Operation Manual of PROFINET 310 Series Expansion Card

1 Product Overview

Thank you for using VEICHI AC300 series frequency inverter (AC300 and AC310 frequency inverter) and choosing AC300 PROFINET expansion card AC300PN1. The AC300PN1card is composed of two boards, AC300PN_CJ、AC300PN_CN, which are connected by communication line. The physical diagram of the two boards is shown in Figure 1.1

Figure 1.1 Hardware object diagram

2 Hardware layout and RJ45 interface

2.1 Hardware Layout

The hardware layout of AC300PN1 card is shown in Figure 2.1





CN1

CN2

The communication status of AC300PN1 card can be displayed by indicator light. The meaning of different status of each indicator is shown in Table 2.1

Table 2.1 description of indicate	or light
-----------------------------------	----------

Indicator light	Indicator status	State description	Processing method
Dorrion	Light on	The power supply is normal	Nothing
Power	Light off	Abnormal power supply	Power on or replace the expansion card
Lad1	Light on	RJ45 port is not started, and	Check whether the network cable is connected
Leui	Light on	the power system is faulty	correctly, and check whether the GSD version

			or configuration is wrong
	Light off	RJ45 port is started, and the power system is normal	Nothing
L ad2	Flashing	Inverter fault	Check the frequency inverter fault type, and then do further processing
Led2	Light off	The frequency inverter is normal	Nothing
Led3	Flashing	Abnormal communication check between expansion card and frequency inverter	Check the version of frequency inverter PN card and software; Observe whether the card is inserted into the frequency inverter; replace the expansion card
	Light off	Normal	Nothing
Led4	Flashing	The function of the expansion card to read and write the inverter is abnormal	Confirm whether the GSD file is correct; Check whether the selected address of PZD is correct
	Light off	Normal	Nothing
	Flashing (0.25s)	Abnormal connection of master station	Check the wiring of the master station
Led5	Flashing (0.5s)	Abnormal connection of master station	The master station is connected to the slave station or is downloading PLC program
	Light off	Master slave communication is normal	Nothing
	The green light is on	The power supply of network cable is normal	Nothing
	The green light is off	The power supply of network cable is abnormal	Check whether the communication line is plugged in properly
Link0/1	The yellow light is on	Communication is normal	Nothing
	The yellow light is flashing	Establishing communication	Nothing

2.2 PROFINET RJ45 interface description

AC300PN1 is connected with PROFINET master station by standard Ethernet RJ45 socket. Its pin definition is consistent with that of standard Ethernet pin, both cross line and direct connection are available

Terminal name	Explain
Network port CN1	The terminal has no direction and can be connected to the terminal near PLC. Facing
CN2 port network	RJ45, the right side is network port 1, and the left side is network port 2.

Table 2.2 PROFINET communication terminal description

3 Communication Configuration Description

AC300PN1 card supports AC300 series frequency inverters (AC300 and AC310 frequency inverters). The relevant function codes should be set for the AC 300PN1 card to communicate with the frequency inverter normally

3.1 AC300 Communication Configuration

3.1.1 Description of AC300 Inverter Communication Configuration

Function	Nomo	Sotting rougo	Setting	Maaring
code	Ivame	Setting range	value	wrearing
F00.02	Run command selection	0: Keyboard given 1: Terminal setting 2: RS485 3: Purchase card	2	The command is given by RS485
F00.03	Frequency given source channel	0: keyboard number given 1: Keyboard analog potentiometer setting 10: Purchase card	6	The frequency is given by RS485
F00.10	Upper limit frequency source selection	Select the given source of frequency inverter upper limit 0: Upper limit frequency given 1: Reserved 2: Current and voltage analog AI1 given 3: Current and voltage analog AI2 given 4: Reserved 5: Terminal pulse PUL setting 6: RS485 communication given 7: Purchase card	-	If you use AC300PN1 card to limit the upper limit frequency, you need to set this to 6
F07.01	Torque command setting	0: Keyboard number 1: Keyboard potentiometer setting 6: RS485 communication setting 7: Purchase card	-	If the torque command is given by AC300PN1 card, it is set to 6
F07.10	Speed limit	0: Set by function code	-	If restricted by AC300PN1 card, it

Table 3.1.1 AC300 function code	e setting
---------------------------------	-----------

	selection of forward	F07.12		is set to 6
	rotation in torque	1: Reservation		
	control			
		6: RS485 given * F07.12		
		7: Purchase card * F12.07		
F07.11	Torque control reverse speed limit selection	 0: Set by function code F07.13 1: Reservation 6: RS485 given * F07.13 	-	If restricted by AC300PN1 card, it is set to 6
		7: Purchase card * F07.13		
F07.12	Maximum forward speed when controlled by torque	0.0%~100.0%	-	Default 100.0%, relative maximum frequency (F00.09)
F07.13	Maximum reverse speed when controlled by torque	0.0%~100.0%	-	Default 100.0%, relative maximum frequency (F00.09)

