



Embedded and IoT

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PREFACE

Embedded system is basically the study of how-to setup a device that is hardware or software or both that is embedded in a larger system and is mostly a real time system. An embedded system usually consists of a microcontroller programmed to do a specific job.

Internet of things is how these devices communicate with each other directly and indirectly to serve a specific purpose. Directly is when two devices or more talk peer to peer. And decide actions based on what the other device says. Indirect is when all of these devices are connected to a single node and the node receives and transmits signals to the devices and intercommunicate is thus established.

The “Internet” side of IOT is about processing the huge amount of data that can be collected by devices and extract the useful bit of information that can improve the way we use many services and devices today. The applications of embedded systems have increased drastically over the past years. Multi-core technologies are being appreciated and are now in great demand across various industry verticals.

IOT BASED MODERN AGRICULTURAL MONITORING AND CONTROL SYSTEM

V.SUJITHA, C.SALMA B.SRIJAYAPRIYA

The main objective of this project is regarded to cover the aspects related to the parameters in agricultural land for monitoring and control purpose. This project is based on IOT sensors. The sensor node is based on microcontroller and Arduino that includes wireless module and connected sensors. The moisture sensor, temperature sensor and ultrasonic sensor and LDR sensor are used for measuring the moisture level in the soil, the temperature of the agricultural land, plant growth level and light intensity level. When the moisture level is low, the relay turns on the water pump, when the light intensity is low, the relay turns on the light. When the temperature is high or low, the relay turns on the exhaust or dryer respectively and it is monitored by the IOT server. After this process the values of the respected sensors will be displayed in the LCD display as well as in the mobile application.

STEP DOWN TRANSFORMER

The working principle of the transformer is based on mutual induction. It has two coils namely primary coil and secondary coil. Any change in the magnetic field in one of the loops of wire which induces an electromotive force in the adjacent loop of the wire. The transformer is an essential component for power distribution and transmission and utilization of AC electric power. The transformer is classified as step up and step-down transformer depending upon the application. In case of the step-down transformer, the secondary coil has a smaller number of windings than the primary coil. The transformer converts the electricity between high voltage and low current for long distance transmission and low voltage, high current for consumer use.

The step-down transform converts high voltage into low voltage. It converts 230V AC into 12V AC. The transformers are used in power grid because of their essential functioning. They convert the electrical power to appropriate voltage to current ratio for

local distribution as well as for long distance transmission. Proper operation and maintenance are necessary to provide expected lifespan of the transformer unit.

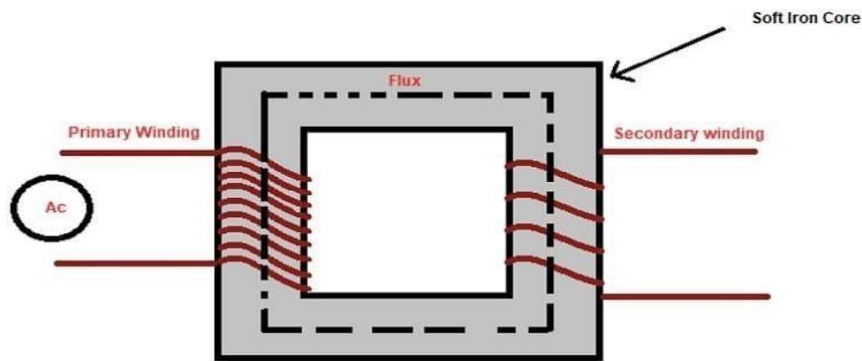


Figure 1: Step Down Transformer

POWER SUPPLY UNIT:

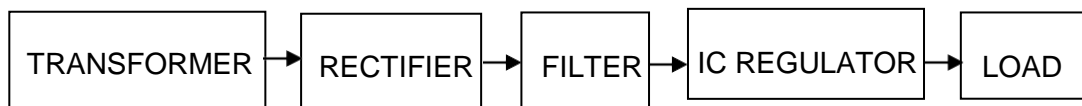


Figure 2: Block Diagram of Power Supply Unit

The regulated linear power supply (RLPS) is similar to the unregulated linear power supply unit whereas in this regulated linear power supply unit 3 terminal regulator is used instead of the bleeder resistor. The basic components of this supply unit are transformer, rectifier, filter and output capacitor and voltage regulator. The disadvantage of the ULPS is overcome by the RLPS which provides constant output and doesn't vary with the load current and input voltage. When the capacity limit is extended for the capacitor, it produces high quality power supply. This is used in electronic appliances operated at low power because the output voltage has small load regulation, reliability is high, ripple is negligible.

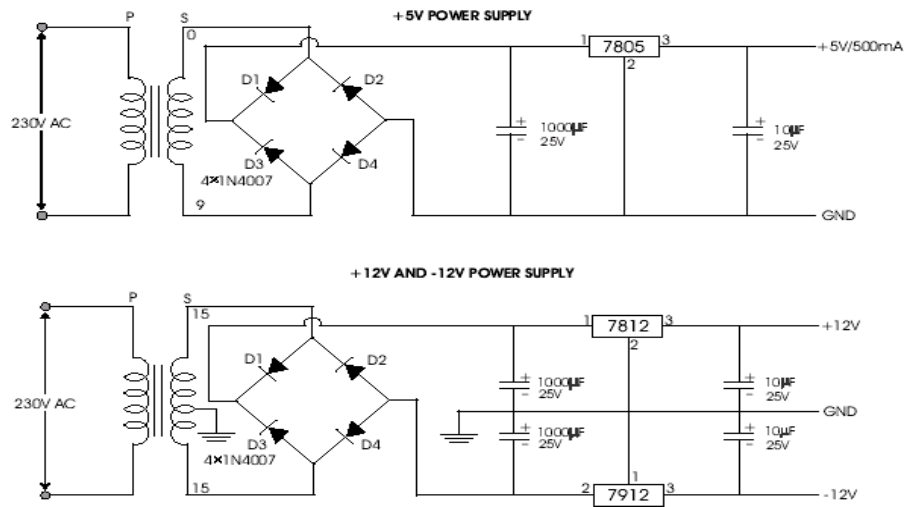


Figure 3: Circuit Diagram of Power Supply Unit

BRIDGE RECTIFIER:

A bridge rectifier from a Wire AC input provides full wave rectification. The applications of rectifier are dc power supplies, radio signal and radio detectors. When four diodes are connected in this circuit it's called as the bridge rectifier. The transformer is working properly, at the point A and B the potential is positive and negative respectively. D3 and D4 will be forward biased and reverse biased by the positive potential and negative potential. Thenegative potential at B will reverse bias D2 and forward bias D1.

At this time D1 and D3 are forward biased and allows the current to passthrough them. D2 and D4 will block flow of current since these diodes are reversing biased. The path for current flow is from point B through D1 throughload resistor through D3 and through the secondary of the transformer to pointOne-half cycle later the polarity across the secondary of the transformer reverse, forward biasing D2 and D4 and reverse biasing D1 and D3.

Current flow will now be from point A through D4, up through RL, through D2, through the secondary of T1, and back to point. The current flowthrough RL is always in the same direction. In flowing through RL this currentdevelops a voltage corresponding to that shown waveform Since current flows through the load (RL) during both half cycles of the applied voltage, this bridgerectifier is a full-wave rectifier.

ARDUINO UNO

Arduino Uno is microcontroller board which is based on Atmega328P. Arduino uno can be easily programmed, erased and reprogrammed at any instance of time. It has 14 digital input and output pins whereas 6 of the pins is used for PWM outputs. It also has 16 MHz quartz crystal, 6 analog inputs, USB connections for the purpose of data transfer, an ICSP header, reset button and power jack. The Uno board version 1.0 of Arduino Software has been evolved from older versions. Most of the Arduino boards has 5V linear regulator, 1 MHz crystal oscillator whereas designs like lilypad run at 8MHz.



