

PN4-GW2MR Integrated PROFINET to 2-Port

Modbus-RTU Gateway

User Manual



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Contents

1 Introduction	1
1.1 About the manual	1
1.2 Copyright statement	1
1.3 Nomenclature	1
2 Product overview	1
2.1 Product functions	1
2.2 Product features	1
2.3 Technical indicators	2
3 Product appearance	5
3.1 Product appearance	5
3.2 Indicator definition	6
3.3 Communication port	7
3.3.1 Power port (of a computer)	7
3.3.2 Serial communications port	8
4 Operation	9
4.1 Configuration modules	9
4.2 PLC module parameter setting procedure	11
4.2.1 Create project	11
4.2.2 GSD installation	13
4.2.3 Device configuration	16

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4.3 Solidotech GW_MR Config tool configuration software	22
4.4 Operation	23
4.4.1 Data exchange	23
4.4.2 PROFINET Slave Station	23
4.4.3 Modbus Master Station	23
4.4.4 Modbus Slave Station	23
4.4.5 Free port protocol	23
4.4.6 General mode - Q&A	24
4.4.7 General mode - receiving	24
4.5 Software installation	
4.6 User interface introduction	35
4.7 Device window	36
4.7.1 Introduction to the device window	
4.7.2 Device window operation	
4.8 Configuration window	38
4.8.1 PROFINET configuration	38
4.8.2 Modbus master station	39
4.8.3 Node configuration	41
4.8.4 Command configuration interface	
4.8.5 Control and status words	43
4.9 Conflict detection	46
4.9.1 Command list operation	46



	4.9.2 Memory-mapped operation	46
	4.10 Communication configuration	48
	4.10.1 Download serial port settings	48
	4.10.2 Download configuration	49
	4.10.3 Upload configuration	49
	4.11 Loading and saving configurations	49
	4.11.1 Save configuration project	49
	4.11.2 Load configuration project	50
	4.11.3 Engineering encryption	50
	4.12 Example description	51
	4.13 Clear gateway configuration	56
N	Aounting	56
	5.1 Mechanical dimensions	56
	5.2 Installation	56
С	Dperation and maintenance and precautions	57



1 Introduction

1.1 About the manual

This manual describes the parameters, specific usage and precautions of the gateway PN4-GW2MR for the convenience of engineering personnel. Please read this manual carefully before using the gateway.

1.2 Copyright statement

Product-related data and application cases mentioned in this manual may not be reproduced or quoted without authorization.

1.3 Nomenclature

Modbus: A serial communication protocol, published by Modicon for use in PLC communications, Modbus has become the industry standard for communication protocols in the industrial sector.

PROFINET: Introduced by the international profibus organization, PROFINET is a new generation of automation bus standard based on industrial ethernet technology.

2 Product overview

2.1 Product functions

This product realizes data communication between PROFINET network and Modbus RTU network, connects two Modbus networks to PROFINET network separately, and supports different Modbus communication baud rates and other settings. It converts Modbus devices into PROFINET devices.

2.2 Product features

- Wide range of applications: This product is widely used in inverters, intelligent high and low voltage appliances, power measuring devices, intelligent field measuring devices, meters, PLC, DCS, FCS and so on that support serial communication interfaces.
- Simple configuration: Users do not need to know the details of Modbus and PROFINET, they only need to refer to the manual and configure the gateway according to the requirements, no complex programming is required, and the connection function can be realized in a short time



2.3 Technical indicators

- The PN4-GW2MR is a PROFINET slave on the PROFINET side and a Modbus master station or Modbus slave station on the serial side.
- Supports standard PROFINET I/O protocols
- PROFINET supports up to 16 slots with a maximum input byte count of 1440 bytes and a maximum output byte count of 1440 bytes. Bytes, length of input and output bytes set by TIA PORTAL
- Supported module types
- Input 001 byte
- Input 002 bytes
- Input 004 bytes
- Input 008 bytes
- Input 016 bytes
- Input 032 bytes
- Input 064 bytes
- Input 128 bytes
- Input 256 bytes
- Input 512 bytes
- > Output 001 byte
- > Output 002 bytes
- Output 004 bytes
- Output 008 bytes
- Output 016 bytes
- Output 032 bytes
- > Output 064 bytes
- Output 128 bytes



- Output 256 bytes
- > Output 512 byte



- Supports two serial communication ports, which can be plugged into different Modbus networks.
- > Supports Modbus master station and Modbus slave station
- > Serial communication parameter specifications:

Serial interface type: RS485, RS232, RS422

Support baud rate: 1200bit/s, 2400bit/s, 4800bit/s, 9600bit/s, 19200bit/s, 38400bit/s, 57600bit/s, 115200bit/s other baud rates can be customized. Operating mode: Half-duplex, full-duplex Verification method: None, odd, even Data bits: 7, 8, 9 bits Stop bits: 1 bit, 2bits

- Function codes: As a Modbus master station, supports 01h, 02h, 03h, 04h, 05h, 06h, 0fh, 10h;
- > Power supply: 24VDC (±5%), maximum power 3.5W
- > Working environment temperature: -25 ~ 55 °C, humidity \leq 95%
- > Overall dimensions: 25mm (width) x 102mm (height) x 72mm (thickness)
- Mounting: 35mm rail
- Protection class: IP20



3 Product appearance

3.1 Product appearance



Number	Name	Description		
1	Power connector	3P terminal		
2	Bus interface	2×RJ45		
3	Network port indicator	Link and data sending and receiving status		
4	Operation indicator light	Module operational status		
5	Power indicator	Module power status		
6	Warning indicator	Indicates module alarm status		
Ø	Channel signal indicator	Indicates the corresponding channel status		
8	Module identification	Marking module model, function		
9	Guideway slot	Fixed modules		
10	Channel marking	Signal corresponding channel identification		
1)	Channel interface	2×20p Terminal		
12	Clear gateway configuration switches	Press and hold then power up for 2 seconds and release to clear the gateway configuration		





DIN 35mm rail, snap-on installation

3.2 Indicator definition

Indicators are defined as follows:

Status \ Light	PWR	RUN	ERR	ТΧ	RX
ON	Power on	PN communicatio n is normal	PN communication abnormality		
OFF	Power supply failure				
FLASHING			PN communication not connected successfully	Send data	Receive data



3.3 Communication port

3.3.1 Power port (of a computer)



Pin	Functionality
1	Power supply 24 VDC (18V~30V)
2	0V
3	PE, ground





3.3.2 Serial communications port



Serial communication transmission technology features:

- > Network topology: Linear bus with active bus termination resistors at both ends;
- Transmission rate: 1200bit/s~115200bit/s;
- Medium: Shielded twisted pair cable, shielding can also be removed, depending on environmental conditions (EMC)
- Number of stations: 32 stations per segment (without trunking) up to 127 stations (with trunking);
- > Plug connection: 20pin pluggable terminal;

Installation points for serial communication transmission equipment:

- The module supports a total of two serial communication networks, each serial communication port can be configured separately in the configuration software;
- A bus termination resistor at each of the furthest ends of the bus ensures reliable network operation.

4 Operation

4.1 Configuration modules

- 1. Connect the power supply correctly and power up the PN4-GW2MR by connecting the PN4-GW2MR to the PC through the RJ45 port;
- 2. Open the configuration software and configure it in the configuration software according to your needs (please refer to how to use the configuration software)
- 3. Click the "Download" Button in the toolbar to download the configuration to the PN4-GW2MR;
- 4. When the download is complete, re-power the gateway if the gateway ip address is changed;

5. Configure the appropriate configuration in TIA PORTAL, including the module to be configured, the IP address of the target device (PN4-GW2MR) and the device name;



- 6. Download the configuration of TIA PORTAL to the PLC;
- 7. Wait approximately 10 seconds for a connection to be established between the PN4-GW2MR and the PLC and the RUN indicator light will be on.



4.2 PLC module parameter setting procedure

4.2.1 Create project

Open TIA PORTAL, select "create new project", enter the project name, select the path and other information, and then click "create", as shown in the following figure.

St	art			Create new project		
			Open existing project	Project name:	PN2MODBUS_RTU_485	
			open existing project	Path:	C:\Users\29719\Documents	
			🥚 Create new project	Version:	V17	
				Author:	Administrator	
			Migrate project	Comment:		~
		-				~
			Welcome Tour			Create
	Online & Diagnostics	10				

Insert the CPU into the project via the PORTAL view or the finished project view.