3.1.2 Address Description of AC300 Communication Control Group

Address	Function description	Exploration of data significance	R/W
definition	Function description	Explanation of data significance	characteristic
02000	Communication given frequency	0.01 Hz, e.g.: 5000 corresponds to	D/W
0x3000	Communication given frequency	50Hz	K/ W
		0: No command	
		1: Forward running	
		2: Reverse running	
		3: Forward jog	
0x2001	Communication command sotting	4: Reverse jog	D/W
0x3001	Communication command setting	5: Slow down and stop	K/ W
		6: Freely stop	
		7: Fault reset	
		8: Run forbidden command	
		9: Run allow command	
0x3004	Communication given upper limit	Unit: 0.01Hz	D/W/
0x3004	frequency		K/ W
0x3005	Communication torque setting	Unit 0.1%	R/W
0x3006	Maximum forward frequency limit of	Unit 0.1%	R/W
073000	torque control		
0x3007	Maximum reverse frequency limit of	Unit 0.1%	R/W
0.0007	torque control		10 //
0x3008	Communication given PID setting	Unit 0.1%	R/W
0.5000	value	Chit 0.170	17/ 14

Table 3.1.2 Address description of AC300 communication control group

0x3009	Communication given PID feedback value	Unit 0.1%	R/W
0x300A	Voltage setting of voltage frequency separation	Unit 0.1%	R/W
0x300B	Tension setting	0 ~ maximum tension	R/W
0x300C	Coil diameter setting	0 ~ maximum coil diameter	R/W
0x300D	Linear speed setting	0 ~ maximum linear speed	R/W
0x300E	retain	-	R/W
0x300F	retain	-	R/W
0x3011	retain	-	R/W
0x3012	retain	-	R/W
0x3013	Tension PID feedback (PROFINET write data invalid)	0 ~ 1000 (corresponding to 100.0%)	R/W
0x3014	Communication given point JOG torque limit (PROFINET write data invalid)	0 ~ 4000 (corresponding to 400.0%)	R/W
0x3015	Communication given generation torque limit (PROFINET write data invalid)	0 ~ 4000 (corresponding to 400.0%)	R/W

3.1.3 AC300 Communication Monitoring Function Code or Address

Table 3.1.3	AC300 comr	nunication	monitoring	table

Parameter code (address)	Name		Explain	R/W
	-	Bit0	0: Shutdown state, 1: Running	
		Bit1	0: Non acceleration state, 1: Acceleration state	
		Bit2	0: Non deceleration state, 1: Deceleration state	
		Bit3	0: Forward, 1: Reverse	
0x3002	Inverter status	Bit4	0: No fault, 1: Inverter fault	R
0x3002	Inverter status	Bit5	0: GPRS non lock, 1: GPRS lock	
		Bit6	0: No warning, 1: Inverter warning	
		Bit7	0: No-ready, 1: Ready	
		Bit8	0: No fault in communication with control board1: Communication failure with control board	
0x3010	Fault code / warning code	Please u	ise c00.36	R

	(address corresponding		
	function is invalid)		
	External borrowing inverter	Bit0: y terminal status	
02018	output terminal	Bit1: relay status	р
0x5018	(address corresponding	Bit2: extended Y1 status	ĸ
	function is invalid)	Bit3: extended relay status	
	AO1 output (address	the analog output of outputs homowing	
0x3019	corresponding function is	fraquency converter is 0, 10000	R
	invalid)	nequency converter is 0-10000	
	AO2 output (address		
0x301A	corresponding function is	0 ~ 10000	R
	invalid)		
C00.00(0x2100)	Given frequency	0.01Hz	R
C00.01(0x2101)	Output frequency	0.01Hz	R
C00.02(0x2102)	Output current	0.1A	R
C00.03(0x2103)	Input voltage	0.1V	R
C00.04(0x2104)	Output voltage	0.1V	R
C00.05(0x2105)	Mechanical speed	1rpm	R
C00.06(0x2106)	Given torque	0.1%	R
C00.07(0x2107)	Output torque	0.1%	R
C00.08(0x2108)	PID given	0.1%	R
C00.09(0x2109)	PID feedback	0.1%	R
C00.10(0x210A)	Output power	0.1%	R
C00.11(0x210B)	Bus voltage	0.1V	R
C00.12(0x210C)	Module temperature 1	0.1°C	R
C00.13(0x210D)	Module temperature 2	0.1°C	R
C00.14(0x210E)	On state of input terminal X	-	R
C00.15(0x210F)	On state of output terminal Y	-	R
C00.16(0x2110)	AI1 analog input value	0.00% (0.001V)	R
C00.17(0x2111)	AI2 analog input value	0.00% (0.001V)	R
C00.18(0x2112)	Retain	-	R
C00.19(0x2113)	Pulse signal PUL input value	0.001kHz	R
C00.20(0x2114)	Analog output AO1	0.01V/0.01mA/0.01kHz	R
C00.21(0x2115)	Analog output AO2	0.01V/0.01mA/0.01kHz	R
C00.22(0x2116)	Counter count value	1	R
C00.02(0.0117)	Operation time of this power		D
C00.23(0x2117)	on	0.1 hours	ĸ
C00.04(0.0110)	Accumulated operation time		D
C00.24(0x2118)	of the machine	Hour	R
C00.25(0-2110)	Power level of frequency		D
C00.25(0X2119)	inverter	KW(U.1KW)	R
C00.26(0x211.4)	Rated voltage of frequency	V	D
C00.26(0x211A)	inverter	V	ĸ

