

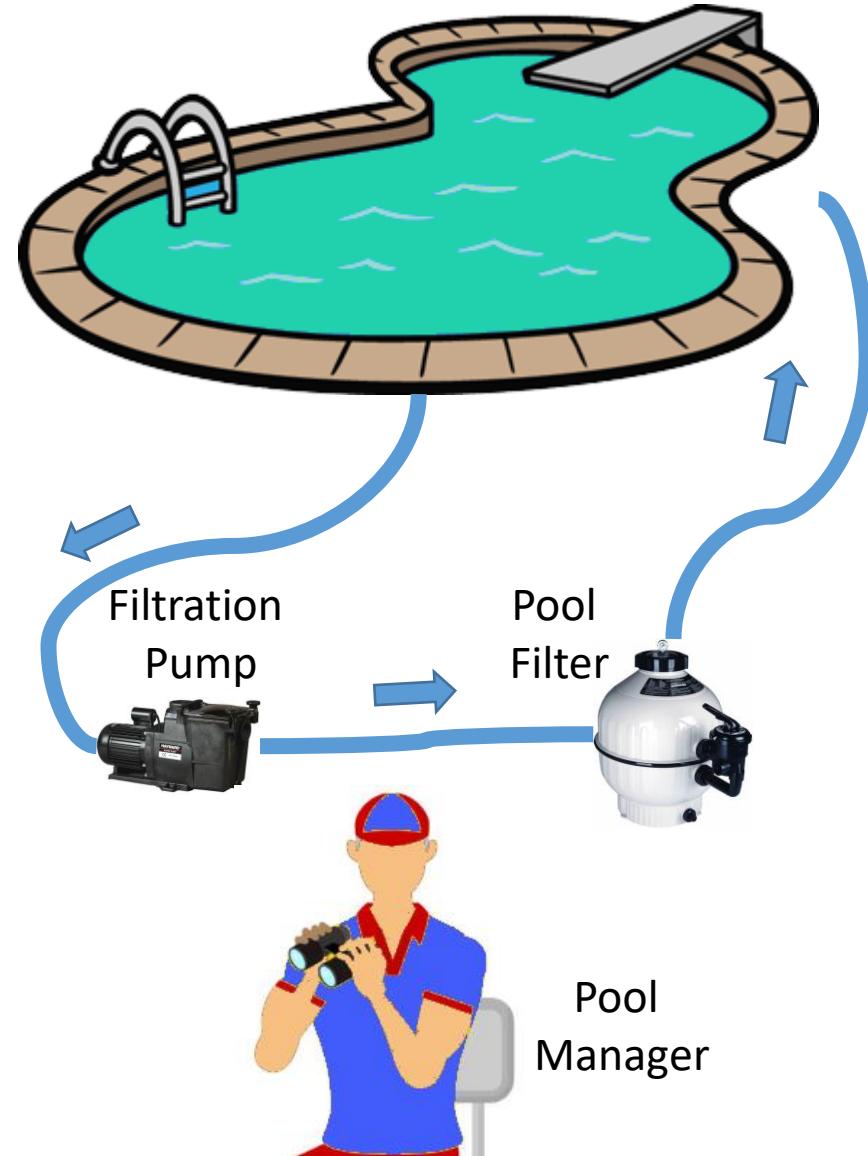
Pool Manager

A complete automation to control and manage the swimming pool.

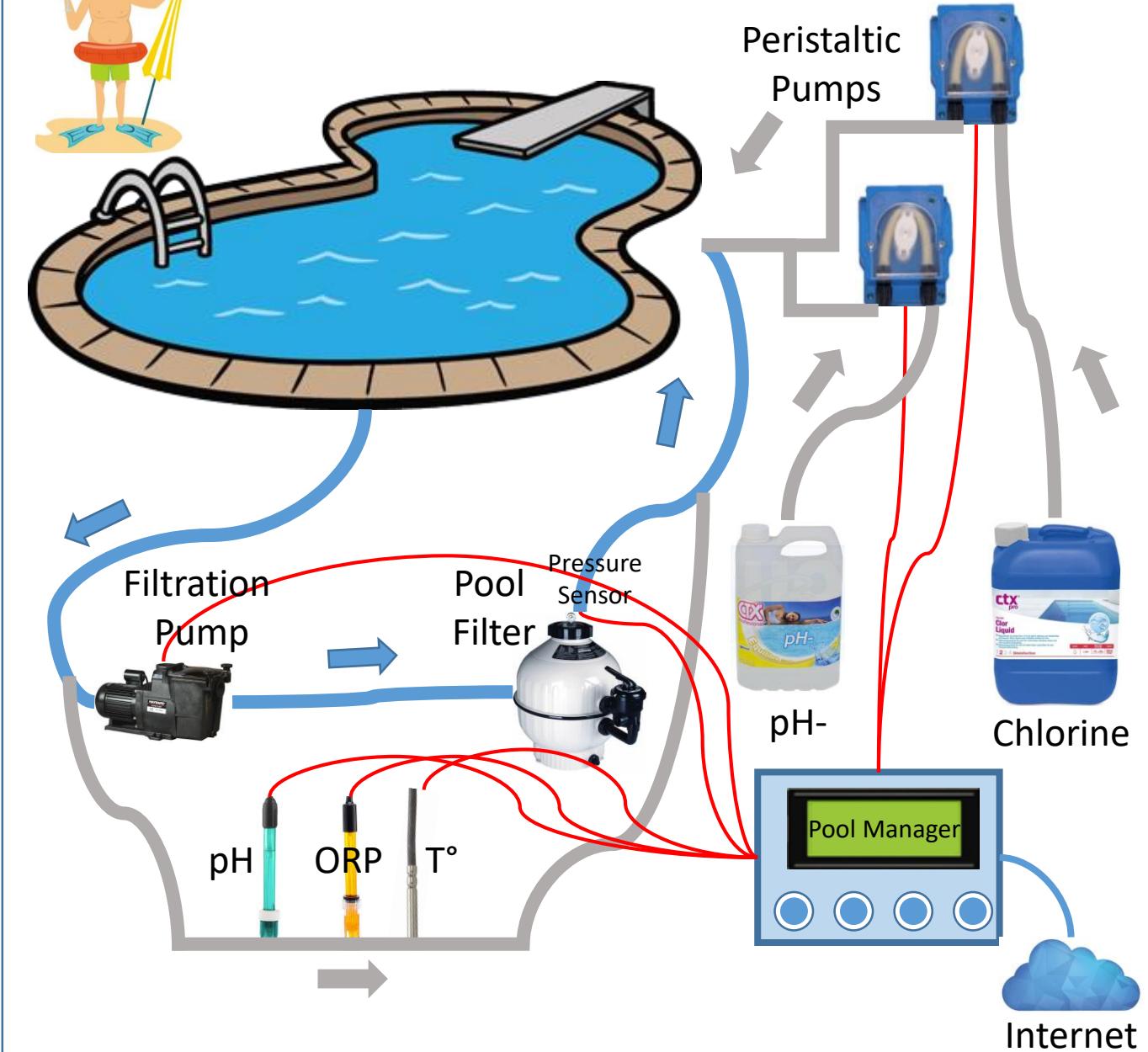
This project is develop by Yves Gaignard

You can follow it on : <https://github.com/yves-gaignard/PoolManager>

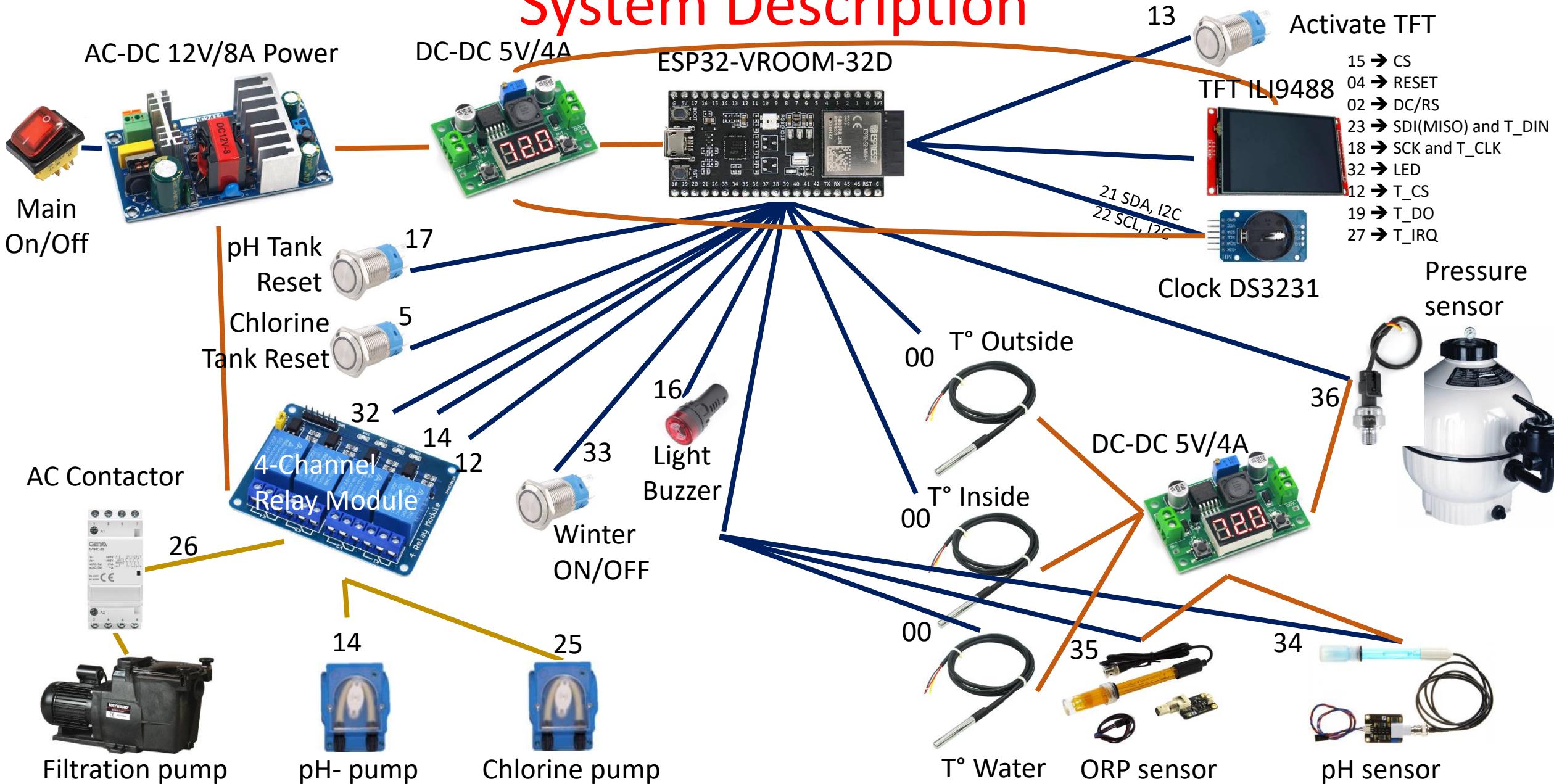
Without "Pool Manager"



