**Step Motor Controller**

- **Two types of operation command**
  - **Step no. defined operation**: Operate using the preset step data in the controller.
  - **Numerical data defined operation**: The actuator operates using values such as position and speed from the PLC.

- **Transition wiring of communication cables**
  - Two communication ports are provided.
  - For the DeviceNet™ type, transition wiring is possible using a branch connector.

- **Numerical monitoring available**
  - Numerical information, such as the current speed, current position, and alarm codes, can be monitored on the PLC.

### Application Examples

**Both air and electric systems can be established under the same protocol.**

**Electric Actuators**

- Electric slide table
  - LES/LESH Series

- Electric actuator
  - Slider type
    - LEF Series
  - Low profile slider type
    - LEM Series

- Electric actuator
  - Guide rod slider
    - LEL Series

- Electric actuator
  - Miniature type
    - LEPY/LEPS Series

- Electric gripper
  - LEH Series

- Electric actuator
  - Rotary table
    - LER Series

**Air Cylinders**

- EX260

**<Applicable electric actuators>**

- Electric motor controller
  - JXCE1/91/P1/D1 Series

---

**INFORMATION**

- Two communication ports are provided.
- For the DeviceNet™ type, transition wiring is possible using a branch connector.

**Step Motor Controller**

- Electric actuator
  - Slider type
    - LEF Series

- Electric actuator
  - Low profile slider type
    - LEM Series

- Electric actuator
  - Guide rod slider
    - LEL Series

- Electric actuator
  - Miniature type
    - LEPY/LEPS Series

- Electric gripper
  - LEH Series

- Electric actuator
  - Rotary table
    - LER Series

**NEW**

- **EtherCAT Type**
- **PROFIBUS Type**
- **DeviceNet Type**
- **EtherCAT/IP Type**

---

**JXCE1/91/P1/D1 Series**
JXCE1/91/P1/D1 Series

System Construction

Electric actuators
- LEY/LEYG Series
- LEF Series
- LES/LESH Series
- LER Series
- LEPY/LEPS Series
- LEH Series
- LEM Series

Actuator cable
- LE-CP-S
- Robotic cable
- LE-CP-S
- Standard cable
- JXC-CD-T
- Straight type
- JXC-CD-S
- T-branch type
- JXC-CD-T

Power supply
- for controller
- 24 VDC

Provided by customer
- PLC
- PLC
- PLC
- PLC

Conversion cable
- Provided by customer
- Communication plug connector for DeviceNet™ p.6

Teaching box
- With 3 m cable
- LEC-T1-3JG

Controller setting kit
- Controller setting kit
- Communication cable, conversion unit, and USB cable are included.
- LEC-W2

Options
- USB cable
- A-mini B type
- (0.3 m)

*1 To connect the teaching box or LEC controller setting kit communication cable to the controller, a conversion cable is required.
# How to Order

## Actuator + Controller

**LEFS16B-100** - **R1** - **CD17T**

### Actuator type

Refer to “How to Order” in the actuator catalog. For compatible actuators, refer to the table below. Example: LEFS16B-100B-R1C917

<table>
<thead>
<tr>
<th>Compatible actuators</th>
<th>Refer to the Web Catalog.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electric Actuator/Rod LEY Series</td>
<td></td>
</tr>
<tr>
<td>Electric Actuator/Guide Rod LEYG Series</td>
<td></td>
</tr>
<tr>
<td>Electric Actuator/Slider LEF Series</td>
<td></td>
</tr>
<tr>
<td>Electric Slide Table LES/LESH Series</td>
<td></td>
</tr>
<tr>
<td>Electric Rotary Table LER Series</td>
<td></td>
</tr>
<tr>
<td>Electric Actuator/Guide Rod Slider LE Series</td>
<td></td>
</tr>
<tr>
<td>Electric Actuator/Miniature LEFY/LEPS Series</td>
<td></td>
</tr>
<tr>
<td>Electric Actuator/Low Profile Slider LEM Series</td>
<td></td>
</tr>
</tbody>
</table>

* Only the step motor type is applicable.

### Communication protocol

- **E** EtherCAT®
- **9** EtherNet/IP™
- **P** PROFINET
- **D** DeviceNet™

### Mounting

1. **7** Screw mounting
2. **8** DIN rail

### Actuator part number

**LEFS16B-100**

### Controller

**JXC** **D** **17** **T** - **LEFS16B-100**

### Communication protocol

- **E** EtherCAT®
- **9** EtherNet/IP™
- **P** PROFINET
- **D** DeviceNet™

### Communication plug connector for DeviceNet™

- **S** Straight type
- **T** T-branch type

### Precautions for blank controllers (JXC-BCW-1)

A blank controller is a controller to which the customer can write the data of the actuator it is to be combined and used with. Use the dedicated software (JXC-BCW) for data writing.

