

GW-7663 (Modbus TCP Server)
How to Communicate with Modbus client?
Example for SIMATIC TIA portal

- Preceding Operation
- Example 1: Modbus client read/write DO from/to PLC
- Example 2: Modbus client read/write AO from/to PLC
- Example 3: Modbus client read DI data from PLC
- Example 4: Modbus client read AI data from PLC



✓ Communication with PLC (LED => AP:ON, BOOT:OFF, ERR:OFF).

[How to configure GW-7663 in SIMATIC TIA portal?](#)

✓ Download PFN_Tool utility.

[PFN_Tool](#)

✓ Download Modbus TCP client utility.

[MBTCP tool](#)

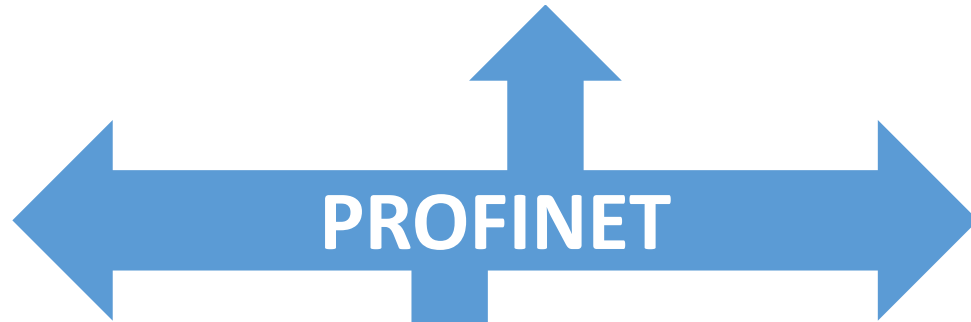
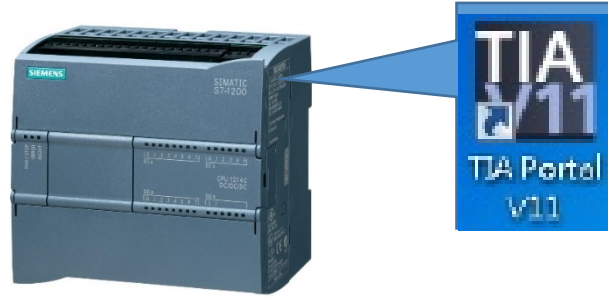


Modbus client read/write 16-channel DO from/to PLC

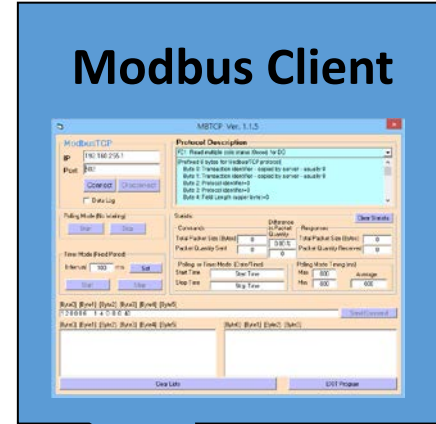


SIMATIC S7-1200

PROFINET IO Controller
(Master)



GW-7663



PROFINET IO device (Slave)	Modbus TCP Server (DO)
	• IP:192.168.77.11
	• Modbus ID:2
	• Data Address: 00001~00016
	• Data Length: 2



PFN_Tool (Version 1.31)

Network Devices : IP: 192.168.77.88 MAC: B8-6B-23-14-E5-76 (Intel(R) Ethernet Connection)

1 Search Module Search Start

Type	Name	IP	Mask	Gateway
S7-1200				
GW-7663				

2 Double Click

Device Basic Configuration

Device Information

Device Type : GW-7663
 Device Name : gw-7663
 IP Address : 0.0.0.0
 Subnet Mask : 0.0.0.0
 MAC Address : 00:0D:E0:17:00:AC

Name Configure

Device Name : gw-7663

Network Configure

IP Address : 192.168.0.111
 Subnet Mask : 255.255.255.0
 Gateway : 192.168.0.254

Advanced

Device Advanced Configuration

Device Information
 Device Type : GW-7663
 Firmware Version : V1.0

Options
 Load File Save File Download Settings Upload Settings

Modbus Settings Modbus Test Diagnostic Msg. Communication Log Information

Parameters

Modbus Type : Master(Client) Polling Interval (ms) : 500
 Byte Order : Little Endian(Intel) Query Timeout (ms) : 1000
 I/O Safe Mode : Last Value TCP Connect Num : 1
 Modbus Device ID (dec) : 1

Server settings.
 Server NO. 0 OK
 IP : 192 . 168 . 0 . 1
 Re-Connect Time (ms) : 5000

Request Command

Function Code : FC1 Read multiple coils status (0xxxx) for DO Add
 Server NO. 0
 Modbus ID (dec) : 1 (1~247)
 Start Address (dec) : 0 (0~65535)
 Count (dec) : 1 (1~1024 Bits)
 Change Word Order (AABB CCDD -> CCDD AABB)

PROFINET Info.
 Total Input (Byte) : 8 Modify
 Total Output (Byte) : 8 Delete
 System used: 8 Bytes

Server NO.	ID	FC	Start Addr.	Count	Word order	PFN Input Addr.(Byte)	PFN Output Addr.(Byte)

3 Press 「Advanced Settings」 button

Suggested Module : RSW:0 Input:32Byte Output:32Byte



Device Advanced Configuration

Device Information: Device Type : GW-7663, Firmware Version : V1.0

Options: Load File, Save File, Download Settings, Upload Settings

Modbus Settings | Modbus Test | Diagnostic Msg. | Communication Log | Information

Parameters:

Modbus Type : Slave(Server) | Polling Interval (ms) : 500 | Server settings: Server NO. 0 | OK

Byte Order : Little Endian(Intel) | Query Timeout (ms) : 1000 | IP : 192 . 168 . 0 . 1

I/O Safe Mode : Last Value | TCP Connect Num : 0 | Re-Connect Time (ms) : 5000

Modbus Device ID (dec) : 2

Request Command:

Slave Type : DO (Output Relay/Coil) | Add

Count (dec) : 16 (1~4032 Bits) | PROFINET Info: Total Input (Byte) : 10, Total Output (Byte) : 8, System used: 8 Bytes | Modify | Delete

Change Word Order (AABB CCDD -> CCDD AABB)

	Server NO.	ID	FC	Mapping Table	Count	Word order	PFN Input Addr.(Byte)	PFN Output Addr.(Byte)
▶ 1	N/A	2	DO	00001~000...	16	No	8~9	N/A

Suggested Module : RSW:0 Input:32Byte Output:32Byte

1. Set Modbus settings

2. Add Modbus Slave Type

3. Upload



The first input 8 bytes and output 8 bytes are allocated for system. (64~71)
The 9th byte to the 32th byte are allocated for Modbus. (72~95)

Device overview							
...	Module	Rack	Slot	I address	Q address...	Type	Order no.
▼	GW-7663	0	0			GW-7663 2-Port De...	GW-7663
▶	Internal	0	0 X1			GW-7663	
	RSW:0 Input:32Byte Output:...	0	1	64...95	64...95	RSW:0 Input:32Byte...	

