

# Secure Bio-metric Based Glucose Control for Diabetic Patients Using Zigbee

Ankur Nagar and Selvakumar A.

## ABSTRACT

Embedded frameworks are generally found in purchaser, cooking, modern, car, medicinal, business and military applications. Information transfers frameworks utilize various implanted frameworks from phone switches for the system to PDAs toward the end-client. PC organizing utilizes devoted switches and system scaffolds to course information.

Buyer hardware incorporate individual advanced aides (PDAs), mp3 players, cellular telephones, videogame reassures, computerized cameras, DVD players, GPS collectors, and printers. Family unit apparatuses, for example, microwave stoves, clothes washers and dishwashers, incorporate installed frameworks to give adaptability, effectiveness and elements. Progressed HVAC frameworks use organized indoor regulators to all the more precisely and effectively control temperature that can change by time of day and season. Home mechanization utilizes wired- and remote systems administration that can be utilized to control lights, atmosphere, security, sound/visual, reconnaissance, and so on., all of which utilize installed gadgets for detecting and controlling.

In this anticipate, a novel non-obtrusive sensor for the estimation of the glucose focuses in blood is displayed. By utilizing a microstrip band pass channel, a remote sensor is accomplished. In the presented outline, the thumb is set on the structure of the channel as a superstrate. The reaction of the channel is subject to the permittivity of the superstrate. A smaller size, linearity and cost viability are the most critical points of interest of the proposed sensor. The straight conduct of the channel as far as the recurrence is examined and for a direct conduct, a specific recurrence for operation is chosen. The presented sensor can be utilized by diabetics for consistent self-observing of the glucose level. The structure of the proposed sensor is outlined on the minimal effort substrate, FR4, by minimized measurements of 50 mm × 40 mm × 1.6 mm

*Catchphrases:* Feature Vector; Kekre change; Walsh change; Haar change; GAR.

## 1. INTRODUCTION

1. Diabetic Patients require constant blood glucose level appraisal all together for appropriate wellbeing support.
2. So a checking plan must be kept up at required timeframe without come up short.
3. Hence it requires to talk about the glucose level with the specialists routinely.
4. Here we computerize the checking procedure by remote sending of glucose level of patients to specialists
5. Use of biometric help for secure database

### 1.1. Existing System

1. Here glucose level is not monitored regularly
2. No automated facility is available for updating the glucose level to the doctors
3. No Security is provided for patient details maintenance
4. Very late process results in improper diagnosis of patients