In the view, select "Devices and networks" And click "Add new device" (or double-click "Add new device" Under the project name in the project view), as shown below. In the "Add new device" Dialog box, add a controller that supports the PROFINET interface, such as 6ES7 212-1BE40-0XB0.







	PN2MODBUS_RTU			_ # i	🖬 🗙 Hardware catalog 📑 🔳
Devices			🚽 Topology view	🛔 Network view 🛛 🏦 Device view	w Options
	🔲 🗟 🔐 PLC_1 [CPU 12	12C] 💌 🖽 🕅	6 🖽 🛄 🔍 ± 📑	Device overview	1
			^	Module	✓ Catalog
PN2MODBUS_RTU_485	^				A Search>
Add new device	40		=		
Devices & networks					Filter All>
PLC_1 [CPU 1212C AC/DC/Rly]		2 2		▼ PLC 1	CPU
Device configuration		2 3		DI 8/DO 6 1	Signal boards
Q Online & diagnostics	SIGMONS BRANCE	- I		AL2 1	Communications board
Program blocks	-			74 Z_1	Battery boards
Technology objects		and the second se		HSC 1	DI
External source files		CRU HINE		HSC 2	▶ 🛄 DQ
PLC tags				ньс з	DI/DQ
PLC data types				HSC_3	IA 📷 AI
Watch and force tables				HSC 5	▶ 🛅 AQ
Online backups				HSC_5	AliAQ
🕨 📴 Traces				Pulse 1	Communications mod
OPC UA communication				Pulse 2	Technology modules
Device proxy data				Pulse_2	-
Program info				Pulse_5	
PLC alarm text lists				OPC UA	
Local modules				BROEINET interface 1	
Ungrouped devices				FROMINE TIMENACE_T	
Security settings					
Cross-device functions		100%			× ·
Common data		100%			<u> </u>
Documentation settings	PLC_1 [CPU 1212	C AC/DC/Riy]	S Properties	🗓 Info 🚺 🖞 Diagnostics	



4.2.2 GSD installation

In the TIA PORTAL menu bar, click options > manage general station description files, as shown in the following figure:

	Support packages				
Project tree Devices	Manage general station <u>d</u> escription files (GSD	PLC_1 [CPU 1212C A	Topology view	Network view 🏘 Device view	Options
11 11	Show reference text		🗄 🔲 🔍 ± 🛛 🖬	Device overview	
			1	∧ ₩ Module	✓ Catalog
PN2MODBUS_RTU_485	Giobal libraries		1		Search>
Add new device	N.				
Devices & networks					Filter All>
PLC_1 [CPU 1212C AC/DC/Rly]		2 3		▼ PLC 1	► CPU d
Device configuration				DI 8/DO 6 1	Signal boards
😧 Online & diagnostics	SIGNERS ARATELES	1		AI21	Communications boards
Program blocks					Battery boards
Technology objects				HSC 1	P III DI
External source files	Line Colorado			HSC 2	P III DQ
PLC tags				HSC 3	▶ III DI/DQ
PLC data types				HSC 4	A
Watch and force tables				HSC 5	▶ <u>∎</u> AQ
Online backups				HSC 6	AI/AQ
🕨 🔀 Traces				Pulse 1	Communications mod
OPC UA communication				Pulse 2	Technology modules
Device proxy data				Pulse 3	
Program info				Pulse 4	
PLC alarm text lists				OPC LIA	
Local modules				PROFINET interface 1	
Generation State St					
Security settings			7		1
Cross-device functions		\$ 100%	T /		1 1
Common data					
Documentation settings	PLC_1 [CPU 1212C AC	IDC/RIY]	Properties	🗓 Info 🚺 💁 Diagnostics	
> Details view	General 10 tag	System constants	Texts		> Information

In the pop-up dialog box, select the "Installed GSD" Tab, click the source path selection button, and in the pop-up browse folder dialog box, find and select the path to the folder where the GSD file "GSDML-v2.33-SDOT-PN4-GW2FP-20220805" Is located and select it. In the browse folder dialog box, find the path to the folder where the GSD file "GSDML-V2.33-SDOT-PN4-GW2FP-20220805" Is located and select it, Just click confirm.





Manage general station description files				×
Installed GSDs GSDs in the project				
Source path: D:\				
Content of imported path				
File	Version	Language	Status	
GSDML-V2.33-Sdot-PN4-GW2FP-20220805.xml	V2.33	English	Not yet installed	
				-
<	111			>
		Delete	Install	el

Select the imported GSD file and click install until the installation is complete.

Manage general statio	n description files	74.			×
Installed GSDs (GSDs in the project				
Source path: D:\					
Content of imported	path				
File		Version	Language	Status	
GSDML-V2.33-Sdot-PN	V4-GV258 20220805	1/2 22	English	Makingtingtallad	
	10% The in:	Installatio	on of GSD file	s e. Remaining tim	ie in seconds: 54
<					Cancel
			Delete	Install	Cancel



Message Installation was completed successfully.	
Installation was completed successfully.	

The software updates the hardware catalog.

Manage general sta	tion description files				×
Installed GSDs	GSDs in the project				
Source path: D:\					-
Content of importe	ed path				
File		Version	Language	Status	
GSDML-V2.33-Sdo	t-PN4-GW2EP-20220805 xml	V2 33	English	Not vet installed	
	Updat The upo	ing the har Jate may tak	rdware catalog e some time.	9	Cancel
٢			Delete	Install	ancel



4.2.3 Device configuration

Double-click "devices&networks" to add the PN4-GW2MR device module in the hardware catalog > other field devices > PROFINET IO > GATEWAY > SOLIDOT > SOLIDOT PN4 SERIES > PN4-GW2FP, as shown below:

 Other field devices
Additional Ethernet devices
VICTOR PROFINETIO
🕨 🛅 Drives
Image Encoders
🕶 🧊 Gateway
🕨 🛅 Sdot
SIEMENS AG
- III SOLIDOT
SOLIDOT PN4 SERIES
PN4-GW2FP
► 🛅 1/O
🕨 🛅 Sensors
PROFIBUS DP
PROFIBUS PA



Project tree 🔲 🖣	PN2MODBUS_RTU_485 > Devices & networks	_ # = ×	Hardware catalog 📰 🗈 🕨 🕨	
Devices	🚽 Topology view 🔒 Network view	Device view	Options	
1	💦 Network 👖 Connections 🔣 HMI connection 💌 🔐 Relations 🕎 🐫 📲 🏢 🔍 ±			Har
		^	✓ Catalog	dwa
PN2MODBUS_RTU_485			<search></search>	6
Add new device		-		1
Devices & networks	CEL11212C ENAGW2EP DE VOER		Pricer Prome: <au></au>	-
 PLC_1 [CPU 1212C AC/DC/Rly] 			Controllers	9
Device configuration	Hot assigned		▶ HM	
🖞 Online & diagnostics			C systems	٧.
Program blocks			Drives & starters	0
Technology objects			Image: Network components	II.
External source files			Detecting & Monitoring	ie
PLC tags			Distributed I/O	00
Q PLC data types			Power supply and distribution	S
Watch and force tables			Field devices	
Online backups		= 2	▼ Im Other field devices	V
🕨 💽 Traces			Additional Ethernet devices	Ta
OPC UA communication			▼ T PROFINETIO	SKa
Device proxy data			Drives	
Program info			Encoders	m
PLC alarm text lists			✓ ☐ Gateway	F
Local modules			▶ 🛅 Sdot	ibr
Unarouped devices			SIEMENS AG	ari
Security settings			- DI SOLIDOT	S
Cross-device functions			SOLIDOT PN4 SERIES	
Unassigned devices			PN4-GW2FP	Þ
Common data			► I 1/O	dd
Documentation settings			Sensors	ins
Languages & resources	1		PROFIBUS DP	1
Version control interface	1		PROFIBUS PA	
Doline access			-	
Card Reader/USB memory				
		×		

