

LF series remote IO

User manual

WUXI XINJE ELECTRIC CO., LTD.

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Basic notes

- Thank you for purchasing the Xinje LF series remote IO and XF series expansion modules.
- This manual mainly introduces the hardware characteristics of LF series couplers and XF series expansion modules.
- Before using the product, please read this manual carefully and operate on the premise of fully understanding the contents of the manual.
- For the introduction of software and programming, please refer to the relevant manzuals.
- Please deliver this manual to the end user.

User instructions

- Only operators with certain electrical knowledge can carry out wiring and other operations on the product. If there are any unknown cases, please consult our technicians.
- The examples listed in the manual and other technical materials are only for users' understanding and reference, and don't guarantee certain actions.
- When using this product in combination with other products, please confirm whether it complies with relevant specifications and principles.
- When using this product, please confirm whether it meets the requirements and is safe.
- Please set up backup and safety functions by yourself to avoid possible machine failure or loss caused by the failure of this product.

Statement of responsibility

- Although the contents of the manual have been carefully checked, errors are inevitable, and we can't guarantee complete consistency.
- We will often check the contents of the manual and correct them in subsequent versions. We welcome your valuable comments.
- Please understand that the contents described in the manual are subject to change without notice.

Contact

If you have any questions about the use of this product, please contact the agent and office who purchased the product, or directly contact Xinje company.

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- Fax: 0510-85111290
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Safety precautions

(Please make sure to read before use)

The potential problems that may arise during the use of the product are basically listed in safety precautions, and are all indicated in two levels: attention and danger. For other unfinished matters, please follow the basic electrical operating procedures.



When used incorrectly, it may pose a danger and may result in moderate or minor injuries, as well as potential property damage.



Danger When used incorrectly, it may pose a danger, causing personal injury or serious injury, as well as potentially causing serious property damage.

• Confirmation upon receiving the product

 1. Damaged controllers, controllers with missing components, or controllers with models that don't meet the requirements, please don't install them. There is a risk of injury.

• System design of the product

Danger

 Denser

 D

There is a risk of causing misoperation and malfunction.



• Product installation



Note 1. Please install and use this product under the environmental conditions specified in the general specifications of the manual. Don't use in damp, high temperature, dusty, smoke, conductive dust, corrosive gases, flammable gases, as well as places with vibration and impact. It may cause electric shock, fire, misoperation, product damage, etc. 2. Don't directly touch the conductive parts of the product. May cause misoperation or malfunction. 3. Please use DIN46277 guide rail to fix this product and install it on a flat surface. Incorrect installation may cause misoperation and product damage. 4. When processing screw holes, please don't allow cutting powder or wire debris to fall into the product casing. May cause misoperation or malfunction. 5. When connecting the expansion module with an expansion cable, please confirm that the connection is tight and the contact is good. May lead to poor communication and misoperation. 6. When connecting peripheral devices, expansion devices, batteries, etc., please make sure to power off the operation.

May cause misoperation or malfunction.

• Product wiring



- 1. Before wiring the controller, be sure to disconnect all external power sources. There is a risk of electric shock.
- 2. Please correctly connect the AC or DC power supply to the dedicated power terminal of the controller. Connecting the wrong power supply may burn out the controller.
- 3. Before powering on and running the controller, please cover the cover plate on the terminal block. There is a risk of electric shock.



- 1. Please use a power supply within the voltage range to power the coupler or module, otherwise it may cause damage to the product.
- Please use a 2mm² wire to perform the third type of grounding on the grounding terminals of the controller and expansion equipment, and don't connect them to the common grounding of the strong current system. May cause malfunctions, product damage, etc.
- Don't perform external wiring on empty terminals. May cause misoperation and product damage.
- When processing screw holes, please don't allow cutting powder or wire debris to fall into the product casing. May cause misoperation, malfunction, etc.
- 5. When using wires to connect terminals, please be sure to tighten them tightly and don't let the conductive parts come into contact with other wires or terminals.
 - May cause misoperation and product damage.

• Operation and maintenance of products



- 1. After powering on the controller, don't touch the terminals. There is a risk of electric shock.
- 2. Don't wire or disassemble terminals with electricity. There is a risk of electric shock.
- 3. Before making changes to the program in the controller, please make sure to stop it first. May cause misoperation.

Note

- Don't disassemble or assemble this product without authorization. May cause damage to the product.
- 2. Please plug and unplug the connecting cable in case of power outage. May cause damage to cables and cause misoperation.
- Don't perform external wiring on empty terminals. May cause misoperation and product damage.
- 4. When disassembling expansion devices, peripheral devices, and batteries, please power off first. May cause misoperation, malfunction, etc.
- 5. When the product is discarded, please dispose of it as industrial waste.
- 6. Before installing the device, please make sure to turn off the power. If the power is not turned off, the device may malfunction or be damaged. When disassembling the XF-I/O unit, be sure to turn off the CPU unit or intermediate power supply.

May cause malfunctions, product damage, etc.

7. Don't stick adhesive tape or labels on both sides of the device or at the golden finger. Adhesive tape or labels may affect the normal vertical sliding installation of the module unit. The residue of the adhesive tape or debris may adhere to the pins of the XF- I/O bus connector.

May cause misoperation, malfunction, etc.

8. Don't touch the XF- I/O bus connector on the device as sweat and dust may adhere to the connector or golden fingers.

This may cause malfunctions.



9. Don't use ink to write on the device in the area shown in the picture. This may cause malfunctions.

Preface

Sincerely thank you for purchasing the XF-IO series of Xinje programmable controllers.

This manual is convenient for users to understand and use the necessary precautions, specifications, functions, and other content when using XF-IO units.

Before use, it is important to thoroughly read this manual and related manuals, and correctly use this product based on a thorough understanding of the functionality/performance of the XF-IO series expansion modules.

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1. Document Guide

1.1 Related manual

1) CPU unit

Manual name	Main content
User Manual for XSF Series Programmable Controllers	Mainly records the hardware specifications and
[Hardware section]	maintenance information of XSF series CPU units
XS series PLCopen standard controller user manual	Mainly recorded in the VS series instruction section
[Instruction section] (XS studio)	Manny recorded in the XS series instruction section
XS series PLCopen standard controller user manual	Mainly records the operation and corresponding
[Software section] (XS studio)	functions of XS Studio programming software

2) I/O unit

Manual name	Main content	
VE Series Expansion Module User Manual	Mainly records the product specifications and	
AF series Expansion Module Oser Manual	maintenance information of the XF series IO unit	

2. Terminology

Term	Explanation		
Coupler	XF series expansion module adapter, supporting EtherCAT and PROFINET bus		
	protocols.		
Power module unit	General term for XF series power modules.		
1020	Protection level according to DIN 40050: protection against finger contact and intrusion		
IP20	of particles with a diameter greater than 12mm.		
	The backplane bus is a serial data bus used by various modules to communicate with		
Backplane bus	each other. The backplane bus is also used to provide some necessary power for each		
	module. Each module is connected through a bus connector.		

In this manual, unless otherwise specified, the following terms will be used for explanation.

3. Coupler unit

In this chapter, the specifications, appearance dimensions, and usage methods of each bus coupler unit are introduced.

3.1 Naming rules

	$\frac{\mathbf{L}}{1}$	$\frac{F}{2}$ $\frac{C}{3}$	$\sum_{n=1}^{\infty} \frac{3}{4} - \frac{AP}{5}$		
1	Series name	L:	Remote I/O series		
2	Refers to the extension module	F:	Indicating compatibility with XF series right		
			expansion module		
3	Bus type	C:	: EtherCAT bus		
	P: Profinet bus		Profinet bus		
		E:	EtherNet/IP bus (In development, please stay tuned)		
4	Ethernet bandwidth	3:	100M		
5	Unit type	AP:	Coupler unit		

3.2 EtherCAT coupler LFC3-AP

3.2.1 Overview

LFC3-AP coupler unit supports EtherCAT bus communication protocol, a single adapter module can connect up to 32 XF series I/O modules, it can achieve seamless connection with mainstream PLCs such as XINJE, Beckhoff, Omron, and Keyence.

- Compact structure, saving installation space.
- Minimum support for 250us DC synchronization.
- Support firmware upgrade for network ports.
- Support hardware static station number setting.
- High speed bus microsecond response.
- Maximum support for 32 expansion modules.
- Module version

Hardware version	Firmware version	Function
H2.0.0	V2.0.0	Basic functions for the first official production
H2.2.0	V2.1.0	Added functions for temperature adaptation, serial port, and high-speed counting module

■ Version explanation

Firmware	XML version	Added modules
V2.0.0	XINJE-LFC3-AP-Rev2.0.0.xml	XF-E8X8Y, XF-E16X, XF-E16Y, XF-E4AD, XF-E4DA
V2.1.0	XINJE-LFC3-AP-Rev2.0.3.xml	XF-E2COM24, XF-E4RTD, XF-E4TC, XF-E1HSC

3.2.2 Module view

1) Description of each section



No.	Name	No.	Name
1	DC24V power supply terminal	2	Status indicator
3	EtherCAT IN port	(4)	EtherCAT OUT port
5	Guide rail buckle	6	Used to set ECAT static station numbers, ranging from 1 to 255. When the station number is 0, the main station automatically assigns a station number

2) System indicator

Abbreviation	Explanation
PWR	Power indicator light, lit when the power system is normal
RUN	Running indicator light, lit up when the system is running normally
ERR	System malfunction indicator light, lit up when system malfunction occurs
SF	Module error indicator light

• RUN indicator

RUN indicator	State	Explanation
Extinguish	INT	Initialize
Flash (2Hz)*2	PRE-OP	Trial running
Flash (1Hz)*1	SAFE-OP	Safe run
Light	OP	Running state
Flash (10Hz)*3	BOOTSTRAP or loading the EEPROM	Download EEPROM

• ERR indicator

ERR indicator	Explanation	Solution
Extinguish	No Error	
$Flach (10Hz)^{*1}$	FEPPOM load error	1. Power on again.
		2. Reflash EEPROM.
		1. Check the configuration of the
Single flash ^{*4}	AL status register error	main station and upper computer.
		2. Reactivate configuration.
		1. Check if the connection between
		the slave station and the master
Double flashing ^{*5}	Process data watchdog timeout	station is intact.
		2. Check if the main station reports
		any errors.
		1. Check if the connection between
		the slave station and the master
		station is intact.
Light	PDI watchdog timeout	2. Check if the main station reports
Light		any errors.
		3. Check if there is excessive
		interference on site.
		4. Power on again.

• SF indicator

SF indicator	Explanation	Solution
Extinguish	Expansion module is normal	
Single flash ^{*4}	Expansion module failure	 Check the module power supply. Check if the module is faulty. Replace the module. Check the external channel wiring status.
Light	Detect configuration topology mismatch with reality	 Check the communication interface contact of the expansion module or restart the entire system. Check if the module in the corresponding slot is powered off or unplugged. Check the communication interface contact of the expansion module or restart the entire system.



*1: A square wave with a duty cycle of 50% and a frequency of 1Hz.

- *2: A square wave with a duty cycle of 50% and a frequency of 2Hz.
- *3: A square wave with a duty cycle of 50% and a frequency of 10Hz.
- *4: Single flash as shown in the figure below:



• *5: Double flashing as shown in the figure below:



3.2.3 General specification

	Gen	eral specification
Project		Specifications
	Maximum temperature	55°C
Operating temperature	Minimum temperature	-20°C
Transportation/Storage	Maximum temperature	70°C
temperature	Minimum temperature	-40°C
Environmental humidity	Upper limit	95%
(including operation/storage)	Lower limit	10%
IP level		IP20
Anti vibration		Compliant with IEC61131-2 Under intermittent vibration (frequency 5-9Hz, constant amplitude 3.5mm peak displacement) and (frequency 9-150Hz, constant acceleration 1.0g peak acceleration) Under continuous intermittent vibration (frequency 5-9Hz half amplitude 1.75mm displacement) and (frequency 9-150Hz constant acceleration 0.5g constant frame amplitude) Scan 10 times in X, Y, and Z directions Complies with IEC61131-2 standard The immediated for the standard
Impact resistance		The impact strength is 15G (peak) and the duration is 11ms. It is applied to three mutually perpendicular axes, and each axis is impacted 3 times (a total of 18 impacts)
Using environment		Non corrosive gas
Using altitude		0-2000m
Overvoltage level		II: Complies with IEC61131-2
Pollution level		2: Complies with IEC61131-2
Anti interference EMC		Complies with IEC 61131-2 IEC61000-6-4 Type B
Related certifications		CE

3.2.4 Technical specifications

Project	Specifications
Bus type	EtherCAT
Rated input voltage	DC24V
Isolation voltage	500VAC
Voltage allowable range	DC21.6-26.4V
Module power	1.5W
Allow instant power outage time	10ms DC24V
Impulse current	10A DC26.4V
Derver protection	Anti reverse connection protection, overcurrent protection, surge
	absorption
Single AP process data	Input maximum 1024 bytes, output maximum 1024 bytes
Network interface	2 RJ45 ports
Physical layer	100BASE-TX
Synchronization cycle	Support 250us, 500us, 1000us, 2000us, 4000us
Transmission distance	Less than or equal to 100m between two nodes
Transmission medium	CAT5e or up
Topological structure	Linear or star shaped (external brancher)
Number of expansion modules	Supports 32 modules
Firmware upgrade	Support
Station number setting	Configuration by dial switch (1-255) or allocation by main station
Module weight	100g

3.2.5 Installation&Wiring

3.2.5.1 Dimension

(Unit: mm)



3.1.5.2 Installation method

The module is installed using DIN rails, which must comply with the IEC 60715 standard (35mm wide, 1mm thick). The dimension information is shown in the following figure, and the unit is (mm).



3.1.5.3 Installation environment

This product can be installed in four positions (i.e. installation direction): horizontal, vertical, top of cabinet, and bottom of cabinet, it is recommended to install in a horizontal direction, and the heat dissipation design should be through natural convection, to ensure normal ventilation and heat dissipation, and to reserve sufficient wiring space, the minimum gap must be left around this product, as shown in the following figure:



If there is a high-temperature heat source equipment (heater, transformer, high resistance, etc.) around this product, at least 100mm gap should be left between it and the high-temperature heat source equipment.

3.2.6 Use cases

3.2.6.1 LFC3-AP connected to XINJE XDH/XLH/XG2

1. Add the ".xml" file corresponding to LFC3-AP. Open the XINJE XDPPro programming software and right-click on "PLC Master" in EthercatMaster, click "Add Device" and click "Import Device" in the device library.

oject III Statistical Control Crown	K PLC1 - Ladder				
Subal library					
Function Library					
Default Library	0				
Config Block		EthercatConfig			×
Sequence Block					
Comment Editor		Scan			
Free Monitor		Butter Dight click	Device library	×	
Data Monitor		Right Click			
Set Reg Init Value		master configuration	Install Uninstall Vendors All Vendors	•	
Eunction Version Switch		Slave District Configuration		<u>v 1</u>	
PIC Config		add device 3	Bane	Vendor	
VO			-XINJE ELECTRONICS, INC.		
Password			-XINJE ELECTRIC CO., LTD.		
(P) C Serial Port					
ethernet					
Pulse					
Module					
BD					
R. ED					
4GBOX					
WBOX					
SystemConfig					
PLC Communication					
LISI Ethernetip					
EipScanner					
EipAdapter					
ElpExplicit					
ModbusTcp					
EthercatMaster					
Motion control(H movement)					
Axis configuration	Information			Add Close	
Axis debug	Error List Output		L		
Axis group configuration	Description				
CAM	Description				
PLC Status					
			Import	Export Read Write Activate OK	Cancel
DI C Desired Hannes					

2. Find the directory where the LFC3-AP xml file is located, select it, and click "Open" to complete the addition.

hercatConfig		Upen				L VER CL
Scan		← → * T → In	IS PC > Local Disk (G:) > Xinje CD > XML file >		V O Sea	rch XML file
Master		Organize 👻 New fold	er			8
PLC Master	Device library	XS PLC open *	Name	Date modified 9/18/2023 1:10 PM	Type EDS File	Size 24 K
Slave	Install Uninstall Vendors All Vendors	This PC	XINJE-DSDC-ECT.Xml	2/18/2024 9:35 AM 11/2/2022 4:44 PM	XML File	787 KI 308 KI
	Name	3D Objects	XINJE-LC3-AP-Rev2.1.1.xml	6/16/2023 3:50 PM	XML File	558 K
	- XINJE ELECTRONICS, INC.	C Desktop	XINJE-LC3-AP-Rev3.1.0.xml	11/2/2022 4:43 PM	XML File	272 Ki
	XINJE ELECTRIC CO., LTD.	Documents	XINJE-LC3-AP-Rev3.1.1E.xml	3/21/2023 2:18 PM	XML File	275 K
		Downloads	XINJE-LC3-AP-Rev3.2.1.xml	8/31/2023 3:32 PM	XML File	262 K
		h Music	XINJE-LC3-AP-Rev3.2.3.rar	1/9/2024 5:09 PM	WinRAR archive	8 K
		Picturer	XINJE-LC3-AP-Rev3.2.3.xml	11/2/2023 2:32 PM	XML File	262 K
		Videos	XINJE-LFC3-AP-Rev2.0.0.xml	12/5/2023 10:48 AM	XML File	218 K
		Videos	XJ_XS3.package	10/16/2023 4:58 PM	CODESYS Package	463 Ki
		Local Disk (C:)	XJ_XS3.rar	1/9/2024 5:07 PM	WinRAR archive	460 Ki
		Local Disk (D:)	XL-4PT3-P-H connect through LC3-AP xml.zip	12/28/2023 1:32 PM	WinRAR ZIP archive	15 KE
		Local Disk (F:)	XL-E4PT3-P-H right expansion module.xml	12/25/2023 5:31 PM	XML File	15 KE
		Local Disk (G:)	XS_2.2.0_patch1_20230915XSF.package	1/24/2024 11:00 AM	CODESYS Package	3,147 KE
		= Local Disk (H:)	H A5_2.2.0_A5A550-L-20250919.package	2/ 19/2024 4:13 PTVI	CODESTS Package	3,022 ND
		File n	ame: XINJE-LFC3-AP-Rev2.0.0.xml			
						Open
			Add Close			
		Import Export	Read Write Activate OK Cano	el		

3. You can query the added xml files in the device library.

Install Uninstall Vendors All Vendors		•	
Name J-XINJE ELECTRONICS, INC.	Vendor		
-RemoteIo			
LC3-AP ETHERCAT ADAPTER 3.2.1	XINJE ELECTRONICS, INC.		
LC3-AP ETHERCAT ADAPTER 2.1.1	XINJE ELECTRONICS, INC.		
-LFC3-AP ETHERCAT ADAPTER 2.0.0	XINJE ELECTRONICS, INC.		
esc_plc			
-ServoDrive			
-XINJE ELECTRIC CO., LTD.			
Name: LFC3-AP ETHERCAT ADAPTER 2.0.0			
Vendor: XINJE ELECTRONICS, INC.			
Group: Device			
Version: #x00000001	N A A A A		
Description : Imported from XML:XINJE-LFU3-AF	-Kev2. U. U. xm1		
		Add	Close

4. Check the connection between PLC and LFC3-AP, which follows the principle of "bottom in and top out".



5. Connect the PLC using XDPPro, click "Scan" in "EthercatMaster", and the PLC will automatically add the following slave stations and modules.

Eunction Library					
Default Library	Scan 2	General Expert process data Launch parameters 1	IO Mapping COE-Online ESC Reg		
Config Block Sequence Block Sequenc	Master FLC Master Slave StatismDio 1250-54 HT-7440 StatismDio 1250-54 HT-7440 HT-7440 HT-7440	Expert Config: 0 ¢ Offset time(ux): SM Watchdog: Slave Information Init State Machine Current State Reguested State Error Message	Fundfogei aglan Fundfodeul e:	0 D	
ModbusTco ModbusTco Methodstori ModbusTco ModbusTco ModbusTco Axis ontrol(H movement) Axis ontparation Axis debug					

6. Click "Configuration Write", after successful writing, click "Activate" to activate the slave station. You can check whether the slave station is in "OP" status in the "Status Machine".

thercatConfig		×
Scan	General Expert process data Launch parameters IO Mapping COE-Online ESC Reg	
Master PLC Master	Expert Config: 🔽 0 🌲 FuncMappingNum: 0 🜲	
Slave	Offset time(us):	
-StationID:0 LFC3-AP -XF-E4AD -XF-F16V	SM Watchdog: IO Module: IO Module	~
=StationID:1 LFC3-AP XF-E4AD	Slave Information Init	
L XF-E4DA	State Machine	
	Current State OP Requested OP	
	Error Message	
		0
L		
	Import Export Read Write A	ctivate OK Cancel

7. In the IO mapping of the module, the mapping address can be viewed, and the corresponding output points can be controlled in the IO mapping to check whether the actual output of the module is consistent with the IO mapping control.

can	Launch parameters	IO Mapping COE-	Online					
aster	Address							
LC Master	Index:SubIdx	Name	Address	Туре	Bit length	Value	-	
	#x7010:01	СНО_ТО	HM10000	BOOL	1	OFF		
Chut' TRIO INCO IN	-#x7010:02	СН1_¥1	HM10001	BOOL	1	OFF		
VE-FAAD	-#x7010:03	СН2_¥2	HM10002	BOOL	1	OFF		
XF-E16Y	-#x7010:04	снз_үз	HM10003	BOOL	1	OFF		
-StationID:1 LFC3-AP	-#x7010:05	СН4_¥4	HM10004	BOOL	1	OFF		
XF-E4AD	-#x7010:06	СНБ_ҮБ	HM10005	BOOL	1	OFF		
XF-E4DA	-#x7010:07	СН6_¥6	HM10006	BOOL	1	OFF		
	-#x7010:08	СН7_¥7	HM10007	BOOL	1	OFF		
	-#x7010:09	СН8_¥10	HM10008	BOOL	1	OFF		
	-#x7010:0A	СН9_¥11	HM10009	BOOL	1	OFF		
	-#x7010:0B	СН10_¥12	HM10010	BOOL	1	OFF		
	-#x7010:0C	СН11_¥13	HM10011	BOOL	1	OFF		
	-#x7010:0D	CH12_¥14	HM10012	BOOL	1	OFF		
	-#x7010:0E	СН13_¥15	HM10013	BOOL	1	OFF		
	-#x7010:0F	CH14_V16	HM10014	BOOL	1	OFF		
	#x7010:10	CH15_¥17	HM10015	BOOL	1	OFF		

3.2.6.2 LFC3-AP and Codesys connection

1. Add the ".xml" file corresponding to LFC3-AP. Open the XS Studio programming software, click on "Device repository..." in the "Tools" dropdown menu, and add the corresponding ". xml" file.

		Library Panaritany		
evices – a 🗙	- 6	Device Repository 2	😤 Device Repository	>
United I United I United I Application PIC Logic Application DIC PRG (PRG) EXC PRG (PRG) EXC PRG (PRG) EXC PRG (PRG) EXC PRG (PRG) EXC PRG (PRG) EX		 Visualization Style Repository License Repository License Manager Scripting Customize Options Import and Export Options Device Reader Edge Gateway 	Location System Repository (C:\Program Files\XS Studio\CODESYS\Repositories\Devices) Installed Degice Descriptions String for a full text search Vendor <ali vendors=""> Name Vendor Version Description Telebuses Telebus</ali>	Edit Locations Install Uninstall Export Qetails Close

2. Click on "Network Configuration" to select "EtherCAT Master Station" and complete the configuration of the EtherCAT protocol.



3. Double click on "EtherCAT_Master_SoftMotion" to select and configure the Ethercat source address (MAC).

Untitled1 Device (XSA530-W)	General	⊘ Autoconfig master/slaves EtherCAT →	
Betwork configuration EtherCAT Frame	Sync Unit Assignment	EtherCAT NIC Settings	
PLC Logic	Log	Destination address (MAC) FF-FF-FF-FF-FF Decoderate Redundancy	
Application	EtherCAT I/O Mapping	Source address (MAC) 00-00-00-00-00 Browse	
PLC_PRG (PRG)	EtherCAT IEC Objects	Select network by MAC O Select network by name	
EtherCAT_Task HeinTask EtherCAT_Master_SoftMotion (EtherCAT Mas HIGH_SPEED J.O. (HighSpeedio) SoftMotion General Axis Pool	Status	选择网络适配器	
	Information	MAC18社 名称 描述 - 805902119990 以太河1 Intel(0) Ethernet Centroller (3) 1225-47 - 805902119991 以太河2 Intel(0) Ethernet Centroller (3) 1225-47 - 805902119991 以太河2 Intel(0) Ethernet Centroller (3) 1225-47 - 805902119991 以太河2 Intel(0) Ethernet Centroller (3) 1225-47 - 805902119940 以太河2 Intel(0) Ethernet Centroller (3) 1225-47 - 805902119840 EXA1 CobSyn EtherExpress Git FCI Ethernet Adapter 45 - 805902119841 EXA12 CobSyn EtherExpress Git FCI Ethernet Adapter 46	
		确定	中止

4. Right click on "EtherCAT_Master_SoftMotion" and click on the scanning device to scan and configure the information of the LFC3-AP+XF-E16YT+XF-E4AD module.

1 Untitled 1	-						
Device (XSA530-W)	10000	General	🖌 Autoconfi	g master/slav	es		EtherCAT
Retwork configuration		Sync Unit Assignment	EtherCAT NIC	Settings —			
EtherCAT Frame		Log	Destination a	Broadcast	Redundancy		
Application Ibrary Manager		EtherCAT I/O Mapping	Source addre	ss (MAC)	00-00-00-00-00	Browse	
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EtherCAT_Task		Status	✓ Distributed	Clock —		> Options	
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EtherCAT_Master_SoftMotion (Ether	CAT Ned		Sync offset	20	\$ %		
HIGH_SPEED_IO (HighSpeedIo)	Å	Cut	Sync windo	w monitoring			
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		Add Device					
		Scan for Devices 2					
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		Update Device					
	Dî.	Edit Object	-				
		Edit Object With					
		Edit IO mapping					
		Import mappings from CSV	a suite a				
		Export mappings to CSV	tion control	ler based o	CODESVS		
				ier based of	1000/1313		
		Collapse Application					

5. After completing the scan, click "Copy all devices to the project" and view the remote IO configuration status scanned under the left tree.

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	用意单元分数		EtherCAT NIC设置						
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d) nc ma	17,3440	17-84AD							
· (11) 1034, 5P200, 10 (高速10)									
· TherCAT Master Sufficient EtherCAT Master SoftMast									
* NJ UPCS_AP (LPCS-AP ETHERICAT ADAPTER 2.0.0)									
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3 Scheeter General Anti Hoo									
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	Concerning of the					19/20	-	-	-
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6. Click to log in and download the corresponding configuration information to the PLC, and view the current running results.

- Ø	X Device Bethe	rCAT_Master_SoftMotion X		
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 N: JF_E40 (F-E40) SoftHoton Central Aus Pool 		诊断信息 Startus freshedi Al slav 经统仇权 0 %	es in operational I	

7. Click on the corresponding module in the left tree, and under the corresponding module, click on "Module I/O Mapping" to monitor or control the corresponding points, and check that the corresponding monitoring or control matches the required output.

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- O Application [16]17]			042_92	%QX8.2	BIT	CUE .			CH2_Y2
■ 库富理器			CH3_Y3	%QX8.3	BET				CH3_Y3
			017.11	76(208.9	BLI			-	014_14
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GNJ XF_E4AD (XF-E4AD)	- 19		CH13_Y15	%QX9.5	BIT FA	L.SE			OH13_Y15
G 🌡 SoftMotion General Axis Pool	- **		CH14_Y16	%QX9.6	BIT FA	NL SE			CH14_Y16
			CH15_Y17	%QX9.7	BIT FA	ALSE			CH15_Y17

3.2.6.3 LFC3-AP connected to Omron

 Click on "Controller", select "Communication Settings", and fill in the IP address of the PLC to be communicated in the specified remote IP address, click on "Ethernet Communication Test" and the display "Test Successful" indicates that the communication between the PC and PLC is successful, click "OK" to complete the communication configuration operation.

	controller_o_oyaniac			
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▼ 配置和设置	同步(Y)	Ctrl+M		
EtherC	传送中(A)	`	▼ 注使天空 请洗择—— 人在线时每次与控制器连接时使用的方法。	
▶ 🖙 CPU/表	模式(M)	•	● USB-直接连接	
¢* I/O 映	监测(N)		 Ethernet-直接连接 USB-示程连接 	
▶ 履 控制器	停止监测(N)		O Ethernet-Hub连接	
▶ ⊕ 运动出 《 Cam教	设置/重置(S)	•	● 每次在线连接时,请从以下选项中选择。	
▶ 事件谈	强制刷新(F)	•	Ethernet 直接连接	
■ 任务谈	MC试运行(U)	•	USB-远程连接 Ethernet-Hub连接	
🖂 数据第	MC監測表(T) CNC級長系的技士(Z)			
▼编程	これに重切いを通过お(2)	·		
▼ @ POUs	SD/3HF/F(D)			
▼ (iii (1±) ▼ (iii	程故访问权限(C)		▼ 沅程19地址	
	更新CPU单元名称(P).		指定远程IP地址。	
- 実 功能	安全性(E)	•	192.168.250.1_	3
	清除所有内存(L)		USB通信期试 Ethernet通信测试	4
▶□双结	重置控制器(R)		测试成功	
- 10 Later			▼选项	
			✓ 在线时端认序列ID。	
	编译	¥.		
	8		▼■加立面別町町 在与控制器的通信中设置順应监视时间。(1-3600秒)	
			9009 当通过多个网络(如VPN连接)连接到控制器时,请设置足够大的值。	
1 筛选器	18H	山 编译		

2. Add the ".xml" file corresponding to LFC3-AP. Open the Omron "Sysmac Studio" programming software, double-click "EtherCAT", right-click "Main Device", click "Display ESI Library" to install the corresponding ".xml" parsing file, click "Close" to complete the installation of the parsing file.

MHEIM - new_Controller_0 - Sysmac S	tudio (54bit)			
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3. Click "Online" to put the PLC in an online state, right-click on "Main Device" and select "Compare and Merge with Physical Network Configuration", configure LFC3-AP+XF-E16YT+XF-E4AD.



4. On the comparison and merging page of the same physical network configuration, click "Apply Physical Network Configuration (A)" to synchronize the scanned node information of LFC3-AP to "Network Configuration on Node Address Sysmac Studio".

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主设备		主设备	主设备	匹配	主设备			
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5. Click "Sync" on the corresponding synchronization interface and click "Transfer to Controller".

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6. View the corresponding node and module information under the left tree of Ethercat, and verify that the scanned module matches the actual configured module, click on "IO Mapping" to view or control the corresponding variables, the output viewing module corresponding to the setting has a corresponding output signal, and the external excitation signal corresponds to the viewing analog input value.

多視图浏览器 🚽 🖓	間 EtherCAT	I/O 映射 ×								工具箱	÷ 1
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		Channels Data_CH3_Y3_7000_04		w	BOOL	TRUE					
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■		Channels Data_CH6_Y6_7000_07		w	BOOL	FALSE					
■ ▶ ℝ 控制器设置		Channels Data_CH7_Y7_7000_08		w	BOOL	FALSE					
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3.3 PROFINET coupler LFP3-AP

3.3.1 Overview

The LFP3-AP coupler unit supports the PROFINET bus communication protocol, and a single adapter module can connect up to 32 XF series I/O modules at most. Capable of connecting with Siemens 200smart, 1200, 1500 series PLCs, and seamlessly connecting with TIA Portal.

- Compact structure, saving installation space.
- Supports RT and IRT transmission modes.
- Support MRP and MRPD redundancy.
- Compatible with Siemens and TIA portal.
- Support firmware upgrade for network ports.
- Maximum support for 32 expansion modules.

Module version

Hardware version	Firmware version	Function
H2.0.0	V2.0.0	Basic functions for the first official production
H2.2.0	V2.1.0	Added functions for temperature adaptation, serial port,
		and high-speed counting module

Version explanation

Firmware	GSD version	Add adaptation extension module					
W2 0 0	CSDML V2.25 Vinia LED2 AD 20221120	XF-E8X8Y, XF-E16X, XF-E16Y, XF-E4AD,					
V2.0.0	GSDML-v2.33-Amje-LFP3-AP-20231130	XF-E4DA					
V2 1 0	CODMI V2.25 Vinia LED2 AD 20240921	XF-E2COM24, XF-E4RTD, XF-E4TC,					
V2.1.0	GSDWL-V2.53-AInje-LFP3-AP-20240821	XF-E1HSC					

3.3.2 Module view

1) Description of each section



No.	Name	No.	Name
1	DC24V power supply terminal	2	Status indicator
3	EtherNet	(4)	MAC address
5	Guide rail buckle		

2) System indicator

Abbreviation	Explanation
PWR	Power indicator light, lit when the power system is normal
RUN	Running indicator light, lit up when the system is running normally
ERR	System malfunction indicator light, lit up when system malfunction occurs
SF	Module error indicator light

• RUN indicator

RUN indicator	State	Explanation
Light	Operating mode	Establish communication with the main station
Extinguish	Not running	Not connected
Single flicker ^{*1}	Find	TIA Portal clicks on the "flashing LED" function
Flash ^{*2}	Firmware update	Firmware update in progress
Light	Operating mode	Establish communication with the main station

• ERR indicator

ERR indicator Explanation		Solution	
Extinguish	No Error	Normal operation	
	ht PDI watchdog timeout	1. Unplugged network cable	
		2. Diagnostic message sent	
Light		3. The number of configured modules is consistent with the	
		number of physical connections, but the modules	
		physically connected to a certain slot are not consistent	

	with the actual configuration (at this time, the SF light
	will also remain on)
	4. The number of configured modules exceeds the actual
	number of physical connections

• SF indicator

SF indicator	Explanation	Solution
Extinguish	Expansion module is normal	
Single flicker ^{*4}	Expansion module failure	 Check the module power supply. Check if the module is faulty. Replace the module. Check the external channel wiring status.
Light	Detect configuration topology mismatch with reality	 Check the communication interface contact of the expansion module or restart the entire system. Check if the module in the corresponding slot is powered off or unplugged. Check the communication interface contact of the expansion module or restart the entire system.



*1: Single flash as shown in the figure below:



• *2: Double flashing as shown in the figure below:



3.3.3 General specification

General specification		
Project		Specifications
On anoting temperature	Maximum temperature	55°C
Operating temperature	Minimum temperature	-20°C
Transportation/Storage	Maximum temperature	70°C
Temperature	Minimum temperature	-40°C
Environmental humidity	Upper limit	95%
(including operation/storage)	Lower limit	10%
IP level		IP20
		Compliant with IEC61131-2
		Under intermittent vibration (frequency 5-9Hz, constant
		amplitude 3.5mm peak displacement) and (frequency
		9-150Hz, constant acceleration 1.0g peak acceleration)
Anti vibration		Under continuous intermittent vibration (frequency 5-9Hz
		half amplitude 1.75mm displacement) and (frequency
		9-150Hz constant acceleration 0.5g constant frame
		amplitude)
		Scan 10 times in X, Y, and Z directions
		Complies with IEC61131-2 standard
T , ',		The impact strength is 15G (peak) and the duration is 11ms.
Impact resistance		It is applied to three mutually perpendicular axes, and each
		axis is impacted 3 times (a total of 18 impacts)
Using environment		Non corrosive gas
Using altitude		0-2000 m
Overvoltage level		II: Compliant with IEC61131-2
Pollution level		2: Compliant with IEC61131-2
Anti interference EMC		Compliant with IEC 61131-2 IEC61000-6-4 Type B
Related certifications		СЕ

3.3.4 Technical specifications

Project	Specifications	
Bus type	PROFINET	
Rated input voltage	DC24V	
Isolation voltage	500VAC	
Voltage allowable range	DC21.6-26.4V	
Module power	1.5W	
Allow instant power outage time	10ms DC24V	
Impulse current	10A DC26.4V	
Dower protection	Anti reverse connection protection, overcurrent protection, surge	
	absorption	
Single AP process data	Input maximum 1440 bytes, output maximum 1440 bytes	
Communication mode	RT mode, IRT mode (≤1ms)	
Media redundancy (MRP)	Support	
Media Path Planning Redundancy	Sunnort	
(MRPD)		
Fault diagnosis	Support	
Network interface	2 RJ45 ports	
Connection rate	10/100Mbps adaptive, full duplex	
Transmission distance	Less than or equal to 100m between two nodes	
Transmission medium	CAT5e and up	
Topological structure	Supports line type, star type, tree type, etc	
Number of expansion modules	Supports 32 modules	
Firmware upgrade	Support	
Module weight	100g	

3.3.5 Installation&Wiring

3.3.5.1 Dimension

(Unit: mm)



3.3.5.2 Installation method

The module is installed using DIN rails, which must comply with the IEC 60715 standard (35mm wide, 1mm thick). The size information is shown in the following figure, in millimeters.



3.3.5.3 Installation environment

This product can be installed in four positions (i.e. installation direction): horizontal, vertical, top of cabinet, and bottom of cabinet, it is recommended to install in a horizontal direction, and the heat dissipation design should be through natural convection, to ensure normal ventilation and heat dissipation, and to reserve sufficient wiring space, the minimum gap must be left around this product, as shown in the following figure :


6

If there is a high-temperature heat source equipment (heater, transformer, high resistance, etc.) around this product, at least 100mm gap should be left between it and the high-temperature heat source equipment.

3.3.6 Use Cases

3.3.6.1 LFP3-AP connected to Siemens S7-1200/1500

1. Create a new project and select the corresponding PLC hardware.

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项目(P) 编辑(E) 视图(V) 插入(I) 在线(O) 选项(N) 工具((1) 窗口(W) 帮助(H)						Totally Integrated Automation
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 ・ ・<			CPU 1211C ACIDCIRIY		P 22		□ 在隐藏文本中查找
▶ 通 语言和资源		1010159	CPU 1211C DODODC				□ 使用通配符
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2. In the menu bar "Selection", click "Manage General Station Description Files (GSD)" to add the GSD file for LFP3-AP.

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☆加新设备 」设备和网络 ■ PLC_1 [CPU 1212C DCIDC/DC]			
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3. Select the folder where the GSD file is located in the source path, select the corresponding GSD file, and click "Install".

管理通用站描述文件				×
」 已安装的 GSD				
源路径: C:\Users\LENOVO\Documents				
导入路径的内容				
文件	版本	语言	状态	
SDML-V2.35-Xinje-LFP3-AP-20230830.xml	V2.35	英语,德语	已经安装	
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		刪除	安装	取消

4. In the menu bar "Online", click "Hardware Detection" and then click "PROFINET Devices in the Network".

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5. Click "Start Search", select the "LFP3-AP" found in the search, and click "Add Device".

PROFINET 设备的硬件检	22	PG/PC接口的类型: PG/PC接口:	PN/IE	ibE Family Controller	× • • •
	所选接口的可访问节点:				开始搜索
	ROFINET 设备名称	设备系列	IP 地址	MAC that	
	manan waan	YE IO SYSTEM	192 168 0 2	6C-70-83-DE-1D-4C	-
		26420, 52, 24 /4 ×	un へや 法元 な 'モ+n五d		TER -
信息:如果设备已在项目中	□、则不进行检查。每次对选择	的设备进行检查时,	\$P\$会将该设备添加到	项目中,即使该设备已位于	项目中。
				添加设备	取消

6. In "Device Configuration", click "Network View" to view the newly added slave devices.

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Ľ.		PLC_1 Hp3-ap	☑ 过渡 配置文件 《全部》
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7. In the Network View, drag the mouse from the PLC network port to the LFP3-AP network port to establish a connection relationship.

项目2 → 设备和网络				
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8. Click on LFP3-AP to enter the device view, right-click and select "Assign Device Name".

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	3			LFP3-AP Profinet Device	0
				XF-E16X(16I 24Vdc)数字	0
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				XF-E4AD (4AI 0-5v,0-10v,±	0
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	▼ 高级选项	-f PM PN/IE_1			
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9. Click "Update List" to "Assign Names" to the corresponding slave stations.

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	PROFINET设备	各称: Ifp3	3-ap_2		
$ \rightarrow $	设备	译型: LFP	3-AP		
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	Taire	- 132 (Rediter PCIe GDE Pa	mily controller	
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网络中的可	访问节点:				
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闪烁 LED				1	3
				車 新列表	分配名称
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在线状态信息:					
 搜索完成。找到1个设备(共2⁻ 	个)。				
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10. Click on LFP3-AP to enter the device view, where you can view the mapping addresses corresponding to the expansion module. For example, the input address of XF-E16X corresponds to I2.0-3.7, and the output address of XF-E16YT corresponds to Q2.0-3.7.

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☆加新设备	=	LEP3-4P Profinet Device	0	0.11			FP3.4P	
品 设备和网络 ない		XF-E16X(16L24Vdr)独立	0	1	2.3		XE-E16X(16L24Vdc	
PLC_1 [CPU 1214C DC/DC/DC] 10		XF-E16Y 1	0	2	L	23	XE-E16Y	
		A CIGI_I	0	2				
型 在线和诊断			0	4				
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DP-NORM DP-NORM			0	7				
🔁 PLC 変量			0	8				
 C PLC 数据类型 			0	9				
 ・			0	10				
▶ 2 在线备份			0	11				
🔯 Traces	٠		0	12				
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11. After setting up, click on compile and download the PLC program.

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¥ 显示聴灌接口				接口/子园的S在接:	PN/IE 1			0 10		HSC	AllAQ	
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▶ [] COM <9> [RS232/PP1多主站编程电缆] 陽				用一门的大					100210.	除海发生器(Technology modules	
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12. Click "Go Online" to check if the connection status of the module is normal.

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模块	1 清息	装至 ? 日期 时间	38: ^
	① 订货号为 XF€16X 的模块已成功添加到设备的插槽 1 中.	2023/9/13 16:30:57	
名称	① 订货号为 XF€16Y 的模块已成功添加到设备的插槽 2 中.	2023/9/13 16:30:57	a.
11 设备组态 ^	* 井留下戦王戦策會。	2023/013 16:31:13	🔁 🕈 , 🛛 🛊 🖩 🖉 🕇
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□ 工艺对象	● 種件服務下載成功。	2023/9/13 16:31:33	
→ 外部策文件	PLC_1已启动。	2023/9/13 16:31:36	订换号:
a PLC 安里	下载完成 (補具:0:警告:0) →	2023/9/13 16:31:36	
「「「「「「「「「」」」」	☑ 已通过地址 IP=192.168.0.1 连摇到 PLC_1。	2023/9/13 16:31:43	. 麻本:

13. In the "Monitoring and Enforcement Table", a monitoring table can be added, mapped IO addresses can be added, and the input and output status of the expansion module can be monitored in real time.

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3.3.6.2 LFP3-AP connected to Siemens S7-200 SMART

- 1. Require 200SMART firmware version V2.05 and above.
- Power on the module and S7-200SMART, and connect the network port to the PC. Open the Siemens STEP 7-MicroWIN SMART software. Under the "File" menu, click on "GSDML Management". In the pop-up window, click browse to find the GSD file for LFP3-AP and click open to complete the installation of the GSD file.

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	可用'GSDML 管理'未为 PROFINET 安装和删除 GSDML 文件。
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3. Click on the tool, click find PROFINET device, click find device, find LFC3-AP module, the module device name is lfp3-ap, you can click "EDIT" to customize the name. (Discovered device name, it needs to be consistent with this name during configuration)

	+0189 -			:	项目 1 - STEP 7	-Micro/WIN SMART
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▶ 项目1 → 新増功能		程序注释				
CPU SR20	1	程序段注释				
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田 (二) 状态图表 田 (二) 数据块		1		ABDROEINET-28		× 1
三 系统块						
- 里 通信	2	输入注释		囲目表山 Realtek PCIe GbE Family Controller.TCPIP.Auto.1	-	按下"编辑"按钮以更改所迭设备的名字。按下"闪烁指示灯"按钮 使设备的LED持续闪烁,以便目测连接的设备。
日 🕜 向导		N		2 PROFINET 设备		MAC 北山
 ・ ・						B8:A7:5E:01:2C:C8 闪烁指示灯
PWM						P 地址
CET/PUT	3	輸入注释				192.168.6.6
- 代 数据日志 PBOFINET						子网摘码
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田 🔤 地籍运具						6 取消
由 22 程序控制 由 23 移位/循环						
田 圖 字符串						

4. Click on the tool and then click on PROFINET. Select the controller and modify the IP address of the PLC. Click "Next".

		项目 1 - STEP 7-Micro/WIN SMART
文件 编辑 视图	PLC 测试 工具 帮 大+ total t	
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	MAIN × SBR_0	PROBINET RELEASE
 ● 新増功能 ● EPU SR20 ● 20 行号表 ● 20 行号表 ● 20 状态图表 	程序注释 1 程序段注释	■ monterenges ■ 白参選(CPU SR20_ptic200mert) 約0号方许多返去地設置 PAOFINET 配置信意在项目中生成并存储,可和项目一起下载到 PAC 中。
 □ 数据块 □ 系统块 □ 交叉引用 ■ 査信 □ (○ 向导 □ (○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○	2 输入注释	rus编码 这称cs的角度
、高速十鉄器 、 PHD 、 文本是示 、 GET/PUT 、 鉄道日志 PROFINET	3 输入注释	戸 控制器 ② 1 新院改革 第6007月8日 指口影射由上站控制器分配
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 田 田 新秋 田 計 計 新秋 田 中間 中間 市 運 運 通 運 近 <	5 输入注释	Mater La
 ● imi 程序控制 ● imi 经价值环 ● imi 字符串 ● imi 表格 ● imi 表相 ● imi 表相 ● imi 和目表 ● imi PROFINET ● imi PROFINET ● imi 印用子例程 	6 输入注释 ————————————————————————————————————	() () () () () () () () () ()
由 🔝 调用子例程		

5. Find LFP3-AP in the hardware directory, add it to the device list, and modify the device name to lfp3-ap (Must match the name in the search for PROFINET devices), the IP address assigned to LFC3-AP simultaneously is 192.168.6.6 (located in the same network segment as the PLC's IP). After completing the modifications, click "Next".

PROFINET 配置向导							
回 PROFINET网络 白-■ 作物器(CPU SR20_plc200smart) 日-■ FF3-APV2.00-(fp3-ap 日-■ LF93AP(0) ■ 元成	IIp3-ap(LFP3AP) 上 音音書到设了哲言	/200) 】 PROPTINET 网络当前组态时 ·制态加设备。		2200smart 12 168.6.2	ta Tita	■ ₱. PLC 57:200 SMART ● PLC 57:200 SMART ● PLC 97:200 ● CPU SR40 ● CPU SR40 ● CPU SR40 ● CPU SR40 ● CPU ST20 ● CPU ST30 ● CPU ST40 ● CPU ST40 ● DE ● NUE ● NUE ● VUE ● VUE	
	改首表 <u>设备号</u>	<u>类型</u> LFP3-APV2.00	しまた。 していた し していた し し し し し し し し し し し し し	□ U 田 中 U 石 4 □ U 田 一 U 田 U 田	IP 地址 192.168.6.6		
	2 3 4 5 6			④填写L 与PLC在	 FC3-AP的IP地址 E同一网段	订货号: LFP3-AP 版本: GSDML-V2.35-Xinje-LFP3-AP-20230921.xml	_
	7 8 ② 添加 冊//	余 			>	说明: GSDML-V2.35-Xinje-LFP3-AP-20230921.xml Wuxixinje LFP3-AP profinet device	^
				生成	取消		~

6. According to the IO module model attached after LFP3-AP, manually add the corresponding module. You can view the addresses and lengths occupied by each module in the PLC, and click "Next".

PROFINET 配置向导								×	
络 CPU SR20_plc200smart)	单i	击 "3	秦加" 打	贪钮来为该设备添加模块。				LFP3-APV2.00 白 主模块	
_FP3-AP(0)	8		席号	模块名	子模块名	插槽 子插槽	PNI 記す へ	中 横块	
XF-E4AD (4AI 0-5v,0-10v,±5v,±10v,1-5	1		0	LFP3-AP	1 18.7.1	0	ALL'S	□ 1x:数字重模块(CT-1xxx)	
XF-E16X(16I 24Vdc)数字里输入(2)	2	in			LFP3-AP Profinet Device	0 32768(×1)		XF-E16X(16I 24Vdc)数字重输入	
XF-E16Y(16O 24Vdc)数字重输出(3)	3	ir.			Port 1	0 32769041	1	- XF-E161(160 24Vdc)数字重制山 - XF-F8X8V(8IO 24Vdc)数字重制山	
•	4	in 1			Port 2	0 32770[×1		□ 2x:模拟量模块(CT-2xxx)	
	5	ÎΠ	1	XF-E4AD (4AI 0-5v,0-10v,±5v,±10v,1		1	128		
	6	ГĒ	2	XF-E16X(16I 24Vdc)数字筆输入		2	144	XF-E4DA (4AO 0-5v,0-10v,±5v,±10v,Vic	
	7	ÌΠ	3	XF-E16Y(160 24Vdc)数字里输出	1	3		一子模块	
	8	in		4		4	e (e)		
	9	1 C				5		(L)	
	10	IT.				6			
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	19	in				15	-		
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	22	i-				18		去持的固件版本为V02.05、V02.06及更高。	
	23	in				19	~	版本。	
		`Æ+n		nnie 1			>	16通道晶体管输出	
	L								
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7. For the parameter description of LFP3-AP, click "Next directly".

PROFINET 配置向导		×
□ PROFINET网络 白	该页可配置所选模块的每个子模块。	
	LFP3-AP LFP3-AP Profinet Device Port 1 Port 2	
□ XF-E16Y(16O 24Vdc)数号 □ 完成	设备识别	
	IP 地址	192.168.6.6
	设备名称	lfp3-ap
	目录	
	简短标识	LFP3AP
	说明	Wuxikinje LFP3AP profinet device
	订货号	LFP3AP
	固件版本	V2.00
	GSIML 路径	C:Weer/Public/Documents/Siemens/STEP 7-MicroW/IN SMART/GSDML \GSDML-V2.35Xinje-LFP3AP-20230921.xml
	标识和维护	
< >	上一步	生成取消

8. Parameters can be configured for each module, and detailed configuration instructions can be found in the manuals of each module. After configuration is completed, click "Production".

PROFINET 配置向导				×
猪谷 (CPU SR20_plc200smart) 3-APV2.00-桁う3-ap LP3-AP(0) XF-ぞ4AD (4AI 0-5v,0-10v,±5v,±10v,1-5 メテキ4AD (4AI 0-5v,0-10v,±5v,±10v,1-5	该页可配置所选模块的每个子模块。			
XF-E16X(16I 24Vdc)数字里输人(2) XF-E16Y(16O 24Vdc)数字里输出(3) 战	IoduleIdentHumber: 0x00290001 模块信息			^
		模块级别错误字节数	1 281569465992194	
	模块配置参数			
		电 源检测 电源检测	11 天街 🔽	
		Channel_0 通道使能	5 1111 -	
		断线检测 重程选择	关闭 、 译 ①~10Vdc 、	
		滤波方式		
<>			▲ IBJBH4-33 (2100mB) 取入国2	~

9. Click download in the "PLC" menu, select all block downloads, and click "Download". After downloading, check if the RUN indicator light of LFP3-AP is always on, which indicates a successful connection and normal operation.

		项目 1 - STEP 7-Micro/WIN SMART
RUN STOP 编译 操作 传	下式 設定 通び 通道 (And 例) 建 DB <	
	● ● ダ 會上传 - ♣ 下载 - 協 描入 - 1% 删除 - 詞 詞 □ 會 承 4	Ӭӏ҇҇҇ӸѦ҇҉ӹҧ҄ҧ҆⇒҆⇒ӏҸѺҵӀѻ҂ӓӹ҄ҜӀӄ҄ҏ
 ○○ (5) (6月1) → 2) 新聞力能 ● CPU 5F20 ● CPU 5F20 ● 日 21 行政意義 ● 日 21 行政意義 ● 日 21 行政意義 ● 日 22 注意 ● 日 22 注意 ● 日 22 注意 ● 日 22 注意 ● ○ (30 向导) ● ○ ○ (30 向导) ● ○ (30 向) ● ○	1 程序注释 1 程序设注释 2 輸入注释 3 輸入注释	下载 × 将线下载到 CPU 诸得要下载的统
 □ ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●	▲ 輸入注释 ● 輸入注释 ● 輸入注释	

4. Digital quantity module unit

4.1 Naming rules

	XF - F		
	$\frac{1}{1}$ $\frac{1}{2}$	$\overline{3}$	$\frac{1}{4} \overline{5} \overline{6} \overline{7} \overline{8} \overline{9}$
1)	Series name	XF:	XF series expansion module
2	Refers to the extension module	E:	Represents the right expansion module
3	Input channel	4:	4 channels
		8:	8 channels
		16:	16 channels
		32:	32 channels
		64 :	64 channels
4	Input point type	Empty:	Digital input PNP&NPN compatible
		N:	Digital input NPN type
		Р:	Digital input PNP type
5	Туре	Х:	Digital input
6	Output channel	4:	4 channels
		8:	8 channels
		16:	16 channels
		32:	32 channels
		64:	64 channels
$\overline{7}$	Type of output	Empty:	Digital output NPN type
		P:	Digital output PNP type
8	Туре	Y:	Digital output
9	Output point type	Τ:	Digital output transistor type
		R:	Digital output relay type

4.2 Digital input unit XF-E16X

4.2.1 Overview

The XF-E16X series digital input expansion module has 16 channels of digital input, supports NPN and PNP inputs, and is compatible with XF, XSF series CPU units and XF series communication coupler units.

- 16 channel digital input.
- Complies with IEC-61131 input standard type 1.
- NPN&PNP bipolar input.
- 12mm width design.
- Module version

Hardware version	Firmware version	Function
H2.0	V2.0	Basic functions for the first official production

4.2.2 Module view

1) Description of each section



No.	Name	No.	Name
1	System LED indicator lights	2	Channel LED indicator light
3	Detachable terminal block	(4)	Snap
5	Model indication	6	Color identification indicating module type
$\overline{7}$	Module hardware and firmware versions	8	Wiring diagram

2) System indicator

System indicator	Explanation			
PWR(Green)	Extinguish	Module not powered on		
	Always ON	All external power supplies of the module are normal		
		(Backplane bus power supply&external input 24V)		
RUN(Green)	Always ON	The module is running normally		
	Flash 1Hz ^{*1}	General errors in module logs		
	Extinguish	Important errors in module logs		
	Flash 10Hz ^{*2}	Module establishing communication		
	Double flashing ^{*3}	Module firmware update		

- *1: A square wave with a duty cycle of 50% and a frequency of 1Hz.
 - *2: A square wave with a duty cycle of 50% and a frequency of 10Hz.
- *3: As shown in the following figure:



3) Channel indicator light

Model	Channel indicator light		
XF-E16X	X0-X17	Always ON (Green)	Corresponding input channel has input ON signal
		Extinguish	Corresponding input channel has no input ON signal

4) Color identification

No.	Color		Module type
1		Grey white	Digital input
2		Gray	Digital output&digital mixed module
3		Light blue	Analog input
4		Deep blue	Analog output
5		Green	RS232&485 serial port communication
6		Pink	Temperature signal input
7		White	High speed counting

4.2.3 General specification

General specification			
Project		Specifications	
Operating temperature	Maximum temperature	55°C	
	Minimum temperature	-20°C	
Transportation/Storage	Maximum temperature	70°C	
temperature	Minimum temperature	-40°C	
Environmental humidity	Upper limit	95%	
(including operation/storage) Lower limit		10%	
IP level		IP20	
		Compliant with IEC61131-2	
		Under intermittent vibration (frequency 5-9Hz, constant amplitude	
		3.5mm peak displacement) and (frequency 9-150Hz, constant	
Anti vibration		acceleration 1.0g peak acceleration)	
		Under continuous intermittent vibration (frequency 5-9Hz half	
		amplitude 1.75mm displacement) and (frequency 9-150Hz constant	
		acceleration 0.5g constant frame amplitude)	
		Scan 10 times in X, Y, and Z directions	
		Complies with IEC61131-2 standard	
Impact resistance		The impact strength is 15G (peak) and the duration is 11ms. It is	
Impact resistance		applied to three mutually perpendicular axes, and each axis is	
		impacted 3 times (a total of 18 impacts)	
Using environment		Non corrosive gas	
Using altitude		0-2000m	
Overvoltage level		II: Compliant with IEC61131-2	
Pollution level		2: Compliant with IEC61131-2	
Anti interference EMC		Compliant with IEC 61131-2 IEC61000-6-4 Type B	
Related certifications		CE	

4.2.4 Technical specifications

Project	Specifications		
Input	16		
Rated input voltage	DC24V		
Rated input current	6mA		
Input impedance	5ΚΩ		
Input ON voltage	11v		
Input ON current	2.5mA		
Input OFF voltage	5v		
Input OFF current	lmA		
Input resistor $ON \rightarrow OFF$ response time	100.00		
(hardware)	Toolds		
Input resistor OFF \rightarrow ON response time	100us		
(hardware)	10005		
Input deroting	Derate by 75% when operating at 60°C (with no more than 12 ON		
	input points), or by 10°C when all input points are ON		
Common end method	8 points 1 common terminal		
Wiring method	Refer to external terminal connection diagram		
Module power consumption	0.5W (internal backplane)+1.4W (external input)		
Module weight	80g		

4.2.5 Installation&Wiring

4.2.5.1 Dimension





(Unit: mm)



4.2.5.2 Terminal definition&Wiring

Terminal definition

XF-E16X					
Meaning	A-column terminal	Terminal layout	B-column terminal	Meaning	
CH0	0		0	CH8	
CH1	1		1	CH9	
CH2	2		2	CH10	
CH3	3		3	CH11	
CH4	4		4	CH12	
CH5	5	3	5	CH13	
CH6	6		6	CH14	
CH7	7		7	CH15	
SS	8		8	SS	

0

Two SS are internally short circuited, so all input points of a single module can only choose between NPN or PNP.

- NPN: S/S terminal is connected to 24V, and the 0-7 of columns A and B are connected to 0V.
- PNP: Connect the S/S terminal to 0V, and connect the 0-7 of columns A and B to 24V.



External wiring

① System indicator ② Channel indicator light

③ Backplane bus

④ Input channels&wiring

4.2.5.3 Installation method

1) Installation requirements

The module is installed using DIN rails, which must comply with the IEC 60715 standard (35mm wide, 1mm thick), the size information is shown in the following figure, the unit is (mm).



2) Installation steps





Explanation: After the module installation is completed, the locking buckle will automatically move downwards for locking, if the latch does not move downwards, press down on the top of the latch, ensure proper installation.

3) Disassembly steps



1. Use a flat screwdriver or similar tool to pry the rail lock upwards, as shown in the left figure:

2. Pull the module straight forward at the buckle position (raised part), after completion, press down on the top of the latch, as shown in the left image:

4.2.5.4 Installation environment

This product can be installed in four positions (i.e. installation direction): horizontal, vertical, top of cabinet, and bottom of cabinet, it is recommended to install in a horizontal direction, and the heat dissipation design should be through natural convection, to ensure normal ventilation and heat dissipation, and to reserve sufficient wiring space, the minimum gap must be maintained around this product, as shown in the following figure:



 $\mathbf{\hat{0}}$

If there are high-temperature heat source equipment (heaters, transformers, large resistors, etc.) around this product, leave at least 100mm gap between the equipment and the high-temperature heat source.

4.2.5.5 Equipment wiring

When wiring the module, its terminal must meet the following requirements:

Adaptor diameter			
National standard/mm ²	American standard/AWG		
0.3	22		
0.5	20		
0.75	18		
1.0	18		
1.5	16		

If using other tube type wire ears, please crimp them to the twisted wire. The shape and size requirements are shown in the following figure:



4.2.6 Usage of XF-E16X and LFC3-AP

4.2.6.1 Process data mapping (PDO)

Name	Туре	Explanation
XF_E16X	Stuct	16 channels input module
CH0_X0	BOOL	Channel 0 input value
CH1_X1	BOOL	Channel 1 input value
CH2_X2	BOOL	Channel 2 input value
CH3_X3	BOOL	Channel 3 input value
CH4_X4	BOOL	Channel 4 input value
CH5_X5	BOOL	Channel 5 input value
CH6_X6	BOOL	Channel 6 input value
CH7_X7	BOOL	Channel 7 input value
CH8_X10	BOOL	Channel 8 input value
CH9_X11	BOOL	Channel 9 input value
CH10_X12	BOOL	Channel 10 input value
CH11_X13	BOOL	Channel 11 input value
CH12_X14	BOOL	Channel 12 input value
CH13_X15	BOOL	Channel 13 input value
CH14_X16	BOOL	Channel 14 input value
CH15_X17	BOOL	Channel 15 input value

Variable name	Туре	Notes
Channel 0 input filtering time	BYTE	
Channel 1 input filtering time	BYTE	
Channel 2 input filtering time	BYTE	
Channel 3 input filtering time	BYTE	0: No filtering 11: 9ms
Channel 4 input filtering time	BYTE	1: 0.25ms 12: 10ms
Channel 5 input filtering time	BYTE	2: 0.5ms 13: 11ms
Channel 6 input filtering time	BYTE	3: 1ms (Default) 14: 12ms
Channel 7 input filtering time	BYTE	4: 2ms 15: 13ms
Channel 8 input filtering time	BYTE	5: 3ms 16: 14ms 6: 4ms 17: 15ms
Channel 9 input filtering time	BYTE	7: 5ms 18: 20ms
Channel 10 input filtering time	BYTE	8: 6ms 19: 30ms
Channel 11 input filtering time	BYTE	9: 7ms 20: 64ms
Channel 12 input filtering time	BYTE	10: 8ms 21: 128ms
Channel 13 input filtering time	BYTE	
Channel 14 input filtering time	BYTE	
Channel 15 input filtering time	BYTE	
Channel 0-7 logic level configuration	BYTE	0: Positive logic (default). 1: Negative logic
Channel 8-15 logic level configuration	BYTE	(bit8~bit15corresponds to channels 0~/

4.2.6.2 Module configuration parameters (SDO)

■ Channel input filtering time

"Filtering time" corresponds to a separate filtering parameter for each channel, and double-click the parameter name to configure the corresponding value.

-	-	-
T	TO Warding	COF-Online

lex:SubIndex	Name	Flag	Value	Communication error message
#x8001:00	Configuration Of 16X	rw	>18<	
-15	Channel O input filtering time	rw		Communication not established
-16	Channel 1 input filtering time	rw		Communication not established
-17	Channel 2 input filtering time	rw		Communication not established
-18	Channel 3 input filtering time	rw		Communication not established
-19	Channel 4 input filtering time	rw		Communication not established
-1A	Channel 5 input filtering time	rw		Communication not established
-1B	Channel 6 input filtering time	rw		Communication not established
-1C	Channel 7 input filtering time	rw		Communication not established
—1D	Channel 8 input filtering time	rw		Communication not established
-1E	Channel 9 input filtering time	rw		Communication not established
-1F	Channel 10 input filtering time	rw		Communication not established
-20	Channel 11 input filtering time	rw		Communication not established
-21	Channel 12 input filtering time	rw		Communication not established
-22	Channel 13 input filtering time	rw		Communication not established
-23	Channel 14 input filtering time	rw		Communication not established
-24	Channel 15 input filtering time	rw		Communication not established
-25	Channel 0-7 logic level configuration	rw		Communication not established
L_26	Channel 8-15 logic level configuration	rw		Communication not established
#x9000:00	Information of 16X	ro	>17<	
	R C L CONON		10/	

Parameter definition	When there is a signal at the input terminal and the signal duration exceeds the
	filtering time, it is considered as a valid signal
Settable parameters	Configure the corresponding index objects in COE-Online, startup parameters, or
	SDO read and write instructions: unfiltered, 0.25ms, 0.5ms, 1ms, 2ms, 3ms, 4ms,
	5ms, 6ms, 7ms, 8ms, 9ms, 10ms, 11ms, 12ms, 13ms, 14ms, 15ms, 20ms, 30ms,
	64ms, 128ms
Default parameters	1ms

■ Channel logic level

"Logic level configuration" each channel corresponds to a separate logic level, and double-click on the parameter name to configure the corresponding value.

