Abstract
This paper proposes a new real time web-based system for controlling Temperature, LDR, Weight, CO2 and MEMS parameter even under unexpected failure of sensors and protects the infant from short circuit. An implementation of a real time smart phone based system for monitoring Temperature, LDR, Weight, CO2 and Physical condition of neonatal by using MEMS. Under the monitoring of neonatal continuous Oxygen sensor supply is ensured. The algorithm is written such that the data is acquired continuously and compared with standard limits based on Upper Limits in case of temperature and is also used for other sensor. Temperature is of primary importance when it comes to incubator control and hence redundancy is applied for the temperature. When a short circuit is detected a warning message is displayed and immediately Logic OFF will be sent to all the Final Control Elements (Cooler, Heater) to protect baby from short circuit. The mechanics of observance are same (as adult), however we've got to be conscious of skin care, especially on our infants. It continuously helps that we will collect & send this data through mobile phone like a smart phone.
1. Introduction

Medical crisis attributable to lack of medical doctors, nurses and excessive expenditure of medical treatment tends to a lot of serious issues in keeping with population ageing during a world. Babies that are born after a pregnancy lasting 37 weeks or less are typically considered premature. Critically ill baby are a special group of patients that consist of premature infants who may suffer from diseases that are mainly caused by immaturity of their organs, and full term infants, who become severely ill during or immediately after birth[3]. There's currently some way to stay new born babies safe once they area unit born. Incubators area unit clear plastic cribs that keep babies heat and facilitate defend them from germs and noise. Incubators were expensive, that the whole space was usually unbroken heat instead. The incubator is considered as an air conditioned room with special specification which we can control it with respect to the condition of baby in incubator. Incubator is designed to provide an optimal environment for new-born babies with growth problems (premature baby) or with illness problems. The incubator is an isolated area environment with no dust, bacteria, and has the ability to control temperature, LDR, and Co2 to remain them in acceptable levels such as (36°C-38°C) for temperature [1].

The popularity of smart phone application stores (e.g.app store, android market) has opened an effective software delivery channel. Smartphone are becoming increasingly popular because of their capabilities and functionalities. Smart phone has open operating systems, such as Palm Operating System, Windows Mobile, Symbian, and Linux and scalable hardware-software multi-function. Cross-infection between babies was greatly feared. A number of the common issues related to premature birth of a baby are related to below mention:
- Breathing issues &Bleeding within the brain.
- Heart conditions, Gut and biological process disorders.
- Eye issues, Jaundice, Anemia, Infections

2. Block Diagram

![Figure 2.1: Block Diagram of Transmitter Section](image_url)
Temperature regulation is one of the most essential factors for the survival of newborn infants. Infants usually lose heat to their environment through physical phenomena, convection, radiation, and evaporation. Premature infants, compared to term infants, are at a greater disadvantage in temperature maintenance. The aim is to keep the baby in a thermo-neutral environmental zone. We have utilized the LM35; this is a positive temperature device used to sense temperature between 21°C to 150°C. The temperature sensor converts the temperature that's being perceived into a voltage output.

Features

- Suitable for remote applications.
- Low price due to wafer-level trimming.
- Current rating is 3mA
- Operates from four to thirty volts
- Less than sixty mA current drain.
- Low electrical resistance output, 0.1 X for one mA load.

II. MEMS

Micro electro mechanical systems. MEMS devices are miniaturized mechanical systems made employing a semiconductor fabrication technique. The sensor is a polysilicon surface-micro machined structure built on top of a silicon wafer. Polysilicon springs suspend the structure over the surface of the wafer and provide a resistance against acceleration forces.

The ADXL335 could be a little, thin, low power, complete 3-axis measuring instrument with signal conditioned voltage outputs. The merchandise measures acceleration with a minimum complete vary of ±3 g. MEMS are the foremost acceptable devices for motion compensation. This detector is employed for sensing a physical activity of baby. [5] The essential physical dimensions of...
MEMS devices will vary from well below one micrometre on the lower finish of the dimensional spectrum, all the thanks to many millimetres.

**Features**

- 3-Axis sensing.
- Small, low profile package
- Four millimeter × 4 millimeter × one.45 millimeter LFCSP.
- Low current consumptions 500μA.
- Low voltage operation: four V to nine V (DC).
- 10,000 g shock survival.

**III. CO2 sensor**

The CO2 Gas Sensor is somewhat sensitive to temperature changes. In most cases, variations in CO2 readings due to temperature changes are small (<100 ppm on LowRange, <1000 ppm on High Range). The sensor is designed to operate between 20°C and 30°C. It's compact, robust, simple to handle, in traditional applications maintenance-free and thus particularly appropriate for watching air quality in interior rooms.

