

EtherCAT

EC4 Series Integrated I/O

User Manual



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1 Product Overview

1.1 Product profile

EC4 series integrated I/O modules equipped with EtherCAT industrial Ethernet bus feature small footprint, high real-time performance, and a rich variety of module types. They provide users with a range of options for achieving high-speed data collection, optimal system configuration, simple on-site wiring, and improved system reliability.

1.2Product features

- Small footprint
 - Compact structure and small footprint, only measuring 102 mm × 72 mm × 25 mm
- High speed

Based on high-performance EtherCAT ASIC communication chips and parallel interface, and

fast in speed

• Rich functional expansion options

A full range of I/O types are available to support flexible expansion. A rich variety of digital, analog, temperature, pulse, and other modules can be integrated to meet demand of different application scenarios.

• Easy diagnosis

An innovative channel indicator design is adopted. As the indicators are placed close to the channels, channel status is displayed intuitively and clearly, facilitating detection and maintenance.

• Easy configuration

The modules are easy to configure, and support all mainstream EtherCAT master stations.

Easy installation

Installation on standard DIN 35 mm rails

Elastic terminal blocks are used for convenient and fast wiring.

2 Designation Rules

2.1 Designation rules

$\frac{EC}{(1)} \frac{4}{(2)} - \frac{A}{(3)} \frac{8}{(4)} \frac{0}{(5)} \frac{V}{(6)}$

No.	Туре	Description				
(1)	Bus protocol	EC: Eth	EC: EtherCAT protocol abbreviation			
(2)	Product line	4: Integ	grated I / O			
(3)	I/O kind	D: Digi	tal			
		A: Ana	log			
(4)	Number of	Analog	ı quantity: 0,4, and	18		
	input	digital	: 0,8,16,24,32			
	pointsignal					
	points					
(5)	Number of	Analog quantity: 0,4, and 8				
	output	digital : 0,8,16,24,32				
	pointsignal					
	points					
(6)	Input output	Digital	Digital]
	features	Code	import	output	Code	
		А	NPN, 3ms	NPN, 0.5A	I	4~20 mA, 0~20 mA
		В	PNP, 3ms	PNP, 0.5A	V	-10~+10 V, 0~+10 V
		J	-	relay		

2.2 Model list

Model	Product description		
EC4-3200A	32-channel digital input module, NPN type		
EC4-3200B	32-channel digital input module, PNP type		
EC4-0032A	32-channel digital output module, NPN type		
EC4-0032B	32-channel digital output module, PNP type		
EC4-1616A	16-channel digital input-output module, NPN type		
EC4-1616B	16-channel digital input and output module, PNP type		
EC4-1600A	16-channel digital input module, NPN type		
EC4-1600B	16-channel digital input module, PNP type		
EC4-0016A	16-channel digital output module, NPN type		
EC4-0016B	16-channel digital output module, PNP type		
EC4-0808A	8-channel digital input and output module, NPN type		
EC4-0808B	8-channel digital input and output module, PNP type		
EC4-2408A	24-channel digital input, 8 channel digital output module, NPN type		
EC4-2408B	24 channel digital input, 8 channel digital output module, PNP type		
EC4-0824A	8-channel digital input, 24 channel digital output module, NPN type		
EC4-0824B	8-channel digital input, 24-channel digital output module, PNP type		
EC4-0012J	12-channel relay output module		
EC4-1612J	16-channel digital input (NPN / PNP type), 12-channel re	lay output module	
EC4-A80V	8-channel analog voltage input module	Optional ranges:	
EC4-A40V	4-channel analog volume voltage input module	-10~+10 V,	
EC4-A08V	8-channel analog voltage output module	0~+10 V	
EC4-A04V	4-channel analog volume voltage output module		
EC4-A80I	8-channel analog current input module	Optional ranges:	
EC4-A40I	4-channel analog current input module	4~20 mA,	
EC4-A08I	8-channel analog current output module	0~20 mA	
EC4-A04I	4-channel analog current output module		
XX 4-C10_4	Common terminal extended module		

3 Product Parameters

3.1 General parameters

Interface parameters				
Bus protocol	EtherCAT			
Number of I/O stations	Depending on master station configuration			
Data transmission medium	Ethernet/EtherCAT CAT5 cable			
Transmission distance	≤100 m (distance between stations)			
Transmission speed	100 Mbps			
Bus interface	2×RJ45			
Technical parameters				
Configuration method	Through the main station			
Power supply rating (range)	24 VDC (18V~36V)			
Electrical isolation	500 VAC			
Weight	About 140g			
Dimensions	102mm×72mm×25 mm			
Working temperature	-10°C~+60°C			
Storage temperature	-20℃~+75℃			
Relative humidity	95%, with no condensation			
Protection degree	IP20			

3.2 Digital parameters

Digital input				
Rated voltage	24 VDC (18V~30V)			
Number of signal points	8, 16, 24, 32			
Signal type	NPN /PNP			
"0" Signal voltage (NPN)	15~30 V			
"1" Signal voltage (NPN)	-3~+3 V			
"0" Signal voltage (PNP)	-3~+3 V			
"1" Signal voltage (PNP)	15~30 V			
Input filtering	3 ms			
Input current	4 mA			
Isolation method	Optical coupling isolation			
Isolation with stand voltage	500 V AC			
Channel indicator	Green LED			
Digital output				
Rated voltage	24 VDC (18V~30V)			
Number of signal points	8, 16, 24, 32			
Signal type	NPN /PNP			
Load type	Resistive load, inductive load			
Single-channel rated current	NPN type Max250 mA			
	PNP type Max: 500 mA			
Port protection	Overvoltage and overcurrent protection			
Isolation method	Optically-coupled isolation			
Isolation with stand voltage	500 V			
Channel indicator	Green LED			
Relay output				
Rated voltage	24 VDC (18V~30V)			
Number of signal points	12			
Isolation method	Optically-coupled, relay			
Rated load	Single port: 4 A			
	Common port: 8 A			
	Whole module: 16 A			
Connecting mode of the common	4 points/1 common terminal			
terminal				
Channel indicator light	Green LED			

3.3 Analog parameter

3.3.1 Technical parameter

Analog input				
Number of input points	4, 8			
Input signal (voltage type)	-10~+10 V (-32768~32767)			
	0~+10 V (0~32767)			
Input signal (current type)	0~20 mA (0~65535)			
	4~20 mA (0~65535)			
Resolution	16 bits			
Sampling rate	≤1 ksps			
Accuracy	±0.1%			
Input impedance (voltage type)	≥2 kΩ			
Input impedance (current type)	100 Ω			
Isolation with stand voltage	500 V AC			
Channel indicator	Green LED			
Analog output				
Number of output points	4, 8			
Output signal (voltage-type)	-10~+10 V (-32768~32767)			
	0~+10 V (0~32767)			
Output signal (current type)	0~20 mA (0~65535)			
	4~20 mA (0~65535)			
Resolution	16 bits			
Accuracy	±0.1%			
Load impedance (voltage type)	≥2 kΩ			
Load impedance (current type)	≤200 Ω			
Isolation withstand voltage	500 V AC			
Channel indicator	Green LED			

3.3.2 Voltage I/O range selection and code value table

Voltage I/O range selection and code value range				
Range selection	0	1		
Range	-10 ~+10 V	0~+10 V		
Code value range	-32768~32767	0~32767		
Voltage input formula	D =(65535/20)*U	D =(32767/10)*U		
Voltage output formula	U =(D*20)/ 65535	U =(D *10)/32767		
Code values table	Please see Table 1.			

Note: D: code value; U: voltage.

