



inv t AX7 Series CPU Module Instruction Manual

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AX7  Series CPU Module User Manual

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AX7 Series CPU Module

Thank you for choosing AX series programmable controller (programmable controller for short).





Based on the Invtmatic Studio platform, the programmable controller fully supports IEC61131-3 programming systems, EtherCAT real-time fieldbus, CANopen fieldbus, and high-speed ports, and provides electronic cam, electronic gear, and interpolation functions.

The manual mainly describes the specifications, features, wiring, and use methods of the CPU module of the programmable controller. To ensure that you use the product safely and properly and bring it into full play, read the manual carefully before the installing. For details about the user program development environments and user program design methods, see AX Series Programmable Controller Hardware User Manual and AX Series Programmable Controller Software User Manual that we issue.


The manual is subject to change without prior notice. Please visit <http://www.invt.com> to download the latest manual version.

Safety precautions


Warning

Symbol	Name	Description	Abbreviation
Danger 	Danger	Severe personal injury or even death can result if related requirements are not followed.	
Warning 	Warning	Personal injury or equipment damage can result if related requirements are not followed.	


Delivery and installation

	<ul style="list-style-type: none"> • Only trained and qualified professionals are allowed to perform installation, wiring, maintenance, and inspection. • Do not install the programmable controller on inflammables. In addition, prevent the programmable controller from contacting or adhering to inflammables. • Install the programmable controller in a lockable control cabinet of at least IP20, which prevents the personnel without electrical equipment related knowledge from touching by mistake, since the mistake may result in equipment damage or electric shock. Only personnel who have received related electrical knowledge and equipment operation training can operate the control cabinet. • Do not run the programmable controller if it is damaged or incomplete. • Do not contact the programmable controller with damp objects or body parts. Otherwise, electric shock may result.
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Cable selection

	<ul style="list-style-type: none"> • Only trained and qualified professionals are allowed to perform installation, wiring, maintenance, and inspection. • Fully understand the interface types, specifications, and related requirements before wiring. Otherwise, incorrect wiring will cause abnormal running. • Cut off all power supplies connected to the programmable controller before performing wiring. • Before power-on for running, ensure that each module terminal cover is properly installed in place after the installation and wiring are completed. This prevents a live terminal from being touched. Otherwise, physical injury, equipment fault or disoperation may result. • Install proper protection components or devices when using external power supplies for the programmable controller. This prevents the programmable controller from being damaged due to external power supply faults, overvoltage, overcurrent, or other exceptions.
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Commissioning and running

	<ul style="list-style-type: none"> • Before power-on for running, ensure that the working environment of the programmable controller meets the requirements, the wiring is correct, the input power specifications meet the requirements, and a protection circuit has been designed to protect the programmable controller so that the programmable controller can run safely even if an external device fault occurs. • For modules or terminals requiring external power supply, configure external safety devices such as fuses or circuit breakers to prevent damage caused due to external power supply or device faults.
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Maintenance and component replacement

	<ul style="list-style-type: none"> • Only trained and qualified professionals are allowed to perform maintenance, inspection, and component replacement for the programmable controller. • Cut off all power supplies connected to the programmable controller before terminal wiring. • During maintenance and component replacement, take measures to prevent screws, cables and other conductive matters from falling into the internal of the programmable controller.
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Disposal

	<p>The programmable controller contains heavy metals. Dispose of a scrap programmable controller as industrial waste.</p>
	<p>Dispose of a scrap product separately at an appropriate collection point but not place it in the normal waste stream.</p>

Product introduction

Model and nameplate

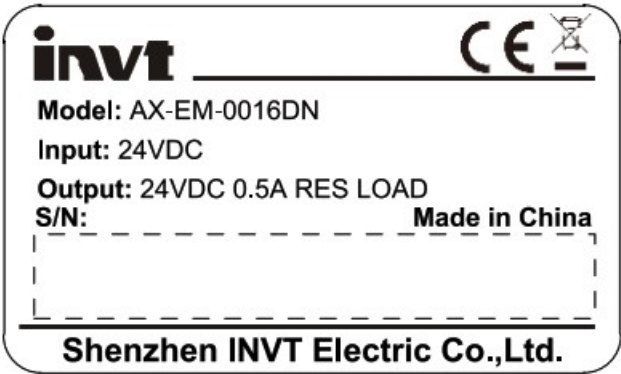


Figure 2-1 Product nameplate

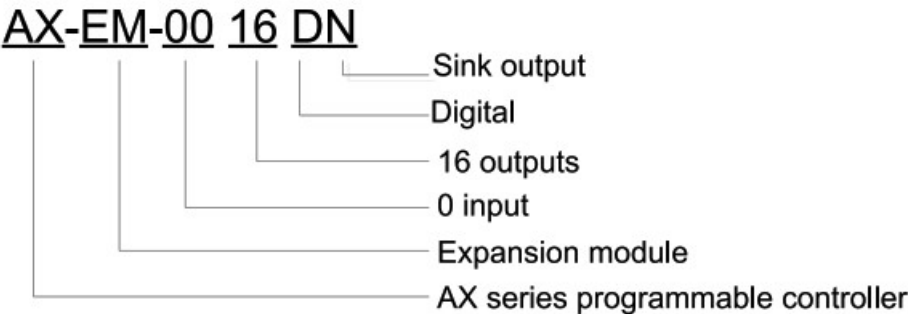


Figure 2-2 Product model

Function overview

As the main control module of the programmable controller, AX7J-C-1608L] CPU module (CPU module for short) has the following functions:

- Realizes the control, monitoring, data processing, and networking communication for the system running.
- Supports the IL, ST, FBD, LD, CFC, and SFC programming languages compliant with IEC61131-3 standards

by using Invtmatic Studio platform that INVT has launched for programming.

- Supports 16 local expansion modules (such as the I/O, temperature, and analog modules).
- Uses Ether CAT or CAN open bus to connect slave modules, each of which supports 16 expansion modules (such as the I/O, temperature, and analog modules).
- Supports Modbus TCP master/slave protocol.
- Integrates two RS485 interfaces, supporting Modbus RTU master/slave protocol.
- Supports high-speed I/O, 16 high-speed inputs and 8 high-speed outputs.
- Supports EtherCAT fieldbus motion control with synchronization time of 1ms, 2ms, 4ms, or 8ms.
- Supports pulse-based single- or multi-axis motion control, including 2-4 axis linear interpolation and 2-axis arc interpolation.
- Supports real-time clock.
- Supports power-failure data protection.

Structural dimensions

The structural dimensions (unit: mm) are shown in the following figure.

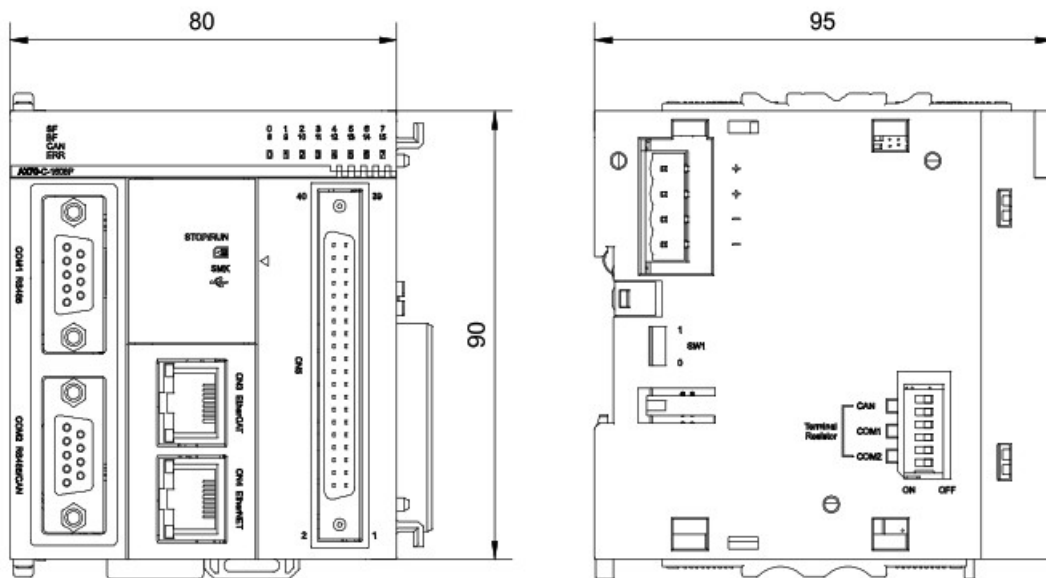


Figure 2-3 AX7-C-1608P CPU module dimensions

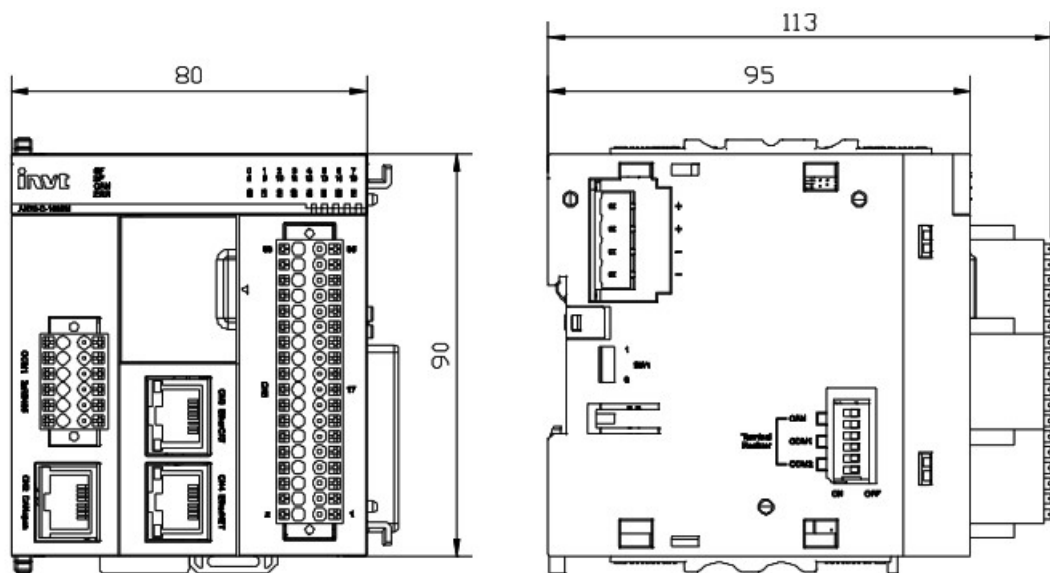


Figure 2-4 AX7-C-1608N CPU module dimensions

Interface

Interface description

Interface distribution

Figure 3-1 and Figure 3-2 show the CPU module interface distribution. For each interface, a respective silk screen description is provided nearby, which facilitates wiring, operation, and check.

