



控制器 PIC-a 基础编程手册

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1 版本

版本	作者	发布日期	描述
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2 前言

2.1 关于 PIC-A

控制器 PIC-a (Pitch Integrated Controller) 是为满足风力发电机组的变桨控制系统 应用而设计开发的变桨集成控制器,具有高度的可靠性和稳健性。

2.2 安全提示

本文件所涵盖的所有操作活动中,操作人员应始终遵照相应国家、地区及厂商包括但不 仅限于:高低压电器操作规范、安全规程、个人防护、环境保护等与安全和环境相关的法律 法规进行规范操作。福氏新能源技术(上海)有限公司谢绝承担由于个人忽视相关法规条例 引发人身安全和财产损失的责任。

2.3 免责声明

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2.4 商标

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3 PIC-A 编程环境

3.1 CODESYS 介绍

控制器 PIC-a 编程环境由工业自动化领域广泛应用的 CODESYS IDE 提供, 福氏技术基于 CODESYS 开发设计控制器 PIC-a 的相关功能。CODESYS 是一种功能强大的 PLC 软件编程工具,支持 IEC 61131-3 标准 IL 、ST、 FBD 、LD、 CFC、 SFC 六种 PLC 编程语言, 用户可以在同一工程中选择不同的语言编辑子程序、功能模块等。

3.2 CODESYS 库管理

CODESYS 标准库和 PIC-a 功能库可以在工程中的 Library Manager 库管理器中进行管理,以便在程序中调用。



3.3 任务配置

Main Task 设置任务周期、优先级、执行方式、程序调用、看门狗等。

Priority: 任务优先级, 0~31, 0优先级最高, 31优先级最低。

Interval: 任务周期。

Type: 任务执行方式, 通常使用循环 Cyclic。

Watchdog:任务看门狗,监控任务执行情况。

Add Call:任务调用程序,选择任务中执行的程序单元。

Demo_PIC.project - CODESYS

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	POU Comment
	E PLC_PRG

3.4 任务看门狗

CODESYS 工程中任务 Task 运行时间过长或 CPU 超载,可以通过设置任务看门狗功能监控系统运行。

- ▶ 任务看门狗设置时间 "Time" 必须大于任务运行周期。
- ▶ 任务运行时间如果超过"Time"דSensitivity",或者任务运行时间连续超过设置

时间"Time"的次数大于灵敏度"Sensitivity",将导致看门狗触发。

Demo4.9_Profibus.project* - CODESYS			
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	PLC_PRG		

3.5 设置 I/O 默认状态

- 在 "Device/PLC Settings" 页面可以进行 I/O 默认状态设置:
- ➤ 勾选"Update IO while in stop"。
- ▶ 设置 "Behaviour for outputs in Stop" 为 "Set all outputs to default"。

Demo4.9_Profibus.project* - CODESYS										
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🖃 👹 Task Configuration 😑 🍪 MainTask	Files	Always update variables	Disabled (update only if used in a task)							
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Digital_Outputs (Digital Outputs)	PLC Settings	Additional Sattings								
Analog_Inputs (Analog Inputs)	PLC Shell	Generate force variables fo	r IO mapping 🛛 EnableDiagnosis for devices							
Temperature_Inputs (Temperature Inputs) Safety_I_O (Safety I/O)	Users and Groups	Show I/O warnings as error	s							
Profibus_DP_Device (Profibus DP Device)	Access Rights									
Devices Profibus Image: Device (PIC-a) Image: Device (PIC-a)	MainTask Device X Communication Settings Applications Backup and Restore Files Log PLC Settings PLC Shell Users and Groups Access Rights	Application for I/O handling PLC Settings Update IO while in stop Behaviour for outputs in stop Always update variables Bus Cycle Options Bus cycle task Additional Settings Generate force variables fo Show I/O warnings as error	Application ✓ Set all outputs to default ✓ Disabled (update only if used in a task) ✓ <unspecified> ✓ r IO mapping ✓ EnableDiagnosis for devices s</unspecified>							

3.6 控制器负载监控

CODESYS 中可以通过 Task Configuration/Monitor 查看任务运行循环时间和统计数

据。任务运行时间必须小于任务设定周期并且尽可能的短,避免任务超时导致系统故障。

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Firmware											
OS version:							1.0	.1.1			
Bootloader version:							1.0	.1.1			
Resources					-						
CPU load:	15	% (cpu0	: 14% cpu	1: 16%))						
Memory.	80	5 MB fre	e, 11% us	ed	_						
Diskspace:	30	57 MB a	vailable, 1	% used							
Uptime:	4	nours 46	minutes 4	4 secon	ds						

3.7 持久型变量

工程项目中某些数据需要长期存储,避免断电等操作导致数据丢失,可以将其声明为持 久型变量,这些变量需要在 Persistent Variables 内声明。虽然持久型变量具有不易丢失的 特性,但仍然建议在此基础上将相关数据保存备份,以防可能的器件损坏、工程误更新等导 致数据丢失。 右键点击 "Application", 弹出对话框选择 "Add Object/Persistent Variables"。



3.8 创建 HMI

CODESYS 工程支持创建和编辑 HMI 界面,并且可以通过浏览器访问 HMI。

- ▶ 新建工程,选择 "Standard project"。
- ▶ 右键点击 "Application", 添加 "Add Object/ Visualization"。



双击"Visualization Manager",勾选"Visible"设置 HMI 存储区容量。HMI 存储 区容量通常采用默认设置,当用户绘制的单一页面元素过多时,若存储区过小可能导致页面 显示卡顿或白屏。

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Device (PIC-a)	General Settings		Additional Settings			
PLC Logic	Use unicodestri	ngs	Activate multitouch handling			
Application	Use CurrentVisu	variable	Activate semi-transparent drawing			
	Preview: Suppo	rt client animations and overlay of native elements	Activate standard keyboard handling			
Structure and a structure and			Paint disabled elements graved out			
🛱 🥸 MainTask	Style Settings		Call after visu initialization			
PLC_PRG	Selected style	Basic style, 3.5.14.0 (3S-Smart Software Solutions GmbH) 🗸 🦻	Program or function call, e.g. VisuInit():			
STASK VISU_TASK		Display all versions (for experts only)				
VisuElems.Visu_Prg	Preview	Button	Advanced			
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Self Wabyer		O Radiobutton	Memory Settings			
		Radiobutton	Size of Memory for Visu (initial value) 400000			
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Analog_Outputs (Analog Outputs)						
Temperature_Inputs (Temperature Inputs)						
Safety_I_O (Safety I/O)			Client Settings			
			Maximum number of visualization clients 100			
	Language Settings					
	Selected language	~				

双击"WebVisu"可以通过修改"Start visualization"设置用户登录到 HMI 界面时

显示的首界面,同时在 WebVisu 中还可以对界面的刷新频率、缓存等参数进行设置 (通常

采用默认设置)。

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「日子」 PLC_PRG 「日子」 VISU_TASK 「日子」 VISUElems.VISU_Prg 一丁 PersistentVars 同 <u>日</u> Visuelization Manager	Scaling Options Fixed Isotropic Use scaling options for dialogs Client width	Show Used Visualizations
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工程中可以在带有 ID 的全局文本列表 Text List 中进行 HMI 界面显示语言切换。右键

