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Support

If you have questions during product selection or usage, customers in China can call our technical support hotline at **400-700-5281** (Chinese service only).

For inquiries about the products described in this manual, please contact your local Kinco office or distributor. For information on user training, visit our company website or consult your local distributor for training plans.

Manual Acquisition

This manual is a paperless document. To obtain a PDF version, visit the Kinco official website (<u>https://en.kinco.cn/</u>), navigate to "Service \rightarrow Download", and search by keywords to download.

Device Description File Acquisition

The AK8X0 series motion controller package file (.PACKAGE) integrates device descriptions for all CPU modules in the AK8X0 series. Please visit the Kinco official website <u>https://www.kinco.cn/</u> (CN), <u>https://en.kinco.cn/</u> (EN) or contact Kinco's official customer service department to obtain the latest device description files.

Reversion History

Reversion Date	Release Version	Description
2024/05/28	AK840_usermanual_V000	Initial Revision
2024/11/27	AK840_usermanual_V001	Content Update
2024/2/12	AK840_usermanual_V002	 2.2 Update the naming rule diagram 3.4 Added AK840M-0808DTP specifications 5.2 Added AK840M-0808DTP wiring diagram Added section 8.3.3, 8.4, 8.9

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1 Safety Instructions

This chapter outlines safety precautions for proper use of the product. Before use, read this manual and any related documentation to understand the safety instructions. Failure to follow these precautions may result in death, serious injury, or equipment damage.

The "Danger," "Warning," and "Caution" notes in this manual are not exhaustive but supplement general safety measures.

Use this product within its design specifications to avoid malfunctions. Damage or issues caused by non-compliance are not covered under warranty.

Kinco assumes no legal responsibility for personal injury, property damage, or other accidents resulting from non-compliance with this manual or improper operation of the product.

To ensure safe use, this manual employs specific symbols and graphical markings to highlight important safety-related information. Please adhere strictly to these precautions.

\bigcirc	Danger/Prohibited Indicates prohibited actions. If proper precautions are not taken, it may result in serious personal injury or even death.
<u>.</u>	Warning Indicates cautionary actions. If proper precautions are not taken, it may result in serious personal injury or even death.
!	Caution Indicates general information or directives. If the corresponding precautions are not followed, it may lead to unintended results.

AK840 Motion Controller User Manual				
When Power is Supplied				
\bigcirc	*	During power supply, do not touch terminals or attempt disassembly. Wait for capacitors to discharge after turning off the power to avoid electric shock or hazards.		
		During electrical assembly		
<u>()</u>	*	nstallation, wiring, maintenance, and inspection must be performed by qualified personnel trained in electrical equipment. Avoid dusty, corrosive, or high-temperature environments.		
!	*	When processing screw holes or wiring, take care to prevent metal shavings, dust, and wire fragments from entering the controller's ventilation channels, as this may cause fire, malfunctions, or other unintended operations.		
		During wiring		
\bigcirc	*	During power supply, do not touch any terminals or terminal blocks, and do not attempt to disassemble any units. Especially during power supply or just after power is turned off, capacitors need time to discharge, which may cause electric shock or other personal or equipment hazards. Before wiring operations, please ensure that all external power supplies to the system are completely disconnected. Otherwise, there is a risk of electric shock to personnel and equipment malfunction.		
<u>^</u>	*	After completing the installation and wiring operations, before energizing and operating the product, ensure that it is fully assembled (including end caps, plate covers, etc.), otherwise there may be a risk of electric shock. Cable terminals should be properly insulated to ensure that the insulation distance between cables does not decrease after the cables are installed on the terminal block. Otherwise, there is a risk of electric shock, short circuit, or equipment damage.		

- During screw assembly or wiring, be careful not to allow metal shavings, dust, or wire ends to fall into the ventilation holes of the PLC. Otherwise, it may cause fire, malfunction, or unintended actions of the PLC.
- Before connecting cables, confirm the type of interface being connected. Incorrect interface connections or wiring errors may result in controller or external equipment malfunctions or damage.
- Tighten the bolts on the terminal block within the specified torque range. Failure to tighten them properly may result in circuit short circuits, loose connections, or fire hazards. Over-tightening could damage the bolts or the controller, causing component detachment, circuit short circuits, or fire hazards.
- When connecting external devices via connectors, use tools specified by the manufacturer for proper crimping, pressing, or soldering. Poor connections may lead to short circuits, fire, or unintended operations.
- Do not bundle control lines or communication cables with main circuit or power supply lines, nor place them too close to each other. Ensure control and communication cables are arranged at least 100 mm apart from main circuit power lines in separate cable ducts or spaces to prevent noise-induced malfunctions.
- For applications with severe interference, use specialized shielded cables for high-frequency signal input or output to enhance the system's anti-interference capability.

During System Design



- Always design a safety circuit to ensure that the control system remains secure in the event of an external power failure or controller malfunction.
- If the output circuit experiences prolonged overcurrent due to exceeding the rated load current or a short circuit in the load, the controller may emit smoke or catch fire. Install external fuses or circuit breakers as safety protection devices.



- * When processing screw holes or wiring, take care to prevent metal shavings, dust, and wire fragments from entering the controller's ventilation channels, as this may cause fire, malfunctions, or unintended operations.
- To ensure safe equipment operation, design external protection *



!	 To ensure safe equipment operation, design external protection circuits and safety mechanisms for significant accident-related output signals. When the controller's CPU detects abnormalities in its system, it may automatically shut off all output signals. Additionally, partial circuit failures in the controller may result in uncontrolled outputs. To ensure equipment's normal operation, suitable external control circuits need to be designed. Damage to the transistor output unit of the controller may render its output status uncontrollable. Programmable controllers should be designed for use in indoor electrical environments with overvoltage level II. The power supply system level should include lightning protection devices to prevent lightning-induced overvoltage from affecting the programmable control output terminals, signal input terminals, control output terminals, and other ports, thus avoiding equipment damage.
	During Operation and Maintenance
\bigcirc	 Assembly, wiring, maintenance, and inspection of this product should all be conducted by professional personnel who have received relevant training in electrical equipment. Before cleaning or tightening the bolts on the terminal block or installing connector bolts, please ensure that the system's power supply is completely disconnected.
	Before making any online modifications to the program, forcing outputs, starting (RUN), or stopping (STOP) operations during equipment debugging, it is essential to thoroughly read the user manual. Only proceed with these operations after ensuring their safety.

2 General Instructions

This product is Kinco's self-developed next-generation medium-sized PLC, integrating 8 digital inputs (DI), 8 digital outputs (DO), 1 RS485, 2 Ethernet ports, 2 EXP expansion ports, 1 EtherCAT port, and 1 Type-C interface. It supports up to 32-axis EtherCAT synchronized motion control (typical synchronization cycle 1ms @8, E-Cam). The dual Ethernet port design enables multi-layer network communication, and the backplane bus supports up to 16 expansion modules.

2.1 Series Introduction

The AK8X0 series is Kinco's new generation of high-performance, cost-effective CoDeSys-based medium-sized EtherCAT bus motion controllers. It has made significant improvements in overall performance, functionality, integration, and ease of use. Paired with the RP20 series remote IO system, it is another new solution offered by Kinco to help break industry barriers for customers in various sectors. The AK8X0 series is widely applicable in the general industrial automation field and more specifically in areas like building automation, agricultural intelligence, energy detection, and energy management, aiming to provide customers with flexible and adaptable solution possibilities.

2.2 Naming Rules



Fig. 2.2-1 'AK840M-0808DTN' naming description

2.3 Fuselage Label



Fig2.3-1 Fuselage Label Diagram

No.	ltem	Description
		Includes basic information such as product
1	Model and Brief Description	model, power supply, and function
		description.
2	Kince official OB Code	Scan the code to directly access Kinco's
	Kinco official QR code	official website for more information.
3	Product Serial Number	Unique and traceable.
4	I/O Wiring Diagram	Provides a clear view of wiring information.
5	Cortification	Includes the product's certification
		standards.
6	Kinco official wabsita	Enter the website address to visit Kinco's
		official website for more information.

