

# RFID Based Advanced Attendance System using UTLP Kit

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**Abstract**— Most educational institutions' administrators are concerned about students irregular attendance. Truancies can affect students overall academic performance.[1]The conventional method of taking attendance by calling names or signing on paper is very time consuming and insecure, hence inefficient.[2]Therefore, Radio frequency Identification (RFID)based attendance system with GSM Module is required to assist the faculty and lecturer for this much convenient method to keep track of their students' attendance.[3]RFID is a technology that allows for a tag affixed on identity card to communicate wirelessly with a reader in order for tags identifier to be retrieved.[4]Its ability o uniquely identify each person based on their RFID tag type of ID card makes process of making attendance easier, faster and secure as compared o conventional method.[5]The proposed system is an embedded system where UTLP kit is being used. The UTLP kit is based on Texas instrument OMAP3530 application processor and Spartan-6FPGA.[6]it also has special feature of "Level Alert" i.e. if the attendance of any student is less than a predetermined level then it gives message alert to class teacher on weekly basis.

**Keywords**— RFID, UTLP KIT, GSM MODULE, READER, TAG

## INTRODUCTION

(RADIO FREQUENCY IDENTIFICATION DEVICE(RFID):-)

Radio frequency communication uses electromagnetic waves as transmission medium. Their Propagation properties at low connections of extremely high distances. Electromagnetic waves pass through nonshielding materials to some extent (e.g. concrete walls). This attractiveness demands some limitation enforced by worldwide regulations defined by standardization groups (e.g. ETSI, FCC). For all regions of the world there exist binding regulations covering following aspects:

- I. Frequency bands (spectrum)
- II. Maximal power of emitted radio waves
- III. Bandwidth of emitted signal Ease of Use

### A. COMPONENTS OF RFID SYSTEM:-

An RFID comprises of various components that are connected to one another by dedicated communication path. The list of components is as follows:

- Tags
- Antenna
- Reader
- Database

### B. UNIFIED LEARNING KIT:-

Unified Learning Kit is based on Texas Instruments OMAP3530 application processor & Spartan-6 FPGA. The OMAP3530 processor supports interfaces such as Mobile DDR, NAND Flash, Audio in & out, TV out, Touch screen LCD, VGA out, Ethernet, Keypad, USB OTG, 2 SD cards & external interface connectors such as Control sensor header, I/O expansion connector, I2C Header for GPS, Bluetooth & Modem Connector, Simple Digital interface connector, IrDA Connector, Camera Connector & LCD connector.

The Spartan-6 FPGA supports interfaces such as DDR2 SDRAM, Ethernet, ADC, DAC, character LCD & external interfaces such as 70-pin IO expansion connector & 20-pin IO header.

### 1. BOARD FEATURES:-

#### A. OMAP 3530 PROCESSOR:-

- TI's OMAP3530 application processor with CUS package
- TI's TPS65930 Power management IC
- NAND Flash Memory of 128Mbytes
- Mobile DDR SDRAM of 128Mbytes
- Ethernet controller with 10/100Mbps PHY and RJ45 LAN connector
- USB2.0 OTG interface
- 2no.s of SD interface
- RS232 Console using UART1&3
- Real Time Clock
- VGA
- CMOS sensor interface
- 24 bit RGB LCD interface
- Mic in and speaker out
- Touch panel controller through SPI interface
- 3.5inch LCD interface
- I2C EEPROM of 256Kbits
- IrDA support using UART3
- Bluetooth & modem connector (3.3V compatible)

- 16x2 Character LCD using I2C to I/O bus expander
- JTAG interface
- 6x6 Keypad interface (Using PMIC)
- Simple digital interface with 5V compatible
- Control sensor connector with 5v compatible
- I/O Expansion connector as same as beagle board through level translators (1.8 to 3.3V/5V) for 3.3V & 5V compatible

#### B. GSM MODULE:-

The GSM/GPRS interface board supports the communication between CPU board and external devices .The board can be used to send and receive SMS as well as to make and receive calls .The board can operate on 5V DC line .Power jack (2.5mm) is provided to draw external 5V from AC to DC adapter.

The GSM Interface Board has a number of communicating options with CPU board and PC. The different Input and Output options are detailed below:

6 Pin Header, Standard DB9,Reset Switch ,LED.

Specifications:-

1. Quad Band GSM/GPRS : 850 / 900 / 1800 / 1900 MHz
2. Built in RS232 to TTL or vice versa Logic Converter (MAX232)
3. Configurable Baud Rate
4. SMA (Sub Miniature version A) connector with GSM L Type Antenna
5. Built in SIM (Subscriber Identity Module) Card holder
6. Built in Network Status LED
7. Inbuilt Powerful TCP / IP (Transfer Control Protocol / Internet Protocol) stack for internet data transfer through GPRS (General Packet Radio Service)
8. Audio Interface Connectors (Audio in and Audio out)
9. Most Status and Controlling pins are available
10. Normal Operation Temperature : -20 °C to +55 °C
11. Input Voltage : 5V to 12V DC
12. LDB9 connector (Serial Port) provided for easy interfacing

#### C. RFID MODULE:-

- 125 KHz RFID reader module *EM18*
- *Reading distance* :100mm
- *Interface*: RS232
- *DC Power Adaptor*:12V
- *Interface rate* : 9600 Bps
- *Dimensions*: 32mm(L)\*32mm(W)\*8mm(H)

#### D.IMPLEMENTATION OF SOFTWARE:-

##### **ulk\_uart\_init ():**

Description: Initialization of UART is done by configuring the related registers.

Parameters: Comport number is passed.

Return: zero

##### **ulk\_uart\_putc ():**

Description: Will dump a character in the transmit register.

Parameters: Port number and value are passed.

