

工业机器人仿真与编程







搬运工作站可以完成物料的取料、放料的搬运工作,该任务使用 IRB120工业机器人与吸盘工具完成正方形物料的搬运,在过程中需要 配置I/O、建立吸盘工具坐标系、建立搬运物料工作台的工件坐标系、 建立Smart组件,程序的编写与调试,最终完成正方形物料的搬运工作。









1. 学会工业机器人常用I/O板DSQC652的设置方法。

2. 学会工业机器人I/O信号的设置方法。

3. 学会使用软件在离线状态下进行工具坐标及工件坐标的建立。







在项目三中我们介绍了如何在RobotStudio软件中使用虚拟示 教器进行配置I/O,其方法与真正的操纵工业机器人基本上是一样的, 在项目四中我们配置I/O的方法将会完全使用RobotStudio软件仿真 进行,虽然项目三和项目四的I/O配置方法不同,但是根据原理都是 一样的,其具体配置表各如表4-1所示。





参数名称	设定值
Name	Board10
Type of Unit	d652
Connected to Bus	DeviceNet
DeviceNet Adress	10





1)在RobotStudio下,打开子任务二完成的工作站,可看到wobj1。

2) 右键单击wobj1, 在下拉菜单中单击修改工件坐标。

3) 在 "banyunrenwu1" 工作站内,打开控制器选项卡,单击
"配置"下来菜单内的 "I/O System",进行I/O信号板的配置。
4) 在 "I/O System"内,右键单击 "DeviceNet Device",
在右侧窗口右键单击 "新建DeviceNet Device",创建一个新的标
准信号板。





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3) 在实例编辑器窗口,单击"使用来自模板的值"下拉菜单内的 "DSQC652 24 VDC I/O Device"。

4) 在 "I/O System"内,右键单击 "DeviceNet Device",在右侧窗口右键单击 "新建DeviceNet Device",创建一个新的标准信号板,如图所示。在该界面中按照表4-1将Name设置为 "Board10",代表地址为10的信号板,Adress就是地址设置为 "10",代表这个信号板在总线通讯过程中的地址为 "10",其余信息在选择DQSC652信号板之后会自动生成,最后单击确定后重启就可以完成I/O信号板的配置。



a	③ 实例编载器					×	18		20 S	萬錢设定		
0	使用来自接触的图	(武法)				v.	管 安全		1 to 11	创建关系		
-		all its			+			打开关系				
詽	名称	DeviceNet Ge	meric Device		-	唐拟控制器		传送				
	Name	ABB DeviceN	et Slave Device									
当前 T i	Connected to Indu	ABB DeviceN	et Anybus Slave Dev	vice		- ٩ -						
Sys	State when System	DSQC 651 Co	mbi I/O Device			ial Network State when System Startup Trust						
-	Trust Level	DSQC 652 24	VDC I/O Device									
1	Simulated	DSQC 653 Re DSQC 351B II	lay I/O Device 85 Adapter									
1	Vendor Name	DSQC 3788 C	Clink Adapter									
	Product Name	ACS00 PLC										
	Recovery Time (ms	0	5000									
1	Identification Labe	1		_								
	Address		63									
	Vendor ID		75									
-	Product Code		0									
	Device Type		0									
	Production Inhibit	Time (ms)	10									
	Connection Type		Polled	*								
	PollRate		1000									
	Connection Output	t Size (bytes)	0									
	Connection Input 9	lize (bytes)	0									
	Quick Connect		 Activated Deactivated 									
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③ 完整编辑器 使用来自模板的语 DSOC 652 24	VDC I/O Device		医素线液 美国間 美国間 美国間 美田田美 美田田美 美田田美		
510	19	6		虚拟控制器	传送
Name	Board10				
Connected to Industrial Network	DeviceNet	(3)			- 9,
State when System Startup	Activated	-		al Network State when System Sta	artap Tra
Trust Level	DefaultTrustLevel ~				
Simulated	O Yes				
No. I No.	No	2020.00			
Vendor Name	ABB KODOLICS	日本水			
Product Name	24 VUC I/O Device	Coeff.			
Mecovery Time (ms)	0000 660 04 UDC UD Davies	054			
Address	105QC 052 24 VDC I/O Device				
Vander ID	14				
Deadart Code	25	日面北			
Device Tune	7	日南山			
Production Inhibit Time (ms)	10	Coche			
Connection Type	Change-Of-State (COS)	已要改	-		
BollPate	1000				
Connection Output Size (butes)	2	日間次			
Connection (nput Size (bytes)	2	已建改			
Quick Connect	 Activated Deactivated 				
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		9		· · · · ·	-



5) I/O信号的配置,这里使用的吸盘只需要一个输出信号就可以控制,因此本任务中只有数字输出信号,按照表进行配置,在"I/O System"内,右键单击"Signal"(信号),在右侧窗口右键单击"新建Signal",创建一个新的数字输出信号。





