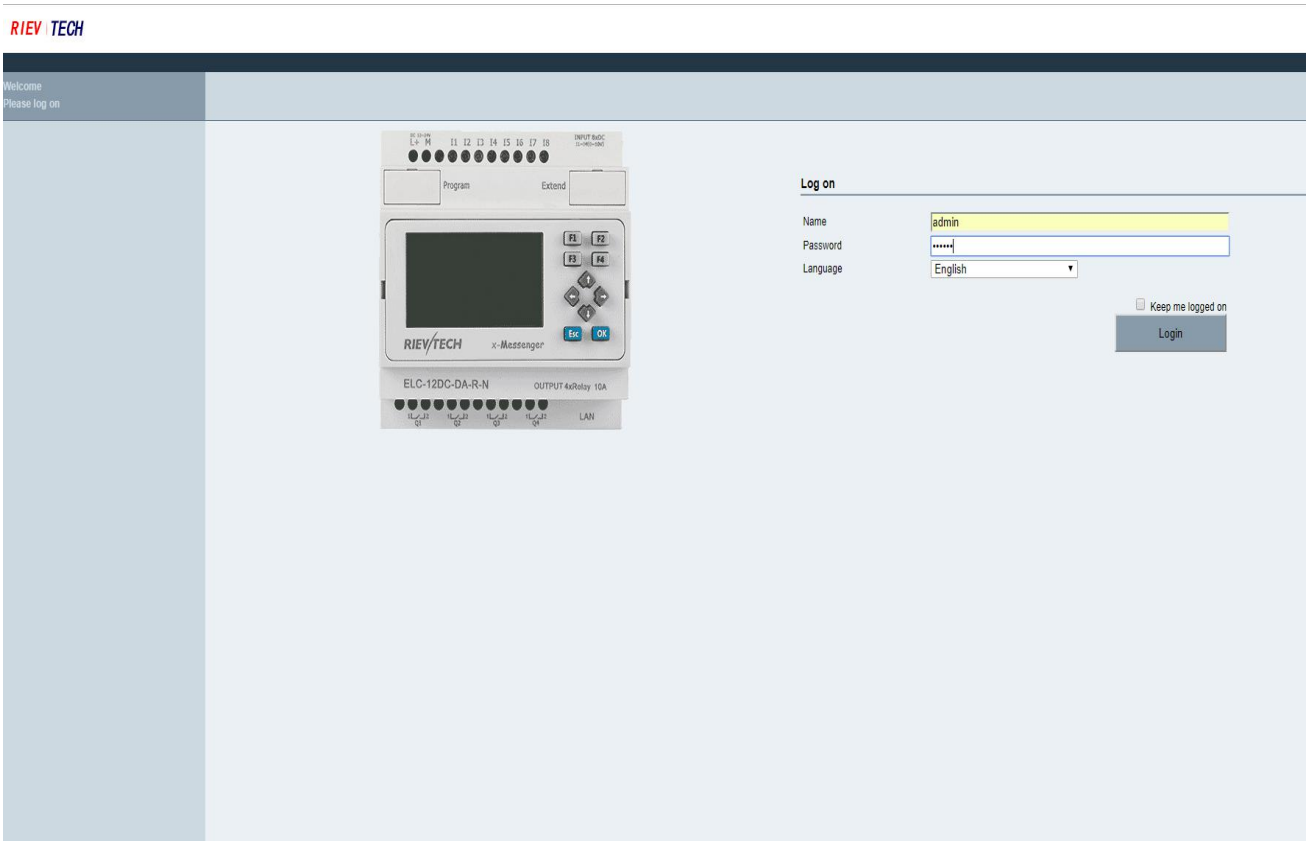
Ethernet module with built-in webserver



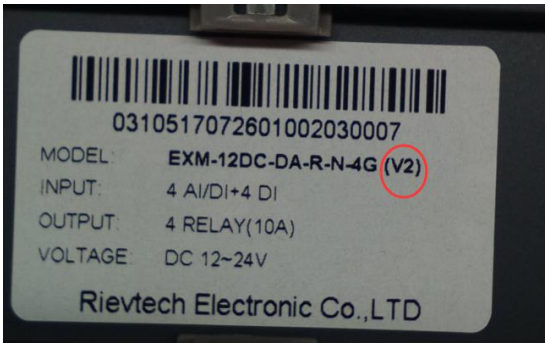
Content

1.Ethernet module with built-in webserver

1.1 How to separate the new version and old version?

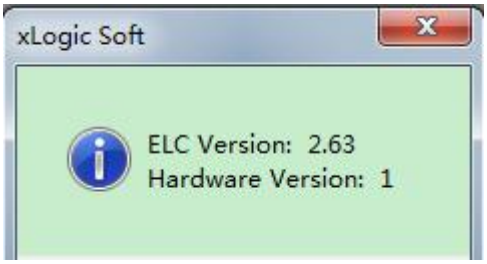
New functions for Ethernet PLC from Rievtech is released.
Included CPU models:
ELC-12DC-DA-R-N
EXM-12DC-DA-R-N(-4G)

Method A:
Label on the bottom of the plastic house of the CPU. The new version marked with “V2” following the model.



Method B:

Get the version number by the software menu Tools-> transfer-> Get PLC version



If the hardware version is 1, that means it is new version.

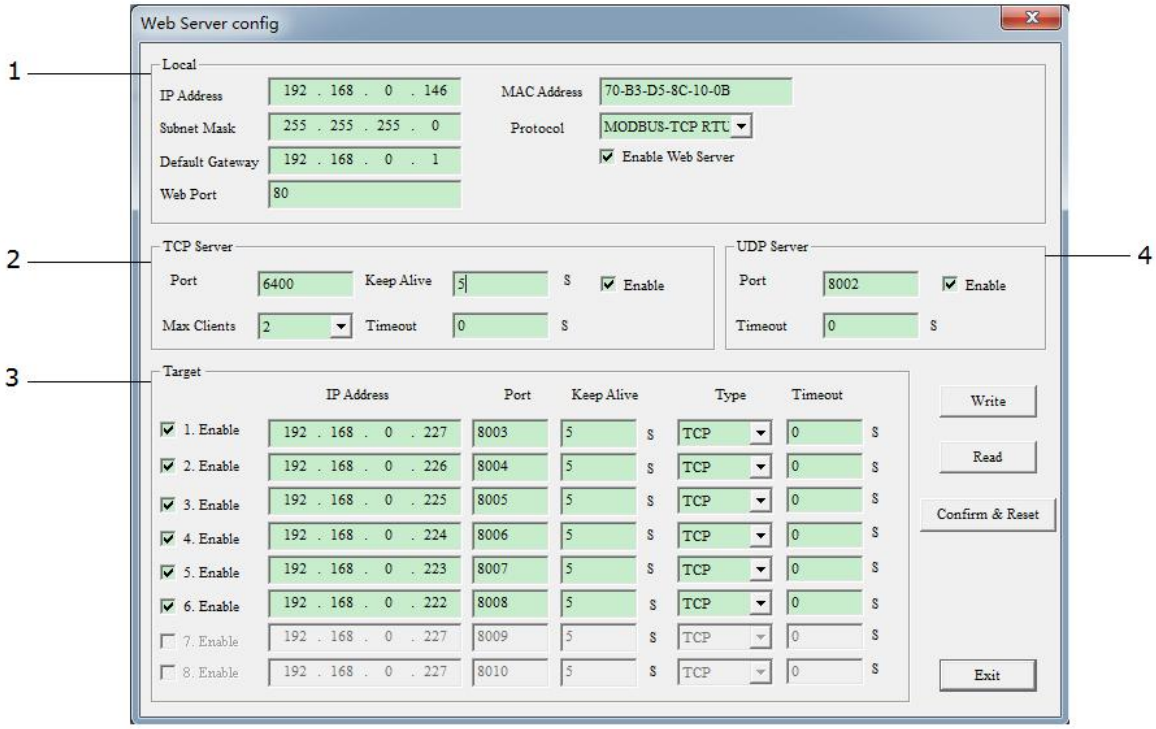
Difference between 2 versions:

Items	New version	Old version
Network parameters configuration software	Program software(xlogicsoft or eSmsconfig)	DeviceManager software

	The menu is Transfer-> Web server config	
TCP Server/client	Work as TCP server or clients at the same time.	Only one mode can be applied (tcp server or Tcp client)
TCP Connections.	Max separate tcp connections(Tcp server+Tcp clients) :8	Works as Tcp client: Can connect 1 Tcp server. Works as TCP
Built-in Web server(Control&Software)	Yes	No.

1.2 How to Configure the Network parameters through program software?

For ELC-12-N or ELC-22-N, you can use xlogicsoft to configure the Ethernet network parameters through the menu Tools-> transfer-> web server config



1. Local CPU Network settings

IP Address

Subnet Mask
Default Gateway
Web Port
MAC Address
Protocol
The option: Enable web Server

2. TCP server

Port : This port is for TCP server. Keep alive: (This settings is no used)

Max Clients:

Total TCP connection numbers is 8, so you can set all the connections for clients, if you set 8, then the PLC cannot work as TCP server anymore.

Timeout: 0s means, it will not be timeout, the server will always on-line even if there is no data transferred. If the value is not 0, that means if there is no data transmission, the connection will restart.

3. Target

If you select max 0 clients in the 2 item(tcp server), then all the 8 target server IP address and port number will be available.

You need tick up the “enable” option and input the remote server ip address and port number.

Keep alive: if there is no data transmission, the CPU will send a package without data to the server to make sure it still is on-line.

Type: TCP or UDP optional

Timeout: 0s means, it will not be timeout, the connection will always be kept even if there is no data transferred. If the value is not 0, that means if there is no data transmission when the timeout, the connection will restart.

4. UDP server

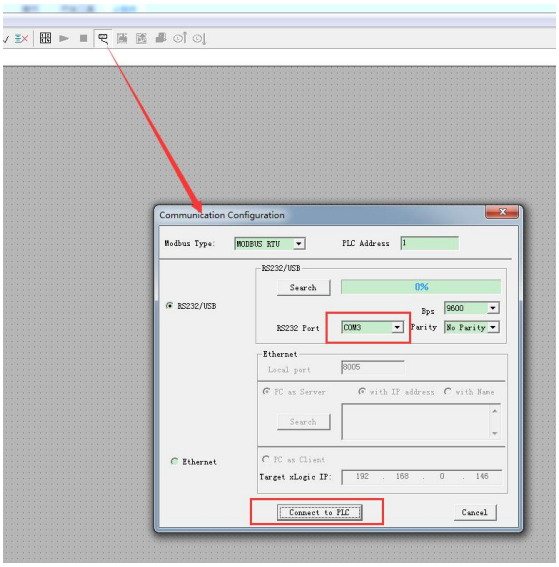
The CPU can work under UDP server as well, you can tickup the enable option.

After you finished the parameters configuration, you need download the settings into the CPU by serial connection or Ethernet Connection like download the program. And at last you need click the “Confirm and Reset” button, then the CPU will restart and the new settings will be available.

Detailed method:

A. Create the connection between PC and the CPU by serial cable(RS232/USB cable) or Ethernet(You can check the CPU IP address and server port number on the LCD menu).

Connect the CPU with PC through the USB cable: Click the open com port option, and select the COM port of the USB cable, here the port number is COM3, then click the button “connect to PLC”.

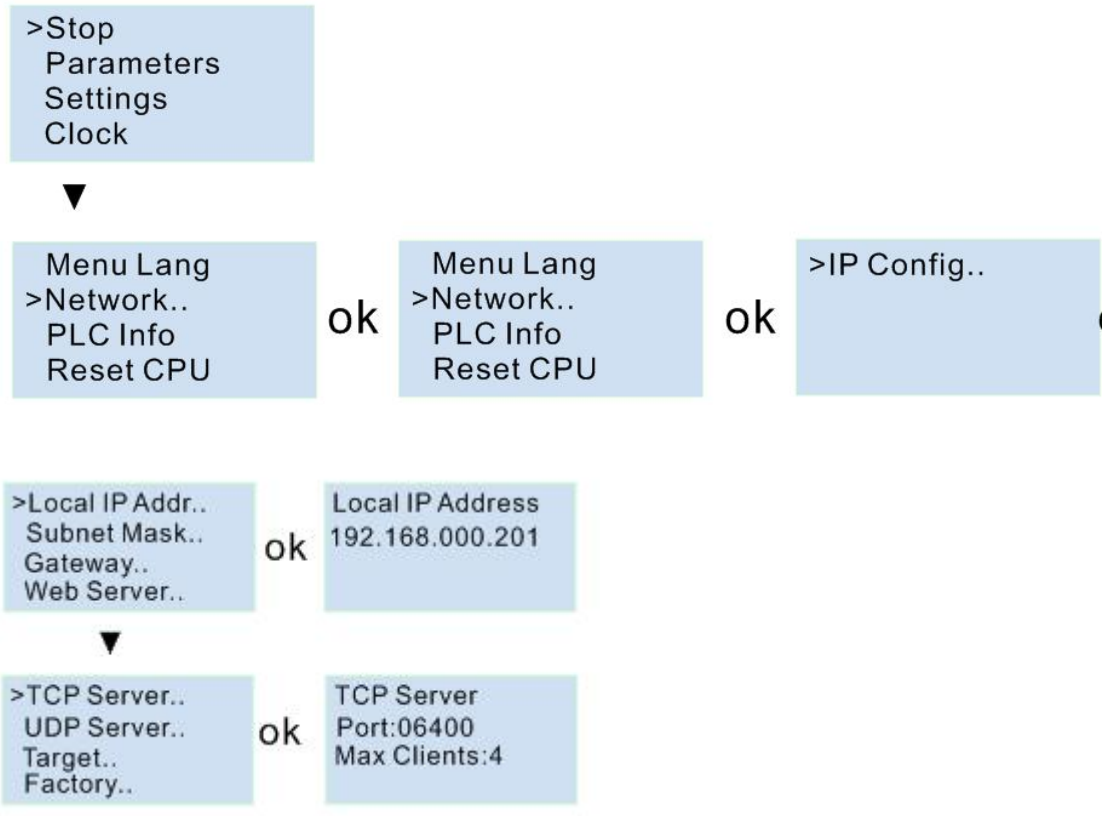


If you has no USB cable there, you can use the Ethernet connection.

First check the PLC address with LCD menu

Get the IP address from:

>Network -> IP Config.. -> Local IP ADDR.. -> Local IP (192.168.0.201)



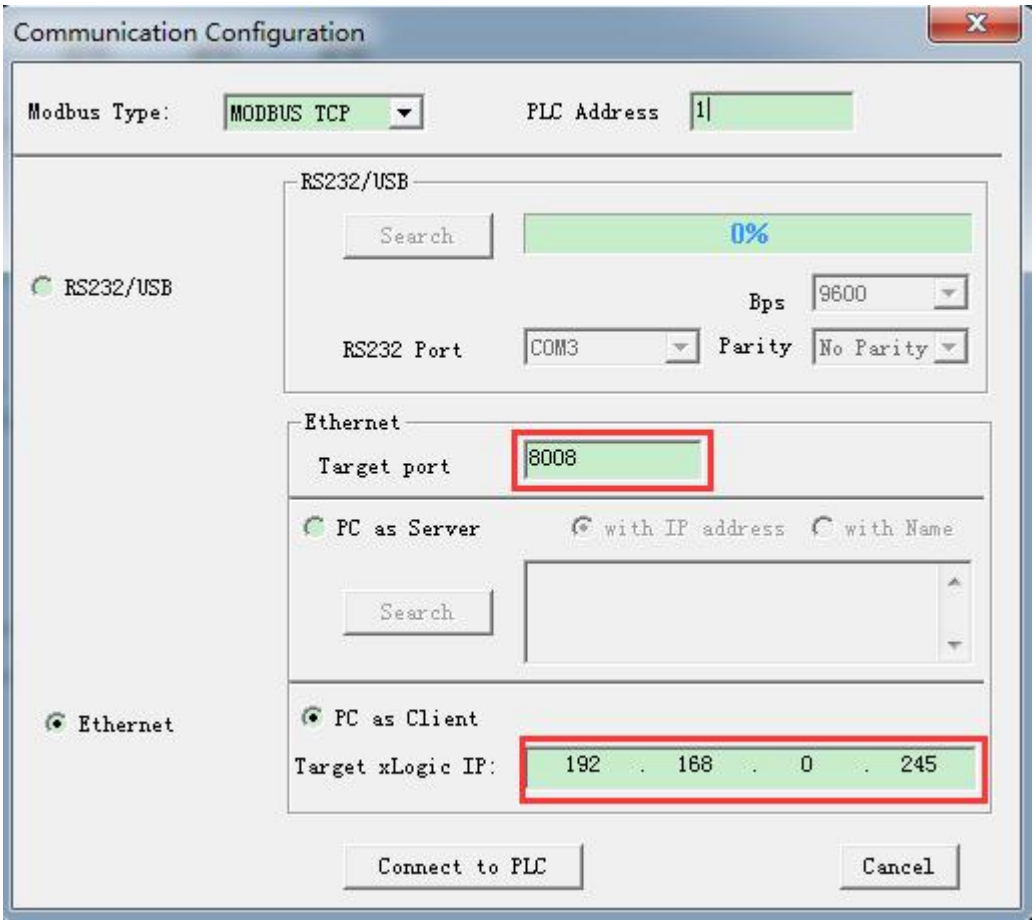
Get the TCP server port from:

>Network -> IP Config.. -> TCP Server.. -> TCP Server Port (6400).

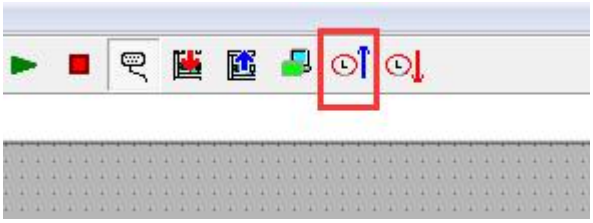
Then you can use the Ethernet option(PC as Client) to connect with CPU.

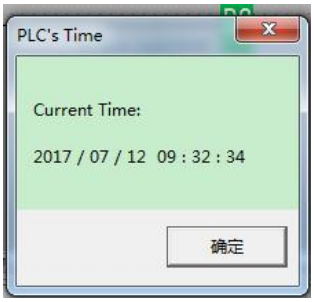
IP:192.168.0.245

Port:8008

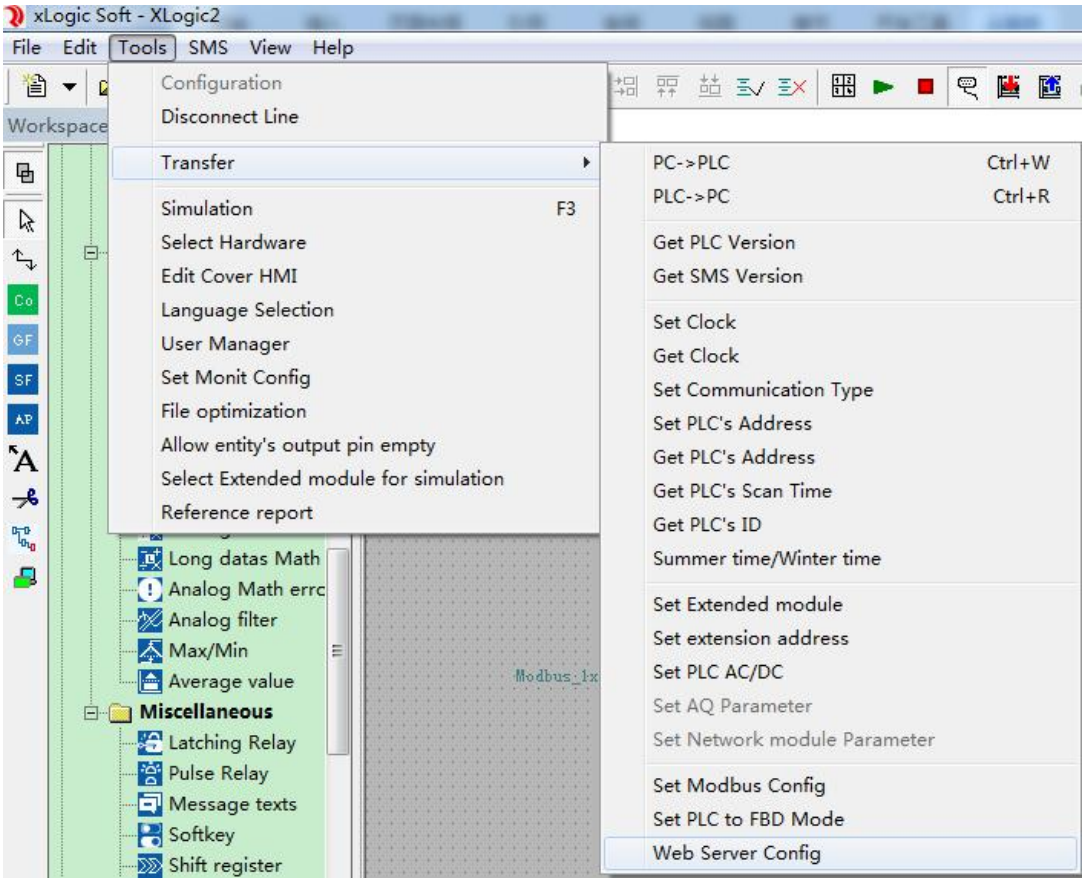


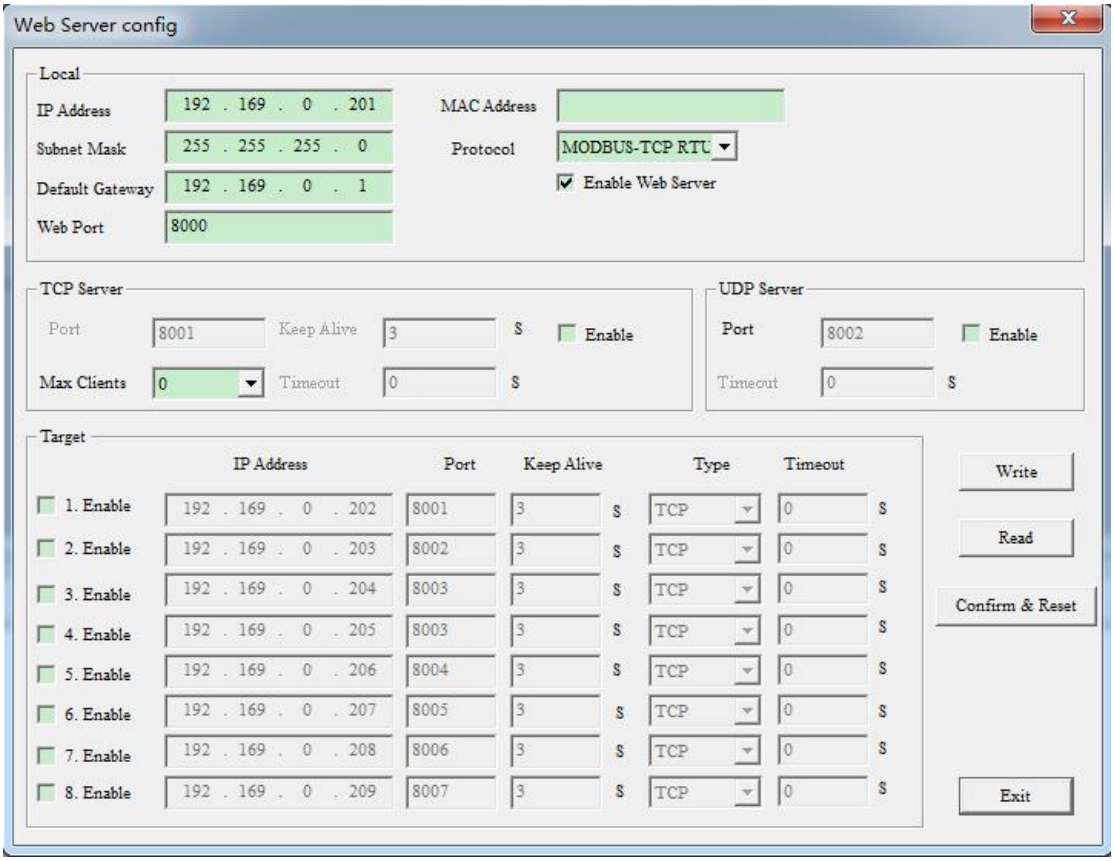
After the connection is created, you can click get the clock icon to confirm the communication is ok.



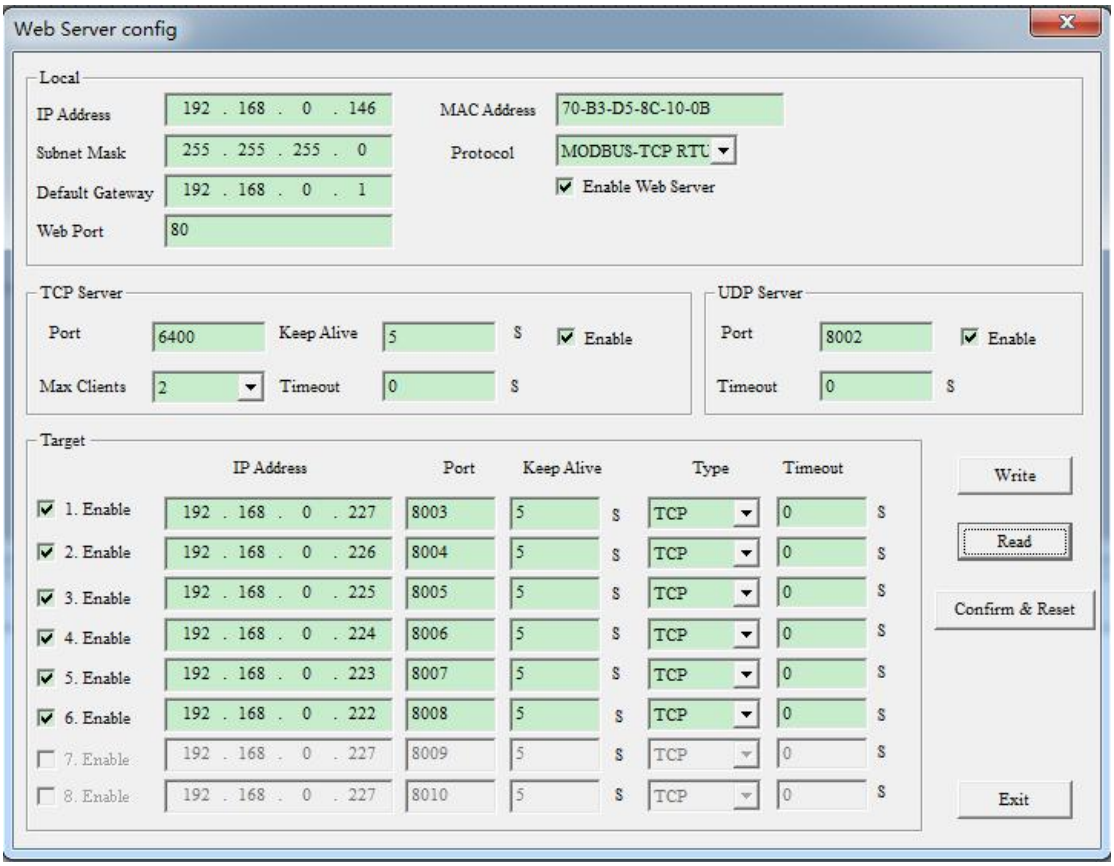


Now you can configure the Network parameter by the menu Tools-> transfer->Web server Config



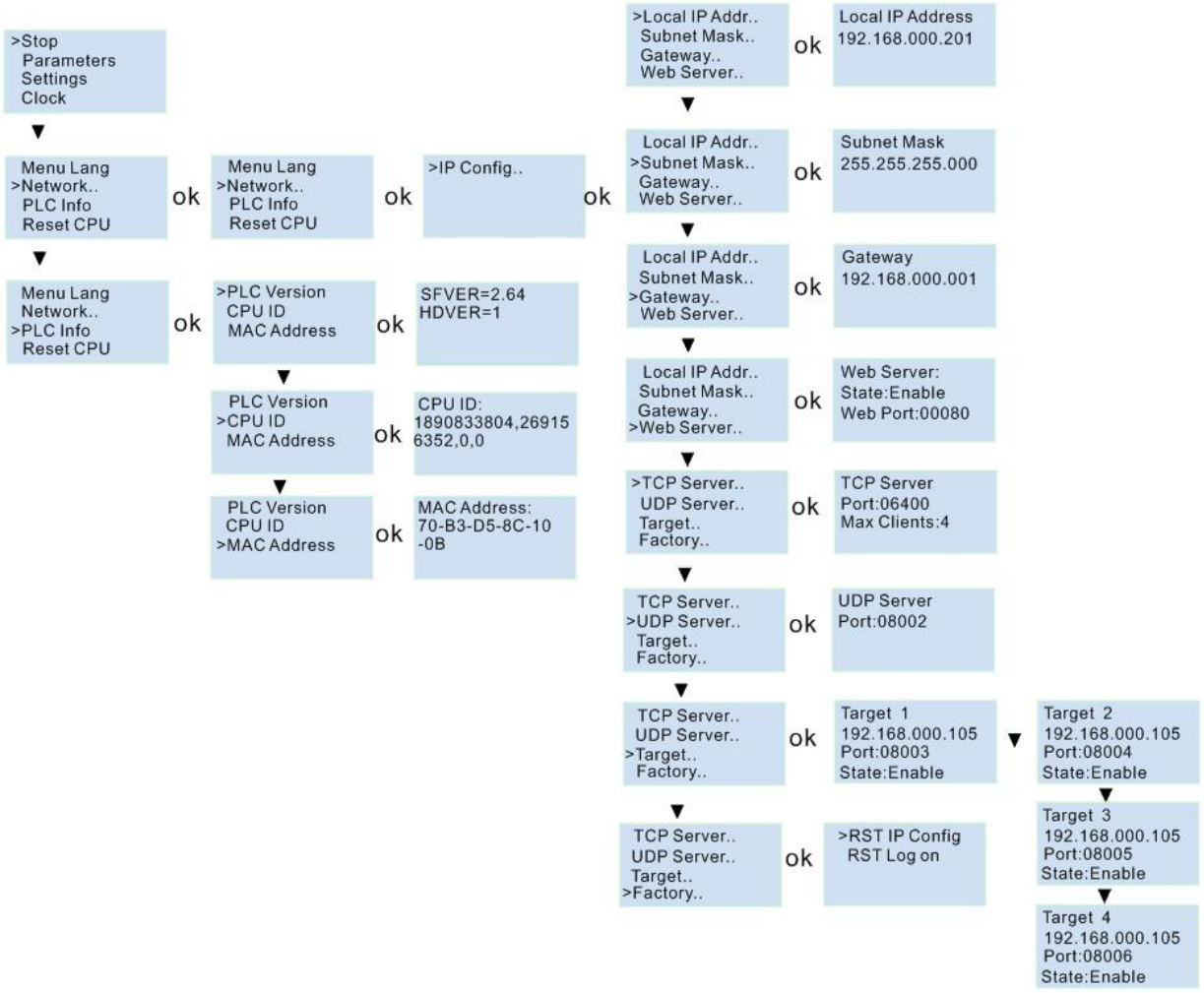


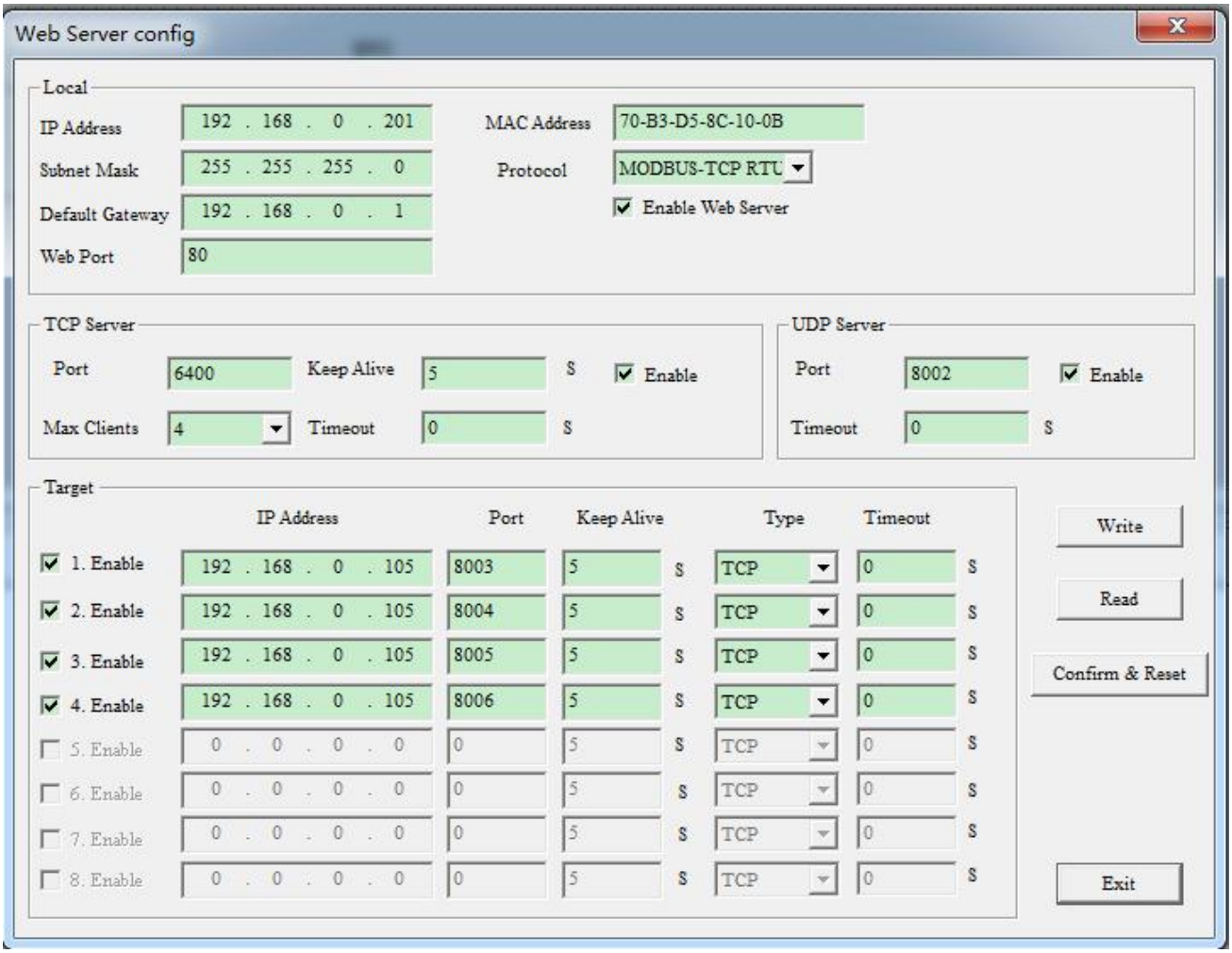
You can read the parameters from the PLC.



1.3 How to view and configure the Ethernet parameters through LCD panel?

You can view and modify the network parameter through the LCD menu.

