Profinet Network Adapter

GN-9287

User Manual

Version 1.02

2020 CREVIS Co.,Ltd

DOCUMENT CHANGE SUMMARY				
REV	PAGE	REMARKS	DATE	EDITOR
1.00	New Document		2019/10/31	MJ Kwon
1.01	9	General Specification	2020/07/27	MJ Kwon
1.02	19	IP Setting information corrected IP-Address setup via Master device software	2020/10/28	MJ Kwon

Table of Contents

1 Important Notes

Solid state equipment has operational characteristics differing from those of electromechanical equipment.

Safety Guidelines for the Application, Installation and Maintenance of Solid State Controls describes some important differences between solid state equipment and hard-wired electromechanical devices.

Because of this difference, and also because of the wide variety of uses for solid state equipment, all persons responsible for applying this equipment must satisfy themselves that each intended application of this equipment is acceptable.

In no event will CREVIS be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, CREVIS cannot assume responsibility or liability for actual use based on the examples and diagrams.

Warning!

✓ **If you don't follow the directions, it could cause a personal injury, damage to the equipment or explosion**

- Do not assemble the products and wire with power applied to the system. Else it may cause an electric arc, which can result into unexpected and potentially dangerous action by field devices. Arching is explosion risk in hazardous locations. Be sure that the area is non-hazardous or remove system power appropriately before assembling or wiring the modules.
- Do not touch any terminal blocks or IO modules when system is running. Else it may cause the unit to an electric shock or malfunction.
- Keep away from the strange metallic materials not related to the unit and wiring works should be controlled by the electric expert engineer. Else it may cause the unit to a fire, electric shock or malfunction

Caution!

✓ **If you disobey the instructions, there may be possibility of personal injury, damage to equipment or explosion. Please follow below Instructions.**

" Check the rated voltage and terminal array before wiring. Avoid the circumstances over 50℃ of temperature. Avoid placing it directly in the sunlight.

" Avoid the place under circumstances over 85% of humidity.

" Do not place Modules near by the inflammable material. Else it may cause a fire.

" Do not permit any vibration approaching it directly.

" Go through module specification carefully, ensure inputs, output connections are made with the specifications. Use standard cables for wiring.

" Use Product under pollution degree 2 environment.

1.1 Safety Instruction

1.1.1 Symbol

DANGER 	Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death property damage, or economic loss
IMPORTANT	Identifies information that is critical for successful application and understanding of the product
ATTENTION 	Identifies information about practices or circumstances that can lead to personal injury, property damage, or economic loss. Attentions help you to identity a hazard, avoid a hazard, and recognize the consequences

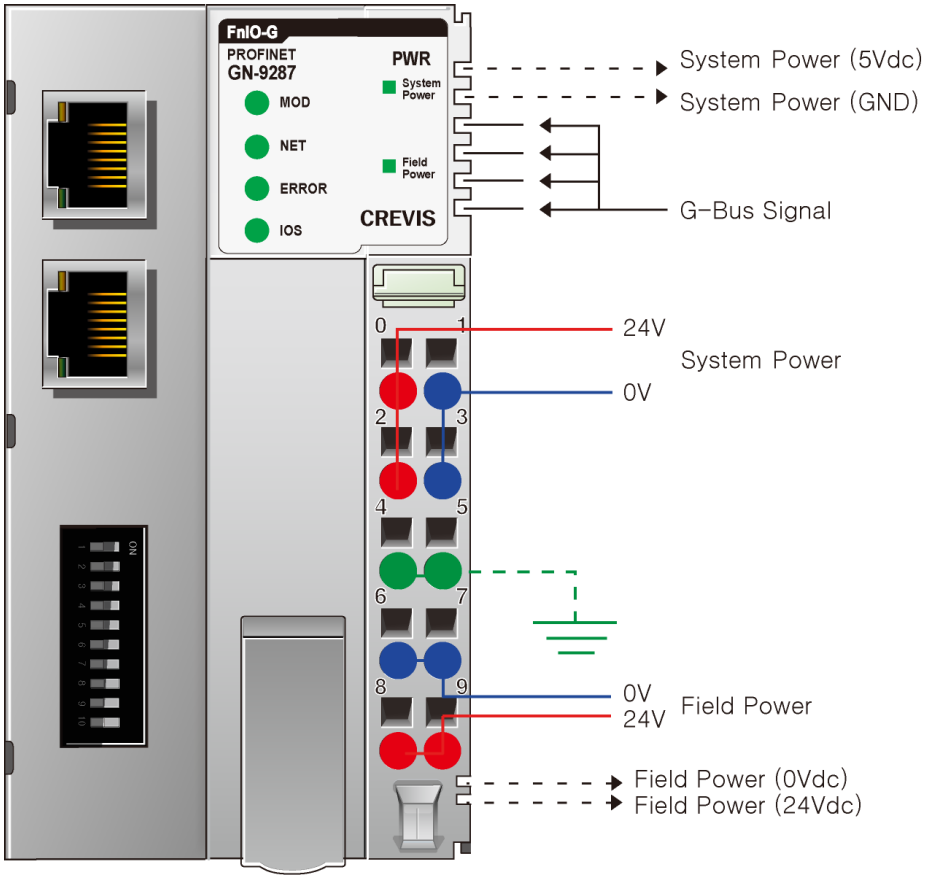
1.1.2 Safety Notes

DANGER 	The modules are equipped with electronic components that may be destroyed by electrostatic discharge. When handling the modules, ensure that the environment (persons, workplace and packing) is well grounded. Avoid touching conductive components, G-BUS Pin.

2 Specification

2.1 The Interface

2.1.1 GN-9287 (PROFINET)



System power and Field power must be supplied separately.

Pin No.	Signal Description	Signal Description	Pin No.
0	System Power, 24V	System Power, Ground	1
2	System Power, 24V	System Power, Ground	3
4	F.G	F.G	5
6	Field Power, Ground	Field Power, Ground	7
8	Field Power, 24V	Field Power, 24V	9

2.2 General Specification

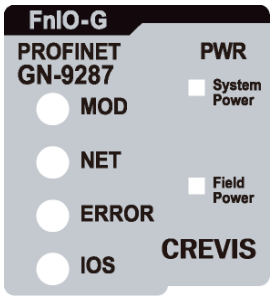
2.2.1 General Specification

General specification	
UL System Power	Supply voltage : 24Vdc nominal, Class 2
System Power	Supply voltage : 24Vdc nominal Supply voltage range : 15~30Vdc Protection : Output current limit (Min. 1.5A) Reverse polarity protection
Power Dissipation	70mA typical @ 24Vdc
Current for I/O Module	1.5A @ 5Vdc
Isolation	System power to internal logic : Non-isolation System power I/O driver : Isolation
UL Field Power	Supply voltage : 24Vdc nominal, Class 2
Field Power	Supply voltage : 24Vdc typical (Max. 30Vdc) * Field Power Range is different depending on IO Module series. Refer to IO Module`s Specification.
Max. Current Field Power Contact	DC 10A Max
Wiring	I/O Cable Max. 2.0 ㎟ (AWG 14)
Torque	0.8Nm(7 lb-in)
Weight	172g
Module Size	54mm x 99mm x 70mm
Environmental specification	
Operating Temperature	-40℃ ~ 60℃: 1.5A full load is allowed.
UL Temperature	-20℃ ~ 60℃
Storage Temperature	-40℃ ~ 85℃
Relative Humidity	5% ~ 90% non-condensing
Mounting	DIN rail

2.2.2 Interface Specification

Items	Specification
Input Specification	
Adapter Type	Slave node (Profinet)
Protocol	Profinet, Modbus RTU
Max. Expansion Module	32 slots
Max. Data Size	Max 1440 bytes
Max Length Bus Line	Up to 100m from Ethernet Hub/Switch with twisted CAT5 UTP/STP
Max. Nodes	Limited by Profinet Specification.
Baud Rate	100Mbps, Auto-negotiation, Full duplex
Interface Connector	RJ-45 socket * 2pcs
IP-Address Setup	Via Master Device Software
Max Parameter Size	2048 Bytes (ex: 1 slot = 64 Byte + I/O Parameter Size(Dword size))
IAP Mode	When DIP Switch 1 to 8 setting is 254 or 255 (Using only Internet Explorer / recommended version 11)
Serial Port	RS232 for MODBUS/RTU, Touch Panel
Serial Configuration (RS232)	Node : 1 (Fixed) Baud Rate : 115200 (Fixed) Data bit : 8 (Fixed) Parity bit : No parity (Fixed) Stop bit : 1 (Fixed)
Indicator	6 LEDs 1 Green/Red, Module Status (MOD) 1 Green, Physical Connection (NET) 1 Green/Red, Network Error(ERROR) 1 Green/Red, Expansion I/O Module Status (IOS) 1 Green, System Power Status 1 Green, Field Power Status 2 LEDs (each RJ45 Connector) 1 Yellow, Link/Active 1 Green, Not used
Module Location	Starter module left side of G-Series system
Field Power Detection	About 14Vdc
General Specification	
Shock Operating	IEC 60068-2-27
Vibration Resistance	Based on IEC 60068-2-6 DNVGL-CG-0039 : Vibration Class B, 4g
Industrial Emissions	EN 61000-6-4/A11 : 2011
Industrial Immunity	EN 61000-6-2 : 2005
Installation Position	Vertical and horizontal installation is available
Product Certifications	CE, UL, FCC

2.3 GN-9287 LED Indicator



LED No.	LED Function / Description	LED Color
MOD	Module Status	Green/Red
NET	Current communication status	Green
ERROR	Error Status (Profinet)	Green
IOS	Extension Module Status	Green/Red
System Power	System Power Enable	Green
Field Power	Field Power Enable	Green

2.3.1 Module Status LED (MOD)

Status	LED	To indicate
No Powered	OFF	Not power is supplied to the unit.
Device Operational	Green	The unit is operating in normal condition.
Unrecoverable Fault	Red	The device has an unrecoverable fault. - Memory error or CPU watchdog error.

2.3.2 Network Status LED (LINK)

Status	LED	To indicate
No Powered	OFF	No power is supplied to the unit.
Communication	Green	Normal communication
Communication Ready	Flashing Green	Communication identification
Invalid Configuration	Flashing Red	DCP Communication error(Invalid Configuration)

2.3.3 Error Status LED (ERROR)

Status	LED	To indicate
No Error	OFF	No Error.
Connection error	Red	Communication connection error.

2.3.4 Expansion Module Status LED (IOS)

Status	LED	To indicate
Not Powered	OFF	Device may not be powered.
No Expansion Module	Flashing Red	Adapter has no expansion module
Internal Bus Connection, Run Exchanging I/O	Green	Exchanging I/O data.
Expansion Configuration Failed	Red	One or more expansion module occurred in fault state. - Detected invalid expansion module ID. - Overflowed Input/ Output Size - Too many expansion module - Initialization failure - Communication failure. - Changed expansion module configuration. - Mismatch vendor code between adapter and expansion module.

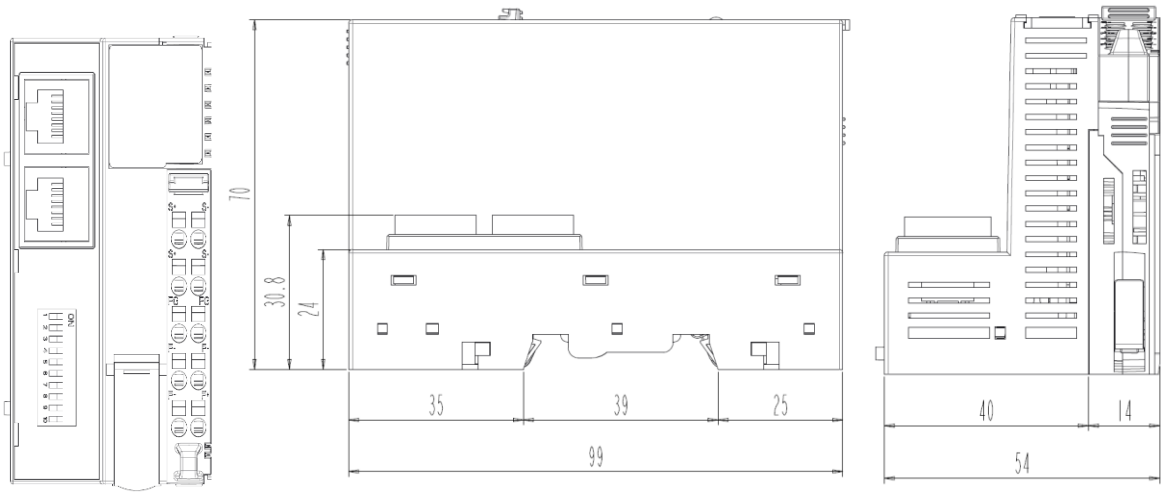
2.3.5 Field Power, System Power Status (Field Power, System Power LED)

Status	LED	To indicate
No field, System power	OFF	Not supplied 24Vdc system power.
Supplied field, System power	Green	Supplied 24Vdc field power

3 Dimension

3.1 GN-9287

(mm)



4 Mechanical Set Up

4.1 Total Expansion

The number of the module assembly that can be connected is 32. So the maximum length is 438mm including GN-9287.

