Controller/DriverSeries LEC





○Normal Mode for Detailed Setting

Select normal mode when detailed setting is required.

- Step data can be set in detail.
- Signals and terminal status can be monitored.
- Parameters can be set.
- JOG and constant rate movement, return to origin, test drive and testing of forced output can be performed.



LEFB

LEJB

Fieldbus Network

CC-Link Direct Input Type Step Motor Controller Series LECPMJ Page 591

○ CC-Link Ver. 1.10 compliant

© External data import function

- The step data can be rewrite temporarily by feeding back external information to the PLC.
- 64 or more data points can be defined with the 3 types of data import modes.



3 types of data import modes

Single numeric parameter (Number of occupied stations: 1) Movement MOD (movement mode) and another parameter item are changed. Half numeric parameters (Number of occupied stations: 2) Up to 6 parameter items are changed at once. Full numeric parameters (Number of occupied stations: 4) Up to 12 parameter items are changed at once.

OPosition and speed can be monitored by the PLC touch panel (display).

© Step data can be edited from the PLC touch panel (display). (Except in the case of the single numeric parameter)











Return-to-origin command signal

Enables automatic return-to-origin action.

• With force limit function (Pushing force/Gripping force operation available) Pushing force/Positioning operation possible by switching signals.

Programless Type (With Stroke Study) Series LECP2 Page 574 Stroke end operation similar to an air cylinder is possible.

(using the 1 stroke study and 2 reduced wiring below)



LECP2

LEFS LEFB

1 Stroke study (Simple registration of both stroke end positions)

After the stroke adjustment unit has travelled, both stroke ends are automatically registered by the stroke study function!



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LAT3

Series LECP6/LECA6/LECP1/LECP2/LECPA

		Function		
Item	Step data input type LECP6/LECA6	Programless type LECP1	Programless type (With stroke study) LECP2	Pulse input type LECPA
Step data and parameter setting	 Input from controller setting software (PC) Input from teaching box 	 Select using controller operation buttons 	Select using controller operation buttons	 Input from controller setting software (PC) Input from teaching box
Step data "position" setting	 Input the numerical value from controller setting software (PC) or teaching box Input the numerical value Direct teaching JOG teaching 	Direct teaching JOG teaching	Stroke end: Automatic measurement Intermediate position: Direct teaching JOG teaching	 No "Position" setting required Position and speed set by pulse signal
Number of step data	64 points	14 points	2 stroke end points + 12 intermediate points (14 points in total)	—
Operation command (I/O signal)	Step No. [IN [*]] input \Rightarrow [DRIVE] input	Step No. [IN*] input only	Step No. [IN*] input only	Pulse signal
Completion signal	[INP] output	[OUT [*]] output	[OUT*] output	[INP] output

Setting Items

	TB: Teaching box PC: Controller setting software					ontroller setting software			
	ltem	Contents	Ea mo TB	ode PC	Normal mode TB·PC	Step data input type LECP6/LECA6	Pulse input type LECPA	Programless type LECP1*	Programless type (With stroke study) LECP2
	Movement MOD	Selection of "absolute position" and "relative position"	Δ	•	•	Set at Absolute/ Relative		Fixed value (Absolute)	Fixed value (Absolute)
	Speed	Transfer speed	•		•	Set in units of 1 mm/s		Select from 16-level	Select from 16-level
	Position	[Position]: Target position [Pushing]: Pushing start position	•	•	•	Set in units of 0.01 mm	No setting required	Direct teaching JOG teaching	Stroke end: Automatic measurement Intermediate position: Direct teaching JOG teaching
	Acceleration/ Deceleration	Acceleration/deceleration during movement	•	•	•	Set in units of 1 mm/s ²		Select from 16-level	Select from 16-level
Step data setting	Pushing force	Rate of force during pushing operation	•	•	•	Set in units of 1%	Set in units of 1%	Select from 3-level (weak, medium, strong)	
(Excerpt)	Trigger LV	Target force during pushing operation	Δ	•	•	Set in units of 1%	Set in units of 1%	No setting required (same value as pushing force)	-
	Pushing speed	Speed during pushing operation			•	Set in units of 1 mm/s	Set in units of 1 mm/s	· · · · · · ·	-
	Moving force	Force during positioning operation	Δ	•	•	Set to 100%	Set to (Different values for each actuator) %		
	Area output	Conditions for area output signal to turn ON	Δ			Set in units of 0.01 mm	Set in units of 0.01 mm		
	In position	[Position]: Width to the target position [Pushing]: How much it moves during pushing	Δ	•	•	Set to 0.5 mm or more (Units: 0.01 mm)	Set to (Different values for each actuator) or more (Units: 0.01 mm)	No setting required	No setting required
	Stroke (+)	+ side limit of position	×	×		Set in units of 0.01 mm	Set in units of 0.01 mm	1	
Parameter	Stroke (-)	 side limit of position 	×	×		Set in units of 0.01 mm	Set in units of 0.01 mm		
setting	ORIG direction	Direction of the return to origin can be set.	×	×		Compatible	Compatible	Compatible	
(Excerpt)	ORIG speed	Speed during return to origin	×	×		Set in units of 1 mm/s	Set in units of 1 mm/s	No setting required	
	ORIG ACC	Acceleration during return to origin	×	×		Set in units of 1 mm/s ²	Set in units of 1 mm/s ²		
	JOG		•	•	•	Continuous operation at the set speed can be tested while the switch is being pressed.	Continuous operation at the set speed can be tested while the switch is being pressed.	Hold down MANUAL button $(\bigcirc \bigcirc)$ for uniform sending (speed is specified value)	Hold down MANUAL button ((()) for uniform sending (speed is specified value)
	MOVE		×	•	•	Operation at the set distance and speed from the current position can be tested.	Operation at the set distance and speed from the current position can be tested.	Press MANUAL button () once for sizing operation (speed, sizing amount are specified values)	Press MANUAL button ((())) once for sizing operation (speed, sizing amount are specified values)
lest	Return to ORIG		•	•	•	Compatible	Compatible	Compatible	Performed by the stroke endpoint operation when power is turned ON.
	Test drive	Operation of the specified step data	•	•	(Continuous operation)	Compatible	Not compatible	Compatible	Compatible
	Forced output	ON/OFF of the output terminal can be tested.	×	×		Compatible	Compatible		
Monitor	DRV mon	Current position, speed, force and the specified step data can be monitored.	•	•	•	Compatible	Compatible	Not compatible	Not compatible
	In/Out mon	Current ON/OFF status of the input and output terminal can be monitored.	×	×	•	Compatible	Compatible		
ALM	Status	Alarm currently being generated can be confirmed.	•	•	•	Compatible	Compatible	Compatible (display alarm group)	Compatible (display alarm group)
	ALM Log record	Alarm generated in the past can be confirmed.	X	×		Compatible	Compatible		
File	Save/Load	Step data and parameter can be saved, forwarded and deleted.	×	×	•	Compatible	Compatible	Not compatible	Not compatible
Other	Language	Can be changed to Japanese or English.				Compatible	Compatible		

