**Step Motor Controller**

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

**Application Examples**

- **Electric Actuators**
  - LEF Series
  - LEM Series
  - LEL Series
  - LEPY/LEPS Series
  - LEH Series
  - LER Series

- **Air Cylinders**
  - EX260

**<Applicable electric actuators>**

- Electric actuator/Slider type
  - LEF Series
- Electric actuator/Low profile slider type
  - LEM Series
- Electric actuator/Guide rod slider
  - LEL Series
- Electric actuator/Rod type
  - LEY/LEYG Series
- Electric slide table
  - LES/LESH Series
- Electric actuator/Miniature type
  - LEPY/LEPS Series
- Electric gripper
  - LEH Series
- Electric actuator/ Rotary table
  - LER Series

**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.
System Construction

**Electric actuators**
- LEY/LEYG Series
- LEF Series
- LES/LESH Series
- LER Series
- LEL Series
- LEP/LEPS Series
- LEH Series
- LEM Series

**Actuator cable**
- Standard cable: LE-CP-S
- Robotic cable: LE-CP-

**Power supply**
- For controller: 24 VDC
- Provided by customer

**Options**
- **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
- **Conversion cable**
  - P5062-5
  - (0.3 m)
- **USB cable**
  - (A-mini B type)
  - (0.3 m)

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

*1 To connect the teaching box or LEC controller setting kit communication cable to the controller, a conversion cable is required.*
Step Motor Controller
JXCE1/91/P1/D1 Series

How to Order

Actuator + Controller

LEFS16B-100 - R1 CD17T

• Controller
  Nil Without controller
  C With controller

Communication

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

For single axis

Mounting

7 Screw mounting
8 DIN rail

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

Communication plug connector for DeviceNet™

nil
S Straight type
T T-branch type

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

Communication protocol

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

Actuator cable type/length

Nil Without cable
S1 Standard cable 1.5 m
S3 Standard cable 3 m
S5 Standard cable 5 m
R1 Robotic cable 1.5 m
R3 Robotic cable 3 m
R5 Robotic cable 5 m
R8 Robotic cable 8 m*1
RA Robotic cable 10 m*1
RB Robotic cable 15 m*1
RC Robotic cable 20 m*1

*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.

Precautions for blank controllers (JXCE1/91/P1/BC)

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

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.

Communication plug connector for DeviceNet™

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.

SMC website
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.
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>

<table>
<thead>
<tr>
<th>Communication specifications</th>
<th>Protocol</th>
<th>Version</th>
<th>Communication speed</th>
<th>Configuration file</th>
<th>I/O occupation area</th>
<th>Terminating resistor</th>
<th>Memory</th>
<th>LED indicator</th>
<th>Cable length [m]</th>
<th>Cooling system</th>
<th>Operating temperature range</th>
<th>Operating humidity range [%RH]</th>
<th>Insulation resistance [MΩ]</th>
<th>Weight [g]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EtherCAT®</td>
<td>V.1.2.6</td>
<td>10/100 Mbps</td>
<td>ESI file</td>
<td>Input 20 bytes</td>
<td>Not included</td>
<td>EEPROM</td>
<td>PWR, RUN, ALM, ERR</td>
<td>Actuator cable: 20 m or less</td>
<td>Natural air cooling</td>
<td>32 to 104°F [0 to 40°C] (No freezing)</td>
<td>90 or less (No condensation)</td>
<td>Between all external terminals and the case 50 (500 VDC)</td>
<td>220 (Screw mounting)</td>
</tr>
<tr>
<td></td>
<td>EtherNet/IP™</td>
<td>V.2 (Edition 1.11)</td>
<td>100 Mbps</td>
<td>EDS file</td>
<td>Output 36 bytes</td>
<td></td>
<td></td>
<td>PWR, ALM, MS, NS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PROFINET</td>
<td>V.2.32</td>
<td>125/250/500 kbps</td>
<td>GSDML file</td>
<td>Output 36 bytes</td>
<td></td>
<td></td>
<td>PWR, ALM, MS, NS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>DeviceNet™</td>
<td>Volume 3 (Edition 1.13)</td>
<td></td>
<td>EDS file</td>
<td>Input 4, 10, 20 bytes</td>
<td></td>
<td></td>
<td>PWR, ALM, MS, NS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Output 4, 12, 20, 36 bytes</td>
<td></td>
<td></td>
<td>PWR, ALM, MS, NS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*1 Please note that versions are subject to change.
*2 Use a shielded communication cable with CAT5 or higher for the PROFINET, EtherNet/IP™, and EtherCAT®.
*3 The files can be downloaded from the SMC website: http://www.smcworld.com

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>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>
</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.

Sequence 1→

Sequence 2→

Sequence 3→

Sequence 4→

0 10 100
Dimensions

**JXCE1**

*Mountable on DIN rail (35 mm)*

For body mounting (Screw mounting)

**JXC91**

*Mountable on DIN rail (35 mm)*

For body mounting (Screw mounting)

**Step Motor Controller JXCE1/91/P1/D1 Series**
## JXCE1/91/P1/D1 Series

### Dimensions

#### JXCP1

[Diagram of JXCP1]

#### JXCD1

[Diagram of JXCD1]

### 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>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>
<td></td>
</tr>
<tr>
<td>L</td>
<td>273</td>
<td>285.5</td>
<td>298</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)**

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

---

**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.

---

**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>

---

**Communication plug connector for DeviceNet™**

<table>
<thead>
<tr>
<th>Terminal name</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>V+</td>
<td>Power supply (+) for DeviceNet™</td>
</tr>
<tr>
<td>CAN_H</td>
<td>Communication wire (High)</td>
</tr>
<tr>
<td>Drain</td>
<td>Grounding wire/Shielded wire</td>
</tr>
<tr>
<td>CAN_L</td>
<td>Communication wire (Low)</td>
</tr>
<tr>
<td>V−</td>
<td>Power supply (−) for DeviceNet™</td>
</tr>
</tbody>
</table>

---

⚠️ **Safety Instructions**

Be sure to read the “Handling Precautions for SMC Products” (M-E03-3) and “Operation Manual” before use.
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