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Kinco PN Servo Operating Instructions

Controller: S7-1200 CPU 1212C Software Version: TIA Portal V16

This case can realize aperiodic data interaction between PLC and Kinco PN drive and use related messages to control the servo. After installing the Portal software, the corresponding command module may not be found. You can download the corresponding library file from the Siemens official website. The website is as follows:

<https://support.industry.siemens.com/cs/document/109475044/sinamics-communication-blocks-drive-lib-for-reading-and-writing-drive-data-within-tia-portal-context?dti=0&lc=en-WW>

After the download is complete, click the software menu on the top of the TIA Portal software → Options → Global Library → Open Library → Follow the prompts to find the corresponding library file.

1、Acyclic data read and write

1.1 Configuration

Using Siemens S7-1200, S7-1500PLC to read and write parameters to MD/FD series profinet drives, it needs to be configured in Siemens Portal software.

①Install GSD file: Options->Manage General Station Description Software, as shown in Figure 1.1.1

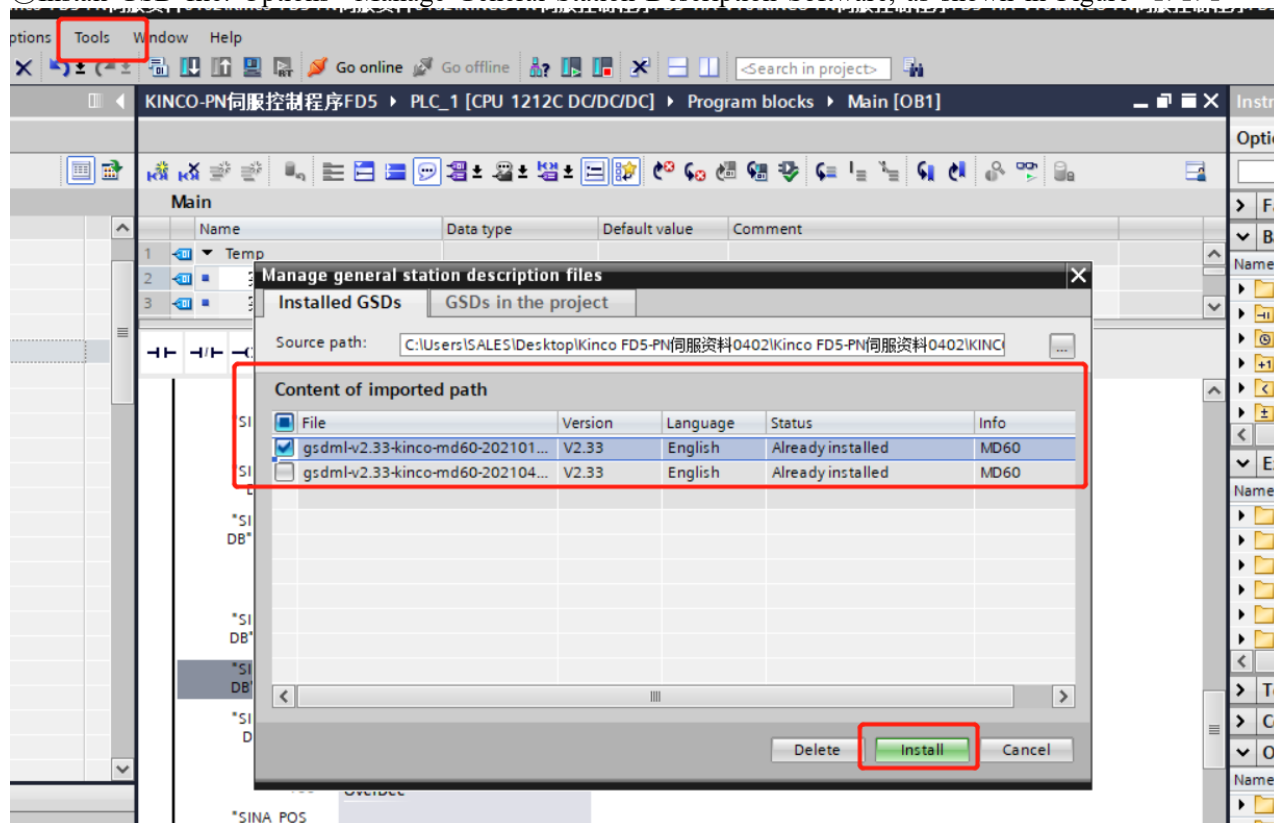
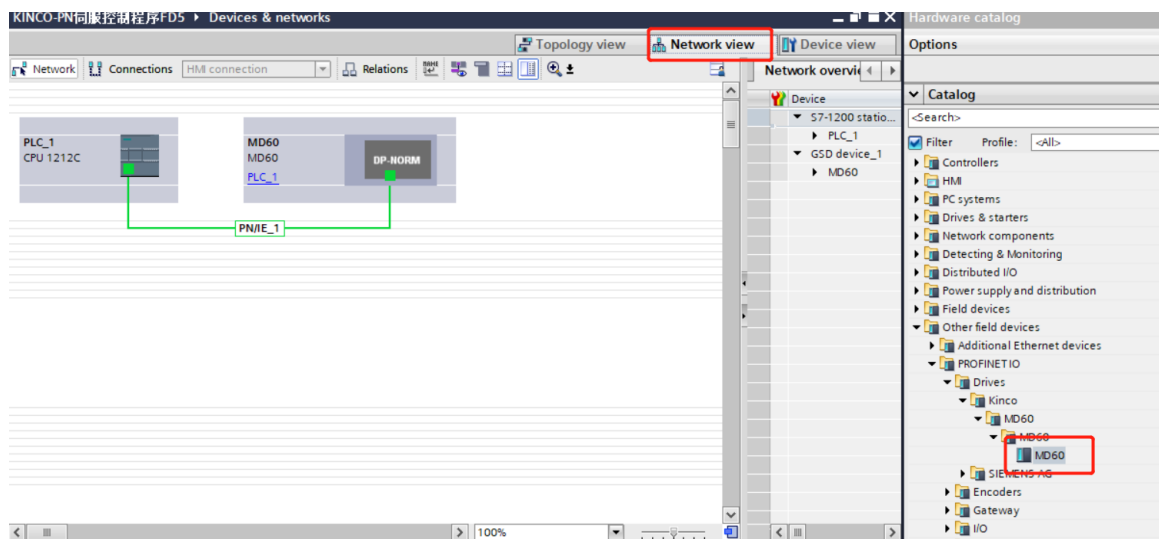


Figure 1.1.1 Install GSD file

②"Select "Device and Network", in the network view, import the corresponding PLC model and MD60 drive, and establish a connection, as shown in Figure 1.1.2. When there are multiple drives, you can import multiple MD60s, and how many PN servos can be connected . , please refer to the official Siemens instructions.



1.2 PLC and drive connection configuration

③ Double-click the MD60 module, click "Ethernet Address" in "General", and set the configuration profinet device name, which must be consistent with the drive's profinet device name. And when there are multiple drives, the device names cannot be the same. Otherwise, the PLC will prompt that there is a drive not connected. Choose to set the IP address in the project, or set the IP address in the device. When setting the IP address in the project, the PLC will set the IP address of the drive whose configuration is consistent with the device name of the drive to the IP address set in the configuration. Figure 1.1.3.

