

GW-7663 (Modbus TCP 從站) *如何與Modbus 主站設備通訊?* *以SIMATIC TIA portal為例*

- 測試前準備
- Example 1:Modbus 主站 讀取/寫入 DO 從/至 PLC
- Example 2:Modbus 主站 讀取/寫入 AO 從/至 PLC
- Example 3:Modbus 主站 從 PLC 讀取 DI
- Example 4:Modbus 主站 從 PLC 讀取 AI

- ✓ 與 PLC 建立 PROFINET 連線 (LED => AP:ON, BOOT:OFF, ERR:OFF).

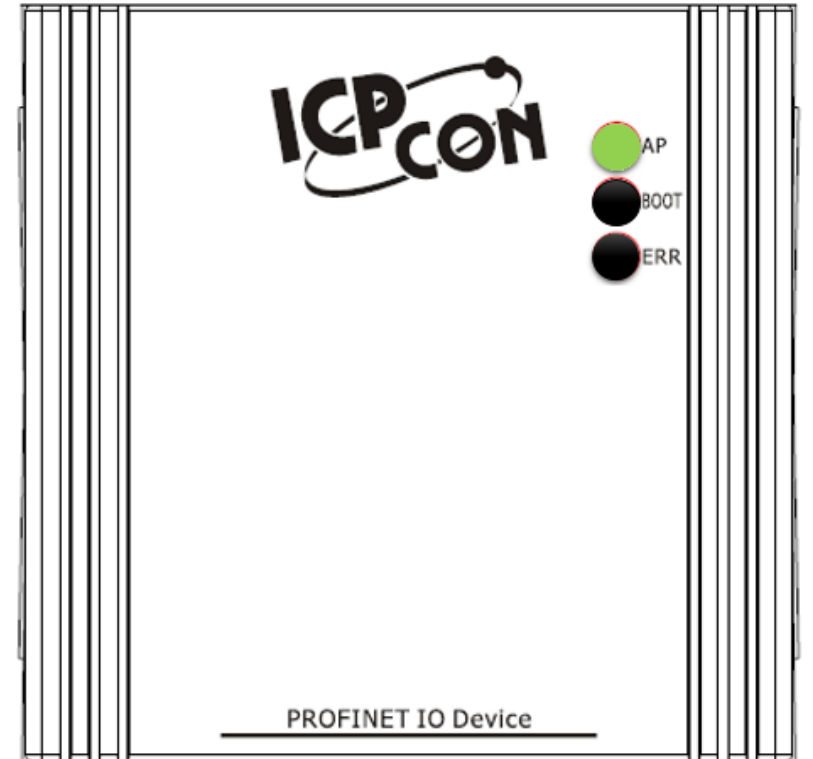
[如何用SIMATIC TIA portal設定GW-7663組態](#)

- ✓ 下載 PFN_Tool 工具軟體

[PFN_Tool](#)

- ✓ 下載 Modbus TCP 主站工具軟體

[MBTCP tool](#)

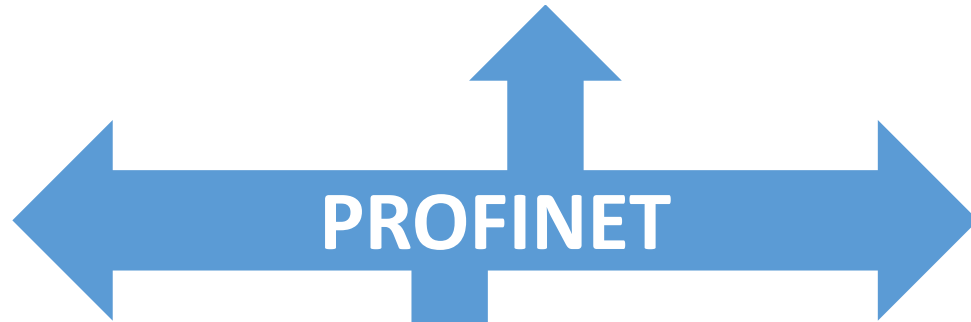
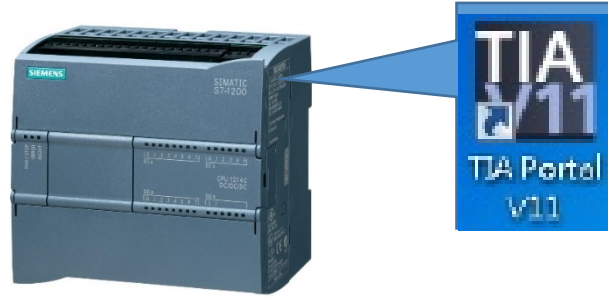