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当前工作站	配置 - 1/O System X	All and a second			+		
A Systemi	典型	Name	Type of Signal	Assigned to Device	Signal Identification Lab		
E III HORE	Access Level	A81	Digital Input	P.WEL	Nutomatic Stop chain (X5:11		
- 11 東田	Cross Connection	182	Digital Input	PAINEL	Automatic Stop chain backu		
🔤 Companio ation	Device Trust Level	FOTUA	Digital Imput	PANEL	Automatic Mode (29:6)		
Controllar	DeviceNet Command	AUTO2	Digital Imput	PANSL	Automatic Mode backup(19.2		
I/O System	DaviosNet Device	031	Digital Input	PANSI.	Run Chain 1		
Var-Washing Company sation	DaviesNet Teternel Davies	CH2	Digital Input	PANEL	Run Chain Z		
. Webbier	PaberNet (10 Commend	DEVISEASE	Digital Output	DEV_1	Brake-release coil		
	tenenter) ip comand	DRV1BRAXE79	Digital Input	DRV_1	Brake Peedback (X3:6) at Co		
	EtherNet/IP Device	DRVIBRAXEOK	Digital Input	DRV_1	Brake Voltage OE		
▶ 篇 1/0 熟練	Industrial Network	DEVICERIMI.	Digite	Final	Chain 1 Interlocking Circu		
EAPID	Route	DRUTCHAINS	Digit 20	signal	Chain 2 Interlooking Circu		
	Signal (1)	DRVLENTCONT	Digit ATS#	Signal (2)	Esternal customer contacto		
	Signal Safe Lavel	DUVIPANI	Digita 200	Signal	Drive Unit FANICID:3 to X		
	System Input	DUV1FAN2	Digits #854	Signal	Drive Unit PANZ 0011:3 to X		
	System Output	DEVSKI	Digits and	- original	Contector El Reed Back cha		
	Sector Sector	DHV1K2	Digital Input	DRV_1	Contactor 52 Read Back cha		
		DRViLINi	Digital Imput	DEV_1	Limit Switch 1 (32s) at Co		
		DRV1LIM2	Digital Input	Lev_1	Limit Switch 2 (125) at Co		
		DEVEPANCHI	Digital Input	03V_1	Orive Voltage costdotor co		
		DEV SPANCES	Diffical lubra	UTV_1	Drive voltage contactor co		
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参数名称	设定值
Name	xi
Type of Signal	Digital Outpt
Assigned to Device	Board10
Device Mapping	16





6)在"新建Signal"窗口内,按照表将Name设置为 "xi"表示为吸盘动作,Type of Signal (信号类型)设置为 数字输出"Digital Output", Assigned to Device (归属 到设备)选择"Board10",即刚刚配置好的I/O信号板 Board10,这个数字输出信号的地址Device Mapping设置 为"16",如图所示。





