

XB6S Series

Temperature acquisition module

User Manual



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1 Product Overview

1.1 Product Introduction

XB6S series temperature acquisition module supports thermal resistors, thermocouples and other types of sensors. There are two types of modules: 4-channel and 8-channel. They use X -bus bottom bus and are compatible with XB6S series couplers. The modules occupy a small space and are highly practical, providing users with high-speed data acquisition, optimized system configuration, simplified on-site wiring, and improved system reliability .

1.2Product Features

• Various measurement types

The measurement types supported are thermocouples, RTDs, and resistors .

• High sensitivity

Sensitivity: 0.1 °C .

• Channel filter

Support single channel filter setting.

• Disconnection Detection

Disconnect detection is supported for RTD, resistor, and thermocouple type sensors.

Noise Suppression

Supports 50Hz , 60Hz , 10Hz and no noise suppression configurations.

• Small size

Compact structure and small space occupation.

• Easy diagnosis

The indicator lights are fully designed, the module status is clear at a glance, and detection and maintenance are convenient.

• Easy to install

DIN 35 mm standard rail installation .

It adopts spring-type terminal blocks, making wiring convenient and quick.

• Easy configuration

The configuration is simple.

2 Product Parameters

2.1 General parameters

Interface parameters		
Product Model	XB6S-A40TM	XB6S-A80TM
Bus protocol	X -bus	
Bus input power rated voltage	5 VDC (4.5V ~ 5.5V)	
Rated current consumption	200mA	110mA
Power consumption	1 W	0.55W
Transfer rate	6 Mbps	
Station Type	Slave	
Power supply	5 VDC , powered by X	C-bus
General parameters		
Specifications and dimensions	10 6.4 × 25.7 × 72.	3 mm
weight	90 g	110 g
Operating temperature	-20 °C~ + 60 °C	
Storage temperature	-40 °C ~+ 80 °C	
Relative humidity	95 %, non- condensin	g
Protection level	IP20	
Safety Certification	CE certification, UL ce	rtification
Green Environmental Certification	RoHS certification, RE	ACH certification

Technical Parameters			
Number of channels	4, 8		
Sensor Type	Thermocouple	Thermal resistor	Resistor
Connection	2-wire	2-wire, 3-wire	2-wire
Sensor code and range	B: 50~1800°C C: (reserved) ^[1] E: -200~1000°C J: -200~1200°C K: -200~1370°C L: (reserved) N: (reserved) R: (reserved) S: -50~1690°C T: (reserved)	Pt100: -200~850°C Pt200: -200~850°C Pt500: -200~850°C Pt1000: -200~850°C Ni120: (reserved) Ni100: -60~250°C Ni1000: -60~250°C Ni200: (reserved) Ni500: (reserved)	15Ω~3kΩ 15Ω~150Ω (reserved) 15Ω~300Ω (reserved) 15Ω~600Ω (reserved)
Accuracy	U: (reserved) ±0.3% @25°C (FS) ±0.5% @-20~60°C (FS)	±0.1% @25℃ (FS) ±0.3% @-20~60℃ (FS)	±0.1% @25°C (FS) ±0.3% @-20~60°C (FS)
Sensitivity	0.1 °C ± 0.1 Ω		± 0.1 Ω
Temperature	Supports switching between Celsius, Fahrenheit, and thermodynamic		
measurement units	temperature scale units (the default unit is Celsius)	[2]
Resolution	16 bits (int type)		
Channel conversion time	29ms/ch 115ms/8ch	73ms/ch 290ms/8ch	
Filter	Single channel filter, conf	igurable (level 0 to 10)	
Disconnection Detection	support		
Disconnection detection time	2ms		
Misconnection overvoltage protection	±30V		
Noise Suppression	50Hz, 60Hz, 10Hz, no noi	se suppression	
Excitation current	<2mA		
Input Impedance	≥10KΩ		
Isolation method	Digital Isolation		
Isolation withstand voltage	500VDC		
Channel indicator light	Green LED light		

Note [1]: Sensor codes C, L, N, R, T, U, Ni120, Ni200, Ni500, $15\Omega \sim 150\Omega$, $15\Omega \sim 300\Omega$, and $15\Omega \sim 600\Omega$ are not currently supported.

Note [2]: Fahrenheit (°F) = 32+T (°C)×1.8; Thermodynamic temperature scale (K) = T (°C)+273.15.

3 Panel

3.1 Panel structure

Product Parts Name

3.2 Indicator light function

Temperature acquisition module indicator light definition					
Marking	Name	Color	State	Status description	
PWR Power		ON	Power supply is normal		
	Green		The product is not powered on or the power		
	indicator	OFF		supply is abnormal	
				ON	The system is running normally
Operation SYS status indicator	Green	Flashing 1 Hz	No business data interaction, waiting to		
			establish business data interaction		
		Flashing 10 Hz	Firmware Upgrade		
		OFF	System not working		
	Channel			The channel is enabled and the sensor is	
07	indicator	Current	ON	connected normally	
		Green	OFF	The channel is prohibited or the sensor is not	
	light			connected normally	

4 Installation and uninstall

4.1 Dimensions





8- channel temperature acquisition module dimensions (unit: mm)

4.2 Installation Guide

Installation\uninstall precautions

- The module protection level is IP 20. The module needs to be installed in a cabinet and used indoors.
- Ensure that the cabinet has good ventilation measures (such as installing an exhaust fan in the cabinet).
- Do not install this device near or over any equipment that may cause overheating.
- Be sure to install the module vertically on the fixing rail and maintain air circulation around it (there should be at least 50 mm of air circulation space above and below the module).
- After the module is installed, be sure to install the guide rail fixings at both ends to secure the module.
- Installation and uninstall must be performed with the power turned off.
- After the module is installed, it is recommended to connect and route the cables in an up-and-down manner.



