Q 100

	Q		Q		
					-
	-				2025-11-11

Q HCP Works3 V1.3.0

Q

HCQXB-CAN-BD HCQXB-RTC-BD HCQXB-2RS232-BD HCQXB-2RS485-BD

Q

2025-11-11	V1.0		

1. EIP

1

2

3 HCP Works3 V1.3.0

4 1514 IO <=1400

5 61 505 /509

6 253 255- -

2. EIP 1 Class1

EIP EtherNet

EDS

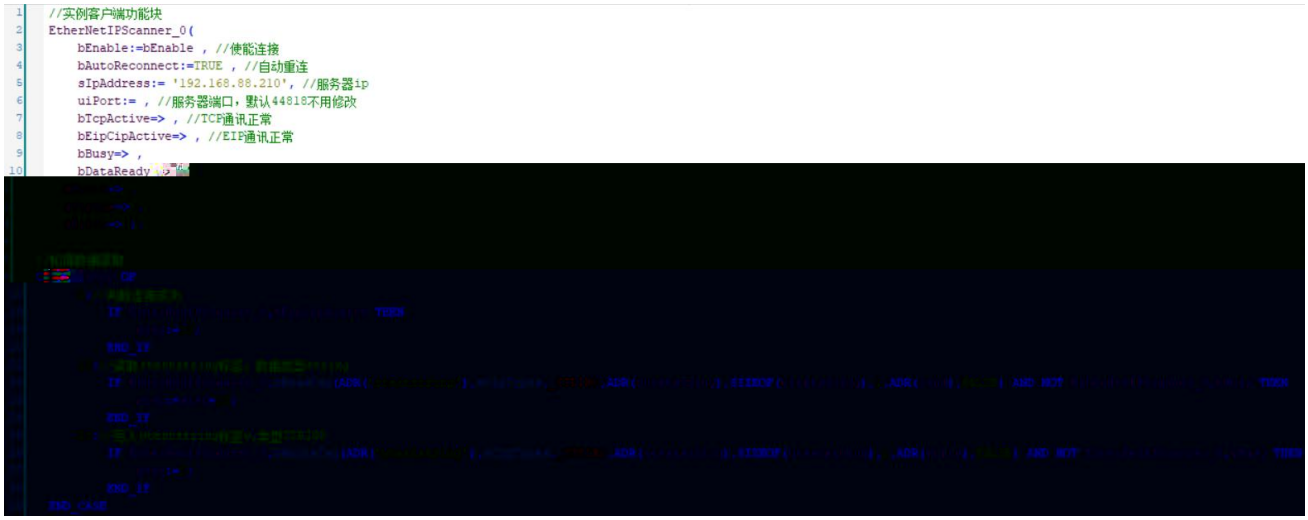
EIP EDS EtherNet

IP

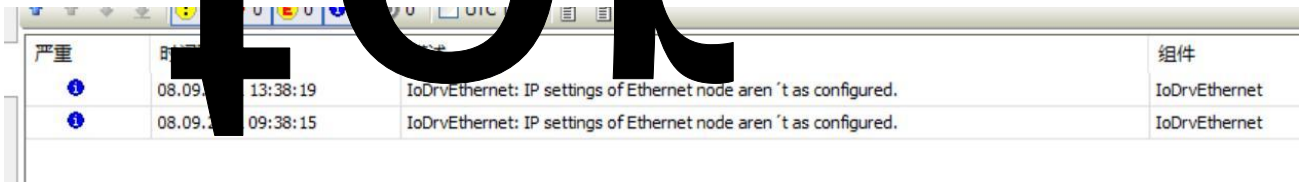
Q EIP

3. EIP 3 Class3

EtherNetIP_Tag_V1.0.3 EtherNetIPScanner Case



4. EIP —IP

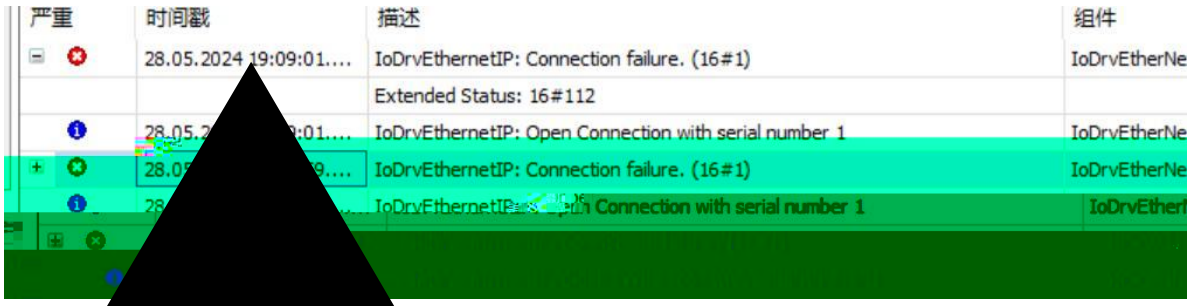


5. EIP —Extended Status 16#112

RPI RPI Adapter IOtask

1 Adapter RPI>=n*IOTask(n 0)

2 Scanner Adapter RPI>=n*ScannerIOtask(n 0)



6. EIP us Invalid O->T size 16#127 O

10. Modbus

1 ModbusTCP

2 IP ModbusTCP

3 ModbusTCP 16 64

4 ModbusTCP 64 99 125 123

5 ModbusRTU 100

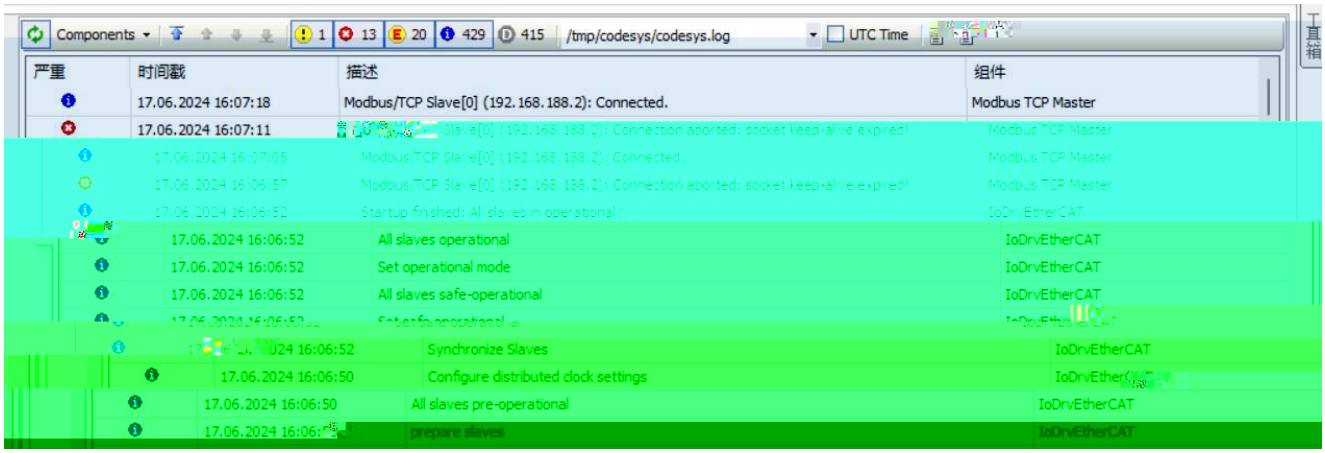
6 ModbusRTU 31

11. ModbusTCP Connection aborted:socket keep-alive expired

ModbusTCP 1 1

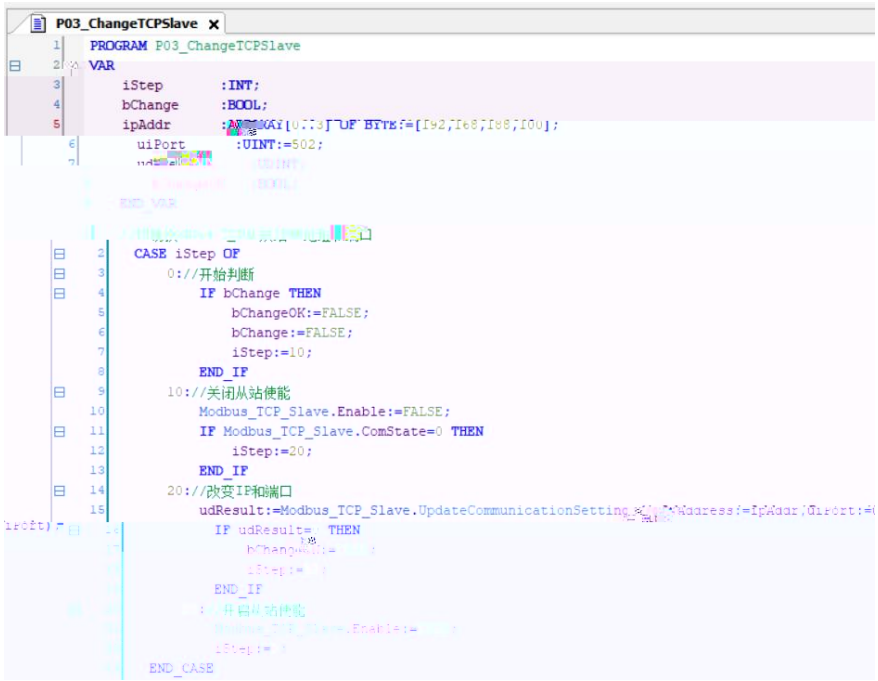
IP IP

socket keep-alive expired TCP keep-alive

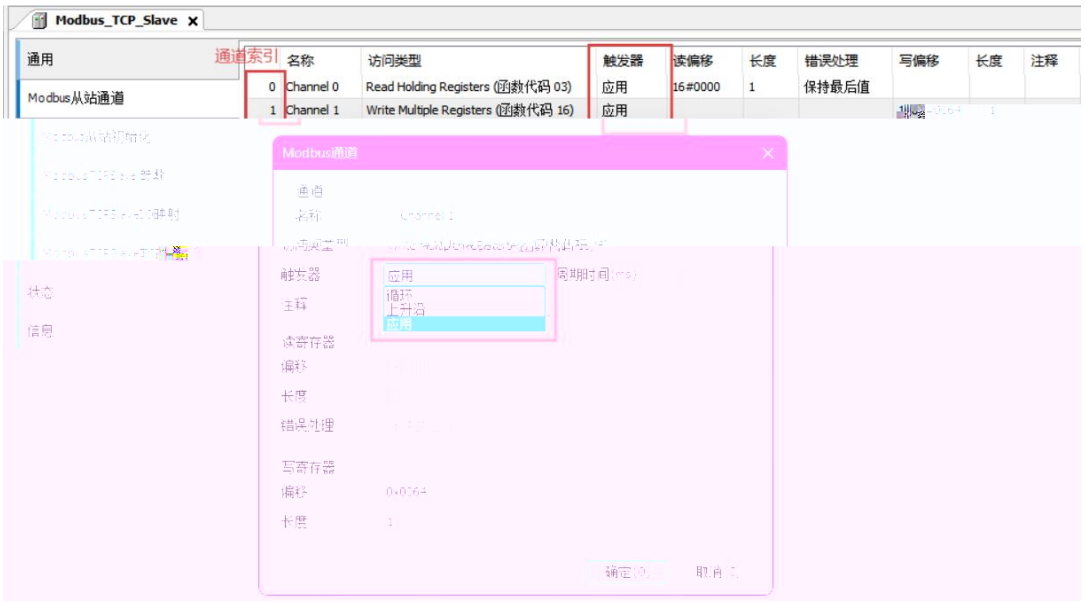


12. ModbusTCP IP

UpdateCommunicationSettings IP



13. ModbusTCP



ModbusChannel

14. Modbus

15. HCQX-RS02-D4-M

RS485 ID

16. ModbusTCP

STOP PLC Stopping STOP

17. Socket

1 TCP_Read.pData TCP_Read.szSize

2 TCP_Read.xEnable TCP_Client.xActive

3 TCP_Client.xEnable NOT TCP_Read.XError

18. Socket 0

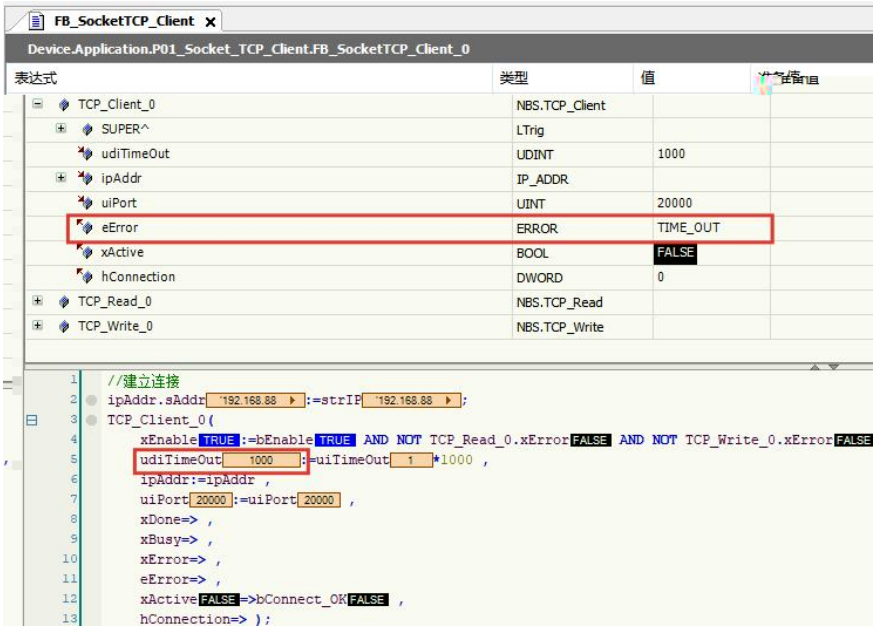
TCP_Write szSize SIZEOF

szSize LEN szSize

19. Socket TCP_Cilent TIME_OUT

TCP_Write udiTimeOut 1000us

TIME_OUT udiTimeOut



20. Q0 COM

Q0 COM1 COM2 COM2

COM1 COM2

1.

