

EtherCAT

XB6S Series Slice I/O

User Manual



Nanjing Solidot Electronic Technology Co., Ltd. 2024

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1 Product Introduction

1.1 Product overview

XB6S series Slice I/O modules adopt the structure of coupler and I/O module combination. The coupler connects the expandable I/O modules to the real-time industrial Ethernet system, the backplane adopts X-bus, and the coupler module is responsible for the fieldbus communication, thus realizing the function of real-time data exchange between various I/O modules and the coupler/controller.

XB6S series Slice I/O modules are rich in variety and high in real-time, providing users with high-speed data acquisition, optimized system configuration, simplified field wiring, and improved system reliability.

1.2Product Features

Less nodes occupied

A node consists of a bus coupler, 1~32 XB6S series I/O modules, 1~32 XBF series expansion I/O modules, and a End cover.

• Extensive functionality

Supports flexible expansion with a full range of I/O; can integrate a variety of digital modules, analog modules and temperature modules, etc., applicable to the needs of different applications.

• Flexible Configuration

Various types of Slice I/O modules are available in any combination.

• high compatibility

The coupler communication interface complies with communication standards and supports mainstream EtherCAT masters.

small volume

Compact and small footprint.

easy diagnosis

Indicator light design is complete, the module status is clear at a glance, easy to detect and maintain.

• High speed

The backplane uses the X-bus: scanning period max. 1ms.

easy installation
DIN 35 mm standard rail mounting.
Adopts spring-type terminals for easy and quick wiring.

1.3 Application Method

The coupler module is connected to the controller at the application site, and the I/O module is responsible for connecting with the input and output sensors at the application site. The usual flow of data acquisition and processing control is as follows:

- a. Input I/O modules collect various signals from the field and send them to the coupler via an internal bus;
- b. The controller reads data from the coupler via fieldbus or industrial Ethernet and processes it, then writes the output data to the coupler;
- c. The coupler then writes the output data to the output I/O modules via the internal bus, thus enabling control of the device.

Expandable I/O modules include digital input modules, digital output modules, digital input and output modules, analog input modules, analog output modules, and temperature modules.

Application method: Application method using a combination of modules such as coupler, digital, analog, temperature, and extended power supply.

Application Configuration: According to the requirements of access capacity of master station, number of stations, I/O points, function types, etc., it can be adapted to the combination configuration of different models of I/O modules.

Configuration rules: Modules are, from left to right, coupler module, power module, I/O module, End cover (must be configured) and so on.

The products are applied using a combination of couplers, I/O modules, and End covers in the following two combinations.



Product combination mode II (coupler module, I/O module, expansion power module, I/O module, End cover)



2 Designation rules

2.1 Designation rules

2.1.1 Coupler Designation Rules

$\frac{XB}{(1)} \frac{6}{(2)} \frac{S}{(3)} - \frac{EC}{(4)} \frac{20}{(5)} \frac{02}{(6)}$

Number	Name	Description of values
(1)	Bus Type	XB: X-bus
(2)	Product Series	6: Slice
(3)	Product Versions	S: Strengthen, upgraded
(4)	bus protocol	EC: EtherCAT
		PN: PROFINET
(E)	power supply (of an	20.24
(5)	appliance etc)	20.2A
(6)	Number of network ports	02: Dual network ports

2.1.2 I/O module designation rules

$\frac{XB}{(1)} \frac{6}{(2)} \frac{S}{(3)} - \frac{A}{(4)} \frac{8}{(5)} \frac{0}{(6)} \frac{V}{(7)}$

Number	Name	Description of values				
(1)	Bus Type	XB: X-bus				
(2)	Product Series	6: Slice	6: Slice			
(3)	Product Versions	S: Streng	then, upgraded	I		
(4)	I/O Module	A: Analog) Jigital			
(5)	Input Signal Points	Analog: 0 Digital: 8,	, 4, 8 16, 32			
(6)	Number of output signal points	Analog: 0 Digital: 8,	Analog: 0, 4, 8 Digital: 8, 16, 32			
			digital quant	ity		analog
		Code	importation	exports	Code	DEFINITION
(7) Input/Output Characteristics defaul (settin	A	A NPN/PNP compatible	NPN	v	Single-ended signal with adjustable range: Disable, -10V~+10V, 0V~10V, -5V~+5V, 0V~5V, 1V~5V	
	В		PNP	VD	Differential signaling with adjustable range: Disable, -10V~+10V, 0V~10V, -5V~+5V, 0V~5V, 1V~5V	
	default (setting)	NPN/PNP compatible	1	I	Single-ended signal with adjustable range: Disable, 4mA~20mA, 0mA~20mA	
	J	J	J /	relay (electronics)	ID	Differential signal with adjustable range: Disable, 4mA~20mA, 0mA~20mA, -20mA~+20mA
					тм	Temperature acquisition of RTDs, thermocouples, etc.

2.2 Module List

Model	Product Description		
XB6S-EC2002	EtherCAT Bus Coupler Modules		
VPCC 2200	32-channel digital input modu	ile, input NPN/PNP compatible, input filtering default	
XB05-3200	<mark>3ms</mark>		
XB6S-0032A	32-channel digital output mod	dule, output NPN type	
XB6S-0032B	32-channel digital output mod	dule, output PNP type	
	16-channel digital input 16-ch	annel digital output module	
XB02-1010A	Input NPN/PNP compatible, ir	nput filtering default 3ms, output NPN type	
	16-channel digital input 16-ch	annel digital output module	
XD02-1010D	Input NPN/PNP compatible, input filtering default 3ms, output PNP type		
XB6S-0012J/6	12-Channel Relay Output Module		
	8-channel analog voltage	Differential signal, adjustable range: Disable,	
XB03-A00VD	input module	-10V~+10V, 0V~10V, -5V~+5V, 0V~5V, 1V~5V	
	8-channel analog current	Differential signal, adjustable range: Disable,	
XB03-A001D	input module	4mA~20mA, 0mA~20mA, -20mA~+20mA	
	8-channel analog voltage	Single-ended signal with adjustable range: Disable,	
XB03-A00V	output module	-10V~+10V, 0V~10V, -5V~+5V, 0V~5V, 1V~5V	
	8-channel analog current	Single-ended signal, adjustable range: Disable,	
7003-7001	output module	4mA~20mA, 0mA~20mA	
XB6S-P2000	Extended Power Module		
XB6S-CVR00	End cover		

3 Module Introduction

3.1 EtherCAT Coupler

3.1.1 panel structure



Number	name	Definition		
1	Power supply terminal block	3P spring-loaded terminal block		
2	Guideway slot	For DIN 35 mm rail mounting		
	Module Indicator and	Indicates coupler neuror status, eneration status		
(3)	Indicator Marker	indicates coupler power status, operation status		
4	Module QR Code	Scan the code to get module related information		
5	System indicators and	Indicates system operational status		
	indicator signs	muicales system operational status		

6	Bus Interface IN	RJ45 interface
\bigcirc	Bus Interface OUT	RJ45 interface

3.1.2 Indicator light function

EtherCAT Coupler Indicator Definition				
markings	name	color	Status	Status Description
		ON	Module power supply is working properly	
PWR	Power indicator	Green	OFF	Module not powered or abnormal power supply
0) (5	Overload		OFF	Not overloaded
OVR	indicator	red	ON	Load up to 90% (±5%) or more
			ON	EtherCAT OP status
			Flashing 2.5Hz	EtherCAT PreOP Status
	EtherCAT		Single flash (always	
RUN	operation status	Green	on 200ms off 1s	EtherCAT SafeOP Status
indicator	indicator		cycle change)	
			Flashing 10Hz	BootStrap Status
		OFF	EtherCAT Init Status	
			double flash ^[1]	EtherCAT Watchdog Timeout
ERR Indicator	red	Single flash (always on 200ms off 1s cycle change)	module local error	
			Flashing 2.5Hz	General Configuration Errors
			OFF	EtherCAT communication is normal
	IO		ON	I/O process data has been created
IOR communication indicator	Green	Flashing 1Hz	No business data interaction	
	indicator		Flashing 10Hz	Coupler Firmware Upgrade
			ON	communications anomaly
IOE		red	Flashing 1Hz	Alarm I/O module exception exists
	Indicator		OFF	No communication anomalies

Note [1]: Double flash means 200ms off for 200ms of constant light, then 200ms off for 1000ms of constant light, and so on in a cycle of blinking.

Network Status Indicator Definitions						
markings	name	color	Status	Status Description		
		orange	flashing	Connection established with data interaction		
	Network status		OFF	No data interaction or exception		
	indicator IN		ON	establish a network connection		
	Green		No network connection established or			
			OFF	abnormal		
			flaching	Connection established with data		
	orange	nasning	interaction			
	Network status		OFF	No data interaction or exception		
indicator OUT	10	ON	establish a network connection			
	0	Green	0.55	No network connection established or		
			UFF	abnormal		

3.1.3 Product Parameters

3.1.3.1 interface parameter

EtherCAT Interface Parameters			
bus protocol	EtherCAT		
Number of slaves	Depending on the number of slaves supported by the master		
data transmission medium	Ethernet/EtherCAT CAT5 cable		
transmission rate	100Mbps		
Minimum cycle time	250us		
transmission distance	≤100m (station to station)		
bus interface	2×RJ45		
Maximum number of modules	32		
in series			
Volume of input and output	1024Bytes ^[1]		
process data			

Note [1]: The total length of upstream and downstream data does not exceed 1024Bytes.

3.1.3.2 Power supply parameters

Power supply parameters			
	SELV Input		
Input voltage	24VDC (18V~36V)		
Input Current	Max: 600mA (24VDC)		
Backplane Supply Current	Max: 2A		
Backplane Supply Voltage	5VDC		

3.1.3.3 General parameter

General technical parameters					
Size		106.4 × 43 × 61mm			
weights		155g			
	operating temperature	-20°C~+60°C			
	Storage temperature	-40°C~+80°C			
o no rotin n	relative humidity	95%, non-condensing			
operating	altitude	≤2000m			
environment	vibration resistance	IEC 60068-2-6 Sinusoidal vibration 5Hz~8.4Hz, 3.5mm, 8.4Hz~150Hz, 1g X/Y/Z triaxial, 10 cycles/axial (100min)			
	impact resistance	IEC 60068-2-27 Mechanical shock 150m/s ² , 11ms, ±X/Y/Z six directions 3 times/direction for a total of 18 times			

	protection class	IP20	IP20			
Overvoltage						
	category	I				
	contamination level	Level 2	Level 2			
electrostatic		Level 3	Contact ±8KV Air ±8KV, IEC61000-4-2			
compatibility	(electrical) surge	Level 3	1KV DM 2KV CM, IEC 61000-4-5			
requirements	Electrical fast pulse group	Level 4	Power cord ±4KV, IEC61000-4-4			
Module Abnorm	al Self-Recovery	Support				
Accessing PDO t	hrough SDO	Support				
diagnostic		Support				
warning		Support				
Firmware Upgrad	de	Support				
short circuit prot	ection	Support (automa	atic recovery mechanism)			
Reverse connect	ion protection	Support (automa	atic recovery mechanism)			
surge protection		Support	Support			
		EMC	EMC			
		EN 61131-2				
		EN IEC 61000-6-4				
CE marking		EN IEC 61000-6-2				
		LVD				
		EN 61010-1:2010/A1				
		en iec 61010-2-201				
UL listed		UL 61010-1/UL 6	UL 61010-1/UL 61010-2-201			
RoHS certification		EU Directive 2011/65/EU Annex II				
REACH Certification		EU Directive EC 1907/2006				

3.1.4 Power supply wiring diagram

Using a 24VDC power module, refer to the wiring method and connect the power supply according to the circuit shown in the following figure, and at the same time ground PE reliably (twisted-pair wire is recommended for the power supply cable).



