Appendix A:

This is the simulation source code for “Design of An Embedded Automobile Engine Locking and controlling System By Using GSM Technology” version 1.0.


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Source code:

/* This sketch for arduino to send message from virtual terminal, depending on this message, control action will be done */

// Include the LiquidCrystal library

#include<LiquidCrystal.h>

LiquidCrystal lcd(7,6,5,4,3,2); // defition of lcd pins,pin 7 is connected to RS, pin 6 is connected to Enable, pins (2,3,4,5) for data

int relay1= 12; // relay1 is used for enabling or disabling the system and is connected to pin 12
int relay2 = 13; // relay2 is used for starting the car ignition system and is connected to pin 13
int engine = 8; // engine is replicating the car engine and connected to pin 8

void setup() {
    lcd.begin(16,2); // define lcd with 2 rows and 16 columns
    pinMode(relay2, OUTPUT); // define pins (12,13,8) in arduino as output pins
    pinMode(relay1, OUTPUT);
    pinMode(engine, OUTPUT);
    Serial.begin(9600); // initialize serial communication at 9600 bits per second
    lcd.setCursor(0,0); // set lcd cursor in first line and first column
    lcd.print("Starting System"); // print this string in the LCD
}

void loop() {

    if (Serial.available()>0) // wait for serial port to connect.
    {
        String message = Serial.readString(); // read input serial
        delay(1500); // delay for 1.5 second
        Serial.println(message); // print the entered message in virtual terminal
        lcd.clear(); // clear lcd rows and columns
        lcd.setCursor(0,0);
        lcd.print("Message Recived ");
    
}
delay(100);
if (message == "qw12*e#") // if this message is received enabling ignition system
    {digitalWrite(engine,LOW);
digitalWrite(relay1,HIGH);
lcd.setCursor(0,1); // set lcd cursor in second row, first column
lcd.print("Enabling System ");}
else if(message =="qw12*d#") // disabling ignition system if the message is (qw12*e#)
    {digitalWrite(engine,LOW);
digitalWrite(relay1,LOW);
lcd.setCursor(0,1);
lcd.print("Disabling System ");}
else if(message == "qw12*s#") // start ignition when receiving this message
    {
digitalWrite(relay1,HIGH);
delay(100);
digitalWrite(relay2,HIGH);
delay(500);
digitalWrite(engine,HIGH);
delay(2000);
digitalWrite(relay2,LOW);
lcd.setCursor(0,1);
lcd.print("Starting Engine");

}
else // any other message disable ignion system and print in lcd "No Response"
{
digitalWrite(relay1,LOW);
digitalWrite(relay2,LOW);
digitalWrite(engine,LOW);
lcd.setCursor(0,1);
lcd.setCursor(0,1);
lcd.print("No Response");
}

}