1 Retain/Persistent

2 Persistent Retain /

3 IO 2

2. PLC U U

U U PORT0

3. BOOL “ ”

1

2

3

4.

Q0 V1.04.03.01

Q1 V3.40.20.00

Q0P/Q1P

Q3P V1.00.01.14

Q5P/Q7P/Q9P V1.01.00.02

5.

STRING WSTRING

1 STRING 80 81 + 1

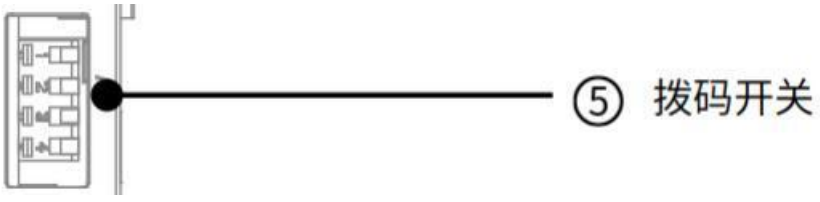
2 WSTRING 80 162 + 2

10 STRING(10)

11

6. IP

Q0 SW1 SW2 FN



Q1-322 5

Q1-330+ 5 0000

0

Q5 5

Q0P/Q1P FN 3s IP

12	FN/RUN/STOP开关	FN/RUN/STOP switch	拨到FN为复位EtherNet通讯接口IP地址，拨到RUN为运行控制器程序，拨到STOP为停止控制器程序

Q3P/Q5P/Q7P/Q9P FN 3s IP

10	STOP/RUN/FN 拨码开关	STOP/RUN/FN dial switch	功能拨码，向左为控制器停止状态，中间为运行状态，向右拨至FN并停留3s为恢复Port1/port2/port4 IP默认值

7.

_XWORD/_XINT/_UXINT 32 4 64

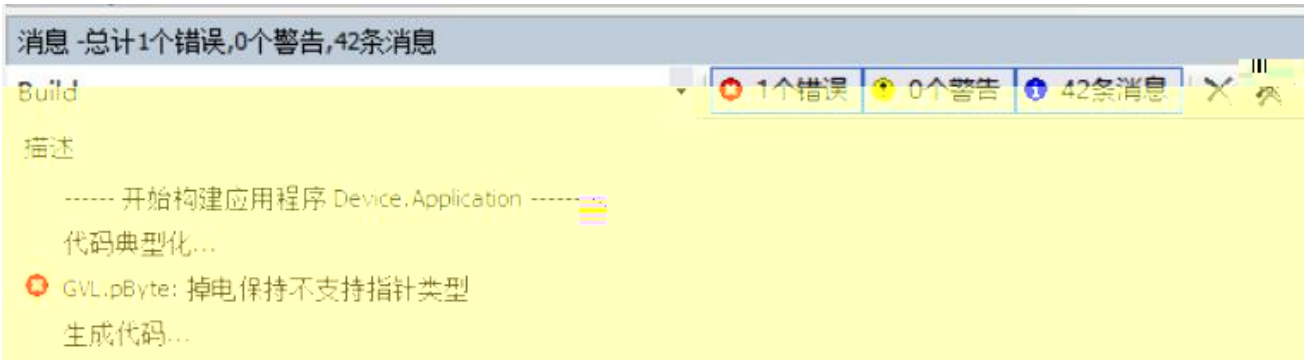
8

8.

16 Byte_To_HexStr ^tH p

11.

POINTER TO



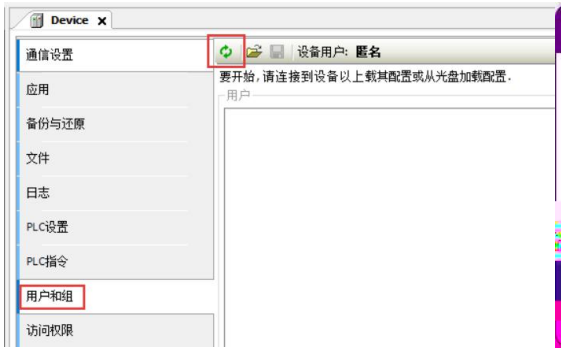
12. **‘ $ ’**

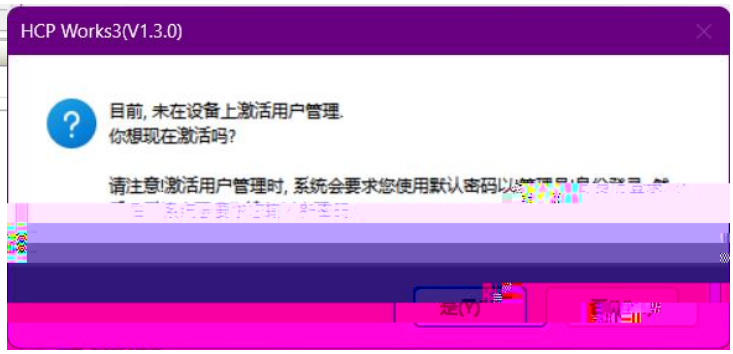
\r\n CODESYS $L/$l $N/$n

定义组合	解释

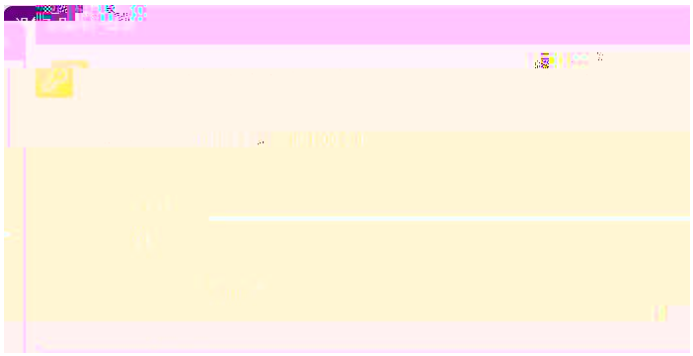
13.

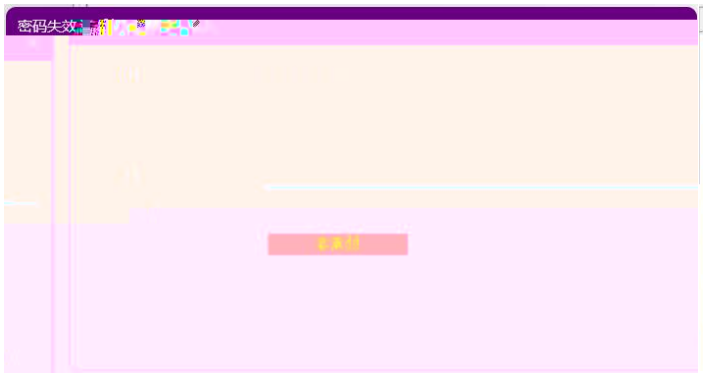
Device

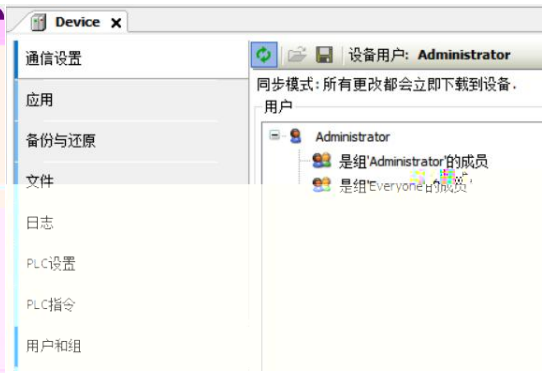




“ ” Administrator

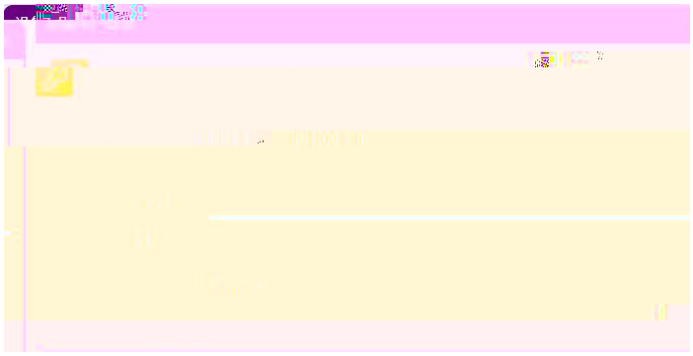




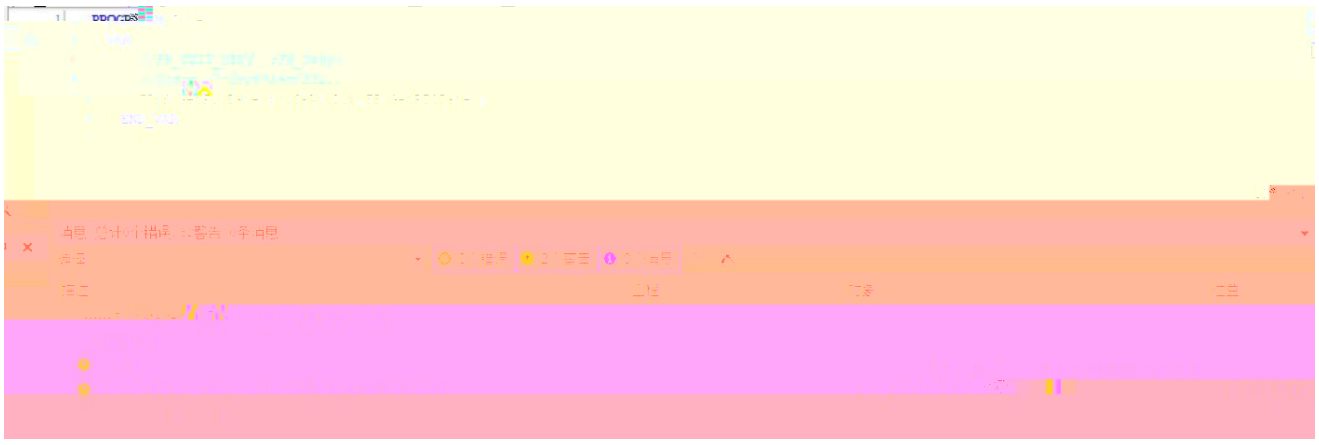


14.

Device “ [device] ”

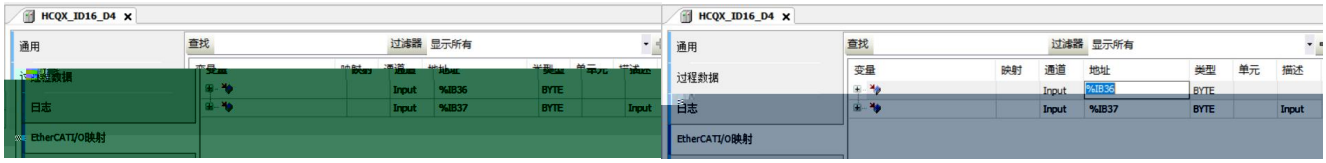


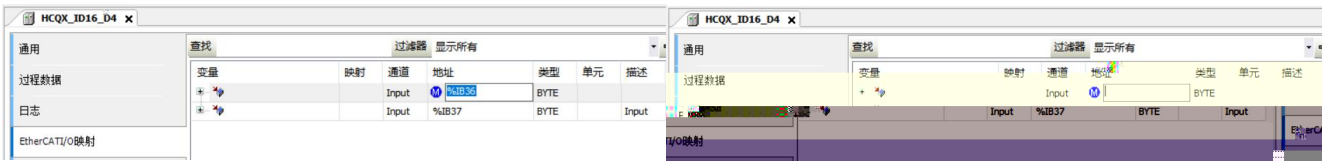
15. C0136 ambiguous use of name “ ”



