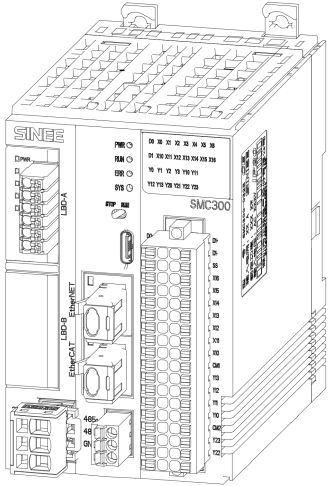


SINEE

SMC300 Series Motion Controller Simple Manual



Shenzhen Sine Electric Co., Ltd.
Building 7, Antoshan High-tech Industrial Park, Xinsha
Road, Baoan District, Shenzhen
www.since.cn

Release time: 2025.03
Version: 1.1
Coding: 31050141

Precautions

Before use: Thank you for purchasing the SMC300 series motion controller. Please read this manual carefully and use the product after understanding the safety precautions of the product. Equipment manufacturers should send this manual to the end user along with the equipment for subsequent reference.

Safety precautions

Safety Definition: In this manual, safety precautions are divided into the following two categories:

	Danger: Danger caused by failure to follow the instructions may result in serious injury or even death;
	Note: Dangers caused by failure to operate as required may result in moderate or minor injuries, and equipment damage;

Safety precautions for installation, startup and maintenance	Danger
1.When wiring, all external power supplies used by the system must be disconnected before operation. If not completely disconnected, it may cause electric shock or equipment failure or malfunction; 2. Do not install if water has entered the package, parts are missing or parts are damaged when unpacking! 3. Do not install if the outer packaging logo does not match the actual name! 4. Please install on flame-retardant objects such as metal, away from combustibles, otherwise it may cause a fire! The instructions of this manual must be followed and used by professional electrical engineers, otherwise unexpected dangers may occur! 5. Please confirm that the power supply is in a zero energy state before wiring, otherwise there is a risk of electric shock! Please properly ground the motion controller according to the standard, otherwise there is a risk of electric shock! 6. The grounding terminal must be reliably grounded, otherwise there is a risk of electric shock and fire! 7. When the motion controller is running, avoid anything falling into the device, otherwise it will cause damage to the device!	

Safety precautions for installation, startup and maintenance	Notice
1. When carrying, lift and place gently, otherwise there is a risk of damaging the equipment! 2. Do not use a damaged motion controller or a motion controller with missing parts, as there is a risk of injury! 3. Please install the motion controller in a place with less vibration and avoid direct sunlight. 4. When placing the motion controller in a relatively closed cabinet or space, please pay attention to the installation gap to ensure the heat dissipation effect. 5. Make sure that the wiring meets the EMC requirements and the safety standards of the area. Please refer to the preferred recommendations for the wire diameter used. Otherwise, an accident may occur! 6. When wiring, do not let metal shavings and wire heads fall into the ventilation holes of the controller, which may cause fire, malfunction, or misoperation; 7. Do not remove the connecting cables inside the motion controller, otherwise it may cause internal damage to the motion controller. 8. Please confirm whether the voltage level of the input power supply is consistent with the rated voltage level of the motion controller; and pay attention to check whether there is a short circuit in the peripheral circuit connected to the motion controller, and whether the connected lines are tight, otherwise it will cause damage to the motion controller! 9. When installing the module, it should be tightly connected to its respective connector and the module connection hook should be firmly locked. If the module is not installed properly, it may cause malfunction, failure and fall off. 10. Do not bundle the control line and communication cable with the power supply line, etc., or make them too close to each other. They should be more than 100mm apart from each other, otherwise noise may cause malfunction; 11. For applications with severe interference, please use shielded cables for input or output cables of high-frequency signals to improve the system's anti-interference ability; 12. For operations such as RUN, STOP, and online modification, you must read the user manual carefully and fully confirm its safety before performing related operations; 13. Avoid severe vibration or tilting of the equipment during cleaning.	