3 Product Specification

3.1 General Specification

Transportation and Storage Conditions			
Climatic Conditions	Ambient Temperature	-40°C~+70°C	
	Relative Humidity	10% \sim 95%,no condensation.	
	Atmospheric Pressure	Equivalent to 0-3000 meters above sea level.	
Mechanical Conditions	Free Fall	With transport packaging, allows 5 drops from 1m height to the cement floor.	
Operating Condit	ions		
	Ambient Temperature	Open device with natural ventilation, ambient temperature range: -20°C \sim +55°C.	
Climatic	Relative Humidity	10% \sim 95%,no condensation.	
Conditions	Atmospheric Pressure	Altitude≤2000 meters	
	Pollution Level	Suitable for pollution level 2	
Mechanical Conditions	Sine Vibration	5 < f < 8.4 Hz, Random: 3.5mm displacement, Continuous: 1.75mm displacement.	
		8.4 < f < 150 Hz, Random: 1.0g acceleration, Continuous: 0.5g acceleration	
	Shock	Half sine wave, 15g, 11ms, 6 times per axis	
	EMC Immunity Level	Zone B,IEC61131-2	
	Electrostatic Discharge	Air discharge 8kV, contact discharge 4kV.	
		Performance Leve A	
Electromagnetic		DC power supply 0.5kV CM, 0.5kV DM.	
(FMC)	Surge	I/O and communication ports: 1kV CM.	
		Performance Leve A	
	Fast Transient Burst	Power coupling: 2kV, 5kHz. I/O and communication coupling: 1kV, 5kHz.	
		Performance Leve A	
Protection Level		IP20	
Cooling Type		Natural air cooling	
Assembly Method		DIN35 rail mounting	
Certification		CE	

3.2 Power Supply

Item	Specification	
Rated Power Supply	24V DC +/-20% (19.2V DC~28.8V DC)	
Rated Power	6W (CPU unit only)/20W (Full-load)	
	Overcurrent Protection	
Power Protection	Reverse Polarity Protection	
	Surge Absorption	

3.3 Overall Specification

Technical Specification		
Program Memory	32MB	
Data Memory	32MB	
Non-volatile Storage	1MB	
	1 × EtherCAT	
EtherCAT	Minimum synchronization period of 1ms, supporting up to 32 axes	
	1ms cycle 8-axis synchronization (execution time of motion control calculation)	
Electronic CAM/interpolation	Support	
Local Expansion	Kinco dedicated K-bus backplane, supports up to 16 local expansion modules of the RP20 series. Without the power module, up to 8 RP20 series local expansion modules are supported.	
Ethernet (RJ45)	2 × Ethernet, both support Modbus TCP master/slave, with a maximum of 31 TCP slaves per channel.	
	Both support program upload and download.	
RS485	nrotocol supporting up to 31 Modbus RTU slaves	
USB (Type-C)	1 × USB OTG, supports firmware updates via USB drive (limited to FAT32 format).	
Local I/O	8 × Digital inputs, sourcing/sinking, supports 2-channel of high-speed counters. supports 2-channel high-speed inputs, A/B phase and pulse/direction signals, with a maximum of 200KHz.	
	8 × Digital outputs, with selectable output types of PNP or NPN.	
	PWR: Power status	
	RUN: Device operation status	
Indicators	ERR: Device error	
	BUS: Expansion bus error	
	BATT: Low voltage of backup battery	
Dimensions (W × H × D) mm	57 × 80 × 108	
Weight	pprox180g	

Item AK840M-0808DTN		AK840M-0808DTP	
Digital Input			
Type and Polarity	Sourcing/Sinking	Sourcing/Sinking	
Number of	0	0	
channels	0	8	
Rated Input	24V DC, maximum	24V DC, maximum allowable	
Voltage	allowable 30V DC.	30V DC.	
Input Impedance	5.4K	5.4K	
Logic "0" Max.	5V 0 8mA	5V 0.8mA	
Input Voltage	5V,0.811A	50,0.011A	
Logic "1" Min.	111/ 2	111/ 2m4	
Input Voltage	110,211A	11V,2IIIA	
Turn-on Delay	<2.5µs	<2.5µs	
Turn-off Delay	<2.5µs	<2.5µs	
	Optoelectronic isolation.	Optoelectronic isolation.	
Isolation	500VAC/minute	500VAC/minute	
Digital Output	· ·		
Type and Polarity	Transistor output NPN	Transistor output PNP	
Number of			
channels	8	8	
Output Maximum 500mA (24)/ DC		Maximum 300mA (24V DC	
Current/Channel	±10%)	±10%)	
Output Leakage			
Current	Maximum:10µA	Maximum:10µA	
Output Impedance	Maximum: 0.3 Ω	Maximum: 0.3 Ω	
Output Delay	<5uS	<20uS	
	Inductive load output	Inductive load output	
Protection	protection	protection	
	Short circuit protection	Short circuit protection	
	Resistive load:	Resistive load: 7.2W/channel,	
	12W/channel, 48W/module	48W/module	
	Inductive load:	Inductive load: 3.6W/channel,	
Output Load	6W/channel, 24W/module	24W/module	
	Lamp load: 5W/channel,	Lamp load: 3W/channel,	
	20W/module	20W/module	
Isolation	Digital isolation,	Digital isolation,	
isolation	500VAC/minute.	500VAC/minute.	

3.4 Local I/O Specification

(12) 13 -1 Kinco 6 2 Kinco (14) AK840M $\overline{\mathbf{7}}$ AK840M 3 (8) 4 (15) Ethernet1 9 EXP-0 EXP-0 (16) at2 10 (6 5 (17) ► (<u>1</u>) EXP

4 Component Description

Fig4.1-1 Photograph of AK840

No.	Item	Comment		
		PWR: Power Status RUN: Device Operating Status	Steady On: Power supply normalOff: Power abnormal or not connectedSteady On: Device is runningOff: Device is stopped	
1	Indicator Panel	ERR: EtherCAT bus Status	Steady On: EtherCAT bus error detected Off: EtherCAT bus is running normally	
		BATT: Battery Status	Steady On: Battery group low or not installed Off: Operating normally	
		BUS: Expansion Bus Status	Steady On: Expansion modules detectedFlashing:Expansion module failuredetectedOff: No expansion modules detected	
2	Model Symbol	Indicates the controller model.		
3	Type-C	Can be used for controller firmware updates.		
4	EXPO	Expansion BD slot . For details, see <u>10.1</u>		
(5)	EXP1	Expansion BD slot . For details, see <u>10.1</u>		
(6)	Cover	Used to protect exposed connectors on the side of the PLC.		

7	Local I/O Indicators	Steady On: Indicates output/input received Off: No output/input received
8	EtherCAT	Connects to EtherCAT bus devices.
9	EtherNet1	Supports Modbus TCP Slave/Master protocols, allows debugging and program downloading. Default IP: 192.168.1.100.
10	EtherNet2	Supports Modbus TCP Master/Slave, allows debugging and program downloading. Default IP: 192.168.2.100.
(11)	Power Supply and RS485 Connector	Two groups, the L group is for RS485 connection, the other group (right side) is for power supply.
(12)	Locking Latch	Standard DIN35 rail installation
(13)	RUN/STOP Toggle	Controls device status: STOP for halting the program, RUN for starting the program.
14)	Side Connectors	Used for backplane (expansion) communication and power supply.
(15)	DIN Rail Slot	Compatible with standard DIN35 rails for assembly
16	Fuselage Label	Includes basic product information such as model number, serial number, certifications, and wiring diagrams. Refer to 2.3 Fuselage Label for details
17)	Local I/O Connector	Plug-In Spring Terminals: Tool-free installation and efficient connections. For details, refer to specific model connection diagrams.

5.Wiring

5.1 Power Supply & RS485

The power supply and RS485 share the same 6-pin dual-row detachable connector, which is equipped with a mechanical lock.



Fig5.1-1 Power supply and RS485 wiring diagram

Pin	Symbol	Description	Pin	Symbol	Description		
A1	485+	RS485+	B1	+24V	Power Supply+		
A2	485-	RS485-	B2	0V	Power Supply-		
A3	SG	RS485 Ground	В3	¢	Power Supply Ground		

The definition of the connector is as follows.

5.2 Local I/O



Fig.5.2-1 Local I/O wiring diagram (output NPN)



Fig.5.2-2 Local I/O wiring diagram (output PNP)

6.Dimensions



Fig.6.1-1 Dimension diagram of AK840

7.Assembly Instructions



7.1 Assembly Dimensions

Fig.7.1-1 Assembly dimension diagram of AK840

7.2 Assembly Method

7.2.1 DIN Rail Dimensions

AK8X0 series controller supports assembly by standard DIN rails (35mm wide and 1mm thick). The following two heights are commonly used.