With "Pool Manager"



System Description



System Description

Component	GPIO	PIN
Activate TFT button	13	
Chlorine Pump	25	
Chlorine tank reset button	5	
Clock DS3231	21	SDA
	22	SCL
Filtration Pump	26	
Light Buzzer	16	
Orp Sensor	35	
pH- Pump	14	
pH sensor	34	
pH tank reset button	17	
Pressure sensor	36	
Temperature Sensor	0	
TFT ILI9488	2	DC/RS
	4	RESET
	12	T_CS
	15	CS
	18	SCK and T_CLK
	19	T_DO
	23	SDI(MISO) and T_DIN
	27	T_IRQ
	32	LED
Winter Mode button	33	

ESP32-VROOM-32

Schematic diagram:

ESP32-VROOM-32D



Product description

ESP32-DevKitC V4 is a small-sized ESP32-based development board produced by Espressif. Most of the I/O pins are broken out to the pin headers on both sides for easy interfacing. Developers can either connect peripherals with jumper wires or mount ESP32-DevKitC V4 on a breadboard. To cover a wide range of user requirements, the following versions of ESP32-DevKitC V4 are available:

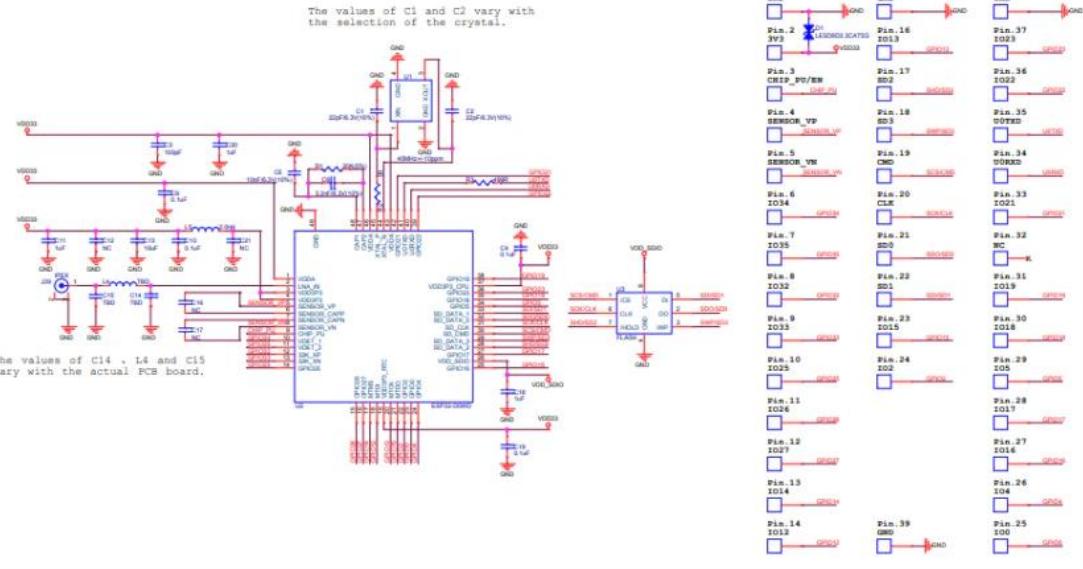
- different ESP32 modules
- [ESP32-WROOM-32](#)
- [ESP32-WROOM-32D](#)
- [ESP32-WROOM-32U](#)
- [ESP32-SOLO-1](#)
- [ESP32-WROVER](#)
- [ESP32-WROVER-B](#)
- [ESP32-WROVER-I](#)
- [ESP32-WROVER-B \(IPEX\)](#)
- male or female pin headers.

For details please refer to [Espressif Product Ordering Information](#).

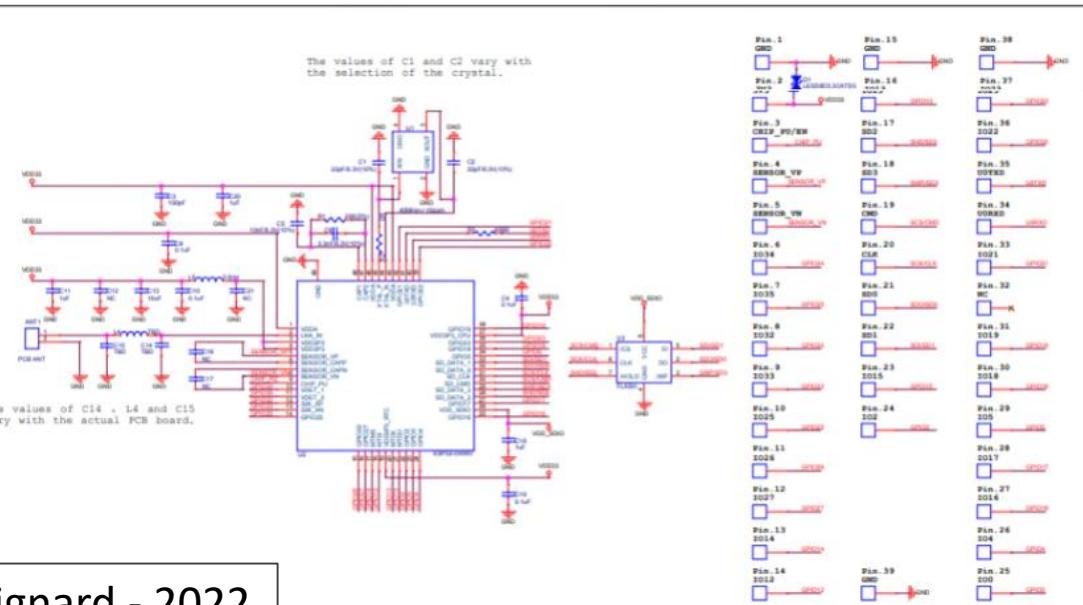
[Getting Started ESP32-DevKitC V4 development board.](#)

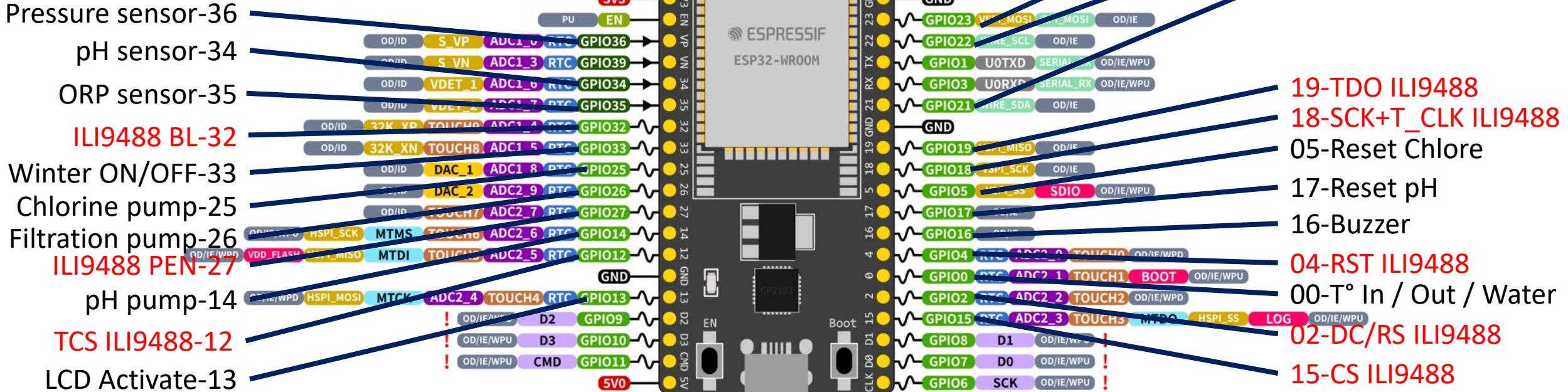
[API Reference](#)

[Demo Code](#)



ESP32-WROOM-32U





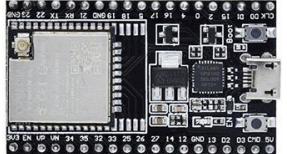
ESP32 Specs

32-bit Xtensa® dual-core @240MHz
Wi-Fi IEEE 802.11 b/g/n 2.4GHz
BLuetooth 4.2 BR/EDR and BLE
520 KB SRAM (16 KB for cache)
448 KB ROM
34 GPIOs, 4x SPI, 3x UART, 2x I2C,
2x I2S, RMT, LED PWM, 1 host SD/eMMC/SDIO,
1 slave SDIO/SPI, TWAI®, 12-bit ADC, Ethernet

