# Water Flow Sensor

## (Technical Note)

## What is Water Flow Sensor?

The rate of flow of liquid is measured by a flow sensor. It is built with a combination of a plastic valve and a water rotor with a hall effect sensor. When water flows through the valve, it rotates the rotor. Changes in flow is observed by the speed of the motor. The change outputs as a pulse signal measured by the hall effect sensor and typically displayed by an LED monitor.

## Scientific Fact and Applications

As the water flows through the valve, depending on the speed of flow and the flow rate, rotor changes its speed. In many sensors, direct estimation can be made by calculating the number of turns the rotor makes however here the module uses a hall effect sensor which gives a pulse for every rotation of the hall effect sensor.

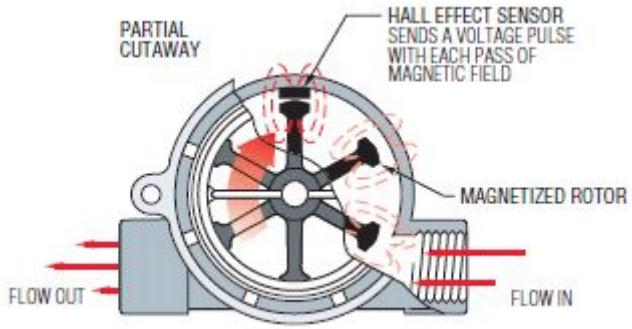
**Applications:**

**Water Suppliers**

Water flow sensors are used by the water suppliers to keep a track of the rate of water supply. It also helps in predicting the problems, maintaining stats, and regulating policies. Water flow sensor are attached in the water motors for reading the volume utilised per month.

**Agriculture**

Water flow sensors can be used for irrigation purposes. With an assembly of relays and other sensors, a smart irrigation system can regulate the flow of water according to specific crop requirements.




**Reference**

1. https://www.elprocus.com/a-memoir-on-water-flow-sensor/#:~:text=Water%20flow%20sensor%20consists%20of,the%20speed%20of%20the%20motor.
2. https://www.14core.com/water-flow-rotormotor-sensor-wiring-guide-with-arduino/

AN-037 Rev 1.0

Z2M Part Number: **EMS-017-A**

# Water Flow Sensor

## (Application Note)

ZERO2MAKER

## Project

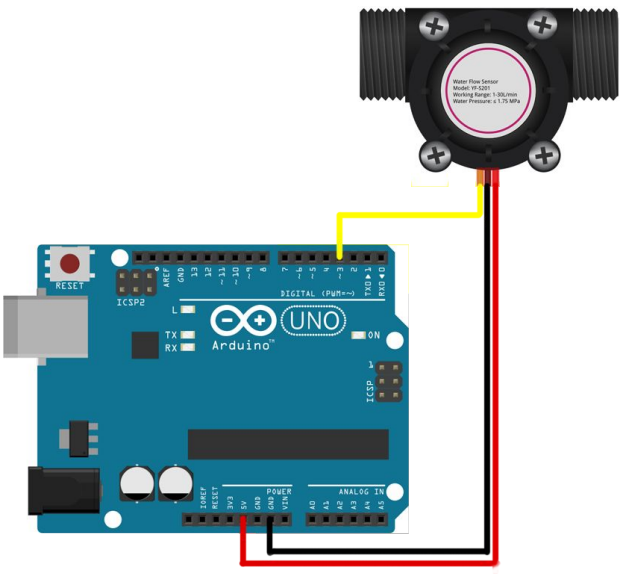
## Components Required

| Component | Part No. | Qty |
|---|---|---|
| Arduino UNO | EMX-001-A | 1 |
| Water Flow Rate Sensor | EMS-017-A | 1 |

## Procedure

1. Connect the wires properly as shown in the schematic.
2. Upload the code.

## Schematic



## Challenge Yourself

## Code

```
int flowPin = 3;/*This is the input pin on the Arduino*/
double flowRate;/*This is the value we intend to calculate.*/
volatile int count;/*This integer needs to be set as volatile to ensure it updates correctly during the interrupt process.*/

void setup() {
/*put your setup code here, to run once:*/
pinMode(flowPin, INPUT);/*Sets the pin as an input*/
attachInterrupt(0, Flow,RISING);
/*Configures interrupt 0 (pin 3 on the Arduino Uno) to run the function "Flow"*/
Serial.begin(9600);
/*Start Serial, setting the baud rate to 9600 */
}
void loop() {
count = 0;/*Reset the counter so we start counting from 0 again*/
interrupts();/*Enables interrupts on the Arduino*/
delay (1000); /*Wait 1 second */
noInterrupts(); /*Disable the interrupts on the Arduino*/

/*Start the calculation*/
flowRate = (count * 2.25);/*Take counted pulses in the last second and multiply by 2.25mL(Pulses per second * 2.25 milliliters per Pulse = milliliters/Second) */
flowRate = flowRate * 60;/*Convert seconds to minutes, giving you mL Minute(mL/Second * 60 Seconds = mL/Minute)*/
flowRate = flowRate / 1000;/*Convert mL to Liters, giving you Liters Minute(mL/Minute / 1000 = Liters/Minute)v*/
Serial.println(flowRate);/*Print the variable flowRate to Serial*/
}

void Flow()
{
count++; /*Every time this function is called, increment "count" by 1*/
}
```