The use manual of ODOT-S7PPI&MPI V2.0

SIEMENS SIMATIC® S7 Series PLC Ethernet Communication Processor

The use of manual

Catalogue

The product function described in this document is based on product firmware version V8.1.3.3.

1.ODOT-S7*PI's application

1.1 Product model

ODOT-S7*PI product has two models:ODOT-S7PPI and ODOT-S7MPI，and they are known as ODOT-S7*PI or ODOT-S7*PI module collectively.

- ODOT-S7PPI：is used for the Ethernet communication of SIEMENS SIMATIC S7-200 PLC（contain two types :CN and imported）;and according to the type of the X2 extended interface, it has two models:"Straight"and"Bridge".
- ODOT-S7MPI：is used for the Ethernet communication of SIEMENS SIMATIC S7 PLC（contain S7-200、S7-300、S7-400）; It has only one model:"Straight".

ODOT-S7*PI can also be used for the Ethernet communication of SIMENS SINUMERIK cnc system, and the controller of the system is SIMATIC S7 controller.

About order information ,see: Ordering information 。

1.2 Functions and applications

ODOT-S7*PI product has powerful communication function, additional software support and wide application range, and it has been checked in the projects of numerous customer.

1.2.1 Equipment information

At persent, manufacturing enterprise management towards integrated information-based direction development, and if you want to realize the production management in the workshop level,you need to build the equipment information network firstly,also can be called the networking equipment.For most enterprises,they usually require：1、Networking equipment can't affect the existing operation of the production;2、The transformation of the existing equipment is less;3、The duration of the networking equipment is short;4、The network communication is stable,and easy to maintain；5、It has very little investment;6、The system is open and extensible.

The function of ODOT-S7*PI product can fully meet the above requirements ,and ODOT-S7*PI of SiChuan LingDian has finished many enterprises' spinning workshop production management system of cotton textile industry，and in these sysytems,there are hundreds of ODOT-S7*PI module in charge of 24 hours real-time collecting the equipment's data and transmiting it reliably and high-speedly to the server for recording and analysising in the production management information center.

1.2.2 S7 series PLC's programming and debugging

We provide Siemens's programming driver, and it will be integrated in the Siemens PG/PC interface after been installed, including NetS7PD (PPI), NetS7PD(MPI) and NetS7PD (PROFIBUS), so the ODOT-S7*PI can also be used as Ethernet's programming tool for S7 series PLC.

About programming debugging，see: Rapid start of application、 driven's programming.

1.2.3 The automation projects of using Ethernet communication

Ethernet communication has many advantages compared to RS485, ODOT-S7*PI product support to communicate with almost all of the SCADA software and the man-machine interface in industrial control field, and up to 32 Ethernet connections of TCP client.

About SCADA and HMI's communication，see： **SCADA and the man-machine equipment's communication**

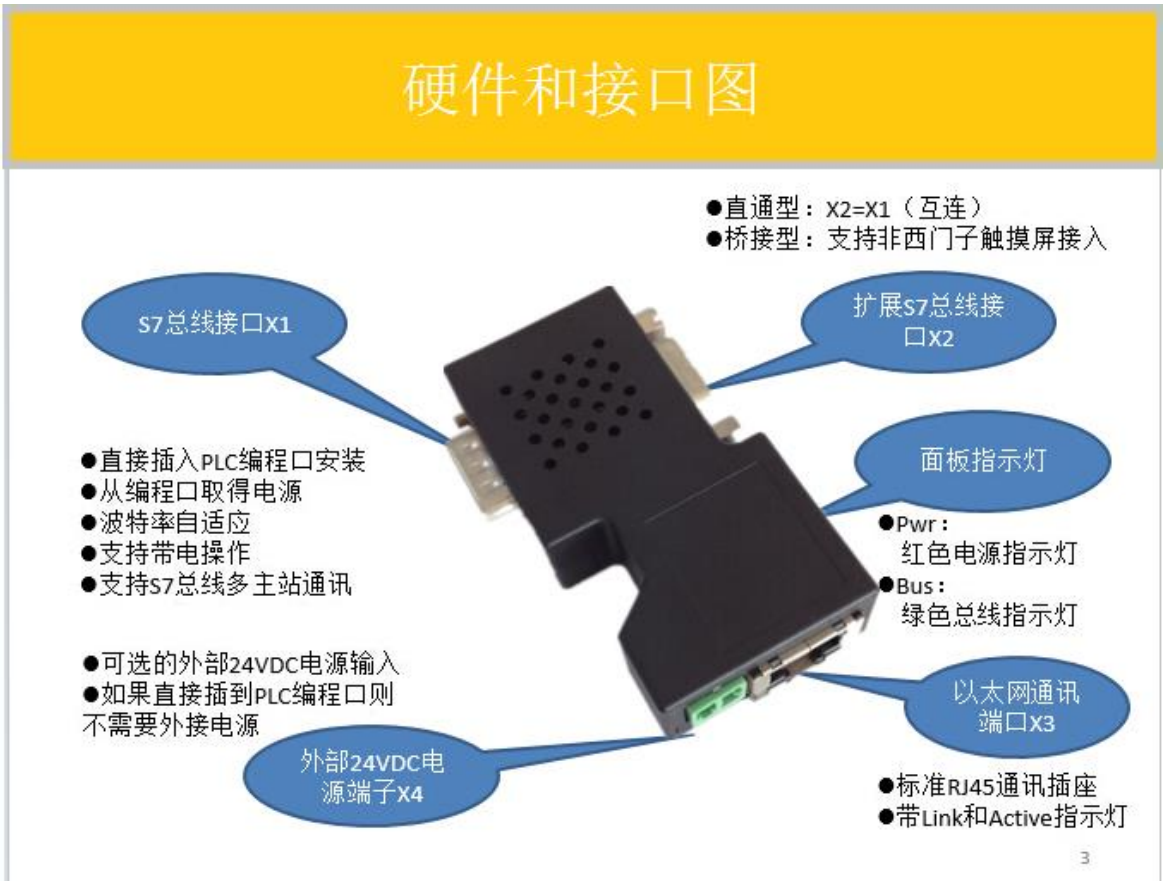
1.2.4 Communicating with S7PLC through ModbusTCP

ODOT-S7*PI project has integrated ModbusTCP server, Modbus register address is automatically mapped to the corresponding data area of the S7 series of PLC, and support to collect the data of PLC for multiple clients through ModbusTCP.

About ModbusTCP's communication，see:ModbusTCP's communication。

2.Hardware and interface

2.1 hardware and interface diagram



2.2 installation

The ODOT-S7*PI module is mounted directly on the communication port of plc.

2.3 interface description

ODOT-S7*PI has four interfaces:DB9 communication common port X1、DB9 communication master port X2、RJ45 communication port X3 and the external power supply terminal X4.

S7 bus interface X1

X1 interface is DB9 common port,and can be directly inserted into the communication port(PPI port、MPI port or PROFIBUS port) of PLC of S7 series.The definition of the communication port's pin is consistent with the PLC,and the 3 pin is RS485's B line、the 8 pin is RS485's A line and the 5 pin is the logic.The 7 pin is 24VDC power's positive of PLC,and the 2 pin is 24VDC power's negative of PLC.The 2/7 pin's 24VDC power is the default power supply input for ODOT-S7*PI.The X1 interface supports multiper band rate,include:9.6K、19.2K、45.45K、93.75K、187.5K、500K and 1.5Mbps.

Extended S7 bus interface X2

X2 interface is DB9 master port， and it is different in the "straight" and "bridge"：

- In the "straight",it is connected with X1 interface,and its interface definition is consistent with X1 interface,and it is used to connect the communication equipment(such as Siemens touch screen、CP5611 communication card) of Siemens company.
- In the "bridge",it is isolated with X1 interface,and only 3 pin、5 pin and 8 pin of interface definition are effective,and it is used to connect the communication equipment(such as MCGS、eView touch screen) of `non Siemens company,and its supported baud rate includes 9.6k、19.2k and 187.5k.

Ethernet port communication X3

Ethernet communication standard RJ45 port follows the Ethernet wiring standard.1 pin is TX+,2 Pin is TX-,3 pin is RX+ and 6 pin is RX-.It has a yellow link lamp and a orange active lamp.It supports 10/100M baud rate adaptive and line sequence(cross T568A/direct T568B)adaptive.The definition of the line sequence is:

Ethernet Cables

RJ45 Pin	Color	Function (100Mbit)	Function (1Gbit)	RJ45 pin for Straight cable (MDI, EIA/TIA568A)	RJ45 pin for Crossover cable (MDI-X, EIA/TIA568B)
1	Green	TX+ Data	Data A+	1	3
2	Green/White	TX- Data	Data A-	2	6
3	Orange	RX+ Data	Data B+	3	1
4	Blue	-	Data C+	4	4
5	Blue/White	-	Data C-	5	5
6	Orange/White	RX- Data	Data B-	6	2
7	Brown	-	Data D+	7	7
8	Brown/White	-	Data D-	8	8

The external 24VDC power supply terminal X4

X4 interface is ODOT-S7*PI's optional external 24VDC power input terminals.The power input's specification: 24VDC ±20%/100mA. If there is a power supply for PLC's communication port (usually does not need an external power supply). Please pay attention to the polarity mark when wiring,the terminal near the RJ45 interface is 24VDC positive input.

attention：

- At present, the hardware version of the ODOT-S7*PI does not support PLC's communication port and the external terminal's power supply at the same time, and long time dual power supply may damage the PLC's communication port!
- Ususlly,Siemens PLC's communication port has power of 24VDC supply; if ODOT-S7*PI has be inserted in the PLC's communication port ,but the Pwr power indicator light doesn't light,you should pull of ODOT-S7*PI module from the PLC ,and through the external power supply terminal X4 to separately access to 24VDC, if the Pwr lamp is not bright, the module has damaged, and the module needs to be repaired; if the Pwr lamp is bright, 24VDC power internal of PLC's communication port has damaged.

2.4 The description of indicator lamp

ODOT-S7*PI product has four LED indicators: the red Pwr power indicator and the green Bus bus indi cator located in the panel, the Yellow Link lamp and orange Active lamp located in the Ethernet X3 i nterface RJ45's socket .

The red Pwr power indicator lamp

Pwr indicator is used to indicate whether ODOT-S7*PI has power supply. Usually,the lamp should bright immediately after been inserted into the PLC's communication port. If Pwr lamp is not bright, you should pull down the module from the PLC, and through the external terminal to supply power , if Pwr lamp is still off, the module needs to be repaired .

operate	Pwr lamp's status	meaning	Troubleshooting

Insert the ODOT-S7*PI into the PLC's communication port	Always bright	Normal power supply	Trouble-free
	Extinguish, micro light, flashing	Abnormal power supply	Check the power supply or take it to be repaired

The green Bus indicator lamp

Bus indicating lamp is used to indicate the state of the S7 bus.Usually, after inserting the ODOT-S7*PI into the PLC's communication port, Bus lamp should be turned into continuous bright in a few seconds;Then, if there is data communication, Bus lamp will flashing alternately based on the communication frequency.

The implementation process of ODOT-S7*PI after having power supply： After the system is initialized,it will start detecting the baud rate of PLC's communication port automatically，When after locking the baud rate ,ODOT-S7*PI will check the S7 network whether there is the other equipment having the same station address ,if there is,Bus lamp will flashing in 1HZ.If there is not the other equipment having the same station address on the network， Bus lamp will be continuous bright.If the baud rate can't be locked,Bus lamp will flashing two times in 1HZ,and ODOT-S7*PI will try to lock the baud rate again.

If Bus lamp is extinct for a long time,there is internal fault in the system,and it needs to be repaired。

operate	Bus lamp's status	meaning	Troubleshooting
After ODOT-S7*PI having power supply	Continuous bright for a few seconds	The baud rate has been locked,the system is operating normally	Trouble-free
	Flashing in 1Hz	There is the same station address on S7 bus	Modifying ODOT's station address through Webpage or ODOT
	Flashing two times in 1Hz after interval seconds	Can't detect the baud rate	Checking the PLC's communication port, or consulting the Beichen's technology support
	extinct	System or indicator lamp has fault	Taking it to be repaired
In the process of communication	flashing	Representing the communication response's frequency	Trouble-free

The yellow Link indicating lamp of ethernet socket

The Link lamp is located above the RJ45 socket of Ethernet, and it is used to indicate the Ethernet's link has been established or not. The lamp will be continuous light after

ODOT-S7*PI accesses the network.

operate	Link lamp's status	meaning	Troubleshooting
ODOT-S7*PI has electricity and connected to the Ethernet network	Continuous light immidiately	The network has been connected	Trouble-free
	extinct	There is the failure of the system or the network	Checking the network connection of local and remote

The orange Active indicating lamp of ethernet socket

The Active lamp is located below the RJ45 socket of Ethernet，and it is used to indicate the Ethernet's data communication has been activated or not.If there is data communication,the Active lamp will flash。

operate	Active lamp's status	meaning	Troubleshooting
ODOT-S7*PI has electricity and connected to the Ethernet network	flashing	There is data communication with remote device	Trouble-free
	extinct	There is not data communicaton	Trouble-free
	Continuous light(non fashing quickly)	There is failtue on the Ethernet part	taking it to be repaired

3. Rapid start of application

When you first get the ODOT-S7*PI products, you can according to the following steps to complete the preliminary test of products.

3.1 The start of ODOT-S7PPI's application

3.1.1 Providing power supply、observeing the indicator light

Providing power supply to the Siemens S7-200CPU (such as CPU224CN),and inserting the ODOT-S7PPI into the CPU's DB9 communication port. ODOT-S7PPI's indicator light should be the correct state:the red Pwr lamp should be bright immediately,and the green Bus lamp should be turned into continuous bright in a few seconds.

The right status of the Indicator lamp indicates that ODOT-S7PPI has completed detecting the baud rate of the CPU's communication port (baud rate is locked) and has entered into the bus network of S7. We call this state is the ready state of ODOT-S7PPI. When ODOT-S7PPI enters the ready state,you can use the all communication of Ethernet port.

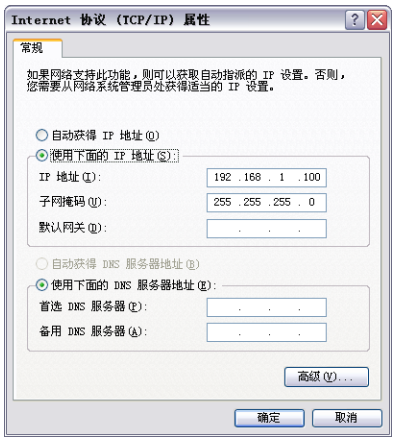
About the indicator light on the detailed description，See: The description of indicator lamp。

3.1.2 Connecting the computer, seeing the Web Webpage

The computer's network card is connected to the RJ45 port of ODOT-S7PPI with the Ethernet cable (cross or straight line) , and we observe the Yellow Link indicator light of ODOT-S7PPI's RJ45 port (the light is located above the RJ45's socket),and it should be continuous light. If the Link light is continuous light,ODOT-S7PPI has established an Ethernet connection.

If the computer has started the wireless network card ,please disabling the wireless network card (sometimes, it will affect the cable card's communication).

The IP of the computer's local network card has been set to 192.168.1.100.As shown below:



Running the Internet Explorer browser on the computer,and you should input: 192.168.1.188 (this is

the factory IP address of the ODOT-S7*PI)in the address bar, and input the account(admin) 、the password(admin) and click login in, the browser should be able to display the internal Web Webpage of ODOT-S7PPI , As shown below:

Web page is introduced in detail.See:4.1 built-in Web page。

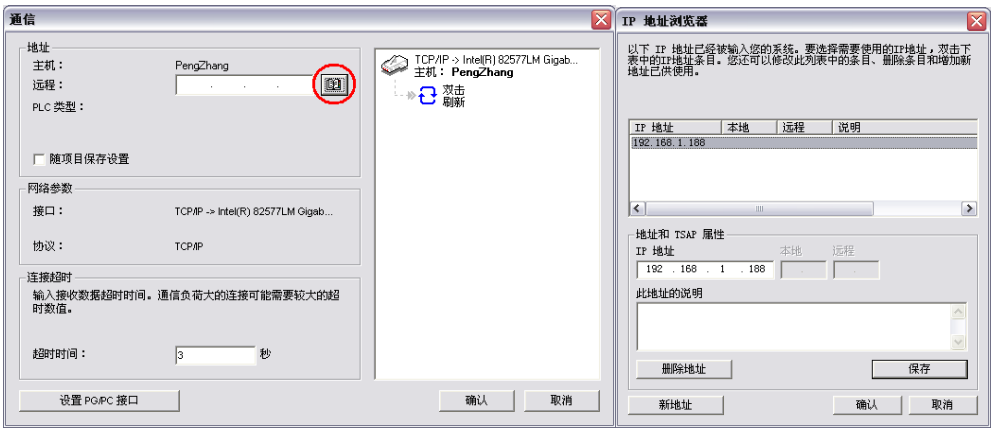
3.1.3 MicroWIN's programming, debugging

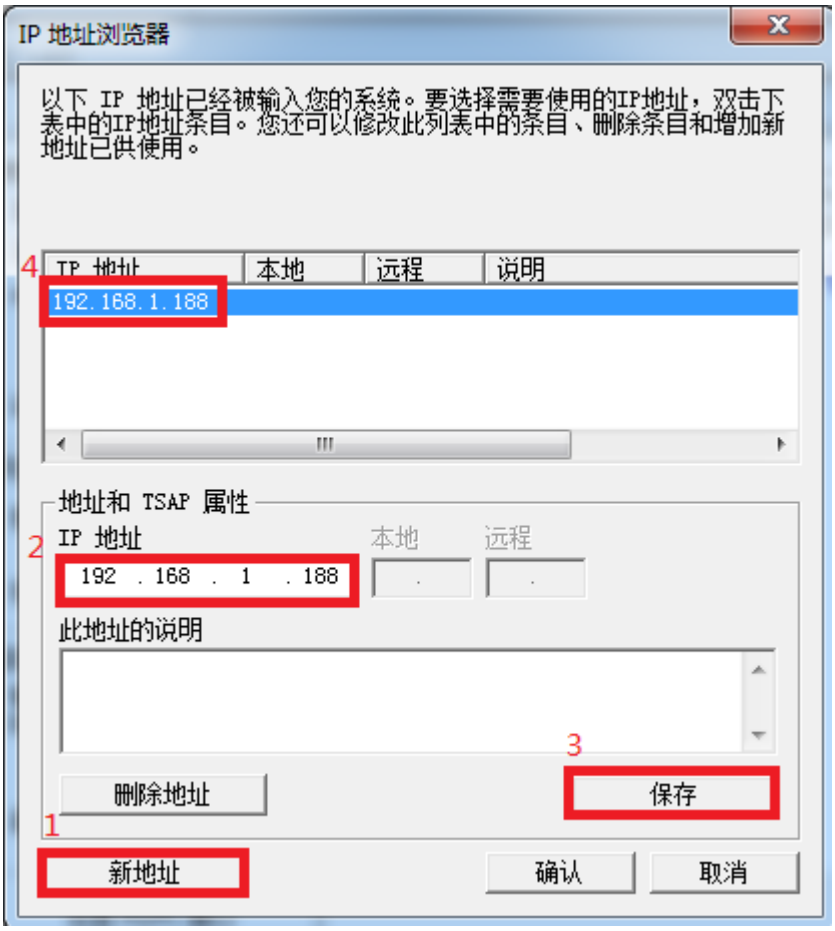
MicroWIN's programming has two methods, one is using SIEMENS's own S7TCP's drive (MicroWIN's version requires above V4.0 SP6); two is using ODOT's programming drive(installing the STEP7's programming drive of ODOT-S7*PI(NetS7PD) from the product's CD).

1, Using SIEMENS's own S7TCP's drive

Running MIcroWIN software, you should click "set PG/PCinterface"in the left navigation bar, and select "TCP/IP-> card" in the interface dialog box, and click "OK" button,as shown below:

You should click "communication" in the left navigation bar, and click the button  in the pop-up dialog box of communication,and input IP address of ODOT-S7*PI, as shown in the following figure:





Double clicking the icon"double click refresh"to find PLC, as shown below:

Selecting the PLC you have searched,and clicking the button "confirm".

attention：

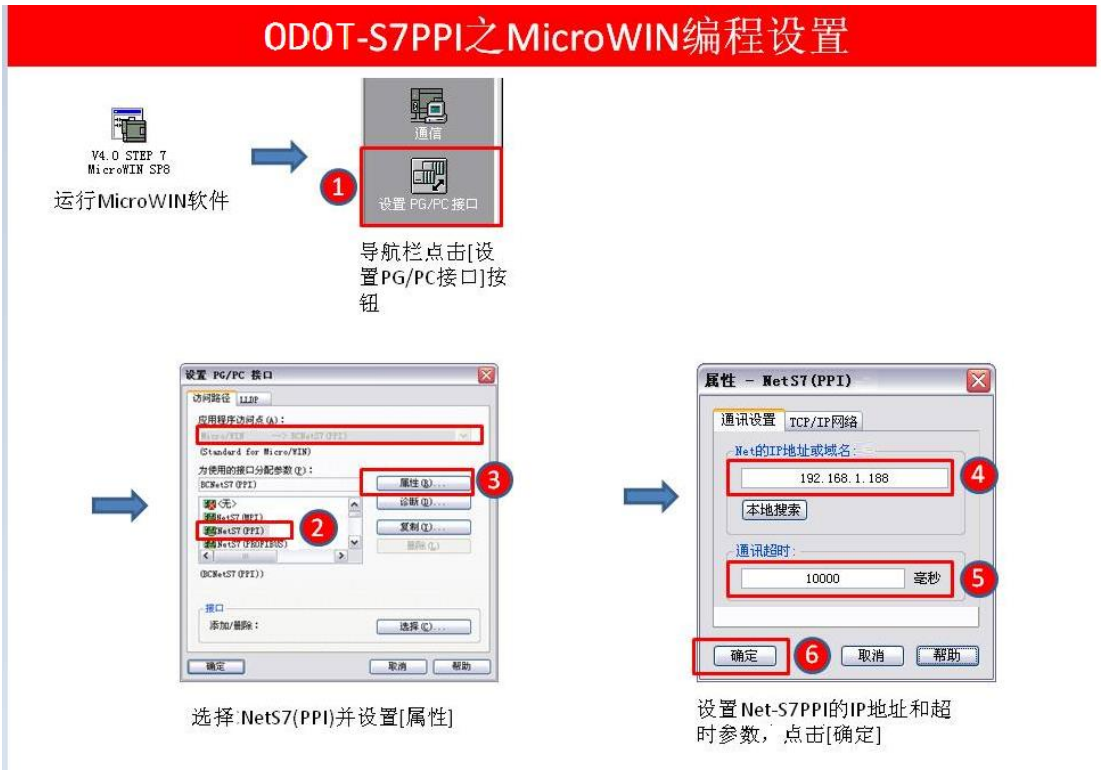
When using the S7TCP driver of Siemens, you need to pay attention to the settings of S7 interface parameter "ODOT S7TCP target PLC address"(default is 2),and usually the station address of PLC is 2；

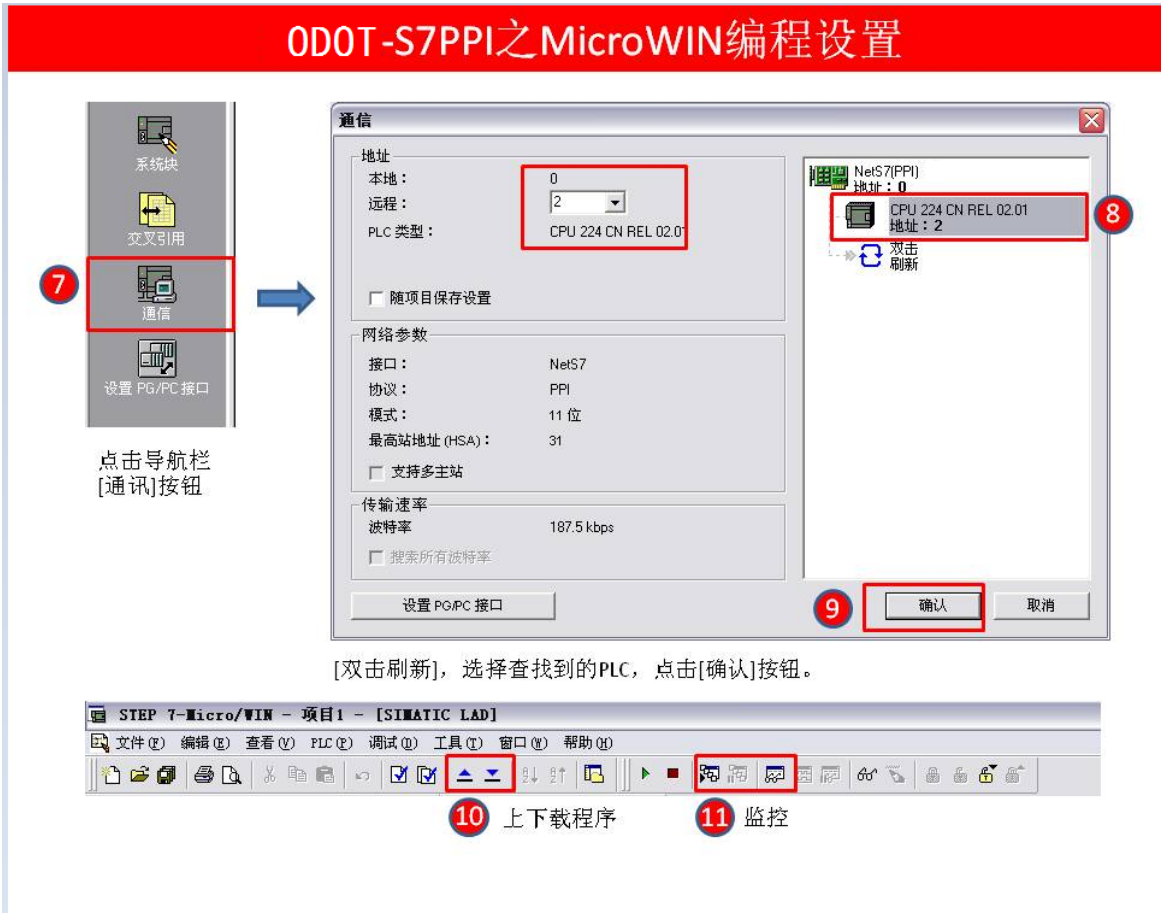
If you can't find the PLC, and the Bus lamp of module is continuous light, then it is likely that the station address of PLC is not 2. You can see the actual station address of PLC from the home page's "the table of slave station address" of the inside Web of ODOT , and then modify parameter "the S7TCP target address of PLC ",and search PLC again.

If you use the STEP7 driven programming of module,you need not to pay attention to the parameter "the S7TCP target address of PLC" , and the drive will search all the possible station of PLC automatically .

2、 Using the STEP7 driven programming of ODOT

According to the following steps to set:





When we use MicroWIN to upload and download or monitoring program,the green Bus lamp of ODOT-S7PPI will flash, the orange Active lamp of RJ45 (the light located below the RJ45's socket) will flash quickly.