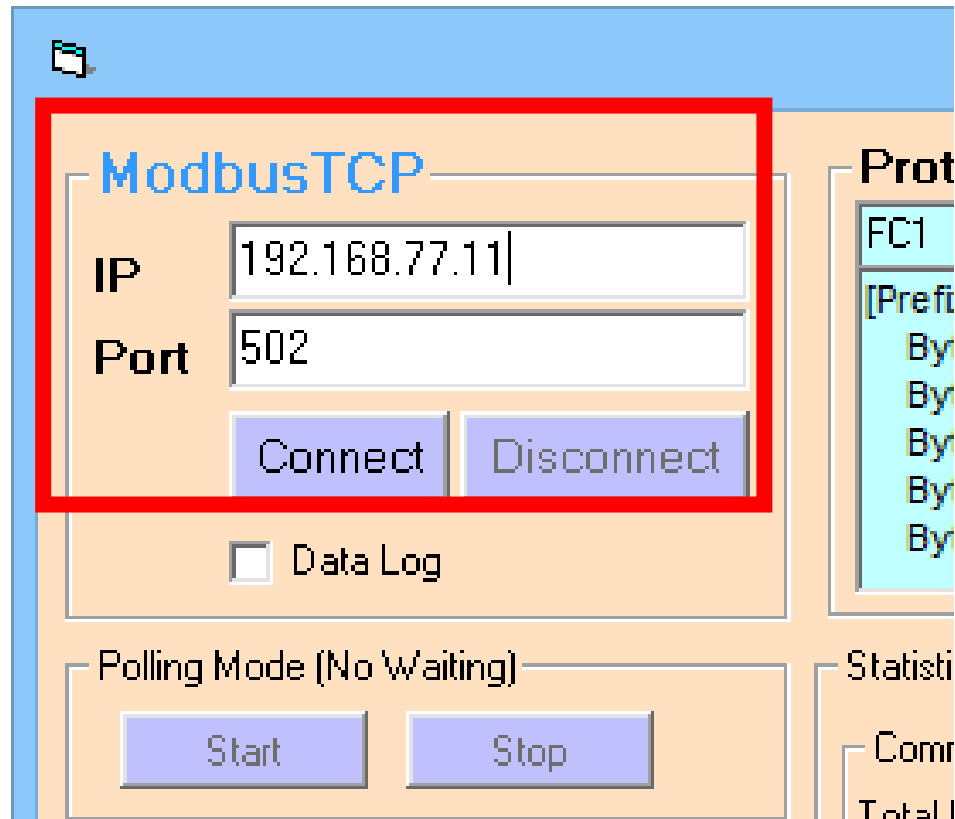
...	Address	Display format	Monitor value
1	%IB72	Hex	16#00
2	%IB73	Hex	16#00
3	%I72.0	Bool	FALSE
4	%I72.1	Bool	FALSE
5	%I72.2	Bool	FALSE
6	%I72.3	Bool	FALSE
7	%I72.4	Bool	FALSE
8	%I72.5	Bool	FALSE
9	%I72.6	Bool	FALSE
10	%I72.7	Bool	FALSE
11	%I73.0	Bool	FALSE
12	%I73.1	Bool	FALSE
13	%I73.2	Bool	FALSE
14	%I73.3	Bool	FALSE
15	%I73.4	Bool	FALSE
16	%I73.5	Bool	FALSE
17	%I73.6	Bool	FALSE
18	%I73.7	Bool	FALSE

IB72 => used to receive DO 1~8 from Modbus client
IB73 => used to receive DO 9~16 from Modbus client

I72.0~7 => used to receive DO 1~8 from Modbus client
I73.0~7 => used to receive DO 9~16 from Modbus client



Confirm GW-7663's IP address is the same with Modbus client tool





Send Modbus command (FC 0F) to change DO status(0xAA, 0x55)

The screenshot shows the MBTCP Ver. 1.1.5 interface. The ModbusTCP section has IP 192.168.77.11 and Port 502. The Protocol Description shows FC1 Read multiple coils status (0xxxx) for DO. The Statistics section shows 15 Bytes Total Packet Size and 1 Packet Quantity Sent. The Command Log shows the following data:

[Byte0]	[Byte1]	[Byte2]	[Byte3]	[Byte4]	[Byte5]
1	2	0	0	6	02 0F 00 00 00 10 02 AA 55
01	02	00	00	00	06 --> 02 0F 00 00 00 10 02 AA 55
01	02	00	00	00	06 --> 02 0F 00 00 00 10

1. Send DO Data
0xAA => for DO 1~8
0x55 => for DO 9~16

2. Receive Resp.



PLC will receives DO status(0xAA, 0x55) at PLC address IB72, IB73

	i	...	Address	Display format	Monitor value
1			%IB72	Hex	16#AA
2			%IB73	Hex	16#55
3			%I72.0	Bool	<input type="checkbox"/> FALSE
4			%I72.1	Bool	<input checked="" type="checkbox"/> TRUE
5			%I72.2	Bool	<input type="checkbox"/> FALSE
6			%I72.3	Bool	<input checked="" type="checkbox"/> TRUE
7			%I72.4	Bool	<input type="checkbox"/> FALSE
8			%I72.5	Bool	<input checked="" type="checkbox"/> TRUE
9			%I72.6	Bool	<input type="checkbox"/> FALSE
10			%I72.7	Bool	<input checked="" type="checkbox"/> TRUE
11			%I73.0	Bool	<input checked="" type="checkbox"/> TRUE
12			%I73.1	Bool	<input type="checkbox"/> FALSE
13			%I73.2	Bool	<input checked="" type="checkbox"/> TRUE
14			%I73.3	Bool	<input type="checkbox"/> FALSE
15			%I73.4	Bool	<input checked="" type="checkbox"/> TRUE
16			%I73.5	Bool	<input type="checkbox"/> FALSE
17			%I73.6	Bool	<input checked="" type="checkbox"/> TRUE
18			%I73.7	Bool	<input type="checkbox"/> FALSE



Send Modbus command (FC 05) to change DO status
Set DO ch-5 (Modbus address: 00005): ON

The screenshot shows the MBTCP Ver. 1.1.5 interface. The ModbusTCP section is configured with IP 192.168.77.11 and Port 502. The Protocol Description shows FC1 Read multiple coils status (0xxxx) for DO. The Statistics section shows 27 Total Packet Size (Bytes) for Commands and 2 Packet Quantity Sent. The Polling Mode is set to No Waiting. The Timer Mode is set to Fixed Period with an Interval of 100 ms. The Send Command button is highlighted in red, and the resulting data exchange is shown in the bottom section.

