

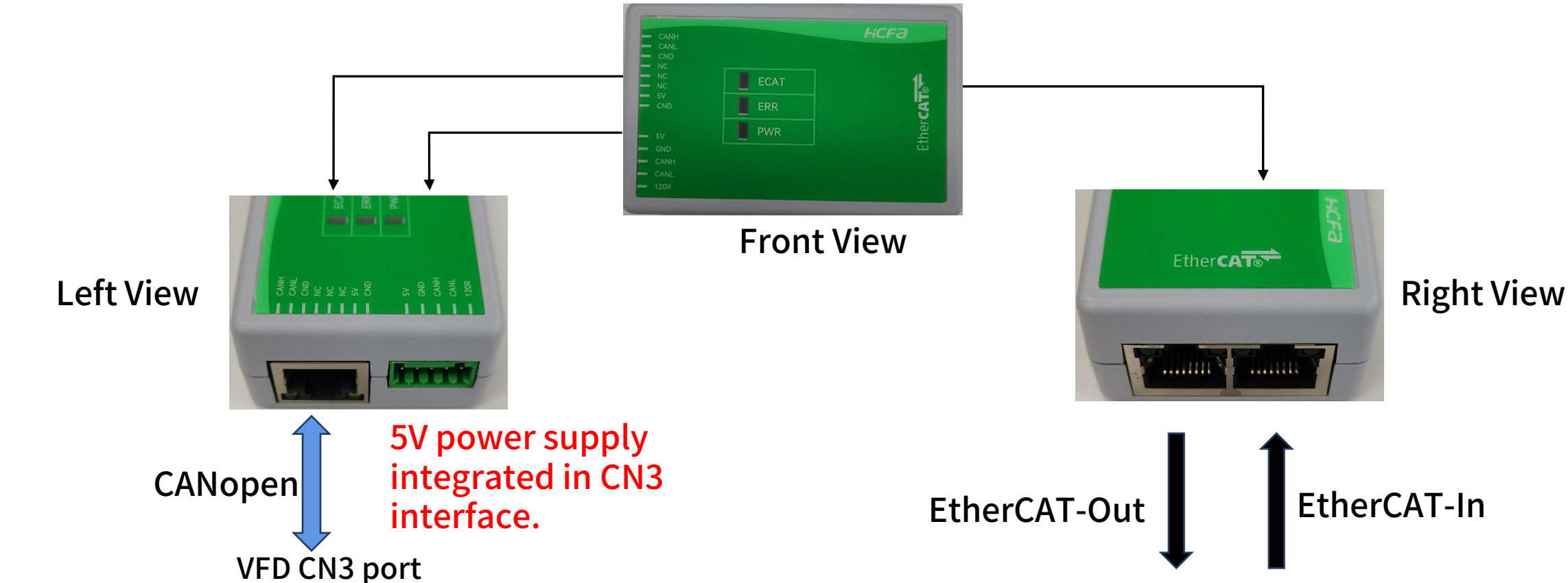


EtherCAT Coupler Communication Manual





Ethercat to CANOpen Communication Card Wiring Diagram



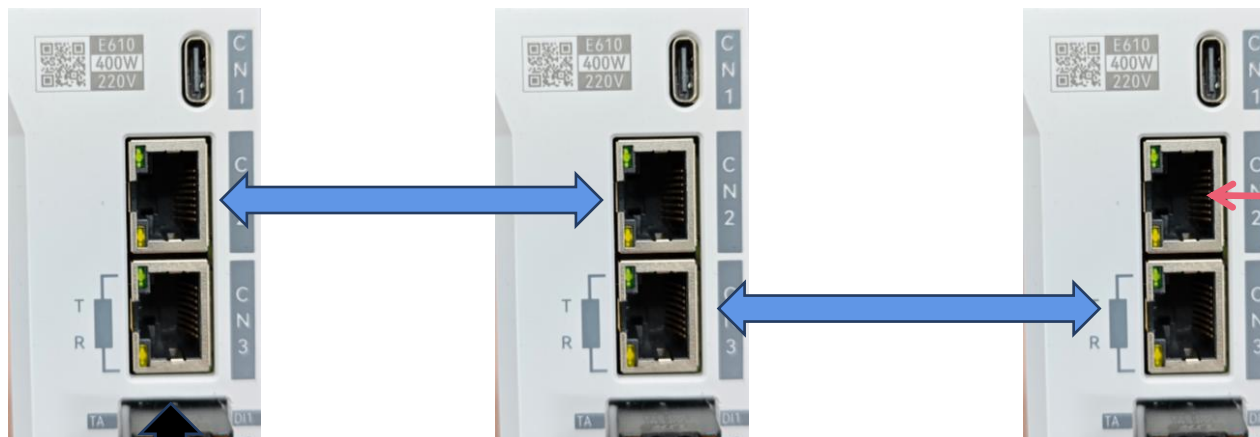
(For connections between CAN network nodes, check the CAN Communication section.)

Pin definition	1	2	3	4~6	7	8
	CANH	CANL	GND	—	+5V	GND

NOTE: The order of EtherCAT input and output must not be reversed.

Note: The coupler can only be connected to the CN3 port of the VFD.

Interconnection of multiple frequency converters



The coupler must be connected to CN3.

CN2/CN3 inputs and outputs are compatible between VFDs

One coupler can support up to eight VFDs.

The **terminal resistor** is plugged into the last VFD.

VFD parameter settings

Parameter	Value		Note
P00.02	2	Serial port command communication	
P00.03	9	Main frequency source set by communication	
P15.00	2	Communication method selection CANopen card	
P15.01		Node number	EtherCAT axis 1 is CAN node 1, and so on.
P15.02	495	Baud rate	Default 500k baud rate
P24.13	1	CAN communication protocol	0-Internal network can; 1-canopen Set 2140 in P24.00 before modifying other parameters in the P24 group.

Note: A terminal resistor must be inserted into the CN2 terminal of the frequency converter.

Indicator notes

Name	Function	Status description	Note
PWR	Power indicator	Constant on: Power supply normal; Constant off: Power supply abnormal.	
CAN	CAN communication status indicator	1 Steady off: All slave communications are normal; 2 Steady on: Slave communications are abnormal; 3 Flashing on and off: Slave communications are unstable;	When the light is constantly off, check if error code A16 (communication error) appears on the slave station panel. If A16 appears, verify the drive parameters and check the wiring connection.
ECAT	EtherCAT communication status indicator	1 Steady off: Startup 2 Slow flashing: Safe operation; 3 Fast flashing: Pre-operation 4 Steady on: Normal operation	After starting the EtherCAT master, the status light will flash first and then remain solid. If communication errors occur, check the master configuration and ensure the connection cable is an 8-core cable.