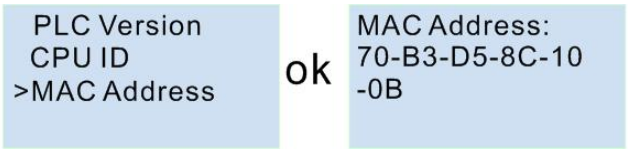




You can modify the Local IP address, subnet mask, gateway from the LCD menu :

Web server port also can be modified and the web server also can be disabled or enabled:

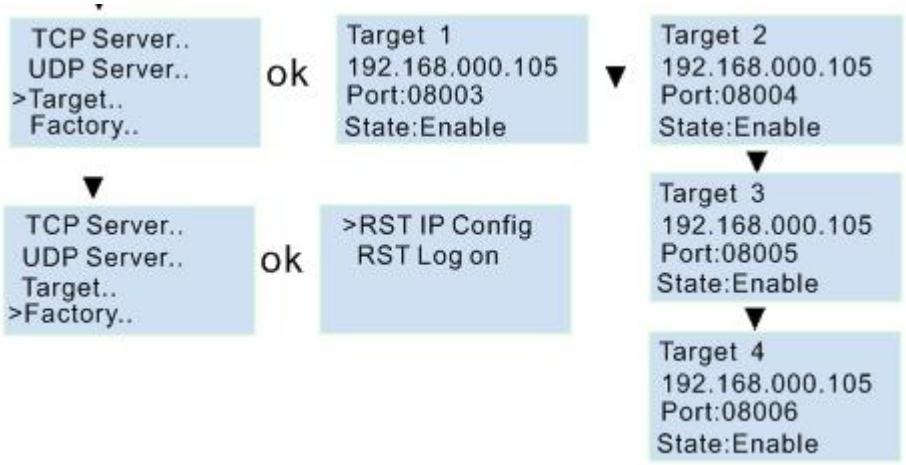
You can view the MAC address from here, but it cannot be modified:



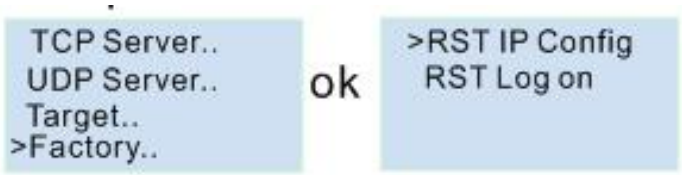
TCP server port settings and allowed tcp clients settings:

View and modify the UDP server from here:

Set the Target server IP address and port number:



You can make the IP settings to factory by the menu

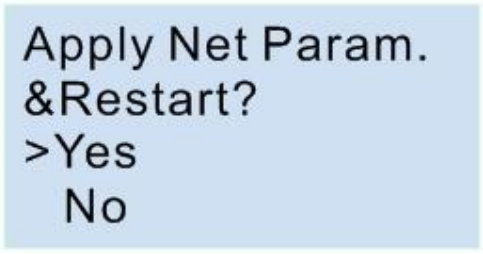


“RST IP Config”, the IP address will return to 192.168.0.201, and the tcp server port number will be 6400.
“RST Log on” the webserver log on name and password will be back to “admin”.

Modify the IP address:

Press ok to enter into the modification mode, the cursor will flash at the address position. The you can move the cursor by Left or Right button, and change the value by pressing UP/DOWN button.
At last confirm with ok.

After you confirm the parameters with the ok button, the settings are not enabled , only after the CPU restart, the settings will be enabled? So when you leave the settings the LCD will show you:



You need select “Yes” and press ok, the the CPU will restart, now the new settings will be available.

1.4 How to create the communication between the CPU and PC through Ethernet?

To communicate with the CPU, you can use the TCP/IP protocol. The CPU can work as TCP server and TCP client at the same time, and also it can work as UDP server or UDP Client as well.

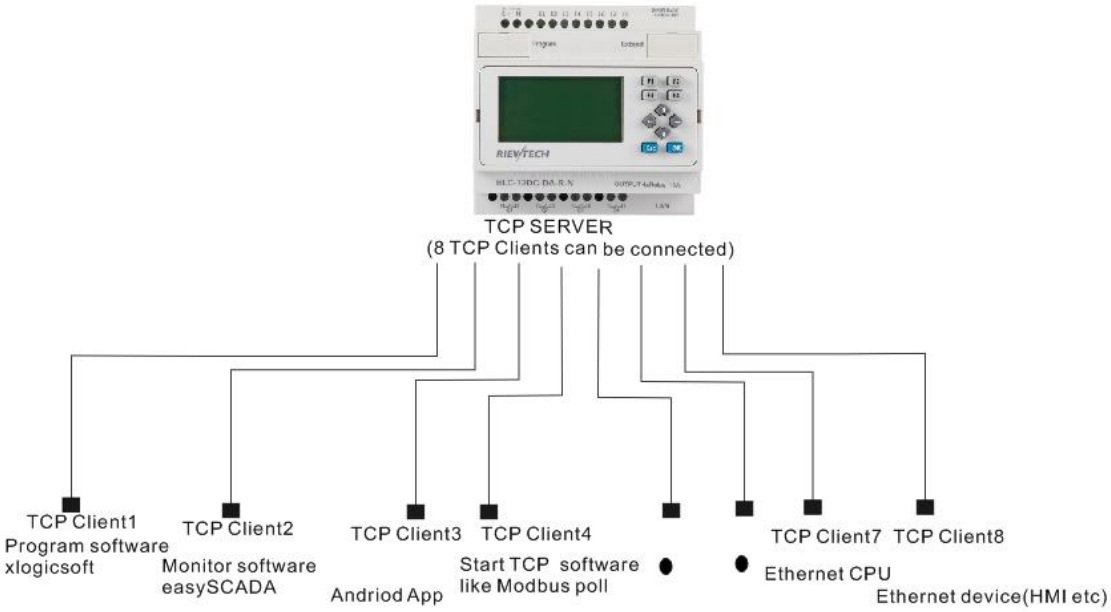
Notes:

1. The Ethernet can work under TCP and UDP mode, you can create the connection between our Ethernet CPUs, and also you can use our Ethernet CPU to create the connection with other factory Ethernet device based on TCP or UDP.
2. The communication protocol through Ethernet is MODBUS TCP or MODBUS RTU of our PLC, so if you want to communicate with other factory device through Ethernet, you need make sure the device also supports MODBUS TCP. Or MODBUS RTU.
3. Our Ethernet PLC(built-in webserver version) can work either as master or slave.

1.4.1 CPU works as TCP server

The maximum TCP connection is 8, so one CPU allow maximum 8 TCP clients to connect with the CPU at the same time. And each TCP connection is totally separately.

For example:



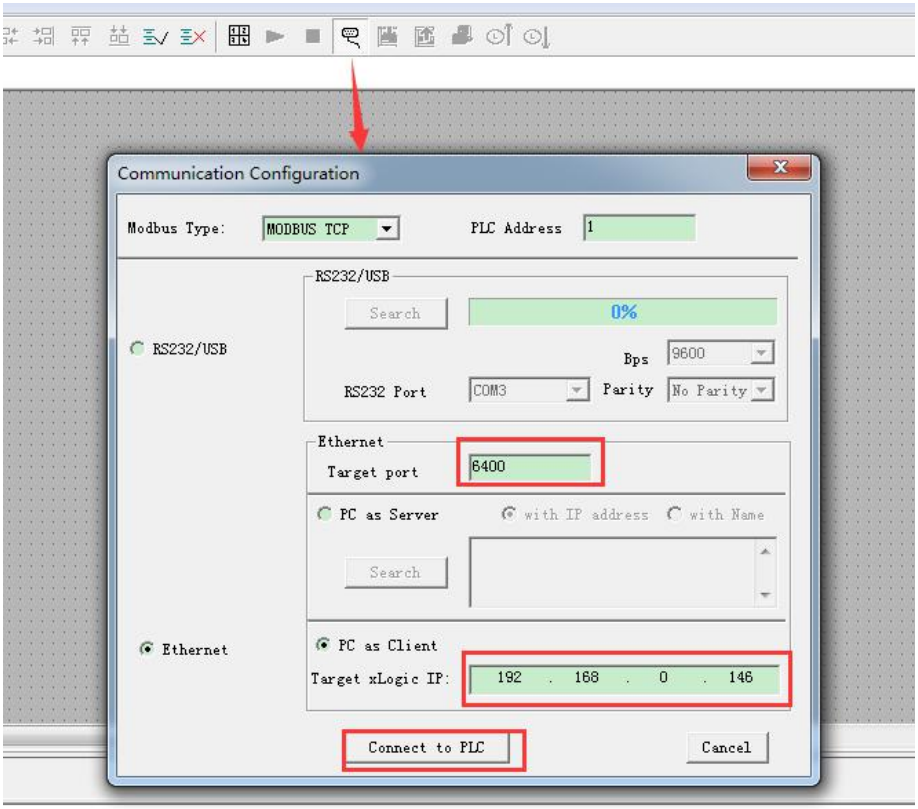
All the 8 clients can monitor and control the CPU at the same time.

Com with xlogicsoft(PC is client)

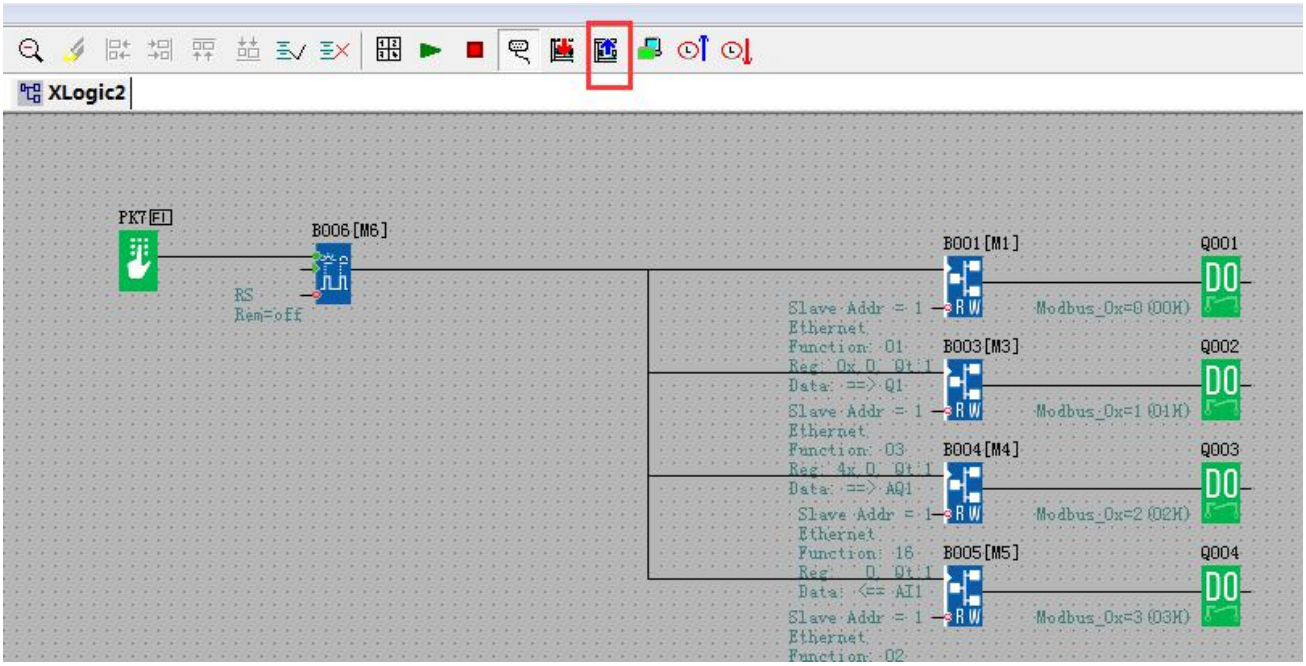
First check the PLC IP address with LCD menu

Get the IP address from:

>Network -> IP Config.. -> Local IP ADDR.. -> Local IP (192.168.0.146)

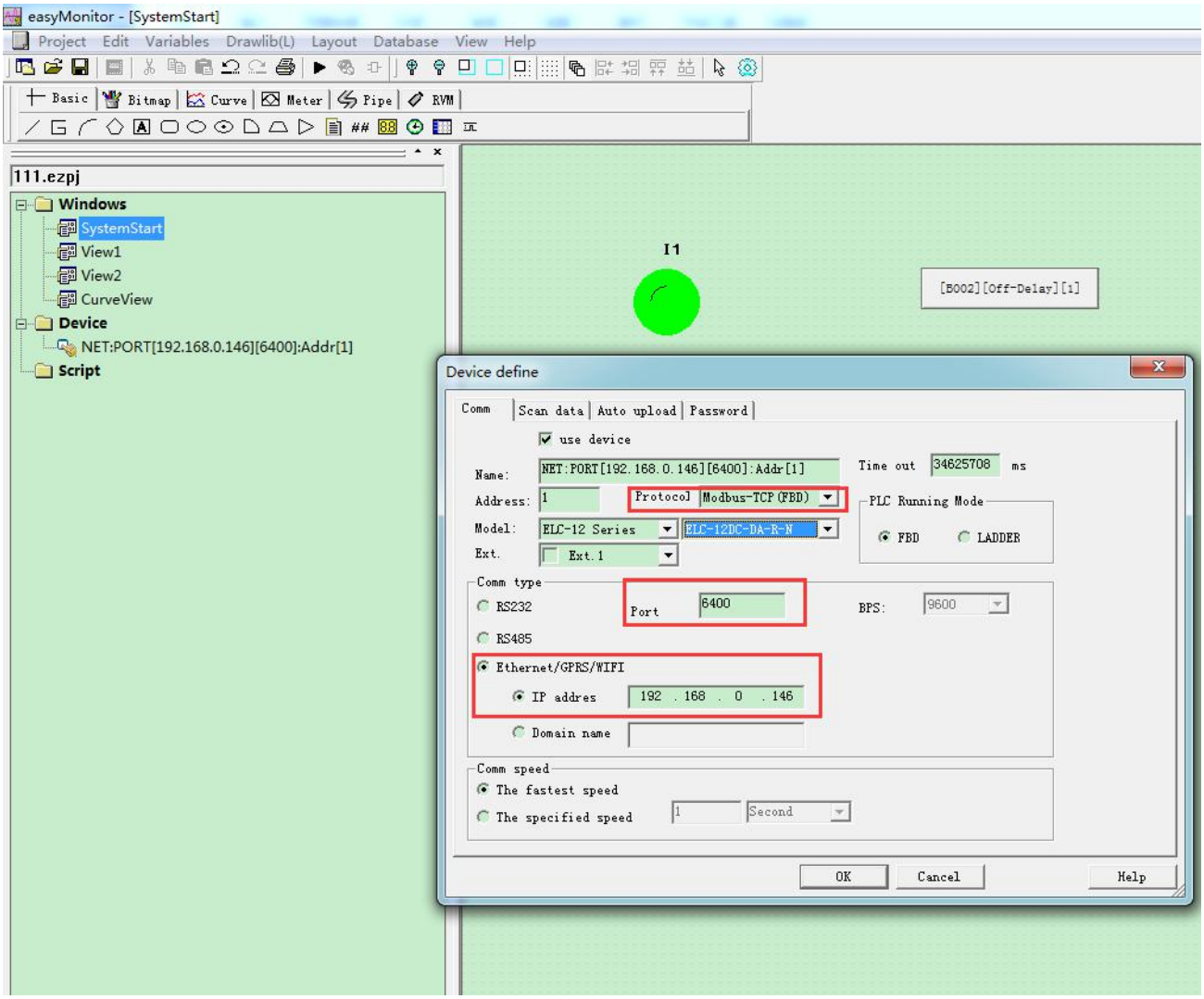


After the connection is established, you can download/upload the program and monitor the program like the usb cable connection.



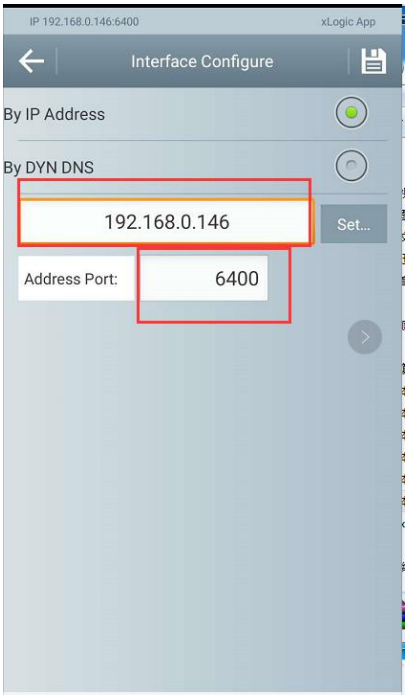
Com with easySCADA(PC is client)

You need set the correct IP address and com port in the device configure of the easySCADA.

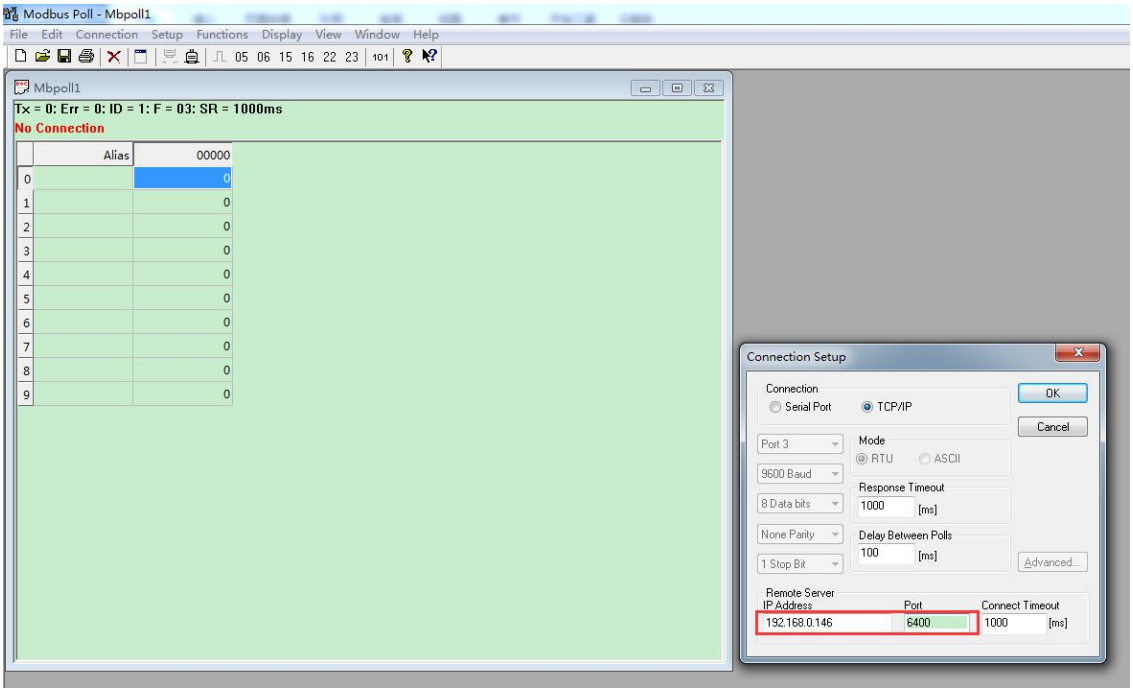


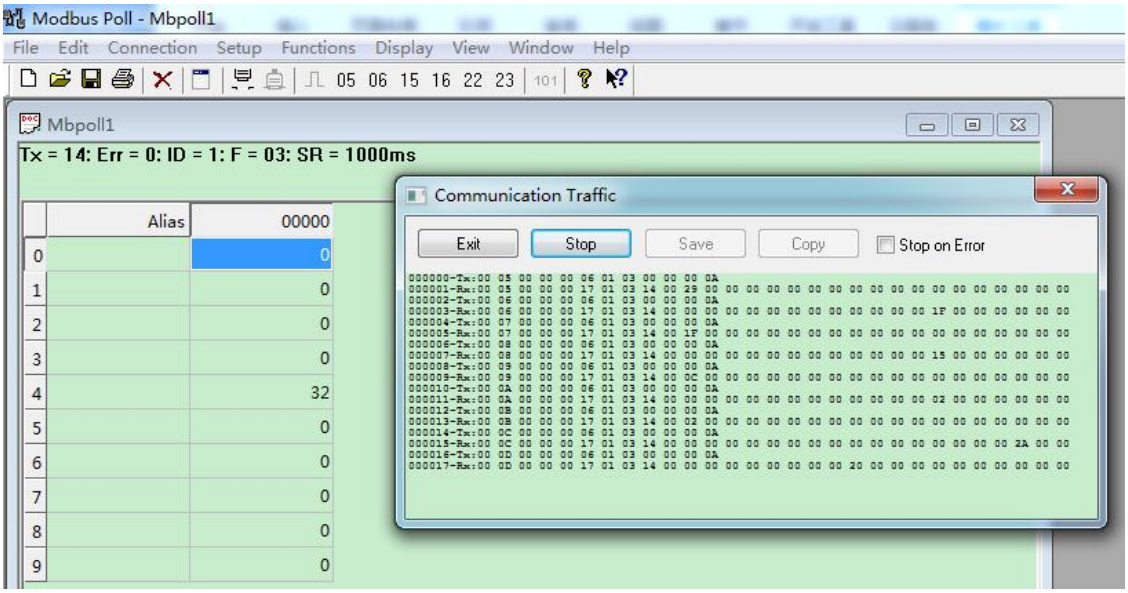
Our xLogicApp(Smart phone is tcp client)

Interface configure



Modbus Poll works as TCP client

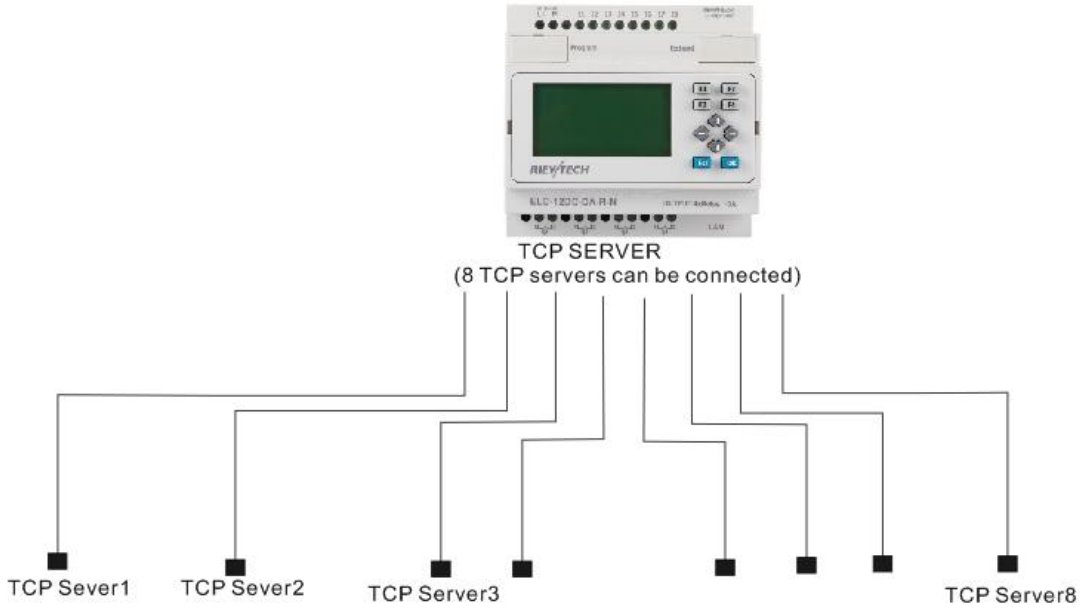




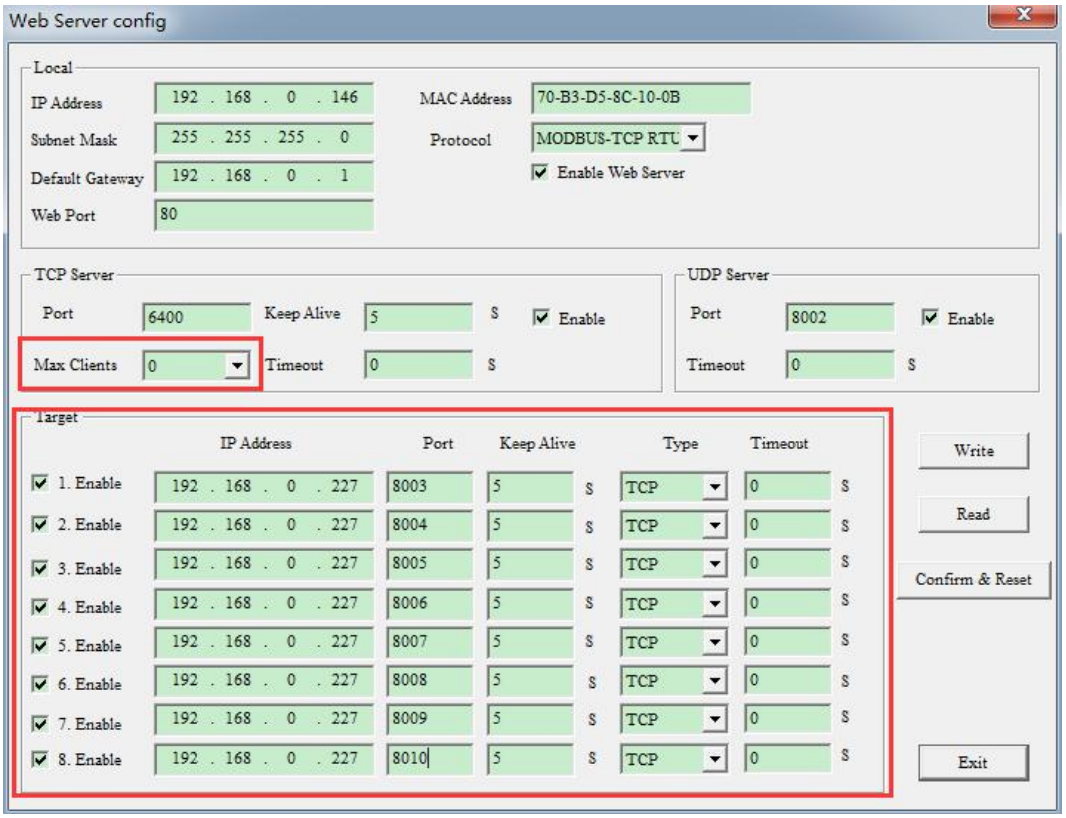
1.4.2 CPU works as TCP Client

The maximum TCP connection is 8, so one CPU allow maximum 8 TCP clients to connect with the CPU at the same time. And each TCP connection is totally separately.

For example:

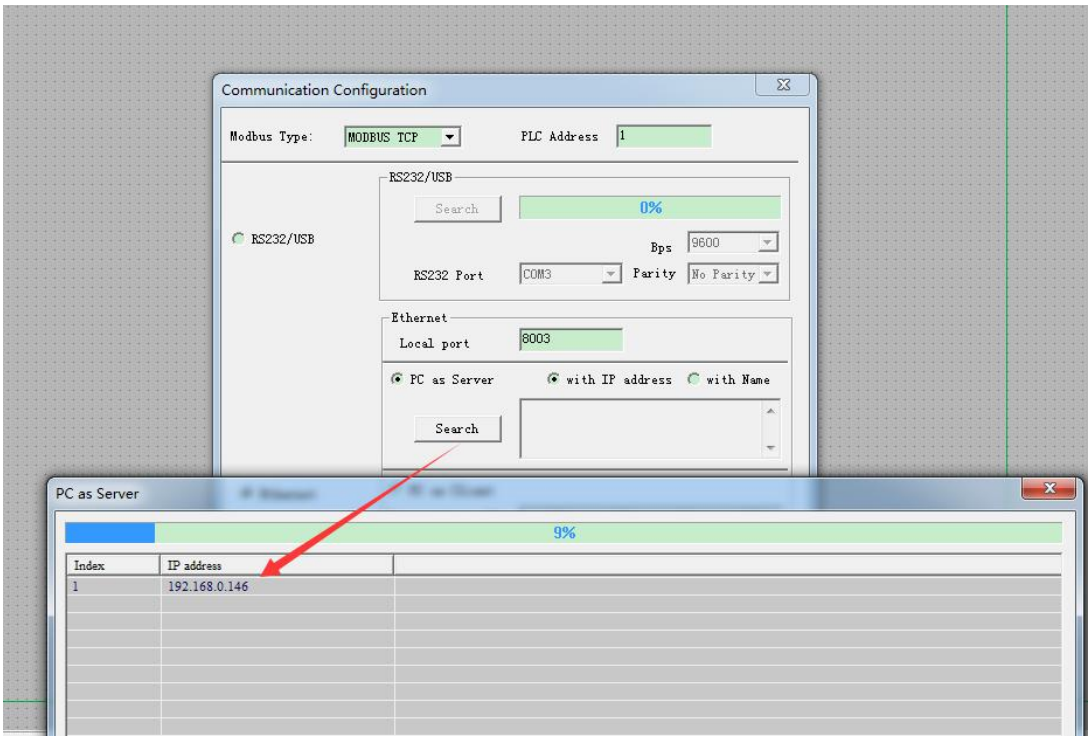


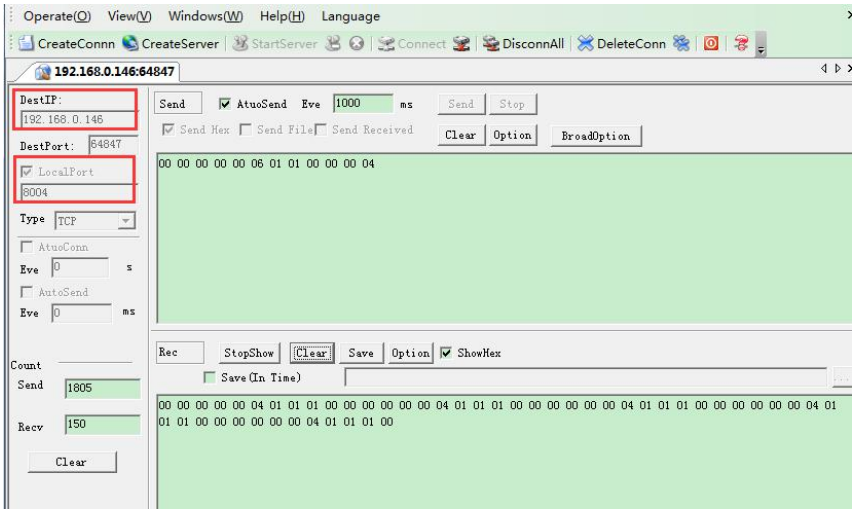
All the 8 Servers can connected, and the data transmission can be processed separately.



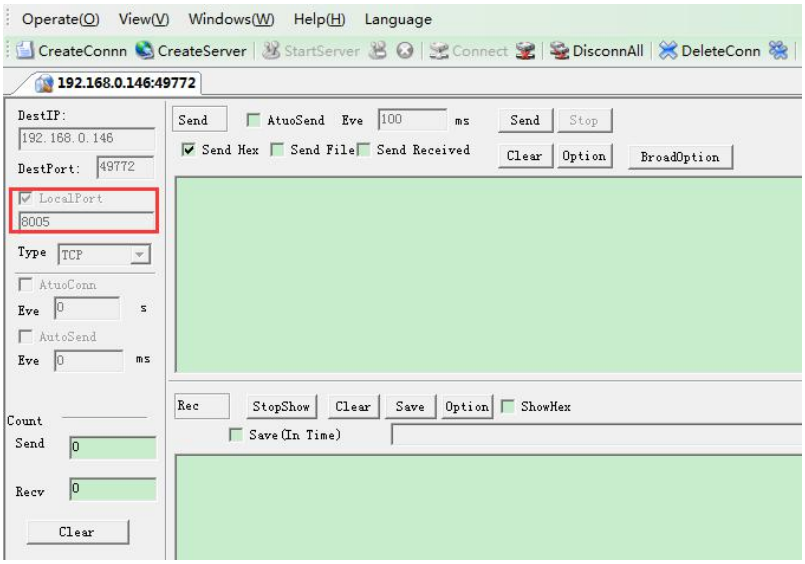
If we set Max clients 0, then the CPU will only play as tcp clients, then there are 8 tcp servers can be connected at the same time.

Xlogicsoft works as TCP server and wait the CPU log on(The PC IP address is 192.168.0.227):

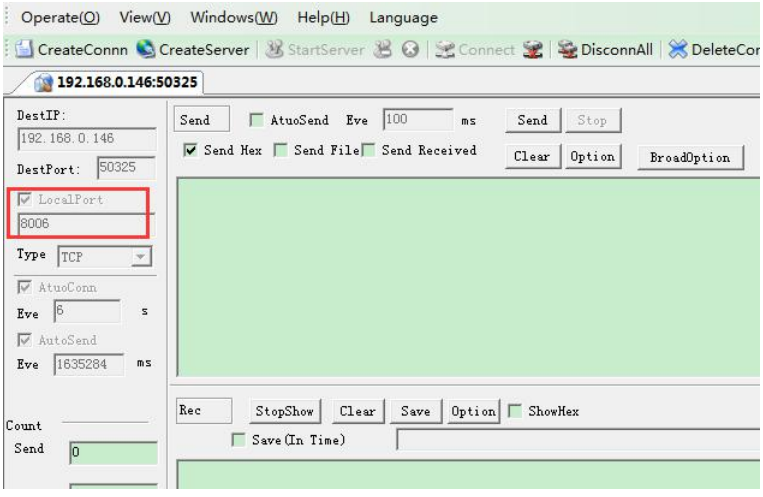




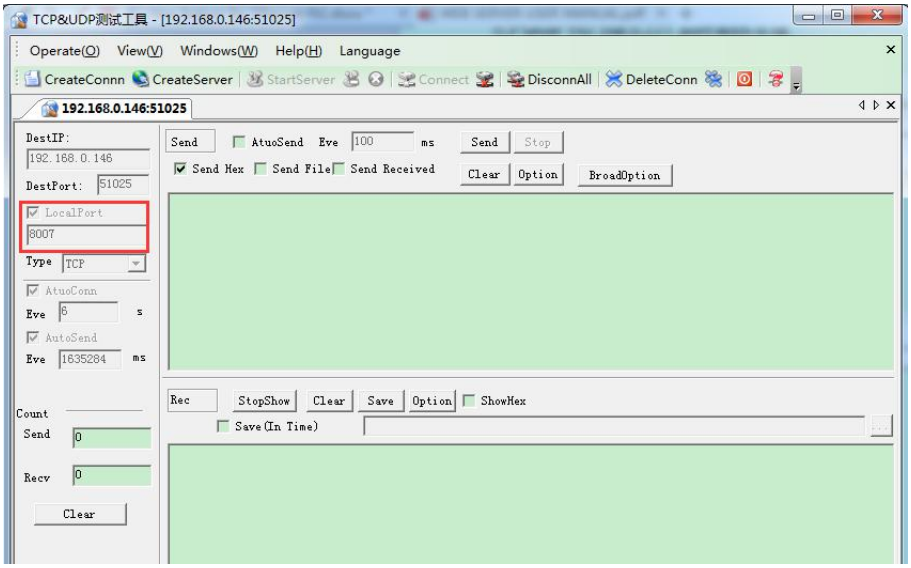
TCP Sever 192.168.0.227, port:8004 is ok.