After adding the device module, as shown below

				indiana catalog	A COLUMN TWO IS NOT
Devices	🖉 To	pology view 🔒 Network view	Device view	Options	U
11 III	💦 Network 🔛 Connections 🔣 HMI connection 💌 🗔 Relations 🕎 🐯	🖬 🖽 🛄 🔍 ±			Hay
			^	✓ Catalog	dwa
PN2MODBUS_RTU_485				<search></search>	and the light
Add new device			-	Silver Brofiles Alls	
📩 Devices & networks	 CPU1212C PNIC PNIC			Priter Profile: All>	
 PLC_1 [CPU 1212C AC/DC/Rly] 				Controllers	ē.
Device configuration	ivot assigned			M HM	
😟 Online & diagnostics				PC systems	8
Program blocks				Drives & starters	9
Technology objects				Network components	1
External source files				Detecting & Monitoring	et
PLC tags				Distributed I/O	0
Eg PLC data types				Power supply and distribution	S
Watch and force tables				Field devices	
Online backups			- Vet	 Other field devices 	
Traces				Additional Ethernet devices	a
OPC UA communication			l a	▼ PROFINETIO	sks
Device proxy data			- 5	Drives	
Program info				Encoders	
PLC alarm text lists				🕶 🛄 Gateway	5
Local modules				🕨 🧾 Sdot	bra
Ungrouped devices				SIEMENS AG	Tie
Security settings				✓ Im SOLIDOT	5
Cross-device functions				SOLIDOT PN4 SERIES	-
Unassigned devices				PN4-GW2FP	Þ
🕨 🙀 Common data				► 🛅 1/O	4
Documentation settings				Sensors	su
Languages & resources				PROFIBUS DP	
Version control interface				PROFIBUS PA	
Online access					
Card Reader/USB memory			~		



Use the Network View of the Device Configuration to create network connections between the devices in the project. After creating a network connection, use the "Properties" tab of the tour window to configure the parameters of the network.

Select "Network View" to display the devices to be connected. Select the PROFINET port of the PN4-GW2MR and drag the connection to the PROFINET port of the PLC_1 module and release the mouse button to create the network connection.

PN2MODBUS_RTU_485 ► Devices & networks	_ - - - ×
Topology view	Device view
💦 Network 🔛 Connections HMI connection 💌 🗛 Relations 🕎 🦉 🖬 🔛 🛄 🍳 ±	A
PLC_1 CPU 1212C PN4-GW2FP PN4-GW2FP PN4-GW2FP PLC_1.PROFINETinterface_1 2	=
	= 2
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	- 1



PN2MODBUS_RTU_485 → Devices & networks	K Hardware catalog 🛛 🖬 🕨	
😴 Topology view 🛛 🔒 Network view 👔 Device view	Options	1
💦 Network 🔢 Connections HMI connection 💌 🖪 Relations 🕎 🖏 📲 🖽 🛄 🍳 ±		Har
4 IO system: PLC_1.PROFINET IO-System (100)	✓ Catalog	dwa
	<search></search>	rec
PLC_1 PNIO CPU 1212C PNA-GW2FP DP.NORM PLC_1		atalog
	PC systems	0.1
	Drives & starters	0
PLC_TPROTINCTIONSISTER.	Image: Interview of the second s	nii i
	Detecting & Monitoring	e t
	Distributed I/O	00
	Power supply and distribution	20
	Field devices	-
	• Other field devices	4
	Additional Ethernet devices	Tas
	PROFINET IO	ks
	Drives	
	Encoders	D
	▼ Gateway	-
	🕨 🖬 Sdot	bra
	SIEMENS AG	rie
	✓ Im SOLIDOT	S
	▼ Im SOLIDOT PN4 SERIES	4
	PN4-GW2FP	
	▶ <u>iii</u> i/o	d
	Sensors	ins
	PROFIBUS DP	
	PROFIBUS PA	

The PROFINET network is created successfully, as shown in the following figure:

Double-click on the PN4-GW2MR device and configure all necessary modules and submodules.

- In the hardware catalog, expand the modules container.
- Double-click or drag the module type under input modules / output modules. This is shown in the figure below:





Project tree	■	💶 🖬 🗮 🗙 Hardware catalog 👘 💷 🕨
Devices	🚰 Topology view 🛔 Ne	twork view Device view Options
	🔟 🗃 🔐 PNIO [PN4-GW2FP] 💌 🛄 🕎 🖆 📋 🍳 ± 📑 🚺 Device overview	/ Ē
	A Module	Rack Slot V Catalog
PN2MODBUS_RTU_485	▼ PNIO	0 0 <search> Mil Mil a</search>
💕 Add new device	- • • Int	erface 0 0X1
Devices & networks		ard input 1 S 0 1
 PLC_1 [CPU 1212C AC/DC/Rly] 	8 ⁴⁴	Nord Output 1 0 2
Device configuration		Module
Online & diagnostics		Input(PN4_GW2FP to PLC)
Program blocks		0 5 001 Byte Input
Technology objects		0 6 OO1 DWord Input
External source files	DP-NORM	0 7 001 Word Input
PLC tags		0 8 002 DWord Input
Ed PLC data types		004 DWord Input
Watch and force tables		10 008 DWord Input
Online backups		0 11 016 DWord Input
🕨 📴 Traces	<u>•</u>	0 12 032 DWord Input
OPC UA communication		0 12 064 DWord Input
Device proxy data		128 DWord Input
Program info		Output(PLC to PN4_GW2FP)
PLC alarm text lists		0 001 Byte Output
Local modules		0 10 III 001 DWord Output
Distributed I/O		🚺 001 Word Output
La Ungrouped devices		002 DWord Output
Security settings		004 DWord Output
Cross-device functions		008 DWord Output
Common data		016 DWord Output
Documentation settings		032 DWord Output
Languages & resources		064 DWord Output
Version control interface		128 DWord Output
Online access		
Card Reader/USB memory		
- /		
		····

To configure the PROFINET interface of the PN4-GW2MR, select the green PROFINET box on the device. The "Properties" Tab in the tour window will show the PROFINET port, select "Ethernet address" From "Properties > PROFINET interface" In the tour window, and set the IP address in the IP protocol as shown below. Select "Ethernet address" Under "Properties > PROFINET interface" In the tour window, and set the IP address in IP protocol as shown in the following figure:





To configure the PROFINET interface of PLC_1, select the green PROFINET box on the CPU. The "Properties" Tab in the viewing window will show the PROFINET port, select "Ethernet address" In "Properties > PROFINET interface" In the viewing window, and set the IP address in the IP protocol as shown below.

Project tree	PN2MODBUS_RTU_485 ►	Devices & networks			_∎≡×	Hardware catalog	
Devices			🛃 Topology view	v 🛔 Network view	Device view	Options	E
1 I I I I I I I I I I I I I I I I I I I	Network Connections	HMI connection	ns 🖭 🖫 🖬 🖢 🖬	Network overview	4 1		
		4 IO system: PLC_1.PRO	FINET IO-System (100) 🛕	V Device	Type	✓ Catalog	
PN2MODBUS_RTU_485				 S7-1200 station_ 	1 \$7-1200	<search></search>	init init i
Add new device				▶ PLC_1	CPU 121	Contraction and	
d Devices & networks	CPU1212C	PNIO PN4-GW2EP DB HOPH		 GSD device_1 	GSD dev	Pliter Profile: <all></all>	
 PLC_1 [CPU 1212C AC/DC/Rly] 		PLC 1		PNIO	PN4-GW	Controllers	4
Device configuration	1	100_1				• HM	
Online & diagnostics	1					PC systems	
Program blocks	PLO	_1.PROFINET IO-Syste				Drives & starters	9
Technology objects		-				Network components	
External source files						Detecting & Monitoring	
PLC tags						Distributed I/O	
LG PLC data types						Power supply and distribution	!`
Watch and force tables			*			Field devices	
Online backups	< III	> 100%	💌 🔟	< III	>	Other field devices	
Traces	PROFINET interface_1 [X1	: PN(LAN)]	Q Properties	1 Info (1) 🖸 Diagn	ostics	Additional Ethernet devices	-
OPC UA communication							2
Device proxy data	General IO tags	System constants Texts				Drives	
Program info	General	Ethernet addresses			^	Encoders	
PLC alarm text lists	Ethernet addresses	Ethemet addresses			1	▼ Li Gateway	
Local modules	Time synchronization	Interface networked with				> Sdot	
Distributed I/O	Operating mode					SIEMENS AG	-
Ungrouped devices	Advanced options	Subne	t: PN/IE_1			- USOLIDOT	[`
Security settings	Web server access		Add new subnet			SOLIDOT PN4 SERIES	
Cross-device functions						PN4-GW2FP	1
Common data		Internet protocol version 4	(IPv4)			10	-
Documentation settings		internet protocol version 4	(Sensors	
Languages & resources		ł	Set IP address in the p	roiect		PROFIBUS DP	- 1
Version control interface						PROFIBUS PA	
Online access			IP address: 1	92.168.0.1			
Card Reader/USB memory			Subnet mask: 2	55 . 255 . 255 . 0			
			Use router				- 1
			Router address: 0				_
> Details view			O IP address is set direct	ly at the device	*	> Information	

