

## **Introduction:**

KnowFlow is designed for environmentalists who want to monitor water quality and get real time data. It can monitor 2 parameters with basic kit: pH and Electronic conductivities. The kit is based on Arduino, easy to change and add more sensors and modules. Currently it stores the data on a micro-SD card, also the data can be viewed on your smart phone via Bluetooth communication.

KnowFlow AWM (Automatic Water Monitor) is the first kit for Open-Source Science in KnowFlow team. KnowFlow team comes from NGO GreenSeed Organization. We are going to build a low-cost water monitor for the people who join the course. Then we found that a lot of people need the water monitor, so we release all the things to help people make themselves water monitors.

Using the water monitor, you can find the water quality by real time, also you can store the data into the TF card, analysis the data. It can be using on environment study, pollution sourcing and teaching ets.

KnowFlow team focuses on the solution of environment and agriculture problem. We can provide best tool by using hardware, software, courses and cloud technology. We can support scientists, students, citizens and environmentalists to using the Digital Technology at application in environment and agriculture. We want to promote the development of the Open Science and Open innovation by this efforts.

KnowFlow Kits is using the DFRobot Gravity Sensor series. Gravity Sensor series are easy to use and high compatibility. If you are not care about the code, you can just upload the sketch into the Bluno board without any coding job. After that you can find that the data is storing into the TF card.

KnowFlow can be powered by power bank or Li-po battery. For the advanced function, you may add ORP sensor, and Dissolve Oxygen sensor in your kit.

You can find the courses video which is made by GreenSeed and MushroomCloud makerspace.

### **Attention**

As a basic version of KnowFlow, this Kit is just INCLUDE pH and EC sensors. You may check Gravity: Waterproof DS18B20 Sensor Kit to enable temperature measuring function.

We will recommend using a 200mmx150mmx75mm waterproof case and a acrylic plate to mount KnowFlow sensors. You can find the dwg in GitHub.

## **FEATURES**

- pH, EC auto record
- Micro-SD Local storage

- Extensible design
- plug and play
- Bluetooth built-in

## SPECIFICATION

Bluno Microcontroller:

\*On-board BLE chip: TI CC2540

Wireless Programming via BLE

Support AT command to config the BLE

Transparent communication through Serial

Upgrade BLE firmware easily

DC Supply: USB Powered or External 7V~12V DC

Microcontroller: Atmega328p

Bootloader: Arduino Uno (disconnect any BLE device before uploading a new sketch)

Compatible with the Arduino Uno pin mapping

Size: 60mm \* 53mm (2.36"\*2.08")

Weight: 30g

pH sensor:

Module Power: 5.00V

Module Size: 43 x 32mm (1.69x1.26")

Measuring Range:0 - 14PH

Accuracy:  $\pm 0.1$ pH (25 °C)

Response Time:  $\leq 1$ min

pH Sensor with BNC Connector

pH2.0 Interface (3 foot patch )

Gain Adjustment Potentiometer

Power Indicator LED

EC sensor

Operating Voltage: +5.00 V

PCB Size: 45 × 32mm(1.77x1.26")

Measuring Range: 1ms/cm -- 20ms/cm

Operating Temperature: 5 - 40 °C

Accuracy:  $\pm 10\%$  F.S (using Arduino 10 bits ADC)

PH2.0 Interface (3-pin SMD)

Conductivity Electrode (Electrode Constant K = 1,BNC connector)

Cable Length of the Electrode: about 60cm(23.62")

Power Indicator

Analog Signal Isolator

Operating Voltage: 5.0V

Response Time: 4 seconds (Typ)

Analog Error (both ends):  $\pm 20\text{mV}$  (Typ)

Interface Type: PH2.0-3P

No load Current: 75mA

Dimension: 42 \* 32mm / 1.65 \* 1.26 inch

Non-isolated Terminal (Arduino Side)

Supply Voltage:  $5.0 \pm 0.1\text{V}$

Analog Output: 0 ~ 5.0V

Isolated Terminal (Sensor Side)

Output Voltage:  $5.0 \pm 0.2\text{V}$

Analog Input: 0 ~ 5.0V

DOCUMENTS

[github](#)

[tutorial](#)

[GreenSeed online courses](#)

[application:Water Quality Investigation on African Tea Garden](#)

[application:Willow Creek Water Quality Monitoring](#)

[pH wiki](#)

[EC wiki](#)

[RTC wiki](#)

[Analog Signal Isolator](#)

[Schematic](#)

[Layout](#)

[Datasheet](#)