PROJECT 9

Water Flow Sensor Using blink

1. **INTRODUCTION: -**

Water flow sensor is capable of measuring flows in pipes from 0.15 to 60 liters per minute, suitable for measuring water consumption or detecting pipe leakage and monitoring agricultural irrigation

Smart Metering often refers to monitor the supply of water, however highly reliable smart metering cannot only be used for managing utility supplies but also brings benefits to managing liquid storage, inventories such as grain in silos and movement of goods., coffee machines and cola dispenser. Etc.

COMPONENTS: -

1. Wemos
2. Water flow sensor

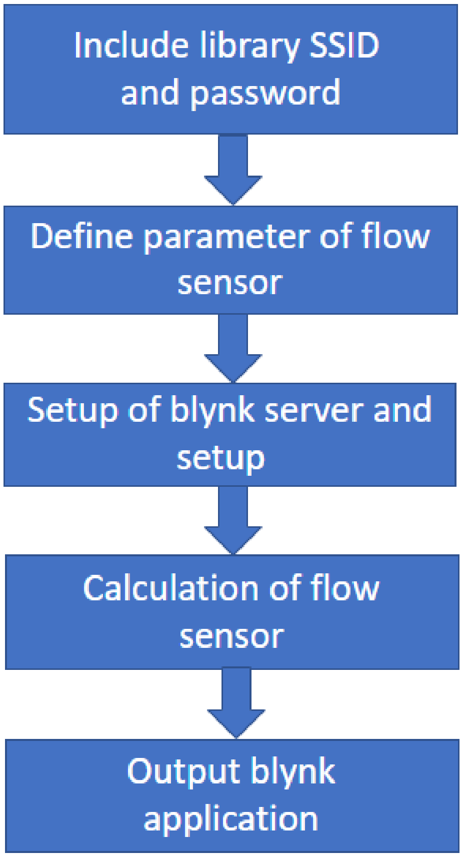
APPLICATION: -

Water flow sensors can measure the rate of flow of water either by measuring velocity or displacement. ... This type of water flow sensor can be used for viscous liquids also. For working with dirty water and wastewater which may be conductive, Magnetic flow meter is used.

OBJECTIVES: -

To monitor the amount of water being supplied and used, the rate of flow of water has to be measured. Water flow sensors are used for this purpose. Water flow sensors are installed at the water source or pipes to measure the rate of flow of water and calculate the amount of water flowed through the pipe.

FLOW CHART:-


Include library SSID and password
Define parameter of flow sensor
Setup of blynk server and setup
Calculation of flow sensor
Output blynk application

PROGRAMMING:-

```
#define BLYNK_PRINT Serial          // Uncomment for debugging

#include <ESP8266WiFi.h>
#include <BlynkSimpleEsp8266.h>

#include <ESP8266mDNS.h>  // For OTA with ESP8266
#include <WiFiUdp.h>  // For OTA
#include <ArduinoOTA.h>  // For OTA

// You should get Auth Token in the Blynk App.
// Go to the Project Settings (nut icon).
char auth[] = "07DQbnsxODMhV3t0HC4QFZ5ZeHKIoFF6";

// Your WiFi credentials.
// Set password to "" for open networks.
char ssid[] = "Tshimologong-General";
char pass[] = "letsinnovate";

#define PULSE_PIN D2  //gpio4
#define FLOW_CALIBRATION 8.2
#define VPIN_TOTAL_LITERS       V1
#define VPIN_FLOW_RATE          V2
```

```
#define VPIN_FLOW_MILLI_LITERS  V3
#define VPIN_RESET             V4


#define OTA_HOSTNAME "Test Flow Sensor Water Meter"


BlynkTimer timer;

volatile long pulseCount = 0;
float flowRate;
unsigned int flowMilliLitres;
unsigned long totalMilliLitres;
float totalLitres;
float totalLitresold;
unsigned long oldTime;


BLYNK_CONNECTED() { // runs once at device startup, once
connected to server.

  Blynk.syncVirtual(VPIN_TOTAL_LITERS); //gets last know value of
V1 virtual pin

}
```

```
// Restores last know value of V1 virtual pin which we got it from
blynk server
BLYNK_WRITE(VPIN_TOTAL_LITERS)
{
  totalLitresold = param.asFloat();


}



BLYNK_WRITE(VPIN_RESET) {  // reset all data with button in PUSH
mode on virtual pin V4
  int resetdata = param.asInt();
  if (resetdata == 0) {
    Serial.println("Clearing Data");
    Blynk.virtualWrite(VPIN_TOTAL_LITERS, 0);
    Blynk.virtualWrite(VPIN_FLOW_RATE, 0);
    flowRate = 0;
    flowMilliLitres = 0;
    totalMilliLitres = 0;
    totalLitres = 0;
    totalLitresold = 0;
  }
}
```

