SIEMENS

PROFINET CBA 用户程序接口

PROFINET CBA User Program Interfaces

Getting Started

Edition (2008-01)

https://support.industry.siemens.com/cs/cn/zh/view/109481289

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摘 要 CBA 即"Component Based Automation"。是基于开放的 PROFINET 标准执行模块化 应用的自动化概念。分布式的智能设备之间可以交换实时数据。PROFINET CBA 接口是 PROFINET 工艺组件的接口。每一个工艺组件都存在一个接口,通过该接口,组件之间以及 组件与 HMI/MES 系统之间可以相互通讯。所以组件的接口类型主要分为两种,一种是 PROFINET interface DB,另一种就是 HMI interface DB。通过刷新 PROFINET Interface DB, SIMATIC S7 控制器可以读到 CBA 的数据。刷新 PROFINET Interface DB 的方式分为 两种,一种是自动刷新接口 DB;另一种是通过用户程序接口刷新接口 DB。与自动刷新接口 DB,在处理 CBA RT 通讯更能满足用户的要求。本文说明 了该方式的优点并提供组态方法。

关键字 PROFINET CBA,实时, PN 接口,用户程序接口

Key words PROFINET CBA, Real Time, PN Interface, User Program Interfaces.



1 刷新 PN CBA Interface 4 1.1 自动刷新 PN Interface 7 1.2 用户接口程序刷新 PN Interface 7 2 本例项目介绍 8 3 Step7 组态 9 3.1 CP443-1 Adv 组态 10 3.2 CPU317-2PN/DP 组态 17 3.3 CPU314-2DP 组态 25 3.4 CPU319-3PN/DP 组态 43 4 iMap 组态 49

目

录



1 刷新 PN CBA Interface

Step7提供一系列的功能块执行CBA的接口刷新。所有新的功能块对应各自的PN CBA设备来刷新接口DB。添加的用户程序接口功能块存在Step7的功能块库中。



下表列出了用于刷新的PROFINET CBA的系统功能和标准功能块。

系统功能/功能块	作用
FB88 "PN_InOut"	CP和Interface DB之间交换数据



FB90 "PN_InOut"	对于S7-400的CPU。CP版本大于2.1, CPU版本大于4.0。最好使用
	FB90,这样会获得更快的响应时间。
SFC112 "PN_IN"	刷新PROFINET控制器CBA接口DB的所有Input值。
SFC113 "PN_OUT"	刷新PROFINET控制器CBA接口DB的所有Output值。
SFC114 "PN_DP"	在PROFINET控制器作为CBA代理组件时,刷新所有本地和远程的组
	件互连。
FC10 "PN_IN"	智能的PROFIBUS从站作为CBA组件时,刷新PROFIBUS设备接口DB
	的所有Input值。
FC11 "PN_OUT"	智能的PROFIBUS从站作为CBA组件时,刷新PROFIBUS设备接口DB
	的所有Output值。

下图为SIMATIC S7 PLC操作CBA功能块的原则。





通过Step7创建组件时,需要选择刷新接口DB的两种方式。当使用用户程序接口刷新时,一定要选择"via user program (Copy blocks)"。

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🖆 Create PROFINET Component 🛛 🛛 🔀
General Component Type Functions Storage Areas Additional Properties
Component type
Standard component
without proxy functionality
C with proxy functionality
C Singleton component
Updating the PN Interface
via user program (copy blocks)
automatic (at the scan cycle check point)
OK Cancel <u>H</u> elp

1.1 自动刷新 PN Interface

选择"automatic (at the Scan Cycle Check Point)"时,为自动刷新PN Interface。使用该方式的 好处就是不需要在Step7中编写刷新接口DB的程序。Scan Cycle Check Point可以说是SIMATIC S7 300/400 CPU刷新过程映像区的时刻。这就是说CPU在刷新过程映像区时刷新PN接口DB。 这意味着Step7程序中需要接口DB的更新数据取决于OB1的扫描循环时间,也就是程序量的 大小。OB1的循环时间越长,接口数据的刷新就越慢。例如,OB1的扫描循环时间为100ms。 组态CBA RT数据要20ms更新一次,那么实际上CPU只能大约100ms才能获得或提供刷新的数 据。

1.2 用户接口程序刷新 PN Interface

选择" via user program (Copy blocks)"时,为用户程序接口刷新PN Interface。也就是可以从 PROFINET系统库和标准库中加入与硬件匹配的功能块到Step7程序中。这样Step7在程序执行 时,执行到刷新PN Interface用户程序接口功能块时,刷新该接口DB。这样可以根据需要,决 定何时刷新接口DB。例如,OB1的扫描循环时间为100ms。组态CBA RT数据要20ms更新一



次,那么可以将刷新PN Interface用户程序接口功能块放到循环中断OB35中(设置循环时间 10ms),这样每隔大约20ms,CPU就能获得或提供刷新的数据。

2 本例项目介绍

下面的示意图为本例项目主要设备的网络配置图。

详细组态CBA的方法可以参考《PROFINET CBA通讯快速入门》。该文档可以从西门子中国网站上的"网上课堂"PLC部分下载,网址如下:

http://www.ad.siemens.com.cn/service/e-training/list.asp?columnid=4



①S7-400PLC作为一个独立体组件。通过CP443-1 Adv连接到PROFINET上。

②CPU319-3PN/DP作为一个独立体组件。提供2个工艺功能与其它组件通讯。通过PN接口连接到PROFINET上。

③带有Step7和iMap的PG/PC通过普通网卡连接到PROFINET上。

④CPU317-2DP/PN作为一个具有代理功能的标准组件,通过PN接口连接到PROFINET上。通过DP接口与CPU314C-2DP的DP组件相连。

⑤CPU314C-2DP作为一个智能DP从站的标准组件通过连接代理集成到PROFINET中。 项目中的主要硬件组成:

模块名称	订货号	数量
SCALANCE X208	6GK5 208-0BA00-2AA3	1
PG/PC+普通网卡		1
CPU414-2DP v4.1	6ES7 414-2XG04-0AB0	1



CP443-1 Adv v2.4	6GK7 443-1EX40-0XE0	1
CPU319-3PN/DP v2.4.2	6ES7 318-3EL00-0AB0	1
CPU317-2PN/DP v2.2.2	6ES7 317-2EJ10-0AB0	1
CPU314C-2DP v1.0.3	6ES7 314-6CF00-0AB0	1

项目中的主要软件组成:

软件名称	版本
Windows XP	SP2
Step7	V5.4 SP2
iMap	3.0

3 Step7 组态

首先设置 PG/PC 的网卡 IP 地址为 192.168.0.199。

neral ou can get IP settings assigned is capability. Otherwise, you ne le appropriate IP settings.	d automatically if your network supports eed to ask your network administrator for
🔿 Obtain an IP address autor	natically
Use the following IP addres	38:
IP address:	192.168.0.199
Subnet mask:	255 . 255 . 255 . 0
Default gateway:	
Obtain DNS server address	s automatically
Use the following DNS served	ver addresses:
Preferred DNS server:	
Alternate DNS server:	
	Advanced

打开 Step7 程序,在 SIMATIC Manager 中,选择"options"菜单下选择 Set PG/PC interface。 或者打开控制面板双击 Set PG/PC interface 图标。设置 PG/PC 接口为 TCP/IP→Broadcom NetXtreme 57...。



Access Point of the Application:	
S7ONLINE (STEP 7)> TCP/IP -> Br	roadcom NetXtreme 👱
Standard for STEP 7)	
nterface Parameter Assignment Used:	
TCP/IP -> Broadcom NetXtreme 57x	Properties
🕮 CP5611(PROFIBUS)	
🗐 ISO Ind. Ethernet -> Broadcom Net	
🕮 PC internal (local) 📃 📄	Сору
TCP/IP -> Broadcom NetXtreme 57	Delete
< · · · · · · · · · · · · · · · · · · ·	**
Assigning Parameters to Your NDIS CPs with TCP/IP Protocol (RFC-1006))	
Intendues	

3.1 CP443-1 Adv 组态

在 SIMATIC Manager 中,新建一个项目为"CBA_UP_Interfaces"。在该项目中添加一个 400 站,3个 300 站。并根据项目需要分别重新命名为 CP443-1, CPU317-2PN/DP, CPU319-

3PN/DP, iSlaveCPU314C-2DP.

