

PROFINET PN4 Series Integrated I/O

User Manual



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Product Features

PN4 series integrated I/O modules equipped with PROFINET protocol, feature small footprint, fast speed, quick wiring, pluggable terminals, and simple configuration. They provide users with a range of options for high-speed data collection, optimal system configuration, simple on-site wiring, and improved system reliability.



- Small footprint
 Compact structure and small footprint, only measuring
 102 mm × 72 mm × 25 mm
- High speed
 100 GB industrial Ethernet
 - Diversified product lines A rich variety of I/O modules including digital, analog, temperature, and other modules that can be integrated to meet demand of different application scenarios.
- Easy diagnosis
 An innovative channel indicator design is adopted. As the indicators are placed close to the channels, channel status is displayed intuitively and clearly, facilitating detection and main
- Easy configuration
 The modules are easy to configure, and support all mainstream PROFINET master stations
- Easy installation
 Installation on standard DIN 35 mm rails
 Elastic terminal blocks are used for convenient and fast wiring

2 Designation Rule

2.1 List of common products

Model	Product Description
PN4-3200A	32-channel digital input module, NPN type
PN4-3200B	32-channel digital input module, PNP type
PN4-0032A	32-channel digital output module, NPN type
PN4-0032B	32-channel digital output module, PNP type
PN4-1616A	16-channel digital I/O module, NPN type
PN4-1616B	16-channel digital I/O module, PNP type
PN4-1600A	16-channel digital input module, NPN type
PN4-1600B	16-channel digital input module, PNP type
PN4-0016A	16-channel digital output module, NPN type
PN4-0016B	16-channel digital output module, PNP type
PN4-0808A	8-channel digital I/O module, NPN type
PN4-0808B	8-channel digital I/O module, PNP type
PN4-2408A	24-channel digital input, 8-channel digital output module, NPN type
PN4-2408B	24-channel digital input, 8-channel digital output module, PNP type
PN4-0824A	8-channel digital input, 24-channel digital output module, NPN type
PN4-0824B	8-channel digital input, 24-channel digital output module, PNP type
PN4-0012J	12-channel relay output module
PN4-1612J	16-channel digital input (NPN/PNP type), 12-channel relay output module

Model	Product description	
PN4-A80V	8-channel analog input module	
PN4-A40V	4-channel analog input module	Optional ranges: -10~+10 V 、0~+10 V
PN4-A08V	8-channel analog output module	-5~+5 V、1~+5 V
PN4-A04V	4-channel analog output module	
PN4-A80I	8-channel analog input module	
PN4-A40I 4-channel analog input module		
PN4-A08I	8-channel analog output module	Optional ranges. 0~20 mA (4~20 mA
PN4-A04I	4-channel analog output module	
PN4-C10_4	Common terminal extended module	

Relay

2.2 Designation rules



J

3 Product Parameters

3.1 General parameters

Interface parameters.	
Bus protocol	PROFINET IO
Number of I/O stations	Depending on master station configuration
Data Transfer medium	Ethernet/EtherCAT CAT5 cable
Transfer distance	≤100 m (distance between stations)
Transfer rate	100 Mbps
Bus interface	2×RJ45
Technical parameters	
Configuration method	Via master station
Power supply	18~36V DC
Electrical isolation	500 V
Weight	About 130 g
Dimensions	102 mm×72 mm×25 mm
Working temperature	-10~+60℃
Storage temperature	-20~+75℃
Relative humidity	95%, non-condensing
Protection degree	IP20

3.2 Digital parameters

Туре		
	Nominal voltage	24 VDC (±25%)
	Number of inputs	8、16、24、32
	Signal type	NPN/ PNP
	"0" signal voltage (PNP)	-3~+3 V
	"1" signal voltage (PNP)	15~30 V
laput	"0" signal voltage (NPN)	15~30 V
input	"1" signal voltage (NPN)	-3~+3 V
	Input filter	3 ms
	Input current	4 mA
	Isolation method	Optically-coupled isolation
	Electrical isolation	500 V
	Channel indicator	Green LED
	Nominal voltage	24 VDC (±25%)
	Number of outputs	8、16、24、32
	Signal type	NPN/PNP
	Load type	Ohmic, inductive load
Transistor output	Single-channel rated current	NPN type Max: 250 mA
		PNP type Max: 500 mA
	Port protection	Overvoltage and overcurrent protection
	Isolation method	Optically-coupled isolation
	Electrical isolation	500 V
	Channel indicator	Green LED
	Nominal voltage	24 VDC (±25%)
	Number of outputs	12
	Isolation method	Optically-coupled, relay
Relay output	Rated load	Single port: 4 A Common port: 8 A Whole module: 16 A
	Common terminal wiring method	4 points/1 common terminal
	Channel indicator	Green LED

3.3 Analog parameters

3.3.1 Technical parameters

Туре	1	
	Number of inputs	4、8
Input	Input signal (voltage type)	0: -10~+10 ∨ (-32768~32767) 1: 0~+10 ∨ (0~65535) 2: -10~+10 ∨ (-27648~27648) 3: 0~+10 ∨ (0~27648) 4: -5~+5 ∨ (-27648~27648) 5: 1~+5 ∨ (0~27648)
	input signal (current type)	0: 4~20 mA (0~65535) 1: 0~20 mA (0~65535) 2: 4~20 mA (0~27648) 3: 0~20 mA (0~27648)
	Resolution	16 bit
	Sampling rate	≤1 ksps
	Accuracy	±0.1%
	Input impedance (voltage type)	≥2 kΩ
	Input impedance (current type)	100 Ω
	Electrical isolation	500 V
	Channel indicator	Green LED
Number of outputs Output signal (voltage type) Output Output signal (current type) Resolution Accuracy	Number of outputs	4、8
	Output signal (voltage type)	0: -10~+10 V (-32768~32767) 1: 0~+10 V (0~65535) 2: -10~+10 V (-27648~27648) 3: 0~+10 V (0~27648) 4: -5~+5 V (-27648~27648) 5: 1~+5 V (0~27648)
	Output signal (current type)	0: 4~20 mA (0~65535) 1: 0~20 mA (0~65535) 2: 4~20 mA (0~27648) 3: 0~20 mA (0~27648)
	Resolution	16 bit
	Accuracy	±0.1%
	Load impedance (voltage type)	≥2 kΩ
	Load impedance (current type)	≤200 Ω
	Electrical isolation	500 V
	Channel indicator	Green LED

Voltage I/O range selection and cold value range 1			
Range selection	0	1	2
Range	-10 ~+10 V	0~+10 V	-10 ~+10 V
Code value range	-32768~32767	0~65535	-27648~27648
Voltage input formula	D=(65535/20)*U	D=(65535/10)*U	D=(55296/20)*U
Voltage output formula	U=(D*20)/65535	U=(D*10)/ 65535	U=(D*10)/55296
Code value table	Table①	Table ^②	Table3

3.3.2 Voltage I/O range selection and code value table

Note: D: code value; U: voltage

• Table ① Correspondence between voltage (-10 ~+10 V) and code value





• Table ② Correspondence between voltage (0 ~+10 V) and code value



Table³ Correspondence between voltage (-10 ~+10 V) and code value

Voltage I/O range selection and cold value range 2			
Range selection	3	4	5
Range	0~+10 V	-5~+5 V	1 ~+5 V
Code value range	0~27648	-27648~27648	0~27648
Voltage input formula	D=(27648/10)*U	D=(55296/10)*U	D=(27648/4)*U-6912
Voltage output formula	U=(D*10)/27648	U=(D*10)/55296	U=(D+6912)*4/27648
Code value table	Table ⁽⁴⁾	Table ⁵	Table ⁶