Modbus 主站讀取/寫入 16通道DO 從/至 PLC

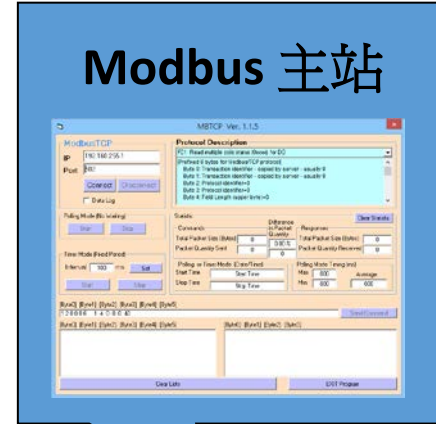


SIMATIC S7-1200

PROFINET IO Controller
(主站)



GW-7663



PROFINET IO device
(從站)

Modbus TCP 從站 (DO)

- IP: 192.168.77.11
- Modbus ID:2
- 資料位址: 00001~00016
- 資料長度: 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 搜尋模組 Search Start

Type	Name	IP	Mask	Gateway
S7-1200				
GW-7663				

2 雙擊模組

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

Device 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 PROFINET Info.
 Modbus ID (dec) : 1 (1~247) Total Input (Byte) : 8 Modify
 Start Address (dec) : 0 (0~65535) Total Output (Byte) : 8 Delete
 Count (dec) : 1 (1~1024 Bits) 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)

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

3 按「Advanced Settings」鈕



1. Modbus 通訊組態設定

2. 添加Modbus 從站類型

3. 儲存設定

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) : 2 Re-Connect Time (ms) : 5000

Request Command

Slave Type : DO (Output Relay/Coil) Add
Count (dec) : 16 (1~4032 Bits) PROFINET Info.
Total Input (Byte) : 10 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	2	DO	00001~000...	16	No	8~9	N/A

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



I address與Q address的前8個bytes供GW-7663內部使用(64~71)
I address與Q address的第9個bytes開始為Modbus資料(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...	

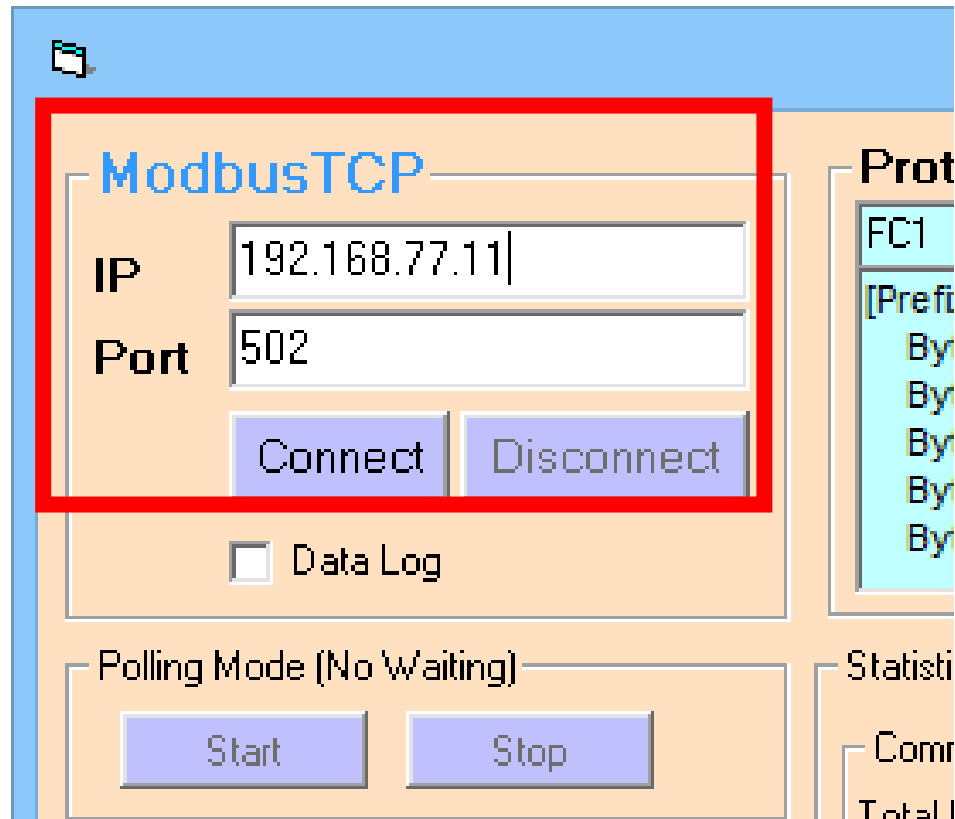
Address	Display format	Monitor value
%IB72	Hex	16#00
%IB73	Hex	16#00
%I72.0	Bool	FALSE
%I72.1	Bool	FALSE
%I72.2	Bool	FALSE
%I72.3	Bool	FALSE
%I72.4	Bool	FALSE
%I72.5	Bool	FALSE
%I72.6	Bool	FALSE
%I72.7	Bool	FALSE
%I73.0	Bool	FALSE
%I73.1	Bool	FALSE
%I73.2	Bool	FALSE
%I73.3	Bool	FALSE
%I73.4	Bool	FALSE
%I73.5	Bool	FALSE
%I73.6	Bool	FALSE
%I73.7	Bool	FALSE