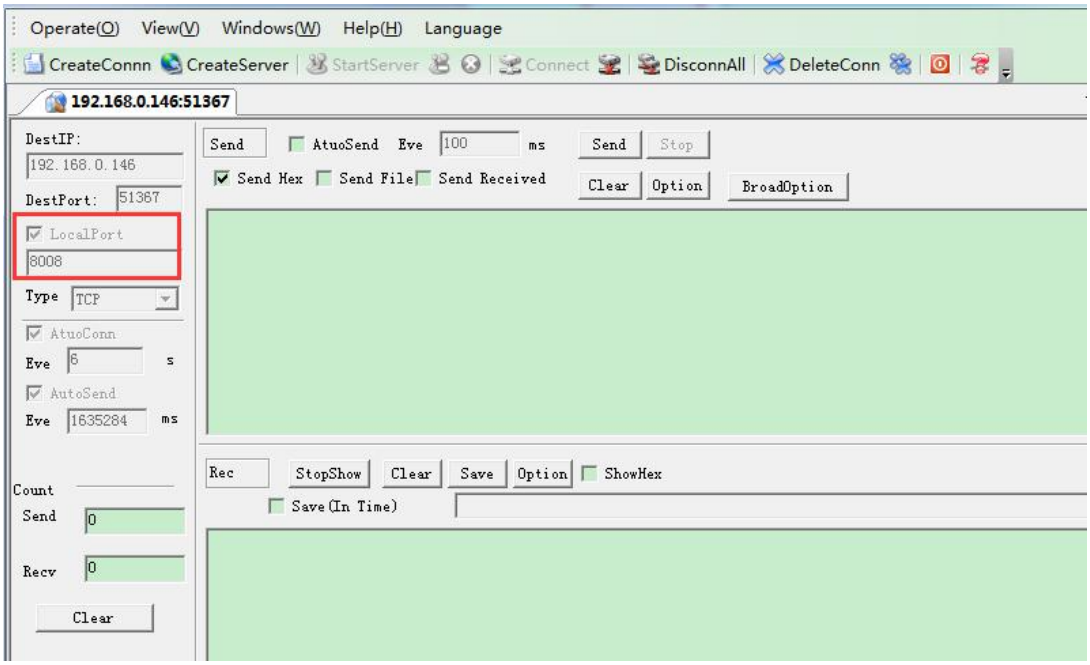
TCP Sever 192.168.0.227, port:8005 is ok.



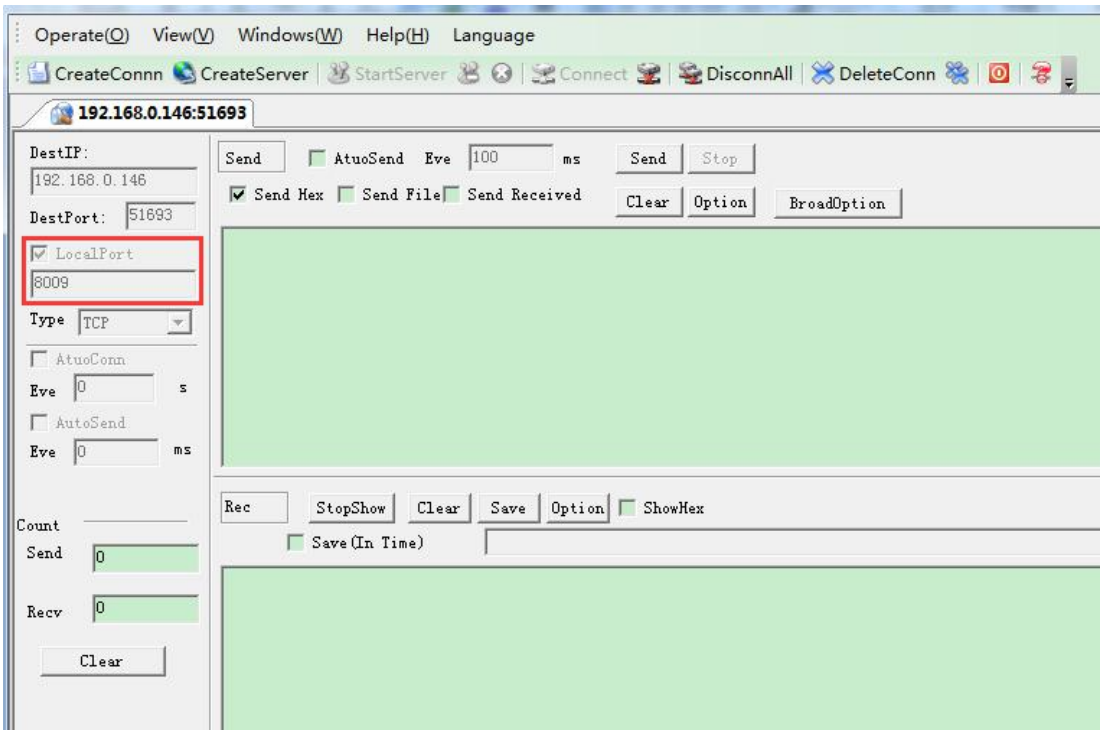
TCP Sever 192.168.0.227, port:8006 is ok.



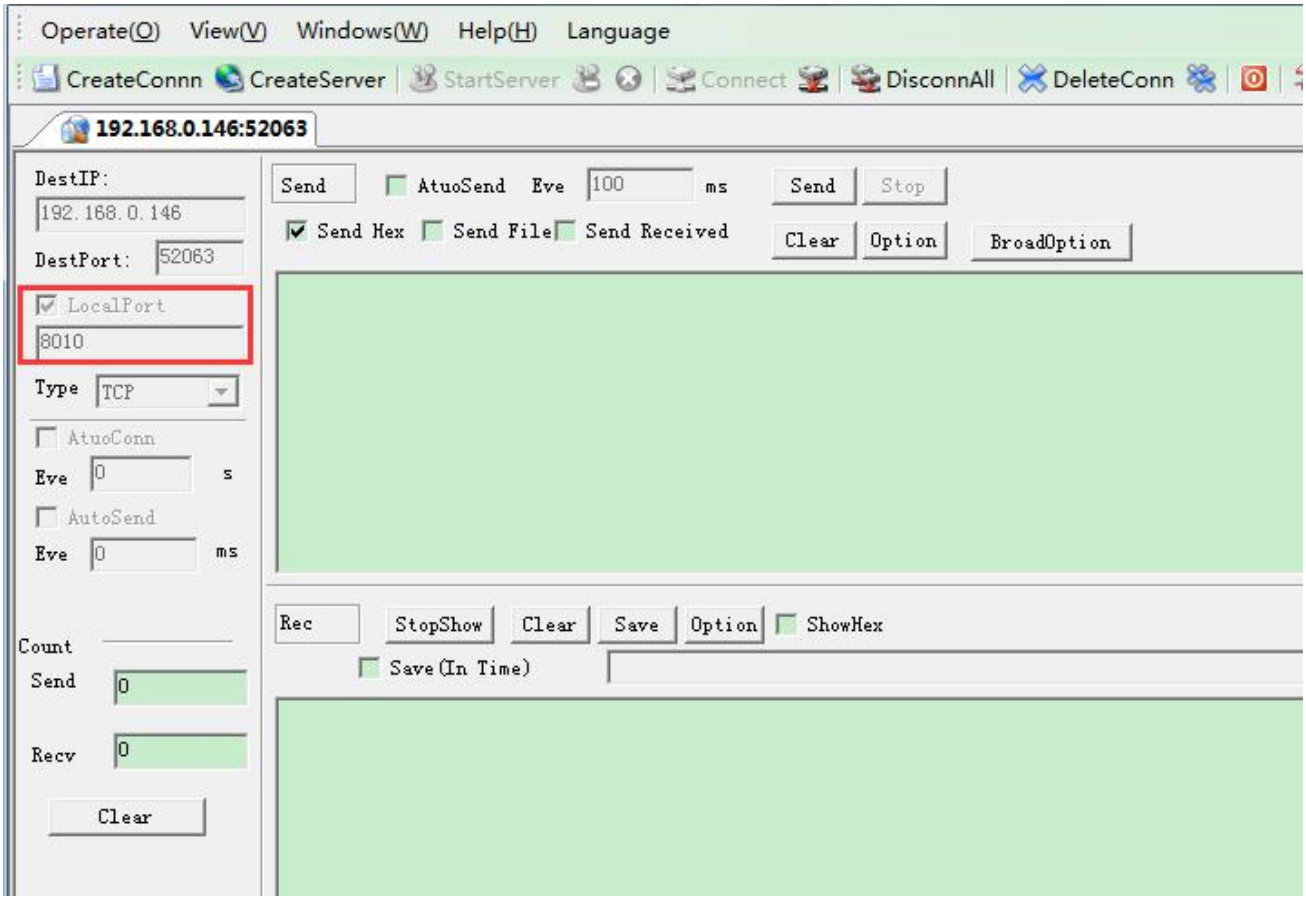
TCP Sever 192.168.0.227, port:8007 is ok.



TCP Sever 192.168.0.227, port:8008 is ok.

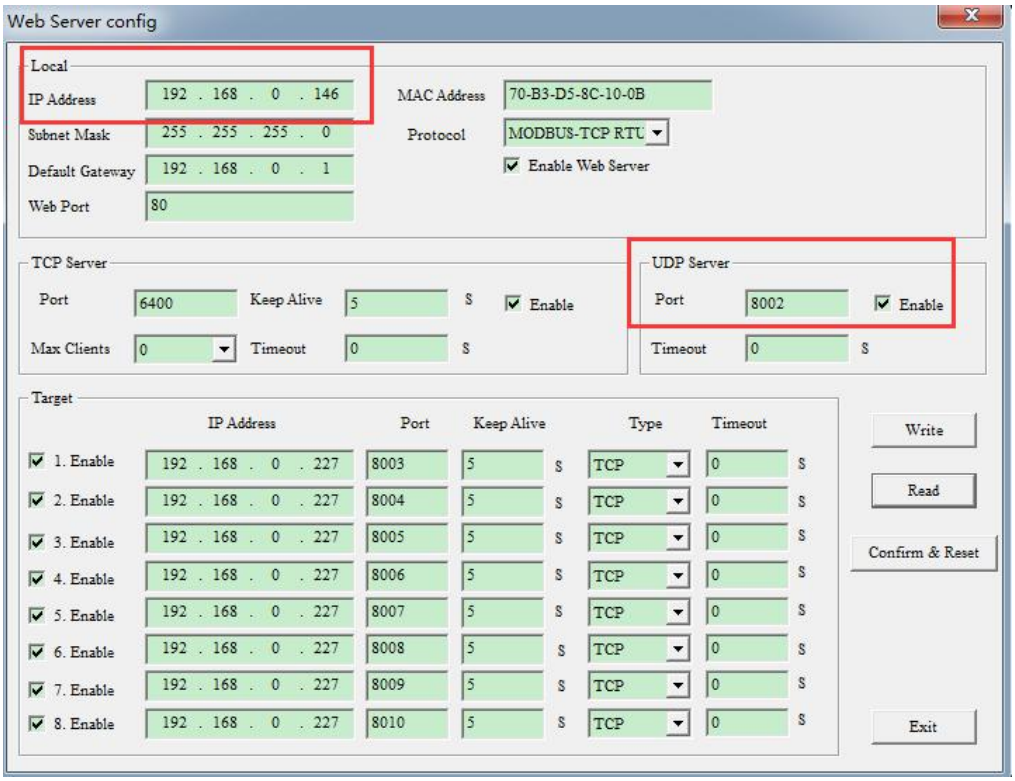


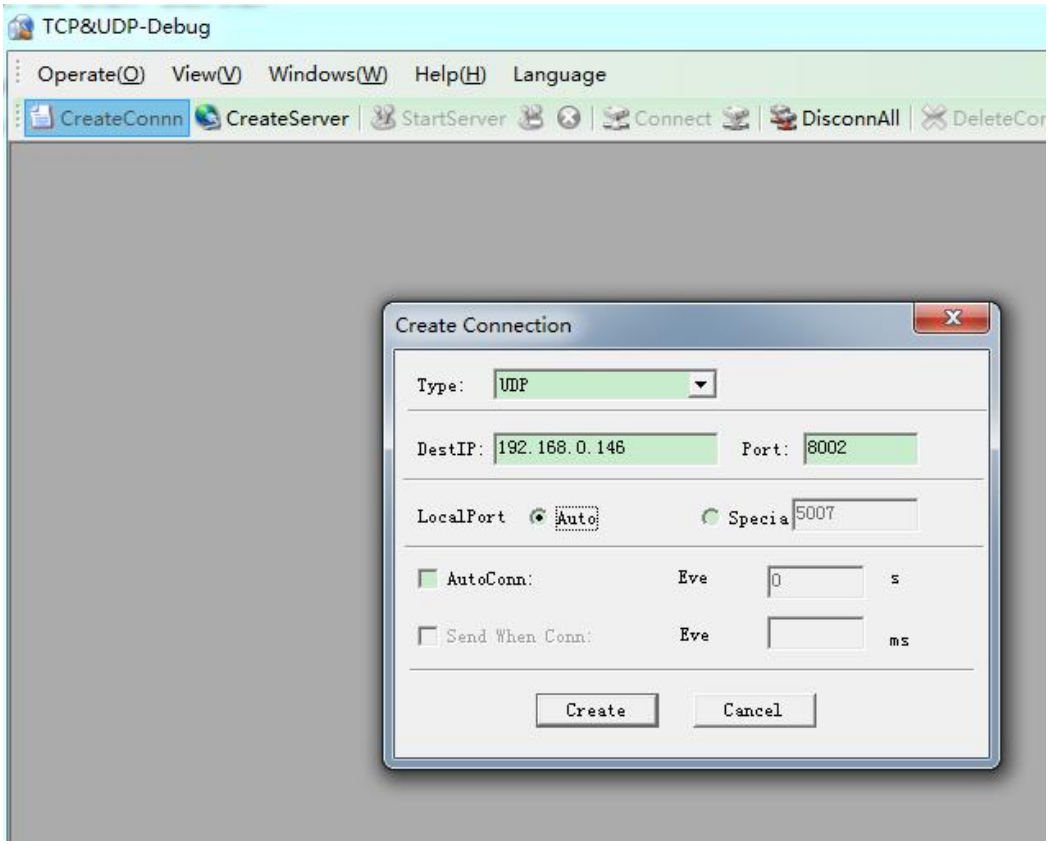
TCP Sever 192.168.0.227, port:8009 is ok.

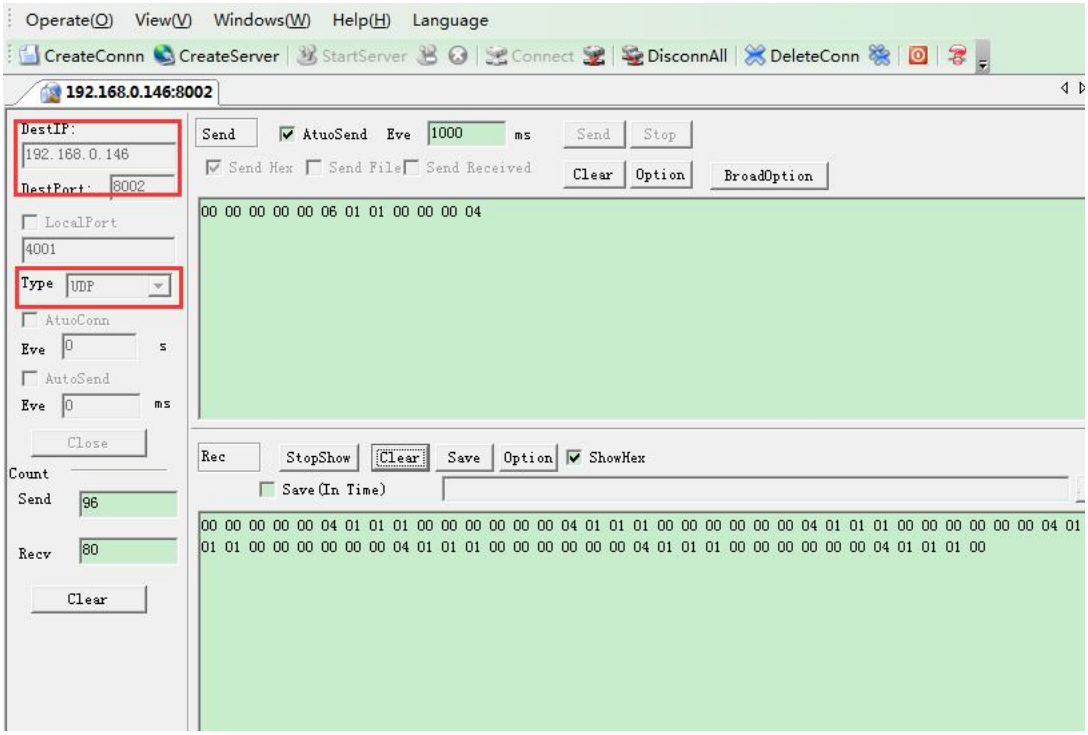


1.4.2 CPU works as UDP Server

CPU can work as UDP server, you can use your software to connect with it through UDP or make several CPUs communication through UDP as well.







After the connection is created, the CPU and the software can communicate based on MODBUS TCP protocol.

1.5 How to log on the built-in Web server

Only the new series ELC-12DC-DA-R-N has built-in web server. So you can use PC or mobile phone to control PLC.

Supported browser

- Chrome
- IE
- Please ensure that your browser is the latest version.

Supported devices

- PC
- iPhone
- iPad
- Android mobile phone
- Android pad

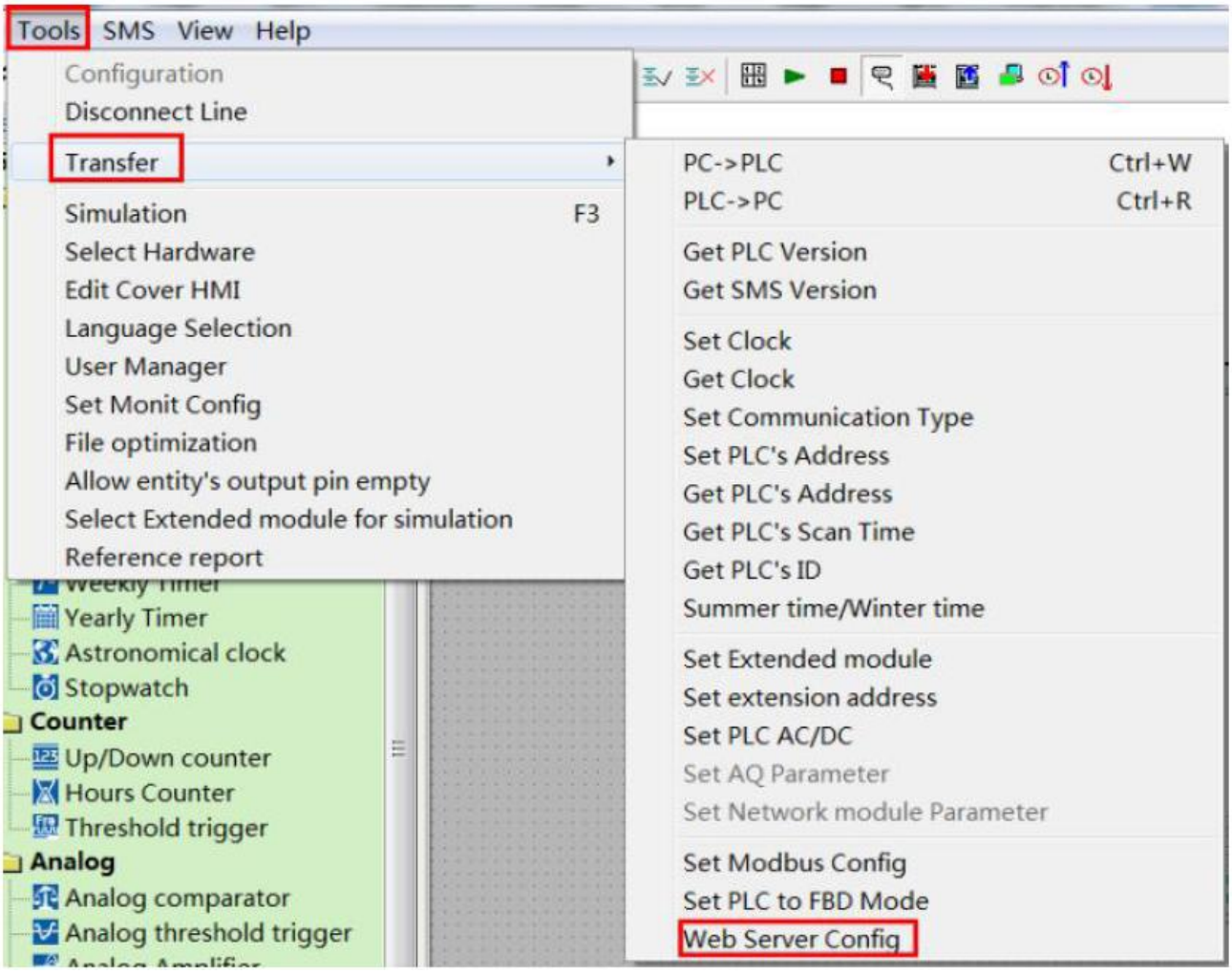
Supported language

- English
- Chinese
- Deutsch

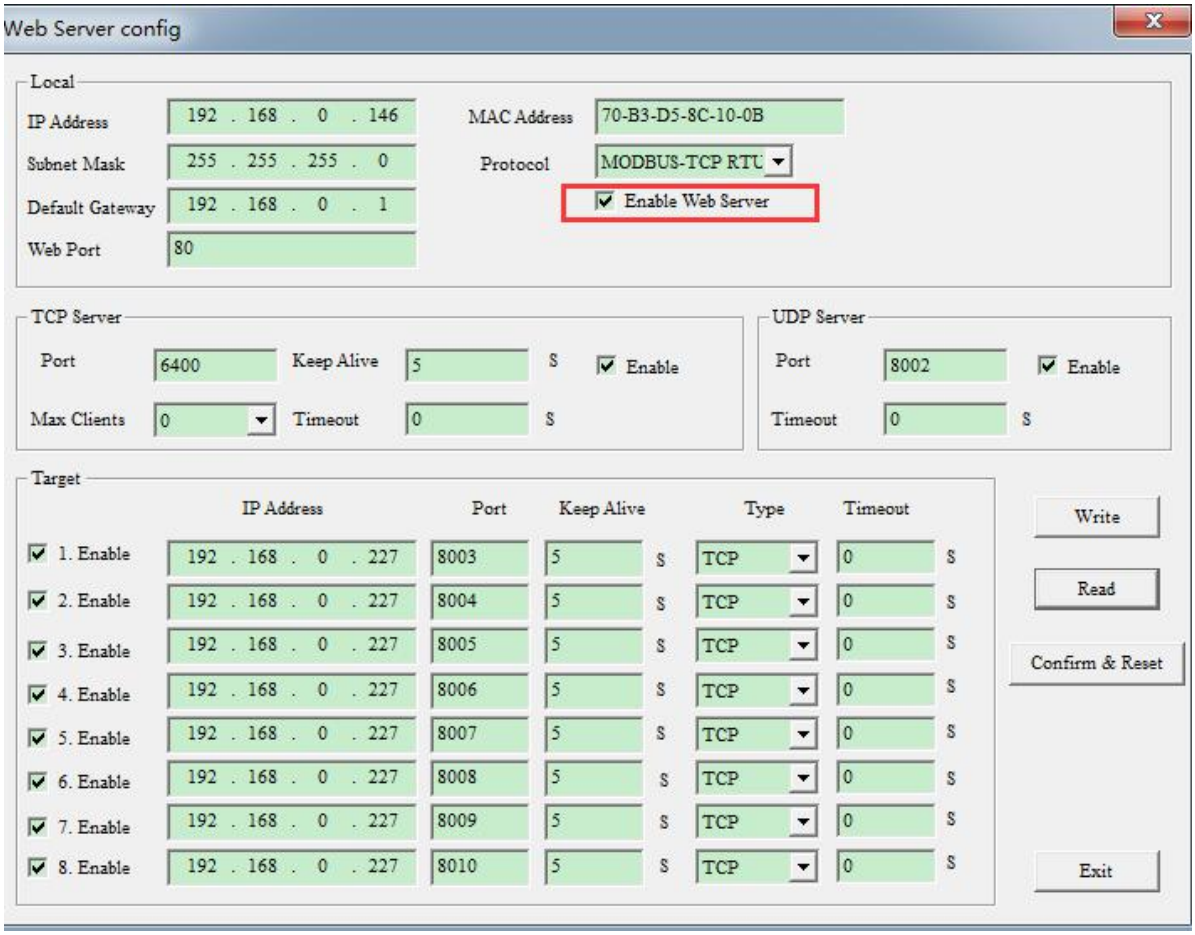
- Francais
- Italiano
- Espanol

1.5.1 How to enable the webserver?

(1)Open Xlogic software,choose ELC-12DC-DA-R-N model and connect xlogicsoft to PLC,you can use serial port or network port to connect PLC.
(2)Tools-->Transfer-->Web Server Config



(3)Click Read button to read web server configure.
The default configuration is as follows:



The webserver is enabled in default, if you want to disable the webserver access, you just only cancel the option “Enable webserver” then the webserver would be not allowed to access.

1.5.2 How to log on the webserver?

1.You have to get IP address of PLC,then input IP address of PLC to the

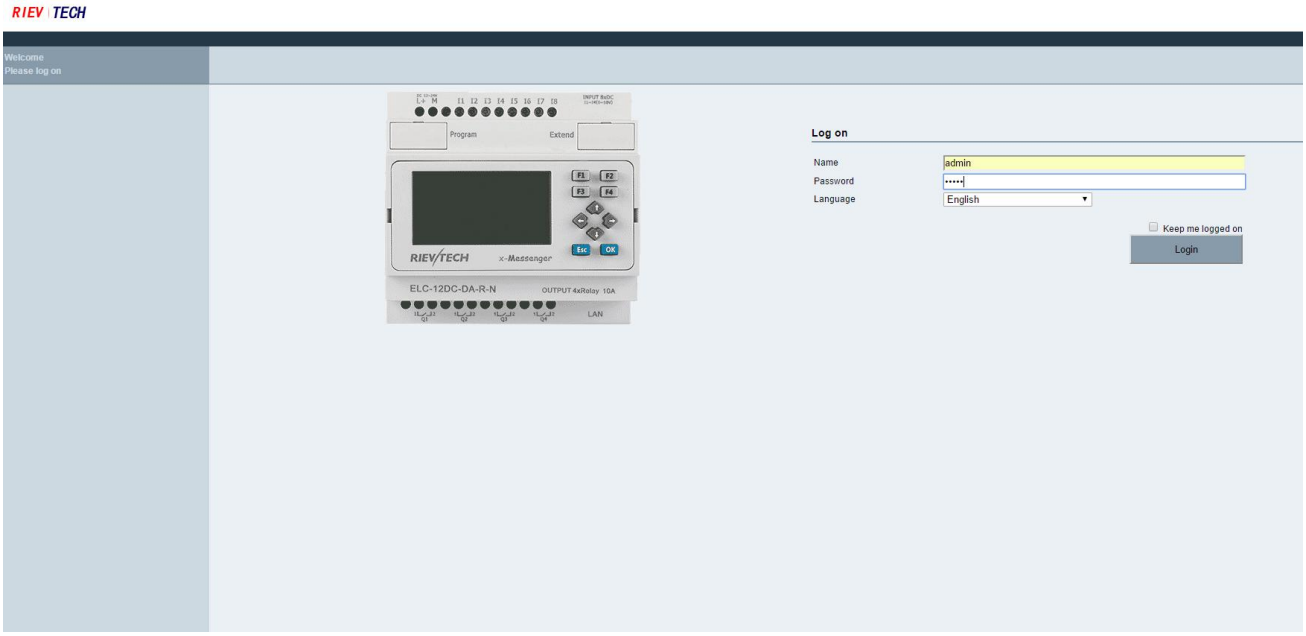
browser,Web server interface will appear.The default IP of PLC is 192.168.0.245, the Default port of PLC is 8008.So you can use the default IP address to log on web server,you can also use the IP and port of PLC to connect the xlogic software to the PLC and configure web server parameters.

If you have changed the IP address, you can view the IP address by the LCD menu

>Network -> IP Config.. -> Local IP ADDR.. -> Local IP

2.Open the browser,then input the IP address of PLC(Input your PLC IP address).

3.Press “Enter” key,the following interface will appear.



4. Log on interface

Name:The default name is admin.

Password:The default password is admin.

Language:Our web server supports six kinds of languages.You can choose your language.

Keep me logged on:When you choose “Keep me logged on” ,then you click on “Log on” and you log on to the web server successfully.You will always stay in the login state.If you close the browser,then you open the browser again,input the IP address ,you will still stay in the login status.You can click on the “Log off” to exit the login status.

Log on:Click on it,log on to the web server.

Check CPU information

After logging on to the web server,web server will display the information of CPU.

CPU name:

Display CPU name.

Current status:

Display the status of PLC

CPU clock:

When you click on the “CPU information”, “CPU clock” will display the current time of PLC.Select the “PC synchronized”,then click on “Set”,the PC time will be written in PLC.

CPU Addr:

Display CPU address.You can change the address of PLC.

Example:

You can input “5” ,then click on“Set”,the CPU address will be 5.

CPU model:

Display CPU model.

Firmware Ver:

Display Firmware Version.

Hardware Ver:

Display Hardware Version.

GPRS connection: (For EXM series CPU)

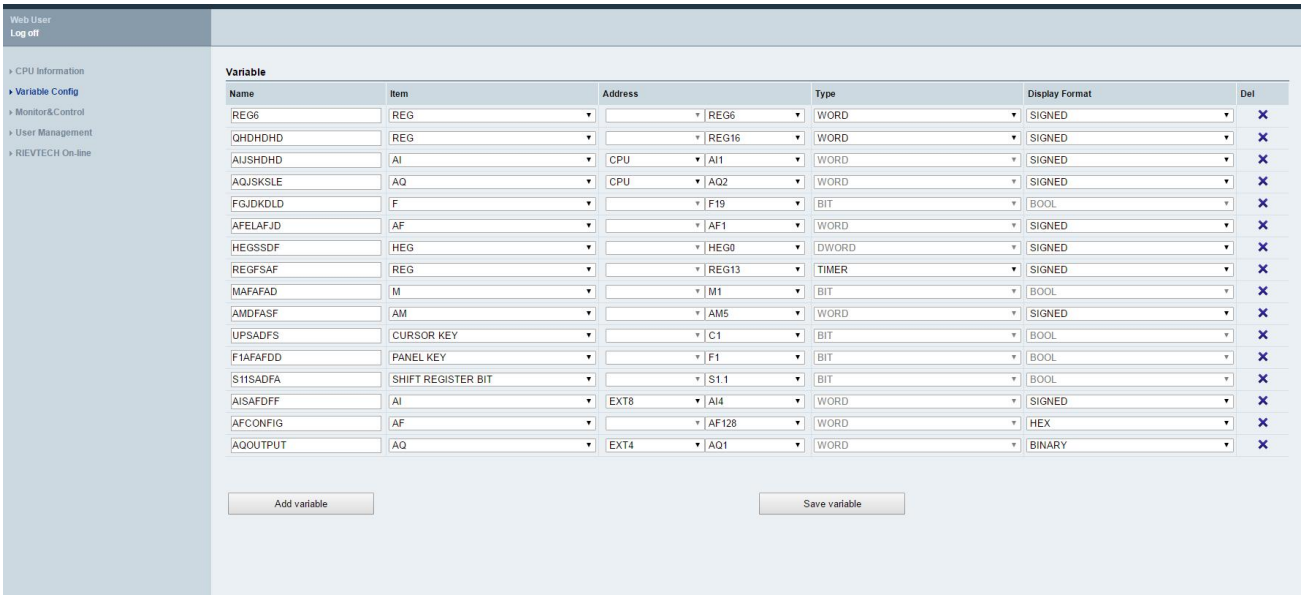
Display “connected” or “Not connected”.

GSM signal:(For EXM series CPU)

Display GSM signal.

Variable Configure

“Variable config” interface



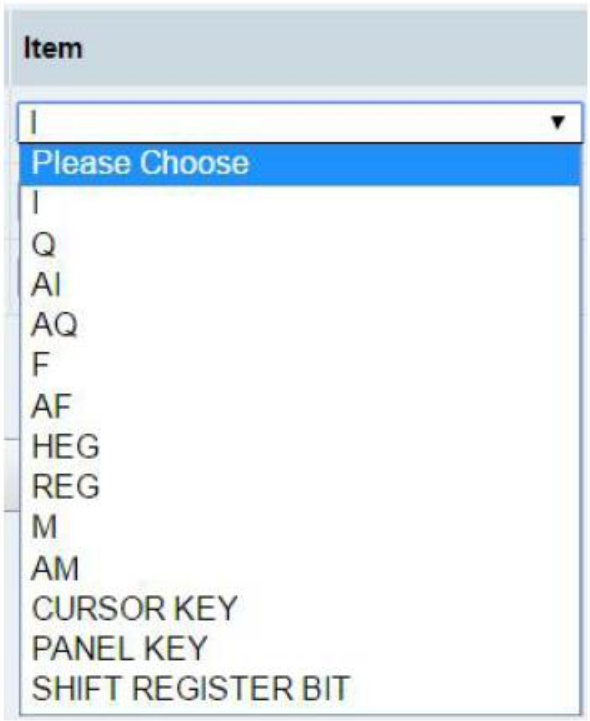
You can click on “Add Variable” to add variable. And you can change or delete the variable as well.
Up to 16 variables can be configured

Name:

You can define a name for variable.(8 characters can be input)

Item:

You can configure 13 kinds of variables.(These variables are in the xlogicsoft)



Address

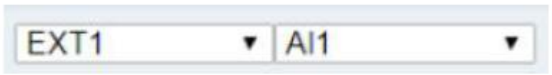
Address:I1

Address:I11

Address:Q1

Address:Q11

Address:AI1



Address:AI11

Type:

Data length of variable.Include: BIT,WORD,DWORD.If you use timer or counter,you should choose TIMER or COUNTER.

Display Format:

Display format, include: BOOL,SIGNEO, UNSIGNED,HEX,BINARY.

DEL:

Click on  to delete variables .

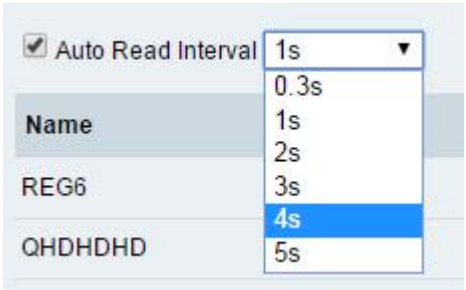
Save Variable:

After finished configuration variables,you have to click on “Save Variable”,then you can monitor and control variables at “Monitor&Control”.