• Table (4) Correspondence between voltage (0~+10 V) and code value



Table Correspondence between voltage (-5~+5 V) and code value







Current I/O range selection and code value range				
Range selection	0	1	3	4
Range	4~20 mA	0~20 mA	4~20 mA	0~20 mA
Code value range	0~65535	0~65535	0~27648	0~27648
Current input formula	D=(65535/16)*I-16384	D=(65535/20)*I	D=(27648/16)*I-6912	D=(27648/20)*I
Current output formula	I=(D+16384)*16/65535	I=(D*20)/65535	I=(D+6912)*16/27648	I=(D*20)/27648
Code value table	Table⑦	Table®	Table9	Table ¹⁰

3.3.3 Current I/O range selection and code value table

Note: D: Code value; I: current

• Table Table Correspondence between current (4~20 mA) and code value



• Table[®] Correspondence between current (0~20 mA) and code value











4 Panel

Name of different module parts and functional description



Number	Name	Description
1	Power interface	3P terminal
2	Bus interface	2×RJ45
3	System ID	SF
4	Fieldbus communication ID	BF
5	Power ID	PWR

6	Operation ID	RDY
7	Guide rail slot	Fixed modules
8	Product Tags	Tagging module model, type, MAC address and other information
9	Channel indicator	Signal status of corresponding channel
10	Network port indicator	Link and data transmission status
(1)	System indicator	SF、BF、PWR、RDY indicator
(12)	Type ID	Module model and bus type identification
(13)	Signal ID	Signal type identification
(14)	Channel ID	Position identification of corresponding channel
15	Channel interface	20P terminal

Indicator description

PWR	Green	ON	Normal status of working power supply	
		OFF	Unpowered or abnormal power supply	
RDY	Green	ON	Normal status of system operation	
		OFF	Abnormal status of system operation	
SF	Red	OFF	Normal status of Modules Operation	
		Flashing	1Hz: Analog module double machine communication abnormal	
		ON	Abnormal status of Modules Operation	
BF	Red	OFF	Normal network connection	
		Flashing	Abnormal network connection	
Network Port 1	Green	ON	Network connection established	
		OFF	Absent or abnormal network connection	
	Yellow	Flashing	Connection established with data interaction	
		OFF	Absent or abnormal network connection	
Network Port 2	Green	ON	Network connection established	
		OFF	Absent or abnormal network connection	
	Yellow	Flashing	Connection established with data interaction	
		OFF	Absent or abnormal network connection	
Input Indication	Green	ON	Presence of signal input in module channel	
		OFF	Absence of signal input in module channel or abnormal signal input	
Output Indication	Green	ON	Presence of signal output in module channel	
		OFF	Absence of signal output in module channel or abnormal signal output	

5Installation and Disassembly

Installation\disassembly precautions

- Ensure that the cabinet is well ventilated (e.g., equipped with a fan).
- Do not install this equipment near or above any equipment that may cause overheating.
- Make sure to install modules vertically and maintain adequate clearance between the modules and nearby devices.
- Installation/disassembly operation may only be carried out after the power supply is cut off.

Installation direction

• In order to maintain normal heat dissipation of the modules, make sure to install them vertically to ensure smooth airflow inside them.



Minimum clearance

The protection degree of the modules is IP20, and they need to be installed inside boxes or cabinets. During installation, please follow the minimum distances (unit: mm) shown in the following figures between modules and those between modules and heating devices, other devices, or wiring slots.





5.1 Dimensions



*Note: Standard DIN guide rails are 35*7.5*1.0 and 35*15*1.0 in size.

5.2 Installation and disassembly







Align the upper edge of the module fastener with the upper edge of the guide rail, and place the module into the guide rail, as shown in Figures (3) and (4).





4

 \square

5

The module is placed as shown in Figure (5).





With a flat head screwdriver



Insert the flat head screwdriver into the fastener and apply force towards the module (until a sound is heard) as shown in Figure ⑦.

Disassemble the module in the reverse order of installation steps.

6 Wiring

6.1 Wiring terminal

Wiring terminal						
Signal wire terminal	Number of poles	20 P				
Signal wire terminal	Wire gauge	28 ~16 AWG 0.2~1.5 mm ²				
Rower terminal	Number of poles	3 P				
Fowerterminar	Wire gauge	26~12 AWG 0.5~2.5 mm ²				
Bus interface	2xRJ45	Ethernet/EtherCAT CAT5 cable				

6.2 Wiring instructions and requirements



Power wiring precautions

- The power supply on the module system side and that on the field side should be wired separately. Mixing should be avoided.
- O PE should be grounded reliably.
- Tool and wiring requirements

```
Wiring tool requirement
```

As the terminals are based on a screw-free design, cable installation and removal can be realized with a slotted screwdriver (size: ≤ 3 mm).



Wiring

Stripping length requirement Recommended stripping length: 10 mm Wiring method For a single-strand hard wire, after stripping a required length, press the button while inserting the wire into the terminal. For a multi-strand flexible wire, after stripping a required length, use a compatible cold-pressed terminal (tubular insulated terminal, as shown in the table below). Press the button whiling inserting the wire.

Specification of tubular insulated terminal							
Specification	Model	Cable section area (mm²)					
	E0510	0.5					
	E7510	0.75					
	E7512	0.75					
	E1010	1.0					
	E1012	1.0					
	E1510						
Length of tubular insulated terminal $L \ge 10$	E1518	1.5					
mm							

3P terminal of power module



Twisted pair cable is recommended for power supply.

20P terminal on the field side



• Signal terminal wiring requirement

 \circ Press the signal cable into the wiring terminal by referring to the I/O module wiring diagram and wiring method.

• Bus wiring requirement

 $\,\circ\,$ Standard RJ45 network interface and standard RJ45 connector are adopted.



Pin	Signal
1	TD+
2	TD-
3	RD+
4	-
5	
6	RD-
7	
8	_

 \circ Category 5 or higher-level double-shielded (braided wire + aluminum foil) STP cable is recommended as communication cable.

 \circ The cable between any two devices should not exceed 100 m.

6.3 Wiring diagrams











PN4-1616A



PN4-1616B

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PN4-0032A





PN4-0032B

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PN4-1600A









PN4-0016A



PN4-0016B







PN4-2408B

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PN4-0824A



PN4-0824A



PN4-0824B

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PN4-0808A



PN4-0808B



PN4-A80V/PN4-A80I



PN4-A40V/PN4-A40I



PN4-A08V



PN4-A04V

PN4-A08I



PN4-A08I



PN4-A04I

PN4-1612J



Notes:

- 1. The input port supports two types of inputs: NPN and PNP, and COM0 is a common port.
- Outputs 0~3 correspond to the common port com1. Outputs 4~7 correspond to the common port com2. Outputs 8~B correspond to the common port com3.

PN4-1612J

PN4-0012J



Notes:

Outputs 0~3 correspond to the common port com1. Outputs 4~7 correspond to the common port com2. Outputs 8~B correspond to the common port com3.



