倍福 PC 组态森特奈 EtherCAT 协议



IO-LINK 主站及子站使用教程

1、本例中,使用 PC 端安装倍福 TwinCAT3 软件,连接一个森特奈符合 EtherCAT 协议的 IO-LINK 主站(ELCT-8IOL-0001),同时在第 5 个端口上连接一个森特奈的 IP20 16 路输入 +16 路输出混合型子站(SIOL-TL-16DIO)。

2、根据 TwinCAT 软件安装路径,按如图路径,将森特奈 EtherCAT 协议 IO-LINK 主站的 ESI 文件复制进去。



3、打开软件 TwinCAT XAE,新建一个工程

N	Start Page - Microsoft Visual Stu	dio						
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		Error List						

4、选择如图所示工程,并给工程取个名字(英文),并选择好存储路径,点击"ok"

New Project				? ×
▷ Recent		.NET Framework 4.5 Sort by: Default	- III 듣	Search Installed Templates (Ctrl+E)
▲ Installed		TwinCAT XAE Project (XML format)	TwinCAT Projects	Type: TwinCAT Projects
 Templates Other Project Types TwinCAT Measurement TwinCAT PLC TwinCAT PLC TwinCAT Projects Samples 				TwinCAT XAE System Manager Configuration
▷ Online			ad find boundable	
		<u>Click here to go online a</u>	nu nnu templates.	
<u>N</u> ame:	IO_LINK			
Location:	E:\TwinCAT\Pro	jects\	•	Browse
Solution name:	IO_LINK			Create directory for solution
				OK Cancel

5、要把电脑网卡添加进去,点击"TwinCAT"---"show Realtime Ethernet Compatible Devices"



6、选中本机的网卡后,点击"install"

Installation of TwinCAT RT-Ethernet Adapters	×
Ethernet Adapters	Update List
Installed and ready to use devices(realtime capable)	Install
└──뼃 以太网 - Realtek PCIe GBE Family Controller └──뼃 Compatible devices	Update
Horompatible devices WLAN - Intel(R) Dual Band Wireless-AC 8265	Bind
Disabled devices	Unbind

7、右键"PLC"----"Add New Item"



8、选中"Standard PLC Project",并取一个名称,点击"Add"

Add New Item - Twi	nCAT Project2						?	\times
▲ Installed		Sort by:	Default 👻			Search Installed Templates ((Ctrl+E)	٩.
Plc Templates		00	Standard PLC Project		Plc Templates	Type: Plc Templates		
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			<u>Click here to go o</u>	nline and find templates	<u>i.</u>			
<u>N</u> ame:	Untitled1							
Location:	E:\TwinCAT\Proje	ects\Twi	inCAT Project2\TwinCAT Proje	ect2\	•	<u>B</u> rowse <u>A</u> dd	Canc	이 전 전 문 문 문 문 문 문 문 문 문 문 문 문 문 문 문 문 문

9、点击 PLC 目录下的"POUs"---MAIN (PRG), 右侧就是编程界面



10、在"I/O"目录下,右键"Device"---Scan(此时要处于 Config mode),进行远程模块扫描,



依次出现如下画面,依次点击"确定"---"OK"---"是"---"是"

Microsoft Visual Studio $ imes$	
HINT: Not all types of devices can be found automatically	
确定取消	
1 new I/O devices found	×
▼Device 2 (EtherCAT) [以太网 (Realtek PCIe GBE Family Controller)]	OK Cancel Select All Unselect All
Microsoft Visual Studio × Scan for boxes	
是(Y) 否(N)	

Microsoft Visual Stu	idio ×							
Activate Free Run								
是(Y)	否(N)							

11、扫描完成后,在Device目录下就可以看见扫描出的森特奈IO-LINK主站模块以及第5端

口上的子站(SIOL-TL-16DIO),其余端口没有连接子站,所以在主站下面没有显示。

说明:模块在刚上电后,会自动检测并与8个端口上连接的IO-Link Device建立通信。如果此时EtherCAT未正常通信,执行扫描操作则会扫描出EtherCAT模块及每个端口的IO-Link Device。也可以手动对EtherCAT模块中的Slots进行更改。

注意:如果刚上电后EtherCAT与EtherCAT Master建立了正常通信,则模块将会按照组态中 Slots参数执行8个IO-Link端口的连接操作。如果想扫描8个端口连接的Device,则需先去除对 EtherCAT模块的组态,使其与EtherCAT Master断开通信,之后重新上电EtherCAT模块,再执 行自动扫描。