3.1.5 Fieldbus connection

Standard RJ45 network interface with standard crystal connector is used, and the pin assignment is shown in the table below.



code
TD+
TD-
RD+
—
—
RD-
—
—

Precaution

• Double shielded (braided mesh + aluminum foil) STP cables of category 5 or higher are recommended as communication cables.

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

3.1.6 Housing Dimensions

Coupler housing specifications (unit mm)





3.2 Digital I/O Modules

3.2.1 panel structure



3.2.2 Indicator light function

Digital I/O Module Indicator Definitions					
markings	name	color	Status	Status Description	
		Green	ON	Power supply is normal	
PWR	Power indicator		OFF	The product is not powered up or the power	
			OFF	supply is abnormal	
			ON	The system is functioning normally	
	Operation		Flashing	No business data interaction, waiting for business	
SYS	indicator	Green	0.5Hz	data interaction to be established	
			Flashing 5Hz	Firmware Upgrade	
			OFF	System not working	
			ON	Module channels have signal inputs	
0~7	Input Channel Indicator	Green	en OFF	No signal input or abnormal signal input on	
				module channel	
	Qutput Channel	Green	ON	Module channels have signal outputs	
0~7	Uniput Channel		OFF	No signal output or abnormal signal output from	
	mulcator			module channel	

3.2.3 Technical Parameters

digital input					
Product Model	XB6S-3200	XB6S-1616A	XB6S-1616B	XB6S-0032A	XB6S-0032B
Bus input power		5			
supply voltage rating			VDC (4.5V~5.5V)		
Bus input power			<100mA		
supply current rating					
Input Rated Voltage		24	VDC (20.4V~28.8V	() 	
Input Current Typical		5mA (24VDC)		-	
Input Signal Points	32	16	16	-	
Input Signal Type	N	PN/PNP compat	ible	-	
	Volt	tage direct input	form		
Input signal form	Sink input (S	ink): NPN open-	collector input		
		form			
	Source: PN	IP open-collecto	r input form	-	
OFF voltage/current	-3V~+5V/0.9	mA or less (betw	veen COM and		
(PNP)		each signal)			
ON voltage/current	11V~30V/2.1r	mA or more (bet	ween COM and		
(PNP)		each signal)		-	
OFF voltage/current	11V~30V/2.1r	mA or more (bet	ween COM and		
(NPN)	each signal)			-	
ON Voltage/Current	-3V~+5V/0.9	mA or less (betv	veen COM and	-	-
(NPN)	each signal)		-		
response time		<50us			
(technology)				-	
Input Filtering	Default 3	ms, settable rang	ge 0~20 ms	-	
Maximum Input	150Hz (filter time: 3ms)				
Frequency				-	
Input Impedance			tion	-	
Isolation method	0	Optocoupler isolation		-	
Voltago		500VAC			
nower wastage	100mA	150mA	110mA	-	
Digital Input Type	TOOTIA	Type1/Type3	TIONA	-	
Channel Indicator	турет/турез			-	
Lights	Green LED light				
		digital out	out	<u> </u>	
Bus input power					
supply voltage rating		5	SVDC (4.5V~5.5V)		
Bus input power	<u></u>				
supply current rating	≤200mA				
Input Rated Voltage		24	VDC (20.4V~28.8V	/)	

Number of output		16	16	32	32	
		NDN	DNID	NDN	DNID	
			- TNF 1\/	 /	FINE	
		Resistive loads inductive loads lamp loads				
Single channel rated		IXE313	live loads, modelin		7803	
current		Max:	0.5A (see <mark>attached</mark>	Figure 1 for de	tails)	
leakage current			<10u	A		
response time			<150			
(technology)	_		<130	us		
Output Channel	-	Short circuit	protection (autor	natic rocovory m	ochanism)	
Protection		Short circuit	protection (autor	natic recovery in	lechanism)	
Modulo protection		Reverse c	onnection protect	ion (automatic ı	recovery	
		me	chanism), field side	e surge protecti	on	
Isolation method			Optocoupler	Isolation		
Isolated Withstand			5001/4	٥٢		
Voltage			50077			
power wastage		-	-	150mA	110mA	
Channel Indicator			Green FI) liaht		
Lights						
		relay outp	ut			
Product Model			XB6S-0012J/6			
Bus input power		L.	VDC (4.5V~5.5V)			
supply voltage rating						
Bus input power	≤200mA					
supply current rating						
Input Rated Voltage	24VDC (20.4V~28.8V)					
Number of output	Number of output		12			
signal points						
output form			Relay			
Output Load Type		Resistive loads, inductive loads, lamp loads				
Single channel rated			24VDC			
voltage						
Single channel rated		Max: 2A (see	attached Figure 2	for details)		
current		-				
Hardware Output		10ms/10ms				
Response Time						
Module protection	Field-side reverse connection protection (automatic recovery mechanism), field-side surge protection					
Isolation method	<u> </u>	Optocouple	er Isolation + Relay	y Isolation		
Isolated Withstand						
Voltage			1500VAC			
power wastage		100mA				
mechanical life	Minimum 20 million operations (18,000 operations/hour)				our)	

Electrical life		Minimum 100,000 operations (2A, 24VDC, inductive load)
Channel	Indicator	Creen LED light
Lights		Green LED light

General technical parameters				
Size	106.4◊25.7◊72.3mm			
weights	110g (except relay XB6S-0012J/6, which is about 135g)			
operating				
temperature	-20 C~+80 C			
Storage temperature	-40°C~+80°C			
relative humidity	95%, non-condensing			
altitude	≤2000m			
contamination level	Level 2			
protection class	IP20			
safety certification	UL certification, CE certification			
Green Certification	RoHS certification, REACH certification			

Attachment 1:



Attachment 2:

Relationship between maximum rated current and temperature of single channel of relay output module



3.2.4 wiring diagram

3.2.4.1 XB6S-3200



*Internal conduction in COM port; NPN/PNP compatible

3.2.4.2 XB6S-1616A



*DI polarity is NPN/PNP compatible, DO polarity is NPN

3.2.4.3 XB6S-1616B



*DI polarity is NPN/PNP compatible, DO polarity is PNP

3.2.4.4 XB6S-0032A



*Internal conduction in 24V port; Internal conduction in 0V port *The load common power supply needs to be the same power supply as the module.

3.2.4.5 XB6S-0032B



*Internal conduction in 24V port; Internal conduction in 0V port *The load common power supply needs to be the same power supply as the module.

3.2.4.6 XB6S-0012J/6



*Internal conduction in 24V port; Internal conduction in 0V port *COM0 internal conduction; COM1 internal conduction

3.2.5 Housing Dimensions



16-Channel Digital I/O Module Housing Factor (Unit mm)



32-Channel Digital I/O Module Housing Factor (Unit mm)

3.3 Analog I/O Modules

3.3.1 panel structure



3.3.2 Indicator light function

Analog I/O Module Indicator Definitions				
markings	name	color	Status	Status Description
		Green	ON	Power supply is normal
PWR	Power indicator		OFF	The product is not powered up or the power
			OFF	supply is abnormal
			ON	The system is functioning normally
	Operation status	Green	Flashing	No business data interaction, waiting for business
SYS	indicator		0.5Hz	data interaction to be established
			Flashing 5Hz	Firmware Upgrade
			OFF	System not working
			ON	Module channels have signal inputs
0~7	Input Channel Indicator	Green	OFF	No signal input or abnormal signal input on
				module channel
	Output Channel	Green	ON	Module channels have signal outputs
0~7			OFF	No signal output or abnormal signal output from
	maicator			module channel

3.3.3 Technical Parameters

analog input						
Product Model	XB6S-A80VD	XB6S-A80ID				
Bus input power supply						
voltage rating	5VDC (4.5V~5.5V)					
Bus input power supply	≤350mA					
current rating						
Input Points	8	8				
Input Type	Voltage type	Current type				
	Disable $-10V \approx +10V = 0V \approx 10V$	Disable, 4mA~20mA, 0mA~20mA,				
input signal	$-5V \sim +5V = 0V \sim 5V = 10V, 0V = 10V,$	-20mA~+20mA				
	adjustable default $-10V \sim +10V$	(Adjustable range, default				
		0mA~20mA)				
Input Signal Type	different	ial signal				
channel response time	550u:	s / ch				
	850us	s / 8ch				
resolution (of a photo)	161	oits				
Sampling rate (full	≤1k	sps				
channel)	- cyp3					
accurate	±0.1% at 25°C, ±0.3% over full temperature range					
Input Filtering	Support					
smoothing step	1~200					
Input Impedance (Voltage	≥1MΩ	-				
Type)						
Input impedance (current	-	≤250Ω				
(ype)	12)///					
range	IZVAC	-				
Maximum permissible						
channel voltage (voltage	301/	_				
type)	301					
Maximum allowable						
channel current (current	_	30mA				
type)						
The system cannot be	When the ±15V power supply is damaged and short-circuited, the system					
compromised	+5V power supply cannot be affected.					
	No isolation between channels, isolation between channels and backplane					
gaivanic isolation	buses, isolation between channels and supply voltage					
Input overvoltage	Supports clamp protection	Do not connect voltage input				
protection		Do not connect voltage input				
input protection	±30V	-				
Isolated Withstand	FOUNDC					
Voltage	500VDC					

power wastage	350mA						
Channel Indicator Lights	Green LED light						
analog output							
Product Model	XB6S-A08V	XB6S-A08I					
Bus input power supply voltage rating	5VDC (4.5V~5.5V)						
Bus input power supply current rating	≤200mA						
Output Points	8	8					
Output type	Voltage type	Current Type					
output signal	Disable, -10V~+10V, 0V~10V, -5V~+5V, 0V~5V, 1V~5V (range adjustable, default -10V~+10V)	Disable, 4mA~20mA, 0mA~20mA (Adjustable range, default 0mA~20mA)					
channel response time	400us / ch 400us / 8ch	400us / ch 400us / 8ch					
resolution (of a photo)	16bits						
accurate	$\pm 0.1\%$ at 25°C, $\pm 0.3\%$ over full temperature range						
Load impedance (voltage	≥2kΩ (1kΩ accuracy: ±3‰ at 25°C, +5‰ at full temperature)	-					
Load impedance (current type)	,	≤500Ω					
The system cannot be compromised	When the ±15V power supply is damaged and short-circuited, the system +5V power supply cannot be affected.						
output protection	Overload protection, open-circuit protection, short-circuit protection (all automatic recovery mechanisms)						
galvanic isolation	No isolation between channels, isolation between channels and backplane buses, isolation between channels and supply voltage						
Isolated Withstand Voltage	500VDC						
Clear Hold Optional Function in Non-OP Status	Support						
Channel Indicator Lights	Green L	ED light					