C00.27(0x211B)	Rated current of frequency inverter	A(0.1A)	R
C00.28(0x211C)	Software version	-	R
C00.29(0x211D)	PG feedback frequency	0.01Hz	R
C00.30(0x211E)	Timer timing time	Second, minute, hour	R
C00.31(0x211F)	PID output value	0.1% (0.01%)	R
C00.32(0x2120)	Sub version of inverter software	-	R
C00.33(0x2121)	Encoder feedback angle	0.1 °	R
C00.34(0x2122)	Accumulated error of Z pulse	1	R
C00.35(0x2123)	Z pulse count	1	R
C00.36(0x2124)	Warning code fault	0 ~ 63 fault number, 64 ~ 128 warning number	R
C00.37(0x2125)	Accumulated power consumption (low level)	1KWh	R
C00.38(0x2126)	Accumulated power consumption (high level)	10000 KWh	R
C00.39(0x2127)	Power factor angle	1° (0.1 °)	R

3.2 AC310 Communication Configuration

3.2.1 Description of AC310 Communication Configuration

Table 3.2.1 AC310 function code setting

Function code	Name	Setting range	Setting value	Meaning
F01.01	Operation command selection	 0: Keyboard given 1: Terminal setting 2: RS485 3: Purchase card given 4: Terminal switching command given 	3	The running command is given by AC300PN1 card
F01.02	Frequency given source channel	 0: Keyboard number given 1: Keyboard analog potentiometer setting 10: Purchase card 	10	Frequency command is given by AC300PN1 card

F01.11	Upper limit frequency source selection	Select the given source of frequency inverter upper limit 0: Upper limit frequency given 1: Reservation 2: Voltage analog VS given 3: Current or voltage analog AI given 4: Current analog AS given 5: Terminal pulse PUL given 6: RS485 communication given 7: Purchase card	-	If you use AC300PN1 card to limit the upper limit frequency, you need to set this to 7
F03.41	Torque command setting	 0: Keyboard number 1: Keyboard potentiometer setting 7: Purchase card 	-	If the torque command is to be given by AC300PN1 card, it is set to 7
F03.54	Speed limit selection of forward rotation in torque control	 0: Set by function code F03.56 1: Reservation 7: Purchase card * F03.56 	-	If you need to limit the speed through the AC300PN1 card, you need to set this to 7
F03.55	Speed limit selection of reverse rotation in torque control	 0: Set by function code F03.57 1: Reservation 7: Purchase card * F03.57 	-	If you need to limit the speed through the AC300PN1 card, you need to set this to 7
F03.56	Maximum forward speed when controlled by torque	0.0%~100.0%	-	Relative maximum output frequency (F01.10)
F03.57	Maximum reverse speed when controlled by torque	0.0%~100.0%	-	Relative maximum output frequency (F01.10)
F12.32	Treatment of disconnection between PN card and inverter	0: No detection1: Alarm and freely stop2: Warn and continuously run		Treatment method of AC300PN1 card after detection of disconnection with control board (Ebus4/A. buS)
F12.43	Master slave communication failure action	0: No detection1: Alarm and freely stop2: Warn and continuously run	-	Handling mode in case of master-slave communication failure

				(when PLC is disconnected from equipment or PLC is in stop state, Ebus3/A. buS is reported)
F12.50	Processing method of communication disconnection of expansion card (frequency inverter processing)	Ones place: EX-A breaking treatment Tens place: EX-B breaking treatment 0: No detection 1: Alarm and freely stop 2: Warn and continuously run	_	Processing mode selection in case of communication failure between AC300PN1 card and frequency inverter,. (frequency inverter self detection, reporting Ebus1/A. buS)

3.2.2 Address Description of AC310 Communication Control Group

Address			R/W	
definition	Function description	Explanation of data significance	characteristic	
02100	Communication given frequency	0.01 Hz, e.g.: 5000 corresponds to	DAV	
0x3100	Communication given frequency	50Hz	K/W	
		0: No command		
		1: Forward running		
		2: Reverse running		
		3: Forward jog		
$0_{\rm W}2101$	Communication command setting	4: Reverse jog	DAV	
0x5101	Communication command setting	5: Slow down and stop	K/ W	
		6: Freely stop		
		7: Fault reset		
		8: Run forbidden command		
		9: Run allow command		
0x3104	Communication given upper limit	Unit: 0.01Hz	P/W	
072104	frequency			
0x3105	Communication torque setting	Unit 0.1%	R/W	
0x3106	Maximum forward frequency limit of	Unit 0.1%	R/W	
	Maximum reverse frequency limit of			
0x3107	torque control	Unit 0.1%	R/W	
	Communication given PID setting			
0x3108	value	Unit 0.1%	R/W	
	Communication given PID feedback			
0x3109	value	Unit 0.1%	R/W	
0x310A	voltage setting of voltage frequency		D/W/	
UX51UA	separation	Unit 0.170	K/W	
0x310B	Tension setting	0 ~ maximum tension	R/W	

Table 3.2.2 Address	description of AC.	310 communication	control group
	· · · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·

0x310C	Coil diameter setting	0 ~ maximum coil diameter	R/W
0x310D	Linear speed setting	0 ~ maximum linear speed	R/W
0x310E	Acceleration time 1	Set unit by function code F01.21	R/W
0x310F	Deceleration time 1	Set unit by function code F01.21	R/W
0x3111	Torque current component	0 ~ 4000 (corresponding to 0.0% ~ 400.0%)	R/W
0x3112	Torque filtering time	0 ~ 6000 (corresponding to 0.000s- 6.000s)	R/W
0x3113	Tension PID feedback	0 ~ 1000 (corresponding to 0.0% ~ 100.0%)	R/W
0x3114	Communication given torque limit in jog state	0 ~ 4000 (corresponding to 0.0% ~ 400.0%)	R/W
0x3115	Communication given torque limit in generation state	0 ~ 4000 (corresponding to 0.0% ~ 400.0%)	R/W

