

Smart System for College Regular Operational Management

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Abstract: *The "Smart System for College Regular Operational Management" is a technological solution designed to streamline and optimize various administrative and operational tasks in a college setting. The system incorporates advanced technologies such as artificial intelligence, machine learning, and data analytics to create a seamless and efficient workflow. The system can perform a wide range of tasks such as student enrollment, fee collection, staff management, course scheduling, and academic record keeping. It can also generate automated reports and analytics, allowing college administrators to make data-driven decisions in real-time. The Smart System can be customized to meet the specific needs of each college, and it can be accessed from any device with an internet connection. With this system, colleges can reduce administrative costs, eliminate manual errors, and improve overall efficiency. This ultimately allows them to focus more on providing quality education and fostering a productive learning environment.*

Keywords: Smart System

I. INTRODUCTION

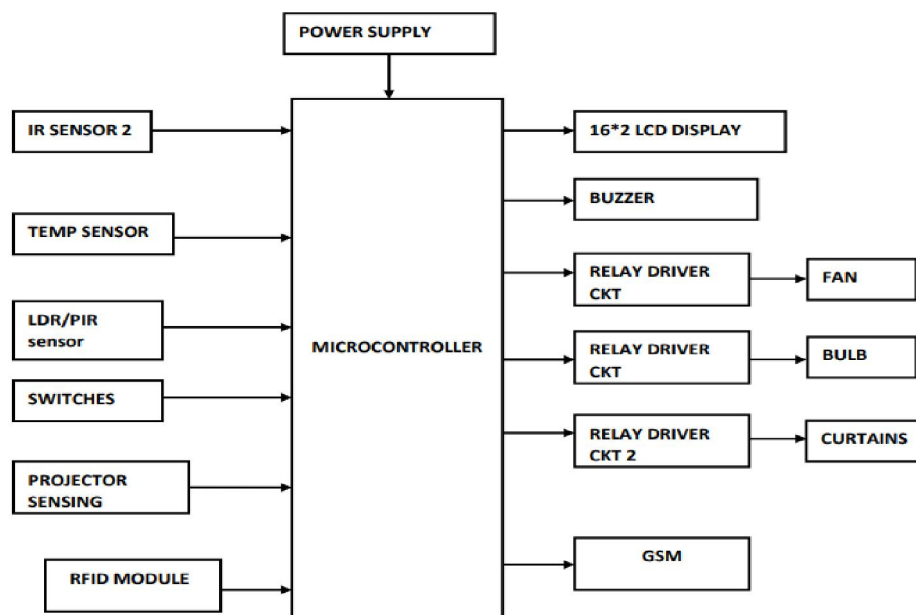
The design and implementation of the system is to provide service in institute and colleges. The system is to provide comprehensive student information system and user interface is to replace the current paper records. College Staff uploads attendance, results, share subject notes and college notifications through a secure, online interface using android devices. All data will be stored on the collage server and validated on the server before actual record alteration occurs. The system plans for student user interface, allowing students to access tips and tricks as provided by their seniors. All data is stored securely on SQL servers managed by the college Administrator. This system will decrease the paperwork and time needed to access student records. Previously, college relied heavily on paper records for this initiative which had its own disadvantages. This system provides a simple interface for the maintenance of student information. It can be used by educational institutes or colleges to maintain the records of students easily. Achieving this objective is difficult using a manual system as the information are scattered, can be redundant and collecting relevant information may be very time consuming. Our proposed system ensures to overcome these limitations. . Online Attendance and Feedback System is software developed for daily student attendance in schools, colleges and institutes. It facilitates to access the information of a particular student in a particular class. There is another part which is feedback, the student can give the feedback at anytime from anywhere to faculty. This feedback can be reviewed by the admin or the management committee of the institute through which the confidentiality of the feedback of the faculty can be maintained. This application is developed for daily student attendance in colleges and institutes. The teachers can send the attendance summary and feedback about the students to their parents. It can also be useful in an organization or company at a certain limit not the whole application. Existing System The system which is used nowadays has some drawbacks which need to be improved for better performance. The system through which the feedback is taken is not good enough. The views of each and every student are not expressed through these systems. As the technology is developed day by day we need to use this technology so we can get an efficient result in adequate time. For attendance management in the present system all work is done on paper. The whole session attendance is stored in register and at the end of the session the reports are generated. We are not interested in generating report in the middle of the session or as per the requirement because it takes more time in calculation. At the end of session the students who don't have 75% attendance get a notice. This is a very time consuming process. In the present system the result is viewed on the notice board. It requires lot of paperwork and is time consuming. Moreover, there is no system still present through which

students can take advice from senior students. College cannot even provide urgent notifications to students in case of emergency

