GW-7662 (Modbus RTU Slave) How to Communicate with Modbus master? Example for SIMATIC TIA portal

Preceding Operation

- ✓ Check wire connection between GW-7662 & Modbus devices.

  How to check the wire connection?

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

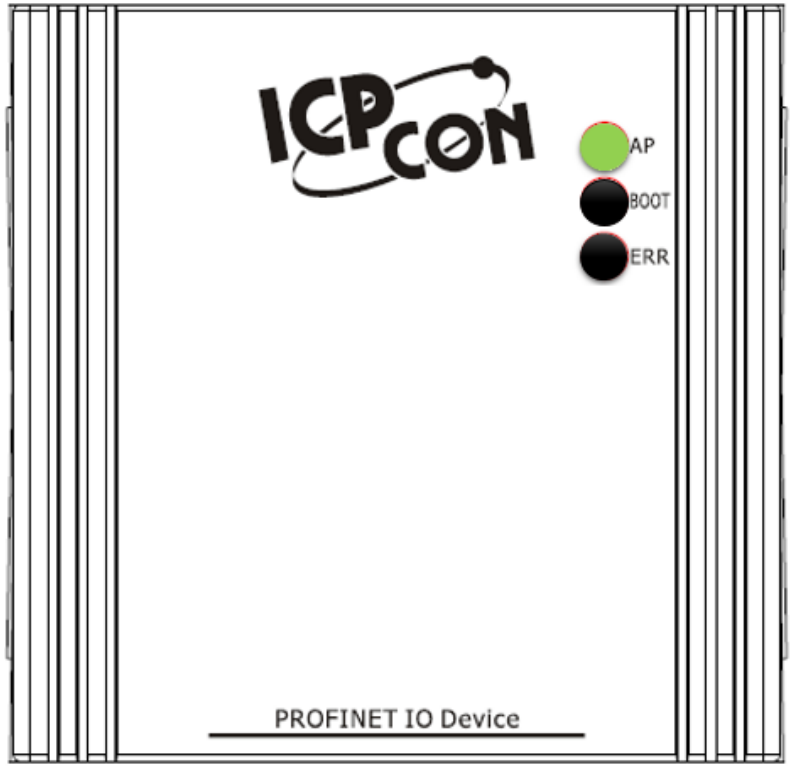
  How to configure GW-7662 in SIMATIC TIA portal?

- ✓ Download PFN_Tool utility.

  PFN_Tool

- ✓Download Modbus RTU master utility.

  MBRTU tool



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

SIMATIC S7-1200

PROFINET IO Controller
(Master)

PROFINET

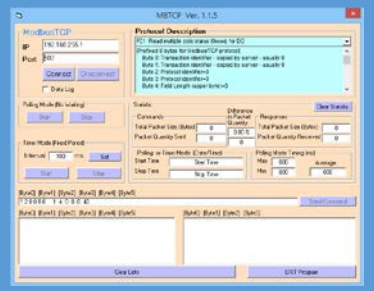
GW-7662

Comport Setting:

115200, n, 8, 1

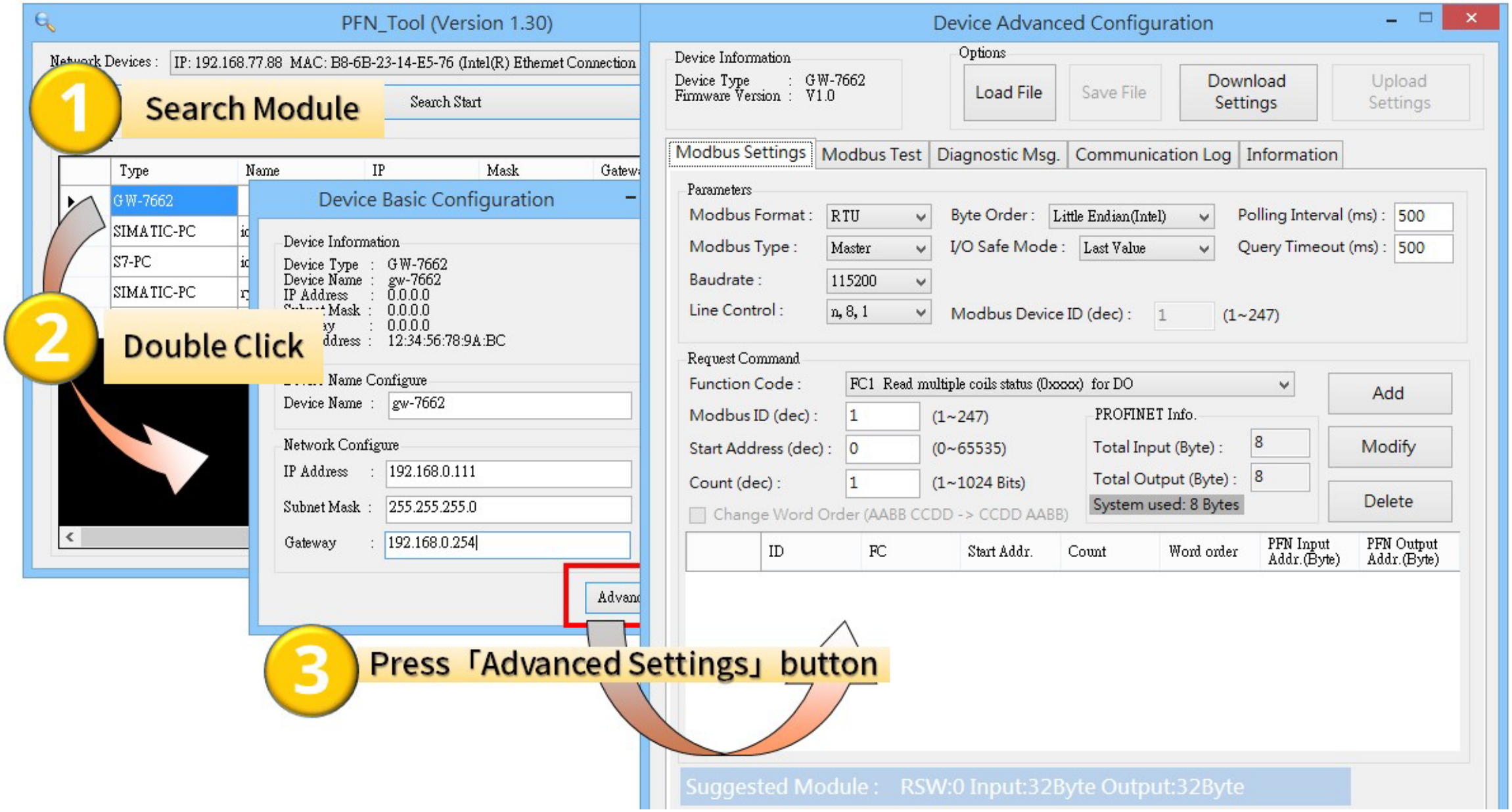
Modbus RTU

Modbus Master



PROFINET IO device (Slave)	Modbus RTU Slave (DO) • Modbus ID:2 • Data Address: 00001~00016 • Data Length: 2

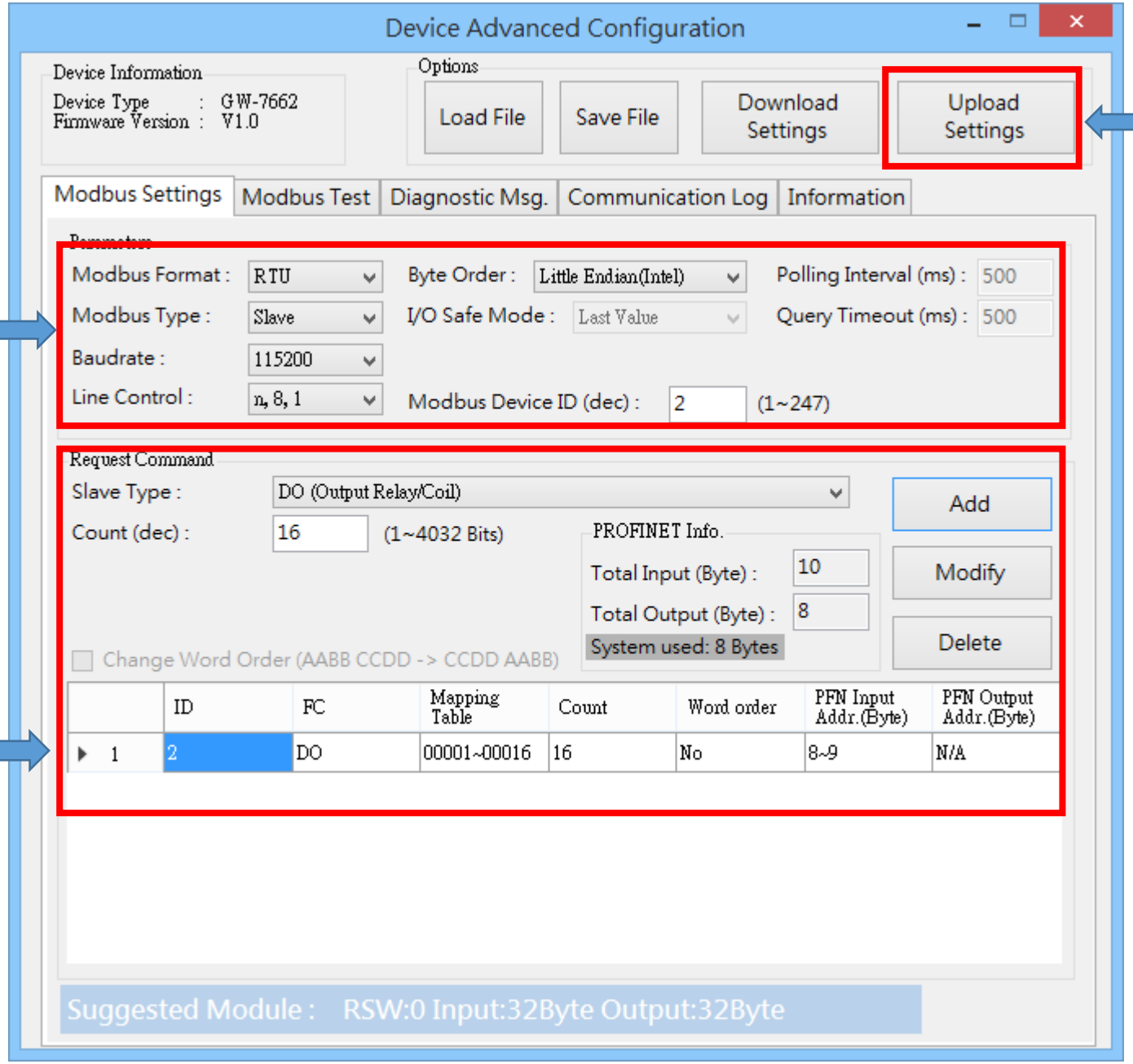
Modbus master read and write 16-channel DO to PLC



Modbus master read and write 16-channel DO to PLC

1. Set Modbus settings

2. Add Modbus Slave Type



3. Upload

Modbus master read and write 16-channel DO to PLC

The first input 8 bytes and output 8 bytes are allocated for system. (1~8)
The 9th byte to the 32th byte are allocated for Modbus. (9~32)