Perform compilation and download

🌁 🎦 🖬 Save project 📑 🐰 🗐 🗊 🗙 🏷 🛨 (4 🗉	🖥 🛄 🗓 🖳 💋 Go online 🖉 Go offine 🛔 🔚 🕞 🗶 🖃 🛄 <search in="" projects="" th="" 👫<=""><th>PORTAL</th></search>	PORTAL
Project tree 🔲 🕯	PN2MODBUS_RTU_485 → Devices & networks	Hardware catalog 📰 🗊 🕨
Devices	🚽 Topology view 🛛 🛔 Network view 👔 Device view	Options
1 I I I I I I I I I I I I I I I I I I I	💦 Network 🔛 Connections - HM connection 🐨 💀 Relations 🕎 💀 📲 🎽 🙀 - Network overview	
	A IO system: PLC_1.PROFINET IO-System (100)	✓ Catalog
▼ PN2MODBUS_RTU_485	■ • 57-1200 station 1 57-1200	<search></search>
Add new device	PLC_1 CPU 121	
Devices & networks	PLC_1 PNIO CPU1312C PMIO(W2EP PAGE CONTRACTOR CONTRACTO	Filter Profile: <all></all>
 PLC_1 [CPU 1212C AC/DC/Rly] 	PNIO PNIO	Controllers
Device configuration		▶ 🔄 HMI
🖞 Online & diagnostics		PC systems
Program blocks	PLC 1 PROFINETIO-Syste	Drives & starters
Technology objects	re_noniero system	Image: Interview of the second s
External source files		Detecting & Monitoring
PLC tags		Distributed I/O
PLC data types		Power supply and distribution
Watch and force tables		Field devices
Online backups		▼ ☐ Other field devices
Traces		Additional Ethernet devices
OPC UA communication		- Im PROFINETIO
Device proxy data		Drives
Program info	×	Encoders
PLC alarm text lists	< III > 100% •	✓ ☐ Gateway
Local modules	S7-1200 station_1 [S7-1200 Station]	🕨 🛅 Sdot
Distributed I/O		SIEMENS AG
La Ungrouped devices	General 10 tags System constants Texts	- 🛅 SOLIDOT
Security settings	▼ General A	 SOLIDOT PN4 SERIES
Cross-device functions	Project information	PN4-GW2FP
Common data	Project information	I/O
Documentation settings		Sensors
Languages & resources		PROFIBUS DP
Version control interface	Name: 57-1200 station_1	PROFIBUS PA
Gonline access	Comment:	
Card Reader/USB memory		
> Datalla view	Author: Administrator	> Information





4.3 Solidotech GW_MR Config tool configuration software

The configuration module requires configuration software, which can be obtained and installed from the CD-ROM or website. Users can easily complete the configuration of PN4-GW2MR using the gateway configuration software, including device IP address, subnet mask, gateway address and device name, serial port baud rate, parity, stop bit, communication protocol selection and protocol parameters, etc., and the conflict detection of the gateway memory mapping data can also be performed. The main interface is shown below:

X* Solidotech GW_MR Config Tool				3 7- 33		Х
File(<u>F)</u> Edit(<u>E)</u> Tool(<u>T</u>) Help(<u>H</u>)						
🗅 📾 स 🖕 ই 🤯 🖓 🐄 📕 🖕 🕼 🖨	÷					
E-PN4 GW2MRMaster	Function	2				
Port - 0:[ethernet]:[PROFINET]	Start address	0				
日 Port - 1:[Modbus]:[RTU]	Quantity	1				
⊟-Node	Memory mapping	0				
Read Discrete Inputs	Bit offset(0~7)	0				
E-Port - 2:[Modbus]:[RTU]	Scan mode	Fast	~			
	Status word	Disable	~			
	Respons err action	Hold	~			
Ready	·			[No av	/ailable (COM]



4.4 Operation

4.4.1 Data exchange

The data conversion between the PROFINET network and the serial port of the PN4-GW2MR is established through a "mapping" relationship. There are two data buffers in the PN4-GW2MR, one is the input buffer (1500 bytes) with the address range of 0x000-0x5DB, and the other is the output buffer (1500 bytes) with the address range of 0x5DC-0xBB7.

4.4.2 **PROFINET Slave Station**

Assuming that the user configures the length of the input data to be L1 and the length of the output data to be L2, the PN4-GW2MR will send the data in the address range of [0x000,L1] to the PROFINET network, and when the data is received from the PROFINET network, the PN4-GW2MR will write the data to the address range of [0x5DC,0x5DC+L2].

4.4.3 Modbus Master Station

When a serial port is running the Modbus master protocol, for all write register, write coil commands supported by the PN4-GW2MR, data can be fetched from the address range of 0x000-0x5DB, 0x5DC-0xBB7 and sent to the Modbus slave Station. For all Read Register, Read Coil commands supported by the PN4-GW2MR, the PN4-GW2MR will write the data returned from the Modbus slave to the 0x000-0x5DB range.

Note: The configurable number of commands per Modbus master is 32, and each command can read a set of consecutive Modbus registers.

4.4.4 Modbus Slave Station

When a serial port runs the Modbus slave protocol, no command needs to be configured. The module takes data from the address range of 0x000-0x5DB, 0x5DC-0xBB7 and sends it to the Modbus master.

4.4.5 Free port protocol

This version does not support



4.4.6 General mode - Q&A

When a serial port is running the general-purpose mode - question-and-answer protocol, the command request portion can be taken from any position in the buffer 0x000-0x5DB, 0x5DC-0xBB7, and then sent out to the slave serial device. When the slave device gives a response, the PN4-GW2MR will write the data portion of the response into the 0x000-0x5DB range if there is any data portion in the response, depending on the user's configuration.

4.4.7 General mode - receiving

When a serial port is running the general purpose mode-receive protocol, one of the PN4-GW2MR's serial ports only receives the data sent by the user's serial master device and does not respond in any way. In this mode the PN4-GW2MR writes the received data to a segment of the 0x000-0x5DB address range.

4.4.7.1 Command output method

The content of this section applies only to the Modbus master protocol and the general mode-question-and-answer protocol. Command execution process:

- 1. The timeout retransmission count is set to 0;
- 2. Sends a request frame for the command. After sending is complete, the response timeout timer starts timing;
- 3. Wait for a response frame to the command;
- 4. If a response frame is received within the response timeout period, a response is considered to be available, and whether the response is correct or not depends on the specific response format. If the response frame is correct, the command execution ends. If no response frame is received within the response timeout period, the response is considered to have timed out. In case of response error and response timeout, go to step 5;
- 5. Determine whether the retransmission count is 3, if it is 3, the command execution ends, otherwise, the timeout retransmission count is increased by one, and go to step 2.

Continuous output mode:

In the master protocol, each command has a unique command index number within each subnet.

When the master protocol operates in the continuous output mode (output command polling mode), it is executed in the following manner:

- 1. Execute nth command;
- 2. After the nth command is executed, n is increased by one, and if it is greater than the



maximum number of commands, n is set to 0. Re-enter step 1.



Varying output mode:

When the master station protocol works in the varying output mode, it is executed as follows:

- 1. If command n is a read command, execute command n. Otherwise, detect whether there is any change in the memory data mapping data contained in the request frame of command n, and execute command n if there is a change;
- 2. If command n is executed, wait for the completion of command n, n is increased by one, and if it is greater than the maximum number of commands, n is set to 0. Go to step 1 again.

4.4.7.2 Byte exchange method

There are 4 types of byte exchange: No exchange, 2-byte exchange, 4-byte register exchange, and 4-byte big endian and little endia exchange.

