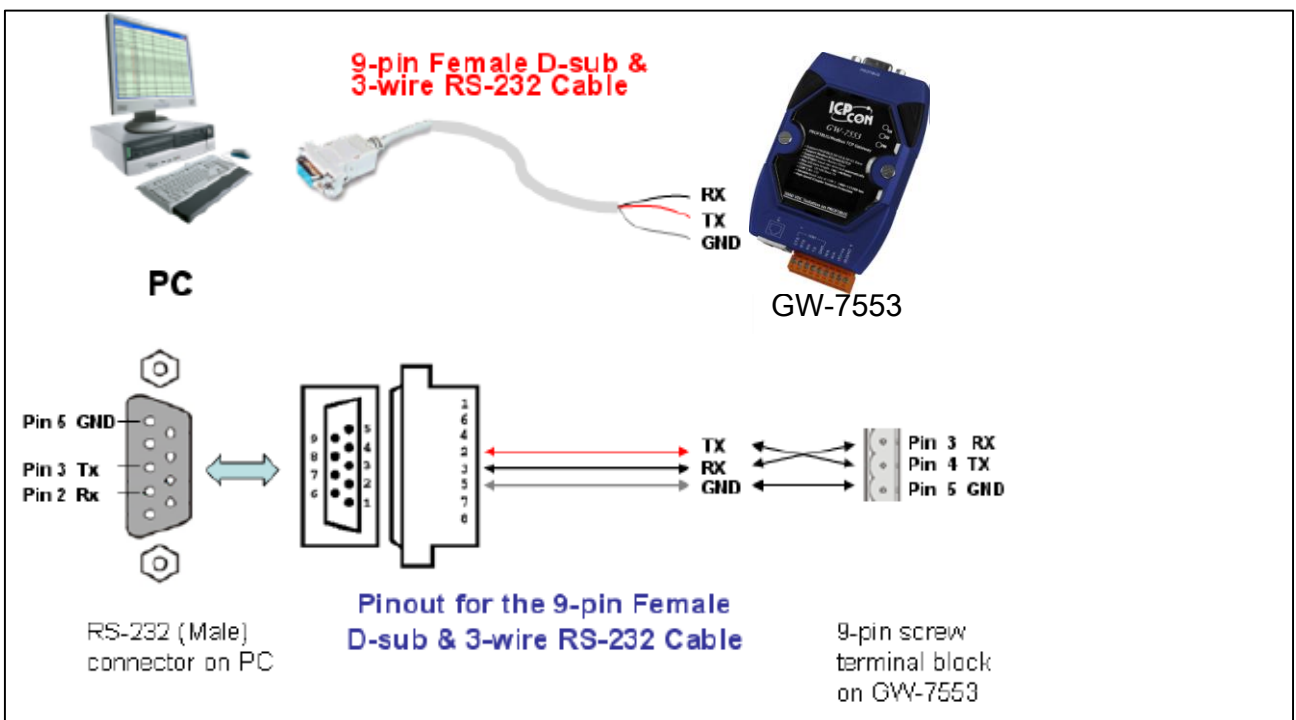
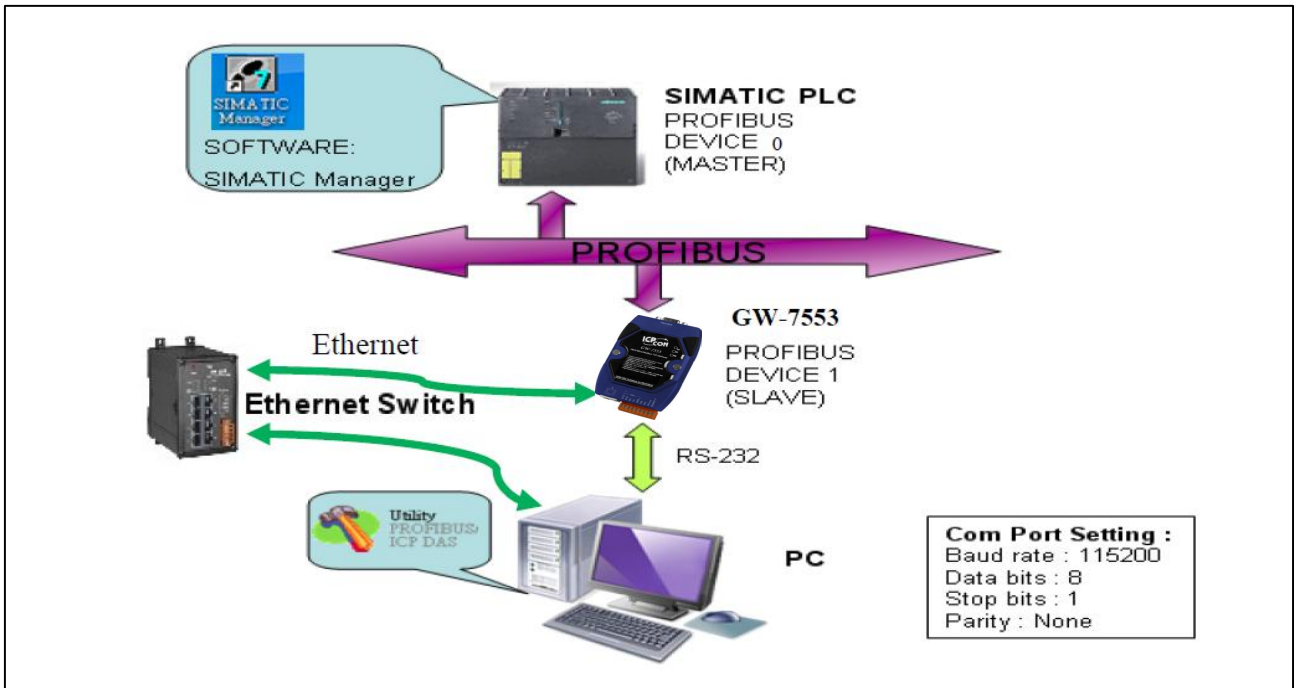


GW-7553 (Modbus TCP Slave)

example for SIMATIC STEP 7

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



Directory

[Example 1:Receives AO data from Modbus master.](#)

[Example 2: Rceives DO data from Modbus master.](#)

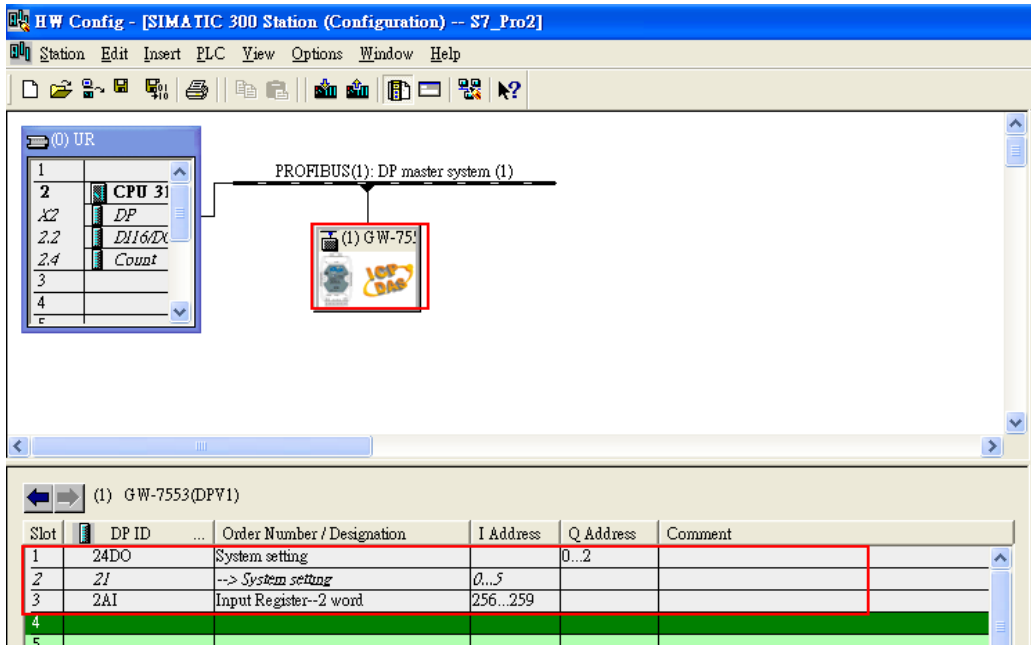
[Example 3: Rereshes DI data to Modbus master.](#)

[Example 4: Rereshes AI data to Modbus master.](#)

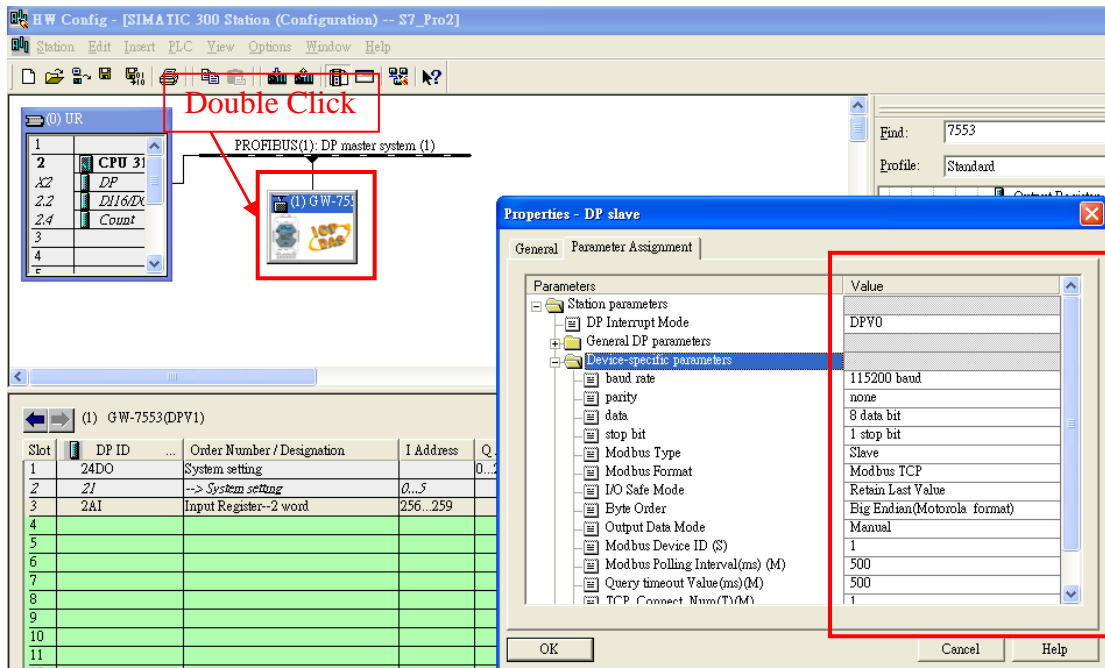
Example 1: PLC receives AO data from Modbus master.

SIMATIC STEP 7 Edit

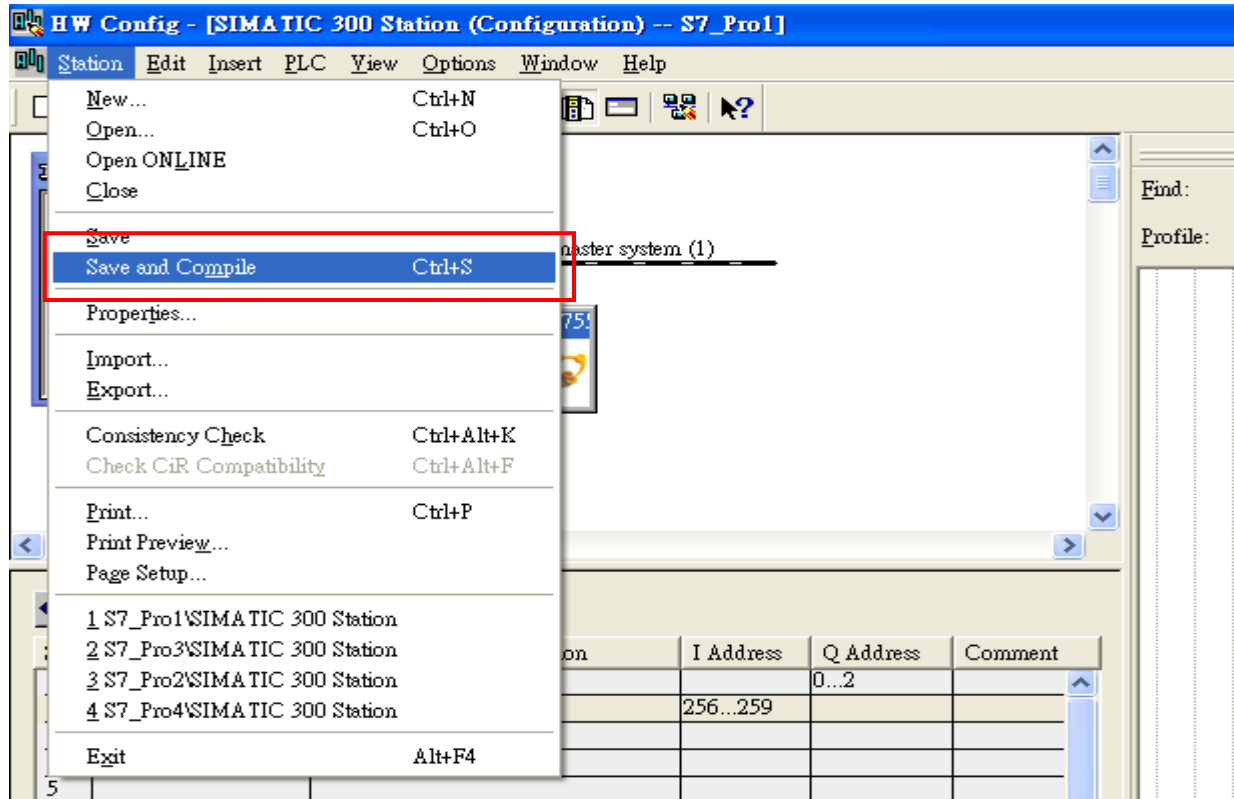
1. HW Config. – configure GW-7553 (ex: System setting module x1, Input Register—2 word module x1)



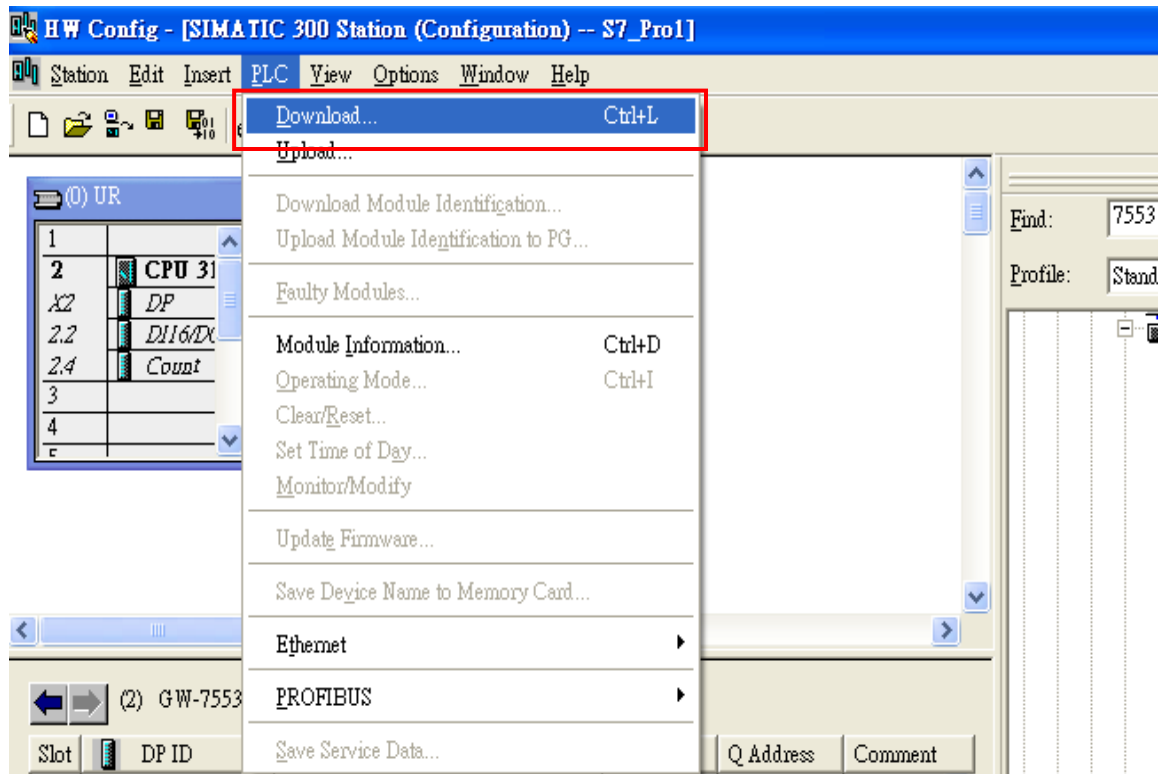
2. HW Config – Parameter assignment (ex: Com port settings, Modbus type: Slave, Modbus format: TCP, Byte Order: Big Endian). Confirm the GW-7553's Com Port setting is the same with MBTCP tool (ex: baud rate-115200, data bits-8, stop bits-1, parity-none). About the MBTCP tool, please refer to the “Communication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



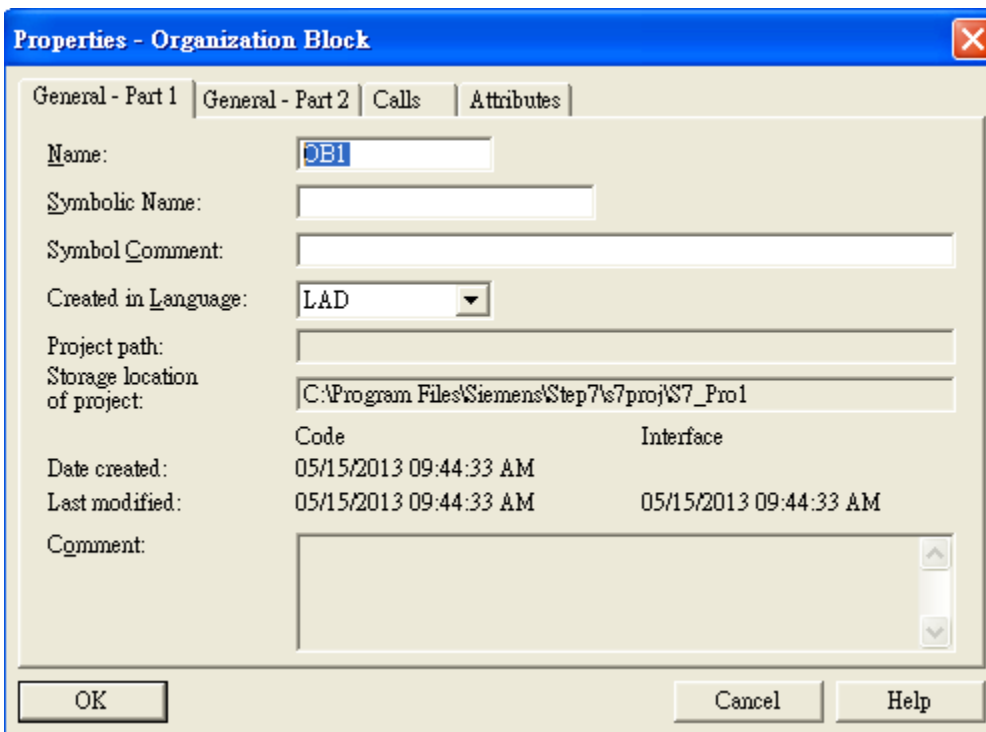
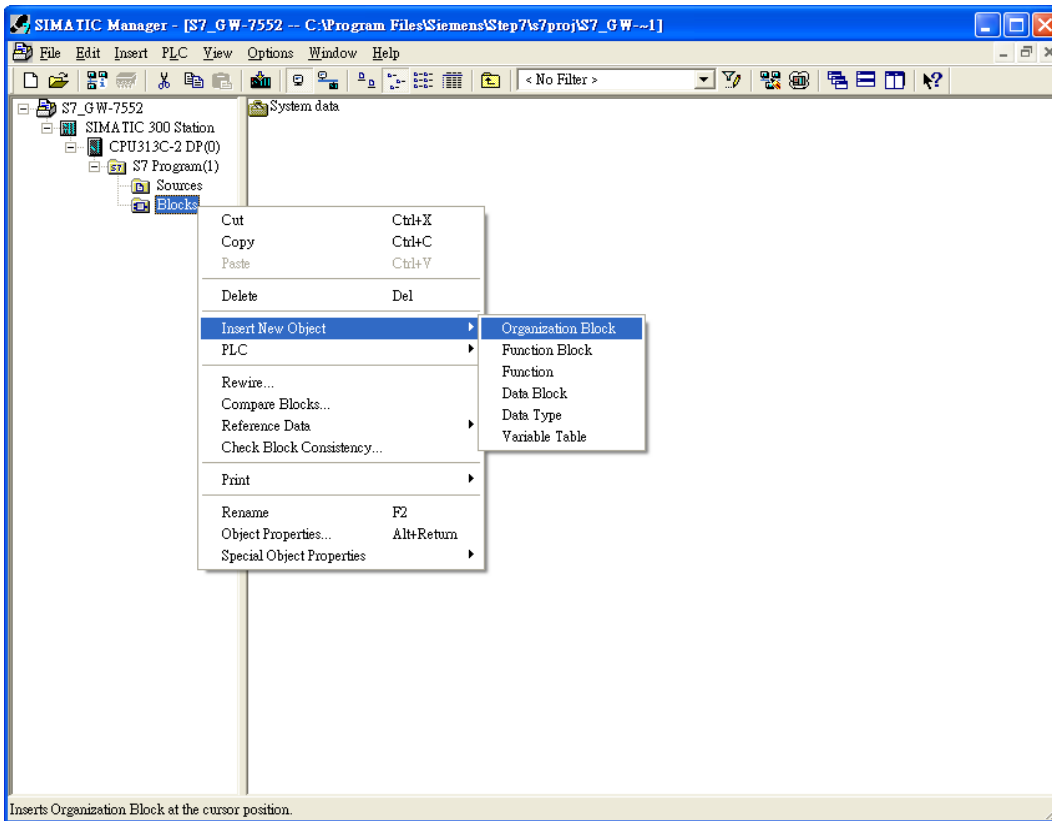
3. Save and Compile