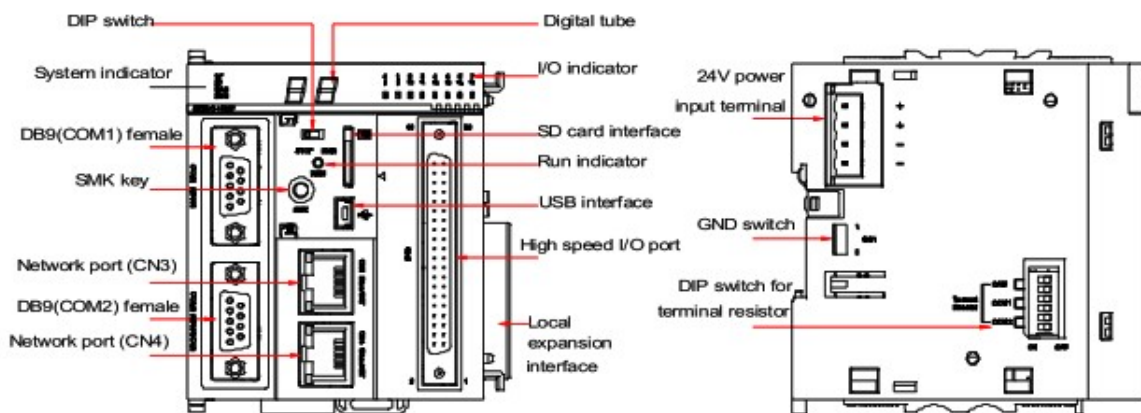


Figure 3-1 AX7-C-1608P CPU module interface distribution

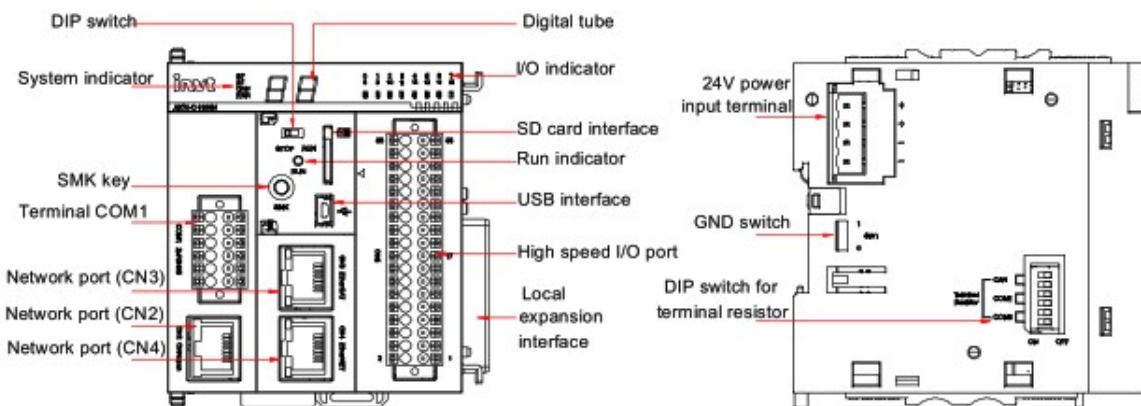


Figure 3-2 AX7-C-1608N CPU module interface distribution

Interface		Function
DIP switch		RUN/STOP DIP switch.
System indicator		SF: System fault indicator. BF: Bus fault indicator. CAN: CAN bus fault indicator. ERR: Module fault indicator.
SMK key		SMK smart key.
WO-C-1608P	COM1 (DB9) female	One RS485 interface, supporting Modbus RTU master/slave protocol.
	COM2 (DB9) female	One RS485 interface, and the other CAN interface The RS485 interface supports Modbus RTU master/slave protocol and the other CAN interface supports CANopen master/slave protocol.
AX70-C-1608N	COM1&COM2 (Push-in terminal)	Two RS485 interfaces, supporting Modbus RTU master/slave protocol.
	CN2 (RJ45)	CAN interface, supporting CAN open master/slave protocol.
CN3 (RJ45)		Ether CAT interface
CN4 (RJ45)		1.Modbus TCP protocol 2.Standard Ethernet functions 3.User program download and debug (only with IPv4)
Digital tube		Displays alarms and replies to SMK key pressing.
I/O indicator		Indicates whether the signals of 16 inputs and 8 outputs are valid.
SD card interface		Used to store user programs and data.
Run indicator		Indicates whether the CPU module is running.
USB interface		Used to download and debug programs.
High-speed I/O		16 high-speed inputs and 8 high-speed outputs.
Local expansion interface		Supports the expansion of 16 I/O modules, disallowing hot swapping.
24V power interface		DC 24V voltage input
Grounding switch		Connection switch between the system internal digital ground and ho using ground. It is disconnected by default (SW1 is set to 0). It is used only in special scenarios where the system internal digital ground is taken as the reference plane. Exercise caution before operating it. Otherwise, system stability is impacted.
DIP switch of terminal resistor		ON indicates terminal resistor connection (it is OFF by default). COM 1 corresponds to RS485-1, COM2 corresponds to RS485-2, and CAN correspond to CAN.

SMK key

The SMK key is mainly used to reset the CPU module IP address (rP), and clear application programs (cA). The default CPU module address is 192.168.1.10. If you want to restore the default address from a modified IP address, you can restore the default address through the SMK key. The method is as follows:

1. Set the CPU module to the STOP state. Press the SMK key. When the digital tube displays “rP”, press and hold the SMK key. Then the digital tube displays “rP” and turns off alternately, indicating IP address reset is being performed. The reset operation succeeds when the digital tube is steady off. If you release the SMK key at this time, the digital tube displays “rP”. Press and hold the SMK key until the tube displays “00” (rP—cA—rU-rP).
2. If you release the SMK key during the process in which the digital tube displays “rP” and turns off alternately, the IP address reset operation is canceled, and the digital tube displays “rP”.

To clear a program from the CPU module, do as follows:
Press the SMK key. When the digital tube displays “cA”, press and hold the SMK key. Then the digital tube displays “rP” and turns off alternately, indicating the program is being cleared. When the digital tube is steady off, restart the CPU module. The program is cleared successfully.

Digital tube description

- If programs have no fault after download, the digital tube of the CPU module displays “00” steadily.
- If a program has a fault, the digital tube displays the fault information in blinking way.
- For example, if only fault 19 occurs, the digital tube displays “19” and turns off alternately. If fault 19 and fault 29 occur simultaneously, the digital tube displays “19”, turns off, displays “29”, and turns off alternately. If more faults occur simultaneously, the display way is similar.

Terminal definition

AX7□-C-1608P COM1/COM2 communication terminal definition

For AX7LJ-C-1608P CPU module, COM1 is the RS485 communication terminal and COM2 is the RS485/CAN communication terminal, both of which use a DB9 connector for data transmission. The interfaces and pins are described in the following.

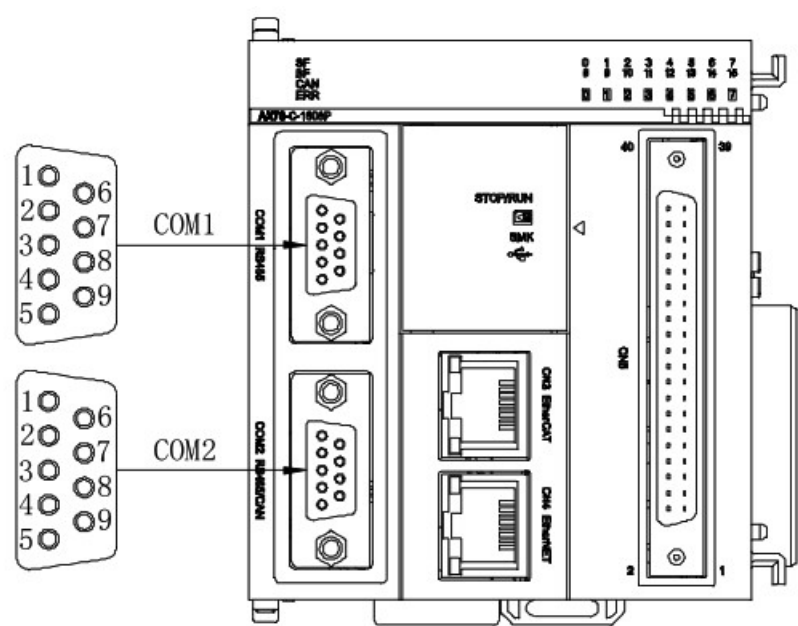
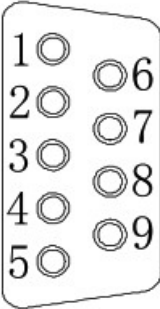
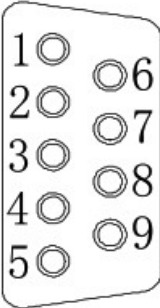


Figure 3-3 DB9 connector interfaces

Table 3-1 COM1/COM2 DB39 connector pins

Interface	Distribution	Pin	Definition	Function
COM1 (RS485)		1	/	/
		2	/	/
		3	/	/
		4	RS485A	RS485 differential signal +
		5	RS485B	RS485 differential signal –
		6	/	/
		7	/	/
		8	/	/
		9	GND_RS485	RS485 power ground
COM2 (RS485/CAN)		1	/	/
		2	CAN_L	CAN differential signal –
		3	/	/
		4	RS485A	RS485 differential signal +
		5	RS485B	RS485 differential signal –
		6	GND_CAN	CAN power ground
		7	CAN_H	CAN differential signal +
		8	/	/
		9	GND_RS485	RS485 power ground

AX7□-C-1608P high-speed I/O terminal definition

AX7□-C-1608P CPU module has 16 high-speed inputs and 8 high-speed outputs. The interfaces and pins are described in the following.