Figure 4: Arduino uno

TECHNICAL SPECIFICATIONS:

Table 1: Technical specification

Microcontroller	ATmega328P
Operating Voltage	5V
Input Voltage	7-12 V
Analog Input Pins	6
Digital I/O Pins	14(6 for PWM output)
PWM Digital I/O Pins	6
DC Current per I/O Pin	20 Ma
DC Current for 3.3V Pin	50 mA
Flash Memory	32 KB
SRAM	2 KB
EEPROM	1 KB
Clock Speed	16MHz
Length	68.6 mm
Width	53.4 mm
Weight	25

PIN DIAGRAM:

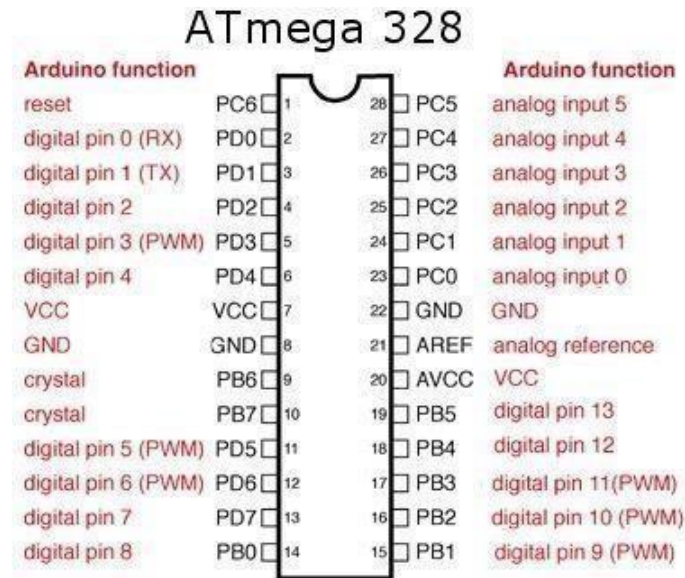


Figure 5: Pin diagram of Atmega328

WIFI MODULE

The WIFI module used in this project is ESP8266 which is a microchip and has low cost. It has the capability of a complete microcontroller and a Transfer control protocol or Internet Protocol stack. ESP8266 is a 32-bit microcontroller, with memory capacity of 32 KiB instructions, 80kiB user data, 16 GPIO pins, operating at the voltage of 3.3V DC. Other features of ESP8266 WIFI module are Inter Integrated Circuit serial communication protocol, Inter IC Sound can interface with Direct Memory Access, ADC (Analog to Digital conversion -10 bit). It also has external flash memory that can be accessed through SPI, 64 KB boot ROM and instruction RAM, 96 KB data RAM. ESP has faster transmission and processing as it handles the information on both the ways, one as sensor interface unit and other as the Wireless Communication.

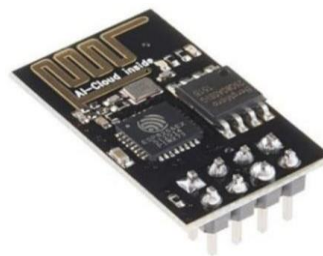


Figure 6: Wifi Module ESP8266

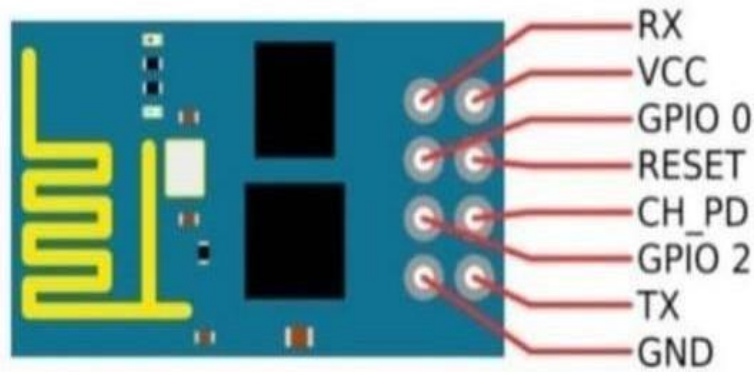


Figure 7: Pin Diagram of Wifi Module ESP8266

The pinout are as follows:

- VCC : 2.5V to 3.6V
- GND : 0V
- RX : Receive data bit x
- TX: Transmit data bit x
- CH_PD : Chip Power Down
- RST-: Reset Pin
- GPIO 1& 2: General purpose Input or Output No 1 & 2

Liquid crystal display (LCD) uses the light modulating properties of Liquid crystal is a thin, flat electronic visual display. They are used in various applications like computer monitors, instrument panels, aircraft cockpit displays, calculator and telephones. LCD's have cathode ray tube in most of its applications. They are easily portable, reliable, lightweight, and compact.

LM393 AMPLIFIER:

LM393 is a differential comparator. It is basically a Dual in package comparator IC because it contains two comparators inside single 8 pin package. Any Op- Amp can work as voltage comparator. It is used in moisture sensor module. In such way, LM393 is advantageous as it provides open collector output and suitable for driving the loads. The output transistor is capable of driving loads upto 50 mA and 50 V and it is appropriate for driving the RTL, TTL and MOS loads. The transistor may isolate the load from the system

ground. LM393 is powered with supply voltage circuit with the voltage of +5V. It is used in applications like oscillator circuits, zero crossing detectors, high voltage protection.

The features and specifications of this differential comparator are:

- It is a dual comparator in single package.
- Power Supply range: Single supply - 2V to +36 V, Dual Supply +1V to +18V.
- It has a drain current of 0.4 mA.
- It provides power dissipation of 660 mW.
- It has low Offset current and voltage.

TEMPERATURE SENSOR:

The temperature sensor used here is the NTC type which is Negative Temperature Coefficient. The temperature sensor also called the thermistor uses the property of resistance of ceramic composites and measures the temperature. These thermistors reduce their resistive value when the operating temperature in the surrounding increases. The important characteristics of the thermistor are the B value – material constant which is obtained based upon the material used. The thermistor operates within the temperature range of -90°C to 130°C .

When the thermistor is driven by constant current source it provides better and accurate conversion of the resistance versus the temperature. The advantages of the NTC sensors are compact in size, long term stability, and high precision. When operated along with potentiometer which sets the reference voltage i.e. threshold voltage level. If the voltage across the thermistor is greater than the reference voltage, LED remains in off state.

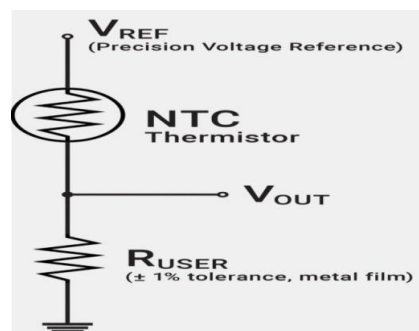


Figure 8: Circuit Diagram of NTC thermistor

MOISTURE SENSOR:

The moisture level of the soil can be measured with the help of the FC28 soil moisture sensor. The sensor predicts the water content Bycalculating the average over the entire length of the sensor . The moisture sensor has two probes which acts as variable resistor. If the moisture content is sufficient in the soil, there will be better conductivity and the resistance will drop low and it provides high signal output where the VCC and GND pins are connected to the Arduino Uno. But the moisture sensor when exposed to moist environment will have short lifespan.

The VCC value ranges from 3.3V to 5V and it also has digital outputinterface (0 &1) and analog output interface. The moisture sensor is operated along with the LM393 comparator which gives active high when the soil is dry whereas it gives active low when the soil is moist. The digitaloutput from the sensor is used as input for the Arduino, which is connectedto the relay, it runs when the moisture is less. By implementing this technique, a huge amount of water can be saved, and excessive watering of plants can be avoided.