SIMATIC Manager - [CBA_UP]	Interfaces C:\Siem	nens\Step7\s7proj\CBA_L	JP_[]	
By File Edit Insert PLC View O	ptions Window Help	and the second	1997) 197	
D 🗃 🔡 🛲 X 🗅 🔂 I		🔠 🔝 🔍 No Filter >	- 70	12
E- B CBA_UP_Interfaces	Object name	Symbolic name	Туре	Size
🕀 🎆 CP443-1	CP443-1		SIMATIC 400 Station	
E CPU317-2PN/DP	CPU317-2PN/DP	222	SIMATIC 300 Station	5322
	CPU319-3PN/DP		SIMATIC 300 Station	
E ISlaveLPU314L-2DP	iSlaveCPU314C-2DP		SIMATIC 300 Station	6538
	HPI(1)	3777	MPI	2984
	PROFIBUS(1)	8. 515	PROFIBUS	7684
	Ethernet(1)	8. 1.1	Industrial Ethernet	2328

根据 S7-400 站的实际配置,对 CP443-1 站进行硬件组态。





1Advanced 的属性页面。设置其 IP 地址为 192.168.0.1/24。并新建一个子网 Ethernet (1)。



T Set MAC addr	ess / use ISO protocol	_		
P address: Subnet mask:	192.168.0.1 255.255.255.0	Gateway C Do not use router Use router Address: 192.16	8.0.1	
Subnet: <u>not network</u> (Ethemet(1)	ed		New	
Etheme(1)			Properties	
			Delete	

设置 CP443-1 Advanced 的 PROFINET 属性, 使能 CBA 通讯。



roperties - CP 443-1 Advanced - (R0/S4)		
General Addresses Port Parameters Options Time-of-Day Synchronic IP Configuration Users Symbols DNS Parameters FTP Device Name [CP-443-1-Advanced Operating Mode PROFINET ID controller CBA Communication IV Use this module for PROFINET CBA communication.	zation IP Act	cess Protection
ОК	Cancel	Help

点击 OK 结束。保存和编译硬件组态。打开 CP443-1 站的程序块 OB1。在 OB1 中加入 FB90, DB90。FB90 的输入变量 LADDR 的逻辑地址(16 进制)要与 CP 硬件组态的地址(10 进 制)一致。保存所编的程序。由于程序为演示程序,并且没有编写其它程序。所以 OB1 的扫 描时间很短,完全可以满足后面的实时要求。在实际中,如果 OB1 的扫描循环时间很长,那 么该功能块就必须放到循环时间中断块中以满足 RT 的要求。



右键点击 CP443-1 站,在下拉菜单中选择创建 PROFINET 接口。

🕼 SIMATIC Manager - [CBA_U	P_Interfaces C:\Si	emens\Step7\s7proj\C	BA_UP_I]
File Edit Insert PLC View	Options Window Help	and the second second second	
0 🚅 🚼 🐖 👗 🖻 🖪		- 📰 🛅 🔁 🛛 < No Fi	ilter > 🔽 🏹
🖃 🎒 CBA_UP_Interfaces	Object name	Symbolic name	Туре
EP443-1	Open Object	Ctrl+Alt+O	Station configuration
THE CPU317-2PN/DP	Cut	Ctrl+X	CPU
E ISlaveCPU314C-2DP	Copy Ctrl+C		υP
	Paste	Ctrl+V	
	Delete	Del	
	PLC	•	
	Print	•	
	Rename	F2	
	Object Properties Alt+Return		
	Create PROFINET Inter	face	
	Create PROFINET comp	onent	
	-		

弹出 PROFINET Interface-New/Open 页面。点击 Add function,添加功能。修改默认的功能名 Function_1 为 Function_CP443。同一项目中的 CBA 组件的功能名必须不同。

PROFINET Interface - New/Open			×
Storage path (S7 Project): C:\Siemens\Step7\s7proj\CBA_UP_I\CBA CBA_UP_Interfaces CP443-1 CPU 414-2 DP Add function CPU 414-2 DP Add function PN blocks Add PN blocks Add HMI blocks Add HMI blocks CPU319-3PN/DP CPU319-3PN/DP SlaveCPU314C-2DP	_UP_I.s7p Block types PN blocks PN blocks HMI blocks Insert new function Delete function Object properties Insert new block		Browse
ОК		Cancel Appl	y Help

在该功能下的 PN blocks 下,点击 — 与 Add PN block,添加 PN 接口 DB。默认为 DB1。

PROFINET Interface - New/Open					
Storage path (S7 Project): C:\Siemens\Step7\s7proj\CBA_UP_I\CBA_UP_I.s7p CBA_UP_Interfaces	Assigned P	N blocks	Associated FB	Δ F	Browse Bronerty
CPU 414-2 DP	CB1				
HMI blocks Add HMI block CPU317-2PN/DP CPU319-3PN/DP Jolever(PLI314C-2DP	-Available bl	pocks		1	Open
	Block	Symbolic name	Associated FB FB90	A F	ROFINET property
ОК		Ca	incel	Apply	Help

点击 ①pen 按钮,打开 PROFINET 接口编辑器,创建 DB1 的 PN 接口变量。根据需要分别新建输入和输出两个变量为整型和实数型。保存后关闭。



PROFINET Interface Editor - [PROFINET Interface DB1 CBA_UP_Interfaces\CP443-1\CPU 414-2 DP]						
File Edit View Window ?						
🗅 🖻 🖬 🎎 🎭 🕷 🛍 🛍	3	8 ?				
Interface - Normal	Сог	tents Of: 'PROF	INET Interface-D	B\PN_Input'	Turnebien (-D.4.40
PROFINET Interface-DB		Name	Data Type	Address	Function_t	.P443
	12	PN Input0	Int	0.0	PN_Input0_12	IZ PN_OutputZ
		PM_loput1	Real	2.0	Pri_inputi K4	UI1 Lifestate
	5	i i i _i i por i	Deel	2.0		
			DOOI Duto			
······ 3 _F Not_assigned			Char			
			Char			
			Vvora Distant			
			Divora			
			Dint			
			Real			
			Date_And_Time			
			String			
			Array [?] o			
			Struct			
			UDT <nr></nr>	J I		

右键点击 CP443-1 站,在下拉菜单中选择创建 PROFINET 组件。

SIMATIC Manager - [CB	A_UP_Interfaces C:\S	iemens\Step7\s7proj\CBA	_UP_I]
File Edit Insert PLC V	iew Options Window Helj	2	
🗋 🗅 🗃 🕌 🚟 🛛 X 🗈		🔚 🔛 🗰 🗈 < No Filter	› • 🋂
🖃 🎒 CBA_UP_Interfaces	Object name	Symbolic name	Туре
⊕- ☐ CP443-1 ⊕- ☐ CPU317-2PN/DP	Open Object	Ctrl+Alt+O	Station configuration
E CPU319-3PN/DP	Cut	Ctrl+X	CP
⊡-∰ iSlaveCPU314C-2E - -	Сору	Ctrl+C	
	Paste	Ctrl+V	
	Delete	Del	
	PLC	۱.	
	Print	►.	
	Rename	F2	
	Object Properties	Alt+Return	
	Create PROFINET Interface		
	Create PROFINET compone	nt	

弹出创建组件对话框,在"Component Type"栏中,在组件类型栏中选择"Singleton component",在刷新 PN 接口选择"via user program (copy blocks)"。点击 OK,开始创建组件。

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_		
- Compoi	nent type	
C Sta	andard component	
G	without proxy functionality	
C	🕈 with proxy functionality	
G Sin Sin	aleton component	
Updatir	ng the PN Interface	
via	user program (copy blocks)	
C au	tomatic (at the scan cycle check point)	

下载 CP443-1 站的硬件组态和全部程序。

3.2 CPU317-2PN/DP 组态

打开 CPU317-2PN/DP 站,根据实际硬件配置进行硬件组态。



eneral l'arameters			1
Address:			
Highest address: 126			
ransmission rate: 1.5 Mbps			
Subnet:			
PROFIBUS(1)	1.5 Mbps	N	ew
		Prop	erties
		D	elete

双击硬件组态的 X2 [PW-10 , 弹出设置 PN-IO 的属性页面。设置其 IP 地址为

192.168.0.2/24.	并选择子网	Ethernet (1) 。
-----------------	-------	----------------

New
operties
Delete

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双击硬件组态的 2 CPU 317-2 PN/DP 6ES7 317-2EJ10-0AB0, 弹出 CPU317-2PN/DP 的属