16. IO

IO

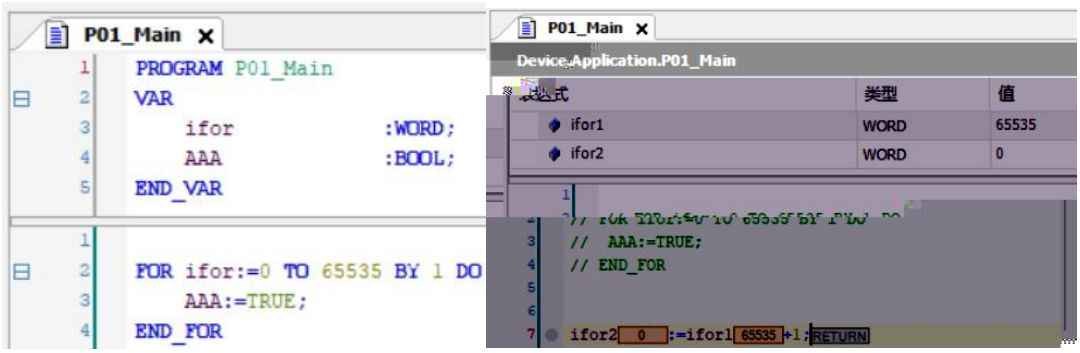




17. FOR

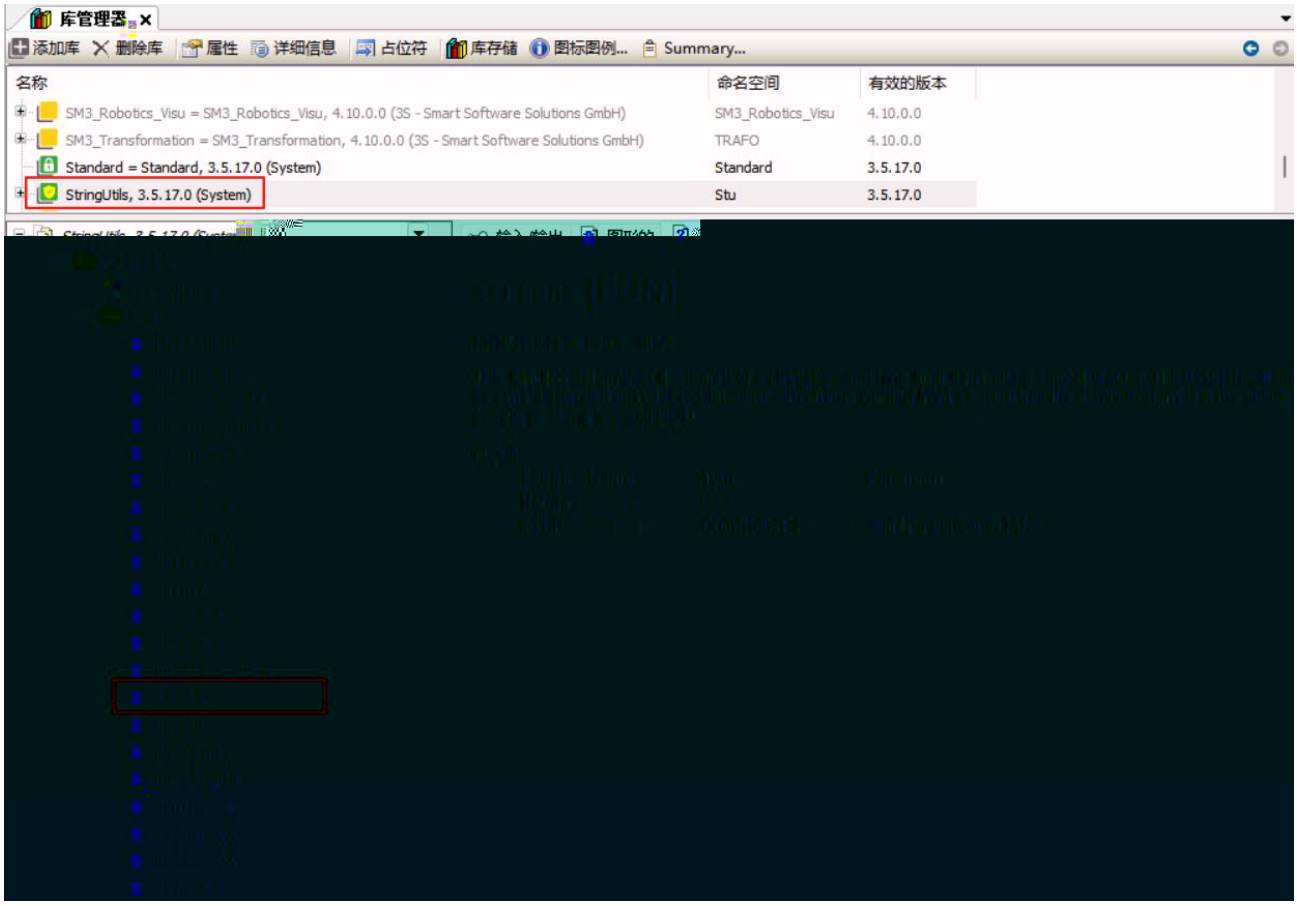
ifor 65535 word FOR +1 ifor

+1 65535+1 ifor 0 word 0~65535

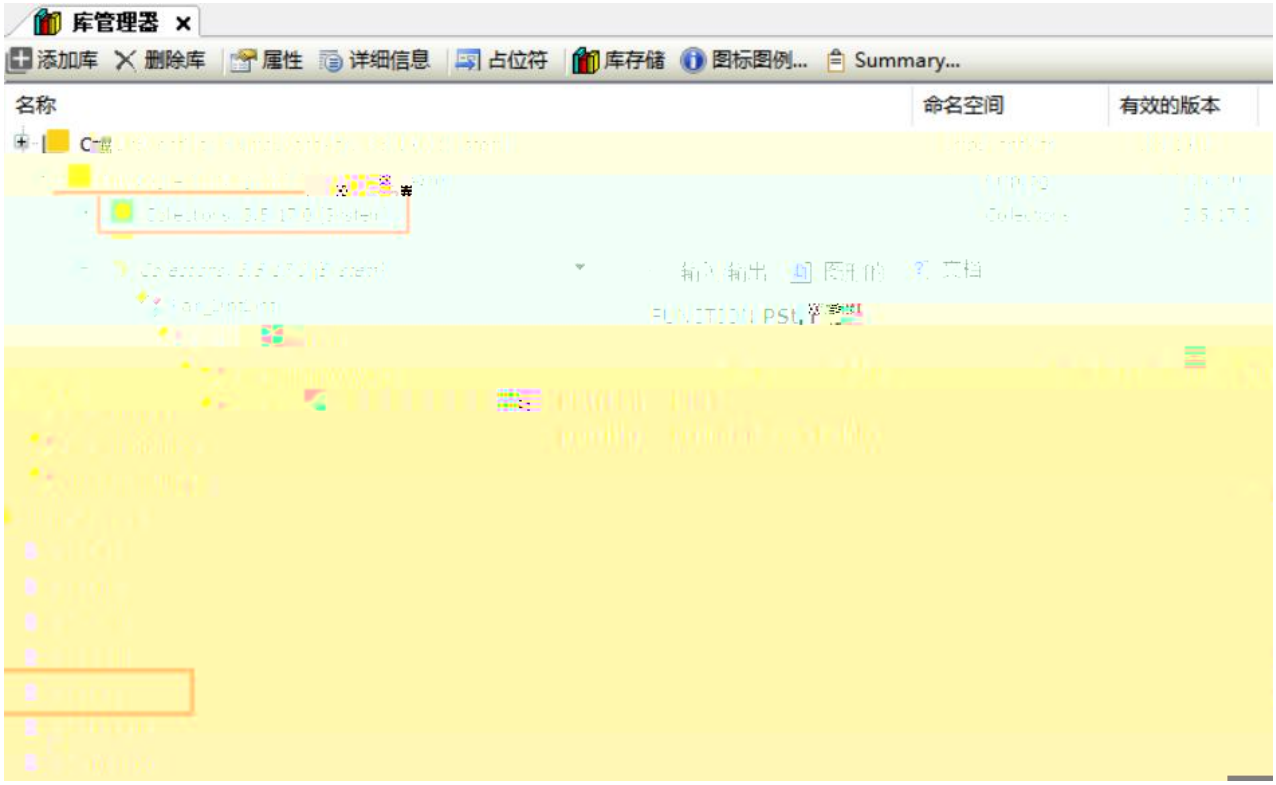


18. 255

Standard LEN 255 255



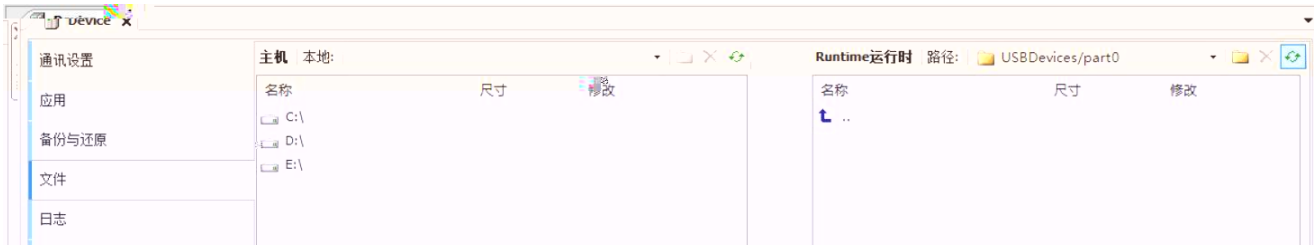
2 Collectiobs PstrLen pSting ADR



3 0

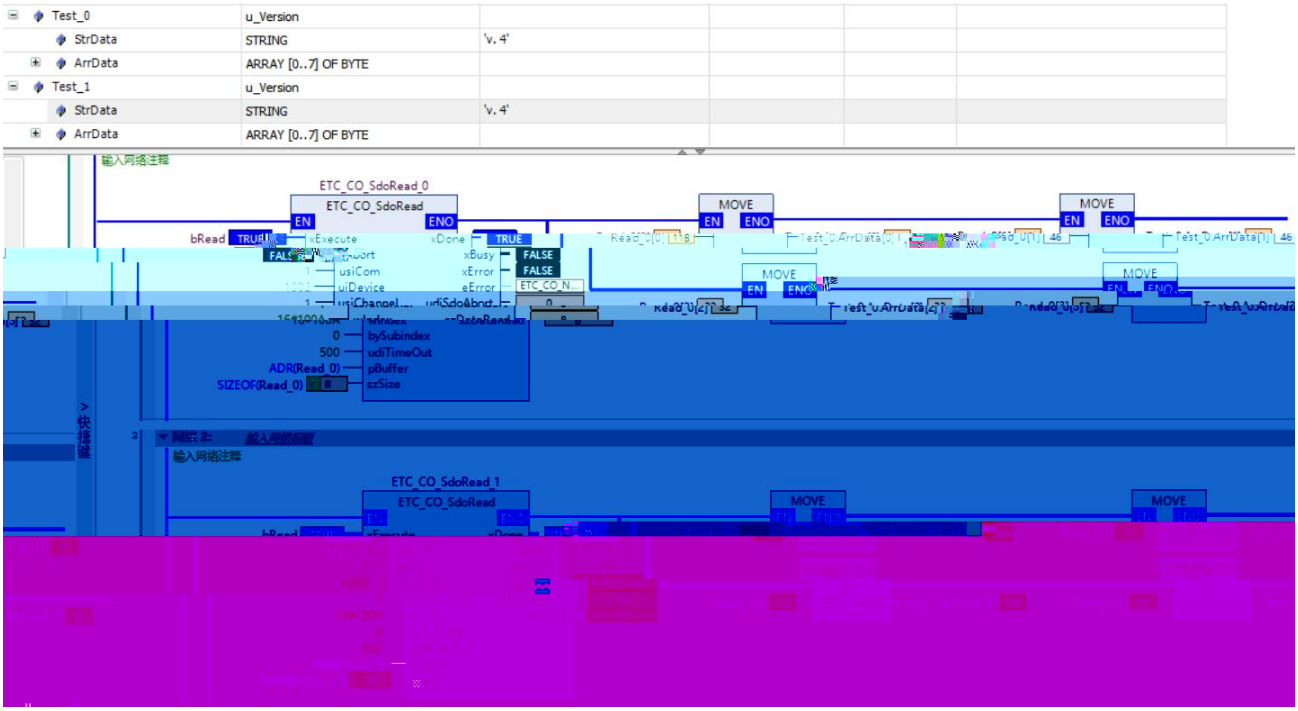
U USBDevices part0 U PLC

U Codesys U



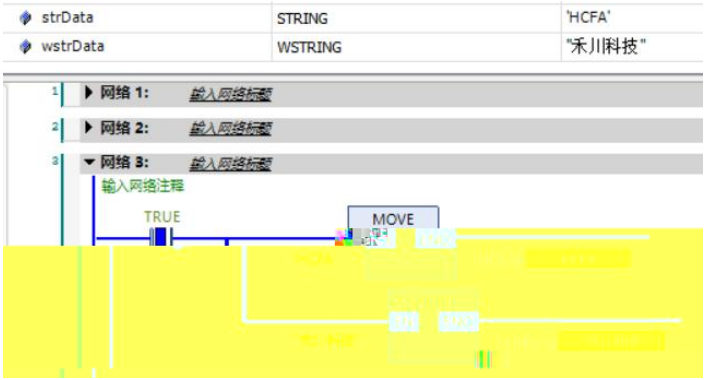
21. SMC3_ETC_ReadParameter CoE DWORD SDO

ETC_co_sdoRead

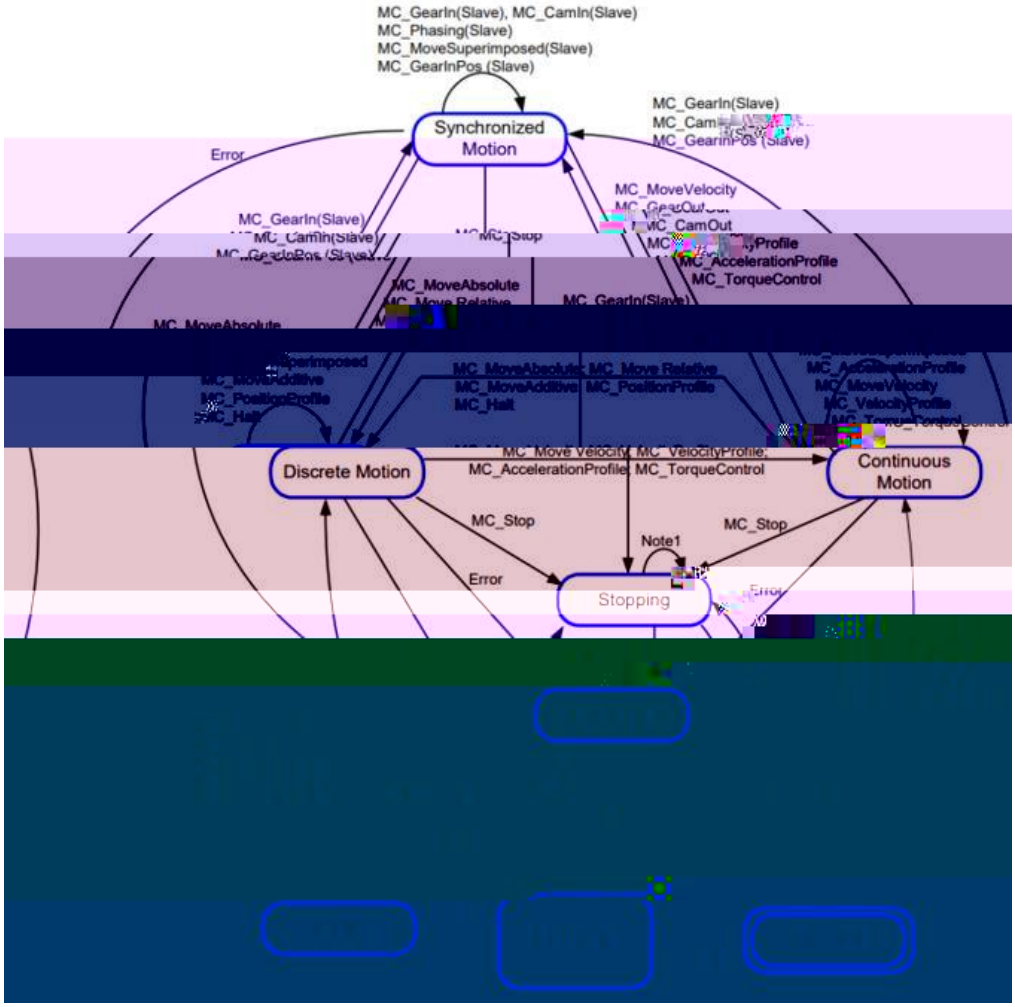


22. STRING MOVE

STRING Wstring



1.




```
//使能
MC_Power_0(
    Axis:=Axis_0 ,
    Enable:=TRUE ,          //此引脚是给MC_Power指令使能，所以直接置TRUE就可以
    bRegulatorOn:=bPower ,
    bDriveStart:=bPower ,
    Status=>bPowerOK ,
    bRegulatorRealState=> ,
    bDriveStartRealState=> ,
    Busy=> ,
    Error=> ,
    ErrorID=> );
```