3.2.3 AC310 Communication Monitoring Function Code Or Address

Parameter code (address)	Name		Explain	
		Bit0	0: Shutdown state, 1: Running state	
		Bit1	0: Non accelerated topic, 1: Accelerated state	
		Bit2	0: Non deceleration state, 1: Deceleration state	
		Bit3	0: Forward, 1: Reverse	
0y2102	Inverter status	Bit4	0: No fault, 1: Fault	- R
0x5102		D:+5	0: GPRS non lock, 1: GPRS	
		DIU	lock	
		Bit6	0: No warning, 1: Warning	
		Bit7	0: No-ready, 1: Ready	
		Bit8	0: No fault in communication	
			with control board	
			1: Communication failure with	
			control board	
0x3010	Fault code / warning code (address	please r	1se c00.36	R
0.0010	corresponding function is invalid)	picase e		
	External borrowing inverter output	Bit0: y	terminal status	
0x3018	terminal	Bit1: re	lay status	R
0x5010	(address corresponding function is	Bit2: ex	tended Y1 status	
	invalid)	Bit3: ex	tended relay status	
0x3019	AO1 output (address corresponding	the ana	log output of external borrowing	D
073017	function is invalid)	frequen	cy converter is 0-10000	IX .

Table 3.2.3 AC310 communication monitoring table

0x2014	AO2 output (address corresponding	0 10000	р
0x501A	function is invalid)	0~10000	ĸ
C00.00(0x2100)	Given frequency	0.01Hz	R
C00.01(0x2101)	Output frequency	0.01Hz	R
C00.02(0x2102)	Output current	0.1A	R
C00.03(0x2103)	Input voltage	0.1V	R
C00.04(0x2104)	Output voltage	0.1V	R
C00.05(0x2105)	Mechanical speed	1rpm	R
C00.06(0x2106)	Given torque	0.1%	R
C00.07(0x2107)	Output torque	0.1%	R
C00.08(0x2108)	PID given	0.1%	R
C00.09(0x2109)	PID feedback	0.1%	R
C00.10(0x210A)	Output power	0.1%	R
C00.11(0x210B)	Bus voltage	0.1V	R
C00.12(0x210C)	Module temperature 1	0.1°C	R
C00.13(0x210D)	Module temperature 2	0.1°C	R
C00.14(0x210E)	Input terminal X On state	-	R
C00.15(0x210F)	Output terminal X on state	-	R
C00.16(0x2110)	AI1 analog input value	0.00% (0.001V)	R
C00.17(0x2111)	AI2 analog input value	0.00% (0.001V)	R
C00.18(0x2112)	Retain	-	R
C00.19(0x2113)	Pulse signal PUL input value	0.001kHz	R
C00.20(0x2114)	Analog output AO1	0.01V/0.01mA/0.01kHz	R
C00.21(0x2115)	Analog output AO2	0.01V/0.01mA/0.01kHz	R
C00.22(0x2116)	Counter count value	1	R
C00.23(0x2117)	Operation time of this power on	0.1 hour	R
C00.24(0x2118)	Accumulated operation time of the machine	hour	R
C00.25(0x2119)	Power level of frequency inverter	Kw(0.1Kw)	R
C00.26(0x211A)	Rated voltage of frequency inverter	V	R
C00.27(0x211B)	Rated current of frequency inverter	A (0.1A)	R
C00.28(0x211C)	Software version	-	R
C00.29(0x211D)	PG feedback frequency	0.01Hz	R
C00.30(0x211E)	Timer timing time	Second, minute, hour	R
C00.31(0x211F)	PID output value	0.1% (0.01%)	R
C00.32(0x2120)	Sub version of inverter software	-	R
C00.33(0x2121)	Encoder feedback angle	0.1 °	R
C00.34(0x2122)	Accumulated error of Z pulse	1	R
C00.35(0x2123)	Z pulse count	1	R
C00.36(0x2124)	Warning code fault	0 ~ 63 fault number, 64 ~ 128 warning number	R
C00.37(0x2125)	Accumulated power consumption (low level)	1 KWh	R

C00.38(0x2126)	Accumulated power consumption (high level)	10000 KWh	R
C00.39(0x2127)	Power factor angle	1°, 0.1°	R

3.3 Description of Communication Configuration between AC300PN1 Card and

PROFINET Master Station

After the communication between the main station and the main station is set up correctly, the communication between the main station and the main station can be realized by setting the communication card with the main station. Taking AC310 as an example, after the communication between AC300PN1 card and AC310 inverter is realized, it is necessary to connect with PROFINET master station correctly. After setting relevant configuration, the communication between AC300PN1 card and master station can be realized.

