A

Mini Project Report

on

COIN BASED MOBILE CHARGER USING ARDUINO

Submitted to

CHADALAWADA RAMANAMMA ENGINEERING COLLEGE

In partial fulfillment of the requirements for the award of the Degree of

BACHELOR OF TECHNOLOGY IN ELECTRONICS & COMMUNICATION ENGINEERING

By

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CHADALAWADA RAMANAMMA ENGINEERING COLLEGE

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CHADALAWADA RAMANAMMA ENGINEERIG COLLEGE

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Certificate

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We are hereby declare that the project work on "**COIN BASED MOBILE CHARGER USING ARDUINO**" done by us under the guidance of **Dr. B. CHANDRA BABU NAIK, M.Tech, Ph.D** in **CHADALAWADA RAMANAMMA ENGINEERING COLLEGE (Autonomous)** is submitted in partial fulfillment of the requirements of the requirements of the award of Degree of Bachelor of Technology.

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ABSTRACT

The coin based mobile charging system charges the mobile phones when the coin is inserted. This system is used by shop owners, rural people, and can be implemented in the public places like railway stations, bus stand to provide mobile charging facility. The coin acceptor recognizes valid coins only and it transmit the signals to Arduino UNO further process. If a valid coin is found, then it start the mobile charging mechanism if applied the power supply 5V to the mobile phone. The Arduino sends the signal to the LCD it starts a reverse countdown timer and then it charge the mobile phone. Further the user adds another coin, the Arduino adds to the currently remaining time and once again decrements the countdown. This system can be used for smart mobile charging at public places. This coin based mobile charging system will supply the enough amount of charge to the mobile phone and is available on demand in public places.

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LIST OF ABBREVATIONS

LCD	- Liquid Crystal Display
E	-Enable
R/W	-Read/Write
LED	-Light Emitting Diode
IR	-Infrared
SPDT	-Single pole double Throw
DPDT	-Double pole Double throw
IDE	-Integrated development En

CHAPTER 1

1.1 INTRODUCTION TO MOBILE PHONES

Mobile phones become a major source of business/personal communication; the mobile phone business is currently worth billions of dollars, and supports millions of phones. The need to provide a public charging service is essential. The coin-based mobile battery charger develop in this project is providing a unique service to the rural public where grid power is not available for partial/full daytime and a source of revenue for site providers. The coin-based mobile charger can be quickly and easily installed outside any business premises. The mobile phone market is a vast industry, and has spread into rural areas as an essential means of communication.

Mobile Phone is often also called “Cellular phone”. It is a device mainly used for a voice call. Presently technological advancements have made our life easy. Today, with the help of a mobile phone we can easily talk or video chat with anyone across the globe by just moving our fingers. Today mobile phones are available in various shapes and sizes, having different technical specifications and are used for a number of purposes like voice calling, video chatting, text messaging or SMS, multimedia messaging, Internet browsing, Email, video games, and photography. Hence it mobile phone also has its pros an cons.

1.2 COIN BASED MOBILE CHARGER

This is the smart coin based mobile charger system that charges your mobile for particular amount of time on inserting a coin. The system is to be used by shop owners, public places like Railway stations to provide mobile charging facility. So that the System consists of a coin Recognition module that recognizes valid coin is found it signals the Arduino for further action. And microcontroller then its starts the mobile charging mechanism providing a 5v supply to through a power section to the mobile phone, now systems also needs to monitor the amount of charging to be provided. So the system can be used for smart mobile charging at public places.

The objective of this project is to develop coin based mobile charger using timer IC along with circuits of IR sensor which we inserting coin and relay of the charger is ON for particular period of time. This Project is very useful to the people who are all using mobile phone are without at charging Condition in public places. In this project, who are all using mobile phones in out of a home Office without charging condition. A sensor system is used to detect the presence of coin. It may be may be of different type (IR sensor). The coin is inserted between the transmitter and received signal.

When a signal came from sensor unit, the microcontroller activates the charger unit for a predefined time. After that it will reset to normal case. Driver circuit is used for providing to that of sufficient input voltage of relay. The relay will on to activate the 230v charger, we will use that charger to charge for our mobile phone.

The major action in this system is controlled by transmitter section this consists of IR transmitter and IR receiver. Here we need to generate IR frequency continuously. So that by the using a small tiny microcontroller and frequency is to produced and is connected by IR receiver continuously receives the signals from the transmitter. Whenever the light path in between an IR transmitter and IR receiver cuts by an obstacle receiver signals gives low to high pulse. By to the IR led to generate IR light rays of 38khz frequency.

Connecting the receiver output to the Arduino interrupt pin, it gives interrupt to the pin Microcontroller immediately the system gives the buzzer and sends the message to the display on LCD.

CHAPTER 2
LITERATURE REVIEW

2.1 INTRODUCTION

In recent times, there has been lots of advancements and technologies are being developed for charging the mobile phones. In most cases solar energy is used for charging the mobile phones. Solar energy converts light energy into DC current that can be used for charging the mobile phones. A fixed solar panel of size 635*550*38mm, 37WP is used to charge the mobile phones up to maximum 2.0 amp.The Infra-Red Sensor is another way to charge mobile phones. The Infra-Red transmitter transmits IR signals in the transmitter side and receives the IR signal in the IR receiver side.

In 2015, Nupur khera had presented a solution to improve the control in charging and discharging of the battery. The solar charge controller will prevent the battery. The solar charge controller will prevent the battery from overcharging thus, it will increase battery life. The solar charge controller will also prevent the reverse flow of current from the batteries to the night's solar panels.

2.2 LITERATURE REVIEW

In 2017, Dhara G. Rangani, Nikunj V. Tahilramani presented mobile charging using a coin in which their main focus was coin detection, for which they used a cantilever type sensor for coin detection. The cantilever-type sensor detects the weight of the 5-rupee coin and gives a digital signal to ADC. They were using this controller to check whether the coin is original or duplicate. They have also used solar power for charging the mobile batteries and used greed power when solar power is not available.