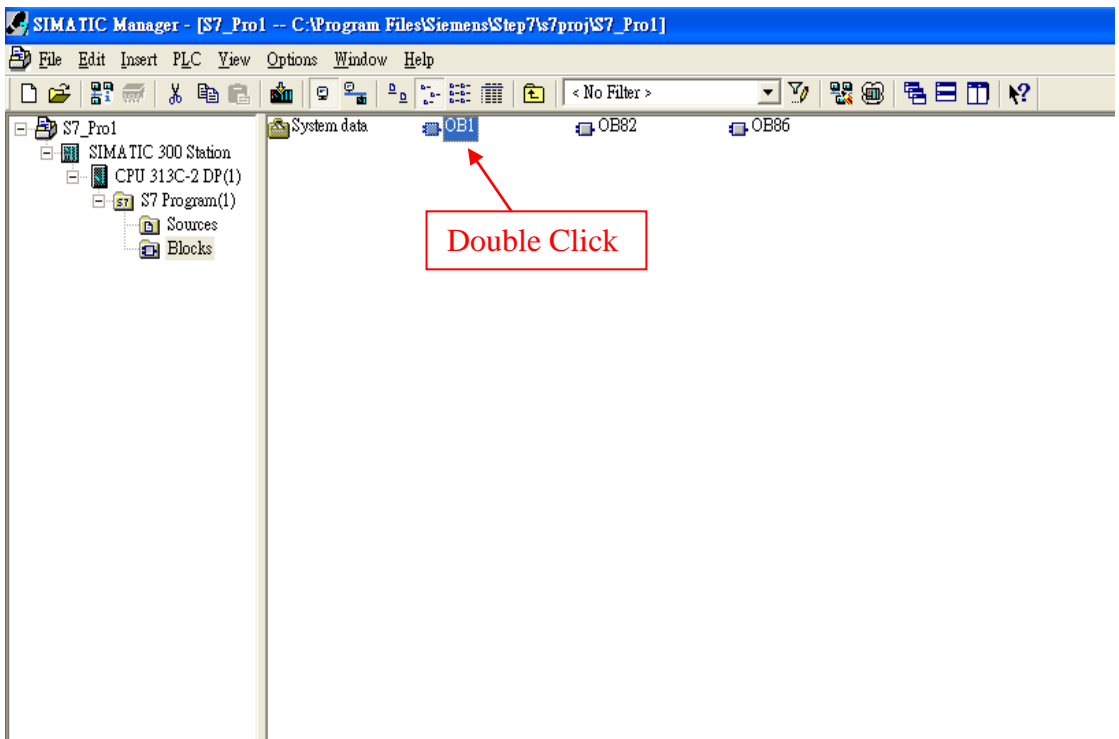


4. Download setting into STEP 7



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



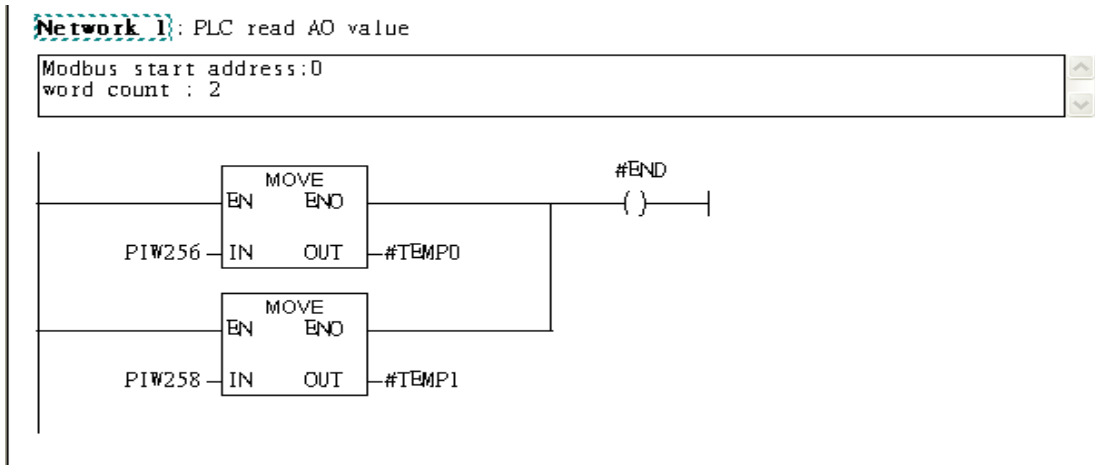


6.S7 program edit

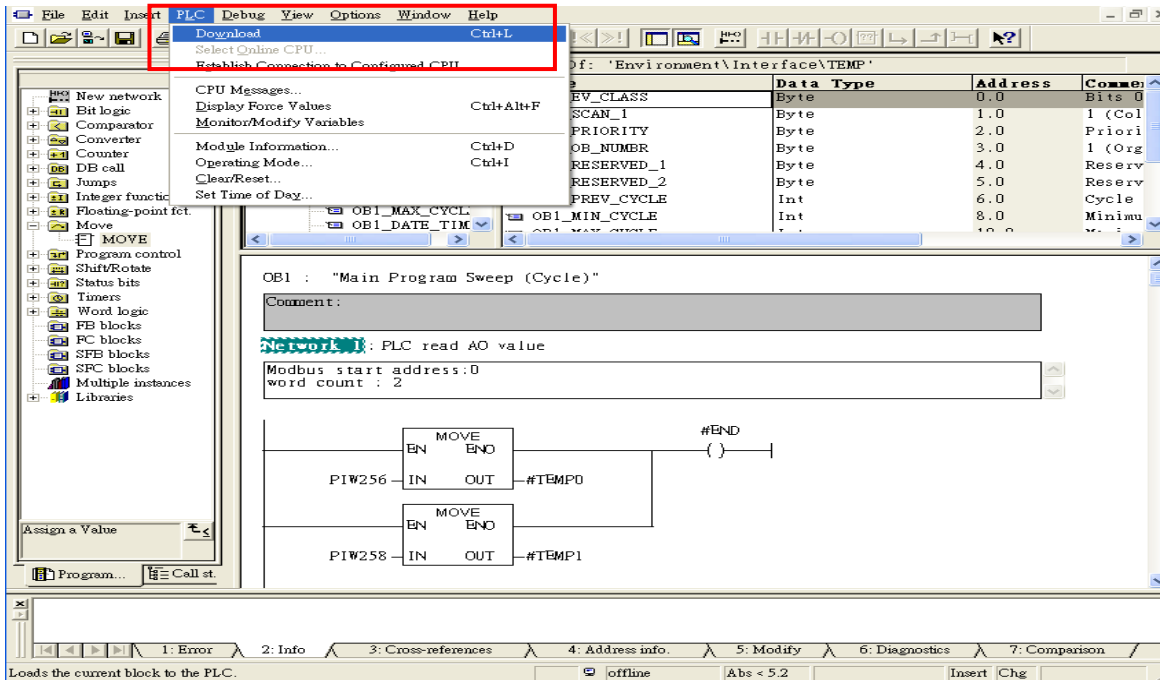
Variables used in the example LD Program:

Contents Of: 'Environment\Interface\TEMP'

Name	Data Type	Address	Comment
OB1_SCAN_1			
OB1_PRIORITY			
OB1_OB_NUMBR	Byte	3.0	1 (Organization block 1, OB1)
OB1_RESERVED_1	Byte	4.0	Reserved for system
OB1_RESERVED_2	Byte	5.0	Reserved for system
OB1_PREV_CYCLE	Int	6.0	Cycle time of previous OB1 scan (milliseconds)
OB1_MIN_CYCLE	Int	8.0	Minimum cycle time of OB1 (milliseconds)
OB1_MAX_CYCLE	Int	10.0	Maximum cycle time of OB1 (milliseconds)
OB1_DATE_TIME	Date_And_Time	12.0	Date and time OB1 started
END	Bool	20.0	
TEMPO	Word	22.0	
TEMP1	Word	24.0	



7. S7 program download



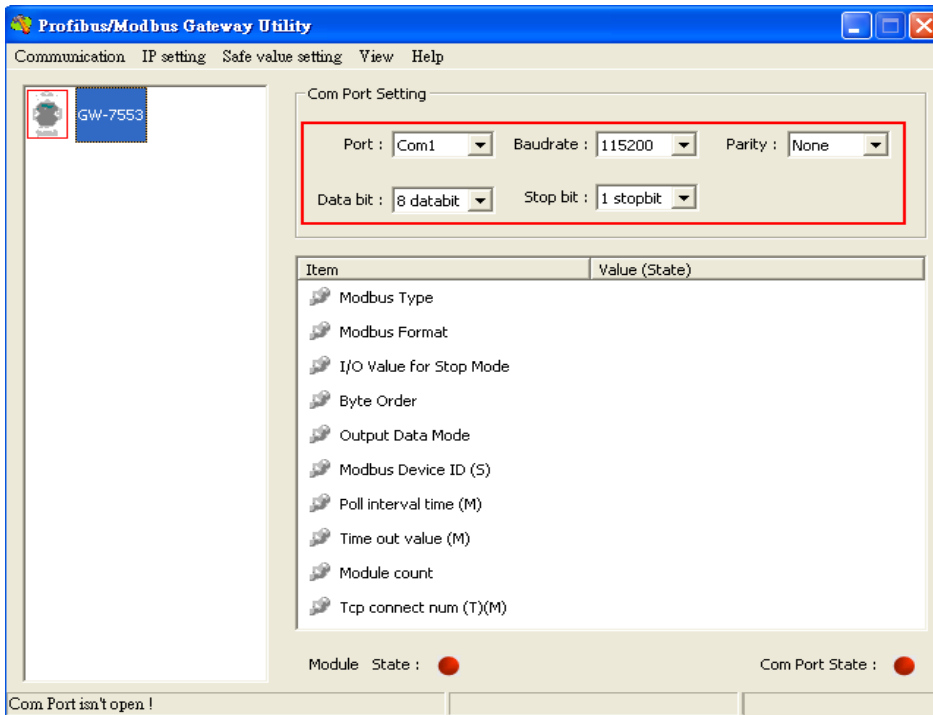
Setup IP of GW-7553 with Utility (the user can download the latest Utility at

ftp://ftp.icpdas.com/pub/cd/fieldbus_cd/profibus/gateway/gw-7553/utilities/

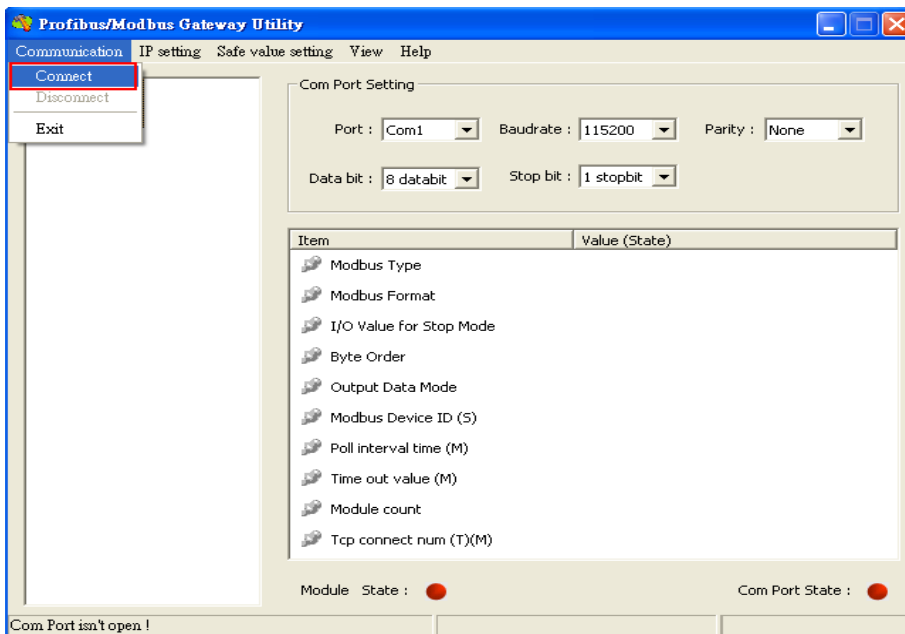
1. Before the connection, please make sure the RUN LED of the GW-7553 is on and the switch of the GW-7553 is at setting mode.



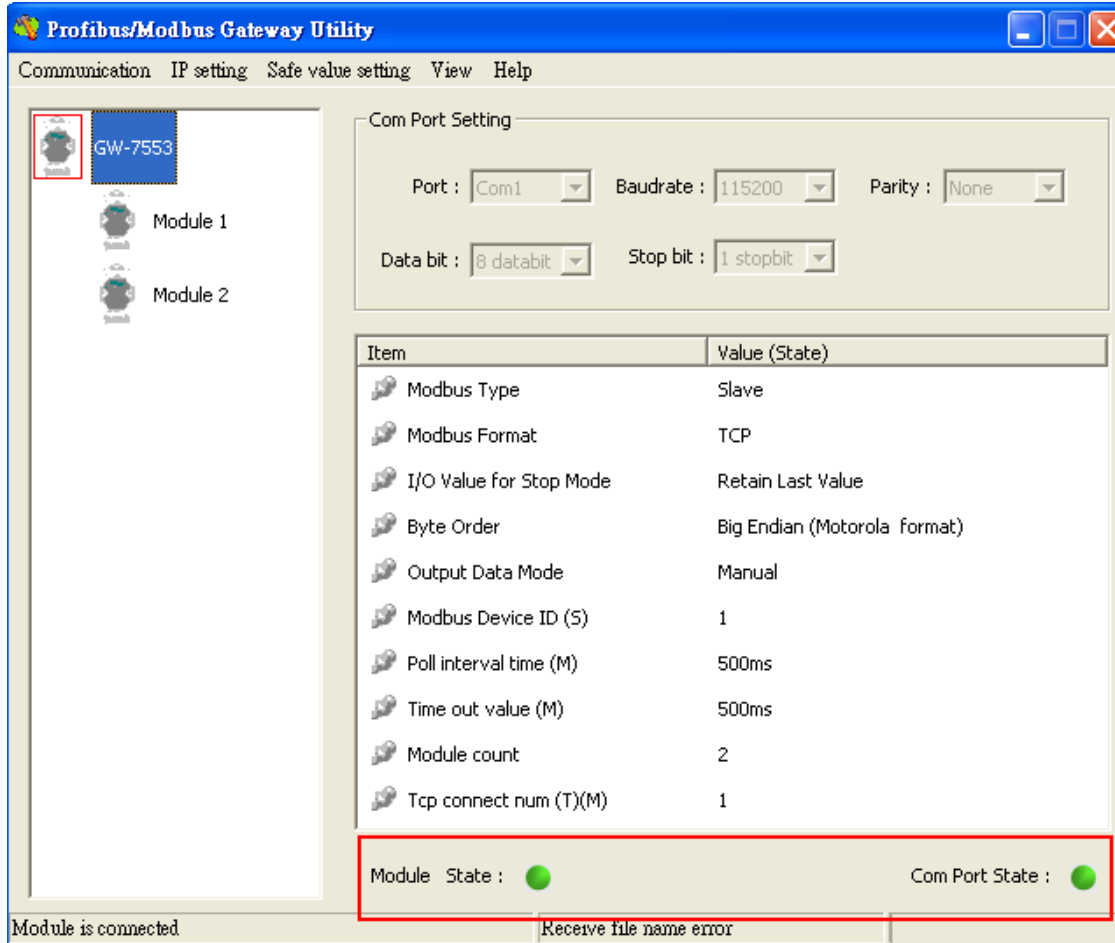
2. Set the Com Port Setting of the Utility



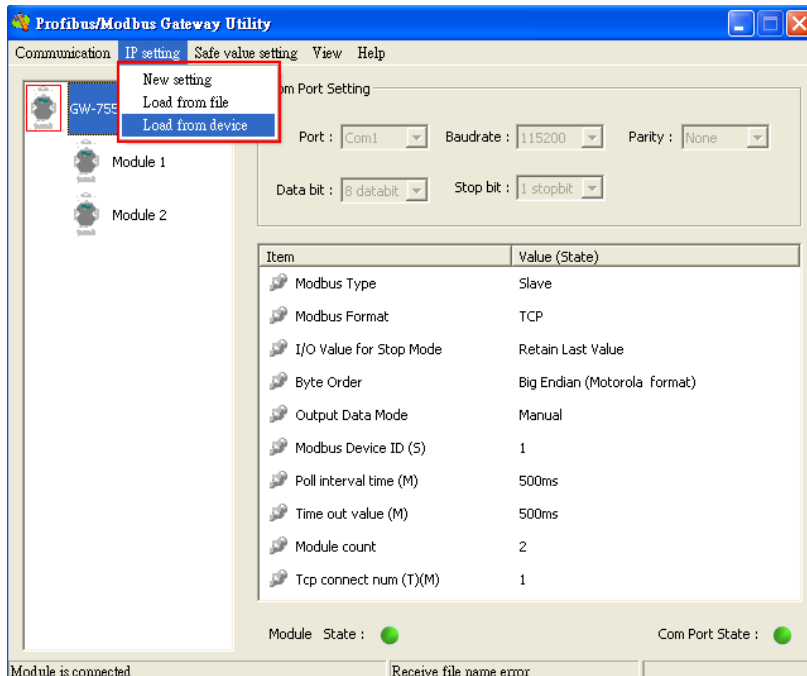
3. Click connect.



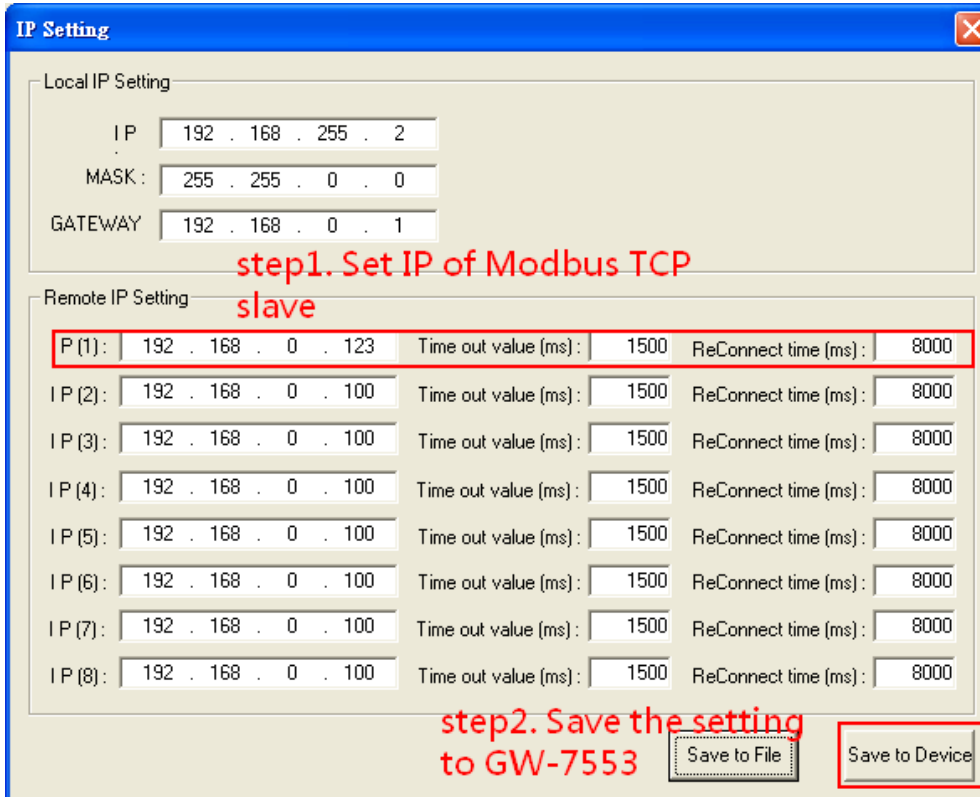
4. Connection success



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.