General technical parameters				
Size	106.4 × 25.7 × 72.3mm			
weights	125g			
operating temperature	-20°C~+60°C (XB6S-A08I working temperature about -20°C~+50°C)			
Storage temperature	-40°C~+80°C			
relative humidity	95%, non-condensing			
altitude	≤2000m			
Pollution degree	Level II			
protection class	IP20			
safety certification	UL certification, CE certification			

Green Certification	RoHS certification, REACH certification
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3.3.4 Analog Voltage Parameters

Voltage input range selection and code value range						
Range	Measuremen	Code Value	Voltage Input	Voltage Output	code-value	
Soloction	trango	Pango Calculation Formula Calculation Fo		Calculation Formula	correspond	
Selection	trange	Kange			ence table	
0	Disable, indic	ates that the char	nel is not enabled			
1	101/ 101/	22760 22767				
(default)	-10v~+10v	-32/68~32/6/	D=(65535/20)^U	U=(D^20)/65535	See <u>3.3.4.3</u>	
2	0V~10V	0~32767	D=(32767/10)*U	U=(D*10)/32767	<u>Voltage</u>	
3	-10V~+10V	-27648~27648	D=(55296/20)*U	U=(D*20)/55296	<u>Input</u>	
4	0V~10V	0~27648	D=(27648/10)*U	U=(D*10)/27648	<u>Code</u>	
5	-5V~+5V	-27648~27648	D=(55296/10)*U	U=(D*10)/55296	<u>Value</u>	
6	0V~5V	0~27648	D=(27648/5)*U	U=(D*5)/27648	<u>Table</u>	
7	1V~5V	0~27648	D=(27648/4)*U-6912	U=(D+6912)*4/27648		

3.3.4.1 Voltage Input Range Selection Table

Note: D means code value, U means voltage, analog voltage input module range default 1: -10V~+10V (-32768~32767).

3.3.4.2 Voltage Output Range Selection Table

Voltage output range selection and code value range					
Range Selection	Measuremen t range	Code Value Range	Voltage Input Calculation Formula	Voltage Output Calculation Formula	code-value corresponde nce table
0	Disable, indic	ates that the char	nel is not enabled		
1 (default)	-10V~+10V	-32768~32767	D=(65535/20)*U	U=(D*20)/65535	
2	0V~10V	0~32767	D=(32767/10)*U	U=(D*10)/32767	See <u>3.3.4.4</u>
3	-10V~+10V	-27648~27648	D=(55296/20)*U	U=(D*20)/55296	voitage
4	0V~10V	0~27648	D=(27648/10)*U	U=(D*10)/27648	<u>output</u>
5	-5V~+5V	-27648~27648	D=(55296/10)*U	U=(D*10)/55296	table
6	0V~5V	0~27648	D=(27648/5)*U	U=(D*5)/27648	
7	1V~5V	0~27648	D=(27648/4)*U-6912	U=(D+6912)*4/27648	

Note: D means code value, U means voltage, analog voltage output module range default 1: $-10V \sim +10V$ (-32768 \sim 32767).

range	-10V~+10V	0V~10V	-10V~+10V	0V~10V
	-32768~32767	0~32767	-27648~27648	0~27648
voltage	code value	code value	code value	code value
-10.13	-	-	-27980	-
-10	-32768	-	-27648	-
-9	-29491	-	-24883	-
-8	-26214	-	-22118	-
-7	-22937	-	-19354	-
-6	-19661	-	-16589	-
-5	-16384	-	-13824	-
-4	-13107	-	-11059	-
-3	-9830	-	-8294	-
-2	-6554	-	-5530	-
-1	-3277	-	-2765	-
-0.13	-426	-	-359	-332
-0.06	-197	-	-166	-156
0	0	0	0	0
1	3277	3277	2765	2765
2	6554	6554	5530	5530
3	9830	9830	8294	8294
4	13107	13107	11059	11059
5	16384	16384	13824	13824
6	19661	19661	16589	16589
7	22937	22937	19354	19354
8	26214	26214	22118	22118
9	29491	29491	24883	24883
10	32767	32767	27648	27648
10.12	-	-	27980	27980
code value	Code value =	Code value =	Code value =	Code value =
formula	(65535/20)*voltage	(32767/10)*voltage	(55296/20)*voltage	(27648/10)*voltage
Voltago	Voltage = (code	Voltage = (code	Voltage = (code	Voltage = (code
formula	value * 20)	value * 10)	value * 20)	value * 10)
IOIIIUId	/65535	/32767	/55296	/27648

3.3.4.3 Voltage Input Code Value Table

Note: ① Voltage input module range selection $-10V \sim +10V$ (-32768 \sim 32767) support **up and down overflow** function, that is, when the channel input is greater than 10V voltage, all display the maximum code value 32767; input channel input is less than -10V voltage, all display the minimum code value -32768.

② Voltage input module range selection 0V ~ 10V (0 ~ 32767) support for **up and down overflow** function, that is, the channel input is greater than 10V voltage, are displayed in the maximum code value of 32767; input channel input is less than 0V voltage, are displayed in the minimum code value 0.

③ Voltage input module range selection -10V~+10V (-27648~27648) supports **overshoot**, **up and down overflow and up and down overflow alarm** functions. Overshoot that is, the channel input

range exceeds the range into the overshoot, in -10.13V ~ +10.12V within the display of the normal calculation code value. Up and down overflow, i.e., when the channel input is greater than 10.12V, the maximum overshoot code value of 27980 will be displayed and an alarm will be issued at the same time; when the input channel input is less than -10.13V, the minimum overshoot code value of -27980 will be displayed and an alarm will be issued at the same time.

④ Voltage input module range selection $0V \sim 10V$ ($0 \sim 27648$) supports **overshoot**, **up and down overflow and up and down overflow alarm** functions. Overshoot that is, the channel input range exceeds the range into the overshoot, in $-0.13V \sim +10.12V$ within the display of the normal calculation code value. Up and down overflow that is, when the channel input is greater than 10.12V voltage, all display overshoot maximum code value 27980, and alarm at the same time; input channel input is less than -0.13V voltage, all display overshoot minimum code value -332, and alarm at the same time.

rang	-5V~+5V	0V~5V	1V~5V
	-27648~27648	0~27648	0~27648
voltage	code value	code value	code value
-5.07	-27980	-	-
-5	-27648	-	-
-4	-22118	-	-
-3	-16588	-	-
-2	-11060	-	-
-1	-5530	-	-
-0.07	-332	-332	-
0	0	0	-
0.94	5198	5198	-345
1	5530	5530	0
2	11060	11060	6912
3	16588	16588	13824
4	22118	22118	20736
5	27648	27648	27648
5.06	27980	27980	27933
code value	Code value =	Code value =	Code value =
formula	(55296/10)*voltage	(27648/5)*voltage	(27648/4)*voltage - 6912
Voltage	Voltage = (code value *	Voltage = (code value *	Voltage = (code value +
formula	10)/55296	5)/27648	6912)*4/27648

Note: ① Voltage input module range selection -5V + 5V (-27648~27648) supports **overshoot, up and down overflow and up and down overflow alarm** functions. Overshoot means that the input range of the channel exceeds the range and enters into overshoot, and the normal calculated code value is displayed within -5.07V + 5.06V. Up and down overflow, i.e., when the channel input is greater than 5.06V, the maximum overshoot code value of 27980 will be displayed and an alarm will be issued at the same time; when the input channel input is less than -5.07V, the minimum overshoot code value of -27980 will be displayed and an alarm will be issued at the same time.

② Voltage input module range selection $0V \sim 5V$ ($0 \sim 27648$) supports **overshoot**, **up and down overflow and up and down overflow alarm** functions. Overshoot that is, the channel input range exceeds the range into the overshoot, in the -0.07V ~ +5.06V within the display of the normal

calculation code value. Up and down overflow that is, when the channel input is greater than 5.06V voltage, all display overshoot maximum code value 27980, and alarm at the same time; input channel input is less than -0.07V voltage, all display overshoot minimum code value -332, and alarm at the same time.

③ Voltage input module range selection $1V \sim 5V$ ($0 \sim 27648$) supports **overshoot**, **up and down overflow and up and down overflow alarm** function. Overshoot that is, the channel input range exceeds the range into the overshoot, in the $0.94V \sim 5.06V$ within the display of the normal calculation code value. Up and down overflow that is, when the channel input is greater than 5.06V voltage, all display overshoot maximum code value 27933, and alarm at the same time; input channel input is less than 0.94V voltage, all display overshoot minimum code value -345, and alarm at the same time.

Range	-10V~+10V	0V~10V	-10V~+10V	0V~10V
	-32768~32767	0~32767	-27648~27648	0~27648
voltage	code value	code value	code value	code value
-10	-32768	-	-27648	-
-9	-29491	-	-24883	-
-8	-26214	-	-22118	-
-7	-22937	-	-19354	-
-6	-19661	-	-16589	-
-5	-16384	-	-13824	-
-4	-13107	-	-11059	-
-3	-9830	-	-8294	-
-2	-6554	-	-5530	-
-1	-3277	-	-2765	-
0	0	0	0	0
1	3277	3277	2765	2765
2	6554	6554	5530	5530
3	9830	9830	8294	8294
4	13107	13107	11059	11059
5	16384	16384	13824	13824
6	19661	19661	16589	16589
7	22937	22937	19354	19354
8	26214	26214	22118	22118
9	29491	29491	24883	24883
10	32767	32767	27648	27648
code value	Code value =	Code value =	Code value =	Code value =
formula	(65535/20)*voltage	(32767/10)*voltage	(55296/20)*voltage	(27648/10)*voltage
Voltago	Voltage = (code	Voltage = (code	Voltage = (code	Voltage = (code
formula	value * 20)	value * 10)	value * 20)	value * 10)
Iormula	/65535	/32767	/55296	/27648

3.3.4.4 Voltage Output Code Value Table

Note: ① Voltage output module supports **up and down overflow** function. That is, when the range of voltage output module is $-10V \sim +10V$ or $0V \sim 10V$, and the code value setting is larger than the maximum code value corresponding to the range, the channels will output 10V voltage;

When the range of voltage output module is selected from -10V to +10V and the code value is set smaller than the minimum code value corresponding to the range, all channels output -10V;

When the range of the voltage output module is selected from 0V to 10V and the code value is set smaller than the minimum code value corresponding to the range, the channels all output 0V voltage.