性页面,选择"Cycle/clock memory"栏,设置通讯负载占用扫描循环时为 50%。

operties - CPU 317-2 PN/DP - (R0/S	52)
Time-of-Day Interrupts Cyclic Interrupts General Startup Cycle/Cloc	Diagnostics/Clock Protection Communication
Cycle	
Scan cycle monitoring time [ms]: Minimum scan cycle time [ms]:	150
Scan cycle load from communication [%]:	50
Size of the process-image input area Size of the process-image output area	256
0B85 - call up at I/O access error:	No OB85 call up
Clock Memory	
Clock memory Memory Byte:	0
OK	CancelHelp

点击 OK 结束。保存和编译硬件组态。打开 CP317-2PN/DP 站的程序块 OB1。在 OB1 中加入 SFC114。由于程序为演示程序,并且没有编写其它程序。所以 OB1 的扫描时间很短,完全 可以满足后面的实时要求。在实际中,如果 OB1 的扫描循环时间很长,那么相应的刷新 PN 接口必须放到循环时间中断块中以满足 RT 的要求。REQ=TRUE,使能刷新 PN 接口。

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 SFC100 SET_CLKS CLK_FUNC SFC101 RTM CLK_FUNC SFC102 RD_DPARA IO_FUNCT SFC103 DP_TOPOL DP SFC104 CIR PGM_CNTL SFC105 READ_SI PMC_FUNC SFC106 DEL_SI PMC_FUNC SFC107 ALARM_DQ PMC_FUNC SFC108 ALARM_D PMC_FUNC SFC112 PN_IN PROFIne2 SFC113 PN_OUT PROFIne2 SFC126 SYNC_PI IO_FUNCT SFC127 SYNC_PO IO_FUNCT SFS-S7 Converting Blocks Organization Blocks PID Control Blocks Communication Blocks 	OB1 : "Main Program Sweep (Cycle)" Comment: Network 1: Title: Comment: CALL "PN_DP" REQ :=TRUE RET_VAL:=MWO BUSY :=M2.0

在 SIMATIC Manager 中,点击打开项目/库图标 🚰,选择库 Libraries。

e n Project Jserprojects Libraries Samp	ole projects Multiprojects					
Name PROFINET System-Library Redundant IO (V1) Redundant IO CGP SIMATIC_NET_CP	Storage path C:\Siemens\Step7\S7libs\PROFInet C:\Siemens\Step7\S7libs\red_io_0 C:\Siemens\Step7\S7libs\red_io_1 C:\Siemens\Step7\S7libs\simation					
📚 Standard Library 📚 stdlibs (V2)	C:\Siemens\Step7\S7libs\stdlib30 C:\Siemens\Step7\S7libs\stdlibs					
Selected ser Projects:						
ample Projects:	Browse					
OK.	Cancel Help					

选中 PROFINET System-Library 库,点击 OK 打开。点击 SIMATIC Manager 中 ➡ 分屏图标。从 CPU300→Blocks 拖入 OB82,OB86 到 CPU317-2PN/DP 站中。也可以手动添加 OB82, OB86。

1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -
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SIMATIC Manager - CBA LID	Interfaces					
File Edit Tosert PLC View Ontic	ninterindous pos Window Help					
		97, 9797 (mm) 🙃 🖂 Ma				
		8-8-8-8- [] [[[] < NO] 4 1	
PROFINET System-Library	- C:\Siemens\Step	7\S7libs\PROFInet				
PROFINET System-Library	Object name	Symbolic name	Created in language	Size in the work me	Туре	Version (Header)
	🖬 0B82	1/0_FLT1	STL	38	Organization Block	0.0
E ST LP 400	OB86	RACK_FLT	STL	38	Organization Block	0.0
Blocks						
€ 🛐 I-DP-Slave						
⊕ 🛐 WinLC PN						
	<					
CBA_UP_Interfaces C:\Si	iemens\Step7\s7p	roj\CBA_UP_I				
🖃 🎒 CBA_UP_Interfaces	Object name	Symbolic name	Created in language	Size in the work me	Туре	Version (Header)
E CP443-1	🚵 System data	S 77			SDB	
E CPU 414-2 DP	0B1		STL	72	Organization Block	0.1
B Sources	CB82	I/O_FLT1	STL	38	Organization Block	0.0
Blocks	SEC114	PN DP	SIL		Organization Block	1.0
🛨 🗧 CP 443-1 Advanced	Bar Si Ci 14	T M_DI	STE		System runction	
						1.0
E I CPU317-2PN/DP						
E-IIII CPU317-2PN/DP ⊡-IIII CPU 317-2 PN/DP ⊡-IIII CPU 317-2 PN/DP ⊡-IIIII CPU 317-2 PN/DP ⊡-IIIII CPU317-2 PN/DP ⊡-IIIII CPU317-2PN/DP ⊡-IIIII CPU317-2PN/DP						
CPU317-2PN/DP						

右键点击 CPU317-2PN/DP站,在下拉菜单中选择创建 PROFINET 接口。

Excellence in Automation & Drives: Siemens	IP_Interfaces C:\Si	iemens\Step7\s7proj\CBA_I
By File Edit Insert PLC View	Options Window Help	
0 🚅 🔡 🛲 👗 🛍 🖻		🗄 🔠 💼 💽 < No Filter >
🖃 🎒 CBA_UP_Interfaces	Object name	Symbolic name
	Hardware	
E- CPU317-2PN/DP	Open Object	Ctrl+Alt+O
⊡ 🔄 S7 Program(2)	Cut	Ctrl+X
B Sources	Сору	Ctrl+C
	Paste	Ctrl+V
	Delete	Del
	PLC	×
	Print	•
	Rename	F2
	Object Properties	Alt+Return
	Create PROFINET Inter	face
	Create PROFINET comp	onent

弹出 PROFINET Interface-New/Open 页面。点击 Add function,添加功能。修改默认的功

能名 Function_1 为 CPU317。同一项目中的 CBA 组件的功能名必须不同。

PROFINET Interface - New/Open		
ROFINET Interface - New/Oper itorage path (S7 Project): CSiemens\Step7\s7proj\CBA_UP_I\C CBA_UP_Interfaces CP443-1 CPU317-2PN/DP CPU317-2PN/DP CPU317-2PN/DP PN blocks PM blocks PM CPU319-3PN/DP	BA_UP_I.s7p Block types PN blocks HMI blocks Insert new function Rename function Delete function	Browse
 PN blocks Add PN bl ⊕ HMI blocks ⊕ EPU319-3PN/DP ⊕ EPU319-3PN/DP ⊕ EPU314C-2DP 	Insert new function Rename function Delete function Object properties Insert new block	
ОК	Cancel	Apply Help

点击该功能的 PN blocks 下 ---- **P** Add PN block, 添加 PN 接口 DB。默认为 DB1。

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PROFINET Interface - New/Open					×
Storage path (S7 Project):					
C:\Siemens\Step7\s7proj\CBA_UP_I\CBA_UP_I.s7p					Browse
🕞 🎒 CBA_UP_Interfaces	Assigned	PN blocks			
⊕ ∰ CP443-1	Block	Symbolic name	Associated FB	A	PROFINET property
E- M CPU317-2PN/DP	DB1				
PN blocks Add PN block DB1 DB1 DU319-3PN/DP ISlaveCPU314C-2DP	- Available b	locks	<u> </u>		Open
	Block	Symbolic name	Associated FB	A	PROFINET property
ОК			Cancel	Apply	Help

点击 [Open] 按钮,打开 PROFINET 接口编辑器,创建 DB1 的 PN 接口变量。分别新

建输入和输出两个变量为整型和实数型。保存后关闭。

■ PROFINET Interface Edito File Edit View Window ? □ 22 H :::::::::::::::::::::::::::::::::	r - (P	ROFINET In	terface DB1 -	- CBA_UP_Inter	faces\CPU317-2PN	1/DP\CPU 317-2 PN/
Interface - Normal	Cor	itents Of: 'PRO	FINET Interface	-DB\PN_Output		
🖃 🕀 PROFINET Interface-DB		Name	Data Type	Address	PN Input0 I2	I2 PN Output2
庄 💶 PN_Input	12	PN_Output2	Int	6.0	PN Input1 R4	R4 PN Output3
		PN_Output3	Real	8.0		UI1 Lifestate

