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Industrial Edge Gateway

USR-M300

IEC104

Protocol conversion

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Directory

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1. product introduction

The M300 is a high-performance, scalable, comprehensive edge gateway. The product integrates edge data acquisition, calculation, active reporting, data reading and writing, linkage control, IO acquisition and control functions, etc. The acquisition protocol includes standard Modbus protocol and a variety of common PLC protocols, as well as industry-specific protocols. Active reporting adopts group reporting mode, and Json reporting template is customized to quickly realize the docking of server data formats. At the same time, the product also has routing and VPN and graphical program ming functions, graphical module design edge computing functions, to meet customer's own design needs. The product supports TCP/MQTT(S) protocol communication, supports multi-channel connection; supports Modbus RTU/TCP and OPC UA protocol conversion and other functions, and supports fast access to common platforms such as PUSR, Alibaba Cloud, AWS and Huawei Cloud.

The product adopts Linux core, the main frequency is up to1.2GHz; the network adopts WAN/LANplus4Gcellular design, the uplink transmission is more reliable, and the LAN port can be connected to external cameras and other devices, and the function application can be realized by combining its own routing function; the hardware integrates2-wayDI,2-wayDO,2-wayAIand2-wayRS485, which not only can realize the industrial field control and acquisition requirements, but also can realize linkage control according to various acquisition point data or status. It can be widely used in intelligent breeding, intelligent factories and other industrial intelligent solutions.

The product adopts expandable design in structure, which can be combined and applied by expanding modules with different functions, so as to better meet the requirements of IO quantity and communication interface in different scenarios. Convenient and cost effective.

2. IEC104 protocol

IEC104 protocol, formally known as IEC60870-5-104, is a standard developed by the International Electro technical Commission (IEC) to support network communication between power system automation equipment. The protocol uses TCP/IP as the underlying communication protocol for monitoring and controlling all types of equipment in power systems,including but not limited to substations, generators, switches, etc.

