



# 控制平台 AWP100 基础编程手册

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## 1 版本

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## 2 前言

## 2.1 关于 AWP100

AWP100 是为满足严苛应用环境而设计开发的高级控制系统平台,模块化控制器和 I/O 模块具有高度的可靠性、稳健性和灵活性。AWP100 产品系列模块之间采用机架背板总线 通信,机架之间采用扩展模块进行分布式连接。

#### 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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EtherCAT®是 Beckhoff Automation GmbH 注册商标和专利技术。

Linux<sup>®</sup>是 Linus Torvalds 注册商标。

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## 3 AWP100 编程环境

## 3.1 CODESYS 介绍

AWP100 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 AWP100 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 户可以在同一项目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 AWP100 功能库可以在工程项目中的 Library Manager 库管理器中进行管理,以便在程序中调用。



## 3.3 添加总线

AWP100 产品系列模块之间采用 EtherCAT 总线通信,添加总线 EtherCAT Master 方法如下。

- ➤ 右键点击 "Device",选择 "Add Device"。
- > 弹出对话框选择 "Fieldbuses / EtherCAT / Master / EtherCAT Master"。



#### Add Device

Х

lame EtherCAT_Master				
Action				
<u>Append device</u> Insert device Plug d	evice OU	pdate device		
String for a fulltext search	Vendor	<all vendors=""></all>		~
Name	Vendor		Version	Description
🗉 🖬 Miscellaneous				
🖹 💮 Fieldbuses				
E-CANbus				
🖶 👦 EtherCAT	/			
Brow Master				
	3S - Sma	art Software Solutions GmbH	3.5.15.20	EtherCAT Master
EtherCAT Master SoftMotion	3S - Sma	art Software Solutions GmbH	3.5.15.20	EtherCAT Master SoftMoti
🗉 🕮 Ethernet Adapter				
🗉 👄 EtherNet/IP				
🖲 🚮 Home&Building Automation				
💷 🛲 Profibus				
🗉 🚟 Profinet IO				
S sercos				
<				>
Group by category Display all versions (f	or experts o	nly) 🗌 Display outdated ve	rsions	
Name: EtherCAT Master				
Vendor: 3S - Smart Software Solutions Gm	ЬН			
Categories: Master				
Version: 3.5.15.20				
Order Number:				-
Description: EtherCAT Master				
Append selected device as last child of Device				
(You can select another target node in the	navigator w	hile this window is open.)		
			Add I	Device Close

▶ 完成 EtherCAT Master 添加,同时"Network Name"处填写"ecat0"且点选

"Select network by name" .



### 3.4 任务配置

Main Task 设置周期、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。

EtherCAT\_Task 通常采用默认设置。

📦 Untitled8.proje	t* - CODESYS														
<u>File Edit V</u> i	ew <u>P</u> roject	<u>B</u> uild (	<u>D</u> nline	<u>D</u> ebug	Tools	Window	<u>H</u> elp								
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🗆 🎒 Untitled8			•	Configura	tion										
🖹 👔 Device (	PCM6.1 Practek	)			_										
P II PLC	Logic			Priority	(031)	: 1							Task Group	IEC-Tasks	$\sim$
=-0	Application	2007		Type			л,			_					
	PLC PRG (P	RG)		(E) Cy	clic	````	~	Interval (e.g	t#200ms) 20						
=-	Task Config	uration					וו								
	- 🕸 EtherC/	AT Task (IEC	-Tasks)	Watch	dog										
l	- MainTa	sk (IEC-Tasks	)	Ena	ble										
Ethe	rCAT Master (F	:_PRG :therCAT Mas	ter)	Time (	e.g.t#2(	00ms)									
	i chi _noster (e														
				Sensit	vity	1									
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				POU					Comment						
				변 PLC	_PRG										
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## 3.5 任务看门狗

CODESYS 工程项目中任务 Task 运行时间过长或 CPU 超载,可以通过设置任务看门狗

功能检测和控制。参考例程 Demo3.5\_Watchdog。

Test Project.project* - CODESYS          File       Edit       View       Project       Build       Online       Debug         ™       Image: Second	]ools <u>W</u> indow <u>Help</u>   ] ] ] ] ] ] ] ] ] ] [ ] ] ] ] [ ] ] [ ] ] [ ] ] ] ] Application [Device: PLC Logic] ▼ ] ] [ ] ] ] ] ] ] ] ] ] ] ] ] ] ] ]
Devices – 🗜 🗙	Library Manager 🕸 MainTask 🗙
Image: State Project	Configuration         Priority (031 ):         1         Type
	POU Comment 倒 PLC_PRG

- ▶ 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" × "Sensitivity",或者任务运行时间连续超过设置 时间的次数大于灵敏度 Sensitivity,将导致看门狗触发。

- 看门狗的触发通常是由于代码中含有空指针的调用、死循环、除零等异常情况,当包括看门狗在内的系统故障触发时,实时系统将停止运行并触发 Exception 故障,此时程序内变量将保持故障前状态不变。
- ▶ 针对系统异常故障的处理,可以使用 CODESYS 提供的接口回调程序,并在回调程序 中设置当出现系统异常故障时采用何种操作处理,例如重启控制器。
- > 禁用或重新使能看门狗也可以通过接口函数的方式进行设置。

## 3.6 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"。

Test Project.project* - CODESYS			
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Devices 👻 🕈 🗙	MainTask 🎁 Library Ma	nager 🔐 Device 🗙	
Test Project     Device (PCM6.1 Practek)	Communication Settings	Application for I/O handling	Application $\checkmark$
Given PLC Logic     Gradient      Gradient     Gradient      Gradient      Gradient      Gradient      Gradie	Applications	PLC Settings	
- mil Library Manager - PLC_PRG (PRG)	Backup and Restore	Behaviour for outputs in stop	Set all outputs to default $\sim$
Task Configuration	Files	Always update variables	Disabled (update only if used in a task) $\qquad \qquad \lor$
AinTask (IEC-Tasks)	Log	Bus Cycle Options	· · · · · · · · · · · · · · · · · · ·
EtherCAT_Master (EtherCAT Master)	PLC Settings	Bus cycle task	EtherCAT_Task ~
PCM61 (PCM6.1 Computer Module)	PLC Shell	Addtional Settings	
AIO61 (AIO6.1 Analogue I/O Module)		Show I/O warnings as error	r 10 mapping M EnableDiagnosis for devices
SIM62 (SIM6.2 Station Interface Module	Users and Groups	Show to warnings as error	3
	A second Disables		

## 3.7 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,也可以测量每个子系统的执行时间。任务运行时间必须小于任务设定周期并且尽可能的
- 短,避免因为任务超时导致系统故障。参考例程 Demo3.7\_CPUload。

<b>→</b> ∓ X	PCM61	ľ.	EtherCAT_Master	Device	DIO61	PLC_PRG	TIM61	I SIM62	AIO6	1 🙀 Tasl	k Config 🗸
1	Task Groups	Aonitor	Variable Usage System E	vents Propert	ties CPU Load						
evice [connected] (PCM6.1)	Task	Status	IEC-Cycle Count	Cycle Count	Last Cycle Time (us)	Average Cycle Time (µs)	Max. Cycle Time (µs)	Min. Cycle Time (µs)	Jitter (us)	Min. Jitter (µs)	Max. Jit
PLC Logic	() EtherCA	Valid	49871	50350	306	320	668	6	93	-49	
Application [run]	MainTask	Valid	9975	10070	9	10	26	7	21	-11	
Library Manager	C				-				0.777.4		1
* ApplicationEventHandler (FB)											
PLC. PRG (PRG)											
= 🧱 Task Configuration											
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🗏 😳 😂 MainTask (IEC-Tasks)											
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EtherCAT Master (EtherCAT Master)											
PCM61 (PCM6, 1 Computer Module)											
😏 🗊 DIO61 (DIO6. 1 Digital Input an	<										>
- 5 II AIO61 (AIO6. 1 Analogue I/O M	Breakpoints										<b>-</b>
G 🗊 TIM61 (TIM6. 1 Temperature In		-Barbara I	Devices Di Citerrial					- 1877.	N/ 107	1 million 1 million	
- 😳 🏢 IFM61 (IFM6. 1 Interface and Fi	Application: Ap	plication	[Device: PLC Logic]	Inclusion and the second			Lited in the second descent	• 1 600 N	ew A 10	1	
5 IM62 (SIM6.2 Station Interfac	POU Locat	ion Ir	nstance Path Tasks	Condition	Hit Count Condit	on Current Hit Count	Watched Values L	ast Updated			

控制器负载情况也可以通过 PLC Shell、网页控制界面查看。

PLC Shell 查看控制器负载:控制器运行条件下, "Device/PLC Shell"页面在线输入 指令"cpuload",即可查看控制器负载情况。

11 🖆 🖬   🕔   🗠 🛪 🦌 🖿 🕼 🗙   🖊 😘	🍓 🌿   川 🗐 🧃 🦄   🏝	🏜 🔹 📋 🔛 🔤 Application [De	vice: PLC Logic] 🔹 👒 🥸	→ ■ 🖑  〔= 9≡ 0= 1= \$   ♦   🛒   ₹   3	2
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ー 三印 PLC Logic	Applications	CPU load average:	19		
Library Manager	Backup and Restore	CoreID: CPU Core load:	35 05		
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□	Log				
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	PLC Shell				
	Users and Groups				
	Access Rights				
	Symbol Rights				
	IEC Objects				
	Task Deployment				
	Status				
	Information				
POUs		cpuload			
Messages - Total 0 error(s), 0 warning(s), 6 message	(s) 🔊 Breakpoints				
Device user: Anonymous Last build: Q	) 0 🕐 0 Precompile 🧹 🔒	RUN	Program loaded	Program unchanged	Proj

#### 网页控制界面查看控制器负载:浏览器登录控制界面, "Info"页面 "CPU load"。

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$\leftarrow$ $\rightarrow$ C $\blacktriangle$ Not secure   192	2.168.20.13/sys/info.shtm	I		९ ☆ 😬 :
👖 Apps 👩 随机数生成算法【详 🤇	PyQt5 (designer) 🕻	编写 Matlab mexFu		» 🗏 Reading list
Home Modules Info	Tools Applications			Œ₽
Firmware		**		
OS version: 0.1.0.0-34	-q94f9dee			
Bootloader version: 0.1.0.0	-			
Resources		-		
CPU load: 15% (cpu0: 14% cpu1: 15% )				
Memory: 891 MB free, 8% used				
Uskspace: 3029 MB available, 1% used				
opune. I nour i minutes so accorda				
Version: Temperature: 0.10.0-34-g94f5tee 51 °C		Hostname: pom61-an20100022400013	Time: 2000-01-01T09:07:43+0800	Use

## 3.8 自动扫描设备

CODESYS 支持 AWP100 自动扫描添加设备功能,方法如下:

- ▶ 新建工程,选择 "Standard project"。
- ▶ 右键点击 "Device" 弹出对话框选择 "EtherCAT/EtherCAT Master"。
- ▶ 双击 "EtherCAT\_Master" 修改配置为 "Select network by name",并将

"Network Name" 修改为 "ecat0" 。

- ▶ 双击"Device",点击"Scan Network"扫描在线控制器,建立 Gateway 连接。
- ▶ 点击"Login",但不要运行程序。
- ▶ 右键点击 "EtherCAT\_Master" 选择 "Scan for Devices"。
- ▶ 在线设备自动被扫描出来后,点击 "Copy All Devices to Project"将自动扫描的设备导入到工程中。

Biteletermeteleg (polet.)       communication Settings       Settings       Settings         A construction Settings       Applications       Bedge and Bestore       Bedge and Bestore         Biteletermeteleg (polet.)       Biteletermeteleg (polet.)       Biteletermeteleg (polet.)       Biteletermeteleg (polet.)         Biteletermeteleg (polet.)       Biteletermeteleg (polet.)       Biteletermeteleg (polet.)       Biteletermeteleg (polet.)       Biteletermeteleg (polet.)         Biteletermeteleg (polet.)       Biteletermetermetermetermetermetermetermet	Device [connected] (PCMs.)       Communication Settings       Scan Network.       Cateway • Device •         Applications       Backup and Restore       Files       Implications       Scan Network.       Device *         Implications       Backup and Restore       Files       Implications       Device Address:       Device Ad
If C isok       Application         If Notice       Bakego and Reator         If Notice       Bakego and Reator         If Notice       Deside         If Notic	IPC Logic   Applications   Backup and Restore   Files   Log   IPC_PRG (PRG)   IPC_PRG (PRG)   IPC_PRG
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Image: State Object       Image: State Object         Edit Object       Edit Object         Edit Object       Edit Object         Export mappings from CSV       Export mappings from CSV         Export mappings from CSV       Export mappings from CSV         Export mappings from CSV       Export mappings from CSV         Devices       Program loaded         Program unchanged       Project user: (not         Attention! The device was not found in the repository       Vendorcode: 0xD0F, Productcode: 0x795B3326, Revision: 0x2       0         PCM61       PCM61       PCM6.1 Computer Module       0         PCM61       DIO6.1 Digital Input and Output Module       0         PM051       Alios Aldoress       0         PCM61       PCM6.1 Computer Module       0         PCM61       PCM6.1 Computer Module       0         PM051       Lister and Pieldbus Module       0         PCM61       PCM6.1 Analogue I/O Module       0         PCM61       PCM6.1 Analogue I/O Module       0         PCM61       PCM6.1 Analogue I/O Module       0         PCM61       PCM6.1 Interface and Fieldbus Module       0         PCM61       PCM6.1 Station Interface Module       0	C Edit Object on
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Link Orienpung       Link Orienpung         Device target mappings from CSV       Export mappings from CSV         Export mappings from CSV       Export mappings from CSV         Dire       Messages - Total 0 error(s),0 waming(s), Emessage(s)         Ince use: Incommous       Lastbuild: © 0 © Precomple ✓ Ta         Devices       —         Incertain the device was not found in the repository       Vendorcode: 0xD0F, Productcode: 0x795B3326, Revision: 0x2         Incertain the device was not found in the repository       Vendorcode: 0xD0F, Productcode: 0x795B3326, Revision: 0x2         Incertain the device was not found in the repository       Vendorcode: 0xD0F, Productcode: 0x795B3326, Revision: 0x2         Incertain the device was not found in the repository       Vendorcode: 0xD0F, Productcode: 0x795B3326, Revision: 0x2         Incertain the device was not found in the repository       Vendorcode: 0xD0F, Productcode: 0x795B3326, Revision: 0x2       0         Incertain the device was not found in the repository       Vendorcode: 0xD0F, Productcode: 0x795B3326, Revision: 0x2       0         Incertain the device was not found in the repository       Vendorcode: 0xD0F, Productcode: 0x795B3326, Revision: 0x2       0         Incertain the device was not found in the repository       PCM6.1       Computer Module       0         Incertain the device was not found in the repository       Vendorcode: 0xD0F, Productcode: 0xD0F, Productcode: 0xD0	Edit Upgett with
Construction       Export mappings to CSV         Offer       Messages - Total 0 error(s),0 waming(s), 6 message(s)       Total       Program loaded       Program unchanged       Pro	Import mapping from CSV
Device type     Alias Address       Wendorcode: 0xD0F, Productcode: 0x795B3326, Revision: 0x2     0       Image: PCM61     PCM6.1 Computer Module     0       Image: PCM61     PCM6.1 Computer Module     0       Image: PCM61     DIO6.1 Digital Input and Output Module     0       Image: PCM61     DIO6.1 Analogue I/O Module     0       Image: PCM61     IFM61     IFM6.1 Interface and Fieldbus Module     0	anned Devices
Attention! The device was not found in the repository     Vendorcode: 0x705E3326, Revision: 0x2     Vendorcode: 0x705E3326, Revision: 0x2     PCM61     PCM61     PCM6.1 Computer Module     O     DIO61     DIO61     DIO6.1 Digital Input and Output Module     O     IFM61     IFM61     IFM61     IFM61     IFM62     SIM62     SIM62     SIM62     SIM62     SIM62	levice name Device type Alias Address
PCM61         PCM6.1 Computer Module         0           DIO61         DIO6.1 Digital Input and Output Module         0           AIO61         AIO6.1 Analogue I/O Module         0           IFM61         IFM6.1 Interface and Fieldbus Module         0	Attention! The device was not found in the repository Vendorcode: 0xD0F, Productcode: 0x795B3326, Revision: 0x2 0
DIO61         DIO6.1 Digital Input and Output Module         0           ~ AIO61         AIO6.1 Analogue I/O Module         0           ~ IFM61         IFM6.1 Interface and Fieldbus Module         0	PCM61 PCM6.1 Computer Module 0
… AlO61         AlO6.1 Analogue I/O Module         0           … IFM61         IFM6.1 Interface and Fieldbus Module         0           … SIM62         SIM6.2 Station Interface Module         0	DIO61 DIO6.1 Digital Input and Output Module 0
IPM61     IPM61     Interface and Fieldbus Module     U	AIO61 AIO61 0
SINDZ SIGUOT INTERIACE MOQUIE	IFM61     IFM61     IFM61     Interface and Fieldbus Module     U