Advanced opt	ions			
Index:SubIndex	Name	Flag	Value	Communication error message
⊒-# x8001∶00	Configuration Of 16X	rw	>18<	
-15	Channel O input filtering time	rw		Communication not established
-16	Channel 1 input filtering time	rw		Communication not established
-17	Channel 2 input filtering time	rw		Communication not established
-18	Channel 3 input filtering time	rw		Communication not established
-19	Channel 4 input filtering time	rw		Communication not established
-1A	Channel 5 input filtering time	rw		Communication not established
—1B	Channel 6 input filtering time	rw		Communication not established
-1C	Channel 7 input filtering time	rw		Communication not established
—1D	Channel 8 input filtering time	rw		Communication not established
-1E	Channel 9 input filtering time	rw		Communication not established
—1F	Channel 10 input filtering time	rw		Communication not established
-20	Channel 11 input filtering time	rw		Communication not established
-21	Channel 12 input filtering time	rw		Communication not established
-22	Channel 13 input filtering time	rw		Communication not established
-23	Channel 14 input filtering time	rw		Communication not established
-24	Channel 15 input filtering time	rw		Communication not established
-25	Channel 0-7 logic level configuration	rw		Communication not established
-26	Channel 8-15 logic level configuration	rw		Communication not established
+-#x9000:00	Information of 16X	ro	>17<	
±−#x9001:00	ErrorCode of 8X8Y	ro	>2<	

	Program execution logic after external signal input						
	External input	Logic level	Running	Operation			
Parameter definition	signal	configuration	programs	result			
	X0=1	Positive logic	LD X0.	Y0=1			
	X0=1	Negative logic	OUT Y0.	Y0=0			
	X0=0	Positive logic		Y0=0			
	X0=0	Negative logic		Y0=1			
Sattable nonomatons	Configure the corresponding index objects in COE-Online or startup parameters:						
Settable parameters	positive logic (default), negative logic.						

4.2.7 Usage of XF-E16X and LFP3-AP

4.2.7.1 Process data mapping

In the device view, the mapping address of module process data can be viewed, with case mapping addresses ranging from I2.0-I3.7.

项目22 › 未分组的设备 › Ifp3-ap_2 [LFP3-AP]							_	_ 7	×
					2 招	计视图	▲ 网络视图	₩ 设备视图	9
👬 [fp3-ap_2 [LFP3-AP] 💌 🔛 🔛 🛃 🛄 🔍 生	3	设备概览						2	
A	^	₩ 模块	机架	插槽	1地址	Q地址	类型	订货号	
232		✓ Ifp3-ap_2	0	0			LFP3-AP	LFP3-AP	^
193	=	LEP3-AP Profinet Device	0	0 X1	<u> </u>		LFP3-AP		
		XF-E16X(16I 24Vdc)数字	0	1	23		XF-E16X(16I 24Vdc	XF-E16X	
		XF-E16Y(16O 24Vdc)数字	0	2		23	XF-E16Y(160 24Vd	XF-E16Y	
		XF-E4AD (4AI 0-5v,0-10v,±	0	3	6883		XF-E4AD (4AI 0-5v,	XF_E4AD	
		XF-E4DA (4AO 0-5v,0-10v,±	0	4		6479	XF-E4DA (4AO 0-5	XF-E4DA	=
DP-NORM			0	5					
			0	6					
			0	7					
	1		0	8					
			0	9					
	1		0	10					
	8		0	11					
			0	12					
			0	13					
			0	14					

Name	Туре	Explanation
XF_E16X	Stuct	16 channels input module
I2.0	BOOL	Channel 0 input value
I2.1	BOOL	Channel 1 input value
I2.2	BOOL	Channel 2 input value
I2.3	BOOL	Channel 3 input value
I2.4	BOOL	Channel 4 input value
I2.5	BOOL	Channel 5 input value
I2.6	BOOL	Channel 6 input value
I2.7	BOOL	Channel 7 input value
I3.0	BOOL	Channel 8 input value
I3.1	BOOL	Channel 9 input value
I3.2	BOOL	Channel 10 input value
13.3	BOOL	Channel 11 input value
I3.4	BOOL	Channel 12 input value
I3.5	BOOL	Channel 13 input value
13.6	BOOL	Channel 14 input value
I3.7	BOOL	Channel 15 input value

Name	Туре	Explanation
XF_E16X	Stuct	16 channels input module

4.2.7.2 Module configuration parameters

项目4 > 未分组的设备	LFP3-AP [LFP3-AP]								_∎≡×
						2	拓扑视图	晶 网络视图	11 设备视图
LFP3-AP [LFP3-AP]	▼ 🖽 🕎 🖌 🖽 🗰 🖲	🛨 🖪 🗍	设备概览						
		^	₩ 模块	机架	插槽	1地址	Q地址	类型	订货号
			✓ LFP3-AP	0	0			LFP3-AP	LFP3-AP
	8	-	LFP3-AP Profinet Device	0	0 X1			LFP3-AP	
193	хт.		 XF-E16X(16I 24Vdc)数字 	0	1	23		XF-E16X(16I 24Vdc	XF-E16X
\$			XF-E16Y(160 24Vdc)数字	0	2		23	XF-E16Y(160 24Vd	XF-E16Y
			XF-E4AD (4AI 0-5v,0-10v,±	0	3	6889		XF-E4AD (4AI 0-5v,	XF_E4AD
			XF-E4DA (4AO 0-5v,0-10v,±	0	4	9095	6479	XF-E4DA (4AO 0-5	XF-E4DA
				0	5				
-	DP-NORM			0	6				
-				0	7				
				0	8	G			
				0	9	(2	9		
」 常現 10 受重 ▼ 常规 目录信息	糸筑常数 文本 模块配置参数								
▼ 模块参数 订货号:XF-E16X	Channel_0	4							
固件版本	通道0输入滤波时间(ms):	3: 1ms							
软件版本 模块ID:0x00280	通道0逻辑电平配置:	0:正逻辑							
模块信息 【模块配置参数】 (3)	Channel_1								
模块故障	通道1输入滤波时间(ms):	3: 1ms							•
Titat on	通道1逻辑电平配置:	0:正逻辑							•
	Channel_2								
	通道2输入滤波时间(ms):	3: 1ms							-
	诵道2逻辑电平配罟:	0:正逻辑							
<	TINE YEAR OF HALL.	- ac/c/4							

• Channel input filtering time

"Filtering time" corresponds to a separate filtering parameter for each channel, and the setting method is to select the parameter from the drop-down menu.

Demonstern 1. Conition	When there is a signal at the input terminal and the signal duration exceeds the
Parameter definition	filtering time, it is considered as an effective signal
Sattable nonomatons	0ms, 0.25ms, 0.5ms, 1ms, 2ms, 3ms, 4ms, 5ms, 6ms, 7ms, 8ms, 9ms, 10ms, 11ms,
Settable parameters	12ms, 13ms, 14ms, 15ms, 20ms, 30ms, 64ms, 128ms
Default parameters	1ms

■ Channel logic level

"Logic level configuration"Each channel corresponds to a separate logic level configuration. The setting method is to select parameters from the drop-down menu.

	Program execution logic after external signal input						
	External input	Logic level	Running	Operation			
	signal	configuration	programs	result			
Parameter definition	X0=1	Positive logic	LD X0.	Y0=1			
	X0=1	Negative logic	OUT Y0.	Y0=0			
	X0=0	Positive logic		Y0=0			
	X0=0	Negative logic		Y0=1			

	Program execution logic after external signal input						
Parameter definition	External input	Logic level	Running	Operation			
	signal	configuration	programs	result			
	X0=1	Positive logic	LD X0.	Y0=1			
	X0=1	Negative logic	OUT Y0.	Y0=0			
	X0=0	Positive logic		Y0=0			
	X0=0	Negative logic		Y0=1			
C	The following table pulling method reflects the adjustable parameters: positive logic,						
Settable parameters	negative logic						

4.3 Digital output unit XF-E16(P)YT

4.3.1 Overview

XF-E16(P)YT series digital output expansion module, which has 16 channels of digital output, compatible with XF, XSF series CPU unit products and LF series communication coupler units.

- 16 channel digital output.
- NPN, PNP output .
- Designed with a width of 12mm.
- Model list

Мос	lel	Eurotion	
NPN output	PNP output	Function	
XF-E16YT	XF-E16PYT	16 channels transistor output	

Module version

Model	Hardware	Firmware	Function
XF-E16YT	H2.0	V2.0	First official production of basic
			functions
XF-E16PYT	H2.0	V2.0	First official production of basic
			functions

4.3.2 Module view

1) Description of each section



No.	Name	No.	Name
1	System LED indicator lights	2	Channel LED indicator light
3	Detachable terminal block	4	Snap

No.	Name	No.	Name
5	Model indication	6	Color identification indicating module type
$\overline{7}$	Module hardware and firmware versions	8	Wiring diagram

2) System indicator

System indicator	Explanation		
	Extinguish	Module not powered on	
	Always ON	All external power supplies of the module are normal (backplane	
PWR(Green)		bus power supply&external input 24V)	
	Flash1Hz ^{*1}	Abnormal power supply in the module and inability to operate	
		normally	
	Always ON	The module is running normally	
	Flash1Hz ^{*1}	General errors in module logs	
RUN(Green)	Extinguish	Important errors in module logs	
	Flash10Hz ^{*2}	Module establishing communication	
	Double flashing ^{*3}	Module firmware update	



- *1: A square wave with a duty cycle of 50% and a frequency of 1Hz.
- *2: A square wave with a duty cycle of 50% and a frequency of 10Hz.
- *3: As shown in the following figure:



3) Channel indicator light

Model	Channel indicator light			
XF-E16(P)YT	Y0-Y17	Always ON(Green)	Corresponding input channel has input ON signal	
		OFF	Corresponding input channel has no input ON signal	

4) Color identification

No.	C	Color	Module type
1		Grey white	Digital input
2		Gray	Digital output&digital mixed module
3		Light blue	Analog input
4		Deep blue	Analog output
5		Green	RS232&485 serial port communication
6		Pink	Temperature signal input
7		White	High speed counting

4.3.3 General specification

General specification			
Project		Specifications	
Operating temperature	Maximum temperature	55°C	
Operating temperature	Minimum temperature	-20°C	
Transportation/Storage	Maximum temperature	70°C	
Temperature	Minimum temperature	-40°C	
Environmental humidity	Upper limit	95%	
operation/storage)	Lower limit	10%	
IP level		IP20	
Anti vibration		Compliant with IEC61131-2 Under intermittent vibration (frequency 5-9Hz, constant amplitude 3.5mm peak displacement) and (frequency 9-150Hz, constant acceleration 1.0g peak acceleration) Under continuous intermittent vibration (frequency 5-9Hz half amplitude 1.75mm displacement) and (frequency 9-150Hz constant acceleration 0.5g constant frame amplitude) Scan 10 times in X, Y, and Z directions	
Impact resistance		Complies with IEC61131-2 standard The impact strength is 15G (peak) and the duration is 11ms. It is applied to three mutually perpendicular axes, and each axis is impacted 3 times (a total of 18 impacts)	
Using environment		Non corrosive gas	
Using altitude		0-2000m	
Overvoltage level		II: Compliant with IEC61131-2	
Pollution level		2: Compliant with IEC61131-2	
Anti interference EMC		Compliant with IEC 61131-2 IEC61000-6-4 Type B	
Related certifications		СЕ	

4.3.4 Technical specifications

Project	Specifications		
Model	XF-E16YT	XF-E16PYT	
Output	16		
Rated load voltage	DC24V(DC21.6V~26.4V)		
Maximum load current	0.5A/1 point, 4A/module		
Surge current protection	Support		
Leakage current when OFF	Below 0.1mA		
Maximum voltage drop during ON	0.5V~1V		
Output $ON \rightarrow OFF$ response time	0.1mg		
(hardware)	0.11115		
Output OFF \rightarrow ON response time	0.1ms		
(hardware)			
Output derating	Reduce the rating by 50% when operating at 55 °C (while the output		
	current of ON does not exceed 2	A), or reduce the rating by 10°C	
	when the output point is fully ON		
Common end method	16 points 1 common terminal		
Output protection	Supports short circuit and overload protection functions		
Module power consumption	1.0W (backplane bus)+0.8W (external input)		
Module weight	80g		
Insulation resistor	1M		
Insulation voltage	AC510V		

4.3.5 Installation&Wiring

4.3.5.1 Dimension

(Unit: mm)



4.3.5.2 Terminal definition&Wiring

XF-E16(P)YT				
Meaning	A-column terminal	Terminal layout	B-column terminal	Meaning
CH0	0		0	CH8
CH1	1		1	CH9
CH2	2		2	CH10
CH3	3	3	3	CH11
CH4	4	4	4	CH12
CH5	5		5	CH13
CH6	6		6	CH14
CH7	7		7	CH15
24V+	8	•	8	0V





(2) Channel LED



(4) Output Channel & Wiring

■ XF-E16PYT



① System indicator ② Channel indicator light

③ Backplane bus

(4) Output Channel & Wiring

4.3.5.3 Installation method

1) Installation requirements

The module is installed using DIN rails, which must comply with the IEC 60715 standard (35mm wide, 1mm thick), the size information is shown in the following figure, the unit is (mm).



2) Installation steps



The assembly between IO modules is installed by sliding through the top and bottom guide rails of the modules, as shown in the left figure:



The module is installed on the guide rail, and during installation, align the module with the DIN rail and press the module in the direction indicated by the arrow, after installation, there is a noticeable snap sound, as shown in the left image:



After the module installation is completed, the locking buckle will automatically move downwards for locking, if the latch does not move downwards, press down on the top of the latch, ensure proper installation.

3) Disassembly steps



Use a flat screwdriver or similar tool to pry the rail lock upwards, as shown in the left figure:



Pull the module straight forward at the buckle position (raised part), after completion, press down on the top of the latch, as shown in the left image:

4.3.5.4 Installation environment

This product can be installed in four positions (i.e. installation direction): horizontal, vertical, top of cabinet, and bottom of cabinet, it is recommended to install in a horizontal direction, and the heat dissipation design should be through natural convection, to ensure normal ventilation and heat dissipation, and to reserve sufficient wiring space, the minimum gap must be left around this product, as shown in the following figure:



If there are high-temperature heat source equipment (heaters, transformers, large resistors, etc.) around this product, leave at least 100mm gap between the equipment and the high-temperature heat source.

4.3.5.5 Equipment wiring

Adaptor diameter		
National standard/mm ²	American standard/AWG	
0.3	22	
0.5	20	
0.75	18	
1.0	18	
1.5	16	

When wiring the module, its terminal must meet the following requirements:

If using other tube type wire ears, please crimp them to the twisted wire. The shape and size requirements are shown in the following figure:



4.3.6 Usage of XF-E16Y and LFC3-AP

4.3.6.1 Process data mapping (PDO)

Name	Туре	Explanation
XF_E16(P)YT	Stuct	16 channel output module
—— СН0	BOOL	Channel 0 output value
CH1	BOOL	Channel 1 output value
CH2	BOOL	Channel 2 output value
CH3	BOOL	Channel 3 output value
CH4	BOOL	Channel 4 output value
CH5	BOOL	Channel 5 output value
СН6	BOOL	Channel 6 output value
CH7	BOOL	Channel 7 output value
CH8	BOOL	Channel 8 output value
——— СН9	BOOL	Channel 9 output value
CH10	BOOL	Channel 10 output value
CH11	BOOL	Channel 11 output value
CH12	BOOL	Channel 12 output value
CH13	BOOL	Channel 13 output value
CH14	BOOL	Channel 14 output value
CH15	BOOL	Channel 15 output value
ErrCode_module	WORD	Module level error code
ErrCode_CH	DWORD	Channel level error code

Error code parameters

Module level error code (ErrCode_module)			
Bit	Meaning	Error level	
0	The 24V input power supply of the module is	Important	
	abnormal		
2	An internal module error has occurred and the	Important	
	user layer is unable to repair it		
---	-----------------------------------	-----------	
3	Version mismatch	Important	



Channel level error code reserved, currently undefined.

4.3.6.2 Module configuration parameters (SDO)

Byte sequence number	Туре	Note
Channel 0 output status in case of abnormality	BYTE	
Channel 1 output status in case of abnormality	BYTE	
Channel 2 output status in case of abnormality	BYTE	
Channel 3 output status in case of abnormality	BYTE	
Channel 4 output status in case of abnormality	BYTE	
Channel 5 output status in case of abnormality	BYTE	
Channel 6 output status in case of abnormality	BYTE	
Channel 7 output status in case of abnormality	BYTE	0: Output replacement value OFF (default)
Channel 8 output status in case of abnormality	BYTE	 Cutput replacement value ON
Channel 9 output status in case of abnormality	BYTE	
Channel 10 output status in case of abnormality	BYTE	
Channel 11 output status in case of abnormality	BYTE	
Channel 12 output status in case of abnormality	BYTE	
Channel 13 output status in case of abnormality	BYTE	
Channel 14 output status in case of abnormality	BYTE	
Channel 15 output status in case of abnormality	BYTE	
Channel 0-7 logic level configuration	BYTE	0: Positive logic (default). 1: Negative logic

Channel 8-15 logic level configuration	BYTE	Bit0~bit7 corresponds to channels 0~7 (bit8~bit15corresponds to channels 8~15)

■ Abnormal/STOP output status

"Abnormal/STOP output status" Each channel corresponds to a separate parameter, and double-click on the parameter name to configure the corresponding value.

	(1.80) e	T Second	T Screek	Tooy IN VS
Index:SubIndex	Name	Flag	Value	Communication error message
]−#x8011:00	Configuration Of 16y	rw	>18<	
-15	Output status when channel O is abnormal	rw		Communication not established
-16	Output status when channel 1 is abnormal	rw		Communication not established
-17	Output status when channel 2 is abnormal	rw		Communication not established
-18	Output status when channel 3 is abnormal	rw		Communication not established
-19	Output status when channel 4 is abnormal	rw		Communication not established
-1A	Output status when channel 5 is abnormal	rw		Communication not established
-1B	Output status when channel 6 is abnormal	rw		Communication not established
-1C	Output status when channel 7 is abnormal	rw		Communication not established
—1D	Output status when channel 8 is abnormal	rw		Communication not established
-1E	Output status when channel 9 is abnormal	rw		Communication not established
—1F	Output status when channel 10 is abnormal	rw		Communication not established
-20	Output status when channel 11 is abnormal	rw		Communication not established
-21	Output status when channel 12 is abnormal	rw		Communication not established
-22	Output status when channel 13 is abnormal	rw		Communication not established
-23	Output status when channel 14 is abnormal	rw		Communication not established
-24	Output status when channel 15 is abnormal	rw		Communication not established
-25	Channel 0-7 logic level configuration	rw		Communication not established
-26	Channel 8-15 logic level configuration	rw		Communication not established
-#x9010:00	Information of 16y	ro	>17<	
#-#x9011:00	ErrorCode of 8X8Y	ro	>2<	

	Configure the corresponding index objects in COE-Online, startup parameters, or			
Parameter definition	SDO read and write instructions: "Output replacement value OFF", "Keep previous			
	value", "Output replacement value ON"			
	Output	When the PLC is in STOP mode, the output terminal is in a		
	replacement	reset state (physical terminal, regardless of channel logic level)		
	value OFF			
	Keep previous value	When the PLC is in abnormal/STOP mode, the output terminal		
Settable parameters		outputs the last state of the PLC from RUN to STOP (physical		
		terminal, regardless of channel logic level).		
	Output	When the PLC is in abnormal/STOP mode, the output terminal		
	replacement	is in the set state (physical terminal, regardless of channel logic		
	value ON	level).		
Default parameters	Output replacement value OFF			

■ Channel logic level

"Logic level configuration" each channel corresponds to a separate logic level, and double-click on the parameter name to configure the corresponding value.

avanced opt	ions			
Index : SubIndex -#x8011 : 00	Name Configuration Of 16y	Flag rw	Value >18<	Communication error message
-15	Output status when channel O is abnormal	rw		Communication not established
-16	Output status when channel 1 is abnormal	rw		Communication not established
-17	Output status when channel 2 is abnormal	rw		Communication not established
-18	Output status when channel 3 is abnormal	rw		Communication not established
-19	Output status when channel 4 is abnormal	rw		Communication not established
-1A	Output status when channel 5 is abnormal	rw		Communication not established
-1B	Output status when channel 6 is abnormal	rw		Communication not established
-1C	Output status when channel 7 is abnormal	rw		Communication not established
-1D	Output status when channel 8 is abnormal	rw		Communication not established
-1E	Output status when channel 9 is abnormal	rw		Communication not established
-1F	Output status when channel 10 is abnormal	rw		Communication not established
-20	Output status when channel 11 is abnormal	rw		Communication not established
-21	Output status when channel 12 is abnormal	rw		Communication not established
-22	Output status when channel 13 is abnormal	rw		Communication not established
-23	Output status when channel 14 is abnormal	rw		Communication not established
-24	Output status when channel 15 is abnormal	rw		Communication not established
-25	Channel 0-7 logic level configuration	rw		Communication not established
-26	Channel 8-15 logic level configuration	rw		Communication not established
<mark>}−#</mark> x9010:00	Information of 16y	ro	>17<	
++x9011:00	ErrorCode of 8X8Y	ro	>2<	

Denometer definition	Configure the corresponding index objects in COE-Online, startup parameters, or				
Parameter definition	SDO read and write instructions: positive logic, negative logic				
	The program execution logic after external signal input.				
	Logic level	Running	Operation result		
	configuration	programs			
Settable parameters	Positive logic	SET Y0.	Y0 set to ON		
	Negative logic		Y0 set to OFF		
	Positive logic	RST Y0.	Y0 set to OFF		
	Negative logic		Y0 set to ON		
	Configure the co	rresponding ind	ex objects in COE-O	nline, startup parameters, or	
Default parameters	SDO read and write instructions: positive logic (default), negative logic.				

4.3.7 Usage of XF-E16(P)YT and LFP3-AP

4.3.7.1 Process data mapping

In the device view, the mapping address of module process data can be viewed, with case mapping addresses ranging from Q2.0 to Q3.7.

项目22 → 未分组的设备 → Ifp3-ap_2 [LFP3-AP]						_ 7	■×
				- 拓扑视图	👗 网络视图	🛯 设备视图	8
👬 [fp3-ap_2 [LFP3-AP] 💌 📰 🔣 🔚 💷 🔍 🛨	□ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □				Ļ		
	▲ ₩ 模块	机架	插槽 1地	址 Q地址	类型	订货号	1
282	✓ Ifp3-ap_2	0	0		LFP3-AP	LFP3-AP	^
102	LFP3-AP Profi	net Device 0	0 X1		LFP3-AP		
	XF-E16X(16I 24V	dc)教字 0	1 2	3	XF-E16X(16I 24Vdc	. XF-E16X	
	XF-E16Y(160 24	Vdc)数字 0	2	23	XF-E16Y(16O 24Vd	. XF-E16Y	
	XF-E4AD (4AI 0-5	v,0-10v,± 0	3 68	83	XF-E4AD (4AI 0-5v,	XF_E4AD	
	XF-E4DA (4AO 0-	5v,0-10v,± 0	4	6479	XF-E4DA (4AO 0-5	XF-E4DA	=
DP-NORM		0	5				
		0	6				
		0	7				
		0	8				
	-	0	9				
		0	10				
		0	11				
		0	12				
		0	13				
		0	14				

Name	Туре	Explanation
XF_E16(P)YT	Stuct	16 channels output module
Q2.0	BOOL	Channel 0 output value
Q2.1	BOOL	Channel 1 output value
Q2.2	BOOL	Channel 2 output value
Q2.3	BOOL	Channel 3 output value
Q2.4	BOOL	Channel 4 output value
Q2.5	BOOL	Channel 5 output value
Q2.6	BOOL	Channel 6 output value
Q2.7	BOOL	Channel 7 output value
Q3.0	BOOL	Channel 8 output value
Q3.1	BOOL	Channel 9 output value
Q3.2	BOOL	Channel 10 output value
Q3.3	BOOL	Channel 11 output value
Q3.4	BOOL	Channel 12 output value
Q3.5	BOOL	Channel 13 output value
Q3.6	BOOL	Channel 14 output value
Q3.7	BOOL	Channel 15 output value

Name	Туре	Explanation
XF_E16(P)YT	Stuct	16 channels output module

4.3.7.2 Module configuration parameters



■ Abnormal/STOP output status

"Abnormal/STOP output status" each channel corresponds to a separate parameter, which can be set by selecting the parameter from the drop-down menu.

Parameter	The following table	e pulling method reflects the adjustable parameters: "Output				
definition	replacement value OFF", "Keep previous value", "Output replacement value ON"					
	Output replacement	When the PLC is in STOP mode, the output terminal is in a reset				
	value OFF	state (physical terminal, regardless of channel logic level).				
	Keep previous	When the PLC is in abnormal/STOP mode, the output terminal				
Sattable nonenations	value	outputs the last state of the PLC from RUN to STOP (physical				
Settable parameters		terminal, regardless of channel logic level).				
	Output replacement	When the PLC is in abnormal/STOP mode, the output terminal is				
	value ON	in the set state (physical terminal, regardless of channel logic				
		level).				
Default parameters	Output replacement v	ralue OFF				

■ Channel logic level

"Logic level configuration"Each channel corresponds to a separate logic level configuration. The setting method is to select parameters from the drop-down menu.

Parameter	The following table pulling method reflects the adjustable parameters: positive logic,				
definition	negative logic				
	The program execution logic after external signal input.				
	Logic level configuration	Running programs	Operation result		
	Positive logic	SET Y0.	Y0 set to ON		
Settable parameters	Negative logic		Y0 set to OFF		
	Positive logic	RST Y0.	Y0 set to OFF		
	Negative logic		Y0 set to ON		
D A 1	The following table pulling method reflects the adjustable parameters: positive logic.				
Default parameters	negative logic	2			

4.4 Digital input output hybrid unit XF-E8NX8YT

4.4.1 Overview

XF-E8NX8YT series digital input output hybrid expansion module, which has 8 channels of digital input and supports NPN input. 8-channel digital output, supporting NPN output, compatible with XF, XSF series CPU units and XF series communication coupler units.

- 8-channel digital input.
- NPN type input.
- 8-channel digital output.
- NPN type output.
- 12mm width design.

Module version

Hardware version	Firmware version	Function
H2.0	V2.0	Basic functions for the first official production

4.4.2 Module view

1) Description of each section



No.	Name	No.	Name
1	System LED indicator lights	2	Channel LED indicator light
3	Detachable terminal block	4	Snap
5	Model indication	6	Color identification indicating module type
7	Module hardware and firmware versions	8	Wiring diagram

2) System indicator

System indicator	Explanation			
	Extinguish	Module not powered on		
	Always ON	All external power supplies of the module are normal		
PWR(Green)		(backplane bus power supply&external input 24V)		
	Flash1Hz ^{*1}	Abnormal power supply in the module and inability to operate		
		normally		
Always ON		The module is running normally		
	Flash1Hz ^{*1}	General errors in module logs		
RUN(Green)	Extinguish	Important errors in module logs		
	Flash10Hz*2	Module establishing communication		
	Double flashing ^{*3}	Module firmware update		



*1: A square wave with a duty cycle of 50% and a frequency of 1Hz.

- *2: A square wave with a duty cycle of 50% and a frequency of 10Hz.
- *3: As shown in the following figure:



3) Channel indicator light

Model	Channel indicator light		
XF-E16X	X0-X7	Always ON (Green)	Corresponding input channel has input ON signal
Y 0- Y 7	Extinguish	Corresponding input channel has no input ON signal	

4) Color identification

No.	Color		Module type
1		Grey white	Digital input
2		Gray	Digital output&digital mixed module
3		Light blue	Analog input
4		Deep blue	Analog output
5		Green	RS232&485 serial port communication
6		Pink	Temperature signal input
7		White	High speed counting

4.4.3 General specification

General specification				
Project		Specifications		
	Maximum	55%		
Operating temperature	temperature			
Operating temperature	Minimum	20%C		
	temperature	-20 C		
	Maximum	70%C		
Transportation/Storage	temperature	/0.0		
Temperature	Minimum	-40°C		
	temperature			
Environmental humidity	Upper limit	95%		
(including	Lower limit	10%		
operation/storage)	Lower mint	1070		
IP level		IP20		
Anti vibration		Compliant with IEC61131-2		
		Under intermittent vibration (frequency 5-9Hz, constant		
		amplitude 3.5mm peak displacement) and (frequency 9-150Hz,		

General specification		
Project Specifications		
	constant acceleration 1.0g peak acceleration)	
	Under continuous intermittent vibration (frequency 5-9Hz half	
	amplitude 1.75mm displacement) and (frequency 9-150Hz	
	constant acceleration 0.5g constant frame amplitude)	
	Scan 10 times in X, Y, and Z directions	
	Complies with IEC61131-2 standard	
Turns at assistance	The impact strength is 15G (peak) and the duration is 11ms. It is	
impact resistance	applied to three mutually perpendicular axes, and each axis is	
	impacted 3 times (a total of 18 impacts)	
Using environment	Non corrosive gas	
Using altitude	0-2000m	
Overvoltage level	II: Compliant with IEC61131-2	
Pollution level	2: Compliant with IEC61131-2	
Anti interference EMC	Compliant with IEC 61131-2 IEC61000-6-4 Type B	
Related certifications	CE	

4.4.4 Technical specifications

	Project	Specifications	
Input channel		8	
	Input type	NPN	
	Rated input voltage	DC24V	
	Rated input current	6mA	
	Input impedance	5ΚΩ	
	Input ON voltage	15v	
	Input ON current	3mA	
Input	Input OFF voltage	5V	
specifications	Input OFF current	1mA	
		Reduce the rating by 50% when operating at 55°C (with	
	Input derating	no more than 4 input points on simultaneously), or by	
		10 °C when all input points are on	
	Input resistor $ON \rightarrow OFF$ response	2005	
	time (hardware)	2005	
	Input resistor OFF \rightarrow ON response	1000	
	time (hardware)	10003	
	Output channel	8	
	Output type	Transistor (NPN)	
Output	Rated load voltage	DC24V(DC21.6V~26.4V)	
specifications	Maximum load current	0.5A/1 point	
	Surge current protection	Support	
	Leakage current when OFF	Below 0.1mA	

	Project	Specifications
	Maximum voltage drop during ON	0.5A, 2A/module
		Reduce the rating by 50% when operating at 55°C (while
	Output derating	the output current of ON does not exceed 2A), or reduce
		the rating by 10°C when the output point is fully ON
	Input resistor $ON \rightarrow OFF$ response	100us
	time (hardware)	
	Input resistor OFF \rightarrow ON response	100us
	time (hardware)	
Module	Module power consumption	1W (backplane bus)+1.2W (external input)
specifications	Module weight	80g

4.4.5 Terminal definition&Wiring

4.4.5.1 Dimension

(Unit: mm)







4.4.5.2 Terminal definition&Wiring

1) Terminal definition

XF-E8NX8YT				
Meaning	A-column terminal	Terminal layout	B-column terminal	Meaning
CH0	0		0	CH8
CH1	1		1	CH9
CH2	2		2	CH10
CH3	3		3	CH11
CH4	4		4	CH12
CH5	5		5	CH13
CH6	6		6	CH14
CH7	7		7	CH15
24V+	8	•	8	0V

2) External wiring



①System indicator

②Channel LED

3 Backplane bus

④Input channels&wiring

g ⑤ Output channel&wiring

4.4.5.3 Installation method

1) Installation requirements

The module is installed using DIN rails, which must comply with the IEC 60715 standard (35mm wide, 1mm thick), the size information is shown in the following figure, in millimeters.



2) Installation steps



1. The assembly between IO modules is installed by sliding through the top and bottom guide rails of the modules, as shown in the left figure:

- 2. The module is installed on the guide rail. When installing, align the module with the DIN guide rail and press the module in the direction indicated by the arrow. After installation, there is a clear sound of engagement, as shown in the left figure:



Explanation: After the module installation is completed, the latch will automatically move downwards to lock. If the latch does not move downwards, press down on the top of the latch to ensure proper installation.

3) Disassembly steps



1. Use a flat screwdriver or similar tool to pry the rail lock upwards, as shown in the left figure:



2. Pull the module straight forward at the buckle position (raised part), and then press down on the top of the latch, as shown in the left figure:

4.4.5.4 Installation environment

This product can be installed in four positions (i.e. installation direction): horizontal, vertical, top of cabinet, and bottom of cabinet. It is recommended to install in the horizontal direction, and the heat dissipation design is through natural convection. To ensure normal ventilation and heat dissipation and reserve sufficient wiring space, the minimum gap must be left around this product, as shown in the following figure:



0

If there are high-temperature heat source equipment (heaters, transformers, large resistors, etc.) around this product, leave at least 100mm gap between the equipment and the high-temperature heat source.

4.4.5.5 Equipment wiring

Adaptor diameter			
National standard/mm ²	American standard/AWG		
0.3	22		
0.5	20		
0.75	18		
1.0	18		
1.5	16		

When wiring the module, its terminal must meet the following requirements:

If using other tube type wire ears, please crimp them to the twisted wire. The shape and size requirements are shown in the following figure:



4.4.6 Usage of XF-E8NX8YT and LFC3-AP

4.4.6.1 Process data mapping (PDO)

Name	Туре	Explanation
XF_E8X8Y	Stuct	8-channel input and 8-channel output module
CH8_Y0	BOOL	Channel 8 output value
——— СН9_Ү1	BOOL	Channel 9 output value
CH10_Y2	BOOL	Channel 10 output value
CH11_Y3	BOOL	Channel 11 output value
CH12_Y4	BOOL	Channel 12 output value
CH13_Y5	BOOL	Channel 13 output value
CH14_Y6	BOOL	Channel 14 output value
CH15_Y7	BOOL	Channel 15 output value
——— СН0_Х0	BOOL	Channel 0 input value
CH1_X1	BOOL	Channel 1 input value
CH2_X2	BOOL	Channel 2 input value
CH3_X3	BOOL	Channel 3 input value
CH4_X4	BOOL	Channel 4 input value
CH5_X5	BOOL	Channel 5 input value
CH6_X6	BOOL	Channel 6 input value
CH7_X7	BOOL	Channel 7 input value

4.4.6.2 Module configuration parameters ((SDO)	
---	-------	--

Byte sequence number	Туре	Note
Channel 0 input filtering time	BYTE	0: No filtering 11: 9ms
Channel 1 input filtering time	BYTE	1: 0.25ms 12: 10ms
Channel 2 input filtering time	BYTE	2: 0.5ms 13: 11ms 3: 1ms (Default) 14: 12ms
Channel 3 input filtering time	BYTE	4: 2ms 15: 13ms
Channel 4 input filtering time	BYTE	5: 3ms 16: 14ms 6: 4ms 17: 15ms
Channel 5 input filtering time	BYTE	7: 5ms 18: 20ms
Channel 6 input filtering time	BYTE	8: 6ms 19: 30ms 9: 7ms 20: 64ms
Channel 7 input filtering time	BYTE	10: 8ms 21: 128ms
Channel 8 output status in case of abnormality	BYTE	
Channel 9 output status in case of abnormality	BYTE	
Channel 10 output status in case of abnormality	BYTE	
Channel 11 output status in case of abnormality	BYTE	0: Output replacement value OFF (default)
Channel 12 output status in case of abnormality	BYTE	2: Output replacement value ON
Channel 13 output status in case of abnormality	BYTE	
Channel 14 output status in case of abnormality	BYTE	
Channel 15 output status in case of abnormality	BYTE	
Channel 0-7 logic level configuration	BYTE	0: Positive logic (default). 1: Negative logic
Channel 8-15 logic level configuration	BYTE	(bit8~bit15corresponds to channels 0~7)

• Channel input filtering time

"Filtering time" corresponds to a separate filtering parameter for each channel, and double-click the parameter name to configure the corresponding value.

and the second second second	ons			
ndex:SubIndex	Name	Flag	Value	Communication error message
-#x8011:00	Configuration Of 8X8Y	rw	>18<	
-15	Channel 0 input filtering time	rw		Communication not established
-16	Channel 1 input filtering time	rw		Communication not established
-17	Channel 2 input filtering time	rw		Communication not established
-18	Channel 3 input filtering time	rw		Communication not established
-19	Channel 4 input filtering time	rw		Communication not established
—1A	Channel 5 input filtering time	rw		Communication not established
-1B	Channel 6 input filtering time	rw		Communication not established
-1C	Channel 7 input filtering time	rw		Communication not established
-1D	Output status when channel 8 is abnormal	rw		Communication not established
—1E	Output status when channel 9 is abnormal	rw		Communication not established
—1F	Output status when channel 10 is abnormal	rw		Communication not established
-20	Output status when channel 11 is abnormal	rw		Communication not established
-21	Output status when channel 12 is abnormal	rw		Communication not established
-22	Output status when channel 13 is abnormal	rw		Communication not established
-23	Output status when channel 14 is abnormal	rw		Communication not established
-24	Output status when channel 15 is abnormal	rw		Communication not established
-25	Channel 0-7 logic level configuration	rw		Communication not established
-26	Channel 8-15 logic level configuration	rw		Communication not established

Parameter definition	When there is a signal at the input terminal and the signal duration exceeds the
	filtering time, it is considered as an effective signal
Settable parameters	Configure the corresponding index objects in COE-Online, startup parameters, or
	SDO read and write instructions: unfiltered, 0.25ms, 0.5ms, 1ms, 2ms, 3ms, 4ms,
	5ms, 6ms, 7ms, 8ms, 9ms, 10ms, 11ms, 12ms, 13ms, 14ms, 15ms, 20ms, 30ms,
	64ms, 128ms
Default parameters	1ms

Abnormal/STOP output status

"Abnormal/STOP output status"Each channel corresponds to a separate parameter, and double-click on the

parameter name to configure the corresponding value.

Launch param	neters IO Mapping COE-Online			
Advanced	options			
Index:SubIr	ndex Name	Flag	Value	Communication error message
=-#x8011:00	D Configuration Of 8X8Y	rw	>18<	
-15	Channel O input filtering time	rw		Communication not established
-16	Channel 1 input filtering time	rw		Communication not established
-17	Channel 2 input filtering time	rw		Communication not established
-18	Channel 3 input filtering time	rw		Communication not established
-19	Channel 4 input filtering time	rw		Communication not established
—1A	Channel 5 input filtering time	rw		Communication not established
-1B	Channel 6 input filtering time	rw		Communication not established
-1C	Channel 7 input filtering time	rw		Communication not established
-1D	Output status when channel 8 is abnormal	rw		Communication not established
-1E	Output status when channel 9 is abnormal	rw		Communication not established
-1F	Output status when channel 10 is abnormal	rw		Communication not established
-20	Output status when channel 11 is abnormal	rw		Communication not established
-21	Output status when channel 12 is abnormal	rw		Communication not established
-22	Output status when channel 13 is abnormal	rw		Communication not established
-23	Output status when channel 14 is abnormal	rw		Communication not established
-24	Output status when channel 15 is abnormal	rw		Communication not established
-25	Channel 0-7 logic level configuration	rw		Communication not established
-26	Channel 8-15 logic level configuration	rw		Communication not established

	Configure the corresponding index objects in COE-Online, startup parameters, or SDO					
Parameter definition	read and write instructions: "Output replacement value OFF", "Keep previous value",					
	"Output replacement v	alue ON"				
	Output replacement	When the PLC is in STOP mode, the output terminal is in a reset				
	value OFF	state (physical terminal, regardless of channel logic level)				
		When the PLC is in abnormal/STOP mode, the output terminal				
Cattable nonenations	Keep previous value	outputs the last state of the PLC from RUN to STOP (physical				
Settable parameters		terminal, regardless of channel logic level)				
	Output nonlocoment	When the PLC is in abnormal/STOP mode, the output terminal				
	Output replacement	is in the set state (physical terminal, regardless of channel logic				
	value ON	level)				
Default parameters	Output replacement value OFF					

Channel logic level

"Logic level configuration"Each channel corresponds to a separate logic level, and double-click on the parameter name to configure the corresponding value.

aunch parameter	s IO Mapping COE-Online			
Advanced opti	ons			
Index:SubIndex	Name	Flag	Value	Communication error message
⊒-# x8011∶00	Configuration Of 8X8Y	rw	>18<	
-15	Channel O input filtering time	rw		Communication not established
-16	Channel 1 input filtering time	rw		Communication not established
-17	Channel 2 input filtering time	rw		Communication not established
-18	Channel 3 input filtering time	rw		Communication not established
-19	Channel 4 input filtering time	rw		Communication not established
-1A	Channel 5 input filtering time	rw		Communication not established
-1B	Channel 6 input filtering time	rw		Communication not established
—1C	Channel 7 input filtering time	rw		Communication not established
-1D	Output status when channel 8 is abnormal	rw		Communication not established
-1E	Output status when channel 9 is abnormal	rw		Communication not established
-1F	Output status when channel 10 is abnormal	rw		Communication not established
-20	Output status when channel 11 is abnormal	rw		Communication not established
-21	Output status when channel 12 is abnormal	rw		Communication not established
-22	Output status when channel 13 is abnormal	rw		Communication not established
-23	Output status when channel 14 is abnormal	rw		Communication not established
-24	Output status when channel 15 is abnormal	rw		Communication not established
-25	Channel 0-7 logic level configuration	rw		Communication not established
-26	Channel 8-15 logic level configuration	rw		Communication not established

Demonster de Caritien	The following table pulling method reflects the adjustable parameters: positive logic,							
Parameter definition	negative logic							
	Program execution	on logic after external s	signal input					
Settable parameters	Logic level	Running programs	Operation result					
	configuration							
	Positive logic	SET Y0.	Y0 set to ON					
	Negative logic		Y0 set to OFF					
	Positive logic	RST Y0.	Y0 set to OFF					
	Negative logic		Y0 set to ON					
Default parameters	Configure the corresponding index objects in COE-Online or startup parameters:							

4.4.7 Usage of XF-E8NX8YT and LFP3-AP

4.4.7.1 Process data mapping

In the device view, the mapping addresses of module process data can be viewed, with case mapping addresses being I4.0-I4.7 and Q4.0-Q4.7.



Name	Туре	Explanation
VE EQVQV	Strat	8-channel input and 8-channel
ΑΓ_ΕδΛδΙ	Stuct	output module
——— I4.0	BOOL	Channel 0 input value
I4.1	BOOL	Channel 1 input value
I4.2	BOOL	Channel 2 input value
I4.3	BOOL	Channel 3 input value
——— I4.4	BOOL	Channel 4 input value
I4.5	BOOL	Channel 5 input value
I4.6	BOOL	Channel 6 input value
——— I4.7	BOOL	Channel 7 input value
Q4.0	BOOL	Channel 8 input value
Q4.1	BOOL	Channel 9 input value
Q4.2	BOOL	Channel 10 input value
Q4.3	BOOL	Channel 11 input value
Q4.4	BOOL	Channel 12 input value
Q4.5	BOOL	Channel 13 input value

Q4.6	BOOL	Channel 14 input value
Q4.7	BOOL	Channel 15 input value

4.4.7.2 Module configuration parameters

								📲 报	5扑视图	▲ 网络视图	👔 设备视图	_
Ifp3-ap_1 [LFP3-AP]	🔹 🖽 🔏 🗄 🔲 🍳 ±	E	4 设	备概览								
			<u> </u>	₩ 模块	1	几架	插槽	」地址	○地址	类型	订货号	T
			= -	v lfp3-ap 1	(0		4.0.4	LFP3-AP	LFP3-AP	۰.
~				LFP3-AP Profinet Device	(0 X1			LFP3-AP		Ē
339			6	F XF-E16X(16I 24Vdc)数字	C	1	1	23		XF-E16X(16I 24Vdc	XF-E16X	
44			6	FE16Y(160 24Vdc)数字	0	1	2		23	XF-E16Y(160 24Vd	XF-E16Y	
	6	5	10	XF-E8X8Y(8IO 24Vdc)数字	0	1	3	4	4	XF-E8X8Y(8IO 24V	XF-E8X8Y	
			<u>ه</u>	XF-E4AD (4AI 0-5V,0-TUV,±	C)	4	6891		XF-E4AD (4AI 0-5v,	XF_E4AD	
			6	XF-E4DA (4AO 0-5v,0-10v,±)	5	9299	6479	XF-E4DA (4AO 0-5	XF-E4DA	
_			7		C)	6					H
a factor of the second s	DP.NOPM				(<u>)</u>	7					
					C	1	8					
			-		C	•	9					
					C	l.	10					
-		_	100		C	1	11					
					C)	12					
					C)	13					
					C		14					
					C	<u>(</u>	15					
					C	•	16					
			~		C	2	17		0			5
<	> 100%					1	18	_	e		>	, İ
XF-E8X8Y(8IO 24Vdc)数字量	論入输出 1 [XF-E8X8Y(8 O 24Vd	c) Sink Input]		71				10	属性	11 信負 12 论师	lif T	R
当相 10 赤母 系法:	台拗 立木								* /14 LL		91	
												5
▼ 吊規 □見住自	模块配置参数											H
日末信息	(4)											H
一般 十中国 - 持由等数	Channel U		-									
* 展状影響 订修是 · vc.cevev	语::::::::::::::::::::::::::::::::::::	2.1	-									
周性版本	通過04個人,這該自己的方法。	5. mis										
校件版本	通道0逻辑电平面(盂:	0:止逻辑									Ŧ	
ModuleIdentNumber : 0x												
植地信息	Channel_1											
模块配置参数 (3)	4 Sector and the sector of	Laura (199										
視状取陴	週週1編人:悲波时间(ms):	3: 1ms									*	
1/0 地址	通道1逻辑电平配置:	0:正逻辑				_						

■ Channel input filtering time

"Filtering time"Each channel corresponds to a separate filtering parameter, which can be set by selecting the parameter from the drop-down menu.

Parameter definition	When there is a signal at the input terminal and the signal duration exceeds the filtering
	time, it is considered as an effective signal
	The following table pulling method reflects the adjustable parameters: No filtering,
Settable parameters	0.25ms, 0.5ms, 1ms, 2ms, 3ms, 4ms, 5ms, 6ms, 7ms, 8ms, 9ms, 10ms, 11ms, 12ms,
	13ms, 14ms, 15ms, 20ms, 30ms, 64ms, 128ms
Default parameters	1ms

■ Abnormal/STOP output status

"Abnormal/STOP output status"Each channel corresponds to a separate parameter, which can be set by selecting a parameter from the drop-down menu.

Parameter definition	The following table	pulling method reflects the adjustable parameters: "Output
	replacement value OF	F", "Keep previous value", "Output replacement value ON"
Sattable nonenators	Output replacement	When the PLC is in STOP mode, the output terminal is in a reset
Settable parameters	value OFF	state (physical terminal, regardless of channel logic level)

	Keep previous value	When the PLC is in abnormal/STOP mode, the output terminal
		outputs the last state of the PLC from RUN to STOP (physical
		terminal, regardless of channel logic level)
	Output replacement value ON	When the PLC is in abnormal/STOP mode, the output terminal
		is in the set state (physical terminal, regardless of channel logic
		level)
Default parameters	Output replacement va	alue OFF

Channel logic level

"Logic level configuration"Each channel corresponds to a separate logic level configuration. The setting method is to select parameters from the drop-down menu.

Doministry definition	The following table pulling method reflects the adjustable parameters: positive logic,					
Parameter definition	negative logic					
	The program execution	logic after external	signal input.			
	Logic level	Running	Operation result			
Settable parameters	configuration	programs				
	Positive logic	SET Y0.	Y0 set to ON			
1	Negative logic	-	Y0 set to OFF			
	Positive logicRST Y0.Negative logicImage: Comparison of the second se		Y0 set to OFF			
			Y0 set to ON			
	The following table pulling method reflects the adjustable parameters: positive logic					
Default parameters	(default), negative logi	с				

4.5 Digital input module XF-E32X

4.5.1 Product overview

The XF-E32X series digital input expansion module has 32 channels of digital input, supports NPN and PNP inputs, and is compatible with XF, XSF series CPU unit products and XF series communication coupler units.

- 32 channels digital input.
- Compliant with IEC-61131 input standard type 1.
- NP&PNP bipolar input.
- Designed with a width of 24mm.
- Module version

Hardware	Firmware	Function
version	version	
H2.0	V2.0	First official production of basic functions

4.5.2 Module View

(1) Each part description



No.	Name	No.	Name
1	System LED indicator light	2	Channel LED indicator light
3	Detachable terminal block	(4)	Buckle
5	Model indication	6	Color identification indicating module type
7	Module hardware and firmware versions	8	Wiring diagram

(2) System indicator light

System	Meaning		
indicator light			
PWR (green)	OFF	Module not powered on	
	Always ON	All external power supplies of the module are normal (backplane	

System indicator light	Meaning				
		bus power supply&external input 24V)			
	Flashing	The module's power supply is abnormal and cannot operate			
	$1 Hz^{*1}$	normally			
	Always ON	The module is running normally			
	Flashing 1Hz ^{*1}	General errors in module logs			
DI N (graan)	OFF	Important errors in module logs			
KUN (green)	Flashing 10Hz ^{*2}	Module establishment communication in progress			
	Double flashing ^{*3}	Module firmware update			

*1: A square wave with a duty cycle of 50% and a frequency of 1Hz.

*2: A square wave with a duty cycle of 50% and a frequency of 10Hz.

*3: The following figure:



(3) Channel indicator light

Model	Channel indicator light			
XF-E32X X0-X37		Always ON (green)	Corresponding input channel has input ON signal	
		OFF	Corresponding input channel has no input ON signal	

(4) Color identification

No.	Color		Module type
1	Grey White		Digital input
2		Gray	Digital output&digital mixed module
3		Light blue	Analog input
4		Dark blue	Analog output
5		Green	RS232&485 serial port communication
6		Pink	Temperature signal input
7		White	High speed counting

4.5.3 General specification

Project		Content
Otime to an entry	Max temperature	55°C
Operating temperature	Min temperature	-20°C
Transportation/storage	Max temperature	70°C
temperature	Min temperature	-40°C
Environmental	Upper limit	95%
humidity		
(Including	lower limit	10%
operation/storage)		
Protection grade		IP20
		Accord with IEC61131-2
		Under intermittent vibration (frequency 5-9Hz, constant
		amplitude 3.5mm peak displacement) and (frequency
Anti wibration		9-150Hz, constant acceleration 1.0g peak acceleration)
Anti vioration		Under continuous vibration (frequency 5-9Hz, half
		amplitude 1.75mm displacement) and (frequency 9-150Hz,
		constant acceleration 0.5g, constant frame amplitude)
		Scan 10 times in X, Y, and Z directions
		Accord with IEC61131-2
Import registeres		Impact strength of 15G (peak) with a duration of 11ms is
Impact resistance		applied to three mutually perpendicular axes, with 3 impacts
		per axis (a total of 18 impacts)
Use environment		Non corrosive gas
Use altitude		0-2000 meters
Over voltage level		II: Accord with IEC61131-2
Pollution level		2: Accord with IEC61131-2
Anti interference EMC		Accord with IEC 61131-2 IEC61000-6-4 B type
Related certifications		UL, CE

4.5.4 Technical specification

Project	Specification			
Input points	32			
Rated input voltage	DC24V			
Rated input current	4mA			
Input impedance	5.5ΚΩ			
Input ON voltage	15V			
Input ON current	2.5mA			
Input OFF voltage	5V			
Input OFF current	1mA			
Input resistance $ON \rightarrow OFF$	100us			
response time (Hardware)				
Input resistance OFF \rightarrow ON response time (Hardware)	100us			
In most do not in a	Derate by 50% when operating at 55°C (with no more than 16			
Input derating	ON input points), or by 10°C when all input points are ON.			
Common end method	1 common terminal of 16 points			
Connection mode	Refer to external terminal connection diagram			
Module power consumption	0.8W (internal backplane)+3.2W (external input)			
Module weight	128g			

4.5.5 Installation&Wiring

4.5.5.1 Dimension



(Unit: mm)

4.5.5.2 Terminal Definition&Wiring

Terminal Definition

XF-E32X								
Meaning	A-list terminal(left)	Meaning	B-list terminal(left)	Terminal layout	Meaning	A-list terminal(right)	Meaning	B-list terminal(right)
CH0	0	CH8	0		CH16	0	CH24	0
CH1	1	CH9	1		CH17	1	CH25	1
CH2	2	CH10	2		CH18	2	CH26	2
CH3	3	CH11	3		CH19	3	CH27	3
CH4	4	CH12	4		CH20	4	CH28	4
CH5	5	CH13	5		CH21	5	CH29	5
CH6	6	CH14	6		CH22	6	CH30	6
CH7	7	CH15	7		CH23	7	CH31	7
SS0	8	SS0	8		SS1	8	SS1	8



SS0 and SS1 are internally short circuited, so the left and right input points of a single module can be either NPN or PNP.

■ External wiring (Taking CH0-CH15 as an example, the same applies to CH16-CH31)



4.5.5.3 Installation method

(1) Installation requirements

The module is installed using DIN rails, which must comply with the IEC 60715 standard (35mm wide, 1mm thick). The size information is shown in the following figure, in millimeters.



(2) Installation steps



The assembly between IO modules is carried out by sliding installation through the top and bottom rails of the modules, as shown in the left figure:



The module is installed on the guide rail. When installing, align the module with the DIN rail and press the module in the direction indicated by the arrow. After installation, there is a noticeable sound of the module engaging, as shown in the left figure:



After the module installation is completed, the lock buckle will automatically move downwards for locking. If the lock buckle does not move downwards, the top of the lock buckle needs to be pressed downwards to ensure proper installation.

(3) Unstallation steps



4.5.5.4 Installation environment

This product can be installed in four positions (installation direction): horizontal direction, vertical direction, top of the cabinet, and bottom of the cabinet. It is recommended to install in the horizontal direction. The heat dissipation design is through natural convection, to ensure normal ventilation and heat dissipation, and to reserve sufficient wiring space, the minimum gap must be left around this product, as shown in the following figure:





If there are high-temperature heat source equipment (heaters, transformers, high resistors, etc.) around this product, a minimum gap of 100mm should be left between the equipment and the high-temperature heat source.

4.5.5.5 Equipment wiring

Suitable cable diameter					
Chinese standard/mm ²	American Standard/AWG				
0.3	22				
0.5	20				
0.75	18				
1.0	18				
1.5	16				

When wiring a module, its terminal must meet the following requirements:

If using other tube type wire lugs, please crimp them to the stranded wire, and the shape and size requirements are shown in the following figure:



4.5.6 Usage of XF-E32X and LFC3-AP

Name	Туре	Description
XF_E32X	Stuct	32 channels input module
—— СНО-ХО	BOOL	Channel 0 input value
——————————————————————————————————————	BOOL	Channel 1 input value
CH2-X2	BOOL	Channel 2 input value
СНЗ-ХЗ	BOOL	Channel 3 input value
CH4-X4	BOOL	Channel 4 input value
СН5-Х5	BOOL	Channel 5 input value
—— СН6-Х6	BOOL	Channel 6 input value
—— СН7-Х7	BOOL	Channel 7 input value
CH8-X10	BOOL	Channel 8 input value
——— СН9-Х11	BOOL	Channel 9 input value
CH10-X12	BOOL	Channel 10 input value
CH11-X13	BOOL	Channel 11 input value
——————————————————————————————————————	BOOL	Channel 12 input value
CH13-X15	BOOL	Channel 13 input value
CH14-X16	BOOL	Channel 14 input value
CH15-X17	BOOL	Channel 15 input value
CH16-X20	BOOL	Channel 16 input value
CH17-X21	BOOL	Channel 17 input value
CH18-X22	BOOL	Channel 18 input value
СН19-Х23	BOOL	Channel 19 input value
CH20-X24	BOOL	Channel 20 input value
CH21-X25	BOOL	Channel 21 input value

4.5.6.1 Process data mapping (PDO)

Name	Туре	Description
XF_E32X	Stuct	32 channels input module
——————————————————————————————————————	BOOL	Channel 22 input value
——————————————————————————————————————	BOOL	Channel 23 input value
CH24-X30	BOOL	Channel 24 input value
CH25-X31	BOOL	Channel 25 input value
—— СН26-Х32	BOOL	Channel 26 input value
CH27-X33	BOOL	Channel 27 input value
CH28-X34	BOOL	Channel 28 input value
—— СН29-Х35	BOOL	Channel 29 input value
—— СН30-Х36	BOOL	Channel 30 input value
CH31-X37	BOOL	Channel 31 input value

4.5.6.2 Module configuration parameters (SDO)

Variable	Туре	Note
Channel 0 input filtering time	BYTE	0: no filter
Channel 1 input filtering time	BYTE	1: 0.25ms
Channel 2 input filtering time	BYTE	2: 0.5ms
Channel 3 input filtering time	BYTE	3: 1ms (default)
Channel 4 input filtering time	BYTE	4: 2ms
Channel 5 input filtering time	BYTE	5: 3ms
Channel 6 input filtering time	BYTE	0: 4IIIS 7. 5ms
Channel 7 input filtering time	BYTE	8: 6ms
Channel 8 input filtering time	BYTE	9: 7ms
Channel 9 input filtering time	BYTE	10: 8ms
Channel 10 input filtering time	BYTE	11: 9ms
Channel 11 input filtering time	BYTE	12: 10ms
Channel 12 input filtering time	BYTE	13: 11ms
Channel 13 input filtering time	BYTE	14: 12ms
Channel 14 input filtering time	BYTE	15: 15ms
Channel 15 input filtering time	BYTE	17: 15ms
Channel 16 input filtering time	BYTE	18: 20ms
Channel 17 input filtering time	BYTE	19: 30ms
Channel 18 input filtering time	BYTE	20: 64ms
Channel 19 input filtering time	BYTE	21: 128ms

Channel 20 input filtering time	BYTE	
Channel 21 input filtering time	BYTE	-
Channel 22 input filtering time	BYTE	
Channel 23 input filtering time	BYTE	
Channel 24 input filtering time	BYTE	
Channel 25 input filtering time	BYTE	
Channel 26 input filtering time	BYTE	
Channel 27 input filtering time	BYTE	
Channel 28 input filtering time	BYTE	
Channel 29 input filtering time	BYTE	
Channel 30 input filtering time	BYTE	
Channel 31 input filtering time	BYTE	
Channel 0-7 logic level configuration	BYTE	
Channel 8-15 logic level configuration	BYTE	0. Desitive legis (default), 1. Magative Legis
Channel 16-23 logic level	DVTE	0: Positive logic (default); 1: Negative Logic Bit0, bit7 corresponds to channels 0.7
configuration	DILE	(hit8~hit15 corresponds to channels $8\sim15$)
Channel 24-31 logic level	BVTE	
configuration	DITE	

■ Channel input filtering time

The 'filtering time' corresponds to a separate filtering parameter for each channel, and double-click the parameter name to configure the corresponding value.

Index:SubIndex	Name	Flag	Value	Communication error message	
- #x8001:00	Configuration of 32X	rw	>36<		
-15	CH0 FilterTime	rw		Communication not established	
- 16	CH1 FilterTime	rw		Communication not established	
-17	CH2_FilterTime	rw		Communication not established	
- 18	CH3_FilterTime	rw		Communication not established	
- 19	CH4_FilterTime	rw		Communication not established	
- 1A	CH5_FilterTime	rw		Communication not established	
- 1B	CH6_FilterTime	rw		Communication not established	
-1C	CH7_FilterTime	rw		Communication not established	
-1D	CH8_FilterTime	rw		Communication not established	
-1E	CH9_FilterTime	rw		Communication not established	
- 1F	CH10_FilterTime	rw		Communication not established	
-20	CH11_FilterTime	rw		Communication not established	
-21	CH12_FilterTime	rw		Communication not established	
-22	CH13_FilterTime	rw		Communication not established	
-23	CH14_FilterTime	rw		Communication not established	_
-24	CH15_FilterTime	rw		Communication not established	
-25	CH16_FilterTime	rw		Communication not established	
-26	CH17_FilterTime	rw		Communication not established	
-27	CH18_FilterTime	rw		Communication not established	
-28	CH19_FilterTime	rw		Communication not established	
-29	CH20_FilterTime	rw		Communication not established	
-2A	CH21_FilterTime	rw		Communication not established	
-2B	CH22_FilterTime	rw		Communication not established	
-2C	CH23_FilterTime	rw		Communication not established	

Launch parameters IO Mapping COE-Online

Index:SubIndex	Name	Flag	Value	Communication error message	
-22	CH13_FilterTime	rw		Communication not established	
-23	CH14_FilterTime	rw		Communication not established	
-24	CH15_FilterTime	rw		Communication not established	
-25	CH16_FilterTime	rw		Communication not established	
-26	CH17_FilterTime	rw		Communication not established	
-27	CH18_FilterTime	rw		Communication not established	
-28	CH19_FilterTime	rw		Communication not established	
-29	CH20_FilterTime	rw		Communication not established	
-2A	CH21_FilterTime	rw		Communication not established	
-2B	CH22_FilterTime	rw		Communication not established	
-2C	CH23_FilterTime	rw		Communication not established	
- 2D	CH24_FilterTime	rw		Communication not established	
-2E	CH25_FilterTime	rw		Communication not established	
-2F	CH26_FilterTime	rw		Communication not established	
- 30	CH27_FilterTime	rw		Communication not established	
-31	CH28_FilterTime	rw		Communication not established	
-32	CH29_FilterTime	rw		Communication not established	
-33	CH30_FilterTime	rw		Communication not established	
-34	CH31_FilterTime	rw		Communication not established	
- 35	CH0-7 Logical level configuration	rw		Communication not established	
-36	CH8-15 Logical level configuration	rw		Communication not established	
-37	CH16-23 Logical level configuration	rw		Communication not established	
- 38	CH24-31 Logical level configuration	rw		Communication not established	
+#x9000:00	Information of 32X	ro	>17<		
+#x9001:00	ErrorCode of 32X	ro	>2<		

Parameter	When there is a signal at the input terminal and the signal duration exceeds the				
definition	filtering time, it is considered as an effective signal				
	The index objects corresponding to startup parameters or SDO read-write				
Parameters	instructions in COE Online: no filtering, 0.25ms, 0.5ms, 1ms, 2ms, 3ms, 4ms, 5ms,				
can be set	6ms, 7ms, 8ms, 9ms, 10ms, 11ms, 12ms, 13ms, 14ms, 15ms, 20ms, 30ms, 64ms,				
	128ms				
Default	lms				
parameter					

■ Channel logic level

Logic Level Configuration: Each channel corresponds to a separate logic level, and double-click the parameter

name to configure the corresponding value.

Advanced opti	ons				
ndex:SubIndex	Name	Flag	Value	Communication error message	
-22	CH13_FilterTime	rw		Communication not established	
-23	CH14_FilterTime	rw		Communication not established	
-24	CH15_FilterTime	rw		Communication not established	
-25	CH16_FilterTime	rw		Communication not established	
- 26	CH17_FilterTime	rw		Communication not established	
-27	CH18_FilterTime	rw		Communication not established	
-28	CH19_FilterTime	rw		Communication not established	
-29	CH20_FilterTime	rw		Communication not established	
-2A	CH21_FilterTime	rw		Communication not established	
-2B	CH22_FilterTime	rw		Communication not established	
-2C	CH23_FilterTime	rw		Communication not established	
-2D	CH24_FilterTime	rw		Communication not established	
-2E	CH25_FilterTime	rw		Communication not established	
-2F	CH26_FilterTime	rw		Communication not established	
-30	CH27_FilterTime	rw		Communication not established	
-31	CH28_FilterTime	rw		Communication not established	
-32	CH29_FilterTime	rw		Communication not established	
-33	CH30_FilterTime	rw		Communication not established	
- 34	CH31 FilterTime	rw		Communication not established	
-35	CH0-7 Logical level configuration	rw		Communication not established	
- 36	CH8-15 Logical level configuration	rw		Communication not established	
-37	CH16-23 Logical level configuration	rw		Communication not established	
-38	CH24-31 Logical level configuration	rw		Communication not established	
#x9000:00	Information of 32X	ro	>17<		
-#x9001:00	ErrorCode of 32X	ro	>2<		

	The program execution logic after external signal input.							
	External input signal	Logic level configuration	Program	Result				
Parameter	X0=1	Positive logic		Y0=1				
definition	X0=1	Negative logic	LD X0;	Y0=0				
	X0=0	Positive logic	OUT Y0;	Y0=0				
	X0=0	Negative logic		Y0=1				
Parameters	Corresponding index objects can be set in COE Online or startup parameter							
can be set	configuration: positive logic (default), negative logic							

4.5.7 Usage of XF-E32X and LFP3-AP

4.5.7.1 Usage of Siemens S7-200 SMART

In the device view, the mapping address of module process data can be viewed, and the mapping starting address of the case is I128.0.

