PROFINET Communication Card

Version 1.0, Edit date 8/24



Safety precautions

The extension card can be installed and operated only by people who have taken part in professional training on electrical operation and safety knowledge, obtained the certification, and been familiar with all steps and requirements for installing, performing commissioning on, operating, and maintaining the device, and are capable of preventing all kinds of emergencies.

Before installing, removing, or operating the communication card, read the safety precautions described in this manual and the variable-frequency drive (VFD) operation manual carefully to ensure safe operation.

For any physical injuries or damage to the device caused due to your neglect of the safety precautions described in this manual and the VFD operation manual, our company shall not be held liable.

- You need to open the housing of the VFD when installing or removing the communication card. Therefore, you must disconnect all power supplies of the VFD and ensure that the voltage inside the VFD is safe. For details, see the description in the VFD operation manual. Severe physical injuries or even death may be caused if you do not follow the instructions.
- Store the communication card in a place that is dustproof and dampproof without electric shocks or mechanical pressure.
- The communication card is electrostatic sensitive. Take measurements to prevent electrostatic discharge when performing operations involving it.
- Tighten the screws up when installing the communication card. Ensure that it is firmly fixed and properly grounded.

Contents

Product confirmation2
PROFINET communication card2
2.1 Overview
2.2 Features2
2.3 Electrical wiring
2.4 Communication4
2.4.1 Packet format4
2.4.2 PROFINET I/O communication4
2.5 Example of PLC communication10
2.5.1 Parameter configuration10
2.5.2 Create a new project12
2.5.3 Add GSD files13
2.5.4 Configure the basic information of the project13
2.5.5 Assign the device name of the IO device (UNITRONICS communication card)17
2.5.6 Save, compile, and download18
2.5.7 VFD parameter watching19

Product confirmation

Check the following after receiving a communication extension card product:

- Whether the communication card is damaged.
- Whether the received communication card is the one you purchase according to the bar code label on the PCB.
- Whether all the following items are contained in the product package:
- One communication card, one tie wrap, one tie, one M3 screw, and one manual
- If the communication card is damaged, a wrong model is delivered, or some items are missing, contact the supplier in a timely manner.
- Confirm the environmental requirements for application.

Table 0-1	Environmental	requirements
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ltem	Requirement
Operation temperature	-10–+50°C
Storage temperature	-20–+60°C
Relative humidity	5%–95%
Other weather conditions	No condensation, ice, rain, snow, or hail; solar radiation < 700 W/m^2
Air pressure	70–106 kPa
Vibration and impact	5.9m/s ² (0.6g) at the sine vibration of 9 Hz to 200 Hz

PROFINET communication card

2.1 Overview

- 1. Thanks for choosing UNITRONICS PROFINET communication cards. This manual describes the function specifications, installation, basic operation and settings, and information about the network protocol. To ensure that you install and operate the product properly, read this manual and the communication protocol section in the VFD operation manual carefully before you use the product.
- 2. This manual only describes how to operate the PROFINET communication card and the related commands but does not provide details about the PROFINET protocol. For more information about the PROFINET protocol, read the related specialized articles or books.
- This communication card is defined as a PROFINET slave station communication card and is used on a VFD that supports PROFINET communication (B7 Series).
- 4. The communication card supports the linear network topology and star-shaped network topology.
- 5. The communication card supports 32 inputs/outputs to read and write process data, read state data, and read and write function parameters of a VFD.

2.2 Features

1. Supported functions

- Supports the PROFINET protocol, and supports PROFINET I/O devices
- > Provides two PROFINET I/O ports and supports the 100 M full-duplex operation
- Supports the linear network topology and star-shaped network topology.

2. Supported communication types

Standard Ethernet channels:

Standard Ethernet channels are non real-time communication channels that use the TCP/IP protocol, and are mainly used for device parameterization and configuration and to read diagnosis data.

Real-time (RT) communication channels:

RT channels are optimized channels for real-time communication. They take precedence over TCP (UDP)/IP, which ensures that various stations on a network perform data transmission with high time requirements at a certain interval. The bus period may reach the precision of millisecond. These channels are used to transmit data such as process data and alarm data.

Isochronous real-time (IRT) communication channels

IRT channels are implemented through the built-in Switch-ASIC IRT chip. IRT communication can further shorten the processing time of the communication stack software, synchronizing data transmission of the program and device. The transmission delay is less than 1 ms, and the jitter is less than 1 µs. The typical application is motion control.

3. Communication ports

Standard RJ45 ports are used in PROFINET communication. The communication card provides two RJ45 ports with no transmission direction defined, and therefore you can insert a cable into the port

without regard to its direction. Figure 0-1 shows the ports, and Table 0-1 describes the functions of the ports.



Figure 0-1 Two standard RJ45 ports

Table 0-1 Standard RJ45 port pins

Pin	Name	Description
1	TX+	Transmit Data+
2	TX-	Transmit Data-
3	RX+	Receive Data+
4	n/c	Not connected
5	n/c	Not connected
6	RX-	Receive Data-
7	n/c	Not connected
8	n/c	Not connected

4. State indicators

PROFINET communication card provides nine LED indicators to indicate its states. Table 0-2 describes the state indicators.

LED	Color	State	Description
LED1	Green		3.3 V power indicator
		On	Not connected through a network cable
LED2 (Bus state indicator)	Red	Blinking	Connected to the PROFINET controller through a network cable, but no communication established
		Off	Communication established with the PROFINET controller
LED3	Deal	On	PROFINET diagnosis enabled
(System fault indicator)	Rea	Off	PROFINET diagnosis disabled
		On	TPS-1 communication stack started
LED4 (Slave ready indicator)	Green	Blinking	TPS-1 waits for the initialization of MCU
(Otave ready indicator)		Off	TPS-1 communication stack not started
LED5 (Maintenance state indicator)	Green		Defined by the manufacturer, depending on the characteristics of the device
LED6/7	Green	On	PROFINET communication card connected to the PC/PLC through a network cable
(Network port state indicator)		Off	PROFINET communication card not connected to the PC/PLC
LED8/9	Gran	On	PROFINET communication card communicating with the PC/PLC
indicator)	Green	Off	PROFINET communication card not communicating with the PC/PLC

Table	0-2	State	indicators
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2.3 Electrical wiring

PROFINET communication card provides standard RJ45 ports and supports the linear and star

topologies. Figure 0-2 and Figure 0-3 show the electrical wiring diagrams for different topologies.

Use CAT5, CAT5e, and CAT6 network cables for electrical wiring. When the communication distance is greater than 50 meters, use high-quality network cables that meet the national standards.



