

Advanced Digital Fuel Meter And Electronically Controlled Devices

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ABSTRACT: The existing fuel indicators installed in vehicles like Honda, Hero, Tvs, Yamaha are having the petrol indication in the form of points and analog meters, which leads to miscalculations to what distance vehicle can go with present fuel in tank. And one of the major problems with the kick less motor vehicles is that once battery gets discharged, the self-start motor will not respond making situation horrible to the user. The latest model cars present in the market also has an fuel indicator but it is not accurate in showing the petrol quantity in the tank. some of the four wheelers like FORD, AUDI, BMW, BENZ are costly and are having huge demand in market had a distance estimator in them, which will show an average of the car's mileage for 1 kilometre. But if we go only in economy speed only the reading is appropriate. If we go with the maximum speed we may not get the exact reading that how much the can travel. To will overcome such unavoidable conditions, the pre-measure and sensor data would help user to play safe on the road. In this project, we propose a digital measurement system which constantly displays the different parameters like fuel quantity and battery health. The fuel indicator which we use gives us 100% accurate result by displaying the quantity of petrol in numerical format i.e. in millilitres. The heart of the project is the microcontroller which takes necessary decision depends on the sensor feeds and displays the results in the digital format. An analog type fuel tank level sensor is interfaced to the Analog to digital controller (ADC) which converts analog voltage output from the sensor to the digital form and feed to microcontroller. Then the microcontroller calculates the level depends on the digital value multiplied with the volume of the tank at that level and displays the digital numeric value on the screen.

INTRODUCTION

An advanced digital Fuel meter is the one which shows the level of Fuel in digital format. In this project, we propose a digital measurement system which constantly displays the different parameters like Fuel quantity and battery health. The heart of the project is the microcontroller which takes necessary decision depending on the sensor feeds and displays the results in the digital format. An analogue type Fuel tank level sensor is interfaced to the analogue-to-digital convertor(ADC), which converts analogue voltage output from the sensor to the digital form and feed to microcontroller. Then the microcontroller calculates the level depending on the digital value multiplied with the volume of the tank at that level and displays the digital numeric value on the screen. Our digital indicator will indicate the level of Fuel in millilitres. This type of Fuel indicator has not been implemented in any of the two wheelers till now. In this project, we are using many components. The important components used in the project are

- [1] Analog To Digital Converter (ADC)
- [2] Microcontrollers
- [3] Kiel micro vision (software)
- [4] Sensors
- [5] LCD display with keypad

ADC Description:

ADC0804 is one of the most commonly used analogues to digital converter IC. In many applications it is required to convert the output of the sensor, which is analogue in nature to a digital form. The data in digital format can then be utilized for further processing by the digital processors. Typical applications include sound processing, temperature processing etc. This circuit demonstrates the principle and operation of interfacing a simple ADC 0804 using 8051 microcontroller (AT89C51). ADC0804 is connected as shown in the circuit diagram. Here the input is taken from a preset, which gives different analogue signals to the ADC. The output pins of the ADC are connected to LEDs. ADC0804 is a single channel analogue to digital convertor i.e., it can take only one analogue

signal. An ADC has n bit resolution (binary form) where n can be 8,10,12,16 or even 24 bits. ADC 0804 has 8 bit resolution. The higher resolution ADC gives smaller step size. Step size is smallest change that can be measured by an ADC. For an ADC with resolution of 8 bits, the step size is 19.53mV ($5\text{V}/255$). The time taken by the ADC to convert analogue data into digital form is dependent on the frequency of clock source. ADC0804 can be given clock from external source. It also has an internal clock. However the conversion time cannot be more than $110\mu\text{s}$. To use the internal clock a capacitor and resistor is connected to pin 19 and 4 as shown in the circuit diagram. The frequency is given by the relation $f = 1/(1.1 \cdot R \cdot C)$. The circuit uses a resistance of 10Ω and a capacitor of 150pF (picofarad) to generate clock for ADC0804. V_{in+} , which is the input pin, is connected to a preset to provide analogue input.

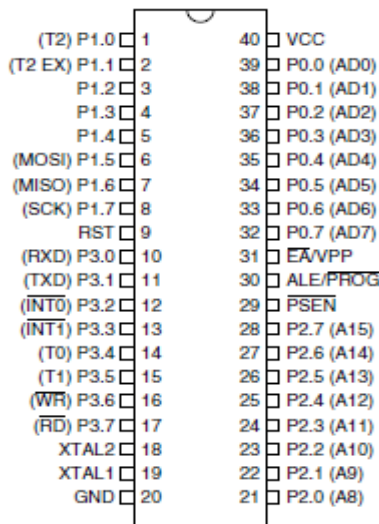
Microcontroller Pin Description:

1. CS, Chip Select: This is an active low pin and used to activate the ADC0804.
2. RD, Read: This is an input pin and active low. After converting the analogue data, the ADC stores the result in an internal register. This pin is used to get the data out of the ADC 0804 chip. When CS=0 & high to low pulse is given to this pin, the digital output is shown on the pins D0-D7.
3. WR, Write: This is an input pin and active low. This is used to instruct the ADC to start the conversion process. If CS=0 and WR makes a low to high transition, the ADC starts the conversion process.
4. CLK IN, Clock IN: This is an input pin connected to an external clock source.
5. INTR, Interrupt: This is an active low output pin. This pin goes low when the conversion is over.
6. V_{in+} : Analogue Input.
7. V_{in-} : Analogue Input. Connected to ground.
8. AGND: Analogue Ground.
9. V_{ref} : This pin is used to set the reference voltage. If this is not connected the default reference voltage is 5V. In some application it is required to reduce the step size. This can be done by using this pin.