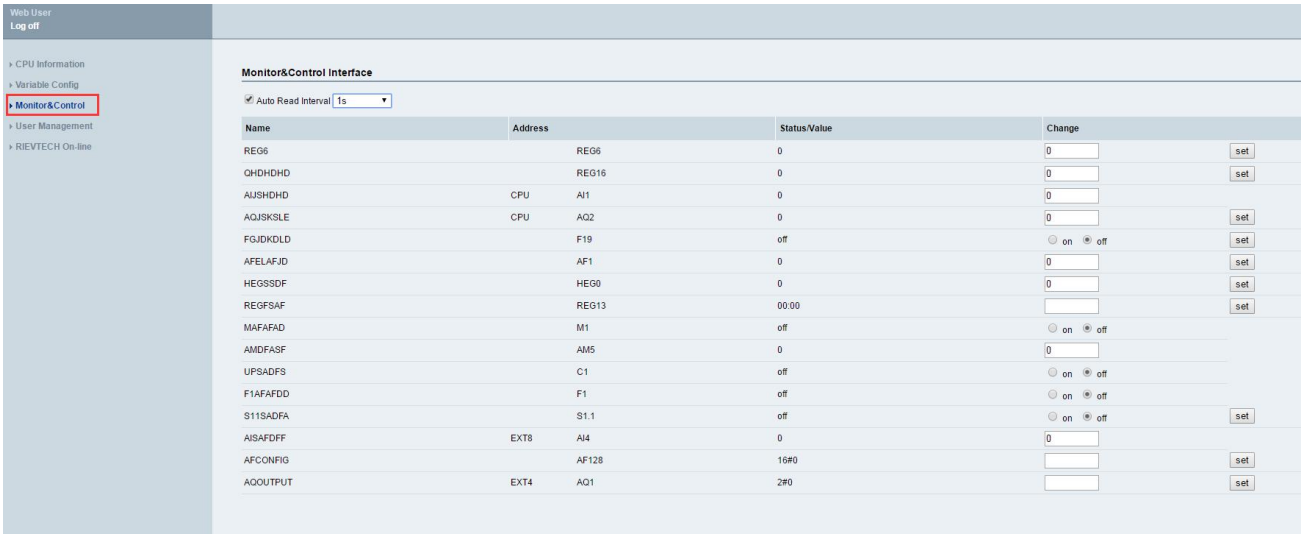
Monitor&Control

On this page,you can monitor and control variables. Web server refreshes data automatically.

Auto refresh:choose “Auto read interval” and choose refresh time.



The web server refreshes the current value of variables every 0.3s-5s.The default auto refresh time is 1 second.



Name:

Display the name of variable.

Address:

Display the address of variable.

Status/Value:

Display the current status or value of variables.

Change:

Change the current status of variable.When you change the current

Status:

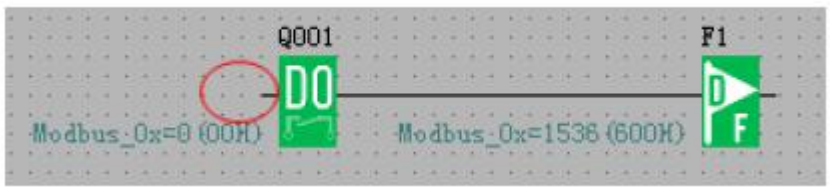
status of variable,you have to click on the corresponding “Set” button.

Description of changing the state of variable

Variable I:

You can’t change the status of variable I.

Variable Q:



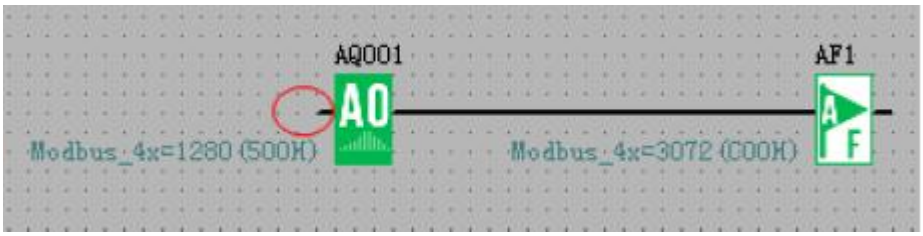
When the input pin of output block Q is not connected,you can change the status of variable Q.

If the input pin of output block Q is already connected with other blocks,you can’t change the status of variable Q anymore.

Variable AI:

You can’t change the value of variable AI.

Variable AQ:

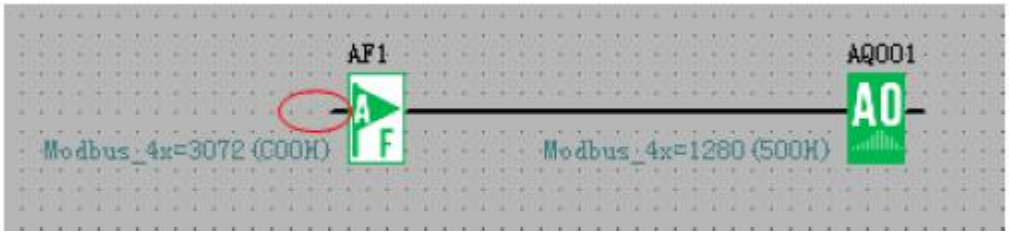


When the input pin of analog output block AQ is not connected,you can change the value of variable AQ.
If the input pin of analog output block AQ is already connected with other blocks,you can’ t change the value of variable AQ anymore.

Variable F:

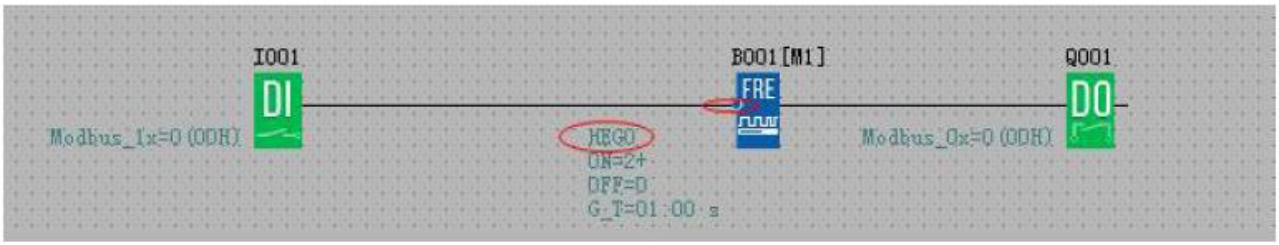
When the input pin of digital flag variable F is not connected,you can change the status of variable F.
If the input pin of digital flag block F is already connected with other blocks,you can’ t change the status of variable F anymore.

Variable AF:



When the input pin of analog flag block AF is not connected,you can change the value of variable AF
If the input pin of analog flag block AF is already connected with other blocks,you can’ t change the value of variable AF anymore.

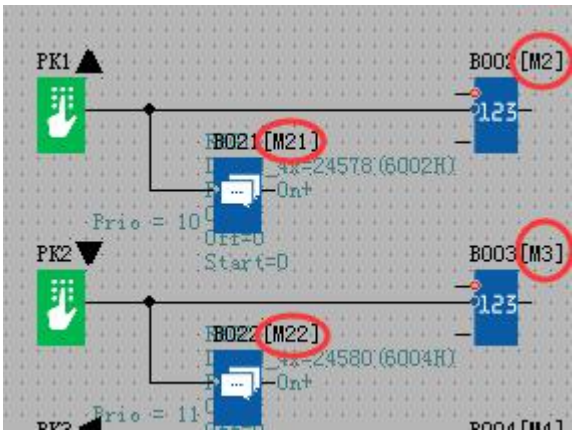
Variable HEG:



Cannot be set, only can be read.

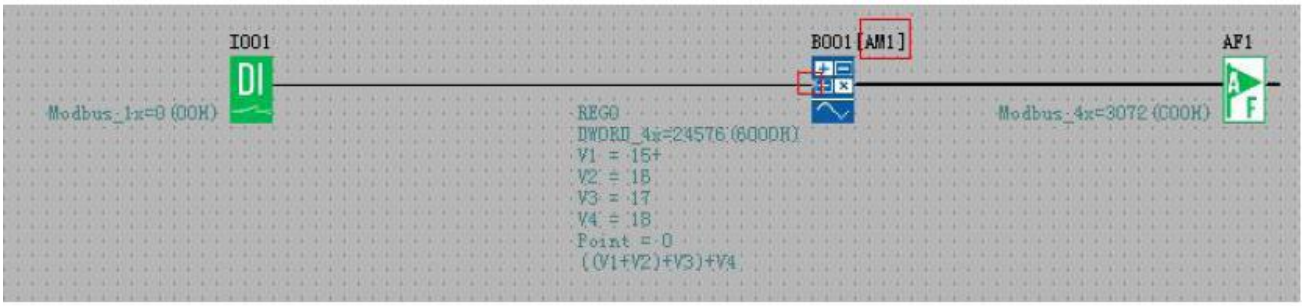
Variable M:

You can’ t change the status of variable M, it only can be read.



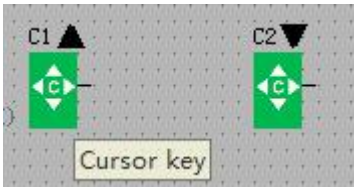
Variable AM:

You can’t change the value of variable AM, it only can be read.



Cursor key:

You can’t change the status of cursor key, it only can be read.



Panel key:

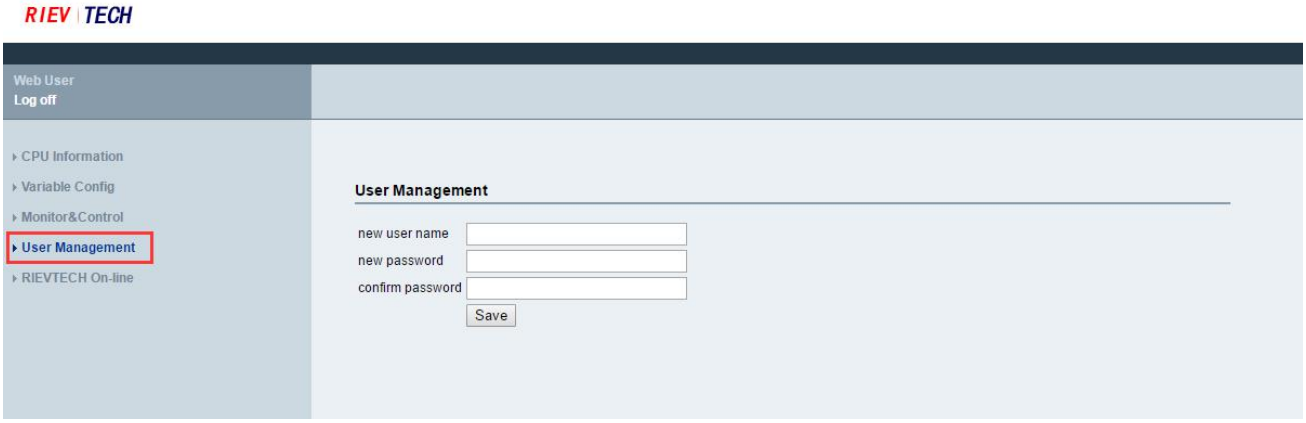
You can’t change the status of panel key, it only can be read.

Shift register bit:

You can’t change the status of shift register bit, it only can be read.

User Management

User management interface



You can set a new user name and new password at this page. If you have set a new user name and password,the old user name and password can’ t be used.A web server just has a user name and a password.

If you forgot the user name or password you logged, you can reset it by the LCD menu

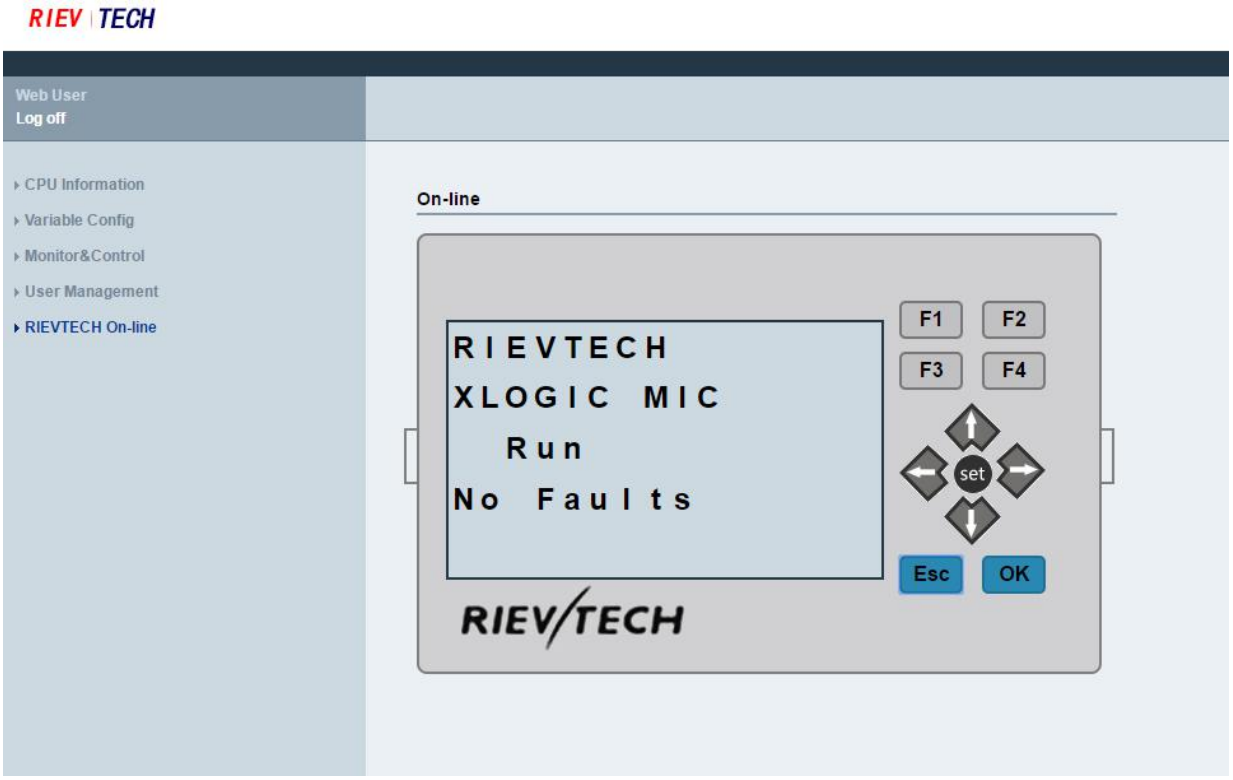
You can make the IP settings to factory by the menu Network-> IP Config..-> Factory-> RST Log on

After you reset the log on, the user name and password will be back to the default “admin”.

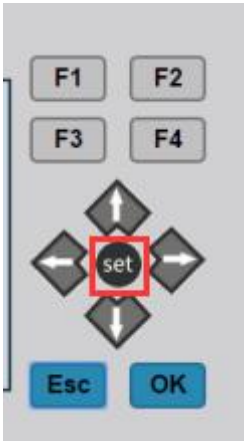
RIEVTECH On-line

RIEVTECH On-line Interface

You can monitor and operate the LCD panel remotely.



The CPU only can get a trigger from the virtual keys, it cannot get a continuous signal, that means if you press the OK key for 3 seconds, the CPU cannot know it pressed down 3 seconds, it only get a trigger signal.
So if you want to realize the press ok key for 3 seconds to change the parameters in the text message on the hardware, you need press the “set” key on the virtual panel.



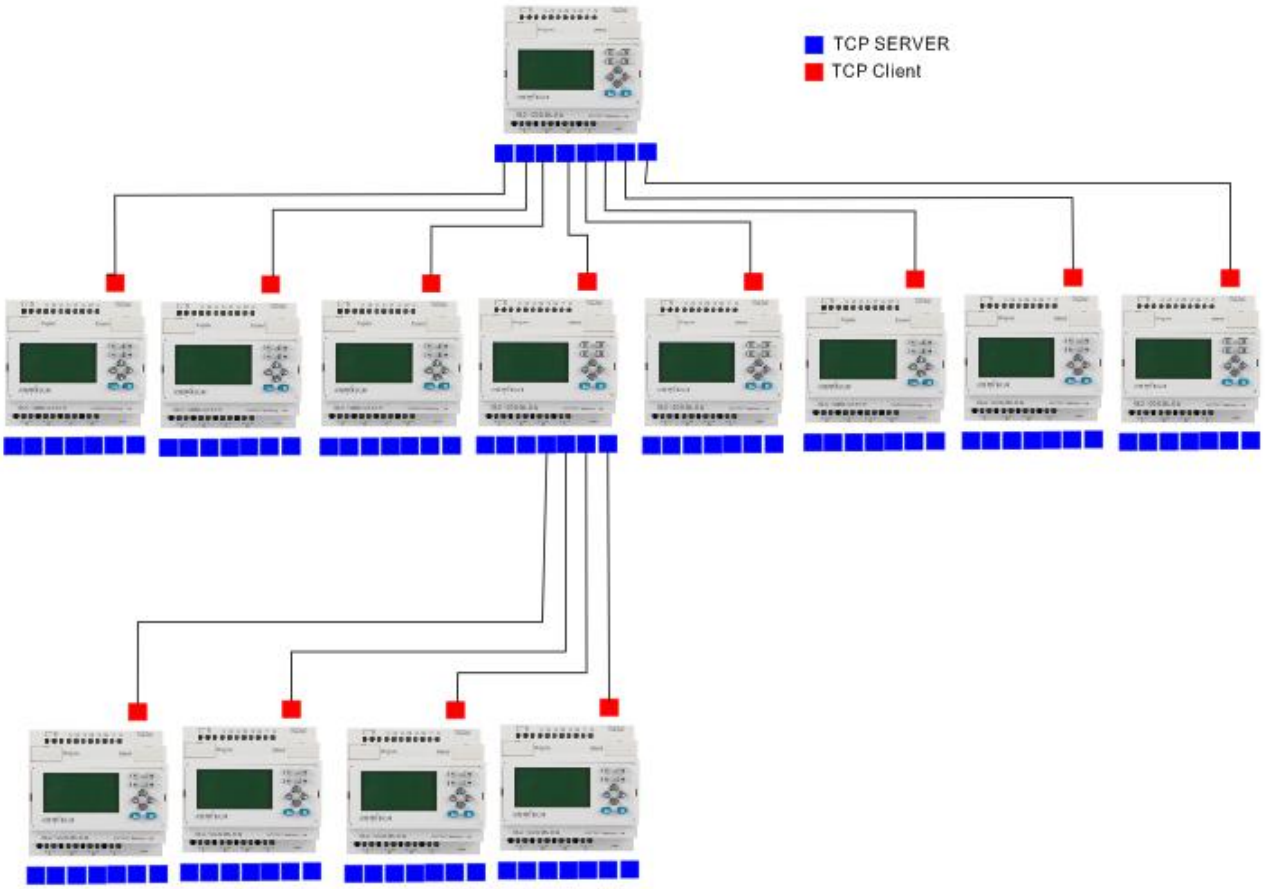
Press “Set” = Press ok key for 3 seconds when there parameters in the text message need be modified!

1.6 How to establish the communication between new Ethernet CPUs?

We can make the Ethernet connection based on the TCP connection or UDP connection. We can see the communication with 2 steps operation.

Step 1: Configure and create the connection(TCP pr UDP)

Each CPU has 8 TCP connections, it can be work both tcp server and tcp client, so a lot of CPUs can be connected in a network. Regarding to how to configure the connection, we will explain in following chapter.

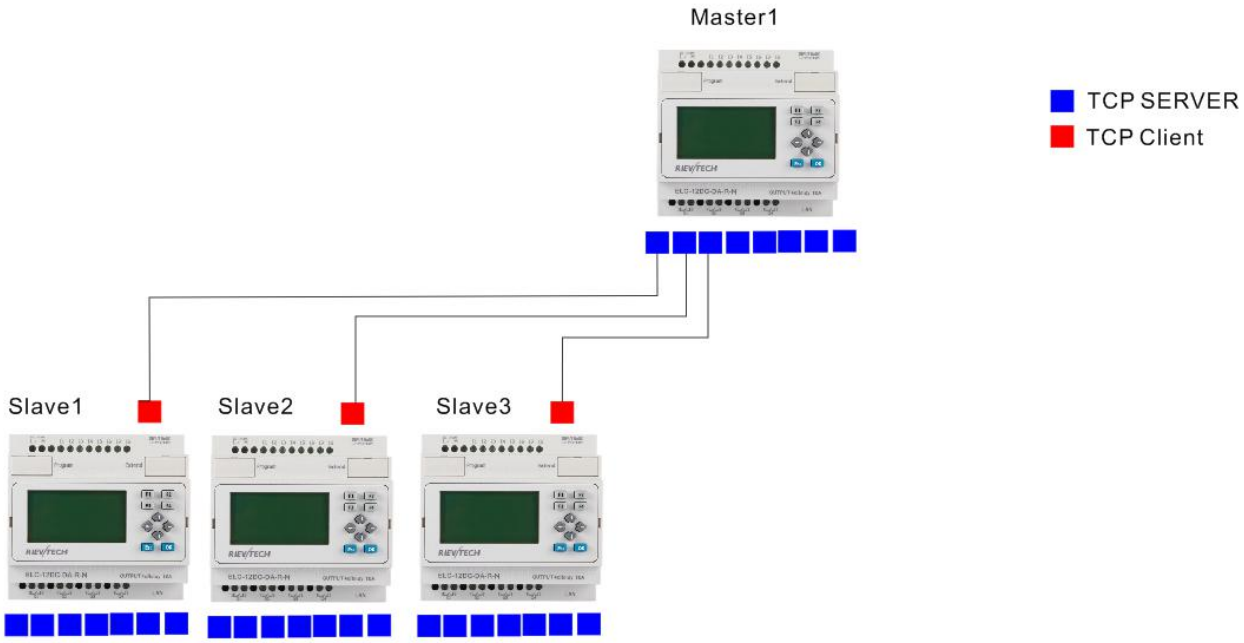


Step2 : Programming and make the data transmission

We need use the function block “Modbus read and write” function block is the master CPU. The TCP server or the TCP client CPU can work as master or slave. It totally decide by yourself. Following chapters we will use examples to explain how to create the communication between 2 Ethernet CPUs.

1.6.1 Example1: One master CPU(TCP server) connect with 3 slave CPUs(TCP Clients)

The connection sketch:



Requirement:

1.If I1 of Master is ON/OFF, the Q1 of slave1---slave3 are ON/OFF.

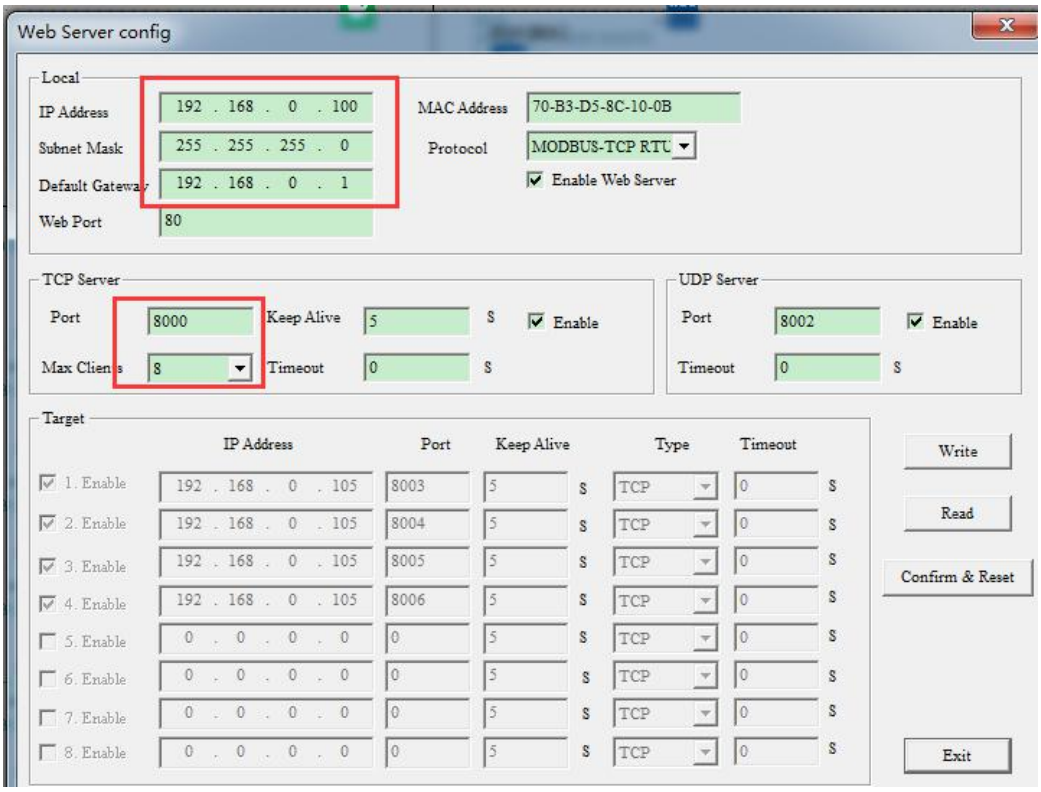
2.Read the AI2 value from the slave1--slave3 to master and display.

Step1: Configure the IP configuration of the PLCs.

Master

IP: 192.168.0.100

TCP port: 8000

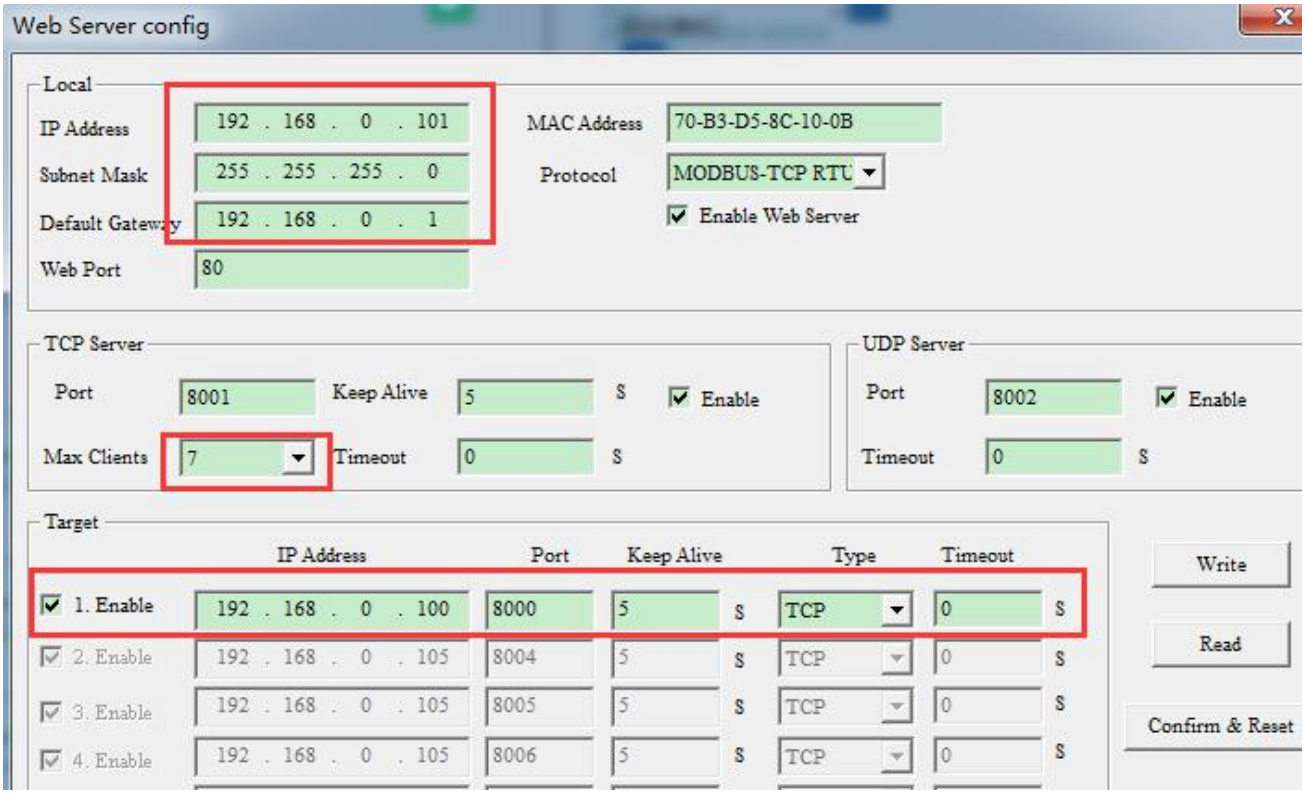


Slave1:

IP:192.168.0.101

Target server: 192.168.0.101

port:8000

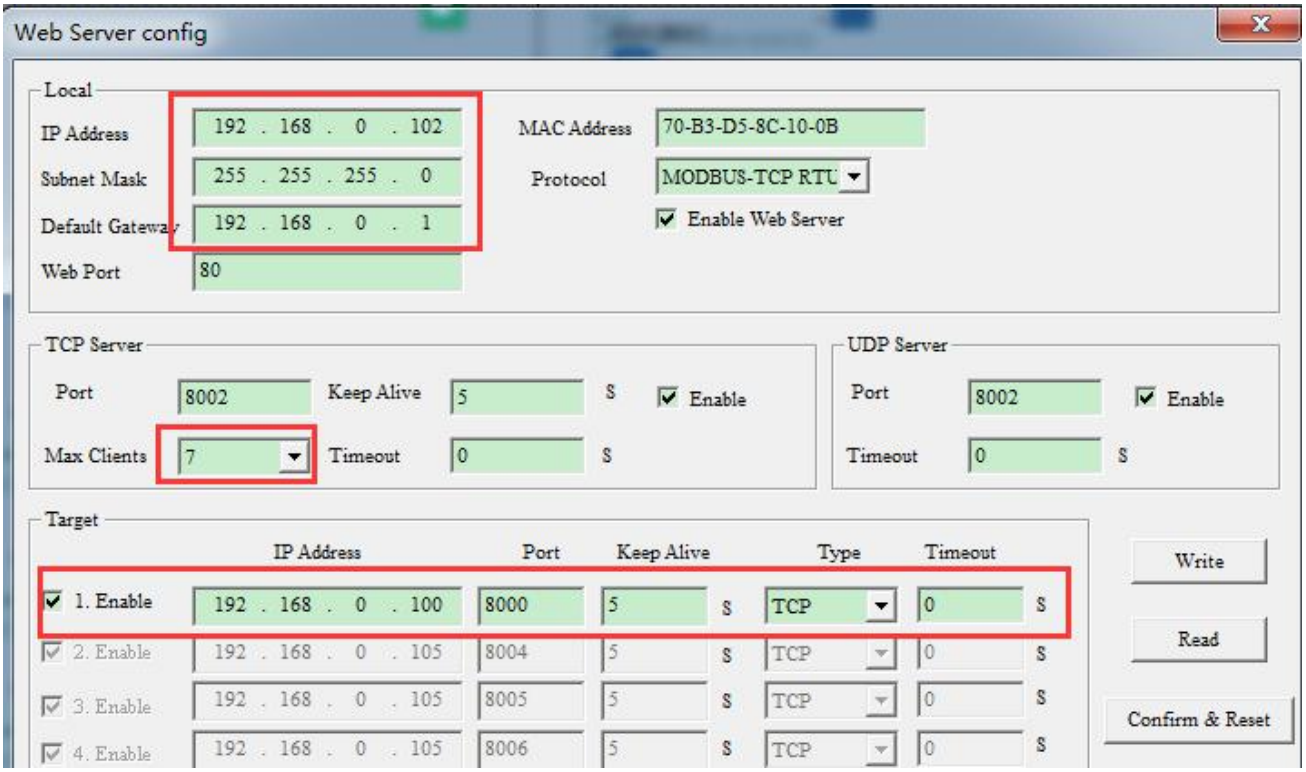


Slave2:

IP:192.168.0.102

Target server: 192.168.0.101

port:8000

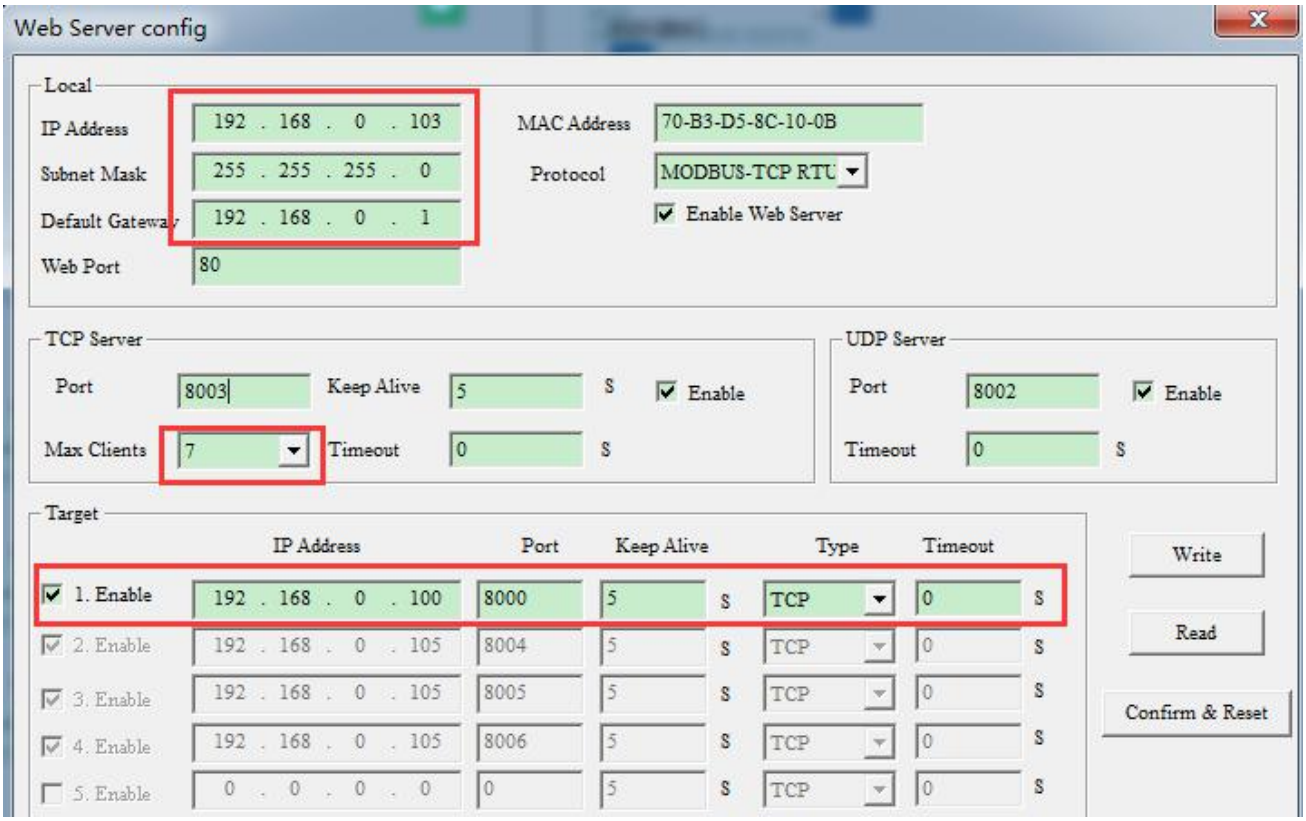


Slave3:

IP:192.168.0.103

Target server: 192.168.0.101

port:8000



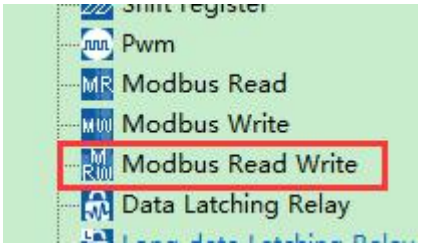
Step2 Programming for the master and slave

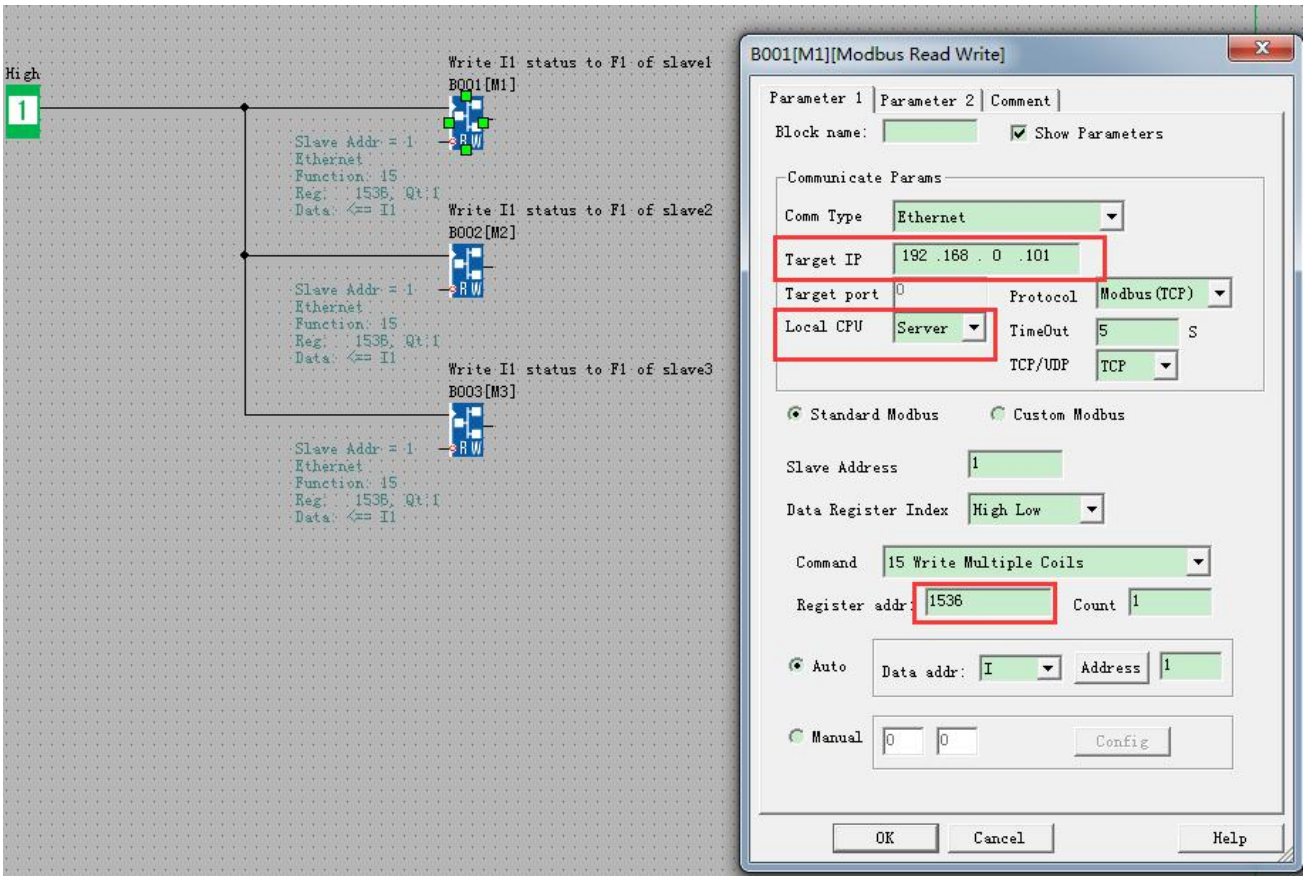
Master program.

