PROFINET 卡操作手册

Operation Guide of PROFINET

操作手册（中文）

感谢您使用本公司 PROFINET 卡产品，在产品使用前，请认真阅读本指南

Operation Guide （ENGLISH）

Thank you for using the PROFINET products. Please read this guide carefully before using the products.

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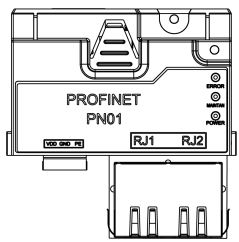
1. 概述

首先感谢您使用本公司变频器，并选用本公司 PROFINET 现场总线扩展卡，以下简称 PN01 卡。

PN01 卡是 PROFINET 现场总线适配卡,符合国际通用的 PROFINET 以太网。该卡安装在本公司变频器上，提高通讯效率，便于实现变频器组网功能，使变频器成为现场总线的从站，接受现场总线主站控制。PN01 适用于本系列全功率段，后续可能支持到更多的系列产品上。

在使用本产品前，请认真阅读本指南。



功能特点:

- 总线通信速率达到 100Mbit/s，通讯周期短;
- 组网拓扑结构灵活，PN01 支持所有类型的拓扑结构:链式、总线型、树型或星型等。
- 扩展卡直接安装在扩展卡插槽上，无需外部供电，安装方便。

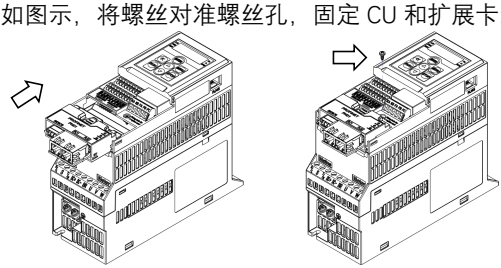
2. PROFINET 卡安装说明

安装步骤:

- 检查扩展卡附件包中包含:PROFINET 卡、可插拔端子*1、螺丝*1、说明书;
- 如下图示安装扩展卡:

  步骤 1，将扩展卡沿着底部导轨推进 CU 底部，扩展卡的端子与 CU 端子对插到底，两个螺丝孔对齐;

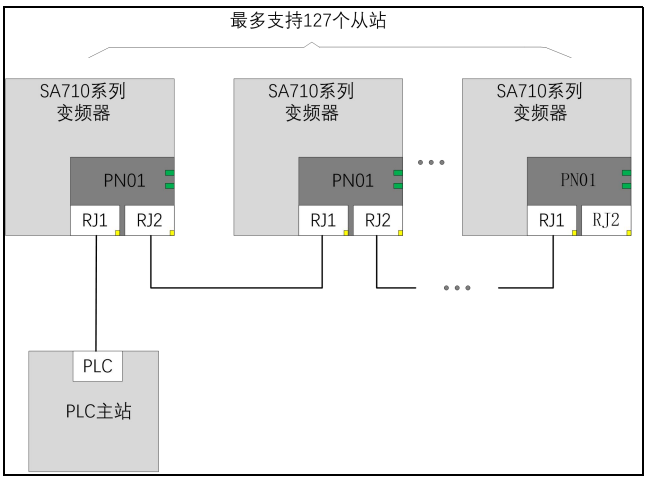
  步骤 2，如图示，将螺丝对准螺丝孔，固定 CU 和扩展卡;



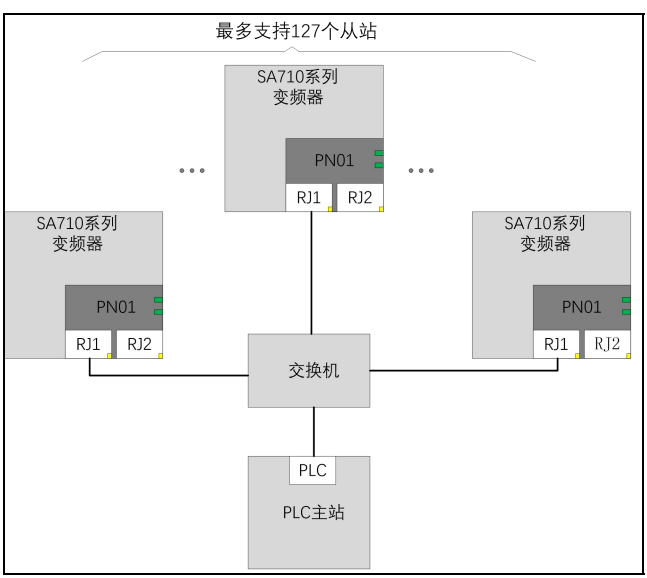
3. 电气连接

PN01 模块采用标准以太网 RJ45 插座与 PROFINET 主站连接，其引脚信号定义与标准以太网管脚一致，交叉线及直连线均可。

1）链式组网电气

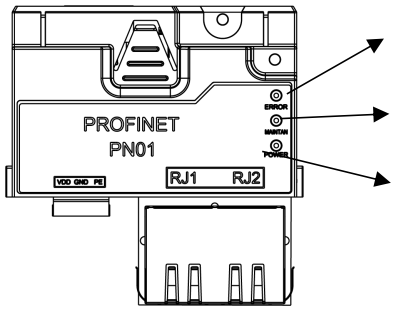


2）星型组网电气连接



4. 状态指示灯说明

PN01 扩展卡可以通过 2 个状态指示灯追踪总线通信故障，诊断故障说明见下表:



指示灯	颜色	状态说明
ERROR	红灯常亮	扩展卡故障
	红灯熄灭	通讯正常
MAINTAN	绿灯常亮	扩展卡故障
	红灯熄灭	通讯正常
POWER	绿灯常亮	扩展卡上电正常
	绿灯熄灭	扩展卡电源异常或者变频器未上电

5. 相关参数

5.1 参数表

参数号	参数名称	解释
P10-00	Device Name	设备名称,用户通过该参数设置设备名称。
P10-01	IP Address[0]	IP 地址。 例如, 192.168.0.1 设置如下参数: P10-01:192，P10-02:168， P10-03:0，P10-04:1
P10-02	IP Address[1]	
P10-03	IP Address[2]	
P10-04	IP Address[3]	
P10-05	IP Address Mask[0]	IP 地址掩码。 例如, 255.255.255.0 设置如下参数: P10-05:255，P10-06:255， P10-07:255，P10-08:0
P10-06	IP Address Mask[1]	
P10-07	IP Address Mask[2]	
P10-08	IP Address Mask[3]	
P10-09	Gateway address[0]	网关地址。 例如,192.168.0.241 设置如下参数: P10-09:192，P10-10:168， P10-11:0，P10-12:241
P10-10	Gateway address[1]	
P10-11	Gateway address[2]	