Device overview

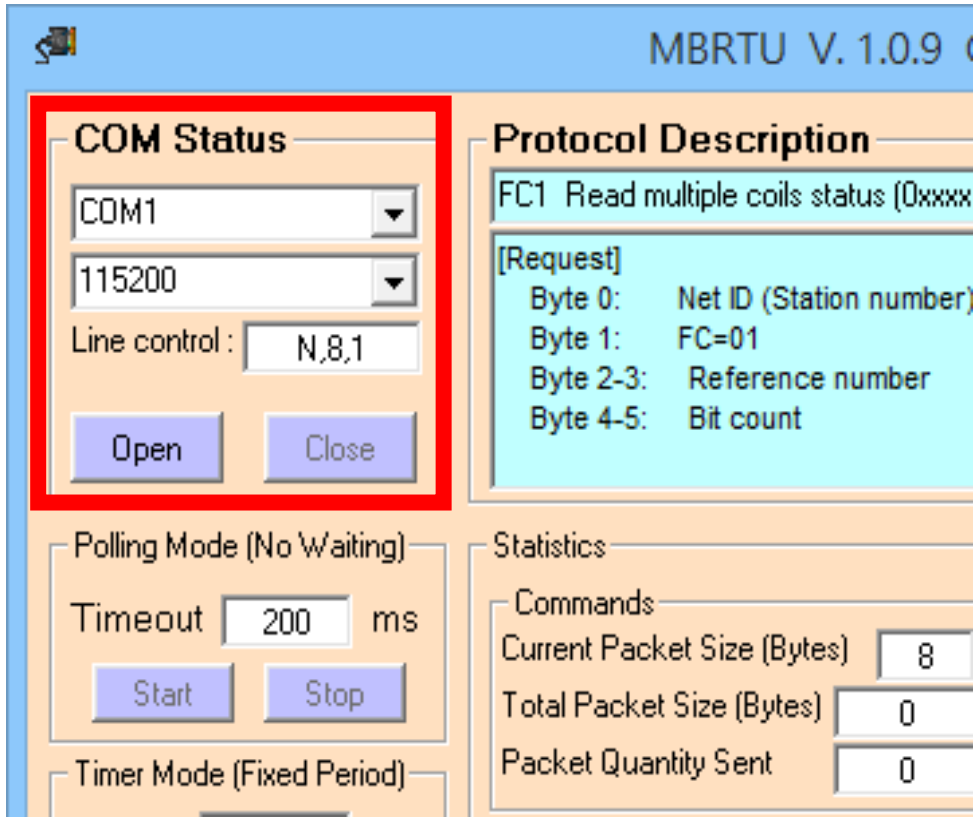
	Module	Rack	Slot	I address	Q address	Type	Order no.
	GW-7662	0	0			GW-7662 2-Port De...	GW-7662
	Internal	0	0 X1			GW-7662	
	RSW:0 Input:32Byte Output:32Byte_1	0	1	1...32	1...32	RSW:0 Input:32Byte...	

	Address	Display format	Monitor value
1	%IB9	Hex	16#00
2	%IB10	Hex	16#00
3	%I9.0	Bool	FALSE
4	%I9.1	Bool	FALSE
5	%I9.2	Bool	FALSE
6	%I9.3	Bool	FALSE
7	%I9.4	Bool	FALSE
8	%I9.5	Bool	FALSE
9	%I9.6	Bool	FALSE
10	%I9.7	Bool	FALSE
11	%I10.0	Bool	FALSE
12	%I10.1	Bool	FALSE
13	%I10.2	Bool	FALSE
14	%I10.3	Bool	FALSE
15	%I10.4	Bool	FALSE
16	%I10.5	Bool	FALSE
17	%I10.6	Bool	FALSE
18	%I10.7	Bool	FALSE

IB9 => used to receive DO 1~8 from Modbus master
IB10 => used to receive DO 9~16 from Modbus master

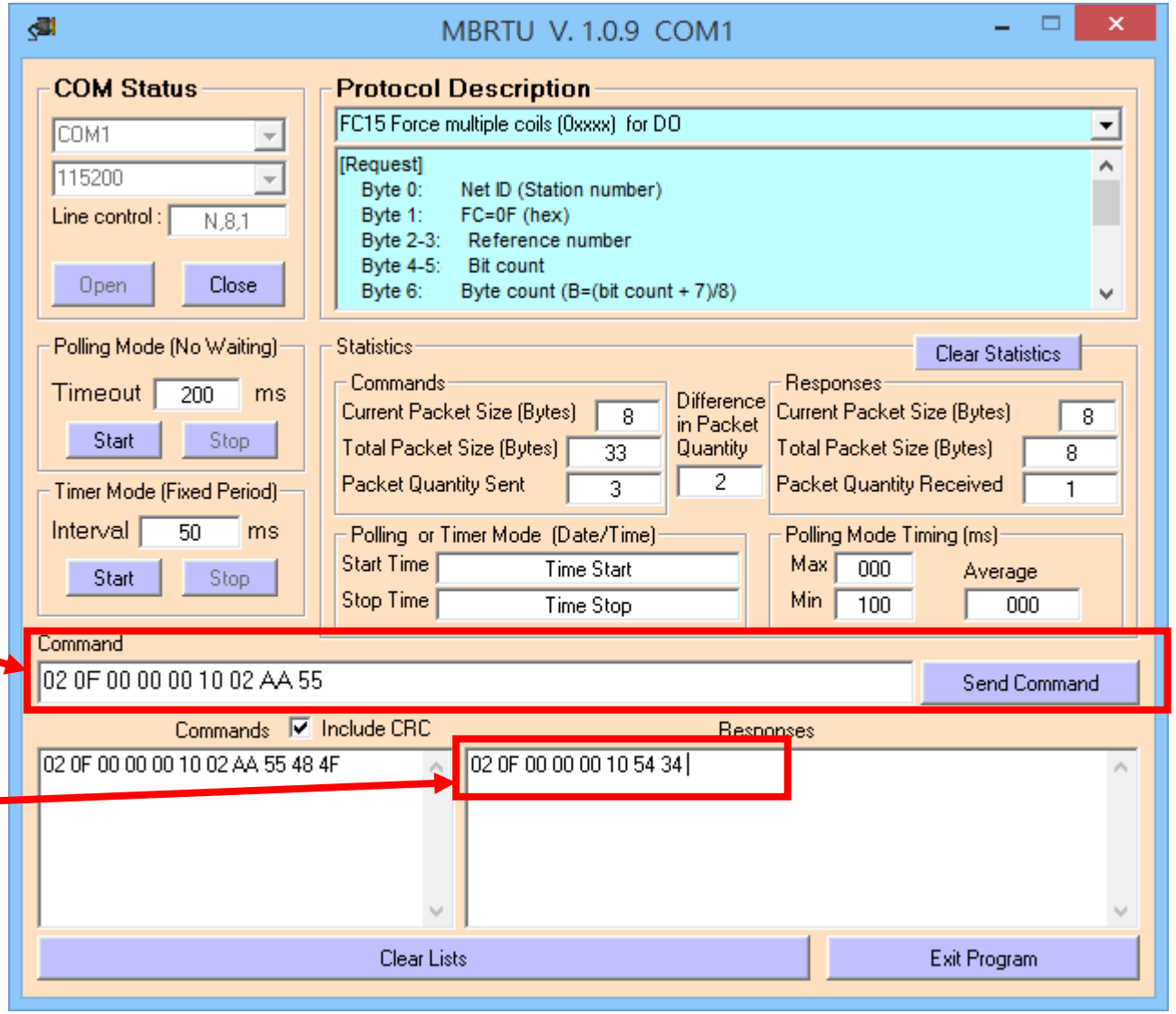
I9.0~7 => used to receive DO 1~8 from Modbus master
I10.0~7 => used to receive DO 9~16 from Modbus master

Confirm GW-7662's COM port setting is the same with Modbus master tool



Modbus master read and write 16-channel DO to PLC

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



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

2. Receive Resp.

Modbus master read and write 16-channel DO to PLC

PLC will receives DO status(0xAA, 0x55) at PLC address IB9, IB10

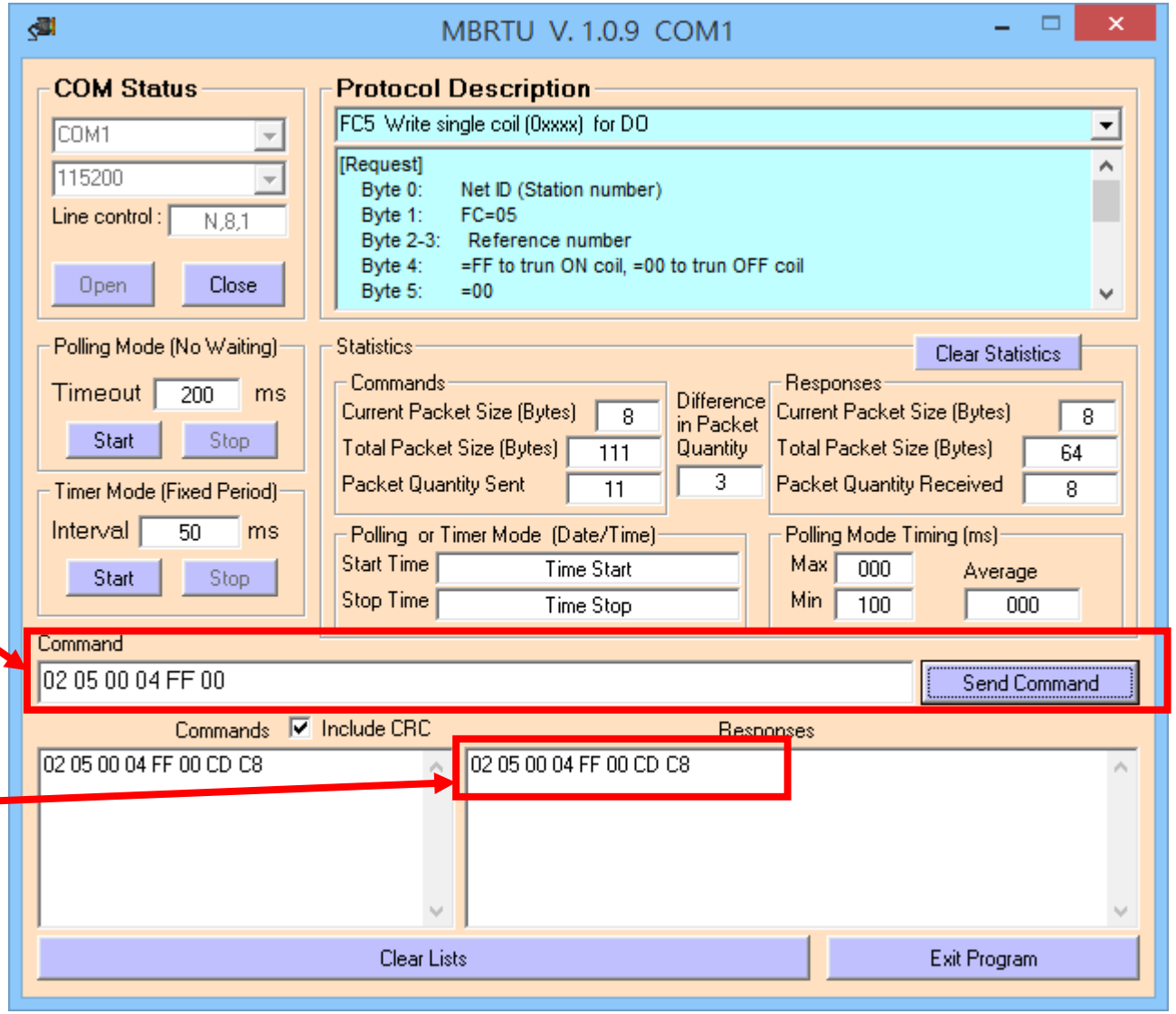
	i	...	Address	Display format	Monitor value	Modify value
1			%IB9	Hex	16#AA	
2			%IB10	Hex	16#55	
3			%I9.0	Bool	FALSE	
4			%I9.1	Bool	TRUE	
5			%I9.2	Bool	FALSE	
6			%I9.3	Bool	TRUE	
7			%I9.4	Bool	FALSE	
8			%I9.5	Bool	TRUE	
9			%I9.6	Bool	FALSE	
10			%I9.7	Bool	TRUE	
11			%I10.0	Bool	TRUE	
12			%I10.1	Bool	FALSE	
13			%I10.2	Bool	TRUE	
14			%I10.3	Bool	FALSE	
15			%I10.4	Bool	TRUE	
16			%I10.5	Bool	FALSE	
17			%I10.6	Bool	TRUE	
18			%I10.7	Bool	FALSE	

