

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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中文

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:									
		□ 错误指示灯									
	PROFINET PN01	◎ ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●									
ſ		□									
指示灯	颜色	状态说明									
	红灯常亮	扩展卡故障									
ERROR	红灯熄灭	通讯正常									
	绿灯常亮	扩展卡故障									
MAINTAN	红灯熄灭	通讯正常									
	绿灯常亮	扩展卡上电正常									
POWER	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。									
P10-02	IP Address[1]	例如, 192.168.0.1 设置如下参数:									
P10-03	IP Address[2]	P10-01:192, P10-02:168,									
P10-04	IP Address[3]	P10-03:0, P10-04:1									
P10-05	IP Address Mask[0]	IP 地址掩码。									
P10-06	IP Address Mask[1]	例如, 255.255.255.0 设置如下参数:									
P10-07	IP Address Mask[2]	P10-05:255, P10-06:255,									
P10-08	IP Address Mask[3]	P10-07:255, P10-08:0									
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 P10-31 读 PCD 2 房期性读参数配置。第一个参数默认为状态 P10-32 读 PCD 3 其后的其他字可通过读 PCD 参数配置。例 p10-33 读 PCD 4 如如果需要读取参数 P0-50, P0-51 可以配 P10-34 读 PCD 6 2(P10-31) 为 51。注意需要跟 PPO 类型一 P10-35 读 PCD 7 P10-36 读 PCD 7 P10-37 读 PCD 8 P10-40 写 PCD 1 P10-41 写 PCD 2 P10-42 写 PCD 4 P10-43 写 PCD 5 P10-43 写 PCD 5 P10-44 写 PCD 5 P10-45 写 PCD 6 P10-47 写 PCD 7 P10-47 写 PCD 8 PPO 类型 (电报 类型) 双节字输入(读) 双节字输出(写) 标准电报1 状态字		
P10-12	参数名称 解释 Gateway address[3] ····································	
P10-30	读 PCD 1	参数名称 解释 Gateway address[3] 读 PCD 1 读 PCD 2 周期性读参数配置。第一个参数默认为状态空字、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 6 读 PCD 6 (2(P10-31) 为 51。注意需要跟 PPO 类型一起配合使用。 读 PCD 7 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 4 写 PCD 3 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。 写 PCD 5 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。 写 PCD 7 写 PCD 7 写 PCD 5 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。 次字介绍 双节字输出(写)次容字 报类型) 双节字输出(写)次容字 双节字输入(读) 双节字输出(写)次容字 戏态字 控制字 寝际值 设定值 母节字输入(读) 双节字输出(写)次容字 秋态字 控制字 寝际值 设定值 費 PCD 1 写 PCD 2 写 PCD 2 写 PCD 1 素 PCD 1 写 PCD 1
P10-31	读 PCD 2	
P10-32	读 PCD 3	子, 弗——什麥奴默认为当則但。弗二个子及 其后的其他它可通过速 DCD 会数配罢 例
P10-33	读 PCD 4	日 兵石的兵他子可通过保 PCD 参数能直。例 加加里雲更速取会粉 D0 50 D0 51 可以配
P10-34	读 PCD 5	9 如如木而女侠取珍奴 P0-50, P0-51 り以乱 罟诗 PCD 1/P10_30\为 50 诗 PCD
P10-35	读 PCD 6	
P10-36	读 PCD 7	記配合使用。
P10-37	读 PCD 8	
P10-40	写 PCD 1	
P10-41	写 PCD 2	图期州它会教职罢 用期州它会教的第三人
P10-42	写 PCD 3	解释 引 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— 起配合使用。 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— 起配合使用。 双节字输出(写) 控制字 设定值 双节字输出(写) 控制字 设定值 双节字输出(写) 控制字 设定值 四节字输出(写) 控制字 设定值 双节字输出(写) 控制字 设定值 写 PCD 1 写 PCD 1 写 PCD 2 六节字输出(写) 控制字 设定值 写 PCD 1 写 PCD 1 写 PCD 2 六节字输出(写) 控制字 设定值 写 PCD 1 写 PCD 2 二 六节字输出(写) 控制字 设定值 写 PCD 2 只 PCD 3 写 PCD 4
P10-43	写 PCD 4	少奴万任前子,
P10-44	写 PCD 5	如未而安与少奴F0-31,F0-32,而能直与 PCD1(P10 40))为51 它 PCD2(D10 41)
P10-45	写 PCD 6	为52 注音雲要跟 PPO
P10-46	写 PCD 7	
P10-47	写 PCD 8	
5.2 控制字和	1状态字介绍	
PPO 类型 (电报类型)	
	双节字输入(读)	双节字输出(写)
标准电报1	状态字	控制字
	实际值	设定值
	双节字输入 (读)	双节字输出)
PPO 类型3	状态字	控制字
	实际值	设定值
	四节字输入(读)	四节字输出(写)
	状态字	控制字
PPO 类型4	实际值	设定值
	读 PCD 1	写 PCD 1
	读 PCD 2	写 PCD 2
	六节字输入(读)	六节字输出(写)
	买际值	
PPO 类型6	读 PCD 1	写 PCD 1
	读 PCD 2	与 PCD 2
	读 PCD 3	与 PCD 3
	读 PCD 4	与 PCD 4

