

AX-EM-RCM-ET Communication Module User Manual

Thanks for choosing INVT AX series programmable controller.





The AX-EM-RCM-ET communication module is an EtherCAT communication module used in conjunction with the main modules of the AX series programmable controllers. Each AX-EM-RCM-ET module can extend 16 I/O modules.

The manual mainly describes the specifications, features, wiring, and use methods of the module. To ensure that you use the product safety 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.


We reserve the right to continuously improve product performance, and the manual may be modified accordingly without prior notice. Please visit www.invt.com to download the latest manual version.

1 Safety precautions


1.1 Warning signs

Sign	Name	Description	Abbreviation
	Danger	Serious physical injury or even death may occur if related requirements are not followed.	
	Warning	Physical injury or device damage may occur if related requirements are not followed.	


1.2 Delivery and installation

	<ul style="list-style-type: none">Only trained and qualified electricians are allowed to perform installation, wiring, maintenance, and inspection for AX series programmable controller.Do not install AX series programmable controller on inflammables. In addition, prevent AX series programmable controller from contacting or adhering to inflammables.Install AX series 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 device damage or electric shock. Only personnel who have received related electrical knowledge and equipment operation training can operate the control cabinet.Do not run AX series programmable controller if it is damaged or incomplete.Do not contact AX series programmable controller with damp objects or body parts. Otherwise, electric shock may result.
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1.3 Wiring

	<ul style="list-style-type: none">Only trained and qualified electricians are allowed to perform installation, wiring, maintenance, and inspection for AX series programmable controller.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 AX series programmable controller before performing wiring.Before power-on for running, ensure that the module terminal cover is properly installed in place after the installation and wiring are completed. This prevents the live terminal from being touched. Otherwise, physical injury, device fault or misoperation may result.Install proper protection components or devices for external power supply input to AX series programmable controller. This prevents the controller from being damaged due to external power supply faults, overvoltage, overcurrent, or other exceptions.
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1.4 Comission and running

	<ul style="list-style-type: none">Before power-on for running, ensure that the working environment of AX series programmable controller meets the requirements, the wiring is correct, the input power specifications meet the requirements, and the respective protection circuit has been designed to protect the controller so that the 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 avoid damage caused due to external power supply or device fault.
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1.5 Maintenance and component replacement

	<ul style="list-style-type: none">Only trained and qualified electricians are allowed to perform maintenance, inspection, and component replacement for AX series programmable controller.Cut off all power supplies connected to AX series programmable controller before wiring AX series programmable controller terminals.During maintenance and component replacement, take measures to prevent conductive materials such as screws and cables from falling into the internal of AX series programmable controller.
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1.6 Disposal

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

2 Product introduction

2.1 Model and nameplate

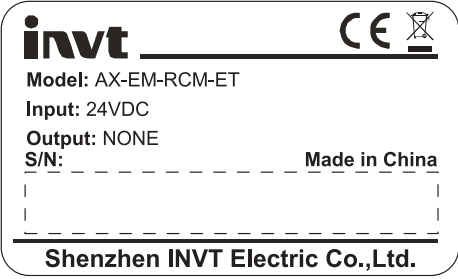


Figure 2.1 Product nameplate

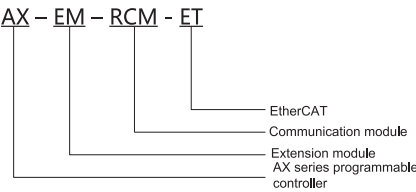


Figure 2.2 Product model

2.2 Product function

The AX-EM-RCM-ET module is the EtherCAT communication module of the AX series programmable controller, whose communication rate is 100Mbps and communication distance is not more than 100 meters. Each EtherCAT communication module can extend 16 I/O modules.

