INFORMATION

EtherNet/IPDirect Input TypeStep Motor Controller(€ ROHS)

■EtherNet/IP[™] compatible

- 10/100 Mbps high-speed communication
- Dual port connection
 - Transition wiring of communication cable





Recovery is possible during a disconnection of the device level ring (DLR)!

In the device level ring type, even though the communication cable is disconnected in one location, EtherNet/IP[™] communication can be continued, and the disconnected portion can be specified by the ring supervisor.



<Data flow when the communication cable is disconnected>

Application Example

Air and electric system configurations

Fieldbus network (EtherNet/IP™)







Series JXC91

System Construction



EtherNet/IP Direct Input Type Step Motor Controller (€ Series JXC91

How to Order

Actuator + Controller LEFS16B-100 - R 1 C 9 1 7 • Actuator type Refer to "How to Order" in the actuator catalog. For compatible actuators, refer to the table below. Example: LEFS16B-100B-R1C917 Compatible actuators Electric Actuator/Rod Series LEY Electric Actuator/Rod Series LEYG

Electric Actuator/Rod Series LEY		
Electric Actuator/Guide Rod Series LEYG		
Electric Actuator/Slider Series LEF		
Electric Slide Table Series LES/LESH		
Electric Rotary Table Series LER	E102	
Electric Actuator/Guide Rod Slider Series LEL		
Electric Actuator/Miniature Series LEPY/LEPS		
Electric Gripper Series LEH		
Electric Actuator/Low Profile Slider Series LEM		
* Only the step motor type is applicable.		

≜Caution

[CE-compliant products] EMC compliance was tested by combining the electric actuator LE series and the controller JXC91 series.

The EMC depends on the configuration of the customer's control panel and the relationship with other electrical equipment and wiring. Therefore, conformity to the EMC directive cannot be certified for SMC components incorporated into the customer's equipment under actual operating conditions. As a result, it is necessary for the customer to verify conformity to the EMC directive for the machinery and equipment as a whole.

Actuator cable ty			
Nil	Without cable		
S	Standard cable		
R	Robotic cable		

Mounting

7 Screw mounting 8 Note) DIN rail mounting Note) DIN rail is not included. Order it separately.

EtherNet/IP™ direct input type

Step motor controller

• Actuator cable length

Nil	Without cable				
1	1.5 m				
3	3 m				
5	5 m				
8	8 m				
Α	10 m				
В	15 m				
С	20 m				

When selecting an electric actuator, refer to the Model Selection of each actuator. Also, for "Speed–Work Load" graph of the actuator, refer to "For LECPMJ" in the Electric Actuators catalog (CAT.E102).

JX<u>C</u>917-Controller Step motor controller Actuator part number (Except cable specifications and actuator options) Example: Enter "LEFS16B-100" for the EtherNet/IP™ direct input type LEFS16B-100B-S1 Mounting 7 Screw mounting When selecting an electric actuator, refer to 8 Note) **DIN** rail mounting the Model Selection of each actuator. Also, Note) DIN rail is not included. for "Speed-Work Load" graph of the actuator, Order it separately. refer to "For LECPMJ" in the Electric Actuators (Refer to page 4.) catalog (CAT.E102).



Series JXC91

Specifications

Model		JXC91			
Cor	npatible motor	Step motor (Servo/24 VDC)			
Power supply Power voltage: 24 VDC±10%		Power voltage: 24 VDC±10%			
Current consumption		130 mA or less (Controller)			
Compatible encoder		Incremental A/B phase (800 pulse/rotation)			
Protocol		EtherNet/IP™			
	Communication speed	10/100 Mbps (Auto negotiation)			
ion	Communication method	Full duplex/Half duplex (Auto negotiation)			
cat	Configuration file Note)	EDS file			
uni	I/O occupation area	Input 36 bytes/Output 36 bytes			
Comm	IP address setting range	Rotary switch settings: 192.168.1.1 to 254 Through DHCP server: Optional address			
	Device information	Vendor ID: 7h (SMC Corporation) Product type: 2Bh (Generic Device) Product code: D1h			
Ме	nory	EEPROM			
LED) indicator	PWR, ALM, MS, NS			
Cable length [m]		Actuator cable: 20 or less			
Cooling system		Natural air cooling			
Operating temperature range		32 to 104°F [0 to 40°C] (No freezing)			
Operating humidity range [%RH]		90 or less (No condensation)			
Insulation resistance [M Ω]		Between all of external terminals and the case 50 (500 VDC)			
We	ght [g]	210 (Screw mounting), 230 (DIN rail mounting)			

Note) The file can be downloaded from the SMC website.

Trademark

EtherNet/IP™ is a trademark of ODVA.

Example of Operation Command

In addition to the step data input of 64 points maximum in EtherNet/IPTM communication, the changing of each parameter can be performed in real time in the numerical data defining operation.

