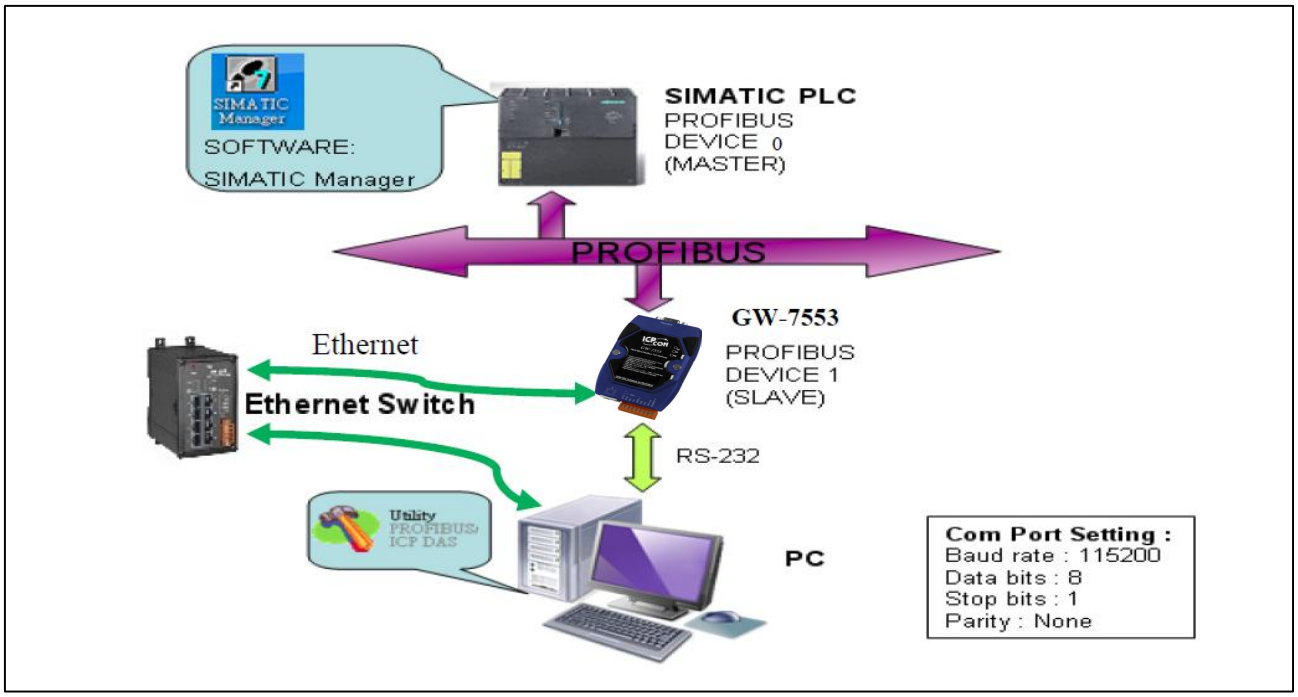
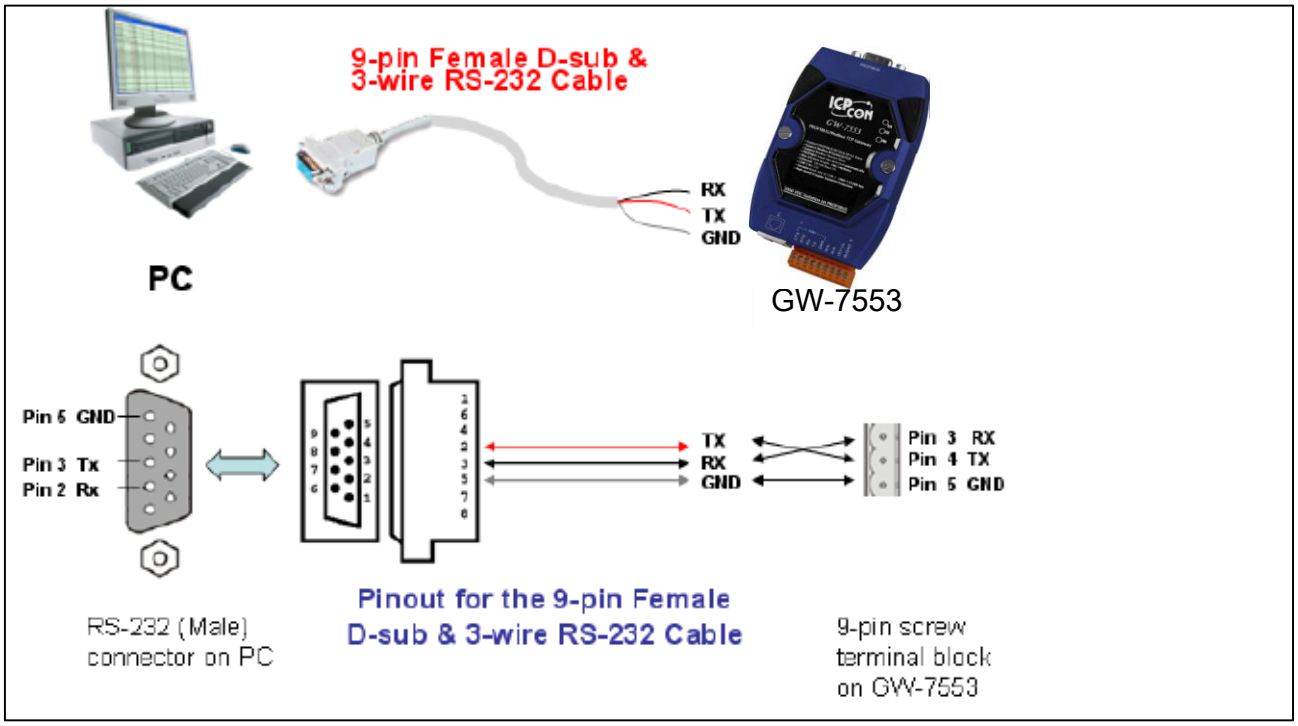
GW-7553 (Modbus TCP Slave)

example for SIMATIC STEP 7

System Architecture: GW-7553 is a PROFIBUS slave and Modbus slave device.



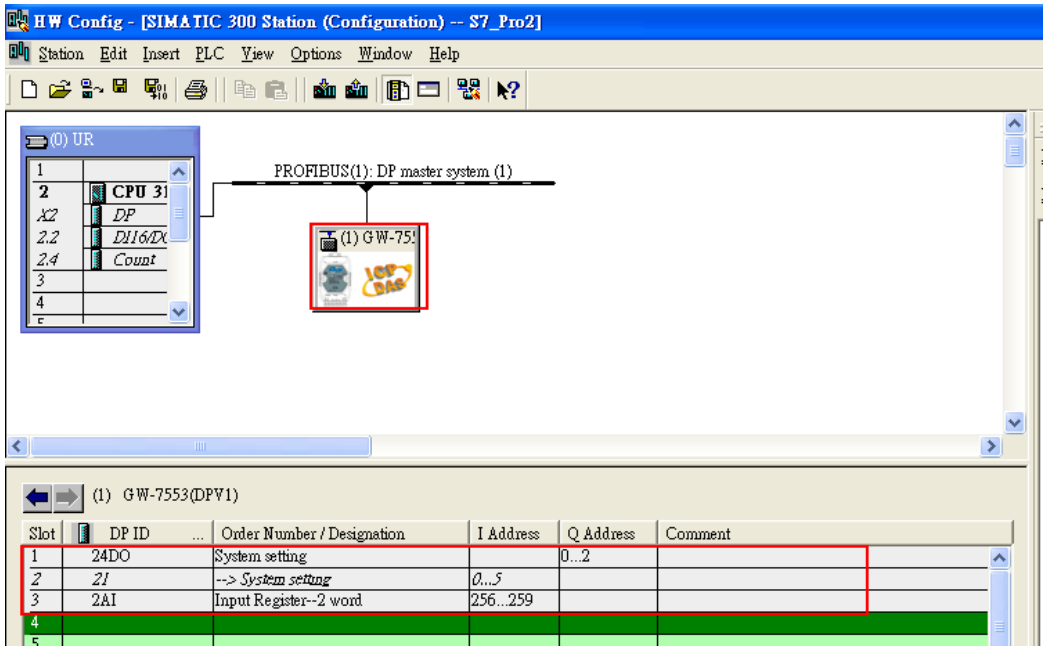


Directory

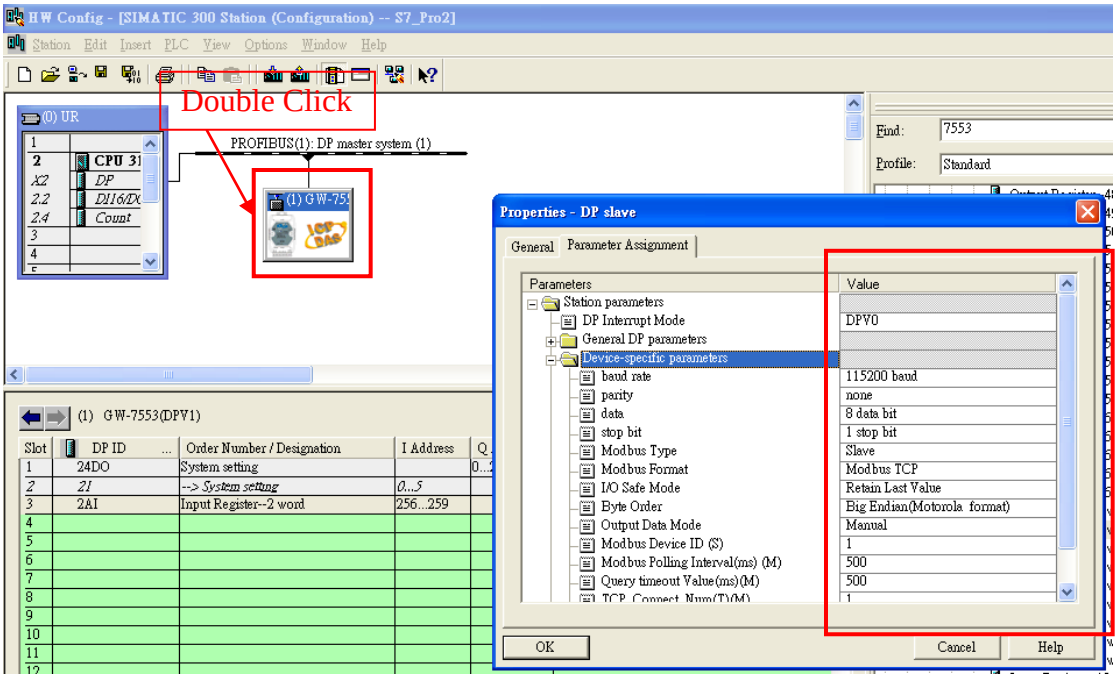
Example 1: PLC receives AO data from Modbus master.

SIMATIC STEP 7 Edit

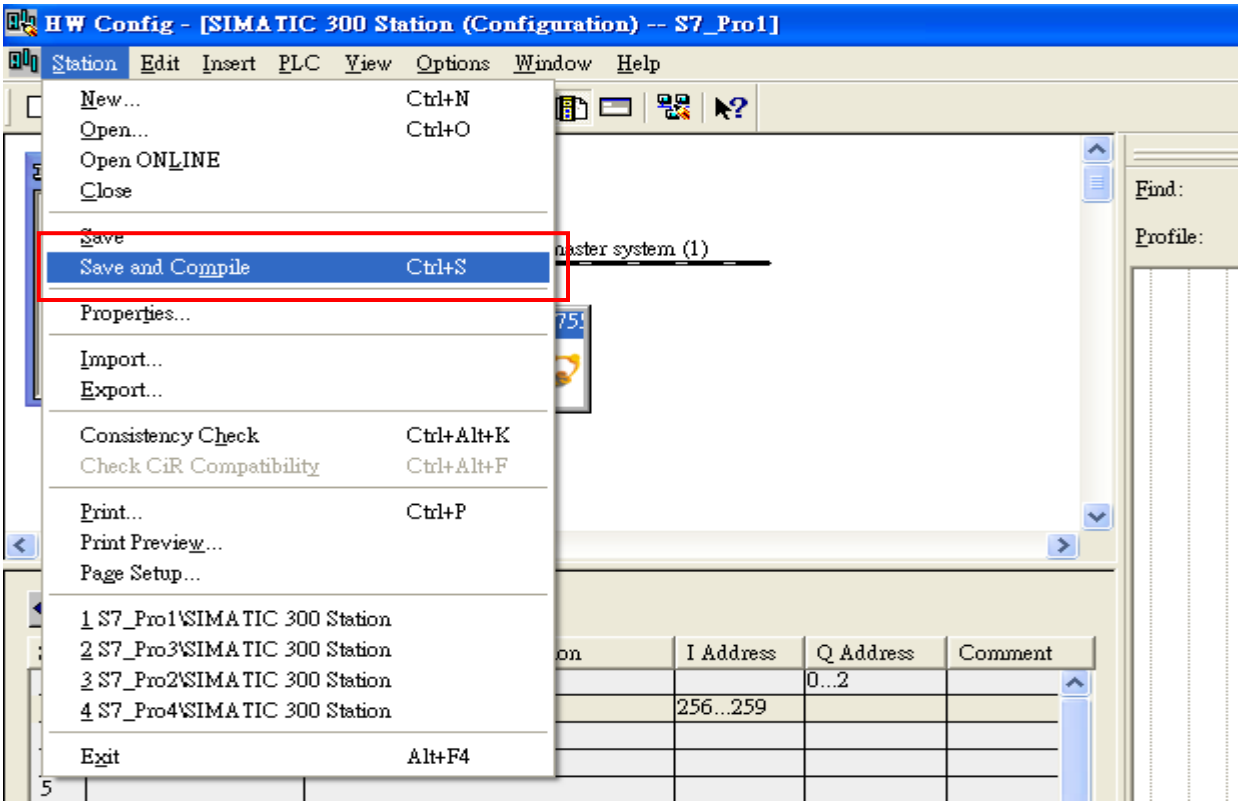
1. HW Config. – configure GW-7553 (ex: System setting module x1, Input Register—2 word module x1)



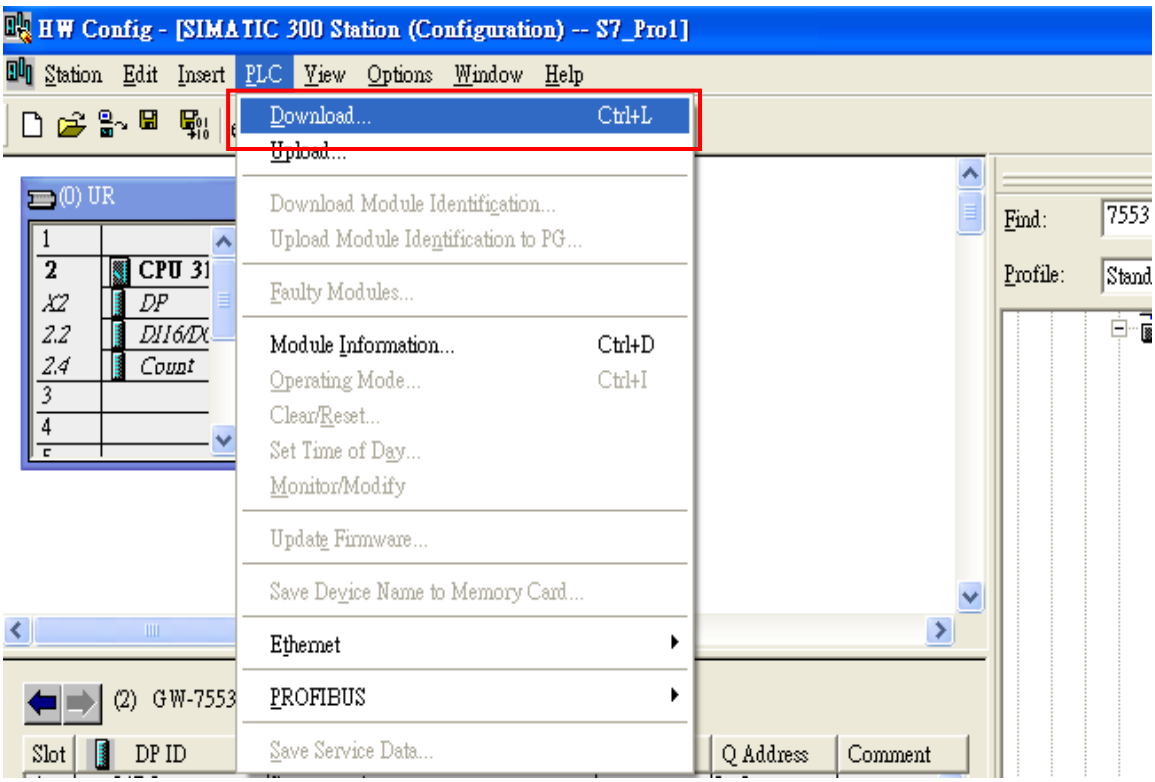
2. HW Config – Parameter assignment (ex: Com port settings, Modbus type: Slave, Modbus format: TCP, Byte Order: Big Endian). Confirm the GW-7553's Com Port setting is the same with MBTCP tool (ex: baud rate-115200, data bits-8, stop bits-1, parity-none). About the MBTCP tool, please refer to the "Communication test" in the below.



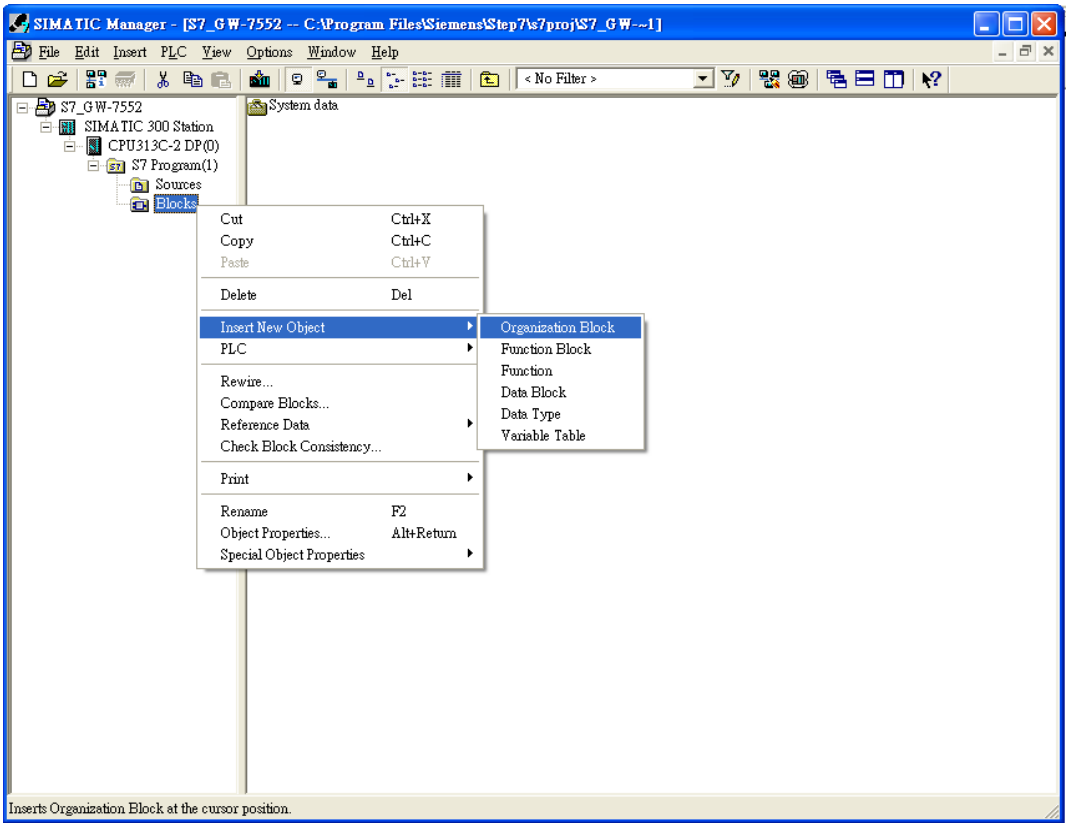
3. Save and Compile

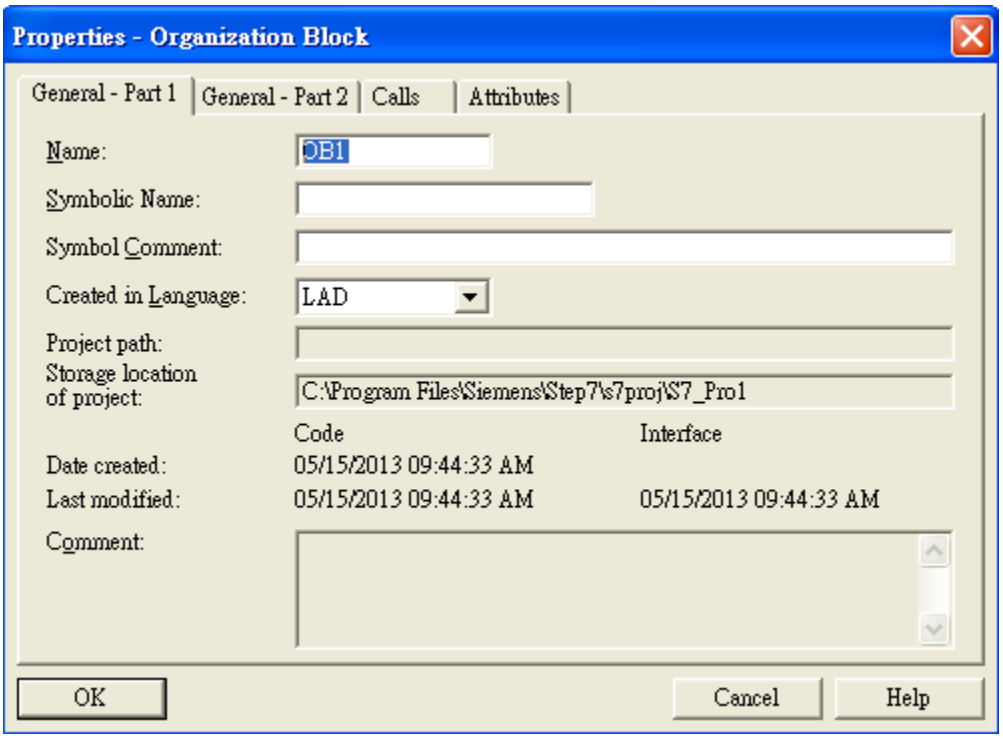


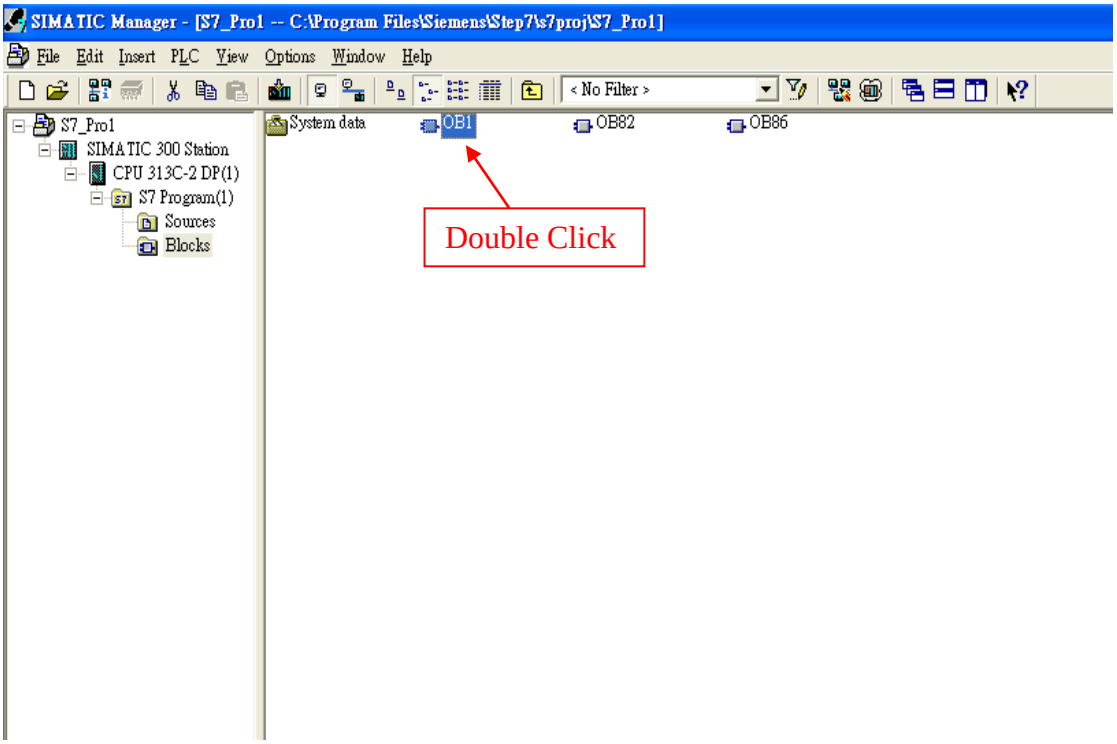
4. Download setting into STEP 7



5.Insert a new Organization Block (OB1,OB82,OB86)