4.2 Plugging and Removal of the Components

As above figure in order to safeguard the FnIO module from jamming, it should be fixed onto the DIN rail with locking level. To do so, fold on the upper of the locking lever. To pull out the FnIO module, unfold the locking lever as below figure.

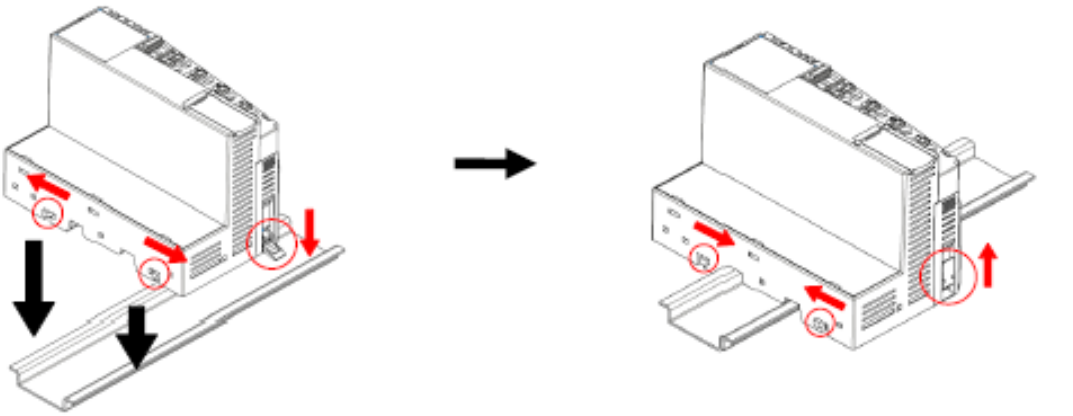
DANGER 	Before work is done on the components, the voltage supply must be turned off.

4.3 Module mounting

How to mount on DIN-rail

① Press down the module lightly on the DIN-rail
※ DIN-rail lockers and lever should be unlocked in this step.

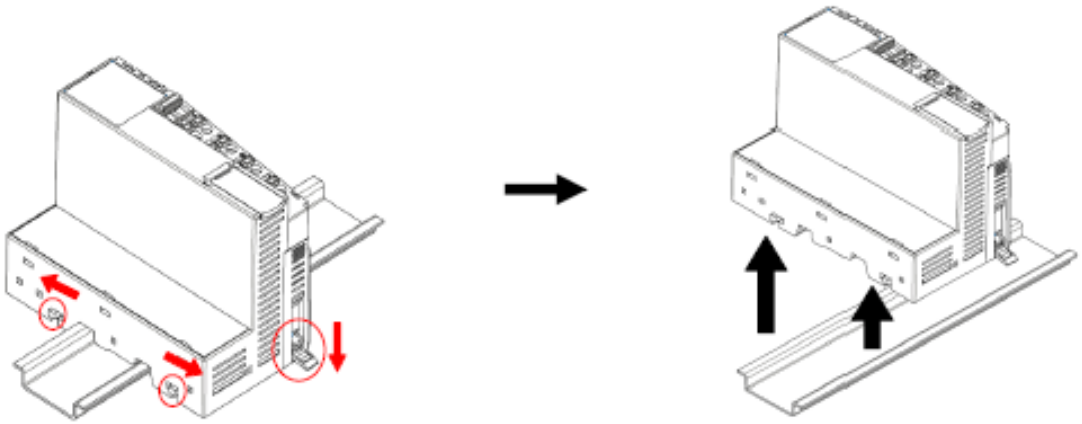
② Lock DIN-rail lockers and lever in right direction



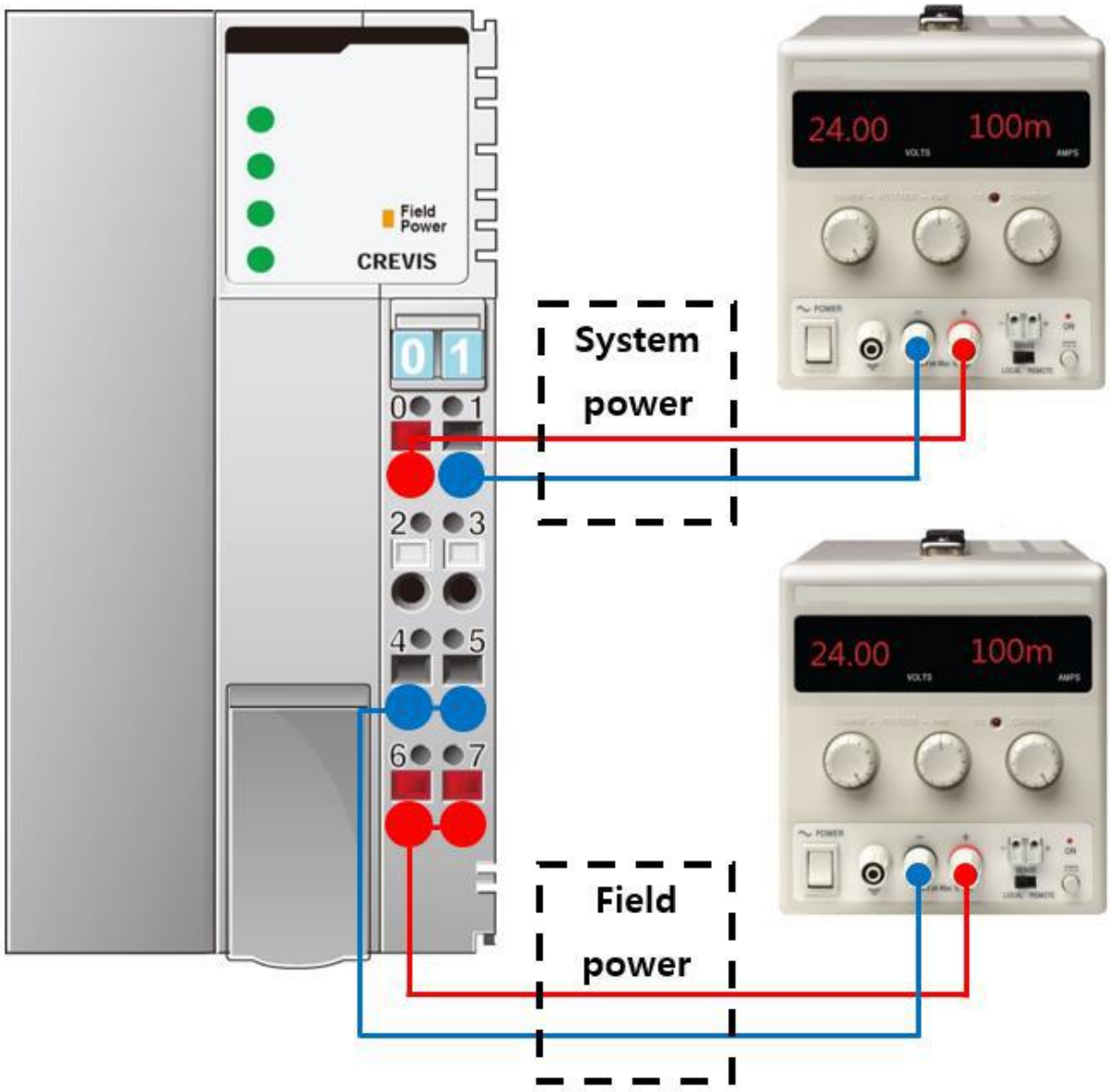
How to dismount from DIN-rail

① Unlock DIN-rail lockers and lever in right direction

② Pull up the module to remove from the DIN-rail



4.4 How to supply the power correctly



- Refer the pin map of power RTB before wiring.
- Current capacity margin should be considered when you supply the power.
- Supply voltage 24Vdc which is recommended voltage level.
- System and Field power must be supplied separately as the picture above.

※ If the power is supplied to each System and Field power from same power source, it would be vulnerable to power noise.

5 PROFINET Electrical Interface

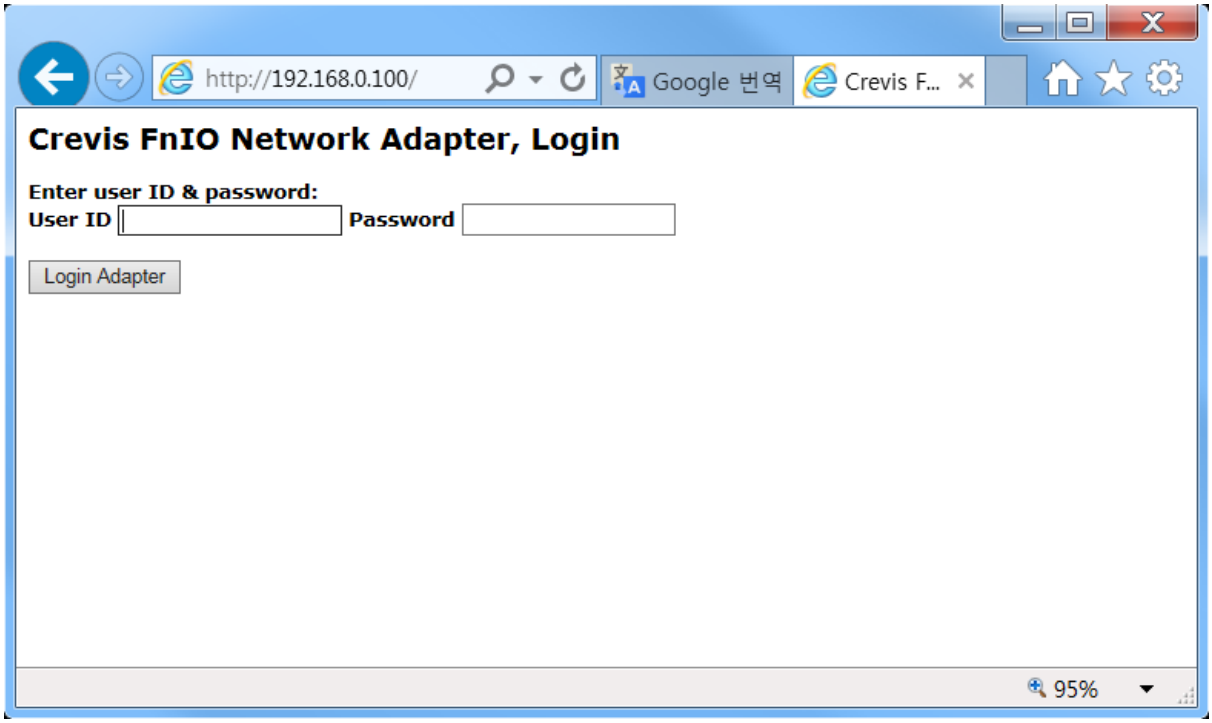
5.1 IAP Functionality

After setting up the dip switch as 254 or 255, Power off and on in order to start the IAP mode.