2.3 Structural dimensions

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

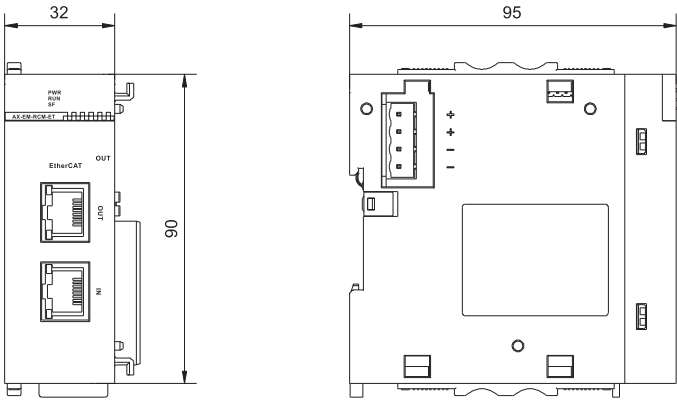


Figure 2.3 Mounting dimensions

3 Interfaces

3.1 Interface appearance

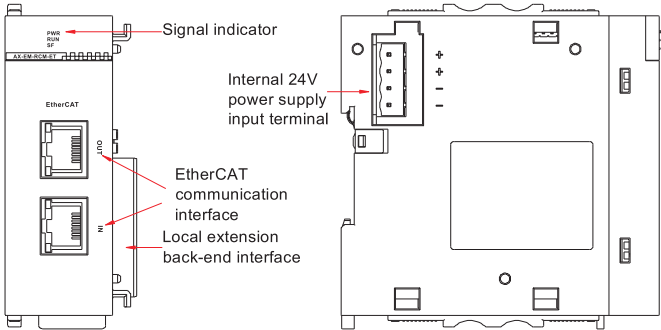


Figure 3.1 Interface distribution

3.2 Interface definition

Interface	Function			
Signal indicator	POWER	Power indicator	Green	It is on when the power supply is

Interface	Function			
				connected
	RUN	Running indicator	Green	It is on when the module is operated normally
	SF	Expansion bus error indicator	Green	It is on when error occurs to the expansion bus
EtherCAT communication interface	IN: EtherCAT input port OUT: EtherCAT output port, connecting the back-end EtherCAT slave station			
Local extension module back-end interface	Connect the back-end module, disallowing hot swapping			
Internal 24V power supply input terminal	Connect power supply module			

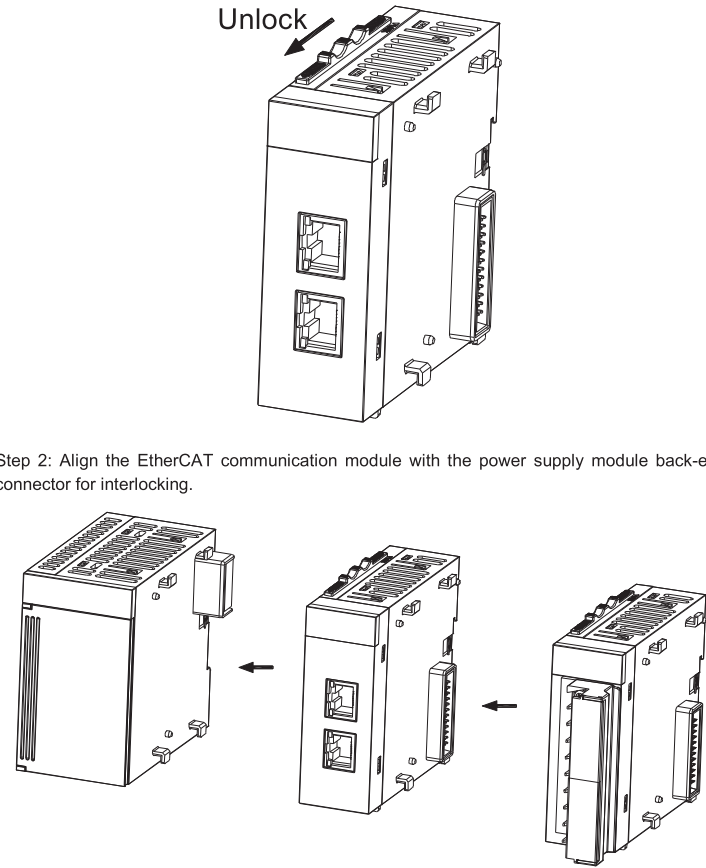
4 Installation and wiring

Using modular design, the AX series programmable controller is easy to install and maintain. As for the EtherCAT communication module, the main connection objects are the power supply module, CPU module, extension I/O module, and other EtherCAT slave station module.

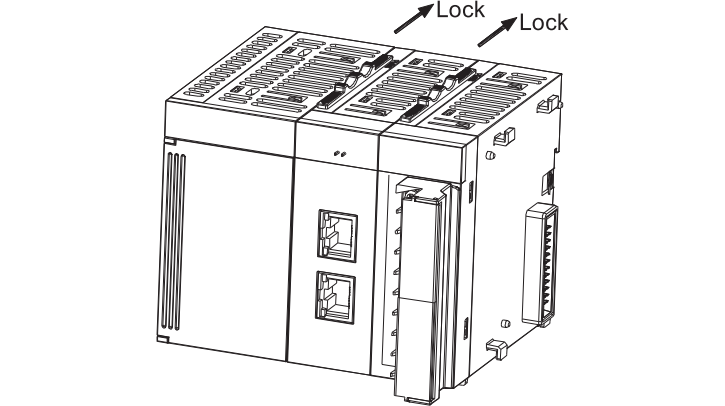
The EtherCAT communication module is directly connected to the CPU module and other EtherCAT slave station modules by using the network cables, while the EtherCAT communication module is connected to the power supply module and I/O module by using the module-provided connection interfaces and snap-fits.