右键点击 CPU317-2PN/DP站,在下拉菜单中选择创建 PROFINET 组件。

Excellence in Automation & Drives: Siemens		
SIMATIC Manager - [CBA_U B File Edit Insert PLC View	P_Interfaces C:\Sie Options Window Help	emens\Step7\s7proj\CBA_
🗖 🗲 🎛 🛲 🐰 🖻 🕞		- 🏥 🔝 主 🛛 < No Filter :
🖃 🎒 CBA_UP_Interfaces	Object name	Symbolic name
EP443-1	🕅 Hardware	
CPU317-2PN/DP	Open Object	Ctrl+Alt+O
🖃 🛐 S7 Program(2)	Cut	Ctrl+X
B Sources	Сору	Ctrl+C
	Paste	Ctrl+V
Erusis-senvor	Delete	Del
	PLC	E
	Print	•
	Rename	F2
	Object Properties	Alt+Return
	Create PROFINET Interf	ace
	Create PROFINET compo	nent

弹出创建组件对话框,在"Component Type"栏中,在组件类型栏中选择"Standard component"" with proxy functionality",在刷新 PN 接口选择"via user program (copy blocks)"。点击 OK,开始创建组件。

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Excellence in 🥆
Automation & Drives
Siemens

Functions	Storage Areas	Additional Properties
General	Component Type	DP Subnets
omponent type		
Standard compon	ent	
G without proxy	functionality	
• with proxy fur	nctionality	
pdating the PN Interf	ace	
odating the PN Interf	ace copy blocks)	
pdating the PN Interf via user program (automatic (at the s	ace copy blocks) scan cycle check point)	
odating the PN Interf via user program (automatic (at the s	ace copy blocks) :can cycle check point)	
dating the PN Interf via user program (automatic (at the s	ace copy blocks) scan cycle check point)	
idating the PN Interf via user program (automatic (at the s	ace copy blocks) scan cycle check point)	

下载 CPU317-2PN/DP 站的硬件组态。

3.3 CPU314-2DP 组态

打开 iSlaveCPU314C-2DP 站,根据实际的硬件配置进行硬件组态。



	- All and a second s							0	rnuri	DUDTA
_ (0)	UR							⊡₩	PROFI	NET IO
1									SIMAT	IC 300
2	CPU 314C-2 D	P				- 21		<u> </u>	📄 C7	
x2		•				- ≡			📄 CP	-300
22	DI24/DO16							□	📄 CP	U-300
23	A/5/402					- 1			÷	CPU 312
24	Count					- 1			÷	CPU 312 IFM
2.7	Position					-			÷	CPU 312C
3						- 🕶			÷	CPU 313
	•						_		÷	CPU 313C
							×		÷	CPU 313C-2 DP
							>		÷	CPU 313C-2 PtP
									÷	CPU 314
€.	🌔 (0) UR								÷	CPU 314 IFM
		(÷	CPU 314C-2 DP
Slot	🚺 Module	Order number	Fi	М	Ι	Q	C			- 6ES7 314-6CF00-0AB
1										6ES7 314-6CF01-0AB
2	CPU 314C-2 DP	6ES7 314-6CF00-0AB0	V1.0	2						📓 6ES7 314-6CF02-0AB
X2	DP DP				1023				+	🛅 6ES7 314-6CG03-0A
2.2	DI24/D016				124	124			÷	CPU 314C-2 PtP
23	🚦 AI5/AO2				752	752			÷	CPU 315
2.4	Count				768	768			÷	CPU 315-2 DP
25	Position				784	784			÷	CPU 315-2 PN/DP
3									÷	CPU 315F-2 DP
4									÷	CPU 315F-2 PN/DP
5									÷	CPU 316
6									÷	CPU 316-2 DP
7									÷	CPU 317-2
8									÷	CPU 317-2 PN/DP
9									÷	CPU 317E-2
10									÷	CPU 317E-2 PN/DP
4.4									1 💳	CDU 210.2
11									+	LPU 318-2

址为2。并选择PROFIBUS(1)子网。



uddress:]		
ransmission rate: 1.5 Mbps			
ubnet: not networked PROFIBUS(1)	1.5 Mbps	N	ew
		Prop	erties
		De	elete

选择 DP 接口属性的操作模式栏。设置该站为 DP 从站。

Properties - DP - (R0/S2.1)		×
General Addresses Operating N	ode Configuration	
C No DP C DP master C DP slave		
Master: Station Module Rack (R) /	slot (S)	
Diagnostic address:	1022	
Address for "slot" 2:	1021	
ОК	Cancel Help	



选择 DP 接口属性的组态栏。

operties	- DP -	(R0/S2.1)					
General A	.ddresse:	s Operating Mod	e Configuratio	n			
Row	Mode	Partner DP a	Partner addr	Local addr	Length	Consiste	
							î
							t
Ne	W	Edit		Delete			
200							
Comm	en.					*	
-							a)
OK					Canc	el He	elp
- Ne	ew	按 加	居州对迁垣				



Properties - DP - ((R0/S2.1) - Cor	figuration - Row 1	
Mode:	MS 💌	(Master-slave configuration)	
DP Partner: Master		Local: Slave	
DP address:	<u></u>	DP address:	2
Name:		Name:	DP
Address type:	<u></u>	Address type:	Input 💌
Address:		Address:	0
"Slot":	["Slot":	
Process image:	<u>_</u>	Process image:	081 PI 💌
Interrupt OB:	<u></u>	Diagnostic address:	
Length: [Unit: [Consistency: [1 Byte 💌 Unit 💌	Comment:	
ОК	Apply	Cano	el Help

不需要做任何修改,点击 OK 结束。保存和编译硬件组态。

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Automation & Drives.
> Siemens

IS MS	-	I O	1 Byte U	onsiste nit
				î
				Ţ
New	Edit.	Delete		
	and the second			
MS Master-slav Master:	ve configuration —			

在 SIMATIC Manager 中,	点击打开项目/库图标 遻,	选择库 Libraries。
	m = 11 / 1 / 1 / 1 / 1 / 1 / 1 / 1 / 1 /	

Name	Storage path				
PROFINET System-Library	C:\Siemens\Step7\S7libs\PR0FInet				
📚 Redundant IO (V1)	C:\Siemens\Step7\S7libs\red_io_0				
📚 Redundant 10 CGP	C:\Siemens\Step7\S7libs\red_io_1				
SIMATIC_NET_CP	C:\Siemens\Step7\S7libs\simation				
📚 Standard Library	C:\Siemens\Step7\S7libs\stdlib30				
Selected					
Selected					
Selected					
Selected ser Projects:					



选中 PROFINET System-Library 库,点击 OK 打开。点击 SIMATIC Manager 中 🖻 分屏图

标。从 I-DP-Slave→Blocks 拖入 OB82,OB86,FC10,FC11,DB2 到 iSlaveCPU314C-2DP 站中。

SIMATIC Manager - CBA_UP_	Interfaces					
File Edit Insert PLC View Optio	ns Window Help					
0 🛩 🔡 🛲 👗 🖻 🖻			Filter > 🗾 🏆] <u>k?</u>	
PROFINET System-Library -	- C:\Siemens\Ste	p7\S7libs\PROFInet				
🖃 📀 PROFINET System-Library	Object name	Symbolic name	Created in language	Size in the work me	Туре	Version (Header)
PROFINET System-Library Object name Symbolic name Created in language Size in the work me Type Version P 200 0882 I/0_FLT1 STL 38 Organization Block 0.0 P 200 0886 PACK_FLT STL 38 Organization Block 0.0 P 200 0886 PACK_FLT STL 38 Organization Block 0.0 P 2010 PS100 PC10 PN_IN STL 1410 Function 3.0 P 2010 PS100 PN_IN STL 1282 PN_IonOut_DB DB 74 Date Block 3.0 P 2017 STL 1282 PN_InOut_DB DB 74 Date Block 3.0 P 2017 PN_InOut_DB DB Versite	0.0					
SIMATIC Manager - CBA_UP_Interfaces File Edit Insert PLC View Options Window Help PROFINET System-Library PROFINET System-Library PROFINET System-Library Diject name	RACK_FLT	STL	38	Organization Block	0.0	
E 🛐 I-DP-Slave	MAILC Manager - CBA_UP_Interfaces Edt Inset PLC Vew Options Window Help Image: Image	3.0				
Blocks	Libert FL: View Options View Options View Options View Options IP: IP: IP: IP: IP: IP: IP: IP: IP: IP: IP: IP: IP:	3.0				
	- Charles					
	<		11			
B CBA_UP_Interfaces C:\Si	emens\Step7\s7	proj\CBA_UP_I				
🖃 🎒 CBA_UP_Interfaces	Object name	Symbolic name	Created in language	Size in the work me	Туре	Version (Header)
	🖄 System data	(113		377	SDB	
E S7 Program(1)	100B1		STL	38	Organization Block	01
B Sources	10882 10882	I/U_FLI1 BACK_FLT	SIL	38	Organization Block	0.0
Blocks	A FE10	PN IN	STL	38 1410	Function	3.0
E - H CP 443-1 Advanced	SI FC11	PN_OUT	STL	1282	Function	3.0
□	DB2	PN_InOut_DB	DB	74	Data Block	3.0
E S7 Program(2)						
SIMATIC Manager - CBA_UP_Interfaces Edit Inset: PLC: Vew Options Window Help PROFINET System-Library Profile T System-						
E Blocks	ATIC Manager 2004. UP Interfaces 3r met P.C. Vew Options Window Help					
iSlaveCPU314C-2DP	UP_Interfaces Options Window Help Image: Start Sta					
🖻 📓 CPU 314C-2 DP						
E S7 Program(4)						
Blocks						