点击"Application",添加"Add Object/Text List"。

Untitled13.project* - CODESYS File Edit View Project Build Online Debug Tools Window Help 🎦 😅 🔚 🕼 🗠 🗠 🐰 🐘 🏦 🗙 🖊 🍇 🕌 🍇 📕 🧌 🦄 📫 🦉 👘 🎁 🎼 🏙 + 👔 👘 🖓 👘 🖓 👘 🖓 👘 🖓 👘 🖓 👘 👘 👘 🖓 👘 👘 👘 👘 👘 👘 👘 👘 👘 👘 👘 👘 🖓 🕶 📮 🗙 🥁 Task Configuration 🛛 🍪 MainTask 👔 PLC_PRG 🏾 🎑 PersistentVars Devices Visualization Visualization □ 👘 Untitled13 🕘 Settings 🕘 Dialog Settings 🗔 Default Hotkeys 🎒 Visualizations 🔮 User Management 🕤 Font Settings -🖻 💮 Device (PIC-a) General Settings Additional Settings an pi Use unicodestrings Activate multitouch - O Application Activate semi-tran X Cut Library Mana Сору s and overlay of native elements Activate standard PLC_PRG (PRG) ß Paste छ Task Configuration Paint disabled elen 🗟 🍪 MainTask × Delete Call after visu initializa ~ 9 .5.14.0 (3S-Smart Software Solutions GmbH) PLC_PRG Program or function of Refactoring - SVISU_TASK ۲ Il versions (for experts only) VisuElems.Visu_Prg Properties... Advanced -5 Headline Button T PersistentVars Visible h Add Object • Application... Visualization Manager Memory Settings I Add Folder. Data Sources Manager... 🗿 WebVisu Size of Memory for Edit Object ◆ DUT... Visualization D° Size of Paintbuffer Digital_Inputs (Digital Inputs) Edit Object with... External File... 2.INDEX Digital_Outputs (Digital Outputs) 1 Global Variable List... 🕼 Login Analog_Inputs (Analog Inputs) image Pool... ÷ Delete application from device Analog_Outputs (Analog Outputs) → Interface... Temperature_Inputs (Temperature Inputs) Metwork Variable List (Receiver)... Safety_I_O (Safety I/O) **Client Settings** Network Variable List (Sender)... 6 Maximum number POU... POU for implicit checks... Recipe Manager... ø Redundancy Configuration .. Language Settings Symbol Configuration Selected language \sim Text List... Trace... 2 Trend Recording Manager... Call Tree 1 Unit Conversion... - Þ-< POU name • Visualization... 125 Call

点击"TextList"页面设置"ID"和"Default",右键点击设置区域弹出对话框选择 "Add Language",输入新增语言名称"Chinese"。

Demo3.8_HMI.project - CODESYS												
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- dl VisuElems. Visu	u_Prg							Remove Language				
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😔 WebVisu						2		Import/Export Text Lists				
Visualization						20		Export All .txt Text List Files				
Digital_Inputs (Digital Inputs)						100		Export All Unicode .txt Text List Files				
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Safety_I_O (Safety I/O)						100		Remove Unused Text List Entries				
						_						

在新增语言 "Chinese" 目录内填写中文模式下需要显示的中文字符。

Demo3.8_HMI.project* - CODESYS

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PLC Logic	2 Tes	st English 2		测试 中文 2		
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文本框显示设置和语言切换按钮设置如下。



如果 HMI 需要使用多种语言切换,可将多种语言添加到全局文本列表 Text List 中。请 注意"Visualization Manager"界面勾选"Use Unicode string"并在"Selected language"中选择"zh-CHS"才能在界面中显示中文。参考例程 Demo3.8 HMI。

 ◆ Demo3.8_HMI.project* - CODESYS File Edit View Project Build Online ™ ₩ Image: I	Debug Iools Window Help 🕼 💑 🏠 📕 🐄 🐄 🖓 🎼 🛅 - 了 🔠 Application [Device: PLC Logic] - 🧐 🥬 🕨 🔳 帐	- 「「」」。 - 「」」。 - 「」。 - 」。 - 」。		
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English

中文

4 PIC-A 程序配置

4.1 数字输出程序配置

控制器 PIC-a 数字输出单元具有 16 个 DO 通道, 分为两组, 由外部电源单独供电。程序中声明定义变量以后, 可以直接在 "Internal I/O Mapping"中进行变量链接。参考例程 Demo4.1 DO。

Demo4.1_DO.project* - CODESYS						
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□ □ Demo4.1 DO	1	PROGRAM PLC_PRG				
E M Device (PIC-a)	8 2	VAR				
	3	Test_DO_0 : BOOL;				
	4	Test_DO_1 : BOOL;				
Application	5	Test DO 2 : BOOL;				
Library Manager	6	END VAR				
PLC_PRG (PRG)		-				
😑 🌃 Task Configuration						
🖻 🤡 MainTask						
Picital Jacuta (Dicital Jacuta)						
Digital_Outputs (Digital Outputs)	1					
Analog_Inputs (Analog Inputs)	2	Test DO 0 := TRUE:				
Analog_Outputs (Analog Outputs)	3	Test DO 1 := FALSE:				
Temperature_Inputs (Temperature Inputs)	4	Test DO 2 := TRUE:				
Safety I O (Safety I/O)	5					
	6					
	7					
	8					
	9					
1						
Demo4.1_DO.project* - CODESYS						
<u>File Edit View Project Build Online Debug Tools</u>	<u>W</u> indow <u>H</u> elp					
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Devices - 7 X PLC_PRG	Device	🙀 Task Configuration 😵 MainTask	👔 Librar	y Manager	Digital_Outp	uts X
□ □ Demo4.1_DO		Find	tor Chausell			L A
Device (PIC-a)	ects	riid rii	ter show all	1		· A
Internal I/O Map	ping	Variable	Mapping	Channel	Address	Туре
Application		Digital Output Group 1				
PLC PRG (PRG)			a.	DO group 1 status	%IB8	BYTE
Task Configuration		Application.PLC_PRG.Test_DO_0	2 2	DO 0	%QX0.0	BIT
AinTask		Application.PLC PRG.Test_DO_1	2	DO 2	%OX0.2	BIT
PLC_PRG		•	•	DO 3	%QX0.3	BIT
Digital_Inputs (Digital Inputs)		· · · · · · · · · · · · · · · · ·		DO 4	%QX0.4	BIT
Digital_Outputs (Digital Outputs)				DO 5	%QX0.5	BIT
Analog_Inputs (Analog Inputs)				DO 6	%QX0.6	BIT
In manageorgena (manageorgena)		···· · · · · · · · · · · · · · · · · ·		00 7	%QX0.7	BIT

4.2 数字输入程序配置

控制器 PIC-a 数字输入单元具有 16 个 DI 通道, 分为两组。程序中声明定义变量以后, 可以直接在 "Internal I/O Mapping"中进行变量链接。参考例程 Demo4.2 DI。



