

Baby Incubator Using Microcontroller & GSM

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Abstract:-This paper helps to prevent the death of such babies & this system can be used for infants at home or in a hospital nursery room. The microcontroller based baby incubator helps to all peoples, the cost this project is very less than today's baby incubator which are used in big hospital. So, everyone which belongs to economical backward also use of it. SMS based Baby Incubator using GSM technology has main application in Hospitals. SMS is sent to the user whenever Temperature or Humidity crosses threshold level. This user should be Doctor or care taking person of baby. Whenever Temperature rises above a threshold level at that time a Relay is turned on. We have provided a 12 volt DC fan at the output of Relay. This should be connected to a heater. The intensity of bulb varies with the increase in Humidity value this controlling humidity, voice of baby, oxygen level & weight.

Keywords:-Humidity Module, Temperature, GSM Module, Weight Module.

1. INTRODUCTION

A new born baby needs high care to have good health. Higher care should be taken round the clock. This system implements an automated system which monitors the environmental conditions around baby and keeps those .The sensors are used to measure parameters like temperature, humidity and oxygen content. Based on the weight of the baby, various parameters are fixed, if the measure values exceed to fixed limit immediate action will be taken within a limit.

2. SUMMARY OF PROJECT

Hence above we discussed about that major parameters such as humidity, temperature which need to be continuously monitored for a just born baby to live a life and how baby incubator as a device can take care of all these three major parameters in comparison to the other devices which cannot do so at one time. Incubators are attracting interest from the medical profession. They are glass and metal cases heated to certain Humidity, into which enough air is admitted to maintain life. Until such time as infant is strong enough for Humidity of room. In baby incubator Humidity control is very important. And therefore we are controlling the Humidity according to our requirements. Humidity controller can be done by using Electronic circuit, Microprocessor & microcontroller. Now microcontroller is advanced among all above circuits therefore we are using Microcontroller for Humidity controlling of baby incubator.

3. BLOCK DIAGRAM

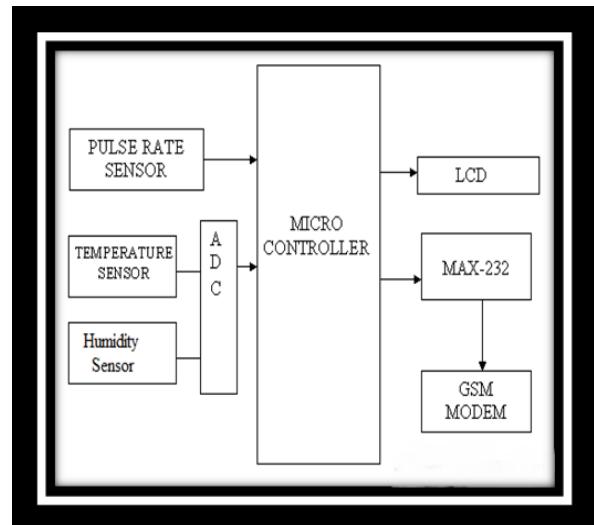


Figure 1. Block diagram of baby incubator using GSM

4. PRINCIPLE OF OPERATION

SMS based Baby Incubator using GSM technology has main application in Hospitals. This project has a Temperature sensor and a Humidity sensor. SMS is sent to the user whenever Temperature or Humidity crosses threshold level. This user should be Doctor or care taking person of baby. Whenever Temperature rises above a threshold level at that time a Relay is turned on. We have provided a 12 volt DC fan at the output of Relay. Whenever humidity rises above a threshold level, at that time microcontroller pulses to a heater. For demo purpose, we have connected a bulb at the output.

The intensity of bulb varies with the increase in Humidity value.

- **Humidity Sensor:** Humidity sensor works on the principle of relative humidity and gives the output in the form of voltage. This analog voltage provides the information about the percentage relative humidity present in the environment.
- **Temperature Sensor:** The LM35 is an integrated circuit sensor that can be used to measure temperature with an electrical output proportional to the temperature (in $^{\circ}\text{C}$).
- **ADC:** Mostly real world signals are Analog. Such signals are sensed through the sensors e.g. Temperature LM35. MCU/CPU processes only digital signals. ADC devices convert these analogy signals into digital to be processed by the MCU/CPU. ADC0808, 0804, etc.
- **Microcontroller:** microcontroller, as the name suggests, are small controllers i.e. called as single chip computer. This single chip computer is embedded into other systems to function as a processing/controlling unit.
- **LCD:** A liquid-crystal display is a flat panel, electronic visual display that uses the light modulating properties of liquid crystals. Liquid crystal does not emit light directly.
- The LCD can represent characters in ASCII.
- Two 8-bit internal registers: Instruction Register (IR) to write instructions to set up LCD
- **Heater:** The heater is used to increase the temperature if it has exceeded the specified value and bring it up to the normal value, hence protecting the baby. The heater used in our project is demonstrated in the form of a bulb. A relay circuit is used for the switching mechanism of the heater.
- **Fan:** The fan is used to decrease the temperature if it has exceeded the specified value and brings it down to the normal value, hence protecting the baby. A relay circuit is used for the switching the voltage from 5V to 12V, the Voltage required to run the fan.
- **GSM MODEM:** A GSM modem is one of the wireless modem. We can read, write and delete SMS messages & we can start Sending SMS messages with help of GSM modem.

5. ADVANTAGES AND DISADVANTAGES

5.1 Advantages

1. Easy for parents to monitor their baby.
2. Small in size.
3. Lightweight.
4. Cost efficient.

5.2 Disadvantages

1. The baby lies in a closed hood so it is difficult to access the baby for medical care. Various applications involved in baby incubator are as follows.
2. SMS based remote control and alerts.
3. Security application.
4. Sensor monitoring.
5. GPRS mode remote data logging.

6. FUTURE DEVELOPMENT

Any work, whatsoever precise it may be, has always some scope of improvement. Some of the future aspects of the work in terms of its improvements are discussed below:

We can provide voice feedback system

We can monitor more parameters like oxygen level and at the same time control the

Wireless transfer of data regarding parameters from infant's unit to the nurse monitoring station can be very beneficial for the doctors and nurses in critical monitoring of each infant in the nursery.

7. CONCLUSION

The project to be designed by keeping in our mind that the medical conditions available in rural areas. After completion of the project it can be effectively used by technicians in a small health care center. It can be a lifesaving machine for low birth weight infants. The chamber to be made is sufficient enough to accommodate the baby comfortably. As the electronic part is separated from the Baby's compartment baby can be assured as safe. The project to be made is simple and efficient in maintaining the temperature of the chamber irrespective of the outside temperature. By keeping in mind the cost the project requires moderate cost.

8. ACKNOWLEDGMENTS

Words are often to less to reveal one's deep regards. An understanding of the work like this is never the outcome of the efforts of a single person. I take this opportunity to express my profound sense of gratitude and respect to all those who helped me through the duration of this thesis. Firstly we extend our gratitude to Dr. Bhavesh Patel principal of S.A.K.P for his continuous support. We would also like to thank Mr.Sanjay M. Lunge Head of the department of Electronics and Telecommunication for his inspiration and guidance. First of all I would like to thank the Supreme Power, one who has always guided us to work on the right path of the life. Without his grace this would never come to be today's reality. This work would not have been possible without the encouragement and able guidance of our Mr. Gaurav Gawas for his valuable guidance and advice related to this work. We

thank all faculty members of department of EJ for all the help extended to us and for motivating us.

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