如何实现 PROF IBUS 从站之间的 DX 通讯

How to DX communication between PROFIBUS Slaves Realized

Single FAQ

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关键词 西门子自动化与驱动, STEP7 软件, PROFIBUS, 从站, DX 通讯. Key Words SIEMENS A&D, STEP7, PROFIBUS, SLAVE, DX Communication.





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1. 问题:如何实现 PROFIBUS 从站之间的 DX 通讯?

回答:通过 DX 方式可以实现 PROFIBUS 从站之间的数据交换,无需再在主站中编写通讯和 数据转移程序。系统中至少需要一台 PROFIBUS 1 类主站,两台 PROFIBUS 非智能从站才 能够实现 DX 模式的数据交换,下面将通过图解,说明实现 DX 通讯的过程: 首先,在 STEP7 中创建一个 Project,分别插入一个主站: CPU314C,两个从站:

百元,在STEP7中创建一下Project,分别抽入一下主站 CPU315-2DP





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					OK													Cance	:	He	elp				

然后选择 Configuration 页面,用鼠标点击 New 键,创建数据交换映射区:

roperties	- DP - (R	0/52.1)					
General .	Addresse:	s Operating Mod	e Configuration	וי			
Row	Mode	Partner DP a	Partner addr	Local addr	Length	Consiste	
							î
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		_					
	ew	Edit		Delete			
							1
Comr	nent:					<u>^</u>	
		,					
OK					Cance	el H	elp

选择 Input 和 Output 区,设定地址和通讯字节长度,数据一致性设置为 ALL:

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operties of a (Ki	, <i>seny</i> co	anngul u			
Mode:	MS	7	(Master-slave configuration))	
- DP Partner: Master-			Local: Slave		
DP address:		~	DP address:	2	
Name:			Name:	DP	
Address type:		~	Address type:	Input 💌	
Address:			Address:	100)
"Slot":			"Slot":		
Process image:		~	Process image:	OB1 PI 💌	
Interrupt OB:		7	Diagnostic address:		
		Co	omment:		
Linit:		ı F		<u></u>	
Unit.	byte 🛨	1			
Consistency:	ALL 🔟	DI		-	



Prop	roperties - DP - (R0/52.1)										
Ge	eneral	Addresse	es Operating Mo	de Configuratio	on						
			1		'						
	Row	Mode	Partner DP a	Partner addr	Local addr	Length	Consiste				
	2	MS MS	3			8 Byte 8 Bute	All				
	2	1.10	0	1100	0.00	0 0 9,00					
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			1	(- (
	N	lew	Edit		Delete						
	- MS M	aster-slav	e configuration —					,			
	Mas	ter:	- (3) DP								
	Stati	ion:	Master	_314C							
	Com	iment:					<u>^</u>				
			1				<u>~</u>				
	ОК					Canc	el H	elp			
	2.11										

组态完进行数据发送的从站后,我们再组态主站,同样在插入 CPU 时,要创建 PROFIBUS 网络,设定为主站模式,并在窗口右侧的 PROFIBUS DP 树型图中选择已经组态的 CPU31X 站,把它拖到 PROFIBUS 总线上:



Excellence in Automation & Drives: Siemens	SIEMENS	
🖳 HW Config - [Master_314C (Configuration) PR	tOFIBUS_DX_Com]	
🖫 Station Edit Insert PLC View Options Windo	w Help	
1 PS 307 2A 2 CPU 314C-2 DP	PROFIBUS(1): DP master system (1)	Pr
X2 DP 2.2 Dl24/D016 2.3 Al5/A02 2.4 Opunt		
2.5 Position	DP slave properties	×
	General Connection Configuration Row Mode Partner DP a Partner addr Local addr Length Consiste 1 MS 3 1100 8 Byte Unit 2 MS 3 0 100 8 Byte Unit	
	New Edit Delete MS Master-slave configuration Master: (3) DP Station: Master_314C Comment: Image: Comment in the second secon	
→ 計動換 〉 上川 計動換山 井南	UK Cancel Help	