3. Environmental preparation

USR-M300 *1

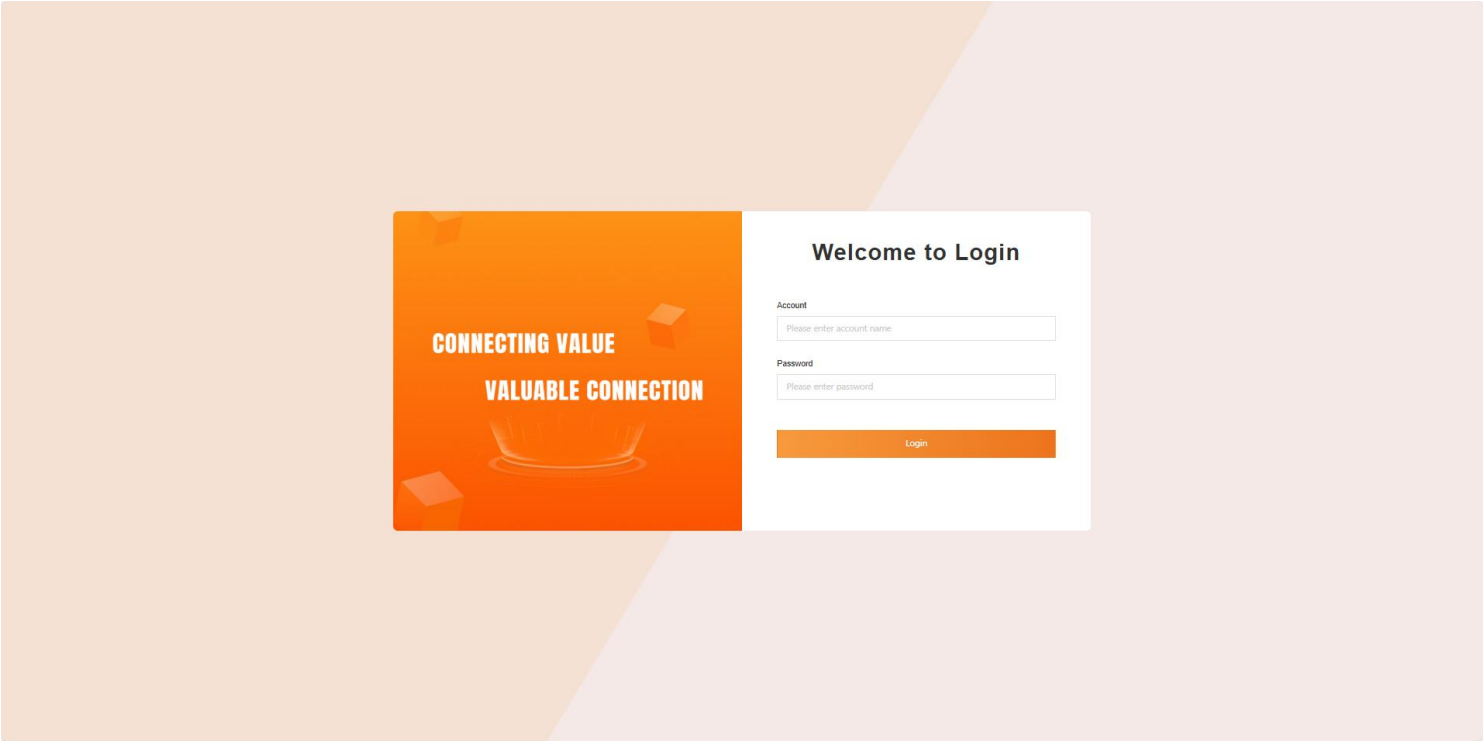
net cable*1

12V/1 A power adapter *1

4. ConfigurationM300

4.1. Connection

Connect the LAN port of the M300 to the computer and enter the built-in page of the M300 through the LAN port IP (192.168.1.1) in the browser of the computer. Enter your account password (default password is admin). Then click Login.



4.2. ConfigureIEC104protocol conversion

（1） Under the interface of Edge Computing-Protocol Conversion-IEC104, configure the basic configurations of Local Port Number, COT Size, K,W ,T0, T1, T2, T3 and Maximum Number of Connections, and click Apply.

·Server address:IP address of the machine

·Local port: custom.

COT Size: An important field used to identify the reason for the data transfer. Default is 2.

K: The maximum number of retransmissions before the host receives an acknowledgement during data transmission.

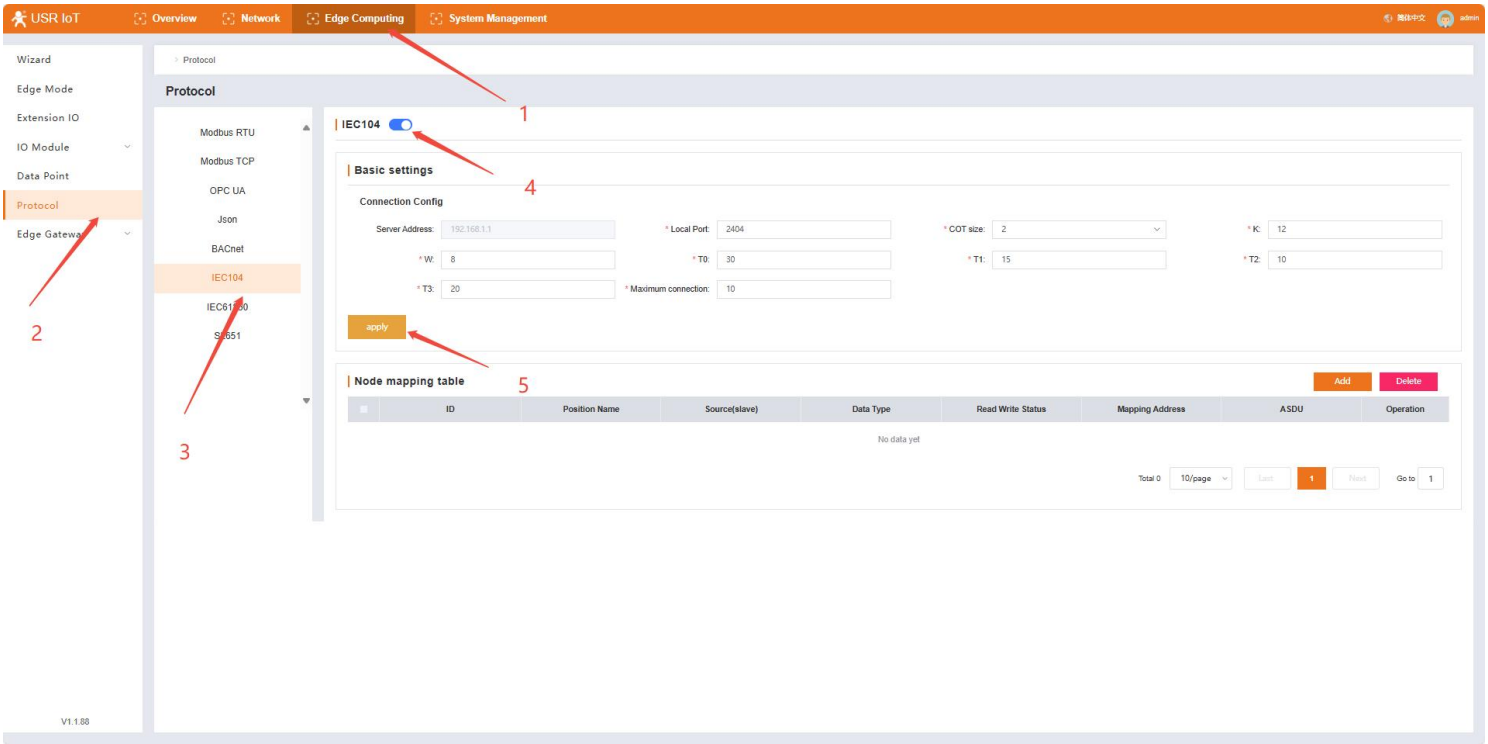
W: The maximum number of unacknowledged data frames a host can send before waiting for an acknowledgement.