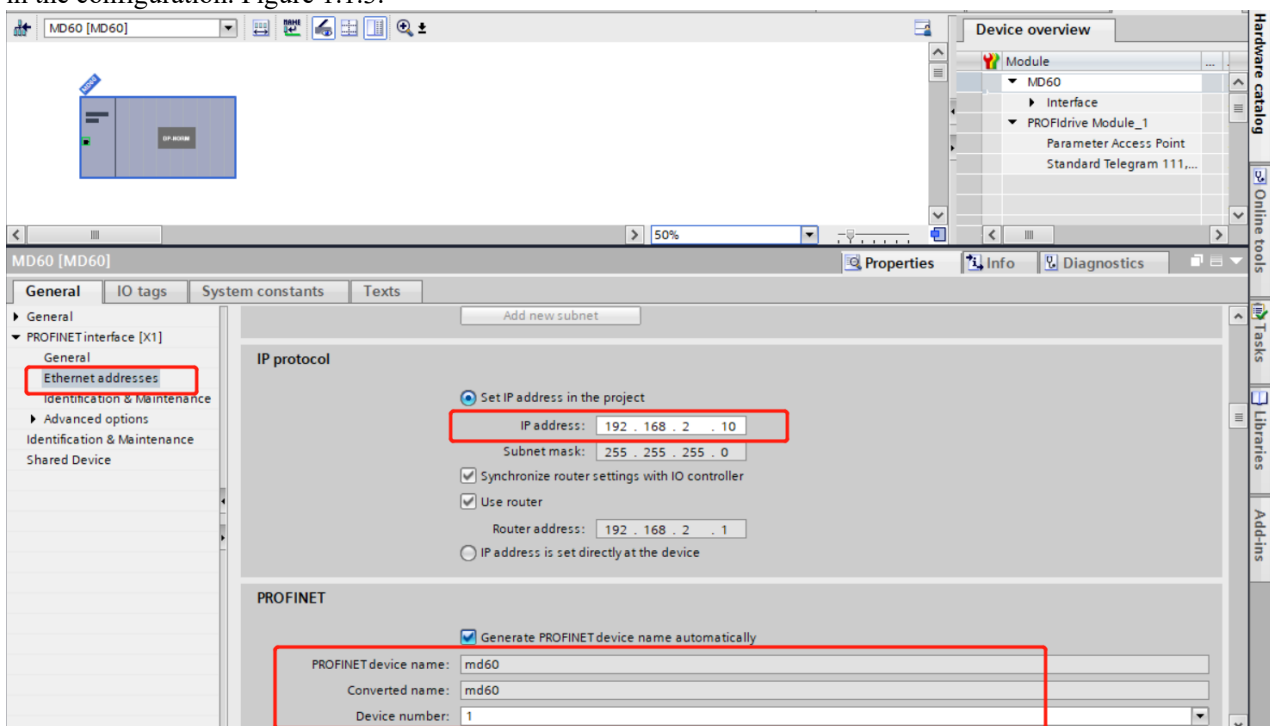


Figure 1.1.3 Set IP address and device name

④ Click the "System Constants" column and write down the hardware identifier of the Interface, which will be used by the read-write parameter module later. Figure 1.1.4.

General IO tags System constants Texts					
Show hardware system constant ▾					
Name	Type	Hardware identi.	Used by	Comment	
MD60~Interface~Port_1	Hw_Interface	274	PLC_1		
MD60~Interface~Port_2	Hw_Interface	275	PLC_1		
MD60~Interface	Hw_Interface	273	PLC_1		
MD60~Proxy	Hw_SubModule	272	PLC_1		
MD60~Head	Hw_SubModule	276	PLC_1		

Figure 1.1.4 Recording Hardware Identifiers

1.2 Modification of drive IP address and device name

Currently, the driver IP address and device name can only be modified in the Portal software temporarily. The specific steps are as follows:

- ① First, connect the drive to the computer through a network cable,
- ② Open the Portal software, expand the "Online Access" drop-down list, select the corresponding network card, and click "Update Accessible Devices". After waiting for the software to scan the drive, double-click Online and Diagnostics.
- ③ Double-click "Assign IP Address" in the "Function" drop-down list. After filling in the IP address and subnet mask, click the "Assign IP Address" button. Figure 1.2.1. This step can be omitted if "Set IP address in project" is selected in the configuration. Skip directly to step ③ to set The PROFINET device name is sufficient PROFINET .

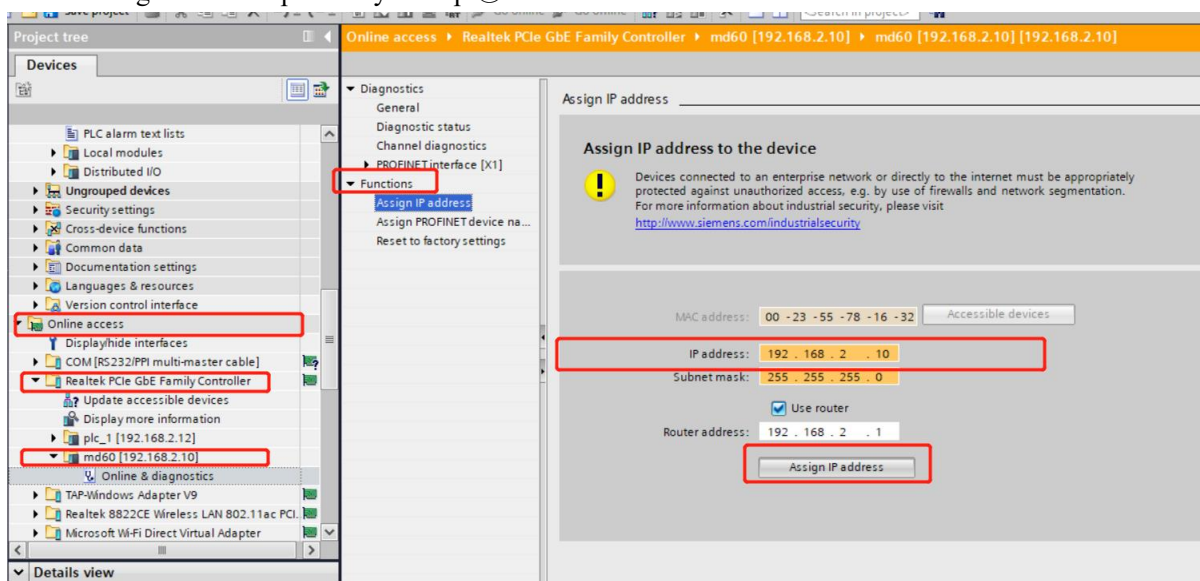


Figure 1.2.1 IP address modification

- ③ Continue to step ②, double-click "Assign PROFINET Device Name" in the "Function" drop-down list. After filling in the PROFINET device name, click the "Assign Name" button. **Note that the name of the PROFINET device must be the same as the name in the configuration, otherwise it cannot be connected to the PLC.** Figure 1.2.2.

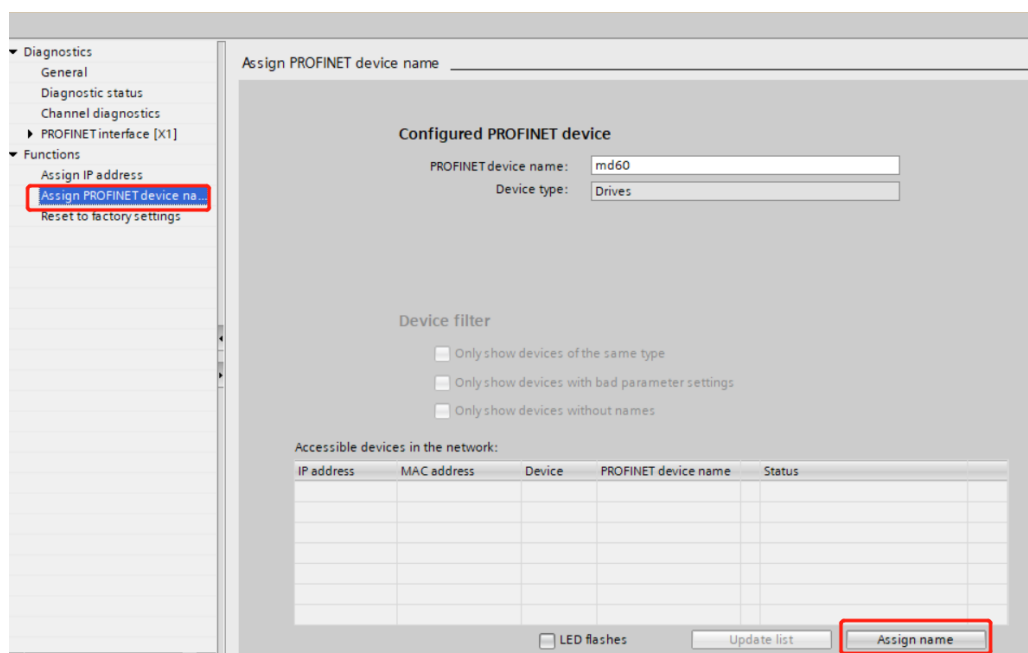


Figure 1.2.2 Modification of PROFINET Device Name

④Click "Update Accessible Devices" again to check whether the IP address and device name are modified successfully. Or check whether the object dictionary corresponding to the servo host computer is successful

15	308003	String	PN_Device_Name	md60	String
16	308004	uint32	PN_Device_Name1	md60	ASCII
17	308005	uint32	PN_Device_Name2		ASCII
18	308006	uint32	PN_Device_Name3		ASCII
19	308007	uint32	PN_Device_Name4		ASCII
20	308008	uint32	Ip_Addr	C0A8020A	HEX
21	308009	uint32	Subnet_Mask	FFFFFF00	HEX
22	30800A	uint32	Def_Router	C0A80201	HEX

1.3 SINA_PAPA_S(FB287)Module

This function block can realize aperiodic data interaction between PLC and MD60-PN drive, and mainly realizes the function of reading and writing servo parameters. After installing the Portal software, the FB287 module may not be found. You can download the corresponding library file from the Siemens official website. The website is as follows:

<https://support.industry.siemens.com/cs/document/109475044/sinamics-communication-blocks-drive-lib-for-reading-and-writing-drive-data-within-tia-portal-context?dti=0&lc=en-WW>