 \triangle : Can be set from TB Ver. 2.** (The version information is displayed on the initial screen) * Programless type LECP1 cannot be used with the teaching box and controller setting kit.

System Construction/General Purpose I/O

System Construction/Pulse Signal

System Construction/Programless Type

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System Construction/Fieldbus Network (CC-Link Direct Input Type)

System Construction/Fieldbus Network

LEYG

* When controller equipped type is selected when ordering the LE series, you do not need to order this controller.

The controller is sold as single unit after the compatible actuator is set.

Confirm that the combination of the controller and the actuator is correct.

<Check the following before use.>

① Check the actuator label for model number. This matches the controller.

with a UL1310 Class 2 power supply.

2 Check Parallel I/O configuration matches (NPN or PNP).

LEFS16A-400 NPN 2 1

* Refer to the operation manual for using the products. Please download it via our website, http://www.smcworld.com

Specifications

Basic Specifications

Item	LECP6	LECA6	
Compatible motor	Step motor (Servo/24 VDC)	Servo motor (24 VDC)	
Bower supply Note 1)	Power voltage: 24 VDC ±10% Note 2)	Power voltage: 24 VDC ±10% Note 2)	
	[Including motor drive power, control power, stop, lock release]	[Including motor drive power, control power, stop, lock release]	
Parallel input	11 inputs (Photo-	coupler isolation)	
Parallel output	13 outputs (Photo	-coupler isolation)	
Compatible encoder	Incremental A/B phase (800 pulse/rotation)	Incremental A/B (800 pulse/rotation)/Z phase	
Serial communication	RS485 (Modbus p	protocol compliant)	
Memory	EEP	ROM	
LED indicator	LED (Green/Red) one of each		
Lock control	Forced-lock release terminal Note 3)		
Cable length [m]	I/O cable: 5 or less, Actuator cable: 20 or less		
Cooling system	Natural air cooling		
Operating temperature range [°C]	0 to 40 (Ne	o freezing)	
Operating humidity range [%RH]	90 or less (No condensation)		
Storage temperature range [°C]	-10 to 60 (No freezing)		
Storage humidity range [%RH]	90 or less (No condensation)		
Insulation resistance [M Ω]	Between the housing and SG terminal: 50 (500 VDC)		
Weight [g]	150 (Screw mounting),	170 (DIN rail mounting)	

Note 1) Do not use the power supply of "inrush current prevention type" for the controller power supply. When conformity to UL is required, the electric actuator and controller should be used with a UL1310 Class 2 power supply.

Note 2) The power consumption changes depending on the actuator model. Refer to the specifications of actuator for more details. Note 3) Applicable to non-magnetizing lock.

Precautions on blank controller (LEC 6 - BC)

Blank controller is a controller to which the customer can write the data of the actuator to be combined and used. Use the dedicated software (LEC-BCW) for data writing.