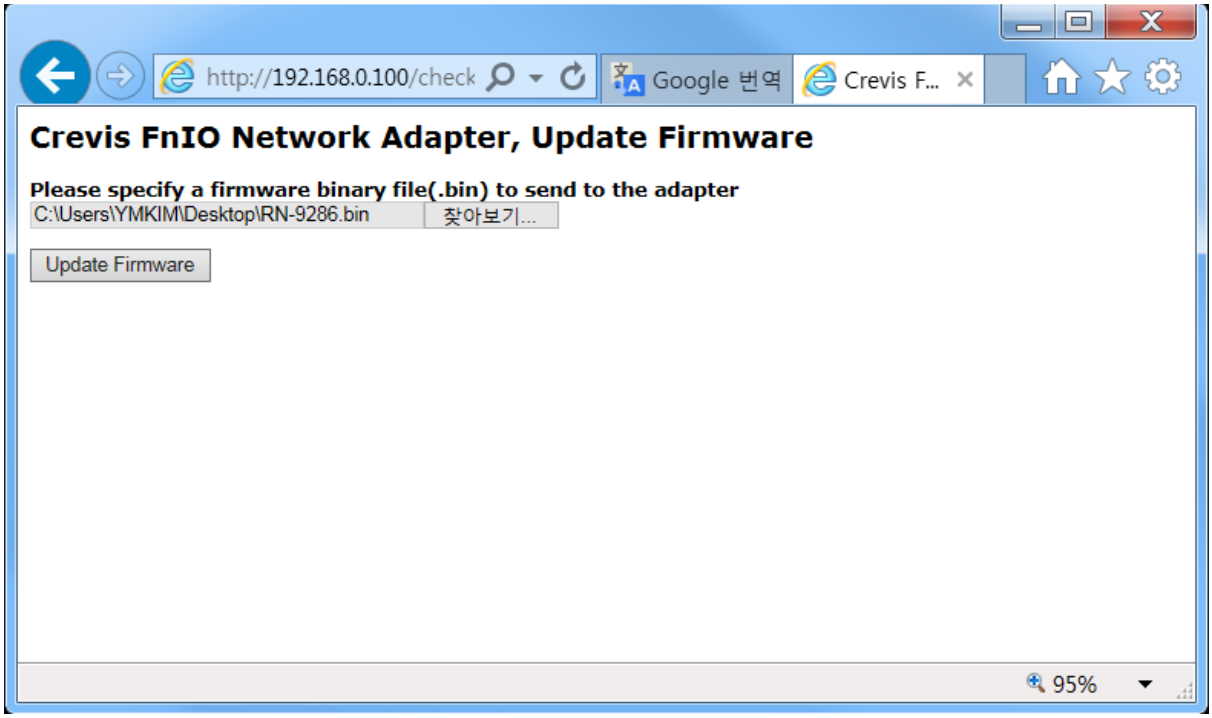
(254=Fixed IP Address (192.168.0.100)/255=Last used IP Address)

After Login the Web Browser connecting (Using only Internet Explorer / Recommended version 11)

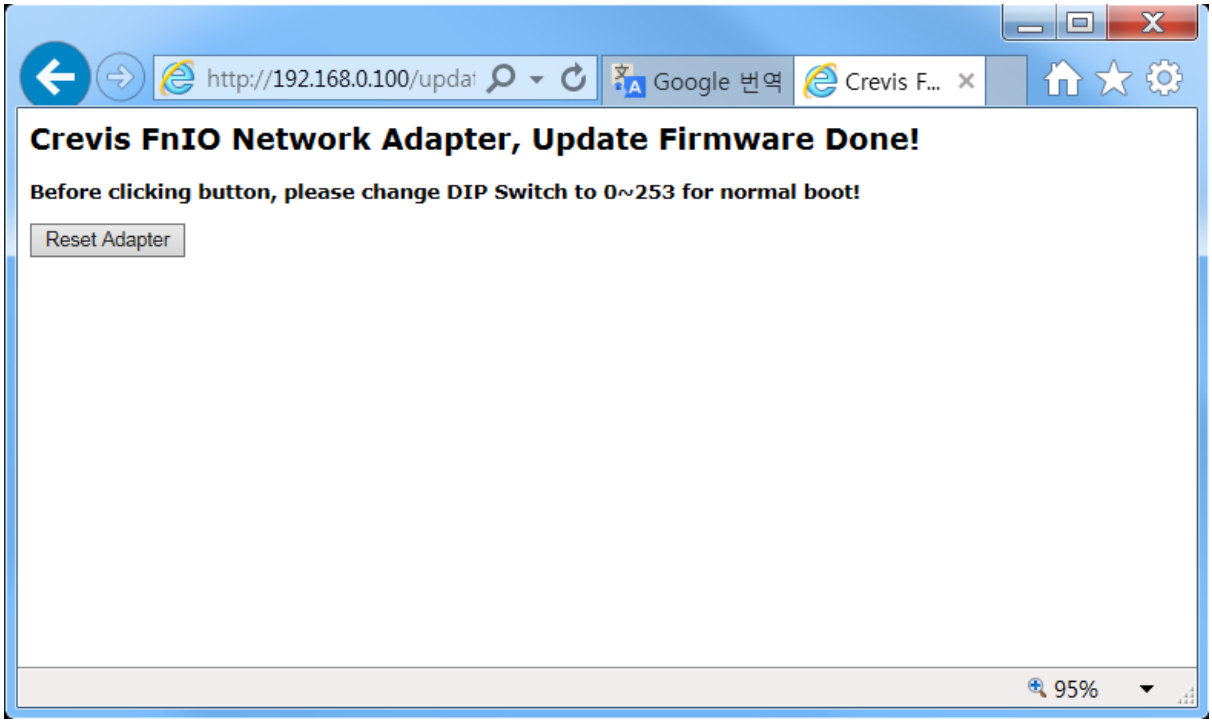
(User ID: Crevis, Password: Crevis)



To update the binary file.

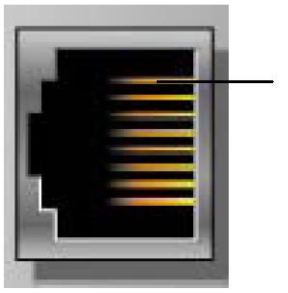


Has been updated. Please reboot the adapter.



6 GN-9287 Communication Interface

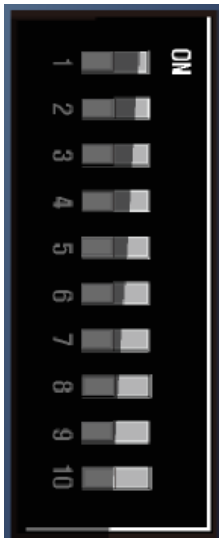
6.1 RJ-45 Socket



Shielded RJ-45 Socket

RJ-45	Signal Name	Description
1	TD+	Transmit +
2	TD-	Transmit -
3	RD+	Receive +
4		
5		
6	RD-	Receive -
7		
8		
Case	Shield	

6.2 Dip Switch (TBD)



DIP Pole#	Description	
1	Node ID Bit0	Device Name (GN9287-XX) - XX must a value between 1~99
2	Node ID Bit1	
3	Node ID Bit2	
4	Node ID Bit3	
5	Node ID Bit4	
6	Node ID Bit5	
7	Node ID Bit6	
8	Reserve	
9	Reserve	
10	Node ID : Flash Memory Value	

✂ **When the dip switch is not set to non-zero(1~99):**

If the decimal value of the dip switch is not zero (0), the name of device will be fixed as "GN9287-xx"(xx:1~99). You must put the fixed device name.

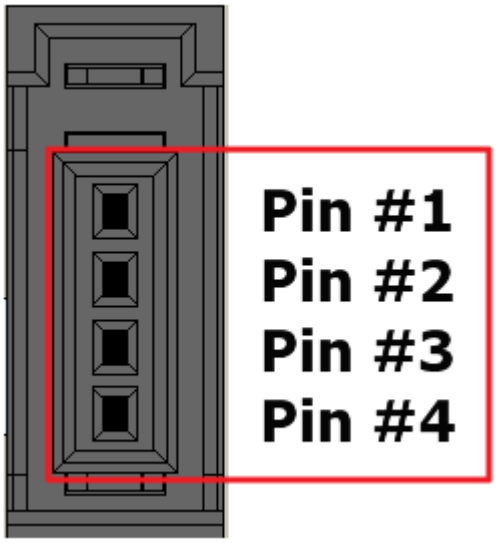
✂ **When the dip switch "10 pole" is set to switch ON:**

GN-9287 Devices on a PROFINET subnet must have unique names. The device names must satisfy DNS naming conventions. This means that the following rules must be observed:

- Names are limited to a total of 127 characters (letters, numbers, dashes or dots)
- Any component part (that is, a character string between two dots) of the device name may only be up to 63 characters long.

- Names cannot contain any special characters such as a umlauts, parentheses, underscores, forward or backward slashes, empty spaces, etc. The dash is the only special character allowed.
- Names must not begin or end with the “-” or “.” characters.
- Names must not have the format n.n.n.n (where n = 0…999).
- The device name must not start with numbers.
- Device names are assigned to PROFINET IO device when the device is being set up and placed in operation for the first time (”commissioned”).
The default name is “GN9287-address”.

6.3 RS232 Port for MODBUS/RTU, Touch Panel

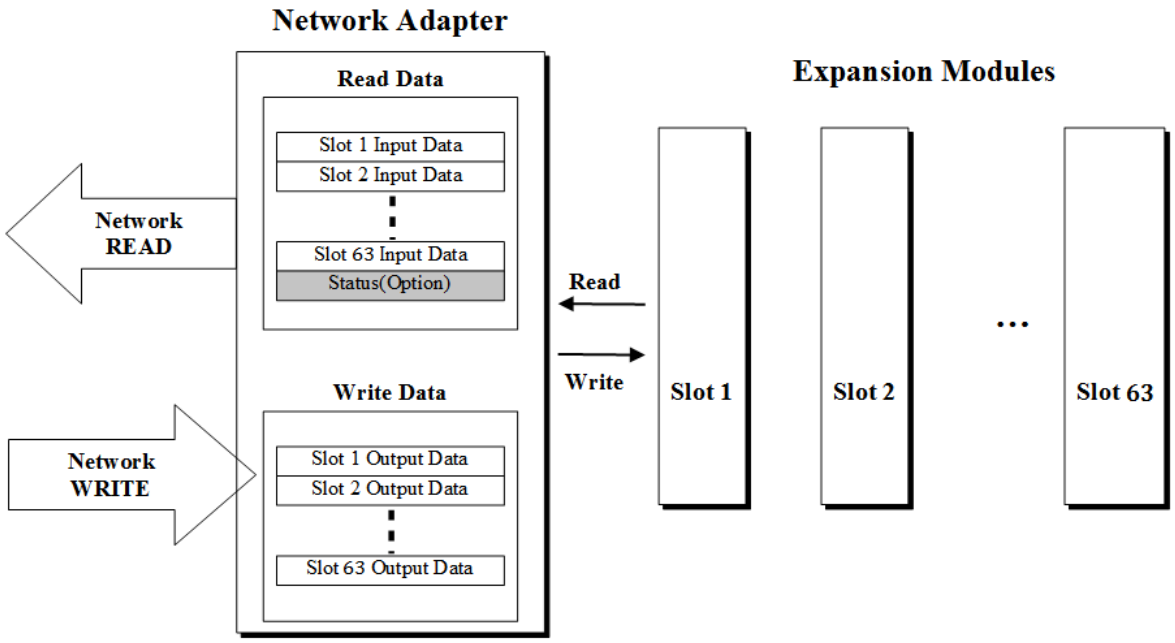


RS232 (37204-62A3-004PL/3M)		
Pin#	**Signal Name**	**Description**
1	Reserved	----
2	TXD	RS232 TXD
3	RXD	RS232 RXD
4	GND	RS232 GND

7 I/O Process Image Map

An expansion module may have 3 types of data as I/O data, configuration parameter and memory register.

The data exchange between network adapter and expansion modules is done via an I/O process image data by G-Series protocol. The following figure shows the data flow of process image between network adapter and expansion modules.



7.1 Mapping Data into image Table

7.1.1 Discrete Input Module

- 4 Point Input Module

Input Module Data

D3	D2	D1	D0

Input Image Value

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte 0	Reserved				D3	D2	D1	D0

- 8 Point Input Module

Input Module Data

D7	D6	D5	D4	D3	D2	D1	D0

Input Image Value

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte 0	D7	D6	D5	D4	D3	D2	D1	D0

- 16 Point Input Module

Input Image Value

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte 0	D7	D6	D5	D4	D3	D2	D1	D0

Input Module Data

D7	D6	D5	D4	D3	D2	D1	D0
D15	D14	D13	D12	D11	D10	D9	D8

- 32 Point Input Module

Input Module Data

D7	D6	D5	D4	D3	D2	D1	D0
D15	D14	D13	D12	D11	D10	D9	D8
D23	D22	D21	D20	D19	D18	D17	D16
D31	D30	D29	D28	D27	D26	D25	D24

Input Image Value

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte 0	D7	D6	D5	D4	D3	D2	D1	D0
Byte 1	D15	D14	D13	D12	D11	D10	D9	D8
Byte 2	D23	D22	D21	D20	D19	D18	D17	D16
Byte 3	D31	D30	D29	D28	D27	D26	D25	D24

7.1.2 Discrete Output Module

- 4 Point Output Module

Output Image Value

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte 0	Reserved				D3	D2	D1	D0

Output Module Data

D3	D2	D1	D0

- 8 Point Output Module

Output Image Value

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte 0	D7	D6	D5	D4	D3	D2	D1	D0

Output Module Data

D7	D6	D5	D4	D3	D2	D1	D0

- 16 Point Output Module

Output Image Value

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte 0	D7	D6	D5	D4	D3	D2	D1	D0
Byte 1	D15	D14	D13	D12	D11	D10	D9	D8

Output Module Data

D7	D6	D5	D4	D3	D2	D1	D0
D15	D14	D13	D12	D11	D10	D9	D8

- 32 Point Output Module

Output Image Value

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte 0	D7	D6	D5	D4	D3	D2	D1	D0
Byte 1	D15	D14	D13	D12	D11	D10	D9	D8
Byte 2	D23	D22	D21	D20	D19	D18	D17	D16
Byte 3	D31	D30	D29	D28	D27	D26	D25	D24

Output Module Data

D7	D6	D5	D4	D3	D2	D1	D0
D15	D14	D13	D12	D11	D10	D9	D8
D23	D22	D21	D20	D19	D18	D17	D16
D31	D30	D29	D28	D27	D26	D25	D24

7.1.3 Analog Input Module

- 4 Channel Analog Input Module

Input Module Data

Analog Input Ch0
Analog Input Ch1
Analog Input Ch2
Analog Input Ch3

Input Image Value

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte 0	Analog Input Ch0 low byte							
Byte 1	Analog Input Ch0 high byte							
Byte 2	Analog Input Ch1 low byte							
Byte 3	Analog Input Ch1 high byte							
Byte 4	Analog Input Ch2 low byte							
Byte 5	Analog Input Ch2 high byte							
Byte 6	Analog Input Ch3 low byte							
Byte 7	Analog Input Ch3 high byte							