Fig.7.2.1-1 Standard DIN Rail

Notes: If the rail thickness is less than 1mm, the latch may not lock securely, causing looseness. If thicker than 1mm, the latch may not close properly, and forcing it to lock could damage the module.

7.2.2 Module Assembly

During assembly, pull the spring-loaded self-locking latch on the top of the module upward, position the module vertically onto the DIN rail, ensure the lower latch aligns with the bottom edge of the rail, and then release the latch. Once it resets automatically, the module will be securely fixed to the rail.



Fig.7.2.2-1 Assembly onto the Din Rail

After all modules are assembled, use rail fixing blocks that are compatible with the rail size to secure the PLC and expansion I/O modules in their intended positions on the rail. This prevents improper displacement during mechanical vibrations or transportation, ensuring system safety.





During disassembly, first loosen the rail fixing block, then use a flathead screwdriver or other tools to lift the spring-loaded self-locking latch on top of the module. Afterward, remove the module from the rail.



Fig.7.2.2-3 Disassembly

Notes: Rail fixing blocks must match the size of the DIN rail. Customers should purchase the blocks separately based on their specific requirements.

7.2.3 Connector Assembly

Disassembly





Assembly



Fig.7.2.3-2 Connector assembly

8.Getting Started

8.1 Device Description File Acquisition

The AK8X0 series motion controller package file (.PACKAGE) integrates device descriptions for all CPU modules in the AK8X0 series. Please visit the Kinco official website <u>https://www.kinco.cn/</u>(CN), <u>https://en.kinco.cn/</u> (EN) or contact Kinco's official customer service department to obtain the latest device description files.

8.2 Install Device Description File

This chapter demonstrates the device installation process using the standard CoDeSys-style interface (CoDeSys V3.5.19).

<u>Step 1</u>: Open CoDeSys V3.5.19, locate and open the "CODESYS Installer" under the "Tools" menu.



Fig. 8.2-1 Open 'CODESYS installer'

Step 2: In the CODESYS Installer, click **Install File** to select the device you want to install. Before installation, please close the CODESYS software as instructed, otherwise the installation cannot proceed.

		Browse
Channel for Add-ons Releases		
	Install File Export Configuration	Import Configuration
4.2.0.0 +		
7.29.0.0		
4.0.0.0		
4.1.1.0		
4.2.0.0		
4.0.2.0		
4.0.0.0		
4.0.0.0		
4.0.0.0		
	Channel for Addone Releases 1.29.0.0 4.0.0 4.1.1.0 4.2.0 4.0.2 4.0.00 4.0.00 4.0.00 4.0.00 4.0.00 4.0.00 4.0.00 4.0.00 4.0.00 4.0.00 4.0.000 4.0.000 4.0.000 4.0.000 4.0.0000 4.0.00000000	Channel for Addoms Releases Install File Export Configuration 4.2.0.0 4.0.0

Fig. 8.2-2 Select file and install

<u>Step 3</u>: After the prompt box appears, check the box 'I want to continue despite the missing signature', and click 'Continue' to proceed with the next step of the installation.

Install packages		
C Kinco XMLs for AK84x 1.0.0.4	Kinco XMLs for AK84x 1.0.0.4	
Signature		
No signature w	as found in package.	
I want to continue despite of the missing signature	(s) Continue	Cancel

Fig. 8.2-3 Click 'Continue' to proceed **Step 4**: Please wait patiently for the installation to complete.



Fig. 8.2-4 Wait for the installation to complete

<u>Step 5</u>: Wait for the installation to finish. After that, you can close the installer and restart CODESYS

software.

CODESTS INSTAILED			
ion DESYS 64 3.5.19.10			
ation codesys\CODESYS			Brows
nnel for Setups eases	Channel for Add-ons Releases		
dd-Ons			
		Install File Export Configuration	Import Configuration
Installed Browse Updates			
CODESYS Sercos III	4.0.0.0		
CODESYS SFC	4.1.0.0		
CODESYS SoftMotion	4.14.0.0		
CODESYS Target Settings Export	4.0.0.0		
CODESYS Trace	4.0.0.0		
CODESYS Visualization	4.3.0.0		
CODESYS Visualization Support	4.1.1.0		
Kinco XMLs for AK84x	1.0.0.4		
	4		

Fig. 8.2-5 Installation complete

8.3 Upgrade Instructions

8.3.1 Upgrade via USB

<u>Step 1</u>: Place the firmware program to be updated in the root directory of the USB drive. The firmware with the **delapp** suffix will erase the existing user program in the PLC (note that the USB drive must be formatted as FAT32).



Fig.8.3.1-1 Place the firmware program

<u>Step 2</u>: Insert the USB drive into the Type-C port on the AK840, and then power off and restart. Please use a USB drive with a Type-C connector or use a USB-A to USB-C adapter.



Fig.8.3.1-2 USB-A to USB-C adapter

Step 3: During the reboot, observe the RUN light. A green flashing light indicates that the firmware update is in progress (do not power off or perform any other interrupting actions). When the RUN light is solid green, it means the update is complete.

8.3.2 Upgrade via CoDeSys

<u>Step 1</u>: After connecting to the AK840, go to the **Device** interface, and in the **Files** tab, place the firmware program in the **runtime** root directory.

Unoted IS Vice and acception	Communication Settings	Host Location 🏣 C:\Users\lenovo\Deskt	op	• 🗅 🗙	5	Runtime Location 🛅 /		• 🖬 🗘 🗙
Difference (weather to accurry Difference (weather to accurry) Difference (weather to acc	Applications	Name L	Size	Modified		Name Cert	Size	Modified
Ibrary Manager IDF PLC_PRG (PRG)	Backup and Restore	.Temp 4PTO				ial lost+found PicLogic		×
😑 🧱 Task Configuration	Files	AK340M+组合				AK840-delapp-2024-05-28.AK840upgrade	13.04 MB (13,676,55	2024/10/12 21:47
S EtherCAT_Task	las.	AKBX0固件版本留档				@ 35.dat	71字节	2024/10/13 1:53
🖻 🥩 MainTask	Log	app app						
PLC_PRG	PLC Settings	bdtestid						
SoftMotion_PlanningTask		CRT						
Task	PLC Shell	InoProShop中型PLC后台编程软件补丁包。						
Q ⁹ Trace		ionit						
HSIO (HSIO)	Users and Groups	K606-24AT MK043E-20DT 这两个型号的						
BP-0 (BP-0)	Access Rights	Kinco AK800_Pack(v1.6.0.2)						
- (EPP_1 (EPP_1)		KO-PLC-FC-HSC000_v02						
- 🛐 LocalBus (LocalBus)	Symbol Rights	LocalBus						
Modbus_Slave_TCP (Modbus Slave TCP ETH1)		MBTcpMaster						
Modbus_Slave_485 (Modbus Slave 485)	Licensed Software Metrics	MK系列固件						
EtherCAT_Master (EtherCAT Master)	IEC Objects	Modbus Tools			1			
K RP20C_ECT (RP20C-ECT-1.1.0.STEST)	and outputs	pp.8.6.5.portable.x64			- 22			
RP20_0202IV (RP20-0202IV(2-channel AI and 2-channel	PLC Parameters	Pld.ogic						
Modbus Slave TCP 2 (Modbus Slave TCP ETH2)		Programmer			<<			
SoftHotion General Axis Pool	Task Deployment	RECP						
	2.000 C	RP20C ECAT V131						
	Status	RP20XMLS2#3						
	Information	testhsio						
		vitu						
		VR5.EC XM 2002ST V3.20						
		- mr						
		- 电口语语 於広田						
		AK940-1.0.0-20240522 AK940-perceda bet	0 ***	2024/10/12 12:47				
		E many-10-0-20200528-Mc0404pgrade.oct	A 46 11	2027 20/12 13:47				

Fig.8.3.2-1 place the firmware program in the runtime root directory

Step 2: Power off and restart the PLC.

<u>Step 3</u>: During the reboot, observe the RUN light. A green flashing light indicates that the firmware update is in progress (do not power off or perform any other interrupting actions). When the RUN light remains green, it means the update is complete.

