



Instruction Manual
4-axis Step Motor Controller
(Parallel I/O type)
Series JXC73 / JXC83



The intended use of the step motor controller is to control the movement of an electric actuator.

1 Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of "Caution," "Warning" or "Danger." They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC) ⁽¹⁾, and other safety regulations.

- IEC 60204-1: Safety of machinery - Electrical equipment of machines. (Part 1: General requirements)
- ISO 10218-1: Robots and robotic devices - Safety requirements for industrial robots - Part 1: Robots.
- Refer to product catalogue, Operation Manual and Handling Precautions for SMC Products for additional information.
- Keep this manual in a safe place for future reference.

Caution	Caution indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
Warning	Warning indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
Danger	Danger indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

Warning

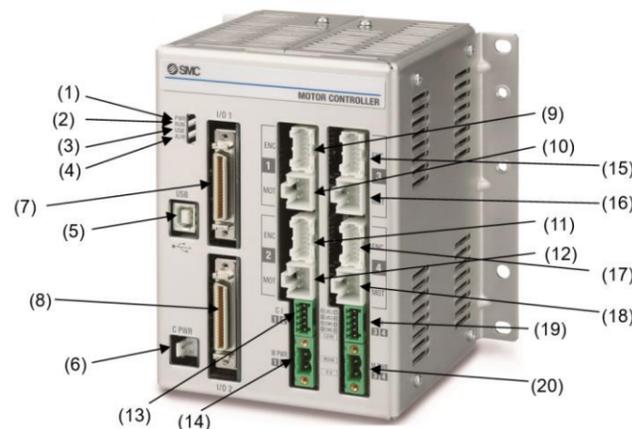
- Always ensure compliance with relevant safety laws and standards.
- All work must be carried out in a safe manner by a qualified person in compliance with applicable national regulations.

2 Specifications

2.1 General specifications

Item	Specifications
Number of axes	4-axis maximum
Compatible motor	Step motor (servo 24 VDC)
Compatible encoder	Incremental A/B phase (800 pulse/rotation)
Power supply	24 VDC +/-10% (motor drive and control).
Current consumption	300 mA maximum (controller) Refer to the actuator specifications for total current consumption.
Parallel Input	16 inputs (optically isolated)
Parallel Output	32 outputs (optically isolated)
Serial communication	USB2.0 (full speed 12 Mbps)
Memory	Flash ROM and Eeprom
Lock control	Forced lock release terminal
Cable length	I/O cable: 5 m max. Actuator cable: 20 m max.
Cooling method	Natural air-cooling
Operating temperature	0°C to 40°C (no freezing)
Storage temperature	-10°C to 60°C (no freezing)
Ambient humidity	90% RH or less (no condensation)
Insulation resistance	50 MΩ (500 VDC) between external terminals and case
Weight	1050 g (Direct mounting) 1100 g (DIN rail mounting)

3 Name and function of parts



No.	Display	Description	Details
1	PWR	Power supply LED (green)	Power supply ON: LED is ON Power supply OFF: LED is OFF
2	RUN	Operating LED (green)	Operation by parallel I/O: LED is ON Operation by USB communication: LED is flashing Stop: LED is OFF
3	USB	USB LED (green)	USB connected: LED is ON USB not connected: LED is OFF
4	ALM	Alarm LED (red)	Alarm condition: LED is ON No alarm: LED is OFF
5	USB	Serial communication	Connect to a PC using a USB cable.
6	C PWR	Main control power supply connector (2 pin) ^{Note)}	Main control power supply (+)(-)
7	I/O 1	Parallel I/O connector (40 pins)	Connect to the PLC using an I/O cable.
8	I/O 2	Parallel I/O connector (40 pins)	Connect to the PLC using an I/O cable.
9	ENC1	Encoder connector (16 pins)	Axis 1: Connect the actuator cable.
10	MOT1	Motor power connector (6 pins)	
11	ENC2	Encoder connector (16 pins)	Axis 2: Connect the actuator cable.
12	MOT2	Motor power connector (6 pins)	
13	CI 1 2	Motor control power supply connector ^{Note)}	Motor control power supply (+), Axis 1 stop (+), Axis 1 unlock (+), Axis 2 stop (+), Axis 2 unlock (+)
14	M PWR 1 2	Motor drive power connector ^{Note)}	Axis 1, Axis 2 Motor drive power (+), common (-)
15	ENC3	Encoder connector (16 pins)	Axis 3: Connect the actuator cable.
16	MOT3	Motor power connector (6 pins)	
17	ENC4	Encoder connector (16 pins)	Axis 4: Connect the actuator cable.
18	MOT4	Motor power connector (6 pins)	
19	CI 3 4	Motor control power supply connector ^{Note)}	Motor control power supply (+), Axis 3 stop (+), Axis 3 unlock (+), Axis 4 stop (+), Axis 4 unlock (+)
20	M PWR 3 4	Motor drive power connector ^{Note)}	Axis 3, Axis 4 Motor drive power (+), common (-)

