Instructions for DH Gripper Function Software Package

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V1.1

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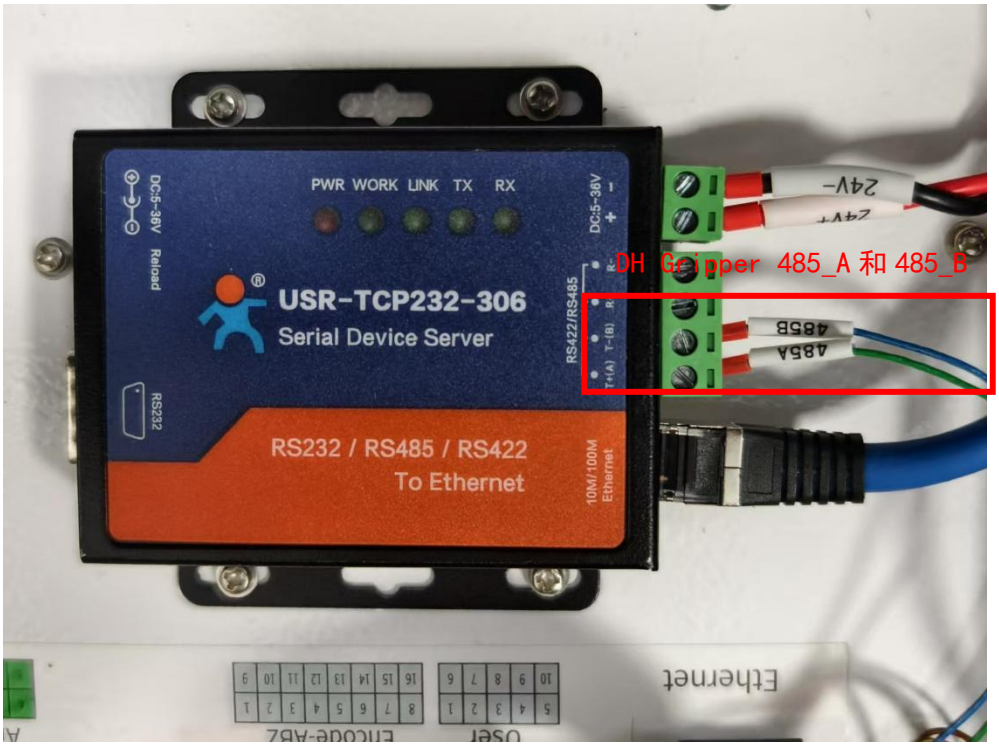
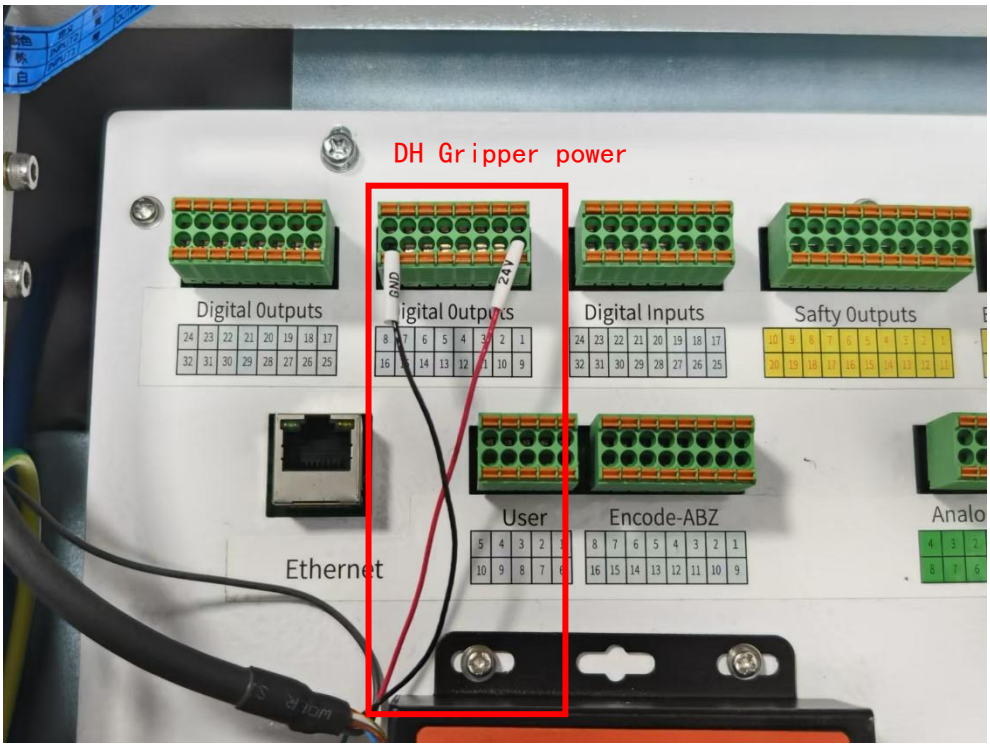
1 HARDWARE INSTALLATION

1.1 DH GRIPPER WIRING

GBT Robotics uses USR-TCP232-306 serial server for Modbus RTU communication control with DH Gripper. The wiring is shown in the figure.

Color	Code	Connect a wire	instructions
Green	485_A	Line to the serial server module. Module access to control cabinet in-cabinet network port	A+
Blue	485_B		B-
Red	24 V	Wire to control cabinet power output or external power supply	24V
Black	GND		0V





1.2 SERIAL SERVER WIRING

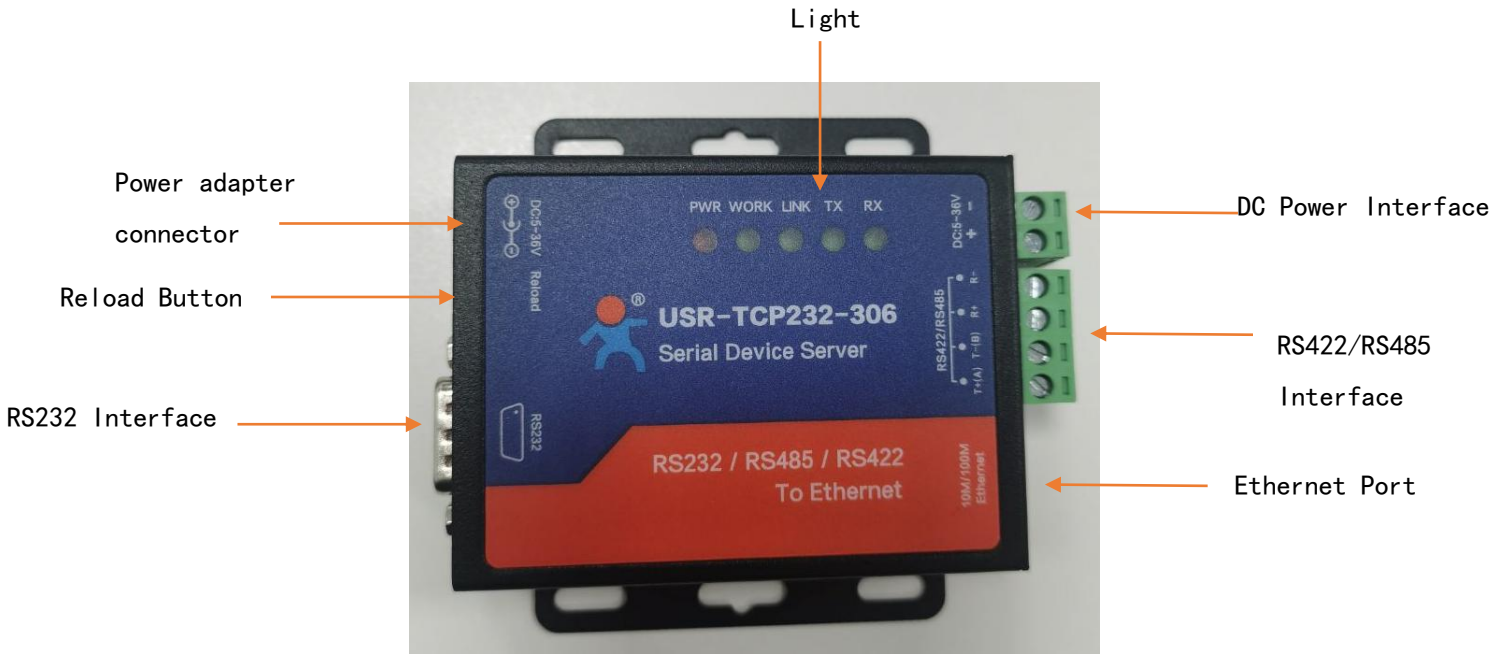
> Caution
>
> **The USR-TCP232-306 serial port server has completed the wiring of the Ethernet port inside the cabinet and the DC power supply before leaving the factory.**

USR-TCP232-306 Serial Server has RS485 serial port and RJ45 crystal header interface, Link light indicates the current connection status.