Precautions for use

Lightning surge protection: This series of motion controllers are equipped with lightning overcurrent protection devices, which have a certain self-protection ability against induced lightning. For areas where lightning frequently occurs, customers should also install protection on the front end of the controller.

Note when scrapping: The electrolytic capacitors on the printed circuit board may explode when burned, and plastic parts will produce toxic gases when burned. Please treat them as industrial waste.

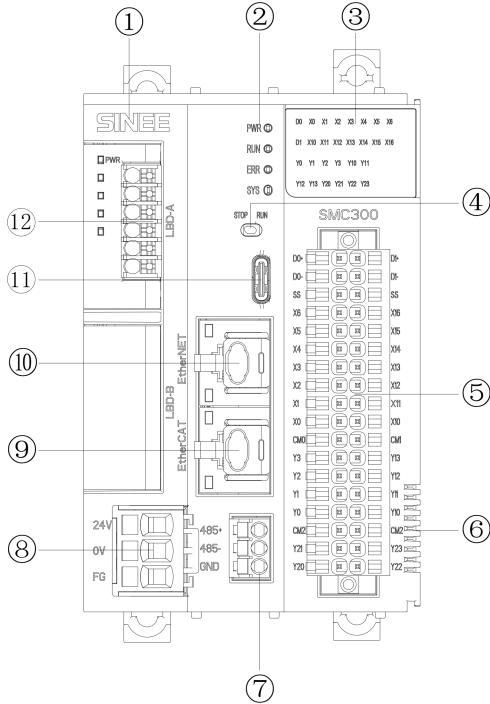
1.Product Information

1.1 Model and nameplate

<u>SMC</u> ①	-	<u>300</u> ②	-	<u>032 E</u> ③④	-	<u>XX</u> ⑤
Product Categories		Series		Axis	Instruction Type	Non-standard customization
SMC Motion controller		300 300 series		032 32 axis	E EtherCAT	

Serial number	Model	description
1	SMC300-032E	EtherCAT master controller capable of controlling 32 axes
2	SMC300-016E	EtherCAT master controller capable of controlling 16 axes
3	SMC300-012E	EtherCAT master controller capable of controlling 12 axes
4	SMC300-008E	EtherCAT master controller capable of controlling 8 axes
5	SMC300-006E	EtherCAT master controller capable of controlling 6 axes

1.2 External Interface



1.3 Power specifications

Item	Specifications
Input power specifications	24V ± 10%, 3A
Undervoltage level	18V
Power-off saving time	1.7s

1.4 Environmental specifications

Item	Specifications
Operating temperature	-10 ~ +55°C
Storage temperature	-25 ~ 80°C
Relative humidity	5% ~ 95% (No condensation)
Altitude	2000m
Pollution degree	Level 2
Protection level	IP20
Cooling method	Natural cooling
Installation	Rail mounting 35mm

Serial	type	Interface ID	definition	illustrate
1	Silkscreen	/	Company logo screen printing	/
2	Indicator Lights	PWR	Power Status	E bus, C bus error indication Red light always on: system error; Green light flashing: wink; Green light always on: system normal
		RUN	Running, Stopping Status	
		ERR	Network Error	
		SYS	System Status	
3	LED Indication	/	16-point input, 12-point output	
4	Dip switch	RUN、STOP	Control system running and stopping	
5	I/O Terminals	/	16-point input, 12-point output	For detailed definition, please refer to 1.6 Terminal Arrangement
6	Right Extension	/	Right expansion module interface	For detailed instructions, please refer to the 《SR30 Right Expansion Module User Manual》
7	RS485 interface	485+	485Communications+	
		485-	485Communications-	
		GND	485Communication grounding	
8	Power interface	+24V	DC 24V input	
		0V		
		PG	PG	
9	Ethernet port 2	EtherCAT	EtherCAT bus communication	
10	Ethernet port1	EtherNET	Ethernet communication	Fixed IP: 192.168.1.8
11	USB	Type-C	For firmware upgrade	
12	Left extension accessory	LBD-A LBD-B	Left expansion card	For detailed instructions, please refer to the SL30 Left Expansion Module User Manual.

