to transfer commands and data between a personal computer and a microcontroller is the use of standard interface. For such an interface hardware is provided on board. A string of numbers of the same interface is send to the receiver also with the same interface an example is provided a message is conveyed through it.

Signals used in communication, and the hardware to transfer signals between devices are defined by the RS232 protocols. To transfer character the time diagram of the typical signal used by it.

1.4 ZIGBEE TECHNOLOGY

The wireless technology is becoming one of the most important areas of research. The most widely used transceiver standard in wireless sensor networks is a ZigBee technology. Data collection, transmission, and processing are the functions that WSN have. As compared to traditional wired network it has many advantages over it such as, convenient organizing network, small influence to environment, low power dissipation, low cost, etc. At present, near field wireless communication technology has been used widely, especially infrared, wireless local area network (WLAN), Bluetooth, etc. But, they have a number of disadvantages such as, complexity, large power dissipation, short distance, networking in small scale.

1.5 LIGHT SENSOR

The light sensor is nothing but the light dependent resistor (LDR). It is made up of cadmium sulfide (CdS). Its resistance is inversely dependent on the amount of light falling on it. It is also called as the photo resistor, photo resistor, photoconductor, photoconductive cell, or photocell. A typical structure of a photocell uses an active semiconductor layer which is deposited on an insulating Substrate.

To enable it to have the required level of conductivity, the semiconductor is lightly doped. Then the contacts are placed on either side of the area which is exposed. The photo-cell, cadmium sulfide, or LDR finds many uses as a low cost photo sensitive element. It was used for years in photographic light meters and also in some other applications such as flame, burglar detectors and flame, lighting controls for street lamps and card readers. For design engineers LDR with high quality performance, the commercial grade PGM photo resistor offered by token electronics.

1.6 DC MOTOR

Almost every mechanical work that we want to do is accomplished by an electric motor. Electric machines are converting energy into some other energy. Mostly DC motors take electrical energy and produce mechanical energy. Electric motors are used to operate hundreds of devices we use in industrial application & home appliances. DC motors are of different type & various sizes. Some application where motor can be used is automobiles section, robots, hand power tools and food blenders. DC motors are differing by their ability to operate from direct current. DC motors have one set of coils, called armature winding, & also inside of it another set of coils or a set of permanent magnets, called the stator. When voltage is applied to the coils, it can produce a torque in the armature, resulting in motion. A conductor that lying perpendicular to a magnetic field, electric energy can be passed through it then interaction of current flowing in the conductor and the magnetic field will produce mechanical force.

2. CONCLUSION

Using embedded system, it achieves remote monitoring for parameter such as temperature, humidity and power supply, conveyer belt mechanism, light intensity control, voltage control increases reliability and flexibility of control system. All of above take the foundation to response speed in real time.

3. REFERENCES

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