Selecting the appropriate drivers for MicroWIN

1) When there is more than one ODOT-S7PPI in your network ,you should choose the S7TCP driver of Siemens, and input IP address of all the ODOT-S7PPI in the IP address book, you can find all of the PLC;

2) when using a ODOT-S7PPI to connect a plurality of S7-200PLC you want to use the ODOT drive,and you can also find all of the PLC

About programming driver Settings,See:STEP7、MicroWIN driven's programming 。

3.2 The start of ODOT-S7MPI's application

3.2.1 Providing power supply、observeing the indicator light

Providing power supply to the Siemens S7-300/400CPU（such as CPU315-2DP）,and inserting the ODOT-S7MPI into the CPU's DB9 communication port. ODOT-S7MPI's indicator light should be the correct state:the red Pwr lamp should be bright immediately,and the green Bus lamp should be turned into continuous bright in a few seconds.

The right status of the Indicator lamp indicates that ODOT-S7MPI has completed detecting the baud rate of the CPU's communication port (baud rate is locked) and has entered into the bus network of S7. We call this state is the ready state of ODOT-S7PPI. When ODOT-S7MPI enters the ready state,you can use the all communication of Ethernet port.

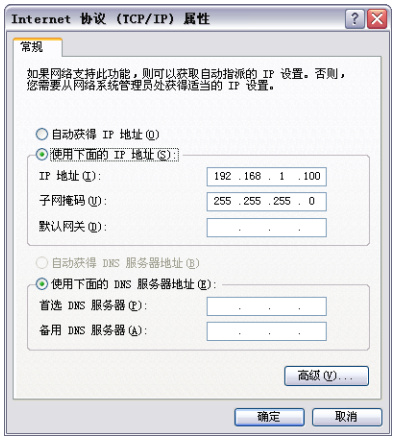
About the indicator light on the detailed description，See: The description of indicator lamp。

3.2.2 Connecting the computer, seeing the Web Webpage

The computer's network card is connected to the RJ45 port of ODOT-S7MPI with the Ethernet cable (cross or straight line) , and we observe the Yellow Link indicator light of ODOT-S7MPI's RJ45 port (the light is located above the RJ45's socket),and it should be continuous light. If the Link light is continuous light,ODOT-S7MPI has established an Ethernet connection.

If the computer has started the wireless network card ,please disabling the wireless network card (sometimes, it will affect the cable card's communication).

The IP of the computer's local network card has been set to 192.168.1.100.As shown below:



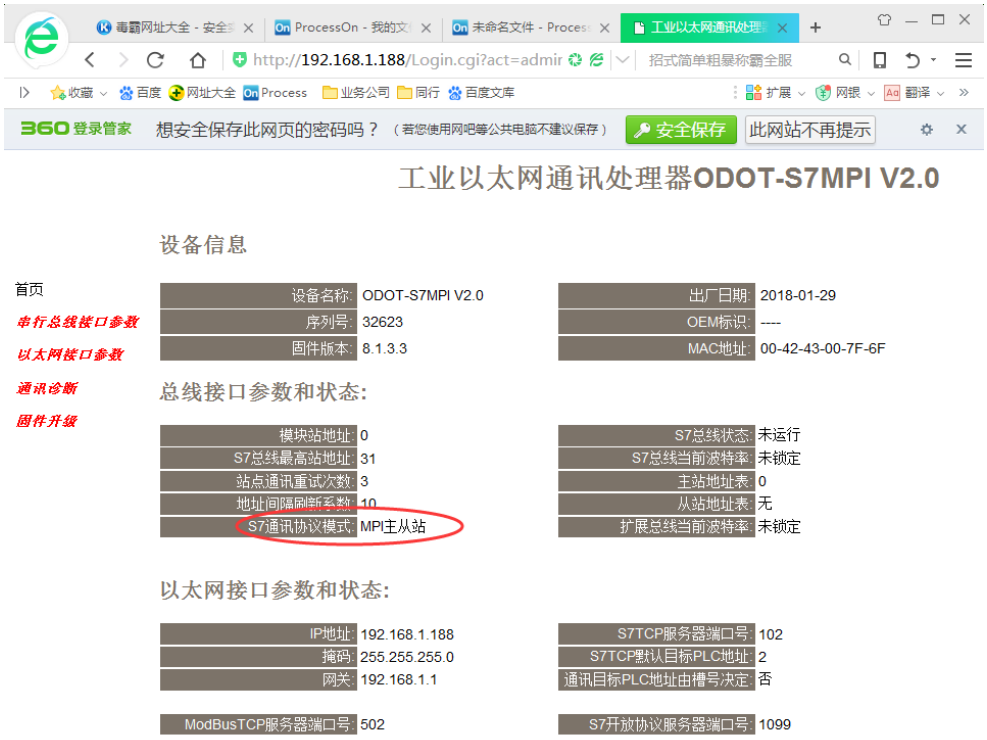
Running the Internet Explorer browser on the computer,and you should input: 192.168.1.188 (this is the factory IP address of the ODOT-S7*PI)in the address bar, and input the account(admin) 、the password(admin) and click login in, the browser should be able to display the internal Web Webpage of ODOT-S7PPI , As shown below:

Web page is introduced in detail.See:4.1 built-in Web page。

3.2.3 Setting the protocol model of ODOT-S7MPI

ODOT-S7MPI can work in the mode of PPI (the same as ODOT-S7PPI, used for S7-200), and it can also work in the mode of MPI or PROFIBUS(for S7-300/400),and the default settings of factory is

the mode of MPI Master-Slave Station, and pay attention to "the mode of S7 communication's protocol" in the home page of web. If it is the mode of "PPI", clicking the "the parameters of Serial bus interface "on the left navigation bar, and set it to the mode of "MPI Master-Slave Station", and clicking the button of [confirmed]. As shown below:



Attention:how to choose the mode of S7 communication's protocol:

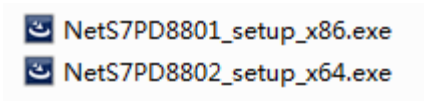
When inserted in the PPI communication interface of S7-200: select **PPI mode**;

When inserted in the PPI communication interface of S7-200 (with reading and writing communication)or inserted on EM277: select the **MPI slave station mode**;

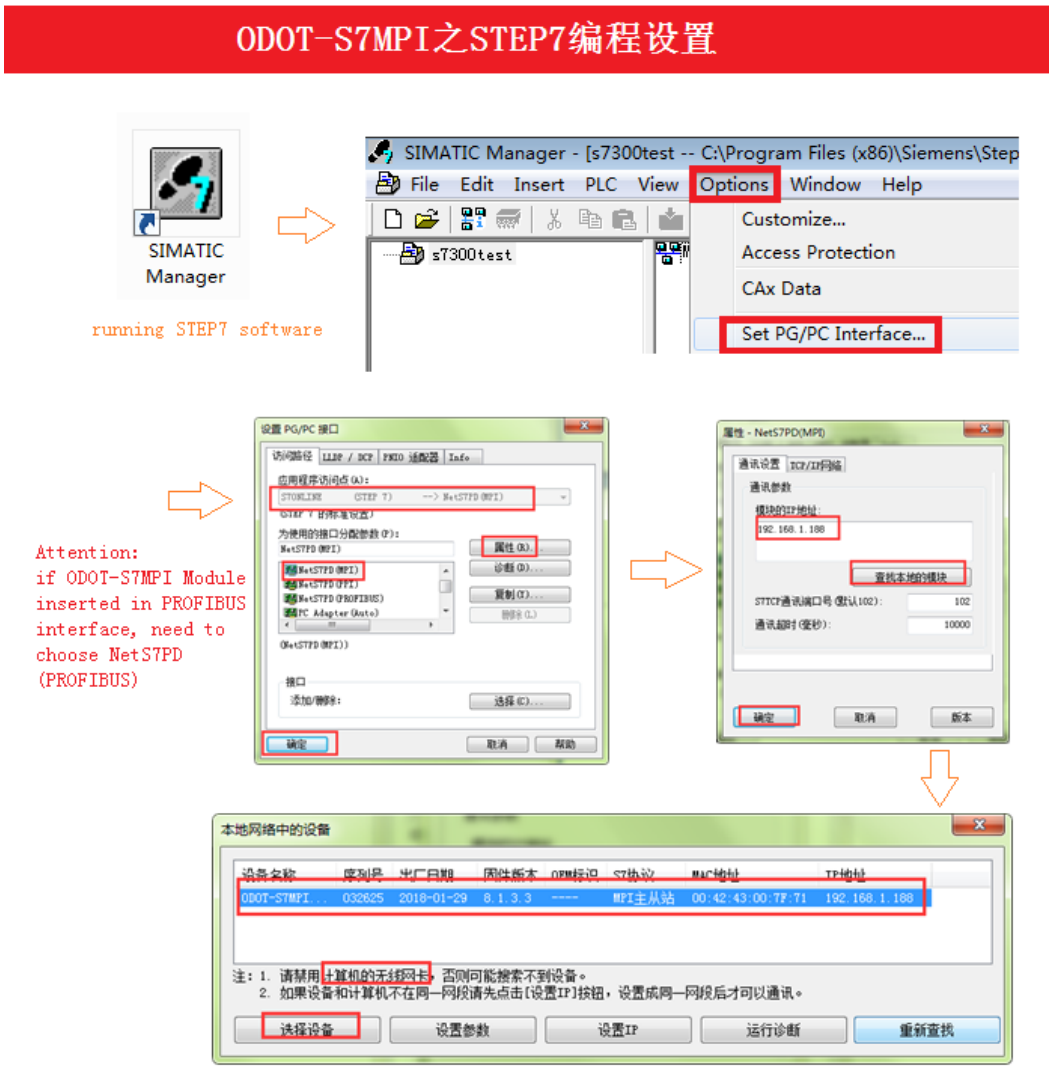
When inserted in the MPI communication interface of S7-300: select the **MPI master-slave station mode**;

When inserted in the PROFIBUS communication interface of S7-300: select **PROFIBUS mode**.

3.2.3 STEP7's programming, debugging

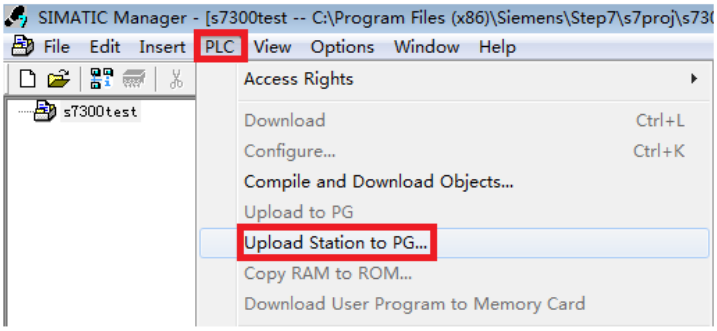
Installing the STEP7's programming driver NETS7PD 

of ODOT-S7*PI from the product's CD ,and running the STEP7 software after installation. Tested according to the following steps:

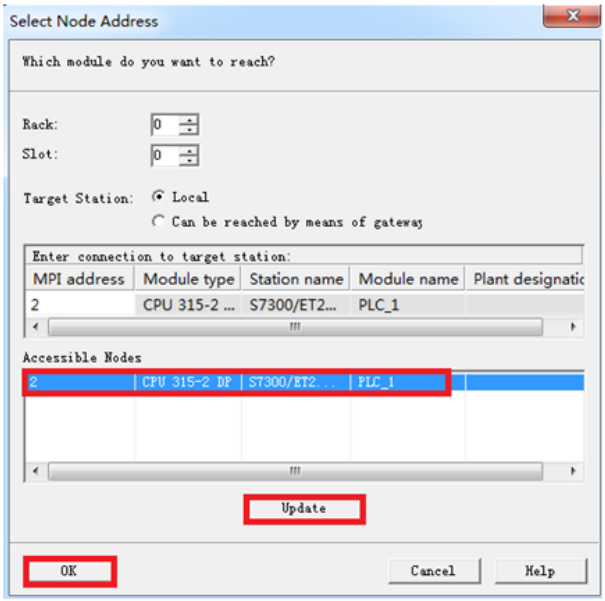


ODOT-S7MPI之STEP7编程设置

choose meun:File-New,to create a new project;
choose menu:PLC-Upload Station to PG...,to execute a program to upload.



choose CPU and click on the OK button,STEP7 will upload the program.



When you use the STEP7 to upload or download ,monitor program, the green Bus lamp of ODOT-S7MPI will flashing, the orange Active lamp of RJ45 (the lamp located below the socket of RJ45) will flash quickly.

About programming driver Settings ,See:STEP7、MicroWIN driven’s programming。

4.Product's related software

ODOT-S7*PI's related software:

Built-in Web page: the configuration and diagnostics of the basic parameters;

NetDevice software: the configuration and diagnostics of the comprehensive parameter;

NetS7PD's driven programming： ODOT-S7*PI's driven programming of STEP7、MicroWIN;

Among them, NetDevice software can be installed together through the product's CD\software installation\SETUP.EXE . NetS7PD can be installed through the product's CD\STEP's driven programming.

4.1 Built-in Web page

ODOT-S7*PI product is built in the simple Web page, for the configuration and diagnostics of the basic parameters. When the computer connects to ODOT-S7*PI through the ethernet, you can input IP address of ODOT-S7*PI in the IE browser to view the built-in Web page.

4.1.1 The home page

The default displayed page is the home page, as shown below：

The basic information of the device：Preset from the factory;the default identification of OEM is "----", can also be specified by the customer when ordering.

The parameters of serial bus's interface：Show the current setting parameters of the S7bus's interface.

The state of S7 bus's interface：Including the current S7 bus's protocol mode of ODOT-S7*PI, the S7 bus's state, the address table of master and slave and the state of automatic baud rate.

Ethernet interface's parameters：Show the current setting of the Ethernet interface's parameters.

4.1.2 The parameters of serial bus's interface

setting parameters of the serial bus 's interface of ODOT-S7*PI,as shown below：

Click on the confirmation, module will restart

Module station address：ODOT-S7*PI's default station address is 0. . This address can not be as the same as the station address of other equipment of S7 bus,must be unique.According to the default definition of Siemens,the address of programming device PG/PC is 0;the address of touch screen TP/OP is 1; the default address of CPU is from 2 onwards.

S7 bus's highest station address：Specifying the possible highest station address of S7 bus, and the default address is 31; ODOT-S7*PI will search the PLC equipment on the network according to the parameters.

Site communication's retry count：the retry count of ODOT-S7*PI when the error occurs on communication,and the default is 3.

The coefficient of address's interval refresh ： the coefficient affects the speed of ODOT-S7*PI searching the other equipment, and the default is 10.

the mode of S7 communication's protocol: protocol mode:

When inserted in the PPI communication interface of S7-200: select **PPI mode**;

When inserted in the PPI communication interface of S7-200 (with reading and writing communication)or inserted on EM277: select the **MPI slave station mode**;

When inserted in the MPI communication interface of S7-300/400: select the **MPI master-slave station mode**;

When inserted in the PROFIBUS communication interface of S7-300/400: select **PROFIBUS mode**.

S7 bus baud rate detection automatically:The default for "open".in "open" state no need to set S7 bus--> baud rate, will automatically identify the PLC communication port baud rate.

Expand bus interface baud rate of automatic detection: the default for [open], in [open] state without setting the expansion bus (HMI)-->baud rate, will automatically identify the HMI communication port baud rate, this parameter is meaningful only for the bridge type module.

Advanced Settings:

S7 bus--> baud rate:only while [S7 bus baud rate detection automatically] status is [close], according to the connection of the PLC communication port baud rate,to set the parameters manually.

Expand bus (HMI)-->baud rate: only while [Expand bus interface baud rate of automatic detection] status is [close], according to the connection of the HMI communication port baud rate,to set the parameters manually. this parameter is meaningful only for the bridge type module.

When you have changed the above parameters, please click [confirmed] button, the ODOT-S7*PI will be reset and restarted. Please refresh the home page in the address bar and view the settings of S7 interface's parameter is valid.

4.1.3 The parameters of Ethernet's interface

Setting ODOT-S7*PI's parameters of Ethernet's interface, as shown below：

Setting the IP address, subnet mask and gateway settings (the router's address);

the destination PLC's address of S7TCP：The default is 2.When configuration software(kingview、WINCC) communication with PLC by the S7TCP Drive,this parameter must consistent with PLC station address.

PLC communication target address is determined by the slot number: The default is [close]. Namely,[the destination PLC's address of S7TCP]parameter is effective.if this parameter is [open], the destination PLC's address of S7TCP is determined by the slot number.

Advanced Settings:

S7TCP Server port: The default is 102.

ModbusTCP port: The default is 502.

Warning!

It is forbidden to enter illegal IP address like 0.0.0.0, or ODOT-S7*PI's Ethernet port will failure!

When you have changed the above parameters,please click [confirmed] button, the ODOT-S7*PI will be reset and restarted. Please come back to the address bar and input a new IP address to refresh the home page and view the settings of parameters of Ethernet's interface are valid.

4.1.4 Communication's diagnosis

Providing the basic information of diagnostic As shown below:

S7Bus -->the total number of communication's request：All number of communication's request sent to PLC;

The times of correct response： the number of correct response in response to PLC;

The times of error response：the number of incorrect response sent from PLC;

Note: for S7-300/400's communication, a communication request may result in multiple correct response. Therefore the times of correct response and the times of error response will be greater than the total number of requests .

Expand bus-->the total number of communication's request：All number of communication's request HMI send to module;

The times of correct response： the number of correct response in response to module;

The times of error response：the number of incorrect response sent from module;

The total number of Ethernet's communication connection：All connection's number of Ethernet's client;

Ethernet TCP connections: all EtherNet client connections.

running time:the operation running time,after power on.

The last time of the internal fault： the failure of system of ODOT-S7*PI, should not generate fault under normal conditions;

4.2 NetDevice software

NetDevice software is the configuration software of the equipment's parameter of ODOT-S7*PI. Features include: equipment's searching, parameter's configuring, operation's diagnosing and ODOTS7 protocol's testing; the following chart:

Before Search equipment,you should select the network interface.

If the computer and the module is through the wiring, please select "local connection";

If the computer and the module is through a wireless connection, please select "wireless network connection".

[Search equipment]: Click 搜索设备 button, can display all the ODOT - S7MPI module on the network, we can see some basic information module, including: serial number, production date, firmware version, IP address, subnet mask, gateway and other information.

[Set IP address]:When the ODOT has been searched is not in the same subnet with the computer,you need to set its IP to the same subnet with the computer firstly. Click 设置IP地址 button, Modify the parameters of "IP address"、"subnet mask"、"gateway", Change is completed，click "Settings" button to save the parameters.

[Modify device's parameters]:

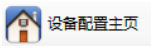
Click 修改设备参数 button, Setting the working's parameters, including the parameters of S7 bus's interface, the parameters of Ethernet's interface, Modbus TCP address mapping table, as shown in the following figure:

attention：the interface of data exchange is invalid.

The parameters of **S7 bus's interface**, the parameters of **Ethernet's interface** and the parameters of the built-in Web page of ODOT-S7*PI are the same，See: Built-in Web page。

Modbus TCP address mapping table: Built into the default address mapping table, mapping rules for all region (0 ~ 65535) : It is recommended to use the default address mapping table.

[the diagnosis of equipment's operation]：Providing the detailed diagnostic's information of operation, as shown in the following figure：

[the configuration page of device]：Click 

button,Calling the IE browser to display the built-in Web page of ODOT-S7*PI .

[the communication test of ODOTS7]：Click 

button the dialog box used to test the ODOTS7's protocol.具体请见 ODOTS7 协议规范。

4.3 NETS7PD driven programming

NETS7PD is the driven programming of ODOT-S7*PI，detailed instructions see: STEP7、MicroWIN driven’s programming 。

5.STEP7、MicroWIN driven’s programming

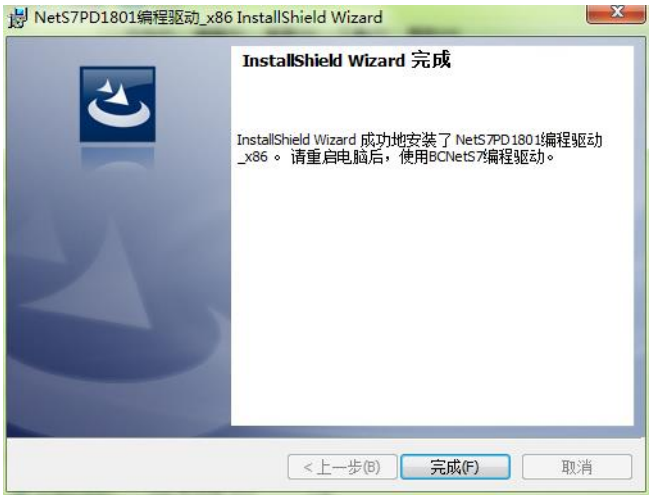
5.1 NETS7PD’s Installing and uninstalling

5.1.1 Application conditions

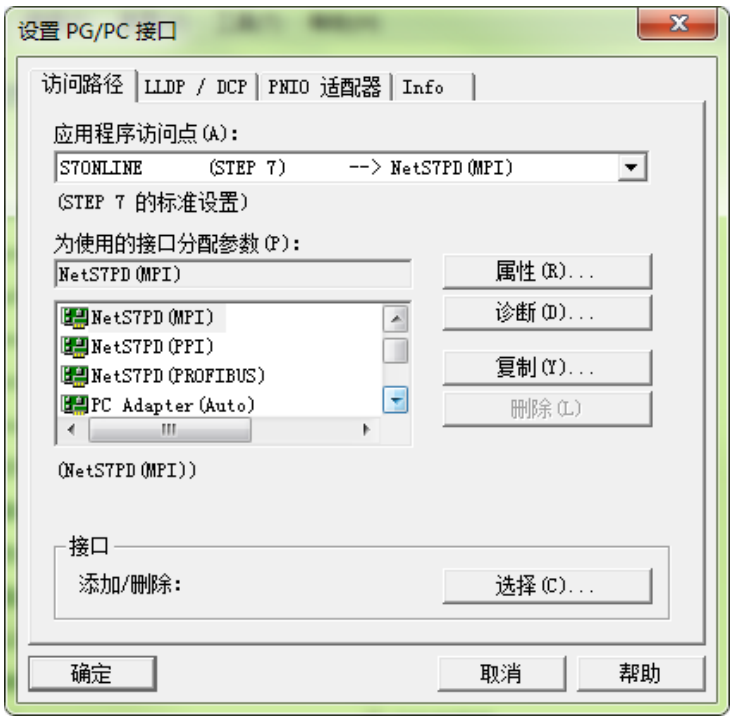
If you want to use the NETS7PD driver, the computer must install the SIEMENS's STEP7 software or MicroWIN software firstlly, the icon of "set PG/PC interface" should be exist in the control panel, as shown below:

5.1.2 Install

NETS7PD (NETS7PD64 is 64 bit's driver) can be installed in the file of "product's CD\STEP7's driven programming", and it will pop-up a dialog box after the success of the installation , as shown in the following figure:

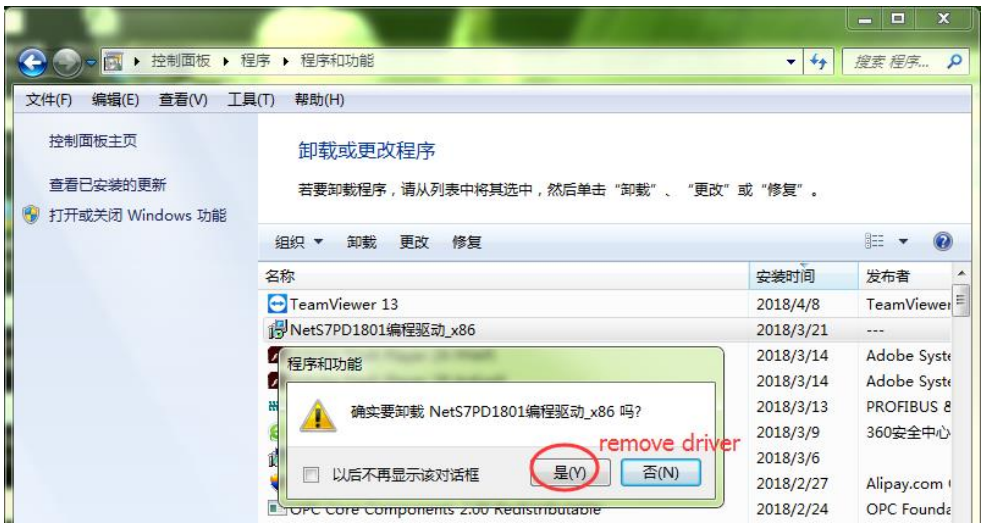


It will appear three communication path: NetS7 (PPI), NetS7 (MPI) and NetS7(PROFIBUS) in the "set PG/PC interface" after the installation is complete . The following diagram:



5.1.3 uninstall

You can uninstall NETS7PD in the“add or remove programs” in the control panel, and select "NETS7PD" and click the "Y" button, It will deleted successfully ,as shown below:



5.2 The operating environment of NETS7PD

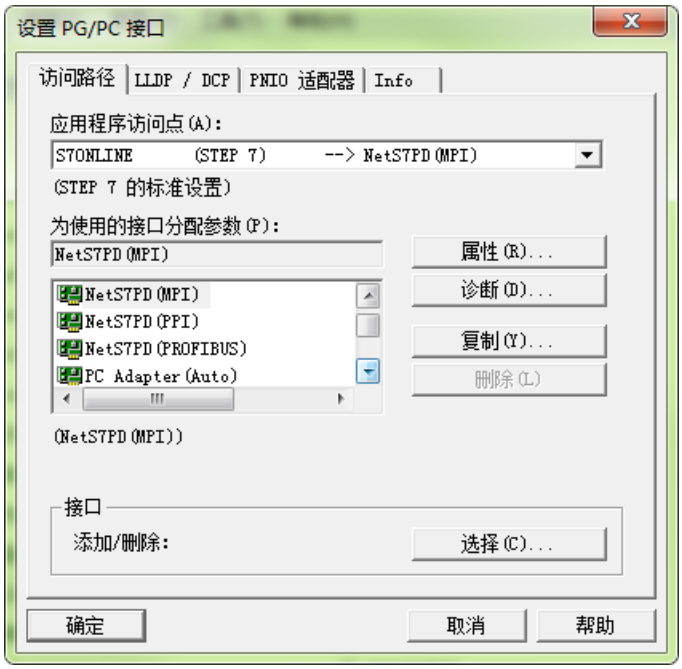
The operating environment of NETS7PD driver is Windows2000,WindowsXP and 32, 64 mode of Win7. In the environment of Win7’s 64 bit,you should install NETS7PD64Setup1400.exe (you need have administrator’s privileges to install).