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

SMC website

http://www.smcworld.com

Controller (Step Data Input Type)/Step Motor (Servo/24 VDC) Series LECP6 Controller (Step Data Input Type)/Servo Motor (24 VDC) Series LECA6

How to Mount

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

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

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Series LECP6 Series LECA6

Dimensions

1

b) DIN rail mounting (LEC 6 D-)

Controller (Step Data Input Type)/Step Motor (Servo/24 VDC) Series LECP6 Controller (Step Data Input Type)/Servo Motor (24 VDC) Series LECA6

Wiring Example 1

Power Su	pply Connector	* Power supply plug is an accessory. <applicable cable="" size=""> AWG20 (0.5 mm²), cover diameter 2.0 mm or less</applicable>	Power supp	
CN1 Power	Supply Connector	Terminal for LECP6 (PHOENIX CONTACT FK-MC0.5/5-ST-2.5)		
Terminal name	Function	Details	hhe	
0V	Common supply (–)	M 24V terminal/C 24V terminal/EMG terminal/BK RLS terminal are common (–).	य य य	
M 24V	Motor power supply (+)	Motor power supply (+) supplied to the controller		
C 24V	Control power supply (+)	Control power supply (+) supplied to the controller	222	
EMG	Stop (+)	Input (+) for releasing the stop	24	
BK RLS	Lock release (+)	Input (+) for releasing the lock	Σc	
CN1 Power Supply Connector Terminal for LECA6 (PHOENIX CONTACT FK-MC0.5/7-ST-2.5)				
Terminal name	Function	Details		
0V	Common supply (–)	M 24V terminal/C 24V terminal/EMG terminal/BK RLS terminal are common (–).		

Motor power supply (+) Motor power supply (+) supplied to the controller

Control power supply (+) Control power supply (+) supplied to the controller

Input (+) for releasing the stop

Input (+) for releasing the lock

Regenerative output 1 Regenerative output terminals for external connection

Regenerative output 2 (Not necessary to connect them in the combination with the LE series standard specifications.)

ly plug for LECP6

VDC

Wiring Example 2

M 24V

C 24V

EMG

BK RLS

RG+

RG-

Stop (+)

Lock release (+)

Parallel I/O Connector: CN5 * When you connect a PLC, etc., to the CN5 parallel I/O connector, please use the I/O cable (LEC-CN5-□). * The wiring should be changed depending on the type of the parallel I/O (NPN or PNP).

Wiring diagram

`	,		Power supply 24 VDC
	CN5		for I/O signal
	COM+	A1	╞────╇─┤┝─┐
	COM-	A2	├ ── ├
	IN0	A3	
	IN1	A4	
	IN2	A5	
	IN3	A6	
	IN4	A7	
	IN5	A8	
	SETUP	A9	
	HOLD	A10	
	DRIVE	A11	
	RESET	A12	
	SVON	A13	
	OUT0	B1	Load
	OUT1	B2	Load
	OUT2	B3	Load
	OUT3	B4	Load
	OUT4	B5	Load
	OUT5	B6	Load
	BUSY	B7	Load
	AREA	B8	Load
	SETON	B9	Load
	INP	B10	Load
	SVRE	B11	Load
	*ESTOP	B12	Load
	*ALARM	B13	Load

Input Signal

	Name	Details
	COM+	Connects the power supply 24 V for input/output signal
	COM-	Connects the power supply 0 V for input/output signal
IN0 to IN5	Step data specified Bit No.	
		(Input is instructed in the combination of IN0 to 5.)
	SETUP	Instruction to return to origin
	HOLD	Operation is temporarily stopped
	DRIVE	Instruction to drive
	RESET	Alarm reset and operation interruption
	SVON	Servo ON instruction

LEC 6P (PNP)

PINP)		
-		Power supply 24 V
CN5		for I/O signal
COM+	A1	╞───╋┤┝┐
COM-	A2	├
IN0	A3	
IN1	A4	
IN2	A5	
IN3	A6	
IN4	A7	
IN5	A8	
SETUP	A9	
HOLD	A10	
DRIVE	A11	
RESET	A12	
SVON	A13	
OUT0	B1	Load
OUT1	B2	Load
OUT2	B3	Load
OUT3	B4	Load
OUT4	B5	Load
OUT5	B6	Load
BUSY	B7	Load
AREA	B8	Load
SETON	B9	Load
INP	B10	Load
SVRE	B11	Load
*ESTOP	B12	Load
*ALARM	B13	Load

Output Signal

Name	Details
OUT0 to OUT5	Outputs the step data no. during operation
BUSY	Outputs when the actuator is moving
AREA	Outputs within the step data area output setting range
SETON	Outputs when returning to origin
INP	Outputs when target position or target force is reached (Turns on when the positioning or pushing is completed.)
SVRE	Outputs when servo is on
*ESTOP Note)	Not output when EMG stop is instructed
*ALARM Note)	Not output when alarm is generated

Note) Signal of negative-logic circuit (N.C.)

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Series LECP6 Series LECA6

Step Data Setting

1. Step data setting for positioning

In this setting, the actuator moves toward and stops at the target position.

The following diagram shows the setting items and operation. The setting items and set values for this operation are stated below.

◎: Need to be set.
O: Need to be adjusted as required.
-: Setting is not required.