- 8 Channel Analog Input Module

Input Module Data

Analog Input Ch0
Analog Input Ch1
Analog Input Ch2
Analog Input Ch3
Analog Input Ch4
Analog Input Ch5
Analog Input Ch6
Analog Input Ch7

Input Image Value

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte 0	Analog Input Ch0 low byte							
Byte 1	Analog Input Ch0 high byte							
Byte 2	Analog Input Ch1 low byte							
Byte 3	Analog Input Ch1 high byte							
Byte 4	Analog Input Ch2 low byte							
Byte 5	Analog Input Ch2 high byte							
Byte 6	Analog Input Ch3 low byte							
Byte 7	Analog Input Ch3 high byte							
Byte 8	Analog Input Ch0 low byte							
Byte 9	Analog Input Ch0 high byte							
Byte 10	Analog Input Ch1 low byte							
Byte 11	Analog Input Ch1 high byte							
Byte 12	Analog Input Ch2 low byte							
Byte 13	Analog Input Ch2 high byte							
Byte 14	Analog Input Ch3 low byte							
Byte 15	Analog Input Ch3 high byte							

7.1.4 Analog Output Module

- 4 Channel Analog Output Module

Output Image Value

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte 0	Analog Output Ch0 low byte							
Byte 1	Analog Output Ch0 high byte							
Byte 2	Analog Output Ch1 low byte							
Byte 3	Analog Output Ch1 high byte							
Byte 4	Analog Output Ch2 low byte							
Byte 5	Analog Output Ch2 high byte							
Byte 6	Analog Output Ch3 low byte							
Byte 7	Analog Output Ch3 high byte							

Output Module Data

Analog Output Ch0
Analog Output Ch1
Analog Output Ch2
Analog Output Ch3

- 8 Channel Analog Output Module

Output Image Value

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte 0	Analog Output Ch0 low byte							
Byte 1	Analog Output Ch0 high byte							
Byte 2	Analog Output Ch1 low byte							
Byte 3	Analog Output Ch1 high byte							
Byte 4	Analog Output Ch2 low byte							
Byte 5	Analog Output Ch2 high byte							
Byte 6	Analog Output Ch3 low byte							
Byte 7	Analog Output Ch3 high byte							
Byte 8	Analog Output Ch4 low byte							
Byte 9	Analog Output Ch4 high byte							
Byte 10	Analog Output Ch5 low byte							
Byte 11	Analog Output Ch5 high byte							
Byte 12	Analog Output Ch6 low byte							
Byte 13	Analog Output Ch6 high byte							
Byte 14	Analog Output Ch7 low byte							
Byte 15	Analog Output Ch7 high byte							

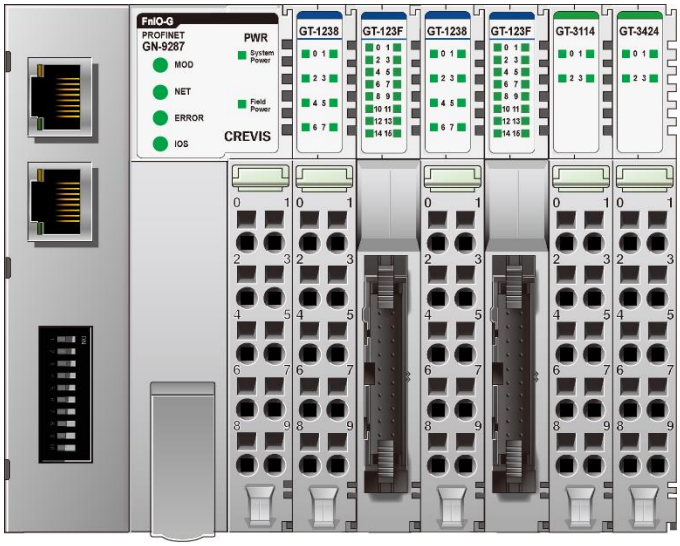
Output Module Data

Analog Output Ch0
Analog Output Ch1
Analog Output Ch2
Analog Output Ch3
Analog Output Ch4
Analog Output Ch5
Analog Output Ch6
Analog Output Ch7

7.2 Example of Input Process Image (Input Register) Map

Input image data depends on slot position and expansion slot data type. Input process image data is only ordered by expansion slot position

*** For example slot configuration**



Slot No.	Module Description
#0	ProfiNet Adapter
#1	8-discrete output
#2	16-discrete output
#3	8-discrete input
#4	16-discrete input
#5	4-analog input
#6	4-analog input

Input Process Image

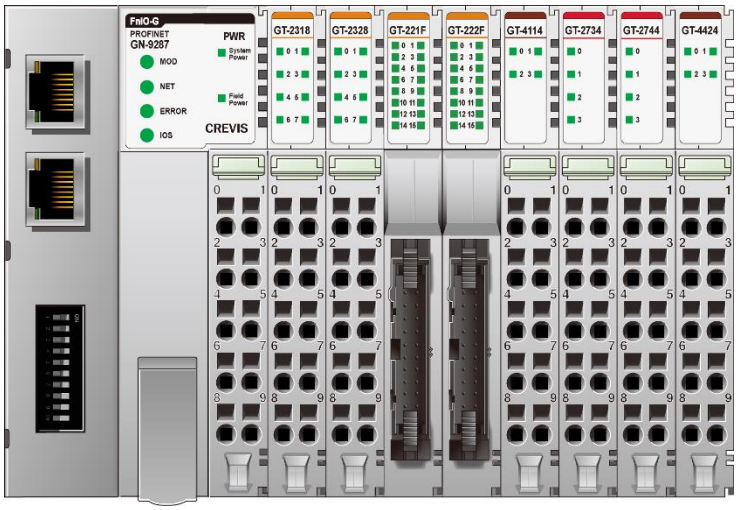
Byte	Slot#	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Ready Byte 0	Slot 1	Discrete Input 8 Point							
Ready Byte 1	Slot 2	Discrete Input 16 Point low byte							
Ready Byte 2		Discrete Input 16 Point high byte							
Ready Byte 3	Slot 3	Discrete Input 8 Point							
Ready Byte 4	Slot 4	Discrete Input 16 Point low byte							
Ready Byte 5		Discrete Input 16 Point high byte							
Ready Byte 6	Slot 5	Analog Input Ch0 low byte							
Ready Byte 7		Analog Input Ch0 high byte							
Ready Byte 8		Analog Input Ch1 low byte							
Ready Byte 9		Analog Input Ch1 high byte							
Ready Byte 10		Analog Input Ch2 low byte							
Ready Byte 11		Analog Input Ch2 high byte							
Ready Byte 12		Analog Input Ch3 low byte							
Ready Byte 13		Analog Input Ch3 high byte							
Ready Byte 14	Slot 6	Analog Input Ch0 low byte							
Ready Byte 15		Analog Input Ch0 high byte							
Ready Byte 16		Analog Input Ch1 low byte							
Ready Byte 17		Analog Input Ch1 high byte							

Ready Byte 18		Analog Input Ch2 low byte
Ready Byte 19		Analog Input Ch2 high byte
Ready Byte 20		Analog Input Ch3 low byte
Ready Byte 21		Analog Input Ch3 high byte

7.3 Example of Output Process Image (Output Register) Map

Output image data depends on slot position and expansion slot data type. Output process image data is only ordered by expansion slot position.

* For example slot configuration



Slot No.	Module Description
#0	ProfiNet Adapter
#1	8-discrete output
#2	8-discrete output
#3	16-discrete output
#4	16-discrete output
#5	4-analog output
#6	4-relay output
#7	4-relay output
#8	4-analog output

Output Process Image

Byte	Slot#	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Write Byte 0	Slot 1	Discrete Output 8 Point							
Write Byte 1	Slot 2	Discrete Output 8 Point							
Write Byte 2	Slot 3	Discrete Output 16 Point low byte							
Write Byte 3		Discrete Output 16 Point high byte							
Write Byte 4	Slot 4	Discrete Output 16 Point low byte							
Write Byte 5		Discrete Output 16 Point high byte							
Write Byte 6	Slot 5	Analog Output Ch0 low byte							
Write Byte 7		Analog Output Ch0 high byte							
Write Byte 8		Analog Output Ch1 low byte							
Write Byte 9		Analog Output Ch1 high byte							
Write Byte 10		Analog Output Ch2 low byte							
Write Byte 11		Analog Output Ch2 high byte							
Write Byte 12		Analog Output Ch3 low byte							
Write Byte 13		Analog Output Ch3 high byte							
Write Byte 14	Slot 6	Not used				Discrete Output 4 Point			
Write Byte 15	Slot 7	Not used				Discrete Output 4 Point			
Write Byte 16	Slot 8	Analog Output Ch0 low byte							
Write Byte 17		Analog Output Ch0 high byte							
Write Byte 18		Analog Output Ch1 low byte							
Write Byte 19		Analog Output Ch1 high byte							
Write Byte 20		Analog Output Ch2 low byte							
Write Byte 21		Analog Output Ch2 high byte							
Write Byte 22		Analog Output Ch3 low byte							
Write Byte 23		Analog Output Ch3 high byte							

8 MODBUS Special Register Map

The special register map can be accessed by function code 3, 4, 6 and 16. Also the special register map must be accessed by read/write of every each address (one address).

8.1 Adapter Identification Special Register (0x1000, 4096)

Address	Access	Type, Size	Description
0x1000(4096)	Read	1word	Vendor ID = 0x0140(320), Crevis. Co., Ltd.
0x1001(4097)	Read	1word	Device type = 0x000C, Network Adapter
0x1002(4098)	Read	1word	Product Code = 0x9070
0x1003(4099)	Read	1word	Firmware revision, if 0x0101, revision 1.01
0x1004(4100)	Read	2word	Product unique serial number
0x1005(4101)	Read	String upto 34byte	Product name string (ASCII) “GN-9287,PROFINET,GBUS”
0x1006(4102)	Read	1word	Sum check of EEPROM
0x1010(4112)	Read	2word	Firmware release date
0x1011(4113)	Read	2word	Product manufacturing inspection date
0x101E(4126)	Read	7word - 1word - 1word - 1word - 1word - 1word - 2word	Composite Id of following address * RTU mode 0x1100(4352), Modbus RS232 Node. (Fixed 0x0001) 0x1000(4096), Vendor ID 0x1001(4097), Device type 0x1002(4098), Product code 0x1003(4099), Firmware revision 0x1004(4100), Product serial number

- String Type consists of valid string length (first 1word) and array of characters

8.2 Other Time Special Register (0x1028, 4136)

Address	Access	Type, Size	Description
0x1028(4136)	Read	1word	IO update time, main loop time. (1 usec unit)

8.3 Adapter IP/MAC Address Special Register (0x1050, 4176)

Address	Access	Type, Size	Description
0x1050(4176)	Read.Write	2word	IP address. If 192.168.123.1, then 0xA8C0, 0x017B. After update this value, IP address, Subnet mask and Gateway are applied as new one.
0x1051(4177)	Read/Write	2word	Subnet mask. If 255.255.255.0, then 0xFFFF, 0x00FF.
0x1052(4178)	Read/Write	2word	Gateway. If 192.168.123.254, then 0xA8C0, 0xFE7B
0x1053(4179)	Read	3word	Ethernet physical address (MAC-ID). If 11-22-33-44-55-66, then 0x2211, 0x4433, 0x6655.

8.4 Adapter Information Special Register (0x1100, 4352)

Address	Access	Type, Size	Description
0x1100(4352)*	Read	1word	Current STATION-NUMBER. If Dip SW 10 = Off
0x1102(4354)	Read	1word	Start address of input image word register. =0x0000
0x1103(4355)	Read	1word	Start address of output image word register. =0x0800
0x1104(4356)	Read	1word	Size of input image word register.
0x1105(4357)	Read	1word	Size of output image word register.
0x1106(4358)	Read	1word	Start address of input image bit. = 0x0000
0x1107(4359)	Read	1word	Start address of output image bit. =0x1000
0x1108(4360)	Read	1word	Size of input image bit.
0x1109(4361)	Read	1word	Size of output image bit.
0x110A(4362)	Read	1word	Update time for cyclic data change (same as 0x1028)
0x110D(4365)	Read	1word	Current Dip Switch State and Field Power Status (MSB) ex) Flash memory Value using, Dip SW(0x01), Field Power On = 0x8201
0x110E(4366)	Read	upto 33word	Expansion slot's GT-number including GN First 1word is adapter's number, if GN-9287, then 0x9287
0x1110(4368)	Read	1word	Number of expansion slot
0x1113(4371)	Read	upto 33word	Expansion slot Module Id. First 1word is adapter's module id.
0x1119(4377)	Read	1word	Hi byte is ModBus status, low byte is internal bus status. Zero value means 'no error'.
0x111D(4381)	Read	1word	Adapter G-Series Revision.