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



Ensure the module is installed vertically





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Module upper and lower wiring diagram



4.3 Installation and uninstall steps

Module install	ation and uninstall
	1. Install the coupler module on the fixed guide rail first.
	2. Install the required I /O modules or functional modules in sequence on the right side
Module	of the coupler module.
installation	3. After installing all required modules, install the end cap to complete the module
steps	installation.
	4. Install the guide rail fixings at both ends of the coupler module and the end cap to fix
	the module.
Module	1. Loosen the guide rail fixings at both ends of the module.
uninstall	2. Use a flat-blade screwdriver to pry open the module buckle.
steps	3. Pull out the uninstalled module.

4.4 Installation and uninstall diagram

Coupler module installation

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



guide rail with force until you hear a "click" sound, and the module is installed in place, as shown in Figure ② below.

2

I /O Module Installation

Follow the steps above to install the coupler module and install the required I/O modules or functional modules one by one . Push them in as shown in Figures ③, ④, and ⑤ below. When you hear a "click", the module is installed in place.



3





End cap installation

Install the end cap on the right side of the last module, aligning one side of the end cap groove with the guide rail. For installation, refer to the installation method of the I/O module and push the end cap inwards into place, as shown in Figure (6) below.



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



Guide rail fixtures installation

Install and tighten the guide rail fixtures close to the left side of the coupler, as shown in Figure below.



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



Uninstall

Use a screwdriver to loosen the guide rail fixtures at one end of the module and move them to another side to ensure that there is a gap between the module and the guide rail fixtures, as shown in Figure ⁽¹⁾ below.





Insert a flat-blade screwdriver into the buckle of the module to be uninstalled, and apply force to the module sideways (until you hear a sound), as shown in Figures (1) and (12) below. Note: Each module has a buckle on the top and bottom, and all modules are operated in the same way.





■ Follow the opposite steps of installing the module to uninstall the module, as shown in Figure ¹³ below .



5 Wiring

5.1 Wiring Diagram

5.1.1 XB6S-A40TM



^{*2-}wire thermal resistor needs to short-circuit "-" and "C" externally

*4-wire sensor needs to be changed to 2-wire or 3-wire connection

5.1.2 X B6S-A80TM



*PE internal conduction

*2-wire thermal resistor needs to short-circuit "-" and "C" externally *4-wire sensor needs to be changed to 2-wire or 3-wire connection

6 Operation

6.1 Configuration parameter definition

Taking XB6S-A80TM as an example, there are 31 parameters in total for module configuration, among which channel filter time parameters, channel enable parameters and temperature compensation parameters can be set for a single channel. Channel 0 is used as an example to introduce the configuration parameters, as shown in the following table.

Function	Parameter name	Value range	Default value
		0 : PT100	
		1: PT200	
		2: PT500	
		3: PT1000	
		4: Ni120_ID (Reserve)	
		5: THERMOCOUPLE_K	
		6: THERMOCOUPLE_J	
		7: THERMOCOUPLE_T (Reserve)	
		8: THERMOCOUPLE_E	0
		9: THERMOCOUPLE_N (Reserve)	
Sensor Type	Sonsor Typo	10: THERMOCOUPLE_S	
Selection	11: THERMOCOUPLE_R (11: THERMOCOUPLE_R (Reserve)	0
		12: THERMOCOUPLE_B	
		13: THERMOCOUPLE_C (Reserve)	
		14: THERMOCOUPLE_L (Reserve)	
		15: THERMOCOUPLE_U (Reserve)	
		16: Ni 100	
		17: Ni 1000	
		18: LG-Ni 1000 (Reserve)	
		19: Ni 200 (Reserve)	
		20: Ni 500 (Reserve)	
			21: RESISTANCE 15:150 (Reserve)

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		22: RESISTANCE_15:300 (Reserve)	
		23: RESISTANCE_15:600 (Reserve)	
		24: RESISTANCE_15:3000	
		25: -1:1V (Reserve)	
		26: -250:250mV (Reserve)	
		27: -50:50mV (Reserve)	
		28: -80 : 80mV (Reserve)	
		0 : Default	
		1: 50hz	
Filter Type	Filter Type	2:6 0hz	
		3: 10hz	
Cold junction	Call Componention	0: Internal Compensation	
compensation function	Mode	1: Disable	0
Temperature		0: Centigrade	
measurement	Temp Mode	1: Fahrenheit	0
unit switch		2: Thermodynamic	
Channel filter	Filter Time All	0~10	0
time	Filter Time CH00	0~10	255 (follow Filter Time All)
		0: Disabled	1
	Enable All	1:Enable	I
Channel Enable		0: Disabled	
	Enable CH00	1:Enable	2
		2: Follow Enable All	
Temperature	Cmp All	- 10000~10000	0
compensation	Cmp CH00	- 10000~10000	32767 (Follow
		10000-10000	Cmp All)

6.1.1 Sensor Type Selection

The module supports sensor type configuration function (for sensor types, see <u>2 Product</u> <u>Parameters</u>).

The same module only supports the same type of sensor, and a single channel cannot be configured.

Note: The default sensor type is PT100.

6.1.2 Filter function

The module provides no filtering, 50Hz , 60Hz , and 10Hz hardware filtering configuration functions.

The channel filter time setting function can support module overall settings (Filter Time All) and single channel settings (Filter Time CHxx). Any channel can be set using Filter Time CHxx or set to Filter Time All. The single channel setting has a higher priority than the overall setting. Filter Time All can set the filter range from 0 to 10, and the default is 0.

Filter Time CHxx for a single channel is 255, which follows Filter Time All. The filter range for a single channel can be set from 0 to 10.

6.1.3 Cold junction compensation function

The cold junction compensation function supports two compensation modes: internal cold junction compensation mode and closed cold junction compensation mode. The internal cold junction compensation mode is enabled by default.

6.1.4 Temperature measurement unit switch

The module supports configuration conversion of temperature measurement units between Celsius , Fahrenheit , and Thermodynamic temperature scales .

Note: The default sensor measurement unit is Celsius .

6.1.5 Channel enable function

The module can determine whether the channel is used through the "Enable/Disable" parameter setting. If the channel is set to disabled, the channel is disabled and no display - 9999 will be displayed regardless of whether the sensor is connected.

The channel enable function can support module overall settings (Enable All) and single channel settings (Enable CHxx). Any channel can be set using Enable CHxx or set to Enable All. Single channel settings have higher priority than overall settings.