NET网络 制器(CPU SR20_plc200smart) LFP3-APV2.00-lfp3-ap	单击"添加"按钮来为该设备添加模块。								
- [] LFP3-AP(0)		序号	模块名	子模块名	插槽_子插槽	PNI 起始地址	输入长度(T	
- [] XF-E32X(32I 24Vdc)数字量输入(1)	1	0	LFP3-AP		0			T	
元成	2			LFP3-AP Pr	0 32768(×1)			T	
	3			Port 1	0 32769(×1			T	
	4			Port 2	0 32770(×1			T	
	5	1	XF-E32X(321 24Vdc)数字里输入		1	128	4	T	
	6				2			T	
	7				3			Т	

Name	Туре	Explanation
XF_E32X	Stuct	32 channels input module
I128.0	BOOL	Channel 0 input value
I128.1	BOOL	Channel 1 input value
I128.2	BOOL	Channel 2 input value
I128.3	BOOL	Channel 3 input value
——— I128.4	BOOL	Channel 4 input value
I128.5	BOOL	Channel 5 input value
I128.6	BOOL	Channel 6 input value
I128.7	BOOL	Channel 7 input value
I129.0	BOOL	Channel 8 input value

■ Process mapping data (PDO)
Name	Туре	Explanation
XF_E32X	Stuct	32 channels input module
———— I129.1	BOOL	Channel 9 input value
I129.2	BOOL	Channel 10 input value
I129.3	BOOL	Channel 11 input value
I129.4	BOOL	Channel 12 input value
I129.5	BOOL	Channel 13 input value
I129.6	BOOL	Channel 14 input value
I129.7	BOOL	Channel 15 input value
I130.0	BOOL	Channel 16 input value
——— I130.1	BOOL	Channel 17 input value
I130.2	BOOL	Channel 18 input value
I130.3	BOOL	Channel 19 input value
——— I130.4	BOOL	Channel 20 input value
I130.5	BOOL	Channel 21 input value
———— I130.6	BOOL	Channel 22 input value
——— I130.7	BOOL	Channel 23 input value
——— I131.0	BOOL	Channel 24 input value
I131.1	BOOL	Channel 25 input value
I131.2	BOOL	Channel 26 input value
I131.3	BOOL	Channel 27 input value
I132.4	BOOL	Channel 28 input value
I131.5	BOOL	Channel 29 input value
I131.6	BOOL	Channel 30 input value
L I131.7	BOOL	Channel 31 input value

■ Module configuration parameter

上版 日本 上版 LK LK <thlk< th=""> LK LK LK</thlk<>
1 2 00-04ALA INJANOVINI 1 F MX** 1 2 1 2 2 00-04ALA INJANOVINI 1 F MX** 3 01-04ALA INJANOVINI 1 F MX**
2 彼快配置參放 Channel_0 通即喻入達然时间(sc) 3 1ma · 通即输入连然时间(sc) 3 1ma · 通道:淡道暗电平配置 [0: 正逻辑 · Channel_1 通道:淡道暗电平配置 [0: 正逻辑 · 正面:逻辑电平配置 [0: 正逻辑 ·
2 《块在艺参数 《块在艺参数 通知输入连续时间(ss) 3 Ins • 通谢注: 通道:输入连续时间(ss) 3 Ins • 通通: 逻辑电平配器 [0: 正逻辑 • 正逻辑 • 正逻辑 •
Chanael_0 通測の輸入連接封詞(sa) 2 1ma ・ 通測の輸入連接封詞(sa) 2 1ma ・ 通測の運輸电甲酸器 [0: 正逻辑 ・ Chanael_1 通測・洗透射詞(sa) 2 1ma ・ 通測・洗透射目(sa) 2 1ma ・ 通測・洗透射 [0: 正逻辑 ・ Chanael_2
▲通9%入连续封间(**) 3 mm → 通過9%入连续封间(**) 3 mm → 通過9次通电平配置 [0: 正逻辑 → Channel_1 通過1次连校封间(**) 3 mm → 通過1次通电平配置 [0: 正逻辑 → Channel_2
通動の運動电平敏器 [0:正逻辑 → 3 Channel_1 通道:輸入達放时间(ss.) [3.1mg → 通道:運動电平磁器 [0:正逻辑 → Channel_2
Chanael_1 通道:約入症於时间(ss) [2 tros ・ 通道:透明电平配型 [0: 正逻辑 ★ Chanael_2
Canada =
· · · · · · · · · · · · · · · · · · ·
田道·定期电+形式 0: 正逆編 ↓ Chanael_2
Chanel_2
通影输入接货时间(ss) 3. Trag ▼
□ 面 通過2週編电平配器 [0:正逻辑 -
Chanel_3
遭避3输入感激时间(ms) 3.1mg 💌
通道の逻辑电平能器 [0:正逻辑 ▼
(

■ Channel input filter time

Each channel corresponds to a separate filtering parameter, which can be set by selecting the parameter from the drop-down menu.

Parameter	When there is a signal at the input terminal and the signal duration exceeds the
definition	filtering time, it is considered as an effective signal
Parameter can	0ms, 0.25ms, 0.5ms, 1ms, 2ms, 3ms, 4ms, 5ms, 6ms, 7ms, 8ms, 9ms, 10ms, 11ms,
be set	12ms, 13ms, 14ms, 15ms, 20ms, 30ms, 64ms, 128ms
Default	lms
parameter	

■ Channel logic level

Each channel corresponds to a separate logic level configuration setting method, which can be set by selecting the parameter from the drop-down menu.

	Program execution logic after external signal input			
	External signal	Logic level	Operation	Operation
Demonstern	input		program	result
Parameter	X0=1	Positive logic	LD X0;	Y0=1
meaning	X0=1	Negative logic	OUT Y0;	Y0=0
	X0=0	Positive logic		Y0=0
	X0=0	Negative logic		Y0=1
Parameter can	Positive logic, neg	gative logic		
be set				

4.5.7.2 Usage of Siemens S7-1200/1500

Process data mapping

In the device view, the mapping address of module process data can be viewed, and the case mapping address is I2.0-I5.7.



Name	Туре	Explanation
XF_E32X	Stuct	32 channels input module
I4.0	BOOL	Channel 16 input value
I4.1	BOOL	Channel 17 input value
I4.2	BOOL	Channel 18 input value
——— I4.3	BOOL	Channel 19 input value
I4.4	BOOL	Channel 20 input value
——— I4.5	BOOL	Channel 21 input value
I4.6	BOOL	Channel 22 input value
I4.7	BOOL	Channel 23 input value
I5.0	BOOL	Channel 24 input value
I5.1	BOOL	Channel 25 input value
I5.2	BOOL	Channel 26 input value
I5.3	BOOL	Channel 27 input value
I5.4	BOOL	Channel 28 input value
I5.5	BOOL	Channel 29 input value
I5.6	BOOL	Channel 30 input value
I5.7	BOOL	Channel 31 input value

■ Module configuration parameter

		-	1 1				
		~	▼ LFP3-AP Profinet Device	0	0 X1		LFP3-AP
		~	Port 1	0	0 X1 P1		Port 1
1123			Port 2	0	0 X1 P2		Port 2
			XF-E32X(32I 24Vdc)数字	0	1	25	XF-E32X
			1	0	2		
			1	0	3		
				0	4		
				0	5		
				0	6		
	DP-NORM			0	7		
				0	8		
				0	9		
				0	10		
				0	11		
				0	12		
				0	13		
				0	14		
				0	15		
				0	16		
				0	17		
				0	18		
				0	19		
	N 1178	1		0	20		
	2 1120 · · · · · · · · · · · ·			_			
XF-E32X(321 24Vdc)	A_1 [XF-E32X (32i 24Vdc) Sink Input]					9	属性 马信
常規 10 变量 系统常	教 文本					2	
) 常規	4					-	
▼ 模块参数	模块配置参数						
订货号:XF-E32X	Channel 0						
 固件版本 	_						
 —	通道0輸入滤波时间(ms): 3:1ms						
模块ID:0x00280005	通道の海綿中亚两署- 0: 工海線						
同供飯木	MARACINE I MULL . LICEN						
模块配置参数 3 模块加度	Channel_1						
1/0 地址	通道1输入滤波时间(ms): 3:1ms						
	通道1逻辑由平数语: 0:正逻辑						
	ABATE PROPERTY AND A ALAR TO						
	Channel 2						

■ Channel input filter time

Each channel corresponds to a separate filtering parameter, which can be set by selecting the parameter from the drop-down menu.

Parameter	When there is a signal at the input terminal and the signal duration exceeds the
definition	filtering time, it is considered as an effective signal
Parameter can	0ms, 0.25ms, 0.5ms, 1ms, 2ms, 3ms, 4ms, 5ms, 6ms, 7ms, 8ms, 9ms, 10ms, 11ms,
be set	12ms, 13ms, 14ms, 15ms, 20ms, 30ms, 64ms, 128ms
Default	1ms
parameter	

■ Channel logic level

Each channel corresponds to a separate logic level configuration setting method, which can be set by selecting the parameter from the drop-down menu.

	Program execution	n logic after extern	nal signal input	
	External signal	Logic level	Operation	Operation
Demonstern	input		program	result
Parameter	X0=1	Positive logic	LD X0;	Y0=1
meaning	X0=1	Negative logic	OUT Y0;	Y0=0
	X0=0	Positive logic		Y0=0
	X0=0	Negative logic		Y0=1
Parameter can	Positive logic, neg	ative logic		
be set				

4.6 Digital input module XF-E32YT

4.6.1 Product overview

The XF-E32YT series digital input expansion module has 32 channels of digital output, suitable for XF, XSF series CPU unit products and XF series communication coupler units.

- 32 channel digital output
- NPN output
- Designed with a width of 24mm

Module version

Hardware version	Firmware version	Function
H2.0	V2.0	Basic functions for the first official production

4.6.2 Module view

(1) Description of each section



No.	Name	No.	Name
1	System LED indicator light	2	Channel LED indicator light
3	Detachable terminal block	4	Clasp
5	Model indicator	6	Color identification indicating module type
$\overline{7}$	Module hardware and firmware version	8	Wiring diagram

(2) System indicator light

System indicator light	Meaning		
	Extinguish	Module not powered on	
PWR(Green)	Normally ON	All external power supplies of the module are normal	
	Flashing 1Hz*1	Module power supply is abnormal and cannot operate	

System indicator light	Meaning		
		normally	
	Normally ON	The module is operating normally	
	Flashing 1Hz*1	General errors in module logs	
RUN(Green)	Extinguish	Important errors in the module log	
	Flashing 10Hz*2	Module establishing communication	
	Double flashing*3	Module firmware update	



*1: A square wave with a duty cycle of 50% and a frequency of 1Hz.

*2: A square wave with a duty cycle of 50% and a frequency of 10Hz.*3: The following figure:



(3) Channel indicator light

Model	Channel indicator light		
	Y0-Y37	Normally	The corresponding output channel has an ON signal
XF-E32YT		ON(Green)	output
		Extinguish	Corresponding output channel has no output ON signal

(4) Color identification

No.	C	Color	Module type
1		Grey White	Digital input
2		Gray	Digital output&digital mixed module
3		Light blue	Analog input
4		Dark blue	Analog output
5		Green	RS232&485 serial port communication
6		Pink	Temperature signal input
7		White	High speed counting

4.6.3 General specifications

Item		Specification
	Max	55%
On anoting tomp anotype	temperature	55 C
Operating temperature	Min	20%C
	temperature	-20°C
	Max	70%
Transportation/storage	temperature	70 C
temperature	Min	4000
	temperature	-40°C

Item		Specification			
Environmental	Upper limit	95%			
humidity					
(including	lower limit	10%			
operation/storage)					
Protection grade		IP20			
		Accord with IEC61131-2			
		Under intermittent vibration (frequency 5-9Hz, constant			
		amplitude 3.5mm peak displacement) and (frequency			
Anti vibration		9-150Hz, constant acceleration 1.0g peak acceleration)			
		Under continuous vibration (frequency 5-9Hz, half			
		amplitude 1.75mm displacement) and (frequency 9-150Hz,			
		constant acceleration 0.5g, constant frame amplitude)			
		Scan 10 times in X, Y, and Z directions			
		Accord with IEC61131-2			
Impact resistance		Impact strength of 15G (peak) with a duration of 11ms is			
impact resistance		applied to three mutually perpendicular axes, with 3 impacts			
		per axis (a total of 18 impacts)			
Use environment		Non corrosive gas			
Use altitude		0-2000 meters			
Over voltage level		II: Accord with IEC61131-2			
Pollution level		2: Accord with IEC61131-2			
Anti interference EMC		Accord with IEC 61131-2 IEC61000-6-4 B type			
Related certifications		UL, CE			

4.6.4 Technical specification

Item	Specification		
Model	XF-E32YT		
Output points	32		
Rated load voltage	DC24V (DC21.6V~26.4V)		
Maximum load current	0.5A/1 point, 8A/module		
Surge current protection	Support		
Leakage current at OFF	Below 0.1mA		
Maximum voltage drop at ON	0.5V		
Output ON \rightarrow OFF response time	0.1		
(Hardware)	0.1 ms		
Output OFF \rightarrow ON response time	0.1ms		
(Hardware)			
	Derate by 50% when operating at 55°C(While the output		
Output derating	current of ON doesn't exceed 2A), or by 10°C when the output		
	point is fully ON		
Common end method	1 common terminal of 16 points		
Output Protection	Support short circuit and overload protection functions		
Module power consumption	1.2W (Backplane bus)+0.6W(External input)		

Item	Specification
Module weight	137g
Insulation voltage	AC510V
Insulated resistance	10M

4.6.5 Installation&Wiring

4.6.5.1 Appearance dimension



(Unit: mm)

4.6.5.2 Terminal Definition&Wiring

(1) Terminal Definition

XF-E32Y								
Meaning	A-list terminal(left)	Meaning	B-list terminal(left)	Terminal layout	Meaning	A-list terminal(right)	Meaning	B-list terminal(right)
CH0	0	CH8	0		CH16	0	CH24	0
CH1	1	CH9	1		CH17	1	CH25	1
CH2	2	CH10	2		CH18	2	CH26	2
CH3	3	CH11	3		CH19	3	CH27	3
CH4	4	CH12	4		CH20	4	CH28	4
CH5	5	CH13	5		CH21	5	CH29	5
CH6	6	CH14	6		CH22	6	CH30	6
CH7	7	CH15	7		CH23	7	CH31	7
24V+	8	0V	8	8 77 8 8 77 8	24V+	8	0V	8



Two 0V internal short circuits and two 24V internal isolation.

(2) External wiring (taking CH0-CH15 as an example, CH16-CH31 is the same)



Number	Name	
1	System indicator light	
2	Channel indicator light	
3	Backplane bus	
4	Input Channel&Wiring	

4.6.5.3 Installation method

(1) Installation requirements

The module is installed using DIN rails, which must comply with the IEC 60715 standard (35mm wide, 1mm thick). The size information is shown in the following figure, in millimeters.



(2) Installation steps



The assembly between IO modules is carried out by sliding installation through the top and bottom rails of the modules, as shown in the left figure:



The module is installed on the guide rail. When installing, align the module with the DIN rail and press the module in the direction indicated by the arrow. After installation, there is a noticeable sound of the module engaging, as shown in the left figure:



After the module installation is completed, the lock buckle will automatically move downwards for locking. If the lock buckle does not move downwards, the top of the lock buckle needs to be pressed downwards to ensure proper installation.

(3) Unstallation steps



4.6.5.4 Installation environment

This product can be installed in four positions (installation direction): horizontal direction, vertical direction, top of the cabinet, and bottom of the cabinet. It is recommended to install in the horizontal direction. The heat dissipation design is through natural convection, to ensure normal ventilation and heat dissipation, and to reserve sufficient wiring space, the minimum gap must be left around this product, as shown in the following figure:





If there are high-temperature heat source equipment (heaters, transformers, high resistors, etc.) around this product, a minimum gap of 100mm should be left between the equipment and the high-temperature heat source.

4.6.5.5 Equipment wiring

When wiring a module, its terminal must meet the following requirements:

Suitable cable diameter				
Chinese standard/mm ²	American Standard/AWG			
0.3	22			
0.5	20			
0.75	18			
1.0	18			
1.5	16			

If using other tube type wire lugs, please crimp them to the stranded wire, and the shape and size requirements are shown in the following figure:



4.6.6 Usage of XF-E32Y and LFC3-AP

4.6.6.1 Process data mapping (PDO)

Name	Туре	Description
XF_E32YT	Stuct	32 channels output module
——— СН0-Ү0	BOOL	Channel 0 output value
——————————————————————————————————————	BOOL	Channel 1 output value
CH2-Y2	BOOL	Channel 2 output value
СНЗ-ҮЗ	BOOL	Channel 3 output value
CH4-Y4	BOOL	Channel 4 output value
—— СН5-Ү5	BOOL	Channel 5 output value
СН6-Ү6	BOOL	Channel 6 output value
CH7-Y7	BOOL	Channel 7 output value
—— СН8-Ү8	BOOL	Channel 8 output value
——— СН9 – Ү9	BOOL	Channel 9 output value
CH10-Y10	BOOL	Channel 10 output value
CH11-Y11	BOOL	Channel 11 output value
CH12-Y12	BOOL	Channel 12 output value
CH13-Y13	BOOL	Channel 13 output value
——————————————————————————————————————	BOOL	Channel 14 output value
——————————————————————————————————————	BOOL	Channel 15 output value
——————————————————————————————————————	BOOL	Channel 16 output value
CH17-Y17	BOOL	Channel 17 output value
CH18-Y18	BOOL	Channel 18 output value
CH19-Y19	BOOL	Channel 19 output value
CH20-Y20	BOOL	Channel 20 output value
CH21-Y21	BOOL	Channel 21 output value
СН22-Ү22	BOOL	Channel 22 output value
CH23-Y23	BOOL	Channel 23 output value

Name	Туре	Description
XF_E32YT	Stuct	32 channels output module
	Dool	
CH24-Y24	BOOL	Channel 24 output value
—— СН25-Ү25	BOOL	Channel 25 output value
——— СН26-Ү26	BOOL	Channel 26 output value
—— СН27-У27	BOOL	Channel 27 output value
——————————————————————————————————————	BOOL	Channel 28 output value
—— СН29-Ү29	BOOL	Channel 29 output value
—— СН30-Ү30	BOOL	Channel 30 output value
—— СН31-Ү31	BOOL	Channel 31 output value

4.6.6.2 Module configuration parameter (SDO)

Byte sequence number	Туре	Note
Channel 0 output status in case of abnormality	BYTE	
Channel 1 output status in case of abnormality	BYTE	
Channel 2 output status in case of abnormality	BYTE	
Channel 3 output status in case of abnormality	BYTE	
Channel 4 output status in case of abnormality	BYTE	
Channel 5 output status in case of abnormality	BYTE	
Channel 6 output status in case of abnormality	BYTE	
Channel 7 output status in case of abnormality	BYTE	
Channel 8 output status in case of abnormality	BYTE	
Channel 9 output status in case of abnormality	BYTE	
Channel 10 output status in case of abnormality	BYTE	0: Output replacement value OFF (default)
Channel 11 output status in case of abnormality	BYTE	2. Output replacement value ON
Channel 12 output status in case of abnormality	BYTE	
Channel 13 output status in case of abnormality	BYTE	
Channel 14 output status in case of abnormality	BYTE	
Channel 15 output status in case of abnormality	BYTE	
Channel 16 output status in case of abnormality	BYTE	
Channel 17 output status in case of abnormality	BYTE	
Channel 18 output status in case of abnormality	BYTE	
Channel 19 output status in case of abnormality	BYTE	
Channel 20 output status in case of abnormality	BYTE	
Channel 21 output status in case of abnormality	BYTE	

Byte sequence number	Туре	Note
Channel 22 output status in case of abnormality	BYTE	
Channel 23 output status in case of abnormality	BYTE	
Channel 24 output status in case of abnormality	BYTE	
Channel 25 output status in case of abnormality	BYTE	
Channel 26 output status in case of abnormality	BYTE	
Channel 27 output status in case of abnormality	BYTE	
Channel 28 output status in case of abnormality	BYTE	
Channel 29 output status in case of abnormality	BYTE	
Channel 30 output status in case of abnormality	BYTE	
Channel 31 output status in case of abnormality	BYTE	
Channel 0-7 logic level configuration	BYTE	
Channel 8-15 logic level configuration	BYTE	0: Positive logic (default). 1: Negative logic
Channel 16-23 logic level configuration	BYTE	bitto-bit / corresponds to channels 0~/
Channel 24-31 logic level configuration	BYTE	(one-on-second storenamers 6~15)

■ Abnormal/STOP output status

Each channel corresponds to a separate parameter, and double-click the parameter name to configure the corresponding value.

			1/1	0	
	Name	Hag	value	Communication error message	
=-#x8001:00	Configuration of 32Y	rw	>36<		
-15	CH0_ExceptionOut	rw		Communication not established	
- 16	CH1_ExceptionOut	rw		Communication not established	
-17	CH2_ExceptionOut	rw		Communication not established	
-18	CH3_ExceptionOut	rw		Communication not established	
- 19	CH4_ExceptionOut	rw		Communication not established	
- 1A	CH5_ExceptionOut	rw		Communication not established	
— 1B	CH6_ExceptionOut	rw		Communication not established	
- 1C	CH7_ExceptionOut	rw		Communication not established	
—1D	CH8_ExceptionOut	rw		Communication not established	
-1E	CH9_ExceptionOut	rw		Communication not established	
—1F	CH10_ExceptionOut	rw		Communication not established	
-20	CH11_ExceptionOut	rw		Communication not established	
-21	CH12_ExceptionOut	rw I		Communication not established	
-22	CH13_ExceptionOut	rw		Communication not established	
-23	CH14_ExceptionOut	rw		Communication not established	
-24	CH15_ExceptionOut	rw		Communication not established	
-25	CH16_ExceptionOut	rw		Communication not established	
-26	CH17_ExceptionOut	rw		Communication not established	
-27	CH18_ExceptionOut	rw		Communication not established	
-28	CH19_ExceptionOut	DW .		Communication not established	
-29	CH20 ExceptionOut	rw		Communication not established	
-2A	CH21 ExceptionOut	rw		Communication not established	
-2B	CH22 ExceptionOut	rw		Communication not established	
-20	CH23 ExceptionOut	TW		Communication not established	

Advanced opti	ons				
dex:SubIndex	Name	Flag	Value	Communication error message	
-22	CH13_ExceptionOut	rw		Communication not established	
-23	CH14_ExceptionOut	rw		Communication not established	
-24	CH15_ExceptionOut	rw		Communication not established	
-25	CH16_ExceptionOut	rw		Communication not established	
-26	CH17_ExceptionOut	rw		Communication not established	
-27	CH18_ExceptionOut	rw		Communication not established	
-28	CH19_ExceptionOut	rw		Communication not established	
-29	CH20_ExceptionOut	rw		Communication not established	
-2A	CH21_ExceptionOut	rw		Communication not established	
-2B	CH22_ExceptionOut	rw		Communication not established	
-2C	CH23_ExceptionOut	rw		Communication not established	
-2D	CH24_ExceptionOut	rw		Communication not established	
-2E	CH25_ExceptionOut	rw		Communication not established	
-2F	CH26_ExceptionOut	rw		Communication not established	
-30	CH27_ExceptionOut	rw		Communication not established	
-31	CH28_ExceptionOut	rw		Communication not established	
-32	CH29_ExceptionOut	rw		Communication not established	
-33	CH30_ExceptionOut	rw		Communication not established	
-34	CH31_ExceptionOut	rw		Communication not established	
-35	CH0-7_Output_LogicLeveL	rw		Communication not established	
-36	CH8-15_Output_LogicLeveL	rw		Communication not established	
-37	CH16-23_Output_LogicLeveL	rw		Communication not established	
-38	CH24-31_Output_LogicLeveL	rw		Communication not established	
-#x9000:00	Information of 32Y	ro	>17<		
-#x9001:00	ErrorCode of 32Y	ro	>2<		

Doromotor con	Configure the corr	responding index objects in COE Online, startup parameters, or				
ba sat	SDO read-write in	nstructions: "Output replacement value OFF", "Keep previous				
be set	value", "Output rep	lacement value ON"				
	Output	When the PLC is in STOP mode, the output terminal is in a reset				
	replacement	state (physical terminal, regardless of channel logic level).				
	value OFF					
Demonstern	V	When the PLC is in abnormal/STOP mode, the output terminal				
Parameter	Keep previous	outputs the last state of the PLC from RUN to STOP (physical				
definition	value	terminal, regardless of channel logic level).				
	Output	When the PLC is in abnormal/STOP mode, the output terminal				
	replacement	is in the set state (physical terminal, not considering channel				
	value ON	logic level)				
Default	Output replacemen	t value OFF				
parameter						

■ Channel logic level

Each channel corresponds to a separate logic level, and double-click the parameter name to configure the corresponding value.

dan Cubbadan	News	Deer	Makaa	Committee	
		Flag	value	Communication error message	
-22	CH13_ExceptionOut	rw		Communication not established	
-23	CH14_ExceptionOut	rw		Communication not established	
- 24	CH15_ExceptionOut	rw		Communication not established	
-25	CH16_ExceptionOut	rw		Communication not established	
-26	CH17_ExceptionOut	rw		Communication not established	
-27	CH18_ExceptionOut	rw		Communication not established	
-28	CH19_ExceptionOut	rw		Communication not established	
-29	CH20_ExceptionOut	rw		Communication not established	
-2A	CH21_ExceptionOut	rw		Communication not established	
-2B	CH22_ExceptionOut	rw		Communication not established	
-2C	CH23_ExceptionOut	rw		Communication not established	
-2D	CH24_ExceptionOut	rw		Communication not established	
-2E	CH25_ExceptionOut	rw		Communication not established	
-2F	CH26_ExceptionOut	rw		Communication not established	
- 30	CH27_ExceptionOut	rw		Communication not established	
-31	CH28_ExceptionOut	rw		Communication not established	
- 32	CH29_ExceptionOut	rw		Communication not established	
-33	CH30_ExceptionOut	rw		Communication not established	
- 34	CH31_ExceptionOut	rw		Communication not established	
- 35	CH0-7_Output_LogicLeveL	rw		Communication not established	
-36	CH8-15_Output_LogicLeveL	rw		Communication not established	
-37	CH16-23_Output_LogicLeveL	rw		Communication not established	
-38	CH24-31_Output_LogicLeveL	rw		Communication not established	
#x9000:00	Information of 32Y	ro	>17<		
-#x9001:00	ErrorCode of 32Y	ro	>2<		

Parameter can	Configure the corresponding index objects by COE Online, startup parameters, or							
be set	SDO read-write instructions: positive logic, negative logic.							
	The program exec	The program execution logic after external signal input.						
	Logic level	Operation	Operation					
Parameter definition	configuration program		result					
	Positive logic SET Y0;		Y0 sets ON					
	Negative logic		Y0 sets OFF					
	Positive logic	RST Y0;	Y0 sets OFF					
	Negative logic		Y0 sets ON					

4.6.7 Usage of XF-E32Y and LFP3-AP

4.6.7.1 Usage of Siemens S7-200SMART

The mapping address of module process data can be viewed in the device view, and the starting address of the case mapping is Q128.0.

T网络 器(CPU SR20_plc200smart) =P3-APV2.00-lfp3-ap	单击 "添加" 按钮来为该设备添加模块。								LFP3-APV 白·主模I	2.00 决 呼3-AP
LFP3-AP(0)		模块名	子模块名	插槽_子插槽	PNI	输	PNQ 起始地	输出长度(日 模块	
1 XF-E32Y(32O 24Vdc)数号	1	LFP3-AP		0		24 				5日 倶吠 5亩 计 粉
6RA	2		LFP3-AP Profinet De	0 32768(×1)		Č.	0		中植	拟甲模块
	3		Port 1	0 32769(×1					田 樹	字里模块
	4		Port 2	0.327700/1						度采集
	5	XF-E32Y(320 24Vdc)数字		1			128	4		决
	6			2						
	7			3		-				
	8			4					-	
	9			5					-	
	10			6		1				
	11			7			1		-	
	12			8					+-	
	13			9		1			+	
	14			10						
	15		1	11		2				
	16			12		-			+	
	17			12		-			-	
	10			13	1	-				
	18			14		2				
	19			15						
	20			16						

■ Process data mapping (PDO)

Name	Туре	Explanation
XF_E32Y	Stuct	32 channels output module
Q128.0	BOOL	Channel 0 output value
Q128.1	BOOL	Channel 1 output value
Q128.2	BOOL	Channel 2 output value
Q128.3	BOOL	Channel 3 output value
Q128.4	BOOL	Channel 4 output value
Q128.5	BOOL	Channel 5 output value
Q128.6	BOOL	Channel 6 output value
Q128.7	BOOL	Channel 7 output value
Q129.0	BOOL	Channel 8 output value
Q129.1	BOOL	Channel 9 output value
Q129.2.	BOOL	Channel 10 output value
Q129.3	BOOL	Channel 11 output value
Q129.4	BOOL	Channel 12 output value

Name	Туре	Explanation
XF_E32Y	Stuct	32 channels output module
Q129.5	BOOL	Channel 13 output value
Q129.6	BOOL	Channel 14 output value
Q129.7	BOOL	Channel 15 output value
Q130.0	BOOL	Channel 16 output value
Q130.1	BOOL	Channel 17 output value
Q130.2	BOOL	Channel 18 output value
Q130.3	BOOL	Channel 19 output value
Q130.4	BOOL	Channel 20 output value
Q130.5	BOOL	Channel 21 output value
Q130.6	BOOL	Channel 22 output value
Q130.7	BOOL	Channel 23 output value
Q131.0	BOOL	Channel 24 output value
Q131.1	BOOL	Channel 25 output value
Q131.2	BOOL	Channel 26 output value
Q131.3	BOOL	Channel 27 output value
Q131.4	BOOL	Channel 28 output value
Q131.5	BOOL	Channel 29 output value
Q131.6	BOOL	Channel 30 output value
Q131.7	BOOL	Channel 31 output value

■ Module configuration parameter

PROFINET 配面向导	×
■ ROOPNET/MM ● 控制器(PCUSR20_jk:200mart) ● 原目 控制器(PCUSR20_jk:200mart) ● (売目) (中) (市) (市) (市) (市) (市) (市) (市) (市) (市) (市	
□ U73 M (0) □ III XF-E22(120 2+iid) 熱引 32過遊高体管輸出值	
2 TEP- 17-1701	^
四件放本	
模块TB:0±00280006	
同件版本	
本地信息 281501280386370	
极块配置修数	
Channel_0	
引レ 通動 昇葉輸出状态 10 輸出 普換値 OFF 👤 3	
通道の逻辑电平磁图 0:正逻辑 ▼	
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R 西文又引用 <u>局</u> 输出图口	

■ Abnormal/STOP output status

Each channel corresponds to a separate parameter, which can be set by selecting the parameter from the drop-down menu.

Parameter can	The parameters can be set are shown in the drop down menu: "Output replacement					
be set	value OFF", "Keep previous value", "Output replacement value ON".					
	Output	When the PLC is in STOP mode, the output terminal is in a reset				
	replacement	state (physical terminal, regardless of channel logic level).				
	value OFF					
Doromotor	Vaan nuovious	When the PLC is in abnormal/STOP mode, the output terminal				
	er Keep previous	outputs the last state of the PLC from RUN to STOP (physical				
definition	value	terminal, regardless of channel logic level).				
	Output	When the PLC is in abnormal/STOP mode, the output terminal				
	replacement	is in the set state (physical terminal, not considering channel				
	value ON	logic level)				
Default	Output replacemen	t value OFF				
parameter						

Channel logic level

Parameter can	The parameters can be set are shown in the drop down menu: positive logic,									
be set	negative logic.	negative logic.								
	The program exec	cution logic after	external signal	input.						
	Logic level	Operation	Operation							
Danamatan	configuration	program	result							
Parameter	Positive logic	SET Y0;	Y0 sets ON							
definition	Negative logic		Y0 sets OFF							
	Positive logic	RST Y0;	Y0 sets OFF							
	Negative logic		Y0 sets ON							

Each channel corresponds to a separate logic level, please select the parameter in the drop down menu.

4.6.7.2 Usage of Siemens S7-1200/1500

Process data mapping

In the device view, the mapping addresses of module process data can be viewed, and the case mapping addresses are Q2.0-Q5.7.



Name	Туре	Explanation
XF_E32Y	Stuct	32 channels output module
Q2.0	BOOL	Channel 0 output value
Q2.1	BOOL	Channel 1 output value
Q2.2	BOOL	Channel 2 output value
Q2.3	BOOL	Channel 3 output value
Q2.4	BOOL	Channel 4 output value
Q2.5	BOOL	Channel 5 output value
Q2.6	BOOL	Channel 6 output value
Q2.7	BOOL	Channel 7 output value

Name	Туре	Explanation
XF_E32Y	Stuct	32 channels output module
Q3.0	BOOL	Channel 8 output value
Q3.1	BOOL	Channel 9 output value
Q3.2	BOOL	Channel 10 output value
Q3.3	BOOL	Channel 11 output value
Q3.4	BOOL	Channel 12 output value
Q3.5	BOOL	Channel 13 output value
Q3.6	BOOL	Channel 14 output value
Q3.7	BOOL	Channel 15 output value
Q4.0	BOOL	Channel 16 output value
Q4.1	BOOL	Channel 17 output value
Q4.2	BOOL	Channel 18 output value
Q4.3	BOOL	Channel 19 output value
Q4.4	BOOL	Channel 20 output value
Q4.5	BOOL	Channel 21 output value
Q4.6	BOOL	Channel 22 output value
Q4.7	BOOL	Channel 23 output value
Q5.0	BOOL	Channel 24 output value
Q5.1	BOOL	Channel 25 output value
Q5.2	BOOL	Channel 26 output value
Q5.3	BOOL	Channel 27 output value
Q5.4	BOOL	Channel 28 output value
Q5.5	BOOL	Channel 29 output value
Q5.6	BOOL	Channel 30 output value
Q5.7	BOOL	Channel 31 output value

Module configuration parameters

			-	· ·	模块	机3	8 插槽	1 地址	Q地址	类型	订货号
	2				✓ Ifp3-ap	0	0			LFP3-AP	LFP3-AP
	33			- I	LFP3-AP Profinet Device	0	0 X1			LFP3-AP	
					XF-E32Y(32O 24Vdc)赦字	0	1		25	XF-E32Y(32O 24Vd	XF-E32Y
					4	0	2				
	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1					0	3				
						0	4				
	_					0	5				
						0	6				
						0	7				
	np	NOPM				0	8				
		- NOISIN				0	9				
				-		0	10				
				<u>-</u>		0	11				
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m	>	138%	· · · · · · · · · ·		1		Ш	1			
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								_	3 属性	11日息 12	诊断
常規 10 受量 系统常	鐵 文本										
常规	描句可留参数										
硬件中断	969/HG1120 XX	4									
模块参数	Channel_0										
订货号:XF-E32Y											
回汗版本	通道0异常输出状态:	0:输出普换值OFF									
秋叶駅本 横井町:0-00280006	通道0逻辑电平配置:	0:正逻辑									
10次回・000280006											
(前th内)要会称 3	Channel_1										
NO HEIL											
real	通道1异常输出状态:	0: 输出替换值OFF									
	通道1逻辑电平配置:	0:正逻辑									

■ Abnormal/STOP output status

Each channel corresponds to a separate parameter, which can be set by selecting the parameter from the drop-down menu.

Parameter can	The parameters can be set are shown in the drop down menu: "Output replacement			
be set	value OFF", "Keep previous value", "Output replacement value ON".			
	Output	When the PLC is in STOP mode, the output terminal is in a reset		
	replacement	state (physical terminal, regardless of channel logic level).		
	value OFF			
Demonstern	Parameter Keep previous	When the PLC is in abnormal/STOP mode, the output terminal		
Parameter		outputs the last state of the PLC from RUN to STOP (physical		
definition	value	terminal, regardless of channel logic level).		
Output		When the PLC is in abnormal/STOP mode, the output terminal		
replacement		is in the set state (physical terminal, not considering channel		
	value ON	logic level)		
Default	Output replacement value OFF			
parameter				

Channel logic level

Parameter can	The parameters can be set are shown in the drop down menu: positive logic,				
be set	negative logic.				
	The program execution logic after ex	xternal signal input.			
	Logic level Operation	Operation			
Demonstern	configuration program	result			
Parameter	Positive logic SET Y0; Y	Y0 sets ON			
definition	Negative logic Y	Y0 sets OFF			
	Positive logic RST Y0; Y	Y0 sets OFF			
	Negative logic Y	Y0 sets ON			

Each channel corresponds to a separate logic level, please select the parameter in the drop down menu.

4.7 Digital IO module XF-E16X16YT

4.7.1 Product overview

The XF-E16X16YT series digital input output expansion module has 16 channels of digital input, supports NPN and PNP inputs, and 16 channels of digital output. It is compatible with XF and XSF series CPU unit products and XF series communication coupler units.

- 16 channel digital input.
- NPN&PNP bipolar input.
- 16 channels digital output.
- NPN output.
- 24mm width design.

Module version:

Hardware version	Software version	Function
H2.0	V2.0	Basic functions for the first official production

4.7.2 Module view

(1) Description of each section



No.	Name	No.	Name
1	System LED indicator light	2	Channel LED indicator light
3	Detachable terminal block	4	Clasp
5	Signal indication	6	Color identification indicating module type
7	Module hardware and firmware version	8	Wiring diagram

(2) System indicator light

System indicator light	Meaning	
	Extinguish	Module not powered on
	Normally ON	All external power supplies of the module are normal
PWR(Green)		(Backplane bus power supply&external input 24V)
	Flashing 1Hz*1	Module power supply is abnormal and cannot operate
		normally
	Normally ON	The module is operating normally
	Flashing 1Hz*1	General errors in module logs
RUN(Green)	Extinguish	Important errors in the module log
	Flashing 10Hz*2	Module establishing communication
	Double flashing*3	Module firmware update



*1: A square wave with a duty cycle of 50% and a frequency of 1Hz.

*2: A square wave with a duty cycle of 50% and a frequency of 10Hz. *3: The following figure:



(3) Channel indicator light

Channel	Channel indicator light		
		Normally	Company ding input shannel has input ON signal
	X0-X17 ON(Green)	Corresponding input channel has input ON signal	
XF-E16X16YT Y0-Y17		Extinguish	Corresponding input channel has no input ON signal
	Normally	Company on diagonations of how output ON signal	
		ON(Green)	Corresponding output channel has output ON signal
		Extinguish	Corresponding output channel has no output ON signal

(4) Color identification

No.	C	Color	Module type
1		Grey White	Digital input
2		Gray	Digital output&digital mixed module
3		Light blue	Analog input
4		Dark blue	Analog output
5		Green	RS232&485 serial port communication
6		Pink	Temperature signal input
7		White	High speed counting

4.7.3 General specifications

Ite	em	Specification
Operating	Max temperature	55°C
temperature	Min temperature	-20°C
Transportation/storage	Max temperature	70°C
temperature	Min temperature	-40°C
Environmental	Upper limit	95%
humidity		
(including	lower limit	10%
operation/storage)		
Protection grade		IP20
		Accord with IEC61131-2
		Under intermittent vibration (frequency 5-9Hz, constant
		amplitude 3.5mm peak displacement) and (frequency
Anti wibration		9-150Hz, constant acceleration 1.0g peak acceleration)
And violation		Under continuous vibration (frequency 5-9Hz, half
		amplitude 1.75mm displacement) and (frequency 9-150Hz,
		constant acceleration 0.5g, constant frame amplitude)
		Scan 10 times in X, Y, and Z directions
Impact resistance		Accord with IEC61131-2
		Impact strength of 15G (peak) with a duration of 11ms is
		applied to three mutually perpendicular axes, with 3 impacts
		per axis (a total of 18 impacts)
Use environment		Non corrosive gas

	- 1 7 1
Item	Specification
Use altitude	0-2000 meters
Over voltage level	II: Accord with IEC61131-2
Pollution level	2: Accord with IEC61131-2
Anti interference EMC	Accord with IEC 61131-2 IEC61000-6-4 B type
Related certifications	UL, CE

4.7.4 Technical specification

	Item	Specification	
	Input channel	16	
	Input type	NPN&PNP compatible	
	Rated input voltage	DC24V	
	Rated input current	6mA	
Input	Input impedance	5ΚΩ	
	Input ON voltage	11V	
	Input ON current	2.5mA	
	Input OFF voltage	5V	
specifications	Input OFF current	1mA	
	Input derating	Derate by 50% when operating at 55°C (with no more than 4	
		ON input points), or by 10°C when all input points are ON.	
	Input resistance ON \rightarrow OFF response time (Hardware)	100us	
	Input resistance OFF \rightarrow ON response time (Hardware)	100us	
	Output channel	16	
	Output type	Transistor (NPN)	
	Rated load voltage	DC24V(DC21.6V~26.4V)	
	Rated load current	0.5A/1 point, 4A/module	
	Surge current protection	Support	
	Leakage current at OFF	Below 0.1mA	
Output	Maximum voltage drop at ON	0.5V~1V	
specifications		Derate by 50% when operating at 55°C(While the output	
	Output derating	current of ON doesn't exceed 2A), or by 10°C when the	
		output point is fully ON.	
	Input resistance $ON \rightarrow OFF$	0.1ms	
	response time (Hardware)	0.1115	
	Input resistance OFF \rightarrow ON	0.1ms	
	response time (Hardware)		
Module	Module power consumption	1W (Backplane bus)+2W(External input)	
specifications	Module weight	132g	

4.7.5 Installation&Wiring

4.7.5.1 Appearance dimension



(Unit: mm)

4.7.5.2 Terminal Definition&Wiring

(1) Terminal definition

XF-E16X16YT								
Meaning	A-list terminal(left)	Meaning	B-list terminal(left)	Terminal layout	Meaning	A-list terminal(right)	Meaning	B-list terminal(right)
CH0	0	CH8	0		CH16	0	CH24	0
CH1	1	CH9	1		CH17	1	CH25	1
CH2	2	CH10	2		CH18	2	CH26	2
CH3	3	CH11	3		CH19	3	CH27	3
CH4	4	CH12	4		CH20	4	CH28	4
CH5	5	CH13	5		CH21	5	CH29	5
CH6	6	CH14	6		CH22	6	CH30	6
CH7	7	CH15	7		CH23	7	CH31	7
SS0	8	SS0	8		24V+	8	0	8



SS0 has an internal short circuit, so all input points of a single module can only choose between NPN or PNP.

(2) External wiring



4.7.5.3 Installation method

(1) Installation requirements

The module is installed using DIN rails, which must comply with the IEC 60715 standard (35mm wide, 1mm thick). The size information is shown in the following figure, in millimeters.



(2) Installation steps



The assembly between IO modules is carried out by sliding installation through the top and bottom rails of the modules, as shown in the left figure:



The module is installed on the guide rail. When installing, align the module with the DIN rail and press the module in the direction indicated by the arrow. After installation, there is a noticeable sound of the module engaging, as shown in the left figure:



After the module installation is completed, the lock buckle will automatically move downwards for locking. If the lock buckle does not move downwards, the top of the lock buckle needs to be pressed downwards to ensure proper installation.

(3) Unstallation steps



4.7.5.4 Installation environment

This product can be installed in four positions (installation direction): horizontal direction, vertical direction, top of the cabinet, and bottom of the cabinet. It is recommended to install in the horizontal direction. The heat dissipation design is through natural convection, to ensure normal ventilation and heat dissipation, and to reserve sufficient wiring space, the minimum gap must be left around this product, as shown in the following figure:





If there are high-temperature heat source equipment (heaters, transformers, high resistors, etc.) around this product, a minimum gap of 100mm should be left between the equipment and the high-temperature heat source.

4.7.5.5 Equipment wiring

sector and the sector and se				
	Suitable cable diameter			
	Chinese standard/mm ²	American Standard/AWG		
	0.3	22		
	0.5	20		
	0.75	18		
	1.0	18		
	1.5	16		

When wiring a module, its terminal must meet the following requirements:

If using other tube type wire lugs, please crimp them to the stranded wire, and the shape and size requirements are shown in the following figure:



4.7.6 Usage of XF-E16X16YT and LFC3-AP

4.7.6.1 Process data mapping (PDO)

Name	Туре	Description		
XF E16X16YT Stuct		16 channel input, 16 channel		
		output module		
——— СН0-Х0	BOOL	Channel 0 input value		
——————————————————————————————————————	BOOL	Channel 1 input value		
CH2-X2	BOOL	Channel 2 input value		
СНЗ-ХЗ	BOOL	Channel 3 input value		
CH4-X4	BOOL	Channel 4 input value		
CH5-X5	BOOL	Channel 5 input value		
CH6-X6	BOOL	Channel 6 input value		
CH7-X7	BOOL	Channel 7 input value		
CH8-X10	BOOL	Channel 8 input value		
CH9 –X11	BOOL	Channel 9 input value		
CH10-X12	BOOL	Channel 10 input value		
CH11-X13	BOOL	Channel 11 input value		
CH12-X14	BOOL	Channel 12 input value		
CH13-X15	BOOL	Channel 13 input value		
CH14-X16	BOOL	Channel 14 input value		
CH15-X17	BOOL	Channel 15 input value		
CH16-Y0	BOOL	Channel 16 input value		
——————————————————————————————————————	BOOL	Channel 17 output value		
CH18-Y2	BOOL	Channel 18 output value		
СН19-ҮЗ	BOOL	Channel 19 input value		
CH20-Y4	BOOL	Channel 20 output value		
CH21-Y5	BOOL	Channel 21 output value		
—— СН22-Ү6	BOOL	Channel 22 output value		

Name	Туре	Description
VE E16V16VT	T Stuct	16 channel input, 16 channel
		output module
CH23-Y7	BOOL	Channel 23 output value
CH24-Y10	BOOL	Channel 24 output value
CH25-Y11	BOOL	Channel 25 output value
CH26-Y12	BOOL	Channel 26 output value
——————————————————————————————————————	BOOL	Channel 27 output value
——————————————————————————————————————	BOOL	Channel 28 output value
——————————————————————————————————————	BOOL	Channel 29 output value
CH30-Y16	BOOL	Channel 30 output value
CH31-Y17	BOOL	Channel 31 output value

4.7.6.2 Module configuration parameter (SDO)

Byte number	Туре	Note
Channel 0 input filter time	BYTE	
Channel 1 input filter time	BYTE	
Channel 2 input filter time	BYTE	
Channel 3 input filter time	BYTE	0: No filter 11: 9ms
Channel 4 input filter time	BYTE	1: 0.25ms 12: 10ms
Channel 5 input filter time	BYTE	2: 0.5ms 13: 11ms
Channel 6 input filter time	BYTE	3: 1ms(default) 14: 12ms
Channel 7 input filter time	BYTE	4: 2ms 15: 13ms
Channel 8 input filter time	BYTE	5: 3ms 10: 14ms 6: 4ms 17: 15ms
Channel 9 input filter time	BYTE	6: 4ms 1/: 15ms 7: 5ms 18: 20ms 8: 6ms 19: 30ms
Channel 10 input filter time	BYTE	
Channel 11 input filter time	BYTE	9: 7ms 20: 64ms
Channel 12 input filter time	BYTE	10: 8ms 21: 128ms
Channel 13 input filter time	BYTE	
Channel 14 input filter time	BYTE	
Channel 15 input filter time	BYTE	
Abnormal output status of channel 16	BYTE	0: Output replacement value OFF (default) 1: Keep the previous value 2: Output replacement value ON
Abnormal output status of channel 17	BYTE	

Abnormal output status of channel 18	BYTE		
Abnormal output status of channel 19	BYTE		
Abnormal output status of channel 20	BYTE		
Abnormal output status of channel 21	BYTE		
Abnormal output status of channel 22	BYTE		
Abnormal output status of channel 23	BYTE		
Abnormal output status of channel 24	BYTE		
Abnormal output status of channel 25	BYTE		
Abnormal output status of channel 26	BYTE		
Abnormal output status of channel 27	BYTE		
Abnormal output status of channel 28	BYTE		
Abnormal output status of channel 29	BYTE		
Abnormal output status of channel 30	BYTE		
Abnormal output status of channel 31	BYTE		
Channel 0-7 logic level configuration	BYTE		
Channel 8-15 logic level configuration	BYTE	0: Positive logic (default); 1: Negative Logic Bit0~bit7 correspond to channels 0~7 (bit8~bit15 correspond to channels 8~15)	
Channel 16-23 logic level configuration	BYTE		
Channel 24-31 logic level configuration	BYTE		

• Channel input filter time

Each channel corresponds to a separate filtering parameter, and double-click the parameter name to configure the corresponding value.
Advanced optic	ons				
ndex:SubIndex	Name	Flag	Value	Communication error message	
+#x8001:00	Configuration of 16X16Y	rw	>36<		
- 15	CH0_FilterTime	rw		Communication not established	
- 16	CH1_FilterTime	rw		Communication not established	
-17	CH2_FilterTime	rw		Communication not established	
- 18	CH3_FilterTime	rw		Communication not established	
- 19	CH4_FilterTime	rw		Communication not established	
-1A	CH5_FilterTime	rw		Communication not established	
- 1B	CH6_FilterTime	rw		Communication not established	
- 1C	CH7_FilterTime	rw		Communication not established	
- 1D	CH8_FilterTime	rw		Communication not established	
-1E	CH9_FilterTime	rw		Communication not established	
— 1F	CH10_FilterTime	rw		Communication not established	
-20	CH11_FilterTime	rw		Communication not established	
-21	CH12_FilterTime	rw		Communication not established	
-22	CH13_FilterTime	rw		Communication not established	
-23	CH14_FilterTime	rw		Communication not established	
-24	CH15_FilterTime	rw		Communication not established	
-25	CH16-ExceptionOut	rw		Communication not established	
-26	CH17-ExceptionOut	rw		Communication not established	
-27	CH18-ExceptionOut	rw		Communication not established	
-28	CH19-ExceptionOut	rw		Communication not established	
-29	CH20-ExceptionOut	rw		Communication not established	
-2A	CH21-ExceptionOut	rw		Communication not established	
-2B	CH22-ExceptionOut	rw		Communication not established	
-2C	CH23-ExceptionOut	rw		Communication not established	

Parameter	When there is a signal at the input terminal and the signal duration exceeds the
definition	filtering time, it is considered as an effective signal
	Configure the corresponding index objects in COE Online, startup parameters, or
Parameters	SDO read-write instructions: no filtering, 0.25ms, 0.5ms, 1ms, 2ms, 3ms, 4ms, 5ms,
can be set	6ms, 7ms, 8ms, 9ms, 10ms, 11ms, 12ms, 13ms, 14ms, 15ms, 20ms, 30ms, 64ms,
	128ms
Default	1ms
parameter	

■ Abnormal/STOP output status

Each channel corresponds to a separate parameter, double-click the parameter name to configure the corresponding value.

Advanced optio	ons				
ndex:SubIndex	Name	Flag	Value	Communication error message	
-22	CH13_FilterTime	rw		Communication not established	
-23	CH14_FilterTime	rw		Communication not established	
-24	CH15_FilterTime	rw		Communication not established	
-25	CH16-ExceptionOut	rw		Communication not established	
-26	CH17-ExceptionOut	rw		Communication not established	
-27	CH18-ExceptionOut	rw		Communication not established	
-28	CH19-ExceptionOut	rw		Communication not established	
-29	CH20-ExceptionOut	rw		Communication not established	
-2A	CH21-ExceptionOut	rw		Communication not established	
-2B	CH22-ExceptionOut	rw		Communication not established	
-2C	CH23-ExceptionOut	rw		Communication not established	
-2D	CH24-ExceptionOut	rw		Communication not established	
-2E	CH25-ExceptionOut	rw		Communication not established	
-2F	CH26-ExceptionOut	rw		Communication not established	
-30	CH27-ExceptionOut	rw		Communication not established	
-31	CH28-ExceptionOut	rw		Communication not established	
-32	CH29-ExceptionOut	rw		Communication not established	
-33	CH30-ExceptionOut	rw		Communication not established	
-34	CH31-ExceptionOut	rw		Communication not established	
- 35	CH0-7 Logical level configuration	rw		Communication not established	
-36	CH8-15 Logical level configuration	rw		Communication not established	
-37	CH16-23 Logical level configuration	rw		Communication not established	
-38	CH24-31 Logical level configuration	rw		Communication not established	
-#x9000:00	Information of 16X16Y	ro	>17<		
+#x9001:00	ErrorCode of 16X16Y	ro	>2<		

Daramatar aan	Configure the corresponding index object in COE Online, startup parameters, or					
ha gat	SDO read-write instructions: "Output replacement value OFF", "Keep previous					
be set	value", "Output replacement value ON".					
	Output	When the PLC is in STOP mode, the output terminal is in a reset				
	replacement	state (physical terminal, regardless of channel logic level).				
D	value OFF					
	Keep previous	When the PLC is in abnormal/STOP mode, the output terminal				
Parameter		outputs the last state of the PLC from RUN to STOP (physical				
definition	value	terminal, regardless of channel logic level).				
	Output	When the PLC is in abnormal/STOP mode, the output terminal				
	replacement	is in the set state (physical terminal, not considering channel				
	value ON	logic level)				
Default	Output replacement value OFF					
parameter						

■ Channel logic level

Each channel corresponds to a separate logic level, and double-click the parameter name to configure the corresponding value.

Advanced opti	ons				
dex:SubIndex	Name	Flag	Value	Communication error message	
-22	CH13_FilterTime	rw		Communication not established	
-23	CH14_FilterTime	rw		Communication not established	
-24	CH15_FilterTime	rw		Communication not established	
-25	CH16-ExceptionOut	rw		Communication not established	
-26	CH17-ExceptionOut	rw		Communication not established	
-27	CH18-ExceptionOut	rw		Communication not established	
-28	CH19-ExceptionOut	rw		Communication not established	
-29	CH20-ExceptionOut	rw		Communication not established	
-2A	CH21-ExceptionOut	rw		Communication not established	
-2B	CH22-ExceptionOut	rw		Communication not established	
-2C	CH23-ExceptionOut	rw		Communication not established	
-2D	CH24-ExceptionOut	rw		Communication not established	
-2E	CH25-ExceptionOut	rw		Communication not established	
-2F	CH26-ExceptionOut	rw		Communication not established	
- 30	CH27-ExceptionOut	rw		Communication not established	
-31	CH28-ExceptionOut	rw		Communication not established	
-32	CH29-ExceptionOut	rw		Communication not established	
-33	CH30-ExceptionOut	rw		Communication not established	
-34	CH31-ExceptionOut	rw		Communication not established	
-35	CH0-7 Logical level configuration	rw		Communication not established	
-36	CH8-15 Logical level configuration	rw		Communication not established	
-37	CH16-23 Logical level configuration	rw		Communication not established	
-38	CH24-31 Logical level configuration	rw		Communication not established	
#x9000:00	Information of 16X16Y	ro	>17<		
#x9001:00	ErrorCode of 16X16Y	ro	>2<		

Parameter can	The parameters can be set are shown in the drop down menu: positive logic,								
be set	negative logic.								
	The program exec	The program execution logic after external signal input.							
Parameter definition	Logic level	Operation	Operation						
	configuration	program	result						
	Positive logic	SET Y0;	Y0 sets ON						
	Negative logic		Y0 sets OFF						
	Positive logic	RST Y0;	Y0 sets OFF						
	Negative logic		Y0 sets ON						

4.7.7 Usage of XF-E16X16YT and LFP3-AP

4.7.7.1 Usage of Siemens S7-200SMART

In the device view, the mapping addresses of module process data can be viewed. The mapping starting addresses for the case are Q128.0 and I128.0.

对络 (CPU SR20_plc200smart) 3-APV2.00-fp3-ap	单击"添加"按钮未为该设备添加模块。							
LFP3-AP(0)		模块名	子模块名	插槽_子插槽	PNI 起始地址	输入长	PNQ 起始地	输出长期
XF-E16X16Y(16IO 24Vdc)数字里输入输	1	LFP3-AP		0				
ξ.	2		LFP3-AP Profi	0 32768(×1)				
	3		Port 1	0 32769(×1				
	4		Port 2	0.327701×1		1	4	
	5 ×F-	×F-E16×16Y(16I0 24Vdc臌		1	128	2	128	2
4	8			2				
	7			3				
	8			4		-	1	
	9		1	5		1	j.	
	10			c				

Process data mapping (PDO)

Nomo	Trues	Evelopation
Name	Туре	Explanation
XF E16X16YT	Stuct	16 channels input, 16 channels
	Studt	output module
I128 0	BOOL	Channel 0 input value
1120.0	DOOL	Chamier o input varae
I128.1	BOOL	Channel 1 input value
I128.2	BOOL	Channel 2 input value
1128.3	BOOL	Channel 3 input value
1120 4	DOOI	
1128.4	BOOL	Channel 4 input value
I128 5	BOOL	Channel 5 input value
1120.5	DOOL	Chamier 5 input value
I128.6	BOOL	Channel 6 input value
		- 1
I128.7	BOOL	Channel 7 input value
I129.0	BOOL	Channel 8 input value
	Deet	
1129.1	BOOL	Channel 9 input value
1120.2	DOOI	
1129.2	BOOL	Channel 10 input value
1120.2	DOOI	Channel 11 innut value
1129.5	DUUL	Channel 11 input value
I129.4	BOOL	Channel 12 input value
1125.1	DOOL	chumer 12 mput vulue
I129.5	BOOL	Channel 13 input value
		-
I129.6	BOOL	Channel 14 input value
	Deet	
1129.7	BOOL	Channel 15 input value
0128.0	BOOI	Channel 16 output value
Q120.0	DOOL	Channel 10 Output value
Q128.1	BOOL	Channel 17 output value
		•
Q128.2	BOOL	Channel 18 output value

Name	Туре	Explanation
XF_E16X16YT	Stuct	16 channels input, 16 channels output module
Q128.3	BOOL	Channel 19 output value
Q128.4	BOOL	Channel 20 output value
Q128.5	BOOL	Channel 21 output value
Q128.6	BOOL	Channel 22 output value
Q128.7	BOOL	Channel 23 output value
Q129.0	BOOL	Channel 24 output value
Q129.1	BOOL	Channel 25 output value
Q129.2	BOOL	Channel 26 output value
Q129.3	BOOL	Channel 27 output value
Q129.4	BOOL	Channel 28 output value
Q129.5	BOOL	Channel 29 output value
Q129.6	BOOL	Channel 30 output value
Q129.7	BOOL	Channel 31 output value

■ Module configuration parameter

示 Get/Put 数据日表 PROFINET 影響		
PROFINET 配置向导 1		×
MAROFINET网络 序 控制器(CPU SR20_plc200smart) 3- [] LFP3-APV2.00-fp3-ap	该页可配置所选模块的每个子模块。	
	1 回海13逻辑电半献素 0:正逻辑	
1)	Channel_14 通道14输入悲掠时间(ms) 3.1mc _	
133	通道14逻辑电平默团 [0: 正逻辑 _ Channel_15	
	通道15输入连波时间(ss) <u>3.1ms</u>	
	Channel_16	
	通道16异常输出状态 0.输出普换值OFF 👤	
	通過16逻辑电平配置 [0:正逻辑] 4 Channel_17	
5 I	通道17异常输出状态 [0: 输出卷检值OFF ▼]	

■ Channel input filter time

Each channel corresponds to a separate filtering parameter, which can be set by selecting the parameter from the

drop-down menu.

Parameter	When there is a signal at the input terminal and the signal duration exceeds the					
definition	filtering time, it is considered as an effective signal					
Parameter can be set	The parameters can be set are shown in the drop down menu: No filtering, 0.25ms, 0.5ms, 1ms, 2ms, 3ms, 4ms, 5ms, 6ms, 7ms, 8ms, 9ms, 10ms, 11ms, 12ms, 13ms, 14ms, 15ms, 20ms, 30ms, 64ms, 128ms					
Default parameter	1ms					

■ Abnormal/STOP output status

Each channel corresponds to a separate parameter, which can be set by selecting the parameter from the drop-down menu.

Parameter can	The parameters can be set are shown in the drop down menu: "Output replacement				
be set	value OFF", "Keep previous value", "Output replacement value ON".				
	Output replacement	When the PLC is in STOP mode, the output terminal is in a reset state (physical terminal, regardless of channel logic level).			
	value OFF				
Parameter definition	Keep previous value	When the PLC is in abnormal/STOP mode, the output terminal outputs the last state of the PLC from RUN to STOP (physical terminal, regardless of channel logic level).			
	Output	When the PLC is in abnormal/STOP mode, the output terminal			
	replacement	is in the set state (physical terminal, not considering channel			
	value ON	logic level)			
Default	Output replacement value OFF				
parameter					

■ Channel logic level

Each channel corresponds to a separate logic level configuration. The setting method is to select parameters from the drop-down menu.

Parameter can	The parameters can be set are shown in the drop down menu: positive logic,						
be set	negative logic.						
	The program execution logic after external signal input.						
Parameter definition	Logic level	Operation					
	configuration	program	result				
	Positive logic	SET Y0;	Y0 sets ON				
	Negative logic		Y0 sets OFF				
	Positive logic	RST Y0;	Y0 sets OFF				
	Negative logic		Y0 sets ON				

4.7.7.2 Usage of Siemens S7-1200/1500

Process data mapping

In the device view, the mapping addresses of module process data can be viewed, the case mapping addresses are I2.0-I3.7 and Q2.0-Q3.7.



Name	Туре	Explanation
XF_E16X16YT	Stuct	16 channels input, 16 channels output module
——— I2.0	BOOL	Channel 0 input value
——— I2.1	BOOL	Channel 1 input value
——— I2.2	BOOL	Channel 2 input value
I2.3	BOOL	Channel 3 input value
——— I2.4	BOOL	Channel 4 input value
——— I2.5	BOOL	Channel 5 input value
I2.6	BOOL	Channel 6 input value
——— I2.7	BOOL	Channel 7 input value
——— I3.0	BOOL	Channel 8 input value
I3.1	BOOL	Channel 9 input value
I3.2	BOOL	Channel 10 input value
I3.3	BOOL	Channel 11 input value
——— I3.4	BOOL	Channel 12 input value
I3.5	BOOL	Channel 13 input value
I3.6	BOOL	Channel 14 input value
I3.7	BOOL	Channel 15 input value
Q2.0	BOOL	Channel 16 output value

Name	Туре	Explanation
XF E16X16YT	Stuct	16 channels input, 16 channels
	Studt	output module
Q2.1	BOOL	Channel 17 output value
Q2.2	BOOL	Channel 18 output value
Q2.3	BOOL	Channel 19 output value
Q2.4	BOOL	Channel 20 output value
Q2.5	BOOL	Channel 21 output value
Q2.6	BOOL	Channel 22 output value
Q2.7	BOOL	Channel 23 output value
Q3.0	BOOL	Channel 24 output value
Q3.1	BOOL	Channel 25 output value
Q3.2	BOOL	Channel 26 output value
Q3.3	BOOL	Channel 27 output value
Q3.4	BOOL	Channel 28 output value
Q3.5	BOOL	Channel 29 output value
Q3.6	BOOL	Channel 30 output value
Q3.7	BOOL	Channel 31 output value

Module configuration parameter

Ifp3-ap [LFP3-AP]	💌 📰 🔏 🗄 🔲 🍳 ±	🔒 🗌 设备	概览						
		^ *	模块	机架	插槽	1 地址	Q地址	类型	订货号
		-	▼ lfp3-ap	0	0			LFP3-AP	LFP3-AP
			LFP3-AP Profinet Device	0	0 X1			LFP3-AP	
			XF-E16X16Y(16IO 24Vdc)	0	1	23	23	XF-E16X16Y(16I0	XF-E16X
	2.39		1	0	2				
	402			0	3				
				0	4				
				0	5				
				0	0				
				0	0				
		-		0	0				
	DP.NOPM	<u>•</u>		0	10				
		2		0	11				
		-		0	12				
				0	13				
				0	14				
				0	15				
				0	16				
				0	17				
				0	18				
				0	19				
				0	20				
				0	21				
		_		0	22				
e	A 1384	×		U			2		_
	> 138%			_	ш	_	-	_	
XF-E16X16Y(16IO_24Vdc)	数字重输入输出_1 [XF-E16X16Y(16IO 24Vdc) Sink Input]						尾性	1.信息 2.	诊断
常規 10 变量 🗄	系统常数 文本					_			
▶ 常規 17(4)+45	模块配置参数								
使用+中間 ▼ 植块参数	Channel 0								
订货号:XF-E16X16Y									
固件版本	通道0输入滤波时间(ms): 3:1ms 4								
软件版本	通道0课程由亚融图: 0:正课程								
模块ID:0x00280004	4								
固件版本	, Channel_1								
相吠配五参数 3									
I/O HEHH	通道1输入滤波时间(ms): 3:1ms			_					
NO YOAL									

■ Channel input filter time

Each channel corresponds to a separate filtering parameter, which can be set by selecting the parameter from the drop-down menu.