<Application Example> Movement between 2 points

No.	Movement mode	Speed	Position	Acceleration	Deceleration	Pushing force	Trigger LV	Pushing speed	Moving force	Area 1	Area 2	In position
0	1: Absolute	100	10	3000	3000	0	0	0	100	0	0	0.50
1	1: Absolute	100	100	3000	3000	0	0	0	100	0	0	0.50

<Step No. defining operation>

Sequence 1: Servo ON instruction

Sequence 2: Instruction to return to origin

Sequence 3: Specify step data No. 0 to input the DRIVE signal.

Sequence 4: Specify step data No. 1 after the DRIVE signal is turned OFF to input the DRIVE signal.

<Numerical data defining operation>

Sequence 1: Servo ON instruction

Sequence 2: Instruction to return to origin

Sequence 3: Specify step data No. 0 and turn ON the input instructions flag (position) and input 10 in the target position. Subsequently the start flag turns ON. Sequence 4: Turn ON step data No. 0 and the input instructions flag (position) to change the target position to 100 while the start flag is ON.

The same operation can be performed with any operation command.

Sequence 1 \rightarrow			
Sequence 2 \rightarrow	4	-	
Sequence $3 \rightarrow$			
Sequence 4 \rightarrow			▶
	0 10	SMC	100

Step Motor Controller (EtherNet/IP™ Direct Input Type) Series JXC91

Dimensions



DIN rail mounting adapter LEC-3-D0 (with 2 mounting screws)

This should be used when the DIN rail mounting adapter is mounted onto the screw mounting type controller afterwards.

Option: Conversion Cable

P5062-5 (Cable length: 0.3 m)



Wiring Example



1	(1) C	④ 0V
	② M 24V	(5) N.C.
	③ EMG	6 LK RLS

PWR Power Supply Plug

Terminal name	Function	Details
٥V	Common supply (–)	M 24V terminal/C 24V terminal/EMG terminal/ BK RLS terminal are common (–).
M 24V	Motor power supply (+)	Motor power supply (+) of the controller
C 24V	Control power supply (+)	Control power supply (+) of the controller
EMG	Stop (+)	Connection terminal of the external stop circuit
LK RLS	Lock release (+)	Connection terminal of the lock release switch

SMC



Series JXC91 Controller and Peripheral Devices/ Specific Product Precautions 1

Be sure to read this before handling. For Safety Instructions and Electric Actuator Precautions, refer to "Handling Precautions for SMC Products" and the Operation Manual on the SMC website, http://www.smcworld.com

Design/Selection

▲Warning

1. Use the specified voltage.

If the applied voltage is higher than the specified voltage, malfunction and damage to the controller may result. If the applied voltage is lower than the specified voltage, there is a possibility that the load cannot be moved due to internal voltage drop. Check the operating voltage prior to start.

2. Do not use the products outside the specifications.

Otherwise, fire, malfunction or damage to the product can result. Check the specifications prior to use.

3. Install an emergency stop circuit.

Install an emergency stop outside the enclosure in easy reach to the operator so that the operator can stop the system operation immediately and intercept the power supply.

- 4. To prevent danger and damage due to a breakdown or malfunction of these products, which may occur at a certain probability, a backup system should be arranged in advance by using a multiple-layered structure or by making a fail-safe equipment design, etc.
- 5. If there is a risk of fire or personal injury due to abnormal heat generation, sparking, smoke generated by the product, etc., cut off the power supply from this product and the system immediately.

Handling

AWarning

1. Never touch the inside of the controller and its peripheral devices.

Otherwise, electric shock or failure can result.

- **2.** Do not operate or set up this equipment with wet hands. Otherwise, electric shock can result.
- 3. Do not use a product that is damaged or missing any components.

Electric shock, fire or injury can result.

4. Use only the specified combination between the electric actuator and controller.

It may cause damage to the actuator or to the controller.

5. Be careful not to touch, get caught or hit by the workpiece while the actuator is moving.

An injury can result.

6. Do not connect the power supply or power up the product until it is confirmed that the workpiece can be moved safely within the area that can be reached by the workpiece.

Otherwise, the movement of the workpiece may cause an accident.

7. Do not touch the product when it is energized and for some time after the power has been disconnected, as it is very hot. Handling

∆Warning

8. Check the voltage using a tester at least 5 minutes after power-off when performing installation, wiring and maintenance.

Otherwise, electric shock, fire or injury can result.

9. Static electricity may cause a malfunction or damage the controller. Do not touch the controller while power is supplied to it.

Take sufficient safety measures to eliminate static electricity when it is necessary to touch the controller for maintenance.

10. Do not use the products in an area where they could be exposed to dust, metallic powder, machining chips or splashes of water, oil or chemicals.

Otherwise, a failure or malfunction can result.