Modbus master read and write 16-channel DO to PLC

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

1. Send query cmd

2. Receive Resp.



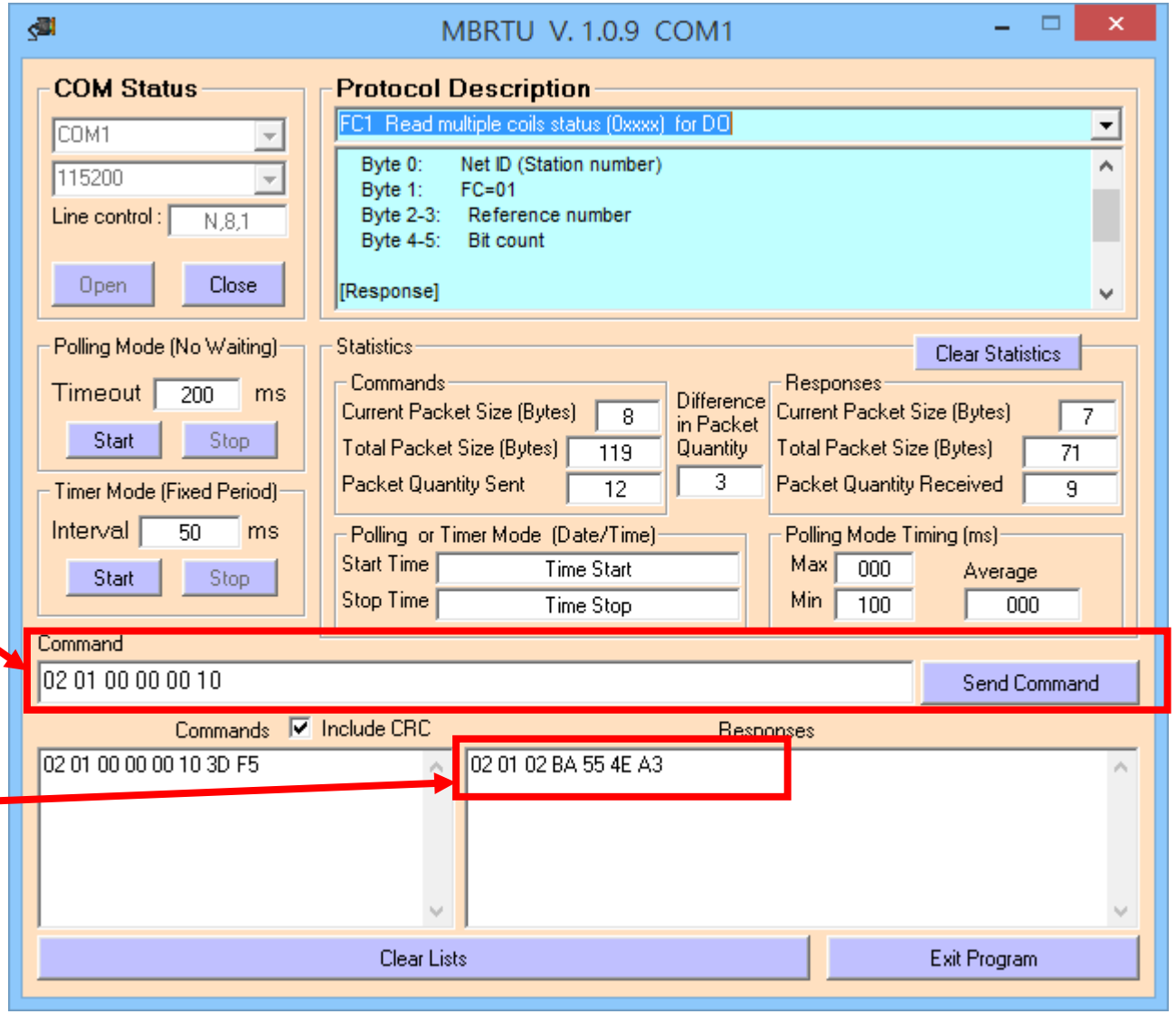
Modbus master read and write 16-channel DO to PLC

PLC will receives DO status at PLC address I9.4(ch-5)

	Address	Display format	Monitor value	Modify value
1	%IB9	Hex	16#AA	
2	%IB10	Hex	16#55	
3	%I9.0	Bool	FALSE	
4	%I9.1	Bool	TRUE	
5	%I9.2	Bool	FALSE	
6	%I9.3	Bool	TRUE	
7	%I9.4	Bool	FALSE	
8	%I9.5	Bool	TRUE	
9	%I9.6	Bool	FALSE	
10	%I9.7	Bool	TRUE	
11	%I10.0	Bool	TRUE	
12	%I10.1	Bool	FALSE	
13	%I10.2	Bool	TRUE	
14	%I10.3	Bool	FALSE	
15	%I10.4	Bool	TRUE	
16	%I10.5	Bool	FALSE	
17	%I10.6	Bool	TRUE	
18	%I10.7	Bool	FALSE	

	Address	Display format	Monitor value	Modify value
1	%IB9	Hex	16#BA	
2	%IB10	Hex	16#55	
3	%I9.0	Bool	FALSE	
4	%I9.1	Bool	TRUE	
5	%I9.2	Bool	FALSE	
6	%I9.3	Bool	TRUE	
7	%I9.4	Bool	TRUE	
8	%I9.5	Bool	TRUE	
9	%I9.6	Bool	FALSE	
10	%I9.7	Bool	TRUE	
11	%I10.0	Bool	TRUE	
12	%I10.1	Bool	FALSE	
13	%I10.2	Bool	TRUE	
14	%I10.3	Bool	FALSE	
15	%I10.4	Bool	TRUE	
16	%I10.5	Bool	FALSE	
17	%I10.6	Bool	TRUE	
18	%I10.7	Bool	FALSE	

Send Modbus command (FC 01) to read DO status



1. Send query cmd

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

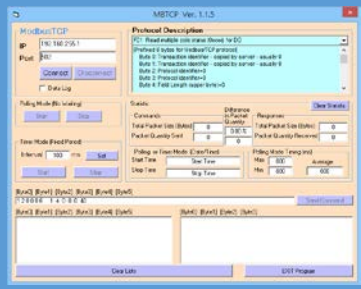
Modbus master read/write 3-channel AO from/to PLC

SIMATIC S7-1200

PROFINET IO Controller
(Master)

PROFINET

Modbus Master



Comport Setting:

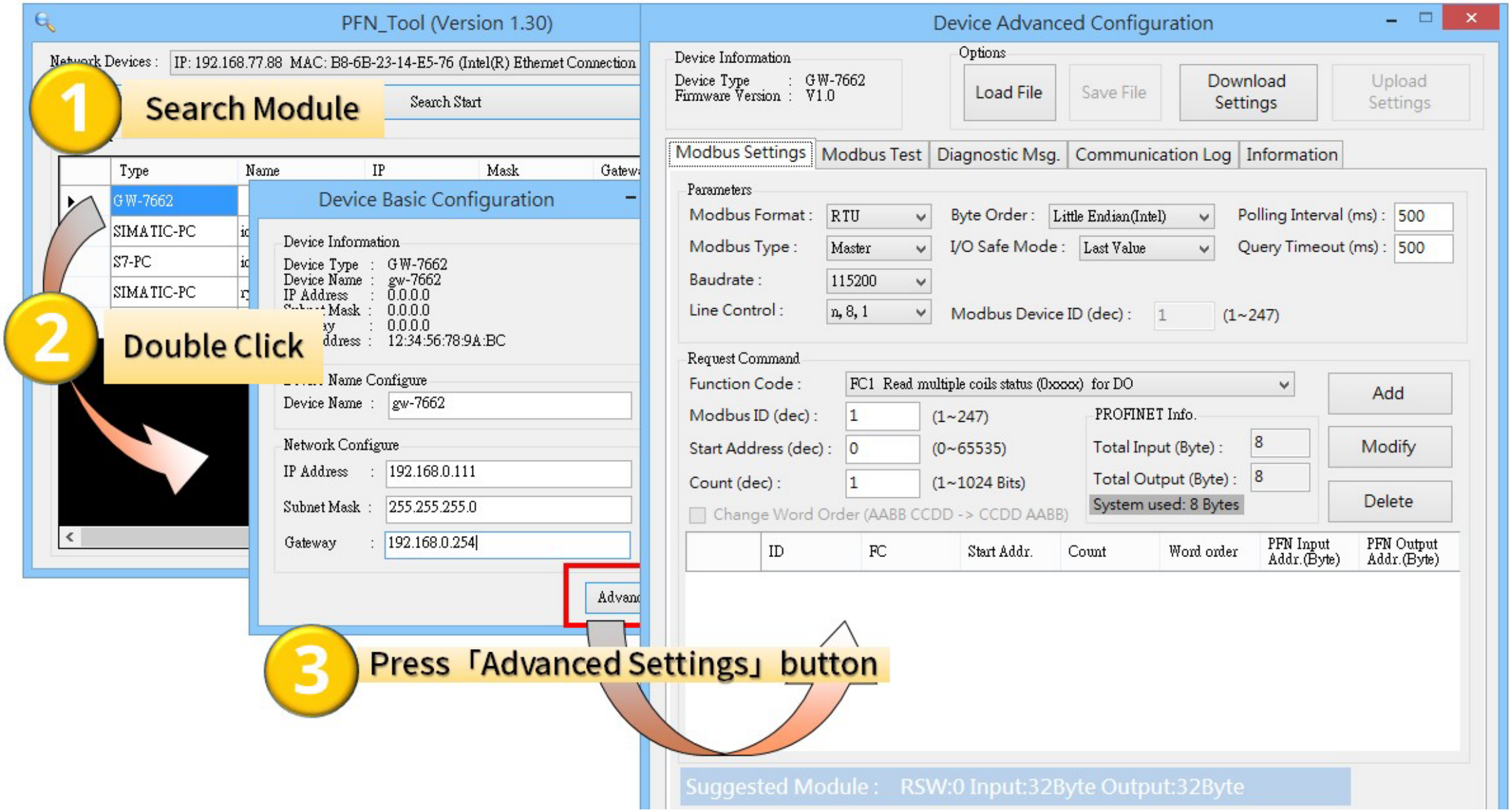
115200, n, 8, 1

Modbus RTU

GW-7662

PROFINET IO device (Slave)	Modbus RTU Slave (AO) • Modbus ID:4 • Data Address: 40001~40003 • Data Length: 3