Table 1. Voltage code value table

range	0 (-10~+10 V)	1 (0~+10 V)
voltage	Code value	Code value
-10	-32768	-
-9	-29491	-
-8	-26214	-
-7	-22938	-
-6	-19661	-
-5	-16384	-
-4	-13107	-
-3	-9830	-
-2	-6554	-
-1	-3277	-
0	0	0
1	3277	3277
2	6554	6553
3	9830	9830
4	13107	13107
5	16384	16384
6	19661	19660
7	22938	22937
8	26214	26214
9	29491	29490
10	32767	32767
	Code value = (65535 / 20) *	Code value = (32767 / 10) *
	voltage	voltage
	Voltage = (code value * 20) /	Voltage = (code value * 10) /
	65535	32767

3.3.3 Current I/O range selection and code value table

Current I/O range selection and code value range				
Range selection	0	1		
Range	4~20 mA	0~20 mA		
Code value range	0~65535	0~65535		
Current input formula	D =65535/16*I-16384	D =65535/20*I		
Current output formula	I =(D +16384)*16/65535	I =D*20/65535		
Code values tableSee Table 2 Current Value Table Table 1.		Table 1.		

Note: D: Code value; I: current.

Table 2. Current code value table

range	0 (4~20 mA)	1 (0~20 mA)
current	Code value	Code value
0	-	0
1	-	3277
2	-	6554
3	-	9830
4	0	13107
5	4096	16384
6	8192	19661
7	12288	22937
8	16384	26214
9	20479	29491
10	24575	32768
11	28671	36044
12	32767	39321
13	36863	42598
14	40959	45875
15	45055	49151
16	49151	52428
17	53247	55705
18	57343	58982
19	61439	62258
20	65535	65535
	Code value =65535 / 16 *	Code value =65535 / 20 *
	current-16384	current
	Current = (code value + 16384) *	Current = code value * 20 /
	16 / 65535	65535

3.4Common terminal expansion module parameters

Common terminal			
Rated voltage	125 VDC/250 VAC		
Rated current	8 A		
Number of	4 sets(10 P/set)		
common terminals			

4 Panel

4.1 Product mix

Name and function description



	Name	Description	
1	Power interface	3Pin push in terminal	
2	Bus interface	2×RJ45	
3	③ Network port indicator Link and data transmission status		
4	System indicator	Indicates the module status	
5	Module identification Mark the module model, bus type, etc		
6	Channel interface The 2×20Pin push in terminal		
7	Channel ID	Corresponding channel position identification	
8	Channel indicator	Indicates the corresponding channel signal status	

4.2 Indicator light function

Name	ID	Color	Status	Description	
Power	PWR	Green	ON	Normal status of working power supply	
			OFF	Unpowered or abnormal power supply	
On creating	RUN	Green	ON	Normal system operation	
Operating			OFF	In initialization or unpowered	
status mulcator			Flashing	5 Hz: Pre-OP status 2 Hz: Safe-OP status	
Manning	ERR	Red	ON	Special system operation occurred	
indicator			OFF	The system is running normally or is not powered up	
	IN	Green	ON	Network connection established	
			OFF	Absent or abnormal network connection	
		Yellow	Flashing	Connection established with data interaction	
Network port			OFF	No data interaction or abnormal status	
status indicator	OUT	Green	ON	Network connection established	
			OFF	Absent or abnormal network connection	
		Yellow	Flashing	Connection established with data interaction	
			OFF	No data interaction or abnormal status	
Input channel status indicator	0 ~ F	Green	ON	Presence of signal input in module channel	
			OFF	Absence of signal input in module channel or abnormal	
				signal input	
Output channel status indicator	0 ~ F	Green	ON	Presence of signal output in module channel	
			OFF	Absence of signal output in module channel or abnormal	
				signal output	

5 Installation and Disassembly

Installation\disassembly precautions

- Ensure that the cabinet is well ventilated (e.g., equipped with a fan).
- Do not install this equipment near or above any equipment that may cause overheating.
- Make sure to install modules vertically and maintain adequate clearance between the modules and nearby devices.
- Installation/disassembly operation may only be carried out after the power supply is cut off.

Installation direction

In order to maintain normal heat dissipation of the modules, make sure to install them vertically to ensure smooth airflow inside them.



Use

Minimum clearance

The protection degree of the modules is IP20, and they need to be installed inside boxes or cabinets. During installation, please follow the minimum distances (unit: mm) shown in the following figures between modules and those between modules and heating devices, other devices, or wiring slots.



5.1 Dimensions

Dimension specification (in mm)



Install:

- 1. Up and down alignment;
- 2. DIN 35 mm Guide rail, buckle type installation.

5.2 Installation and disassembly

Installation





2

Step

Push the buckle at the bottom of the module outward, push the buckle to Figure ① ②, and hear the "click" sound.

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The upper edge of the module buckle is aligned with the upper edge of the guide rail and put the module into the guide rail as shown in Figure ③ and 4.

3



The module placement is shown in Figure (5).



Push the buckle to the direction of the guide rail, hear the sound, and complete the module installation, as shown in Figure ⁽⁶⁾.

Disassembly



Step

Insert the word flat head into the buckle and push in the direction of the module (hear the sound) as shown in Figure ⑦. Disassemble the module according to the opposite operation of the installation module.

1

6 Wiring

6.1 Wiring terminal

Wiring terminal			
Signal wire terminal	Number of poles	2×20 P	
	Line diameter	22~17 AWG 0.3~1.0 mm ²	
Power supply	Number of poles	3	
terminal	Wire gauge	22~16 AWG 0.3~1.5 mm ²	
Bus interface	2×RJ45	Ethernet/Ether CAT CAT5 cable	

6.2 Wiring instructions and requirements

Power supply wiring precautions

- The module system side power supply and the field side power supply are configured separately. Do not mix them.
- The PE shall be reliably grounded.

Requirements for the wiring tools

The terminal adopts the screw-free design, and the

installation and disassembly of the cables can be used

One-type screwdriver operation (specification: 3mm).

-0



terminal, reference specification is shown in the following table), and lower the pressure button to insert

Specification table of pipe-type insulated end head				
Specification	Model	Cable section area mm ²		
	E0310	0.3		
L	E0510	0.5		
	E7510	0.75		
	E1010	1.0		
Length of the tube-type insulated terminal L is 10 mm	E1510	1.5		

the wire at the same time.

The module power supply is DC24V, and twisted pair is recommended for the power cord. The power

supply wiring is shown in the following figure.



Bus wiring

Standard RJ 45 network interface and standard crystal connector, pin allocation as shown in the following figure.



The pin	signal	
number		
1	T D+	
2	T D-	
3	R D+	
4	one	
5	one	
6	R D-	
7	one	
8	one	

matters need attention

• Category 5 or higher-level double-shielded (braided wire + aluminum foil) STP cable is recommended as communication cable.

• The length of cables between devices should not exceed 100 m.

The load power supply uses DC 24V power supply. For the load power supply and signal line, refer to the wiring diagram of the corresponding I / O module and the wiring method to press the cable into the terminal (refer to 6.3 I / O module wiring diagram).

