

Integrated quantitative control box instructions



Preface

- Thank you very much for using the intelligent quantitative control system produced by our company !
- This manual provides the performance indicators, installation and wiring, operation, parameter settings, fault diagnosis, etc. of this model of quantitative control equipment . Before using the equipment , please read this manual carefully and master the usage method correctly before proceeding with the specifics. operation to avoid unnecessary losses due to incorrect operation.
- After you have finished reading, please keep it in a safe place so that you can refer to it whenever needed .

Statement

- The contents of this manual may be modified without prior notice due to function and performance upgrades, etc.
- The content of this manual is strictly prohibited from being reproduced or copied in whole or in part.
- Our company strives to ensure that the content of this manual is correct. If you find any inaccuracies or errors, please contact us .

Version **DLPLC2 40 1.V1**

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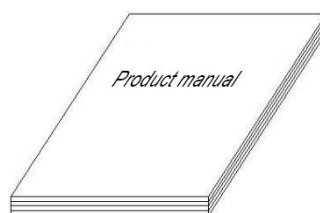
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1.Packing items

After opening the box, please confirm the following before use. Once the product you receive is incorrect in quantity or physically damaged in appearance, please contact our company or sales outlet.



Quantitative control box



user 's Guide



Product certification

serial number	name	unit	quantity	Remark
1	Quantitative control box	tower	1	
2	user's Guide	Book	1	
3	Product CE / warranty card	share	1	
4	flow meter	tower	1	Optional accessories
5	The solenoid valve	tower	1	Optional accessories

Precautions

- If the instrument is found to be damaged due to transportation when unpacking, please contact the manufacturer.
- This system is suitable for general industrial occasions. If there are special usage requirements, please install additional protection devices.

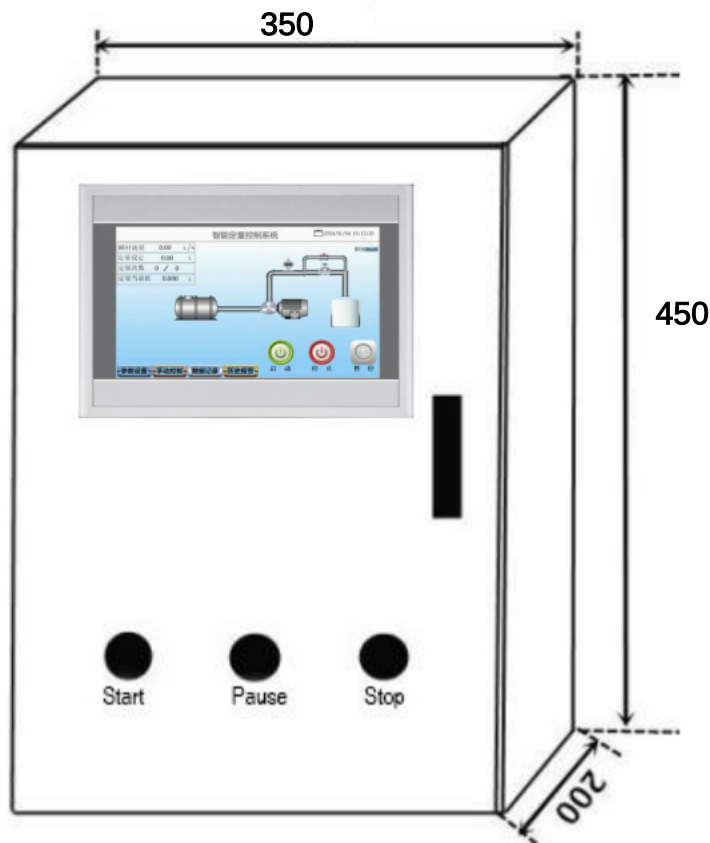
For the safety of you and the equipment, please do not install it while the power is on.

Please use a power supply with rated voltage, wire it correctly, and ground it properly

Please install it indoors. The installation location must ensure smooth ventilation and avoid wind, rain and direct sunlight. Do not install in the following situations:

- ⊙ Where the temperature and humidity exceed the usage conditions
 - ⊙ Where there are corrosive, flammable or explosive gases
 - ⊙ Where there is a large amount of dust, salt and metal powder
 - ⊙ Places where water, oil and chemical liquids are easily splashed
 - ⊙ Where there is direct vibration or impact
 - ⊙ In the case of electromagnetic generation source
- Corresponding shielding measures should be taken in situations close to power lines, strong electric fields, strong magnetic fields, interference from static electricity, noise or AC contactors.
 - To extend the service life of your equipment , please perform regular care and maintenance. Do not repair or disassemble the instrument yourself. When wiping the instrument, please use a clean soft cloth. Do not dip it in organic solvents such as alcohol or gasoline for cleaning, which may cause discoloration or deformation.
 - If the equipment has water, smoke, odor, or abnormal noise, please immediately cut off the power supply, stop using it, and contact the supplier or our company in time.