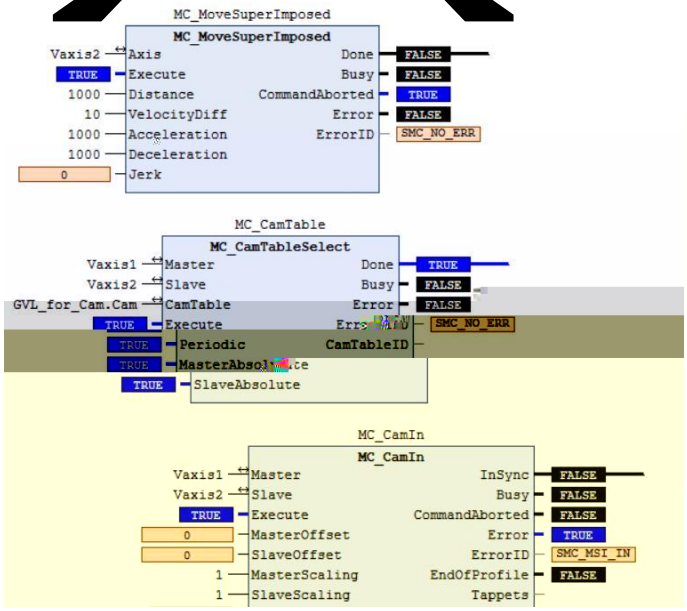
```
//复位—需要轴处于错误状态，并且通讯状态正常
MC_Reset_0(
    Axis:=Axis_0 ,
    Execute:=bReset AND Axis_0.nAxisState=1 AND Axis_0.wCommunicationState=100 ,
    Done=> ,
    Busy=> ,
    Error=> ,
    ErrorID=> );

//驱动器复位—当总线异常时可以执行复位驱动器
SMC3_ReinitDrive_0(
    Axis:=Axis_0 ,
    bExecute:=bReset AND Axis_0.wCommunicationState<>100 ,
    bVirtual:= ,
    bDone=> ,
    bBusy=> ,
    bError=> ,
    nErrorID=> );
```

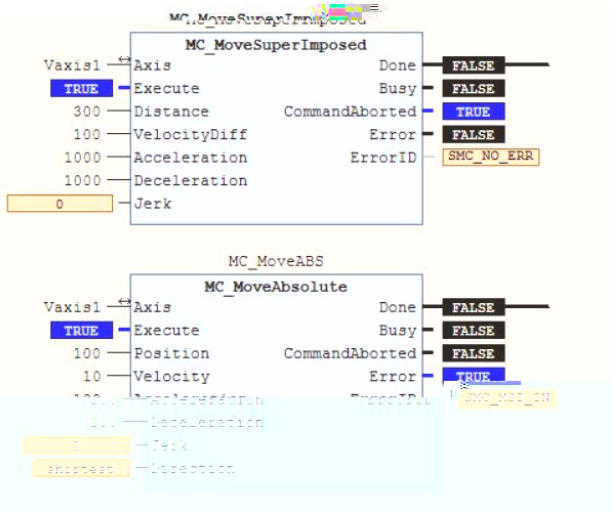
```
//回原—需要防止轴处于未使能（Power_off）、错误状态（Errorstop）、停止状态（Stopping）下被触发
MC_Home_0(
    Axis:=Axis_0 ,
    Execute:=bHome AND Axis_0.nAxisState>2 ,
    Position:=0 ,
    Done=> ,
    Busy=> ,
    CommandAborted=> ,
    Error=> ,
    ErrorID=> );
```

```
//暂停—需要防止轴处于未使能（Power_off）、错误状态（Errorstop）、停止状态（Stopping）下被触发
MC_Halt_0(
    Axis:=Axis_0 ,
    Execute:=bHalt AND Axis_0.nAxisState>3 ,
    BufferMode:=Aborting ,
    Done=> ,
    Busy=> ,
    CommandAborted=> ,
    Error=> ,
    ErrorID=> );

//点动—需要防止轴处于未使能（Power_off）、错误状态（Errorstop）、停止状态（Stopping）、回原（Homing）下被触发
MC_Jog_0(
    Axis:=Axis_0 ,
    JogForward:=bJogF AND Axis_0.nAxisState>2 AND Axis_0.nAxisState<>7 ,
    JogBackward:=bJogB AND Axis_0.nAxisState>2 AND Axis_0.nAxisState<>7 ,
    Velocity:=50 ,
    Acceleration:=1000 ,
    Deceleration:=1000 ,
    Jerk:=0 ,
    Busy=> ,
    CommandAborted=> ,
    Error=> ,
    ErrorID=> );
```

MC_MoveAbsolute MC_MoveRelative MC_MoveSuperImpsed MC_MoveAdditive MC_Jog ，

Power_off Errorstop Stopping Homing

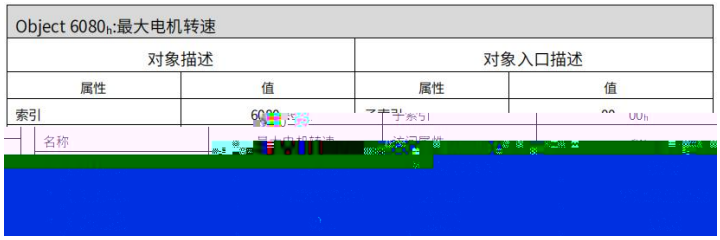




3. standstill

0 standstill 6041

EtherCAT PDO 16#607F 16#6080



softmotion

11. Codesys Port4 Port3

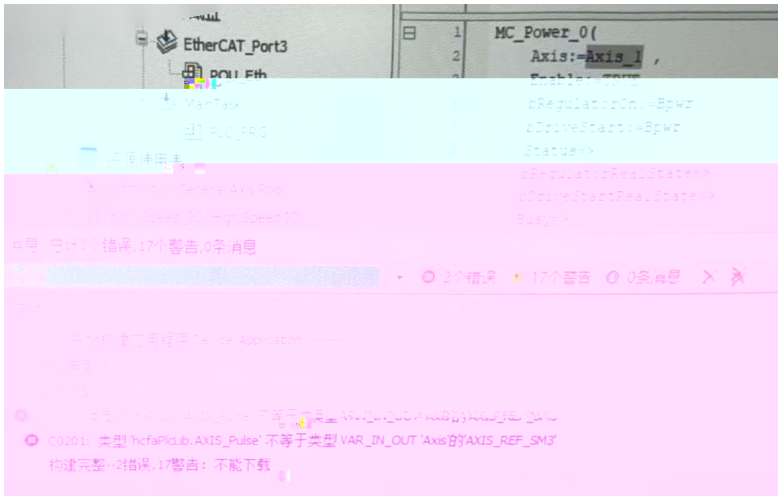
Codesys EtherCAT EtherCAT EtherCAT

Port3 EtherCAT

12. HCP Works3 V1.3.0

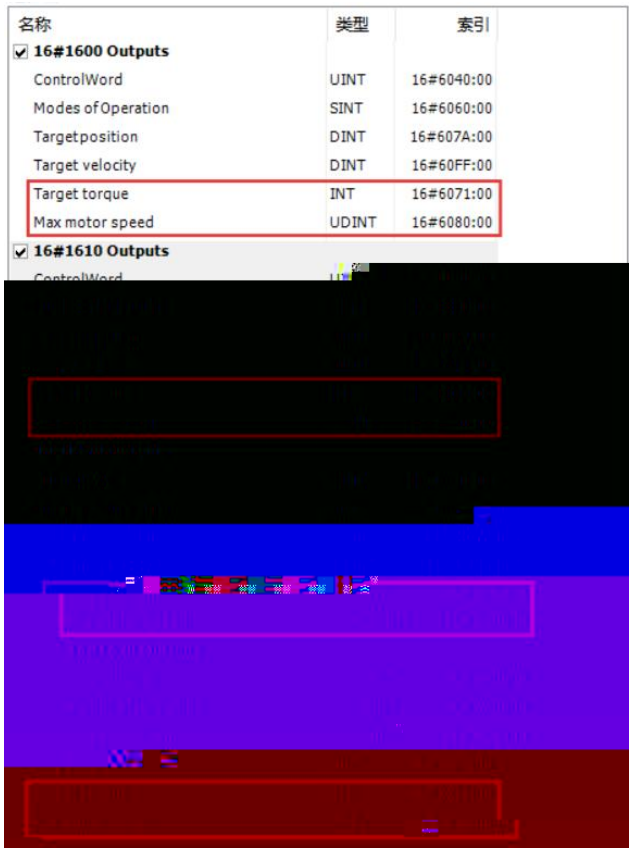
Softmotion 4.10.0 Codesys HCP Works3 V1.3.0

Softmotion



13. SV730W

SV730W XML 16#6071 16#607F 16#6080 PDO


名称
类型
索引
16#1600 Outputs
ControlWord
UINT
16#6040:00
Modes of Operation
SINT
16#6060:00
Target position
DINT
16#607A:00
Target velocity
DINT
16#60FF:00
Target torque
INT
16#6071:00
Max motor speed
UDINT
16#6080:00
16#1610 Outputs

14.

dò

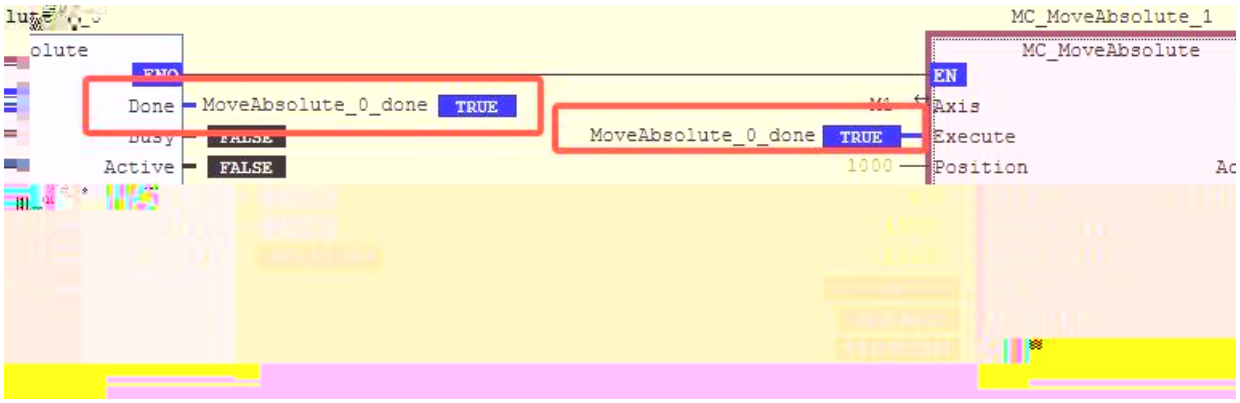
2

15.

X Nm Y7 X 6076 Y7

6076 6071 6076 0

16. BufferMode



17.

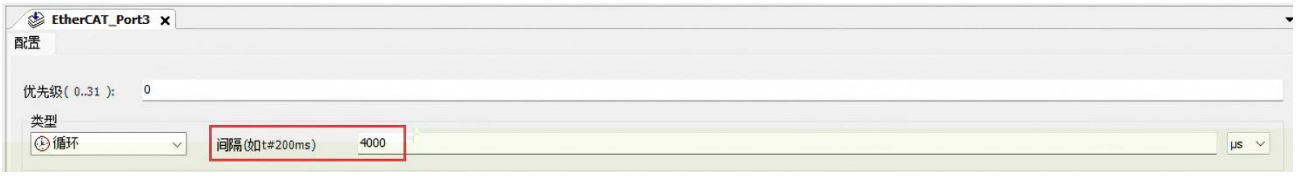
IO 16#60FD Axis.in.dwDigitalInputs

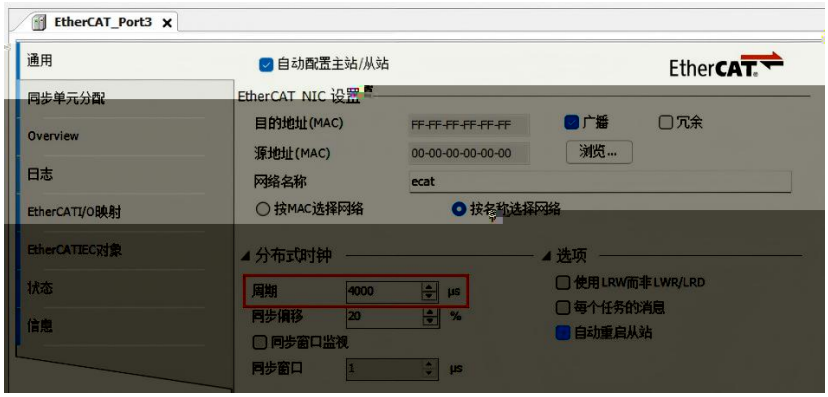
Y7S

```
b负限位   :=Axis_0.in.dwDigitalInputs.0;
b正限位   :=Axis_0.in.dwDigitalInputs.1;
b原点     :=Axis_0.in.dwDigitalInputs.2;
b探针1    :=Axis_0.in.dwDigitalInputs.11;
```