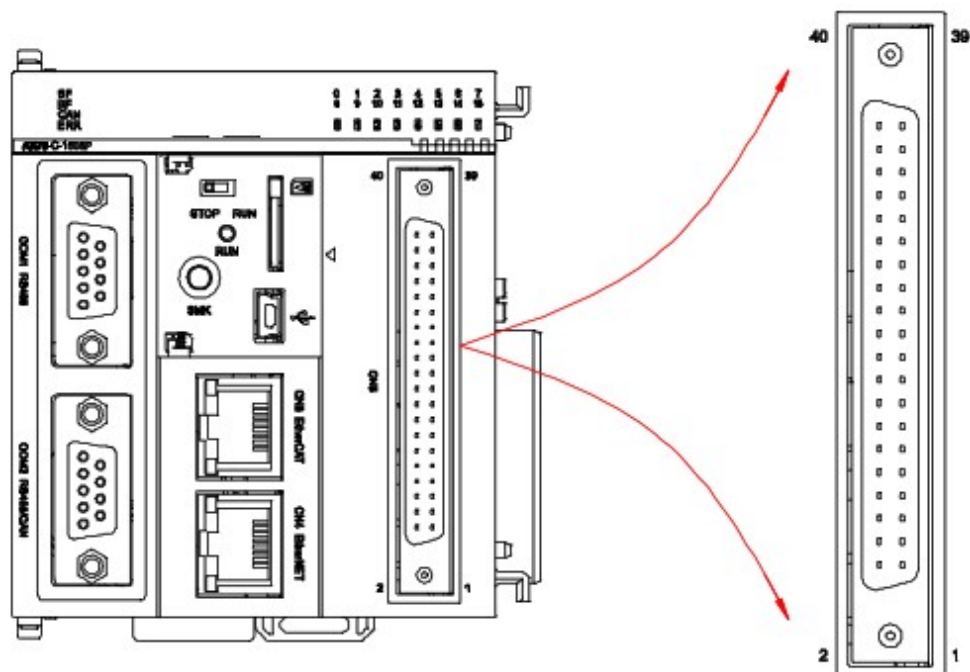
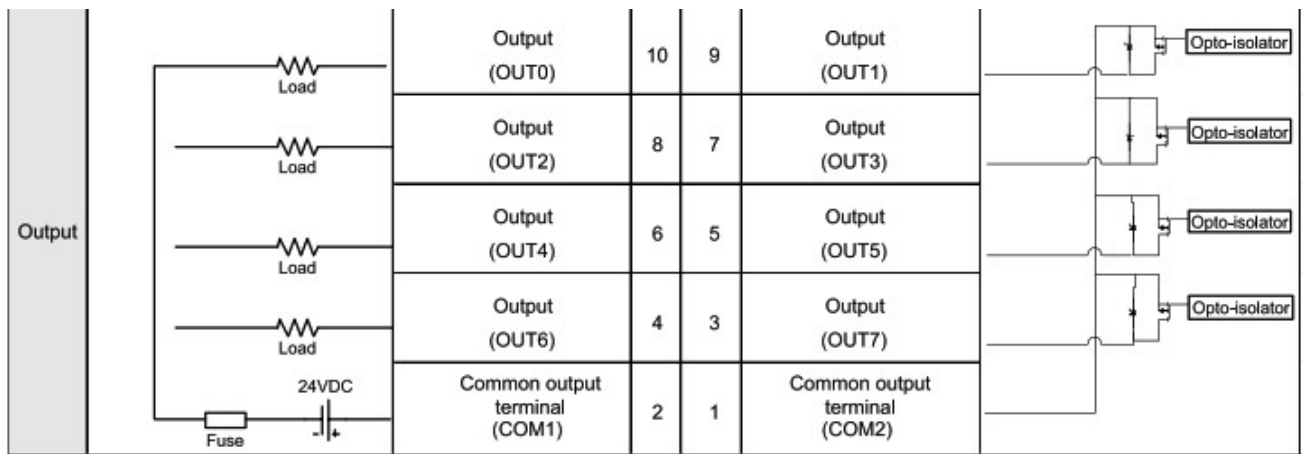


Figure 3-4 High-speed I/O interfaces

Table 3-2 High-speed I/O pins

Type	External circuit	Signal	CN5 pin no.		Signal	Internal circuit
		Line B			Line A	
Input		HSD 24V input (IN0-24V)	40	39	HSD 24V input (IN1-24V)	
		HSD differential input (IN0-DIFF)	38	37	HSD differential input (IN1-DIFF)	
		HSD input common terminal (IN0-COM)	36	35	HSD input common terminal (IN1-COM)	
		HSD 24V input (IN2-24V)	34	33	HSD 24V input (IN3-24V)	
		HSD differential input (IN2-DIFF)	32	31	HSD differential input (IN3-DIFF)	
		HSD input common terminal (IN2-COM)	30	29	HSD input common terminal (IN3-COM)	
		HSD 24V input (IN4-24V)	28	27	HSD 24V input (IN5-24V)	
		HSD differential input (IN4-DIFF)	26	25	HSD differential input (IN5-DIFF)	
		HSD input common terminal (IN4-COM)	24	23	HSD input common terminal (IN5-COM)	
		Input common terminal SS1	22	21	Input common terminal SS2	
		Standard input (IN6)	20	19	Standard input (IN7)	
		Standard input (IN8)	18	17	Standard input (IN9)	
		Standard input (IN10)	16	15	Standard input (IN11)	
		Standard input (IN12)	14	13	Standard input (IN13)	
		Standard input (IN14)	12	11	Standard input (IN15)	



AX7-C-1608N COM1/CN2 communication terminal definition

For AX7-C-1608N CPU module, COM1 is the two-channel RS485 communication terminal, using a 12-pin push-in connector for data transmission. CN2 is the CAN communication terminal, using the RJ45 connector for data transmission. The interfaces and pins are described in the following.

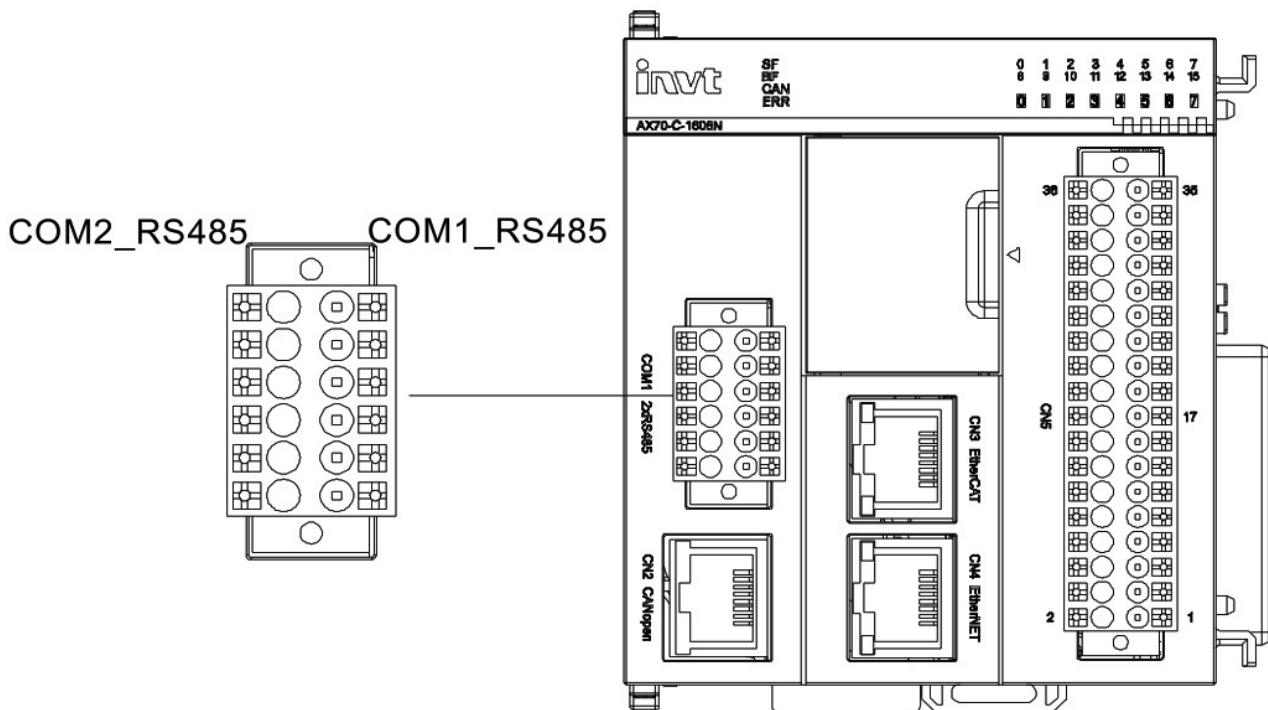
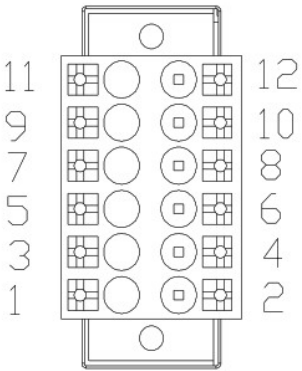
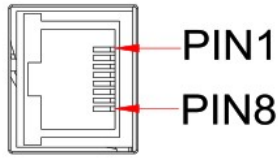


Figure 3-5 COM1/CN2 interfaces

Table 3-3 COM1/ CN2 connector pins

Push-in terminal functions of COM1				
Definition			Function	Pin
	COM1 RS485	A	RS485 differential signal +	12
		B	RS485 differential signal –	10
		GND	RS485_1 chip power ground	8
		PE	Shield ground	6
	COM2 RS485	A	RS485 differential signal +	11
		B	RS485 differential signal –	9
		GND	RS485_2 chip power ground	7
		PE	Shield ground	5
	Note: Pins 1-4 are not used.			

Pin functions of CN2				
Definition			Function	Pin
	CANopen	GND	CAN power ground	1
		CAN_L	CAN differential signal –	7
		CAN_H	CAN differential signal +	8
	Note: Pins 2-6 are not used.			

AX7□-C-1608N high-speed I/O terminal definition

AX7□1-C-1608N CPU module has 16 high-speed inputs and 8 high-speed outputs. The following figure shows the terminal distribution and the following table lists the pins.