· Measuring box dimensions and wiring diagram



Pump and valve control (AC220V/3~AC380V 2.2KW/5KW) , such as high-power water pump, or other special needs can be customized

Key Description:

1. Start: After the quantitative value is set, press the start button to start the quantitative program.

If you need to quantify multiple batches, or use different measurement units for measurement and quantification (such as Kg, t), etc., you need to enter the parameter setting interface first , set the corresponding parameters, and then press the start button. For detailed parameter setting introduction, please see below.

2. Pause: Press the pause button during operation to pause the program and the pump valve stops working. Press the pause button again and the program continues to execute.

3. End: Press the end button during running to end the program and terminate the quantitative task.

Chapter 1 Overview

This type of quantitative controller is based on high-performance PLC + HMI human-machine interface, and is matched with various flow transmitters, sensors (such as turbine, vortex, electromagnetic and other flow meters) and solenoid valve pump bodies. A flow measurement control system that can accumulate flow and control rationing.

This quantitative controller has good human-machine interface and software and hardware protection measures. The UI operation interface is simple, easy to operate, safe and reliable, has excellent anti-interference performance and excellent stability. It is mainly used in petroleum, chemical industry, medicine and food and other industries. Quantitative packaging and control, such as: quantitative punching / feeding, loading, batching, discharging, material dispensing, gas filling, etc.

Features

- ⊙ Visual human-computer interaction makes the operation simple and easy to understand.
- ⊙ Application tube rice, suitable for most flow meters and fluid media.
- ⊙ L, K g, m 3 and other units are available.
- ⊙ Safety protection functions: flow interruption alarm; water pump overload protection; high and low liquid level alarm (optional function), etc.
- ⊙ Data recording: power on and off recording and quantitative data recording.
- ⊙ Cumulative reports: Support cumulative traffic and batch traffic statistics.
- ⊙ Communication function: standard Modbus RTU Protocol, external data transfer.
- ⊙ Data storage function: parameter setting values, quantitative record data (can be cleared manually), historical fault records (can be cleared manually), permanently saved after power outage

Chapter 2 Technical Indicators

Screen : 7-inch, industrial-grade touch screen.

Controller : It adopts a high-performance dedicated quantitative accumulation calculation chip, which is stable and durable.