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6.4 Common terminal expansion module wiring diagrams

For our PN4 series IO modules, the power supply and common terminals on the field side of the modules can be expanded to facilitate sensor wiring and realize simpler wiring.

The wiring method of two-wire and three-wire sensors is described in this section, taking the two modules of PN4-1616A and PN4-1616B as examples.



Wiring method of two-wire sensor (NPN type)

Wiring method of two-wire sensor (PNp type)

XX4-1616B	XX4 -C10_4	
DI		
Input 0	COM0 [
Input 1 1 Input 9		
Input 2 12 Input A	2 12	
Input 3 3 13 Input B	3 13	
Input 4 4 14 Input C	4 14	
Input 5 5 15 Input D	5 Ŭ 15 ¦	
Input 6 6 16 Input E	6 × 16	/
Input 7 7 17 Input F	7 117	
Power +24 V	8 18	
Power 0 V	9 J 19	
Output 0 Output 8	сом2	
Output 1 1 1 Output 9	┼┍╷┥╶┊╹ <u>Ҋ</u> ╶ <u>Ҋ</u> ╹╵┆────	
Output 2 2 12 Output A	2 12	
Output 3 3 13 Output B	3 13	1
Output 4 4 14 Output C	4 14	
	5 15	
		/
	7 17	
Power +24 VI 8 18 Power +24		
Power 0.V 9 19 Power 0	9 19	
		+241/ 2201/~]
		01
	<u> </u>	24/ =

XX4-1616A	XX4 -C10_4]
DI		v aut v
	СОМ0 [СОМ1	
Input 2 2 12 Input A	2 12	
Input 3 13 Input B	3 13	
Input 4 4 14 Input C	4 ∐ 14	
Input 5 5 15 Input D	5 15	
Input 6 6 16 Input E	6 [16	
Input 7 7 17 Input F	7 117	
Power +24 V	₩ ₩ ₩ ₩ ₩ ₩ ₩ ₩ ₩ ₩	V QUE VI
Power 0 V	9 19	
Output 0 Output 8	сом2	
Output 1 1 1 Output 9	┼┝─┝─┆╹┟─┟╙╵	
Output 2 2 12 Output A		
Output 3 3 13 Output B	3 13	(
Output 4 4 0 14 Output C	4 14	
Output 5 5 15 Output D	5 15	
Output 6 6 16 Output E		
	7 17	
Power +24 V 8 18 Power +24		
Power 0 V	9 19	
L 1020 J		+24V 220V ~
		ov
	<u> </u>	24V =

Wiring method of three-wire sensor (NPN type)

Wiring method of three-wire sensor (NPN type)



7 Operation

7.1 Parameters and functional configuration

In this manual, TIA Portal V14 software platform and Siemens PLC (model S7-1200) are taken as an example to introduce module parameters, functions, and configuration methods.



\odot After the configuration is complete, please re-power the module

7.1.1 Digital input filtering time

Digital input filtering can prevent unexpected rapid changes in program response input signals. Such changes may result from jumping of switch contact or electrical noise. The duration of digital input filtering is currently fixed at 3 ms, and all clutters within 3 ms can be filtered out. Separate channel configuration is not allowed.

The 3 ms input filtering time means that a single signal changing from 0 to 1 or from 1 to 0 can only be detected after 3 ms has lapsed following such change, while a single high pulse or low pulse shorter than 3 ms will not be detected.

7.1.2 Analog filtering parameter configuration function

Analog input filtering function

The analog input filtering function can average the data internally after A/D conversion to reduce the fluctuation effect on input signals due to noise.

Analog inputs are subject to moving average processing based on the specified A/D conversion times.

• Filtering function configuration

Each channel can be configured separately. Configuration range: 1~1024, default: 10.

Sampling rate of 8-channel module: 1.25 KHZ/8-channel (800 us/8-channel);

Sampling rate of 4-channel module: 2.5 KHZ/4-channel (400 us/4-channel).

A. Under the Devices and Networks interface, click on the Network Overview menu folder

14—体式10)设备和网络					
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	및 IO 系统: PLO	C_1.PROFINET IO-Syste	em (100) 🛕	₩ 设备	类型
				 S7-1200 station_1 	S7-1200 station
	PNIO	•	DNI	PLC_1	CPU 1211C AC/D.
2PU 1211C	PN4-A08I DR HORM	PN4	 GSD device_1 	GSD device	
	PLC 1	Di -itoran	PLC	PNIO	PN4-A08I
	<u></u>	- H		 GSD device_2 	GSD device
				▶ PNIO 1	PN4-A80V

B. Select the existing model of the module, in this case, "PN4-A80V", select the corresponding channel, and set the filter parameters.

PN4一体式IO → 设备和网络					_ 1
			🛃 拓扑视图	晶 网络	视图 🛛 👖 设备社
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ф I(D 系统: PLC_1.PROFINET	10-System (100) 🛕	·····		<u>米</u> 刑
NIO N4-A08I LC_1	PNIO_1 PN4-A80V PLC_1	DP-NORM	 S7-1200 stat PLC_1 GSD device_ PNIO GSD device_1 PNIO 	ion_1 1 2	S7-1200 station CPU 1211C AC/E GSD device PN4-A08I GSD device PN4-A80V
		~			
< III > 10	0% -	<u></u>	<		
PNIO_1 [PN4-A80V]			💁 属性	自信息	见诊断
常規 10 变量 系统常数	文本				
▶ 常规 档 中参数					
▼ PROFINET接口 [X1] 读外多数					
「 常規 MODUL	e parameter				
 ○ (太内)地址 > 高级洗顶 	Analog Input Channel0				
硬件标识符	Filter(1-1024):	10			
标识与维护	Analog Input Channel1	10			
模块参数	Filter(1-1024):				
硬件标识符	Filter(1-1024):	10			
Shared Device	Analog Input Channel3				
	Filter(1-1024):	10			
	Analog Input Channel4	10			
	Analog Input Channel5				
	Filter(1-1024):	10			
	Analog Input Channel6				
	Filter(1-1024):	10			
	Analog Input Channel7 Filter(1-1024):	10			
	Channel O Range Select:	-10V~10V -32768~32767		-	
	Channel 1 Range Select:	-10V~10V -32768~32767		-	
	Channel 2 Range Select	-10V~10V -32768~32767		-	
	Thannel 3 Range Select	-10V~10V -32768~32767		_	
	Thannel 4 Pange Select:	-10V-10V-32768-32767		-	
	Thannel 5 Pange Select:	-10/-10/-32768-22767			
	Channel 5 Kange Select:	101/101/32/00~32/6/		•	
	Lhannel 6 Kange Select:	-10V~10V -32768~32767			
	Lhannel 7 Range Select:	-10V~10V -32768~32767		•	

* Please re-power the module after the modification is completed

7.1.3 Output clearing/holding function

Output clearing: When the communication is disconnected, the module output channel will clear its output automatically.

Output holding: When the communication is disconnected, the module output channel will maintain its output.

• Output clearing/holding function configuration

Under the <u>Devices and Networks</u> interface, double click on the "PNIO" icon (in this case, "PN4-1616A"). Under the <u>General</u> menu folder, click on <u>Module Parameters</u> and change the value of <u>Data</u> <u>Clear or Hold Settings</u>.