12、双击"BOX1(ELCT-8IOL-0001)",点击右侧"Slots",我们也可以查看到 8 个端口的连

接情况

Solution Explorer	• 4 ×	IO_LINK -⊨ ×	MAIN								
© ⊃ ☆ ™ → ₱ ₽ <mark>→</mark>		General Eth	erCAT Proce	ss Data Plo	S	lots	Startup	o Col	E - Onlin	e Onli	ine
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		€IO-LIN	NK PORT1			Emp	otyPort		0x00		
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🖌 🗃 Untitled1 Project		⊘ IO-LIN	NK PORT3			Emp	otyPort		0x00		
External Types		€IO-LIN	NK PORT4			Emp	otyPort		0x00	Х	
References		⊘ IO-LIN	NK PORT5			SIO	-TL-16	DIO	0x00		
📴 DUTs		⊘ IO-LIN	VK PORT6			Emp	otyPort		0x00		
🛅 GVLs		⊘ IO-LIN	NK PORT7			Emp	otyPort		0x00		
POUs		⊘ IO-LIN	NK PORT8			Emp	otyPort		0x00		
MAIN (PRG)											
P PICTASK (PICTASK)											
		Namo	Online	Тура	Sizo	<u>> ۸</u>	ln/	LIC	Linkod	to	
		R 8 Port IO	16	цемт	1.0	20.0	In/	05	LIIIKeu	10	
		Port IO	0		1.0	40.0	111 In	0			
Devices		Error Tim	0		1.0	40.0	111 In	0			
 Device 4 (EtherCAT) 		Error Tim	0		1.0	41.0	111 In	0			
🛟 Image		Error Tim	0	USINT	1.0	42.0	111 In	0			
🕂 Image-Info		Error Tim	0	LICINIT	1.0	43.0	111 In	0			
SyncUnits		Error Tim	0	LICINIT	1.0	44.0	111 In	0			
👂 🔜 Inputs		Error Tim	0	USINT	1.0	45.0	III	0			
Outputs		Error Tim	0	USINT	1.0	40.0	10 In	0			
🕨 🛄 InfoData		Enor hm	0	USINT	1.0	47.0		U			
Box 1 (ELCT-8IOL-0001)		Error List									

13、除了可以自动扫描外,还可以手动添加主站、子站模块,右键"Devices",点击"Add New

Item..."

▲ 🗐 Untitled1 I ▲ 🛄 PlcTask		
👻 I 🛅	Add New Item	Ins
	Add Existing Item	Shift+Alt+A
	Export EAP Config File	
🔜 🔤 🔍	Scan	
SAFETY	Paste	Ctrl+V
▲ 🔀 I/O	Paste with Links	
📲 Devices		EITOI LISU
📸 Mappings		Error List Out

14、选择"EtherCAT Master",点击"OK",然后选择正确的网卡,继续点击"OK"

Type: EtherCAT Ok	X
EtherCAT Automation Protocol (Network Variables) EtherCAT Automation Protocol via EL6601, EtherCAT EtherCAT Simulation EtherCAT Simulation Ethernet	



15,继续右键点击"Device1(EtherCAT)",点击"Add New Item…"

IO_LINK - Microsoft Visual St	udic)					
FILE EDIT VIEW PROJECT	BU	JILD	DEBUG	TWINCAT	TWINSAFE	PLC	TOOLS S
G - O 10 - 10 - 20	°	Add	New Item		Ins		
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Search Solution Explorer (Ctrl+;)		Save	Device 1	(EtherCAT) A	s		il onnie
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GVLs	Арр	Append Dynamic Container					
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A PICTASK INPUT		Char					
MAIN.X2	പ	Com			Ctrl+	C	
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MAIN.Y1	ക	Past	ρ		Ctrl+	V	Ad T
SAFETY		Past	e with Link	/s	curr	•	Au 1)
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▲ 🔽 I/O		inde	pendent r	TOJECT FILE			_
Devices	۰	Disa	ble				
	AI)						

16,、在弹出的对话框中,选中森特奈主站模块"ELCT-8IOL 8PORT IO-LINK",点击"OK"



17、双击"BOX1(ELCT-8IOL-0001)",点击右侧"Slots",选中"IO-LINK PORT5",然后点 击中间的"X",将该槽内的"Empty PORT"删除,然后在右侧找到森特奈子站型号"SIOL-TL-16DIO",选中后点击中间的"<",将子站加入端口 5 插槽内。如果是第三方子站,则找到对应 字节长度的通用子站,导入即可。另外如果删除端口内的子站后,必须导入一个空的插槽 "Empty PORT"。