Figure 0-2 Electrical wiring diagram for a linear topology

Note: For the star-shaped network topology, you need to use a PROFINET switch.



Figure 0-3 Electrical wiring diagram for a star topology

2.4 Communication

2.4.1 Packet format

Table 0-3 describes the structure of an RT frame (non-synchronous).

Table 0-3 Structure of an RT fra	ame
----------------------------------	-----

Data header	Ethernet type	VLAN	Ethernet type	Frame identifier	RT user data	Perioc count	d D er s	Data State	Transmission state	FCS
	2 bytes	2 bytes	2 bytes	2 bytes	36–1440 bytes	2 byte	s 1	byte	1 byte	4 bytes
	0x8100		0x8892							
	VLAN flag					APDU	state			
Data head	Data header									
7-byte prea	byte preamble 1-byte synchronization 6-byte source MAC address 6-byte destination MAC address									

Table 0-4 describes the structure of the IRT frame (synchronous).

Table 0-4 Structure of an IRT frame

Data header				Ethernet type	VLAN	Ethernet type	Frame identifier	IRT user data	FCS
7-byte preamble	1-byte synchronization	6-byte source MAC address	6-byte destination MAC address	2 bytes	2 bytes	2 bytes	2 bytes	36–1440 bytes	4 bytes

2.4.2 PROFINET I/O communication

The PROFINET communication card supports 16-word input/output. Figure 0-4 shows the packet format for transmitting data with a VFD.

•	Fixed -	P	rocess d (PZD) Distributa	ata				
PKW1	PKW2	PKW3	PKW4	CW SW	PZD2 PZD2	PZD3 PZD3		PZD12 PZD12

Figure 0-4 Packet structure

By using the 32 inputs/outputs, you can set the reference parameters of the VFD, monitor the status values, transmit control commands, monitor the running state, and read/write the function parameters of the VFD. For specific operations, see the following description.

Parameter zone:

PKW1—Parameter identification

PKW2—Array index number

PKW3—Parameter value 1

PKW4—Parameter value 2

Process data:

CW-Control word (transmitted from the master to a slave. For description, see

Table 0-5)

SW—Status word (transmitted from a slave to the master. For description, see Table 0-7.)

PZD—Process data (defined by users)

(When the process data is output by the master to a slave, it is a reference value; and when the process data is input by a slave to the master, it is an actual value.)

PZD zone (process data zone): The PZD zone in a communication packet is designed for controlling and monitoring a VFD. The master and slave stations always process the received PZD with the highest priority. The processing of PZD takes priority over that of PKW, and the master and slave stations always transmit the latest valid data on the interfaces.

CWs and SWs

Using CWs is the basic method of the fieldbus system to control VFDs. A CW is transmitted by the fieldbus master station to a VFD device. In this case, the adapter module functions as a gateway. The VFD device responds to the bit code information of the CW and feeds state information back to the master through an SW.

Reference value: A VFD device may receive control information in multiple channels, including analog and digital input terminals, VFD control panel, and communication modules such as RS485 To enable the control over VFD devices through PROFINET, you need to set the communication module as the controller of the VFD device.

Actual value: An actual value is a 16-bit word that includes information about VFD device operation. The monitoring function is defined through VFD parameters. The conversion scale of an integer transmitted as an actual value from the VFD device to the master depends on the set function. For more description, see the related VFD operation manual.

Note: A VFD device always checks the bytes of a CW and reference value.

Task packet (master station -> VFD)

CW: The first word in a PZD task packet is a VFD CW. You can select the expression method according

to P15.43. Table 0-5 and Table 0-6 describe the control words (CWs) of the B7 series VFD.

Bit	Name	Value	Description
		1	Forward running
		2	Reverse running
		3	Forward jogging
		4	Reverse jogging
0–7	Communication-based control	5	Stop
		6	Coast to stop (emergency stop)
		7	Faultreset
		8	Jogging to stop
		9	Decelerate to stop
8	Enable writing	1	Enable reading and writing (PKW1-PKW4)
0.10	Mater group patting	00	Motor 1
9-10	Motor group seturig	01	Motor 2
11	Control mode ou itabies	1	Enable torque/speed control switching
	Control mode switching	0	Disable switching

Bit	Name	Value	Description
12	Reset power consumption to zero	1	Enable
		0	Disable
10	Dre excitation	1	Enable
13	Pre-excitation	0	Disable
14	DC braking	1	Enable
		0	Disable
15	l la antha a tha fanan a a	1	Enable
		0	Disable

Table 0-6 B7 series VFD CWs expressed in binary format

Bit	Name	Description	Priority
0	Forward running	0: Decelerate to stop 1: Forward running	1
1	Reverse running	0: Decelerate to stop 1: Reverse running	2
2	Faultreset	0: Disable 1: Enable	3
3	Coast to stop	0: Disable 1: Enable	4
4	Forward jogging	0: Disable 1: Enable	5
5	Reverse jogging	0: Disable 1: Enable	6
6	Jogging to stop	0: Disable 1: Enable	7
7	1	Reserved	
8	Enable reading and writing (PKW1- PKW4)	0: Disable 1: Enable	
9	1	Reserved	
10	Decelerate to stop	0: Disable 1: Enable	0: Top priority
11–15	1	Reserved	

Reference value (REF): The second to twelfth words in a PZD task packet are the main settings. The

main frequency settings are provided by the main setting signal source. Table 0-7 describes the settings of B7 series VFD.

Function code	Word	Value range	Default value
P16.32	Received PZD2	0: Invalid	0
P16.33	Received PZD3	1: Set frequency (0–Fmax, unit: 0.01 Hz) 2: PID reference (-1000–1000, in which 1000 corresponds to 100.0%)	0
P16.34	Received PZD4	3: PID feedback (-1000–1000, in which 1000 corresponds to 100.0%) 4: Torque setting (-3000–+3000, in which 1000 corresponds to 100.0% of the rated	0
P16.35	Received PZD5	current of the motor) 5: Setting of the upper limit of forward running frequency (0–Fmax, unit: 0.01 Hz)	0
P16.36	Received PZD6	6: Setting of the upper limit of reverse running frequency (0–Fmax, unit: 0.01 Hz) 7: Upper limit of the electromotive torque (0–3000, in which 1000 corresponds to	0
P16.37	Received PZD7	100.0% of the rated current of the motor) 8: Upper limit of the brake torque (0–3000, in which 1000 corresponds to 100.0% of	0
P16.38	Received PZD8	the rated current of the motor) 9. Virtual input terminal command, 0x000–0x3EE (bit9–bit0	0
P16.39	Received PZD9	correspond to S8/S7/S6/S5/HDIB/HDIA/S4/S3/S2/S1 in	0
P16.40	Received PZD10	10: Virtual output terminal command, 0x00–0x0F (bit3–bit0 correspond to R02/B01/HD0/V1 in sequence)	0
P16.41	Received PZD11	11: Voltage setting (for V/F separation)	0
P16.42	Received PZD12	12: AO1 output setting 1 (-1000-+1000, in which 1000 corresponds to 100.0%) 13: AO2 output setting 2 (-1000-+1000, in which 1000 corresponds to 100.0%)	0