Range	-5V~+5V	0V~5V	1V~5V
	-27648~27648	0~27648	0~27648
voltage	code value	code value	code value
-5	-27648	-	-
-4	-22118	-	-
-3	-16588	-	-
-2	-11060	-	-
-1	-5530	-	-
0	0	0	-
1	5530	5530	0
2	11060	11060	6912
3	16588	16588	13824
4	22118	22118	20736
5	27648	27648	27648
code value	Code value =	Code value =	Code value =
formula	(55296/10)*voltage	(27648/5)*voltage	(27648/4)*voltage - 6912
Voltage	Voltage = (code value *	Voltage = (code value *	Voltage = (code value +
formula	10)/55296	5)/27648	6912)*4/27648

Note: ① Voltage output module supports **up and down overflow** function. That is to say, when the range of voltage output module selects $-5V \sim +5V/0V \sim 5V/1V \sim 5V$, and the code value setting is larger than the maximum code value corresponding to the range, the channels all output 5V voltage;

When the range of the voltage output module is selected from -5V to +5V and the code value is set smaller than the minimum code value corresponding to the range, the channels all output -5V voltage; When the range of the voltage output module is selected from 0V to 5V and the code value is set to

be less than the minimum code value corresponding to the range, the channels all output 0V voltage;

When the range of the voltage output module is selected from 1V to 5V and the code value is set to be less than the minimum code value corresponding to the range, the channels all output 1V.

3.3.5 Analog current parameters

3.3.5.1 Current input range selection table

Current input range selection and code value range						
Range	Measurement	Code Value	Current input calculation	Current Output	code-value	
Selection range		Range	formula	Calculation Formula	ence table	
0	Disable, indicates that the channel is not enabled					
1	4mA~20mA	0~65535	D=(65535/16)*I-16384	I=(D+16384)*16/65535	See <u>3.3.5.3</u>	
2 (default)	0mA~20mA	0~65535	D=(65535/20)*I	I=(D*20)/65535	<u>Current</u> Input	
3	4mA~20mA	0~27648	D=(27648/16)*I-6912	I=((D+6912)*16)/27648	<u>Code</u>	
4	0mA~20mA	0~27648	D=(27648/20)*I	I=(D*20)/27648	<u>Value</u>	
5	-20mA~+20mA	0~65535	D=(65535/40)*(I+20)	I=(D*40)/65535-20	Table	

Note: D means code value, I means current, analog current input module range default 2: 0mA~20mA (0~65535).

3.3.5.2 Current output range selection table

Current output range selection and code value range					
Danga Massuraman	Maacuraman	Code	Current input calculation	Current Output	code-value
Soloction	Range Measuremen	Value	formula	Calculation Formula	corresponde
Selection t ran	trange	Range	Iomua		nce table
0	Disable, indicates that the channel is not enabled				
1	4mA~20mA	0~65535	D=(65535/16*I)-16384	I=(D+16384)*16/65535	6
2 (default)	0mA~20mA	0~65535	D=(65535/20)*I	I=(D*20)/65535	<u>Current</u>
3	4mA~20mA	0~27648	D=(27648/16)*I-6912	I=((D+6912)*16)/27648	Output Code
4	0mA~20mA	0~27648	D=(27648/20)*I	I=(D*20)/27648	Value Table

Note: D means code value, I means current, analog current output module range default 2: 0mA~20mA (0~65535).

3.3.5.3 Current input code value table

Range	4mA~20mA	0mA~20mA	4mA~20mA	0mA~20mA	-20mA~+20mA
	0~65535	0~65535	0~27648	0~27648	0~65535
Current	code value	code value	code value	code value	code value
-20	-	-	-	-	0
-15	-	-	-	-	8192
-10	-	-	-	-	16384
-9	-	-	-	-	18022
-8	-	-	-	-	19661
-7	-	-	-	-	21299
-6	-	-	-	-	22937
-5	-	-	-	-	24576
-4	-	-	-	-	26214
-3	-	-	-	-	27852
-2	-	-	-	-	29491
-1	-	-	-	-	31129
0	-	0	-	0	32768
1	-	3277	-	1382	34406
2	-	6554	-	2765	36044
3	-	9830	-	4147	37683
4	0	13107	0	5530	39321
5	4096	16384	1728	6912	40959
6	8192	19661	3456	8294	42598
7	12288	22937	5184	9677	44236
8	16384	26214	6912	11059	45875
9	20479	29491	8640	12442	47513
10	24575	32768	10368	13824	49151
11	28671	36044	12096	15206	50790
12	32767	39321	13824	16589	52428
13	36863	42598	15552	17971	54066
14	40959	45875	17280	19354	55705
15	45055	49151	19008	20736	57343
16	49151	52428	20736	22118	58982
17	53247	55705	22464	23501	60620
18	57343	58982	24192	24883	62258
19	61439	62258	25920	26266	63897
20	65535	65535	27648	27648	65535
20.19	-	-	28034	27917	-
20.24	-	-	28085	27986	-
code	Code value =	Code value -	Code value =	Code value -	Code value =
value	65535/16*current	(65535/20)*current	(27648/16)*current	(27648/20)*current	(65535/40)*(current
formula	- 16384		- 6912		+ 20)

Note: ① Current input module range selection 4mA~20mA (0~65535) support **up and down overflow** function, that is, when the channel input is greater than 20mA current, all display the maximum code value 65535; input channel input is less than 4mA current, all display the minimum code value 0.

②Current input module range selection 0mA ~ 20mA (0 ~ 65535) support **up and down overflow** function, that is, the channel input is greater than 20mA current, are displayed in the maximum code value of 65535; input channel input is less than 0mA current, are displayed in the minimum code value 0.

③ Current input module range selection 4mA ~ 20mA (0 ~ 27648) when supporting the **overflow overshoot**, **up and down overflow and overflow alarm** function. Overflow that is, the channel input range exceeds the range into the overshoot, in the 4mA ~ 20.24mA within the display of the normal calculation code value. Up and down overflow that is, when the channel input is greater than 20.24mA current, all display overshoot maximum code value 28085, and alarm at the same time; input channel input is less than 4mA current, all display overshoot minimum code value 0.

(4) Current input module range selection 0mA~20mA (0~27648) supports **overflow overshoot, up and down overflow and overflow alarm** functions. Overflow that is, the channel input range exceeds the range into the overshoot, in the 0mA ~ 20.24mA within the display of the normal calculation code value. Up and down overflow that is, when the channel input is greater than 20.24mA current, all display overshoot maximum code value 27986, and alarm at the same time. When the input channel input is less than 0mA current, all display overshoot minimum code value 0.

(5) Current input module range selection -20mA ~ +20mA (0 ~ 65535) support **up and down overflow** function, that is, when the channel input is greater than 20mA current, all display the maximum code value 65535; input channel input is less than -20mA current, all display the minimum code value 0.

Range	4mA~20mA	0mA~20mA	4mA~20mA	0mA~20mA
	0~65535	0~65535	0~27648	0~27648
Current	code value	code value	code value	code value
0	-	0	-	0
1	-	3277	-	1382
2	-	6554	-	2765
3	-	9830	-	4147
4	0	13107	0	5530
5	4096	16384	1728	6912
6	8192	19661	3456	8294
7	12288	22937	5184	9677
8	16384	26214	6912	11059
9	20479	29491	8640	12442
10	24575	32768	10368	13824
11	28671	36044	12096	15206
12	32767	39321	13824	16589
13	36863	42598	15552	17971
14	40959	45875	17280	19354
15	45055	49151	19008	20736
16	49151	52428	20736	22118
17	53247	55705	22464	23501
18	57343	58982	24192	24883
19	61439	62258	25920	26266
20	65535	65535	27648	27648
22.81	-	-	32511	31538
23.52	-	-	-	32511
code value formula	Code value = 65535/16*current - 16384	Code value = (65535/20)*current	Code value = (27648/16)*current - 6912	Code value = (27648/20)*current

3.3.5.4 Current Output Code Table of Values

Note: ①When the current output module selects $4mA \sim 20mA(0 \sim 27648)$ and $0mA \sim 20mA(0 \sim 27648)$, it supports the functions of **overflow, overflow and underflow**. That is, when the range of current output module selects $4mA \sim 20mA(0 \sim 27648)$ and the code value is set to be greater than 32511, the channels all output 22.81mA current. When the range of current output module is $0mA \sim 20mA(0 \sim 27648)$ and the code value setting is greater than 32511, the channels all output 23.52mA current.

3.3.6 wiring diagram

3.3.6.1 XB6S-A80VD



*All PEs internally conductive

* Recommended to use shielded twisted pair cable, connect the shield to the PE port and ground it reliably

3.3.6.2 XB6S-A80ID



*All PEs internally conductive

* Recommended to use shielded twisted pair cable, connect the shield to the PE port and ground it reliably

3.3.6.3 XB6S-A08V





- *COM internal conduction, PE internal conduction
- * All channel loads need to be homogenous
- *Shielded twisted pair cable is recommended for signal cables

3.3.6.4 XB6S-A08I





*COM internal conduction, PE internal conduction

* All channel loads need to be homogenous

*Shielded twisted pair cable is recommended for signal cables

3.3.7 Housing Dimensions



4-Channel Analog I/O Module Housing Factor (Unit mm)



8-Channel Analog I/O Module Housing Factor (Unit mm)

3.4 Extended Power Module

3.4.1 panel structure



3.4.2 Indicator light function

Extended Power Module Indicator Definitions				
markings name color Status Status Description				
	Power	Croop	ON	Module power supply is working properly
PWR	indicator	Green	OFF	Module not powered or abnormal power supply
	Overload		OFF	Not overloaded
OVR	indicator	rea	ON	Load up to 90% (±5%) or more

3.4.3 Technical Parameters

Power supply parameters			
	SELV Input		
Input voltage	24VDC (18V~36V)		
Input Current	600mA (24VDC)		
output voltage	5VDC		
Output Current	2A		
	General technical parameters		
Size	106.4 × 25.7 × 61mm		
weights	110g		
operating	-20°C~+60°C		
temperature			
Storage temperature	-40°C~+80°C		
relative humidity	95%, non-condensing		
altitude	≤2000m		
contamination level	Level 2		
short circuit	Support (automatic recovery mechanism)		
protection			
Reverse connection	Support (automatic recovery mechanism)		
protection			
surge protection	Support		
protection class	IP20		
safety certification	UL certification, CE certification		
Green Certification	RoHS certification, REACH certification		

3.4.4 wiring diagram



3.4.5 Housing Dimensions



Extended Power Supply Outline Specifications (in mm)

3.5 End cover

3.5.1 Housing Dimensions

End cover profile specification (unit mm)



Note: All are installed with DIN 35 mm standard rail, DIN rail specification 35*7.5*1.0, 35*15*1.0 (unit mm).