项目25 → 设备和网络	}	_ @ = ×
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	♀ IO 系统: PLC_1.PROFINET IO-S	ystem (100) 🔷 🔐 设备 类型
		■ ▼ S7-1200 s S7-1200 station
CPU 1211C	N4-1616A DP-NORM PN4-A0BI DP-NORM	PN4-A80V PLC_1 CPU 1211C A
	PLC 1	FLC_1 GSD device GSD device
		FINIO FIN4-1616A
	PLC_1.PROFINETIO-System	PNIO 1 PN4-408
		▼ GSD device
		► PNIO 2 PN4-A80V
	750	
	/ /5/	
PNIO [PN4-1616A]		9.属性1.信息1.诊断
常規 IO 变量	系统常数 文本	
▶ 常規	掛扣分数	
▼ PROFINET接口 [X1]	【快伏》 2011	
常规	Setting for Clear/Hold	
以太网地址		
▶ 高级选项	Data Clear or Hold Settings: Clear	
健住标识符	Clear	
称以与维护		
[「 提状 一 変数 一 一 一 一 一 一 一 一 一 一 一 一		
晚日标识付 Shared Device		
Shared Device		

* Please re-power the module after the modification is completed

7.1.4 Analog range selection

The analog modules support range selection function, please refer to "3.3 Analog Parameters" for the specific ranges.

In the <u>Device View</u> menu, select the module of the existing model, in this case "PN4-A80V", select the corresponding channel, and set the range selection parameters.

PN4一体式IO ▸ 设备	和网络							_ = = ×
					🖥 拓扑视图	🔒 网络视	聖 【】 设	备视图
💦 网络 🔡 连接 🖽	∥ 连接 🛛 🔻	🖭 🐮 🖽	🔟 🔍 ± 🛛		网络概览		通信	VPN 🖪 🕨
	및 IO 系统: P	LC_1.PROFINET	IO-System (100)	^	· と 备		类型	
					• S7-1200 stat	ion_1	S7-1200 st	ation
	PNIO 1			_	PLC_1		CPU 1211C	AC/DC/Rly
N4-A08I DP.	NORM PN4-A8	ov	DP-NORM	<u> </u>	GSD device_	1	GSD device	1
LC_1	PLC_1				► PNIO		PN4-A08I	
				-	GSD device_	2	GSD device	ł
				-	PINIO_1		PIN4-A80V	
		ri T	LC_1.PROFINETIO					
< .	> 100%	•		•	<			>
PNIO_1 [PN4-A80V]					◎属性	包信息	2 诊断	
常規 10 变量	系统常数 文本	k						
▶ 常规								
▼ PROFINET接口 [X1]	模块奓颈							
常规	MODULE PARA	METER						
以太网地址								
▶ 高级选项 	Analog I	nput Channel0 Filter(1-1024):	10					
使け体現付	Analog	nput Channel1						
植块参数	, and g	Filter(1-1024):	10					
硬件标识符	Analog I	nput Channel2						
Shared Device		Filter(1-1024):	10					
	Analog I	nput Channel3 Filter(1-1024):	10					
	Analog I	nput Channel4						
		Filter(1-1024):	10					
	Analog I	nput Channel5	10					
		Filter(1-1024):	10					
	 Analog Input Channel6 Filter(1-1024): 		10					
	 Analog I 	nput Channel7						
Filter(1-1024):		10						
Channel 0 Range Select:		-10V~10V -32768	~32767		-			
	Channel I	Range Select:	0V~10V_32768	65535				
	Channel 2	Range Select:	-10V~10V -27648	~27648				
	Channel 3	Range Select:	0V~10V 0~ -5V~ 5V -27648-	27648 ~27648				
	Channel 4	Range Select	1V~ 5V 0~	27648				
	Channel 5	Range Select:	Reserve	~32767				
	Channel S	Dange Select:	101/101/32768	20767				
	Channel 6	-100~100-32768	~52/6/		•			

7.2 Module configuration description

- 7.2.1 Application in TIA Portal V14 software environment
 - 1. Preparation
 - Hardware environment
 - > Module model

Туре	Model	Number
10	PN4-1616A	1
IU Madulaa	PN4-A80V	1
modules	PN4-A08I	1

- > A computer installed with TIA Portal V14 software
- > Two dedicated PROFINET shielded cables
- > Siemens PLC S7-1200
- > A switching power supply
- > Module installation guide rail and fasteners
- > Device configuration files
 - Website of configuration files: <u>https://www.solidotech.com/documents/configfile</u>
 - Hardware configuration and wiring

Please operate according to "5 Installation and Disassembly" and "6 Wiring".

2. TIA Portal V14 configuration

• Project Creation

Click <u>"Create New Project"</u>, fill in the <u>"Project Name"</u>, select <u>"Path"</u>, click <u>"Create"</u> to complete the project creation;



• Adding a PLC

Choose "First steps ", "Devices &networks", then "Configure a device"



In <u>"Devices and networks</u>", click <u>"Add new device"</u>, select <u>"Controllers</u>", select the PLC model you are currently using, and click <u>"Add"</u>.



• Scan devices

In <u>"Online Access"</u>, double-click the network adapte, double-click <u>"Update accessible devices"</u>. After the update complete, the device salve connected to the network cable will be automatically added. (Generally, the first device is the PLC controller, PLC and the IP address of the computer must be in the same network segment, if not, close the project, modify the IP address of the computer, and repeat the above steps)



• Assign IP address and device name to the slave module

Double-click <u>"Online and diagnostics"</u> under the slave device, and under the <u>"Functions"</u> menu, you can assign the IP address and device name of the current slave module.

Fill in <u>"Subnet Mask"</u> first, then <u>"IP Address"</u>, and click <u>"Assign IP Address"</u>.

Click "Assign PROFINET device name", fill in "PROFINET device name", click "Assign name"

		1	 Diagnostics 	Assign IP address
			General	
Measurements o		~	Diagnostic status	
Combined meas			Diagnostics buffer	Assign IP address to the device
Device proxy data			Cycle time	Devices connected to an enterprice network or directly to the interpret must be space
Program info			Memory	protected against unauthorized access, e.g. by use of firewalls and network segment
PLC alarm text lists			PROFINET interface [X1]	For more information about industrial security, please visit
Local modules	~		▼ Functions	http://www.siemens.com/industrialsecurity
🔚 Ungrouped devices	_		Assign IP address	
Security settings			Set time	
Common data			 Firmware update 	
Documentation settings			Assign PROFINET device na	
Languages & resources			Reset to factory settings	MAC address: 8C -F3 - 19 - AA - BB - 49 Accessible devices
Online access			Format memory card	
Display/hide interfaces				IP address: 192 . 168 . 0 . 1
COM [RS232/PPI multi	1	=		Subnet mask: 255 . 255 . 0
COM <3> [RS232/PPI m	1			
Realtek PCIe GbE Fam				Use router
y Update accessible de				Router address: 0 . 0 . 0 . 0
🗳 Display more inform				
▼ 🛅 plc_1 [192.168.0.1]			-	Assign IP address
😮 Online & diagnos				
🕨 🔙 Program blocks				

• Add GSD configuration files

In the menu bar, click "Options" and select "Manage general station description files (GSD)"