打开 iSlaveCPU314C-2DP 站的程序块 OB1。在 OB1 中编写 FC10,FC11。FC10 和 FC11 的输入 入变量 DBNO 写入 16#1,这意味着 FC10 和 FC11 刷新 PN 接口 DB1。FC10 和 FC11 的输入 变量 PN_InOut_DB,写入 DB2。DB2 包含 FC10 和 FC11 需要的数据,不必修改它。FC10 "PN_IN"要放在程序的开始,例如 network 1。FC11" PN_OUT"要放在程序的结尾,例如 network 3。数据的处理放在 FC10 和 FC11之间,例如 network 2。由于程序为演示程序,并 且没有编写其它程序。所以 OB1 的扫描时间很短,完全可以满足后面的实时要求。在实际 中,如果 OB1 的扫描循环时间很长,那么相应的刷新 PN 接口必须放到循环时间中断块中以 满足 RT 的要求。



OB1 : "Main Program Sweep (Cycle)"

Comment:

Network 1: Title:

Comment:

CALL ["]PN_IN" DBNO :=W#16#1 PN_InOut_DB:="PN_InOut_DB" RET_VAL :=MWO

Network 2: Title:

Comment:

Metwork 3: Title:

Comment:

CALL "PN_OUT" DBNO :=W#16#1 PN_InOut_DB:="PN_InOut_DB" RET_VAL :=MW2

右键点击 iSlaveCPU314C-2DP 站,在下拉菜单中选择创建 PROFINET 接口。

Excellence in Automation & Drives: Siemens			
SIMATIC Manager - [CBA_U	IP_Interfaces C:\Si	emens\Step7\s7proj\C	BA_UP_I]
File Edit Insert PLC View	Options Window Help		
🗋 🗅 😂 🔡 🛲 📈 🕷 💼 💼		- 🏥 🏢 🔁 🛛 🔇 No F	ilter > 🔄 🋂
🖃 🎒 CBA_UP_Interfaces	Object name	Symbolic name	Туре
CP443-1 CPU 414-2 DP S7 Program(1) Sources Blocks CPU317-2PN/DP CPU 317-2 PN/DP S7 Program(2) Sources Blocks CPU319-3PN/DP	Hardware		Station configuration CPU
E-CPU 314C-2DP	Open Object	Ctrl+Alt+O	
⊡ 🔄 S7 Program(4)	Cut	Ctrl+X	
	Сору	Ctrl+C	
E BIOCKS	Paste	Ctrl+V	
	Delete	Del	
	PLC	×	
-	Print	×	
	Rename	F2	
	Object Properties	Alt+Return	
	Create PROFINET Interf	ace	
	Create PROFINET compo	onent	

弹出 PROFINET Interface-New/Open 页面。点击 → Add function,添加功能。修改默认的功能名 Function_1 为 CPU314C。同一项目中的 CBA 组件的功能名必须不同。

Excellence in Automation & Drives: Siemens			
PROFINET Interface - New/Open			
Storage path (S7 Project): C:\Siemens\Step7\s7proj\CBA_UP_I\CEA CBA_UP_Interfaces CP443-1 CPU317-2PN/DP CPU319-3PN/DP CPU319-3PN/DP CPU314C-2DP CPU314C-2DP CPU314C-2DP Add function CPU314C PN blocks Add PN blocks HMI blocks	New/Open New/Open Notes Cancel Apply Help		
ОК		Cancel Apply	Help

点击该功能名下的 PN blocks - - - Add PN block,添加 PN 接口 DB。一定要选择 DB1,这与编

程的 FC10 和 FC11 的 DBNO=1 一致。

PROFINET Interface - New/Open					
Storage path (S7 Project):					
PROFINET Interface - New/Open Storage path (S7 Project): C:\Siemens\Step7\s7proj\CBA_UP_I\CBA_UP_I\S7p Bioxe Bioxe Bioxe Bioxe Bioxe Bioxe Bioxe Bioxe CNSiemens\Step7\s7proj\CBA_UP_I\CBA_UP_I\CBA_UP_I\S7p Bioxe Bioxe Bioxe Bioxe Bioxe Bioxe CPU317-2PN/DP Bioxe CPU314C Philocks Philocks CPU314C Philocks Bioxe Starage Add PN block Philocks Bioxe Symbolic name Associated FB A PROFINET property OK					
CBA_UP_Interfaces	Assigned F	PN blocks			
🕀 🎆 CP443-1	Block	Symbolic name	Associated FB	A P	ROFINET property
CP443-1 CPU317-2PN/DP CPU319-3PN/DP SlaveCPU314C-2DP CPU314C-2 DP CPU314C-2 DP CPU314C CPU314C PN blocks PN blocks DB1 E HMI blocks	DB1				
PN blocks Add PN block Mathematical Structure HMI blocks	VET Interface - New/Open path (S7 Project): eners/Step7/s7proj/CBA_UP_I/CBA_UP_I.s7p CBA_UP_Interfaces CP43-1 CPU317-2PN/DP CPU317-3PN/DP CPU316-3PN/DP CPU316-2DP CPU314C PN blocks CPU314C PN blocks CPU314C PN blocks Block CPU314C PN blocks Block PN blocks Block PN blocks Block PN blocks Block PN HIT Block PN blocks Block PN blocks Block Block PN blocks <td>Open</td>	Open			
	Block	Symbolic name	Associated FB	A P	ROFINET property
PROFINET Interface - New/Open Storage path (\$7 Project): C:\Siemens\Step?\s7proj\CBA_UP_I\CBA_UP_I.s7p Browse					
PROFINET Interface - New/Open Storage path (S7 Project); C:\Siemens\Step?\s7proNCBA_UP_I\CBA_UP_I.s7p Browse Browse<	Help				
PROFINET Interface - New/Open Storage path (S7 Project); C:\Siemens\Step?\s7proj\CBA_UP_I\CBA_UP_I.s7p Bit CP431-1 Bit CP431-1 Bit CP431-2PN/OP Bit CP431-3PN/OP Bit CP431-3PN/OP Bit CP431-4C-2DP CPU314-C2DP CPU314-C2DP CPU314-C2DP CPU314-C2DP CPU314-C2DP CPU314-C2DP CPU314-C2DP Add Ph block CPU314-C2DP Add Ph block CPU314-C2DP Add Ph block CPU314-C2DP Add Ph block CPU314-C Ph N blocks Add Ph block CPU314-C CPU314-C CPU314-C Ph N blocks Block Symbolic name Associated FB A PROFINET property DK Cancel Apply Help					

点击 按钮,打开 PROFINET 接口编辑器, 创建 DB1 的 PN 接口变量。分别新

建输入和输出两个变量为整型和实数型。保存后关闭。



PROFINET Interface Edito	r - (P	ROFINET In	iterface DB1 -	- CBA_UP_Ir	iterfaces\	iSlaveCPU314C-	2DP\CPU 3140	C-1
File Edit View Window ?					11100			
D 🗃 🖬 🤹 绿 👗 🗈	8	e ?						
Interface - Normal	Cor	ntents Of: 'PR	OFINET Interface	-DB\PN_Input'				2
🖃 🕀 PROFINET Interface-DB		Name	Data Type	Address	Inter	PN Input0 12	I2 PN Output2	
🛨 💶 PN_Input	12	PN_Input0	Int	0.0		PN Input1 R4	R4 PN Output3	
I = I PN_Output I = 57_Variable I > Not_assigned		PN_Input1	Real	2.0			UI1 Lifestate	