Table 0-7 Settings of B7 series VFD

Function code	Word	Value range	Default value
		14: MSB of position reference (signed number)	
		15: LSB of position reference (unsigned number)	
		16: MSB of position feedback (signed number)	
		17: LSB of position feedback (unsigned number)	
		18: Position feedback setting flag (position feedback can be set only after this flag is set to 1 and then to 0)	
		19: Function code mapping (PZD2–PZD12 correspond to P14.49–P14.59	
		respectively.)	
		20-31: Reserved	

Response packet (VFD -> master station)

SW: The first word in a PZD response packet is a VFD SW. You can select the expression method according to P15.43.

Table 0-8 and Table 0-9 describe the control words (CWs) of the B7 series VFD.

Bit	Name	Value	Description
		1	Forward running
		2	Reverse running
0–7	Running state	3	Stopped
		4	Faulty
		5	POFF
0	Dura valta za antolalia ha d	1	Ready to run
8	Bus voltage established	0	Not ready to run
0.40		0	Motor 1
9–10	Motor group teedback	1	Motor 2
		1	Synchronous motor
11	Motor type feedback	0	Asynchronous motor
10		1	Overload pre-alarm generated
12	Overload pre-alarm feedback	0	No overload pre-alarm generated
		0	Keypad-based control
10 11	Dun/Ston mode	1	Terminal-based control
13 - 14	Run/Stop mode	2	Communication-based control
		3	Reserved
45		1	Heartbeat feedback
15	Heartbeat feedback	0	No heartbeat feedback

Table 0-8 B7 series VFD SWs expressed in decimal format

Table 0-9 B7 series VFD SWs expressed in binary format

Bit	Name	Description	Priority
0	Forward running	0: Disable 1: Enable	1
1	Reverse running	0: Disable 1: Enable	2
2	Stopped	0: Disable 1: Enable	3
3	Fault	0: Disable 1: Enable	4
4	POFF	0: Disable 1: Enable	5
5	Pre-excited	0: Disable 1: Enable	6
6–15	/	Reserved	

Actual value (ACT): The second to twelfth words in a PZD task packet are the main actual values. The

main actual frequency values are provided by the main actual value signal source. Table 0-10 lists the actual status values of the B7 series VFD.

Function code	Word	Value range	Default value
P16.43	Transmitted PZD2	0: Invalid	0
P16.44	Transmitted PZD3	1: Running frequency (×100, Hz)	0
P16.45	Transmitted PZD4	3: Bus voltage (×10, V)	0
P16.46	Transmitted PZD5	4: Output voltage (×1, V)	0
P16.47	Transmitted PZD6	5: Output current (×10, A) 6: Actual output torque (×10, %)	0
P16.48	Transmitted PZD7	7: Actual output power (×10, %)	0
P16.49	Transmitted PZD8	8: Rotating speed of the running (×1, RPM)	0
P16.50	Transmitted PZD9	10: Ramp frequency reference	0
P16.51	Transmitted PZD10	11: Fault code	0
P16.52	Transmitted PZD11	12: Al1 value (×100, V)	0
P16.53	Transmitted PZD12	 14: Al3 value (*100, V) 14: Al3 value (*100, V) 15: HDIA frequency (*100, kHz) 16: Terminal input state 17: Terminal output state 18: PID reference (×100, %) 19: PID feedback (×100, %) 20: Rated torque of the motor 21: MSB of position reference (signed number) 22: LSB of position reference (unsigned number) 23: MSB of position feedback (signed number) 24: LSB of position feedback (unsigned number) 25: Status word 26: HDIB frequency value (×100, kHz) 	0

Table 0-10 Actual status values of Goodrive350 series VFD

PKW zone

PKW zone (parameter identification flag PKW1—numerical zone): The PKW zone describes the processing mode of the parameter identification interface. A PKW interface is not a physical interface but a mechanism that defines the transmission mode (such reading and writing a parameter value) of parameter between two communication ends.

Parameter identification (PKW)				Proces	ss data	
PKW1	PKW2	PKW3	PKW4	CW SW	PZD2 PZD2	
Request No. Response No.	Parameter address	Parameter value error No.	 Parameter value			

Figure 0-5 Parameter identification zone

In the periodic communication, the PKW zone consists of four 16-bit words. The following table describes the definition of each word.

First word PKW1 (16 bits)				
Bits 15–00	Bits 15–00 Task or response identification flag 0–7			
Second word PKW2 (16 bits)				
Bits 15–00	Bits 15–00 Basic parameter address 0–247			
Third word PKW3 (16 bits)				
Bits 15–00	Value (most significant word) of a parameter or error code of the returned value	00		
Fourth word PKW4 (16 bits)				
Bits 15–00 Value (least significant word) of a parameter 0–65535				

Note: If the master station requests the value of a parameter, the values in PKW3 and PKW4 of the packet that the master station transmits to the VFD are no longer valid.

Task request and response: When transmitting data to a slave, the master uses a request number, and the slave uses a response number to accept or reject the request.

	Request No. (from the master to a slave)		Response signal	
Request No.	Function	Acceptance	Rejection	
0	No task	0		
1	Requesting the value of a parameter	1, 2	3	
2	Modifying a parameter value (one word) [modifying the value only on RAM]	1	3 or 4	
3	Modifying a parameter value (two words) [modifying the value only on RAM]	2	3 or 4	
4	Modifying a parameter value (one word) [modifying the value on both RAM and EEPROM]	1	3 or 4	
5	Modifying a parameter value (two words) [modifying the value on both RAM and EEPROM]	2	3 or 4	

Table 0-11 Task identification flag PKW1

Note: The requests #2, #3, and #5 are not supported currently.

Response No. (from a slave to the master)		
Response No.	Function	
0	No response	
1	Transmitting the value of a parameter (one word)	
2	Transmitting the value of a parameter (two words)	
3	The task cannot be executed and one of the following error number is returned: 1: Invalid command 2: Invalid data address 3: Invalid data value 4: Operation failure 5: Password error 6: Data frame error 7: Parameter read only 8: Parameter cannot be modified during VFD running 9: Password protection	

PKW examples

Example 1: Reading the value of a parameter

You can set PKW1 to 1 and PKW2 to 0A to read a frequency set through keypad (the address of the frequency set through keypad is 10), and the value is returned in PKW4. The following data is in hexadecimal format.