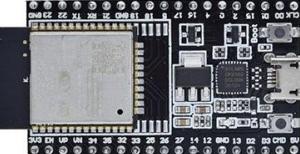
- PWM Capable Pin
- GPIO Input Only
- GPIO Input and Output
- Digital-to-Analog Converter
- JTAG for Debugging
- External Flash Memory (SPI)
- Analog-to-Digital Converter
- Touch Sensor Input Channel
- Other Related Functions
- Serial for Debug/Programming
- Arduino Related Functions
- Strapping Pin Functions

RTC RTC Power Domain (VDD3P3_RTC)
GND Ground
PWD Power Rails (3V3 and 5V)
! Pin Shared with the Flash Memory
Can't be used as regular GPIO

GPIO STATE
WPU: Weak Pull-up (Internal)
WPD: Weak Pull-down (Internal)
PU: Pull-up (External)
IE: Input Enable (After Reset)
ID: Input Disabled (After Reset)
OE: Output Enable (After Reset)
OD: Output Disabled (After Reset)



ESP32-WROOM-32U



ESP32-WROOM-32D

Aperçu

ESP32-DevKitC V4 est un petit-taille ESP32-based conseil de développement produit par Espressif. Plus de la I/O pins sont éclaté à les en-têtes broches sur les deux côtés pour un interfaçage aisément. Les développeurs peuvent soit connecter des périphériques avec jumper fils ou montage ESP32-DevKitC V4 sur une planche à pain.

Pour couvrir une large gamme de besoins des utilisateurs, les versions suivantes de ESP32-DevKitC V4 sont disponibles:

Différents ESP32 modules

ESP32-WROOM-32

ESP32-WROOM-32D

ESP32-WROOM-32U

ESP32-SOLO-1

ESP32-WROVER

ESP32-WROVER-B

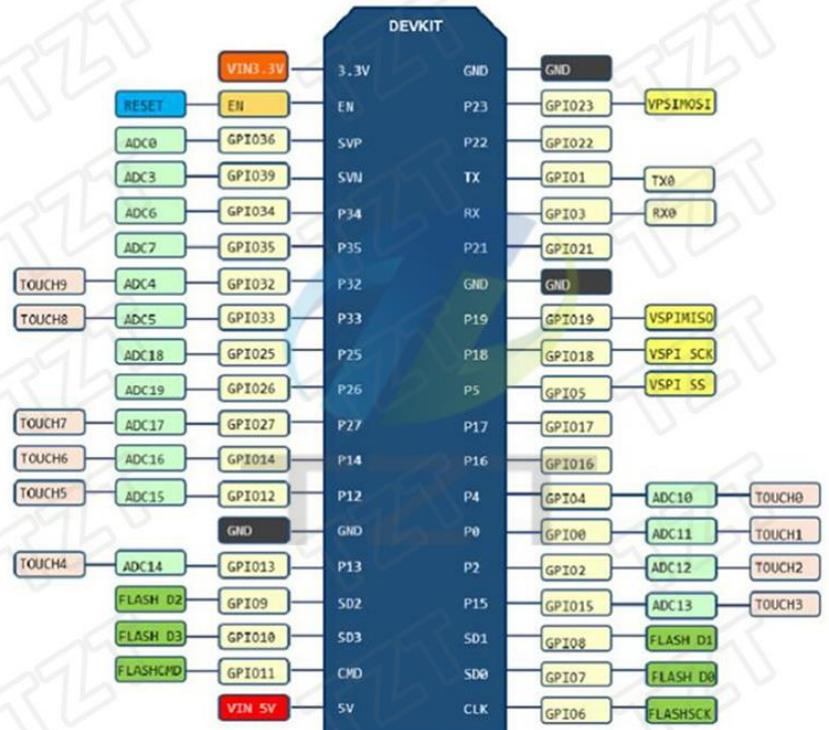
ESP32-WROVER-I

ESP32-WROVER-B (IPEX)

Mâle ou femelle broches.

Pour plus de détails s'il vous plaît se référer à [Espressif Produit Informations De Commande](#).

PRODUCT **ESP32-WROOM-32D/U**



[Getting Started ESP32-DevKitC V4 development board.](#)

[API Reference](#)

[Demo Code](#)

FUNCTIONAL DESCRIPTION

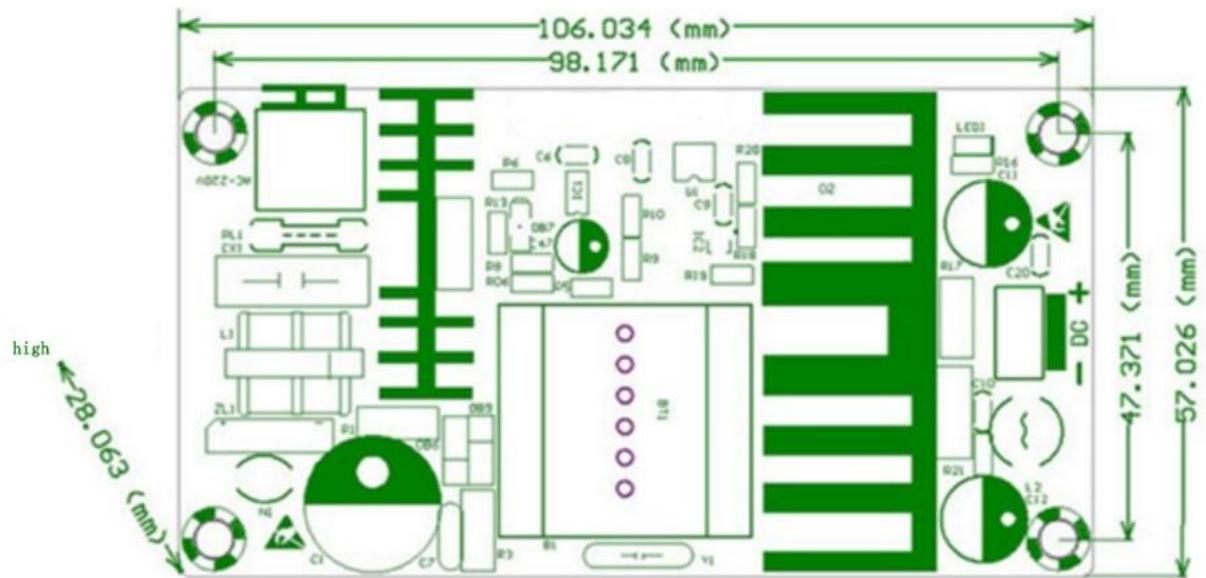
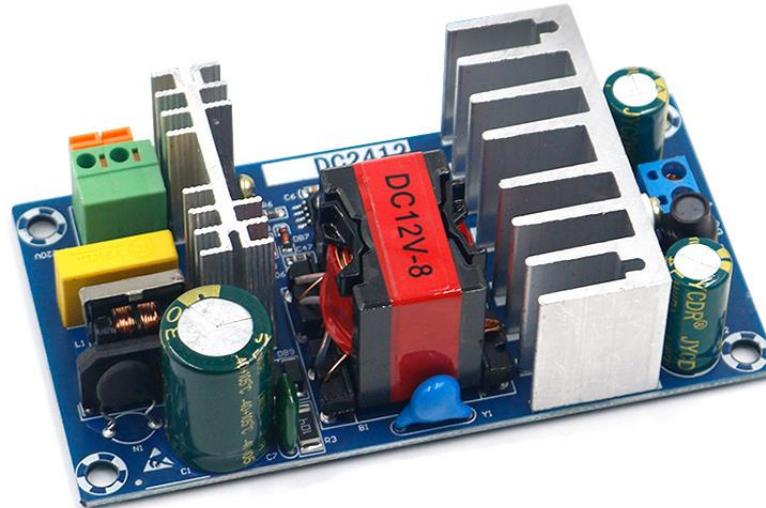
The following figure and the table below describe the key components, interfaces and controls of the ESP32-DevKitC V4 board.



AC-DC 12V 8A Power Supply

12V Features:

- Power supply model: WX-DC2412
- Power protection: overvoltage, overload, short circuit protection, etc.
- AC input: AC85-265V worldwide
- AC frequency: Mains 50HZ/60HZ
- Output voltage: DC DC12V
- Output current: rated 8A - peak 11A
- Output power: rated 100W
- Overall size: 10.65cm*5.7cm
- Positioning hole size: 9.8cm*4.7cm
- Overall height: 2.8cm



DC-DC 5V/4A Step Down Module

Product features

100% Brand New.

The Voltmeter Resolution: $\pm 0.1V$

The Voltmeter Digital Display Range: 0v-40v

The Voltmeter Input Voltage Range: Dc 4v-40v

Output Voltage: Continuous Adjustable (1.3v-37 V)

Output Current: 2a

size :65*35mm

Led Digital Voltmeter Tube, The Accuracy Is Adjustable

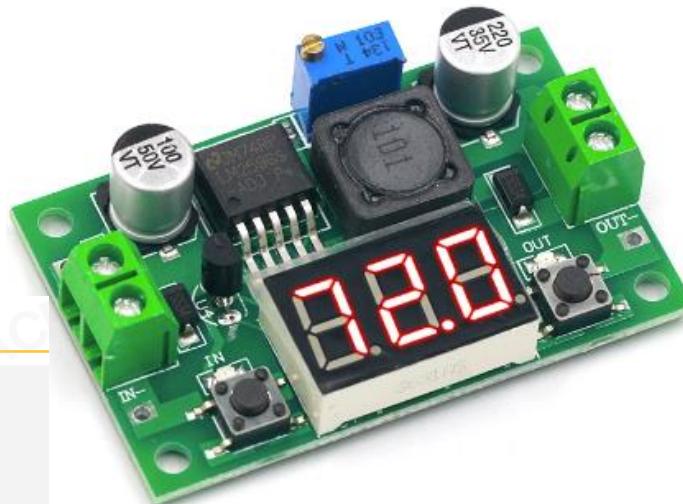
Function, Can Be Aimed At Your Multimeter Adjustable Accurate.