After the download is complete, click the software menu above the TIA Portal software → Options → Global Library → Open Library → Follow the prompts to find the corresponding library file and install it in the software

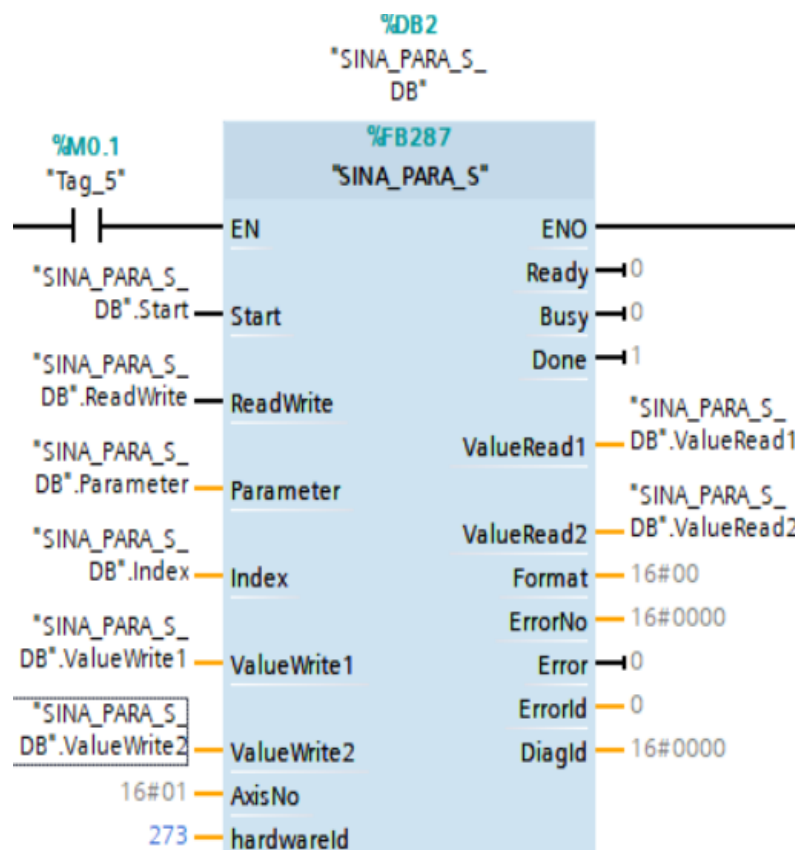


Figure 1.3.1 FB287 pin introduction

Start: Rising edge triggers data transmission

ReadWrite: 0: read parameters, 1: write parameters

Parameter: bit8~bit15: sub-index, bit0~bit7: send command word

Index: index

ValueWrite1: reserved

ValueWrite2: Data write area, can write 1~4byte

AxisNo: fixed at 1

hardwareId: The hardware identifier of the Interface interface, which is used to distinguish different axes

ValueRead1: reserved

ValueRead2: Data read area

Error: Indicates an error in reading and writing parameters. When the "reply command word" in the Kinco communication protocol is 0x80, this bit is set to 1. For other pins, please refer to the description of the FD287 module.

For the meaning of index, sub-index, sending command word, etc., please refer to the relevant chapters of Kinco Servo User Manual for Communication

1.4 FB287 Parameter read and write example

Take the reading and writing target position as an example: the target position index is 0x607A, the sub-index is 0x00, and the data type is int32, so the sending command word for writing parameters is 0x23, and the sending command word for reading parameters is uniformly 0x40.

- ① Reading the target position: When the Start pin M0.0 is triggered from 0 to 1, the data read area MD10 automatically changes to 10, and the Error pin is 0, and the data read is successful.

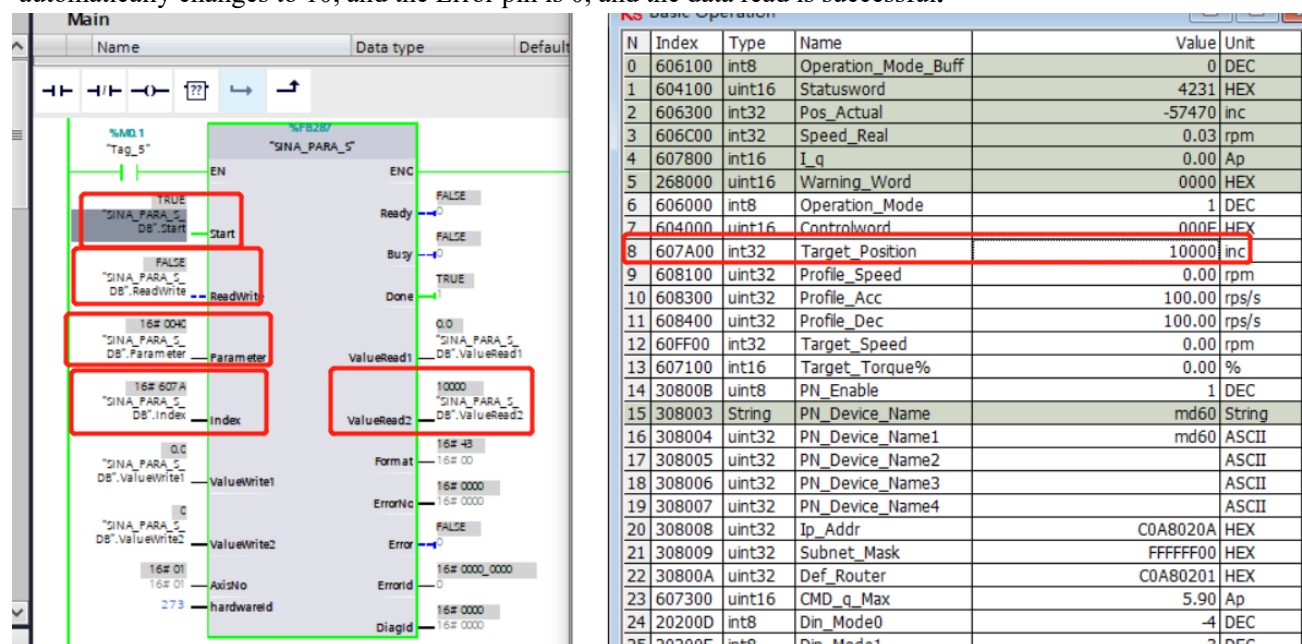


Figure 1.4.1 Read Servo Parameters

- ② Write target position: ReadWrite is switched to 1, Parameter is changed to 0x0023, 100000 is written in the data write area, and then start is triggered to write the data. Observe the KincoServo+ software, the target position is changed to 100000.

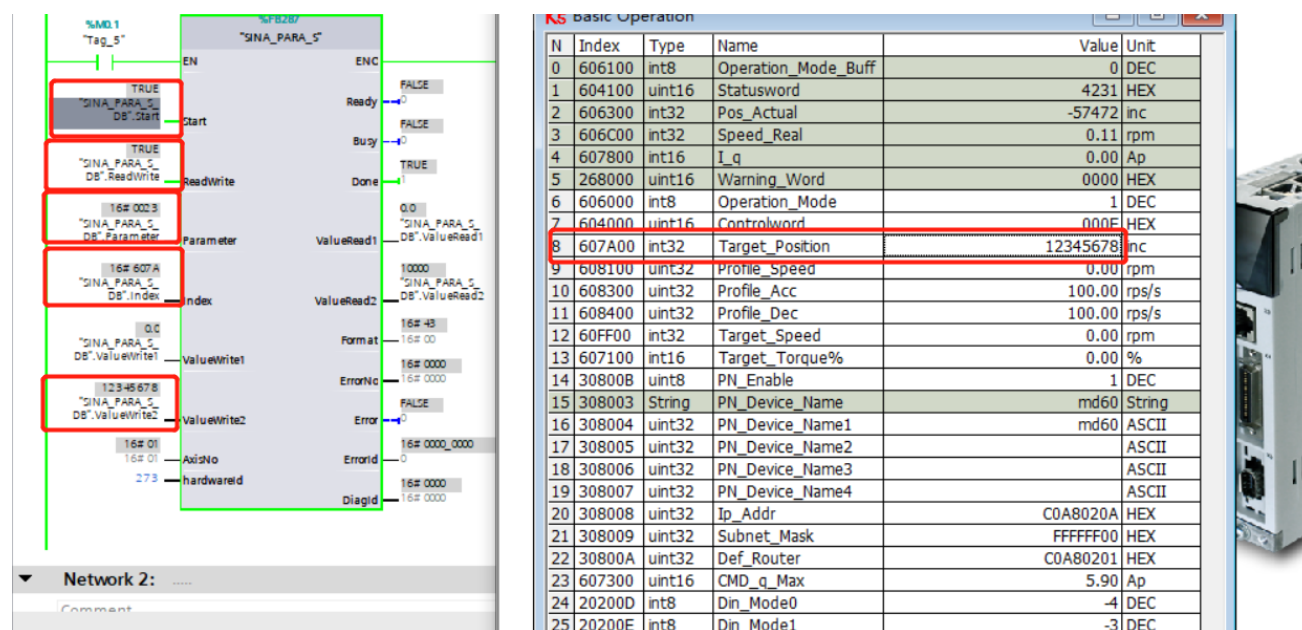


Figure 1.4.2 Write Servo Parameters

1.5 Acyclic Read and Write Using WRREC and RDREC Modules

The following describes how to use the WRREC/RDREC block of PLC to read and write parameters. These two blocks can be found in **Instructions->Extended Instructions->Distributed IO**.