Enable All is enabled by default.

Enable CHxx single channel is set to follow Enable All.

6.1.6 Temperature compensation function

The module supports manual cold-end compensation for each channel data in thermocouple and thermal resistor modes. The data compensation value can be entered according to actual needs. After setting the compensation value, the compensated temperature will be automatically calculated in the upstream data (Input), that is, the upstream data is the final compensated temperature. Divide the read data by 10 to get the compensated temperature in °C.

The temperature compensation function can support module overall settings (Cmp All) and single channel settings (Cmp CHxx). Any channel can be set using Cmp CHxx or set to Cmp All. Single channel settings have higher priority than overall settings.

Cmp All can set the temperature compensation range from -10000 to 10000 (-1000°C to 1000°C), and the default is 0.

The default setting of Cmp CHxx single channel is 32767, which follows Cmp All. The temperature compensation range of a single channel can be set from -10000 to 10000 (-1000°C to 1000°C).

6.2 Process data

6.2.1 Upstream data

Upstream data 16 bytes (2 bytes per channel, channel n ranges from 0 to 7)				
Name	Definition	Value Range	Data Types	Length
Channel n	Channel n temperature/resistance data acquisition	-32768~32767	Int16	2 bytes

Data description:

◆ Temperature/resistance data acquisition Channel [n]

The upstream data (input) of the temperature module is the temperature or resistance data collected by each channel. The data of each channel is a 2-byte signed integer, and the collected data is 10 times the actual data . Divide the read data by 10 to get the actual temperature or resistance value in C or Ω .

6.3 Module Configuration Description

6.3.1 Application in TwinCAT3 software environment

1. Preparation

• Hardware Environment

> Module preparation, this instruction takes XB6S-EC2002 + XB6S-A80TM topology as an example

- > A computer with TwinCAT3 software pre-installed
- > EtherCAT dedicated shielded cable
- > Switching power supply
- Device Configuration File Configuration file acquisition address: <u>https://www.solidotech.com/documents/configfile</u>
- Hardware configuration and wiring Please follow the instructions in " <u>4 Installation and uninstall</u> " and " <u>5 Wiring "</u>

2、 Pre-configured configuration files

Place the ESI configuration file (EcatTerminal-XB6S_V1.19_ENUM.xml) in the TwinCAT installation directory " C:\TwinCAT\3.1\Config\Io\EtherCAT ", as shown in the figure below.

📕 > 此电脑 > 本地磁盘 (C:) > TwinCAT > 3.1 > Config > Io > EtherCAT

名称	修改日期 ^	类型	大小
Beckhoff El 32xx.xml	2017/10/25 15:43	XMI 文档	5,997 KB
Beckhoff EL66xx.xml	2017/10/27 8:55	XML 文档	1.820 KB
Beckhoff EKx9xx.xml	2017/11/3 9:53	XML 文档	1,223 KB
Beckhoff EP7xxx.xml	2017/11/8 9:46	XML 文档	9.290 KB
Beckhoff ATH2xxx.xml	2017/11/23 13:22	XML 文档	439 KB
Beckhoff EPP3xxx.xml	2017/12/8 8:48	XML 文档	2,099 KB
Beckhoff EPP1xxx.xml	2017/12/14 11:34	XML文档	480 KB
Beckhoff EL34xx.xml	2017/12/15 15:35	XML 文档	5,634 KB
Beckhoff EK13xx.xml	2017/12/19 14:30	XML 文档	16 KB
Beckhoff EPP2xxx.xml	2017/12/28 12:22	XML 文档	1,811 KB
Beckhoff EJ1xxx.xml	2018/1/4 10:00	XML 文档	67 KB
Beckhoff EJ3xxx.xml	2018/1/4 10:07	XML文档	1,169 KB
Beckhoff EJ7xxx.xml	2018/1/4 10:11	XML 文档	2,339 KB
Beckhoff EJ9xxx.xml	2018/1/4 10:23	XML 文档	160 KB
Beckhoff EJ6xxx.xml	2018/1/4 10:31	XML 文档	313 KB
Beckhoff EL30xx.xml	2018/1/11 13:03	XML 文档	11,508 KB
Beckhoff EL37xx.xml	2018/1/23 13:59	XML 文档	11,837 KB
Beckhoff EJ2xxx.xml	2018/1/23 14:21	XML 文档	239 KB
Beckhoff EL5xxx.xml	2018/1/23 15:11	XML文档	6,307 KB
Beckhoff EJ5xxx.xml	2018/1/23 15:12	XML 文档	218 KB
Beckhoff EL2xxx.xml	2018/1/24 9:40	XML 文档	2,868 KB
Beckhoff EL33xx.xml	2018/1/26 9:34	XML 文档	6,727 KB
Beckhoff ELM3xxx.xml	2018/2/1 10:19	XML 文档	14,238 KB
Beckhoff AX5xxx.xml	2018/2/8 16:15	XML 文档	930 KB
Beckhoff EL1xxx.xml	2018/2/19 17:15	XML 文档	3,387 KB
Beckhoff EL25xx.xml	2018/2/21 10:23	XML 文档	6,543 KB
EcatTerminal-XB6S V1.19 ENUM.xml	2024/4/12 9:54	XML 文档	1,118 KB

3、 Create a project

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



b. Click " New TwinCAT Project". In the pop-up window, "Name" and "Solution name" correspond to the project name and solution name respectively, and "Location" corresponds to the project path. You can select the default for these three items, then click "OK". The project is created successfully, as shown in the figure below.

New TwinCAT Project	Get Started Beckhoff Ne	ws
New Measurement Project	 A second s	What's New in TwinCAT 3
New Project		? ×
▶ Recent	.NET Framework 4.5 Sort by: Default	- 🏭 🔚 Search Installed 👂
 Installed Templates Other Project Types TwinCAT Measurement TwinCAT PLC TwinCAT Projects Samples Online 	TwinCAT XAE Projec TwinCAT Projects	Type: TwinCAT Projects TwinCAT XAE System Manager Configuration
Name: TwinCAT Pro	Click here to go online and find templates.	
Location: D:\workspace	e\TwinCAT Project •	Browse
Solution name: TwinCAT Pro	ject1	Create directory for solution
_		OK Cancel

4. Scan Devices

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



b. Check the "Local Area Connection" network card, as shown in the figure below.
 1 new I/O devices found ×



c. A pop-up window "Scan for boxes " appears, click and select "Yes"; a pop-up window "Activate Free Run " click and select "Yes", as shown in the following figure.