参数号	参数名称	解释
P10-12	Gateway address[3]	
P10-30	读 PCD 1	周期性读参数配置。第一个参数默认为状态字，第二个参数默认为当前值。第三个字及其后的其他字可通过读 PCD 参数配置。例如如果需要读取参数 P0-50，P0-51 可以配置读 PCD 1(P10-30)为 50，读 PCD 2(P10-31) 为 51。注意需要跟 PPO 类型一起配合使用。
P10-31	读 PCD 2	
P10-32	读 PCD 3	
P10-33	读 PCD 4	
P10-34	读 PCD 5	
P10-35	读 PCD 6	
P10-36	读 PCD 7	
P10-37	读 PCD 8	
P10-40	写 PCD 1	周期性写参数配置。周期性写参数的第一个参数为控制字，第二个参数为目标参考值。如果需要写参数 P0-51，P0-52;需配置写 PCD 1 (P10-40)) 为 51，写 PCD 2(P10-41) 为 52。注意需要跟 PPO 类型一起配合使用。
P10-41	写 PCD 2	
P10-42	写 PCD 3	
P10-43	写 PCD 4	
P10-44	写 PCD 5	
P10-45	写 PCD 6	
P10-46	写 PCD 7	
P10-47	写 PCD 8	

5.2 控制字和状态字介绍

PPO 类型 （电报类型）

标准电报 1	双节字输入（读) 状态字 实际值	双节字输出(写) 控制字 设定值
PPO 类型3	双节字输入 (读) 状态字 实际值	双节字输出) 控制字 设定值
PPO 类型4	四节字输入(读) 状态字 实际值 读 PCD 1 读 PCD 2	四节字输出(写) 控制字 设定值 写 PCD 1 写 PCD 2
PPO 类型6	六节字输入(读) 状态字 实际值 读 PCD 1 读 PCD 2 读 PCD 3 读 PCD 4	六节字输出(写) 控制字 设定值 写 PCD 1 写 PCD 2 写 PCD 3 写 PCD 4

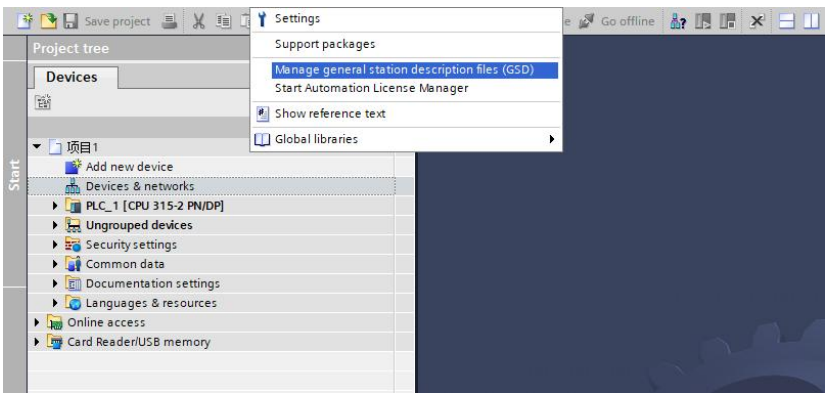
PPO 类型7	八节字输入(读) 状态字 实际值 读 PCD 1 读 PCD 2 读 PCD 3 读 PCD 4 读 PCD 5 读 PCD 6	八节字输出(写) 控制字 设定值 写 PCD 1 写 PCD 2 写 PCD 3 写 PCD 4 写 PCD 5 写 PCD 6
PPO 类型8	10 words In(读) 状态字 实际值 读 PCD 1 读 PCD 2 读 PCD 3 读 PCD 4 读 PCD 5 读 PCD 6 读 PCD 7 读 PCD 8	10 words Out(写) 控制字 设定值 写 PCD 1 写 PCD 2 写 PCD 3 写 PCD 4 写 PCD 5 写 PCD 6 写 PCD 7 写 PCD 8
状态字说明 P09.02 状态字对应表		
Bit 位	0	1
bit0	控制未就绪	控制就绪
bit1	控制未就绪	控制就绪
bit2	惯性停止	运行
bit3	无故障	故障跳脱
bit4	无故障	故障未跳脱
bit5	保留	保留
bit6	无故障	故障跳脱
bit7	无警告	警告
bit8	不按参考值运行	按参考值运行
bit9	手动模式	远程控制
bit10	频率不在范围	频率在范围内
bit11	停止	运行
bit12	保留	保留
bit13	在电压范围内	超出电压限制
bit14	保留	保留
bit15	无过热警告	过热警告

6. GSD 文件配置

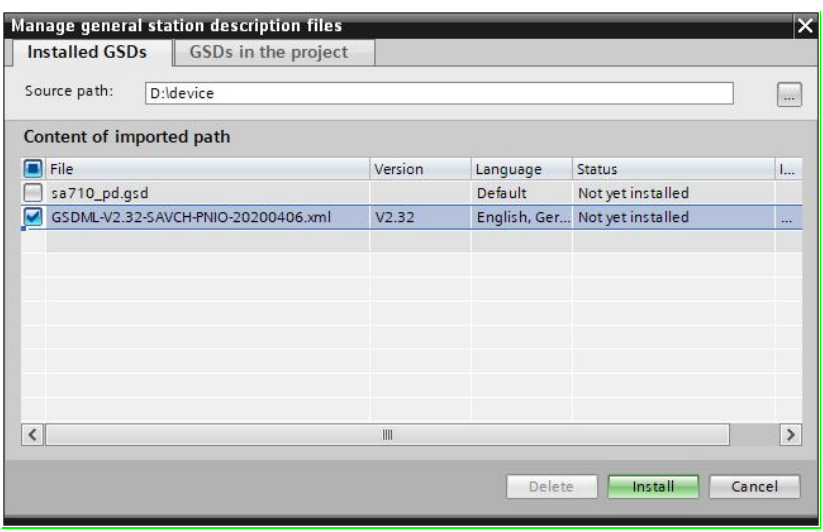
在 PROFINET 主站使用时一定要首先配置从站的 GSD 文件，使对应从站设备添加到主站的系统中。GSD 文件可以向供应商或厂家索取。

以 S7-300 为例:

步骤 1: 选择/管理总站描述文件（GSD），安装 GSDML 文件;



步骤 2:浏览 GSDML 文件所在路径，点击安装即可。



7. 周期性通讯设置指导

步骤 1:根据示例工程配置设置变频器参数。IP: 192.168.0.2. ;IP Address Mask:255.255.255.0.;Gateway:192.168.0.241. ;Device Name:1;示例工程配置 PPO Type 6, 6 words in and 6 words out. 需要设置变频器配置参数:

P10-30 读 PCD 1: P0-51; need to set P10-30=51

P10-31 读 PCD 2: P0-52 需设置 P10-31=52

P10-32 读 PCD 3: P0-54 需设置 P10-32=53

P10-33 读 PCD 4: P0-55 需设置 P10-33=54

P10-40 写 PCD 1: P0-57 需设置 P10-40=57

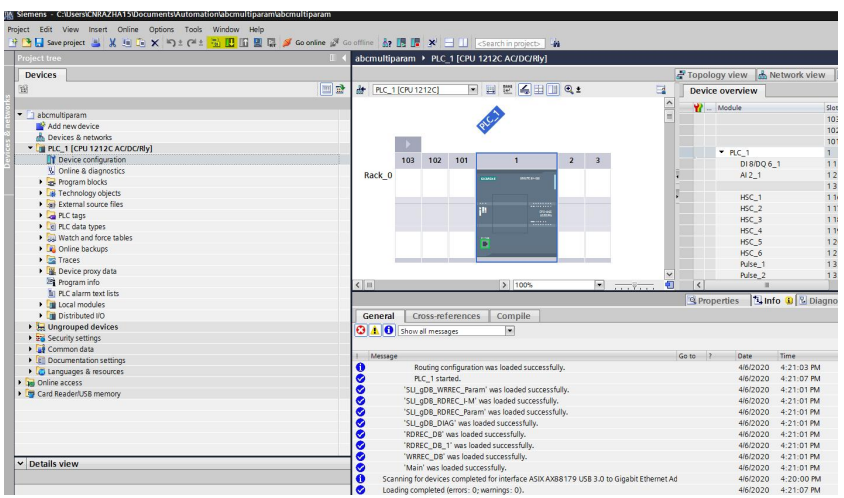
P10-41 写 PCD 2: P0-58 需设置 P10-41=58

P10-42 写 PCD 3: P0-60 需设置 P10-42=60

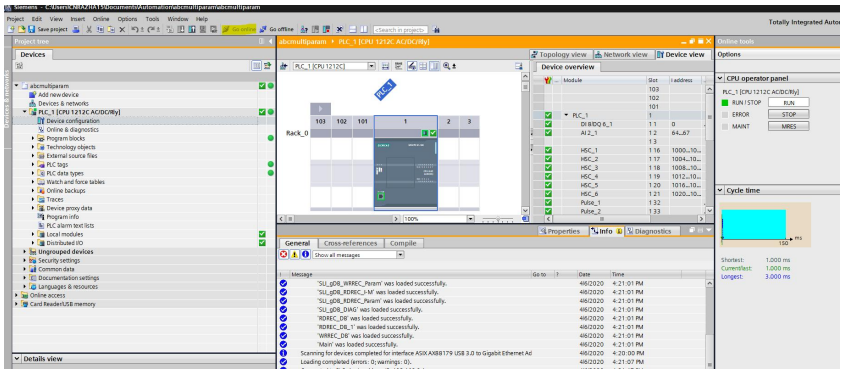
P10-43 写 PCD 4: P0-61 需设置 P10-43=61

步骤 2: 重启设备;

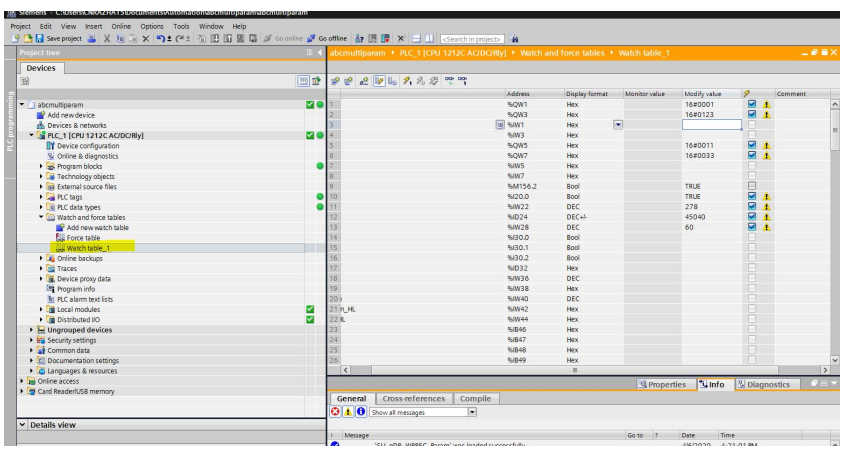
步骤 3: 编译并下载工程到 PLC,如果当前 PLC 网址不在一个网段，按照提示操作即可。PLC 手册有详细说明。



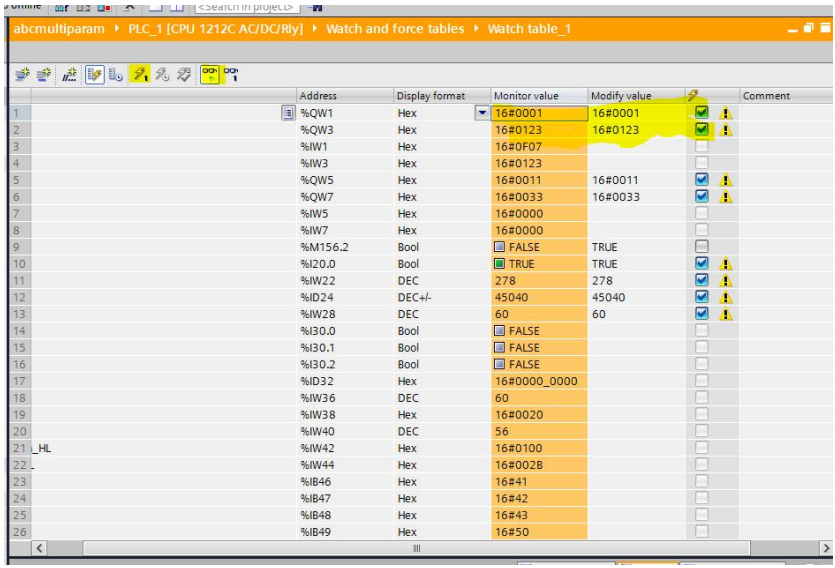
步骤 4:选中 PLC,点击 Go Online，进入在线模式。确认没有任何错误信息，如下图所示