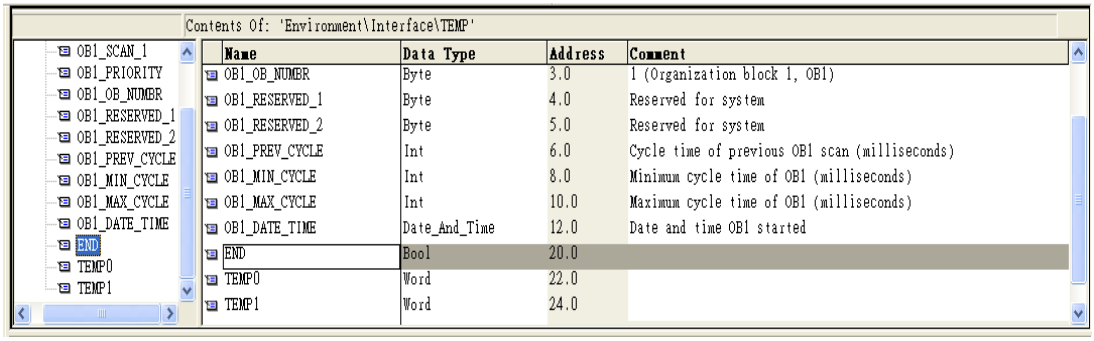


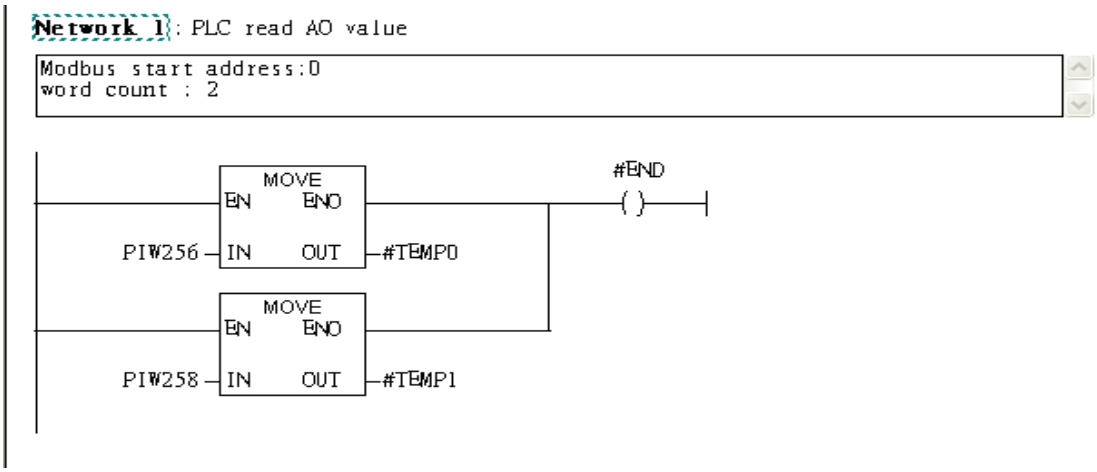




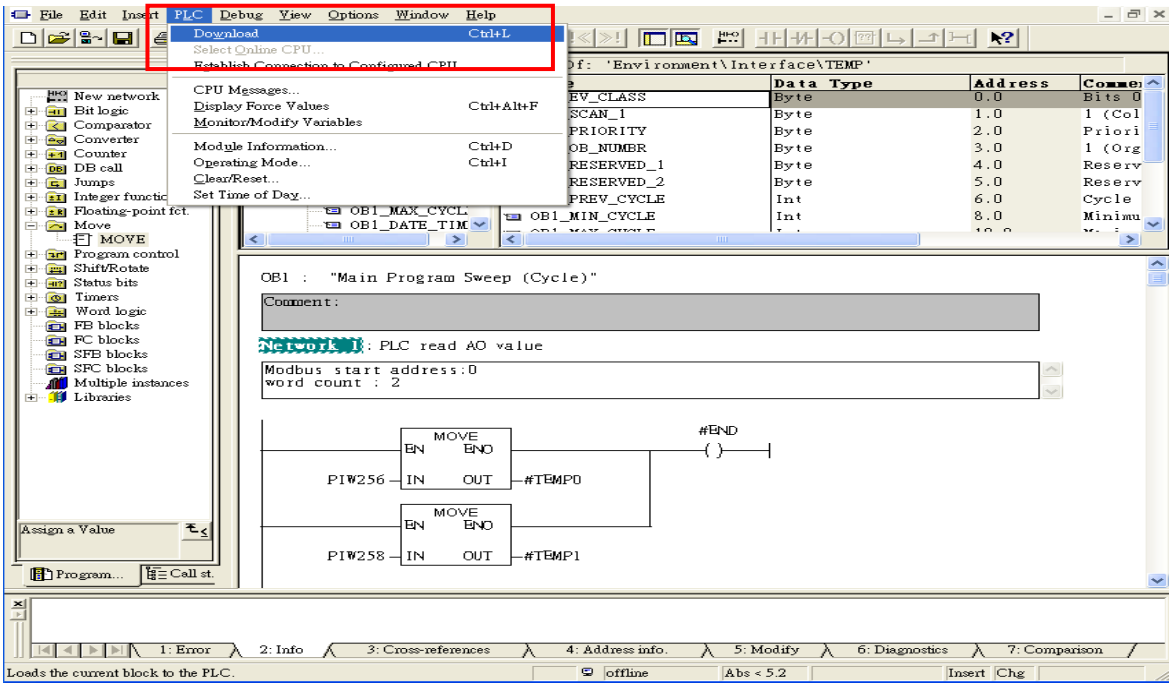
6.S7 program edit

Variables used in the example LD Program:





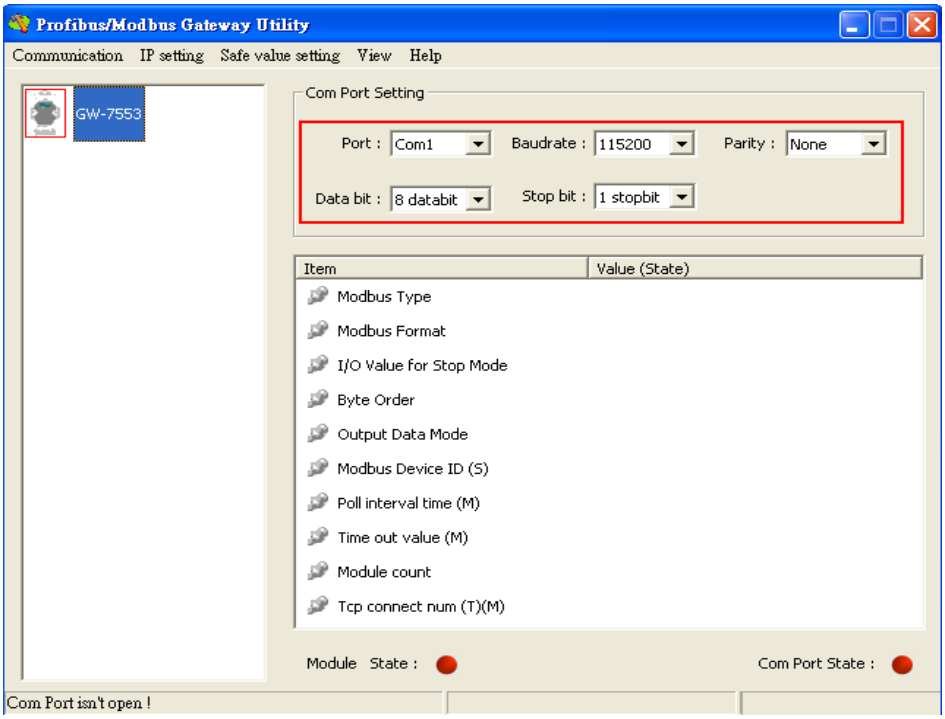
7. S7 program download



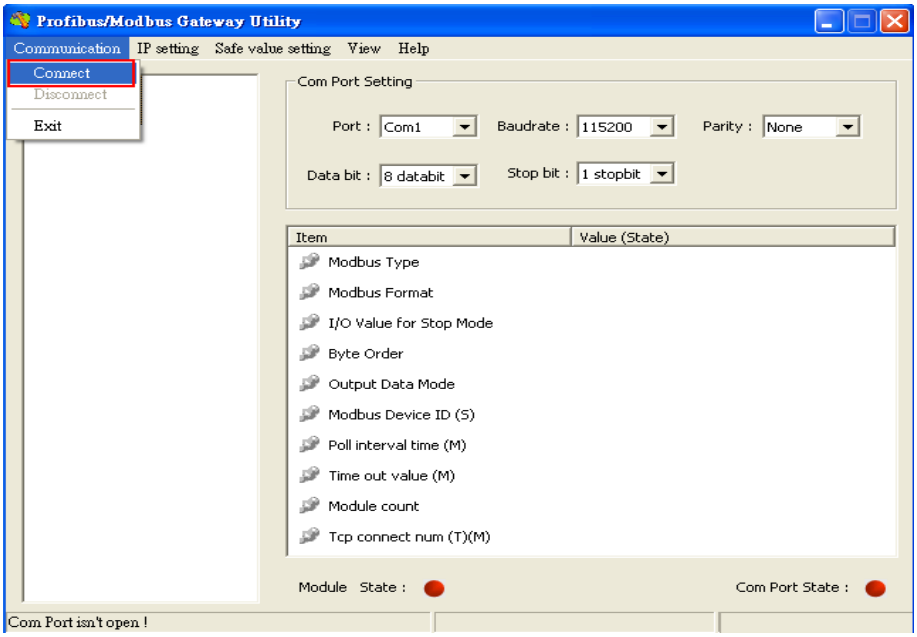
Setup IP of GW-7553 with Utility (the user can download the latest Utility at ftp://ftp.icpdas.com/pub/cd/fieldbus_cd/profibus/gateway/gw-7553/utilities/

1. Before the connection, please make sure the RUN LED of the GW-7553 is on and the switch of the GW-7553 is at setting mode.

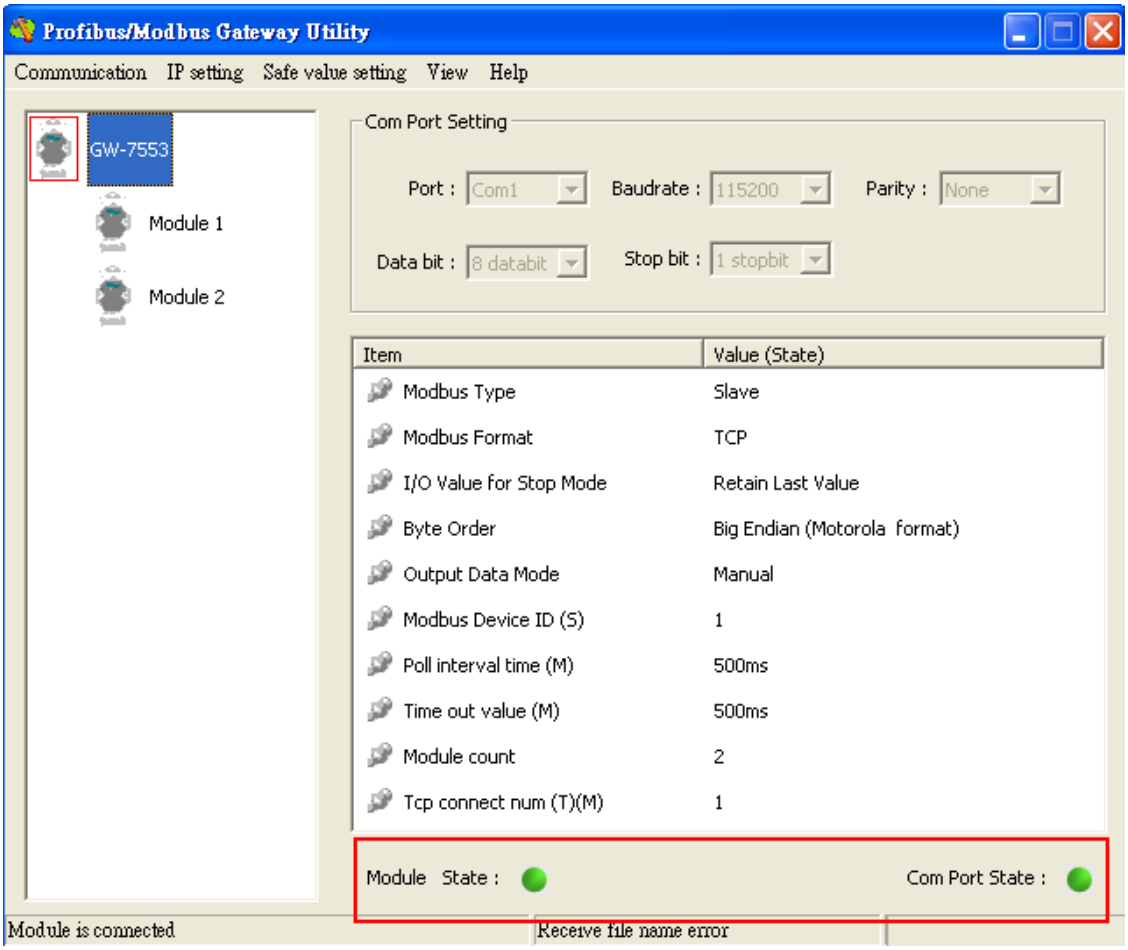
2. Set the Com Port Setting of the Utility



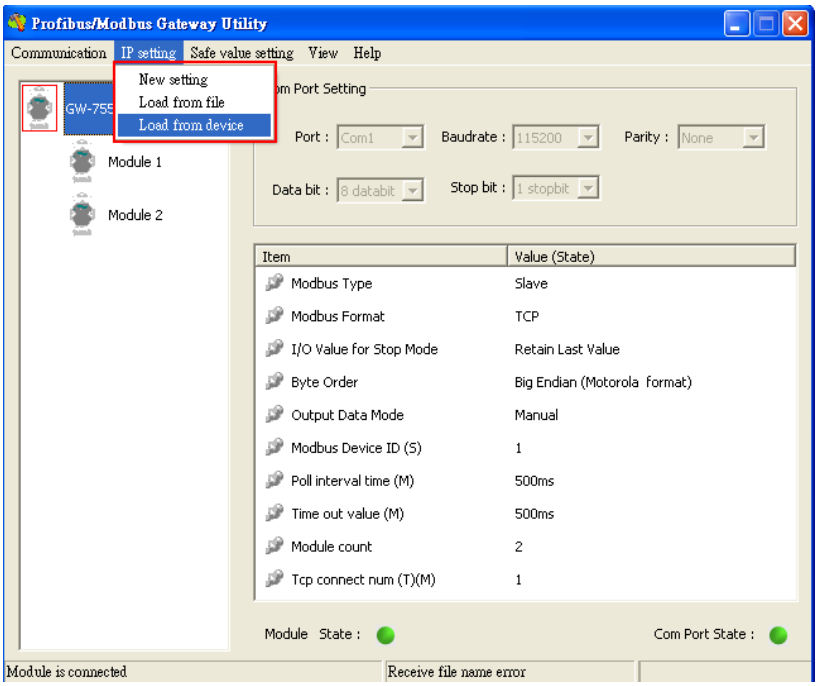
3.Click connect.



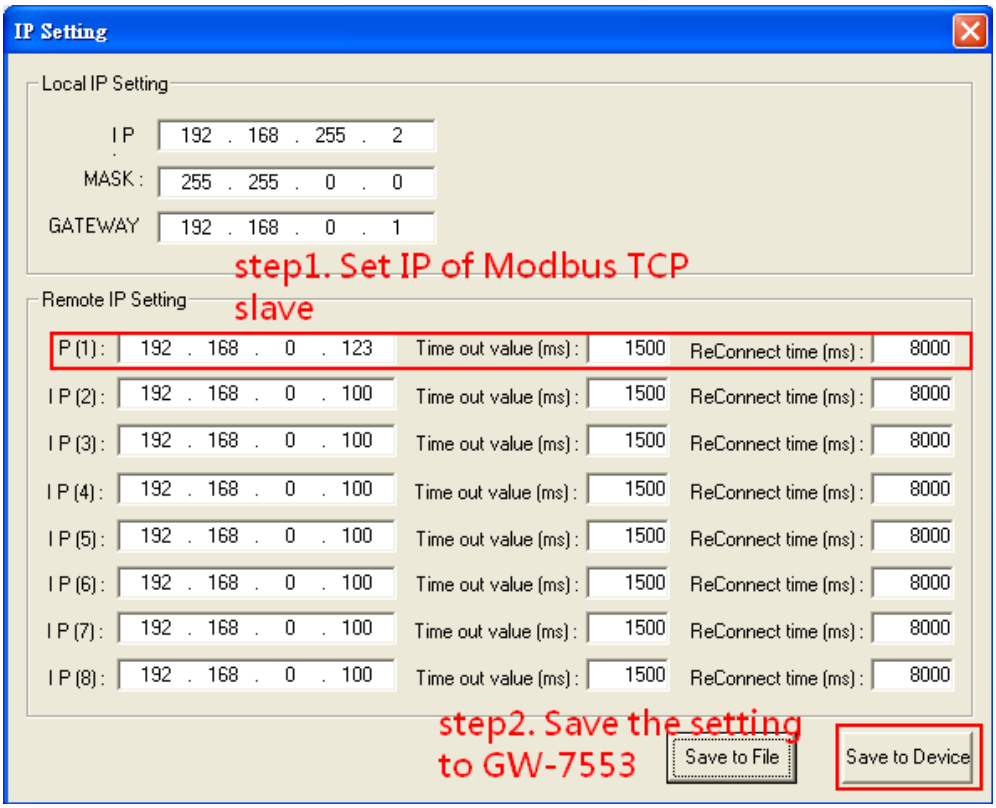
4. Connection success



5. Click IP setting→Load from device to show IP setting dialog



6. Set the IP of the Modbus TCP Slave and click “Save to Device” button to save the settings.



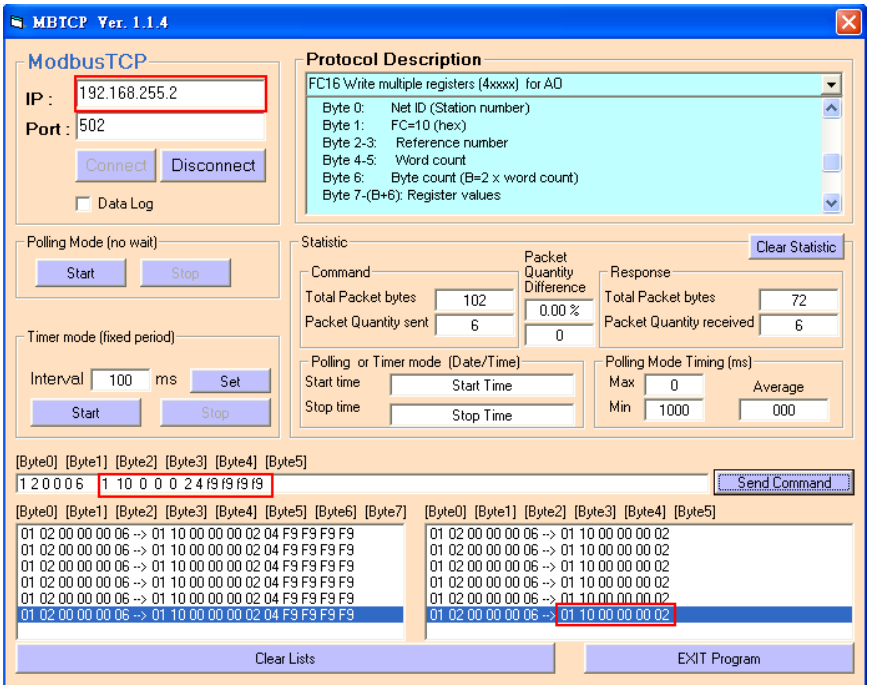
7.Set the switch of the GW-7553 to Normal Mode then reset the power of GW-7553.

Communication test

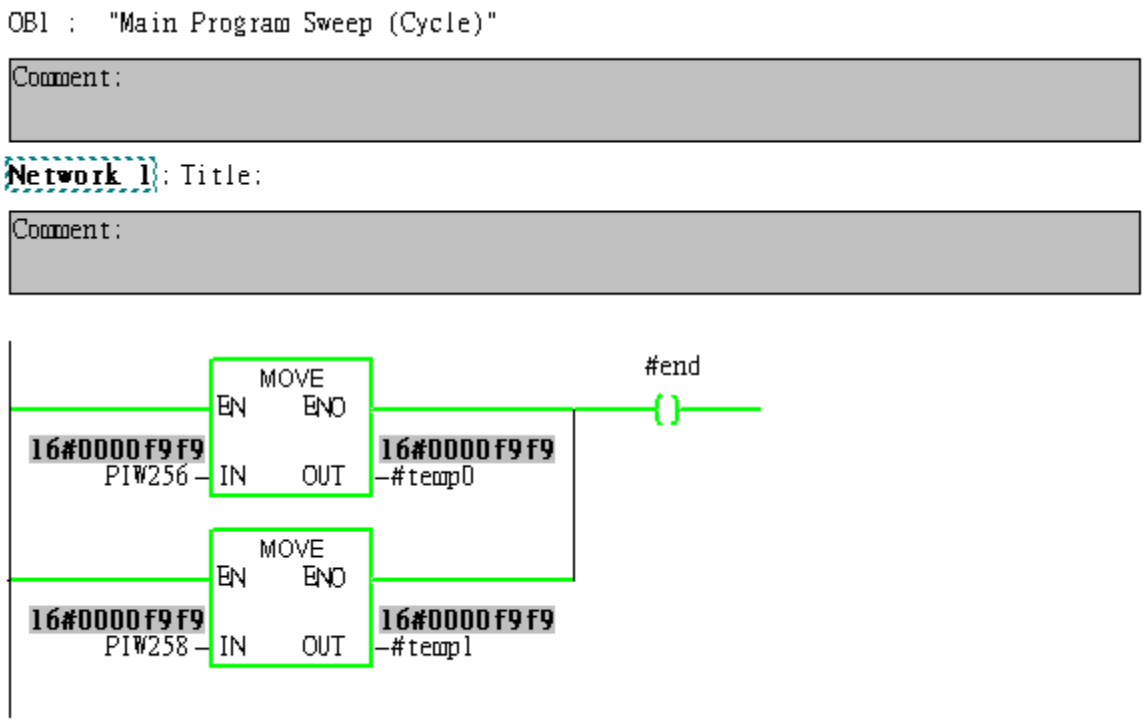
1. Confirm the GW-7553's Com Port setting is the same with Modbus Master tool (ex: MBTCP, you can download MBTCP from http://ftp.icpdas.com.tw/pub/cd/8000cd/napdos/modbus/modbus_utility/)