Microsoft Visual Studio		licrosoft Visual Stud	× oib
Scan for boxes		? Activate Fre	e Run
是(Y)	否(N)	是(Y)	否(N)

d. After scanning the device, you can see Box 1 (XB6S-EC2002) and Module 1 (XB6S-A80TM) in the left navigation tree. At " Online ", you can see that TwinCAT is in "OP" state, and the RUN light of the slave device is on , as shown in the figure below.



5. Parameter configuration

a. Click "Box1 -> Startup -> New" in the left navigation tree to enter the configuration parameter editing page, as shown in the figure below.

解决方案资源管理器 ▼ ×	TwinCAT Project1 + ×	•
000 0·20 P -	General EtherCAT DC Process Data Plc Slots Startup CoE - Online Diag History Online	
授素解決方面設備管理機(Ctrl+)) ■ 解決方案(TwinCAT Project1'(1 个项目) ▲ TwinCAT Project1 ▲ SYSTEM ■ MOTION ■ PLC ■ SAFETY ■ C++ ■ ANALYTICS ▲ VO ▲ Topovice 1 (EtherCAT) ■ Image Info ■ SyncUnits ■ Image Info ■ SyncUnits ■ Outputs ■ Outputs ■ Outputs ■ Image InfoOata	Transition Protocol Index Data Comment C <ps> CoE 0xF030 C 0 01 00 01 E2 00 00 download slot cfg</ps>	
 ▶ ■ Inputs ▶ ■ Outputs ▶ M Module 1 (XB6S-A80TM) ▶ ■ WcState ▶ ■ InfoData ▲ Mappings 	Move Up Move Down New Delete Edit	

b. Edit CANopen Startup Entry pop-up window, click the "+" in front of Index 2000 : 0 to expand the configuration parameter menu. You can see 28 configuration parameters . Click the parameter to set the related configuration, as shown in the figure below.

Edit CANopen St	artup Entry				×
Transition I -> P P -> S S -> 0	S -> P Sub-Index] S -> P Sub-Inde] O -> S √alida	x): x (dec): ate	0 0 Complete Access		OK Cancel
Data (hexbin):					Hex Edit
Validate Mask.					
Comment:					Edit Entry
Index	Name	Flags	Value	Unit	~
⊡ 2000:0	XB6S-A80TM Config	RO	> 31 <		
2000:01	Sensor Type	RW	PT100 (0)		
2000:02	Filter Type	RW	Default (0)		
2000:03	Cold Compensation Mode	RW	Internal Compensation (0)		
2000:04	Temp Mode	RW	Centigrade (0)		
2000:05	Filter Time All	RW	0x00000000 (0)		
2000:06	Filter Time CH00	RW	0x000000FF (255)		
2000:07	Filter Time CH01	RW	0x000000FF (255)		
2000:08	Filter Time CH02	RW	0x000000FF (255)		
2000:09	Filter Time CH03	RW	0x000000FF (255)		
2000:0A	Filter Time CH04	RW	0x000000FF (255)		
2000:0B	Filter Time CH05	RW	0x000000FF (255)		
2000:0C	Filter Time CH06	RW	0x000000FF (255)		
2000:0D	Filter Time CH07	RW	0x000000FF (255)		
2000:0E	Enable All	RW	Enable (1)		~
2000.0E	Epoblo CH00	D\//	Follow Epoble All (2)		

c. For example, to modify the sensor type selection, you can double-click " Sensor Type " and modify the parameter value in the drop-down box, as shown in the figure below.

Edit CANopen	Startup Entry			×
Transition				ОК
□I->P		Index (hex):	2000	
✓P->S	S→P	Sub-Index (dec)	: 1	Cancel
□S->0	□0->s	Set Value Dial	og	×
Data (hexbin):	00 00 00 00	Dec:	0	ОК
Validate Mask:		Hex	0x00000000	Cancel
Comment	Sensor Type	_		
Commente	Concer type	Enum:	PT100	^{``}
Index	Name		PT100 PT200	<u> </u>
- 2000-0	XB6S-A80TM Confid	Bool	PT500	Edit
2000:01	Sensor Type	Binary:	Ni120_ID(Reserve) THERMOCOUPLE_K	4
2000:02	Filter Type Cold Componention	Pit Cino:	THERMOCOUPLE_J	
2000.03	Temp Mode	Dit Size.	THERMOCOUPLE_T(Reserve)	
2000:05	Filter Time All	BW	THERMOCOUPLE_N(Reserve)	
2000:06	Filter Time CH00	RW	THERMOCOUPLE_S	
2000:07	Filter Time CH01	RW	THERMOCOUPLE_R(Reserve)	
2000:08	Filter Time CH02	RW	THERMOCOUPLE_C(Reserve)	
2000:09	Filter Time CH03	RW		
- 2000:0A	Filter Time CH04	RW	Ni 100	
2000:0B	Filter Time CH05	RW	Ni 1000	
2000:0C	Filter Time CH06	RW	LG-Ni 1000(Reserve) Ni 200(Beserve)	
	Filter Time CH07	RW	Ni 500(Reserve)	
2000-0E	Enable ∆ll	RW	RESISTANCE_15:150(Reserve)	×
			RESISTANCE_15:300(Reserve) RESISTANCE_15:600(Reserve)	-
			RESISTANCE_15:3000	
			V: -1: 1V(Reserve) V: -250: 250mV(Reserve)	
			V: -50: 50mV(Reserve)	
			V80:80mV(Beserve)	

d. After the parameter modification is completed, the modified parameter items and parameter values can be seen under Startup, as shown in the figure below. After the parameter setting is completed, it is necessary to perform the Reload operation and re-power the module to realize the automatic transmission of parameter settings by the master station.

nCAT Projec	:t1 ∜ ×							
eneral Ethe	erCAT DC	Process Data	Plc Slots	Startup	CoE - Online	Diag History	Online	
Transition	Protocol	Index	Data		Comment			
C <ps></ps>	CoE	0xF030 C 0	01 00 01 E	2 00 00	download s	ot cfg		
C PS	CoE	0x2000:01	PT200 (1)		Sensor Type	•		

e. In the left navigation tree "Module 1 - > Inputs" displays the module's upstream data and is used to monitor the module's status, as shown in the figure below.