- Power Indicator: After the module is powered on normally, the power indicator (PWR) is red and stays on constantly, indicating that the power supply for the module is normal.
- Working Indicator: After the module is powered on, in the normal working state, the "work" light blinks once per second. If it enters the upgrade state, the "work" light blinks once every 200 milliseconds (i.e., flashes rapidly).
- L Link Indicator: It is used in conjunction with the link function of the 306. The Link function is used to indicate the TCP connection status and can only work in the TCP Client/Server mode. When the 306 establishes a TCP connection, the indicator lights up. When the connection is disconnected normally, the indicator goes out instantly. In case of an

abnormal disconnection, the indicator will go out after a delay of about 40 seconds. After the Link function is enabled in the UDP mode, the indicator stays on constantly.

- Transmit/Receive Indicator: When there is data being transmitted through the serial port, the TX light blinks. When there is data being received through the serial port, the RX light blinks.

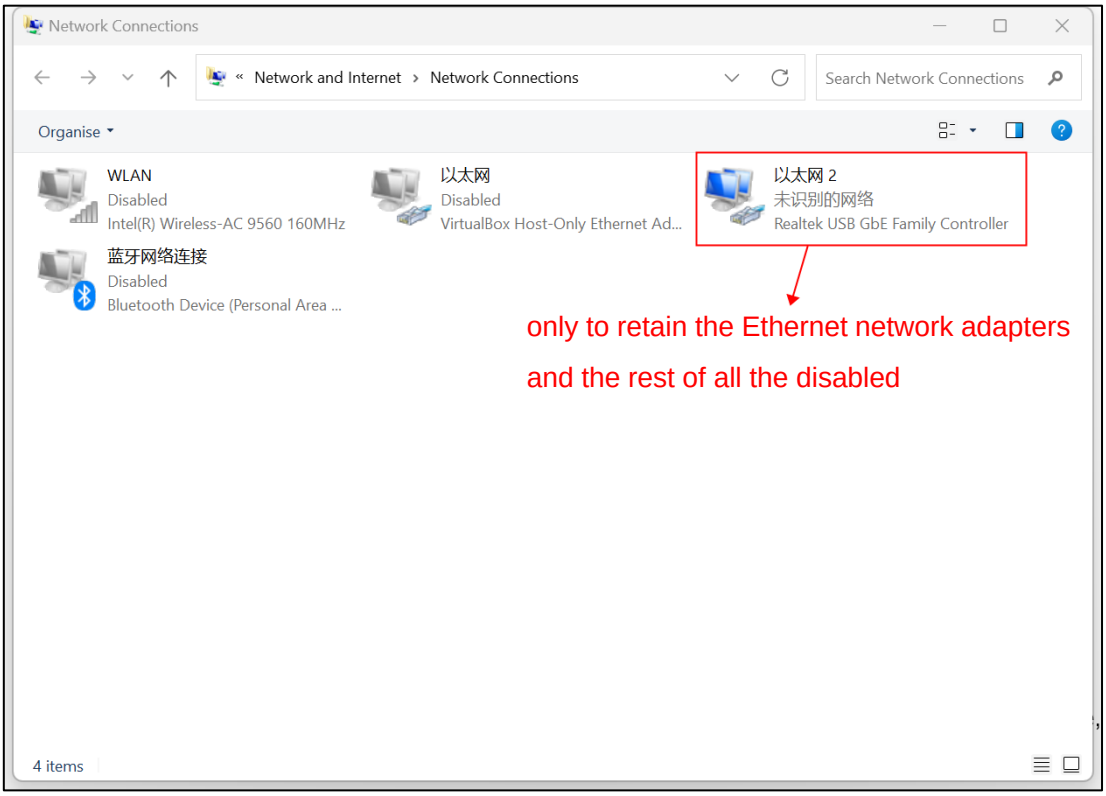


1.3 SERIAL SERVER CONFIGURATION

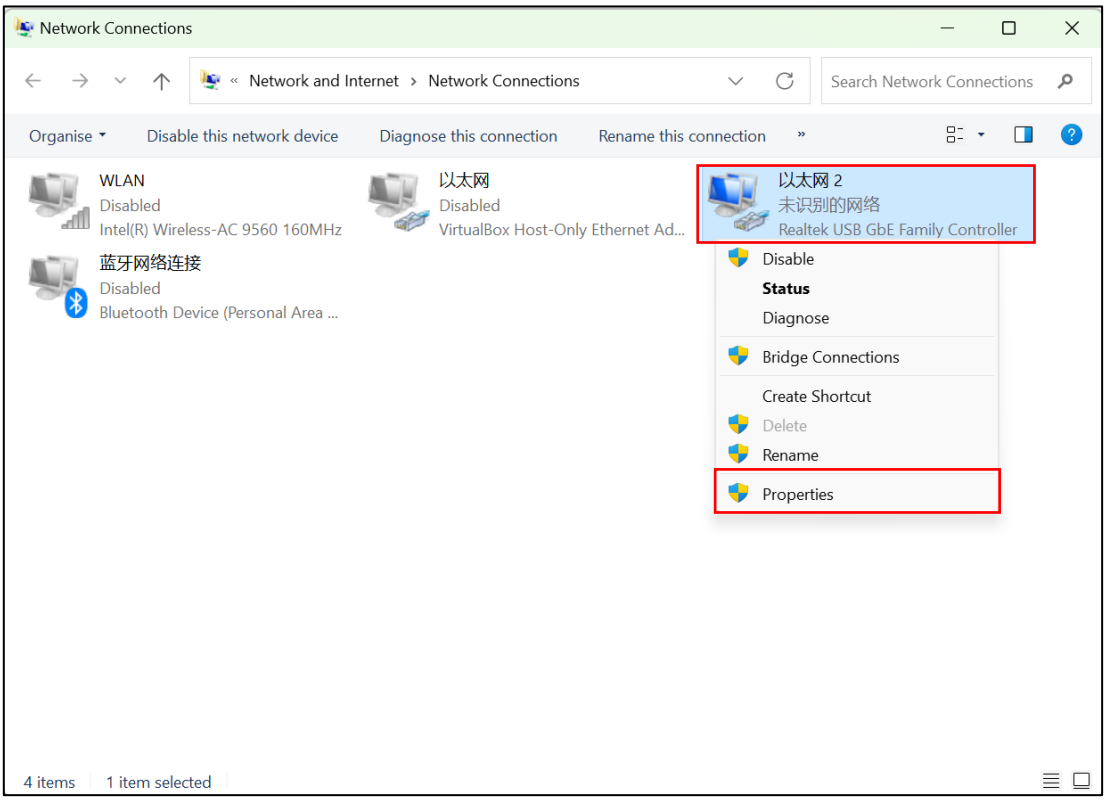
The serial server has been configured to communicate with the robot before it is shipped from the factory and does not need to be configured by the user. The following steps are for reconfiguring the serial server.