6.3 Wiring diagrams

6.3.1 EC4-3200A



s'Dot

EC4-3200B EtherCAT 32DI,PNP

Dla

0/8

1/9

2/A

3/B

4/C

5/D

6/E

7/F

24V

lb

0/8

1/9

2/A

3/B

4/C

5/D

6/E

7/F 24\ 0V

RUN

PWR

ERR

6.3.2 EC4-3200B



*24V internal conduction; 0V internal conduction

6.3.3 EC4-0032A



*24V is internally conductive; 0V is internally conductive; DOa and DOb are not connected to each other. *The load common terminal power supply must use the same power supply as the module

6.3.4 EC4-0032B



*24V is internally conductive; 0V is internally conductive; DOa and DOb are not connected to each other. *The load common terminal power supply must use the same power supply as the module

6.3.5 EC4-1616A



*24V is internally conductive; 0V is internally conductive; DI and DO are not connected to each other. *The load common terminal power supply must use the same power supply as the module

6.3.6 EC4-1616B



*24V is internally conductive; 0V is internally conductive; DI and DO are not connected to each other. *The load common terminal power supply must use the same power supply as the module

6.3.7 EC4-1600A



6.3.8 EC4-1600B



6.3.9 EC4-0016A



6.3.10 EC4-0016B



6.3.11 EC4-0808A



6.3.12 EC4-0808B



6.3.13 EC4-2408A



*24V is internally conductive; 0V is internally conductive; DIa,DIb and DO are not connected to each other. *The load common terminal power supply must use the same power supply as the module
DI

1/9

2/A

3/B

4/0

5/D

6/E

7/F

24

0V

10

1/1

4/4

6.3.14 EC4-2408B



*24V is internally conductive; 0V is internally conductive; DIa,DIb and DO are not connected to each other. *The load common terminal power supply must use the same power supply as the module



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*24V is internally conductive; 0V is internally conductive; DI,DOa and DOb are not connected to each other. *The load common terminal power supply must use the same power supply as the module



*24V is internally conductive; 0V is internally conductive; DI,DOa and DOb are not connected to each other. *The load common terminal power supply must use the same power supply as the module

6.3.17 EC4-0012J



8/A

9/B C3 +/-

6.3.18 EC4-1612J



(11) CD 1 +/-

*DI part COM is internally conductive, NPN/PNP compatible *The DO part COM0-COM2 can be connected to the positive or negative pole, and they are connected internally respectively. Only support DC48V. *The load common terminal power supply must use the same power supply as the module

6.3.19 EC4-A80V



6.3.20 EC4-A40V



6.3.21 EC4-A08V



6.3.22 EC4-A04V



6.3.23 EC4-A80I



6.3.24 EC4-A40I



6.3.25 EC4-A08I



6.3.26 EC4-A04I



6.3.27 XX 4-C 10_4



*A column of ports with the same identification number from C0 to C3 are internally connected. *No communication with each other

7 Operation

7.1 Parameters and functional configuration

This manual uses the Twin CAT3 software platform as an example to introduce the module parameters, functions, and configuration methods.

7.1.1 Digital output clearing/holding function

The clearing/holding function is for modules with output that can be configured for module output actions in an abnormal bus state.

Empty output: the module output channel will automatically empty the output when the communication is disconnected

Maintain output: The module output channel keeps the output when the communication is disconnected

In the case of abnormal bus, the temporary default is the empty state.

- collocation
 - A. In the configuration interface, click "New" in "Startup" to enter the "Edit CAN open Startup Entry" interface, as shown in the figure below.

00000	0 · 0	<u> </u>		Conoral	EthorCAT	Process Data	Startup	CoE - Opling	Opline
earch Solutio	n Expl	lorer (Ctrl+;)	<u>- م</u>	Jeneral	LUIEICAI	Process Data	oundp	COL - Online	Onime
Solution ** TwinC4 TwinC4 Sys MO O	TwinC AT Prec TTEM TTION ETY + Device C Device Device C Device Device Device Device C Device C Device C Device C Device Device Device Device Device Device	AT Project47' (ject47 iss vice 2 (EtherC/ Image Image-Info SyncUnits Inputs Outputs Outputs InfoData Box 1 (EC4-A4 InfoData Box 2 (EC4-00 ings	1 pro (T) (0V)	Transi	ti Proto	col Index	Data		Comment
				Mov	e Up	Move Down			New De

General EtherCAT Process Data Startup CoE - Online Online

	it CANopen S	Startup Entry				
	「ransition I -> P P -> S _ [S -> 0 _ [_ S → P _ O → S	Index (hex): Sub-Index (dec):	0 0	e Access	OK Cance
Da Va	ata (hexbin): Ilidate Mask:					HexEdi
Co	imment:					Edit Ent
	ndex	Name		Flags	Value	
E	8000:0	BusFault_Outp	put	RW	>1<	
	0000.01	Dusi duit_cica	in toid	1177	cieai (0)	
Move						
10401						

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nsiti	Protocol	Index	Data		Comm	ent		
E	Edit CANopen	Startup Entry	/					×
	Transition		TÍ					OK
	∐I->P ⊡P \ c		Index (he:	k):	8000			Cancel
	© F → 3	0.>S	Sub-Index	((dec j: te	Complete	Access		
	Data (hexbin):	00 00 00 00)					Hex Edit
	Validate Mask: Comment:	BusFault_C	lear/Hold					Edit Entry
	Index	Name			Flags	Value		
	E 8000:0 8000:01	BusFault_Ou BusFault_Cle	tput ar/Hold		RW BW	> 1 < Clear (0)		
		_	Set Value	Dialog				×
			Dec:	0				ОК
			Hex	0x00	000000		С	ancel
ve			Enum:	Clea	r		Y	
			Back	Hold			Ha	. F 40
			Binatur	00.0	0.00.00		He.	4
ate			Dialog.	000	0.000			

Charles o r o r

Note: After the configuration is complete, download the configuration and the program again.

7.1.2 Digital input filtering time

Digital input filtering prevents unexpected rapid changes in the input pointsignal that may be caused by switch contact jumps or electrical noise. The digital input filter is currently fixed and configured as 3ms, which can filter out the clutter within 3ms, and the channel cannot be configured separately.

The input filter time of 3 ms indicates that a single signal changes from "0" to "1" or from "1" to "0" for 3 ms can be detected, while a single high or low pulses shorter than 3 ms will not be detected.

7.1.3 Analog range configuration function

Analog range setting function for the analog input and output module, can set the analog range range.(For details, see"<u>3.3 analog quantity parameters</u>")

- collocation
 - A. In the configuration interface, click "New" in the "Startup" to enter the "E dit CAN open Startup E ntry" interface.

B. Double-click 8000:05 C hannel 0 R ange S etting to select the range range setting.

Transiti Prot	ocol Index	Data		Comment		
Edit CANopen '	Startup Entry				3	×
Transition		ndex (hex):	8000		OK	
⊠ P -> S □ S -> O	_ S -> F Set Value _ O -> { Dec:	Dialog 0		ОК	X	
Data (hexbin): Validate Mask:	00 00 Hex: Enum:	0x0000	/(-32768~32767)	Canc	el Hex Edit	
Comment:	Chan Bool:	- <u>10~+10\</u> 0~+10\(0 0	(-32768~32767) ~32767) 1	Hex Ed	Edit Entry	
Index = 8000:0 - 8000:01	Name Binary: Device Chann Bit Size:	00 00	8 16 0	32 () 64 () ?	2	
8000:02 8000:03	Channel2 Filter		RW	0x000A (10)		
8000:04	Channel3 Filter Channel0 Range Se	tting	RW RW	0x000A (10) -10~+10V(-3276	68~32767) (0)	-
8000:06	Channel1 Range Se Channel2 Range Se Channel2 Range Se	tting tting	RW RW	-10~+10V(-327) -10~+10V(-327) -10~+10V(-327)	58~32767) (0) 58~32767) (0) 58~32767) (0)	
0000.00	Charineis narige se	ung	ΠW	10 +104(-527)	50 32707)(U)	d to

Note: After the configuration is complete, download the configuration and the program again.

Use

7.1.4 Analog filtering parameter configuration function

• Analog quantity input filter function

Analog input filtering function, the A / D transformed data can be averaged internally, used to reduce the fluctuation of the input pointsignal due to noise.