II. LITERATURE SURVEY

SnehaNahatkar et al, [1] has proposed a home embedded security system which evaluates the development of a low-cost security system using small PIR (Piezoelectric Infrared) sensor built around a microcontroller with ultra-low alert power. PIR sensor detects the presence of individuals not at thermal equilibrium with the surrounding environment. On detecting the presence of any unauthorized person, it triggers an alarm & calls to a predefined number through a GSM module. After the MCU sends the sensor signals to the embedded system, the program starts the Web camera which captures the images that can be viewed and analyzed later. The proposed surveillance system is based on an embedded system along with GSM module and sensor networks. The movement of the warm body is detected by the PIR sensor. The system triggers an alarm detecting the presence of a warm body and simultaneously sends how many people have intruded via sending a SMS through GSM Module. When the security system is activated, additionally the CCTV camera is activated. This highly reactive approach has low computational requirement. Therefore, it is well suited for home surveillance system. This surveillance system is implemented using PIC micro controller, camera, GSM and sensors. T. Gayathri et AL,[2] proposed a system for monitoring the status of crops growing continuously throughout the year. But in real time, cultivator faces too many problems in the farmland. This paper eases the work of the farmer in cultivated land through the usage of different kind of sensors. The two LDR sensors are interfaced with PIC16F877A embedded system whereas its top array receives solar radiation to supply the charge and the bottom of the LDR array is for measuring leaf area index (LAI). The soil moisture sensor will measure the moisture level in the corn field, if the level decreases, then it automatically turns ON the DC motor. All this information of the cropland is sent to the farmer through GSM and displayed on the LCD screen. Smart Crop protection system from living objects and fire using Arduino This paper motive to designing and executing the superior improvement in embedded device for Crops in farms are over and over ravaged with the aid of nearby animals like buffaloes, cows, goats, birds, and fireplace etc. This results in huge losses for the farmers. It is now not feasible for farmers to barricade complete fields or precede field 24 hours and protect it.

BLOCK DIAGRAM



INTRODUCTION TOPIC 18F4520

Data Memory up to 4k bytes Data register map - with 12-bit address bus 000-FFFF Divided into 256-byte banks There are total of F banks Half of bank 0 and half of bank 15 form a virtual (or access) bank that is accessible no matter which bank is selected – this selection is done via 8-bits Program memory is 16-bits wide accessed through a separate program data bus and address bus inside the PIC18. Program memory stores the program and also static data in the system. On-chip External On-chip program memory is either PROM or EEPROM. n The PROM version is called OTP (one-time programmable) (PIC18C) The EEPROM version is called Flash memory (PIC18F). Maximum size for program memory is 2M n Program memory addresses are 21-bit addresses starting at location 0x00000

INTRODUCTION GSM

This GSM modem has a SIM800A chip and RS232 interface while enables easy connection with the computer or laptop using the USB to Serial connector or to the microcontroller using the RS232 to TTL converter. Once you connect the SIM800 modem using the USB to RS232 connector, you need to find the correct COM port from the Device Manager of the USB to Serial Adapter. Then you can open Putty or any other terminal software and open a connection to that COM port at 9600 baud rate, which is the default baud rate of this modem. Once a serial connection is open through the computer or your microcontroller you can start sending the AT commands. When you send AT commands for example: "AT\r" you should receive back a reply from the SIM800 modem saying "OK" or other response depending on the command send. SIM800 is a complete Quad-band GSM/GPRS solution in a LGA type which can be embedded in the customer applications. SIM800H support Quad-band 850/900/1800/1900MHz, it can transmit Voice, SMS and data information with low power consumption. With tiny size of 15.8*17.8*2.4 mm, it can fit into slim and compact demands of customer design.