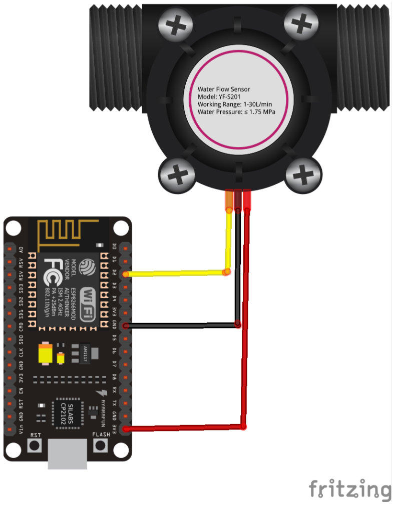
```
void pulseCounter()
{
  pulseCount++;
}

void flow()
{

  if ((millis() - oldTime) > 1000)   // Only process counters once per second
  {
    detachInterrupt(PULSE_PIN);
    flowRate = ((1000.0 / (millis() - oldTime)) * pulseCount) / FLOW_CALIBRATION;
    oldTime = millis();
    flowMilliLitres = (flowRate / 60) * 1000;
    totalMilliLitres += flowMilliLitres;
    totalLitres = totalLitresold + totalMilliLitres * 0.001;
    unsigned int frac;

    // Print the flow rate for this second in liters / minute
    Serial.print("flowrate: ");
    Serial.print(int(flowRate));  // Print the integer part of the variable

    Serial.print(".");            // Print the decimal point
  frac = (flowRate - int(flowRate)) * 10; // Determine the fractional part. The 10 multiplier gives us 1 decimal place.
    Serial.print(frac, DEC) ;      // Print the fractional part of the variable
    Serial.print("L/min");

    Serial.print("  Current Liquid Flowing: ");  // Print the number of liters flowed in this second
    Serial.print(flowMilliLitres);
    Serial.print("mL/Sec");

    Serial.print("  Output Liquid Quantity: ");  // Print the cumulative total of liters flowed since starting
    Serial.print(totalLitres);
    Serial.println("L");

    pulseCount = 0;  // Reset the pulse counter so we can start incrementing again

    attachInterrupt(PULSE_PIN, pulseCounter, FALLING);    // Enable the interrupt again now that we've finished sending output
  }

}
```

```
void sendtoBlynk()  // In this function we are sending values to blynk
server


{
  Blynk.virtualWrite(VPIN_TOTAL_LITERS, totalLitres);         // Total
water consumption in liters (L)
  Blynk.virtualWrite(VPIN_FLOW_RATE, flowRate);            // Displays
the flow rate for this second in liters / minute (L/min)
  //  Blynk.virtualWrite(VPIN_FLOW_RATE, flowMilliLitres);  // Displays
the number of liters flowed in second (mL/Sec)


}


void setup()
{
  Serial.begin(57600);
  Blynk.begin(auth, ssid, pass);
  ArduinoOTA.setHostname(OTA_HOSTNAME);  // For OTA - Use your
own device identifying name
  ArduinoOTA.begin();  // For OTA


  pulseCount        = 0;
  flowRate          = 0.0;
  flowMilliLitres   = 0;
  totalMilliLitres  = 0;
  oldTime           = 0;
  totalLitresold = 0;
  pinMode(PULSE_PIN, INPUT);  // Initialization of the variable "PULSE_PIN" as INPUT (D2 pin)

  attachInterrupt(PULSE_PIN, pulseCounter, FALLING);

  timer.setInterval(10000L, sendtoBlynk); // send values blynk server every 10 sec

}



void loop()
{

  Blynk.run();
  ArduinoOTA.handle();  // For OTA
  timer.run();
  flow();

}
```

HARDWARE CONNECTION:-

1. Connect Pin water flow sensor To wemos
2. Connect pin 3.3v to 3.3v
3. Connect pin GND to GND
4. Connect pin sensor to D2

CIRCUIT DIAGRAM:-


Water Flow Sensor
Model: YF-S201
Working Range: 1-30L/min
Water Pressure: ≤ 1.75 MPa
fritzing