ModBus status	Internal bus status(G-Bus)
	0x00 : OPERATING 0x01 : COMMUNICATION_FAULT 0x02 : CONNECT_FAULT 0x03 : CONFIG_FAULT 0x04 : NO_EXPANSION 0x05 : INVALID_ATTR_VALUE 0x06 : TOO_MUCH_DATA 0x07 : VENDOR_ERROR 0x08 : NOT_EXPECTED_SLOT 0X09 : CRC_ERROR 0X80 : NO FIELD POWER

*After the system is reset, the new "Set Value" action is applied.

** If the slot location is changed, set default value automatically (all expansion slot are live).

8.5 Expansion Slot Information Special Resister (0x2000, 8192)

Each expansion slot has 0x20(32) address offset and same information structure.

Slot#1 0x2000 (8192) ~ 0x201F (8223) Slot#2 0x2020 (8224) ~ 0x203F (8255)
Slot#3 0x2040 (8256) ~ 0x205F (8287) Slot#4 0x2060 (8288) ~ 0x207F (8319)
Slot#5 0x2080 (8320) ~ 0x209F (8351) Slot#6 0x20A0 (8352) ~ 0x20BF (8383)
Slot#7 0x20C0 (8384) ~ 0x20DF (8415) Slot#8 0x20E0 (8416) ~ 0x20FF (8447)
Slot#9 0x2100 (8448) ~ 0x211F (8479) Slot#10 0x2120 (8480) ~ 0x213F (8511)
Slot#11 0x2140 (8512) ~ 0x215F (8543) Slot#12 0x2160 (8544) ~ 0x217F (8575)
Slot#13 0x2180 (8576) ~ 0x219F (8607) Slot#14 0x21A0 (8608) ~ 0x21BF (8639)
…..
Slot#32 0x23E0 (9184) ~ 0x23FF (9215)

Address Offset	Expansion Slot#1	Expansion Slot#2	Expansion Slot#3	Expansion Slot#4	…	Expansion Slot#63
+ 0x00(+0)	0x2000(8192)	0x2020(8224)	0x2040(8256)	0x2060(8288)	…	0x27C0(10176)
+ 0x01(+1)	0x2001(8193)	0x2021(8225)	0x2041(8257)	0x2061(8289)	…	0x27C1(10177)
+ 0x02(+2)	0x2002(8194)	0x2022(8226)	0x2042(8258)	0x2062(8290)	…	0x27C2(10178)
+ 0x03(+3)	0x2003(8195)	0x2023(8227)	0x2043(8259)	0x2063(8291)	…	0x27C3(10179)
+ 0x04(+4)	0x2004(8196)	0x2024(8228)	0x2044(8260)	0x2064(8292)	…	0x27C4(10180)
+ 0x05(+5)	0x2005(8197)	0x2025(8229)	0x2045(8261)	0x2065(8293)	…	0x27C5(10181)
+ 0x06(+6)	0x2006(8198)	0x2026(8230)	0x2046(8262)	0x2066(8294)	…	0x27C6(10182)
+ 0x07(+7)	0x2007(8199)	0x2027(8231)	0x2047(8263)	0x2067(8295)	…	0x27C7(10183)
+ 0x08(+8)	0x2008(8200)	0x2028(8232)	0x2048(8264)	0x2068(8296)	…	0x27C8(10184)
+ 0x09(+9)	0x2009(8201)	0x2029(8233)	0x2049(8265)	0x2069(8297)	…	0x27C9(10185)
+ 0x0A(+10)	0x200A(8202)	0x202A(8234)	0x204A(8266)	0x206A(8298)	…	0x27CA(10186)
+ 0x0B(+11)	0x200B(8203)	0x202B(8235)	0x204B(8267)	0x206B(8299)	…	0x27CB(10187)
+ 0x0C(+12)	0x200C(8204)	0x202C(8236)	0x204C(8268)	0x206C(8300)	…	0x27CC(10188)
+ 0x0D(+13)	0x200D(8205)	0x202D(8237)	0x204D(8269)	0x206D(8301)	…	0x27CD(10189)
+ 0x0E(+14)	0x200E(8206)	0x202E(8238)	0x204E(8270)	0x206E(8302)	…	0x27CE(10190)
+ 0x0F(+15)	0x200F(8207)	0x202F(8239)	0x204F(8271)	0x206F(8303)	…	0x27CF(10191)
+ 0x10(+16)	0x2010(8208)	0x2030(8240)	0x2050(8272)	0x2070(8304)	…	0x27D0(10192)
+ 0x11(+17)	0x2011(8209)	0x2031(8241)	0x2051(8273)	0x2071(8305)	…	0x27D1(10193)

+ 0x12(+18)	0x2012(8210)	0x2032(8242)	0x2052(8274)	0x2072(8306)	… ….	0x27D2(10194)
+ 0x13(+19)	0x2013(8211)	0x2033(8243)	0x2053(8275)	0x2073(8307)	… ….	0x27D3(10195)
+ 0x14(+20)	0x2014(8212)	0x2034(8244)	0x2054(8276)	0x2074(8308)	… ….	0x27D4(10196)
+ 0x15(+21)	0x2015(8213)	0x2035(8245)	0x2055(8277)	0x2075(8309)	… ….	0x27D5(10197)
+ 0x16(+22)	0x2016(8214)	0x2036(8246)	0x2056(8278)	0x2076(8310)	… ….	0x27D6(10198)
+ 0x17(+23)	0x2017(8215)	0x2037(8247)	0x2057(8279)	0x2077(8311)	… ….	0x27D7(10199)
+ 0x18(+24)	0x2018(8216)	0x2038(8248)	0x2058(8280)	0x2078(8312)	… ….	0x27D8(10200)
+ 0x19(+25)	0x2018(8217)	0x2038(8249)	0x2058(8281)	0x2078(8313)	… ….	0x27D9(10201)
+ 0x1A(+26)	0x201A(8218)	0x203A(8250)	0x205A(8282)	0x207A(8314)	… ….	0x27DA(10202)
+ 0x1B(+27)	0x201B(8219)	0x203B(8251)	0x205B(8283)	0x207B(8315)	… ….	0x27DB(10203)
+ 0x1C(+28)	0x201C(8220)	0x203C(8252)	0x205C(8284)	0x207C(8316)	… ….	0x27DC(10204)
+ 0x1D(+29)	0x201D(8221)	0x203D(8253)	0x205D(8285)	0x207D(8317)	… ….	0x27DD(10205)
+ 0x1E(+30)	0x201E(8222)	0x203E(8254)	0x205E(8286)	0x207E(8318)	… ….	0x27DE(10206)
+ 0x1F(+31)	0x201F(8223)	0x203F(8255)	0x205F(8287)	0x207F(8319)	… ….	0x27DF(10207)

Address Offset	**Access**	**Type, Size**	**Description**
+ 0x02(+2) **	Read	1word	Input start register address of input image word this slot.
+ 0x03(+3) **	Read	1word	Input word's bit offset of input image word this slot.
+ 0x04(+4) **	Read	1word	Output start register address of output image word this slot.
+ 0x05(+5) **	Read	1word	Output word's bit offset of output image word this slot.
+ 0x06(+6) **	Read	1word	Input bit start address of input image bit this slot.
+ 0x07(+7) **	Read	1word	Output bit start address of output image bit this slot.
+ 0x08(+8) **	Read	1word	Size of input bit this slot
+ 0x09(+9) **	Read	1word	Size of output bit this slot
+ 0x0A(+10)**	Read	n word	Read input data this slot
+ 0x0B(+11)**	Read/Write	n word	Read/write output data this slot
+ 0x0E(+14)	Read	1word	GT-number, if GT-1238, returns 0x1238
+ 0x0F(+15)	Read	String upto 72byte	First 1word is length of valid character string. If GT-1238, returns "00 1E 52 54 2D 31 32 33 38 2C 20 38 44 49 2C 20 32 34 56 64 63 2C 20 55 6E 69 76 65 72 73 61 6C 00 00" Valid character size = 0x001E =30 characters, "GT-1238, 8DI, 24Vdc, Universal"
+ 0x10(+16)	Read	1word	Size of configuration parameter byte

+ 0x11(+17)**	Read/Write	n word	Read/write Configuration parameter data, Refer to each IO parameter Specification.
+ 0x17(+23)	Read	2word	Firmware Revision ex) 0x00010010 (Major revision 1 /Minor revision 1, Rev 1.001)
+ 0x19(+25)	Read	2word	Firmware release date.

* After the system is reset, the new “Set Value” action is applied.

** Nothing of output, input, and memory or configuration parameter corresponding slot returns Exception 02.

9 Parameter

9.1 GN-9287 Parameter

Parameter	Setting	Description
Word data type	All type	Little Endian format(LSB-MSB)
Stop action	Clear output image to 0 *	All outputs are set to 0.
	Hold last valid output image	All outputs are remain the last value.
Stop action Mode	General Mode*	For SIEMENS PLC
	Special Mode	For Soft PLC (ex-CoDeSys)

* : Default setting

9.2 GN-9287 Profinet IO Characteristics

9.2.1 Device Identity

Item	**Value**
Vendor	CREVIS
Vendor ID	0x0140
Product family	CREVIS FnIO System
Device ID	0x9A00
Details	GN9287 PROFINET IO Device

9.2.2 Device Access Point

Item	**Value**
Module Ident Number	0x00009A00
Details	GN9287 PROFINET IO Device
Vendor Name	CREVIS
Order Number	GN-9287
Category	CREVIS PROFINET I/O
Software Version	V1.0
Hardware Version	V1.0
Maximal Input Length	1440 Bytes
Maximal Output Length	1440 Bytes
Physical Slots	0..32
Minimal Device Interval	4msec
Based on	port Stack
DNS Compliant Name	GN9287-xx
Supports Extended Assignment of IP Address	No
Fixed in Slots	0
Instance Field of the Object UUID	1
Supports Multiple Write	Yes
Requires IOPS/IOCS	Yes
Requires Engineering tool which supports at least GSDML Version	V2.32
Item	Value
Sub-slot Number	Sub-slot Label

32768(0x8000)	X1
32769(0x8001)	P1

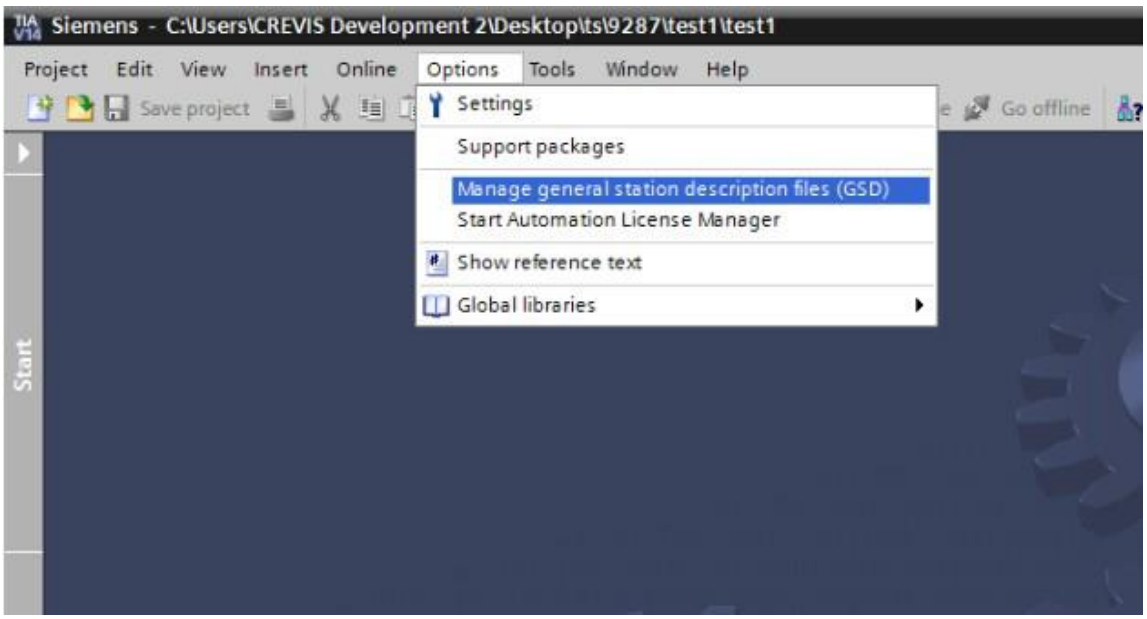
Sub-module								
Sub-module Ident Number	0x00000001							
GN-9287 Parameters (Index : 1, Length : 2Bytes, Transfer sequence : 0)								
Byte Offset	Data							
0	0x00, 0x00							
Name of Parameter	Data Type	Byte Offset	Bit Offset	Bit Length	Default Value	Value Range	Changeable	Visible
Word data format	Bit Area	0	0	1	MOTOROLA	0..1	Yes	Yes
Stop action	Bit Area	1	0	1	Clear output images to 0	0..1	Yes	Yes