2-byte exchange: When using 2-byte exchange, the number of bytes exchanged must be an integer multiple of 2. 2-byte exchange is done in units of 2 bytes, and the exchange method is shown in the following table:

Before exchange		After exchange		
byte index	byte value	byte index	byte value	
0	0x12	0	0x34	
1	0x34	1	0x12	

4-byte register swap:

When using 4-byte register exchange, the number of bytes to be exchanged must be an integer multiple of 4. 4-byte register exchange is performed in units of 2 registers, and the exchange method is shown in the following table:

Before exchange		After exchange		
Byte index	Byte value	Byte index	Byte value	
0	0x12	0	0x56	
1	0x34	1	0x78	
2	0x56	2	0x12	
3	0x78	3	0x34	



4 byte big endian and little endia exchange:

When using 4-byte big endian and little endia exchange, the number of bytes to be exchanged must be an integer multiple of 4. 4-byte big endian and little endia exchange is performed in units of 4 bytes, and the method of exchange is shown in the following table:

Before exchange		After exchange			
byte index	byte value	byte index	byte value		
0	0x12	0	0x78		
1	0x34	1	0x56		
2	0x56	2	0x34		
3	0x78	3	0x12		



4.4.7.3 Control word

In order to enable the user to control the Modbus network through PROFINET, the concept of control word is introduced in the configuration of Modbus. If the control word is enabled, the control word occupies 2 words in the output data of PROFINET, as shown in the table below:

	High byte	Low byte
Word1	Port2 control bit	Port1 control bit
	High byte	Low byte
Word2	Reserve	Port3 control bit

Portx control bit: 0, Modbus master of this port is not activated, 1, Modbus master of this port is activated;

🛠 Solidotech GW_MR Config Tool				-		×
File(E) Edit(E) Tool(T) Help(H)						
🗅 📨 R 🖕 ই 🖬 🖏 🐄 📕 🖕 🐻 🔀	÷					
	Protocol type	Modbus maste	r Y			
	Baud rate	1200	~			
E-Port - 1:[Modbus]:[RTU]	Data bit	8	*			
⊢RIU ⊢Node	Parity	None	~			
	Stop bit	1	~			
	Transmission mode	RTU	×			
	Response timeout(ms)	100				
	Poll idle time(ms)	100				
	Write cmd poll mode	Cycle	*			
	Write cmd Pulse time(ms)	1000				
	Cmd scan rate(F/S)	10				
	Master Control Word	Disable	<u>~</u>			
Ready				[No a	vailable C	OM]





4.4.7.4 Status word

In order to easily obtain the execution status of each command under each master, a status word is introduced, which is specific to the Modbus master station protocol only.

🛠 Solidotech GW_MR Config Tool				-		×
File(E) Edit(E) Tool(T) Help(H)						
🗅 📾 🖶 🖕 🏣 🏭 📢 📢 🐝 🗮 🖕 🖾 🕕	÷					
PPN4_GW2MRMaster Deprive 0:[ethernet]:[PROFINET] Deprive 0:[ethernet]:[PROFINET]	Function	2				
	Start address	0				
PROFINE	Quantity	1				
	Memory mapping	0				
⊟-Node	Bit offset(0~7)	0				
-Read Discrete Inputs -Port - 2:[Modbus]:[RTU]	Scan mode	Fast	~			
L_RTU	Status word	Disable	¥			
	Respons err action	Hold	~			
Ready				[No	available	COM]



The status word uses each bit to indicate the success or failure of each command. When the command is executed successfully, the corresponding bit is set to 1, otherwise it is set to 0.

If the status word of a command is enabled, space is allocated for the input data of that command in the PROFINET, one bit per command. The status word is allocated in words, and the number of input data areas occupied (words) = (number of commands with the status word enabled + 15) / 16.

For example, two nodes are added, and 9 commands are added to each node, for a total of 18 commands.

		Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
	Low	Node1_							
	Byte	cmd8	cmd7	cmd6	cmd5	cmd4	cmd3	cmd2	cmd1
word	High	Node2_	Node1_						
	Byte	cmd7	cmd6	cmd5	cmd4	cmd3	cmd2	cmd1	cmd9
	Low							Node2_	Node2_
Word2	Byte	Reserve	Reserve	Reserve	Reserve	Reserve	Reserve	cmd9	cmd8
	High								
	Byte	Reserve							

For example, if all commands on node1 and node2 enable the status word, the number of input data areas occupied =(18+15)/16 = 2, i.e., two words are needed



For example, if command 1, command 4 and command 8 of node1 enable the status word, and command 3 and command 7 of node2 enable the status word, and the other commands are not enabled, the number of input data areas occupied =((3+2)+15)/16 = 1, i.e., 1 word is required.

		Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
	Low				Node2_	Node2_	Node1_	Node1_	Node1_
Marel 1	Byte	Reserve	Reserve	Reserve	cmd7	cmd3	cmd8	cmd4	cmd1
wordi	High								
	Byte	Reserve							

If all commands do not have an enable status word, no input data space is occupied.

Pre-configuration notes:

The configuration software is based on Windows platform and is used to configure the parameters and commands related to PN-TRU/RS485.

4.5 Software installation

The recommended computer configuration for installing the solidotech GW_MR Config tool (hereafter referred to as SCT) software is shown in the table below.

Environment	Туре	Model
	Monitor	Color CRT
Hardware environment	Input and output	Standard keyboard, mouse
	Usb interface	At least one 2.0 interface
	Display card	Resolution support 1280×1024
	CPU	Intel pentium 2.4GHz or above
	Memory	512M or more
	Hard disk	10G or more
Software environment	Operating system	Windows 7
	Application	Solidotech GW_MR Config
	software	Toolv2.0.5.10



The main steps for installing the SCT software are described below

Step 1 start the installation instruction

Double-click the installation package, the following figure will pop up, select the installation location and click next:

Setup - Solidotech GW_MR Config Tool version			×
Select Destination Location			P
Where should Solidotech GW_MR Config Tool be installed?			(10m)
Setup will install Solidotech GW_MR Config Tool into the fe	ollowii	ng folder.	
To continue, click Next. If you would like to select a different folder	r, <mark>cl</mark> ick	Browse.	
C:\Program Files (x86)\Solidotech GW_MR Config Tool	٦Г	Browse.	
At least 11.7 MB of free disk space is required.			
		-	

Step 2 select additional tasks

Select additional tasks pop-up window, select whether to "Create a desktop shortcut", and then left mouse click "Next", as shown in the figure.

Setup -	Solidotech GW_MF	Config Tool ver	sion	1903	
elect Sta	rt Menu Folder				F
Where :	should Setup place the p	program's shortcuts?			
	Setup will create the pr	og <mark>ram's shortcuts</mark> in	the follov	ving Start	Menu folder.
To cont	nue, click Next. If you w	ould like to select a	different f	older, clic	k Browse.
Solidot	ech GW_MR Config Tool				Browse
	t create a Start Menu fo	lder			
Don'	t create a <mark>Start Menu fo</mark>	lder			
<u>D</u> on'	t create a Start Menu fo	lder <u>B</u> acl	¢.	Next	Can



lect Additional Tasks	F
Which additional tasks show	uld be performed?
Select the additional tasks GW_MR Config Tool, then o	you would like Setup to perform while installing Solidotecl click Next.
Additional shortcuts:	
Create a <u>d</u> esktop short	icut
	Back Next Can
	<u>B</u> ack <u>N</u> ext Can
	<u>B</u> ack <u>N</u> ext Cane
etup - Solidotech GW	<u>Back</u> <u>N</u> ext Can
etup - Solidotech GW ady to Install Setup is now ready to begi	<u>Back</u> <u>Next</u> Cane
etup - Solidotech GW ady to Install Setup is now ready to begi computer.	Back Next Cana MR Config Tool version —
etup - Solidotech GW ady to Install Setup is now ready to begi computer. Click Install to continue witi change any settings.	<u>Back</u> <u>Next</u> Cana <u>MR Config Tool version</u> —
etup - Solidotech GW ady to Install Setup is now ready to begi computer. Click Install to continue witi change any settings. Destination location: C:\Program Files (x86	<u>Back</u> <u>Next</u> Cana <u>MR Config Tool version</u> —
etup - Solidotech GW ady to Install Setup is now ready to begi computer. Click Install to continue with change any settings. Destination location: C:\Program Files (x86 Start Menu folder: Solidotech GW_MR Co	<u>Back</u> <u>Next</u> Cana <u>MR Config Tool version</u> —
etup - Solidotech GW ady to Install Setup is now ready to begi computer. Click Install to continue witi change any settings. Destination location: C:\Program Files (x86 Start Menu folder: Solidotech GW_MR Co Additional tasks: Additional shortcuts:	Back Next Cana MR Config Tool version —
etup - Solidotech GW ady to Install Setup is now ready to begi computer. Click Install to continue witi change any settings. Destination location: C:\Program Files (x86 Start Menu folder: Solidotech GW_MR Co Additional tasks: Additional shortcuts: Create a desktop sh	Back Next Cana MR Config Tool version — — — — — — — — — — — — — — — — —
etup - Solidotech GW ady to Install Setup is now ready to begi computer. Click Install to continue wit change any settings. Destination location: C:\Program Files (x86 Start Menu folder: Solidotech GW_MR Co Additional tasks: Additional shortcuts: Create a desktop sh	<u>Back</u> Next Cana <u>MR Config Tool version</u> — — — in installing Solidotech GW_MR Config Tool on your th the installation, or click Back if you want to review or 5)\Solidotech GW_MR Config Tool onfig Tool hortcut



Step 3 installation completion prompt

When the installation is complete, the "SCT installation completion wizard" Window will pop up. Left click on "Finish" To run SCT immediately, as shown in the figure.