In May 2017, Mr, C V Raja Reddy, Uzoigwe Daniel, Rupesh Rai, Balaji R proposed coin based mobile charging with solar tracking in which their main focus was solar tracking for which they have used LDR's so according to the sunlight intensity, LDR resistance will

be varied. When the sun intensity is high, then LDR offers less resistance, the voltage across each LDR is given to the ADC, then the controller checks in accordance with the algorithm designed and rotate the motor in the specified direction.

The small amount of charge can be used in the initial phase to reduce the long charging time without pushing the batterie's reliability limits. This DPCS technique effectively decreases longer charging time hence provides an efficient alternative battery charging system, in this method, after applying a constant current for a short amount of time, that system rests for a few tens of a milliseconds to let and chemicals settle and stabilize.

This technique can be utilized in future mobile, wireless charging and power transfer system in which coin recognition is based on the detection of the coin's natural frequencies. The frequencies of these vibrations depend on the objects properties like mass, shape anmaterial type, and remain the same as long as these properties do not change. Also, this method permits the recognition of fake or deteriorated coins because they have different properties. The principle applied in this paper can be used for the recognition of numerical sequences produced by others.

The type of coin and the size will be displayed at the LCD to ensure correct coin insertion. Any other coin, if inserted in the slot, will be refund box. A sensor attached to the coin insertion slot accepts the coin into the battery charging unit and starts charging the mobile battery for a specific period controlled by the microcontroller software. The sensor is an IR sensor. The resistance of the sensor decreases when IR light falls on it. Coin is whether accepted or rejected is based on the diameter of the coin. When the routine completes, it indicates the complete charge message through the LCD.

CHAPTER 3

SYSTEM ARCHITECTURE

3.1 BLOCK DIAGRAM

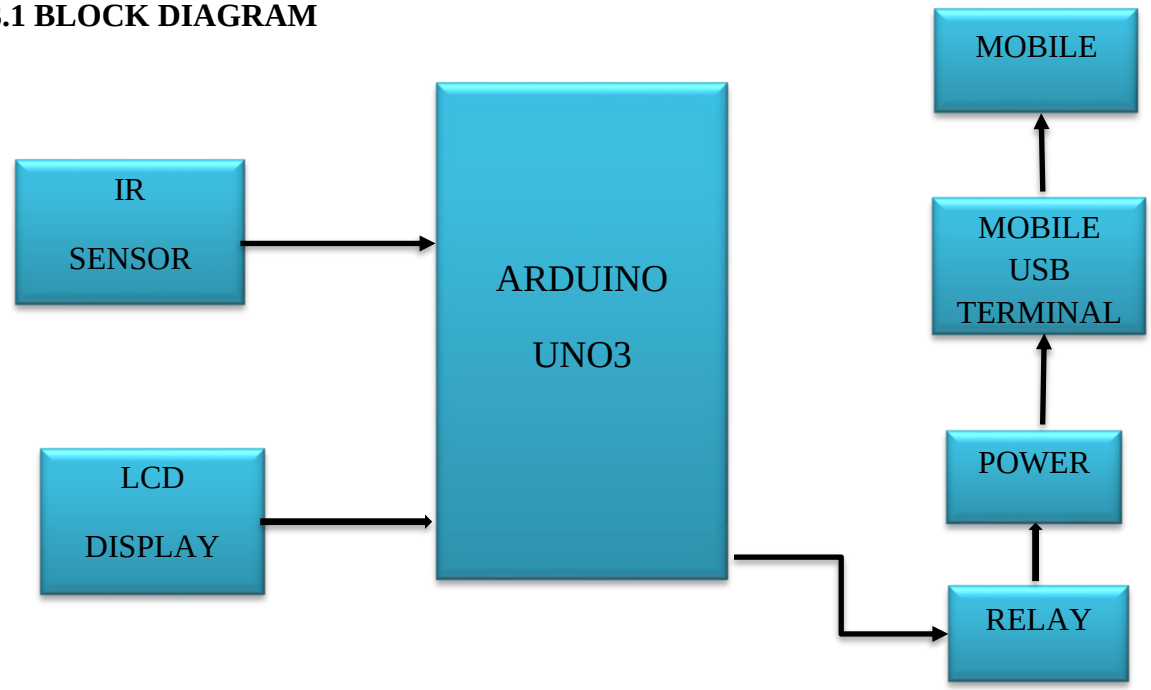

Fig. 3.1: Block diagram of coin Based Mobile charger

3.2 MODULES

This section describes the modules for the proposed system.

- Input stage-To accepts the valid coin.
- Controller-To control the voltage using relay.
- Power-To supply the power based on the requirements.
- Output and display-To display the output information.

3.2.1 Input Stage: The user inserts a coin to the coin insertion slot. The sensor is attached to the coin insertion slot and the coin is validated based on the diameter of the coin inserted. Initially the LCD display a message as “Please insert coin”. If the inserted coin is valid, the message is displayed in the LCD and signal is sensor the Arduino.

If the coin is not valid, itis returned back. when the coin is accepted, the Arduino and relay is activated and the battery starts getting charged by the software of relay

3.2.2 Controller: The system performs according to the input signal from the circuit. Based on the diameter of the coin, the coin is either accepted or rejected. If the coin is accepted, it sends signal to Arduino along with LCD interface. Once the Arduino receives the signal from the coin insertion slot, it sends signal to the relay. The relay generates the voltage of 5v, which in turn charges the mobile phone through the mobile USB terminal.

3.2.3 Output and Display: The LCD connected displays the messages as and when required. Initially, when the mobile charger is connected the LCD displays as, "Please insert coin". When the mobile phone is charging, it displays "Charging" and the duration of charging based on the coin inserted.