8.3.3 Upgrade via FTP

<u>Step 1</u>: Connect to AK840 through FTP software, using mobaxotem as an example. <u>The Username is userftp and the password is kinco.</u>

💽 💽 🛃 🛄 SSH Telnet Rsh Xdmcp RDP	v VNC FTP SFTP Serial File	P 🌍 🔊 🍄 🂷 Shell Browser Mosh Aws S3 WSL
Sasic Ftp settings Remote host * 192.168.1.100	Username userftp 🔽 🗾	Port 21
🔇 Advanced Ftp settings 🛛 ★ Bookma	ark settings	
	FTP session	Ś
	OK Cancel	

Fig.8.3.3-1 Connect to AK840 through FTP software

<u>Step 2</u>: Transfer the update file to the root directory.

i 192.																			
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	192.1	68.0.100			RP20				1	Name			Size (KB)	Last modified	Owner	Group	Access	Size (Bytes)	
	192.1	68.1.100			RP20XM	L留档 カエオオのGH			'	cert				2025-01-09 08:00		1000	drwxrwsr-x	4096	
	N 192.1	68.1.100			KP2018					lost+found				2025-01-09 08:00			drwx	16384	
1	A 192 1	68 1 100 1	(root)			_	-		_	PicLogic				2025-01-20 08:00		1000	drwxrwsr-x	4096	
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	102 1	0 1 110		. 🔁 视:	颊					StdLogger	_2.csv		97	2025-01-16 08:00		1000	-rw-rr	100019	
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Fig.8.3.3-2 Transfer the update file to the root directory

<u>Step 3</u>: Power off and restart the PLC.

Step 4: During the reboot, observe the RUN light. A green flashing light indicates that the firmware update is in progress (do not power off or perform any other interrupting actions). When the RUN light remains green, it means the update is complete.

8.4 Program download

8.4.1 Online download

<u>Step 1</u>: After connecting to the AK840, click **Login** on the toolbar. The following dialog box is displayed, select "Yes" to download the current program to the device.



Fig.8.4.1-1 Online update program

8.4.2 USB download

- Pa	g bene x						
 Otheranti 	 Communication Settings 	Host Location		• (🗈 🗙 💠)	Runtime Location 🛅 /		- 🗅 🖉 🖓
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Soffvielen General Aus Pool	Pi-C Parainters Task Deployment Staformation				~~		

<u>Step 1</u>: After connecting to the AK840, find "**Files**" in the **Device** and insert a USB flash drive into the computer.

Fig.8.4.2-1 Open the Files

<u>Step 2</u>: After refreshing, enter the following directory and send the two files in the directory to the USB flash drive.

Communication Settings	Host Location		- 🗎 🗙 💠	Runtime Location 🛅 PlcLog	gic/Application	- 🗀 🗘
Applications	Name	Size	Modified	Name	Size	Modified
Backup and Restore				L	20 bytes	1970/1/1 8:04
Files				Application.app	560.42 KB (573,872 b	. 1970/1/1 8:04
DI C Sattings						
ecc settings						
PLC Snell	-					
Users and Groups						
Access Rights	_					
Symbol Rights						
Software metrics for license determination						
IEC Objects			1	>>		
PLC Parameters						
Task Deployment				<<		
Status						
Information						

Fig.8.4.2-2 Extract program files to USB flash drive

<u>Step 3</u>: Set the Run/Stop DIP switch to Stop, insert a USB flash drive into the AK840, and the program can be downloaded successfully after restart.

8.4.3 FTP download

<u>Step 1</u>: After connecting to the AK840, find "Files" in the Device .

vices 👻 🖣 🗙	BD20_CAN CANDUS	CANopen_Manager	🕤 JD_driver 🛛 🚷 EtherCA	KT_Task) 🗑 D	evice x	
Lindledd	Communication Settings	Host Location		• 📾 🗙 💠		Runtime Location	- 💼 🔇
	Applications Backup and Restore Files Log RC Stettings PC Shell Uses and Groups Access Ripits Software matrice for license Access Ripits Software matrice for license USC Variantes Task Deployment Batus Erformation	Name	Size	Modified	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Name Size <clok icon="" lab="" on="" refresh="" the="" to="" update=""></clok>	Modified

Fig.8.4.3-1 Open the Files

<u>Step 2</u>: After refreshing, enter the following directory and extract the two files from the directory to the computer (this method is recommended), or directly create the corresponding. application and. crc files offline. To ensure the normal operation of the program, please first verify through physical object download.



Fig.8.4.3-2 Extract program files to computer

ي / test				<u>`</u> 12	С, L С, L	ogin ogout		Alt+F8 Ctrl+F8
□	✓ 董 查看 ✓ 修改日期		大小	Devices		reate Boot Applicat Iownload Inline Change	ion	
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Application.crc	2025/2/10 15:03	CRC 文件	1 KB	= 🚫 Application	N	Aultiple Download		
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Untitled8_project.precompilecache Untitled8-AllUsers.opt	2025/2/10 15:03	OPT 文件	1 KB	- 👘 HSIO (HSIO) 👘 EXP_0 (EXP_0)	C V A	perating Mode ssign Server Applic	ations on Do	wnload
				GP_1 (EXP_1) GDP_1 (EXP_1) GDP_1 (EXP_1) GDP_1 (EXP_1) GDP_1 (EXP_1) GDP_1 (EXP_1) GModus_Slav_TCP (Modus Slav GP (Modus Slav_TCP (Modus Slav) GP (CANope) GANous (CANbus) GP (CANopen_Manager (CANope G) CANopen_Manager (CANope G) CAnopen_Manager (CANope G) CAnopen_Manager (CANopen_Manager	ve TCP ET Motion) n_Manag	H1) er)	Informatio	n

Fig.8.4.3-3 Createe files on the computer offline

<u>Step 3</u>: Connect to AK840 through FTP software, using mobaxotem as an example. <u>The Username is userftp and the password is kinco.</u>

SSH Telnet Rsh	Xdmcp RDP VNC	Image: Weight of the second se	💉 選 Serial File	ک 🔇 کی Shell Browser Mosh	💖 🔳 Aws S3 WSL
Remote host * 19	2.168.1.100 Use	rname userftp	× 2	Port 21	
😵 Advanced Ftp settings	s 🔺 Bookmark settings]			
	FTP	session			Ø
	۲	ок	8 Cancel		

Fig.8.4.3-4 Connect to AK840 through FTP software

<u>Step 4</u>: Transfer the update file to the root directory.

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1							-			PicLogic			2025-01-20 08:00		1000	drwxrv	/sr-x	4096	
	192.1	68.1.100 ((root)	名称			大小	项目类型	0	3S.dat			2025-01-01 08:00		1000				
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Fig.8.4.3-5 Transfer the update file to the root directory

<u>Step 5</u>: Power off and restart the PLC.

8.5 IP Modification

<u>Step 1</u>: After logging into the device, go to the PLC Parameters option under the Device tab. Modify the IP by entering the desired IP address in the preset value field of the corresponding channel, then click **Write Parameters** button in the upper right corner to apply the changes.

) Unobled18								_			
G 🗐 Device (connected) (AK840M-0808DTN)	Communication Settings									-	Write Para
PIC Logic Application [run]	Applications	Parameter	Туре	Current Value	Prepared Value	Value	Default Value	Unit	Description		
1 Library Manager	Backup and Restore	m . Ethernel 1							Set value, click write Para	meter, Stop PLC I	o make it works
PLC PRG (PRG)		P Address	STRING	192.168.1.100		192.168.1.100	192.168.1.100	-			
Task Configuration	Files	Netmask	STRING	255.255.255.0		255.255.255.0	255-255.255.0				
-OSS EtherCAT Task		Gateway	STRUNG	192.168.1.1		192, 166, 1, 1	192.168.1.1				1
B-OSS MainTask	Log	e enemerz							Set value, Cloc write Para	meter, stop PLC	o make it works
- dl PLC PRG	PLC Settings	- V P Address	STRING	192.168.2.100		192.168.2.100	192.168.2.100				
G III HSTO (HSTO)		Netmask	STRING	255.255.255.0		255.255.255.0	255.255.255.0				
G G EXP 0 (EXP 0)	PLC Shell	Gateway	STRING	192.168.2.1		192, 168, 2, 1	192, 168, 2, 1				
*	alaman and a second	Date And Time	CONTRACT CONTRACTOR	Contraction of the local division of the loc							
G III LocaBus (LocaBus)	Users and Groups	P Date And Time	DATE_AND_TIME	DI#1970-1-1-5:43:6							
Modern Slave TCP (Modern Slave TCP FTH1)	Access Rights	System Information									
+ Coll Noders Marter TCP (Moders Marter TCP)		Firmware Version	STRING	1.2.1.240925							
Com EtherCAT Marter Cofficient (EtherCAT Marter Cofficience)	Symbol Rights	Hardware Version	STRING	1.1.0							
B G K RP20C ECT (RP20C-ECT-1, 1.0.5)	Software metrics for license	🗢 🌻 Retain Capacity	UDINT	3145728							
G F PP20 0400TV (PP20.0400TV(4 channels & module)	determination										
	PLC Parameters	-									
	R: Granders R: C Parameters Task Deployment Batus Jeformation										
	El constantes EL C Parametes Status Information Messages - Total O error(b), 8 warrey Build	(d), J message(d)	rrar(s) 🖲 0 warning	j(c) • 3 message(c)	××						

Fig.8.5-1 Modify device IP and gateway

<u>Step 2</u>: At this point, the IP of the corresponding channel has not been fully updated. The new IP will take effect only after reboot.