特别提示:

- 不是所有的硬件设备都可以被正确扫描并添加到工程项目中,因此建议核对已扫描添加的设备是否符合配置要求,推荐采用手动方式逐个添加硬件设备。
- ➢ SIM6.2 位于 PCM6.1 下一层级。
- ▶ 子站扩展模块 SIM6.1/SIM6.3 位于 SIM6.2 下一层级。



### 3.9 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,以防备可能的器件损坏、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"。 参考例程 Demo3.9\_PersistentVariables。



## 3.10 创建 HMI

CODESYS 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"。

Devices 🗸 🛛	X / Ibrary Manager	Xiel De	wice ¥ YoR MainTack Yill Ether	AT Master		a
	Communication Settings		Scan Network Gateway - Device -			
Application     Applicati	Cut Copy Paste Delete Refactoring	,		Gateway		
Ether CAT, Yaster Ether CAT Visite?     Toron (CAT) (Sale)     Toron (CAT) (Sale)     Toron (CAT) (CAT)     Toron (CAT)	Properties Add Object Edit Object with Edit Object with Login Detest application from device Task Deployment Status Joformation		Alam Configuration Application Data Source Manager DUT External File Global Wriable List Global Wriable List Global Wriable List Global Wriable List Global Wriable List Metwork Wrable List. (Baceiver) Network Wrable List. (Baceiver) Network Wrable List. (Baceiver) Persistent Variables POU POU for implicit checks Recipe Manager	86	Device Address: press-resolution 255000255000028 Device Address: 030.1000 Target Vipet: 1788 0010 Target Vipet: 406 Target Vipet: 406 Target Vipet: 100 DEF Wind Power Technology(Shangha)Co., Ltd. Target Version 3.5.15.20	
t 2 Devices 1 POUs	Call Tree POU name Symbol Location		Symbol Configuration Text List Trace Unit Conversion			- #
Messages - Total 0 error(s), 0 warning(s), 0 message(s)		2 2	Visualization Visualization Manager		Last build: 0 0 • 0 Precomple 🦯 🕼	🔁 o 🤸 🛛 🕹 🖀 🕷

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。

ces - 4 X	Library Manag	er Device S MainTask EtherCAT_Master	PLC_PRG     Visualization     Visualization Manager × 6     WebVisu
(Enringed)     (Enrichae)      (Enrichae)	General Settings Use unicodestria Use unicodestria De CurrentVisu Preview: Support Style Settings Selected style Preview	gg settings in behavior hotseys (in vocadations) (in the operation of the	Additional Settings Additional Settings Additional Settings Additional Settings Additivate multitouch handling Advivate semi-transparent drawing Advivate semi-transparent drawing Advivate semi-transparent drawing Call after visu initialization Program or function call, e.g., VeuUnit();  Advinced Visiole Memory Settings Size of Memory for Visu (initial value) Size of Memory for Visu (initial value) Size of Paintbuffer (per Client, initial value) Calent Settings Additional Settings Advinum number of Visualization clients
	Language Settings		

双击"Visualization Manager"下面的"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)。

<u>File Edit View Project Build Online Debug</u>	<u>T</u> ools <u>W</u> indow <u>H</u> elp	
≘ ☞ ■   ●   ∽ ∝ ∦ ℡ 臨 X   桷 端 楢 ≦	1 1 1 1 1 B	Application [Device: PLC Logic] 🝷 🧐 📦 🔳
Devices - 4 X	Library Manager 🕤 Devic	ce 🚱 MainTask 🚮 EtherCAT_Master
Test Project		
Device (PCM6.1 Practek)	Start visualization	Visualization
E II PLC Logic	Name of .htm file	webvisu
Application		Use as default page
Library Manager     DEC_PRG (PRG)	Update rate (ms)	200
Task Configuration	Default communication buffer size	50000
EtherCAT_Task (IEC-Tasks)		
□ → → → → → → → → → → → → → → → → → → →	Scaling Options	Show Used Visualizations
VISU_TASK (IEC-Tasks)	O Fixed O Isotropic	Anisotropic
Visueliens. visu_Prg	Use scaling options for dialogs	
WebVieu	Client width	1280
Visualization	Client height	1024
EtherCAT_Master (EtherCAT Master)	Presentation Options	
PCM61 (PCM6.1 Computer Module)     DIO61 (DIO6.1 Digital Input and Output Mod	Antialiased drawing	
AIO61 (AIO6.1 Analogue I/O Module)	Default Text Input	
SIM62 (SIM6.2 Station Interface Module)	Input with	Touchscreen $\checkmark$

在项目开发过程中,添加到 HMI 中的所有静态文本都会在默认语言下自动添加到带有

ID 的全局文本列表 Text List 中。



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 Demo3.10\_HMI。



⊗ test × +		• - • ×
← → C ▲ Not secure   192.168.20.13:	3080/webvisu.htm	९ ☆ 🔒 :
🚻 Apps 👩 随机数生成算法【详 💽 PyQt5(de	signer) 🔌 编写 Matlab mexFu 🚺 C++通过engine引	» 🔚 Reading list
		A
测试_中文		
	English 中文	
		•

## 4 AWP100 程序配置

#### 4.1 PCM6.1 程序配置

#### 4.1.1 数字量程序配置

PCM6.1 模块具有 1 个数字量输入 DI 和 1 个数字量输出 DO,它们通常被用作控制器的看门狗干接点输入和输出,当用户系统或控制器运行异常时,通过硬件节点发出信号触发相应的硬件保护逻辑。

程序中完成 DI、DO 变量定义以后,在 "EtherCAT I/O Mapping"中配置变量,并将 右下角的 "Always update variables"更改为 "Enabled 2(always in bus cycle task)", 保证每个周期数据更新,无论该通道是否在程序中被调用。参考例程 Demo4.1 PCM61。



General	Find	Filter Show all		
				Add FB for IO Channel T Go to Instand
Process Data	Variable	Mapping Channel Addre	ss Type Unit	Description
EtherCAT I/O Mapping	Application.PCM61_DIDO.PCM61_DI	* In %£x0,	2 BIT	In
EtherCAT IEC Objects		-		
Status				
Information				
	EtherCAT I/O Mapping EtherCAT I/O Mapping EtherCAT IEC Objects Status Information	Process Usea PhercAT I/O Mapping EthercAT I/O Mapping EthercAT I/C Objects Status Information	Process Data "Application PCM61_DIDO.PCM61_DD Ot 44Q40 EtherCAT I/O Mapping "Application PCM61_DIDO.PCM61_DD " In 44240 EtherCAT IEC Objects Status Information	Process Uses PhercAT I/O Mapping EtherCAT I/O Mapping EtherCAT I/O Mapping EtherCAT I/O Mapping EtherCAT I/O Mapping In 44240+2 BIT In 44240+2 BIT

#### 4.1.2 串口程序配置

PCM6.1 模块具有 2 个 RS-422/485 通道,支持 Modbus-RTU 通信,相关参数配置需要通过代码实现。参考例程 Demo4.1\_PCM61。

采用 RS-485 通信时,端口选择、校验方式、停止位、波特率、数据位以及调用 Syscom 库函数的使用,全部通过代码实现。COM1 发送数据,COM2 接收数据。



采用 Modbus-RTU 主站通信时,端口选择、校验方式、停止位、波特率、数据位以及

调用 Libmodbus 库函数的使用, 全部通过代码实现。



### 4.1.3 CANopen 程序配置

PCM6.1 模块具有 2 个 CAN 通道,每个接口均可以作为主站或从站使用。CAN bus 需要手动添加,右键点击"Device"选择"Add Device/CANbus",弹出对话框选择

"CANbus"添加。

Demo4.1.project - CODESYS		
<u>File Edit View Project Build Online Debug Too</u>	ls <u>W</u> indow <u>H</u> elp	
🎦 😅 🔚   😂   🗠 🗠 🐰 ங 🋍 🗙   🖊 🌿 🖓   📕	- 🍿 🎕 🍓 🛗 🖬 🖞 🛗 🖞 🖽 🛛 Application [Device: PLC Logic] 🔹 🧐 🚯 🕤 📲 🤻 🗐 🗐 🛬 🎫 🖇 🗋 🔶 🛒 🗮	,
	M Add Device	×
Devices – 4 X		_
□ □ Demo 4.1	Name CANbus	
Device (PCM6.1 Practek)	Action	
≓ ∰ I PLC Logic	Append device Insert device Plug device Update device	
Application		
Library Mapager	String for a fulltext search Vendor <all vendors=""></all>	~
PCM61 CAN (PRG)	Name Vendor Version Description	^
PCM61_Modbus (PRG)	🗷 🛅 Miscellaneous	
PLC_PRG (PRG)	🖻 📶 Fieldbuses	
E Task Configuration	General Canbus	
EtherCAT_Task (IEC-Tasks)	CANbus C	
MainTask (IEC-Tasks)	In the canous 35 - Smart Software Solutions GmbH 3.5.15.0 Canous on a net device	
PLC_PRG		
PCM61 (PCM6.1 Computer Module)	B 😝 EtherNet/IP	~
DIO61 (DIO6.1 Digital Input and Output Module)	< > >	
AIO61 (AIO6.1 Analogue I/O Module)	Group by category Display all versions (for experts only) Display outdated versions	
TIM61 (TIM6.1 Temperature Input Module)	11 Name: CANbus	
IFM61 (SIM6.2 Station Interface Module)	Vendor: 3S - Smart Software Solutions GmbH	
SIM62 (SIM6.2 Station Interface Module)	Categories: CANbus	
	Version: 3.5.15.0	
	Order Nullider.	
	Append selected device as last child of	
	Device	
	(You can select another target node in the navigator while this window is open.)	
	Add Davies Class	
	Add Device Clos	-
	Keset mapping Always u	pdatevá

点击新添加的"CANbus/General",将"Network"设置为0,即使用PCM6.1的 CAN 接口 1。CAN Network 编号在控制器内部是从0开始编排的,即PCM6.1的CAN 接口 1 对应 Network 编号为0,PCM6.1的CAN 接口 2 对应 Network 编号为1。当 AWP100 配置其他 CAN 功能模块时,其CAN 接口将依次被编号为2、3、4 等。



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

#### 两种选择:

- ➤ CANopen 主站: CANopenManager/CANopen\_Manager。
- > CANopen 子站: Local Device/CANopen Device。



由于 PCM6.1 模块具有两个 CAN 接口,下面将 CAN 接口 1 配置为 CANopen 主站,将 CAN 接口 2 配置为 CANopen 子站,使其相互通讯。参考例程 Demo4.1\_PCM6.1。

(1) 按照前面所述方法添加两个 CANbus 设备,分别命名为 CANbus Port1 和

CANbus\_Port2, 修改 CANbus\_Port1 的 Network 为 0, 修改 CANbus\_Port2 的

Network为1,并将两个接口的波特率设置为500kbit/s。



(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。

Demo4.1.project* - CODESYS <u>File <u>E</u>dit <u>View Project Build Online Debug</u></u>	<u>T</u> ools <u>W</u> indow <u>H</u> elp		
🖹 🖆 📕   🎒   🗠 🗠 👃 ங 🛝 🗙   🗛 🎼 🛀	別別省  臨  ஊ- 13	Application [Device: PLC Logic]	• <b>05 0</b> 9 • • • <b>4</b>   [= •= •=
Devices – 4 ×	Task 🛛 🔐 EtherCAT_Master	PCM61 PCM61_Modbu	is 🛛 🧱 Task Configuration
Demo4.1     Device (PCM6.1 Practek)     Device (PCM6.1 Dractek)     Device (PCM6.1 Dractek)     Device (PCM6.1 Dractek)     Device (PCM6.1 Dractek)     Device (PCM6.1 Dractek)	General Object Dictionary	General Node ID 1	¢
GVL	PDOs	Device profile 0	
PCM61_CAN (PRG)      PCM61_Modbus (PRG)      PCG (PRG)      PIC PRG (PRG)	CANopen I/O Mapping	Edit I/O Area	Edit SDO Parameter Area
■ _ Jask Configuration	Status	▲ EDS File	
□ S MainTask (IEC-Tasks)	Information	Vendor name 3S - Smar Vendor number 801	t Software Solutions GmbH
If EtherCAT_Master (EtherCAT Master)     Improvement (EtherCAT Master)		Product name CANopent	Device
IDO61 (DIO6.1 Digital Input and Output Me AIO61 (AIO6.1 Analogue I/O Module)		Revision number 1	
<ul> <li>III TIM61 (TIM6.1 Temperature Input Module)</li> <li>IFM61 (SIM6.2 Station Interface Module)</li> <li>SIM62 (SIM6.2 Station Interface Module)</li> </ul>		Install to Device Repositor	y Export EDS File
CANbus_Port1 (CANbus)			
CANopen_Device (CANopen Device)			

点击"Edit I/O Area"、"Add Area",添加输入输出数据通道配置,这里添加一个

USINT 类型的输入和一个 USINT 类型的输出。

	Ge	eneral —					
Object Dictionary		Node ID	1	-		•	<b>AN</b> ope
PDOs		Device profil	e 0	÷			
CANopen I/O Mapping		Edi	it I/O Area	Edit SDC	) Parameter Area		
CANopen IEC Objects	Edit I/O Area						× _
Status	I/O Overview	Ad	ld I/O Range			×	
nformation	Range Name	Count					
		4		Digital Inputs1	O - Receive	_	
			bject index	16#3800	<b></b>		
		c	ount	1	÷		
		D	ata type	USINT	$\sim$		
				Force new PDO			
				0	K Can	cel	
	Add Area	Delete A	rea	Used TxPDOs	0/512	Used RxPDOs	/512
		-				ОК	Cancel
General		General —					
General Object Dictionary		General —	1				(0)
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General Object Dictionary PDOs CANopen I/O Mapping CANopen IEC Objects Status Information	Edit I/O Area I/O Overview Range Nam	General — Node ID Device provide provi	1 ofile 0 Edit I/O Area d I/O Range O direction ange name bject index ount ata type	Edit Digital_Outputs1 16#3000 1 USINT Force new PDC	SDO Parameter	Area	CANC
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General Object Dictionary PDOs CANopen I/O Mapping CANopen IEC Objects Status Information	Edit I/O Area I/O Overview Range Nam N Digital_I	General	1 ofile 0 Edit I/O Area d I/O Range O direction ange name bject index ount ata type	Edit Edit Digital_Outputs1 16#3000 1 USINT Force new PDC C Used TxP	SDO Parameter	Area	CANC ×

PDO 配置页面描述	
Transmit	主站接收数据,子站发送数据
Receive	主站发送数据,子站接收数据
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