1.3.1 MODIFY USR-TCP232-306 SERIAL SERVER IP

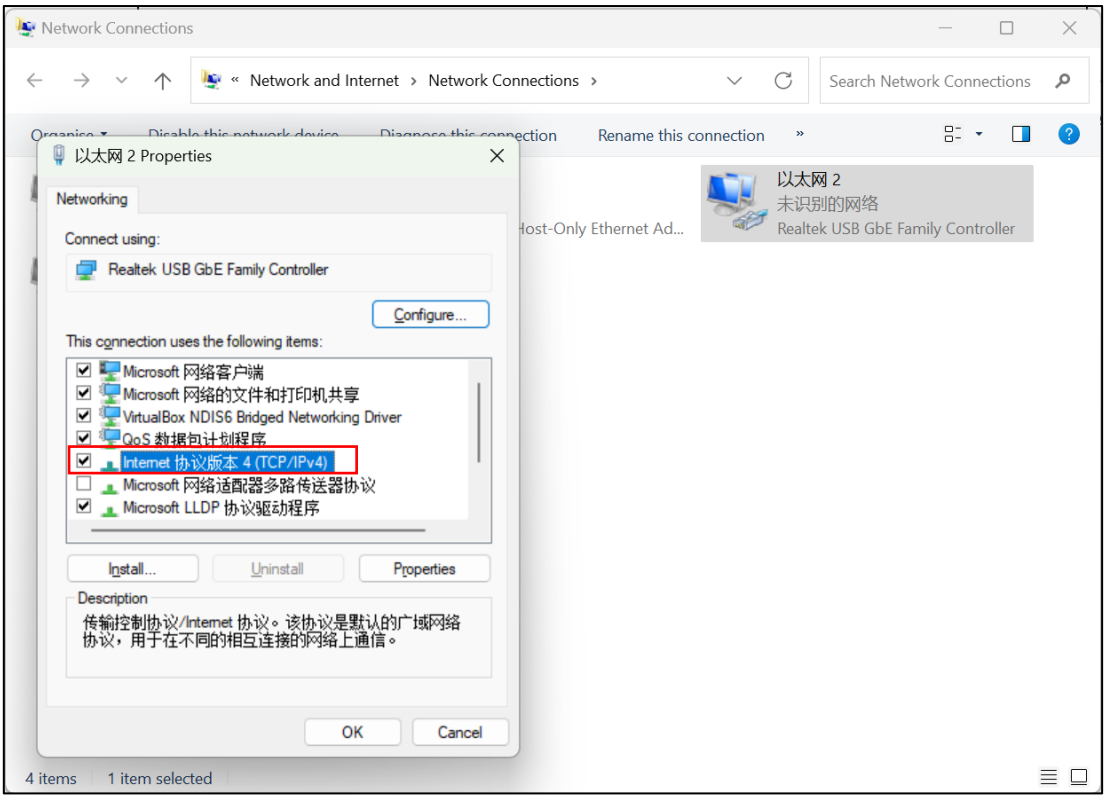
1、the device will be through the network cable and the computer for direct connection, open the computer 's network sharing centre - network adapters, only to retain the Ethernet network adapters and the rest of all the disabled.

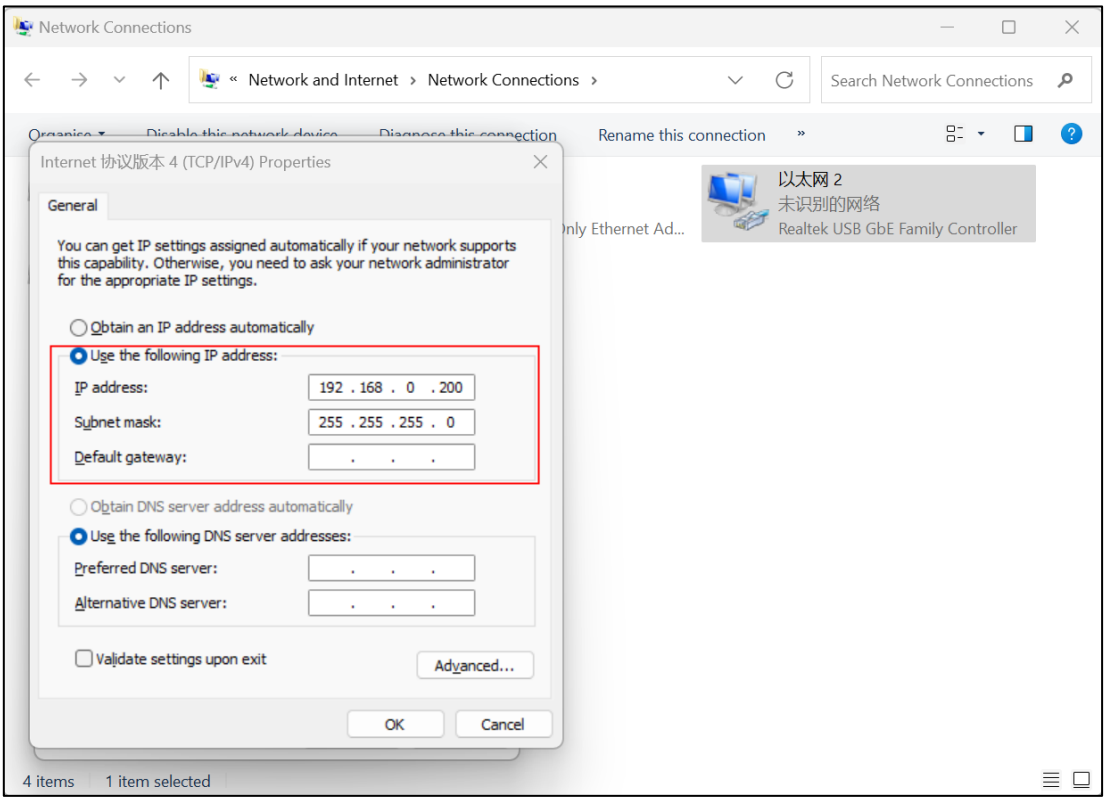


2、Click on the Ethernet adapter and select Properties.

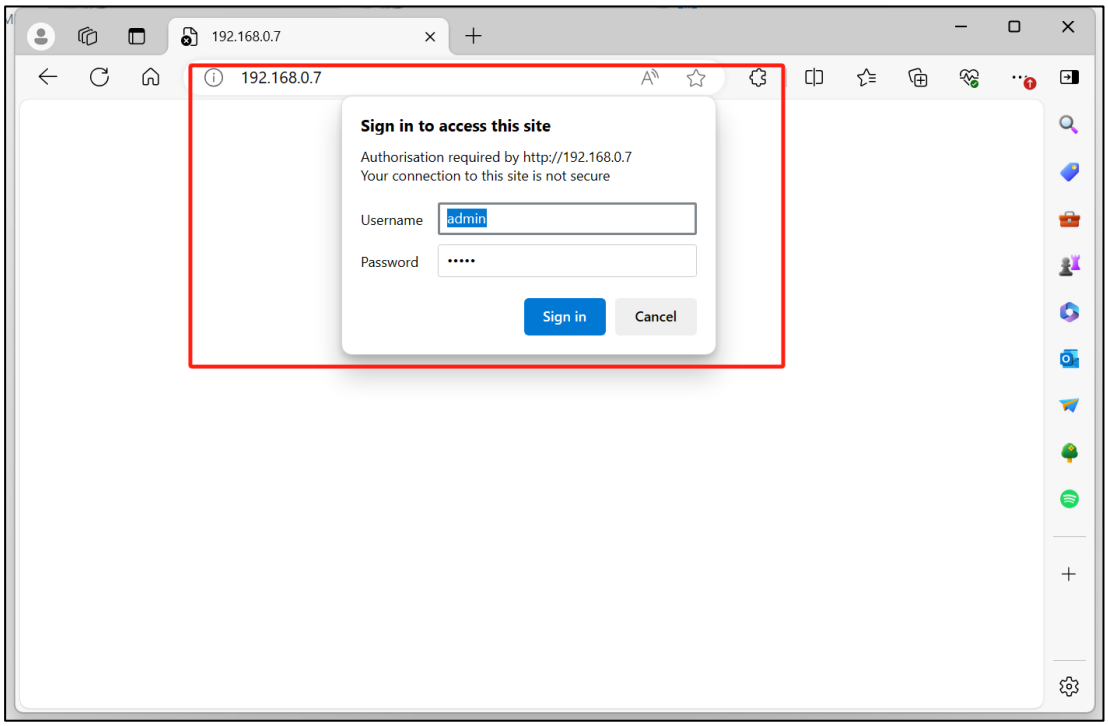


3、Double click the Internet Protocol version 4 (TCP/IPv4) to enter the IP configuration interface, the IP should be changed to the same network segment IP with the serial server, the default IP 192.168.0.7 of the serial server.