Press the key "S1" to let the display show the input or output voltage. when the green led light, it shows output, the red show input.

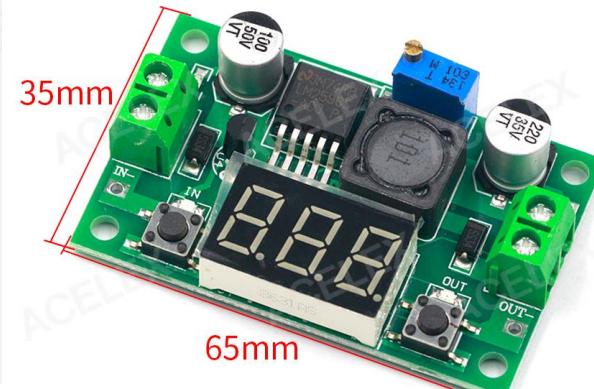
Note:

To guarantee the accuracy of the voltmeter , make sure the input voltage above 4V.

The input voltage must be 1.5v higher than the output voltage or 1.5v above.



Package Content:
1 Pcs x LM2596 Power Modul



Product description

The DC-DC module based on LM2596 advocate current to 3.0A, but only to 1.8A.However, being introduced module adds a heatsink, using high-power devices.This module can easily reach 4A, 50W, add heat sink circumstances can reach 75W, has a high price!!

Product parameter

5A high power ,high efficiency and low ripple with power indicator !!!

1. Input voltage range:4~38VDC(Note:input voltage not exceeding 38V)
2. Output voltage range:1.25-36VDC adjustable
3. Output current: 0-5A, recommended for use in 4.5A.
4. Output power: 75W
5. Working temperature: -40~+85 degrees
6. Operating frequency: 180KHz
7. Efficiency:96%(max)
8. Short circuit protection: yes(limit current 8A).
9. Over temperature protection
10. Input reverse polarity protection: None (if required, high current diode in series with the input).
11. L x W x H = 54 * 23 * 18mm

Push Button

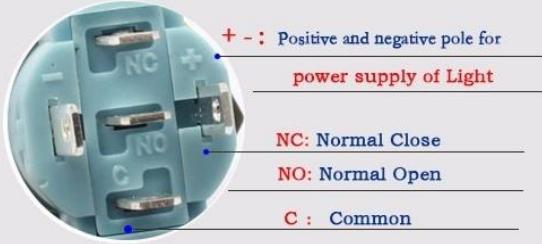


Automatically return



Stay in locking

Pin terminal



①Link to NO and C :

The circuit is always **Open** unless **Press** the button .

②Link to NC and C :

The circuit is always **Close** unless **Press** the button .

Please note :

If the button is without light , "+ -" pin terminal is not available.
It is "NO" , "C" Pin terminal if the button only have two pin terminals (besides "+" , "-" Pin terminal).

Momentary , Self-reset :

When you **Press** the button ,

Press-key will **automatically return** .

Latching , Self-locking :

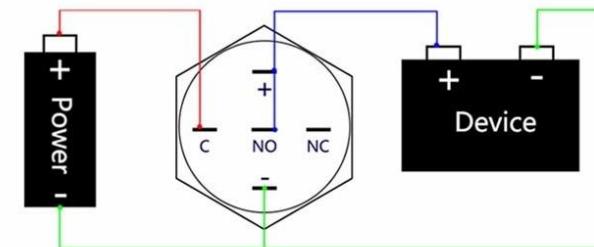
When you **Press** the button ,

Press-key will **stay in position until you press again** .

And then the press-key **return** .



Wiring diagram 1:

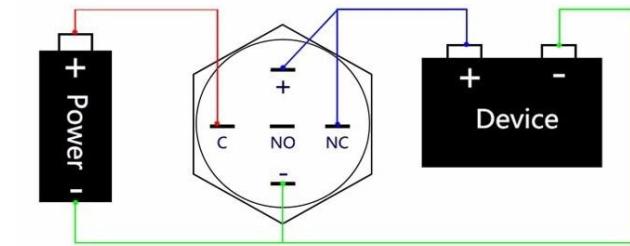


Wiring diagram 1:

Light : NOT Working , Switch : Opened

When you **Press** the button , Light : Working Switch : Closed

Wiring diagram 3:

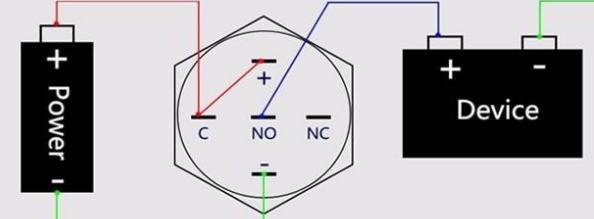


Wiring diagram 3:

Light : Working , Switch : Closed

When you **Press** the button , Light : Not Working , Switch : Opened

Wiring diagram 2:

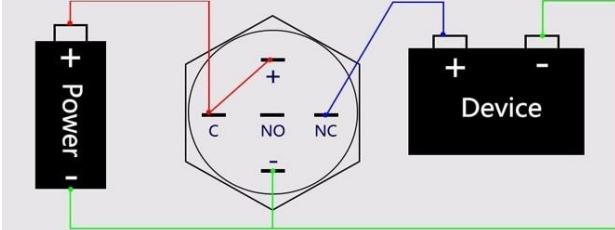


Wiring diagram 2:

Light : Working , Switch : Opened

When you **Press** the button , Light : Working Switch : Closed

Wiring diagram 4:



Wiring diagram 4 :

Light : Working , Switch : Closed

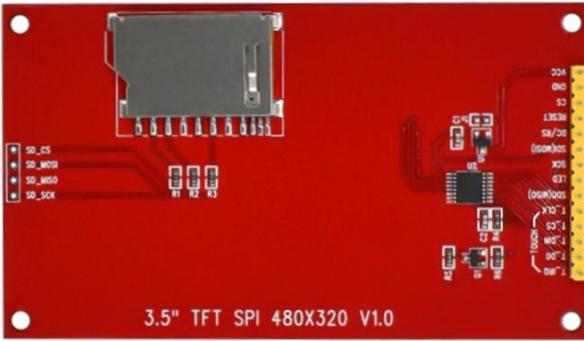
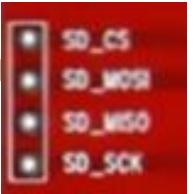
When you **Press** the button , Light : Working , Switch : Opened



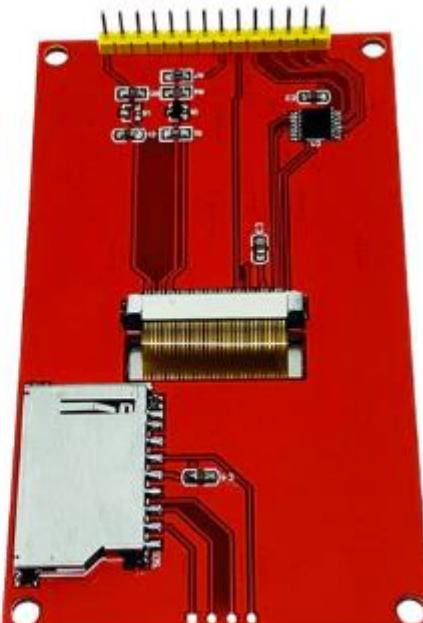
HD 3.5 inch SPI serial LCD module 480*320 TFT module ILI9488

Product Description

- 3.5-inch color screen, support 65K color display, display rich colors
- 480X320 resolution, optional touch function
- Using the SPI serial bus, it only takes a few IOs to illuminate the display
- Easy to expand the experiment with SD card slot
- Provide a rich sample program
- Military-grade process standards, long-term stable work
- Provide underlying driver technical support



Product Parameter	
1	Dimension
2	Type
3	Touch Panel
4	Resolution
5	Driver IC (Please choose)
6	Interface
7	Effective Display Area(A.A.)
8	Module PCB base board dimension
9	VCC Supply Voltage
10	Logic IO port Voltage
11	Power Waste



Number	Pin Label	Description
1	VCC	5V/3.3V power input
2	GND	Ground
3	CS	LCD chip select signal, low level enable
4	RESET	LCD reset signal, low level reset
5	DC/RS	LCD register / data selection signal, high level: register, low level: data
6	SDI(MOSI)	SPI bus write data signal
7	SCK	SPI bus clock signal
8	LED	Backlight control, high level lighting, if not controlled, connect 3.3V always bright
9	SDO(MISO)	SPI bus read data signal, if you do not need to the read function, you can not connect it

(The following is the touch screen signal line wiring, if you do not need to touch function or the module itself does not have touch function, you can not connect them)

10	T_CLK	Touch SPI bus clock signal
11	T_CS	Touch screen chip select signal, low level enable
12	T_DIN	Touch SPI bus input
13	T_DO	Touch SPI bus output
14	T_IRQ	Touch screen interrupt signal, low level when touch is detected

ESP32

VCC—>5V.

GND—>GND.

CS—>G5.

RST—>G12.

O/C—> G13.