2. Send command 01 10 00 00 00 02 04 F9 F9 F9 F9 write two byte AO

3. Response value 01 10 00 00 00 02



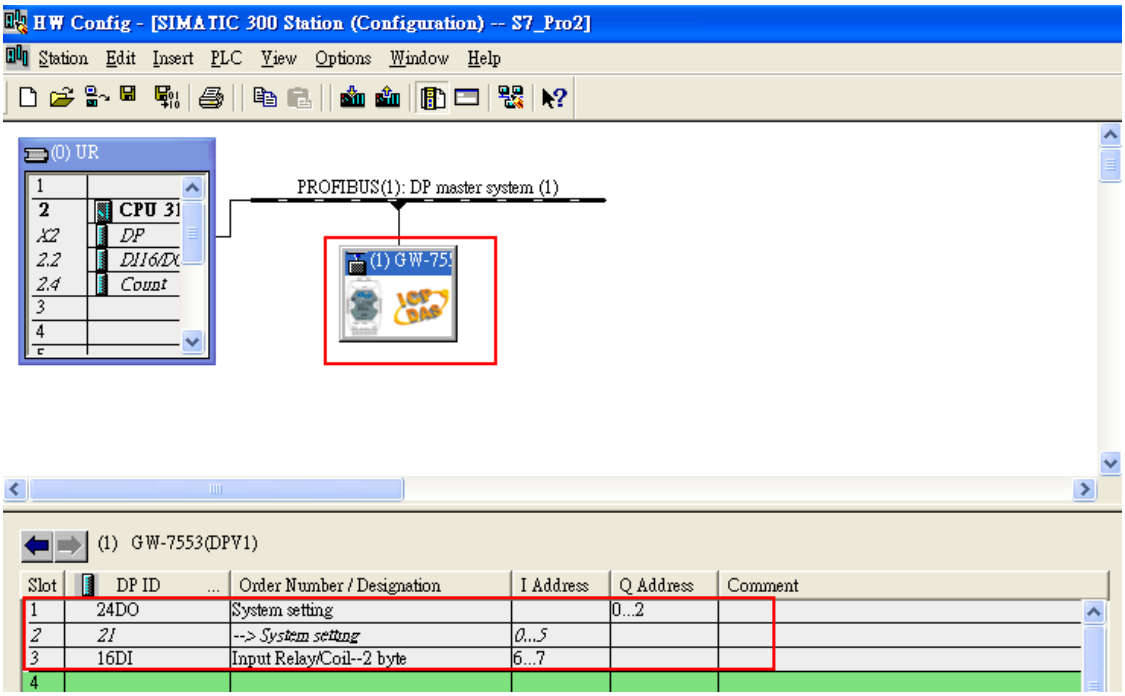
4. PLC will receives the "AO Value (0xF9, 0xF9, 0xF9, 0xF9)" at PLC address PIW256, PIW257, PIW258, PIW259



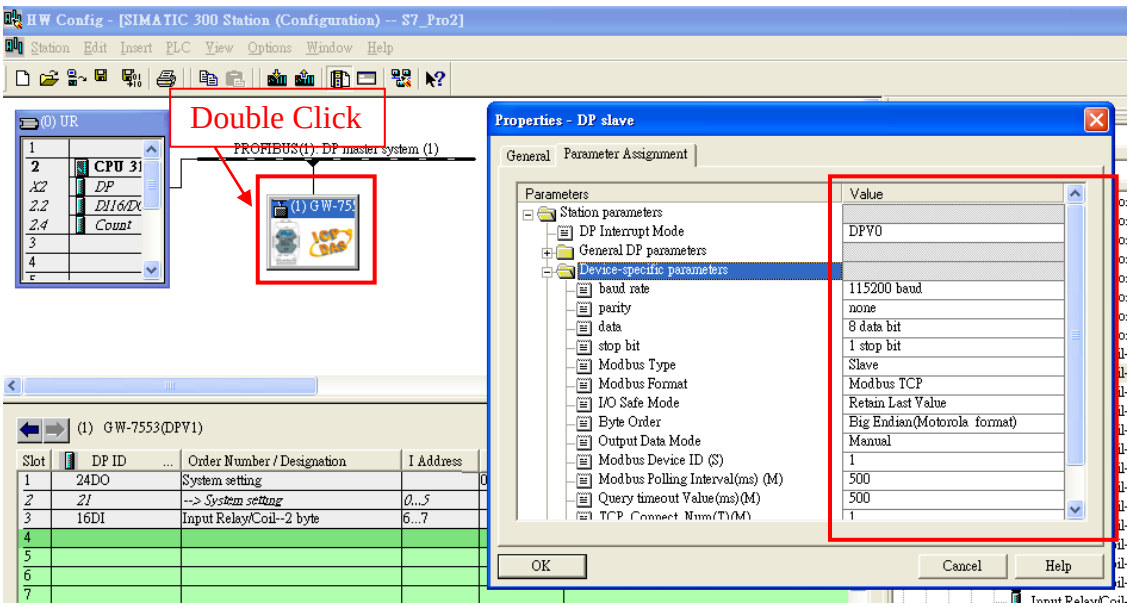
Example 2: PLC receives DO data from Modbus master.

SIMATIC STEP 7 Edit

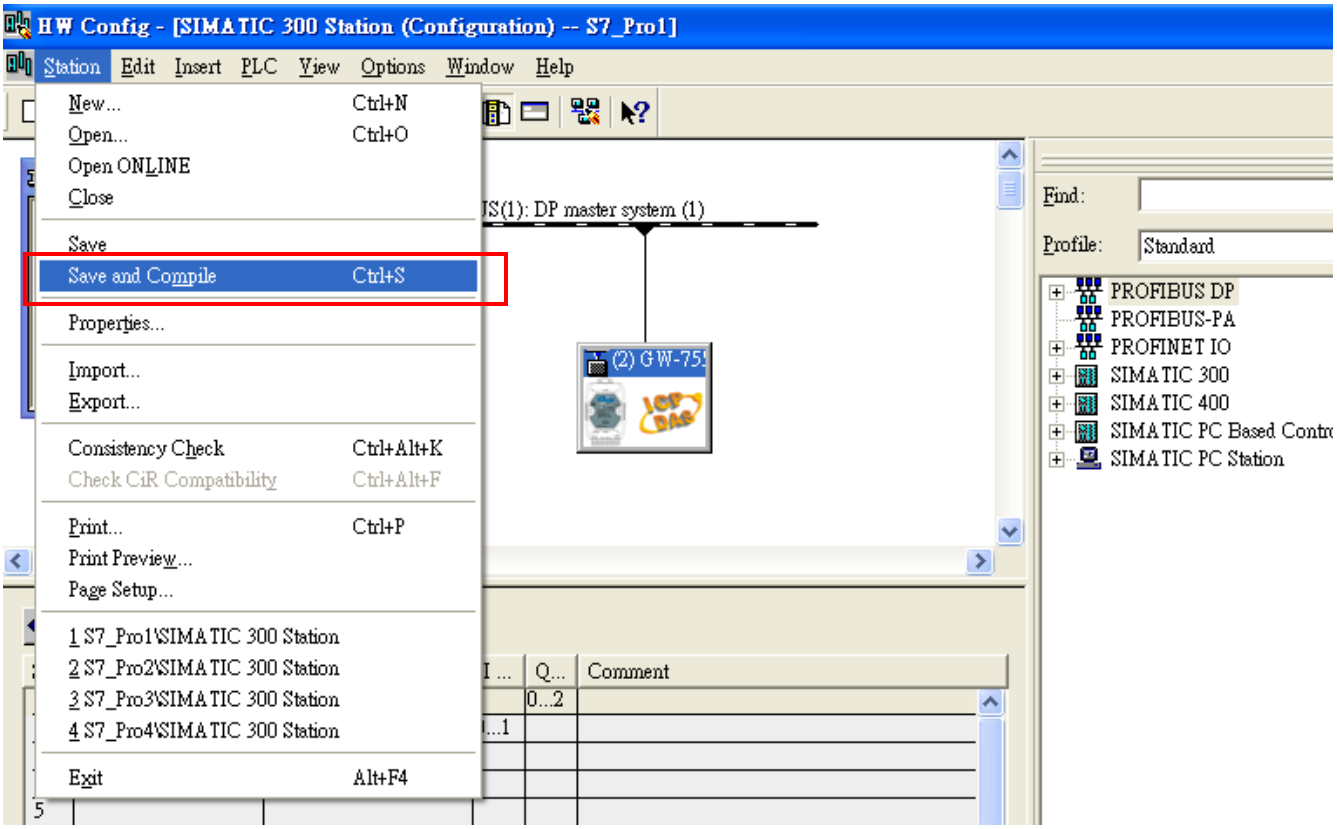
1. HW Config. – configure GW-7553 (ex: System setting module x1, Input Relay/Coil – 2 byte module x1)



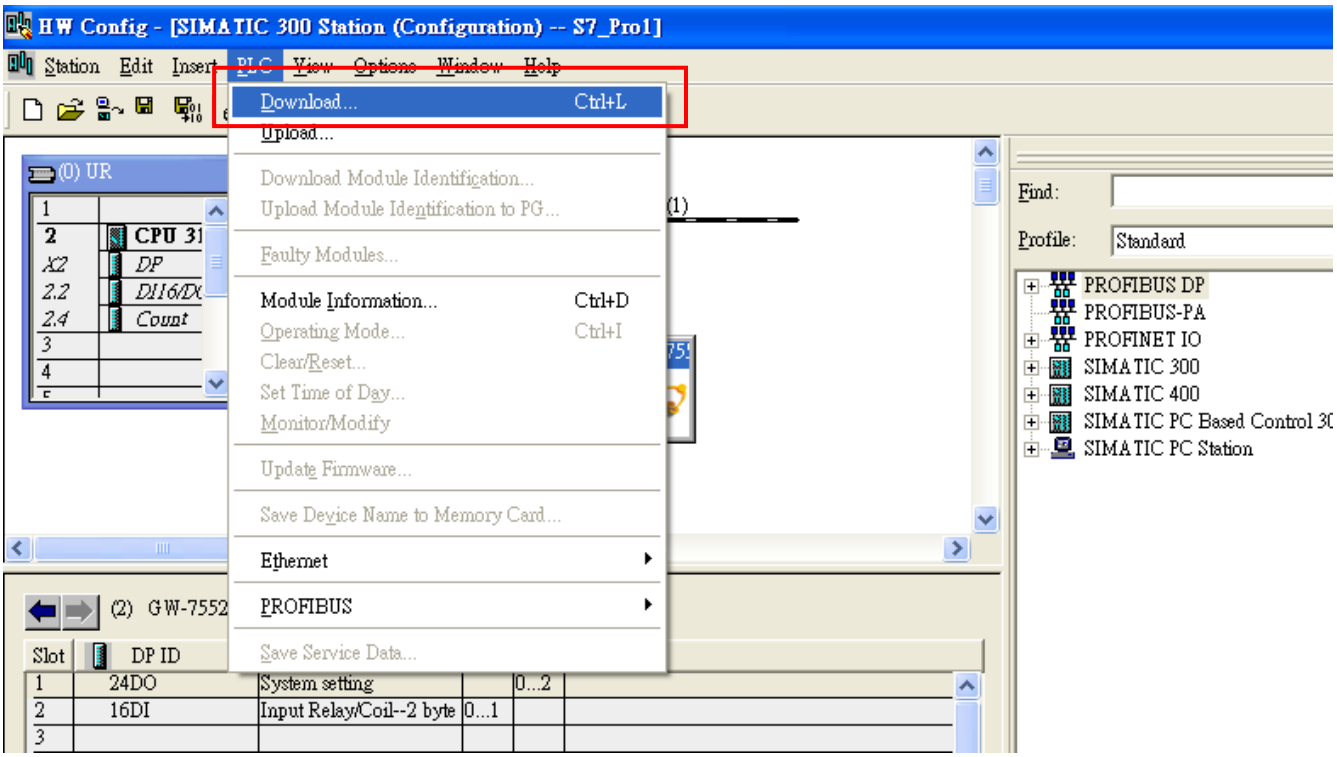
2. HW Config – Parameter assignment (ex: Com port settings, Modbus type: Slave, Modbus format: TCP, Byte Order: Big Endian). Confirm the GW-7553's Com Port setting is the same with MBTCP tool (ex: baud rate-115200, data bits-8, stop bits-1, parity-none). About the MBTCP tool, please refer to the "Communication test" in the below.



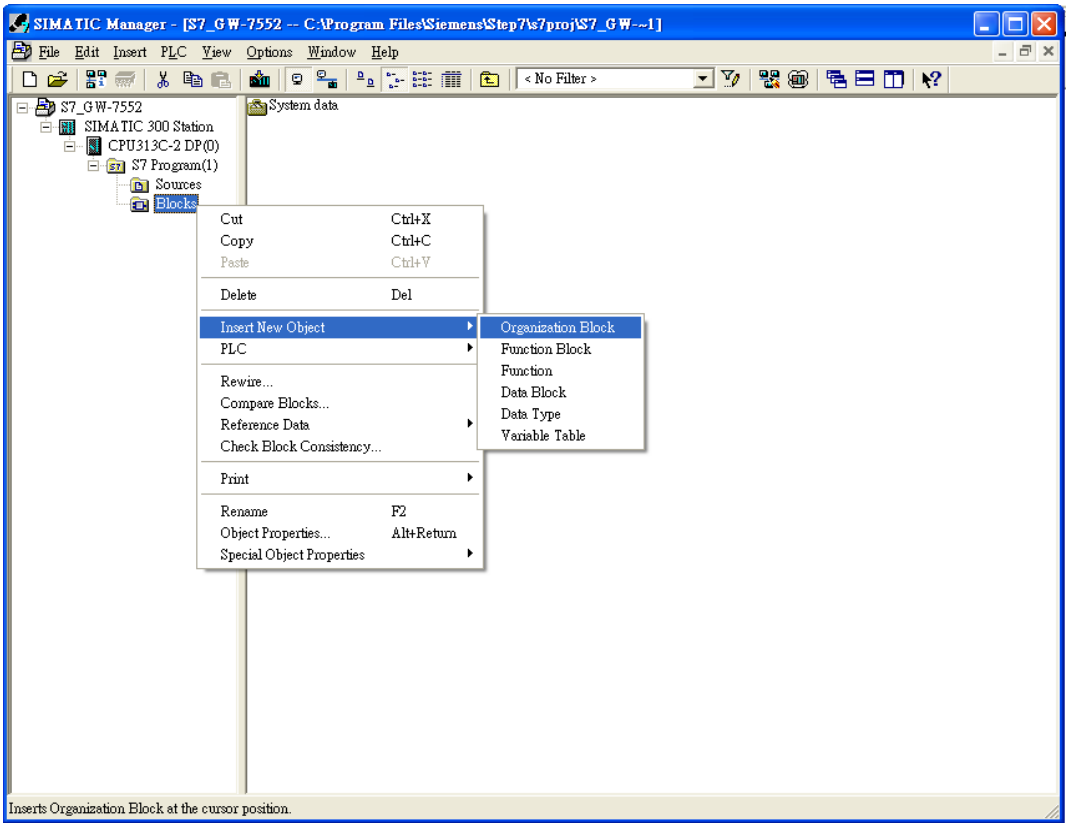
3. Save and Compile

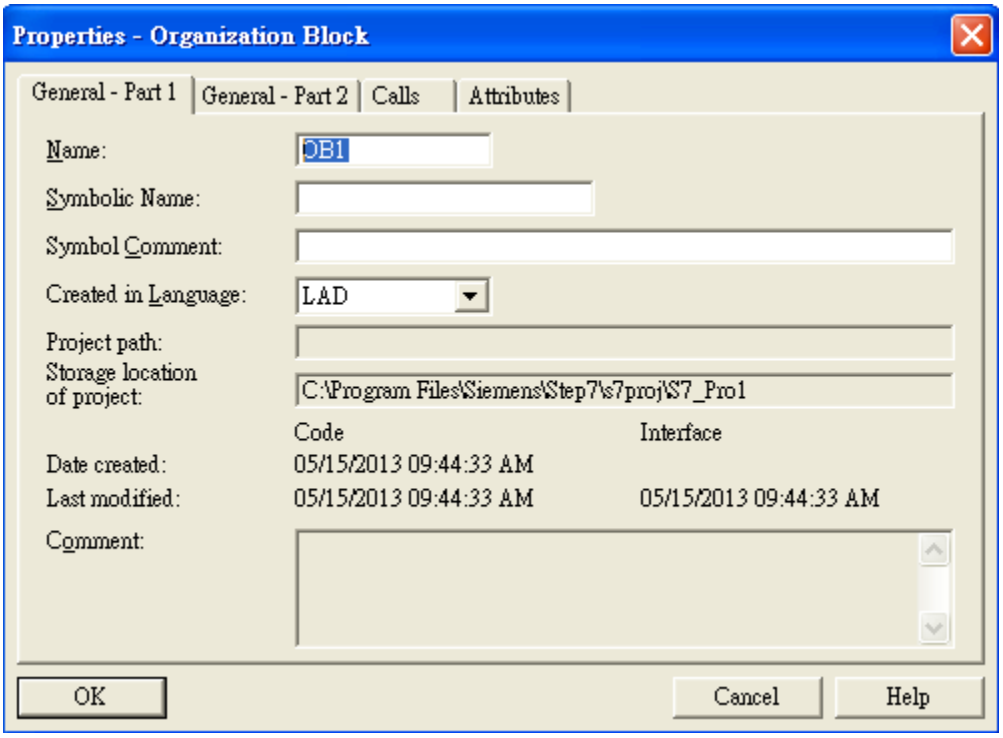


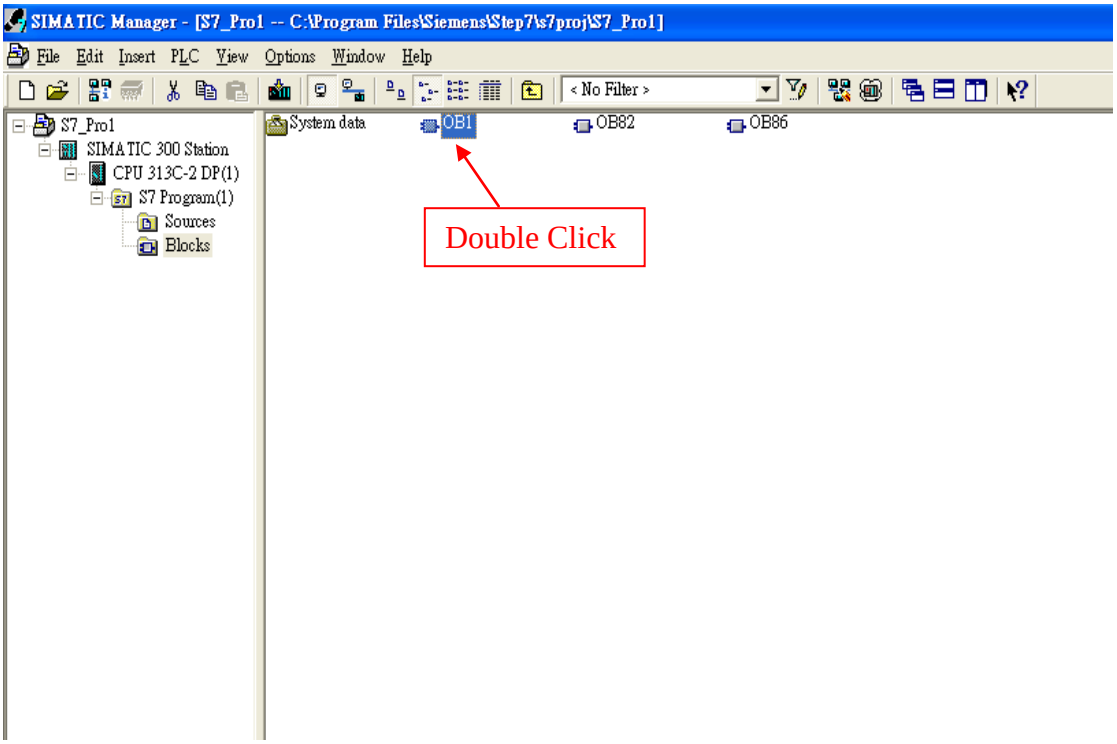
4. Download setting into STEP 7



5.Insert a new Organization Block (OB1,OB82,OB86)







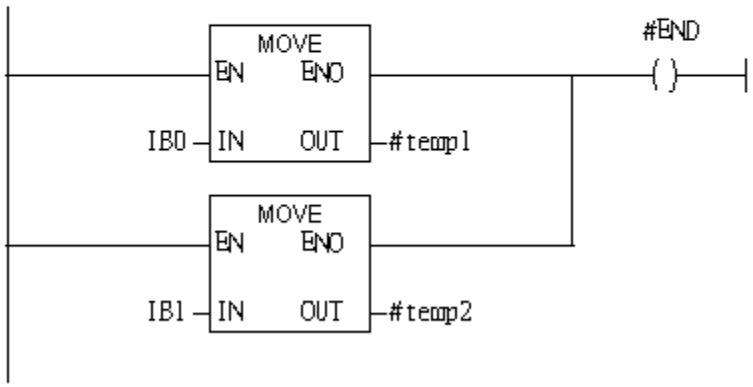
6. S7 program edit

Variables used in the example LD Program:

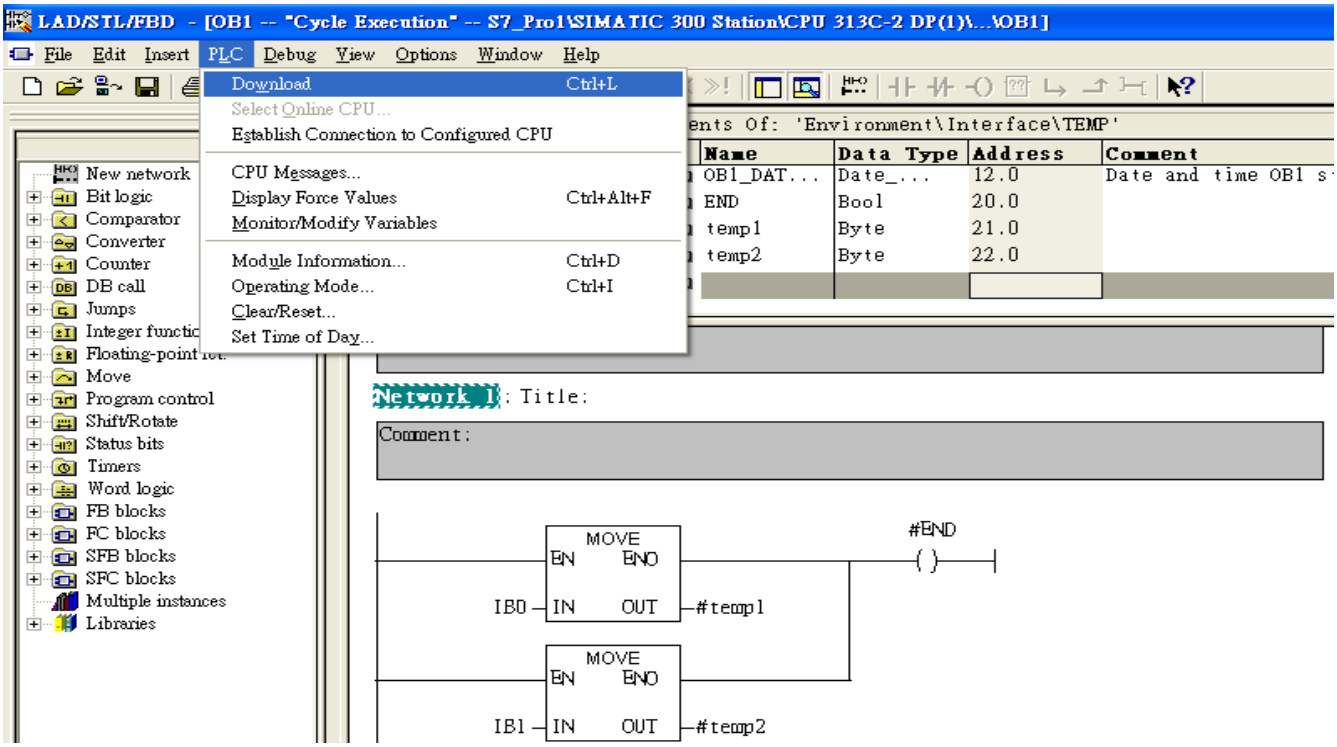
	Name	Data Type	Address	Comment
	OB1_DAT...	Date_...	12.0	Date and time OB1 started
	END	Bool	20.0	
	temp1	Byte	21.0	
	temp2	Byte	22.0	

Network 1: Title:

Comment:



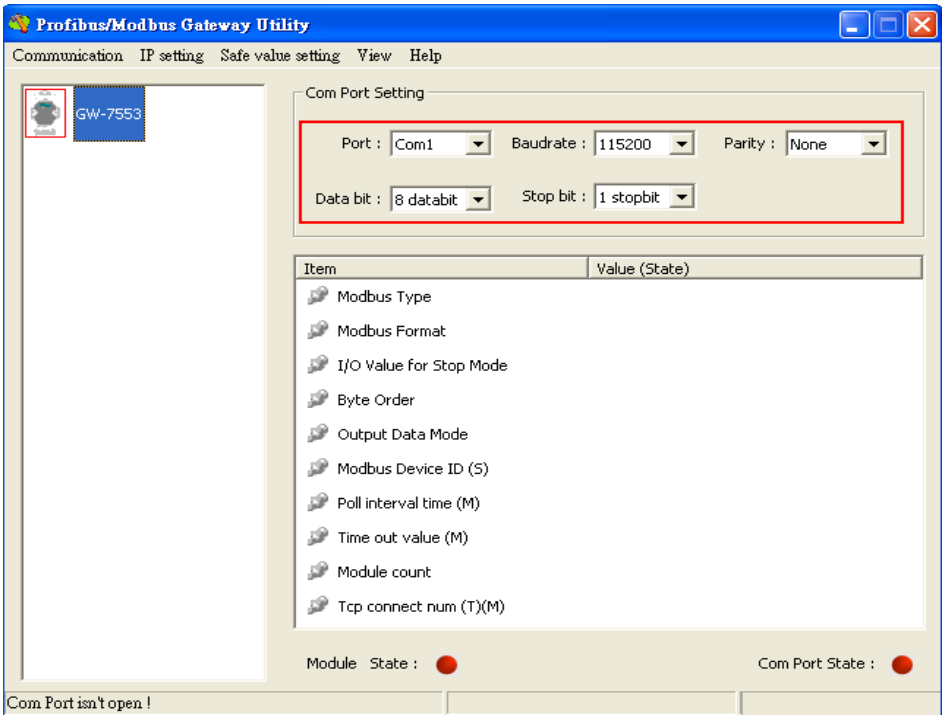
7. S7 program download



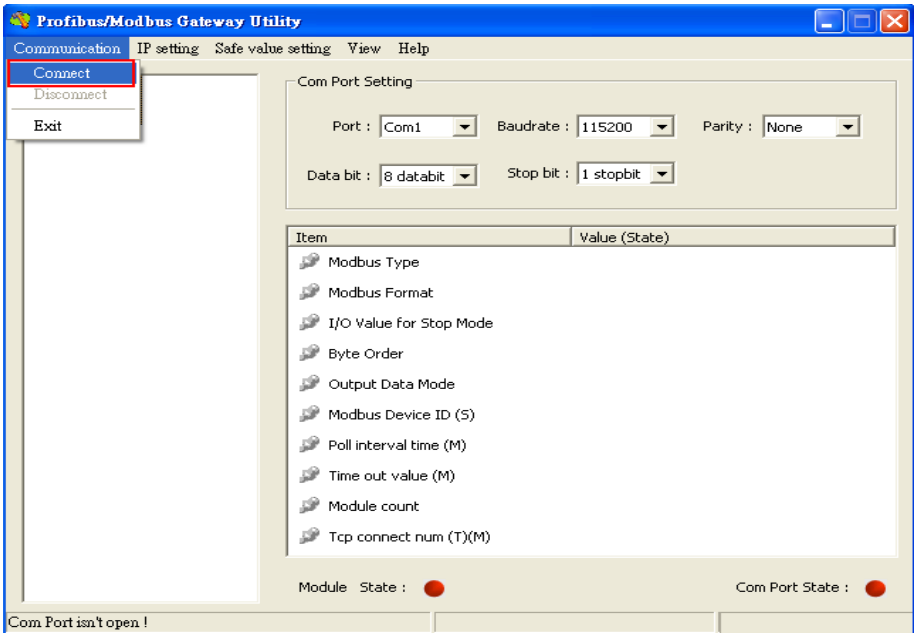
Setup IP of GW-7553 with Utility (the user can download the latest Utility at ftp://ftp.icpdas.com/pub/cd/fieldbus_cd/profibus/gateway/gw-7553/utilities/

1. Before the connection, please make sure the RUN LED of the GW-7553 is on and the switch of the GW-7553 is at setting mode.

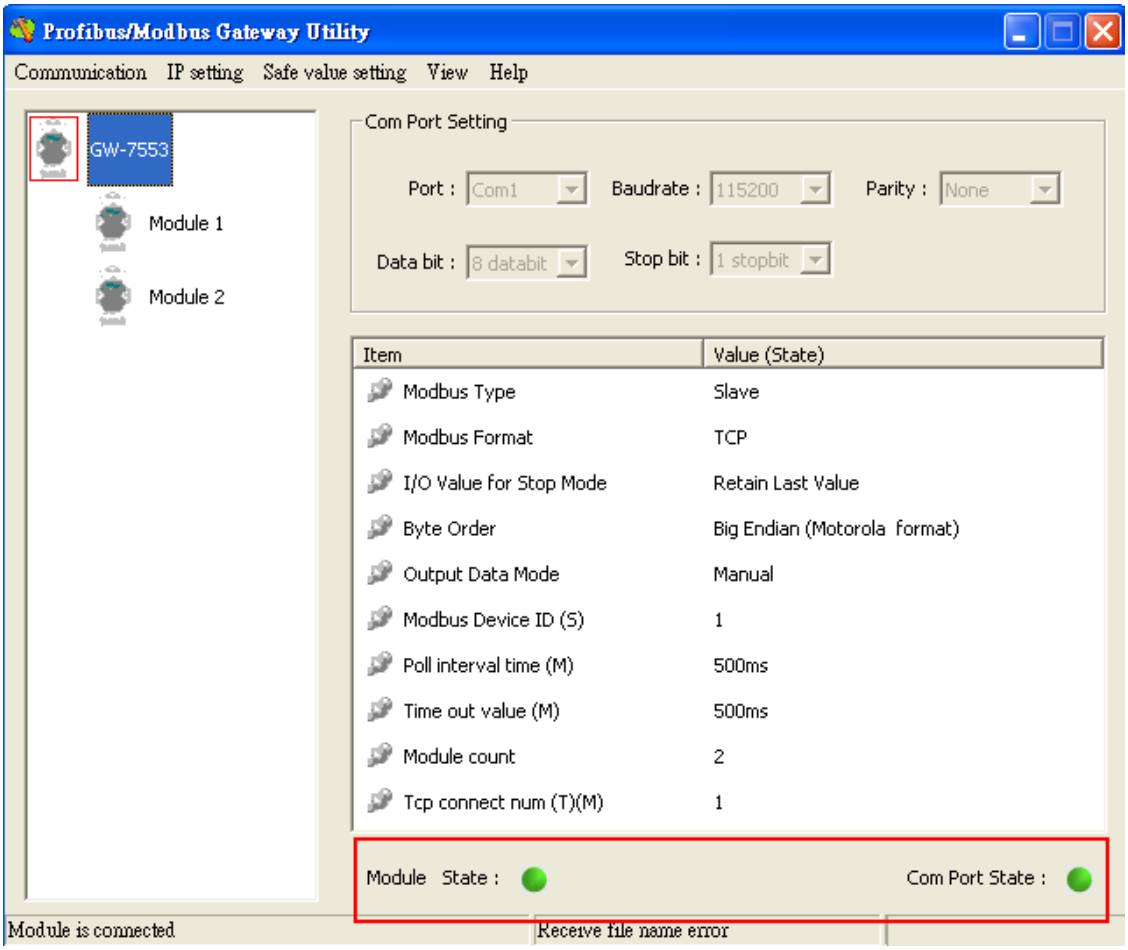
2. Set the Com Port Setting of the Utility



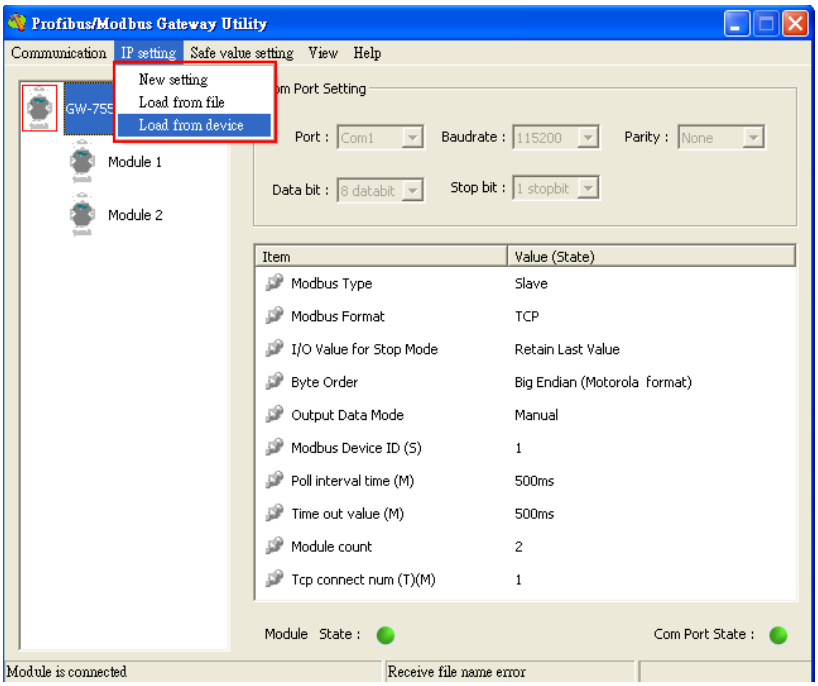
3.Click connect.



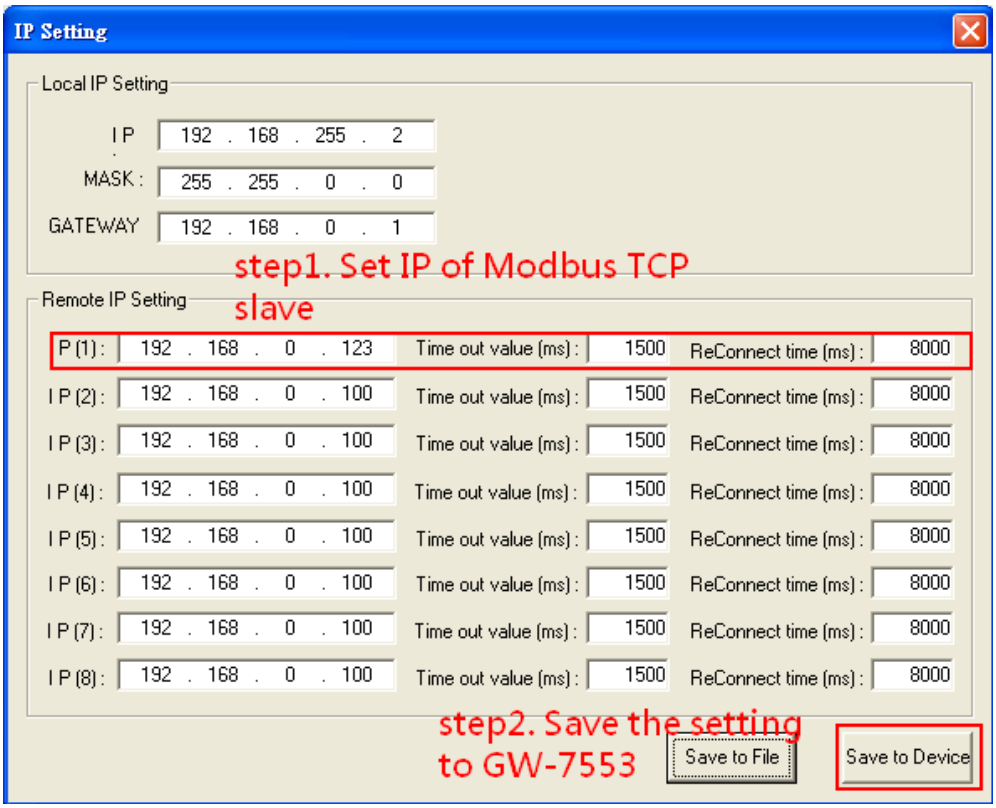
4. Connection success



5. Click IP setting→Load from device to show IP setting dialog



6. Set the IP of the Modbus TCP Slave and click “Save to Device” button to save the settings.



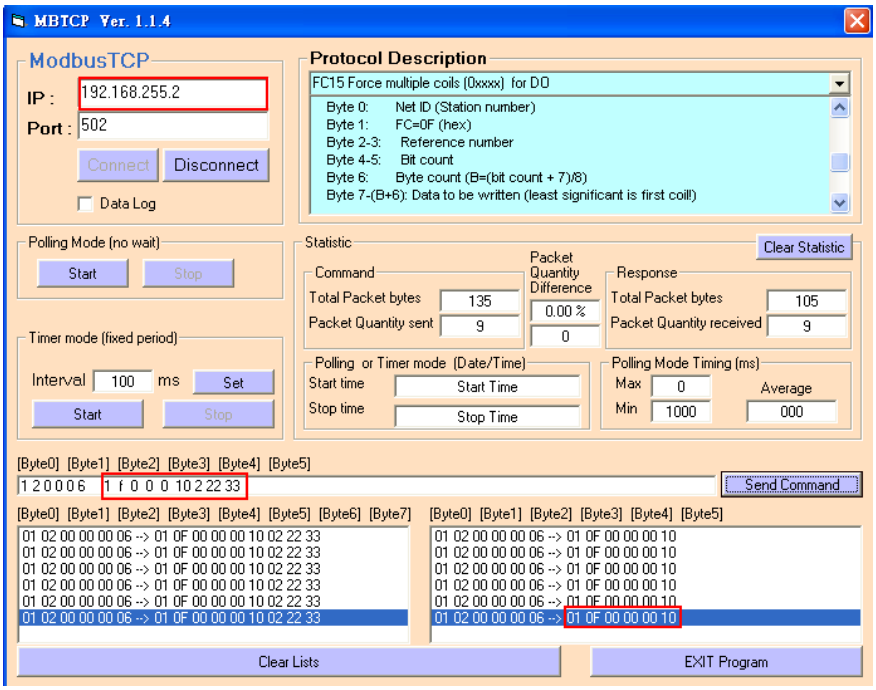
7.Set the switch of the GW-7553 to Normal Mode then reset the power of GW-7553.

Communication test

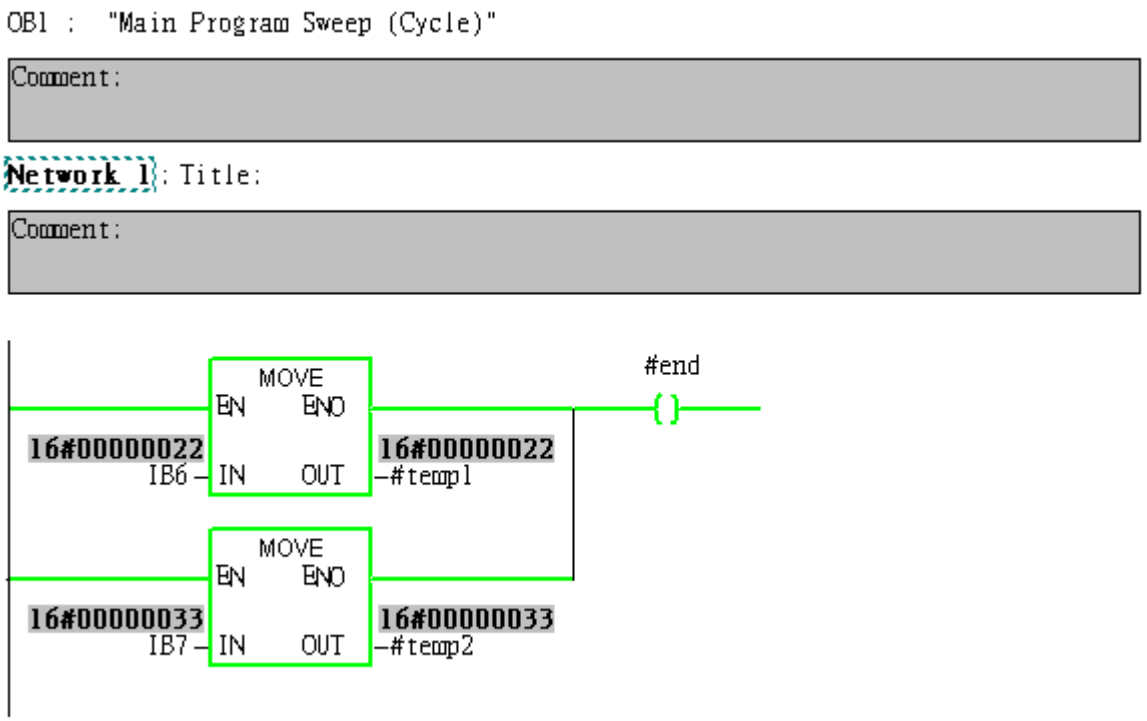
1. Confirm the GW-7553's Com Port setting is the same with Modbus Master tool (ex: MBTCP, you can download MBTCP from http://ftp.icpdas.com.tw/pub/cd/8000cd/napdos/modbus/modbus_utility/)

2. Send command 01 0F 00 00 00 10 02 22 33 write two byte DO

3. Response value 01 0F 00 00 00 10



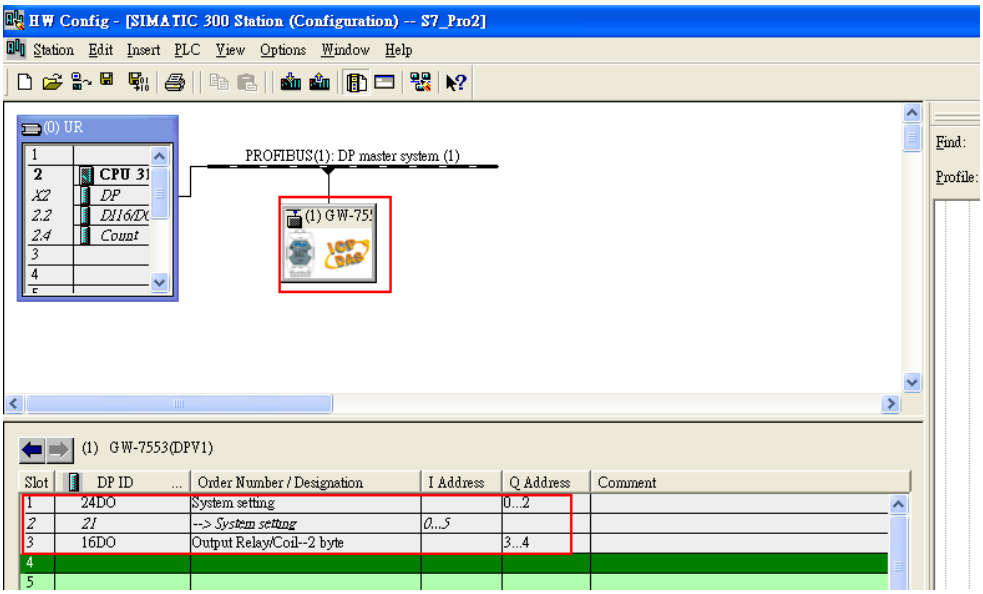
4. PLC will receives the "DO Value (0x22, 0x33)" at PLC address IB6&IB7.



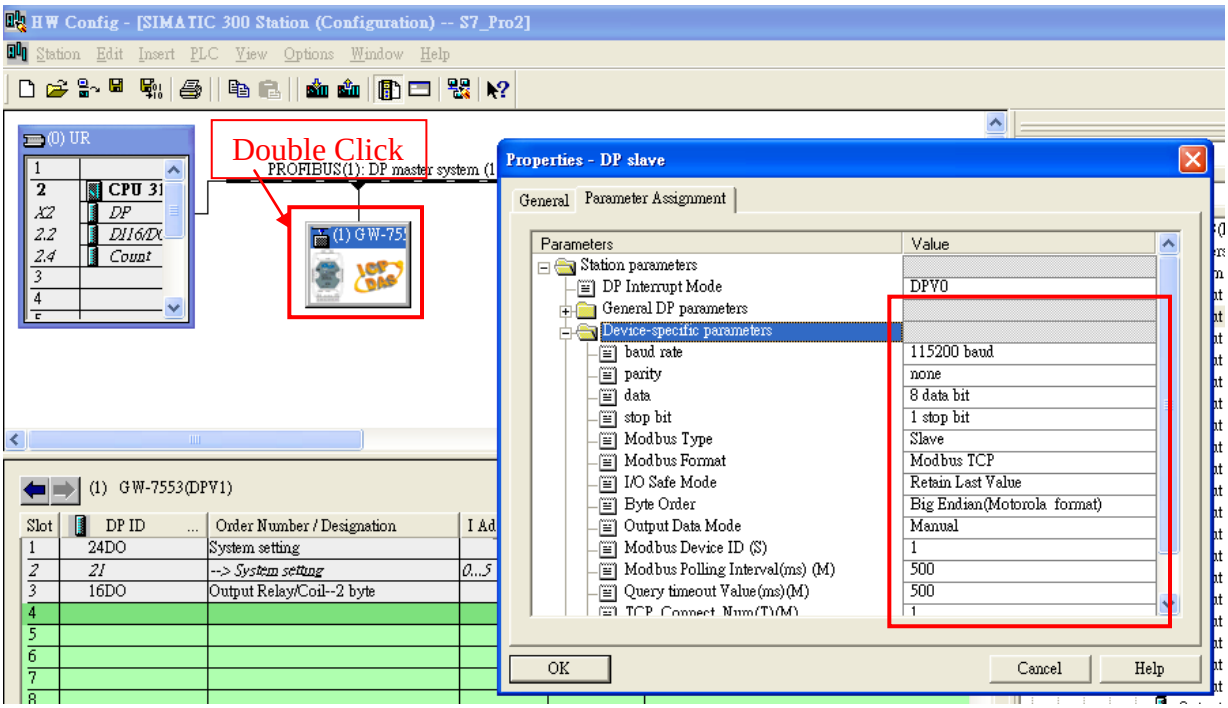
Example 3: PLC refreshes DI data to Modbus master.