In the master program, you need read and write data to the slaves, the function block is “Modbus Read Write”.\

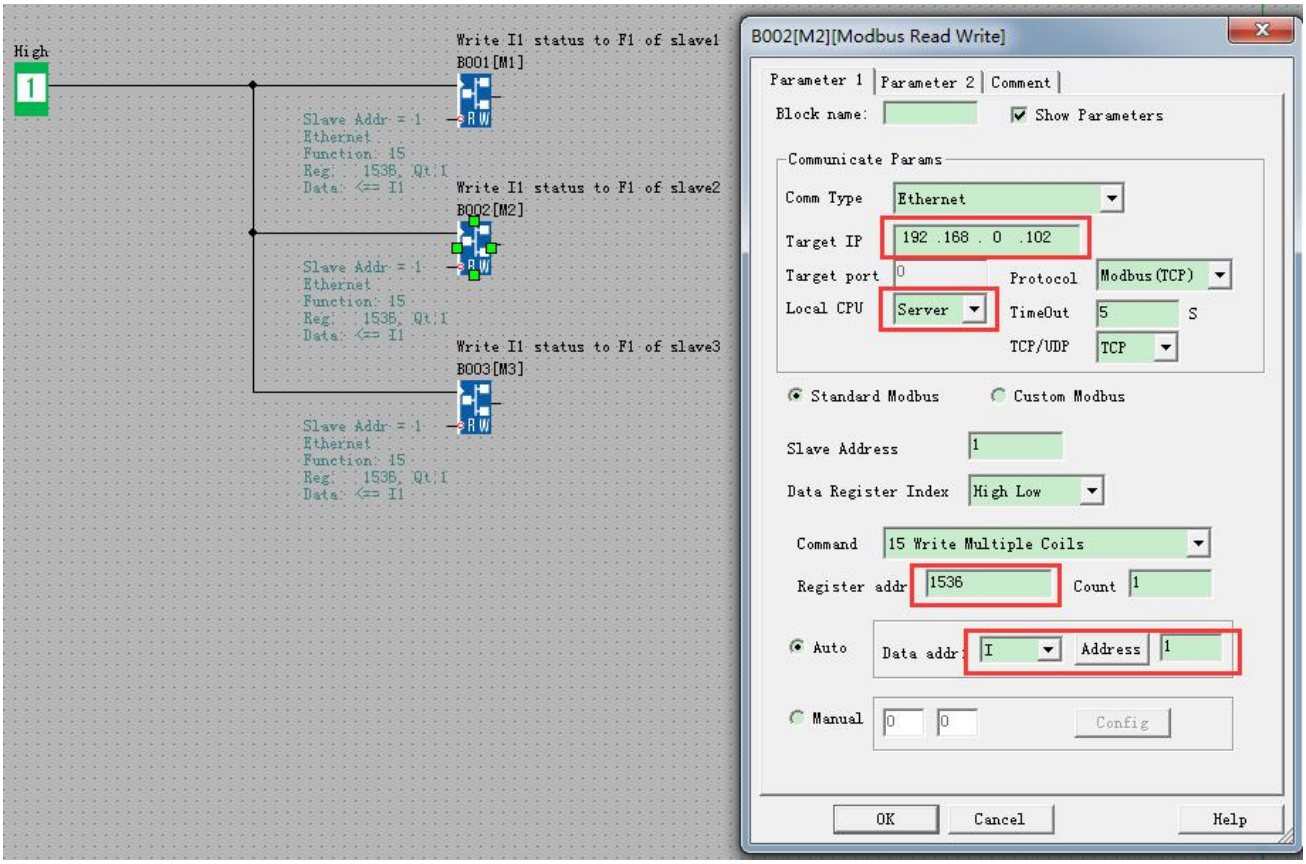
Note:

Even if the MODBUS READ and MODBUS WRITE block also have the Ethernet interface, but they only can be used for the old version Ethernet CPU, it cannot be applied to the new one built-in web server.

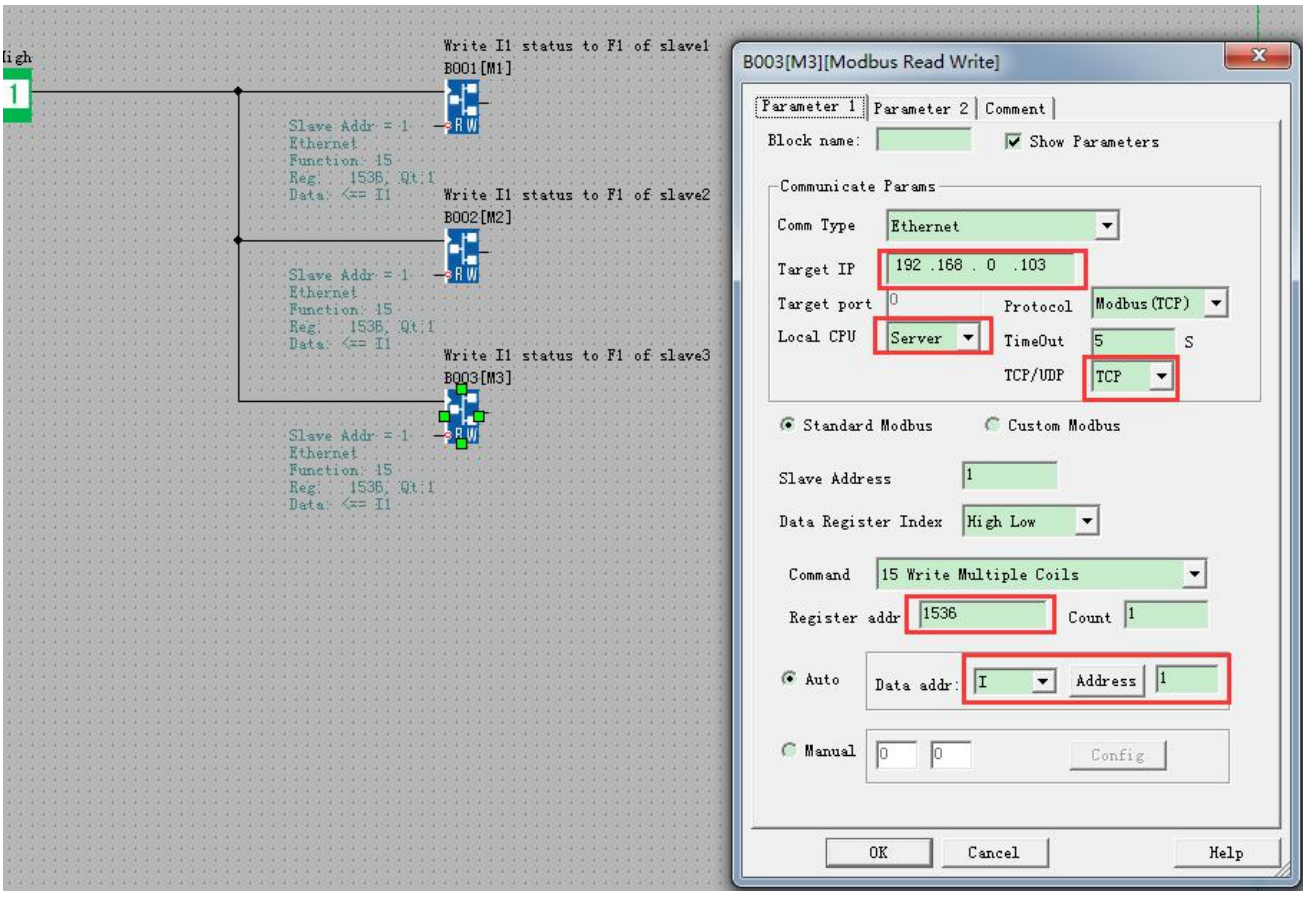




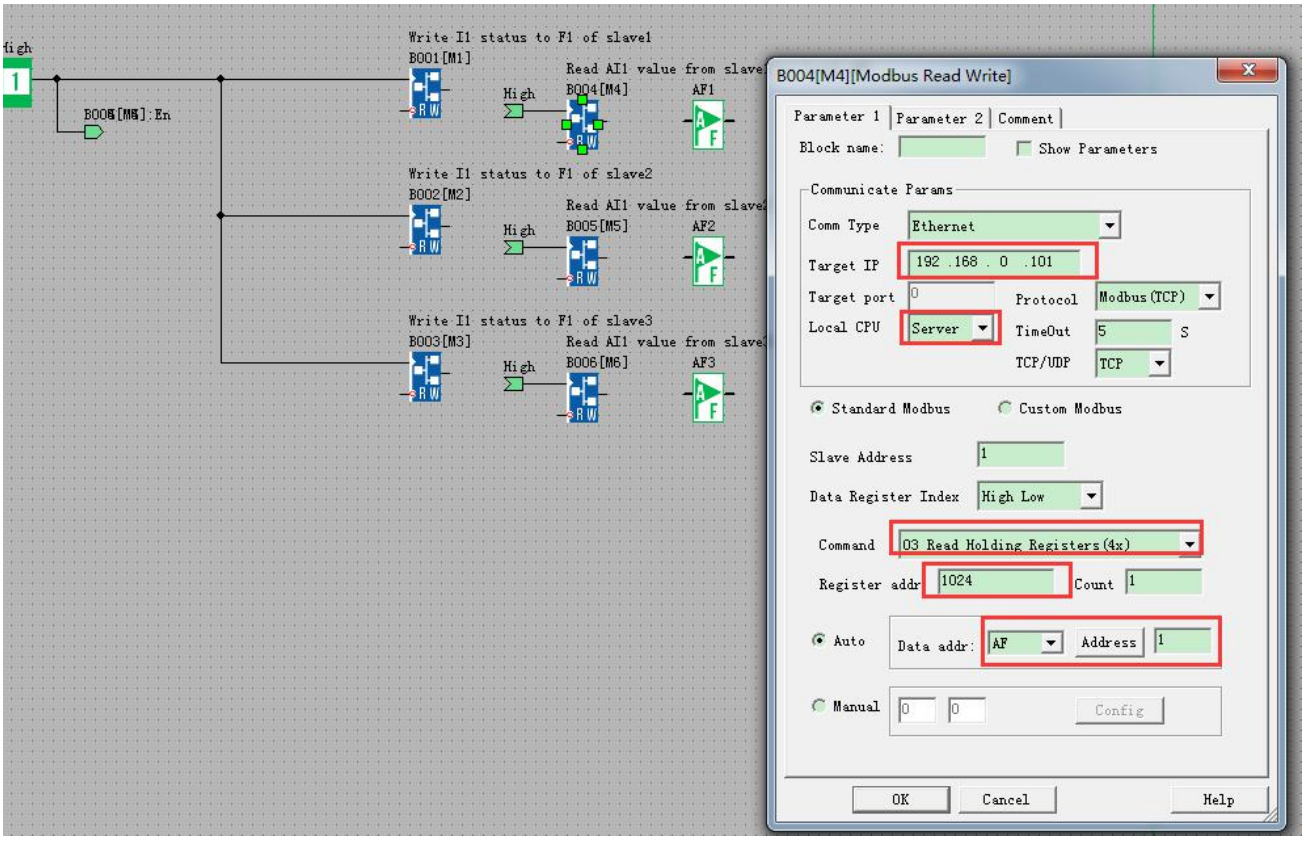
If B001 is enabled, the I1 status of master will transferred to the F1(Modbus address is 0x 1536)slave1(IP:192.168.0.101).



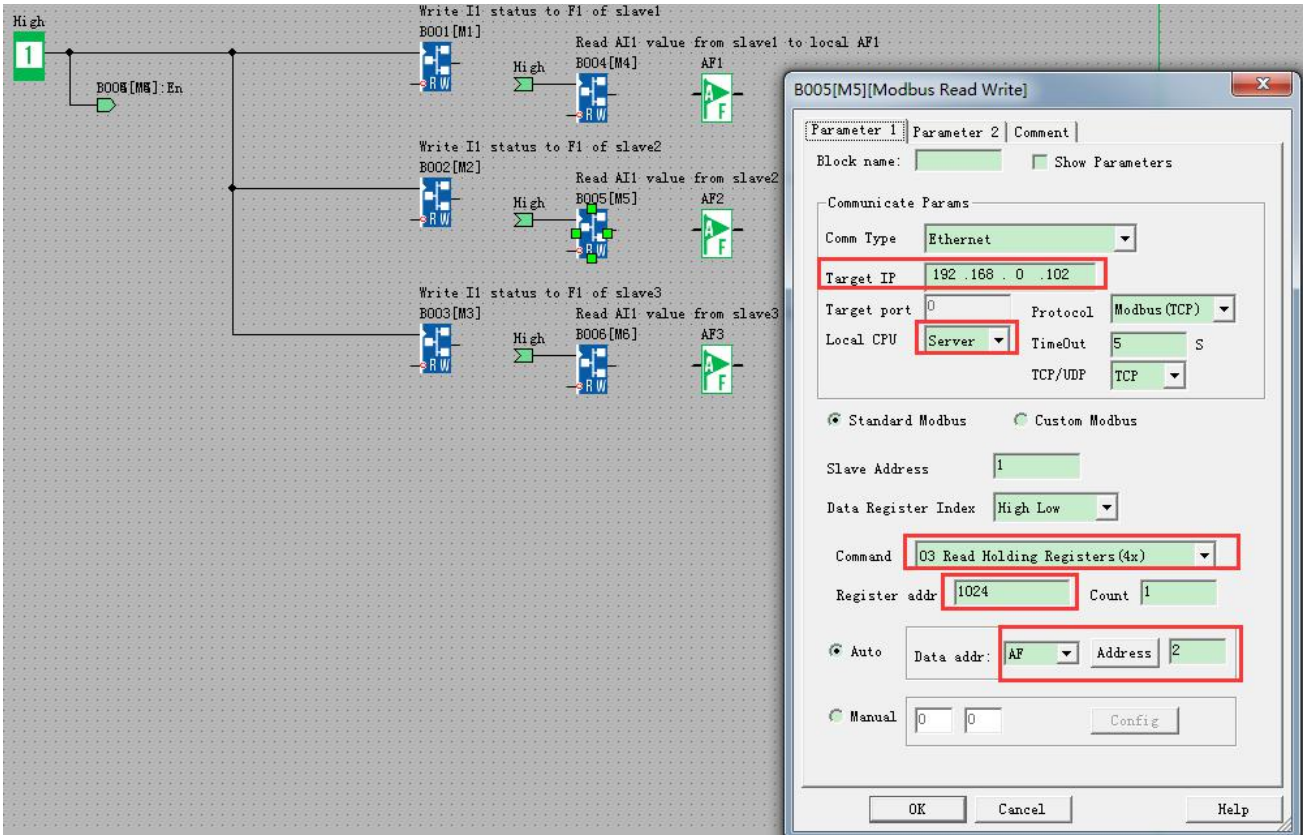
If B002 is enabled, the I1 status of master will transferred to the F1(Modbus address is 0x 1536)slave2(IP:192.168.0.102).



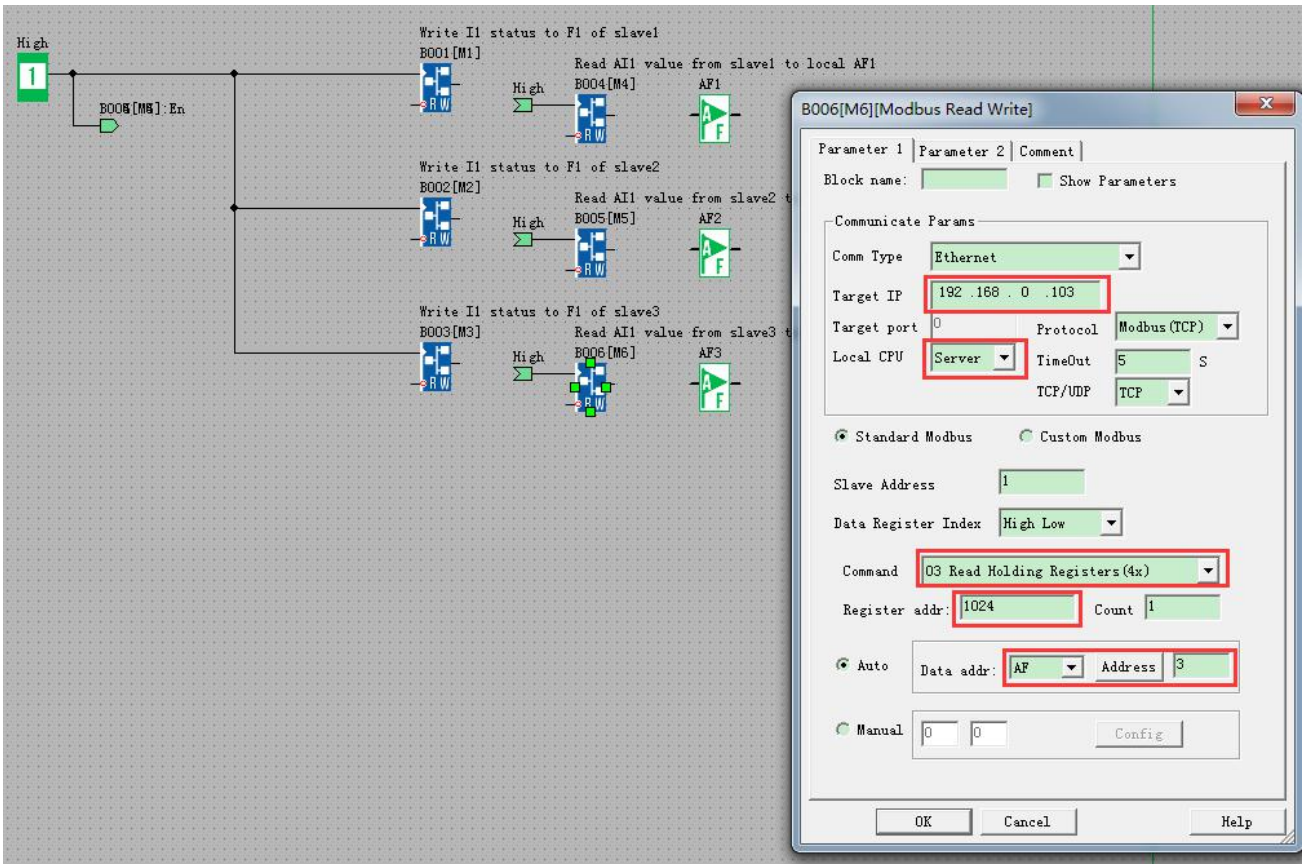
If B003 is enabled, the I1 status of master will transferred to the F1(Modbus address is 0x 1536)slave3(IP:192.168.0.103).



If B004 is enabled, the master will read the AI1 value(modbus address 4x 1024) of slave1 and save into local AF1.

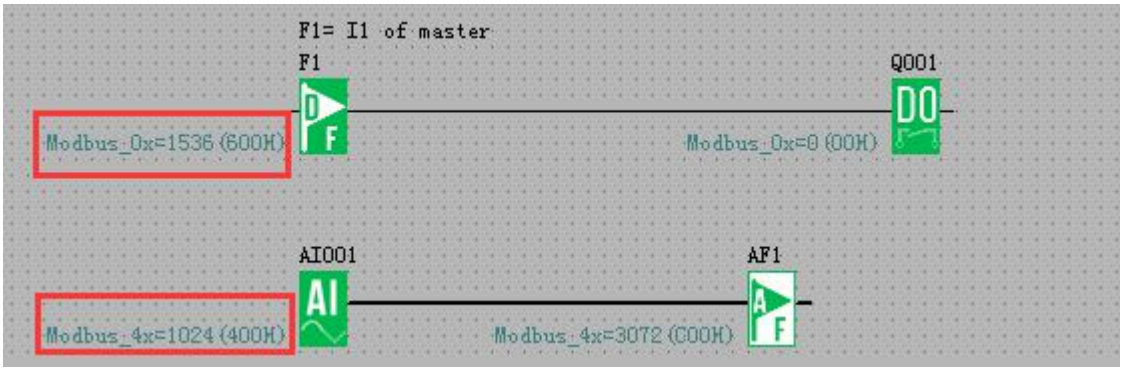


If B005 is enabled, the master will read the AI1 value(modbus address 4x 1024) of slave2 and save into local AF2.



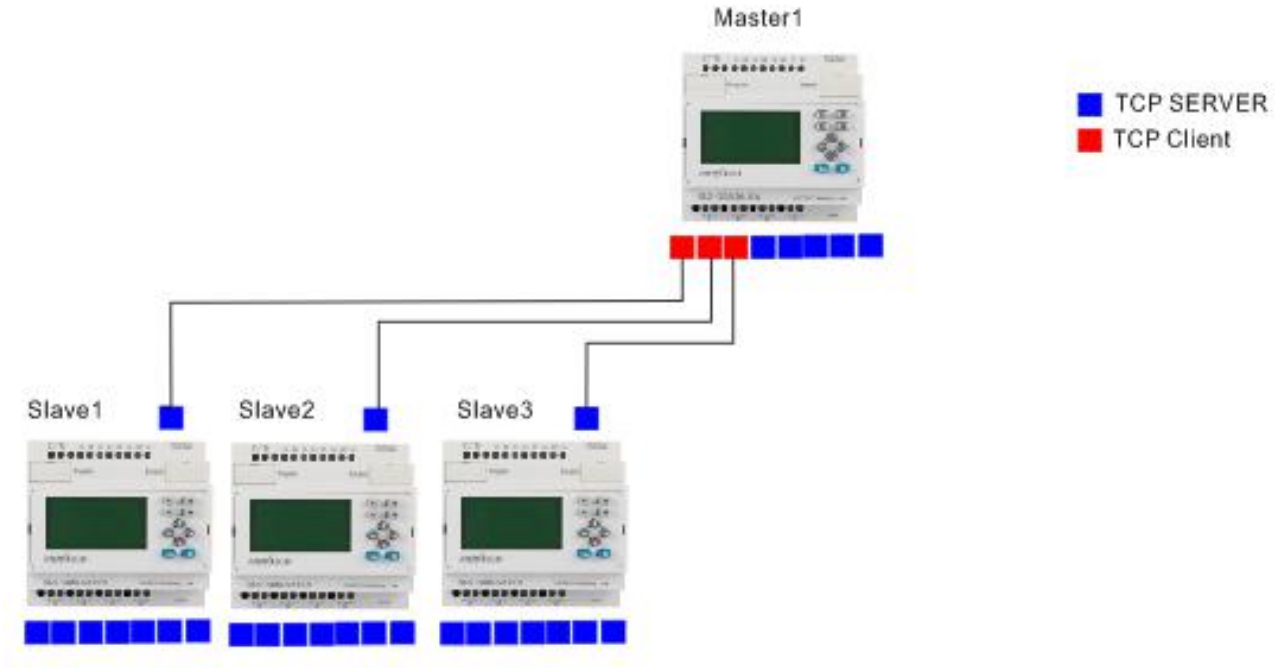
If B006 is enabled, the master will read the AI1 value(modbus address 4x 1024) of slave3 and save into local AF3.

Slave1--Slave3 Program would be same.



1.6.2 Example2: One master CPU(TCP Client) connect with 3 slave CPUs(TCP Servers)

The connection sketch:



Requirement:

1.If I1 of Master is ON/OFF, the Q1 of slave1---slave3 are ON/OFF.

2.Read the AI2 value from the slave1--slave3 to master and display.

Step1: Configure the IP configuration of the PLCs.

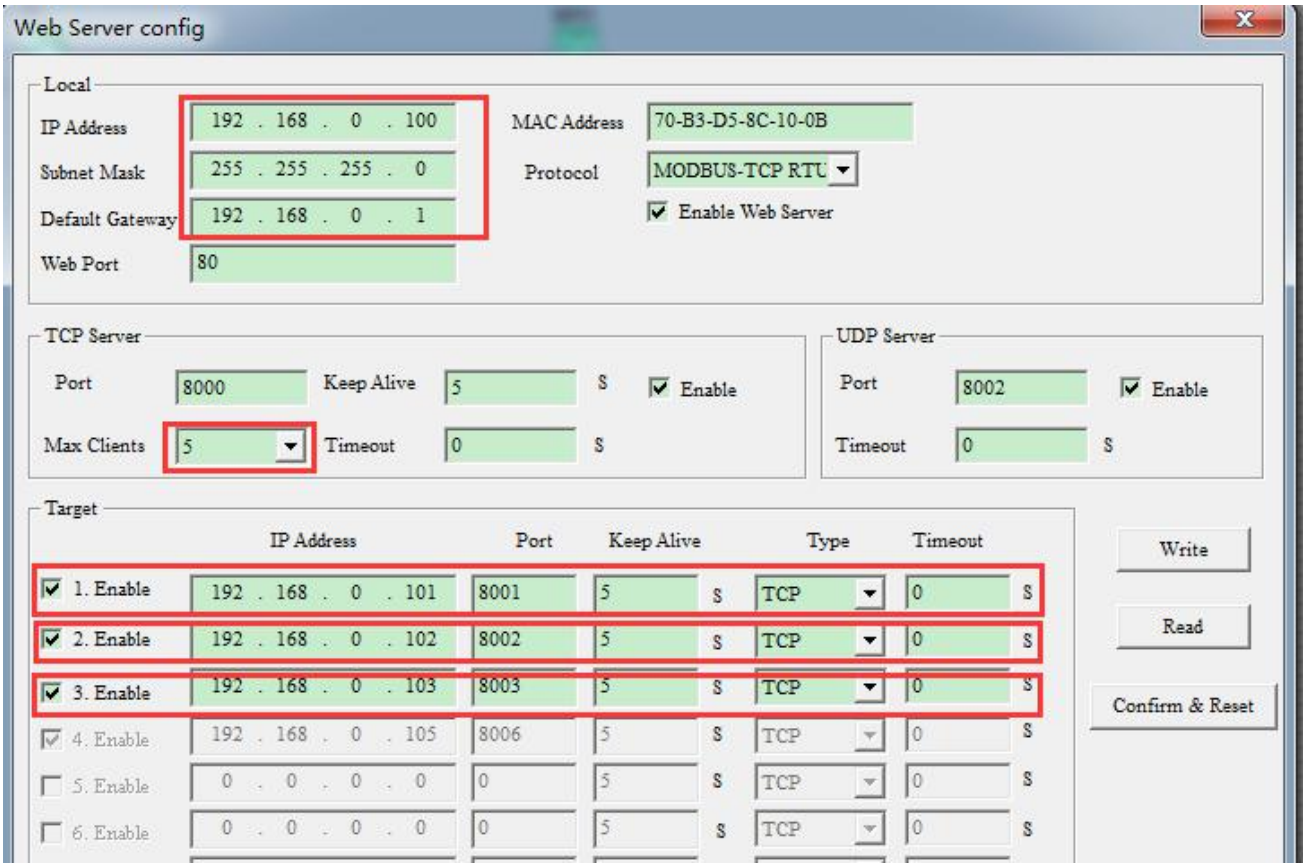
Master

IP: 192.168.0.100

Target server 1 IP :192.168.0.101 port 8001

Target server 2 IP :192.168.0.102 port 8002

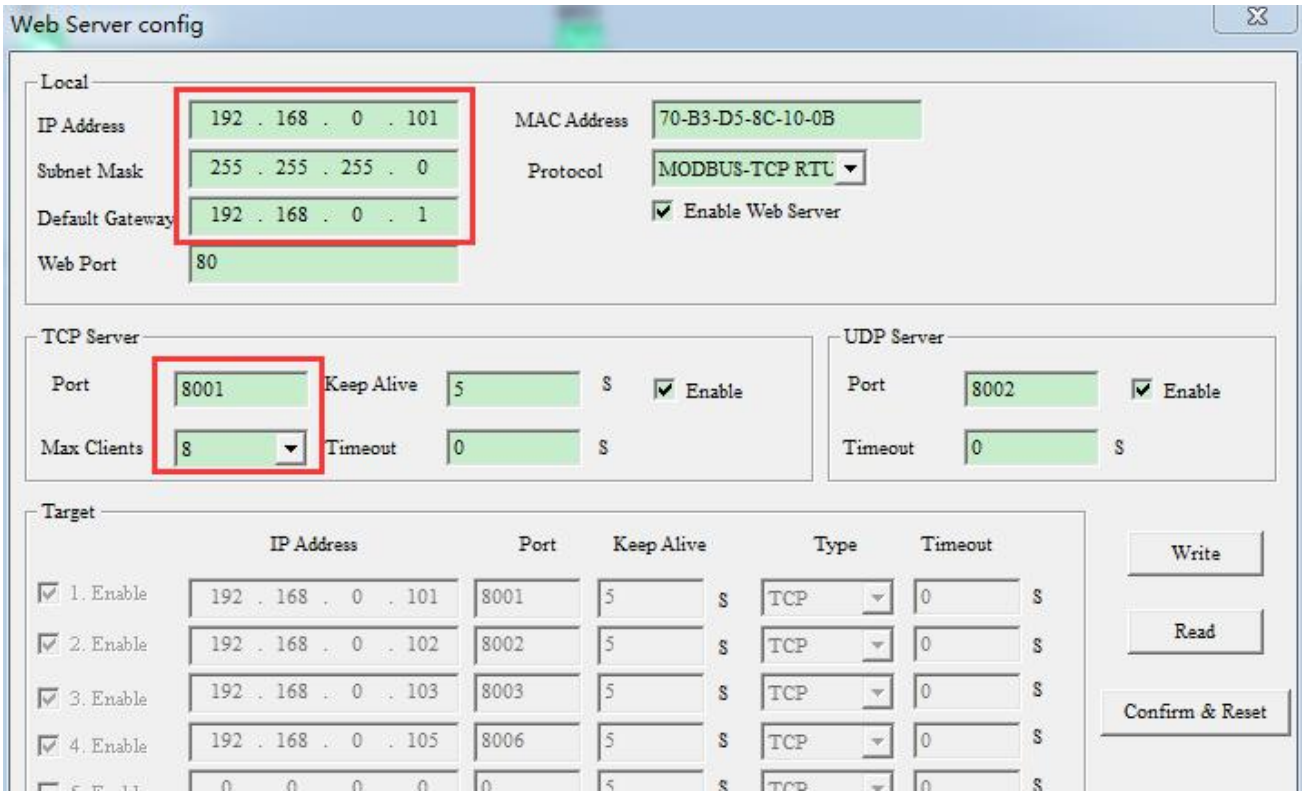
Target server 3 IP :192.168.0.103 port 8003



Slave1:

IP:192.168.0.101

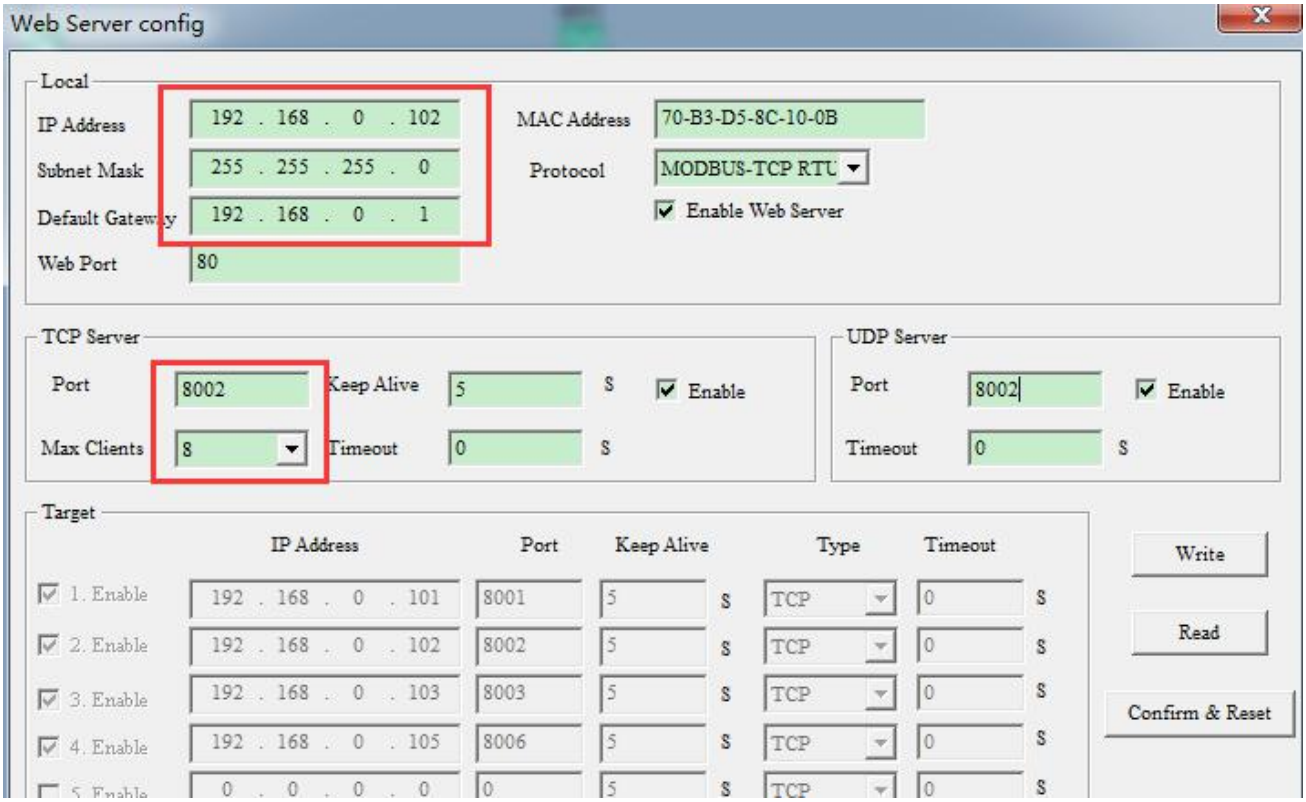
TCP server port:8001



Slave2:

IP:192.168.0.102

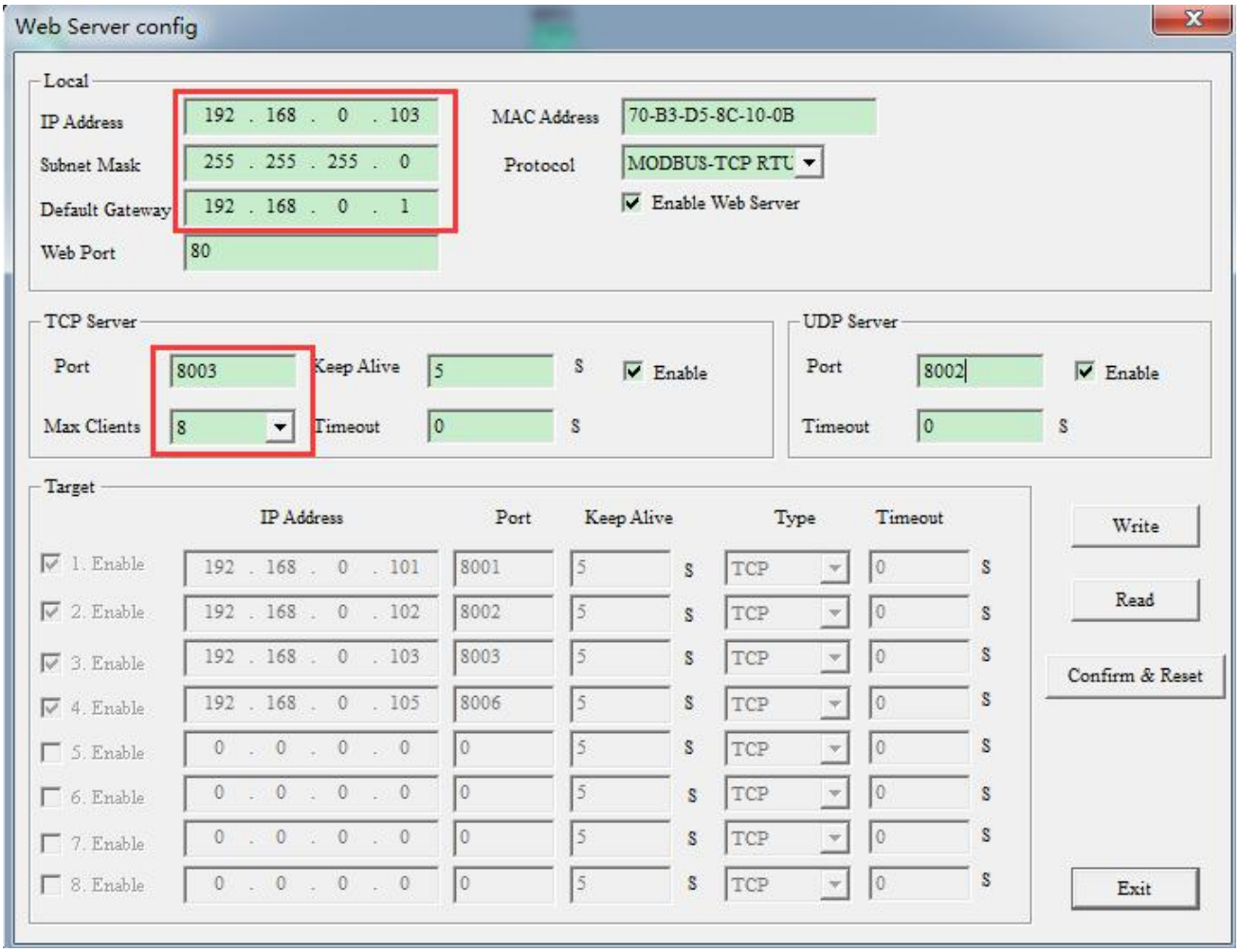
TCP server port:8002



Slave3:

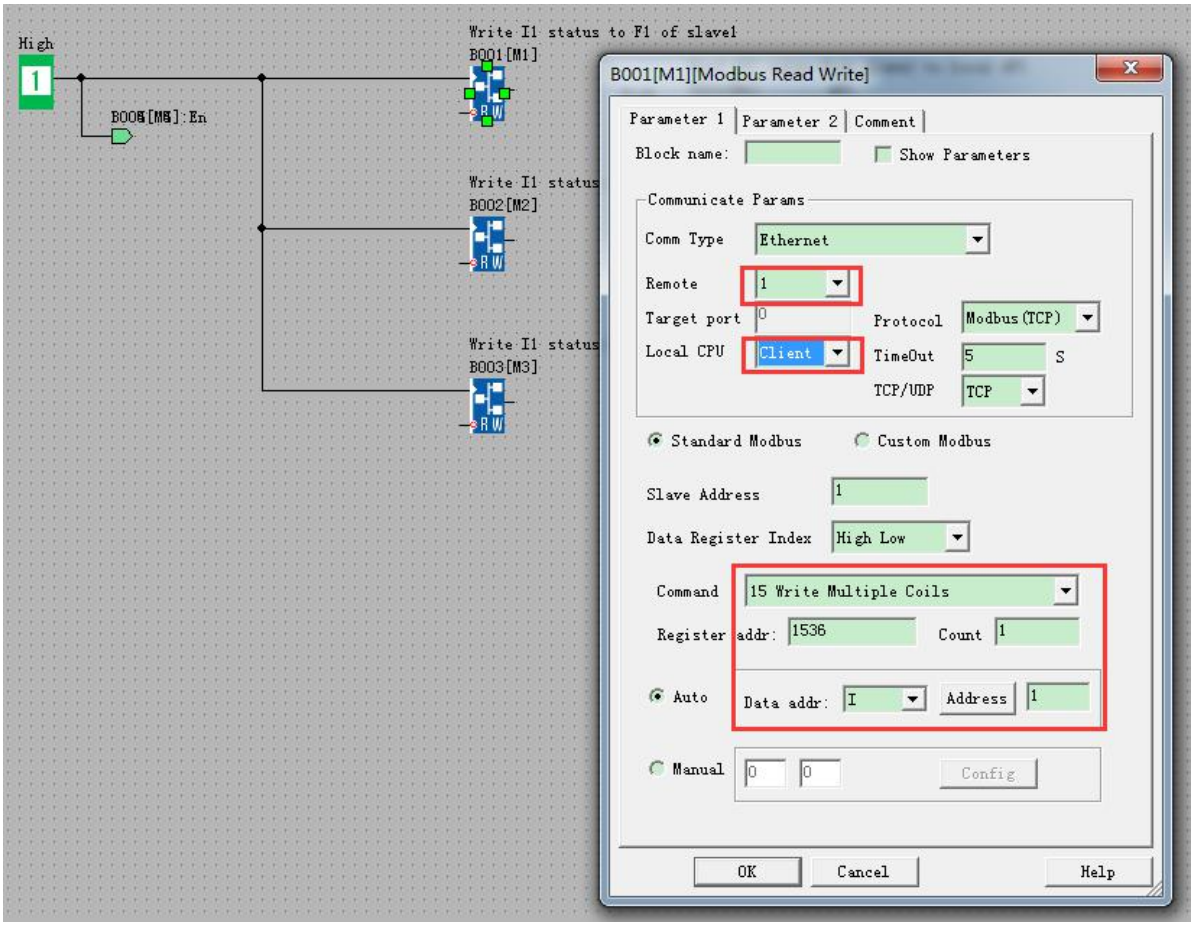
IP:192.168.0.103

TCP server port:8003

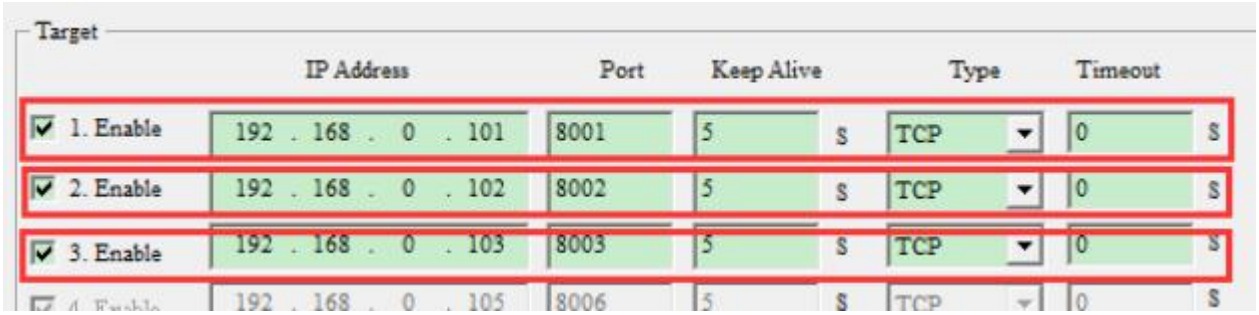


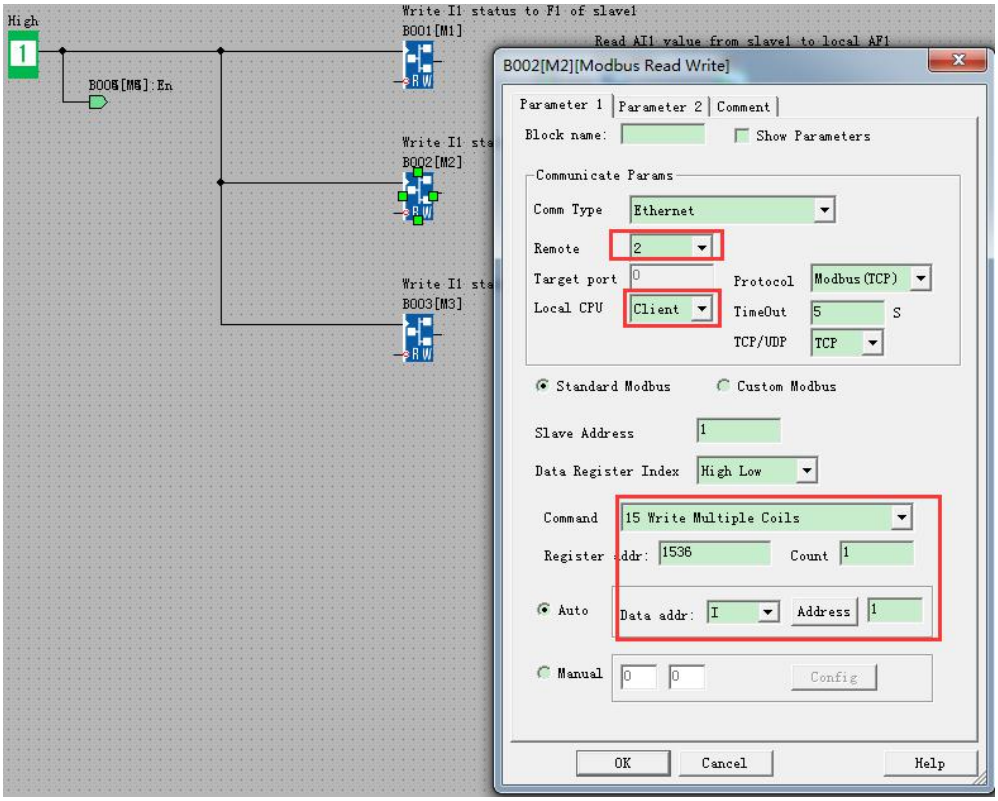
Step 2 Program in master and slave

Master program

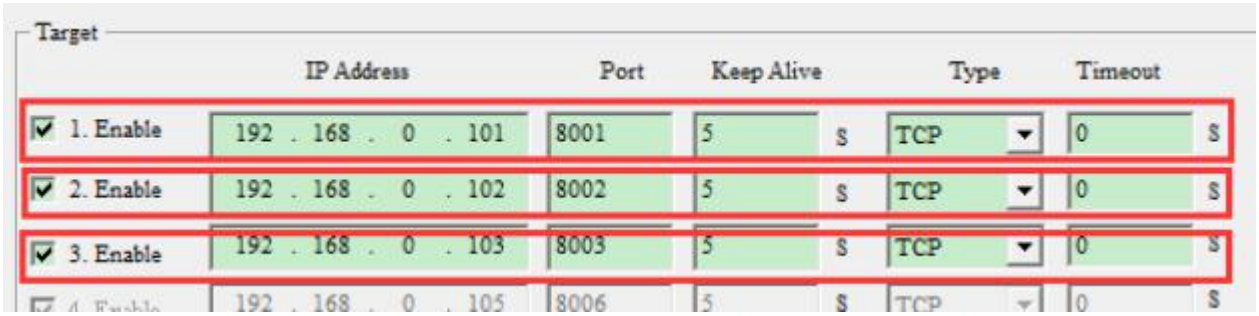


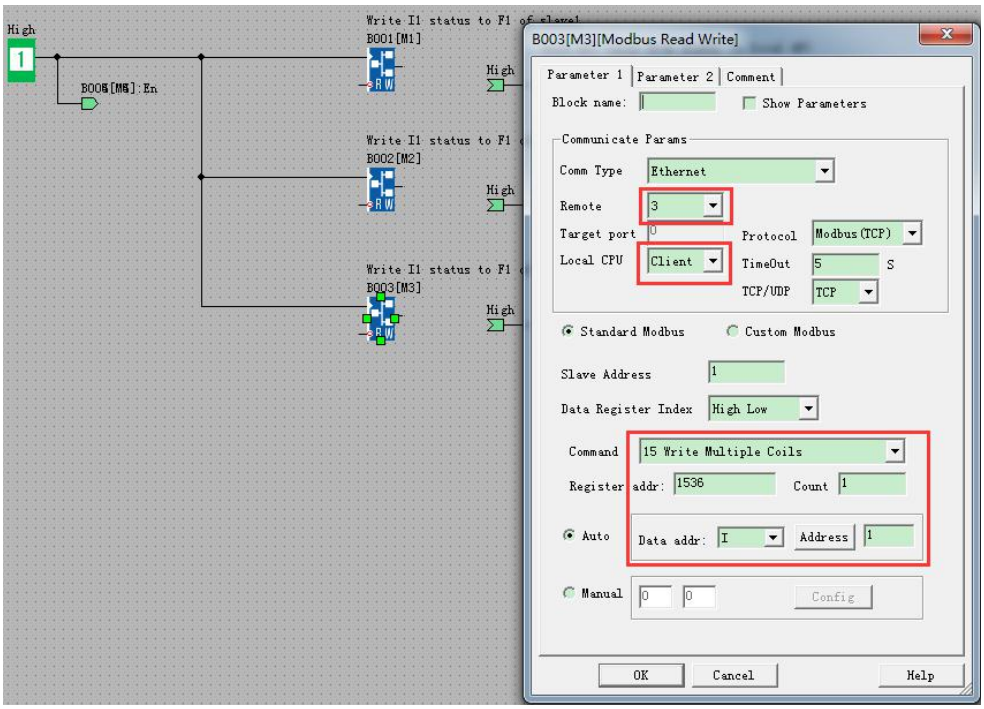
B001 is used to write I1 status to F1 of slave1, the Remote 1 is the target1 in the network parameter settings.



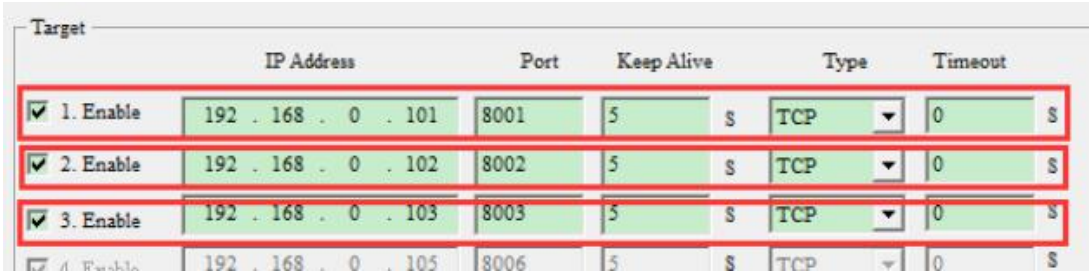


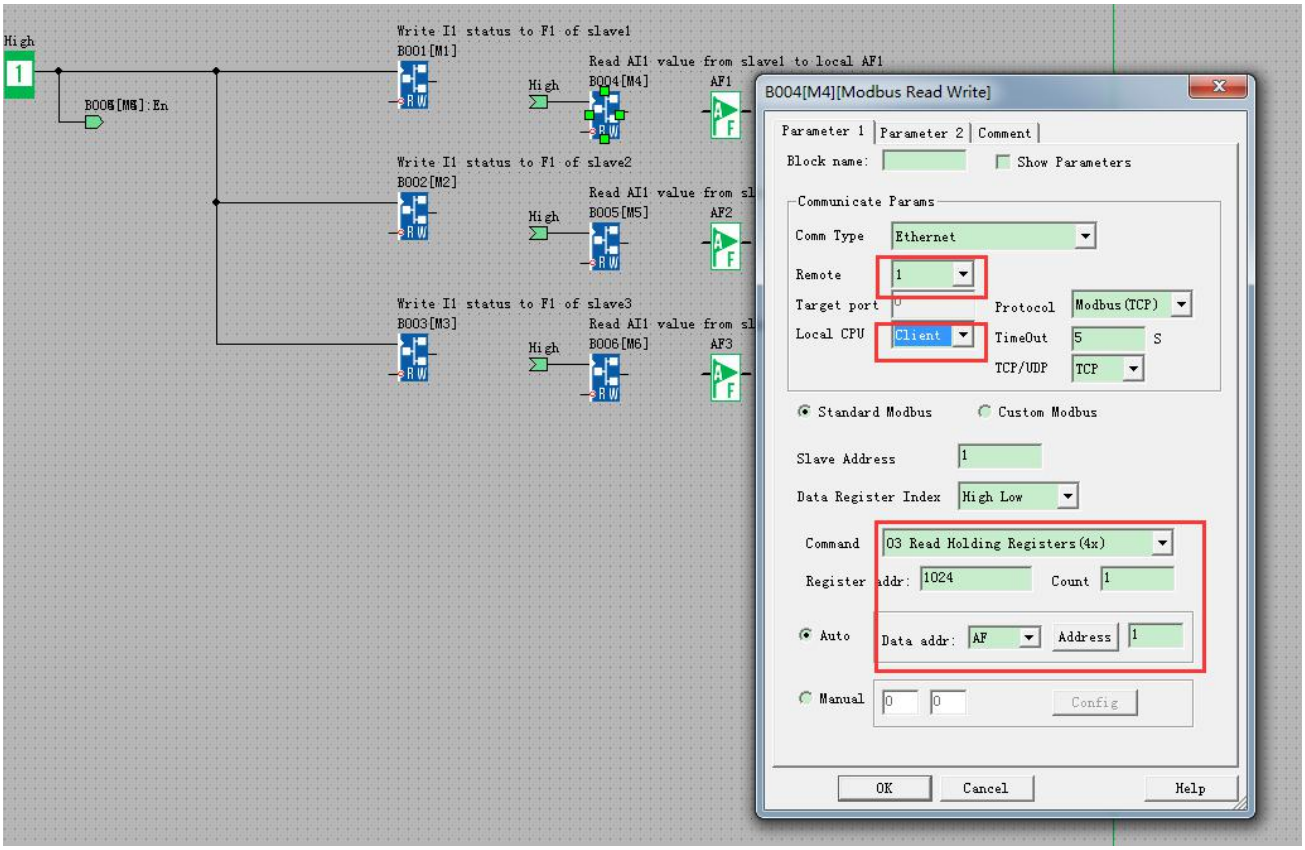
B002 is used to write I1 status to F1 of slave1, the Remote 2 is the target2 in the network parameter settings.



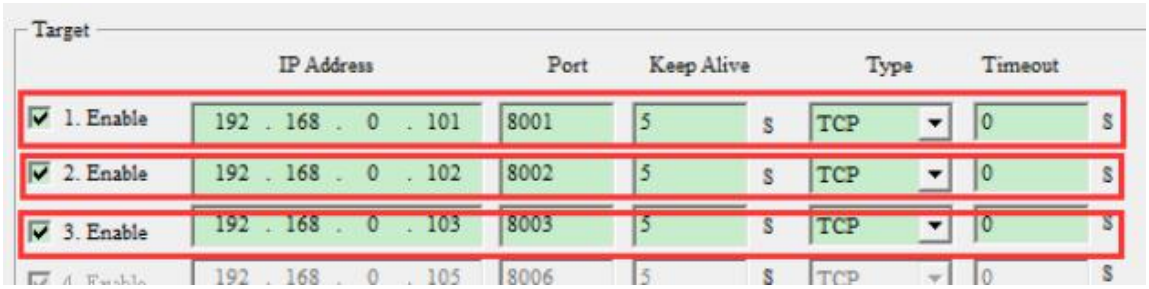


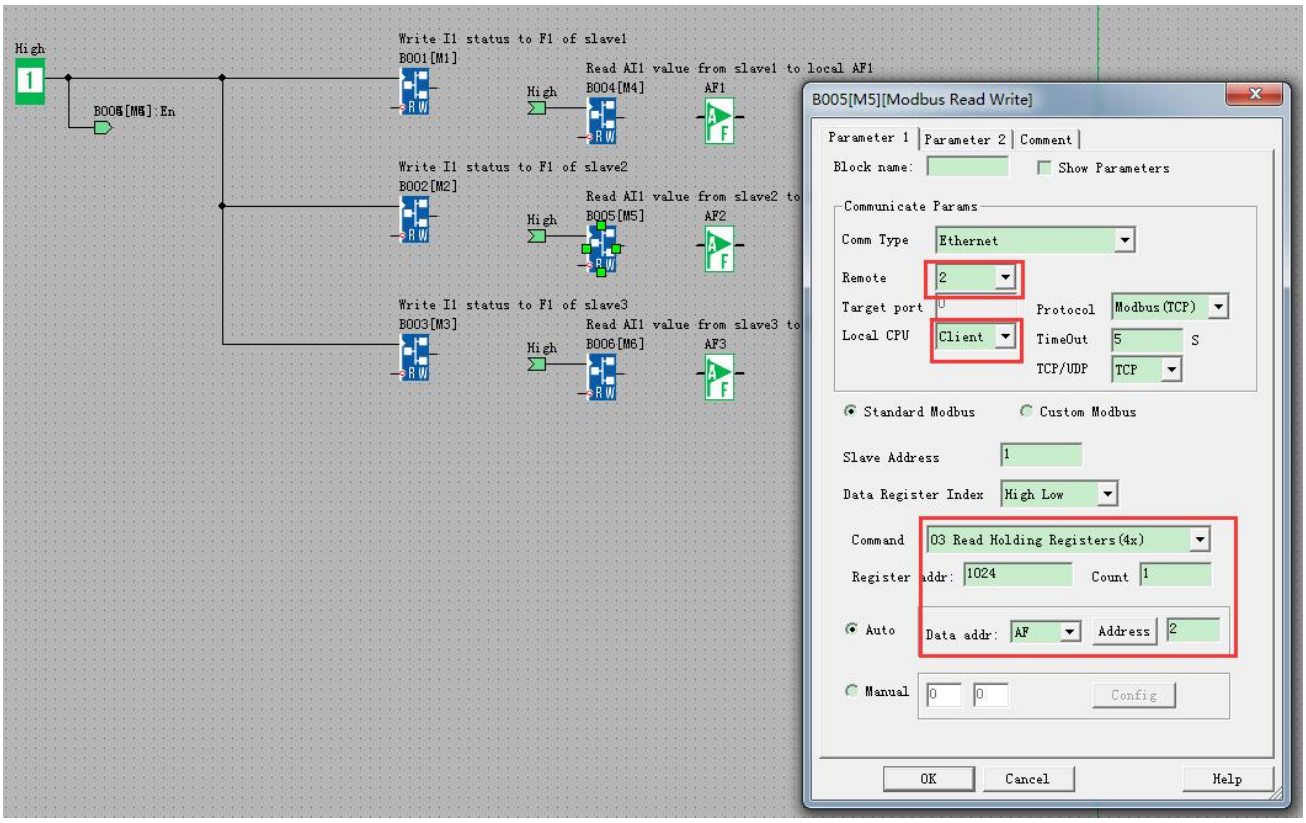
B003 is used to write I1 status to F1 of slave1, the Remote 3 is the target3 in the network parameter settings.



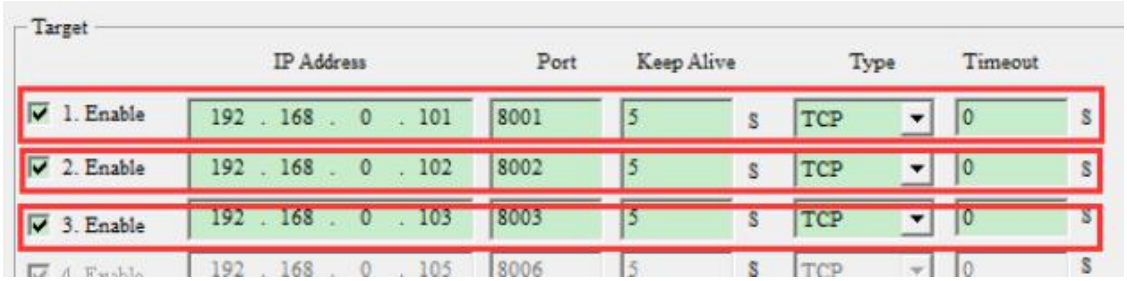


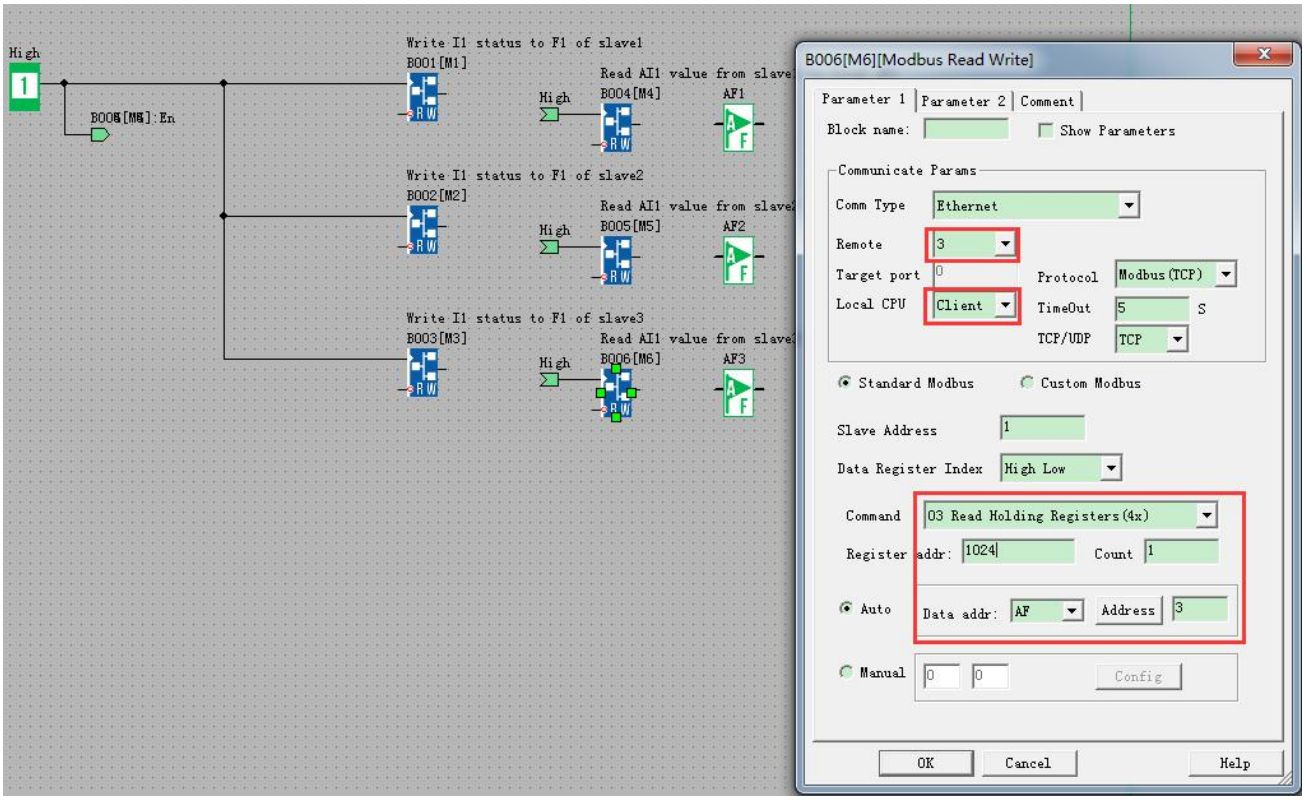
B004 is used to read AI1 value of slave1 then save into AF1 , the Remote 1 is the target1 in the network parameter settings.



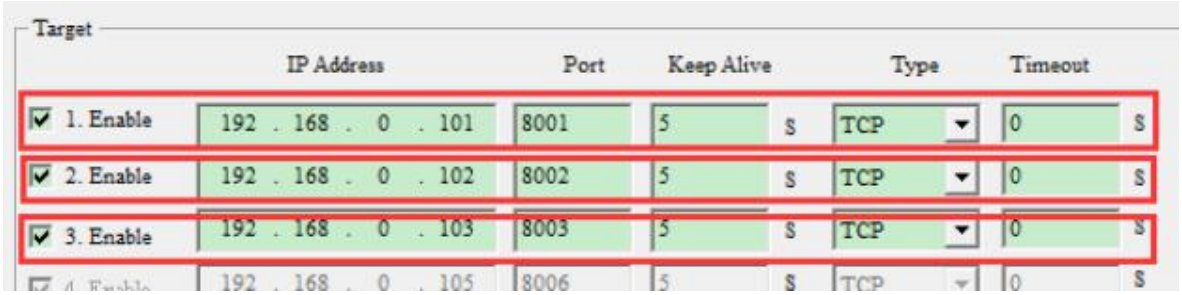


B005 is used to read AI1 value of slave2 then save into AF2 , the Remote 2 is the target2 in the network parameter settings.

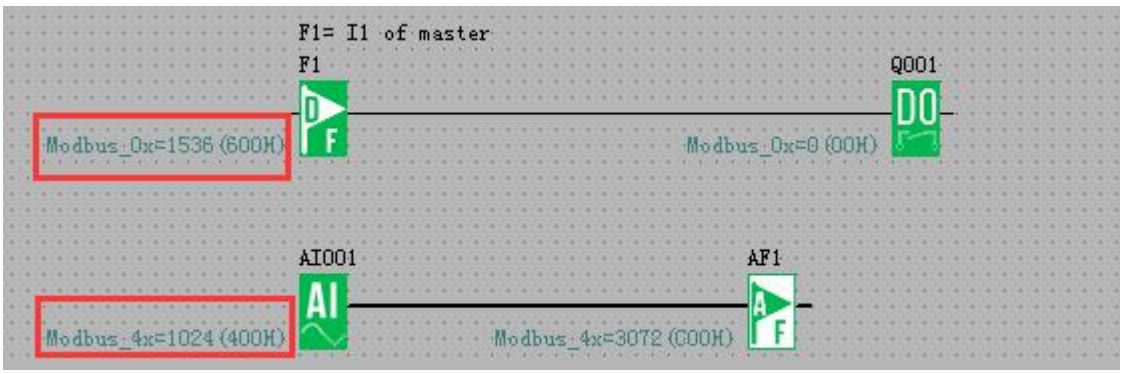




B006 is used to read AI1 value of slave3 then save into AF3,the Remote 3 is the target3 in the network parameter settings.

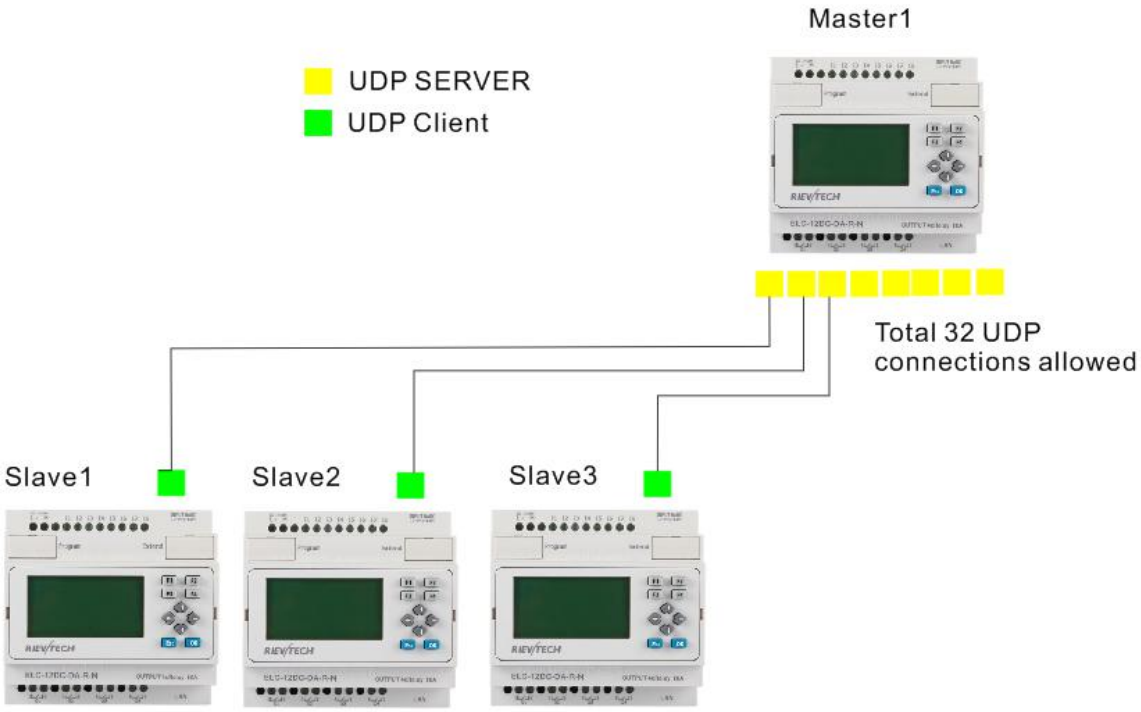


Slave1--Slave3 Program would be same.