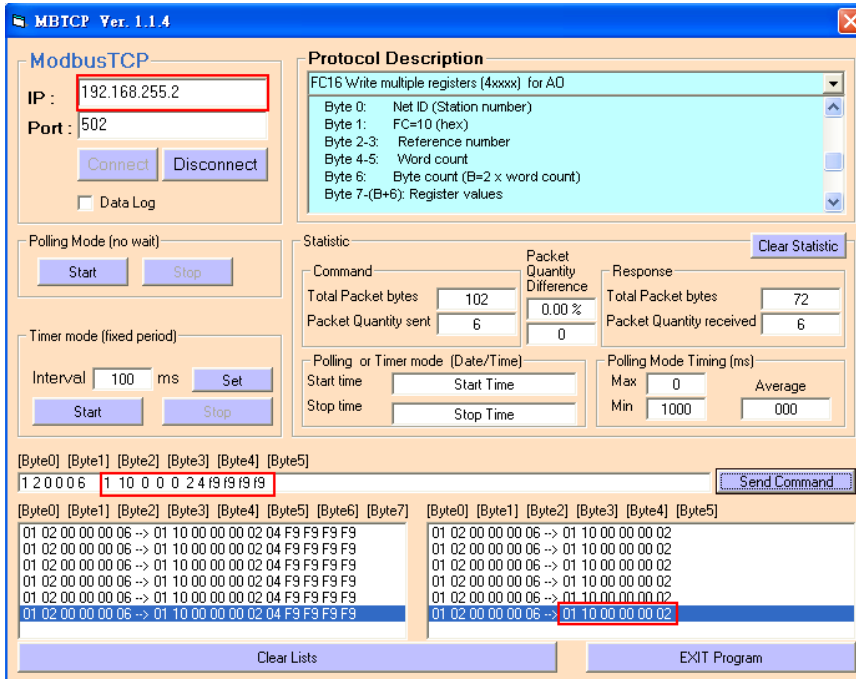


7. Set the switch of the GW-7553 to Normal Mode then reset the power of GW-7553.



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



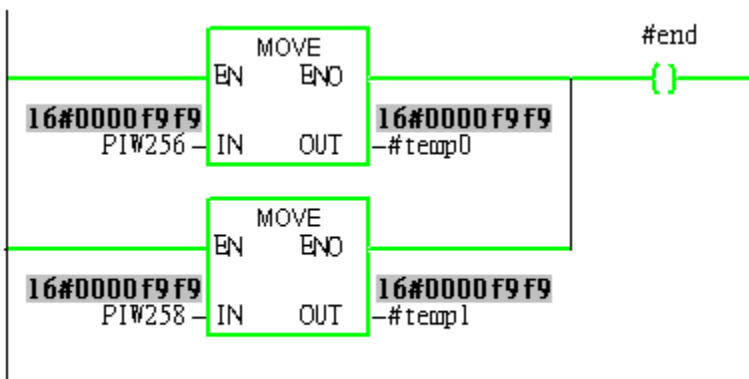
4. PLC will receives the "AO Value (0xF9, 0xF9, 0xF9, 0xF9)" at PLC address PIW256, PIW257, PIW258, PIW259

OBI : "Main Program Sweep (Cycle)"

Comment:

Network 1: Title:

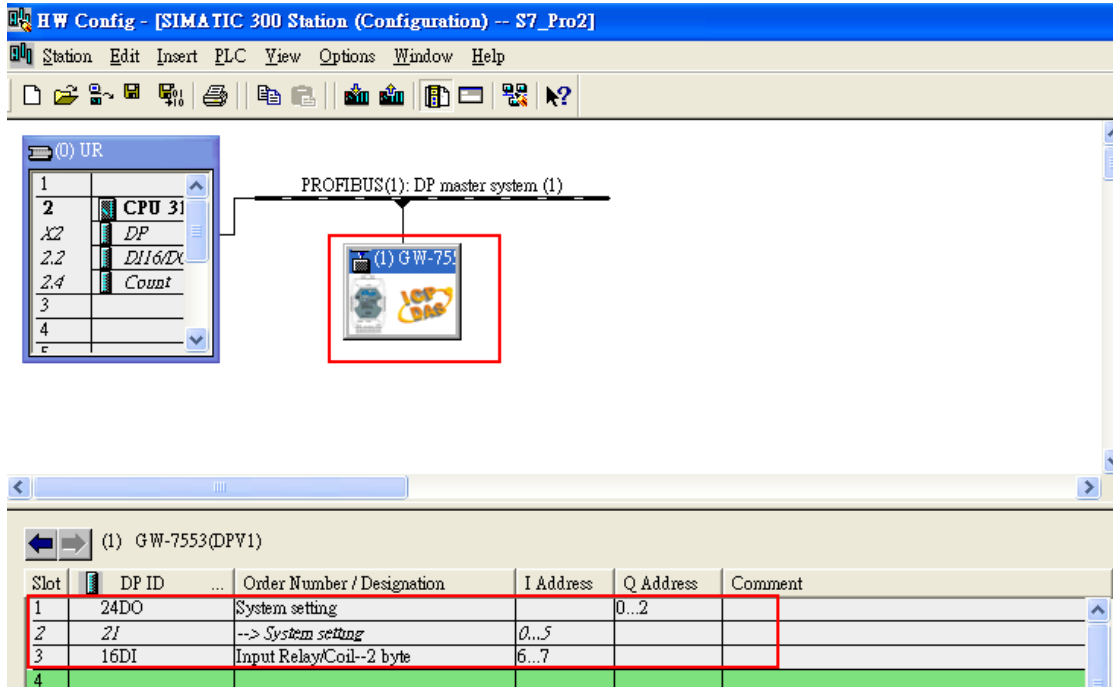
Comment:



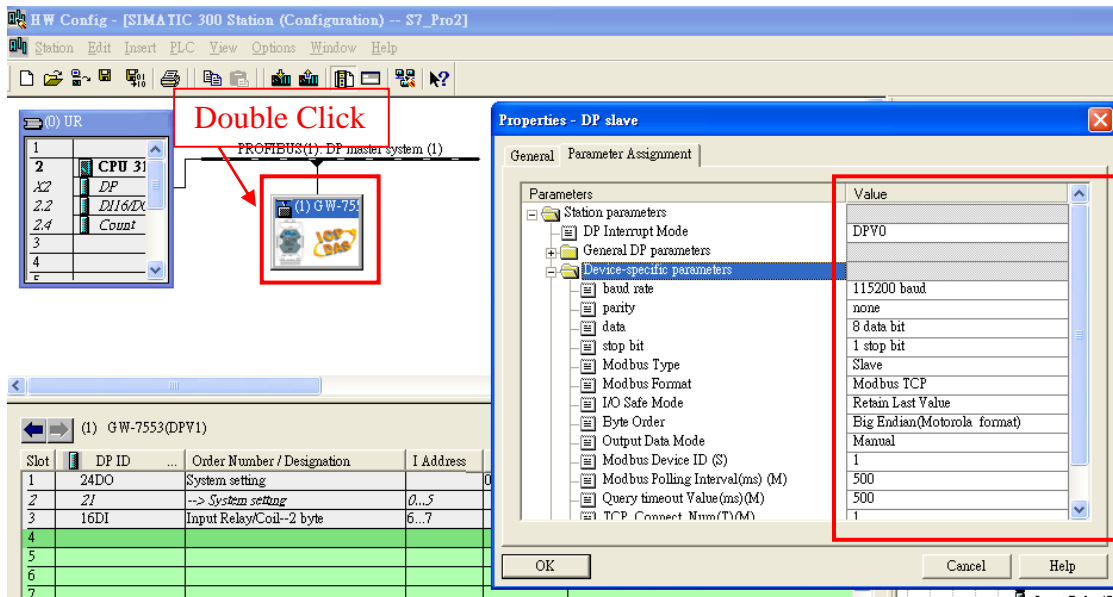
Example 2: PLC receives DO data from Modbus master.

SIMATIC STEP 7 Edit

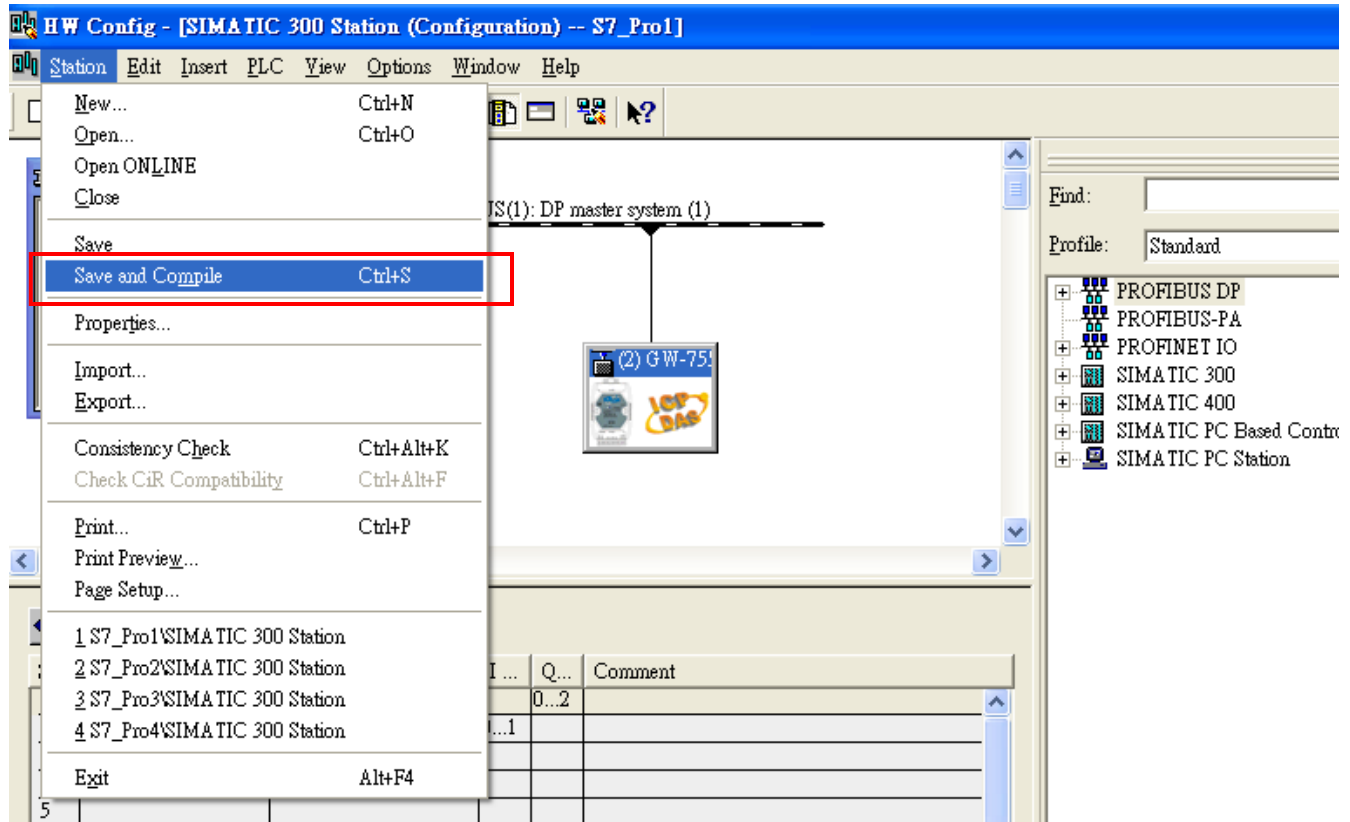
1. HW Config. – configure GW-7553 (ex: System setting module x1, Input Relay/Coil – 2 byte module x1)



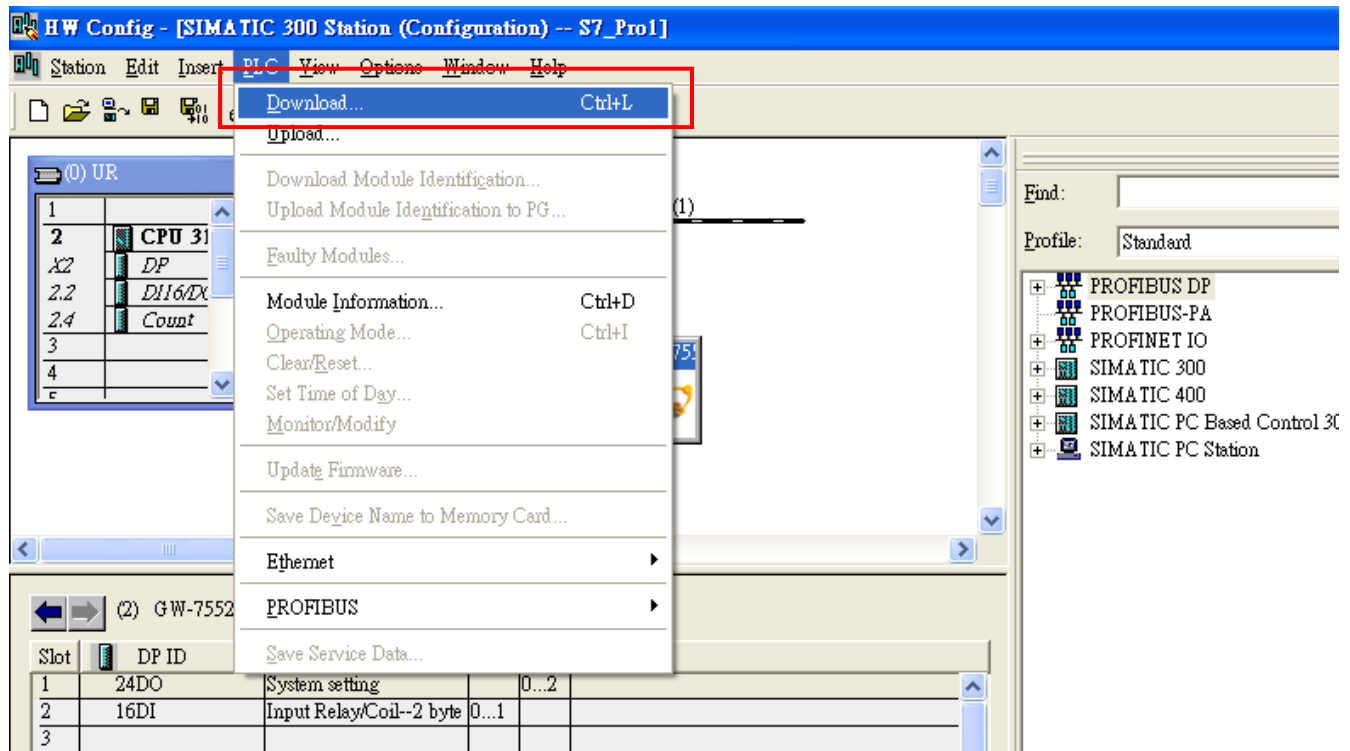
2. HW Config – Parameter assignment (ex: Com port settings, Modbus type: Slave, Modbus format: TCP, Byte Order: Big Endian). Confirm the GW-7553's Com Port setting is the same with MBTCP tool (ex: baud rate-115200, data bits-8, stop bits-1, parity-none). About the MBTCP tool, please refer to the “Communication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



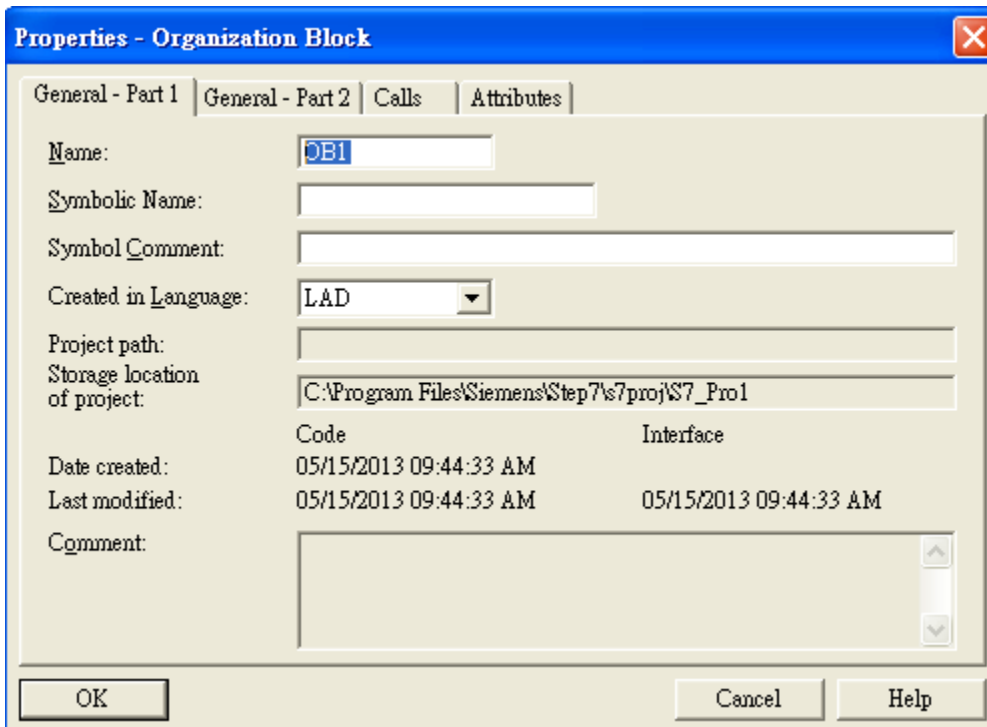
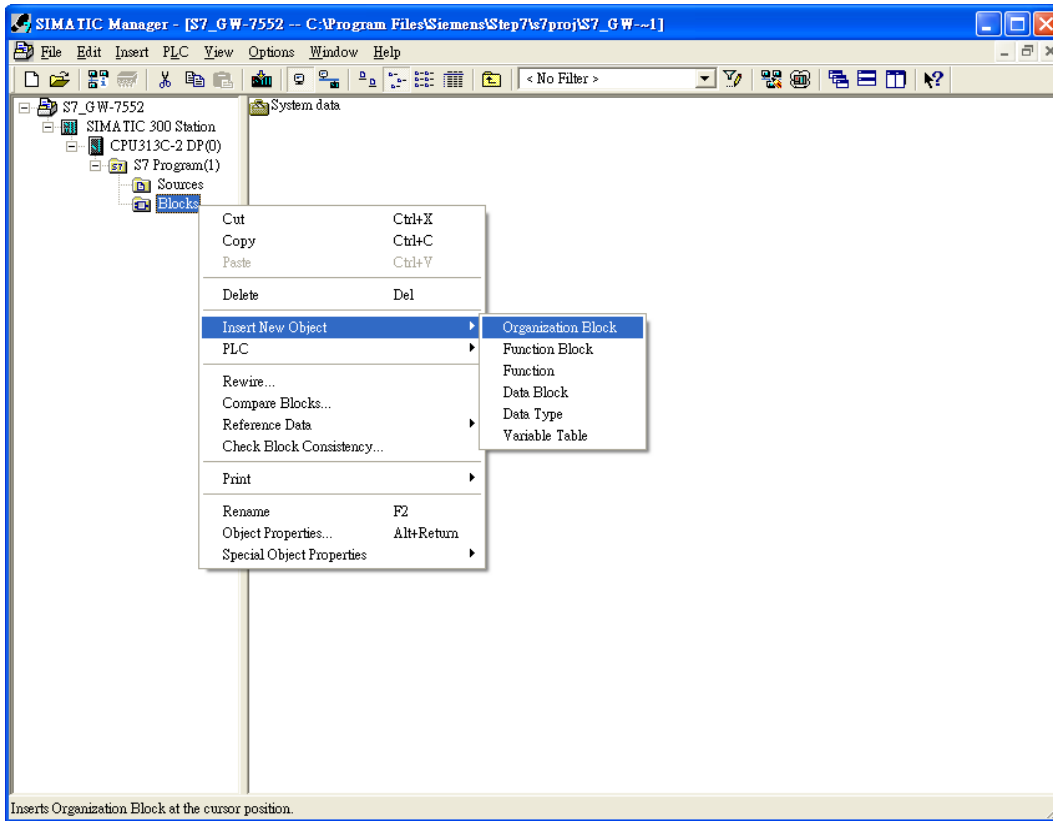
3. Save and Compile