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Step Data (Positioning)

Necessity	Item	Details	
0	Movement MOD	When the absolute position is required, set Absolute. When the relative position is required, set Relative.	
0	Speed	Transfer speed to the target position	
0	Position	Target position	
0	Acceleration	Parameter which defines how rapidly the actuator reaches the speed set. The higher the set value, the faster it reaches the speed set.	
0	Deceleration	Parameter which defines how rapidly the actuator comes to stop. The higher the set value, the quicker it stops.	
0	Pushing force	Set 0. (If values 1 to 100 are set, the operation will be changed to the pushing operation.)	
—	Trigger LV	Setting is not required.	
—	Pushing speed	Setting is not required.	
0	Moving force	Max. torque during the positioning operation (No specific change is required.)	
0	Area 1, Area 2	Condition that turns on the AREA output signal.	
0	In position	Condition that turns on the INP output signal. When the actuator enters the range of [in position], the INP output signal turns on. (It is unnecessary to change this from the initial value.) When it is necessary to output the arrival signal before the operation is completed, make the value larger.	

2. Step data setting for pushing

The actuator moves toward the pushing start position, and when it reaches that position, it starts pushing with the set force or less.

The following diagram shows the setting items and operation. The setting items and set values for this operation are stated below.

Step	Data (Pushing)	\bigcirc : Need to be set. \bigcirc : Need to be adjusted as required.
Necessity	Item	Details
Ø	Movement MOD	When the absolute position is required, set Absolute. When the relative position is required, set Relative.
O	Speed	Transfer speed to the pushing start position
O	Position	Pushing start position
0	Acceleration	Parameter which defines how rapidly the actuator reaches the speed set. The higher the set value, the faster it reaches the speed set.
0	Deceleration	Parameter which defines how rapidly the actuator comes to stop. The higher the set value, the quicker it stops.
Ø	Pushing force	Pushing force ratio is defined. The setting range differs depending on the electric actuator type. Refer to the operation manual for the electric actuator.
Ø	Trigger LV	Condition that turns on the INP output signal. The INP output signal turns on when the generated force exceeds the value. Trigger level should be the pushing force or less.
0	Pushing speed	Pushing speed during pushing. When the speed is set fast, the electric actuator and workpieces might be damaged due to the impact when they hit the end, so this set value should be smaller. Refer to the operation manual for the electric actuator.
0	Moving force	Max. torque during the positioning operation (No specific change is required.)
0	Area 1, Area 2	Condition that turns on the AREA output signal.
Ø	In position	Transfer distance during pushing. If the transferred distance exceeds the setting, it stops even if it is not pushing. If the transfer distance is exceeded, the INP output signal will not turn on.

Controller (Step Data Input Type)/Step Motor (Servo/24 VDC) Series LECP6 Controller (Step Data Input Type)/Servo Motor (24 VDC) Series LECA6

Signal Timing

Series LECP6 Series LECA6

Options: Actuator Cable

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Series LECP6 Series LECA6

Option: I/O Cable

Option: Noise Filter Set for Servo Motor (24 VDC)

LEC-NFA

Contents of the set: 2 noise filters (Manufactured by WURTH ELEKTRONIK: 74271222)

Shield

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* Refer to the LECA6 series Operation Manual for installation.

Series LEC Windows®XP, Windows®7 compatible Controller Setting Kit/LEC-W2

How to Order

Controller setting kit (Japanese and English are available.)

Contents

	Description	Model*			
1	Controller setting software (CD-ROM)	LEC-W2-S			
2	Communication cable	LEC-W2-C			
3	USB cable (between the PC and the communication cable)	LEC-W2-U			
⊧ Car	Can be ordered separately.				

Compatible Controller/Driver

Step data input type
Pulse input type
CC-Link direct input type

Series LECP6/Series LECA6 Series LECPA Series LECPMJ

Hardware Requirements

OS	IBM PC/AT compatible machine running Windows [®] XP (32-bit), Windows [®] 7 (32-bit and 64-bit), Windows [®] 8.1 (32-bit and 64-bit).
Communication interface	USB 1.1 or USB 2.0 ports
Display	XGA (1024 x 768) or more

* Windows®XP, Windows®7 and Windows®8.1 are registered trademarks of Microsoft Corporation in the United States.

* Refer to SMC website for version upgrade information, http://www.smcworld.com

Screen Example

Easy mode screen example

Easy operation and simple setting

- Allowing to set and display actuator step data such as position, speed, force, etc.
- Setting of step data and test drive can be performed on the same page.
- Can be used to jog and move at a constant rate.

Normal mode screen example

Detailed setting

- Step data can be set in detail.
- Signals and terminal status can be monitored.
- Parameters can be set.
- JOG and constant rate movement, return to origin, test drive and testing of forced output can be performed.

Series LEC Teaching Box/LEC-T1

How to Order

* The displayed language can be changed to English or Japanese.

Specifications

Standard functions	Switch
 Chinese character display 	Cable I

• Stop switch is provided.

Option

• Enable switch is provided.

Item	Description				
Switch	Stop switch, Enable switch (Option)				
Cable length [m]	3				
Enclosure	IP64 (Except connector)				
Operating temperature range [°C]	5 to 50				
Operating humidity range [%RH]	90 or less (No condensation)				
Weight [g]	350 (Except cable)				

[CE-compliant products] The EMC compliance of the teaching box was tested with the LECP6 series step motor controller (servo/24 VDC) and an applicable actuator.

[UL-compliant products] When conformity to UL is required, the electric actuator and controller should be used with a UL1310 Class 2 power supply.