Interface : GN-9287	
Sub-module Ident Number	0x0002
Sub-slot Number	32768 (0x8000)
Supports Real time Class	Class 1
Supports Isochronous Mode	No
Number of Additional Input CRs	0
Number of Additional Output CRs	0
Number of Additional Multicast Provider CRs	0
Number of Multicast Consumer CRs	0
Supported Send-clock Factors (Base 31.25us)	32 64 128
Supported Reduction Ratios	1 2 4 8 16 32 64 128 256 512
Port 1 : Port 1	
Sub-module Ident Number	0x0003
Sub-slot Number	32769 (0x8001)
MAU Type	100BASETXFD

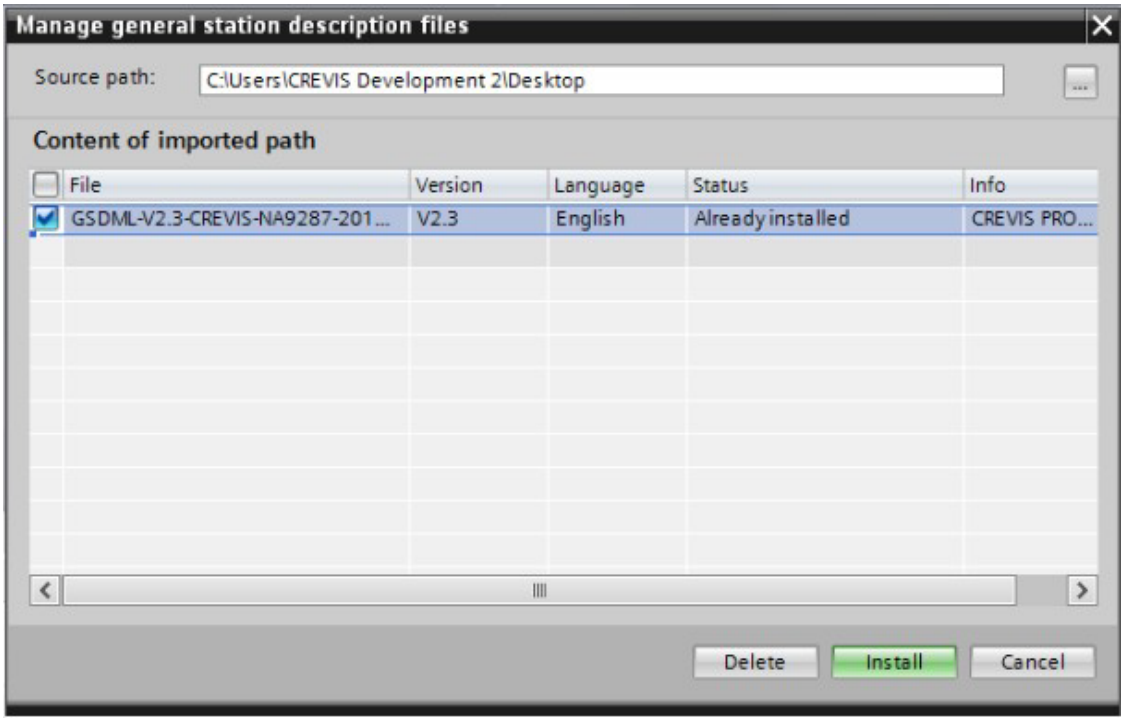
10 TIA Portal V14

10.1 Import GSDML file

(1) Option → Manage general station description files (GSD)