Demo4.2_DI.project - CODESYS

```
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🗑 📽 🖬 🞒 🗠 🗠 🎗 ங 🗈 🗙 / 🏘 🏠 📕 🧌 🦄 🎼 😳 🗇 🕮 🎒 Application (Device: PLC Logic) 🔹 🧐 🐠 🕨 🚛 🔧 (二 年) 🛤 (二 年) (二 年)
```

Devices 👻 🕂 🗙	Library Manager	PLC_PRG	Task Configuration)igital_Inputs	🖌 🗶 MainTask	Devic	e		
■ Demo4.2_DI	Internal I/O Manning	Find	F	ilter Show all			- 🕂 Add	FB for IO	Channel → Go to Instance
Device (PIC-a)	Internal 1/0 Happing								
PLC Logic	Status	Varia	able	Mapping	Channel	Address	Туре	Unit	Description
Application			Incremental Encoder 1						
🎁 Library Manager	Information	B-6	Digital Input Group 1						
PLC_PRG (PRG)			- 70	ר	DI Group 1 Status	%IB4	BYTE		Digital Input Group 1 Status
🖻 🌃 Task Configuration			Application.PLC PRG.Test DI 0	2	DI 0	%IX5.0	BIT		Digital Input 0
🖹 🕸 MainTask			Application.PLC PRG.Test DI 1	2	DI 1	%IX5.1	BIT		Digital Input 1
			Application, PLC PRG. Test DI 2	2	DI 2	%IX5.2	BIT		Digital Input 2
Digital_Inputs (Digital Inputs)			¥ø		DI 3	%IX5.3	BIT		Digital Input 3
Digital_Outputs (Digital Outputs)			×ø		DI 4	%IX5.4	BIT		Digital Input 4
Analog_Inputs (Analog Inputs)			≥		DI 5	%IX5.5	BIT		Digital Input 5
Analog_Outputs (Analog Outputs)			🍫		DI 6	%IX5.6	BIT		Digital Input 6
Temperature_Inputs (Temperature Inputs			i 🐅		DI 7	%IX5.7	BIT		Digital Input 7
Safety_I_O (Safety I/O)		8-6	Digital Input Group 2						
			*		DI Group 2 Status	%IB6	BYTE		Digital Input Group 1 Status
			🍫		DI 8	%IX7.0	BIT		Digital Input 8
					DI 9	%IX7.1	BIT		Digital Input 9
					DI 10	%IX7.2	BIT		Digital Input 10
			**		DI 11	%IX7.3	BIT		Digital Input 11
			🍫		DI 12	%IX7.4	BIT		Digital Input 12
			¥þ		DI 13	%IX7.5	BIT		Digital Input 13
			🍫		DI 14	%IX7.6	BIT		Digital Input 14
			i 🧤		DI 15	%IX7.7	BIT		Digital Input 15

4.3 模拟输出程序配置

控制器 PIC-a 模拟输出单元具有 2 个 AO 通道, 0~10V 电压信号。程序中声明定义变量以后,可以直接在"Internal I/O Mapping"中进行变量链接。参考例程Demo4.3_AO。

Demo4.3_AO.project* - CODESYS							
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1 2 2 4 4	× 🗛 🍪 🐴 🚱		[™] - C ⊞ 4	Application [Dev	vice: PLC Lo	ogic] 🔹 🔾	5 °§ → =
Devices Demo4.3_AO Device (PIC-a)	▼ 7 X 1 ▼ 1 ⊟ 2	Analog_Outputs	PLC_PRG X	Device	👖 Library	Manager	Ana
Classic Cl	34	Test_AO_0 Test_AO_1 END_VAR	REAL; REAL;				
□ S MainTask □ Digital_Inputs (Digital Inputs))	// <i>模拟输出 A0</i> Test AO 0 := 5	使用实际电压值,	不需要数据: 就值电压 5 句	转换 e		
Digital_Outputs (Digital Outp Outputs (Analog Input Analog_Inputs (Analog Input Analog_Outputs (Analog Outputs (Analog Outputs)	ts) 4 tputs) 6	Test_A0_1 := 8	.8; // AO_1 /	就值电压 8.8	t R		
Safety_I_O (Safety I/O)	8 10 10 10 10 10 10 10 10 10 10 10 10 10						
 Demo4.3_AO.project* - CODESYS File Edit View Project Build Online Dr Im Im I	ebug Iools Window E 철 산 및 제 제 제 문급	telp b : ::::::::::::::::::::::::::::::::::	Device: PLC Logic] 🔹 🧐	灣 ト = ペ 〔3 「個 Analog Inputs	야 <u>글</u> 손 <u>ㅋ</u> +필 (Ş 4 📰	π * <i>N</i>
□ Demo4.3_AO	PCI-Bus IEC Objects	Find	Filter Sh	ow all		- + A	Add FB for IO Chan
Broke (rit-a)	Internal I/O Mapping Status	Variable	KG.Test_AO_0 %	Channel Analog Output 0 Analog Output 1	Address %QD1 %QD2	Type Unit REAL V REAL V	Description Analog Output 0 Analog Output 1
PIC_PRG (PRG) Figure 2 Task Configuration Second 2 Task Configuration PIC_PRG PIC	Information						
Safety⊥_C (Safety I/O)							

4.4 模拟输入程序配置

控制器 PIC-a 模拟输入单元具有 4 个 AI 通道, 0~10V 电压信号。程序中声明定义变量

以后,可以直接在"Internal I/O Mapping"中进行变量链接。参考例程 Demo4.4 AI。

Demo4.4_Al.project* - CODESYS							
<u>File Edit View Project Build</u>	l <u>O</u> nline <u>D</u> ebug	g <u>T</u> ools <u>W</u> indov	/ <u>H</u> elp				
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Devices	× /	PLC_PRG X	Analog_Inputs				
Demo4.4_AI	•	1 PROGRAM PL	C_PRG				
Device (PIC-a)	B	2 VAR					
E II PLC Logic		3 Test_A	[_0 : REAL;				
		4 Test_A	<pre>I_1 : REAL;</pre>				
		5 Test_A	<pre>[_2 : REAL;</pre>				
		6 Test_A	<pre>I_3 : REAL;</pre>				
		7 END_VAR					
Task Configuration							
I S MainTask							
de PLC_PRG							
Digital_Inputs (Digital Input	s)						
😳 📆 Digital_Outputs (Digital Out	puts)	1 // 横划绘)		() 不感到			
🛯 🔟 Analog_Inputs (Analog Inpu	its)	- // 192394-891/ 2		S18 / 11 m 3	C 96 IN 112 PT 20C		
Analog_Outputs (Analog Ou	itputs)	3					
Temperature_Inputs (Temp	erature Inputs	4					
Safety I O (Safety I/O)		5					
		6					
		7					
		8					
Demo4.4. Al.project* - CODESYS							
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Devices	PLC_PRG Maak	og_Inputs 🗙					
Demo4.4_AI	PCI-Bus IEC Objects	Find	Filter Sh	ow all			Add FB for IO Chann
	1	Variable	Mapping	Channel	Address Tv	pe Unit	Description
🖻 🔘 Application	Internal I/O Mapping	Application.PLC	_PRG.Test_AI_0	analog input 0	%ID7 RE	AL V	Analog Input 0
Library Manager	Status	Application.PLC	PRG.Test_AI_1	analog input 1	%ID8 RE	EAL V	Analog Input 1
PLC_PRG (PRG) Task Configuration		Application.PLC	_PRG.Test_AI_2	analog input 2	%ID9 RE	EAL V	Analog Input 2
	Information	Application.PLC	_PRG.Test_AI_3	analog input 3	%ID10 RE	AL V	Analog Input 3