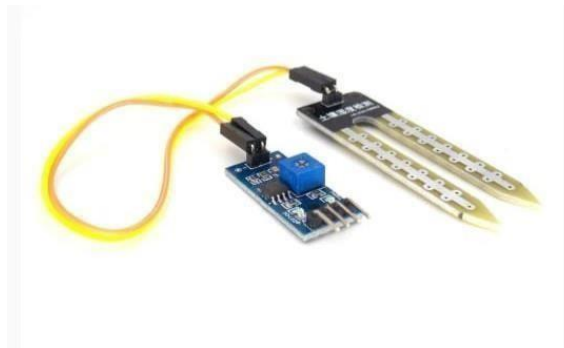


Figure 9: Moisture Sensor

ULTRASONIC SENSOR:

Ultrasonic sensor which is an electronic device measuring the distance of targeted object by the process of emitting the ultrasonic sound waves by using piezo electric crystals. and results in conversion of reflected sound into an electrical signal. Ultrasonic waves consist of frequencies greater than 20 kHz. Audible sound waves travel slower than the ultrasonic waves. The two main components of the ultrasonic sensors are transmitter and the receiver. The distance between the object and sensor is calculated by measuring the time taken between waves emitted to and from the object. Ultrasonic sensor is especially used as proximity sensors and also as level sensors for detecting, monitoring and regulating liquid levels in closed containers. Used in medical industry for diagnosing internal organs, identifying tumors.



Figure 10: Ultrasonic Sensor

Features of HC-SR04 are,

- The measuring distance range (Theoretical value) is around 2cm to 450 cm.
- The measuring distance range (Practical value) is around 2cm to 80cm.
- The accuracy achieved is 3 mm.
- The measuring angle covered is less 15 degrees.
- Operating current is less than 15 mA.
- It operates at the frequency of 40Hz.
- It operates at the voltage of +5V.

LDR SENSOR:

LDR referred as Light Dependent Resistor detects any change in the light intensity since its sensitive and responsive to light. As soon as the light ray falls the value of the resistance is changed. The resistance value is inversely proportional to the light intensity. Whenever the light intensity increases, the resistance decreases and when the light intensity decreases, the resistance increases. The resistor is made up of semiconductor materials like Cadmium Sulfide or Cadmium Selenide, Lead Sulfide, Indium antimonide. The LDR has no polarity since they don't have no polarity though the resistor is made up of semiconductor. In this way they differ from photodiodes and phototransistor. The LDR is of two types such as the linear type LDR, Nonlinear type LDR. The advantages of using LDR are high sensitivity, inexpensive, simple device, small, inexpensive, it has high ratio for light to dark resistance.

RELAY:

A relay is an electromechanical device which is used break or creates an electrical connection. It contains a flexible mechanical part which is movable controlled via electromagnet. It controls the high -powered circuit with the low power signal. It operates at a voltage of +12V. A relay consists of the components like movable armature, yoke, contacts, copper wire, windings, core, normally closed and opened terminals, coil terminals, common terminal. In this project we have used SPDT (Single Pole Double Throw) relay. Relay is a metal which doesn't the property of magnet but converted into magnet using the electrical signal. When the metal is winded with copper wire which is driven with sufficient power supply, the metal acts as magnet, attracting the other metals within the specified range.



Figure 8.4: Relay

The relay's switch connections are usually labelled COM, NC and NO:

- **COM** = Common, always connect to this, it is the moving part of the switch.
- **NC** = Normally Closed, COM is connected to this when the relay coil is off.
- **NO** = Normally Open, COM is connected to this when the relay coil is on.

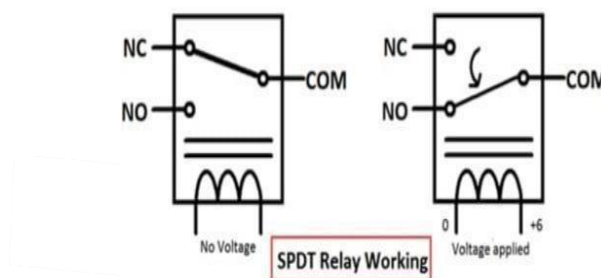


Figure 11: SPDT Relay Working

TRANSMITTER AND RECEIVER:

Radio frequency operating range is from 30KHz to 300GHz. Usually in the Rf system, amplitude of carrier waves represents the digital data. Data transmission and reception is made possible with the antenna used at ends. The RF module operating at this frequency are used for simple purposes and used in small area applications for data transfer. The features of RF module are less power consumption, transmitter and receiver frequency range are 433.92MHz and 433MHz respectively, operating voltage of receiver is 5V.

The RF module can be operated without decoder and encoder pair, but it can only have one input and one output. The RF transmitter and receiver which operates at 433MHz have four pins namely Vcc, Gnd, Data, Antenna. The Vcc pin powers the transmitter and receiver, the ground pin is connected to the ground of the encoder and decoder pair. The data pin is used to transmit data in case of transmitter and receive data in case of the receiver. When the RF module is combined with the encoder and decoder pair, multiple input and output can be received and transmitted. RF modules have applications such as wireless smart cards and meter reading, vehicle monitoring, security systems and so on.

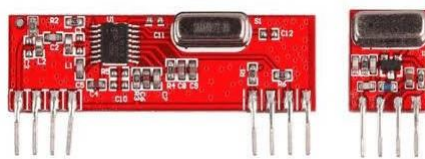


Figure 12: RF Transmitter & Receiver

HT12E & HT12D:

Encoder and decoder are combinational circuits. Encoder has 2^n input lines and n output lines whereas the decoder has no input lines and 2^n output lines. Encoder converts the input signal into binary code output, but the decoder converts the binary input into signal. HT12E and HT12D are 12-bit encoder and decoder which combines to form encoder-decoder pair to transmit and receive data. Often used in IF wireless transmission and RF

wireless transmission. Used in applications like home automation, fire alarms, burglar alarms and remote-controlled systems, water level indicator

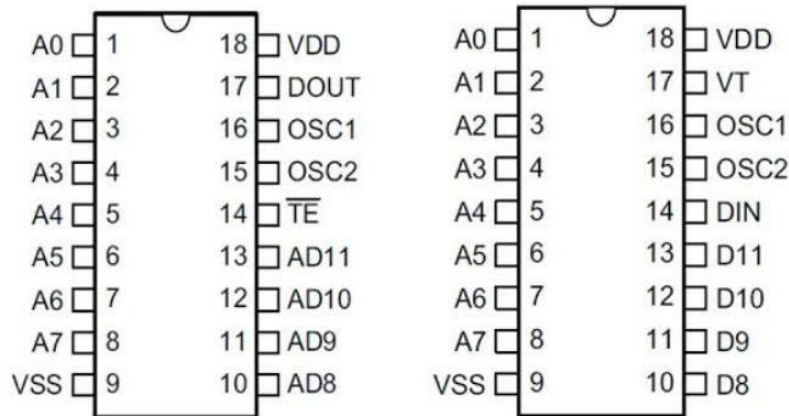


Figure 13: Pin diagram of HT12E & HT12D

INTERNET OF THINGS (IOT)

The Internet of things is the network of physical objects or maybe devices, vehicles, buildings, embedded along with the sensor, microcontroller, or devices like Arduino uno, Node MCU and the network connectivity which makes the collection and exchange of data possible. Cloud serves as an environment for storage, user interaction, handling real time database and others analytic work for project implementation. The traditional fields of IOT are home automation, building automation, wireless sensor network, embedded systems. Earlier, it was estimated that 50 billion things are supposed to be connected to the internet. Bluetooth, Wifi, RFID, Zigbee are wireless technologies that connect the system to the internet. The wifi has higher data rate and it provides flexibility for the interface design.

An IOT system with smart web devices which can collect, sending data and connects the electronic devices. The IOT devices share the sensor data by connecting to IOT gateway or to the cloud for storing the data. The emerging IOT standards are Zigbee, LiteOS, OneM2M, Data Distribution Service, Advanced Message Queuing Protocol,

Constrained Application Protocol. The frameworks technologies are Amazon Web Services, Arm microcontroller, Microsoft Azure, Calvin. IOT is very much useful for business purpose and for controlling and monitoring devices anywhere they are. In business it reduces time, saves money as well it reduces the number of laborer's and helps to perform smart work and live better.