- 10. DGND: Digital Ground.
- 11-18. Output Data Bits (D7-D0).
- 19. CLKR: Clock Reset.
- 20. V_{cc}: Positive Supply

In this circuit microcontroller is used to provide the control signals to the ADC. CS pin of ADC is directly connected to ground. The pin P1.1, P1.0 and P1.2 are connected to the pin WR, RD and INTR of the ADC respectively. When the input voltage from the preset is varied the output of ADC varies which can be seen on the LCD. When the preset is at minimum level, no LED glows and when the preset is at maximum position all the LEDs starts glowing. The microcontroller is the heart of the circuit and will control the total main logic depending on the sensor inputs. The microcontroller used here is AT89S52 which is 40 pin DIP IC. This microcontroller has 4 ports with each 8 bit parallel and only PORT3 has serial data transference capability. The ports namely are PORT0, PORT1, PORT2, PORT3. PORT 1, 2, 3 are bi-directional and bit-wise

40-lead PDIP



ports and Port 0 is Uni-directional and bit-wise port.
Pin description of micro controller

Keil Microvision (software):

Keil development tools for the 8051 Microcontroller Architecture support every level of software developer from the professional applications engineer to the student just learning about embedded software development. The industry-standard Keil C Compilers, Macro Assemblers, Debuggers, Real-time Kernels, Single-board Computers, and Emulators support all 8051 derivatives and help you get your projects completed on schedule

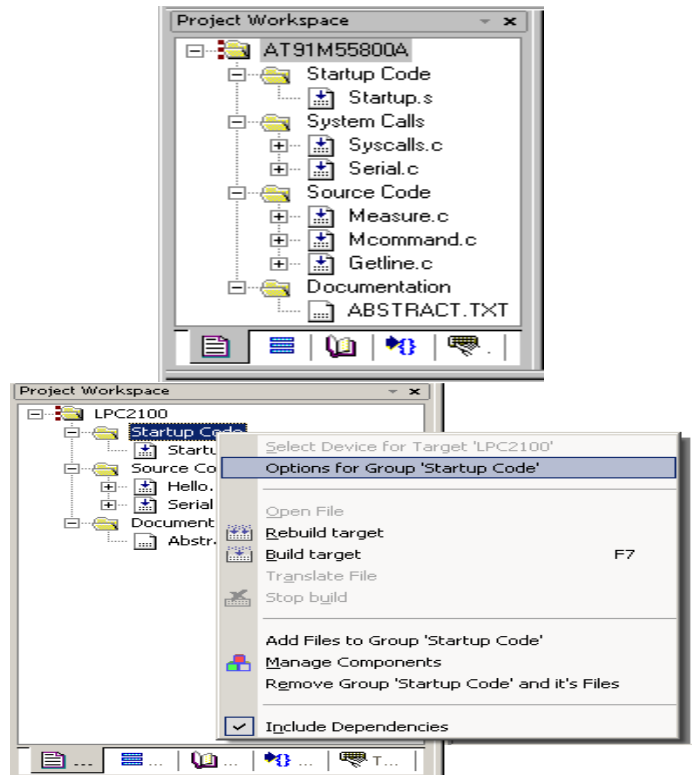
- When starting a new project, simply select the microcontroller you use from the Device Database and the µVision IDE sets all compiler, assembler, linker, and memory options for you.
- Numerous example programs are included to help you get started with the most popular embedded 8051 devices.
- The Keil µ-Vision Debugger accurately simulates on-chip peripherals (I²C, CAN, UART, SPI, Interrupts, I/O Ports, A/D Converter, D/A Converter, and PWM Modules) of your 8051 device. Simulation helps you understand hardware configurations and avoids time wasted on setup problems.

Additionally, with simulation, you can write and test applications before target hardware is available.

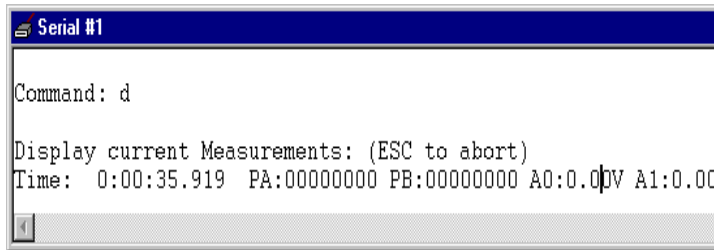
- When you are ready to begin testing your software application with target hardware, use the MON51, MON390, MONADI, or FlashMON51 Target Monitors, the ISD51 In-System Debugger, or the ULINK USB-JTAG Adapter to download and test program code on your target system.