SDI—>G23.

SCK—>G16

BL—>G32.

SDO—>G19

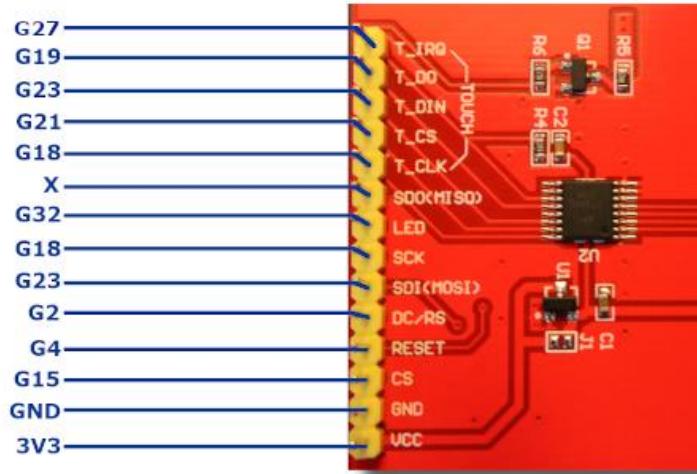
Use TFT ESPI library.

Remember to redefine the correct ILI in the user setup folder.

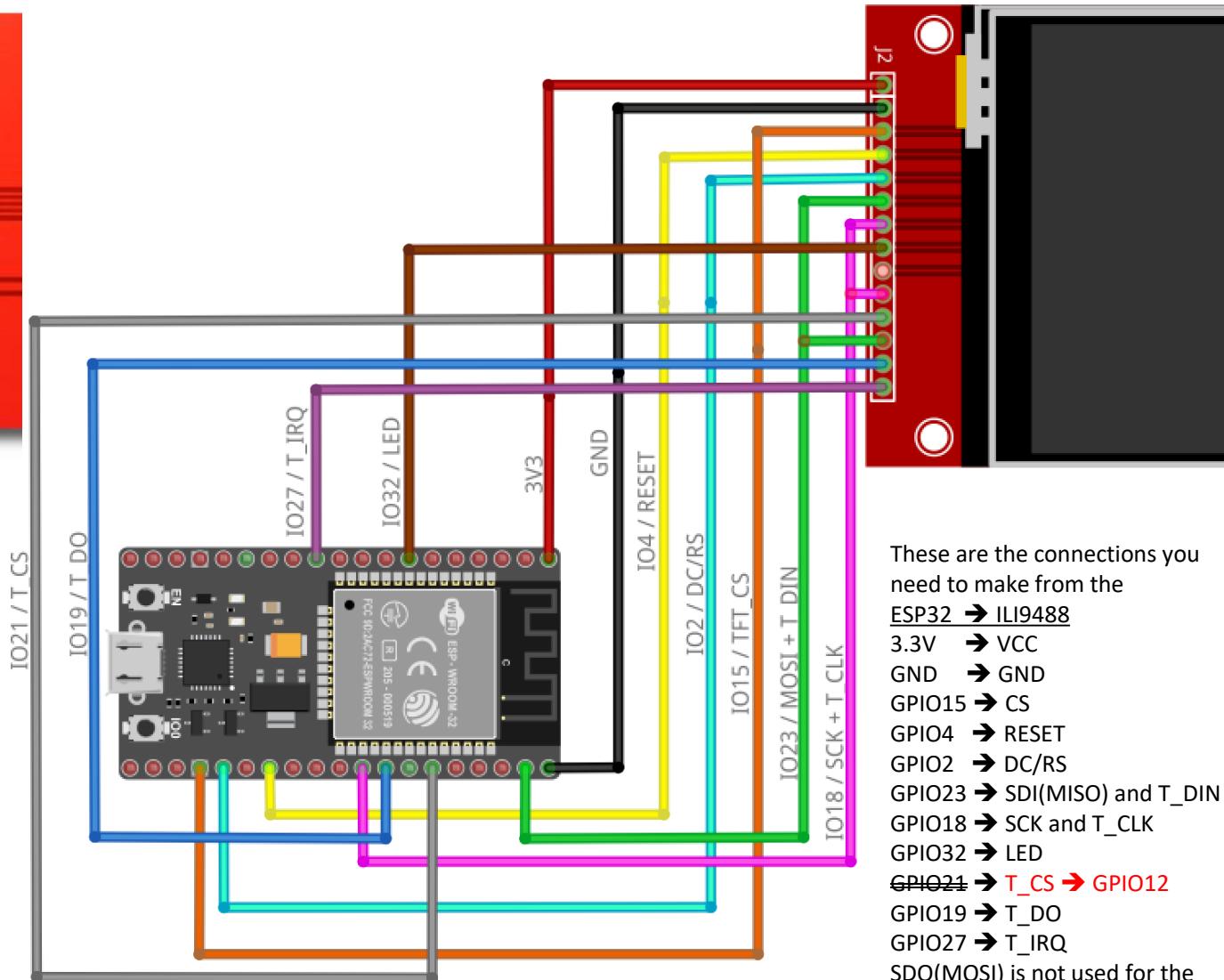
H and correct wiring

Wiring TFT module ILI9488 with ESP32-VROOM-32

TFT Pin	ESP32 Pin
VCC	3V3
GND	GND
CS	GPIO15
RESET	GPIO4
DC/RS	GPIO2
SDI (MOSI)	GPIO23
SCK	GPIO18
LED	GPIO32
SDO (MISO)	N.C.
T_CLK	GPIO18
T_CS	GPIO21
T_DIN	GPIO23
T_DO	GPIO19
T_IRQ	GPIO27



The wiring may seem a bit daunting at first. But don't let all the wires scare you. It is pretty straight forward. The images above will help you when you wire your TFT + Touchscreen to your ESP32. This is also decision making time. There are few options when it comes to connecting the two together. You can use a breadboard, you can use prototyping board or you can order a PCB specifically to connect the ILI9488 + touch to the 38-pin ESP32 DevKitC. I'd like to point out that the breadboard option is only an option for testing your connections and screen. It is not very practical to have on your desk and loose connections can cause problems.
It is important to know that these screens run at 3.3V. Connecting them to 5V can cause damage!



These are the connections you need to make from the
ESP32 → ILI9488
3.3V → VCC
GND → GND
GPIO15 → CS
GPIO4 → RESET
GPIO2 → DC/RS
GPIO23 → SDI(MISO) and T_DIN
GPIO18 → SCK and T_CLK
GPIO32 → LED
GPIO21 → T_CS → GPIO12
GPIO19 → T_DO
GPIO27 → T_IRQ
SDO(MISO) is not used for the TFT screen, so you are left with one unconnected pin on the TFT module. That's ok!

DS3231 is a low-cost, extremely accurate I2C real-time clock (RTC), with an integrated temperature-compensated crystal oscillator (TCXO) and crystal. The device incorporates a battery input, disconnect the main power supply and maintains accurate timekeeping. Integrated oscillator improve long-term accuracy of the device and reduces the number of components of the production line. The DS3231 is available in commercial and industrial temperature ranges, using a 16-pin 300mil SO package.

RTC maintains seconds, minutes, hours, day, date, month, and year information. Less than 31 days of the month, the end date will be automatically adjusted, including corrections for leap year. The clock operates in either the 24 hours or band / AM / PM indication of the 12-hour format. Provides two configurable alarm clock and a calendar can be set to a square wave output. Address and data are transferred serially through an I2C bidirectional bus.

A precision temperature-compensated voltage reference and comparator circuit monitors the status of VCC to detect power failures, provide a reset output, and if necessary, automatically switch to the backup power supply. In addition, / RST pin is monitored as generating µP reset manually.

Save time and high precision addition, DS3231 also has some other features that extend the system host of additional features and a range of options. The device integrates a very precise digital temperature sensor, through the I2C * interface to access it (as the same time). This temperature sensor accuracy is $\pm 3^{\circ}\text{C}$. On-chip power supply control circuit can automatically detect and manage the main and standby power (i.e., low-voltage battery) to switch between the power supply. If the main power failure, the device can continue to provide accurate timing and temperature, performance is not affected. When the main power re-power or voltage value returns to within the allowable range, the on-chip reset function can be used to restart the system microprocessor.

Module parameters:

1 Size: 38mm (length) * 22mm (W) * 14mm (height)

2 Weight: 8g

3 Operating voltage :3.3 - 5 .5 V

4 clock chip: high-precision clock chip DS3231

5 Clock Accuracy :0-40 ° range, the accuracy 2ppm, the error was about 1 minute

6 calendar alarm clock with two

7 programmable square-wave output

8 Real time clock generator seconds, minutes, hours, day, date, month and year timing and provide valid until the year 2100
leap year compensation

9 chip temperature sensor comes with an accuracy of $\pm 3^{\circ}$

10 memory chips: AT24C32 (storage capacity 32K)

11.IIC bus interface, the maximum transmission speed of 400KHz (working voltage of 5V)

12 can be cascaded with other IIC device, 24C32 addresses can be shorted A0/A1/A2 modify default address is 0x57

13 with rechargeable battery LIR2032, to ensure the system after power failure, the clock move any natural normal

14 Packing: single anti-static packaging

Wiring instructions (for Arduino uno r3 for example):