Siemens - C:\Users\Administrator\	Documents\Automation\PN4_IO\PN4_IO	
Project Edit View Insert Online	Options Tools Window Help	
📑 📑 🔚 Save project ا 🐰 🗐 🗍	Y Settings	e 🖋 Go offline 🖪 🔒
Project tree	Support packages	AC/DC/Rly]
Devices	Manage general station description files (GSD)	🐙 Topology vie
Defa	Start Automation License Manager	
<u> </u>	Show reference text	Device overview
	Global libraries	🍟 Module
Program blocks		
🚆 🕨 🙀 Technology objects	₹*	
🖉 🕨 🔚 External source files		
👸 🔹 🕨 🍋 PLC tags		▼ PLC 1
PLC data types		DI (/DO 4.1
Watch and force tables	244172 (A. 101	DI 6/DQ 4_1
a la	SIEMENS and Carried	AI 2_1

Click <u>"Source path"</u> to find the target folder where the GSD file is stored, select the file and click <u>"OK"</u>;

Check the status of the GSD file to be added, whether it is <u>"not yet installed"</u>, if it is not yet installed, check the box in front of the GSD file and click "Install"; if it is already installed, you can click <u>"Cancel"</u> to skip the installation step and continue to the next operation;

Manage general station description files 🛛 🕹 🗙									
Installed GSDs GSDs in the	project								
Source path: D: 配置文件\PN4-GSDML\PN4-GSDML									
Content of imported path									
File	Version	Language	Status	Info					
GSDML-V2.3-Sdot-PN4-0008A-20	V2.3	English	Already installed	Solidot 🔺					
GSDML-V2.3-Sdot-PN4-0008B-20	V2.3	English	Already installed	Solidot 🔤					
GSDML-V2.3-Sdot-PN4-0016A-20	V2.3	English	Already installed	Solidot					
GSDML-V2.3-Sdot-PN4-0016B-20	V2.3	English	Already installed	Solidot					
GSDML-V2.3-Sdot-PN4-0032A-20	V2.3	English	Already installed	Solidot					
GSDML-V2.3-Sdot-PN4-0032B-20	V2.3	English	Already installed	Solidot					
GSDML-V2.3-Sdot-PN4-0800A-20	V2.3	English	Already installed	Solidot					
GSDML-V2.3-Sdot-PN4-0800B-20	V2.3	English	Already installed	Solidot					
GSDML-V2.3-Sdot-PN4-0808A-20	V2.3	English	Already installed	Solidot					
GSDML-V2.3-Sdot-PN4-0808B-20	V2.3	English	Already installed	Solidot 🗸					
<		I		>					
			Delete Install	Cancel					

Click <u>"Close"</u>

Man	lanage general station description files 🛛 🗙											
Ins	stallation result											
1	Message											
0	Installation was completed successfully.											
	Save log Install additional	al files Close										

• Add PN4 IO Module

Double click on <u>"Devices and networks"</u>, under the right directory of <u>"Network View"</u>, look for the installed GSD file's product model and path, as shown (Other field devices->PROFINET IO->I/O->SOLIDOTPROFINETI/O->PN4-1616A), drag or double click PN4-1616A to <u>"Network View"</u>;

PN4_IO → Devices & networks	Hardware catalog	7 11
🛃 Topology view 🛛 🚠 Network view 🛛 🏠 Device view	Options	
💦 Network 🔡 Connections 🛛 🕅 connection 🔻 📴 📲 🐂 🔤 🚺 Network overvie 4 🕨		
Device	✓ Catalog	
■ ▼ \$7-1200 station	<search></search>	i Jin
PLC_1 PNIO	Filter Profile: <all></all>	
CPU 1211C PN4-1600A CSD device_1	Distributed I/O	_ [
Not assigned PNIO	Power supply and distribution	
	Field devices	
	🕶 🧊 Other field devices	
	Additional Ethernet devices	
•	PROFINET IO	
	Drives	
	Encoders	
	🕨 🛅 Gateway	
	🗕 🛅 1/0	
	🕨 🤙 Sdot	
	🕨 🤙 Sico Robot Valve termin	als
	🕶 🛅 SOLIDOT	
	SOLIDOT C2S SERIES	
	👻 📊 SOLIDOT PN4 SERIES	
	👻 🛅 SOLIDOT PROFINET	1/0
×	II PN4-0008A	
< Ⅲ > 100% ▼	I PN4-0008B	
	I PN4-0016A	
Properties Info i Diagnostics	I PN4-0016B	
General 1 Cross-references Compile	I PN4-0032A	
💦 🛕 🔒 Show all mercaner	PN4-0032B	

In the <u>"Network view</u>", click on <u>"Not assigned (blue font)</u> on the slave device and select "PLC_1.PROFINET interface_1";

PN4_IO → Devices & network	s
	📰 Topology view 🚽 🎰 Network view 🛛 👔 🛙
Network	MI connection 💌 🕮 🖽 🛄 🗖 🚺 Netwo
	A De
PLC_1 CPU 1211C	PNIO_1 PN4-A08I
	-Select IO controller
	PLC_1.PROFINET interface_1
	· · · · · · · · · · · · · · · · · · ·
	-
	,
PNIO PN4-1600A	PNIO_2 PN4-A08V
Not assigned	Not assigned

After the connection is completed, the following figure shows:



• Assign device name in the configuration

Right-click on the connection line between PLC and PNIO and select "Assign device name".

PN4_IO → Devices & networks		_ 7 =	×
🛃 Topolo	ogy view 🔒 Network v	iew 🚺 Device view	
Network 1 Connections HMI connection	· 🕎 🐮 🖽 🛄 🔍 ±		
	4 IO system: PLC_1.PROF	INET IO-System (100) 🛕	
CPU 1211C PNIO_1			
PLC 1			
PLC_1.PROFINET IO-Syst	🗶 Cut	Ctrl+X	
	Depy Copy	Ctrl+C	
	🛅 Paste	Ctrl+V	Ĭž
	🗙 Delete	Del	ä
	Rename	F2	
PNIO PNIO_2	Assign to new DP master	/ IO controller	
PN4-1600A PN4-A08V	Compile	•	
	Download to device	•	
	💋 Go online	Ctrl+K	
	🔊 Go offline	Ctrl+M	
	Q Online & diagnostics	Ctrl+D	
	Assign device name	· · · · · · · · · · · · · · · · · · ·	
	Update and display forced	d operands	
Red Prog	Show catalog	Ctrl+Shift+C	-
General (1) Cross-references Compile	Roperties	Alt+Enter	
Show all messages			

Click the drop-down menu after <u>"PROFINET Device Name"</u>, select the name of the previously assigned device, and choose "PN/IE" for <u>"Type of the PG/PC interface"</u>. <u>"PG/PC interface"</u> select your own network device; click <u>"Update list"</u> and wait for the <u>"Online status information"</u> to show <u>"Search completed"</u>. When <u>"XX devices were found"</u>, check whether the status in <u>"Accessible devices in the network"</u> is "OK", if not, select the device, click <u>"Assign Name"</u> below to finish assigning the device name, and click <u>"Close"</u> to close the page;