3.3.1 PROFINET Wiring Diagram

PROFINET supports a variety of connection modes. Through reasonable use of switches, different networking modes can be realized, as shown in the figure below



Figure 3.1 Schematic diagram of string connection



Figure 3.2 Schematic diagram of star connection



Figure 3.3. Schematic diagram of connection tree

3.3.2 communication description

AC300PN1 card requires customers to select different PZD lengths for transmission according to different requirements. Users can select the corresponding functions of each PZD in the configuration. The functions supported by each data format are shown in the table below

Data type	Data length	Supported features
		Frequency inverter command and frequency setting
Standard telegram 1	PZD-2/2	Operation status and frequency feedback of frequency
		inverter
		Frequency inverter command and frequency setting
		$0 \sim 2$ function parameters are written periodically
Standard telegram 2	PZD-4/4	Operation status and frequency feedback of frequency
		inverter
		$0 \sim 2$ monitoring parameters are read periodically
		Frequency inverter command and frequency setting
	PZD-6/6	$0 \sim 4$ function parameters are written periodically
Standard telegram 3		Operation status and frequency feedback of frequency
		inverter
		$0 \sim 4$ monitoring parameters are read periodically
		Frequency inverter command and frequency setting
Standard tale arous 4		$0 \sim 6$ function parameters are written periodically
Standard telegram 4	PZD-8/8	Operation status and frequency feedback of frequency
		inverter

	0 ~ 6 monitoring parameters are read periodi					
		Frequency inverter command and frequency setting				
		$8 \sim 0$ cycle write function				
Standard telegram 5	PZD-10/10	Operation status and frequency feedback of frequency				
		inverter				
		0 ~ 8 monitoring parameters are read periodically				
		Frequency inverter command and frequency setting				
		$0 \sim 10$ function parameters are written periodically				
Standard telegram 6	PZD-12/12	Operation status and frequency feedback of frequency				
		inverter				
		0 ~ 10 monitoring parameters are read periodically				

PZD is the process data. The master station of PZD can send instructions to the frequency inverter periodically and read the current status of the frequency inverter periodically. Each PZD can select configuration and select the parameters to be interacted between the master station and the slave station. PZD1 and PZD2 are fixed configuration and cannot be modified. The configuration of PZD3 ~ PZD12 can be changed according to the specific needs of users. The interactive data is shown in table 3.5

PZD (Master->Slave)				
PZD1	PZD2	PZD3~PZD12		
Inverter command	er command Frequency command of frequency			
	inverter	parameters		
PZD (Slave->Master)				
PZD1	PZD2	PZD3~PZD12		
Inverter status	Frequency feedback of frequency	Other monitoring parameters		
	inverter			

Table 3.5 Description of data sent by master station

Master station se	ends data					
PZD1	Inverter control command	5: Slow down and stop				
	0: No command	6: Freely stop				
	1: Forward running	7: Fault reset				
	2: Reverse running	8: Run forbidden command				
	3: Forward jog	9: Run allow command				
	4: Reverse jog					
PZD2	Frequency command of frequency inverter, unit: 0.01Hz					
PZD3~PZD12	It can be configured with different contro	l parameters (0x3xxx group address) to issue				
	periodic instructions to the frequency inv	erter				

Table 3.6 Description of data sent by slave station

Sending data from slave station							
PZD1	Bit0	0: Shutdown state, 1: running state					
	0: non accelerated state, 1: accelerated state						
	Bit2	0: non deceleration state, 1: deceleration state					
	Bit3	0: forward, 1: reverse					

	Bit4 0: no fault, 1: fault					
	Bit5	0: GPRS unlock, 1: GPRS lock status				
	0: no warning, 1: warning					
PZD2	Frequency feedback of frequency inverter, unit: 0.01Hz					
PZD3~PZD12	It can be configured for different monitoring parameters (C00.xx group and part of 0x300					
	group address) to read data periodically from frequency inverter					

4 S7-1200 Configuration AC300PN1 Card Example

The following shows that S7-1200 is used with V15 to show how to configure with AC310 and AC300PN1 card.

Step 1: Build a new project and add S7-1200 master station

Open the software and click create new project.

Fill in the project information, project name, path, etc. When finished, click to create.





游 Siemens - C:\Users\pan\Desktop\AC:	300-PROFINEAC300-PROFINE		그 리 X Totally Integrated Automation PORTAL
Start	Open existing project	First steps Project: "AC300-PROFINE" was opened successfully. Please select the next step:	
PLC programming Motion &	Create new project Migrate project Close project	Start Start	
technology	Welcome Tour	Devices & Configure a device Devices & State Configure a device PLC programming	
Visualization Online & Diagnostics	First steps	Motion & Configure technology the technology objects	=
	Help	Drive parameterization The parameterize drive Parameterize drive Visualization Configure an HM screen	
	S User interface language	Project view Open the project view	



Click add equipment, select the corresponding model of PLC, and click Add.

Step 2: import the GSDML file

In "options", click "manage general station description file"

Visers\pan\Desktop\AC	300-F	PROFINE/AC300-PROFI	IE											_ •
Project Edit View Insert Online	Optic	ons Tools Window	Help										Totally Into	arated Automation
📑 🎦 🔜 Save project 🔳 🐰 💷 🗊	¥ 5	ettings			e gi	🖉 Go off	line 🛔	, IR II	×	Ξm	Search in project>	3.	rotany inte	PORTAL
Deciset tree	S	upport packages			/P1	1			eja j					
	-			- fl (CCD)	nxiy									
Devices	5	tart Automation License	Vanager	n nies (GSD)	_							🚽 Topology view	🔥 Network view	Device view
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		are not comparent circles of				8 🔳	🔁 🛓							
	S 🖉	how reference text					•							
T ACBOD-PROFINE	🛄 G	lobal libraries			•									
E Add new device		* ~												
B Devices & networks														=
▼ PLC_1 [CPU 1214C AC	l en													
Device configuration =		1		2 3	4	5	6	7	8	9				
🐫 Online & diagnostics	11													
Program blocks														
Technology objects														
External source files	1.6		Filmed											
🕨 🚂 PLC tags	1.8													
PLC data types	ы.													
Watch and force ta														- 2
I Online backups	6.8		_											<u>।</u> क्षे
Traces														= ~
Device proxy data														
Program info														
Carces Traces Device proxydata Program info Carce to a listr	L													