Byte	0	1	2	3	4	5
Request	1	2	0	0	6	02 05 00 04 FF 00
Response	01	02	00	00	00	06 --> 02 05 00 04 FF 00

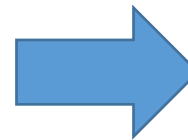
1. Send query cmd

2. Receive Resp.



PLC will receives DO status at PLC address I72.4(ch-5)

	i	...	Address	Display format	Monitor value
1			%I72	Hex	16#AA
2			%I73	Hex	16#55
3			%I72.0	Bool	<input type="checkbox"/> FALSE
4			%I72.1	Bool	<input checked="" type="checkbox"/> TRUE
5			%I72.2	Bool	<input type="checkbox"/> FALSE
6			%I72.3	Bool	<input checked="" type="checkbox"/> TRUE
7			%I72.4	Bool	<input type="checkbox"/> FALSE
8			%I72.5	Bool	<input checked="" type="checkbox"/> TRUE
9			%I72.6	Bool	<input type="checkbox"/> FALSE
10			%I72.7	Bool	<input checked="" type="checkbox"/> TRUE
11			%I73.0	Bool	<input checked="" type="checkbox"/> TRUE
12			%I73.1	Bool	<input type="checkbox"/> FALSE
13			%I73.2	Bool	<input checked="" type="checkbox"/> TRUE
14			%I73.3	Bool	<input type="checkbox"/> FALSE
15			%I73.4	Bool	<input checked="" type="checkbox"/> TRUE
16			%I73.5	Bool	<input type="checkbox"/> FALSE
17			%I73.6	Bool	<input checked="" type="checkbox"/> TRUE
18			%I73.7	Bool	<input type="checkbox"/> FALSE



	i	...	Address	Display format	Monitor value
1			%I72	Hex	16#BA
2			%I73	Hex	16#55
3			%I72.0	Bool	<input type="checkbox"/> FALSE
4			%I72.1	Bool	<input checked="" type="checkbox"/> TRUE
5			%I72.2	Bool	<input type="checkbox"/> FALSE
6			%I72.3	Bool	<input checked="" type="checkbox"/> TRUE
7			%I72.4	Bool	<input checked="" type="checkbox"/> TRUE
8			%I72.5	Bool	<input checked="" type="checkbox"/> TRUE
9			%I72.6	Bool	<input type="checkbox"/> FALSE
10			%I72.7	Bool	<input checked="" type="checkbox"/> TRUE
11			%I73.0	Bool	<input checked="" type="checkbox"/> TRUE
12			%I73.1	Bool	<input type="checkbox"/> FALSE
13			%I73.2	Bool	<input checked="" type="checkbox"/> TRUE
14			%I73.3	Bool	<input type="checkbox"/> FALSE
15			%I73.4	Bool	<input checked="" type="checkbox"/> TRUE
16			%I73.5	Bool	<input type="checkbox"/> FALSE
17			%I73.6	Bool	<input checked="" type="checkbox"/> TRUE
18			%I73.7	Bool	<input type="checkbox"/> FALSE



Send Modbus command (FC 01) to read DO status

The screenshot shows the MBTCP Ver. 1.1.5 interface. The ModbusTCP section is configured with IP 192.168.77.11 and Port 502. The Protocol Description shows 'FC1 Read multiple coils status (0xxxx) for DO'. The Statistics section shows 39 Bytes Total Packet Size and 3 Packet Quantity Sent. The Data Log shows the following exchange:

[Byte0]	[Byte1]	[Byte2]	[Byte3]	[Byte4]	[Byte5]
1	2	0	0	6	02 01 00 00 00 10
01	02	00	00	00	06 --> 02 01 00 00 00 10
01	02	00	00	00	05 --> 02 01 02 BA 55

1. Send query cmd

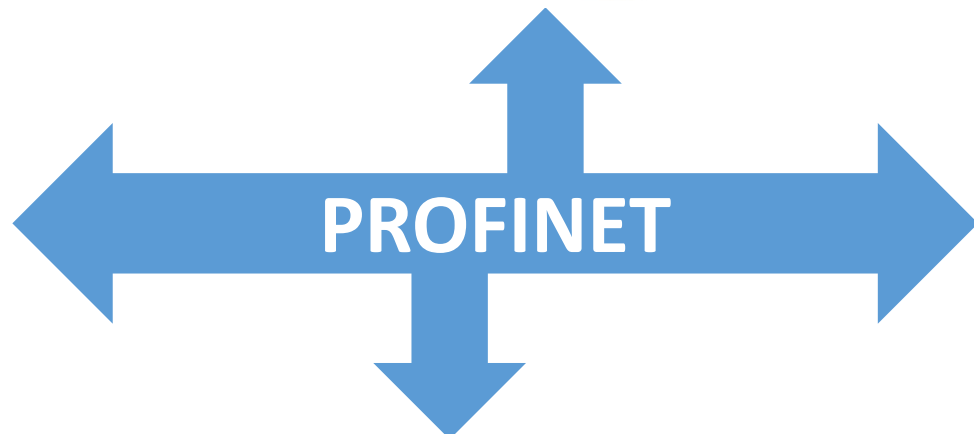
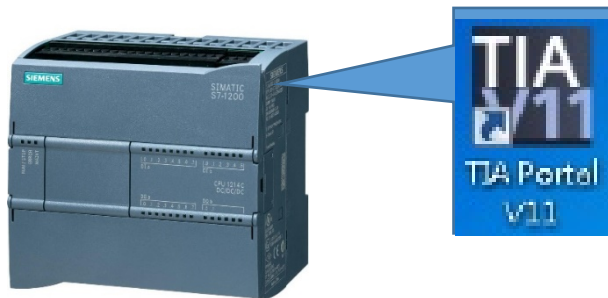
2. Receive DO data
0xBA => for DO 1~8
0x55 => for DO 9~16

Modbus client read/write 3-channel AO from/to PLC

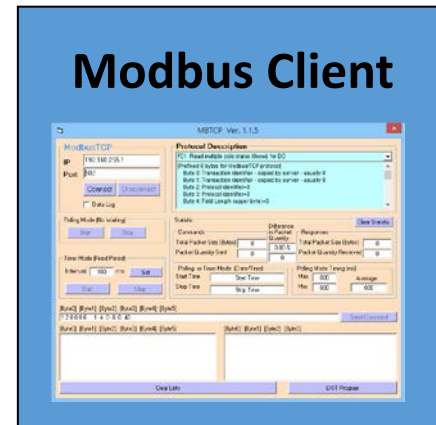


SIMATIC S7-1200

PROFINET IO Controller
(Master)



GW-7663



PROFINET IO device (Slave)	Modbus TCP Server (AO)
	• IP:192.168.77.11
	• Modbus ID:4
	• Data Address: 40001~40003
	• Data Length: 3

Modbus client read/write 3-channel AO from/to PLC



PFN_Tool (Version 1.31)

Network Devices : IP: 192.168.77.88 MAC: B8-6B-23-14-E5-76 (Intel(R) Ethernet Connection)

1 Search Module Search Start

Type	Name	IP	Mask	Gateway
S7-1200				
GW-7663				

2 Double Click

Device Basic Configuration

Device Information
Device Type : GW-7663
Device Name : gw-7663
IP Address : 0.0.0.0
Subnet Mask : 0.0.0.0
Gateway : 0.0.0.0
MAC Address : 00:0D:E0:17:00:AC

Name Configure
Device Name : gw-7663

Network Configure
IP Address : 192.168.0.111
Subnet Mask : 255.255.255.0
Gateway : 192.168.0.254

Advanced

Device Advanced Configuration

Device Information
Device Type : GW-7663
Firmware Version : V1.0

Options
Load File Save File Download Settings Upload Settings

Modbus Settings Modbus Test Diagnostic Msg. Communication Log Information

Parameters
Modbus Type : Master(Client) Polling Interval (ms) : 500
Byte Order : Little Endian(Intel) Query Timeout (ms) : 1000
I/O Safe Mode : Last Value TCP Connect Num : 1
Modbus Device ID (dec) : 1

Server settings.
Server NO. 0 OK
IP : 192 . 168 . 0 . 1
Re-Connect Time (ms) : 5000