	八节字输入(读)	八节字输出(写)
	状态字	控制字
	实际值	设定值
	读 PCD 1	写 PCD 1
PPO 类型7	读 PCD 2	写 PCD 2
	读 PCD 3	写 PCD 3
	读 PCD 4	写 PCD 4
	读 PCD 5	写 PCD 5
	读 PCD 6	写 PCD 6
	10 words In(读)	10 words Out(写)
	状态字	控制字
	实际值	设定值
	读 PCD 1	写 PCD 1
	读 PCD 2	写 PCD 2
PPO 类型8	读 PCD 3	写 PCD 3
	读 PCD 4	与 PCD 4
	读 PCD 5	写 PCD 5
	读 PCD 6	与 PCD 6
	读 PCD 7	与 PCD 7
业太宁说明		与 PCD 8
私心子呪叻	PU9.UZ	1
bitu		控制就绪
bit1	控制木就绪	
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;

E	🛉 🎦 🔒 Save project 🚇 🐰 💷 🛙	Settings	e 🖉 Go offline 🛔 🖪 🖪 🔛
	Project tree	Support packages	
	Devices	Manage general station description files (GSD) Start Automation License Manager Show reference text	
Start	Add new device Add new device Devices & networks Im PLC_1 [CPU 315-2 PN/DP] Eugrouped devices Sig Security settings Min Account at a a a a a a a a a a a a a a a a a		

步骤 2:浏览 GSDML 文件所在路径,点击安装即可。

Installed GSDs	GSDs in the project				
ource path: D:\	device				
Content of import	ed path				
File		Version	Language	Status	1
sa710_pd.gsd			Default	Not yet installed	
GSDML-V2.32-SAVCH-PNIO-20200406.xml		V2.32	English, Ger	Not yet installed	
¢		III			>
			Delete	Install C	ancel