Network configuration when using EtherCAT to CANopen communication card + Q series PLC

D:\桌面\Q工程文件\2\未命名1\未命名1.project* - HCP Works3(V1.2.0)

文件 编辑 视图 工程 编译 在线 调试 工具 窗口 帮助

Application [Device: PLC逻辑]

设备

Device (HCQ0-1200-D)

设备组态

本地模块配置

PLC逻辑

Application

库管理器

PLC_PRG (PRG)

任务配置

EtherCAT_Port3

EtherCAT_Port3.EtherCAT_Task

MainTask

PLC_PRG

资源使用表

LocalDevice

SoftMotion General Axis Pool

EtherCAT_Port3 (EtherCAT Master SoftMotion)

LocalEtherCATDevice (LocalEtherCATDevice)

通信设置

应用

备份与还原

文件

日志

PLC设置

PLC指令

用户和组

访问权限

符号权限

Licensed Software Metrics

系统设置

设备信息

任务部署

状态

扫描网络

网关

设备

扫描网络连接PLC

Gateway-1

IP-Address: localhost

Port: 1217

HCQ0-1200D (激活)

设备名称: HCQ0-1200D

节点地址: 033A.4064

目标ID: 16C7 0004

目标类型: 4102

目标供应商: Zhejiang Hechuan Technology

目标版本: 3.5.14.10

网络设备列表

EtherCAT(Port3)

HCFA Co.,Ltd.

HCFA-Coupler

HCQX-EC01-C

HCQX-EC02-C

AC Servo Driver

HCFA X3E Ser

HCFA X5E Ser

HCFA X6B Ser

HCFA Y7 Ser

HCFA-DIGIO

HCNEX-ID324

HCNEX-OD32

HCNEX-MD24

HCNEX-MD16

EcatSwitch

HCQX-ES06-C

HCFA-E610-DRIV

HCFA E610 M

第三方

消息 总计0个错误,0个警告,5条消息

Build

0个错误 0个警告 5条消息

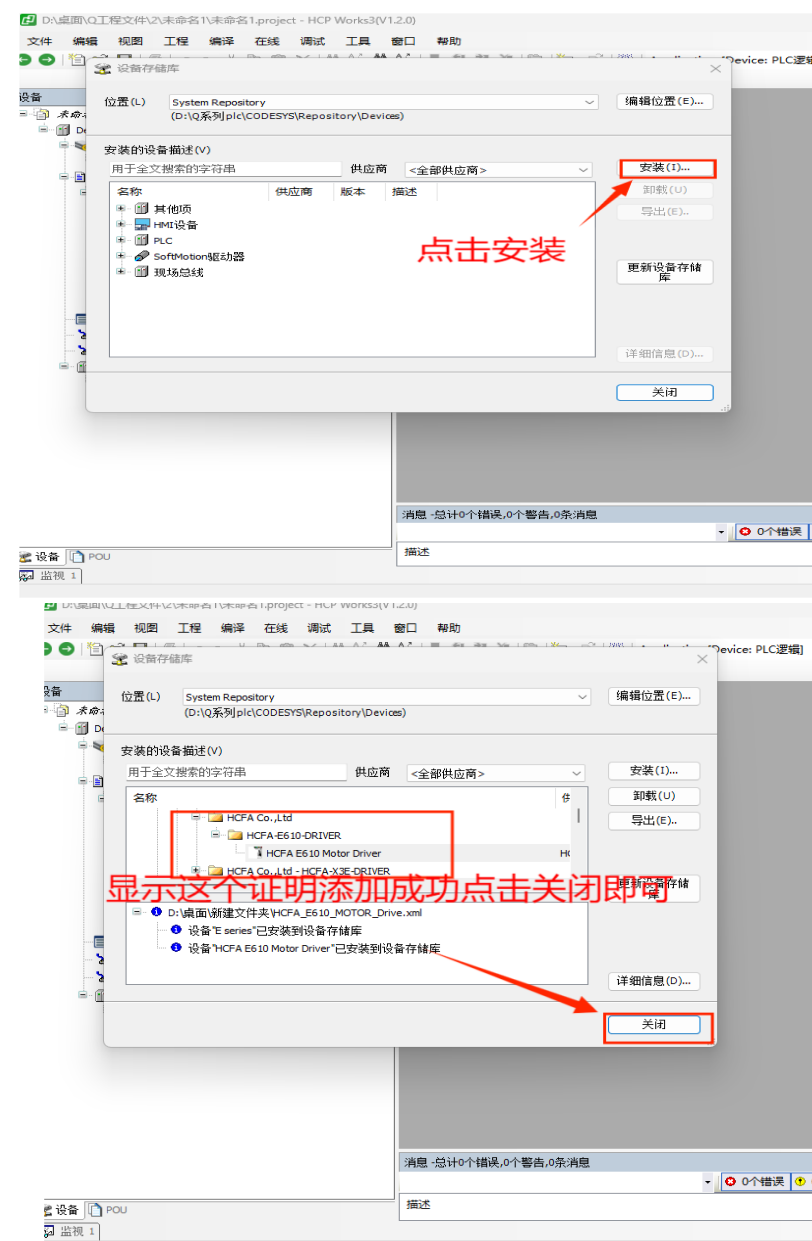
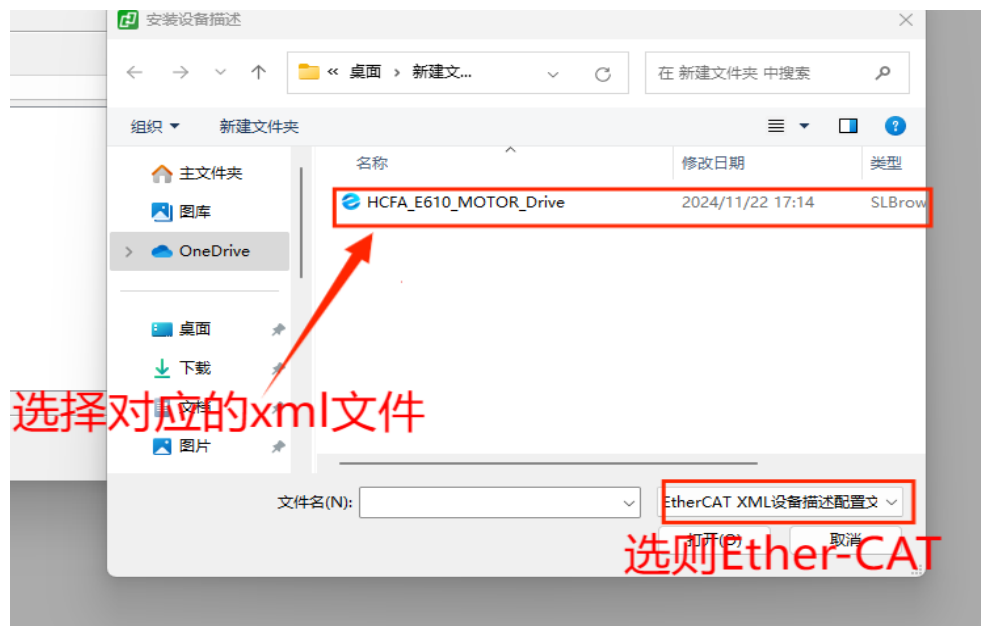
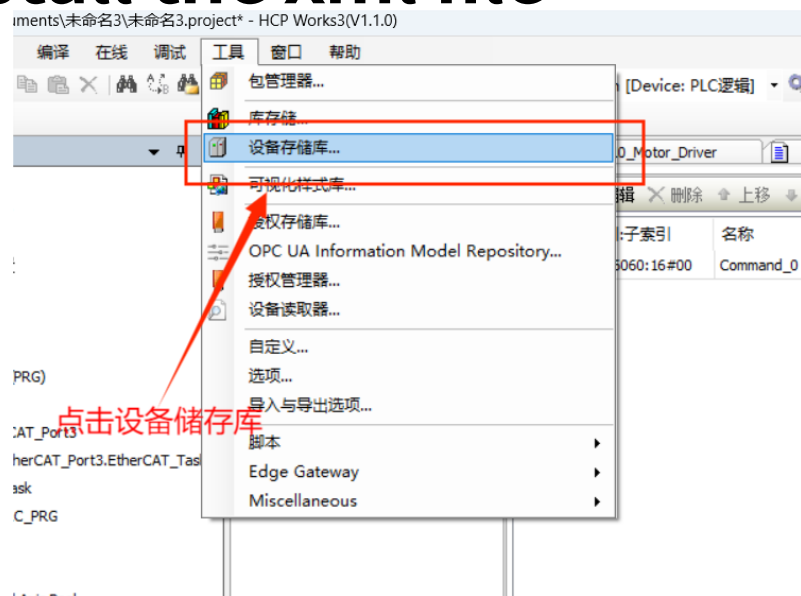
描述