		Configured PRO	FINET dev	/ice		
		PROFINET devir	e name:	plc 1		-
		Dev	vice type:	CPU 1211C AC/DC/Blv		
				a o izricito o ilij		
		Online access				
		type of the PG/PC I	interrace:	PN/IE		
		PG/PC I	interface:	Realtek PCIe GbE Fami	ly Controller	• • •
		Device filter				
		🛃 Only show	devices of t	he same type		
		Only show	devices wit	h bad parameter settings		
			devices wit	houtnames		
	Accessible dev	ices in the network:				
	IP address	MAC address	Device	PROFINET device name	Status	
	192.168.0.1	8C-F3-19-AA-BB-49	S7-1200	plc_1	💙 ОК	
Elach LED						
THUSTI LED						1
HUSHLED						
HIGHTED	<					
	<				Ipdate list	Assign name
HIGHLED	<				Ipdate list	Assign name
	<			L	Ipdate list	Assign name
					lpdate list	Assign name
ine status information	1:				Ipdate list	Assign name
ine status information Search completer	n: d. 1 of 2 devices w	ere found.			Ipdate list	Assign name
ine status information Search completer	1: 1. 1 of 2 devices w	ere found.			Ipdate list	Assign name
ine status information Search completer	1: d. 1 of 2 devices w	ere found.			Ipdate list	Assign name
line status information Search complete	1: d. 1 of 2 devices w	ere found.	III		lpdate list	Assign name
ine status information Search complete	1: d. 1 of 2 devices w	ere found.	1111		ipdate list	Assign name
line status information	k. d. 1 of 2 devices w	ere found.	111		Ipdate list	Acsign name

• Download the configuration structure

Double click <u>"Devices and networks"</u>, go back to <u>"Network view"</u>, select PLC and click <u>"Download</u> to device" button in the menu bar to download the current configuration to the PLC;



Click "Continue without synchronization";

Status	1	Target	Message	Action	
4	<u> </u>	▼ PLC_1	Ready for loading.	Load 'PLC_1'	1
		 Protection 	Protection from unauthorized access		
			Devices connected to an enterprise network or directly to the internet must be appropriately protected against unauthorized access, e.g. by use of firewalls and network segmentation. For more information about industrial security, please visit http://www.immers.com/industrial.security.		=
	-		http://www.siemens.com/industnaisecunty		
		Different modules	Differences between configured and target modules (online)		
	0	Stop modules	The modules are stopped for downloading to device.	Stop all	1
	0	Device configurati	Delete and replace system data in target	Download to device	1
<	•				· >

Click "Finish" to complete the download operation;

Load re:	sults				×
?	Status	and actions after downloa	ding to device		
Status	!	Target	Message	Action	
4	0	 PLC_1 	Downloading to device completed without error.	Load 'PLC_1'	
	0	Start modules	Start modules after downloading to device.	Start module	
<	_		III		>
			Finish	Load Cancel	

Communication connection

Select PLC, click "Go to online" in the menu bar, as shown below, all for Green for successful connection;

• IO Mapping Addresses

Click on <u>"Device view</u>", and under the <u>"Device overview</u>" menu folder, you can find the addresses assigned to the IO modules by the system software, or you can modify the addresses as required. PN4_IO > Ungrouped devices > PNIO [PN4-1600A]

					📲 To	pology	view	📥 Netwo	ork view
dt-	PNIO [PN4-1600A]		Dev	ice overview					
	<select device=""> PLC_1 [CPU 1214C]</select>	^	- *	Module		Rack	Slot	l address	Q address
	PNIO [PN4-1600A]			PNIO		0	0		
	PNIO_1 [PN4-A081] PNIO_2 [PN4-A08V]			PN-IO		0	0 X1		
				IN_1		0	1	23	
	84								
	_								
			•						
			•						

• IO Verification

Click on <u>"Force table"</u> and switch the CPU to "RUN" in the <u>"CPU operation panel"</u>. Add "QB" in the <u>"Address"</u> of the output module (e.g., address 1 is "QB1"), click "Enter" after typing. Then, address 1 column will automatically generate <u>"%QB1:P"</u>. <u>"Display format"</u> column can choose the display format of the monitor value, in this case hexadecimal was taken as an example, in the <u>"Monitor value"</u> column to fill in the data FF (%QB1: P's monitor value is a byte, it ranges from 0 to FF, it will be converted into binary, which ranges from 0000000000 to 1111111, a byte of data consists of 8 bits of binary data, from right to left, each binary control a channel. If you want to control channel 2 alone, change the third position to be 1, which is 00000100 = 0x03). After filling in the data, click the <u>"Start or replace the visible variable mandatory"</u> button to complete the output mode of data interaction;

Project tree		PN4_I	O ▶ PLC_1	[CPU 1214C DC/DC	(/DC] 🕨 Watch and	force tables 🔸	Force table		
Devices									
		1) 🧟 🗓 I	F. F. 😤 📬					
		i	Name	Address	Display format	Monitor value	Force value	F	Comment
▼ 🔄 PN4_IO	2 • •	1		%QB1:P	Hex	8	16#FF		<u> </u>
💕 Add new device		2		%QB2:P	Hex	0 0	16#FF		1
Devices & networks		3		%QB3:P	Hex	0 0	16#FF		1
PLC_1 [CPU 1214C DC/		4		%QB4:P	Hex	- 6	16#FF		1
Device configuration		5		<add new=""></add>					
Q Online & diagnostics									
🔻 🛃 Program blocks									
Add new block									
Main [OB1]									
Technology objects									
External source files									
PLC tags									
PLC data types									
 Watch and force tabl 									
Add new watch t									
Force table									
Watch table_1									
Online backups									
🔻 🔄 Traces									
📑 Add new trace									
🕨 🔀 Measurements									
Measurements o									

Double-click <u>"Add new block"</u>, double-click the newly added Monitoring Table "Monitoring Table_1" (you can change the name). Add "IB" in the <u>"Address"</u> of the input module (e.g., address 1 is "IB1"), click "Enter" after typing. Then the address 1 column will automatically generate "%IB1", after the address to be monitored is filled in, click the "Monitor All" button, you can monitor the input data;

	Project tree		١	PN4_IO	▶ PLC_1 [CPU 12	214	4C DC/DC/DC] 🕨	Watch and force	tables 🕨 Watch	table_1
	Devices									
	ÊŇ		2	2	11. 11 In 11	ħ	🖉 📴 📬			
5				i	Name	-	Address	Display format	Monitor value	Modify value
Ē	▼ PN4_IO		^	1			%IB1	Hex	16#00	
a l	🗳 Add new device			2			%IB2	Hex	16#00	
6	💑 Devices & networks			3			%IB3	Hex	16#00	
Ē	▼ 1 PLC_1 [CPU 1214C DC/	V •		4			%IB4	Hex	16#00	
۲Ľ	Device configuration			5			<add new=""></add>			
	🐫 Online & diagnostics									
	🔻 🔙 Program blocks	•								
	📑 Add new block		≡							
	📲 Main [OB1]	•								
	🕨 🚂 Technology objects									
	External source files									
	🕨 🌄 PLC tags	•								
	PLC data types									
	🔻 텛 Watch and force tabl									
	📑 Add new watch t									
	Force table									
	Watch table_1									
	🕨 📴 Online backups									

Note: Cancel the monitor values in the PLC and stop the PLC when not in use to avoid the problem of unsuccessful loading when downloading the configuration next re-configuration.