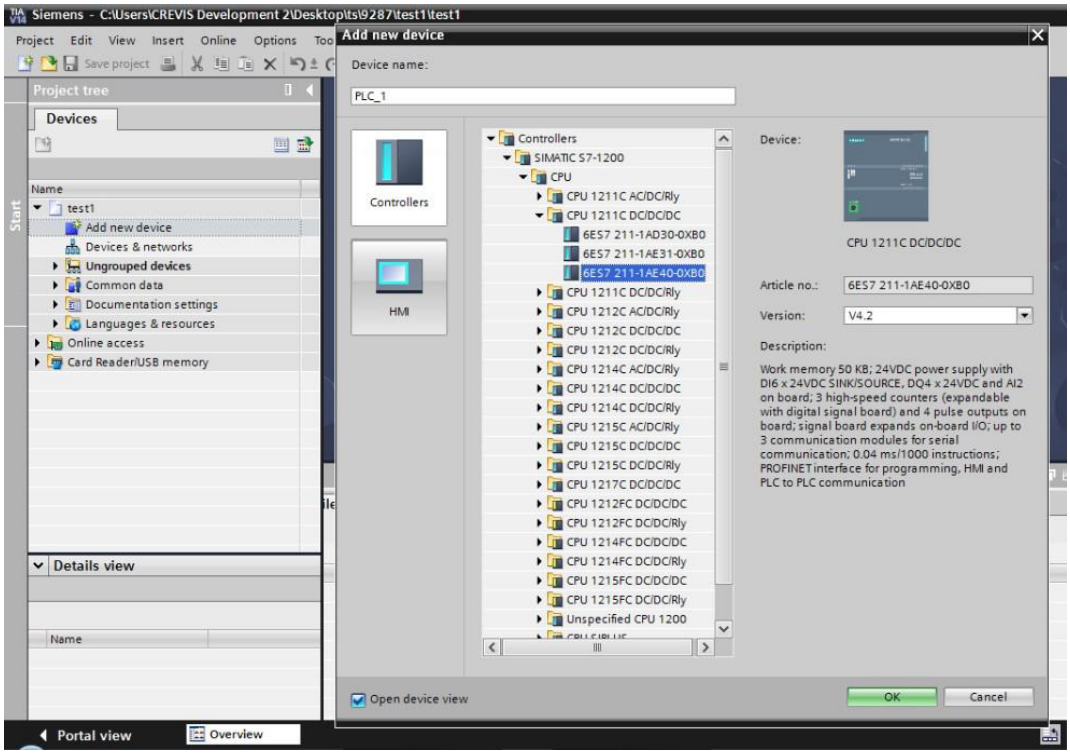


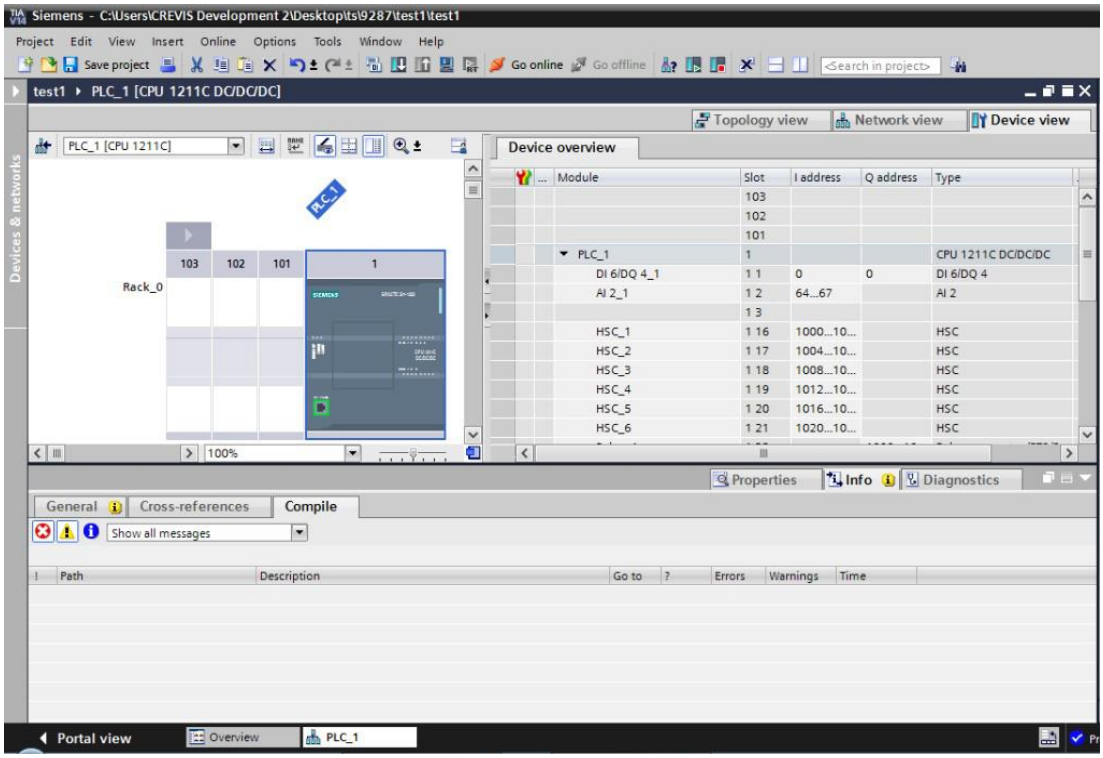
(2) Check GSDML file -> Install



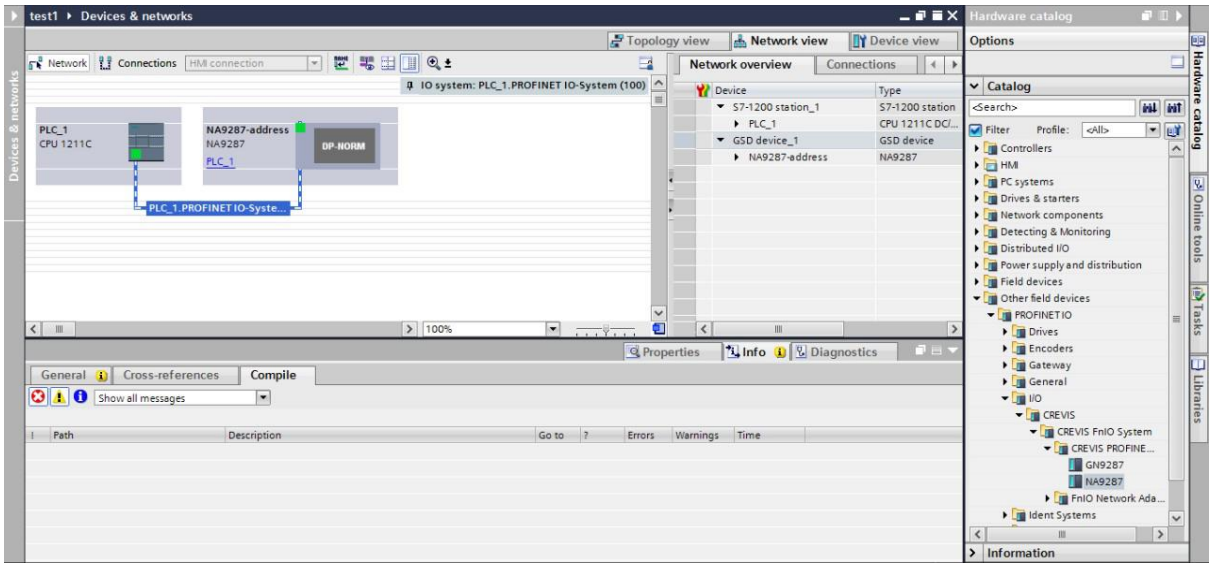
10.2 Hardware configuration setting

(1) Add new device

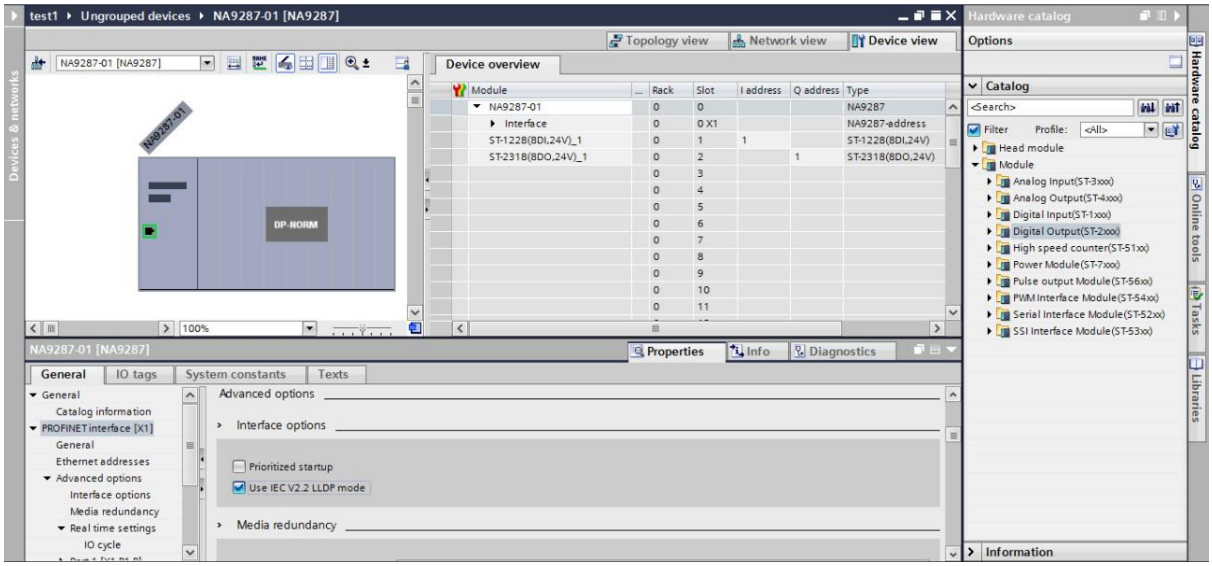




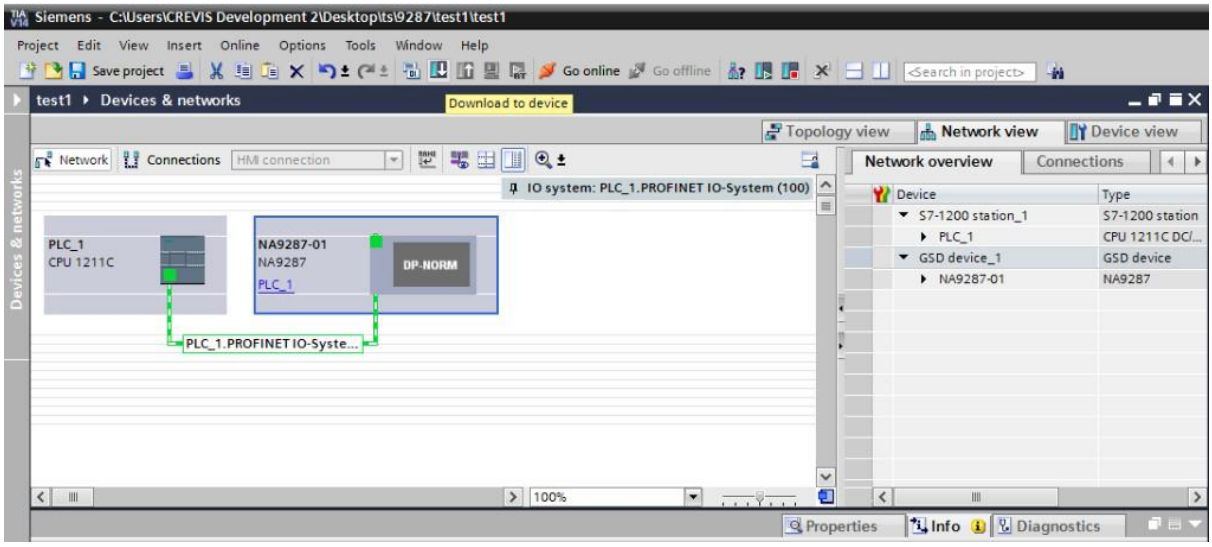
(2) Network view -> Add GN-9287 -> Connect



(3) Change module name -> Add I/O modules -> Check IEC V2.2 LLDP

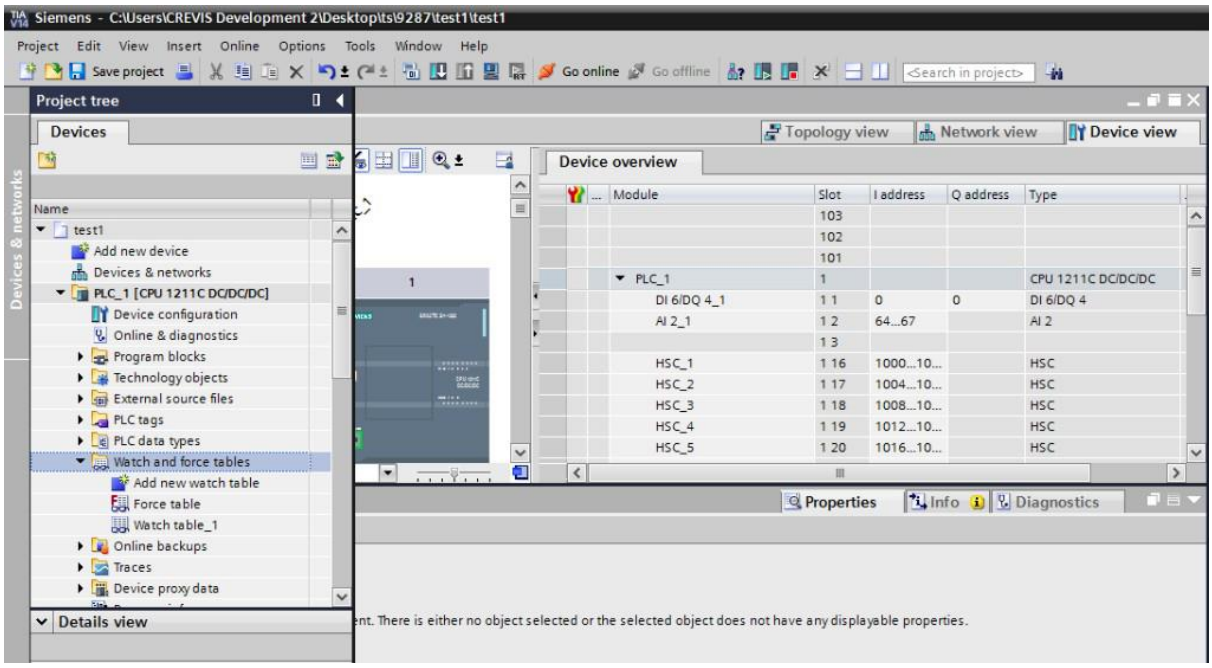


(4) Download to device

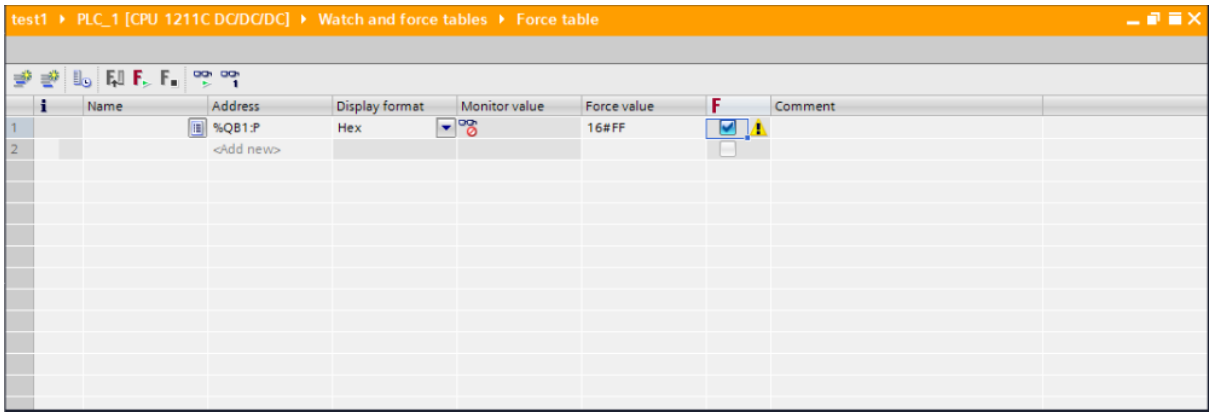


10.3 I/O test

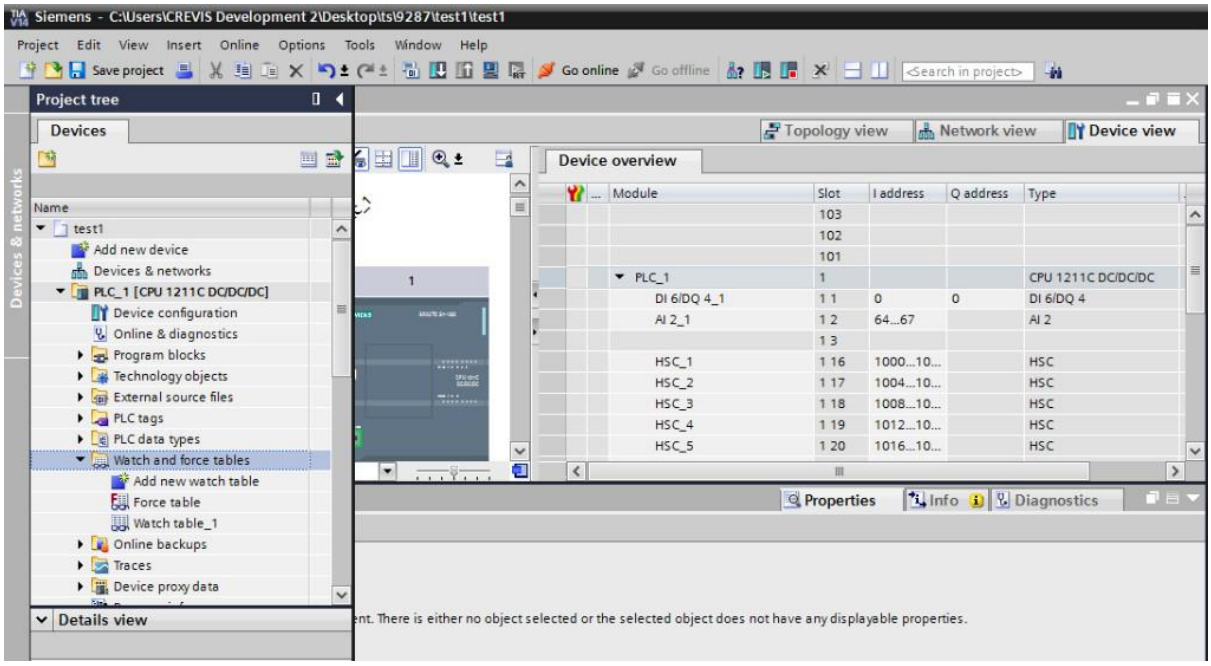
(1) Watch and force tables -> force table



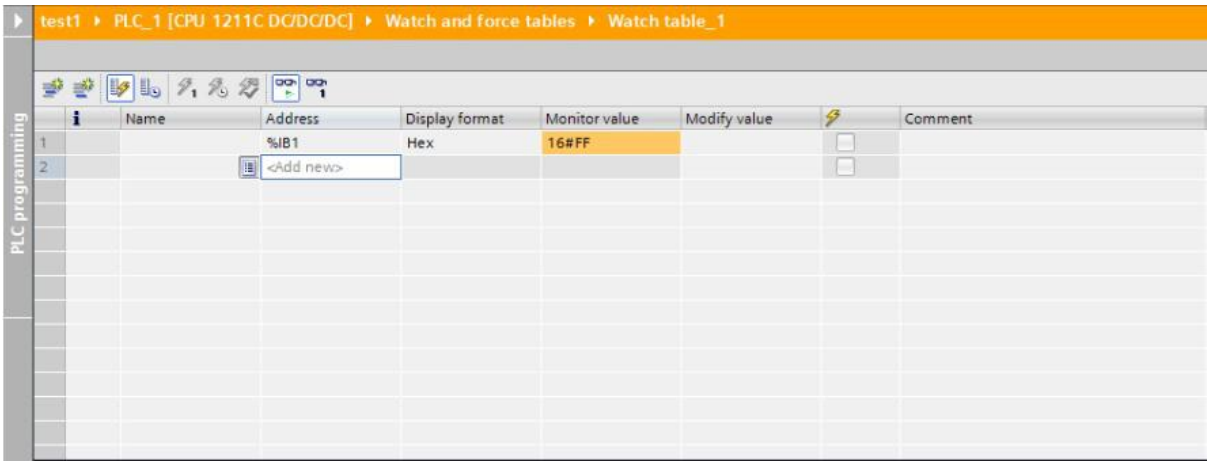
(2) Create new force table -> Check ‘F’ -> Force all