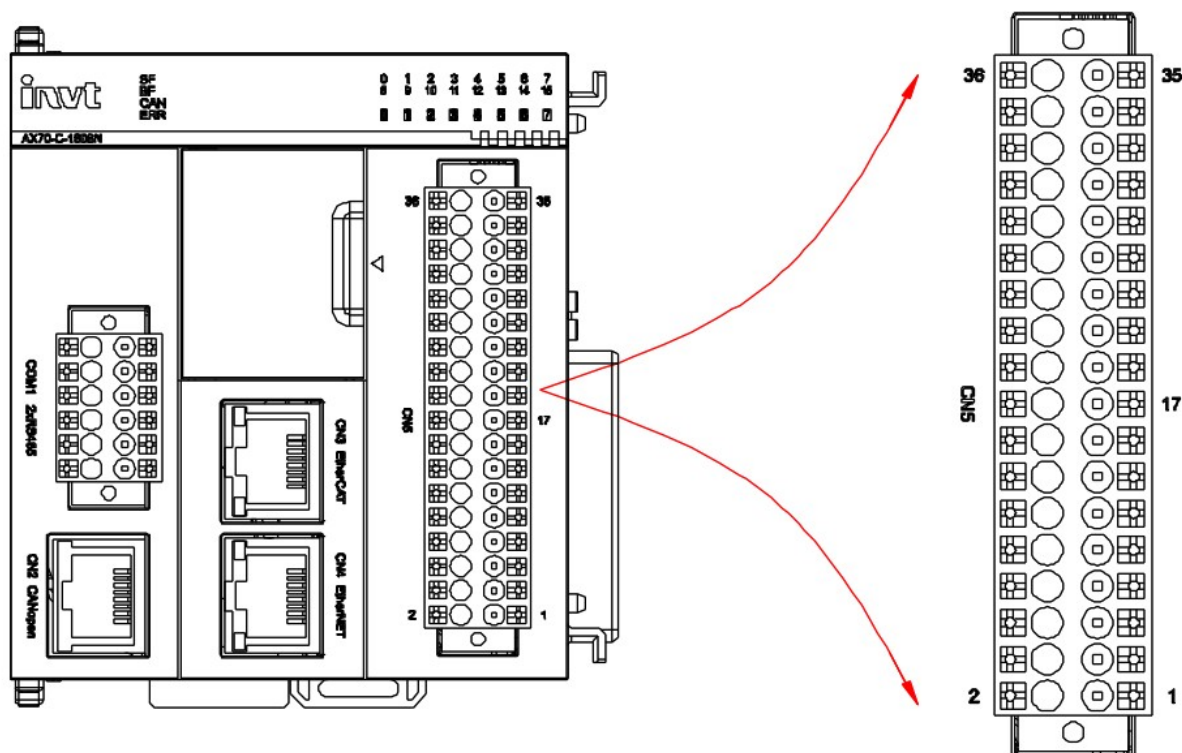
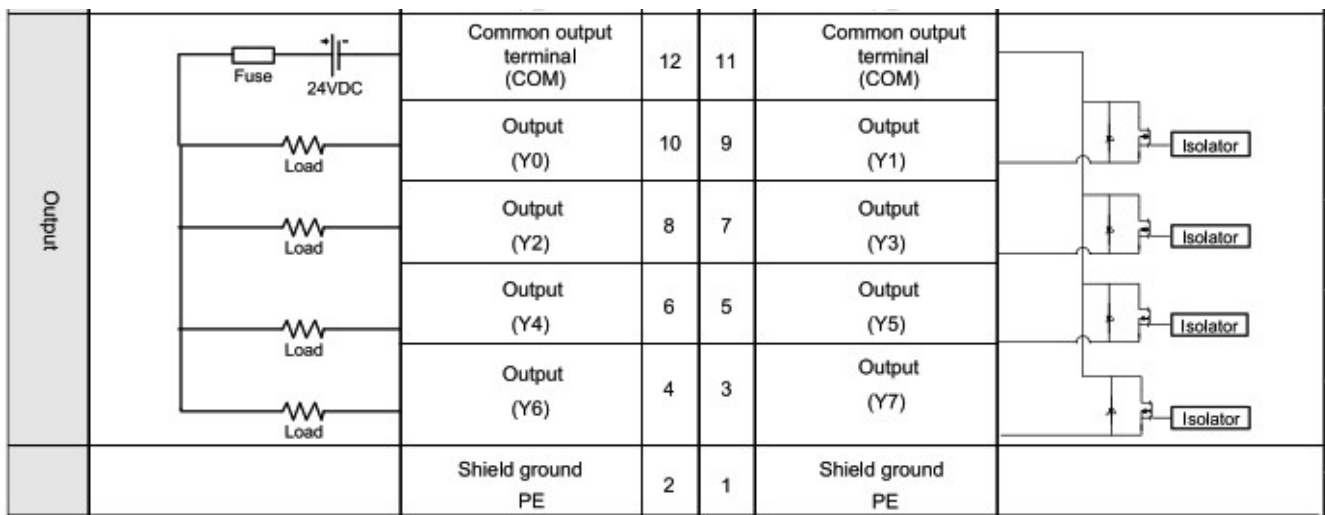


Figure 3-6 High-speed I/O interfaces

Table 3-4 High-speed I/O pins

Type	External circuit	Signal		CN5 pin no.	Signal		Internal circuit
		Line B	Line A		Line A	Line B	
Differential input		HSD differential input (A0+)	36	35	HSD differential input (B0+)	270 Ω	
		HSD differential input (A0-)	34	33	HSD differential input (B0-)	270 Ω	
		HSD differential input (A1+)	32	31	HSD differential input (B1+)	270 Ω	
		HSD differential input (A1-)	30	29	HSD differential input (B1-)	270 Ω	
Single-end input		Standard input (X4)	28	27	Standard input (X5)	2K	
		Standard input (X6)	26	25	Standard input (X7)	2K	
		Standard input (X8)	24	23	Standard input (X9)	2K	
		Standard input (X10)	22	21	Standard input (X11)	2K	
		Standard input (X12)	20	19	Standard input (X13)	2K	
		Standard input (X14)	18	17	Standard input (X15)	2K	
		Common input terminal (SS)	16	15	Common input terminal (SS)		
		Shield ground PE	14	13	Shield ground PE		



Note:

- All 16 input channels of AX7 □-C-1608P CPU module allow high-speed input, but the first 6 channels support 24V single-end or differential input, and the last 10 channels support 24V single-end input.
- All 16 input channels of AX7 □-C-1608N CPU module allow high-speed input, but the first 4 channels support differential input, and the last 12 channels support 24V single-end input.
- Each I/O point is isolated from the internal circuit.
- The total length of high-speed I/O port connection cable cannot exceed 3 meters.
- Do not bend the cables when fastening the cables.
- During cable routing, separate the connection cables from high-power cables that cause strong interference but not bind the connection cables with the latter together. In addition, avoid long-distance parallel routing.

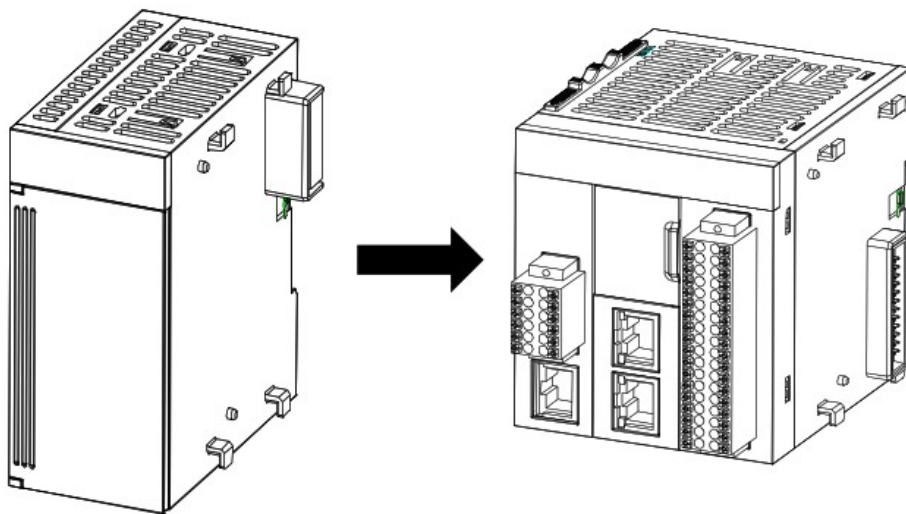
Module installation

Using modular design, the programmable controller is easy to install and maintain. As for the CPU module, the main connection objects are the power supply and expansion modules.

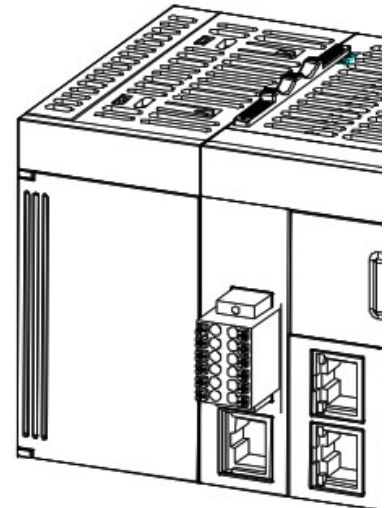
The modules are connected by using the module-provided connection interfaces and snap-fits.

The mounting procedure is as follows:

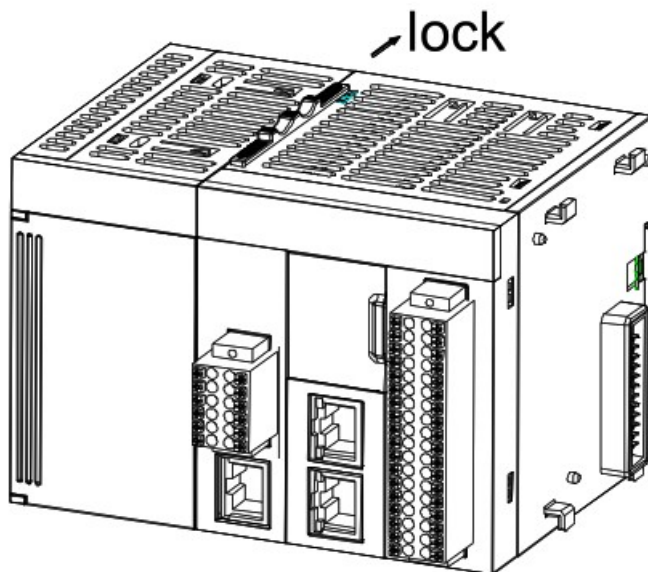
Step 1 Slide the snap-fit on the CPU module in the direction shown in following figure (using power module connection for example).



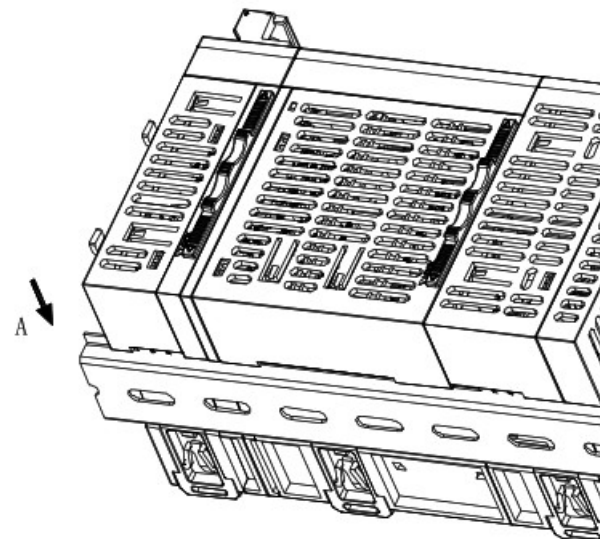
Step 2 Align the CPU module with the rack for interlocking.