MAIN 7 <mark>IO_LINK 7 ×</mark>						
General EtherCAT Process Data Plc	Slots Startup	CoE - Online	e Online			
Slot	Module	Modu	1		Modulelo	
O-LINK PORT1	EmptyPort	0x00F		EmptyP	ort	0x00FFFF
O-LINK PORT2	EmptyPort	0x00F	<	SIOL-M8	8-8DI	0x00010
IO-LINK PORT3	EmptyPort	0x00F		SIOL-TL	-16DIO	0x000103
e IO-LINK PORT4	EmptyPort	0x00F	x	SIOL-TL	-32DI	0x00010
IO-LINK PORT5	EmptyPort	0x00F		SIOL-TL	-32DO	0x00010
O-LINK PORT6	EmptyPort	0x00F		SIOL-M	12-16DI	0x00010
IO-LINK PORT7	EmptyPort	0x00F	•	SIOL-M	12-16DO	0x000102
O-LINK PORT8	EmptyPort	0x00F		SIOL-M	12-8DIO	0x000102
	-					1
Slot	Module	Modu	M	lodule		ModuleIde
●IO-LINK PORT1	EmptyPort	0x00F	0			0x00FFFFI
●IO-LINK PORT2	EmptyPort	0x00F	< 0	SIOL-M8-	0x000101	
●IO-LINK PORT3	EmptyPort	0x00F		SIOL-TL-1	0x000103	
●IO-LINK PORT4	EmptyPort	0x00F	X	SIOL-TL-3	0x000103	
IO-LINK PORT5			0	SIOL-TL-3	32DO	0x000103
€IO-LINK PORI6	EmptyPort	0x00F	0	SIOL-M12-16DI		0x000102
€IO-LINK PORT7	EmptyPort	0x00F	0	SIOL-M12	2-16DO	0x000102
€IO-LINK PORT8	EmptyPort	0x00F	0	SIOL-M12	2-8DIO	0x000102
	-	-				
Slot	Module	M	odu		1odule	
IO-LINK PORT1	EmptyPo	ort Ox	:00F	0	EmptyPo	ort
IO-LINK PORT2	EmptyPo	ort Ox	:00F	< 0	SIOL-M8	8-8DI
❷IO-LINK PORT3	EmptyPo	ort Ox	:00F	0	SIOL-TL-	16DIO
O-LINK PORT4	EmptyPo	ort Ox	:00F	x @	SIOL-TL-	32DI
IO-LINK PORT5	SIOL-TL-	16DIO _0x	000		SIOL-TL-	32DO
♥IO-LINK PORT6	EmptyPa	ort Ox	:00F	e	SIOI -M1	2-16DI
	EmptyPe	ort Ov	00F	0	SIOL-M1	2-16DO
	EmptyP	ort Ov	00F	à		2-8010
	LIIIPtyPt	71. UX				

18、子站模块为 2 个字节输入+2 个字节输出,双击"MAIN (PRG) ",如下图,定义 4 个字

节变量





19、编写完成后,右键"Untiled1 project"---"Build"

20、系统会自动编译这段代码,如果没有错误就会在消息栏中提示成功生成,并且在



"Untiled1 instance"中生成输入输出变量可供连接。

21、分别点"Untiled1 instance"中的输入输出变量开始进行变量连接,双击"MAIN,X1"----点 击"Linked to" ,在弹出的对话框中选中"BYTE_IN0>IB 51.0.BYTE[1.0]",点击 "OK"。(注: 如果子站比较多,可能会有多个"BYTE_IN0",为了防止选错,此时应该查看后面的地址,

比如"IB51.0",不同模块地址不同。)



22、用同样的方法将 X2 与"BYTE1_IN"、Y1 与"BYTE0_OUT"、、Y2 与"BYTE1_OUT"---

映射起来(做好映射的变量,左下角有个箭头图标)。然后就可以编写程序



23、选择"TwinCAT"-----"Active Configuration"激活配置,依次点击"确定"---"确定"





24、点击绿色箭头"Login",在弹出的对话框中点击"YES"

Visual Studio	T 2
BUILD DEBUG TWINCAT TWINSAFE PLC TOOLS SCOPE WINDOW HELP	
I L 口 白 ツ - ペ - ト Attach Release - TwinCAT RT (x64)	- 5
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▼ 및 X TwinCAT Project2 P X MAIN Logi	n HRE
Variable Flags Online	
Name: MAIN.input1]
Type: BOOL	
TwinCAT PLC Control	×
Application 'Port_851' does not exist on device 'TwinCAT_Project2'. Do you want to create it and proceed with download?	
Yes No Details	

25、随后点击工具栏上的绿色箭头"Start"启动程序。



			Release		<u>x04)</u>	P-
	<pre>Local></pre>	Ŧ	₽ Untitled1	▼ 1 ▼	-2 ▶ ■ €	G. G
١X	MAIN [Online]	[₽] × IO_LINK				
	IO_LINK.Untitle	ed1.MAIN				
	Expression			Туре	e Value	Pre
<u>۶</u>	X1			BYTE	1	
				BYTE	0	
	Y1			BYTE	1	
				BYTE	0	
	1 y1 1:	=x1 1;				
	2 RETURN					