🖻 🔮 MainTask PLC_PRG Digital_Inputs (Digital Inputs) Digital Outputs (Digital Outputs) Analog_Outputs (Analog Outputs) Temperature_Inputs (Temperature Inpu Safety_I_O (Safety I/O)

4.5 温度输入程序配置

控制器 PIC-a 温度输入单元具有 4 个 TEMP 通道, 接入 2 线制 PT100 传感器。程序中 声明定义变量以后,可以直接在"Internal I/O Mapping"中进行变量链接。参考例程 Demo4.5 TEMP。



4.6 安全数字量程序配置

控制器 PIC-a 安全数字量单元具有 2 个 SDI 安全数字输入通道和 2 个 SDO 安全数字输 出通道。程序中声明定义变量以后,可以直接在"Internal I/O Mapping"中进行变量链 接。参考例程 Demo4.6_SafetyDigital。

Demo4.6_SafetyDigital.project* - CODESYS	
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Devices 🗸 🗸 🗶	PLC_PRG X Safety_I_O Device
Demo4.6_SafetyDigital	1 PROGRAM PLC_PRG
Device (PIC-a)	E 2 VAR
PLC Logic	3 Test_SDI_0 : BOOL;
Application	<pre>4 Test_SDI_1 : BOOL;</pre>
Library Manager	5
PLC PRG (PRG)	6 Test_SDO_0 : BOOL; 7 Test_SDO_1 : BOOL;
Task Configuration	8 END VAR
🖻 🥩 MainTask	
PLC PRG	
Ti Digital Inputs (Digital Inputs)	
Digital Outputs (Digital Outputs)	
Analog Inputs (Analog Inputs)	
Analog Outputs (Analog Outputs)	Z Test_SDO_U := IKUE; Z Test_SDO_U := FAISE:
Temperature Inputs (Temperature Inputs)	4
Safety I O (Safety I/O)	
Temperature_Inputs (Temperature Inputs) Safety_I_O (Safety I/O)	4

Demo4.6_SafetyDigital.project - CODESYS

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Devices 👻 🕈 🗙	PLC_PRG Safety_I_0) x				
Demo4.6_SafetyDigital	local bus IEC Objects	Find	Filter Show all			- +.
□ Device (PIC-a)		Veriable	Magning	Channel	Address	Tura
	Internal I/O Mapping		wiapping	Channel Safabuiaaut 0	Address	уре
Library Manager	Status	Application.PLC_PRG.Test_SDI_0		Safety input 0	961260.0	BIT
PLC_PRG (PRG)	Status	Application.PLC PRG.Test SDO 0	~	Safety output 0	%OX12.0	BIT
🖹 🌃 Task Configuration	Information	Application.PLC_PRG.Test_SDO_1	~**	Safety output 1	%QX12.1	BIT
MainTask		L	_			
Digital Inputs (Digital Inputs)						
Digital_inputs (Digital_inputs)						
Analog_Inputs (Analog Inputs)						
Analog_Outputs (Analog Outputs)						
Temperature Inputs (Temperature Inputs)						
Safety_I_O (Safety I/O)						

4.7 CAN 程序配置

控制器 PIC-a 具有 2 个 CAN 端口(X6B 和 X6D),支持配置成 CANopen 主站或 CANopen 从站。CAN bus 需要手动添加,右键点击"Device"选择"Add Device",弹 出对话框选择"CANbus"添加。

Demo4.7_CANopen.project - CODESYS								
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Devices	•	4 🗙 🔂 Analog_Outputs		Digital_Inputs	Digital_Output	s 📑	Safety_I_O	PLC_PRG
Demo 4.7_CANopen		Communication Sattings		Scan Network	Gateway - Devi	re •		
Device (PIC-a)	X	Cut	-			~		
		Сору						
Library Manager	ß	Paste					•	
PLC_PRG (PRG)	\times	Delete						
Task Configuration		Refactoring						
	m.	Properties	- 11				Gateway	
Ti Digital Inputs (Digital Inputs)	4:=		-11		Gat	eway-1		~
Digital_Outputs (Digital Outputs	;)	Add Object			IP-A	ddress:		
Analog_Inputs (Analog Inputs)	~	Add Police			loca	host		
Analog_Outputs (Analog Output	its	Add Device			Port 1217			
Safety_I_O (Safety I/O)	۳.	Edit Object						
		Edit Object with						
		Edit IO manning	-12					
		Import mappings from CSV						
		Export mappings to CSV						
	*	Online Config Mode						
		Reset Origin Device [Device]						
		Simulation						

🚹 Add Device						×
Name CANbus						
Action						
Append device		Indate device				
String for a fulltext search	Vendor	<all vendors=""></all>				~
Name	Vendor		Version	Description		^
🖭 🗊 Miscellaneous						
🖻 👔 Fieldbuses						
CANbus						
CANbus	3S - Smart Softwar	e Solutions GmbH	3.5.15.0	Needed for all fieldbusses w	hich communicate	over the CANBus, e.g
NetX CANbus	3S - Smart Softwar	e Solutions GmbH	3.5.15.0	CANbus on a netX device		
Brow EtherCAT						
Ethernet Adapter						
EtherNet/IP						~
						>
Group by category Display all v	ersions (for experts o	only) 🗌 Display o	outdated versi	ions		
Vendor: 35 - Smart Software So	utions GmbH					
Categories: CANbus						
Version: 3.5.15.0						2
Order Number:						
Description: Needed for all fal	thurses which commun	isste quer the CAN		anan ar 11020		
Description: Needed for all new	abusses which commun	icate over the CAN	bus, e.g. CAN	open or J1959.		
Append selected device as last chil Device	d of					
(You can select another target no	de in the navigator w	hile this window is	open.)			
					Add De	vice Close

右键点击刚刚添加的"CANbus",弹出窗口"Add Device/Fieldbuses/CANopen"

有两种选择:

- ➤ CANopen 主站: CANopenManager/CANopen_Manager。
- ➤ CANopen 从站: Local Device/CANopen Device。



由于控制器 PIC-a 具有两个 CAN 接口(X6B 和 X6D),下面将 CAN 接口(X6B)配置为 CANopen 主站,将 CAN 接口(X6D)配置为 CANopen 子站,两个 CAN 接口相互通信。参考例程 Demo4.7 CANopen。

(1)按照前面所述方法添加两个 CANbus 设备,分别命名为 CANbus_Port1 (X6B)
和 CANbus_Port2 (X6D)。修改 CANbus_Port1 (X6B)的 Network为0,修改
CANbus Port2 (X6D)的 Network为1,并将两个接口的波特率设置为500kbit/s。