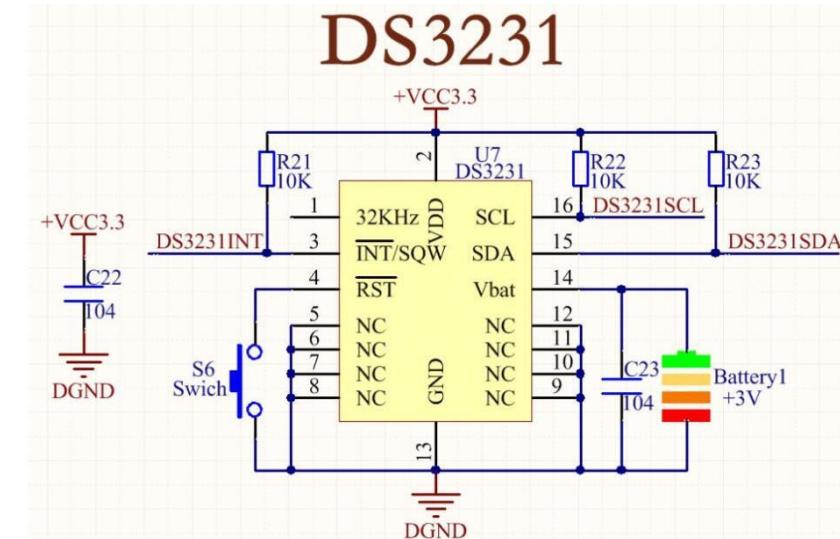
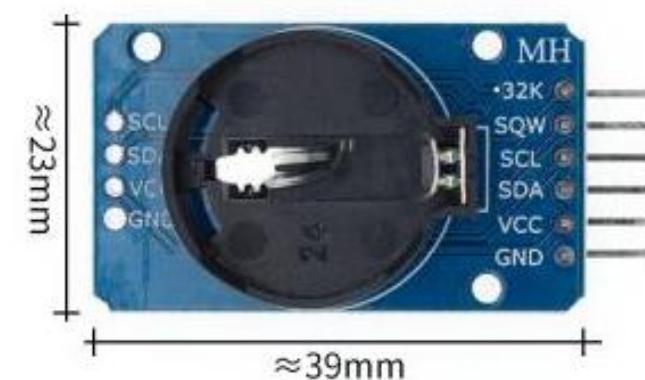
SCL → A5

SDA → A4

VCC → 5V

GND → GND

DS3231 RTC



Peristaltic Pump

Features:

- ✓ **HIGH FLOWRATE & ACCURACY**- Up to 460 mL/min
- ✓ **POWERFUL** - Suitable for slurries, viscous, shear-sensitive and aggressive fluids
- ✓ **EASY USE** - The pump head designed for easy disassembly, low maintenance needs and easy to clean
- ✓ **CHANGEABLE FLOW DIRECTION** - flow direction can be controlled by the positive and negative connection
- ✓ **WIDELY USE** - has been widely used in the field of pharmaceutical, food & dairy processing, biochemical analysis, chemical processing, biotechnology, cosmetics, ceramics, water treatment, environmental protection, etc.

Specifications:

- INPUT: DC 12V 800mA
- PUMP TUBE MATERIAL: food grade silicone tube (6.4mm ID x 9.6mm OD)
- FLOW DIRECTION: flow direction can be controlled by the positive and negative connection
- WORKING CONDITION: 0~40°C, relative humidity <80%
- WEIGHT: 280 g

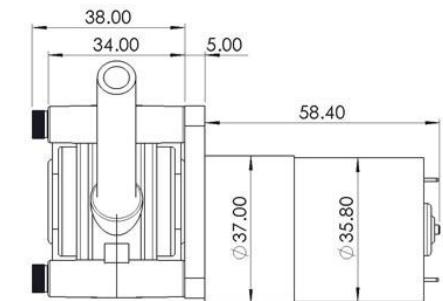
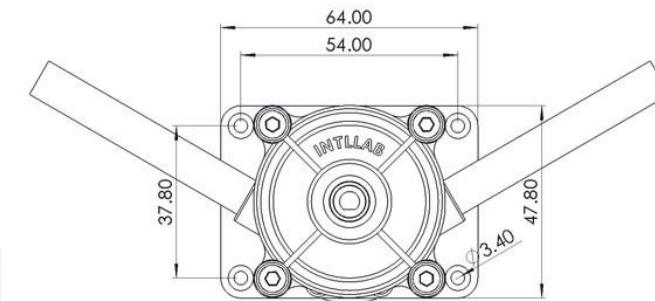
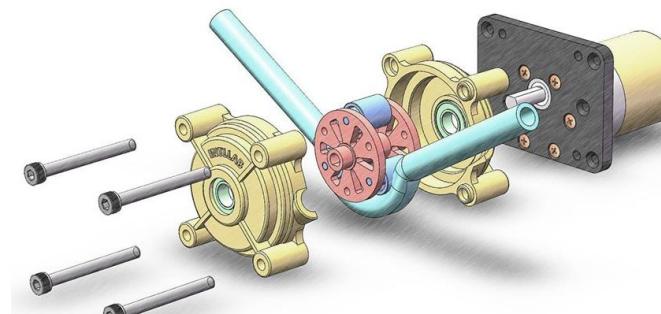
Packing list:

- 1 x Peristaltic Pump
- 2 x Barbed Connectors
- 1 x Hex Key Wrench

Description:

This peristaltic pump has been widely used in the field of pharmaceutical, food & dairy processing, biochemical analysis, chemical processing, biotechnology, cosmetics, ceramics, water treatment, environmental protection, etc.

Peristaltic Pump DP-520



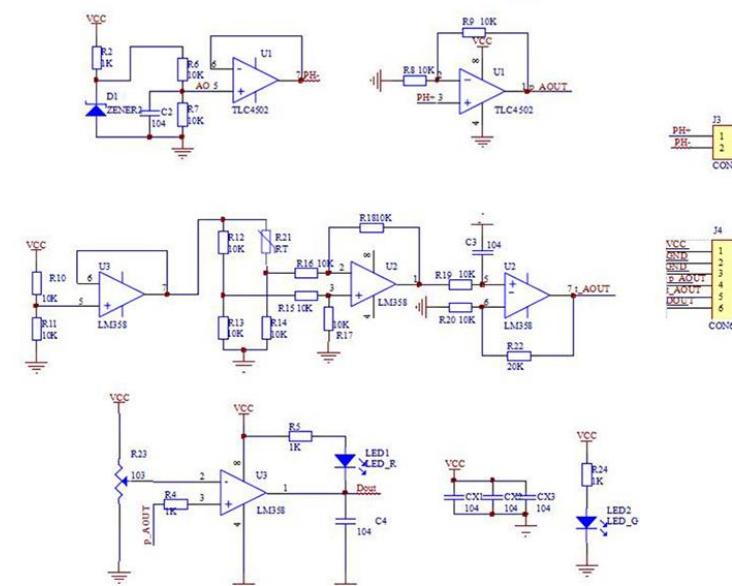
MODEL	FLOWRATE
DP520-460	170~460 mL/min
DP520-220	80~220 mL/min

Product Introduction

A sensor (English name: transducer/sensor) is a detection device that can feel the information being measured, and can transform the sensed information into electrical signals or other required forms of information output according to a predetermined law to satisfy the information Requirements for transmission, processing, storage, display, recording, and control.



PH sensor schematic diagram



What is the difference between rechargeable and non-rechargeable PH probes?

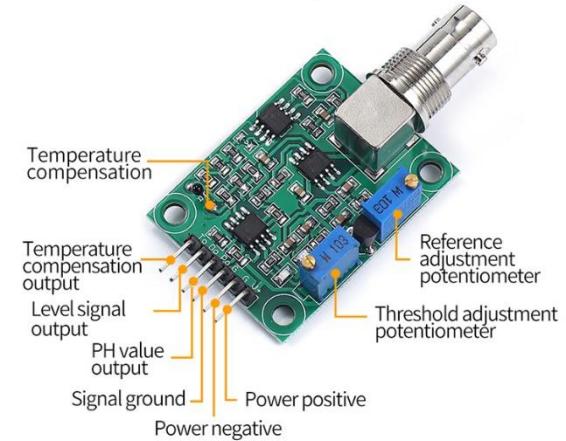
The refillable pH composite electrode has a dosing hole on the electrode shell. When the external reference solution of the electrode is lost, the dosing hole can be opened to replenish the KCl solution. The non-refillable pH composite electrode is equipped with gel-like KCl, which is not easy to lose and has no liquid filling hole.

The characteristic of the rechargeable pH composite electrode is that the reference solution has a higher permeation rate, the liquid junction potential is stable and reproducible, and the measurement accuracy is higher. And when the reference electrode is reduced or contaminated, the KCl solution can be supplemented or replaced, but the disadvantage is that it is more troublesome to use. When using the refillable pH composite electrode, the filling hole should be opened to increase the liquid pressure and accelerate the electrode response. When the liquid level of the dielectric fluid is lower than the filling hole 2cm, new dielectric fluid should be added in time.