步骤 5:进入监测变量界面,更改控制字（QW1），参考值（QW2）。并点击强制按钮。

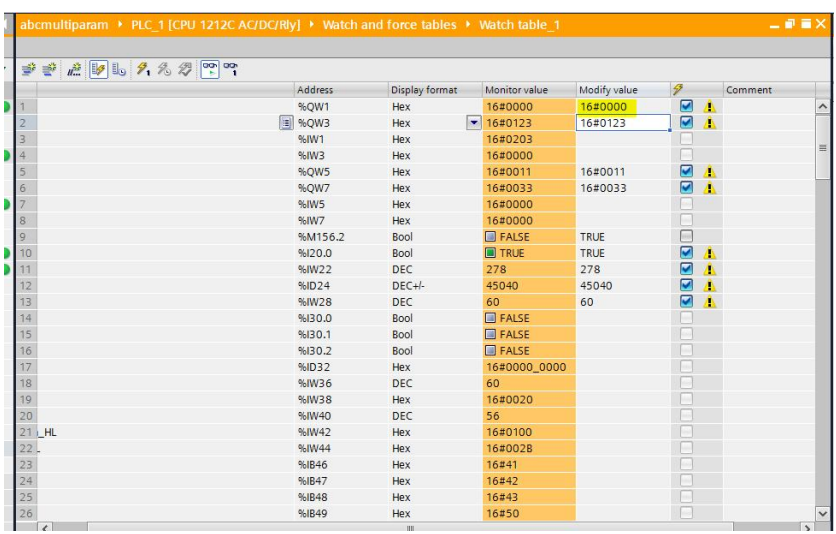


步骤 6:更改控制字（QW１）为 1，参考值（QW２）为 123。并点击强制按钮。如下图所示:验证状态字（ＩW１）为 0f07 和当前值（IW2 ）为 123。



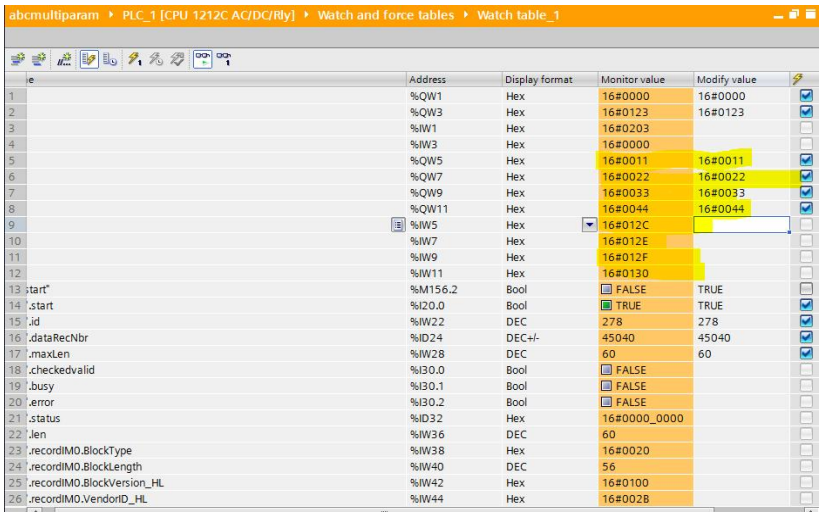
		Address	Display format	Monitor value	Modify value	Comment
1		%QW1	Hex	16#0001	16#0001	
2		%QW3	Hex	16#0123	16#0123	
3		%IW1	Hex	16#0F07		
4		%IW3	Hex	16#0123		
5		%QW5	Hex	16#0011	16#0011	
6		%QW7	Hex	16#0033	16#0033	
7		%IW5	Hex	16#0000		
8		%IW7	Hex	16#0000		
9		%M156.2	Bool	FALSE	TRUE	
10		%I20.0	Bool	TRUE	TRUE	
11		%IW22	DEC	278	278	
12		%ID24	DEC+/-	45040	45040	
13		%IW28	DEC	60	60	
14		%I30.0	Bool	FALSE		
15		%I30.1	Bool	FALSE		
16		%I30.2	Bool	FALSE		
17		%ID32	Hex	16#0000_0000		
18		%IW36	DEC	60		
19		%IW38	Hex	16#0020		
20		%IW40	DEC	56		
21	_HL	%IW42	Hex	16#0100		
22	_	%IW44	Hex	16#002B		
23		%IB46	Hex	16#41		
24		%IB47	Hex	16#42		
25		%IB48	Hex	16#43		
26		%IB49	Hex	16#50		

步骤 7: 更改控制字（QW１）为 0，并点击强制按钮。如下图所示:验证状态字（ＩW１）为 0203 和当前值（IW2 ）为 0。



		Address	Display format	Monitor value	Modify value	Comment
1		%QW1	Hex	16#0000	16#0000	
2		%QW3	Hex	16#0123	16#0123	
3		%IW1	Hex	16#0203		
4		%IW3	Hex	16#0000		
5		%QW5	Hex	16#0011	16#0011	
6		%QW7	Hex	16#0033	16#0033	
7		%IW5	Hex	16#0000		
8		%IW7	Hex	16#0000		
9		%M156.2	Bool	FALSE	TRUE	
10		%I20.0	Bool	TRUE	TRUE	
11		%IW22	DEC	278	278	
12		%ID24	DEC+/-	45040	45040	
13		%IW28	DEC	60	60	
14		%I30.0	Bool	FALSE		
15		%I30.1	Bool	FALSE		
16		%I30.2	Bool	FALSE		
17		%ID32	Hex	16#0000_0000		
18		%IW36	DEC	60		
19		%IW38	Hex	16#0020		
20		%IW40	DEC	56		
21	_HL	%IW42	Hex	16#0100		
22	_	%IW44	Hex	16#002B		
23		%IB46	Hex	16#41		
24		%IB47	Hex	16#42		
25		%IB48	Hex	16#43		
26		%IB49	Hex	16#50		

步骤 8:验证 Write PCD 1, Write PCD 2, Write PCD 3,Write PCD 4, Read PCD 1, Read PCD 2, Read PCD 3, Read PCD4 。修改参数 P0-51:300, P0-52:302, P0-54:303，P0-55:304，验证其实际读取值如图所示。修改 QW5，QW7，QW9，QW11 为下图所示值，并强制变量，读取变频器参数 P0-57, P0-58, P0-60, P0-61 验证其为如图所示值。



	e	Address	Display format	Monitor value	Modify value	
1		%QW1	Hex	16#0000	16#0000	☑
2		%QW3	Hex	16#0123	16#0123	☑
3		%IW1	Hex	16#0203		☐
4		%IW3	Hex	16#0000		☐
5		%QW5	Hex	16#0011	16#0011	☑
6		%QW7	Hex	16#0022	16#0022	☑
7		%QW9	Hex	16#0033	16#0033	☑
8		%QW11	Hex	16#0044	16#0044	☑
9		%IW5	Hex	16#012C		☐
10		%IW7	Hex	16#012E		☐
11		%IW9	Hex	16#012F		☐
12		%IW11	Hex	16#0130		☐
13	start"	%M156.2	Bool	FALSE	TRUE	☐
14	.start	%I20.0	Bool	TRUE	TRUE	☑
15	.id	%IW22	DEC	278	278	☑
16	.dataRecNbr	%ID24	DEC+/-	45040	45040	☑
17	.maxLen	%IW28	DEC	60	60	☑
18	.checkedvalid	%I30.0	Bool	FALSE		☐
19	.busy	%I30.1	Bool	FALSE		☐
20	.error	%I30.2	Bool	FALSE		☐
21	.status	%ID32	Hex	16#0000_0000		☐
22	.len	%IW36	DEC	60		☐
23	.recordIM0.BlockType	%IW38	Hex	16#0020		☐
24	.recordIM0.BlockLength	%IW40	DEC	56		☐
25	.recordIM0.BlockVersion_HL	%IW42	Hex	16#0100		☐
26	.recordIM0.VendorID_HL	%IW44	Hex	16#002B		☐

步骤 9: 根据附录 1 和附录 2 所列 PPO 类型以及 PCD 对应参数, 测试其他报文类型。更改 PPO 类型需要重新修改程序，如下图所示删除 PPO6，加入其他 PPO 类型即可。测试方式类似。

8. 故障描述与处理

类型	ERR0R	MAINTAN	POWER	对应处理措施
1	红灯亮	X	X	内部故障
2	X	红灯亮	X	内部故障
3	X	X	绿灯亮	PN01 电源正常
4	X	X	绿灯不亮	PN01 电源异常或者未上电

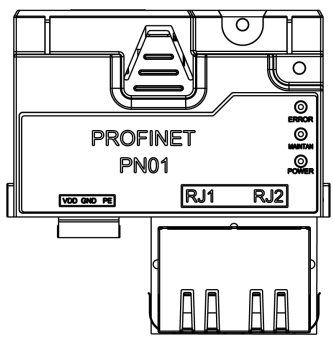
注意:当设置好相关参数，但仍然 PLC 与通讯不上时，请使用 CMD（Windows 命令提示符）ping 变频器对应的 IP 地址，如果该 IP 正确回复则表示变频器参数设置正确。

ENGLISH

1. Summary

The PN01 card is a PROFINET fieldbus adapter card, which conforms to the international PROFINET Ethernet. The modified card is installed on the series inverter to improve the communication efficiency and facilitate the realization of the inverter networking function, so that the inverter becomes the slave station of the field bus and accepts the control of the field bus master. PN01 is suitable for series full power range , and it may support more series products in the future.