The µ-Vision3 IDE is a Windows-based software development platform that combines a robust editor, project manager, and makes facility. µVision3 integrates all tools including the C compiler, macro assembler, linker/locator, and HEX file generator. µVision3 helps expedite the development process of your embedded applications by providing the following:

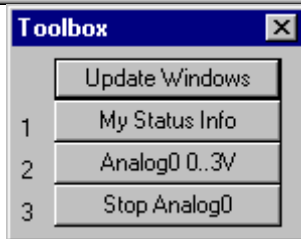
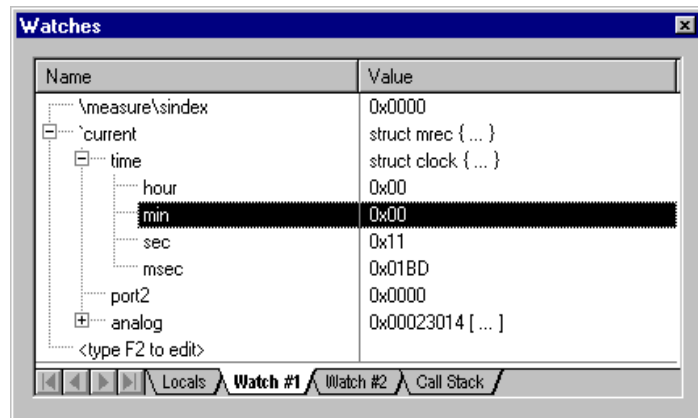
- Full-featured source code editor,
- Device database for configuring the development tool setting,
- Project manager for creating and maintaining your projects,
- Integrated make facility for assembling, compiling, and linking your embedded applications,
- Dialogs for all development tool settings,
- True integrated source-level Debugger with high-speed CPU and peripheral simulator,
- Advanced GDI interface for software debugging in the target hardware and for connection to Keil ULINK,
- Flash programming utility for downloading the application program into Flash ROM,
- Links to development tools manuals, device datasheets & user's guides.



The project work space



Serial window #1 for viewing and modifying the program



DESIGN PROCEDURE

This idea was actually formed for the good cause of common people. Petrol rates are hiking every day and it's a burning issue. In the present, all bikes which are available in the market are not having a digital Fuel meter in it. With this the person cannot know how much amount of petrol is there. So if the bike consists of a digital Fuel meter in it, the person will be able to know how much petrol is present in millimeters. So, this concept will be very helpful for a common man. Generally, in the winter season the battery gets drained. Because of this, the vehicle will not start soon. So, it's a problem faced by many people. If the vehicle is consisting of a battery indicator, it shows how much amount of charging is present in it. So, if these two concepts are present in the bike or a car it will be very useful to everyone. This is actually an innovative project. This concept is not present in any of the automobile companies like Benz, BMW, Audi and Ferrari. So, this is just an innovative project and we are implementing this on a 2 stroke two wheeler vehicle.



Suzuki samurai model

Construction Phase:

- Tank construction
- Digital Fuel meter construction
- Battery mechanism

Tank Construction:

- The original petrol tank is used by modifying the sensor present in it.
- The capacity of the tank is 12 litres.
- The tank is of indefinite shape.

Digital Fuel meter construction:

- The Fuel meter is directly assembled in the bike.
- The Fuel meter will work accurately with the help of microcontrollers and ADC.
- Fuel meter consists of LCD, Fuel level sensor.

Battery Mechanism:

- The measurement of the time rate at which electrical energy is being transmitted or dissipated in an electrical system. The potential difference in volts between two points is equal to the energy per unit charge (in joules/coulomb) which is required to move electric charge between the points. Since the electric current measures the charge per unit time (in coulombs/second), the electric power p is given by the product of the

$$P = VI \quad (\text{watts})$$

$$P = i^2 R = \frac{V^2}{R} \quad (\text{watts})$$

- Most of all digital circuits needs 5.1V regulated voltage. Any sort of fluctuation in the power supply is not tolerated by the digital circuits. To processes clean DC of 5V we need a voltage regulated IC.
- The stepped down 12V AC output from the transformer or a 12V DC from a battery can be used. This voltage is given to the voltage regulator through 1N4007 rectifier diode D_1 , this practice helps protect the circuit when reverse terminals are connected. The same rectifier diode D_1 will convert the 12V AC to DC when connected to transformer. The converted dc supply will be now filtered using a 100µf capacitor C_3 across the cathode of diode and gnd. Then this half waved rectified power supply is given to pin1 of the voltage regulator 7805.

LCD Description:

Initializing the LCD:

Before you may really use the LCD, you must initialize and configure it. This is accomplished by sending a number of initialization instructions to the LCD. The first instruction we send must tell the LCD whether we'll be communicating with it with an 8-bit or 4-bit data bus. We also select a 5x8 dot character font. These two options are selected by sending the command 38h to the LCD as a command. As you will recall from the last section, we mentioned that the RS line must be low if we are sending a command to the LCD.

Fuel gauge:

A Fuel level detector (Fuel gauge) is a device inside of a car or other vehicle that measures the amount of Fuel still in the vehicle. This type of system can be used to measure the amount of gasoline or some other type of liquid. It will typically consist of a sensing or sending unit that measures the amount of Fuel actually left and a gauge or indicator that relays this information outside the Fuel container. A Fuel gauge can be designed in a number of different ways and many gauges have several flaws that can make the readings less than accurate. The two parts of a Fuel gauge are the sensing or sending unit and the indicator or gauge. A sensing unit is the part of a Fuel gauge found within or connected to the actual Fuel storage container on a vehicle. In a car these days, for example, the sensing unit will consist of a float inside the Fuel tank, which is connected to a metal rod that runs to a small electrical circuit. The float raises or lowers depending on the amount of gasoline in the Fuel tank.