工程 对象 位置

设备 POU

监视 1

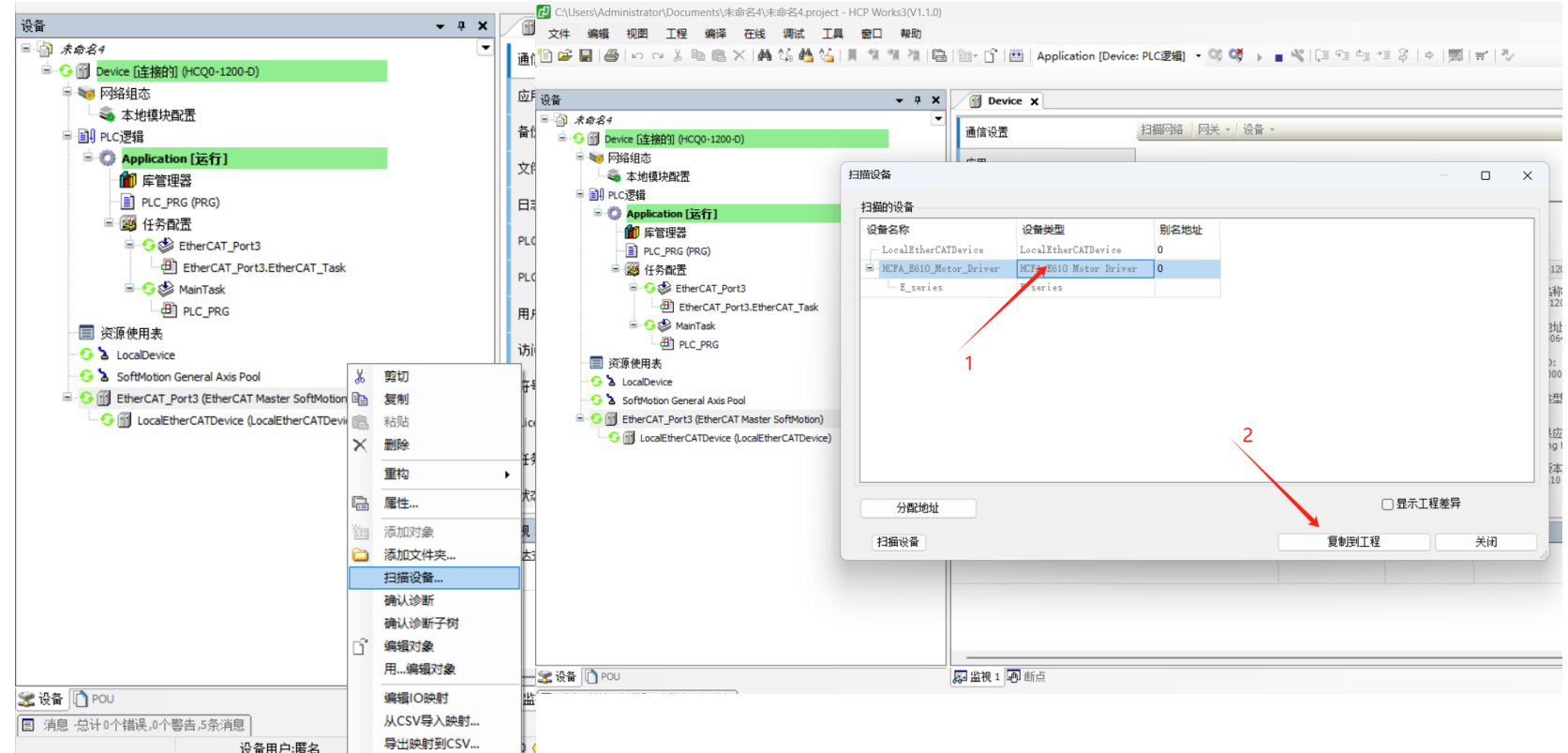
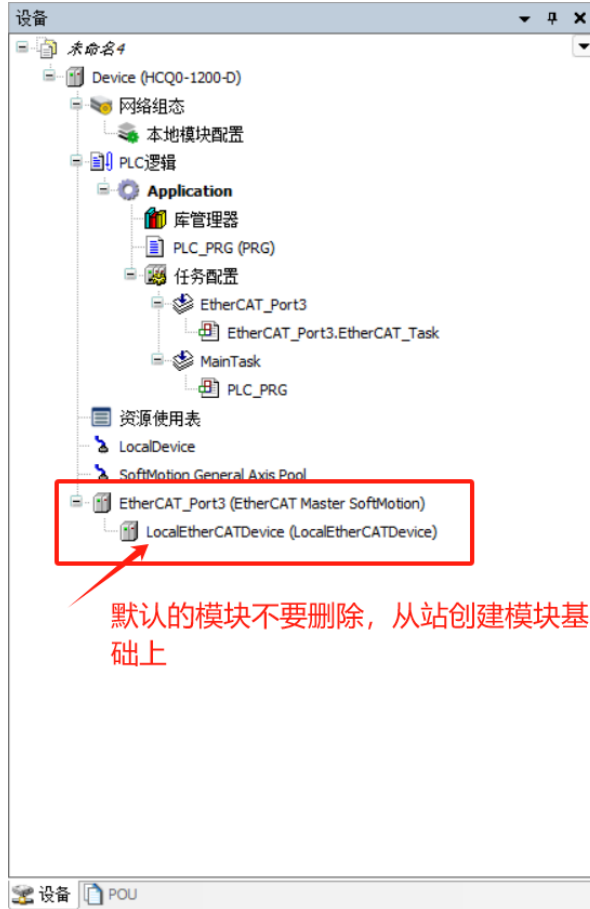
Install the xml file



