

FLOOD MONITORING AND EARLY WARNING SYSTEMS

Components Required

ESP8266

GSM module (SIM 8001)

Ultrasonic sensor

Float sensor

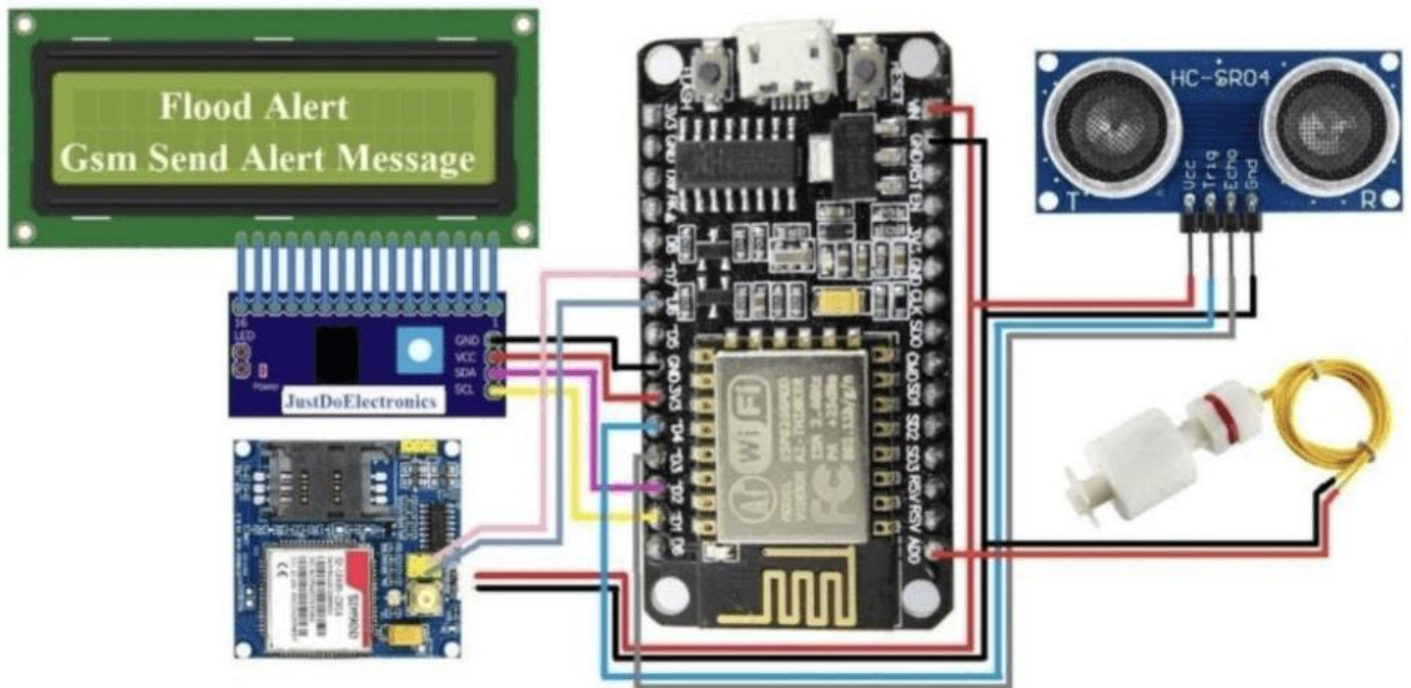
16 x 2 LCD Display with 12C

Zero PCB

5V Power supply

CIRCUIT DIAGRAM

The circuit diagram for this IoT based smart parking system project is given above



PROGRAM

```

1  #include <Wire .h>
2  #include <LiquidCrystal_I2C.h>
3  #include <New Ping .h>
4  #include <Software Serial .h>
5
6  // LCD Display
7  LiquidCrystal_I2C lcd(0x27, 16, 2);
8
9  // Ultrasonic Sensor
10 #define TRIGGER_PIN 12
11 #define ECHO_PIN 11
12 #define MAX_DISTANCE 200
13 New Ping sonar(TRIGGER_PIN, ECHO_PIN, MAX_DISTANCE);
14
15 // Float Sensor
16 #define FLOAT_SENSOR_PIN 10
17
18 // GSM Module
19 Software Serial gsm Serial (8, 9); // RX, TX
20 #define GSM_BAUDRATE 9600
21
22 // Thresholds
23 #define FLOOD_THRESHOLD 50 // Example threshold in cm
24
25 // Phone Numbers
26 String phoneNumbers[] = { "+9188305848xx", "+9188305848xx" }; // Example phone numbers
27
28 void setup() {
29   // Initialize LCD Display
30   lcd.begin(16, 2);
31   lcd.backlight();
32
33   // Initialize GSM Module
34   gsm Serial.begin(GSM_BAUDRATE);
35   delay(2000); // Give GSM module time to initialize
36   send Command("AT"); // Check communication
37   send Command("AT+CMGF=1"); // Set SMS text mode
38
39   // Display Initialization Message
40   lcd.clear();
41   lcd.setCursor(0, 0);
42   lcd.print("Flood Monitoring");
43   lcd.setCursor(0, 1);
44   lcd.print("System");
45
46   delay(3000); // Display initialization message for 3 seconds
47 }
48
49 void loop() {
50   // Read Ultrasonic Sensor
51   unsigned int distance = sonar.Ping_cm();
52
53   // Read Float Sensor
54   int floatSensorValue = digitalRead(FLOAT_SENSOR_PIN);
55
56   // Calculate Flood Level
57   int floodLevel = distance;
58
59   // Update LCD Display
60   lcd.clear();
61   lcd.setCursor(0, 0);
62   lcd.print("Water Level: ");
63   lcd.print(floodLevel);
64   lcd.print("cm");
65
66   // Check Flood Threshold

```

```
67 if (flood Level > FLOOD_THRESHOLD && float Sensor Value == HIGH) {
68   // Send Alert SMS
69   Send Alert SMS (flood Level);
70 }
71
72 delay(500); // Delay for stability
73 }
74
75 void send Alert SMS(int flood Level) {
76   String message = "Flood Alert! Water level is ";
77   message += flood Level;
78   message += "cm. Take necessary actions.";
79
80   for (int i = 0; i < size of(phone Numbers) / size of(phone Numbers[0]); i++) {
81     send Command("AT+CMGS=\"" + phone Numbers[i] + "\"");
82     delay(1000);
83     send Command(message);
84     delay(100);
85     send Command((String) char(26));
86     delay(1000);
87   }
88 }
89
90 void send Command(String command) {
91   gsm Serial.println(command);
92   delay(1000);
93   while (gsm Serial.available()) {
94     gsm Serial.read();
95   }
96 }
```