Request (master station -> VFD)

	PK	W1	PK	W2	PK	W3	PK	W4	C	W	PZ	D2	PZ	D3	 PZI	D12
Request	00	01	00	0A	00	00	00	00	xx	xx	xx	xx	xx	xx	 хх	xx
					, 0 c	010: 0001:	Parar Requ	neter est fo	addre or read	ess ding p	baram	ieter v	/alues	6		

Response (VFD -> master station)



Example 2: Modifying the value of a parameter (on both RAM and EEPROM)

You can set PKW1 to 4 and PKW2 to 0A to modify a frequency set through keypad (the address of the frequency set through keypad is 10), and the value to be modified (50.00) is in PKW4.

Request (master station -> VFD)



- 0004: Parameter value to be modified

Response (VFD-> master station)

	PK	W1	PK	W2	PK	W3	PK	W4	C	W	ΡZ	D2	ΡZ	D3	 PZI	012
Response	00	01	00	0A	00	00	13	88	хх	xx	xx	xx	xx	xx	 xx	xx
	$\overline{}$	تے														

0001: Response (parameter value updated)

PZD examples: The transmission of the PZD zone is implemented through VFD function code settings. For the function codes, see the related UNITRONICS VFD operation manual.

Example 1: Reading the process data of a VFD

In this example, PZD3 is set to "8: Rotating speed of the running" through the VFD parameter P15.14. This operation sets the parameter forcibly. The setting remains until the parameter is set to another option.

Response (VFD -> master station)

	PK	W1	PK	W2	PK	W3	PK\	N4	C/	N	PZI	D2	PZ	D3	 PZI	D12
Response	ХХ	XX	ХХ	ХХ	хх	XX	00	0A	 ХХ	XX						

Example 2: Writing process data to a VFD device

In this example, PZD3 is set to "2: PID reference" through the VFD parameter P15.03. The parameter specified in each request frame is updated with the information contained in PZD3 until another parameter is specified.

Request (master station -> VFD)

	PK	W1	PK	W2	PK	W3	PK\	N4	C/	N	PZI	D2	PZ	D3	 PZI	D12
Response	хх	XX	ХХ	XX	ХХ	XX	00	00	 XX	ХХ						

Subsequently, the information contained in PZD3 is used as tractive force reference in each request frame until another parameter is specified.

2.5 Example of PLC communication

This example shows how to use a Siemens S7-1200 series PLC to communicate with the PROFINET adapter module (through using the TIA Portal V13 PC software as the configuration tool).

2.5.1 Parameter configuration

Connect the PLC to the PC with a standard network cable, and set the computer IP (e.g. 192.168.0.100) in the PC network settings. Set the IP and name of the PLC.

1) Open the "TIA PORTAL V13" software, and click "Online & Diagnostics" --> "Accessible Devices" on the left. Select "PN/IE" in the drop-down list of "Type of the PG/PC interface", select the Ethernet port in

the "PG/PC Interface", and finally click "Refresh" to scan the connected PLC devices, as shown in the following figure.



2) If the connection between the PLC and PC is normal, after scanning is completed, the PLC device will appear in the device bar, as shown in the red box of the following figure. The device bar displays the device, device type and device MAC address. Then click the "Show" button in the lower right corner to enter the device settings.

Accessible devices				_	×
	Type	e of the PG/PC interfac PG/PC interfac	ce: LPN/IE	ntel PCI Ethernet Ad	apter (Gigabit) 💌 👻 🔇
	Accessible houes of the se	incened interface.	1	1	1
	Device	Device type	Туре	Address	MAC address
	PLC_1	CPU 1215C DC/D	PN/IE	192.168.0.23	AC-64-17-13-9F-DF
1 a					
Flash LED					
Online status informatior	n:				<u>R</u> efresh
Scan and informatio	n retrieval completed.				•
Display only problem	reports				*
					<u>Show</u> <u>C</u> ancel

3) Click "Online & Diagnostics" in the device tree, click "Assign IP Address" under the "Functions" on the right of the menu bar, and set the IP address and subnet mask of the PLC shown in the red box marked ③, to ensure that the IP address of the PC and the IP address of the PLC are in the same network segment, as shown in the following figure.

	Project tree	Online access TwinCAT-Inte	ntel PCI Ethernet Adapter (Gigabit) PLC_1 [192.168.0.23]	_ 🖬 🖬 🗙
	Project tree Devices Comparison Devices Devices Displayhide interfaces D	Online access > TwinCAT-Inte > Diagnostics > Functions Set time Firmware update Assign name	Not PCI Ethernet Adapter (Gigabit) PLC_1 [192.168.0.23] Assign IP address	× • • -
Onlin	Claim V3G (1921) Vinit (1921)	Reset to factory settings	IP address: 192.168.023 Subnet mask: 255.255.255.0 Use router Router address: 0.0.00 Assign IP address	
	✓ Details view			

4) Set the IP address of the PLC to "192.168.0.1" and subnet mask to "255.255.255.0" (you can check "Use router", that is, the router assigns IP). Click the "Assign IP address" button after the setting is completed, as shown in the following figure.

Diagnostics	Assign IP address
 Functions 	
Assign IP address	
Set time	
Firmware update	MAC address: AC - 64 - 17 - 13 - 9F - DF Accessible devices
Assign name	
Reset to factory settings	IP address: 192.168.0.1
	Subnet mask: 255 . 255 . 0
	_ ose router
	Router address: 0 . 0 . 0 . 0
	Assign IP address

5) Click "Assign Name", and mark the PLC name in the position shown in the red box marked ②, such as "PLC1215C". Click the "Assign Device Name" button, as shown in the following figure.

Diagnostics		CON	ngurea PROFINET a	evice		
▼ Functions			PROFINET device name:	PLC1215C		1
Assign IP address			Type:	\$7-1200		
Set time						
Firmware update						
Assign name						
Reset to factory settings						
	-	Dev	ice filter			
			Only show devices o	f the same type		
	4		Only show devices v		settings	
	-		Only show devices v	vithout names		
	•	han an ing biotecords				
	are tenne	MAC address	Turne	Manag	Chattan	
	15	MAC address	type	Name	Status	
						-
) flashes	Update	Assign name	
	<					

2.5.2 Create a new project

Double click the TIA PORTAL V13 icon to open the TIA PORTAL V13 project tool. Click the "Create new project" button to create a new project, add project name, project storage path, author, comment and other related information, and click the "Create" button to create a new project, as shown in the following figure.