Relay Driver:

Relay is an electro-mechanical switch which can be controlled by an electronic circuit. Relay consists of contact points and electromagnetic coil. In most of the cases there will be a need of a device switches the electrical appliance on or off depending on the logic produced by a electronic circuit board which runs on few volts of DC. In such scenario, relays are used which isolate high voltage AC from DC logic sections.

The relay has a high quality contact points which can bare more amps of current. The common relay coil is designed for 5-6V of operation. The output pin of the microcontroller is given to the current amplifier through 1K resistor.

Procedure:

- i. In sense of the mileage of any vehicle is affected by some factors which we have consider in and also take most economical, useful, intelligent and quick responding sensors to calculate the effect of the all the factors directly as well as indirectly too.
- ii. All the sensors are situated on their particular separate place to perform their operation. Sensors are very efficient quick responding units. The sensors collect all the data in running vehicle and then the collected information moves up to the E.C.U. E.C.U. is controlling unit which make command on all the individual sensors give them power to run and forward the collected data to the C.P.U. The E.C.U. is electronic control unit. Then the data moves up to the central processing unit i.e. C.P.U. at this unit the data finally computed into the numeric form by the mean of programming. All the data from the sensors is converted into the one form of mileage means How

much the vehicle can run? All the information is in coded form which moves towards the modulator. Modulator is the unit to modulate the information and finally the data in display on the digital Fuel indicator in a numeric form.

- iii. To maintain the accuracy level the C.P.U. has designed. By providing the clearance in data computation there is 3% to 4% of clearance for sensors errors and immeasurable factors so the information as given by system as near as actual. Thus the modified type intelligent Fuel indicator system operates.

Programs:

There are two main programs which are used in this project. One is for the password, which is substituting the key and battery indicator and the other one is for the Fuel indication.