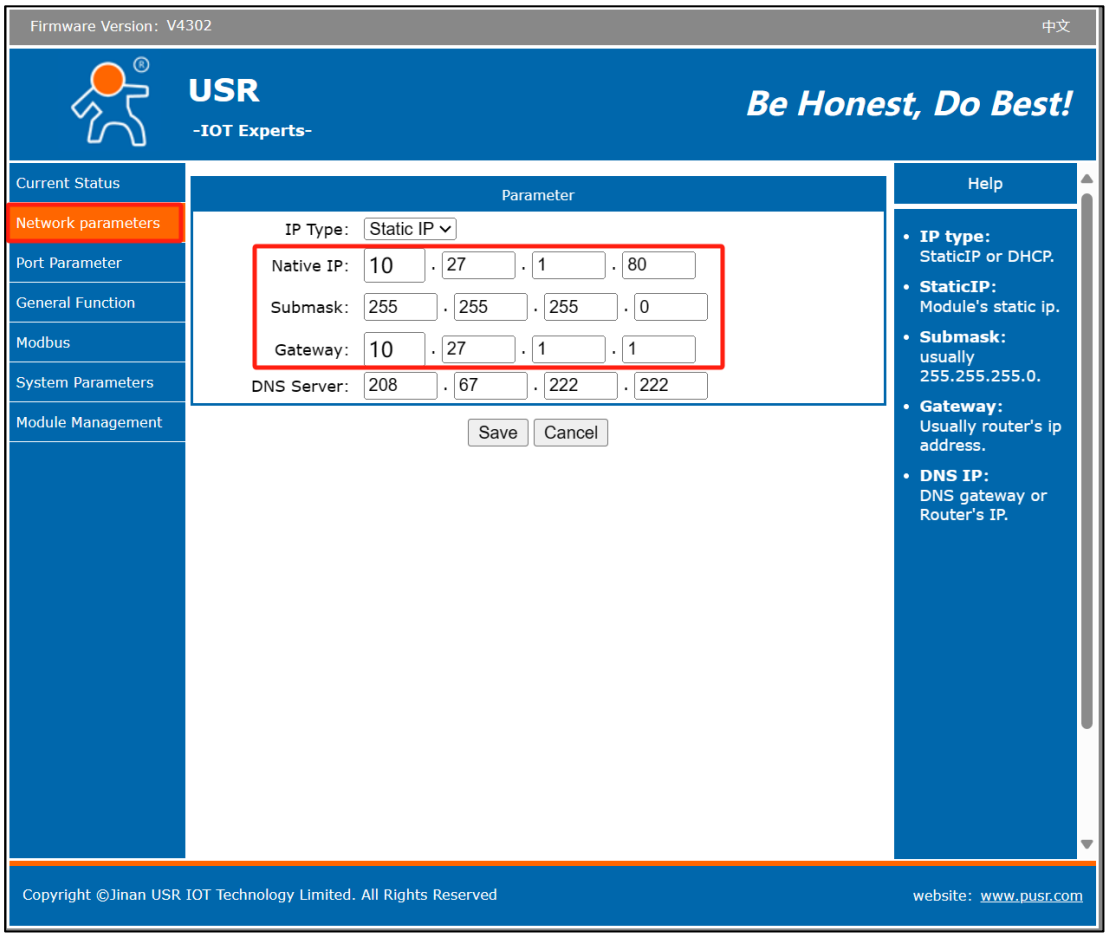




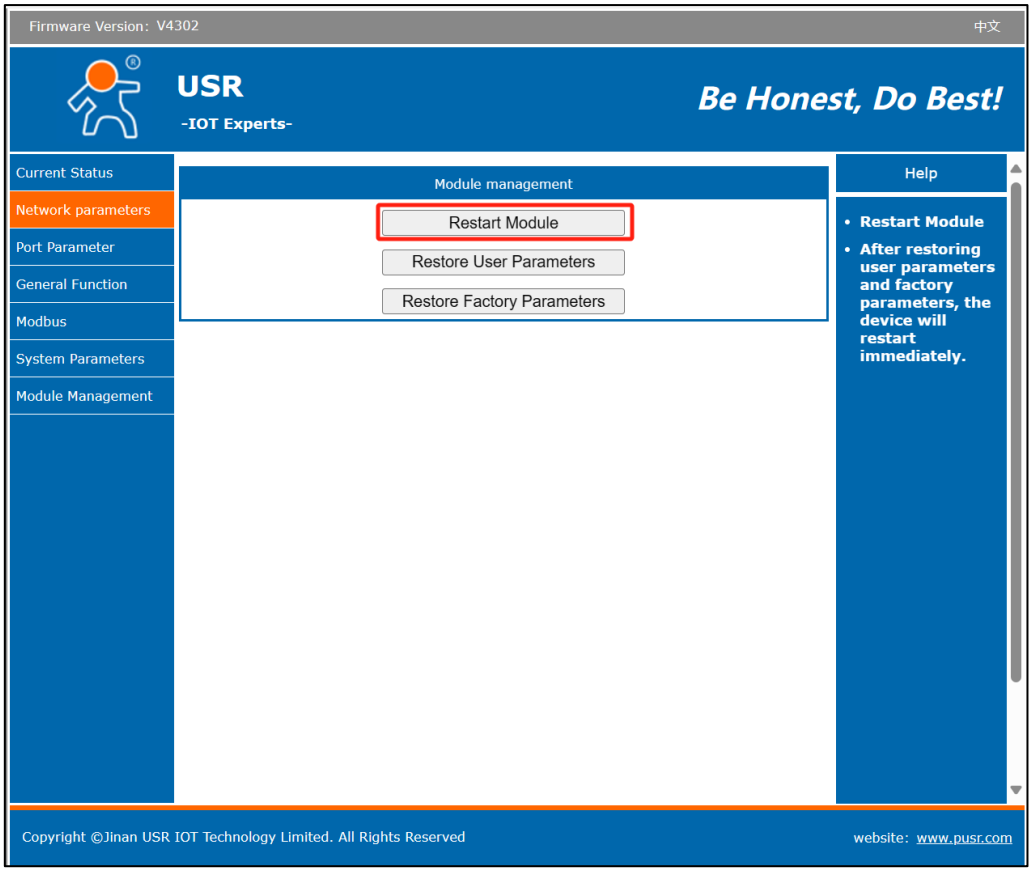
4、In your browser, enter the URL: 192.168.0.7 (the module's default IP), enter the Username: admin Password: admin, and click Login.