3.2.4 Power: This coin based mobile charger draws power from the Arduino through relay. The voltage is regulated based on the type of the mobile phone for charging. The following list describes the various mobile phones and their charging requirement

CHAPTER 4

IMPLEMENTATION OF HARDWARE

4.1 LIQUID CRYSTAL DISPLAY

A liquid crystal display (LCD) is a thin, flat display device made up of any number of color or monochrome pixels arrayed in front of a light source or reflector. Each pixel consists of a column of liquid crystal molecules suspended between two transparent electrodes, and two polarizing filters, the axes of polarity of which are perpendicular to each other. Without the liquid crystals between them, light passing through one would be blocked by the other. The liquid crystal twists the polarization of light entering one filter to allow it to pass through the other.

For an 8-bit data bus, the display requires a +5V supply plus 11 I/O lines. For a 4-bit data bus it only requires the supply lines plus seven extra lines. When the LCD display is not enabled, data lines are tri-state and they do not interfere with the operation of the microcontroller.

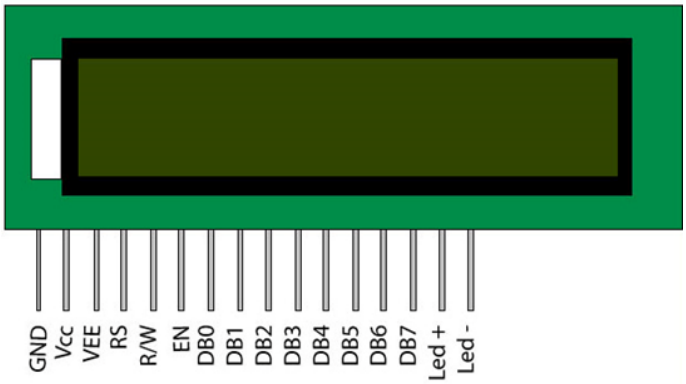

Fig 4.1: Pin diagram of LCD

4.1.1 SIGNALS TO THE LCD

The LCD also requires three control lines from the microcontroller:

1) Enable (E)

This line allows access to the display through R/W and RS lines. When this line is low, the LCD is disabled and ignores signals from R/W and RS. When (E) line is high, the LCD checks the state of the two control lines and responds accordingly.

2) Read/Write (R/W)

This line determines the direction of data between the LCD and microcontroller.

When it is low, data is written to the LCD. When it is high, data is read from LCD.

3) Register select (RS)

With the help of this line, the LCD interprets the type of data on data lines. When it is low, an instruction is being written to the LCD. When it is high, a character is being written to LCD.

4.1.2 LCD Schematic Diagram

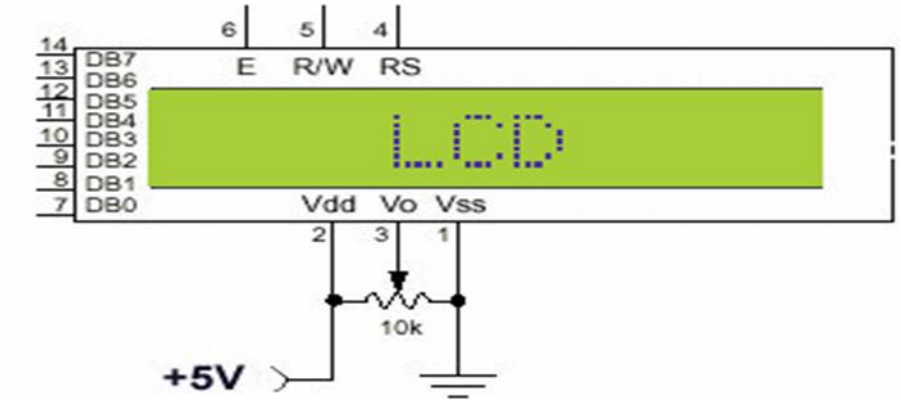

Fig 4.2: Schematic diagram of LCD

4.1.3 Pin Description:

Pin No.	Name	Description
1.	Vss	Ground pin
2.	Vcc	+5v power supply
3.	Vee	Contrast setting
4.	RS (Register select)	RS = 0; Command register is selected RS = 1; Data register is selected
5.	R/W (Read/Write)	R/W = 0; for writing R/W = 1; for reading
6.	E (Enable)	When enable pin goes from high to low the LCD takes command or data
7.	D0	Data pin0
8.	D1	Data pin1
9.	D2	Data pin2
10.	D3	Data pin3
11.	D4	Data pin4
12.	D5	Data pin5
13.	D6	Data pin6
14.	D7	Data pin7
15.	LED+	Backlight +5v
16.	LED-	Backlight Ground

4.2 Infrared Detectors Basics

An infrared emitter is an LED made from gallium arsenide, which emits near-infrared energy at about 880nm.The infrared phototransistor acts as a transistor with the base voltage determined by the amount of light hitting the transistor. Hence it acts as a variable current source. Greater amount of IR light cause greater current to flow through the collector-emitter leads. As shown in the diagram below, the phototransistor is wired in a similar configuration to the voltage divider. The variable current traveling through the resistor causes a voltage drop in the pull-up resistor. Generally we have IR LED and Photodiode based infrared proximity detector available in market. It has LM358 op-amp based voltage comparator circuit to give digital logic state for the microcontroller.