SIMATIC STEP 7 Edit

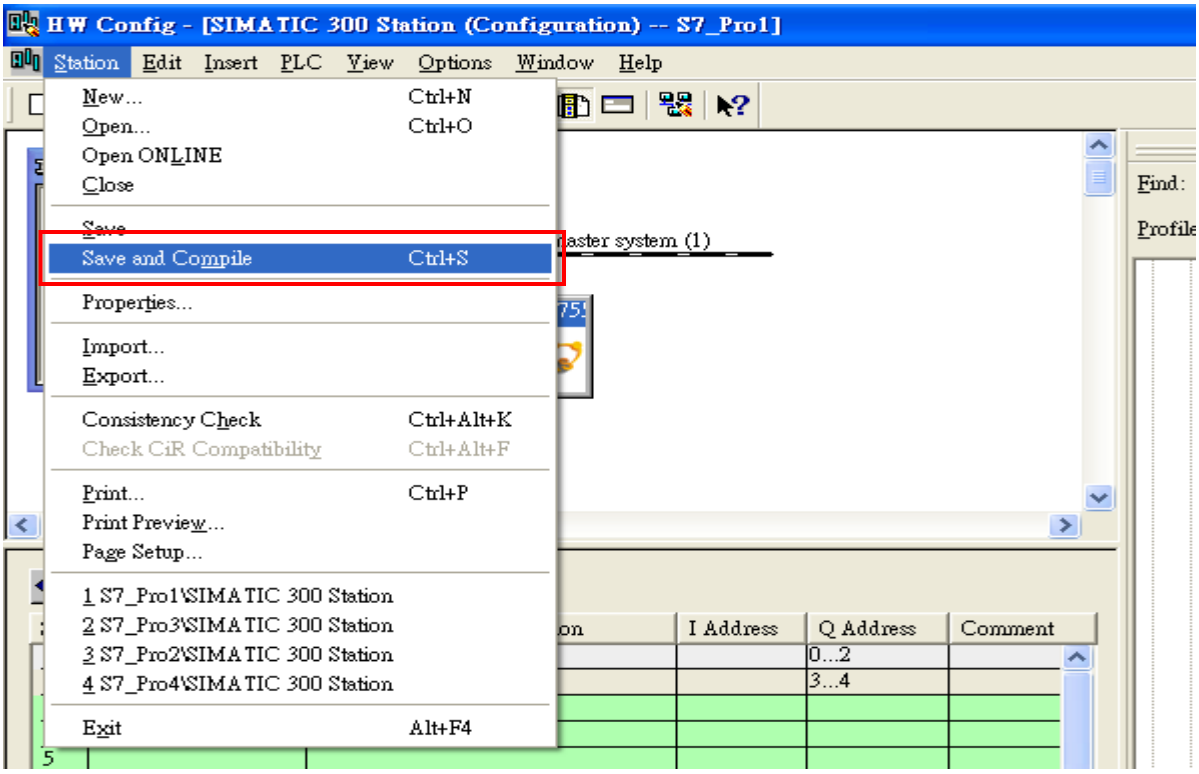
1.HW Config. – configure GW-7553 (ex: System setting module x1, Output Relay/Coil—2 byte module x1)



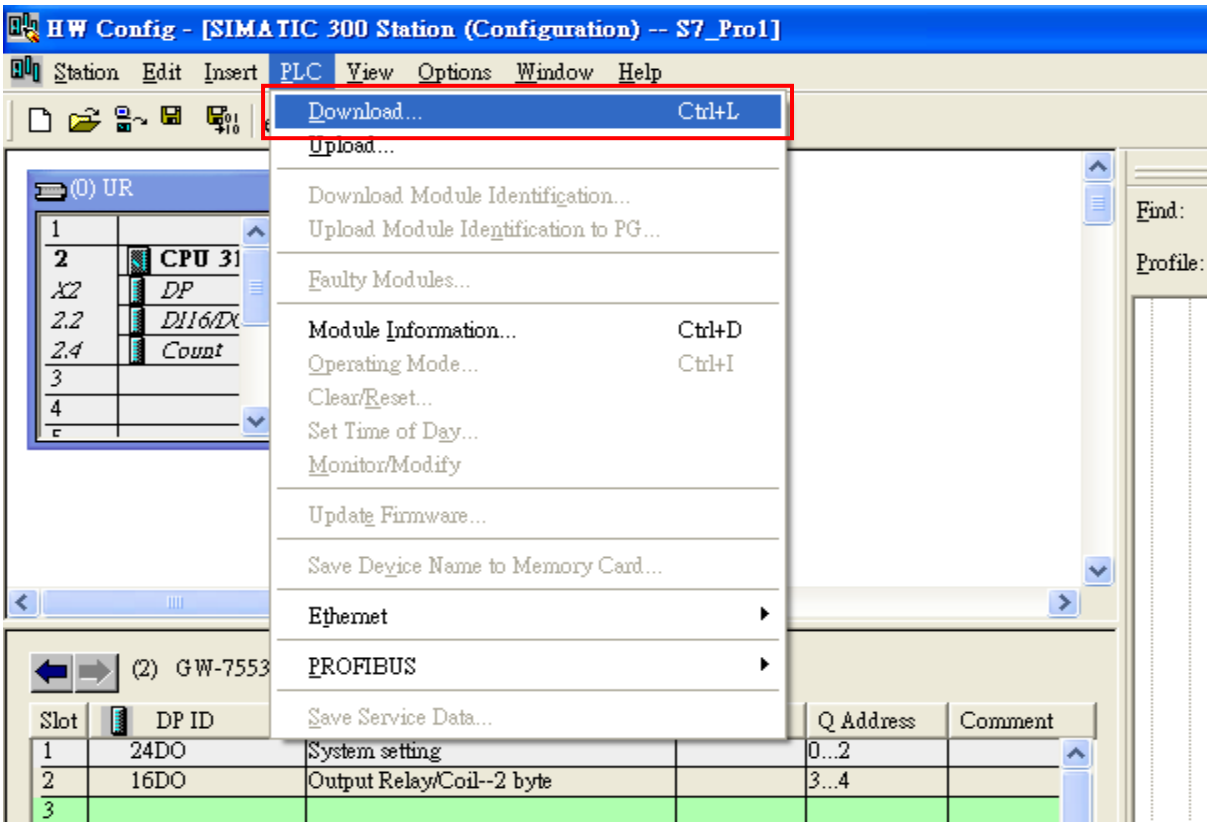
2. HW Config – Parameter assignment (ex: Com port settings, Modbus type: Slave, Modbus format: TCP, Byte Order: Big Endian). Confirm the GW-7553's Com Port setting is the same with MBTCP tool (ex: baud rate-115200, data bits-8, stop bits-1, parity-none). About the MBTCP tool, please refer to the "Communication test" in the below.



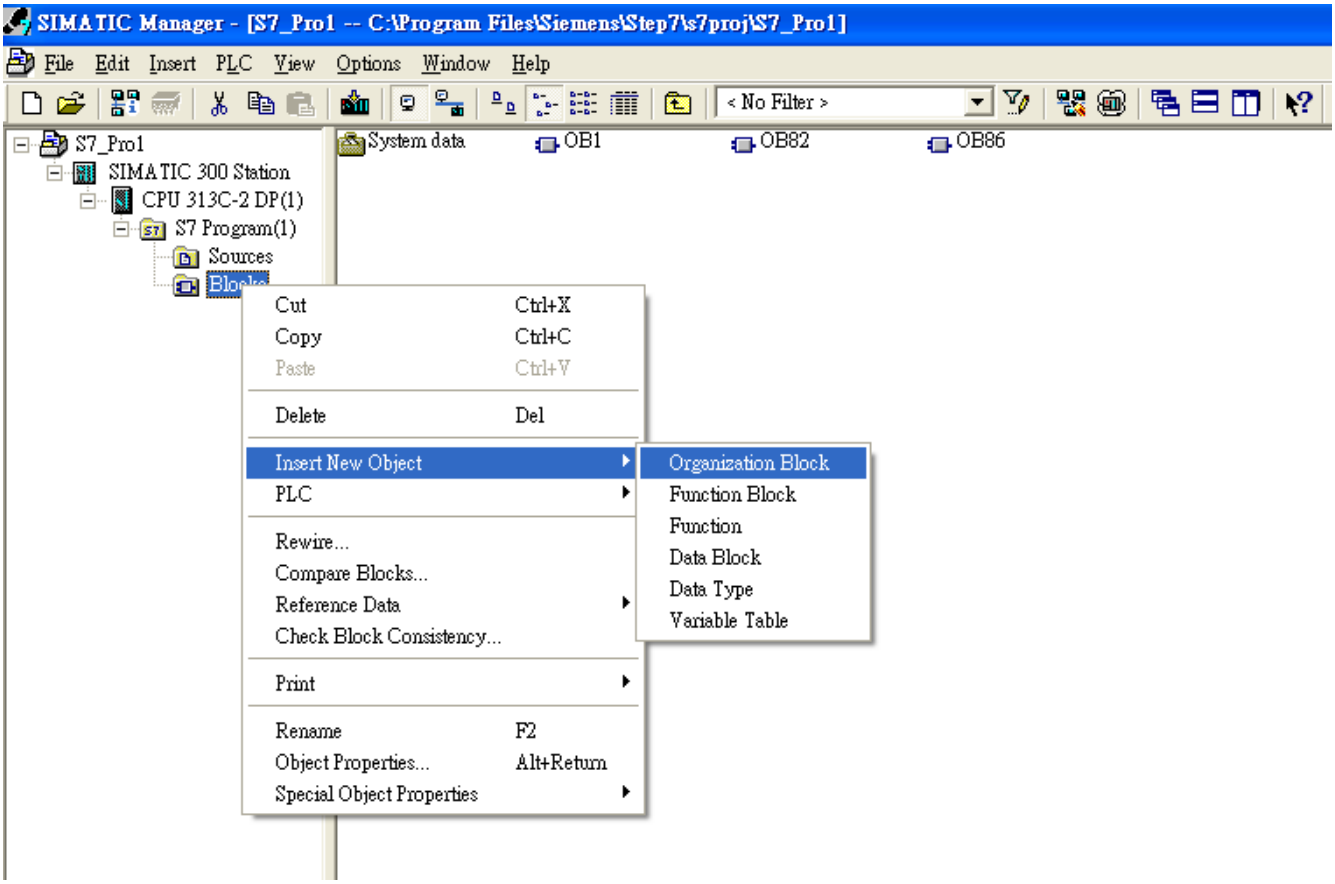
3. Save and Compile

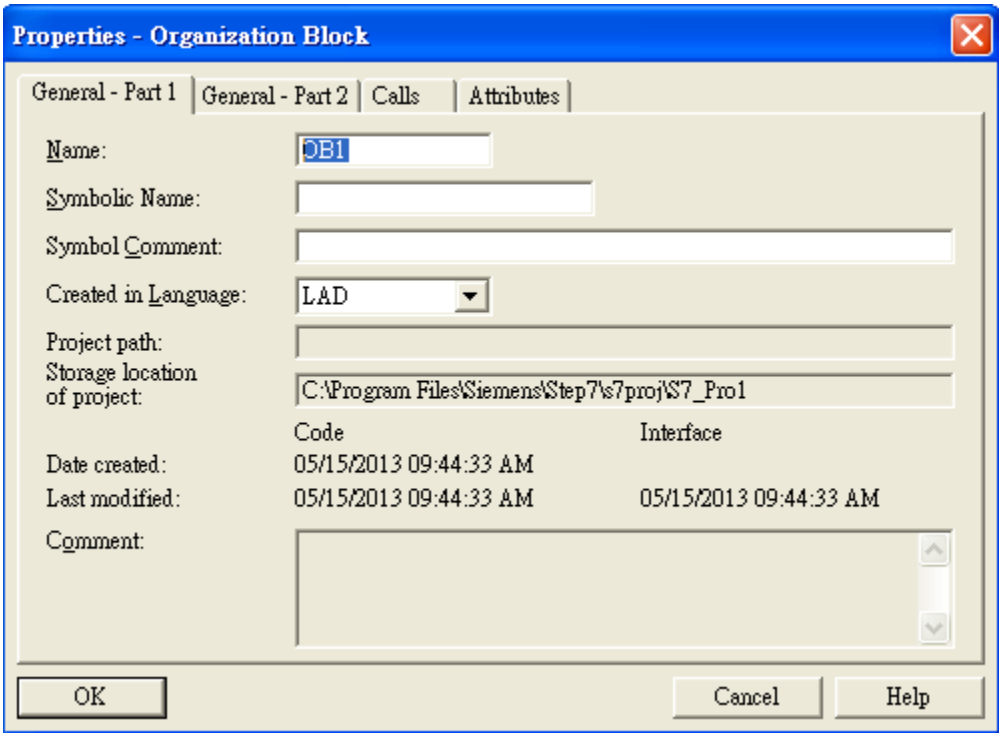


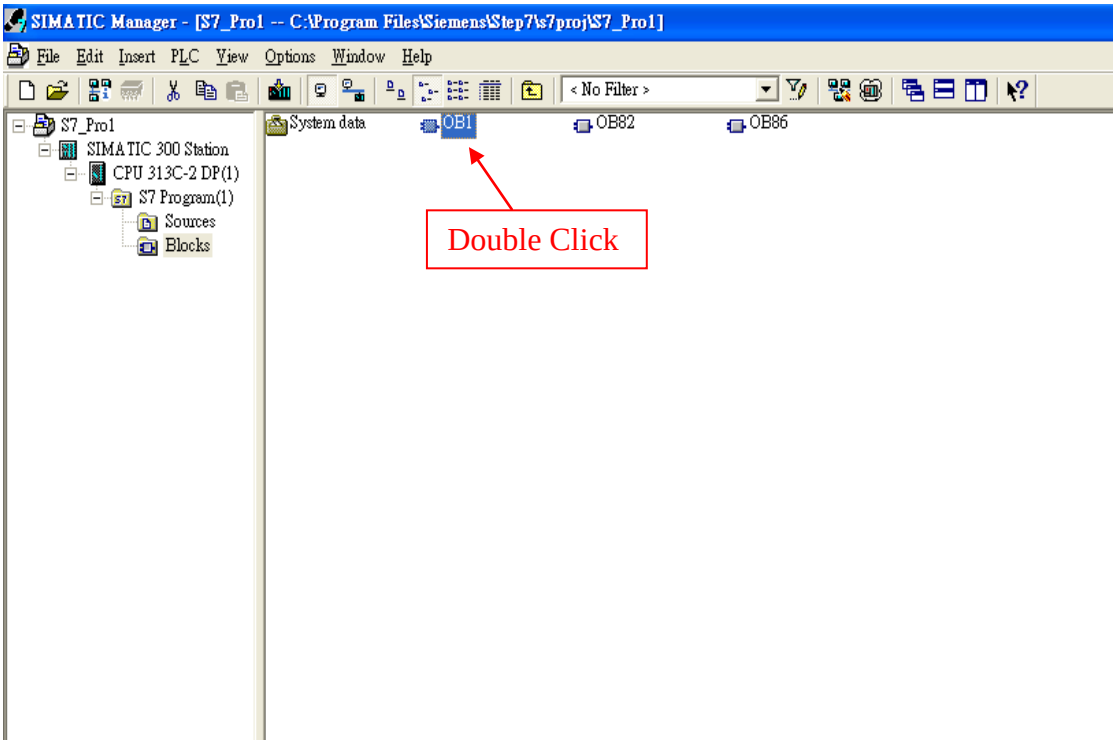
4. Download setting into STEP 7



5.Insert a new Organization Block (OB1,OB82,OB86)







6.S7 program edit

Variables used in the example LD Program:

	Name	Data Type	Address	Comment
	OB1_MAX...	Int	10.0	Maximum cycle time of OB1 (milliseconds)
	OB1_DAT...	Date_...	12.0	Date and time OB1 started
	END	Bool	20.0	
	Init	Bool	20.1	
	tri	Int	22.0	

Network 2: Initial Cl

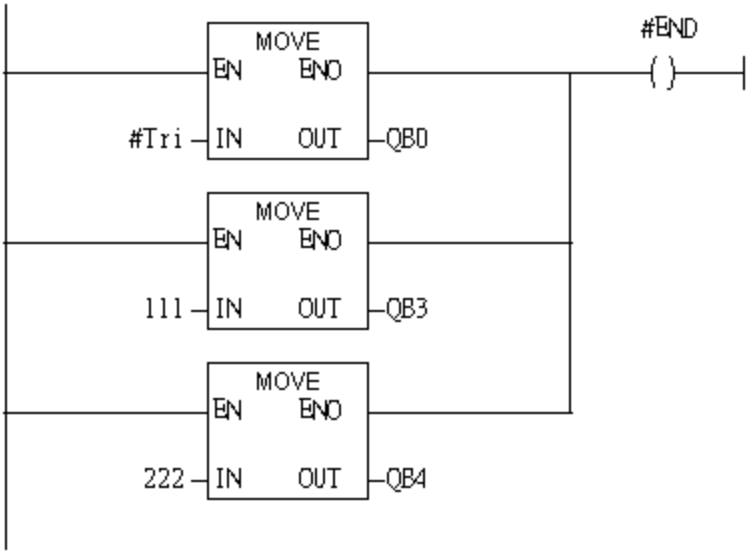
Initial Cl

OB1 : "Main Program Sweep (Cycle)"

```
PROFIBUS slave
Modbus   slave
```

Network 1: QB0 add "1" refresh DO value

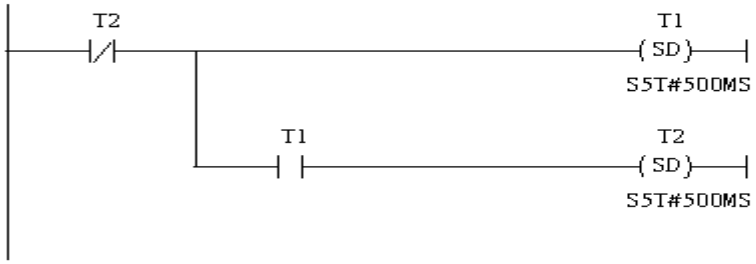
```
2 byte 16 DO
```



Using T2 trigger T1 .C1 and Tri will add 1 every 1s.

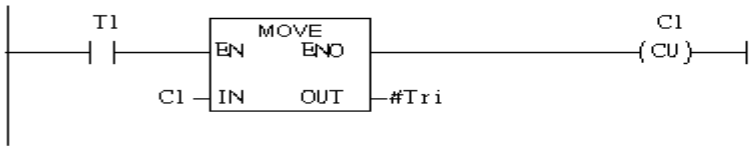
Network 2 : Timer T1 & T2

```
Using T2 triggle T1
```



Network 3 : T1 triggle Counter(C1)

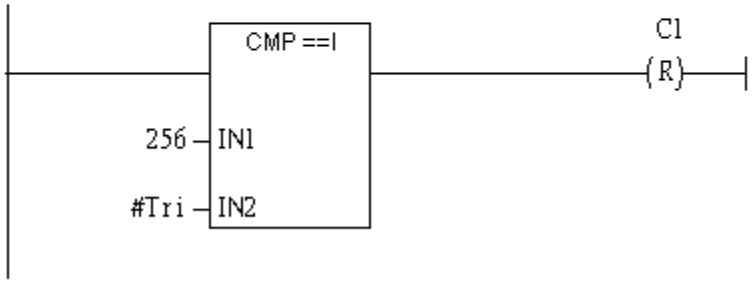
```
Counter(C1) add "1" and Tri add "1" , too.
```



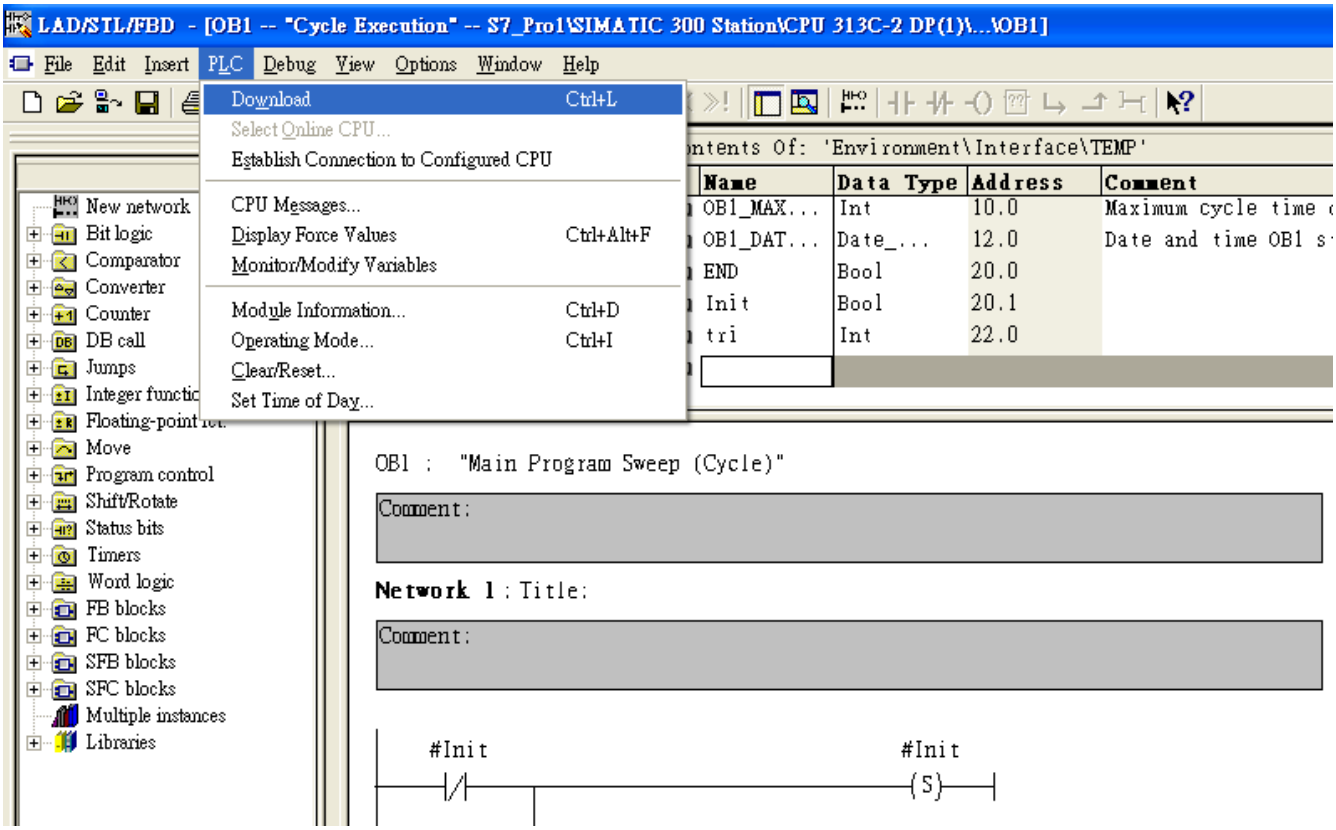
If Tri is equal to 256, reset counter (C1)

Network 4 : Compare Tri with 256

If Tri is equal to 256 that will reset C1.



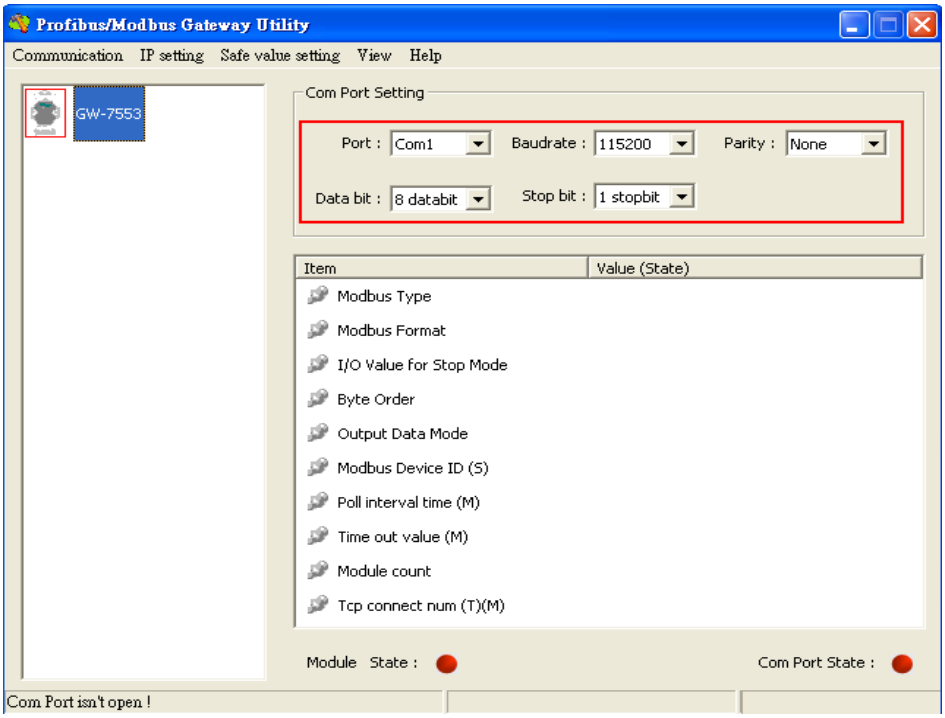
7. S7 program download



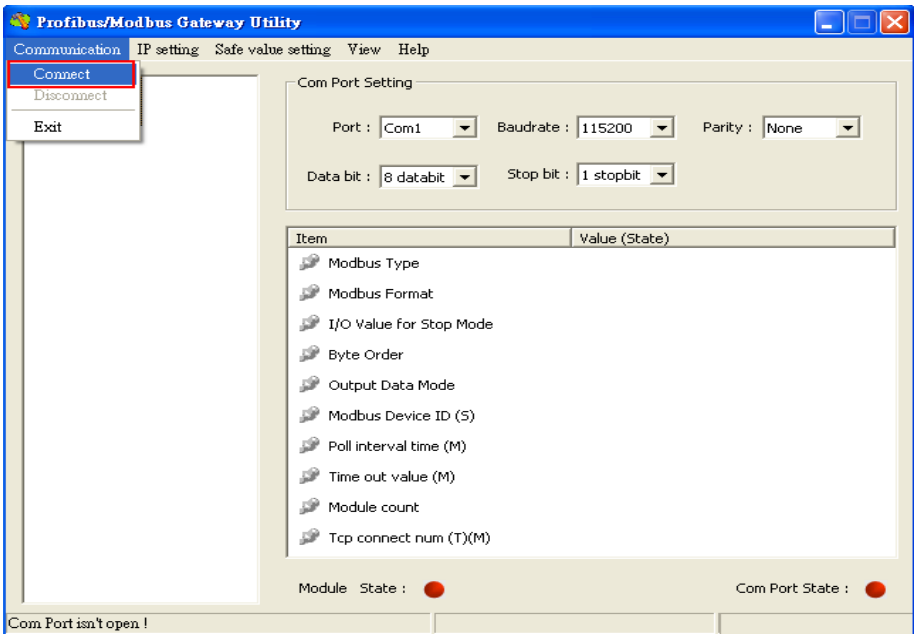
Setup IP of GW-7553 with Utility (the user can download the latest Utility at ftp://ftp.icpdas.com/pub/cd/fieldbus_cd/profibus/gateway/gw-7553/utilities/

1. Before the connection, please make sure the RUN LED of the GW-7553 is on and the switch of the GW-7553 is at setting mode.