- ① First create a new data block, the data in the block is defined as shown in the figure below. In the request and response structure, the defined number of bytes must be the same, otherwise the data may be shifted.

	Name	Data type	Start value	Monitor value	Retain	Accessible f...	Wr...
1	Static						
2	ask	Struct					
3	ReqRef	Byte	16#1	16#01			
4	ReqID	Byte	16#1	16#02			
5	AxisID	Byte	16#1	16#01			
6	ParaNo	Byte	16#1	16#01			
7	Attribute	Byte	16#10	16#10			
8	Number of Element	Byte	16#1	16#01			
9	SubindexCMD	Word	16#0023	16#0040			
10	index	Word	16#607A	16#6073			
11	Write Format	Byte	16#43	16#43			
12	Write Values numb...	Byte	16#01	16#01			
13	Write Value	Dint	16#0	0			
14	response	Struct					
15	RespRef	Byte	16#0	16#01			
16	Respid	Byte	16#0	16#02			
17	AxisID	Byte	16#0	16#01			
18	ParaNo	Byte	16#0	16#01			
19	Format	Byte	16#0	16#43			
20	CMD	Byte	16#0	16#4B			
21	Value	Dint	0	671			

Figure 1.5.1 Definition request of data block:

ReqID: 0x01 is read-only, 0x02 is readable and writable, others are reserved

Sunindex/CMD: bit8~bit15: sub-index, bit0~bit7: send command word

Index: index

Write Value: Data write area

Other data remain consistent with the above figure in principle:

CMD: reply command word Value: reply data area

- ② Establish the connection of the WRREC/RDREC block according to the following figure. The transmission starts when the REQ pin is 1, and the ID is the hardware identifier of the Interface, which can be used to distinguish different axes. INDEX is fixed at 47, MLEN=0.

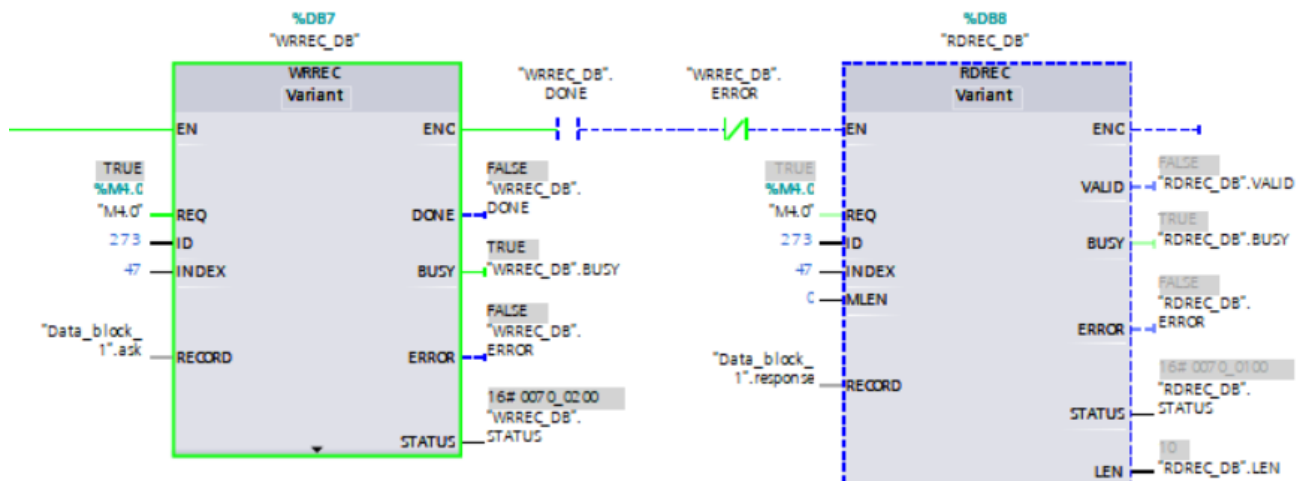


Figure 1.5.2 Call of the WRREC/RDREC block

- ③The following takes the target current limit as an example to introduce the reading and writing of the WRREC/RDREC block.

Use the host computer software to check the target current limit value: 844 DEC

18	308006	uint32	PN_Device_Name3		ASCII
19	308007	uint32	PN_Device_Name4		ASCII
20	308008	uint32	Ip_Addr	C0A8020A	HEX
21	308009	uint32	Subnet_Mask	FFFFFFF0	HEX
22	30800A	uint32	Def_Router	C0A80201	HEX
23	607300	uint16	CMD_q_Max	671	DEC
24	20200D	int8	Din_Mode0	-4	DEC
25	20200E	int8	Din_Mode1	-3	DEC

Figure 1.5.3 View the target current limit value

The index of the target current limit is 0x6073, the sub-index is 0x0, and the data type is uint16, so the write command word is 0x2B, and the read command word is uniformly 0x40.

Read target current limit: ReqID is assigned 0x02, Subindex/CMD is assigned 0x0040, and Index is assigned 0x6073. trigger

The REQ pin of the WRREC/RDREC block completes data reading, and the read data is displayed in the value of the response, as shown in Figure 1.5.4 below.

Data_block_1					
	Name	Data type	Start value	Monitor value	R
1	Static				
2	ask	Struct			
3	ReqRef	Byte	16#1	16#01	
4	ReqID	Byte	16#1	16#02	
5	AxisID	Byte	16#1	16#01	
6	ParaNo	Byte	16#1	16#01	
7	Attribute	Byte	16#10	16#10	
8	Number of Element	Byte	16#1	16#01	
9	Subindex/CMD	Word	16#0023	16#0040	
10	index	Word	16#607A	16#6073	
11	Write Format	Byte	16#43	16#43	
12	Write Values numb...	Byte	16#01	16#01	
13	Write Value	DInt	16#0	0	
14	response	Struct			
15	RespRef	Byte	16#0	16#01	
16	Respid	Byte	16#0	16#02	
17	AxisID	Byte	16#0	16#01	
18	ParaNo	Byte	16#0	16#01	
19	Format	Byte	16#0	16#43	
20	CMD	Byte	16#0	16#4B	
21	Value	DInt	0	671	

Figure 1.5.4 Reading the target current limit value

Write target current limit 1000 DEC: ReqID is assigned 0x02, Subindex/CMD is assigned 0x002B, Index is assigned 0x6073, Write Value is assigned 1000. Toggling the REQ pin of the WRREC/RDREC block completes the data write. As shown in Figure 1.5.5, the reply CMD is 0x60, indicating that the writing is successful, and the returned data is the written data 1000. As shown in Figure 1.5.6, use KincoServo+ to check that the target current limit becomes 1000 DEC.

Data_block_1						
	Name	Data type	Start value	Monitor value	Retain	A
	Static				<input type="checkbox"/>	
	ask	Struct			<input type="checkbox"/>	
	ReqRef	Byte	16#1	16#01	<input type="checkbox"/>	
	ReqID	Byte	16#1	16#02	<input type="checkbox"/>	
	AxisID	Byte	16#1	16#01	<input type="checkbox"/>	
	ParaNo	Byte	16#1	16#01	<input type="checkbox"/>	
	Attribute	Byte	16#10	16#10	<input type="checkbox"/>	
	Number of Element	Byte	16#1	16#01	<input type="checkbox"/>	
	SubindexCMD	Word	16#0023	16#002B	<input type="checkbox"/>	
	index	Word	16#607A	16#6073	<input type="checkbox"/>	
	Write Format	Byte	16#43	16#43	<input type="checkbox"/>	
	Write Values numb...	Byte	16#01	16#01	<input type="checkbox"/>	
	Write Value	DInt	16#0	1000	<input type="checkbox"/>	
	response	Struct			<input type="checkbox"/>	
	RespRef	Byte	16#0	16#01	<input type="checkbox"/>	
	Respid	Byte	16#0	16#02	<input type="checkbox"/>	
	AxisID	Byte	16#0	16#01	<input type="checkbox"/>	
	ParaNo	Byte	16#0	16#01	<input type="checkbox"/>	
	Format	Byte	16#0	16#43	<input type="checkbox"/>	
	CMD	Byte	16#0	16#60	<input type="checkbox"/>	
	Value	DInt	0	1000	<input type="checkbox"/>	

Figure 1.5.5 Write operation of target current limit value

18	308006	uint32	PN_Device_Name3		ASCII
19	308007	uint32	PN_Device_Name4		ASCII
20	308008	uint32	Ip_Addr	C0A8020A	HEX
21	308009	uint32	Subnet_Mask	FFFFFFF0	HEX
22	30800A	uint32	Def_Router	C0A80201	HEX
23	607300	uint16	CMD_q_Max	1000	DEC
24	20200D	int8	Din_Mode0	-4	DEC
25	20200E	int8	Din_Mode1	-3	DEC
26	269000	uint8	Encoder_Data_Reset	0	DEC

Figure 1.5.6 Write display of target current limit value

2、Siemens telegram 1 application

2.1 Configuration

Siemens S7-1200, S7-1500PLC uses standard message 1 and Sina_Speed command block to control the speed of MD/FD series profinet drives. When using message communication, set PN enable (30800B) to 1. If PN is enabled, write 1, the object associated with the PN conversion will always be refreshed by the PN message, and the RS232 control will be invalid.