Easy Mode

Function	Details
Step data	 Setting of step data
Jog	Jog operationReturn to origin
Test	 1 step operation Return to origin
Monitor	 Display of axis and step data no. Display of two items selected from Position, Speed, Force.
ALM	Active alarm displayAlarm reset
TB setting	 Reconnection of axis (Ver. 1.**) Displayed language setting (Ver. 2.**) Setting of easy/normal mode Setting step data and selection of items from easy mode monitor

Menu Operations Flowchart

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Normal Mode

Function	Details						
Step data	Step data setting						
Parameter	Parameters setting						
Test	 Jog operation/Constant rate movement Return to origin Test drive (Specify a maximum of 5 step data and operate.) Forced output (Forced signal output, Forced terminal output) 						
Monitor	 Drive monitor Output signal monitor Input signal monitor Output terminal monitor Input terminal monitor 						
ALM	 Active alarm display (Alarm reset) Alarm log record display 						
File	 Data saving Save the step data and parameters of the controller which is being used for communication (it is possible to save four files, with one set of step data and parameters defined as one file). Load to controller Loads the data which is saved in the teaching box to the controller which is being used for communication. Delete the saved data. File protection (Ver. 2.**) 						
TB setting	 Display setting (Easy/Normal mode) Language setting (Japanese/English) Backlight setting LCD contrast setting Beep sound setting Max. connection axis Distance unit (mm/inch) 						
Reconnect	Reconnection of axis						

Dimensions

No.	Description	Function						
1	LCD	A screen of liquid crystal display (with backlight)						
2	Ring	A ring for hanging the teaching box						
3	Stop switchWhen switch is pushed in, the switch locks and stops. The lock is released when it is turned to the right.							
4	Stop switch guard	A guard for the stop switch						
5	Enable switch (Option)	Prevents unintentional operation (unexpected operation) of the jog test function. Other functions such as data change are not covered.						
6	Key switch Switch for each input							
7	Cable	Length: 3 meters						
8	Connector A connector connected to CN4 of the controller							

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Gateway Unit Series LEC-G

How to Order

Specifications

	Model									
	Widder	Fieldbus	CC		DeviceNet™		EtherNet/IPTM			
	Applicable system	Version Note 1)	Ver. 2.0		Belease 2.0	V1	Belease 1.0			
	Communicat	ion speed [bps]	156 k/6 /5 N	25 k/2.5 M //10 M	125 k/250 k/500 k	9.6 k/19.2 k/45.45 k/ 93.75 k/187.5 k/500 k/ 1.5 M/3 M/6 M/12 M	10 M/100 M			
	Configuratio	n file Note 2)		_	EDS file	GSD file	EDS file			
Communication specifications	I/O occupatio	on area	4 stations occupied (8 times setting)	Input 896 points 108 words Output 896 points 108 words	Input 200 bytes Output 200 bytes	Input 57 words Output 57 words	Input 256 bytes Output 256 bytes			
	Power supply for	Power supply voltage [V] Note 6)	_		11 to 25 VDC	_				
	communication	Internal current consumption [mA]		_	100	_	_			
	Communication	connector specifications	Connector (Accessory)		Connector (Accessory)	D-sub	RJ45			
	Terminating	resistor	Not included		Not included	Not included	Not included			
Power supply voltage	ge [V] Note 6)		24 VDC ±10%							
Current	Not connect	ed to teaching box	200							
consumption [mA]	Connected to	o teaching box	300							
EMG output termina	<u>l</u>		30 VDC 1 A							
Controller	Applicable c	ontrollers	Series LECP6, Series LECA6							
specifications	Communicati	on speed [bps] Note 3)	115.2 k/230.4 k							
opeenieudene	Max. number of co	onnectable controllers Note 4)		12	8 Note 5)	5	12			
Accessories		Power sup	ply connector,	communication connector	Power supp	ly connector				
Operating temperature range [°C]			0 to 40 (No freezing)							
Operating humidity range [%RH]			90 or less (No condensation)							
Storage temperature range [°C]			-10 to 60 (No freezing)							
Storage humidity ra	nge [%RH]		90 or less (No condensation)							
Weight [g]					200 (Screw mounting),	220 (DIN rail mounting)				

Note 1) Please note that the version is subject to change.

Note 2) Each file can be downloaded from the SMC website, http://www.smcworld.com

Note 3) When using a teaching box (LEC-T1-D), set the communication speed to 115.2 kbps.

Note 4) A communication response time for 1 controller is approximately 30 ms.

Refer to "Communication Response Time Guideline" for response times when several controllers are connected.

Note 5) For step data input, up to 12 controllers connectable.

Note 6) When conformity to UL is required, the electric actuator and controller should be used with a UL1310 Class 2 power supply.

Communication Response Time Guideline

Response time between gateway unit and controllers depends on the number of controllers connected to the gateway unit. For response time, refer to the graph below.

* This graph shows delay times between gateway unit and controllers. Fieldbus network delay time is not included.

Dimensions

Screw mounting (LEC-G

Applicable Fieldbus protocol: CC-Link Ver. 2.0

Applicable Fieldbus protocol: PROFIBUS DP

Applicable Fieldbus protocol: DeviceNet™

Applicable Fieldbus protocol: EtherNet/IP™

■Trademark DeviceNet[™] is a trademark of ODVA. EtherNet/IP[™] is a trademark of ODVA.