					PORTAL
Start			Create new	project	
	1 1	Open existing project		Project name: Path:	Project1 D3Protal V13IV15_workspace
		🥚 Create new project		Author:	Administrator
		Migrate project		Comment:	
					×
					Create
		Welcome Tour			
Online & Diagnostics	10				
		Installed software			
		Help			
		🚯 User interface language			

After creating a new project, double click "Open the project view", as shown in the following figure.

VA SI	emens - Project1				_ # X
					Totally Integrated Automation PORTAL
s	tart			First steps	
	Devices & networks	*	Open existing project	Project: "Project1" was opened successfully. Please select the next step:	
		۲	 Create new project Migrate project 	Start	
	Motion & technology	-	Close project		_
		1	Welcome Tour	Devices & Configure a device	
	Online & Diagnostics	10	First steps	PLC programming Write PLC program	
				Motion & Configure technology objects	
			Installed software Help	Visualization Configure an HMI screen	
			🚱 User interface language	► Project view Open the project view	
	Destantes				

2.5.3 Add GSD files

In the project view, click "Options" on the toolbar, select the "Manage general station description files (GSD)" option from the drop-down list, and a box pops up, as shown in the following figure. Enter the file directory where the UNITRONICS GSD file is located in the source path, select the GSD file, and click the "Install" button to start the installation.

Install genera	l station description file				×
Source path:	C:\Users\Administrator\Desktop				
Content of i	mported path				
File		Version	Language	Status	
GSDML-	Jame	11/10/2017	English	Not yet installed	
<					>
				Install Can	cel

After the installation was completely successful, a prompt pops up, indicating that the GSDML file has been installed successfully, as shown in the following figure.

Instal	l general station description file	×
Inst	allation result	
	Installation was completed successfully	
	······································	
		_

2.5.4 Configure the basic information of the project1) Enter the "Devices & networks" view interface.

In the project view, select and double click "Devices & networks" in the project tree on the left to enter the "Network overview" view interface, as shown in the following figure.

W	Siemens - Project1		_ # X
P	roject Edit View Insert Online Optio	s Tools Window Help	ntally Integrated Automation
E	🛉 🎦 🔚 Save project 🔳 🐰 🗉 🗎 🗙	"이 # (제 표 표 표 표 표 제 제 Go online 🖉 Go offline 🏤 🖪 🖪 😿 😑 💷	PORTAL
	Project tree	Project1 > Devices & networks	Hardware catalog 🛛 🗊 🕨 🕨
	Devices	🛃 Topology view 🛛 🛔 Network view 📑 Device view	Options
	1 O O	🕈 💦 Network 🔢 Connections HM connection 🔍 📆 🔛 🔍 ± 100% 💌 🔤 🚺 Network overvie 4 🕨	. 그 물
orks	_	V Device	✓ Catalog
Ę	Project1	<u>^</u>	<search> Mu Mit d</search>
8	Add new device	=	Filter
8	di Devices & networks		Controllers
Ř.	Common data		▶ 🛅 HM
ă	Languages & resources		PC systems
	Online access		▶ 🛅 Drives & starters O
	T Displayhide interfaces		Network components
	USB [S7USB]		▶ 🛅 Detecting & Monitoring
	PLCSIM V5.x [PN/IE]		Distributed I/O
	🕶 🛄 TwinCAT-Intel PCI Ethernet Adapt 🐻		Field devices
	Y Update accessible devices		Other field devices
	▼ D PLC 1 [192.168.0.23]	<u>×</u>	<u> </u>
	<		as
	✓ Details view		ι (i)
	Name		
			iii iii iii iii iii iii iii iii iii ii
			i i i i i i i i i i i i i i i i i i i
		A properties Linto L & Diagnostics	 Information
Π.	Portal view 🗠 Overview	🚓 Devices & ne 💙 Project Pro	viect1 created

2) Add Project device and PROFINET network.

(1) Add PLC S7-1215C to the "Devices & networks" view.

In the "Hardware catalog" on the right sidebar, select "Controller" \rightarrow "SIMATIC S7-1200" \rightarrow "CPU" \rightarrow "CPU 1215C AC/DC/Rly" \rightarrow "6ES7 215-1BG40-0XB0", and double click the "6ES7 215-1BG40-0XB0" icon or drag it to the project, as shown in the following figure.

1	Project1 > Devices & networks			_ = = ×	Hardware catalog	7 0	Þ	
		🚰 Topology view	h Network view	Device view	Options			
F	Network	: ⊞ @. ± '		Network overvie 4		[Har
			^	Device.	✓ Catalog			dwa
5				S7-1200 station	Search	ini in	i T	Te
٦			=	► PLC 1			-	et
l	PLC_1				Filter			e
					Controllers		2I	٦
-					SIMAIIC S7-1200			
								8
					CBU 1211C DC/DC/DC			E
					CPU 1211C DC/DC/Rlv			ine
					CPU 1212C AC/DC/Rly			to
					CPU 1212C DC/DC/DC			s
			•		CPU 1212C DC/DC/Rly			
7					CPU 1214C AC/DC/Rly			
			· · ·		CPU 1214C DC/DC/DC			Tas
					CPU 1214C DC/DC/Rly			ks
1					CPU 1215C AC/DC/Rly			
-					CPU 1215C DC/DC/DC			
1					6ES7 215-1AG31-0XE	80		F
					6ES7 215-1AG40-0XE	80		ran
					CPU 1215C DC/DC/Rly			es
					CPU 1217C DC/DC/DC			
					Unspecified CPU 1200			
					Communications modules			
					SIMATIC 57-1500			
			~					
	< III		> 🔁	< III >	SIMATIC ET 200 CPU		~	
		Q Properties	🗓 Info 追 🗓 Diag	nostics 📑 🗖 🗖 📥	> Information			

(2) Add the UNITRONICS communication card to the "Devices & networks" view.

In the "Hardware Catalog", click "Other field devices" \rightarrow "Profinet IO" \rightarrow "I/O" \rightarrow "UNITRONICS" \rightarrow "UNITRONICS Profinet Adapter" \rightarrow "UNITRONICS Profinet Adapter V1.0", and double click the "UNITRONICS Profinet Adapter V1.0" icon or drag it to the view of "Devices & networks". The communication card is displayed as "Not assigned", as shown in the following figure.

Click the "Not assigned" option of "UNITRONICS Profinet Adapter V1.0" and select the IO controller "PLC_1. PROFINET IO-System", then CPU and UNITRONICS Profinet in the network view are connected to the same Profinet subnet, as shown in the following figure.



(3) Add the UNITRONICS I/O sub-module to the project.

Double click the "UNITRONICS Profinet Adapter V1.0" icon in the "Devices & Networks" view to enter the "Device view" interface, as shown in the following figure.