Parameter	When there is a signal at the input terminal and the signal duration exceeds the					
definition	filtering time, it is considered as an effective signal					
Parameter can be set	The parameters can be set are shown in the drop down menu:					
	No filtering, 0.25ms, 0.5ms, 1ms, 2ms, 3ms, 4ms, 5ms, 6ms, 7ms, 8ms, 9ms, 10ms,					
	11ms, 12ms, 13ms, 14ms, 15ms, 20ms, 30ms, 64ms, 128ms					
Default	1ms					
parameter						

■ Abnormal/STOP output status

Each channel corresponds to a separate parameter, which can be set by selecting the parameter from the drop-down menu.

Parameter can	The parameters can be set are shown in the drop down menu: "Output replacement				
be set	value OFF", "Keep previous value", "Output replacement value ON".				
	Output When the PLC is in STOP mode, the output terminal is in a reset				
	replacement	state (physical terminal, regardless of channel logic level).			
Parameter	value OFF				
definition	1 /2 ·	When the PLC is in abnormal/STOP mode, the output terminal			
	Keep previous	outputs the last state of the PLC from RUN to STOP (physical			
	value	terminal, regardless of channel logic level).			

	Output	When the PLC is in abnormal/STOP mode, the output terminal
	replacement	is in the set state (physical terminal, not considering channel
	value ON	logic level)
Default	Output replacement	t value OFF
parameter		

■ Channel logic level

Each channel corresponds to a separate logic level configuration. The setting method is to select parameters from the drop-down menu.

Parameter can	The parameters can be set are shown in the drop down menu: positive logic,						
be set	negative logic.						
	The program execution logic after external signal input.						
Parameter definition	Logic level	Operation	Operation				
	configuration	program	result				
	Positive logic	SET Y0;	Y0 sets ON				
	Negative logic		Y0 sets OFF				
	Positive logic	RST Y0;	Y0 sets OFF				
	Negative logic		Y0 sets ON				

5. Analog module unit

5.1 Naming rules

	XF - E O	AD [$] DA - \bigcirc - \square$
	$\frac{1}{1} \frac{1}{2} \frac{1}{3}$	$\overline{4}$ $\overline{5}$	$\overline{0}$ $\overline{6}$ $\overline{7}$ $\overline{8}$
(1)	Series name	XF.	XE series expansion module
	Refers to the extension module		Represents the right expansion module
 	Input channel	1.	
3	input channel	1:	
		2:	2 channel
		4:	4 channel
		6:	6 channel
		8:	8 channel
4	Туре	AD:	Indicates analog voltage and current input
5	Output channel	1:	1 channel
		2:	2 channel
		4:	4 channel
		6:	6 channel
		8:	8 channel
6	Туре	DA:	Indicates analog voltage and current input
$\overline{7}$	Analog quantity type	Empty:	Indicating current&voltage type
		A:	Indicating current type
		V:	Indicating voltage type
8	Module type	Empty:	General
		Н:	Channel to channel isolation
		S:	High-precision
		U:	High speed
-			

5.2 Analog input unit XF-E4AD

5.2.1 Overview

XF-E4AD series analog input expansion module, which has 4 channels of analog input, supports current and voltage inputs, adapt to XF, XSF series CPU unit products and XF series communication coupler units.

- 4-channel analog input.
- Channel conversion speed 60us/channel.
- Maximum 0.2% error.
- Voltage and current input.
- Designed with a width of 12mm.

Module version

Hardware version	Firmware version	Function
H2.0	V2.0	Basic functions for the first official production

5.2.2 Module view

1) Description of each section



No.	Name	No.	Name
1	System LED indicator lights	2	Channel LED indicator light
3	Detachable terminal block	4	Snap
5	Model indication	6	Color identification indicating module type
\overline{O}	Module hardware and firmware versions	8	Wiring diagram

2) System indicator

System indicator		Explanation				
	Extinguish	Module not powered on				
DWD (Croon)	Light	All external power supplies of the module are normal (backplane bus				
PWK (Green)		power supply & external input 24V)				
	Flash1Hz ^{*1}	Abnormal power supply in the module and inability to operate normally				
	Light	The module is running normally				
	Flash1Hz ^{*1}	General errors in module logs				
DUN (Croop)	Extinguish	Important errors in module logs				
KUN (Green)	Flash10Hz ^{*2}	Module establishing communication				
	Double	Madula firmurara undata				
	flashing*3					

- - *1: A square wave with a duty cycle of 50% and a frequency of 1Hz.
 - *2: A square wave with a duty cycle of 50% and a frequency of 10Hz.
 - *3: As shown in the following figure:



3) Channel indicator light

Model	Channel indicator light			
		Light (Green)	Channel enabled and configured correctly	
AF-E4AD	Спо~Спз	Extinguish	Disable channel	

4) Color identification

No.	Color		Module type
1		Grey white	Digital input
2		Gray	Digital output&digital mixed module
3		Light blue	Analog input
4		Deep blue	Analog output
5		Green	RS232&485 serial port communication
6		Pink	Temperature signal input
7		White	High speed counting

5.2.3 General specification

General specification			
Project	_	Specifications	
On anoting to management	Maximum temperature	55°C	
Operating temperature	Minimum temperature	-20°C	
Transportation/Storage	Maximum temperature	70°C	
Temperature	Minimum temperature	-40°C	
Environmental	Upper limit	95%	
humidity (including operation/storage)	Lower limit	10%	
IP level		IP20	
		Compliant with IEC61131-2	
Anti vibration		Under intermittent vibration (frequency 5-9Hz, constant amplitude 3.5mm peak displacement) and (frequency 9-150Hz, constant acceleration 1.0g peak acceleration) Under continuous intermittent vibration (frequency 5-9Hz half amplitude 1.75mm displacement) and (frequency 9-150Hz constant acceleration 0.5g constant frame amplitude) Scan 10 times in X, Y, and Z directions	
Impact resistance		Complies with IEC61131-2 standard The impact strength is 15G (peak) and the duration is 11ms. It is applied to three mutually perpendicular axes, and each axis is impacted 3 times (a total of 18 impacts)	
Using environment		Non corrosive gas	
Using altitude		0-2000m	
Overvoltage level		II: Compliant with IEC61131-2	
Pollution level		2: Compliant with IEC61131-2	
Anti interference EMC		Compliant with IEC 61131-2 IEC61000-6-4 Type B	
Related certifications		CE	

5.2.4 Technical specifications

5.2.4.1 Module performance

Project		Specifications		
	Input channel	4		
		0V~5V (0~64000)		
		0V~10V (0~64000)		
	V. 14	-5V~5V (-32000~32000)		
	voltage input range	-10V~10V (-32000~32000)		
Analog input		1v~5v (12800~64000)		
range (rated)		Impedance greater than 1M		
		0mA~20mA (0~64000)		
		4mA~20mA (12800~64000)		
	Current input range	-20mA~20mA (-32000~32000)		
		Impedance is approximately 120 Ω		
Maximum input	Voltage input	DC±15V		
range	Current input	-40~40mA		
Conversion speed		12us/CH		
Response speed		60us		
Resolution		1/64000 (16Bit)		
Module power	Rated input	DC24V±10%, 150mA		
supply	Protect	Reverse polarity protection		
D ame a	Room temperature 25°C±5°C	±0.1% (25±5 °C)		
Error	Full temperature end -20~55°C	±0.2%		
Isolated		Channel non isolated, power isolated		
Module power con	sumption	0.7W (backplane bus)+0.5W (external input)		
Module weight		80g		

5.2.4.2 Analog-to-digital conversion diagram

(1) Voltage









5.2.5 Terminal definition&Wiring

5.2.5.1 Dimension



87. 84

5.2.5.2 Terminal definition&Wiring

(1) Terminal definition

XF-E4AD					
Meaning	A-column	Terminal	B-column	Meaning	
	terminal	layout	terminal		
CH0- Input ground	0		0	CH2- Input ground	
CH0-AD analog voltage input	1		1	CH2-AD analog voltage input	
terminal	1		1	terminal	
CH0-AD analog current input	2		2	CH2-AD analog current input	
terminal	2		2	terminal	
CH1- Input ground	3		3	CH3- Input ground	
CH1-AD analog voltage input	1		1	CH3-AD analog voltage input	
terminal	7			terminal	
CH1-AD analog current input	5	• 000•	5	CH3-AD analog current input	
terminal	5		5	terminal	
Empty	6		6	Empty	
Empty	7		7	Empty	
External 24V power supply for	Q		0	External power supply to the	
module positive	0		0	module 24V power supply negative	

(2) External wiring



(1)System indicator (2)Channel indicator light (3)Backplane bus (4)Input channels&wiring

5.2.5.3 Installation method

1) Installation requirements

The module is installed using DIN rails, which must comply with the IEC 60715 standard (35mm wide, 1mm thick). The dimension information is shown in the following figure, and the unit is (mm).



2) Installation steps



1. The assembly between IO modules is installed by sliding through the top and bottom guide rails of the modules, as shown in the left figure:



2. The module is installed on the guide rail. When installing, align the module with the DIN guide rail and press the module in the direction indicated by the arrow. After installation, there is a clear sound of engagement, as shown in the left figure:



Explanation: After the module installation is completed, the locking buckle will automatically move downwards for locking, if the latch does not move downwards, press down on the top of the latch, ensure proper installation.

3) Disassembly steps



1. Use a flat screwdriver or similar tool to pry the rail lock upwards, as shown in the left figure:

- 2. Pull the module straight forward at the buckle position (raised part), and then press down on the top of the latch, as shown in the left figure:

5.2.5.4 Installation environment

This product can be installed in four positions (i.e. installation direction): horizontal, vertical, top of cabinet, and bottom of cabinet. It is recommended to install in the horizontal direction, and the heat dissipation design is through natural convection. To ensure normal ventilation and heat dissipation and reserve sufficient wiring space, the minimum gap must be left around this product, as shown in the following figure:





If there are high-temperature heat source equipment (heaters, transformers, large resistors, etc.) around this product, leave at least 100mm gap between the equipment and the high-temperature heat source.

5.2.5.5 Equipment wiring

Adaptor diameter			
National standard/mm ²	American standard/AWG		
0.3	22		
0.5	20		
0.75	18		
1.0	18		
1.5	16		

When wiring the module, its terminal must meet the following requirements:

If using other tube type wire ears, please crimp them to the twisted wire. The shape and size requirements are shown in the following figure:



5.2.6 Usage of XF-E4AD and LFC3-AP

5.2.6.1 Process data mapping (PDO)

	Name	Туре	Explanation
	XF_E4AD	Stuct	4-channel input module
_	——— СН0	DINT	Channel 0 input value
	——————————————————————————————————————	DINT	Channel 1 input value
-	—— СН2	DINT	Channel 2 input value
	СНЗ	DINT	Channel 3 input value
_	ErrCode_module	WORD	Module level error codes
	ErrCode_CH	DWORD	Channel level error code

Error code parameters

Module level error codes (ErrCode_module)				
Bit position	Meaning	Error level		
0	The 24V input power supply of the module is abnormal	Important		
2	Internal module error occurred and cannot be fixed by the user layer	Important		
3	Version mismatch	Important		
4	ADC/DAC read/write failure	Important		

Channel level error code (ErrCode_CH)				
Bit position	Meaning	Error level		
0	Channel 0 upper limit overflow	General		
1	Channel 0 lower limit overflow	General		
2	Channel 0 disconnected	Important		
3	Reserve	-		
4	Channel 1 upper limit overflow	General		
5	Channel 1 lower limit overflow	General		
6	Channel 1 disconnected	Important		
7	Reserve	-		
8	Channel 2 upper limit overflow	General		
9	Channel 2 lower limit overflow	General		
10	Channel 2 disconnected	Important		
11	Reserve	-		
12	Channel 3 upper limit overflow	General		
13	Channel 3 lower limit overflow	General		
14	Channel 3 disconnected	Important		

5.2.6.2 Module configuration parameters (SDO)

Parameter	Туре	Channel	Nc	ite
Power detection			0: Close	1: Open
Channel enable/disable	Enumeration of BYTE		0: Close	1: Open
Enable/disable wire	Enumeration of BYTE		0: Close	1: Open
breakage detection				r
			0: 0~10V(Default)	4: 1~5V
Range selection	BYTE		1: 0~5V	5: 0~20mA
Trange bereenon	DITE		2: -10~10V	6: 4~20mA
			3: -5~5V	7: -20~20mA
			0: First order	2: Average
Filtering method	BYTE		filtering	number of times
			1: Time average	3: Moving average
			Time average (2-100n	ns) default value 2
			Average frequency (4	-500) default value 4
Filtering parameter	INT		Moving average (2-50	00) default value 2
			First order delay filte	ring (0-254) defaults
			to 0 (no filtering)	
Calibration enable/disable	Enumeration of BYIE		0: Close	1: Open
Calibration 1 analog	INIT		Voltage input	
quantity	11N 1		0~10V:	
			Analog range: 0-1000	0mV
		Channel	Digital range: 0-64000)
			0~5V:	
		0-4	Analog range:0-5000r	nV
			Digital range: 0-64000)
			-10~10V:	
Calibration 1 digital			Analog range: -10000	-10000mV
quantity	DINI		Digital range: -32000-32000	
			-5~5V:	
			Analog range: -5000-:	5000mV
			Digital range: -32000-	-32000
			1~5V:	
			Analog range: 1000mV-5000mV	
			Digital range: 12800-64000	
Calibration 2 analog	NT		Current input	
quantity	11N 1		0~20mA:	
			Analog range: 0-2000	0uA
			Digital range: 0-64000)
Calibration 2 digital			4~20mA:	
Canoration 2 digital	DINT		Analog range: 4000-2	0000uA
qualitity			Digital range: 12800-0	54000
			-20~20mA:	
			Analog range: -20000-20000uA	

Parameter	Туре	Channel	Note
			Digital range: -32000-32000
Enable/disable unit display conversion	Enumeration of BYTE		0: Close 1: Open
Unit display conversion limit Unit Display Conversion	DINT		Range: -100000000~10000000 and after conversion of enabled units (Upper limit-Lower limit) > 0
Enable/disable upper and lower limit overflow settings	Enumeration of BYTE		0: Close 1: Open
Upper limit overflow analog quantity	INT		Analog range: in mV, uA units, for example: 0~10V: 0~10000mV
Upper limit overflow output digital quantity	DINT		Voltage input 0~10V:
Lower limit overflow analog quantity	INT		Analog range: 0-10000mV Digital range: 0-64000
Lower limit overflow output digital quantity	DINT	•	0~5V: Analog range: 0-5000mV
Lower limit overflow output digital quantity	DINT		Digital range: $0-64000$ - $10\sim10V$: Analog range: $-10000-10000mV$ Digital range: $-32000-32000$ - $5\sim5V$: Analog range: $-5000-5000mV$ Digital range: $-32000-32000$ $1\sim5V$: Analog range: $1000mV-5000mV$ Digital range: $12800-64000$ Current input $0\sim20mA$: Analog range: $0-20000uA$ Digital range: $0-64000$ $4\sim20mA$: Analog range: $4000-20000uA$ Digital range: $12800-64000$ $-20\sim20mA$: Analog range: $-20000-20000uA$ Digital range: $-20000-20000uA$ Digital range: $-32000-32000$

- Module power supply detection
 - Check if the external 24V power supply of the module is normal.
 - Normal: The module is running normally.

- Exception: The module channel cannot be used but can be configured, and scanned normally. ٠
- Can set parameters: enable or disable (default is disabled).

Advanced opti	ons			
Index : SubIndex =-#x8021 : 00	Name Module	Flag rw	Value >1<	Communication error message
-01	Power Detection	rw		Communication not established
-#x 8022:00	Channal O	rw	>18<	
-15	Channel enable/disable	rw		Communication not established
-16	Enable/disable wire breakage	rw		Communication not established
-17	Range selection	rw		Communication not established
-18	Filtering method	rw		Communication not established
-19	filtering parameter	rw		Communication not established
—1B	Calibration enable/disable	rw		Communication not established
-1C	Calibration 1 Analog Quantity	rw		Communication not established
-1E	Calibration 1 Digital Quantity	rw		Communication not established
-22	Calibration 2 Analog Quantity	rw		Communication not established
-24	Calibration 2 Digital Quantity	rw		Communication not established
-28	Enable/disable unit display	rw		Communication not established
-29	Unit display conversion limit	rw		Communication not established

Channel enable/disable

Enable or disable AD sampling channels to save module sampling time.

	Launch parame	ters IO Mapping COE-Online						
	Advanced o	options						
	Index:SubInd	lex Name	Flag	Value	Communication error message			
	E-#x8021:00	Module	rw	>1<				
	-01	Power Detection	rw		Communication not established			
	=-#x8022:00	Channal O	rw	>18<				
	-15	Channel enable/disable	rw		Communication not established			
	-16	Enable/disable wire breakage	rw		Communication not established			
	-17	Kange selection	rw		Communication not established			
	-18	Filtering method	rw		Communication not established			
	-19	filtering parameter	rw		Lommunication not established			
	-18	Calibration enable/disable	rw		Lommunication not established			
		Calibration 1 Analog Quantity	rw		Communication not established			
	21	Calibration I Digital Quantity	rw		Communication not established			
	24	Calibration 2 Analog Quantity	rw		Communication not established			
	-24	Rachla/dischla unit disalay	IW		Communication not established			
	20	Mable disable unit display	1.		Communication not established			
	23	Unit Display Conversion Laws	1.		Communication not established			
	-31	Enable/disable upper and low	1 n Yw		Communication not established			
	-32	Upper limit overflow analog			Communication not established			
	-34	Upper limit overflow output	rw		Communication not established			
	-38	Lower limit overflow analog	rw		Communication not established			
	—3A	Lower limit overflow output	rw		Communication not established			
Settable parameter	ers	Enable/disable (in d	lisable n	node, subs	sequent software function	ns for	the	
		corresponding channel cannot be set)						
Default paramete	ers	Enable						
		The conversion time f	for each c	hannel is 6	50us, and the total time is	equal to	o the	
Note		on/off conversion speed multiplied by the number of enabled channels. If this						
1000		channel is not used, it	can be set	t to "disable	e" to reduce the total conver	sion tin	ne of	
		the module						

Wire breakage detection

Detect abnormal disconnection of AD input channel and configure alarm logs. If there is no current • flowing through the module or the current flowing is too low (the measurement range is 4-20 mA or 1-5V), the corresponding alarm log will be triggered, which can activate both circuit breaker detection and underflow simultaneously.

• Can set parameters: enable or disable (default is disabled).

 $\mathbf{0}$

This function is only supported when the "measurement range" is set to "4mA~20mA" and "1V~5V".

aunch paramet	ers IU Mapping COLUNTING			
Advanced op	otions			
Index:Sub	Name	Flag	Value	Communication error message
-#x8022:00	Channal O	rw	>18<	
-15	Channel enable/disable	rw		Communication not established
-16	Enable/disable wire breakage detection	rw		Communication not established
-17	Range selection	rw		Communication not established
-18	Filtering method	rw		Communication not established
-19	filtering parameter	rw		Communication not established
-1B	Calibration enable/disable	rw		Communication not established

■ Sampling type/range

You can choose different types and ranges of sampling analog signals.

Advanced or	otions			
Index:Sub	Name	Flag	Value	Communication error message
#x8022:00	Channal O	rw	>18<	
-15	Channel enable/disable	rw		Communication not established
-16	Enable/disable wire breakage detection	rw		Communication not established
-17	Range selection	rw		Communication not established
-18	Filtering method	rw		Communication not established
-19	filtering parameter	rw		Communication not established
-1B	Calibration enable/disable	rw		Communication not established
-1C	Calibration 1 Analog Quantity	rw		Communication not established
-1E	Calibration 1 Digital Quantity	rw		Communication not established
-22	Calibration 2 Analog Quantity	rw		Communication not established
-24	Calibration 2 Digital Quantity	rw		Communication not established
-28	Enable/disable unit display conversion	rw		Communication not established
-29	Unit display conversion limit	rw		Communication not established
—2D	Unit Display Conversion Lower Limit	rw		Communication not established
-31	Enable/disable upper and lower limit overflow settings	rw		Communication not established
-32	Upper limit overflow analog quantity	rw		Communication not establishe
-34	Upper limit overflow output digital quantity	rw		Communication not established
-38	Lower limit overflow analog quantity	rw		Communication not established
-3A	Lower limit overflow output digital quantity	rw		Communication not established

Settable parameters	Configure the corresponding index objects in COE-Online, startup parameters, or SDO read and write instructions: voltage, current				
Default parameters	0V~10V				
	0V~5V, 0V~10V, -5V~5V, -10V~10V, 1V~5V				
voltage measurement range	Default: 0V~10V				
Current measuring range	g range 0mA~20mA, 4mA~20mA, -20mA~20mA				

Channel filtering parameters

• First order filtering

The first-order low-pass filtering method uses the weighting of the current sampling value and the output value of the previous filtering to obtain the effective filtering value. The filtering coefficient is set by the user to $0\sim254$. The smaller the value, the more stable the data will be, but it may cause data lag;

Therefore, when set to 1, the filtering effect is strongest and the data is most stable. When set to 254, the filtering effect is weakest. The default is 0 (not filtered).

-	i i ei age interin	
		Perform A/D conversion according to the set time, and average the total value
	Functional	after removing the maximum and minimum values. The average processed value
Time	actions	is stored in the corresponding output buffer memory. The number of processing
average	actions	times within the set time varies depending on the number of channels allowed
		for A/D conversion.
	Set range	$2 \sim 100 \text{ms}$ (Default value 2)
		Perform A/D conversion according to the set number of times, and average the
		total value after removing the maximum and minimum values. The average
Engangener	Functional	processed value is stored in the corresponding channel variable. The time it takes
Frequency	actions	for the average of the number of times to be stored in the corresponding channel
average		variable varies depending on the number of channels allowed for A/D
		conversion.
	Set range	$4 \sim 500$ (Default value 4)
		After averaging the specified number of digital output values obtained in each
Move	Functional	sampling cycle, store them in the corresponding output register/variable. Due to
average	actions	moving average processing in each sampling process, the latest digital output
times		values can be obtained.
	Set range	$2\sim$ 500 (Default value 2)

• Average filtering

• Settable parameters

• Filtering mode (configuring corresponding index objects in COE-Online, startup parameters, or SDO read and write instructions): "first order filtering", "time average filtering", "frequency average filtering", and "moving average filtering" (default: first order filtering).

• Filter parameters (corresponding index objects configured in COE-Online, startup parameters, or SDO read and write instructions): in the "first-order filtering" mode, you can set: 0~254 (default value: 0), in the "time average filtering" mode, you can set: 2ms~100ms(default value: 2), in the "average filtering times" mode, it can be set to 4~500 (default value: 4), in the "moving average filtering" mode, it can be set to 2~500 (default value: 2).

Advanced op	tions			
Index:SubI	Name	Flag	Value	Communication error message
∓- #x8021∶00	Module	rw	>1<	
# x8022:00	Channal O	rw	>18<	
-15	Channel enable/disable	rw		Communication not established
-16	Enable/disable wire breakage detection	rw		Communication not established
-17	Range selection	rw		Communication not established
-18	Filtering method	rw		Communication not established
-19	filtering parameter	rw		Communication not established
-1B	Calibration enable/disable	rw		Communication not established
-1C	Calibration 1 Analog Quantity	rw		Communication not established
-1E	Calibration 1 Digital Quantity	rw		Communication not established
-22	Calibration 2 Analog Quantity	rw		Communication not established

Calibration function



Due to the possibility of drift between the digital signals obtained from AD acquisition and conversion and the analog signals received after the product has been used for a period of time at the factory, customers can calibrate by setting the AD calibration function, immediately reflect to the scaling value (numerical operation value), you can easily complete the calibration during system startup on your own.

Advanced opti	ons			
Index:SubIndex	Name N. J1.	Flag	Value	Communication error message
==#x8021.00	-#xouzi.uu module r		>180	
-15	Channel enable/disable	rw	,101	Communication not established
-16	Enable/disable wire breakage detection	rw		Communication not established
-17	Range selection	rw		Communication not established
-18	Filtering method	rw		Communication not established
-19	filtering parameter	rw		Communication not established
—1B	Calibration enable/disable	rw		Communication not established
-1C	Calibration 1 Analog Quantity	rw		Communication not established
-1E	Calibration 1 Digital Quantity	rw		Communication not established
-22	Calibration 2 Analog Quantity	rw		Communication not established
-24	Calibration 2 Digital Quantity	rw		Communication not established
-28	Enable/disable unit display conversion	rw		Communication not established
-29	Unit display conversion limit	rw		Communication not established
-2D	Unit Display Conversion Lower Limit	rw		Communication not established
-31	Enable/disable upper and lower limit o	rw		Communication not established
-32	Upper limit overflow analog quantity	rw		Communication not established
-34	Upper limit overflow output digital qu	rw		Communication not established
-38	Lower limit overflow analog quantity	rw		Communication not established
-3A	Lower limit overflow output digital qu	rw		Communication not established

Unit display conversion

This function can directly display the output analog data as the actual output unit required by the customer.

Due to the fact that customers use analog expansion module DA to output analog signals that correspond to the outputs of some instruments or sensors. For example, controlling the frequency output range of a frequency converter to be 0-50Hz, and controlling the output frequency of the frequency converter to control the analog signal to be 4-20mA, the existing DA module will output 4-20mA analog signal to the analog acquisition terminal of the frequency converter. Customers need to convert the digital signal from 0 to 65535 to 0 to 50Hz for the actual output frequency of the frequency converter the analog output of module DA into the actual output frequency value of the frequency converter by setting the conversion value range.

Advanced opti				
Index:SubIndex	Name	Flag	Value	Communication error messag
-# x8021:00	Module	rw	>1<	
#x8022:00	Channal O	rw	>18<	
-15	Channel enable/disable	rw		Communication not establish
-16	Enable/disable wire breakage detection	rw		Communication not establish
-17	Range selection	rw		Communication not establish
-18	Filtering method	rw		Communication not establish
-19	filtering parameter	rw		Communication not establis
-1B	Calibration enable/disable	rw		Communication not establis
-1C	Calibration 1 Analog Quantity	rw		Communication not establis
-1E	Calibration 1 Digital Quantity	rw		Communication not establis
-22	Calibration 2 Analog Quantity	rw		Communication not establis
-24	Calibration 2 Digital Quantity	rw		Communication not establis
-28	Enable/disable unit display conversion	rw		Communication not establis
-29	Unit display conversion limit	rw		Communication not establis
-2D	Unit Display Conversion Lower Limit	rw		Communication not establis
-31	Enable/disable upper and lower limit o	rw		Communication not establis
-32	Upper limit overflow analog quantity	rw		Communication not establis
-34	Upper limit overflow output digital qu	rw		Communication not establis
-38	Lower limit overflow analog quantity	rw		Communication not establis
L_3A	Lower limit overflow output digital qu	rw		Communication not establis

■ Up and down overflow settings

When the AD channel sampling is greater than the Upper limit/Lower limit set value, an alarm log is triggered and the set value is output.

Launch parameter	s IO Mapping COE-Online			
Advanced opti	ons			
Index:SubIndex	Name	Flag	Value	Communication error message
⊞-#x8021:00	Module	rw	>1<	
⊨ - # x8022∶00	Channal O	rw	>18<	
-15	Channel enable/disable	rw		Communication not established
-16	Enable/disable wire breakage detection	rw		Communication not established
-17	Range selection	rw		Communication not established
-18	Filtering method	rw		Communication not established
-19	filtering parameter	rw		Communication not established
-1B	Calibration enable/disable	rw		Communication not established
-1C	Calibration 1 Analog Quantity	rw		Communication not established
-1E	Calibration 1 Digital Quantity	rw		Communication not established
-22	Calibration 2 Analog Quantity	rw		Communication not established
-24	Calibration 2 Digital Quantity	rw		Communication not established
-28	Enable/disable unit display conversion	rw		Communication not established
-29	Unit display conversion limit	rw		Communication not established
-2D	Unit Display Conversion Lower Limit	rw		Communication not established
-31	Enable/disable upper and lower limit overflow settings	rw		Communication not established
-32	Upper limit overflow analog quantity	rw		Communication not established
-34	Upper limit overflow output digital quantity	rw		Communication not established
-38	Lower limit overflow analog quantity	rw		Communication not established
-3A	Lower limit overflow output digital quantity	rw		Communication not established

5.2.7 Usage of XF-E4AD and LFP3-AP

5.2.7.1 Process data mapping

In the device view, the mapping address of module process data can be viewed, and the case mapping address is IB68-IB89.



Name	Туре	Explanation
XF_E4AD	Stuct	4-channel input module
ID68(IB68~IB71)	DINT	Channel 0 input value
ID72(IB72~IB75)	DINT	Channel 1 input value
ID76(IB76~IB79)	DINT	Channel 2 input value
ID80(IB80~IB83)	DINT	Channel 3 input value
ID84(IB84~IB85)	WORD	Module level error codes
ID86(IB86~IB89)	DWORD	Channel level error code

Error code parameters

Module level error codes (ErrCode_module)					
Bit position	Meaning	Error level			
0	The 24V input power supply of the module is abnormal	Important			
2	Internal module error occurred and cannot be fixed by the user layer	Important			
3	Version mismatch	Important			
4	ADC/DAC read/write failure	Important			

Channel level error code (ErrCode_CH)				
Bit position	Meaning	Error level		
0	Channel 0 upper limit overflow	General		

Channel level error code (ErrCode_CH)				
Bit position	Meaning	Error level		
1	Channel 0 lower limit overflow	General		
2	Channel 0 disconnected	Important		
3	Reserve	-		
4	Channel 1 upper limit overflow	General		
5	Channel 1 lower limit overflow	General		
6	Channel 1 disconnected	Important		
7	Reserve	-		
8	Channel 2 upper limit overflow	General		
9	Channel 2 lower limit overflow	General		
10	Channel 2 disconnected	Important		
11	Reserve	-		
12	Channel 3 upper limit overflow	General		
13	Channel 3 lower limit overflow	General		
14	Channel 3 disconnected	Important		

5.2.7.2 Module configuration parameters

项目4 > 未分组的设备	 LFP3-AP [LF 	P3-AP]											- 6	7 = >
										6	拓扑视图	📥 网络视图	1 设备视	18
LFP3-AP [LFP3-AP]		₩ 🔏 🗄 🛄 🤆	Q 🛨 📑	K	备概览									
				^	₩ 模块			机架	插槽	1地址	Q地址	类型	订货号	
					 LFP3-A 	P		0	0			LFP3-AP	LFP3-AP	
	23			_	LFP	3-AP Profinet Device		0	0 X1			LFP3-AP		
Se	5				XF-E16	X(16I 24Vdc)数字		0	1	23		XF-E16X(16I 24Vdc	XF-E16X	
				- 0	XF-E16	Y(160 24Vdc)数字		0	2		23	XF-E16Y(16O 24Vd	XF-E16Y	
				U	XF-E4A	D (4AI 0-5v,0-10v,±	1	0	3	6889	64 70	XF-E4AD (4AI 0-5v,	XF_E4AD	
					XF-E4U	A (4AO 0-50,0-100,±		0	4	9095	6479	XF-24DA (4AU 0-5	XF-E4UA	
VE FAAD (AAL O F. O 1	0		0 4 . 20 4 .	由法由	王绘入 117		-	0		0	Col FR M		A HIT	
AT-E4AD (4AI 0-5V,0-1)	0v,±3v,±10v,1-5	0v,0~2011A \ 4~2	UIIIA,±20IIIA)	电流电》	下1個人「「~	F-E4AD(4AI)]	_			2	3 唐任	11111111111111111111111111111111111111	ý BT	1-3
常規 10 变量	系统常数	文本												
▼ 常规	柑 也积 罢 参 数													
目录信息							_							
硬件中断	电源检测													
▼ 模块参数		中 (四十) (1)												_
り気号・XF-E4AD 因仕版本		电源检测:	天闭											-
软件版本	Chappel 0													
模块ID: 0x00290	channel_0													
模块信息		诵道使能:	打开											-
模块配置参数 3		能能能	关闭											Ş.
1/0 地址		G9 19 24 42 .	0.101/de											5
		里柱远挥	U~TUVUC											3
		悲波万式:	一阶渡波											2
		滤波参数:	时间平均(2-1	00ms) 點	t认值2								1	-
		校准使能:	关闭										1	-
		校准1模拟量:	0											
		校准1数字里:	0											
		校准2模拟争:	0											
		校准2粉字册-	0		_									
		10/12-30/子里:											-	51
< III >		甲12並示转化使能:	大团										1	
P3-AP								_	_		🗸 项目 项	目4 已成功保存。		

Module power supply detection

- Check if the external 24V power supply of the module is normal:
- Normal: The module is running normally.
- Exception: The module channel cannot be used but can be configured, configured, and scanned normally.

- Parameters can be set: enable or disable (default is disabled).
- Channel enable/disable

Enable or disable AD sampling channels to save module sampling time.

Sattable nonenatore	Enable/disable (in disable mode, subsequent software functions for the						
Settable parameters	corresponding channel cannot be set)						
Default parameters	Enable						
	The conversion time for each channel is 60us, total time=on/off conversion speed *						
Note	number of enabled channels, if this channel is not used, it can be set to "disable" to						
	reduce the total conversion time of the module						

- Wire breakage detection
- Detect abnormal disconnection of AD input channel and configure alarm logs. If there is no current flowing through the module or the current flowing is too low (the measurement range is 4-20 mA or 1-5V), the corresponding alarm log will be triggered, which can activate both circuit breaker detection and underflow simultaneously.
- Parameters can be set: enable or disable (default is disabled).



This function is only supported when the "measurement range" is set to "4mA~20mA" and "1V~5V".

■ Sampling type/range

Can choose different types and ranges of sampling analog signals.

Sattable perameters	The following table pulling method reflects the adjustable parameters: voltage,		
Settable parameters	current		
Default parameters	0V~10V		
X7-14	0V~5V, 0V~10V, -5V~5V, -10V~10V, 1V~5V		
voltage measurement range	Default: 0V~10V		
Current measuring range	0mA~20mA, 4mA~20mA, -20mA~20mA		

- Channel filtering parameters
- First order filtering

The first-order low-pass filtering method uses the weighting of the current sampling value and the output value of the previous filtering to obtain the effective filtering value. The filtering coefficient is set by the user to $0\sim254$. The smaller the value, the more stable the data will be, but it may cause data lag. Therefore, when set to 1, the filtering effect is strongest and the data is most stable. When set to 254, the filtering effect is weakest. The default is 0 (not filtered).

• Average filter

Time average	Functional actions	Perform A/D conversion according to the set time, and average the total value after removing the maximum and minimum values. The average processed value is stored in the corresponding output buffer memory. The number of processing times within the set time varies depending on the number of channels allowed for A/D conversion.
	Set range	$2 \sim 100 \text{ms}$ (Default value 2)
Frequency average	Functional actions	Perform A/D conversion according to the set number of times, and average the total value after removing the maximum and minimum values. The average processed value is stored in the corresponding channel variable. The time it takes for the average of the number of times to be stored in the corresponding channel variable varies depending on the number of channels allowed for A/D conversion.
	Set range	$4 \sim 500$ (Default value 4)
Move average times	Functional actions	After averaging the specified number of digital output values obtained in each sampling cycle, store them in the corresponding output register/variable. Due to moving average processing in each sampling process, the latest digital output values can be obtained.
	Set range	$2 \sim 500$ (Default value 2)

- Settable parameters
- Filter mode (selected from dropdown menu): "first order filtering", "time average filtering", "frequency average filtering", and "moving average filtering" (default: first order filtering).
- Filter parameters (selected using input box): in the "first-order filtering" mode, it can be set to 0~254 (default value: 0), in the "Time Average Filtering" mode, it can be set to 2ms~100ms (default value: 2), in the "average filtering" mode, you can set: 4~500 (default value: 4), in the "moving average filtering" mode, it can be set to 2~500 (default value: 2).
- Calibration function



Due to the possibility of drift between the digital signals obtained from AD acquisition and conversion and the analog signals received after the product has been used for a period of time at the factory, customers can calibrate by setting the AD calibration function, immediately reflect to the scaling value (numerical operation value), you can easily complete the calibration during system startup on your own.

Unit display conversion

This function can directly display the output analog data as the actual output unit required by the customer. Due to the fact that the customer's use of analog expansion module DA outputs mostly analog signals corresponding to the outputs of some instruments or sensors. For example, controlling the frequency output range of a frequency converter to be $0\sim$ 50Hz, the frequency control analog signal of the frequency converter is $4\sim$ 20mA. The existing DA module will output the $4\sim20$ mA analog signal to the analog acquisition terminal of the frequency converter, and the customer needs to convert the digital signal from $0\sim65535$ to $0\sim50$ Hz for the actual output frequency of the frequency converter. It is possible to automatically convert the analog output of module DA into the actual output frequency value of the frequency converter by setting the conversion value range.

■ Up and down overflow setting

Trigger an alarm log and output the set value when the AD channel sampling is greater than the Upper limit/Lower limit setting value.

5.3 Analog output unit XF-E4DA

5.3.1 Overview

XF-E4DA series analog output expansion module, which has 4 channels of analog input, supporting current and voltage inputs, adapt to XF, XSF series CPU unit products and XF series communication coupler units.

- 4-channel analog output.
- Channel conversion speed 60us/channel.
- Maximum error of 0.2%.
- Voltage and current output.
- Designed with a width of 12mm.
- Module version

Hardware version	Firmware version	Function
H2.0	V2.0	Basic functions for the first official production

5.3.2 Module view

1) Description of each section



No.	Name	No.	Name
1	System LED indicator lights	2	Channel LED indicator light
3	Detachable terminal block	4	Snap
5	Model indication	6	Color identification indicating module type
7	Module hardware and firmware versions	8	Wiring diagram

2) System indicator

System indicator	Explanation				
	Extinguish	Module not powered on			
	Light	All external power supplies of the module are normal (backplane bus			
PWR (Green)		power supply&external input 24V)			
	Flash1Hz ^{*1}	Abnormal power supply in the module and inability to operate			
		normally			
	Light	The module is running normally			
	Flash1Hz ^{*1}	General errors in module logs			
RUN (Green)	Extinguish	Important errors in module logs			
	Flash10Hz ^{*2}	Module establishing communication			
	Double flashing ^{*3}	Module firmware update			



*1: A square wave with a duty cycle of 50% and a frequency of 1Hz.

- *2: A square wave with a duty cycle of 50% and a frequency of 10Hz.
- *3: As shown in the following figure:



3) Channel indicator light

Model	Channel indicator light				
XF-E4DA		Light (Green)	Channel enabled and configured correctly		
	Спо~Спз	Extinguish	Disable channel		

4) Color identification

No.	Color		Module type
1		Grey white	Digital input
2		Gray	Digital output&digital mixed module
3		Light blue	Analog input
4		Deep blue	Analog output
5		Green	RS232&485 serial port communication
6		Pink	Temperature signal input
7		White	High speed counting

5.3.3 General specification

General specification	General specification					
Project	_	Specifications				
	Maximum	55%C				
Operating temperature	temperature					
Operating temperature	Minimum	-20°C				
	temperature	-20 C				
	Maximum	70°C				
Transportation/Storage	temperature					
Temperature Minimum		10%				
	temperature					
Environmental	Upper limit	95%				
humidity (including	Lower limit	10%				
operation/storage)						
IP level		IP20				
		Compliant with IEC61131-2				
		Under intermittent vibration (frequency 5-9Hz, constant amplitude				
Anti vibration		3.5mm peak displacement) and (frequency 9-150Hz, constant				
		acceleration 1.0g peak acceleration)				
		Under continuous intermittent vibration (frequency 5-9Hz half				
		amplitude 1.75mm displacement) and (frequency 9-150Hz constant				
General specification						
------------------------	---	--	--	--		
Project	Specifications					
	acceleration 0.5g constant frame amplitude)					
	Scan 10 times in X, Y, and Z directions					
	Complies with IEC61131-2 standard					
Impact resistance	The impact strength is 15G (peak) and the duration is 11ms. It is					
	applied to three mutually perpendicular axes, and each axis is					
	impacted 3 times (a total of 18 impacts)					
Using environment	Non corrosive gas					
Using altitude	0-2000m					
Overvoltage level	II: Compliant with IEC61131-2					
Pollution level	2: Compliant with IEC61131-2					
Anti interference EMC	Compliant with IEC 61131-2 IEC61000-6-4 Type B					
Related certifications	CE					

5.3.4 Technical specifications

5.3.4.1 Module performance

Project		Specifications			
	Input channel	4			
		0V~5V (0~64000)			
		0V~10V (0~64000)			
	Valte en entent non en	-5V~5V (-32000~32000)			
A mala a immut	vonage output range	-10V~10V (-32000~32000)			
Analog input		1v~5v (12800~64000)			
range (rated)		External load resistance $2K\Omega \sim 1M\Omega$			
		0mA~20mA (0~64000)			
	Current output range	4mA~20mA (12800~64000)			
		External load resistance less than 500Ω			
Maximum	Voltage input	DC±15V			
input range Current input -40~40mA		-40~40mA			
Conversion speed		45us/CH			
Response time		60us			
Resolution rati	0	1/64000 (16Bit)			
Module	Rated input	DC24V±10%, 150mA			
power supply	Protect	Reverse connection protection			
Emer	Room temperature 25°C±5°C	±0.1% (25±5°C)			
EIIOI	Full temperature end -20~55°C	±0.2%			
Isolated		Channel non isolated, power isolated			
Module power	consumption	0.8W (backplane bus)+1.2W (external input)			
Module weight	;	80g			

5.3.4.2 Analog-to-digital conversion diagram

Voltage



Current



5.3.5 Terminal definition&Wiring

5.3.5.1 Dimension

(Unit: mm)



5.3.5.2 Terminal definition&Wiring

Terminal definition

XF-E4DA				
Meaning	A-column terminal	Terminal layout	B-column terminal	Meaning
CH0- output ground	0		0	CH2- output ground
CH0-DA analog voltage output terminal	1		1	CH2-DA analog voltage output terminal
CH0-DA analog current output terminal	2		2	CH2-DA analog current output terminal
CH1- output ground	3		3	CH3- output ground
CH1-DA analog voltage output terminal	4		4	CH3-DA analog voltage output terminal
CH1-DA analog current output terminal	5		5	CH3-DA analog current output terminal
Empty	6		6	Empty
Empty	7		7	Empty
External 24V power supply for module positive	8		8	External power supply to the module 24V power supply negative

External wiring



5.3.5.3 Installation method

1) Installation requirements

The module is installed using DIN rails, which must comply with the IEC 60715 standard (35mm wide, 1mm thick), the size information is shown in the following figure, in millimeters.



2) Installation steps



1. The assembly between IO modules is installed by sliding through the top and bottom guide rails of the modules, as shown in the left figure:

2. The module is installed on the guide rail. When installing, align the module with the DIN guide rail and press the module in the direction indicated by the arrow. After installation, there is a clear sound of engagement, as shown in the left figure:



Explanation: After the module installation is completed, the locking buckle will automatically move downwards for locking, if the latch does not move downwards, press down on the top of the latch, ensure proper installation.

3) Disassembly steps



1. Use a flat screwdriver or similar tool to pry the rail lock upwards, as shown in the left figure:



5.3.5.4 Installation environment

This product can be installed in four positions (i.e. installation direction): horizontal, vertical, top of cabinet, and bottom of cabinet. It is recommended to install in the horizontal direction, and the heat dissipation design is through natural convection. To ensure normal ventilation and heat dissipation and reserve sufficient wiring space, the minimum gap must be left around this product, as shown in the following figure:





If there are high-temperature heat source equipment (heaters, transformers, large resistors, etc.) around this product, leave at least 100mm gap between the equipment and the high-temperature heat source.

5.3.5.5 Equipment wiring

When wiring the module, its terminal must meet the following requirements:

Adaptor diameter		
National standard/mm ²	American standard/AWG	
0.3	22	
0.5	20	
0.75	18	

Adaptor diameter		
National standard/mm ²	American standard/AWG	
1.0	18	
1.5	16	

If using other tube type wire ears, please crimp them to the twisted wire. The shape and size requirements are shown in the following figure:



5.3.6 Usage of XF-E4DA and LFC3-AP

5.3.6.1 Process data mapping (PDO)

Name	Туре	Explanation
XF_E4DA	Stuct	4-channel output module
——— СН0	DINT	Channel 0 output value
——————————————————————————————————————	DINT	Channel 1 output value
—— СН2	DINT	Channel 2 output value
СНЗ	DINT	Channel 3 output value
ErrCode_module	WORD	Module level error codes

ErrCode CH	DWORD	Channel level error code
	2.00102	

Error code parameters

Module level error codes (ErrCode_module)			
Bit position	Meaning	Error level	
0	The 24V input power supply of the module is abnormal	Important	
2	Internal module error occurred and cannot be fixed by the user layer	Important	
3	Version mismatch	Important	
4	ADC/DAC read/write failure	Important	

5.3.6.2 Module configuration parameters (SDO)

Parameter	Туре	Channel	nannel Note		
Power detection	Enumeration of BYTE		0: Close	1: Open	
Channel enable/disable	BYTE		0: Close	1: Open	
Output type and range	BYTE		0: 0~10V (Default) 1: 0~5V 2: -10~10V 3: -5~5V	4: 1~5V 5: 0~20mA 6: 4~20mA	
In the STOP state, the output remains at the previous value/preset value	Enumeration of BYTE		0: Keep the previous value	1: Set value	
Presets	DINT		-32000~64000		
Calibration enable/disable	Enumeration of BYTE		0: Close	1: Open	
Calibration 1 analog quantity	INT		Voltage output 0~10V:		
Calibration 1 digital quantity	DINT	Channel	Analog range: 0-10000mV Digital range: 0-64000		
Calibration 2 Analog Quantity	INT	0-4	0~5V: Analog range: 0-5000mV		
Calibration 2 Digital Quantity	DINT		Digital range: 0-6400 -10~10V: Analog range: -10000 Digital range: -32000 -5~5V: Analog range: -5000- Digital range: -32000 1~5V: Analog range: 0mV-5 Digital range: 12800- Current output 0~20mA: Analog range: 0-2000	0 -10000mV -32000 5000mV -32000 5000mV 64000	

			Digital range: 0- 4~20mA: Analog range: 0-	-20000uA
			Digital range: 12	2800-64000
Enable/disable unit display conversion	Enumeration of BYTE		0: Close	1: Open
Unit display conversion limit			Range: -100000	000~10000000
Unit Display Conversion	DINT		And after enablin	ng unit conversion,
Lower Limit			(Upper Lower L	imit)>0

- Module power supply detection
 - Check if the external 24V power supply of the module is normal:
 - Normal: The module is running normally.
 - Exception: The module channel cannot be used but can be configured, and scanned normally.
 - Can set parameters: enable or disable (default is disabled).

aunch parameter.	s IO Mapping COE-Online			
Advanced opti	ons			
Index:SubIndex	Name	Flag	Value	Communication error message
⊒ - # x8031∶00	Module	rw	>1<	
-01	Power Detection	rw		Communication not established
⊨-#x80 32∶00	Channal O	rw	>12<	
-15	Channel enable/disable	rw		Communication not established
-16	Output Range and Type	rw		Communication not establishe
-17	In the STOP state, the output remains at the previous	rw		Communication not establishe
-18	Presets	rw		Communication not establishe
-1C	Calibration enable/disable	rw		Communication not establishe
—1D	Calibration 1 Analog Quantity	rw		Communication not establishe
-1F	Calibration 1 Digital Quantity	rw		Communication not establishe
-23	Calibration 2 Analog Quantity	rw		Communication not establishe
-25	Calibration 2 Digital Quantity	rw		Communication not establishe
-29	Enable/disable unit display conversion	rw		Communication not establishe
-2A	Unit display conversion limit	rw		Communication not establishe
-2E	Unit Display Conversion Lower Limit	rw		Communication not establishe

■ Channel enable/disable

Enable or disable AD sampling channels to save module sampling time.

Advanced opti	ons			
Index:SubIndex	Name	Flag	Value	Communication error message
⊟−# x8031∶00	Module	rw	>1<	
L_01	Power Detection	rw		Communication not establish
⊨ - # x8032∶00	Channal O	rw	>12<	
-15	Channel enable/disable	rw		Communication not establish
-16	Output Range and Type	rw		Communication not establish
-17	In the STOP state, the output remains at the previous	rw		Communication not establish
-18	Presets	rw		Communication not establish
-1C	Calibration enable/disable	rw		Communication not establish
-1D	Calibration 1 Analog Quantity	rw		Communication not establish
-1F	Calibration 1 Digital Quantity	rw		Communication not establish
-23	Calibration 2 Analog Quantity	rw		Communication not establish
-25	Calibration 2 Digital Quantity	rw		Communication not establish
-29	Enable/disable unit display conversion	rw		Communication not establish
-2A	Unit display conversion limit	rw		Communication not establish
-2E	Unit Display Conversion Lower Limit	rw		Communication not establish

Sattable noremators				
Settable parameters	corresponding channel cannot be set)			
Default parameters	Enable			
	The conversion time for each channel is 60us, Total time=On/Off conversion speed *			
Note	Number of enabled channels, if this channel is not used, it can be set to "disable" to			
	reduce the total conversion time of the module			

Output type/range

Can choose different output types and output ranges.

launch parameter	s IO Mapping COE-Online			
Advanced opti	ons			
Index:SubIndex	Name	Flag	Value	Communication error message
	Module Power Detection	rw	214	Communication not established
-#x8032:00	Channal O	rw	>12<	
-15	Channel enable/disable	rw		Communication not established
-16	Output Range and Type	rw		Communication not established
-17	In the STOP state, the output remains at the previous	rw		Communication not established
-18	Presets	rw		Communication not established
-1C	Calibration enable/disable	rw		Communication not established
-1D	Calibration 1 Analog Quantity	rw		Communication not established
—1F	Calibration 1 Digital Quantity	rw		Communication not established
-23	Calibration 2 Analog Quantity	rw		Communication not established
-25	Calibration 2 Digital Quantity	rw		Communication not established
-29	Enable/disable unit display conversion	rw		Communication not established
-2A	Unit display conversion limit	rw		Communication not established
L_2E	Unit Display Conversion Lower Limit	rw		Communication not established

Sattable nonentations	Configure the corresponding index objects in COE-Online, startup parameters, or
Settable parameters	SDO read and write instructions: voltage, current
Default parameters	0V~10V
Voltage measurement	0V~5V, 0V~10V, -5V~5V, -10V~10V, 1V~5V
range	Default: 0V~10V
Current measuring range	0mA~20mA, 4mA~20mA

■ STOP output

- When the CPU unit is in STOP mode or abnormal error mode, the corresponding DA channel of the module outputs according to the set parameters.
- Can set parameters: maintain the previous value, set value (default to maintain the previous value).

Launch parame	ters IO Mapping COE-Online			
Advanced o	ptions			
Index:Su	Name	F.	۷	Communication error message
⊟ - # x8031∶00	Module	rw	>1<	
	Power Detection	rw		Communication not established
-#x8032:00	Channal O	rw	>12<	
-15	Channel enable/disable	rw		Communication not established
-16	Output Range and Type	rw		Communication not established
-17	In the STOP state, the output remains at the previous value/preset value	rw		Communication not established
-18	Presets	rw		Communication not established
-1C	Calibration enable/disable	rw		Communication not established
-1D	Calibration 1 Analog Quantity	rw		Communication not established
-1F	Calibration 1 Digital Quantity	rw		Communication not established
-23	Calibration 2 Analog Quantity	rw		Communication not established
-25	Calibration 2 Digital Quantity	rw		Communication not established
-29	Enable/disable unit display conversion	rw		Communication not established
-2A	Unit display conversion limit	rw		Communication not established
-2E	Unit Display Conversion Lower Limit	rw		Communication not established
++x8033:00	Channal 1	rw	>12<	
+-#x8034:00	Channal 2	rw	>12<	
+-#x8035:00	Channal 3	rw	>12<	
	Information of 4DA	ro	>17<	

Calibration function

Launch parame	ters IO Mapping COE-Online			
Advanced o	ptions			
Index:Su	Name	F.	۷	Communication error message
□ - # x8031:00	Module	rw	>1<	
-01	Power Detection	rw		Communication not established
=-#x8032:00	Channal O	rw	>12<	
-15	Channel enable/disable	rw		Communication not established
-16	Output Range and Type	rw		Communication not established
-17	In the STOP state, the output remains at the previous value/preset value	rw		Communication not established
-18	Presets	rw		Communication not established
-1C	Calibration enable/disable	rw		Communication not established
-1D	Calibration 1 Analog Quantity	rw		Communication not established
—1F	Calibration 1 Digital Quantity	rw		Communication not established
-23	Calibration 2 Analog Quantity	rw		Communication not established
-25	Calibration 2 Digital Quantity	rw		Communication not established
-29	-29 Enable/disable unit display conversion			Communication not established
-2A	-2A Unit display conversion limit			Communication not established
-2E	Unit Display Conversion Lower Limit	rw		Communication not established



Due to the possibility of drift between the analog quantity obtained from DA output conversion and the set digital quantity after the product leaves the factory or has been used for a period of time, customers can set the DA offset calibration function, immediately reflect to the scaling value (numerical operation value), can easily complete the calibration during system startup on your own.

For example, if DA1 Analog output is set to 0-10V output, and 51118 is assigned to the output channel, the output voltage is 8V. When a value of 14418 is assigned to the output channel, the output voltage is 2V. At this point, set 8000mV in the analog setting of DA1 calibration 1, set 51118 in the DA1 calibration 1 digital quantity setting value, set 2000mV in the analog settings of DA1 calibration 2, set 14418 in the digital quantity settings of DA1 calibration 2, the calibration function can be achieved.

Unit display conversion

This function can directly display the output analog data as the actual output unit required by the customer. Due to the fact that the customer's use of analog expansion module DA outputs mostly analog signals

corresponding to the outputs of some instruments or sensors. For example, controlling the frequency output range of a frequency converter to be 0-50Hz, and controlling the output frequency of the frequency converter to control the analog signal to be 4-20mA, the existing DA module will output a 4-20mA analog signal to the analog acquisition terminal of the frequency converter, the customer needs to convert the digital quantity from 0 to 65535 to 0 to 50Hz for the actual output frequency of the frequency converter. It is possible to automatically convert the analog output of module DA into the actual output frequency value of the frequency converter by setting the conversion value range.

Advanced o	ptions			
Index : Su - #x8031 : 00	Name Module	F. rw	v >1<	Communication error message
L_01	Power Detection	rw		Communication not established
-#x8032:00	Channal O	rw	>12<	
-15	Channel enable/disable	rw		Communication not established
-16	Output Range and Type	rw		Communication not established
-17	In the STOP state, the output remains at the previous value/preset value	rw		Communication not established
-18	Presets	rw		Communication not established
-1C	Calibration enable/disable	rw		Communication not established
-1D	Calibration 1 Analog Quantity	rw		Communication not established
-1F	Calibration 1 Digital Quantity	rw		Communication not established
-23	Calibration 2 Analog Quantity	rw		Communication not established
-25	Calibration 2 Digital Quantity	rw		Communication not established
-29	Enable/disable unit display conversion	rw		Communication not established
-2A	Unit display conversion limit	rw		Communication not established
-2E	Unit Display Conversion Lower Limit	rw		Communication not established

5.3.7 Usage of XF-E4DA and LFP3-AP

5.3.7.1 Process data mapping

In the device view, the mapping addresses of module process data can be viewed, and the case mapping addresses are IB90-IB95 and QB64-QB79.



Name	Туре	Explanation
XF_E4DA	Stuct	4-channel output module
QD64(QB64-QB67)	DINT	Channel 0 output value
QD68(QB68-QB71)	DINT	Channel 1 output value
QD72(QB72-QB75)	DINT	Channel 2 output value
QD76(QB76-QB79)	DINT	Channel 3 output value
ID90(IB90-IB91)	WORD	Module level error codes
ID92(IB92-IB95)	DWORD	Channel level error code

Error code parameters

Module level error codes (ErrCode_module)					
Bit position	Meaning	Error level			
0	The 24V input power supply of the module is abnormal	Important			
2	Internal module error occurred and cannot be fixed by the user layer	Important			
3	Version mismatch	Important			
4	ADC/DAC read/write failure	Important			

5.3.7.2 Module configuration parameters

									6	拓扑视图	📥 网络视图	11 设备视	18
LFP3-AP [LFP3-AP]		🖻 🔚 🛄 G	🛯 🛨 🗖	设备概览	[
			^	₩ 模块			机架	插槽	1地址	Q 地址	类型	订货号	
				- L	FP3-AP		0	0			LFP3-AP	LFP3-AP	1
	8		=	•	LFP3-AP Profinet De	vice	0	0 X1			LFP3-AP		
49	3			X	F-E16X(16I 24Vdc)数	字	0	1	23		XF-E16X(16I 24Vdc	XF-E16X	
v				X	F-E16Y(160 24Vdc)数	(字	0	2		23	XF-E16Y(160 24Vd	XF-E16Y	
				X	F-E4AD (4AI 0-5v,0-10	W,±	0	3	6889		XF-E4AD (4AI 0-5v,	XF_E4AD	
	_				F-E4DA (4AO 0-5v,0-1	0v,±	0	4	9095	6479	XF-E4DA (4AO 0-5	XF-E4DA	
			a state whether provide				0	5				1	
XF-E4DA (4AO 0-5v,0-1	10v,±5v,±10v,Vd	lc,0~20mA 、4~2	0mA)电流电压和	前出_1 [XF-E	4DA (4AO 0-5,0-1	10,±5,±1	0 Vdc,)~20mA	× 4~2	🧕 属性	3.信息 🗓 🖞 i	診断	
常規 10 变量	系统常数	文本							2.				
▼ 常规	拔力到望会粉	6											-
目录信息	1关:六日し 丘多 女!												
▼ 模块参数	电源检测												
订货号:XF-E4DA						9							
回作版本		电源检测:	关闭										-
秋叶版本 遺址ID:0x00290	Channel O.												
模块信息	Channel_0												
模块配置参数 3		通 道伸能:	±T∓F										-
1/0 地址		HTTP:// 472.	0.100/4										5
•		里柱远挥:	0~10/00										<u> </u>
	STOP状态	N输出保持上一个值/ 预设值:	关闭										-
f		希设值:	0		1								
		校准使能:	关闭										-
		校准1模拟量:	0]								
		校准1 称 字 里·	0										
		校准?模拟骨.	0										
		标准2称字册·	0										
		单位显示转化:	学问									5	-
<		单位显示转换上阻-	0		1				_				-
											日,口广办但左		

■ Module power supply detection

- Check if the external 24V power supply of the module is normal:
 - Normal: The module is running normally;
 - Exception: The module channel cannot be used but can be configured, configured, and scanned normally.
- Parameters can be set: enable or disable (default is disabled).
- Channel enable/disable

Enable or disable AD sampling channels to save module sampling time.

Sattable nonenatore	Enable/disable (in disable mode, subsequent software functions for the							
Settable parameters	corresponding channel cannot be set)							
Default parameters	Enable							
	The conversion time for each channel is 60us, total time=On/Off conversion speed *							
Note	Number of enabled channels, if this channel is not used, it can be set to "disable" to							
	reduce the total conversion time of the module.							

Output type/range

Can choose different output types and output ranges.

Settable parameters	The following table pulling method reflects the adjustable parameters: voltage,
Securite parameters	current

Default parameters	0V~10V
37.14	0V~5V, 0V~10V, -5V~5V, -10V~10V, 1V~5V
vonage measurement range	Default: 0V~10V
Current measuring range	0mA~20mA, 4mA~20mA

STOP output

- When the CPU unit is in STOP mode or abnormal error mode, the corresponding DA channel of the module outputs according to the set parameters.
- Can be set parameters: Keep the previous value, set value (default to keep the previous value).

Calibration function



Due to the possibility of drift between the analog quantity obtained from DA output conversion and the set digital quantity after the product leaves the factory or has been used for a period of time, customers can set the DA offset calibration function, immediately reflect to the proportional scaling value (numerical operation value), and you can easily complete the calibration at system startup on your own.

For example, setting the DA1 analog output to 0-10V output, when a value of 51118 is assigned to the output channel, the output voltage is 8V. When a value of 14418 is assigned to the output channel, the output voltage is 2V. At this point, set 8000mV in the analog setting of DA1 calibration 1, set 51118 in the DA1 calibration 1 digital quantity setting value, set 2000mV in the analog settings of DA1 calibration 2, set 14418 in the digital quantity settings of DA1 calibration 2, the calibration function can be achieved.

Unit display conversion

This function can directly display the output analog data as the actual output unit required by the customer. Due to the fact that the customer's use of analog expansion module DA outputs mostly analog signals corresponding to the outputs of some instruments or sensors. For example, controlling the frequency output range

of a frequency converter to be 0-50Hz, and controlling the output frequency of the frequency converter to control the analog signal to be 4-20mA, the existing DA module will output a 4-20mA analog signal to the analog acquisition terminal of the frequency converter, the customer needs to convert the digital quantity from 0 to 65535

to 0 to 50Hz for the actual output frequency of the frequency converter. It is possible to automatically convert the analog output of module DA into the actual output frequency value of the frequency converter by setting the conversion value range.

6. Serial port communication module

6.1 Naming rule

	<u>XF</u> -	$-\underline{E}$ \bigcirc	
	1	$\bigcirc \bigcirc $	4 5
1	Series	XF:	XF series expansion module
2	Expansion module	E:	Right expansion module
3	Channels	1:	1 channel
		2:	2 channels
		4:	4 channels
4	Communication type	COM:	Serial port communication
_		CAN:	CAN communication
5	Physical interface type	24:	232&485
		2:	232
		4:	485

6.2 Serial port communication module XF-E2COM24

6.2.1 Product overview

The XF-E2COM4 series serial communication expansion module has 2 serial channels and supports RS232 and RS485 communication (each channel can only select one of RS232 and RS485 for communication). It is compatible with XF, XSF series CPU unit products and LF series communication coupler units.

- Two independent RS232/485 serial communication channels;
- Supports Modbus master, slave, and free-form communication;
- Channel and internal isolation treatment improve anti-interference performance;
- Designed with a width of 12mm.
- Module version

Hardware	Firmware	Function		
H2.0	V2.0	First official production of basic functions		



A single coupler can support up to 8 serial communication modules for expansion.