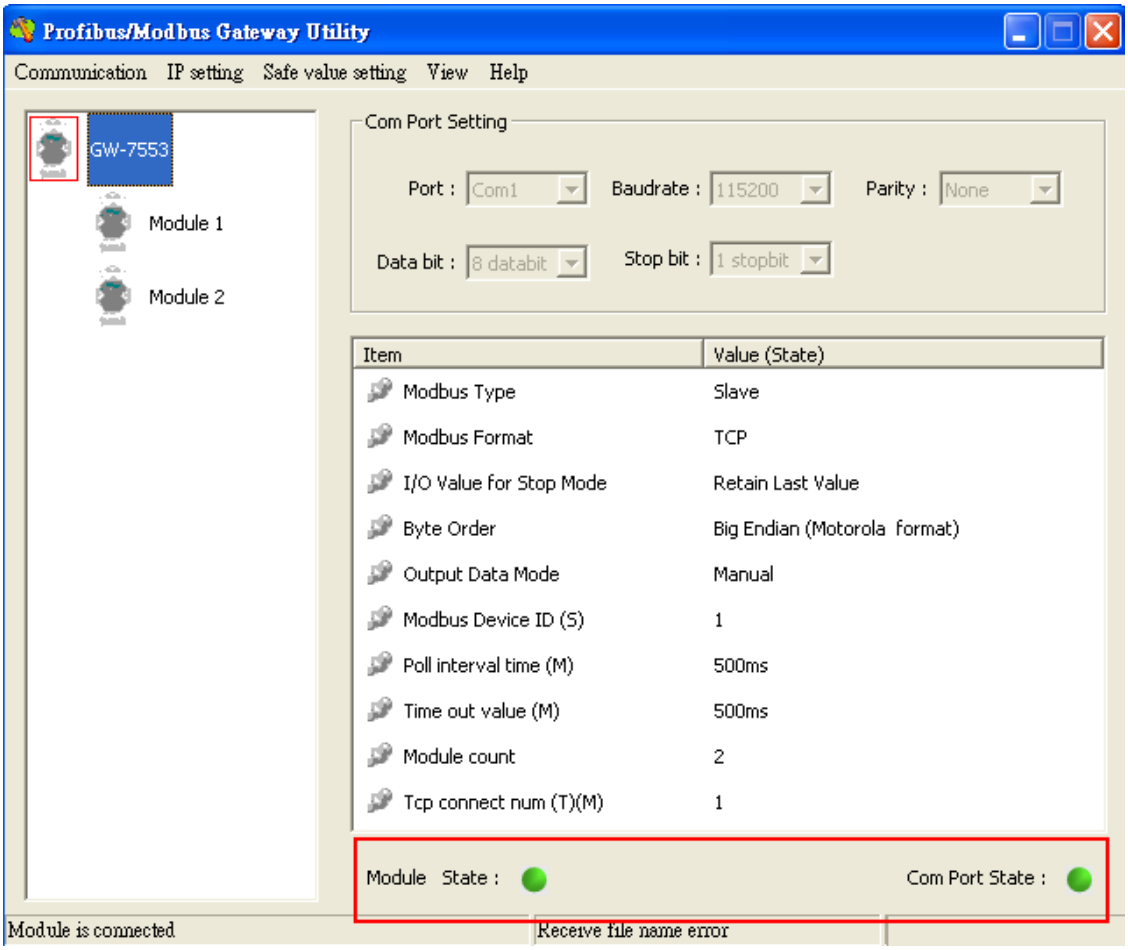
2. Set the Com Port Setting of the Utility



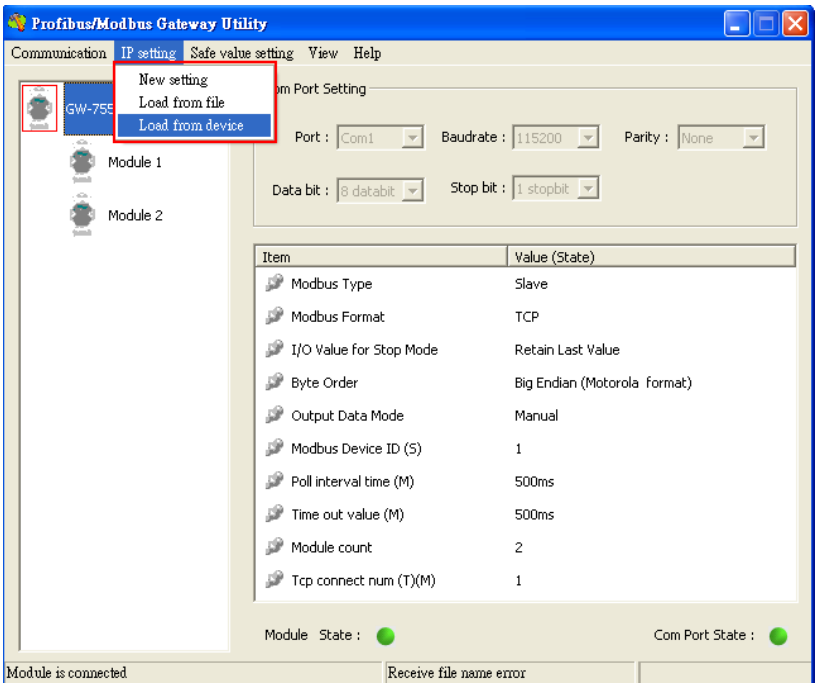
3.Click connect.



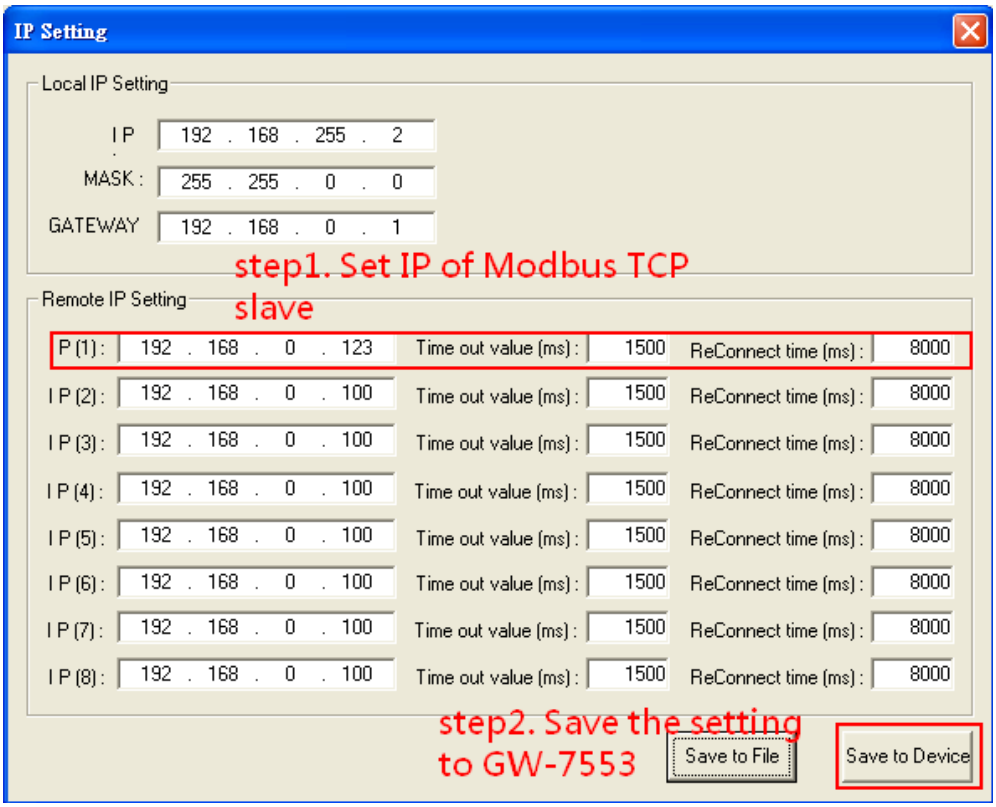
4. Connection success



5. Click IP setting→Load from device to show IP setting dialog



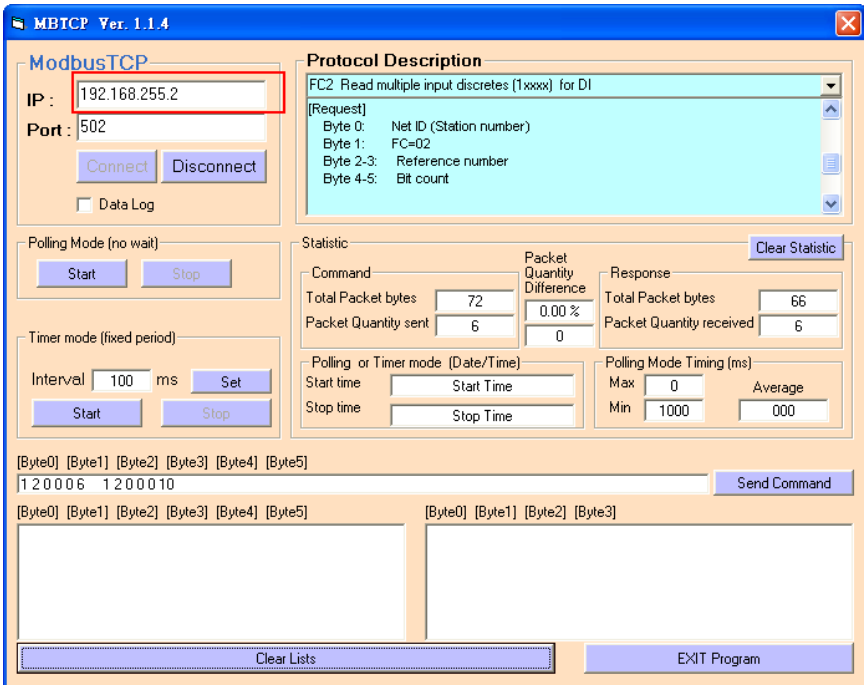
6. Set the IP of the Modbus TCP Slave and click “Save to Device” button to save the settings.



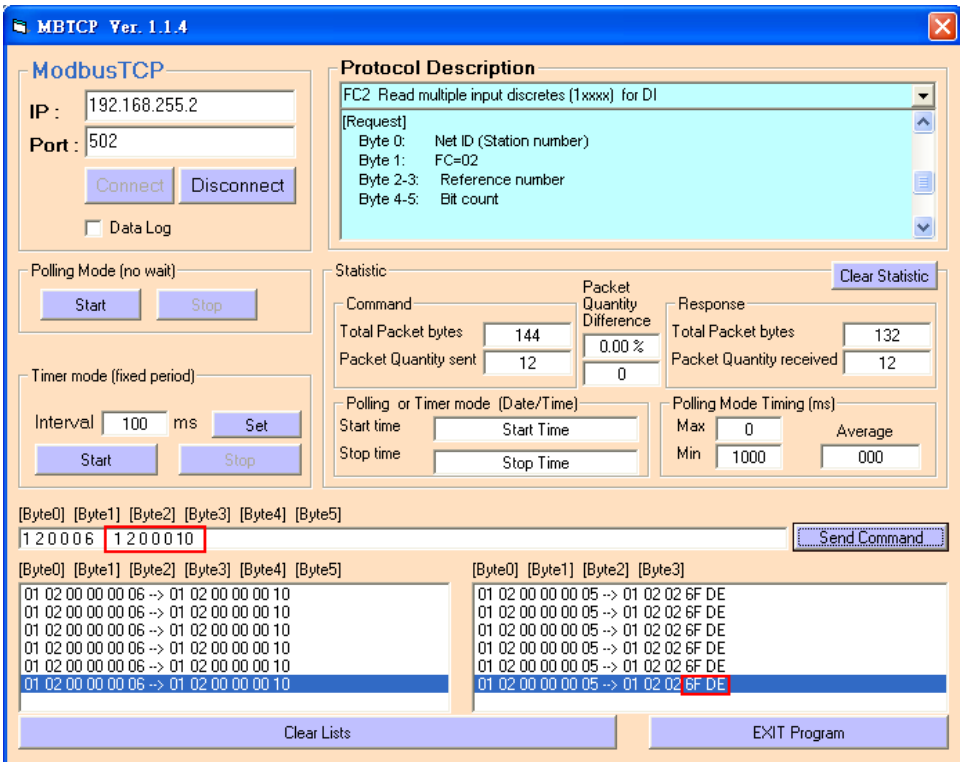
7.Set the switch of the GW-7553 to Normal Mode then reset the power of GW-7553.

Communication test

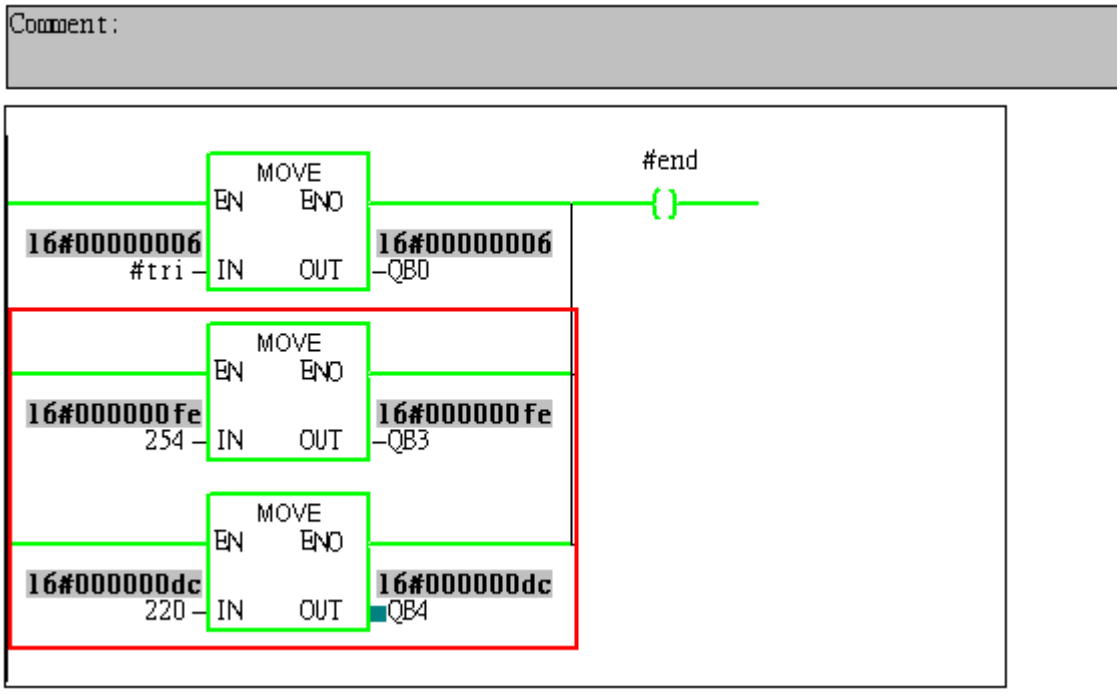
1. Confirm the GW-7553's Com Port setting is the same with Modbus Master tool (ex: MBTCP, you can download MBTCP from http://ftp.icpdas.com.tw/pub/cd/8000cd/napdos/modbus/modbus_utility/)

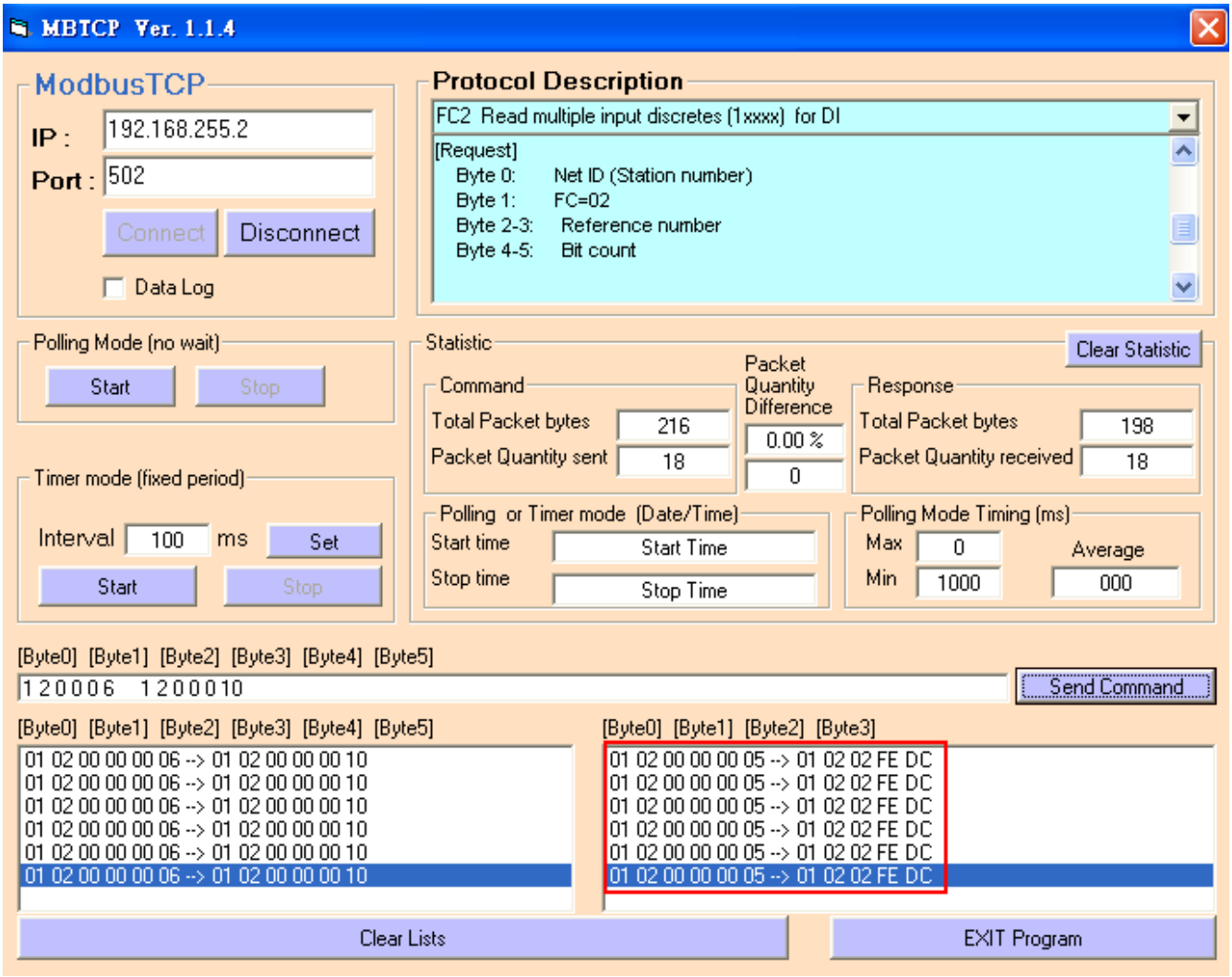


2. Input command (” 01 02 00 00 00 10”) in MBTCP and click <Send Command> button to send Modbus command: “01 02 00 00 00 10”. We can get the DI value (0x6F, 0xDE) from the response message



3. We change QB3 to 0xFE and QB4 to 0xDC, and then we can click <Send Command> button to read DI again at MBTCP and we will get the new DI value (0xFE, 0xDC) from the response message.

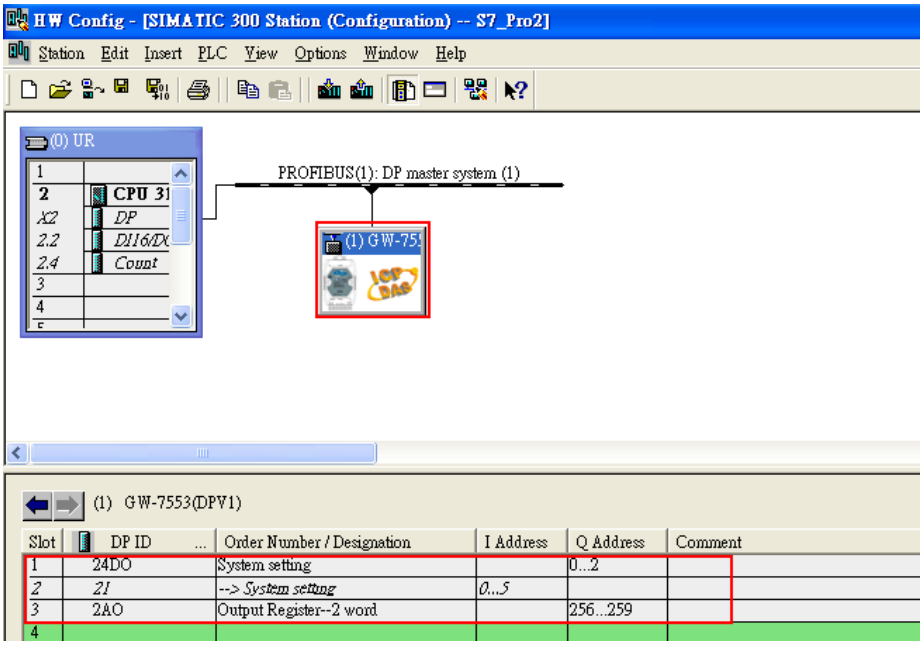



MBTCP Ver. 1.1.4
ModbusTCP
IP :
192.168.255.2
Port :
502
Connect
Disconnect
Data Log
Protocol Description
FC2 Read multiple input discretes (1xxxx) for DI
[Request]
Byte 0: Net ID (Station number)
Byte 1: FC=02
Byte 2-3: Reference number
Byte 4-5: Bit count
Polling Mode (no wait)
Start
Stop
Timer mode (fixed period)
Interval
100
ms
Set
Start
Stop
Statistic
Clear Statistic
Command
Total Packet bytes
216
Packet Quantity sent
18
Packet Quantity Difference
0.00 %
0
Response
Total Packet bytes
198
Packet Quantity received
18
Polling or Timer mode (Date/Time)
Start time
Start Time
Stop time
Stop Time
Polling Mode Timing (ms)
Max
0
Min
1000
Average
000
[Byte0] [Byte1] [Byte2] [Byte3] [Byte4] [Byte5]
1 2 0 0 0 6 1 2 0 0 0 1 0
Send Command
[Byte0] [Byte1] [Byte2] [Byte3] [Byte4] [Byte5]
01 02 00 00 00 06 --> 01 02 00 00 00 10
01 02 00 00 00 06 --> 01 02 00 00 00 10
01 02 00 00 00 06 --> 01 02 00 00 00 10
01 02 00 00 00 06 --> 01 02 00 00 00 10
01 02 00 00 00 06 --> 01 02 00 00 00 10
01 02 00 00 00 06 --> 01 02 00 00 00 10
[Byte0] [Byte1] [Byte2] [Byte3]
01 02 00 00 00 05 --> 01 02 02 FE DC
01 02 00 00 00 05 --> 01 02 02 FE DC
01 02 00 00 00 05 --> 01 02 02 FE DC
01 02 00 00 00 05 --> 01 02 02 FE DC
01 02 00 00 00 05 --> 01 02 02 FE DC
01 02 00 00 00 05 --> 01 02 02 FE DC
Clear Lists
EXIT Program

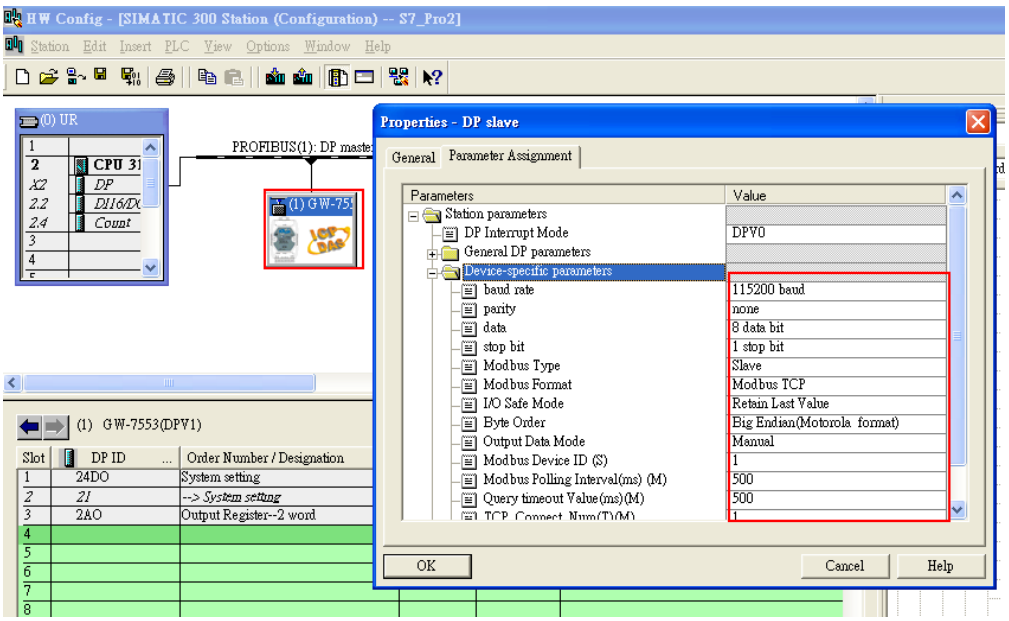
Example 4: PLC refreshes AI data to Modbus master.