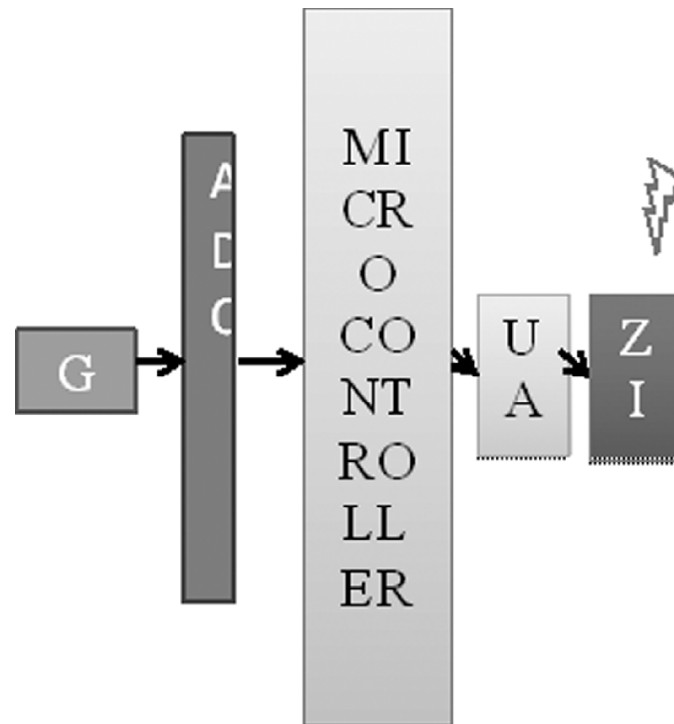
---

\* Ankur.nagar15@gmail.com

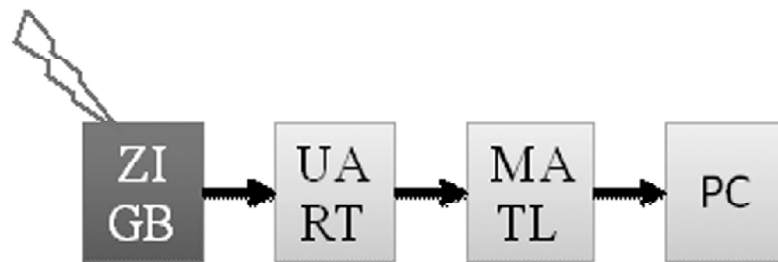
## 1.2. PROPOSED SYSTEM

1. Here glucose level is monitored using glucose sensor
2. The glucose sensor value is sent wirelessly using zigbee to the doctor
3. At the receiver side , only authorized doctor can receive the patient information
4. Finger print id is used for checking the authentication of doctor
5. Based on the authentication the patients details are received and stored in PC

**SYSTEM ARCHITECTURE:  
GLUCOSE LEVEL MONITORING**



**BLOCK DIAGRAM:  
RECEIVER SIDE**



## 2. METHODOLOGY FOR FINGERPRINT

### 2.1. Dataset Preparation

- Here readiness of dataset is finished by gathering Biometric misled Images of a man
- of diverse biometrics, for example, finger, iris and face. All these datasets are put away in a neighborhood registry
- Here the Images are prepared taking into account diverse calculations according to the biometric utilized.

In This papers we remove elements of finger , iris and face and create score values which are utilized for confirmation and further control of gadgets in light of these outcomes.

## 2.2. Finger print feature Extraction

- Fingerprints are the most used biometrics in applications where a high level of security is required. This project implements the identification procedure: it matches one fingerprint among N fingerprints. It uses minutiae points based algorithms: in the enrollment step, the points are extracted from the print. Later on, during the authentication step, the points are matched. This step is implemented utilizing unique mark upgrade and minutia separating.
- In a unique finger impression, they compare to either an edge finishing or a bifurcation.. There is a duality between the two types of minutiae: if the pixel brightness is inverted, ridge endings become bifurcations and vice versa. The position of the minutia point is at the tip of the ridge or the valley. The orientation is given by the orientation of the arrow formed by the ridge or the valley . First, the local orientation field needs to be computed.

## 3. ALGORITHMS/PROTOCOLS

### 3.1. Uart Protocol

The Universal Asynchronous Receiver/Transmitter (UART) controller is the key part of the serial interchanges subsystem of a PC. UART is likewise a typical coordinated element in many microcontrollers. The UART takes bytes of information and transmits the individual bits in a successive manner. At the destination, a second UART re-gathers the bits into complete bytes. Serial transmission of advanced data (bits) through a solitary Correspondence can be “full duplex” (both send and get in the meantime) or “half duplex” (gadgets alternate transmitting and accepting

#### 3.1.1. Hardware Requirement

- Microcontroller 8051
- ADC
- Glucose sensor
- UART
- Pc
- Zigbee
- Power Supply Unit

#### 3.1.2. Software Requirement

- Keil compiler
- Embedded C
- MATLAB

### 3.2. Microcontroller

All the capacities required on a solitary chip. A microcontroller contrasts from a microchip, which is a broadly useful chip that is utilized to make a multi-capacity PC or gadget and requires different chips to handle different assignments. A microcontroller is intended to be more independent and autonomous, and capacities as a little, committed PC.

They are ordinarily outlined utilizing CMOS (integral metal oxide semiconductor) innovation, a productive manufacture strategy that uses less power and is more invulnerable to power spikes than different procedures. There are likewise different designs A microcontroller is a coordinated chip that is frequently part of an installed framework. The microcontroller incorporates a CPU, RAM, ROM, I/O ports, and clocks like a standard PC, but since they are intended to execute just a solitary particular errand to control a solitary framework, they are much littler and streamlined so they can incorporate utilized, however the transcendent engineering is CISC (Complex Instruction Set Computer), which permits the microcontroller to contain various control directions that can be executed with a solitary full scale guideline. Some utilization a RISC (Reduced Instruction Set Computer) engineering, which executes less guidelines, yet conveys more prominent straightforwardness and lower power utilization.