Index	Sub.	Name	Search	30800B	Search
Index	Sub.	Name	Data Type	Attribute	
3080	0B	PN_Enable			
3080	0C	En_SoftWare_Limit			
3080	0D	PN_User_Receive			
3080	0E	PN_User_Send			
3080	0F	Mac_Addr1			
3080	10	Mac_Addr2			
3296	00	Service_Request			
3297	00	Service_Status			
3298	00	Service_Timeout			
6004	00	Pos_Abs			

Value	Unit
1	DEC

Help Information of:PN_Enable
 PN Enable
 0: PN disconnected, can use 232 control
 1: PN enable, no can use 232 control

(If you can't find the relevant parameters of PN settings in the host computer software, please contact Kinco Technology to obtain a new host computer patch file)

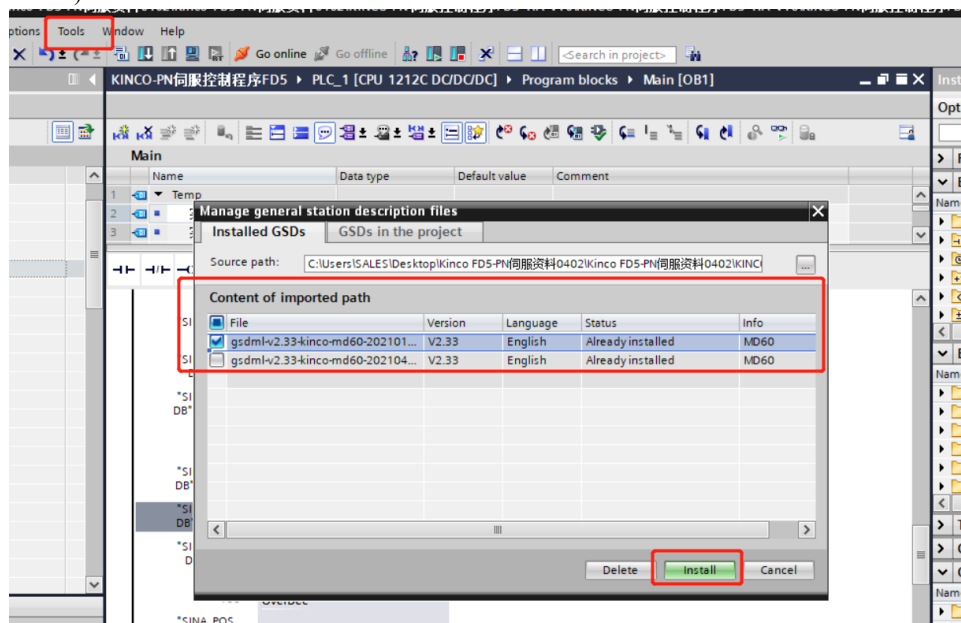


Figure 1 Installing the GSD file

Then select "Device and Network", import MD60 in the network view and establish a connection with the PLC, as shown in Figure 2.

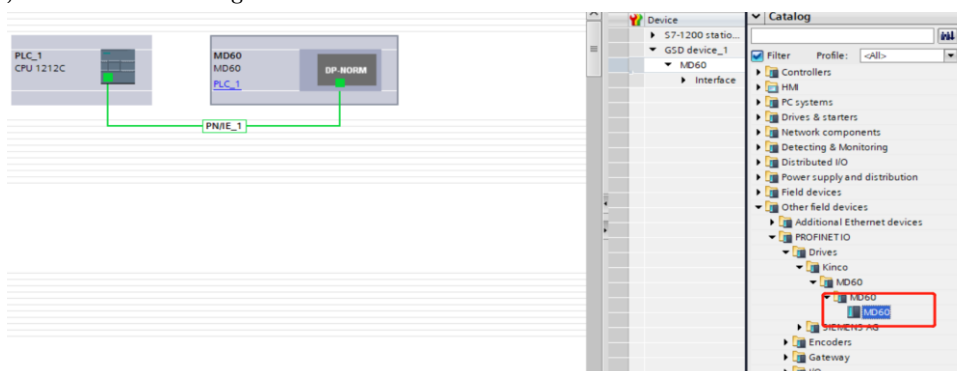


Figure 2 Establish connection between PLC and servo

Double-click MD60 in the device view to add message 1, as shown in Figure 3.

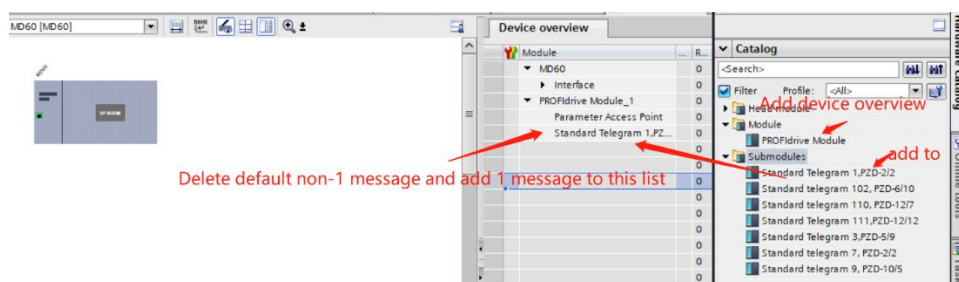


Figure 3 Add message 1

Then find the hardware identifier: select message 1 → right-click properties → system constants → hardware identifier, as shown in Figure 4

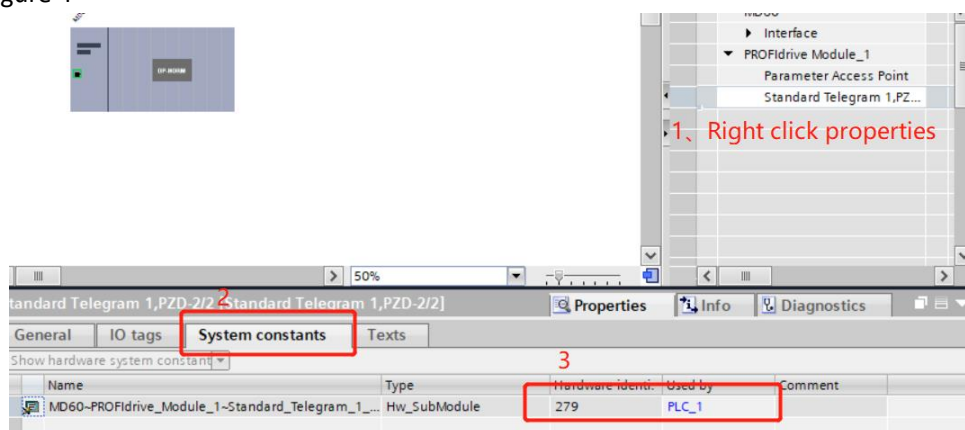


Figure 4 Hardware Identifier

Drag and drop the SINA_Speed (FB285) function block into the programming network in OB1, as shown in Figure 5.