解决方案资源管理器	- ₽ ×	TwinCAT Project	1 + ×							1
004 0·# 0 /		Name		Online	Туре	Size	>Address	In/Out	User ID	Linked to
增索解油方案资源等理题/(trl)	Ω.	🔊 Channel 0		-9999	INT	2.0	41.0	Input	0	
ISCREW/C/J SHEDGING ESERI(COTTY)	~	🕫 Channel 1		226	INT	2.0	43.0	Input	0	
a」解决方案"TwinCAT Project1"(1 个项目)		🕫 Channel 2		229	INT	2.0	45.0	Input	0	
TwinCAT Project1		🕶 Channel 3		219	INT	2.0	47.0	Input	0	
P G SYSTEM		😎 Channel 4		-9999	INT	2.0	49.0	Input	0	
MOTION DI C		🕶 Channel 5		-9999	INT	2.0	51.0	Input	0	
PLC CALETY		🔊 Channel 6		-9999	INT	2.0	53.0	Input	0	
SAFETY		Channel 7		-9999	INT	2.0	55.0	Input	0	
A Bevices										
A T Device 2 (EtherCAT)										
Image										
Image-Info										
SyncUnits										
Inputs										
Outputs										
👂 🛄 InfoData										
Box 1 (XB6S-EC2002)										
Inputs										
Outputs	_									
 Module 1 (XB6S-A80TM))									
Inputs										
WcState										
👂 🛄 InfoData										
Mappings										

Module Functionality Examples

Temperature input channel data monitoring

a. Channel 0 ~ Channel 2 are connected to thermistor sensors, and the configuration parameters are configured as needed. Select PT100 as the sensor type , and the temperature measurement unit switch is set to Celsius by default. Channel 0 ~ Channel 2 are set to enable by default, as shown in the figure below.

Edit (C <mark>AN</mark> open	Startup Entry					×
Tran	nsition I -> P P -> S S -> O	□S->P □O->S	Index (he Sub-Inde	x): x (dec): ite	2000 1 Complete Access	(OK Cancel
Data	(hexbin):	00 00 00 00				He	ex Edit
Valida	ate Mask:						
Comr	nent:	Sensor Type				Ed	it Entry
Inde	×	Name		Flags	Value	Unit	^
	2000:01	Sensor Type		RW	PT100 (0)		
	2000:02	Filter Type		RW	Default (0)		
1	2000:03	Cold Compensation	Mode	RW	Internal Compensation (0)		
	2000:04	Temp Mode		RW	Centigrade (0)		
1	2000:05	Filter Time All		RW	0x00000000 (0)		
	2000:06	Filter Time CH00		RW	0x000000FF (255)		
	2000:07	Filter Time CH01		RW	0x000000FF (255)		
	2000:08	Filter Time CH02		RW	0x000000FF (255)		
	2000:09	Filter Time CH03		RW	0x000000FF (255)		
	- 2000:0A	Filter Time CH04		RW	0x000000FF (255)		
	2000:0B	Filter Time CH05		RW	0x000000FF (255)		
	2000:0C	Filter Time CH06		RW	0x000000FF (255)		
	2000:0D	Filter Time CH07		RW	0x000000FF (255)		
	2000:0E	Enable All		RW	Enable (1)		
		Enable CH00		RW	Follow Enable All (2)		
1	2000.10	Epoble CH01		D\4/	Follow Enable All (2)		~

b. It can be seen that the current temperature values of channel 0 to channel 2 are 228, 232, and 233, namely 22.8 °C, 23.2 °C, and 23.3 °C respectively. The other channels are not connected to sensors and the displayed values are - 9999, as shown in the figure below.

解决方案资源管理器		TwinCAT Project	:t1 + ×						
001 i0+20 ¥		Name	Online	Туре	Size	>Address	In/Out	User ID	Linked to
搜索解决方案资源管理器(Ctrl+:)	ρ.	🕫 Channel 0	228	INT	2.0	41.0	Input	0	
		🔊 Channel 1	232	INT	2.0	43.0	Input	0	
ig」解决方案"IwinCAI Project1"(1 个项目)		🔁 Channel 2	233	INT	2.0	45.0	Input	0	
IwinCAT Project1		🕫 Channel 3	-9999	INT	2.0	47.0	Input	0	
		😕 Channel 4	-9999	INT	2.0	49.0	Input	0	
MOTION		🕫 Channel 5	-9999	INT	2.0	51.0	Input	0	
		🕫 Channel 6	-9999	INT	2.0	53.0	Input	0	
SAFELY		🔊 Channel 7	-9999	INT	2.0	55.0	Input	0	
A The Devices									
Device 2 (EtherCAT)									
🚼 Image									
🚼 Image-Info									
SyncUnits									
Inputs									
Outputs									
👂 🛄 InfoData									
Box 1 (XB6S-EC2002)									
Inputs									
Outputs									
Module 1 (XB6S-A80TM)									
👂 🛄 Inputs									
WcState									
👂 🛄 InfoData									
Mappings									

c. Click "Box1 -> CoE-Online" in the left navigation tree to enter the configuration parameter editing page and set channel 0 to disabled, as shown in the figure below.