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

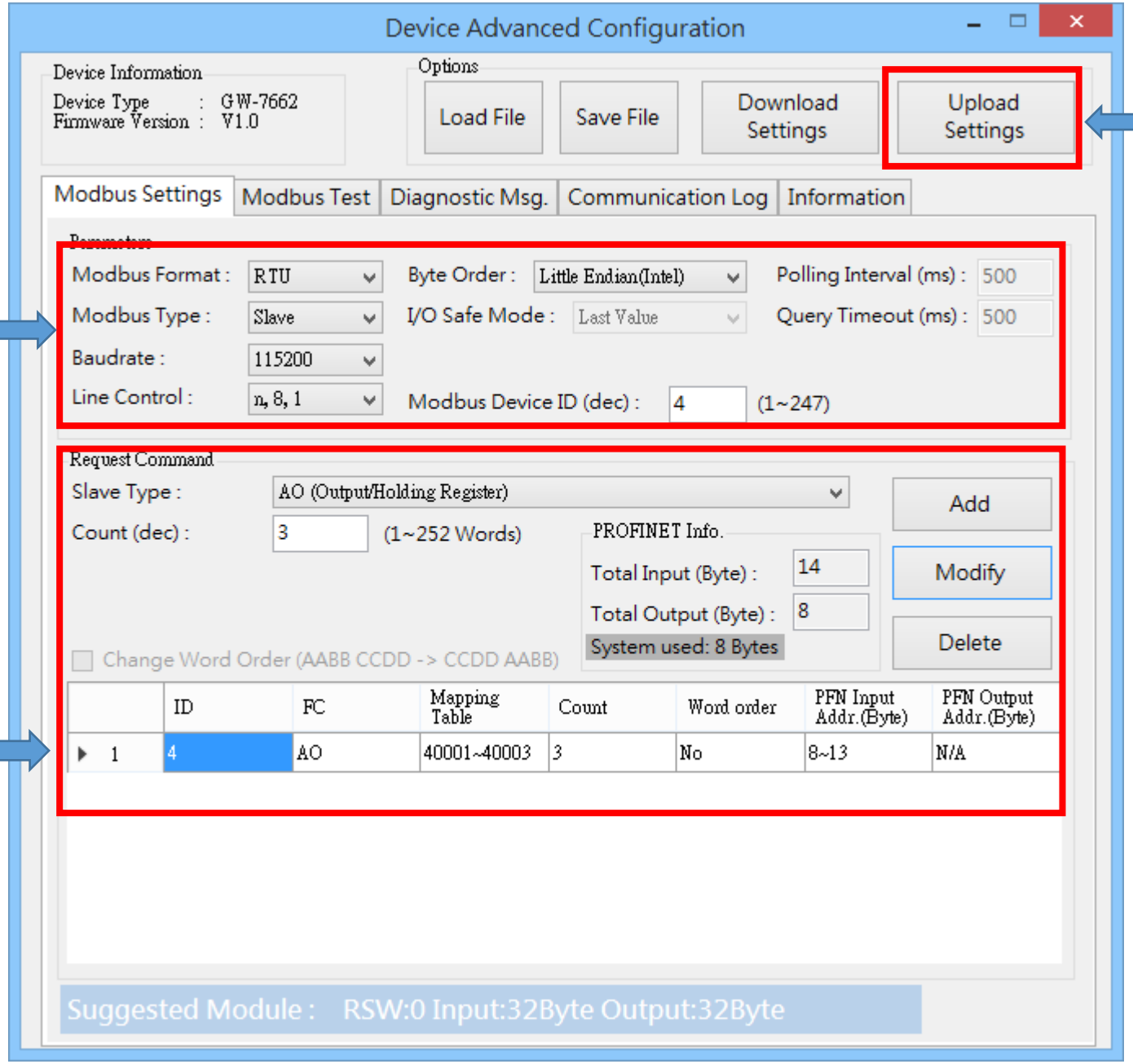


Modbus master read/write 3-channel AO from/to PLC

1. Set Modbus settings

2. Add Modbus Slave Type

3. Upload

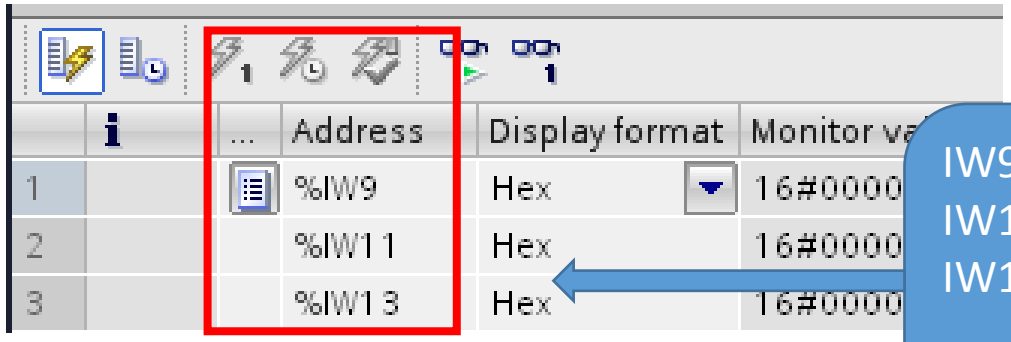


Modbus master read/write 3-channel AO from/to PLC

The first input 8 bytes and output 8 bytes are allocated for system. (1~8)
The 9th byte to the 32th byte are allocated for Modbus. (9~32)

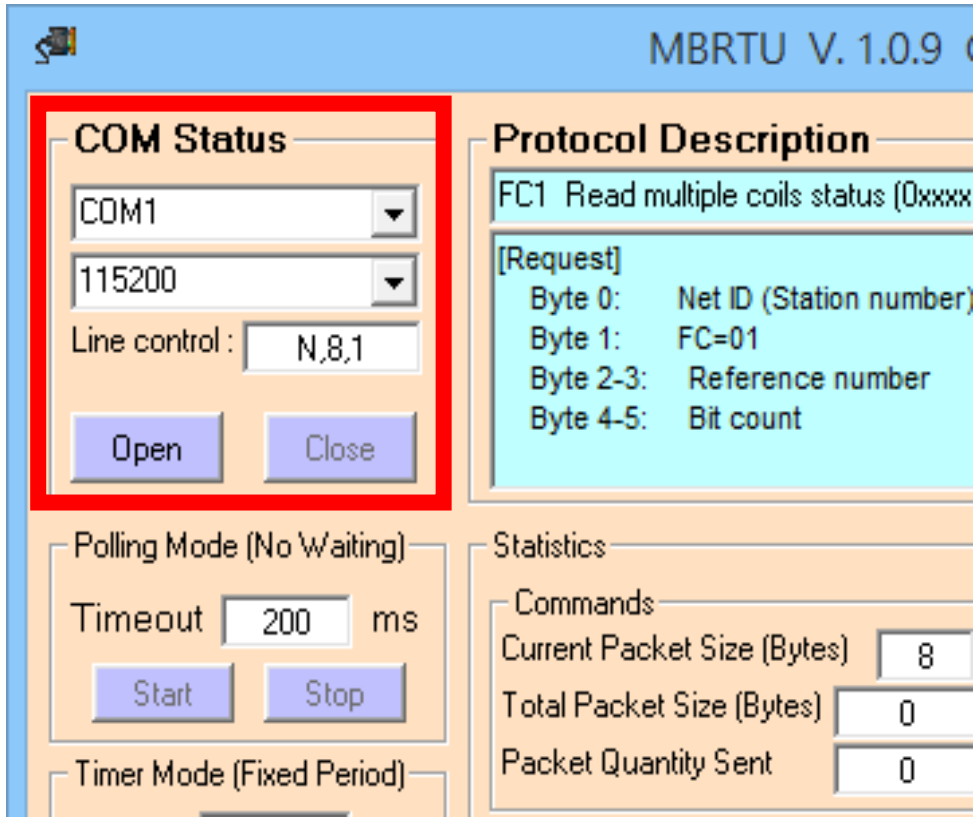
Device overview

	Module	Rack	Slot	I address	Q address	Type	Order no.
	GW-7662	0	0			GW-7662 2-Port De...	GW-7662
	Internal	0	0 X1			GW-7662	
	RSW:0 Input:32Byte Output:32Byte_1	0	1	1...32	1...32	RSW:0 Input:32Byte...	



IW9 => used to receive AO 1 from Modbus master
IW11 => used to receive AO 2 from Modbus master
IW13 => used to receive AO 3 from Modbus master

Confirm GW-7662's COM port setting is the same with Modbus master tool

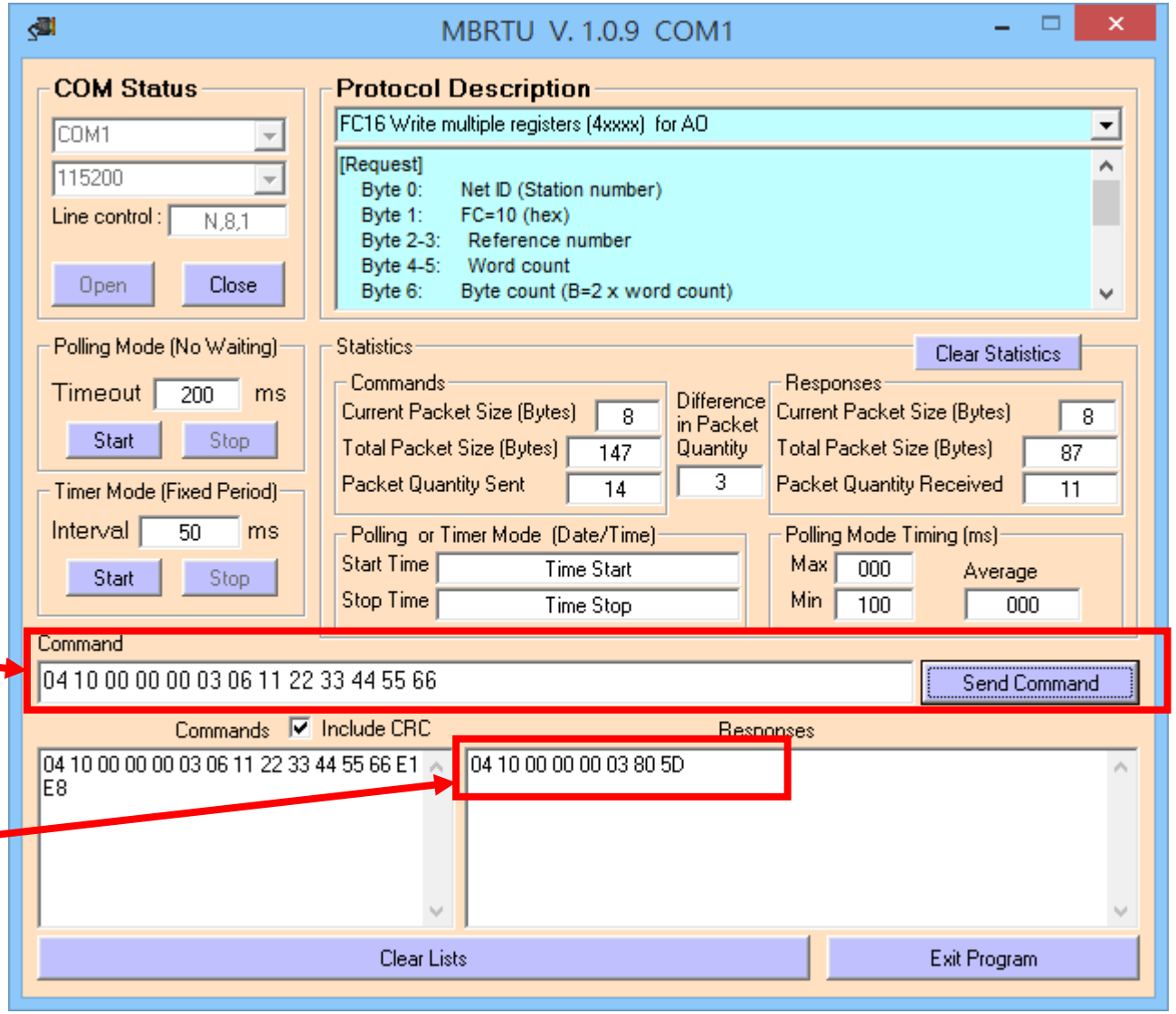


Modbus master read/write 3-channel AO from/to PLC

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

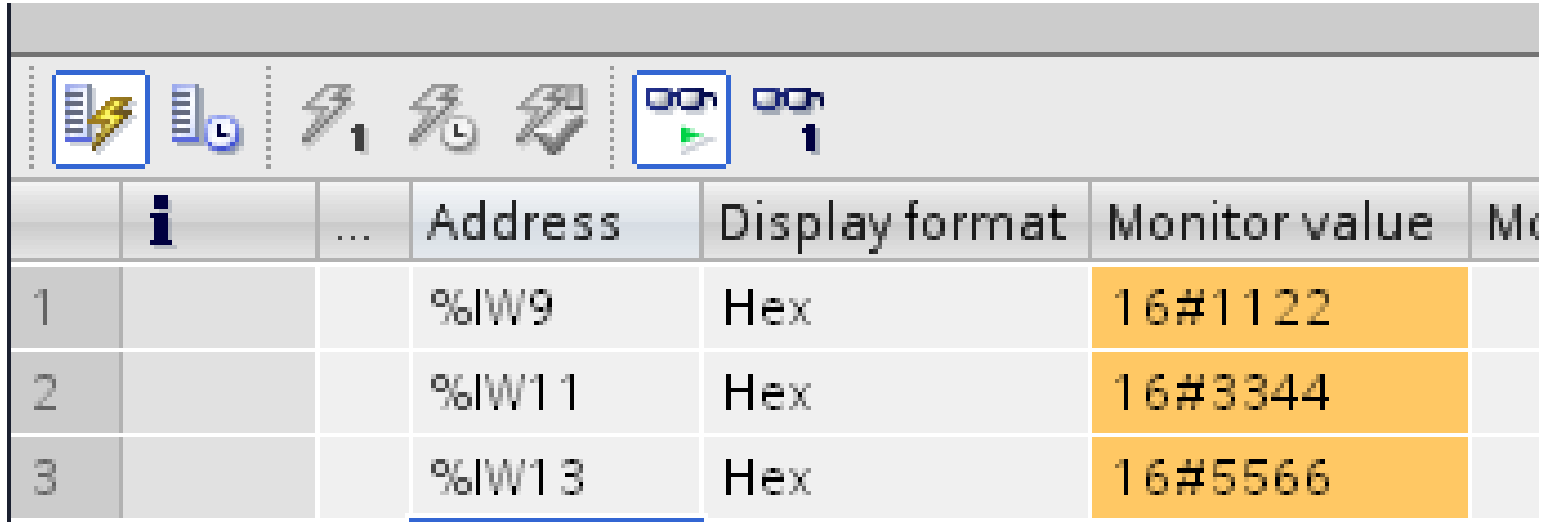
1. Send AO Data
0x1122 => for AO 1
0x3344 => for AO 2
0x5566 => for AO 3