FEATURES PROVIDED IN CURRENT STABLE VERSION:

- The Gradle based build support.
- Pro Guard integration and app signing capabilities.
- Support for building Android Wear apps.
- Android Virtual Device (Emulator) to run and debug apps in the Android studio.
- Templates-based wizards to create common Android designs and components.
- Lint tools are used to catch the performance, usability, and the version capabilities and other problems.

The Android Emulator has additional requirements along with basic system requirements for Android Studio:

- SDK Tools 26.1.1 or higher
- 64-bit processor
- Intel Hardware Accelerated Execution Manager (HAXM) 6.2.1 or later (HAXM 7.2.0 or later it will be recommended)
- Windows: CPU and UG

The Android Studio provides a unified environment in which you can build apps for

Android phones, tablets, Android Wear, Android TV, and Android Auto and the Structured code modules allow you to build and divide your project into the units of functionality in which you can independently build, test, and debug. Kotlin is a modern statically typed programming language which was used by over 60% of professional Android developers satisfaction, and code safety.

WORKING PRINCIPLE:

We are using 12V Battery to operate the kit, then we are using the power supply unit for getting the constant output and for sending the output we are using regulator power supply unit it consists of diode, rectifier, capacitor, filter, it receives the output from the battery. In this project we are using four types of sensors such as temperature sensor, ultrasonic sensor and moisture sensor and LDR sensor. The temperature sensor is used for measuring the temperature of its environment and converts the input data into electronic data to record, monitor the signal temperature changes. Ultrasonic sensor is used to measure the distance of a target objects by emitting ultrasonic sound waves and converts the reflected sound into an electronic signal. The moisture sensor uses capacitance to measure the water content of soil. Depending upon the light intensity, the value of the LDR sensor.

The sensors send their corresponding values to the Arduino Uno, when the moisture level is low, the relay turns the water pump to increase the moisture level of the soil. RF transmitter and receiver are used along with the encoder & decoder pair to transmit the signal which contains the sensor values. The receiver kit receives the signal from the transmitter kit which has the sensor outputs. The receiver kit has step down transformer which converts the 230V ac voltage to 12V dc voltage which is connected to the relay. The relay turns on the Light when the light intensity is low. The relay turns on the dryer when the temperature is low, and it turns on the exhaust when the temperature is high. The wifi module in the transmitter kit which sends the sensor values through the server which is received by the mobile app through the hotspot. Then the values of the sensor and status of

the sensors are displayed in LCD display as well as in the mobile app.

IOT BASED SMART POWER MANAGEMENT AND THEFT IDENTIFICATION SYSTEM FOR AGRICULTURE

KATHIRVELU.V, THILAK.G , HARIHARAN.R

Recent survey and studies on saving of electricity have concluded that the significant portion of electricity is being wasted due to improper use of electrical appliances mainly in domestic and corporate sectors. The idea of conserving electricity means that you should only use it is necessary and when we should avoid wasting it. This means doing simple things, such as turning off lights when you leave a room, as well as more involved processes, such as replacing standard light bulbs and appliances with those that use less electricity. While you may not notice much of an impact on your day-to-day life when you make these types of changes, the environmental impact of your actions will be much larger. The working of this project is based on Normal mode and Agricultural mode, Normal mode is the mode designed in the circuit which helps to indicate the usage of power up to a certain extent (limitation range) to the consumer which prevents them from excess usage of power. In Agricultural mode, the location of the power theft is identified and is intimated to the individual (field owner) via message which helps the individual from paying excess electricity bill for the hefted power usage and in additional we also display the graphical representation of the output by using Think speak application.

The objective of the project is to identify, develop and demonstrate technological control systems that can ensure large-scale energy consumers (power consumption exceeding 0.16wh/year) more flexible power consumption so they can reduce energy costs and the impact on the environment as well as utilize periods with large environmental power generation and minimum load on the grid. In this project we have introduced two modes such as Normal mode and Agricultural mode. In Normal mode the actual power is supplied to all the home appliances and their usage are said to be monitored and when they reach a particular limit of usage (limitation range:500units) it is indicated via message to the consumer, where for excess usage solar power can be used as an alternative. In agricultural fields, Agricultural mode is said to be used such that whenever a power theft occurs the detection and the location of the theft are said to be identified and it is intimated via

message to the landowners. This substantially reduces the electricity bill for both the consumers and the landowners and helps them out in various means.

ALGORITHM:

- Step1: 230V power supply is given and the toggle switch is switched to normal mode.
- Step2: Here the 230v is given to step down transformer and reduced to 12v and again reduced to 5v using voltage regulator.
- Step3: Since the NODE MCU, PIC-Microcontroller, LCD, Toggle switch works in 5v. So, it reduced & PN-junction diode is used to avoid reverse current flow.
- Step4: Then here the powers used by the appliances are showed in LCD display.
- Step5: When the usage of current (or) power cross the limit cut off occurs to indicate maximum usage. (limitation range : 20 units used in project).
- Step6: For further extra usage power can be utilized from Solar panel which is already stored in the two 6V battery and then send to the inverter circuit and it is used for household appliances.
- Step7: The toggle switch is reversed, and agriculture mode is ON.
- Step8: Generally motor run in 3 phases.
- Step9: Generally, after 10 hrs only single phase is said to run and when it is series theft occurs.
- Step10: When the theft occurs, it is indicated and it is informed via message (field owner).
- Step11: Using the message, location of the theft is identified.
- Step12: Consumer's Energy Meter Readings and Message of power utilization are displayed and viewed using thinks speak & GSM module.

FLOW CHART:

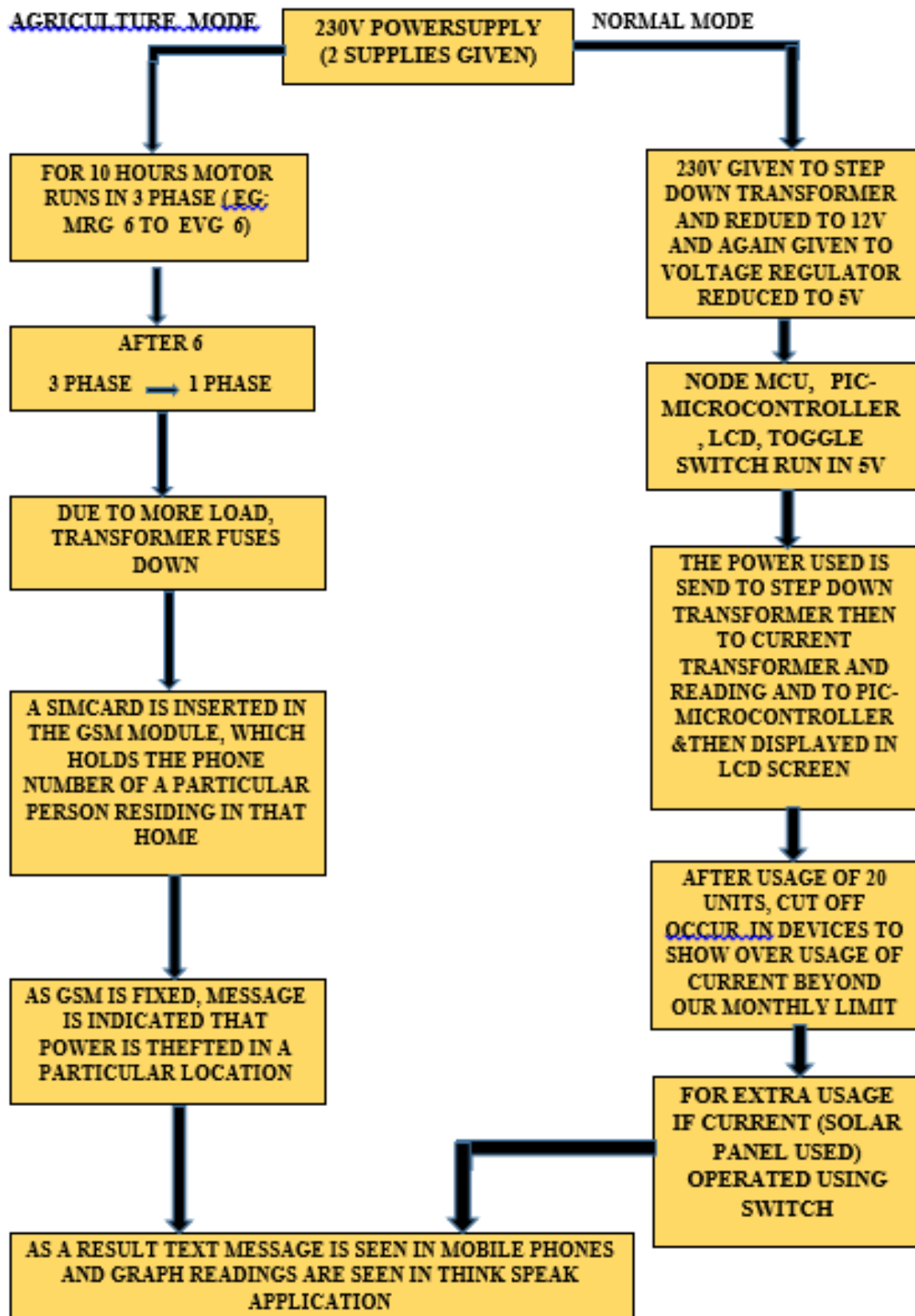


Fig.1 Flow Chart

BLOCK DIAGRAM:

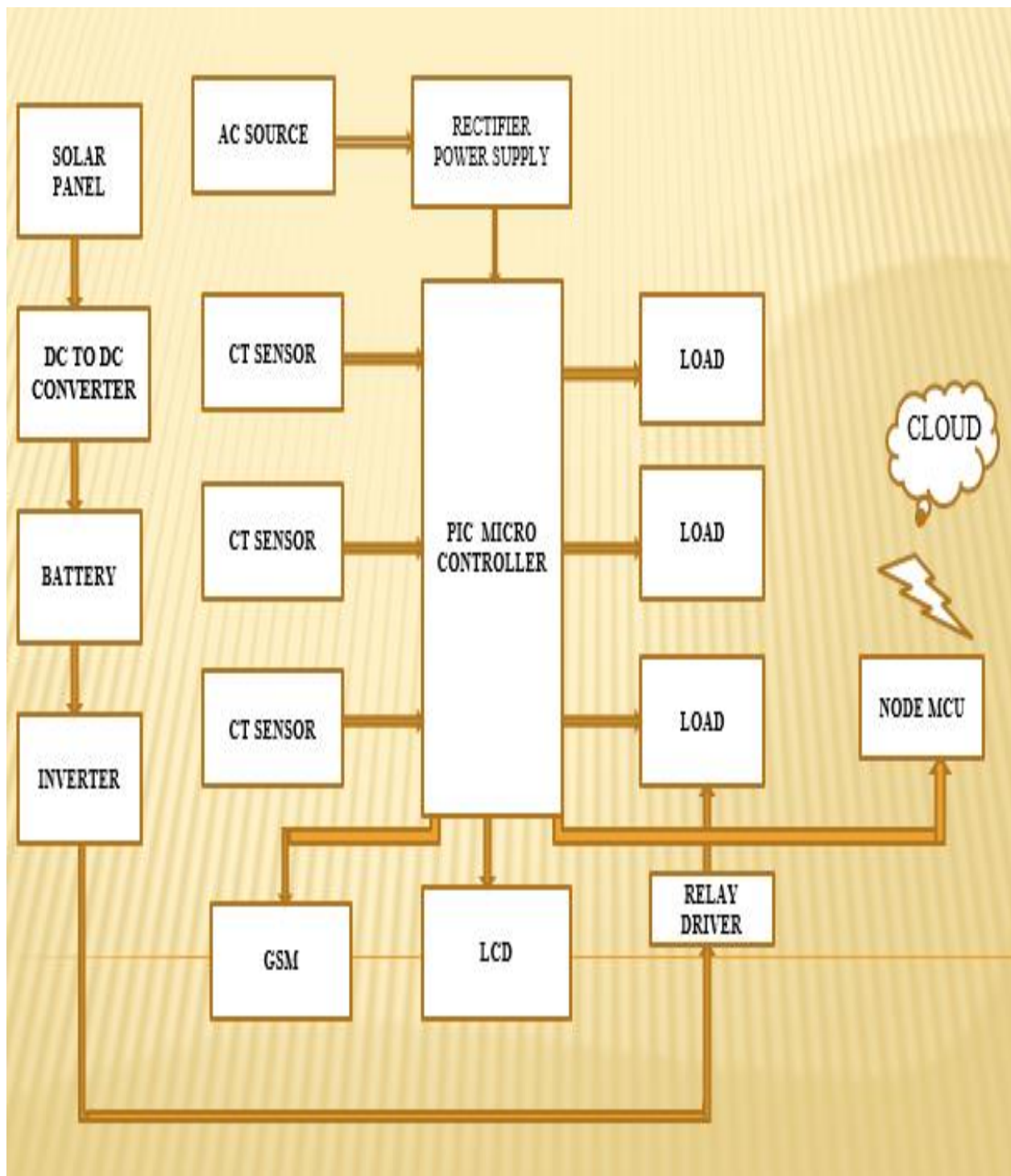


Fig.2 Block Diagram

CIRCUIT DIAGRAM:

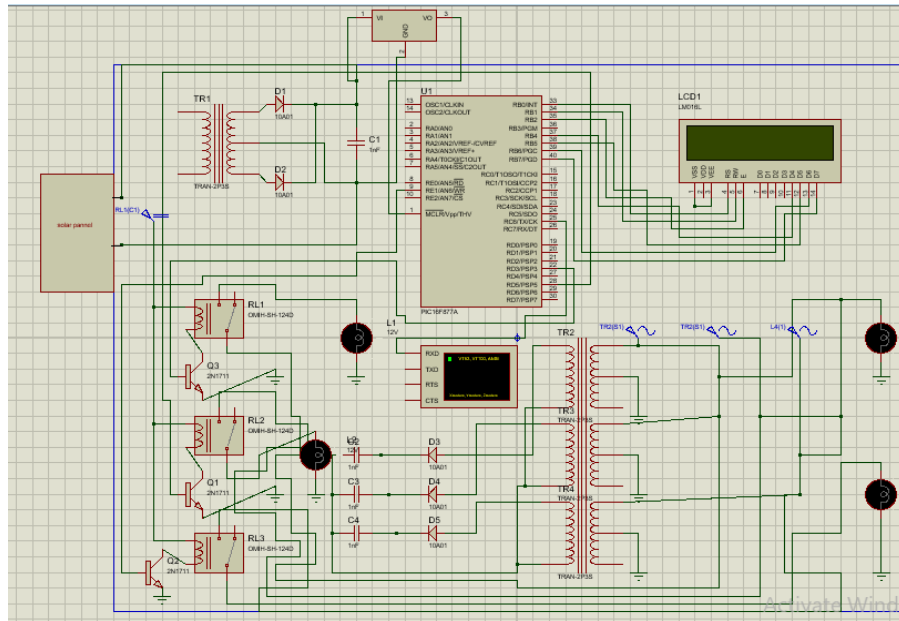


Fig.3 Circuit Diagram

WORKING:

The circuit consists of DC power supply unit, Transformer, Control unit, Micro-controller, NODE MCU, GSM Module, Solar Panel, LCD display, Relay and Capacitor.

The working of this project is based on two modes:

- ❖ Normal Mode.
- ❖ Agriculture Mode.

NORMAL MODE:

In normal mode, the power usage of the appliances is displayed in the LCD screen and the main aim is to control the usage of power within the given limit. When the appliances usage once reaches the limit (limitation range: 500 units) it gets tripped off and the consumer is said to be intimated via message & for further extra usage of power renewable energy can be used as an alternative (e.g., Solar energy). The output is seen via

text message in android mobile phones and in additional we also display the graphical representation of the output by using Think speak application.