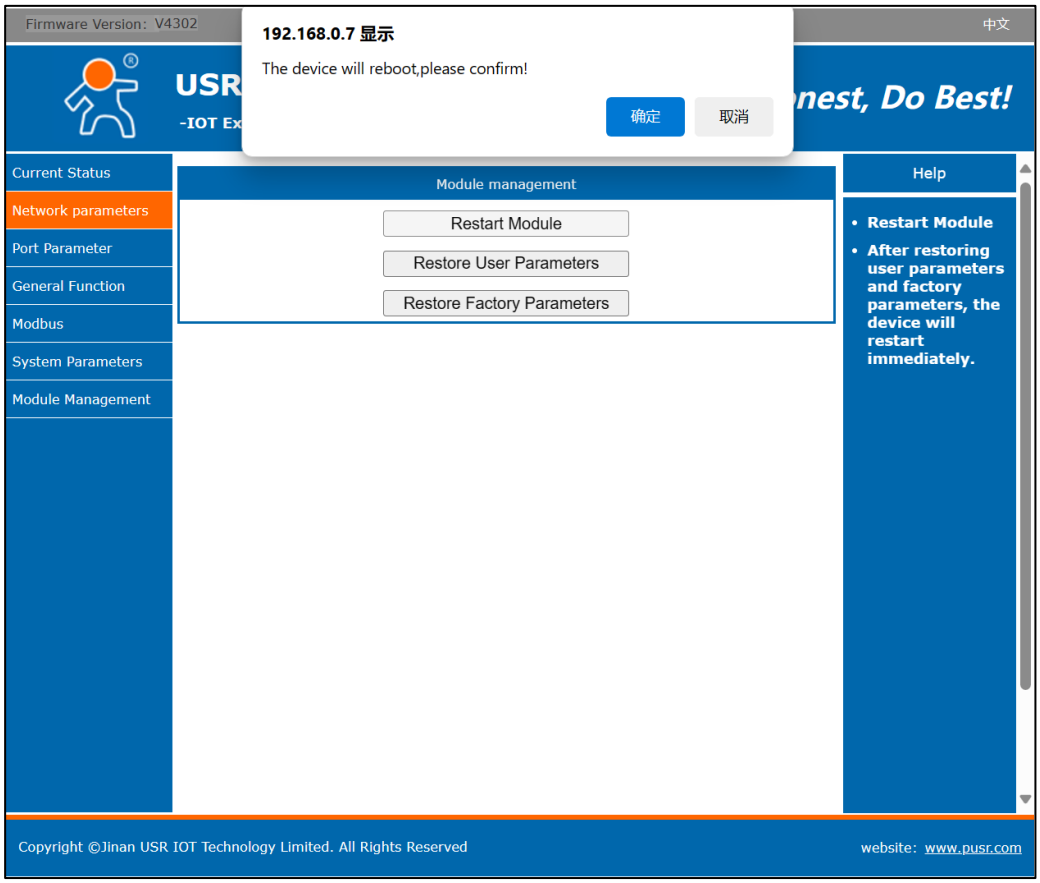


5、Click Network Parameters, modify the Native IP to 10.27.1.80, subnet mask:255.255.255.0, gateway:10.27.1.1 , click Save.



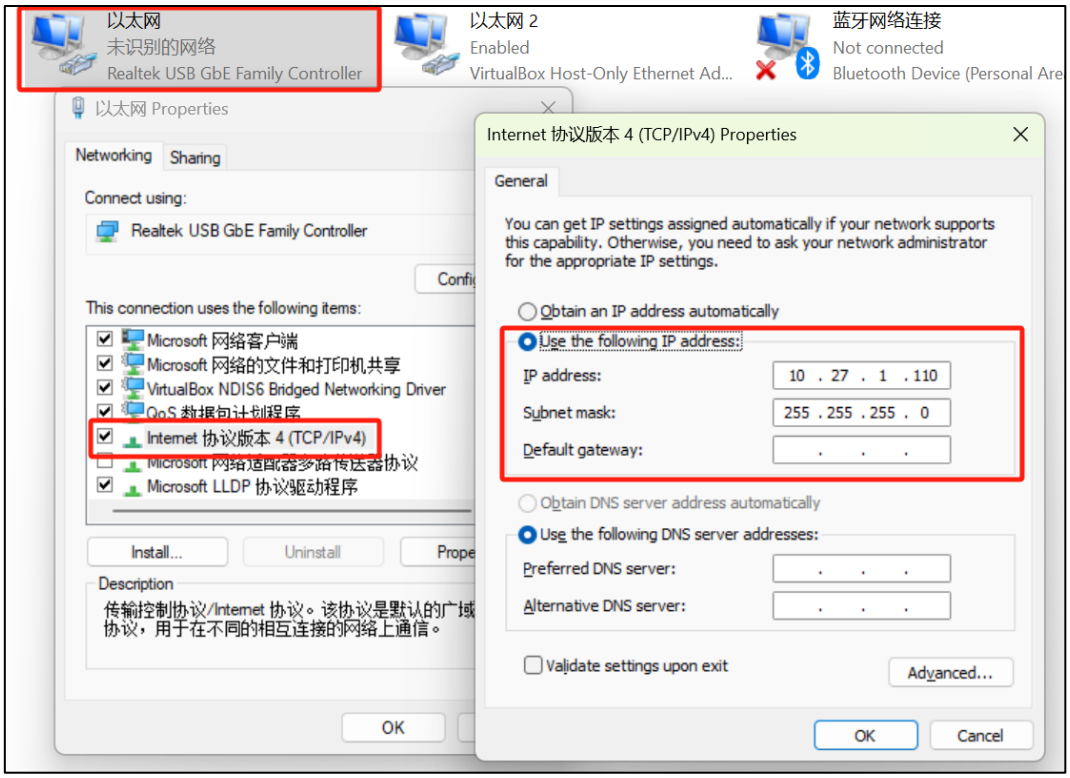
6、Click Restart Module，Confirm reboot.