Return: zero

##### **ulk\_uart\_getc ():**

Description: Will read a character from the receiver register

Parameter: Port number is passed

Return: zero

##### **ulk\_uart\_puts ()**

Description: Will write a string of character to the transmit register.

Parameters: Port number and string values are passed.

Return: zero

##### **ulk\_uart\_gets ()**

Description: Will read a string of character from the receiver register

Parameter: Port number is passed and receiving string pointer is passed.

Return: Char.

#### E. RESULT AND ANALYSIS:-

In this way we learned about the growing technology of UTP & RFID also implemented successfully. This project is easy to implement and it has become one of the modern and user friendly system in near future. Thus we found that the RFID have limited range of operation .To increase the no of student in the data base some modification must be necessary. System operation time is maximum 180 sec. Output can be displayed on both the terminals; LCD of UTP kit & ULK terminal. Implementation of system is bulky. The data of every student stored in the database can be displayed on the LCD of ULK Kit when card is swapped through RFID module.

To display the output on LCD, we have to use normal mode.

The size of EPROM of the ARM processor is 32kbytes.

The execution time in UTP is limited up to 180sec.

#### F. APPLICATION:-

- OMAP 3530 is mainly used in android based some mobiles like Samsung, Nexus.
- These are very high performance microprocessors used in typical electronics accessories.
- With the help of the UTP kit we can easily implement library management through RFID.
- The basic application of this project is to generate and display student's data base.
- We can design a security system using this kit.
- We can use it to design calculator.
- Government office record
- We can use it inHospitals

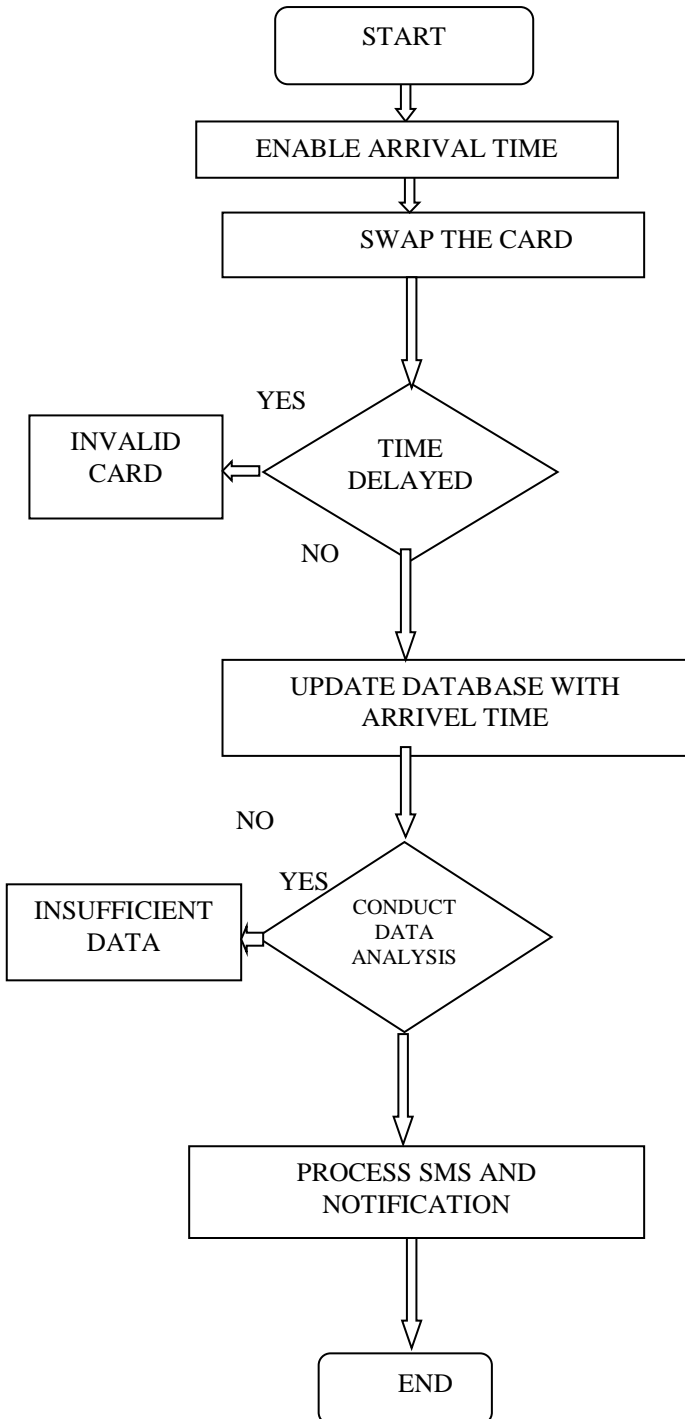
#### G. ADVANTAGES:-

Use of RFID technology in a library can decrease the time needed for circulation duties since more than one tag can read at a time. Level check done automatically No line-of-sight contact necessary . RFID work contactless and require no line of sight. Robust system . Transponders can be read through a whole number of substances, e.g. snow, fog, ice, paint, dirt, and in difficult constructional scenarios where barcodes or other optical reading technologies would be no use at all. System is time efficient. System requires less manual work System has high accuracy. Speed of an RFID system. RFID transponders can be read at remarkable speed even in difficult conditions, and in most cases respond in less than 100 milliseconds. The

reading/writing capability of an active RFID system is also a significant advantage in interactive applications, e.g. when tracking products in process or maintenance jobs. In tough environments. In difficult external conditions RFID has the advantage of being able to communicate contactless and without direct line-of-sight contact with the data medium. Where the transponder is doesn't matter either -- it can be read through substances like dust, paint or ice.

H. FIGURES:-

A. FLOWCHART



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