添加完成 USINT 类型的输入和 USINT 类型的输出,可以在"Object Dictionary"内

查看新添加数据。

evices vices	CM61_DIDO	CANbus_Port2 CAN	bus_Port1 PLC_PRG	PCM61_Mod	bus 🔐 Librar	ry Manager	
Demo4.1_PCM61				-			-
= 🕤 Device (PCM6.1 Practek)	General	🕂 Add Object 🕂 Add Sub	object 🗶 Delete 🗇 Clone 省 li	mport from EDS	•		
PLC Logic	Ohiot Distance	Index	Name	Data type	Default Value	Access Type	Vari
🖹 🔘 Application	Object Dictionary	···· D1_16#1000	Device Type	LINSIGNED 32	16#0	10	
Library Manager	PDOs	- D 16#1001	Error Register	LINSIGNEDS	16#0	10	
PCM61_CAN (PRG)		16#1003	Predefined Error Field	0101010200	1000	10	
PCM61_DIDO (PRG)	CANopen I/O Mapping	16#1005	Sync COB-ID	UNSIGNED32	16#80	rw	
PCM61_Modbus (PRG)	CANopen IEC Objects	16#1006	Communication Cycle Period	UNSIGNED32	16#0	rw	
PLC_PRG (PRG)		- D 16#100C	Guard Time	UNSIGNED 16	16#0	rw.	
Task Configuration		- 16#100D	Life Time Factor	UNSIGNED8	0	rw	
EtherCAT_Task (IEC-Tasks)	Status	16#1014	COB-ID FMCY	UNSIGNED32	\$NODEID+16#80	rw	
🖻 😻 MainTask (IEC-Tasks)		16#1016	Consumer Heartbeat Time				
PLC_PRG	Information	16#1017	Producer Heartbeat Time	UNSIGNED 16	16#0	rw	
EtherCAT_Master (EtherCAT Master)		16#1018	Identity Object				
PCM61 (PCM6.1 Computer Module)		16#1200	ServerSdoParameter				
DIO61 (DIO6.1 Digital Input and Output Mo		B 16#1400	RPDO communication parameter				
AIO61 (AIO6.1 Analogue I/O Module)		I6#1600	RPDO mapping parameter				
TIM61 (TIM6.1 Temperature Input Module)			TPDO communication parameter				
IFM61 (SIM6.2 Station Interface Module)		🖲 🙀 16#1A00	TPDO mapping parameter				
SIM62 (SIM6.2 Station Interface Module)		😑 📫 16#3000	Digital_Outputs1				
CANbus_Port1 (CANbus)		☐ 16#3000:16#00	Number of Entries	UNSIGNED8	16#01	const	
CANopen_Manager (CANopen_Manager)		16#3000:16#01	Digital_Outputs1_1	UNSIGNED8		rww	
CANbus_Port2 (CANbus)		🖃 📓 16#3800	Digital_Inputs1				
CANopen_Device (CANopen Device)		16#3800:16#00	Number of Entries	UNSIGNED8	16#01	const	
		16#3800:16#01	Digital_Inputs1_1	UNSIGNED8		ro	
		± ∎ 16#5000	ParamRange2				
			ParamRange1				

点击"Edit SDO Parameter Area",可以配置从站的 SDO 通讯,这里添加一个 USINT 类型的输入和一个 USINT 类型的输出。

Object Dictionary	
PDOs	Device profile 0
CANopen I/O Mapping	Edit I/O Area Edit SDO Parameter Area
CANopen IEC Objects	4 EDS Eile
Status	Edit SDO Parameter Area X
Information	Parameter Overview
	Range Name Count Data ty Add Parameter Range X
	SDO access type
	Range name ParamRange 1
	Count 1
	Data type USINT V
	Add Area Delete Area OK Cancel
ieneral	
ieneral Ibject Dictionary	General
ieneral Ibject Dictionary	General Node ID 1 👻 Device profile 0 👻
Seneral Object Dictionary DOs ANopen I/O Mapping	General Node ID 1 € Device profile 0 € Edit I/O Area Edit SDO Parameter Area
ieneral Object Dictionary DOs ANopen I/O Mapping ANopen IEC Objects	General Node ID 1 Device profile 0 Edit I/O Area Edit SDO Parameter Area
ieneral Ibject Dictionary DOs ANopen I/O Mapping ANopen IEC Objects tatus	General Node ID 1 1 Device profile 0 1 Edit I/O Area Edit SDO Parameter Area FDS File Edit SDO Parameter Area
ieneral Object Dictionary DOs ANopen I/O Mapping ANopen IEC Objects tatus	General Node ID 1  Device profile  Edit I/O Area  Edit SDO Parameter Area  FDS File  Edit SDO Parameter Area  Parameter Overview
ieneral Ibject Dictionary DOs ANopen I/O Mapping ANopen IEC Objects tatus	General          Node ID       1       Image: Contemportal and the second
ieneral Abject Dictionary DOS ANopen I/O Mapping ANopen IEC Objects tatus	General          Node ID       1       1         Device profile       0       1         Edit I/O Area       Edit SDO Parameter Area         Edit SDO Parameter Area       X         Parameter Overview       X         Range Name       Count       Data type       Index         ParamRange1       1       USINT       16#5800
ieneral bject Dictionary DOs ANopen I/O Mapping ANopen IEC Objects tatus	General          Node ID       1       Image: Control of the state of
ieneral Abject Dictionary DOS ANopen I/O Mapping ANopen IEC Objects tatus	General Node ID 1 Device profile 0 Edit I/O Area Edit SDO Parameter Area Edit SDO Parameter Area FDS File Edit SDO Parameter Area Verview Range Name Count Data type Index Node ID 1 Add Parameter Range SD0 access type ^ Read only @ * Read/Write
ieneral bijet Dictionary DOs ANopen I/O Mapping ANopen IEC Objects tatus	General Node ID 1 Device profile 0 Edit I/O Area Edit SDO Parameter Area FDS File Edit SDO Parameter Area FDS File Edit SDO Parameter Area V Parameter Overview Range Name Count Data type Index Parameter Range X SD0 access type Read only * Read/Write Range name ParamRange2
Seneral Ubject Dictionary DOS CANopen I/O Mapping CANopen IEC Objects tatus Information	General Node ID 1 Device profile 0 Edit I/O Area Edit SDO Parameter Area EDIS File Edit SDO Parameter Area Verview Range Name Count Data type Index Varameter Overview Range Name Count Data type Index Verview Range Name Count Data type Index SDO access type Verview Add Parameter Range SDO access type Verview SDO access type Verview Range name ParamRange2 Object index 16#5000 Verview
ieneral Object Dictionary DOs ANopen I/O Mapping ANopen IEC Objects Atatus Anormation	General Node ID 1 Device profile 0 Edit I/O Area Edit SDO Parameter Area FDS File Edit SDO Parameter Area Parameter Overview Range Name Count Data type Index Parameter Overview Range Name Count Data type Index Parameter Overview Range Name Count Data type Index SDO access type % Read only @ % Read/Write Range name ParamRange2 Object index 16#5000 Count 1 ©
ieneral Ibject Dictionary DOS ANopen I/O Mapping ANopen IEC Objects tatus	General          Node ID       1       1         Device profile       0       1         Edit I/O Area       Edit SDO Parameter Area         Edit I/O Area       Edit SDO Parameter Area         FDS Fila       X         Parameter Overview       Node Note         Parameter Overview       Index         Add Parameter Range       X         SDO access type       * Read only         Add Parameter Range       X         SDO access type       * Read only         Object index       16#5000         Count       11         Data type       USINT

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

Demo4.1_PCM61.project - CODESYS								
File Edit View Project Build Online Debug	Tools Window Help							
筒 📽 🖬 📾 1 い つ よ 🏗 億 🗙 🛤 🌿	乳乳油	Application [Device: PLC Logic] - 😋 🔍 🕟	= <b>%</b> 103	F≣ 4 <u>⊒</u> +≣ 8   4		13/		
Devices - 7 X	CM61_DIDO	CANbus_Port2 CANbus_Port1 P	LC_PRG	PCM61_Modbus	👔 Libr	ary Manager	20	CANopen_Device
- Demo4.1_PCM61								
B- Device (PCM6. 1 Practek)	General	Find Filter	Show all		•	de Add FB	for IO Ch	annel
PLC Logic	object Distances	Variable	Mapping	Channel	Address	Туре	Unit	Description
🖹 🔘 Application	Object Dictionary	- Cal Rx IoRange 16#3000: Digital Outputs1						16#3000
Library Manager	PDOs		3	Digital Outputs1 1	%IB125	USINT		16#3000:16#1
PCM61_CAN (PRG)		= i Tx IoRange 16#3800: Digital Inputs1						16#3800
PCM61_DIDO (PRG)	CANopen I/O Mapping	Application.PCM61_CAN.slave_output	٠,	Digital_Inputs1_1	%Q89	USINT		16#3800:16#1
PCM61_Modbus (PRG)		= 📴 R/W SDORange 16#5000: ParamRange2						16#5000
PLC_PRG (PRG)	CANopen IEC Objects	Application.PCM61_CAN.slave_sdo_input	٠,	ParamRange2_1	%IB126	USINT		16#5000:16#1
Task Configuration		🖻 📴 RO SDORange 16#5800: ParamRange1						16#5800
EtherCAT_Task (IEC-Tasks)	Status	Application.PCM61_CAN.slave_sdo_output	t 💊	ParamRange1_1	%QB10	USINT		16#5800:16#1
MainTask (IEC-Tasks)	Information	L						
· 셴 PLC_PRG								
EtherCAT_Master (EtherCAT Master)								
PCM61 (PCM6.1 Computer Module)								
ALOS 1 (ALOS 1 Appleaus 1 (0 Module)								
TIM61 (TIM6.1 Temperature Input Module)								
TEM61 (SIM6 2 Station Interface Module)								
SIM62 (SIM6.2 Station Interface Module)								
CANbus Port1 (CANbus)								
CANopen_Manager (CANopen_Manager)								
CANbus_Port2 (CANbus)								
CANopen_Device (CANopen Device)								
			ant Managina	at a second state of the	ables mare			
		Ke	ser napping	Always updatevan	Use p	arent device	secung	

(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。

Demo4.1.project - CODESYS			
<u>File Edit View Project Build Online Debug</u>	Tools Window Help		
🎦 🖨 📕 🞒 🗠 여 🕹 ங 🛍 🗙 🖊 🐫 🖄	41月19月19日1日 110-151	🕮   Application [Device: PLC Logic] 🔹 🧐 🌖 🝵 🕷	(∃ €∃ ¢∃ +∃ \$   ¢   <b>18</b>   <b>#</b>   ₩
Devices 🗸 🗸 🗙	PCM61 PCM61_Modbus	Task Configuration	Nbus_Port1 CANbus_Port2 CANo
Demo4.1  Device (PCM6.1 Practek)  Device (PCM6.1 Practek)  Device (PCM6.1 Practek)  Device (PCM6.1 Practek)  Device (PCM6.1 CAN (PRG)  PCM61_CAN (PRG)  PCM61_	General Object Dictionary PDOs CANopen I/O Mapping CANopen IEC Objects Status Information	General Node ID Device profile Edit I/O Area Edit SDO Parame Edit SDO Parame Vendor name Practek Vendor number 801 Product name CANopenTest Product number 1 © Install to Device Repository Export EDS	ter Area

(5) 点击菜单栏"Tools/Device Respository",在弹出窗口中点击"Install",选择子站 EDS 文件加载添加。

<ul> <li>Demo4.1.project - CODESYS</li> <li><u>File Edit View Project Build Online Deb</u></li> </ul>	ug <u>I</u> ools <u>W</u> indow <u>H</u> elp	
🎦 🛩 🖬 🕌 🗠 🗠 🌾 🛍 🖀 🗶 🕌 🌿	) 👌 📔 🥦 🦄 🌾 🛱 🔚 🔚 - 😭 🔛 🗛 Application [Device: PLC Logic] 🝷 👒 🥬	) 🗉 🔏   ĈE GE GE +
Devices • 4 	CM61 PCM61_Modbus Task Configuration PCM61_CAN     Configuration PCM61_CAN     Configuration System Repository     (C:\ProgramData\CODESYS\Devices)  Installed device descriptions	CANbus_Port1 X
	String for a fulltext search     Vendor: <all vendors="">       Name     Vendor     Version     Description       Image: String for a fulltext search     Vendor     Version     Description       Image: String for a fulltext search     Vendor     Version     Description       Image: String for a fulltext search     Vendor     Version     Description       Image: String for a fulltext search     Vendor     Version     Description       Image: String for a fulltext search     Vendor     Version     Description       Image: String for a fulltext search     Image: String for a fulltext search     Vendor       Image: String for a fulltext search     Image: String for a fulltext search     Vendor       Image: String for a fulltext search     Image: String for a fulltext search     Vendor       Image: String for a fulltext search     Image: String for a fulltext search     Vendor       Image: String for a fulltext search     Image: String for a fulltext search     Vendor       Image: String for a fulltext search     Image: String for a fulltext search     Vendor       Image: String for a fulltext search     Image: String for a fulltext search     Vendor       Image: String for a fulltext search     Image: String for a fulltext search     Vendor       Image: String for a fulltext search     Image: String for a fulltext search     Vendor</all>	Install Uninstall Export.
CANopen_Device (CANopen Device)		Close

(6) 右键点击 "CANbus\_Port1" 添加 CANopen 主站设备,选择"Add

Device/CANopen\_Manager" .

● Demo4.1.project - CODESYS File Edit View Project Build Online Debug ① 畲 🔲 番   い っ 炎 ℡ 喩 ×   桷 🏠 🌺 🎕	Iools Window Help [] 月 刘 刘 洵 清 后   御- 亡   逆   Applica	tion [Device: PLC Logic] 🔹 🥰 👀 🕟	■ ♥ 〔= ⁰= ⁰= °= (ゑ + ゑ =  ∛
Devices	PCM61     PCM61_Modbus     Task C       Image: Add Device     Name     CANopen_Manager       Action     Action     Image: Action       Image: Action     Image: Action     Image: Bug dw       String for a fulltext search     String for a fulltext search	nfiguration [1] PCM61_CAN [1] vice () Update device Vendor ( <all vendors=""></all>	CANbus_Port1 ( CANbus_Port2 ) ( X
Construction     C	Name Cifi CANopen Cifi CANopenManager Cifi CANopenManager CANopen_Manager_Still.2 CANopen_Manager_softMotio CANopen_Manager_softMotio CANopen Device CANopen Device CANopen Device CANopen Device CANopen Device Display all versions (fr	Vendor  35 - Smart Software Solutions GmbH  rexperts only) □ Display outdated version	Version Description   S.5.15.0 CANopen Manager  S.5.15.0 CANopen_Manager_SIL2  S.5.15.0 CANopen_Manager_SoftMotion  S.5.15.0 Local CANopen Device (Slave) indu  S.5.15.0 Local SL2 CANopenSafety Device ( ¥  10  10  10  10  10  10  10  10  10  1
CANbus_Port1 (CANbus)  CANbus_Port2 (CANbus)  CANbos_Port2 (CANbus)  CANopen_Device (CANopen Device)	Name: CANopen_Manager     Vendor: 35 - Smart Software Solutions Gm     Categories: CANopenManager     Version: 3.5.15.0     Order Number:      Append selected device as last child of     CANbus_Port1     (You can select another target node in the r	H avigator while this window is open.)	Û

#### (7) 右键点击刚添加的"CANopen\_Manager",选择"Add Device",弹出窗口

选择已经完成添加的子站设备。

		PCM61_CAN CANDUS	_Port1CANBUS_Port2	CANopen_Device	
emo4.1 Device (PCM6.1 Practek) DLC Logic C Application	Add Device				×
GVL  GVL  GVL  GVL  GVL  GVL  GVL  GVL	Action  Action  Action  Action  Append device  Insert device	O Plug device O Update devic	e		
E PCM61_Modbus (PRG)	String for a fulltext search	Vendor <all td="" vendor<=""><td>rs&gt;</td><td></td><td>~</td></all>	rs>		~
Task Configuration	ame		Vendor	Version	^
EtherCAT_Task (IEC-Tasks)	ARS2320W SoftMot	ion	Metronix GmbH	4.4.0.0	
🖻 🎲 MainTask (IEC-Tasks)	ARS2320 SoftMotio	n	Metronix GmbH	4.4.0.0	
PLC_PRG	🕤 ARS2340_SoftMotio	n	Metronix GmbH	4.4.0.0	
EtherCAT_Master (EtherCAT Master)	TI ARS2360W_SoftMot	ion	Metronix GmbH	4.4.0.0	
PCM61 (PCM6.1 Computer Module)	- f CANopenTest		Practek	Revision=16#00000	001, F
DIO61 (DIO6.1 Digital Input and Output	it Mc CD1-k_Softmotion		INFRANOR S.A.	4.3.0.0	
AIO61 (AIO6.1 Analogue I/O Module)	- 10 CMMP-AS-C10-11A-	P3-M0_SoftMotion	Festo AG & Co. KG	4.3.0.0	
TIM61 (TIM6.1 Temperature Input Mod	dule) fill CMMP-AS-C10-11A-	P3-M3 SoftMotion	Festo AG & Co. KG	4.3.0.0	~
IFM61 (SIM6.2 Station Interface Module	le) <				>
SIM62 (SIM6.2 Station Interface Module	le) Group by category Display a	ll versions (for experts only)	splay outdated versions		
GANbus_Port1 (CANbus)     GANopen_Manager (CANopen_Manager)     GANbus_Port2 (CANbus)     GANopen_Device (CANopen Device)	Name: CANopenTest Vendor: Practek Categories: Remote Device Version: Revision = 16#00000	001, FileVersion=1.0		Î	
	Order Number: 0			×	
		- 11.1 - 6			