Request Command
Function Code : FC1 Read multiple coils status (0xxxx) for DO Add
Server NO. 0
Modbus ID (dec) : 1 (1~247)
Start Address (dec) : 0 (0~65535)
Count (dec) : 1 (1~1024 Bits)
PROFINET Info.
Total Input (Byte) : 8 Modify
Total Output (Byte) : 8 Delete
System used: 8 Bytes

Change Word Order (AABB CCDD -> CCDD AABB)

Server NO.	ID	FC	Start Addr.	Count	Word order	PFN Input Addr.(Byte)	PFN Output Addr.(Byte)
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3 Press 「Advanced Settings」 button

Suggested Module : RSW:0 Input:32Byte Output:32Byte



Device Advanced Configuration

Device Information
Device Type : GW-7663
Firmware Version : V1.0

Options
Load File Save File Download Settings **Upload Settings**

Modbus Settings Modbus Test Diagnostic Msg. Communication Log Information

Parameters

Modbus Type : Slave(Server) Polling Interval (ms) : 500 Server settings.
Byte Order : Little Endian(Intel) Query Timeout (ms) : 1000 Server NO. 0 OK
I/O Safe Mode : Last Value TCP Connect Num : 0 IP : 192 . 168 . 0 . 1
Modbus Device ID (dec) : 4 Re-Connect Time (ms) : 5000

Request Command

Slave Type : AO (Output/Holding Register) Add
Count (dec) : 3 (1~252 Words) PROFINET Info. Total Input (Byte) : 14 Modify
Total Output (Byte) : 8 Delete
System used: 8 Bytes

Change Word Order (AABB CCDD -> CCDD AABB)

	Server NO.	ID	FC	Mapping Table	Count	Word order	PFN Input Addr.(Byte)	PFN Output Addr.(Byte)
▶ 1	N/A	4	AO	40001~400...	3	No	8~13	N/A

Suggested Module : RSW:0 Input:32Byte Output:32Byte

1. Set Modbus settings

2. Add Modbus Slave Type

3. Upload



The first input 8 bytes and output 8 bytes are allocated for system. (64~71)
The 9th byte to the 32th byte are allocated for Modbus. (72~95)

Device overview

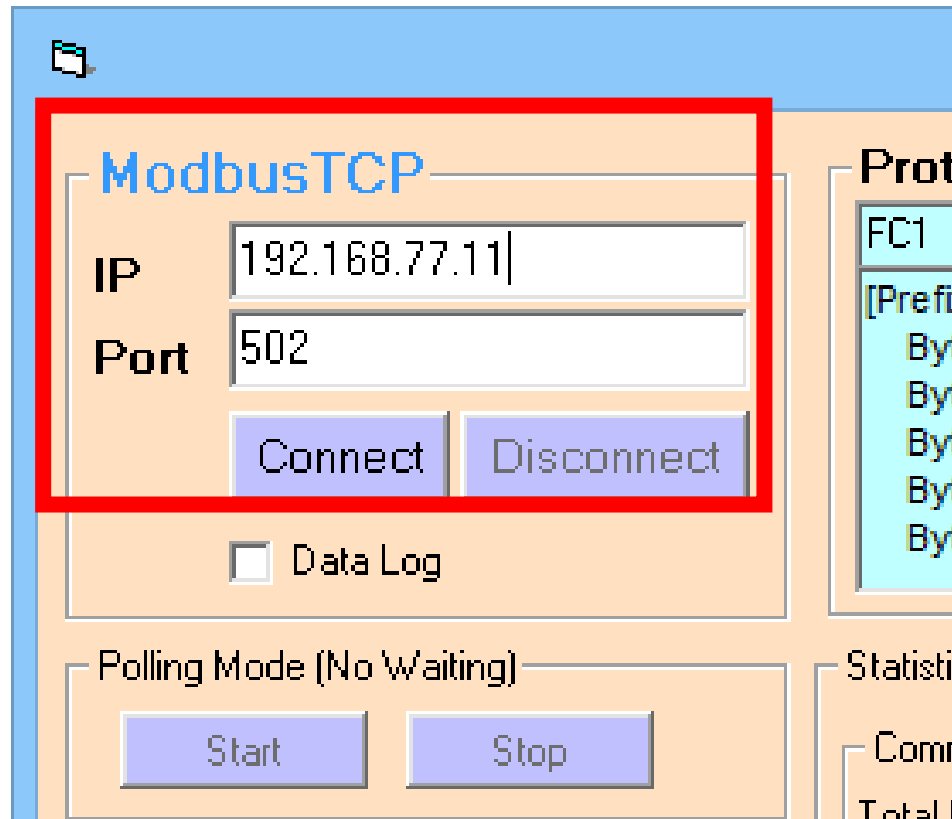
Module	Rack	Slot	I address	Q address	Type	Order no.
GW-7663	0	0			GW-7663 2-Port De...	GW-7663
Internal	0	0 X1			GW-7663	
RSW:0 Input:32Byte Output:...	0	1	64...95	64...95	RSW:0 Input:32Byte...	

...	Address	Display format	Monitor
1	%IW72	Hex	
2	%IW74	Hex	
3	%IW76	Hex	

IW72 => used to receive AO 1 from Modbus client
IW74 => used to receive AO 2 from Modbus client
IW76 => used to receive AO 3 from Modbus client



Confirm GW-7663's IP address is the same with Modbus client tool





Send Modbus command (FC 10) to change AO status(0x1122, 0x3344, 0x5566)

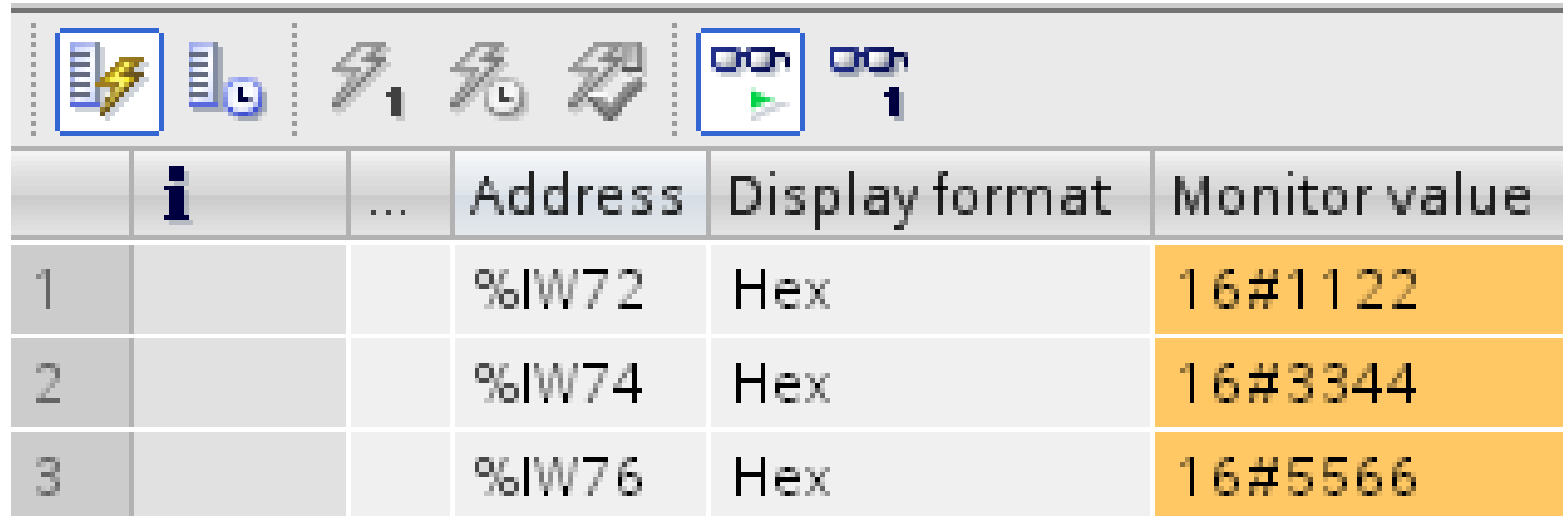
The screenshot shows the MBTCP Ver. 1.1.5 interface. The ModbusTCP section is configured with IP 192.168.77.11 and Port 502. The Protocol Description shows FC1 Read multiple coils status (0xxxx) for DO. The Command field contains the hex string 1 2 0 0 0 6 04 10 00 00 00 03 06 11 22 33 44 55 66. The Send Command button is highlighted. The response field shows 01 02 00 00 00 06 --> 04 10 00 00 00 03.