In the pop-up dialog box, first select the path where the GSDML file is stored (be careful not to put the GSDML file in the Chinese path, otherwise an error may be reported), and then select and click **Install**. The GSDML file can be obtained from the manufacturer or the official website



Manage general station description files	×
Installation result	
1 Miessage	
Installation was completed successfully.	
Save log Install additional files	

If the installation is successful, you will be prompted as follows. Click "close"

Step 3: configure the slave information

Double-click devices and networks in the project

Find "other field devices" - "PROFINETIO" - "I/O" - "AC310" - "AC310PN" under the "hardware directory" on the right, and double-click "Standard, MRP"

Wŝ	Siemens - C:\Users\pan\Desktop\AC300-PRC	DFINEWAC300-PROFINE	_ # X
Er	roject <u>E</u> dit <u>V</u> iew <u>I</u> nsert <u>O</u> nline Optio <u>n</u> s	Tools Window Help Totally Ir	tegrated Automation
E	🛉 🎦 🔚 Save project 🚊 🐰 💷 🗈 🗙 🕷	🖸 ± (# ± 🔚 🔃 🖬 🚆 🐺 💋 Go online 🖉 Go online 🏭 🖪 📅 🛠 🚽 🛄 <search in="" project=""> 🐪</search>	PORTAL
	Project tree 🔲 🖣	AC300-PROFINE > Devices & networks	∎ 🗈 🕨
	Devices	Topology view 🕼 Network view DY Device view Options	
	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	💦 Network 🔡 Connections HM connection 💎 🖾 🕄 🗐 🔍 🛎 📑	
1×		► Catalog	dw
Ť.	AC300-PROFINE		eat ant
Ĕ	Add new device		
80	Devices & networks	Pluster Pronie: <al></al>	B
ġ.	PLC_1 [CPU 1214C AC/DC/Rly]	Invetvork components	
å	Device configuration =	The Detecting a Monitoring The Detecting a Monitoring The Detecting a Monitoring The Detecting and the Detection of the Detec	
	Contine & diagnostics Pressam blasks	Brower supply & distribution	2
	Technology objects	I The Bield dowings	
	External source files		Te t
	PLC tags	La Additional Ethernet devices	00
	PLC data types		N I
	Watch and force tables	Ver Drives	
	Online backups	🔋 🔁 🕨 🛄 Encoders	3
	🕨 🔀 Traces	- E Gateway	a
	Device proxy data		ŝ
	Program info		= = =
	PLC alarm text lists	► UKA Roboter GmbH	
	Local modules		İ
	► Ungrouped devices		
	✓ Details view		~ v
		→ ma Ac310PN	
		I Standard, MRF	
	Name	► Im Network Components	
		► Figure PLCs & CPs	
		S 100%	
			· · · · · · · · · · · · · · · · · · ·
		Supervises Sumo Supervises Information	
	Portal view Overview	🚵 Devices & ne	FINE was saved

Select the Ethernet port of PLC, switch to "**properties**" – "**Ethernet address**", set IP address and subnet mask, and click "**add subnet**"

_	,,	-									
	Project tree	_ □ ∢	AC300-PROFINE > Dev	ices & networks						_ # =>	<
	Devices							🛃 Topology view	📥 Network view	Device view	
	窗	😐 🐋	Network	ns HMI connection	- 100 100	🗄 🛄 🍳 ±				3	Ŧ
¥										^	d a
ž	 AC300-PROFINE 	^								E	12
e l	Add new device			_							2 8
8	📥 Devices & networks		PLC_1	AC310PN							
<u>ë</u>	PLC_1 [CPU 1214C AC/DC/Rly]	1	CPU 1214C	Standard, MRP	DP-NORM					E	i 🧉
a l	Device configuration	=		Not assigned						Þ	
	Online & diagnostics				-						8
	Program blocks										9
	Technology objects									~	
	External source files		< II					> 100	%		1 a
	🕨 🛺 PLC tags		PROFINET interface 1	X1 · PN(LAN)]				Properties	Dinfo D Dino	montion	- ĕ
	E PLC data types		Thormer interface_r [Properties		nostics	
	Watch and force tables		General IO tags	System constants	Texts						
	🕨 🙀 Online backups		General								~ 4
	🕨 🚰 Traces		Ethernet addresses	Ethernet ad	dresses						= as
	Device proxy data		Time synchronization	Interface	networked with						ି
	Program info		Operating mode								
	PLC alarm text lists		Advanced options		Subnet	Not networked				-	-
	Local modules		Web server access			Add new subnet					- iii
	Ungrouped devices	~									arie
	✓ Details view			IP protoco							ŝ
				, in protoco							
ľ						Set IP address in the	project				
						Waddrass	102 100 0	-			
	Name					- Cir audress.	192 . 168 . 0				
						Subnet mask:	255 . 255 . 25	5.0			

Click "unassigned" of AC310PN, and click "PLC_1. PROFINET interface_1"



Select the slave station, click "**properties**" - "**Ethernet address**", and set the IP address of the slave station. Under "**PROFINET**", tick off "**automatically generate PROFINET device name**", and enter the desired name (you can also keep the check box to let the system automatically generate the name)