右键点击 iSlaveCPU314C-2DP 站,在下拉菜单中选择创建 PROFINET 组件。

🛃 SIMATIC Manager - [CBA_U	P_Interfaces C:\Sie	mens\Step7\s7proj\(BA_UP_I]
By File Edit Insert PLC View	Options Window Help		
0 🛩 📅 🛲 🐰 🖻 🕄		- 🏥 🏢 主 🛛 < No F	Filter > 🔄 ゾ
CBA_UP_Interfaces CP443-1 CPU 414-2 DP S7 Program(1) Sources Blocks CPU317-2PN/DP CPU317-2PN/DP S7 Program(2) S7 Program(2) CPU319-3PN/DP	Object name I Hardware CPU 314C-2 DP	Symbolic name 	Type Station configuration CPU
E SlaveCPU314C-2DP E CPU 314C-2 DP	Open Object	Ctrl+Alt+O	
S7 Program(4)	Cut Copy Paste	Ctrl+X Ctrl+C Ctrl+V	
_	Delete	Del	
	PLC	F	
	Print	•	
	Rename Object Properties	F2 Alt+Return	
	Create PROFINET Interfa	ace	
	Create PROFINET compo	nent	

弹出创建组件对话框,在"Component Type"栏中,设置的选项均为默认。点击OK,开始 创建组件。



reat	e PROFINET Component
neral	Component Type Functions Storage Areas Additional Properties
Compo	inent type
St	andard component
(without proxy functionality
(with proxy functionality
C Si	ngleton component
Ipdati	ng the PN Interface
с.	
• vi	a user program (copy blocks)
€ vi Cau	a user program (copy blocks) itomatic (at the scan cycle check point)
€ vi	a user program (copy blocks) itomatic (at the scan cycle check point)
€ vi	a user program (copy blocks) itomatic (at the scan cycle check point)

通过修改PG/PC接口,为CP5611(MPI)。利用MPI方式下载iSlaveCPU314C-2DP的硬件组态, 目的就是初始化DP的接口参数。例如地址为2,波特率为1.5M等。下载完毕后,将设置 PG/PC接口改为原有的S7ONLINE→TCP/IP→Broadcom......。

Access Path		
Access Point of the Application:		
S70NLINE (STEP 7)> CP5611	1(MPI)	*
(Standard for STEP 7)		
Interface Parameter Assignment Used:		
CP5611(MPI) <active></active>	_	Properties
CP5611(FWL)	~	Diagnostics
CP5611(MPI) <active></active>		Carry
CP5611(PPI)		
	×	Delete
(Parameter assignment of your communications processor CP5611 for a MPI network)	an	
Add/Remove:		Select

点击 SIMATIC Manager 或 HW Config 的工具栏组态网络图标 28。打开 NetPro 界面。



在右侧的网络部件的 Stations 中选择 PG/PC 加入到左侧网络组态中。



22 Netro - [CBA_UP_interfaces (Network) → C:\StemensStep/Ns/proj\CBA_UP_]]	
Ethernet(1)	
Industrial Ethernet	
MPI(1)	
MPI	
PROFIBUS(1)	
PROFIBUS	
	PG/PC(1)
8	~
To display the connection table, please select a module capable of a connection (CPU, FM module,	

To display the connection table, please select a module capable of a connection (CPU, FM module, OPC server or application). To display the network address overview, please select a subnet.

双击 PG/PC 图标。打开 PG/PC 属性对话框,选择 Interface 栏。

Name	Туре	Address	Subnet
New	Properties	Generate LDB	Delete

点击 Kew... 按钮,新建一个 PG/PC 接口。选择 Industrial Ethernet。

erties -PG/PC meral Interface:	s Assignment		Σ
Name	Туре	Address	Subnet
New	Type: Industrial Et MPI PROFIBUS	hemet	Delete

点击 OK, 弹出设置以太网接口对话框。设置 IP 地址与本机网卡 IP 地址相同。连接到 Ethernet(1)上。

operties - Ether	net interface		
General Paramet Set MAC addre MAC address: IP protocol is be IP address: Subnet mask:	ers ss / use ISO protocol 08-00-06-01-00-01 eing used 192.168.0.199 255.255.255.0	If a subnet is selected, the next available addre Gateway © Do not use router C Use router Address: 192.16	esses are suggested. 58.0,199
Subnet: not networked Ethernet(1)	j ::		New Properties Delete

点击 OK 结束设置以太网接口属性。

eneral Interfaces	Assignment		
Name	Туре	Address	Subnet
themet port(1)	industrial Ethernet	132,166.0,133	E memed ()
New	Properties Gen	erate LDB	Delete

然后,点击 PG/PC 站属性的 Assignment 栏。在 PG/PC 站接口参数选择 TCP/IP→Broadcom NetXtreme 57x.....。

STUES FUILS			
neral Interfaces	Assignment		
Not Assigned			
Configured Interface	es:		
Name	Туре	Subnet	
Ethernet port[1]	Industrial Ethe	rnet Ethernet[1]	
nterface Parameter	Assignments in the PG.	/PC·	
nterface Parameter	Assignments in the PG/	/PC:	
nterface Parameter ISO Ind. Ethernet - PC internal (local)	Assignments in the PG/ > Broadcom NetXtre	/PC:	
nterface Parameter ISO Ind. Ethernet - PC internal (local) TCP/IP(Auto) -> Br	Assignments in the PG/ > Broadcom NetXtre coadcom NetXtreme	/PC:	
nterface Parameter ISO Ind. Ethernet - PC internal (local) TCP/IP(Auto) -> Br TCP/IP -> Broadco	Assignments in the PG/ > Broadcom NetXtre toadcom NetXtreme om NetXtreme 57x	/PC:	Assign
nterface Parameter ISO Ind. Ethernet - PC internal (local) TCP/IP(Auto) -> Br TCP/IP -> Broadco	Assignments in the PG/ > Broadcom NetXtre roadcom NetXtreme om NetXtreme 57x	/PC:	Assign
nterface Parameter ISO Ind. Ethernet - PC internal (local) TCP/IP(Auto) -> Br TCP/IP -> Broadco (ssigned:	Assignments in the PG/ > Broadcom NetXtre toadcom NetXtreme om NetXtreme 57x	/PC:	Assign Disconnect
nterface Parameter ISO Ind. Ethernet - PC internal (local) TCP/IP(Auto) -> Br TCP/IP -> Broadco \ssigned: Interface	Assignments in the PG/ > Broadcom NetXtreme om NetXtreme 57x	/PC:	Assign Disconnect
nterface Parameter ISO Ind. Ethernet - PC internal (local) TCP/IP(Auto) -> Br TCP/IP -> Broadco Assigned: Interface	Assignments in the PG/ > Broadcom NetXtreme om NetXtreme 57x	/PC:	Assign Disconnect line . S70NLINE Access:
nterface Parameter ISO Ind. Ethernet - PC internal (local) TCP/IP(Auto) -> Br TCP/IP -> Broadco	Assignments in the PG/ > Broadcom NetXtreme om NetXtreme 57x Parameter assign	/PC:	Assign Disconnect Iine S70NLINE Access: Active

	a contentante de la contente de la c			
Not Assigned				
Configured Interfac	es:			
Name	Туре	Subnet		
Interface Paramete	er Assignments in the PG	G/PC:		
Interface Paramete	er Assignments in the PG	i/PC:		
Interface Paramete CP5611(MPI) CP5611(PPI) CP5611(PB0FIBI	er Assignments in the PG JS - DP Slave)	i/PC:		
Interface Paramete CP5611(MPI) CP5611(PPI) CP5611(PROFIBL CP5611(PROFIBL	er Assignments in the PG JS - DP Slave) JS)	i/PC:		Assign
Interface Paramete CP5611(MPI) CP5611(PPI) CP5611(PROFIBL CP5611(PROFIBL	er Assignments in the PG JS - DP Slave) JS)	G/PC:		Assign
Interface Paramete CP5611(MPI) CP5611(PPI) CP5611(PROFIBL CP5611(PROFIBL VOL 1 511	er Assignments in the PG JS - DP Slave) JS) - D - N - N - N	i/PC:	×	Assign
Interface Paramete CP5611(MPI) CP5611(PPI) CP5611(PROFIBL CP5611(PROFIBL Solution Filteria Assigned: Interface	er Assignments in the PG JS - DP Slave) JS) - D - M - M - M Parameter assign.	G/PC:	S70nline -	Assign Disconnect
Interface Paramete CP5611(MPI) CP5611(PPI) CP5611(PROFIBL CP5611(PROFIBL VSC + 511 - 1 Assigned: Interface Ethernet port(1)	er Assignments in the PG JS - DP Slave) JS) - D	i/PC: Subnet	S70nline - Active	Assign Disconnect