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。

	E ∢ al	cmultip	aram I	PLC_	1 [CPU	12120	ACIDCI	Rly]							
Devices												🚽 Торо	ology	view 📥 I	Network view
B	🔤 🛣 🛔	PLC_1	I [CPU 12	12C]					€ ±		3	Dev	rice ov	verview	
											^		. Ale	di da	
 abcmultiparam 											=			004	
Add new device						N									
📥 Devices & networks															
PLC_1 [CPU 1212C AC/DC/Rly]														PLC 1	
🕅 Device configuration			103	102	101		1		2	3				DI 8/DO 6	1
Solution Contraction Contractico Contra		Rack 0	_				_		-					412 1	-1
Program blocks		Nuch_0				COMON COMPANY		-						/// 2_/	
Technology objects						-								HSC 1	
External source files														HSC 2	
PLC tags						1.0		2200						HSC 2	
Eg PLC data types														HSC 4	
Watch and force tables														HSC_4	
Doline backups														HSC 6	
Traces			-	_	-				-	-				Pulse 1	
Device proxy data														Pulse_1	
Program info	1	11				0	100%					1		Pulse_2	
In PLC alarm text lists		144											_	100	- (
Incal modules												S Pr	ropert	ies 🛄 In	fo 🗓 🗳 Dia
Distributed I/O		General	Cro	oss-ref	erence	s C	ompile								
Ungrouped devices			1			-	1								
Security settings	<u> </u>		Snowa	il messa	ges		100								
Common data															
Documentation settings	1	Messag	e									Go to	?	Oate	Time
Languages & resources	0		Ro	uting co	nfigurati	ion was li	oaded suc	cessfully	y.					4/6/2020	4:21:03 PM
Generation access			PLI	C_1 star	ted.									4/6/2020	4:21:07 PM
Card Reader/USB memory			'SU_g	DB_WRI	REC_Par	am' was	loaded su	iccessful	ly.					4/6/2020	4:21:01 PM
			'SU_g	DB_RDF	REC_I-M	' was loa	ded succe	essfully.						4/6/2020	4:21:01 PM
)	'SU_g	DB_RDF	REC_Para	am' was	loaded su	ccessfull	ly.					4/6/2020	4:21:01 PM
	0		'SU_g	DB_DIA	G' was I	oaded su	iccessfully	1.						4/6/2020	4:21:01 PM
	0		RDRE	C_DB' V	was load	ed succe	ssfully.							4/6/2020	4:21:01 PM
	0)	RDRE	C_DB_1	l' was lo	aded suc	cessfully.							4/6/2020	4:21:01 PM
1	0)	WRRE	EC_DB'	was load	led succe	ssfully.							4/6/2020	4:21:01 PM
Details view			'Main	was loa	aded suc	cessfully	r.							4/6/2020	4:21:01 PM
		Sca	inning for	devices	comple	ted for in	terface At	SIX AX88	8179 U	SB 3.0 to Gig	abit Ethernet Au	t		4/6/2020	4:20:00 PM
			diam name	and a deal of the		a los mala	(0							41010000	4 34 97 84

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

	U < abcmultiparam + PLC_1 [CPU 1212C AC/DC/Hy]			_ • • • ×	Online tools	
Devices		Z Topolog	y view 🛔 Network view	Device view	Options	
2	🔟 😫 🏄 (R.C_1 (CPU 1212C) 🕢 🖽 🖾 🖾 🛄	🔍 ± 📑 Device o	werview			
		^ .	indula dia	Laddoer	· CPU operato	or panel
abcmultiparam		-	10	3		
Add new device			10	2	PLC_1 (CPU 121)	2C AD/DORM
devices & networks			10	1	RUN I STOP	FUN
PLC_1 [CPU 1212C AC/DC/Rly]			BC 1		FEROR	STOP
Device configuration	103 102 101 1	2 3	DISDO6 1 11			
Se Online & diagnostics	Buck 0		412.2	61.67	MAINT	MRES
Program blocks	•			04207		
Technology objects	(000) million	1 12	HSC 1 11	6 1000 10		
External source files			100.0	7 1004 10		
PLC teas			100.2	0 1009-10-		
Co PLC data types	• i" ***		HIGS I	0 100510		
 Watch and force tables 			POC.1	9 1012m10m		
Online backups			HOLD 12	0 1016.10.	 Cycle time 	
Traces			PDC_0 12	1 1020-10-		
 Device providata 			Puble_1 13	4	1	
Mi Poeraminfo			nuse_z 13	3		
E PIC alarm text lists	X #					
Local modules		St Prope	rties 🚺 Info 🚯 📓 Diagno	istics		
Distributed NO	General Cross-references Compile					150 ms
El Unarouned devices						
Security settions	Show all messages				Shortest:	1.000 ms
Commendata					Currentiast	1,000 ms
Competitation settines	1 Message	Ge to ?	Oate Time		Longest:	3.000 ms
Languager & percentrar	'SU_gDB_WRREC_Param' was loaded successful	olty.	4/6/2020 4:21:01 PM	^		
Colos accert	SU_gDB_RDREC_I-M' was loaded successfully.		4(6/2020 4:21:01 PM			
Card England SE mamory	SU_gD8_RDREC_Param' was loaded successfu	ully.	4/6/2020 4:21:01 PM			
	SU_g08_DWG' was loaded successfully.		4/6/2020 4:21:01 PM			
	RDREC_D8' was loaded successfully.		4/6/2020 4:21:01 PM			
	'RDEC_D0_1' was loaded successfully.		4/6/2020 4:21:01 PM			
	WRREC_DB' was loaded successfully.		4/6/2020 4:21:01 PM			
	Main' was loaded successfully.		4/6/2020 4:21:01 PM			
	Scanning for devices completed for interface ASIX AXB	\$8179 USB 3.0 to Gigabit Ethernet Ad	4(6/2020 4:20:00 PM		1	
Details view	Leader cometand (coner, 0, uppring, 0)					