SIMATIC STEP 7 Edit

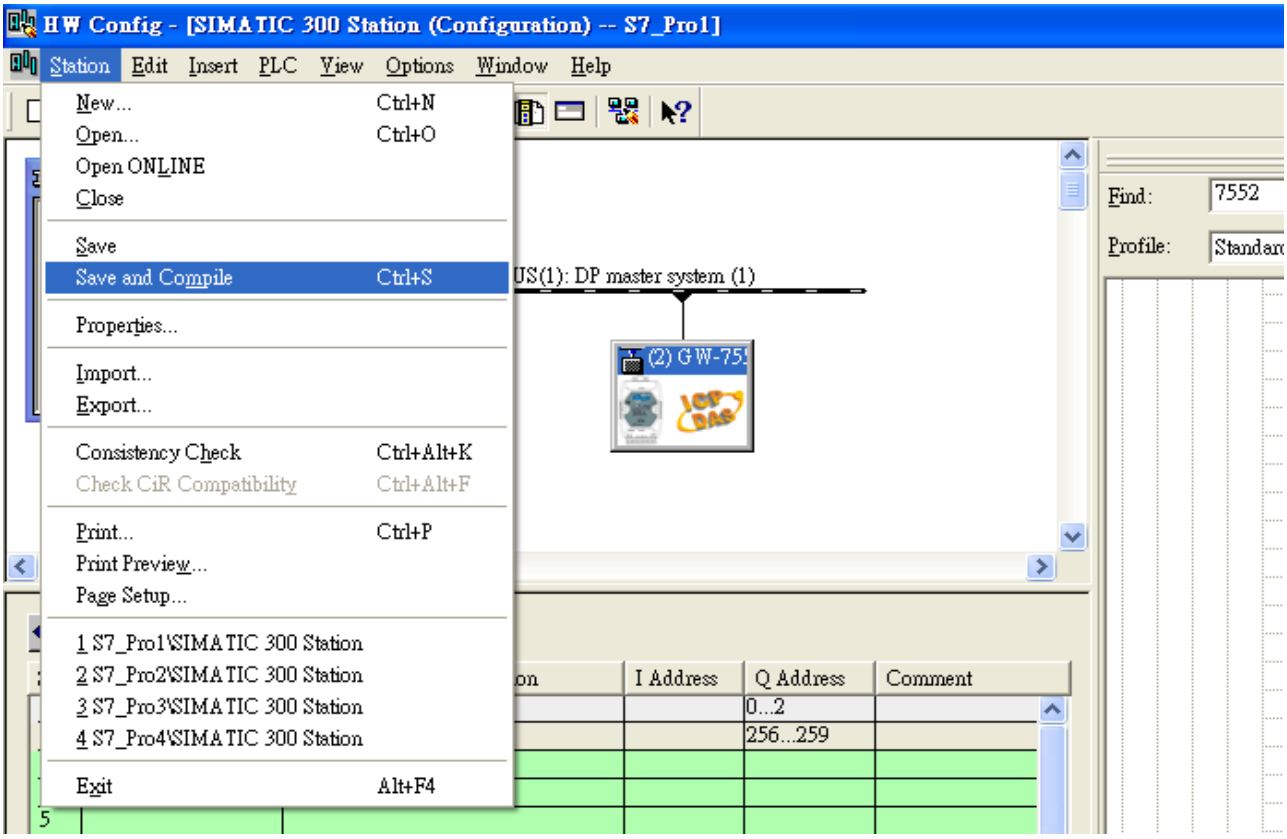
1.HW Config. – configure GW-7553 (ex: System setting module x1, Output Register—2 word module x1)



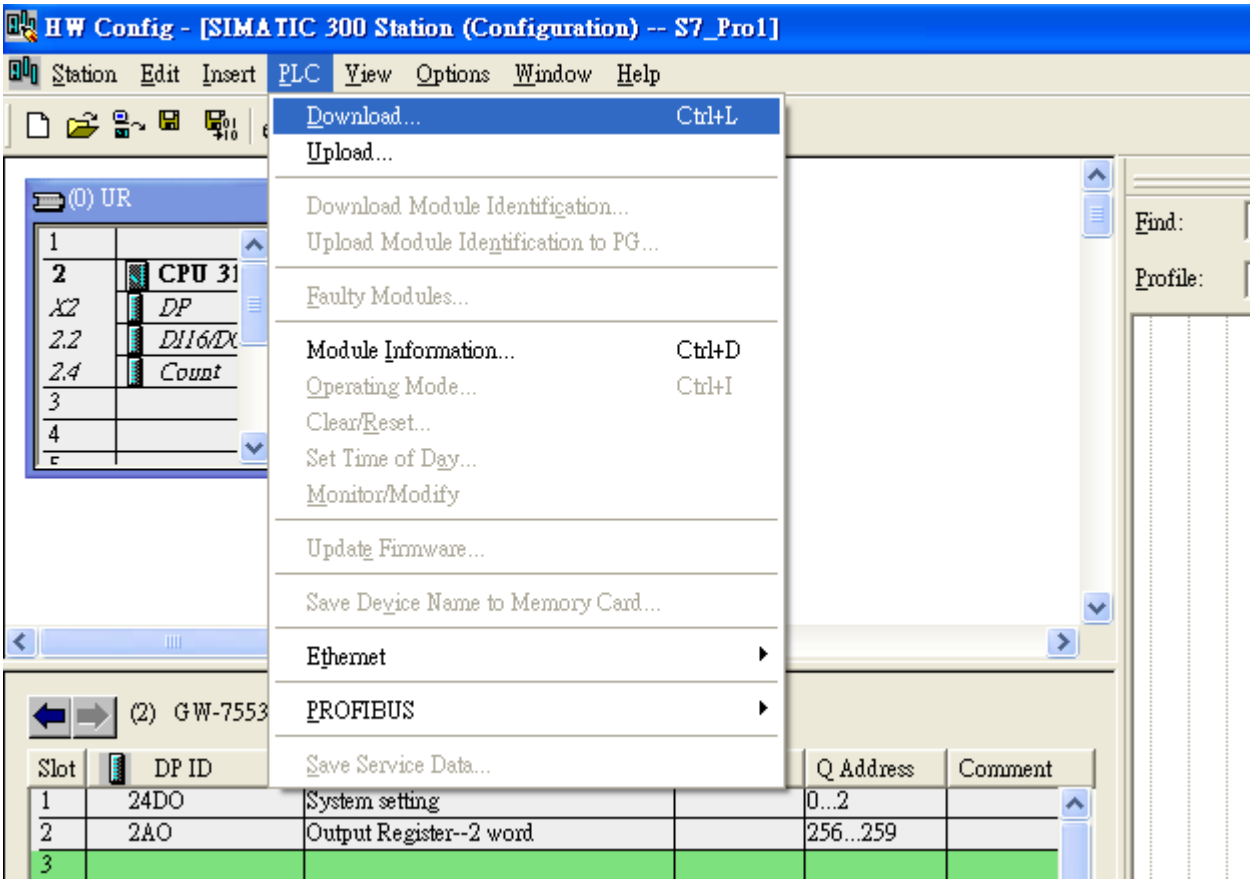
2. HW Config – Parameter assignment (ex: Com port settings, Modbus type: Slave, Modbus format: TCP, Byte Order: Big Endian). Confirm the GW-7553's Com Port setting is the same with MBTCP tool (ex: baud rate-115200, data bits-8, stop bits-1, parity-none). About the MBTCP tool, please refer to the "Communication test" in the below.



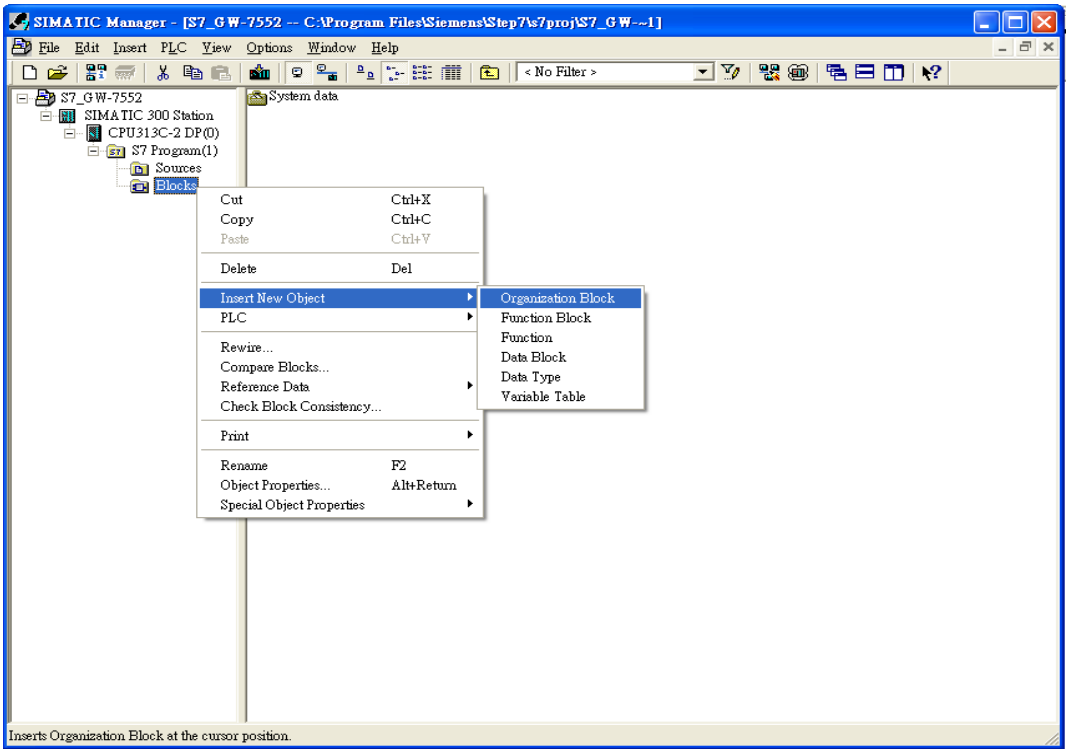
3. Save and Compile

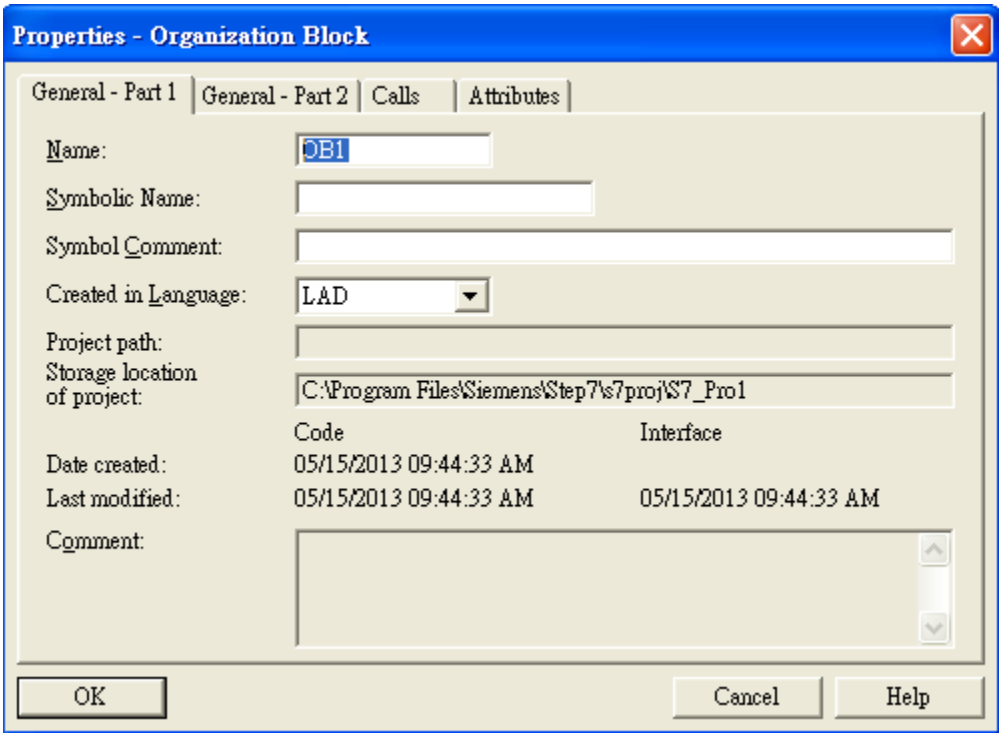


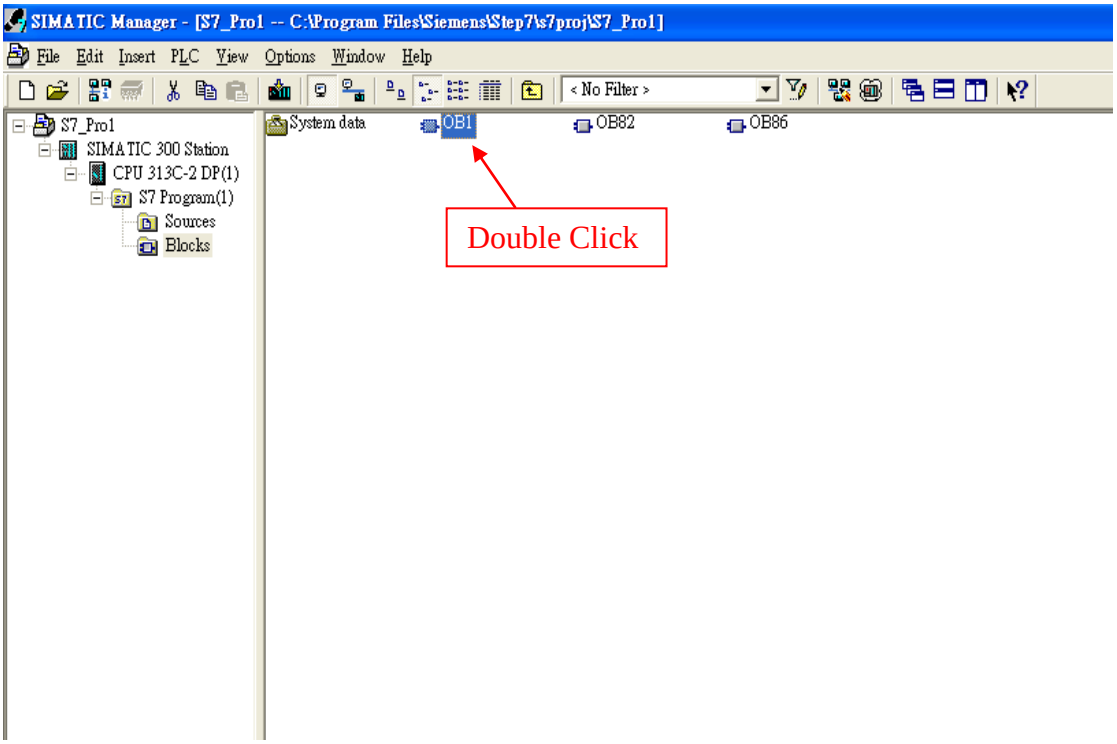
4. Download setting into STEP 7



5.Insert a new Organization Block (OB1,OB82,OB86)







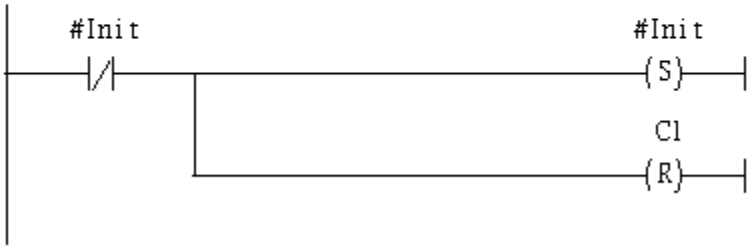
6.S7 program edit

Variables used in the example LD Program:

	Name	Data Type	Address	Comment
	OB1_DAT...	Date_...	12.0	Date and time OB1 started
	END	Bool	20.0	
	Tri	Int	22.0	
	Init	Bool	24.0	

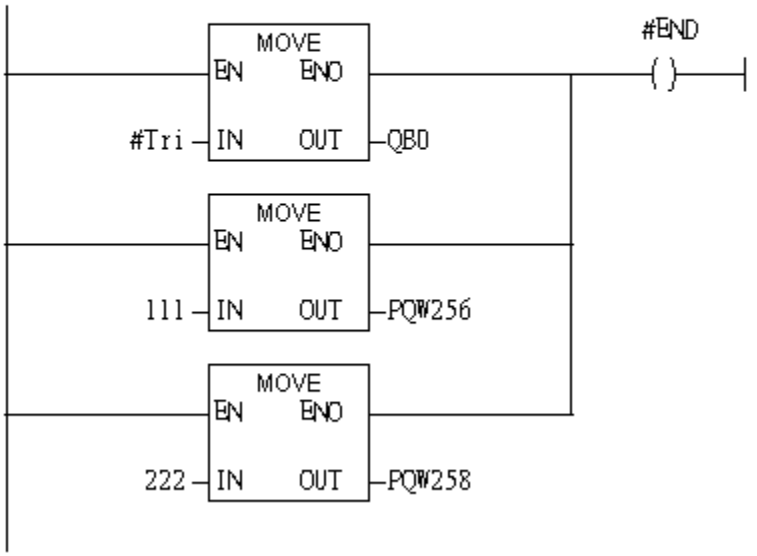
Network 1: Initial Cl

Initial Cl



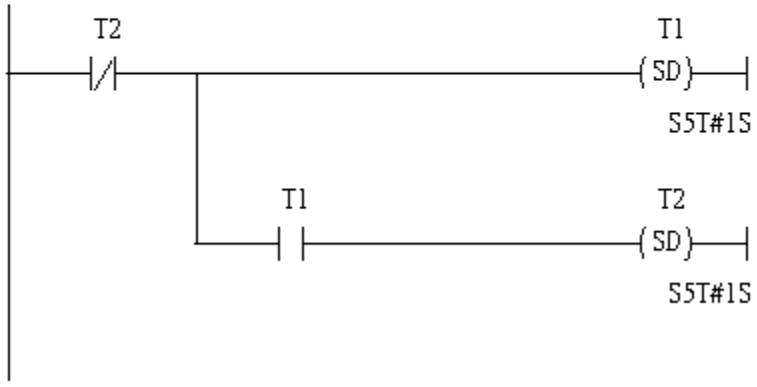
Network 2 : QB0 add "1" refresh AO value

2 word 2AO



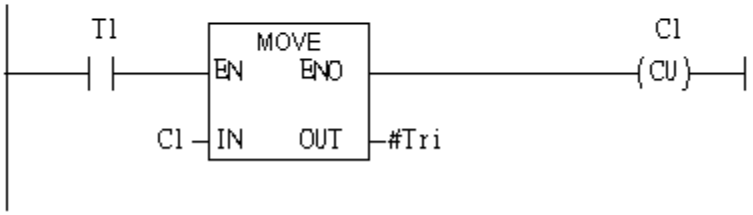
Network 3 : Timer T1 & T2

Using T2 trigger T1

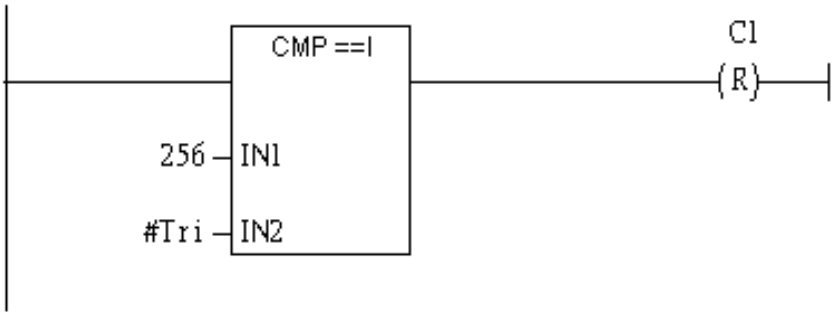


Network 4 : T1 trigger C1

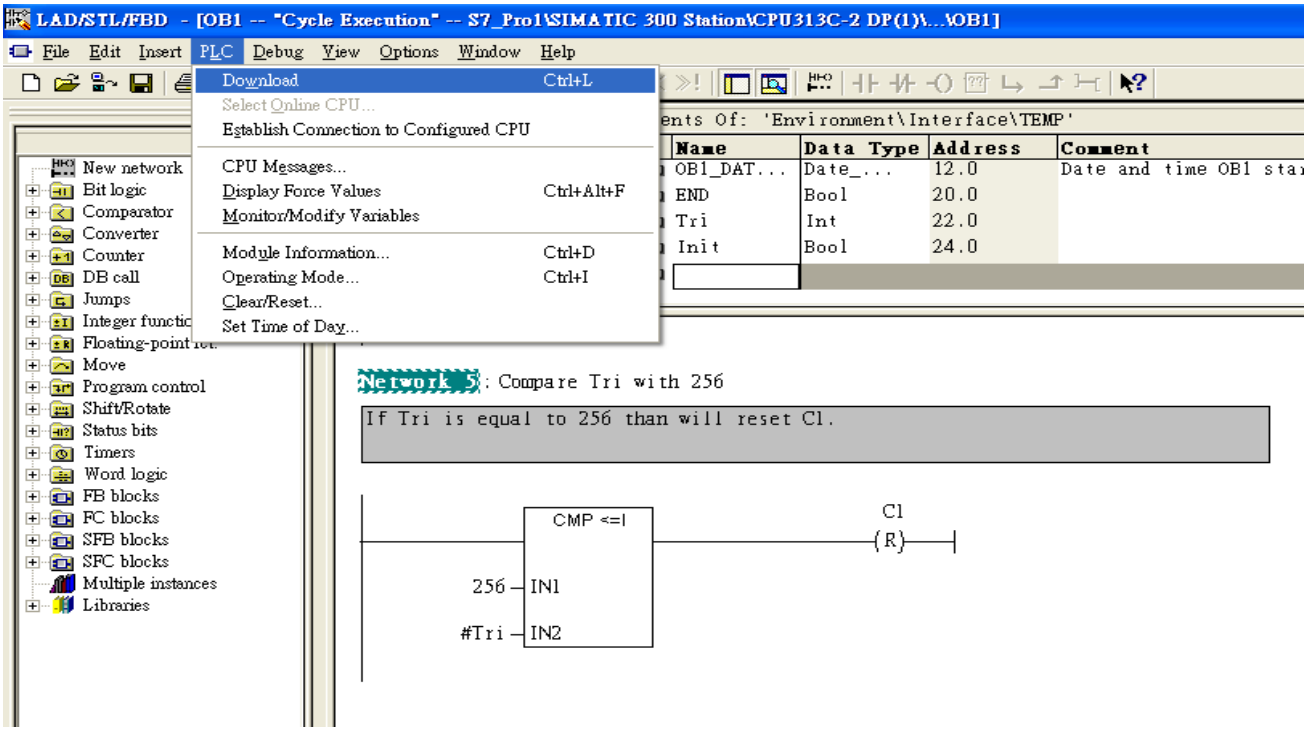
Counter(C1) add "1" and Tri add "1" ,too.



If Tri is equal to 256 that will reset C1.