点击 OK 结束设置。NetPro 的网络组态,组态完的编程器 PG/PC 会出现黄色线条连接到

🔀 NetPro - [CBA_UP_Interfaces (Network) C:\Siemens\Step7\s7proj\CBA_UP_I]	
Retwork Edit Insert PLC View Options Window Help	
Rthernet(1)	
Industrial Ethernet	
ung (a)	
MP1 (1) MP1	
PROFILEUS(1) PROFILEUS	
CPU317-2PN/DP CPU319-3PN/DP iSlaveCPU314C-2DP	Pa (Pa (1)
	PG/PC(I)
	~
	>
To display the connection table, please select a module canable of a connection (CPU, FM module,	

Ethernet 上。编译结束 NetPro。

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OPC server or application). To display the network address overview, please select a subnet.

这时可以对 iSlaveCPU314C-2DP 通过路由方式从以太网路由到 PROFIBUS 下载硬件组态。

3.4 CPU319-3PN/DP 组态

打开 CPU319-3PN/DP 站,根据实际的硬件配置进行硬件组态。

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1 1 2 CPU 319-3 PN/DP X1 MPI/DP X2 DP X3 PN-IO-1 3 4 5		
<	>	CPU 315F-2 PN/DP CPU 315 CPU 316 CPU 316-2 DP CPU 316-2 DP CPU 317-2 CPU 317-2 CPU 317-2 PN/DP
Slot Module Order number	Fi M I Q Com	⊕
2 CPU 319-3 PN/DP 6ES7 318-3EL00-0AB0	V2.4 2	
X1 MPI/DP	2 8191	E
	8190	V2.4
3		V2.5
4		🗎 🕀 🧰 CPU 614
5		III

双击 X3 月 PW-IO-1, 弹出组态该 PN-IO 接口对话框。设置该 PLC 的 IP 地址为

192.168.0.3/24。并且选择 Ethernet(1)。

Properties - Ethernet interface PN-IO	(R0/S2.3)
General Parameters IP address: Subnet mask:	Gateway © Do not use router © Use router
Subnet: not networked	Address: 192.168.0.3
Etherne(1)	Properties
	Delete
OK	Cancel Help

打开 CPU319-3PN/DP 站的程序块 OB1。在 OB1 中编写 SFC112, FC113。SFC112 和 SFC113 的输入变量 DBNO 写入 16#0,这意味着 SFC112 和 SFC113 刷新 PN 的所有接口。SFC112



" PN_IN"要放在程序的开始,例如 network 1。SFC113" PN_OUT"要放在程序的结尾,例 如 network 3。数据的处理放在 SFC112 和 SFC113 之间,例如 network 2。由于程序为演示程 序,并且没有编写其它程序。所以 OB1 的扫描时间很短,完全可以满足后面的实时要求。在 实际中,如果 OB1 的扫描循环时间很长,那么相应的刷新 PN 接口必须放到循环时间中断块 中以满足 RT 的要求。



右键点击 CPU319-3PN/DP站,在下拉菜单中选择创建 PROFINET 接口。

Automation & Drives: Siemens			
SIMATIC Manager - [CBA_U	P_Interfaces C:\Sie	emens\Step7\s7proj\CB/	_UP_I]
🞒 File Edit Insert PLC View	Options Window Help		
0 🚅 🚼 🛲 👗 🖻 🖻		- 🔠 🚺 💽 < No Filte	o 🔽
🖃 🞒 CBA_UP_Interfaces	Object name	Symbolic name	Туре
CP443-1 CPU317-2PN/DP CPU319-3PN/DP CPU 319-3 PN/DP CPU 319-3 PN/DP S7 Program(3)	Hardware		Station configuration CPU
	Open Object	Ctrl+Alt+O	
	Cut	Ctrl+X	
	Сору	Ctrl+C	
iSlaveCPU314C-2DP	Paste	Ctrl+V	
	Delete	Del	
	PLC	۱.	
	Print	×	
	Rename Object Properties	F2 Alt+Return	
	Create PROFINET Inter	face	
	Create PROFINET comp	onent	

弹出 PROFINET Interface-New/Open页面。点击 Add function,添加 2 个功能。修改默认

的功能名 Function_1, Function_2 为 319Function_1, 319CPUFunction_2。同一项目中的 CBA 组件的功能名必须不同。

PROFINET Interface - New/Open		
Storage path (S7 Project): C:\Siemens\Step7\s7proj\CBA_UP_I\CB.	A_UP_I.s7p	Browse
□ □ CBA_UP_Interfaces □ □ □ CPU317-2PN/DP □ □ □ CPU319-3PN/DP □ □ □ CPU 319-3 PN/DP □ □ □ CPU 319-3 PN/DP □ □ □ CPU 319-3 PN/DP □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □	Block types PN blocks HMI blocks Insert new function Delete function Object properties Insert new block	
ОК		Cancel Apply Help

在 319Function_1 中,点击 💶 Add PN block,添加 PN 接口 DB。默认为 DB1。点击

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Open 按钮,打开 PROFINET 接口编辑器,创建 DB1 的 PN 接口变量。新建一个输

入和输出变量为整型。保存后关闭。

PROFINET Interface Editor	- [PROFINET Interface DB1	CBA_UP_Interfac	es\CPU319-3PN/DP\CPU_319-3 PN/DP]
File Edit View Window ?			
0 😅 🖬 🎲 🖗 👗 🖻	2 3 ?		
Interface - Normal PROFINET Interface-DB PN_Input PN_Input0 PI_Output1 S7_Variable Not_assigned	Contents Of: 'PROFINET Interface Name Data Type PN_Output1 Int Data Type	-DB\PN_Output' Address I 2.0	S19Function_1 PN_Input0 I2 I2 PN_Output1 UI1 Lifestate
在 319Function_2 中, 点击	击 [™] , ₽ Add PN block , 添加 Ŧ PROFINET 接口编辑器 保存后关闭。	1 PN 接口 DB。 ,创建 DB2 的 I	状认为 DB2。点击 PN 接口变量。新建一个输
PROFINET Interface Editor File Edit View Window ? D	- [PROFINET Interface DB2	CBA_UP_Interfac	:es\CPU319-3PN/DP\CPU-319-3 PN/DP]
Interface - Normal PROFINET Interface-DB PN_Input PN_Input0 P-IP PN_Output PN_Output S7_Variable Not_assigned	Contents Of: 'PROFINET Interface Name Data Type PN_Input0 Real Contents of the second seco	e-DB\PN_Input' Address I 0.0	S19Function_2 PN_Input0 R4 R4 PN_Output1 UI1 Lifestate

右键点击 CPU319-3PN/DP站,在下拉菜单中选择创建 PROFINET 组件。

Automation & Drives: Siemens	LID 1-46 C.1C					
Simatic manager - [CBA_ B) File Edit Insert PLC View	Options Window Help	emens is tep 7 is 7 proj v	CBA_UP_I			
0 🛩 🖁 🛲 🕺 🖻 🖻		- 🏥 🏢 🔁 🛛 < No	Filter >	• 70		
🖃 🎒 CBA_UP_Interfaces	Object name	Symbolic name	Туре			
	Hardware		Station c CPU	onfiguration		
CPU319-3PN/DP	Open Object	Ctrl+Alt+O				
E S S7 Program(3)	Cut	Ctrl+X				
B Sources	Сору	Ctrl+C				
Blocks	Paste	Ctrl+V				
E ISlaveCPU314C-2DP -	Delete	Del				
	PLC	۲.				
-	Print	×				
	Rename	F2				
	Object Properties	Alt+Return				
	Create PROFINET Interfa	ce				
	Create PROFINET compor	hent				