CAN bus 配置命名	CAN 端口标识	CAN bus Network
CANbus_Port1	X6B	0
CANbus_Port2	X6D	1

Demo4.7_CANopen.project - CODESYS			
<u>File Edit View Project Build Online Debug To</u>	ools <u>W</u> indow <u>H</u> elp		
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Devices - 4 X	.C_PRG CANbus_Port1 X	CANbus_Port2	
CANbus Port2 (CANbus)	s IEC Objects	ork 0 rate (kbit/s) 500	CAN

(2) 点击 "CANbus_Port2" 添加 "Local Device/CANopen Device",并在

"CANopen_Device/General"标签中将 "Node ID" 设置为 1。

点击 "Edit I/O Area" 、 "Add Area" , 添加输入输出数据通道配置。

Object Dictionary	Node ID 1	CANopen
PDOs	Device profile 0	
CANopen I/O Mapping	Edit I/O Area Edit SDO Parameter Area	
ANopen IEC Objects	EDS File	
tatus	Add I/O Range	
nformation	Edit I/O Area I/O direction	×
	I/O Overview Range name Digital_Inputs3	
	Range Name Object index 16#3802	0
	Digital_Inputs Count 1	
	♥ Digital_Inputs ♥ Digital_Outpu Data type USINT ∨	
	V Digital_Outpu	
	OK Cancel	
	Add Area Delete Area Used TxPDOs 2/512 U	sed RxPDOs 2/512
		OK Cancel

PDO 配置页面描述	
Transmit	主站接收数据,从站发送数据
Receive	主站发送数据,从站接收数据
Range name	自定义数据名称
Count	选择每组数据数量
Data type	选择每组数据类型
Force new PDO	勾选表示新建一组数据,否则在原数据组添加

(3) 在 "CANopen_Device / CANopen I/O Mapping"页面关联程序变量。

Demo4./_CANopen.project* - CODESYS	
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Devices 🗸 🗸 🗙	PLC_PRG X
	1 PROGRAM PLC_PRG 2 VAR 3 // CANopen Master Data 4 CANopenMaster_Input_1 : INT; // Slave to Master 5 CANopenMaster_Output_2 : REAL; 6 CANopenMaster_Output_1 : INT; // Master to Slave 7 CANopenMaster_Output_2 : REAL; 8 // CANopen Slave Data 10 CANopenSlave_Input_1 : INT; // Master to Slave 11 CANopenSlave_Input_2 : REAL; 12 CANopenSlave_Output_2 : REAL; 13 CANopenSlave_Output_1 : INT; // Slave to Master 14 END_VAR
CANbus_Port2 (CANbus) CANbus_Port2 (CANbus) CANbus_Port2 (CANbus) CANopen_Device (CANopen Device)	<pre>// CANopen Master Data CANopenMaster_Output_1 := CANopenMaster_Output_1 + 1; CANopenMaster_Output_2 := CANopenMaster_Output_2 + 1.2; // CANopen Slave Data CANopenSlave_Output_1 := CANopenSlave_Output_1 + 1; CANopenSlave_Output_2 := CANopenSlave_Output_2 + 1.6; </pre>

Devices • 4 ×	PLC_PRG GANop	en_Device X					
Device (PIC-a)	General	Find	Filter Show a	11		- 🕆 Ado	FB for IO Ch
PLC Logic	Object Dictionary	Variable	000: Digital Outputs1	Mapping	Channel	Address	Туре
🎁 Library Manager 📄 PLC_PRG (PRG)	PDOs	Application.P Applica	C_PRG.CANopenSlave_Input_1 001: Digital_Outputs2	**	Digital_Outputs1_1	%IW36	INT
🖻 🎇 Task Configuration 🖻 🥸 MainTask	CANopen I/O Mapping	Application.P	C_PRG.CANopenSlave_Input_2 800: Digital_Inputs1	۳.	Digital_Outputs2_1	%ID19	REAL
Digital_Inputs (Digital Inputs)	CANopen IEC Objects	Application.P Tx IoRange 16#3	C_PRG.CANopenSlave_Output_1 801: Digital_Inputs2	۰.	Digital_Inputs1_1	%QW12	INT
Digital_Outputs (Digital Outputs)	Status	Application.P	C_PRG.CANopenSlave_Output_2	٦.	Digital_Inputs2_1	%QD7	REAL
Analog_Outputs (Analog Outputs) Temperature_Inputs) Safety_I_O (Safety I/O) Safety_I_O (Safety I/O) CANbus_Port1 (CANbus) CANbus_Port2 (CANbus) CANbus_Port2 (CANopen_Device)	Information			,			

(4) 在 "CANopen_Device/General"页面,点击 "Export EDS file"导出从站的

EDS 文件,以方便主站配置添加。Vendor name、Product name 等信息可根据实际情况

进行配置。

Demo4.7_CANopen.project* - CODESYS		
<u>File Edit View Project Build Online De</u>	bug <u>T</u> ools <u>W</u> indow <u>H</u> elp	
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Devices 👻 🖣 🗙	PLC_PRG CANopen_De	evice X G CANbus_Port2
Demo4.7_CANopen Device (PIC-a)	General	General
=-∰I PLC Logic =-Ô Application	Object Dictionary	
Library Manager	PDOs	Device profile 0
i≡- 🎆 Task Configuration i≡- 🎲 MainTask	CANopen I/O Mapping	Edit I/O Area Edit SDO Parameter Area
Digital_Inputs (Digital Inputs)	CANopen IEC Objects	A EDS File
Digital_Outputs (Digital Outputs)	Status	Vendor name 3S - Smart Software Solutions GmbH
Analog_Outputs (Analog Outputs)	Information	Vendor number 801
Temperature_Inputs (Temperature Inputs)		Product name CANopenDevice_Test
CANbus Port1 (CANbus)		Product number 0
CANbus_Port2 (CANbus)		Revision number 1
CANopen_Device (CANopen Device)		Install to Device Repository Export EDS File