Create project

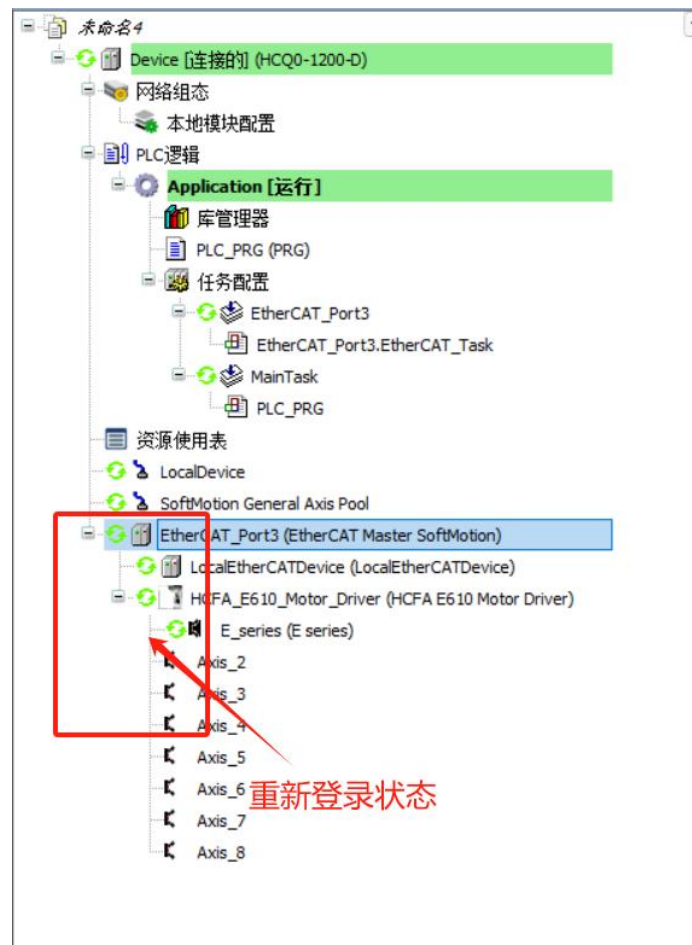
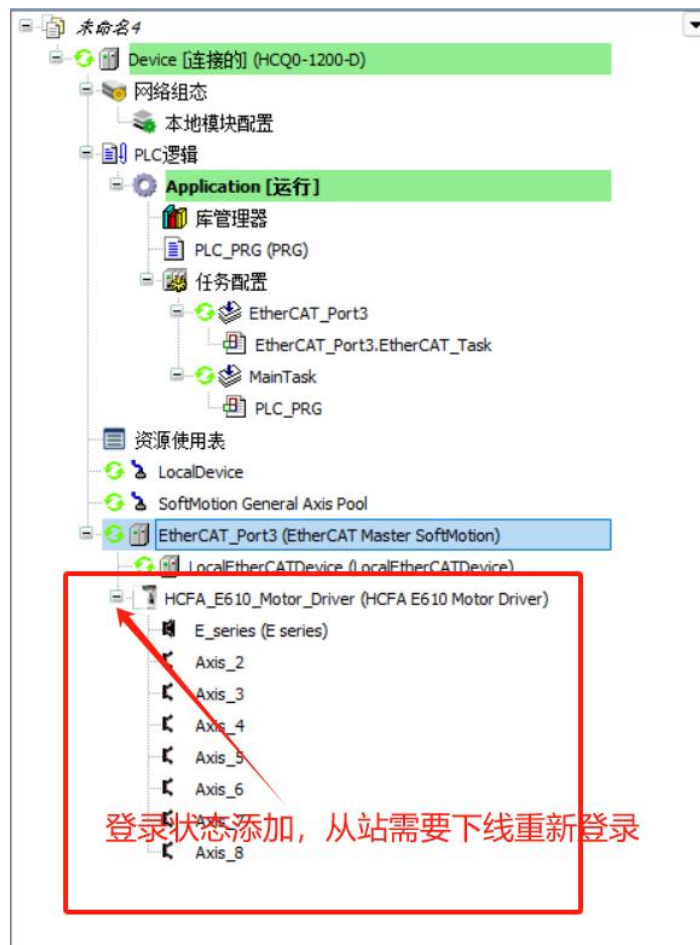
1. Create a project;