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。

									- *
Devices									
	🛄 🛣 🗉	9 🔮 🚑 🔰 🐻 👂 🕫	2 00 00						
				Address	Display format	Monitor value	Modify value	9 Co	mment
abcmultiparam	M 🕒 🖬	1		%QW1	Hex		16#0001	🗹 🔔	
Add new device	3	2		%QW3	Hex		16#0123	🗹 🔺	
A Devices & networks	3	3		%/W1	Hex				
PLC_1 [CPU 1212C AC/DC/Rly]	🖬 🔍 🖉	4		%W3	Hex				
Device configuration	1	5		%QW5	Hex		16#0011	M 1	
Se Online & diagnostics	6	6		%QW7	Hex		16#0033	🗹 🚹	
Program blocks	• 3	7		%/WS	Hex				
Technology objects	16	6		%W7	Hex				
Get External source files	5	9		%M156.2	Bool		TRUE		
PLC tags	• 1	10		%/20.0	Bool		TRUE	M 🔥	
Cel PLC data types	• 3	11		%/W22	DEC		278		
Watch and force tables	3	12		%ID24	DEC+I-		45040		
Add new watch table	3	13		%W28	DEC		60		
Force table	1	14		96130.0	Bool				
Watch table 1	1	15		%/30.1	Bool				
Online backups	1	16		%/30.2	Bool				
Traces	3	17		%D32	Hex				
Device proxy data	1	18		%W36	DEC				
Program info		19		%/W38	Hex				
In PLC alarm text lists		201		%/W40	DEC				
Local modules	2	21 n HL		%/W42	Hex				
Distributed I/O	V	22 .		%IW44	Hex				
Hungrouped devices		23		%B46	Hex				
Security settions	3	24		%/B47	Hex				
Common data	3	25		%/B48	Hex				
Documentation settings		26		%849	Hex				
anguages & resources		<							
Online access						100 m	1411-1	[II] est	_
Card Reader/USB memory						S Properti	25 34 Into	Diagnosti	:5
The state of the second s		General Cross-refer	ences Compile						
	1	3 1 6 Show all message							

步骤 6:更改控制字(○)	W1)	为1.参考	值 (OW	2) 为1	23.	并点击强
	μ			÷/= (\\.	0	사 100
钮。如下图所示:短证状念	子(1	VVI)刃(/TU/ 和当月	J1且(IVV	2)	万 123。
cmultiparam → PLC_1 [CPU 1212C AC/DC/Riy	Watch a	ind force tables	Watch table_1			
	Address	Display format	Monitor value	Modify value	9	Comment
	%QW1	Hex	• 16#0001	16#0001		1
	%QW3	Hex	16#0123	16#0123		1
	%IW1	Hex	16#0F07			
	%IW3	Hex	16#0123			
	%QW5	Hex	16#0011	16#0011		1
	%QW7	Hex	16#0033	16#0033		1
	%IW5	Hex	16#0000			
	%IW7	Hex	16#0000			
	%M156.2	Bool	FALSE	TRUE		
	%120.0	Bool	TRUE	TRUE		1
	%IW22	DEC	278	278		1
2	%ID24	DEC+/-	45040	45040		1
	%IW28	DEC	60	60		1
1	%130.0	Bool	FALSE			
5	%130.1	Bool	FALSE			
5	%130.2	Bool	FALSE			
7	%ID32	Hex	16#0000_0000			
3	%IW36	DEC	60			
9	%IW38	Hex	16#0020			
	%IW40	DEC	56			
I <u>I</u> HL	%IW42	Hex	16#0100			
2.	%IW44	Hex	16#002B			
3	%IB46	Hex	16#41			
1	%IB47	Hex	16#42			
5	%IB48	Hex	16#43			
5	%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	9	Comment	
	%QW1	Hex	16#0000	16#0000		4	
	🔳 %QW3	Hex	16#0123	16#0123		<u>A</u>	
1	%IW1	Hex	16#0203				
	96IW3	Hex	16#0000				
i	%QW5	Hex	16#0011	16#0011		4	
i l	%QW7	Hex	16#0033	16#0033		<u>Å</u>	
	%IW5	Hex	16#0000				
	96IW7	Hex	16#0000				
	%M156.2	Bool	FALSE	TRUE			
0	%120.0	Bool	TRUE	TRUE		4	
1	%IW22	DEC	278	278		4	
2	96ID24	DEC+/-	45040	45040		4	
3	%IW28	DEC	60	60		4	
4	96130.0	Bool	FALSE				
5	96/30.1	Bool	FALSE				
6	96130.2	Bool	FALSE				
7	%ID32	Hex	16#0000_0000				
8	%IW36	DEC	60				
9	%W38	Hex	16#0020				
0	%IW40	DEC	56				
1 HL	%IW42	Hex	16#0100				
2 .	%IW44	Hex	16#002B				
3	%IB46	Hex	16#41				
4	%IB47	Hex	16#42				
5	%IB48	Hex	16#43				
6	%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 PCD 4。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。