IB72=> 用來從Modbus 主站接收DO 1~8
IB73 => 用來從Modbus 主站接收DO 9~16

I72.0~7 =>用來從Modbus 主站接收DO 1~8
I73.0~7 =>用來從Modbus 主站接收DO 9~16



確認 GW-7663 的 IP位址 跟 Modbus 主站相同





發送 Modbus 命令 (FC 0F) 改變 DO 狀態(0xAA, 0x55)

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 15 Bytes Total Packet Size and 1 Packet Quantity Sent. The Timer Mode is set to 100 ms. The Send Command button is highlighted.

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

[Byte0]	[Byte1]	[Byte2]	[Byte3]	[Byte4]	[Byte5]	[Byte6]	[Byte7]	[Byte0]	[Byte1]	[Byte2]	[Byte3]	[Byte4]	[Byte5]		
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. 發送 DO 值
0xAA => DO 1~8
0x55 => DO 9~16

2. 接收回應訊息



PLC 在 PLC 位址 IB72, IB73 接收 DO 狀態(0xAA, 0x55)

	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



發送 Modbus 命令 (FC 05) 改變 DO 狀態
設定 DO 通道5(Modbus 位址: 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 24 for Responses. The interface also includes Polling Mode (No Waiting) and Timer Mode (Fixed Period) options. A red box highlights the command field containing the hex string 1 2 0 0 0 6 02 05 00 04 FF 00, and another red box highlights the response field containing 01 02 00 00 00 06 --> 02 05 00 04 FF 00. A 'Send Command' button is visible next to the command field.

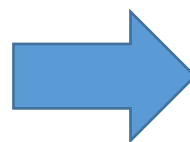
1. 發送 查詢命令

2. 接收回應訊息



PLC 在 PLC 位址 I72.4(通道5) 接收 DO 狀態

	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



發送 Modbus 命令 (FC 01) 讀取 DO 狀態

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 Packets Sent. The data exchange section shows a command packet [1 2 0 0 6 02 01 00 00 00 10] and a response packet [01 02 00 00 00 06 -> 02 01 00 00 00 10]. A red box highlights the response packet, and a red arrow points to it from the text box below.

1. 發送 查詢命令

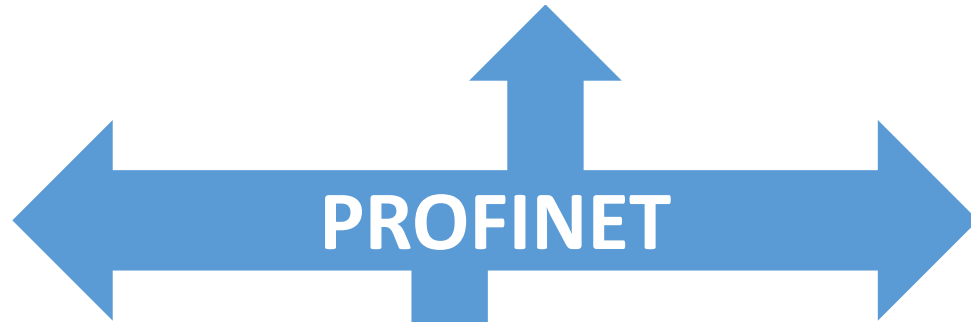
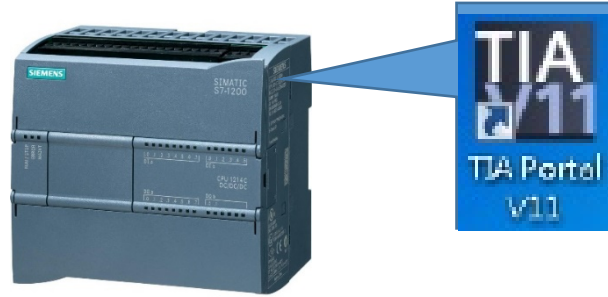
2. 接收 DO 值
0xBA => DO 1~8
0x55 => DO 9~16

Modbus 主站讀取/寫入 3通道AO 從/至 PLC

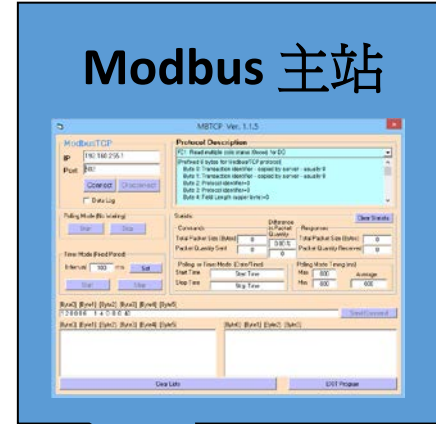


SIMATIC S7-1200

PROFINET IO Controller
(主站)