6.2.2 Module View

(1) Part description



No.	Name	No.	Name
1	System LED indicator light	2	Channel LED indicator light
3	Detachable terminal block	4	Buckle
(5)	Model indication	6	Color identification indicating

No.	Name	No.	Name
			module type
$\overline{\bigcirc}$	Module hardware and firmware versions	8	Wiring diagram

2) System indicator light

System		Meaning		
indicator light				
DW/D (groop)	OFF	Module not powered on		
PWK (green)	Awlays ON	All power supplies of the module are normal		
	Awlays ON	The module is running normally		
	Flashing 1Hz ^{*1}	General errors in module logs *3		
RUN (green)	OFF	Important errors in module logs *4		
	Flashing 10Hz ^{*2}	Module establishment communication in progress		

- * 1: A square wave with a duty cycle of 50% and a frequency of 1Hz.
- * 2: A square wave with a duty cycle of 50% and a frequency of 10Hz.
- * 3: General errors will not affect the operation of the equipment.
- * 4: Important error that causes the device to malfunction. Currently, there are only configuration parameter errors.

3) Channel indicator light

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Model	Channel indicator light		
	RX0 RX1	Always ON (green)	Receiving data
VE E2COM24		OFF	Received completed or no communication
AF-E2COWI24	TX0	Always ON	Sending data
	TX1 (green)		
		OFF	Sending completed or no communication

During normal communication, RX/TX alternately flashes, and the speed of flashing can indicate the communication rate.

4) Color identification

No.	Color		Module type
1		Gray White	Digital input
2		Gray	Digital output & digital mixed module
3		Light blue	Analog input
4		Dark blue	Analog output
5		Green	RS232&485 serial port communication
6		Pink	Temperature signal input
7		White	High speed counting

6.2.3 General specifications

General specifications			
Item		Specification	
Operating	Max temperature	55°C	
temperature	Min temperature	-20°C	
Storage	Max temperature	70°C	
temperature	Min temperature	-40°C	
Environmental	Upper limit	95%	
humidity (including operation/storage)		10%	
Protection level		IP20	
Anti vibration		Compliant with IEC61131-2 Under intermittent vibration (frequency 5-9Hz, constant amplitude 3.5mm peak displacement) and (frequency 9-150Hz, constant acceleration 1.0g peak acceleration) Under continuous intermittent vibration (frequency 5-9Hz half amplitude 1.75mm displacement) and (frequency 9-150Hz constant acceleration 0.5g constant frame amplitude) Scan 10 times in each direction of X, Y, and Z	
Impact resistance		Compliant with IEC61131-2 standard Impact strength of 15G (peak) with a duration of 11ms is applied to three mutually perpendicular axes, with 3 impacts per axis (a total of 18 impacts)	
Use environment		Non corrosive gas	
Use altitude		0-2000 m	
Overvoltage level		II: Compliant with IEC61131-2	
Pollution level		2; Compliant with IEC61131-2	
Anti interference E	MC	Compliant with IEC 61131-2 IEC61000-6-4 Type B	
Related certifications		СЕ	

6.2.4 Technical specification

Item	Specification

Number of ports		2			
Communication port		RS-232 and RS-485 (choose one of RS232 and RS485 for single			
		COM)			
Communication protocol		Modbus-RTU/ASCII Master/Slave/Free Format			
	communication				
	mode	Hall-duplex			
	Channel	X7			
	isolation	Yes			
Communication	Baud rate	2400bps, 4800bps, 9600bps, 19200bps (Default), 38400bps,			
specifications		57600bps, 115200bps			
	Data bits	7 or 8 (Default)			
	Stop bit	1(Default) or 2			
	Check bit	Odd, even (Default), none			
Commenter	1:	RS-232 15m (19200bps)			
Communication	distance	RS-485 1200m (9600bps)			
Max number of modules		8 pcs (The right extension of the main body and the remote IO			
		adapter each support max 8 modules)			
Max number of bytes		256 bytes(Modbus) 1024 bytes(Free Format)			
Module power consumption		0.8W			

6.2.5 Installation&Wiring

6.2.5.1 Dimension







Unit: mm

6.2.5.2 Terminal definition&wiring

1) Terminal definition

XF-E2COM24				
Meaning	A column terminal	Terminal layout	B column terminal	Meaning
TR0—A channel terminal resistor	0		0	TR1—B channel terminal resistor
TR0—A channel terminal resistor	1		1	TR1—B channel terminal resistor
A0—RS485+ terminal	2		2	A1—RS485+ terminal
B0—RS485- terminal	3		3	B1—RS485- terminal
GND—grounding terminal	4		4	GND— grounding terminal
RX0—RS232 receive data terminal	5		5	RX1— RS232 receive data terminal
TX0—RS232 send data terminal	6		6	TX1— RS232 send data terminal
GND—grounding terminal	7	•	7	GND— grounding terminal
	8		8	

2) External wiring



6.2.5.3 Installation method

(1) Installation requirements

The module is installed using DIN rails, which must comply with the IEC 60715 standard (35mm wide, 1mm thick). The size information is shown in the following figure, in millimeters.



(2) Installation steps



The assembly between IO modules is carried out by sliding installation through the top and bottom rails of the modules, as shown in the left figure:



The module is installed on the guide rail. When installing, align the module with the DIN rail and press the module in the direction indicated by the arrow. After installation, there is a noticeable sound of the module engaging, as shown in the left figure:



After the module installation is completed, the lock buckle will automatically move downwards for locking. If the lock buckle does not move downwards, the top of the lock buckle needs to be pressed downwards to ensure proper installation.

(3) Unstallation steps



6.2.5.4 Installation environment

This product can be installed in four positions (i.e. installation direction): horizontal direction, vertical direction, top of the electrical cabinet, and bottom of the electrical cabinet. It is recommended to install it in the horizontal direction, and the heat dissipation design is through natural convection. To ensure normal ventilation and heat dissipation and reserve sufficient wiring space, the minimum gap must be retained around this product, as shown in the following figure:



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If there are high-temperature heat source equipment (heaters, transformers, large resistors, etc.) around this product, a gap of at least 100mm should be left between them.

6.2.5.5 Equipment wiring

in whing includes, then connectors must need the following requirements.			
Adaptive wire diameter			
National standard /mm ²	American Standard /AWG		
0.3	22		
0.5	20		

When wiring modules, their connectors must meet the following requirements:

0.75

1.0 1.5

If using	other typ	es of	terminal	lugs,	crimp	them	onto	the	stranded	wire.	The	shape	and	dimensions	should
conform	to the dia	gram	shown bel	low.											

18 18

16



6.2.6 Usage of XF-E2COM24 and LFC3-AP

6.2.6.1 Process data mapping (PDO)

Name	Туре	Description
XF_E2COM24	Stuct	2 channels serial port module
ErrCode_module	WORD	Module level error code
ErrCode_CH	DWORD	Channel level error code

Error code parameters

Module level error code (ErrCode_module)				
Bit	Meaning	Error level		
0	Version error	Important		
1	Hardware error	Important		
2	Operation fault	Important		
3	Parameter error	Important		

Serial module has no channel level error.

6.2.6.2 Module configuration parameters (SDO)

The serial port parameters are configured through SDO, allowing the corresponding serial port parameters to be configured as startup parameters.

Under each XF-E2COM24, there are 2 Modbus_COM setting ports that can be used to set the protocol for each serial port. Modbus master, Modbus slave, and free format can be selected, and only one communication mode can be selected simultaneously for each serial port to take effect.

Parameter	Description	Туре	Note		
Com() Enchlo	Serial port	UGNIT	1: Enable Com0 serial port (default)		
	enable	USINI	2: Disable Com0 serial port		
			1: Modbus RTU Master, also known		
			as RTO Master mode (default)		
			2: Modbus RTU Slave, also known as		
			RTU slave mode		
Com Communicate Tune	Communication mode (M/S/F)	UCINIT	3: Modbus ASCLL Master, also		
Como Communicate Type		USINI	known as ASCLL Master mode		
			4: Modbus ASCLL Slave, also known		
			as ASCLL slave mode		
			5: FreePort stands for Serial Port Free		
			Protocol		
Com0 ModBus Slave ID	Slave station no.	USINT	1-247 (The default slave station		

Parameter	Description	Туре	Note
			number is 1, and in slave mode, each
			serial port has only one slave station
			number)
			1: 1200bps
			2: 2400bp
			3: 4800bps
~ ~ ~ ~ ~ ~	Serial port baud		4: 9600bps
Com0 BaudRate	rate (M/S/F)	USINT	5: 19200bps (default)
			6: 38400bps
			7: 57600bps
			8: 115200bps
	Data bit		1: 7-bit (default when ASCII mode)
Com0 DataBits	(M/S/F)	USINT	2: 8-bit (default when RTU mode)
	Stop bit		1: 1 bit (default)
Com0 StopBit	(M/S/F)	USINT	2: 2-bit
	(112.2.12)		0: None
Com() Parity	Parity bit	USINT	1: Odd
	(M/S/F)	05111	2. Even (default)
	Frame timeout		
Come0 Frame interval	(M/S/F)	UINT	Default 3ms, range 0-65535ms
			If the slave station does not respond
	Response		within the set time, the master station
Come0 Response Timedout	timeout	UINT	will resend. The range is 3-65535ms.
			with a default of 1000ms
	Byte order		
Come0 Btve Swan	conversion	USINT	0: Conversion prohibited
e onneo 20je z nap	(M/S)*	0.01111	1: Enable conversion
	High low word		
Come0 Word Swap	conversion	USINT	0: Conversion prohibited (default)
1	(M/S)		1: Enable conversion
			If the slave station does not respond
			within the set time, the master station
Come0 Reissued Num	Resend times	USINT	will resend. The range is 0-255, with a
			default of 3 times
~ ~ ~ ~ ~ ~ ~			0: Maintain the final output value
Come0 Error handing	Error handling	USINT	1: Output is zero (default)
	Serial port		1: Enable Com0 serial port (default)
Coml Enable	enable	USÍNT	2: Disable Com0 serial port

Parameter	Description	Туре	Note
Com1 Communicate Type	Communication mode (M/S/F)	USINT	 Modbus RTU Master, also known as RTU Master mode (default) Modbus RTU Slave, also known as RTU slave mode Modbus ASCLL Master, also known as ASCLL Master mode Modbus ASCLL Slave, also known as ASCLL slave mode FreePort stands for Serial Port Free Protocol
Com1 ModBus Slave ID	Slave station no.	USINT	1-247 (default slave station number is1, in slave mode, each serial port hasonly one slave station number)
Com1 BaudRate	Serial port baud rate (M/S/F)	USINT	 1: 1200bps 2: 2400bp 3: 4800bps 4: 9600bps 5: 19200bps (default) 6: 38400bps 7: 57600bps 8: 115200bps
Com1 DataBits	Data bit (M/S/F)	USINT	 1: 7-bit (default when ASCII mode) 2: 8-bit (default when RTU mode)
Com1 StopBit	Stop bit (M/S/F)	USINT	1: 1 bit (default) 2: 2-bit
Com1 Parity	Parity bit (M/S/F)	USINT	0: None 1: Odd 2: Even (default)
Come1 Frame interval	Frame timeout (M/S/F)	UINT	Default 3ms, range 0-65535ms
Come1 Response Timedout	Response timeout	UINT	If the slave station does not respond within the set time, the master station will resend. The range is 3-65535ms, with a default of 1000ms
Comel Btye Swap	Byte order conversion (M/S)*	USINT	0: Conversion prohibited (default) 1: Enable conversion
Come1 Word Swap	High low word conversion (M/S)	USINT	0: Conversion prohibited (default) 1: Enable conversion
Come1 Reissued Num	Resend times	USINT	If the slave station does not respond within the set time, the master station will resend. The range is 0-255, with a default of 3 times

		-	
Parameter	Description	Туре	Note
Comel Error handing	Error handling	USINT	0: Maintain the final output value
Comer Error nandnig	Error nandning	USINI	1: Output is zero (default)

 $\mathbf{0}$

- Com0 and Com1 only have some parameters as startup parameters, and users need to add other parameters as startup parameters themselves.
- *: Byte order conversion LFP3-AP parameter is disabled by default, LFC3-AP parameter is enabled by default.

6.2.6.3 Modbus master station

The function codes supported by ModBus master station are as follows:

Function code	Bit/word operation	Operand	Operation quantity
0x01	Read coil	Bit	Single or multiple
0x02	Read input coil	Bit	Single or multiple
0x03	Read register	Word	Single or multiple
0x04	Read input register	Word	Single or multiple
0x05	Write a single coil register	Bit	Single
0x06	Write a single hold register	Word	Single
0x0F	Write multiple coil registers	Bit	Multiple
0x10	Write multiple hold registers	Word	Multiple

When the serial module is configured as a Modbus master, the PDO size allows for the configuration of virtual communication modules with valid data of 8, 16, 32, 64, and 128 bytes, making it easier for users to allocate PDO size resources according to usage scenarios. The types of virtual modules that can be configured are shown in the table below:

No.	ModBus mode virtual module name			
1	Modbus Master Length 4 Words			
2	Modbus Master Length 8 Words			
3	Modbus Master Length 16 Words			
4	Modbus Master Length 32 Words			
5	Modbus Master Length 64 Words			

Add device

Open the XDPPRO software and scan the slave device on the EthercatMaster interface:

EthercatConfig		×
Scan	General Expert process data Launch parameters IO Mapping COE-Online ESC	Reg
Scan Master PLC Master Slave → StationID:0 LFC3-AP ↓ XF-E2COM24	General Expert process data Launch parameters 10 Mapping COE-Online ESC Expert Config:	Reg MappingNum: 0 € sModeule: Servo Module ✓
	Inport	Read Write Activate OK Cancel

■ Add the valid byte size corresponding to the required serial communication type

Take Modbus Master Length 4 Words as an example.

Right click "LFC3-AP"---add device---choose Modbus Master Length 4 Words.

Scan	General Expert process data Launch para	ameters IO Mapping COE-Online ESC Reg	
Master			
PLC Master	Expert Config: 600 📤	FuncMappingNum: 0	
	Device library	×	
Slave	Install Uninstall		
StationID:0 LFC3-AP			
XF-E2COM24	Name	Vendor	
	- XF-E1HSC	XINJE ELECTRONICS, INC.	
	- XF-E16X16Y	XINJE ELECTRONICS, INC.	
		XINJE ELECTRONICS, INC.	
	-XF-E32Y	XINJE ELECTRONICS, INC.	
	Modbus Master Length 4 Words	XINJE ELECTRONICS, INC.	
	Modbus Master Length & Words		
	Modbus Master Length 10 Words		
	Modbus Master Length 62 Words	XIN E ELECTRONICS, INC.	
	Modbus Slave Bead 16 Bits(0xxx)	XINJE ELECTRONICS, INC.	
	Modbus Slave Read 32 Bits(0xxxx)	XINJE ELECTRONICS, INC.	
	- Modbus Slave Read 64 Bits(0xxxx)	XINJE ELECTRONICS, INC.	
	Name: Modbus Master Length 4 Words Vendor: XINJE ELECTRONICS, INC. Group: Module Version: 0 Description: Imported from XML:XINJE-LFC3-AP-Re-	v2.0.3 xml Add Close	

Scan	Launch parameters	IO Mapping COE-Online				
Master	Address					
PLC Master	Index:SubIdx	Name	Address	Туре	Bit length	Value
	te- #x7010:01	Control Word	HD10008	UINT	16	
lave	te⊢#x7010:02	Module ID	HD10010	USINT	8	
StationID:0 LFC3-AP	te⊢#x7010:03	Port ID	HD10012	USINT	8	
- XF-E2COM24	⊕-#x7010:04	Slave ID	HD10014	USINT	8	
- Modbus Master Lerigtri 4 Words	s ⊕-#x7010:05	Function Code	HD10016	USINT	8	
	te⊢#x7010:06	Start Addr	HD10018	UINT	16	send RXPDO data
	te⊢#x7010:07	Len	HD10020	UINT	16	
	ta⊢#x7010:08	Output Datas1	HD10022	UINT	16	
	te⊢#x7010:09	Output Datas2	HD10024	UINT	16	
	te⊢#x7010:0A	Output Datas3	HD10026	UINT	16	
	±⊢#x7010:0B	Output Datas4	HD10028	UINT	16	
	12-#X5010:01	State Word	HD 10030	UINT	16	
	⊕-#x6010:02	Module ID	HD10032	USINT	8	
	te⊢#x6010:03	Port ID	HD10034	USINT	8	
	te⊢#x6010:04	Slave Addr	HD10036	USINT	8	
	te⊢#x6010:05	Function Code	HD10038	USINT	8	
	te-#x6010:06	Address	HD10040	UINT	16	receive TXPDO dat
	te⊢#x6010:07	Len	HD10042	UINT	16	
	te-#x6010:08	Input Datas1	HD10044	UINT	16	
	te⊢#x6010:09	Input Datas2	HD10046	UINT	16	
	⊕-#x6010:0A	Input Datas3	HD10048	UINT	16	
	±-#x6010:0B	Input Datas4	HD10050	UINT	16	
		1				

The configuration of RXPDO data for the communication virtual module is described as follows:

Index: subindex	Name	Туре	Explanation
#Xxxxx: 01	Control Word	UINT (2 bytes)	0: Clear errors/restore to pending status
			1: Normal sending
			The position order of the serial port
#Xxxxx: 02	Module ID	USINT (1 byte)	module in the module defaults to
			starting from 0
# V www 02	Dout ID	USINT (1 byta)	0: Serial port 1
#AXXXX: 05	Poit ID	USINI (I byte)	1: Serial port 2
#Xxxxx: 04	Slave ID	USINT (1 byte)	ModBus station no.
#Xxxxx: 05	Function Code	USINT (1 byte)	ModBus function code
#Xxxxx: 06	Start Addr	UINT (2 bytes)	ModBus slave station address
			The number of data to be sent is
# V	Len (Length on	UINT (2 bytes)	distinguished based on the function
#AXXXX: 07	ModBus protocol)		code, whether the length unit is Bit or
			Word
#Xxxxx: 08	Output Datas1	UINT (2 bytes)	Sending valid data 1
#Xxxxx: 09	Output Datas2	UINT (2 bytes)	Sending valid data 2
#Xxxxx: 0A	Output Datas3	UINT (2 bytes)	Sending valid data 3
#Xxxxx: 0B	Output Datas4	UINT (2 bytes)	Sending valid data 4
#Xxxxx: 48	Output Datas64	UINT (2 bytes)	Sending valid data 64



Module ID refers to the position order of the serial module in the expansion module, starting from 0 by default.

Example: In the following topology, the Module ID configuration data for two serial port modules are 0 and 1, respectively.



The TXPDO data feedback from the communication virtual module is described as follows:

Index: subindex	Name	Туре	Explanation
			Low byte definition
			1: Communication successful
	State Word (ModDue		2: Communication timeout
#Xxxxx: 01	Brotocol roturn codo)	UINT (2 bytes)	3: Function code error
	Flotocol letulii code)		4: CRC check error
			(Control word starts sending, status
			word cleared)
			The position order of the serial port
#Xxxxx: 02	Module ID	USINT (1 byte)	module in the module defaults to
			starting from 0
# V yyyy, 02	Dort ID	USINT (1 byta)	0: Serial port 1
#AXXXX: 03	FOITID		1: Serial port 2
#Xxxxx: 04	Slave Addr	USINT (1 byte)	ModBus station no.
#Xxxxx: 05	Function Code	USINT (1 byte)	ModBus function code
#Xxxxx: 06	Address	UINT (2 bytes)	ModBus address
#Xxxxx: 07	Len	UINT (2 bytes)	Return data length
#Xxxxx: 08	Input Datas1	UINT (2 bytes)	Receive valid data 1
#Xxxxx: 09	Input Datas2	UINT (2 bytes)	Receive valid data 2
#Xxxxx: 0A	Input Datas3	UINT (2 bytes)	Receive valid data 3

Index: subindex	Name	Туре	Explanation		
#Xxxxx: 0B	Input Datas4	UINT (2 bytes)	Receive valid data 4		
#Xxxxx: 42	Input Datas64	UINT (2 bytes)	Receive valid data 64		

- The serial port module acts as the master station to communicate with XDH via 485 communication (Modbus RTU mode)
- 1. Set the XDH serial port parameters

PLC config—PLC serial port—set "COM2" parameters.

PLC Config	Add - Remove	Modbus Comm	unication Para	ms		
Password)M2	Comport:	COM2 ·	Station Num:	100	•
Ethemet		Baudrate:	19200bp: *	Mode:	RTU	~
		Databits:	8	Send Delay Time(ms):	3	
ED 4GBOX		Checkbits:	Even	Response timeout(ms):	300	-
WBOX		Stopbits:	1 .	Retry Times:	3	-
SystemConfig		Frame TimeOut(ms):	þ			
		notice:Config el XNET is config	flictive need to ured by the co	reboot PLC nfiguration tool		
						_
	Rea	d From PLC \	Nrite To PLC	OK	Cancel	

2. Click on the serial port module to configure the required parameters in the launch parameters (taking the first serial port as an example), and select the Modbus Master Length 4 Words for the virtual module.

5	Launch	parameters IO Man	ning COE-Opline							
scan	Add	Edit Delete Mo	ve up Move down							
Master									1222	
PLC Master	Row	Index: subindex	Name	Value	Bits len	Error -> exit	Error -> jump	Next row	Notes	
		#x8000.01		91226	32			0	factory data	
blave	2	#2000.00		1026	32			0	factory data	
- StationID:0 LFC3-AP		#40000.00	Com0 Enable	1	0			0	Com/ Enable	
Medbue Master Length 4 Words	5	#20001.01		1	0			0		8
Mousus Master Lengur 4 Words	6	#x8001.03	Com0 ModBue Slave ID	1	8			0	Com0 ModBue Slav	
	7	#x8001.04	Com0 BaudBate	5	0			0	Com0 BaudBate	e ib
	8	#x8001:06	Com0 DataBite	2	8			0	Com0 DataBite	
	9	#x8001:07	Com0 Stop Bit	1	8			0	Com0 Ston Bit	
	10	#x8001:08	Com0 Parity	2	8			0	Com0 Parity	
	11	#x8001:41	Com1 Enable	1	8			0	Com1 Enable	
	12	#x8001:43	Com1 Commu Type	1	8			0	Com1 Commu Type	
	13	#x8001:44	Com 1 ModBus Slave ID	1	8		Π	0	Com1 ModBus Slav	re ID
	14	#x8001:45	Com1 BaudRate	5	8			0	Com1 BaudRate	24/2
	15	#x8001:46	Com1 DataBits	2	8	Ē	Ē	0	Com1 DataBits	
	16	#x8001:47	Com1 Stop Bit	1	8		Ē	0	Com1 StopBit	
	17	#x8001:48	Com1 Parity	2	8		Ē	0	Com1 Parity	
								10		
				- Description			144.9			-

For example, the configured slave station number is 100, the function code is 06 (write to a single register), the starting address of the slave station is 10 (corresponding to the Modbus communication address of XDH, which is D10), the length is 4 words, and the transmitted data is 10.

can	Launch parameters	s IO Mapping COE-Online					
aster	Address						
LC Master	Index:SubIdx	Name	Address	Туре	Bit length	Value	
	⊕-#x7010:01	Control Word	HD10008	UINT	16		
ave	⊕-#x7010:02	Module ID	HD10010	USINT	8		
StationID:0 LFC3-AP		Port ID	HD10012	USINT	8		
XF-E2COM24	⊕-#x7010:04	Slave ID	HD10014	USINT	8		
Modbus Master Length 4 Words	⊕ #x7010:05	Function Code	HD10016	USINT	8		
	⊕-#x7010:06	Start Addr	HD10018	UINT	16		
	⊕-#x7010:07	Len	HD10020	UINT	16		
	⊕-#x7010:08	Output Datas1	HD10022	UINT	16		
	⊕-#x7010:09	Output Datas2	HD10024	UINT	16		
	⊕-#x7010:0A	Output Datas3	HD10026	UINT	16		
		Output Datas4	HD10028	UINT	16		
	⊕-#x6010:01	State Word	HD10030	UINT	16		
	⊕-#x6010:02	Module ID	HD10032	USINT	8		
	te⊢#x6010:03	Port ID	HD10034	USINT	8		
	te-#x6010:04	Slave Addr	HD10036	USINT	8		
		Function Code	HD10038	USINT	8		
	te⊢#x6010:06	Address	HD10040	UINT	16		
	t #x6010:07	Len	HD10042	UINT	16		
	te⊢#x6010:08	Input Datas1	HD10044	UINT	16		
	⊕-#x6010:09	Input Datas2	HD10046	UINT	16		
	⊕-#x6010:0A	Input Datas3	HD10048	UINT	16		
	±-#x6010:0B	Input Datas4	HD10050	UINT	16		

3. Successful communication result (D10 value of PLC is 10).

PLC1 - 梯形图							• ×	PLC1-自由监控1		we make a line			ģ
								- 22.22.201 - 12	加修改制除主		18 下移 重原	重統	
0								名标	监控值	英型	映射地址/字长	汪梓	
×								r ♥ D10	10	INT	单字		
herest金数积弱							~	D11	0	INT	单字		
uner carge scaller								- 🔷 D12	0	INT	单字		
扫描	启动参数 10映	射 COE-Online						- 🔷 D13	0	INT	单字		
主站	地址 配置							L					
PLC Master	(ma), 7(ma)	61b	14-1.1	4.21	44 M	26.77		-					
	※51: 于※51	-6149	地址	央望	1275	8212	_						
11.9F	#x7010:01	Control Word	ADTOODS	UINT	16	1	_						
StationTD-0 LBC2eAP	-#x7010:02	Module 10	7010010	USINI	8	0							
TRESCOND O LPCS-W	#x7010:03	Fort ID	A010012	USINI	8	0							
Nodbus Master Length 4 Words	-#x7010:04	STave ID	A010014	USINI	a	100	_						
	ta 7010∶05	Function Uode	AU10016	USINI	8	6	_						
	te #x7010:06	Start Addr	X010018	UINT	16	10	_						
		Len	HD10020	UINT	16	4	_						
	€ \$x7010:08	Output Datas1	HD10022	UINT	16	10	_						
		Output Datas2	HD10024	UINT	16	0	_						
	€ \$x7010:0A	Output Datas3	HD10026	UINT	16	0							
	⊕-\$x7010:0B	Output Datas4	HD10028	UINT	16	0	_						
	€-\$x6010:01	State Word	HD10030	UINT	16	1							
	€-\$x6010:02	Module ID	HD10032	USINT	8	0							
	#x6010:03	Port ID	HD10034	USINT	8	0							
	€-\$x6010:04	Slave Addr	HD10036	USINT	8	100							
	# #x6010:05	Function Code	HD10038	USINT	8	6							
	€ \$x6010:06	Address	HD10040	UINT	16	10							
	# #x6010:07	Len	HD10042	UINT	16	4							
	€-\$x6010:08	Input Batasi	HD10044	UINT	16	0							
	#=#x6010:09	Input Datas2	HD10046	UINT	16	0							
	€-\$x6010:0A	Input Datas3	HD10048	UINT	16	0							
	i⊞-\$x6010:0B	Input Datas4	HD10050	UINT	16	0							
								-					
				-									
			与人配盘 与出配置	配置读取	副: 11 月 11	は、確定	「「「「「」」「「」」「「」」「「」」「「」」「」「」」「」」「」」「」」「」						

The communication status returned at this time is as follows:

The returned communication status word displays a value of 1, indicating successful communication.

4. Use the debugging tool to monitor the following message:



For specific message analysis, please refer to the "XD and XL Series Programmable Controller Instruction User Manual".

6.2.6.4 Modbus slave station

When the slave station is configured to read registers or coils, the master station is allowed to perform read operations on the configured slave stations; When the slave is configured as a write register or coil, the master is allowed to perform write operations on the configured slave.

When the serial module is configured in slave mode, the following types of virtual modules can be configured:

No.	ModBus mode virtual module name (0xxxx)
1	Modbus Slave Read 16 Bits(0xxxx)
2	Modbus Slave Read 32 Bits(0xxxx)
3	Modbus Slave Read 64 Bits(0xxxx)
4	Modbus Slave Read 128 Bits(0xxxx)
5	Modbus Slave Read 256 Bits(0xxxx)
6	Modbus Slave Read 1024 Bits(0xxxx)
7	Modbus Slave Write 16 Bits(0xxxx)
8	Modbus Slave Write 32 Bits(0xxxx)
9	Modbus Slave Write 64 Bits(0xxxx)
10	Modbus Slave Write 128 Bits(0xxxx)

• Communication type is 0xxxx

No.	ModBus mode virtual module name (0xxxx)
11	Modbus Slave Write 256 Bits(0xxxx)
12	Modbus Slave Write 1024 Bits(0xxxx)

• Communication type is 1xxxx

No.	ModBus mode virtual module name (1xxxx)
1	Modbus Slave Read 16 Bits(1xxxx)
2	Modbus Slave Read 32 Bits(1xxxx)
3	Modbus Slave Read 64 Bits(1xxxx)
4	Modbus Slave Read 128 Bits(1xxxx)
5	Modbus Slave Read 256 Bits(1xxxx)
6	Modbus Slave Read 1024 Bits(1xxxx)

• Communication type is 3xxxx

No.	ModBus mode virtual module name (3xxxx)
1	Modbus Slave Read 4 Words(3xxxx)
2	Modbus Slave Read 8 Words(3xxxx)
3	Modbus Slave Read 16 Words(3xxxx)
4	Modbus Slave Read 32 Words(3xxxx)
5	Modbus Slave Read 64 Words(3xxxx)

• Communication type is 4xxxx

No.	ModBus mode virtual module name (4xxxx)
1	Modbus Slave Read 4 Words(4xxxx)
2	Modbus Slave Read 8 Words(4xxxx)
3	Modbus Slave Read 16 Words(4xxxx)
4	Modbus Slave Read 32 Words(4xxxx)
5	Modbus Slave Read 64 Words(4xxxx)
6	Modbus Slave Write 4 Words(4xxxx)
7	Modbus Slave Write 8 Words(4xxxx)
8	Modbus Slave Write 16 Words(4xxxx)
9	Modbus Slave Write 32 Words(4xxxx)
10	Modbus Slave Write 64 Words(4xxxx)

Add device

Open the XDPPRO software and scan the slave device on the EthercatMaster interface:
EthercatConfig			×
Scan	General Expert process data Launch parameters IO Mapping CO	E-Online ESC Reg	
Master PLC Master Slave ⊖-StationID:0 LFC3-AP └─XF-E2COM24	Expert Config: 600 \$ Offset time(us): SM Watchdog: Slave Information Init	FuncMappingNum: 0	
	State Machine Current State Requested State Error Message		
		Fund With Adjusts OK	Grand

- Add the valid byte size corresponding to the required serial communication type
- (1) Take Modbus Slave Read 16 Bits(0xxxx) as an example

Right click "LFC3-AP"---add device---choose Modbus Slave Read 16 Bits(0xxxx).

Scan	General Expert process data Launch p	arameters IO Mapping COE-Online ESC Reg	
Master			
PLC Master	Expert Config: 600	FuncMappingNum: 0	
	Device library		×
Slave	Install Uninstall		
- StationID:0 LFC3-AP		Mada	
-XF-E2COM24	Name	Vendor	
	-XF-E32X	XINJE ELECTRONICS, INC.	
	-XF-E32Y	XINJE ELECTRONICS, INC.	
	Modbus Master Length 4 Words	XINJE ELECTRONICS, INC.	
	Modbus Master Length 8 Words	XINJE ELECTRONICS, INC.	
	Modbus Master Length 16 Words	XINJE ELECTRONICS, INC.	
	Modbus Master Length 32 Words	XINUE ELECTRONICS, INC.	
	Modbus Master Length 64 Words	XINJE ELECTRONICS, INC.	
	Modbus Slave Read To bits(00000)	XINJE ELECTRONICS, INC.	4
	Modbus Slave Read 64 Bite(0vvv)	XIN JE ELECTRONICS, INC.	
	Modbus Slave Read 128 Bite(0xxx)	XIN JE ELECTRONICS, INC.	
	Modbus Slave Read 256 Bits(0xxxx)	XINE ELECTRONICS, INC.	v
	Names Madeus Claus David 10 Bis(Owner)	Ainte Electriones, inc.	
	Vendor: XINJE ELECTRONICS, INC. Group: Module Version: 0 Description: Imported from XML:XINJE-LFC3-AP-F	Nev2.0.3 xml	
		Add Close	

an	Launch parameter	s IO Mapping COE-Online					
ster	Address						
C Master	Index:SubIdx	Name	Address	Туре	Bit length	Value	
	⊕-#x7010:01	Module ID	HD10008	USINT	8		
ve	⊕-#x7010:02	Port ID	HD10010	USINT	8		
StationID:0 LFC3-AP	te-#x7010:03	Start Addr	HD10012	UINT	16		
- XF-E2COM24	⊕-#x7010:04	Output Datas1	HD10014	UINT	16		
Modbus Slave Read 16 Bits(Uxxx	∝) 	State Word	HD10016	UINT	16		

When the slave station is configured as a read register or coil, the corresponding RXPDO parameter description is:

Index: subindex	Name	Туре	Explanation
#Xxxxx: 01	Module ID	USINT (1 byte)	The position order of serial port modules
			in the module starts from 0 by default
$\#\mathbf{V}_{\mathbf{Y}\mathbf{Y}\mathbf{Y}\mathbf{Y}\mathbf{Y}} = 02$	Dort ID	USINT (1 byta)	0: Serial port 1
#AXXXX: 02	Port ID	USINI (I byte)	1: Serial port 2
# V www 02	Start Addr	UINT (2 butes)	ModBus slave station assign space
#AXXXX: 05	Start Addr	UINT (2 bytes)	address
#Xxxxx: 04	Output Datas1	UINT (2 bytes)	Send valid data 1
#Xxxxx: 05	Output Datas2	UINT (2 bytes)	Send valid data 2
#Xxxxx: 06	Output Datas3	UINT (2 bytes)	Send valid data 3
#Xxxxx: 07	Output Datas4	UINT (2 bytes)	Send valid data 4
#Xxxxx: 48	Output Datas64	UINT (2 bytes)	Send valid data 64

When the slave station is configured as a read register or coil, the corresponding TXPDO feedback parameter description is:

Index: subindex	Name	Туре	Explanation
#Xxxxx: 01	State Word	UINT (2 bytes)	Low byte definition 0: Sending 1: Communication successful 2: Communication timeout

	2. Exaction and a sman
	5. Function code entor
	4: CRC check error

(2) Take Modbus Slave Write 16 Bits(0xxxx) as an example

Right click "LF	C3-AP"add de	evicechoose N	Modbus Slave	Write 16	Bits(0xxxx).
ingin oner Li				1110 10	Dito(OMM).

can	Launch parameters	IO Mapping COE-Online					
aster	Address						
LC Master	Index:SubIdx	Name	Address	Туре	Bit length	Value	1
	⊞-#x7020:01	Module ID	HD10018	USINT	8		
ave	te⊢#x7020:02	Port ID	HD10020	USINT	8		
- StationID:0 LFC3-AP	te⊢#x7020:03	Start Addr	HD10022	UINT	16		
Madhua Slava David 16 Pite (Gunu)	te-#x6020:01	State Word	HD10024	UINT	16		
Modbus Slave Nead 16 Bits(0xxxx)	±+#x6020:02	Input Datas1	HD10026	UINT	16		
							-

When the slave station is configured as a write register or coil, the corresponding RXPDO parameter description is:

Index: subindex	ndex: subindex Name Type		Explanation
# V www 01	Madula ID	USINT (1 buta)	The position order of serial port modules in the module starts
#AXXXX: 01	Module ID	USINT (T byte)	from 0 by default
# V	Port ID	USINT (1 byte)	0: Serial port 1
#AXXXX: 02			1: Serial port 2
#Xxxxx: 03	Start Addr	UINT (2 bytes)	ModBus slave station assign space address

$\mathbf{\hat{0}}$

Module ID refers to the position order of the serial module in the expansion module, starting from 0 by default.

Example: In the following topology, the Module ID configuration data for two serial port modules are 0 and 1, respectively.



When the slave station is configured as a write register or coil, the corresponding TXPDO feedback parameter description is:

Index: subindex	Name	Туре	Explanation
#Xxxxx: 01	#Xxxxx: 01 State Word		Low byte definition 0: Communication successful 1: Communication timeout 2: Function code error
			3: CRC check error
#Xxxxx: 03	Start Addr	UINT (2 bytes)	ModBus slave station assign space address
#Xxxxx: 02	Input Datas1	UINT (2 bytes)	Receive valid data 1
#Xxxxx: 03	Input Datas2	UINT (2 bytes)	Receive valid data 2
#Xxxxx: 04	Input Datas3	UINT (2 bytes)	Receive valid data 3
#Xxxxx: 05	Input Datas4	UINT (2 bytes)	Receive valid data 4
#Xxxxx: 42	Input Datas64	UINT (2 bytes)	Receive valid data 64

- The serial port module acts as a slave to perform RS485 communication with XDH (Modbus RTU mode)
- Configure the serial port parameters of XDH
 PLC config—PLC serial port—set the parameters of COM2.

∃	Add - Remove	Modbus Comm	unication Params		
Password	COM2	Comport:	COM2 ~	Station Num:	100
Ethemet		Baudrate:	19200bp: ~	Mode:	RTU ~
Module		Databits:	8 ~	Send Delay Time(ms):	3
ED		Checkbits:	Even 🗸	Response timeout(ms):	300
WBOX		Stopbits:	1 ~	Retry Times:	3
SystemConfig		Frame TimeOut(ms):	0		
		notice:Config e XNET is config	ffictive need to re ured by the confi	eboot PLC guration tool	

2. Click on the serial port module to configure the required parameters in the launch parameters (taking the first serial port as an example), and select the Modbus Slave Read 16 Bits (0xxxx) type for the virtual module

Scan	Launch	parameters IO Map	ping COE-Online						
Master	Add	Edit Delete Mo	ve up Move down						
PLC Master	Row	Index: subindex	Name	Value	Bits len	Error -> exit	Error -> jump	Next row	Notes
	1	#x8000:01		2818049	32			0	factory data
ilave	2	#x8000:0B		91236	32			0	factory data
StationID:01EC3-AP	3	#x8000:0C		1026	32			0	factory data
-XF-E2COM24	4	#x8001:01	Com0 Enable	1	8			0	Com0 Enable
Modbus Slave Read 16 Bits(0xxx)	5	#x8001:03	Com0 Commu Type	1	8			0	Com0 Commu Type
	6	#x8001:04	Com0 ModBus Slave ID	1	8			0	Com() ModBus Slave ID
	7	#x8001:05	Com0 BaudRate	5	8			0	Com0 BaudRate
	8	#x8001:06	Com0 DataBits	2	8			0	Com0 DataBits
	9	#x8001:07	Com0 Stop Bit	1	8			0	Com0 StopBit
	10	#x8001:08	Com0 Parity	2	8			0	Com0 Parity
	11	#x8001:41	Com1 Enable	1	8			0	Com1 Enable
	12	#x8001:43	Com1 Commu Type	1	8			0	Com1 Commu Type
	13	#x8001:44	Com1 ModBus Slave ID	1	8			0	Com1 ModBus Slave ID
	14	#x8001:45	Com1 BaudRate	5	8			0	Com1 BaudRate
	15	#x8001:46	Com1 DataBits	2	8			0	Com1 DataBits
	16	#x8001:47	Com1 Stop Bit	1	8			0	Com1 StopBit
	17	#x8001:48	Com1 Parity	2	8			0	Com1 Parity
								1	

For example, using the first serial port of the serial module as the slave station, the slave station number is configured as 0, and the Modbus starting address is 0. The master station reads the slave station data through the read coil command, and the read data is displayed according to the Uint type.

扫描	启动参数 IO映射	COE-Online						
主站	地址 配置							
北区 Master 小法 -StationID:0 LFC3-AF -XF-Z2COM24 Modbus Slave Read 16 Bits(Охххх)	索引: 子索引 ⊕ #x7010:01 ⊕ #x7010:02 ⊕ #x7010:03 ⊕ #x7010:04 ⊕ #x7010:01	名称 Module ID Port ID Start Addr Output Datasl State Word		地址 地10008 地10010 地10012 地10014 地10016	类型 USINT UINT UINT UINT	位长 8 16 16 16	数值 0 0 1 0	
PLC1 - 株形图			导入配置		(配置读取) 目	2番与入 数 1 1 K1 K0 K16	括 确定 Mite Mite Mite Mite Mite Mite Mite Mite	取消

3. Successful communication result (PLC's M100 is set to ON, DM100 value is 1)

PLC1 - 梯形图							. ×	PLC1-自由监控1				
								: 监控窗口 ・ 添加	0 修改 删除 全	部删除 上标	下移 置顶	置底
M10								名称	收达值	大田	映射地址/字长	注释
				COL	R K1 K0 K1	6 M100 K2		- V IM100	1	INT	单字	
						ON		- 0 H 100	01	BIT	位	
								- W101	OFF	BIT	位	
								- 🔷 M102	OFF	BIT	位	
								- • M103	OFF	BIT	位	
ercat参数配置							×	- 🌩 M104	OFF	BIT	位	
	mart de la Tolle I	D4						- 🍑 M105	OFF	BIT	位	
日油	局初参数 1000	85 COE-Online						- 🔷 M106	OFF	BIT	位	
E站	地址 配置							- • M107	OFF	BIT	位	
LC Master	索리: 구춘리	复款	1011	杰刑	位长	恭信		- 🔷 M108	OFF	BIT	位	
	# 31- 3 # 51	undule TD	707E	ISDE	8	8×05		- 🔷 N109	OFF	BIT	位	
从站	#x7010:02	Port ID	HD10010	USINT	8	0		- 🔷 M110	OFF	BIT	位	
-StationID:0 LFC3-AP	#x7010:03	Start Addr	HD10012	UINT	16	0		- 🔷 M111	OFF	BIT	位	
-XF-E2COH24		Output Datasi	HD10014	UINT	16	1		- III 12	OFF	BIT	位	
-Modbus Slave Read 16 Bits(Oxxxx)	(g)=#x6010:01	State Word	HD10016	UINT	16	0		- 🍑 M113	OFF	BIT	位	
								- 🔷 M114	OFF	BIT	位	
								- 🔷 M115	OFF	BIT	位	
								5D160	0	INT	单字	串口2 Hodbus指令执行结婚
								L				
	-											
	-											
		-										
			导入配盘 导出配置	副 古 读 职 首	K本与人 38	オ 研定	「現消」					

The communication status returned at this time is as follows:

The returned communication status word is 0, indicating that there are no errors from the slave station.

4. Use the serial port debugging assistant to monitor the following message:



 $\mathbf{\hat{0}}$

For specific message analysis, please refer to the XD and XL Series Programmable Controller User Manual [Basic Instructions].

6.2.6.5 Free format

- The free-format data frame supports a maximum of 128 words.
- Free format allows simultaneous configuring sending and receiving sub-modules. Users can switch between sending and receiving and control the conditions for sending or receiving by operating the corresponding control word. When using RS485, only receiving or sending is possible. However, for RS232, simultaneous sending and receiving is allowed.
- When sending data in free format, multiple sending instructions can be configured, while only one write instruction is allowed when configured for reception.
- When the serial port module is set to free format, the available types of virtual modules are as follows:"

Set as sending mode

No.	Free format virtual module name
1	Free-Port Send 4 Words
2	Free-Port Send 8 Words
3	Free-Port Send 16 Words
4	Free-Port Send 32 Words
5	Free-Port Send 64 Words
6	Free-Port Send 128 Words

Set as receiving mode

No.	Free format virtual module name
1	Free-Port Rcv 4 Words
2	Free-Port Rcv 8 Words
3	Free-Port Rcv 16 Words
4	Free-Port Rcv 32 Words
5	Free-Port Rcv 64 Words
6	Free-Port Rcv 128 Words

Add device

Open XDPPRO software, scan slave device on EthercatMaster interface:

EthercatConfig						×
Scan	General Expert process data Launch parameters 10 Mapping COE-Onlin	e ESC Reg				
Scan Master PLC Master Slave ⊡-StationID:0 LFC3-APXF-E2COM24	General Expert process data Launch parameters IO Mapping COE-Onlin Expert Config: 600 \$ Offset time(us):	ESC Reg FuncMappingNum: FuncModeule:	0 🔶	~		
	Impot	port Read	Write	Activate	ОК	Cancel

■ Add the valid byte size corresponding to the required serial communication type

Take Free-Port Send 4 Words as an example.

Right click "LFC3-AP"---add device---choose Free-Port Send 4 Words.

Master PLC Master Device Slave StationID:0 LFC3-AP XF-E2COM24 Name	Expert Config: 600 + Expert Config: 600 + Elibrary Uninstall Modbus Slave Write 256 Bits(Docox) Modbus Slave Write 1024 Bits(Docox) Modbus Slave Write 1024 Bits(Docox) Modbus Slave Write 8 Words(4xxxx) Modbus Slave Write 16 Words(4xxxx) Modbus Slave Write 32 Words(4xxxx) Modbus Slave Write 32 Words(4xxxx) Free-Port Send 4 Words Free-Port Send 4 Words	Vendor XINJE ELECTRONICS, INC.	×	
PLC Master Device Slave Insta ⇒ StationID:0 LFC3-AP Name ↓ XF-E2COM24	Expert Config: 600 E library I Uninstall Modbus Slave Write 256 Bits(Docox) Modbus Slave Write 1024 Bits(Docox) Modbus Slave Write 1024 Bits(Docox) Modbus Slave Write 8 Words(4xxxx) Modbus Slave Write 16 Words(4xxxx) Modbus Slave Write 21 Words(4xxxx) Modbus Slave Write 21 Words(4xxxx) Free-Port Send 4 Words Free-Port Send 4 Words	Vendor XINJE ELECTRONICS, INC. XINJE ELECTRONICS, INC. XINJE ELECTRONICS, INC.		
Device Slave Inste □-StationID:0 LFC3-AP □-XF-E2COM24	E library II Uninstall Modbus Slave Write 256 Bits(Docox) Modbus Slave Write 1024 Bits(Docox) Modbus Slave Write 1024 Bits(Docox) Modbus Slave Write 8 Words(4xxxx) Modbus Slave Write 16 Words(4xxxx) Modbus Slave Write 32 Words(4xxxx) Modbus Slave Write 32 Words(4xxxx) Free-Port Send 4 Words Free-Port Send 4 Words	Vendor XINJE ELECTRONICS, INC. XINJE ELECTRONICS, INC. XINJE ELECTRONICS, INC. XINJE ELECTRONICS, INC. XINJE ELECTRONICS, INC. XINJE ELECTRONICS, INC. XINJE ELECTRONICS, INC.		
Slave Insta StationID:0 LFC3-AP - XF-E2COM24	II Uninstall Modbus Slave Write 256 Bits(Dococ) Modbus Slave Write 1024 Bits(Dococ) Modbus Slave Write 1024 Bits(Dococ) Modbus Slave Write 8 Words(4cocc) Modbus Slave Write 8 Words(4cocc) Modbus Slave Write 32 Words(4cocc) Modbus Slave Write 54 Words(4cocc) Free-Port Send 4 Words Free-Port Send 4 Words	Vendor XINJE ELECTRONICS, INC. XINJE ELECTRONICS, INC. XINJE ELECTRONICS, INC. XINJE ELECTRONICS, INC. XINJE ELECTRONICS, INC. XINJE ELECTRONICS, INC. XINJE ELECTRONICS, INC.		
StationID:0 LFC3-AP XF-E2COM24 Name	Modbus Slave Write 256 Bits(Dooox) Modbus Slave Write 1024 Bits(Dooox) Modbus Slave Write 1024 Bits(Dooox) Modbus Slave Write 8 Words(4xxxx) Modbus Slave Write 16 Words(4xxxx) Modbus Slave Write 32 Words(4xxxx) Modbus Slave Write 54 Words(4xxxx) Free-Port Send 4 Words	Vendor XINJE ELECTRONICS, INC. XINJE ELECTRONICS, INC. XINJE ELECTRONICS, INC. XINJE ELECTRONICS, INC. XINJE ELECTRONICS, INC. XINJE ELECTRONICS, INC. XINJE ELECTRONICS, INC.		
- XF-E2COM24	Modbus Slave Write 256 Bits(Doox) Modbus Slave Write 1024 Bits(Doox) Modbus Slave Write 4 Words(4xxxx) Modbus Slave Write 8 Words(4xxxx) Modbus Slave Write 16 Words(4xxxx) Modbus Slave Write 32 Words(4xxxx) Modbus Slave Write 54 Words(4xxxx) Free-Port Send 4 Words	Vendor XINJE ELECTRONICS, INC. XINJE ELECTRONICS, INC. XINJE ELECTRONICS, INC. XINJE ELECTRONICS, INC. XINJE ELECTRONICS, INC. XINJE ELECTRONICS, INC. XINJE ELECTRONICS, INC.		
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	-Modbus Slave Write 1024 Bits(0xxxx) -Modbus Slave Write 4 Words(4xxxx) -Modbus Slave Write 8 Words(4xxxx) -Modbus Slave Write 16 Words(4xxxx) -Modbus Slave Write 32 Words(4xxxx) -Modbus Slave Write 32 Words(4xxxx) -Modbus Slave Write 54 Words(4xxxx) -Free-Port Send 4 Words -Free-Port Send 8 Words	XINJE ELECTRONICS, INC. XINJE ELECTRONICS, INC. XINJE ELECTRONICS, INC. XINJE ELECTRONICS, INC. XINJE ELECTRONICS, INC. XINJE ELECTRONICS, INC. XINJE ELECTRONICS, INC.		
	-Modbus Slave Write 4 Words(4xxxx) -Modbus Slave Write 8 Words(4xxxx) -Modbus Slave Write 16 Words(4xxxx) -Modbus Slave Write 32 Words(4xxxx) -Modbus Slave Write 32 Words(4xxxx) -Free-Port Send 4 Words -Free-Port Send 8 Words	XINJE ELECTRONICS, INC. XINJE ELECTRONICS, INC. XINJE ELECTRONICS, INC. XINJE ELECTRONICS, INC. XINJE ELECTRONICS, INC. XINJE ELECTRONICS, INC.		
	Modbus Slave Write 8 Words(4xxxx) Modbus Slave Write 16 Words(4xxxx) Modbus Slave Write 32 Words(4xxxx) Modbus Slave Write 64 Words(4xxxx) Free-Port Send 4 Words Free-Port Send 8 Words	XINJE ELECTRONICS, INC. XINJE ELECTRONICS, INC. XINJE ELECTRONICS, INC. XINJE ELECTRONICS, INC. XINJE ELECTRONICS, INC.		
	Modbus Slave Write 16 Words(4xxxx) Modbus Slave Write 32 Words(4xxxx) Modbus Slave Write 54 Words(4xxxx) Free-Port Send 4 Words	XINJE ELECTRONICS, INC. XINJE ELECTRONICS, INC. XINJE ELECTRONICS, INC. XINJE ELECTRONICS, INC.		
	Modbus Slave Write 32 Words(4xxxx) Medbus Slave Write 54 Words(4xxxx) Free-Port Send 4 Words Free-Port Send 8 Words	XINJE ELECTRONICS, INC. XINJE ELECTRONICS, INC. XINJE ELECTRONICS, INC.		
	Medbus Slave Write 54 Words(4xxxx) Free-Port Send 4 Words Free-Port Send 8 Words	XINJE ELECTRONICS, INC. XINJE ELECTRONICS, INC.		
	Free-Port Send 4 Words	XINJE ELECTRONICS, INC.		
	Free-Port Send & Words			
		XINJE ELECTRONICS, INC.		
	Free-Port Send 16 Words	XINJE ELECTRONICS, INC.		
	Free-Port Send 32 Words	XINJE ELECTRONICS, INC.		
	Free-Port Send 64 Words	XINJE ELECTRONICS, INC.	×	
Vern Grou Vers Dese	er reford send 4 molds Jor: XINJE ELECTRONICS, INC. p: Module ion: 0 cription: Imported from XML:XINJE-LFC3-AP-Rev2.0.3.	xml	Close	

can	Launch parameters	IO Mapping COE-Online					
Master	Address						
PLC Master	Index:SubIdx	Name	Address	Туре	Bit length	Value	
	⊕-#x7010:01	Control Word	HD10008	UINT	16		
lave	⊕-#x7010:02	Module ID	HD10010	USINT	8		
- StationID:0 LFC3-AP	⊕-#x7010:03	Port ID	HD10012	USINT	8		
- XF-E2COM24	⊕-#x7010:04	Send Len	HD10014	UINT	16		
Free-Port Send 4 Words	⊕-#x7010:05	Output Datas1	HD10016	UINT	16		
	⊕-#x7010:06	Output Datas2	HD10018	UINT	16		
	⊕-#x7010:07	Output Datas3	HD10020	UINT	16		
	⊕-#x7010:08	Output Datas4	HD10022	UINT	16		
	⊞-#x6010:01	Send State	HD10024	UINT	16		
						-	

When the free format is used as the sending data configuration (RXPDO), the corresponding data is defined as:

Index: subindex	Name	Туре	Explanation
#Xxxxx: 01	Control Word	UINT (2 bytes)	0: Clear errors/restore to pending status 1: Ordinary sending
#Xxxxx: 02	Module ID	USINT (1 byte)	The position order of the serial port module in the module defaults to starting from 0
#Xxxxx: 03	Port ID	USINT (1 byte)	0: Serial port 1 1: Serial port 2
#Xxxxx: 04	Send Len (byte unit)	USINT (1 byte)	The number of data to be sent (in bytes)
#Xxxxx: 05	Output Datas1	UINT (2 bytes)	Send valid data 1
#Xxxxx: 06	Output Datas2	UINT (2 bytes)	Send valid data 2
#Xxxxx: 07	Output Datas3	UINT (2 bytes)	Send valid data 3
#Xxxxx: 08	Output Datas4	UINT (2 bytes)	Send valid data 4
#Xxxxx: 84	Output Datas128	UINT (2 bytes)	Send valid data 128
#Xxxxx: 01	Tx State	UINT (2 bytes)	Sending status 0: Sent successfully 1: Sending failed 2: Sending timeout

When free format is used as the receiving data configuration (TXPDO), the corresponding data is defined as:

Index: subindex	Name	Туре	Explanation
#Xxxxx: 01	Control Word	UINT (2 bytes)	0: Clear errors/restore to pending status
#Xxxxx: 02	Module ID	USINT (1 byte)	1: Ordinary sending The position order of the serial port module in the module defaults to starting from 0
#Xxxxx: 03	Port ID	USINT (1 byte)	0: Serial port 1 1: Serial port 2
#Xxxxx: 04	Rcv Len (byte numbers)	USINT (1 byte)	The number of data to be received (in bytes)
#Xxxxx: 01	Rx State	UINT (2 bytes)	Receiving status 0: Received successfully 1: Receiving failed 2: Receiving timeout
#Xxxxx: 02	Actual receiving length	UINT (2 bytes)	Actual data reception length
#Xxxxx: 03	Input Datas1	UINT (2 bytes)	Receive valid data 1
#Xxxxx: 04	Input Datas2	UINT (2 bytes)	Receive valid data 2
#Xxxxx: 05	Input Datas3	UINT (2 bytes)	Receive valid data 3
#Xxxxx: 81	Input Datas128	UINT (2 bytes)	Receive valid data 128



Module ID refers to the position order of the serial module in the expansion module, starting from 0 by default.

Example: In the following topology, the Module ID configuration data for two serial port modules are 0 and 1, respectively.



- Module communicates with XDH in free format (send mode)
- 1. Configure the serial port parameters of XDH

PLC config—PLC serial port—set COM2 parameters.

PLC Config	Add + Remove	Free Commun	ication Params			
Password	COM2	Comport:	COM2	Frame timeout(ms):	3	-
Pulse		Baudrate:	19200bps	Response timeout(ms):	300	ł
BD ED		Databits:	8	V Begin char	: 0x0	
4GBOX		Checkbits:	Even	V End Char:	0x0	
SystemConfig		Stopbits:	1	✓ Buffer bit:	8bits	~
		notice:Config XNET is confi	effictive need t gured by the co	o reboot PLC onfiguration tool		
	Rea	d From PLC	Write To PLC	ОК	Cance	ł

2. Click on the serial port module to configure the required parameters in the launch parameters (taking the first serial port as an example), and select the Free Port Send 4 Words type for the virtual module.

Master PLC Master Name Value Bits len Error Slave 1 #x8000:08 91236 32 Slave 3 #x8000:0C 1026 32 Free-Port Send 4 Words 4 #x8001:01 Com0 Enable 1 8 Free-Port Send 4 Words 5 #x8001:03 Com0 Commu Type 2 5 6 #x8001:03 Com0 DataBits 2 8 9 7 #x8001:06 Com0 DataBits 2 8 9 9 #x8001:07 Com0 DataBits 2 8 1 10 #x8001:04 Com1 DataBits 2 8 1 11 #x8001:05 Com0 DataBits 2 8 1 12 #x8001:06 Com0 Parity 2 8 1 13 #x8001:07 Com1 DataBits 2 8 1 14 #x8001:43 Com1 Commu Type 1 8 1 14 #x8001:43 Com1 Commu Type 1 8 1 15 <td< th=""><th>r -> exit Error -> jump</th><th>11.52</th><th></th></td<>	r -> exit Error -> jump	11.52	
PLC Master Row Index: subindex Name Value Bits len Error 3lave 2 #x8000:01 2818049 32 32 State 1 #x8000:08 91236 32 32 State 1026 32 32 32 32 Free-Port Send 4 Words 1 8 6 4 #x8001:01 Com0 Enable 1 8 6 Free-Port Send 4 Words 6 #x8001:03 Com0 Commu Type 2 5 8 7 6 #x8001:05 Com0 ModBus Slave ID 1 8 6 7 7 #x8001:05 Com0 DataBits 2 8 9 #x8001:08 2 8 10 #x8001:08 2 8 10 1 8 10 #x8001:08 2 8 10 1 8 10 1 8 10 1 8 1 1 1 1 1 1 1 1<	r -> exit Error -> jump		1 232
1 #x8000:01 2818049 32 2 #x8000:08 91236 32 3 #x8000:0C 1026 32 3 #x8001:01 Com0 Enable 1 8 Free-Port Send 4 Words 5 #x8001:03 Com0 Commu Type 2 free 6 #x8001:03 Com0 Commu Type 2 8 free 6 #x8001:05 Com0 BaudRate 5 8 7 9 #x8001:05 Com0 DataBits 2 8 10 10 #x8001:08 Com0 Party 2 8 10 11 #x8001:05 Com0 DataBits 2 8 10 10 #x8001:08 Com0 Party 2 8 10 11 #x8001:41 Com1 DataBits 2 8 11 12 #x8001:43 Com1 Commu Type 1 8 12 13 #x8001:43 Com1 Commu Type 1 8 12 13 14 14 14 14 14 14 14 14 <		Next row	Notes
Slave 91236 32 3 #x8000:0C 1026 32 3 #x8001:01 Com0 Enable 1 8 Free-Port Send 4 Words 5 #x8001:03 Com0 Commu Type 2 free 6 #x8001:04 Com0 ModBus Slave ID 1 8 format 7 #x8001:05 Com0 BaudRate 5 8 9 #x8001:06 Com0 StopBit 1 8 10 10 #x8001:06 Com0 VapBit 1 8 10 #x8001:07 Com0 StopBit 1 8 10 11 #x8001:08 Com0 Parity 2 8 1 1 8 1 1 8 1 1 8 1 1 8 1 1 8 1 1 8 1 1 8 1		0	factory data
3 #x8000:0C 1026 32 4 #x8001:01 Com0 Enable 1 8 Free-Port Send 4 Words 5 #x8001:03 Com0 Commu Type 2 free 6 #x8001:04 Com0 ModBus Slave ID 1 8 format 7 #x8001:05 Com0 BaudRate 5 8 8 #x8001:06 Com0 DataBits 2 8 9 #x8001:07 Com0 StopBit 1 8 10 #x8001:41 Com1 Enable 1 8 11 #x8001:42 Com1 Enable 1 8 12 #x8001:43 Com1 Parity 2 8 13 #x8001:44 Com1 ModBus Slave ID 1 8 14 #x8001:44 Com1 ModBus Slave ID 1 8 15 #x8001:45 Com1 BaudRate 5 8 15 #x8001:46 Com1 DataBits 2 8 16 #x8001:48 Com1 Parity 2 8 17 #x8001:48 Com1 Parity 2 8		0	factory data
KEEECOMM2 4 #x8001:01 Com0 Enable 1 8 Free-Port Send 4 Words 5 #x8001:03 Com0 Commu Type 2 free 6 #x8001:04 Com0 ModBus Slave ID 1 8 format 7 #x8001:05 Com0 BaudRate 5 8 8 #x8001:06 Com0 DataBits 2 8 9 #x8001:07 Com0 StopBit 1 8 10 #x8001:08 Com0 Parity 2 8 11 #x8001:01 8 11 12 #x8001:14 Com1 Enable 1 8 12 #x8001:44 Com1 ModBus Slave ID 1 8 12 #x8001:44 Com1 Commu Type 1 8 12 #x8001:44 Com1 ModBus Slave ID 1 8 13 #x8001:45 Com1 BaudRate 5 8 15 #x8001:46 Com1 DataBits 2 8 16 #x8001:47 Com1 StopBit 1 8 17 #x8001:48 Com1 Parity 2 8 16 1 <t< td=""><td></td><td>0</td><td>factory data</td></t<>		0	factory data
Free-Port Send 4 Words 5 #x8001/03 Com0 Commu Type 2 Iffee 6 #x8001:04 Com0 ModBus Slave ID 1 8 format 7 #x8001:05 Com0 DataBits 2 8 9 #x8001:06 Com0 DataBits 2 8 10 #x8001:07 Com0 StopBit 1 8 10 #x8001:08 Com0 Parity 2 8 11 #x8001:41 Com1 Enable 1 8 12 #x8001:43 Com1 Commu Type 1 8 13 #x8001:45 Com1 BaudRate 5 8 14 #x8001:45 Com1 BaudRate 5 8 15 #x8001:46 Com1 DataBits 2 8 16 #x8001:48 Com1 Parity 2 8 17 #x8001:48 Com1 Parity 2 8		0	Com0 Enable
6 #x8001:04 Com0 ModBus Slave ID 1 8 format 7 #x8001:05 Com0 BaudRate 5 8 8 #x8001:06 Com0 DataBits 2 8 9 #x8001:07 Com0 StopBit 1 8 10 #x8001:08 Com0 Parity 2 8 11 #x8001:41 Com1 Enable 1 8 12 #x8001:43 Com1 Commu Type 1 8 13 #x8001:44 Com1 ModBus Slave ID 1 8 14 #x8001:45 Com1 BaudRate 5 8 15 #x8001:46 Com1 DataBits 2 8 16 #x8001:47 Com1 StopBit 1 8 17 #x8001:48 Com1 Parity 2 8		0	Com0 Commu Type
7 #x8001.05 Com0 BaudRate 5 8 8 #x8001.06 Com0 DataBits 2 8 9 #x8001.07 Com0 Stop Bit 1 8 10 #x8001.08 Com0 Parity 2 8 11 #x8001.43 Com1 Commu Type 1 8 12 #x8001.43 Com1 Commu Type 1 8 13 #x8001.44 Com1 ModBus Slave ID 1 8 14 #x8001.45 Com1 DataBits 2 8 15 #x8001.46 Com1 DataBits 2 8 16 #x8001.47 Com1 Stop Bit 1 8 17 #x8001.48 Com1 Parity 2 8		0	Com0 ModBus Slave ID
8 #x8001:06 Com0 DataBits 2 8 9 #x8001:07 Com0 StopBit 1 8 10 #x8001:08 Com0 Parity 2 8 11 #x8001:41 Com1 Enable 1 8 12 #x8001:43 Com1 Commu Type 1 8 13 #x8001:44 Com1 ModBus Slave ID 1 8 14 #x8001:45 Com1 BaudRate 5 8 15 #x8001:46 Com1 DataBits 2 8 16 #x8001:47 Com1 StopBit 1 8 17 #x8001:48 Com1 Parity 2 8		0	Com0 BaudRate
9 #x8001:07 Com0 StopBit 1 8 10 #x8001:08 Com0 Parity 2 8 11 #x8001:11 Com1 Enable 1 8 12 #x8001:41 Com1 Commu Type 1 8 13 #x8001:44 Com1 ModBus Slave ID 1 8 14 #x8001:45 Com1 BaudRate 5 8 15 #x8001:46 Com1 DataBits 2 8 16 #x8001:48 Com1 Parity 2 8 17 #x8001:48 Com1 Parity 2 8		0	Com0 DataBits
10 #x8001:08 Com0 Parity 2 8 11 #x8001:41 Com1 Enable 1 8 12 #x8001:43 Com1 Commu Type 1 8 13 #x8001:43 Com1 ModBus Slave ID 1 8 14 #x8001:45 Com1 BaudRate 5 8 15 #x8001:46 Com1 DataBits 2 8 16 #x8001:47 Com1 StopBit 1 8 17 #x8001:48 Com1 Parity 2 8		0	Com0 StopBit
11 #x8001:41 Com1 Enable 1 8 12 #x8001:43 Com1 Commu Type 1 8 13 #x8001:44 Com1 ModBus Slave ID 1 8 14 #x8001:45 Com1 BaudRate 5 8 15 #x8001:46 Com1 DataBits 2 8 16 #x8001:47 Com1 StopBit 1 8 17 #x8001:48 Com1 Parity 2 8		0	Com0 Parity
12 #x8001:43 Com1 Commu Type 1 8 13 #x8001:44 Com1 ModBus Slave ID 1 8 14 #x8001:45 Com1 BaudRate 5 8 15 #x8001:46 Com1 DataBits 2 8 16 #x8001:47 Com1 StopBit 1 8 17 #x8001:48 Com 1 Parity 2 8		0	Com1 Enable
13 #x8001:44 Com1 ModBus Slave ID 1 8 14 #x8001:45 Com1 BaudRate 5 8 15 #x8001:46 Com1 DataBits 2 8 16 #x8001:47 Com1 StopBit 1 8 17 #x8001:48 Com1 Parity 2 8		0	Com1 Commu Type
14 #x8001:45 Com 1 BaudRate 5 8 15 #x8001:46 Com 1 DataBits 2 8 16 #x8001:47 Com 1 StopBit 1 8 17 #x8001:48 Com 1 Parity 2 8		0	Com1 ModBus Slave ID
15 #x8001:46 Com1 DataBits 2 8 16 #x8001:47 Com1 StopBit 1 8 17 #x8001:48 Com1 Parity 2 8		0	Com1 BaudRate
16 #x8001:47 Com1 StopBit 1 8 17 #x8001:48 Com1 Parity 2 8		0	Com1 DataBits
17 #x8001:48 Com1 Parity 2 8		0	Com1 StopBit
		0	Com1 Parity

Scan	General Expert process data Launch parame	eters IO Mapping COE-Online ESC Reg		
Master			w2201	
PLC Master	Expert Config: 600	FuncMappingNum: 0		
	Device library		~	
ave	Install Uninstall			
StationID:0 LFC3-AP	Name	Vendor		
- XF-E2COM24	Modbus Slove Witte 1024 Bits/Orvey)	VINUE ELECTRONICS INC		
- Free-Port Sena 4 Words	Modbus Slave Write 1024 bits(UXXX)	XINJE ELECTRONICS, INC.		
	- Modbus Slave Write 8 Words(4xxx)	XIN E ELECTRONICS, INC.		
	-Modbus Slave Write 16 Words(4xxx)	XINJE ELECTRONICS, INC.		
	Modbus Slave Write 32 Words(4xxxx)	XINJE ELECTRONICS, INC.		
	Modbus Slave Write 64 Words(4xxxx)	XINJE ELECTRONICS, INC.		
	Free-Port Send 4 Words	XINJE ELECTRONICS, INC.		
	- Free-Port Send 8 Words	XINJE ELECTRONICS, INC.		
	- Free-Port Send 16 Words	XINJE ELECTRONICS, INC.		
	- Free-Port Send 32 Words	XINJE ELECTRONICS, INC.		
	- Free-Port Send 64 Words	XINJE ELECTRONICS, INC.		
	- Free-Port Send 128 Words	XINJE ELECTRONICS, INC.	~	
	Name: Free-Port Send 4 Words Vendor: XINJE ELECTRONICS, INC. Group: Module Version: 0 Description: Imported from XML:XINJE-LFC3-AP-Rev2.	0.3.xml Add	Clase	
		Import Export Read	Write Activate OK	Cance

For example, sending 4 types of Word data with the following content: 1, 0, 0, 0.