4 Installation and disassembly

4.1 Installation Guide

Precautions for installation\disassembly

- The module protection class is IP20 and the module needs to be installed in the cabinet for indoor use.
- Ensure that the cabinet is well ventilated (e.g., the cabinet is fitted with an exhaust fan).
- Do not install this equipment next to or above equipment that may cause overheating.
- Be sure to mount the module vertically on the fixed rails and maintain air circulation around it (at least 50 mm air circulation space above and below the module).
- Once the module is installed, be sure to secure the module by installing rail mounts on both ends.
- Be sure to disconnect the power supply when installing/disassembling.
- Once the module is installed, it is recommended that wiring and cabling be done in accordance with the top and bottom alignments.

A Warnings

• The protection provided by the device may be jeopardized if it is not used in accordance with the product user manual.





Ensure that the module is mounted vertically on the fixed rail



Be sure to install the rail mounts



Schematic diagram of upper and lower wiring of the module



4.2 Installation and disassembly steps

Module Installation and Removal				
	1. Install the coupler module first on the rail that has been fixed.			
	2. Install the required I/O modules or function modules in order to the right of the			
Module	coupler module.			
Installation	3、After installing all the required modules, install the End cover to complete the			
Steps	assembly of the module.			
	4. Install the rail fixings at both ends of the coupler module and End cover to fix the			
	module.			
Module	1. Loosen the guide rail fixings at both ends of the module.			
disassembly	2. Use a one screwdriver to pry off the module snap.			
procedure	3. Pull out the disassembled module.			

4.3 Installation and disassembly diagram

Coupler Module Installation

■ Align the coupler module vertically in the rail slot as shown in Figure ① below.



Press the coupler module in the direction of the guide rail, and when you hear a "click" sound, the module is installed in place, as shown in Figure 2 below.



I/O Module Installation

Install the required I/O modules or function modules one by one according to the above steps of installing coupler modules as shown in Figures ③, ④ and ⑤ below, and push them in, and the modules will be installed in place when you hear the "click" sound.







End cover installation

Install the End cover on the right side of the last module, with the grooved side of the End cover aligned with the guide rail. Refer to the installation method of the I/O module for the installation method, and push the End cover inward into place, as shown in Figure (6) below.



■ After the End cover is installed, check whether the entire front of the module is flat to ensure that all modules and end caps are installed in place and the front is flush, as shown in Figure ⑦ below.



Mounting of rail fixings

Install and tighten the rail retainer firmly against the left side face of the coupler as shown in Figure 8 below.



Install the rail fixing on the right side of the End cover, first push the rail fixing firmly in the direction of the coupler to ensure that the module is mounted tightly, and lock the rail fixing with a screwdriver, as shown in Figure (9) below.



dismantle

■ Loosen the rail retainer at one end of the module with a screwdriver and move it to one side, making sure there is clearance between the module and the rail retainer, as shown in Figure ⁽¹⁾ below.



Insert a flat head start into the snap of the module to be removed, and apply pressure (hear the rattle) in the direction of the module sideways, as shown in the following figures (1) and (12).

Note: There is one snap on the top and bottom of each module, follow this method.





(12)

Remove the module as shown in figure (13) below, following the same procedure as for installing the module.



5 Wiring

5.1 wiring terminal

A warnings

wiring terminal					
	rated voltage	320V			
power supply	rated current	20A			
terminal	extremity	3P			
	wire diameter	22~16 AWG 0.3~1.5 mm²			
Circul line terreinele	rated voltage	200V			
(i.e. input and output	rated current	9.5A			
(i.e., input and output	extremity	16P+20P			
(errinnais)	wire diameter	22~17 AWG 0.3~1.0 mm²			
bus interface	2×RJ45	Category 5+ UTP or STP (STP recommended)			

5.2 Wiring instructions and requirements

Power supply wiring precautions

- The module system-side power supply and the field-side power supply are configured and used separately, so do not mix them.
- PE must be reliably grounded.

Wiring Tool Requirements

The power supply and signal line terminals adopt the

screwless design, and the installation and removal of

the cables can be operated with a single screwdriver



Beterrel

(specification: \leq 3mm).

Stripped Wire Length Requirements

The recommended cable stripping length for the power and signal line terminals is 10 mm.



Wiring Method

length of wire, press down the button while inserting the single stranded wire directly into the corresponding end hole.

Multi-stranded flexible wires, after stripping the corresponding length of wire, can be directly connected or supporting the use of the

corresponding standard specifications of the cold-pressing end (tube-type insulated terminals, the reference specifications are shown in the table below), press the button down at the same time will be insulated terminal inserted directly into the corresponding end holes.

The specifications for the power supply terminals and signal line terminals are shown in the table below:

Tube Insulation End Specification Sheet				
specification	model number	Cross-sectional area of		
specification		conductor mm ²		
\bigwedge	E0310	0.3		
	E0510	0.5		
	E7510	0.75		
D	E1010	1.0		
Tube insulated terminal L with a length of 10 mm	E1510	1.5		

A warnings

- Use only copper wires for wiring conductors.
- Utilisez uniquement des conducteurs en cuivre.

6 Operation

6.1 Parameter description

6.1.1 Digital Input Filtering

Digital input filtering prevents the program from responding to unexpected rapid changes in the input signal, which can be generated by switch contact jumps or electrical noise. Digital input filtering supports a single module setup, where each module is individually configurable and channels are not individually configurable.

Digital input filter Filter Time is currently configured as 3ms by default, and the supported setting range is 0~20ms, when configured as 3ms, it can filter out spurious waves within 3ms. 3ms input filter time means that a single signal from "0" to "1" or from "1" to "0" lasts for 3ms before it can be detected, while a single high pulse or low pulse shorter than 3ms will not be detected. The 3ms input filtering time means that a single signal from "0" to "1" or from "1" to "0" lasts for 3ms before it can be detected, while a single high pulse or low pulse shorter than 3ms will not be detected. The 3ms input filtering time means that a single signal from "0" to "1" or from "1" to "0" lasts for 3ms before it can be detected, while a single high pulse or low pulse shorter than 3ms will not be detected.

Function Description: When the input filter is configured to 1ms, spurious waves within 1ms can be filtered out. As shown in the figure below, a 250us signal input will be considered as an invalid signal. Individual high or low pulses shorter than 1ms will not be detected; signals of 1ms and above can be captured.


6.1.2 Digital output signal clear/hold

The Clear/Hold function is intended for modules with output channels. This function configures the output mode of the output channel when the module is in a non-OP Status (stopped operation or coupler net disconnected condition). This parameter supports the following output Statuss:

Clear output: When communication is disconnected, the output channel of the module will automatically clear the output, i.e. output 0.

Output RMS: When communication is disconnected, the module output channel always outputs RMS, i.e. output 1.

Hold previous output value: When communication is disconnected, the module output channel holds the previous output value.

The digital clear hold function supports both overall module setting (template mode) and single channel setting (single channel mode). Any channel can be set up using the single channel mode, or it can be set to the template mode, and the single channel mode has higher priority than the template mode. The specific configuration method is shown in the following table, and the default is module overall clear output.

Digital output module clear hold parameter										
Darameter name	Parameter	parameter	parameter Value Meaning							
Parameter name	Meaning	value	Parameter value Meaning	value						
TemplateMode	tomplato	1	PresetLow clears the output, i.e. outputs 0							
	template	2	PresetHigh outputs a valid value, i.e., outputs 1	1						
	mode	3	KeepMode holds the last output value.							
		0	TemplateValue template mode value, i.e. single							
		0	channel mode is not enabled							
Channel x	Single-channel	1	PresetLow clears the output, i.e. outputs 0	0						
	mode setting	2	PresetHigh outputs a valid value, i.e., outputs 1							
		3	KeepMode holds the last output value.							

6.1.3 Analog range Setting

The analog range setting Range Select is used to set the analog range range, which can be configured individually for each channel (see <u>3.3.4 and 3.3.5 Analog Parameters</u> for range details).

6.1.4 Analog Input Filtering

• Analog input filter function

The analog input filter function, Filter, averages the A/D converted data internally to reduce the effects of fluctuations in the input signal due to noise.

Analog inputs are processed as moving averages with a specified number of A/D conversions.

• Filter Function Configuration

Each channel can be configured individually, configuration range: 1~200, default 10 times. 8-channel module sampling rate: 2.5KHz/8 channels (400us/8 channels).

6.1.5 Analog output signal clear/hold

The Clear/Hold function is intended for modules with output channels. This function configures the output mode of the output channel when the module is in a non-OP Status (stopped operation or coupler net disconnected condition). This parameter supports the following output Statuss:

Clear Output: When communication is disconnected, the module output channel automatically clears the output.

Hold Outputs: The module output channels keep outputs when communication is disconnected.

Output preset value: When communication is disconnected, the module output channel outputs the preset value.

The analog clear hold function supports overall module setting (template mode) and single channel setting (single channel mode). Any channel can be set up using the single channel mode, or it can be set up as the template mode, and the single channel mode has a higher priority than the template mode. The specific configuration method is shown in the following table, and the default is module overall clear output.

Analog output module clear hold parameter											
Parameter	Parameter	parameter		default							
name	Meaning	value	Parameter value Meaning	value							
	tomoloto	0	0 Clear all-channel clear output								
TemplateMode	template	1	Hold full channel hold output	0							
	mode	2	2 Preset all-channel output presets								
		0	TemplateValue template mode value, i.e.								
Tamplata\/alua	Single channel	0	single channel mode is not enabled								
Chy	clear/hold	1	Clear single channel clear output	0							
	configuration	2	Hold single channel hold output								
		3	Preset single channel output preset								
Procet Value	Single channel	Code	Current/voltage value corresponding to the								
Chy	Single-Channel	Value	output code value								
Chx	presets	Range	(Table of corresponding range code values)								

Note: When the overall module setting (template mode) is configured to 2, i.e., when the full channel output preset value is in effect, the preset value is based on the preset code value of channel 0 in the single channel preset value for full channel output.