Features of SIM800A Bands: GSM 850MHz, EGSM 900MHz, DCS 1800MHz, PCS 1900MHz GPRS class 2/10 Control via AT commands (3GPP TS 27.007, 27.005 and SIMCOM enhanced AT command set) Supply voltage 3.4-4.4V Coding schemes: CS-1, CS-2, CS-3, CS-4 Tx power: Class 4 (2W), Class 1 (1W) Small package: 23 * 23 * 3mm Low power: down to 1mA in sleep mode TCP/IP AT firmware Operating temperature: -40C to +85C Audio channels which include a microphone input and a receiver output. One SIM card

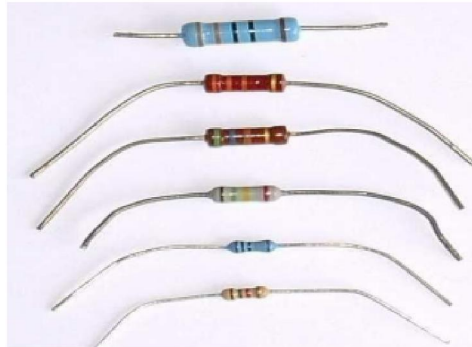


Interfacing with controller: GSM module is used in many communication devices which are based on GSM (Global System for Mobile Communications) technology. It is used to interact with GSM network using a computer. GSM module only understands AT commands, and can respond accordingly. The most basic command is "AT", if GSM respond OK then it is working good otherwise it respond with "ERROR". There are various AT commands like ATA for answer a call, ATD to dial a call, AT+CMGR to read the message, AT+CMGS to send the sms

INTRODUCTION TO RESISTORS

A resistor is a two-terminal electronic component designed to oppose an electric current by producing a voltage drop between its terminals in proportion to the current, that is, in accordance with Ohm's law: $V = IR$ Resistors are used as part of electrical networks and electronic circuits. They are extremely commonplace in most electronic equipment. Practical resistors can be made of various compounds and films, as well as resistance wire (wire made of a high-

resistivity alloy, such as nickel/chrome). The primary characteristics of resistors are their resistance and the power they can dissipate. Other characteristics include temperature coefficient, noise, and inductance. Less well-known is critical resistance, the value below which power dissipation limits the maximum permitted current flow, and above which the limit is applied voltage. Critical resistance depends upon the materials constituting the resistor as well as its physical dimensions; it's determined by design. Resistors can be integrated into hybrid and printed circuits, as well as integrated circuits. Size, and position of leads (or terminals) are relevant to equipment designers; resistors must be physically large enough not to overheat when dissipating their power



A resistor is a two-terminal passive electronic component which implements electrical resistance as a circuit element. When a voltage V is applied across the terminals of a resistor, a current I will flow through the resistor in direct proportion to that voltage. The reciprocal of the constant of proportionality is known as the resistance R , since, with a given voltage V , a larger value of R further "resists" the flow of current I as given by Ohm's law

IR SENSOR

Proximity Sensor are used to detect objects and obstacles in front of sensor. Sensor keeps transmitting infrared light and when any object comes near, it is detected by the sensor by monitoring the reflected light from the object. It can be used in robots for obstacle avoidance, for automatic doors, for parking aid devices or for security alarm systems, or contact less tachometer by measuring RPM of rotation objects like fan blades. Digital low output on detecting objects in front



LM 35 Sensor



Outputs 10mV per Degree that can also be read directly on multimeter or read in to microcontroller. For example at 30 degree Celsius it will output 300mV at linear scale. The LM35 series are precision integrated-circuit temperature sensors, whose output voltage is linearly proportional to the Celsius (Centigrade) temperature. The LM35 thus has an advantage over linear temperature sensors calibrated in ° Kelvin, as the user is not required to subtract a large constant voltage from its output to obtain convenient Centigrade scaling. The LM35 does not require any external calibration or trimming 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. Low cost is assured by trimming and calibration at the wafer level. The LM35's low output impedance, linear

output, and precise inherent calibration make interfacing to readout or control circuitry especially easy. It can be used with single power supplies, or with plus and minus supplies. As it draws only 60 μA from its supply, it has very low self-heating, less than 0.1°C in still air. The LM35D is rated to operate over a 0° to $+100^\circ\text{C}$ temperature range. General Description The LM35 series are precision integrated-circuit temperature sensors, whose output voltage is linearly proportional to the Celsius (Centigrade) temperature. The LM35 thus has an advantage over linear temperature sensors calibrated in $^\circ$ Kelvin, as the user is not required to subtract a large constant voltage from its output to obtain convenient Centigrade scaling. The LM35 does not require any external calibration or trimming 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. Low cost is assured by trimming and calibration at the wafer level. The LM35's low output impedance, linear output, and precise inherent calibration make interfacing to readout or control circuitry especially easy. It can be used with single power supplies, or with plus and minus supplies. As it draws only 60 μA from its supply, it has very low self-heating, less than 0.1°C in still air. The LM35 is rated to operate over.