18. EtherCAT

EtherCAT EtherCAT





19. SMC_MOVING_WITHOUT_ACTIVE_MOVEMENT

SMC_SetControllerMode Done

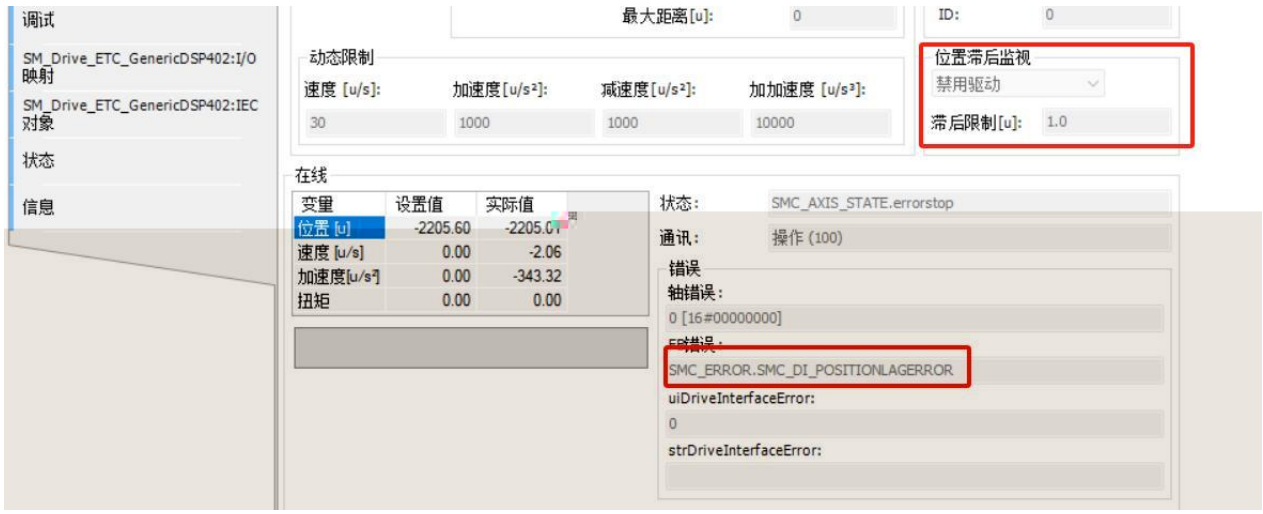
Done Halt Stop Softmotion 4.4.0.2

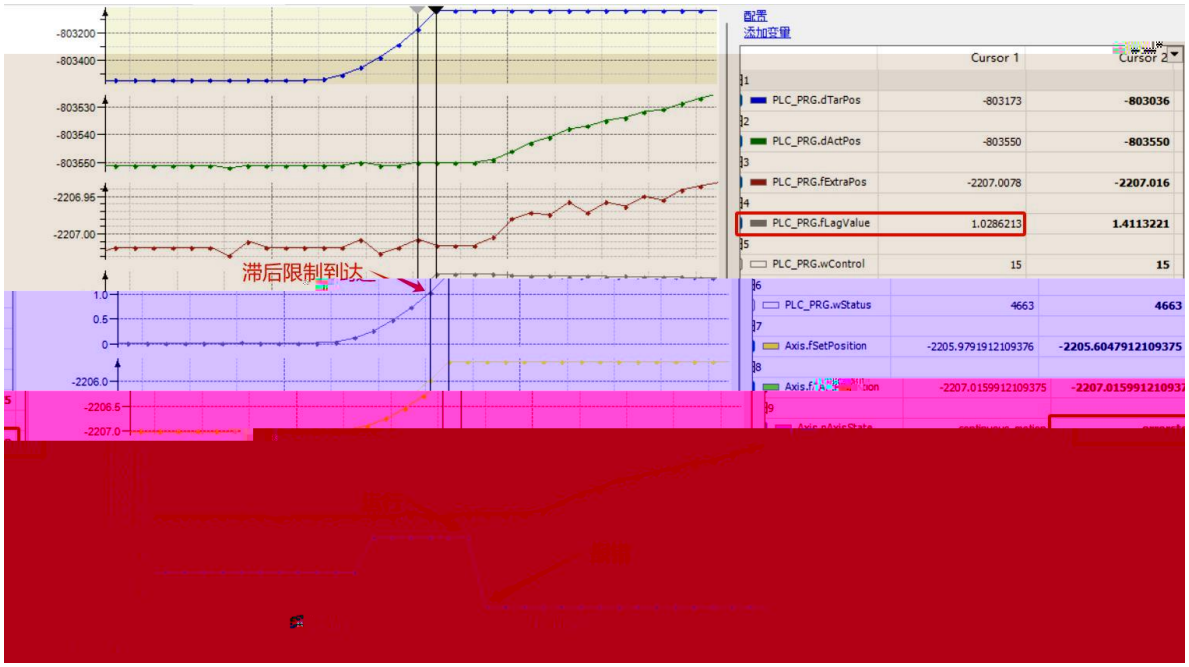
softmotion 4.10.0.0 softmotion

```
SMC_SetControllerMode_0(
    Axis:=Axis_0 ,
    bExecute:= ,
    nControllerMode:=3 ,
    bDone=> ,
    bBusy=> ,
    bError=> ,
    nErrorID=> );

MC_Stop_0(
    Axis:=Axis_0 ,
    Execute:=SMC_SetControllerMode_0.
      Deceleration:=10000 ,
      Jerk:= ,
      Done=> ,
      Busy=> ,
      Error=> ,
      ErrorID=> );
```

20. SMC_DI_POSITIONLAGERROR

abs(fSetPositon-fActPositon)>





"位置滞后监督"

定义系统的检测滞后误差后的反应。当额定位置和补偿的实际位置之间的差值超过滞后限制就会产生滞后误差。实际位置的计算公式：

```
Extranolated actual position := actual position + actual velocity * cycle time * Axis.fSetActTimeLagCycles
```

这个值等于轴的结构体中的`fSetActTimeLagCycles`周期（⇘"功能块 AXIS_REF_SM3"）补偿用于因为通讯而导致设置值与当前值之间的偏差

检测到滞后误差可能出现的反应是：

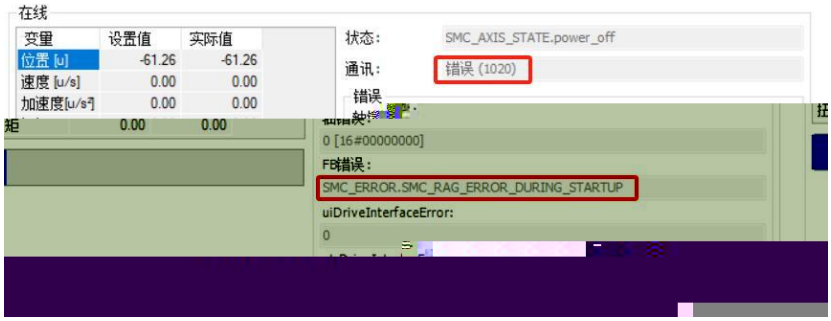
- *"停用"*：没有任何反应，因为滞后监督被取消。
- *"禁用驱动器"*：位bRegulatorOn被强制为 FALSE (与 MC_Power 输入比较)，这导致驱动器被禁用 (当然依据驱动器减速度实现方式)。
- *"执行快速停止"*：位bDriveStart被强制为 FALSE (与 MC_Power 输入比较)，这导致驱动器快速停止。
- *"保留当前状态"*：驱动器在触位于当前状态，但是停止后有运动。
- *"滞后限制"*：定义滞后限制。

21. 1020

SMC_RAG_ERROR_DURING_STARTUP 20 1020 SMC_ERROR

" Error at startup of the axis group " SDO

MC_ReadAxisError MC_ReadParameter MC_WriteParameter



SDO SDO

SDO CRC SDO

1020 SDO SDO

softmotion 4.10.0.0 14 17 SMC3_ReinitDrive

SMC3_ReinitDrive SDO MC_ReadAxisError 603F 20

1020

22. SMC_CGR_INVALID_POSPERIOD

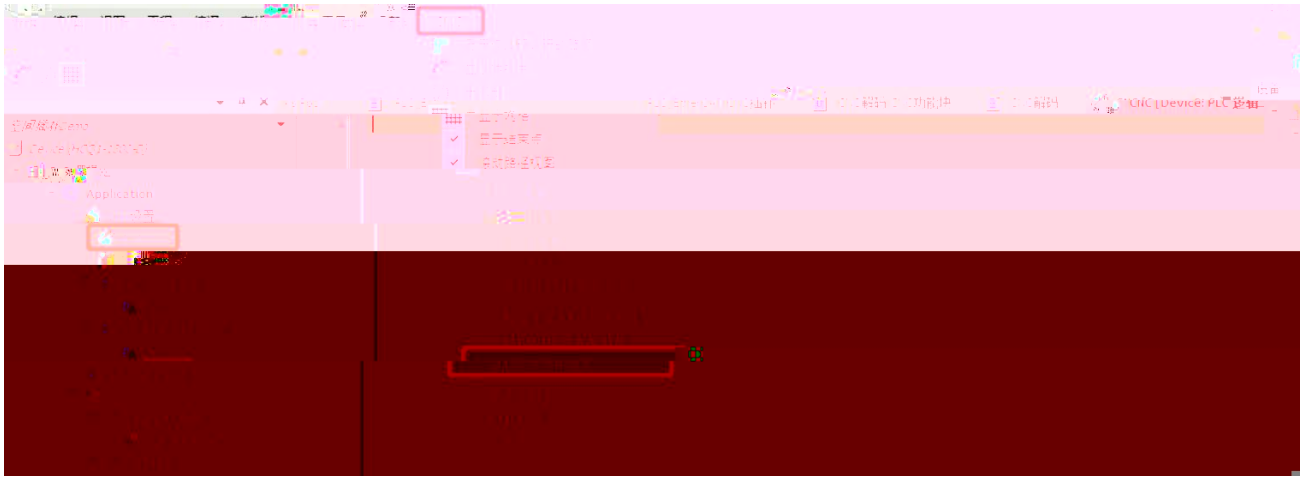
$$= \frac{2^{32} \times \quad \times}{\times} \div 2$$