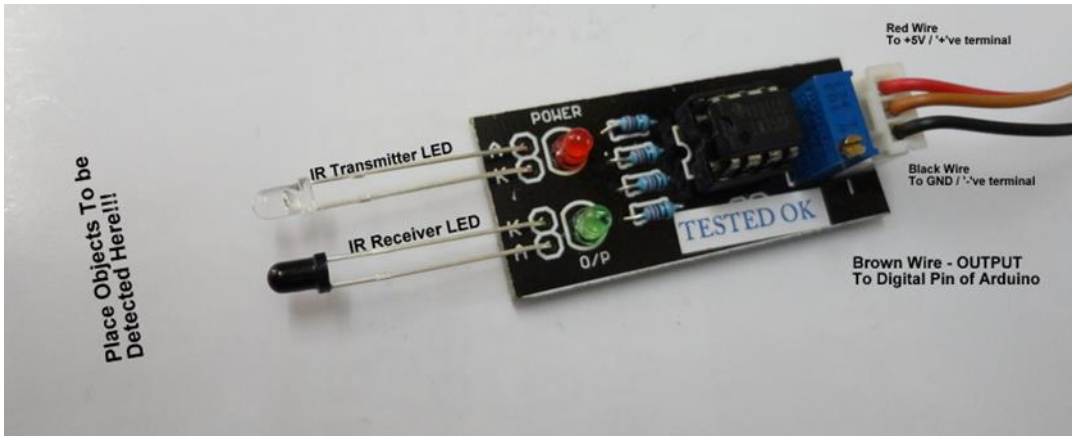

Fig 4.3: IR Sensor

4.2.1 LM358 (Low Power Operational Amplifier):

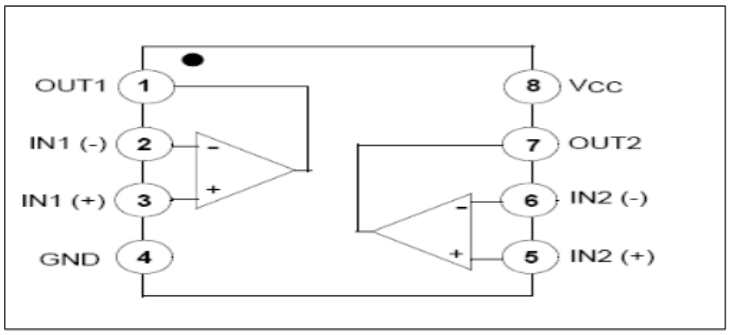

Fig 4.4: Internal Block Diagram of LM358 IC

Features

• Internally Frequency Compensated for Unity Gain

• Large DC Voltage Gain: 100dB

• Wide Power Supply Range: LM258/LM258A, LM358/LM358A: 3V~32V (or ±1.5V ~ 16V) LM 2904 : 3V~26V (or ±1.5V ~ 13V)

• Input Common Mode Voltage Range Includes Ground

• Large Output Voltage Swing: 0V DC to VCC -1.5V DC

• Power Drain Suitable for Battery Operation.

Description

The LM2904, LM358/LM358A, LM258/LM258A consist of two independent, high gain, internally frequency compensated operational amplifiers which were designed specifically to operate from a single power supply over a wide range of voltage. Operation from split power supplies is also possible and the low power supply current drain is independent of the magnitude of the power supply voltage. Application areas include transducer amplifier, DC gain blocks and all the conventional OP-AMP circuits which now can be easily implemented in single power supply systems.

The LM358 consists of two independent, high gain, internally frequency compensated operational amplifiers which were design specifically to operate from a single power supply over a wide range of voltage. Operation from split power supplies is also possible and the low power supply current drain is independent of the magnitude of the power supply voltage. Application areas include transducer amplifier, DC gain blocks and all the conventional OP-AMP circuits which now can be easily implemented in single power supply systems. In this, op-amp is used as voltage comparator. It provides zero reference signal for interrupt pin of microcontroller. This is basically a part of zero cross detector circuit required for firing tri at particular instant.

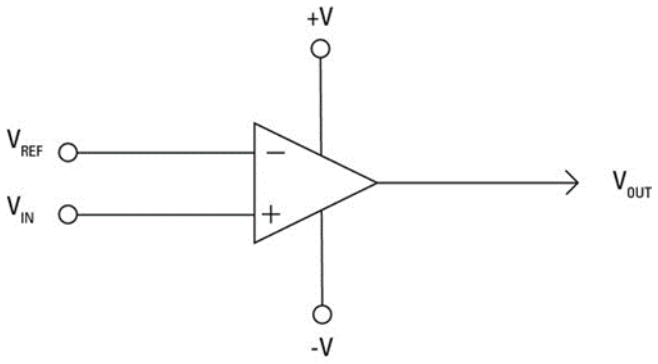

Fig 4.5: Voltage Comparator

A voltage comparator is an electronic circuit that compares two input voltages and lets you know which of the two is greater. op-amp's output depends on the polarity of the difference between the two input voltages. In the voltage-comparator circuit, first a reference voltage is applied to the inverting input (V–); then the voltage to be compared with the reference voltage is applied to the noninverting input. The output voltage depends on the value of the input voltage relative to the reference voltage, as follows.

Input Voltage	**Output Voltage**
Less than Reference voltage	Negative
Equal to Reference voltage	Zero
Greater than Reference voltage	Positive

4.3 RELAY

A relay is an electrically operated switch. Current flowing through the coil of the relay creates a magnetic field which attracts a lever and changes the switch contacts the coil current can be on or off, so relays have two switch positions and they are double throw switches.

Relays allow one circuit to switch a second circuit which can be completely separate from the first. For example, a low voltage battery circuit can use a relay to switch a 230v ac mains circuit. There is no electrically connection inside the relay between the two circuits; the link is magnetic and mechanical. The coil of a relay passes relatively large current, typically 30mA for a 12v relay, but it can be as much as 100mA for relays designed to operate from lower voltages. Most chips cannot provide this current and transistor. Usually used to amplify the small IC current to the larger value required for the relay coil.

The maximum output current for the popular 555timer IC is 200ma, so these devices can supply relay coils directly without amplifications.

Relays usually SPDT or DPDT but they can have more sets of switch contacts, for example relays with four sets of change over contacts are readily available.

Most relays are designed for PCB mounting but you can solder wires directly to the pins providing you take care to avoid melting the plastic case of the relay.

The supplier's catalogue should show you relay connection. The coil will be obvious and it may be connected either way round. Relay coils produce brief high voltage spikes. When they are switched off and this can be destroying transistors and IC's in the circuit. To prevent damage, we must connect a protection diode across a relay coil.