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Series LEC-G

Dimensions

DIN rail mounting (LEC-G D)

Applicable Fieldbus protocol: CC-Link Ver. 2.0

Applicable Fieldbus protocol: PROFIBUS DP

DIN rail AXT100-DR-□

 \ast For $\Box,$ enter a number from the "No." line in the table below. Refer to the dimensions above for the mounting dimensions.

Applicable Fieldbus protocol: DeviceNet™

Applicable Fieldbus protocol: EtherNet/IP™

* Mountable on DIN rail (35 mm)

L Dimension [mm]

No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L	23	35.5	48	60.5	73	85.5	98	110.5	123	135.5	148	160.5	173	185.5	198	210.5	223	235.5	248	260.5
No.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
L	273	285.5	298	310.5	323	335.5	348	360.5	373	385.5	398	410.5	423	435.5	448	460.5	473	485.5	498	510.5

■Trademark DeviceNet[™] is a trademark of ODVA. EtherNet/IP[™] is a trademark of ODVA. 565

LEFS LEFB LEJS LEJB Ц LEM LEYG LESH LEPY LEPS LER LEH 11-LEJS 11-LEFS LEY-X5 25A-Motorless LECYM LECSS-T LECS LEC LAT3

Programless Controller Series LECP1

How to Order

[CE-compliant products]

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

When conformity to UL is required, the electric actuator and controller should be used with a UL1310 Class 2 power supply.

sinale unit after the compatible actuator is set. Confirm that the combination of the

controller and the actuator is correct.

* Refer to the operation manual for using the products. Please download it via our website, http://www.smcworld.com

Specifications

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Basic Specifications

Item	LECP1
Compatible motor	Step motor (Servo/24 VDC)
Devuer every loc Note 1)	Power supply voltage: 24 VDC ±10% Note 2)
Power supply the ly	[Including the motor drive power, control power supply, stop, lock release]
Parallel input	6 inputs (Photo-coupler isolation)
Parallel output	6 outputs (Photo-coupler isolation)
Stop points	14 points (Position number 1 to 14(E))
Compatible encoder	Incremental A/B phase (800 pulse/rotation)
Memory	EEPROM
LED indicator	LED (Green/Red) one of each
7-segment LED display Note 3)	1 digit, 7-segment display (Red) Figures are expressed in hexadecimal ("10" to "15" in decimal number are expressed as "A" to "F")
Lock control	Forced-lock release terminal Note 4)
Cable length [m]	I/O cable: 5 or less, Actuator cable: 20 or less
Cooling system	Natural air cooling
Operating temperature range [°C]	0 to 40 (No freezing)
Operating humidity range [%RH]	90 or less (No condensation)
Storage temperature range [°C]	-10 to 60 (No freezing)
Storage humidity range [%RH]	90 or less (No condensation)
Insulation resistance [M Ω]	Between the housing and SG terminal: 50 (500 VDC)
Weight [g]	130 (Screw mounting), 150 (DIN rail mounting)

Note 1) Do not use the power supply of "inrush current prevention type" for the controller input power supply. When conformity to UL is required, the electric actuator and controller should be used with a UL1310 Class 2 power supply.

SMC

Note 2) The power consumption changes depending on the actuator model. Refer to the each actuator's operation manual etc. for details.

Note 3) "10" to "15" in decimal number are displayed as follows in the 7-segment LED.

Controller Details

No.	Display	Description	Details					
1	PWR	Power supply LED	Power supply ON/Servo ON : Green turns on Power supply ON/Servo OFF: Green flashes					
2	ALM	Alarm LED	With alarm: Red turns onParameter setting: Red flashes					
3	—	Cover	Change and protection of the mode switch (Close the cover after changing switch)					
4	—	FG	Frame ground (Tighten the screw with the washer when mounting the controller. Connect the ground wire.)					
5	_	Mode switch	Switch the mode between manual and auto.					
6	_	7-segment LED	Stop position, the value set by (8) and alarm information are displayed.					
\bigcirc	SET	Set button	Decide the settings or drive operation in Manual mode.					
8	—	Position selecting switch	Assign the position to drive (1 to 14), and the origin position (15).					
9	ΜΑΝΠΑΙ	Manual forward button	Perform forward jog and inching.					
10	MANUAL	Manual reverse button	Perform reverse jog and inching.					
11	SPEED	Forward speed switch	16 forward speeds are available.					
(12)	SFEED	Reverse speed switch	16 reverse speeds are available.					
(13)	ACCEL	Forward acceleration switch	16 forward acceleration steps are available.					
14	ACCEL	Reverse acceleration switch	16 reverse acceleration steps are available.					
15	CN1	Power supply connector	Connect the power supply cable.					
16	CN2	Motor connector	Connect the motor connector.					
17	CN3	Encoder connector	Connect the encoder connector.					
18	CN4	I/O connector	Connect I/O cable.					

How to Mount

Controller mounting shown below.

•Use a watchmaker's screwdriver of the size shown below when changing position switch (8) and the set value of the speed/acceleration switch (1) to (1).