Program for battery indication and password:

```
#include<stdio.h>
#include<reg8051.h>
voidinitpass();
void banner();
voidkey_scan();
void master();
void on();
void bat();
sbit c3=P3^0;
sbit c1=P3^1;
sbit c2=P3^2;
sbit r1=P3^3;
sbit r2=P3^4;
sbit r3=P3^5;
sbit r4=P3^6;
sbitrel=P3^7;
sbitrst=P2^6;
intn,r=0,c=0,key=0;
int pass[5],tpass[5];
intj,m=1,bp=0;
inta,b,c;
void main()
{
    rel=0x00;
    banner();
    yy:
    for(j=0;j<=5;j++)
    {pass[j]=0,tpass[j]=0;}
    bat();lcddeley();lcddeley();lcddeley();
    command(0x01);m=1;
    command(0x80);display(" Enter Password ");
    command(0xc0);display("to activate Igni");
    for(;;)
    {
        for(j=0;j<=5;j++)
        {
            key_scan();
            if(j==0){command(0xc0);display("
");command(0xc5);}
            pass[j]=key;display("***");
        }
        if(pass[0]==read_i2c(0xa0,0x06) &&
        pass[1]==read_i2c(0xa0,0x07) &&
        pass[2]==read_i2c(0xa0,0x08) &&
        pass[3]==read_i2c(0xa0,0x09) &&
        pass[4]==read_i2c(0xa0,0x0a) &&
```

```

        pass[5]==read_i2c(0xa0,0x0b))
        {
            command(0x01);
            command(0x80);display(" Master
code ");
            command(0xc0);display(" OK
");
            lcddeley();lcddeley();lcddeley();
            command(0x01);
            command(0x80);display(" Main
Menu ");
            command(0xc0);display("Changing
pascode");
            lcddeley();lcddeley();lcddeley();
            yyy:
            for(j=0;j<=5;j++)
            {pass[j]=0;tpass[j]=0;}
            command(0x01);
            command(0x80);display("Enter new
Pcode ");
            command(0xc5);
            for(j=0;j<=5;j++)
            {
                key_scan();
                pass[j]=key;display("***");
            }
            command(0x01);
            command(0x80);display("Re Enter
Pcode ");
            command(0xc5);
            for(j=0;j<=5;j++)
            {
                key_scan();
                tpass[j]=key;display("***");
            }
            if(pass[0]==tpass[0] &&
            pass[1]==tpass[1] && pass[2]==tpass[2] &&
            pass[3]==tpass[3] &&
            pass[4]==tpass[4] && pass[5]==tpass[5])
            {
                write_i2c(0x00,pass[0]);deley(10);
                write_i2c(0x01,pass[1]);deley(10);
                write_i2c(0x02,pass[2]);deley(10);
                write_i2c(0x03,pass[3]);deley(10);
                write_i2c(0x04,pass[4]);deley(10);
                write_i2c(0x05,pass[5]);deley(10);
                command(0x01);
                com-
                mand(0x80);display(" Passcode saved ");
                com-
                mand(0xc0);display(" Sucessfully ");
                lcdde-
                ley();lcddeley();lcddeley();//gotoyy;
                }elsegotoyyy;
                command(0x01);
                command(0x80);display(" Main
Menu ");
                Mcode ");
                command(0xc0);display(" Changing
                lcddeley();lcddeley();lcddeley();
                yyy:
                for(j=0;j<=5;j++)
                {pass[j]=0;tpass[j]=0;}
                command(0x01);
                command(0x80);display("Enter new
                Mcode ");
                command(0xc5);
                for(j=0;j<=5;j++)
                {
                    key_scan();
                    pass[j]=key;display("***");
                }
                command(0x01);
                command(0x80);display("Re Enter
                Mcode ");
                command(0xc5);
                for(j=0;j<=5;j++)
                {
                    key_scan();
                    tpass[j]=key;display("***");
                }
                if(pass[0]==tpass[0] &&
                pass[1]==tpass[1] && pass[2]==tpass[2] &&
                pass[3]==tpass[3] &&
                pass[4]==tpass[4] && pass[5]==tpass[5])
                {
                    write_i2c(0x06,pass[0]);deley(10);
                    write_i2c(0x07,pass[1]);deley(10);
                    write_i2c(0x08,pass[2]);deley(10);
                    write_i2c(0x09,pass[3]);deley(10);
                    write_i2c(0x0a,pass[4]);deley(10);
                    write_i2c(0x0b,pass[5]);deley(10);
                    command(0x01);
                    com-
                    mand(0x80);display("Mastercode saved");
                    com-
                    mand(0xc0);display(" Sucessfully ");
                    lcdde-
                    ley();lcddeley();lcddeley();gotoyy;
                    }elsegotoyyy;
                }
                if(pass[0]==read_i2c(0xa0,0x00) &&
                pass[1]==read_i2c(0xa0,0x01) &&
                pass[2]==read_i2c(0xa0,0x02) &&
                pass[3]==read_i2c(0xa0,0x03) &&
                pass[4]==read_i2c(0xa0,0x04) &&
                pass[5]==read_i2c(0xa0,0x05))
                {
                    command(0x01);
                    command(0x80);display(" Code Ac-
                    cepted ");
                    command(0xc0);display(" Ignition
    
```

```

ON ");
        m=1;
        on():gotoyy;
    }
    else
    {
        command(0x01);
        command(0x80);display(" Passcode
Wrong ");
        if(m==1){command(0xc0);display("
1 ");}lcddeley();
        if(m==2){command(0xc0);display("
2 ");}lcddeley();
        if(m==3){command(0xc0);display("
3 ");}lcddeley();
        if(m==3)
        {
            master();
            gotoyy;
        }
        m++;
    }
}
void on()
{
aa:
    bat();lcddeley();lcddeley();lcddeley();
    command(0x01);rel=0x01;
    command(0x80);display(" Igni is Active ");
    command(0xc0);display(" Press * to off ");
    key_scan();
    if(key==10){rel=0x00;}else gotoaa;
}
void bat()
{
    if(P1==0x00){bp=100;}
    if(P1==0x80){bp=90;}
    if(P1==0xc0){bp=80;}
    if(P1==0xe0){bp=70;}
    if(P1==0xf0){bp=60;}
    if(P1==0xf8){bp=50;}
    if(P1==0xfc){bp=40;}
    if(P1==0xfe){bp=30;}
    if(P1==0xff){bp=0;}
    command(0x01);
    command(0x80);display(" Battery charge ");
    command(0xc0);display("percentage : ");
    command(0xcd);
    a=bp%10;bp=bp/10;b=bp%10;bp=bp/10;c=bp%10;bp
=bp/10;
    ndisplay(c+0x30);ndisplay(b+0x30);ndisplay(a+0x30);
}
void master()
{
    xx:
    command(0x01);
    command(0x80);display("Security Breach ");
    command(0xc0);display("Enter MasterCode");
    for(j=0;j<=5;j++)
    {
        key_scan();
        if(j==0)
    }
    {
        command(0x80);display("Enter Mas-
terCode");
        command(0xc0);display("
");
        command(0xc5);
    }
    pass[j]=key;display("");
}
if(pass[0]==read_i2c(0xa0,0x06) &&
pass[1]==read_i2c(0xa0,0x07) &&
pass[2]==read_i2c(0xa0,0x08) &&
pass[3]==read_i2c(0xa0,0x09) &&
pass[4]==read_i2c(0xa0,0x0a) &&
pass[5]==read_i2c(0xa0,0x0b))
{
    command(0x01);
    command(0x80);display(" Master
Code ");
    command(0xc0);display(" Accept-
ed ");
    lcddeley();lcddeley();
}
else
{
    command(0x01);
    command(0x80);display(" Passcode
Wrong ");
    command(0x80);display(" Enter
again ");
    lcddeley();lcddeley();goto xx;
}
}
voidkey_scan()
{
    key=0;r=0;c=0;
    c1=c2=c3=0x00;
    r1=r2=r3=r4=0x01;
    while(r1==r2==r3==r4==0x00)
    {
        if(rst==0x00)
        {
            while(rst==0x00);
            initpass();
        }
    }
    if(r1==0x00){r=1;}
    if(r2==0x00){r=2;}
    if(r3==0x00){r=3;}
    if(r4==0x00){r=4;}
    c1=c2=c3=0x01;
    r1=r2=r3=r4=0x00;deley(100);
    if(c1==0x00){c=1;}
    if(c2==0x00){c=2;}
    if(c3==0x00){c=3;}
    while(c1==0x00 && c2==0x00 && c3==0x00);
    if(r==1 && c==1){key=1;}
    if(r==1 && c==2){key=2;}
    if(r==1 && c==3){key=3;}
    if(r==2 && c==1){key=4;}
    if(r==2 && c==2){key=5;}
    if(r==2 && c==3){key=6;}
    if(r==3 && c==1){key=7;}
}
    
```

```

if(r==3 && c==2){key=8;}
  if(r==3 && c==3){key=9;}
  if(r==4 && c==1){key=10;}
  if(r==4 && c==2){key=11;}
  if(r==4 && c==3){key=12;}
  deley(500);
}
voidinitpass()
{
  write_i2c(0x00,1);deley(10);
  write_i2c(0x01,2);deley(10);
  write_i2c(0x02,3);deley(10);
  write_i2c(0x03,4);deley(10);
  write_i2c(0x04,5);deley(10);
  write_i2c(0x05,6);deley(10);
  write_i2c(0x06,3);deley(10);
  write_i2c(0x07,4);deley(10);
  write_i2c(0x08,5);deley(10);
  write_i2c(0x09,6);deley(10);
  write_i2c(0x0a,7);deley(10);
  write_i2c(0x0b,8);deley(10);
}
void banner()
{
  init_lcd();
  command(0x80);display(" Welcome to ");
  command(0xc0);display("WITS.....GPHD");
  lcddeley();lcddeley();command(0x01);
  command(0x80);display(" Project title: ");
  lcddeley();command(0x01);
  command(0x80);display(" Digital Fuel ");
  command(0xc0);display(" Monitor ");
  lcddeley();lcddeley();command(0x01);
  command(0x80);display(" HOD ");
  command(0xc0);display("Sri G Buchibabu");
  lcddeley();lcddeley();command(0x01);
  command(0x80);display(" Project Guide: ");
  command(0xc0);display(" Sri E Surendar ");
  lcddeley();lcddeley();command(0x01);
  command(0x80);display("Project Done by:");
  lcddeley();
  command(0xc0);display(" I Meghana ");
  lcddeley();lcddeley();
  command(0xc0);display(" G Sagar ");
  lcddeley();lcddeley();
  command(0xc0);display(" K Ravi Varma ");
  lcddeley();lcddeley();
  command(0xc0);display(" K Sravan Kumar ");
  lcddeley();lcddeley();
  command(0xc0);display(" M Prashanth ");

  lcddeley();lcddeley();ndisplay(1);command(0x01);
}