Flow channel : pulse input signal; frequency range: < 5000Hz voltage level DC24V

Relay output : supports 3 relay outputs, contact capacity 3A 250VAC/24VDC 5A

Power supply: 220VAC/380VAC 50HZ AC power supply

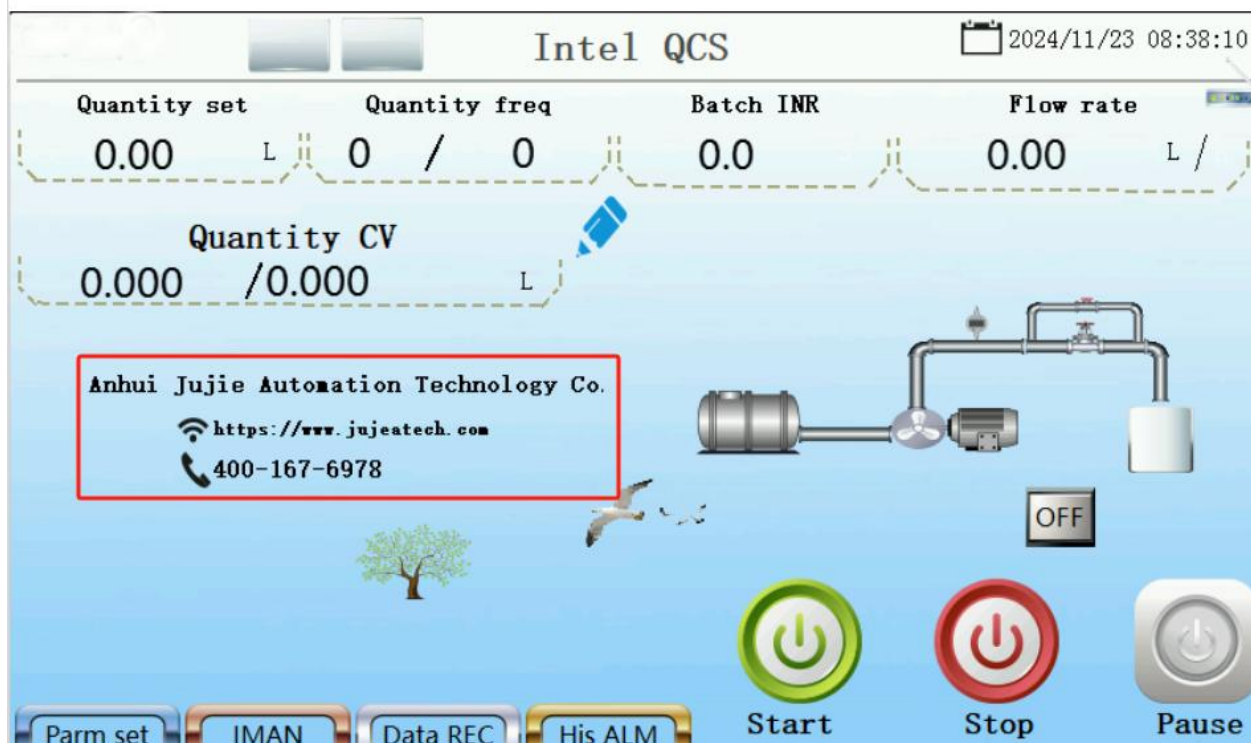
If you need special output, please ask the supplier for customization when ordering.

■ Main terminal description

Terminal name	Instruction
Large valve	Solenoid valve large valve, + end
Current signal +/- Current signal -	Current signal input terminal (additional function)
Pulse signal	Pulse signal, please note that the voltage level is DC24V
485A, 485B	modbus communication port (connect to host computer or other data reading equipment)
24V	Flowmeter power supply +, pay attention to whether the voltage level of the flowmeter power supply matches
0V	Flowmeter, solenoid valve power supply-
L 1 L 2 L3 N	3-phase power incoming terminal. The power supply adopts 3-phase 5-wire system. The controller box shell must be correctly and reliably grounded to reduce signal interference and ensure equipment and personal safety.
U1 V 1 W 1	For the water pump power supply, pay attention to the correct and reliable grounding of the water pump shell to ensure equipment and personal safety.

Chapter 3 Basic Operation and Running Screen

3.1 Main control screen introduction



parameter settings:

- ⊙ Instantaneous traffic: displays the current real-time traffic. This parameter can only be read and cannot be modified.
- ⊙ Quantitative setting: the target value for this quantitative measurement.
- ⊙ Quantification times: The number of times to repeat quantification, the setting range is 1-100 times.
- ⊙ Quantitative current value: real-time data for the quantitative process.

Operation buttons:

- ⊙ Start: start the quantitative program
- ⊙ Stop: Stop the quantitative program
- ⊙ Pause: Press the pause button during operation to pause the program and the pump valve stops working. Press the pause button again or press the start button to continue the program.

Notice:

- ⦿ If the system detects a hardware failure during the quantification process, such as no signal from the flow meter, it will automatically stop the quantification process and prompt an equipment failure!
- ⦿ The high and low liquid level alarm functions are optional. If you need this function, please make a note when ordering, or contact the salesperson.

Page switching

- ⦿ Historical alarm: Click this button once and the system will jump to the alarm recording interface .
- ⦿ Manual control: Click this button once and the system will jump to the manual operation interface .
- ⦿ Parameter setting: Click this button once and the system will jump to the parameter setting interface.
- ⦿ Data recording: Click this button once and the system will jump to the data recording interface.
- ⦿ The page switching button is displayed on every page and has the same function, which will not be described further below.