描	启动参数 IO映射	† COE-Online					
站	地址 配置						
C Master	索引:子索引	名称	地址	类型	位长	数值	
	🖪 #x7010:01	Control Word	H010008	UINT	16	1	
站	⊕-#x7010:02	Module ID	10010010	USINT	8	0	
StationID:0 LFC3-AP	⊕-#x7010:03	Port ID	HD10012	USINT	8	0	
-XF-E2COM24	#-#x7010:04	Send Len	HD10014	UINT	16	4	
-Free-Port Send 4 Words		Output Datas1	HD10016	UINT	16	1	
	⊕ - # x7010:06	Output Datas2	HD10018	UINT	16	0	
	#x7010:07	Output Datas3	HD10020	UINT	16	0	
	⊕ - # x7010:08	Output Datas4	HD10022	UINT	16	0	
	±−#x6010:01	Send_State	HD10024	UINT	16	1	

PLC as receiver instruction:

0	MO	SM13					RCV D10 D30 K2
Ū							0 0

3. The result of successful communication (the value of D11 in PLC is 1).

NO Set13 RCV D10 D30 K2 0 4 0 4		加 修改 删除 全部	部删除 上移	: 下移 置顶 置底 随射地址/文长	注释
840 840 840 840 840 840 840 840	交称 □◆ D10	<u>监控值</u> 0	<u></u>	隐默地址/宝长	注释
RCV D10 D30 K2 0 4	→ D10	0			
M10			LNI	单字	
		1	INT	単字	
1 SEND D100 D200 K2	- 🔷 D12	0	INT	単字	
0 0	- 🔷 D13	0	INT	单字	
	- 🔷 D14	0	INT	单字	
	- 🔷 D15	0	INT	单字	
	- 🔷 D16	0	INT	单字	
	- 🔷 D17	0	INT	单字	

-

4. Use the serial port debugging assistant to monitor the following message:

[14:53:19(201)Rx]00 01 00 00

■ Free format communication between module and XDH (receiving mode)

For example, if the data sent by the PLC is 00 0A, the module will receive data of 10.



6.2.7 Usage of XF-E2COM24 and LFP3-AP

6.2.7.1 Use with Siemens S7-200SMART

In the device view, the mapping address of module process data can be viewed, and the starting address of the case mapping is IB128.

ROFINET网络 控制器(CPU SR20_plc200smart) 二 IFP3-APV2.00-lfp3-ap	单	击"添	加" 按钮来为该设备添加模块。				LFP3-APV2.00 白-主模块 LFP3-AP
[] LFP3-AP(0)		序号	模块名	子模块名	插槽_子插槽	PNI 起始地址	白模块
└──	odbus通(1 C	0	LFP3-AP		0		
	2			LFP3-AP Profinet Device	0 32768(×1)		田· 樟拟甲樟块
	3			Port 1	0 32769(×1		
	4	-		Port 2	0 32770(×1		田温度采集
	5	1	XF-E2COM24 Modbus通信模块		1 128		曰 子模块
	6				1 2(MD)		Ⅲ·XF-E2COM24子模块
	7				1 3(MD)		
	8				1 4(MD)	I	
	9	1			1.5(MD)		

■ Process data mapping (PDO)

 Name	Туре	Explanation
XF_E2COM24	Stuct	2 channels serial port module
ID128(IB128-IB129)	WORD	Module level error code
ID130(IB130-IB131)	DWORD	Channel level error code

Error code parameters

	Module level error code (ErrCode_module)	
Bit	Meaning	Error level
0	Version error	Important
1	Hardware error	Important
2	Operation error	Important
3	Parameter error	Important

Serial module has no channel level error.

Module configuration parameters

Taking the serial module as the master station to write 1 Word register as an example (XDH as the slave station).

1. Slave station serial port parameter configuration

Set station number to 3, baud rate to 19200bps, 8 data bits, 1 stop bit, even parity.

PLC Config	dd - Remove	Modbus Comm	unication Par	ams	
Password	M2	Comport:	COM2	Station Num:	1
Ethemet		Baudrate:	19200bp:	✓ Mode:	RTU
		D <mark>a</mark> tabits:	8	Send Delay Time(ms):	3
ED AGROY		Checkbits:	Even	 Response timeout(ms): 	300
WBOX		Stopbits:	1	V Retry Times:	3
SystemConfig		Frame TimeOut(ms):	0		
		notice:Config el	ffictive need t ured by the c	to reboot PLC onfiguration tool	
	1				
	Rea	d From PLC \	Write To PLC	OK	Cancel

2. Configure the module parameters in Siemens S7-200SMART (consistent with the slave parameters);

In the case, the first serial port of the serial module is used, and a polling of 100ms is set to send a message and keep it valid.

PROFINET 配置向导		×
 ■ PROFINET网络 □ 控制器(CPU SR20_plc200smart) □ □ 控制器(CPU SR20_plc200smart) 	该页可配置所选模块的每个子模块。	
	Modbus 通信模块 M: Write 01 Words 4xxxx	
·····································	串口0	
	Ⅲ/S/F:串口使能	M/S/F:使能串口 🔽
	Ⅲ/S/F:通讯类型	Modbus RTU主站 ▼
	S:从站ID	1
	M/S/F:标准波特率	19200 bps 💌
-	M/S/F:数据位	8位 💌
	M/S/F:停止位	1位 •
	M/S/F:校验位	偶校验 🖌
-	M/S/F: 帅前间隔 (ms)	3
-	M:响应进出寸(ms)	1000
	M/F:轮询延时(ms)	100
	M/F:数据输出模式	
	17.72,1若1出1穴中()击伏(
	加/『-1架/大学中引文化	

If the rising edge trigger is set to be effective once, the module control enable needs to be turned on and the Control Output parameter needs to be added as the trigger enable condition.

PROFINET 配置向导		×
- PROFINET网络 □ □ 控制器(CPU SR20_plc200smart) □ □ □ LFP3-APV2.00-fp3-ap	该页可配置所选模块的每个子模块。	
LFP3-AP(0) XF-E2COM24 Modbus通(Modbus 通信模块 M: Write 01 Words 4xxxxx	
	M/S/F:串口使能 M/S/F:使能串口 ▼	
	IX/S/7:通讯类型 Modbus RTU主站	
	S:从站在ID 1	
	M/S/F:标准波特率 19200 bps ▼	
	11/S/7:数据位 <u>8位</u> ▼	
_	11/S/F:停止位 1位 -	
	M/S/7:校验位 偶校验 ▼	
	M/S/F: • 帧间明语 (ms) 3	
-	M:响应超时(ms) 1000	
-	M/F: 论词延时(ms) 100	
-	M/F: 数据输出模式 16间	
	re athen	
	M/r:模块空的I使能 ↓	
	M/F:模块控制方式 上升沿触发(单次有效)	
	上一步 下一步 <u>生成 </u> 取消	

LFP3-AP(0)		a – Xi	を加"主	铵钮来为该设备添加模块。		□- 模块 □- 標块				
			序号	模块名	子模块名	插槽_子插槽	PNI 起加	自·模拟重模块		
D XF-E2COM24 Modbus通(1		0	0	0	LFP3-AP		0		田 数字重模块
元成	2				LFP3-AP Profinet Device	0 32768(×1)		山"油反木条 向		
	3	Г			Port 1	0 32769(×1		回 XF-E2COM24子模块		
	4				Port 2	0 32770(×1		田 F: 输入输出数据模块		
	5		1	XF-E2COM24 Modbus通信模块		1	128	白诊断模块		
	6	Г			- M: Write Of Words Amm	1 2(MD)		- Control Output (32 CH)		
	7				Control Output (32 CH)	1 3(MD)		Status Input (32 CH)		
	8	Г			-	1 4(MD)		田·M:读线圈(0xxxx)		
	9	Г				1 5(MD)		Ⅲ M: 读离散里输入(1xxxx)		
	10	F				1 6(MD)		Ⅲ M: 读输入寄存器(3xxxx)		
	11	Г	••			1 7(MD)		田 M: 读保持寄存器(4xxxx)		
	12					1 8(MD)		田 M: 与线圈(Docox)		
	13					1 9(MD)		田-S:写线圈(0xxxx)		
	14	Г				1 10(MD)		田 S: 写保持寄存器(4xxxx)		
	15	F				1 11(MD)		田 S:读线圈(0xxxx)		
	16	Г				1 12(MD)		□ □ □ ○		
	17					1 13(MD)		订货号:		
	18					1 14(MD)				
	19					1 15(MD)				
	20		••			1 16(MD)				
	21					1 17(MD)		说明:		
	22					1 18(MD)		支持的固件版本为V02.05、V02.06及更高		
	23	-				1 19(MD)		版本。		

3. Add submodules to Siemens S7-200SMART (corresponding address QW128, modifiable).

Among them: M: added as the main station communication.

S: As a slave communication.

F: Free format communication.

Add M: Write 01 Words 4xxxx here.



4. Configure submodule parameters: the station number of the slave station is 3, and the starting address is set to 0 (write a value to D0 of XDH, where D0's address corresponds to 0).

ROFINETING编 注 (#93.470.00 Htp3.49 ① (#93.470.00 Htp3.49 ① (#93.470.00 Htp3.49 ① (#93.470.00 Htp3.49 ① (#95.470.00 Htp3.49) ① (#95.470.00 Htp3.49) ① (#95.470.00 Htp3.49) ③ (#95.470.00 Htp3.49) ③ (#95.470.00 Htp3.49) ③ (#95.470.00 Htp3.49) ③ (#95.470.00 Htp3.49) ④ (#95

5. Establish communication.

After generating the configuration, download the program and run the PLC, and add the monitoring address QW128.

(1) In the polling mode setting, when the value given to QW128 is 10, the D0 of the slave station is written as 10.

	-1.77C	10	1-1-1-1									
○○慰 含上传 - 単下载 - 協 插入 -	2111年 - 🎘 🎘 👝 🐿 🕯	3 🍅 🔁 🛔 🐁 😘 式 -	-↓ - + + + () - 1 - □ •									
MAIN × SBR_0 INT_0												
程序注释												
1 程序段注释												
×												
大志图表				□ × 🛛 安量表								
h-h-lpn////////////////////////////////////	0.			2 3 4					_			_
地址 格式	当前值	新旗		地址	符号	安里类型	救援类型	注释				
Qw128 有符号	+10			1		TEMP						
2 有符号				2	-	TEMP		8				
有符号				3	-	TEMP					-	
有符号				4		TEMP						
有付号												
□ 信捷PLC编程工具软件										-	0	×
文件(E) 通帰(E) 春秋(華海(S) 見一(M)		*15(O) ※日のの 終胎(H)										
	rectand) rectand			-								
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			1 4 7 7			RB -HO						
				· • • • •	ा माना ख ख	40 🗸						
19 9 × /	LC1 - 梯形图					- ×	PLC1-自由监控1					4 ×
							监控審□ • 添加	修改 劉除 全	部删除 上相	5 下移 置顶	置應	
							名称	出行を用	类型	联射地址/字长		汪和
111 14日2月1日日日 0							- • 10	10	INT	单字		
12 地址管理	hannan						L					
●						[
SVS DD												
□ 全同交撃表												
POU												
日-E POU功能库												
白-圖 系统库												
BasicEipScanner												

The monitoring message of the serial port debugging assistant is as follows:

	[10:02 [10:02 [10:02 [10:02	42 (04 42 (16 42 (30 42 (4)	44)Bx 54)Bx 53)Bx 11)Bx]03]03]03]03	10 10 10	00 00 00 00	00 00 00	00 00 00	01 01 01 01	02 02 02 02	00 00 00	0A 0A 0A	3F 3F 3F 3F	37 37 37 37	03 03 03	10 10 10	00 00 00	80000	00 00 00	01 01 01 01	00 00 00 00	23 23 28 28	re	plie	ed	me	ssage
5	自动推	417 B		大変	徳	•	R	2示	-	8 (2 1	ا	941	4	•	2	1	期			2	自力	教送	ate	iá)		ANALY INC.
					S	er	ıd	m	es	sa	ge															a V	友送后 起始字

(2) Set to rising edge trigger single mode: after setting Q134.0, when the value of QW128 is 10, the D0 of the slave station is written as 10.

	-	于模块名	插槽_子插槽	PNI 起始地	输入长度(PNQ 起始	输出长度(固件版本	1
EZCOM24 MOUDUS通旧误纸(1)	1		0					V2.00	
	2	LFP3-AP Profinet Device	0 32768(×1)						
	3	Port 1	0 32769(X			(
	4	Port 2	0 32770(X						
	5		1	128	6			V1.00	
	6	M: Write 01 Words 4xxxx	1 2(MD)			128	2		
	7	Control Output (32 CH)	1 3(MD)		1	134	4	1	
	8		1 4(MD)						
	9		1 5(MD)						
	10		1 6(MD)		·			·	
	11		1 7(MD)						
	12		1 8(MD)						
	13		1 9(MD)						
	14	4	1 10(MD)						
	15		1 11(MD)					14 10	
	16		1 12(MD)						
	17		1 13(MD)						
	18		1 14(MD)		0.	0			
	19		1 15(MD)						
	20		1 16(MD)						
	21		1 17(MD)						
	22		1 18(MD)						
	23		1 19(MD)						
	24		1 20(MD)						

●●●◎●=================================					
4 MAIN X SER_0 BIT_0					
1 程序段注释					
N					
42.小田田	. I willing				
	へ 支重次				
		+211	:+ 62		
1 00/029 本第二 10		2 刻描央型	注柳		_
2 Q134.0 10 2#1	2 TEMP				_
	3 TEMP				
□ 信律PLC编程工具软件				-	o x
文件(日編編(日) 査技(諸接(5) 显示(V) PLC操作(P) PLC设置(5) 法项(2) 審日(W) 報助(H)					
	3. -				
┃ +++ 岩·※ 茎 + + +++ +++ ↑ ↓ → +> +8> +3> + - > → ★ │ ≭ ^{>} > ℵ ፲ • ፲	· C · S 🕪 🕀 🔍 🏙 .	ю			
14 単 X PLC1・機形图 抽配置	• 3	PLC1-自由监控1			₽×
		监控窗口 · 添加	修改 删除 全部	彩删除 上移 下移 置顶 引	査応
		西称	用行行用	突型 限制地址/字衣	注释
		- 0 DO	10	INT 单字	
		-			_
					_
POU 4					
6 5		I			

The monitoring message of the serial port debugging assistant is as follows:



For specific message analysis, please refer to the XD and XL Series Programmable Controller User Manual (Basic Instructions).

6.2.7.2 Using with Siemens S7-1200/1500

The mapping address of module process data can be viewed in the device view, and the case mapping address is IB68-IB73.

项目2 > 未分组的设备 > Ifp3-ap [LFP3-AP]										×
						2	拓扑视图	📥 网络视图	₩ 设备视图	a l
🔐 [fp3-ap [LFP3-AP] 🔹 🖽 🕼 🗐 🗐 🔍 ±	a []	设备	観览							
	^	Y	模块	机架	插槽	1地址	Q 地址	类型	订货号	
			▼ lfp3-ap	0	0			LFP3-AP	LFP3-AP	^
			LFP3-AP Profinet Device	0	0 X1			LFP3-AP		
.3**			▼ XF-E2COM24 Modbus通信	0	1	6873		XF-E2COM24 Mod	XF-E2COM24	=
<i>h</i> ,			Modbus 通信模块	0	11	6873		Modbus 通信模块		
				0	1 MD					
				0	1 MD					
				0	1 MD					
DP.NORM				0	1 MD					
				0	1 MD					
				0	1 MD					
				0	1 MD					
				0	1 MD					
				0	1 MD					
				0	1 MD					1
	~			0	1 MD					~
X III > 100%	💌	<			Ш					>

Process data mapping (PDO)

Name	Туре	Explanation
XF_E2COM24	Stuct	2 channels serial port module
ID68(IB68-IB69)	WORD	Module level error code
ID70(IB70-IB73)	DWORD	Channel level error code

Error code parameter

Module level error code (ErrCode_module)										
Bit	Meaning	Error level								
0	Version error	Important								
1	Hardware error	Important								
2	Operation error	Important								
3	Parameter error	Important								

Serial module has no channel level error.

■ Module configuration parameter

Taking the module as the master station to write 1 Words register as an example (XDH as the slave station).

1. Configure the serial port parameters of the slave station.

Set station number to 3, baud rate to 19200bps, 8 data bits, 1 stop bit, even parity.

PLC Config	Add - Remove	Modbus Comm	unication Params	3	
Password	COM2	Comport:	COM2 \sim	Station Num:	1
Ethemet		Baudrate:	19200bp: ~	Mode:	RTU ~
		Databits:	8 ~	Send Delay Time(ms):	3
ED		Checkbits:	Even \vee	Response timeout(ms):	300
WBOX		Stopbits:	1 ~	Retry Times:	3
SystemConfig		Frame TimeOut(ms):	0		
		notice:Config et	ffictive need to re ured by the confi	eboot PLC	
		A TE THE COMING		guidelion tool	

2. Configure the module parameters in Siemens S7-1200/1500 (consistent with the slave parameters).

In the case, the first serial port of the serial module is used, and a polling of 100ms is set to send a message and keep it valid.

项目6 > 未分组的设备 > If	p3-ap [LFP3-AP]			16					_ 7	
		P**				2	拓扑视图	图 晶 网络视图	₩ 设备视图	<u>z</u>
Ifp3-ap [LFP3-AP]		□ 设备概	览							
		模	块	机架	插槽	1地址	Q地址	类型	订货号	
		-	lfp3-ap	0	0			LFP3-AP	LFP3-AP	
20			LFP3-AP Profinet Device	0	0 X1			LFP3-AP		
1193-01		· •	XF-E2COM24 Modbus通信	0	1			XF-E2COM24 Mod	XF-E2COM24	
			Modbus 通信模块	0	11	6873		Modbus 通信模块		
			IVE WITE OT WORDS 40000	0	1 MD		25	WE WRITE OT WORDS		
				0	1 MD					
	NOOM	~		0	1 MD					
100%		- 1			III		64	ŀ		>
Nodbus 通信模块 [Modbus]	Interface Module	1					◎ 屋性	1 信息 1	诊断	
労損 10 売品 系统	大女 楼台						A VALLE	23 1H / 23	0.01	
			391855636218882	_						ł
日录信息			551055050210002	100						
模块参数	模块配置参数	1								
固件版本	the second									1
Modbus 通信模块	串口0									
模块ID:0x00280001		M/S/F:串口使能:	M/S/F:使能串口						-	
道件版本 措力取罢 参数		M/S/F·通讯类型·	Modbus RTU主站							
1/0 地址		s-litero-	1	1						
		MICIC:行准定快安。	10300 bor							
		1003/11-1小庄:汉行学。	19200 Ups							
		MIS/F:氨化的U:	[이꼬 [·····							
		M/S/F:1停止1立:							-	
		M/S/F:校验位:	偶校验	15					-	
	1	M/S/F:帧间隔(ms):	3							
		M:响应超时(ms):	1000							
		M/F:轮询延时(ms):	100							
		M/F:数据输出模式:	轮询						*	
		M/F:模块控制使能:	禁止						-	
		M/F:模块控制方式:	电平触发(持续有效)						•	
	M(Reg)/	5(Reg)/F:字节序转换:	禁止转换(默认)							
		F·真任实转换	「埜止转捡(账记)							
		M·ffiti次粉(me)	3	1						
		いまたは人類(115).	0.014	1						
		wioir:相厌处理:	P1#19							
	串口1									
	2	M/S/F:串口使能:	M/S/F:使能串口						-	

							右扑视图	孟 网 希 倪 图	11 设备视图	
Ifp3-ap [LFP3-AP]		📑 🛛 设备	概览							
		<u>^</u>	模块	机架	插槽	1地址	Q 地址	类型	订货号	
			▼ lfp3-ap	0	0			LFP3-AP	LFP3-AP	1
R		10	LFP3-AP Profinet Device	0	0 X1			LFP3-AP		1
1103		-	▼ XF-E2COM24 Modbus通信…	. 0	1	60.73		XF-E2COM24 Mod	XF-E2COM24	
		· · · · · ·	Modbus 画盲操状 M: Write 01 Words 4xxxx	0	1 MD	00/ 5	23	Modbus 通信快吠 M: Write 01 Words		
				0	1 MD					
-				0	1 MD					
DP-I	NORM	~		0	1 MD					
100%	· · · · · · · · · · · · · · · · · · ·	- <			Ш				2	>
odbus 通信模块 [Modbus Ir							【属性	1 信息 1	诊断 📑 🗆	
常規 10 变量 系统	常数 文本									
常规	12	本地信息	: 391855636218882							1
目录信息										1
模块参数	模块配罟参数									_
固件版本	串口0									
Modbus 通信視状 描述ID: 0×00280001										
固件版本		M/S/F:串口使能	: M/S/F:使能串口						-	h
模块配置参数		M/S/F:通讯类型	: Modbus RTU主站						•	
I/O 地址		S:从站ID	E 1							
		M/S/F:标准波特率	: 19200 bps							
		M/S/F:数据位	: 8位							
		M/S/F:停止位	: 1位							
		M/S/E·校验位	偶校验							
		M/S/F·曲志词限亭(ms	- 140.0002						11	
			1000	_						
			1000	_						
		MVF:\$它相处时(ms	100							
	5	M/F:数据输出模式	: 轮间						×	
		M/F:模块控制使能	: 禁止						· ·	
	1	M/F:模块控制方式	: 电平触发(持续有效)						· · · ·	
	M(Reg)/S(Reg)/F:字节序转换	: 禁止转换(默认)						•	
		F:高低字转换	: 禁止转换(默认)	14					•	
		M:重试次数(ms): 3							
		M/S/F:错误处理	!: □·保持						-	
										411
	串口1									1

If the rising edge trigger is set to be effective once, the module control enable needs to be turned on and the Control Output parameter needs to be added as the trigger enable condition. After setting Q4.0, data transmission can be performed.

Ifp3-ap [LFP3-AP]	🔄 🖽 🖭 ' 🖼 🔤 设备	概览								
0	<u>^</u> ¥	模块	机架	插槽	1地址	Q地址	类型	订货号		▼ 目录
493		▼ lfp3-ap	0	0			LFP3-AP	LFP3-AP	^	
V .		LFP3-AP Profinet Device	0	0 X1			LFP3-AP		=	☑ 过滤 配置文件 <全部>
	<u>*</u>	▼ XF-E2COM24 Modbus通信	0	1			XF-E2COM24 Mod	XF-E2COM24		Head module
		Modbus 通信模块	0	11	6873		Modbus 通信模块			▶ 🛅 Module
		M: Write U1 Words 4xxxx	0	1 MD		2.3	M: Write OT Words	1		🕶 🛅 Submodules
		control output (32 cm)	0	1 100		4/	control output (52			▼ 🛅 XF-E2COM24 Submodule
D	P-NORM		0	1 MD						 In Diagnostic Modules
U 100k							1	1	×	Control Output (32 CH)
			_							Error Code Input(32 CH)
odbus 通肩楔状 [Modbus	Interface Modulej					🗵 属性	3.16息 3.6	Br		FIO Data Modules
常規 IO 变量 系统	文本 数									M: Read Coils (0xxxx)
常规	141113192-0045								^	M: Read Discrete Inputs (1xxxx)
目录信息	194-77BC [112-53]								Ξ	M: Read Holding Registers (4xxxx)
模块參数	串口0									 M: Read Input Registers (3x00x)
固件版本										Im M: Write Coils (0xxxx)
Modbus 通信模块	M/S/F:串口使能	: MIS/F:使能串口						(m)		M: Write Holding Registers (4xxxx)
模块ID · 0x00280001 国供版本	M/S/F:通讯类型	: Modbus RTU主站					S: Read Coils (0x00x)			
	S:从站IC	6 1								S: Read Discrete Inputs (1xxxx)
IO HEIN	M/S/F:标准波特罩	: 19200 bps								S: Read Inout Depirters (4000)
	M/S/F:對据信	: 8位								S: Write Coils (0x0xx)
	MSIE·值止伏	- 1位						1		S: Write Holding Registers (4xxxx)
	100111	· /#+/xiA								
	WEST STORES	: IP913C822								
	WISH: WEIGHA	. 3								
	* M:响应超时(ms	1000								
	MIF:轮调强时(ms	100								
	MF:数据输出模式	: 轮询								
	MF:模块控制使能	: 使能			_					
	MF:模块控制方式	: 上升沿触发(单次有效)								
	M(Reg)/S(Reg)/F:字节序转换	: 禁止转换(默认)						w.		
	1- 宣任今转拾	- 林正祥排(明社)						T		
	· (m) Ref 12 19	n maaren wordt								
	MC里山大銀(ms									
	M/S/F:错误处理	1: 01米持						(W)		

3. Add submodules to Siemens S7-1200/1500 (corresponding to QW2)

Among them: M: added as the main station communication.

- S: Slave communication.
- F: Free format communication.

Add M: Write 01 Words 4xxxx here.

	will								195 TT 11 124	
					2 拍	扑视图	▲ 网络视图	₩ 设备视图	选项	
3-ap [LFP3-AP]	• 🖬	過發展當					1			
	~		1 1 10 100	11111	1			There are an		
		14 模块	机架	插槽	「地址	Q地址	英型	订货号		1
		♥ Itp3-ap	0	0			LFP3-AP	LFP3-AP	△ <要案>	101
ø		LFP3-AP Protinet Device	0	0 X1			LFP3-AP		☑ 过滤 配置文件 <全部>	
		▼ XF-E2COM24 Modbus通信	0	1			XF-E2COM24 Mod	XF-E2COM24	+ Head module	
		Modbus 通信视识	0	11	6873		Modbus 通信視吠	-	• 🛅 Module	
		M: Write 01 Words 4x000	0	1 MD		23	M: Write 01 Words		✓ jm Submodules	
			0	TMD					▼ Im XF-E2COM24 Submodule	
			0	1 MD					Diagnostic Modules	
DP-NORM			0	1 MD					F: IO Data Modules	
			0	1 MD					M: Read Coils (0xxxx)	
			0	1 MD					M: Read Discrete Inputs (1xxxx)	
			0	1 MD					M: Read Holding Registers (4xxxx)	
	-		0	1 MD					M: Read Input Registers (3xxx)	
			0	1 MD					M: Write Coils (0xxxx)	
			0	1 MD					 M: Write Holding Registers (4xxx) 	
			0	1 MD					M: Write O1 Words 4xxxx	
			0	1 MD					M: Write 02 Words 4xxxx	
			0	1 MD					M: Write 04 Words 4xxxx	
			0	1 MD					M: Write 08 Words 4xxxx	
		•	0	1 MD					M: Write 16 Words 4xxxx	
			0	1 MD					M: Write 32 Words 4xxxx	
		•	0	1 MD					M: Write 64 Words 4xxxx	
			0	1 MD					M: Write Single Register(4xxxx)	
			0	1 MD					S: Bead Coils (0x00)	
			0	1 MD					S: Read Discrete Inputs (1xxx)	
			0	1 MD					S: Read Holding Registers (Avox)	
			0	1 MD					S: Read Input Registers (3xxx)	
			0	1 MD					S: Write Coils (Dyny)	
			0	1 MD					S: Write Holding Begisters (4000)	
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Configure submodule parameters: the station number of the slave station is 3, and the starting address is set to 0 (write a value to D0 of XDH, where D0's address corresponds to 0).

项目6 > 未分组的设备 > Ifj	p3-ap [LFP3-AP]							- * *	■× 硬件目录	# I •
					🖉 拓打	卜视图	🔒 网络视图	₩ 设备视图	选项	
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		LEP3-AP Profinet Device	0	0 X1			LEP3-AP	LIT JYA		
3.08		▼ XF-E2COM24 Modbus诵信	0	1			XF-E2COM24 Mod	XF-E2COM24	=	- U U
46.		Modbus 通信模块	0	11	6873		Modbus 通信模块		Head module	2
		M: Write 01 Words 4xxxx	0	1 MD	2	23	M: Write O1 Words		Module	23
			0	TIMD					The Submodules	
_		1	0	1 MD					Diagnostic Modules	~
DP-	NORM	1	0	1 MD					F: IO Data Modules	-
-			0	1 MD					M: Read Coils (0xxxx)	-
			0	1 MD					M: Read Discrete Inputs (1xxx)	13
			0	1 MD					M: Read Holding Registers (4xxxx)	-
			0	1 MD					M: Read Input Registers (3xxxx)	
			0	1 MD					M: Write Coils (0xxxx)	3
			0	1 MD					✓ M: Write Holding Registers (4xxxx)	
	~		0	1 MD					M: Write 01 Words 4xxxx	-
< III > 100%	· · · · · · · · · · · · · · · · · · ·	<		11)	M: Write 02 Words 4xxxx	
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	at we land					ANIT	10.405 J	19101	M: Write 08 Words 4xxxx	
□ 常規 □0 受重 系统	常發 又本								M: Write 16 Words 4x00x	
▼ 常規	模块参数								M Write 64 Words 4xxxx	
目录信息									M: Write Single Register(4xxxx)	
ALMANERAN	酉仟版 本								Fin S: Read Coils (0xxxx)	
ID HIM									S: Read Discrete Inputs (1xxx)	
	软件版本								S: Read Holding Registers (4xxxx)	
									S: Read Input Registers (3xxxx)	
	游也忍望忿物								S: Write Cails (0xxxx)	
	De-Mikillar SX								S: Write Holding Registers (4x00x)	
		串口号: COMO								
		#\$kin是・3								
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		別能時: 10年3月1日日常(+X)	_							
		起始地址: 0	_							
		数据长度: 1								
									-	
1										
									> 信白	
									 ID35 	

4. Establish communication.

After downloading the program and going online, add a monitoring table and monitor the address %QW2. This mapping address can be changed by selecting the submodule - General - I/O address in offline mode.

lfp3-ap [LFP3-AP] ・ 型 型 ・ G 设备観览 の の の の の の の の の の の の の の の の の の の			2	拓扑视图	🔒 网络视图	■ 设备视图	
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∞ ₩ 模块							
N	机架	插槽	1地址	Q地址	类型	订货号	
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LFP3-AP Profinet Device	0	0 X1			LFP3-AP		
✓ ✓ XF-E2COM24 Modbus通信	0	1			XF-E2COM24 Mod	XF-E2COM24	
▲ Modbus 通信模块	0	11	6873		Modbus 通信模块		
M: Write 01 Words 4xxxx	0	1 MD		23	M: Write O1 Words		
	0	1 MD					
DP.NOPM	0	1 MD					
	0	1 MD					5
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inte of words 4XXXX [W. Write of words 4XXXX]				S 周11	13 12 23	12 BT	
10 变量 系统常数 文本							
3录信息 //O 地址							-
·参数 输出地址							
	_						
起始地址: 2							
结束////· 3	_						
组织块: [(目初更新)							
过程映像: 自动更新							

(1) In polling mode, when the value given to %QW2 is 10, D0 in XDH is written as 10.

		 监控与强制表 	监控表_1					× 测试		
								选项		
) 1 <u>4</u> 117 11 ₀	9. 9. 2 00 00									
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_		******* D () ##41	-			_		PIC 1	[CPU 1214	
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	-9128-								000P	STOP
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2 [Tag]						◎ 属性	3. 信息 2. 诊断	<u> </u>		
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é	程序 0						名称	出空間	英型	映射地址
	語 梯形際編程						1 0	10	TNT	#5 #0
	17 地址管理 28 소름夺母							0	TNT	「王っ」
	■ 用户数据						- 0 13	0	INT	单:
							- 🗢 D4	0	INT	单等
	SYS_ETI						- 🔷 D5	0	INT	单号
	▲ 全局変量						- 🔷 D6	0	INT	单号

The monitoring message of the serial port debugging assistant is as follows:

[18:44:35(004)8x]03 10 00 00 00 01 02 00 0A 3F 37 03 10 00 00 00 10 028 [18:44:35(128)8x]03 10 00 00 00 01 02 00 0A 3F 37 03 10 00 00 00 10 028 [18:44:35(239)8x]03 10 00 00 00 11 02 00 0A 3F 37 03 10 00 00 00 01 00 28 [18:44:35(239)8x]03 10 00 00 00 11 02 00 0A 3F 37 03 10 00 00 00 01 00 28	message l			
O 自动操行 O 显示发送 O 仅 表示数据 O 显示时间 O 显示日期 O 自增发送时自动机				
sent message				

(2) Set to rising edge trigger single mode: After setting %Q4.0, when the value of %QW2 is 10, D0 in XDH is written as 10.

						2	布扑视图	🚠 网络视图	₩ 设备视图	8	选项			
	🕈 🔐 Ifp3-øp [LFP3-AP]	💌 📰 👻 * 🖼	设备概览											
		^	₩ 模块		插槽	1 地址	Q地址	类型	订货号		∨ 目录			
	·		🗹 💌 lfp3-sp	0	0			LFP3-AP	LFP3-AP	^				
ł	44		 LFP3-AP Profinet Device 	0	0 X1			LFP3-AP		=	2496 B388444	+OP.		
i			✓ ▼ XF-E2COM24 Modbus通信	0	1			XF-E2COM24 Mod	XF-E2COM24			* (主部)		
/ 1214C DC/DC/DC]			✓ Modbus 通信模块	0	11	6873		Modbus 通信模块			Head module			
S			M: Write 01 Words 4xxxx	0	1 MD		23	M: Write O1 Words			Module			
断			Control Output (32 CH)	0	1 MD		47	Control Output (32.			Submodules			
				0	1 MD						T INFE2COM24	Submodule		
2	面目6 ▶ PLC 1 [CPU	1214C DC/DC/DC1 > 些珍与器1	1未) 些抄来 1						- 1	T X	- Diagnost	c Modules		
(14	WHEN THE TIME	it is a second s	day - milay-								Contro	Output (32 C	H)	
t i	•										Error C	ode Input(32)	CH)	
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ŧ.	3	(in 1997) (in 19	[4] [10 10		-						M: Read H	folding Registe	ers (4x000)	
	制软件												-	
THE IDSP. CONST.L.S.	SPAIT.													0 1
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(□) (100%)	쓸수								L					
- (1)	(4) 1													

The monitoring message of the serial port debugging assistant is as follows:





For specific message analysis, please refer to XD and XL Series Programmable Controller User Manual [Basic Instructions].

7. Temperature module

7.1 Naming rule

<u> </u>	$\underbrace{\operatorname{KF}}_{1} - \underbrace{\operatorname{E}}_{2} \underbrace{\operatorname{O}}_{3}$	$ \begin{array}{c} \square \\ \hline 4 \end{array} \begin{array}{c} \bigcirc \\ \hline 5 \end{array} $	$\square - \bigcirc - \square \\ \hline 6 \qquad \hline 7 \qquad \hline 8 \qquad \hline 8 \qquad \hline$
1	Series name	XF:	XF series expansion module
2	Expansion module	E:	Right expansion module
3	Input channel	4:	4 channels
		8:	8 channels
(4)	Input type	RTD:	Thermal resistance
		TC:	Thermocouple
5	Output channel	Vacant:	No output
		4:	4 channels
		8:	8 channels
6	Output type	Vacant:	No output
		Y:	Digital output
		DA:	Analog output
7	PID control	Vacant:	No PID control
		Р:	Support PID control
8	Module type	Vacant:	Normal
		Н:	Isolated between channels

7.2 Thermistor temperature acquisition module XF-E4RTD

7.2.1 Product overview

XF-E4RTD series ordinary thermistor temperature acquisition expansion module, 4-channel thermistor temperature acquisition, power supply DC24V, compatible with XF, XSF series CPU unit products and LF series communication coupler units.

- 4-channel thermal resistance temperature acquisition;
- Compatible with three wire and two-wire thermal resistance sensors;
- Supports PT100, PT1000, CU50, CU100, NTC-5K, NTC-10K sensor types;
- 0.1°C, 1°C resolution (optional);
- Conversion speed of 250ms/4CH, 500ms/4CH, 1000ms/4CH (optional);
- 12mm width design.
- Module version

Hardware version	Firmware version	Function
H2.0	V2.0	Basic functions for the first official production

7.2.2 Module view

(1) Description of each section



No.	Name	No.	Name			
1	System LED indicator light	2	Channel LED indicator light			
3	Detachable terminal block	4	Buckle			
ß	Model indication	ß	Color identification indicating			
0	Model marcation		module type			

$\overline{7}$	Module hardware and firmware	8	Wiring diagram
\bigcirc	versions		wiring diagram

(2) System indicator light

System	Meaning				
indicator light					
	OFF	Module not powered on (backplane bus)			
PWR (green)	Always ON	All power supplies for the module are normal (backplane bus			
		power supply&external input 24V)			
	Flashing 1Hz ^{*1}	Module power supply abnormal and unable to operate norma			
		(external)			
	Always ON	The module is running normally			
	Flashing 1Hz ^{*1}	General errors in module logs			
	OFF	Important errors in module logs			
RUN (green)	Flashing	Madula actabilishment communication in ano areas			
	10Hz ^{*2}	Module establishment communication in progress			
	Double	Madula <i>Errouxana</i> un data			
	flashing*3				



* 1: A square wave with a duty cycle of 50% and a frequency of 1Hz.

* 2: A square wave with a duty cycle of 50% and a frequency of 10Hz.

• * 3: Double flashing as shown in the following figure:



(3) Channel indicator light

Model		Channel indicator				
		Always ON	The channel is enabled and configured correctly			
		(green)				
XF-E4RTD	CH0~CH3	Flashing	Sensor disconnection/channel level error			
		1Hz				
		OFF	Disable channel			

(4) Color identification

No.	Color	Module type			
1	Grey White	Digital input			

27		. 1	
No.	C	Color	Module type
2		Gray	Digital output&digital mixed module
3		Light blue	Analog input
4		Dark blue	Analog output
5		Green	RS232&485 serial port communication
6		Pink	Temperature signal input
7		White	High speed counting

7.2.3 General specifications

General specifications				
Item	Specification			
Protection level	IP20			
	Compliant with IEC61131-2			
	Under intermittent vibration (frequency 5-9Hz, constant amplitude			
	3.5mm peak displacement) and (frequency 9-150Hz, constant			
	acceleration 1.0g peak acceleration)			
Anti vibration	Under continuous intermittent vibration (frequency 5-9Hz half			
	amplitude 1.75mm displacement) and (frequency 9-150Hz constant			
	acceleration 0.5g constant frame amplitude)			
	Scan 10 times in each direction of X, Y, and Z			
	Compliant with IEC61131-2 standard			
Immost unsistance	Impact strength of 15G (peak) with a duration of 11ms is applied to			
Impact resistance	three mutually perpendicular axes, with 3 impacts per axis (a total			
	of 18 impacts)			
Use altitude	0-2000m			
Overvoltage level	II: Compliant with IEC61131-2			
Pollution level	2, Compliant with IEC61131-2			
Anti interference EMC	Compliant with IEC 61131-2 IEC61000-6-4 Type B			
Related certifications	CE			

7.2.4 Technical specification

Item		Specification		
Number of input channels		4CH		
Sensor type		PT100, PT1000, CU50, CU100, NTC-5K, NTC-10K		
Temperature input range		Pls refer to the sensor accuracy table for details		
Conversion speed		250ms, 500ms,1000ms optional (Default 500ms)		
Resolution		1°C, 0.1°C optional (Default 0.1°C)		
Module	Rated input	DC24V±10%, 6mA		
power supply	Protection	Reverse polarity protection		

Accuracy	Normal temperature 25°C±5°C	Please refer to the sensor accuracy table for details		
	Full temperature range -20~55°C	Please refer to the sensor accuracy table for details		
Isolation		Channel not isolated, Power isolated		
Module power consumption		0.7W (Backplane bus)+0.3W(External input)		
Weight		82g		
Maximum cable length		200m(Only three wire PT100, PT1000, CU50, CU100; two line sensors cannot measure line resistance, while NTC sensors have low sensor accuracy and cannot guarantee sampling accuracy over long distances		

Example of channel conversion speed calculation:

If the sampling time is set to 250ms, then each channel=250ms/4 channels=62.5ms. When channels are not disabled, sampling time=number of channels 4*62.5ms=250ms for each 4 channels; When disabling a channel and enabling three channels, the sampling time is 3*62.5ms=187.5ms; When disabling two channels and enabling two channels, the sampling time is 2*62.5ms=125ms.

7.2.5 Sensor Accuracy Table

Туре		Temperature lower limit	temperature upper limit	Normal temperature accuracy (25°C±5°C)	Full temperature accuracy (-20~55°C)
	PT100	-200.0	850.0	±1°C	±2°C
	PT1000	-200.0	850.0	±1°C	±2°C
CU50		-50.0	150.0	±1°C	±2°C
CU100		-50.0	150.0	±1°C	±2°C
NTC-5K	B value:2000~6000	Resistance value: 40000Ω Calculate the temperature	Resistance value: 400Ω Calculate the temperature	±1.5°C	±3°C
NTC-10K	B value: 2000~6000	Resistance value: 40000Ω Calculate the temperature	Resistance value: 400Ω Calculate the temperature	±1.5°C	±3°C

The above accuracy indicators are all technical indicators in °C units.

The resistance measurement range of NTC sensor is 400 Ω ~40000 Ω , the setting range of B value is 2000~6000, and the sensor label supports 5K and 10K. The temperature measurement range of NTC sensor is calculated based on the B value and sensor label setting. The temperature calculation formula is as follows:

 $T = \frac{298.15^{*B}}{298.15^{*}\ln \left(\frac{R_{L}}{R_{25}}\right) + B} - 273.15 \quad (Refer to the method specified in 4.9 of the Chinese national standard GB/T6663.1-2007)$

The resistance value measured by R_L has a maximum value of 40000 Ω and a minimum value of 400 Ω . B is the B value, with a mini value of 2000 and a max value of 6000. R_{25} is the sensor label, currently supporting 5K and 10K.

For example:

The NTC sensor is NTC-5K, with a B value set to 3000, a maximum R_L value of 40000 Ω , and a minimum R_L value of 400 Ω . The lower temperature limit is calculated to be -26 °C (rounded to the nearest integer), and the upper temperature limit is calculated to be 125 °C (rounded to the nearest integer).

7.2.6 Installation&Wiring

7.2.6.1 Dimension





(unit: mm)

7.2.6.2 Terminal definition and wiring

(1) Terminal definition

XF-E4RTD						
Meaning	Terminal	A-column terminal	Terminal layout	B-column terminal	Terminal	Meaning
CH0—input terminal	A0	0		0	A2	CH2— input terminal
CH0—common terminal	B0	1		1	B2	CH2— common terminal
CH0— common terminal	C0	2		2	C2	CH2— common terminal
CH1—input terminal	A1	3		3	A3	CH3— input terminal
CH1— common terminal	B1	4		4	В3	CH3— common terminal
CH1— common terminal	C1	5		5	C3	CH3— common terminal
Empty	NC	6		6	NC	Empty
Empty	NC	7		7	NC	Empty
External power supply to the module 24V power supply positive	24V	8		8	0V	External power supply to the module 24V power supply negative

(2) External wiring



7.2.6.3 Installation method

(1) Installation requirements

The module is installed using DIN rails, which must comply with the IEC 60715 standard (35mm wide, 1mm thick). The size information is shown in the following figure, in millimeters.



(2) Installation steps



The assembly between IO modules is carried out by sliding installation through the top and bottom rails of the modules, as shown in the left figure:



The module is installed on the guide rail. When installing, align the module with the DIN rail and press the module in the direction indicated by the arrow. After installation, there is a noticeable sound of the module engaging, as shown in the left figure:



After the module installation is completed, the lock buckle will automatically move downwards for locking. If the lock buckle does not move downwards, the top of the lock buckle needs to be pressed downwards to ensure proper installation.

(3) Unstallation steps



7.2.6.4 Installation environment

This product can be installed in four positions (i.e. installation direction): horizontal direction, vertical direction, top of the electrical cabinet, and bottom of the electrical cabinet. It is recommended to install it in the horizontal direction, and the heat dissipation design is through natural convection. To ensure normal ventilation and heat dissipation and reserve sufficient wiring space, the minimum gap must be retained around this product, as shown in the following figure:



If there are high-temperature heat source equipment (heaters, transformers, large resistors, etc.) around this product, a gap of at least 100mm should be left between them.

7.2.6.5 Equipment wiring

Adaptive wire diameter				
American Standard /AWG				
22				
20				
18				
18				
16				

When wiring modules, their connectors must meet the following requirements:

If using other types of terminal lugs, crimp them onto the stranded wire. The shape and dimensions should conform to the diagram shown below.



7.2.7 Usage of XF-E4RTD and LFC3-AP

7.2.7.1 Process data mapping (PDO)

Name	Туре	Explanation		
XF-E4RTD	Stuct	4-channel temperature control module		
CH0_PV	REAL	Channel 0 temperature input value		
CH1_PV	REAL	Channel 1 temperature input value		
CH2_PV	REAL	Channel 2 temperature input value		
CH3_PV	REAL	Channel 3 temperature input value		
ErrCode_Module	WORD	Module level error code		
ErrCode_CH	DWORD	Channel level error code		

■ Module level error code parameters

Module level error code (ErrCode_module)				
Bit	Meaning	Error level		
0	The 24V input power supply of the module is	Important		
0	abnormal			
2	An internal module error has occurred and the	Important		
2	user layer is unable to repair it			
3	Version mismatch	Important		
4	ADC read/write failure	Important		

• Channel level code parameters

Channel level error code (ErrCode_CH)				
Bit	Meaning	Error level		
0	Channel 0 upper limit overflow	General		
1	Channel 0 lower limit overflow	General		
2	Channel 0 disconnected	General		
3	Reserved	-		
4	Channel 1 upper limit overflow	General		
5	Channel 1 lower limit overflow	General		
6	Channel 1 disconnected	General		
7	Reserved	-		
8	Channel 2 upper limit overflow	General		
9	Channel 2 lower limit overflow	General		
10	Channel 2 disconnected	General		
11	Reserved	-		
	Channel level error code (ErrCode_CH)			
-----	---------------------------------------	-------------		
Bit	Meaning	Error level		
12	Channel 3 upper limit overflow	General		
13	Channel 3 lower limit overflow	General		
14	Channel 3 disconnected	General		
15	Reserved	-		

7.2.7.2 Module configuration parameters (SDO)

Parameter	Туре	Channel	Explanation
			Power detection
Basic_PowerDiagnostics	ENUM		0: Disabled
			1: Enable (default)
			Sampling period
			0: 250ms/4CH
Basic_AcquisitionCycle	ENUM		1: 500ms/4CH (default)
			2: 1000ms/4CH
			Temperature unit
Basic_TemperatureUnit	ENUM		0: Celsius °C (default)
			1: Fahrenheit °F
			Resolution
Basic_ResolutionRatio	ENUM		0: 1°C/1°F
			1: 0.1 °C/0.1 °F (default)
Basic_NC	-		Reserved
			Channel enablement
CH0_Enable/Disable	ENUM		0: Disabled
			1: Enable (default)
			Wire breakage detection
CH0_BrokenWireDiagnotics	ENUM		0: Disabled (default)
			1: Enable
			Up and down overflow detection
CH0_OverflowDiagnostics	ENUM		0: Disabled (default)
			1: Enable
			Sensor type
		Channel 0-3	0: PT100 (default)
			1: PT1000
CH0_SensorType	ENUM		2: CU50
			3: CU100
			4: NTC-5K
			5: NTC-10K
CH0_NC	-		Reserved
			Filtering method
CUO EilterMade			0: First order filtering (default)
Unu_rimeriviode	ENUM		1: Time averaged
			2: Average frequency

Parameter	Туре	Channel	Explanation		
			3: Moving average		
			Filter parameters		
			First order filtering (0~254) defaults to		
			0		
CH0_FilterPar	UINT		Time average (250~60000ms) default		
		Time average (250~60000ms) devalue 1000			
			Filter parameters First order filtering (0~254) defaults to 0 Time average (250~60000ms) default value 1000 Average frequency (4~500) default 4 Moving average (2~500) default 2 The NTC material constant B value can be inputted when the "sensor type" is "NTC 5K" or "NTC 10K"		
			Moving average (2~500) default 2		
			The NTC material constant B value		
CHA NEC D			can be inputted when the "sensor type"		
	UINI		is "NTC-5K" or "NTC-10K"		
			Range: 2000~6000 (default 3950)		

- Module power detection
 - Check if the external 24V power supply of the detection module is normal.
 - Normal: The module is running normally;
 - Exception: The module channel cannot be used but can be configured, and scanned normally.
 - Parameters that can be set: enabled, disabled (default is enabled).

Scan	Launch paramete	rs IO Mapping COE-Online							
laster	Advanced options								
LC Master	Index:SubIndex	Name	Flag	Value	Communication	error message			
		Module	rw	>4<					
lave	-01	Basic_PowerDiagnostics	rw		Communication r	iot established			
StationID:0 LFC3-AP	-02	Basic_AcquisitionCycle	rw		Communication r	iot established			
-XF-E4RTD	-03	Basic_TemperatureUnit	rw		Communication r	iot established			
	-04	Basic_Resolution Ratio	rw		Communication r	iot established			
	te−#x8002:00	Channal 0	rw	>7<					
	te−#x8003:00	Channal 1	rw	>7<					
	ta−#x8004:00	Channal 2	rw	>7<					
	t⊒−#x8005:00	Channal 3	rw	>7<					
		Information of E4RTD	ro	>17<					
		0							

• Other standard parameter settings

Scan	Launch parameter	s IO Mapping COE-Online			
laster	Advanced opt	ions			
PLC Master	Index:SubIndex	Name	Flag	Value	Communication error message
lave		Basic PowerDiagnostics	rw		Communication not established
⊢ StationID:0 LEC3-AP	-02	Basic AcquisitionCycle	rw		Communication not established
KF-E4RTD	-03	Basic_TemperatureUnit	rw		Communication not established
	-04	Basic_ResolutionRatio	rw		Communication not established
	⊕-#x8002:00	Channal 0	rw	>7<	
	⊕-#x8003:00	Channal 1	rw	>7<	
	⊕-#x8004:00	Channal 2	rw	>7<	
	te−#x8005:00	Channal 3	rw	>7<	
		Information of E4RTD	ro	>17<	

Parameter	Initial value	Explanation
		250ms/4CH
Acquisition cycle	500ms/4CH	500ms/4CH
		1000ms/4CH
Temperature unit	°C	°C/°F
Desclution notio	0.1%	1°C/1°F
Resolution ratio	0.1 °C	0.1°C/0.1°F

■ Channel parameter settings

nercatConfig							
Scan	Launch paramete	rs IO Mapping COE-Online					
Master	Advanced op	tions					
PLC Master	Index:SubIndex	Name	Flag	Value	Communication error message		
Slave	-01	Basic PowerDiagnostics	rw		Communication not established		
=- StationID:0 LEC3-AP	-02	Basic AcquisitionCycle	rw		Communication not established		
KF-E4RTD	-03	Basic_TemperatureUnit	rw		Communication not established		
	-04	Basic_ResolutionRatio	rw		Communication not established		
		Channal 0	rw	>7<			
	-15	CH0_Enable/Disable	rw		Communication not established		
	- 16	CH0_BrokenWireDiagnostics	rw		Communication not established		
	-17	CH0_OverflowDiagnostics	rw		Communication not established		
	-18	CH0_SensorType	rw		Communication not established		
	-1A	CH0_FilterMode	rw		Communication not established		
	-1B	CH0_FilterPar	rw		Communication not established		
	-1D	CH0_NTC_B	rw		Communication not established		
	te- #x8003:00	Channal 1	rw	>7<			
	te-#x8004:00	Channal 2	rw	>7<			
	⊕-#x8005:00	Channal 3	rw	>7<			
	±−#x9000:00	Information of E4RTD	ro	>17<			
			Import	Export Re	ead Write Activate OK Can		

Parameter	Initial value	Explanation
Channel enable	Enable	Disable/enable
Broken wire diagnostics	Disable	Disable/enable
Overflow diagnostics	Disable	Disable/enable
Sensor type	PT100	PT100/PT1000/CU50/CU100/NTC-5K/NTC-10K

- Channel filtering parameters
 - First order filtering

The first-order low-pass filtering method weights the current sampling value with the previous filtering output value to obtain the effective filtering value. The filtering coefficient is set by the user to $0\sim254$. The smaller the value, the more stable the data is, but it may cause data lag. Therefore, when set to 1, the filtering effect is the strongest and the data is the most stable. When set to 254, the filtering effect is the weakest; 0 is unfiltered.

	• Average	filtering
		Perform A/D conversion according to the set time, and average the total
		value after removing the maximum and minimum values. The average
Time	Functional	processed value is stored in the corresponding output buffer memory. The
1 ime	actions	number of processing times within the set time varies depending on the
average		number of channels allowed for A/D conversion.
		The larger the value, the stronger the filtering effect.
	Set range	250~60000ms (default value 1000)

Count average	Functional actions	Perform A/D conversion according to the set number of times, and average the total value after removing the maximum and minimum values. The average processed value is stored in the corresponding channel variable. The time it takes for the average of the number of times to be stored in the corresponding channel variable varies depending on the number of channels allowed for A/D conversion.
		The larger the value, the stronger the filtering effect.
	Set range	4~500 (default value 4)
Moving average	Functional actions	After averaging the specified number of digital output values obtained in each sampling cycle, store them in the corresponding output register/variable. Due to moving average processing in each sampling process, the latest digital output values can be obtained. The larger the value, the stronger the filtering effect.
	Set range	2~500 (default value 2)

 $\mathbf{0}$

Calculate the number of measurement input values to be averaged when using 'time averaging' according to the following formula.

The average processed number of measured input values =average time ÷ sampling period.

Discard the numerical value after the decimal point in the calculation result. When the calculated quantity is less than or equal to 1, it is not filtered.

- Parameters can be set
- Filtering modes (configure the corresponding index objects in COE-Online or SDO read/write instructions):
 "First order filtering", "Time averaged filtering", "Frequency averaged filtering", "Moving average filtering"
 (default: First order filtering).
- Filter parameters (configure the corresponding index objects in COE-Online or SDO read/write instructions): can be set from 0 to 254 in "first-order filtering" mode (default value: 0), from 250 to 60000ms in "time averaging filtering" mode (default value: 1000), from 4 to 500 in "frequency averaging filtering" mode (default value: 4), and from 2 to 500 in "moving average filtering" mode (default value: 2).

Scan	Launch parameters	IO Mapping COE-Online					
Master	Advanced opti	ons					
PLC Master	Index:SubIndex	Name Module	Flag	Value >4<	Communication error message		
Slave	₽-#x8002:00	Channal 0	rw	>7<			
StationID:0 LFC3-AP	-15	CH0_Enable/Disable	rw		Communication not established		
-xF-E4RTD	- 16	CH0_BrokenWireDiagnostics	rw		Communication not established		
	-17	CH0_OverflowDiagnostics	rw		Communication not established		
	-18	CH0_SensorType	rw		Communication not established		
	-1A	CH0_FilterMode	rw		Communication not established		
	-1B	CH0_FilterPar	rw		Communication not established		
	-1D	CH0_NTC_B	rw		Communication not established		
	te-#x8003:00	Channal 1	rw	>7<			
	te-#x8004:00	Channal 2	rw	>7<			
	te-#x8005:00	Channal 3	rw	>7<			
	±+#x9000:00	Information of E4RTD	ro	>17<			

■ NTC material constant value B

Scan	Launch parameters	IO Mapping COE-Online									
Master	Advanced opti	Advanced options									
PLC Master	Index:SubIndex	Name	Flag	Value	Communicatio	n error message					
		Module	rw	>4<							
Slave	E-#x8002:00	Channal 0	rw	>7<							
- StationID:0 LFC3-AP	-15	CH0_Enable/Disable	rw		Communication	n not established					
LXF-E4RTD	- 16	CH0_BrokenWireDiagnostics	rw		Communication	n not established					
	-17	CH0_OverflowDiagnostics	rw		Communication	n not established					
	-18	CH0_SensorType	rw		Communication	n not established					
	-1A	CH0_FilterMode	rw		Communication	n not established					
		CH0 FilterPar	rw		Communication	n not established					
	-1D	CH0_NTC_B	rw		Communication	n not established					
	⊕- #x8003:00	Channal 1	rw	>7<							
	⊕-#x8004:00	Channal 2	rw	>7<							
	⊕-#x8005:00	Channal 3	rw	>7<							
		Information of E4RTD	ro	>17<							
			Import	Evenet D	and Write	Activato	OK	Canor			

Parameter	Initial value	Explanation
NTC material	3950	When the "sensor type" is "NTC-5K" or "NTC-10K", it can be
constant value B		inputted; Range: 2000~6000 (default 3950)

7.2.8 Usage of XF-E4RTD and LFP3-AP

7.2.8.1 Use with Siemens S7-200SMART

In the configuration wizard, the mapping address of module process data can be viewed, and the mapping starting address of the case is IB128.

■ PROFINET网络 □-□ 控制器(CPU SR20_plc200smart) □-□ IEP3-AP/2.00-fn3-ap	单击"添加"按钮来为该设备添加模块。					LFP3-APV2.00 白-主模块 LFP3-AP	_
LFP3-AP(0)	模块名	子模块名	插槽_子插槽	PNI 起始地址	输入-	曰 模块	
XF-E4RTD温度采集(1)	1 LFP3-AP		0				
└──◎ 元成	2	LFP3-AP Profinet Device	0 32768(X1)	1		国·特达里保埃 国·特宁田精神	
1	3	Port 1	0 32769(×1			田 温度采集	
	4	Port 2	0 32770(×1			子模块	
	5 XF-E4RTD温度采集		1	128	22		
	6		2				
	7		3				
	8		4				
1 1	q		5				

Name	Туре	Explanation
XF-E4RTD	Stuct	4-channel temperature control module
ID128(IB128-IB131)	REAL	Channel 0 temperature input value
ID132(IB132-IB135)	REAL	Channel 1 temperature input value
ID136(IB136-IB139)	REAL	Channel 2 temperature input value
ID140(IB140-IB143)	REAL	Channel 3 temperature input value
ID144(IB144-IB145)	WORD	Module level error code
ID146(IB146-IB149)	DWORD	Channel level error code

■ Module level error code parameters

Module level error code (ErrCode_module)				
Bit	Meaning Error level			
0	The 24V input power supply of the module is	Important		
0	abnormal			
2	An internal module error has occurred and the	Important		
Ζ	user layer is unable to repair it			
3	Version mismatch Important			
4	ADC read/write failure	Important		

■ Channel level code parameters

Channel level error code (ErrCode_CH)			
Bit	Meaning	Error level	
0	Channel 0 upper limit overflow	General	
1	Channel 0 lower limit overflow	General	

	Channel level error code (ErrCode_CH)				
Bit	Meaning	Error level			
2	Channel 0 disconnected	General			
3	Reserved	-			
4	Channel 1 upper limit overflow	General			
5	Channel 1 lower limit overflow	General			
6	Channel 1 disconnected	General			
7	Reserved	-			
8	Channel 2 upper limit overflow	General			
9	Channel 2 lower limit overflow	General			
10	Channel 2 disconnected	General			
11	Reserved	-			
12	Channel 3 upper limit overflow	General			
13	Channel 3 lower limit overflow	General			
14	Channel 3 disconnected	General			
15	Reserved	-			

Module configuration parameters

PROFINET 配置向导				×
■ PROFINET网络 □···□ 控制器(CPU SR20_plc200smart) □··□□ LP93-APV2.00-fp3-ap	该页可配置所选模块的每个子机	莫块。		
UFP3-AP(0) XF-E4RTD温度采集(1)	#RTD输入			
		通用参数		
		电源检测	打开 💌	
		采样周期	500ms/4CH 💌	
-		温度单位	攝氏度℃ ▼	
		分辨率	0.1°C/0.1°F 🗨	1
		Channel_0		
-		通道使能	打开 -	
-		断线检测	<u>शम -</u>	
		上下溢出检测	打开 •	
		传感器类型	PT100 •	
		滤波方式		
		滤波参数	0	
		NTC材料常数B值	3950	
	2	Channel_1		
	上一步		生成 取消	

Module power detection

- Check if the external 24V power supply of the detection module is normal:
 - Normal: The module is running normally;
 - Exception: The module channel cannot be used but can be configured and scanned normally.
- Parameters that can be set: enabled, disabled (default is enabled).