```

Program for Fuel indication:

```

#include<stdio.h>
#include<reg8051.h>
voidinitpass();
void banner();
voidkey_scan();
void master();
void on();
void bat();

```

```

sbit c3=P3^0;
sbit c1=P3^1;
sbit c2=P3^2;
sbit r1=P3^3;
sbit r2=P3^4;
sbit r3=P3^5;
sbit r4=P3^6;
sbitrel=P3^7;
sbitrst=P2^6;
intn,r=0,c=0,key=0;
int pass[5],tpass[5];
intj,m=1,bp=0;
inta,b,c;
void main()
{
  rel=0x00;
  banner();
  yy:
  for(j=0;j<=5;j++)
  {pass[j]=0;tpass[j]=0;}
  bat();lcddeley();lcddeley();lcddeley();
  command(0x01);m=1;
  command(0x80);display(" Enter Password ");
  command(0xc0);display("to activate Igni");
  for(;;)
  {
    for(j=0;j<=5;j++)
    {
      key_scan();
      if(j==0){command(0xc0);display("
");command(0xc5);}
      pass[j]=key;display(" *");
    }
    if(pass[0]==read_i2c(0xa0,0x06) &&
    pass[1]==read_i2c(0xa0,0x07) &&
    pass[2]==read_i2c(0xa0,0x08) &&
    pass[3]==read_i2c(0xa0,0x09) &&
    pass[4]==read_i2c(0xa0,0x0a) &&
    pass[5]==read_i2c(0xa0,0x0b))
    {
      command(0x01);
      command(0x80);display(" Master
code ");
      command(0xc0);display(" OK
");
      lcddeley();lcddeley();lcddeley();
      command(0x01);
      command(0x80);display(" Main
Menu ");
      command(0xc0);display("Changing
pascode");
      lcddeley();lcddeley();lcddeley();
      yy:
      for(j=0;j<=5;j++)
      {pass[j]=0;tpass[j]=0;}
      command(0x01);
      command(0x80);display("Enter new
Pcode ");
      command(0xc5);
      for(j=0;j<=5;j++)
      {
        key_scan();
        pass[j]=key;display(" *");