3.2 Introduction to parameter setting screen

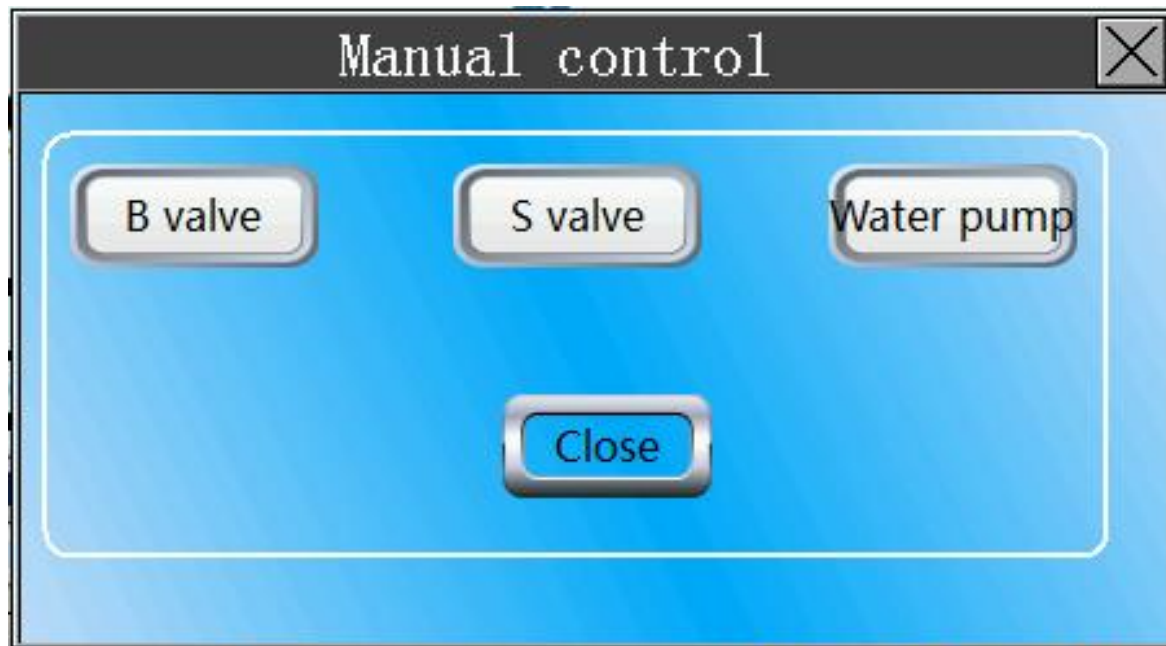
Parameter settings	
Flowmeter Coe	0.000 L/P
CO ALM freq	0.0 Hz
CO ALM time	0.0 S
Density	0.000 g/cm³
CALC unit	L ▼
Pulse mode	
Com value CL	
Initialize	
Close	
LV ADV val	0.00 L
SV ADV val	0.00 L
Pump ADV val	0.00 L
Pump DEL	0.0 S
Com val 1	0.00 L
Com val 2	0.00 L
Com val 3	0.00 L
Com val 4	0.00 L
Com val 5	0.00 L

- ⊙ Flowmeter coefficient (pulse mode): Set according to the flowmeter coefficient, accurate to 3 decimal places. Flow measurement range (current mode): Enter the range according to the nameplate of the current type flow meter.
- ⊙ Large valve advance amount: In order to prevent overshoot when large flow rate is determined, the large valve advance amount can be set as needed to close the large valve in advance.
- ⊙ Small valve advance amount: When dosing large flow rates, in order to prevent overshoot, the small valve advance closing amount can be set as needed to close the small valve in advance.
- ⊙ Water pump advance amount: In order to prevent overshoot when the flow rate is large, the water pump advance closing amount can be set as needed to shut down the water pump in advance.

- ⊙ Pump start delay: It means how long it takes to start the water pump after the valve is opened. It is usually used when the valve and the water pump are opened at the same time, and the valve is difficult to open or is held back .
- ⊙ Batch interval time: If the number of quantifications is greater than 1, this parameter can set the interval between the completion of the last quantification and the start of the next quantification;
- ⊙ Cut-off alarm frequency (pulse mode): the lowest frequency during operation, below which the system will generate an alarm; cut-off alarm flow (current mode): the lowest flow rate in current mode, below which the system will generate an alarm;
- ⊙ Cut-off alarm time: alarm delay, that is, when the frequency is lower than the cut-off alarm frequency when the II is working, how long does it take for the system to generate an alarm;
- ⊙ Density: The factory default of the equipment is volume quantification. When mass quantification is required, the density needs to be set according to the quantitative substance;
- ⊙ Measurement unit: Select the quantitative measurement unit. The optional units are L, m³, Kg, and t;
- ⊙ Pulse mode/current mode: Select according to the type of flow meter. The default is pulse mode. Generally speaking, pulse mode is recommended for quantitative measurement.