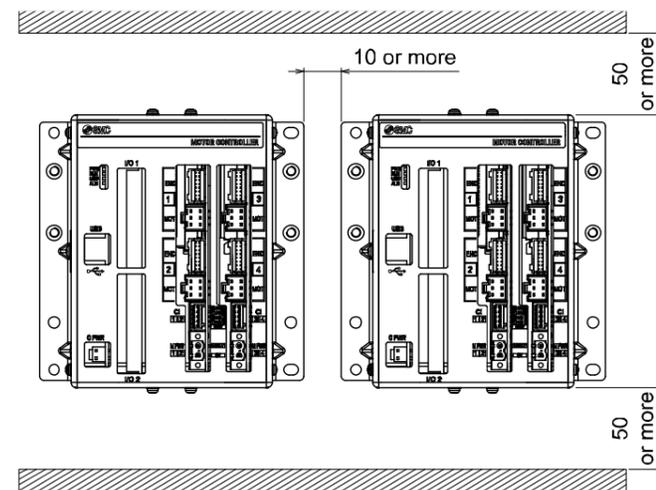
Note) The mating connector is supplied with the controller.

4 Installation

4.1 Installation

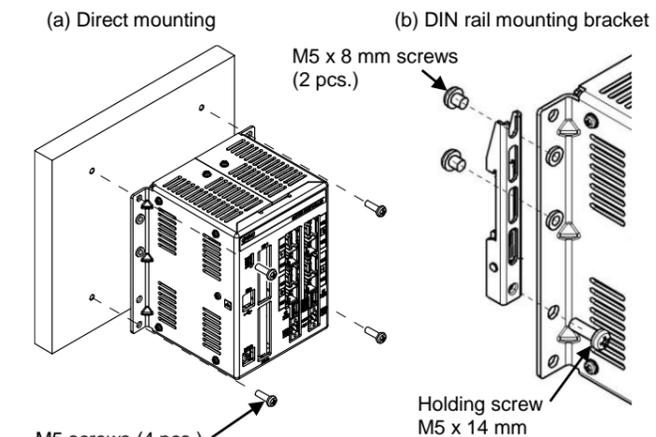
Warning

- Do not install the product unless the safety instructions have been read and understood.
- Design the installation so that the temperature surrounding the controller is 40°C max. Leave enough space between the controllers so that the operating temperature of the controllers remains within the specification range.
- Mount the controller vertically with 50 mm minimum space on the top and bottom of the controller as shown below.
- Allow 100 mm minimum space between the front of the controller and a door (lid) so that the connectors can be connected and disconnected.



4.2 Mounting

- The controller can be direct mounted using 4 x M5 screws (prepared by the user) or mounted on a DIN rail.
- Secure the DIN rail mounting bracket to the controller using the mounting screws supplied (M5 x 8 mm) in 2 places on each side. Recommended torque: 3.0 N.m.
- Then fit the DIN rail mounting bracket holding screw supplied (M5 x 14 mm) in one place on each side. Tighten approximately 2 turns. Recommended torque: 0.4 to 0.6 N.m.



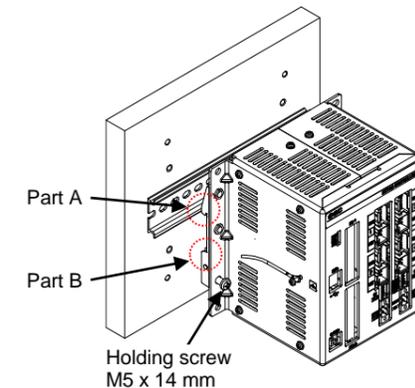
Caution

If the mounting surface for the controller is not flat or is uneven, excessive stress may be applied to the enclosure, which can cause failure. Be sure to mount it on a flat surface.