Figure 5 Calling the FB285 function block

When using FB285 control, the working mode of the host computer is 3

2.2 SINA_SPEED(FB285) introduce

Function block pin introduction:

input signal	type	default	Function
EnableAxis	BOOL	0	Enable axis Servo control word display Enable: F Disable: E
AckError	BOOL	0	Reset fault Active on rising edge

SpeedSp	REAL	0.0[rpm]	Speed setting
RefSpeed	REAL	0.0[rpm]	Reference speed, set as the maximum speed limit of the servo drive(608000) 1/2
ConfigAxis	WORD	3	Configuration Control Word
HWIDSTW	HW_IO	0	Hardware Identifier/IO Address
HWIDZSW	HW_IO	0	Hardware Identifier/IO Address

ConfigAxis defaults to 16#3F, and its corresponding bit is as follows

ConfigAxis	function
Bit0	OFF2
Bit1	OFF3
Bit2	Pulse enable
Bit3	Enable ramp-function generator
Bit4	continue ramp-function generator
Bit5	Enable set value
Bit6	Reserve
Bit7-Bit15	Reserve

RefSpeed is the rated speed setting (RPM) of the drive, which should be 1/2 of the maximum speed limit (608000) of the Kinco servo drive. If it is not 1/2, the running speed of the motor cannot match the setting value (SpeedSp).

input signal	type	default	Function
AxisEnabled	BOOL	0	axis is enabled
Lockout	BOOL	0	Prohibit closing
ActVelocity	REAL	0.0[rpm]	actual speed
Error	BOOL	0	Fault
Status	INT	0	16#7002: No error – block is being processed 16#8401: Fault in the drive 16#8402: Switching-on inhibit 16#8600: Error DPRD_DAT 16#8601: Error DPWR_DAT
DiagID	WORD	0	communication error

2.2 Precautions for use of message 1

1. The deceleration after power off is related to the shutdown stop mode (605B00).
2. The acceleration/deceleration time of speed switching during running is related to trapezoidal acceleration (608300) and trapezoidal deceleration (608400).
3. AckError is fault reset, reset alarm after triggering
- 4.SpeedSP is the target speed setting value (unit: 1RPM)

3、 Siemens 111 message application

S7-1200/1500 can connect Kinco PN servo drive through PROFINET communication, PLC can realize basic positioning control of Kinco PN servo drive through function block FB284 in the drive library provided by Siemens.

There are two ways to obtain the FB284 function block as follows:

You can download the corresponding library file from the Siemens official website, the URL is as follows:

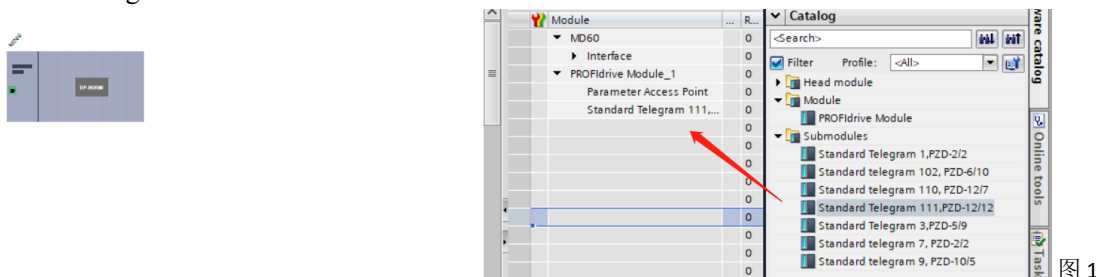
<https://support.industry.siemens.com/cs/document/109475044/sinamics-communication-blocks-drivelib-for-reading-and-writing-drive-data-within-tia-portal-context?dti=0&lc=en-WW>

After the download is complete, click the software menu on the top of the TIA Portal software → Options → Global Library → Open Library → Follow the prompts to find the corresponding library file. installed in the software

3.1 、 configuration

For detailed configuration steps, please refer to II Siemens telegram 1

The application double-clicks MD60 in the device view to add message 111, as shown in Figure 1



Add message 111

Then find the hardware identifier: select message 111→right-click properties→system constants→hardware identifier, as shown in Figure 2

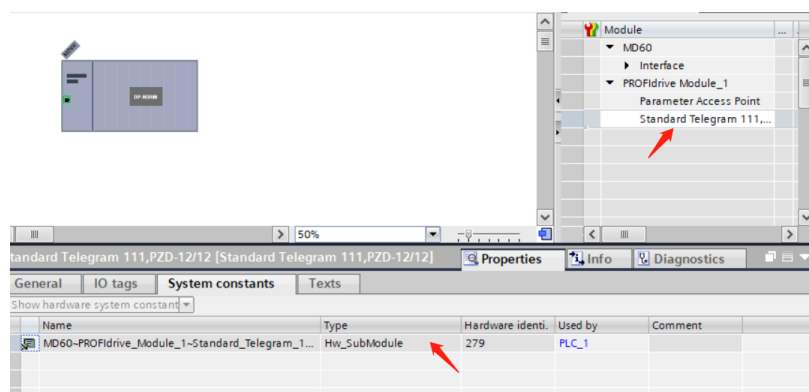


Figure 2 Hardware Identifier

Drag and drop the SINA_Speed (FB284) function block into the programming network in OB1, as shown in Figure 3.

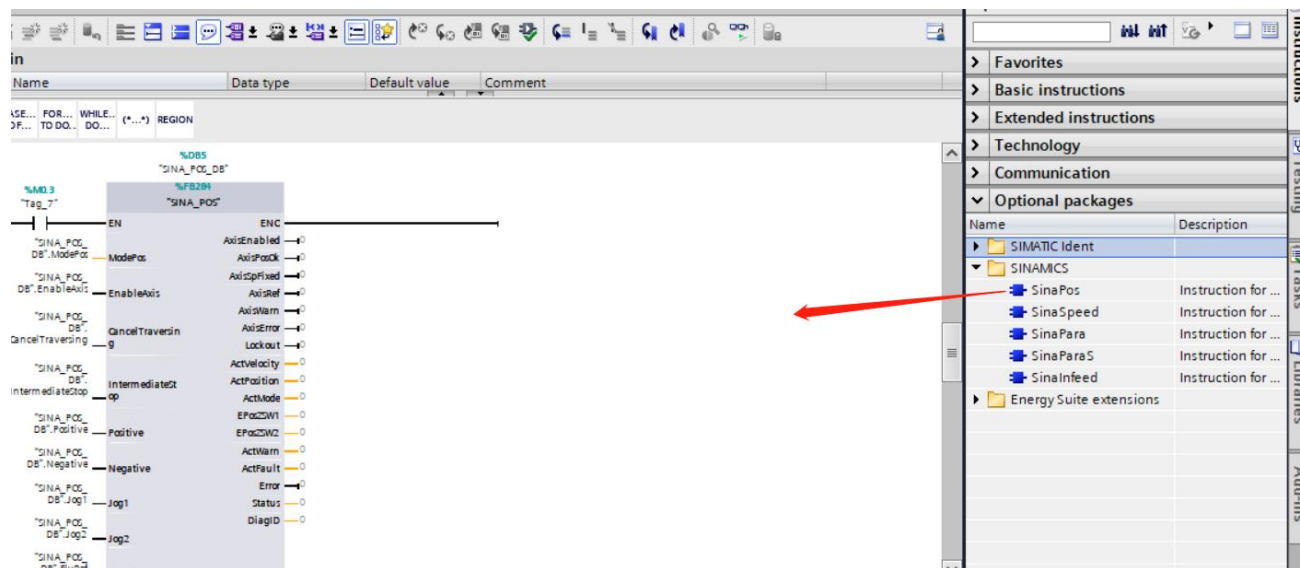


Figure 3 Calling the FB284 function block

3.2 SINA_POS(FB284) introduce

When using message communication, the PN enable (30800B) of the servo should be set to 1. If the PN enable is written to 1, the object converted with the PN will always be refreshed by the PN message, and the RS232 control will be invalid.

Function block pin introduction:

input signal	type	default	Function
ModePos	INT	0	Operation mode: 1 = Relative positioning 2 = absolute positioning 3 = Continuous operation mode (runs at specified speed) 4 = Active homing 5 = Set home position directly 6 = Running block 0~15 7 = Jog at specified speed 8 = Jog by specified distance Kinco servo currently supports 1 2 4 5 7 mode
EnableAxis	BOOL	0	Servo running command: 0 = Servo loose axis 0 1 = Servo enabled
CancelTraversing	BOOL	1	0 = Cancel the current running task 1 = Do not cancel the current running task
IntermediateStop	BOOL	1	Pause the task from running: 0 = Pause the current running task Servo loose axis 1 = Do not pause currently running tasks
Positive	BOOL	0	Positive direction
Negative	BOO L	0	negative direction
Jog1	BOOL	0	reverse jog
Jog2	BOOL	0	forward jog
FlyRef	BOOL	0	Drive home operation (valid in any mode)
AckError	BOOL	0	0->1: fault reset
ExecuteMode	BOOL	0	Active requested mode Rising edge valid
Position	DINT	0[LU]	Position setting value when ModePos=1 or 2
Velocity	DINT	0 [1000LU/min]	Speed setting value when ModePos=1, 2, 7
OverV	INT	100[%]	Setting Speed percentage 0~199%
OverAcc	INT	100[%]	Set acceleration percentage when ModePos=1, 2, 7 0~100%
OverDec	INT	100[%]	Set deceleration percentage when ModePos=1, 2, 7 0~100%
ConfigEPOS	DWORD	0	The related functions of basic positioning can be controlled by this parameter. The corresponding relationship of the bits is shown in the following table:
			<table><tr><th>ConfigEPos 位</th><th>Function Description</th></tr></table>
ConfigEPos 位	Function Description		