(5) 点击菜单栏 "Tools/Device Respository", 在弹出窗口中点击 "Install",选

择从站 EDS 文件加载添加。



(6) 右键点击 "CANbus_Port1" 添加 CANopen 主站,选择"Add Device/CANopen_Manager"。



(7) 右键点击刚刚添加的"CANopen_Manager",选择"Add Device",弹出窗口选择已经完成添加的从站设备。



(8) CANopen 主站 "CANopen I/O Mapping"页面进行变量链接配置。



(9) 下载程序, CANopen 通信数据正常。

Demo4.7_CANopen.project - CODESYS						
<u>File Edit View Project Build Online Debug Tools</u>	<u>W</u> indow <u>H</u> elp					
11 🖆 🛃 🚭 🗠 🗠 🕹 🛍 🛍 🗙 🛤 🎼 🌿 📕	🐄 🎢 🎢 🔚 🎘 - 🗂 🕮 Applica	ation [Device: P	LC Logic] 🔹 🧐 👹	▶ ■ 🖋 Ç≡ 🤆	i di +≣ \$	¢ 🎆 🛱 🦤
Devices • 4 ×	PLC_PRG X CANopen_Devic	e 🎦 C/	ANbus_Port2	CANbus_Port1	CANopen_	Manager CANopen
Device Concentral (NCC a)	Device.Application.PLC_PRG					
Device [connected] (PIC-a)	Expression	Туре	Value	Prepared value	Address	Comment
	CANopenMaster_Input_1	INT	1316			Slave to Master
	CANopenMaster_Input_2	REAL	2105.5813			
	CANopenMaster_Output_1	INT	1317			Master to Slave
	CANopenMaster_Output_2	REAL	1580.38477			
Bar Ask Configuration	CANopenSlave_Input_1	INT	1316			Master to Slave
	CANopenSlave_Input_2	REAL	1579.18481			
	CANopenSlave_Output_1	INT	1317			Slave to Master
Digital_inputs (Digital_inputs)	CANopenSlave_Output_2	REAL	2107.1814			
Analog Inputs (Analog Inputs)						
G III Analog Outputs (Analog Outputs)						
• Temperature Inputs (Temperature Inputs)	1 // CANopen Master Data					
Safety_I_O (Safety I/O)	2					
CANbus_Port1 (CANbus)	3 CANopenMaster_Output_1	1317 := CZ	ANopenMaster_Outpu	$t_1 1317 + 1;$		
🖃 😔 🚮 CANopen_Manager (CANopen_Manager)	CANOpenMaster_Output_2	1.58E+03	= CANOpenMaster_	0utput_2 1.58E+03	+ 1.2;	
CANopenDevice_Test (CANopenDevice_Test)	6					
GANbus_Port2 (CANbus)	7 // CANopen Slave Data					
GANopen_Device (CANopen Device)	8					
	9 CANopenSlave_Output_1	1317 := CAN	NopenSlave_Output_	1 1317 + 1;		
	10 CANopenSlave_Output_2	2.11E+03 🕨 🚦	= CANopenSlave_Out	tput_2 2.11E+03 >	+ 1.6;	
	11					
	12					
	1°					

4.8 RS-485 程序配置

控制器 PIC-a 具有 1 个 RS-485 (X6E) 通道,可以与其他支持 RS-485 的设备进行通

信。使用 RS-485 串口需要用到 CAA SerialCom 库和 CAA Types Extern 库。

- ▶ 打开"Library Manager"库管理器页面,点击"Add Library"。
- ▶ 弹出的 Add Library 对话框点击 "Advanced"。
- > 搜索框内通过关键词搜索库文件添加到工程中。

<u>File Edit View Project Libraries Build</u>	Online Dehug Teols Window Help
	Chine Debug Tools Window Teb
	유 🎂 🚰 📜 🔰 🧌 🦄 🖓 🖫 🏧 - 🛅 🕮 Application [Device: PLC Logic] 💌 🧐 👀 🕞 🔳 👋 (파 역표 역표 역표 위표 용기
Devices 👻 👎	X Library Manager X
Device (PIC-a)	Add Library X Delete Library Properties 🟐 Details 🔄 Placeholders 👔 Library Repository 🕦 Icon legend
= III PLC Logic	Name Namespace Effective v
	Solicense = 3SLicense = 3.5.14.0 (3S - Smart Software Solutions GmbH) 3S LICENSE 3.5.14.0
Library Manager	
Task Configuration	🖲 🔄 IoSta String for a fulltext search
🖻 🤡 MainTask	Library Company
PLC_PRG	■ ⊕ Application
Digital_Inputs (Digital Inputs)	
Digital_Outputs (Digital Outputs) Analog_Inputs (Analog_Inputs)	
Analog_Outputs (Analog Outputs)	(Miscellaneous)
Temperature_Inputs (Temperature Inputs)	s)
Safety_I_O (Safety I/O)	
	Advanced
Demo4.8_RS485.project - CODESYS	
<u>File Edit View Project Libraries</u>	<u>B</u> uild <u>O</u> nline <u>D</u> ebug <u>T</u> ools <u>W</u> indow <u>H</u> elp
🖹 🖆 📕 🎒 い 🖂 👗 🛍 🗶 🕯	🛤 🅼 🐴 🌿 📕 🦄 🦄 📾 🖄 👘 📑 🖓 🕮 🖓 🖓 👘 📲 👘 🖓 👘 🖓 🖬 🖓 👘 🖓 👘 🖉
Devices 🗸	- 4 X Min Library Manager X
=	Add Library X Delete Library Repository Properties To Details Placeholders Millibrary Repository
Device (PIC-a)	
	Name Names
- O Application	📧 🛅 Add Library
Library Manager	CAA SerialCom
PLC_PRG (PRG)	
Lorary Manager LC_PRG (PRG) Second Sec	H Lihrary Placebolder
Liorary Manager PLC_PRG (PRG) Task Configuration MainTask	Library Placeholder
Liorary Manager PLC_PRG (PRG) Gradient Task Configuration Gradient MainTask PLC_PRG	Library Placeholder
Liorary Manager PLC_PRG (PRG) ■ - ∰ Task Configuration ■ - ∰ MainTask → Digital_Inputs (Digital Inputs)	Library Placeholder
	Library Placeholder Library Library CAA SerialCom, 3.5.15.0
	Library Placeholder
	Library Placeholder
	Inputs)
	Inputs)
	Inputs)
	Inputs)
Lorary Manager PLC_PRG (PRG) PLC_PRG (PRG) MainTask PLC_PRG Digital_Inputs (Digital Inputs) Digital_Outputs (Digital Outputs) Analog_Inputs (Analog Inputs) Analog_Outputs (Analog Outputs) Temperature_Inputs (Temperature I Safety_I_O (Safety I/O)	Inputs)
Lorary Manager PLC_PRG (PRG) PLC_PRG (PRG) MainTask Digital_Inputs (Digital Inputs) Digital_Outputs (Digital Outputs) Analog_Inputs (Analog Inputs) Analog_Outputs (Analog Outputs) Temperature_Inputs (Temperature I Safety_I_O (Safety I/O)	Inputs)
Lorary Manager PLC_PRG (PRG) PLC_PRG (PRG) MainTask Digital_Toputs (Digital Inputs) Digital_Outputs (Digital Outputs) Analog_Inputs (Analog Inputs) Analog_Outputs (Analog Outputs) Temperature_Inputs (Temperature I Safety_I_O (Safety I/O)	Inputs)
Lorary Manager PLC_PRG (PRG) PLC_PRG (PRG) MainTask PLC_PRG Digital_Toputs (Digital Inputs) Digital_Outputs (Digital Outputs) Analog_Inputs (Analog Inputs) Analog_Outputs (Analog Outputs) Temperature_Inputs (Temperature I Safety_I_O (Safety I/O)	Inputs)
Lorary Manager PLC_PRG (PRG) PLC_PRG (PRG) MainTask PLC_PRG Digital_nputs (Digital Inputs) Digital_Outputs (Digital Outputs) Analog_Inputs (Analog Inputs) Analog_Outputs (Analog Outputs) Temperature_Inputs (Temperature I Safety_I_O (Safety I/O)	Inputs)