解决方案资源管理器 ▼ 및 ×	TwinCAT Project1 🏼 🕸	×				•
○ ○ △ ○ マ 司 チ - 搜索解決方案资源管理器(Ctrl+:) ・	General EtherCAT	DC Process Data Plc Slot	s Startup C	oE - Online Diag History Online	2	
 □ 解決方案"TwinCAT Project1"(1 个项目) ▲ TwinCAT Project1 ▶ ▲ SYSTEM ▲ WOTION 	Update Lis Advanced.	t Auto Update 🗹	Single Update	e ☑ Show Offline Data		
III PLC	Index	Name	Flags	Value	Unit	
See C++	E 2000:0	XB6S-A80TM Config	RO	> 31 <		
ANALYTICS	2000:01	Sensor Type	RW	PT100 (0)		
🔺 🔁 I/O	2000:02	Filter Type	RW	Default (0)		
 Te Devices 	2000:03	Cold Compensation Mode	RW	Internal Compensation (0)		
Device 1 (EtherCAT)	2000:04	Temp Mode	RW	Centigrade (0)		
Timage	2000:05	Filter Time All	RW	0x00000000 (0)		
Timage-Info	2000:06	Filter Time CH00	RW	0x000000FF (255)		-
b syncomis	2000:07	Filter Time CH01	RW	0x000000FF (255)		
D Outputs	2000:08	Filter Time CH02	RW	0x000000FF (255)		
b InfoData	2000:09	Filter Time CH03	RW	0x000000FF (255)		
A Box 1 (XB6S-EC2002)	2000:0A	Filter Time CH04	RW	0x000000FF (255)		
Inputs	2000:0B	Filter Time CH05	RW	0x000000FF (255)		
Outputs	2000:0C	Filter Time CH06	RW	0x000000FF (255)		
 Module 1 (XB6S-A80TM) 	2000:0D	Filter Time CH07	RW	0x000000FF (255)		
Inputs	2000:0E	Enable All	RW	Enable (1)		
WcState	2000:0F	Enable CH00	RW	Disable (0)		
👂 🛄 InfoData	2000:10	Enable CH01	RW	Follow Enable All (2)		
Mappings	2000:11	Enable CH02	RW	Follow Enable All (2)		
	2000:12	Enable CH03	RW	Follow Enable All (2)		
	2000:13	Enable CH04	RW	Follow Enable All (2)		
	2000:14	Enable CH05	RW	Follow Enable All (2)		
	2000:15	Enable CH06	RW	Follow Enable All (2)		
	2000:16	Enable CH07	RW	Follow Enable All (2)		
	2000:17	Cmp All	RW	0		
	2000:18	Cmp CH00	RW	32767		
	2000:19	Cmp CH01	RW	32767		
	2000-14	Cmp CH02	DIM	20767		· · ·

d. You can see that the current channel 0 displays a value of -9999, as shown in the figure below.

解决方案资源管理器 🔹 🖓	× TwinCAT Proje	ct1 + ×						
000 10 + 2 m ×	Name	Online	Туре	Size	>Address	In/Out	User ID	Linked to
搜索解冲方案资源管理器(Ctrl+;)	🛫 🏴 Channel 0	-9999	INT	2.0	41.0	Input	0	
	- Channel 1	231	INT	2.0	43.0	Input	0	
lg」解决方案"TwinCAT Project1"(1 个项目)	🕫 Channel 2	235	INT	2.0	45.0	Input	0	
TwinCAT Project1	🕫 Channel 3	-9999	INT	2.0	47.0	Input	0	
P SYSTEM	🕫 Channel 4	-9999	INT	2.0	49.0	Input	0	
MOTION	🕫 Channel 5	-9999	INT	2.0	51.0	Input	0	
	🕫 Channel 6	-9999	INT	2.0	53.0	Input	0	
SAFETY	🕫 Channel 7	-9999	INT	2.0	55.0	Input	0	
	and the second second							
 Devices 2 (Ethor(AT)) 								
Synclinits								
Inputs								
Outputs								
InfoData								
Box 1 (XB6S-EC2002)								
Inputs								
Outputs								
 Module 1 (XB6S-A80TM) 								
Inputs								
WcState								
👂 🛄 InfoData								
📸 Mappings								

◆ Temperature compensation function

a. Channel 0 is connected to a thermocouple sensor. The configuration parameters are configured as needed. The sensor type is selected as K-type thermocouple. The temperature measurement unit is switched to Celsius by default. Channel 0 is enabled by default, as shown in the figure below.

Edit CANopen	Startup Entry				×
Transition □I→P ☑P->S □S->0	Index (he S -> P Sub-Index 0 -> S √alid	ex): ex (dec): ate	0 0 Complete Access		OK Cancel
Data (hexbin):					Hex Edit
Validate Mask:					
Comment:					Edit Entry
Index	Name	Flags	Value	Unit	^
2000:01	Sensor Type	RW	THERMOCOUPLE_K (5)		
2000:02	Filter Type	RW	Default (0)		
2000:03	Cold Compensation Mode	RW	Internal Compensation (0)		
2000:04	Temp Mode	RW	Centigrade (0)		
2000:05	Filter Time All	RW	0x00000000 (0)		
2000:06	Filter Time CH00	RW	0x000000FF (255)		
2000:07	Filter Time CH01	RW	0x000000FF (255)		
2000:08	Filter Time CH02	RW	0x000000FF (255)		
2000:09	Filter Time CH03	RW	0x000000FF (255)		
2000:0A	Filter Time CH04	RW	0x000000FF (255)		
2000:0B	Filter Time CH05	RW	0x000000FF (255)		
2000:0C	Filter Time CH06	RW	0x000000FF (255)		
2000:0D	Filter Time CH07	RW	0x000000FF (255)		
2000:0E	Enable All	RW	Enable (1)		
2000-0E	Enable CH00	R/A/	Eollow Enable All (2)	1	~

b. Taking module channel 0 as an example, you can see that the temperature value measured by channel 0 is 233, which is 23.3°C, as shown in the figure below.