Step 3 Slide the snap-fit on the CPU module in the direction shown in the following figure to connect and lock the two modules.



Step 4 As for standard DIN rail installation, hook the standard installation rail until the snap-fit clicks in.



Cable connection and specifications

Ether CAT bus connection

Ether CAT bus specifications

Item	Description
Communication protocol	Ether CAT
Supported service	COE (PDO/SDO)
Min. synchronization interval	1ms/4 axes (Typical value)
Synchronization method	DC for sync/DC unused
Physical layer	100BASE-TX
Duplex mode	Full duplex
Topology structure	Serial connection
Transmission medium	Network cable (see the section “Cable selection”)
Transmission distance	Less than 100m between two nodes
Number of slave nodes	Up to 125
Ether CAT frame length	44 bytes-1498 bytes
Process data	Up to 1486 bytes contained in a single frame

Cable selection

The CPU module can implement Ether CAT bus communication through the CN3 port. INVT standard cables are recommended. If you make the communication cables by yourself, ensure the cables meet the following requirements:

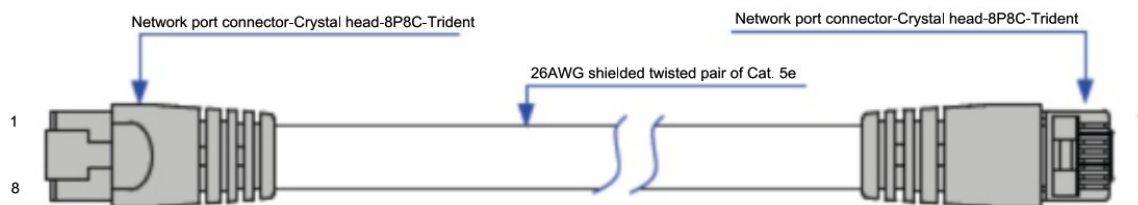


Figure 3-7 User-made network cable requirements

Note:

- The communication cables you use must pass the conductivity test 100%, without short circuit, opened circuit, dislocation or poor contact.
- To ensure communication quality, the EtherCAT communication cable length cannot exceed 100 meters.
- You are recommend to make the communication cables by using the shielded twisted pair cables of category 5e, compliant with EIA/TIA568A, EN50173, ISO/IEC11801, EIA/TIA bulletin TSB, and EIA/TIA SB40-A&TSB36.

CAN open cable connection

Networking

The CAN bus connection topology structure is shown in the following figure. It is recommended that the shielded twisted pair be used for CAN bus connection. Each end of the CAN bus connects to a 1200 terminal resistor to prevent signal reflection. In most cases, the shield layer uses single-point grounding.

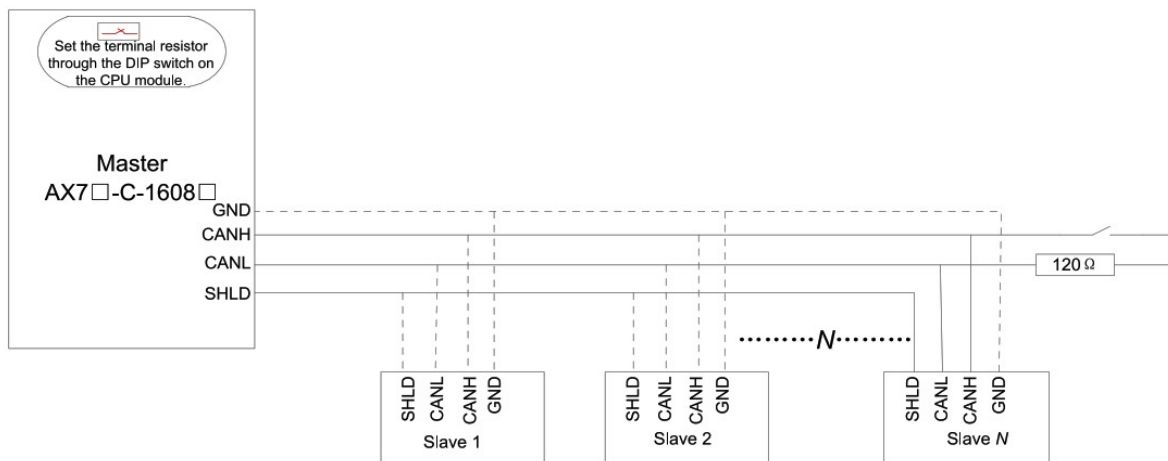


Figure 3-8 CAN bus connection

Cable selection

- For AX7-C-1608P CPU module, the same terminal is used for both CANopen communication and RS485 communication, using a DB9 connector for data transmission. The pins in the DB9 connector have been described earlier.
- For AX71-C-1608N CPU module, the RJ45 terminal is used for CANopen communication for data transmission. The pins in the RJ45 connector have been described earlier.

INVT standard cables are recommended. If you make the communication cables by yourself, make the cables according to the pin description and ensure the manufacturing process and technical parameters meet communication requirements.

Note:

- To enhance cable anti-interference capability, you are recommended to use aluminum foil shielding and aluminum-magnesium braid shielding techniques when making the cables.
- Use the twisted-pair winding technique for differential cables.

RS485 serial communication connection

The CPU module supports 2 channels of RS485 communication.

- For AX7-C-1608P CPU module, the ports COM1 and COM2 use the DB9 connector for data transmission. The pins in the DB9 connector have been described earlier.
- For AX7-C-1608N CPU module, the port uses the 12-pin push-in terminal connector for data transmission. The pins in the terminal connector have been described earlier.

INVT standard cables are recommended. If you make the communication cables by yourself, make the cables according to the pin description and ensure the manufacturing process and technical parameters meet communication requirements.

Note:

- To enhance cable anti-interference capability, you are recommended to use aluminum foil shielding and aluminum-magnesium braid shielding techniques when making the cables.

- Use the twisted-pair winding technique for differential cables.

Ethernet connection

Networking

The Ethernet port of the CPU module is CN4, which can connect to another device such as a computer or HMI device by using a network cable in the point-to-point mode.

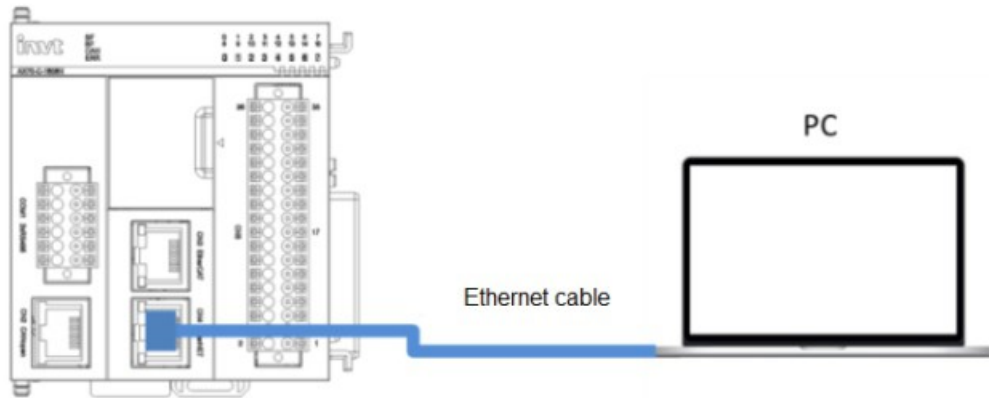


Figure 3-9 Ethernet connection

You can also connect the Ethernet port to a hub or switch by using a network cable, implementing multi-point connection.

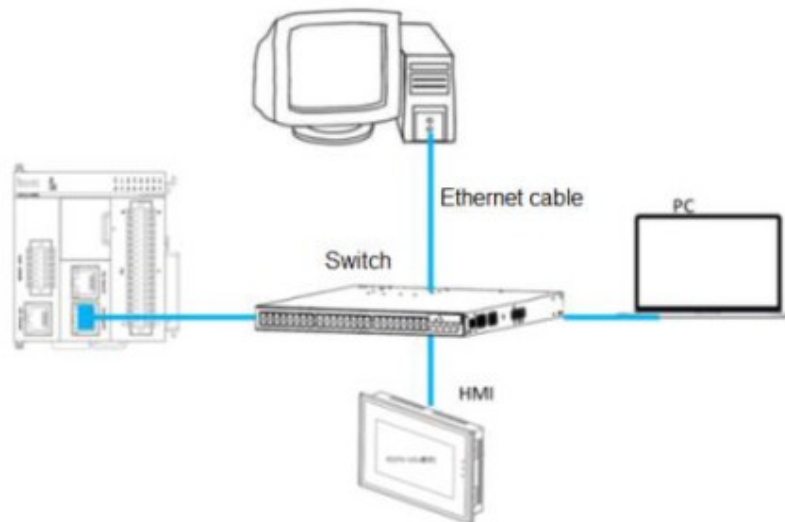


Figure 3-10 Ethernet networking

Cable selection

To improve communication reliability, use shielded twisted-pair cables of category 5 or higher as Ethernet cables. INVT standard cables are recommended.

Use instructions

Technical parameters

CPU module general specifications

Item	Description					
Input voltage	24VDC					
Power consumption	< 15W					
Power-failure protection time	300ms (no protection within 20 seconds after power-on)					
Backup battery of the real-time clock	Supported					
Backplane bus power supply	5V/2.5A					
Programming method	IEC 61131-3 programming languages (LD, FBD, IL, ST, SFC, and CFC)					
Program execution method	Local online					
User program storage space	10MB					
Flash memory space for power failure protection	512KB					
SD card specifications	32G MicroSD					
Soft elements and characteristics	Element	Name	Count	Storage characteristics		
				Default	Writable	Description
	I	Input relay	64KWord	Not save	No	X: 1 bit B. 8 bits W: 16 bits D: 32 bits L: 64 bits
	Q	Output relay	64KWord	Not save	No	
	M	Auxiliary output	256KWord	Save	Yes	
Program retention method upon power failure	Retention by the internal flash					
Interruption mode	The high-speed DI signal of the CPU module can be set as interruption input, allowing up to eight points of input, and the rising edge and falling edge interruption modes can be set.					