			ConfigEPos.%X0	OFF2 stop
			ConfigEPos.%X1	OFF3 stop
			ConfigEPos.%X2	Activate software limit
			ConfigEPos.%X3	Activate hardware limit
			ConfigEPos.%X6	Zero switch signal
			ConfigEPos.%X8	ModePos=2
				Support continuous change of set value and take effect immediately
			Note: If this variable is assigned in the program, it must be kept The initial value is 3 (that is, ConfigEPos.%X0 and ConfigEPos.%X1 is equal to 1, OFF2 and OFF3 if not active stop is always in effect)	
HWIDSTW	HW_IO	0	Hardware identifier for telegram 111	
HWIDZSW	HW_IO	0	Hardware identifier for telegram 111	
Output				
AxisEnabled	BOOL	0	driver is enabled	
AxisPosOk	BOOL	0	target position reached	
AxisSpFixed	BOOL	0	set position reached	
AxisRef	BOOL	0	Reference point is set	
AxisWarn	BOOL	0	drive alarm	
AxisError	BOOL	0	drive alarm	
Lockout	BOOL	0	The drive is in the state where it is forbidden to connect, check whether the drive is faulty.	
ActVelocity	DINT	0	actual speed	
ActPosition	DINT	0[LU]	actual location	
ActMode	INT		currently active operating mode	
EPosZSW1	WORD	0	Status of EPOS ZSW1	
EPosZSW2	WORD	0	Status of EPOS ZSW2	
ActWarn	WORD		The current alarm code of the drive	
ActFault	WORD	0	The current fault code of the drive refers to the servo object dictionary (603F)	
Error	BOOL	0	1=The drive has an error	
Status	Word	0	16#7002: No error, the function block is executing 16#8401: Driver error 16#8402: The driver is forbidden to start 16#8403: The homing cannot be started during operation 16#8600: DPRD_DAT error 16#8601: DPWR_DAT error 16#8202: Incorrect operating mode selection 16#8203: Incorrect setpoint parameter 16#8204: Incorrect block number selected	

DiagID	WORD	0	Communication error, an error occurred while executing the SFB call
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3.3 SINA_POS function description

The basic positioning (EPOS) of Kinco PN servo drives can be used for absolute and relative positioning of linear axes or rotary axes. The SINA_POS function block in the library file DriveLib_S7_1200_1500 in TIA Portal can be used for basic positioning control of Kinco servo drives. The main operating modes are Jog, Homing, MDI, etc.

3.3.1 Operating conditions

1 Axis is enabled by the input EnableAxis= 1, if the axis is ready and driven without fault (AxisError= 0), the output AxisEnabled signal becomes 1.

2 ModePos input for selection of operating mode.

3 The rising edge of ExecuteMode triggers the positioning movement

4 Input signal CancelTraversing, IntermediateStop is valid for all running modes except jog, it must be set to 1 during running, the setting instructions are as follows:

5. Set CancelTraversing=0, abandon the current running task, loosen the axis, stop deceleration and quick stop mode

(605B00) The operation mode can be switched after the relevant axis is stopped. To enable it again, you need to reactivate EnableAxis

6. Set IntermediateStop=0, use the currently set deceleration value to stop, and keep the current running task. If IntermediateStop=1 is set again, the axis will continue to run, which can be understood as the pause of the axis. The operation mode can be switched after the axis is at a standstill.

7. When a fault occurs, AckError=1 is used to clear the fault, the fault is cleared to re-trigger the axis enable EnableAxis=1, and the command is activated again

3.3.2 Activate hardware limit switches

If hardware limit switches are used, the input ConfigEPos.%X3 of the FB284 function block needs to be set to 1

(ConfigEPos value: 16#0000000B)



Activate the hardware limit function, set the DIN function of the Kinco PN servo drive as a positive and negative hardware limit switch. If the hardware limit switch function is activated, the axis can only be run when the hardware limit switch signal is at a high level.

Note: Only the positive and negative limits are configured in the host computer software, and ConfigEPos.%X3 is not set to 1, the hardware limit function does not take effect.

3.3.3 Activate software limit switches

If a software limit switch is used, the input ConfigEPos.%X2 of the FB284 function block needs to be set to 1 (ConfigEPos value: 16#00000007 or servo parameter software limit enable (308001) is set to 1)



Activate the software limit function, set the software limit positive setting (607D01) and the software limit negative setting (607D02) in the drive.

25	607D01	int32	Soft_Positive_Limit	100000	DEC
26	607D02	int32	Soft_Negative_Limit	-100000	DEC
27	20200E	int8	Din_Mode1	-3	DEC

Set “soft limit positive setting” > “soft limit negative setting”, the software limit function starts to be enabled after the origin is found .

3.4 Relative position operating mode 1

The relative position operation mode can be realized by driving the relative positioning function, which adopts the internal position controller driven by the Kinco servo drive to realize the relative position control.

Require:

- Operation mode selection ModePos=1
- Axis Enable EnableAxis=1
- If the switching mode is greater than 3, the axis must be stationary and can be switched at ModePos=1、 2 at any time
- ConfigEPos value default: 16#00000003 Steps:

- Specify the target position and speed through the input parameters Position, Velocity, the speed unit is 1DEC, please refer to the servo manual for conversion (the unit of Velocity is converted to: $DEC = \text{rpm} * 512 * \text{feedback accuracy} (641003) / 1875$)
- Specify the target speed inside the servo and the percentage of trapezoidal acceleration and deceleration through the input parameters OverV, OverAcc, OverDec. The default value is 100, and the set value corresponds to the actual value.
- Running conditions CancelTraversing and IntermediateStop must be set to 1, Jog1 and Jog2 must be set to 0
- In relative position, the movement direction is determined by the positive and negative values set in Position. The position movement is triggered by the rising edge of ExecuteMode, and the current state of the activation command is monitored or monitored by EPosZSW1 and EPosZSW2. When the target position is reached, AxisPosOk is set to 1. If an error occurs during positioning, the output parameter Error is set to 1.
- A currently running command can be replaced by a new command with a rising edge of ExecuteMode, but only in run mode ModePos 1,2

3.5 Absolute position operation mode 2

The absolute positioning operation mode can be realized by driving the absolute positioning function, which adopts the internal position controller driven by the Kinco servo drive to realize the absolute position control.

Require:

- Operation mode selection ModePos=2
- Axis Enable EnableAxis=1
- If the switching mode is greater than 3, the axis must be stationary and can be switched at ModePos=1,2 at any time
- ConfigEPos value default: 16#00000003 Steps:
- Specify the target position and speed through the input parameters Position, Velocity, the unit is 1DEC, you need to refer to the servo manual for conversion (the unit of Velocity is converted to: $DEC = \text{rpm} * 512 * \text{feedback accuracy} (641003) / 1875$)
- Specify the target speed inside the servo and the percentage of trapezoidal acceleration/deceleration through the input parameters OverV, OverAcc, and OverDec. The default value of 100 can be used, and the speed setting value corresponds to the servo target speed value
- Running conditions CancelTraversing and IntermediateStop must be set to 1, Jog1 and Jog2 must be 0
- In absolute positioning, the running direction runs to the target position according to the shortest path, and the input parameters Positive and Negative must be 0
- The positioning movement is triggered by the rising edge of ExecuteMode, and the current state of the active command can be accessed through EPosZSW1, EPosZSW2 is monitored. When the target position is reached, AxisPosOk is set to 1. When an error occurs during the positioning process, the output parameter Error is set to 1.
- A currently running command can be replaced by a new command with a rising edge of ExecuteMode, but only in run mode ModePos 1,2

3.5.1 Continuous location update

In ModPos=2 (absolute positioning mode), by setting the 111 message ConfigEpos.%X8, after updating Position, Velocity, OverV, OverACC, OverDEC on the PLC side, there is no

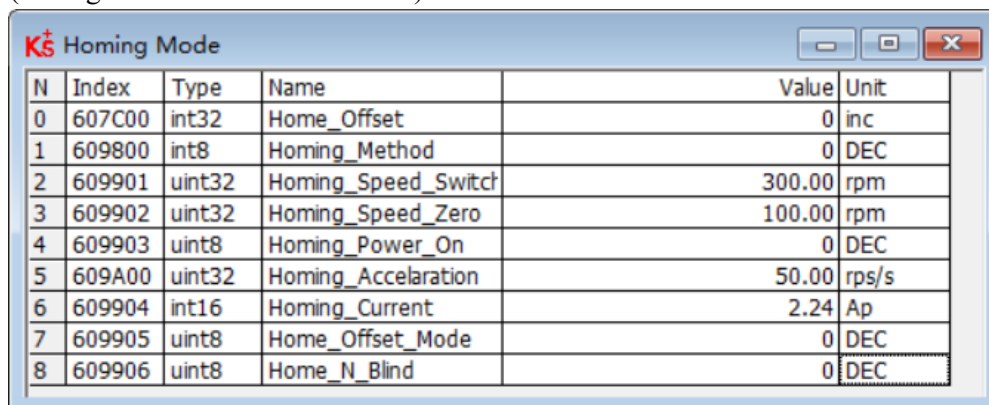
need to trigger ExecuteMode, just enable it and it will run immediately, the servo The corresponding values will be updated in real time and take effect.