- Please download the dedicated software (JXC-BCW) via our website.
- Order the controller setting kit (LEC-W2) separately to use this software.

SMC website [http://www.smcworld.com](http://www.smcworld.com)

### Warning

**Caution**

[CE-compliant products]

EMC compliance was tested by combining the electric actuator LE series and the JXCE1/91/P1/D1 series.

The EMC depends on the configuration of the customer’s control panel and the relationship with other electrical equipment and wiring. Therefore, compliance with 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 compliance with the EMC directive for the machinery and equipment as a whole.

### Caution

* Only the step motor type is applicable.

*1 Produced upon receipt of order (Robotic cable only)

* The standard cable should only be used on fixed parts. For use on moving parts, select the robotic cable.

### Communication plug connector for DeviceNet™

- **Nil** Without plug connector
- **S** Straight type
- **T** T-branch type

* Select “Nil” for anything other than DeviceNet™.

### Mounting

1. **7** Screw mounting
2. **8** DIN rail

*1 DIN rail is not included. It must be ordered separately. (Page 6)

When selecting an electric actuator, refer to the model selection chart of each actuator. Also, for the “Speed–Work Load” graph of the actuator, refer to the LECPMJ section on the model selection page of the electric actuators [Web Catalog](http://www.smcworld.com).

When selecting an electric actuator, refer to the model selection chart of each actuator. Also, for the “Speed–Work Load” graph of the actuator, refer to the LECPMJ section on the model selection page of the electric actuators [Web Catalog](http://www.smcworld.com).
## Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>JXCE1</th>
<th>JXC91</th>
<th>JXCP1</th>
<th>JXCD1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network</td>
<td>EtherCAT®</td>
<td>EtherNet/IP™</td>
<td>PROFINET</td>
<td>DeviceNet™</td>
</tr>
<tr>
<td>Compatible motor</td>
<td>Step motor (Servo/24 VDC)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power supply</td>
<td>Power voltage: 24 VDC ±10%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current consumption (Controller)</td>
<td>200 mA or less</td>
<td>130 mA or less</td>
<td>200 mA or less</td>
<td>100 mA or less</td>
</tr>
<tr>
<td>Compatible encoder</td>
<td>Incremental A/B phase (800 pulse/rotation)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Communication specifications

<table>
<thead>
<tr>
<th>Applicable system</th>
<th>Protocol</th>
<th>Version¹</th>
<th>Communication speed</th>
<th>I/O occupation area</th>
<th>Terminating resistor</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EtherCAT®¹/²</td>
<td>1</td>
<td>100 Mbps¹/²</td>
<td>Input 20 bytes</td>
<td>Not included</td>
</tr>
<tr>
<td></td>
<td>EtherNet/IP™¹/²</td>
<td>1</td>
<td>10/100 Mbps¹/²</td>
<td>Output 36 bytes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PROFINET²</td>
<td>1</td>
<td>100 Mbps²</td>
<td>Input 36 bytes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>DeviceNet™</td>
<td>1</td>
<td>125/250/500 kbps</td>
<td>Output 36 bytes</td>
<td></td>
</tr>
</tbody>
</table>

### Memory

<table>
<thead>
<tr>
<th>LED indicator</th>
<th>PWR, RUN, ALM, ERR</th>
<th>PWR, ALM, MS, NS</th>
<th>PWR, ALM, SF, BF</th>
<th>PWR, ALM, MS, NS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cable length [m]</td>
<td>Actuator cable: 20 m or less</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cooling system</td>
<td>Natural air cooling</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating temperature range [°C]</td>
<td>0 to 40 (No freezing)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating humidity range [%RH]</td>
<td>90 or less (No condensation)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insulation resistance [MΩ]</td>
<td>Between all external terminals and the case 50 (500 VDC)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### I/O occupation area

<table>
<thead>
<tr>
<th></th>
<th>Input 20 bytes</th>
<th>Output 36 bytes</th>
<th>Input 36 bytes</th>
<th>Output 36 bytes</th>
<th>Input 36 bytes</th>
<th>Output 4, 10, 20 bytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actuator cable: 20 m or less</td>
<td>Output 36 bytes</td>
<td>Input 36 bytes</td>
<td>Output 36 bytes</td>
<td>Input 4, 10, 20 bytes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Terminating resistor

- Not included

### Terminating resistor

- Not included

---

**Trademark**

EtherNet/IP™ is a trademark of ODVA.
DeviceNet™ is a trademark of ODVA.
EtherCAT® is registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.