• Other general parameter settings

Parameter	Initial value	Explanation
		250ms/4CH
Sampling period	500ms/4CH	500ms/4CH
		1000ms/4CH
Temperature unit	°C	°C/°F
Resolution	0.190	1°C/1°F
	0.1%	0.1°C/0.1°F

■ Channel parameter setting

Parameter	Initial value	Explanation
Channel enable	Enable	Disable/enable
Sensor disconnection	Diachla	Dischle/mahle
detection	Disable	Disable/enable
Up and down overflow	Disable	Disable/anable
detection	Disable	Disable/enable
Sensor type	PT100	PT100/PT1000/CU50/CU100/NTC-5K/NTC-10K

■ Channel filtering parameters

• First order filtering

The first-order low-pass filtering method weights the current sampling value with the previous filtering output value to obtain the effective filtering value; The filtering coefficient is set by the user to $0\sim254$. The smaller the value, the more stable the data is, but it may cause data lag; Therefore, when set to 1, the filtering effect is the strongest and the data is the most stable; When set to 254, the filtering effect is the weakest; 0 is unfiltered.

•	Average filter	ing
		Perform A/D conversion according to the set time, and average the total
F		value after removing the maximum and minimum values. The average
	Functional	processed value is stored in the corresponding output to the buffer memory.
Time	action	The number of processing times within the set time varies according to the
average		number of channels allowed for A/D conversion.
		The larger the value, the stronger the filtering effect.
	Setting	250~60000ms (default 1000)
	range	
		Perform A/D conversion according to the set number of times, and average
Func		the total value after removing the maximum and minimum values. The
	Functional	average processed value is stored in the corresponding channel variable. The
	runctional	average value of the number of times stored in the corresponding channel
Count	action	variable varies depending on the number of channels allowed for A/D
average		conversion.
		The larger the value, the stronger the filtering effect.
	Setting	4~500 (default value 4)
	range	

Moving average	Functional action	After averaging the specified number of digital output values obtained in each sampling period, store them in the corresponding output register/variable. Due to the use of moving average processing in each sampling process, the latest digital output value can be obtained. The larger the value, the stronger the filtering effect.
	Setting	2~500 (default value 2)
	range	



Calculate the number of measurement input values to be averaged when using 'time averaging' according to the following formula.

The average number of measured input values processed=average time \div sampling period

Discard the numerical value after the decimal point in the calculation result. When the calculated quantity is less than or equal to 1, it is not filtered.

- Parameters can be set
 - Filter mode (selected from the drop-down menu): "First order filter", "Time averaged filter", "Count averaged filter", "Moving average filter" (default: First order filter).
 - Filter parameters (selected using input box): can be set in "first-order filtering" mode: 0~254 (default value: 0), "time average filtering" mode: 250~60000ms (default value: 1000), "count average filtering" mode: 4~500 (default value: 4), "moving average filtering" mode: 2~500 (default value: 2).

■ NTC material constant B value

Parameter	Initial value	Explanation
NTC material constant B value	3950	When the "Sensor Type" is "NTC-5K" or "NTC-10K", it can be inputted Range: 2000~6000 (default 3950)

7.2.8.2 Usage of Siemens S7-1200/1500

The mapping address of module process data can be viewed in the device view, and the case mapping address is IB68-ID89.

项目6 > 未分	Y组的设备 → Ifp3-ap [LFP3-AP]								_ 7 = X	硬件目录
						2	拓扑视图	📥 网络视图	11 设备视图	选项
Ifp3-ap [LF	P3-AP]	4	设备概览							
		^	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	机架	插槽	1地址	Q 地址	类型	订货号	▼ 目录
+03-8Y			✓ Ifp3-ap	0	0			LFP3-AP	LFP3-AP	<搜索>
		-	 LFP3-AP Profinet Device 	0	0 X1			LFP3-AP		 ✓ 过滤 配置文件 <全部> ✓ im Head module ✓ im LFP3-AP □ LFP3-AP
	•		Port 1	0	0 X1 P1			Port 1		
			Port 2	0	0 X1 P2			Port 2		
			XF-E4RTD温度采集_1	0	1	6889		XF-E4RTD温度采集	XF-E4RTD	
	DP.NORM			0	2					
				0	3					Analog Module
				0	4					Digital Input Medule
				0	5					Consist Medule
				0	6					· Special Module
				0	7					
				0	8					
				0	9					
				0	10					▲ XF-6410渔技未展

Name	Туре	Explanation
XF-E4RTD	Stuct	4-channel temperature control module
ID68(IB68-IB71)	REAL	Channel 0 temperature input value
ID68(IB72-IB75)	REAL	Channel 1 temperature input value
ID76(IB76-IB79)	REAL	Channel 2 temperature input value
ID80(IB80-IB83)	REAL	Channel 3 temperature input value
ID84(IB84-IB85)	WORD	Module level error code
ID86(IB86-IB89)	DWORD	Channel level error code

■ Module level error code parameters

Module level error code (ErrCode_module)			
Bit location	Meaning Error level		
0	The 24V input power supply of the module	Important	
0	is abnormal		
2	An internal module error has occurred and	Important	
	the user layer is unable to repair it		
3 Version mismatch I		Important	
4	ADC read/write failure	Important	

■ Channel level code parameters

Channel level error code (ErrCode_CH)			
Bit location	Meaning	Error level	
0	Channel 0 upper limit overflow	General	
1	Channel 0 lower limit overflow	General	
2	Channel 0 disconnected	General	
3	Reserved	-	
4	Channel 1 upper limit overflow	General	
5	Channel 1 lower limit overflow	General	
6	Channel 1 disconnected	General	
7	Reserved	-	
8	Channel 2 upper limit overflow	General	
9	Channel 2 lower limit overflow	General	
10	Channel 2 disconnected	General	
11	Reserved	-	
12	Channel 3 upper limit overflow	General	
13	Channel 3 lower limit overflow	General	
14	Channel 3 disconnected	General	
15	Reserved	-	

■ Module configuration parameters

16日6 入土公知的迟久 入 If #2 ap [IED2 AD]		▼ 蕪社日录
🏄 [fp3-ap [LFP3-AP]	26 10 10 10 10 10 10 10 10 10 10 10 10 10	
46 ³ ^M	資産換 机梁 插播 1地址 ○地址 英型 订货号 ● fb3ap 0 0 0 LFF3AP LFF3AP ● LFF3AP formetDevice 0 0X1 LFF3AP LFF3AP XFE4RTD温度采集_1 0 1 68_89 XFE4RTD温度采集 XFE4RTD	▼ 目录 個法 個法 ● 通知 ● 通知 ● 通知 ● 通知 ● ● ●
< III > 100% •		✓ Cin LFP3-AP
XF-E4RTD温度采集_1 [XF-E4RTD Temperature Collec 常規 10 变量 系统常数 文本	on]일属性 및 试信息 및 诊断 및 트 프 	Module Analog Module
 ¹ 和规 目录信息 · 植块配置参数 · 植状参数 通田参数 		 ▲ Digital Input Module ■ Special Module ▲ XFE2COM24 Modbusi通信模块
10次号:XF-E4TC 固件版本 软件版本		✓ ☐ Temperature Collection XF-E4RTD温度采集 XF-E4TC温度采集 XF-E4TC温度采集
模块D:0x002A0002 固件板本 模块配置参数	は 最単位: 現代度:C 分類章 (0.1℃0.1°F マ	
wo.地址 Channel_0		
	■道使能: 打开 ・	
+T	#5階級別: 打井 ▼	
	288 大型: PT100 ・	
	髪波方式: 一阶速波 ▼	
•	を装き数: 0 実数の値: 3950	

- Module power detection
 - Check if the external 24V power supply of the detection module is normal:
 - Normal: The module is running normally;
 - Exception: The module channel cannot be used but can be configured and scanned normally.
 - Parameters that can be set: enabled, disabled (default is enabled).
- Other general parameter settings

Parameter	Initial value	Explanation
		250ms/4CH
Sampling period	500ms/4CH	500ms/4CH
		1000ms/4CH
Temperature unit	°C	°C/°F
Decelution	0.100	1°C/1°F
Kesolution	0.1 °C	0.1°C/0.1°F

■ Channel parameter setting

Parameter	Initial value	Explanation		
Channel enable	Enable	Disable/enable		
Sensor disconnection	Disable	Disable/enable		
detection	Disable			
Up and down overflow	Disable	Dischle/anghle		
detection	Disable	Disable/enable		
Sensor type	PT100	PT100/PT1000/CU50/CU100/NTC-5K/NTC-10K		

- Channel filtering parameters
 - First order filtering

The first-order low-pass filtering method uses the weighting of the current sampling value and the output value of the previous filtering to obtain the effective filtering value. The filtering coefficient is set by the user to $0\sim254$. The smaller the value, the more stable the data will be, but it may cause data lag; Therefore, when set to 1, the filtering effect is strongest and the data is most stable. When set to 254, the filtering effect is weakest. The default is 0 (not filtered).

- Perform A/D conversion according to the set time, and average the total value after removing the maximum and minimum values. The average processed value Functional Time is stored in the corresponding output buffer memory. The number of processing actions times within the set time varies depending on the number of channels allowed average for A/D conversion. $2 \sim 100 \text{ms}$ (Default value 2) Set range Perform A/D conversion according to the set number of times, and average the total value after removing the maximum and minimum values. The average Functional processed value is stored in the corresponding channel variable. The time it takes Frequency for the average of the number of times to be stored in the corresponding channel actions average variable varies depending on the number of channels allowed for A/D conversion. $4 \sim 500$ (Default value 4) Set range After averaging the specified number of digital output values obtained in each Move Functional sampling cycle, store them in the corresponding output register/variable. Due to average actions moving average processing in each sampling process, the latest digital output times values can be obtained. $2 \sim 500$ (Default value 2) Set range
- Average filtering



Calculate the number of measurement input values to be averaged when using 'time averaging' according to the following formula.

The average number of measured input values processed=average time ÷ sampling period

Discard the numerical value after the decimal point in the calculation result. When the calculated quantity is less than or equal to 1, it is not filtered.

- Parameters can be set
 - Filter mode (selected from the drop-down menu): "First order filter", "Time averaged filter", "Count averaged filter", "Moving average filter" (default: First order filter).
 - Filter parameters (selected using input box): can be set in "first-order filtering" mode: 0~254 (default value: 0), "time average filtering" mode: 250~60000ms (default value: 1000), "Count average filtering" mode: 4~500 (default value: 4), "moving average filtering" mode: 2~500 (default value: 2).
- NTC material constant B value

Parameter	Initial value	Explanation
NTC material constant B value	3950	When the "sensor type" is "NTC-5K" or "NTC-10K", it can be inputted; Range: 2000~6000 (default 3950)

7.3 Thermocouple temperature acquisition module XF-E4TC

7.3.1 Product overview

XF-E4TC series thermocouple temperature acquisition expansion module, 4-channel thermocouple temperature acquisition, suitable for pure acquisition scenarios, no output channel, power supply DC24V, compatible with XSF series CPU unit and XF series communication coupler units.

- 4-channel thermocouple temperature acquisition.
- Supports K, S, E, N, B, T, J, and R sensor types.
- Support -100mV~100mV voltage acquisition.
- 0.1°C, 1°C resolution (optional).
- Conversion speed of 250ms/4CH, 500ms/4CH, 1000ms/4CH (optional).
- Designed with a width of 12mm.

Module version

	Hardware	Firmware	Function
_	H2.0	V2.0	First official production of basic functions

7.3.2 Module view

(1) Explanation of each section



No.	Name	No.	Name
1	System LED indicator light	2	Channel LED indicator light
3	Detachable terminal block	4	Buckle
5	Model indication	6	Color identification indicating module type
7	Module hardware and firmware versions	8	Wiring diagram

(2) System indicator light

System	Meaning			
indicator light				
	OFF Module not powered on (backplane bus)			
	Awlays ON	All power supplies for the module are normal (backplane bus		
PWR (green)		power supply&external input 24V)		
	Flashing 1Hz ^{*1}	Module power supply abnormal and unable to operate normally		
		(external)		
	Always ON	The module is running normally		
	Flashing 1Hz ^{*1}	General errors in module logs		
	OFF	Important errors in module logs		
RUN (green)	Flashing	Madula actabilishment communication in ano areas		
	10Hz*2	Module establishment communication in progress		
	Double	Madula <i>Erromana</i> un data		
	flashing*3			



- * 1: A square wave with a duty cycle of 50% and a frequency of 1Hz.
- * 2: A square wave with a duty cycle of 50% and a frequency of 10Hz.
- * 3: Double flashing as shown in the following figure:



(3) Channel indicator light

Model	Channel indicator light			
		Awlays ON	The channel is enabled and configured correctly	
		(green)		
XF-E4TC	CH0~CH3	-CH3 Flashing Sensor disconnection/channel level error	Sensor disconnection/channel level error	
		1Hz		
		OFF	Disable channel	

(4) Color identification

No.	C	Color	Module type
1		Grey white	Digital input
2		Gray	Digital output&digital mixing module
3		Light blue	Analog input
4		Deep blue	Analog output
5		Green	RS232&485 serial port communication
6		Pink	Temperature signal input
7		White	High speed counting

7.3.3 General specification

General specification		
Item	Specification	
Protection level	IP20	
	Under the requirements of IEC 61131-2.	
	For intermittent vibration:	
	- Frequency from 5-9 Hz with a constant amplitude of 3.5 mm peak displacement	
	- Frequency from 9-150 Hz with a constant acceleration of 1.0g peak acceleration	
Anti-vibration	For continuous vibration:	
	- Frequency from 5-9 Hz with a half amplitude of 1.75 mm displacement	
	- Frequency from 9-150 Hz with a constant acceleration of 0.5g constant frame	
	amplitude	
	Scanning is performed 10 times in each direction: X, Y, and Z.	
	Compliant with IEC 61131-2 standards;	
Impost register of	Shock intensity of 15g (peak) with a duration of 11ms is applied to each of the	
Impact resistance	three mutually perpendicular axes. Each axis is subjected to 3 shocks, totaling 18	
	shocks.	
Using altitude	0-2000m	
Usage environment	Non corrosive gas	
Overvoltage level	II: Compliant with IEC61131-2	
Pollution level	2; Compliant with IEC61131-2	
EMC	Compliant with IEC 61131-2 IEC61000-6-4 B type	
Certificate	СЕ	

7.3.4 Technical specification

Item		Specification		
Input channels		4CH		
		Thermod	couple: K, S, E, N, B, T, J, R	
Sensor type		Voltage:	-100mV~100mV	
		K	-200.0°C~1300.0°C	
		S	-50.0°C~1768.0°C	
A 1	Thermocouple	Е	-200.0°C~1000.0°C	
Analog		N	-200.0°C~1300.0°C	
input		В	250.0°C~1820.0°C	
range		Т	-200.0°C~400.0°C	
(lated)		J	-210.0°C~1200.0°C	
		R	-50.0°C~1768.0°C	
	Voltage	-100mV~100mV (-32000~32000)		
Conversion speed 250ms, 500ms, 1000ms optional (default		500ms, 1000ms optional (default 500ms)		
Resolution	Thermocouple	1°C, 0.1°	°C optional (default 0.1°C)	

	Voltage	1/64000	
Module	Rated input	DC24V±10%, 6 mA	
power supply	Protection	Reverse connection protection	
A	normal atmospheric temperature 25°C±5°C	Please refer to the sensor accuracy table for details.	
Accuracy	Full temperature range -20~55°C	Please refer to the sensor accuracy table for details.	
Repeatabilit	у	±0.05%	
Cold end co	mpensation method	Built in cold end sensor, external cold end compensation, fixed value compensation	
Cold end co	mpensation accuracy	Please refer to the cold end accuracy table for details	
Isolation		Channel non isolated, power isolated	
Module power consumption		0.7W (backplane bus) +0.3W (external input)	
Module weight		82g	
Maximum c	able length	50m	

Example of channel conversion speed calculation:

If the sampling time is set to 250ms, then each channel=250ms/4 channels = 62.5ms.

When channels are not disabled, sampling time=number of channels 4 * 62.5ms=250ms/4 channels.

When disabling a channel, such as disabling one channel and enabling three channels, the sampling time is 3 * 62.5ms=187.5ms; Disable 2 channels, and enable 2 channels with a sampling time of 2 * 62.5ms=125ms.



If the "external compensation channel" method is selected for the "cold end compensation method", the sampling time of the module will be increased by one channel.

If the sampling time is set to 250ms, the channel is not disabled, and the "external compensation channel" method is selected for the "cold end compensation method", then the actual sampling time of the module is 250+250/4=312.5ms.

7.3.5 Sensor accuracy table

Accuracy standards

T			Room	Full
	Lower limit temperature	Upper limit temperature	temperature	temperature
Туре			accuracy	range accuracy
			(25°C±5°C)	(-20~55°C)
K	-200.0°C	1300.0°C	±1.5°C	±3°C
S	-50.0°C	1768.0°C	±2°C	±4°C
Е	-200.0°C	1000.0°C	±1°C	±2°C
N	-200.0°C	1300.0°C	±1.5°C	±3°C

D	250.0°C	799.9°C	±4°C	±5°C
В	800.0°C	799.9°C = 1820.0°C = 400.0°C = 1200.0°C = 1768.0°C = 32000 (Numbers are only integers, decimals =	±2°C	±4°C
Т	-200.0°C	400.0°C	±1°C	±2°C
J	-210.0°C	1200.0°C	±1°C	±2°C
R	-50.0°C	1768.0°C	±2°C	±4°C
100	-32000 (Numbers are	32000 (Numbers are		
-100mv	only integers, decimals	only integers, decimals	±0.1%	±0.2%
/+100mV	are 0)	are 0)		

Built in cold end compensation accuracy

		Built in sensor cold end compensation accuracy		
Installation direction	Adjacent module types	T-type above 90°C J, E, K, N above -100°C R, S above 200°C Above 400°C for B type	T-type below -90°C J, E, K, N below -100°C R, S below 200°C B-type does not guarantee accuracy below 400°C	
Horizontal	Temperature module	±1.5	±3.0	
upright installation	Non temperature module	± 4.0	±7.0	
Non horizontal	Temperature module	± 4.0	±7.0	
upright installation	Non temperature module	±4.0	±7.0	

External cold end channel compensation accuracy: $\pm 1.5^{\circ}$ C.

Comprehensive accuracy=channel conversion accuracy+cold end compensation accuracy

Explanation: The above accuracy indicators are all technical indicators in °C units.

7.3.6 Installation and wiring

7.3.6.1 Dimension



(Unit: mm)

7.3.6.2 Terminal definition and wiring

(1) Terminal definition

XF-E4TC						
Meaning	Terminal	A-column terminal	Terminal layout	B-column terminal	Terminal	Meaning
Cold end compensation -A	CJ-A	0		0	CJ-B	Cold end compensation -B
Vacant	NC	1		1	NC	Vacant
CH0-input terminal	TC0+	2		2	TC2+	CH2- input terminal
CH0-common terminal	TC0-	3		3	TC2-	CH2- common terminal
CH1- input terminal	TC1+	4		4	TC3+	CH3- input terminal
CH1- common terminal	TC1-	5		5	TC3-	CH3- common terminal
Vacant	NC	6		6	NC	Vacant
Vacant	NC	7		7	NC	Vacant
External power supply to the module 24V+	24V	8	•	8	0V	External power supply to the module 24V-

(2) External wiring



7.3.6.3 Installation method

(1) Installation requirements

The module is installed using DIN rails, which must comply with the IEC 60715 standard (35mm wide, 1mm thick). The size information is shown in the following figure, in millimeters.



(2) Installation steps



The assembly between IO modules is carried out by sliding installation through the top and bottom rails of the modules, as shown in the left figure:



The module is installed on the guide rail. When installing, align the module with the DIN rail and press the module in the direction indicated by the arrow. After installation, there is a noticeable sound of the module engaging, as shown in the left figure:



After the module installation is completed, the lock buckle will automatically move downwards for locking. If the lock buckle does not move downwards, the top of the lock buckle needs to be pressed downwards to ensure proper installation.

(3) Unstallation steps



7.3.6.4 Installation environment

This product can be installed in four positions (i.e. installation direction): horizontal direction, vertical direction, top of the electrical cabinet, and bottom of the electrical cabinet. It is recommended to install it in the horizontal direction, and the heat dissipation design is through natural convection. To ensure normal ventilation and heat dissipation and reserve sufficient wiring space, the minimum gap must be retained around this product, as shown in the following figure:





If there are high-temperature heat source equipment (heaters, transformers, large resistors, etc.) around this product, a gap of at least 100mm should be left between them.

7.3.6.5 Equipment wiring

Adaptive wire diameter		
National standard /mm ²	American Standard /AWG	
0.3	22	
0.5	20	
0.75	18	
1.0	18	
1.5	16	

When wiring modules, their connectors must meet the following requirements:

If using other types of terminal lugs, crimp them onto the stranded wire. The shape and dimensions should conform to the diagram shown below.



7.3.7 Usage of XF-E4TC and LFC3-AP

Name	Туре	Explanation
XF_E4TC	Stuct	4-channel temperature input module
CH0_PV	REAL	Temperature measurement value of channel 0
CH1_PV	REAL	Temperature measurement value of channel 1
CH2_PV	REAL	Temperature measurement value of channel 2
CH3_PV	REAL	Temperature measurement value of channel 3
ErrCode_Module	WORD	Module level error code
ErrCode_CH	DWORD	Channel level error code

7.3.7.1 Process data mapping (PDO)

■ Error code parameters

Module level error code (ErrCode_module)			
Bit location	Meaning	Error level	
0	The 24V input power supply of the module is abnormal	Important	
	An internal module error has occurred and the user layer is	Important	
2	unable to repair it		
3	Version mismatch	Important	
4	ADC read/write failure	Important	
5	Cold end sensor disconnected	Important	

■ Channel level code parameters

Bit	Meaning	Error level
location		
0	Upper limit of channel 0 overflowed	General
1	Lower limit of channel 0 overflowed	General
2	Channel 0 is disconnected	General
3	Reserved	-
4	Upper limit of channel 1 overflowed	General
5	Lower limit of channel 1 overflowed	General
6	Channel 1 is disconnected	General
7	Reserved	-
8	Upper limit of channel 2 overflowed	General
9	Lower limit of channel 2 overflowed	General
10	Channel 2 is disconnected	General
11	Reserved	-
12	Upper limit of channel 3 overflowed	General
13	Lower limit of channel 3 overflowed	General
14	Channel 3 is disconnected	General
15		-



When there is a cold end fault, the channel temperature displays the current collected value (cold end compensation is 0° C).

7.3.7.2 Module configuration parameters (SDO)

Parameter	Туре	Channel	Explanation
			Power detection
Basic_PowerDiagnostics	ENUM	-	0: Disabled
			1: Enable (default)
			Sampling period
			0: 250ms/4CH
Basic_AcquisitionCycle	ENUM	-	1: 500ms/4CH (default)
			2: 1000ms/4CH
			Temperature unit
Basic_TemperatureUnit	ENUM	-	0: Celsius °C (default)
			1: Fahrenheit °F
			Resolution
Basic_ResolutionRatio	ENUM	-	0: 1°C/1°F
			1: 0.1 °C/0.1 °F (default)
Basic_NC	-	-	Reserved
			Cold end compensation method
		-	0: Built in temperature sensor (default)
Basic_ColdJunctionCompensation	ENUM		1: External compensation channel
			2: Fixed value compensation
			Fixed value compensation temperature
	DIT		Unit: 0.1°C
Basic_FixedCompensationTemperature	INT	-	Range: -145.0°C~155.0°C (default 250, i.e.
			25.0°C)
Basic_NC	-	-	Reserved
			Channel enablement
CH0_Enable/Disable	ENUM		0: Disabled
			1: Enable (default)
			Wire breakage detection
CH0_BrokenWireDiagnostics	ENUM		0: Disabled (default)
			1: Enable
			Up and down overflow detection
CH0 OverflowDiagnostics	ENUM	Channel	0: Disabled (default)
		0-3	1: Enable
			Sensor type
			0: K-type (default)
			1: S-type
CH0_Sensor1ype	ENUM		2: E-type
			3: N-type
			4: B-type

Parameter	Туре	Channel	Explanation
			5: T-type
			6: J-type
			7: R-type
			8: - 100mv/+100mv
CH0_NC	-		Reserved
			Filtering method
			0: First order filtering (default)
CH0_FilterMode	lterMode ENUM		1: Time averaged
			2: Average frequency
			3: Moving average
			Filter parameters
			First order filtering (0-254) defaults to 0
CII0 EilterDer	UINT		Time average (250~60000ms)
CH0_FilterPar	UINI		Default value 1000
			Average frequency (4~500) default 4
			Moving average (2~500) default 2
CH0_NC	-		Reserved

Calculate the number of measurement input values to be averaged when using time averaging according to the following formula.

The average number of measured input values $processed = the average time \div the sampling period.$ The value after rounding off the decimal point in the calculation result.

- Module power supply detection
 - Check if the external 24V power supply of the detection module is normal
 - Normal: The module is running normally.
 - Exception: The module channel cannot be used but can be configured and scanned normally.
 - Parameters that can be set: enabled, disabled (default is enabled).

unch parameters	IO Mapping COE-Online			
Advanced optic	ons			
ndex:SubIndex	Name	Flag	Value	Communication error message
-#x8001:00	Module	rw	>6<	
-01	Basic_PowerDiagnostics	rw		Communication not established
-02	Basic_AcquisitionCycle	rw		Communication not established
-03	Basic_TemperatureUnit	rw		Communication not established
-04	Basic_ResolutionRatio	rw		Communication not established
-08	Basic_ColdJunctionCompensation	rw		Communication not established
L-09	Basic_FixedCompensationTemperation	rw		Communication not established
#x8002:00	Channal 0	rw	>6<	
- 15	CH0_Enable/Disable	rw		Communication not established
- 16	CH0_BrokenWireDiagnostics	rw		Communication not established
-17	CH0_OverflowDiagnostics	rw		Communication not established
- 18	CH0_SensorType	rw		Communication not established
- 1A	CH0_FilterMode	rw		Communication not established
L-1B	CH0_FilterPar	rw		Communication not established
+#x8003:00	Channal 1	rw	>6<	
E⊢#x8004:00	Channal 2	rw	>6<	
- #x8005:00	Channal 3	rw	>6<	
E-#x9000:00	Information of E4TC	ro	>17<	

• Other parameters can be set

Launch parameters	s IO Mapping	COE-Online				
Advanced opti	ons					
Index:SubIndex	Name		Flag	Value	Communication error message	
Ģ− #x8001:00	Module		rw	>6<		
-01	Basic Power	Diagnostics	rw		Communication not established	
-02	Basic_Acquis	itionCycle	rw		Communication not established	
-03	Basic_Tempe	erature Unit	rw		Communication not established	
-04	Basic_Resolu	tionRatio	rw		Communication not established	
-08	Basic_ColdJunctionCompensation		rw		Communication not established	
-09	Basic_FixedCompensationTemperation		rw		Communication not established	
te-#x8002:00	Channal 0		rw	>6<		
⊕-#x8003:00	Channal 1		rw	>6<		
ter #x8004:00	Channal 2	Channal 2		>6<		
te-#x8005:00	Channal 3		rw	>6<		
⊞-#x9000:00	Information of	mation of E4TC		>17<		
Param	eter	Initial value		Exp	lanation	
			250ms/4CH			
Sampling per	riod	500ms/4CH	500ms/4CH			
			1000n	ns/4CH		

		10001115/4C11
Temperature unit	°C	°C/°F
Resolution	0.1°C	1°C/1°F 0.1°C/0.1°F

■ Cold end compensation method&fixed value compensation temperature

Thermocouples consist of two wires made from different metals or metal alloys, with the ends of the wires welded together at one end, known as the measuring junction, and the other ends are open, referred to as the reference junction (or cold junction). A thermoelectric voltage appears at the measuring junction, which is dependent on the temperature there. By measuring this thermoelectric voltage, the temperature at the measuring junction can be determined. When measuring temperature with a thermocouple, it is important to keep the temperature of the cold junction constant so that the resulting thermoelectric voltage maintains a proportional relationship with the measured temperature. If the ambient temperature of the cold junction changes during measurement, it will significantly affect the accuracy. Therefore, when using a thermocouple for temperature measurement, cold junction compensation is typically required.

The module provides three methods for cold junction compensation: "built-in temperature sensor," "external compensation channel," and "fixed value compensation."

• "Built-in temperature sensor" cold junction compensation uses the temperature collected by the module's built-in cold junction sensor. This requires directly connecting the thermocouple to the module or connecting it through compensation wires.



• External compensation channel: the A0 and B0 terminals of the module are external cold end compensation channels, equipped with NTC thermistor (10K, B3950) when out of the factory, used to measure the temperature of the thermocouple cold end connection point. The terminal temperature is measured by default when out of the factory, which means that thermocouples need to be directly connected or connected to the module's terminals using compensating wires. When the cold end connection point is not on the module terminal, the NTC sensor can be attached near the connection point, and then the connection wire of the NTC sensor can be connected to the external compensation channel.



• "Fixed value compensation" uses a preset "fixed compensation temperature" for the cold junction, with a default of 250 (25.0°C). The setting range is -1450 to 1550 (in 0.1°C units). It's important to ensure that the "fixed compensation temperature" matches the actual temperature at the cold junction location. To further improve accuracy, you can use a thermostat as shown in the diagram and set the "fixed compensation temperature" to match the thermostat's temperature.



Advanced optio	ons			
Index:SubIndex	Name	Flag	Value	Communication error message
<mark>⊒- #x8001:0</mark> 0	Module	rw	>6<	
-01	Basic_PowerDiagnostics	rw		Communication not established
-02	Basic_AcquisitionCycle	rw		Communication not established
-03	Basic_TemperatureUnit	rw		Communication not established
-04	Basic_ResolutionRatio	rw		Communication not established
-08	Basic_ColdJunctionCompensation	rw		Communication not established
09	Basic_FixedCompensationTemperation	rw		Communication not established
+ #x8002:00	Channal 0	rw	>6<	
#x8003:00	Channal 1	rw	>6<	
- #x8004:00	Channal 2	rw	>6<	
#x8005:00	Channal 3	rw	>6<	
≟-#x9000:00	Information of E4TC	ro	>17<	

• Channel parameter setting

aunch parameter	s IO Mapping COE-Online			
Advanced opti	ons			
Index:SubIndex	Name	Flag	Value	Communication error message
Ģ -#x8001:00	Module	rw	>6<	
-01	Basic_PowerDiagnostics	rw		Communication not establishe
-02	Basic_AcquisitionCycle	rw		Communication not establishe
-03	Basic_TemperatureUnit	rw		Communication not establishe
-04	Basic_ResolutionRatio	rw		Communication not establishe
-08	Basic_ColdJunctionCompensation	rw		Communication not establishe
09	Basic_FixedCompensationTemperation	rw		Communication not establishe
- #x8002:00	Channal 0	rw	>6<	
-15	CH0_Enable/Disable	rw		Communication not establishe
- 16	CH0_BrokenWireDiagnostics	rw		Communication not establishe
-17	CH0_OverflowDiagnostics	rw		Communication not establishe
-18	CH0_SensorType	rw		Communication not establishe
-1A	CH0_FilterMode	rw		Communication not establishe
-1B	CH0_FilterPar	rw		Communication not establishe
the #x8003:00	Channal 1	rw	>6<	
++x8004:00	Channal 2	rw	>6<	
te- #x8005:00	Channal 3	rw	>6<	
≟- #x9000:00	Information of E4TC	ro	>17<	

Parameter	Initial value	Explanation				
Channel enable	Enable	Enable/disable				
Sensor disconnection	Dischla	Enchla/dischla				
detection	Disable					
Overflow/underflow	Dischla	Enchle/dischle				
detection	Disable	Enable/disable				
		Thermocouples: K-type, S-type, E-type, N-type, B-type,				
Sensor type	Туре К	T-type, J-type, R-type				
		Voltage: -100mv/+100mv				

Parameter	Initial value	Explanation
Filtoring mode	First order	First order filtering/time averaging/count
Filtering mode	filtering	averaging/moving average
		First order filtering (0~254) defaults to 0
Filtonin a nonomotora		Time average (250~60000ms) default value 1000
Finering parameters		Average frequency (4~500) default 4
		Moving average (2~500) default 2

• First order filtering

The first-order low-pass filter method uses a weighted combination of the current sample value and the previous filtered output value to obtain an effective filtered value. The filter coefficient is user-defined, ranging from 0 to 254. A smaller value results in more stable data but may cause data lag. Therefore, setting it to 1 provides the strongest filtering effect and most stable data, while setting it to 254 gives the weakest filtering effect. A setting of 0 means no filtering.

•	Average fi	ltering
Time average	Functional action	Perform A/D conversion according to the set time, and average the total value after removing the maximum and minimum values. The average processed value is stored in the corresponding output to the buffer memory. The number of processing times within the set time varies according to the number of channels allowed for A/D conversion.
	Setting	2~100ms (default 2)
	range	
Count average	Functional action	Perform A/D conversion according to the set number of times, and average the total value after removing the maximum and minimum values. The average processed value is stored in the corresponding channel variable. The average value of the number of times stored in the corresponding channel variable varies depending on the number of channels allowed for A/D conversion.
	Setting	4~500 (default 4)
	range	
Moving	Functional action	After averaging the specified number of digital output values obtained in each sampling period, store them in the corresponding output register/variable. Due to the use of moving average processing in each
average		sampling process, the latest digital output value can be obtained.
	Setting	2~500 (default 2)
	range	

- Parameters can be set
 - Filtering modes (configured the corresponding index objects in COE Online, startup parameters, or SDO read-write instructions): "first-order filtering", "time averaging filtering", "count averaging filtering", "moving average filtering" (default: first-order filtering).
 - Filter parameters (configured the corresponding index objects in COE Online, startup parameters, or SDO read-write instructions): "first-order filtering" mode: 0~254 (default value: 0), "time average filtering" mode: 2ms~100ms (default value: 2), "count average filtering" mode: 4~500 (default value: 4), "moving average filtering" mode: 2~500 (default value: 2).

■ Overflow/underflow setting

When the channel sampling is greater than the upper limit of the sensor and less than the lower limit of the sensor, an alarm log is triggered and the set value is output. Display the upper limit value if it is greater than the upper limit of the sensor, and display the lower limit value if it is less than the lower limit of the sensor.

7.3.8 Usage of XF-E4TC and LFP3-AP

7.3.8.1 Usage of Siemens S7-200SMART

In the configuration wizard, the mapping address of module process data can be viewed, and the mapping starting address of the case is IB128.

3-AP(0)		模块名	子模块名	插槽_子插槽	PNI 起始地址	输入-	□·模块
E4TC温度采集(1)	1	LFP3-AP		0			田田模块
	2		LFP3-AP Profinet Device	0 32768(×1)	1		世 煤拟里煤状
	3		Port 1	0 32769(×1			田温度采集
	4		Port 2	0 32770[×1			子模块
	5	XF-E4TC温度采集		1	128	22	
	6			2			
	7			3	1		
	8			4			
	9			5			
	10			6			
	11			7			
	12			8			
	13			9			
	14			10			
	15			11	1		
	16			12			
	17			13	1		
	18			14			
	19			15			
	20			16			
	21			17			
	22			18			
	23	3		19			

Name	Туре	Explanation
XF_E4TC	Stuct	4 channels input module
ID128(IB128~IB131)	REAL	Channel 0 temperature input value
ID132(IB132~IB135)	REAL	Channel 1 temperature input value
ID136(IB136~IB139)	REAL	Channel 2 temperature input value
ID140(IB140~IB143)	REAL	Channel 3 temperature input value
ID144(IB144~IB145)	WORD	Module level error code
ID146(IB146~IB149)	DWORD	Channel level error code

Error code parameters

Module level error code (ErrCode_module)				
Bit location	Meaning	Error level		
0	The 24V input power supply of the module is abnormal	Important		
2	An internal module error has occurred and the user layer is unable to repair it	Important		
3	Version mismatch	Important		
4	ADC read/write failure	Important		
5	Cold end sensor disconnected	Important		

Channel level error code (ErrCode_CH)			
Bit location	Meaning	Error level	
0	Channel 0 upper limit overflow	General	
1	Channel 0 lower limit overflow	General	
2	Channel 0 disconnected	General	
3	Reserved	-	
4	Channel 1 upper limit overflow	General	
5	Channel 1 lower limit overflow	General	
6	Channel 1 disconnected	General	
7	Reserved	-	
8	Channel 2 upper limit overflow	General	
9	Channel 2 lower limit overflow	General	
10	Channel 2 disconnected	General	
11	Reserved	-	
12	Channel 3 upper limit overflow	General	
13	Channel 3 lower limit overflow	General	
14	Channel 3 disconnected	General	

Module configuration parameter

PROFINET网络				
E LFP3-APV2.00-lfp3-ap.dev1	该页可配置所选模块的每个子模块。			
□ LFP3-AP(0) □ XF-E4TC温度采集(1)	4TC输入			
	模块配置参数			
		通用参数		
		电源检测	打开 👤	
		采样周期	500ms/4CH 💌	
		温度单位	攝氏度℃ ▼	
		分辨率	0.1°C/0.1°F	
		冷端补偿方式	内罟温度传感器 ▼	
		固定值补偿温度	250	
		Channel_0		
		通道使能	打开 💌	
		断线检测	打开 🔻	
		上下溢出检测	打开 •	
		传感器类型	K刑 ▼	
	上一步 下一步		生成 取消	
DFINET 配置向导				
ROFINETWISH 戸 控制器(CPU SR20_plc200smart) □ □ LFP3-APV2.00-lfp3-ap.dev1	该页可配置所选模块的每个子模块。			
LFP3-AP(0) □ XF-E4TC温度采集(1)	4TC输入			
		Channel_0		1
		通道使能	打开 👤	
		通道使能 断线检测	打开 」 打开 」	
		通道使能 断线检测 上下溢出检测	打开 - 打开 - 打开 -	
		通道使能 断线检测 上下溢出检测 传感器类型	打开 」 打开 」 打开 」	
		通道使能 断线检测 上下溢出检测 传感器类型 源波方式	打开 - 打开 - 打开 - K型 - 一 いきま -	
		通道使能 断线检测 上下溢出检测 传感器类型 滤波方式 滤波参数	打开 」 打开 」 打开 」 「本型 」 の で の	
		通道使能 断线检测 上下溢出检测 传感器类型 滤波方式 滤波参数	打开 J 打开 J 「打开 J 「小学波 J 0	
		通道使能 断线检测 上下溢出检测 传感器类型 悲波夸数 Channel_1 通道使能	打开 → 打开 → 打开 → 「本型 → 「一 新速波 → 0 打开 →	
		通道使能 断线检测 上下溢出检测 传感器类型 悲波方式 悲波参数 Channel_1 通道使能 断线检测	打开 」 打开 」 ド型 、 一防滤波 」 0	
		通過使能 断线检测 上下溢出检测 传感器类型 速波方式 速波参数 Channel_1 通過使能 断线检测 上下溢出检测	打开 、 打开 、 ド型 、	
		通道使能 断线检测 上下溢出检测 传感器类型 滤波方式 滤波参数 Channel_1 通道使能 断线检测 上下溢出检测 上下溢出检测 在成类术则	打开 、 打开 、 打开 、 ● ● 打开 、 打开 、	
		通道使能	打开 、 打开 、 「小游波波 、 0 打开 、 打开 、 打开 、 「二、二、二、二、二、二、二、二、二、二、二、二、二、二、二、二、二、二、二、	

- Module power supply detection
 - Check if the external 24V power supply of the module is normal
- Normal: The module is running normally.

上一步 下一步

• Exception: The module channel cannot be used but can be configured and scanned normally.

生成

取消

- Parameters that can be set: enabled, disabled (default is enabled).
- Other parameter setting

Parameter	Initial value	Explanation
Sampling period	500ms/4CH	250ms/4CH

		500ms/4CH
		1000ms/4CH
Temperature unit	°C	°C/°F
Desclution	0.1%	1°C/1°F
Resolution	0.1 °C	0.1°C/0.1°F

■ Cold end compensation method&fixed value compensation temperature

The module provides three cold end compensation methods: "built-in temperature sensor", "external compensation channel", and "fixed value compensation".

- The "built-in temperature sensor" uses the temperature collected by the module's built-in cold end sensor for the cold end temperature.
- The cold end temperature of the "external compensation channel" is collected by the cold end sensors NTC10K and B3950 connected to the module terminal blocks A0 and B0.
- The "fixed value compensation" cold end temperature adopts the set "fixed value compensation temperature", which defaults to 250 (25.0°C) and is set within the range of -1450~1550. However, it should be noted that the set "fixed value compensation temperature" must be consistent with the actual temperature at the location of the cold end and be measured in units of 0.1°C.

Parameter	Initial value	Explanation			
Channel enable	Enable	Enable/disable			
Sensor disconnection	Disable	Enchla/dischla			
detection	Disable				
Overflow/underflow	Disabla	Enchla/dischla			
detection	Disable				
		Thermocouples: K-type, S-type, E-type, N-type, B-type,			
Sensor type	Туре К	T-type, J-type, R-type			
		Voltage: -100mv/+100mv			
Filtonin o mode	First order	First order filtering/time averaging/count			
Filtering mode	filtering	averaging/moving average			
		First order filtering (0~254) defaults to 0			
Filtoning nonomotors		Time average (250~60000ms) default value 1000			
Filtering parameters		Average frequency (4~500) default 4			
		Moving average (2~500) default 2			

■ Channel parameter setting

• First order filtering

The first-order low-pass filter method uses a weighted combination of the current sample value and the previous filtered output value to obtain an effective filtered value. The filter coefficient is user-defined, ranging from 0 to 254. A smaller value results in more stable data but may cause data lag. Therefore, setting it to 1 provides the strongest filtering effect and most stable data, while setting it to 254 gives the weakest filtering effect. A setting of 0 means no filtering.

• Average filtering

Time average	Functional action	Perform A/D conversion according to the set time, and average the total value after removing the maximum and minimum values. The average processed value is stored in the corresponding output to the buffer memory. The number of processing times within the set time varies according to the number of channels allowed for A/D conversion.
	Setting	2~100ms (default 2)
	range	
Count average	Functional action Setting range	Perform A/D conversion according to the set number of times, and average the total value after removing the maximum and minimum values. The average processed value is stored in the corresponding channel variable. The average value of the number of times stored in the corresponding channel variable varies depending on the number of channels allowed for A/D conversion. 4~500 (default 4)
Moving average	Functional action Setting	After averaging the specified number of digital output values obtained in each sampling period, store them in the corresponding output register/variable. Due to the use of moving average processing in each sampling process, the latest digital output value can be obtained. 2~500 (default 2)
	range	

- Parameters can be set
 - Filter mode (selected from the drop-down menu): "First order filter", "Time averaged filter", "Count averaged filter", "Moving average filter" (default: First order filter).
 - Filter parameters (selected using input box): "first-order filtering" mode: 0~254 (default value: 0), "time average filtering" mode: 2ms~100ms (default value: 2), "count average filtering" mode: 4~500 (default value: 4), "moving average filtering" mode: 2~500 (default value: 2).

7.3.8.2 Usage of Siemens S7-1200/1500

The mapping address of module process data can be viewed in the device view, and the case mapping address is IB68-ID89.

				23	石扑视图	📥 网络视图	1 设备视图	选项
🏕 [fp3-ap [LFP3-AP] 💌 🔛 🔛 🍊 🖽 🛄 🔍 ± 📑	设备概览							
Ê	¥Y 模块 ▼ Ifp3-ap	机架	插槽 0	1地址	Q地址	类型 LFP3-AP	订货号 LFP3-AP	✓目录 (指索> (約) (約) (約)
War	▶ LFP3-AP Profinet Device XF-E4TC温度采集_1	0	0 X1	6889		LFP3-AP XF-E4TC温度采集	XF-E4TC	 ✓ 过滤 配置文件 全部> ✓ Ⅲ Head module
-		0	3 4					▼ []] LFP3-AP ↓ LFP3-AP ▼ [] Module
DP-NORM		0	5 6 7					▶ [m] Analog Module ▼ [m] Digital Input Module ■ xs=tsx(1st 24xd=200+200+200+200+200+200+200+200+200+200
		0	8 9 10					XF-E16Y(160 24Vdc)数字里输出 XF-E8X8Y(8IO 24Vdc)数字里输入输出
		0	11 12					▼ 1 Special Module
		0	13 14 15					xF-E4RTD温度采集 xF-E4RTC温度采集
		0	16					

Name	Туре	Explanation
XF-E4TC	Stuct	4-channel temperature control

		module
ID68(IB68-QB71)	REAL	Channel 0 temperature input value
ID68(IB72-IB75)	REAL	Channel 1 temperature input value
——— ID76(IB76-IB79)	REAL	Channel 2 temperature input value
ID80(IB80-IB83)	REAL	Channel 3 temperature input value
ID84(IB84-IB85)	WORD	Module level error code
ID86(IB86-IB89)	DWORD	Channel level error code

■ Error code parameters

Module level error code (ErrCode_module)			
Bit location	Meaning	Error level	
0	The 24V input power supply of the module is	Important	
0	abnormal		
2	An internal module error has occurred and the user	Important	
	layer is unable to repair it		
3	Version mismatch	Important	
4	ADC read/write failure	Important	
5	Cold end sensor disconnected	Important	

Channel level error code (ErrCode_CH)			
Bit location	Meaning	Error level	
0	Channel 0 upper limit overflow	General	
1	Channel 0 lower limit overflow	General	
2	Channel 0 disconnected	General	
3	Reserved	-	
4	Channel 1 upper limit overflow	General	
5	Channel 1 lower limit overflow	General	
6	Channel 1 disconnected	General	
7	Reserved	-	
8	Channel 2 upper limit overflow	General	
9	Channel 2 lower limit overflow	General	
10	Channel 2 disconnected	General	
11	Reserved	-	
12	Channel 3 upper limit overflow	General	
13	Channel 3 lower limit overflow	General	
14	Channel 3 disconnected	General	

Module configuration parameters
						2	拓扑视图	▲ 网络视图	1 设备视	8	选项
f [fp3-ap [LFP3-AP]		2 设1	紙覧								
		<u>^</u>	模块		抵债	i detati	10.000	类型	订接号		▼ 目录
		=	▼ Ifp3-ap	0	0			LFP3-AP	LFP3-AP	^	(被索>
			LEP3-AP Profinet Device	0	0 X1			LFP3-AP			☑ 讨波 配置文件 <全部>
1103-01			XF-E4TC温度采集_1	0	1	6889		XF-E4TC温度采集	XF-E4TC		- In Head module
				0	2					- 1	▼ 📑 LFP3-AP
				0	4						LFP3-AP
		4		0	5						▼ Module
	DP.NORM	-		0	6						Analog Module Digital Input Medule
		*		0	7						Clightan input woulde XEF16X(16) 24Vdc)教会開始)
				0	8						XF-E16Y(160 24Vdc)数字量输出
				0	9						III XF-E8X8Y(8IO 24Vdc)数字量输入输出
				0	10						👻 🛅 Special Module
				0	12						III XF-E2COM24 Modbus通信模块
				0	13						Temperature Collection
				0	14						
2	100%	_ 1 (1	~	15				1	Ň	1 Ar-241C建設未開
4TC温度采集_1 [XF-E41	C Temperature Collection]						尾性	し信息 🗊 🛛	诊断	- E -	
10 恋量 系统	学教 文本					- <u>-</u>		<u>.</u>			1
8										-	
- 目录信息	模块配置参数									_	
候物	通用参数										
订货号:XF-E4TC											
固件版本	电源检测	打开								1	
X1年版本 新知り:0×00340003	采样周期	: 500ms/4CH								-	
0.200 · 0.002.0002	温度单位	: 摄氏度°C								3	
如中国2番参数	分册车	: 0.1°C/0.1°F								-	
的址	冷端补倍方式	内置温度传感器								ā 👘	
	4 (III	250									
	[[]]][[]][[]][[]][[]][[]][]][[]][[]][]]										
	四定值作"南省成										
	Channel_0										
	Channel_0										
	Channel_0 通道使能	: [打开									
	- 回走置作用编奏 Channel_0 通道使能	: 打开 : 打开							•	3	
		: 打开 : 打开 : 打开							•		
		: 打开 : 打开 : 打开 : R型							•		
	- 四定置作用名法 - Channel_0 通道传磁 影线检测 上下型比线测 传磁表型 	: 打开 : 打开 : 打开 : 灯开 : M型							, , , , ,		
	Channel_0 Channel_0 通道体验 新线检测 上下型比较 传感器类型 维索方式	: 打开 : 打开 : 打开 : K型 : 一阶速波							 		

- Module power supply detection
 - Check if the external 24V power supply of the module is normal
- Normal: The module is running normally.
- Exception: The module channel cannot be used but can be configured and scanned normally.
 - Parameters that can be set: enabled, disabled (default is enabled).
- Other parameter setting

Parameter	Initial value	Explanation
		250ms/4CH
Sampling period	500ms/4CH	500ms/4CH
		1000ms/4CH
Temperature unit	°C	°C/°F
Dere let'en	0.190	1°C/1°F
Resolution	0.14	0.1°C/0.1°F

■ Channel parameter setting

Parameter	Initial value	Explanation
Channel enable	Enable	Enable/disable
Sensor disconnection detection	Disable	Enable/disable
Overflow/underflow detection	Disable	Enable/disable
Sensor type	Туре К	Thermocouples: K-type, S-type, E-type, N-type, B-type, T-type, J-type, R-type Voltage: -100mv/+100mv
Filtering mode	First order filtering	First order filtering/time averaging/frequency

		averaging/moving average
Filtering parameters		First order filtering (0~254) defaults to 0
		Time average (250~60000ms) default value 1000
		Average frequency (4~500) default 4
		Moving average (2~500) default 2

■ Channel filtering parameters

• First order filtering

The first-order low-pass filter method uses a weighted combination of the current sample value and the previous filtered output value to obtain an effective filtered value. The filter coefficient is user-defined, ranging from 0 to 254. A smaller value results in more stable data but may cause data lag. Therefore, setting it to 1 provides the strongest filtering effect and most stable data, while setting it to 254 gives the weakest filtering effect. A setting of 0 means no filtering.

• Average filtering

Paramter		Explanation
Time average	Functional action	Perform A/D conversion according to the set time, and average the total value after removing the maximum and minimum values. The average processed value is stored in the corresponding output to the buffer memory. The number of processing times within the set time varies according to the number of channels allowed for A/D conversion. The larger the value, the stronger the filtering effect.
	Setting	250~60000ms (default 1000)
Count average	Functional action Setting range	Perform A/D conversion according to the set number of times, and average the total value after removing the maximum and minimum values. The average processed value is stored in the corresponding channel variable. The average value of the number of times stored in the corresponding channel variable varies depending on the number of channels allowed for A/D conversion. The larger the value, the stronger the filtering effect. 4~500 (default value 4)
Moving average	Functional action	After averaging the specified number of digital output values obtained in each sampling period, store them in the corresponding output register/variable. Due to the use of moving average processing in each sampling process, the latest digital output value can be obtained. The larger the value, the stronger the filtering effect.
	Setting range	2~500 (default value 2)



Calculate the number of measurement input values to be averaged when using 'time averaging' according to the following formula.

The average number of measured input values processed=average time ÷ sampling period

Discard the numerical value after the decimal point in the calculation result. When the calculated quantity is less than or equal to 1, it is not filtered.

- Parameters can be set
 - Filter mode (selected from the drop-down menu): "First order filter", "Time averaged filter", "Count averaged filter", "Moving average filter" (default: First order filter).
 - Filter parameters (selected using input box): "first-order filtering" mode: 0~254 (default value: 0), "time average filtering" mode: 250~60000ms (default value: 1000), "count average filtering" mode: 4~500 (default value: 4), "moving average filtering" mode: 2~500 (default value: 2).

8. High speed counting module

8.1 Naming rule

	$\underline{\mathbf{XF}}$ –	$-\frac{\mathbf{E}}{2} \stackrel{\mathbf{O}}{\overline{3}}$	
1	Series	XF:	XF series expansion module
2	Expansion module	E:	Right expansion module
3	Input channel	1:	1 channel
		2:	2 channels
		4:	4 channels
(4)	Output type	HSC:	High speed counting
		HSP:	High speed pulse output

8.2 High speed counting module XF-E1HSC

8.2.1 Product overview

XF-E1HSC high-speed counting expansion module, power supply DC24V, compatible with XSF series CPU unit products and LF series communication coupler units.

- The module supports encoder single ended input (bipolar) or differential input (A\B\Z) for one channel.
- Differential input supports up to 2MHz (1×frequency), single ended input supports up to 200KHz (1×frequency).
- Channel mode supports single-phase, pulse+direction, A/B/Z phase, CW/CCW mode.
- A/B phase supports 1/2/4 frequency doubling.
- The module supports frequency measurement function.
- Support pulse width measurement function.
- Supports two channels of high-speed (high response) inputs X0 and X1, and supports probe function.
- Support 4-channel high-speed (high response) output Y0, Y1, Y2, Y3, and support comparison output (snapshot) function.
- Designed with a width of 12mm.
- Module version

Hardware	Firmware	Function
version	version	
H2.0	V2.0	First official production of basic functions

8.2.2 Module view

(1) Each part description



No.	Name	No.	Name
1	System LED indicator light	2	Channel LED indicator light
3	Detachable terminal block	4	Buckle
5	Model indication	6)	Color identification indicating module type
7	Module hardware and firmware versions	8	Wiring diagram

(2) System indicator light

System	Meaning					
indicator						
light						
	OFF	Module not powered on (backplane bus)				
	Always ON	All power supplies for the module are normal (backplane bus				
PWR (green)		power supply&external input 24V)				
	Flashing 1Hz ^{*1}	Module power supply abnormal and unable to operate normally				
		(external)				
	Always ON	The module is running normally				
	Flashing 1Hz ^{*1}	General errors in module logs				
	OFF	Important errors in module logs				
	Flashing					
RUN (green)	$10 Hz^{*2}$	Module establishment communication in progress				
	Flashing *3	Module heartbeat detection in progress				
	Double					
	flashing ^{*4}	Module firmware update				



- * 1: A square wave with a duty cycle of 50% and a frequency of 1Hz.
- * 2: A square wave with a duty cycle of 50% and a frequency of 10Hz.
- * 3: Indicator light flashing specification: ON: 0.2s OFF: 1.8s
- * 4: Double flashing as shown in the following figure:



(3) Channel indicator light

Model		Chan	nel ind	icator light
		Always	ON	The corresponding input channel has an
		(green)		input ON signal
	A, D, Z	OFF		Corresponding input channel has no
				input ON signal
		Always	ON	The corresponding input channel has an
VE EIUSC	VO VI	(green)		input ON signal
AF-EIRSC	Λ0, Λ1	OFF		Corresponding input channel has no
				input ON signal
		Always	ON	The corresponding output channel has
	V0 V1 V2 V2	(green)		an ON signal output
	10, 11, 12, 15	OFF		The corresponding output channel has
				no output ON signal

(4) Color identification

No.	Color		Module type
1	Grey white		Digital input
2		Grey	Digital output&digital mixing module
3		Light blue	Analog input
4		Deep blue	Analog output
5		Green	RS232&485 serial port communication
6		Pink	Temperature signal input
7		White	High speed counting

8.2.3 General specification

		General specification
Item		Specification
Operation	maximum temperature	55°C
temperature	Minimum temperature	-20°C
Transportation/storage	maximum temperature	70°C
temperature	Minimum temperature	-40°C
Environmental	Upper limit	95%
humidity (including operation/storage)	Lower limit	10%
Protection level		IP20
		Conforming to IEC 61131-2:
		Under intermittent vibration:
		- Frequency 5-9 Hz with a constant amplitude of 3.5mm peak
		displacement
		- Frequency 9-150 Hz with a constant acceleration of 1.0g peak
Anti withnotion		acceleration
Anu-vioration		Under continuous vibration:
		- Frequency 5-9 Hz with a half amplitude of 1.75mm
		displacement
		- Frequency 9-150 Hz with a constant acceleration of 0.5g
		constant frame amplitude
		Each direction (X, Y, Z) is scanned 10 times.
		Conforming to IEC 61131-2:
T		Shock intensity of 15G (peak) with a duration of 11ms is applied
Impact resistance		to each of the three mutually perpendicular axes. Each axis is
		subjected to 3 shocks, making a total of 18 shocks.
Usage environment		Non corrosive gas
Using altitude		0-2000m
Overvoltage level		II: conforming to IEC61131-2
Pollution level		2; conforming to IEC61131-2
EMC		Conforming to IEC 61131-2 IEC61000-6-4 B type
Certificate		СЕ

8.2.4 Technical specification

	Item	Specification
	Counter	A, B, Z
	Туре	Support single ended input or differential input
	High speed counting channel	2 channels (X0 X1)
Input	Input type	NPN&PNP
specification	Rated input voltage	24VDC
	Rated input current	6mA
	Input ON current	Above 2.5mA
	Input OFF current	Below 1mA
	Output type	NPN
	Control circuit voltage	DC24V(DC21.6V~26.4V)
Output	Rated load current	0.5A/1 point 1A/module
specification	ON response time	lus
	OFF response time	lus
	Output protection	Support short circuit and overload protection functions
Module power	consumption	0.8W (internal backplane)+1.2W (external input)

8.2.5 Installation and wiring

8.2.5.1 Appearance drawing







(Unit: mm)

8.2.5.2 Terminal definition and wiring

(1) Terminal definition

XF-E1HSC					
Meaning	A-column terminal	Terminal layout	B-column terminal	Meaning	
A-DIFF	0		0	B-DIFF	
A-COM	1		1	B-COM	
A-24V	2	2	2	B-24V	
Z-DIFF	3		3	X0	
Z-COM	4	4	4	X1	
Z-24V	5		5	S/S	
Y0	6		6	Y2	
Y1	7	7	7	Y3	
24V+	8		8	24V-	

(2) External wiring



System LED (2) Channel LED (3) Backplane bus (4) Output channel and wiring
 Input channel and wiring

The module supports a set of A, B, Z high-speed single-ended and differential signal inputs. When in use, ensure correct wiring. Using A0 as an example, the application is illustrated in the table

	Input type	Extemal wiring	No.	Si gnal name	Internal circuit
		PNP	0	Differential input (A-DIFF)	
	PNP collector type (24V level)	$\begin{bmatrix} 0V \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ $	1	In put common terminal (A-COM)	
	10 (01)	24V encoder <u>A/B/Z</u>	2	34V single end input (A-24V)	<u>3. 3K</u> Ω
		NPN	0	Differential input (A-DIFF)	
	NPN collector type (24V level)	0V (single $A/B/Z$ ended	1	In put common terminal (A-COM)	
	(211 1010)	24V encoder	2	34V single end input (A-24V)	<u>3. 3K</u> Ω
		A+/B+/Z+	0	Differen tial input (A-DIFF)	
	Differential signal	Differential encoder	1	In put common terminal (A-COM)	
below:			2	34V sn gle end input (A-24V)	<u>3.3K</u> Ω

Explanation: If it is a PNP type AB phase encoder, A-COM and B-COM need to be short circuited, and if it is an NPN type AB phase encoder, A-24V and B-24V need to be short circuited.

8.2.5.3 Installation method

(1) Installation requirements

The module is installed using DIN rails, which must comply with the IEC 60715 standard (35mm wide, 1mm thick). The size information is shown in the following figure, in millimeters.



(2) Installation steps



The assembly between IO modules is carried out by sliding installation through the top and bottom rails of the modules, as shown in the left figure:



The module is installed on the guide rail. When installing, align the module with the DIN rail and press the module in the direction indicated by the arrow. After installation, there is a noticeable sound of the module engaging, as shown in the left figure:



After the module installation is completed, the lock buckle will automatically move downwards for locking. If the lock buckle does not move downwards, the top of the lock buckle needs to be pressed downwards to ensure proper installation.

(3) Unstallation steps



Use a Phillips screwdriver or similar tool to pry up the rail lock, as shown in the left figure:



Pull the module straight forward at the buckle position (protruding part), and then press down on the top of the lock buckle, as shown in the left figure:

8.2.5.4 Installation environment

This product can be installed in four positions (i.e. installation direction): horizontal direction, vertical direction, top of the electrical cabinet, and bottom of the electrical cabinet. It is recommended to install it in the horizontal direction, and the heat dissipation design is through natural convection. To ensure normal ventilation and heat dissipation and reserve sufficient wiring space, the minimum gap must be retained around this product, as shown in the following figure:



If there are high-temperature heat source equipment (heaters, transformers, large resistors, etc.) around this product, a gap of at least 100mm should be left between them.

8.2.5.5 Equipment wiring

When wiring modules, their connectors must meet the following requirements:

Adaptive wire diameter			
National standard /mm ²	American Standard /AWG		
0.3	22		
0.5	20		
0.75	18		
1.0	18		
1.5	16		

If using other types of terminal lugs, crimp them onto the stranded wire. The shape and dimensions should conform to the diagram shown below.



8.2.6 Usage of XF-E1HSC and LFC3-AP

8.2.6.1 General function

General parameters

Туре	Parameter	Description	Data type	Explanation
	Power_Detection	Power detection	USINT	0: Close (default) 1: Open
	HSC_CH0_CountType	Counter type	USINT	0: Linear 1: Circular (default)
	HSC_CH0_CountMaximum	Maximum value of counter	DINT	Default is 2147483647
SDO	HSC_CH0_CountMinimum	Minimum value of counter	DINT	Default is -2147483648
SDO	HSC_CH0_CountMode	Counter mode	USINT	0: AB phase 1×frequency (default) 1: AB phase 2×frequency 2: AB phase 4×frequency 3: Single phase 4: Pulse+direction 5: CW/CCW
	HSC_CH0_CountPowerDo wnSave/NoSave	Counting value is kept when power off	USINT	0: not keep 1: keep (default)
RxPDO	HSC_CH0_Counter_Control Word	CH0 counter control word	UINT	bit0: Counter enable 0: Counting disabled 1: Counting enabled bit6: Counter internal preset trigger 0: Invalid 1: Trigger the internal preset of the counter bit7: Channel digital input terminal preset enable 0: Invalid 1: Enable X terminal preset function bit8: Z terminal preset enable 0: Invalid 1: Enable Z terminal preset function

Туре	Parameter	Description	Data type	Explanation
				bit9: Clear the internal preset
				completion flag
				0: Invalid
				1: Clear completion flag
				bit10: Clear the preset
				completion flag of the digital
				input terminal
				0: Invalid
				1: Clear completion flag
				bit11: Z terminal preset
				completion flag cleared
				0: Invalid
				1: Clear completion flag
				bit12: Counting direction
				setting
				0: A-phase priority (default)
				1: B-phase priority
				bit13: Pulse width high and low
				level selection
				0: Measure high level
				1: Measure low level
				bit0: Counter status
				0: Stop counting
				1: Normal counting
				bit1: Counting direction
				0: Count up
				1: Count down
		CHIO		bit2: Counter overflow flag
	HSC_CH0_CounterState	CH0 counter	UINT	0: Invalid
xPDO		status word		1: Overflow
				bit3: Counter underflow flag
				0: Invalid
				1: Underflow
				bit4: Module fault status
				0: No malfunction
				1: Module malfunction
	HSC_CH0_CounterValue	Counter value	DINT	

■ Counter type

The data type of the counter is a 32-bit signed number (-2147483648~2147483647). Counter counting types can be divided into ring counters and linear counters.

• Ring counters

Ring counter counts between the maximum and the minimum value.

When forward counting exceed the maximum value, it jumps to the minimum value. When backward counting is less than the minimum, it jumps to the maximum value.



• Linear counter

Linear counter counts between the maximum and the minimum value.

When the forward counting reaches the maximum value or the backward counting reaches the minimum value, it will stop counting.

When the current counting value reaches the set limit, up and down overflow alarm will be triggered.



Pulse + direction	A phase
	Backward Forward
	A phase
A/B phase 1/2/4 times frequency	B phase
	4 times frequency ABX1
	4 times frequency ABX2
	4 times frequency ABX4
	A phase
CW/CCW input	Forward B phaseBackward

■ Counter direction control

The counting direction of the counter can be changed through PDO, and A-phase priority or B-phase priority can be set.