Click the "Hardware Catalog" on the right \rightarrow "Module", double click the "32 Byte IN/OUT" module or drag it to the blank space in the "Device view", and the "32 Byte IN/OUT" module is added to the project, as shown in the following figure.

ject Edit View Insert Onlin	e Options	Tools Window F	telp IC IN IN ICL	🖉 Go online 🖉 Go offlin					Totally Integrated A	utomation PORT/
Project tree		PLC_1 [CPU 1	215C DC/DC/D	C] > Distributed I/O >	PROFINET	IO-System (100): PN/IE_1	TPS-1 _	∎ ≡ ×	Hardware catalog	
Devices					🚽 Topolog	y view 💧 Network view	Device	view	Options	
900	*	de TPS-1		• 🖽 🍊 🖽 @,±'		Device overview				
					^	W Module	Rack	Slot	✓ Catalog	
Project1	^					 TPS-1 	0	0	<search></search>	itig in
Add new device						▼ PNHO	0	0 X1	Filter	
Devices & networks			and the		-	Port 1 - RJ45	0	0 X1	e riter	
PLC_1 [CPU 1215C DC/DC/D	c] _					Port 2 - RI45	0	0 X1	Plead module	
🕨 📑 Common data	-					32 Byte INIOUT 1	0	1	• Im Module	
Documentation settings										
Languages & resources									2 Byte IN/OUT	
Gonline access									4 Byte IN/OUT	
Y Display/hide interfaces				DP-NORM					8 Byte IN/OUT	
USB [S7USB]	100								12 Byte IN/OUT	
PLCSIM V5.x [PNIE]	28								16 Byte IN/OUT	
 TwinCAT-Intel PCI Ethernet A 	dapt 🐻 📃								24 Byte IN/OUT	
Device accessible device	es 🗸				_				32 Byte IN/OUT	
Ш	>									
Details view										
Name										
					~					
		< 11			> 🗉	< III		>	1	
					Prope	rties 🚺 Info 🚯 関 Dia	anostics		> Information	
1.0.1.1.	n inu	1. 706-1			311010					

(4) Simple configuration of S7-1215C and UNITRONICS Profinet parameters.

<1> Configure parameters of PLC S7-1215C.

Double click the "Devices & Networks" option to enter the view interface of "Devices & Networks".

Double click the "PLC S7-1215C" icon in the interface to enter the "Device view" interface of the PLC. Double click the network interface position in the PLC icon to enter the properties editing interface bar of

"PROFINET interface_1".

Click the "Ethernet addresses" option in the "General" list to set the PLC address and name (In this example, IP address of the PLC is 192.168.0.1 and PLC name is PLC1215C).

Operations are shown in the following figure.



<2> Configure parameters of the UNITRONICS Profinet communication card.

Double click the "Devices & Networks" option to enter the view interface of "Devices & Networks".

Double click the "UNITRONICS Profinet Adapter V1.0" icon in the interface to enter the "Device view" interface of the communication card.

Double click the network interface position in the UNITRONICS Profinet communication card icon to enter the properties editing interface bar of PROFINET interface.

Click the "PROFINET interface [X1]" option in the "General" list, and click the "Ethernet addresses" option. Configure parameters of the UNITRONICS PROFINET communication card according to the parameters shown in the following figure such as IP address and device name of the communication card (in this example, IP address of the communication card is 192.168.0.2 and the name is unitronics1).

Operations are shown in the following figure.

M Siemens - Project1				1.				_ # X
Project Edit View Insert Online Options	Tools Window Help						Totally Integra	ated Automation
🕒 🎦 🔚 Save project 🚢 🐰 🗉 🕞 🗙 🏷	e 🗠 🖬 🗄 🛙 🖓 🖓	🚿 Go online 🖉 Go o	iffline 🔥 🖪				rotany integre	PORTAL
Project tree 🔲 🖪	Project1 > PLC_1 [CPU 12150	DC/DC/DC] + Distri	buted VO 🔸	PROFINET IO-System (10)	0): PN/IE_1	▶ TPS-1	_ # =×	Hardw 🗊 🗉 🕨
Devices				🚰 Topolo	gy view	📩 Network view	Y Device view	Options 📴
800 2	dt TPS-1	🖻 🔜 🍊 🖽 🍳 :	100%		3	Device overview		III F
Jorks	_				^	W Module	Rac	✓ Catalog
Project1						▼ TPS-1	0	<search> Mi Mi 0</search>
ab Devices & networks		DP-NOR			-	► PN-IO	0	Filter
PLC_1 [CPU 1215C DC/DC/DC]					<u>-</u>	32 Byte IN/OUT	_1 0	🕨 🔚 Head module 🗳
Common data								• Module
Documentation settings	(2	< =	2	
Coline access	TPS-1 [Module]	57		D Prop	portion	1 Info Diagnos	tice I in a	4 Byt
Displayhide interfaces			T	Shop	percies [Samo 10 biagnos	ues parate	8 Byt
🕨 🚺 USB [S7USB]	General 10 tags Sy	stem constants	1 exts	Cat IP address in the proj	last		l est	12 Byt 0
PLCSIM V5.x[PN/IE]	PROFINET interface [X1]			Deddaraa aa			-	24 Byt
Indate accessible devices	General			ir address: 192	. 168 . 0	. 2		32 Byt
< II >	Ethernet addresses			Subnet mase. [255	200 - 200			Tas
✓ Details view	Advanced options			luse router				ks
	Hardware identifier			Router address: 0	0.0			
Name	Module parameters			O in address is set directly	at the device		1	5
	Hardware identifier	PROFINET						brar
	Shared Device							es
				Generate PROFINET device	e name auton	natically		
		PROFINE	T device name	unitronics1				
		Co	nverted name:	unitronics1				
		C	evice number:	1				
								< = >
							~	> Information
Portal view Overview	TPS-1					🗸 Pro	ject Project1 created.	

2.5.5 Assign the device name of the IO device (UNITRONICS communication card)

After the CPU and UNITRONICS Profinet communication card are successfully connected to the PC through the network cable, click "Online access" on the left to find the network card corresponding to the PC that is connected to the PLC and communication card.

In all displayed devices, find the UNITRONICS communication card device and click it, such as emc (192.168.0.2) device, as shown in the following figure (**Note:** When the communication card is used for the first time, there is no device name, and only the default IP can be scanned).

Double click "Online & Diagnostics" to enter the online diagnostics state.

Click "Functions" \rightarrow "Assign name" to enter the "Assign name" interface.

Enter the communication card name in "PROFINET device name", and click "Assign Name" in the lower right corner to confirm.