Early controllers were regularly worked from rationale parts and were typically entirely huge. Later, microchips were utilized, and controllers could fit onto a circuit board. Microcontrollers now put the majority of the required parts onto a solitary chip. Since they control a solitary capacity, some unpredictable gadgets contain various chip.

Microcontrollers have gotten to be regular in numerous regions, and can be found in home machines, PC gear, and instrumentation. They are regularly utilized as a part of cars, and have numerous mechanical uses also, and have turned into a focal piece of modern apply autonomy. Since they are generally used to control a solitary procedure and execute basic guidelines, microcontrollers don't require noteworthy handling power.

## 4. INTRODUCTION

The AT89c51 is a low-control, elite CMOS 8-bit microcontroller with 8K bytes of in-framework programmable Flash memory. The gadget is made utilizing Atmel's high-thickness nonvolatile memory innovation and is perfect with the business standard 80C51 direction set and stick out. The on-chip Flash permits the project memory to be reinvented in-framework or by a routine nonvolatile memory professional. By joining an adaptable 8-bit CPU with in-framework programmable Flash on a solid chip, the Atmel AT89c51 is an intense microcontroller which gives an exceedingly adaptable and financially savvy answer for some implanted control applications. The AT89c51 provides the accompanying standard components: 8K bytes of Flash, 256 bytes of RAM, 32 I/O lines, Watchdog clock, two information pointers, three 16-bit clock/counters, a six-vector two-level interfere with design, a full duplex serial port, on-chip oscillator, and clock hardware. Furthermore, the AT89c51 is composed with static rationale for operation down to zero recurrence and backings two programming selectable force sparing modes. The Idle Mode stops the CPU while permitting the RAM, clock/counters, serial port, and interfere with framework to keep working.

### 4.1. Features

- Compatible with MCS-51 Products
- 8K Bytes of In-System Programmable (ISP) Flash Memory
  - Endurance: 10,000 Write/Erase Cycles
- 4.0V to 5.5V Operating Range
- Fully Static Operation: 0 Hz to 33 MHz
- Three-level Program Memory Lock
- 256 × 8-bit Internal RAM
- 32 Programmable I/O Lines

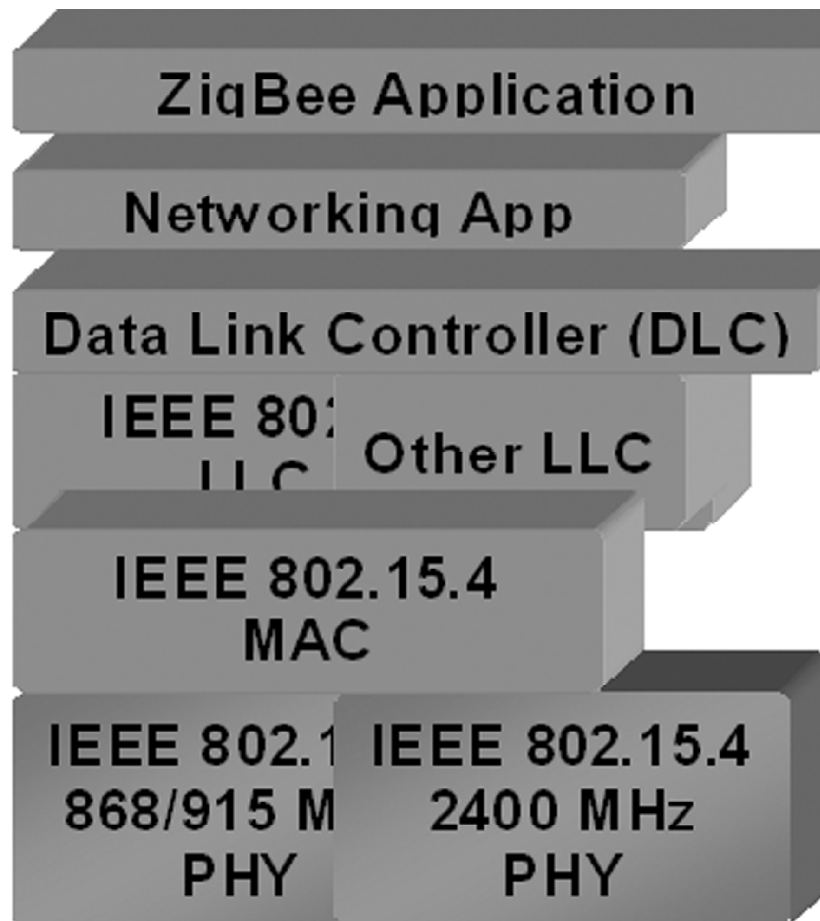
- Three 16-bit Timer/Counters
- Eight Interrupt Sources
- Full Duplex UART Serial Channel
- Low-power Idle and Power-down Modes
- Interrupt Recovery from Power-down Mode
- Watchdog Timer