abcmultiparam PLC_1 [CPU 1212C AC/DC/F	ldy] ▶ Watch and force tables ▶ 1	Watch table_1			
# # # 19 h / , % // ⁰⁰ 00,					
	Address	Display format	Monitor value	Modify value	4
1	%QW1	Hex	16#0000	16#0000	
2	%QW3	Hex	16#0123	16#0123	
3	96IW1	Hex	16#0203		
1	%IW3	Hex	16#0000		
5	%QW5	Hex	16#0011	16#0011	
5	96QW7	Hex	16#0022	16#0022	~
7	%QW9	Hex	16#0033	16#0033	V
3	%QW11	Hex	16#0044	16#0044	
2	B %IW5	Hex	▼ 16#012C		
0	96IW7	Hex	16#012E		
1	96IW9	Hex	16#012F		
2	96IW11	Hex	16#0130		
3 start"	%M156.2	Bool	FALSE	TRUE	-
4 '.start	96120.0	Bool	TRUE	TRUE	
15 '.id	%IW22	DEC	278	278	
6 '.dataRecNbr	%ID24	DEC+/-	45040	45040	
7 '.maxLen	%IW28	DEC	60	60	
8 .checkedvalid	96130.0	Bool	FALSE		
9 '.busy	%130.1	Bool	FALSE		
0 '.error	%130.2	Bool	FALSE		
21 '.status	%ID32	Hex	16#0000_0000		
2 '.len	%IW36	DEC	60		
3 '.recordIMO.BlockType	%IW38	Hex	16#0020		
4 '.recordIMO.BlockLength	%IW40	DEC	56		
25 '.recordIMO.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	ERROR	MAINTAN	POWER	对应处理措施				
1	红灯亮	Х	Х	内部故障				
2	Х	红灯亮	Х	内部故障				
3	Х	Х	绿灯亮	PN01 电源正常				
4	Х	Х	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