1. Send AO Data
0x1122 => for AO 1
0x3344 => for AO 2
0x5566 => for AO 3

2. Receive Resp.



PLC will receives AO status(0x1122, 0x3344, 0x5566) at PLC address IW72, IW74, IW76



	i	...	Address	Display format	Monitor value
1			%IW72	Hex	16#1122
2			%IW74	Hex	16#3344
3			%IW76	Hex	16#5566



Send Modbus command (FC 06) to change AO status
Set AO ch-2 (Modbus address: 40002): 0xABCD

1. Send query cmd

2. Receive Resp.

The screenshot shows the MBTCP Ver. 1.1.5 interface. The ModbusTCP section is configured with IP 192.168.77.11 and Port 502. The Protocol Description shows FC1 Read multiple coils status (0xxxx) for DO. The Statistics section shows 50 Total Packet Size (Bytes) for Commands and 36 for Responses. The data exchange section shows a command packet [1 2 0 0 6 04 06 00 01 AB CD] and a response packet [01 02 00 00 00 06 -> 04 06 00 01 AB CD].

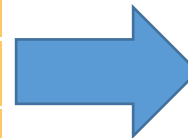
Byte	Value
[Byte0]	1
[Byte1]	2
[Byte2]	0
[Byte3]	0
[Byte4]	6
[Byte5]	04
[Byte6]	06
[Byte7]	00
[Byte8]	00
[Byte9]	01
[Byte10]	AB
[Byte11]	CD

Byte	Value
[Byte0]	01
[Byte1]	02
[Byte2]	00
[Byte3]	00
[Byte4]	00
[Byte5]	00
[Byte6]	06
[Byte7]	->
[Byte8]	04
[Byte9]	06
[Byte10]	00
[Byte11]	01
[Byte12]	AB
[Byte13]	CD



PLC will receives AO status(0xABCD) at PLC address IW74

	i	...	Address	Display format	Monitor value
1			%IW72	Hex	16#1122
2			%IW74	Hex	16#3344
3			%IW76	Hex	16#5566



	i	...	Address	Display format	Monitor value
1			%IW72	Hex	16#1122
2			%IW74	Hex	16#ABCD
3			%IW76	Hex	16#5566



Send Modbus command (FC 03) to read AO status

The screenshot shows the MBTCP Ver. 1.1.5 interface. The ModbusTCP section is configured with IP 192.168.77.11 and Port 502. The Protocol Description shows FC1 Read multiple coils status (0xxxx) for DO. The Statistics section shows 62 Bytes Total Packet Size, 4 Packet Quantity Sent, and 51 Bytes Total Packet Size, 4 Packet Quantity Received. The Polling Mode is set to No Waiting. The Timer Mode is set to Fixed Period with an Interval of 100 ms. The Send Command button is highlighted in red, and the resulting data is shown in the output area.

Byte	Value
[Byte0]	1
[Byte1]	2
[Byte2]	0
[Byte3]	0
[Byte4]	0
[Byte5]	6
[Byte0]	04
[Byte1]	03
[Byte2]	00
[Byte3]	00
[Byte4]	00
[Byte5]	03

Byte	Value
[Byte0]	01
[Byte1]	02
[Byte2]	00
[Byte3]	00
[Byte4]	00
[Byte5]	06
[Byte0]	04
[Byte1]	03
[Byte2]	06
[Byte3]	11
[Byte4]	22
[Byte5]	AB
[Byte6]	CD
[Byte7]	55
[Byte8]	66

1. Send query cmd

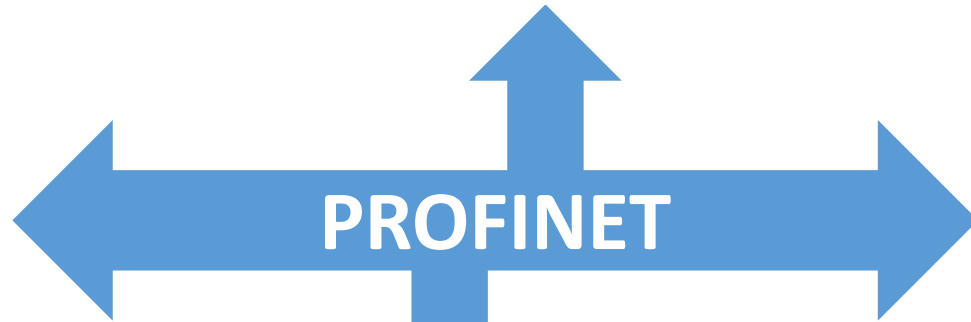
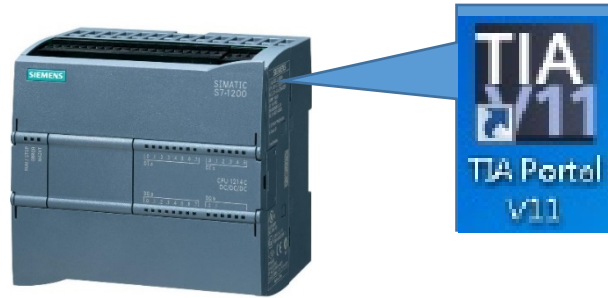
2. Receive AO data
0x1122 => for AO 1
0xABCD => for AO 2
0x5566 => for AO 3

Modbus client read 14-channel DI from PLC

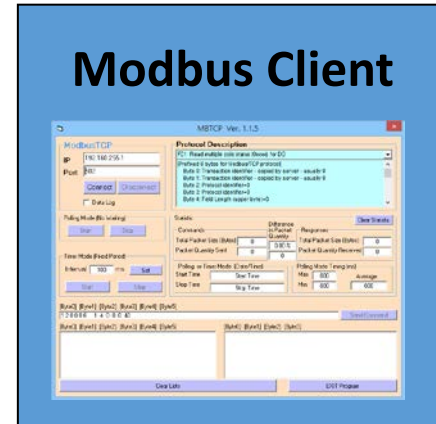


SIMATIC S7-1200

**PROFINET IO Controller
(Master)**



GW-7663



**PROFINET IO device
(Slave)**

- Modbus TCP Server (DI)**
- IP:192.168.77.11
 - Modbus ID:3
 - Data Address: 10001~10014
 - Data Length: 2

Modbus client read 14-channel DI from PLC



PFN_Tool (Version 1.31)

Network Devices : IP: 192.168.77.88 MAC: B8-6B-23-14-E5-76 (Intel(R) Ethernet Connection)

1 Search Module

Type	Name	IP	Mask	Gateway
S7-1200				
GW-7663				

2 Double Click

Device Basic Configuration

Device Information

Device Type : GW-7663
Device Name : gw-7663
IP Address : 0.0.0.0
Subnet Mask : 0.0.0.0
Gateway : 0.0.0.0
MAC Address : 00:0D:E0:17:00:AC

Name Configure

Device Name : gw-7663

Network Configure

IP Address : 192.168.0.111
Subnet Mask : 255.255.255.0
Gateway : 192.168.0.254

Advanced

Device Advanced Configuration

Device Information

Device Type : GW-7663
Firmware Version : V1.0

Options

Load File Save File Download Settings Upload Settings

Modbus Settings Modbus Test Diagnostic Msg. Communication Log Information

Parameters

Modbus Type : Master(Client) Polling Interval (ms) : 500
Byte Order : Little Endian(Intel) Query Timeout (ms) : 1000
I/O Safe Mode : Last Value TCP Connect Num : 1
Modbus Device ID (dec) : 1

Server settings.