GW-7663



PROFINET IO device
(從站)

Modbus TCP 從站 (AO)

- IP:192.168.77.11
- Modbus ID:4
- 資料位址: 40001~40003
- 資料長度: 3



PFN_Tool (Version 1.31)

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

1 搜尋模組 Search Start

Type	Name	IP	Mask	Gateway
S7-1200				
GW-7663				

2 雙擊模組

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

Device 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 PROFINET Info.
 Modbus ID (dec) : 1 (1~247) Total Input (Byte) : 8 Modify
 Start Address (dec) : 0 (0~65535) Total Output (Byte) : 8 Delete
 Count (dec) : 1 (1~1024 Bits) 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)

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

3 按「Advanced Settings」鈕



1. Modbus 通訊組態設定

2. 添加Modbus 從站類型

3. 儲存設定

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



I address與Q address的前8個bytes供GW-7663內部使用(64~71)
I address與Q address的第9個bytes開始為Modbus資料(72~95)

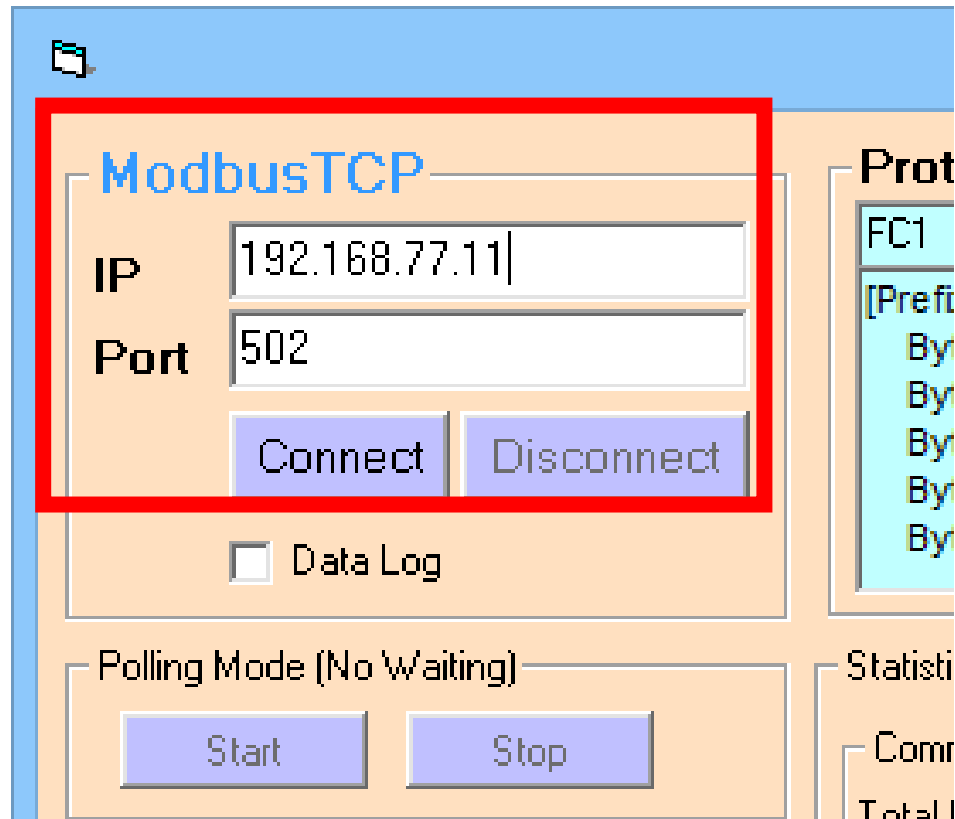
Module	Rack	Slot	I address	Q address	Type	Order no.
GW-7663	0	0			GW-7663 2-Port De...	GW-7663
Internal	0	0 X1			GW-7663	
RSW:0 Input:32Byte Output:...	0	1	64...95	64...95	RSW:0 Input:32Byte...	

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

IW72 => 用來從 Modbus 主站接收 AO 1
IW74 => 用來從 Modbus 主站接收 AO 2
IW76 => 用來從 Modbus 主站接收 AO 3



確認 GW-7663 的 IP位址 跟 Modbus 主站相同





發送 Modbus 命令 (FC 10) 改變 AO 狀態(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 Statistics section shows 38 Total Packet Size (Bytes) and 2 Packet Quantity Sent. The Polling Mode (No Waiting) and Timer Mode (Fixed Period) sections are also visible.