T0: The longest time the host waits for an acknowledgement after sending a message.

T1: The longest time the slave sends an acknowledgement after receiving a message.

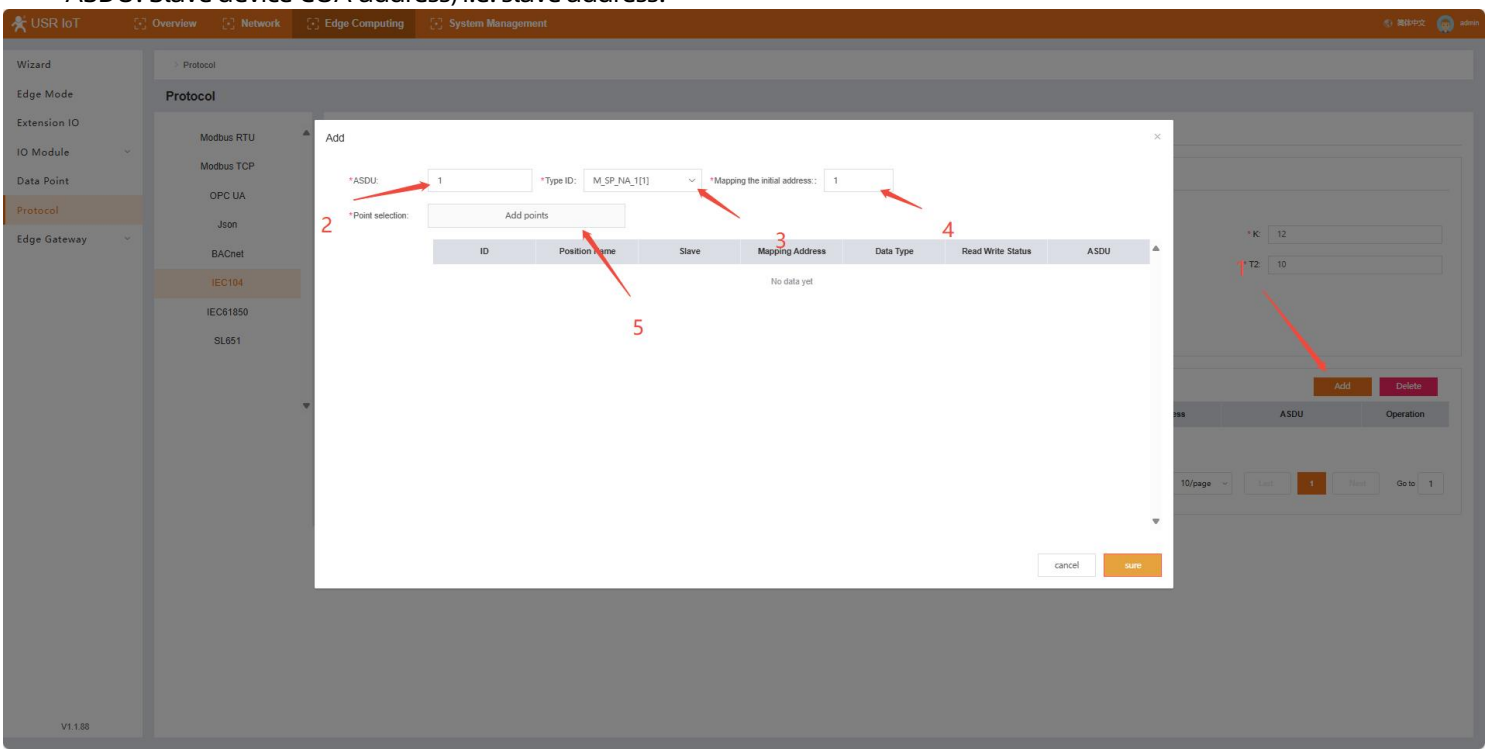
T2: The longest time the host sends a life-detection request without receiving any data or acknowledgement. Note: T2 < T1