11. Do not use the products in a magnetic field.

Otherwise, a malfunction or failure can result.

12. Do not use the products in an environment where flammable, explosive or corrosive gases, liquids or other substances are present.

Otherwise, fire, explosion or corrosion can result.

13. Avoid heat radiation from strong heat sources, such as direct sunlight or a hot furnace.

Otherwise, it will cause a failure to the controller or its peripheral devices.

14. Do not use the products in an environment with cyclic temperature changes.

Otherwise, it will cause a failure to the controller or its peripheral devices.

15. Do not use the products in an environment where surges are generated.

Devices (solenoid type lifters, high frequency induction furnaces, motors, etc.) that generate a large amount of surge around the product may lead to deterioration or damage to the internal circuits of the products. Avoid supplies of surge generation and crossed lines.

16. Do not install the products in a place subject to vibration and impact.

Otherwise, a malfunction or failure can result.

- 17. When a surge generating load such as a relay or solenoid valve is directly driven, use a product that incorporates a surge absorbing element.
- The power supplies should be separated between the controller power and the I/O signal power, and both power supplies must not be of "inrush current limited" type.

If the power supply is of "inrush current limited" type, a voltage drop may occur during the acceleration or deceleration of the actuator.

Otherwise, it may cause burns due to the high temperature.

Series JXC91 Controller and Peripheral Devices/ Specific Product Precautions 2

Be sure to read this before handling. For Safety Instructions and Electric Actuator Precautions, refer to "Handling Precautions for SMC Products" and the Operation Manual on the SMC website, http://www.smcworld.com

Mounting

AWarning

1. Install the controller and its peripheral devices on fireproof material.

Direct installation on or near flammable material may cause fire.

2. Do not install these products in a place subject to vibration and impact.

Otherwise, a malfunction or failure can result.

- 3. Do not mount the controller and its peripheral devices on the same base together with a large-sized electromagnetic contactor or no-fuse breaker that generate vibration. Mount them on different base plates, or keep the controller and its peripheral devices away from such vibration supplies.
- 4. Install the controller and its peripheral devices on a flat surface.

If the mounting surface is not flat or uneven, excessive force may be applied to the housing and other parts resulting in a malfunction.

5. Take measure so that the operating temperature of the controller and its peripheral devices are within the range of the specifications. Also, the controller should be installed with 50 mm or larger spaces between each side of it and the other structures or components.

Otherwise, it may cause the controller and its peripheral devices to fail and can result in a fire.

Power Supply

∆Warning

1. Use a power supply with low noise between lines and between power and ground.

In cases where noise is high, use an isolation transformer.

2. Take appropriate measures to prevent surges from lightning. Ground the surge absorber for lightning separately from the grounding of the controller and its peripheral devices.

Grounding

AWarning

- 1. Make sure the product is grounded to ensure the noise tolerance of the controller.
- 2. Use a dedicated grounding.

Use a D-class grounding. (Ground resistance 100Ω or less)

- 3. The grounding point should be as close as possible to the controller, and the ground wires as short as possible.
- 4. In the unlikely event that malfunction is caused by the ground, it may be disconnected.

Wiring

A Warning

1. Do not apply any excessive force to cables by repeated bending, tensioning or placing a heavy object on the cables.

It may cause an electric shock, fire, or breaking of wire.

2. Connect wires and cables correctly.

Incorrect wiring could break the controller or its peripheral devices depending on the seriousness.

3. Do not connect wires while the power is supplied.

It can break the controller or its peripheral devices could be damaged to cause a malfunction.

4. Do not carry the product by holding its cables.

It may cause an injury or damage to the product.

5. Do not connect power or high voltage cables in the same wiring path as the unit.

The product can malfunction due to noise and surge voltage interference in the signal line from the power and high voltage cables.

Separate the wiring of the controller and its peripheral device from that of power and high voltage cables.

6. Verify wiring insulation.

Insulation failure (interference with other circuits, poor insulation between terminals, etc.) could introduce excessive voltage or current to the controller or its peripheral devices and damage them.

Maintenance

AWarning

1. Perform maintenance checks periodically.

Confirm wiring and screws are not loose. Loose screws or wires may cause unexpected malfunction.

2. Conduct an appropriate functional inspection and test after completed maintenance.

In case of any abnormalities (if the actuator does not move or the equipment does not operate properly, etc.), stop the operation of the system. Otherwise, unexpected malfunction may occur and safety cannot be assured. Conduct a test of the emergency stop to confirm the safety of the equipment.

- 3. Do not disassemble, modify or repair the controller or its peripheral devices.
- 4. Do not put anything conductive or flammable inside the controller.

Otherwise, fire can result.

- 5. Do not conduct an insulation resistance test or insulation withstand voltage test.
- 6. Reserve sufficient space for maintenance.

Design the system so that it allows required space for maintenance.



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