The analog quantity input is processed on a moving average with the specified A / D conversion times.

• Filter function configuration

Each channel can be configured separately, configuration range: 1~1024; default 10; The sampling rate of 8-channel module is: 1.25 KHZ / 8 channel (800us / 8 channel); The sampling rate of 4-channel module is: 2.5 KHZ / 4 channel (400us / 4 channel).

• collocation

- A. In the configuration interface, click "New" in the "Startup" to enter the "E dit CAN open Startup E ntry" interface.
- B. Double-click 8000:05 C hannel 0 F ilter to select range range settings.

Transiti	Protocol Inde	ex Dat	a		Comment			
1	Edit CANopen	Startup Entry					>	×
	Transition						OK	
	□I -> P		Index (he	ex):	8000			
	✓ P -> S	□ S -> P	Sub-Inde	ex (dec):	1	-	Lancel	
	□ S -> O	🗌 0 -> S	Valida	ate	Complete			
	Data (hexbin):	0A 00					Hex Edit	
	Validate Mack							
	Panado mase							
	Comment:	ChannelU Fil	ter				Edit Entry	
	Index	Name			Flags	Value		
	Ē- 8000:0	Device Config	uration Info		RW	> 8 <		
	8000:01	Channel0 Filte	r		RW	0x000A (10)		
	8000:02	Channel1 Filte	r		RW	0x000A (10)		
	8000:03	Channel2 Filte	ſ		RW	0x000A (10)		1
	8000:04	Channel3 Filte	ſ		HW	UXUUUA (1U)		
Move Up	8000:05	Channell Ra	Set Value D	lialog			×	
	8000.07	Channel ² Ba						
	8000:08	Channel3 Ra	Dec:	10			OK	
lame			Hex:	0x0004	1		Cancel	
Analog Inpu			Ele ele		<u></u>			
Analog Inpu			Filoat:					
Analog inpl								
Analog Inpl	8		Bool:	0	1	Н	ex Edit	15
Analog Inpl	***		D:	04.00				
WcState	0		Binary:	UA UU				
InputToggle	1		Bit Size:	01 (8 🖲 16	○ 32 ○ 64 ○	?	
State	8					mput v		

Note: After the configuration is complete, download the configuration and the program again.

7.2 Module configuration description

7.2.1 Application in TwinCAT3 software environment

1、 dead work

- hardware environment
 - > Module model E C4-A04V
 - > One computer, pre-installed with Twin CAT3 software
 - > Ether CAT Special shielding cable
 - Switch power supply
 - > Module installation of guide rail and guide rail fixings
 - Device configuration file
 Profile acquisition address:<u>https://www.solidotech.com/documents/configfile</u>
- Hardware configuration and wiring

Please follow the "<u>5 Install and remove it</u>" "<u>6 The wiring</u>" Requires the operation

2. Preset profile

Place the ESI profile (Solidot EC4_V1.0.2.xml) under the TwinCAT installation directory C: TwinCAT3.1 Config Io EtherCAT, as shown in the following figure.

« 3.1	> Config > Io > EtherCAT	~ Ō	搜索"Ether(CAT"	Q
^	名称 ^	修改E	期	类型	^
	Beckhoff ER7xxx.xml	2016/	/11/22 12:14	XML 文档	
	Beckhoff ER8xxx.xml	2016/	/3/14 11:52	XML 文档	
	Beckhoff EtherCAT EvaBoard.xml	2015/	/2/4 12:57	XML 文档	
	Beckhoff EtherCAT Terminals.xml	2015/	/2/4 12:57	XML 文档	
	Beckhoff FB1XXX.xml	2017/	/5/24 12:26	XML 文档	
	Beckhoff FCxxxx.xml	2015/	2/4 12:57	XML 文档	
	Beckhoff ILxxxx-B110.xml	2015/	/2/4 12:57	XML 文档	
	Solidot EC4_V1.0.2.xml	2018/	/12/17 9:46	XML 文档	~
~	<				>

3、 scanner

a. Run the T win CAT3 software

Click the TwinCAT icon in the lower right corner of the desktop, select "TwinCAT XAE (VS xxxx)", and open the TwinCAT software, as shown in the figure below.



b. Create the project

Select "New TwinCAT Project", "Name" and "Solution name" will correspond to the project name and solution name respectively, "Location" will correspond to the project path, these three items can choose the default, and then click "OK", the project has been successfully created, as shown in the following figure.



c. scanner

After creating the project, right-click the Scan option under I / O-> Devices to scan the station device, as shown in the figure below.



Check the "local connection" network card, as shown in the figure below. 1 new I/O devices found



Scan for boxes Select Yes, and Activate for Run select Yes, as shown in the figure below.

×

Microsoft Visual Studio		Х	Micros	oft Vis	ual Stu	idio		×
Scan for boxes			?	Act	ivate Fr	ee Rui	n	
是(Y)	否(N)]		是(Y)		否(N)	

After scanning the device, you can see the TwinCAT in the "OP" state at the "Online", and the slave device RUN light can be observed long on.

Use

	General Et	herCAT F	Process Data	Startup	CoE - Online	Online	
Search Solution Explorer (Ctrl+;)	State Ma Init Pre-Op Op	chine	Bootstrap Safe-Op Clear Erro	r	Current State Requested St	: iate:	OP OP
 I/O I/O Image Image-Info SyncUnits 	DLL Statu Port A: Port B: Port C:	Carr No No	rier / Open Carrier / Clos Carrier / Clos	ed			
 Inputs Outputs InfoData Source Box 1 (EC4-A04V1-D1) 	Port D:	No ss over Et	Carrier / Clos herCAT	ed			
Mappings	Down	oad	Upload				

4. Data interaction

Analog output operation: take channel 0 output as an example, if the station equipment analog output channel 0 output 10V voltage, can in TwinCAT Outputs corresponding "Online", "Chanenl0" left click "Write", in the corresponding dialog, can see the corresponding channel light on, with the



7.2.2 Application in CODESYS V3.5 software environment

1、 dead work

- hardware environment
 - > Module model E C4-A 80V
 - > One computer, pre-installed with CODESYS V3.5 software
 - > Ether CAT Special shielding cable
 - Switch power supply
 - > Module installation of guide rail and guide rail fixings
- Device configuration file
 Profile acquisition address:<u>https://www.solidotech.com/documents/configfile</u>

 Hardware configuration and wiring
- Please follow the "<u>5 Installation and wiring</u>"And "<u>6 The wiring</u>" Requires the operation

2. Install the profile

- a. Log in to the CODESYS.
- b. Select the Tools-> Device Repository item.
- c. Click Install to select the E th erCAT XML device description file (Solidot EC4_V1.1.7.xml).
 Successfully installation with "Device xxxx installed to device repository" as shown in the following figure.

ocation:	System Repository	~	Edit Locations
	(C:\ProgramData\CODESYS\Devices)		
nstalled d	e <u>v</u> ice descriptions:		
Name		^	<u>I</u> nstall
6	Broth Slave		<u>U</u> ninstall
	🖃 🛅 Nanjing Solidot Electronic Technology Co., Ltd - EC4 Series Terminal		
			Install DT <u>M</u>
	EC4-0016A		
	FC4-00324		
<		>	
⊟- () (:\Users\dell\Desktop\SD\EC4\SolidotEC4_V1.1.7.xml	^	
(Device "EC4-0808A" installed to device repository.		
	Device "EC4-0808B" installed to device repository.		<u>D</u> etails
	Device "EC4-1616A" installed to device repository.		
	Device "EC4-1616B" installed to device repository.	~	
`			

3. Add the EtherCAT Master

a. Select "Ether C AT-> Master-> EtherCAT Master" and add it, as shown in the figure below

				Die Edit View Grosect Build Online	Debug Tools Window Help x 1446 25 100 100 1 100 100 100 100 100 100 100
evices Lintifed2 Device (CODESYS (Device (CODESYS (PLC Logic PLC Logic PLC P PLC P PLC P C M Device (CODESYS (Application PLC P C M PLC P C M PLC P C M PLC P C M PLC P C M PLC P C M C M C M C M C M C M C M C M		P × Image: Copy Paste Delete Properties Add Object Add Folder	1 •	A second s	A Ad Davie Tame Resolutions and the set of
	ſ ¥	Add Device Update Device Edit Object Edit Object With Edit IO mapping Import mappings from CSV Export mappings to CSV Online Config Mode Reset origin device [Device] Simulation Device Configuration		3	Beneficial and the set of th

4. Configure the EtherCAT Master

a. Click Browse to select Co d e s ys Ethernet Adapter Ethernet 2, as shown below.