#### 4.2. Introduction to Microcontroller (At89c51)

The AT89c51 is a low-control, elite CMOS 8-bit microcontroller with 8Kbytes of in-framework programmable Flash memory. The gadget is made utilizing Atmel's high-thickness non-unpredictable memory innovation and is good with the Industry standard 80C51 guideline set and stick out. The on-chip Flash permits the project memory to be reconstructed in-framework or by a traditional non-unpredictable memory software engineer. By consolidating an adaptable 8-bit CPU with in-framework programmable Flash on a solid chip, the Atmel's AT89c51 is a capable microcontroller which gives an exceptionally adaptable and practical answer for some implanted control application.

- Network, Security and Application layers
- Brand administration

IEEE 802.15.4



- “the equipment”
- Physical and Media Access Control layers
  - IEEE 802.15.4 Architecture
- PHY functionalities:
  - Activation and deactivation of the radio handset
  - Energy location inside the present channel
  - Link quality sign for got parcels
  - Clear channel evaluation for CSMA-CA
  - Channel recurrence determination
  - Data transmission and gathering
  - PHY parcel fields
  - Preamble (32 bits) – synchronization
  - Start of parcel delimiter (8 bits) – should be arranged as “11100101”
  - PHY header (8 bits) –PSDU length
  - PSDU (0 to 127 bytes) – information field
  - The standard determines two PHYs:
    - 868 MHz/915 MHz direct grouping spread range (DSSS) PHY (11 channels1 channel (20Kb/s) in European 868MHz band
    - 10 channels (40Kb/s) in 915 (902-928)MHz ISM band

USB to RS232 Converter Circuit Description

## 5. CIRCUIT OVERVIEW

The USB to RS232 Converter board is a PIC microcontroller based gadget that gets a USB signal from a PC and proselytes the sign to a RS232 yield. The yield sign can be sent to any of three serial ports. Gadgets which might be associated with the RS232 ports incorporate the ASI Inc. X-Y Stage, the Olympus Z-Focus, and the Mai Tai LASER.

## LITERATURE SURVEY

Title 1:Development of the Portable Blood Glucose Meter for Self-observing of Blood Glucose

Creator : Qi Li 1, Jingqi Yuan

### Theoretical :

The work laid out in this paper is towards building up a convenient, economy blood glucose meter for self-checking of blood glucose, which has elite value proportion with multifunction and is alluring to the normal individuals. Its capacities incorporate blood glucose focus estimation, LCD show, chronicled records reestablish, schedule/clock. It empowers the patients with diabetes to identify blood glucose with a glucose oxidase anode freely at home. This paper will plot equipment design in the usage and programming administration. Particularly, realistic pattern bend on LCD permits people to effortlessly perceive how real