2. Click “Login” (scanning is possible even when not logged in) and scan the slave devices based on the EtherCAT master.



Create project

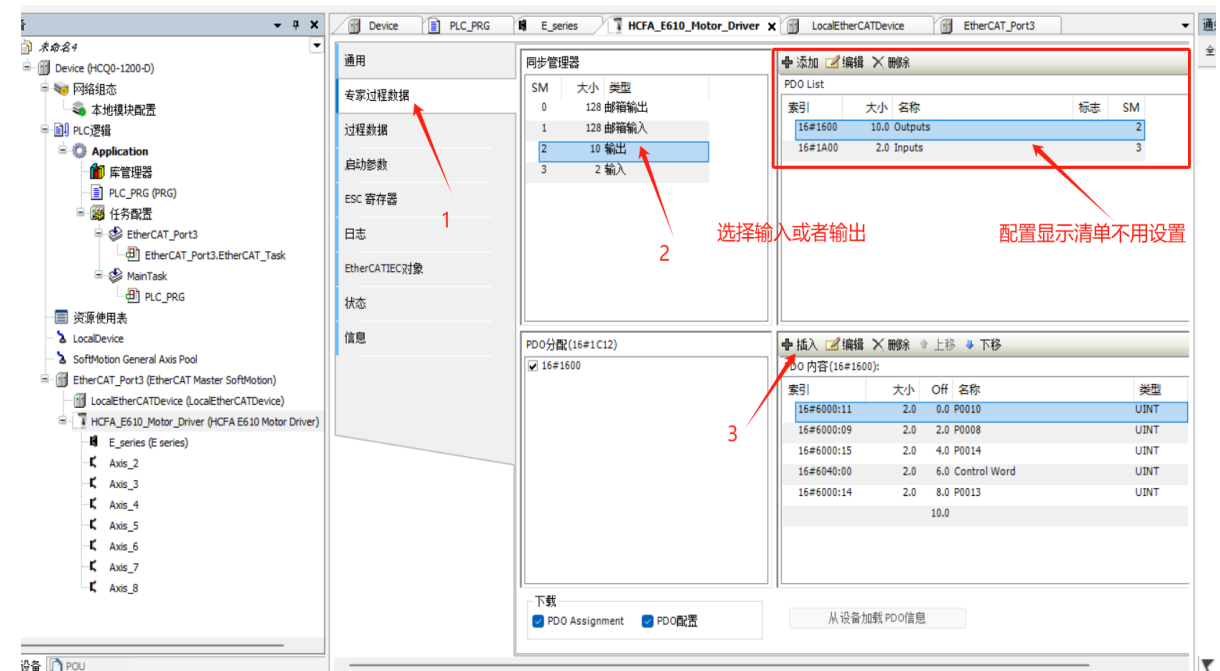
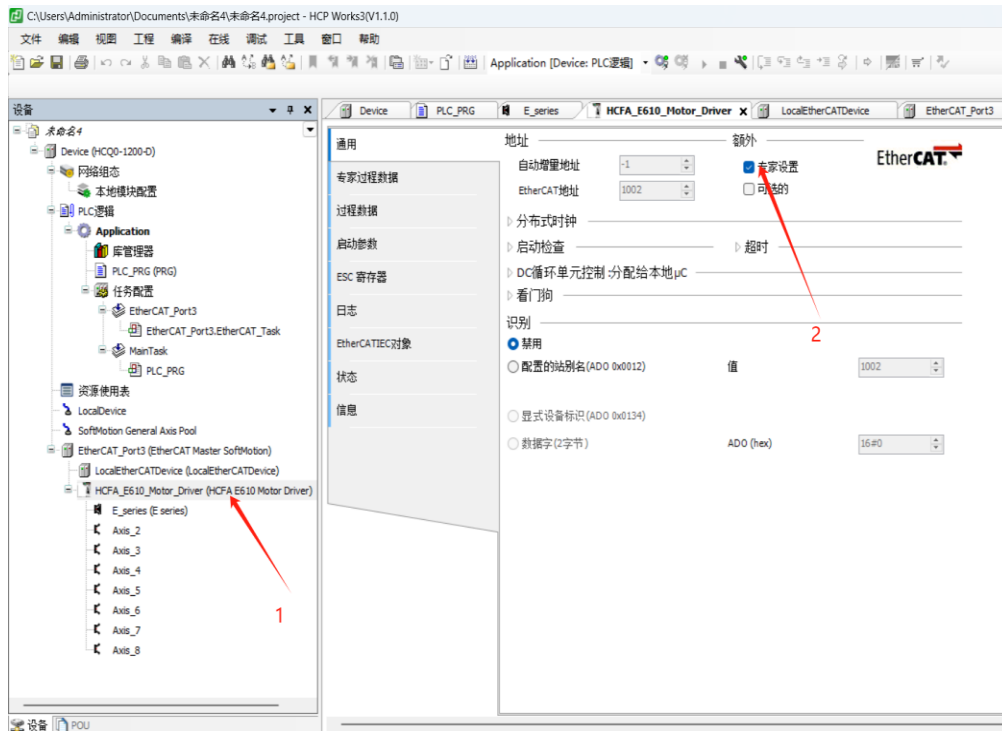
3. Re- login after when there is no connection icon(Green circle) shows