8.6 Modbus TCP

8.6.1 Modbus TCP Slave

<u>Step 1</u>: The Modbus_slave_TCP (Modbus TCP Slave ETH1) is one of the default items created when generating a new program. Double-click Modbus_slave_TCP to open the settings interface and adjust the configuration. For instance, the default parameters for the ETH1 port are Port: 502 and Slave ID: 1, as shown. (To configure parameters for the ETH2 port, you'll need to add a corresponding TCP slave for ETH2).



Fig.8.6.1-1 Modify device configuration

<u>Step 2:</u> After downloading the program, use **Modbus_Poll** to simulate communication. In the **Modbus_Poll** simulation software, set the function code to **16** and write the value **100** to the PLC register address **%MW100**. If the program shows that **%MW100** has received the value **100**, it indicates that Modbus TCP communication has been successfully established.

Image: Sector Secto	· · ·	A X Modus_Slave_TCP Device PRC_PRG X					
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• • • • • • • • • • • • • • • • • • •	= 😳 🗐 Device (连指的) (AK340M-0908DTN)	表达式	英型	98	准新道	2332L	注释
● September (BfT) (f) (f) </td <td>◎ 圖則 PLC 漫編</td> <td>* Test WORD</td> <td>WORD</td> <td>100 .</td> <td></td> <td>%MW100</td> <td></td>	◎ 圖則 PLC 漫編	* Test WORD	WORD	100 .		%MW100	
I create a	- 〇 Application [运行]	Test Bit	BT	PALSE		%QX0.0	
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		1					

Fig.8.6.1-2 use Modbus Poll to simulate communication

8.6.2 Modbus TCP Master

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<u>Step 1</u>: Right-click on **Device**, select **Add Device**, and add **Modbus Master TCP** in the shown directory.

Fig.8.6.2-1 Add Modbus TCP Master Device

<u>Step 2</u>: Right-click on **Modbus Master TCP**, select **Add Device**, and then add **Modbus Device TCP**.



Fig.8.6.2-2 Add Modbus Device TCP

<u>Step 3</u>: Configure the slave information in the **Modbus Device TCP** tab.

Devices 👻 🕈 🗙	Modbus_Slave_TCP	Modbus_Device_TCP X					
Droted4 Orbited4 Orbited4 Orbited4 Orbited4	IEC Objects	Parameter	Туре	Value	Default Value	Unit	Description
	Parameters	Slave IP address	STRING	192, 168, 1, 1	'192, 168, 1, 1'		
Application	Chature	- / Port	UINT	502	502		
	Julus	Response Timeout	UINT	1000	1000	ms	
Task Configuration	Information	🔶 <	USINT(1247)	1	1		
EtherCAT Task		🔶 🌵 Frame Interval	UINT	5	5	ms	
🖃 🥸 MainTask		Mask Disconnect	BOOL	FALSE	FALSE		
@ PLC_PRG		Mask Time	UINT	600	600	s	
HSIO (HSIO)			L				
EXP_0 (EXP_0)							
EXP_1 (EXP_1)							
LocalBus (LocalBus)							
Modbus_Slave_TCP (Modbus Slave TCP ETH1)							
EtherCAT (EtherCAT Master SoftMotion)							
Modbus_Master_TCP (Modbus Master TCP)							
Modbus_Device_TCP (Modbus Device TCP)							
SoftMotion General Axis Pool							

Fig.8.6.2-3 Modify the configuration information

<u>Step 4</u>: Right-click on **Modbus Device TCP**, select **Add Device**, and under the slave device, you can add a functional channel. In this example, add **Function Code 16**: **Write Multiple Registers**.



Fig.8.6.2-4 Add functional channels

<u>Step 5:</u> In the Write_Multiple_Registers tab, configure the parameters as shown in the diagram, setting the length to 10.

Devices - 4 X	Modbus_Slave	TCP Modbu	s_Device_TCP	rite_Multiple_Registers X		
(httled4 (AK840M-0808DTN) (AK840M-0808DTN) (AK840M-0808DTN)		Parameter	Type Enumeration of USINT	Value 16: Write Multiple Registers	Default Value	Unit Descript
		Ø Offset	UINT	0	0	
Library Manager		Length	UINT(110)	10	1	
PLC_PRG (PRG)		Cyclic Time	UINT	100	100	ms
E Task Configuration		- 🔷 Trigger	Enumeration of BOOL	Cydic	Cyclic	
EtherCAT_Task		Error Handling	Enumeration of BOOL	Keep Last Value	Keep Last Value	
🖻 🍪 MainTask		- 🖗 Resend Times	USINT(110)	1	1	
If SD (MSD) Image: DP_1 (EP_1) Image: DP_1 (E						

Fig.8.6.2-5 Modify the configuration information

Step 6: After downloading the program, use Modbus_slave to simulate

communication. In the Write_Multiple_Registers channel, write 100 in the I/O mapping. If the Modbus_slave simulation software receives the value 100, it indicates that Modbus TCP communication has been successfully established.



Fig.8.6.2-6 Use Modbus Slave to simulate communication

8.7 Modbus RTU

8.7.1 Modbus RTU Slave

<u>Step 1</u>: Right-click on **Device**, select **Add Device**, and add **Modbus Slave 485** in the shown directory.



Fig.8.7.1-1 Add Modbus RTU slave

<u>Step 2</u>: Double-click to open the **Modbus Slave 485** tab, and modify the configuration information in the **Parameter** interface.



Fig.8.7.1-2 Modify the configuration information

<u>Step 3</u>: After downloading the program, use **Modbus Poll** to simulate communication. Set the function code to 16, and write the value 100 to the PLC register address %MW100 as shown in the diagram. If the data transfer is successful, it indicates that the Modbus RTU communication has been successfully established.



Fig.8.7.1-3 Use Modbus Poll to simulate communication

8.7.2 Modbus RTU Master

<u>Step 1</u>: Right-click on **Device**, select **Add Device**, and add **Modbus Master 485** in the shown directory.

vices 👻 a 🗙	Device X	
Untitled3	Communication Settings Scan Network Ga	steway + Device +
	n CSV SV Torsy ts ts ts ts ts ts ts ts ts ts	Price Blug device Ugdate device Vendor Vendor Version Description then) Ltd. ter 232 BD0 KDKC0 Blectric (Shensher) Ltd. 1.0.0.0 Modbus Master 232 [BD0] ter 232 BD1 KIKC0 Blectric (Shensher) Ltd. 1.0.0.0 Modbus Master 232 [BD0] ter 435 KDKC0 Blectric (Shensher) Ltd. 1.0.0.0 Modbus Master 435 [BD0]
Reset Orgin Device [Pervice Pervice Task Deployment Status Status Information Inform	s5 [Shenzhen] Ltd.
	Append selected device as la	ist child of

Fig.8.7.2-1 Add Modbus Master 485

<u>Step 2</u>: Right-click on **Modbus Master 485**, select **Add Device**, and then add **Modbus Device RTU**.

evices 👻 4	X Device X	
Dirbited3	Communication Setting	scan Network Gateway + Device +
Device (AK840M-0808DTN) Device (AK840M-0808DTN) Device (AK840M-0808DTN)	Applications	
Application	Backup and Restore	
PLC_PRG (PRG) Task Configuration	Files	Madd Device
EtherCAT_Task	Log	alge Modbus_Device_RTU
PLC_PRG	PLC Settings	Action Action Action Action Action Plug device Update device
- 🗐 HSIO (HSIO) - 🗐 EXP_0 (EXP_0)	PLC Shell	String for a full text search Vendor <a>Al vendors>
EXP_1 (EXP_1)	Users and Groups	Name Vendor Version Description
Modbus_Slave_TOP B Copy Copy Modbus_Slave_48 Paste Modbus_Master 48 Pelete SoftMotion General	g , et	E Modus Device RTU KINCO Electric (Shenuhen) Ltd. E Modus Device RTU KINCO Electric (Shenuhen) Ltd. 1.0.0.0 Modus Device RTU
Properties.	-	
Add Object	t r	Group by category Display all versions (for experts only) Display outdated versions
Add Devic Insert Devi Disable De Update De G ^{**} Edit Object Edit Object	e ce vice vice t t With	

Fig.8.7.2-2 Add Modbus Device RTU

<u>Step 3</u>: Double-click to open the **Modbus Master 485** tab, and modify the configuration information in the **Parameter** interface.