The NETS7PD driver supports all software that can access to Siemens’s PG/PC interface, such as:

- STEP7 V5.3~5.5,STEP7 V11 is not supported；
- MicroWIN V4.0 SP3~SP9
- WINCC V5、V6、V7

5.3 NETS7PD’s settings

Double clicking "setting PG/PC interface" in the control panel,and selecting “the application’s access point" in the dialog box , as shown below:

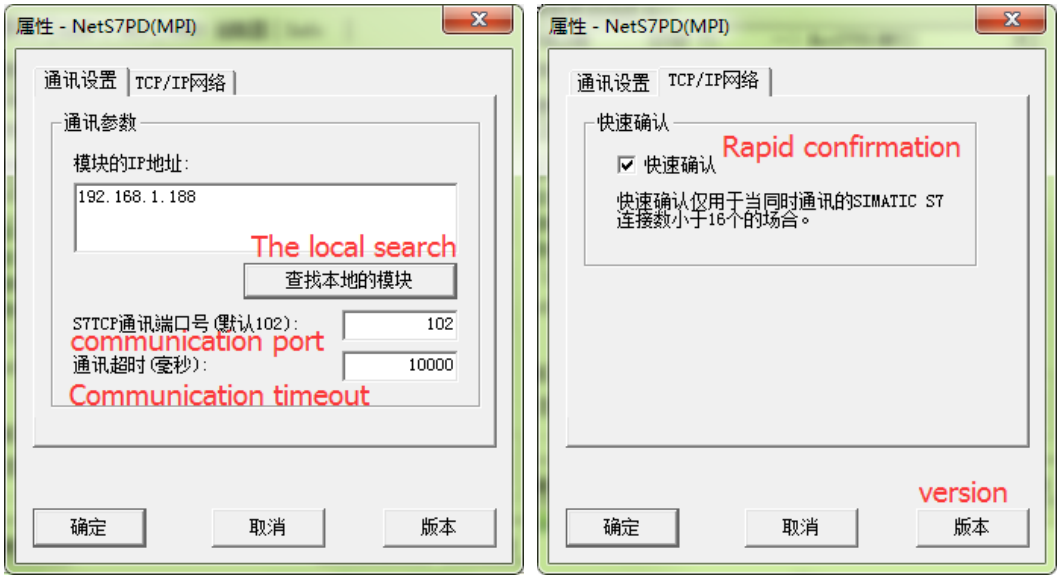


Note：

You can also enter into the "setting the PG/PC interface" in MicroWIN software or STEP7 software, the difference is that "the application's access point" will be fixed for MicroWIN or S7ONLINE (STEP7), is not allowed to modify.

Among them, MicroWIN, MPI (WINCC), S7ONLINE (STEP7) represents the different application respectively. And then in the "distributing the parameters of using interface",you can select NetS7 (PPI), NetS7 (MPI) or NetS7(PROFIBUS). For MicroWIN's programming, you should choose NetS7 (PPI);For WINCC or S7ONLINE (STEP7), you should choose NetS7 (MPI) or NetS7(PROFIBUS), depending on the communication port of S7-300/400PLC that ODOT-S7*PI inserted into: if ODOT-S7*PI is inserted into the communication port of MPI, you need to choose NetS7 (MPI); if it is inserted into the communication port of PROFIBUS , you need to choose NetS7(PROFIBUS).

Clicking the [attribute] button on the right side after you choice a good access point, it will pop-up a dialog box, as shown in the following figure:



The IP address or domain name of module：entering in the IP address of module domain name or the IP address of remote communication router or domain name .

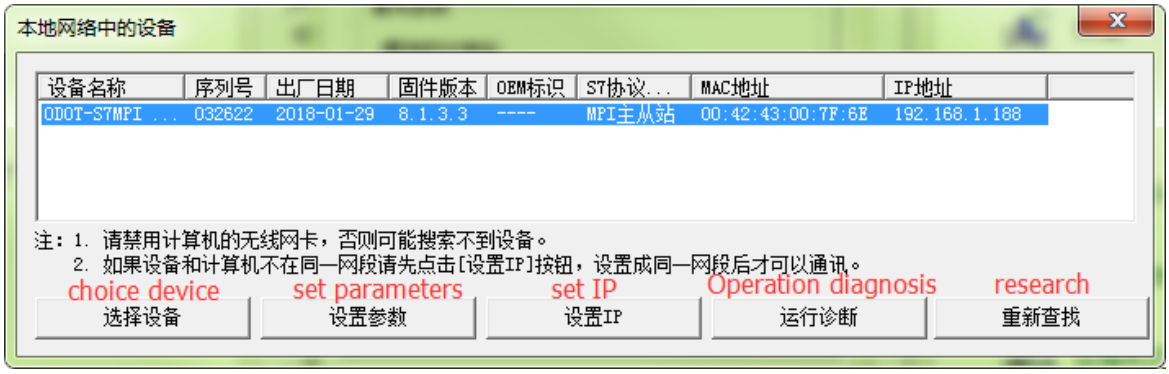
[The local search]： Clicked to search for the module on the local network.

Communication timeout：Setting the parameter of Ethernet's communication timeout of driven , the default is 10000 milliseconds; if the network is not good or module is connected through the Internet remote, please set it larger, such as 30000 milliseconds.

Rapid confirmation： The default is been ticked, and it can accelerate the speed of PLC's communication, if the number of module's ethernet connection is not more than 16, you need ensure it is ticked.

[version]：Viewing the latest version and using the document.

It will pop-up a dialog box after Clicking the [the local search] button , as shown in the following figure:



[choice device]：Selecting a device you have searched, the IP address will be entered in"ODOT IP address or domain name"of [attribute] dialog box automatically.

[set parameters]：Setting the parameters of module , and the parameters and the inparameters of built-in Web page are the same, detailed instructionssee: Built-in Web page 。

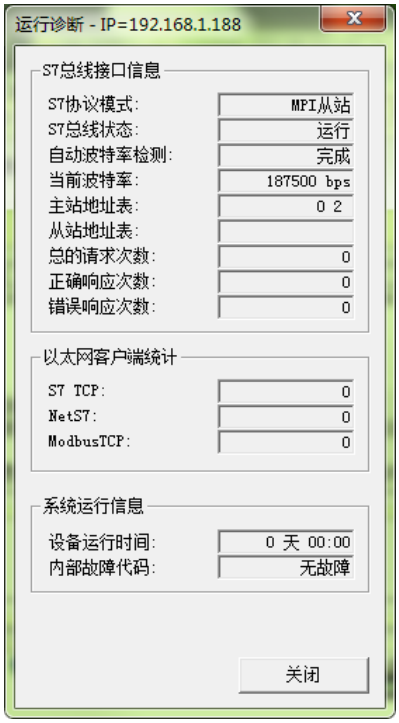
[set IP]：When the module and the computer are not in the same subnet, you need set them to the

same segment firstly by[setting IP],then it can be used to data communication.

[Operation diagnosis]：running a diagnostic on module

[research]：searching the device of module

Clicking the [Operation diagnosis] button can make a diagnosis to the current access point corresponding to the module,as shown in the following figure:



6.SCADA and the man-machine equipment's communication

ODOT-S7*PI supports most SCADA software (PC monitorconfiguration software) in the industrial area, the man-machine device can communicate with S7 series PLC by ODOT-S7*PI.

The driver connection of configuration software communicates with ODOT-S7*PI includs:

- Through the driver of Siemens PG/PC interface NetS7 (PPI/MPI/PROFIBUS);
- Through theS7TCP channel of Siemens;
- Through SIMATIC NET or the OPC server of PC Access;
- Through ModbusTCP communication;
- Through KepWareOPC server;

How to choose a suitable driver:

- If the configuration software supports to communicate with Siemens CP243/343/443 Ethernet module, you can select the S7TCP channel directly;

Note: when using the S7TCP driver to communicate with module, you should pay attention to "S7TCP target PLC address" of module, the reason is that CP Ethernet module of Siemens can only communicate with the CPU on the same machine frame, and module can communicate with a plurality of CPU on S7 bus.

- If the configuration software supports to communicate with PC Adapter, CP5611, CP5613 of RS485 device(access S7ONLINE of PG/PC interface), you can choose NetS7 (PPI/MPI/PROFIBUS) drive;
- If the configuration software supports OPC communication, you can choose OPC server of the other company;
- If the configuration software supports ModbusTCP communication, you can choose ODOT-S7*PI drive directly;

6.1 The settings of Siemens WINCC through ODOT-S7PPI

Siemens S7-200 uses ODOT-S7PPI to connect to WINCC, the methods include: OPC (PC Access OPC server), the TCP drive of WINCC and the ModbusTCP driver of WINCC V7.

Note: If you use the TCP drive of WINCC to connect to S7-200 ,the firmware version of module must be V 8.1.3.3,see:release's difference。

6.1.1 Through PC Access OPC server

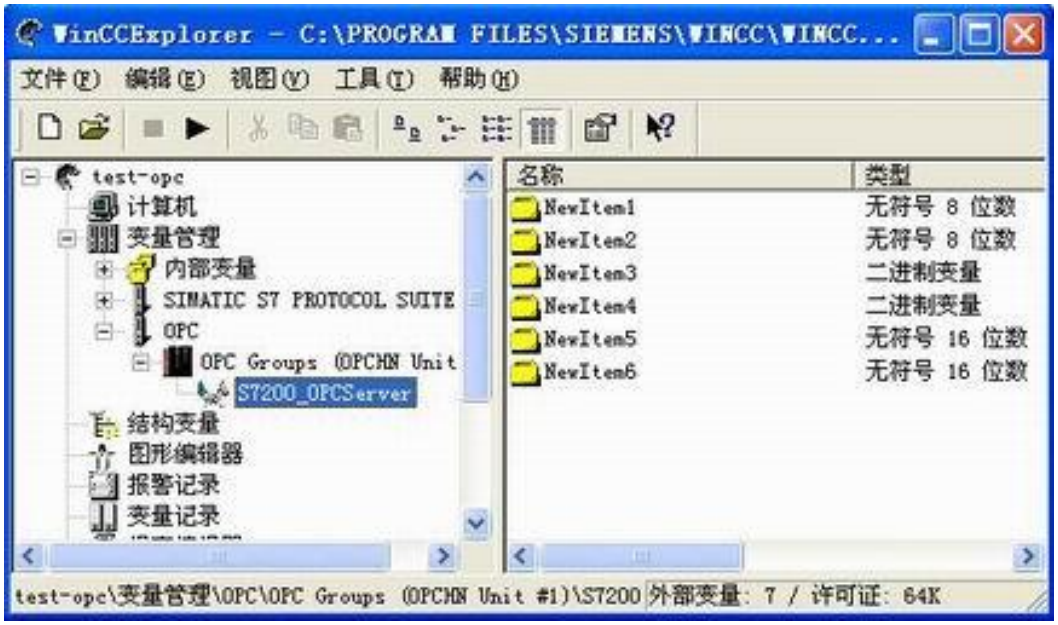
1、Opening the WINCC software,creating a new project; right clicking "variable management", selecting "add new driver", selecting "OPC.chn", as shown below:

2 、 Right-clicking the OPC connection, selecting"system parameters", openning the "OPC item manager", selecting "S7-200.OPCServer", as shown below:

3、"Browse server" ：

4、Clicking "next", search the variables of the OPC server internal;

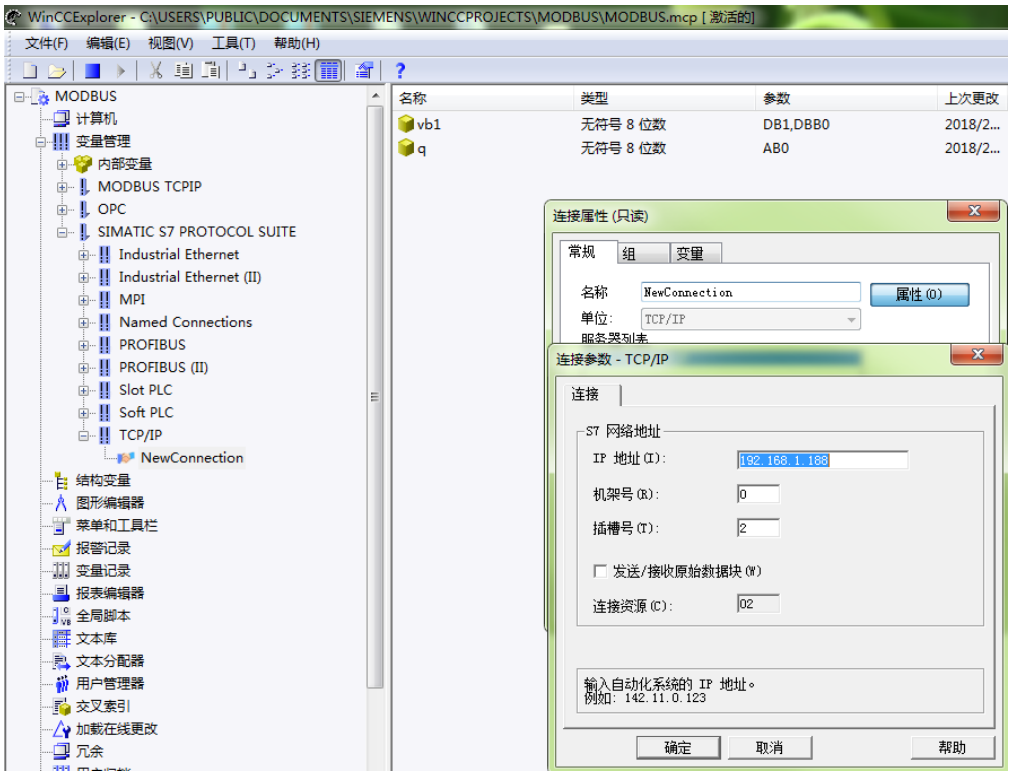
5、 Selecting all the variables, "add enter", adding the variables to the WINCC.



6.1.2 Through the TCP/IP driver of WINCC

1、 Openning the WINCC software, creating a new project, right-clicking "variable management", selecting "add new driver", selecting "SIMATIC S7 Protocol Suite.chn".

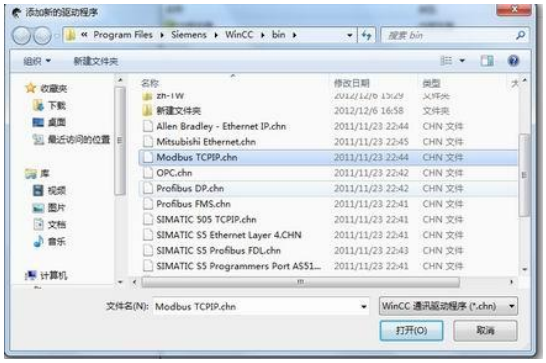
2、 Right-clicking the TCP/IP connection, selecting" new driver's connection", defining the name of a connection, clicking "properties", in the "IP address" ,entering the IP address of ODOT-S7PPI, clicking "ok".



3、Right-clicking the "TCP/IP" connection, selecting "system parameters", selecting "TCP/IP"-> your network card in the "logical device name(D)" of the "unit" option.

6.1.3 Through the ModbusTCP driver of WINCC V7

1、 Openning the Wincc software, newwing a project, right-clicking "variable management", selecting "add new drive connection", selecting "Modbus TCPIP.chn" in the pop-up dialog box, clicking "ok".



2、 Right-clicking the "Modbus TCPIP/IP unit #1" ,selecting “new driver connection”,newwing a name, clicking"properties", entering the IP address of ODOT in the"server" in the pop-up properties dialog box,entering the station address of PLC in the "remote slave station address", clicking confirm.

3、 Right-clicking "variable name", newwing the variables, we create a VW0 variable, the settings of the corresponding address, please clicking "select", , selecting "4x hold register" in the “regional” in the pop-up dialog box, entering "400001" in the "4x" , The mapping relationship between S7 200PLC data area and Modbus data area,see:ModbusTCP Communication。

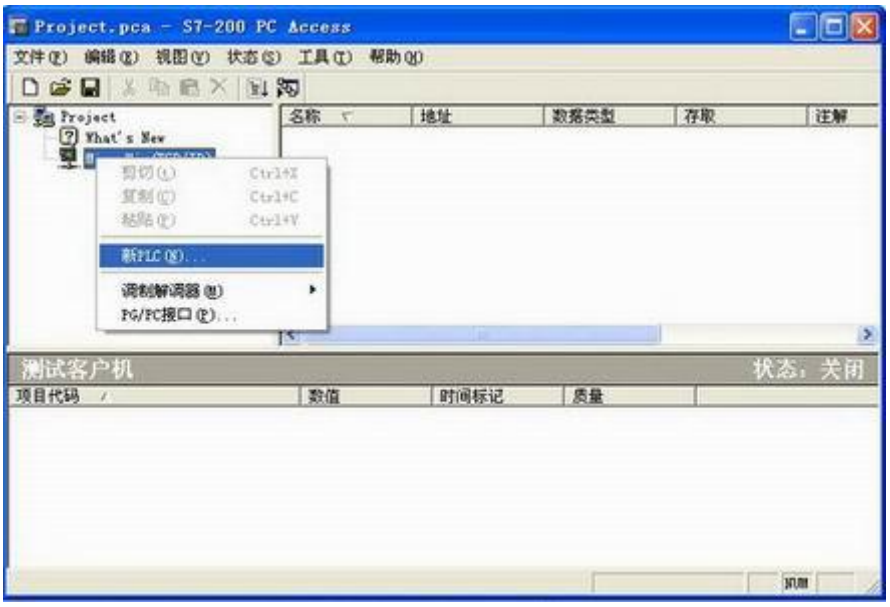
6.2 The settings of Siemens PC Access through ODOT-S7PPI

Siemens S7-200 uses ODOT-S7PPI to connect to PC Access, two methods include: the TCP/IP driver of Siemens and ODOTS7 driver (PPI).

6.2.1 Through the TCP/IP driver of Siemens（S7TCP）

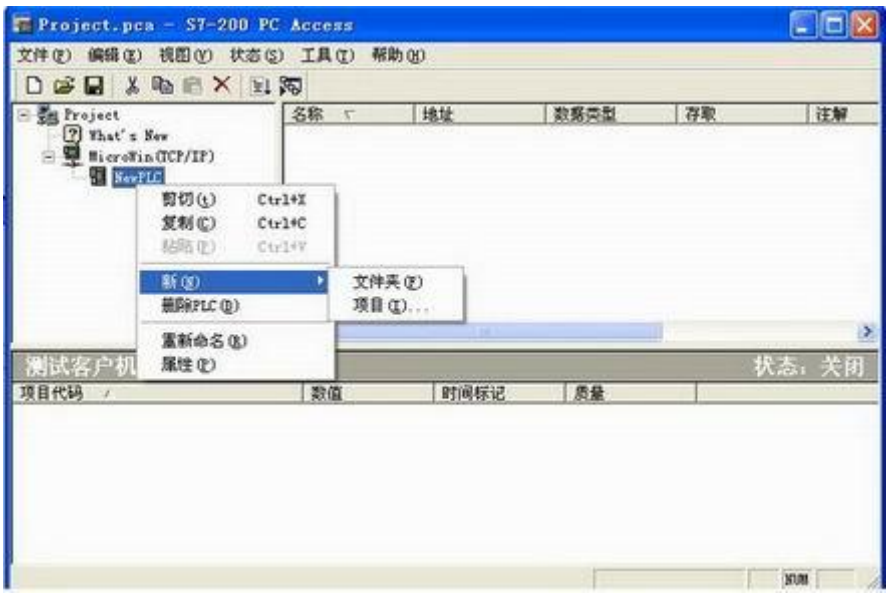
1、 Through the control panel or MicroWIN software, openning the "set PG/PC interface", selecting MicroWIN -> TCP/IP.

2、Openning S7-200 PC Access software.

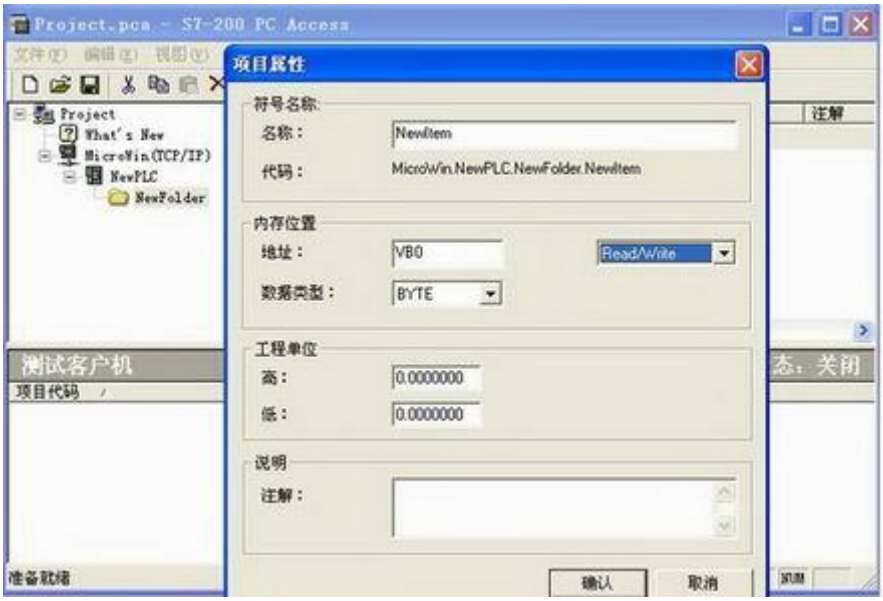


3、Creating a new connection of PLC , entering in the IP address of ODOT-S7PPI .

4、 Creating new variable group (file), or creating new variable (project) directly.



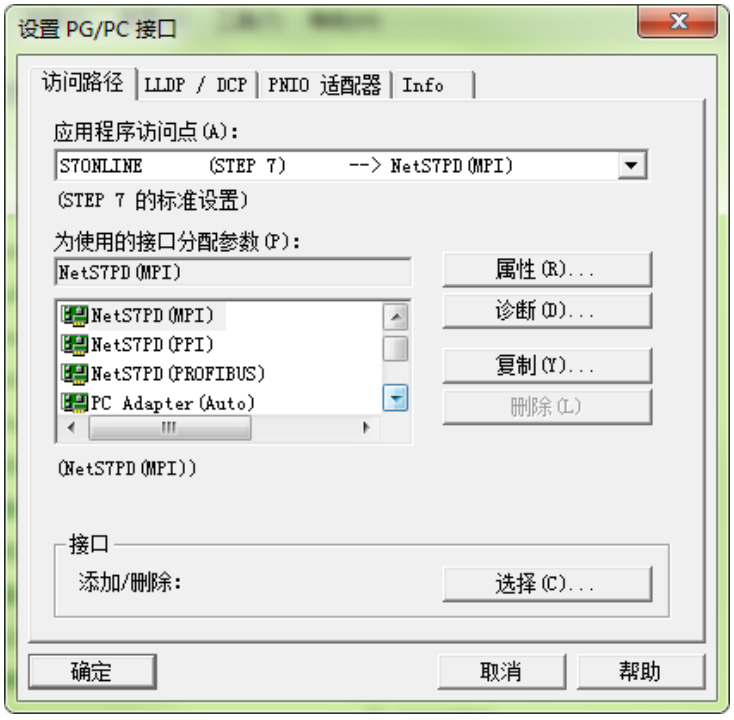
5、Creating new variable (project).



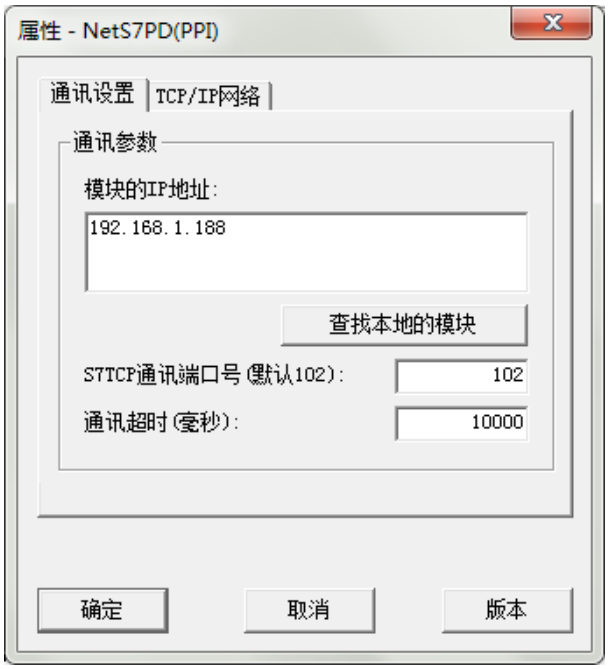
6、Testing the variable, putting the variable into the test area, clicking the test of client

6.2.2 Through NetS7PD(PPI) driver

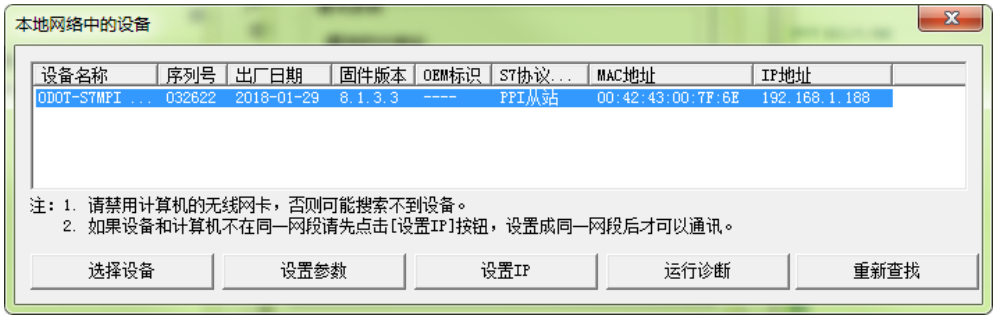
1、Through the control panel or MicroWIN software, openning the "set PG/PC interface", selecting MicroWIN -> NetS7PD(PPI).



2、Clicking the "properties" button on the right.



3、Clicking "local search", selecting the equipment have been searched, the ODOT-S7MPI must be set to PPI slave mode(in Web set), clicking "select equipment".



4、Please back to the PC Access software, creating a new PLC.

5、Creating new variable group (file), or creating new variable (project) directly.

6、Testing the variables, putting the variable into the test area, clicking the test of client.

6.3 The settings of KingView through ODOT-S7PPI

Siemens S7-200 uses ODOT-S7PPI to connect to KinView, the methods include: the TCP/IP driver of Siemens s7-200 、OPC server (Siemens PC Acess) 、Modbus TCP driver.

6.3.1 Through the TCP driver of Siemens S7-200

1、Openning the project browser of Kingview--equipment (COM1), double-clicking "new" on the right

2、Selecting Siemens S7-200 series(TCP) driver

3、Entering the name of the equipment.

4、Entering the IP address of ODOT-S7PPI, the slot of CPU（the default is 0）.

5、The communication parameters can be the default.

6、Completing the settings of parameters.

6.3.2 Through PC Access OPC

1、Openning the project browser of Kingview--equipment (OPC server), double-clicking "new" on the right.

2、Selecting“S7-200.OPCServer”.

6.3.3 Through ModbusTCP

1、In the device configuration, selecting PLC- Modicon -Modbus(Ethernet) -TCP driver.