🛠 Setup - Solidotech GV	<i>N</i> _MR Config Tool version $ \Box$ \times
	Completing the Solidotech GW_MR Config Tool Setup Wizard
Tion	Setup has finished installing Solidotech GW_MR Config Tool on your computer. The application may be launched by selecting the installed shortcuts. Click Finish to exit Setup. Launch Solidotech GW_MR Config Tool
	Einish



4.6 User interface introduction

The user interface has three main components, as shown below:

- Device window: Used to enumerate device information, including: Ports, protocols, commands, etc;
- > Configuration window: Used to configure parameters;
- > Description window: Used to display description information.

🛠 Solidotech GW_MR Config Tool						×
File(<u>E)</u> Edit(<u>E)</u> Tool(<u>I</u>) Help(<u>H</u>)						
🗅 💩 🖶 🝦 🏣 🏭 🖏 🖏 💭 🖕 🐻 🖨						
	Protocol type	Modbus master	~			
	Baud rate	1200 ~				
E-Port - 1:[Modbus]:[RTU]	Data bit	8 ~				
	Parity	None Y				
	Stop bit	1 ~				
	Transmission mode	RTU ~				
	Response timeout(ms)	100				
	Poll idle time(ms)	100				
	Write cmd poll mode	Cycle ~	61			
	Write cmd Pulse time(ms)	1000				
Ready				[No a	vailable	COM]



4.7 Device window

4.7.1 Introduction to the device window

The device window adopts a tree structure, the root node is the selected gateway device, each actual physical interface of the gateway device corresponds to each port of the device's child node, each port child node corresponds to the type of protocol supported by this port, and according to the different protocols you can continue to the next sub or the protocol is used as a leaf node (tail node).

For example, in the case of the Modbus-RTU protocol, when acting as a master, the child nodes are the individual Modbus slaves under this master, and the child nodes of the slaves are in turn the commands configured for this slave. If you want to set the parameters of each hierarchical node, you can click on this node, and in the configuration window on the right, you can realistically set its parameters. The device window is shown below:

E-P	N4_GW2 -Port - (MRMaste D:[etherne	er et]:[PROI	FINET]	
E	ーPRC 于Port - 1 白-RTU 白-	Node	s]:[RTU]		
B	-Port - 2	Write -Write 2:[Modbu	Holding Muliple s]:[RTU]	Registe Register	rs rs





4.7.2 Device window operation

- Add node operation: Click the left mouse button on a subnet or node, select the node, and then perform the add node operation. Add a node with the name "Node" To the subnet;
- Delete node operation: Click the left mouse button, select the node to be deleted, and then execute the delete node operation. The node and its command nodes are all deleted;
- Add command operation: Click the left mouse button on the node, and then execute the add command operation to add commands for the node, and the select command dialog box will pop up for the user to choose as shown in the following figure:

Select comm	nand		×
Read Coils	1		
Read Discre	te Inputs		
Read Holdir	ng Registers		
Read Input	Registers		
Write Single	e Coil		
Write Single	e Register		
Write Mulip	le Coils		
Write Mulip	le Registers		
	OK	Cancel	

Delete command operation: Click the left mouse button, select the command to be deleted, and then execute the delete command operation, the command is deleted.



4.8 Configuration window

4.8.1 **PROFINET** configuration

R Solidotech GW_MR Config Tool				1.000		\times
File(<u>F)</u> Edit(<u>E)</u> Tool(<u>I</u>) Help(<u>H</u>)						
। 🗅 📾 📮 ই 🗱 🖓 🐄 🗮 📮 🐻 🔞	Ţ					
E-PN4_GW2MRMaster	IP Set Mode	Static	~			
Port - 0:[ethernet]:[PROFINET] Port - 1:[Modbus]:[RTU]	IP	192.168.0.5				
Port - 2:[Modbus]:[RTU]	Mask	255.255.255.0)			
	Gateway	0.0.0.0				
	FieldBus Offline Action	Hold	~			
	PROFINET PORT					
Ready				[No a	available	COM]

The above parameters are described below:

- Ip address: Ip address of the device; (note: Must be the same as the ip address set by the TIA PORTAL software)
- Subnet mask: Device subnet mask;
- Gateway address: The address of the gateway on the LAN;



4.8.2 Modbus master station

Configurable parameters are: Modbus communication baud rate, data bits, parity mode, stop bit, communication transmission mode, response waiting time, polling delay time, output command polling mode, pulse output time, scanning ratio, and master control word, and the configuration interface is as follows:

	Protocol type	Modbus master	~		
Port - 0:[ethernet]:[PROFINET]	Baud rate	1200 ~	1		
E-Port - 1:[Modbus]:[RTU]	Data bit	8 ~			
B-Node	Parity	None Y			
	Stop bit	1 ~	1		
	Transmission mode	RTU ~			
	Response timeout(ms)	100]		
	Poll idle time(ms)	100			
	Write cmd poll mode	Cycle ~			
	Write cmd Pulse time(ms	s) 1000			
			7		

- Modbus communication baud rate: 1200bit/s, 2400bit/s, 4800bit/s, 9600bit/s, 19200bit/s, 38400bit/s, 57600bit/s, 115200bit/.
- Data bits: 7, 8, 9.
- > Parity mode: None, odd, even.
- Stop bit: 1 bit, 2 bits.
- > Communication transmission mode: RTU.
- Response waiting time: When Modbus master sends a command, wait for the slave to respond, range: 100ms~50000ms.
- Polling delay time: When the Modbus master sends a command and receives a correct response or a response times out, the delay time before sending the next Modbus command ranges from 0 to 2500m.
- Output command polling mode: Modbus write command, there are four output modes: Continuous output, prohibit output, variable output and pulse output.
 Continuous output: Same as Modbus read command output, scanning output according



to scanning ratio;

Prohibit output: Prohibit output of Modbus write command;

Variable output: Outputs the write command when there is a change in the output data and stops the output after receiving the correct response data;

Pulse output: Outputs the write command in accordance with the pulse period.

- > Pulse output time: Pulse time of the pulse output method.
- Scanning ratio.
- Status word: Status word switch, enable it to configure status word for this subnet, disable it to not configure status word for this subnet.
- Control word: Control word switch, enable it to configure control word for this subnet, disable it to not configure control word for this subnet.