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		
	Red light is alway	s on	Expansion card failure		
ERROR	Red light is off		Communication is normal		
ΜΛΙΝΙΤΛΝΙ	Red light is alway	s on	Expansion card failure		
Red light is off			Communication is normal		
	Green light is alw	ays on	The expansion card is powered on normally		
POWER	Red light is off		The power supply of the expansion card is abnormal or the inverter is not powered on		
	5. Relat	ed Par	rameters		
5.1 Paramet	ter List				
Parameter Number	Parameter Name		Comments		
P10-00	Device Name	The device name, user sets the device nam through this parameter.			
P10-01	IP Address[0]	IP addr	ress. E.g,192.168.0.1 set the following		
P10-02	IP Address[1]	parame	eters:		
P10-03	IP Address[2]	P10-01	L: 192, P10-02: 168,		
P10-04	IP Address[3]	P10-03	03: 0, P10-04: 1		
P10-05	IP Address Mask[0]	IP add	ress mask. E.g,255.255.255.0 set the		
P10-06	IP Address Mask[1]	followi	ng parameters:		
P10-07	IP Address Mask[2]	P10-05: 255, P10-06: 255,			
P10-08	IP Address Mask[3]	P10-07	7: 255, P10-08: 0		
P10-09	Gateway address[0]	Gatewa	ay address. E.g,192.168.0.241 set the		
P10-10	Gateway address[1]	following parameters: P10-09: 192, P10-10: 168,			
P10-11	Gateway address[2]				
P10-12	Gateway address[3]	P10-11	L: 0, P10-12: 241		
P10-30	Read PCD 1	Periodi	cally read parameter configuration. The		
P10-31	Read PCD 2	first pa	rameter defaults to the status word,		
P10-32	Read PCD 3	and th	e second parameter defaults to the		
P10-33	Read PCD 4	actual after it	can be configured through the Read		
P10-34	Read PCD 5	PCD p	arameter.E. g. if you need to read		
P10-35	Read PCD 6	parame	eters P0-50,P0-51 can be configured to		
P10-36	Read PCD 7	read P	CD 1 (P10-30) as 50 and Read PCD 2		
P10-37	Read PCD 8	(P10-3) in conju	1) as 51.Note that it needs to be used unction with PPO Type.		

Parameter Number	Parameter Name	Comments
P10-40	Write PCD 1	Periodically write parameter configuration.
P10-41	Write PCD 2	The first parameter of periodic write
P10-42	Write PCD 3	parameters is Control word, and the second
P10-43	Write PCD 4	parameter is Reference (target reference
P10-44	Write PCD 5	P0-51 P0-52 you need to configure Write
P10-45	Write PCD 6	PCD 1 (P10-40)) to 51 and Write PCD 2
P10-46	Write PCD 7	(P10-41) to 52. Note that it needs to be
P10-47	Write PCD 8	used in conjunction with PPO Type.
5.2 Control w	ords and Status words	
PPO type (Telegram type)	
Standard	2 words In(Read)	2 words Out(Write)
Telegram 1	Status Word	Control Word
	Actual Value	Setpoint
PPO Type 3	2 words In(Read)	2 words Out(Write)
	Status Word	Control Word
	Actual Value	Setpoint
PPO Type 4	4 words In(Read)	
	Status Word	4 words Out(Write)
	Actual Value	Control Word
	Read PCD 1	Setpoint
	Read PCD 2	Write PCD 1
	Write PCD 2	
РРО Туре в	6 words In(Read)	6 words Out(Write)
	Status Word	Control Word
	Actual Value	Setpoint
	Q words In(Read)	9 words Out(Mrita)
Pro Type i	Status Word	Control Word
	Actual Value	Setnoint
	Read PCD 1	Write PCD 1
	Read PCD 2	Write PCD 2
	Read PCD 3	Write PCD 3

	Read PCD 4	Write PCD 4
	Read PCD 5	Write PCD 5
	Read PCD 6	Write PCD 6
PPO Type 8	10 words In(Read)	10 words Out(Write)
	Status Word	Control Word
	Actual Value	Setpoint
	Read PCD 1	Write PCD 1
	Read PCD 2	Write PCD 2
	Read PCD 3	Write PCD 3
	Read PCD 4	Write PCD 4
	Read PCD 5	Write PCD 5
	Read PCD 7	Write PCD 7
	Read PCD 8	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
hit10	Frequency out of	Frequency in the range
	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;

3	🛉 🞦 🔚 Save project 🚢 🐰 🟥 🕻	1 Settings	e 🖉 Go offline 🕌 🖪 🖪 🗶 📘 🛄
		Support packages	
	Devices	Manage general station description files (GSD)	
	P 64 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Start Automation License Manager	
		Show reference text	
	▼ 「] 项目1	🛄 Global libraries	•
art	Add new device		
St	📥 Devices & networks		
	PLC_1 [CPU 315-2 PN/DP]		
	Ungrouped devices		
	Security settings		
	Common data		
50	Documentation settings		
	Languages & resources		
	Online access		
	Card Reader/USB memory		