Before using this product, please read this guide carefully.



Features:

- The bus communication rate reaches 100Mbit/s, the communication cycle is short;
- Flexible networking topology, PN01 supports all types of topologies: chain, bus, tree or star, etc.
- The expansion card is directly installed on the expansion card slot, no external power supply is required, and the installation is convenient.

2. PROFINET Installation

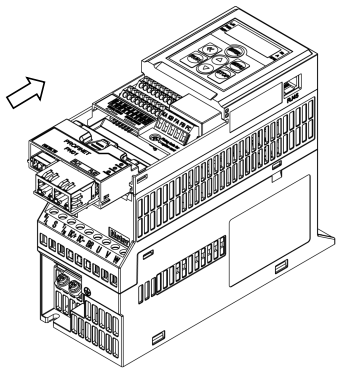
Installation steps:

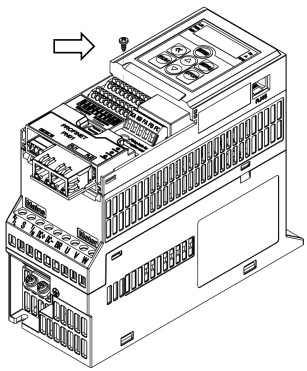
1. Check the expansion card accessory package contains: Profinet card, pluggable terminal *1, screw *1, manual;
2. Install the expansion card as shown below:

Step 1. Push the expansion card along the bottom rail into the bottom of the CU. Then terminals of the expansion card are inserted into the bottom of the CU terminal, and the two screw holes are aligned;

Step 2, as the picture shows, align the screws with the screw holes to fix the CU and the Profinet card.

Note: When installing the Profinet, should be make sure that the DP01 card and the CU interface pin are inserted in place and the pin is not bent, otherwise the communication may not work or not stable.

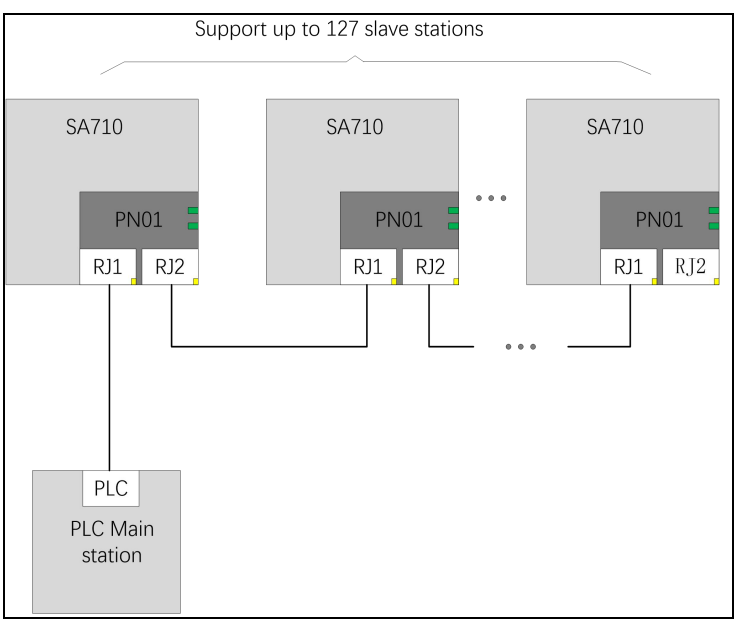




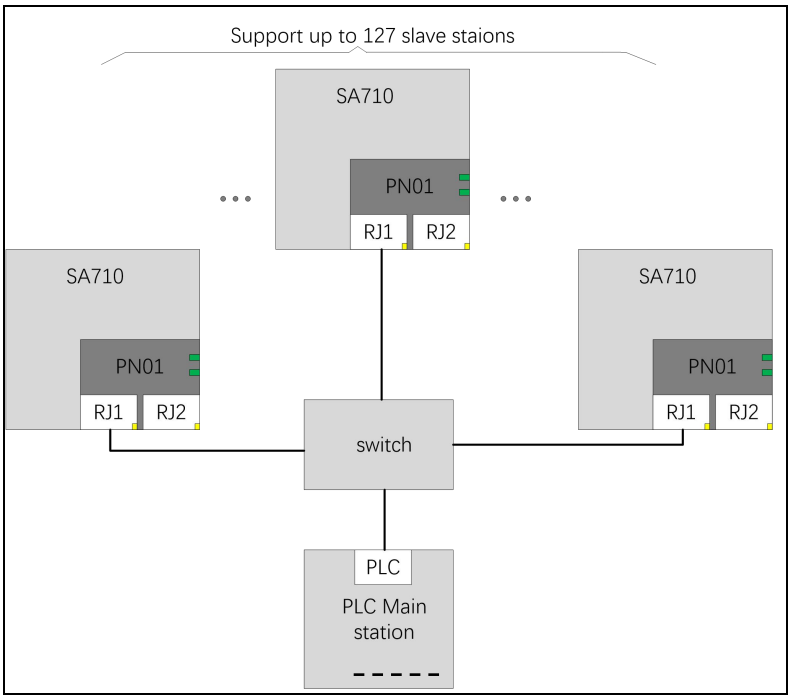
3. Electrical connections

The PN01 module uses a standard Ethernet RJ45 socket to connect to the PROFINET master station, and its pin signal definition is the same as the standard Ethernet pin, cross-wire and straight-wire are both available.

1) Chain network electrical connection

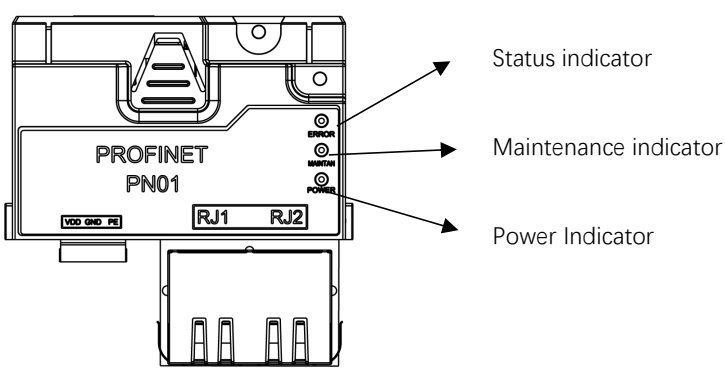


2) Star network electrical connection



4. Status indicator description

PN01 expansion card can track bus communication failures through 2 status indicators. The diagnosis failure description is shown in the following table:



Indicator light	Color	Status description
ERROR	Red light is always on	Expansion card failure
	Red light is off	Communication is normal
MAINTAN	Red light is always on	Expansion card failure
	Red light is off	Communication is normal
POWER	Green light is always on	The expansion card is powered on normally
	Red light is off	The power supply of the expansion card is abnormal or the inverter is not powered on