```

```

    }
    command(0x01);
    command(0x80);display("Re Enter
Pcode ");
    command(0xc5);
for(j=0;j<=5;j++)
    {
        key_scan();
        tpass[j]=key;display("***");
    }
    if(pass[0]==tpass[0] &&
pass[1]==tpass[1] && pass[2]==tpass[2] &&
        pass[3]==tpass[3] &&
pass[4]==tpass[4] && pass[5]==tpass[5])
    {
        write_i2c(0x00,pass[0]);deley(10);
        write_i2c(0x01,pass[1]);deley(10);
        write_i2c(0x02,pass[2]);deley(10);
        write_i2c(0x03,pass[3]);deley(10);
        write_i2c(0x04,pass[4]);deley(10);
        write_i2c(0x05,pass[5]);deley(10);
        command(0x01);
        com-
mand(0x80);display(" Passcode saved ");
        com-
mand(0xc0);display(" Sucessfully ");
        lcdde-
ley();lcddeley();lcddeley();//gotoyy;
        }elsegotoyyy;

        command(0x01);
        command(0x80);display(" Main
Menu ");
        command(0xc0);display(" Changing
Mcode ");
        lcddeley();lcddeley();lcddeley();
        yyyy:
        for(j=0;j<=5;j++)
        {pass[j]=0;tpass[j]=0;}
        command(0x01);
        command(0x80);display("Enter new
Mcode ");
        command(0xc5);
        for(j=0;j<=5;j++)
        {
            key_scan();
            pass[j]=key;display("***");
        }
        command(0x01);
        command(0x80);display("Re Enter
Mcode ");
        command(0xc5);
        for(j=0;j<=5;j++)
        {
            key_scan();
            tpass[j]=key;display("***");
        }
    }
}

        if(pass[0]==tpass[0] &&
pass[1]==tpass[1] && pass[2]==tpass[2] &&
        pass[3]==tpass[3] &&
pass[4]==tpass[4] && pass[5]==tpass[5])
    {
        write_i2c(0x06,pass[0]);deley(10);
        write_i2c(0x07,pass[1]);deley(10);
        write_i2c(0x08,pass[2]);deley(10);
        write_i2c(0x09,pass[3]);deley(10);
        write_i2c(0x0a,pass[4]);deley(10);
        write_i2c(0x0b,pass[5]);deley(10);
        command(0x01);
        com-
mand(0x80);display("Mastercode saved");
        com-
mand(0xc0);display(" Sucessfully ");
        lcdde-
ley();lcddeley();lcddeley();gotoyy;
        }elsegotoyyyy;
    }
    if(pass[0]==read_i2c(0xa0,0x00) &&
pass[1]==read_i2c(0xa0,0x01) &&
pass[2]==read_i2c(0xa0,0x02) &&
pass[3]==read_i2c(0xa0,0x03) &&
pass[4]==read_i2c(0xa0,0x04) &&
pass[5]==read_i2c(0xa0,0x05))
    {
        command(0x01);
        command(0x80);display(" Code Ac-
cepted ");
        command(0xc0);display(" Ignition
ON ");
        m=1;
        on();gotoyy;
    }
    else
    {
        command(0x01);
        command(0x80);display(" Passcode
Wrong ");
        if(m==1){command(0xc0);display("
1 ");}lcddeley();
        if(m==2){command(0xc0);display("
2 ");}lcddeley();
        if(m==3){command(0xc0);display("
3 ");}lcddeley();
        if(m==3)
        {
            master();
            gotoyy;
        }
        m++;
    }
}
}
void on()
    
```



```

{
    aa:
    bat();lcddeley();lcddeley();lcddeley();
    command(0x01);rel=0x01;
    command(0x80);display(" Igni is Active ");
command(0xc0);display(" Press * to off ");
    key_scan();
    if(key==10){rel=0x00;}else gotoaa;
}
void bat()
{
    if(P1==0x00){bp=100;}
    if(P1==0x80){bp=90;}
    if(P1==0xc0){bp=80;}
    if(P1==0xe0){bp=70;}
    if(P1==0xf0){bp=60;}
    if(P1==0xf8){bp=50;}
    if(P1==0xfc){bp=40;}
    if(P1==0xfe){bp=30;}
    if(P1==0xff){bp=0;}
    command(0x01);
    command(0x80);display(" Battery charge ");
    command(0xc0);display("percentage : ");
    command(0xcd);
    a=bp%10;bp=bp/10;b=bp%10;bp=bp/10;c=bp%10;bp
=bp/10;
    ndisplay(c+0x30);ndisplay(b+0x30);ndisplay(a+0x30);
}
void master()
{
    xx:
    command(0x01);
    command(0x80);display("Security Breach ");
    command(0xc0);display("Enter MasterCode");
    for(j=0;j<=5;j++)
    {
        key_scan();
if(j==0)
        {
            command(0x80);display("Enter Mas-
terCode");
            command(0xc0);display("
");
            command(0xc5);
        }
        pass[j]=key;display("***");
    }
    if(pass[0]==read_i2c(0xa0,0x06) &&
    pass[1]==read_i2c(0xa0,0x07) &&
    pass[2]==read_i2c(0xa0,0x08) &&
    pass[3]==read_i2c(0xa0,0x09) &&
    pass[4]==read_i2c(0xa0,0x0a) &&
    pass[5]==read_i2c(0xa0,0x0b))
    {
        command(0x01);
        command(0x80);display(" Master
Code ");
        command(0xc0);display(" Accept-
ed ");
    }
    else
    {
        command(0x01);
        command(0x80);display(" Passcode
Wrong ");
        command(0x80);display(" Enter
again ");
        lcddeley();lcddeley();goto xx;
    }
}
voidkey_scan()
{
    key=0;r=0;c=0;
    c1=c2=c3=0x00;
    r1=r2=r3=r4=0x01;
    while(r1==r2==r3==r4==0x00)
    {
        if(rst==0x00)
        {
            while(rst==0x00);
            initpass();
        }
    }
    if(r1==0x00){r=1;}
    if(r2==0x00){r=2;}
    if(r3==0x00){r=3;}
    if(r4==0x00){r=4;}
    c1=c2=c3=0x01;
    r1=r2=r3=r4=0x00;deley(100);
    if(c1==0x00){c=1;}
    if(c2==0x00){c=2;}
    if(c3==0x00){c=3;}
    while(c1==0x00 && c2==0x00 && c3==0x00);
    if(r==1 && c==1){key=1;}
    if(r==1 && c==2){key=2;}
    if(r==1 && c==3){key=3;}
    if(r==2 && c==1){key=4;}
    if(r==2 && c==2){key=5;}
    if(r==2 && c==3){key=6;}
    if(r==3 && c==1){key=7;}
    if(r==3 && c==2){key=8;}
    if(r==3 && c==3){key=9;}
    if(r==4 && c==1){key=10;}
    if(r==4 && c==2){key=11;}
    if(r==4 && c==3){key=12;}
    deley(500);
}
voidinitpass()
{
    write_i2c(0x00,1);deley(10);
    write_i2c(0x01,2);deley(10);
    write_i2c(0x02,3);deley(10);
    write_i2c(0x03,4);deley(10);
    write_i2c(0x04,5);deley(10);
    write_i2c(0x05,6);deley(10);
    write_i2c(0x06,3);deley(10);
    write_i2c(0x07,4);deley(10);
    write_i2c(0x08,5);deley(10);
    write_i2c(0x09,6);deley(10);
    write_i2c(0x0a,7);deley(10);
    write_i2c(0x0b,8);deley(10);
}
void banner()
{
    init_lcd();
}