主站的输入与从站的输出对应,主站的输出与从站的输出对应,注意将数据通讯的一致性设置为 ALL:

Made				-
Mode:	MS 💌	U U	Master-slave configuration)	
- DP Partner: Master			- Local: Slave	
DP address:	3 💌		DP address:	2
Name:	DP		Name:	DP
Address type:			Address type:	Input 💌
Address:	Output	Ы	Address:	100
"Slot":	4		"Slot":	4
Process image:	🔻		Process image:	OB1 PI
Interrupt OB:	Ţ		Diagnostic address:	
Length: 8		Comm	ient:	
Unit: B	yte 🔻			

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DP	slave p	ropertie	5					×
G	ieneral	Connecti	on Configuration	ו				
	Row	Mode	Partner DP a	Partner addr	Local addr	Length	Consiste	
	2	MS MS	3		l 100 O 100	8 Byte 8 Bute	All	
	 ²	мэ	5	1100	0 100	0 Dyte	~"	
								î
								I
			1			- 1		
	N	lew	Edit		Delete			
	– MS M	aster-slavi	e configuration—					1
	Mas	ter:	- (3) DP					
	Stat	ion:	Master	_314C				
	Com	iment:					^	
			1				7	
								<u> </u>
	OK					Canc	el H	elp
_								

此时组态接收数据的从站,插入该从站 CPU 时创建 PROFIBUS 网络,并在 Configuration 页面中新建两个数据交换对应区,分别设置为 MS 模式和 DX 模式:

Excellence in Automation & Drives: Siemens		SIEMENS
🙀 HW Config - [Slave_Rec_315_2AG10 (Configuration) PROFIBUS	6_DX_Com]	
💵 Station Edit Insert PLC View Options Window Help		
	2	
	Properties - DP - (R0/S2.1) - Configur	ation - Row 1
3 Properties - DP - (RD/S	Mode:	
4 DI8/DO: 5 General Addresses C	DP Partner: Master/Public	Local: Slave/Recipient
	DP address:	DP address:
now mode ra	Name:	Name:
	Address type:	Address type:
	Address:	Address:
(0) UR	"Slot":	"Slot":
Slot Module Order numt 1 PS 307 2A 6ES7 307-1	Process image:	Process image:
2 CPU 315-2 DP 6ES7 315 X2 DP New	Interrupt OB:	Diagnostic address:
3 4 J DI8/D08xDC24V/0,5A 6ES7 323-1		
	Length:	iomment:
	Unit:	<u> </u>
	Consistency:	

设定 DX 模式下的通讯交换区时,需要设定发送数据从站的站地址,这里为 2:

stare properties configuration	KUW Z	
Aode: DX 🔽	(Direct data exchange)	
DP Partner: Publisher	Local: Recipient	
DP address: 2	DP address:	4
Name: CPU 315-2 DF	Name:	DP
Address type:	Address type:	Input 💌
Address:	Address:	30
"Slot":	"Slot":	5
Process image:	Process image:	OB1 PI 💌
Interrupt OB:	Diagnostic address:	2044
Length: 18	Lomment:	A
Unit: Byte 💌		
Consistency:		-

组态完该从站后,再打开主站的硬件组态窗口,将第二个从站挂到 PROFIBUS 总线上去, 点击 Connect 按键,建立主从站的链接:

Excellence in Automation & Drives: Siemens		SIEI	MENS
HW Config - [Master_314C (Configuration)	PROFIBUS_DX_Com]		6
Image:	PROFIBUS(1): DP master system (1) (2) \$7:300 slave properties General Connection Configuration Configured Slave Controllers Configured Slave controllers can be connected to the PROFIBUS Select a slave and click "Connect": Slave PROFIBUS Address in Station (PU 315-2 DP PROFIBUS(1) 4 Slave_Rec Active Connection Active Connection OK	master. Slot 315 0/2/1 Connect Disconnect Help	Profile Standard PROFIBUS DP Additional Field Devices CIR-Object CiR-Object Configured Stations CPU 31x CPU 31x CP