6.1.6 Analog power-down save

Analog parameters support abnormal power-down communication disconnection, all configuration parameters of the module to save the function, analog modules are default support power-down save.

This manual takes Sysmac Studio as an example to introduce the parameter configuration method of XB6S-EC2002 coupler + I/O module combination, the specific steps are described in detail in the parameter setting in chapter 6.3.1, and it is recommended to re-power up the system after the modification is completed.

6.2 Fault Code Information

6.2.1 Coupler General Fault Codes

serial number	Type of error	error code	Event Name	Event Code (2#)	Event Code (16#)	Treatment
2	Online ungrade	1	Firmware upgrade exception	00000001000001	0x0081	Try to re-upgrade, check for interference in the environment, oversized firmware, etc.
	error	2	Firmware does not match current module model	000000010000010	0x0082	Check for correct documentation, abnormalities or interference in modules, etc.
3	voltage error	5	Load side voltage not connected	0000000011000101	0x00C5	Detecting if the field side power supply is wired
7	parameter error	0	Parameter setting abnormality	0000000111000000	0x01C0	Checking module parameter settings
		1	X-bus initialization failure	0000111111000001	0x0FC1	Check that the module is connected properly
62	X-bus	2	X-bus token timeout	0000111111000010	0x0FC2	Check the module for abnormalities or interference, etc.
63	error	3	X-bus module running offline	0000111111000011	0x0FC3	Check if the module is online or there is interference, etc.
		4	Parsing data CRC error	0000111111000100	0x0FC4	Check the module for abnormalities or interference, etc.

6.2.2 Fault Code Viewing

TwinCAT3 software, for example, in the Error List window Error below to view the alarm information, as shown in the figure below, the alarm code code for Hex: 00c5, that is, the voltage error, the load side voltage is not connected, you can check the field side of the power supply is wired.

Solution Explorer 👻 🖣 🗙	TwinCAT Project1 🕫 🗙	
○ ○ ☆ [™] - ●	General Adapter EtherCAT Online CoE - Online	
Search Solution Explorer (Ctrl+;) Solution TwinCAT Project1' (1 project) TwinCAT Project1 Solution TwinCAT Project1 Ctrl Solution TwinCAT Project1 Ctrl Solution TwinCAT Project1 Solution TwinCAT Project1 Solu	No Addr Name State CRC T 1001 Box 1 (XB6S-EC2002) OP 0	
 ✓ Device 2 (EtherCAI) Image Image-Info ✓ SyncUnits ✓ Inputs ✓ Outputs ✓ InfoData ✓ Box 1 (X865-EC2002) ✓ Inputs 	Number Box Name Ad Type In Si Out E-Bu	File
 ▶ Outputs > M Module 1 (XB65-0032B) ▶ → VcState ▶ → InfoData ☆ Mappings 	Eventpriori - 2024/2/29 10:45:12 732 ms 'Box 1 (XB6S-EC2002)' (1001): CoE - Emergency (Hex: 00c5, 01, '01 00 00 00 ff').	The

The method of viewing event information is shown in the following table:

Structu	re of ever	nt information									
byte0	byte1	byte2		byte3	byte4	byte5	byte6	byte7			
				Module							
event	code	event Status	5	station	produ	ct lines	channel number				
				number							
		Example 0x01:	Event				Evampla Ov	EF. Channel			
		Generation					example ux	rr. Channei			
		0x00:	Event					Channel O			
		disappears									

6.3 EtherCAT Coupler Configuration Application

6.3.1 Application in Sysmac Studio software environment

1. Preparation

- hardware environment
 - > Module preparation, this note takes

XB6S-EC2002+XB6S-1616B+XB6S-A80VD+XB6S-A08I topology as an example

- > One computer with Sysmac Studio software pre-installed
- > One Omron PLC
 - This description is based on model NJ301-1100 as an example.
- > Shielded cables for EtherCAT
- > One switching power supply
- > Device Configuration Files

Configuration file access: https://www.solidotech.com/documents/configfile

Hardware configuration and wiring

Follow "<u>4 Installation and Disassembly</u>" and "<u>5 Wiring</u>".

• Computer IP requirements

Set the IP address of the computer and the IP address of the PLC to make sure they are on the same network segment.

2. New construction

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

Sysmac Studio (64bit)		- 🗆 X
Offline New Project Open Project Open Project Import Export	Project Properties Project name XB65 Author Comment	
Online <u>Connect to Device</u> Version Control <u>Version Control Explorer</u>	Type Standard Project	
License	Category Controller Device NI301 • 1 Version 1.42	
- Robot System		Create

• Project name: Customize.

- Select device: "Device" selects the corresponding PLC model and "Version" selects the corresponding PLC version number.
- b. When you have finished entering the project properties, click Create.
- c. Click "Controller -> Communication Set up" in the menu bar, select the method to be used every time you connect to the controller when you are online, and enter "Remote IP Address" as shown in the following figure.

Setup		-		\times					
▼ Connection type									
Select a method to connect with the Controller to use every time you go online.									
Remote connection via USB									
 Ethernet connection via a hub Select one method from these options at every online connection. 		_		0.42 mm					
Remote connection via USB									
▼ Remote IP Address		_	_						
Specify the remote IP address.									
192.168.250	.1								
USB Communications Test Eth	ernet Communications Test								
Test OK									
▼ 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 networks, such as VPN connection. 2 (s)									
ОК	Cancel								

d. Click "Ethernet communication test", the system shows that the test is successful.

3、Installation of XML files

- a. Expand "Configuration and Setup" in the left navigation tree and double-click on "EtherCAT".
- b. Right-click on "Master Device" and select "Display ESI Library" as shown below.



c. In the pop-up "ESI Library" window, click "Install (file)", select the module's XML file path, click "Yes" to complete the installation, as shown below.



4、 Add Device

There are two ways to add devices: online scanning and offline adding, and this note introduces offline adding as an example.

a. In the right side of the "Toolbox" column, click to expand all suppliers, select "Nanjing Solidot Electronic Technology Co.,Ltd."



b. Click to select XB6S Series Fieldbus and double-click the XB6S-EC2002 Coupler Module to add a slave device, as shown below.

XB6S - new_Controller_0 - Sysmac Studio (64bit)	- 0	×
Eile Edit View Insert Project Controller Simulation Tools Window Help		
★●■■サイ■■中へを同時ます。 スータッー ○出記 江のへた		
Multiview Explorer 🗸 🕴 🔛 EtherCAT 🗙 🗸 🗸 Toolbox		- q
new_Controller_0 Maging Solidot Electronic	lechnology Co	., Ltd 🔻
Configurations and Setup Master Item name Value All groups		
The CAT BEL X865-EC2002 Rev0x00000001 Model name X865-EC2002 Rev0x00000001 Model name X865-EC2002		
L		
► CPU/Expansion Racks Revision 0x00000001 Node Address 1		
e VO Map Enable/Disabl Enabled ▼ Input Kerword		
Kontonie Setup Serial Number Ox0000000	Show al	versions
e' Cam Data Settinas PDO Map Set En DOM	00000001	
Event Settings Enable Distri Disabled	s/Slots and ME	IP):
Task Settings		
🛙 Data Trace Settings Set a name for the slave.		
Programming		
output • • • ×		
Model name :	XB6S-FC2002	
Final Product name	: XB6S-EC200	2(Mo
Revision : 0x00 Vendor: Nani	000001 ina Solidot Fl	ectroi
i Filter Comment :	ig solidot Li	

c. In the EtherCAT main page, select the XB6S-EC2002 coupler module you just added, and choose "Edit Module Configuration" as shown in the following figure.



d. Position the cursor in "Module", click on the module in the right toolbox module list, and add I/O modules one by one in the order of I/O module configuration. Note: The order and model number must be consistent with the physical topology!

XB6S - new_Controller_0 - Sysm	ac Studio (64bit)	- 🗆 ×
Eile Edit View Insert Project	t <u>C</u> ontroller <u>S</u> imulation <u>T</u> ools <u>W</u> indow <u>H</u> elp	
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X IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	Image: State of the series	Colbox P Toolbox P Sroup All groups Digital IO Terminals Digital Output Terminals Digital Quitput Terminals Digital Output Terminals Digital Output Terminals Digital Output Terminals Digital Output Terminals Digital Output Terminals Input Keyword X865-0023 X865-0023 P X865-0024 Channel Relay Output X865-0029 Channel Analog Output, Voltage X865-A001 Channel Analog Input, Voltage X865-A001 Channel Analog Input, Voltage X865-A001 Channel Analog Input, Current X865-A001 Channel Analog Input, Current
		Model : XBOS-AUdi Product name : 8 Chann Vendor : Nanjing Solido
i Filter	Output Build	

5. Setting the node address

a. Click "Controller -> Online" in the menu bar to turn the controller to online status. Right-click the master device, click and select "Write Slave Node Address", as shown in the following figure.



b. In the Set Node Address window, click the value under Set Value, enter the node address, and click "Write" to change the slave device node address, as shown in the following figure.

Slave Node Address Writing	-		×
Present value/Set value/Actual network configuration			l.
Master			
з 1 ХВ6S-ЕС2002 Rev:0x00000001			
Update With Latest Actual N	etwork C	onfigura	tion
Node 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 privaddresses set here are applicable.	ority. In c	other cas	es, the
	Write	e Ca	ncel

c. After writing, a re-power prompt will pop up, as shown in the following figure, click "Write", and then follow the prompts to reboot the power from the device.



6. Download configuration to PLC

a. Click the button "Controller -> Transfer (A) -> To Controller (T)" in the menu bar, as shown in the following figure.



b. The configuration will be downloaded to the PLC, the transmission confirmation pop-up window will appear, click "Execute", and then click "Yes/OK" in the subsequent pop-up window, as shown in the figure below, after the download is completed, you need to re-power up.



7. parameterization

a. Switch the configuration to offline Status, edit module configuration page in node 1, select XB6S-1616B module, click "Edit Initialization Parameter Settings", as shown in the following figure

ngure.		
XB6S - new_Controller_0 - Sysm	ac Studio (64bit)	- 🗆 X
<u>Eile Edit View Insert Projec</u>	t <u>C</u> ontroller <u>S</u> imulation <u>T</u> ools <u>W</u> indow <u>H</u> elp	
		10 B # 2 Q .
Multiview Explorer	EtherCAT Node1 : XB65-EC2002 (EO × Positi Slot Module Node1 : XB65-EC2002 (EO.1) Image: Constraint of the state of t	Value Value Voluce Volu
1 Filter	Output Build	

Note: If the PLC firmware version is too low, you need to use EC_CoESDOWrite, EC CoESDORead instruction to write and read the SDO address.

b. In the XB6S-1616B parameter setting page, you can configure the digital input filtering and output signal clear/hold functions as shown below.