---

### Example of Operation Command

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

#### <Application example> Movement between 2 points

<table>
<thead>
<tr>
<th>No.</th>
<th>Movement mode</th>
<th>Speed</th>
<th>Position</th>
<th>Acceleration</th>
<th>Deceleration</th>
<th>Pushing force</th>
<th>Trigger LV</th>
<th>Pushing speed</th>
<th>Moving force</th>
<th>Area 1</th>
<th>Area 2</th>
<th>In position</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1: Absolute</td>
<td>100</td>
<td>10</td>
<td>3000</td>
<td>3000</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>100</td>
<td>0</td>
<td>0</td>
<td>0.50</td>
</tr>
<tr>
<td>1</td>
<td>1: Absolute</td>
<td>100</td>
<td>100</td>
<td>3000</td>
<td>3000</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>100</td>
<td>0</td>
<td>0</td>
<td>0.50</td>
</tr>
</tbody>
</table>

#### <Step No. defined 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 has been temporarily turned OFF to input the DRIVE signal.

#### <Numerical data defined 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). 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.
Step Motor Controller  
**JXCE1/91/P1/D1 Series**

### Dimensions

#### JXCE1

[Diagram of JXCE1 dimensions]

#### JXC91

[Diagram of JXC91 dimensions]
JXCE1/91/P1/D1 Series

Dimensions

JXCP1

![Diagram of JXCP1]

- Mountable on DIN rail (35 mm)

JXCD1

![Diagram of JXCD1]

- Mountable on DIN rail (35 mm)

L Dimensions [mm]

<table>
<thead>
<tr>
<th>No.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
<th>18</th>
<th>19</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>23</td>
<td>35.5</td>
<td>48</td>
<td>60.5</td>
<td>73</td>
<td>85.5</td>
<td>98</td>
<td>110.5</td>
<td>123</td>
<td>135.5</td>
<td>148</td>
<td>160.5</td>
<td>173</td>
<td>185.5</td>
<td>198</td>
<td>210.5</td>
<td>223</td>
<td>235.5</td>
<td>248</td>
<td>260.5</td>
</tr>
<tr>
<td>L</td>
<td>21</td>
<td>22</td>
<td>23</td>
<td>24</td>
<td>25</td>
<td>26</td>
<td>27</td>
<td>28</td>
<td>29</td>
<td>30</td>
<td>31</td>
<td>32</td>
<td>33</td>
<td>34</td>
<td>35</td>
<td>36</td>
<td>37</td>
<td>38</td>
<td>39</td>
<td>40</td>
</tr>
<tr>
<td>L</td>
<td>273</td>
<td>285.5</td>
<td>296</td>
<td>310.5</td>
<td>323</td>
<td>335.5</td>
<td>348</td>
<td>360.5</td>
<td>373</td>
<td>385.5</td>
<td>398</td>
<td>410.5</td>
<td>423</td>
<td>435.5</td>
<td>448</td>
<td>460.5</td>
<td>473</td>
<td>485.5</td>
<td>498</td>
<td>510.5</td>
</tr>
</tbody>
</table>
Options

- DIN rail AXT100-DR-
  - For □, enter a number from the No. line in the table. (Page 5)
  - Refer to the dimension drawings (Page 5) for the mounting dimensions.

- Conversion cable P5062-5 (Cable length: 0.3 m)

- DIN rail mounting adapter
  - LEC-3-D0 (with 2 mounting screws)
  - This should be used when a DIN rail mounting adapter is mounted onto a screw mounting type controller afterwards.

- Power supply plug JXC-CPW
  - The power supply plug is an accessory.

- Communication plug connector for DeviceNet™
  - Straight type JXC-CD-S
  - T-branch type JXC-CD-T

<table>
<thead>
<tr>
<th>Communication plug connector for DeviceNet™</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terminal name</td>
</tr>
<tr>
<td>V+</td>
</tr>
<tr>
<td>CAN_H</td>
</tr>
<tr>
<td>Drain</td>
</tr>
<tr>
<td>CAN_L</td>
</tr>
<tr>
<td>V–</td>
</tr>
</tbody>
</table>

Power supply plug

<table>
<thead>
<tr>
<th>Terminal name</th>
<th>Function</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>0V</td>
<td>Common supply (–)</td>
<td>M24V terminal/C24V terminal/EMG terminal/LK RLS terminal are common (–).</td>
</tr>
<tr>
<td>M24V</td>
<td>Motor power supply (+)</td>
<td>Motor power supply (+) of the controller</td>
</tr>
<tr>
<td>C24V</td>
<td>Control power supply (+)</td>
<td>Control power supply (+) of the controller</td>
</tr>
<tr>
<td>EMG</td>
<td>Stop (+)</td>
<td>Connection terminal of the external stop circuit</td>
</tr>
<tr>
<td>LK RLS</td>
<td>Lock release (+)</td>
<td>Connection terminal of the lock release switch</td>
</tr>
</tbody>
</table>
Safety Instructions Be sure to read the “Handling Precautions for SMC Products” (M-E03-3) and “Operation Manual” before use.