```

```

command(0x80);display(" Welcome to ");
command(0xc0);display("WITS.....GPHD");
lcddeley();lcddeley();command(0x01);
command(0x80);display(" Project title: ");
lcddeley();command(0x01);
command(0x80);display(" Digital Fuel ");
command(0xc0);display(" Monitor ");
lcddeley();lcddeley();command(0x01);
command(0x80);display(" HOD ");
command(0xc0);display("Sri G Buchibabu");
lcddeley();lcddeley();command(0x01);
command(0x80);display(" Project Guide: ");
command(0xc0);display(" Sri E Surendar ");
lcddeley();lcddeley();command(0x01);
command(0x80);display("Project Done by:");
lcddeley();
command(0xc0);display(" I Meghana ");
lcddeley();lcddeley();
command(0xc0);display(" G Sagar ");
lcddeley();lcddeley();
command(0xc0);display(" K Ravi Varma ");
lcddeley();lcddeley();
command(0xc0);display(" K Sravan Kumar ");
lcddeley();lcddeley();
command(0xc0);display(" M Prashanth ");

lcddeley();lcddeley();ndisplay(1);command(0x01);
}
    
```



Battery level indicator



Battery Level varying from 080% to 70%

PERFORMANCE TESTING

Fuel indicator specifications:

After the prototype is developed many observations are done on the Fuel indicator. checking had been done by pouring selected amount Fuel and noting down the reading shown in LCD display. So by checking variations in the indication the total observations were performed.



Fuel level indicator

Battery indicator specifications:

The observations of the battery indicator are performed, by keeping the bike constant. So, if the bike is still for long period the battery gets discharged. When we again start the bike, ignition gets activated and so the battery gets charged when it is in movement.

Password substituting key:

A password is being set for the bike such a way that, if we enter the password the ignition gets activated. If we enter the wrong password for three times the indicator asks for the master key. The master key is also a 6 digit password. and it is flexible to change to provide more security to our bike.



LCD displays and keyboard



Enter password for activating ignition in LCD display



Showing the Security breach enter password in LCD display



Passcode wrong indicating once in LCD display



Passcode wrong indicating twice in LCD display

Conclusion:

In our present study we have conducted experimental analysis on a two stroke two wheeler vehicle. The project gives us the indication of parameters like Fuel level and battery health. The result shows us two meters which display

- Fuel level indicator which shows the amount of Fuel present in the petrol tank.
- Battery level indicator which shows the percentage of charging left over in the battery.
- A six digit password substituting the key. The ignition will activate, as soon as we enter the password. From the above results, it is observed that as the digital values of the Fuel are displayed on the LCD, the person can know the accurate level of the Fuel. So that there is no chance of thefts to be done in petrol pumps. The battery indicator helps us to know the amount of charging left over and it helps us mainly in the winter and rainy seasons when the battery generally gets discharged. There is a password which substitutes the key. If the wrong password is entered for three times, the master code should be entered and it can be changed also. Therefore bike thefts can be overcome up to some extent.

Future Scope:

The future scope of this project is to know the amount of impurities present in the total quantity of the fuel. This can be known with the help of sensors which senses the impurity in the fuel. The level of impurity will be shown with the help of digital meter. This idea is taken from the impure milk detector. From that, the amount of water present in the milk can be known. So, using the same principle amount of impurities present in the total fuel can be shown digitally.



Fuel Quality Meter

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