Server NO. 0 OK
IP : 192 . 168 . 0 . 1
Re-Connect Time (ms) : 5000

Request Command

Function Code : FC1 Read multiple coils status (0xxxx) for DO Add
Server NO. 0
Modbus ID (dec) : 1 (1~247) PROFINET Info.
Start Address (dec) : 0 (0~65535) Total Input (Byte) : 8 Modify
Count (dec) : 1 (1~1024 Bits) Total Output (Byte) : 8 Delete
System used: 8 Bytes

Change Word Order (AABB CCDD -> CCDD AABB)

Server NO.	ID	FC	Start Addr.	Count	Word order	PFN Input Addr.(Byte)	PFN Output Addr.(Byte)
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3 Press 「Advanced Settings」 button

Suggested Module : RSW:0 Input:32Byte Output:32Byte

Modbus client read 14-channel DI from PLC



Device Advanced Configuration

Device Information
Device Type : GW-7663
Firmware Version : V1.0

Options
Load File Save File Download Settings **Upload Settings**

Modbus Settings Modbus Test Diagnostic Msg. Communication Log Information

Parameters

Modbus Type : Slave(Server) Polling Interval (ms) : 500 Server settings.
Byte Order : Little Endian(Intel) Query Timeout (ms) : 1000 Server NO. 0 OK
I/O Safe Mode : Last Value TCP Connect Num : 0 IP : 192 . 168 . 0 . 1
Modbus Device ID (dec) : 3 Re-Connect Time (ms) : 5000

Request Command

Slave Type : DI (Input Relay/Coil) Add
Count (dec) : 14 (1~4032 Bits) PROFINET Info.
Total Input (Byte) : 8 Modify
Total Output (Byte) : 10 Delete
System used: 8 Bytes

Change Word Order (AABB CCDD -> CCDD AABB)

	Server NO.	ID	FC	Mapping Table	Count	Word order	PFN Input Addr.(Byte)	PFN Output Addr.(Byte)
▶ 1	N/A	3	DI	10001~100...	14	No	N/A	8~9

Suggested Module : RSW:0 Input:32Byte Output:32Byte

1. Set Modbus settings

2. Add Modbus Slave Type

3. Upload



The first input 8 bytes and output 8 bytes are allocated for system. (64~71)
The 9th byte to the 32th byte are allocated for Modbus. (72~95)

Module	Rack	Slot	I address	Q address	Type	Order no.
GW-7663	0	0			GW-7663 2-Port De...	GW-7663
Internal	0	0 X1			GW-7663	
RSW:0 Input:32Byte Output:...	0	1	64...95	64...95	RSW:0 Input:32Byte...	

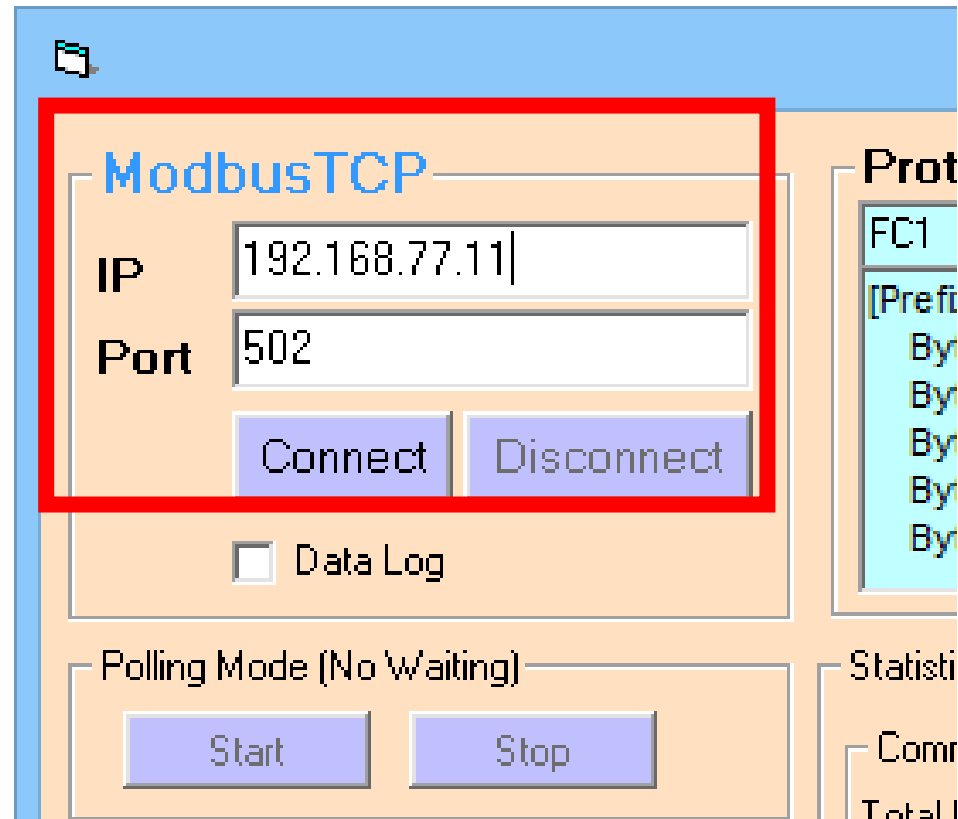
Address	Display format	Monitor value
%QB72	Hex	16#0000
%QB73	Hex	16#0000
%Q72.0	Bool	16#0000
%Q72.1	Bool	
%Q72.2	Bool	
%Q72.3	Bool	
%Q72.4	Bool	
%Q72.5	Bool	
%Q72.6	Bool	
%Q72.7	Bool	
%Q73.0	Bool	
%Q73.1	Bool	
%Q73.2	Bool	
%Q73.3	Bool	
%Q73.4	Bool	
%Q73.5	Bool	

QB72 => used to refresh DI 1~8
QB73 => used to refresh DI 9~14

Q72.0~7 => used to refresh DI 1~8
Q73.0~5 => used to refresh DI 9~14



Confirm GW-7663's IP address is the same with Modbus client tool





Send Modbus command (FC 02) to read DI status

The screenshot shows the MBTCP Ver. 1.1.5 interface. The ModbusTCP section has IP 192.168.77.11 and Port 502. The Protocol Description shows FC1 Read multiple coils status (0xxxx) for DO. The Statistics section shows 12 bytes for commands and 11 bytes for responses. The data exchange area shows a command packet [1 2 0 0 6 03 02 00 00 00 0E] and a response packet [01 02 00 00 00 06 -> 03 02 00 00 0E].