设定主站与从站的地址对应关系,并将数据一致性选为 ALL:



DP s	slave p	ropertie	s					×
G	eneral	Connecti	on Configuration					
				'				
	Row	Mode	Partner DP a	Partner addr	Local addr	Length	Consiste	
	2	MS DX	2	0 70	170	8 Byte 8 Bute	All	
	-	2	-			0.0,10		
								î
								•
	N	em	Edit	1	Delete	1		
[-MS Ma	aster-slave	e configuration —					1
	Masi	ter:	(3) DP	2140				
	Com	on: ment:	Master	_3140				
	00	morn.					-	
			,					
_								
	OK					Cano	el H	elp

到此,系统的硬件组态完成,分别将各个站的组态信息下载到 PLC 中。 在数据发送从站的 OB1 中编写 SFC15 程序块,并插入发送数据区 DB1,在数据接收从站中 的 OB1 中编写 SFC14 程序块,插入接收数据区 DB2:





从以上的界面图中,注意 SFC14 和 SFC15 的 LADDR 参数对应的是 MS, DX 模式下的 Local Addr 中的地址值,并且为 16 进制,所以 W#16#64 对应 100, W#16#64 对应 30,在 线监视 SFC14 和 SFC15 的 RET_VAL 参数值为 0。

将编写好的 OB1, SFC14, SFC15, DB1, DB2 分别下载到两个从站当中,同时为了保证 从站调电不导致主站停机,向主站下载 OB1,OB82,OB86,OB122 等程序块。 将各个站切至运行状态,通过变量表对两个从站进行监视如下:

	¥a	r - [VAT	1	@PROF	IBUS	DX_Com\S	ave_Send_3	15_2AF03\(CPU 315-2			
	👪 Table Edit Insert PLC Variable View Options Window Help											
÷		0 🖻		5	<u>ኡ</u> 🖻		y 🗙 🖻	- ₽) / 60			
		Address		Symbol	Displ	Status value	Modify value					
1		DB1.DBE	30		HEX	B#16#11	B#16#11					
2		DB1.DBE	31		HEX	B#16#22	B#16#22					
3		DB1.DBE	32		HEX	B#16#33	B#16#33					
4		DB1.DBE	33		HEX	B#16#44	B#16#44					
5		DB1.DBE	34		HEX	B#16#55	B#16#55					
6		DB1.DBE	35		HEX	B#16#66	B#16#66					
7		DB1.DBE	36		HEX	B#16#77	B#16#77					
8		DB1.DBE	37		HEX	B#16#88	B#16#88					
9		2										



Var - [VAT_1 @PROFIBUS_DX_Com\Slave_Rec_315_2AG10\CPU 315-2 DP\5											
	👪 Table Edit Insert PLC Variable View Options Window Help										
▰▯◪▰▮▩▯▫▫▾◣▫▯▯๚											
		Address		Symbol	Displ	Status value	Modify value				
1		DB2.DBB	0		HEX	B#16#11]			
2		DB2.DBB	1		HEX	B#16#22					
3		DB2.DBB	2		HEX	B#16#33					
4		DB2.DBB	3		HEX	B#16#44					
5		DB2.DBB	4		HEX	B#16#55					
6		DB2.DBB	5		HEX	B#16#66					
7		DB2.DBB	6		HEX	B#16#77					
8		DB2.DBB	7		HEX	B#16#88					
9											

可以看出从站间的数据实现了交换。

2. 附录一推荐网址

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西门子(中国)有限公司 自动化与驱动集团 客户服务与支持中心 网站首页: <u>http://www.ad.siemens.com.cn/Service/</u> 专家推荐精品文档: <u>http://www.ad.siemens.com.cn/Service/recommend.asp</u> AS常问问题: <u>http://support.automation.siemens.com/CN/view/zh/10805055/133000</u> AS更新信息: <u>http://support.automation.siemens.com/CN/view/zh/10805055/133400</u> "找答案" AS版区: <u>http://www.ad.siemens.com.cn/service/answer/category.asp?cid=1027</u>

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