Device (AK840M-0808DTN)	IEC Objects	Parameter	Туре	Value	Default Value	Unit	Description
9 DLC Logic	Parameters	🔶 🌵 Baudrate	Enumeration of UDINT	9600	9600		
= O Application	Parameters	Parity	Enumeration of STRING	Even	Even		
Library Manager	Status	- 🗇 Data Bits	UINT	8	8		ASCII(7) / RTU(8)
PLC_PRG (PRG)		Stop Bits	Enumeration of USINT	1	1		
E I Task Configuration	Information	🔶 🔷 Frame Interval	UINT	5	5	ms	
EtherCAT_Task							
😑 🥵 MainTask					J		
DIC_PRG							
HSIO (HSIO)							
- 1 HSIO (HSIO) - 1 EXP_0 (EXP_0)							
- (1) HSIO (HSIO) - (1) EXP_0 (EXP_0) - (1) EXP_1 (EXP_1)							
- (1) HSIO (HSIO) - (1) EXP_0 (EXP_0) - (1) EXP_1 (EXP_1) - (1) Localius (Localius)							
- 데 HSIO (HSIO) - 데 EVP_0 (EVP_0) - 데 EVP_1 (EVP_1) - 데 LocaBlus (LocaBlus) - 데 Modbus_Slave_TCP (Modbus Slave TCP ETH:							
∰ FSD (FSD) ∰ EP_0 (EP_0) ∭ EP_1 (EP_1) ∭ Localbus (Localbus) ∭ Modbus _Slave_TCP (Modbus Slave TCP ETH: ∰ EffectAT (EtherCAT Master SoftWotion)							
- - HSD (%SIO) - EVP.0 (EVP.0) - - EVP.0 (EVP.0) - - Exetable (Locable) - - Ever.CAT (Ether CAT Masker SoftWoton) - - Moduu, Save.45 (Moduus Save 45) - - Moduu, Save.45 (Moduus Save 45) - - Moduu, Save.25 (Moduus Master 45) - - Moduu, Save.25 (Moduus Master 45) - - Moduu, Save.26 (Moduus Master 45) -							

Fig.8.7.2-3 Modify the configuration information

<u>Step 4</u>: Double-click to open the **Modbus Device RTU** tab, and modify the configuration information in the **Parameter** interface.



Fig.8.7.2-4 Modify the configuration information

<u>Step 5</u>: Right-click on **Modbus Device RTU**, select **Add Device**, and under the slave device, you can add a functional channel. In this example, add **Function Code 16**: Write Multiple Holding Registers.



Fig.8.7.2-5 Add Modbus RTU functional channel

<u>Step 6</u>: In the **Write_Multiple_Registers** tab, configure the parameters as shown in the diagram, setting the length to 10.

Device (AK840M-0808DTN)	Parameters	Parameter	Туре	Value	Default Value	Unit	Description
PLC Logic	1/0 Mapping	Function Code	Enumeration of USINT	16: Write Multiple Registers	16: Write Multiple Registers		
S O Application	a chapping	🔶 <	UINT	0	0		
Library Manager	IEC Objects	Æ Length	UINT(110)	10	1		
PLC_PRG (PRG)		🔷 🌵 Cyclic Time	UINT	100	100	ms	
🖻 🧱 Task Configuration	Status	🔶 🖗 Trigger	Enumeration of BOOL	Cydic	Cyclic		
EtherCAT_Task	Information	Error Handling	Enumeration of BOOL	Keep Last Value	Keep Last Value		
🖻 🥩 MainTask		Resend Times	USINT(110)	1	1		
EXP_0 (EXP_0)							

Fig.8.7.2-6 Configure functional channel parameters.

<u>Step 7</u>: After downloading the program, use **Modbus_slave** to simulate communication. In the **Write_Multiple_Registers** channel, write **100** in the I/O mapping. If the **Modbus_slave** simulation software receives the value **100**, it indicates that Modbus RTU communication has been successfully established.

8.8 High-speed Input

All AK840 series PLCs support two high-speed inputs.

- In Pulse/Direction mode:
 - For CH0 (Channel 0), the pulse signal connects to terminal I0, and the direction signal connects to terminal I1.
 - For CH1 (Channel 1), the pulse signal connects to terminal I2, and the direction signal connects to terminal I3.
- In AB Phase mode:
 - For **CHO (Channel O)**, the A-phase signal connects to terminal **IO**, and the B-phase signal connects to terminal **I1**.
 - For **CH1 (Channel 1)**, the A-phase signal connects to terminal **I2**, and the B-phase signal connects to terminal **I3**.

PIN	A/B Phase Mode	Pulse/Direction mode
10	CH0 A-phase	CH0 Pulse
11	CH0 B-phase	CH0 Dir
12	CH1 A-phase	CH1 Pulse
13	CH1 B-phase	CH1 Dir
14	CH0 Latch Signal	CH0 Latch Signal
16	CH1 Latch Signal	CH1 Latch Signal

In the HSIO tab's parameter interface, you can configure the high-speed counter parameters: counting mode, count upper limit, count lower limit, and latching mode.

Device (AK840M-0808DTM)	Kinco.HSIO IEC Objects		arameter	Туре	Value	Default Value	Unit	Description
			DO module CH0 Stopmode after lost link	BYTE	0	0		False : Hold Output; True : Set
C Application	HSIO Parameters		DO module CH0 Stopvalue after lost link	BYTE	0	0		
Library Manager	HSIO I/O Mapping	8	Counter CH0					
PLC_PRG (PRG)	1		Counter Mode	Enumeration of BYTE	Disable	Disable		
Task Configuration	Status		 P Counter Upper 	DINT	2147483647	2147483647		
EtherCAT_Task	Information		Counter Lower	DINT	-2147483648	-2147483648		
🖻 🍪 MainTask	1 monnetion		Latch Mode	Enumeration of BOOL	Rising Edge	Rising Edge		
PLC_PRG		8	Counter CH1					
HSIO (HSIO)		-	Counter Mode	Enumeration of BYTE	Disable 🗸 🗸	Disable		
- 🛐 EXP_0 (EXP_0)			🚽 < Counter Upper	DINT	Disable Physe Dir	2147483647		
- 🗊 EXP_1 (EXP_1)			Counter Lower	DINT	AB x1	-2147483648		
LocalBus (LocalBus)			Latch Mode	Enumeration of BOOL	AB x2 AB x4	Rising Edge		
Modbus_Slave_TCP (Modbus Slave TCP E								
EtherCAT (EtherCAT Master SoftMotion)								
😑 🚮 Modbus_Master_TCP (Modbus Master TCF								
Modbus_Device_TCP (Modbus Device								
Write_Multiple_Registers (Write M								
SoftMation General Avis Pool		- 11 -						

Fig.8.8-1 High-speed counter configuration interface

In the HSIO I/O mapping parameters under the HSIO tab, there are default register addresses available for users to control the high-speed counter, such as enabling channel pins, clearing the count value, enabling latching, etc.



Fig.8.8-2 High-speed counter apply interface

8.9 Battery detection

8.9.1 View battery status in IDE

After connecting to the AK840, click **login** on the toolbar. The current RTC clock battery status can be queried by finding the battery status in the PLC parameter in the Device TAB. False: The battery is operating normally; True: the battery is low and needs to be replaced.