 Size

 End width
 L: 2.0 to 2.4 [mm]

 End thickness
 W: 0.5 to 0.6 [mm]

SMC

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LEFB

LEJB

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LEM

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LESH

LEPY

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LEY-X5

11-LEFS

11-LEJS

25A-

LECYM LECSS-T LECS

Motorless

LAT3

Series LECP1

Dimensions

Screw mounting (LEC 1 -)

DIN rail mounting (LEC 1 D-)

for body mounting

DIN rail AXT100-DR-

* For \Box , enter a number from the "No." line in the table below. Refer to the dimensions above for the mounting

dimensions.

Dimension [mm]									
No.	1	2	3	4	5				
						17			

No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
L	23	35.5	48	60.5	73	85.5	98	110.5	123	135.5	148	160.5	173	185.5
No.	15	16	17	18	19	20	21	22	23	24	25	26	27	28
L	198	210.5	223	235.5	248	260.5	273	285.5	298	310.5	323	335.5	348	360.5
No.	29	30	31	32	33	34	35	36	37	38	39	40		
L	373	385.5	398	410.5	423	435.5	448	460.5	473	485.5	498	510.5		

DIN rail mounting adapter LEC-1-D0 (with 2 mounting screws)

SMC

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

Power supply cable for LECP1 (LEC-CK1-1)

Wiring Example 1

Power Supply Connector: CN1 * When you connect a CN1 power supply connector, please use the power supply cable (LEC-CK1-1). * Power supply cable (LEC-CK1-1) is an accessory.

CN1 Power Supply Connector Terminal for LECP1

Terminal name	Cable color	Function	Details
0V	Blue	Common supply (–)	M 24V terminal/C 24V terminal/BK RLS terminal are common (–).
M 24V	White	Motor power supply (+)	Motor power supply (+) supplied to the controller
C 24V	Brown	Control power supply (+)	Control power supply (+) supplied to the controller
BK RLS	Black	Lock release (+)	Input (+) for releasing the lock

Wiring Example 2

Parallel I/O Connector: CN4 * When you connect a PLC, etc., to the CN4 parallel I/O connector, please use the I/O cable (LEC-CK4-□). * The wiring should be changed depending on the type of the parallel I/O (NPN or PNP).

■PNP

Input Signal

Name	Details					
COM+	Conne	cts the powe	er supply 24	V for input/o	output signal	
COM-	Conne	cts the powe	er supply 0 \	/ for input/ou	utput signal	
	Instruction to drive (input as a combination of IN0 to IN3					
	 Instru 	ction to return	to origin (IN0 t	o IN3 all ON s	imultaneously)	
IN0 to IN3	Example - (instruction to drive for position no. 5)					
		IN3	IN2	IN1	IN0	
		OFF	ON	OFF	ON	
	Alarm reset and operation interruption					
DEGET	During operation: deceleration stop from position at which					
RESET	signal is input (servo ON maintained)					
	While alarm is active: alarm reset					
STOP	Instructi	on to stop (afte	er maximum de	eceleration sto	p, servo OFF)	

nput Signal [IN0 - IN3] Position Number Chart O: OFF . ON								
Position number	IN3	IN2	IN1	INO				
1	0	0	0	•				
2	0	0	•	0				
3	0	0	•					
4	0	•	0	0				
5	0	•	0					
6	0	•	•	0				
7	0	•	•					
8	•	0	0	0				
9	•	0	0					
10 (A)	•	0	•	0				
11 (B)	•	0	•					
12 (C)	•	•	0	0				
13 (D)	•	•	0					
14 (E)	•	•	•	0				
Return to origin	•		•					

Output Signal

	-						
Name		Details					
OUT0 to OUT3	Turns (Outpu Ex	Turns on when the positioning or pushing is completed. (Output is instructed in the combination of OUT0 to 3.) Example - (operation complete for position no. 3)					
		OUT3	OUT2	OUT1	OUT0		
		OFF	OFF	ON	ON		
BUSY	Output	Outputs when the actuator is moving					
*ALARM Note)	Not ou	tput when al	arm is active	e or servo O	FF		

Note) Signal of negative-logic circuit (N.C.)

Position number	OUT3	OUT2	OUT1	OUT0
1	O	0	0	
2	0	0		0
3	O	0		
4	0		0	0
5	0		0	
6	0		•	0
7	0		•	
8	•	0	0	0
9	•	0	0	
10 (A)	•	0	•	0
11 (B)	•	0		
12 (C)	•		0	0
13 (D)	•		0	
14 (E)	•		•	0
Return to origin	•		•	

Series LECP1

Signal Timing

(1) Return to Origin

* "*ALARM" is expressed as negative-logic circuit.

(2) Positioning Operation

(3) Cut-off Stop (Reset Stop)

(4) Stop by the STOP Signal

(5) Alarm Reset

* "*ALARM" is expressed as negative-logic circuit.

Options: Actuator Cable

Series LECP1

Options

* Parallel I/O signal is valid in auto mode. While the test function operates at manual mode, only the output is valid.

Black

Red

Black

Red

Black Red

Black

Red

Black

Red

Black

Red

OUT0

OUT1

OUT2

OUT3

BUSY

ALARM

IN0

IN1

IN2

IN3

RESET

STOP

3

4

5

6

7

8

9

10

11

12

13

14

Yellow

Yellow

Light green

Light green

Gray

Gray

White

White

Light brown

Light brown

Yellow

Yellow

.