(8) 在主站 "SDOs" 页面中可以设置 SDO 启动参数,即在从站运行开始时主站即可

发送给从站的 SDO 参数。在主站 "CANopen I/O Mapping"页面中进行变量链接。

ces 🗸 🗸 🕇	x guration PCM61_CAN	CANb	ıs_Port1	CANbus_Port2	CANC	pen_Device	Device
Demo 4. 1 Image: Margin Device (PCM6. 1 Practek)	General	+ Add	SDO 🖋 Edit 💥 D	elete 🛧 Move Up	↓ Move Do	own	
E D Logic GVL	PDOs	Line 1	Index:Subindex 16#5000:16#01	Name ParamRange2_1	Value 16#5	Bit length 8	Comment
Library Manager	Log	_					
PLC_PRG (PRG)     Task Configuration     Configuration	CANopen I/O Mapping	-					
	Status	-					
EtherCAT_Master (EtherCAT Master)     E-     PCM61 (PCM6.1 Computer Module)     IO011 (NIOC 1 Digital length and Outburk	Information						
AIO61 (cites. 1 Jugital infut and Oxford     AIO61 (AIO6. 1 Analogue I/O Module)     If TIM61 (TIM6. 1 Temperature Input Mod     IFM61 (SIM6. 2 Station Interface Module)     SIM62 (SIM6. 2 Station Interface Module)	ule) a) b)						
CANbus_Port1 (CANbus)							
CANbus_Port2 (CANbus)							

#### (9) 在主站 "CANopen I/O Mapping"页面中进行 PDO 变量链接配置。

<b>-</b> + × 9	uration PCM61_CAN	CANbus_Port1 CANbus_Port2	CANopen_De	vice 🔐 Device	👘 Lib	rary Manage	r	CANoper
Demo4.1	General	Find Filter	Show all		•	🕂 Add FB	for IO Ch	annel +
PLC Logic	PDOs	Variable	Mapping	Channel	Address	Туре	Unit	Description
= Q Application		Application.PCM61_CAN.master_output	<b>*</b>	Digital_Outputs1_1	%QB8	USINT		
GVL	SDOs	- **		Bit0	%QX8.0	BOOL		
Library Manager		- **		Bit1	%QX8.1	BOOL		
PCM61_CAN (PRG)	Log	- *		Bit2	%QX8.2	BOOL		
PCM61_Modbus (PRG)		- **		Bit3	%QX8.3	BOOL		
E PLC_PRG (PRG)	CANopen I/O Mapping	- **		Bit4	%QX8.4	BOOL		
Task Configuration		- 50		Bit5	%QX8.5	BOOL		
EtherCAT_Task (IEC-Tasks)	CANopen IEC Objects	- **		Bit6	%QX8.6	BOOL		
HainTask (IEC-Tasks)	Chature	- <b>*</b>		Bit7	%QX8.7	BOOL		
DLC_PRG	Status	Application.PCM61_CAN.master_input	۰.	Digital_Inputs1_1	%IB124	USINT		
EtherCAT_Master (EtherCAT Master)	Information	-*		Bit0	%IX124.0	BOOL		
PCM61 (PCM6.1 Computer Module)		- *		Bit1	%JX124.1	BOOL		
DIO61 (DIO6.1 Digital Input and Output Me		-*>		Bit2	%IX121.2	BOOL		
AIO61 (AIO6.1 Analogue I/O Module)		- *		Bit3	%IX124.3	BOOL		
TIM61 (TIM6.1 Temperature Input Module)		-*		Bit4	%IX124.4	BOOL		
IFM61 (SIM6.2 Station Interface Module)		- *>		Bit5	%IX124.5	BOOL		
SIM62 (SIM6.2 Station Interface Module)		-*>		Bit6	%IX124.6	BOOL		
CANbus_Port1 (CANbus)		L-¥≱		Bit7	%IX124.7	BOOL		
CANopen_Manager (CANopen_Manager)								

正常通讯阶段,写入和读取 SDO 数据不能通过在 CANopen I/O Mapping 中关联变量的方式进行,而需要使用库函数 CiA405.SDO\_READ()以及 CiA405.SDO\_WRITE()来实现,而且 CODESYS 对 CAN Network 的编号自 0 开始,而 CiA405 对 CAN Network 的

编号自1开始。



## 4.2 DIO6.1 程序配置

DIO6.1 为数字量输入输出模块,具有 10 个 DO 和 16 个 DI。程序中声明变量后,可 直接在 "EterCAT I/O Mapping"中将变量关联到硬件通道上。

参考例程 Demo4.2\_DIO61。

Eile Edit View Proj	ect <u>B</u> uild <u>O</u> nli	ne <u>D</u> ebug	lools Wir	ndow	the local sectors				
🗎 🚅 🔲 🚑 🗠 🗠					Help				
	ä 🖻 🛍 🗙 🕼	4 😘 🍋 🌿	11 11 11	21	₽ 1.	Dî li	***	Applic	ation [Device: PLC l
Devices		лх		¥					
Demo4.2 DIO61			1 PRO	GRAM F	LC PRG				
Device (PCM6_1 Pra	(tek)		2 VAR		-				
	LUCKY		3						
- El Pic Logic			4 DIO	61_DI_	1 : 800	L;			
	on M		5 DIO	61_DI_	2 : 800	L;			
	Manager		6						
	rg (PRG)		7 DIO	61_DO_	1 : BOO	L;			
= 🔛 Task Co	onfiguration		8 DIO	61_DO_	2 : 800	L;			
😂 Eth	nerCAT_Task (IEC-Tas	sks)	9						
🖻 🍲 Ma	inTask (IEC-Tasks)		10 END	VAR					
	PLC_PRG		_						
EtherCAT_Mast	ter (EtherCAT Master)								
- T PCM61 (PC	M6.1 Computer Modul	le)	1						
DTO61	(DIO6, 1 Digital Input	and Outpu							
-									
Demo42_DI061.project - CODESYS	Debug Tools Window H	elp	n Davies PLC Logic	1 - 08 08		: ⊊= ¢= →1	= <del>2</del>   4		e 18.
Demo42_DIO61.project - CODESYS File Edit View Project Build Online	Debug Jools Window H	elp	on [Device: PLC Logic	1 • <b>c</b> ¢ c¢		년 6월 4 <u>1</u> 41	± 000		₹   <sup>8</sup> 2
Demo42_DI061.project - CODESYS         File       Edit       Yiew       Project       Build       Online         Image:	Debug Jools Window H	elp 	on [Device: PLC Logic	] • <b>0</b> ; 0;	) = <b>4</b>	[ 6 <u>-</u> ] 4]	± 000		₹   <sup>8</sup> 2
P Demo42_DI061.project - CODESYS File Edit View Project Build Online Professor View Project Build Online Professor View Project Build Online evices	Debug Jools Window H	elp Im · C · C Application X Find Vaciable	on [Device: PLC Logic	] • 😋 😋 Filter Show	→ = ペ (C=	[ ⊊] ¢] +]	₿ (¢   ¢	-   🎘   Ŧ - 🕹 Add	로   리/ IFB for IO Channel <sup>4</sup> Go to Instanc
Demo4.2,DIO61,project - CODESYS Elle Edit View Project Build Online I	Debug Jools Window H M M M II II II II II II III PLC_PRG G DIO61 General Process Data	elp Im · C · C Applicatio Find Variable ~ * Application.PLC	m [Device: PLC Logic	] • 😋 😋 Filter Show Mapping	► ■ ♥   〔 ■ all Channel DO1	G G d g +)	ВІТ	▼ ➡ Add Unit	로   킹, IFB for IO Channel * Go to Instanc Description Dol (terminal 1)
Demo42_DIO61.project - CODESYS  Elle Edit View Project Build Qunline  Demo42_DIO61 Project Build Qunline  exces   Demo42_DIO61  exces  Application  Device (PCM6.1Practek)  Application  Dic Pract Manager  Dic Pract (PCM)  Dic P	Debug Jools Window H M M M M M M M M PLC_PRG G DIO61 General Process Data EtherCAT 1/0 Mapping	elp M · C · M Application Find Variable · Application.PLC · Application.PLC	n [Device: PLC Logic PRG.01061_D0_1 PRG.01061_D0_2	] - 😋 😋 Filter Show Mapping	all Channel DO1 DO2 DO2	다		<ul> <li>✓ ♣ Add</li> <li>Unit</li> </ul>	국   전, IFB for IO Channel <sup>+</sup> Go to Instan Description DO2 (terminal 1) DO2 (terminal 2)
P Demo4.2,DIO61,project - CODESYS Elle Edit View Project Build Online D B B B P P A B B X M C Notes ▼ 4 X D Demo4.2,DIO61 P Device (PCH6.1 Practek) B	Debug Jools Window H	elp M · ① M Application Find Variable · Application.PLC · Application.PLC	n [Device: PLC Logic PRG.DI061_D0_1 PRG.DI061_D0_2	Filter Show	► ■ ペ () = all Channel D01 D02 D03 D04	G = C = +3 Address <del>%QX1.0</del> %QX1.2 %QX1.2	♀         ↓           Type         BIT           BIT         BIT           BIT         BIT	▼ ♣ Add	f FB for IO Channel ** Go to Instan Description DOI (terminal 1) DOI (terminal 2) DO3 (terminal 4)
Demo4.2_DIO61.project - CODESYS File Edit View Project Build Online Common State S	Debug Jools Window H	elp Mar C Application Find Variable Variable Application.PLC Application.PLC	n [Device: PLC Logic PRG.DI061_D0_1 PRG.DI061_D0_2	Filter Show	→ = ペ () all Do1 Do2 Do3 Do4 Do5	G = 4] = +) Address <del>%Q%1.0</del> %Q%1.3 %Q%1.4		Add	<ul> <li># FB for IO Channel <sup>+1</sup> Go to Instan</li> <li>Description</li> <li>DO1 (terminal 1)</li> <li>DO2 (terminal 2)</li> <li>DO3 (terminal 3)</li> <li>DO4 (terminal 4)</li> <li>DO5 (terminal 5)</li> </ul>
Demo42_DIO61.project - CODESYS Elle Edit View Project Build Online Common Section Common Section Common Section Demo4.2_DIO61 Demo4.2_DIO61 PCLogic PCLOG PCLOGIC PCLO	Debug Jools Window H M M M M M M PLC_PRG DIO61 General Process Data EtherCAT I/O Mapping EtherCAT I/C Objects Status	elp Mar C Application Find Variable - Variable -	n [Device: PLC Logic PRG.DIO61_DO_1 PRG.DIO61_DO_2	Filter Show	→ ■ ペ 〔3 all D02 D03 D04 D05 D05 D05	آل الله           Address           %QX1.0           %QX1.2           %QX1.3           %QX1.4           %QX1.4           %QX1.4	\$\vee\$         \$\phi\$           Type         BIT           BIT         BIT           BIT         BIT           BIT         BIT	V - Add	#     #     Go to Instan       IFB for IO Channel     **     Go to Instan       Description     001 (terminal 1)     000 (terminal 2)       DO3 (terminal 3)     DO4 (terminal 4)       DO5 (terminal 5)     DO5 (terminal 5)       DO5 (terminal 5)     DO5 (terminal 5)       DO5 (terminal 5)     DO5 (terminal 5)
Demo42_DIO61.project - CODESYS Elle Edit View Project Build Online Comparison of the Project Build Online Comparison of the Project Build Online Comparison of the Project Build Online Project Project Build Online Project Project Build Online Project Build Online Comparison of the Project Build Online Comparison of t	Debug Jools Window H Market State PLC_PRG DIO61 General Process Data EtherCAT I/O Mapping EtherCAT IEC Objects Status Information	elp Image: Image: Imag	n [Device: PLC Logic PRG.DIO61_D0_1 PRG.DIO61_D0_2	J • C\$ C\$	→ = ペ 〔3 all Channel DO1 DO2 DO3 DO4 DO5 DO6 DO7 DO8	G         d         +)           Address         sightile         sightile           Sightile         sightile         sightile	\$\overline{\coverlin}\coverlin{\coverlin}\coverlin{\coverlin}\coverlin{\coverlin}\coverlin{\coverlin}\coverlin{\coverlin}\coverlin{\coverlin}\coverlin{\coverlin}\coverlin{\\coverlin}\coverlin{\coverlin}\coverlin{\\coverlin}\coverlin{\\coverlin}\coverlin{\\coverlin}\coverlin{\\coverlin}\coverlin{\\coverlin}\coverlin{\\coverlin}\coverlin{\\coverlin}\coverlin{\\coverlin}\coverlin{\\coverlin}\coverlin{\\coverlin}\coverlin{\\coverlin}\cover	V - Add	F   7 Go to Instan Description D01 (terminal 1) D03 (terminal 2) D03 (terminal 3) D04 (terminal 4) D05 (terminal 5) D06 (terminal 15) D07 (terminal 15) D07 (terminal 15)
Demo4.2_DIO61.project - CODESYS Elle Edit View Project Build Qnline I I I I I I I I I I I I I I I I I I I	Debug Jools Window H	elp Image: Second Seco	In [Device: PLC Logic PRG.01061_D0_1 PRG.01061_D0_2	Filter Show	► = २२ (2) all Channel DO1 DO2 DO3 DO4 DO5 DO6 DO7 DO8 DO9 DO9	G         4           Address         %Q%1.0           %QX1.1         %QX1.2           %QX1.2         %QX1.3           %QX1.5         %QX1.6           %QX1.6         %QX1.7           %QX1.7         %QX1.7	20         ↓           Type         BIT           BIT         BIT           BIT         BIT           BIT         BIT           BIT         BIT           BIT         BIT	V + Add	F Go to Instan Description D01 (terminal 1) D03 (terminal 2) D04 (terminal 3) D04 (terminal 4) D05 (terminal 4) D05 (terminal 15) D06 (terminal 15) D07 (terminal 15) D09 (terminal 19) D09 (terminal 19)
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Demo42_DIO61.project - CODESYS Elle Edit View Project Build Online Wices V A Configuration Configuration Provide CPO45.1 Practek) Configuration Provide CPO45.1 Practek) Configuration Provide CPO45.1 Practek) Configuration Provide CPO45.1 Practek) Configuration Con	Debug Jools Window H M M M M M M PLC_PRG O DIOSI General Process Data EtherCAT I/O Mapping EtherCAT IEC Objects Status Information	elp  image: selection and sele	m [Device: PLC Logic PRG.D1061_D0_1 PRG.D1061_D0_2 PRG.D1061_D0_2	Filter Show Mapping	Image: Second	Address 9494-0 9494-0 9494-12 9494-13 9494-14 94944-14 9494-14 9494-14 9494-14 9494-14 9494-14 9494-14 9494-14	⅔         ⇒           Type         Bit           Bit         Bit           Bit         Bit           Bit         Bit           Bit         Bit           Bit         Bit           Bit         Bit	▼	F B for IO Channel *** Go to Instan Description DO1 (terminal 1) DO3 (terminal 2) DO3 (terminal 3) DO5 (terminal 3) DO5 (terminal 15) DO5 (terminal 15) DO5 (terminal 15) DO9 (terminal 15) DO9 (terminal 19) DO10 (terminal 19) DO10 (terminal 19) DO10 (terminal 19) DO10 (terminal 19) DO10 (terminal 19)
Demo4.2_DIO61.project - CODESYS Elle Edit View Project Build Online I Control Contro	Debug Jools Window H	elp  ind  Variable  Variab	PRG.DI061_D0_1 PRG.DI061_D0_2 PRG.DI061_D0_2 PRG.DI061_D1_2	Filter Show	Image: Second	Gill         Cill         Cill <td< td=""><td>3         \$           Type         \$           BIT         \$</td><td>- ● Add Unit</td><td>**         #           IFB for I/O Channel         ***         Go to Instan           Description         000 (terminal 1)         000 (terminal 2)         000 (terminal 3)         000 (terminal 4)           DOS (terminal 5)         DOG (terminal 10)         DOS (terminal 17)         DOS (terminal 17)         DOS (terminal 17)         DOS (terminal 17)         DOS (terminal 19)         DOI (terminal 20)         Output tatus (false if the output drivers DI (terminal 7)         DOI (terminal 20)         DUI (terminal 7)         DI (terminal 7)</td></td<>	3         \$           Type         \$           BIT         \$	- ● Add Unit	**         #           IFB for I/O Channel         ***         Go to Instan           Description         000 (terminal 1)         000 (terminal 2)         000 (terminal 3)         000 (terminal 4)           DOS (terminal 5)         DOG (terminal 10)         DOS (terminal 17)         DOS (terminal 17)         DOS (terminal 17)         DOS (terminal 17)         DOS (terminal 19)         DOI (terminal 20)         Output tatus (false if the output drivers DI (terminal 7)         DOI (terminal 20)         DUI (terminal 7)         DI (terminal 7)
Demo4.2_DIO61.project - CODESYS File Edit View Project Build Online Control Control	Debug Jools Window H	elp Mar C Application Find Variable Variab	PRG.DIO61_D0_1 PRG.DIO61_D0_2 PRG.DIO61_D0_2 PRG.DIO61_D1_1 PRG.DIO61_D1_1	Filter Show	Image: Constraint of the second sec	G	2         0           Type         817           817         817           817         817           817         817           817         817           817         817           817         817           817         817           817         817           817         817           817         817           817         817           817         817	「素」字 Add	
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P. Demo4.2, DIO61, project - CODESYS Elle Edit View Project Build Online in the second secon	Debug Jools Window H	elp  important in the second s	In [Device: PLC Logic PRG.DI061_D0_1 PRG.DI061_D0_2 PRG.DI061_D0_2 PRG.DI061_D1_2	Filter Show		Fill         Cill         I           Address         Sqqxt+0         Sqqxt+1           Sqqxt+1         Sqqxt+1         Sqqxt+1           Sqqxt+2         Sqqxt+2         Sqqxt+2           Squx+2         Squx+2         Squx2-4           Squx2-4         Squx2-4         Squx2-4	3         0           Type         81T           81T         81T	· ⊕ Add	**         #*         Go to Instan           1 FB for IO Channel         **         Go to Instan           Description         00         10           DO3 (terminal 1)         D00 (terminal 4)         D00 (terminal 4)           DO5 (terminal 15)         D00 (terminal 15)         D00 (terminal 10)           D06 (terminal 10)         D00 (terminal 10)         D01 (terminal 10)           D11 (terminal 7)         D12 (terminal 8)         D13 (terminal 10)           D13 (terminal 10)         D15 (terminal 10)         D16 (terminal 12)
Demo42_DI061.project - CODESYS File Edit View Project Build Online Works ↓ B ← ← ↓ ★ Demo42_DI061 Constraints Demo42_DI061 DEmo42_DI061 DEM042_DI061 DEmo42_DI061 DEM042_DI061 DEmo42_DI061 DEM042_DI061	Debug Jools Window H	elp  Pind  Variable  Application  Applicatio	In [Device: PLC Logic PRG.01061_D0_1 PRG.01061_D0_2 PRG.01061_D0_2 PRG.01061_D1_2	Filter Show Mapping 70		Address %QX1.0 %QX1.2 %QX1.3 %QX1.4 %QX1.5 %QX1.4 %QX1.5 %QX1.7 %QX2.1 %QX1.6 %QX2.1 %QX2.1 %QX2.1 %QX2.1 %QX2.1 %QX2.2 %QX2.	3         0           Type         0           817         0           817         0           817         0           817         0           817         0           817         0           817         0           817         0           817         0           817         0           817         0           817         0           817         0	V Add	**         #           IFB for IO Channel         ***         Go to Instan           Description         Dool (terminal 1)         Dool (terminal 2)           DO3 (terminal 2)         Dool (terminal 3)         Dool (terminal 4)           DO5 (terminal 5)         Dool (terminal 10)         Dool (terminal 10)           DO6 (terminal 10)         DO00 (terminal 20)         Output tathus (false if the output drivers 10)           DO10 (terminal 20)         Dui (terminal 20)         Di1 (terminal 8)           DI3 (terminal 8)         DI3 (terminal 10)         DI3 (terminal 10)           DI5 (terminal 11)         DI6 (terminal 12)         DI7 (terminal 13)
P Demo4.2_DIO61.project - CODESYS Elle Edit View Project Build Online Common State	Debug Jools Window H	elp  image: selection PLC  image: selection	PRG.DIO61_D0_1 PRG.DIO61_D0_2 PRG.DIO61_D0_2 PRG.DIO61_D1_1 PRG.DIO61_D1_2	Filter Show	Image: Constraint of the second sec	G         C           Address         %QX1.0           %QX1.1         %QX1.1           %QX1.2         %QX1.3           %QX1.4         %QX1.5           %QX1.5         %QX1.6           %QX1.6         %QX1.7           %QX1.7         %QX1.8           %QX1.8         %QX1.1           %QX1.1         %QX1.2           %QX1.2         %QX1.2           %QX2.2         %QX2.2           %QX2.2         %QX2.2           %DX2.4         %DX2.5           %DX2.6         %DX2.6	\$\overline{\coverlin}\coverlin{\coverlin}\coverlin{\coverlin}\coverlin{\coverlin}\coverlin{\coverlin}\coverlin{\coverlin}\coverlin{\coverlin}\coverlin{\coverlin}\coverlin{\coverlin}\coverlin{\coverlin}\coverlin{\coverlin}\coverlin{\coverlin}\coverlin{\coverlin}\coverlin{\coverlin}\coverlin{\coverlin}\coverlin{\coverlin}\coverlin{\coverlin}\coverlin{\coverlin}\coverlin{\coverlin}\coverlin{\coverlin}\coverlin}\cover	- ● Add Unit	#         #         Go to Instan           Description         Do3 (terminal 1)         Do2 (terminal 2)           DO3 (terminal 3)         DO4 (terminal 3)         DO5 (terminal 5)           DO6 (terminal 16)         DO5 (terminal 17)         DO6 (terminal 18)           DO9 (terminal 18)         DO9 (terminal 18)         DO9 (terminal 19)           DO1 (terminal 20)         Output status (raise if the output drivers         DI1 (terminal 20)           DI3 (terminal 19)         DI3 (terminal 10)         DI3 (terminal 12)           DI3 (terminal 12)         DI3 (terminal 12)         DI3 (terminal 12)           DI3 (terminal 12)         DI3 (terminal 12)         DI3 (terminal 12)           DI3 (terminal 12)         DI3 (terminal 12)         DI3 (terminal 12)           DI3 (terminal 12)         DI3 (terminal 12)         DI3 (terminal 12)
P Demo4.2_DIO61.project - CODESYS Elle Edit View Project Build Online  elvees even Demo4.2_DIO61 De	Debug Jools Window H	elp  i i i i i i i i i i i i i i i i i i i	PRG.DIO61_DO_1 PRG.DIO61_DO_2 PRG.DIO61_DO_2 PRG.DIO61_DI_1 PRG.DIO61_DI_2	Filter Show	Image: Constraint of the second sec	Address           Address           SqQXL3           SqQXL3           SqQXL4           SqQXL3           SqQXL3           SqQXL3           SqQXL1           SqQXL3           SqQXL3           SqQXL3           SqQXL2           SqQXL3           SqQXL2           SqQXL2           SqQXL2           SqQXL2           SqQXL3           SqQXL2           SqQXL2           SqQX2.1           SqQX2.1           SqQX2.1           SqQX2.1           SqQX2.2           SqQX2.3           SqUX2.4           SqUX2.5           SqUX2.6           SqUX2.7           SqUX2.7	Image: Constraint of the second sec		#       #         FB for IO Channel       *** Go to Instan         Description       001 (terminal 1)         D03 (terminal 2)       003 (terminal 3)         D04 (terminal 4)       005 (terminal 5)         D06 (terminal 5)       000 (terminal 15)         D09 (terminal 10)       000 (terminal 10)         D09 (terminal 10)       0010 (terminal 20)         Output status (false if the output drivers       011 (terminal 9)         D14 (terminal 10)       015 (terminal 11)         D15 (terminal 12)       015 (terminal 12)         D16 (terminal 12)       010 (terminal 12)         D17 (terminal 14)       010 (terminal 12)         D18 (terminal 14)       010 (terminal 12)
Demo4.2_DIO61.project - CODESYS      Ele Edit View Project Build Online      Demo4.2_DIO61     DIO61 (DIO6.1 Digital Input and	Debug Jools Window H	elp  implication	In [Device: PLC Logic PRG.DIO61_DO_1 PRG.DIO61_DO_2 PRG.DIO61_DO_2 PRG.DIO61_DI_1 PRG.DIO61_DI_1	Filter Show	Image: Constraint of the second sec	Gill         Cill         Cill           Address         Sugxt.0           Sugxt.0         Sugxt.1           Sugxt.1         Sugxt.1           Sugxt.1         Sugxt.1           Sugxt.1         Sugxt.1           Sugxt.1         Sugxt.1           Sugxt.1         Sugxt.1           Sugxt.1         Sugxt.1           Sugxt.2         Sugxt.1           Sugxt.2         Sugxt.2           Sugxt.3         Sugxt.3           Sugxt.3         Sugxt.3	3         0           Type         0           817         0	Add	#         #         Go to Instant           Description         Dool (terminal 1)         Dool (terminal 2)           DO3 (terminal 2)         Dool (terminal 3)         Dool (terminal 4)           DO5 (terminal 4)         Dool (terminal 15)         Dool (terminal 16)           DO6 (terminal 17)         DO0 (terminal 17)         DO0 (terminal 17)           DO9 (terminal 10)         DO1 (terminal 10)         DO1 (terminal 10)           D11 (terminal 10)         D13 (terminal 10)         D13 (terminal 11)           D16 (terminal 12)         D10 (terminal 12)         D10 (terminal 12)           D10 (terminal 12)         D10 (terminal 12)         D10 (terminal 12)           D10 (terminal 12)         D10 (terminal 12)         D10 (terminal 12)           D10 (terminal 12)         D10 (terminal 12)         D10 (terminal 12)           D10 (terminal 12)         D10 (terminal 12)         D10 (terminal 12)           D10 (terminal 12)         D10 (terminal 12)         D10 (terminal 12)
Demo42_DIO61.project - CODESYS      Ele Edit View Project Build Online      wrocs     wrocs     wrocs     Demo4.2_DIO61     Proce (PO46.1 Practek)      Demo4.2_DIO61     Proce (PO46.1 Practek)	Debug Jools Window H	elp Marcola Construction PLC Variable Varia	n [Device: PLC Logic PRG.01061_D0_1 PRG.01061_D0_2 PRG.01061_D1_1 PRG.01061_D1_1 PRG.01061_D1_2	Filter Show	Image: Constraint of the second sec	Gill	3         4           Type         817           817         817           817         817           817         817           817         817           817         817           817         817           817         817           817         817           817         817           817         817           817         817           817         817           817         817           817         817           817         817           817         817	· ● Add	**         #           FB for IO Channel **         Go to Instan           Description            D01 (terminal 1)         D02 (terminal 2)           D03 (terminal 3)         D04 (terminal 4)           D05 (terminal 5)         D06 (terminal 5)           D06 (terminal 10)         D06 (terminal 17)           D08 (terminal 10)         D01 (terminal 20)           Output status (false if the output drivers at 011 (terminal 8)         D13 (terminal 10)           D13 (terminal 10)         D13 (terminal 12)           D13 (terminal 13)         D10 (terminal 13)           D10 (terminal 12)         D10 (terminal 12)           D10 (terminal 20)         D10 (terminal 20)