7.2.2 Application in STEP 7-MicroWIN SMART software environment

- 1. Preparation
 - Hardware environment

Module Model and Type

Туре	Model	Quantity
10	PN4-1616A	1
IU Medulee	PN4-A80V	1
Modules	PN4-A08I	1

- > A computer installed with STEP 7-MicroWIN SMART software
- > OMRON PLC Model: S7-200 SMART
- > Dedicated PROFINET shielded cable
- > A switching power supply
- > Module installation guide rail and fastener
- > Device configuration files
 - Website of configuration files: <u>https://www.solidotech.com/documents/configfile</u>
 - Install device configuration file
- Please operate according to "5 Installation and Disassembly" and "6 Wiring".
- 2. Computer IP requirements
 - Make sure the IP address of the computer and the PLC to are in the same network segment.
- 3. PLC Settings



- 1. Double click the directory "- CPU ST30" as the left figure
- Select the CPU model, in this case: SIMATIC S7-200 SMART\CPU ST30 as the below figure.

			9XE 1 7 3	IL CONTRACT	9 YELLS 3141	N/1.1				
🔍 文件 编辑 视题	PLC WELL	工具 帮助								0
- 2	0 0 XI + H	● ● 下載 ● 日本 語入 ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●	- 1 Sa Sa Loo	en en dis i	61 J.A.	s ≪l →		212108	_	
		COD C UNIT C I MO MONT C I M MARK	No lio Co							
- 16日1	MAIN X	SBR_0 INI_0								
→ 新聞功能	程序注释									<u>^</u>
EPU ST30	 程序校注释 									
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1										
10 1日 行ち次										
 一 新規時 		系统块					×			
- 系统块		1812	K*	(0)	40.4F	T#8				
🖲 📴 交叉引用			V02 04 00 00 00	10.0	00.0	5ES7 289,1ST 30,00A0				
「「「「「」」「「」」	2 输入注释	SB CPU ST20 (DC/DC/DC)	102.01.00_00.00.00				_			~
D N 円存 日 一 工具	<	EMD CPU STRU DC/0C/DC								>
10111121000000000000000000000000000000	输出窗口	EM 1 CPU ST60 (DC/DC/DC)								3 ×
	30	EM 2 CPU SR20 (AC/DC/Relay)								
SMART 驱动器组态	SBR. 0 (SBR0)	EM 3 CPU SR40 (AC/DC/Relay)								0
·····································	INT_0(INTO)	EM 4 CPU SR60 (AC/DC/Relay)								
11 2 設備失	現天小=16(赤中)	EM 5 CPU CR30s (AC/DC/Relay)								
🗉 🧰 位逻辑	正在编译数据页一	CPU CR40s (AC/DC/Relay)								
B 20 Bith	·陕大小=0(子中)	E 通信CPU CR40 (AC/DC/Relay)	1							
10 12 通信	正在编译系统块	回 数字(CPU CR60 (AC/DC/Relay)	址数据固定为下面	的画,不能通	过其它方式	更改				
● ● 转换	Call the last of the last	11.0 - 11.7								
🗉 🔝 计数器	错误急计:0	12.0 - 12.7	n. 1617.:				_			v .
◎ 🔤 浑点运算	нчэн (Шат	□ 数字跟输出	子网捕码:							
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	and a second sec								-	,

• Find, add, and delete CPUs

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文件 编辑 视图 中国	PLC 编述 工具 帮助
3 5 项目1 - ○ 新増功能	程序注释
(翻 CPU ST30 (形) (副 程序块	1 框序段注释
 日 201 符号表 日 201 状态图表 	k
□ □ 数据块	
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PID 整定控制面板 SMART 和PA服务	
·····································	SBR_0(SBR0) 副信摘日 INT_0(NT0) Realtek PCIe (BE Family Controller, TCPIP, Auto. 2 校下 1編編* 按照以更改所述 CPU 的 P 数据和站名称。按下 17月
□ ● ◎ 收藏夫 ● ◎ 位源編	
田 (四) 时钟 田 (四) 通信	块大小 = 0(字 特 □ 192,168.1.100 (mmert200) 通う知 CPU エカ (使 速 系 後 由 □ 200)
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	▲ 3 站名称(ASCII 字符 a 2、0 9、+ 和.)
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WRREC	型状 CPU 送加 CPU (編曲 CPU) 時所会 CPU
BLKMOV_BIW	
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Realtek PCIe GBE Fa	mily Controller.TCPIP.Auto.2
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192,168,1,1	00 (smart200)
🗾 添加 CPU	MAC that
192.168.1.1	00 (1) E0:DC:A0:73:51:8D 闪烁指示灯
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	戰认网关
	,
	站名称(ASCII 字符 a-z、0-9、- 和 .)
	smart200
-	
查找 CPU》	加 CPU 编辑 CPU 删除 CPU
	福完 取消

• Assign CPU IP address

Click the Set button, the IP address bar will become lighted, you can modify the IP and station name, click the Set button again after the modification is completed.

- 4. Manage GSD files
 - Manage GSD files
 - a) Click <u>"GSDML Management"</u> in the <u>"GSDML"</u> section of the <u>"File"</u> menu

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文件 编辑 视图	PLC 调试	工具 帮助			
☐ 貸打开 ☐ 关闭 新建 ☐ 关闭 ↓ ☐	↓ 下载	 □ 预览 □ 页面设置 	☆ 项目 ☆ POU ☆ 数据页	 1) 创建 1) 打开文件夹 1) 存储器 	XML GSDML 管理
操作	传送	才TED	保护	库	GSDML

b) Click the <u>"Browse"</u> button in the <u>"Manage general station description files"</u> dialog box

GSDML 管理			×
简介			
可用"GSDML 管理"来为 PROFINET 安装和删除 GSDML 文件。			
导入的 GSDML 文件			
文件名	安装日期	状态	
<		>	
导入新的 GSDEL			
2 () and			
1	-261542 UU9875		
			确认

- c) Navigate to the folder where the GSDML file is saved.
- d) Select the GSDML file to be imported. (You can also import multiple GSDML files.)
 Click the <u>"Confirm"</u> button to complete the GSDML file import
- Delete GSD files
 - a) Click <u>"GSDML Management"</u> in the <u>"GSDML"</u> section of the <u>"File"</u> menu.
 - b) Select the GSDML file to be deleted in the <u>"Manage general station description files"</u> dialog box.
 - c) Select the check box for the GSDML file and click the <u>"Delete"</u> button. You can also delete multiple GSDML files.

GSDML 管理			×
育介			
可用'GSDML 管理'来为 PROFINET 安装和删除 GSDML 文件。			
导入的 GSDML 文件			
文件名	安装日期	状态	
1 GSDML-V2.3-Sdot-PN4-1616A-20181125.xml	2019-10-25 15:52:29	正常	
4		,	
导入新的 GSDML			
C: \Users\dell\Desktop\PN\ 浏览	删除		
			确认

- d) Confirm the deletion of the GSDML file in the Reminder window.
- e) OK button to close the dialog box. The deleted GSDML files will be removed from the Imported GSDML files field.

5. Device Naming

All PROFINET devices must have a device name and IP address. Use STEP 7-Micro/WIN SMART to define the device name. Assign device names to devices via PROFINET DCP (Discovery and Configuration Protocol).

PROFINET devices and PCs are located in the same subnet

• Click the <u>"Find ROFINET Devices"</u> button in the <u>"Tools"</u> area of the <u>"Tools"</u> menu.