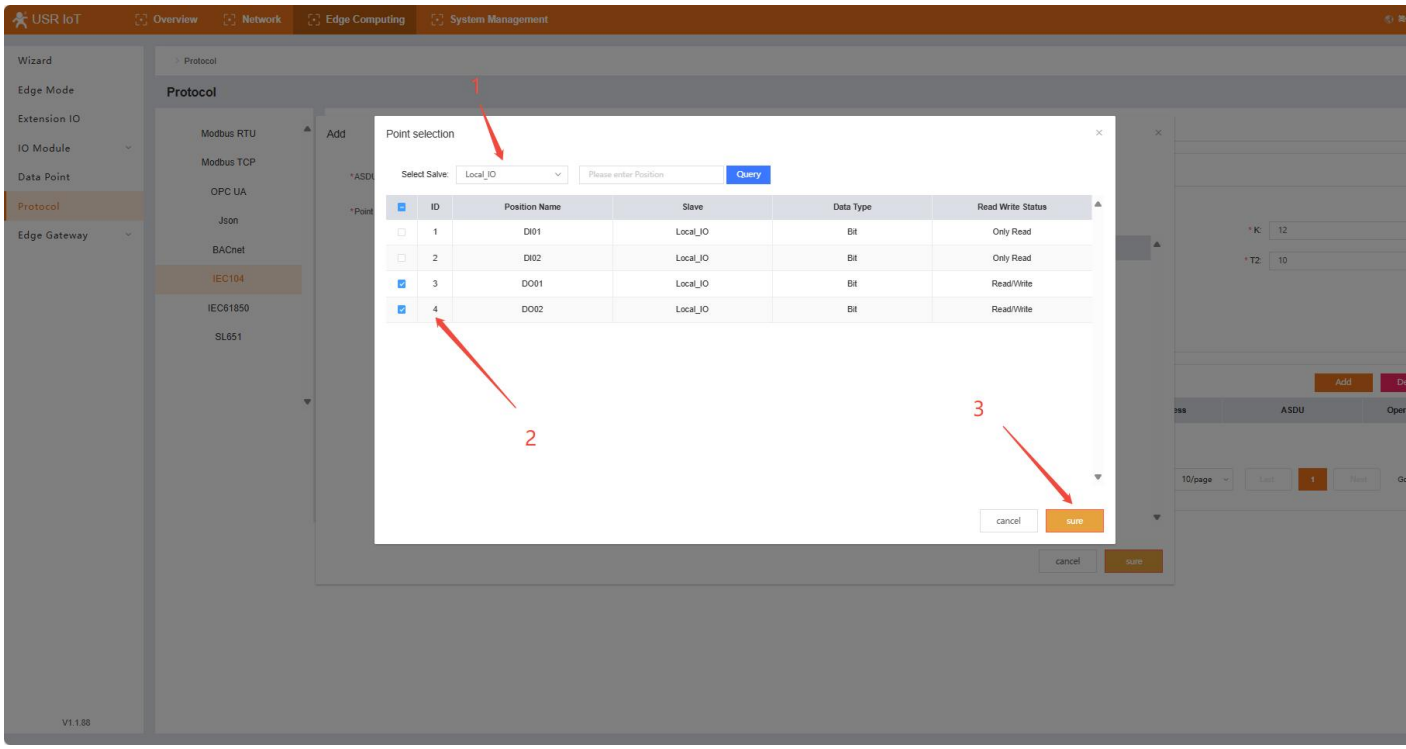
T3: The longest time the host waits for a response after sending a life-detection request.