The data exchange section shows the following bytes:

[Byte0]	[Byte1]	[Byte2]	[Byte3]	[Byte4]	[Byte5]
1	2	0	0	6	04 10 00 00 00 03 06 11 22 33 44 55 66

The response section shows the following bytes:

[Byte0]	[Byte1]	[Byte2]	[Byte3]	[Byte4]	[Byte5]	[Byte6]	[Byte7]	[Byte0]	[Byte1]	[Byte2]	[Byte3]	[Byte4]	[Byte5]		
01	02	00	00	00	06	-->	04 10 00 00 00 03 06 11 22 33 44 55 66	01	02	00	00	00	06	-->	04 10 00 00 00 03

- 1. 發送 AO 值
- 0x1122 => AO 1
- 0x3344 => AO 2
- 0x5566 => AO 3

- 2. 接收回應訊息



PLC 在PLC 位址 IW72, IW74, IW76 接收 AO 狀態(0x1122, 0x3344, 0x5566)

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



發送 Modbus 命令 (FC 06) 改變 AO 狀態
設定 AO 通道2(Modbus 位址: 40002): 0xABCD

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 'Statistic' section shows 50 Total Packet Size (Bytes) and 3 Packet Quantity Sent. The 'Polling Mode (No Waiting)' section has 'Start' and 'Stop' buttons. The 'Timer Mode (Fixed Period)' section has an interval of 100 ms. The 'Send Command' button is visible. The data exchange area shows the following hex data:

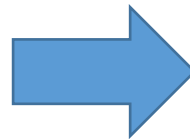
[Byte0]	[Byte1]	[Byte2]	[Byte3]	[Byte4]	[Byte5]
1	2	0	0	6	04 06 00 01 AB CD
01	02	00	00	00	06 --> 04 06 00 01 AB CD

1. 發送 查詢命令

2. 接收回應訊息

PLC 在 PLC 位址 IW74 接收 AO 狀態(0xABCD)

	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



發送 Modbus 命令 (FC 03) 讀取 AO 狀態

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 Total Packet Size (Bytes) and 4 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 is shown in the bottom section.

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

04 03 00 00 00 03

Byte	Value
[Byte0]	01
[Byte1]	02
[Byte2]	00
[Byte3]	00
[Byte4]	00
[Byte5]	00

00 06 --> 04 03 00 00 00 03

Byte	Value
[Byte0]	01
[Byte1]	02
[Byte2]	00
[Byte3]	00
[Byte4]	00
[Byte5]	00

00 09 --> 04 03 06 11 22 AB CD 55 66

1. 發送 查詢命令

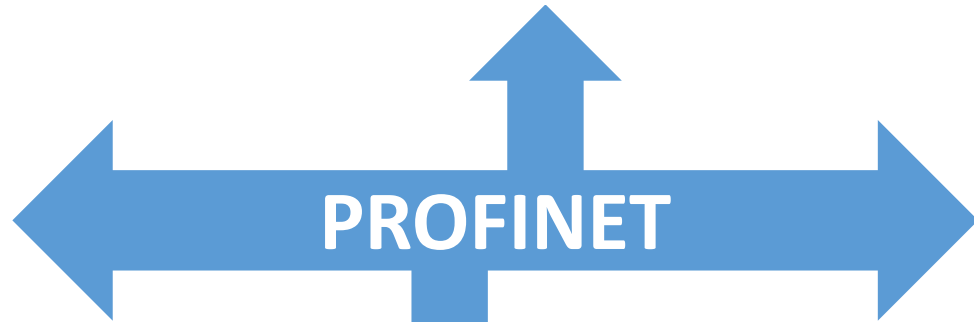
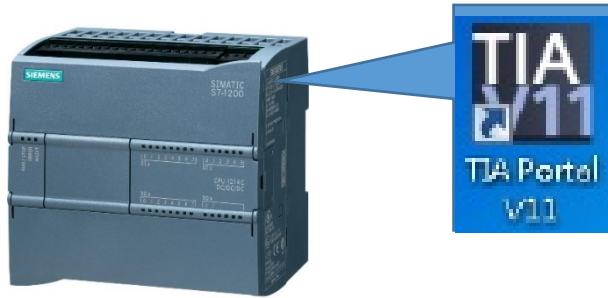
2. 接收 AO 值
0x1122 => AO 1
0xABCD => AO 2
0x5566 => AO 3

Modbus 主站從 PLC 讀取 14 通道 DI

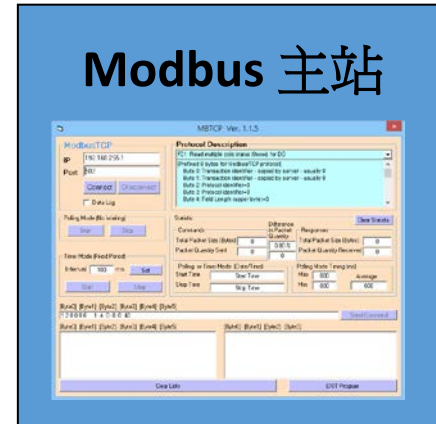


SIMATIC S7-1200

PROFINET IO Controller
(主站)