## 4.3 AIO6.1 程序配置

AIO6.1 为模拟量输入输出模块,具有 2 个 AO 和 16 个 AI。根据实际使用传感器的信 号类型需要逐个通道进行启动参数配置。启动参数不可以批量操作,每次新建启动参数只可 以配置一个通道。

AO1 启动参数配置方法:

- ▶ 点击设备 "AIO6.1/Startup Parameters"。
- > 点击 "Add", 弹出对话框中进行启动参数设置, 点击 "AO 1 Advanced settings/AO 1 Output type"。
- > 选择"Value"数据范围 0~10 V / 0~20 mA / 4~20 mA。



Al1 启动参数配置方法:

- ▶ 点击设备 "AIO6.1/Startup Parameters"。
- ▶ 点击 "Add", 弹出对话框中进行启动参数设置, 点击 "Al 1 Advanced settings/Al 1 Input type"。
- ▶ 选择 "Value" 数据范围 0~10 V / 0~20 mA / 4~20 mA。

	Debug Jools Window Help 환 산   비 위 에 계 제 등 (종)	- 📑   🕮   Application [[	Device: PLC Logic] 👻 🎙	<b>0;</b> 0ÿ,	■ <b>4</b>   [= 6]	e <sup>=</sup> +≣ \$   ¢	罰  〒  考V
B-Demo4.3_AIO61		• · · · · • • • • • • • • • • • • • • •					
Device (PCM6.1 Practek) 로그와 PLC Logic	General 3	Line Index:Subindex	Move Up & Move Name	Down Value	Bit Length	Abort on Error	Jump to Line on Erro
Application     Official Library Manager     Decrypt (PRG)	Startup Parameters	Select Item from Object	Directory				
■ W Task Configuration     ● EtherCAT_Task (IEC-Tasks)     ■ WainTask (IEC-Tasks)     ● HinTask (IEC-Tasks)     ● HinTask (IEC-Tasks)	EtherCAT I/O Mapping 2 EtherCAT IEC Objects	Index:Subindex	Name Diagnosis History RxPDO-Assign	Flags	Type De	fault	^
EtherCAT_Master (EtherCAT Master)	Status	<ul> <li>16#1C13:16#00</li> <li>16#7000:16#00</li> <li>16#7010:16#00</li> </ul>	TxPDO-Assign AO 1 AO 2				
		<ul> <li>16#800D:16#00</li> <li>16#800F:16#00</li> <li>16#801D:16#00</li> </ul>	AO 1 Advanced settings AO 1 vendor data AO 2 Advanced settings	s	4		
		- 16#801F:16#00 - 16#810D:16#00 - :16#11	AO 2 vendor data AI 1 Advanced settings AI 1 Input type AI 1 vendor data	RW	USINT 16#	t0e	
		<ul> <li>16#811D:16#00</li> <li>16#811F:16#00</li> <li>16#812D:16#00</li> <li>16#812D:16#00</li> </ul>	AI 2 Advanced settings AI 2 vendor data AI 3 Advanced settings				, v
		Name AI 1	Input type		· · ·		6
		Index: 16# 810		Bit length 8		÷	ок
		SubIndex: 16# 11	Byte array 5	Value 0	- 10 V	~	Cancel

模拟量启动参数设置完成后,可以通过工具栏进行编辑、删除、上移、下移操作。每

次点击 "Add" 添加只能配置一个通道的启动参数, 配置多个参数需要多次点击 "Add"。

eneral	🕂 Add [	🖉 Edit 🗙 Delete 👍	Move Up 🐥 Move Do	own					
rocess Data	Line	Index:Subindex	Name	Value	Bit Length	Abort on Error	Jump to Line on Error	Next Line	Commen
	1	16#810D:16#11	AI 1 Input type	0 - 10 V	8			0	
artup Parameters	- 2	16#811D:16#11	AI 2 Input type	0 - 20 mA	8			0	
	- 3	16#812D:16#11	AI 3 Input type	4 - 20 mA	8			0	
erCAT I/O Mapping	- 4	16#800D:16#11	AO 1 Output type	0 - 10 V	8			0	
	- 5	16#801D:16#11	AO 2 Output type	0 - 20 mA	8			0	
nerCAT IEC Objects									

模拟量数据需要标定计算, 0~10V/0~20mA 线性对应 0~32767, 参考例程

Demo4.3\_AIO61。

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Devices 👻 🕂 🗄	x / 🗇 /	AIO61 PLC_PRG X
= Demo4.3_AIO61	• 1	PROGRAM PLC_PRG
E Movice (PCM6.1 Practek)	□ 2	VAR
In the second se	3	AIO61_AI1 : INT;
	4	AIO61_AI2 : INT;
Library Manager	5	AI1_IN_V : REAL;
	6	AI2_IN_MA : REAL;
EtherCAT_Task (IEC-Task	s) 9	ATO61 A01 : INT:
A MainTask (IEC-Tasks)	10	AIO61 AO2 : INT:
	11	AII Out V : REAL;
EtherCAT Master (EtherCAT Master)	12	AI2_Out_mA : REAL;
Euler CAT _Master (Euler CAT Master)	13	END_VAR
	Mo	_
AIO61 (AIO6.1 Analogue 1/O		
		//裁性化标定。 0~10V对应0~32767, 0~20mA对应0~32767
		AI1_IN_V := INT_TO_REAL(AI061_AI1) * 10 / 32767;
		AI2_IN_mA := INT_TO_REAL(AI061_AI2) * 20 / 32767;
		AIO61 A01 := REAL TO INT (AI1 Out V * 32767 / 10);
		AIO61 AO2 := REAL TO INT (AI2 Out mA * 32767 / 20);

## 4.4 TIM6.1 程序配置

TIM6.1 为温度输入模块,具有 14 个 TEMP 温度输入。在程序中声明变量后,可直接 在"EterCAT I/O Mapping"中将变量关联到硬件通道上。温度输入通道的原始值需要乘 以 0.1 换算成实际温度值,参考例程 Demo4.4 TIM61。