5. Related Parameters

5.1 Parameter List

Parameter Number	Parameter Name	Comments
P10-00	Device Name	The device name, user sets the device name through this parameter.
P10-01	IP Address[0]	IP address. E.g,192.168.0.1 set the following parameters: P10-01: 192, P10-02: 168, P10-03: 0, P10-04: 1
P10-02	IP Address[1]	
P10-03	IP Address[2]	
P10-04	IP Address[3]	
P10-05	IP Address Mask[0]	IP address mask. E.g,255.255.255.0 set the following parameters: P10-05: 255, P10-06: 255, P10-07: 255, P10-08: 0
P10-06	IP Address Mask[1]	
P10-07	IP Address Mask[2]	
P10-08	IP Address Mask[3]	
P10-09	Gateway address[0]	Gateway address. E.g,192.168.0.241 set the following parameters: P10-09: 192, P10-10: 168, P10-11: 0, P10-12: 241
P10-10	Gateway address[1]	
P10-11	Gateway address[2]	
P10-12	Gateway address[3]	
P10-30	Read PCD 1	Periodically read parameter configuration. The first parameter defaults to the status word, and the second parameter defaults to the actual value.The third word and other words after it can be configured through the Read PCD parameter.E, g, if you need to read parameters P0-50,P0-51 can be configured to read PCD 1 (P10-30) as 50 and Read PCD 2 (P10-31) as 51.Note that it needs to be used in conjunction with PPO Type.
P10-31	Read PCD 2	
P10-32	Read PCD 3	
P10-33	Read PCD 4	
P10-34	Read PCD 5	
P10-35	Read PCD 6	
P10-36	Read PCD 7	
P10-37	Read PCD 8	

Parameter Number	Parameter Name	Comments
P10-40	Write PCD 1	Periodically write parameter configuration. The first parameter of periodic write parameters is Control word, and the second parameter is Reference (target reference value). If you need to write parameters P0-51, P0-52; you need to configure Write PCD 1 (P10-40)) to 51 and Write PCD 2 (P10-41) to 52. Note that it needs to be used in conjunction with PPO Type.
P10-41	Write PCD 2	
P10-42	Write PCD 3	
P10-43	Write PCD 4	
P10-44	Write PCD 5	
P10-45	Write PCD 6	
P10-46	Write PCD 7	
P10-47	Write PCD 8	
5.2 Control words and Status words		
PPO type (Telegram type)		
Standard Telegram 1	2 words In(Read) Status Word Actual Value	2 words Out(Write) Control Word Setpoint
PPO Type 3	2 words In(Read) Status Word Actual Value	2 words Out(Write) Control Word Setpoint
PPO Type 4	4 words In(Read) Status Word Actual Value Read PCD 1 Read PCD 2 Write PCD 2	4 words Out(Write) Control Word Setpoint Write PCD 1
PPO Type 6	6 words In(Read) Status Word Actual Value Read PCD 1 Read PCD 2 Read PCD 3 Read PCD 4	6 words Out(Write) Control Word Setpoint Write PCD 1 Write PCD 2 Write PCD 3 Write PCD 4
PPO Type 7	8 words In(Read) Status Word Actual Value Read PCD 1 Read PCD 2 Read PCD 3	8 words Out(Write) Control Word Setpoint Write PCD 1 Write PCD 2 Write PCD 3

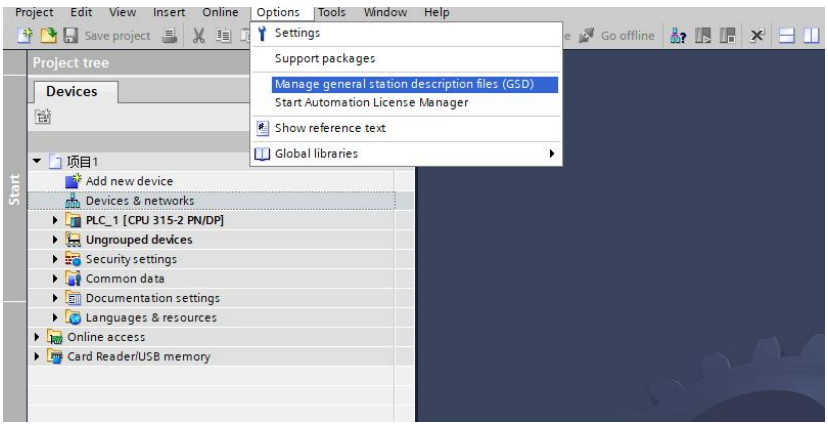
	Read PCD 4 Read PCD 5 Read PCD 6	Write PCD 4 Write PCD 5 Write PCD 6
PPO Type 8	10 words In(Read) Status Word Actual Value Read PCD 1 Read PCD 2 Read PCD 3 Read PCD 4 Read PCD 5 Read PCD 6 Read PCD 7 Read PCD 8	10 words Out(Write) Control Word Setpoint Write PCD 1 Write PCD 2 Write PCD 3 Write PCD 4 Write PCD 5 Write PCD 6 Write PCD 7 Write PCD 8
P9-02 Status word correspondence table		
Bit	0	1
bit0	Control not ready	Control ready
bit1	Control not ready	Control ready
bit2	Inertial stop	Run
bit3	Fault-free	Fault tripping
bit4	Fault-free	The fault is not tripped
bit5	Reserve	Reserve
bit6	Fault-free	Fault tripping
bit7	No warnings	Warning
bit8	does not Run by reference value	Run by reference value
bit9	Manual mode	Remote control
bit10	Frequency out of range	Frequency in the range
bit11	Stop	Run
bit12	Reserve	Reserve
bit13	Within the voltage range	Over voltage limit
bit14	Reserve	Reserve
bit15	No overheat warning	Overheat warning

6. GSD file configuration

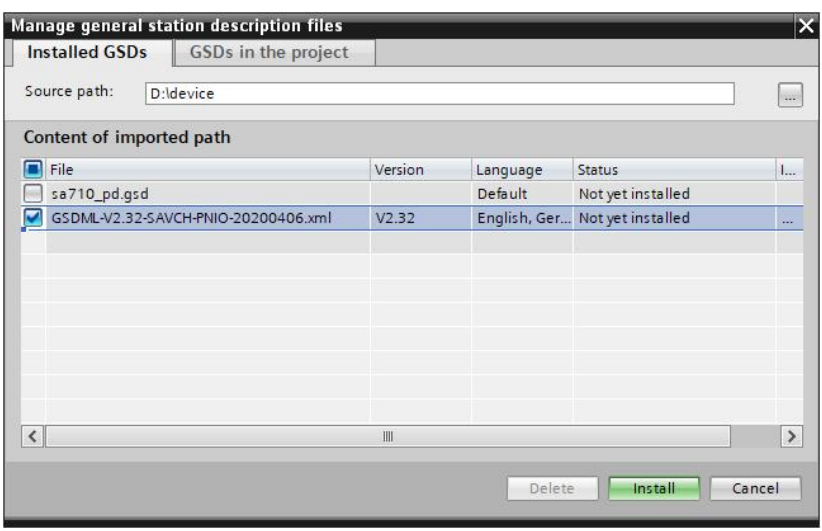
When using the PROFINET master station, you must first configure the GSD file of the slave station so that the corresponding slave station equipment is added to the system of the master station. GSD files can be obtained from suppliers or manufacturers.

Take S7-300 as an example:

Step1:Chose Option/Manage general station description files(GSD), Install GSDML;



Step 2:Browse to the path where the GSDML file is located and click install.