4 Installation (continued)

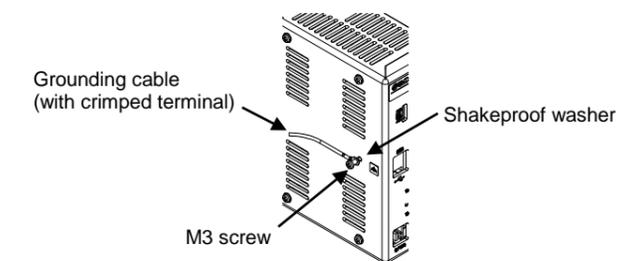
4.3 Mounting on to DIN rail

The figure below shows how to mount the controller to the DIN rail. Hook part A on to the DIN rail. Press part B on to the DIN rail and then tighten the holding screws (M5 x 14). Recommended torque: 0.4 to 0.6 N.m.



4.4 Ground connection

- Fit the grounding cable using a crimped terminal between the M3 screw and shakeproof washer as shown below and tighten the screw.
- The cable and crimped terminal are prepared by the user. The controller must be connected to ground to reduce noise.



Caution

- A dedicated Ground connection must be used. Grounding should be to a D-class ground specification (resistance of 100 Ω maximum).
- The cross-sectional area of the ground cable shall be 2 mm² minimum.
- The Grounding point should be as near as possible to the controller. Keep the grounding cable as short as possible.

4.5 Environment

Warning

- Do not use in an environment where corrosive gases, chemicals, salt water or steam are present.
- Do not use in an explosive atmosphere.
- Do not expose to direct sunlight. Use a suitable protective cover.
- Do not install in a location subject to vibration or impact in excess of the product's specifications.
- Do not mount in a location exposed to radiant heat that would result in temperatures in excess of the product's specifications.
- Avoid mounting the controller near a vibration source, such as a large electromagnetic contactor or circuit breaker on the same panel.
- Do not use in an environment with strong magnetic fields present.

5 Wiring

5.1 Wiring

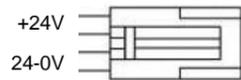
Caution

- Do not perform wiring while the power is on.
- Confirm proper insulation of wiring.
- Do not route wires and cables together with power or high voltage cables.
- Keep wiring as short as possible to prevent interference from electromagnetic noise and surge voltage.
- Do not use an inrush current limited type of power supply for the motor drive and motor control power.
- Do not insert multiple wires into one terminal.

5 Wiring (continued)

5.2 Main Control Power Connector (C PWR)

- Wire the Main control power supply cable to the power supply plug connector, then insert it into connector C PWR on the controller.
- Use the power cable for main control, SMC part number JXC-C1.

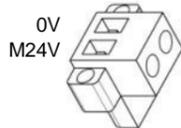


Pin No.	Terminal	Wire colour	Description
1	+24V	Blue	Power supply (+) for main control.
2	24-0V	Brown	Power supply (-) for main control.

Wire specifications

Item	Specifications
Wire size	Stranded wire → AWG20 (0.5mm ²)

5.3 Motor Drive Power Connector (M PWR)



Phoenix Contact GmbH
Part No. MSTB2,5/2-STF-5,08

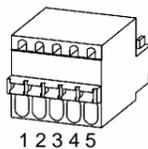
Terminal	Function	Description
0V	Motor power (-)	Power supply (-) common for M24V terminal, C24V terminal, EMG terminal and LKRLS terminal
M24V	Motor power (+)	Motor drive power supply (+) for Axis 1 and 2 or Axis 3 and 4.

Prepare the electrical wiring according to the following specifications (to be prepared by the user).

Item	Specifications
Applicable wire size	Single stranded wire → AWG16 (1.25 mm ²) The rated temperature of the insulation coating should be 60°C or more.
Stripped wire length	7 mm

- Insert only the stripped part of the wire into the connector.

5.4 Motor Control Power Connector (CI)



Phoenix Contact GmbH
Part No. FK-MC0,5/5-ST-2,5

Pin No.	Terminal	Function	Description
1	C24V	Motor control power supply (+)	Power supply (+) for motor control.
2	EMG1 / EMG3	Stop (+)	Release stop status (+) of Axis 1 or Axis 3 (normal operation by applying 24 V).
3	EMG2 / EMG4	Stop (+)	Release stop status (+) of Axis 2 or Axis 4 (normal operation by applying 24 V).
4	LKRLS1 / LKRLS3	Unlock (+)	Release lock status (+) of Axis 1 or Axis 3.
5	LKRLS2 / LKRLS4	Unlock (+)	Release lock status (+) of Axis 2 or Axis 4.