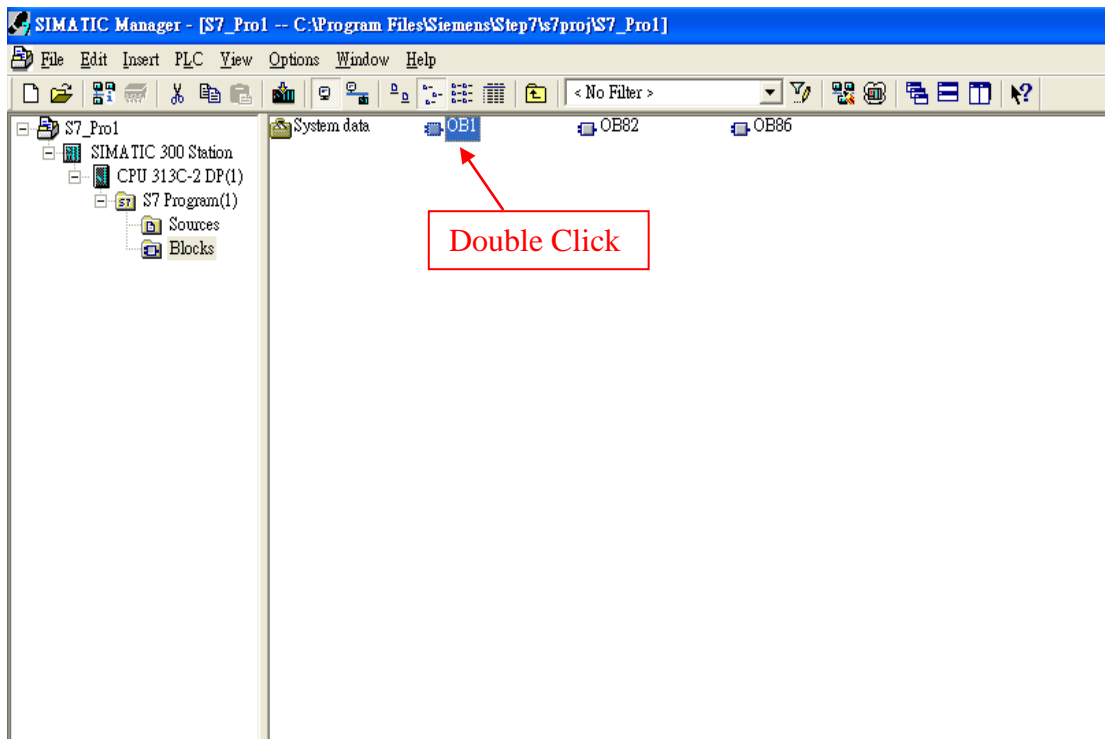


4. Download setting into STEP 7



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





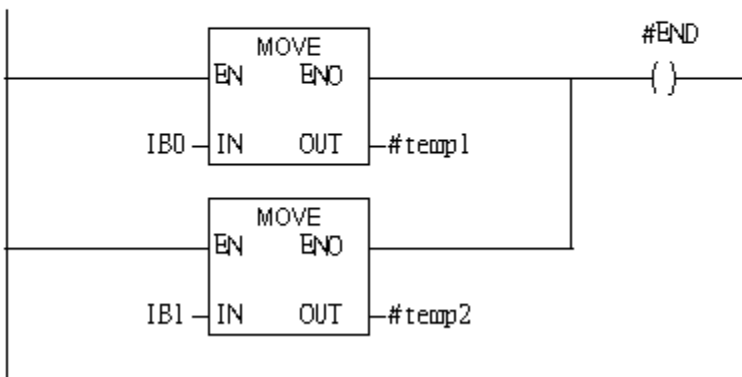
6. S7 program edit

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

The screenshot shows the SIMATIC Manager interface. The 'Download' menu is open, displaying options such as 'Select Online CPU...', 'Establish Connection to Configured CPU', 'CPU Messages...', 'Display Force Values', 'Monitor/Modify Variables', 'Module Information...', 'Operating Mode...', 'Clear/Reset...', and 'Set Time of Day...'. The main workspace displays a ladder logic network with two 'MOVE' blocks. The first block has 'IB0' as the input and '#temp1' as the output. The second block has 'IB1' as the input and '#temp2' as the output. A common output line connects the outputs of both blocks to a coil labeled '#END'. A table in the background lists variables:

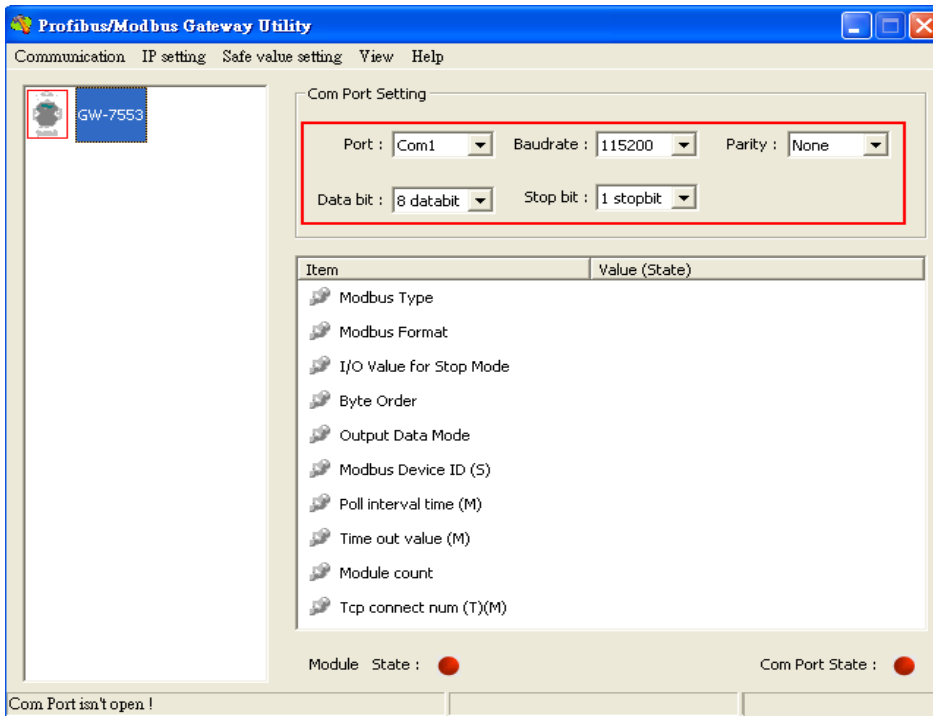
Name	Data Type	Address	Comment
OBI_DAT...	Date_...	12.0	Date and time OBI s
END	Bool	20.0	
temp1	Byte	21.0	
temp2	Byte	22.0	

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/)

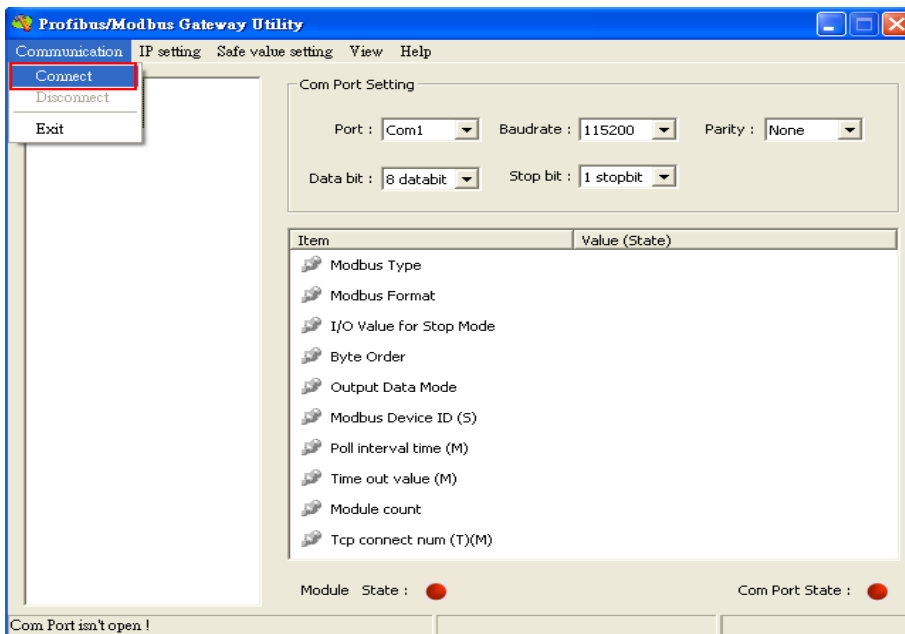
1. Before the connection, please make sure the RUN LED of the GW-7553 is on and the switch of the GW-7553 is at setting mode.



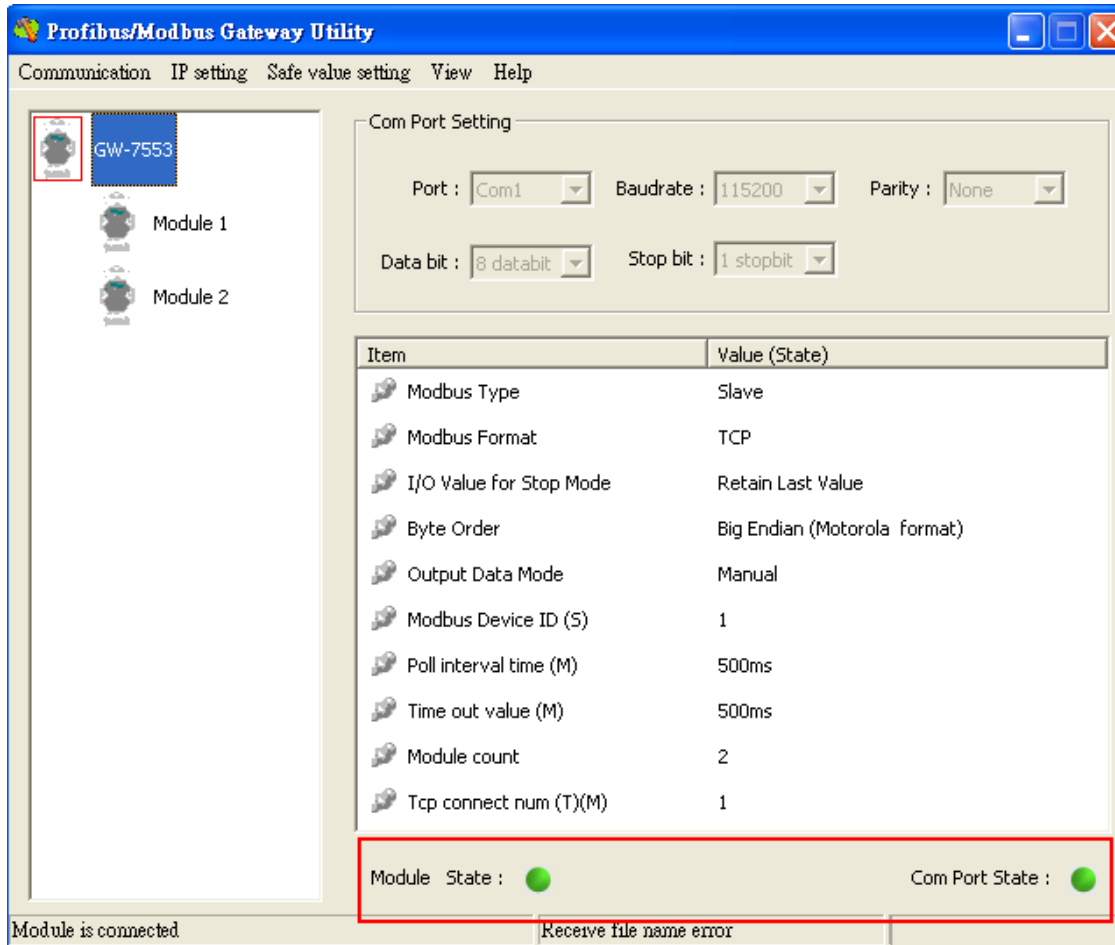
2. Set the Com Port Setting of the Utility



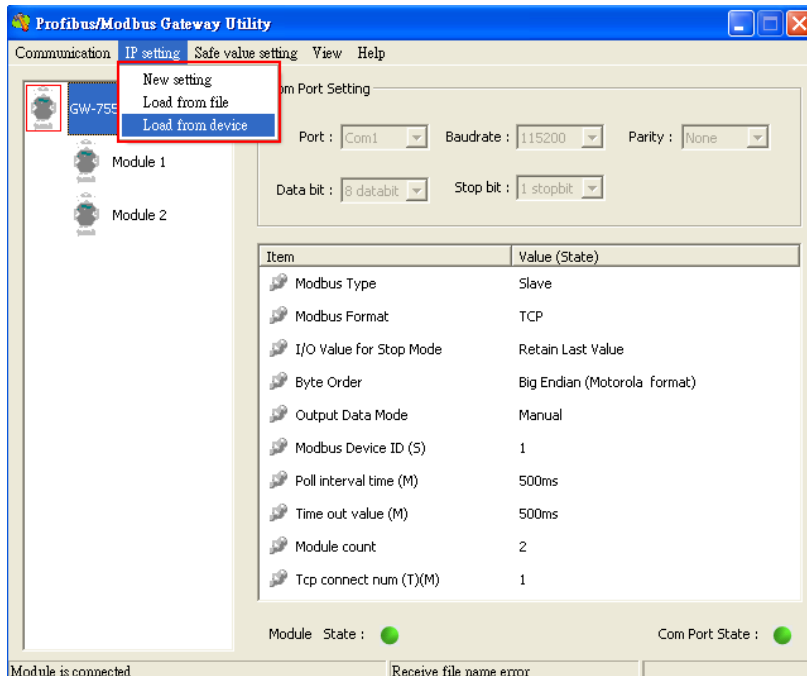
3. Click connect.



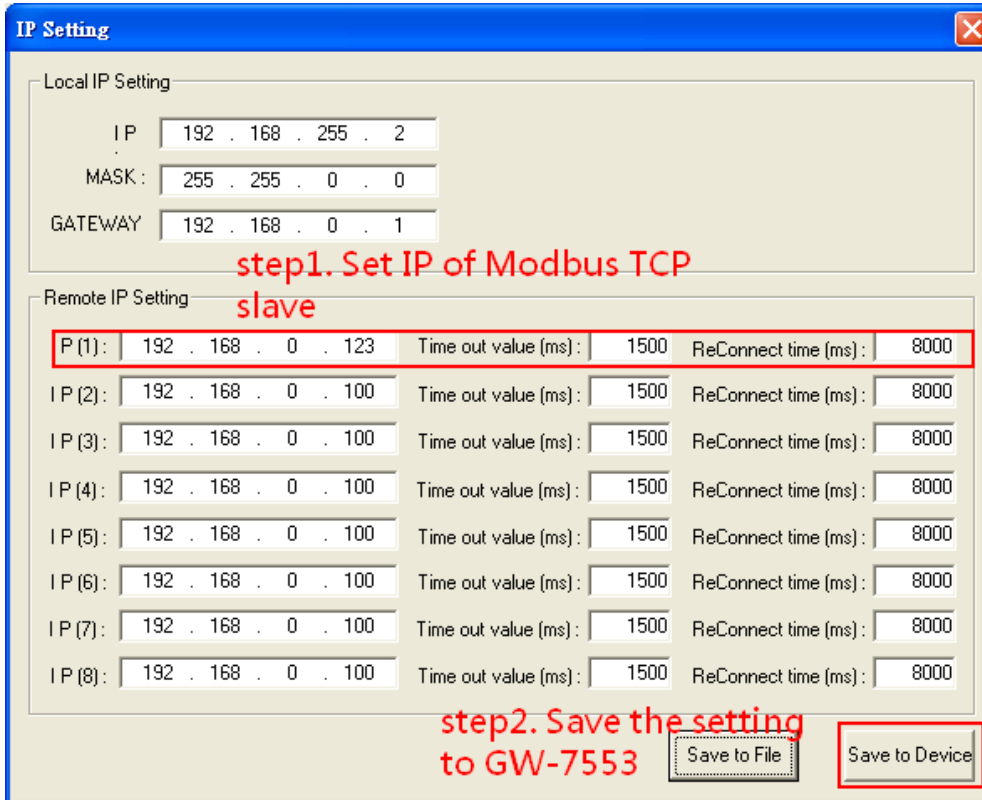
4. Connection success



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.

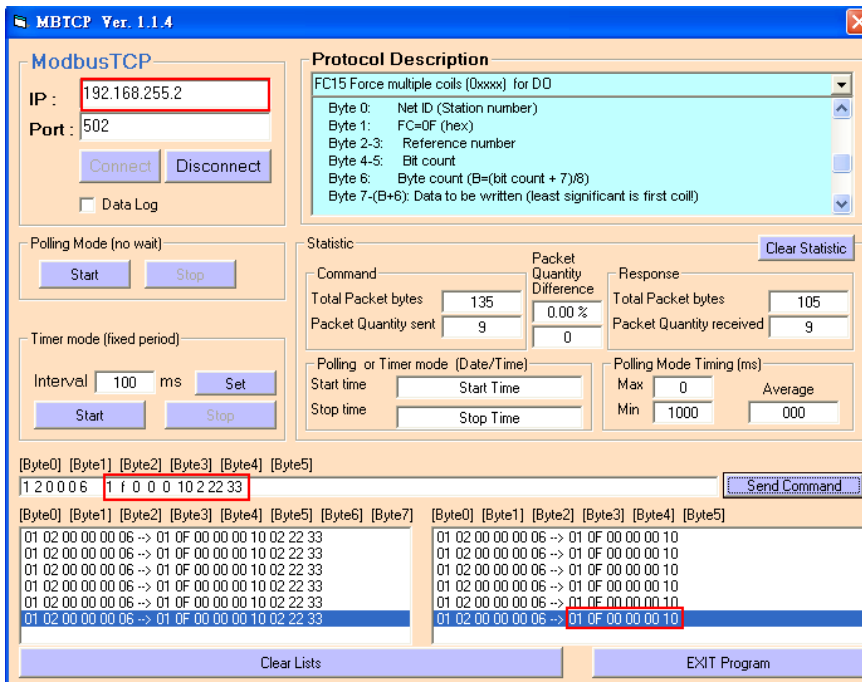


7. Set the switch of the GW-7553 to Normal Mode then reset the power of GW-7553.



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



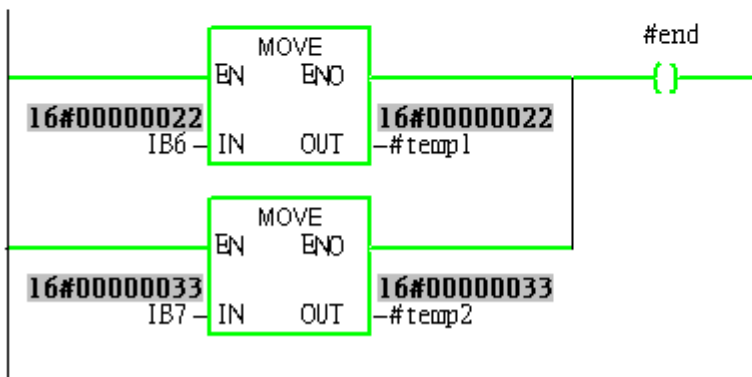
4. PLC will receives the "DO Value (0x22, 0x33)" at PLC address IB6&IB7.

OBI : "Main Program Sweep (Cycle)"

Comment:

Network 1: Title:

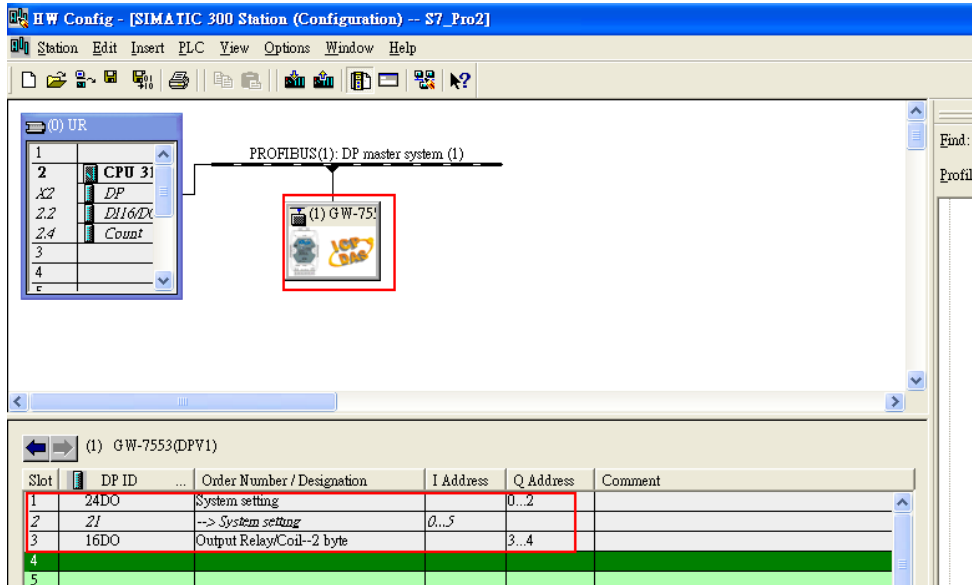
Comment:



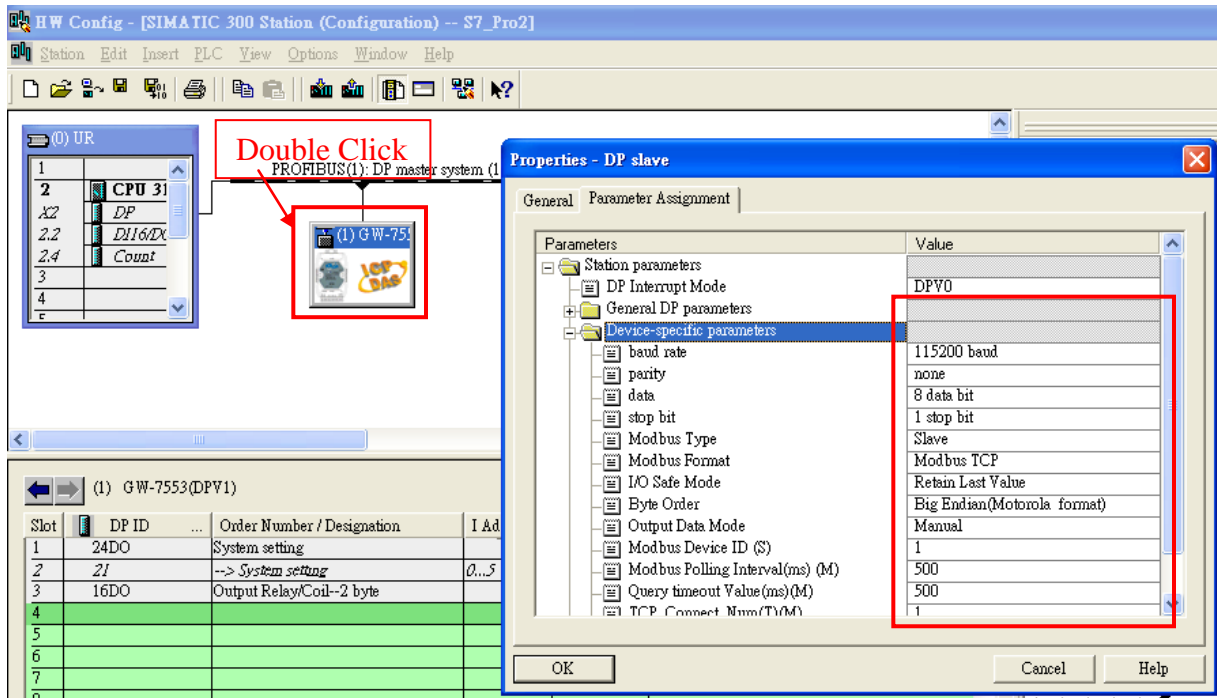
Example 3: PLC refreshes DI data to Modbus master.