The figure shows a working relay with its coil and switch contacts. You can see the lever on the being attracted by magnetism when the coil is switched on. This lever moves the switches contacts.

The relay's switch connections are usually labeled 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 relay is off.
- NO=normally open, COM is connected to this when relay is no.
- Connect to COM and NO if you want the switched circuit to be on when coil is on.

Fig 4.6: Relay Module

- Connect to COM and NC if you want the switched circuit to be on when the relay coil is off.

4.4 Arduino Hardware:

An Arduino board consists of an 8-bit Atmel AVR microcontroller with complementary components to facilitate programming and incorporation into other circuits. An important aspect of the Arduino is the standard way that connectors are exposed, allowing the CPU board to be connected to a variety of interchangeable add-on modules known as shields. Some shields communicate with the Arduino board directly over various pins, but many shields are individually addressable via an I²C serial bus, allowing many shields to be stacked and used in parallel. Official Arduino's have used the mega AVR series of chips, specifically the ATmega8, ATmega168, ATmega328, ATmega1280, and ATmega2560. A handful of other processors have been used by Arduino compatibles. Most boards include a 5 volt linear regulator and a 16 MHz crystal oscillator (or ceramic resonator in some variants), although some designs such as the Lily Pad run at 8 MHz and dispense with the onboard voltage regulator due to specific form-factor restrictions. An Arduino's microcontroller is also pre-programmed with a boot loader that simplifies uploading of programs to the on-chip flash memory, compared with other devices that typically need an external programmer.

At a conceptual level, when using the Arduino software stack, all boards are programmed over an RS-232 serial connection, but the way this is implemented varies by hardware version. Serial Arduino boards contain a simple inverter circuit to convert between RS-232-level and TTL-level signals. Current Arduino boards are programmed via USB, implemented using USB-to-serial adapter chips such as the FTDI FT232. Some variants, such as the Arduino Mini and the unofficial Board uno, use a detachable USB-to-serial adapter board or cable, Bluetooth or other methods. (When used with traditional microcontroller tools instead of the Arduino IDE, standard AVR ISP programming is used.)

The Arduino board exposes most of the microcontroller's I/O pins for use by other circuits. The Diecimila, Duemilanove, and current Uno provide 14 digital I/O pins, six of which can produce pulse-width modulated signals, and six analog inputs. These pins are

on the top of the board, via female 0.1 inch headers. Several plug-in application shields are also commercially available.

4.4.1 Arduino UNO Features

- ATmega328 microcontroller
- Input voltage - 7-12V
- 14 Digital I/O Pins (6 PWM outputs)
- 6 Analog Inputs
- 32k Flash Memory
- 16Mhz Clock Speed

The maximum values that Arduino can handle:

- Max frequency: 16MHz
- Max Voltage: 5V
- Max Current: 50mA

Pin description

• Arduino can be powered using power jack, USB port. Apart from this it can also be powered by using a external battery or AC to DC adaptor through pin Vin.

•5V, 3.3V: there is a inbuilt regulator on the board. Through this regulator a constant DC supply of 5V, 3.3V is provided.

•Reset: This pin enables to reset the micro controller.

•IOREF: This pin acts as reference to the inputs given to the Arduino board.

•There are 6 pins A0 – A5 through which analog input can be given to the Arduino board.

•There is a inbuilt LED on pin 13.

•AREF- This pin acts as reference to the analog inputs.

•Rx, Tx are used for receiving and transmitting serial data.

•ICSP- (In circuit serial programming)- These pins enable the user to programma the chips on the circuit.

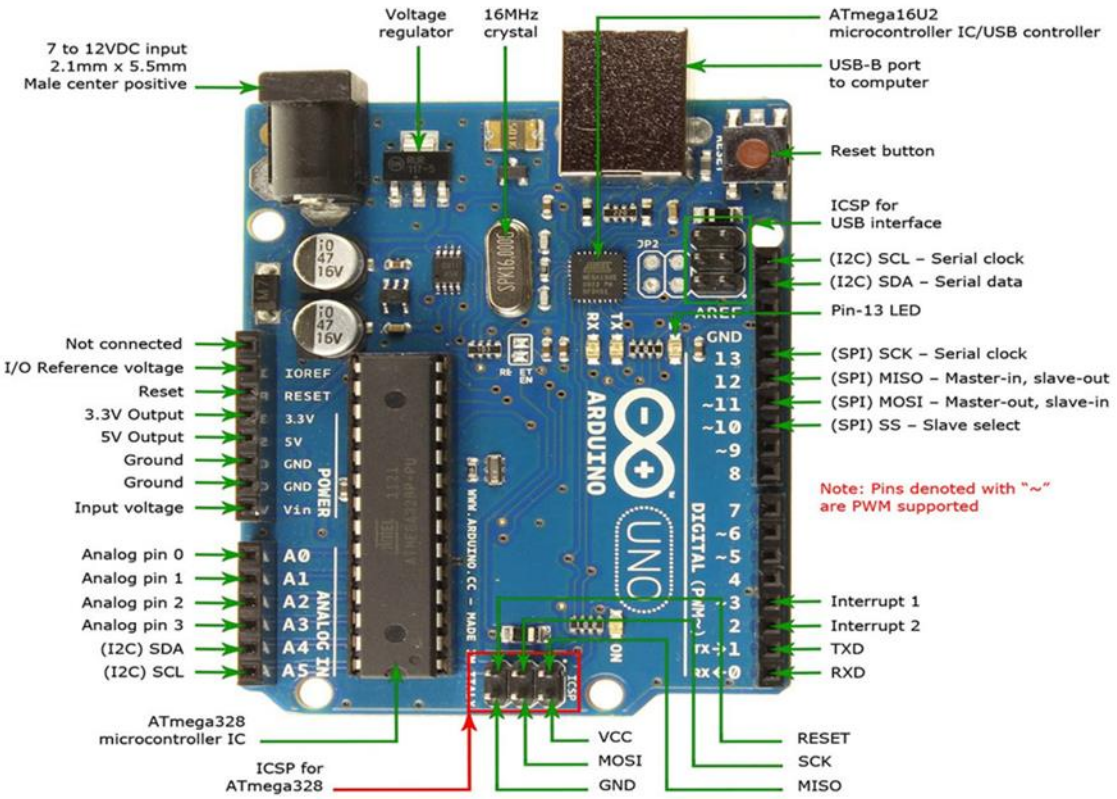

Fig 4.7: Pin description of Arduino

CHAPTER 5

DESIGN OF COIN BASED MOBILE CHARGER

5.1 Hardware Implementation

As shown in figure there are some of the building blocks in the circuit and it charge the phone with the help of coin and display the time in LCD with the help of Arduino UNO.