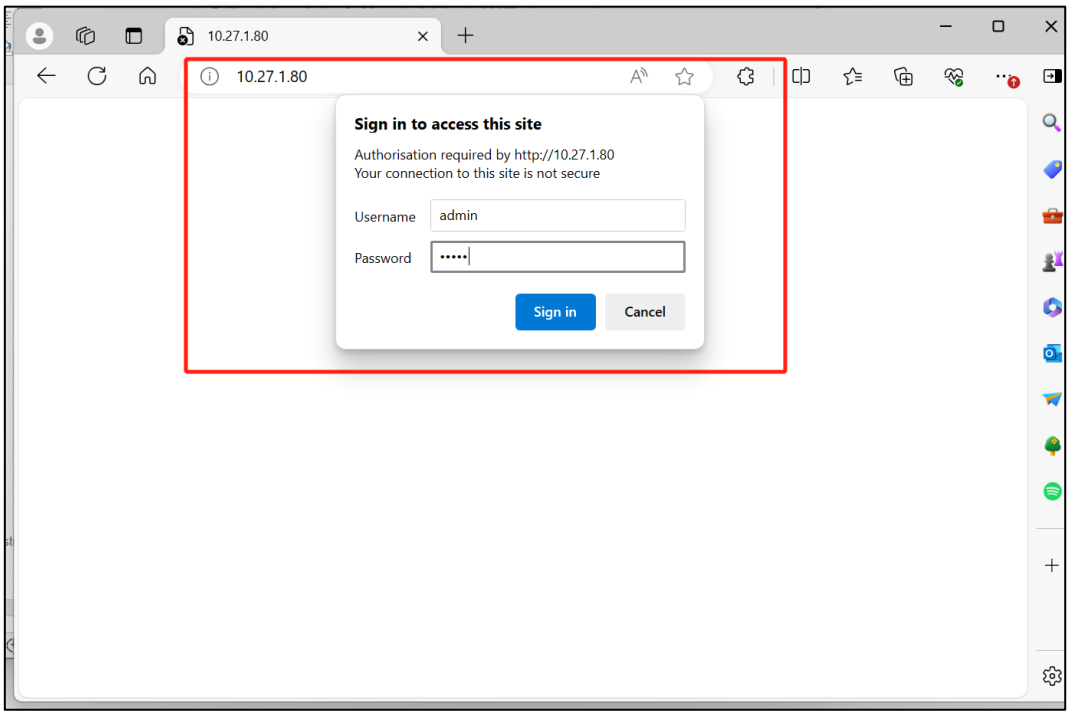


1.3.2 CONFIGURING USR-TCP232-306 SERIAL SERVER PORT PARAMETERS

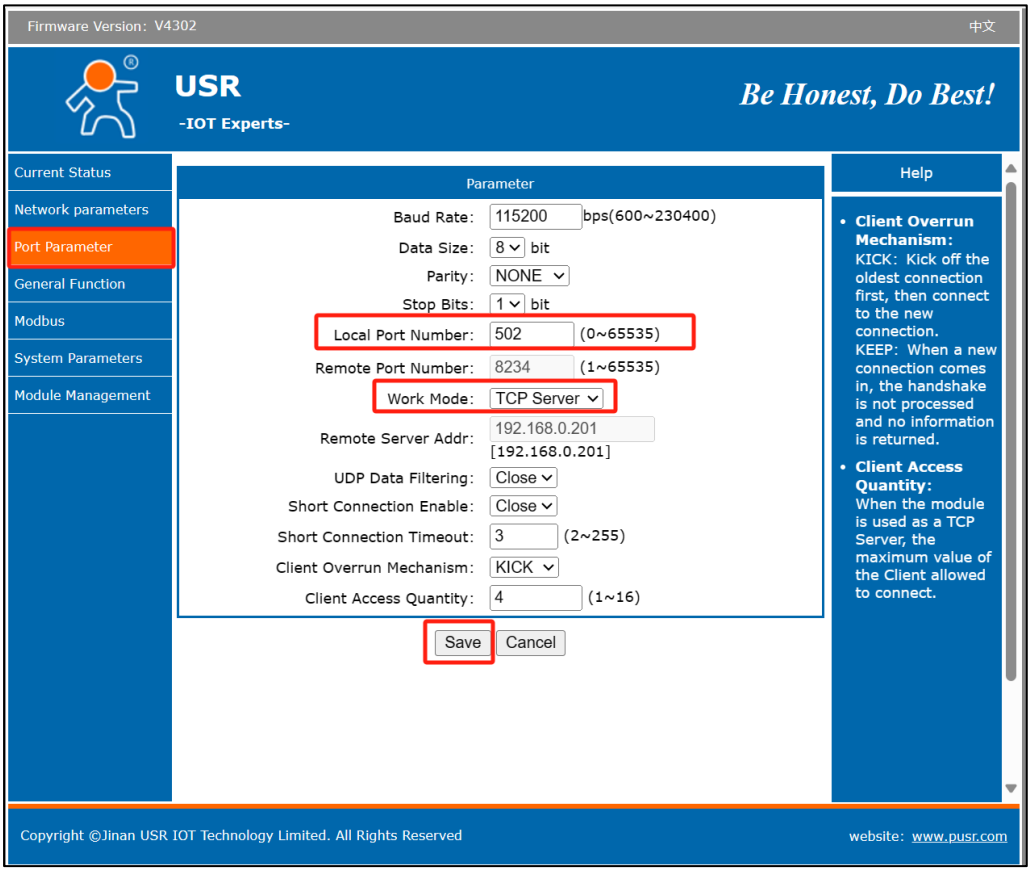
1、Again modify the computer IP, double-click the Internet Protocol version 4 (TCP/IPv4) to enter the IP configuration interface, the computer IP change to 10.27.1.110.



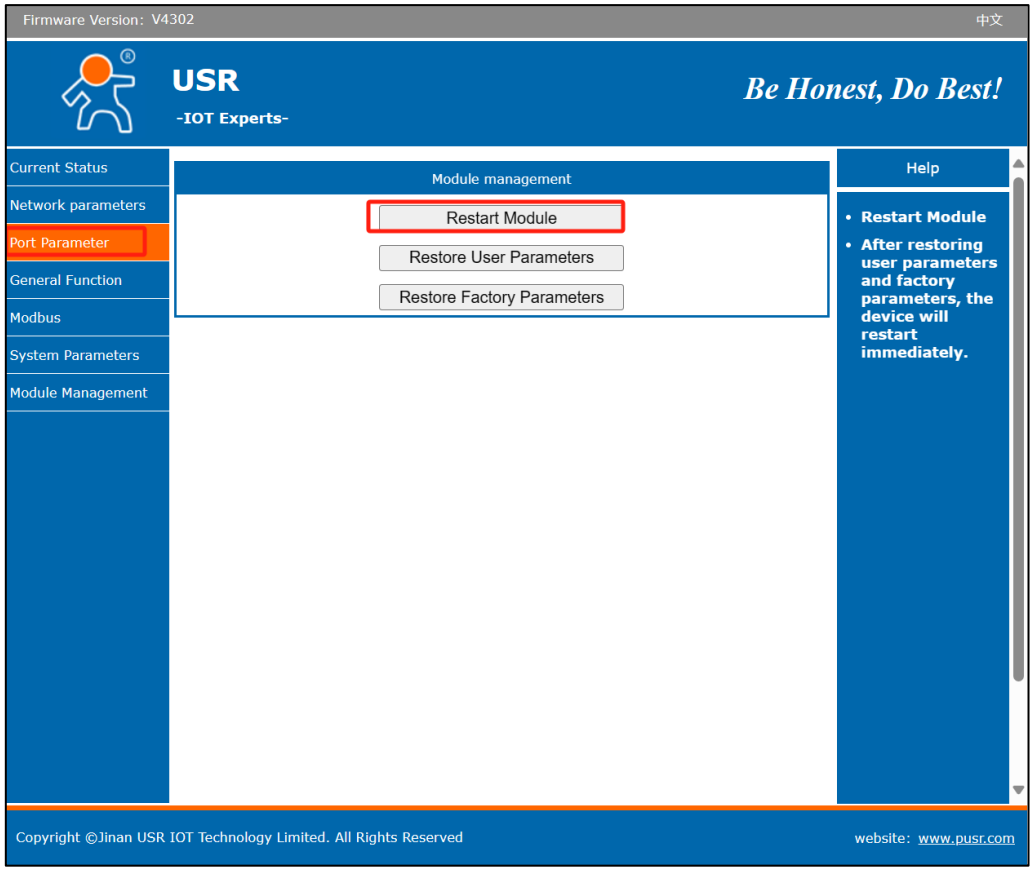
2、In your browser, enter the URL: 10.27.1.80, enter the Username: admin Password: admin, and click Login.