SIMATIC STEP 7 Edit

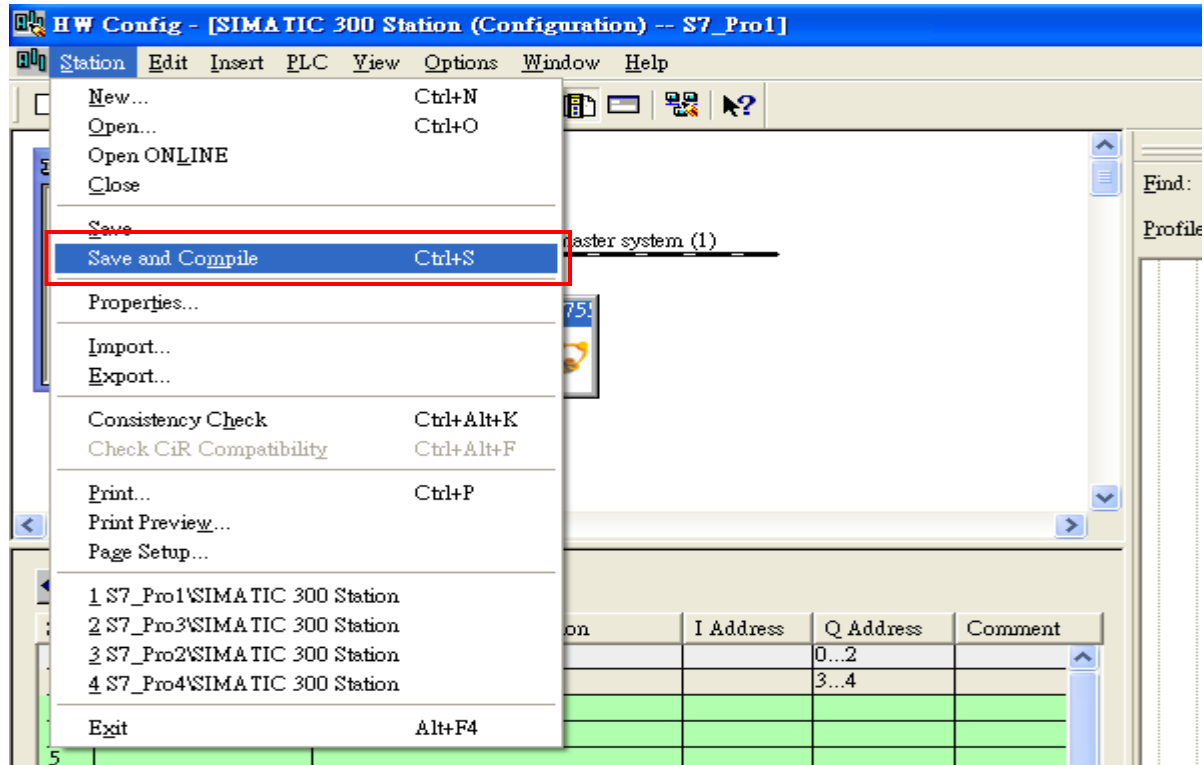
1.HW Config. – configure GW-7553 (ex: System setting module x1, Output Relay/Coil—2 byte module x1)



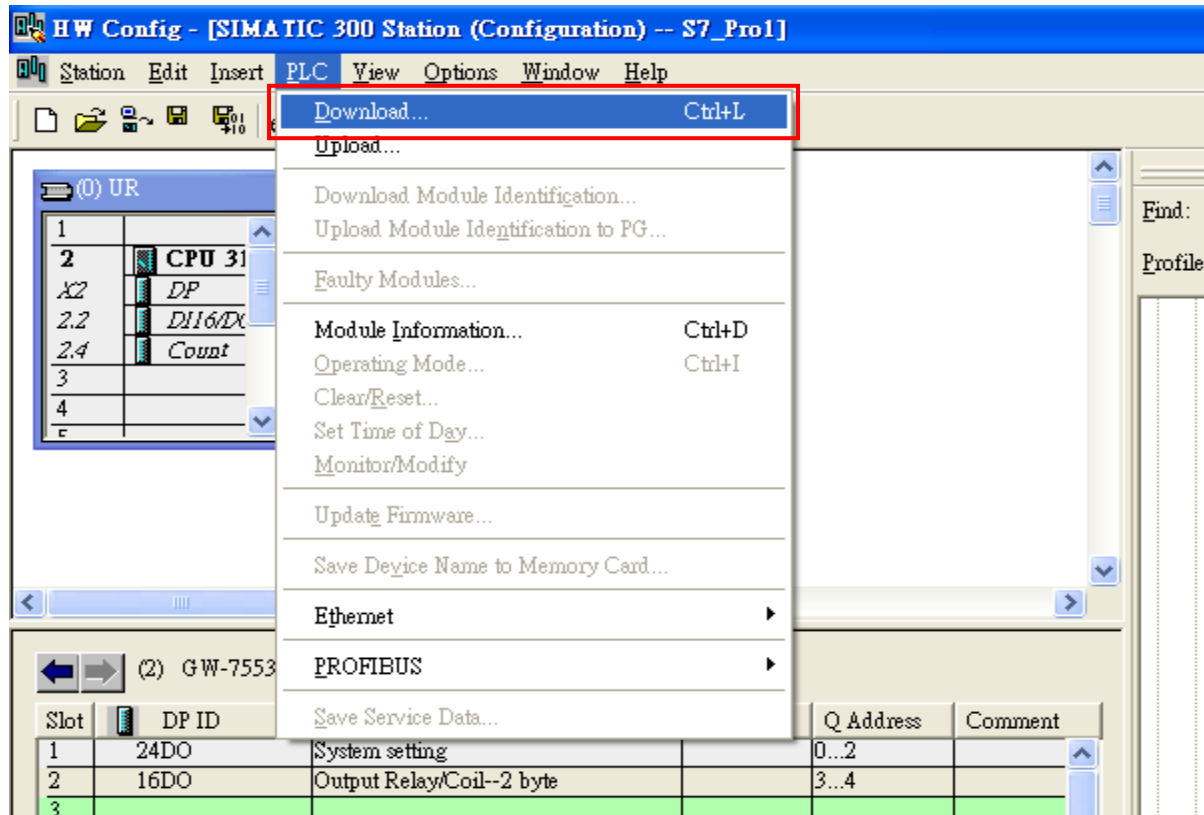
2. HW Config – Parameter assignment (ex: Com port settings, Modbus type: Slave, Modbus format: TCP, Byte Order: Big Endian). Confirm the GW-7553's Com Port setting is the same with MBTCP tool (ex: baud rate-115200, data bits-8, stop bits-1, parity-none). About the MBTCP tool, please refer to the “Communication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



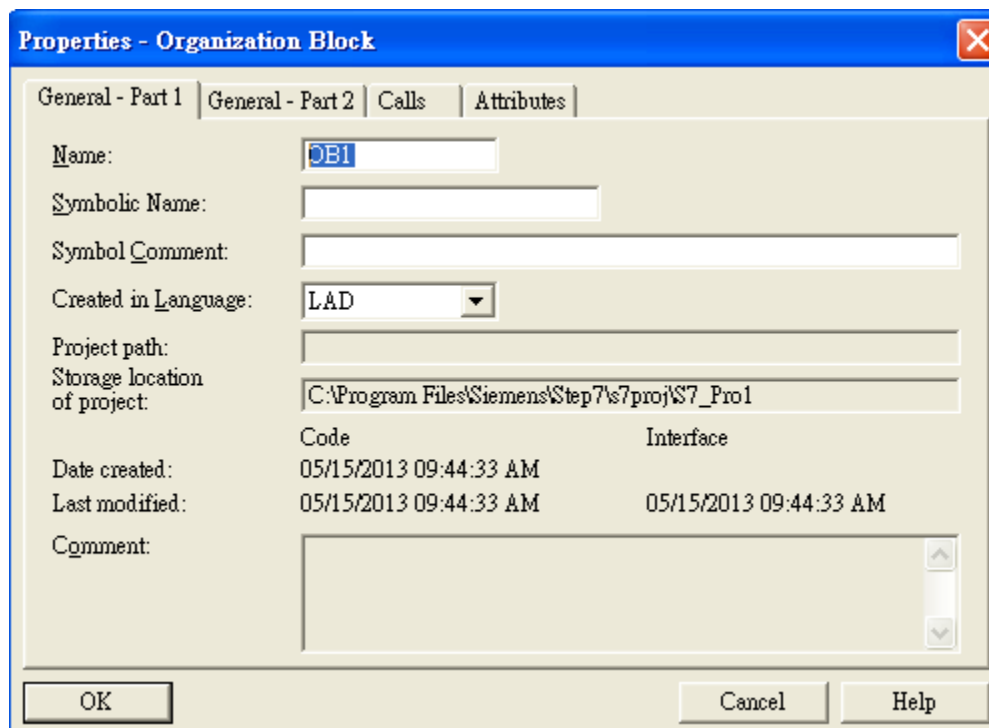
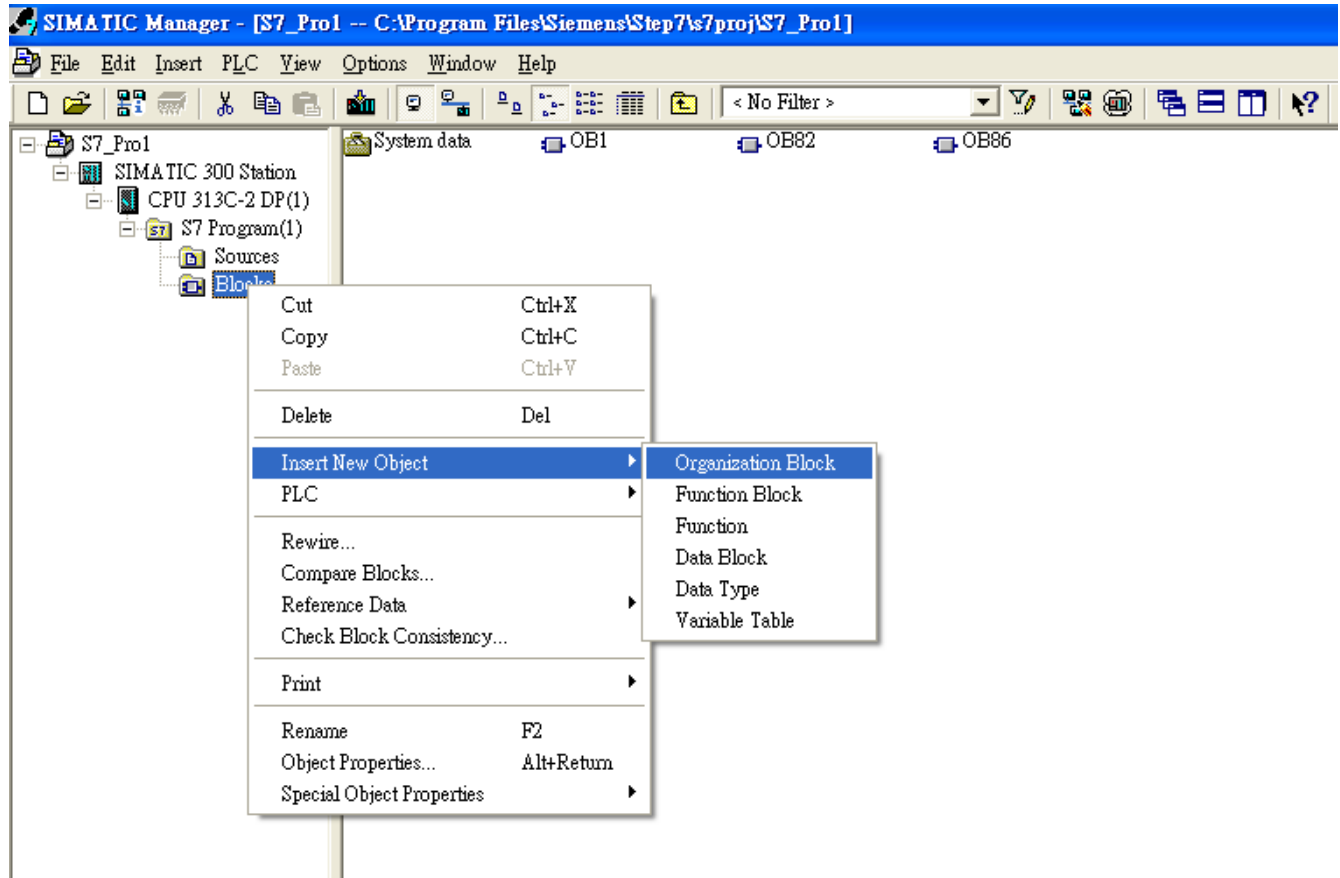
3. Save and Compile

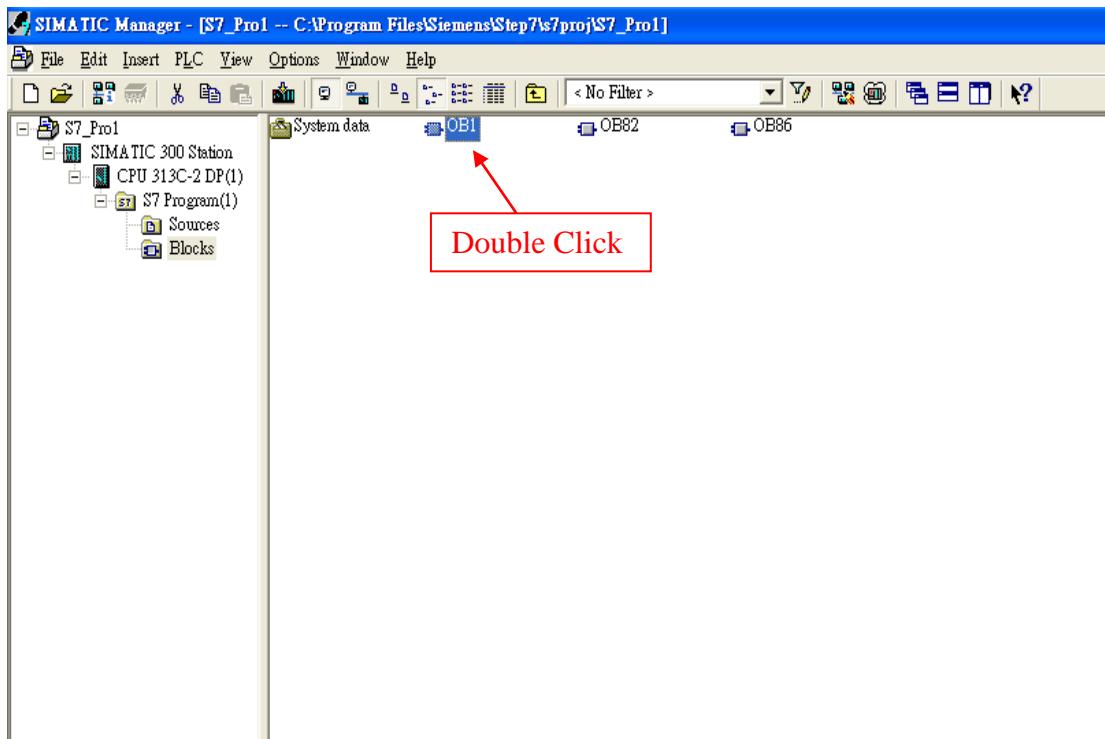


4. Download setting into STEP 7



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





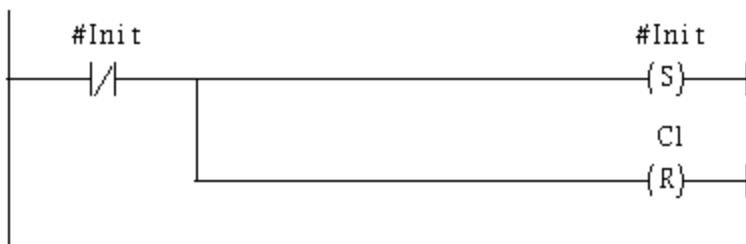
6.S7 program edit

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

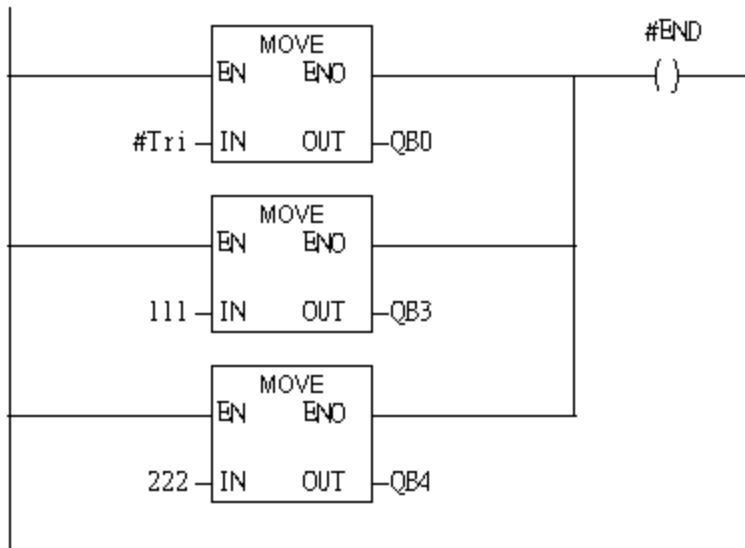


OBI : "Main Program Sweep (Cycle)"

PROFIBUS slave
Modbus slave

Network 1: QB0 add "1" refresh DO value

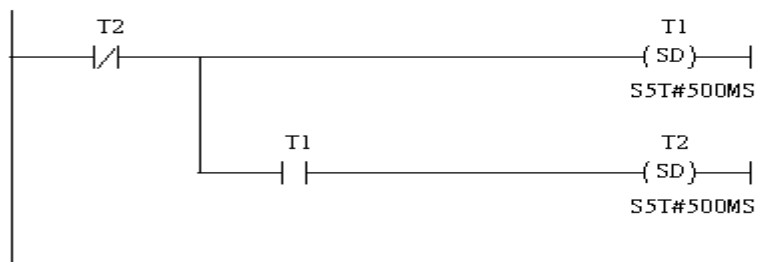
2 byte 16 DO



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

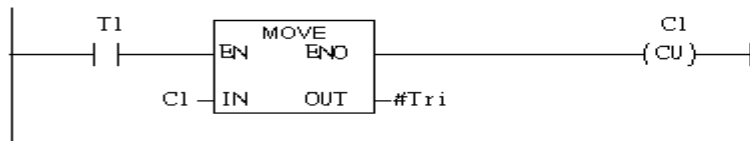
Network 2 : Timer T1 & T2

Using T2 triggler T1



Network 3 : T1 triggler Counter(C1)

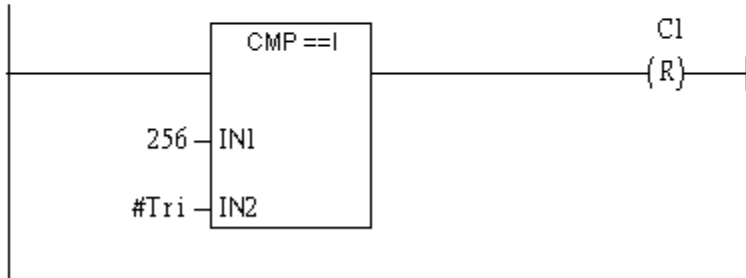
Counter(C1) add "1" and Tri add "1" , too.