弹出创建组件对话框,在"Component Type"栏中,弹出创建组件对话框,在组件类型栏中选择"Singleton component",在刷新 PN 接口选择"via user program (copy blocks)"。点击 OK,开始创建组件。



l Creat	e PROFINET Component
General	Component Type Functions Storage Areas Additional Properties
Comp	onent type
C S	tandard component
10	🗭 without proxy functionality
	C with proxy functionality
€ Si	ingleton component
Updat	ing the PN Interface
📀 vi	a user program (copy blocks)
Ca	utomatic (at the scan cycle check point)
C at	utomatic (at the scan cycle check point)

下载硬件组态和全部程序。

4 iMap 组态

4.1 在 iMap 中组态工艺组件

打开 iMap3.0, 在 iMap3.0 的右侧项目库中, 根据生成组成时的存储路径, 导入前面所生成的 组件。



	en 🥜 🐶	4 🕈 🛛 🗧 🗖 🔀
Working range	Ît Libraries	×
E Chart view	Project library CPU317-2PN_DP CPU319-3PN_DP CPU319-3PN_DP CPU314C-2DP	
	▼ stdlib - C:\Program Files Name Version	Siemens\iMap\libs ×
S Pla M Netwo	<u>≥ </u> je ·	

然后使用鼠标托拽到右侧的 Plant chart 中。



在 Working range 中, 点击进入"Network view"。



在 iMap 的网络拓扑图中, CPU319-3PN/DP 和 CPU414-2DP 是" singleton component"。IP 地 址自动产生。而 CPU317-2PN/DP 是" standard component", IP 地址需要人为设定,点击右 键弹出属性对话框,在" Addresses"栏内添加 IP 地址 192.168.0.2/24,注意要与 Step7 硬件组 态的 IP 地址一致。

	Project view	5
CPU 314C-2 DP	Properties	4
m	Instance Connectors Addresses Component	
CPU314C	Ethernet addresses	_
	IP address:	
192.168.0.3	192.168.0.2	
CPU 319-3 PN_DP	Subnet mask:	
— —	255.255.255.0	
Eurotions: 2	Router:	
	Use router Note: Without a valid router address, the device will be	
CPU 317-2 PN DP	accessible from within it's own subnet only.	
m		
ш	PROFIBUS address(es)	
CPU317	DP master system name: Address:	
PROFIBUS(1)	PROFIBUS(1) 3	
197 169 0 1		-
CPU 414-2 DP		
Eurotics CD442		
ancoon_or the		

CPU314C-2DP 是智能从站组件。使用鼠标托拽到 PROFIBUS(1)总线上。注意 DP 地址要与 Step7 的 DP 地址一致。



在 iMap 中选择 Project 菜单中的 Properties。



弹出设置互连的属性,选择 cyclical,等级为 Fast,并且调整 RT 传输频率等级为 20ms。

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Properties	s of New Plant										?
General Inte	rconnections Special										
– Default sett	ing for the new interconne	ections									
 cyclical c acyclic 	fast	•									
- Transfer fre	quencies (cyclic)	_ 1	2	-	10	20	50	100	200	500	1000
fast:	every 20 ms 👻	-	2	2	10	- -	50	100	200	500	1000
medium:	everu E0 ma		×	×	- 44	~ 2	÷.	- 84	-24	- 36	-
		•	s:	•	2	2	1		-33	-33	•
slow:	every 100 ms 💌		×	×	8	80		- }	-23	- 24	-
- Scanning fr	equencies (acyclic)										
		1	2	5	10	20	50	100	200	500	1000
fast:	every 50 ms 💌	1	10	10	10	18	- }	26	-23		_
medium:	every 500 ms 💌	-								-}	-
slow:	every 1000 ms 💌	-			20	- 10 - 10 - 10 - 10 - 10 - 10 - 10 - 10	- 10 	26	20	122	-]
					-	40	15	20	- 23		/
	OK			Canc	el		Ap	oply	1		Help

回到" Plant view",根据工艺要求连接组件。



保存和编译 iMap 项目。选择 iMap 菜单的 Online→Download all instances→All。下载全部程



序和互连。需要注意的是 singleton 组件,需要通过 Step7 事先下载全部程序和硬件组态。

Mr [test_UP3 - C:\Program F	iles\SIEMENS\iMap\projects] -	SIMATIC iMap
Project Edit View Insert	Online Library Options ?	
] 🗅 🚅 🗃 🛼 📇 🗶 🏻	😂 Monitor	📴 » 📴 🖓 » 🔍 🔍 100%
Project tree	Download all instances	All Ctrl+L
Plant tree Wetwork tree	Download selected instances Continue download	Program only Interconnections only
CPU317 III 319Function_1 IIII 319Function_2	Online/Offline comparison \mathcal{J}_{\odot} Check accessibility \mathbf{I}_{\odot} Online device analysis	Plant chart
	Variable table Plant view	c view

下载后,没有错误,组建之间的RT通讯即建立起来。

	Downloa	ıd							
	☐ Save	list to continue later							
	De	vice	Stop	Prog	Inter	Start	Previ	Time stamp	
	I CPU	J 317-2 PN DP		V	~	V	Start	1/9/2007 2:05:40 PM	
	Г ср	J 414-2 DP		-	~	-	Interc	1/9/2007 2:05:23 PM	
	П сри	J 319-3 PN DP	-	-	~	-	Interc	1/9/2007 2:05:26 PM	
	CPI	J 314C-2 DP		~	~	~	Start	1/9/2007 2:05:42 PM	
	J Shov	v selected only							
	-Action:	5							~
		woload program (complete)) and interconn	ections				More	>
🛈 Info		miloda program (complete)	, and meet com	000000					Diagnostics X
	14					12		_	Diagnostics
General C Generate	e 💉 Online/Off				Run		Close	Help	-
Reference object					5 (ACO)				Time stamp
	Downloading the programs	s and interconnections to th	ne instances sel	lected in th	ne list				1/9/2007 2:04:43 PM
CPU 314C-2 DP	Device 'CPU 314C-2 D	P' will be stopped for the d	ownload OK						1/9/2007 2:04:46 PM
CPU 317-2 PN_DP	Device 'CPU 317-2 PN	_DP' will be stopped for the	download C	Ж					1/9/2007 2:04:49 PM
CPU 317-2 PN_DP	🗄 Download programs fo	or 'CPU 317-2 PN_DP' OF	<						1/9/2007 2:04:58 PM
🔥 CPU 414-2 DP	The program downloa -> V0.0.0.0'.	d for the device 'CPU 414-2	2 DP' cannot be	performed	l because it	is an ins	stance of th	ne Singleton compon	1/9/2007 2:04:58 PM
1 CPU 319-3 PN_DP	The program downloa -> 'CPU319-3PN_DP'	d for the device 'CPU 319-3 /0.0.0.0'.	3 PN_DP' cannol	t be perfor	med becau:	se it is ar	n instance (of the Singleton com	1/9/2007 2:04:58 PM
CPU 314C-2 DP	 Download programs for 	or 'CPU 314C-2 DP' OK							1/9/2007 2:05:16 PM
CPU 317-2 PN DP	Download interconnect	tions for 'CPU317' OK							1/9/2007 2:05:19 PM
CPU 414-2 DP	Download interconned	tions for 'Function CP443'	ок						1/9/2007 2:05:23 PM
CPU 319-3 PN DP	Download interconned	tions for '319Function 1, 3	19Function 2	OK					1/9/2007 2:05:26 PM
CPU 314C-2 DP	Download interconnect	tions for 'CPU314C' OK	_						1/9/2007 2:05:29 PM
CPU 317-2 PN_DP	Save interconnections	of all proxy system device	s to target dev	ice 'CPU 3:	17-2 PN_DP	' perman	nently O	к	1/9/2007 2:05:29 PM
CPU 414-2 DP	Save interconnections	to the target device 'CPU	414-2 DP' perm	anently	OK				1/9/2007 2:05:31 PM
CPU 319-3 PN DP	Save interconnections	to the target device 'CPU	319-3 PN DP' D	ermanentl	y OK				1/9/2007 2:05:31 PM
COLLON T O DU DD	Deutice CDU 217.2 DN	ppi di internetto		014					1 JO/0007 0.05.40 PM
CPU 317-2 PN DP	Device CPU 317-2 PN	DP will be restarted after	the download .	UK					1/9/2007 2:05:40 PM
CPU 317-2 PN_DP CPU 314C-2 DP	Device CPU 317-2 PN Device 'CPU 314C-2 D	_DP' will be restarted after th P' will be restarted after th	the download	UK OK					1/9/2007 2:05:40 PM