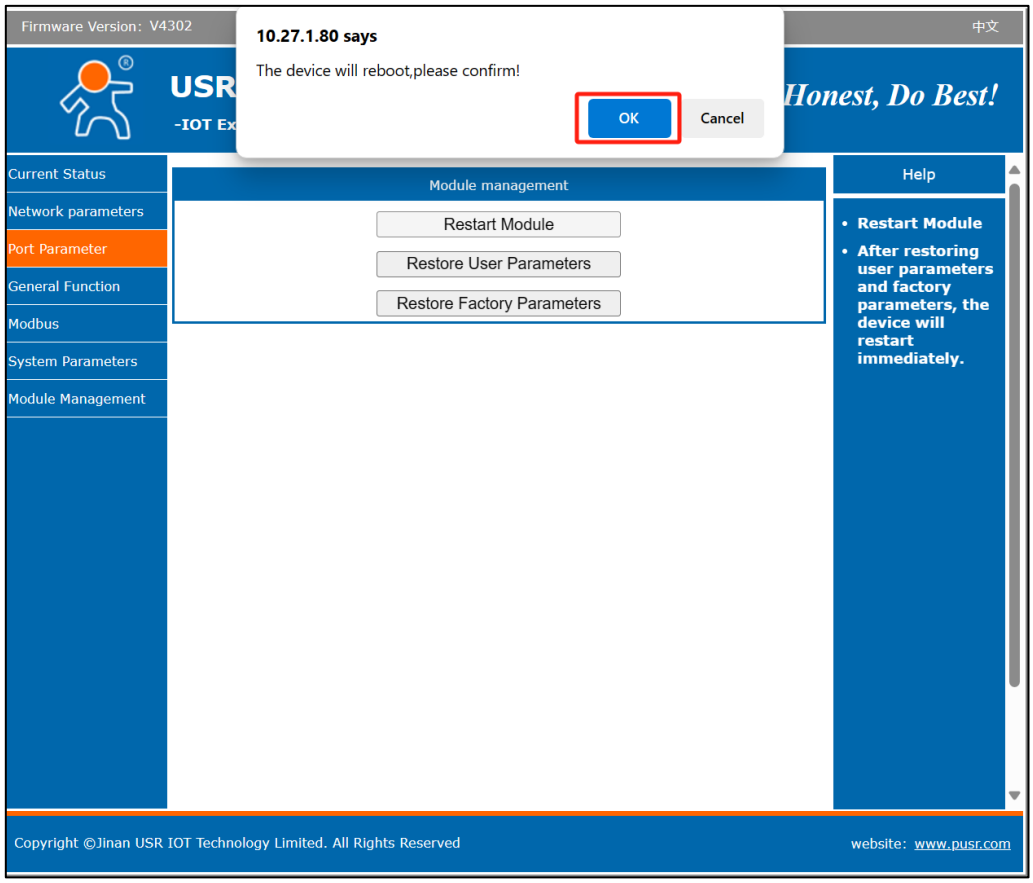


3、Click the Port Parameters, set the Local Port Number to 502, Work mode for TCP Server mode, modify the completion of the click to save.



4、Click Restart Module，Confirm reboot.





2 OPERATING INSTRUCTIONS FOR DH GRIPPERS

> Caution
>
> **Before the robot is configured with a gripper, the gripper needs to be preconfigured with a Modbus ID address using the DH PC commissioning software.**

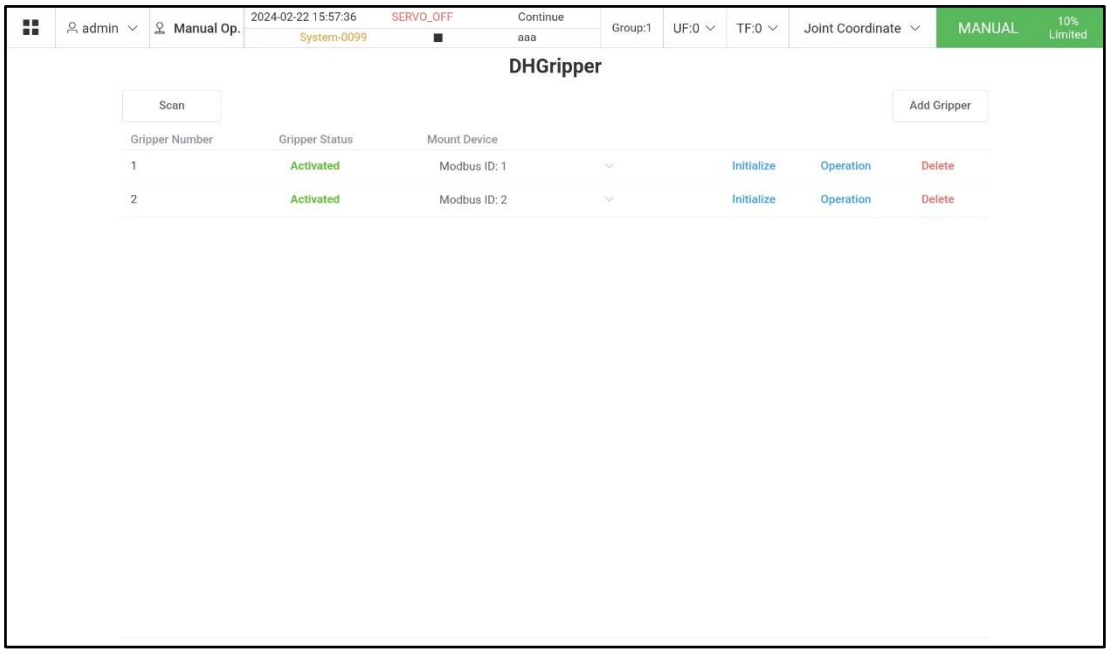
2.1 ABOUT DH GRIPPERS

The DHGripper expansion package supports DAHUAN electric grippers. For more details, please contact our company.

DH GRIPPERS	Applicable Models
Industrial Rotary Electric Grippers	RGI Series
Industrial Slim - Parallel Electric Grippers	PGE Series
Articulated Self - Adaptive Electric Grippers	AG Series
Economical - type Electric Grippers	PGSE Series

2.2 DH GRIPPERS CONFIGURATION

1、Click Menu→Application→AddOn→DHGripper to enter the electric claw configuration page, as shown in the following figure.

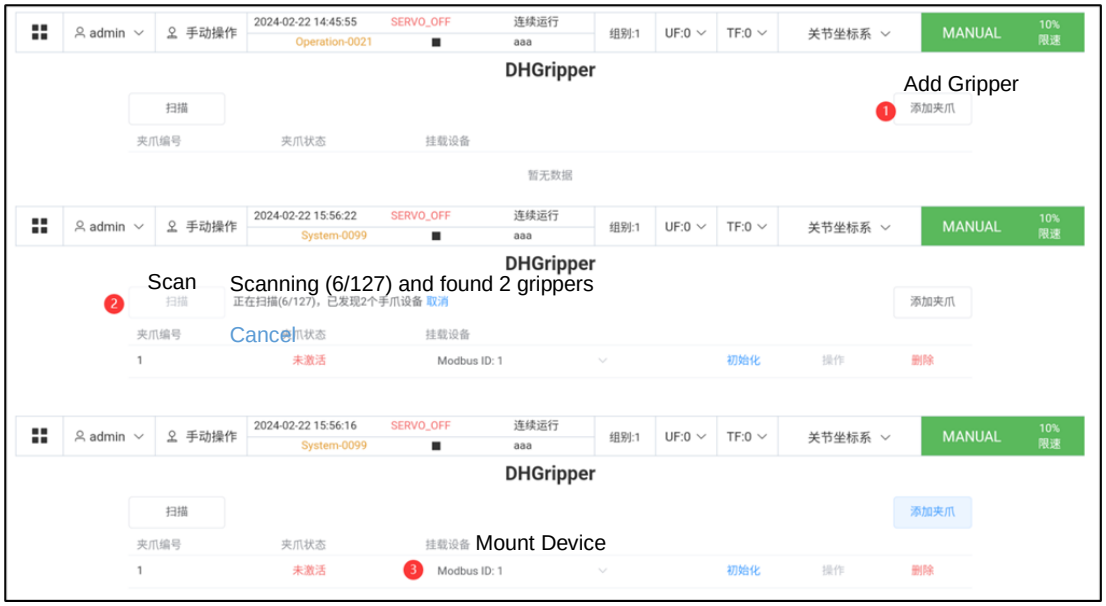


Setup page description

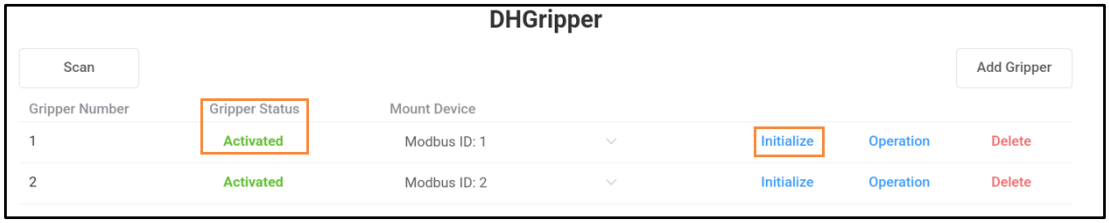
Function	Type	Description

Scan	Button	Clicking this button automatically searches for the gripper to be configured.
Cancel	Button	Click this button to cancel the search.
Add Gripper	Button	Click this button to add a gripper manually.
Initialization	Button	Click this button to initialize the gripper.
Operation	Button	Click this button to enter the manual operation interface of the gripper.
Delete	Button	Click this button to delete the configured gripper.
Gripper Number	Display	Displays the number of the current gripper configuration.
Gripper Status	Display	Displays the current status of the gripper, with the status "Activated, Not Activated, Not Found" at the bottom of the column.
Mount Device	Display	Displays the currently configured Modbus ID channel of the electric claw, and the drop-down can switch the Modbus ID channel.