	Project tree 🔲 🖣	AC300-PROFINE ► Devices & networks	k 🖪
	Devices	😴 Topology view 🚔 Network view 👔 Device view	100
	1 I I I I I I I I I I I I I I I I I I I	🚰 Network 🔢 Connections HMI connection 💌 📅 🔛 🔠 🕲 💵	H
Devices & networks	Add new device Add new device Add new device Devices & networks Add new device Add	PLC_1 CPU 1214C PLC_1.PROFINET IO-System (100) PLC_1.PROFINET	dware catalog Online tools Tasks Natwork data >
	PLC alarm text lists Distributed I/O Details view	PROFINET	Libraries
	Name	PROFINET device name automatically PROFINET device name automatically Converted name: ac310pn Device number: 1	

Step 4: select the interactive data station

Select the slave station, switch to the "**device view**", expand the "**module**" in the right directory, and select the periodic interactive data according to the number of parameters to be sent and received. For example, if there are four parameters for the master station to send to the slave station and the master station to read the status of the slave station, select standard message 2



After that, select the message and click "**properties**"-"**module parameters**" to see the specific configuration of PZD. PZD1 and PZD2 are fixed configurations, PZD1 (Master > slave) and PZD2 (Master > slave) are the control commands and frequency given by the master station respectively. PZD1 (slave > Master) and PZD2 (slave > Master) are the state and frequency feedback of the frequency inverter, read by the master station. PZD3 (Master > slave) and PZD4 (master > slave) can select the command to send according to table 3.2, and 0xFFFF means invalid. PZD 3 (slave > Master) and PZD4 (slave > Master) can select the parameters to be monitored according to table 3.3, and 0xFFFF means invalid.

Vß	Siemens - C:\Users\pan\Desktop\AC300-PR	OFINE/AC300-PROFINE						_ • ×
Er	oject <u>E</u> dit <u>V</u> iew <u>I</u> nsert <u>O</u> nline Optio <u>n</u> s	<u>T</u> ools <u>W</u> indow <u>H</u> elp				Totally inte	grated Automati	on
E	🛉 🎦 🔚 Save project 🚊 🐰 🏥 🛅 🗙 🎙	ን ቷ (ቶ 🗄 🖪 🗓 🖆 📮	🖡 Go online 🖉 Go offline 🛛 🛔 🚺	🖥 🗶 📃 🛄 <earch in="" proje<="" td=""><td>c> 🖬</td><td></td><td>POI</td><td>RTAL</td></earch>	c> 🖬		POI	RTAL
	Project tree 🔲 🖣	AC300-PROFINE Ungroupe	d devices 🕨 AC310PN [Standard,	MRP]			_ 7	∃ × ∢,
	Devices				Topology view	A Network view	Device vie	w
	144 E E E E E E E E E E E E E E E E E E	AC310PN [Standard, MRP]	▼ = ₩ ∠ = = • •		Device overview	loon		Ŧ
		ten i constanti farmanatura i			Device overview			- dv
2	- AC300-PROFINE	to			Y Module	Rack	Slot Laddress	Q are
1	💣 Add new device	5(3)0			ACSTOPN	0	0 ¥1	a la
8	Devices & networks				Standard teleora	m2.P7D-4/ 0	1 2.9	2 9 8
ic.	▼ 1 [CPU 1214C AC/DC/Rly]							
ő	Device configuration			•				
	& Online & diagnostics							8
	Program blocks	•	DP-NORM					nii
	External source files							ne
	PLC tags	<	> 100%		<	11		> 5
	PLC data types	Standard telegram2,PZD-4/4_			Properties	🗓 Info 🔒 🗓 Diag	nostics	
	Watch and force tables	General IO tags Sv	tem constants Texts					
	Online backups	General						
	🕨 🔄 Traces	Catalog information	general paramete					as
	Device proxy data	Identification & Maintenance	gen al parameter					- 6
	Program info	Hardware interrupts		\frown				- m
	E PLC alarm text lists	 Module parameters 	PZD1(master->slave):	0x310			v	5
	Distributed I/O	general parameter	PZD2(master->slave):	0x3100			-	bra
	M Details view	Module failure	PZD3(master->slave):	OXEFFF			-	ries
	Details view	I/O addresses	P7D4(masteroslava)	OVEEEE				
			1204(master-snave).	(o.a.102)				
			F2D1(slave->master)	003102			· ·	
	Name		PZD2(slave->master):	[C00.01			*	
			PZD3(slave->master):	OXFFFF			•	
			PZD4(slave->master):	VEFE			-	

Switch back to the network view. If you need to add more slaves, repeat the above. If the configuration is the same, you can copy the slave directly, and then modify the IP address and device name

Step 5: download configurationSave the configuration, set the IP address of the computer and PLC in the same network segment (do not duplicate the IP address of the slave station), compile and click download