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

lanage general station description fi	les			
Installed GSDs GSDs in the pro	ject			
Source path: D:\device				
Content of imported path				
📕 File	Version	Language	Status	1
sa710_pd.gsd		Default	Not yet installed	
GSDML-V2.32-SAVCH-PNIO-20200406.xr	ml V2.32	English, Ger	Not yet installed	
<	100			>
		Delete	Install Ca	ncel

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:

			Colline tools
Devices		af Topology view 🖾 Network view 🕅 Device view	Options
1	11 22	# PLC_1[CPU1212C] * II E 4 II I 9.1	
			Y CPU operator papel
abcmultparam	20		
Add new device		102	PLC_1 [CPU 1212C ACIDCRIy]
devices & networks		101	RUN/STOP RUN
 M PLC_1 [CPU 1212C ACIDORIY] 	20	54 * BC 1 1	EFFOR STOP
Device configuration		103 102 101 1 2 3 2 2 0 100 1 11 0	
W Online & diagnostics		Back 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	MANI MISS
Program blocks	•		
Technology objects		HTC 1 110 1000-10-	
 Sai External source files 		5 MSC 2 117 1004 10	
RLC tags	•	112 HILL 2 1029 10	
 RLC data types 	•	1 119 1132 10	
 Watch and force tables 		ALL 1016 10	
Online backups		17 HSC 0 121 1020-10-	✓ Cycle time
 Traces 		Page 1 122	
Device proxy data			~
Program info			
PLC alarm text lists		Second and the second sec	
 Local modules 	2	34 Properties 34 Info u S Diagnostics	
Distributed NO	2	General Cross-references Compile	1 150
E Ungrouped devices		0 A 0 Sevel nerves	
 Mail Security settings 			Shortest: 1.000 ms
Common data		later is later 1	Currentilast: 1.000 ms
 C Documentation settings 		La la r	Longest: 2.000 ms
 Languages & resources 		SL_gou_weak_yearm was isobed tocestrury. 462020 4:21:01 PM	^
Online access		31_0/20 421:01 M	
Card Reader/USB memory		Su got nutri man baba social s	
		S SL_gge_daws was readed successfully. 46/02/20 4 21/01 PM	
		AUTEX_UD Was reserved successmay. 46/2020 4:21:01 PM	
		V KINK_DET WEIGENERUSE	
		460220 4:21:01 PM	
		Main was loaded successfully. 46/2020 4:21:01 PM	
		Consider for dealers and the landers of the bell of the ball of th	

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

		abomultiparam + PLC_1						- *
Devices								
3i	III 🖻	2 2 2 L 10 L 9. 5	5 49 man man					
			Address	Display format	Monitor value	Modify value	9	Comment
 abcmultiparam 		3	%QW1	Hex		16#0001	M 🛃	
Add new device		2	%QW3	Hex		16#0123	M 🛓	
devices & networks		3	1 %/W1	Hex	•			
PLC_1 [CPU 1212C AC/DC/Rly]	Z	4	%/W3	Hex				
Device configuration		5	%QW5	Hex		16#0011	M 1	
Se Online & diagnostics		6	%QW7	Hex		16#0033	🗹 🙏	
Program blocks	•	7	%IW5	Hex				
Technology objects		8	%/W7	Hex				
External source files		9	%M156.2	Bool		TRUE		
PLC tags	•	10	%120.0	Bool		TRUE	M 🛃	
FLC data types	•	11	%IW22	DEC		278	🗹 🚹	
 Watch and force tables 		12	%D24	DEC+/-		45040	🗹 🚹	
Add new watch table		13	%/W28	DEC		60	M 🚹	
Elli Force table		14	%\30.0	Bool				
od, Watch table_1		15	%130.1	Bool				
Online backups		16	%130.2	Bool				
🕨 📴 Traces		17	%ID32	Hex				
Device proxy data		18	%/W36	DEC				
Program info		19	%/W38	Hex				
PLC alarm text lists		20)	%/W40	DEC				
Coral modules	Z	21 p_HL	%IW42	Hex				
Distributed NO	Z	22 K	95IW44	Hex				
Ungrouped devices		23	%iB46	Hex				
Security settings		24	%1847	Hex				
Common data		25	%/848	Hex				
Cocumentation settings		26	%IB49	Hex				
Languages & resources		<		11				
Online access					2 Proper	loc 11 Info	Diagno	tice
Card Reader/USB memory		1			Troper	Samo	Car chagnos	465
		General Cross-refe	rences Compile					
		3 A 3 Show all message	5					