Note: The name of the PROFINET communication card set online must be consistent with that set in the configuration project, otherwise PROFINET communication cannot be carried out between the devices.

The operation steps are shown in the following figure.



2.5.6 Save, compile, and download

Download the project configuration information to the PLC S7-1215C after the entire project configuration is completed.

Click "Save Project" to save the entire project.

Right click "PLC_1 [CPU 1215C AC/DC/Rly]" \rightarrow left click "Compile" \rightarrow "Hardware and software (change only)" to compile the entire project.

Click the "Download to device" icon to download the project configuration to the PLC controller.

Operations are shown in the following figure.

M Siemens - Project1												
Project E <mark>fit View Insert O</mark> nline C	Options To	ools Window	Help									Totally Integ
📑 🎦 🛃 Save project 🔠 🐰 💷 💼	×⊳≞	@ 🗄 🖬 🗄		🔊 Go online 🖉 (Go offline 🛛 🛔 🖪	: × 🗆 (
Project		Project1 →	Devices & net	works								_ = = >
Devices							Topology	view	🔥 Ne	twork vi	ew 🛐	Device view
1900	a	Network	Connections	HMI connection		± 100%					Netwo	rk overvie 🕢 🛛
2						J IO system	n: PLC 1. PROFI	NETIC)-System (100) ^		
Project1	^					1					T D	svice
Add new device											•	57-1200 station
Devices & networks	_	PLC_1	and the second se	TPS-1								GSD device 1
PLC_1 [CPU 1215C DC/DC/DC]		CPU 1215C		UNITRONICS	DP-NORM							N TPC-1
Device configuration	-			PLC_1								·
Online & diagnostics											•	
Program blocks			PIC 1	PROFINET IO-Syste	J					_	-	
Technology objects			res_1							_	<u>*</u>	
External source files										_		
PLC tags										_		
PLC data types										_		
Watch and force tables		1										
Traces												
Program info										~		
Device proxy data		<								> 📒	< =	
Text lists							C Propert	ios	1 Info		Diagnostic	
Local modules			1.0	L a u			Support		1.34	1.02	onagnostic	
Distributed I/O		General	Cross-refer	ences Compile	•							
Common data		Compiling co	ompleted (errors:	0; warnings: 1)								
Documentation settings	~	l Path		Description				Go to	?	Errors	Warnings	Time
✓ Details view		11	 PLC_1 					~		0	1	10:02:30 AM
		1	 PROFIN 	IET inte				~		0	1	10:02:30 AM
litera i		4		The device r	eplacement without e	xchangeable m	edium functio.	~	?	0	1	10:02:30 AM
mante		🚺 👻 Pr	ogram blocks					~		0	0	10:02:30 AM
		0		No block wa	s compiled. All blocks	are up-to-date.				0	0	10:02:30 AM
		4		Compiling c	ompleted (errors: 0; w	arnings: 1)				0	1	10:02:30 AM
		<										>

In the download dialog box, search for the connected PLC device, as shown in the following figure. Select the "PN/ IE_1" option in the drop-down list of "Connection to interface/subnet". Click the "Start search" button in the lower right corner to start scanning and detecting PLC devices in the subnet.

	Device	Device type	Slot	Туре	Address	Subnet					
	PLC_1	CPU 1215C DC/D	1 X1	PN/IE	192.168.0.1	PN/IE_1					
		Type of the PG/PC inte PG/PC inte Connection to interface/su iscourt	erface: erface: ubnet: teway.	PN/IE TwinCAT PN/IE_1	-Intel PCI Ethernet Ad	apter (Gigabit)					
	Compatible dev	impatible devices in target subnet:									
	Device	Device type	Туре		Address	Target device					
	-	-	PINITE		Access address	-					
Flash LED											
Flash LED											
Flash LED						<u>S</u> tart se					
Flash LED	2011:					<u>S</u> tart se					
Flash LED	on:					<u>Start se</u>					
Flash LED	ın:					<u>Start se</u>					

After searching is completed, the PLC S7-1215C that is connected to the PC will be displayed in the list of "Compatible devices in target subnet", as shown in the following figure.

Select the PLC to be	downloaded in t	he following figu	ire, and	click the	"Download"	button t	o download
the configuration infor	mation and PLC	program to the s	elected	PLC.			

Extended download to	device							×
	Configured access node	as of "PLC 1"						
	Device	Device type	Slot	Type	Address		Subnet	
	PLC_1	CPU 1215C DC/D	1 X1	PN/IE	192.168.0.1		PN/IE_1	
	т	voe of the PG/PC inte	rface:	PN/IE			•	
		PG/PC inte	rface:	TwinCAT-In	tel PCI Ethernet Adar	oter (Gigab	it) 🔻 (e 🖸
	Conne	ection to interface/su	bnet:	PN/IE_1			•	•
		1st gate	eway:				- (•
	Compatible devices in t	arget subnet:			🛃 Sho	w all comp	patible dev	ices
	Device	Device type	Туре	/	ddress	Target de	wice	_
· ···	PLC_1	CPU 1215C DC/D	PN/IE	1	92.168.0.1	PLC_1		
P			PN/IE	,	eccss address			
1 0								
Flash LED								
							<u>S</u> tart sea	arch
Online status information:								
Scan and information	retrieval completed.							^
								~
Display only problem i	reports						1	
						oad	Cano	el

2.5.7 VFD parameter watching

Click "Watch and force tables" in the left menu bar, and double click "Add new watch table" in the dropdown menu, as shown in the following figure.

	14	Project1 >									_ # #×	Hardware catalog	
Devices						🛃 Topology v	view	Netwo	ork view	Dev	ice view	Options	
300	2	Network	Connections	HMI connection	-	6 🗄 , 🖻		Network ove	rview		< >		1
			9	IO system: PLC_1	PROFINET	0-System (100)		Perice.			Tune	✓ Catalog	
Project1	^						1	× 57-12	00 station	0	\$7-1200 sta	dearch>	itin it
Add new device	100						-	• 37-12	C 1		CPI11215C		
📥 Devices & networks		PLC_1	The second second	TPS-1				- GSD (device 1		GSD device	Filter	
- DC_1 [CPU 1215C DC/DC/DC]		CP0 1215C		UNITRONICS.	0	P-NORM		• TP	5-1			Controllers	
Device configuration				PLC_1								HM HM	
😵 Online & diagnostics		_										PC systems	
Program blocks	H		PLC 1	PROFINET IO-Syste								Drives & starters	
Technology objects							-					Petwork components	
External source files												Detecting a Monitoni	ig
PLC tags												Field devices	
C PLC data types												The Other field devices	
 Watch and force tables 													
Add new watch table												Drives	
Gill Force table						~	-			10		Encoders	
Traces		< ≡				> 🧧		<			>	Gateway	
En Program into						Q Propert	ties	1 Info	& Diagr	ostics		- 10	
Tau Device proxy data		Conoral	Croce rofor	oncos Comp	la				1				
I lexi lisis		General	Clossieler	ences comp	16		_					- UNITRONICS Profinet	Adapter
Distributed I/O												UNITRONICS Profin	et Adapter V1.
	~	Message									Go to ?	Ident Systems	
Details view	-	• • •									^	Sensors	
		X	The software co	oninguration has not	been loaded	, because it is up-to	o-date	e				PROFIBUS DP	
Name			Marduare coofe	s not been loaded, b	ecouse it is	up-to-date.							
		Canal Canal	naroware comig	guration	a TuinCATA	atal PCI Ethernat Adv		(Cinchis) Foun	d 7 daviea/e	an the			
		J Scan	ming for devices c	ompleted for interior	C INHICATH	iterrer Eulemet Aug	aprei	(Gigabit), roun	o z bevice(s	/ on the	12	and the second	
		A Land	ing completed (er									(all and	