1.6.3 Example3: One master CPU(UDP Server) connect with 3 slave CPUs(UDP clients)

The connection sketch:



Requirement:

1.If I1 of Master is ON/OFF, the Q1 of slave1---slave3 are ON/OFF.

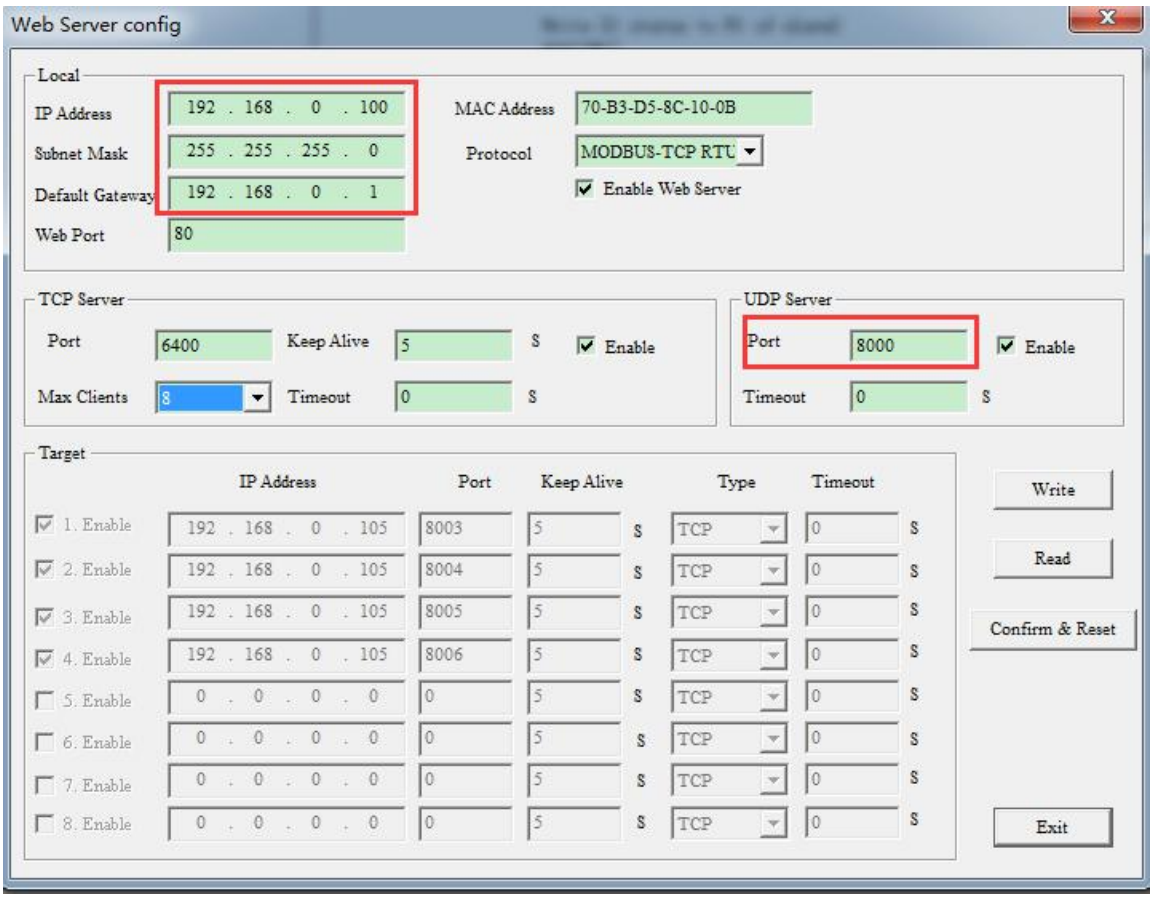
2.Read the AI2 value from the slave1--slave3 to master and display.

Step1: Configure the IP configuration of the PLCs.

Master

IP: 192.168.0.100

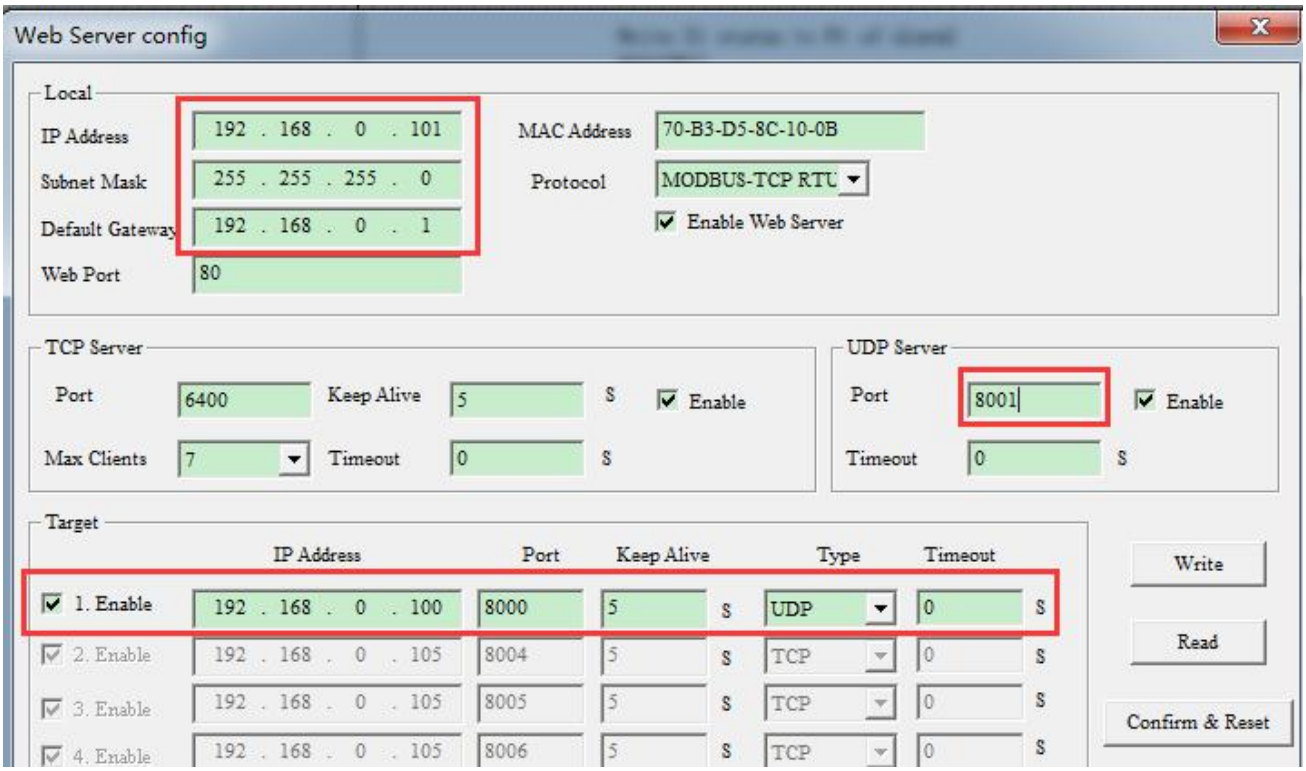
UDP Server port 8000



Slave1:

IP:192.168.0.101 UDP Port 8001

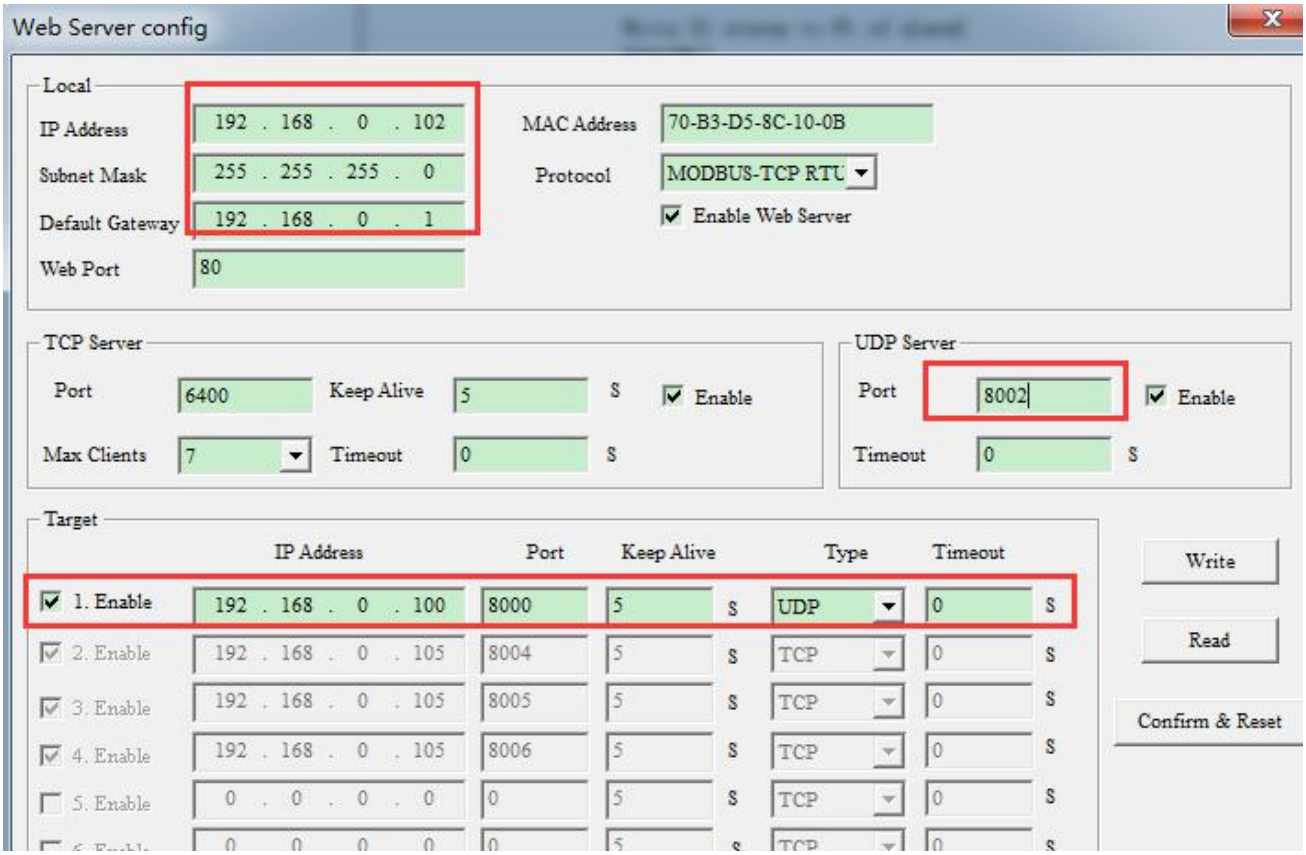
Target1 IP address:192.168.0.100. UDP port 8000



Slave2:

IP:192.168.0.102 UDP port: 8002

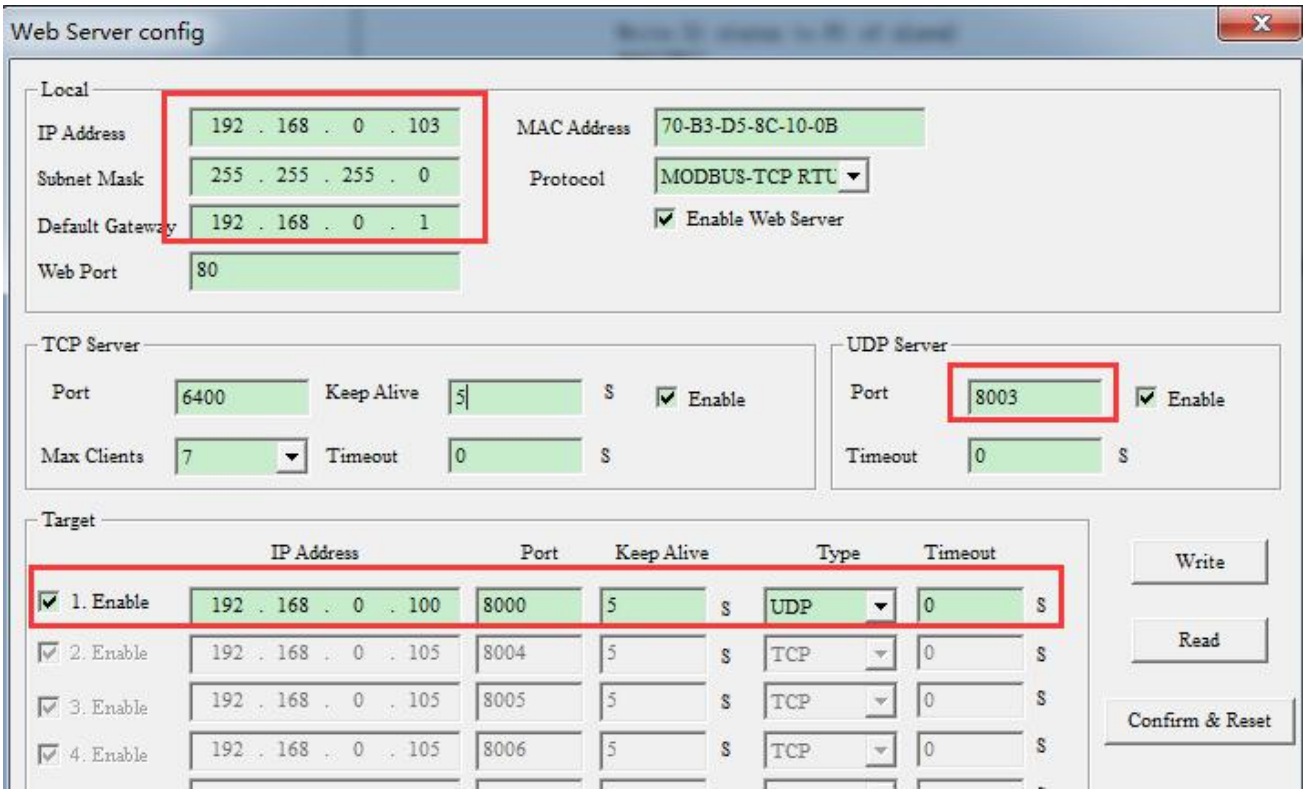
Target1: 192.168.0.100 UDP port:8000



Slave3:

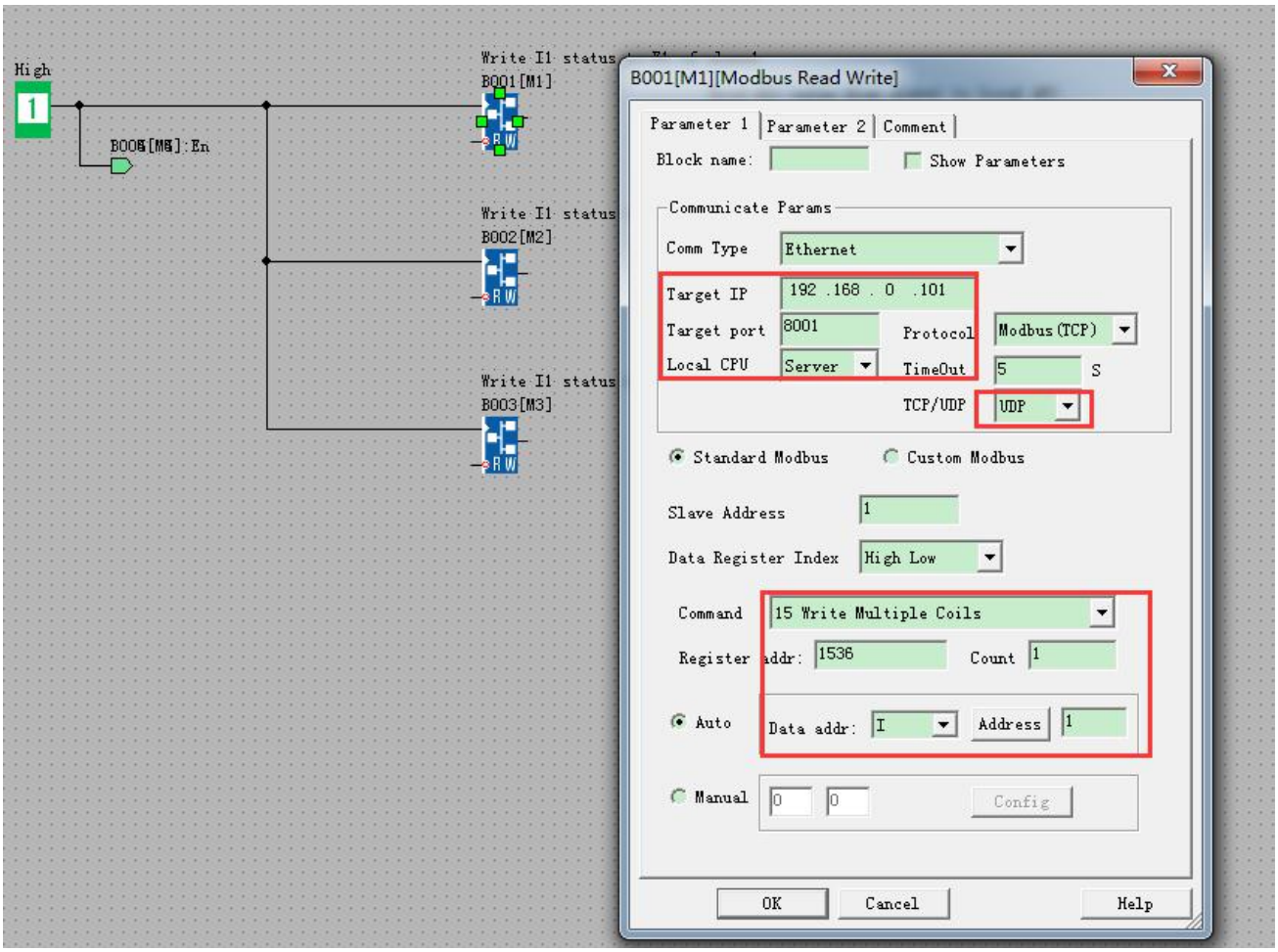
IP:192.168.0.103 UDP port: 8003

Target1: 192.168.0.100 UDP port:8000

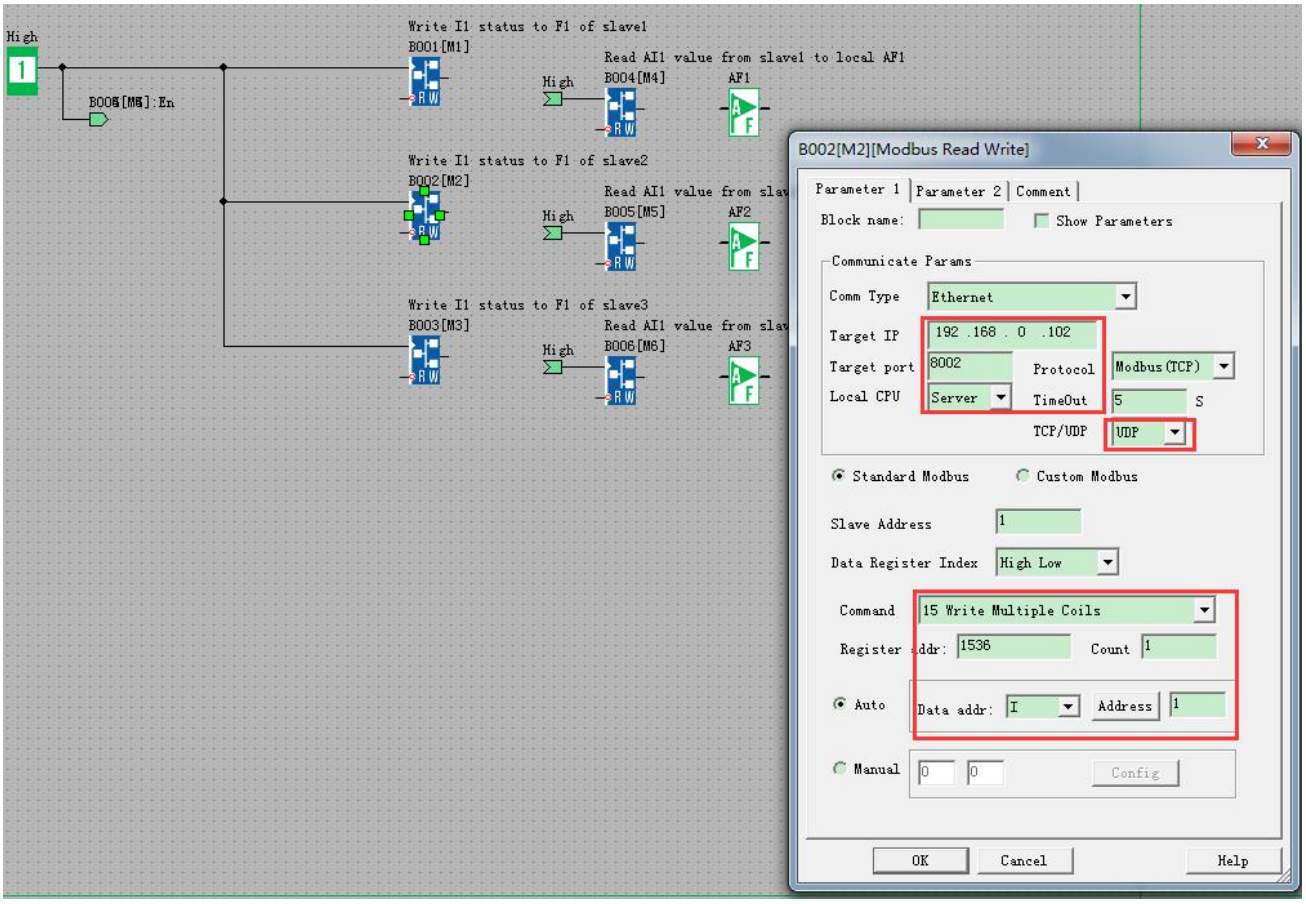


Step 2 Program in master and slave

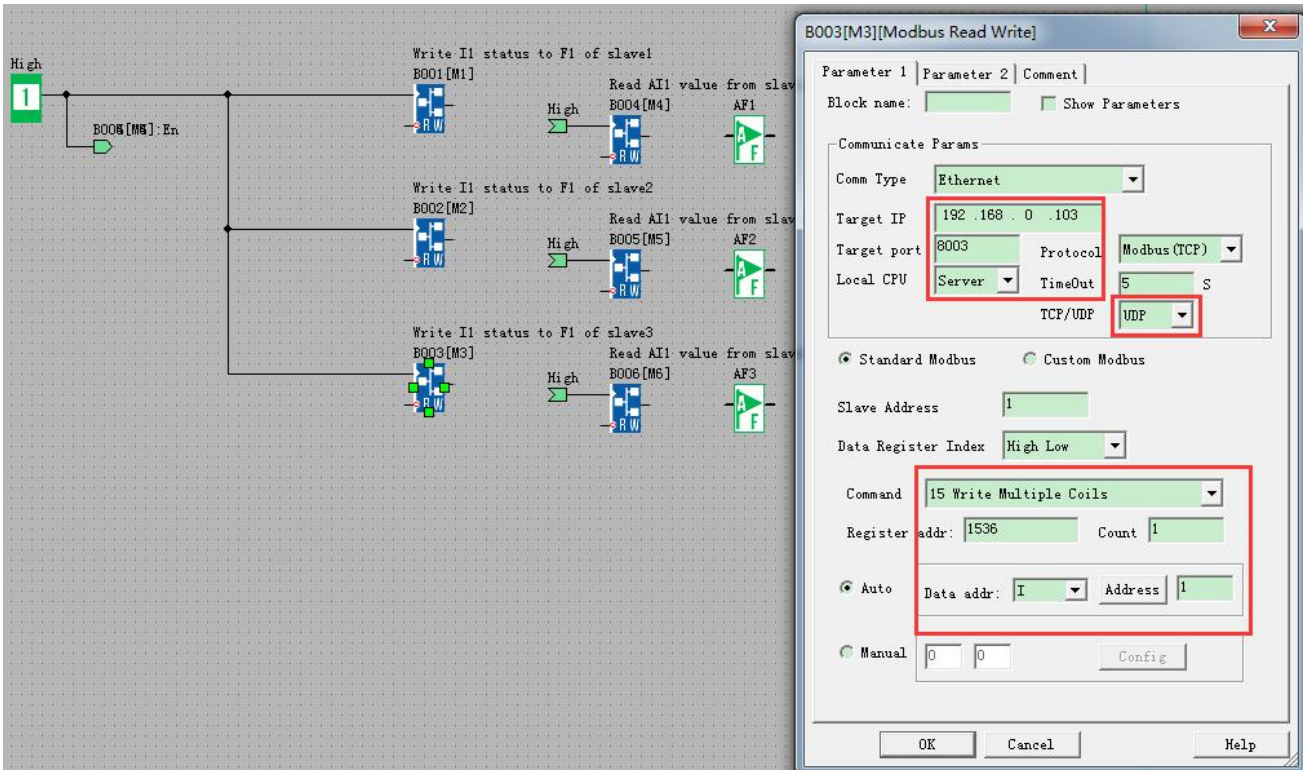
Master program



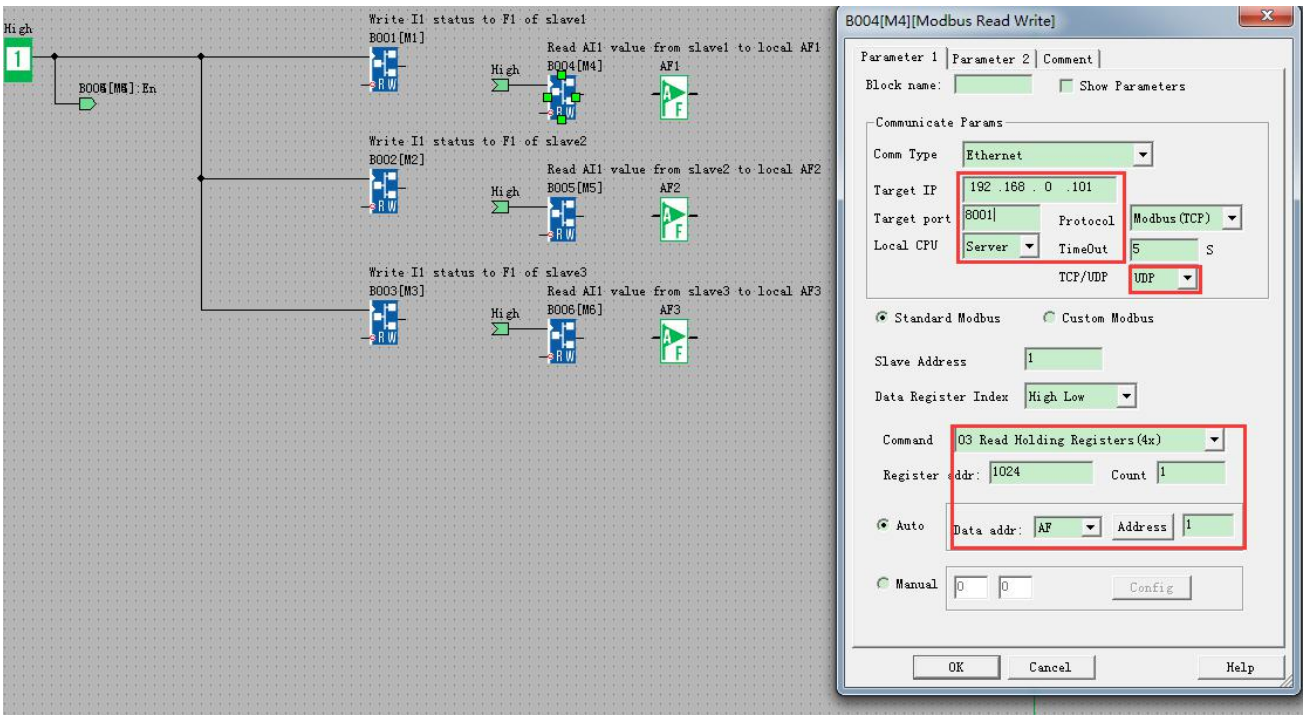
B001 is used to transfer the I1 status to the F1 of slave1(slave1 IP 192.168.0.101, UDP port is 8001)



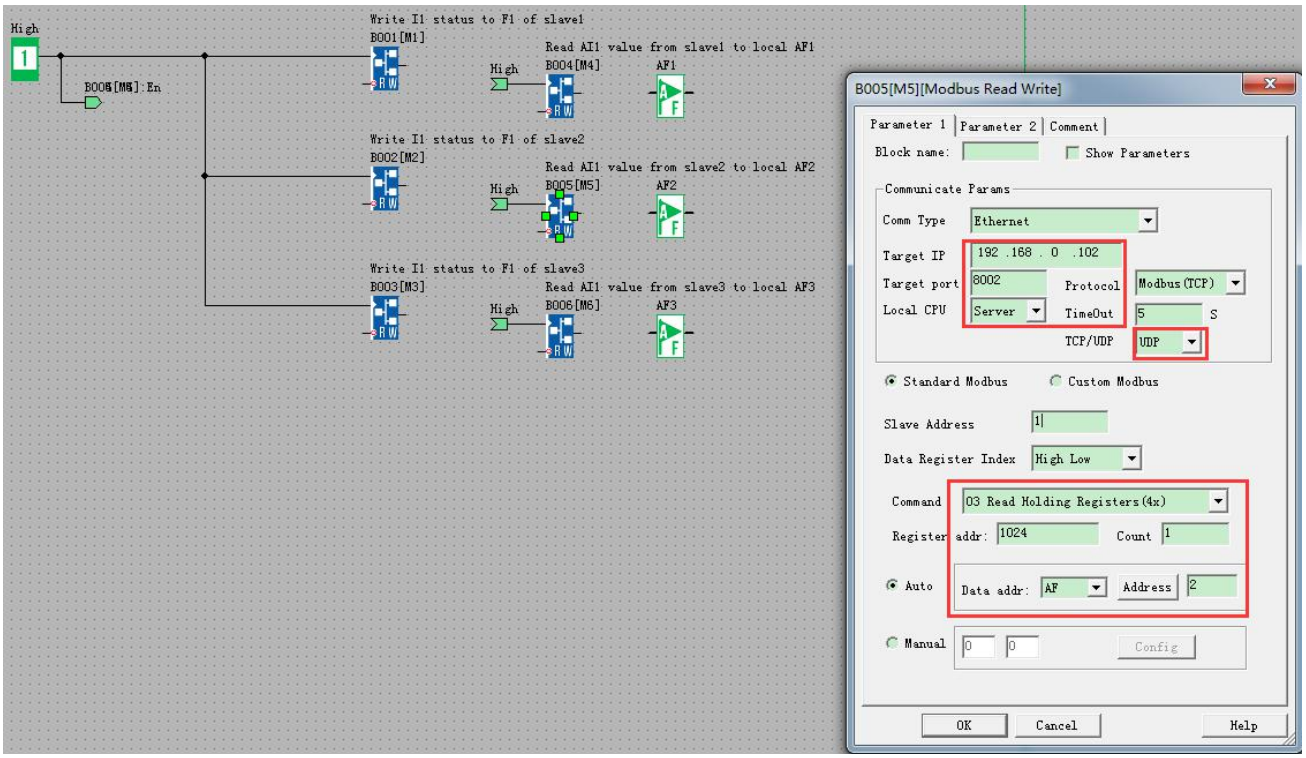
B002 is used to transfer the I1 status to the F1 of slave2(slave2 IP 192.168.0.102, UDP port is 8002)



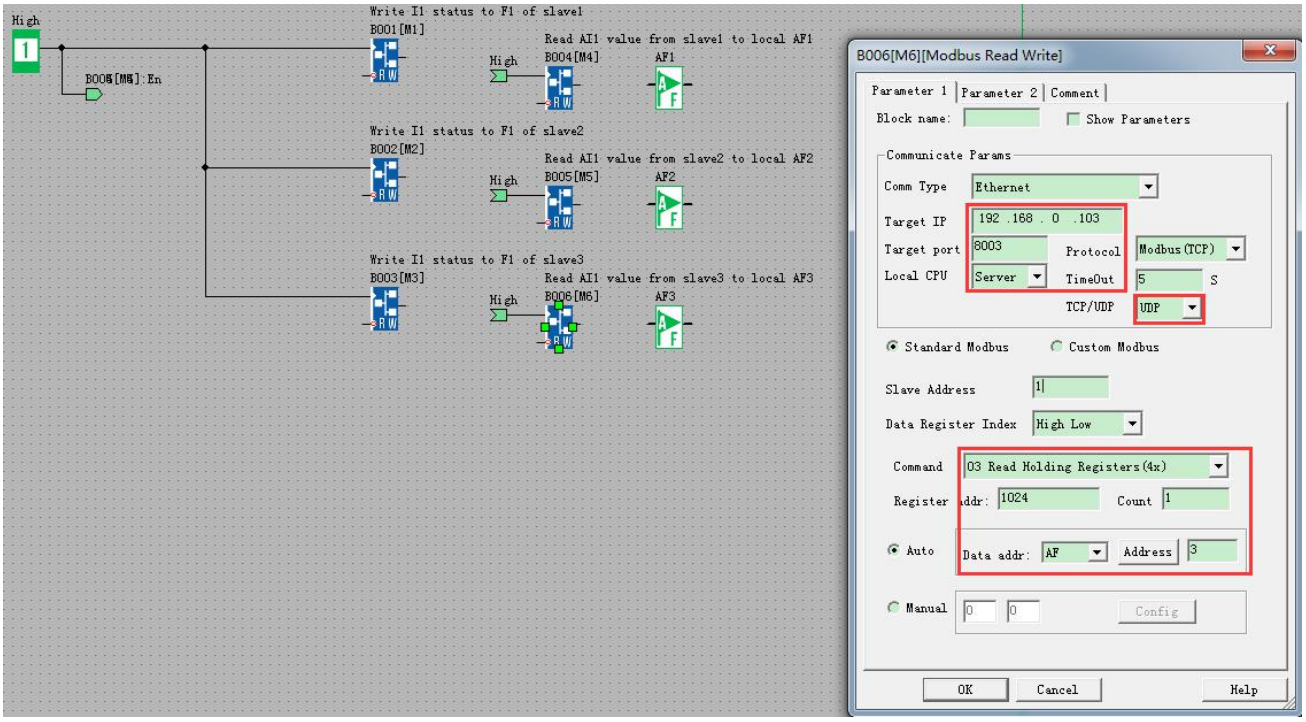
B003 is used to transfer the I1 status to the F1 of slave3(slave3 IP 192.168.0.103, UDP port is 8003)



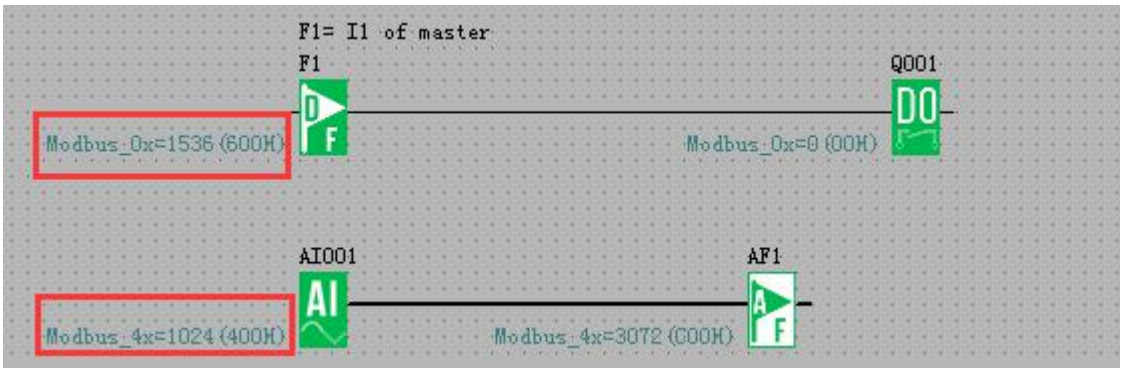
B004 is used to read the AI1 value from slave1, then save it into AF1 of master(slave1 IP 192.168.0.101, UDP port is 8001)



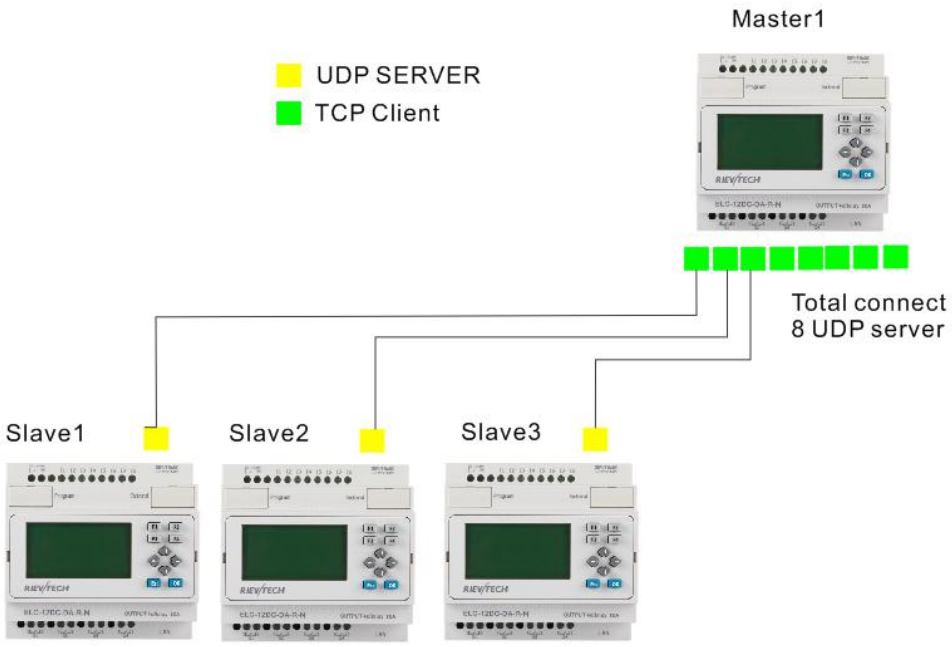
B005 is used to read the AI1 value from slave2, then save it into AF2 of master(slave1 IP 192.168.0.102, UDP port is 8002)



Slave1--Slave3 Program would be same.