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

The screenshot shows the SIMATIC Manager interface. The 'Download' menu is open, listing options such as 'Select Online CPU...', 'Establish Connection to Configured CPU', 'CPU Messages...', 'Display Force Values', 'Monitor/Modify Variables', 'Module Information...', 'Operating Mode...', 'Clear/Reset...', and 'Set Time of Day...'. Below the menu, a table displays variable declarations:

Name	Data Type	Address	Comment
Obl_MAX...	Int	10.0	Maximum cycle time c
Obl_DAT...	Date_...	12.0	Date and time Obl s
END	Bool	20.0	
Init	Bool	20.1	
tri	Int	22.0	

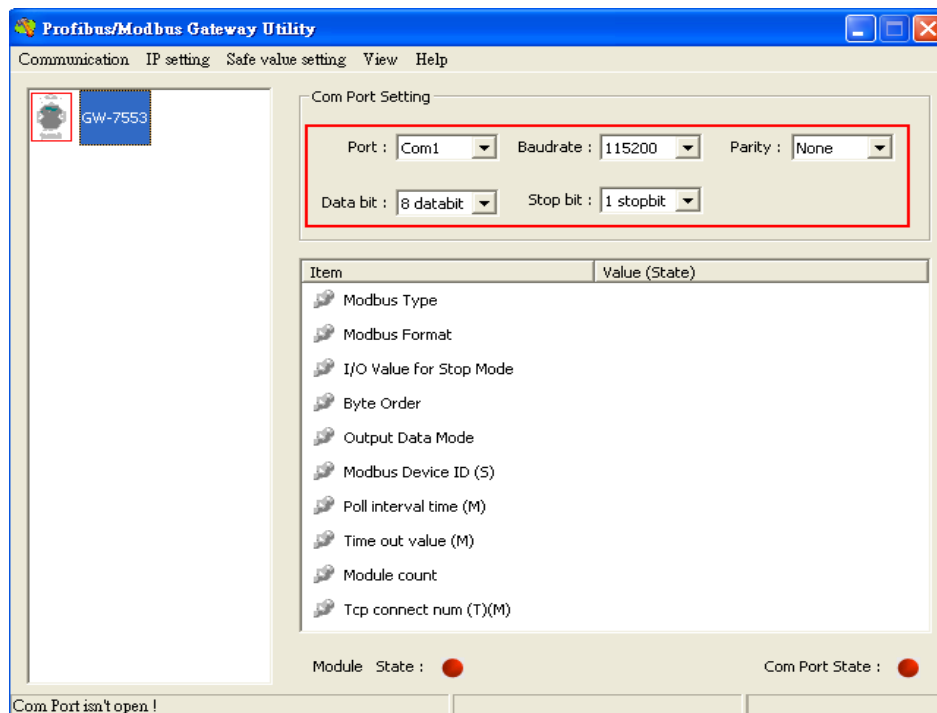
Below the table, the main program window shows 'OB1 : "Main Program Sweep (Cycle)"'. Underneath, there are two 'Comment:' fields. At the bottom, a ladder logic diagram for 'Network 1' is visible, featuring a normally open contact labeled '#Init' connected to a coil labeled '#Init (S)', representing a set instruction for the variable #Init.

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/)

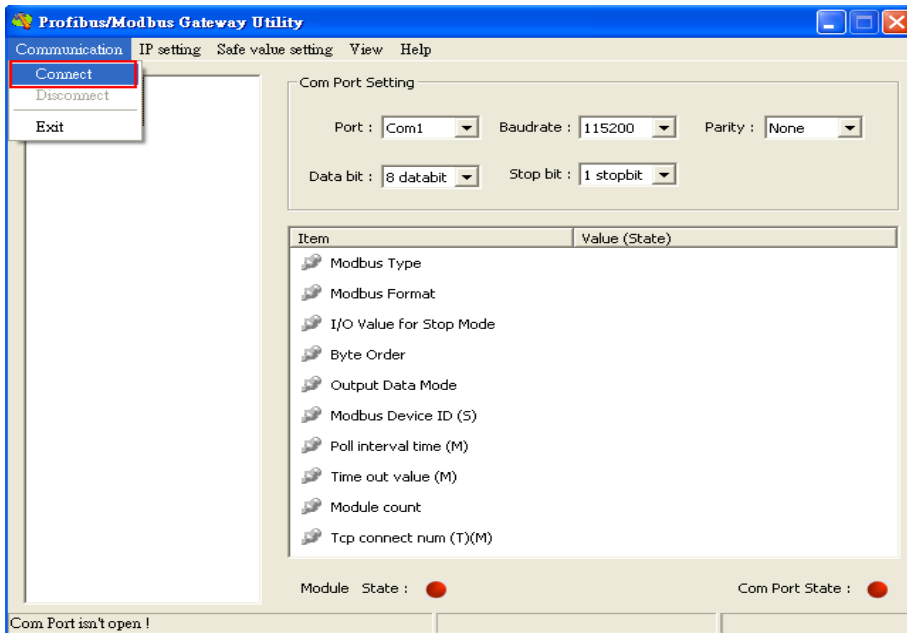
1. Before the connection, please make sure the RUN LED of the GW-7553 is on and the switch of the GW-7553 is at setting mode.



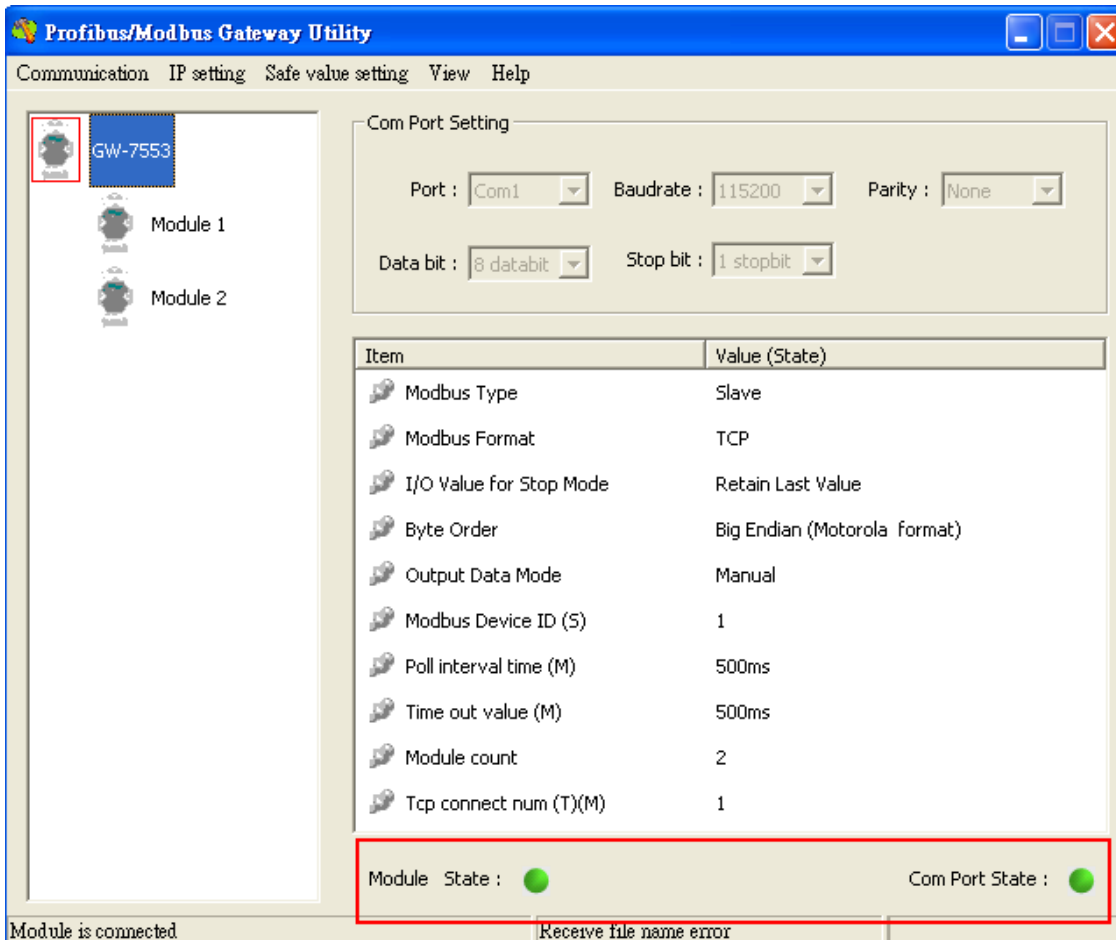
2. Set the Com Port Setting of the Utility



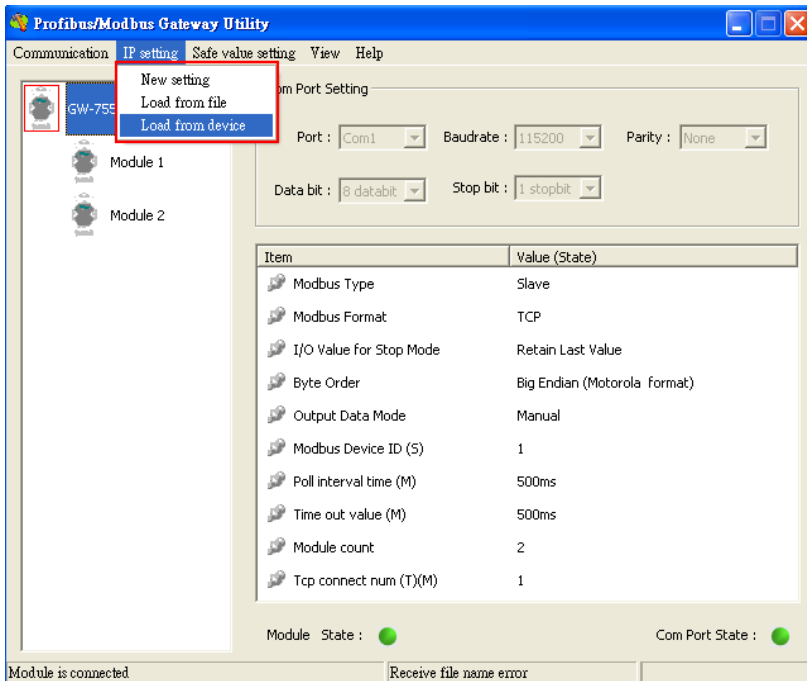
3. Click connect.



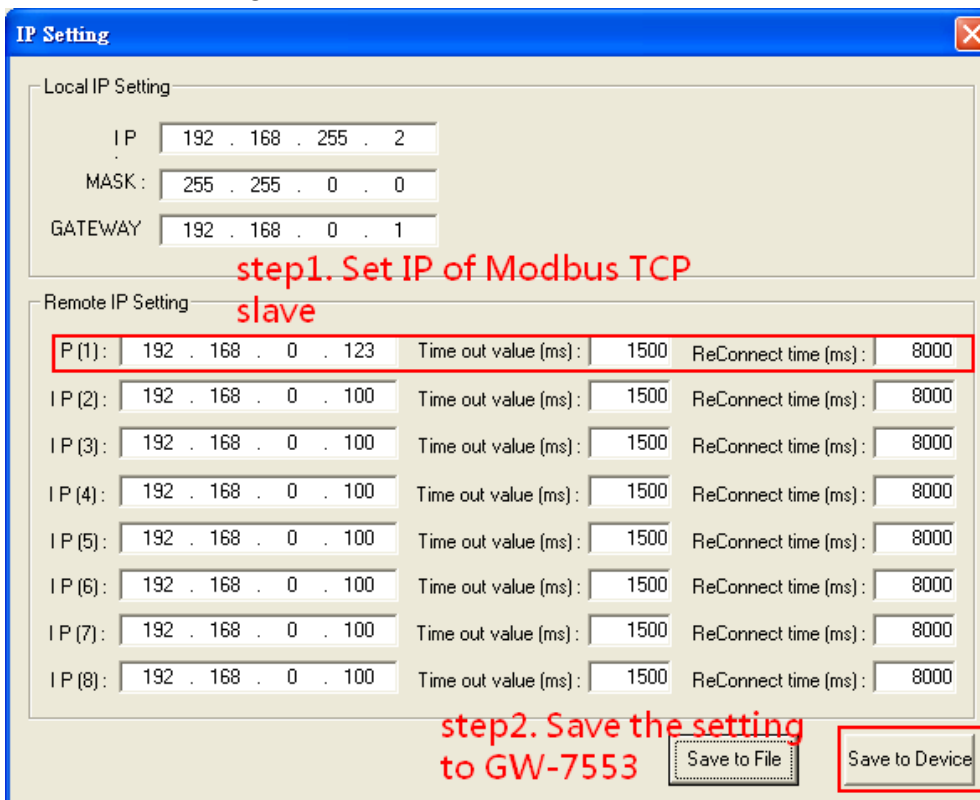
4. Connection success



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.

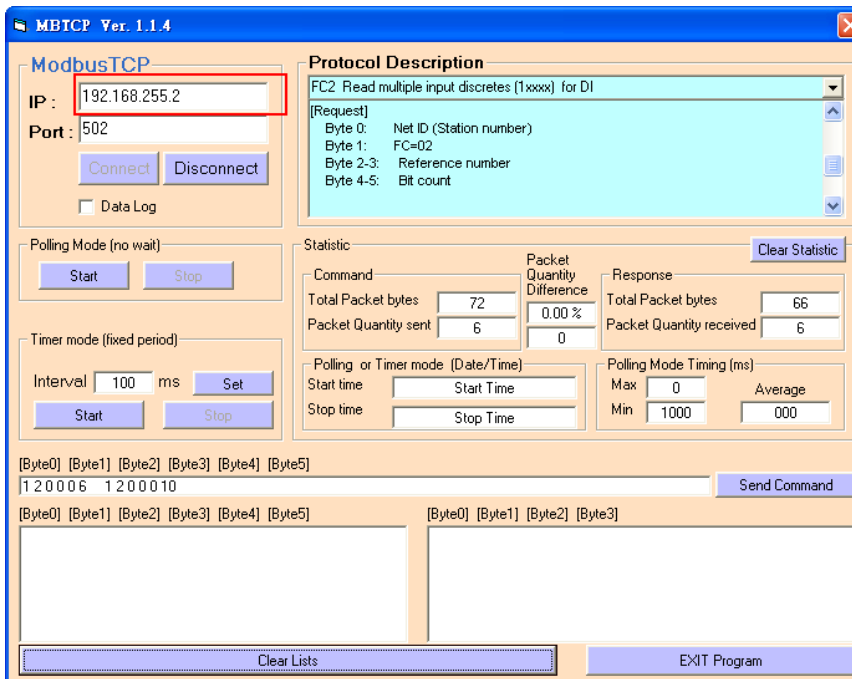


7. Set the switch of the GW-7553 to Normal Mode then reset the power of GW-7553.

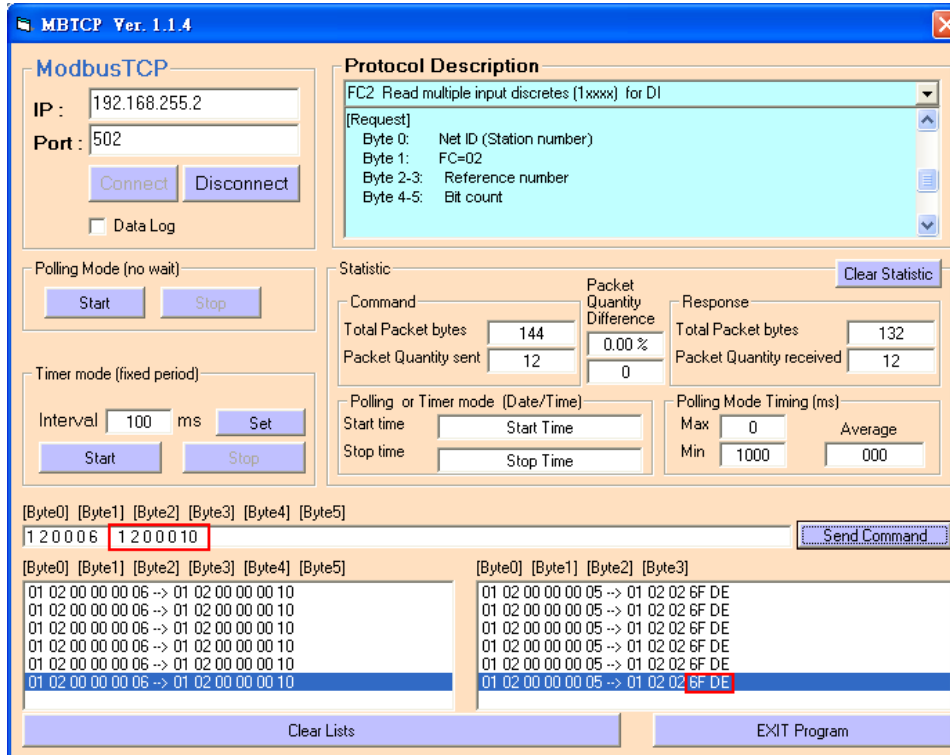


Communication test

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/)

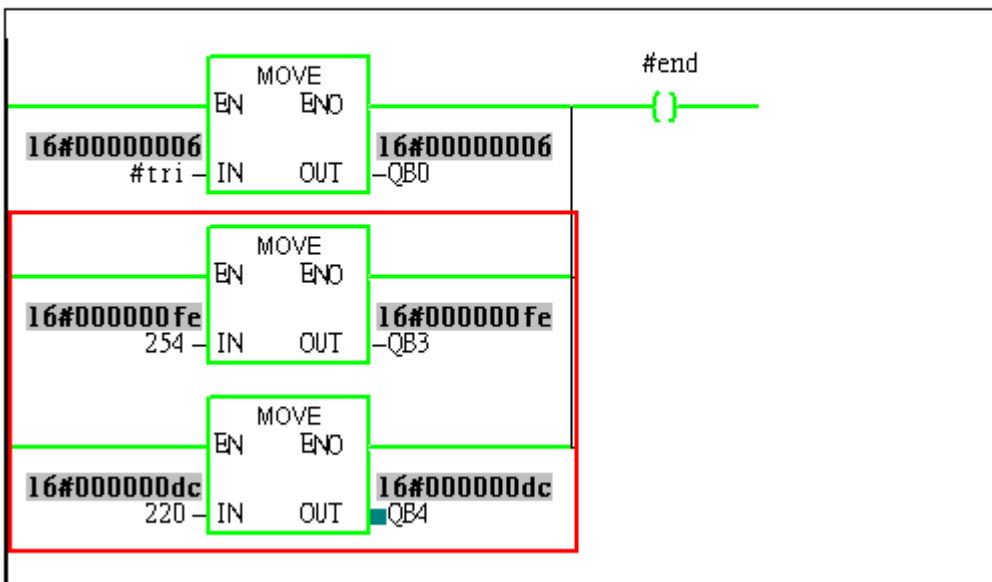


2. Input command ("01 02 00 00 00 10") in MBTCP and click <Send Command> button to send Modbus command: "01 02 00 00 00 10". We can get the DI value (0x6F, 0xDE) from the response message



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.

Comment:



MBTCP Ver. 1.1.4

ModbusTCP

IP :

Port :

Data Log

Protocol Description

FC2 Read multiple input discretes (1xxxx) for D1

[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)

Statistic

Command	Packet Quantity Difference	Response
Total Packet bytes	216	Total Packet bytes
Packet Quantity sent	18	Packet Quantity received
	0.00 %	
	0	

Timer mode (fixed period)

Interval ms

Polling or Timer mode (Date/Time)

Start time

Stop time

Polling Mode Timing (ms)

Max Average

Min

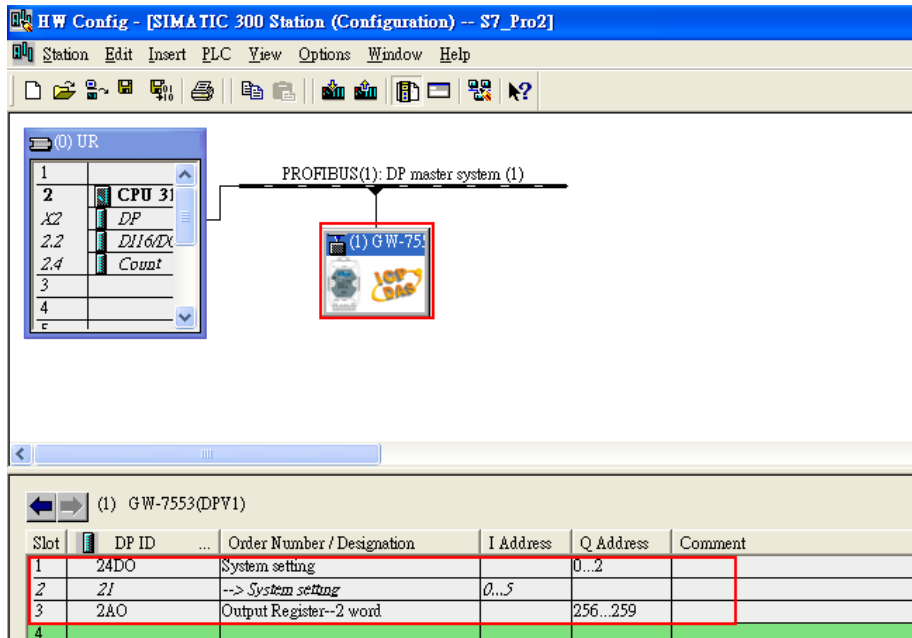
[Byte0] [Byte1] [Byte2] [Byte3] [Byte4] [Byte5]

[Byte0]	[Byte1]	[Byte2]	[Byte3]	[Byte4]	[Byte5]	[Byte0]	[Byte1]	[Byte2]	[Byte3]								
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					
01	02	00	00	00	06	-->	01	02	00	00	05	-->	01	02	02	FE	DC
01	02	00	00	00	05	-->	01	02	00	00	05	-->	01	02	02	FE	DC
01	02	00	00	00	05	-->	01	02	00	00	05	-->	01	02	02	FE	DC
01	02	00	00	00	05	-->	01	02	00	00	05	-->	01	02	02	FE	DC
01	02	00	00	00	05	-->	01	02	00	00	05	-->	01	02	02	FE	DC
01	02	00	00	00	05	-->	01	02	00	00	05	-->	01	02	02	FE	DC

Example 4: PLC refreshes AI data to Modbus master.