High-speed I/O specifications

High-speed input specifications

Item	Specifications	
Signal name	High-speed differential input	High-speed single-end input
Rated input voltage	$2.5V < V_{IN+} - V_{IN-} < 6V$	24VDC (-15% — +20%, pulsating within 5%)
Rated input current	6.8mA	5.7mA (Typical value) (at 24V DC)
ON current	/	Less than 2mA
OFF current	/	Less than 1mA
Input resistance	5400	2.2k Ω
Max. counting speed	800K Pulses/s (2PH fourfold frequency), 200kHz (single channel of input)	
2PH input duty ratio	40%. 60%	
Common terminal	/	One common terminal is used.

High-speed output specifications

Item	Specifications
Signal name	Output (YO—Y7)
Output polarity	AX7 <input type="checkbox"/> -C-1608P: Source type output (active high) AX7 <input type="checkbox"/> -C-1608N: Sink type output (active low)
Control circuit voltage	DC 5V-24V
Rated load current	100mA/point, 1A/COM
Max. voltage drop at ON	0.2V (Typical value)
Leakage current at OFF	Less than 0.1mA
Output frequency	200kHz (The output of 200kHz requires the externally connected equivalent load must be greater than 12mA.)
Common terminal	Every eight points use one common terminal.

Note:

- The high-speed I/O ports have restrictions on the allowed frequency. If the input or output frequency exceeds the allowed value, control and identification may be abnormal. Arrange the I/O ports properly.
- The high-speed differential input interface does not accept the differential pressure input level of greater than

7V. Otherwise, the input circuit may be damaged.

Programming software introduction and download

Programming software introduction

INVTMATIC Studio is programmable controller programming software that INVT develops. It provides an open and fully integrated programming development environment with advanced technology and powerful functions for project development that is based on programming languages compliant with IEC 61131-3. It is widely used in energy, transportation, municipal, metallurgy, chemical, pharmaceutical, food, textile, packaging, printing, rubber and plastics, machine tools and similar industries.

Running environment and download

You can install Invtmatic Studio on a desktop or portable computer, of which the operating system is at least Windows 7, memory space is at least 2GB, free hardware space is at least 10GB, and the CPU main frequency is higher than 2GHz. Then you can connect your computer to the CPU module of the programmable controller through a network cable and edit the user programs through the Invtmatic Studio software so that you can download and debug user programs.

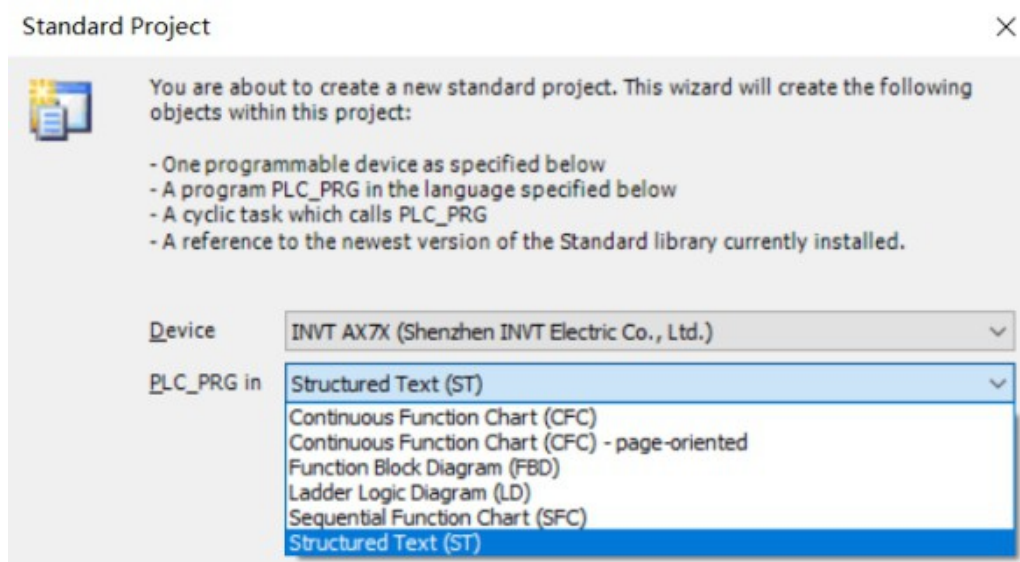
Programming instance

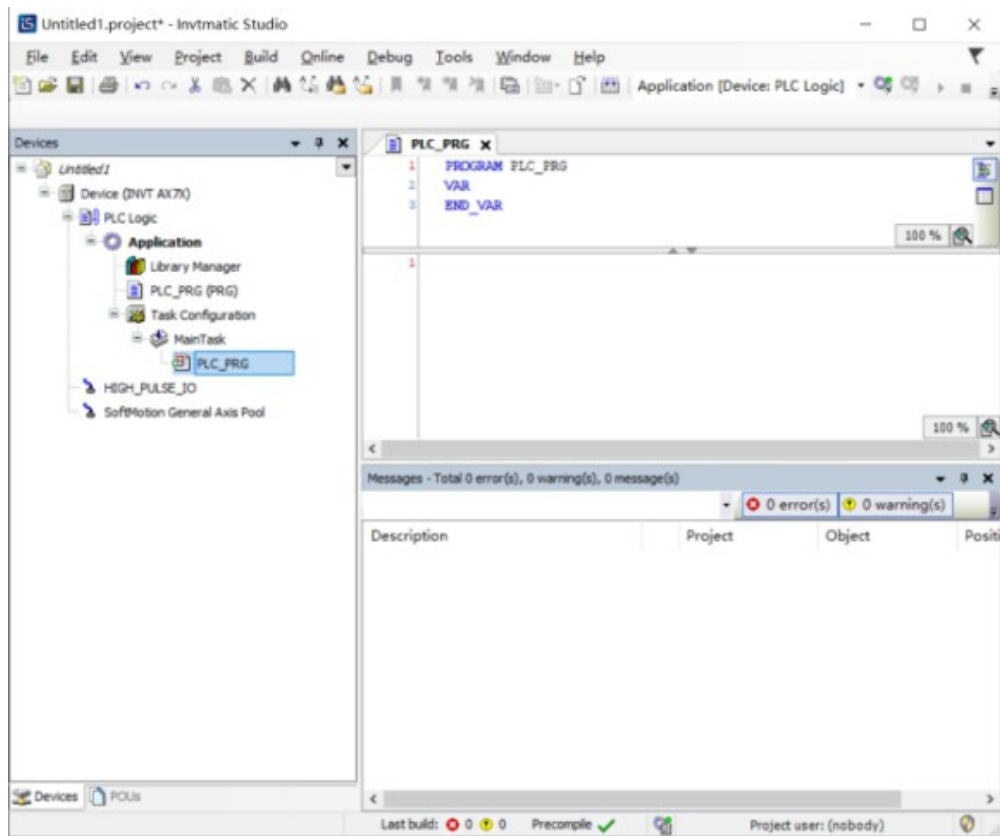
The following describe how to perform programming by using an example (AX72-C-1608N).

First of all, connect all the hardware modules of the programmable controller, including connecting the power supply to the CPU module, connecting the CPU module to the computer where Invtmatic Studio has been installed and to the required expansion module, and connecting the EtherCAT bus to the motor drive. Start Invtmatic Studio to create a project and perform programming configuration.

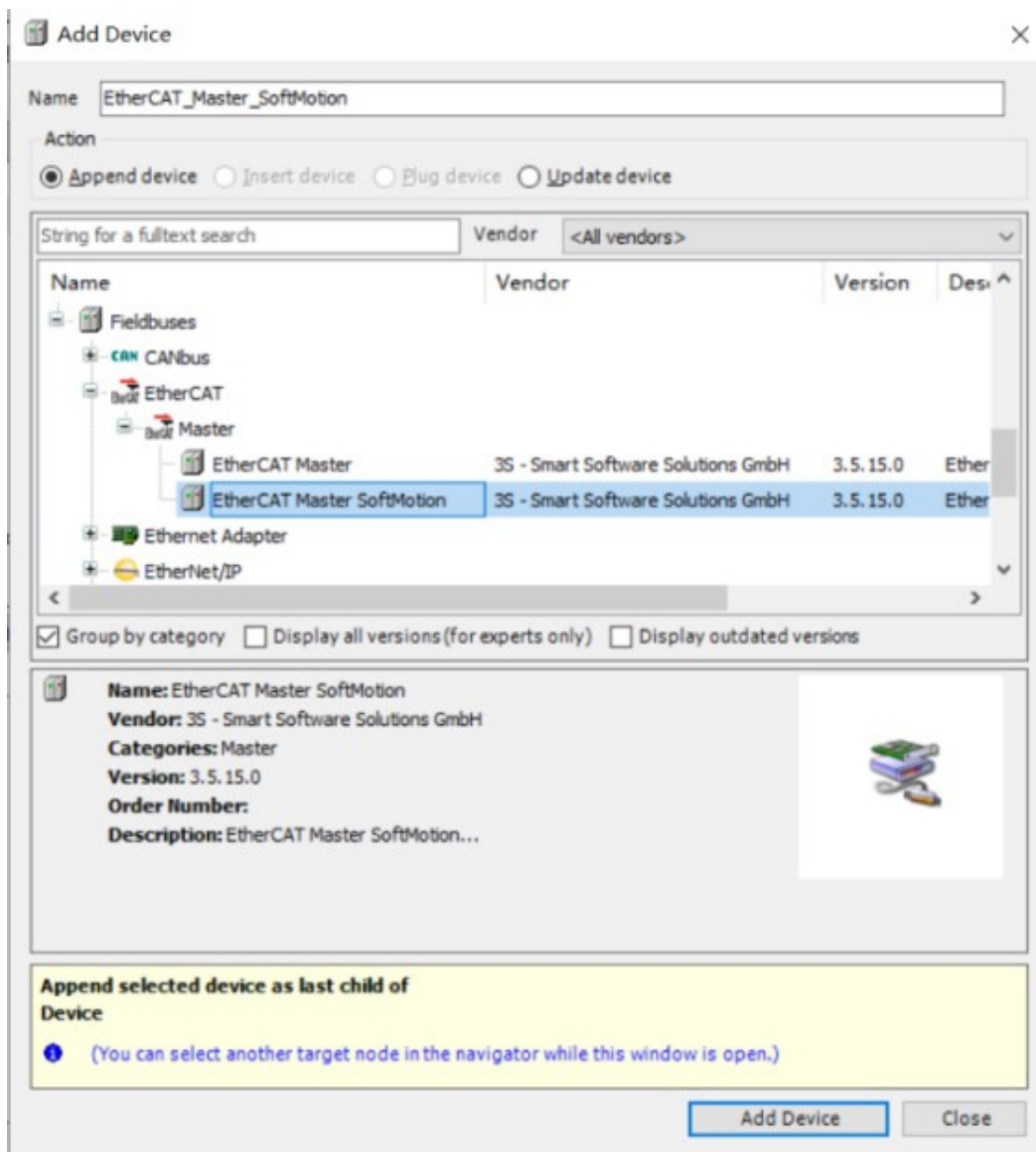
The procedure is as follows:

Step 1 Choose File > New Project, select the standard project type, and set the project saving location and name. Click OK. Then select the INVT AX7X device and Structured Text (ST) programming language in the standard project configuration window that appears. The CODESYS configuration and programming interface appears.