GW-7663



PROFINET IO device
(從站)

- Modbus TCP從站 (DI)
- IP:192.168.77.11
 - Modbus ID:3
 - 資料位址: 10001~10014
 - 資料長度: 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 搜尋模組 Search Start

Type	Name	IP	Mask	Gateway
S7-1200				
GW-7663				

2 雙擊模組

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

Device 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 PROFINET Info.
 Modbus ID (dec) : 1 (1~247) Total Input (Byte) : 8 Modify
 Start Address (dec) : 0 (0~65535) Total Output (Byte) : 8 Delete
 Count (dec) : 1 (1~1024 Bits) 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)

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

3 按「Advanced Settings」鈕



1. Modbus 通訊組態設定

2. 添加Modbus 從站類型

3. 儲存設定

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
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	3	DI	10001~100...	14	No	N/A	8~9

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



I address與Q address的前8個bytes供GW-7663內部使用(64~71)
I address與Q address的第9個bytes開始為Modbus資料(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...	

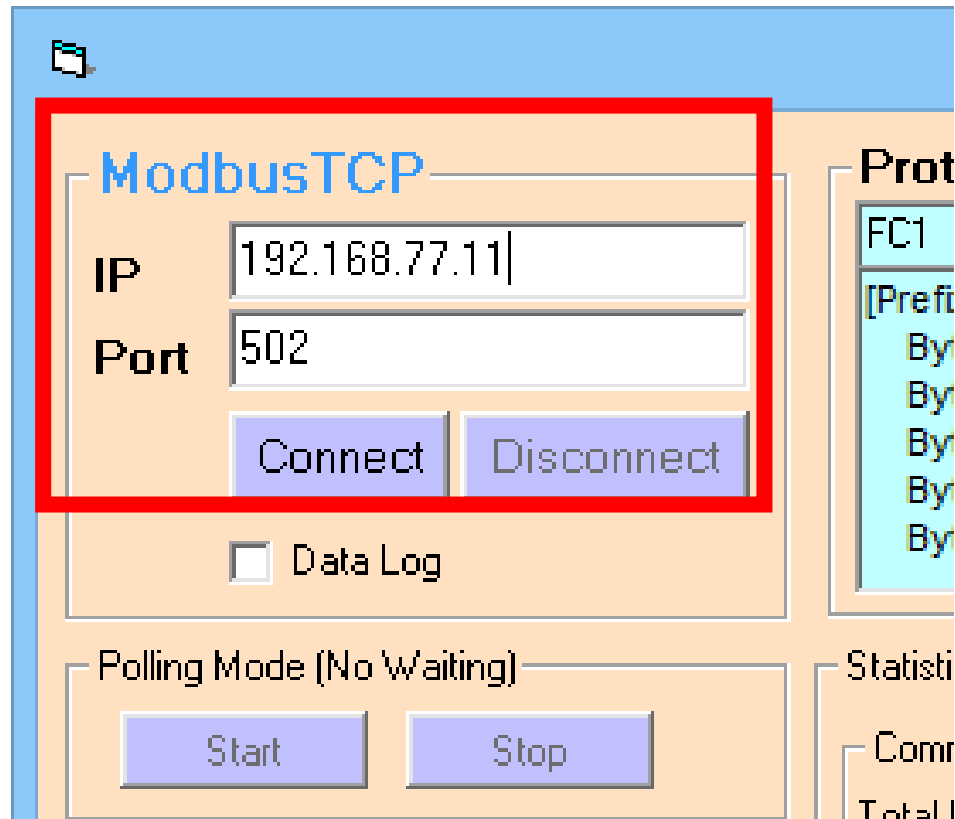
i	Address	Display format	Monitor value
1	%QB72	Hex	16#0000
2	%QB73	Hex	16#0000
3	%Q72.0	Bool	16#0000
4	%Q72.1	Bool	
5	%Q72.2	Bool	
6	%Q72.3	Bool	
7	%Q72.4	Bool	
8	%Q72.5	Bool	
9	%Q72.6	Bool	
10	%Q72.7	Bool	
11	%Q73.0	Bool	
12	%Q73.1	Bool	
13	%Q73.2	Bool	
14	%Q73.3	Bool	
15	%Q73.4	Bool	
16	%Q73.5	Bool	

QB72 => 用來更新 DI 1~8
QB73 => 用來更新 DI 9~14

Q72.0~7 => 用來更新 DI 1~8
Q73.0~5 => 用來更新 DI 9~14



確認 GW-7663 的 IP位址 跟 Modbus 主站相同





發送 Modbus 命令 (FC 02) 讀取 DI 狀態

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 12 bytes for commands and 11 bytes for responses. The data exchange section shows a request 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 00 05].