	EtherCAI_Master X	Device		
ce (CODESYS Control Win V	General	☑ Autoconfig Master/Slaves	Ether CAT.	
C Application C Application P LC_PRG (PRG) S Task Configuration MainTask P LC_PRG C AT_Master (EtherCAT)	Sync Unit Assignment EtherCAT I/O Mapping Status Information	EtherCAT NIC Setting Destination Address (MAC) FFFFFFFFFFFFF Source Address (MAC) Source Address (MAC) Source Address (MAC) Solect Network by Mac Select Network by MAC Select Network by Mac Distributed Clock Cycle Time 4000 Select Network by Ls	ot Enable Redundancy	
	Select Network Adapter	Sync Offset 20 5 %		
	MAC address Name	Description Realtek PCTs GBE Family Controller #2		
	- 509A4C3B4514 以太网 2:1 - 1252161768D9 本地连接*	Realtek FCIe GBE Family Controller #2 1 Microsoft Wi-Fi Direct Virtual Adapter 2 Microsoft Wi-Fi Direct Virtual Adapter		
	- B052161768B9 WLAN 2	Qualcom QCA9565 802.11b/g/n Wireless Adapter		

5、scanner

a. Before the first scan you must go to PLC, select and install the device as shown in the figure below.



6. Test the IO module

a. Exit the PLC and login to the "L ogout", as shown in the figure below.

티 🖻 📕 (종) 🗠 🖂 🦉	ALCH O	199 99 1 I I I		♀ Ξ					
Q	Logout Ctrl+F8								
levices	Create boot application	EtherCAT Master	EC4 A80V1 X						
Untitled5	Download	- Church							
Bevice [connected] (CC	Device [connected] (CC Online Change								
PLC Logic	Source download to connected device	Var	iable	Mapping	Channel	Addres			
= 💮 Application [sto	Multiple Download	*	*		Analog Input[0]	%IW(
Library Manage		*	9		Analog Input[1]	%IW			
PLC_PRG (PRG	Reset warm		10		Analog Input[2]	%IW:			
Task Configura	Reset cold	P	10		Analog Input[3]	%IW:			
🗏 🍪 MainTask	Reset origin	· · · ·	*>		Analog Input[4]	%IW-			
- Ether(Simulation	H	*		Analog Input[5]	%IW!			
BICP	Security		×ø.		Analog Input[6]	%IW			
EtherCAT Master (Operating Mode		*>		Analog Input[7]	%IW			
TA FE EC4 A80V1 (EC4-	A80V1)								
	A80V1)								

b. Select "E t herCAT I / O Mapping" in the module E C4-A80V1 menu folder, as shown in the figure below.

ntitled5										
Device (CODESYS Control Win V:	General	Channels		el 1		-	11.5	8 1 J		
E PLC Logic	Process Data	Variable	Mapping	Channel	Address	Type	Unit	Description		
B O Application		-		Analog Input[0]	961000	UINT		Analog Input(U)		
Library Manager	Startup Parameters	+ *		Analog Input[2]	96110/2	LIINT		Analog Input[1]		
PLC_PRG (PRG)	EtherCAT I/O Managing	a. %a		Analog Input[2]	96110/3	LIINT		Analog Input[2]		
🖹 🧱 Task Configuration	collecter to Mapping			Analog Input[4]	9611/14	LIINT		Analog Input[4]		
🖹 🍪 MainTask	Status			Analog Input[5]	9CTIN/5	LIINT		Analog Input[5]		
EtherCAT_N		- Ma		Analog Input[6]	9611/15	LIINT		Analog Input[6]		
PLC_PRG	Information			Analog Input[7]	961W7	LIINT		Analog Input[7]		
EtherCAT_Master (EtherCAT				Analog Inport/1	70LVV 7	OTHE		Analog hipor(7)		
					Deceb	lapping				
					Reset N	lapping	Always u	ndate variables: Use parent dev	vice setting	

c. In the lower right corner of the page, select "E nabled 1" mode, as shown in the figure below.

ed5	Conservation	Channels								
evice (CODESYS Control Win V	General	Variable	Mapping	Channel	Address	Type	Unit	Description		
PLC Logic	Process Data	H 46		Analog Input[0]	96100	LIINT		Analog Input[0]		
Application	-	B-10		Analog Input[1]	%IW1	LUINT		Analog Input[1]		
Library Manager	Startup Parameters	B 40		Analog Input[2]	%IW2	UINT		Analog Input[2]		
PLC_PRG (PRG)	EtherCAT I/O Mapping	6.49		Analog Input[3]	%IW3	UINT		Analog Input[3]		
Task Configuration		·····		Analog Input[4]	%IW4	UINT		Analog Input[4]		
MainTask	Status	(e. *p		Analog Input[5]	%IW5	UINT		Analog Input[5]		
EtherCAT_		(i) · · · · · · · · · · · · · · · · · · ·		Analog Input[6]	%IW6	UINT		Analog Input[6]		
PLC_PRG	Information	1 - Ng		Analog Input[7]	%IW7	UINT		Analog Input[7]		
g conercal_master (EtherCA)										
					Reset	1apping	Always up	odate variables:	Use parent device setting	
		LEC Objects			Reset M	1apping	Always ut	ndate variables:	Use parent device setting	
		IEC Objects	Mansian	Ture	Reset M	1apping	Always up	odate variables :	Lise parent device setting Lise parent device setting	24 If foot use vice task)

d. Log back in, and run the software, and test the module, as shown in the figure below.

levices	- + X Device 💮 Ether	CAT_Master 🛛 🗑 EC4_A80	V1 X								
Untitled5	General	Channels									
= 🧐 🔟 Device [connected] (CODESYS	Control Win V3	Variable	Mapping	Channel	Address	Туре		Current Value	Prepared Value	Unit	Descri
E III PLC Logic	Process Data	B- 40		Analog Input[0]	%IW0	UINT	0				Analog I
= () Application [run]	and the second s	a. No		Analog Input[1]	%IW1	UINT	0				Analog I
Library Manager	Startup Parameters	8.49		Analog Input[2]	%IW2	UINT	0			1	Analog I
PLC_PRG (PRG)	EtherCAT I/O Mapping	·····		Analog Input[3]	%IW3	UINT	0				Analog I
Task Configuration		· · · · ·		Analog Input[4]	%IW4	UINT	0				Analog I
= 💝 MainTask	Status	8.49		Analog Input[5]	%IW5	UINT	0				Analog I
di EtherCAT_M	ster.EtherCAT	B. No		Analog Input[6]	%IW6	UINT	0				Analog I
de PLC_PRG	Information	B-10		Analog Input[7]	%IW7	UINT	0				Analog I
		¢									
		< Analog Irput[1]		Reset M	spping Alwa	ys update 1	variabl	es: Enabled 1 (use	: bus cycle task if not	used in a	ny task)
		< Avaiog input[1] JEC Objects		Reset M	apping Alwa	ys update 1	variabl	es: Enabled 1 (use	bus cycle task if not.	used in a	ny task)
		< Analog Input[1] JEC Objects Variable	Mapping	Rest M. Type	apping Alwa	ys update 1	variabl	es: Enabled 1 (use	bus cycle task if not	used in a	ny task)