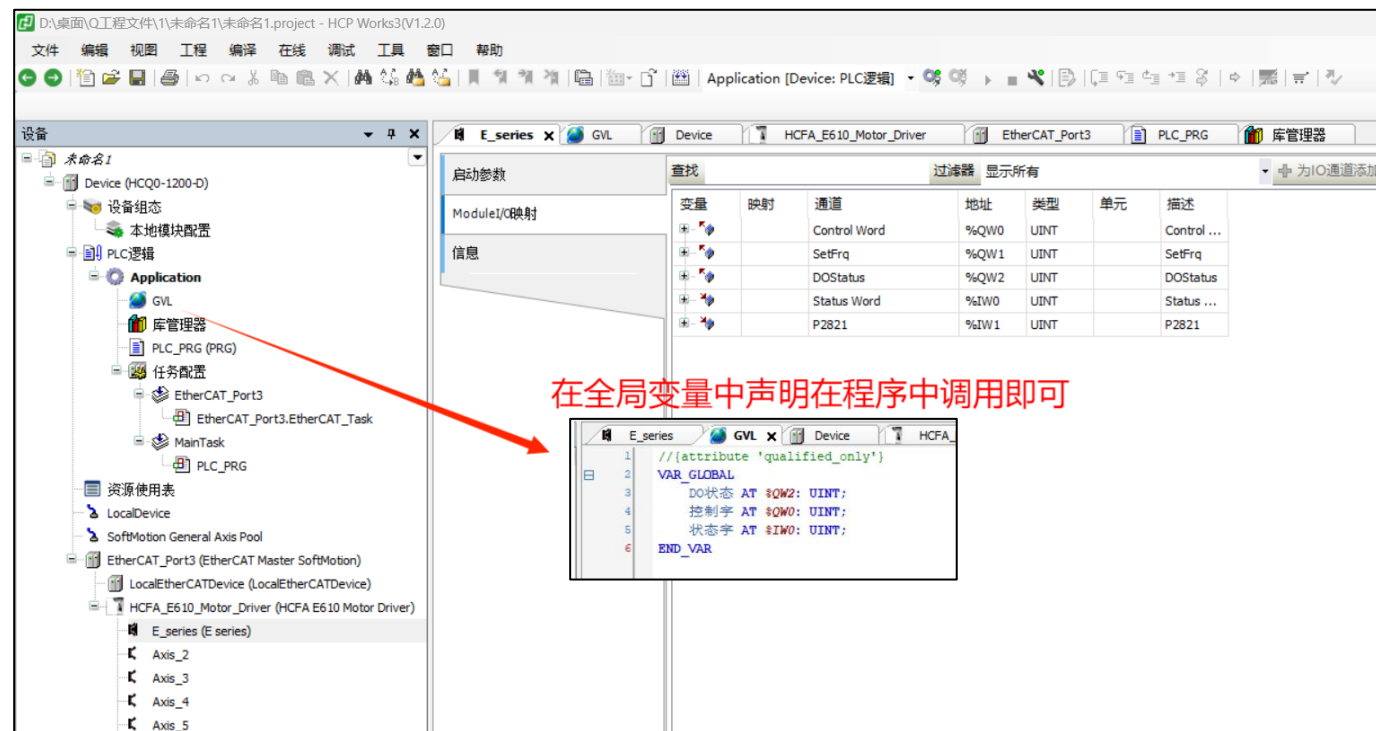
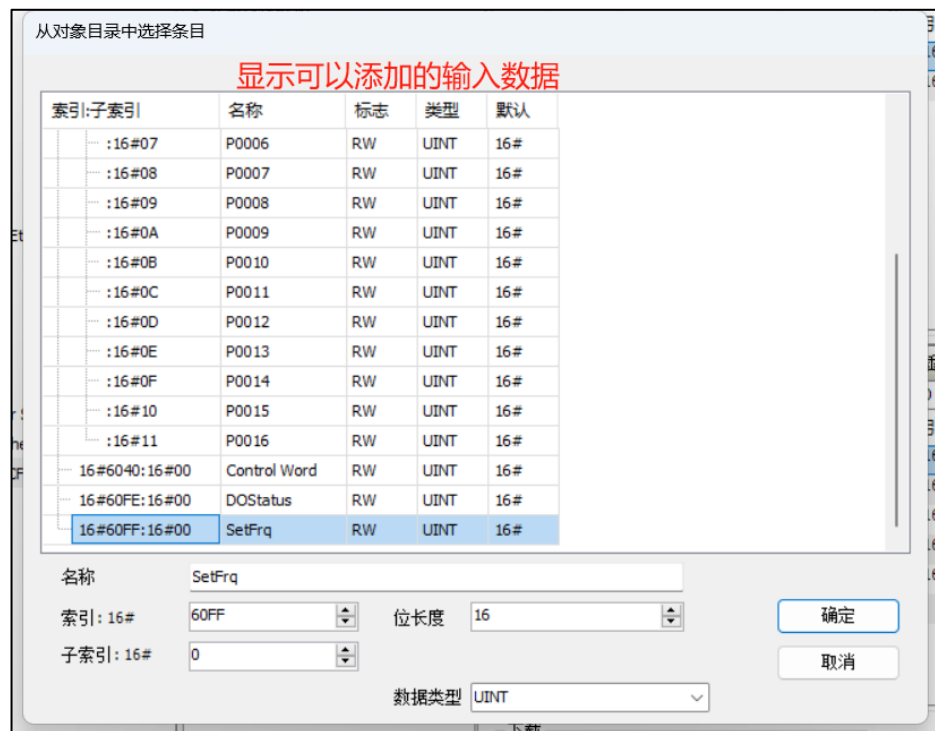
Configure process parameters

1. Double-click the EtherCAT slave and select expert setting.

2. Insert input or output parameters (add according to index) in the expert process data.



Configure process parameters



Control DO status

The screenshot shows the HCFA E610 Motor Driver configuration interface. The left sidebar displays the project tree with the 'HCFA_E610_Motor_Driver' selected. The main window is divided into several panels:

- 同步管理器 (Synchronization Manager):** A table showing the mapping of SM (Start/Stop) signals to the driver's inputs/outputs.

SM	大小	类型
0	128	邮箱输出
1	128	邮箱输入
2	4	输出
3	4	输入

 A red arrow points to the '输出' (Output) row with the label '选择输出' (Select Output).
- PDO List:** A table showing the list of PDOs (Process Data Objects) configured for the driver.

索引	大小	名称	标志	SM
16#1600	4.0	Outputs		2
16#1A00	4.0	Inputs		3
- PDO分配 (16#1C13):** A section for configuring the PDO assignment. It shows a table of PDOs and their parameters.

索引	大小	Off	名称	类型
16#6040:00	2.0	0.0	Control Word	UINT
16#60FF:00	2.0	2.0	SetFrq	UINT

 A red arrow points to the 'Control Word' row with the label '点击插入' (Click Insert).
- 从对象目录中选择条目 (Select Item from Object Directory):** A dialog box that appears when configuring the PDO. It shows a list of objects and their parameters.

索引/子索引	名称	标志	类型	默认
16#6000:16#00	P00		UINT	16#
16#6040:16#00	Control Word	RW	UINT	16#
16#60FE:16#00	D0Status	RW	UINT	16#
16#60FF:16#00	SetFrq	RW	UINT	16#

 A red arrow points to the 'D0Status' row with the label '选择DO状态' (Select DO status).

At the bottom of the dialog, there are fields for '名称' (Name), '索引: 16#' (Index), '子索引: 16#' (Sub-index), and '数据类型' (Data type). The '名称' field is set to 'D0Status', '索引: 16#' is '60FE', '子索引: 16#' is '0', and '数据类型' is 'UINT'. A red arrow points to the '确定' (Confirm) button with the label '点确定' (Click Confirm).