4.1 Installation steps

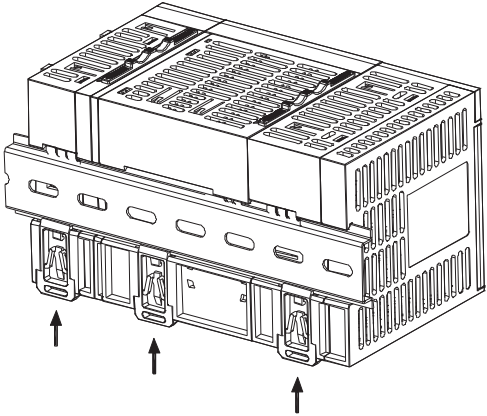
Step 1: Slide the snap-fit on the EtherCAT communication module in the direction shown in the following figure.



Step 2: Align the EtherCAT communication module with the power supply module back-end connector for interlocking.



Step 4: As for standard DIN rail installation, hook the respective module into the standard installation rail until the snap-click fits into place.



4.2 Wiring instruction

For user wiring requirements, see the wiring diagram as below.

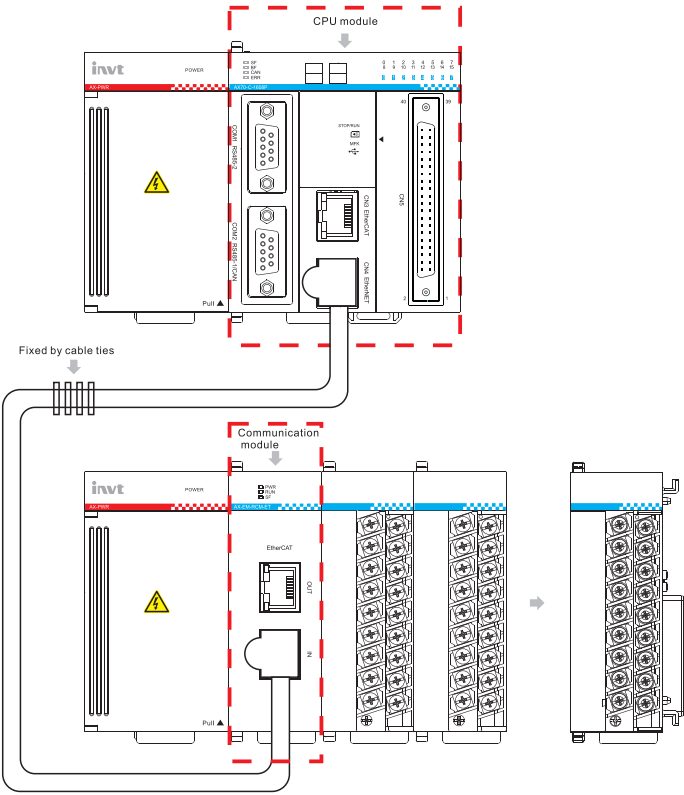


Figure 4.1 Wiring diagram

Notes:

- When you connect the network cable, you shall hold the crystal head with the cable and insert it into the RJ45 network port of the communication module until you can hear a "snap" sound. When you remove the installed network cable, you shall press the tail mechanism of the crystal head so as to pull out the connector from the module horizontally.
- Please use the shielded twisted pairs in more than Category 5e with ironclad molding cable. INVT optional network cables are recommended.

Optional accessories	Model	Specifications	Material number
Shielded cable for communication	AX-L3-20	Shielded cable for EtherCAT communication, two meters	67004-00036
Shielded cable for communication	AX-L3-50	Shielded cable for EtherCAT communication, five meters	67004-00037

If you make the communication cables by yourself, the signal pins of the cables shall be distributed as below.

Pin	Signal	Signal direction	Signal description
1	TD+	Output	Data transmission+
2	TD-	Output	Data transmission-
3	RD+	Input	Data receiving+
4	--	--	Do not use
5	--	--	Do not use
6	RD-	Input	Data receiving-
7	--	--	Do not use
8	--	--	Do not use