XB	6S -	new_C	ontr	oller_	0 - Sy	/smac	Studio	(64bi	t)																		_		\times
File	Edit	t Vie	w	nsert	Pro	oject	Contr	oller	Sim	ulatio	n T	ools	Wir	ndow	He	elp													
X	١	Ê	Ŵ	¢	€	2	3D	5	く	2	63	5	63 701	Ä	0	R		A		63	63	¢۶	e _m	0	9 <u>1</u> 1	P 1] Q	Q "?	
Multi	viev	🔝 Ec	lit Se	tting	Parar	meters	;																				-		×
DOW	Con							Item	name	e													۷	/alue					
ITEW_		0x200	0:01	XB6S-	1616	B Confi	g/Filter	Time		_	_	_	_	_	_	-0	3: 3m	5											
V Co	nfigu	0x200	0.02	AB02-	1616	B Confi B Confi	ig/Temp ig/Chan	nateivi nal 00									0. Ter	nnlate	/alue										
	7 m E	0x200	0:04	XB6S-	1616	B Confi	ig/Chan	nel 01									0: Ter	nplate\	/alue										÷
		0x200	0:05	XB6S-	1616	B Confi	ig/Chan	nel 02									0: Ter	nplate\	/alue										
		0x200	0:06	XB6S-	1616	B Confi	ig/Chan	nel 03									0: Ter	nplate\	/alue										
		0x200	0:07	XB6S-	1616	B Confi	ig/Chan	nel 04									0: Ter	nplate\	/alue										
		0x200	0:08	XB6S-	1616	B Confi	ig/Chan	nel 05									0: Ter	nplate\	/alue										
		0x200	0:09	XB6S-	1616	B Confi	ig/Chan	nel 06									0: TemplateValue 0: TemplateValue												
	- tar C	0x200	0:0A	AB02.	1616	в Conf В Conf	ig/Chan	nel 07									0: TemplateValue												
	-* 1	0x200	0.00	XB6S-	1616	B Conf	ig/Chan	nel 09									0: TemplateValue 0: TemplateValue												
	▶ 艮 (0x200	0:0D	XB6S	-1616	B Conf	ia/Char	inel 10									0: Ter	nplate\	/alue										$\overline{\mathbf{v}}$
	► @																			_									_
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		- Help																											
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	9																												
		\geq																											=
		This Selec	Settii t Syr	ng Pai Ichroi	ramet nize o	ters ar	e savec Toolba	l in th r to tr	e CPl ansfe	J Unit er.	as a j	oart o	of Eth	erCA	l set	ting.													
																										OK	Ca	ncel	Apply
<	lter					>	output	Build																					

c. Digital input filter time FilterTime can be set from 0 to 20ms, after the configuration is complete, click "Apply", click "OK", as shown in the figure below. After all the parameters are configured, you need to re-download the program to the PLC, and the PLC and module need to be re-powered.

XB69	s - n	new_Cor	ntroller_	0 - Sysmao	Studio	(64bi	.)																	-			\times
File E	dit	View	Insert	Project	Contr	oller	Sim	ulation	ו Tool	s W	indow	He	elp														
X í	١	î î	د ا	< ₹?	3D	ď	く	*	53 F3	63 ML	Ä	0		i,	<u>A</u>	X	69	63	\$ с _н ,	0	P 1	r	Ľ	Ð,	Θ, "	ಷಿ	
Multivi	ev	🚵 Edit	Setting	Parameter	s																			-			×
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► Prog		-Help – Data ty Comme	pe : ent :											18:	18ms												ł
		This Sel Select S	ting Par	rameters a nize on the	re saveo Toolba	d in th ar to tr	e CPL ansfe	J Unit r.	as a par	t of Et	herCA	.T set	ting.										ЭK	Car	icel	Appl	y
<	er				Dutput	Build																					

d. Digital output signal clear/hold function, the default full-channel preset for the output clear mode, the module channel can be configured separately, the corresponding relationship see <u>6.1.2 Digital Output Signal Clear/Keep</u>, after the configuration is complete, click "Apply", click "OK". After configuration, click "Apply" and "OK", as shown in the following figure. After all the parameters are configured, you need to re-download the program to PLC, and the PLC and module need to be re-powered.

📓 XB6S -	new_	Cont	roller	_0 - S	ysmac	Studio	64bi	t)																			-		×
File Edi	t Vie	w	Inser	t Pi	roject	Cont	roller	Sin	nulatio	on [°]	Tools	Wi	ndow	He	elp	_	_	_	_	_	_	_	_	_	_	_	_	_	_
Χ 🛍	P	Ū	¢	¢	?	30	ď	く	*	69	₽63	63 	Ä	0	ŀ	ž,	<u>A</u>	X	69	63	۴Þ	e _{ll}	0	P 1	r		Ð,	Q, "	ಷಿ
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e. On the Edit Module Configuration page of Node 1, select the XB6S-A80VD module and click "Edit Setting Parameters", as shown in the following figure.

XB6S - new_Controller_0 - Sysm	nac Studio (64bit) — 🗆 🗙
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L ⊂ 0 : Abds-TisTel(WT) L ⊂ 1 : XB65-Ab80(M2) L ⊂ 2 : XB65-Ab81(M3) ► © CPU/Expansion Racks # I/O Map ► 3 Controller Setup ► Michion Control Setup e' Cam Data Settings ► Event Settings	4 Ierminals Oxdot 1x0 inputs/Channel 5 5 Ierminals 0x6001 1x0 inputs/Channel 6 6 Terminals 0x6001 1x0 inputs/Channel 7 7 Ierminals Edit PDO Map Settings 8 Terminals Setting Parameters 9 Terminals Edit PDO Map Settings 10 Ierminals Device name 11 Terminals Setting Parameter Settings 12 Ierminals Set a name for the device.
Task Settings Data Trace Settings	15 Terminals
Programming	Output • • • • • •
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f. In the XB6S-A80VD Analog Voltage Input Module Parameter Setting page, you can configure the analog voltage range and analog input filter parameters as shown below.

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g. Analog input voltage can be configured as 8 ranges, each channel is configured independently, after the configuration is complete, click "Apply", click "OK", as shown in the figure below. After all the parameters are configured, you need to re-download the program to the PLC, and the PLC and module need to be re-powered.

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Analog input filtering can be configured from 1 to 200, support for single-channel independent configuration, configuration is complete, click "Apply", click "OK", as shown in the figure below.
 After all the parameters are configured, you need to re-download the program to the PLC, and the PLC and module need to be re-powered.

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i. On the Node 1 Edit Module Configuration page, select the XB6S-A08I module and click "Edit Setting Parameters", as shown in the following figure.

XB6S - new_Controller_0 - Sysr	nac Studio (64bit) — 🗆 >
<u>File Edit View Insert Proje</u>	ect <u>C</u> ontroller <u>S</u> imulation <u>I</u> ools <u>W</u> indow <u>H</u> elp
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Multiview Explorer Multiview Explorer Configurations and Setup Configurations Multiview Controller Setup Controller Setup Controller Setup Controller Setup Controller Setup Control Setup Controller Setup Controller Setup Control S	HercAT Node1 : X865-EC2002 (E0). × Positi Slot Module Node1 : X865-EC2002 (E001) Item name Value 0 Terminals MuK865-1616B (M1) 0x7001-02 Outputs/Channel 1 1 Terminals MuK865-A080 (M2) 0x7001-02 Outputs/Channel 3 2 Terminals MuK85-A080 (M2) 0x7001-05 Outputs/Channel 4 3 Terminals 0x7001-05 Outputs/Channel 5 0x7001-06 Outputs/Channel 4 4 Terminals 0x7001-05 Outputs/Channel 6 0x7001-06 Outputs/Channel 7 5 Terminals 0x7001-07 Outputs/Channel 6 0x7001-09 Outputs/Channel 6 6 Terminals 0x7001-09 Outputs/Channel 6 0x7001-09 Outputs/Channel 6 7 Terminals Edit PDO Map Settings Edit PDO Map Settings 8 Terminals Edit Setting Parameters Edit Setting Parameters 9 Terminals Edit Setting Parameters Edit Setting Parameters 110 Terminals Edit Setting Parameters Setting 12 Terminals Edit Setting Parameters Setting 13 Terminals Edit Setting Parameters </th
Programming	Output • # ×

j. In the XB6S-A08I Analog Current Output Module Parameter Setting page, you can configure the analog current range and analog output signal clear/hold parameters as shown below.

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Ox2000:03 XB6S	-A08I Config/Range Select Ch02		2: 0~20mA(0~65535)			s
0x2000:04 XB6S	-A08I Config/Range Select Ch03		2: 0~20mA(0~65535)			als
0x2000:05 XB6S	-A08I Config/Range Select Ch04 -A08I Config/Range Select Ch05		2: 0~20mA(0~65535) 2: 0~20mA(0~65535)			hals
L = 0x2000:07 XB6S	-A08I Config/Range Select Ch05		2: 0~20mA(0~65535)		÷.	
0x2000:08 XB6S	-A08I Config/Range Select Ch07		2: 0~20mA(0~65535)			
● © CPU/E 0, 2000,04 X865	-A08I Config/TemplateMode		0: Clear			
I/O Mi 0x2000:0A XB65 → I/O Mi 0x2000:0B XB65	-A081 Config/TemplateValue Ch00 -A081 Config/TemplateValue Ch01		0: TemplateValue		N	anipat, conter
► R Contrc 0x2000:0C XB65	-A08I Config/TemplateValue Ch02		0: TemplateValue			nput, Voltage
►	-A08I Config/TemplateValue Ch03		0: TemplateValue			ial Analog Inr
∉ Cam D			Move Up Move Down	Add Re	move	in Analog inp
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This Setting Pa Select Synchro	rameters are saved in the CPU Un nize on the Toolbar to transfer.	it as a part of EtherCAT settin	g.			
				OK Cancel	Apply	-A08I
	T			Ve	ndor: Na	njing Solido
<	>					
i Filter	Output Build					

k. Analog output current can be configured as 5 ranges, each channel is configured independently, after the configuration is complete, click "Apply", click "OK", as shown in the figure below. After all the parameters are configured, you need to re-download the program to the PLC, and the PLC and module need to be re-powered.