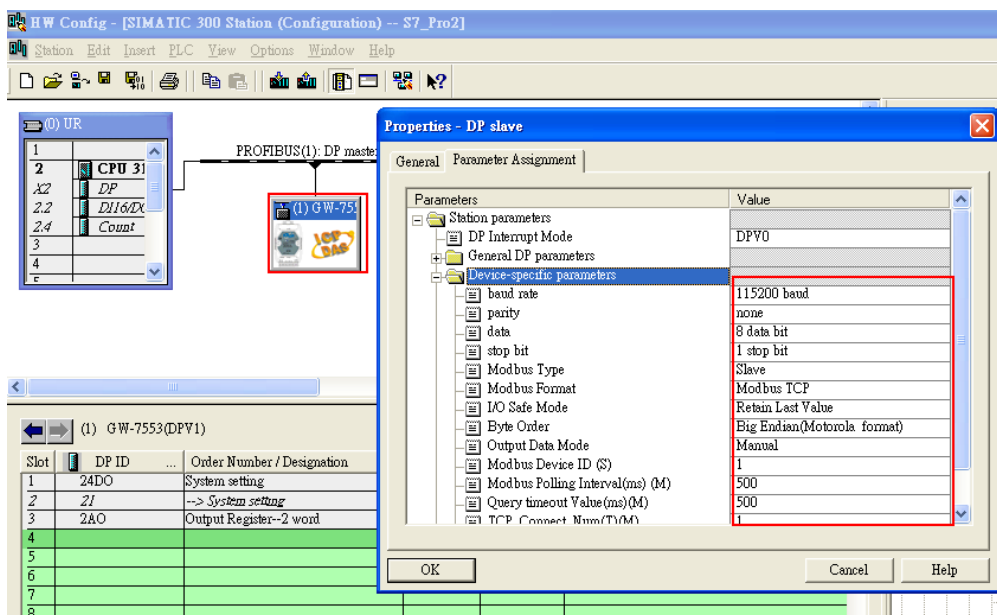
SIMATIC STEP 7 Edit

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



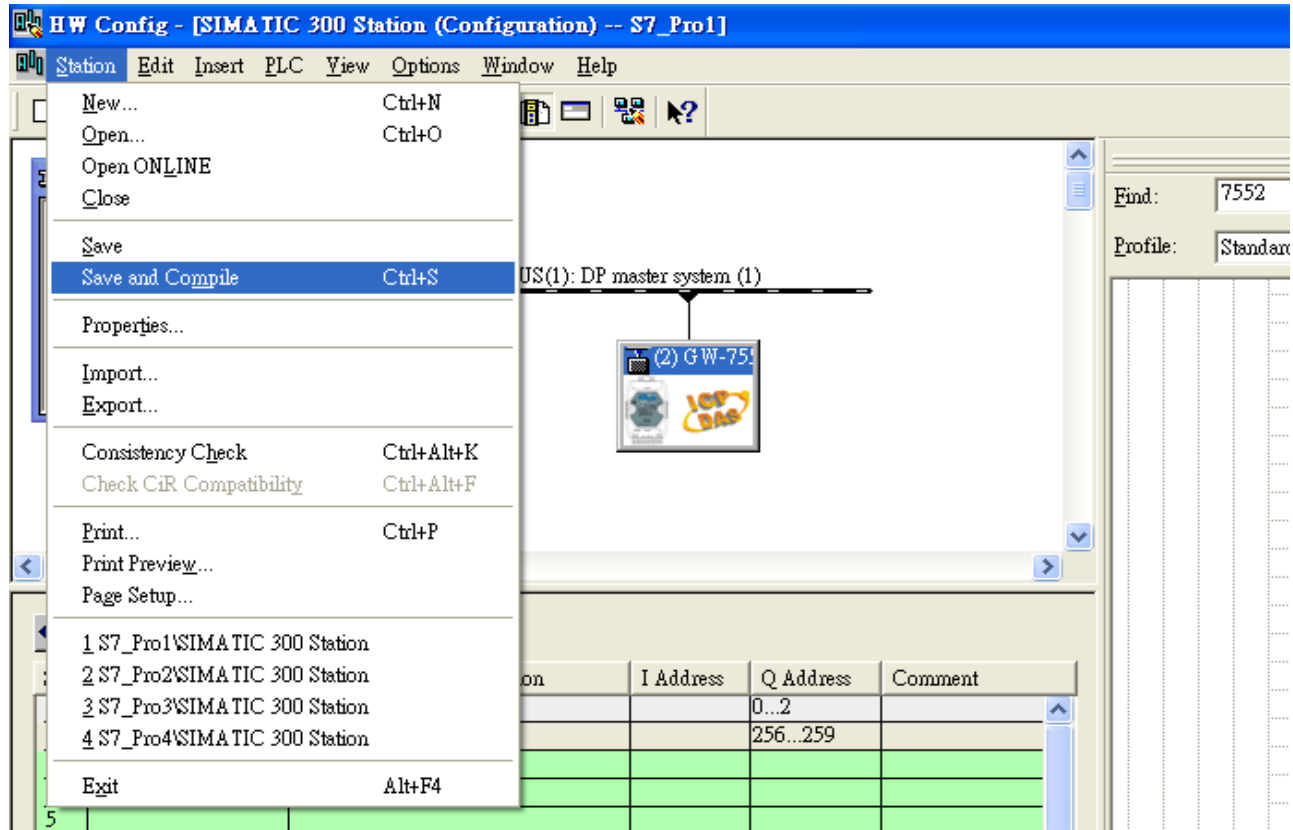
Slot	DP ID	...	Order Number / Designation	I Address	Q Address	Comment
1	24DO		System setting		0...2	
2	2I		--> System setting	0...5		
3	2AO		Output Register--2 word		256...259	
4						

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.

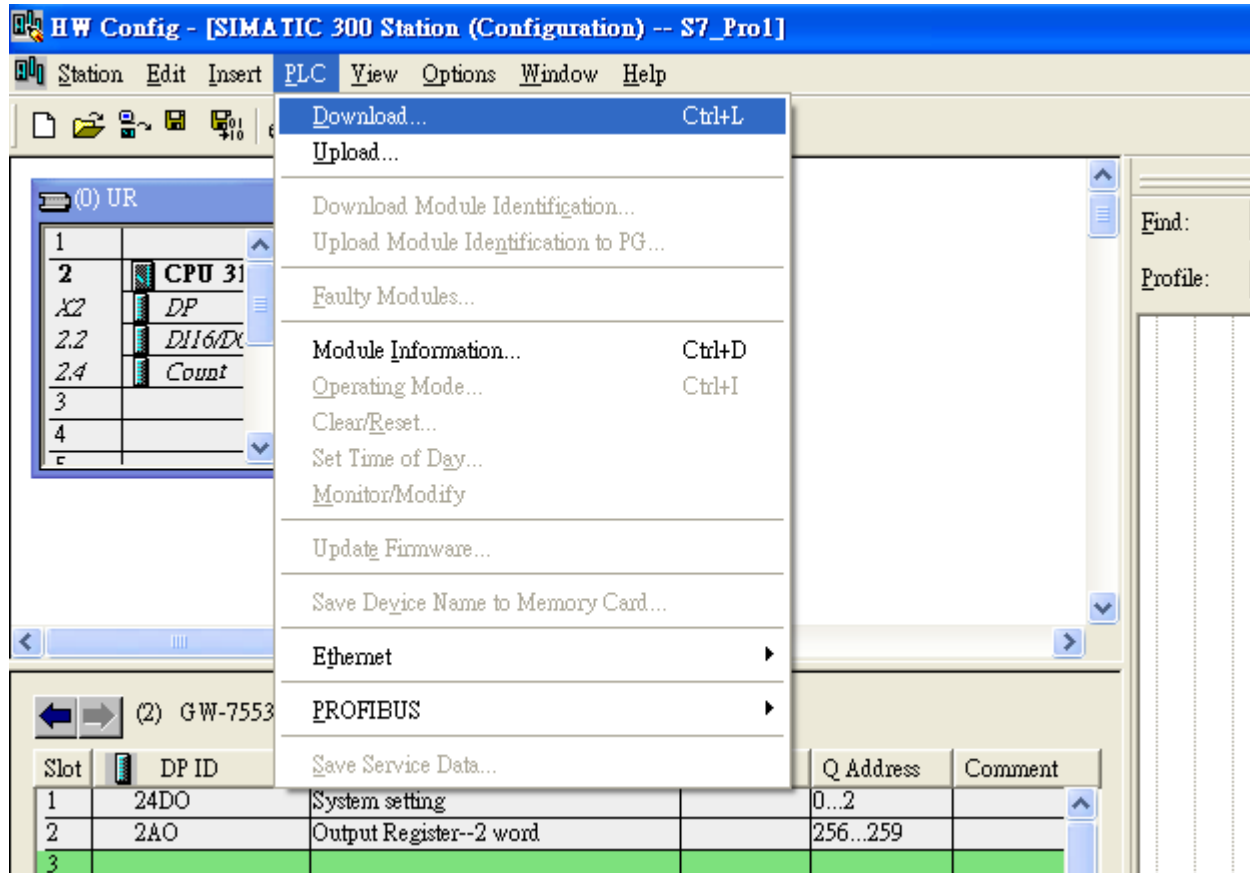


Parameters	Value
Station parameters	
DP Interrupt Mode	DPV0
General DP parameters	
Device-specific parameters	
baud rate	115200 baud
parity	none
data	8 data bit
stop bit	1 stop bit
Modbus Type	Slave
Modbus Format	Modbus TCP
I/O Safe Mode	Retain Last Value
Byte Order	Big Endian(Motorola format)
Output Data Mode	Manual
Modbus Device ID (S)	1
Modbus Polling Interval(ms) (M)	500
Query timeout Value(ms)(M)	500
TCP Connect Num(T)/M	1

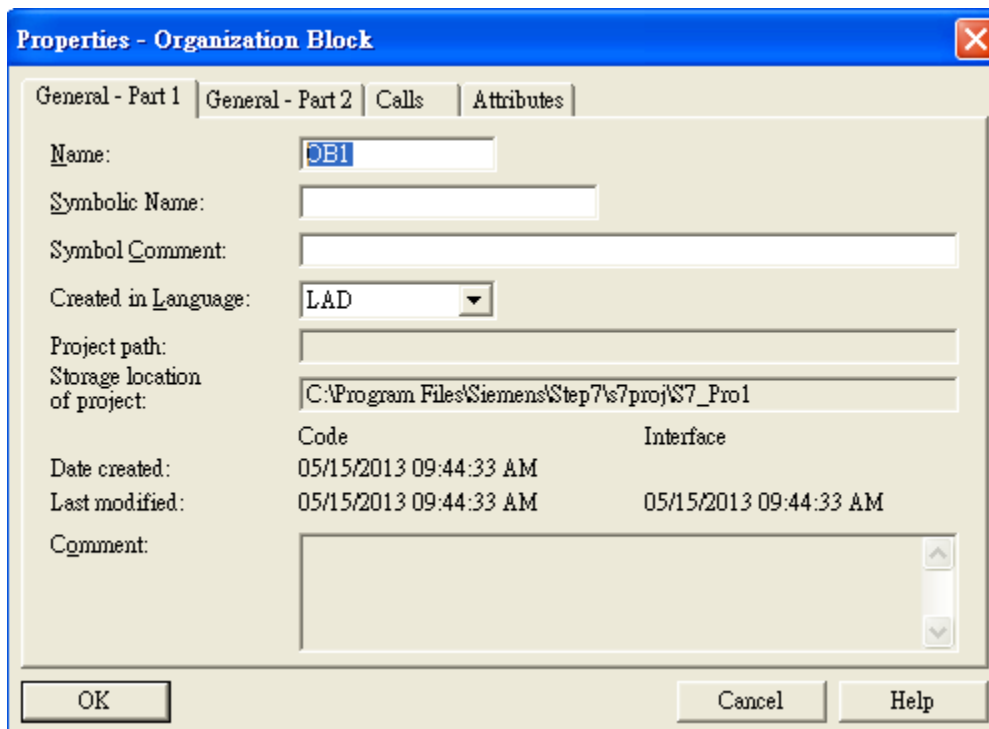
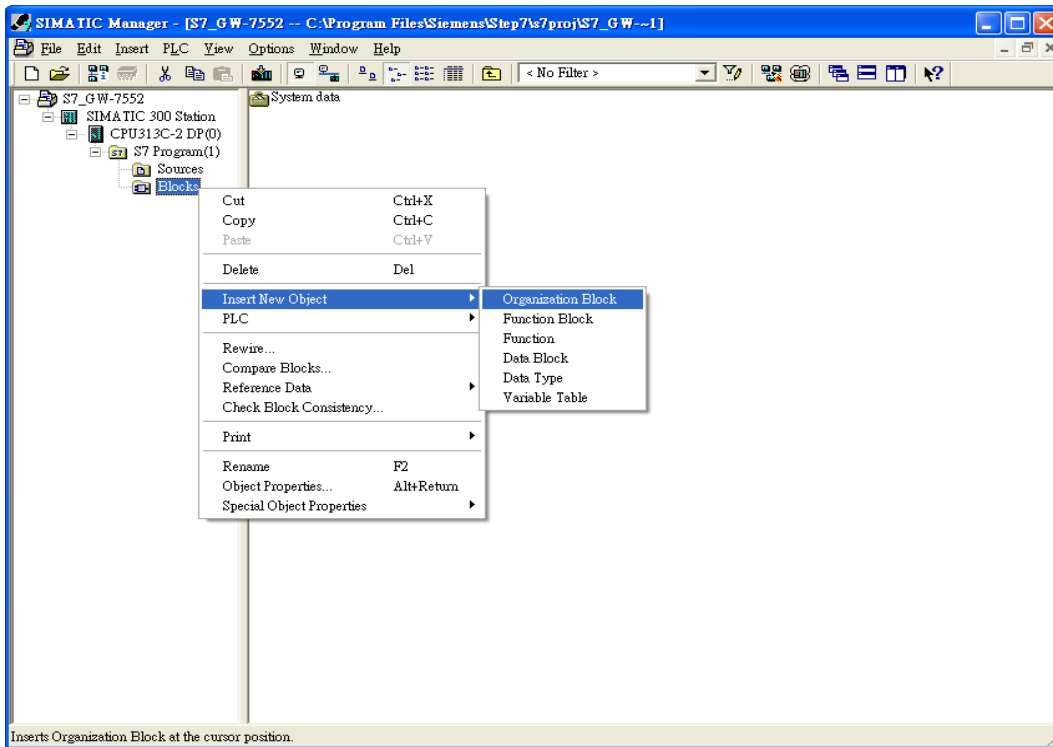
3. Save and Compile

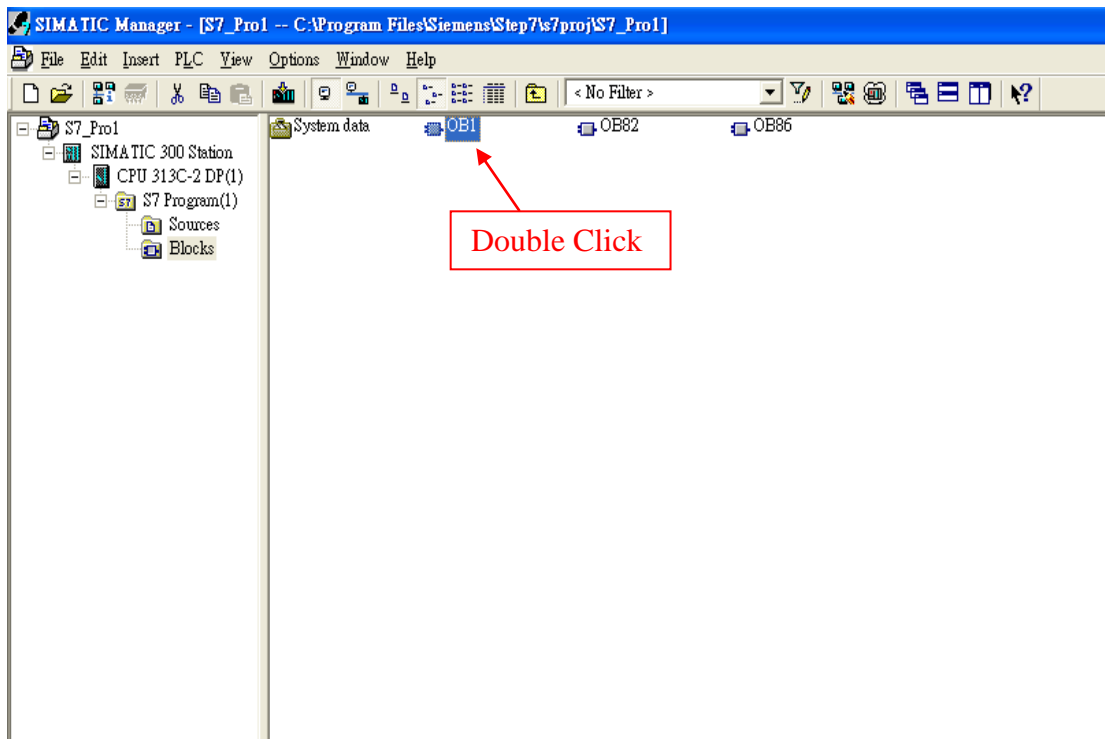


4. Download setting into STEP 7



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





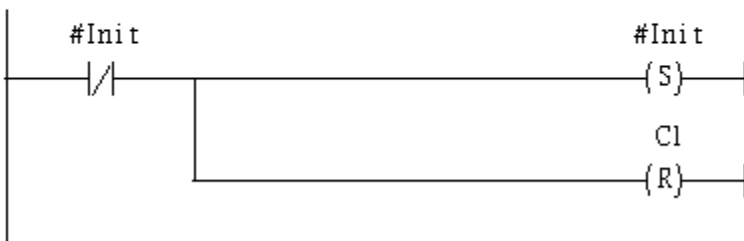
6.S7 program edit

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	

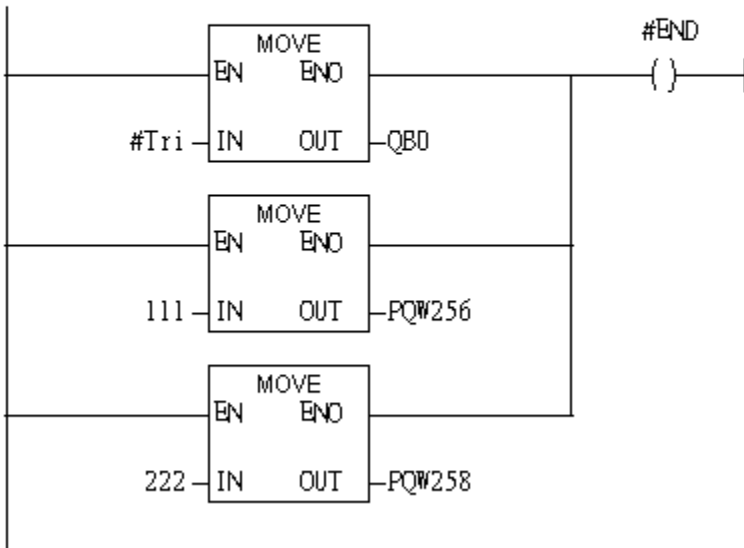
Network 1 : Initial Cl

Initial Cl



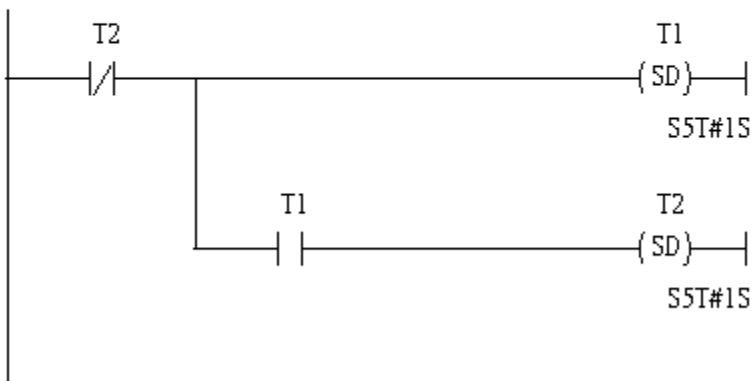
Network 2 : QBD add "1" refresh AO value

2 word 2AO



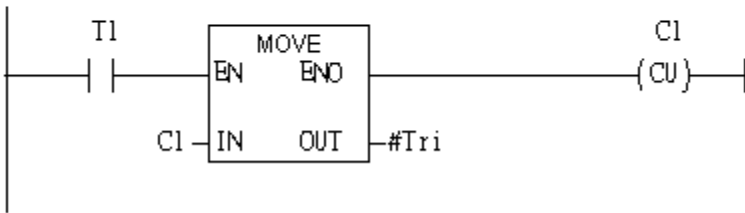
Network 3 : Timer T1 & T2

Using T2 trigger T1

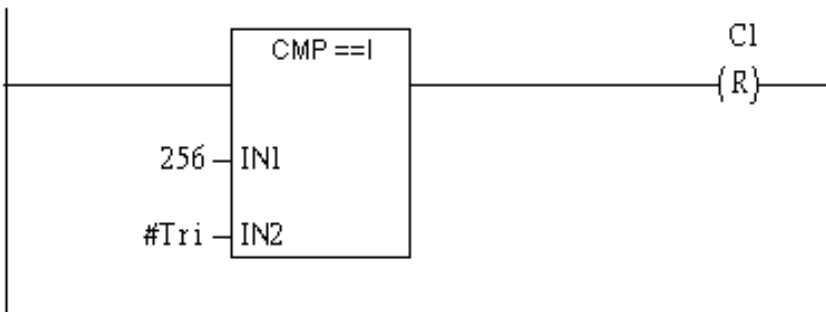


Network 4 : T1 trigger C1

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



If Tri is equal to 256 that will reset C1.