Demo4.4_TIM61.project - CODESYS						
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Devices – 4 X	TIM61 X					
Demo 4. 4_TIM61     Device (PCM6. 1 Practek)	General	Find	Filter Show	all		• 🕂 A
PLC Logic	Process Data	Variable	Mapping	Channel	Address	Туре
Library Manager	Startup Parameters			RTD 1 Under range RTD 1 Over range	%IX2.0 %IX2.1	BIT
PLC_PRG (PRG)	EtherCAT I/O Mapping	→		RTD 1 Error RTD 1 TyPDO State	%IX2.6	BIT
EtherCAT_Task (IEC-Tasks	5) EtherCAT IEC Objects			RTD 1 TxPDO Toggle	%IX3.7	BIT
PLC_PRG	EtherCAT IEC Objects	Application.PLC_PRG.TIM61_TEMP1	•	RTD 1 Value RTD 2 Under range	%IW2 %IX6.0	BIT
EtherCAT_Master (EtherCAT Master)	Status			RTD 2 Over range	%IX6.1	BIT
= PCM61 (PCM6.1 Computer Module)	Information			RTD 2 Error	%IX6.6	BIT
TIM61 (TIM6.1 Temperature In		🐪		RTD 2 TxPDO State	%IX7.6	BIT
				RTD 2 TxPDO Toggle	%IX7.7	BIT
				RTD 2 Value	%IW4	INT
				RTD 2 Value	%IW4	INI

Demo4.4_TIM61.project* - CODESYS	
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🛅 🖆 🖬 I 🎒 I 🗠 🗠 👗 🗈 🛍 🗙 I 🛤 🔇	🕼 🝓 🚰   📕 🧌 🎢 🦄   📾   🏧 - 📑   🕮   Application [Device: PLC Le
Devices 👻 🕈 🗙	TIM61 PLC_PRG X
Careford Demo4.4_TIM61	1 PROGRAM PLC_PRG
Device (PCM6.1 Practek)	$\square$ 2 VAR
PLC Logic	3 TIM61_TEMP1 : INT;
Application	4 III_DEGC : REAL;
Library Manager	
PLC_PRG (PRG)	
🖃 🌃 Task Configuration	
EtherCAT_Task (IEC-Tasks)	1
🖃 🤡 MainTask (IEC-Tasks)	2 //原始值乘以 0.1 等于实际温度值
PLC_PRG	<pre>3 TI1_DegC := INT_TO_REAL(TIM61_TEMP1)/10;</pre>
EtherCAT_Master (EtherCAT Master)	
PCM61 (PCM6.1 Computer Module)	
TIM61 (TIM6.1 Temperature Inp	e

## 4.5 IFM6.1 程序配置

#### 4.5.1 Profibus DP 程序配置

IFM6.1 通信模块具有 2 个 Profibus DP Master 端口,在进行 Profibus DP 变量链接 之前,需要进行 Process Data 设置。IFM6.1 提供一个默认 122 字节的数组来实现与 Profibus DP 子站的数据交互,该数组与 Profibus 通信数据的映射是由 PDO 实现的。

Process Data 设置需要将"16#1702" 替换成"16#1600" (用于 slave1)、 "16#1601" (用于 slave2)、"16#1602" (用于 slave3)、"16#1603" (用于 slave4)、"16#1604" (用于 slave5);将"16#1B02" 替换成"16#1A00" (用于 slave1)、"16#1A01" (用于 slave2)、"16#1A02" (用于 slave3)、

"16#1A03" (用于 slave4)、"16#1A04" (用于 slave5),完成 Profibus DP1 的 slave 1、slave 2、slave 3、slave 4、slave 5 的 Process Data 设置。"16#1703"和 "16#1B03" 设置方法与上面相同,用于 Profibus DP2 的数据通信。

单击"IFM61"、"Process Data"进入 Process Data 配置页面。在"select the Outouts"分组内取消"16#1702"和"16#1703"的勾选,勾选"16#1600"和

"16#1640",这样就设置了 Profibus Outputs 的 DP1 slave1 和 DP2 slave1。如果有两 个子站同时连接主站,那么需要继续勾选"16#1601"和"16#1641",设置 Profibus Outputs 的 DP1 slave2 和 DP2 slave2。

	Profibus Outputs										
		16#170	)2		16#1703						
16#1600	16#1601	16#1602	16#1603	16#1604	16#1640	16#1641	16#1642	16#1643	16#1644		
DP1	DP1	DP1	DP1	DP1	DP2	DP2	DP2	DP2	DP2		
slave1	slave2	slave3	slave4	slave5	slave1	slave2	slave3	slave4	slave5		

Test Project.project\* - CODESYS

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Devices 👻 🕈 🗙	PLC_PRG 😸 MainTask	Device EtherCAT_Master	1	Library Manager IFM6	1 X
Test Project	Canada	Salact the Outputs			Calact the Tapute
Device (PCM6.1 Practek)	General	Select the Outputs			
= III PLC Logic	Process Data	Name	lype	Index	Name lype index
= 🥥 Application		COM2 Data out 20	BYIE	16#7810:22	16#1A00 DP 1 inputs slave 1 (ex
Library Manager	Startup Parameters		BYIE	16#7810:23	DP1 S1 Byte array slave-out/master-i AKKAY [ 16#6000:01
PLC_PRG (PRG)	-	16#1702 COPI 3 (DP 1) outputs	UTNIT	16#7020-01	
Task Configuration	EtherCAT I/O Mapping	COM3 Data out 0	DINT	16#7020:01	
EtherCAT_Task (IEC-Tasks)		COM3 Data out 1	DITE	16#7020:02	
AinTask (IEC-Tasks)	EtherCAT IEC Objects	COM3 Data out 1	DTIE	16#7020:03	C 1041401 DD 1 insula alous 3 (au
-@ PLC_PRG	Charles -	COM3 Data out 2	DTIE	16#7020:04	DD1 S2 Rute array share submaches i ADDAV [ 16#6010/01
EtherCAT_Master (EtherCAT Master)	Status	COM3 Data out 3	DITE	16#7020:05	DP1 52 byte alray slave-out/master-i ARRAT [ 10#0010.01
PCM61 (PCM6.1 Computer Module)	Information	COM3 Data out 5	DTIE	16#7020:00	
IFM61 (IFM6.1 Interface and Fieldb	Inomation	COM3 Data out 5	DTIE	16#7020:07	
		COM3 Data out 3	DITE	16#7020:00	
		COM3 Data out 9	DTIE	16#7020:09	
		COM3 Data out o	DITE	16#7020:10	DDI C2 Pute area alere aut/marker i ADDAV [ 16#6020-01
		COM3 Data out 10	DTIE	16#7020:11	DP1 55 byte array slave-out/master-i ARRAT [ 16#6020:01
		COM3 Data out 10	DTIE	16#7020:12	
		COM3 Data out 12	DITE	16#7020:15	
		COMS Data out 12	DTIE	16#7820:14	
		COM3 Data out 13	BTIE	16#7820:15	
		COM3 Data out 14	BYIE	16#7820:16	16#1A03 DP 1 inputs slave 4 (ex
		COM3 Data out 15	DTIE	16#7820:17	DP1 54 Byte array slave-out/master-i ARRAT [ 16#6030:01
		COM3 Data out 16	BYIE	16#7820:18	
		COM3 Data out 17	BYIE	16#7820:19	
		COM3 Data out 18	BYIE	16#7820:20	
		COM3 Data out 19	BYIE	16#7820:21	
		COM3 Data out 20	BYIE	16#7820:22	16#1A04 DP 1 inputs slave 5 (ex
		COM3 Data out 21	BYIE	16#7820:23	DP1 55 Byte array slave-out/master-LARRAY [ 16#6040:01
		16#1703 COM 4 (DP 2) outputs		10.07000.01	and the second sec
		COM4 Cut	UINT	16#/830:01	
		Ľ			
< >	Call Tree				

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🎦 🖆 🔚   🚭   બ બ 🐰 🗈 🛍 🗙   🖊 😘	🐴 🌿   📕 🧌 🦄 🦓   🖳 🎦	)• 👕 🛙 🛗 📔 Application [Device: PLC Logic]	- 👒 💖 🕞 🗉 % IC	≣ e⊒ e⊒ ⇒≣ S	응   후   麗   로   장~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Devices 👻 🕈 🗙	PLC_PRG 🔮 MainTask	k Device EtherCAT_Master	👔 Library Manager	IFM61	×
Test Project	General	Select the Outputs			Select the Inputs
Device (PCM6.1 Practek)		Name	Type	Ind A	Name
	Process Data	✓ 16#1600 DP 1 outputs slave 1	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		16#1A02 DP 1 inputs slave 3
Library Manager	Charles Descention	DP1 S1 Byte array slave-in/master-out	ARRAY [0121] OF BYTE	16#7000:	DP1 S3 Byte array slave-out/mas
PLC_PRG (PRG)	Startup Parameters		-		
🖃 🌃 Task Configuration	EtherCAT I/O Mapping				
EtherCAT_Task (IEC-Tasks)					
MainTask (IEC-Tasks)	EtherCAT IEC Objects				
	Status	DP1 S2 Byte array slave in/master-out	APPAY [0, 121] OF BYTE	16#7010	DP1 S4 Byte array slave-out/mas
EtherCAT_Master (EtherCAT Master)	Status		ANNAL [0.121] OF DITE	10-7010.	
IFM61 (IFM6.1 Interface and Fieldb	Information				
		16#1602 DP 1 outputs slave 3			16#1A04 DP 1 inputs slave 5
		DP1 S3 Byte array slave-in/master-out	ARRAY [0121] OF BYTE	16#7020:	DP1 S5 Byte array slave-out/mas
		16#1603 DP 1 outputs slave 4			16#1A40 DP 2 inputs slave 1
		DP1 S4 Byte array slave-in/master-out	ARRAY [0121] OF BYTE	16#7030:	DP2 S1 Byte array slave-out/mas
		DP1 S5 Byte array slave in/master out	APPAY IN 1211 OF PYTE	16#7040	DP2 S2 Byte array slave out/mas
			ANNAT [0.121] OF BITE	10-7040.	
		<		>	

单击 "IFM61" 、 "Process Data" 进入 Process Data 配置页面。在 "select the Inputs" 分组内取消 "16#1B02" 和 "16#1B03" 的勾选, 勾选 "16#1A00" 、

"16#1A40"。这样就设置了 Profibus Inputs 的 DP1 slave1 和 DP2 slave1。如果有两 个子站同时连接主站,那么需要继续勾选"16#1A01"和"16#1A41",设置 Profibus Inputs 的 DP1 slave2 和 DP2 slave2。

	Profibus Inputs										
		16#1B0	)2		16#1B03						
16#1A00	16#1A01	16#1A02	16#1A03	16#1A04	16#1A40	16#1A41	16#1A42	16#1A43	16#1A44		
DP1	DP1	DP1	DP1	DP1	DP2	DP2	DP2	DP2	DP2		
slave1	slave2	slave3	slave4	slave5	slave1	slave2	slave3	slave4	slave5		

Test Project.project\* - CODESYS

ile <u>E</u> dit <u>V</u> iew <u>P</u> roject <u>B</u> uild <u>O</u> nline	<u>D</u> ebug <u>T</u> ools <u>W</u> indow <u>H</u> elp					
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vices 🗸 🕂 🗙	MainTask 📄 PLC_PRG	Device 👔 Library Manag	er 🛐 PCM6	1 EtherCAT_Master	IFM61 🗙	
👔 Test Project 💌						
🖹 👚 💼 Device (PCM6. 1 Practek)	General	Select the Outputs		Select the Inputs		
E BI PLC Logic	Designed Dates	Name Type	Inde: ^	Name	Туре	Index
Application	Process Data	□ 16#1600 DP 1 outputs		COM2 Data in 21	BYTE	16#6810:23
- 🎁 Library Manager	Startup Parameters	DP1 S1 Byte array slave-in ARRAY	16#7000:0	16#1802 COM 3 (DP 1) inputs		
PLC_PRG (PRG)	Startap Farameters			COM3 Status	UINT	16#6820:01
🖹 🌃 Task Configuration	EtherCAT I/O Mapping			COM3 Data in 0	BYTE	16#6820:02
🛛 😻 EtherCAT_Task (IEC-Task:				COM3 Data in 1	BYTE	16#6820:03
🖃 🍪 MainTask (IEC-Tasks)	EtherCAT IEC Objects			COM3 Data in 2	BYTE	16#6820:04
PLC_PRG		16#1601 DP 1 outputs		COM3 Data in 3	BYTE	16#6820:05
EtherCAT_Master (EtherCAT Master)	Status	DP1 S2 Byte array slave-in ARRAY	16#7010:0	COM3 Data in 4	BYTE	16#6820:00
PCM61 (PCM6.1 Computer Module)				COM3 Data in 5	BYTE	16#6820:0
IFM61 (IFM6. 1 Interface and F	Information			COM3 Data in 6	BYTE	16#6820:0
				COM3 Data in 7	BYTE	16#6820:0
				COM3 Data in 8	BYTE	16#6820:1
		16#1602 DP 1 outputs		COM3 Data in 9	BYTE	16#6820:1
		DP1 S3 Byte array slave-in ARRAY	16#7020:0	COM3 Data in 10	BYTE	16#6820:1
				COM3 Data in 11	BYTE	16#6820:1
				COM3 Data in 12	BYTE	16#6820:1
				COM3 Data in 13	BYTE	16#6820:1
				COM3 Data in 14	BYTE	16#6820:1
		16#1603 DP 1 outputs		COM3 Data in 15	BYTE	16#6820:1
		DP1 S4 Byte array slave-in ARRAY	16#7030:0	COM3 Data in 16	BYTE	16#6820:1
				COM3 Data in 17	BYTE	16#6820:1
				COM3 Data in 18	BYTE	16#6820:2
				COM3 Data in 19	BYTE	16#6820:2
				COM3 Data in 20	BYTE	16#6820-2
		16#1604 DP 1 outputs			BYTE	16#6820-2
		DD1 S5 Byte array clave-in ADDAY	16#7040+0	16#1803 COM 4 (DP 2) inputs	DITE	10#0020.2
		DF1 35 Dyte array slave-in ARRAT	10#104010	10-10-1005 COFI 4 (DP 2) Inputs	UINT	16#6920-0
			×	COM4 Data in 0	DINT	16#6930:0
		s .	>	COM4 Data in 0	BTIE	10#0830:02

在 "select the Inputs" 分组内勾选 "16#1A84" 、 "16#1AC4" ,这样就设置了 Profibus Inputs 的 DP1 和 DP2 子站通信状态。

	Profibus Inputs										
	16#1B02 16#1B03										
16#1A84					16#1AC4						
DP1 S1	DP1 S2	DP1 S3	DP1 S4	DP1 S5	DP2 S1	DP2 S2	DP2 S3	DP2 S4	DP2 S5		
Status	Status	Status	Status	Status	Status	Status	Status	Status	Status		

evices 🗸 🕈 🖌 🛃 MainTask	PLC_PRG	PCM61 🔐 EtherCAT_Master 🖉 IFM61 🗙	
General	Select the Outputs	Select the Inputs	
Process Data	Name Type Inde	Name Type	Index
Application	16#1600 DP 1 outputs	16#1A84 DP 1 slave status	
Library Manager Startup Parameters	DP1 S1 Byte array slave-in ARRAY [ 16#7000:0	DP1 51 Status USINT	16#F102:01
PLC_PRG (PRG)		DP1 S2 Status USINT	16#F102:02
E-10 Task Configuration EtherCAT I/O Mapping		DP1 S3 Status USINT	16#F102:03
EtherCAT_Task (IEC-Tasks		DP1 S4 Status USINT	16#F102:04
EtherCAT IEC Objects		DP1 S5 Status USINT	16#F102:0
PLC_PRG	□ 16#1601 DP 1 outputs		
EtherCAT_Master (EtherCAT Master)	DP1 S2 Byte array slave-in ARRAY [ 16#7010:0	16#1A85 DP 1 master status	
= 1 PCM61 (PCM6.1 Computer Module)		DP1 Bus error counter UINT	16#F101:0
IFM61 (IFM6.1 Interface and F Information		DP1 Cycle counter UINT	16#F101:0
		DP1 Slave status counter UINT	16#F101:0
		DP1 Cycle time UINT	16#F101:04
	16#1602 DP 1 outputs	DP1 Repeat counter UINT	16#F101:0
	DP1 S3 Byte array slave-in ARRAY [ 16#7020:0	DP1 Device diag BIT	16#F101:2
		DP1 Sync error BIT	16#F101:2
		DP1 Cycletoggle BIT	16#F101:2
		DP1 Cycle state BIT	16#F101:2
	16#1603 DP 1 outputs	16#1AC3 DP 2 slave diag flags	
	DP1 S4 Byte array slave-in ARRAY [ 16#7030:0		
		DP2 S1 Diag flag BIT	16#+10/:0
		DP2 S3 Diag flag BIT	16#F107:0
		DP2 S3 Diag flag BIT	16#F107:0
		DP2 54 Diag flag BIT	16#F107:0
	16#1604 DP 1 outputs	DP2 SS Diag flag BIT	16#F107:0
	DP1 S5 Byte array slave-in AKKAY [ 16#7040:0		
		V 10#1AC4 DP 2 slave status	