The non-rechargeable pH composite electrode is characterized by simple maintenance and convenient use, so it has also been widely used. However, when used as a laboratory pH electrode, under long-term and continuous use conditions, the KCl concentration at the liquid junction will decrease, which will affect the accuracy of the test. Therefore, when the non-rechargeable pH composite electrode is not in use, it should be immersed in the electrode soaking solution, so that the electrode performance will be very good in the next test. However, most laboratory pH electrodes are not long-term and continuous tests, so this structure is not. The impact of accuracy is relatively small.

pH Probe

• Interface Description



• Features

pH range: 0-14PH
Temperature range: 0-60°C
BNC connection is suitable for most pH meters and controllers
Suitable for a wide range of applications: aquariums, hydroponics, laboratories, etc.
The pH electrode has a single cylinder, allowing direct connection to the input terminal of a pH meter, a controller, or any pH device with a BNC input terminal.
The pH electrode probe is accurate and reliable and can provide almost instantaneous readings, helping you to recheck the quality of your water again and again

• Product Size



• Product parameter

1. Heating voltage: $5 \pm 0.2V$ (DC)
2. Working current: 5-10mA
3. Detection concentration range: PH0-14
4. Detection temperature range: 0-80°C
5. Response time: $\leq 5S$
6. Stability time: $\leq 60S$
7. Component power consumption: $\leq 0.5W$
8. Working temperature: -10~50°C (nominal temperature 20°C)
9. Working humidity: 95%RH (nominal humidity 65%RH)
10. Output mode: analog voltage signal output
11. With temperature compensation output

pH Probe

Use, maintenance and maintenance of PH electrode probe:

One: Preparation before use

1. Gently remove the protective bottle from the top of the electrode and put it away for use.
2. Use deionized water to clean the white deposited salt on the outside of the electrode.
3. In order to maintain a proper penetration rate, the liquid level in the tube must submerge the end of the spiral glass tube and exceed the sample liquid level by at least 1 inch (2.5cm). When using, put the electrode bulb end in the measured liquid completely. Let the bulb come into full contact with the liquid to be tested, so that it produce an ionic reaction effect.
4. Gently shake the electrode (just like shaking a clinical thermometer) to remove air bubbles in the electrode.
5. Soak the electrode in the pH electrode storage solution for 1 hour. If there is no electrode storage solution, add 1gKCl to 200mL pH7 buffer as a temporary electrode storage solution. When the electrode is not in use, it can be equipped with a long-term preservation solution to activate and protect the bulb end. The preparation method can add 10mL 3.3kcl solution to 200mL pH4 buffer solution. [3.3KCL is saturated potassium chloride, the configuration method weighs 23 grams of potassium chloride and 100ml deionized water] appropriate amount of preservative

Two: Matters needing attention when using the electrode probe

1. Use fresh buffer
2. Open the electrode protective cover
3. Measure the gap and rinse the electrode with deionized water
4. Stir the buffer and the sample: a) Stir at the same speed all the time; b) Stir first, then measure
5. When preparing the pH electrode, rinse the electrode with distilled water before and after the measurement. Use a lint-free cloth to absorb the excess water on the electrode tip to avoid rubbing the electrode bulb, otherwise it will generate static electricity and interfere with the accurate measurement of pH.
6. Make sure that the temperature of the buffer is the same as that of the sample. If the sample temperature is different, please use a temperature compensation probe for temperature compensation.
7. Periodically check the electrode slope with a two-point calibration method. When the electrode reading drifts or the slope is lower than 92%, please refer to the cleaning of the electrode to clean the electrode.

Three: Maintenance of the electrode probe

1. Cleaning the electrode

General cleaning solution-soak the electrode in 0.1M HCl or 0.1M HNO₃ solution for 15 minutes, and then soak the electrode in the electrode storage solution for 30 minutes.

2. The liquid junction is blocked (salt precipitation)

Causes: hard water, mud, organic dirt, plankton microorganisms, moss, etc. Attached to the water-permeable sand core around the bulb and PTFE, causing the external reference electrode to not work properly.

Solution: Soak the electrode in hot water (60°C) for 15-20 minutes; soak the electrode in a hot saturated KCl (60°C) solution for 20-30 minutes and cool to room temperature; soak the electrode in pH 4 buffer for 20 to 30 minutes minute. Check for excessive crystals. If so, rinse the crystals with deionized water and check if the flow rate is normal. If not, soak the electrode in hot water (60°C) for 15-20 minutes; soak the electrode in hot saturated KCl (60°C) in the solution for 20-30 minutes, and cool to room temperature; soak the electrode in pH4 buffer for 30 minutes. Soak the electrode tip in concentrated HCl for 5-10 minutes, rinse the electrode, and check whether the electrolyte flow rate is normal. If the junction is still blocked, pull the junction (don't touch the glass bulb)

4: The precipitation of inorganic substances on the pH sensitive membrane

Cause: Inorganic sample measurement

Solution: clean with EDTA, ammonia or acid

5: pH sensitive membrane dehydration

Causes: improper storage, long-term use, high-temperature operation or strong alkaline solutions, resulting in slow and unstable response

Solution: activated electrode

Soak the electrode in 0.1 M HCl for 1 minute, rinse with tap water for 30 seconds, soak the electrode in 0.1 M KOH for 1 minute, rinse with tap water for 30 seconds, calibrate the test electrode with buffer solution, if it still does not work, repeat the above steps, at most 3 times

6: The PH electrode is used for a long time, and the necessary cleaning and maintenance work is not performed correctly on the electrode in the tested environment, which causes the electrode data to be unstable and other factors. Solution: After using the electrode for 2-3 months, clean the electrode bulb and check the liquid junction. Solution: Take the electrode out of the environment to see if there is any dirt on the surface of the bulb. If there is any dirt, wipe it with ethanol cotton and then clean it with deionized water.

[Note that the bulb is fragile, pay attention to during the wiping process]. Then check the liquid junction to see if there is any contaminants attached to the surface. If there is, you can use deionization to rinse, or you can shake the electrode back and forth in the measuring cup. If the water is not clean, change the water until the dirt disappears.. Then wash the electrode and place it in the activation solution for 8 hours, then measure it in the standard solution to restore the measurement state.

ORP Probe

Pay Attenions

1. The traditional measurement method of oxidation-reduction potential is very simple, it consists of ORP composite electrode and mV meter. However, it takes a long time to reach the equilibrium potential value. Especially when measuring weak equilibrium systems, since the platinum electrode is not absolutely inert, its surface can form an oxide film or adsorb other substances. It affects the electron return rate of each redox couple on the platinum electrode, so the establishment of the equilibrium potential is extremely slow, and it takes several hours or even 1-2 days in some media, and the measurement error is very large, usually -20~100mV.
2. It needs to be calibrated once with the calibration fluid before it can be put into use. Do not connect the power supply during calibration.
3. When the calibration button is not pressed, the reading will be big data (1700~2000, will eventually stay at 2000); press the calibration button without releasing, the reading will be small data (usually -20~20); press When you go down the calibration button, you cannot connect the device, nor can you touch the terminal of the device with your hands.

Introduction

ORP (Oxidation-Reduction Potential) composite electrode is composed of gold or platinum electrodes and reference electrodes to measure redox potential of solution. ORP is the abbreviation of oxidation-reduction Potential in English, that is, redox potential. ORP is a measurement index of redox capacity, which characterizes the relative degree of redox or reducibility, and its unit is mV. The measuring element is ORP composite electrode, which is composed of gold or platinum electrodes and reference electrodes to measure the redox potential of solution.

Main Technical Parameters

MV value in ORP standard solution: $222 \pm 15\text{mV}$ (25 °C)

Test in ORP standard solution

Connect the ORP electrode to the pH/mV meter and set the electronic unit on the MV measuring file.

The ORP composite electrodes are immersed in standard solution, stirred and stationary, and read after the display value is stable, which should conform to the above technical standards.

Technical Specifications

Modular Power Supply: +5.00V

Module size: 40mm X27mm

Measurement range: -2000 mV-2000 mV

Applicable temperature: 5-70 °C

Accuracy: $\pm 10\text{ mV}$ (25 °C)

Response time: <20sec

BNC Interface ORP Electrode

XH2.54 Interface (3-foot patch)

Zero Calibration Button

Power Indicator Lamp

ORP standard solution temperature coefficient characteristics

$222\text{mV} \pm 15\text{mV}$ (25 °C)

(3.5mol/L KCL)

°C	mV	°C	mV
10	242	30	215
15	235	35	209
20	227	38	205
25	222	40	201

ORP Probe

Steps for usage

Note:

1. Please use a high-quality switching power supply, the voltage should be as close as + 5.00V, the more accurate the voltage, the higher the accuracy!
2. The ORP electrode does not need to be calibrated when used, it can be used directly. Only when in doubt about the quality or test results of the ORP electrode, the ORP standard solution can be used to check the electrode potential to determine the quality of the ORP electrode or instrument.
3. Each solution of the ORP electrode needs to be cleaned with clean water. Deionized water is recommended.
4. When the ORP electrode is connected to the ORP meter circuit board, it is strictly prohibited to press the calibration button, otherwise the ORP electrode will be damaged!

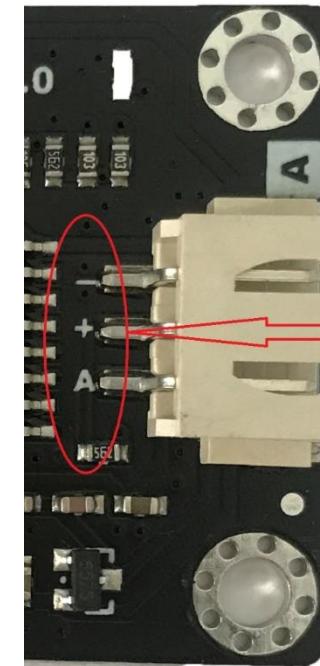
(1) Connect the connector on the right side of the ORP meter circuit board to the analog port 1 of the Arduino controller with an analog cable. After powering on the Arduino controller, you can see that the blue indicator light on the ORP meter circuit board is on.

(2) Program the sample code to the Arduino main controller (Note: At this time, the sample program should be #define OFFSET 0).

(3) Open the serial monitor of the Arduino IDE, and you can see the currently printed ORP value. Press and hold the calibration button on the ORP meter circuit board, you should see that the printed value is a small value, and then modify the offset in the sample program based on this printed value. For example, the serial port prints: "ORP: 8mV", then modify "#define OFFSET 0" in the sample program to "#define OFFSET 8". The purpose of modifying the offset is to eliminate the zero-drift voltage generated by the operational amplifier and improve the measurement accuracy. After modifying the sample program, recompile and download it, and the calibration is completed.