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業権	12	185		安全 控制面板 摄	計畫國口 答	181
Name	xI	DEA			1000	1
Type of Signal	Digital Output -	CREW.		4810	GERUND.	
Assigned to Device	Board10 =	已更改				
Signal Identification Label		Sec.				1.01
Device Mapping	15	已要改		Assigned to Device	Signal Ident	111cm
Category				Protect	Automatic Stop	p cta
Access Level	Default	1		PANEL	Automatic Mode	0.029
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Detault value	0	1		PANEL.	Bun Chain 1	
Invert Physical Value	() Yes			PANEL	Ban Chain 2	
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				DEV_1 DEV_1 DEV_1 DEV_1	Brake Voltage Chain 1 Inter Chain 2 Inter External cust-	OE lock locki
				DBV_1 DBV_1 DBV_1 DBV_1 DBV_1 DBV_1	Brake Voltage Chain 1 Jatier Chain 2 Inter External custs Drive Unit FAD	GE Locki Iocki Iocki Iocki Iocki
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				DEV_1 DEV_1 DEV_1 DEV_1 DEV_1 DEV_1 DEV_1 DEV_1 DEV_1	Brake Voltage Chain 1 Inter Chain 2 Inter External custo Drive Unit FAU Drive Unit FAU Contertor X1 1	GE Locki Iocki NI (4) NI (4) Reed
				DEV_1 DEV_1 DEV_1 DEV_1 DEV_1 DEV_1 DEV_1 DEV_1 DEV_1	Brake Voltage Chain 1 Inter Chain 2 Inter External casts Drive Unit FAD Drive Unit FAD Contactor K1 1 Contactor K2 1	GE Locki oner N1 (4) Reed Reed Reed
				DEV_1 DEV_1 DEV_1 DEV_1 DEV_1 DEV_1 DEV_1 DEV_1 DEV_1 DEV_1 DEV_1 DEV_1 DEV_1 DEV_1 DEV_1	Brake Voltage Chain 1 Inter Chain 2 Inter External cust Drive Unit FAU Drive Unit FAU Contactor X1 1 Contactor X2 1 Limit Switch	GE locki locki oner N1(0) N2(0) Read Read L (32
				DEV_1 DE	Brake Voltage Chain 1 Inter Chain 2 Inter- Baternol costs Orive Unit FAI Drive Unit FAI Contactor E2 I Limit Switch 1 Limit Switch 2 Drive Voltage	GE locki oner N1(4) N2(4) Reed Eest 1 (32 2 (32 cont
				D3V_1 D3V_2 D3V_3 D3V_3 D3V_3 D3V_3 D3V_1 D3V_	Brake Voltage Choin 1 Jatier Chain 2 Inter Riternal costs Orive Unit FAJ Delve Unit FAJ Contactor X1 1 Contactor X2 1 Limit Switch Limit Switch Drive Voltage Drive Voltage	OE locki locki locki Ni (4) Ni (4) Ni (4) Ni (4) Read Evad L (3) L (3)L (3)L (3)L (3)L (3)
				D8V_1 D8	Brake Voltage Choin 1 Inter Chain 2 Inter Riternal cist Drive Unit Fal Contactor XI 1 Contactor XI 1 Contactor XI 1 Limit Switch Limit Switch Drive Voltage External Note	GE lock lock lock lock N1 (1) N2 (1)
				D8V_1 D8V_1 D8V_1 D8V_1 D8V_1 D8V_1 D8V_1 D8V_1 D8V_1 D8V_1 D8V_1 D8V_1 D8V_1 D8V_1	Brake Voltage Chain 1 Inter Chain 2 Inter Enternal cont Drive Unit Fal Contactor El Limit Seltch Limit Seltch Drive Voltage Enternal Notes	GE Lock oner N1 (1) Reed Reed L (32 cont cont r tee
				D3V_1 D3V_1 D3V_1 D3V_1 D3V_1 D3V_1 D3V_1 D3V_1 D3V_1 D3V_1 D3V_1 D3V_1 D3V_1 D3V_1 D3V_1 D3V_1 D3V_1	Brake Voltage Chain 1 Inter Chain 2 Inter Enternal costs Orive Unit FAD Contactor X1 Contactor X1 Contactor X1 Limit Switch Limit Switch Drive Voltage Drive Voltage External Note	OE lock lock lock not not not not not not not not not not
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Value (字符集) 控制器重点新更成才会生动。	■小学符数为 ×无效。	、最大字符数为	≪灭竦≻.	DBV_1 DB	Brake Voltage Choin 1 Inter Chain 2 Inter Enternal cost Orive Unit FAD Orive Unit FAD Contactor E1 1 Contactor E2 1 Limit Switch Limit Switch Drive Voltage External Noter	GE lock: oner N1 (A) Read Event 1 (32 2 (32 2 (32 2 (32 2 (32) 2





参数名称	设定值
Name	xi
Type of Signal	Digital Output
Assigned to Device	Board10
Device Mapping	16





7) 在图中,使用同样的方法创建"jh"数字输出信号 用作激活"Attacher"Smart组件使用,此处可以理解为 本任务中的虚拟信号,在实际工业机器人操作过程中,此 步骤可以忽略,不需要设置类似激活信号,然后单击确定 并重启,完成完成信号"xi""jh"的配置,如图所示。





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	the second	No			1	PANEL	ioft Auto Stop					Devised the Devise	There is a second se	DRVIEXTOON	Digital Input	DR7_1	External custoper contect
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					1 PANEL Soft Superior Stop						Signal	Signal	DEV1PWRCH2	Digital Input	DRV_1	Drive Voltage contactor c	
					PANEL Superior Stop chain(36:4				Signal Sa	Signal Safe Level	DRV1PTCENT	Digital Imput	DRV_1	External Motor temperatur			
					PANE. Superior Stop chain backs					System In	System Input	DRV1PTCINT	Digital Input	DRV_1	Notor temperature sarning		
					¥ .3	PANEL	Set status LED) to green :				Seaton De	trath	DRV1SF3ED	Digital Input	DRV_1	Speed Signal (X1:7) at Con
					1	PANEL	Set status LED) to green i						DEVITESTI	Digital Input	DKY_1	Ran chain 1 glitch test
					*	PANEL	Set status LED	to swi of 0						DRV1TE3T2	Digital Input	DR7_1	Run chain 8 glitch test
					ŧ	PANEL	Set status LED) to red fla						DRV1TE3T32	Bigital Output	DHV_1	Activate EXABLES glitch t
					1	PANEL.	Activete Glite	intest for b						DEV12480	Disital Inout	DK7_1	Drive Unit 2/02/X11-3 to
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