控制器 PIC-a 的 RS-485 功能采用代码形式完成,参考例程 Demo4.8_RS485。

4.9 PROFIBUS DP 程序配置

控制器 PIC-a 具有 1 个 Profibus DP(X6A)通道,可以作为 Profibus DP 从站与其

他 Profibus DP 主站设备进行通信。

右键点击 "Device/Add Device/Fieldbuses/Profibus/DP Device/Profibus DP

Device"添加 Profibus DP 从站设备。



右键点击 "Profibus DP Device/Add Device"添加通信传输数据,本例添加数据说明如下:

名称	描述	传输方向
1 BYTE Slave-In/Master-Out	1个 BYTE 数据	Master to Slave
1 BYTE Slave-Out/Master-In	1个 BYTE 数据	Slave to Master
16 WORD Slave-In/Master-Out	16个WORD 数据	Master to Slave
16 WORD Slave-Out/Master-In	16个WORD数据	Slave to Master



Demo4.9_Profibus.project* - CODESYS								
File Edit View Project Build Online Debug Tools Wind	ow <u>H</u> elp							
自己の	a i 🖾 👘 - 😚 🕅 Applicatie	n (Device: PLC Logic) 👻 🞯	01 3	= ⊊= d= +=	8 6 6	티글니판		
		in [bevice Fee cogic]			SP * pm	a m w		
Devices 👻 🕂 🛪	Profibus_DP_Device		Aaster_Out	_16_WORD_5	lave_Out_Ma	ster_In 🗙		
Demo4.9_Profibus		Find		Eilter Chausell			Add ER 6	or IO Channel
🖹 - 🚮 Device (PIC-a)	Internal I/O Mapping	rinu		Filter Show all			Add FB I	or to channel
🗏 🛄 PLC Logic	Internal IEC Objects	Variable	Mapping	Channel	Address	Туре	Unit	Description
O Application	Internal IEC Objects	⊟-*∳		Slave-Out	%QW7	ARRAY [015] OF WORD		Slave-Out/Master-In
👘 Library Manager	Status	- **		Slave-Out[0]	%QW7	WORD		Slave-Out/Master-In
PLC_PRG (PRG)		***		Slave-Out[1]	%QW8	WORD		Slave-Out/Master-In
Task Configuration	Information	- **		Slave-Out[2]	%QW9	WORD		Slave-Out/Master-In
= 💝 MainTask		- **		Slave-Out[3]	%QW10	WORD		Slave-Out/Master-In
PLC_PRG		- **		Slave-Out[4]	%QW11	WORD		Slave-Out/Master-In
Digital_Inputs (Digital Inputs)				Slave-Out[5]	%QW12	WORD		Slave-Out/Master-In
Digital_Outputs (Digital Outputs)		- **		Slave-Out[6]	%QW13	WORD		Slave-Out/Master-In
Analog_Inputs (Analog Inputs)		* ø		Slave-Out[7]	%QW14	WORD		Slave-Out/Master-In
Analog_Outputs (Analog Outputs)		- * ø		Slave-Out[8]	%QW15	WORD		Slave-Out/Master-In
Temperature_Inputs (Temperature Inputs)		* ø		Slave-Out[9]	%QW16	WORD		Slave-Out/Master-In
iii Safety_I_O (Safety I/O)		- **		Slave-Out[10]	%QW17	WORD		Slave-Out/Master-In
Profibus_DP_Device (Profibus DP Device)		* ø		Slave-Out[11]	%QW18	WORD		Slave-Out/Master-In
_1_BYTE_Slave_In_Master_Out (1 BYTE Slave-In/Master-Out)		* ø		Slave-Out[12]	%QW19	WORD		Slave-Out/Master-In
_1_BYTE_Slave_Out_Master_In (1 BYTE Slave-Out/Master-In)		* ø		Slave-Out[13]	%QW20	WORD		Slave-Out/Master-In
	_	* ø		Slave-Out[14]	%QW21	WORD		Slave-Out/Master-In
		L		Slave-Out[15]	%QW22	WORD		Slave-Out/Master-In

程序中声明定义变量以后,可以直接在"Internal I/O Mapping"中进行变量链接。参

考例程 Demo4.9_Profibus。

Demo4.9_Profibus.project* - CODESYS		
<u>File Edit View Project Build Online Debug Tools Window</u>	<u>H</u> elp	
🛅 🚅 🔚 🎒 🕫 🗠 🔏 酯 🏙 🗙 桷 🌿 🆓 🎽 🎁 🦄 🦄	🖶 🏪 -	🖸 🛗 Application [Device: PLC Logic] 🔹 🧐 🕠 🕞 📲 🔧 🖓 🖓 🕁 📲 🖓 🖓 🛱
Devices 👻 🕈 🗙		1 BYTE Slave Out Master In 16 WORD Slave In Master Out 16 WORD
Demo4.9_Profibus	1	PROGRAM PLC_PRG
🖮 🕤 Device (PIC-a)	⊟ 2	VAR
🖶 🗐 PLC Logic	3	// Master to Slave data
Application	4	Slave_In_Master_Out_Data : BYTE;
Library Manager	5	Slave_In_Master_Out_Array : ARRAY[116] OF WORD;
PLC PRG (PRG)	6	// Claure he Mashan Jaka
		// Slave to Master Gata
B S MainTack		Slave Out Master In Array : APPAV(1 161 OF WOPD)
	10	END VAR
Digital_inputs (Digital inputs)		
Anaiog_Inputs (Anaiog Inputs)	1	
Analog_Outputs (Analog Outputs)	2	Slave_Out_Master_In_Data := Slave_Out_Master_In_Data + 1;
Temperature_Inputs (Temperature Inputs)	3	
Safety_I_O (Safety I/O)	4	Slave_Out_Master_In_Array[1] := Slave_Out_Master_In_Array[1] + 1;
Profibus_DP_Device (Profibus DP Device)	6	
	7	
	, s	
	9	
	10	
	11	
	12	

Demo4.9_Profibus.project* - CODESYS						
<u>File Edit View Project Build Online Debug Tools Wind</u>	ow <u>H</u> elp					
🎦 🚔 🔚 😂 🗠 🗠 🏷 🐚 🏦 🗙 🔥 🏰 🖄 🐘 🧌 🎢	🆄 🕼 👘 🕤 🎬 🗛 🕯	olication [Device: PLC Logic] 🔹 🥨 👀 🕞 📲 🔏 🗍 🗐	1 S I +	¢ ∭ ≓	3/	
Devices		WORD Clave To Master Out M				
Devices • • • •						
Denice (PIC ->)	Internal I/O Mapping	Find Filter Sho	w all			- 🖶 Add FB for IO Channel
		Verieble	Manaiaa	Channel	Address	Trans
	Internal IEC Objects		wapping	Channel	Address	iype
Library Manager		Application.PLC_PRG.Slave_In_Master_Out_Array		Slave-In	%IW33	ARRAY [015] OF WORD
PLC PRG (PRG)	Status			Slave-In[U]	7027733	WORD
Task Configuration	Information			Slave-In[1]	9/11/25	WORD
🖹 🍪 MainTask				Slave-In[3]	8/11/26	WORD
PLC_PRG				Slave-In[4]	8/10/27	WORD
Digital_Inputs (Digital Inputs)				Slave-In[5]	9/,TW28	WORD
Digital_Outputs (Digital Outputs)		- *		Slave-In[6]	%JW39	WORD
Analog_Inputs (Analog Inputs)		- *		Slave-In[7]	%IW40	WORD
Analog_Outputs (Analog Outputs)				Slave-In[8]	%IW41	WORD
Temperature_Inputs (Temperature Inputs)				Slave-In[9]	%IW42	WORD
Safety_I_O (Safety I/O)		×		Slave-In[10]	%IW43	WORD
Profibus_DP_Device (Profibus DP Device)		- *•		Slave-In[11]	%IW44	WORD
_1_BYTE_Slave_In_Master_Out (1 BYTE Slave-In/Master-Out)				Slave-In[12]	%IW45	WORD
		- *		Slave-In[13]	%IW46	WORD
		*		Slave-In[14]	%IW47	WORD
If				Slave-In[15]	%IW48	WORD