(2) To add point mapping, click Add in Point Mapping Table, fill in ASDU of slave, select Type ID, fill in Mapping Initial Address, select Add Point in Point, select slave to add point, select point to add, click OK after configuration. Then restart. (This test converts the DO point of the M300 it self).

ASDU: Slave device COA address, i.e. slave address.





5. Analog Slave Software Configuration

5.1. Create links

In this test, IEC104 Client Simulator software is used to simulate the master station to collect data converted from M300 protocol. Click "New Connection", fill in the corresponding configuration, and click OK after configuration.

·Server IP address: M300's local IP address

Server port: Local port of M300.

COT Size: An important field used to identify the reason for the data transfer. Default is 2.

K: The maximum number of retransmissions before the host receives an acknowledgement during data transmission.

W: The maximum number of unacknowledged data frames a host can send before waiting for an acknowledgement.

T0: The longest time the host waits for an acknowledgement after sending a message.

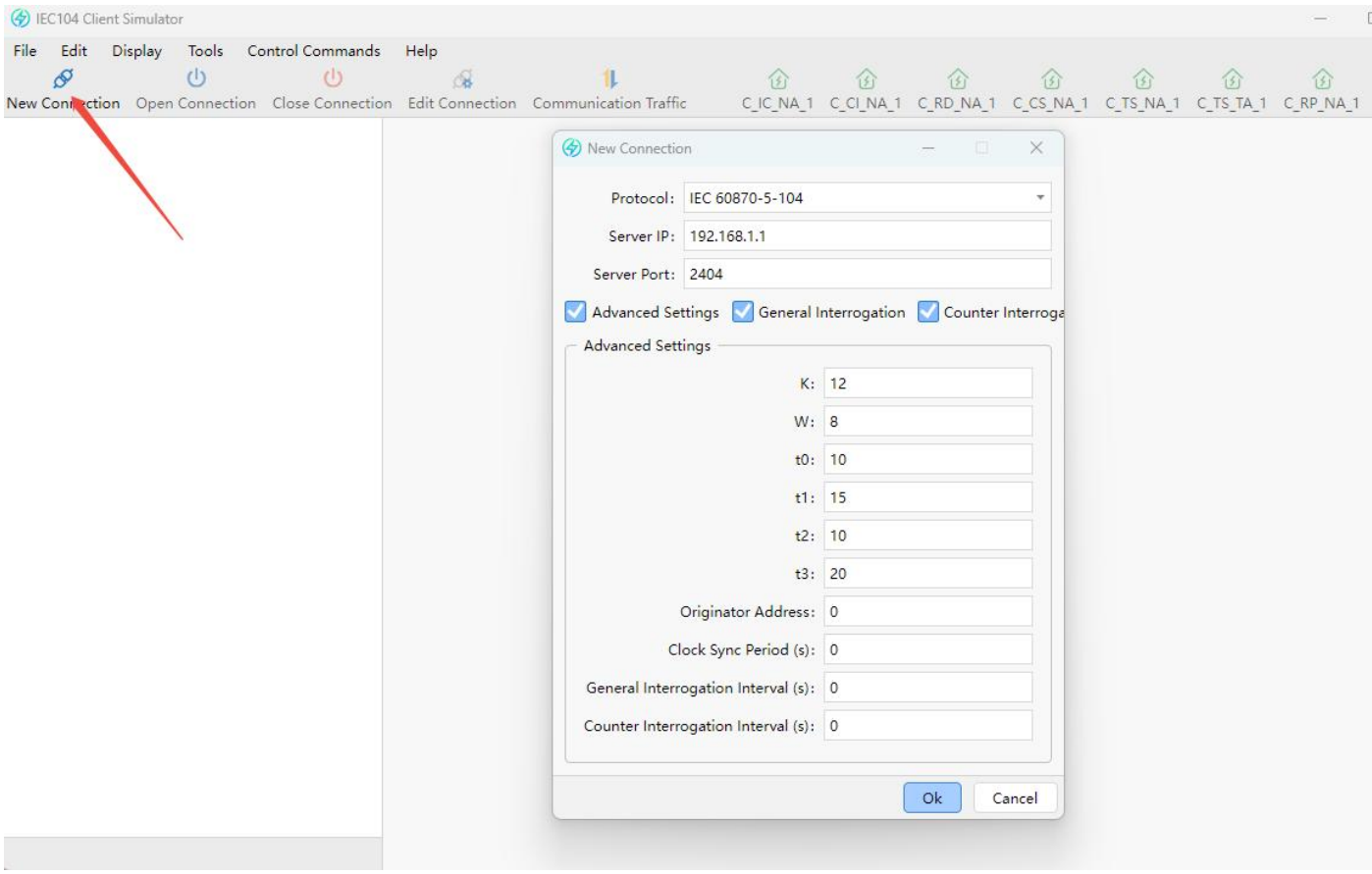
T1: The longest time the slave sends an acknowledgement after receiving a message.