1.5 Performance Specifications

Item	Specifications
Program data capacity	10MB
Power-off storage capacity	512KB
Ethernet	1. Modbus TCP protocol 2. 10/100M transmission rate 3. User program download and debugging (only supports IPv4)
EtherCAT	Synchronous cycle 4ms/32 axes
RS485 serial communication	1. Serial port number: COM1 2. Baud rate: 4800-115200
Extension method	Left and right local extensions
Programmatically	IEC 61131-3 programming languages(LD、FBD、IL、ST、SFC、CFC)
USB	Type-C interface, firmware upgrade

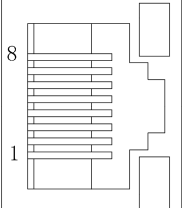
1.6 Terminal arrangement

Wiring	Descrip	Name	No.	Name	Descrip	Wiring
	Differential input +	D0+	35	36	D1+	Differential input +
	Differential input -	D0-	33	34	D1-	Differential input -
	Input common	SS	31	32	SS	Input common
	High-speed input	X6	29	30	X16	High-speed input
	Low-speed input	X5	27	28	X15	Low-speed input
	Low-speed input	X4	25	26	X14	Low-speed input
	Low-speed input	X3	23	24	X13	Low-speed input
	Low-speed input	X2	21	22	X12	Low-speed input
	Low-speed input	X1	19	20	X11	Low-speed input
	Low-speed input	X0	17	18	X10	Low-speed input
	Output common 0	CM0	15	16	CM1	Output common 1
	Low speed output	Y3	13	14	Y13	Low speed output
	Low speed output	Y2	11	12	Y12	Low speed output
	Low speed output	Y1	9	10	Y11	Low speed output
	Low speed output	Y0	7	8	Y10	Low speed output
	Output common 2	CM2	5	6	CM2	Output common 2
	High speed output	Y21	3	4	Y23	High speed output
	High speed output	Y20	1	2	Y22	High speed output

2. Electrical Design Description

2.1 Ethernet/EtherCAT network interface

SMC300 has two 10M/100M Ethernet interfaces, Ethernet and EtherCAT. Both use standard Ethernet RJ45 interfaces. The wiring definitions are as follows:

Ethernet		EtherCAT		Function	Terminal pinout
Signal name	Pin Name	Signal name	Pin Name		
TD+	1	TD+	1	Send Data+	
TD-	2	TD-	2	Send Data-	
RD+	3	RD+	3	Receive Data+	
-	4	-	4	Not used	
-	5	-	5		
RD-	6	RD-	6	Receive Data-	
-	7	-	7	Not used	
-	8	-	8		
PE	Metal shielding layer	PE	Metal shielding layer	Protective grounding	

Both Ethernet communication and EtherCAT communication use shielded twisted-pair cables for network data transmission. Please use cables with the following specifications:

Item	Specifications
Cable Type	Flexible crossover cable, Category 5e
Wire Type	Twisted Pair
Line pair	4
isolation	Cross skeleton
Connectors	With shielding layer crystal head
Cable Material	PVC material, injection molding
Cable length	No more than 100 meters

2.2 RS485 communication interface

aisle	Pinout	definition	Function
COM1	1	485+	RS485 differential positive signal
	2	485-	RS485 differential pair negative signal
	3	GND	Power Ground

2.3 Input Specifications

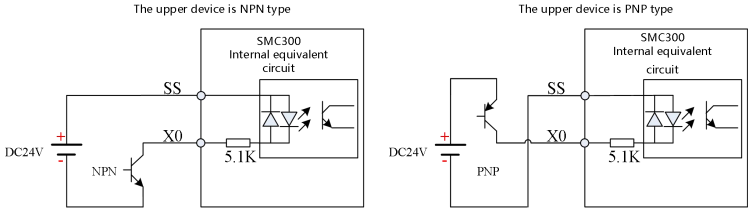
The basic performance of the input port is shown in the following table:

Item	Normal input	High-speed input	Differential input
name	X0-X5、X10-X15	X6、X16	D0、D1
Input method	Sink/Source Type		Differential input
Electrical parameters	24V± 10%	24V± 10%	5V± 10%
Input Impedance	5.1KΩ	3.3KΩ	200Ω
Maximum pulse frequency	1K	200K	500K
Public Mode	16 points and one public port		/

2.3.1 Normal/high-speed input wiring instructions

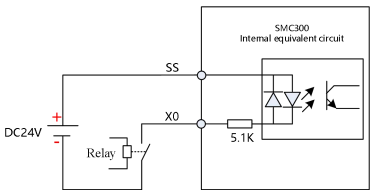
Normal/high-speed inputs share a common SS terminal. The internal equivalent circuits are the same except for the current limiting resistor. The following description is taken as an example:

A. When the upper device is open collector output:



B. When the upper device is a relay output:

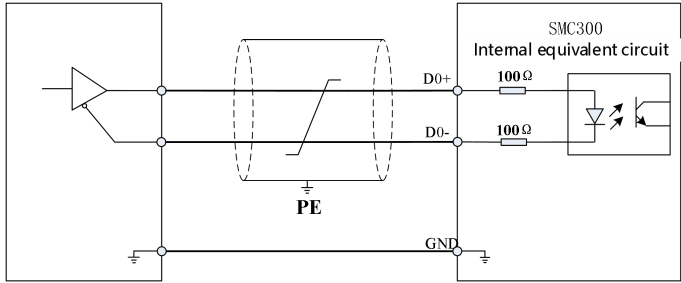
The upper device is a relay type



2.3.2 Differential input wiring instructions

There are two differential input ports, supporting single-phase and AB-phase counting. Take D0 as an

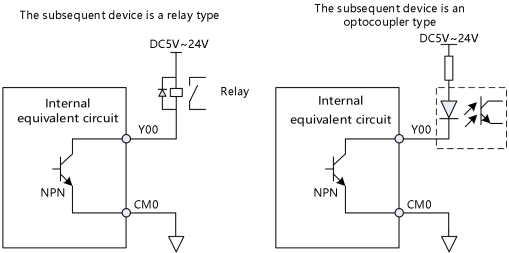
example to show the wiring method and internal equivalent circuit:



2.4 Output specifications

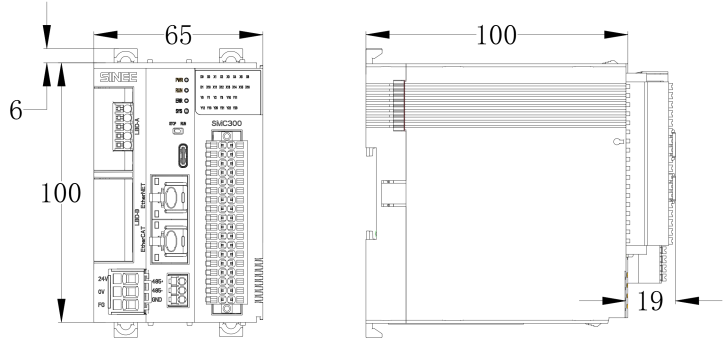
Item	Normal output	High-speed output
name	Y0-Y3, Y10-Y13	Y20-Y23
Output method	NPN type output	NPN type output
Electrical parameters	DC5-24V	DC24V
Rated load	0.1A/point, 0.5A/common end	0.05A/point
Maximum frequency	1K	200K
Public Mode	One common port for every 4 points	

Take Y0 as an example to explain the wiring method of the back stage:



3. Mechanical design dimensions

3.1 Appearance size



3.2 Connection diagram