1、 dead work

- hardware environment
 - > Module model EC 4-1616B
 - > One computer, pre-installed with Sysmac Studio software
 - The Omron PLC has one set Take the model N X1P 2-9024 DT as an example
 - > EtherCAT Special shielding cable
 - > Switch power supply
 - Device Profile
 Profile acquisition address:<u>https://www.solidotech.com/documents/configfile</u>
- Hardware configuration and wiring Please follow the"<u>5 Installation and wiring</u>"And"<u>6 The wiring</u>"Requires the operation
- Computer IP requirements

Set the IP address of the computer and the IP address of the PLC to ensure that it is in the same network segment.

2、 new construction

a. Open the Sysmac Studio software and click the New Project button.

📓 Sysmac Studio (64bit)					- 0	×
	_					
Offline						
New Project	Project Pi	roperties				
🖕 Open Project	Project name	EC4				
á [□] Import	Autnor	29/19		_		
ි _{ම්} Export	Comment					
Online						
4 <u>C</u> onnect to Device	Туре			-		
Version Control						
N. Version Control Explorer	Select	Device				
License	Category	Controller				
E License	Device	NX1P2	▼ - 9024DT	-		
-	Version			-		
Robot System				Create		
Open in Emulation Mode				Grate		

- Project name: custom-defined.
- Select equipment: "Device" selects the corresponding PLC model, and "Version" recommends selecting V 1.40 and above.
- b. When the project property input is complete, click the Create button.

3. Install the XML file

a. In the left navigation tree, expand Configuration and Settings, double-click EtherCAT, right-click Home Device, and select Display ESI Library, as shown in the figure below.

File Edit View Insert Project Controller Simulation Tools Window	v Help		
Х画画面もく園園中人家の同能業	🛛 🔁 🛦 🛦 🖉 🎙 🖬 O 🕾 🖓	H Q Q R	
Multiview Explorer • 4 EtherCAT ×		•	Toolbox 🗸 🖡
reve Controller 0 Controller 0	Cut Copy Paste Dielete Undo	Value Master Master Master 0 Cycle 1 2000 us	All groups All groups Ferminal Coupler Servo Drives Frequency Inverter Digital IO
A Louronder Setup e Motion Control Setup e' Cam Data Settings Forent Settings Task Settings Mask Settings	Redo Expand All Collapse All Calculate Transmission Delay Time of the Master	Cycle 2 us Exist 1000 m ting Fail-soft operation ▼ artup 30 s time 2 times	Input Keyword Show all versions N-ECC201 Rev1.2 Show all versions The second state and second N-ECC202 Rev1.2
 Programming Programming Programming Programs K Programs K Programs K Sectord 	Import Slave Settings and Insert New Slave Export Slave Settings Write Slave Node Address Compare and Merge with Actual Network Configuration Get Slave Serial Numbers	ster.	NX-ECC203 EtherCAT coup NX-ECC203 Rev1.7 NX-ECC203 EtherCAT coup NX-ECC203 EtherCAT coup R88D-1SAN02H-ECT Rev: R88D-1SAN02H-ECT Rev: R88D-1SAN04H-ECT 200V/ R88D-1SAN04H-ECT 200V/
LX Functions Build LX Function Blocks Summerces Avenue/Largence ► II Data I Description I ► II Tasks	Clear All Settings Display Diagnesis/Statistics Information Display Production Information Display Packet Monitor Display ESI University	• V X	R88D-1SAN08H-ECT Rev: R88D-1SAN08H-ECT 200V R88D-1SAN10H-ECT 200V R88D-1SAN10H-ECT 400V R88D-1SAN10H-ECT 200V R88D-1SAN10H-ECT 200V
1 Filter ? Output Build	Export Configuration Information Output to ENS File Export All Couplers' (/O Allocations Assign Drives to Axes Safety Related PDOs Batch Setting		Model name : NX-El × Product name : NX- Revision : 1.2 Vendor : OMRON C Comment : EtherCA URL - Onen on a brc

b. In the ESI Library window, click the Install (File) button, select the XML file path, and click the button Yes to complete the installation.

🔝 ESI Libra	ary –	-	\times
 ESI Libra All ESI On 	ary – files firon 3G3AX-MX2-ECT faron 3G3AX-RX2-ECT faron 3G3AX-RX2-ECT faron 3G3AX-RX2-ECT faron G3AX-RX2-ECT faron C11W-ECTxx faron E3NW-ECT faron E3NW-ECT faron FL/Txxxxxxx faron FL/Txxxxxxx faron FQ-MS12x-x-ECT faron GX-I2 faron GX-I2 faron GX-Digital IO-T faron GX-ICO-Link faron GX-ICO-Link faron GX-JC0-H faron R88D-1SAN02H-ECT faron R88D-1SAN04H-ECT faron R88D-1SAN10F-ECT faron R88D-1SAN10F-ECT faron R88D-1SAN10F-ECT faron R88D-1SAN10F-ECT faron R88D-1SAN10F-ECT faron R88D-1SAN10F-ECT faron R88D-1SAN20H-ECT faron R88D-	talled.	
■ On Install (Fil	hron R88D-1SN01H-ECT le) Install (Folder) Uninstall		Close

4. Add from the device

a. Under the Toolbox bar on the right, click Expand All Suppliers, and select Nanjing Solidot Electronic Technology Co., Ltd.", As shown in the figure below.



b. Double-click the module to add the slave device, as shown below.

Eile Edit View Insert Proje	et <u>C</u> ontroller <u>S</u> imulation <u>T</u> ools <u>W</u> indow <u>H</u> elp	
	■ ■ 冉 ㅅ ¥ & & # # 0 ★ ▲ ★ & # ↓ # 0 9 2 □ ● ● ♥	
Multiview Explorer 🚽 📮	EtherCAT x	Toolbox 🗸 🖣
new_Controller_0	Node AddressINetwork configuration	Groups
Configurations and Setup	The second secon	All groups EC4 Series Terminal
⊢ □ Node1 : EC4-1616B(W)	EC4-16106(W) Model name EC4-16168(W) Product name EC4-16168(W)	
GPU/Expansion Racks I/O Map	Revision 0x00000001 PDO Communications Cycle PDO Communications Cy	
► R Controller Setup	Node Address 1 Enable/Disable Settings Enabled V	Input Keyword
	Serial Number 0x/0000000 000000 0x/00000 0x/000000 0x/00000 0x/000000 0x/000000 0x/00000 0x/00000 0x/00000 0x/00000 0x/00000 0x/00000000	Show all versions EC4-0824B(W) Rev:0x00000
Event Settings Task Settings	0x7000x32 Outputs/Chan 0x7000x30 Outputs/Chan 0x7000x40 Outputs/Chan	EC4-08248(W) EC4-1600A Rev:0x00000001
☑ Data Trace Settings	Device name	EC4-1600A EC4-1600B Rev:0x00000001
Programming POUs	Jet a name for the starts.	EC4-1612J Rev:0x00000001
▼ ≅ Programs		EC4-1616A Rev:0x00000001
⊾⊕ Section0	Build • • • • ×	EC4-1616B(W) Rev:0x00000
L≋ Functions L≋ Function Blocks	I Description I Program I Location I	EC4-2408A Rev:0x00000001 EC4-2408A
► I Data		EC4-2408B(W) Rev:0x00000 EC4-2408B(W)
		Model name : EC4-16
		Revision : 0x00000001
i Filter	Output Build	Comment :

5. Communication Settings

a. Click the menu bar "Controller-> Communication Setup" to display the communication settings window, as shown in the figure below.