The infrared instrument determines absolutely the carbonic acid gas content of the encompassing air monitors itself unceasingly and signals malfunctions of the hardand software package. The total measurement vary is linear. Power provides happens via twenty four V DC. Basic process and output of the measured values (linear output, either 4-20 mA or 0-10 V) are integrated into the instrument. Analysis and any process of the measured values occur in an exceedingly downstream device per the users specifications (for e.g. ventilation, limit monitor, display, programmable logic controller).

**IV. Weight sensor**

A load cell could be an electrical device that converts mechanical force into electrical signals. There are many various styles of load cells that operate in several ways that, however the foremost normally used load cell nowadays is that the strain gage (or strain gauge) load cell. As their name implies, strain gauge load cells use associate degree array of strain gages to live the deformation of a support associate degreed convert it into an electrical signal.[5]

A load cell is a transducer that is used to convert a force into electrical signal. The most common type is a strain gauge load cell. A Strain Gauge is a device used to measure the strain of an object. The most common type of strain gauge consists of an insulating flexible backing which supports a metallic foil pattern.

**Feature**

- Excitation voltage: 9VDC-12VDC
- Current rating 50μA

**V. LDR**

A photo electrical device or light-dependent electrical device (LDR) or photoconductive cell could be a light-controlled resistance. It is device which has a resistance which varies according to the amount of light falling on its surface. Since LDR is extremely sensitive in visible light range, it is
well suited for the proposed application. Light dependent resistors have a particular property in that they remember the lighting conditions in which they have been stored.

This memory effect can be minimized by storing the LDRs in light prior to use. Light storage reduces equilibrium time to reach steady resistance values. Two cadmium sulphide photoconductive cells with spectral responses similar to that of the human eye. The cell resistance falls with increasing light intensity.

2.2 Receiver section

Bluetooth

It is a wireless technology developed to replace cables on devices like mobile phones and PCs. Although "cable-replacement" could create a point-to-point communication. Bluetooth allows wireless devices to be able to communicate with each other within range. It is mainly used for data exchange which adds a new feature to smartphones. Bluetooth technology, created by telecom vendor Ericsson in 1994, shows its advantage by integrating with smartphones.

Serial port Bluetooth module is fully qualified Bluetooth V2.0+EDR with enhanced data rate) of 3Mbps at an operating frequency of 2.4GHz. It has the footprint as small as 12.7mmx27mm.

The aim is to obtain a continuous and remote monitoring of the babies. A system is developed for the generation of alerts on the smart phone in order to reduce the response time of the medical employees. Bluetooth is low power, low cost, and easily available device. It is easily available in smart phone [2].

3. Algorithm, Snapshot & Flow Chart for the project

Figure 3.1: Project Hardware Structure Snapshot
Algorithm for the project

i. Start
ii. Initialize all the sensor’s and LCD
iii. Connect Bluetooth with mobile
iv. Sense the individual parameter
v. Display that value on LCD
vi. Compare with standard values
vii. Values exceed, if No then go to step 9
viii. Send message to doctor mobile
ix. End

Figure 3.2: Flow Chart for the Project
4. Result

When the system is switched on, a Neonatal Baby Moni. System message will be displayed on the LCD.

The next message to be displayed is the sensor value on LCD.

![Screen Shot Of Sensor](image1)

**Figure 4.1: Screen Shot Of Sensor**

![Screen Shot Of Sensor](image2)

**Figure 4.2: Screen Shot Of Sensor**

If the sensor values exceed the limit of set value then message will be displayed on doctor mobile. “X level has crossed the limit”

**ADVANTAGES**

- Accurately monitoring.
- Easily can adapt.
- Monitor from anywhere in the remote area.
- System will be robust, at any situation of power failure it will inform to doctor through text message.
- Set doctor can get information of set patient.
APPLICATION

- In medical field.
- Uses in Biology.
- In Tissue Culture.
- In Genetic Engineering.

5. Conclusion

Real time parameters like Temperature, LDR, Weight, CO2, etc. may be no heritable and even fault tolerant conditions may be enforced to save lots of the lifetime of babe. Additional sensors may be enclosed to cut back noise, Vibrations etc. Remote watching and management of parameters is helpful particularly just in case of transport incubators and conjointly remote treatment of babies wherever correct medical facilities aren't offered. Price incurred is that the instrumentation cost and also the impact is of lifesaving of the baby.

References

[10] www.babygearlab.com