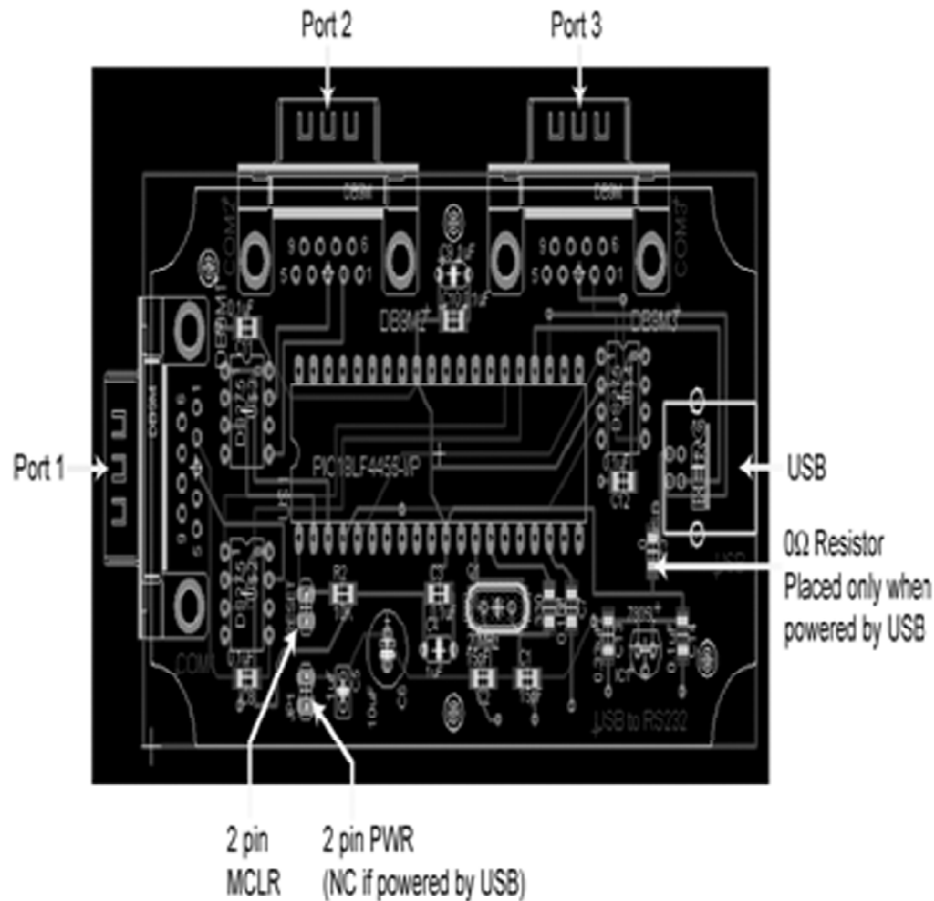


Figure 4: Current PCB Layout

blood glucose readings contrast and chronicled records put away in the meter and show how people stay inside their particular target run so they can decide how well they arecontrolling their diabetes. Test results show that this gadget is anything but difficult to-use and appropriate for home blood glucose observing for patients..

### Disadvantage:

Patient data is insecure and is not maintained

Title2 :A 3micro W CMOS Glucose Sensor for Wireless Contact-Lens Tear Glucose Monitoring

Creator : Yu-Te Liao, Huanfen Yao, Andrew Lingley, BabakParviz, and Brian P. Otis

Unique :

This paper displays a noninvasive remote sensor stage for ceaseless wellbeing observing. The sensor framework coordinates a circle reception apparatus, remote sensor interface chip, and glucose sensor on a polymer substrate. The IC comprises of force administration, readout hardware, remote correspondence interface, LED driver, and vitality stockpiling capacitors in a 0.36-mm CMOS chip with no outer parts. The affectability of our glucose sensor is 0.18 A mM . The framework is remotely fueled and accomplishes a deliberate glucose scope of 0.05–1 mM with an affectability of 400 Hz/mM while expending 3 W from a controlled 1.2-V supply.

Weakness:

Information of glucose is not recorded remotely

**REFERENCES**

- [1] A. Anandkumar, N. Michael, and A. Tang. Pioneering range access with different players: Learning under rivalry. In Proc. of IEEE INFOCOM, 2010.
- [2] P. Auer, N. Cesa-Bianchi, and P. Fischer. Limited time examination of the multiarmed marauder issue. *Machine learning*, 47: 235–256, 2002.
- [3] W. Bao, H. Li, N. Li, and W Jiang. A liveness identification technique for face acknowledgment taking into account optical flow field. In Proc. IEEE Int. Conf. on Image Anal. also, Signal Process., 2009, IASP2009, pages 233–236. IEEE, 2009.
- [4] S. Barbarossa, S. Sardellitti, and P. Di Lorenzo. Calculation of offloading for portable distributed computing taking into account wide cross-layer improvement. In IEEE Future Network and Mobile Summit (FutureNetworkSummit), 2013, pages 1–10. IEEE, 2013.
- [5] B. C. Becker and E. G Ortiz. Assessment of face acknowledgment methods for application to facebook. In eighth IEEE Internat. Conf. on Automatic Face and Gesture Recognition, 2008. FG’08., pages 1–6. IEEE, 2008.
- [6] G. Bianchi. Execution investigation of the ieee 802.11 conveyed coordination capacity. *IEEE J. Select. Ranges in Commun.*, 18(3):535–547, 2000.