Communication Settings									Write Parameter
Applications	Parameter	Type	Current Value	Prepared Value	Value	Default Value	Unit	Description	
	Construction							Set value, Click 'Write Parameter', Stop PLC to make it works	
Backup and Restore	B- Cale EtherNET2							Set value, Click 'Write Parameter', Stop PLC to make it works	
Blar	🖲 🔛 Date And Time								
inca .	🖲 🦳 System Information								
og	🖹 🔚 BatteryStatus								
Cattings	Battery Low	BOOL	FALSE						
ee settings									
4LC Shell									
Isers and Groups									
ccess Rights									
ymbol Rights									
oftware metrics for license etermination									
EC Objects									
PLC Parameters									
Fask Deployment									
Status									
Information									

Fig.8.9.1-1 View battery status in IDE

8.9.2 View battery status in IDE through indicator light

View the BATT indicator light on the AK840. If the indicator light is steady orange, it means that the battery is low; if the indicator light is off, it means that the battery is fully charged.



Fig.8.9.2-1 View battery status in IDE through indicator light

9.Error Diagnosis

9.1 Error Query Method

Error queries require logging into the device. After logged in, go to the Device interface, select the Logs tab, and click the Refresh button to display the latest device log information.

ces 👻 🗘 :	X Modbus_Device_TCP_6_2	Modbu	_Device_TCP_2_2	us_Device_TCP_3_3 🛛 Modbus_Device_TCP_5_1 👘 Modbus_Device_TCP_3_1	PLC_PRG Modbus_Device_TC
Untitled 18	-		h - T		Internet of St
= 🗊 Device [connected] (AK840M-0808DTN)	Communication Settings	Component		7 0 0 481 0 0 Search in messages X X M0.00 • 1	
PLC Logic	Applications	Severity	Time Stamp	Description	Component
= O Application	Approximity	0	01.01.1970 13:23:00.688	Application [Application] loaded via [Download]	СтрАрр
Library Manager	Backup and Restore	0	01.01.1970 13:23:00.648	No Modules Found!!!	CmpLocalBus
PLC_PRG (PRG)		•	01.01.1970 13:22:59.840	SysTaskJoin [ModbusMasterTCP]: error Connection timed out	SysTask
😑 🧱 Task Configuration	Files	0	01.01.1970 10:31:48.181	Application [Application] loaded via [OnlineChange]	СтрАрр
😑 🥵 MainTask	100	0	01.01.1970 10:31:10.226	Startup finished: All slaves in operational !	IEC=0x00001005
D PLC_PRG		0	01.01.1970 10:31:10.222	All slaves operational	IEC=0x00001005
HSIO (HSIO)	PLC Settings	0	01.01.1970 10:31:10.122	Set operational mode	IEC=0x00001005
- 🛐 EXP_0 (EXP_0)		0	01.01.1970 10:31:10.058	All slaves safe-operational	IEC=0x00001005
= 🗊 EXP_1 (EXP_1)	PLC Shell	0	01.01.1970 10:31:10.050	SDO write ok: Address: 1001 Index: 16#1C13 SubIndex: 0 Data: 16#03 Result: 16#00	IEC=0x00001005
BD20_232_485 (8D20-232/485)	Lisers and Groups	0	01.01.1970 10:31:10.034	SDO write ok: Address: 1001 Index: 16#1C13 SubIndex: 3 Data: 16#1A13 Result: 16#00	IEC=0x00001005
💮 LocalBus (LocalBus)	Coelo and Groups	0	01.01.1970 10:31:10.018	SDO write ok: Address: 1001 Index: 16#1C13 SubIndex: 2 Data: 16#1A0A Result: 16#00	IEC=0x00001005
Modbus_Slave_TCP (Modbus Slave TCP ETH1)	Access Rights	0	01.01.1970 10:31:10.002	SDO write ok: Address: 1001 Index: 16#1C13 SubIndex: 1 Data: 16#1BA0 Result: 16#00	IEC=0x00001005
* 💮 Modbus_Master_TCP (Modbus Master TCP)		0	01.01.1970 10:31:09.986	SDO write ok: Address: 1001 Index: 16#1C13 SubIndex: 0 Data: 16#00 Result: 16#00	IEC=0x00001005
SoftMotion General Axis Pool	Symbol Rights	0	01.01.1970 10:31:09.970	SDO write ok: Address: 1001 Index: 16#1C12 SubIndex: 0 Data: 16#02 Result: 16#00	IEC=0x00001005
	Software metrics for license	0	01.01.1970 10:31:09.954	SDO write ok: Address: 1001 Index: 16#1C12 SubIndex: 2 Data: 16#1601 Result: 16#00	IEC=0x00001005
	determination	0	01.01.1970 10:31:09.938	SDO write ok: Address: 1001 Index: 16#1C12 SubIndex: 1 Data: 16#17A0 Result: 16#00	IEC=0x00001005
	IEC Objects PLC Parameters	0	01.01.1970 10:31:09.922	SDO write ok: Address: 1001 Index: 16#1C12 SubIndex: 0 Data: 16#00 Result: 16#00	IEC=0x00001005
		0	01.01.1970 10:31:09.906	SDO write ok: Address: 1001 Index: 16#F800 SubIndex: 4 Data: 16#00 Result: 16#00	IEC=0x00001005
		0	01.01.1970 10:31:09.890	SDO write ok: Address: 1001 Index: 16#F800 SubIndex: 3 Data: 16#01 Result: 16#00	IEC=0x00001005
	Task Daployment	0	01.01.1970 10:31:09.874	SDO write ok: Address: 1001 Index: 16#F800 SubIndex: 2 Data: 16#00 Result: 16#00	IEC=0x00001005
	rask Deployment	0	01.01.1970 10:31:09.858	SDO write ok: Address: 1001 Index: 16#F800 SubIndex: 1 Data: 16#00 Result: 16#00	IEC=0x00001005
	Status	0	01.01.1970 10:31:09.842	SDO write ok: Address: 1001 Index: 16#F030 SubIndex: 0 Data: 16#03 Result: 16#00	IEC=0x00001005
		0	01.01.1970 10:31:09.826	SDO write ok: Address: 1001 Index: 16#F030 SubIndex: 3 Data: 16#10F41051 Result: 16#00	IEC=0x00001005
	Information	0	01.01.1970 10:31:09.810	SDO write ok: Address: 1001 Index: 16#F030 SubIndex: 2 Data: 16#10F41030 Result: 16#00	IEC=0x00001005
		0	01.01.1970 10:31:09.794	SDO write ok: Address: 1001 Index: 16#F030 SubIndex: 1 Data: 16#10F41020 Result: 16#00	IEC=0x00001005
		0	01.01.1970 10:31:09.778	SDO write ok: Address: 1001 Index: 16#F030 SubIndex: 0 Data: 16#00 Result: 16#00	IEC=0x00001005
		0	01.01.1970 10:31:09.762	SDO write ok: Address: 1001 Index: 16#8087 SubIndex: 4 Data: 16#00 Result: 16#00	IEC=0x00001005
		0	01.01.1970 10:31:09.746	SDO write ok: Address: 1001 Index: 16#8087 SubIndex: 3 Data: 16#00 Result: 16#00	IEC=0x00001005
		0	01.01.1970 10:31:09.730	SDO write ok: Address: 1001 Index: 16#8087 SubIndex: 2 Data: 16#00 Result: 16#00	IEC=0x00001005
			01.01.1970 10:31:09.714	SDO write ok: Address: 1001 Index: 16#8087 SubIndex: 1 Data: 16#00 Result: 16#00	IEC=0x00001005
		0	01.01.1970 10:31:09.698	SDO write ok: Address: 1001 Index: 16#8086 SubIndex: 4Data: 16#F574 Result: 16#00	IEC=0x00001005
		0	01.01.1970 10:31:09.682	SDO write ok: Address: 1001 Index: 16#8086 SubIndex: 3 Data: 16#F574 Result: 16#00	IEC=0x00001005
		0	01.0 截图 Shift + Alt + A	SDO write ok: Address: 1001 Index: 16#8086 SubIndex: 2 Data: 16#F574 Result: 16#00	IEC=0x00001005
		0	01.01.1970 10:31:09.650	SDO write ok: Address: 1001 Index: 16#8086 SubIndex: 1 Data: 16#F574 Result: 16#00	IEC=0x00001005
		0	01.01.1970 10:31:09.634	SDO write ok: Address: 1001 Index: 16#8085 SubIndex: 4 Data: 16#3584 Result: 16#00	IEC=0x00001005
			01 01 1070 10-31-00 618	CDD units dr. Address: 1001 Index: 16#8085 C. bIndex: 3 Date: 16#8882 Dan H: 16#00	TEC-0-00001005

