CHITKARA UNIVERSITY INSTITUTE OF ENGINEERING & TECHNOLOGY

COMPUTER SCIENCE ENGINEERING

Project Report

On

Fuel Analyser

Course Name – Internet of Things
Course Code – CS201

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Project Title

Introduction of project: In this project we are trying to solve the fuel leakage problem in industries.We are checking the incoming flow of fuel entering into the tank and by that we are calculating the height of the column of the fuel and other factors. We are sending all this data to the cloud with the help of node mcu as it is cost effective.

Circuit diagram of the project:

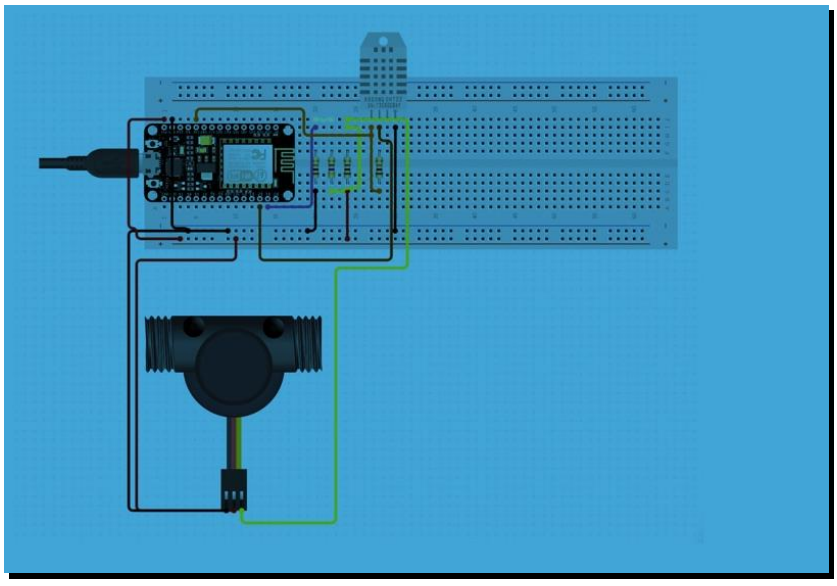

Fig 1.1-Circuit diagram

Working of the project : In this project the water flow sensor is measuring the fuel flow rate coming into the tank and it tells the volume of fuel entering in the tank . The ultrasonic sensor is at the top of tank which measures the amount of the fuel in the tank and the height level of fuel . The DHT11 sensor is measuring the amount of humidity and temperature of the tank which tells us the density of liquid . Data from each sensor is getting stored in the cloud. If the data mismatches the theoretical it will reflect it on the screen.

Screenshot of the project:

Fig 1.2-Water flow sensor

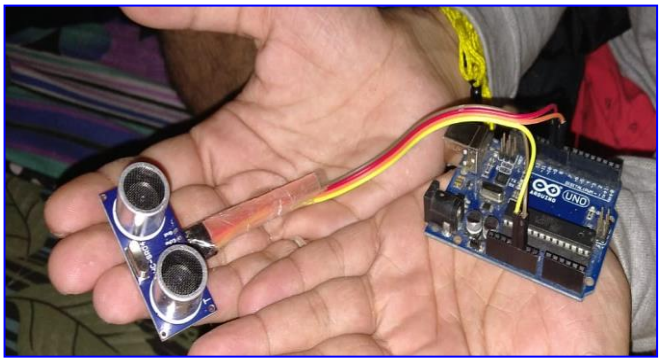

Fig 1.3-Ultrasonic sensor

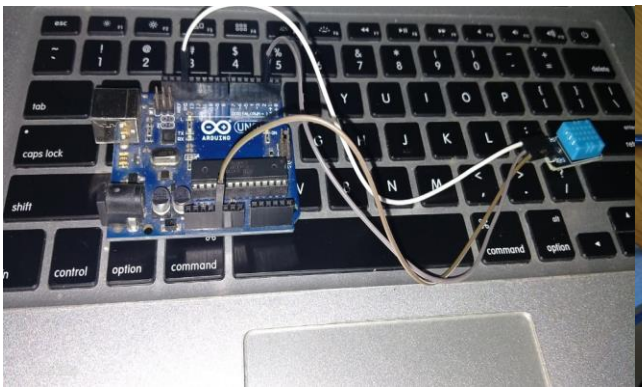

Fig 1.4-DHT11 sensor

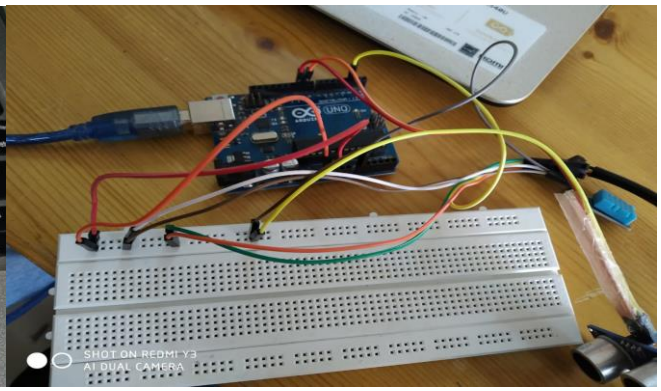

Fig 1.4- Full circuit diagram

Software program of the project:

```
#include <dht.h>
#define dht_apin A0                    // Analog Pin sensor is connected to
dht DHT;
const int trigPin = 9;
const int echoPin = 10;
volatile int flow_frequency;           // Measures flow sensor pulses
unsigned int l_hour;                   // Calculated litres/hour
unsigned char flowsensor = 2;          // Sensor Input
unsigned long currentTime;
unsigned long cloopTime;

float duration, distance;
void setup()
{
  Serial.begin(9600);
  delay(500);                          //Delay to let system boot
  Serial.println("DHT11 Humidity & temperature Sensor\n\n");
  delay(1000);                         //Wait before accessing Sensor
   pinMode(trigPin, OUTPUT);
  pinMode(echoPin, INPUT);
  Serial.begin(9600);
   pinMode(flowsensor, INPUT);
   digitalWrite(flowsensor, HIGH);     // Optional Internal Pull-Up
   Serial.begin(9600);
   attachInterrupt(0, flow, RISING);   // Setup Interrupt
```

```
  sei();                                  // Enable interrupts
  currentTime = millis();
  cloopTime = currentTime;
}
void flow ()                              // Interrupt function
{
  flow_frequency++;
}

void loop()
{
   DHT.read11(dht_apin);
   Serial.print("Current humidity = ");
   Serial.print(DHT.humidity);
   Serial.print("%  ");
   Serial.print("temperature = ");
   Serial.print(DHT.temperature);
   Serial.println("C  ");

   delay(5000);

    digitalWrite(trigPin, LOW);
 delayMicroseconds(2);
 digitalWrite(trigPin, HIGH);
 delayMicroseconds(10);
 digitalWrite(trigPin, LOW);

 duration = pulseIn(echoPin, HIGH);
 distance = (duration*.0343)/2;
 Serial.print("Distance: ");
 Serial.println(distance);
 delay(100);
```

```
  currentTime = millis();
  // Every second, calculate and print litres/hour
  if(currentTime >= (cloopTime + 1000))
  {
    cloopTime = currentTime;                    // Updates cloopTime


    l_hour = (flow_frequency * 60 / 7.5);       // Pulse frequency (Hz) = 7.5Q, Q
                                                   is flow rate in L/min.

    flow_frequency = 0;                         // Reset Counter
    Serial.print(l_hour, DEC);                  // Print litres/hour
    Serial.println(" L/hour");

}
}
```

Bill of materials required:

Sr.no	Name of item	Quantity	Amount in INR
1	Arduino uno	1	320
2	Node mcu	1	240
3	Breadboard	1	60
4	Male to male jumper wires	10	20
5.	Male to female jumper wires	10	20
		TOTAL	660