RFID TAG READER



RF ID is Radio Frequency Identification which is used to make track of every physical object. The frequency of operation widely used at present are LF –Low Frequency 125 KHz & UHF (Mifare) 13.5MHz. In this post our focus is on 125KHz RF ID. The main components of the RF ID system are : 1) The RF ID Reader – EM-18 type of RFID reader is used for demo in this post. 2) RF ID tag – The Tag contains an Integrated circuit for memory & an Antenna coil. There are 2 types of Tags – Passive & Active. We make use of Passive tags here .As the name implies these tags do not have a power source .When the passive Tag is near a RF ID reader , the energy is induced by electromagnetic waves.The tag “wakes up” & responds by sending the data stored in its memory. The RANGE of passive tag access is below 10 cm. Active tags have their own battery source & offer a long range of access.Active tags are costlier than the passive ones.

Buzzer



Figure: Buzzer

What is a Buzzer

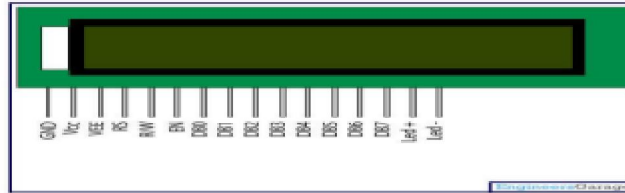
An audio signaling device like a beeper or buzzer may be electromechanical or piezoelectric or mechanical type. The main function of this is to convert the signal from audio to sound. Generally, it is powered through DC voltage and used in timers, alarm devices, printers, alarms, computers, etc. Based on the various designs, it can generate different sounds like alarm, music, bell & siren.

The **pin configuration of the buzzer** is shown below. It includes two pins namely positive and negative. The positive terminal of this is represented with the ‘+’ symbol or a longer terminal. This terminal is powered through 6Volts whereas the negative terminal is represented with the ‘-’ symbol or short terminal and it is connected to the GND terminal.

Working Principle

The working principle of a buzzer depends on the theory that, once the voltage is given across a piezoelectric material, then a pressure difference is produced. A piezo type includes piezo crystals among two conductors. Once a potential disparity is given across these crystals, then they thrust one conductor & drag the additional conductor through their internal property. So this continuous action will produce a sharp sound signal

16-2 LCD Display



LCD (Liquid Crystal Display) screen is an electronic display module and find a wide range of applications. A 16x2 LCD display is very basic module and is very commonly used in various devices and circuits. These modules are preferred over seven segments and other multi segment LEDs: The reasons being: LCDs are economical, easily programmable, have no limitation of displaying special & even custom characters (unlike in seven segments), animations and so on. A 16x2 LCD means it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in 5x7 pixel matrix. This LCD has two registers, namely, Command and Data. The command register stores the command instructions given to the LCD, A command is an instruction given to LCD to do a predefined task like initializing it, clearing its screen, setting the cursor position, controlling display etc. The data register stores the data to be displayed on the LCD. The data is the ASCII value of the character to be displayed on the LCD. Click to learn more about internal structure of a LCD.

Set led contrast here. Best way is to use variable resistor such as potentiometer. Output of the potentiometer is connected to this pin. Rotate the potentiometer knob forward and backward to adjust the led contrast.

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IV. CONCLUSION

It will decries the paper work. The admin, faculty or the student will perform all the task very easily and more convenience way. The application offers reliability, security, time savings and easy control. . It can be used as a base for creating and enhancing applications for viewing results, tracking attendance for colleges. Students and their parents will also view results, attendance and curriculum details using this application. Also students can view details, notifications anywhere and anytime. The application will greatly simplify and speed up the result preparation and management process. The proposed system will decries the work time of the admin as well as the faculty. This will brings more perfection to the work..

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