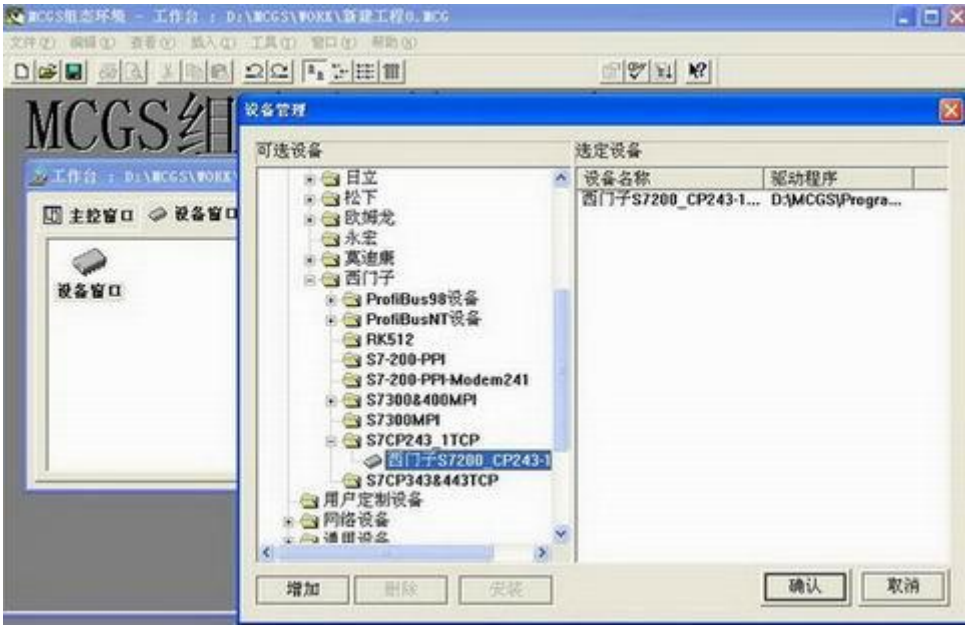
2、Entering the IP address of ODOT-S7PPI+the port number+the station address of S7-200PLC

6.4 The settings of MCGS through ODOT-S7PPI

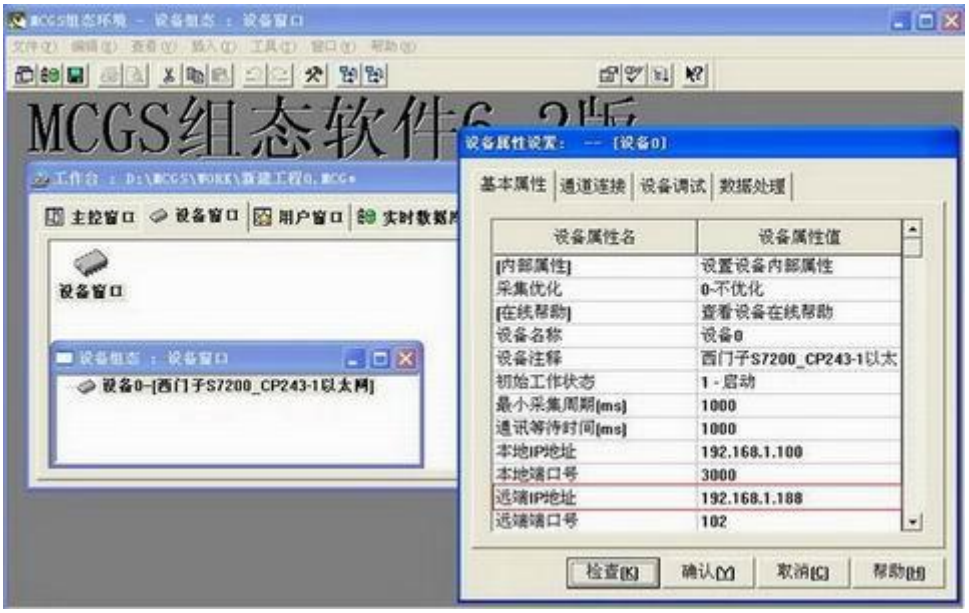
Siemens S7-200 uses ODOT-S7PPI to connect to MCGS(The general version and the embedded version), the methods include: the TCP/IP driver of Siemens s7-200 、OPC server (Siemens PC Acess) 、Modbus TCP driver.

6.4.1 Through the TCP driver of Siemens S7-200

1、Openning the configuration environment of MCGS--equipment window, selecting the PLC- Siemens -S7CP243_1TCP



2、In the attribute settings of equipment , entering the remote IP address in the IP address of ODOT-S7PPI .



3、Clicking "set internal attribute of the equipment" to create new variables.

4、Clicking "quick connect variables" after creating new variables, then clicking "start equipment's debugging" to monior the variables.

索引	连接变量	通道名称	通道处理	调试数据	采集周期
0000		通讯状态		0	1
0001	Data01	读写Q0000.0		0	1
0002	Data02	读写M0000.0		0	1
0003	Data03	读写VWUB0000		4386.0	1

6.4.2 Through PC Access OPC

1、Openning the configuration environment of MCGS--equipment window,selecting OPC server.

2、Selecting "S7-200.OPCServer".

6.4.3 Through ModbusTCP

1、In the device configuration,selecting “general TCP/IP parent device”-“standard Modbus TCP sub device”;

2、In“the remote IP address”,entering“ODOT-S7PPI’s IP address”； In “equipment address”,entering “S7-200PLC’s station address”.

6.5 The settings of iFIx through ODOT-S7PPI

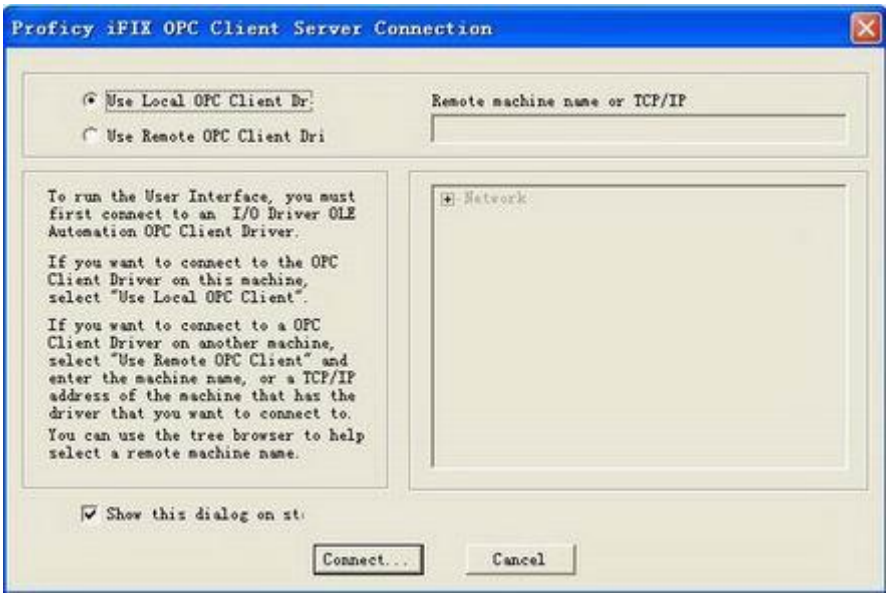
Siemens S7-200 uses ODOT-S7PPI to connect to iFIX, the methods include: the S7 driver of iFIX(need to purchase a license) 、OPC server (Siemens PC Acess) 、Modbus TCP driver.

6.5.1 Through PC Access OPC

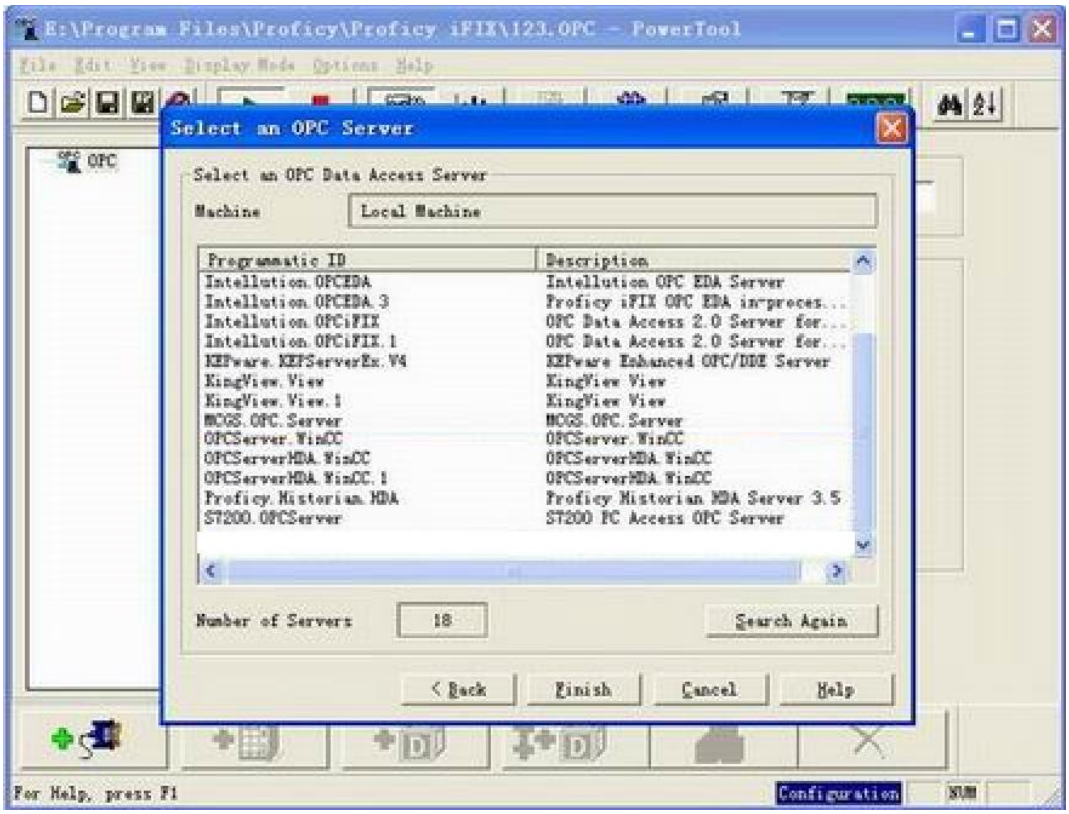
1、 Openning the system configuration of iFIX（SCU-FIX）.

2、Selecting “OPC Client” driver.

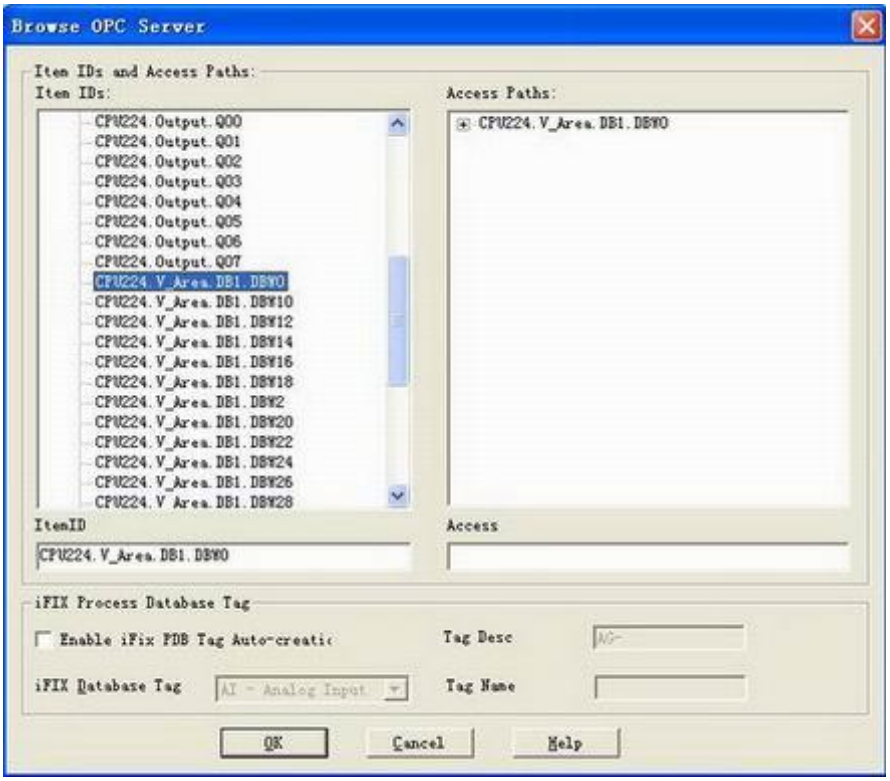
3、 "configuration", selecting the local connection "Use Local OPC Client Driver","Connet..." Connect the OPC server



4、“Add OPC Server”，selecting “S7-200.OPCServer”，“Finish”。



5、Adding group and item，“Add Group”，“Add Item”;browsing OPC server，“Browse Server”; the variables in the Server will be corresponded to the variables in iFIX.



6.5.2 Through ModbusTCP

In the device configuration, selecting the Moubus TCP driver.

6.6 The settings of ForceControl through ODOT-S7PPI

Siemens S7-200 uses ODOT-S7PPI to connect to ForceControl, the methods include: the TCP driver of Siemens S7-200 、OPC server (Siemens PC Acess) 、Modbus TCP driver.

6.6.1 Through the TCP driver of Siemens S7-200

1、Openning the development system of ForceControl -- IO equipment configuration,selecting "PLC-SIEMENS (Siemens) - S7-200 TCP protocol".

2、Entering the equipment name.

3、Entering the IP address and the port number(the default is 102) of ODOT-S7PPI, completing the settings.

6.6.2 Through PC Access OPC

1、Openning the development system of ForceControl -- IO equipment configuration,selecting“OPC--MICROSOFT OPC CLIENT--OPC CLIENT 3.6”

2、Entering the equipment name.

3、Selecting “OPC.ODOT.S7” .

6.6.3 Through ModbusTCP

1、Openning the development system of ForceControl -- IO equipment configuration, selecting “PLC-MODICON（Modicon）—modbus TCP communication”.

2、Entering the equipment name; the equipment address（S7-200PLC’s station address）;

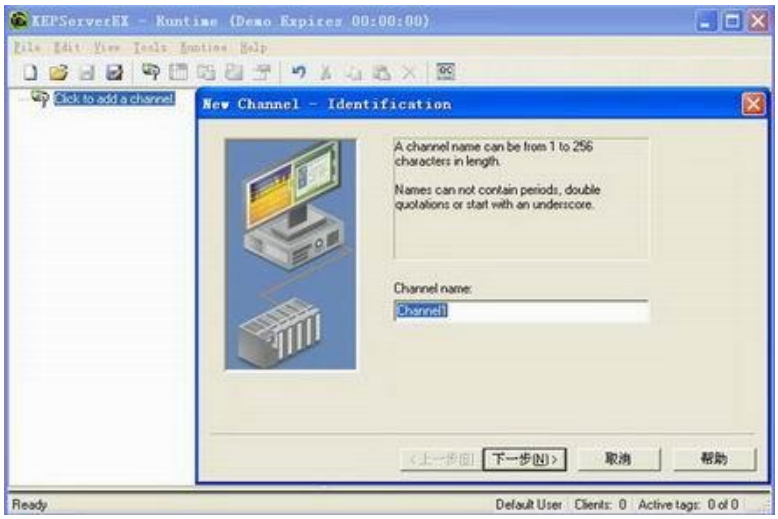
3、Entering the IP address and the port number(the default is 502) of ODOT-S7PPI 的 IP, completing the settings.

6.7 The settings of KepWare OPC through ODOT-S7PPI

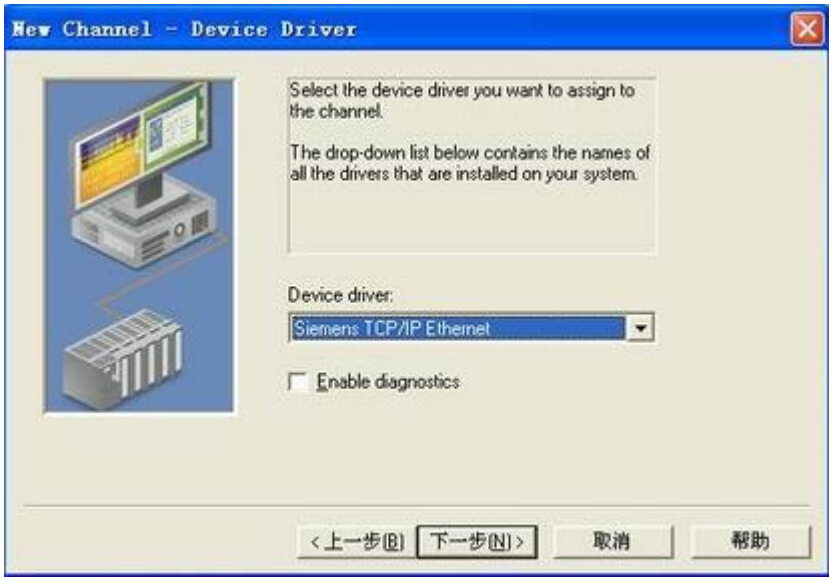
Siemens S7-200 uses ODOT-S7PPI to connect to KepWare OPC, the method is through the TCP driver of Siemens S7-200.

6.7.1 Channel settings

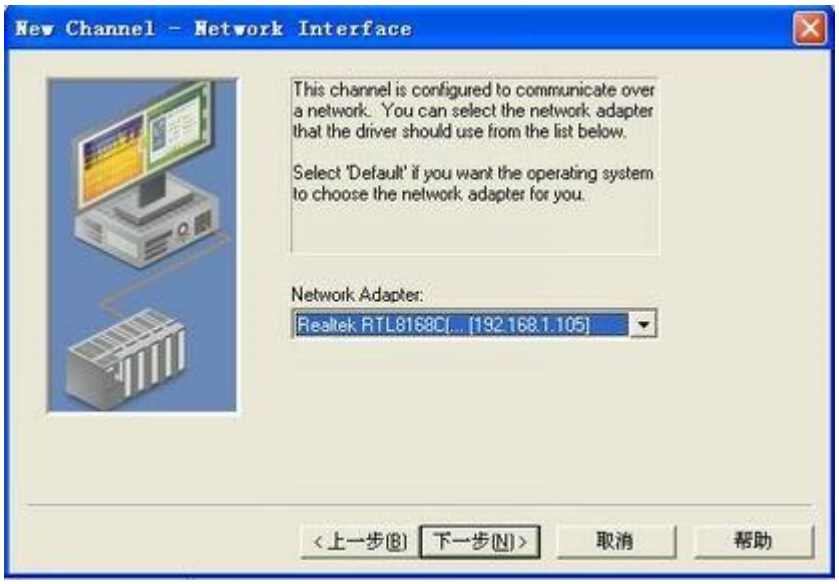
1、Openning Kepware OPC Configuration,adding a channel,entering the channel name,the next step;



2、Selecting Siemens TCP/IP Ethernet driver,the next step;

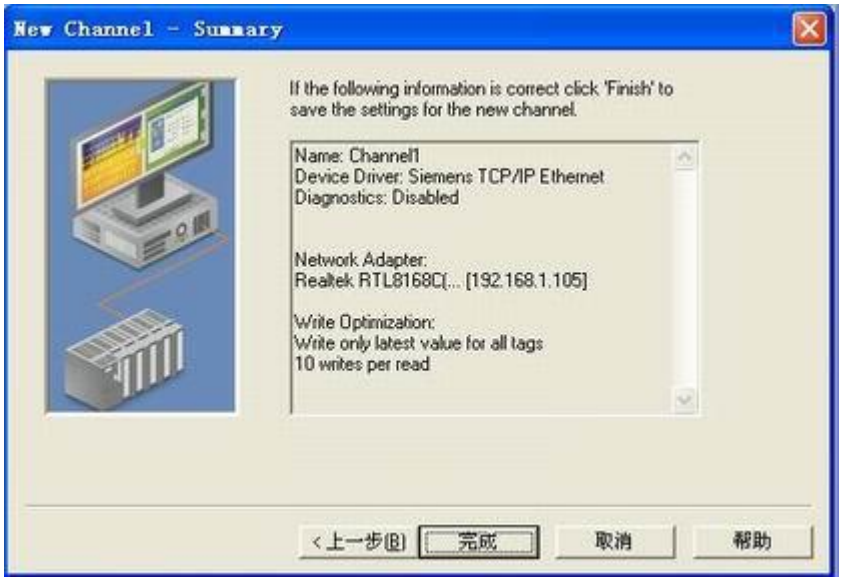


3、Selecting the network card of the computer;



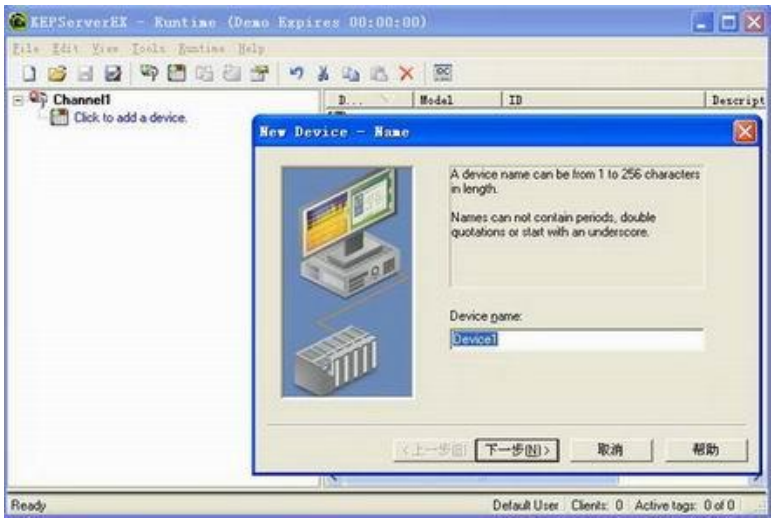
4、According to the need to choose the mode (the default is ok), the next step;

5、Complete the settings of channel parameter.

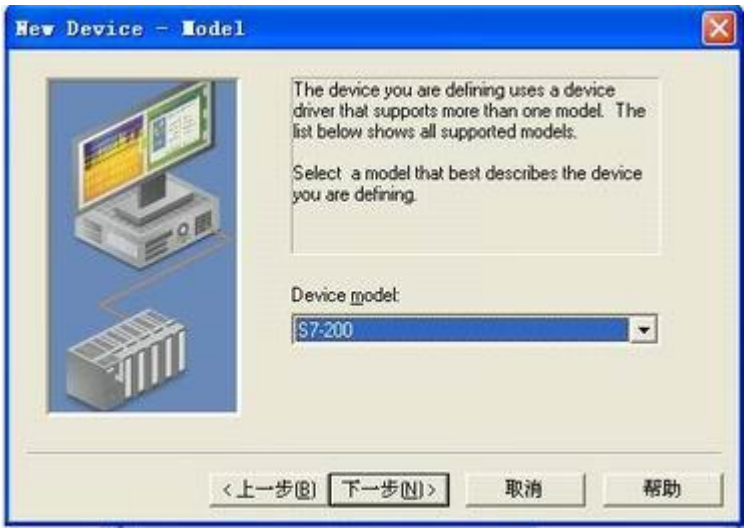


6.7.2 Device settings

1、Adding a device, entering the device name,the next step;



2、Selecting S7-200, the next step;

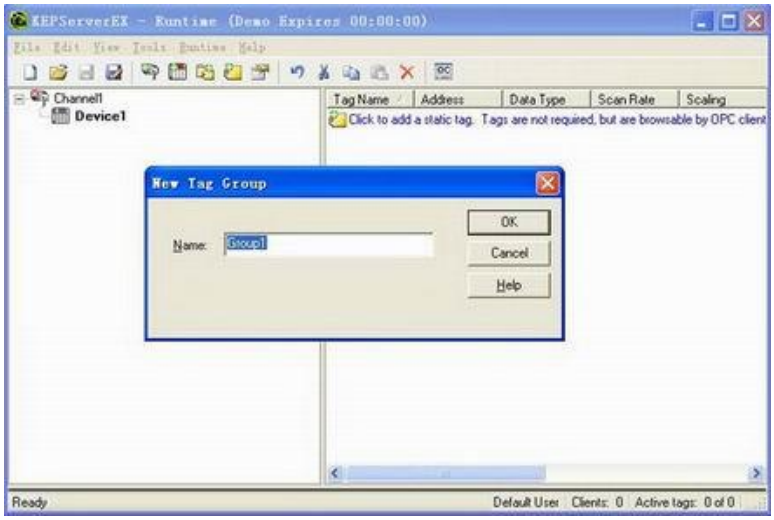


3、Entering the IP address of ODOT-S7PPI, the next step;

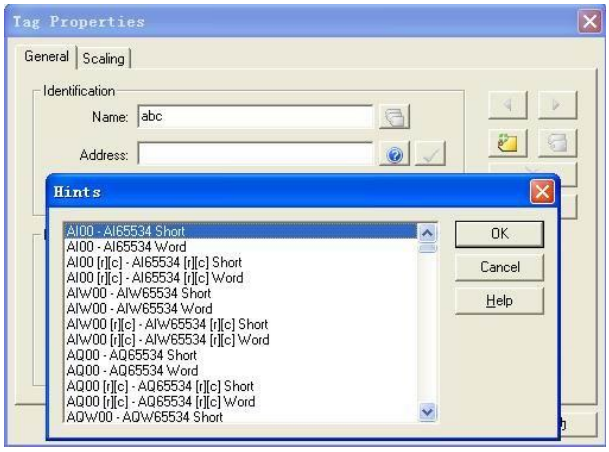
4、The other parameters can be default, completing the settings of device.

6.7.3 Variable settings

1、Creating a new variable group;



2、Creating new variables;



3、Checking the data communication in the OPC client.

6.8 The settings of FrameView through ODOT-S7PPI

Siemens S7-200 uses ODOT-S7PPI to connect to FrameView, the methods include: the S7TCP driver of Siemens、OPC server (Siemens PC Access) 、Modbus TCP driver.

6.8.1 Through the S7TCP driver of Siemens

1、Installing the driver

Selecting "basic application"--“equipment communication”, executing "1.install driver", showing the following dialog box:

Selecting "S7TCP" driver from the Siemens, clicking "Install" button to install.

2、Definingi equipment’s data sheet

Select "basic application"--“equipment communication”, executing"4.equipment’s data sheet", displaying the definition interface of equipment’s data table.Double clicking D2 equipment number, defining it by the following dialog box:

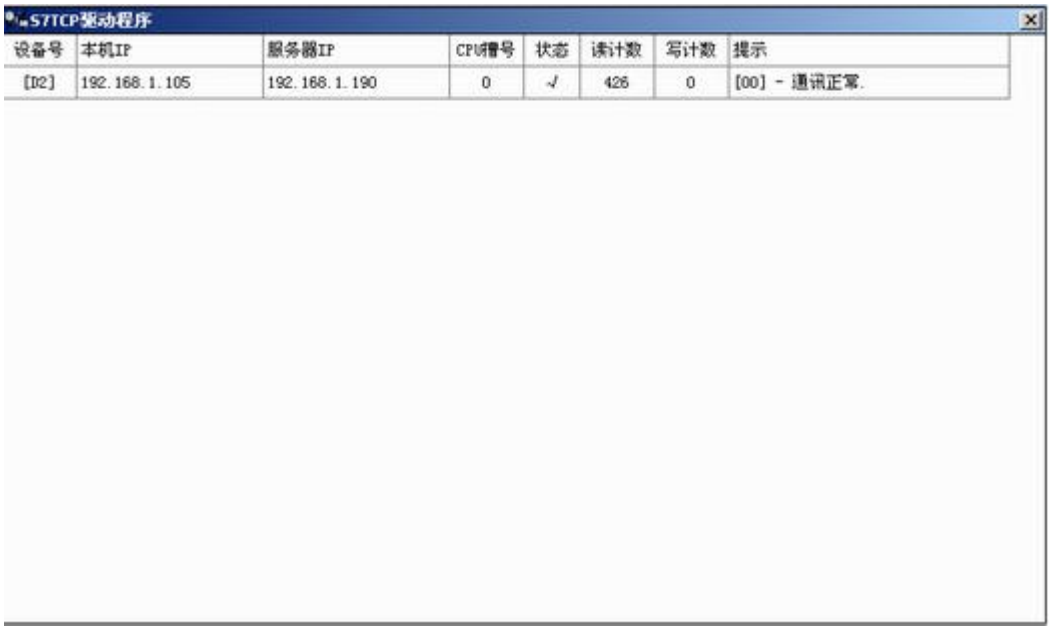
We define VB30~VB39 of S7-200PLC, a total of 10 bytes data.