5 Wiring (continued)

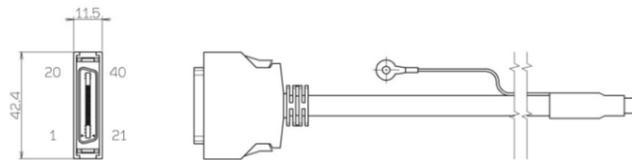
Prepare the electrical wiring according to the following specifications (to be prepared by the user).

Item	Specifications
Applicable wire size	Single stranded wire → AWG20 (0.5 mm ²) The rated temperature of the insulation coating should be 60°C or more.
Stripped wire length	8 mm

- Insert only the stripped part of the wire into the connector.

5.5 Parallel I/O Connector

- When connecting the parallel I/O connector to a PLC use SMC parallel I/O cable (JXC-C2-#).



Input Terminals	
No.	Function
1	+COM1
21	+COM2
2	IN0
22	IN1
3	IN2
23	IN3
4	IN4
24	IN5
5	IN6
25	IN7
6	IN8
26	IN9
7	IN10
27	SETUP
8	HOLD
28	DRIVE
9	RESET
29	SVON

Output Terminals	
No.	Function
10	OUT0
30	OUT1
11	OUT2
31	OUT3
12	OUT4
32	OUT5
13	OUT6
33	OUT7
14	OUT8
34	BUSY (OUT9)
15	AREA (OUT10)
35	SETON
16	INP
36	SVRE
17	□ESTOP
37	□ALARM
18	-COM1
19	-COM1
38	-COM1
20	-COM2
39	-COM2
40	-COM2

For further details of the Parallel I/O wiring refer to the Operation Manual on the SMC website (URL: <https://www.smcworld.com>).

6 LED Display

Refer to the table below for the LED status.



LED	Details		
PWR	Power supply status	Green LED ON	Power is supplied
		OFF	Power is not supplied
RUN	Operation status	Green LED ON	Operating
		Green LED flashing	Operating using the setting software
		OFF	Not operating
USB	USB status	Green LED ON	USB connected
		OFF	USB not connected
ALM	Alarm status	Red LED ON	Alarm generated
		OFF	No alarm generated

Caution

Do not turn OFF the power supply for the controller or connect / disconnect the cable while data is being written to memory (PWR LED (green) is flashing) to avoid the possibility of incorrect / corrupt data (step data, parameter).

7 How to Order

Refer to the operation manual or catalogue on the SMC website (URL: <https://www.smcworld.com>) for the How to Order information.

8 Outline Dimensions (mm)

Refer to the operation manual or catalogue on the SMC website (URL: <https://www.smcworld.com>) for outline dimensions.

9 Maintenance

9.1 General Maintenance

Caution

- Not following proper maintenance procedures could cause the product to malfunction and lead to equipment damage.
- Before performing maintenance, turn off the power supply. Check the voltage with a tester 5 minutes after the power supply is turned OFF.
- If any electrical connections are disturbed during maintenance, ensure they are reconnected correctly and safety checks are carried out as required to ensure continued compliance with applicable national regulations.
- Do not make any modification to the product.
- Do not disassemble the product, unless required by installation or maintenance instructions.

Caution

- Maintenance should be performed according to the procedure indicated in the Operation Manual.
- When equipment is serviced, first confirm that measures are in place to prevent dropping of work pieces and run-away of equipment, etc, then cut the power supply to the system. When machinery is restarted, check that operation is normal with actuators in the correct position.

Warning

- Perform maintenance checks periodically.
- Confirm wiring and screws are not loose. Loose screws or wires may cause unexpected malfunction.
- Conduct an appropriate functional inspection and test after completing maintenance. In case of any abnormalities (if the actuator does not move, etc.), stop the operation of the system. Otherwise, an unexpected malfunction may occur and it will become impossible to ensure safety. Operate an emergency stop instruction to confirm safety.
- Do not put anything conductive or flammable inside of the controller.
- Ensure sufficient space around the controller for maintenance.

10 Limitations of Use

10.1 Limited warranty and Disclaimer/Compliance Requirements

Refer to Handling Precautions for SMC Products.

11 Product disposal

This product shall not be disposed of as municipal waste. Check your local regulations and guidelines to dispose of this product correctly, in order to reduce the impact on human health and the environment.

12 Contacts

Refer to www.smcworld.com or www.smc.eu for your local distributor / importer.

SMC Corporation

URL: <https://www.smcworld.com> (Global) <https://www.smc.eu> (Europe)
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Specifications are subject to change without prior notice from the manufacturer.
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