When we insert a coin the sensor is connect to the Arduino and breadboard with giving power supply to them. Some of the pins of LCD is connected to Arduino and breadboard. As well as Arduino pins are connected to breadboard. Relay is acts as a switch.

The Circuit operation of this project is when we give 12v supply to the circuit, it will start operating. The Arduino board receives a signal from the laptop through code, then it sends the signal to the LCD and it shows please insert a coin. When we insert a coin it sense the coin and sends signals to the LCD to display in reverse countdown process and then the phone cable is connected to the switch and when insert a coin it starts charging. When the reverse countdown will stop in LCD it shows Time up and phone stops charging.

Again we insert a coin it again starts to charging and the process is repeated until how much percent charge to the phone. By putting number of coins in it. This is the process of operation of coin based mobile charger using Arduino.

Fig 5.1: Hardware implementation

5.2 Software Implementation

Software simulation we need to install Arduino IDE software, then open a new file and write the program.

- Arduino Software
- proteus

5.2.1 Arduino Software:

The Arduino IDE is a cross-platform application written in Java, and is derived from the IDE for the Processing programming language and the Wiring project. It is designed to introduce programming to artists and other newcomers unfamiliar with software development. It includes a code editor with features such as syntax highlighting, brace matching, and automatic indentation, and is also capable of compiling and uploading programs to the board with a single click. There is typically no need to edit make files or run programs on a command-line interface. The Arduino IDE comes with a C/C++ library called "Wiring" (from the project of the same name), which makes many common input/output operations much easier. Arduino programs are written in C/C++, although users only need define two functions to make a runnable program:

- setup() – a function run once at the start of a program that can initialize settings
- loop() – a function called repeatedly until the board powers off

It is a feature of most Arduino boards that they have an LED and load resistor connected between pin 13 and ground, a convenient feature for many simple tests. The above code would not be seen by a standard C++ compiler as a valid program, so when the user clicks the "Upload to I/O board" button in the IDE, a copy of the code is written to a temporary file with an extra include header at the top and a very simple main() function at the bottom, to make it a valid C++ program. The Arduino IDE uses the GNU tool chain and AVR Lib to compile programs, and uses to upload programs to the board. As the Arduino platform uses Atmel microcontrollers.

Atmel's development environment, AVR Studio the newer Atmel Studio, may also be used to develop software for the Arduino. The Arduino hardware reference designs are distributed under a Creative Commons Attribution Share-Alike 2.5 license and are available on the Arduino Web site. Layout and production files for some versions of the Arduino hardware are also available. The source code for the IDE and the on-board library are available.

Arduino and Arduino-compatible boards uses of shields, which are printed circuit boards that sit atop an Arduino, and plug into the normally supplied pin-headers. These are expansions to the base Arduino. There are many functions of shields, from motor controls, to breadboarding

Arduino and Arduino-compatible boards uses of shields, which are printed circuit boards that sit atop an Arduino, and plug into the normally supplied pin-headers. These are expansions to the base Arduino. There are many functions of shields, from motor controls, to breadboarding (prototyping).

5.2.2 Arduino IDE

IDE stands for Integrated Development Environment. The IDE is a text editor-like program that allows you to write, compile and upload code in the microcontroller. The code file is called as sketch. The coding language that Arduino uses is very much like C++ ("see plus plus"), which is a common language in the world of computing. The toolbar button t0 verify and upload programs, create, open, and save sketches, and open the serial monitor and upload it.

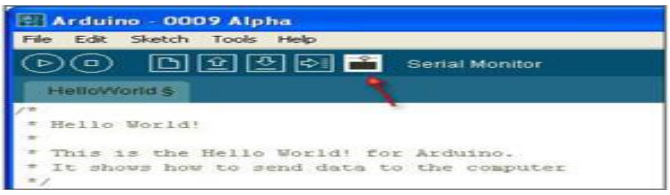

Fig 5.2: Arduino IDE

File

- New

Creates a new instance of the editor, with the bare minimum structure of a sketch already in place.

- Open

Allows to load a sketch file browsing through the computer drives and folders.

- Open Recent

Provides a short list of the most recent sketches, ready to be opened.

- Sketchbook

Shows the current sketches within the sketchbook folder structure; clicking on any name opens the corresponding sketch in a new editor instance.

- Examples

Any example provided by the Arduino Software (IDE) or library shows up in this menu item. All the examples are structured in a tree that allows easy access by topic or library

.• Close

Closes the instance of the Arduino Software from which it is clicked.

- Save

Saves the sketch with the current name. If the file hasn't been named before, a name will be provided in a "Save as.." window.

- Save as...

Allows to save the current sketch with a different name.

- Page Setup

It shows the Page Setup window for printing.

- Print

Sends the current sketch to the printer according to the settings defined in Page Setup.

- Preferences

Opens the Preferences window where some settings of the IDE may be customized, as the language of the IDE interface.

Sketchbook

The Arduino Software (IDE) uses the concept of a sketchbook: a standard place to store your programs (or sketches). The sketches in your sketchbook can be opened from the File > Sketchbook menu or from the Open button on the toolbar. The first time you run the Arduino software, it will automatically create a directory for your sketchbook.