Control DO status

DO状态的地址 在全局变量中声明就可以调用

The screenshot shows the HCP Works3 software interface. The left tree view displays the project structure, with the 'E_series (E series)' device selected. The main window shows the 'Module I/O Mapping' tab, which contains a table of DO status variables. A red box highlights the table, and a red arrow points to the 'DOSStatus' variable.

变量	映射	通道	地址	类型	单元	描述
DOSStatus			%QW0	UINT		DOSStatus
Bit0			%QX0.0	BOOL		
Bit1			%QX0.1	BOOL		
Bit2			%QX0.2	BOOL		
Bit3			%QX0.3	BOOL		
Bit4			%QX0.4	BOOL		
Bit5			%QX0.5	BOOL		
Bit6			%QX0.6	BOOL		
Bit7			%QX0.7	BOOL		
Bit8			%QX1.0	BOOL		
Bit9			%QX1.1	BOOL		
Bit10			%QX1.2	BOOL		
Bit11			%QX1.3	BOOL		
Bit12			%QX1.4	BOOL		
Bit13			%QX1.5	BOOL		
Bit14			%QX1.6	BOOL		
Bit15			%QX1.7	BOOL		
Control Word			%QW1	UINT		Control Word
SetFrq			%QW2	UINT		SetFrq
Status Word			%IW0	UINT		Status Word

消息: 总计3个错误, 0个警告, 0条消息

Precompile

描述

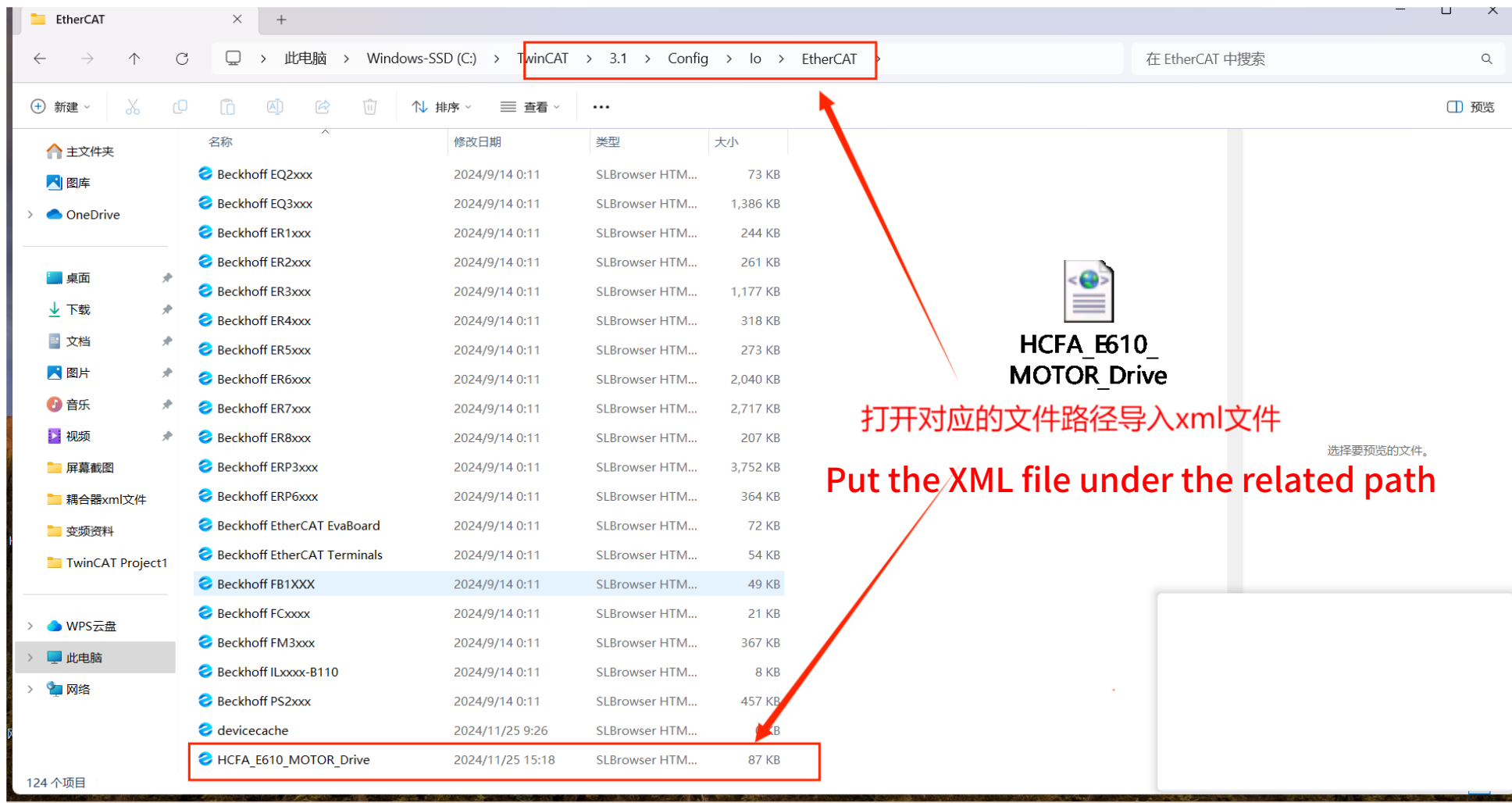
工程 对象 位置

Control DO status

Correspondence	DO status	
	bit0	Relay
	bit1	DO1
	bit2	DO2

Set the inverter parameter relay output selection (06.01) and DO output selection (06.02—06.03) to communication control (20).

Beckhoff PLC and VFD EtherCAT communication



Beckhoff PLC and VFD EtherCAT communication

1. 右键

2. 扫描设备

3. 选择对应的设备

Right click to scan and add the device

2 new I/O devices found

Device	Address
Device 1 (EtherCAT Automation Protocol)	[PCI\Tcl8254x2]
<input checked="" type="checkbox"/> Device 3 (EtherCAT)	[PCI\Tcl8254x1]

OK
Cancel
Select All
Unselect All

错误列表

说明	项目	文件	行
整个解决方案 错误 0 警告 0 1消息的 0 Clear 生成 + IntelliSense 搜索错误列表			

属性 工具箱

Beckhoff PLC and VFD EtherCAT communication

选择对应的设备

输入

输出

Display the data that can be added

选择DO状态

Do status

SM	Size	Type	Flags
0	128	Mbx...	
1	128	MbxIn	
2	4	Outp...	
3	2	Inputs	

Index	Size	Name	Flags	SM	SU
0x1A00	2.0	Inputs		3	0
0x1600	4.0	Outputs		2	0

Index	Size	Offs	Name	Type	Default (h...
0x6041...	2.0	0.0	Status Word	UINT	
			2.0		