- Operation mode selection ModePos=2
- Axis Enable EnableAxis=1
- ConfigEPos value: 16#00000103
- Real-time modification of running parameters

3.6 Active zero return 4

This function allows the axis to homing in the forward or reverse direction according to the preset homing speed and method, and activates the active homing of the drive. Require:

- Operation mode selection ModePos=4
- Axis Enable EnableAxis=1
- Running conditions CancelTraversing and IntermediateStop must be set to 1, Jog1 and Jog2 must be set to 0
- The method of returning to origin and the speed of returning to origin can be configured in the servo host computer software (PLC only sends back the original command, and the planning of returning to the original point is set by the servo parameters). Please refer to the low-voltage servo manual for the specific returning to the original point.
- The homing movement is triggered by a rising edge in ExecuteMode. Activate the current state of the command or monitor it through EPosZSW1 and EPosZSW2. After the zero return is completed, AxisRef is set to 1. When an error occurs during the running process, the output parameter Error is set to 1.
- To use hardware limit, set the input ConfigEPos.%X3 of the FB284 function block to 1 (ConfigEPos value: 16#0000000B)



N	Index	Type	Name	Value	Unit
0	607C00	int32	Home_Offset	0	inc
1	609800	int8	Homing_Method	0	DEC
2	609901	uint32	Homing_Speed_Switch	300.00	rpm
3	609902	uint32	Homing_Speed_Zero	100.00	rpm
4	609903	uint8	Homing_Power_On	0	DEC
5	609A00	uint32	Homing_Acceleration	50.00	rps/s
6	609904	int16	Homing_Current	2.24	Ap
7	609905	uint8	Home_Offset_Mode	0	DEC
8	609906	uint8	Home_N_Blind	0	DEC

3.7 Directly set the zero position 5

This operating mode allows the zero position of the axis to be set when the axis is in any position. Require:

- Operation mode selection ModePos=5
- Axis Enable EnableAxis=1
- The axis must be stationary when executing the pattern. Steps:
- The zero position of the axis is set by the rising edge of ExecuteMode when the axis is stationary.

3.8 Jog at the specified speed 7

Jog operation mode is realized by the Jog function of the drive. Require:

- Operation mode selection ModePos=7
- Axis Enable EnableAxis=1
- The axis is at standstill
- Velocity specifies the jog speed, which must be a positive value, and the OverV parameter scales the jog speed set value by percentage
- The operating conditions CancelTraversing and IntermediateStop are independent of the jog operating mode and are set to 1 by default
- Jog1=reverse jog, Jog2=forward jog, Jog1 Jog2 can only be triggered independently, the running direction is the same as Positive and

Negative parameters are irrelevant, no need to trigger ExecuteMode

- The current status of the activation command can be monitored via EPosZSW1, EPosZSW2, the jog ends (Jog1 or

Jog2=0) AxisPosOK is set to 1 when the axis is stationary, when an error occurs during the running process, the output parameter Error is set to 1

3.9 Set and read servo parameters with 111 message

After configuring the message 111, the system automatically allocates 24 bytes of receiving and sending areas. The allocated objects can be viewed in the SINA_POS_DB block. The Reserve variables under the structures sxSendBuf and sxRecvBuf are user-defined to set and read Get servo parameters

名称	名称	数据类型	起始值	保持	从 HMI/OPC...	从 H...	在 HMI...	设定值	注释
PLC_1 [CPU 1212C DC/DC...]	73	sxSendBuf	Struct						
设备组态	74	STW1	Word	WORD#16#0000					
在线和诊断	75	EPosSTW1	Word	WORD#16#0000					
程序块	76	EPosSTW2	Word	WORD#16#0000					
添加新块	77	STW2	Word	WORD#16#0000					
Main [OB1]	78	OverrideV	Word	WORD#16#0000					
SINA_POS [FB284]	79	Position	DWord	DWORD#16#0000					
SINA_POS_DB [DB1]	80	Velocity	DWord	DWORD#16#0000					
系统块	81	OverrideA	Word	WORD#16#0000					
工艺对象	82	OverrideD	Word	WORD#16#0000					
外部源文件	83	Reserve	Word	WORD#16#0000					
PLC 变量	84	sxRecvBuf	Struct						
PLC 数据类型	85	ZSW1	Word	WORD#16#0000					
监控与强制表	86	EPosZSW1	Word	WORD#16#0000					
添加新监控表	87	EPosZSW2	Word	WORD#16#0000					
监控表_1	88	ZSW2	Word	WORD#16#0000					
强制表	89	NotUsed	Word	WORD#16#0000					
在线备份	90	Position	DWord	DWORD#16#0000					
Traces	91	Velocity	DWord	DWORD#16#0000					
详细视图	92	ErrNr	Word	WORD#16#0000					
	93	WarnNr	Word	WORD#16#0000					
	94	Reserve	Word	WORD#16#0000					

伺服

PN user-defined parameters

27	30800D	uint8	PN_User_Receive	0	DEC
28	30800E	uint8	PN_User_Send	0	DEC

PN user-defined receive word:

0: no function

1: Additional torque

PN user-defined sending word:

0: no function

1: Actual torque

2: Actual current

3: DIN condition

3.9.1 Torque limit

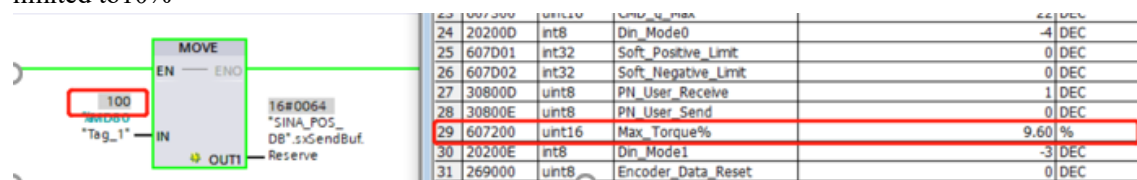
When using the torque limit function, the torque limit value should be set appropriately. If the torque limit value is too small, it may cause the drive to report a following error.

First, set the servo parameter PN user-defined receiving word (30800D) to 1: additional torque,

Search	30800D				Search
Index	Sub.	Name	Data Type	Attribute	
3080	0D	PN_User_Receive	Unsigned8	RWL	
Value		Unit			
1		DEC			

Help Information of:PN_User_Receive
User defined receive word
0: non
1: torque

The torque limited by the assignment in the user-defined sending area of the SINA_POS_DB block corresponds to the maximum torque limit of the servo parameter % (607200), if the setting value is 16#64=100, the corresponding servo is: $100 \times 10\% = 10$, then the maximum torque of the servo is limited to 10%



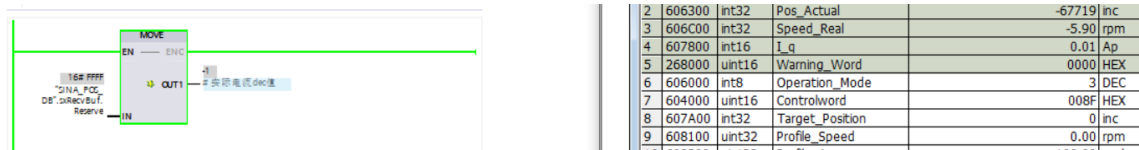
3.9.2 Read the actual current

First, set the servo parameter PN user-defined sending word (30800E) to 2: actual current

Search	30800E				Search
Index	Sub.	Name	Data Type	Attribute	
3080	0E	PN_User_Send	Unsigned8	RWL	
Value		Unit			
2		DEC			

Help Information of:PN_User_Send
User defined receive word
0: non
1: actual torque
2: I_q
3: DIN_real

Use the user-defined receiving area of the SINA_POS_DB block to read the actual current of the servo, and the read value needs to be converted into a dec value



For example, replace the read value with Ap: $16\#FFFF = -1$ is $-1/2048 * 36Ap$ (the maximum current of the driver is 651003), about 0.01Ap

4 、 Communication interruption mode

If there is a communication abnormality during operation, in order to protect the equipment and personal safety, the servo communication interruption mode can be turned on, and the servo will report an error when the bus is disconnected. Set the communication interruption mode to 1: error processing, set 0: no processing

19	600700	int16	Abort Connection Mo	1	DEC
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April 2, 2022