1. 發送 查詢命令

2. 接收 DI 值
0x00 => DI 1~8
0x00 => DI 9~14



改變 QB72, QB73 值為 0xAA, 0x15

		...	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	

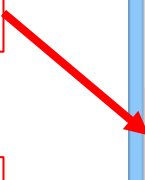


再次發送 Modbus 命令 (FC 02) 讀取 DI 狀態

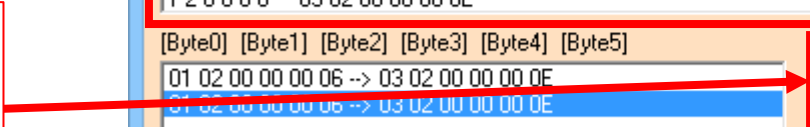
The screenshot shows the MBTCP Ver. 1.1.5 interface. The ModbusTCP section is configured with IP 192.168.77.11 and Port 502. The Protocol Description shows FC1 Read multiple coils status (0xxxx) for DO. The Polling Mode is set to (No Waiting) and the Timer Mode is set to (Fixed Period) with an interval of 100 ms. The Statistic section shows 24 Bytes of Commands and 22 Bytes of Responses. The data exchange section shows the following data:

[Byte0]	[Byte1]	[Byte2]	[Byte3]	[Byte4]	[Byte5]
1	2	0	0	6	03 02 00 00 00 0E
01	02	00	00	00	06 --> 03 02 00 00 00 0E
01	02	00	00	00	06 --> 03 02 00 00 00 0E
01	02	00	00	00	05 --> 03 02 02 00 00
01	02	00	00	00	05 --> 03 02 02 AA 15

1. 發送 查詢命令



2. 接收 DI 值
0xAA => DI 1~8
0x15 => DI 9~14

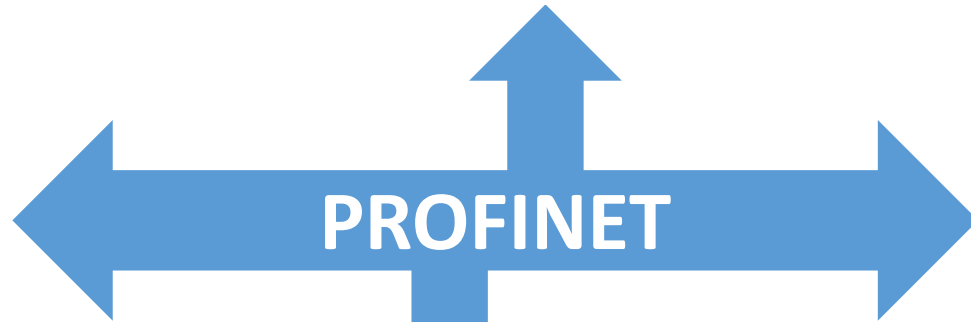
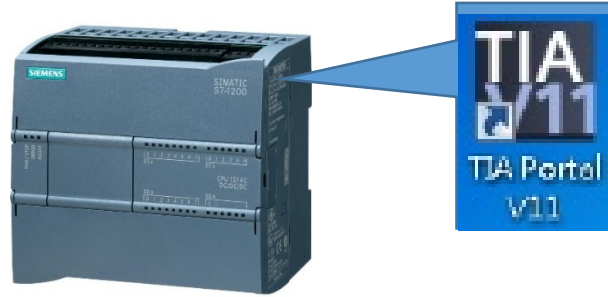


Modbus 主站從 PLC 讀取 4 通道 AI

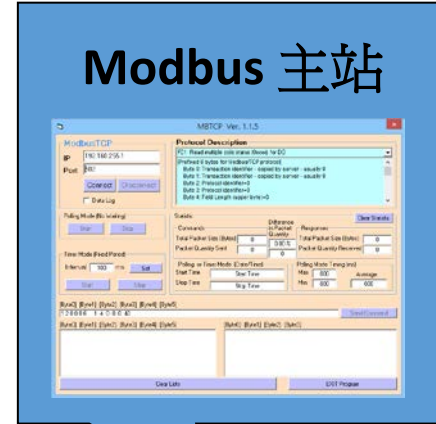


SIMATIC S7-1200

PROFINET IO Controller
(主站)



GW-7663



PROFINET IO device
(從站)

Modbus TCP 從站 (AI)

- IP:192.168.77.11
- Modbus ID:5
- 資料位址: 30001~30004
- 資料長度: 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 搜尋模組 Search Start

Type	Name	IP	Mask	Gateway
S7-1200				
GW-7663				

2 雙擊模組

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

Device 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
 System used: 8 Bytes Delete

Change Word Order (AABB CCDD -> CCDD AABB)