• AB phase

When set to prioritize A phase , the counter increases when A phase leads B phase . When set to prioritize B phase , the counter decreases when A phase lags behind B phase .

• Single phase

Only for A phase , without directional control.

• Pulse + direction

When set to prioritize A-phase, the counter increases when B-phase input is at high level. When set to prioritize B-phase, the counter increases when B-phase input is at low level.

• CW/CCW

When set to prioritize A-phase, the counter increase when A-phase has a count. When set to prioritize B-phase, the counter increase when B-phase has a count.

■ Counter application example

For example, if the power detection is not turned on, the counter type is set to circular, the counter mode is AB phase 1x frequency, the count value is power down hold, and the maximum and minimum values of the counter are default. The result of connecting the external rotating encoder is as follows:

• Encoder rotates forward (counting up)

扫描	启动参数 IO映射 COE-Online						
主站	地址 配置						
PLC Master	索引:子索引	名称	地址	类型	位长	数值	
		Y2_OutputControlWord	HD10026	USINT	8	0	
从站	⊕-#x7000:0D	Y3_OutputControlWord	HD10028	USINT	8	0	
-StationID:0 LFC3-AP	⊕-#x7000:0E	HSC_CHO_Counter_ControlWord	НD10030	UINT	16	1	
XF-E1HSC	⊕-#x7000:0F	HSC_Probel_ControlWord	HD10032	USINT	8	0	-
	⊕-#x7000:10	HSC_Probe2_ControlWord	HD10034	USINT	8	0	
	#x6000:01	XO_InputState	HD10036	USINT	8	0	
	⊕- # x6000:02	X1_InputState	HD10038	USINT	8	0	
	€- # x6000:03	Y0_OutputState	HD10040	USINT	8	0	
	t∃-#x6000:04	Y1_OutputState	HD10042	USINT	8	0	
	€- # x6000:05	Y2_OutputState	HD10044	USINT	8	0	
	€-#x6000:06	Y3_OutputState	HD10046	USINT	8	0	
	⊕ -#x6000:07	HSC_CHO_CounterState	HD10048	UINT	16	1	1
	⊕ - # x6000∶08	HSC_Preset_StateWord	HD10050	USINT	8	0	
	€-#x6000:09	HSC_Probe_StateWord	HD10052	UINT	16	0	
	⊕-#x6000:0A	HSC_CHO_CounterValue	HD10054	DINT	32	6142]
	±−#x6000:0B	HSC_Probe1_RisingEdge	HD10056	DINT	32	0	
	⊞ - # x6000∶0C	HSC_Probe1_TrailingEdge	HD10058	DINT	32	0	
	te-#x6000∶0D	HSC_Probe2_RisingEdge	HD10060	DINT	32	0	
		HSC_Probe2_TrailingEdge	HD10062	DINT	32	0	
	⊕-#x6000:0F	HSC_CHO_Probe1_Rising_DCClock_Low	10064	UDINT	32	0	
	⊕ - # x6000∶10	HSC_CHO_Probe1_Rising_DCClock	10066	UDINT	32	0	
	⊕ - # x6000∶11	HSC_CHO_Probe1_Trailing_DCCloc	HD10068	UDINT	32	0	
	La # 2000-10	1000 CHO D 1 4 T '1' DCC1	1010020	1007.000			

Write a value of 1 to the counter control word (i.e. set bit 0) to enable the counter to count, which can monitor the counting value increasing. The value of the monitoring counter status word is 1, where bit 0 is 1 (normal counting) and bit 1 is 0 (up counting).

	启动参数 10映频	COE-Online					
	地址 配置						
LC Master	索引:子索引	名称	地址	类型	位长	数值	
	+++x 7000 : 0C	V2 OutputControlWord	HD10026	USINT	8	0	
、站		Y3 OutputControlWord	HD10028	USINT	8	0	
-StationID:O LFC3-AP		HSC CHO Counter ControlWord	HD10030	UINT	16	1	
-XF-E1HSC		HSC Probel ControlWord	HD10032	USINT	8	0	
		HSC_Probe2_ControlWord	HD10034	USINT	8	0	
	±-#x6000:01	X0 InputState	HD10036	USINT	8	0	
		X1_InputState	HD10038	USINT	8	0	
		Y0_OutputState	HD10040	USINT	8	0	
	te-#x6000∶04	¥1_OutputState	HD10042	USINT	8	0	
	⊕-#x6000:05	¥2_OutputState	100044	USINT	8	0	
		V3 OutputState	10046	USINT	8	0	
	+x6000:07	HSC_CHO_CounterState	HD10048	UINT	16	3	
	⊕-#x6000:08	HSC_Preset_StateWord	HD10050	USINT	8	0	-
	te #x6000∶09	HSC_Probe_StateWord	HD10052	UINT	16	0	
	⊕-#x6000:0A	HSC_CHO_CounterValue	1010054	DINT	32	38649	
	te-#x6000∶0B	HSC_Probe1_RisingEdge	HD10056	DINT	32	0	
	⊕ #x6000:0C	HSC_Probe1_TrailingEdge	HD10058	DINT	32	0	
	te-#x6000∶0D	HSC_Probe2_RisingEdge	HD10060	DINT	32	0	
	#x6000:0E	HSC_Probe2_TrailingEdge	HD10062	DINT	32	0	
	#x6000:0F	HSC_CHO_Probe1_Rising_DCClock_Low	HD10064	UDINT	32	0	
	#x6000:10	HSC_CHO_Probe1_Rising_DCClock	HD10066	UDINT	32	0	
	# #x6000:11	HSC_CHO_Probe1_Trailing_DCCloc	HD10068	UDINT	32	0	
	# 4 0000-10	1000 CHO D 1 4 7 '1' DOCT	1010020	Inter		<u> </u>	_

• Encoder rotates reverse (counting down)

Write a value of 1 to the control word of the counter (i.e. set bit 0) to enable the counter to count. This will monitor the decreasing value of the count value. The status word of the monitoring counter will have a value of 3, where bit 0 is 1 (normal counting) and bit 1 is 1 (down counting).

Error code parameter

Module level error code (ErrCode_module)				
Bit location	Meaning	Error level		
0	The 24V input power supply of the module is abnormal	General		
1	Incorrect allocation of module parameters	Important		
2	An internal module error has occurred and the user layer is unable to repair it	Important		
3	Version mismatch	Important		

■ Channel level code parameter

Channel level error code (ErrCode_CH)			
Bit location	Meaning	Error level	
0	Input frequency overload	General	

8.2.6.2 Preset function

There are three preset methods for counters, namely internal command, external digital input terminal, and Z signal.

Туре	Parameter	Description	Data type	Explanation
		X0 terminal		0: Normal input (default)
	X0 FunctionSelect	function	USINT	1: Probe
	<u>10_1 unetionseleet</u>	selection	Convi	3: Preset
SDO		sciection		4: Gate Control
500		X1 terminal		0: Normal input (default)
	V1 FunctionSelect	function	USINT	1: Probe
	A1_FunctionSelect	selection		3: Preset
				4: Gate Control
	HSC PresetValue	Dreset volue		-2147483648~2147483647
		Treset value	DINI	Default: 0
				bit0: Counter enable
				0: Counting disabled
RxPDO	HSC_CH0_Counter_Co	CH0 counter		1: Counting enabled
		control word	UINT	bit6: Counter internal preset trigger
	nuorword			0: Invalid
				1: Trigger the internal preset of the counter
				bit7: Channel digital input terminal preset

Туре	Parameter	Description	Data type	Explanation
				enable
				0: Invalid
				1: Enable X terminal preset function
				bit8: Z terminal preset enable
				0: Invalid
				1: Enable Z terminal preset function
				bit9: Clear the internal preset completion
				flag
				0: Invalid
				1: Clear completion flag
				bit10: Clear the preset completion flag of
				the digital input terminal
				0: Invalid
				1: Clear completion flag
				bit11: Z terminal preset completion flag
				cleared
				0: Invalid
				1: Clear completion flag
				hit12: Counting direction setting
				0: A-phase priority (default)
				1: B-phase priority
				hit13: Pulse width high and low level
				selection
				0. Measure high level
				1. Measure low level
				Bit0: CH0 channel digital input terminal
				preset function enabled
				0. Invalid
				1. Already enabled
				hit1: Enable preset function for CH0
				channel 7 input terminal
				0. Involid
				1. Already enabled
		CH0 preset		hit?: Internal preset completion flag
	USC Dreast StateWard	function status	UCINIT	0. Invalid
TAFDO	115C_Flesel_state word	nunction status	USINI	1: Internal preset completed
		word		hit2: CH0 shannal digital input tarminal
				bits. Cho channel digital input terminal
				preset completion flag
				1: Preset completed
				out: CHU channel Z input terminal preset
				completion flag
				0: Invalid
				1: Preset completed

Example: Change the current high speed count value to 200.

(1) Internal preset writing

Set the preset value of the counter to 200.

索引:子索引	名称	地址	类型	位长	数值	
⊞-#x7000:01	HSC_PresetValue	10004	DINT	32	200	

Set the counter control word value to 65 (i.e. set bit 6) to trigger the internal preset of the counter. At this time, the monitoring count value is 200 and the preset function status word value is 4, which means the internal preset completion flag bit 2 is set.

If you want to write other preset values again, you need to adjust the set value and modify the counter control word value: 65->1->65.

Finally, the internal preset completion flag status can be reset by changing the counter control word value to 513 (i.e. set bit 9).

The execution effect is shown in the figure:

索引:子索引	名称	地址	类型	位长	数值	
taria di tari	HSC_CHO_2TH_Comparison_OutputTime	10016	UINT	16	0	
#-#x7000:08	HSC_CHO_3TH_Comparison_OutputTime	НД10018	UINT	16	0	
₫- # x7000:09	HSC_CHO_4TH_Comparison_OutputTime	HD10020	UINT	16	0	
#-#x7000:0A	YO_OutputControlWord	HD10022	USINT	8	0	
#-#x7000:0B	¥1_OutputControlWord	10024	USINT	8	0	
₫- # x7000:0C	¥2_OutputControlWord	HD10026	USINT	8	0	
∯-#x7000:0D	¥3_OutputControlWord	HD10028	USINT	8	0	
₫-#x7000:0E	HSC_CHO_Counter_ControlWord	HD10030	UINT	16	65	
⊕-#x7000:0F	HSC_Probe1_ControlWord	HD10032	USINT	8	0	
⊕-#x7000:10	HSC_Probe2_ControlWord	HD10034	USINT	8	0	
⊕ - # x6000∶01	X0_InputState	НД10036	USINT	8	1	
#-#x6000:02	X1_InputState	НД10038	USINT	8	0	
⊕ - # x6000∶03	YO_OutputState	10040	USINT	8	0	
⊕-#x6000:04	¥1_OutputState	HD10042	USINT	8	0	
⊕-#x6000∶05	Y2_OutputState	10044	USINT	8	0	
∲- #x6000∶06	¥3_OutputState	100046	USINT	8	0	
#-#x6000:07	HSC_CHO_CounterState	10048	UINT	16	1	-
€-#x6000:08	HSC_Preset_StateWord	Н010050	USINT	8	4	
⊡− #x6000:09	HSC Probe StateWord	HD10052	UINT	16	0	
₫-#x6000:0A	HSC_CHO_CounterValue	1010054	DINT	32	200	
⊕-#x6000:0B	HSC_Probe1_RisingEdge	HD10056	DINT	32	0	

(2) External digital quantity preset

Taking X0 as an example, set the X0 terminal function to 3 (preset) and set the counter preset value to 200

6 # x8	001:16 X0_Funct	ionSelect 3	8			0
索引:子索引	名称	地址	类型	位长	数值	
	HSC PresetValue	1000)4 DINT	32	200	

Set the counter control word value to 129 (i.e. set bit 7) to trigger the preset function of the channel digital input terminal.

When the rising edge (or corresponding edge) of the external signal X0 arrives, the monitoring count value is 200, and the value of the preset function status word is 9, which means that the CH0 channel digital input terminal preset function flag bit 0 is set, and the CH0 channel digital input terminal preset completion flag bit 3 is set.

If you want to write other preset values again, you need to adjust the set value and modify the counter control word value: 129->1->129.

Finally, the CH0 channel digital input terminal preset function enable flag status and CH0 channel digital input terminal preset completion flag status can be reset by modifying the counter control word value to 1025 (i.e. set bit 10).

The execution effect is shown in the figure:

索引:子索引	名称	地址	类型	位长	数值	
∲-#x7000:07	HSC_CHO_2TH_Comparison_OutputTime	НD10016	UINT	16	0	
⊕-#x7000:08	HSC_CHO_3TH_Comparison_OutputTime	НD10018	UINT	16	0	
⊕-#x7000:09	HSC_CHO_4TH_Comparison_OutputTime	НD10020	UINT	16	0	
⊕-#x7000:0A	YO_OutputControlWord	НD10022	USINT	8	0	
#-#x7000:0B	¥1_OutputControlWord	HD10024	USINT	8	0	
⊕-#x7000:0C	Y2_OutputControlWord	НD10026	USINT	8	0	
⊕-#x7000:0D	Y3_OutputControlWord	HD10028	USINT	8	0	
⊞-#x7000:0E	HSC_CHO_Counter_ControlWord	НD10030	UINT	16	129	
⊕-#x7000:0F	HSC_Probe1_ControlWord	HD10032	USINT	8	0	
⊕-#x7000:10	HSC_Probe2_ControlWord	НD10034	USINT	8	0	
⊕ - # x6000∶01	X0_InputState	НD10036	USINT	8	1	
⊕-#x6000:02	X1_InputState	НD10038	USINT	8	0	
⊕-#x6000:03	Y0_OutputState	НD10040	USINT	8	0	
⊕-#x6000:04	¥1_OutputState	HD10042	USINT	8	0	
⊕-#x6000:05	Y2_OutputState	НD10044	USINT	8	0	
±− #x6000:06	¥3_OutputState	НD10046	USINT	8	0	
	HSC_CHD_CounterState	HD10048	UINT	16	1	
ta-#x6000∶08	HSC_Preset_StateWord	НD10050	USINT	8	9	
⊕-#x6000:09	HSC_Probe_StateWord	HD10052	UINT	16	0	
⊕-#x6000:0A	HSC_CHO_CounterValue	НD10054	DINT	32	200	
	HSC Probel RisingEdge	HD10056	DINT	32	0	

(3) Z signal preset

Set the preset value of the counter to 200.

索引:子索引	名称	地址	类型	位长	数值	
⊞-#x7000:01	HSC_PresetValue	10004	DINT	32	200	

Set the counter control word value to 257 (i.e. set bit 8) to trigger the Z terminal preset enable function. When the rising edge (or corresponding edge) of the external Z signal arrives, the monitoring counter value is 200, and the preset function status word value is 18, which means that the CH0 channel Z input terminal preset enable bit 1 is set, and the CH0 channel Z input terminal preset completion flag bit 4 is set.

If you want to write other preset values again, you need to adjust the set value and modify the counter control word value: 257->1->257.

Finally, the Z terminal preset completion flag status can be reset by changing the counter control word value to 2049 (i.e. set bit 11).

索引:子索引	名称	地址	类型	位长	数值	
∰-#x7000:07	HSC_CHO_2TH_Comparison_OutputTime	НD10016	UINT	16	0	
#-#x7000:08	HSC_CHO_3TH_Comparison_OutputTime	НД10018	UINT	16	0	
₫- # x7000:09	HSC_CHO_4TH_Comparison_OutputTime	HD10020	UINT	16	0	
#-#x7000:0A	YO_OutputControlWord	Ю10022	USINT	8	0	
#-#x7000:0B	¥1_OutputControlWord	10024	USINT	8	0	
₫-#x7000:0C	Y2_OutputControlWord	НD10026	USINT	8	0	
∯-#x7000:0D	Y3_OutputControlWord	НD10028	USINT	8	0	
±−#x7000:0E	HSC_CHO_Counter_ControlWord	НD10030	UINT	16	257	
⊕-#x7000:0F	HSC_Probe1_ControlWord	НD10032	USINT	8	0	
⊕-#x7000:10	HSC_Probe2_ControlWord	Ю10034	USINT	8	0	
⊕-#x6000:01	X0_InputState	НД10036	USINT	8	0	
++x6000:02	X1_InputState	Ю10038	USINT	8	0	
±−#x6000:03	YO_OutputState	Ю10040	USINT	8	0	
⊕-#x6000:04	¥1_OutputState	100042	USINT	8	0	
⊕-#x6000∶05	Y2_OutputState	Ю10044	USINT	8	0	
±− #x6000:06	Y3_OutputState	НD10046	USINT	8	0	
⊕-#x6000:07	HSC_CHO_CounterState	Ю10048	UINT	16	1	
€-#x6000:08	HSC_Preset_StateWord	НО10050	USINT	8	18	
⊕-#x6000:09	HSC_Probe_StateWord	HD10052	UINT	16	0	
₫-#x6000:0A	HSC_CHO_CounterValue	10054	DINT	32	200	
⊕-#x6000:0B	HSC_Probe1_RisingEdge	HD10056	DINT	32	0	_

8.2.6.3 Gate control function

The gate control function refers to hardware enabled control, and users can set X0 or X1 as the gate control function. When the gate control function is invalid, the counter is only enabled by the control command. When the gate control function is valid, the counter is enabled to count when both the control command and the gate control input signal are valid. After the counter starts counting, the status word related flag bits will be valid. The control logic is shown in the following figure:

• Not use gate control function



[•] Use gate control function



Туре	Parameter	Description	Data type	Explanation
				0: Normal input (default)
	V0 EurotionSoloot	V0 torminal function coloction	UGINIT	1: Probe
	X0_FunctionSelect	X0 terminal function selection	USINT	3: Preset
SDO				4: Gate Control
300				0: Normal input (default)
	V1 FunctionSolast	V0 terminal function selection	USINT	1: Probe
	AI_FunctionSelect	X0 terminal function selection		3: Preset
				4: Gate Control

Example: Set the X0 terminal to enable gate control function for counting.

Set the X0 terminal function to 4 (gate control). With the counter enabled, when there is a signal input to X0 through external wiring, there will be a change in the monitored count value after rotating the encoder.

8.2.6.4 Probe function

The probe function is used to latch the DC time and counter value when a specific signal occurs. Each channel can be equipped with up to two probe terminals, and each probe can achieve rising edge latching and falling edge latching.

Туре	Parameter	Description	Data type	Explanation
	X0_FunctionSelect			0: Normal input (default)
		X0 terminal	USINT	1: Probe
		function selection		3: Preset
SDO				4: Gate Control
300				0: Normal input (default)
	X1_FunctionSelect	X0 terminal	USINT	1: Probe
		function selection		3: Preset
				4: Gate Control
		CH0 probe 1		bit0: Probe enable
	HSC_Probe1_ControlWord	function control		0: Invalid
		word	USINT	1: Enable
KXPDU		CH0 probe 2	USINI	bit2: Probe trigger signal
	HSC_Probe2_ControlWord	function control		selection
		word		0: X terminal

Туре	Parameter	Description	Data type	Explanation
Туре	Parameter	CH0 probe function status word	UINT	Explanation1: Z signalbit3: Probe rising edge enable0: Invalid1: Enablebit4: Probe descent edge enable0: Invalid1: Enablebit0: Probe 1 Enable Status0: Invalid1: Already enabledbit1: Probe 1 rising edgetriggering state0: Invalid1: Triggeredbit2: Probe 1 falling edgetriggering state0: Invalid1: Triggeredbit6: Probe 1 triggering signal0: X0 terminal1: Z signalbit7: Probe 2 Enable Status
TxPDO				0: Invalid 1: Already enabled bit8: Probe 2 rising edge triggering state 0: Invalid 1: Triggered bit9: Probe 2 falling edge triggering state 0: Invalid 1: Triggered bit13: Probe 2 triggering signal 0: X0 terminal 1: Z signal
	HSC_Probe1_RisingValue	CH0 probe 1 rising edge count value		
	HSC_Probel_FallingValue	CH0 probe 1 falling edge count value	DNT	
	HSC_Probe2_RisingValue	CH0 probe 2 rising edge count value	DINI	
	HSC_Probe2_FallingValue	CH0 probe 2 falling edge count value		

Туре	Parameter	Description	Data type	Explanation
	HSC_CH0_Probe1_Rising_ DCClock_Low	CH0 probe 1 rising edge DC clock low 32 bits		
	HSC_CH0_Probe1_Rising_ DCClock_High	CH0 probe 1 rising edge DC clock high 32 bits		
	HSC_CH0_Probe1_Falling_ DCClock_Low	CH0 probe 1 falling edge DC clock low 32 bits		
	HSC_CH0_Probe1_Falling_ DCClock_High	CH0 probe 1 falling edge DC clock high 32 bits		
	HSC_CH0_Probe2_Rising_ DCClock_Low	CH0 probe 2 rising edge DC clock low 32 bits	UDINI	
	HSC_CH0_Probe2_Rising_ DCClock_High	CH0 probe 2 rising edge DC clock high 32 bits		
	HSC_CH0_Probe2_Falling_ DCClock_Low	CH0 probe 2 falling edge DC clock low 32 bits		
	HSC_CH0_Probe2_Falling_ DCClock_High	CH0 probe 2 falling edge DC clock high 32 bits		

For example, using the X0 terminal as a probe trigger signal, locks the probe position at the rising edge. Set X0 terminal function to 1 (probe)

6	#x8001:16	XO_FunctionSelect	1	8			0	XO_FunctionSelect
---	-----------	-------------------	---	---	--	--	---	-------------------

When the counter is enabled, the value of the control word for CH0 probe 1 function is set to 9 (i.e. bit0, bit3). When the rising edge of the X0 signal arrives, the current counter value will be latched in the CH0 probe 1 rising edge count value. The monitoring CH0 probe function status word is 3 (bit0, bit1 set). At the same time, the DC time value can also be monitored.

数值 0 1 9 0 0
数值 0 1 9 0 0
0 1 9 0 0
1 9 0 0
9 0 0
0
0
0
0
0
0
0
1
4
3
159
160
0
0
0
1613981086
339
0
0
0

8.2.6.5 Comparison output

Туре	Parameter	Description	Data type	Explanation
	Y0_FunctionSelect			
SDO	Y1_FunctionSelect	Y terminal	USINT	0: Normal output (default)
300	Y2_FunctionSelect	function selection	USINI	1: Comparison output
	Y3_FunctionSelect			
	Y0_OutputControlWord			bit0: Comparison output
	Y1_OutputControlWord			channel enable
	Y2_OutputControlWord			0: Invalid
				1: Enable
		Y output control		bit1: Comparison output
	Y3_OutputControlWord	word	USINT	channel completion flag clear
		, ord		0: Invalid
				1: Clear completion flag
				bit2: Output control
				0: OFF
RxPDO				1: ON
	HSC_CH0_1TH_Compa	CH0 first channel		
		comparison output		
		set count value		
		CH0 second		
	HSC_CH0_2TH_Compa	channel comparison	DINT	
	rativeValue	output set count	DIVI	
		value		
	HSC CH0 3TH Compa	CH0 third channel		
	rativeValue	comparison output		
		set count value		

Туре	Parameter	Description	Data type	Explanation
	USC CUO ATU Compo	CH0 fourth channel		
	HSC_CH0_41H_Compa	comparison output		
	rative value	set count value		
	USC CUO 1TU Commo	CH0 first channel		
	ricon Output Timo	comparison output		
	Inson_Output Time	setting output time		
		CH0 second		
	HSC_CH0_2TH_Compa	channel comparison		
	rison_OutputTime	output setting		Unit: 100ug mayimum autaut
		output time	UINT	time is 2000mg
	USC CUO 2TU Compo	CH0 third channel		
	rison Output Time	comparison output		
		setting output time		
	HSC_CH0_4TH_Compa rison_OutputTime	CH0 fourth channel		
		comparison output		
		setting output time		
	Y0_OutputState			bit0: Comparison output enable
	Y1_OutputState			state
	Y2_OutputState			0: Not enabled
				1: Already enabled
ΤνΡΠΟ		Y terminal output	USINT	bit1: Comparison output signal
INDO		status	USINI	0: No comparison signal output
	Y3_OutputState			1: Output signal completed
				bit2: Output status
				0: OFF
				1: ON

Example: Take Y0 as the comparison output signal.

Set the Y terminal function to 1 (compare output), set the CH0 first channel comparison output set count value and CH0 first comparison output set output time, assign the value of the Y output control word to 1 (i.e. set bi0), and when the count value is greater than the CH0 first channel comparison output set count value, the corresponding Y0 will output the state of the corresponding time.

8.2.6.6 Other functions

■ Pulse frequency measurement

Туре	Parameter Description I		Data type	Note	
SDO HSC_CH0_PulseInputSa		Pulse input sampling	UINT	0-65535ms	
SDO	mpleTime	time	UINI	Unit: ms, default is 10	
	USC CUO InputEroa	CH0 pulse input	UDINT	Ua	
TXPDO	nsc_cno_inputrieq	frequency		HZ	

■ Pulse width measurement

Туре	Parameter	Description	Data type	Note
				bit0: Counter Enable
				0: Counter disabled
				1: Counter enabled
				bit6: Counter internal
				preset trigger
				0: Invalid
				1: Trigger the internal
				preset of the counter
				bit7: Channel digital input
				terminal preset enable
				0: Invalid
				1: Enable X terminal preset
				function
				bit8: Z terminal preset
				enable
		CH0 counter control word	UINT	0: Invalid
				1: Enable Z terminal preset
				function
				bit9: Clear the internal
RxPDO	ISC_CH0_Counter_Con			preset completion flag
	trolWord			0: Invalid
				1: Clear completion flag
				bit10: Clear the preset
				completion flag of the
				digital input terminal
				0: Invalid
				1: Clear completion flag
				bit11: Z terminal preset
				completion flag cleared
				0: Invalid
				hit 12: Counting direction
				setting
				0: A phase priority
				(default)
				1. B-nhase priority
				hit13. Pulse width high and
				low level selection
				0. Measure high level
				1. Measure low level
TxPDO	HSC CH0 PulseWidth	CH0 pulse width	UDINT	Unit: us

■ Input filtering

It is possible to filter the A, B, and Z pulse input terminals, as well as the X0 and X1 digital input terminals, to reduce the interference of external pulse signals.

Туре	Parameter	Description	Data type	Note
	HSC_CH0_A\B\Z_FilterTi	$\Lambda D Z$ filter time	UINT	0-65535, default is 2us
SDO -	me	A\D\Z Inter time	UINT	Unit: us
	X0_FilterTime	X0 filter time	UINT	0-65535, default is 2us
	X1_FilterTime	X1 filter time	UINT	0-65535, default is 2us

■ Input terminals

Туре	Parameter	Description	Data type	Note
	V0 EurotionSoloot	X0 terminal function		0: Normal input (default)
	A0_FunctionSelect	selection	UCINIT	1: Probe
	V1 Eurotian Salaat	X1 terminal function	USINI	3: Preset
SDO	AI_FunctionSelect	selection		4: Gate Control
SDO	V0 LovelLogia	X0 terminal input level		0. Desitive Lesie
	X0_LevelLogic	logic	UCINIT	(defeult)
	V1 L	X1 terminal input level	USINI	(default)
	AI_LevelLogic	logic		1. Inegative Logic
TxPDO	X0_InputState	X0 terminal input status	UCINIT	0: OFF
	X1_InputState	X1 terminal input status	USINI	1: ON

Output terminals

Туре	Parameter	Description Data type		Note		
	V0 EurotionSoloot	Y0 terminal mode				
	10_FunctionSelect	selection				
	V1 FunctionSelect	Y1 terminal mode				
		selection	USINT	0: Normal input (default)		
	V2 EurotionSoloot	Y2 terminal mode	USINI	1: Comparison output		
	12_FunctionSelect	selection				
	V2 EurotionSoloot	Y3 terminal mode				
	15_FunctionSelect	selection				
SDO	V0 LovelLogia	Y0 positive and				
300		negative logic				
	V1 LavelLagia	Y1 positive and				
	I I_LEVEILOgic	negative logic	UCINIT	0: Positive Logic		
	V2 LovelLogia	Y2 positive and	USINI	1: Negative Logic		
		negative logic				
	V2 LovelLogia	Y3 positive and				
	15_LevelLogic	negative logic				
	V0 OutputStatus	Y0 abnormal	USINIT	0: Output replace to OFF		
		output status	USINI	1: Keep the previous state		

Туре	Parameter	Description	Data type	Note
	V1 OutputStatus	Y1 abnormal		2: Output replace to ON
		output status		
	V2 OutputStatus	Y2 abnormal		
		output status		
	V3 OutputStatus	Y3 abnormal		
	15_OutputStatus	output status		
	V0 OutputControlWord	Y0 output control		bit0: Comparison output
		word		channel enable
	V1 OutputControlWord	Y1 output control		0: Invalid
		word		1: Enable
	V2 OutputControlWord	Y2 output control		bit1: Comparison output
RxPDO		word	USINT	channel completion flag
			CONT	clear
				0: Invalid
	Y3_OutputControlWord	Y3 output control		1: Clear completion flag
		word		bit2: Output control
				0: OFF
				1: ON
	Y0_OutputState	Y0 output status		bit0: Comparison output
	Y1_OutputState	Y1 output status		enable state
	Y2_OutputState	Y2 output status		0: Disable
				1: Already enabled
				bit1: Comparison output
				signal
TxPDO			USINT	0: No comparison signal
	V2 OutputState	V2 output status		output
				1: Output signal
				completed
				bit2: Output status
				0: OFF
				1: ON

8.2.7 Usage of XF-E1HSC and LFP3-AP

8.2.7.1 Usage of Siemens S7-200SMART

You can view the mapping address of module process data in the configuration wizard. The correspondence between data types and addresses is as follows:

Data type	Mapping address type
USINT	IB
UINT	IW
DINT	ID
UDINT	- ID

In this case, the mapped addresses are IB128~IB205 QB128~QB163.

ROFINET网络 ② 控制器(CPU SR20_plc200smart) →	单击"添加"按钮来为该设备添加模块。					LFP3-APV2.00 曰-主模块 		
LFP3-AP(0)		模块名	子模块名	插槽_子插槽	PNI 起始地址	输入-	日 模块	
TF-E1HSC High Speed Cc	1	LFP3-AP		0				
- 🛄 元阪	2		LFP3-AP Profinet Device	0 32768(×1)			1) 高速 F 刻 雨 横拟 甲横快	
	3		Port 1	0 32769(×1			田 数字里模块	
	4		Port 2	0 32770[X1			田温度采集	
	5	XF-E1HSC High Speed Counting		1	128	78	→→子模块	
	6			2				
	7			3				
	8			4				
	9			5				
	10			6				
	11			7				
	12			8				
	13			9				
	14			10				
	15			11				

Name	Туре	Explanation
XF_E1HSC	Stuct	High speed counting module
IB128	USINT	X0 terminal input status
IB129	USINT	X1 terminal input status
IB130	USINT	Y0 terminal output status
IB131	USINT	Y1 terminal output status
IB132	USINT	Y2 terminal output status
IB133	USINT	Y3 terminal output status
IW134	UINT	CH0 counter status
IB136	USINT	CH0 preset function status word
IW137	UINT	CH0 probe function status word
ID139	DINT	Count value
ID143	DINT	CH0 probe 1 rising edge count value
ID147	DINT	CH0 probe 1 falling edge count value

Name	Туре	Explanation
ID151	DINT	CH0 probe 2 rising edge count value
ID155	DINT	CH0 probe 2 falling edge count value
ID159	UDINT	CH0 probe 1 rising edge DC clock low 32 bits
ID163	UDINT	CH0 probe 1 rising edge DC clock high 32 bits
ID167	UDINT	CH0 probe 1 falling edge DC clock low 32 bits
ID171	UDINT	CH0 probe 1 falling edge DC clock high 32 bits
ID175	UDINT	CH0 probe 2 rising edge DC clock low 32 bits
ID179	UDINT	CH0 probe 2 rising edge DC clock high 32 bits
ID183	UDINT	CH0 probe 2 falling edge DC clock low 32 bits
ID187	UDINT	CH0 probe 2 falling edge DC clock high 32 bits
ID191	UDINT	CH0 pulse input frequency
IB195	USINT	CH0 input frequency overload
ID196	UDINT	CH0 pulse width
IW200	UINT	Module level error code
ID202	UDINT	Channel level error code
QD128	DINT	Preset value
QD132	DINT	CH0 first channel comparison output set count value
QD136	DINT	CH0 second channel comparison output set count value
QD140	DINT	CH0 third channel comparison output set count value
QD144	DINT	CH0 fourth channel comparison output set count value
QW148	UINT	CH0 first channel comparison output set output time
QW150	UINT	CH0 second channel comparison output set output time
QW152	UINT	CH0 third channel comparison output set output time
QW154	UINT	CH0 fourth channel comparison output set output time
QB156	USINT	Y0 output control word
QB157	USINT	Y1 output control word
QB158	USINT	Y2 output control word
QB159	USINT	Y3 output control word

Name	Туре	Explanation
QW160	UINT	CH0 counter control word
QB162	USINT	CH0 probe 1 function control word
QB163	USINT	CH0 probe 2 function control word

Error code parameters

Module level error code (ErrCode_module)		
Bit location	Meaning	Error level
0	The 24V input power supply of the module is abnormal	General
1	Incorrect allocation of module parameters	Important
2	An internal module error has occurred and the user layer is	Important
	unable to repair it	
3	Version mismatch	Important

■ Channel level code parameters

Channel level error code (ErrCode_CH)		
Bit location	Meaning	Error level
0	Input frequency overload	General

■ Counter type

The data type of the counter is a 32-bit signed number (-2147483648~2147483647). Counter counting types can be divided into ring counters and linear counters.

• Ring counters

Ring counter counts between the maximum and the minimum value.

When forward counting exceed the maximum value, it jumps to the minimum value. When backward counting is less than the minimum, it jumps to the maximum value.



• Linear counter

Linear counter counts between the maximum and the minimum value.

When the forward counting reaches the maximum value or the backward counting reaches the minimum value, it will stop counting.

When the current counting value reaches the set limit, up and down overflow alarm will be triggered.



■ Counter mode

Mode	Waveform
Single phase (P)	A phase
Pulse + direction	A phase
-------------------	------------------------
	Backward Forward
	A phase
	B phase
A/B phase 1/2/4	4 times frequency ABX1
times frequency	4 times frequency ABX2
	4 times frequency ABX4
	A phase
CW/CCW input	Forward B phase
	Backward

■ Counter direction control

The counting direction of the counter can be changed through PDO, and A-phase priority or B-phase priority can be set.

• AB phase

When set to prioritize A phase , the counter increases when A phase leads B phase . When set to prioritize B phase , the counter decreases when A phase lags behind B phase .

• Single phase

Only for A phase, without directional control.

• Pulse + direction

When set to prioritize A-phase, the counter increases when B-phase input is at high level. When set to prioritize B-phase, the counter increases when B-phase input is at low level.

• CW/CCW

When set to prioritize A-phase, the counter increase when A-phase has a count. When set to prioritize B-phase, the counter increase when B-phase has a count.

■ Counter application example

For example, set in the module configuration parameter interface: do not turn on power detection, set the counter type to circular, set the counter mode to AB phase 1xfrequency, set the count value to power down holding, and default the maximum and minimum values of the counter.

PROFINET网络 ● 定 控制器(CFU SR20_plc200smart) ● 〔 LFP3-APV2.00-fb3-ap □ [LFP3-AP(0) □] XF-E1HSC High Speed Cc □ 完成	该页可配置所选模块的每个子模块。 1HSC Counting			
	模块配置参数	通用参数 电源检测 [0:	: 关闭 _	
● PROFINET研究 ヨーの [F3b]器(CPU SR20_plc200smart) 日一回 [F3-APV2.00 /F3-3ap □ LF9-3APV2.00 /F3-3ap □ LF9-3APV2.00 /F3-3ap □ XF-E1HSC High Speed Cc □ 元式	该页可配置所选模块的每个子模块。 1HSC Counting	¥3: 电平逻辑 [0:] 功能选择 [0:] 輸出状态 [0: 4] 輸出状态 [0: 4] 輸出状态 [0: 4] 计数模式 [0: 4] 计数模式 [0: 4] 计数模式 [0: 4] 计数盘种电保持 [1: 4] 脉冲输入采样时间 [10] A\B\ZE&皮时间 [2] 计数器最大值 [2]47 计数器最小值 [2]47	正逻辑 苦通輸出 AB相称:中,1倍频; 环型 保持	

The result of the external rotating encoder is as follows:

• Encoder turns forward (count up)

Write 1 to the counter control word (i.e. set bit 0) to enable the counter to count, which can monitor the accumulation of count values. The value of the monitoring counter status word is 1, where bit 0 is 1 (normal count) and bit 1 is 0 (count up).

鍧	- 🖄 - 🔰	🖸 🔲 🖓 🖉 🖌 🕯	🚡 🔂 🕅 🗹] 🖸 🔹		
	地址~		格式	当前值	新值	
1	IW134	CH0计数器状态字	有符号	+1		
2	ID139	计数值	有符号	+9821		
3	QW160	CH0计数器控制字	有符号	+1		
4			有符号			
5			有符号			

• Encoder turns reverse (count down)

Write 1 to the control word of the counter (i.e. set bit 0) to enable the counter to count, which can monitor the counting value to decrease. The value of the monitoring counter status word is 3, where bit 0 is 1 (normal counting) and bit 1 is 1 (count down).

状态图表								
🎦 - 🎦 - 🔂 📶 🖓 🥒 🖀 🚡 🐯 🖃 🖘								
	地址一		格式	当前值	新值			
1	IW134	CH0计数器状态字	有符号	+3				
2	ID139	计数值	有符号	+9213				
3	QW160	CH0计数器控制字	有符号	+1				
4			有符号					
5			有符号					

Preset function

There are three preset methods for counters, namely internal command, external digital input terminal, and Z signal.

Example: Change the current high speed count value to 200.

(1) Internal preset write in

Set the preset value of the counter to 200, and set the control word value of the counter to 65 (i.e. set bit 6) to trigger the internal preset function of the counter. At this time, the monitoring count value is 200 and the preset function status word value is 4, which means the internal preset completion flag bit 2 is set.

状态	图表					
1	- 🖄 - 📙	🗩 🗉 🖓 🌽 🖬 🕯	🖞 🕅 📶 🖸) •		
	地址~		格式	当前值	新值	
1	QD128	计数器预置值	有符号	+200		
2	QW160	CH0计数器控制字	有符号	+65		
3	ID139	计数值	有符号	+200		
4	IB136	CH0预置功能状态字	无符号	4		
5			有符号			

If you want to write other preset values again, you need to adjust the set value and modify the counter control word value: 65->1->65.

Finally, the internal preset completion flag status can be reset by changing the counter control word value to 513 (i.e. set bit 9).

The execution effect is shown in the figure:

🋅 - 🆄 - 🛯 🔽 🕼 🥒 🔒 📸 🛞 🗹 🖘 🥶							
	地址~	格式	当前值	新值			
1	QD128	有符号	+200				
2	QW160	有符号	+513				
3	ID139	有符号	+200				
4	IB136	无符号	0				
5		有符号					

(2) External digital preset value

Taking X0 as an example, set the X0 terminal function to preset in the module configuration parameter interface.



Set the preset value of the counter to 200, and set the control word value of the counter to 129 (i.e. set bit 7) to trigger the preset of the channel digital input terminal. At this time, when the rising edge (or corresponding edge) of the external signal X0 arrives, the monitoring count value is 200, and the value of the preset function status word is 9, which is the CH0 channel digital input terminal preset function enable bit 0 to set on and the CH0 channel digital input terminal preset on.

状态	图表					
-	- 🎽 - 🛛	🗊 🔳 🖓 🥒 🗟 🚡	📸 🕅 🛛 🖂 🖸) +		
	地址~		格式	当前值	新值	
1	QD128	计数器预置值	有符号	+200		
2	QW160	CH0计数器控制字	有符号	+129	1	
3	ID139	计数值	有符号	+200		
4	IB136	CH0预置功能状态字	无符号	9		
5			有符号			

If you want to write other preset values again, you need to adjust the set value and modify the counter control word value: 129>1->129.

Finally, the CH0 channel digital input terminal preset function enable flag status and CH0 channel digital input terminal preset completion flag status can be reset by modifying the counter control word value to 1025 (i.e. set bit 10).

状态图表									
🛅 - 🎽 - 1 🔽 🔟 63 🥒 🔒 🖀 🔂 🕺 🖃 🖘									
	地址	格式	当前值	新值					
1	QD128	有符号	+200						
2	QW160	有符号	+1025						
3	ID139	有符号	+200						
4	IB136	无符号	0						
5		有符号							

(3) Z signal preset

The preset value of the counter is set to 200, and the control word value of the counter is set to 257 (i.e. set bit 8) to trigger the Z terminal preset enable. When the rising edge (or corresponding edge) of the external Z signal arrives, the monitoring counter value is set to 200, and the preset function status word value is set to 18, which

means that the channel CH0 Z input terminal preset function enable bit 1 is set on, and the channel CH0 Z input terminal preset completion flag bit 4 is set on.

状态	图表					
1	- 🖄 -	🗩 💷 🧀 🥒 🔒 🚡	🛗 🕅 🛛 🖂 🖸) +		
	地址		格式	当前值	新值	
1	QD128	计数器预置值	有符号	+200		
2	QW160	CH0计数器控制字	有符号	+257		
3	ID139	计数值	有符号	+200		
4	IB136	CH0预置功能状态字	无符号	18		
5			有符号			

If you want to write other preset values again, you need to adjust the set value and modify the counter control word value: 257->1->257.

Finally, the Z terminal preset completion flag status can be reset by changing the counter control word value to 2049 (i.e. set bit 11).

状态	图表				
-	- 🛅 - 🕞 🔲 🖌 🌽	१। 🔒 🚡 🔂 🕅 🖂 🖸) -		
	地址	格式	当前值	新值	
1	QD128	有符号	+200		
2	QW160	有符号	+2049		
3	ID139	有符号	+200		
4	IB136	无符号	0		
5		有符号			1

Probe function

The probe function is used to latch the DC time and counter value when a specific signal occurs. Each channel can be equipped with up to two probe terminals, and each probe can achieve rising edge locking and falling edge locking.

For example, using the X0 terminal as a probe trigger signal, locks the probe position at the rising edge.

Set the X0 terminal function to probe in the module configuration parameter interface of the configuration wizard.

PROFINET 配置向导		×
□ PROFINET网络 □-□ 控制器(CPU SR20_plc200smart) □-□ LFP3-APV2.00-lfp3-ap	该页可配置所这模块的每个子模块。	
□ LFP3-AP(0) □ XF-E1HSC High Speed Co □ 完成	1HSC Counting	1
	模块露盂参数	
	通用参数	
	电源检测 1:打开 💌	
	XO :	
	电平逻辑 0:正逻辑 👤	1
	功能法择 1: 探针 🔽	
	滤波时间 2	

When the counter is enabled, the value of the control word for CH0 probe 1 function is set to 9 (i.e. bit0, bit3). When the rising edge of the X0 signal arrives, the current counter value will be latched in the CH0 probe 1 rising edge count value. The CH0 probe function status word is 3 (bit0, bit1 set). At the same time, the DC time value can also be monitored.

状态	图表					
1	- 🛅 - 📙	🗾 🖩 🕼 🥒 🔒 🖀 🐮 🕅 🖂 🤉				
	地址一		格式	当前值	新值	
1	ID163	CH0探针1上升沿DC时钟高32位	有符号	+236		
2	QB162	CH0探针1功能控制字	无符号	9		
3	QW160	CH0计数器控制字	有符号	+1		
4	ID159	CH0探针1上升沿DC时钟低32位	有符号	-1422392282		
5	ID143	CH0探针1上升沿计数值	有符号	+9858		
6	ID139	计数值	有符号	+9858		
7	IW137	CH0探针功能状态字	有符号	+3		

■ Comparison output

Example: take Y0 as the comparison output signal.

Set the Y terminal function to compare output in the module configuration parameter interface of the configuration wizard.

PROFINET 配置向导	
NET网络 制器(CPU SR20_plc200smart) 1 LFP3-APV2.00-1fp3-ap 	该页可配置所送模块的每个子模块。
— 🔲 XF-E1HSC High Speed Counting(1) 創 完成	1HSC Counting TO: 电平逻辑 功能选择 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 0: 1: <td< td=""></td<>

Set the CH0 first channel comparison output setting count value and the CH0 first channel comparison output setting output time. The value of the Y output control word is assigned to 1 (i.e. set bi0). When the count value is greater than the CH0 first channel comparison output setting count value, the corresponding Y0 outputs the state of the corresponding time.

状态	图表									
1	· 恤 · 恤 · 🗊 Ⅲ / ↔ 🖉 🔒 🚡 📆 陳 ळ · ·									
	地址~		格式	当前值	新值					
1	IB130	Y0端子输出状态	无符号	3						
2	QD132	CH0第一路比较输出设定计数值	有符号	+15000						
3	ID139	计数值	有符号	+15160						
4	QW148	CHO第一路比较输出设定输出时间	有符号	+3000						
5	QB156	Y0输出控制字	无符号	1						
6	QW160	CH0计数器控制字	有符号	+1						

8.2.7.2 Usage of Siemens S7-1200/1500

The mapping address of module process data can be viewed in the device view.

The correspondence between data types and addresses is as follows:

Data type	Mapping address type
USINT	IB
UINT	IW
DINT	ID
UDINT	ID

					21	石扑视图	👗 网络视图	🛐 设备视图	选项
👉 [fp3-ap [LFP3-AP] 💌 🗒 🖭 🚺 🍳 🛨		设备概览							E
	^	₩ 模块	机架	插槽	1 地址	Q地址	类型	订货号	▼ 目录
		🗹 🔻 lfp3-ap	0	0			LFP3-AP	LFP3-AP	<搜索> 前計 前計
		 LFP3-AP Profinet Device 	0	0 X1			LFP3-AP		
13 ²⁰¹		XF-E1HSC High Speed Count	0	1	68145	6499	XF-E1HSC High Spe.	. XF-E1HSC	
H,	-		0	2					T Module
· · · · · · · · · · · · · · · · · · ·			0	3					Till Analon Module
			0	4					Digital Input Module
			0	5					Tim High Speed Counting Collection
			0	6					XE-E1HSC High Speed Counting
DP-NORM			0	7					The Special Module
			0	8					T XE-E2COM24 Modbus通信植中
			0	9					Temperature Collection
			0	10					
			0	11					
			0	12					

In this case, the mapped addresses are IB68~IB145, QB64~QB99.

Name	Туре	Explanation
XF_E1HSC	Stuct	High speed counting module
IB68	USINT	X0 terminal input status
IB69	USINT	X1 terminal input status
IB70	USINT	Y0 terminal output status
IB71	USINT	Y1 terminal output status
IB72	USINT	Y2 terminal output status
IB73	USINT	Y3 terminal output status
IW74	UINT	CH0 counter status
IB76	USINT	CH0 preset function status word
IW77	UINT	CH0 probe function status word
ID79	DINT	Counter value
ID83	DINT	CH0 probe 1 rising edge count value
ID87	DINT	CH0 probe 1 falling edge count value
ID91	DINT	CH0 probe 2 rising edge count value
ID95	DINT	CH0 probe 2 falling edge count value
ID99	UDINT	CH0 probe 1 rising edge DC clock low 32 bits
ID103	UDINT	CH0 probe 1 rising edge DC clock high 32 bits
ID107	UDINT	CH0 probe 1 falling edge DC clock low 32 bits
ID111	UDINT	CH0 probe 1 falling edge DC clock high 32 bits
ID115	UDINT	CH0 probe 2 rising edge DC clock low 32 bits
ID119	UDINT	CH0 probe 2 rising edge DC clock high 32 bits
ID123	UDINT	CH0 probe 2 falling edge DC clock low 32 bits
ID127	UDINT	CH0 probe 2 falling edge DC clock high 32 bits

Name	Type	Explanation
ID131	UDINT	CH0 pulse input frequency
IB135	USINT	CH0 input frequency overload
ID136	UDINT	CH0 pulse width
IW140	UINT	Module level error code
ID142	UDINT	Channel level error code
QD64	DINT	Preset value
QD68	DINT	CH0 first channel comparison output set count value
QD72	DINT	CH0 second channel comparison output set count value
QD76	DINT	CH0 third channel comparison output set count value
QD80	DINT	CH0 fourth channel comparison output set count value
QW84	UINT	CH0 first channel comparison output setting output time
QW86	UINT	CH0 second channel comparison output setting output time
QW88	UINT	CH0 third channel comparison output setting output time
QW90	UINT	CH0 fourth channel comparison output setting output time
QB92	USINT	Y0 output control word
QB93	USINT	Y1 output control word
QB94	USINT	Y2 output control word
QB95	USINT	Y3 output control word
QW96	UINT	CH0 counter control word
QB98	USINT	CH0 probe 1 function control word
QB99	USINT	CH0 probe 2 function control word

■ Error code parameter

Module level error code (ErrCode_module)						
Bit location	Meaning	Error level				
0	The 24V input power supply of the module is abnormal	General				
1	Incorrect allocation of module parameters	Important				
2	An internal module error has occurred and the user layer is	Important				
	unable to repair it					
3	Version mismatch	Important				

■ Channel level code parameter

Channel level error code (ErrCode_CH)					
Bit location	Meaning	Error level			
0	Input frequency overload	General			

■ Counter type

The data type of the counter is a 32-bit signed number (-2147483648~2147483647). Counter counting types can be divided into ring counters and linear counters.

• Ring counters

Ring counter counts between the maximum and the minimum value.

When forward counting exceed the maximum value, it jumps to the minimum value. When backward counting is less than the minimum, it jumps to the maximum value.



• Linear counter

Linear counter counts between the maximum and the minimum value.

When the forward counting reaches the maximum value or the backward counting reaches the minimum value, it will stop counting.

When the current counting value reaches the set limit, up and down overflow alarm will be triggered.



■ Counter mode

Mode	Waveform
Single phase (P)	A phase
	A phase
Pulse + direction	Backward Forward
	A phase
	B phase
A/B phase 1/2/4 times frequency	ABX1
times nequency	4 times frequencyABX2ABX2
	4 times frequencyABX4
	A phase
CW/CCW input	Forward B phase
	Backward

• Counter direction control

The counting direction of the counter can be changed through PDO, and A-phase priority or B-phase priority can be set.

• AB phase

When set to prioritize A phase , the counter increases when A phase leads B phase . When set to prioritize B phase , the counter decreases when A phase lags behind B phase .

• Single phase

Only for A phase , without directional control.

• Pulse + direction

When set to prioritize A-phase, the counter increases when B-phase input is at high level. When set to prioritize B-phase, the counter increases when B-phase input is at low level.

• CW/CCW

When set to prioritize A-phase, the counter increase when A-phase has a count. When set to prioritize B-phase, the counter increase when B-phase has a count.

■ Counter application example

For example, set in the general parameter interface of the module configuration parameters, the settings are: do not turn on power detection, set the counter type to circular, set the counter mode to AB phase 1xfrequency, set the count value to power down holding, and default the maximum and minimum values of the counter.

模块配置参数			
通用参数	电源检测: 0:关闭		×
固件版本 软件版本 模块ID:0x002b0002 固件版本	HSC_CH0: 计数模式:	O:AB相脉冲.1倍频;	
模块配置参数	计数类型:	1:环型	.*
1/0 地址	计数值掉电保持:	1:保持	*
	脉冲输入采样时间:	10	
	A\B\Z滤波时间:	2	
	计数器最大值:	2147483647	
	▶ 计粉翠最小值:	-2147483648	

The result of the external rotating encoder is as follows:

• Encoder turns forward (count up)

Write 1 to the counter control word (i.e. set bit 0) to enable the counter to count, which can monitor the accumulation of count values. The value of the counter status word is 1, where bit 0 is 1 (normal count) and bit 1 is 0 (count up).

名称	地址	显示格式	监视值	注释		
	%IW74	无符号十进制	1	CH0计数器状态		
	%ID79	无符号十进制	21308	计数值		
	%QW96	无符号十进制	1	CH0计数器控制字		

• Encoder turns reverse (count down)

Write 1 to the control word of the counter (i.e. set bit 0) to enable the counter to count, which can monitor the counting value to decrease. The value of the counter status word is 3, where bit 0 is 1 (normal counting) and bit 1 is 1 (count down).

名称	地址	显示格式	监视值	注释			
	%IW74	无符号十进制	3	CHO计数器状态			
	%ID79	无符号十进制	19680	计数值			
	%QW96	无符号十进制	1	CH0计数器控制字			

Preset function

There are three preset methods for counters, namely internal command, external digital input terminal, and Z signal.

Example: Change the current high speed count value to 200.

(1) Internal preset writing

Set the preset value of the counter to 200, and set the control word value of the counter to 65 (i.e. set bit 6) to trigger the internal preset function of the counter. At this time, the monitoring count value is 200 and the preset function status word value is 4, which means the internal preset completion flag bit 2 is set on.

i 🎼	10 91 %					
名称	地址	显示格式	监视值	修改值	3	注释
	%QD64	无符号十进制	200	200	M 🛃	计数器预置值
	%QW96	无符号十进制	65	65	🗹 🔔	CHO计数器控制字
	%ID79	无符号十进制	200	1		计数值
	%IB76	无符号十进制	4			CHO预置功能状态字

If you want to write other preset values again, you need to adjust the set value and modify the counter control word value: 65->1->65.

Finally, the internal preset completion flag status can be reset by changing the counter control word value to 513 (i.e. set bit 9).

The execution effect is shown in the figure:

名称	地址	显示格式	监视值	修改值	9	注释
	%QD64	无符号十进制	200	200	🗹 🚹	计数器预置值
	%QW96	无符号十进制	513	513	M 1	CHO计数器控制字
	%ID79	无符号十进制	200	1		计数值
	%IB76	无符号十进制	0			CHO预置功能状态字

(2) External digital value preset

Taking X0 as an example, set the X0 terminal function to preset in the module configuration parameter interface.

										2	拓扑视图	🚠 网络视图	■】 设备视目
f [fp3-ap [LFP3-AP]	💌 🖽 🖾 🖾 🖽	🔢 🔍 ±					设备概览						
						^	₩ 模块	机架	插槽	1 地址	Q地址	类型	订货号
103.09						=	▼ Ifp3-ap	0	0			LFP3-AP	LFP3-AP
N ¹							LFP3-AP Profinet Device	0	0 X1			LFP3-AP	
						1	XF-E1HSC High Speed Cour	it 0	1	68145	6499	XF-E1HSC High Spe.	XF-E1HSC
_						-		0	2				
						•		0	3				
	DP-NORM							0	4				
		-						0	5				
								0	7				
						~		0	0				
				10010	11	. •				10			
France I C I C P											C1 101 PT	171 100 101 101 10	C Block
-E1HSC High Speed Counti	ing_1 [XF-E1HSC High	Speed Counting]								1	5 //w12	1.29 10.305 1.20 6	2 101
-E1HSC High Speed Count 常規 IO 変量 系统	ing_1 [XF-E1HSC High 常数 文本	Speed Counting]								-		129 1125 120 16	2001
-E1HSC High Speed Counti 常規 10 変量 系统 常規	ing_1 [XF-E1HSC High :常数 文本 模块配置参数	Speed Counting]								4		124 10 20 10 10	2001
-E1HSC High Speed Count 常規 10 交量 系统 常規 目录信息 目示信息	ing_1 [XF-E1HSC High 常数 文本 模块配置参数 通用数数	Speed Counting]										129 10 22 1 20 6	
E1HSC High Speed Count 常規 <u>10 夜量 系统</u> 常規 目录信息 現決参数 订资号: XF-E1HSC	ing_1 [XF-E1HSC High 常数 文本 模块配置参数 通用参数	Speed Counting										1.24 III.82	
ETHSC High Speed Count 許規 <u>IO 変量 系统</u> 常規 目录信息 製夫参数 订货号: SFETHSC 圖件板本	ing_1 [XF-E1HSC High 常数 文本 横块配置参数 通用参数	Speed Counting] 电源检测: 0:3	<ia< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></ia<>										
ETHSC High Speed Count 款援 10 交量 系统 影與 目示信息 與恐参数 订货号: XFETHSC 固件版本 软件版本	ing_1 [XF-E1HSC High 常数 文本 模块配置参数 通用参数	Speed Counting] 电源检测: 0: 5	्म										
E1HSC High Speed Count 客規 目示信息 気於巻数 可没号:XFE1HSC 固件版本 软件版本 截決の:0x0000002	ing_1 [XF-E1HSC High 常数 文本 橫块配置参数 通用参数 	Speed Counting] 电源检测: 0:疗	€in								3 //011		× 1091
ETHSC High Speed Count 条規 日交量 系统 周 周 原 原 原 原 原 原 原 原 原 原 原 原 原	ing_1 [XF-E1HSC High 常数 文本 模块配置参数 通用参数 X0:	Speed Counting] 电源检测: 0:3	€in									9 U 250 H	▼ 101
ETHSC High Speed Count	ing_1 [XF-E1HSC High 溶数 文本 模块配置参数 通用参数 X0:	Speed Counting] 电源检测: 0: う 电平逻辑: 0: ī	€闭 E逻辑									9 E 30 10	•
EtHSCHigh Speed Count K集 10 安服 系统 系统 取 国示信息 取 和 取 取 和 取 和 和 和 和 和 和 和 和 和 和 和	ing_1 [XFE1HSC High 常数 文本 模块配置参数 通用参数 X0:	Speed Counting] 电源检测: 0:3 电平逻辑: 0:3 功能选择: 3 f	 (i) E 逻辑 6面 									9 E 350 E	× 101

Set the preset value of the counter to 200, and set the control word value of the counter to 129 (i.e. set bit 7) to trigger the preset of the channel digital input terminal. At this time, when the rising edge (or corresponding edge) of the external signal X0 arrives, the monitoring count value is 200, and the value of the preset function status word is 9, which is the CH0 channel digital input terminal preset function enable bit 0 to set on and the CH0 channel digital input terminal preset on.

名称	地址	显示格式	监视值	修改值	9	注释
	%QD64	无符号十进制	200	200	🗹 🔔	计数器预置值
	%QW96	无符号十进制	129	129	M 📥	CH0计数器控制字
	%ID79	无符号十进制	200	1		计数值
	%IB76	无符号十进制	9			CHO预置功能状态字

If you want to write other preset values again, you need to adjust the set value and modify the counter control word value: 129->1->129.

Finally, the CH0 channel digital input terminal preset function enable flag status and CH0 channel digital input terminal preset completion flag status can be reset by modifying the counter control word value to 1025 (i.e. set bit 10).

÷ 19	1. 2. 20	🖉 약 약				
名称	地址	显示格式	监视值	修改值	4	注释
	%QD64	无符号十进制	200	200	M 🚹	计数器预置值
	%QW96	无符号十进制	1025	1025	🗹 🔔	CHO计数器控制字
	%ID79	无符号十进制	200	1		计数值
	%IB76	无符号十进制	0			CHO预置功能状态字

(3) Z signal preset

Set the preset value of the counter to 200, and the control word value of the counter to 257 (i.e. set bit 8) to trigger the Z terminal preset enable. When the rising edge (or corresponding edge) of the external Z signal arrives, the counter value is 200. The preset function status word value is 18, which means the CH0 channel Z input terminal preset function enable bit 1 is set on, and the CH0 channel Z input terminal preset completion flag bit 4 is set on.

ä 🌆	1. 1. 18	🖉 📴 💁			-	
名称	地址	显示格式	监视值	修改值	9	注释
	%QD64	无符号十进制	200	200	🗹 🔥	计数器预置值
	%QW96	无符号十进制	257	257	🗹 🔔	CHO计数器控制字
	%ID79	无符号十进制	200			计数值
	%IB76	无符号十进制	18			CHO预置功能状态字

If you want to write other preset values again, you need to adjust the set value and modify the counter control

word value: 257->1->257.

Finally, the Z terminal preset completion flag status can be reset by changing the counter control word value to 2049 (i.e. set bit 11).

ž 🖌	1. 1. 18					
名称	地址	显示格式	监视值	修改值	9	注释
	%QD64	无符号十进制	200	200	🗹 🔺	计数器预置值
	%QW96	无符号十进制	2049	2049	🗹 🔺	CHO计数器控制字
	%ID79	无符号十进制	200			计数值
	%IB76	无符号十进制	0			CHO预置功能状态字

Probe function

The probe function is used to latch the DC time and counter value when a specific signal occurs. Each channel can be equipped with up to two probe terminals, and each probe can achieve rising edge locking and falling edge locking.

For example, using the X0 terminal as a probe trigger signal, locks the probe position at the rising edge. Set the X0 terminal function as a probe in the module configuration parameter interface.

									2	拓扑视图	🔥 网络视图	₿ 设备视	8
🏕 [fp3-ap [LFP3-AP]		🔲 🔍 ±		3	设备	概览							
				1	· ·	模块	机架	插槽	1地址	Q地址	类型	订货号	
13.89				-		✓ Ifp3-ap	0	0			LFP3-AP	LFP3-AP	^
an.						LFP3-AP Profinet Device	0	0 X1			LFP3-AP		
						XF-E1HSC High Speed Count	0	1	68145	6499	XF-E1HSC High Spe.	XF-E1HSC	=
							0	2					
_							0	3					
DP-1	ORM				-		0	4					
					1		0	5					
							0	6					
							0	7					
							0	8					
							0	9					
							0	10					
< II			> 100%				0	11					5
XE-E1HSC High Speed Count	ling 1 [XE-E1HSC Hig	h Speed Counting]	1.							1 尾井	为 估白 [0] 2	AK 7	
2540 10 mm 7/4	which where the	n speed counting;								3 AG II		201	_
■ 常規 ■ 10 受重 ● 糸羽	高賀 又本												_
▼ 常規 目录信息	模块配置参数												
▼ 模块参数	通用参数												
订货号:XF-E1HSC													
固件版本		电源检测: 0:关闭											
软件版本													
模块ID:0x002b0002	X0:												
固件版本													
模块配置参数		电平逻辑: 0:正逻辑											
UO HIM		功能选择: 1:探针											
		游戏时间: 2	1										
		and a state of the											

When the counter is enabled, the value of the control word for CH0 probe 1 function is set to 9 (i.e. bit0, bit3). When the rising edge of the X0 signal arrives, the current counter value will be latched in the CH0 probe 1 rising edge count value. The CH0 probe function status word is 3 (bit0, bit1 set). At the same time, the DC time value can also be monitored.

ä 🎼	1. 9, % ;						
名称	地址	显示格式	监视值	修改值	9	注释	
	%QB98	无符号十进制	9			CH0探针1功能控制字	
	%QW96	无符号十进制	1			CHO计数器控制字	
	%ID103	无符号十进制	10			CHO探针1上升沿DC时钟高32位	
	%ID99	无符号十进制	1_677_168_450			CHO探针1上升沿DC时钟低32位	
	%ID83	无符号十进制	5598			CHO探针1上升沿计数值	
	%ID79	无符号十进制	5598			计数值	
	%IW77	无符号十进制	3			CHO探针功能状态字	

Comparison output function

Example: Take Y0 as the comparison output signal.

Set the Y terminal function to compare output in the module configuration parameter interface of the configuration wizard.

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Set the CH0 first channel comparison output count value and the CH0 first channel comparison output time. The value of the Y output control word is assigned to 1 (i.e. set bi0). When the count value is greater than the CH0 first channel comparison output set count value, the corresponding Y0 outputs the state of the corresponding time.

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名称	地址	显示格式	监视值	修改值	9	注释
	%IB70	无符号十进制	3	3	🗹 🛕	YO端子输出状态
	%ID79	无符号十进制	18544			计数值
	%QD68	无符号十进制	15000	15000	🗹 🔺	CH0第一路比较输出设定计数值
	%QW84	无符号十进制	30000	30000	M 🔺	CH0第一路比较输出设定输出时间
	%QB92	无符号十进制	1	1	M 🔺	YO输出控制字
	%QW96	无符号十进制	1	1	🗹 🔺	CHO计数器控制字



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