2、Add Gripper → Scan → select the Mount Device , the gripper configuration is complete, as shown.



3、Click the "Initialization", wait for the completion of the initialization of the claw, the claw status is displayed as "Activated", as shown in the figure.



Caution

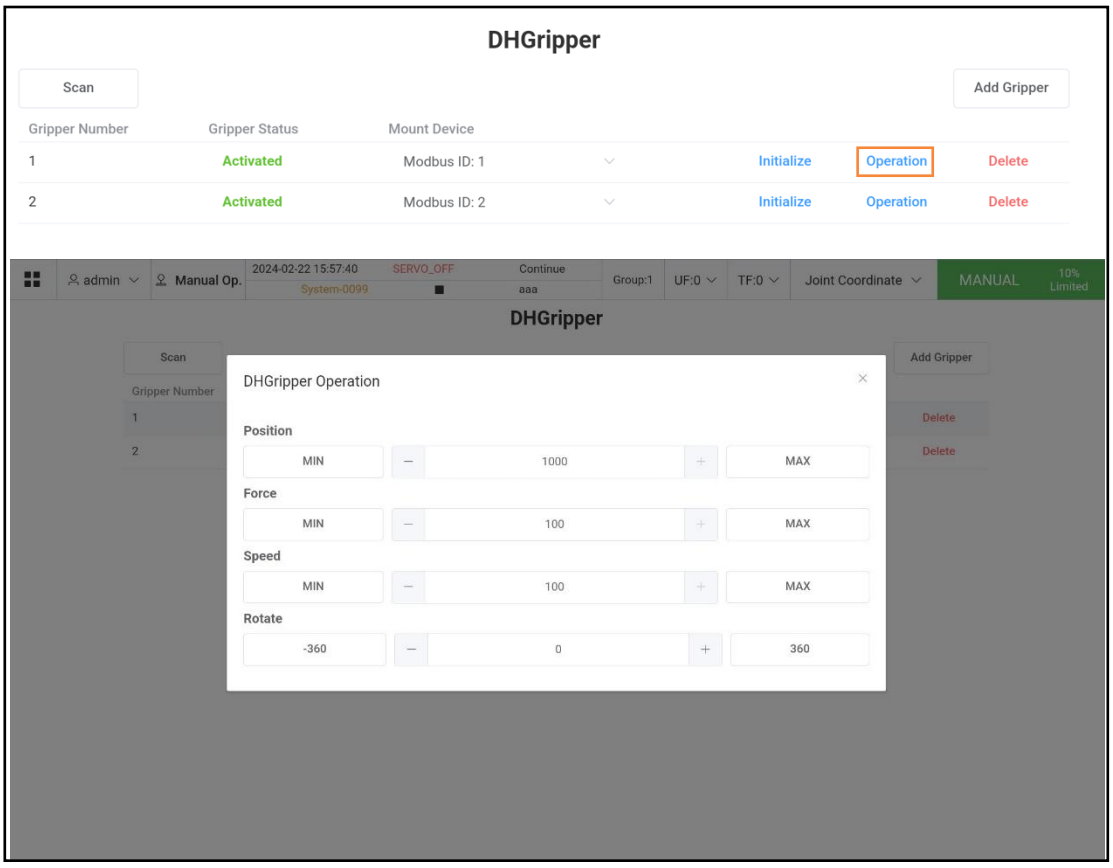
Description of RGI Series Indicator Lights：

- **Inactivate**：The red light blink;
- **Activated**：Blue light constant;
- **Read**：The red light blink quickly;
- **Detect object**：green light constant;
- **Dropped**：The green light blink.

Please refer to the relevant product operation manuals for instructions on other series of DH Gripper.

2.3 DHGRIPPER OPERATION

Click "Operation" to enter the manual operation interface of the gripper, as shown in the figure.



Setup Instructions:

Parameter	Unit	Range of values
Position	per - mille（‰）	0 ~ 1000
Force	percent（ %）	0 ~ 100
Speed	percent（ %）	0 ~ 100
Rotate	°	-32767~32767

1. The gripper will perform this action immediately after clicking the position or rotation angle button.

2. The gripper performs this action immediately after entering the value of the position or rotation angle button.

3 PROGRAM INSTRUCTIONS

3.1 DHGRIPPERACTIVATE INSTRUCTION

Used to activate the gripper.

Instruction format: DHGripperActivate gripper ID

e.g.： DHGripperActivate 1 Activate the gripper ID1.

3.2 DHGRIPPERMOVE INSTRUCTION

Used to control the position of the gripper movement.

Instruction format:

DHGripperMove gripper ID，position，force，speed，Additional Information: WAIT_COMPLETED

e.g.：DHGripperMove 1, 1000, 100, 100, WAIT_COMPLETED

With 100% of the force and 100% of the speed, the gripper ID1 moves to position 1000‰ and waits for the movement to complete before executing the next program.

3.3 DHGRIPPERROTATE INSTRUCTION

Used to control the angle of rotation of the gripper.

Instruction format:

DHGripperMove gripper ID，rotate，force，speed，Additional Information: WAIT_COMPLETED

e.g.：DHGripperRotate 1, 180, 100, 100

With 100% of the force and 100% of the speed, the gripper ID1 is rotated to a position of 180°.

3.4 DHGRIPPERCHECKED INSTRUCTION

The fault code used to detect the gripper is stored in the specified R register.。

Instruction format: DHGripperChecked gripper ID，R[i]

e.g.：DHGripperChecked 1, R[1：]

Detects the fault code for the gripper ID1 and the result is stored in the R1 register.

4 EXAMPLE OF PROGRAM

DHGripperActivate 1	Activate the gripper ID1.
WAIT 5 sec	WAIT 5 sec
DHGripperMove 1, 0, 100, 100	With 100% of the force and 100% of the speed, the gripper ID1 moves to position 0‰
DHGripperMove 1, 1000, 100, 100	With 100% of the force and 100% of the speed, the gripper ID1 moves to position 1000‰
DHGripperActivate 2	Activate the gripper ID2.
WAIT 5 sec	WAIT 5 sec
DHGripperMove 2,0, 100, 100, WAIT_COMPLETED	With 100% of the force and 100% of the speed, the gripper ID2 moves to position 0‰ and waits for the movement to complete before executing the next program.
DHGripperMove 2, 1000, 100, 100	With 100% of the force and 100% of the speed, the gripper ID2 moves to position 1000‰

5 GRIPPER FAULT CODES

The R register feedback value in the DHGripperChecked instruction is the fault code of the electric claw, and the fault code is based on the DH Gripper's product operation manual.

Product Series	Fault Codes
RGI Series	0 No questions asked 04 Overheating 08 Overload 11 Excessive speed
PGE Series	/
AG Series	/
PGSE Series	/

Contact us

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