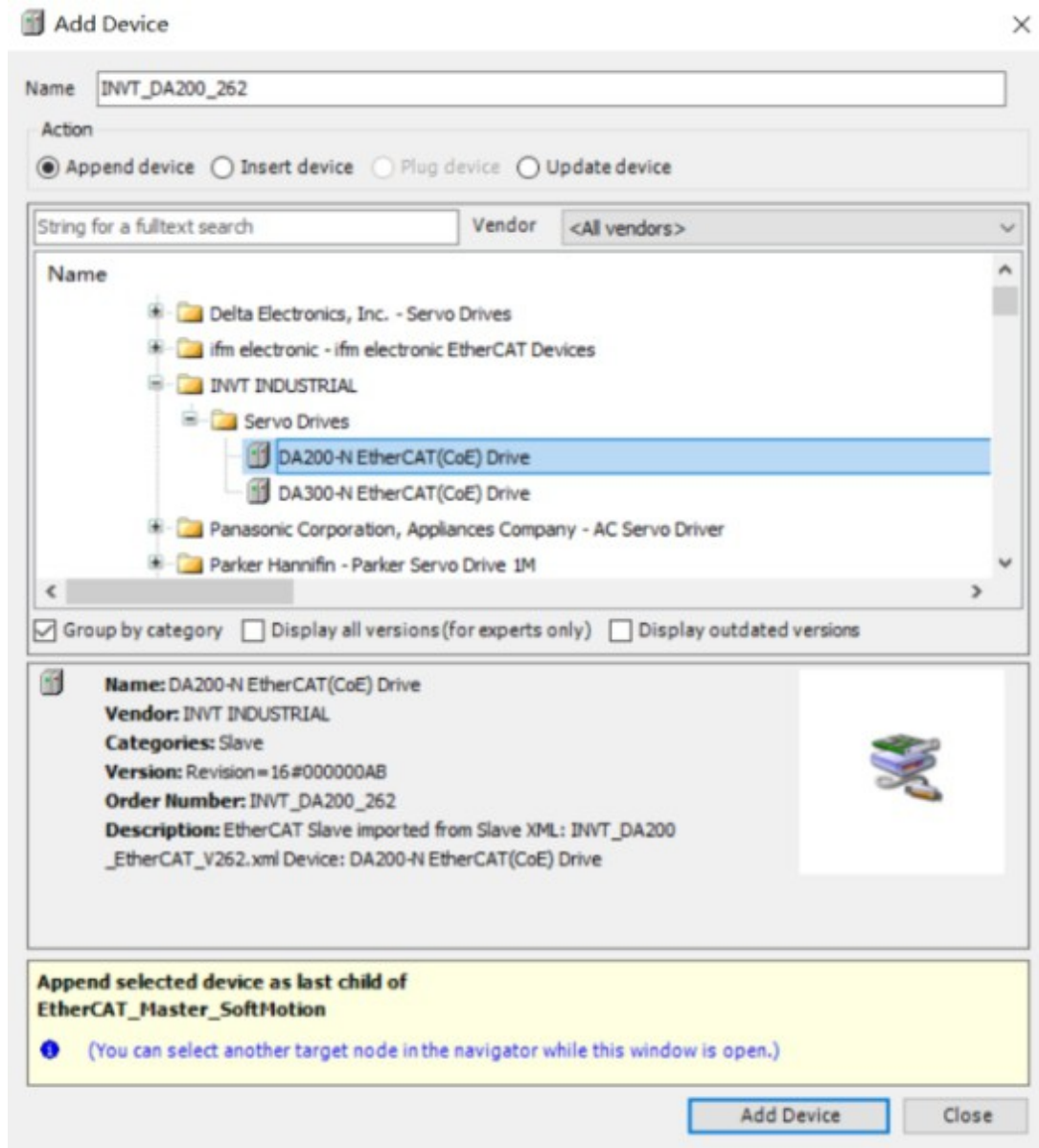




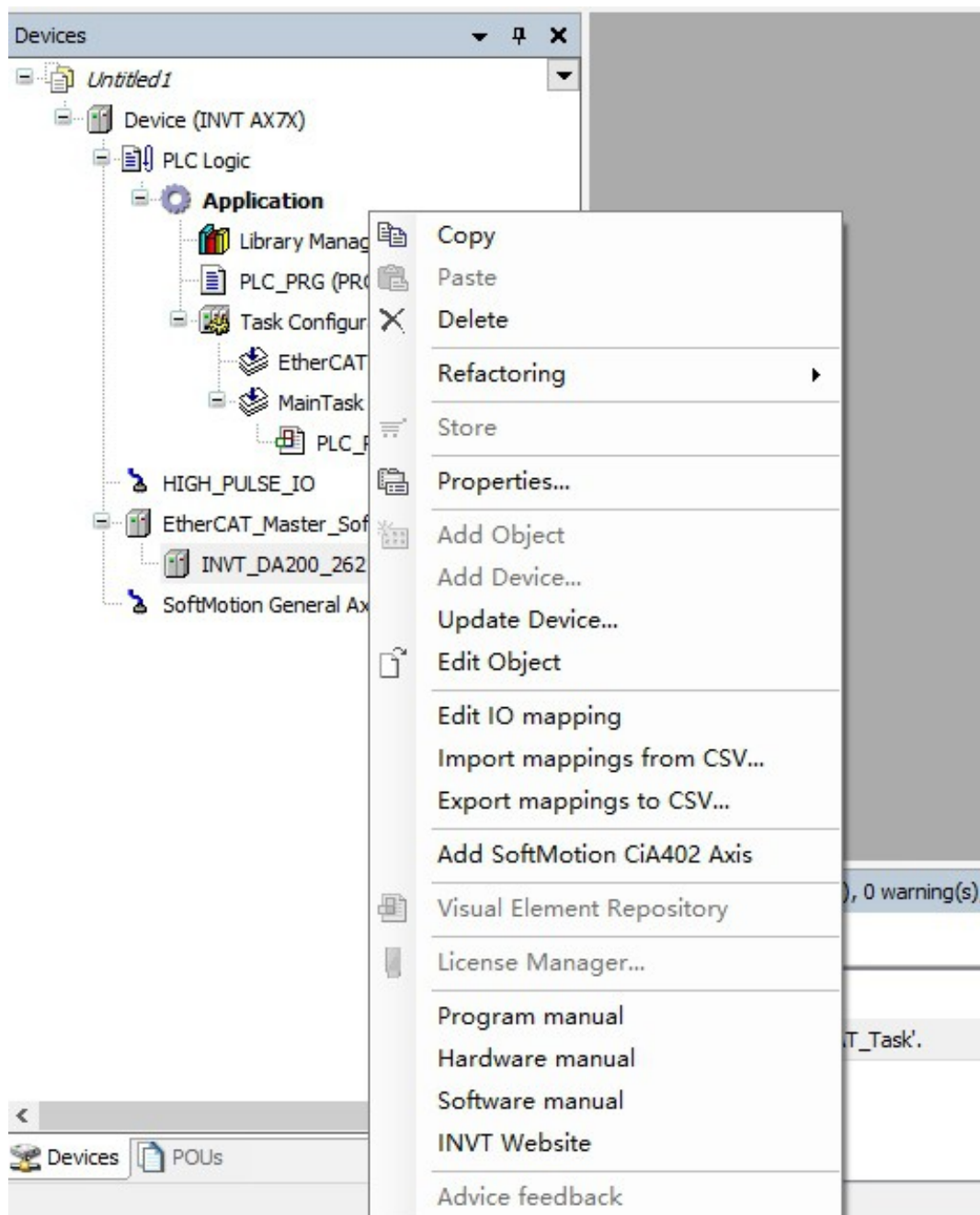
Step 2 Right-click on the Device navigation tree. Then choose Add Device. Choose Ether CAT Master Soft Motion.