 Click on the <u>"Find Devices"</u> button to display all available PROFINET devices on the local Ethernet

查找PROFINET设备	×
通信接口 Realtek PCIe GBE Family Controller.TCPIP.Auto.2	按下"编辑"按钮以更改所选设备的名字。按下"闪烁指示灯"按钮 使设备的LED持续闪烁,以便目观连接的设备。
🧃 PROFINET 设备	MAC 地址 闪烁指示灯
	IP 地址
	子网摘码
	默认网关
	站名称 (中文,ASCII字元 \a'±z','0'+9','1'和 '~。不可以 '','' 和 'port-n(n=09)'开始,不可以 〉 和 `' 结束 。)
	编辑
查找设备	
	取消

Click the <u>"Edit"</u> button to change the device name

找PROFINET设备	X
1自接口 Realtek PCIe GBE Family Controller.TCPIP.Auto.2	按下"编辑"按钮以更改所选设备的名字。按下"闪烁指示灯"按钮 使设备的HED持续闪烁,以便目测连接的设备。
2 PROFINET 设备 白-2 PNIO - 2 192.168.1.5 (pnio)	MAC 地址 00:A0:45:00:03:B9
	- <u>192</u> ,168,1,5 子 对_播码
	255.255.255.0 默认网关 192.168.1.5
	, 站名称 (中文,ASCII字元 \a'2,10+9°,公和14。不可以14,2 和 port-n(n=09) 开始,不可以14和14结束。)
	pnio
查找设备	
	取消

6. **PROFINET Networks Configurations**

• Open the PROFINET configuration guide.

📺 🗋 🚰 💭 🔻 项目 1 - STEP 7-N									TEP 7-Micro/WI	N SMAR	т			
	文條	ŧ	编辑	视图	PLC	调试	工具	帮助						
\$ [高速计	+ 心 数器	运动				Get/Put		PROFINET	运动控制面板	PID 控制面板 驱	SMART SMART	查找 PROFINET 设备	选项	
					向导					I	具		设置	

• Select the PLC role as "PROFINET controller"

PROFINET 配置向导		×
■ PROFINET网络 	篇介	
	此句导允许您逐步地配置 PROFINET 网络。PROFINET 配置信息在项目中主成并存储,可知项目一起下载到 PLC 中。	
	PLC角色	
	法保PLC的角色	
	PROFINET 控制語 是用 RROTINET Procenter	
	上—步 下 —步 生成 取消	-

- Set controller (CPU) address
- Add the IO module, change the device name and configure the IP address.

设备号 类型 设备名 IP 地址 注释 1 PN4-A08IV10.00.00 pnio 192.168.0.12 1	控制器参数 以太网端口 ☑ Ⅳ 地址数排 ☑ Ⅳ 地址: 子网摘码: 默认网关:	固定为下面的值,不能通过其它, 192 - 168 - 0 - 1 255 - 255 - 255 - 0 0 - 0 - 0 - 0	方式更改 站名称: ∫smart200	发送时钟: 「 启动时间: 「	1.000 v ms
政策亏 突型 技能者 世地班 注释 1 PN4-A08IV10.00.00 pnio 192.168.0.12 1	设备表		1.44	ro likili	 _3⊽
	<u>设备亏</u>	<u>奕型</u> PN4-408TV 10_00_00		IP 地址 192 168 0 12	
<	<		рино		>

Similarly, add IO modules such as PN4-1616A/PN4-A08I.

Note: The device name should be the same as the module name, IP address should be set in the same network segment with PLC.

Click Next and click Generate button.

7. Download the program

	- (👙 🖬 🖏 -							项目 1 - STEP 7-Micro/WIN SMART			
U	文件	编辑	视图	PLC	调试	工具	帮助				
し 新建	┣┛ □ 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	保存	a े 导入 - र₀ 导出 - ि 上一个 -		下载	ATED	△ 预览 □ 页面设置	 2 项目 2 POU 2 数据页 	 1) 创建 1) 打开文件夹 1) 存储器 	XML GSDML 管理	
		操作		(送			保护	库	GSDML	

Click the Download button

下载			×
将块下载到 CPU 选择要下载的块。			
① 单击 "下载" 开始			
块	选项		_
▶ 程序块	☑ 从 RUN 切换到 STOP 时提示		
☑ 数据块	☑ 从 STOP 切换到 RUN 时提示		
▶ 系统块	□ 成功后关闭对话框		
2 单击获取帮助和支持	下载 :	关闭	
Click Download			
下载			\times
将块下载到 CPU 选择要下载的块。			
① 下载已成功完成!			
	洗 项		
▼ 程序块	☑ 从 RUN 切换到 STOP 时提示		
☑ 数据块	☑ 从 STOP 切换到 RUN 时提示		
▼ 系统块	□ 成功后关闭对话框		
2 单击获取帮助和支持	下载	关闭	
	11.494	N IAU	

The download is complete and the dialogue menu is closed.

Notes: After the download is complete, re-power the module to process

8. Test Data

Set the PLC to RUN mode • 🗅 💕 🚽 🏟 🔻 项目 1 - STEP 7-Micro/WIN SMART **F**) 文件 见图 PLC 调试 TE 帮助 💁 PLC 😋 暖启动 O 0 ľ V. **省比较** 🕑 设置时钟 下载 RUN STOP 编译 上传 设定 清除 🔞 通过 RAM 创建 DB 文件 編辑 视歴 项目 1 - STEP 7-Micro/WIN SMART PLC 调试 工具 帮助 🖸 🖸 🖄 | 🏠 上传 🗸 🦺 下载 🗸 🕼 |河河| = ちきめ| ⊇| ≙ ‰ 🍯 t 🤿 + → | + O -1 | ⊂ • # ff K| = = = = _ MAIN × SBR (INT_0 | 程序注释 1 程序段注释 ĸ 2 | 输入注释 ĸ 3 1 输入注释 × 🖗 -SBR_0 (SBR0) INT_0 (INT0) 块天小 = 16(字节),0个错误 RUN × 正在编译数据页... 块大小=0(字节),0个错误 ? 是否将 CPU 置于 RUN 模式? 正在编译系统块... 已编译的块,0个错误,0个警告 是 ____ 否 相庆<u>爲</u>町・0 国 ∢ ▶ 月 **組建** / 🛅 - 🛅 - | 🗩 🔟 (🔗 🥒 🖀 🐀 🐔 🚷 | 🗷 🗢 -格式 有符号 有符号 地址 当前值 新值 2

• Monitor data and force output



- 1、 Double click the directory "I 图表1" as the left figure
- 2. Enter the corresponding channel address and data format, you can force and input monitoring of IO module here

	- Xa - I 🗖 🗖 🖓	1	A 🗆 🛪		
	地址	格式		新值	
1	QW128	十六进制	16#FFFF		
2	QW130	十六进制	16#0000		
3	QW132	十六进制	16#0000		
4	IW128	十六进制	16#0000		
5		有符号			
6		有符号			

8 FAQ

8.1 The device cannot be found in the software

- 1. Check the GSDML configuration file is correctly installed or not
- 2. Check the GSDML configuration file version is accurate or not

8.2 The device cannot enter the online state

- 1. Check the project is set up correctly or not
- 2. Make sure the power supply of the device is normal
- 3. Make sure the PROFINET communication line is normal
- 4. Whether the device name is assigned to the PLC device line after the connection
- 5. Whether the PLC model is correct

8.3 Unable to load when downloading to the device

- 1. Make sure the PLC is not in the forced state
- 2. Make sure the CPU is stopped.