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.

bcmultiparam 🕨 PLC_1	[CPU 1212C AC/DC/Rly] 🕨 Watch a	ind force tables	 Watch table_1 			
P 🔮 🙋 🕼 💪 🔗 🤗							
		Address	Display format	Monitor value	Modify value	9	Comment
		%QW1	Hex	▼ 16#0001	16#0001		
		%QW3	Hex	16#0123	16#0123		
		%IW1	Hex	16#0F07			
		%IW3	Hex	16#0123			
		%QW5	Hex	16#0011	16#0011	M (
		%QW7	Hex	16#0033	16#0033		
		%IW5	Hex	16#0000			
		%IW7	Hex	16#0000			
		%M156.2	Bool	FALSE	TRUE		
)		%120.0	Bool	TRUE	TRUE		
		%IW22	DEC	278	278	Image: A state of the state	
		%ID24	DEC+/-	45040	45040	Image: A start and a start	
		%IW28	DEC	60	60	I	
		%130.0	Bool	FALSE			
		%130.1	Bool	FALSE			
		%130.2	Bool	FALSE			
		%ID32	Hex	16#0000_0000			
3		%IW36	DEC	60			
)		%IW38	Hex	16#0020			
)		%IW40	DEC	56			
1 _HL		%IW42	Hex	16#0100			
2		%IW44	Hex	16#002B			
5		%IB46	Hex	16#41			
1		%IB47	Hex	16#42			
5		%IB48	Hex	16#43			
5		%IB49	Hex	16#50			
<			III				

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	9		Comment	
	%QW1	Hex	16#0000	16#0000		4		1
1	🔳 %QW3	Hex	16#0123	16#0123		Â		
E	96IW1	Hex	16#0203					
£	96IW3	Hex	16#0000					
5	%QW5	Hex	16#0011	16#0011		4		
5	%QW7	Hex	16#0033	16#0033		4		
P.	96IW5	Hex	16#0000					
10	96IW7	Hex	16#0000					
P	%M156.2	Bool	FALSE	TRUE				
0	%120.0	Bool	TRUE	TRUE		Â		
1	%IW22	DEC	278	278		4		
2	%ID24	DEC+/-	45040	45040		4		
3	%IW28	DEC	60	60		4		
4	96130.0	Bool	FALSE					
5	96130.1	Bool	FALSE					
6	%130.2	Bool	FALSE					
7	%ID32	Hex	16#0000_0000					
8	%IW36	DEC	60					
9	%IW38	Hex	16#0020					
0	%IW40	DEC	56					
1 HL	%IW42	Hex	16#0100					
2	96IW44	Hex	16#002B					
3	%IB46	Hex	16#41					
4	%IB47	Hex	16#42					
15	%IB48	Hex	16#43					
16	%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.

					- 71
# # ₩ b 1, % # °° °°					
)e	Address	Display format	Monitor value	Modify value	9
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	%120.0	Bool	TRUE	TRUE	
15 '.id	%IW22	DEC	278	278	
16 dataRecNbr	%ID24	DEC+/-	45040	45040	
17 ImaxLen	%IW28	DEC	60	60	
18 checkedvalid	%130.0	Bool	FALSE		
19 '.busy	%130.1	Bool	FALSE		
20 '.error	%130.2	Bool	FALSE		
21 'status	%ID32	Hex	16#0000_0000		
22 'Jen	%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				
Туре	ERROR	MAINTAN	POWER	Corresponding
				measures
1	Red light on	Х	Х	Internal fault
2	Х	Red light on	Х	Internal fault
3	х	X	Green light on	PN01 power supply is
				normal
4	х	Х	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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Quanzhou Factory

Address:3# Zixin Road, Jiangnan Hi-Tech Industrial Park, Quanzhou, Fujian, China Tel: 0595-24678267 Fax: 0595-24678203

Service Network Website: www.savch.net

Qualification

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