1. Send query cmd

2. Receive DI data
0x00 => for DI 1~8
0x00 => for DI 9~14



Modify QB72, QB73 to 0xAA, 0x15

	i	...	Address	Display format	Monitor value	Modify value
1			%QB72	Hex	16#AA	16#AA
2			%QB73	Hex	16#15	16#15
3			%Q72.0	Bool	<input type="checkbox"/> FALSE	
4			%Q72.1	Bool	<input checked="" type="checkbox"/> TRUE	
5			%Q72.2	Bool	<input type="checkbox"/> FALSE	
6			%Q72.3	Bool	<input checked="" type="checkbox"/> TRUE	
7			%Q72.4	Bool	<input type="checkbox"/> FALSE	
8			%Q72.5	Bool	<input checked="" type="checkbox"/> TRUE	
9			%Q72.6	Bool	<input type="checkbox"/> FALSE	
10			%Q72.7	Bool	<input checked="" type="checkbox"/> TRUE	
11			%Q73.0	Bool	<input checked="" type="checkbox"/> TRUE	
12			%Q73.1	Bool	<input type="checkbox"/> FALSE	
13			%Q73.2	Bool	<input checked="" type="checkbox"/> TRUE	
14			%Q73.3	Bool	<input type="checkbox"/> FALSE	
15			%Q73.4	Bool	<input checked="" type="checkbox"/> TRUE	
16			%Q73.5	Bool	<input type="checkbox"/> FALSE	



Send Modbus command (FC 02) to read DI status again

The screenshot shows the MBTCP Ver. 1.1.5 interface. The ModbusTCP section is configured with IP 192.168.77.11 and Port 502. The Protocol Description shows 'FC1 Read multiple coils status (0xxxx) for DO'. The interface includes sections for Polling Mode, Timer Mode, and Statistics. The data exchange section shows a command being sent and a response received. The response data is highlighted in blue and contains two lines of hex data: '01 02 00 00 00 06 --> 03 02 00 00 00 0E' and '01 02 00 00 00 05 --> 03 02 02 AA 15'. The second line is highlighted in blue.

Byte0	Byte1	Byte2	Byte3	Byte4	Byte5
1	2	0	0	6	03 02 00 00 00 0E

Byte0	Byte1	Byte2	Byte3	Byte4	Byte5
01	02	00	00	00	06 --> 03 02 00 00 00 0E
01	02	00	00	00	05 --> 03 02 02 AA 15

1. Send query cmd

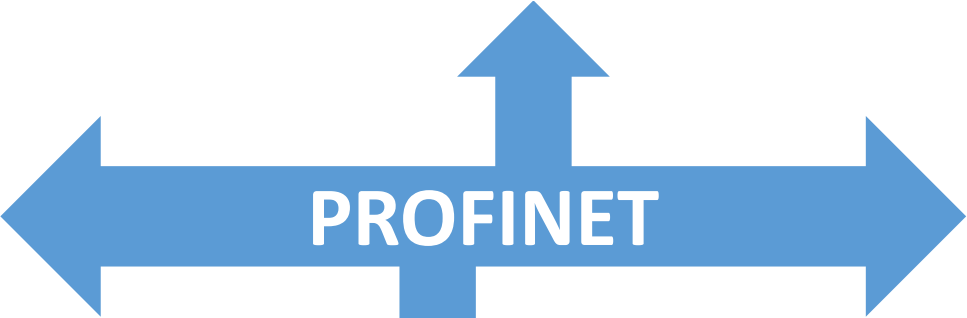
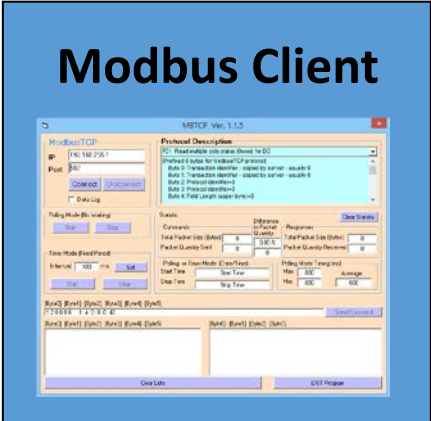
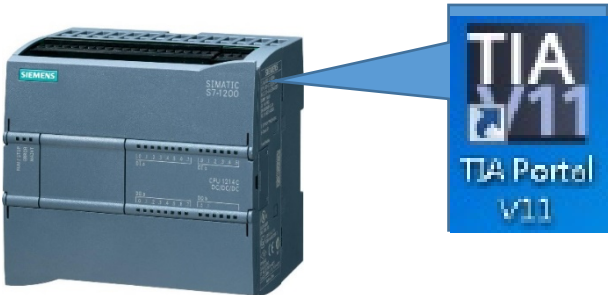
2. Receive DI data
0xAA => for DI 1~8
0x15 => for DI 9~14

Modbus client read 4-channel AI from PLC



SIMATIC S7-1200

**PROFINET IO Controller
(Master)**



GW-7663



**PROFINET IO device
(Slave)**

- Modbus TCP Server (AI)**
- IP:192.168.77.11
 - Modbus ID:5
 - Data Address: 30001~30004
 - Data Length: 4



PFN_Tool (Version 1.31)

Network Devices : IP: 192.168.77.88 MAC: B8-6B-23-14-E5-76 (Intel(R) Ethernet Connection)

1 Search Module Search Start

Type	Name	IP	Mask	Gateway
S7-1200				
GW-7663				

2 Double Click

Device Basic Configuration

Device Information
Device Type : GW-7663
Device Name : gw-7663
IP Address : 0.0.0.0
Subnet Mask : 0.0.0.0
Gateway : 0.0.0.0
MAC Address : 00:0D:E0:17:00:AC

Name Configure
Device Name : gw-7663

Network Configure
IP Address : 192.168.0.111
Subnet Mask : 255.255.255.0
Gateway : 192.168.0.254

Advanced

Device Advanced Configuration

Device Information
Device Type : GW-7663
Firmware Version : V1.0

Options
Load File Save File Download Settings Upload Settings

Modbus Settings Modbus Test Diagnostic Msg. Communication Log Information

Parameters
Modbus Type : Master(Client) Polling Interval (ms) : 500
Byte Order : Little Endian(Intel) Query Timeout (ms) : 1000
I/O Safe Mode : Last Value TCP Connect Num : 1
Modbus Device ID (dec) : 1

Server settings.
Server NO. 0 OK
IP : 192 . 168 . 0 . 1
Re-Connect Time (ms) : 5000

Request Command
Function Code : FC1 Read multiple coils status (0xxxx) for DO Add
Server NO. 0
Modbus ID (dec) : 1 (1~247)
Start Address (dec) : 0 (0~65535)
Count (dec) : 1 (1~1024 Bits)
PROFINET Info.
Total Input (Byte) : 8 Modify
Total Output (Byte) : 8 Delete
System used: 8 Bytes

Change Word Order (AABB CCDD -> CCDD AABB)

Server NO.	ID	FC	Start Addr.	Count	Word order	PFN Input Addr.(Byte)	PFN Output Addr.(Byte)
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3 Press 「Advanced Settings」 button