T2: The longest time the host sends a life-detection request without receiving any data or acknowledgement. Note: T2T1<

T3: The longest time the host waits for a response after sending a life-detection request.

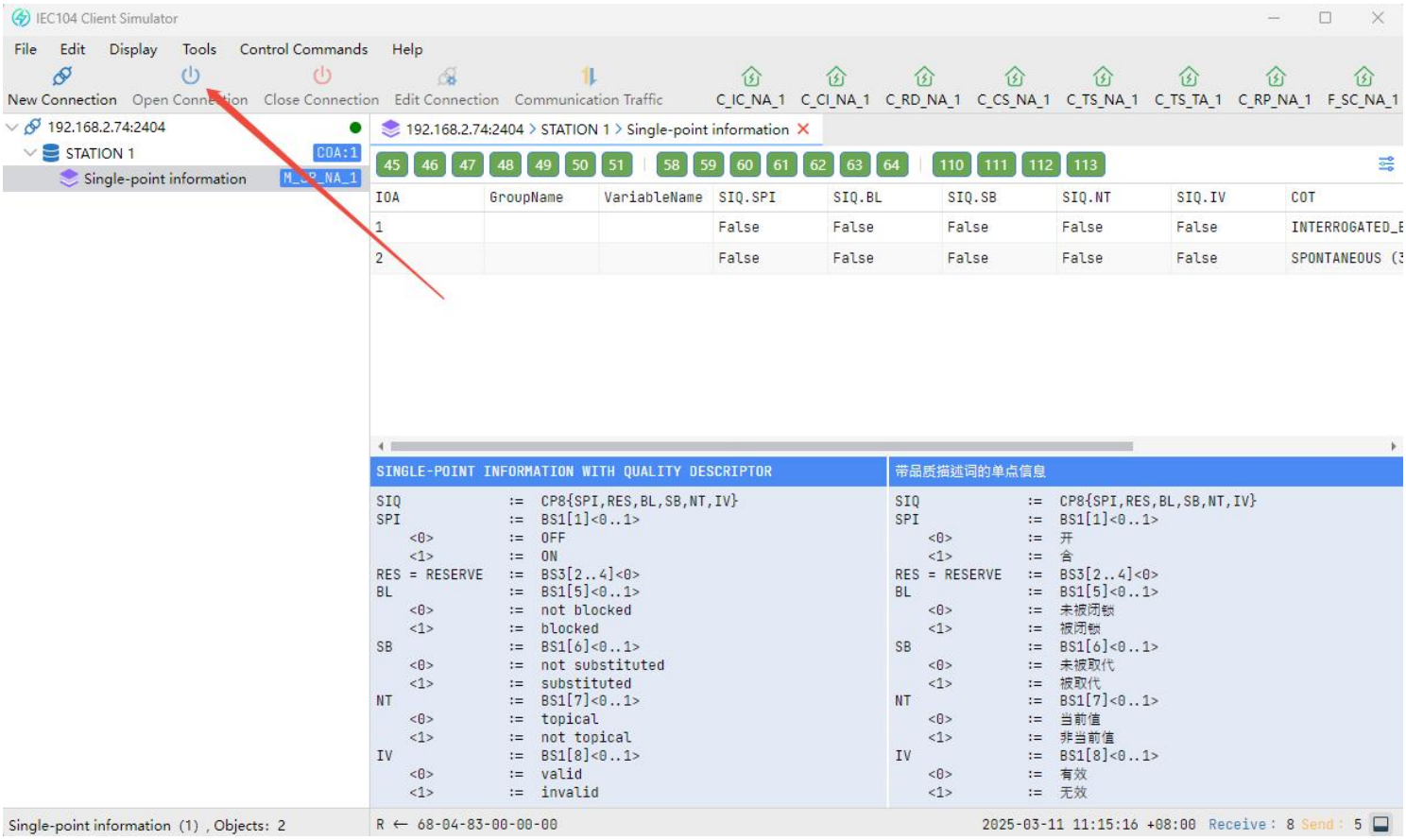
·Clock synchronization period: The time interval between the master sending a clock synchronization request to the slave.