Note：“the IP address of equipment” is the IP address of ODOT-S7PPI（the default is 192.168.1.188）.

3、Monitor equipment communication

After activating the monitoring system, you can monitor the communication state of the driver.

Selecting "basic application"--"equipment communication", "6.monitor S7TCP drive", the interface is shown below:



4、Monitoring equipment’s data sheet

Selecting "basic application"-- "equipment communication", "5.monitor“equipment’s data sheets "", the interface is shown below:

In the line of [D2], showing 10 bytes data you predefined.

6.8.2 Through PC Accsee OPC

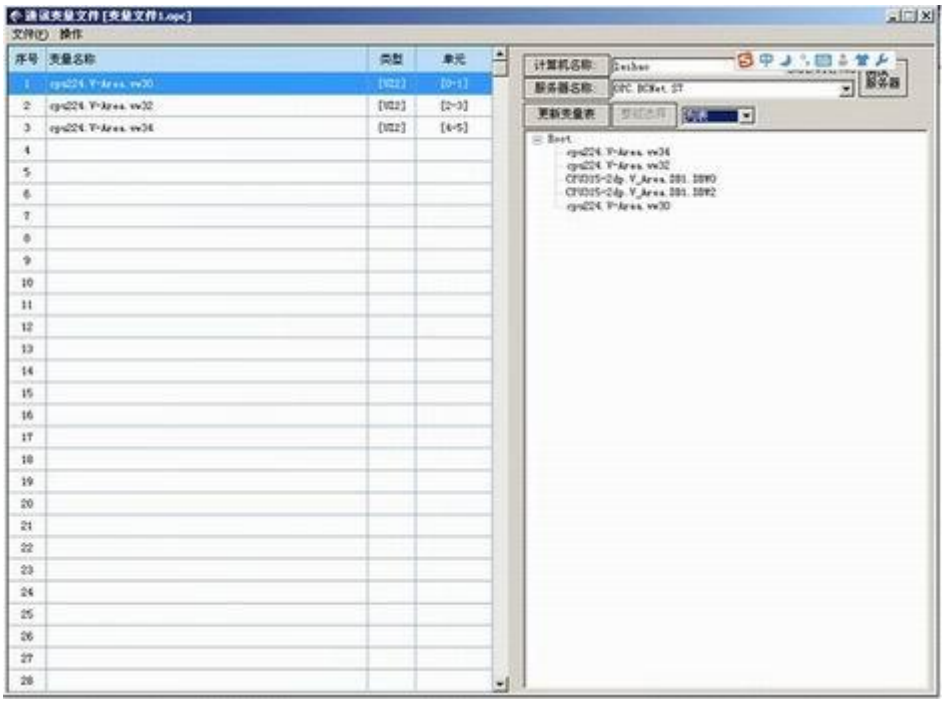
1、Installing the driver

Selecting "basic application"--“equipment communication”, executing "1.install driver", showing the following dialog box:

Selecting OPC—“OPC (customer)" drive, clicking "Install" button to install.

2、Making the variable file

Selecting the "expansion application"--" variable file", executing"1.make variable file", creating and selecting the variable, shown in the following dialog box:

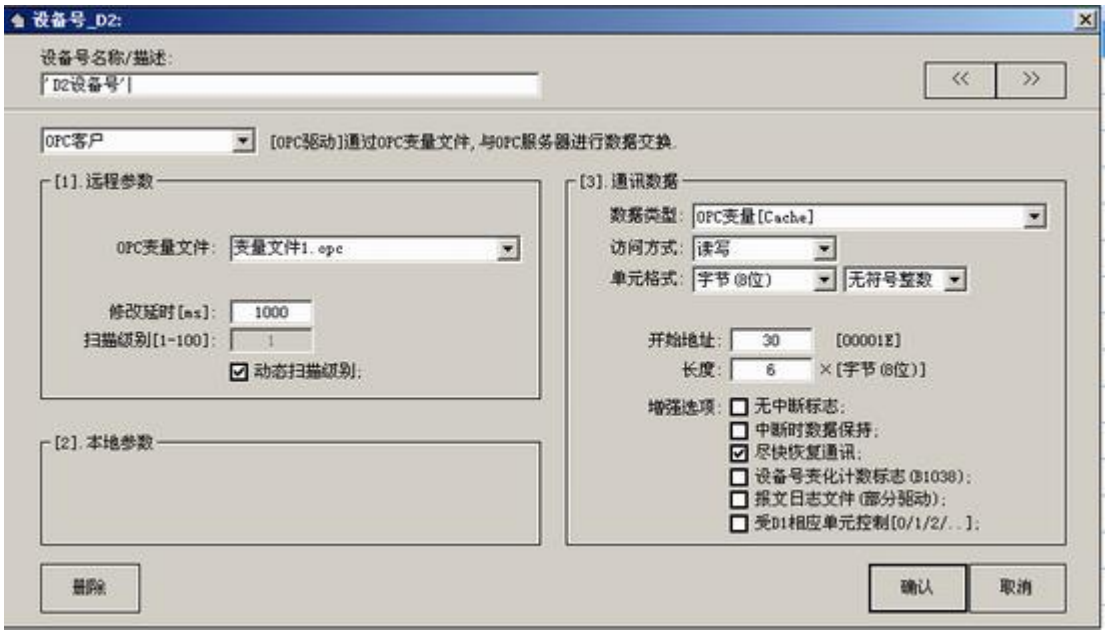


Selecting the correct name of the computer, the name of the server selects " S7-200.OPCServer ", then you can click "test server" to confirm whether it has already connected to the server, clicking "update variable table", double clicking the variable, the variable is added to the list of the variable name, saving the variables.

3、Defining equipment data sheet

Selecting "basic application"—“communication equipment”, executing"4.equipment data sheet", displaying the definition interface of equipment data table.

Double clicking D2 equipment number, defined by the following dialog box:

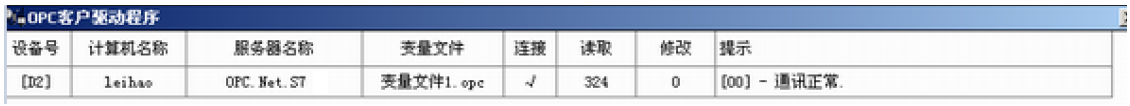


Selecting the variable table have been edited in the "OPC variable file","communication data"--"start address" and "length" correspond to the data defined in the variable sheet (VW30~VW36 6 bytes).

4、Monitoring equipment communication

After activating the monitoring system, you can monitor the communication state of the driver program.

Selecting "basic application"--"equipment communication", "6.monitor “OPC customer” driver", the interface is shown as below:



5、Monitoring the variable sheet of equipment

Selecting "basic application"--"equipment communication", "5.monitor “equipment data sheet"", the interface is shown as below:

In [D2], there is 6 bytes data you have predefined.

6.8.3 Through ModbusTCP

1、Installing the driver

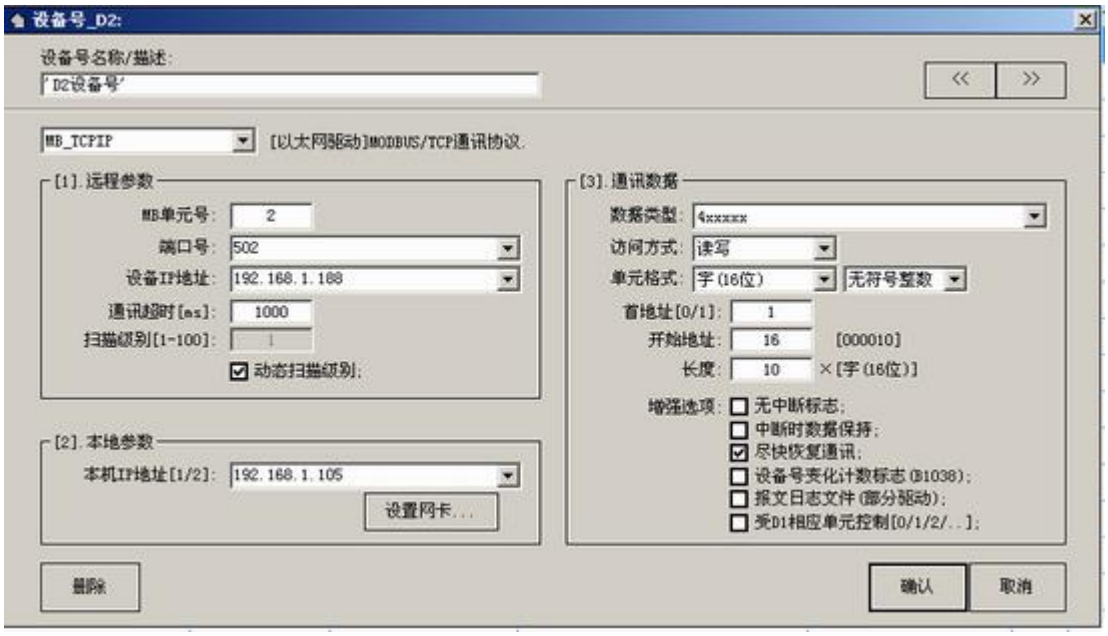
Selecting "basic application"--“equipment communication”, executing "1.install driver", showing the following dialog box:

Selecting MODBUS—“MB_TCPIP” driver, clicking "Install" button to install.

2、Defining equipment data sheet

Selecting "basic application"—“communication equipment”, executing"4.equipment data sheet", displaying the definition interface of equipment data table.

Double clicking D2 equipment number, defined by the following dialog box:



We define VW16~VW26 here, a total of 10 word data.

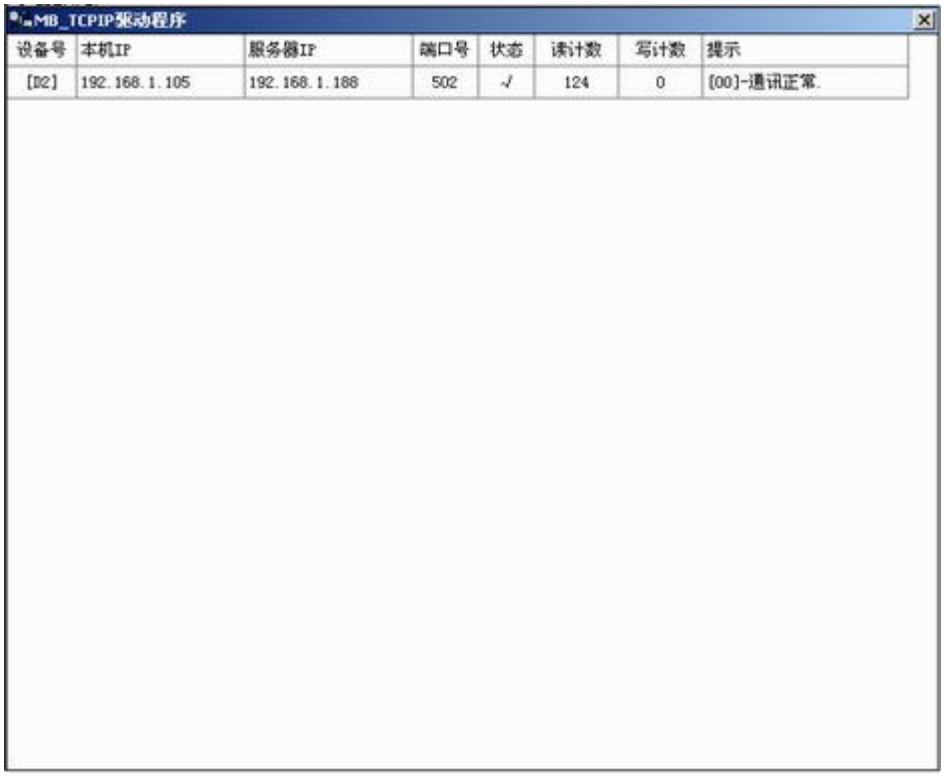
Note：“equipment IP address” is the IP address of ODOT-S7PPI（The default is 192.168.1.188）.

3、Monitoring equipment communication

After activating the monitoring system, you can monitor the communication state of the driver

program.

Selecting "basic application"--"equipment communication", "6.monitor “Modbus TCP” driver",the interface is shown as below:



4、Monitoring the variable sheet of equipment

Selecting "basic application"--"equipment communication", "5.monitor “equipment data sheet"", the interface is shown as below:

In [D2], there is 10 word data you have predefined.

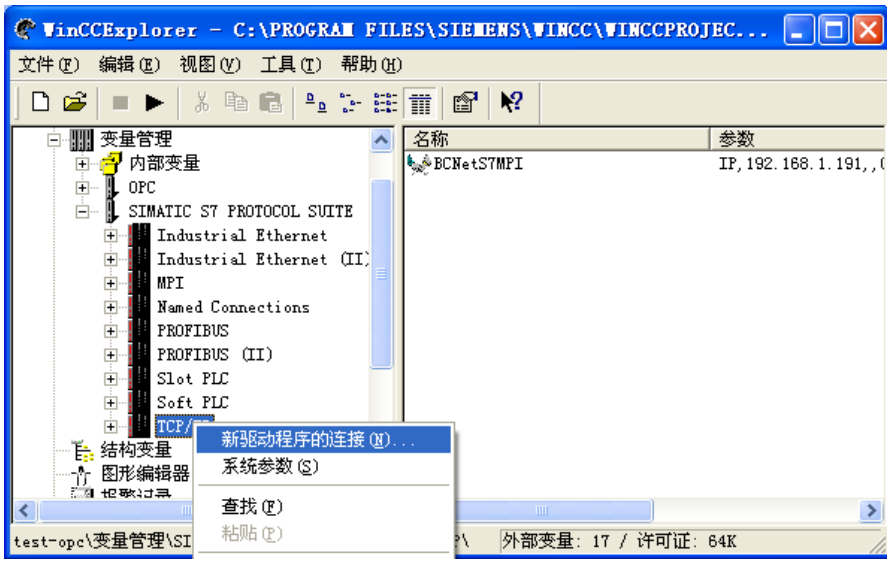
6.9 The settings of WINCC through ODOT-S7MPI

Siemens S7-300/400 uses ODOT-S7MPI to connect to WINCC, the methods include: the S7TCP driver of Siemens、OPC server (Siemens PC Acess) 、Modbus TCP driver.

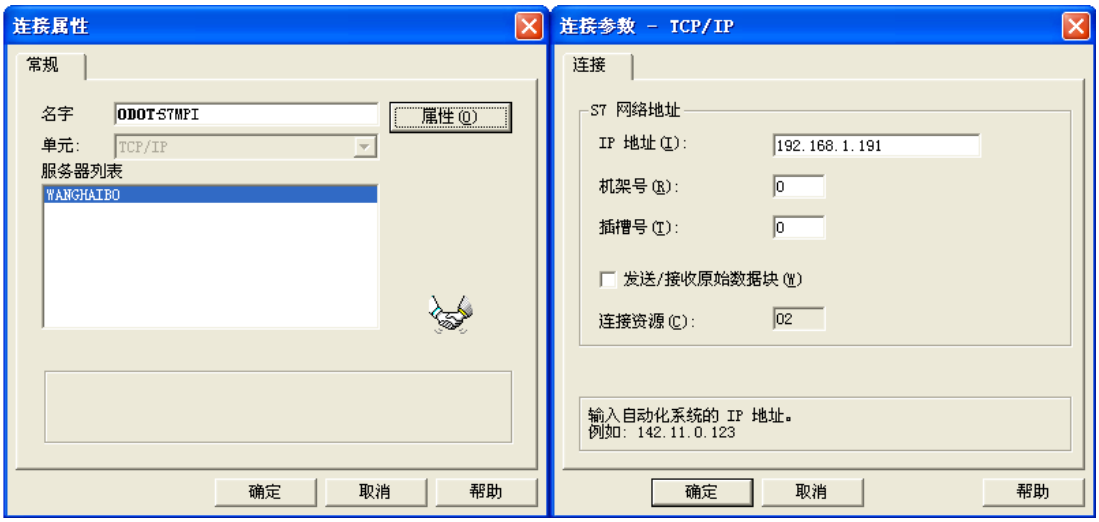
6.9.1 Through S7TCP channal

1、Creating a new WINCC project, selecting the variable management of the project, clicking the right button of the mouse, selecting the shortcut menu "add new driver", in the pop-up dialog

box, selecting SIMATIC S7 PROTOCOL SUITE, selecting TCP/IP, clicking the right button of the mouse, selecting the link of the new driver.



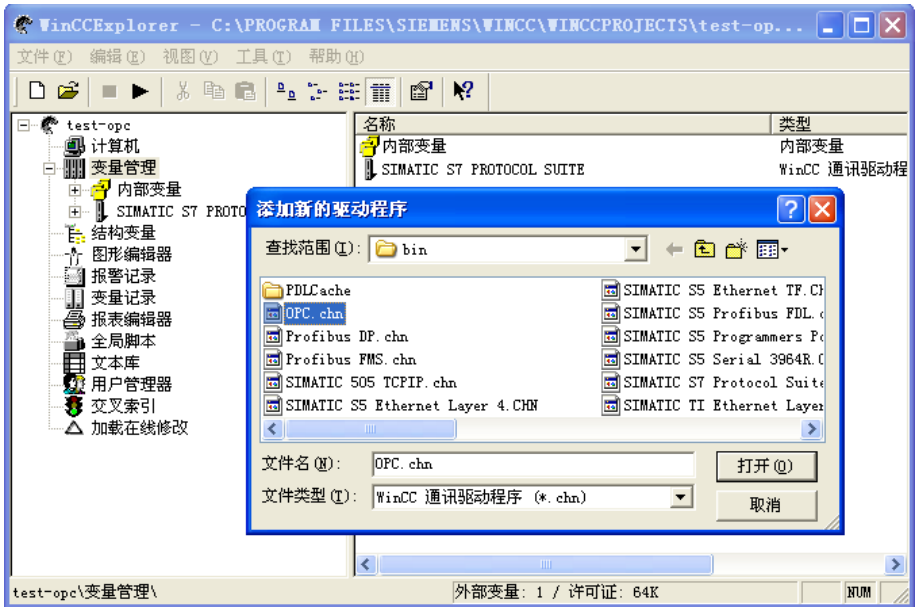
2、Entering the connection name in the pop-up dialog box of the connection property , such as "ODOTS7MPI", clicking the Property button,in the pop-up dialog box of property, entering the IP address,and it is the IP address of ODOT-S7MPI .



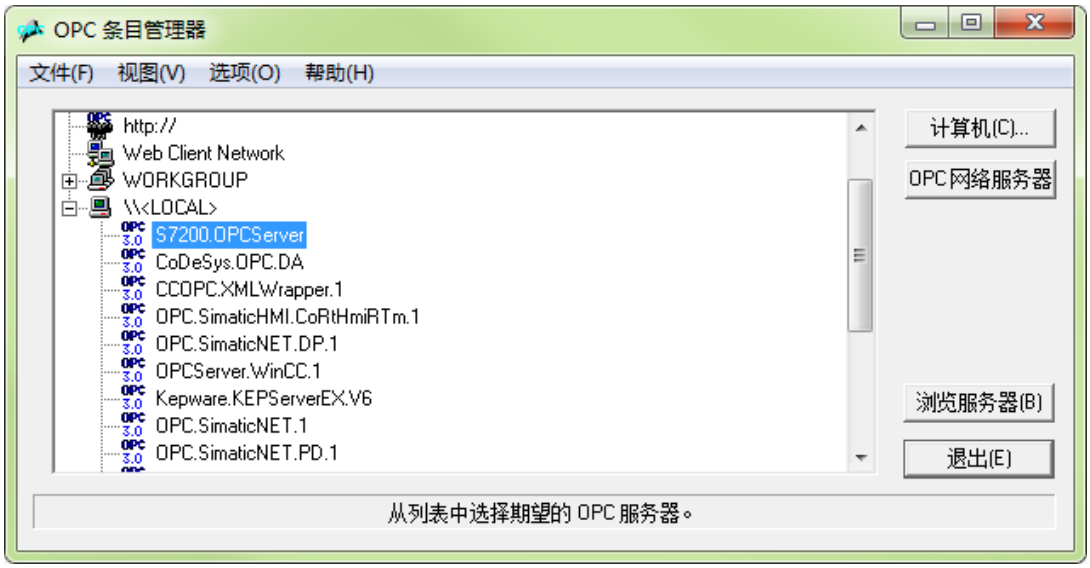
2、 Right clicking TCP/IP, selecting "system parameter", selecting "unit" property page, setting the logical device name for the TCP/IP-> (computer's network card).

6.9.2 Through PC Access OPC

1、Openning WINCC software,creating a new project;Right clicking"Variable management", selecting "add new driver", selecting "OPC.chn".

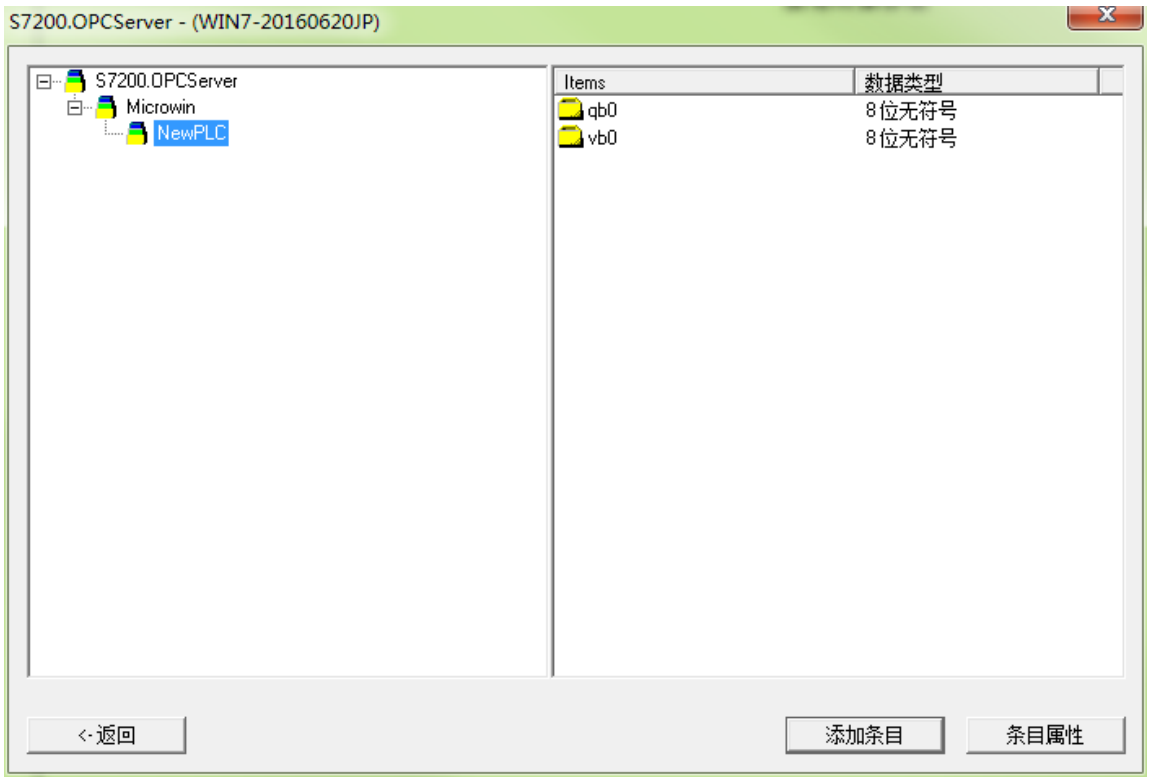


2、Right clicking OPC connection, selecting “system parameter”, openning“OPC enter Manager”, selecting “S7200.OPC,Server”.

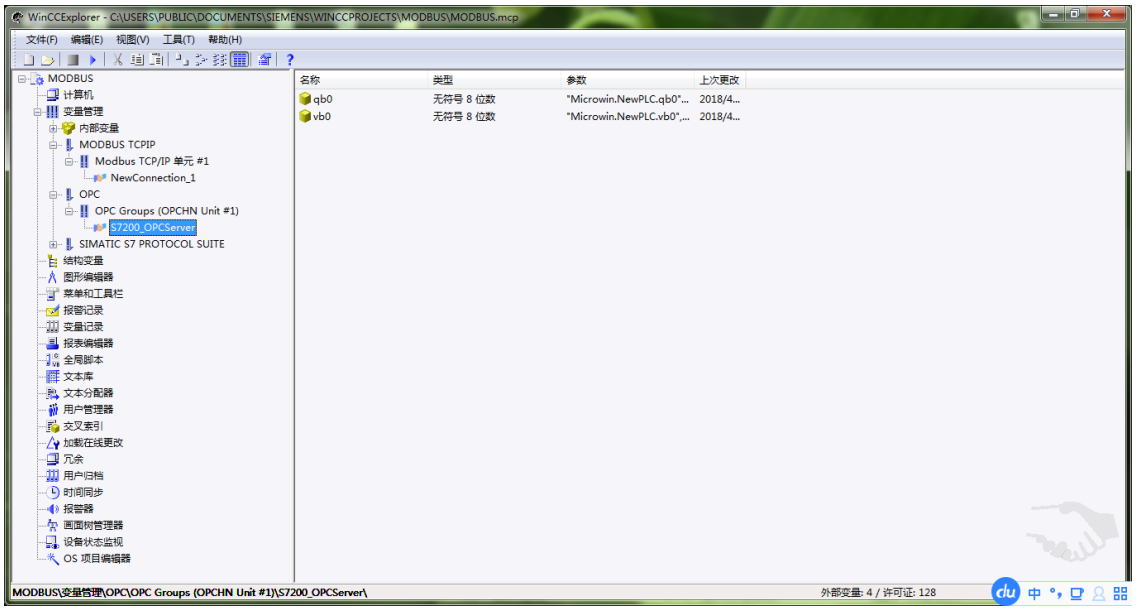


3、“Browse server”

4、Clicking “next step”, Search the variables of OPC server;



5、Selecting all the variables, "add enter", adding the variables to the WINCC.



6、Creating the new variables in the new connection.