Fig.9.1-1 Error queries

9.2 Common Error Codes and Description

Name	Codes	Comment
ERR_FAILED	0x0001	Common error
ERR_PARAMETER	0x0002	Error parameters
ERR_NOTINITIALIZED	0x0003	Function cannot be executed, since component has not been initialized yet. It may work later
ERR_VERSION	0x0004	Version conflict
ERR_TIMEOUT	0x0005	Operation timed out
ERR_NOBUFFER	0x0006	Insufficient memory to carry out the request
ERR_PENDING	0x000A	For async-calls: call not complete, yet
ERR_NUMPENDING	0x000B	To many pending calls. Try later
ERR_INVALIDID	0x000D	No object with the provided id found
ERR_OVERFLOW	0x000E	Integer overflow
ERR_BUFFERSIZE	0x000F	The size of a buffer is to small or invalid
ERR_NO_OBJECT	0x0010	No object with this specified name available
ERR_NOMEMORY	0x0011	No heap memory available
ERR_DUPLICATE	0x0012	An object with the same name is still available
ERR_MEMORY_OVERWRITE	0x0013	Heap memory was written out of bounds!
ERR_INVALID_HANDLE	0x0014	Invalid handle to an object
ERR_END_OF_OBJECT	0x0015	End of object reached
ERR_NO_CHANGE	0x0016	No changes done
ERR_INVALID_INTERFACE	0x0017	Invalid or unknown interface
ERR_NOT_SUPPORTED	0x0018	Functionality not supported

ERR_NO_ACCESS_RIGHTS	0x0019	No access rights FOR THIS operation
ERR_OUT_OF_LIMITS	0x001A	Specified limits OF a resource exceeded
ERR_ENTRIES_REMAINING	0x001B	Remaining entries that could NOT be transmitted because OF buffer limitation
ERR_INVALID_SESSION_ID	0x001C	Invalid online session ID
ERR_EXCEPTION	0x001D	Exception occurred
ERR_SIGNATURE_MISMATCH	0x001E	Signature mismatch OF an api FUNCTION
ERR_VERSION_MISMATCH	0x001F	Version mismatch
ERR_TYPE_MISMATCH	0x0020	TYPE mismatch
ERR_ID_MISMATCH	0x0021	ID mismatch
ERR_NO_CONSISTENCY	0x0022	Consistency error
ERR_NO_COMM_CYCLE	0x0023	No COMM_CYCLE needed
ERR_DONT_SUSPEND_TASK	0x0024	DO NOT suspend task after an exception
ERR_MEMORY_LOCK_FAILED	0x0025	Memory cannot be locked in THIS operation
ERR_LICENSE_MISSING	0x0026	License missing FOR the runtime
ERR_OPERATION_DENIED	0x0027	Operation denied
ERR_DEVICE	0x0028	Device error
ERR DISK FULL	0x0029	Disk full
ERR_CRC_FAILED	0x0030	Internal use in runtime
ERR_FILE_ERROR	0x0032	File error. e.g. cannot open a file FOR writing because it could be write PROTECTED
ERR_NO_RETAIN_MEMORY	0x0033	No RETAIN memory available
ERR_OUT_OF_LIMITS_MIN	0x0034	Specified minimum-limit of a resource exceeded
ERR_OUT_OF_LIMITS_MAX	0x0035	Specified maximum-limit of a resource exceeded
ERR_CALL_AGAIN	0x0037	Specified maximum-limit of a resource exceeded
ERR_NOTHING_TO_DO	0x0038	Operation has nothing TO DO. No execution.
ERR_SECURITY_CHECKS_FAILED	0x0039	Some security checks have failed. THIS is a generic error code TO report THIS error over PUBLIC channels. In THIS CASE the error code doesn't provide a detailed cause for the error.
ERR_INVALID_REFERENCE	0x003B	Dereferencing an IEC reference in IecVarAccess failed due to invalid destination address, e. G. NULL.
ERR_CONVERSION_INCOMPLETE	0x003C	Conversion of string encodings was not lossless.
ERR_SOCK_NOTINITIALIZED	0x0201	Socket not initialized
ERR_SOCK_NOTSOCKET	0x0202	The provided socket handle is invalid
ERR_SOCK_AFUNSUPPORTED	0x0203	The address family is NOT supported

ERR_SOCK_PROTOUNSUPPORTED	0x0204	Protocol is NOT supported
ERR_SOCK_NOBUFFER	0x0205	NOT enough buffer TO handle the request
ERR_SOCK_WOULDBLOCK	0x0206	Socket is in nonblocking mode but THIS call would block
ERR_SOCK_ADDRINUSE	0x0207	The provided address is already in use
ERR_SOCK_ADDRNOTAVAILABLE	0x0208	The provided address is NOT available on THIS computer
ERR_SOCK_CONNREFUSED	0x0209	Connection has been refused BY the remote host
ERR_SOCK_TIMEDOUT	0x020A	Operation timed out
ERR_SOCK_HOSTNOTFOUND	0x020B	The host has NOT been found
ERR_SOCK_HOSTUNREACHABLE	0x020C	Host is unreachable
ERR_SOCK_ISCONNECTED	0x020D	Socket is already connected
ERR_SOCK_NOTCONNECTED	0x020E	The socket is NOT connected
ERR_SOCK_SHUTDOWN	0x020F	Shutdown has been called on the socket
ERR_SOCK_MSGSIZE	0x0210	FOR sockets OF TYPE DGRAM. The package TO send exceeds the maximum package size
ERR_SOCK_CLOSED	0x0211	Socket has been gracefully closed. No more send/receives allowed
ERR_L7_TAG_MISSING	0x0300	Tag missing in online communication buffer
ERR_L7_UNKNOWNCMDGROUP	0x0301	Unknown command group
ERR_L7_UNKNOWNCMD	0x0302	Unknown command (within a valid command group)
ERR_L7_INCOMPLETE	0x0303	Level 7 service incomplete
ERR_CERT_UNABLE_TO_GET_ISS UER_CERT	0x701	illegal error (FOR uninitialized values, TO avoid ERR_CERT_OK)

10.Appendix

10.1 EXP-BD Model List

Model	Description	Available Slot ID	
BD20-CAN	1×CANopen	EXP1	
	1×RS485,1×RS232		
	RS485 support Modbus RTU master/slave and		
	free protocol, supporting up to 31 Modbus RTU		
BD20-COM	slaves.	EXPO/EXP1	
	RS232 support Modbus RTU master/slave		
	protocol, supporting up to 31 Modbus RTU		
	slaves.		
	Supports firmware updates, user program		
BD20-TF	updates, memory expansion, and data backup	EXP1	
	functions.		
BD20-04DI	DI 4×24V DC, Sourcing/Sinking	EXPO/EXP1	
BD20-04DO	DO 4×24V DC, PNP/NPN	EXPO/EXP1	

10.2 RP20 Model List

Model	Description
RP20-1600DT	DI 16×24V DC, sourcing/sinking
RP20-0016DTP	DO 16×24V DC, PNP
RP20-0016DTN	DO 16×24V DC, NPN
RP20-0008DR	DO 8×Relay output, normally open contacts (NO)
RP20-0808DTP	DI 8×24V DC, sourcing, DO 8×24V DC, PNP
RP20-0202IV	AI 2×IV, 4-20mA/0-20mA/0-10V/1-5V
	AO 2×IV, 4-20mA/0-20mA/0-10V/1-5V
RP20-0400IV	AI 4×IV, 4-20mA/0-20mA/±10V/1-5V/*±20mA
RP20-0004IV	AO 4×IV, 4-20mA/0-20mA/±10V/1-5V
RP20-0400RD	AI 4×RTD, sensor type: Pt100/Pt1000/Cu50
RP20-0400TC	AI 4×TC, thermocouple type: J/K/E/S/T/0-99mV
RP20-PW	Power Module, powered by 24V DC, rated output: 5V DC, 2A