控制器 PIC-a 具有一个旋钮开关,用于设置 Profibus DP Slave ID。应用程序仅在启动时读取一次旋钮位置,因此如果更改旋钮位置,那么可以对控制器进行断电重启操作使旋钮开关位置更改生效。旋钮开关位置 0 对应于 Slave ID 为 40,依次类推顺序增加。

		PIC-a Profibus DP 旋钮开关位置与 Slave ID 对应表														
旋钮	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
ID	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55

在 Profibus DP 主站设备安装加载 PIC-a GSD 文件后,便可以与 PIC-a 进行 Profibus DP 通信。

4.10 SSI 程序配置

控制器 PIC-a 具有 2 个 SSI 通道, SSI 编码器符合 RS-422 的时钟和数据信号。右键点击 "Device/Add Device/Miscellaneous/SSI Input"添加 SSI 设备。

Demo4.10_SSI.project - CODESYS

File	Edit	View	Project	Build	Online	Debug	Tools	Window	Help		
1		6 10	CH X	• 6 :	× # 1	S 🐴 😘	1	케ળ	🖷 🛅 🖬 🖞	🛗 Application [Device: PLC Logic] 🔹 😋 🕠 🕟	🗉 🖑 ÇI 🖓



Demo4.10_SSI.project - CODESYS						
<u>File Edit View Project Build Online Deb</u>	ug <u>T</u> ools <u>W</u> indow <u>H</u> elp					
🋍 🚔 🔲 📾 🗠 🤉 🏜 🎰 🖉 🖓	14 I 1 1 1 1 A B B - 16-	กิ 🗎 🎬 🛛 🗛	oplication [Device: PLC Logic] 🛛 🗣 😋	🖉 🕞 🖌 🖌 🖉	4 → 3 0 4 1
	🗂 Add Device				×	_
Devices - 4 X	-					
Demo4.10_SSI	Name SSI_Input					
Device (PIC-a)	Action					
	Append device Insert devi	ice O Plug d		Indate device		
= Q Application						
Library Manager	String for a fulltext search		Vendor	ndor <all vendors=""></all>		
PLC_PRG (PRG)						
Iask Configuration	Name	Vendor	Version	Description		
= · ⊗ maintask	Miscellaneous					
PLC_PRG	Analog Inputs	DEIF A/S	0.1.0.0	PIC-a analog input driver		
Digital_Inputs (Digital Inputs)	Analog Outputs	DEIF A/S	0.1.0.0	PIC-a analog output		
	Digital Inputs	DEIF A/S	0.1.2.0	PIC-a digital inputs		
Analog_Inputs (Analog Inputs)	Digital Outputs	DEIF A/S	1.0.0.0	PIC-a Digital Outputs		
	Safety I/O	DEIF A/S	0.0.1.0	PIC-a safety I/O		
	SSI Input	DEIF A/S	1.0.0.0	PIC-a SSI		
Salety_1_0 (Salety 1/0)	Temperature Inputs	DEIF A/S	0.0.1.0	PIC-a Temperature Input		
	Heldbuses					
	Group by category Display	all versions (for experts o	only) Display outdated ve	rsions	
	Name: SSI Input					
	Vendor: DEIF A/S					
	Categories:					
	Version: 1.0.0.0				2	
	Order Number: ???				-	
	Description: PIC-a SSI					
	Append selected device as last child of					
	Device					
	while this window is open)					
(Tou can select another target node in the navigator while this window is open.)						
4				Add Dev	vice Close	
Povices Dolle					ciose	

控制器 PIC-a 基础编程手册

程序中声明定义变量以后,可以直接在"Internal I/O Mapping"中进行变量链接。参

考例程 Demo4.10_SSI。

Demo4.10_SSI.project - CODESYS <u>File Edit View Project Build Online Debug Tools Window H</u>elp 🎦 😅 🔚 🕼 🗠 🖂 👗 🛍 🎕 🗶 🕌 🍓 🌿 📕 🐄 🦄 🖏 🔚 🛗 👘 🐐 🖓 🖓 🖓 🖓 🖓 🖓 🖓 🖓 Application (Device: PLC Logic) 🔹 🥵 🥬 🕟 💼 🔦 📜 🖓 👘 👘 🍕 🌾 Devices **-** ₽ X PLC_PRG X □ Demo4.10_SSI • PROGRAM PLC PRG 🖻 🚮 Device (PIC-a) VAR SSI_Input_Data_1 : DWORD; // SSI 1 通信数据 3 BLC Logic SSI_Input_Status_1 : WORD; // SSI 1 通信状态,通信正常情况下数值为 0 🖻 🔘 Application 👘 Library Manager // SSI_2 *通信数据* // SSI_2 *通信状态,通信正常情况下数值为* 0 SSI_Input_Data_2 : DWORD; PLC_PRG (PRG) SSI_Input_Status_2 : WORD; 🗏 🌃 Task Configuration END VAR 🖹 🥩 MainTask PLC_PRG Digital_Inputs (Digital Inputs) Digital_Outputs (Digital Outputs) Analog_Inputs (Analog Inputs) Analog Outputs (Analog Outputs) Temperature_Inputs (Temperature Inputs) Safety_I_O (Safety I/O) SSI_Input_1 (SSI Input) SSI_Input_2 (SSI Input) Demo4.10_SSI.project - CODESYS <u>File Edit View Project Build Online Debug Tools Window Help</u> Devices **-** ₽ X PLC_PRG SSI_Input_1 X Demo 4. 10_SSI • Find Filter Show all • + PCI-Bus IEC Objects 🖻 💮 Device (PIC-a) 😑 🗐 PLC Logic Variable Mapping Channel Address ι Туре Internal Parameters = 🔘 Application Application.PLC PRG.SSI Input Data 1 ۵. Data %JD16 DWORD 👘 Library Manager Internal I/O Mapping Application.PLC_PRG.SSI_Input_Status_1 ۵ Status %IW34 WORD PLC_PRG (PRG) Task Configuration Status 🖻 🥩 MainTask PLC_PRG Information Digital_Inputs (Digital Inputs) Digital Outputs (Digital Outputs) Analog_Inputs (Analog Inputs) Analog_Outputs (Analog Outputs) Temperature_Inputs (Temperature Inputs) Safety_I_O (Safety I/O) SSI_Input_1 (SSI Input)

SSI_Input_2 (SSI Input)