4.8.3 Node configuration

In "Modbus master" Mode, in the device window interface, click on the node, and the configuration window interface will be displayed as follows:

🛠 Solidotech GW_MR Config Tool				×
File(<u>F)</u> Edit(<u>E</u>) Tool(<u>T</u>) Help(<u>H</u>)				
🗈 📾 🖕 ই 🦝 🗐 🗐 🐄 🗮 🖕 🐻 🕻	-			
□-PN4_GW2MRMaster □-Port - 0:[ethernet]:[PROFINET] □-Port - 1:[Modbus]:[RTU] □-RTU □-RTU □-Port - 2:[Modbus]:[RTU]	Slave ID 2			
Ready	L	 [No a	va <mark>ila</mark> ble (COMJ



4.8.4 Command configuration interface

In the device window interface, when Modbus master is selected for protocol type, click the new command, and the configuration window interface is displayed as follows:

R Solidotech GW_MR Config Tool				8 8		×
File(<u>F)</u> Edit(<u>E)</u> Tool(<u>T)</u> Help(<u>H</u>)						
🗅 📾 स 🖕 ই 🤂 🕅 🐄 🗮 🖕 🐻 🛈	-					
E-PN4_GW2MRMaster	Function	3				
Port - 0:[ethernet]:[PROFINET]	Start address	0				
	Quantity	1				
Ė-Node	Memory mapping	0				
-Read Holding Registers	Byte swap	Not excha	ange 🖌			
Port - 2:[Modbus]:[RTU]	Scan mode	Fast	~			
	Status word	Disable	*			
	Respons err action	Hold	~			
Ready				[No	available	COM]

- Modbus register starting address: Starting address of registers, switches, coils, etc. In Modbus slave devices, range: 0 to 65535;
- > Number of registers: The number of registers, switches, and coils in the Modbus slave device;
- Memory mapped starting address: The starting address of the data in the module memory buffer, the address range of the data mapped in the gateway memory: Read command: 0x000~0x5db (0~1499)
 Write command: 0x5dc~0xbb7 (1500~2999)
 The write command can also be used as a local data exchange: 0x000~0x5db (0~1499)



4.8.5 Control and status words

The device supports control word and status word, which are used to control whether the Modbus port works or not and get the status of each Modbus command respectively. The controller and status words are not enabled by default, and users can choose to enable them through the configuration software, as shown below:

🛠 Solidotech GW_MR Config Tool			- 🗆 X
File(<u>F)</u> Edit(<u>E)</u> Tool(<u>T</u>) Help(<u>H</u>)			
🗈 🐱 🕂 ই 🗸 🗐 🗐 🗞 🗮 📜 🐻 🕻	• .		
E-PN4_GW2MRMaster	Protocol type	Modbus master 👻	
Port - 0:[ethernet]:[PROFINET] Dert - 1:[Modbus]:[RTU]	Baud rate	1200 ~	
Ė RTU	Data bit	8 ~	
⊢Read Discrete Inputs	Parity	None Y	
Port - 2:[Modbus]:[RTU]	Stop bit	1 ~	
-RIU	Transmission mode	RTU ~	
	Response timeout(ms)	100	
	Poll idle time(ms)	100	
	Write cmd poll mode	Cycle ~	
	Write cmd Pulse time(m	s) 1000	
	Cmd scan rate(F/S)	10	
	Master Control Word	Disable 👻	
Ready			[No available COM]



🛠 Solidotech GW_MR Config Tool				-	×
File(<u>F)</u> Edit(<u>E)</u> Tool(<u>T</u>) Help(<u>H</u>)					
🗅 📨 स 🖕 ই 🗟 🕼 🕅 🐄 🗶 🖕 🛙	ē 0 .				
E-PN4 GW2MRMaster	Function	2			
Port - 0:[ethernet]:[PROFINET]	Start address	0			
E Port - 1:[Modbus]:[RTU]	Quantity	1			
⊟-Node	Memory mappin	g 0			
Read Discrete Inputs	Bit offset(0~7)	0			
RTU	Scan mode	Fast	~		
	Status word	Disable	~		
	Respons err actio	n Hold	~		
Peadu				(No.	 COM



After the user enables the control word and status word, the user can control the port through the control word and check the status of each Modbus command through the status word in TIA.

For example, the gateway module PN4-GW2MR maps the output address: QB374-405 and the input address: IB354-385. in the configuration software, the PN4-GW2MR enables the port1, port2, and port3 control words: port_1_CtrlWord occupies QB374, port_2_CtrlWord occupies QB375, and port_3_CtrlWord occupies QB376; and port_3_CtrlWord occupies QB376. port_1_CtrlWord occupies QB374, port_2_CtrlWord occupies QB375, port 3 CtrlWord occupies QB376;

Enable the status words of commands 1-4 (one node is inserted into each of port1 and port2, two commands are inserted into each node, and the status word occupies one word), as follows:

1	Iodule	 Rack	Slot	l address	Q addre	ss	Туре		A	rticle no.
<u>-</u>	PN4-GW2MR	0	0				PN4	-GW2MR		PN4-GW2MR
~	Interface	0	0 X1				PN4	-GW2MR		
~	Input 032 bytes_1	0	1	354385			Input	032 bytes		
	Output 032 bytes_1	0	2		37440	5	Outp	ut 032 byt	es	
	port_1_CtrlWord	Ву	te	%QB3	74				\checkmark	16#01
-	port_2_CtrlWord	By	te	%QB3	75					16#01
-	port_3_CtrlWord	Ву	te	%QB3	76					16#01
-	reserved	Ву	te	%QB3	77					16#00
-00	status_Word	W	ord	%IW35	4					16#000F

The control word is accessed by byte, when the control word of a port is 0, the port is working normally, when it is 1, the port stops working.

The status word is accessed by bit. When the status word of a command is 0, it means that the communication of the command is wrong, and when it is 1, the communication of the command is normal.



4.9 Conflict detection

Select "Check" In "Tools" To detect if there is any conflict in the memory mapped data, if there is conflict, you can adjust it in time, as shown in the following figure:



4.9.1 Command list operation

The command list lists all supported commands, the check box before each command is used to check each type of command, it is checked by default, if unchecked, this type of command will not participate in the memory mapping check. As shown in the following figure:

Command list	
✓ Read Coils	
Read Discrete Inputs	
Read Holding Registers	
Read Input Registers	
✓ Write Single Coil	
✓ Write Single Register	
✓ Write Muliple Coils	
✓ Write Muliple Registers	

4.9.2 Memory-mapped operation

Memory mapping distinguishes between input and output areas, with each square representing a byte address.



Output : Blue color is displayed when the address mapping area is located in the output area and there is no conflict;

Swap : The write command displays yellow when the address mapping area is in the input area



and there is no conflict;

Conflict : In the input area or output area, different commands occupy the same byte address, the byte area is displayed in red.





4.10 Communication configuration

4.10.1 Download serial port settings

Select "Communication settings" In "Tools", the software will automatically search for available serial ports on the PC, if the PC does not search for available serial ports, a dialog box will pop up, as shown below:



If you select tcp interface, the communication settings dialog box will be displayed, click "Search" To search the ethernet information of the corresponding gateway, and then click "Select" Button.



4.10.2 Download configuration

Select download configuration to download the configured gateway information to the gateway device;

4.10.3 Upload configuration

Select upload configuration to upload the gateway configuration information from the device to the configuration software;

4.11 Loading and saving configurations

4.11.1 Save configuration project

📯 Save				×
← → ∽ ↑ 📕	> This PC > Documents > PROJECT	~ Ŭ	Search PROJECT	Ą
Organise 🔹 Nev	N folder			· · · ?
This PC Desktop	▲ Name ▲	Date modified	Туре	Size
 Documents Downloads Music Pictures Videos 				
🐌 Local Disk (C: 🧅 Data (D:) 🗳 Network) ~ <			>
File <u>n</u> ame:	TEST.dsn			~
Save as type:	*.dsn			~
 Hide Folders 			Save	Cancel

Select "Save" In "File" To save the configured project as a .dsn file, as shown below:



4.11.2 Load configuration project

You can open a saved .dsn file by selecting "Open" In "File".

⊢ → × ↑ 📜 > This	PC > Documents > PROJECT	マ ひ Search	PROJECT P
Organise • New folder			:= • 🔟 🕜
A Quick access	^ Name	Date modified	Type Si
	TEST.dsn	10/04/2024 17:23	Data Source Name
This PC			
Desktop Documents			
Downloads			
Music			
Music			
 Music Pictures Videos 			
 Music Pictures Videos Local Disk (C:) 			
 Music Pictures Videos Local Disk (C:) Data (D:) 			
 Music Pictures Videos Local Disk (C:) Data (D:) Network 	~ <		
 Music Pictures Videos Local Disk (C:) Data (D:) Network 	< ✓ < TEST.dsn	v] *.dsn	~

4.11.3 Engineering encryption

Set or change your password as follows:

1. In the SCT interface, add "Permission settings" To "Tools" In the menu;

2. Click "Permission settings" To bring up the "Permission settings" Dialog box;

3. If encrypted for the first time the current password column is grayed out and not editable;

	 11		
Password			
New			
Confirm			

4. If it is not the first time to encrypt the password, you have to enter the current password for comparison first, and only when the comparison is successful and the two new passwords are the same, can you change the password successfully;



Project encrypt	on	
Password New Confirm		

5. If you set the password successfully and then download the project, the project stored in the gateway is encrypted;

6. If you click the "Tools" Menu "Upload" Item, if you have not set the project password, it will be opened directly, if you have set the project password, first of all, the pop-up dialog box to enter the password, enter the password, you can open the project.