Step 6: assign device name Select the slave station and click "**online**" - "**assign device name**"

nens - C:\Users\panit	JesktopAC300-PROFINEAC300-PROFIN	E		
Edit View Inset	Online Options Tools Window	Ctrl+K n	ne 🖉 Go offline 🛔 🅞 📑 🐺 🚍 🛄 🤇 Search in project> 🐐	omation POR
ject tree	Go offline	Ctrl+M	is .	- • •
levices	Simulation	•	🛃 Topology view 🛛 🛔 Network view 👔 Devic	ce view
	Stop runtime/simulation	ti	ion 💌 📅 🔛 🛄 🔍 ±	
	I Download to device	Ctrl+L	IO system: PLC_1.PROFINET IO-System (1	100) ^
AC300-PROFINE Add new device	Extended download to device Download and reset PLC program Download user program to Memory O	ard P	PN	
PLC_1 [CPU 1214: Device config Online & diag	A Snapshot of the actual values			
Program block Green and the second	Upload from device (software)	are and software)	-Syste)	
External source External source PLC tags PLC data types	Backup from online device Hardware detection	•		
Watch and for	HMI Device maintenance	•		
🕨 🙀 Online backup	Accessible devices	Ctrl+U		
 Traces Device proxy d 	Start CPU	Ctrl+Shift+E Ctrl+Shift+Q		
Program info	Online & diagnostics	Ctrl+D		-1
Local modules Distributed I/O	Receive alarms			
Distributed I/O Details view	Receive alarms			

Click "**update list**", where the device name should be consistent with the name in "configured PROFINET device"

		PROFINET devic	e name:	ac310pn 💌
		Dev	ice type:	Standard, MRP
		Online access		
		Type of the PG/PC i	nterface:	PN/IE
		PG/PC i	nterface:	🐱 Intel(R) Ethernet Connection (3) I218-V 💌 💌 🔯
		Device filter		
		🛃 Only show	devices of	the same type
		Only show	devices wi	th bad parameter settings
		Only show	devices wi	thout names
	Accessible de	Only show	devices wi	thout names
	Accessible de IP address	Only show vices in the network: MAC address	devices wi	PROFINET device name
	Accessible de IP address 0.0.0.0	Only show vices in the network: MAC address 50-00-30-CB-20-68	devices wi Device VEICHI Inv	PROFINET device name Status
	Accessible de IP address 0.0.0.0	Only show vices in the network: MAC address 50-00-30-CB-20-68	devices wi Device VEICHI Inv	PROFINET device name ac310pn
	Accessible de IP address 0.0.0	Only show vices in the network: MAC address 50-00-30-CB-20-68	devices wi Device VEICHI Inv	PROFINET device name ac310pn
I.	Accessible de IP address 0.0.0.0	Only show vices in the network: MAC address 50-00-30-CB-20-68	devices wi Device VEICHI Inv	PROFINET device name ac310pn

If there are more than one other devices, you can select other devices to assign the name. After receiving the assigned name, the slave station will save the name. The master station distinguishes each slave station by the device name. The essence of assigning the name is to bind the device name and MAC address. After modifying the name of the station device in the configuration, the name must be reassigned

After all the above operations are completed, PLC program can be written to control the inverter

5 AC300PN1 Card Fault Direct Replacement

When the fault of AC300PN1 card cannot be recovered, it can be replaced directly. It is only necessary to set the corresponding settings on the upper computer of PLC when configuration is needed, and there is no need to reconfigure the equipment

Replacement conditions:

- 1. The replacement AC300PN1 card has never been assigned a device name;
- 2. When PLC configures network, it configures topology network;
- 3. In PLC configuration, check "support equipment replacement without exchangeable media"

The following takes Portal V15 as an example to illustrate how to make settings that can be replaced directly

In the hardware configuration, select the PROFINET interface of the master station, and in the "advanced options" of the "properties", check "support equipment replacement without replaceable media". If you use S7-1200 or S7-1500, you can check "allow to cover all assigned IO device names", and the direct replacement condition 1 can be ignored



Switch to the "topology view", click on the PLC port, hold it down, and drag it to the port of AC300PN1 card which is directly connected with. Note here that the wiring in the topology view must be consistent with the actual physical network wiring. Facing RJ45 interface, P1 is on the right and P2 is on the left of the AC300PN1 card.



After connecting, compile and download to PLC

6 Others

1. When AC300PN1 card is used, please use super-5m or above shielded network cable for communication, so as to enhance the anti-interference ability of the equipment;

2. When AC300PN1 card is used, in order to ensure the accuracy and reliability of the signal, the

distance of the communication network lines between the two cards should not exceed 100 meters. Due to the long wiring, the signal attenuation and anti-interference performance are reduced. It is recommended to use the switching unit network (as shown in Figure 3.2)

3. Try not to be parallel with the power line (R/S/T, U/V/W) as far as possible. If the wiring conditions are limited, please keep a distance of more than 0.5m when parallel routing;

4. Grounding the shielded network cable port can effectively reduce the interference

Thank you again for using AC300PN1 card!



Figure 6.1 Category 5 shielded network cable

7 PN Card Installation

The current software version is 711, which is usually inserted in the EX-A slot of the inverter. The installation method is different depending on the structure of the inverter, which is 2.2KW and below, as shown in Figure 7-1.



Figure 7-1 2.2KW installation physical



Figure 7-2 4KW/5.5KW above installation physical



Figure 7-3 High Power Installation Physical

8 GSD file selection

The GSDML file is different for AC300/AC310 series, and the type of upper computer is different, so it is summarized as follows as follows.

Siemens SMART Series:

AC300: GSDML-V2.31-Veichi-AC300-20201012.xml

AC310: GSDML-V2.31-Veichi-AC310-20201012.xml

Siemens S7-1200/S7-1500 Series:

- AC300: GSDML-V2.35-Veichi-AC300-20201012.xml
- AC310: GSDML-V2.35-Veichi-AC310-20201012.xm