Note: The quantitative progress of pulse mode is higher than that of current mode, and its applicable range is wider. The current mode can only have good quantitative accuracy when the flow rate is relatively stable and each quantitative cycle is greater than 30S.

3.3 Manual screen introduction



When the equipment needs to be inspected, or a valve, pump, etc. can be operated individually, it can be operated manually. Only when the equipment is in a stopped state, manual operation can be performed through the manual operation interface, as detailed below (note that manual operation is not possible when the equipment is in a running state!)

- ⊙ Large valve: Click once to open the large valve, click again to close the large valve;
- ⊙ Small valve: Click once to open the small valve, click again to close the small valve;
- ⊙ Water pump: Click once to turn on the water pump, click again to turn off the water pump;

Note: In order to prevent the pump from holding back, the water pump can only be turned on when at least one of the large valve or small valve is open; click Stop once on the main control screen to close all the large valves, small valves, and water pumps. Pressing the external stop button also has the same function.

3.4 Data record

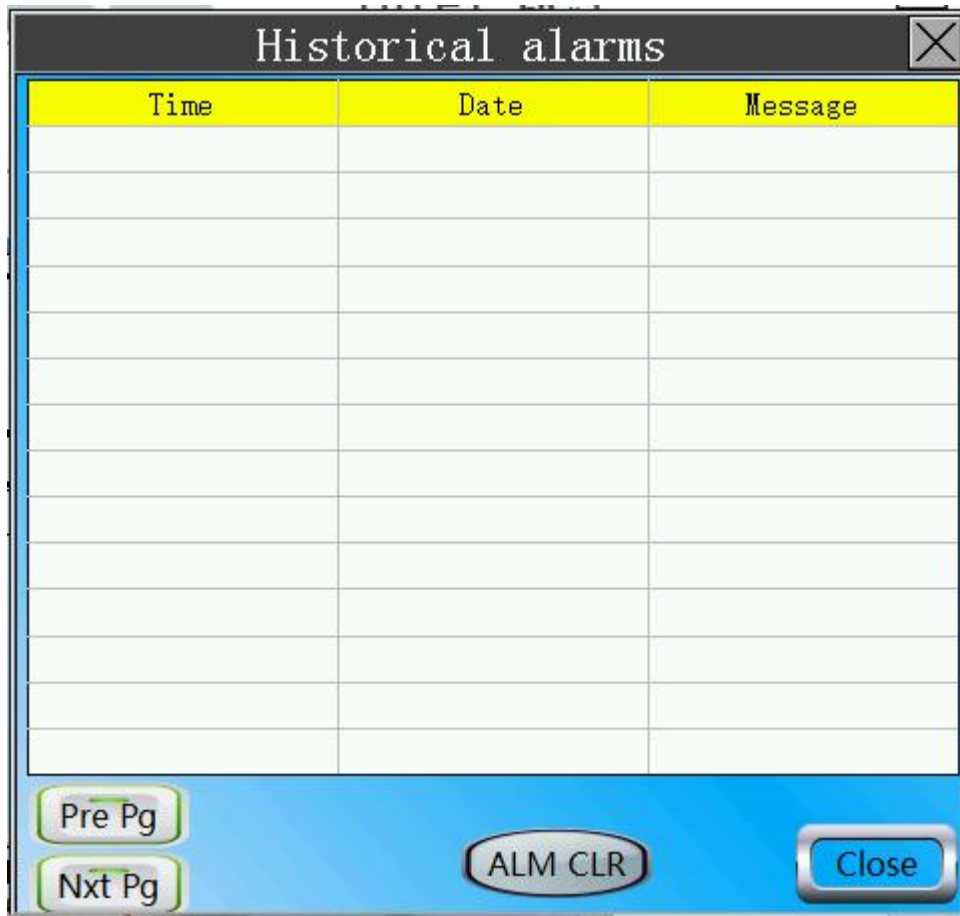
The screenshot shows a software window titled "Data Logging" with a close button in the top right corner. Inside the window is a table with three columns: "Time", "Date", and "Q value". The table has 15 empty rows. Below the table, there is a blue bar containing several controls: "ToL cum flow" with a value of "0.00", "Batch cum AMT" with a value of "0.00", a "Pre Pg" button, a "Nxt Pg" button, a "Data CLD" button (which is highlighted with a red rectangular border), and a "Close" button.

This page can record the date, time and quantitative data of each quantitative transaction.