Total call-up interval: The cycle time for the master to send a message requesting all data to the slave.

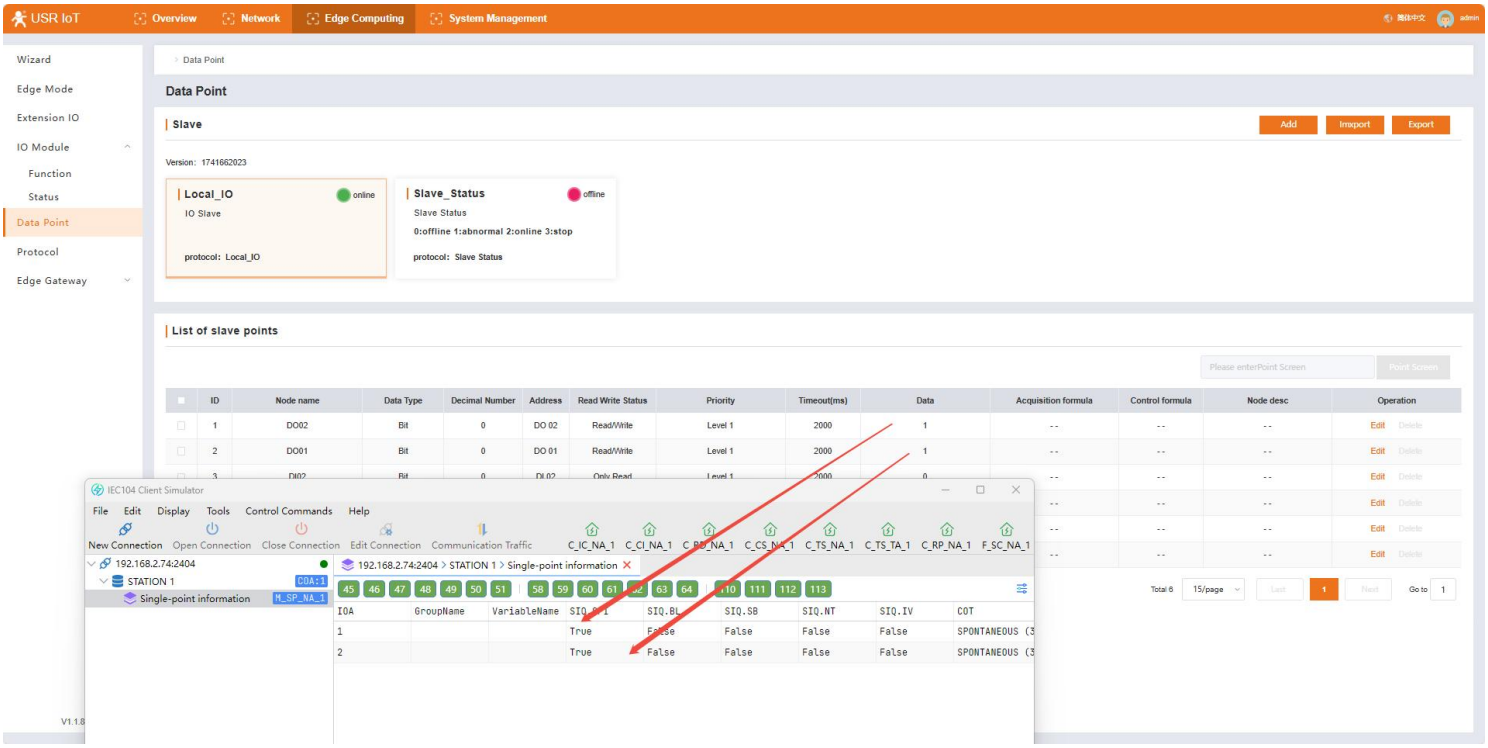


5.2. Open the collection point

Click on the established link, and then "open the connection", the corresponding point will be automatically generated below the link.



6. view results



7. Update history

Versions	Update content	Turnover time
V1.0.0	First edition	2025-03-11