6.10 The settings of KingView through ODOT-S7MPI

Siemens S7-300/400 uses ODOT-S7MPI to connect to KingView, the methods include: S7TCP、Modbus TCP driver.

6.10.1 Through S7TCP

1、Openning the project browser of Kingview--equipment (COM1), double clicking "new" on the right.

2、Selecting Siemens S7-300 series(TCP) driver

3、Entering the name of the equipment.

4、Entering the IP address of ODOT-S7MPI, the slot of CPU（the default is 3）.

5、The communication parameters can be the default.

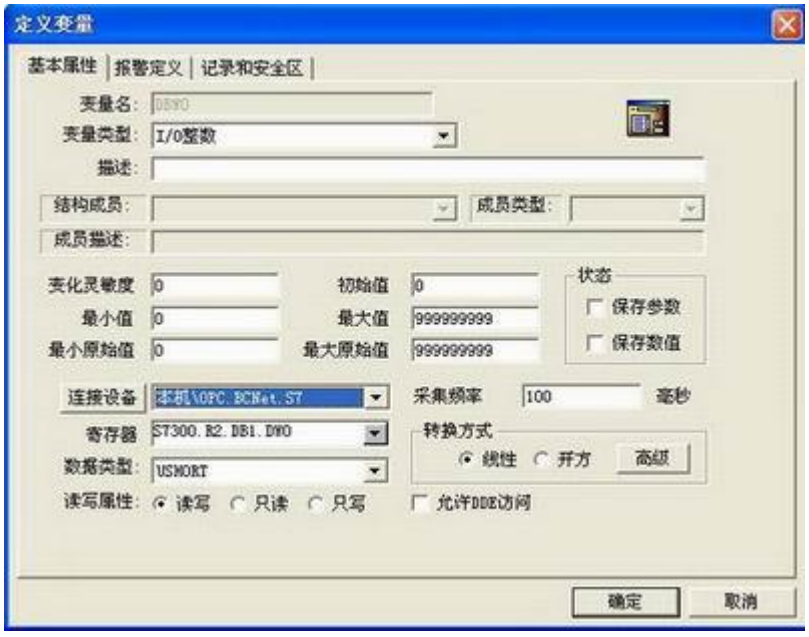
6、Completing the settings of parameters.

6.10.2 Through PC Access OPC

1、Openning the project browser of Kingview--equipment (OPC server), double clicking "new" on the right.

2、Selecting“S7200 OPC Server”.

3、Defining the variables in the data dictionary.



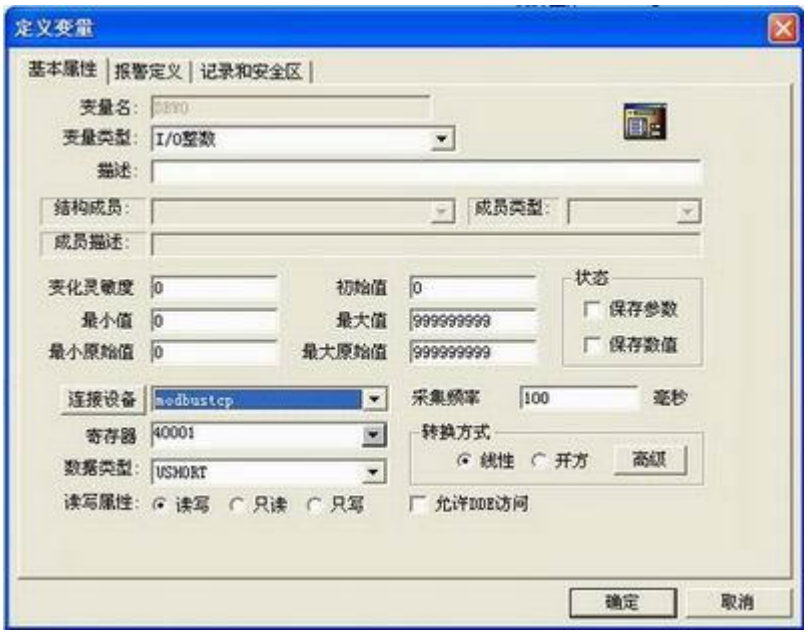
6.10.3 Through ModbusTCP

1、In the device configuration, selecting PLC- Modicon -Modbus(Ethernet) -TCP driver.

2、Entering the equipment name（such as modbustcp）

3、Entering the IP address of ODOT-S7MPI+the port number+the station address of S7-300PLC

4、Defining the variables in the data dictionary.

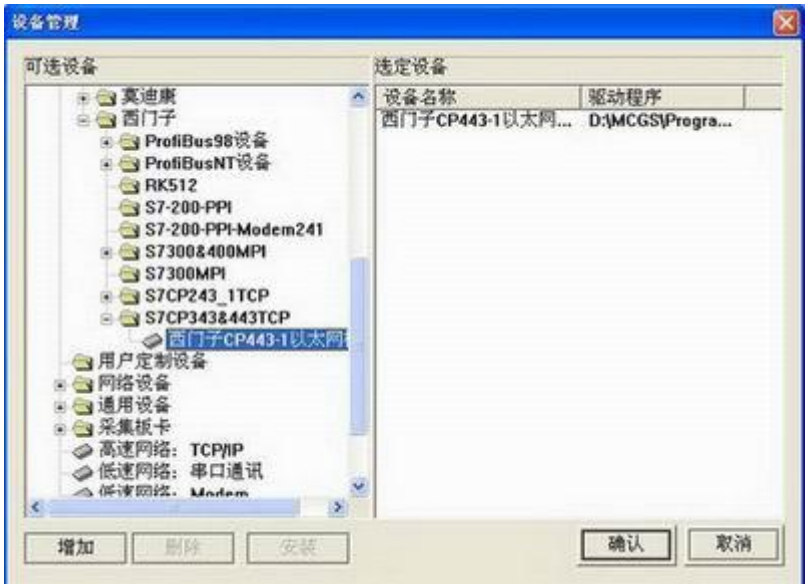


6.11 The settings of MCGS through ODOT-S7MPI

Siemens S7-300/400 uses ODOT-S7MPI to connect to MCGS(The general version and the embedded version), the methods include: S7TCP、OPC server 、Modbus TCP driver.

6.11.1 Through S7TCP

1、Openning the configuration environment of MCGS--equipment window, selecting the PLC- Siemens-S7CP343&443TCP-Siemens CP443-1 ethernet module.



2、In the attribute settings of equipment , entering the remote IP address in the IP address of ODOT-S7MPI .

3、Clicking "set internal attribute of the equipment" to create new variables.

4、Clicking "quick connect variables" after creating new variables, then clicking "start equipment’s debugging" to monior the variables.

6.11.2 Through PC AccessOPC

1、 Openning the configuration environment of MCGS--equipment window, selecting OPC server.

2、Selecting “S7200 OPC Server”.

6.11.3 Through ModbusTCP

1、 In the device configuration,selecting “general TCP/IP parent device”-“standard Modbus TCP sub device”;

2、 In“the remote IP address”, entering“ODOT-S7MPI’s IP address”；In “equipment address”, entering “S7-300PLC’s station address”.

6.12 The settings of iFIX through ODOT-S7MPI

Siemens S7-300/400 uses ODOT-S7MPI to connect to iFIX, the methods include: the S7 driver of iFIX(need to purchase a license) 、Modbus TCP driver.

6.12.1 Through ModbusTCP

In the device configuration, selecting the Moubus TCP driver.

6.13 The settings of ForceControl through ODOT-S7MPI

Siemens S7-300/400 uses ODOT-S7PPI to connect to ForceControl, the methods include: S7TCP、Modbus TCP driver.

6.13.1 Through S7TCP

1、 Openning the development system of ForceControl -- IO equipment configuration,selecting "PLC-SIEMENS (Siemens) - S7 series TCP protocol".

2、Entering the equipment name and the equipment address（S7300PLC's station adderss）.

3、Entering the IP address and the port number(the default is 102) of ODOT-S7MPI, completing the settings.

6.13.2 Through ModbusTCP

1、Openning the development system of ForceControl -- IO equipment configuration, selecting "PLC-MODICON（Modicon）—modbus TCP communication".

2、Entering the equipment name and the equipment address（S7-300PLC's station address）;

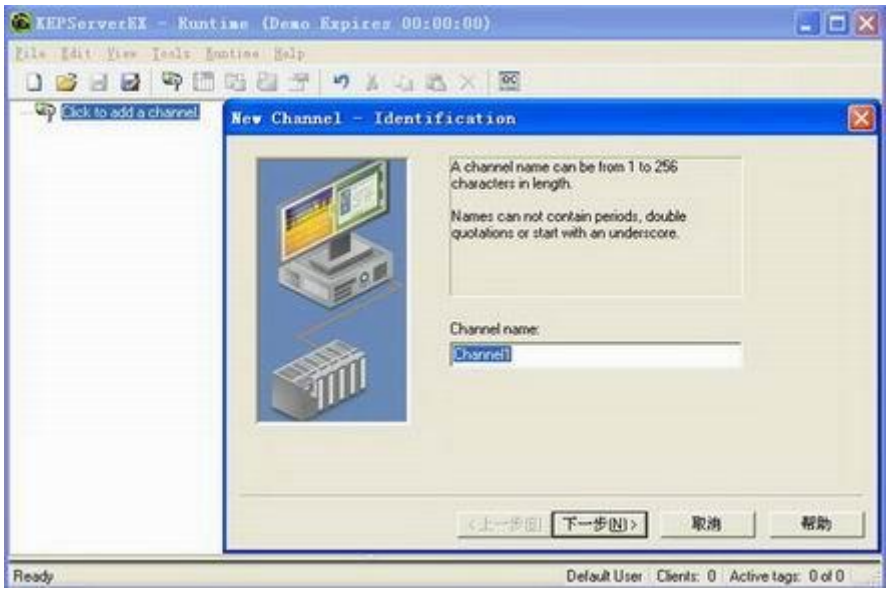
3、Entering the IP address and the port number(the default is 502) of ODOT-S7MPI, completing the settings.

6.14 The settings of KepWare OPC through ODOT-S7MPI

Siemens S7-300/400 uses ODOT-S7MPI to connect to KepWare OPC, the method is through the S7TCP driver of Siemens.

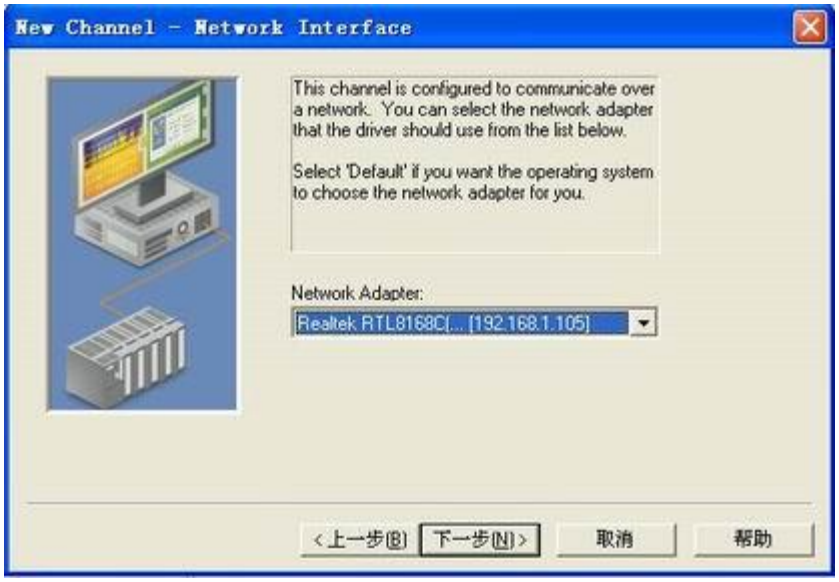
6.14.1 Channel settings

1、Openning Kepware OPC Configuration,adding a channel,entering the channel name,the next step;

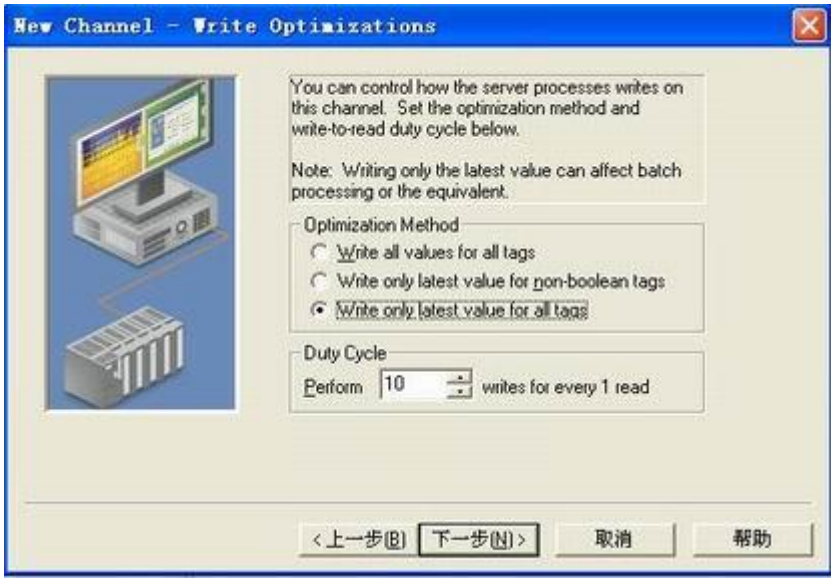


2、Selecting Siemens TCP/IP Ethernet driver,clicking the next step;

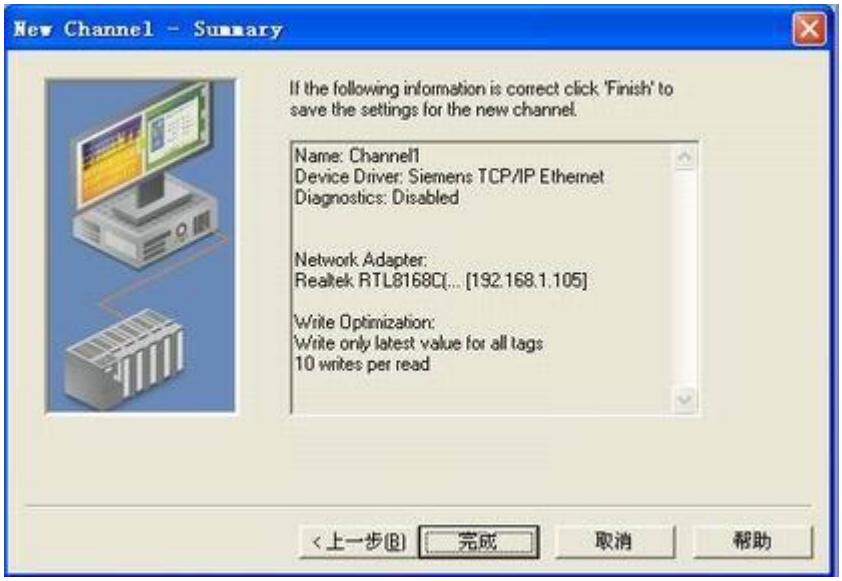
3、Selecting the network card of the computer;



4、According to the need to choose the mode (the default is ok),clicking the next step;

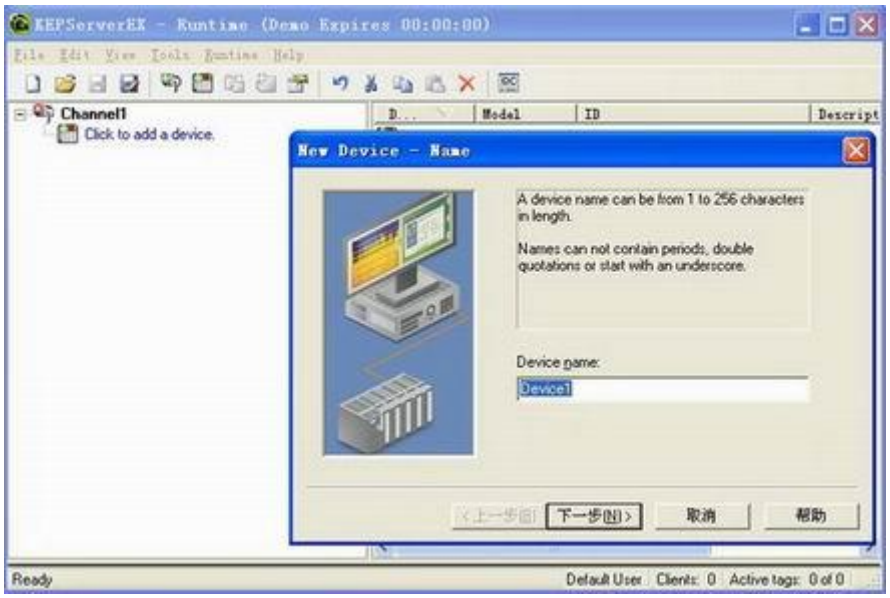


5、Complete the settings of channel parameter.



6.14.2 Device settings

1、Adding a device, entering the device name,clicking the next step;



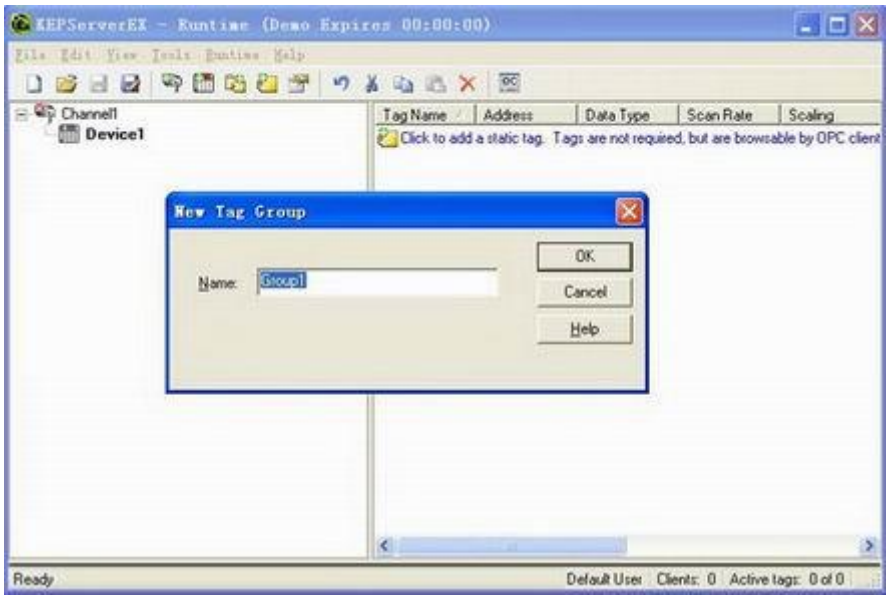
2、Selecting S7-300,clicking the next step;

3、Entering the IP address of ODOT-S7MPI, clicking the next step;

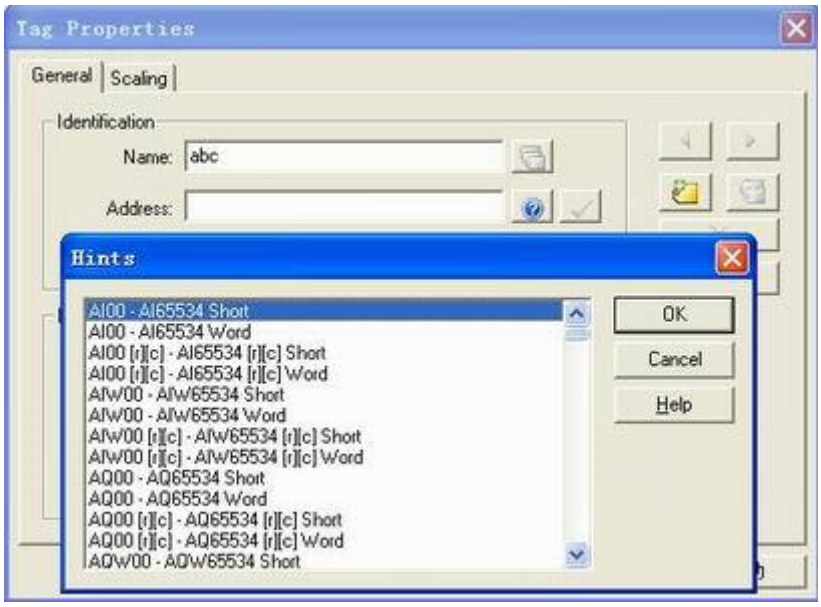
4、The other parameters can be default, completing the settings of device.

6.14.3 Variable settings

1、Creating a new variable group;



2、Creating new variables;



4、 Checking the data communication in the OPC client.

6.15 The settings of FrameView through ODOT-S7MPI

Siemens S7-300/400 uses ODOT-S7MPI to connect to FrameView, the methods include: the S7TCP driver of Siemens、 Modbus TCP driver.

6.15.1 Through the S7TCP driver of Siemens

1、Installing the driver

Selecting "basic application"--“equipment communication”, executing "1.install driver", showing the following dialog box:

Selecting "S7TCP" driver from the Siemens, clicking "Install" button to install.

2、Definingi equipment’s data sheet

Selecting"basic application"--“equipment communication”, executing"4.equipment’s data sheet", displaying the definition interface of equipment’s data table.

Double clicking D2 equipment number, defining it by the following dialog box:

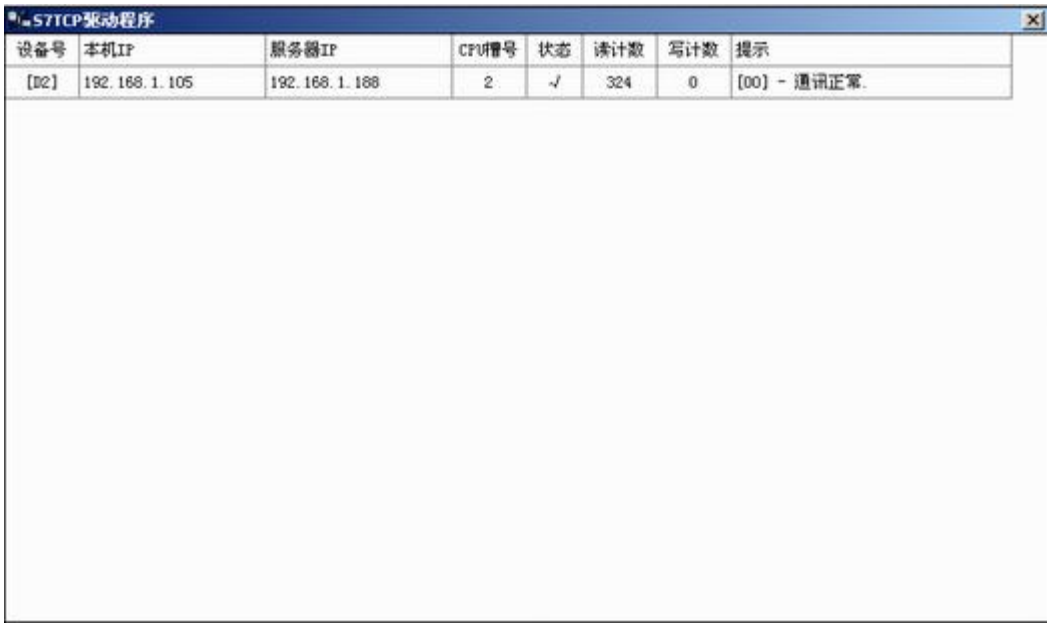
We define DB1.DBB0~DB1.DBB19 of S7-300PLC, a total of 20 bytes data.

注意：Note：“the IP address of equipment” is the IP address of ODOT-S7MPI（the default is 192.168.1.188）.

3、Monitor equipment communication

After activating the monitoring system, you can monitor the communication state of the driver.

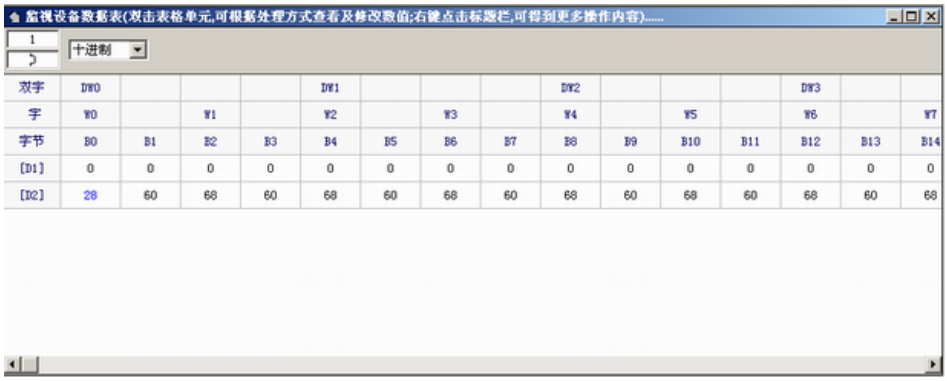
Selecting "basic application"--"equipment communication", "6.monitor S7TCP drive", the interface is shown below:



4、Monitoring equipment’s data sheet

Selecting "basic application"-- "equipment communication", "5. monitor “equipment’s data

sheets "", the interface is shown below:

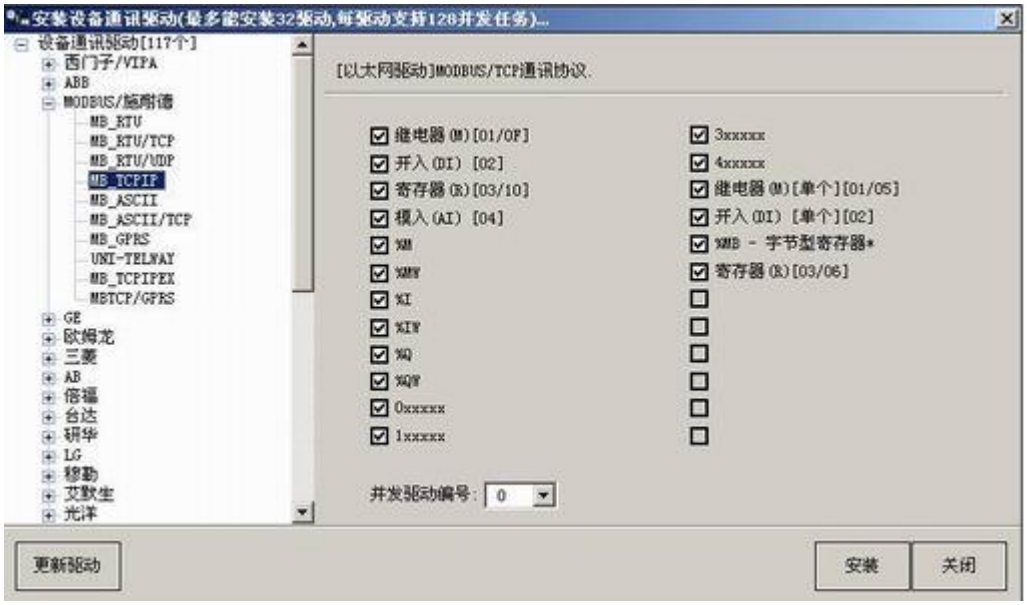


In the line of [D2], showing 20 bytes data you predefined.