18432

23. CNC DXF

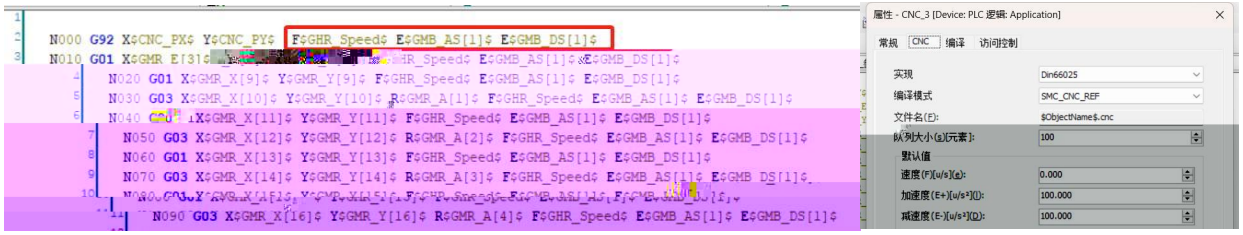
Codesys CAD DXF G CNC-

CNC - DXF - DXF

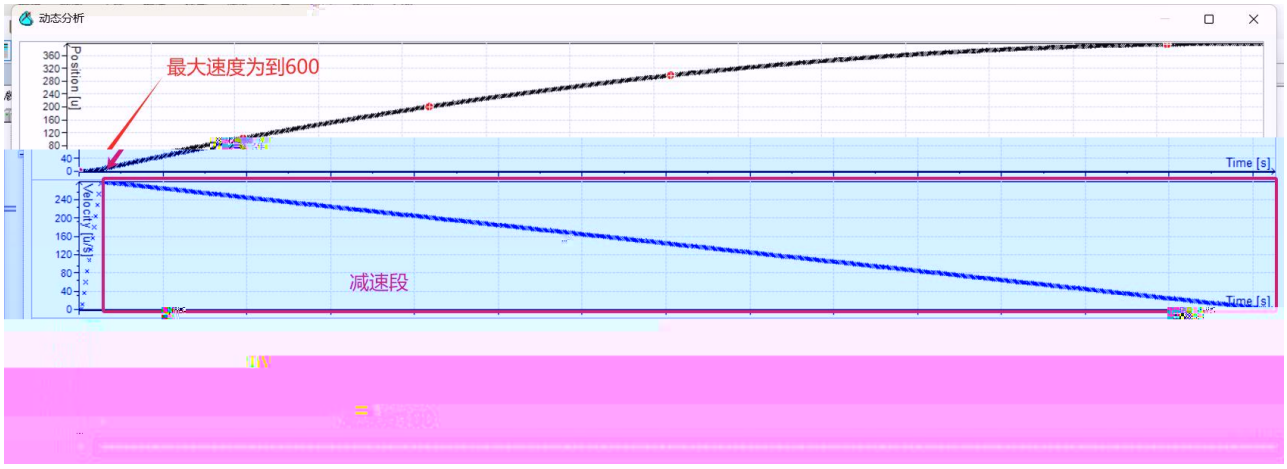


24. CNC

100



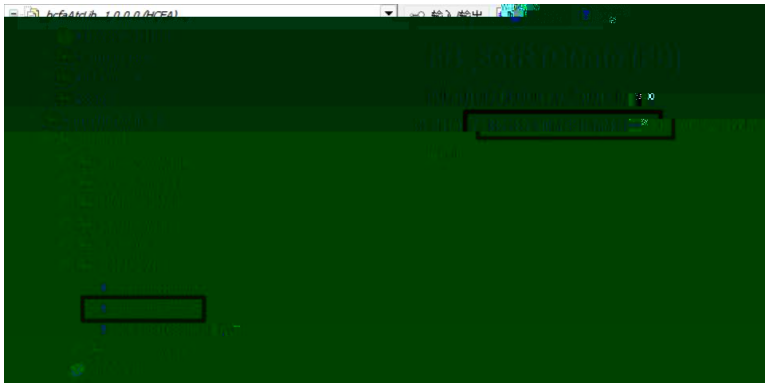
600 6



25. EtherCAT

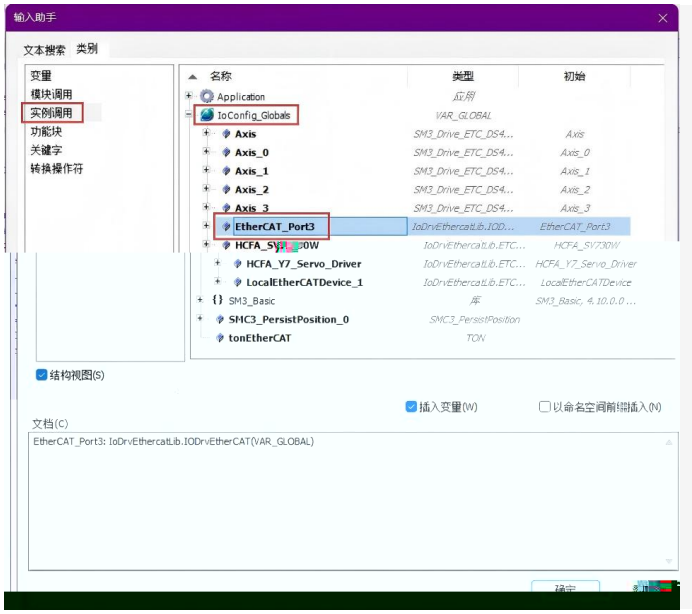
FB_SetRTCDate EtherCAT EtherCAT

SMC_DI_FIELDBUS_LOST_SYNCRONICITY



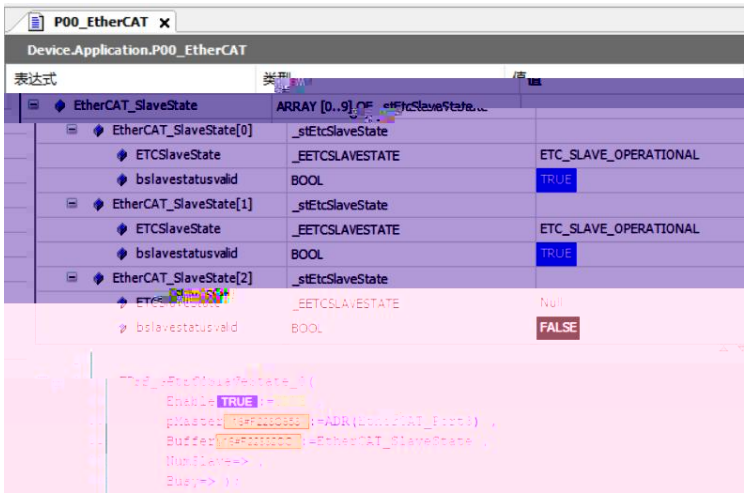
26. EtherCAT

EtherCAT F2 xRestart EtherCAT



27.

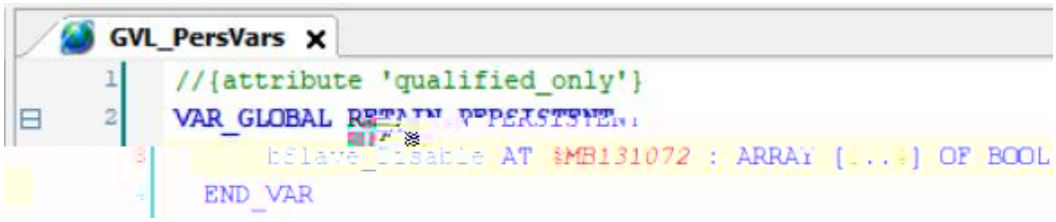
ATC FB_GetEtcSlaveState pMaster Buffer _stEtcSlaveState NumSlave _stEtcSlaveState ETCSlaveState Null

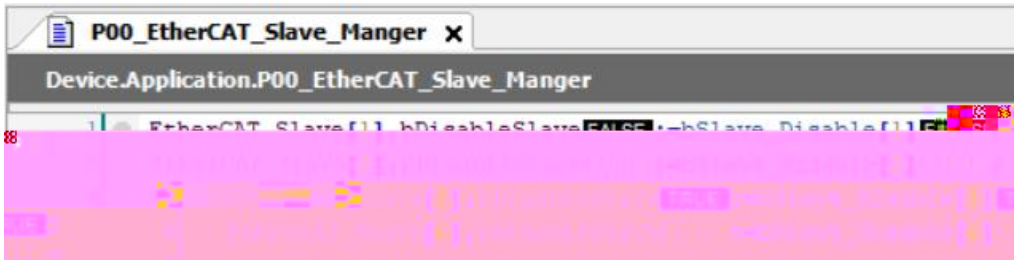


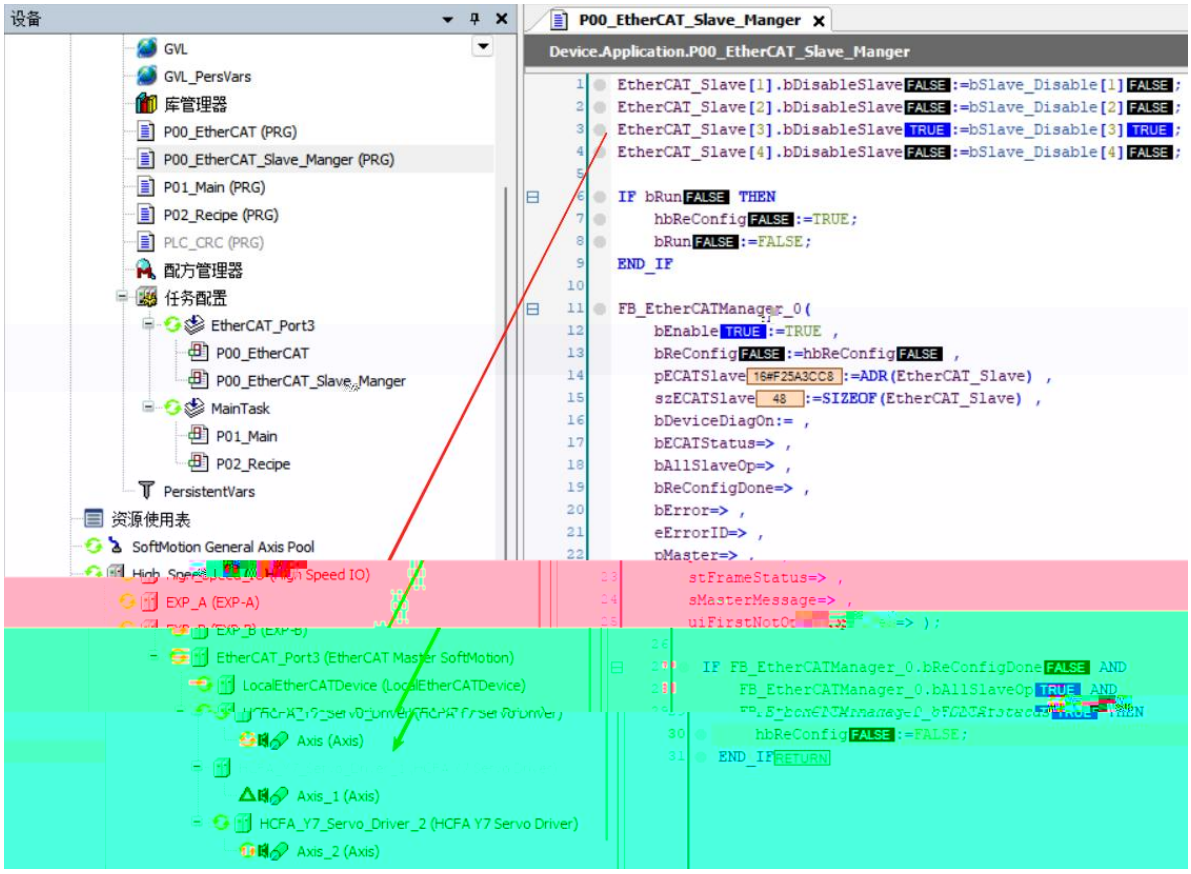
28. EtherCAT

hcfaAtcLib FB_EtherCATManager stECATSlave

LocalEtherCATDevice







SetEnabled

```
EtherCAT_Port3(
    xRestart:=bRestart ,
    xStopBus:= ,
    xConfigFinished=> ,
    xDistributedClockInSync=> ,
    xError=> ,
    xSyncInWindow=> );

HCFA_Y7_Servo_Driver_1.SetEnabled(pConnector:=HCFA_Y7_Servo_Driver_1.m_pConnector,xEnabled:=NOT bEnable);
HCFA_Y7_Servo_Driver_1.SetEnabled(pConnector:=Axis_1.m_pConnector,xEnabled:=NOT bEnable);
```

29. DXF CNC

CAM DXF CNC CNC U \SD CNC

1. —— ER0000

Q0P/Q1P ERR

2. —— ER0051

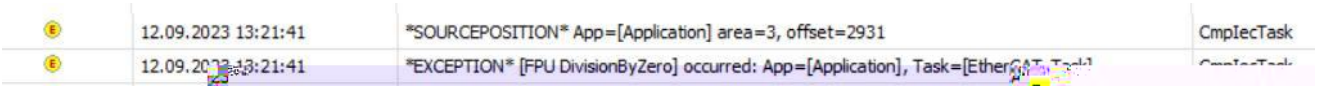
PLC

FOR

FOR

3. —— ER0102 ER0152

FPU DevisionByZero



POU REAL/LREAL

POU

4. —— HCFA

HCFA

HCFA

5. EtherCAT ——

CRC Port0 Port1 Link Lost Counter

6. EtherCAT —— “ ”

XML XML

7. EtherCAT ——

1 In Out

2

3 STOP

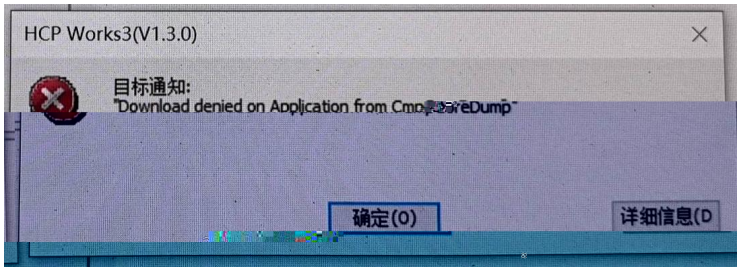
4

5

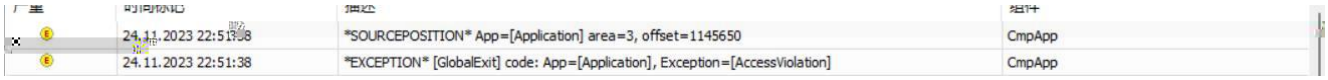
8. EtherCAT ——

LocaEtherCATDevice EtherCAT EtherCAT 1001

9. ——Download Denied on Application from CmpCoreDump



“ EXCEPTION ”



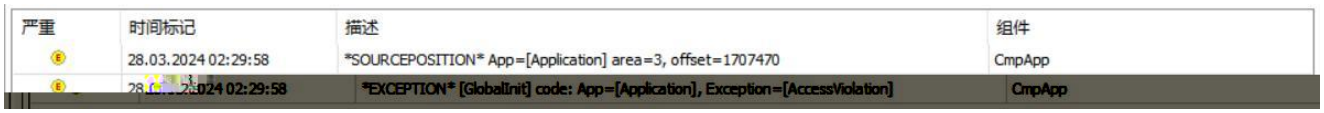
1 PLC STOP

2 PLC Device→

3

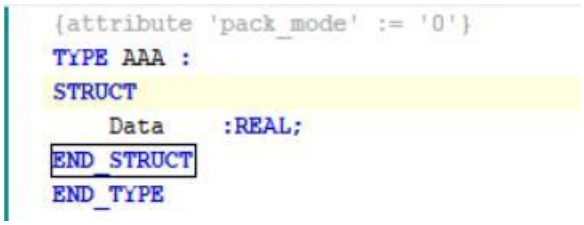
10. ——

GlobalInit



4 4 ARM 32

64

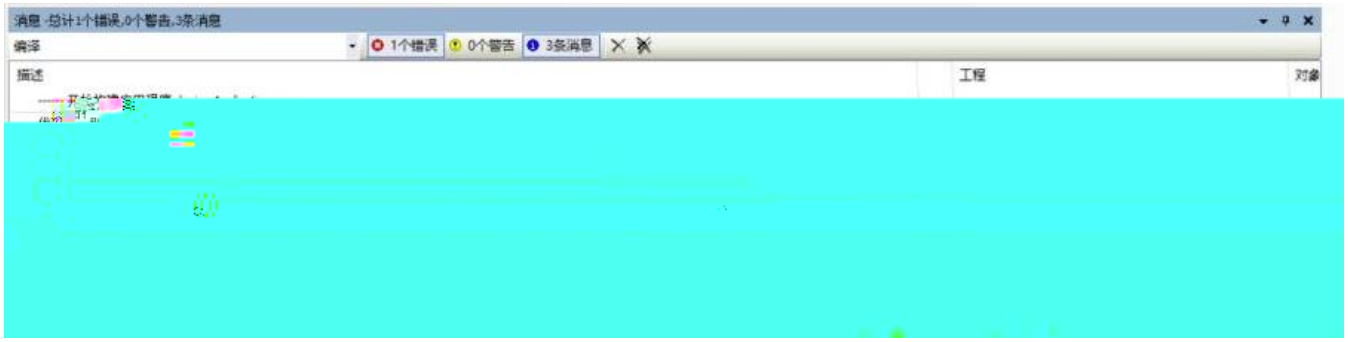


11. —— 'sm3basic,4.10.0.0...