解决方案资源管理器 ▼ ↓ ×	TwinCAT Project1	÷ ×						
© ⊂ ☆ ¯ ►	Name	Online	Туре	Size	>Address	In/Out	User ID	Linked to
搜索解决方案资源管理器(Ctrl+·) の・	🕫 Channel 0	233	INT	2.0	41.0	Input	0	
	🕫 Channel 1	-9999	INT	2.0	43.0	Input	0	
Ig」解决方案"TwinCAT Project1"(1 个项目)	🔁 Channel 2	-9999	INT	2.0	45.0	Input	0	
TwinCAT Project1	🕫 Channel 3	-9999	INT	2.0	47.0	Input	0	
P G SYSTEM	Channel 4	-9999	INT	2.0	49.0	Input	0	
MOTION	🕫 Channel 5	-9999	INT	2.0	51.0	Input	0	
PLC	🔁 Channel 6	-9999	INT	2.0	53.0	Input	0	
SAFELY	🕫 Channel 7	-9999	INT	2.0	55.0	Input	0	
₩ C++								
Devices								
Device 2 (EtherCAT)								
image								
s image-inio								
> Syncolines								
P outputs								
b lafe Data								
BOX T (XBOS-EC2002)								
Outputs								
Modulo 1 (YP65, A90TM)								
b WcState								
Appings								
mappings								

c. Click "Box1 -> CoE-Online" in the left navigation tree to enter the configuration parameter editing page and set the channel 0 temperature compensation value to 50, that is, 5°C, as shown in the figure below.

解决方案资源管理器 ▼ 및 ×	TwinCAT Project1 🕸	×		
	General EtherCAT	DC Process Data Plc	Slots Startup CoE - Online Diag History On	line
12家府次万案页际目生商(Lt1+;) 同解決方案"TwinCAT Project1"(1 个项目)	Update Li	st 🗌 Auto Update	🗹 Single Update 🗹 Show Offline Data	
 TwinCAT Project1 GSYSTEM 	Advanced			
MOTION PLC	Add to Start	up Online Data	Module OD (AoE Port): 0	
🙆 SAFETY	Index	Name	Flags Value	Unit 🔺
56- C++	2000:05	Filter Time All	RW 0x0000000 (0)	
ANALYTICS	2000:06	Filter Time CH00	RW 0x00000FF (255)	
▲ 🔁 I/O	2000:07	Filter Time CH01	RW 0x00000FF (255)	
 Devices 	2000:08	Filter Time CH02	RW 0x00000FF (255)	
 Device 1 (EtherCAT) 	2000:09	Filter Time CH03	RW 0x00000FF (255)	
Image	2000:0A	Filter Time CH04	RW 0x00000FF (255)	
Image-Info	2000:0B	Filter Time CH05	RW 0x00000FF (255)	
SyncUnits	2000:0C	Filter Time CH06	RW 0x00000FF (255)	
P Inputs	2000:0D	Filter Time CH07	RW 0x00000FF (255)	
	2000:0E	Enable All	RW Enable (1)	
A Box 1 (XR65 EC2002)	2000:0F	Enable CH00	RW Follow Enable All (2)	
b Di Inputs	2000:10	Enable CH01	RW Follow Enable All (2)	
b Outputs	2000:11	Enable CH02	RW Follow Enable All (2)	
Module 1 (XB6S-A80TM)	2000:12	Enable CH03	RW Follow Enable All (2)	
b WcState	2000:13	Enable CH04	RW Follow Enable All (2)	
	2000:14	Enable CH05	RW Follow Enable All (2)	
St Mappings	- 2000:15	Enable CH06	RW Follow Enable All (2)	
	2000:16	Enable CH07	RW Follow Enable All (2)	
	2000:17	Cmp All	RW 0	
	2000:18	Cmp CH00	RW 50	
	2000:19	Cmp CH01	RW 32767	
	2000:1A	Cmp CH02	RW 32767	
	2000:1B	Cmp CH03	RW 32767	
	2000:1C	Cmp CH04	RW 32767	
	2000:1D	Cmp CH05	RW 32767	*

d. After setting the compensation value, the temperature value of channel 0 is 283 , which is 28.3 °C, as shown in the figure below.

解决方案资源管理器 ▼ ↓ ×	TwinCAT Project	1 # X						
001 0-20 ×-	Name	Online	Туре	Size	>Address	In/Out	User ID	Linked to
捜索解決方案资源管理器(Ctrl+:) ・	🕫 Channel 0	283	INT	2.0	41.0	Input	0	
	🕫 Channel 1	-9999	INT	2.0	43.0	Input	0	
MJ 解决方案 TWINCAT Project1 (1 个项目)	Channel 2	-9999	INT	2.0	45.0	Input	0	
	🕫 Channel 3	-9999	INT	2.0	47.0	Input	0	
	🕫 Channel 4	-9999	INT	2.0	49.0	Input	0	
	🕫 Channel 5	-9999	INT	2.0	51.0	Input	0	
SAFETY	🕫 Channel 6	-9999	INT	2.0	53.0	Input	0	
C++	🕫 Channel 7	-9999	INT	2.0	55.0	Input	0	
A Devices								
Device 2 (EtherCAT)								
📜 Image								
Image-Info								
SyncUnits								
Inputs								
Outputs								
🕨 🛄 InfoData								
 Box 1 (XB6S-EC2002) 								
Inputs								
Outputs								
Module 1 (XB6S-A80TM)								
Inputs								
WcState								
👂 🛄 InfoData								
📸 Mappings								

◆ Temperature cold junction compensation function

a. Channel 0 is connected to a thermocouple sensor, and the configuration parameters are configured as needed. Select K-type thermocouple as the sensor type, and set the cold junction compensation to on, as shown in the figure below.

dit CANopen	Startup Entry				×
Transition □I->P ☑P->S	Inde	x (hex):			OK Cancel
⊡s->0	□0→S □	(alidata			
		alidate			
Data (hexbin):	0				Hex Edit
Validate Mask:					
Comment:					Edit Entry
					-
Index	Name	Flags	Value	Unit	^
2000:0	XB6S-A80TM Config	RO	> 31 <		
2000:01	Sensor Type	RW	THERMOCOUPLE_K (5)		
2000:02	Filter Type	RW	Default (0)		
2000:03	Cold Compensation Mode	RW	Internal Compensation (0)		
2000:04	Temp Mode	RW	Centigrade (0)		
2000:05	Filter Time All	RW	0×00000000 (0)		
2000:06	Filter Time CH00	RW	0×000000FF (255)		
2000:07	Filter Time CH01	RW	0×000000FF (255)		
2000:08	Filter Time CH02	RW	0×000000FF (255)		
2000:09	Filter Time CH03	RW	0x000000FF (255)		
2000:0A	Filter Time CH04	RW	0x000000FF (255)		
2000:0B	Filter Time CH05	RW	0x000000FF (255)		
2000:0C	Filter Time CH06	RW	0x000000FF (255)		
2000:0D	Filter Time CH07	RW	0x000000FF (255)		
2000-0E	Enablo ∆ll	R\//	Enable (1)		~

b. You can see the temperature value when the cold junction compensation of channel 0 is turned on, as shown in the figure below.