File Edit View Insert Project	Controller Simulation Tools Window Help			
	Communications Setup	A X 63 63 6	40 000	0 0 %
	Change Device	A 40 A 10		~ ~ ~
Multiview Explorer 🚽 📮	Online Ctrl+W			-
	Offline Ctrl+Shift+W	1		
new_Controller_0	Synchronize Ctrl+M	-		
Configurations and Setup	Transfer		Item name	Value
EtherCAT		001	Model name	EC4-1616B(W)
∟ ー Node1 : EC4-1616B(W) (Mode	_	Product name	EC4-1616B(W)
CPU/Expansion Racks	Monitor		Revision PDO Communications Cycle	0x00000001 PDO Communications Cv
■ I/O Map	Stop Monitoring		Node Address	1
► R Controller Setup	Set/Reset		Enable/Disable Settings	Enabled 🔹
■ ►	Forced Refreshing		Serial Number	0x00000000
er Cam Data Settings	MC Test Run			0x7000:02 Outputs/Chan
Event Settings Tack Settings	MC Monitor Table			0x7000:03 Outputs/Chan
Task Settings Data Trace Settings	CNC Coordinate System Monitor Table		C Device name	UV/UUD/U4 UUITDUITS/UDAD
Programming	cive coordinate system monitor rable	-	Set a name for the slave.	
▼ # POUs	SD Memory Card			
▼ ≋ Programs	Controller Clock			
▼ Program0	Release Access Right			
L≝ Section0 E	Update CPU Unit Name			- å ×
🔳 L 🗷 Functions 🚦	Security •			
LIE Function Blocks	Clear All Memory	I Location		1
► 🖩 Data	Reset Controller			
► 🖿 Tasks		_		
Filter 🕅 0	utput Build			

b. In the communication setting window, the connection type selects "Ethernet connection via a hub", selects the method "Ethernet connection via a hub" used when connecting to the controller, the remote IP address fills in the IP address of the corresponding PLC, click "Ethernet Communications Test", if the communication is normal, then "Test Success" is displayed in the box below. Make sure the communication is OK and click the OK button, as shown in the figure below.

Setup Communications Setup					\times
▼ Connection type					
Select a method to connect with the Controller to use every time you go online. Direct connection via Ethernet Remote connection via JSB Select one method from these options at every online connection. Direct connection via Ethernet Remote connection via JSB Select one with a bub		N.		-	
▼ Remote IP Address			-		
Specify the remote IP address.					
USB Communications Test Etherne Test OK	Communications Test				
▼ Options		_	-	_	
Confirm the serial ID when going online. Check forced refreshing when going offline.					
▼ Response Monitor Time					
Set the Response Monitor Time in the communications with the Controller.(1-3600sec Please set a sufficiently large value when connecting to the Controller via multiple net 2 (s)	vorks, such as VPN connection				
OK Can	el				

6. Set the node address

a. Click the menu bar "Controller-> Online" to turn the controller to online status as shown in the figure below.



b. Right-click the main device and click to select Write to the slave device node address, as shown in the figure below.



c. In the window that sets the node address, click the numerical value under the setting value, enter the node address, and click the "Write" button to change the slave device node, address, as shown in the figure below.

📓 Slave Node Address Writing	—		\times
Present valuelSet valuelActual network configuration			
Master			
0 1 EC4-1616B(W) Rev:0x00000001			
Update With Latest Actual	Network (Configura	ition
wode addresses are set for slaves. When any value other than 0 is set to a slave whose node address can be set from hardware, the setting has p addresses set here are applicable.	riority. In	other cas	es, the
	Writ	e Ca	ncel

d. After writing, the pop-up prompt appears again, as shown in the figure below, click "Write", and then restart the power supply from the device according to the prompt.



7. Downloads the configuration to the PLC

a. Click the menu bar "Controller-> Transfer(A) -> To Controller (T)" button to transfer the configuration to the controller, as shown in the figure below.

File Edit View Insert Project	Controller Simulation Tools Window Help		
x 🗐 🛱 🔠 ち c 🖻	Communications Setup	🔺 🔌 60 🍄 🖡 📬 🔿 🗣 😭 🗔	Q Q "U
	Change Device		
Multiview Explorer 🚽 🗸 🗸	Online Ctrl+W		*
new_Controller_0 🔻	Offline Ctrl+Shift+W		
Configurations and Setup	Synchronize Ctrl+M	Item name	Value
EtherCAT	Transfer •	To Controller Ctrl+T le	E001
∟-□ Node1 : EC4-1616B(W)	Mode •	From Controller Ctrl+Shift+T	EC4-1616B(W)
► CPU/Expansion Racks	Monitor	Revision	0x00000001
🛹 I/O Map	Stop Monitoring	PDO Communications Cycle Node Address	PDO Communications Cy 1
Controller Setup	Set/Reset	Enable/Disable Settings	Enabled
► Motion Control Setup	Forced Refreshing	Serial Number	0x0000000
e' Cam Data Settings	No. 7 - 12		0x7000:01 Outputs/Chan
Event Settings	MC Test Run		0x7000:03 Outputs/Chan
Task Settings	MC Monitor Table		0x7000:04 Outputs/Chan
Data Trace Settings	CNC Coordinate System Monitor Table		0x7000:06 Outputs/Chan
▼ Programming	SD Memory Card		0x7000:07 Outputs/Chan
V III POUs	Controller Clock		0x7000:09 Outputs/Chan
V ill Programs	Release Access Right		0x7000:0A Outputs/Chan
V ≅ Programo	Update CPU Unit Name		0x7000:08 Outputs/Chan
L≋ Functions	Security +	- Device name	
∟≋ Function Blocks	Clear All Memory	Set a name for the slave.	
▶ Data	Reset Controller		
► m Tasks			
В	uild		→ ‡ ×
<u>د</u>	0 Errors 0 Warnings		
	Description Description		

b. Popup the transmission confirmation window, click the "Execute" button, and then the popup will click "Yes / OK", as shown in the following figure. After downloading, you need to power on again.


8. Module parameter configuration

a. Switch the configuration to the offline state, in the EtherCAT main page, select EC4 module and click "Edit Setting Parameters", as shown in the figure below.

EC4 - new_Controller_0 - Sysma	c Studio (64bit)			
<u>Eile Edit View Insert Proje</u>	ct <u>C</u> ontroller <u>S</u> imulation <u>T</u> ools <u>W</u>	(indow <u>H</u> elp		
	2 🔟 🗗 🔨 🖓 🗔 🖽 🎬	HA 🖳 🕅 🗛 🔉 63	🖉 🆒 🛍 O 🕾 🕼 🕽	
Multiview Explorer 🗸 🗸	EtherCAT 🗙			.
Multiview Explorer	Node AddressINetwork configuration Master Master 1 Ether Master 1 Ether Master Master Master Master Master Master	I -1616B(W) Rev:0x00000001	Item name	Value Dx600004 Inputs/Channel In4 Dx600005 Inputs/Channel In5 Dx600006 Inputs/Channel In6 Dx600007 Inputs/Channel In7 Dx600008 Inputs/Channel In9 Dx600008 Inputs/Channel In Dx600008 Inputs/Channel In Dx600006 Inputs/Channel In Dx6000710 Inputs/Channel In Edit PDO Map Settings
▼			Setting Parameters Backup Parameter Settings	Setting Edit Setting Parameters
∟≋ Functions ∟≋ Function Blocks ▶⊞ Data ▶≋ Tasks			Set a name for the slave.	
<	Build	l Program I Locatio	an I	• û ×

Note: If the PLC firmware version is too low, write and read the EC_CoESDOWrite and EC_CoESDORead instructions for the SDO address.

b. On the parameter setting page, the output point signal empty / hold function can be configured for "0" and after the configuration, click OK and click Apply. After all the parameters are configured, the program needs to be downloaded again to the PLC. The PLC and the module need to be powered on again.