程序中声明数据输入输出数组(122字节)和子站状态变量以后,在"EtherCAT I/O Mapping"页面关联 DP 数据 slave-in/master-out 和 slave-out/master-in 数组以及 DP 子站状态变量。

Demo4.5_IFM61_Profibus.project - CODESYS		
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Devices $\checkmark$ $\downarrow$ $\checkmark$	X IFM61 I PLC_PRG X	
Demo4.5_IFM61_Profibus	I PROGRAM PLC_PRG	
Device (PCM6.1 Practek)	2 VAR	
PLC Logic	A DrofibusDP MasterOUT DPIS1 : ARAT [0121] OF BILE;	
🖹 🌍 Application	FIGHDUSDE_MasterOUT_DELS2 : ARACI [0121] OF BILE, EnofibueDE MasterOUT_DELS3 : ADDAY [0121] OF BYTE:	
📶 Library Manager	6 ProfibusDP MasterOUT DPIS4 : ARRAY [0., 121] OF BYTE:	
PLC_PRG (PRG)	7 ProfibusDP MasterOUT DP155 : ARRAY [0.,121] OF BYTE:	
= 🔣 Task Configuration	8	
EtherCAT_Task (IEC-Tasks	9 ProfibusDP MasterIN DP1S1 : ARRAY [0121] OF BYTE;	
□ 🕸 MainTask (IEC-Tasks)	10 ProfibusDP_MasterIN_DPIS2 : ARRAY [0121] OF BYTE;	
DLC PRG	<pre>11 ProfibusDP_MasterIN_DP1S3 : ARRAY [0121] OF BYTE;</pre>	
EtherCAT Master (EtherCAT Master)	12 ProfibusDP_MasterIN_DP1S4 : ARRAY [0121] OF BYTE;	
PCM61 (PCM6.1 Computer Module)	13 ProfibusDP_MasterIN_DP1S5 : ARRAY [0121] OF BYTE;	
IEM 1 (TEM6.1 Interface and E	-/ 14	
	15 ProfibusDP_Status_DP1S1 : USINT;	
	<pre>16 ProfibusDP_Status_DP1S2 : USINT;</pre>	
	<pre>17 ProfibusDP_Status_DP1S3 : USINT;</pre>	
	<pre>18 ProfibusDP_Status_DPIS4 : USINT;</pre>	
	19 ProfibusDP_Status_DPIS5 : USINT;	
	20 21 DestinueDD MasterOUT DD2C1 , ADDAY (0, 1211 OF BYTTE,	
	21 ProfibusDP_MasterOUT_DP2S1 : ARAT [0121] OF BILE; 22 ProfibusDP_MasterOUT_DP2S2 : APDAY [0121] OF BYTE:	
	23 ProfibueDD MasterOUT DD252 : ARAMI [0121] OF BITE,	
	24 ProfibusDP MasterOUT DP254 : ARRAY [0., 121] OF BYTE:	
	25 ProfibusDP MasterOUT DP2S5 : ARRAY [0.,121] OF BYTE:	
	1 ;	
1		

IFM61 X

General	Find	Filter Show all		- 🕂 Add FB	for IO Channel	→ Go to Instance	
Process Data	Variable		Mapping	Channel	Address	Туре	
Process Data	■ * Application.PLC_PR	G.ProfibusDP_MasterOUT_DP1S1	~⊘	DP1S1Byte array slave-in/master-out	%QB2	ARRAY [0121] OF BYTE	: )
Startup Parameters	. ★ Application.PLC_PR	G.ProfibusDP_MasterOUT_DP1S2	۵	DP1S2Byte array slave-in/master-out	%QB124	ARRAY [0121] OF BYTE	:
	Application.PLC_PR	G.ProfibusDP_MasterOUT_DP1S3	۵	DP1S3Byte array slave-in/master-out	%QB246	ARRAY [0121] OF BYTE	:
EtherCAT I/O Mapping	Application.PLC_PR	G.ProfibusDP_MasterOUT_DP1S4	<b>~</b>	DP1 S4 Byte array slave-in/master-out	%QB368	ARRAY [0121] OF BYTE	:
	Application.PLC_PR	G.ProfibusDP_MasterOUT_DP1S5	<b>~</b>	DP1S5Byte array slave-in/master-out	%Q8490	ARRAY [0121] OF BYTE	:
EtherCAT IEC Objects	Application.PLC_PR	G.ProfibusDP_MasterOUT_DP2S1	<b>~</b>	DP2 S1 Byte array slave-in/master-out	%Q8612	ARRAY [0121] OF BYTE	:
	Application.PLC_PR	G.ProfibusDP_MasterOUT_DP2S2	۵.	DP2 S2 Byte array slave-in/master-out	%QB734	ARRAY [0121] OF BYTE	:
Status	Image: State S	G.ProfibusDP_MasterOUT_DP2S3	۵	DP2 S3 Byte array slave-in/master-out	%QB856	ARRAY [0121] OF BYTE	:
Information	Application.PLC_PR	G.ProfibusDP_MasterOUT_DP2S4	۵	DP2 S4 Byte array slave-in/master-out	%Q8978	ARRAY [0121] OF BYTE	:
Information	Application.PLC_PR	G.ProfibusDP_MasterOUT_DP2S5	۵	DP2 S5 Byte array slave-in/master-out	%QB1100	ARRAY [0121] OF BYTE	:
	😟 🌠			COM1 Ctrl	%QW611	UINT	
	iii <b>*</b> ⊘			COM1 Data out 0	%QB1224	BYTE	
	🛱 🍢			COM1 Data out 1	%QB1225	BYTE	
	L do KA						

eneral	Find Filter St	how all	- 🕂 Add FB	for IO Channe	I → Go to Instance		
ocess Data	Variable	Mapping	Channel	Address	Туре	Unit	Description /
Jeess Data	Application.PLC_PRG.ProfibusDP_MasterIN_DP1	S1 🍞	DP1S1Byte array slave-out/master-in	%IB2	ARRAY [0121] OF BYTE		DP1S1Byte
rtup Parameters	Application.PLC_PRG.ProfibusDP_MasterIN_DP1	S2 🍞	DP1 S2 Byte array slave-out/master-in	%IB124	ARRAY [0121] OF BYTE		DP1S2Byte
	Application.PLC_PRG.ProfibusDP_MasterIN_DP1	53 🍞	DP1 S3 Byte array slave-out/master-in	%IB246	ARRAY [0121] OF BYTE		DP1S3Byte
erCAT I/O Mapping	Application.PLC_PRG.ProfibusDP_MasterIN_DP1	S4 🇳	DP1 S4 Byte array slave-out/master-in	%IB368	ARRAY [0121] OF BYTE		DP1 S4 Byte
	Application.PLC_PRG.ProfibusDP_MasterIN_DP1	S5 🍞	DP1 S5 Byte array slave-out/master-in	%IB490	ARRAY [0121] OF BYTE		DP1 S5 Byte
erCAT IEC Objects	B- Application.PLC_PRG.ProfibusDP_MasterIN_DP2	IS1 🍞	DP2 S1 Byte array slave-out/master-in	%IB612	ARRAY [0121] OF BYTE		DP2 S1 Byte
	Application.PLC_PRG.ProfibusDP_MasterIN_DP2	IS2 🍞	DP2 S2 Byte array slave-out/master-in	%IB734	ARRAY [0121] OF BYTE		DP2 S2 Byte
tus	Application.PLC_PRG.ProfibusDP_MasterIN_DP2	IS3 🇳	DP2 S3 Byte array slave-out/master-in	%IB856	ARRAY [0121] OF BYTE		DP2 S3 Byte
	Application.PLC_PRG.ProfibusDP_MasterIN_DP2	IS4 🍞	DP2 S4 Byte array slave-out/master-in	%IB978	ARRAY [0121] OF BYTE		DP2 S4 Byte
rmation	Application.PLC_PRG.ProfibusDP_MasterIN_DP2	IS5 🍞	DP2 S5 Byte array slave-out/master-in	%IB1100	ARRAY [0121] OF BYTE		DP2 S5 Byte
	Application.PLC_PRG.ProfibusDP_Status_DP1S1	۵۵	DP1S1Status	%IB1222	USINT		DP1S1Stat
	Application.PLC_PRG.ProfibusDP_Status_DP1S2	۵.	DP1 S2 Status	%IB1223	USINT		DP1 S2 Stat
	Application.PLC_PRG.ProfibusDP_Status_DP1S3	۰	DP1 S3 Status	%IB1224	USINT		DP1S3Stat
	Image: Application.PLC_PRG.ProfibusDP_Status_DP1S4	۰	DP1 S4 Status	%IB1225	USINT		DP1 S4 Stat
	Application.PLC_PRG.ProfibusDP_Status_DP1S5	۵	DP1 S5 Status	%IB1226	USINT		DP1 S5 Stat
	Application.PLC_PRG.ProfibusDP_Status_DP2S1	<b>*</b>	DP2 S1 Status	%IB1228	USINT		DP2 S1 Stat
	Application.PLC_PRG.ProfibusDP_Status_DP2S2	۰	DP2 S2 Status	%IB1229	USINT		DP2 S2 Stat
	Image: Application.PLC_PRG.ProfibusDP_Status_DP2S3	۵.	DP2 S3 Status	%IB1230	USINT		DP2 S3 Stat
	Application.PLC_PRG.ProfibusDP_Status_DP2S4	<b>*</b>	DP2 S4 Status	%IB1231	USINT		DP2 S4 Stat
	Application.PLC_PRG.ProfibusDP_Status_DP2S5	<b>*</b>	DP2 S5 Status	%IB1232	USINT		DP2 S5 Stat
	iii		COM1 Status	%IW617	UINT		COM1 Statu
	iii - ¥≱		COM1 Data in 0	%IB1236	BYTE		COM1 Data
			COM1 Data in 1	%IB1237	BYTE		COM1 Data
	10 - <b>1</b> 0		COM1 Data in 2	%IB1238	BYTE		COM1 Data
	<						>
	COM1 Data in 1		Reset Mapping Always upda	tevariables (	Use parent device setting		

IFM6.1 Profibus DP Master 端口需要设置 8 个启动参数, 分别为 Termination、 Bias、Master address、Data rate、Station address、Ident number、PRM data、 CFG data。Profibus DP1 端口启动参数设置如下, Profibus DP2 端口设置方法相同。

点击设备"IFM61"、"Startup Parameters"、"Add"开始添加启动参数,弹出对 话框中设置相应的启动参数。每次点击"Add"新建启动参数只能添加一个参数,添加多个 启动参数则需要多次点击"Add"新建。

vices 👻 🕂 🕂	X IFM61 X PLC_PRG						
Demo4.5_IFM61_Profibus	General 3	🕂 Add 📝 Edit 🗙 Delete	🕆 Move Up 🐥 Move Down				
Deckee ( children for the certify     Deckee ( children for the c		Line Index:Subindex	Name Value				
=- 💮 Application	Process Data						
Library Manager	Startup Parameters	Select Item from Object	Directory				
PLC_PRG (PRG)							
Task Configuration	EtherCAT I/O Mapping	Index:Subindex	Name	Flags	Type	Default	
EtherCAT_Task (IEC-Tasks)	The CAT IFC Objects		COM 1 baud rate				
	EtherCAT IEC Objects	· 16#8801:16#00	COM 1 data frame				
EtherCAT Master (EtherCAT Master)	Status		COM 1 feature bits				
PCM61 (PCM6, 1 Computer Module)		I6#8803:16#00	COM 1 Rx buffer full notification				
IFM61 (IFM6.1 Interface and Fieldbur	s M Information	* 16#8810:16#00	COM 2 baud rate				
		# 16#8811:16#00	COM 2 data frame				
1		* 16#8812:16#00	COM 2 feature bits			4	
1		16#8813:16#00	COM 2 RX buffer full notification				<b>_</b>
		:16#01	Termination	RW	USINT	16#00	
		:16#02	Bias	RW	USINT	16#00	
		# 16#8832:16#00	COM 4 (DP 2) feature bits				_
		I6#F800:16#00	DP 1 bus parameter set				
		I6#F840:16#00	DP 2 bus parameter set				
							— <u>6</u> ^
		Name Te	rmination				
		Index: 16# 88	22 Sit length 8			÷	ОК

▶ 16#8822:16#00 COM3(DP1) feature bits 设置:

分项 16#01 Termination, Value 设置为 True。

分项 16#02 Bias, Value 设置为 True。

▶ 16#F800:16#00 DP1 bus parameter set 设置:

分项 16#01 Master address, Value 设置为 1 且不同于子站站号。

分项 16#02 Data rate, Value 按实际波特率设置。

▶ 16#8000:16#00 DP1 communication parameter slave 1 设置:

分项 16#01 Station address, Value 按实际子站站号设置。

分项 16#04 Ident number, Value 按实际子站 GSD 参数设置。

▶ 16#8001:16#00 DP1 PRM data slave 1 设置:

PRM data 需要根据实际连接的子站配置信息确定,比如子站 Ident number 为 0x06FC,Own PrmData 为 C0 00 08 0C。则勾选"Byte array"后填入 PRM data 为 16#88,16#01,16#64,16#0B,16#06,16#FC,16#00,16#C0,16#00,16#08,16#0C。



▶ 16#8002:16#00 DP1 CFG data slave 1 设置:

CFG data 需要根据实际连接的子站配置信息确定,比如子站 Own PrmData 为 C0 00 08 0C。则勾选"Byte array"后填入 CFG data 为 16#C0,16#00,16#08,16#0C。

월 🗐 🕘   이 여 분 🖻 🖹 🗙 ( 🏘 (	14 de 14      11 11 11 11 11	🕝 📑 🔛   Application [Device	e: PLC Logic] 🝷 📽 🕬 🕟 🔳 🔏 🛛	ji fi d	∎ *≣ Ş	> ¢ ∰  <del> </del>  ₹
vices 🗸	4 X IFM61 X PLC_PR	G				
Demo4.5_IFM61_Profibus	General	🕂 Add 🗹 Edit 🗙 Delet	e 🔮 Move Up 😽 Move Down			
E I PLC Logic	Process Data	Select Item from Objec	t Directory			
Library Manager     PIC PRG (PRG)	Startup Parameters				_	
E W Task Configuration	EtherCAT I/O Mapping	Index:Subindex	Name	Flags	Туре	Default
🍪 EtherCAT_Task (IEC-Tasks)	current yo hopping	16#1B02:16#00	TxPDO-Map COM 3 (DP 1) inputs			
🖻 😻 MainTask (IEC-Tasks)	EtherCAT IEC Objects	16#1003:16#00	RxPDO-Assign			
PLC_PRG	<b>2</b> • • •	■ 16#1C13:16#00	TxPDO-Assign			
EtherCAT_Master (EtherCAT Master)	Status	· 16#7800:16#00	COM 1 outputs			
PCM61 (PCM6.1 Computer Module)	Information	€ 16#7810:16#00	COM 2 outputs			
		16#8000:16#00	DP 1 communication parameter slave 1			
		16#8001:16#00	DP 1 PRM data slave 1	RW	BYTE	16#000000000000000000000000000000000000
		16#8002:16#00	DP 1 CFG data slave 1	RW	BYTE	16#000000000000000000000000000000000000
		16#8010:16#00	DP 1 communication parameter slave 2	DW	PVTC.	16 #000000000000000000000000000000000000
		16#8012:16#00	DP 1 CEG data slave 2	RW	BYTE	16#000000000000000000000000000000000000
		16#8020:16#00	DP 1 communication parameter slave 3		Diric.	20.000000000000000000000000000000000000
		16#8021:16#00	DP 1 PRM data slave 3	RW	BYTE	16#000000000000000000000000000000000000
		16#8022:16#00	DP 1 CFG data slave 3	RW	BYTE	16#000000000000000000000000000000000000
		Name DP	1 CFG data slave 1			
		Index: 16# 80	02 🖨 Bit length 8			
		SubIndex: 16# 0	Value 16#0	0 16#00 1	5#08 16:	#0C