(3) Watch and force table -> Watch table

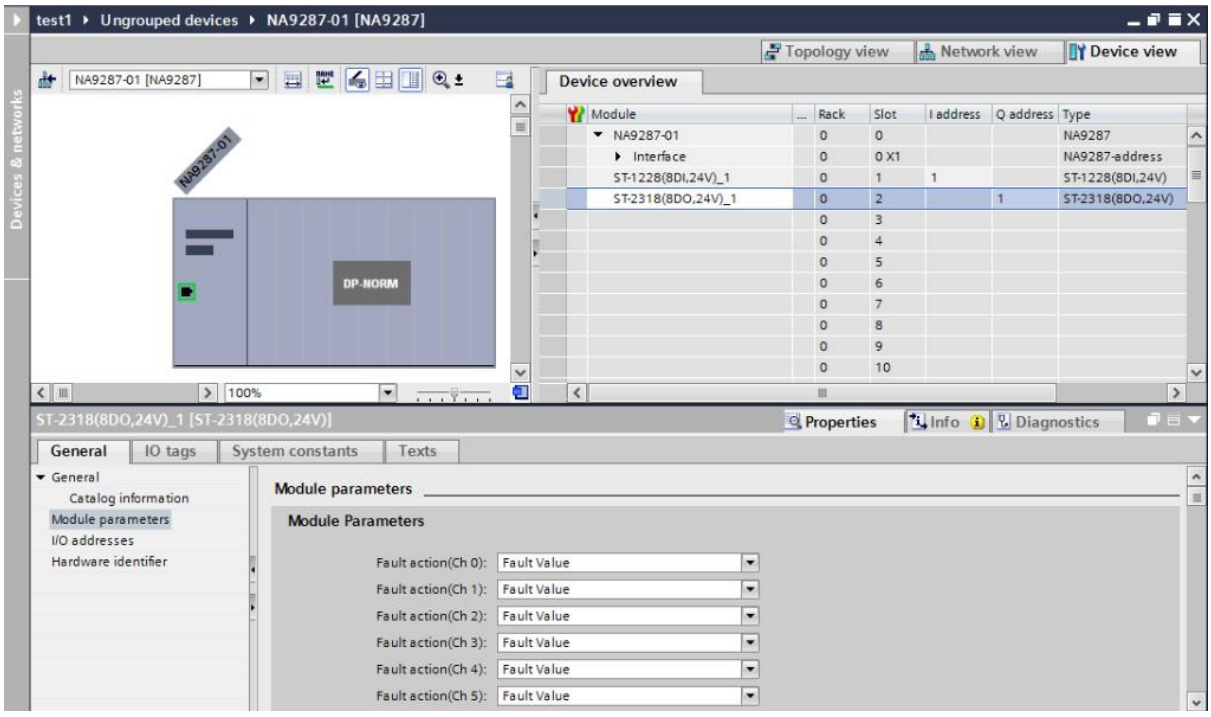


(4) Create new watch table -> Start monitoring



10.4 Change I/O parameter

(1) Device view -> Check module -> General -> Module parameters



(2) Download to device

11 Trouble Shooting

11.1 How to diagnose by LED indicator

LED Status	Cause	Action
All LED turns off	- No power	- Check main power Cable
MOD LED Green/Red Toggle	- MODBUS error such as watchdog error, etc.	- Check Modbus watchdog time value(see index 0x1020
MOD LED is red	- Occurrence critical error in firmware	- Contact Sales team and send module for repair.
LINK LED turns off	- Device may not be powered	- Check main power Cable
ACTIVE LED turns off	- Device is idle or may not be powered.	- Check main power Cable
IOS LED turns off	- Device may not be powered.	- Check main power Cable
IOS LED flashes red	- Adapter has no expansion module	- Add one or more expansion modules.
IOS LED is red	One or more expansion module occurred in fault state. - Detected invalid expansion module ID. - Overflowed Input/ Output Size - Too many expansion module - Initialization failure - Communication failure. - Changed expansion module configuration. - Mismatch vendor code between adapter and expansion module.	- Use expansion slot up to 63. - Compose that IO total size is not excess. - Check status of expansion IO connection. - Check the vendor code of module.
Field Power LED turns off	- Field power is not supplied.	- Check main power Cable - Contact Sales team and send module for repair.
System Power LED turns off	- System power is not supplied.	- Check main power Cable - Contact Sales team and send module for repair.

APPENDIX A

A. 1 Product List

No.	GT-Number	Description	ID(hex)
Digital Input Module			
1	GT-1238	8 Points, Universal, 24Vdc, 10RTB	1238
2	GT-123F	16 Points, Universal, 24Vdc, 20P connector	123F
3	GT-12DF	16 Points, Universal, 24Vdc, 18RTB	12DF
4	GT-12FA	32 Points, Universal, 24Vdc, 40P connector	12FA
5	GT-1428	8 Sink Input / 8 Source Output with Diagnostic, 24Vdc	1428
6	GT-1804	4 Points, 120Vac, 10RTB	1804
7	GT-1904	4 Points, 240Vac, 10RTB	1904
Digital Output Module			
8	GT-2318	8 Points, Sink, 24Vdc/0.5A, 10RTB	2318
9	GT-2328	8 Points, Source, 24Vdc/0.5A, 10RTB	2328
10	GT-221F	16 Points, Sink, 24Vdc/0.3A, 20P connector	221F
11	GT-222F	16 Points, Source, 24Vdc/0.3A, 20P connector	222F
12	GT-225F	16 Points, Sink, 24Vdc/0.3A, 18RTB	225F
13	GT-226F	16 Points, Source, 24Vdc/0.3A, 18RTB	226F
14	GT-22BA	32 Points, Sink, 24Vdc/0.3A, 40P connector	22BA
15	GT-22CA	32 Points, Source, 24Vdc/0.3A, 40P connector	22CA
16	GT-2418	8 Channels Sink Output with Diagnostics	2418
17	GT-2428	8 Channels Source Output with Diagnostics	2428
18	GT-2618	8 Points, Sink, 24Vdc/2A, 10RTB	2618
19	GT-2628	8 Points, Source, 24Vdc/2A, 10RTB	2628
20	GT-2734	4 Points, MOS Relay, 240Vdc/ac, 0.5A, 10RTB	2734
21	GT-2738	8 Points, MOS Relay Output Terminal, 240Vdc, 0.5A	2738
22	GT-2744	4 Points, Relay, 24Vdc/2A, 240Vac/2A, 10RTB	2744
23	GT-2764	4 Points, MOS Relay, 24Vdc/ac, 2A, 10RTB	2764
24	GT-2768	8 Points, Relay Output Terminal, 24Vdc/ac, 2A	2768
25	GT-2784	4 Points, MOS Relay, 110Vdc/ac, 1A, 10RTB	2784
26	GT-2788	8 Points, Relay Output Terminal, 110Vdc/ac, 1A	2788
Analog Input Module			
27	GT-3002	2ch load cell input unit, strain gauge	3002
28	GT-3114	4 Channels, 0~20, 4~20mA, 12bits, 10RTB	3114
29	GT-3154	4 Channels, 0~20, 4~20mA, 16bits, 10RTB	3154
30	GT-3118	8 Channels, 0~20, 4~20mA, 12bits, 10RTB	3118
31	GT-3158	8 Channels, 0~20, 4~20mA, 16bits, 10RTB	3158
32	GT-311F	16 Channels, 0~20, 4~20mA, 12bits, 20P connector	311F
33	GT-315F	16 Channels, 0~20, 4~20mA, 16bits, 20P connector	315F
34	GT-317F	16 Channels, 0~20, 4~20mA, 12bits, 18RTB	317F
35	GT-319F	16 Channels, 0~20, 4~20mA, 16bits, 18RTB	319F
36	GT-3424	4 Channels, 0~10, 0~5, 1~5Vdc, 12bits, 10RTB	3424
37	GT-3464	4 Channels, 0~10, 0~5, 1~5Vdc, 16bits, 10RTB	3464
38	GT-3428	8 Channels, 0~10, 0~5, 1~5Vdc, 12bits, 10RTB	3428
39	GT-3468	8 Channels, 0~10, 0~5, 1~5Vdc, 16bits, 10RTB	3468
40	GT-342F	16 Channels, 0~10, 0~5, 1~5Vdc, 12bits, 20P connector	342F

41	GT-346F	16 Channels, 0~10, 0~5, 1~5Vdc, 16bits, 20P connector	346F
42	GT-347F	16 Channels, 0~10, 0~5, 1~5Vdc, 12bits, 18RTB	347F
43	GT-349F	16 Channels, 0~10, 0~5, 1~5Vdc, 16bits, 18RTB	349F
44	GT-3704	4 Channels, RTD, 10RTB	3704
45	GT-3708	8 Channels, RTD, 20P connector	3708
46	GT-3804	4 Channels, Thermocouple, 10RTB	3804
47	GT-3808	8 Channels, Thermocouple, 20P connector	3808
48	GT-3714	4 Channels, TEMP. Controller, RTD Input, SSR Output	3714
49	GT-3734	4 Channels, TEMP. Controller, RTD Input, Current Output	3734
50	GT-3814	4 Channels, TEMP. Controller, TC Input, SSR Output	3814
51	GT-3834	4 Channels, TEMP. Controller, TC Input, Current Output	3834
52	GT-3901	AC Measurement	3901
53	GT-3914	4 Channels, Differential, 0~20, 4~20, +/-20mA, 12Bits, 10RTB	3914
54	GT-3934	4 Channels, Differential, 0~20, 4~20, +/-20mA, 16Bits, 10RTB	3934
55	GT-3918	8 Channels, Differential, 0~20, 4~20, +/-20mA, 12Bits, 18RTB	3918
56	GT-3938	8 Channels, Differential, 0~20, 4~20, +/-20mA, 16Bits, 18RTB	3938
57	GT-3924	4 Channels, Differential, 0~5, 0~10, +/-5, +/-10Vdc, 12Bits, 10RTB	3924
58	GT-3944	4 Channels, Differential, 0~5, 0~10, +/-5, +/-10Vdc, 16Bits, 10RTB	3944
59	GT-3928	8 Channels, Differential, 0~5, 0~10, +/-5, +/-10Vdc, 12Bits, 18RTB	3928
60	GT-3948	8 Channels, Differential, 0~5, 0~10, +/-5, +/-10Vdc, 16Bits, 18RTB	3948
Analog Output Module			
61	GT-4114	4CH, 0~20mA, 12Bits, 10RTB	4114
62	GT-4154	4CH, 0~20mA, 16Bits, 10RTB	4154
63	GT-4118	8CH, 0~20mA, 12Bits, 10RTB	4118
64	GT-4158	8CH, 0~20mA, 16Bits, 10RTB	4158
65	GT-4214	4 Channels, Current Output, 4~20mA, 12bits	4214
66	GT-4254	4 Channels, Current Output, 4~20mA, 16bits	4254
67	GT-4218	8 CHANNELS CURRENT OUTPUT, 4~20mA, 12BIT	4218
68	GT-4258	8 CHANNELS CURRENT OUTPUT, 4~20mA, 16BIT	4258
69	GT-4424	4CH, 0~10Vdc, 12Bits, 10RTB	4424
70	GT-4464	4CH, 0~10Vdc, 16Bits, 10RTB	4464
71	GT-4428	8CH, 0~10Vdc, 12Bits, 10RTB	4428
72	GT-4468	8CH, 0~10Vdc, 16Bits, 10RTB	4468
73	GT-442F	16CH, 0~10Vdc, 12Bits, 20P Connector	442F
74	GT-446F	6CH, 0~10Vdc, 16Bits, 20P Connector	446F
75	GT-447F	16CH, 0~10Vdc, 12Bits, 18RTB	447F
76	GT-449F	16CH, 0~10Vdc, 16Bits, 18RTB	449F
77	GT-4524	AO 4 CHs, ±10Vdc, 12Bits, 10RTB	4524
78	GT-4564	AO 4 CHs, ±10Vdc, 16Bits, 10RTB	4564
Special Module			
79	GT-5102	2CH, Encoder, Input, 5Vdc, 10RTB	5102
80	GT-5112	High Speed Counter, 2CHs, 24Vdc, Encoder Input, 10RTB	5112
81	GT-5114	High Speed Counter, 4CHs, 24Vdc, Encoder Input, 10RTB	5114
82	GT-5211	1CH, RS 232, RTS/CTS, Full Duplex Type, 10RTB	5211
83	GT-5212	2CH, RS 232, Full Duplex Type, 10RTB	5212
84	GT-5221	1CH, RS 485, Full Duplex Type, 10RTB	5221
85	GT-5231	1CH, RS 485, Half Full Duplex Type, 10RTB	5231
86	GT-5232	2CH, RS 485, Half Full Duplex Type, 10RTB	5232

87	GT-5352	2CH, Synchronous Serial Interface Input, 10RTB	5352
88	GT-5442	PWM Output, 2CHs, 0.5A/24Vdc, Source, 18RTB	5442
89	GT-5444	PWM Output, 4CHs, 0.5A/24Vdc, Source, 18RTB	5444
90	GT-5642	Pulse Output, 2CHs, 0.5A/24Vdc, Source, 18RTB	5642
91	GT-5652	Pulse Output, 2CHs, RS422 (Differential), 18RTB	5652
92	GT-5521	1CH, Stepper Module (TBD)	5521
Power Module			
93	GT-7408	Shield Module	7408
94	GT-7508	Common for 0Vdc	7508
95	GT-7511	Power Expansion, In 24Vdc, Out 1A/5Vdc	7511
96	GT-7518	Common for 24Vdc	7518
97	GT-7588	Common for 0Vdc, 24Vdc	7588
98	GT-7641	Field Power, 5/24/48 Vdc, 110/220 Vac	7641
99	GT-7151	Noise Filter Module, 18RTB, None ID Type	7151
100	GT-7851	Noise Filter Module, 18RTB, ID Type	7851

A.2. Glossary

- System Power: The power for starting up CPU.

- Field Power: The power for input and output line.

- Terminator Resistor: Resistor for prevention reflected wave.

- EDS: Electronic Data Sheet.

- Sink: The method of in/output power supply if a device has no power source.

- Source: The method of in/output power supply if a device has the power source.