Arduino Sketch

Basically Arduino sketch consists of two main functions namely

1. Void setup()
2. Void loop()

1. **VOID SETUP(): Setup ()** is called when a sketch starts. It is used to initialize variables, pin modes, start using libraries etc. The **setup ()** will only run once, after each power up or reset of the Arduino board.

Syntax:

```
Void setup ()
{
Statements;
}
```

2.Void loop():

After creating a **setup ()** function which initializes and sets the initial values, the **loop ()** function does precisely what its name suggests, and loops consecutively, allowing your program to change and respond. It is used to actively control the Arduino board.

Syntax:

Void loop ()

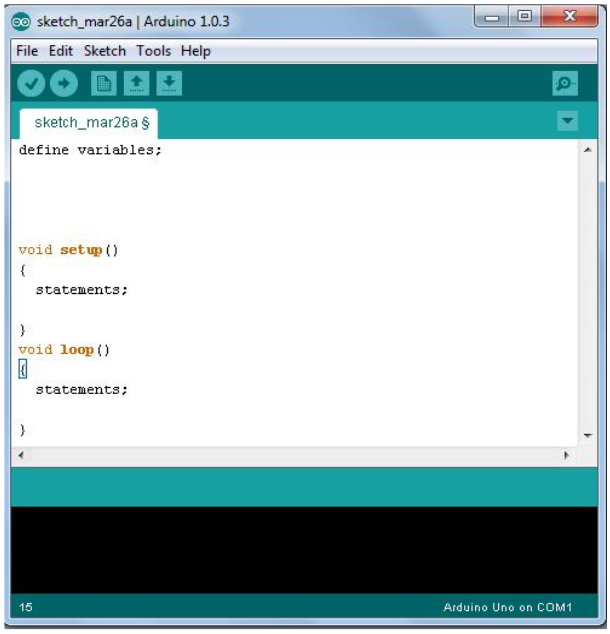

Fig 5.3 :Illustration of Arduino

{

Statements;

}

5.2.3 Software Program

```
#include<LiquidCrystal.h>

int relay= 10;

int ir1 = 2,ir2=3;

const int rs = 4, en = 5, d4 = 6, d5 = 7, d6 = 8, d7 = 9;

LiquidCrystal lcd(rs, en, d4, d5, d6, d7);
```

```
byte heart[8] = {
  0b00000,
  0b01010,
  0b11111,
  0b11111,
  0b11111,
  0b01110,
  0b00100,
  0b00000
};
byte smiley[8] = {
  0b00000,
  0b00000,
  0b01010,
  0b00000,
  0b00000,
  0b10001,
  0b01110,
  0b00000
};
byte mobile[8]={
  B00010,
  B00010,
  B11111,
```

```
  B10001,
  B10001,
  B11111,
  B11111,
  B11111
};
byte charge[8]={
  B01010,
  B01010,
  B11111,
  B10001,
  B10001,
  B01010,
  B00100,
  B00100
};
void setup() {
  pinMode(10,OUTPUT);
  pinMode(2,INPUT);
  pinMode(3,INPUT);
  lcd.begin(16,2);
  lcd.createChar(1,heart);
  lcd.createChar(2,smiley);
  lcd.createChar(3,mobile);
```

```
  lcd.createChar(4,charge);
  lcd.setCursor(0,0);
  lcd.print("Welcome to my  ");
  lcd.setCursor(2,1);
  lcd.print("project...");
  lcd.write(2);
  lcd.write(2);
  delay(3000);
  lcd.clear();
  lcd.setCursor(2,0);
  lcd.print("Coin Based ");
  lcd.setCursor(1,1);
  lcd.print("Mobile Charger");
  delay(3000);
  Serial.begin(9600);
// put your setup code here, to run once:
}
  void loop() {
  int value1 = digitalRead(ir1);
  int value2 = digitalRead(ir2);
  Serial.println("");
  Serial.print("value1: ");
  Serial.print(value1);
  delay(500);
```

```
  Serial.println("");
  Serial.print("value2: ");
  Serial.print(value2);
if(value2==1)
   {
   Serial.println("");
   Serial.print("value2: ");
   Serial.print(value2);
   lcd.clear();
   lcd.setCursor(0,0);
   lcd.print("1 rupees coin ");
   lcd.setCursor(0,1);
   lcd.print("detected ");
   delay(3000);
   lcd.clear();
   lcd.setCursor(0,0);
   lcd.print("1min charging ");
for(int d=60;d>=0;d--)
   {
     lcd.clear();
     lcd.setCursor(0,0);
     lcd.print("1 MIN CHARGING”);
     lcd.setCursor(0,1);
     lcd.print(d);
```

```
      lcd.print(" SEC");
      delay(1000);
      if(d==60)
      {
        lcd.clear();
        lcd.setCursor(0,0);
        lcd.print("ONE MIN CHARGED");
      }
      else if(d==1)
      {
        lcd.clear();
        lcd.setCursor(0,1);
        lcd.print("ONE MIN CHARGED");
      }
}
    digitalWrite(10,HIGH);
    lcd.clear();
    lcd.setCursor(4,0);
    lcd.print("Time up ");
    delay(3000);
  }
  else{
    lcd.clear();
    lcd.setCursor(1,0);
```

```
   lcd.print("Please insert ");
   lcd.setCursor(4,1);
   lcd.print("the coin");
   lcd.write(2);
   digitalWrite(10,HIGH);
  }
}
```

5.2.4 Proteus Software

- Proteus is used to simulate, design and drawing of electronic circuits.
- By using proteus you can make two-dimensional circuits designs as well.
- With the use of the engineering software, you can construct and simulate different electrical and electronics circuits on your personal computers or laptops.
- There are numerous benefits to simulate circuits on proteus before make them practically.
- Designing of circuits on the proteus takes less time than practical construction of the circuit.
- The Possibility of error is less in software simulation such as loose connection that takes a lot of time to find out connection problems in a practical circuit.
- Circuit simulations provide the main feature that some components of circuits are not practical then you can construct your circuit on proteus.
- There is zero possibility of burning and damaging of any electronic components in proteus.
- The electronics tools that are very expensive can easily get in proteus such as oscilloscope.
- Using proteus you can find different parents of circuits such as current, a voltage value of any components and resistance at any instant which is very difficult in a practical circuit.