6.15.2 Through ModbusTCP

1、Installing the driver

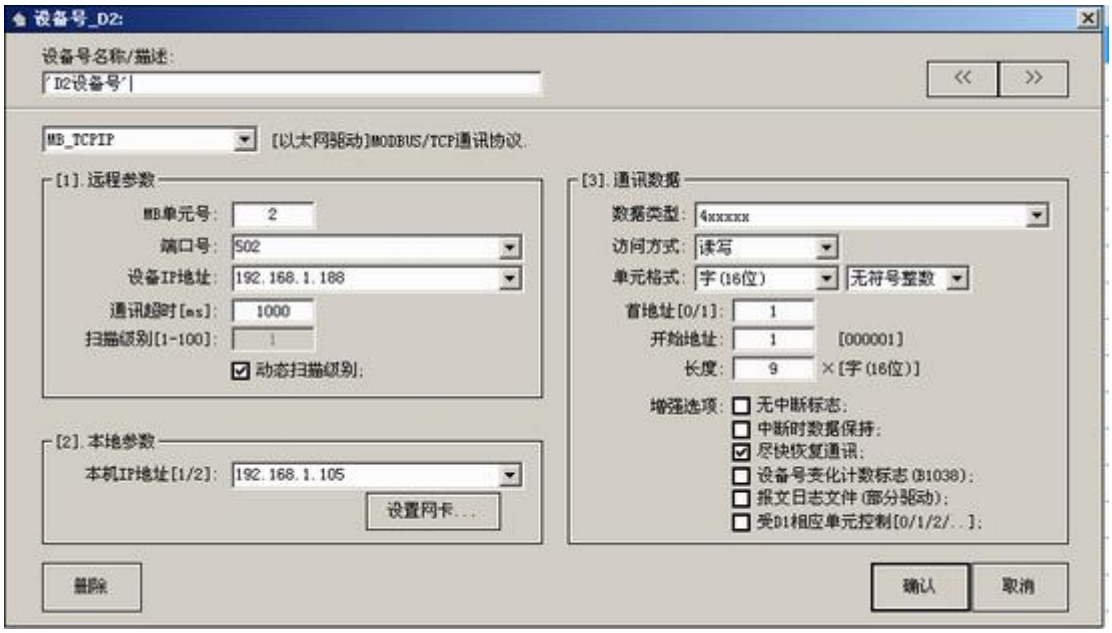
Selecting "basic application"--“equipment communication”, executing "1.install driver", showing the following dialog box:



Selecting MODBUS—“MB_TCPIP” driver, clicking "Install" button to install.

2、Defining equipment data sheet

Selecting "basic application"—“communication equipment”, executing"4.equipment data sheet", displaying the definition interface of equipment data table.



We define 400001~400009here, a total of 9 word data.

Note：“equipment IP address” is the IP address of ODOT-S7MPI（The default is 192.168.1.188）.

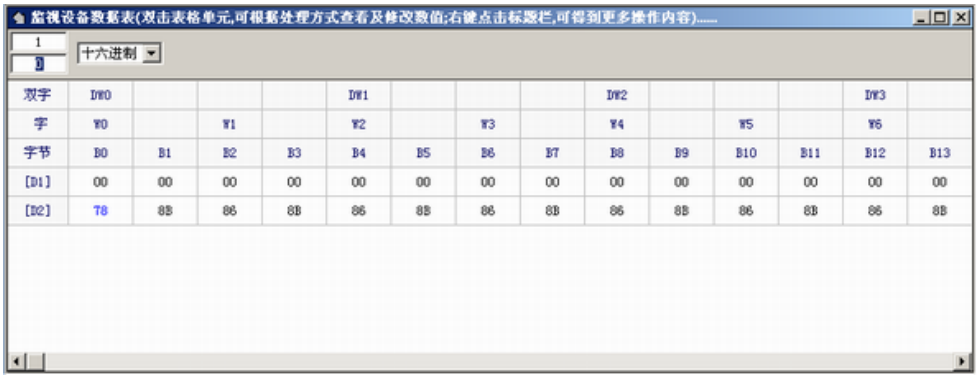
3、Monitoring equipment communication

After activating the monitoring system, you can monitor the communication state of the driver program.

Selecting "basic application"--"equipment communication", "6.monitor “Modbus TCP” driver", the interface is shown as below:

4、Monitoring the variable sheet of equipment

Selecting "basic application"--"equipment communication", "5.monitor “equipment data sheet"", the interface is shown as below:



In [D2], there is 10 word data you have predefined.

6.16 The communication settings of ODOT-S7PPI/MPI and Siemens Ethernet touch screen

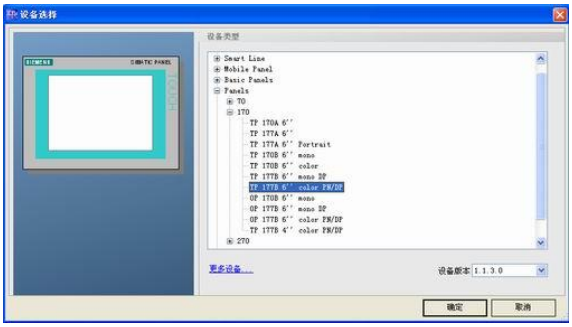
6.16.1 Hardware configuration

A Siemens S7-200PLC and a S7-300PLC; A ODOT-S7PPI and a ODOT-S7MPI; TP177B touch screen; a computer; a switch.

Program description: Siemens S7-200, S7-300PLC through ODOT Ethernet module establish the Ethernet communication of Siemens touch screen (with the network port) and the computer. Realizing ethernet communication of the touch screen and PLC.

6.16.2 Creating a new project

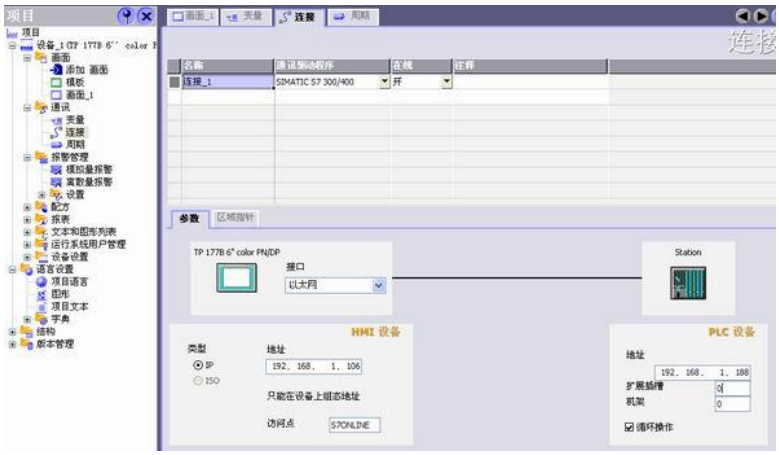
Openning WinCC flexible Standard software, clicking“project”-“new”,selecting the corresponding type of the touch screen（such as TP177B Color PN/DP）,clicking“ensure”.



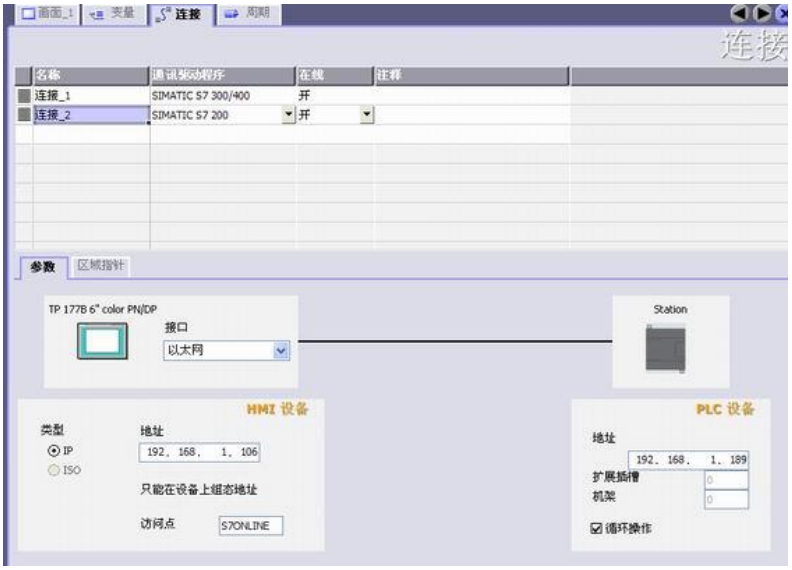
6.16.3 Establishing the connection

Double clicking "communication"-"connection", in the "communication driver connetion",selecting "SIMATIC S7 300/400" drive (establishing the connection with S7 300), in the"interface", selecting

"Ethernet", in the "HMI devices"-"address" ,entering the IP address of the touch screen (192.168.1.106), in the "PLC devices"-"address",entering the IP address of ODOT-S7MPI (here is 192.168.1.188).

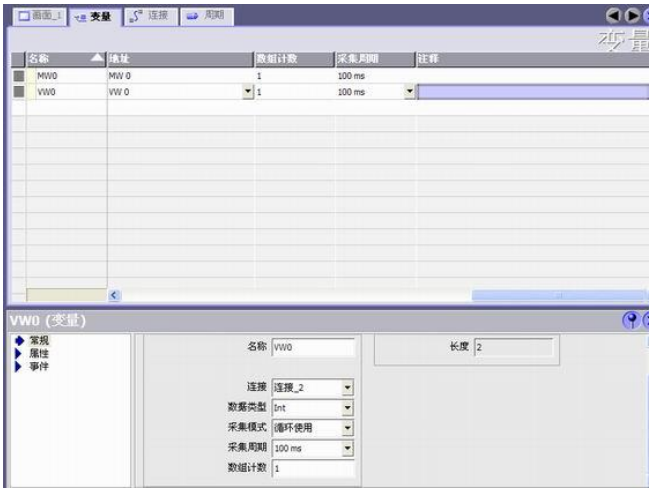


Using the same method to establish a connection with the S7 200 (connection 2), in the "HMI devices"-"address" ,entering the IP address of the touch screen (192.168.1.106), in the "PLC devices"-"address",entering the IP address of ODOT-S7PPI(192.168.1.189).



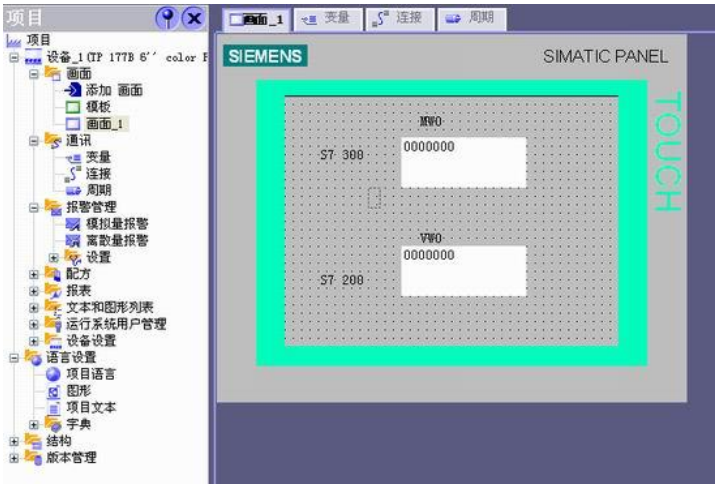
6.16.4 Creating variables

Double clicking "communication"-"variables", creating the variable MW0 (connecting S7 300), creating the variable VW0 (connecting S7 200).



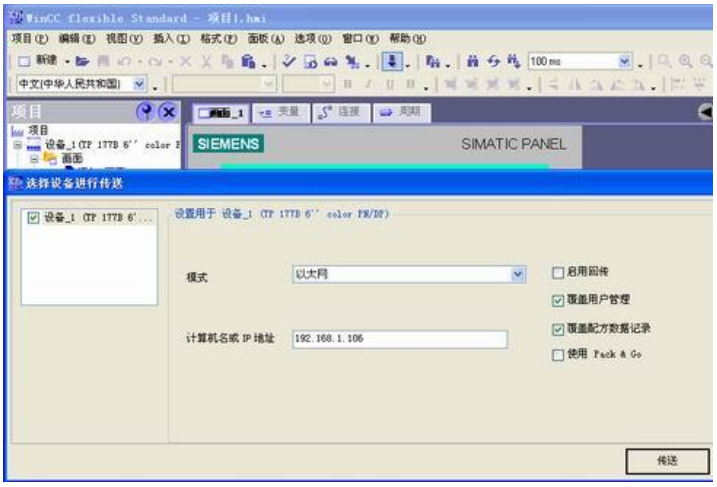
6.16.5 Creating a new frame

Creating the frame of two variables (MW0 of S7 300, VW0 of S7 200).

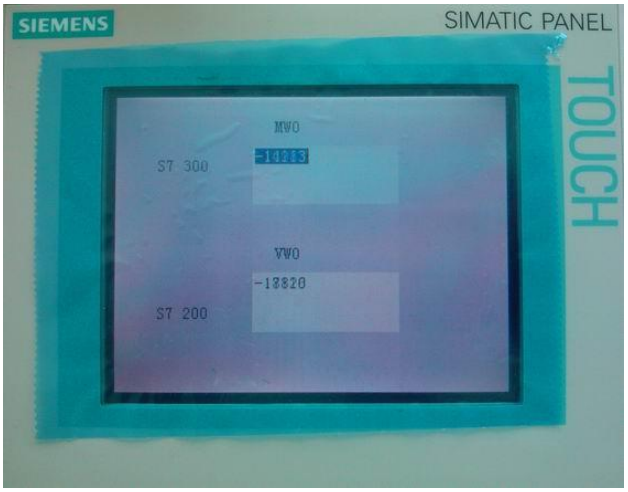


6.16.6 Downloading touch screen's program

Clicking "transfer", in the "computer name or IP address", entering the IP address of touch screen (192.168.1.106), clicking "transfer".



6.16.7 The operation of touch screen



6.17 The communication settings of ODOT-S7MPI and Siemens SmartIE

Siemens touch screen SmartIE has a high price, but can only be used to connect the S7-200; ODOT-S7MPI above the firmware version of 0.1.4.5 supports that SmartIE connects S7-300.

6.17.1 Project description

Siemens S7-300PLC through ODOT Ethernet module establishes the Ethernet communication of Siemens touch screen SMART 700 IE and the computer. Realizing ethernet communication of the touch screen and PLC.

6.17.2 Hardware configuration

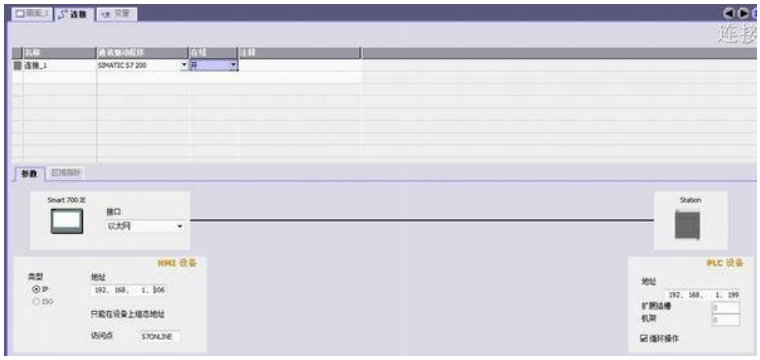
A S7-300PLC； Ethernet communication module ODOT-S7 MPI； SMART 700 IE touch screen.

6.17.3 Creating a new project

Openning WinCC flexible Standard software, clicking“project”-“new”,selecting the corresponding type of the touch screen（SMART 700 IE）,clicking“ensure”.

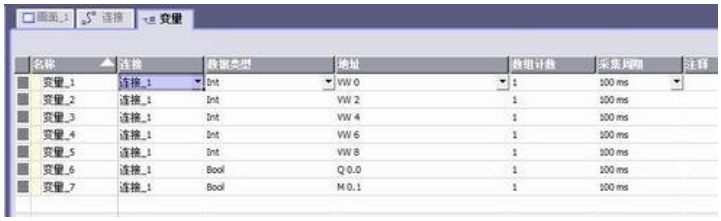
6.17.4 Establishing the connection

Double clicking "communication"-"connection", in the "communication driver connetion",selecting "SIMATIC S7 200" drive (establishing the connection with S7 300), in the"interface", selecting "Ethernet", in the "HMI devices"-"address" ,entering the IP address of the touch screen (192.168.1.106), in the "PLC devices"-"address",entering the IP address of ODOT-S7MPI (here is 192.168.1.188).

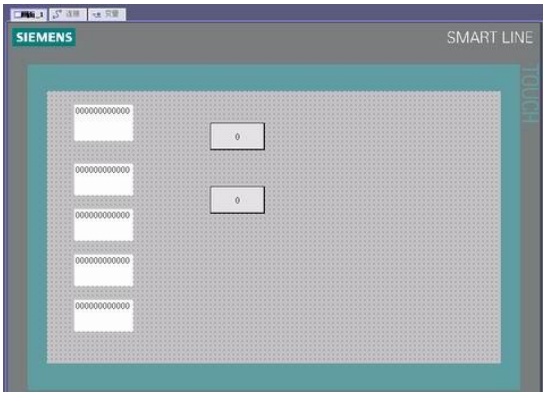


6.17.5 Creating variables

Double clicking "communication"-"variables", creating the variables (connecting S7 300).Note:the V eara of S7-200 corresponds the DB1 of S7 300.



6.17.6 Creating a new frame



6.17.7 Downloading touch screen's program

Clicking "transfer", in the "computer name or IP address", entering the IP address of touch screen (192.168.1.106), clicking "transfer".

6.18 The settings of INTOUCH through ODOT-S7*PI

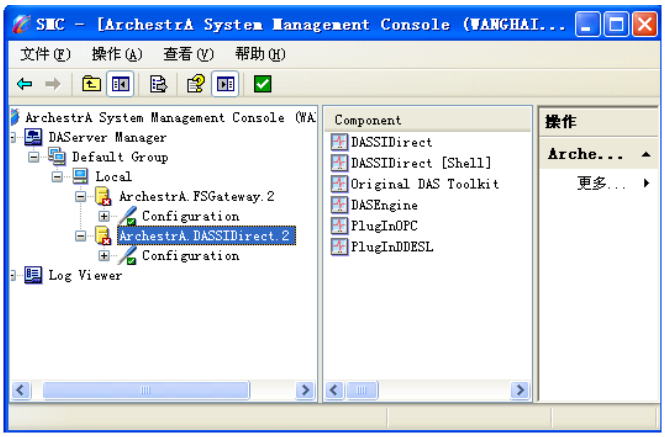
Siemens S7PLC use ODOT-S7*PI to connect to INTOUCH, the methods include: the S7TCP driver of

Siemens.

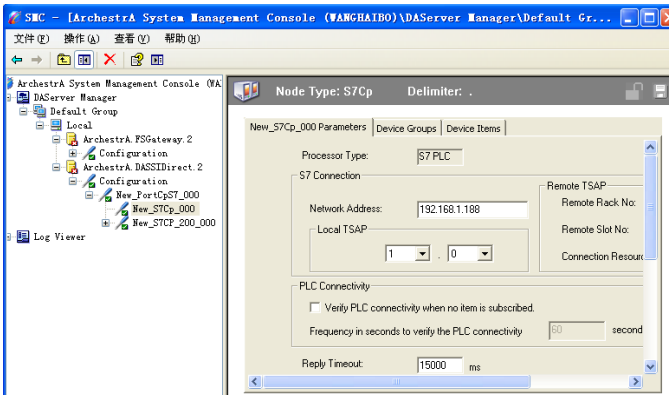
6.18.1 Through the S7TCP driver of Siemens

1、 You should set the parameter of ODOT-S7*PI module: through the S7TCP driver of Siemens, you need to pay attention to the parameter "S7TCP target PLC address", you need to enter the station address of PLC. For example: ODOT-S7PPI, the IP address:192.168.1.188,S7TCP target PLC address: 2; ODOT-S7MPI, IP address:192.168.1.189, S7TCP target PLC address: 3;

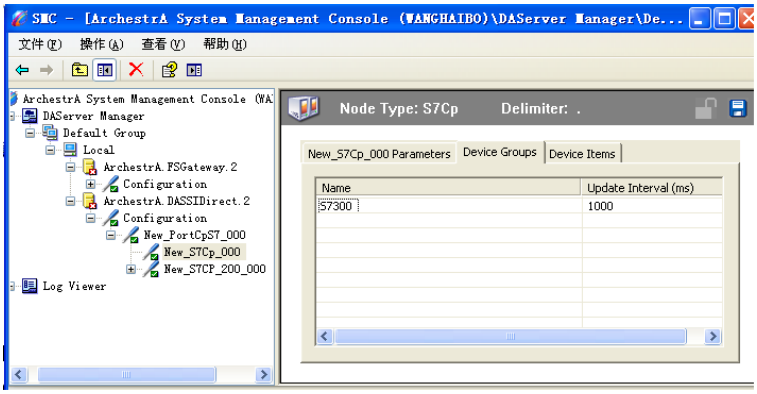
2、 Installing the S7TCP driver of Siemens "DASSIDirect": running “start menu / program /Wonderware/System Management Console (SMC) ”, in DAServer Manager, you can find "SIDirect DAServer", shown in the following figure:



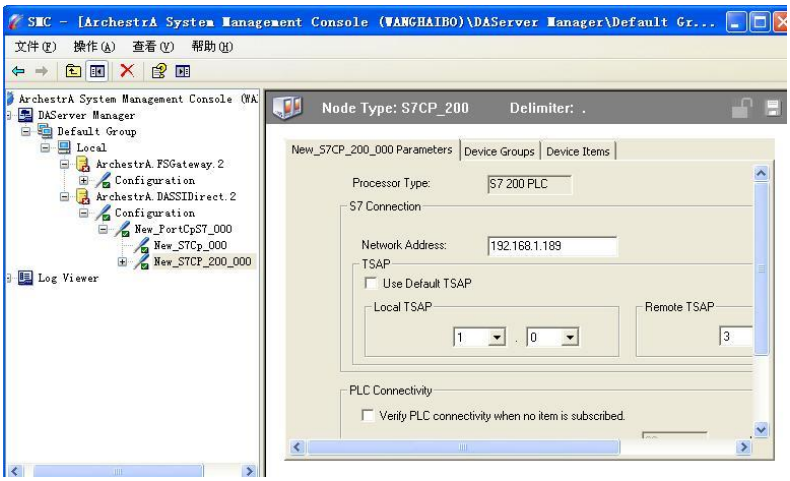
3、 Right clicking the "Configuration", selecting "Add PortCpS7 Object" in the menu; right clicking "New_PortCp_000" and selecting "Add S7Cp Object", adding a S7300 or S7400 site; you only need to enter the IP address of ODOT-S7MPI, the other parameter can be default.



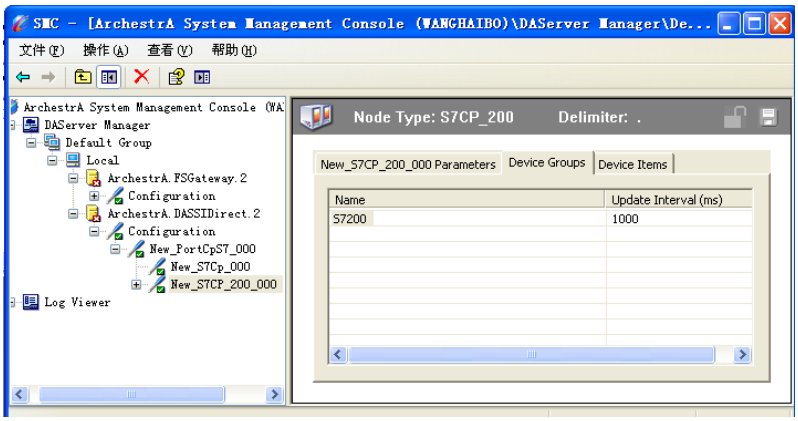
Selecting "Device Group" property page. , right clicking the blank area of "Device Group" dialog, selecting "Add", adding a Device Group, you need to enter a name for"Topic_0" , such as "S7300",and this name will be used in INTOUCH.



4、Right clicking "New_PortCp_000" and selecting "Add PortCpS7_200 Object", adding a S7200 site,you only need to enter the IP address of ODOT-S7PPI, the other parameters can be default, and you need not enter the TSAP.

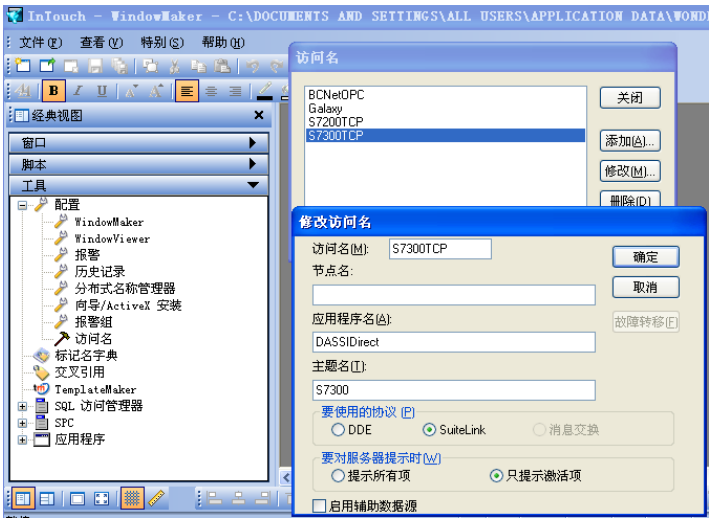


Selecting "Device Group" property page. , right clicking the blank area of "Device Group" dialog, selecting "Add", adding a Device Group, you need to enter a name for"Topic_0" , such as "S7200",and this name will be used in INTOUCH.



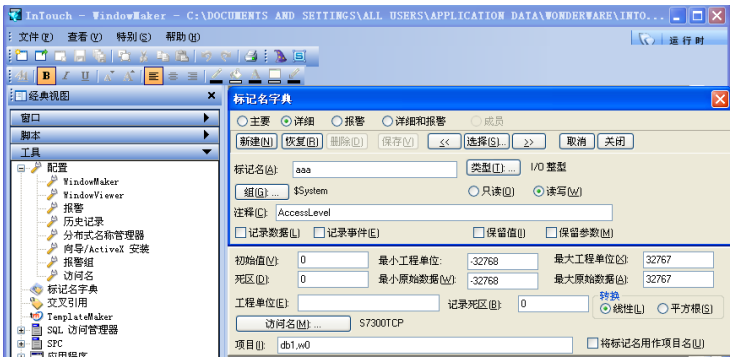
5、Right clicking "ArchestrA.DASSIDirect", selecting "Activate Server" to start the DA Server.