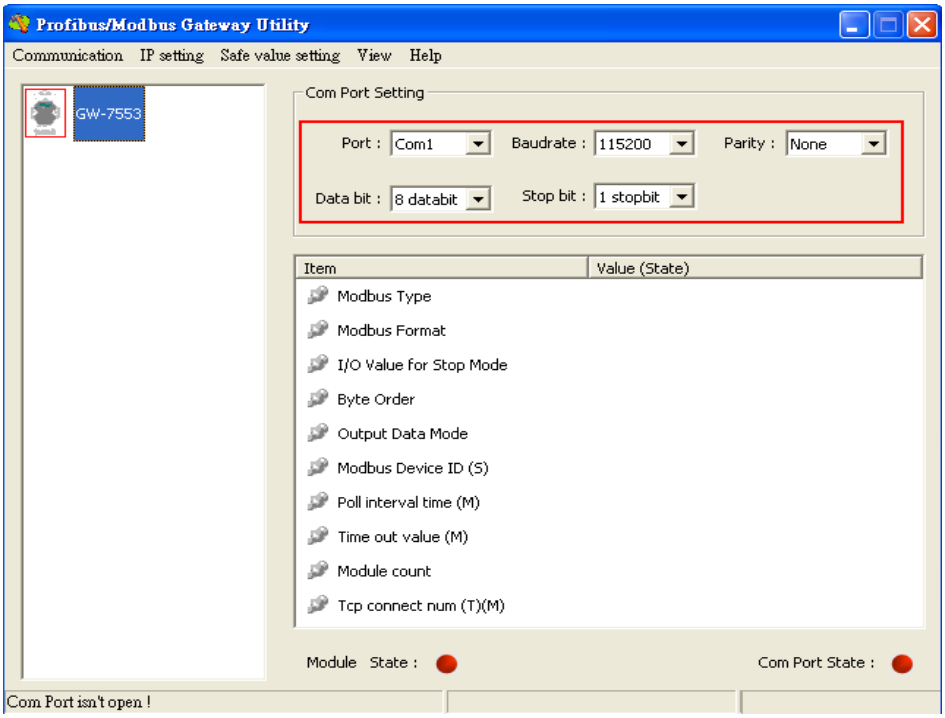
7. S7 program download



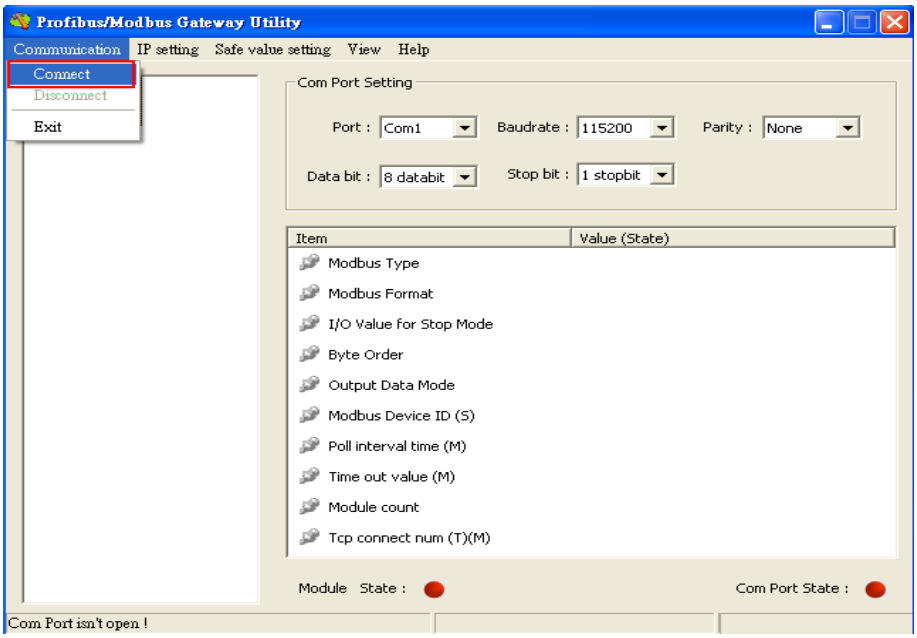
Setup IP of GW-7553 with Utility (the user can download the latest Utility at ftp://ftp.icpdas.com/pub/cd/fieldbus_cd/profibus/gateway/gw-7553/utilities/

1. Before the connection, please make sure the RUN LED of the GW-7553 is on and the switch of the GW-7553 is at setting mode.

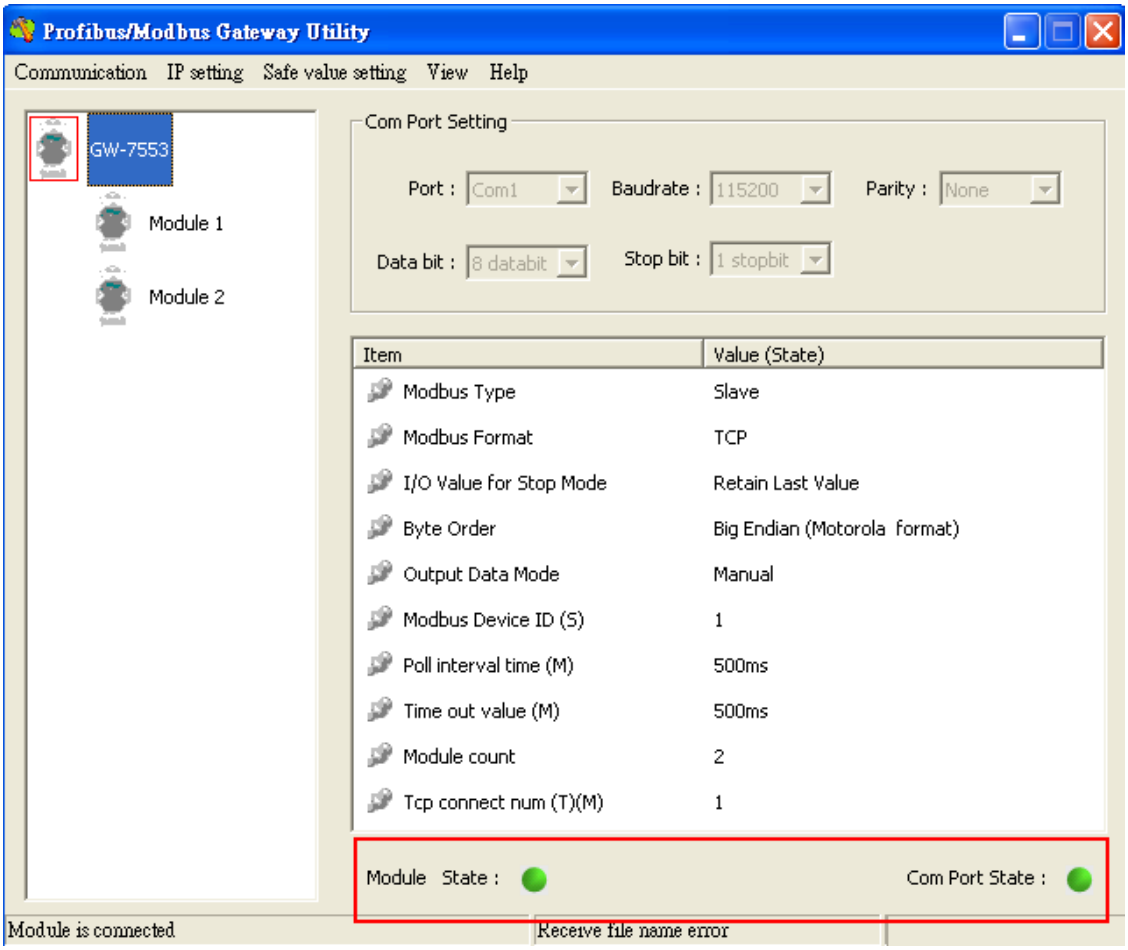
2. Set the Com Port Setting of the Utility



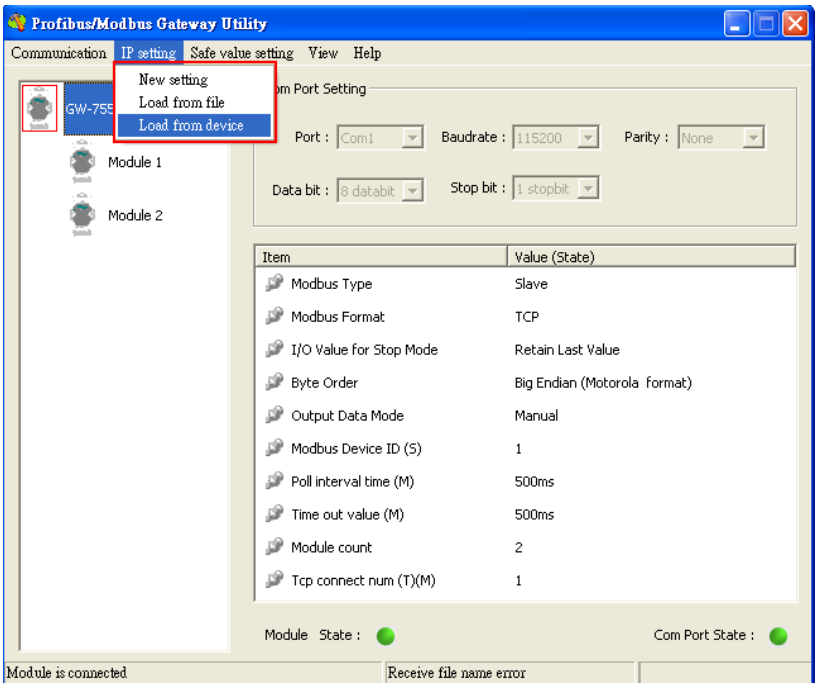
3.Click connect.



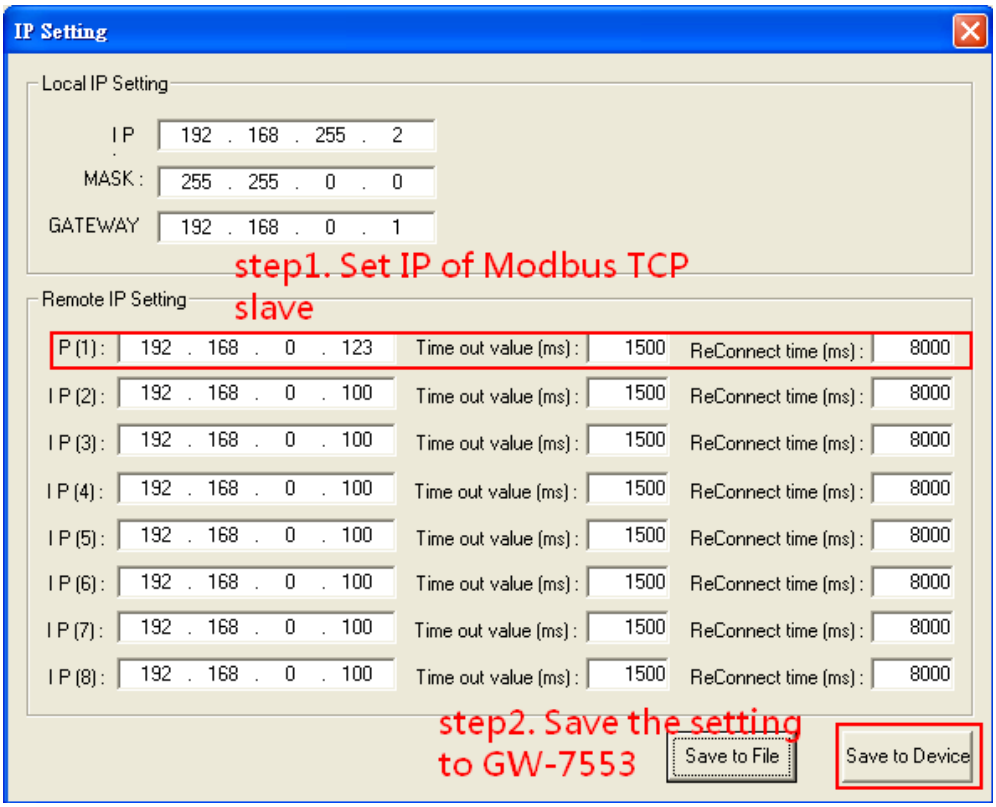
4. Connection success



5. Click IP setting→Load from device to show IP setting dialog



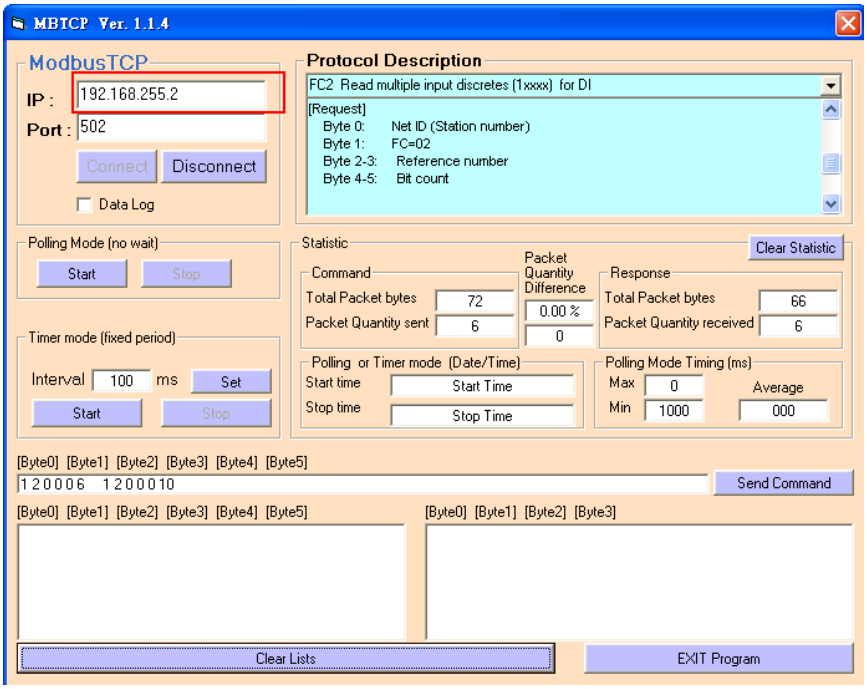
6. Set the IP of the Modbus TCP Slave and click “Save to Device” button to save the settings.



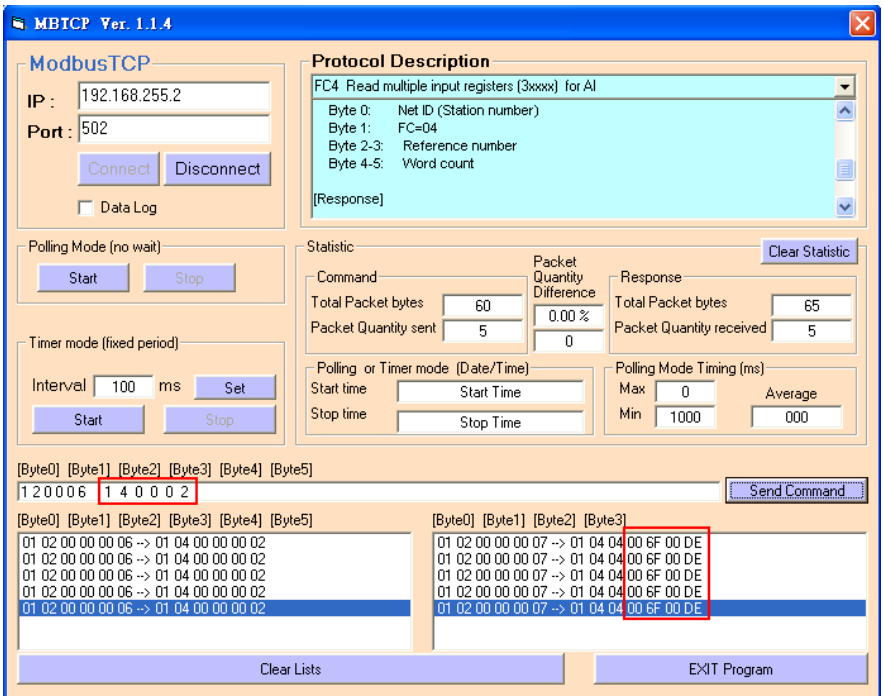
7.Set the switch of the GW-7553 to Normal Mode then reset the power ofGW-7553.

Communication test

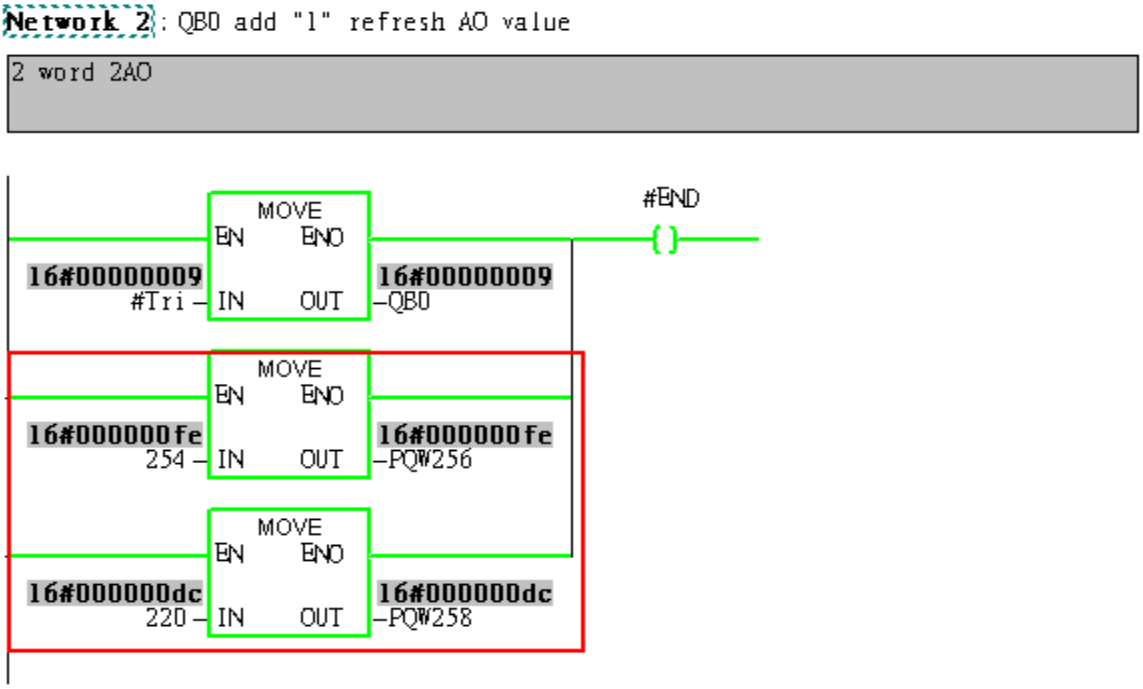
1. Confirm the GW-7553's Com Port setting is the same with Modbus Master tool (ex: MBTCP, you can download MBTCP from http://ftp.icpdas.com.tw/pub/cd/8000cd/napdos/modbus/modbus_utility/)

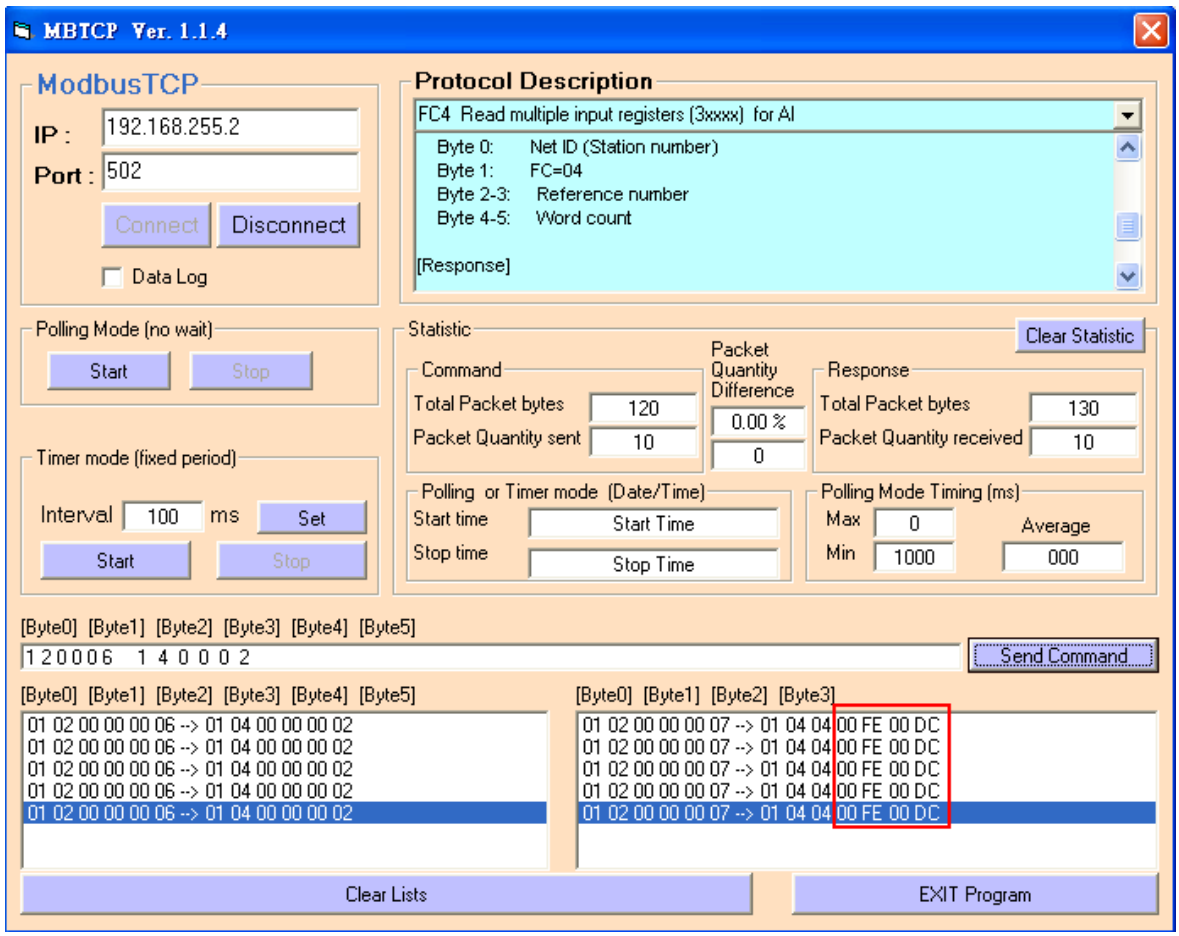


2. Input command (" 01 04 00 00 00 02") in MBTCP and click <Send Command> button to send Modbus command: "01 04 00 00 00 02". We can get the AI value (0x006F, 0x00DE) from the response message.



3. We change PQW256 to 0x00FE and PQW258 to 0x00DC, and then we can click <Send Command> button to read AI again at MBTCP and we will get the new AI value (0x00FE, 0x00DC) from the response message.




MBTCP Ver. 1.1.4
ModbusTCP
IP : 192.168.255.2
Port : 502
Connect
Disconnect
Data Log
Protocol Description
FC4 Read multiple input registers (3xxxx) for AI
Byte 0: Net ID (Station number)
Byte 1: FC=04
Byte 2-3: Reference number
Byte 4-5: Word count
[Response]
Polling Mode (no wait)
Start
Stop
Timer mode (fixed period)
Interval 100 ms
Set
Start
Stop
Statistic
Clear Statistic
Command
Total Packet bytes 120
Packet Quantity sent 10
Packet Quantity Difference
0.00 %
0
Response
Total Packet bytes 130
Packet Quantity received 10
Polling or Timer mode (Date/Time)
Start time Start Time
Stop time Stop Time
Polling Mode Timing (ms)
Max 0
Min 1000
Average 000
[Byte0] [Byte1] [Byte2] [Byte3] [Byte4] [Byte5]
1 2 0 0 0 6 1 4 0 0 0 2
Send Command
[Byte0] [Byte1] [Byte2] [Byte3] [Byte4] [Byte5]
01 02 00 00 00 06 --> 01 04 00 00 00 02
01 02 00 00 00 06 --> 01 04 00 00 00 02
01 02 00 00 00 06 --> 01 04 00 00 00 02
01 02 00 00 00 06 --> 01 04 00 00 00 02
01 02 00 00 00 06 --> 01 04 00 00 00 02
[Byte0] [Byte1] [Byte2] [Byte3]
01 02 00 00 00 07 --> 01 04 04 00 FE 00 DC
01 02 00 00 00 07 --> 01 04 04 00 FE 00 DC
01 02 00 00 00 07 --> 01 04 04 00 FE 00 DC
01 02 00 00 00 07 --> 01 04 04 00 FE 00 DC
01 02 00 00 00 07 --> 01 04 04 00 FE 00 DC
Clear Lists
EXIT Program