1.6.4 Example4: One master CPU(UDP Client) connect with 3 slave CPUs(UDP Servers)



Requirement:

1.If I1 of Master is ON/OFF, the Q1 of slave1---slave3 are ON/OFF.

2.Read the AI2 value from the slave1--slave3 to master and display.

Step1: Configure the IP configuration of the PLCs.

Master

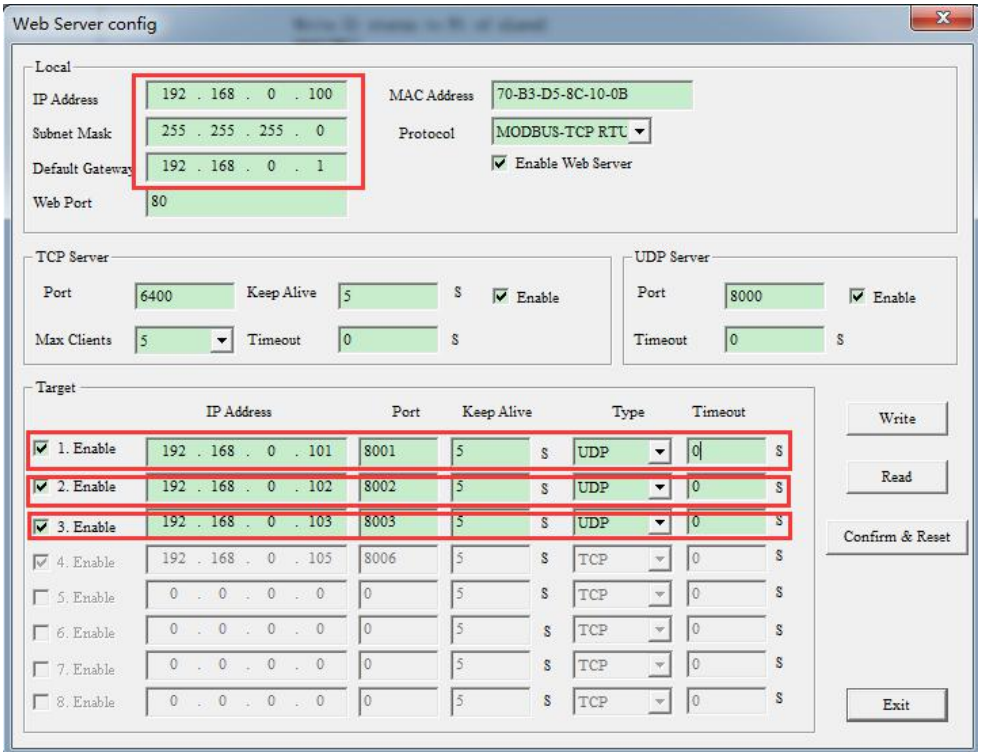
IP: 192.168.0.100

UDP Server port 8000

Target1 UDP 192.168.0.101, Port :8001

Target2 UDP 192.168.0.102, Port :8002

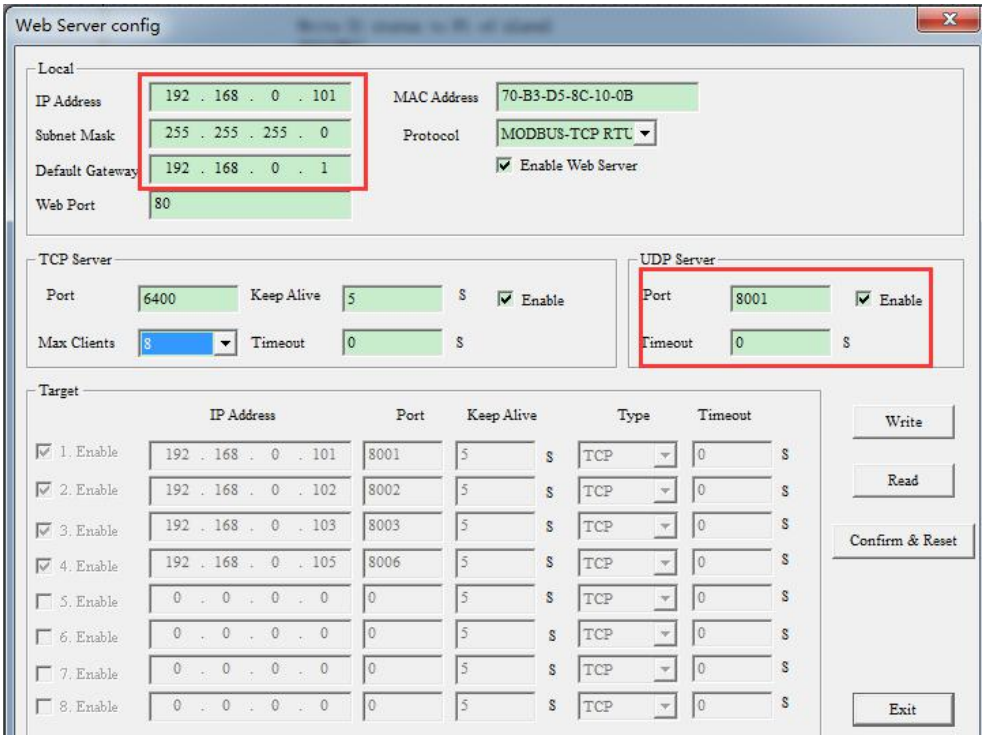
Target3 UDP 192.168.0.103, Port :8003



Slave1

IP: 192.168.0.101

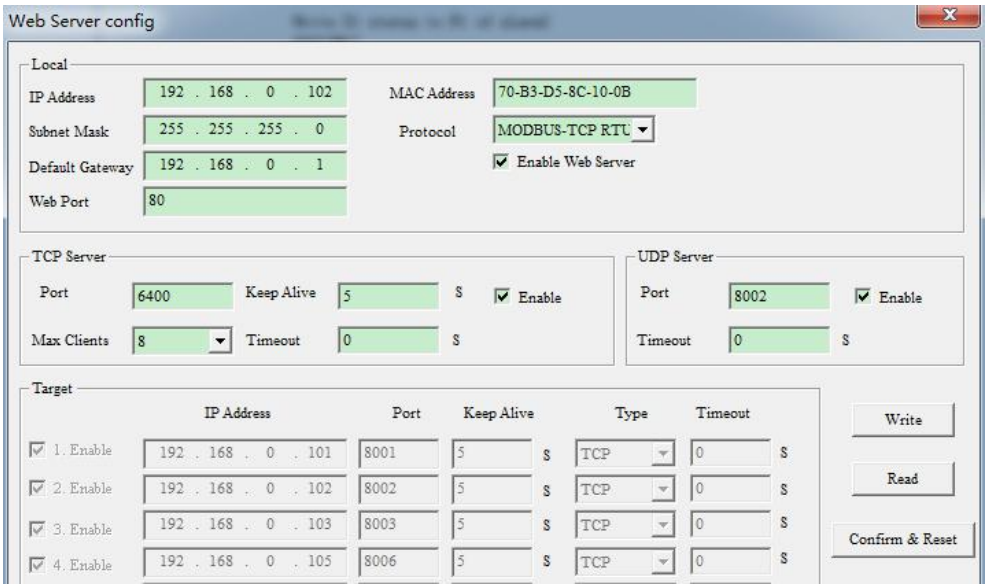
UDP Server port 8001



Slave2

IP: 192.168.0.102

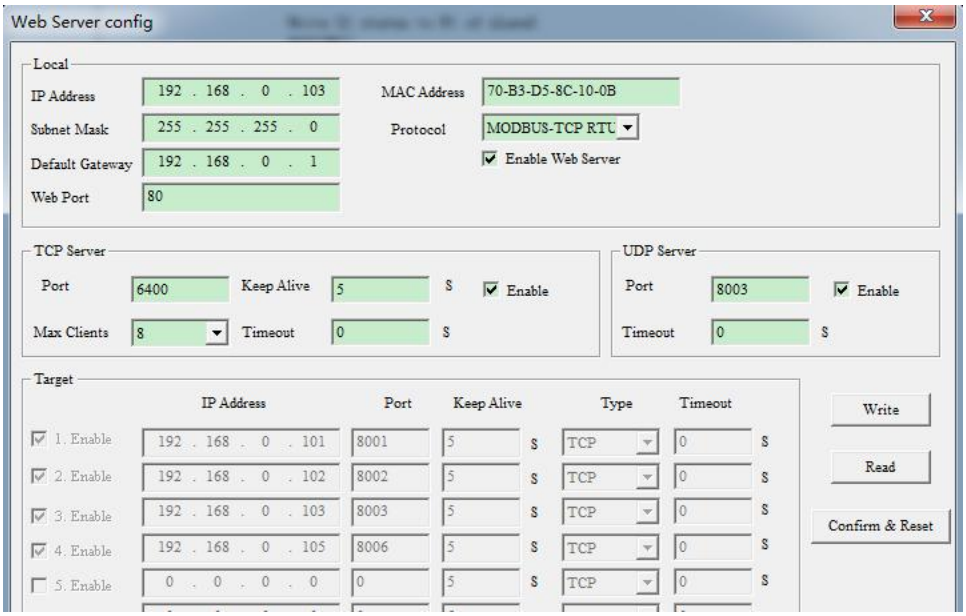
UDP Server port 8002



Slave3

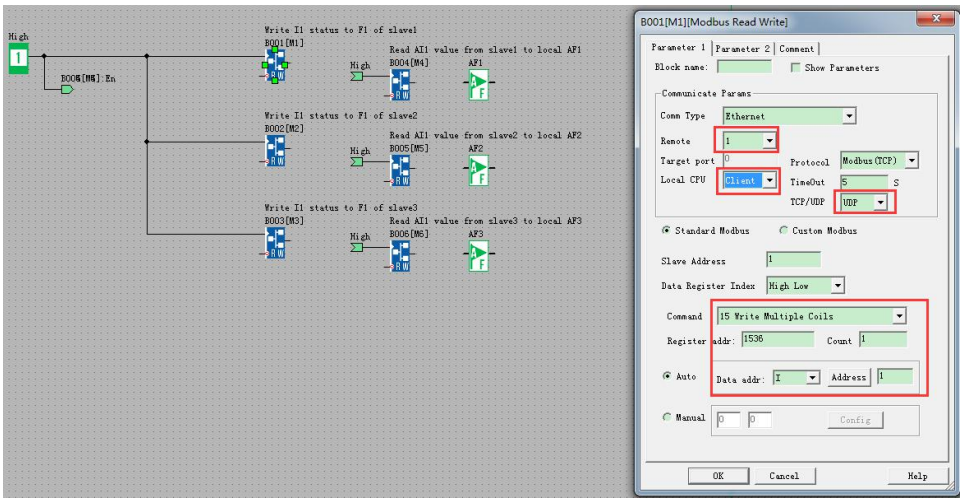
IP: 192.168.0.103

UDP Server port 8003



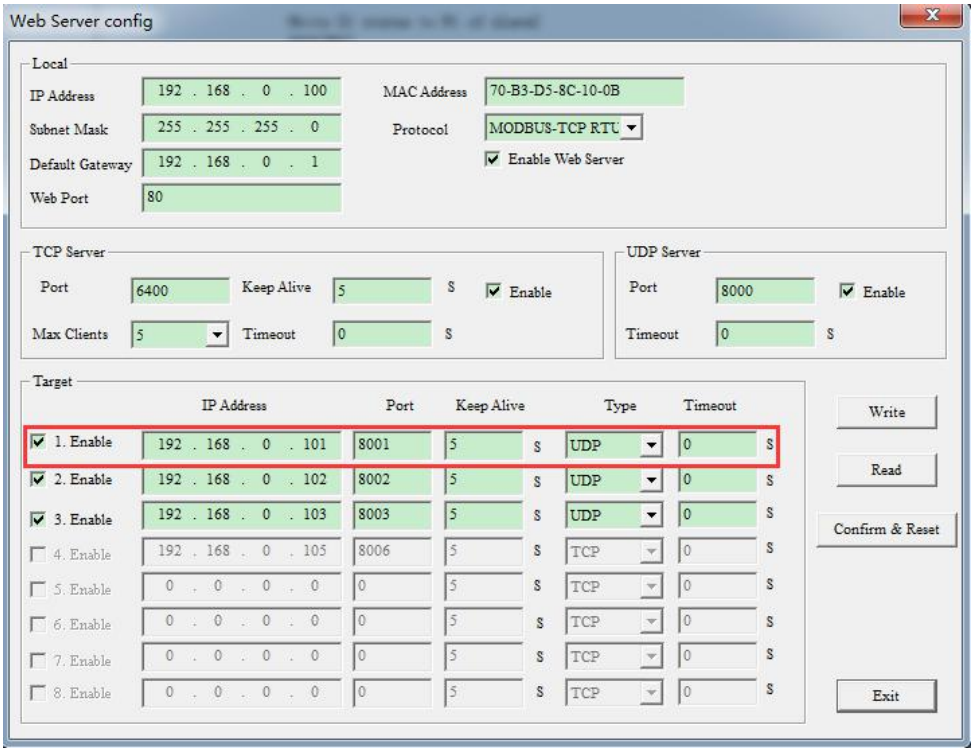
Step 2 Program in master and slave

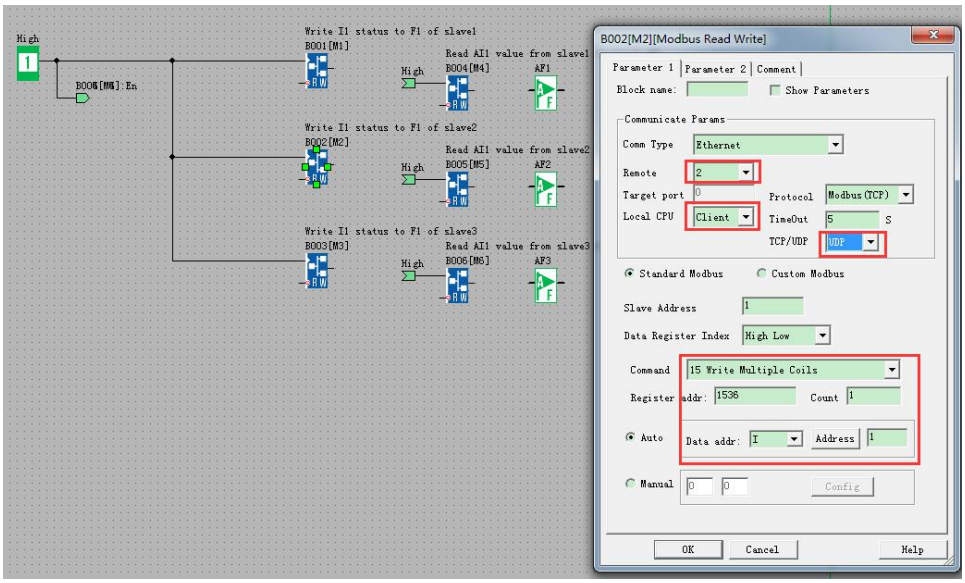
Master program



B001 is used to transfer I1 status to the F1 of slave1 by UDP connection.

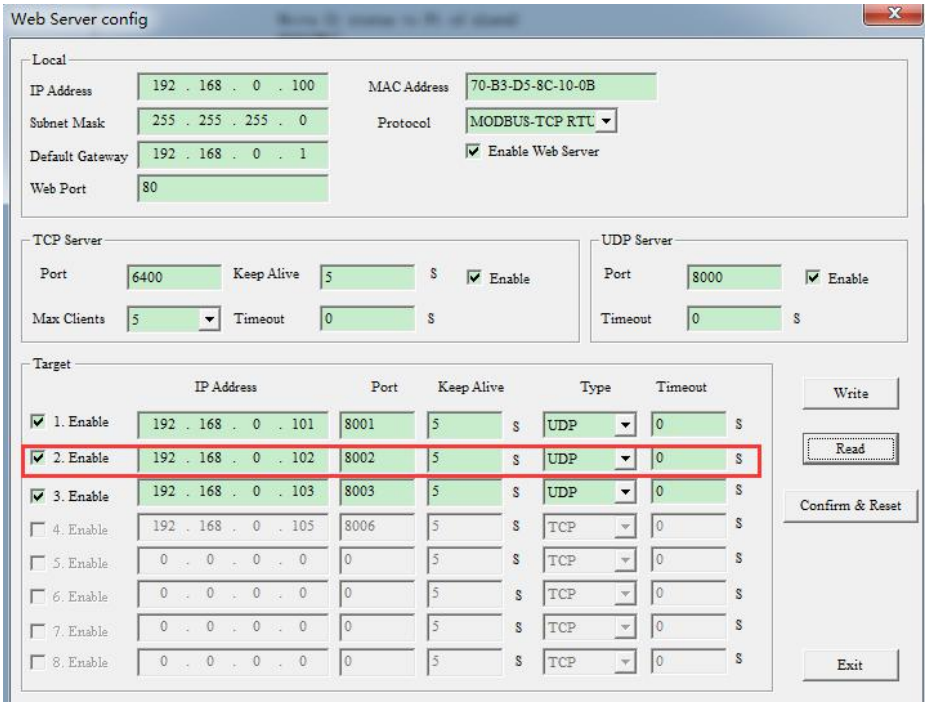
The Remote1 is the target UDP server setting in the network parameter:

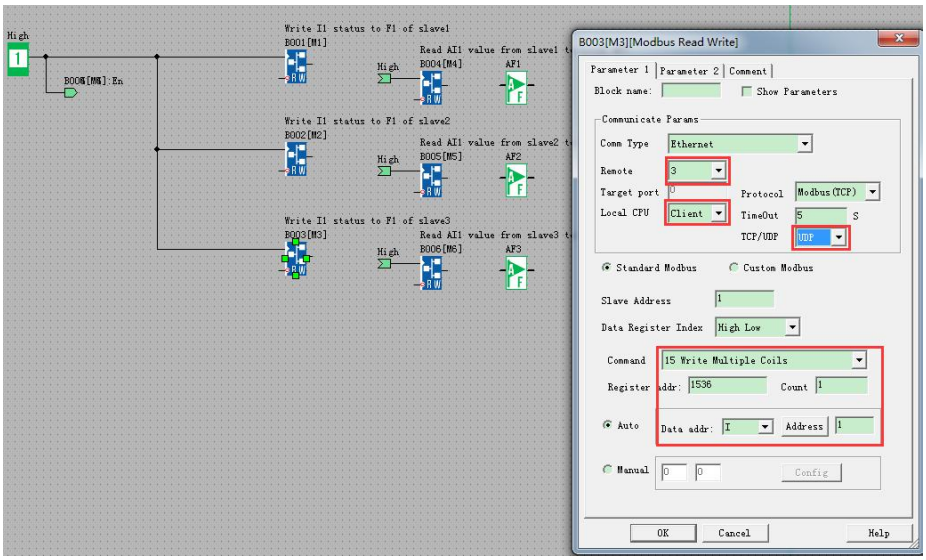




B002 is used to transfer I1 status to the F1 of slave2 by UDP connection.

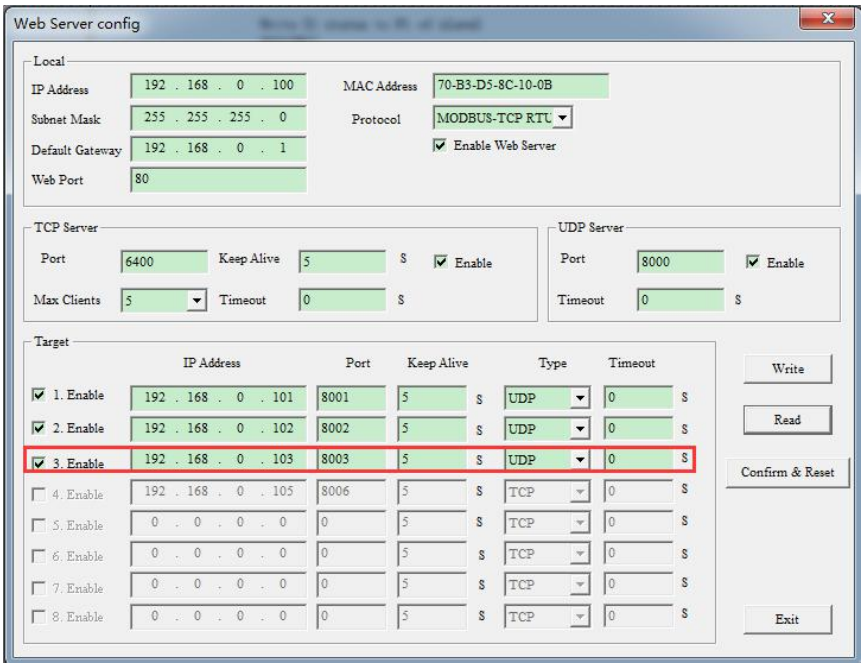
The Remote2 is the target UDP server setting in the network parameter:

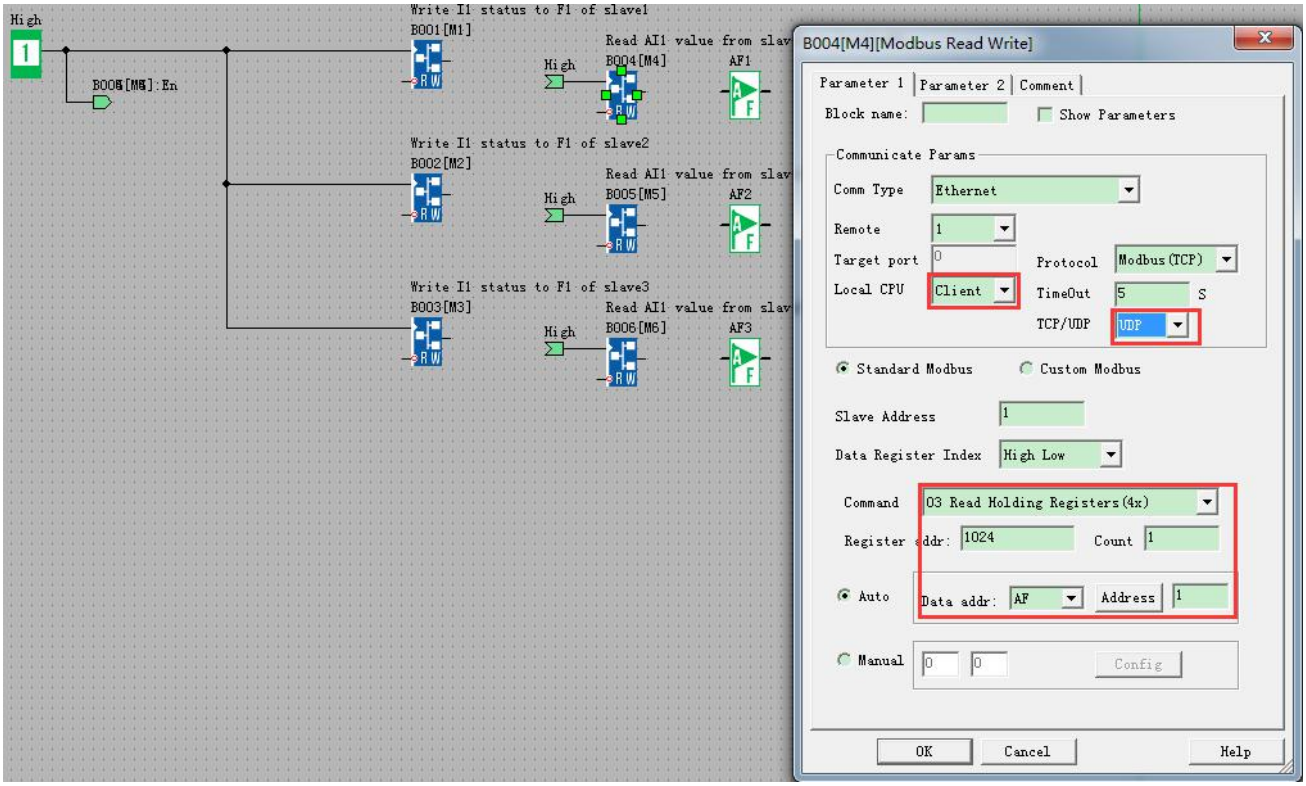




B003 is used to transfer I1 status to the F1 of slave3 by UDP connection.

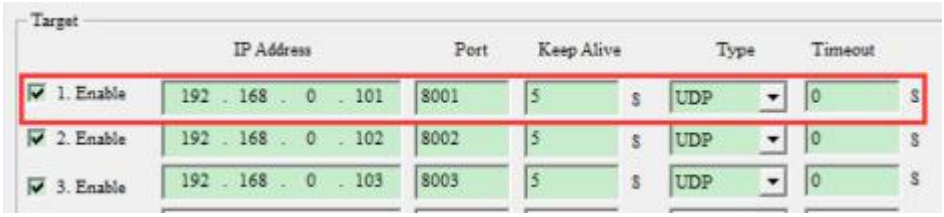
The Remote3 is the target UDP server setting in the network parameter:

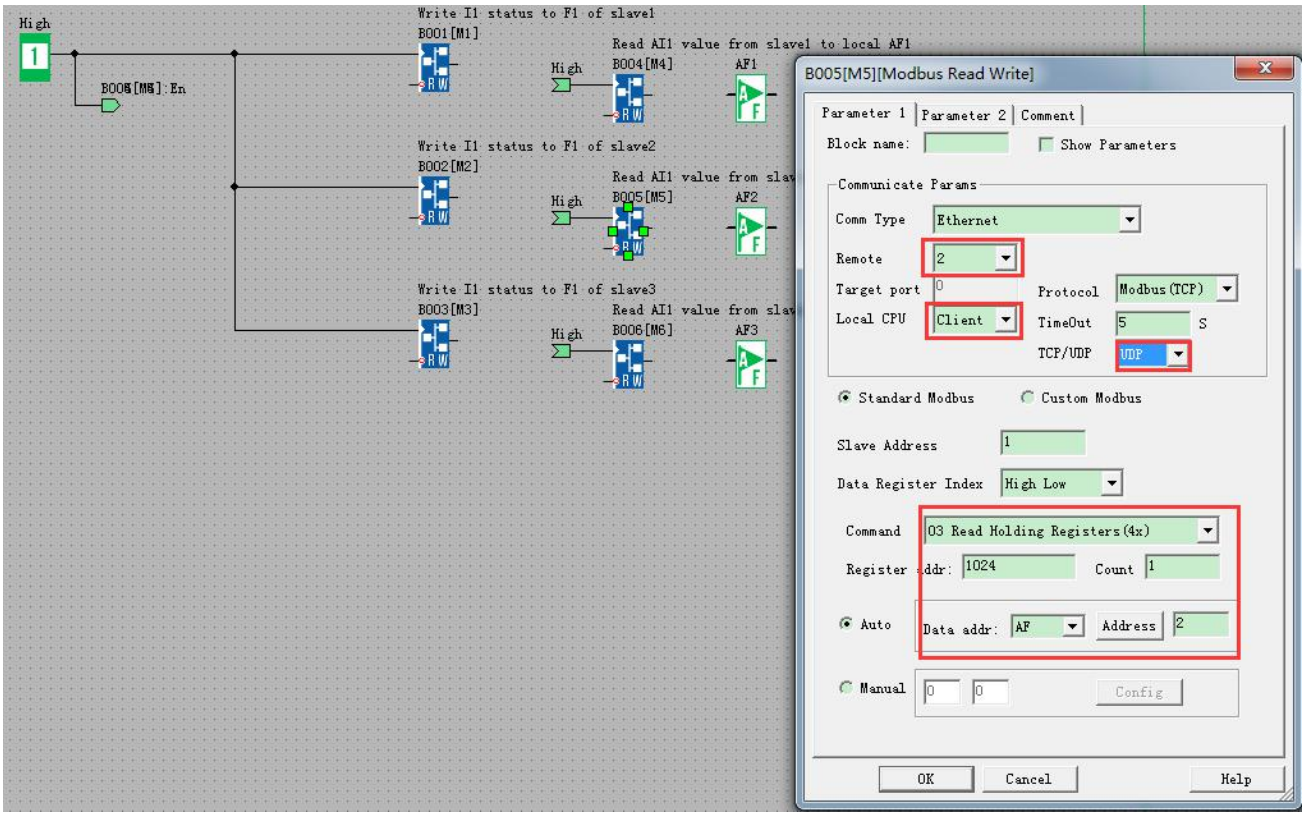




B004 is used to read AI1 value from slave1 and save the value into AF1 by UDP connection.

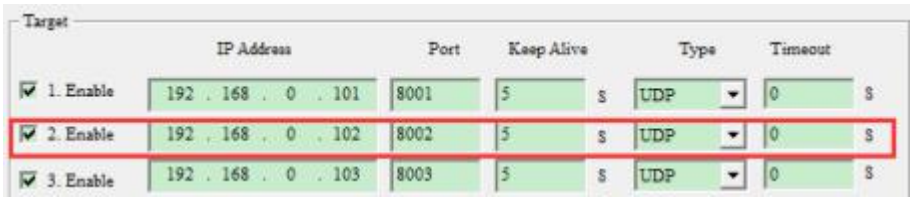
The Remote1 is the target UDP server setting in the network parameter:

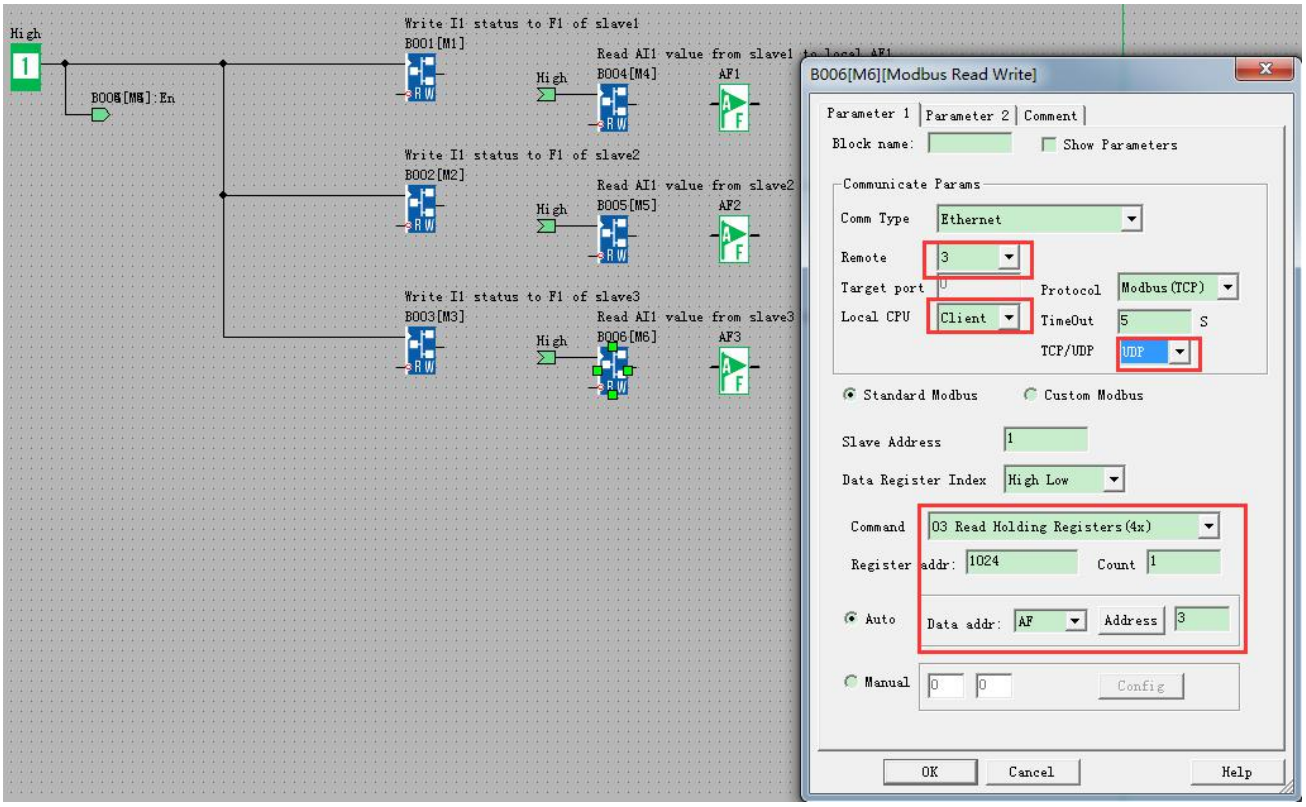




B005 is used to read AI1 value from slave2 and save the value into AF2 by UDP connection.

The Remote2 is the target UDP server setting in the network parameter:





B006 is used to read AI1 value from slave3 and save the value into AF3 by UDP connection.

The Remote3 is the target UDP server setting in the network parameter:

Slave1--Slave3 Program would be same.