解決方案资源管理器 ▼ 平 ×	TwinCAT Project	t1 ₽ ×						
001 0·20 / -	Name	Online	Туре	Size	>Address	In/Out	User ID	Linked to
搜索解决方案资源管理器(Ctrl+:) の・	🐔 Channel 0	235	INT	2.0	41.0	Input	0	
	🕫 Channel 1	-9999	INT	2.0	43.0	Input	0	
ig」解决万案"IwinCAI Project1"(1 个项目)	🕫 Channel 2	-9999	INT	2.0	45.0	Input	0	
IwinCAT Project1	😎 Channel 3	-9999	INT	2.0	47.0	Input	0	
	🔁 Channel 4	-9999	INT	2.0	49.0	Input	0	
MOTION	🕫 Channel 5	-9999	INT	2.0	51.0	Input	0	
	🕫 Channel 6	-9999	INT	2.0	53.0	Input	0	
SAFETY	🕫 Channel 7	-9999	INT	2.0	55.0	Input	0	
4 🖼 1/0								
A Device 2 (Ether(AT)								
Image-Info								
Synclinits								
Outputs								
InfoData								
Box 1 (XB6S-EC2002)								
Inputs								
Outputs								
▲ Module 1 (XB6S-A80TM)								
Inputs								
WcState								
👂 🔜 InfoData								
Mappings								

c. Click "Box1 -> CoE-Online" in the left navigation tree to enter the configuration parameter editing page and turn off cold junction compensation, as shown in the figure below.

解决方案资源管理器 ▼ ↓ ×	TwinCAT Project1 👎	×				-
	General EtherCAT	DC Process Data Plc S	Slots Startup Co	E - Online Diag History Onl	ine	
設備の「一般の時代」の 「一般の時代」 「「「」」 「「」 「「」 「「」 「「」 「」 「」 「」 「」 「」 「	Update Lis	List Auto Update Single Update Show Offline				
TwinCAT Project1 SYSTEM	Advanced.					
	Add to Start	Jp Online Data	Module O			
BAFETY	Index	Name	Flags	Value	Unit	*
56- C++	⊟-2000:0	XB6S-A80TM Config	RO	> 31 <		
ANALYTICS	2000:01	Sensor Type	RW	THERMOCOUPLE_K (5)		
▲ 🔄 VO	2000:02	Filter Type	RW	Default (0)		
 Devices 	2000:03	Cold Compensation Mode	RW	Disable (1)		
Device 1 (EtherCAT)	2000:04	Temp Mode	RW	Centigrade (0)		
Timage	2000:05	Filter Time All	RW	0x00000000 (0)		
image-info	2000:06	Filter Time CH00	RW	0x000000FF (255)		
P 2 SyncUnits	2000:07	Filter Time CH01	RW	0x000000FF (255)		
P - Inputs	2000:08	Filter Time CH02	RW	0x000000FF (255)		
	2000:09 2000:0A	Filter Time CH03	RW	0x000000FF (255)		
A Box 1 (XB6S-EC2002)		Filter Time CH04	RW	0x000000FF (255)		
	2000:0B	Filter Time CH05	RW	0x000000FF (255)		
Dutputs	2000:0C	Filter Time CH06	RW	0x000000FF (255)		
Module 1 (XB6S-A80TM)	2000:0D	Filter Time CH07	RW	0x000000FF (255)		
VcState	2000:0E	Enable All	RW Enable (1)	Enable (1)		
👂 🛄 InfoData	2000:0F	Enable CH00	RW	Follow Enable All (2)		
Mappings	2000:10	Enable CH01	RW	Follow Enable All (2)		
	2000:11	Enable CH02	RW	Follow Enable All (2)		
	2000:12	Enable CH03	RW	Follow Enable All (2)		
	2000:13	Enable CH04	RW	Follow Enable All (2)		
	2000:14	Enable CH05	RW	Follow Enable All (2)		
	2000:15	Enable CH06	RW	Follow Enable All (2)		
	2000:16	Enable CH07	RW	Follow Enable All (2)		
	2000:17	Cmp All	RW	0		
	2000:18	Cmp CH00	RW	32767		-

d. the temperature value when the cold junction compensation of channel 0 is turned off, as shown in the figure below.

解决方案资源管理器	- 4 ×	TwinCAT Project	₽×						
001 i0-20 🖊 🗕		Name	Online	Туре	Size	>Address	In/Out	User ID	Linked to
搜索解决方案资源管理器(Ctrl+;)	ρ-	📌 Channel 0	-54	INT	2.0	41.0	Input	0	
		📌 Channel 1	-9999	INT	2.0	43.0	Input	0	
MJ 解决方案 TWINCAT Project I (I 小坝日)		🕫 Channel 2	-9999	INT	2.0	45.0	Input	0	
TwincAT Project		🕫 Channel 3	-9999	INT	2.0	47.0	Input	0	
		🕫 Channel 4	-9999	INT	2.0	49.0	Input	0	
		🕫 Channel 5	-9999	INT	2.0	51.0	Input	0	
A SAFETY		🕫 Channel 6	-9999	INT	2.0	53.0	Input	0	
SALEN SALEN		🐔 Channel 7	-9999	INT	2.0	55.0	Input	0	
Devices									
Device 2 (EtherCAT)									
📜 Image									
📑 Image-Info									
SyncUnits									
Inputs									
Outputs									
👂 🔚 InfoData									
 Box 1 (XB6S-EC2002) 									
Inputs									
Outputs									
 Module 1 (XB6S-A80TM) 									
Inputs									
WcState									
👂 🔚 InfoData									
Mappings									