AGRICULTURE MODE:

In general, to irrigate the agricultural fields the power supply given to the motor is said to be in three phases, but few people use three phase current during the daytime and during the night-time they convert the three-phase current to single phase by connecting the other two-phase wires in series in a single phase and they irrigate their fields. As a result, more load is experienced and the transformer fuses down. In order to overcome this issue, we have developed a project to detect the location of the service who has converted the three phases to single phase and used the power supply to irrigate the fields via text message indicating that power is hefted as GSM module is fixed in it.

MICROCONTROLLER BASED PASSWORD BASED CIRCUIT BREAKER

B. DHIVYASRI, G.S. GAYATHRIDEVI AND S.RANJANI

The task is intended to control an electrical switch with assistance of a secret key as it were. A keypad is associated with the undertaking to enter the secret word. Lethal electrical mishaps to the line man are expanding during the electric line fix because of the absence of correspondence and co-appointment between the upkeep staff and the electric substation staff. This proposed framework gives an answer, which can guarantee the security of the support staff for example line man. The control to turn ON/OFF the line lies with the line man as it were. This framework has a course of action to such an extent that a secret phrase is needed to work the electrical switch (ON/OFF).

Line man can turn off the stock and easily fix it, and get back to the substation, at that point turn on the line by entering the right secret word. The framework is completely constrained by a microcontroller from 8051 family. A grid keypad is interfaced to the microcontroller to enter the secret word.

The entered secret word is contrasted and the secret word put away in the ROM of the microcontroller. If the secret key entered is right, just the line can be turned ON/OFF. Actuation/deactivation of the electrical switch is shown by a light (ON/OFF).

Further the undertaking can be upgraded by utilizing an EEPROM for client to change the secret phrase for a more got framework. It can likewise be interfaced with a GSM modem for distantly controlling the circuit breaker through SMS.

BLOCK DIAGRAM

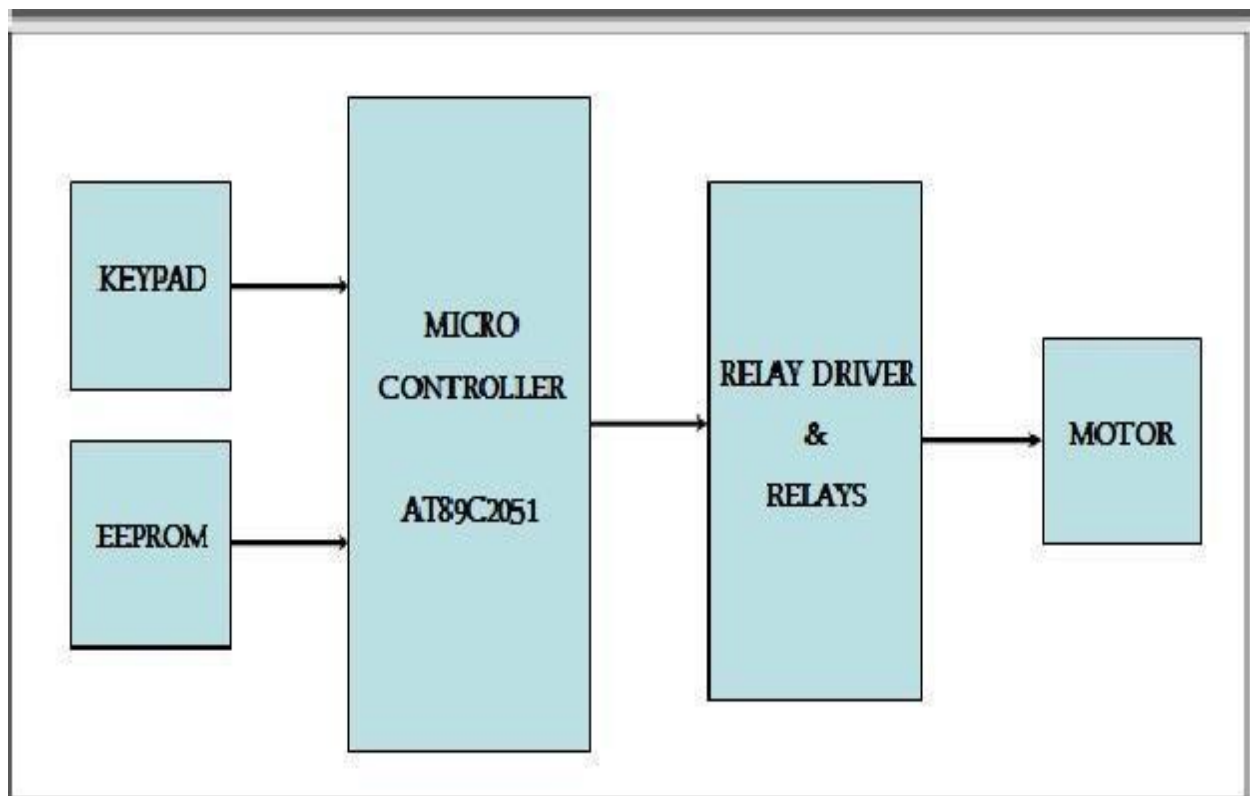


FIGURE 1

INTEL'S 8051 ARCHITECTURE

The nonexclusive 8051 engineering sports a Harvard design, which contains two separate transports for both program and information. In this way, it has two memory spaces of 64K X 8 size for both program and information. It depends on an 8 cycle focal handling unit with a 8 bit Collector and another 8 digit B register as principle handling blocks. Different segments of the design incorporate not many 8 digit and 16-bit registers and 8-bit memory areas.

Each 8031 gadget has some measure of information RAM inherent the device for internal processing. This area is used for stack tasks and transitory stockpiling of information. This base design is upheld with on chip fringe capacities like I/O ports, clocks/counters, flexible sequential correspondence port. So obviously this 8051 engineering was intended to cater numerous continuous implanted necessities.

THE FOLLOWING LIST GIVES THE FEATURES OF THE 8051 ARCHITECTURES:

- ☐ Optimized 8 bit CPU for control applications.
- ☐ Extensive Boolean processing capabilities.
- ☐ 64K Program Memory address space.
- ☐ 64K Data Memory address space.
- ☐ 128 bytes of on chip Data Memory.
- ☐ 32 Bi directional and individually addressable I/O lines.
- ☐ Two 16 bit timer/counters.
- ☐ Full Duplex UART.
- ☐ 6 source / 5 vectors interrupt structure with priority levels.

Presently you might be pondering about the non-referencing of memory space implied for the program stockpiling, the main piece of any implanted regulator. Initially this 8031 engineering was presented with on chip, 'once programmable' rendition of Program Memory of size 4K X 8. Intel conveyed every one of these microcontrollers (8051) with client's program melded inside the gadget. The memory divide was planned at the lower end of the Program Memory territory. In any case, in the wake of getting gadgets, clients couldn't transform anything in their program code, which was at that point made accessible inside during gadget manufacture. Thus, very soon Intel presented the 8031 gadgets (8751) with reprogrammable kind of Program Memory utilizing worked in EPROM of size 4K X 8. Like a customary EPROM, this memory can be re customized commonly. Afterward on Intel began fabricating these 8031 gadgets with no on chip Program Memory.

CENTRAL PROCESSING UNIT

The central processor is the cerebrum of the microcontrollers perusing client's projects and executing the normal undertaking according to guidelines put away their in. Its essential components are an 8-bit Number-crunching Rationale Unit (ALU), Gatherer (Acc), few more 8 cycle registers, B register, Stack Pointer (SP), Program Status Word (PSW) also, 16 cycle registers, Program Counter (PC) and Information Pointer Register (DPTR).

The ALU (Acc) performs math and rationale capacities on 8 cycle input factors. Number juggling tasks incorporate fundamental expansion, deduction, increase and division. Intelligent activities are AND, OR, Selective OR just as turn, clear, supplement etc. Separated from all the above, ALU is responsible in conditional branching choices, and gives an impermanent spot in information move activities inside the data bit.