7. Periodic communication setting guide

Set the inverter parameters according to the example project configuration, IP: 192.168.0.2.; IP Address Mask:255.255.255.0; Gateway:192.168.0.241; Device Name:1; Example project configuration PPO Type 6, 6 words in and 6 words out. Need to set inverter configuration parameters:

P10-30 Read PCD 1: P0-51; need to set P10-30=51

P10-31 Read PCD 2: P0-52; need to set P10-31=52

P10-32 Read PCD 3: P0-54, need to set P10-32=53

P10-33 Read PCD 4: P0-55; need to set P10-33=54

P10-40 write PCD 1: P0-57; need to set P10-40=57

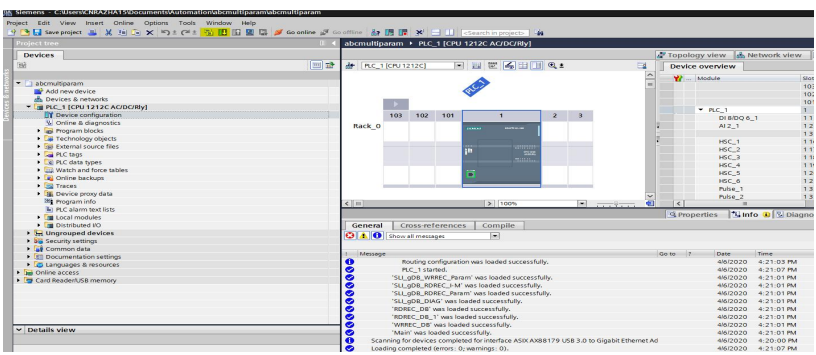
P10-41 write PCD 2: P0-58; need to set P10-41=58

P10-42 write PCD 3: P0-60, need to set P10-42=60

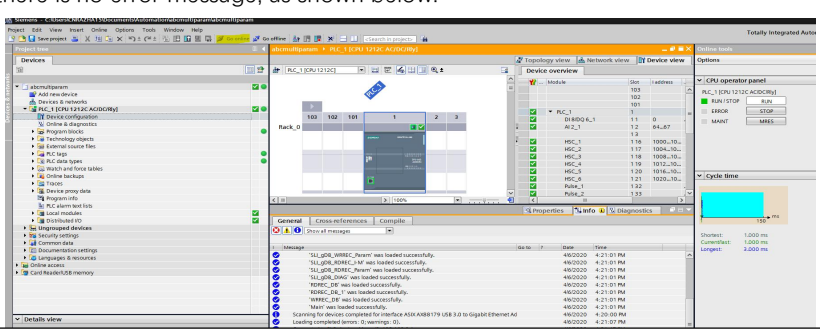
P10-43 write PCD 4: P0-61. need to set P10-43=61

Step 2: Restart the device.

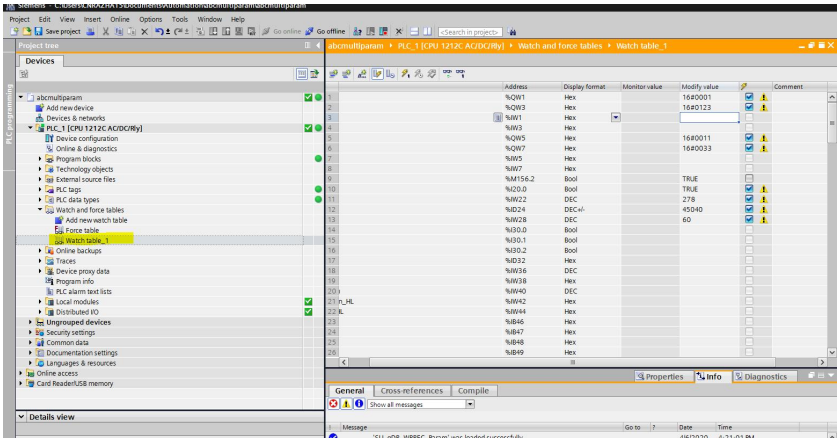
Step3: Compile and download the project to the PLC. If the current PLC URL is not in a network segment, just follow the prompts. Siemens PLC manual has detailed instructions.



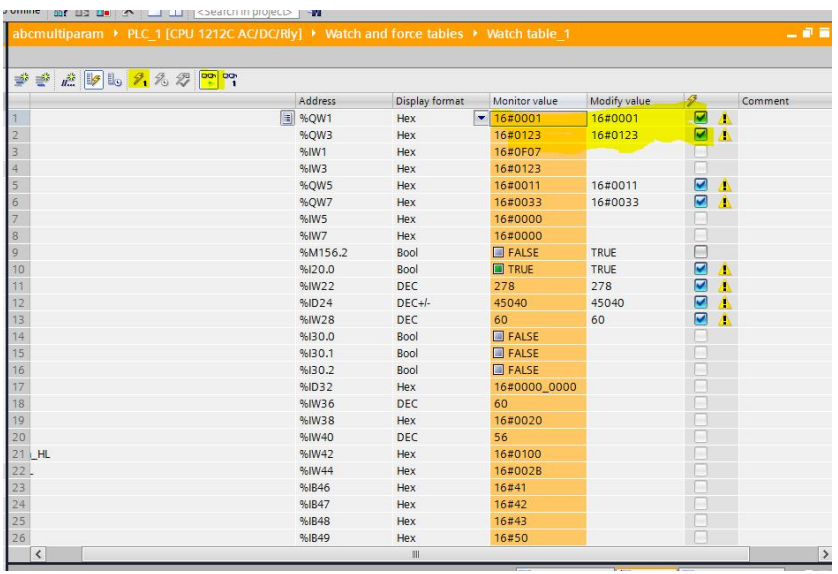
Step 4: Select PLC and click Go Online to enter online mode. Confirm that there is no error message, as shown below:



Step 5: Enter the monitoring variable interface and change the control word (QW1) and reference value (QW2). And click the force button.



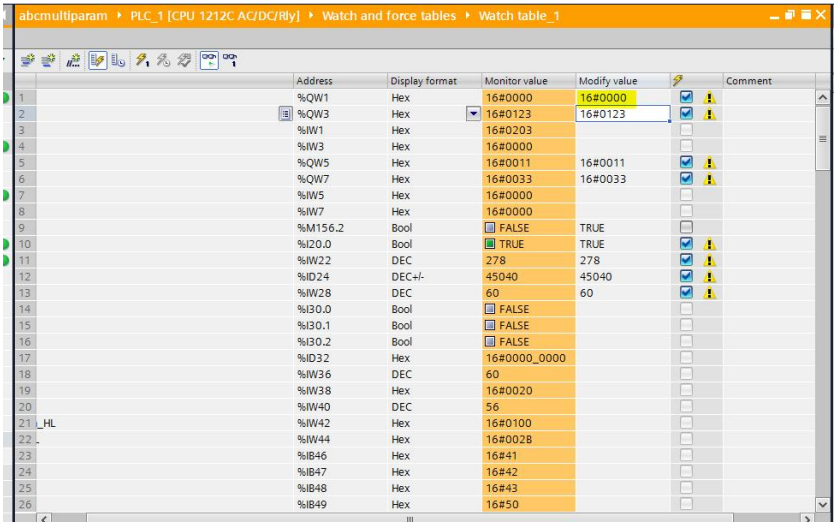
Step 6: Change the control word (QW1) to 1, and the reference value (QW2) to 123. And click the force button. As shown in the figure below: Verify that the status word (IW1) is 0f07 and the current value (IW2) is 123.