Suggested Module : RSW:0 Input:32Byte Output:32Byte



Device Advanced Configuration

Device Information
Device Type : GW-7663
Firmware Version : V1.0

Options
Load File Save File Download Settings **Upload Settings**

Modbus Settings Modbus Test Diagnostic Msg. Communication Log Information

Parameters

Modbus Type : Slave(Server) Polling Interval (ms) : 500 Server settings.
Byte Order : Little Endian(Intel) Query Timeout (ms) : 1000 Server NO. 0 OK
I/O Safe Mode : Last Value TCP Connect Num : 0 IP : 192 . 168 . 0 . 1
Modbus Device ID (dec) : 5 Re-Connect Time (ms) : 5000

Request Command

Slave Type : AI (Input Register) Add

Count (dec) : 4 (1~252 Words) PROFINET Info.
Total Input (Byte) : 8 Modify
Total Output (Byte) : 16
System used: 8 Bytes Delete

Change Word Order (AABB CCDD -> CCDD AABB)

	Server NO.	ID	FC	Mapping Table	Count	Word order	PFN Input Addr.(Byte)	PFN Output Addr.(Byte)
▶ 1	N/A	5	AI	30001~300...	4	No	N/A	8~15

Suggested Module : RSW:0 Input:32Byte Output:32Byte

1. Set Modbus settings

2. Add Modbus Slave Type

3. Upload



The first input 8 bytes and output 8 bytes are allocated for system. (64~71)
The 9th byte to the 32th byte are allocated for Modbus. (72~95)

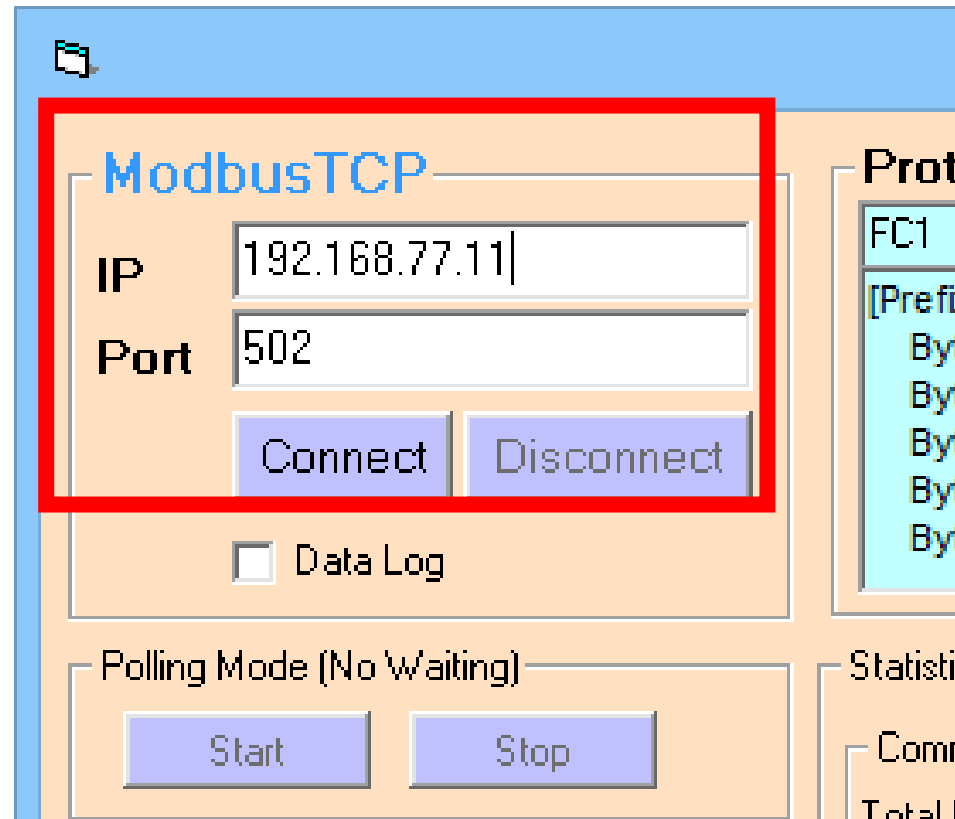
Module	Rack	Slot	I address	Q address	Type	Order no.
GW-7663	0	0			GW-7663 2-Port De...	GW-7663
Internal	0	0 X1			GW-7663	
RSW:0 Input:32Byte Output:...	0	1	64...95	64...95	RSW:0 Input:32Byte...	

i	...	Address	Display format	Monitor val
1		%QW72	Hex	
2		%QW74	Hex	
3		%QW76	Hex	
4		%QW78	Hex	

QW72 => used to refresh AI 1
QW74 => used to refresh AI 2
QW76 => used to refresh AI 3
QW78 => used to refresh AI 4



Confirm GW-7663's IP address is the same with Modbus client tool





Send Modbus command (FC 04) to read AI status

The screenshot shows the MBTCP Ver. 1.1.5 interface. The ModbusTCP section is configured with IP 192.168.77.11 and Port 502. The Protocol Description shows FC1 Read multiple coils status (0xxxx) for DO. The Polling Mode is set to (No Waiting). The Timer Mode is set to (Fixed Period) with an interval of 100 ms. The Statistics section shows 24 Total Packet Size (Bytes) and 2 Packet Quantity Sent. The Responses section shows 34 Total Packet Size (Bytes) and 2 Packet Quantity Received. The Polling or Timer Mode (Date/Time) section shows Start Time and Stop Time. The Polling Mode Timing (ms) section shows Max 0 and Average 000. The Send Command button is highlighted. The data exchange section shows the following bytes:


[Byte0]	[Byte1]	[Byte2]	[Byte3]	[Byte4]	[Byte5]
1	2	0	0	6	05 04 00 00 00 04
01	02	00	00	00	06 --> 05 04 00 00 00 04
01	02	00	00	00	08 --> 05 04 08 AA 15 00 00 00 00 00 00

1. Send query cmd

2. Receive AI data
0x0000 => for AI 1
0x0000 => for AI 2
0x0000 => for AI 3
0x0000 => for AI 4



Modify QW72, QW74, QW76, QW78 to 0x1122, 0x3344, 0x5566, 0x7788

		...	Address	Display format	Monitor value	Modify value
1			%QW72	Hex	16#1122	16#1122
2			%QW74	Hex	16#3344	16#3344
3			%QW76	Hex	16#5566	16#5566
4			%QW78	Hex	16#7788	16#7788



Send Modbus command (FC 04) to read AI status again

The screenshot shows the MBTCP Ver. 1.1.5 interface. The ModbusTCP section is configured with IP 192.168.77.11 and Port 502. The Protocol Description shows FC1 Read multiple coils status (0xxxx) for DO. The interface includes sections for Polling Mode (No Waiting) and Timer Mode (Fixed Period) with Start and Stop buttons. A Statistics section shows Commands (Total Packet Size: 36, Packet Quantity Sent: 3) and Responses (Total Packet Size: 51, Packet Quantity Received: 3). The bottom section displays a hex dump of the Modbus command and response. The command is 01 02 00 00 06 05 04 00 00 00 04. The response is 01 02 00 00 00 08 05 04 08 AA 15 00 00 00 00 00 00. A red box highlights the command and response hex data, and a red arrow points from the 'Send Command' button to the command hex data.

1. Send query cmd

2. Receive AI data
0x1122 => for AI 1
0x3344 => for AI 2
0x5566 => for AI 3
0x7788 => for AI 4