4.12 Example description

1. Parameterization

Slave device: Set slave address: 2, baud rate: 38400, data bits: 8, parity: None, stop bit: 1.

PN4-GW2MR gateway:

Slave address: 2, as follows



Solidotech GW_MR Config Tool		-		×
File(<u>F)</u> Edit(<u>E)</u> Tool(<u>T</u>) Help(<u>H</u>)				
े 🗅 🧀 🖶 🚦 🧮 🦝 📢 🐄 🗮 🖕 🗺 🌒	Ð .			
B-PN4_GW2MRMaster	Slave ID 2			
Ready	m	[No a	vailable	COM]

Serial port1 communication parameters:

🛠 Solidotech GW_MR Config Tool				8 		×
File(<u>F)</u> Edit(<u>E)</u> Tool(<u>T</u>) Help(<u>H</u>)						
🗅 📾 🖶 📮 🏭 🏜 📢 체 🐄 📕 🖕 🐻	0 <u>.</u>					
E-PN4_GW2MRMaster	Protocol type	Modbus ma	aster ~			
Port - 0:[ethernet]:[PROFINET] Port - 1:[Modbus]:[RTU]	Baud rate	38400 ~				
	Data bit	8 ~				
	Parity	None	~			
	Stop bit	1	v			
	Transmission mode	RTU	~			
	Response timeout(ms)	100				
	Poll idle time(ms)	100				
	Write cmd poll mode	Cycle	~			
	Write cmd Pulse time(ms	s) 1000				
Ready				[No a	available	COM



2. Data mapping

1) PN4-GW2MR gateway, insert the command as follows:

Read holding register starting address: 5000, length: 2, me	emory map starting address: 0;
---	--------------------------------

				×
File(<u>F)</u> Edit(<u>E)</u> Tool(<u>T</u>) Help(<u>H</u>)				
🗅 📨 🗛 🖕 ই 🎝 🖓 🐄 🗮 🖕 🐻	0 .			
E-PN4 GW2MRMaster	Function	3		
Port - 0:[ethernet]:[PROFINET]	Start address	5000		
	Quantity	2		
	Memory mapping 0			
	Byte swap	Not exchange ~		
Port - 2:[Modbus]:[RTU]	Scan mode	Fast ~		
	Status word	Disable Y		
	Respons err action	Hold ~		

Write multiple registers starting address: 5002, length: 2, memory map starting address: 1500;



🛠 Solidotech GW_MR Config Tool	- 🗆 X
File(<u>F)</u> Edit(<u>E)</u> Tool(<u>T)</u> Help(<u>H</u>)	
i 🗅 📾 🖶 🚦 🧮 🏭 📢 🐄 📕 👷 🐻 🔀 💭 🖕	
E-PN4_GW2MRMaster Function	16
Port - 0:[ethernet]:[PROFINET] Start address	5000
Deport - 1:[Modbus]:[RTU] Quantity	2
hode Memory mapping	1500
-Read Holding Registers Write Muliple Registers	Not exchange ~
Port - 2:[Modbus]:[RTU] Scan mode	Fast ~
Status word	Disable Y

3. Set the ip address, device name, and submodule address of the gateway module in the portal as follows

PN4-GW2MR[PN4-GW2MR			💁 Properties 🚺 Info 追 🗓 Diagnostics 💷 🗆
General	IO tags	System co	nstants Texts	
General		Π		Add new subnet
· PROFINET inte	erface [X1]			
General		Inte	rnet protocol version 4 (IPv4)
Ethernet a	ddresses			
 Advanced 	options			Set IP address in the project
Interfac	e options			IP address: 192 168 0 11
Real tin	ne settings			Subnetmarki ass ass o
▼ Port 1 [X1 P1 R]			Subhet mask: 255.255.0
Gen	eral			Synchronize router settings with IO controller
Port	interconnectio	n		Use router
Port	options			Router address: 0 0 0 0
▼ Port 2 [X1 P2 R]			O IP address is set directly at the device
Gen	eral	-		
Port	interconnectio	n 🖡 📭	CINET	
Port	options	PRO	FINEI	
Identification	& Maintenance	e		Generate PROFINET device name automatically
			PROFINET device name:	PN4-GW2MR
			Converted name:	PN4-GW2MR
			Device number:	4
<		>		



2MODBUS_RTU_485 > Ungrouped devices > PN4-GW2MR[PN4-GW2MR]							_ 7	X	
					T T	opology view	Network view	Device view	
Device	overview								
**	Module	Rack	Slot	I address	Q address	Туре	Article no.	Firmware	
	▼ PNIO	0	0			PN4-GW2MR	1234567		^
	Interface	0	0 X1			PNIO			
	Input 004 bytes_1	0	1	9497		Input 004 bytes			
	Output 004 bytes_1	0	2		114117	Output 004 bytes			=
		0	3						
		0	4						
		0	5						
		0	6						
		0	7						
		0	8						
		0	9						
		0	10						~
<				1				>	

4. The PN4-GW2MR is configured in the configuration software with the same parameters as in the portal, including ip address and device name.

Ip address:

IP Set Mode	Static ~	
IP	192.168.0.5	
Mask	255.255.255.0	
Gateway	0.0.0.0	
FieldBus Offline Action	Hold ~	

Device name:

E-PN4_GW2MRMaster	Device Name PN4_GW2MR
Port - 0:[ethernet]:[PROFINET]	
Port - 1:[Modbus]:[RTU]	
B-Port - 2:[Modbus]:[RTU]	

5. After downloading the configuration for each module, the monitoring data is as follows:

j∰ D	ata_bl	▶ ➡ 📰 前 ock_2			_		_	_	
-	N	ame	Data type	Start value	Retain	Accessib	Writable	Visible in	Modify value
1	-	Tag_78	Word	%QW114 💌					16#048F
2	-	Tag_79	Word	%QW116					16#0066
З	-	Tag_80	Word	%IW94					16#0032
4	-	Tag_81	Word	%IW96					16#0062



🖾 Bus Hound					
Capture	Save	Settings Devices Help Exit			P <mark>er</mark> isoft
Device	Phase	Data	Description	Delta	Cmd.Phase.Ofs(rep) 🔺
39 39 39 39 39 39 39 39 39	IN IN IN IN IN IN IN IN	02 10 13 8a 00 02 04 04 8f 00 66 1d 3 02 10 13 8a 00 02 64 95 02 03 13 88 00 02 40 96 02 03 13 88 00 02 40 96 02 10 13 8a 00 02 04 04 8f 00 66 1d 3 02 10 13 8a 00 02 64 95 02 03 13 88 00 02 40 96 02 03 13 88 00 02 40 96 02 03 13 88 00 02 40 95	56. 	11sc 94ms 21ms 184ms 44ms 95ms 92ms 125ms 43ms	1.1.0 2.1.0 3.1.0 4.1.0 5.1.0 6.1.0 ₹.1.0 8.1.0 8.1.0 9.1 0
39 39 39 39 39 39	IN IN IN IN IN IN	02 10 13 8a 00 02 04 04 8f 00 66 1d 3 02 10 13 8a 00 02 64 95 02 03 13 88 00 02 40 96 02 03 13 88 00 02 40 96 02 03 40 00 32 00 62 e9 15	5	45ms 112ms 76ms 15ms 99ms 40ms	10.1.0 11.1.0 12.1.0 13.1.0(2) 14.1.0(2)

4.13 Clear gateway configuration



- To clear the gateway configuration, you need to press and hold then power up 2s and release to clear the gateway configuration.
- Use an insulated tool with a diameter or thickness of less than 1.2mm for the reset tool.

5 Mounting

5.1 Mechanical dimensions

Size: 25mm (w) x 102mm (h) x 72mm (d)

5.2 Installation

35mm din rail mounting







6 Operation and maintenance and precautions

- > Modules need to be protected from heavy pressure to prevent damage;
- > The module needs to be protected from heavy impact to prevent damage to the device;
- The supply voltage is controlled within the requirements of the manual to prevent internal devices from burning out;
- > The module prevents water ingress and damage to internal devices;
- Please check the wiring before powering up to prevent damage to the module by connecting it incorrectly.