- After open the tab we have to proteus software by building the virtual connections and dump the code in Arduino UNO, using a USB cable.

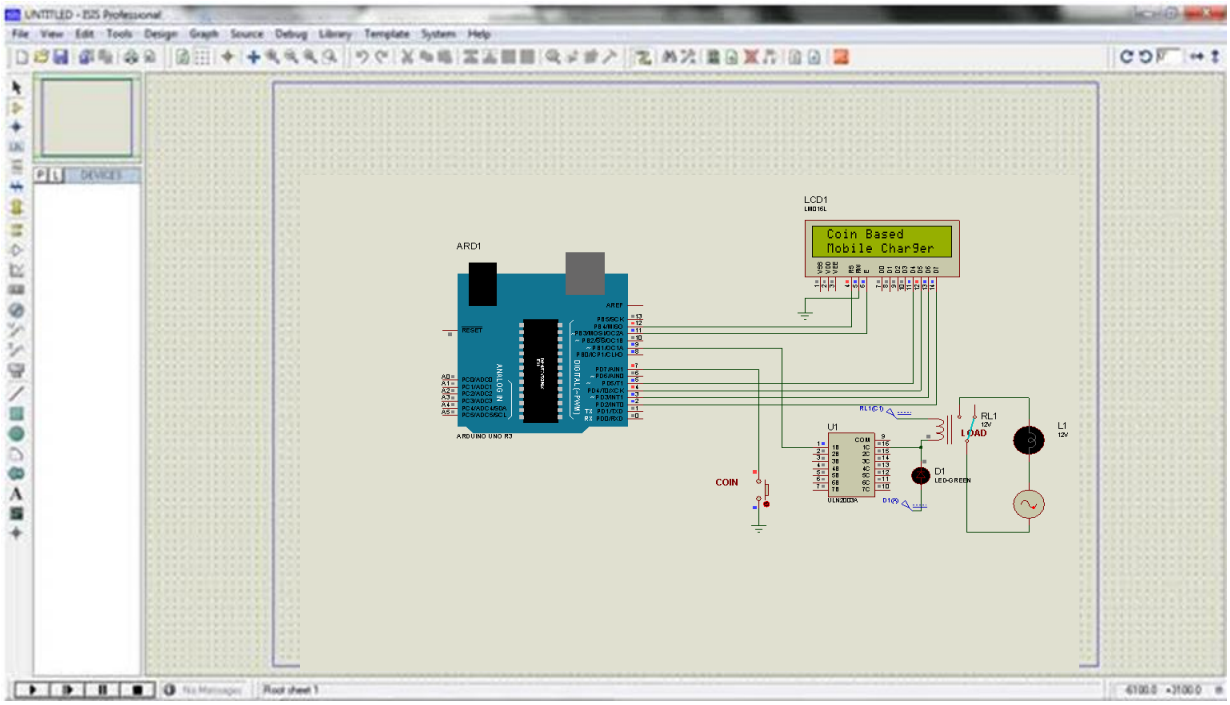

Fig 5.4 : Software Implementation

5.3 ADVANTAGES

- Low cost to design the circuit.
- Easy to implement the circuit.
- Low power consumption.
- High reliability.
- Good performance.

5.4 DISADVANTAGES

- The life of the battery will be less than that of the given period.
- There is a chance of high voltage flow during charging.

5.5 APPLICATIONS

- Useful to public for using coin to charger for the mobile phone in any places.
- It can be used for different type of mobiles.
- It is used for emergency charging purposes.
- It can be Installed railway station, bus stops, villages and rural areas and public places.

CHAPTER 6

RESULTS

6.1 RESULTS

A Novel Technique for outside mobile charging with the coin acceptor module is explained. The block diagram for the entire system and the Arduino working are discussed. The diagram for the system shows how working of Arduino when we insert a coin in it. Here in this project phone is charging when we insert a coin it sense and sends signals to the Arduino and it gives signal to the LCD and starts reverse countdown starts. This project is very useful to the rural peoples and in public places. Simultaneously in colleges and offices also we can use it.

6.2 OBSERVATIONS

Fig 5.5: Charging the mobile phone &Display on LCD

Phone is charging and it display time in LCD in reverse count down when we insert a coin. Timing is maximum. The System is designed to charge a mobile phone with the

help of coin. Arduino receives the signal when we insert a coin and Arduino process it and send signal to the LCD to display timer with the help of relay we can charge the mobile phone. Relay act as a switch so when power on it charges the phone. It is most important to the rural areas, public places and railway stations. Mostly is used in colleges and offices to charge their mobile phone for emergency.

CHAPTER 7

CONCLUSION AND FUTURE SCOPE

7.1 CONCLUSION

As our project describes the new way of charging services to the public. It would be of less cost because conventional grid power is used and beneficial to the long distance travelers. This coin based mobile charging system can be installed at various public places for the convenience of mobile users. It usually owing to the fact that it relayed the electricity the coin based mobile charger needed to bring the mobile phone back to the life. A novel method of charging mobile batteries of different manufactures has been designed and developed for rural and remote areas where the grid power is not available at any time at any places.

7.2 FUTURE SCOPE

Now in this project the coin sense by sensor and it sends signal to the Arduino and display in LCD timer and phone charges. So in future we can use Image processing. Image processing can identify which type of coin is like 1 rupee, 2 rupee, 5 rupee and 10 rupee. And it can easily detect by image processing.

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