abcmultiparam ▸ PLC_1 [CPU 1212C AC/DC/Rly] ▸ Watch and force tables ▸ Watch table_1

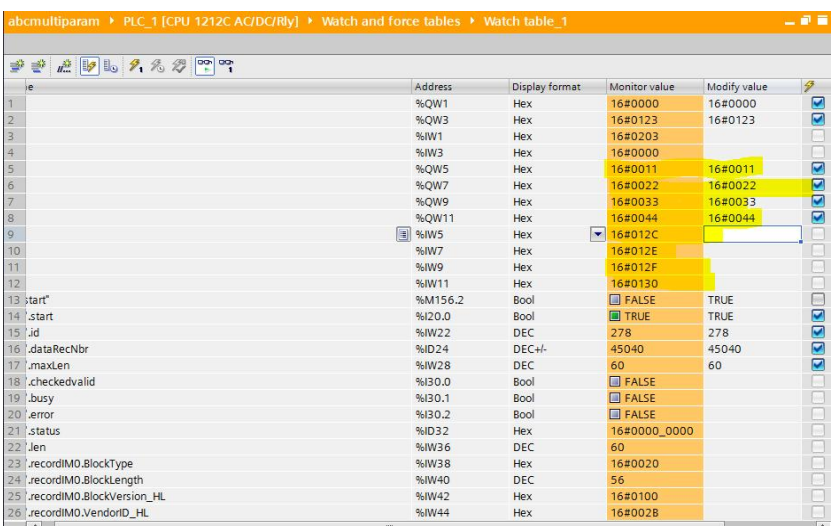
	Address	Display format	Monitor value	Modify value	Comment
1	%QW1	Hex	16#0001	16#0001	
2	%QW3	Hex	16#0123	16#0123	
3	%IW1	Hex	16#0F07		
4	%IW3	Hex	16#0123		
5	%QW5	Hex	16#0011	16#0011	
6	%QW7	Hex	16#0033	16#0033	
7	%IW5	Hex	16#0000		
8	%IW7	Hex	16#0000		
9	%M156.2	Bool	FALSE	TRUE	
10	%I20.0	Bool	TRUE	TRUE	
11	%IW22	DEC	278	278	
12	%ID24	DEC+/-	45040	45040	
13	%IW28	DEC	60	60	
14	%I30.0	Bool	FALSE		
15	%I30.1	Bool	FALSE		
16	%I30.2	Bool	FALSE		
17	%ID32	Hex	16#0000_0000		
18	%IW36	DEC	60		
19	%IW38	Hex	16#0020		
20	%IW40	DEC	56		
21	%IW42	Hex	16#0100		
22	%IW44	Hex	16#002B		
23	%IB46	Hex	16#41		
24	%IB47	Hex	16#42		
25	%IB48	Hex	16#43		
26	%IB49	Hex	16#50		

Step 7: Change the control word (QW1) to 0, and click the force button. As shown in the figure below: Verify that the status word (IW1) is 0203 and the current value (IW2) is 0.



		Address	Display format	Monitor value	Modify value	Comment
1		%QW1	Hex	16#0000	16#0000	
2		%QW3	Hex	16#0123	16#0123	
3		%IW1	Hex	16#0203		
4		%IW3	Hex	16#0000		
5		%QW5	Hex	16#0011	16#0011	
6		%QW7	Hex	16#0033	16#0033	
7		%IW5	Hex	16#0000		
8		%IW7	Hex	16#0000		
9		%M156.2	Bool	FALSE	TRUE	
10		%I20.0	Bool	TRUE	TRUE	
11		%IW22	DEC	278	278	
12		%ID24	DEC+/-	45040	45040	
13		%IW28	DEC	60	60	
14		%I30.0	Bool	FALSE		
15		%I30.1	Bool	FALSE		
16		%I30.2	Bool	FALSE		
17		%ID32	Hex	16#0000_0000		
18		%IW36	DEC	60		
19		%IW38	Hex	16#0020		
20		%IW40	DEC	56		
21	_HL	%IW42	Hex	16#0100		
22	_	%IW44	Hex	16#002B		
23		%IB46	Hex	16#41		
24		%IB47	Hex	16#42		
25		%IB48	Hex	16#43		
26		%IB49	Hex	16#50		

Step8:Verify Write PCD 1, Write PCD 2, Write PCD 3, Write PCD 4, Read PCD 1, Read PCD 2, Read PCD 3, Read PCD 4. Modify the parameters 051:300, 052:302, 054:303; 055:304, and verify the actual reading value as shown in the figure. Modify QW5, QW7, QW9, QW11 to the values shown in the figure below, and force the variables, read the inverter parameters 057, 058, 060, 061 to verify that they are the values shown in the figure.



		Address	Display format	Monitor value	Modify value
1		%QW1	Hex	16#0000	16#0000
2		%QW3	Hex	16#0123	16#0123
3		%IW1	Hex	16#0203	
4		%IW3	Hex	16#0000	
5		%QW5	Hex	16#0011	16#0011
6		%QW7	Hex	16#0022	16#0022
7		%QW9	Hex	16#0033	16#0033
8		%QW11	Hex	16#0044	16#0044
9		%IW5	Hex	16#012C	
10		%IW7	Hex	16#012E	
11		%IW9	Hex	16#012F	
12		%IW11	Hex	16#0130	
13	start"	%M156.2	Bool	FALSE	TRUE
14	.start	%I20.0	Bool	TRUE	TRUE
15	.id	%IW22	DEC	278	278
16	.dataRecNbr	%ID24	DEC+/-	45040	45040
17	.maxLen	%IW28	DEC	60	60
18	.checkedvalid	%I30.0	Bool	FALSE	
19	.busy	%I30.1	Bool	FALSE	
20	.error	%I30.2	Bool	FALSE	
21	.status	%ID32	Hex	16#0000_0000	
22	.len	%IW36	DEC	60	
23	.recordIM0.BlockType	%IW38	Hex	16#0020	
24	.recordIM0.BlockLength	%IW40	DEC	56	
25	.recordIM0.BlockVersion_HL	%IW42	Hex	16#0100	
26	.recordIM0.VendorID_HL	%IW44	Hex	16#002B	

Step9: Test other message types according to the PPO types listed in Appendix 1 and Appendix 2 and the corresponding parameters of PCD. To change the PPO type, you need to re-modify the program, delete PPO6 as shown in the figure below, and add other PPO types. The test method is similar.

8. Fault description and disposal

Type	ERR0R	MAINTAN	POWER	Corresponding measures
1	Red light on	X	X	Internal fault
2	X	Red light on	X	Internal fault
3	X	X	Green light on	PN01 power supply is normal
4	X	X	Green light off	PN01 power supply is abnormal or not powered on

Note: When the relevant parameters are set, but the PLC and communication still cannot be connected, please use the command to directly PIN the corresponding IP address of the inverter. If successfully PIN, it means that the inverter parameters are set correctly.

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Qualification

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