6、Openning the INTOUCH software, tool/configure/access name, adding two access name corresponding to the DeviceGroup of the two S7TCP site of DA Server. S7300TCP: in the "access name",entering "S7300TCP", in the "application program name",entering "DASSIDirect",in the "theme name",entering "S7300"; S7200TCP: in the "access name",entering"S7200TCP",in the "application program name",entering"DASSIDirect",in the "theme",entering "S7200";

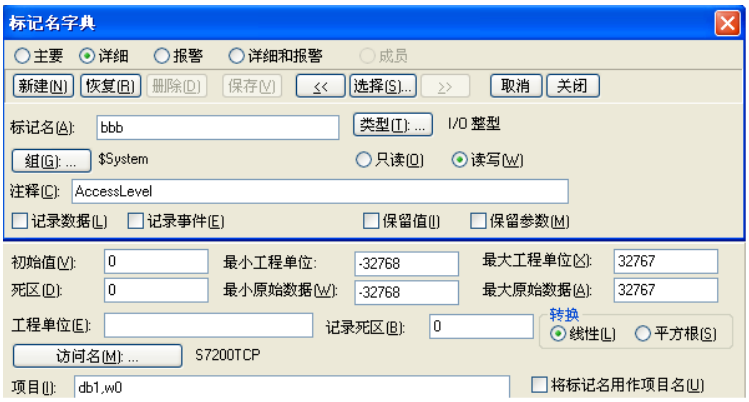


7、Selecting "mark name dictionary"

Creating the new variables of S7300, entering the "mark name", such as: "AAA"; selecting the "access name", such as "S7300TCP"; in the "project", entering the address of S7PLC, such as "db1, W0", corresponding DB1.DBW0.



Creating the new variables of S7200, entering the "mark name", such as: "bbb"; selecting the "access name", such as "S7200TCP"; in the "project", entering the address of S7PLC, such as "db1, W0", corresponding VW0.



7.ModbusTCP's communication

ODOT-S7*PI module integrated ModbusTCP's communication server, so the ModbusTCP's client, such as the configuration software,OPC server,PLC supporting ModbusTCP, and the software realizing the development of high-level language of ModbusTCP's client , can access the internal data area of S7 series PLC directly. The address of Modbus's protocol inside ODOT has been mapped to the address area of S7 series PLC ,and the function number includs: FC1,FC2, FC3, FC4, FC5, FC6 and FC16.

The frame definition of ModbusTCP's protocol :

事务处理标识符	事务处理标识符	协议标识符	协议标识符	长度字段（高字节）	长度字段（低字节）	从站地址	功能号	数据地址（高字节）	数据地址（低字节）	指令数（高字节）	指令数（低字节）
0x0	0x0	0x0	0x0	0x0	后面的字节数						

7.1. The mapping table of address

Modbus	S7 系列 PLC	数据类型	计算公式	功能号	最大指令数
Slave address	S7station address	byte	equal	-	-
00001~	Q0.0~	位	Q***m.n*** = 00001 + ***m****8 + ***n***	FC1（read coils）	S7-200：119 S7-300：784
				FC5（Write single coil）	1
10001~	I0.0~	位	I***m.n*** = 10001 + ***m****8 + ***n***	FC2（Read Discrete Inputs）	S7-200：119 S7-300：784
30001~	MW0	字（2 字节）	MW***m***= 30001 + ***m***/2，***m*** 为偶数	FC4（Read input register）	S7-200：16 S7-300：111
40001~	DBx.DBW0	字（2 字节）	DB***x***.DBW***m*** = 40001 + ***m***/2，***m*** 为偶数（***x*** 由参数指定，S7-200 的 V 区为 DB***1***）（见 S7 总线接口参数）	FC3（Read input register） FC16（write Multple registers）	111
				FC6（write single register）	1

7.2 Using the ModScan32 to test

Unpack modscan2_cr.rar under the product's CD\using manual\software of communication test.

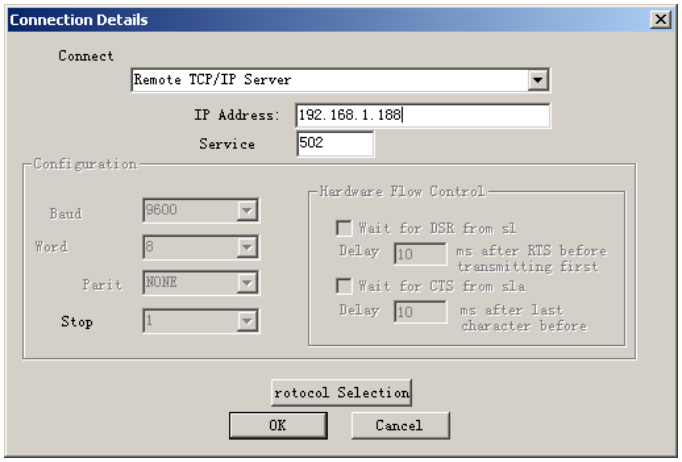
1. Running the software of modscan32.

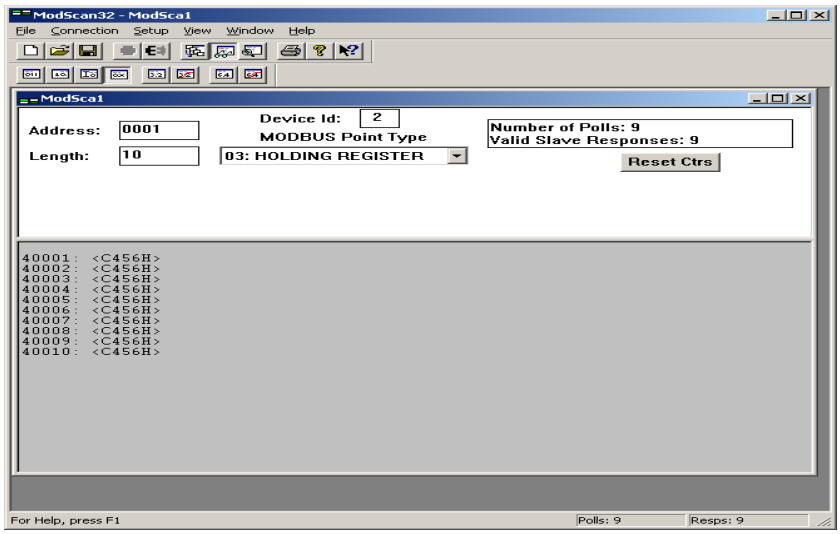
2. Selecting the menu Connection/Connect, and selecting the Remote TCP/IP Server, and inputing the IP address of ODOT-S7*PI,and the Service port is 502; clicking the [OK] button.

3. Setting the Device ID in the sub window "ModSca1" to the station address of S7-200PLC (such as 2),and the function number is 03:HOLDING REGISTER, Address = 00001, Length = 10.

4. Displaying 16 hexadecimal data of 40001-40010 in the data area of the sub window corresponding to the value of S7-200's VW0-VW18.

5. Double clicking the data in the data area of the sub window can modify the value.





8.Diagnostic guidelines

ODOT-S7*PI module's hardware has the basic ability of hardware diagnostic, for the communication problem in the process of using, can be diagnosed by NetDevice software and Wireshark the capture tool of Ethernet packet.

8.1 Fast hardware diagnosis

The detailed hardware descriptionsee: Hardware and interface。

- The PLC is energized,and the ODOT-S7*PI module is inserted into the communication port of PLC , please observe the panel indicator of the module:

1. Red Pwr indicator light should be bright.

   If it is bright, the power source of the module is normal.

   If it is extinguished, the possible reason is that:

   1) The power source of the module has fault; please pull down the module from PLC, and supply the power sourse 24VDC from the external terminal, if the Pwr lamp is still not bright, the module can be confirmed the power source of the module has fault, and needs to repair.

   2) If the Pwr light is bright when the external terminal supply the power sourse, indicating that the power source inside the communication port of PLC has fault, please change a PLC to try again.

2. Green Bus indicating light should be bright in seconds.

   If it is bright, the module has found PLC, and the communication of PLC and the module is normal.

   If it is flash, the module has not found PLC， the possible reason is that：

   1) The communication Part of the module has fault, and can not be detected by PLC, so it need to repair.

   2) The baud rate of PLC's communication port can not detect, such as greater than 1.5Mbps.

   3) If the module is inserted into the PROFIBUS communication port, it maybe that PROFIBUS communication does not start (if PLC is the new factory, its PROFIBUS communication port is prohibited).

   4) For ODOT-S7MPI, if it is running in the PPI/MPI/PROFIBUS protocol model, while the PLC is S7-200PLC, the Bus ligth will flash.

   5) The communication port of PLC has fault.

   If the Bus indicator light is not bright, the module inside the system has fault, so it needs to

repair.

- Computer is using the Ethernet cable (T568A or T568B) to connect to ODOT-S7*PI module,please observe the indicating lamp on the ethernet socket of the module:

  1. Yellow Link light located above the socket should be bright.

     If the light is bright, the module and the computer have established Ethernet connection.
     If the Link light is not bright, the module has not established Ethernet connection, the possible reason is that:

     1) Cable or socket has failure in contacting, check or replace the cable.

     2) The Ethernet of the module has fault, needs to repair.

  2. Orange Active light located below the socket should not be bright or flashes occasionally.

     When the other device on the network communicate with the module, the Active light will flash, if there is no communication, it should be extinguished.

     If the Active light is continuous bright (note: is not rapid flsahing), the Ethernet of the module has fault, so it needs to repair.

- Openning the computer's IE browser, entering 192.168.1.188 (the factory IP of the module) to the address bar of the browser, if you can see the inner Web page of the module, the module works normally

  If you can not see the inner Web page of the module, the possible reason is that:

  1. The computer and the module are not in the same network segment, you need to set the parameters of computer's IP address.

  2. In some situations, if the wireless communication of the computer is been started, it will affect the communication of the local network card. Please disable the computer wireless network card.

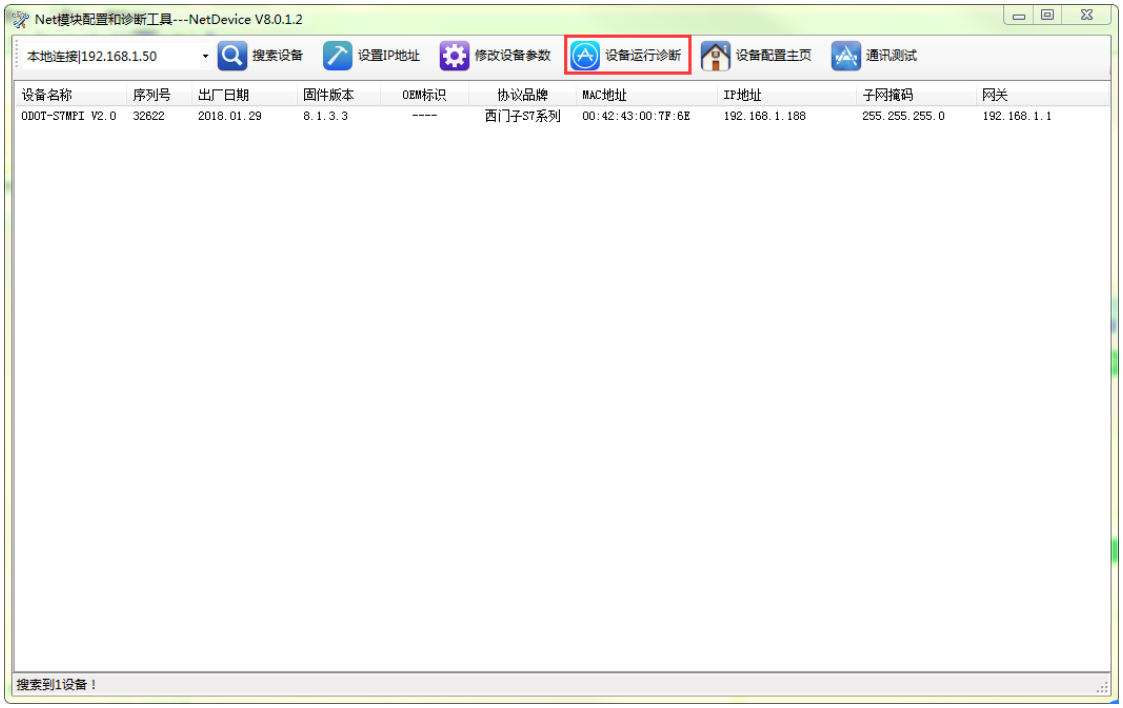
  3. The IP address of the module has been changed, you need to use the NetDevice software to search the module.

  4. If the NetDevice software can not search for the module (note: you should add NetDevice to the exception of the firewall), the module may have fault, and needs to repair.

8.2 The communication diagnosis of module

The communication diagnostic of ODOT-S7*PI can been realized through the internal diagnosis Webpage, NetDevice software or STEP7 driven programming.

4、 Running NetDevice software，as shown blew：



5、 Selecting the module you have searched, clicking [equipment's operation diagnosis] button , as shown below:

The state of the picture's [S7 bus's interface information] is very important, for a ODOT-S7*PI module under normal working condition, the state of bus should be "run", automatic baud rate should be "complete", and can display the correct baud rate.

The address table of the master station contains all address of the master station on the network, and the address table of the slave station contains all address of the slave station on the network, S7-300/400 are the master station, S7-200 are the slave station.The ODOT module is the master station.

If the times of the error response are non 0, there is mistake in communication, the possible reason is that:

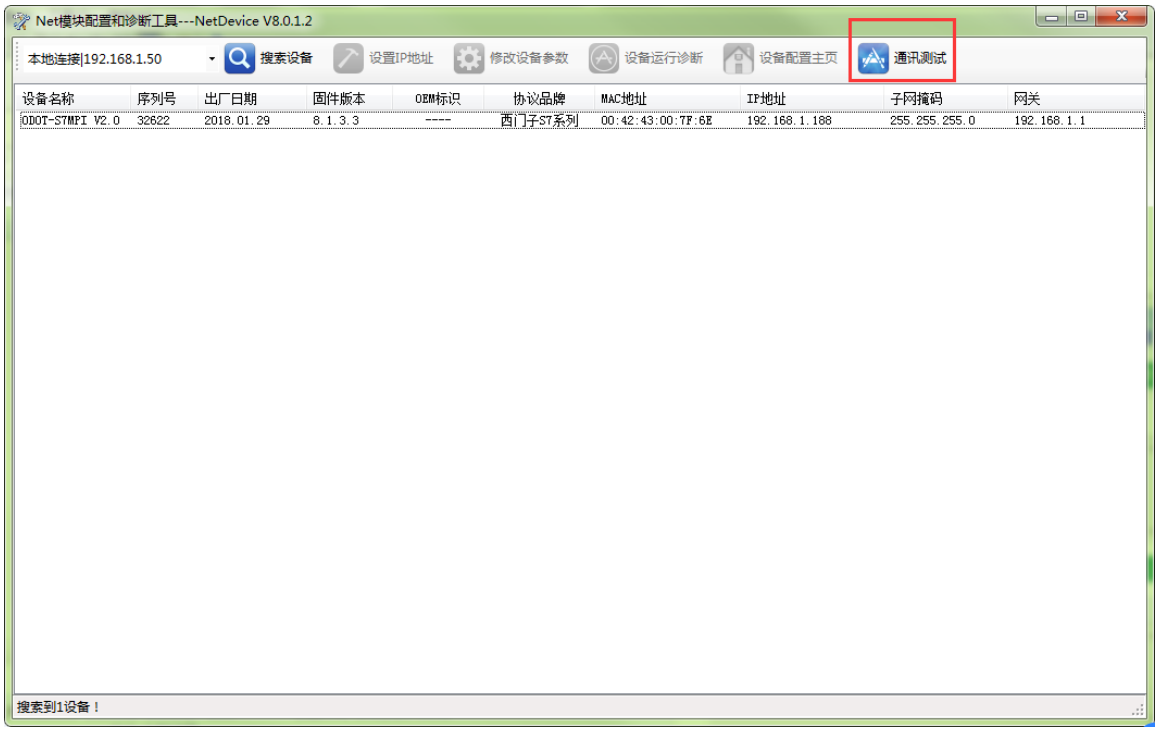
- The PLC of the upper software accesses does not exist.
- The data region of the upper software accesses does not exist in PLC.
- There is error of S7 protocol model, such as ODOT-S7MPI is in the PPI mode, but the PLC is S7-300, the error will occur when using STEP7 software to communicate

If the error response frame has data (non 16 hexadecimal FF), you can click the copy button to copy it down and provide it to Beichen's technical support, it can help us to find out the problem.

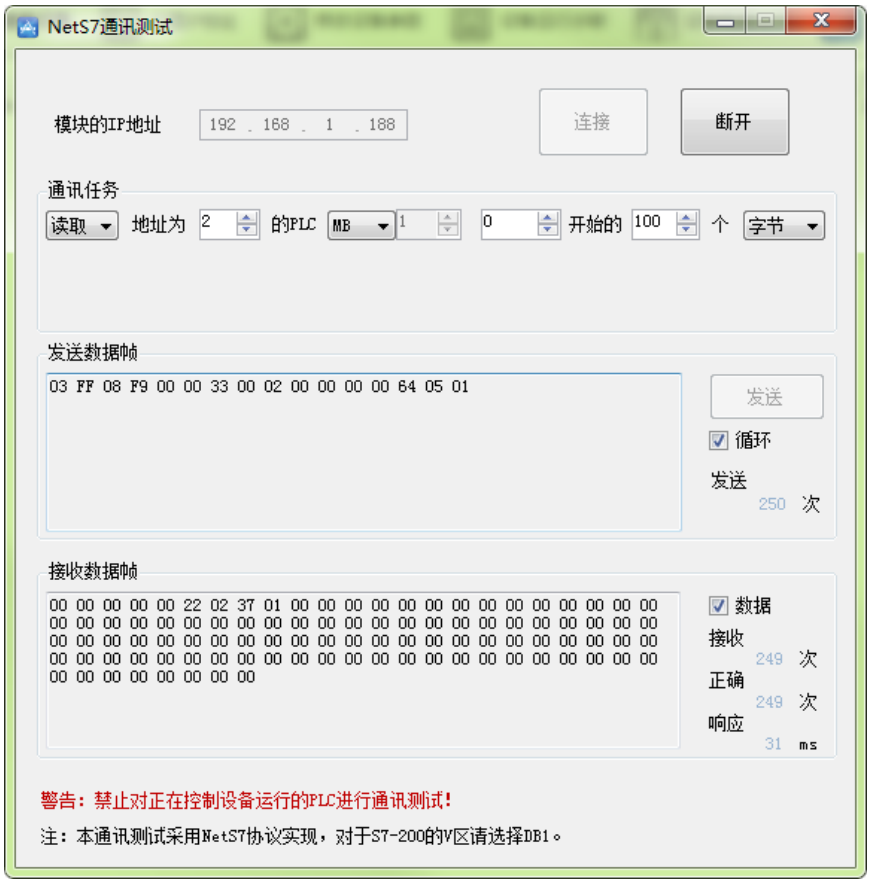
The Internal fault of the system's operation information is the system fault of the module, under normal circumstances,it should not exist, if it exists,please contact Beichen's technical support.

All error messages (except the system faults) is automatically cleared after the module has electricity again.

6、 Selecting the module you have searched , clicking the [ODOTS7 communication test]button, as shown below:



ODOTS7 communication test can be used to test whether the normal communication of the module and the PLC. as shown below:



7、 If you encounter the software problems of communication, before contacting Wuxi Beichen's technical support ,please get two pictures ready firstly: [equipment's operation diagnosis] chart and [ODOTS7 communication test] chart.

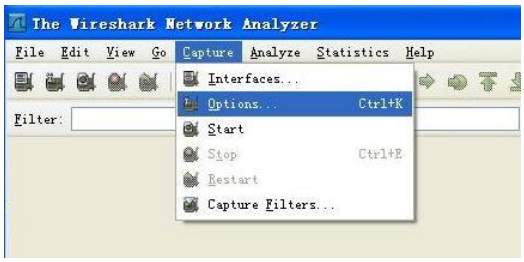
8.3 Wireshark capture tool

If there is some problems in the Ethernet application of module, you can use Wireshark to capture the data packet of the computer communicates with module to analysis. Wireshark is a free software,and it can be downloaded from the internet.

1、Operating the monitoring software (MicroWIN, STEP7, WINCC etc.).

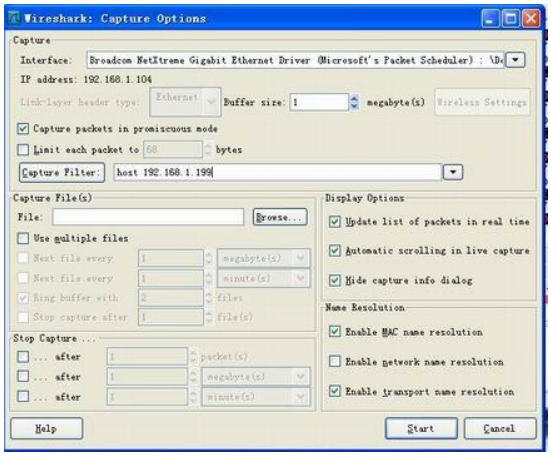
2、Openning WireShark software.

3、Clicking "Options" of "Capture".

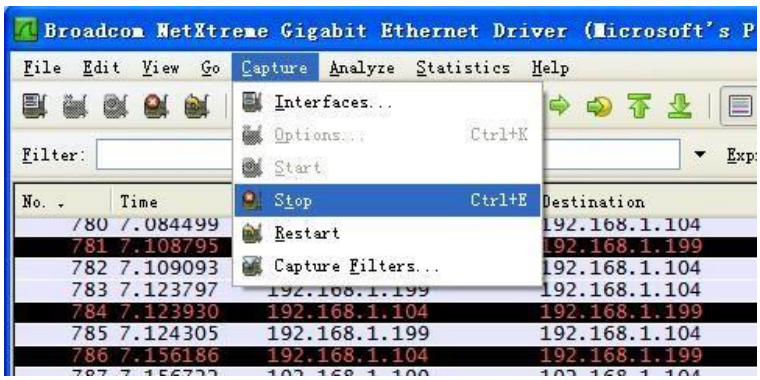


4.selecting your network card in "Interface" of the pop-up dialog box,entering in "host 192.168.1.199" in "Capter Filter" , 192.168.1.199 is the IP address of

ODOT-S7*PI, clicking "Start" to start capturing.



5. Clicking "Stop" of "Capture" to stop capturing.



6. Saving the file and sending to ODOT's technical support.

9.FAQ

9.1 The use of ODOT-S7*PI module？

ODOT-S7*PI module is used for Ethernet data communication of Siemens S7 series PLC, its uses include PLC's programming and debugging, remote data's acquisition as well as equipment's maintenance through Internet. It can replace the traditional communication scheme using RS485 , such as CP5611,CP5613 communication card, also can replace the communication scheme using CP243, CP343, CP443E, so it is so cost-effective. Please refer to th: ODOT-S7*PI application。

9.2 The technical advantages of ODOT-S7*PI module

1、ODOT-S7*PI module can be used for multi master token communication of Siemens S7 ,the multi master device of Siemens can access to "the straight", such as CP5611 or Siemens's touch screen etc.;

2、The perfect driver of "PG/PC" interface can be used for STEP7, MicroWIN's programming and debugging;

3、 Non Siemens's touch screen can access to the extension communication port of "The bridge", it does not affect the original communication system, and increases a interface of Ethernet communication;

4、Supporting ModbusTCP communication;

5、Supporting the program maintenance of equipment through the Internet;

6、The electricity can be get from the communication port of PLC , without a power cut for the equipment,and it is plug-and-play；

9.3 The stability of ODOT-S7*PI module?

Each ODOT-S7*PI module must operate a week at a 60 degree aging box befor saling, and the number of tests of having electricity and no electricity more than 50000. We can ensure its long-term stable operation in the environment of 0 to 60 degree.

9.4 ODOT-S7MPI can be inserted in the communication port of PROFIBUS to operate?

Yes.The highest baud rate of communication ODOT-S7MPI supported is 1.5Mbps.

9.5 How to realize the connection of ODOT-S7*PI module and the remote PLC through the internet?

There are a variety of ways to connect the remote PLC through the Internet,using the port mapping of the router or VPN,具体请参考本手册的 Internet 远程设备维护 这一章。

9.6 The communication speed of ODOT-S7*PI module and the PLC?

For S7-200, at the baud rate of 187500bps, if you read 200 bytes of data, the time is about 20

milliseconds; for S7-300/400, at the baud rate of 187500bps, if you read 200 bytes of data, the time is about 30 milliseconds (no other master access PLC).

9.7 How many connections of Ethernet client of ODOT-S7*PI module?

For S7-200, the largest number of connections of client is 24; for S7-300/400,the maximum number of connections depends on the PG connection settings of CPU parameter (the most is 16/32).

9.8 If the communication port of S7-200 has been occupied by EasyView touch screen,can i realize the Ethernet communication by ODOT-S7PPI?

Yes, you can use “the bridge” of ODOT-S7PPI, put the communication cable of touch screen inserted in the extended communication port of module.

9.9 Does The ODOT-S7*PI module support the communication of a plurality of the PLC located on bus at the same time?

Yes, as long as the S7 address of PLC on the bus is unique.

9.10 If the computer connects with the ODOT-S7*PI module, should I use the cross line or the straight line?

Every one is ok, ODOT-S7*PI module’s Ethernet supports automatic line sequence adaptation.

9.11 How to read and write the data of PLC using ModbusTCP?

ODOT-S7*PI module has been integrated ModbusTCP server, the data area of Siemens PLC is automatically mapped to the data area of Modbus， see: ModbusTCP Communication。

9.12 Can ODOT-S7*PI module be used to Siemens 840D NC?

Yes. The PLC internal the system of Siemens NC is S7-300, some communication ports may not be integrated 24VDC power, you need to provide 24VDC power for module.

9.13 If the password protection has been set in PLC, can I use the ODOT-S7*PI module to read and write the data of PLC?

Yes.

10.Product’s technical indicators

The ODOT-S7*PI module meet the following technical indicators:

Power supply	24VDC±20%/100mA
The working environment	0-60 Centigrade，90% humidity，No condensation

Installation	installed at the DB9 communication port of Siemens S7PLC directly
size	65 x 33 x 17 mm
DB9 communication port	TIA/EIA RS-485 is compatible，ESD：±15KV，at most 32 notes
DB9 communication protocol	the multi master protocol of Siemens S7 bus，supports PPI、MPI and PROFIBUS，supports the baud rate（bps）：9600、19200、45450、93750、187500、500K、1.5M
RJ45 ethernet	IEEE 802.3 is compatible，10/100M BT，1500Vrms，with Link/Active indicator light,supports Auto-MDIX
Ethernet protocol	S7TCP， ModbusTCP，24 connections of TCP/IP
RoHS production	Yes
antiknock	4.5mm/30Hz/10Min
ESD	6KV
aging befor the factory	running at 60 degrees of aging box 168 hours, the number of times having electricity or not is 500000000
Communication stability	communicating with the PLC constantly for a month,there is no error in the 130 million times of communication

11.Ordering information

ODOT-S7PPI/the straight：

For the Ethernet data communication of Siemens S7-200, the expansion port and PLC's communication port is connected, can be used to access the multi master devices of Siemens, such as CP5611, CP5613 or touch screen.

ODOT-S7PPI/the bridge：

For the Ethernet data communication of SIEMENS S7-200, the expansion port and PLC's communication port is isolated, can be used to access the HMI devices of non SIEMENS, such as EasyView, MCGS, delta touch screen.

ODOT-S7MPI：

For the Ethernet data acquisition of SIEMENS S7-200/300/400, the expansion port and PLC's communication port is connected, can be used to access the multi master devices of SIEMENS, such as CP5611, CP5613 or touch screen.

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