📓 Edit Setting Parameters				\times
Item name	Value			
0x8000:01 BusFault_Output/BusFault_Clear/Hold	0: Ciear			
1				
ĸ				
L Contraction of the second				
		Retu	ırn to De	fault
ر Help				
Data type :				
Comment :				
This Setting Parameters are saved in the CPU Unit as a part of EtherCAT setting.		_	_	
Select Synchronize on the Toolbar to transfer.				
	ОК	Cano	el A	pply

9、 Test the IO module

After switching on again, the lower right corner can see the PLC as the operation mode.
 Double-click the "I/O Map" in the left navigation tree to monitor and force the input and output signals, as shown in the figure below.

EC4 - new_Controller_0 - Sysmac Studio	(64bit)			
Eile Edit View Insert Project Cor	itroller Simulation Iools Window Help			
X 🗐 🛱 🗰 ち さ 🖻 🗵) - 	🔺 🔌 63 🍻 🆡 🕯	• O % # # I	Q Q 12
Multiview Explorer 🗸 🗜 🛗 Eth	erCAT 🦽 I/O Map 🗙			
new Controller 0	psition Port	Description R/W	Data Type Value Var	iable Variable Corr
	EtherCAT Network Configuration			
 Configurations and Setup 	de1 🔻 EC4-1616B(W)			
■ ▼	Outputs_Channel Out1_7000_01	w	BOOL FALSE	
□ □ Node1 : EC4-1616B(W) (Outputs_Channel Out2_7000_02	w	BOOL FALSE	
► S CPU/Expansion Racks	Outputs_Channel Out3_7000_03	w	BOOL FALSE	
I/O Map	Outputs_Channel Out4_7000_04	w	BOOL FALSE	
► 2 Controller Setup	Outputs_Channel Out5_7000_05	w	BOOL FALSE	
A Motion Control Sotup	Outputs_Channel Out6_7000_06	w	BOOL FALSE	
Com Data Sattings	Outputs_Channel Out/_/000_0/	W	BOOL FALSE	
	Outputs_Channel Out8_/000_08	W	BOOL FALSE	
Event Settings	Outputs_Channel Out9_7000_09	W	BOOL FALSE	
Iask Settings	Outputs_Channel Out10_7000_0A	W	BOOL FALSE	
Data Trace Settings	Outputs_Channel Out 11_7000_08	W	BOOL FALSE	-
Programming	Outputs_Channel Out12_7000_0C	VV W		
■ V 🖞 POUs	Outputs_Channel Out14_7000_0D	W		
▼	Outputs_Channel Out14_7000_0E	w	ROOL FALSE	
■ ▼ 🖻 Program0	Outputs Channel Out15_7000_01	W	BOOL FALSE	
⊾ e Section0	Inputs Channel In1 6000 01	R	BOOL FALSE	
LIN Functions	Inputs Channel In2 6000 02	R	BOOL FALSE	
⊢⊯ Function Blocks	Inputs Channel In3 6000 03	R	BOOL FALSE	
▶ Data	Inputs Channel In4 6000 04	R	BOOL FALSE	
		P		
- Monit	ior type ata type 🕒 Binary 🌑 Hex 🌑 Signed decimal 🌑 Un	signed decimal		Bit order MSB-LSB LSB-MSB
Suid				- 4 ×
i Filter 🗹 Outpu	1 Build			

b. For the digital input channel 1, if the slave device input channel 1 has an effective voltage input, it can be observed in Input points_Channel In 1_6000_01 in the I / O map. If you want to output channel 5 and channel 6 output, you can write "1" on Out put points_ Channel Out 5_7000_05 and _ Out put points_ Channel Out 6_7000_06. After the operation, you can see the corresponding channel light is on, as shown in the figure

below.

📓 EC4 - new_Controller_0 - Sysmac S	Studio (64bit)	
<u>File Edit View Insert Project</u>	<u>C</u> ontroller <u>S</u> imulation <u>T</u> ools <u>W</u> indow <u>H</u> elp	
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Multiview Explorer 🗸 🗸	🛗 EtherCAT 🚽 🕼 I/O Map 🗙	+
new_Controller_0 Configurations and Setup K EtherCAT	Position Port Description R/W Data Type Value Variable V EtherCAT Network Configuration V EC4-16168(W) V V EC4-16168(W) V V EC4-16168(W) V EtherCAT Network Configuration V EC4-16168(W) V EtherCAT Network Configuration V EC4-16168(W) V EtherCAT Network Configuration EtherCAT Netwo	Variable Com
L ⊂ Node1 : EC4-1616B(W) ► © CPU/Expansion Racks I/O Map	Outputs_Channel Out2_7000_02 W BOOL FALSE Outputs_Channel Out3_7000_03 W BOOL FALSE Outputs_Channel Out3_7000_04 W BOOL FALSE Outputs_Channel Out5_7000_05 W BOOL TALSE	
Controller Setup Motion Control Setup Cam Data Settings Event Satings	Outputs_Channel Out6_7000_06 W BOOL TRUE Outputs_Channel Out7_7000_07 W BOOL FALSE Outputs_Channel Out8_7000_08 W BOOL FALSE Outputs_Channel Out8_7000_09 W BOOL FALSE	
	Outputs_channel Out19_7000_09 W BOOL FALSE Outputs_channel Out10_7000_0A W BOOL FALSE Outputs_channel Out11_7000_0B W BOOL FALSE Outputs_channel Out12_7000_0C W BOOL FALSE	
▼ ■ POUs ▼ ≋ Programs ▼ ⊞ Program0	Outputs_Channel Out13_7000_00 W BOOL FALSE Outputs_Channel Out14_7000_0E W BOOL FALSE Outputs_Channel Out15_7000_0F W BOOL FALSE Outputs_Channel Out16_7000_10 W BOOL FALSE	
∟ল Section0 ⊔≋ Functions ⊔≋ Function Blocks ►ল Data	Inputs_Channel In1_6000_01 R BOOL IRME Inputs_Channel In2_6000_02 R BOOL FALSE Inputs_Channel In3_6000_03 R BOOL FALSE Inputs_Channel In4_6000_04 R BOOL FALSE	_
► m Tasks	Monitor type ◯ Data type ● Binary ● Hex ● Signed decimal ● Unsigned decimal ●	order MSB-LSB 🌒 LSB-MSB
< ► ► ► ► ► ► ► ► ► ► ► ► ► ► ► ► ► ► ►	Build Output Build	- 4 ×

8 FAQ

8.1 Failure to find a device in the software

- 1. Confirm that the ESI profile is installed correctly.
- 2. Confirm that the ESI profile, version is accurate.
- 3. Whether to restart the Twin CAT software after installing the ESI profile.

8.2 Failure to start operation of a device

- 1. Confirm whether the project is established correctly.
- 2. Confirm the relevant setting of the node station number.
- 3. Make ify the power supply is normal.
- 4. EtherCAT The communication line is normal.
- 5. Re-power the device after changing from the device node address.