Create target watch variables—PZD, PKW, control word and status word variables of the VFD in the newly created watch table, as shown in the following figure.

Mi Siemens - Project1									_ = X
Project Edit View Insert Online Optio	ns Tools Windov	v Help						Totally Integrated Aut	mation
📑 🞦 📑 Save project 📑 🐰 🗐 🗎 🗙	🔊 ± (4 ± 📊	88888	Go online 📓 Go offli	ne 🗛 🖪 🖪	× 🖃 🛄			Totally integrated Auto	PORTAL
Project tree	■	PLC_1 [CPU 1215C [C/DC/DC] → Watcl	and force table	• Watch table	e_1	_ • •	i X Testing	
Devices								Options	2
	🖻 🥏 🥑 🛛	1 6 9 8 2 3	001 1						E I
2	lame	Address	Display format	Monitor value	Modify value	9	Comment	✓ CPU operator panel	ti
🗧 👻 📄 Project1	▲ 1	%QW2	Hex				PKW1 (PLC send)		
Add new device	2	%QW4	Hex				PKW2(PLC send)	No online connection	
Devices & networks	3	%QW6	Hex				PKWB(PLC send)		-
PLC_1 [CPU 1215C DC/DC/DC]	4	%QW8	Hex				PKW4(PLC send)		ask
Device configuration	5	%QW10	Hex				CW		ion l
🕓 Online & diagnostics	6	%QW12	Hex				PZD2(PLC send)		-
Program blocks	≡ 7	%QW14	Hex				PZD3(PLC send)		<u> </u>
Technology objects	8	%QW16	Hex				PZD4(PLC send)		it i
External source files	9	%QW18	Hex				PZD5(PLC send)		ar.
PLC tags	10	%QW20	Hex				PZD6(PLC send)		es
PLC data types	11	%QW22	Hex				PZD7(PLC send)		
▼ 📖 Watch and force tables	12	%QW24	Hex				PZD8(PLC send)		
Add new watch table	13	%QW26	Hex				PZD9(PLC send)		
Force table	14	%QW28	Hex				PZD10(PLC send)		
Watch table_1	15	%QW30	Hex				PZD11(PLC send)		
Tioces	16	%QW32	Hex				PZD12(PLC send)		
Program info	17								
Device proxy data	18								
Text lists	19								
Local modules	20	<add new=""></add>							
	<u> </u>								
✓ Details view	<							>	
				O Prop	ortion 😕 Inf		liagnostics		
Name				les nop			ragilostics	_	
	General	Cross-references	Compile						
	I Messag	e					Go to	?	
	5						1		_
Portal view 🔀 Overview	Force table	🔍 Watch table_1					<u> </u>	🗸 Project Project1 opened.	

Siemens - Project1			_	_	_		_		
oject Edit View Insert Online O	ptions To	ools Window Help						Totally Integrated Auto	omation
🖥 🛃 Save project 🚢 🐰 🛄 间	X ₪±	Car 🖬 🗐 🕅 🔃	🖳 🔛 🔊 Go online	Go offline					PORT
		Project1 > PLC_1 [CF					_ = = ×	Testing	
Devices								Options	
B 0 0	B	1	R 27 😤 📬						
		Address	Display format	Monitor value	Modify value	2 Comment		✓ CPU operator panel	
Project1		%IW2	Hex	16#0000		PKW1 (PLC receive)	1	
Add new device		961W4	Hex	16#0000		PKW2(PLC receive)	PLC_1 [CPU 1215C DC/DC/DC]	
A Devices & networks		3 %IW6	Hex	16#0000		PKW3(PLC receive)	RUN / STOP RUN	
▼ PLC_1 [CPU 1215C DC/DC/DC]		4 %IW8	Hex	16#0000		PKW4(PLC receive)	ERROR STOP	
Device configuration		\$ %IW10	Hex	16#0004		SW			=
🛂 Online & diagnostics		6 %IW12	Hex	16#0000		PZD2(PLC receive))	MAINT MRES	
🕨 🏣 Program blocks		%IW14	Hex	16#0000		PZD3(PLC receive))		
Technology objects		8 %IW16	Hex	16#0000		PZD4(PLC receive))		
External source files		9 %IW18	Hex	16#0000		PZD5(PLC receive))		
PLC tags		0 %IW20	Hex	16#0000		PZD6(PLC receive))		
PLC data types		1 %IW22	Hex	16#0000		PZD7(PLC receive))		
 Watch and force tables 		2 %IW24	Hex	16#0000		PZD8(PLC receive))		
Add new watch table		3 %IW26	Hex	16#0000		PZD9(PLC receive))		
Force table		4 %IW28	Hex	16#0000		PZD10(PLC receive	e)		
Watch table_1		5 %IW30	Hex	16#0000		PZD11(PLC receive	e)		
Watch table_2		6 %IW32	Hex	16#0000		PZD12(PLC receive	e)		
Traces		7 🔳							
Program info		8 <add new=""></add>							
Device proxy data									
Text lists									
	-								
Details view		<					>		
					Q Properties	Linfo Diagnostic	s 7	1	
Name		Deutee tefermetter	L Constantion in	(amounting 1)	Lama d'astau			1	
		Device information	Connection in	ironnation F	tarm display			-	
		No devices with p	roblems						
		🍟 Onlin 堶 Opera 🛛	Device/module N	lessage	Details	H	lelp	1	

After the watch variables are created, click the "Watch all" button in the watch table to monitor the values of all variables, and click the "Modify parameters" button in the watch table to modify the parameters of the target variable, so as to watch the VFD through the PLC.