B register is mainly used in increase and partition activities. During execution, B register either keeps one of the two information sources or then holds a bit of the outcome. For different guidelines, it tends to be utilized as another universally useful register.

TIMERS/COUNTERS

8031 has two 16 cycle Clocks/Counters fit for working in various modes. Each comprises of a 'High' byte and a 'Low' byte which can be gotten to under programming. There is a mode control register and a control register to arrange these clocks/counters in number of ways. These clocks can be utilized to gauge time spans, decide beat widths, or start occasions with one microsecond goal up to a limit of 65 millisecond (relating to 65, 536 checks).

Use programming to get longer postponements. Filling in as counter, they can collect events of outer occasions (from DC to 500 KHz) with 16-digit accuracy. In our venture we are utilizing 8-digit microcontroller AT89C2051, it is the high level 8-bit microcontroller from ATMEL, which joins Streak Rom, and Clock and so on.

FEATURES OF AT89C2051:

The AT89C2051 gives the accompanying standard highlights: 2K bytes of Glimmer, 128 bytes of Slam, 15 I/O lines, two 16-digit clock/counters, a five-vector two-level interfere with engineering, a full duplex sequential port, an accuracy simple comparator, on-chip oscillator, and clock hardware.

DESCRIPTION

The AT89C2051 is a low-voltage, superior CMOS 8-bit microcomputer with 2 Kbytes of Glimmer Programmable and erasable read as it were memory (PEROM).

The gadget is produced utilizing Atmel's high thickness nonvolatile memory innovation and is viable with the business Standard MCS- 51 guidance set and pin out.

By joining a flexible 8-bit computer chip with Streak on a solid chip, the Atmel AT89C2051 is an incredible microcomputer which gives an exceptionally adaptable and practical answer for some implanted control applications.

CIRCUIT DIAGRAM EXPLANATION

The Primary Piece of the above Circuit outlines is the Microcontroller AT89C2051. The Keypad was the information gadget, and it was associated in a grid design, so the quantities of ports required are decreased. The Microcontroller peruses a four-digit secret phrase through the Keypad.

At that point the Microcontroller contrasts the four-digit secret phrase and the number which is pre-programmed and if it is equal the n the Microcontroller will turn on the engine for the entryway also, on the off chance that we enter some unacceptable secret phrase for multiple occasions, an alert will be turned on until a correct secret key was squeezed through the Keypad.