2. Receive Resp.



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

PLC will receives AO status(0x1122, 0x3344, 0x5566) at PLC address IW9, IW11, IW13



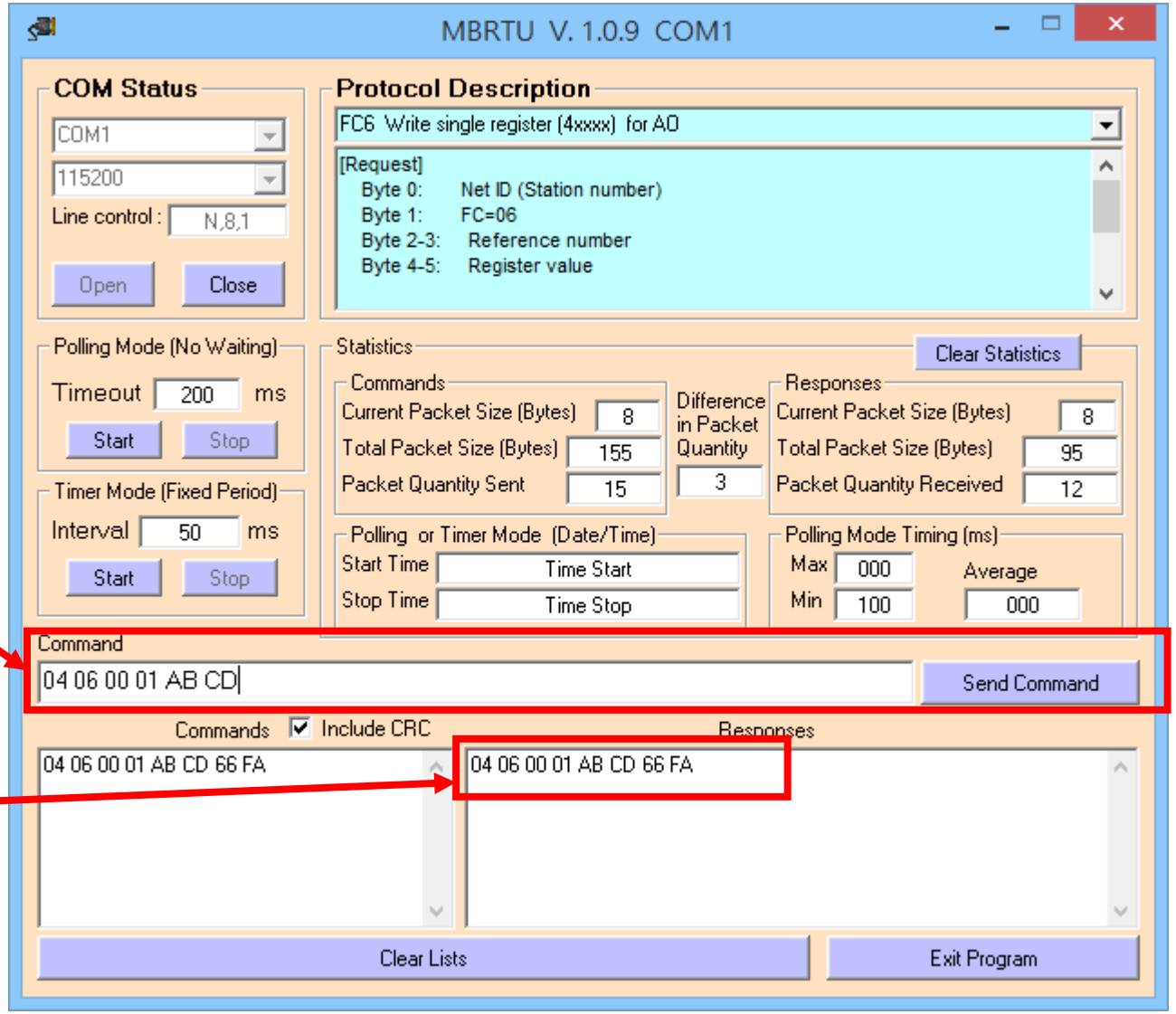
	i	...	Address	Display format	Monitor value	Mo
1			%IW9	Hex	16#1122	
2			%IW11	Hex	16#3344	
3			%IW13	Hex	16#5566	

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

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

1. Send query cmd

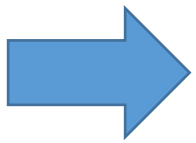
2. Receive Resp.



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

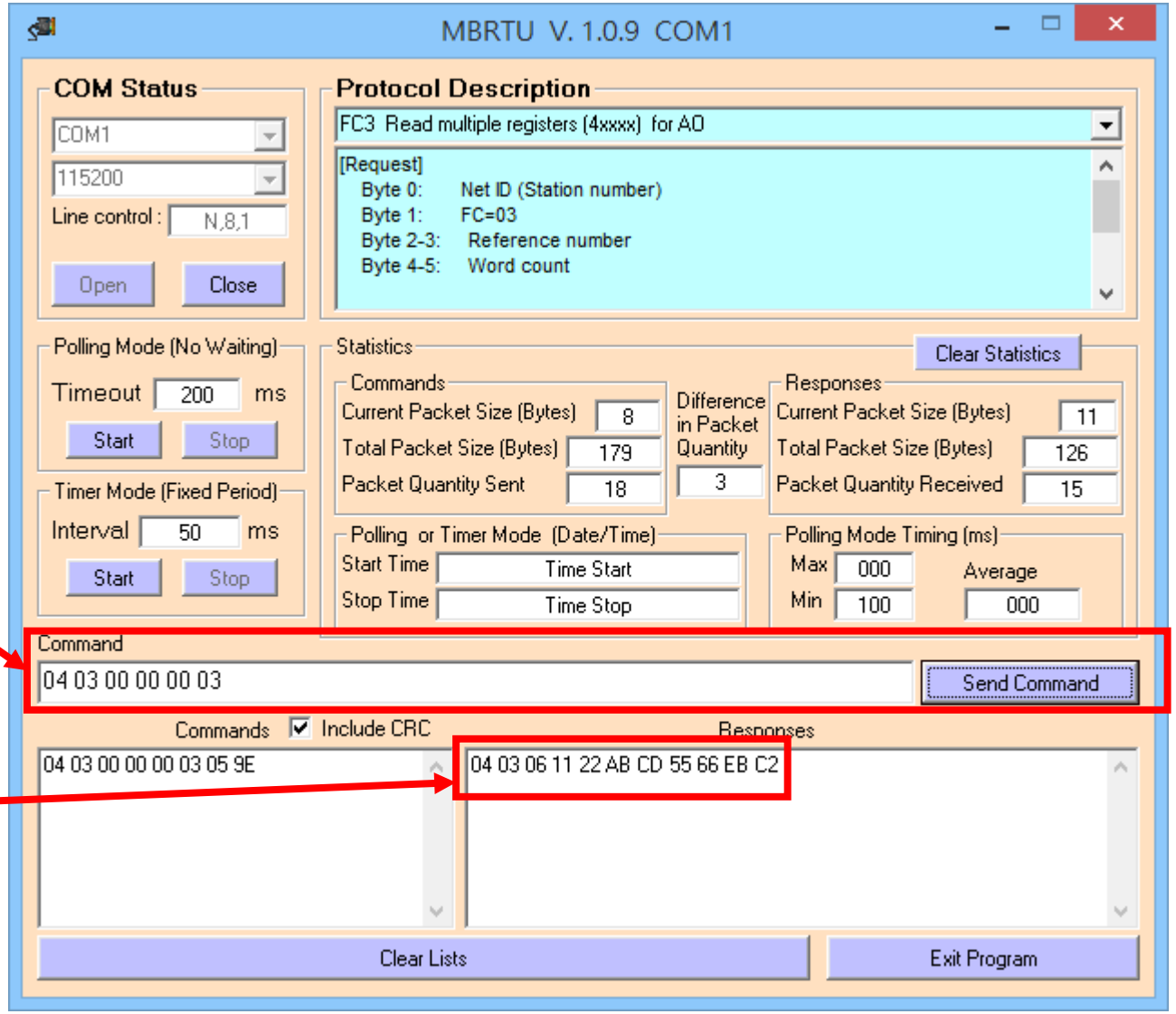
PLC will receives AO status(0xABCD) at PLC address IW11

	i	...	Address	Display format	Monitor value	Mo
1			%IW9	Hex	16#1122	
2			%IW11	Hex	16#3344	
3			%IW13	Hex	16#5566	



	i	...	Address	Display format	Monitor value	M
1			%IW9	Hex	16#1122	
2			%IW11	Hex	16#ABCD	
3			%IW13	Hex	16#5566	

Send Modbus command (FC 03) to read AO status



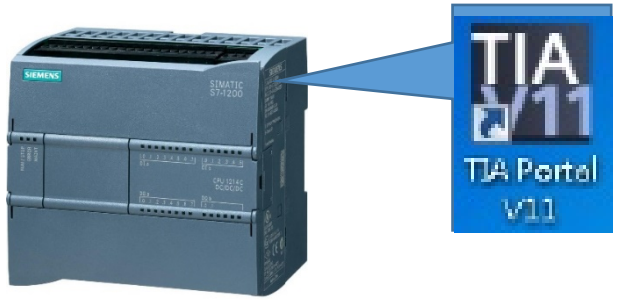
1. Send query cmd

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

Modbus master read 14-channel DI from PLC

SIMATIC S7-1200

PROFINET IO Controller
(Master)



PROFINET

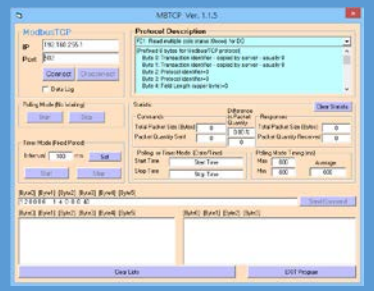
GW-7662

Comport Setting:

115200, n, 8, 1

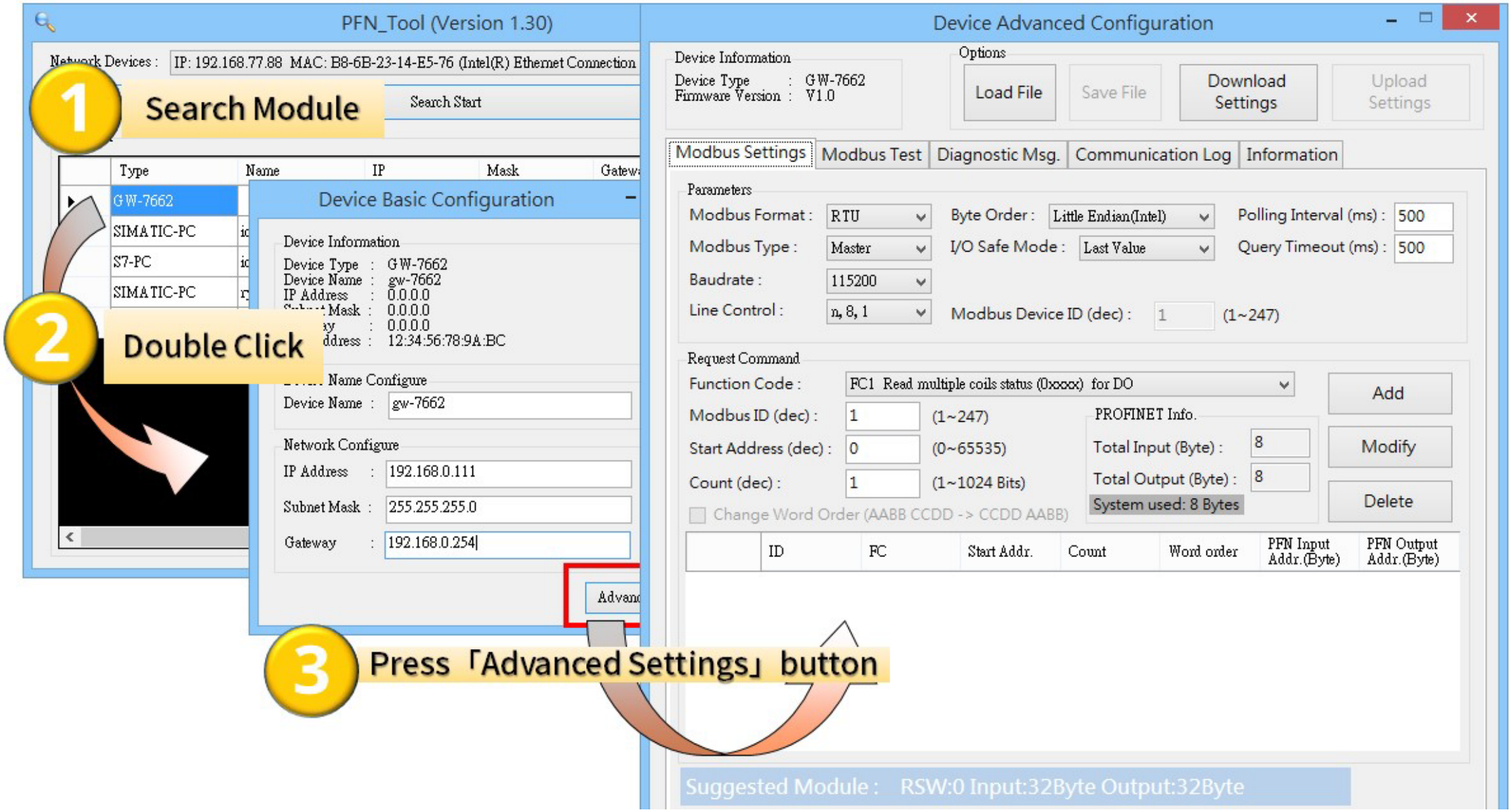
Modbus RTU

Modbus Master



PROFINET IO device (Slave)	Modbus RTU Slave (DI) • Modbus ID:3 • Data Address: 10001~10014 • Data Length: 2

Modbus master read 14-channel DI from PLC

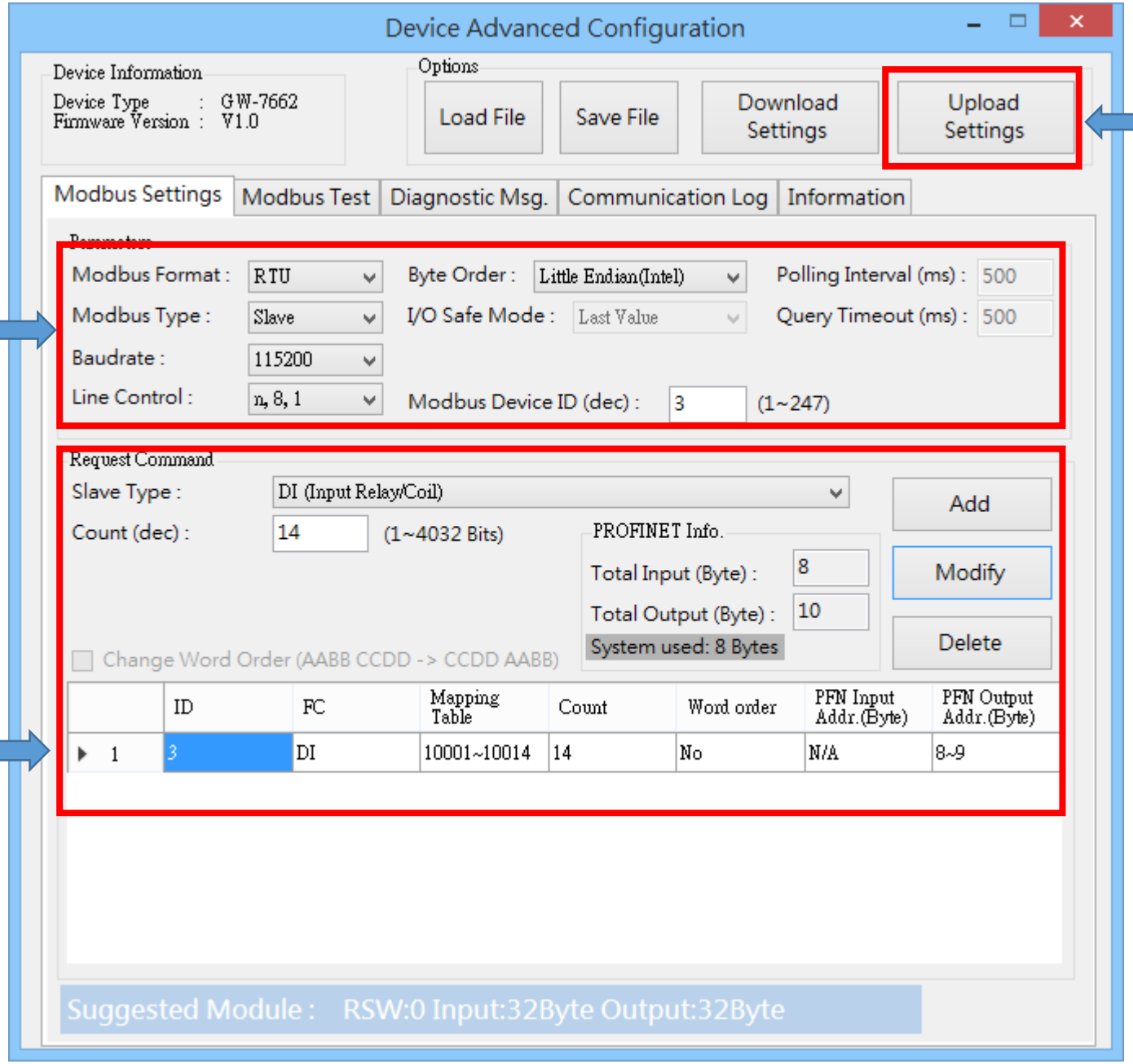


Modbus master read 14-channel DI from PLC

1. Set Modbus settings

2. Add Modbus Slave Type

3. Upload



Modbus master read 14-channel DI from PLC

The first input 8 bytes and output 8 bytes are allocated for system. (1~8)
The 9th byte to the 32th byte are allocated for Modbus. (9~32)

Device overview

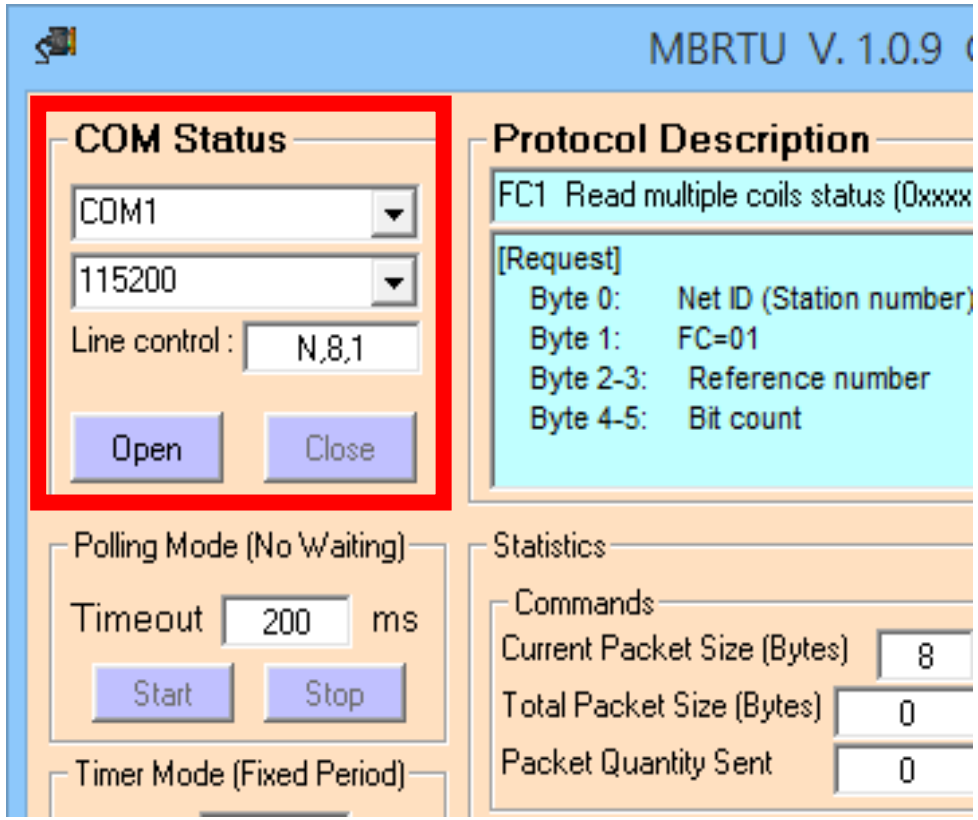
	Module	Rack	Slot	I address	Q address	Type	Order no.
	GW-7662	0	0			GW-7662 2-Port De...	GW-7662
	Internal	0	0 X1			GW-7662	
	RSW:0 Input:32Byte Output:32Byte_1	0	1	1...32	1...32	RSW:0 Input:32Byte...	