“ ”

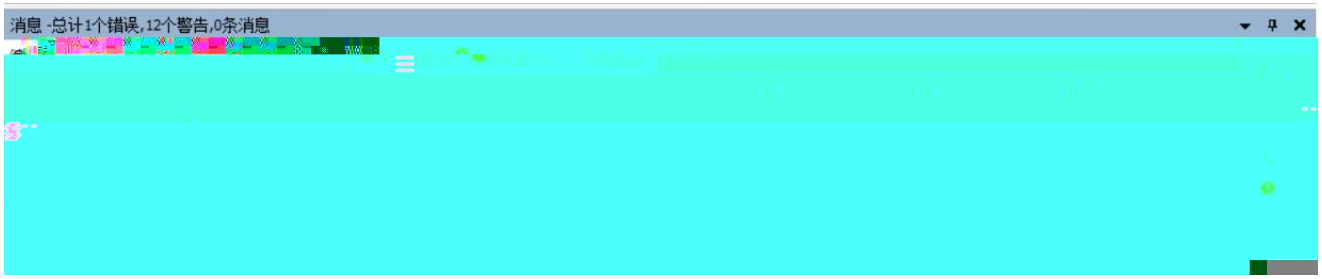
12. ——Internal error:System.NullReferenceException

softmotion



13. ——The Library * is only supported in 32 bit applications**

32

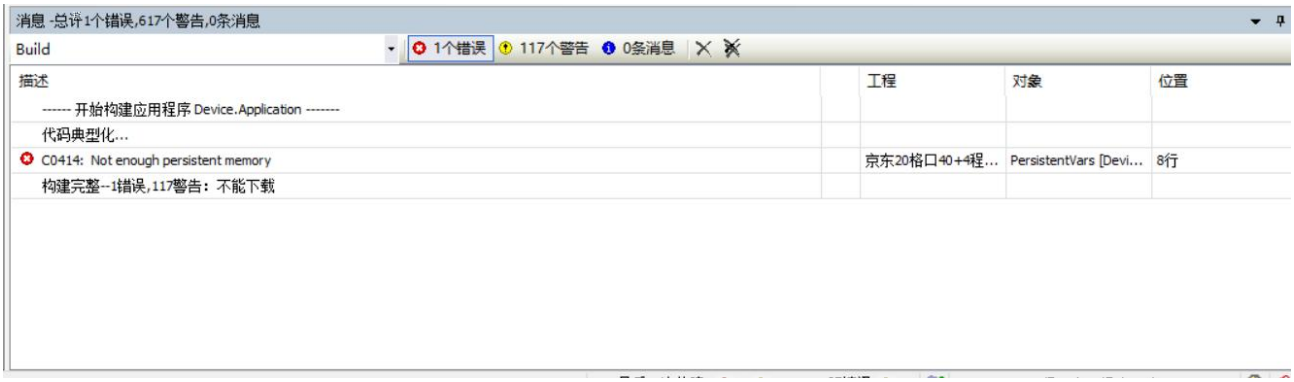


23 32 64 sysmem23 32 sysmem

32 /64

14. ——Not enough persistent memory

/


消息 -总计1个错误,617个警告,0条消息
Build
1个错误
117个警告
0条消息
描述
工程
对象
位置
------ 开始构建应用程序 Device.Application -------
代码典型化...
C0414: Not enough persistent memory
京东20格口40+4程...
PersistentVars [Devi...
8行
构建完整---1错误,117警告：不能下载

1.

/ / Codesys

POU / / /Lrange

/

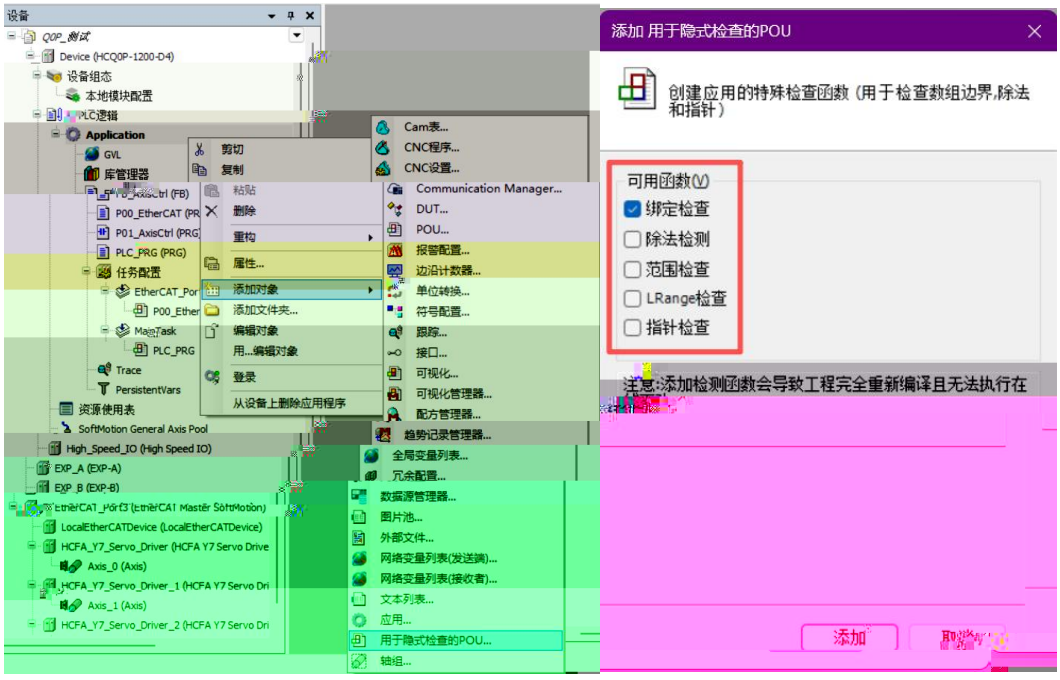
CPU

POU “ no_check ” POU

POU POU

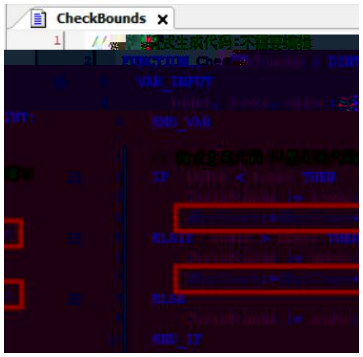
```
{attribute 'no_check'}
PROGRAM P00_EtherCAT
VAR
    tonEtherCAT             :TON;
    SMC3_PersistPosition_0  :SMC3_PersistPosition;
    FB_GetEtcSlaveState_0   :FB_GetEtcSlaveState;
    EtherCAT_SlaveState     :ARRAY[0..9] OF _stEtcSlaveState;
    bRestart                :BOOL;
    bEnable                 :BOOL;
END_VAR
```

POU Application→ → POU, →

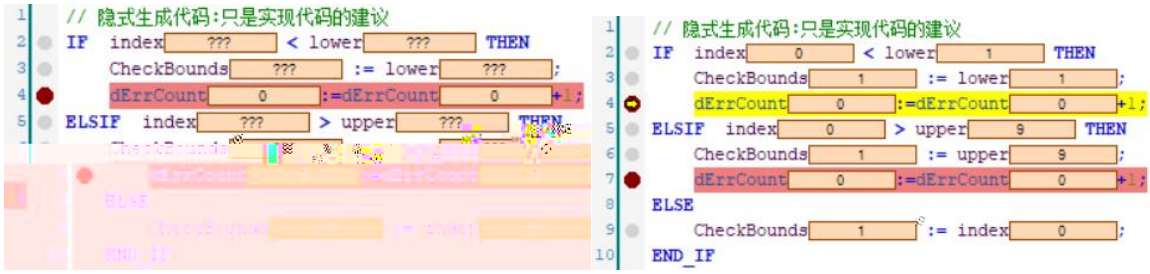


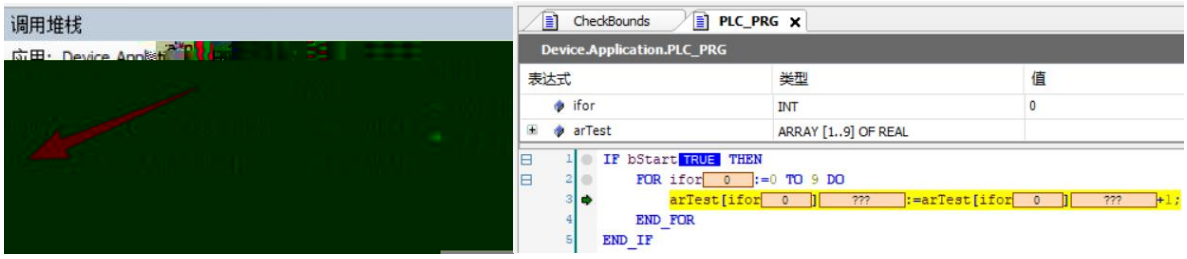
dErrCount dErrCount

1 dErrCount



dErrCount 0





PLC

2. PID

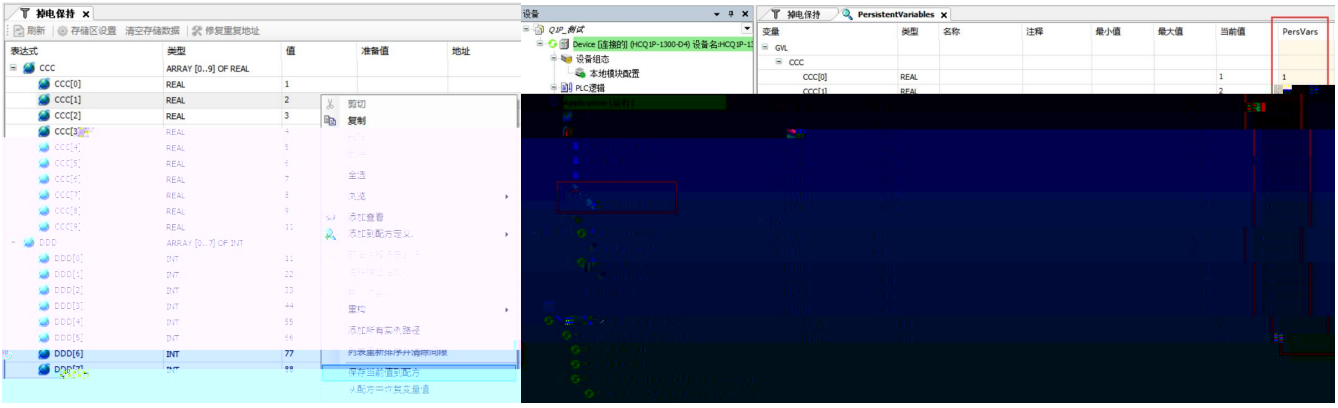
PIDLIB 2.0.0.0.compiled-library PID PWS PID

```
rActValue:=TO_REAL(%IW2)/10;

PID_0(
    RUN:=bRun ,                          //功能块开始运行
    ManualCtrl:=FALSE ,
    AutoTune:=bAutoTune ,                //开始自动调整
    SV:=rSetValue ,
    PV:=rActValue ,
    CycleTime:=LTIME#100MS ,
    Proportional:=rP ,                   //在自调整时随便给个值，但不能为0，给个初始值就好
    IntegrationTime:=ltI ,               //在自调整时随便给个值，但不能为0，给个初始值就好
    DerivativeTime:=ltD ,                //在自调整时随便给个值，但不能为0，给个初始值就好
    RangLow:=0 ,                         //输入下限
    RangUp:=300 ,                        //输入上限
    MVLow:=0 ,                           //输出下限
    MVUp:=100 ,                          //输出上限
    ManualMV:=rManualMV ,
    Direction:= ,
    Options:= ,
    ATDone=> ,
    ATBusy=> ,
    Error=> ,
    ErrorID=> ,
    MV=> );                              //输出值的范围是0-100

PWM_0(
    Enable:=bOut ,
    OnTime:=REAL_TO_INT(PID_0.MV*10) ,   //PID输出值*10就是相当于将ON时间调成在1s中所占百分比
    CycleTime:=1000 ,                    //周期为1000ms
    Out=>%QX0.0 );

//执行RUN,功能块开始运行。ATBUSY输出此表示功能块正在忙...
//当ATDone被置位代表运算完成，PID新的参数也会生成，结果会覆盖到比例系数，微分时间，积分时间引脚上
//如需下次使用该组参数无需自调节，将AutoTune复位，直接run即可使用该组PID参数
```

3.