- ⦿ Accumulated total flow: Indicates the accumulated total flow since use
Note that even if the device is not running, as long as there is flow in the flow meter, it will be added to the total flow total.
- ⦿ total quantitative value of the batch just completed .
- ⦿ Data Clear: Click this button once to clear all traffic statistics! Once cleared, the data cannot be recovered, so proceed with caution!

Click the Previous Page and Next Page buttons to page up and down to view historical data records. When the storage memory is full, the previous data will be automatically overwritten.

3.5 Historical alarm records



The screenshot shows a window titled "Historical alarms" with a close button in the top right corner. Inside the window is a table with three columns: "Time", "Date", and "Message". The table is currently empty. Below the table, there are four buttons: "Pre Pg", "Nxt Pg", "ALM CLR", and "Close".

Time	Date	Message

Pre Pg ALM CLR Close

Nxt Pg

If an alarm occurs when the system is in use, the alarm information will be recorded in this table. In practice, we can use this table to analyze the equipment status for equipment maintenance and adjustment.

Alarm Clear: Clicking this button will clear all alarm records and cannot be restored, please be informed!

Chapter 4 Common faults and countermeasures

This quantitative control equipment adopts advanced production technology and undergoes strict testing before leaving the factory, which greatly improves the reliability of the instrument. Common faults are generally caused by improper operation or parameter settings. If you find a fault that cannot be solved, please record the fault phenomenon and notify the local agent or contact us in time.

The following table shows several common failures of quantitative control systems in daily applications:

Fault phenomenon	Cause Analysis	Treatment measures
The system does not respond when pressing the start button	1 . The number of quantification times is 0 or the quantification target value is 0	Set the number of quantification times and the quantification target value and press Start
The flow rate displayed by the device does not match the actual flow rate	1 . Inappropriate setting of instrument coefficient 2. Improper installation of instruments	1. Please follow the instrument instructions to correctly set the flow meter coefficient or flow measurement range. 2 . Please follow the instrument instructions to install and use the flow meter correctly.
The device prompts a hardware failure	1 . The valve is not open 2. The instrument circuit is disconnected 3 . Flow meter failure 4. No liquid flows	Check the corresponding hardware status

	through the pipe	
Quantitative overshoot	1 . When the flow rate is large and the flow rate is high, the advance amount is not set. 2. The valve moves slowly	Please set the corresponding advance amount

Communication Instructions

485 communication parameter description:

1.Communication parameters: The slave mode of RTU-Modbus, data length 8 bits, no check, 1 stop bit, baud rate 9600bps, station number 1, that is, 96008 N 1

2.The register type is 4-zone, read-only

Instantaneous flow address :H60(decimal 96), 32-bit floating-point number, word order 3412

PS Sending :01 03 00 60 00 02 C4 15.Receiving :01 03 04 3D 71 42 85 56 87, Received value 3D71 4285, high and low word exchange 4285 3D71.To floating-point number =66.62

Total cumulative traffic address :H212(decimal 530), 32-bit floating-point number, word order 3412

PS Sending :01 03 02 12 00 02 65 B6.Receiving 01 03 04 B8 52 42 B1 8F 96 .Received value B852 42B1, high and low exchange 42B1 B852.To floating-point number =88.86

Batch cumulative traffic address :H21E(decimal 542), 32-bit floating-point number, word order 3412

PS Sending :01 03 02 1E 00 02 A5 B5.Receiving :01 03 04 68 85 42 92 46 F3 .Received value 6B85 4292 ,high and low exchange 4292 6B85 .To floating-point number =73.21

Current quantitative real-time value address: H6C(decimal 108), 32-bit floating-point number, word order 3412

PS occurrence :01 03 00 6C 00 02 04 16 .Receiving :01 03 04 B8 52 4212 CF EF. Received value B852 4212 ,high and low character swap 4212 B852 .To floating-point number =36.68

3. The register type is 4-zone, read-write type

Quantitative number address :H206(decimal 518), 16-bit unsigned integer, set range 1-100

PS set the quantitative quantity for 8 times. Send :01 06 02 06 00 08 69 B5, receive :01 06 02 06 00 08 69 B5

Quantitative set value address :H21A(decimal 538) ,32-bit floating-point number

In PS, set a fixed amount of 30.0 to a floating-point number =41F0 0000 and swap high and low characters 0000 41F0

Send :01 10 02 1A 00 02 04 00 00 41 F0 5B A8, Receive :01 10 02 1A 00 02 61 B7