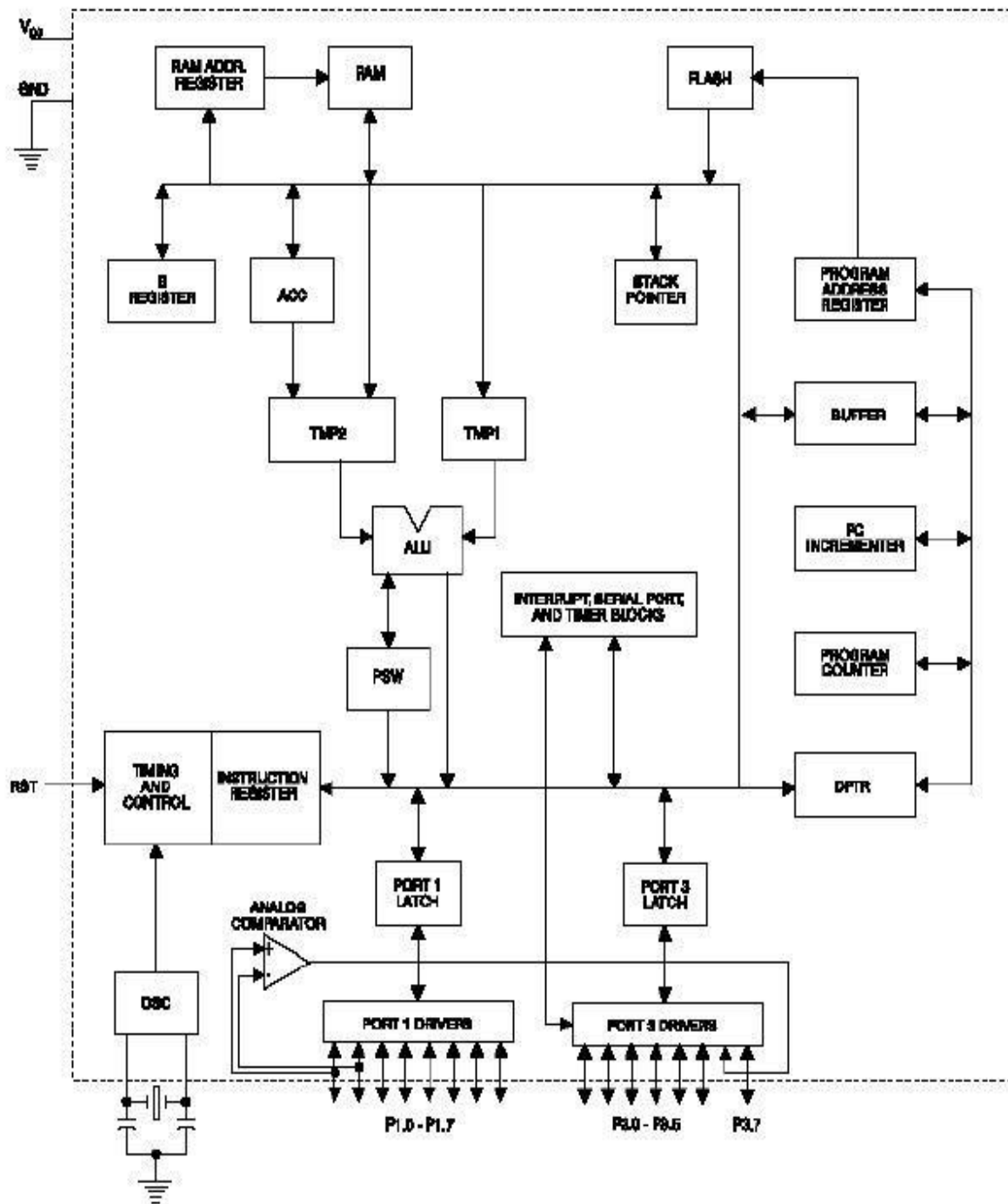


FIGURE 2

MAIN CIRCUIT DIAGRAM

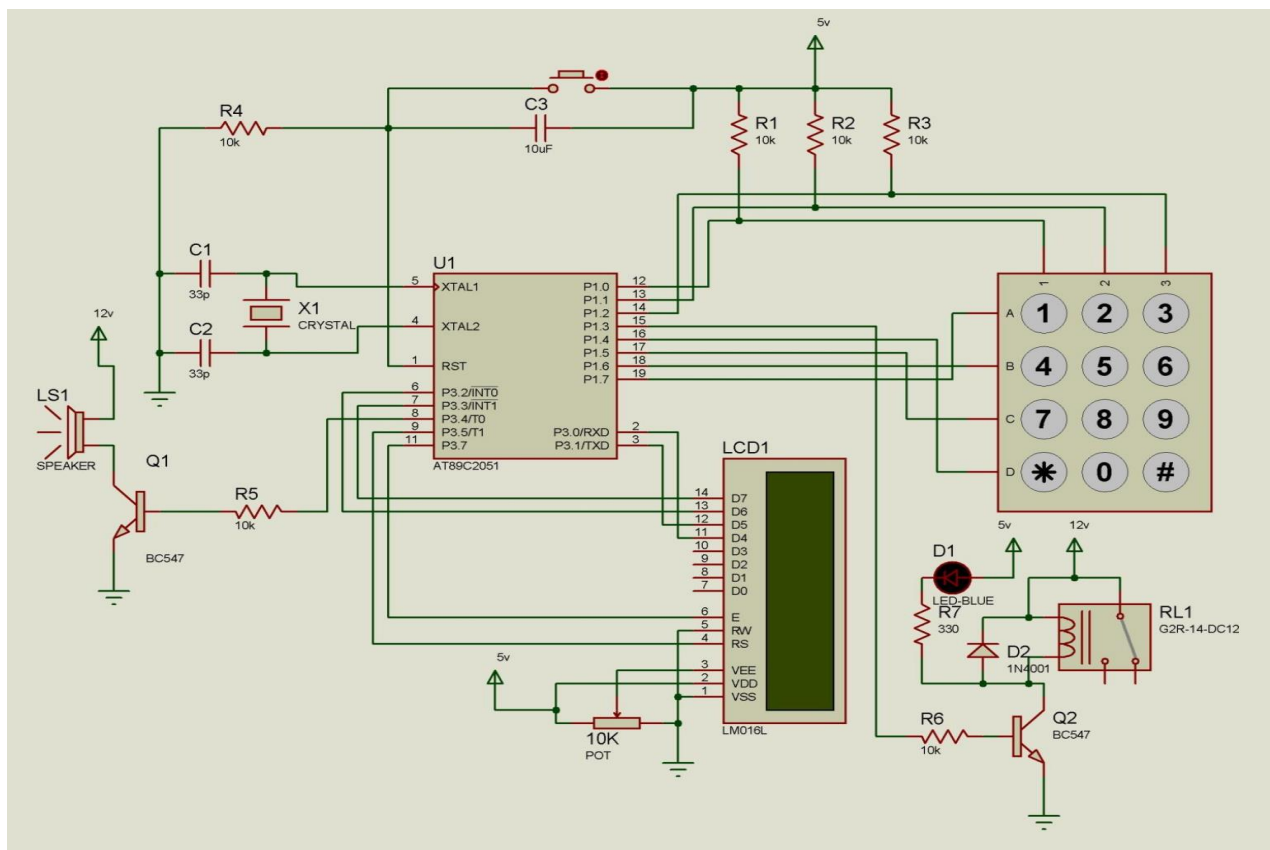


FIGURE 3

4.2. POWER SUPPLY DIAGRAM

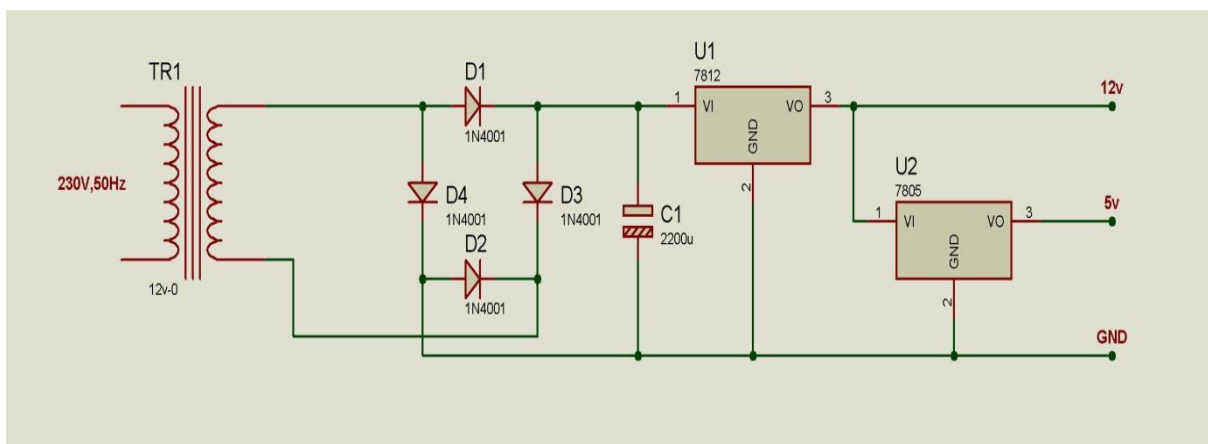


FIGURE 4

The Secret key was put away in the EEPROM and the secret phrase can be changed at whenever utilizing a similar keypad. To change the secret phrase dial 12345 Old secret

phrase - New Secret word. The force supply area is the significant one. It ought to convey steady yield managed power supply for fruitful working of the undertaking. A 0-12V/500 Mama transformer is utilized for our motivation the essential of this transformer is associated into primary stock through on/off switch& combine for shielding from over-burden and short out insurance. The optional is associated to the diodes convert from 12V AC to 12V DC voltage. Which is additionally managed to +5v, by utilizing IC 7805.

FLOWCHART

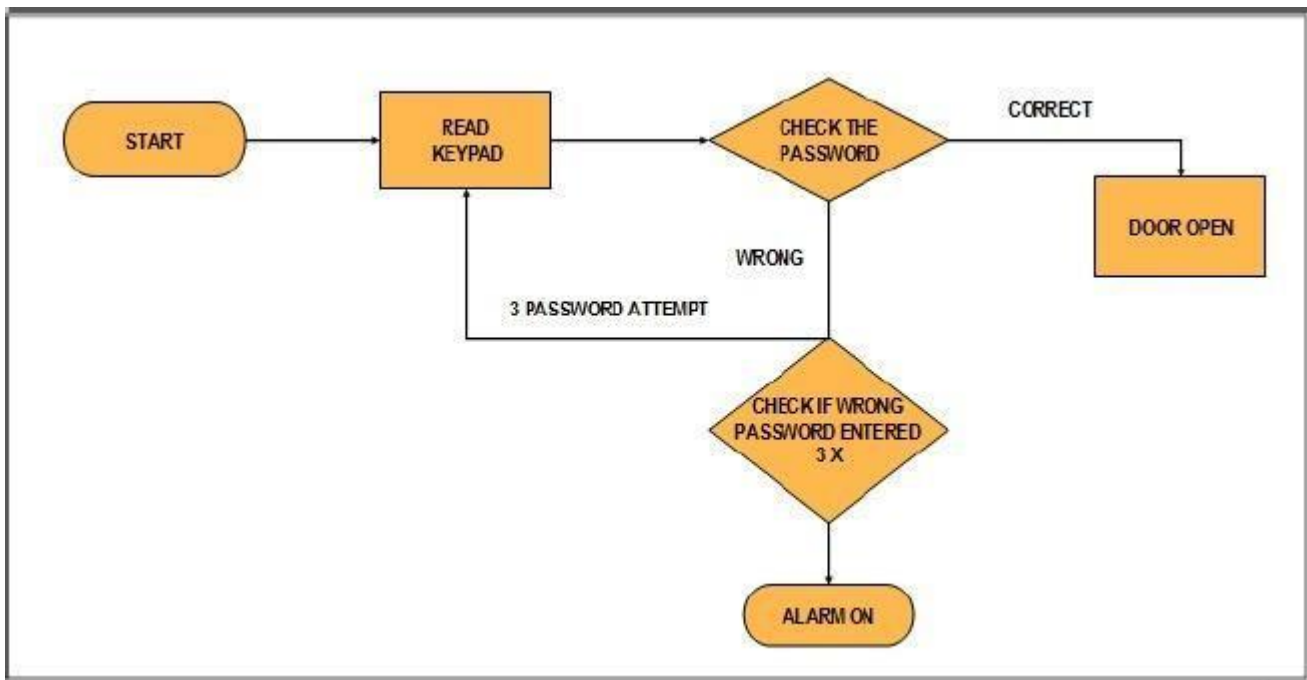


FIGURE 5

Department of Electronics and Communication Engineering

Vision

To be recognized by the society at large as a full- fledged department, offering quality higher education in the Electronics and Communication Engineering field with research focus catering to the needs of the stakeholders and staying in tune with the advancing technological revolution and cultural changes.

Mission

To achieve the vision, the department will

- Establish a unique learning environment to enable the students to face the challenges in Electronics and Communication Engineering field.
- Promote the establishment of centres of excellence in niche technology areas to nurture the spirit of innovation and creativity among faculty and students.
- Provide ethical and value-based education by promoting activities addressing the societal needs.
- Enable students to develop skills to solve complex technological problems and provide a framework for promoting collaborative and multidisciplinary activities.