7. S7 program download

The screenshot shows the SIMATIC Manager interface. The 'Download' menu is open, displaying options such as 'Select Online CPU...', 'Establish Connection to Configured CPU', 'CPU Messages...', 'Display Force Values', 'Monitor/Modify Variables', 'Module Information...', 'Operating Mode...', 'Clear/Reset...', and 'Set Time of Day...'. In the background, a table lists variables:

Name	Data Type	Address	Comment
OBI_DAT...	Date_...	12.0	Date and time OBI sta
END	Bool	20.0	
Tri	Int	22.0	
Init	Bool	24.0	

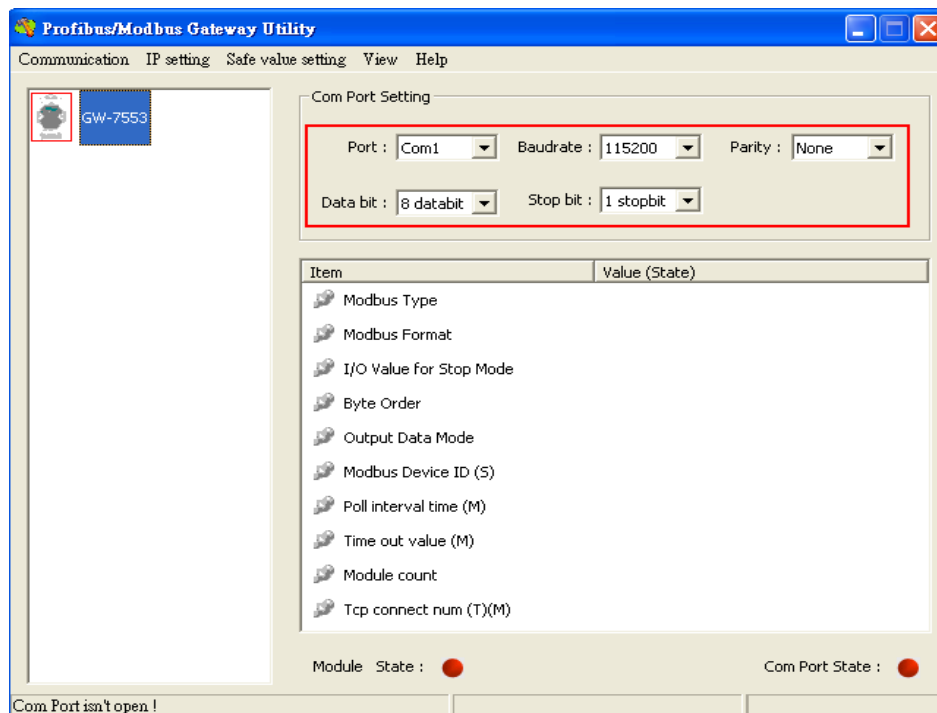
Below the menu, 'Network 5' is highlighted with a green box. A text box contains the instruction: 'If Tri is equal to 256 than will reset C1.' Below this, the ladder logic diagram for Network 5 is shown, featuring a 'CMP <=I' instruction block with '256' at IN1 and '#Tri' at IN2, leading to a 'C1 (R)' coil.

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/)

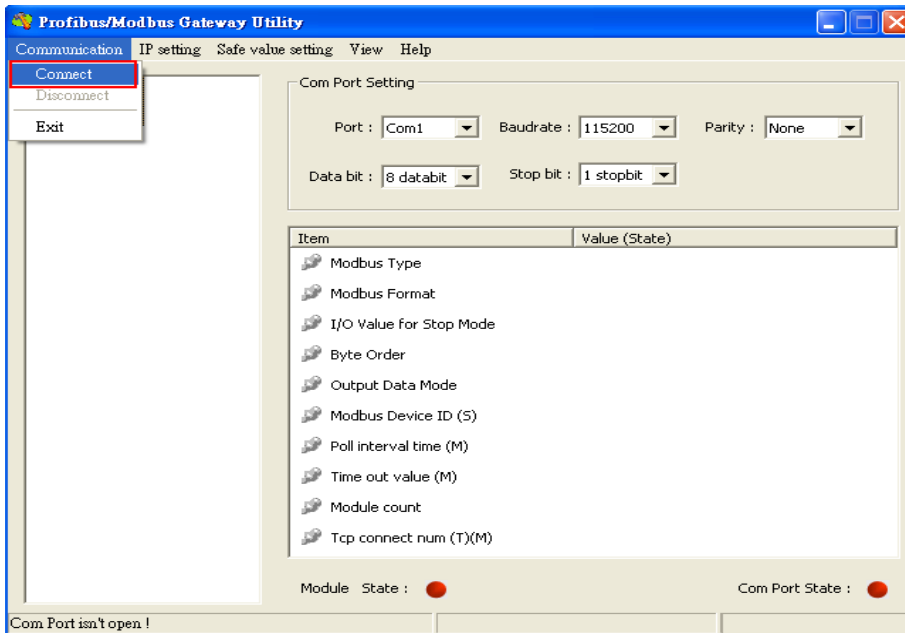
1. Before the connection, please make sure the RUN LED of the GW-7553 is on and the switch of the GW-7553 is at setting mode.



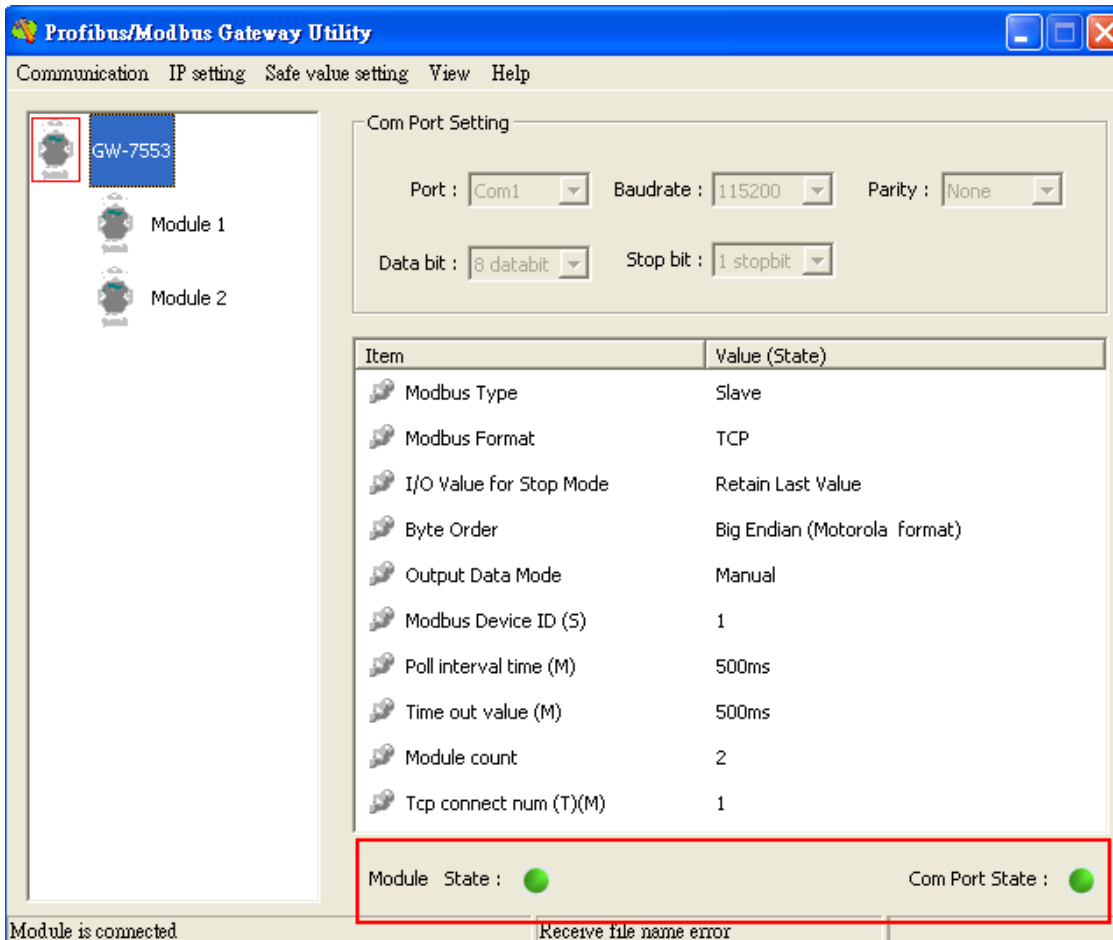
2. Set the Com Port Setting of the Utility



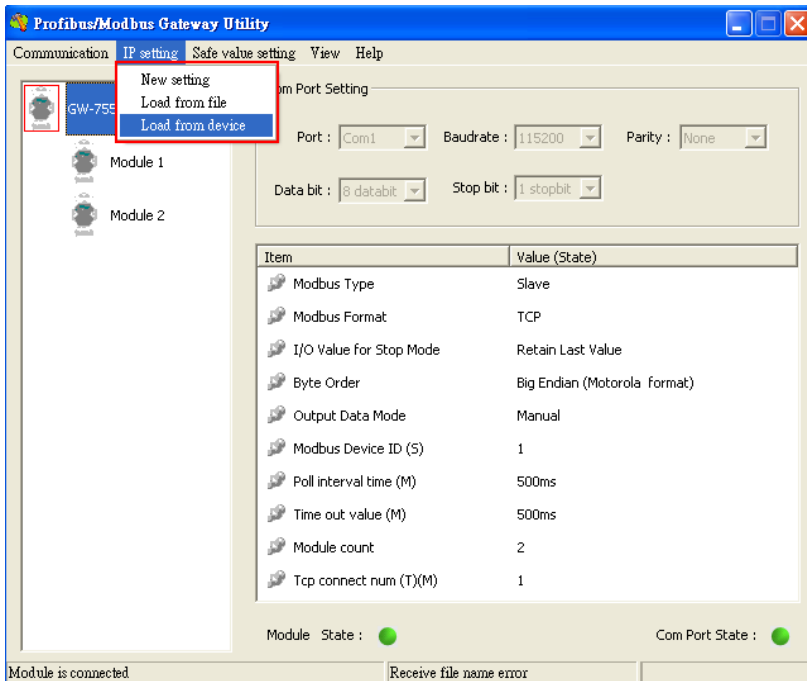
3. Click connect.



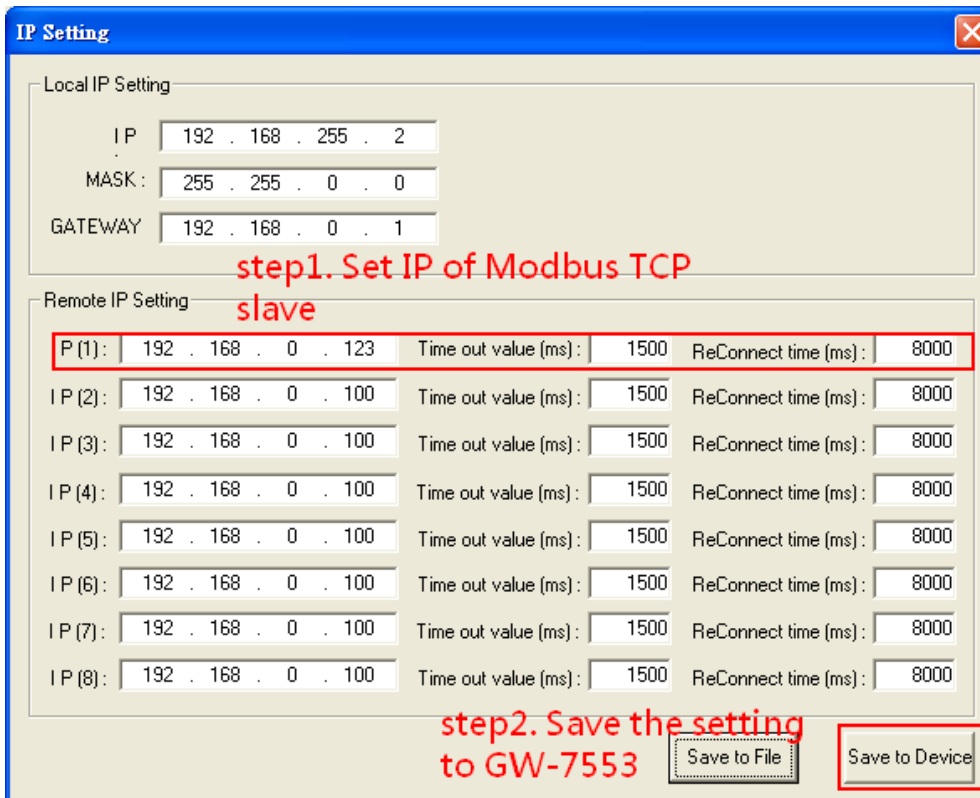
4. Connection success



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.

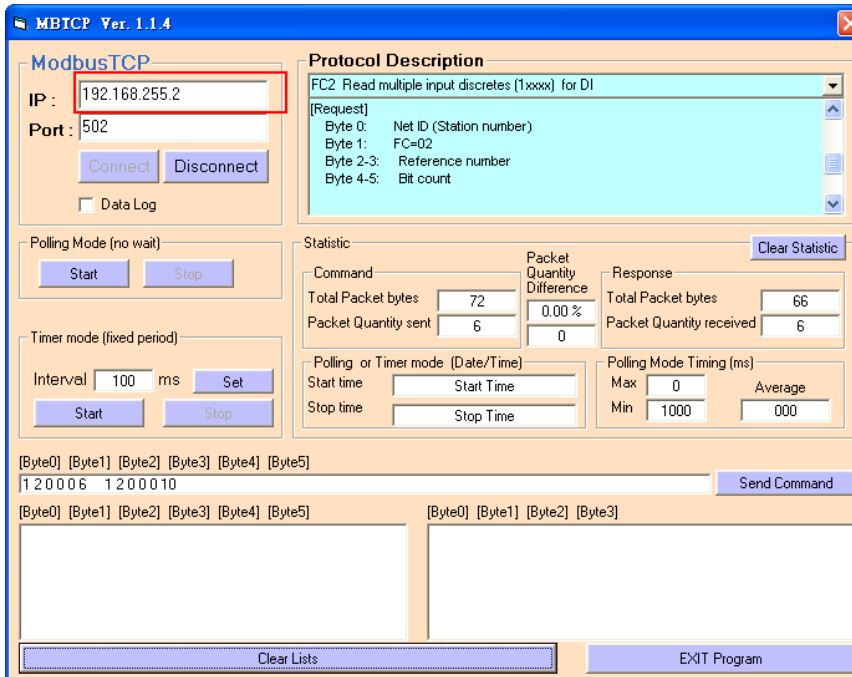


7. Set the switch of the GW-7553 to Normal Mode then reset the power of GW-7553.

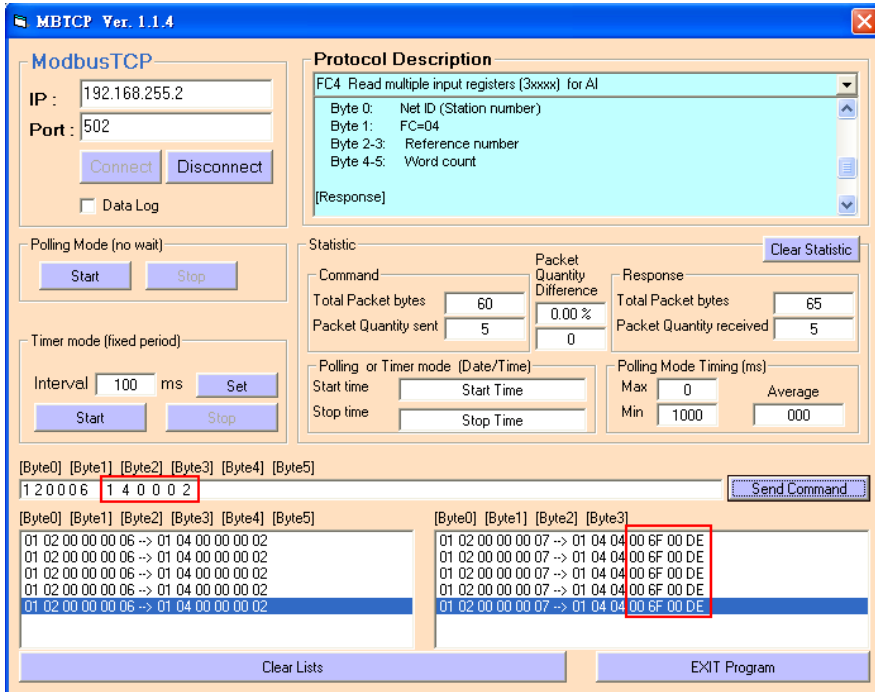


Communication test

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/)



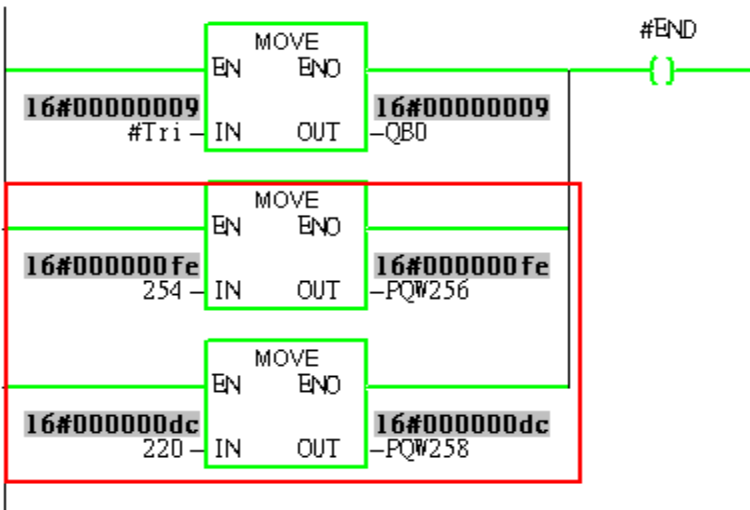
2. Input command (" 01 04 00 00 00 02") in MBTCP and click <Send Command> button to send Modbus command: "01 04 00 00 00 02". We can get the AI value (0x006F, 0x00DE) from the response message.



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.

Network 2: QBD add "1" refresh AO value

2 word 2AO



MBTCP Ver. 1.1.4

ModbusTCP

IP: 192.168.255.2

Port: 502

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)

Statistic

Command	Packet Quantity	Difference	Response
Total Packet bytes	120	0.00 %	Total Packet bytes 130
Packet Quantity sent	10	0	Packet Quantity received 10

Timer mode (fixed period)

Interval 100 ms

Polling or Timer mode (Date/Time)

Start time Start Time

Stop time Stop Time

Polling Mode Timing (ms)

Max 0 Average 000

Min 1000

[Byte0] [Byte1] [Byte2] [Byte3] [Byte4] [Byte5]

1 2 0 0 0 6 1 4 0 0 0 2

[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

01 02 00 00 00 07 --> 01 04 04 00 FE 00 DC