Name	Online	Type	Size	>Addr...	In/Out
Status Word	3	UINT	2.0	39.0	Input

整个解决方案 错误 0 警告 0 消息 0 Clear 生成 + IntelliSense 搜索错误列表

From Dictionary:

- 0x6000:08 - P0007
- 0x6000:09 - P0008
- 0x6000:0A - P0009
- 0x6000:0B - P0010
- 0x6000:0C - P0011
- 0x6000:0D - P0012
- 0x6000:0E - P0013
- 0x6000:0F - P0014
- 0x6000:10 - P0015
- 0x6000:11 - P0016
- 0x6040 - Control Word
- 0x60FE - DOSStatus
- 0x60FF - SetFrq

Beckhoff PLC and VFD EtherCAT communication

The screenshot displays the TwinCAT Project1 - TcXaeShell interface. The left sidebar shows the project tree with the following structure:

- Real-Time
 - Tasks
 - Routes
 - Type System
 - TcCOM Objects
- MOTION
 - NC-Task 1 SAF
- PLC
 - SAFETY
- C++
- VISION
- ANALYTICS
- I/O
 - Devices
 - Device 3 (EtherCAT)
 - Image
 - Image-Info
 - SyncUnits
 - Inputs
 - Outputs
 - InfoData
 - Drive 1 (HCFA E610 Motor Driver)
 - Module 1 (E series)
 - Inputs
 - Status Word
 - P2821
 - Outputs
 - Control Word
 - SetFrq
 - DOStatus** (highlighted with a red box)

The main window shows the 'Online' tab for the 'DOStatus' variable. The 'Value' is set to 0. The 'Write...' button is highlighted with a red box. A red arrow points from the 'Write...' button to the 'Set Value Dialog' window, which is open and shows the 'Dec' field set to 0. The 'Hex' field is set to 0x0000. The 'Bit Size' is set to 16. The 'OK' button is highlighted with a red box. A red arrow points from the 'OK' button back to the 'Write...' button in the 'Online' tab.

Red text annotations provide instructions:

- 选择刚添加的DO状态 (Select the added DO status) - points to the 'DOStatus' variable in the project tree.
- 输入对应的值即可对DO进行控制 (Enter the corresponding value to control the DO) - points to the 'Dec' field in the 'Set Value Dialog'.

Name	Index	Function	Description	Read/Write
Status Word	16x6041:00	Read the operation status of the frequency converter.	1: Running in forward direction	R
			2: Running in reverse direction	
			3: Shutdown	
			4: Fault	
SetFrq	16x60FF:00	Modify the running frequency.	-1000%~1000%	W
Control Word	16x6040:00	Control the operating status of the frequency converter.	1: Forward rotation	W
			2: Reverse rotation	
			3: Forward JOG	
			4: Reverse JOG	
			5: Free stop	
			6: Shutdown based on shutdown mode function code	
			7: Fault reset	
			8: Forward/reverse switching	
DOStatus	16x60FE:00	Control the DO status.	bit0:Relay status	W
			bit1:D01 status	
			bit2:D02 status	

Name	Index	Function	Description	Read/Write
P00.00	16x6000:01	GP type display	1: G-type (constant torque load model) 2: P-type (fan, pump load model)	W
P00.01	16x6000:02	Motor control mode	0: 0: Sensorless vector control (SVC) 1: Reserved 2: V/F control	W
P00.02	16x6000:03	Command source selection	0: Control panel control 1: External terminal control 2: Communication control	W
P00.03	16x6000:04	Main frequency source X selection	0: Digital setting (no power memory) 1: Digital setting (power memory) 2: AI1 3: AI2 5: PULSE setting 6: Multi-step command 7: Simple PLC 8: PID 9: Communication setpoint	W
P00.04	16x6000:05	Auxiliary frequency source Y selection	0: Digital setting (no power memory) 1: Digital setting (power memory) 2: AI1 3: AI2 5: PULSE setting 6: Multi-step command 7: Simple PLC 8: PID 9: Communication setpoint	W
P00.05	16x6000:06	Frequency source superposition selection	Units Digit: Frequency Command Selection 0: Main frequency source X1: Result of main/auxiliary calculation (relationship determined by tens digit) 2: Switch between main frequency source X and auxiliary frequency source Y 3: Switch between main frequency source X and calculation result 4: Switch between auxiliary frequency source Y and calculation result Tens Digit: Main/Auxiliary Frequency Calculation Mode 0: Main + Auxiliary 1: Main - Auxiliary 2: Maximum value of the two 3: Minimum value of the two	W

P00.06	16x6000:07	Auxiliary frequency source Y range selection during superposition	0: Relative to the maximum frequency 1: Relative to frequency source X	W
P00.07	16x6000:08	Auxiliary frequency source Y range during superposition	0%~150%	W
P00.08	16x6000:09	Maximum frequency	50Hz~599Hz	W
P00.09	16x6000:0A	Upper limit frequency source	0: P00.10 setting 1: AI1 2: AI2 4: PULSE pulse setting 5: Communication setting	W
P00.10	16x6000:0B	Upper limit frequency	Lower limit frequency P00.11 to maximum frequency P00.08	W
P00.11	16x6000:0C	Lower limit frequency	0Hz to upper limit frequency P00.10	W
P00.12	16x6000:0D	Preset frequency	0Hz to maximum frequency P00.08	w
P00.13	16x6000:0E	Acceleration time 1	0s~6500s	w
P00.14	16x6000:0F	Deceleration time 1	0s~6500s	w
P00.15	16x6000:10	Upper limit frequency offset	0Hz to maximum frequency P00.08	w

Code	Name
P28.00	Current power-on time
P28.01	Current operating time
P28.02	Inverter operating status
P28.03	Fault information
P28.04	Operating frequency
P28.05	Set frequency
P28.06	Bus voltage
P28.07	Output voltage
P28.08	Output current
P28.09	Output power
P28.10	Target torque
P28.11	Output torque
P28.12	Feedback frequency
P28.13	Detection frequency
P28.14	Resolver position
P28.15	ABZ position
P28.16	Z signal counter
P28.17	Synchronous motor rotor position
P28.18	Power factor angle
P28.19	Controller temperature
P28.20	Motor temperature value
P28.21	DI input status
P28.22	DO output status