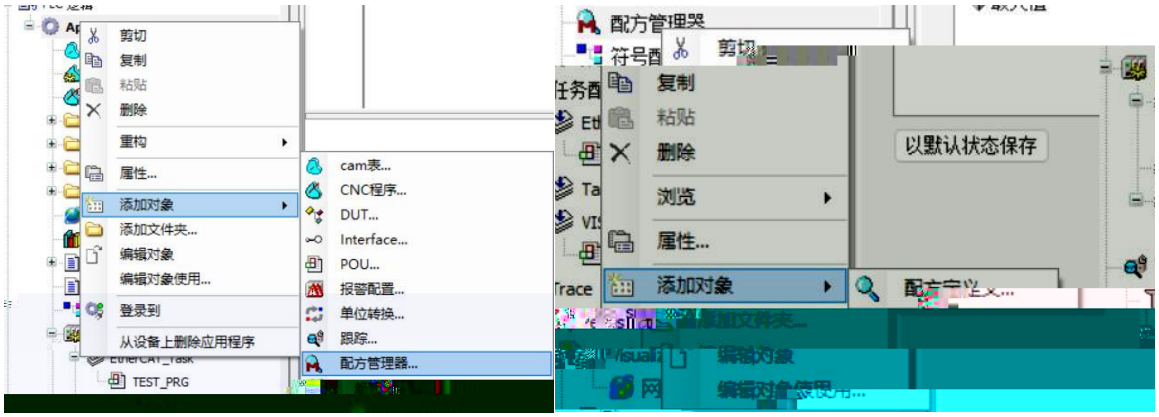
PersistentVars PersistentVars

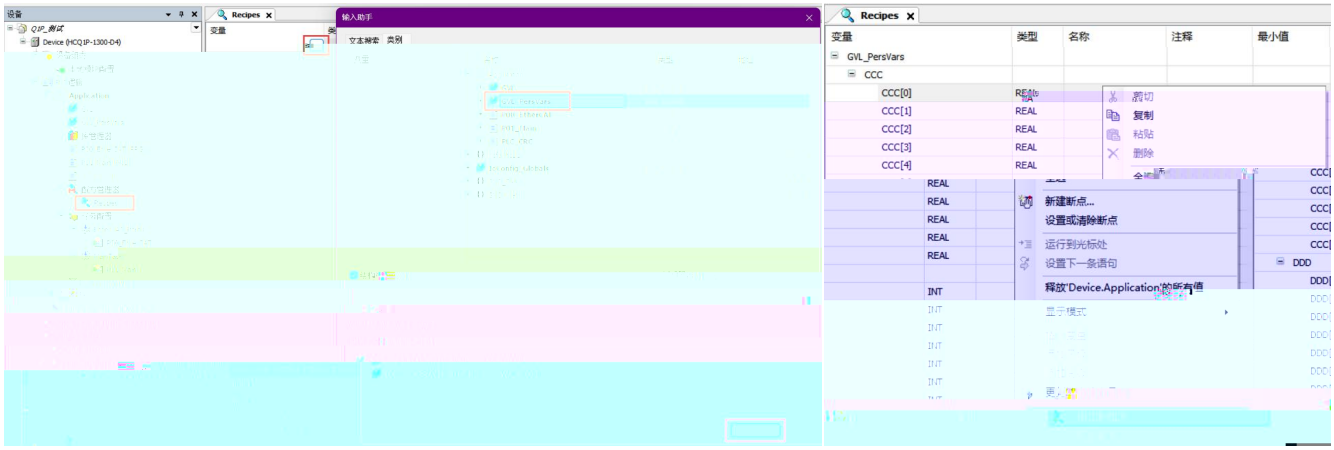
PersistentVariables PersVars



PersistentVars Application →

→

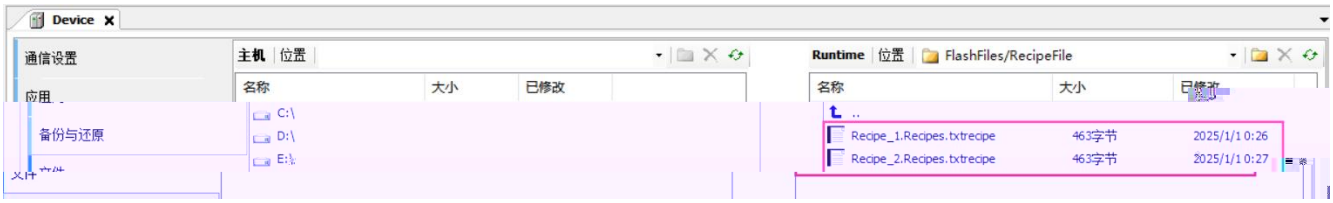




→ PLC RecipeManagement.library

RecipeManCommands “ FlashFiles/ ”

```
//实例调用
RecipeManCommands_0();

//设置存储路径
IF bSetStoragePath THEN
    IF RecipeManCommands_0.SetStoragePath(stPath:='FlashFiles/RecipeFile/') THEN
        bSetStoragePath_OK:=TRUE;
        bSetStoragePath:=FALSE;
    END_IF
END_IF

//生成配方名称
strRecipeNum:=TO_STRING(wRecipeNum);
strRecipeName:=CONCAT('Recipe_',strRecipeNum);

//创建配方文件
IF bCreateRecipe AND bSetStoragePath_OK THEN
    IF RecipeManCommands_0.CreateRecipe(RecipeDefinitionName:='Recipes'
```



1 EtherCAT PLC 100ms

2

3 “ FlashFiles/RecipeFile/ ” FlashFiles

RecipeFile

4 FlashFiles

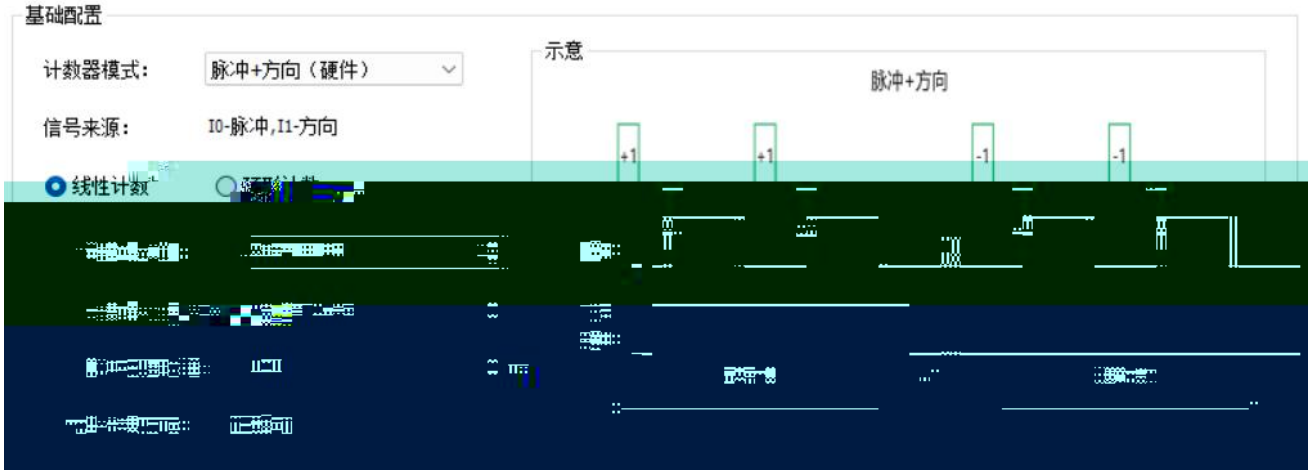
4.

—— High_Speed_IO 0

Counter0 Encoder Encoder_0

Counter0 A/B 1 2 4 CW/CCW +

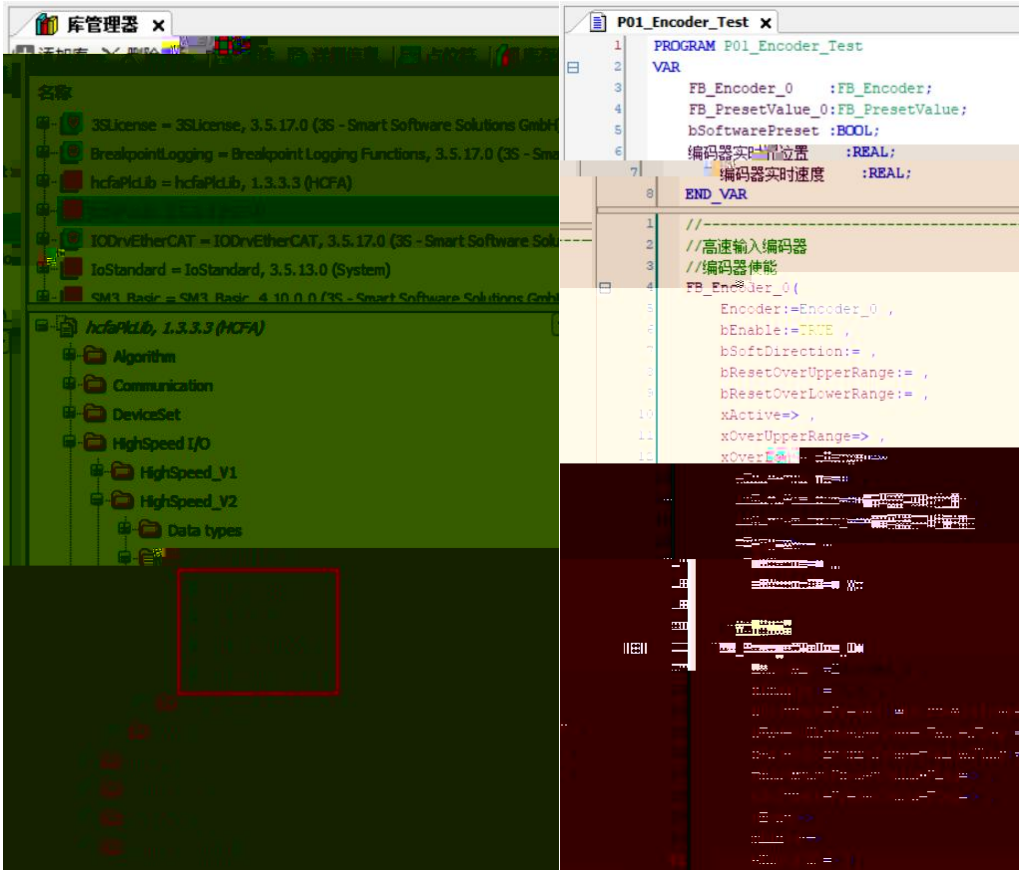
-2147483648~2147483647



IO

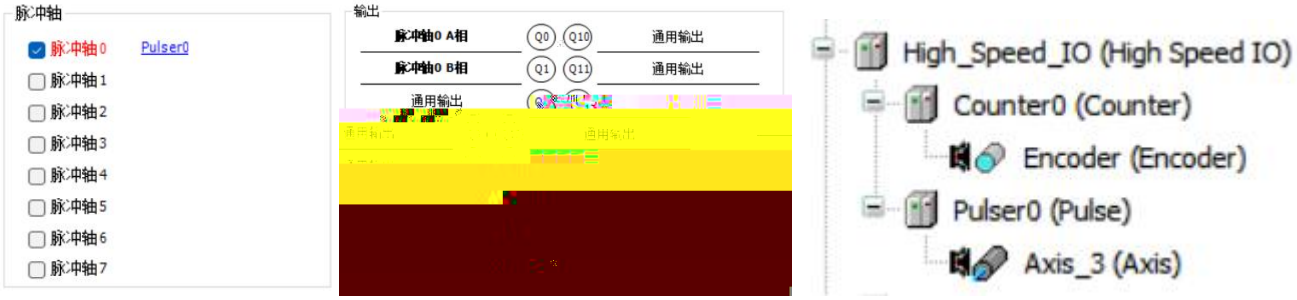
IO FB_PresetValue

Encoder 2 FB_Latch

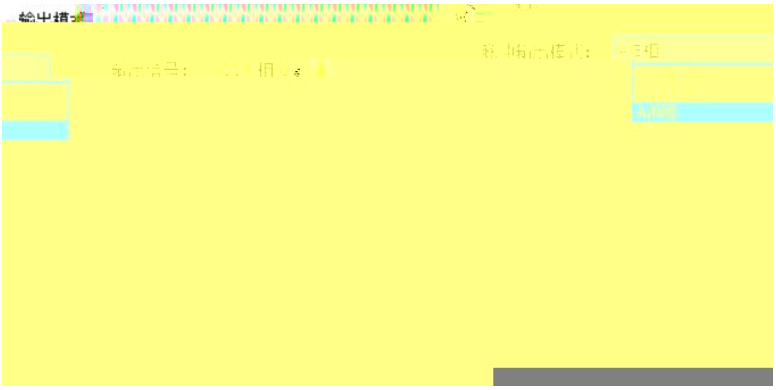


—— High_Speed_IO 0

Pulser0 Axis



Pulser0 + CW/CCW A/B



Codesys MC MC_Home EtherCAT

P00_Pulser_Test

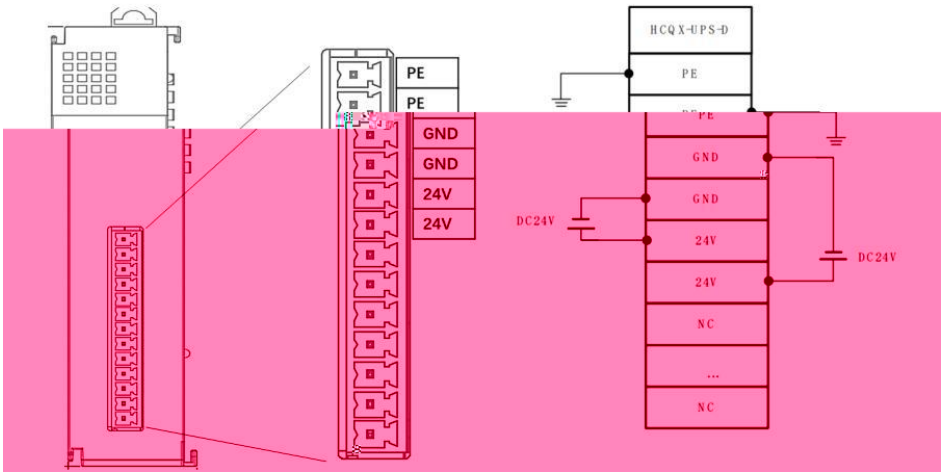
```
PROGRAM P00_Pulser_Test
VAR
    MC_Power_0      :MC_Power;
    MC_Jog_0        :MC_Jog;
    bPower          :BOOL;
    bJogF           :BOOL;
    bJogB           :BOOL;
    rJogVel         :REAL;
END_VAR
```

```
//----------------------------------------------------------------------------------------------------
//高速输出轴
//脉冲轴使能
MC_Power_0(
    Axis:=Axis_0 ,
    Enable:=TRUE ,
    bRegulatorOn:=bPower ,
    bDriveStart:=bPower ,
    Status=> ,
    bRegulatorRealState=> ,
    bDriveStartRealState=> ,
    Busy=> ,
    Error=> ,
    ErrorID=> );

//脉冲轴点动
MC_Jog_0(
    Axis:=Axis_0 ,
    JogForward:=bJogF ,
    JogBackward:=bJogB ,
    Velocity:=rJogVel ,
    Acceleration:=1000 ,
    Deceleration:=1000 ,
    Jerk:=10000 ,
    Busy=> ,
    CommandAborted=> ,
    Error=> ,
    ErrorId=> );
```

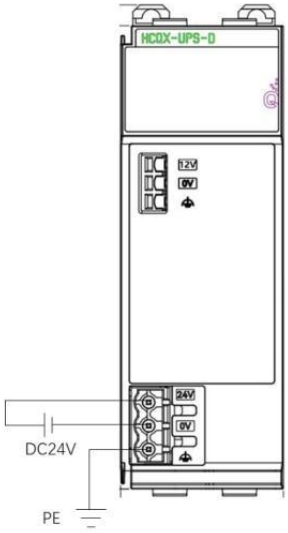
5. UPS

UPS

HCQX-UPS-D-T05 96W(MAX)



HCQX-UPS-D-T09 16 60.48W(MAX)



HCQX-UPS-D-T09　　HCQX-UPS-D-TRF　　16

HCQX-UPS-D-TRF

表三 中转模块 HCQX-UPS-D-TRF 端子排列说明

说明	NO.		说明
GND	0	10	12V
	1	11	
	2	12	
	3	13	
	4	14	
	5	15	
	6	16	
	7	17	
PE	8	18	PE

注：PE（8，18）之间内部导通，任意接一个即可