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

3 按「Advanced Settings」鈕

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



1. Modbus 通訊組態設定

2. 添加Modbus 從站類型

3. 儲存設定

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



I address與Q address的前8個bytes供GW-7663內部使用(64~71)
I address與Q address的第9個bytes開始為Modbus資料(72~95)

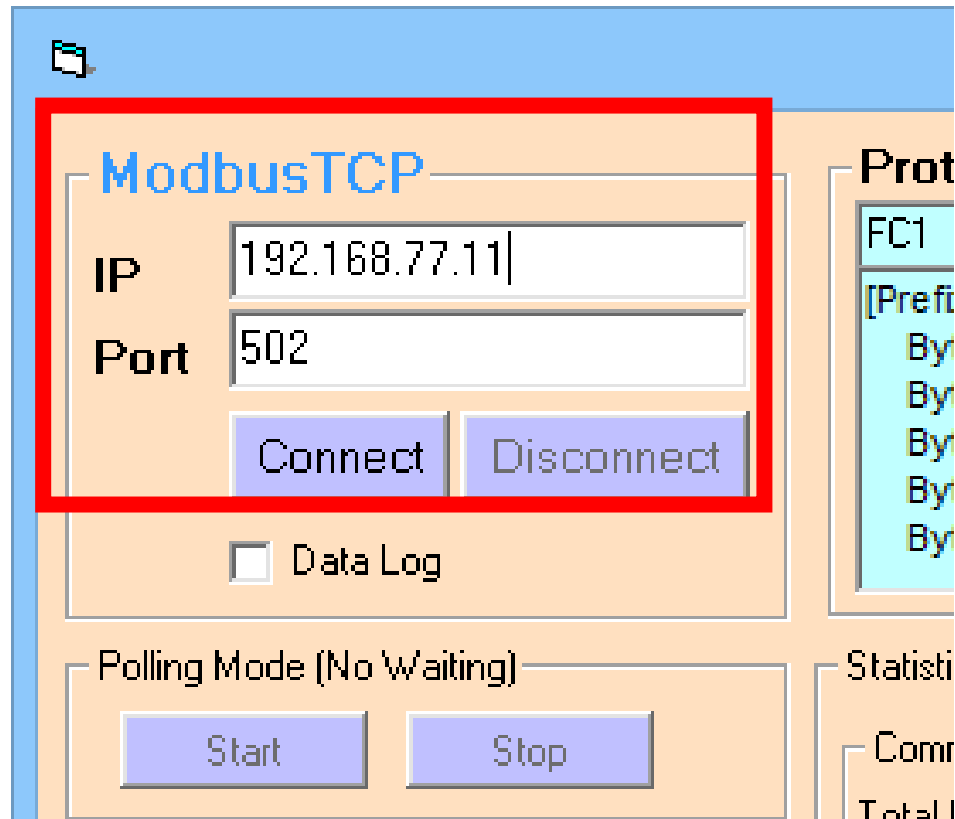
Module	Rack	Slot	I address	Q address	Type	Order no.
GW-7663	0	0			GW-7663 2-Port De...	GW-7663
Internal	0	0 X1			GW-7663	
RSW:0 Input:32Byte Output:...	0	1	64...95	64...95	RSW:0 Input:32Byte...	

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

QW72 => 用來更新 AI 1
QW74 => 用來更新 AI 2
QW76 => 用來更新 AI 3
QW78 => 用來更新 AI 4



確認 GW-7663 的 IP位址 跟 Modbus 主站相同






發送 Modbus 命令 (FC 04) 讀取 AI 狀態

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 24 Bytes Total Packet Size and 2 Packet Quantity Sent. The Polling Mode is set to 'No Waiting' with a 100 ms interval. The data exchange section shows a request packet [1 2 0 0 6 05 04 00 00 00 04] and a response packet [01 02 00 00 00 06 -> 05 04 08 AA 15 00 00 00 00 00].

1. 發送 查詢命令

2. 接收 AI 值
0x0000 => AI 1
0x0000 => AI 2
0x0000 => AI 3
0x0000 => AI 4

改變 QW72, QW74, QW76, QW78 值為 0x1122, 0x3344, 0x5566, 0x7788

						
	i	...	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



再次發送 Modbus 命令 (FC 04) 讀取 AI 狀態

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) and the Timer Mode is set to (Fixed Period) with an interval of 100 ms. The Statistic section shows 36 Total Packet Size (Bytes) and 3 Packet Quantity Sent. The Responses section shows 51 Total Packet Size (Bytes) and 3 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 data exchange section shows the following data:

[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
01	02	00	00	00	08 --> 05 04 08 11 22 33 44 55 66 77 88

1. 發送 查詢命令

2. 接收 AI 值
0x1122 => AI 1
0x3344 => AI 2
0x5566 => AI 3
0x7788 => AI 4