	Address	Display format	Monitor value	Modify
1	%QB9	Hex	16#00	
2	%QB10	Hex	16#00	
3	%Q9.0	Bool	FALSE	
4	%Q9.1	Bool	FALSE	
5	%Q9.2	Bool	FALSE	
6	%Q9.3	Bool	FALSE	
7	%Q9.4	Bool	FALSE	
8	%Q9.5	Bool	FALSE	
9	%Q9.6	Bool	FALSE	
10	%Q9.7	Bool	FALSE	
11	%Q10.0	Bool	FALSE	
12	%Q10.1	Bool	FALSE	
13	%Q10.2	Bool	FALSE	
14	%Q10.3	Bool	FALSE	
15	%Q10.4	Bool	FALSE	
16	%Q10.5	Bool	FALSE	

QB9 => used to refresh DI 1~8
QB10 => used to refresh DI 9~14

Q9.0~7 => used to refresh DI 1~8
Q10.0~5 => used to refresh DI 9~14

Confirm GW-7662's COM port setting is the same with Modbus master tool

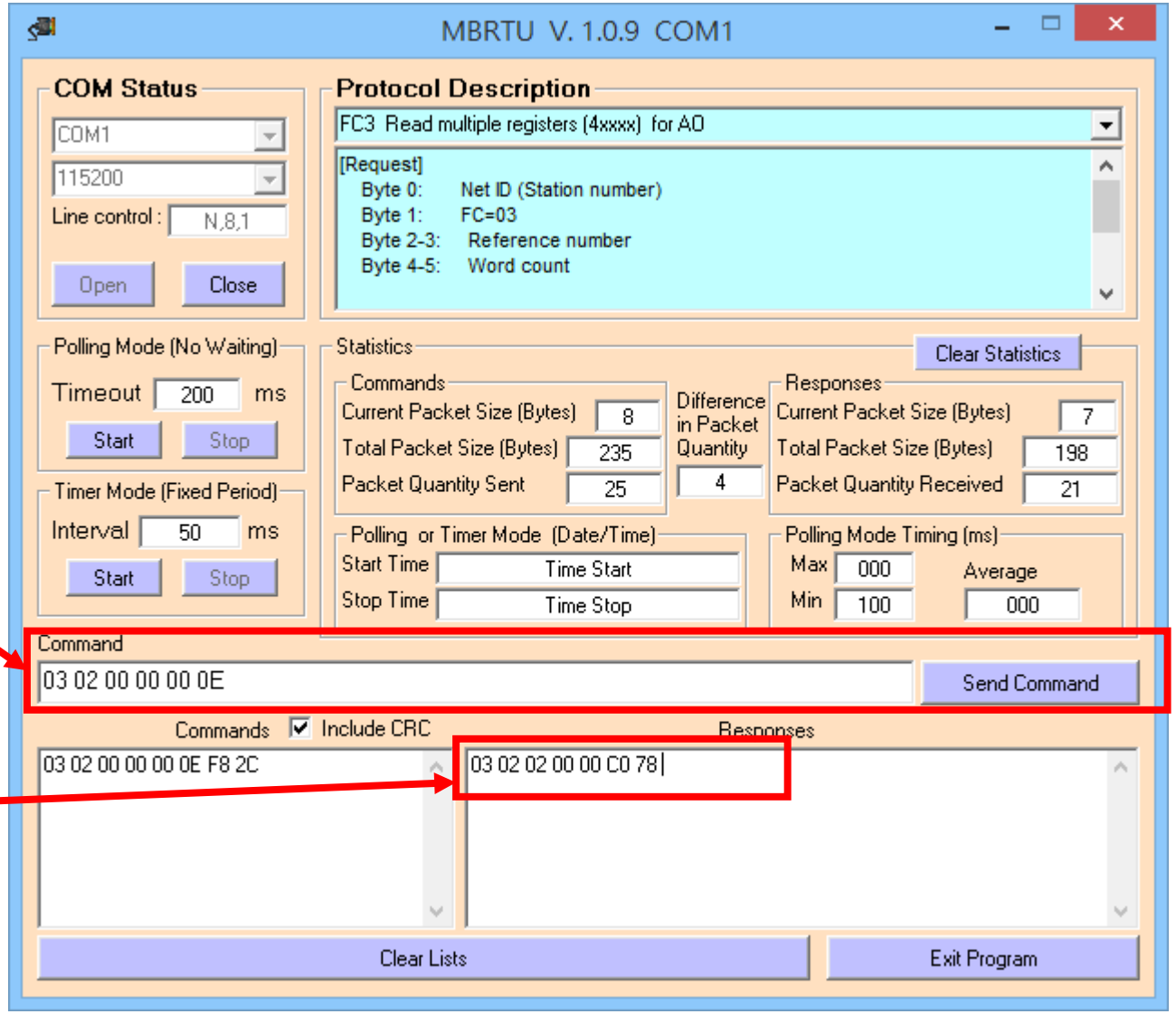


Modbus master read 14-channel DI from PLC

Send Modbus command (FC 02) to read DI status

1. Send query cmd

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



Modify QB9, QB10 to 0xAA, 0x15

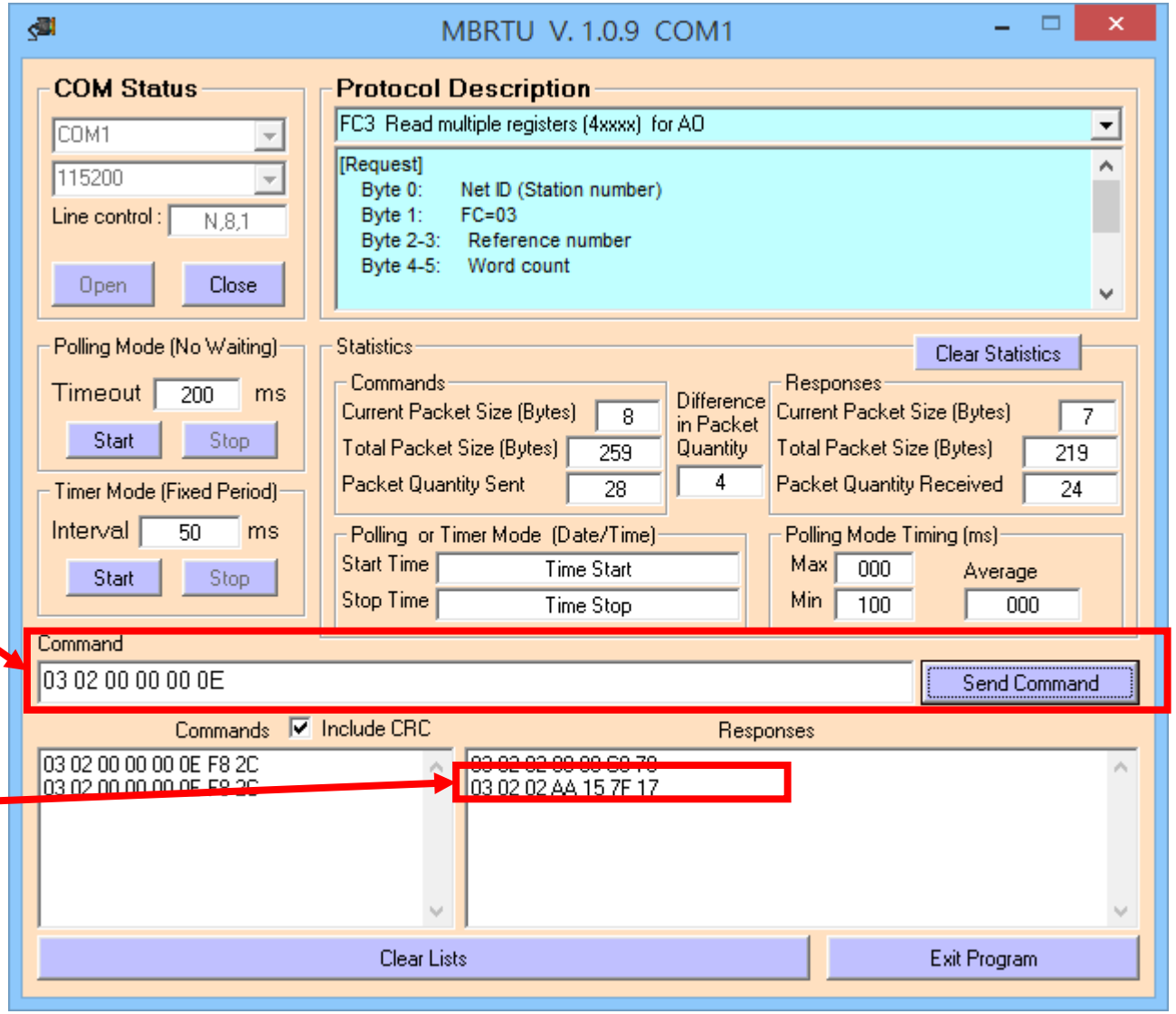
	i	...	Address	Display format	Monitor value	Modify value
1			%QB9	Hex	16#AA	16#AA
2			%QB10	Hex	16#15	16#15
3			%Q9.0	Bool	FALSE	
4			%Q9.1	Bool	TRUE	
5			%Q9.2	Bool	FALSE	
6			%Q9.3	Bool	TRUE	
7			%Q9.4	Bool	FALSE	
8			%Q9.5	Bool	TRUE	
9			%Q9.6	Bool	FALSE	
10			%Q9.7	Bool	TRUE	
11			%Q10.0	Bool	TRUE	
12			%Q10.1	Bool	FALSE	
13			%Q10.2	Bool	TRUE	
14			%Q10.3	Bool	FALSE	
15			%Q10.4	Bool	TRUE	
16			%Q10.5	Bool	FALSE	

Modbus master read 14-channel DI from PLC

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

1. Send query cmd

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



Modbus master read 4-channel AI from PLC

SIMATIC S7-1200

PROFINET IO Controller
(Master)

PROFINET

GW-7662

Comport Setting:

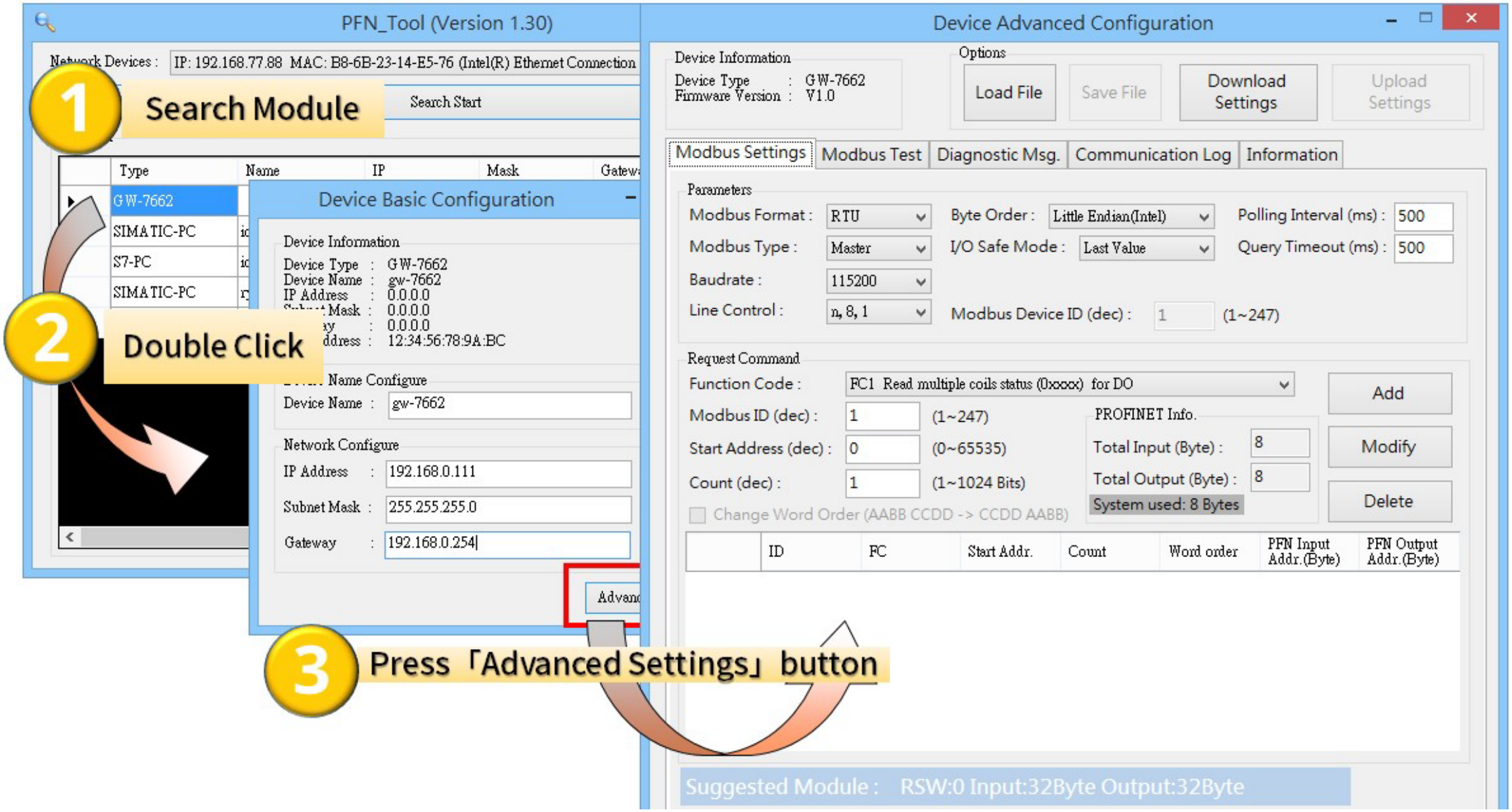
115200, n, 8, 1

Modbus RTU

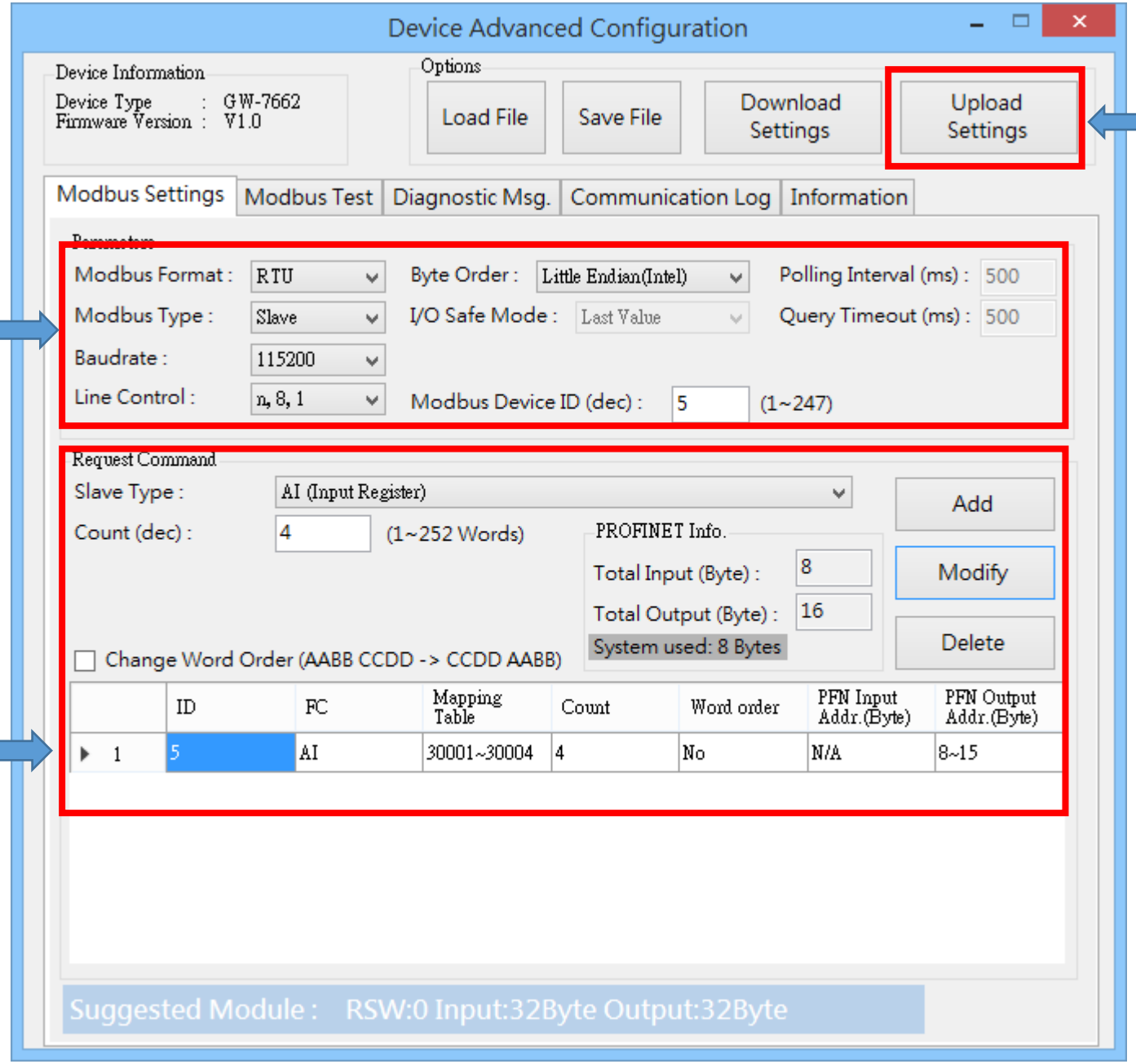
Modbus Master

PROFINET IO device (Slave)	Modbus RTU Slave (AI) • Modbus ID:5 • Data Address: 30001~30004 • Data Length: 4

Modbus master read 4-channel AI from PLC



Modbus master read 4-channel AI from PLC



1. Set Modbus settings

2. Add Modbus Slave Type

3. Upload

Modbus master read 4-channel AI from PLC

The first input 8 bytes and output 8 bytes are allocated for system. (1~8)
The 9th byte to the 32th byte are allocated for Modbus. (9~32)

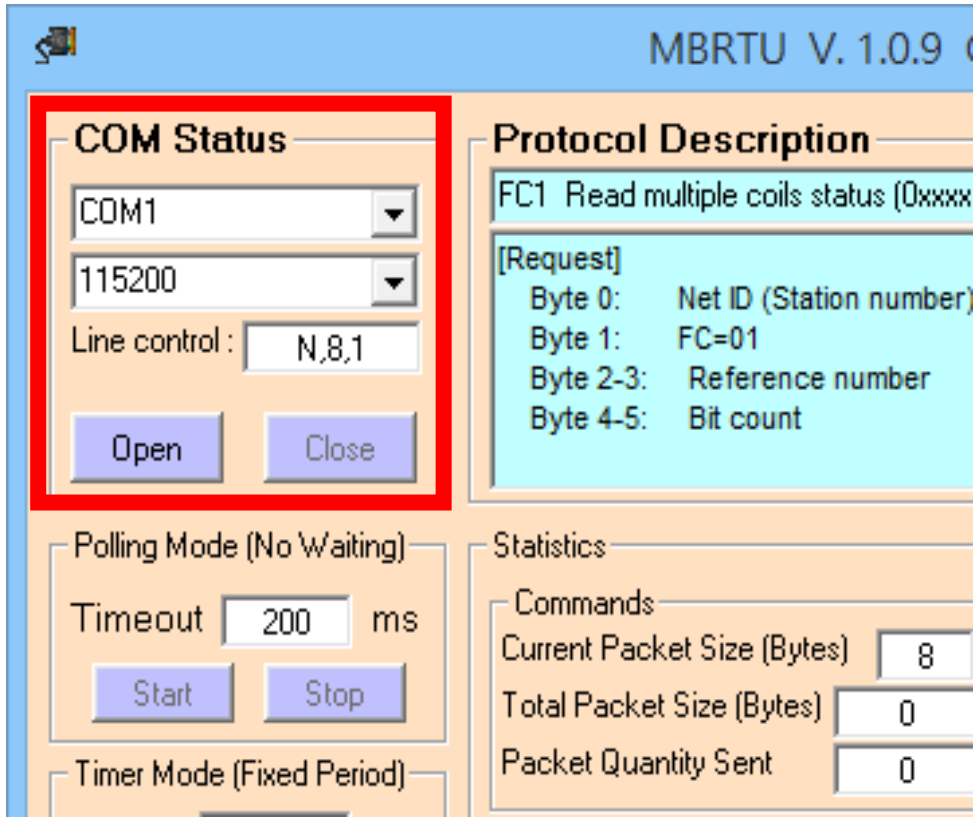
Device overview

	Module	Rack	Slot	I address	Q address	Type	Order no.
	GW-7662	0	0			GW-7662 2-Port De...	GW-7662
	Internal	0	0 X1			GW-7662	
	RSW:0 Input:32Byte Output:32Byte_1	0	1	1...32	1...32	RSW:0 Input:32Byte...	

	Address	Display format	Monitor value	Modify
1	%QW9	Hex	16#0000	
2	%QW11	Hex	16#0000	
3	%QW13	Hex		
4	%QW15	Hex	16#0000	

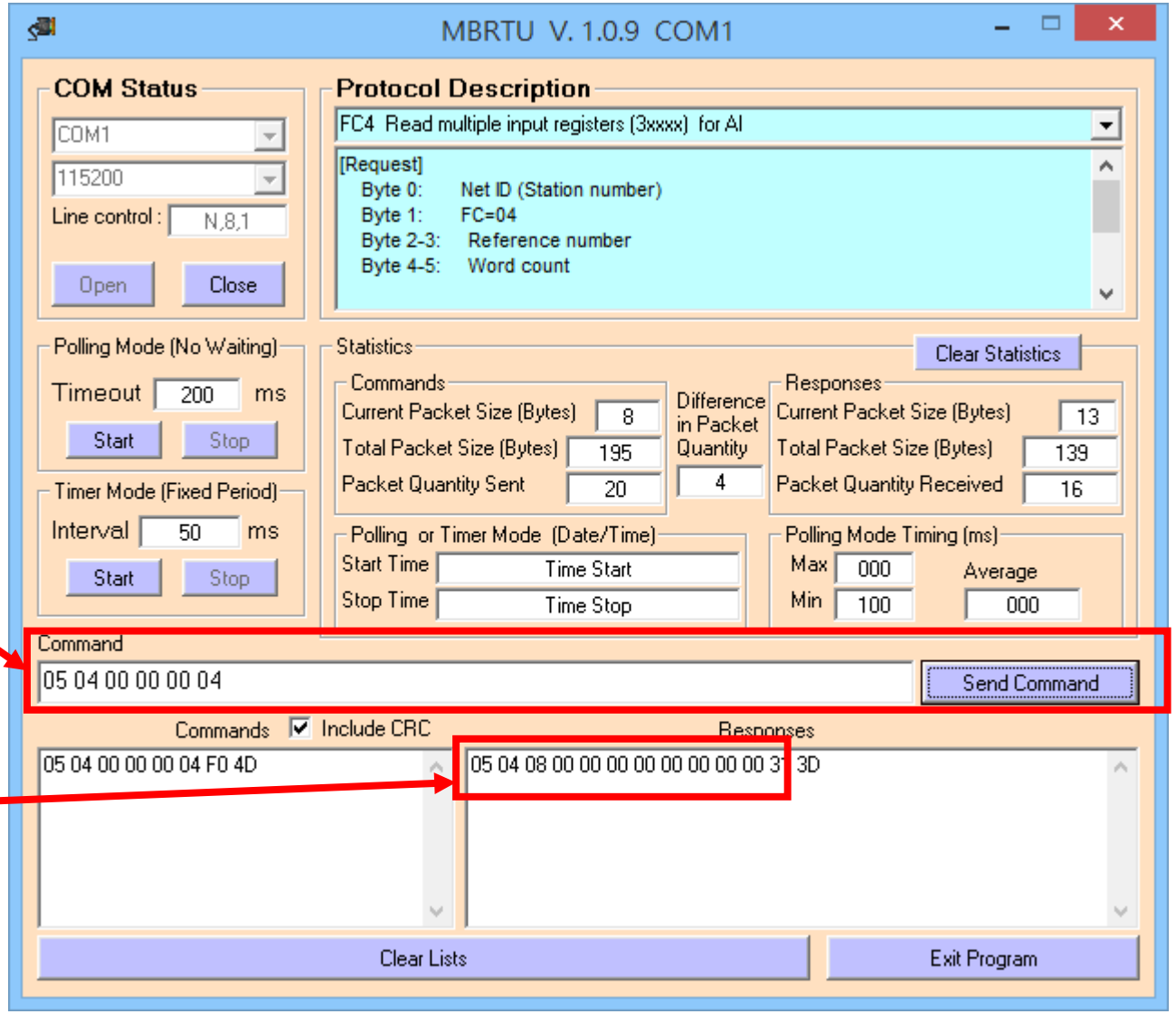
QW9 => used to refresh AI 1
QW11 => used to refresh AI 2
QW13 => used to refresh AI 3
QW15 => used to refresh AI 4

Confirm GW-7662's COM port setting is the same with Modbus master tool



Modbus master read 4-channel AI from PLC

Send Modbus command (FC 04) to read AI status



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 QW9, QW11, QW13, QW15 to 0x1122, 0x3344, 0x5566, 0x7788

	i	...	Address	Display format	Monitor value	Modify value
1		"...	%QW9	Hex	16#1122	16#1122
2			%QW11	Hex	16#3344	16#3344
3			%QW13	Hex	16#5566	16#5566
4			%QW15	Hex	16#7788	16#7788

Modbus master read 4-channel AI from PLC

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

1. Send query cmd

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