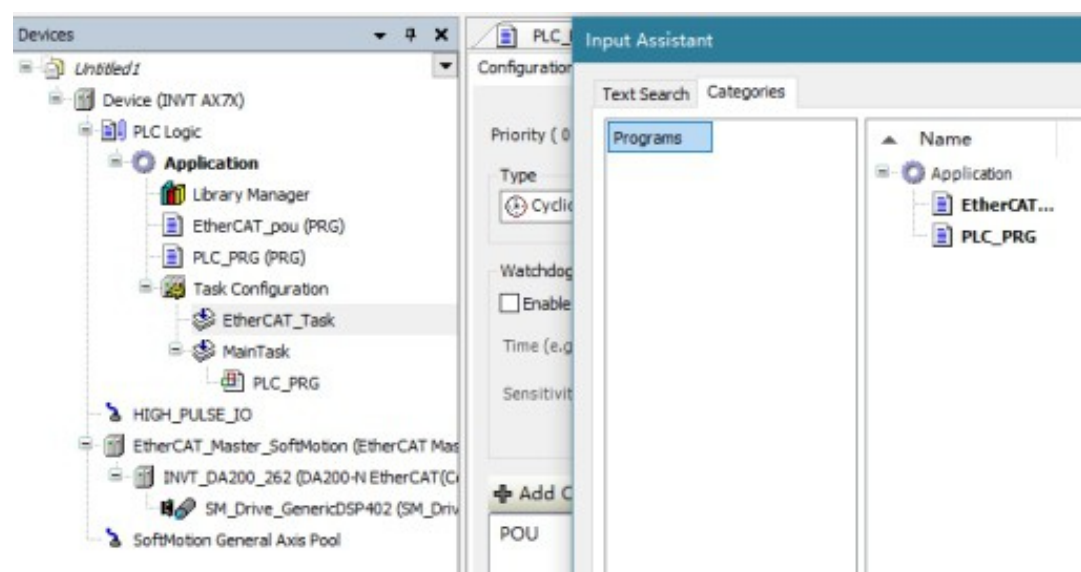
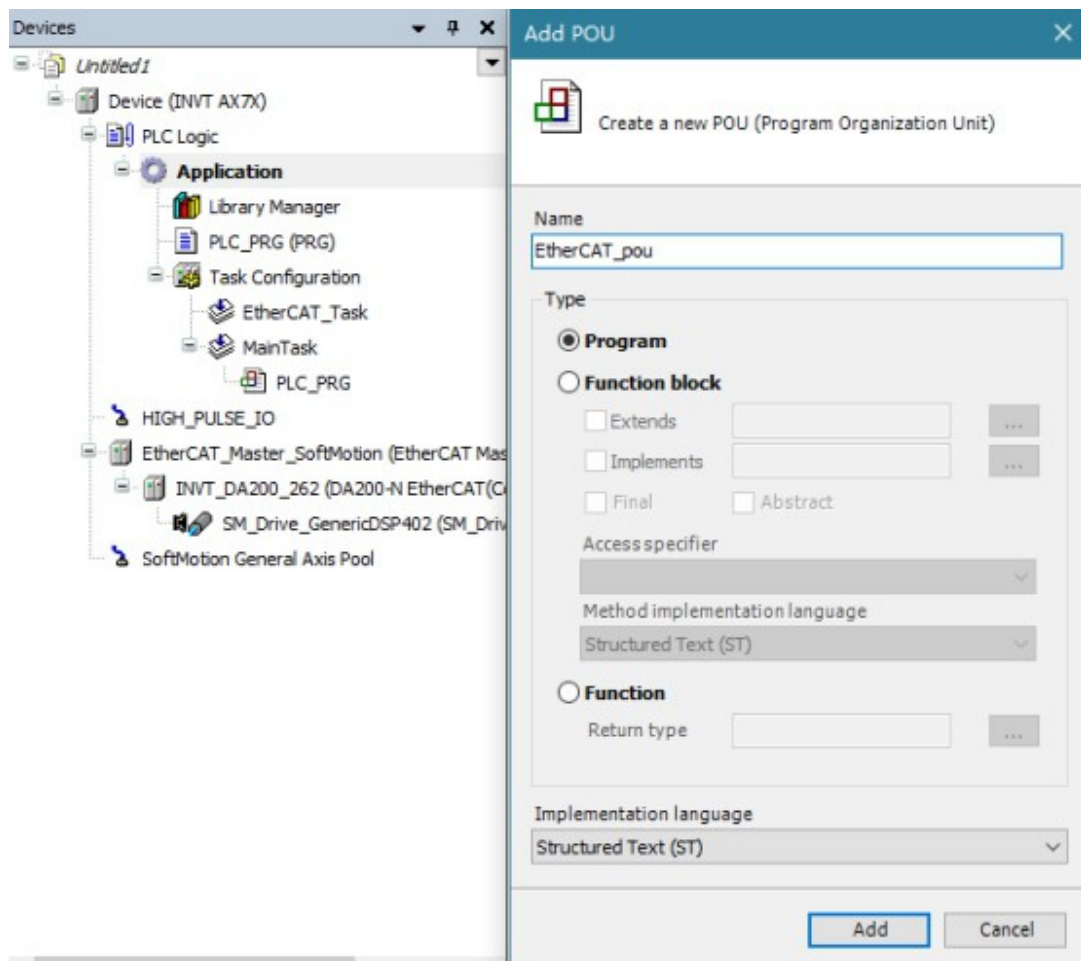
Step 3 Right-click **EtherCAT_Master_SoftMotion** on the left navigation tree. Choose Add Device. Choose DA200-N Ether CAT(CoE) Drive in the window that appears.



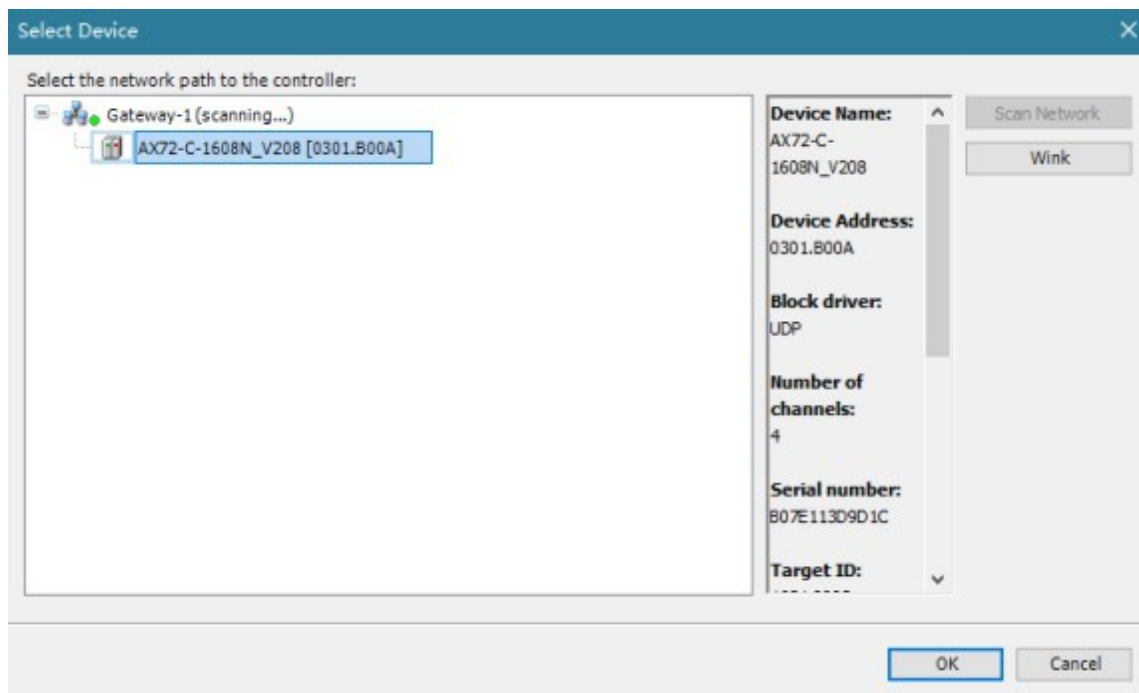
Step 4 Choose Add SoftMotion CiA402 Axis in the shortcut menu that appears.



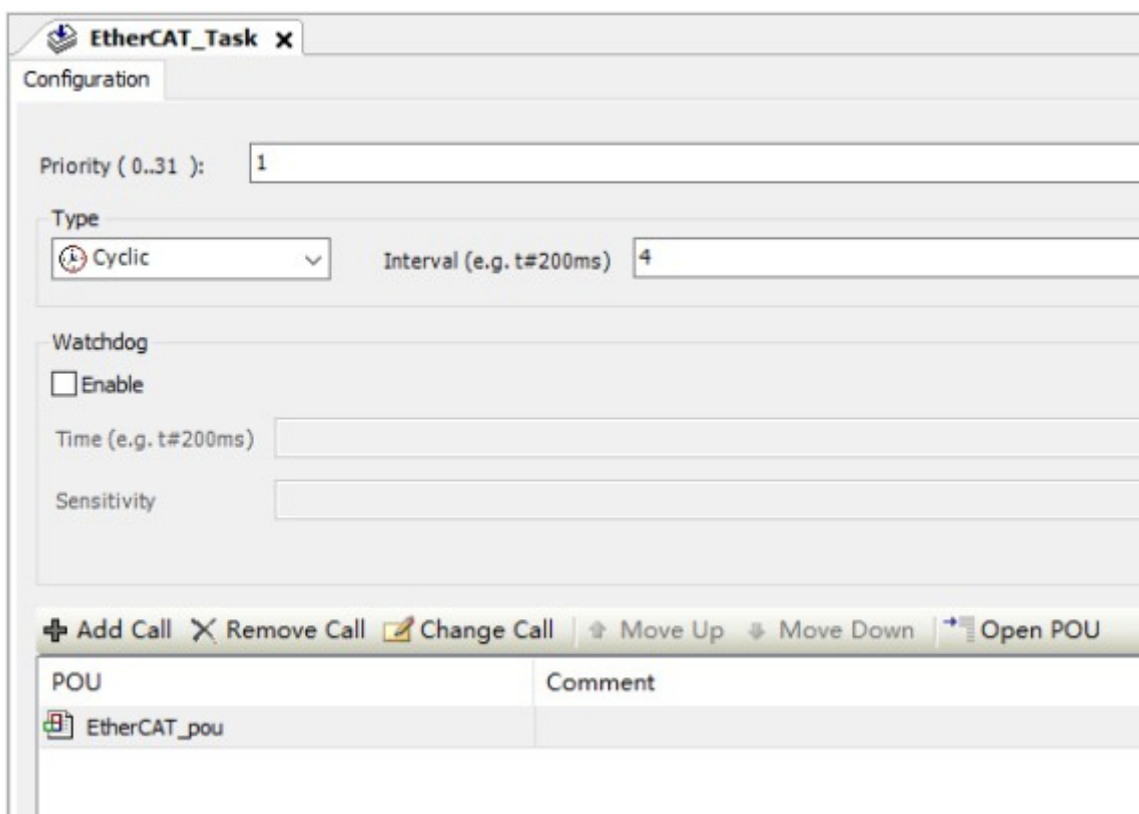
Step 5 Right-click Application on the left navigation tree and choose to add an EtherCAT POU. Double-click the automatically generated EtherCAT_Task to invoke. Choose the created EtherCAT_pou. Write the application program based on the application control process.





Step 6 Double-click the Device navigation tree, click Scan Network, choose AX72-C-1608N shown in the following figure, and click Wink. Then click OK when the CPU system indicator blinks.



Step 7 Double-click EtherCAT_Task under Task Configuration in the left pane. Set task priorities and execution intervals based on task real-time requirements.



In Invtmatic Studio, you can click  to compile programs, and you can check for errors according to logs. After confirming the compilation is fully correct, you can click  to log in and download user programs to the programmable controller and you can perform simulation debugging.

Pre-startup check and preventive maintenance

Pre-startup check

If you have completed the wiring, ensure the following before starting the module to work:

1. The module output cables meet requirements.
2. The expansion interfaces at any levels are reliably connected.
3. The application programs use the correct operation methods and parameter settings.

Preventive maintenance

Perform preventive maintenance as follows:

1. Clean the programmable controller regularly, prevent foreign matters falling into the controller, and ensure good ventilation and heat dissipation conditions for the controller.
2. Formulate maintenance instructions and regularly test the controller.
3. Regularly check the wiring and terminals to ensure that they are securely fastened.

Further information

Please feel free to contact us for further information. Please provide the product model and serial number when making an inquiry.

To obtain related product or service information, you can:

- Contact INVT local office.
- Visit www.invt.com.
- Scan the following QR code.



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