IFM6.1 Profibus DP 启动参数设置参考例程 Demo4.5\_IFM61\_Profibus, DP1 端口启

动参数设置完成如下所示, DP2 启动参数设置方法相同。

Demo4.5.1.project* - CODESYS							
<u>File Edit View Project Build Online De</u>	bug <u>T</u> ools <u>W</u> indow <u>H</u> elp						
🎦 🚅 📓 🕼 🖙 🌡 📾 🔛 🖊 🎼 🎼	🖢 🌿 🗍 🖄 🦄 🖓 🖓 🐘	- nî i 🎬 i	Application [Device	PLC Logic] 🔹 😋 🔍	· · · · · · · · · · · · · · · · · · ·		
Devices 👻 🕂 🗙	IFM61 X						
B- Demo4.5.1							
E Movice (PCM6. 1 Practek)	General	-I- Hou	in care produce				
PLC Logic	Process Data	Line	Index:Subindex	Name	Value	Bit Length	
= Q Application		1	16#8822:16#01	Termination	True	8	
Library Manager	Startup Parameters	- 2	16#8822:16#02	Bias	True	8	
PLC_PRG (PRG)		- 3	16#F800:16#01	Master address	1	8	
Task Configuration	EtherCAT I/O Mapping	- 4	16#F800:16#02	Data rate	1.5 MBaud	8	
EtherCAT_Task (IEC-Tasks)		- 5	16#8000:16#01	Station address	40	16	
AainTask (IEC-Tasks)	EtherCAT IEC Objects	- 6	16#8000:16#04	Ident number	16#06,16#FC	16	
□ del PLC_PRG		- 7	16#8001:16#00	DP 1 PRM data slave 1	16#88,16#01,16#64,16#0B,16#06,16#FC,16#00,16#C0,16#00,16#08,16#0C	88	
EtherCAT_Master (EtherCAT Master)	Status	8	16#8002:16#00	DP 1 CFG data slave 1	16#C0, 16#00, 16#08, 16#0C	32	
PCM61 (PCM6.1 Computer Module) IFM61 (IFM6.1 Interface and Fieldbu	Information						

#### 4.5.2 串口程序配置

IFM6.1 通信模块具有 2 个 RS-485 端口,支持 Modbus-RTU 通信,支持 IFM6.1 作为 主站与外接传感器或其他设备通讯。

IFM6.1 COM 端口 Modbus-RTU 需要设置 4 个启动参数, 分别为 Termination、

Bias、Baud rate、Frame format。IFM6.1 COM1 Modbus-RTU 通信启动参数设置如下,

COM2 端口设置方法相同。

点击设备"IFM61"、"Startup Parameters"、"Add"开始添加启动参数,弹出对

话框中设置相应的启动参数。每次点击"Add"新建启动参数只能添加一个参数,添加多个

启动参数则需要多次点击"Add"新建。

ces 👻 🕂 🕹	K IFM61 X PLC_PRG					
Demo 4. 5_IFM61_Profibus	General 2	🕂 Add 📝 Edit 🗙 Delete	e 🔮 Move Up 🍦 Move Down			
- III PLC Logic  - C Application	Process Data	Select Item from Object	t Directory			
Ibrary Manager     Ibrary Manager     PLC PRG (PRG)	Startup Parameters					
Task Configuration	EtherCAT I/O Manning	Index:Subindex	Name	Flags	Туре	Default
EtherCAT_Task (IEC-Tasks)	Endrext yo hopping	16#8431:16#00	DP 2 PRM data slave 4	RW	BYTE	16#000000000000000000000000000000000000
😑 🍪 MainTask (IEC-Tasks)	EtherCAT IEC Objects	16#8432:16#00	DP 2 CFG data slave 4	RW	BYTE	16#000000000000000000000000000000000000
DIC_PRG		± 16#8440:16#00	DP 2 communication parameter slave 5			
EtherCAT_Master (EtherCAT Master)	Status	16#8441:16#00	DP 2 PRM data slave 5	RW	BYTE	16#000000000000000000000000000000000000
PCM61 (PCM6.1 Computer Module)		16#8442:16#00	DP 2 CFG data slave 5	RW	BYTE	16#000000000000000000000000000000000000
IFM61 (IFM6.1 Interface and Fieldbus	s M Information	16#8800:16#00	COM 1 data frame			
L	4	16#8801:16#00	COM 1 data frame			
1		16#00	Termination	DW	LISTNT	16#00
1		:16#02	Bias	RW	USINT	16#00
		±− 16#8803:16#00	COM 1 Rx buffer full notification		00111	10000
		* 16#8810:16#00	COM 2 baud rate			
		· 16#8811:16#00	COM 2 data frame			
		· 16#8812:16#00	COM 2 feature bits			
		I6#8813:16#00	COM 2 Rx buffer full notification			
		<				<u> </u>
		Name Te	ermination			

▶ 16#8802:16#00 COM1 feature bits 设置:

分项 16#01 Termination, Value 设置为 True。

分项 16#02 Bias, Value 设置为 True。

▶ 16#8800:16#00 COM1 baud rate 设置:

分项 16#01 Baud rate, Value 按需设置波特率。

▶ 16#8801:16#00 COM1 data frame 设置:

分项 16#01 Frame format, Value 按需设置报文格式。

IFM6.1 COM1 端口 Modbus-RTU 启动参数设置完成,硬件通道变量链接需要使用

"AT" COM 端口地址方式,不可以使用常用的"Mapping"。输入数组首位绑定 COM

端口 Status 地址, 输出数组首位绑定 COM 端口 Ctrl 地址。绑定地址可能跟随 IFM6.1 所

处位置变化而发生变化,需要注意核对地址是否正确。参考例程

Demo4.5 IFM61 ModbusRTU。



## 4.6 IFM6.2 程序配置

#### 4.6.1 CANopen 程序配置

IFM6.2 通信模块具有 2 个 CAN 端口, CANopen 程序配置方法与 PCM6.1 基本相

同,此处不再赘述。

#### 4.6.2 SSI 程序配置

IFM6.2 通信模块具有 2 个 SSI 端口,在 "EtherCAT I/O Mapping"中将变量关联到

硬件通道上。

控制平台 AWP100 基础编程手册

File Edit View Project Build Online Debug	lools <u>W</u> indow <u>H</u> elp						
🖹 🚅 🔛   🚝   🗠 🖂 🖁 🛍 📉   🛤 😘 🐴 🚰	川州州州门匾 圖一 🔓	Application [Device: PLC	Logic] 🔹 👒 👒 🕠	🔳 🚜   Či 👌 🦷	:*18 ¢  <b>≣</b>  =	1 1/2	
Devices – 4 X	IFM62 🗙						
=- 👔 Demo4.6		Find	Filter	Shaw all			Channel +=
Device (PCM6.1 Practek)	General	rinu	Filter	Show all		Add PB TO TO	channel
E II PLC Logic	Process Data	Variable		Mapping	Channel	Address	Туре
C Application	1100000 0000	- *>			SSI 1 Data error	%IX224.0	BIT
Library Manager	Startup Parameters	- *>			SSI 1 Frame error	%IX224.1	BIT
PLC_PRG (PRG)		- *			SSI 1 Data mismatch	%IX224.2	BIT
Task Configuration	EtherCAT I/O Mapping	- *			SSI 1 TxPDO State	%IX225.6	BIT
EtherCAT_Task (IEC-Tasks)		¥			SSI 1 TxPDO Toggle	%TV225 7	BIT
B G Parce Backs)	EtherCAT IEC Objects	H- W Application.PLC_PL	RG.IFM62_SSI_1_CounterV	alue 🐐	SSI 1 Counter value	%ID57	UDINT
EtherCAT Master (EtherCAT Master)	Status Information				SSI 2 Data error	%IX232.0	BII
Enercal_Master (Enercal Master)		- 10			SSI 2 Frame error	%IX232.1	BIT
PCM61 (PCM6.1 Computer Module)		- *			SSI 2 Data mismatch	%IX232.2	BIT
IFM62 (IFM6.2 Interface and Fieldbus Module)		- *			SSI 2 TxPDO State	%IX233.6	BIT
A CAN 1		- *			SSI 2 TxPDO Toggle	%IX233.7	BIT
3 CAN 2		Application.PLC_P	RG.IFM62_SSI_2_CounterV	alue 🛯 🧳	SSI 2 Counter value	%ID59	UDINT
					FREQ 1 State	7617240.0	BIT
		- *>			FREQ 1 TxPDO State	%IX241.6	BIT
		- *>			FREQ 1 TxPDO Toggle	%IX241.7	BIT
		🗰 - 🍫			FREQ 1 Counter value	%ID61	UDINT

点击设备"IFM62"、"Startup Parameters"、"Add"新建启动参数,在弹出对话 框内选择需要配置的参数进行配置。每次点击"Add"新建启动参数只能添加一个参数,添 加多个启动参数则需要多次点击"Add"新建。

SSI 端口需要配置 2 个启动参数,分别为 Frame size 和 Data length。例如编码器 Baumer GM400.Z103,8192 × 4096,25 bit Gray code,由于此编码器是 25 位格雷码则 Frame size 设置为 25,由于此编码器 8192 × 4096 则 Data length 设置为 25。参考例程 Demo4.6\_IFM62。

🐞 Demo4.6.project* - CODES	YS									
<u>File Edit View Proje</u>	ct <u>B</u> uild <u>O</u> nline	<u>D</u> ebug <u>T</u>	ools <u>W</u> indow	<u>H</u> elp						
11 12 12 12 12 12 12 12 12 12 12 12 12 1	• • • × •	्र 🐴 🚰	医骨骨	🛱 🛅 🖬 🔓	Applica	ation [Device: PLC Log	jic] 🔹 😋 😋	→ =	<b>%</b>   (1 - 1 - 0	¢  \$ ≣* ≝
Devices		<b>- - - ×</b>	IFM62 >	<						
Demo 4.6     Device (PCM6.1 Prace)	tek)	•	General		🕂 Add	🗹 Edit 🔀 Delete 🕂	🗈 Move Up 🛛 🦊	Move Dowr	n	
			Process Data	Line	Index:Subindex	Name	Value	Bit Length	Abort on Error	
				( <sup></sup> 1	16#8020:16#11	Frame size	25	16		
			Startup Parame	eters	- 2	16#8020:16#12	Data length	25	16	
			EtherCAT I/O N	1apping						
			EtherCAT IEC 0	Objects						
			Status							
		eldbus Module	Information							
	1 2									

#### 4.6.3 FI 程序配置

IFM6.2 通信模块具有 2 个 FI (Digital Frequency Input) 端口, 在 "EtherCAT I/O Mapping" 中将变量关联到硬件通道上。Counter Value 将在每个输入脉冲的上升沿递增, 两个脉冲周期间隔时间为 10 ns。参考例程 Demo4.6\_IFM62。

		Application [Device: PLC Logi		≝ d- <u>1</u> +1	\$ ¢ ∰ ≓ ∛		
Demo4.6 IFM62				102_11			
Device (PCM6.1 Practek)	General	Find	Filter Show all		- 4	Add FB for IO Cha	nnel <sup>→</sup> Go te
⊨- ■- PLC Logic		Variable	м	lapping	Channel	Address	Туре
🖹 🔘 Application	Process Data				SSI 1 Data error	%IX224.0	BIT
- 👔 Library Manager	Startun Parameters				SSI 1 Frame error	%IX224.1	BIT
IFM62_FI (PRG)	Startop Forometers	- *			SSI 1 Data mismatch	%IX224.2	BIT
PLC_PRG (PRG)	EtherCAT I/O Mapping				SSI 1 TxPDO State	%IX225.6	BIT
🖹 🌃 Task Configuration		- *			SSI 1 TxPDO Toggle	%IX225.7	BIT
😻 EtherCAT_Task (IEC-Tasks)	EtherCAT IEC Objects	Application.PLC_PRG.IF	M62_SSI_1_CounterValue	<b>~</b>	SSI 1 Counter value	%ID57	UDINT
🖻 👹 MainTask (IEC-Tasks)					SSI 2 Data error	%IX232.0	BIT
PLC_PRG	Status				SSI 2 Frame error	%IX232.1	BIT
EtherCAT_Master (EtherCAT Master)	to farmer bland				SSI 2 Data mismatch	%IX232.2	BIT
PCM61 (PCM6.1 Computer Module)	Information	**			SSI 2 TxPDO State	%IX233.6	BIT
IFM62 (IFM6.2 Interface and Fieldbus Module		- *			SSI 2 TxPDO Toggle	%IX233.7	BIT
- 3 CAN 1		Application.PLC_PRG.IF	M62_SSI_2_CounterValue	~¢	SSI 2 Counter value	%ID59	UDINT
CANopen_Manager (CANopen_Manag					FREQ 1 State	%IX240.0	BIT
E 2 CAN 2					FREQ 1 TxPDO State	%IX241.6	BIT
CANopen_Device (CANopen Device)		*			FREQ 1 TxPDO Toggle	%IX241.7	BIT
		Application.IFM62_FI.IF	M62_FI_1_CounterValue	<b>~</b>	FREQ 1 Counter value	%ID61	UDINT
		1			FREQ 1 Period value	%ID62	UDINT
					FREQ 2 State	%IX252.0	BIT
					FREQ 2 TxPDO State	%IX253.6	BIT
		*			FREQ 2 TxPDO Toggle	%IX253.7	BIT
		Application.IFM62_FI.IF	M62_FI_2_CounterValue	<b>~</b>	FREQ 2 Counter value	%ID64	UDINT
		1 m · · · ·			FREO 2 Period value	%ID65	UDINT

#### 4.7 CMM6.1 程序配置

CMM6.1 为高频模拟量输入模块,具有2个端口,通常用来对机械部件振动情况进行 超采样,对采样数据进行频谱分析。

CMM6.1 需要设置 4 个启动参数, 分别为 Input type、Sensor excitation、Input range、Sample frequency。下面以通道 Ch 1 设置启动参数举例, 通道 Ch 2 设置启动参数方法相同。参考例程 Demo4.7 CMM61。

点击设备"CMM61"、"Startup Parameters"、"Add"新建启动参数,在弹出 对话框内选择需要配置的参数进行配置。每次点击"Add"新建启动参数只能添加一个参 数,添加多个启动参数则需要多次点击"Add"新建。

1) 22 문 [ 42   10 ~ ~ 3 = 10 = 10 × [ 44 5] 45 45 55 1 H 51 71 71 71 75 1 155	PRG MM61 X	vice: PLC Logic] 🔹 😋 🐗	→ = 4	[] न	1 ¢1 +1 ;	\$ ¢ ∰  <u>≓</u>   <sup>:</sup>	₹⁄
Demot.Z.CMM61     Device (PCM6.1 Practek)     Device	Select Item from Object	ete 🔮 Move Up 🔮 Move Do	wn				
Channelbescription (STRUCT)     Channels     ChannelsData     GuL_bf     GuL_sf     GuL_sf     GuL_sf     DLoray Manager     Enc_data (PRG)     PLC_PRG (PRG)     Gotto (PLC-Tasks)     DEnc_data     Gotto (PLC-Tasks)     DEnc_data     Gotto (PLC-Tasks)     DENc_Mata     DENc_Mata     Gotto (PLC-Tasks)     DENc_Mata     DENc_Mata	Index:Subindex	Name TxPDO-Assign Input type Ch 1 Sensor excitation Ch 1 Input range Ch 1 HW filter setting Ch 1 HW filter setting Ch 1 HW filter state Ch 1 ADC resolution Ch 2 Input type Ch 2 HW filter state Ch 2 ADC resolution Ch 2 HW filter state Ch 2 ADC resolution Ch 2 Sample frequency Ch 1 Sample frequency Ch 1 Sample frequency Ch 2 Simulator state	Flags	Type	Default	<ul> <li></li> <li></li></ul>	OK Cancel

▶ 16#8000:16#00 Input type Ch 1 设置:

分项 16#01 Input type, Value 设置为 AC Mode, 外接传感器输入交流信号。

▶ 16#8001:16#00 Sensor excitation Ch 1 设置:

分项 16#01 Sensor excitation, Value 按需设置传感器响应电流。

▶ 16#8002:16#00 Input range Ch 1 设置:

分项 16#01 Input range, Value 按需设置测量范围。

▶ 16#8100:16#00 Sample frequency Ch 1 设置:

分项 16#01 Sample frequency, Value 按需设置采样频谱。



CMM6.1 硬件通道链接只能通过代码定义 "AT" CMM61 数据地址,不可以使用

CMM61中"Mapping"。

Demo4.7_CMM61.project - CODESYS
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□ Demo4.7_CMM61
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