(4) Connect the ORP electrode to the BNC interface of the ORP meter circuit board. For the complete wiring diagram, please refer to the connection diagram. After calibration, the ORP electrode of the solution can measure the ORP value of the solution. Through the serial monitor, the ORP value of the current solution can be easily viewed.

Wiring Diagram



The wiring is a fool-type terminal, please pay attention to the screen printing mark on the circuit board: "+" - "A", where A is the analog signal line.

ORP Probe

Use and maintenance

1. ORP composite electrode can be directly used in the instrument without calibration. When the quality of the electrode or the test results are in doubt, the MV value of the standard solution can be tested as a method to judge whether the electrode is good or bad.
2. There is an appropriate amount of electrode immersion solution in the protective bottle of the front end of the electrode. The electrode head is immersed in it. The cap is loosened and the electrode is pulled out. After washing and drying with pure water, the electrode can be used (pay attention not to friction the surface of the sensitive element). When measuring, the electrode should be stirred in the solution and placed statically to accelerate the response. After measuring, the electrode should be washed with pure water and inserted into the protective bottle. Tighten the cap to prevent the leaching of the soaking liquid. If it is found that the soaking solution in the protective bottle is turbid and mildewed, it should be washed in time and replaced with new soaking solution.
3. Configuration of electrode immersion solution: take a bag of buffer at pH 4.00, dissolve in 250ML pure water, add 56 grams of analytical pure potassium chloride, heated properly in electric furnace, stir until completely dissolved.
4. Cleaning and activation of ORP electrodes: After long-term use of ORP electrodes, contamination of sensitive elements will lead to inaccurate measurement and slow response. At this time, the following methods can be used for cleaning and activation:
 - A. For inorganic contamination, the electrode can be washed with pure water and immersed in the immersion solution of the electrode for 6 hours after entering 0.1 mol/L dilute hydrochloric acid for 30 minutes.
 - B. For organic oil pollution and oil film pollution, the sensitive components can be cleaned with detergent, washed with pure water, and then immersed in the electrode immersion solution for 6 hours.
 - C. Sensors are seriously polluted, and oxide or reduction films are formed on the surface. Fine metallographic sandpaper can be used to polish the surface of sensitive elements, then clean it with pure water, and then immerse it in the electrodes immersion solution for 6 hours.

Hydraulic Pressure Sensor

Description

It can measure the pressure of non-corrosiveness liquid / Gas and output linear analog voltage.

Features:

- Working Voltage VCC: 5.0 V DC
- Output Voltage: 0.5-4.5V DC, $V_{out} = V_{CC} * (0.75 * \text{Pressure} + 0.1)$
- Working Current: $\leq 10\text{mA}$
- Pressure Scale: 0-1.2MPa
- The Biggest Pressure: 2.4MPa
- Destroy Pressure: 3.0MPa
- Working temperature range: 0-85 Celsius Degree
- Measuring Error: $\pm 1.5\% \text{FSO}$
- Temperature Range Error: $\pm 3.5\% \text{FSO}$
- Response Time: $\leq 2.0\text{ms}$
- Variable-speed pump interface: G1/4 (1/4 inch)
- Output connector: XH2.54MM-3P
- Output leads: yellow (DATA), red (VCC), black (GND)
- Lead length: 20cm





4-Channel Relay Module With Optocoupler

Features

- Using high-current relay , AC250V 10A DC30V 10A
- Contact some independent wiring , safe and reliable
- Standard interface , can be extended in a variety of development board
- With fixed screw holes for easy installation
- Suitable for a variety of platforms such as 51/AVR/AVR/ARM

Module Description :

1. the module complies with international safety standards , the load control area and regional isolation tank ;
2. using double-sided FR-4 circuit board design, high-end chip production process ;
3. using loose music authentic relay control ;
4. with the relay instructions , pull off, disconnect does not shine ;
5. the signal input has a low signal , often beginning with a common terminal will be turned on ;
6. the relay can control the various devices and the load ;
7. 4 and 4 normally open normally closed contact ;
8. blue KF301 terminals to the control line is more convenient.
9. Module size : 138m * 56mm * 18.5mm (L * W * H) , Weight : 120g
10. with 4 fixing bolt holes , hole 3.1mm, pitch 131mm * 49.5mm
11. finished by 100% functional testing and stability testing

Two module interface :

1. VCC: 5V power supply connected to the positive
2. GND: 5V power supply connected to the negative
3. IN1-IN8: trigger signal , active low

Relay outputs : a 12- line interface, the interface can be directly connected to all leads , user-friendly

1. NO1 - NO8: normally open relay interfaces , relay before the vacant after the pull shorted with COM
2. COM1 - COM8 Relay Common Interface
3. NC1 - NC8: normally closed relay interface relay shorted with COM ago , after the pull- vacant

•Low Level 5V solid state relay:

Product description:

1. Omron 5V solid state relay 240V 2A, the output with a resistive fuse 240V 2A.
2. size: 57 * 55 * 25 (long * wide * high)
3. input power: 5V DC (160MA)
4. the input control signal voltage:
 1. High level module: (0-2.5V state low level relay ON)
 2. (3.3-5V state high level relay OFF)
 3. Low level module: (0-2.5V state low level relay OFF)
 4. (3.3-5V state high level relay ON)
5. there are 2.54CM pin and blue KF301 terminal control line is more convenient.

•Input section:

1. DC +: Connect the power supply positive (according to the relay voltage)
2. DC-: Connect the power supply negative
3. CH1: 1 relay module signal trigger terminal (low level trigger active)
4. CH2: 2 relay module signal trigger terminal (low level trigger active)
5. CH3: 2 relay module signal trigger terminal (low level trigger active)
6. CH4: 2 relay module signal trigger terminal (low level trigger active)

•High and low meaning:

- High-level trigger refers to the signal trigger side (IN) and the negative power supply has a positive voltage between the positive and the power supply is usually connected to the trigger side of a trigger, when the trigger side voltage or trigger to reach the trigger Voltage, the relay is pull.
- Low-level trigger refers to the voltage between the signal trigger terminal and the negative terminal of the power supply is OV, or the voltage of the trigger terminal is lower than the voltage of the positive terminal of the power supply. When the voltage is low enough to trigger, the relay is pulled in, The negative side of the power supply is connected to the trigger side of a trigger, so that the relay is pull.

•Electrical parameters:

- Voltage Version Quiescent Current Operating Current Trigger Voltage Trigger Current
- 1 channel 5V 0mA 12.5mA 0-2.5V 2mA
- 2 5V 0mA 22.5mA 0-2.5V 2mA
- 4 5V 0mA 48mA 0-2.5V 2mA
- 4 5V 0mA 102mA 0-2.5V 2mA

•product manual:

1. Module power supply: the power must be DC, the voltage and the relay voltage to match
2. Wiring method:
When the trigger side of the signal trigger level, the relay will be connected, the device has electricity and work

•Precautions:

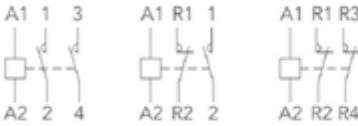
1. Module power supply: power must be DC, 5V power supply
2. Module control terminal voltage: This module can only be used to control the AC current, can not control the DC

Automatic Modular Household Contactor AC230V 4P 25A



类型
Type

2P



额定电流(In)
Rated current

AC-7a	AC-7b
16A	6A
20A	7A
25A	9A
32A	12A
40A	15A
63A	20A

控制电压(V AC)(50/60Hz)
Control voltage (V AV)(50/60Hz)

24V/48V/110V/230V

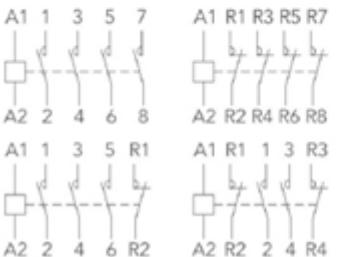
触点
Contact

2NO

2NC

1NO1NC

4P



16A	6A
20A	7A
25A	9A
32A	12A
40A	15A
63A	20A

24V/48V/110V/230V

4NO

4NC

2NO2NC

3NO1NC

主电路特性
Main Circuit Characteristics

额定电压(Ue) Rated operational voltage(Ue)	1P/2P 3P/4P	250V AC 400V AC
频率 Frequency		50Hz

寿命(O-C)
Durability

电气寿命 Electrical durability	100000次
每天最大开关操作次数 Maximum number of switching operation a day	100次

附加特性
Additional Characteristic

绝缘电压(Ui) Rated insulation voltage (Ui)	500V AC
污染等级 Pollution class	2
额定冲击耐受电压(Uimp) Rated impulse withstand voltage (Uimp)	4kV
防护等级(IEC/EN 60529) Protection Grade(IEC/EN 60529)	IP20
接触器本体 Contactor only	IP20
安装在配电箱内 Contactor in modular enclosure	IP40
工作温度 Operating temperature	-5°C~+60°C ⁽¹⁾
存储温度 Storage Temperature	-40°C~+70°C
抗湿热性(IEC/EN 60068-1) Tropicalization(IEC/EN 60068-1)	2类(温度55°C时, 相对湿度为95%) Treatment 2 (relative humidity 95% at 55°C)
认证 Certification	CCC/CE

ELSV(超低安全电压)符合12/24/48V AC 版本
ELSV compliance (extra low safety voltage) for 12/24/48V AC versions

产品控制符合SELV(超低安全电压)的要求
The product control conforms to the SELV(safety extra low voltage) requirements

(1)当接触器安装在配电箱内时, 其两侧必须拼装间隔件, 以利于散热。

(1)In the case of contactor mounting in a enclosure for which the interior temperature is in range between 50°C and 60°C.
It is necessary to use a spacer between each contactor.