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new_Controll Configurati Confi	Item name Value 02200001 X865-X08I Config/Ange Select Ch00 (2 0 - 20nAQ - 6553) ▼ 0x200002 X865-X08I Config/Ange Select Ch01 0 Diable ▼ 0x200001 X865-X08I Config/Ange Select Ch01 0 Diable ▼ 0x200002 X865-X08I Config/Ange Select Ch02 1:4-20nAQ - 65533 ▼ 0x200005 X865-X08I Config/Ange Select Ch03 2:0 - 20nAQ - 27640) ▼ 0x200007 X865-X08I Config/Ange Select Ch05 -0 - 20nAQ - 27640) ▼ 0x200009 X865-X08I Config/Ange Select Ch05 -2 - 20nAQ - 25533 ▼ 0x200009 X865-X08I Config/Ange Select Ch06 2:0 - 20nAQ - 25533 ▼ 0x200009 X865-X08I Config/Ange Select Ch07 2:0 - 20nAQ - 25533 ▼ 0x200009 X865-X08I Config/Ange Select Ch07 2:0 - 20nAQ - 25533 ▼ 0x200009 X865-X08I Config/Ange Select Ch07 2:0 - 20nAQ - 25533 ▼ 0x200009 X865-X08I Config/Ange Select Ch07 2:0 - 20nAQ - 25533 ▼ 0x200009 X865-X08I Config/Ange Select Ch07 0:1 FinaplateValue ▼ 0x200009 X865-X08I Config/Ange Select Ch07 0:1 FinaplateValue ▼ 0x200000 X865-X08I Config/Amge Select Ch07 0:1 FinaplateValue	al Analog Ins put, Voltage put, Current al Analog Ins put, Current
	This Setting Parameters are saved in the CPU Unit as a part of EtherCAT setting. Select Synchronize on the Toolbar to transfer. OK Cancel Apply	utput, Currer
<	Vendor: Nan	jing Solido

I. Analog output signal clear/hold function, the default all channels for the output clear mode, module channels can be configured separately, the corresponding relationship see <u>6.1.5 Analog</u> <u>Output Signal Clear/Hold</u>, configuration is complete, click "Apply", click "OK". Click "Apply" and "OK" when the configuration is completed, as shown in the figure below. After all the parameters have been configured, you need to re-download the program to the PLC, and the PLC and module need to be re-powered.

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	This Setting Parameters are saved in the CPU Unit as a part of EtherCAT setting. Select Synchronize on the Toolbar to transfer.		6S-A08I
E Filter		OK Cancel Apply	

8、 I/O Functions

a. Double-click "I/O Map" in the left navigation tree to see the mapping table of each module in the topology, so as to monitor the input and output values of each channel of each module, as shown in the following figure.

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Multiview Explorer Reference T The EtherCAT T Node1 : XB6S-EC2002 (E0	Toolt
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v 21 EtherCAT Outputs_CouplerCtrl_F200_01 W UINT 0	
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L ⊂ 0 : XB6S-1616B(M1) Slot 0 P XB6S-1616B	
L □ 1 : X865-A80V(M2) Slot 2 > X865-A081	
L ⊂ 2 : XB65-A08I(M3) ▼ CPU/Expansion Racks	
CPU Rack 0	
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► Motion Control Setup	
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▶ Event Settings	
■ Task Settings	
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Programming Output	- 4 ×
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b. Expand the mapping table of XB6S-1616B digital module, when the input channel inputs the effective voltage, you can monitor the input value in the mapping table; the output channel can be modified by modifying the value of the channel to force the output control, as shown in the following figure.

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c. Expanding the mapping table of the XB6S-A80VD analog module, you can monitor the input voltage code value of each channel as shown below, and the correspondence between code value and voltage is detailed in <u>3.3.4 and 3.3.5 Analog Parameters</u>.

XB6S - new_Controller_0 - Sysmac	Studio (64bit)												-		1	×
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new Controller 0	位置		端口		. k		说明		R/W	数据3	起!	值	Ţ	变量			柏
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L = 1 : XB6S-A80VD(M2)	India .	Inputs (Channel 0 600	1 01					R	INT		17	<u> </u>				
= L = 2 : XB6S-A08I(M3) =	-	Inputs	Channel 1 600	1 02					R	INT	3						
▶ re CPU/扩展机架 -	8	Inputs_0	Channel 2_600	1_03					R	INT	5						
■ 1/0 映射		Inputs_0	Channel 3_600	1_04					R	INT	-	17					
■ ▶ 🛛 控制器设置		Inputs_0	Channel 4_600	1_05					R	INT	6						
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🖉 🖌 Cam数据设置		Inputs_0	Channel 6_600	1_07					R	INT	7						
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d. Expand the mapping table of XB6S-A08I analog module, write current code value can be forced to output for each channel, as shown below, the correspondence between code value and current is detailed in 3.3.4 and 3.3.5 Analog Parameters.

XB6S - new_Controller_0 - Sysma	ac Studio (64bi	it)			- 🗆 X
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 Configurations and Setup 	Node1	▼ TXB6S-EC2002			
▼		Outputs_CouplerCtrl_F200_01	w	UINT	
▼ □ Node1 : XB6S-EC2002(E		Inputs_CouplerState_F100_01	R	UINT	
L □ 0 : XB6S-1616B(M1)	Slot 0	XB6S-1616B			
L □ 1 · XB6S-A80V(M2)	Slot 1	► XB6S-A80V			
1 □ 2 · XB6S-A08I(M3)	Slot 2	XB6S-A08I			
► © CPU/Expansion Backs		Outputs_Channel 0_7001_01	w	UINT 65535	
		Outputs_Channel 1_7001_02	W	UINT 0	
Controller Setup		Outputs_Channel 2_7001_03	W	UINT 0	
► # Motion Control Setup		Outputs_Channel 3_7001_04	W		
► ♥ Motion Control Setup		Outputs_Channel 4_7001_05	W		
& Cam Data Settings		Outputs Channel 5 7001 07	W		
P Event Settings		Outputs Channel 7 7001 08	Ŵ		
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6.4 Firmware Online Upgrade

1、 Take TwinCAT3 software as an example, the topology is XB6S-EC2002+XB6S-0032B as shown below.

Solution Explorer - 7 ×	TwinCAT Project	:t1 ≄ ×				
ෙ ට යු <mark>` ල -</mark> ඕ ዾ _=	General Ethe	erCAT DC	Process D	ata Slots	Startup CoE - Onlin	e Diag History Online
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✓ TwinCAT Project1	Init		Bootstrap			
SYSTEM	Pre-Op		Safe-Op		Current State:	OP
	Op		Clear Error		Requested State:	OP
GATELY C++						
	-DLL Status	-				
 Devices Device 2 (EtherCAT) 	Port A:	Carrie	r / Open			
Image Image-Info	Port B:	No Ca	rrier / Closed	d		
SyncUnits	Port C:	No Ca	rrier / Closed	d		
 Inputs Outputs 	Port D:	No Ca	rrier / Closed	d		
InfoData Boy 1 (XB6S_EC2002)						
 Inputs 	File Access	over Ether	CAT			
 Outputs Module 1 (XB6S-0032B) 	Down	load	Upload	ł		
 WcState 		1				
InfoData	Name	Online	Туре	Size >/	A In/ Us Linked	to
Mabbulas	✓ CouplerS ✓ WcState	0	BIT	2.0 39	1.0 In 0 2 In 0	
		1	RIT	01 15	12 In 0	

2、 Click the coupler "XB6S-EC2002" in the navigation tree on the left, click the "Online" option in the menu on the right, click the "Bootstrap" option in Status Machine, and then click the "Download" option in File Access over EtherCAT below after the Current Status shows "BOOT" status. Click the "Bootstrap" option in Status Machine, and then click the "Download" option in File Access over EtherCAT at the bottom of the menu after the Current Status displays the "BOOT" status, as shown in the figure below. Click the "Download" option in File Access over EtherCAT as shown in the figure below.

Solution Explorer - 📮 🛪	TwinCAT Proje	ct1 +⊨ ×					
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Search Solution Explorer (Ctrl+;)	CL 1 M			2			
Solution 'TwinCAT Project1' (1 project)	State Mac	nine		3			1
TwinCAT Project1	Init		Bootstrap				T
SYSTEM	Pro On		Cafe On		Î	Current State:	ROOT
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	DUL Statu						
Devices	DLL Status	,	202200				
 Device 2 (EtherCAT) 	Port A:	Carrier	/ Open				
📑 Image	Port B	No Car	rier / Close	ed	1		
Timage-Info			5 9.29	1.02			
P Syncunits	Port C:	No Cari	rier / Close	ed			
Outputs	Port D:	No Carr	rier / Close	ed			
🕨 🛄 InfoData							
A Box 1 (XB6S-EC2002) 1	F 11 A	511 0	AT				
Inputs	File Acces	s over EtherC	AI				
Outputs	Down	load 5	Uploa	d			
Module 1 (XB6S-0032B)							
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	WcState	1	BIT	0.1	152	In 0	
		0	BIT	0.1	152	In 0	

3. Open the file window, select the "All Files" option, select the bin file corresponding to the module to be upgraded, click "Open", as shown in the following figure.

▶ 打开					×
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组织 • 新建文件	夹				0
💄 此电脑	^	名称 人		修改日期	
3D 对象		enccrypt(XB6S-EC200	2-1)0229-134006.bin	2024/2/29 13:40	
📑 视频					
■ 图片					
🖹 文档					
➡ 下载					
♪ 音乐					
💶 桌面					
😍 Windows (C:)					
🤳 Work (D:)					
🥩 网络					
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	文件	名(<u>N</u>): enccrypt(XB6S-EC200)2-1)0229- ~ All Fil	es (*.*) 开(O) 取当	~
			11		

4. The setting window pops up, enter Password, Password is 0 for upgrading the coupler, click "OK" to upgrade, as shown in the following figure. Note: To upgrade the corresponding slave module, you need to fill in the corresponding station number in the Password, such as XB6S-0032B upgrade here, fill in 1. After confirming the upgrade, observe the progress bar and the performance of the module to confirm whether the upgrade is successful or not (see the next step for details).

Edit Foe Name		
String:	enccrypt(XB6S-EC2002-1)0229-134006	ОК
Hex:	65 6E 63 63 72 79 70 74 28 58 42 36 53 2D 45	Cancel
Length:	34	
Password (hex):	0000000	

5. Successful upgrade process for different modules

EtherCAT couplers are upgraded online:

- 1) When the progress bar is full, the coupler IOR starts flashing at 10Hz (50ms on 50ms off);
- 2) The IOR changes from 10Hz blinking to 1Hz blinking, indicating a successful upgrade;
- 3) You need to manually switch to OP status after successful online upgrade to re-establish the connection;
- 4) To repeat the upgrade you need to cut the OP Status to BOOT Status again.

IO modules are upgraded online:

- 1) When the progress bar is full, the coupler IOR and the SYS of the module being upgraded begin to flash at 10Hz (50ms on 50ms off);
- 2) The SYS of the module being upgraded changes from 10Hz to off, indicating that the upgrade is successful (the upgrade needs to be re-powered to connect normally after completion);
- 3) It is possible to continue upgrading other modules without losing power.