Note 4) Applicable to non-magnetizing lock

Series LECP2

Controller Details

No.	Display	Description	Details
1	PWR	Power supply LED	Power supply ON/Servo ON : Green turns on. Power supply ON/Servo OFF: Green flashes.
2	ALM	Alarm LED	With alarm: Red turns on.Parameter setting: Red flashes.
3	_	Cover	Change and protection of the mode switch (Close the cover after changing switch.)
4	—	FG	Frame ground (Tighten the screw with the washer when mounting the controller. Connect the ground wire.)
(5)	_	Mode switch	Switch the mode between manual and auto.
6	_	7-segment LED	Stop position, the value set by $(\ensuremath{\$})$ and alarm information are displayed.
\bigcirc	SET	Set button	Decide the settings or drive operation in manual mode.
8		Position selecting switch	Assign the position to drive (1 to 14), and the origin position (15).
9	ΜΑΝΠΑΙ	Manual forward button	Perform forward jog and inching.
10	MANOAL	Manual reverse button	Perform reverse jog and inching.
1	SPEED	Forward speed switch	16 forward speeds are available.
(12)	SFEED	Reverse speed switch	16 reverse speeds are available.
(13)		Forward acceleration switch	16 forward acceleration steps are available.
14)	ACCEL	Reverse acceleration switch	16 reverse acceleration steps are available.
(15)	CN1	Power supply connector	Connect the power supply cable.
16	CN2	Motor connector	Connect the motor connector.
17	CN3	Encoder connector	Connect the encoder connector.
(18)	CN4	I/O connector	Connect the I/O cable

How to Mount

Controller mounting shown below

2. Grounding

Tighten the screw with the washer when mounting the ground wire as shown below.

SMC

Programless Controller (With Stroke Study) Series LECP2

Dimensions

SMC

Series LECP2

Wiring Example 1

Power Supply Connector: CN1 * When you connect a CN1 power supply connector, use the power supply cable (LEC-CK1-1). * Power supply cable (LEC-CK1-1) is an accessory.

CN1 Power Supply Connector Terminal for LECP2

Terminal name	Cable color	Function	Details
٥V	Blue	Common supply (–)	M 24V terminal/C 24V terminal/BK RLS terminal are common (–).
M 24V	White	Motor power supply (+)	Motor power supply (+) supplied to the controller
C 24V	Brown	Control power supply (+)	Control power supply (+) supplied to the controller
BK RLS	Black	Lock release (+)	Input (+) for releasing the lock

Power supply cable for LECP2 (LEC-CK1-1)

Wiring Example 2

Parallel I/O Connector: CN4 * When you connect a PLC, etc., to the CN4 parallel I/O connector, use the I/O cable (LEC-CK4-□). * The wiring should be changed depending on the type of the parallel I/O (NPN or PNP).

PNP

Input Signal

Name		Details						
COM+	Conne	Connects the power supply 24 V for input/output signal						
COM-	Conne	cts the powe	er supply 0 V	/ for input/ou	ıtput signal			
	• Instru Ex	Instruction to drive (input as a combination of IN0 to IN3) Example - (instruction to drive for position no. 5)						
		IN3	IN2	IN1	IN0			
INIO to INI2		OFF	ON	OFF	ON			
	Instruction to return to origin After the power is turned ON, first turn on IN0 or IN1. Return to origin using IN0: Return to origin by moving to the extended end. Return to origin using IN1: Return to origin by moving to the motor end.							
RESET	Alarm reset and operation interruption During operation: deceleration stop from position at which signal is input (servo ON maintained) While alarm is active: alarm reset							
STOP	Instructi	on to stop (aft	er maximum d	eceleration sto	op, servo OFF)			

Input Signal [IN0 - IN3] Position Number Chart O: OFF O: ON

Position number	IN3	IN2	IN1	IN0
1 (End side)	0	0	0	
2 (Motor side)	0	0	•	0
3	0	0	•	
4	0	•	0	0
5	0	•	0	
6	0	•	•	0
7	0	•	•	
8	•	0	0	0
9	•	0	0	
10 (A)	•	0	•	0
11 (B)		0	•	
12 (C)	•	•	0	0
13 (D)	•	•	0	
14 (E)	•	•	•	0

Output Signal

Name	Details						
	 Positioning completion (input as a combination of OUT0 to OUT3) Example - (positioning completion for position no. 3) 						
		OUT3	OUT2	OUT1	OUT0		
OUT0 to OUT3		OFF	OFF	ON	ON		
	Return to origin completion Completion of return to origin using IN0: Only OUT0 is ON. Completion of return to origin using IN1: Only OUT1 is ON.						
BUSY	Outputs when the actuator is moving						
*ALARM Note)	Not out	put when al	arm is active	e or servo O	FF		

Note) Signal of negative-logic circuit (N.C.)

Output Signal [OUT0 - OUT3] Position Number Chart O: OFF O: ON

Position number	OUT3	OUT2	OUT1	OUT0
1 (End side)	0	0	0	
2 (Motor side)	0	0	•	0
3	0	0	•	•
4	0		0	0
5	0		0	
6	0	•	•	0
7	0		•	
8	•	0	0	0
9	•	0	0	•
10 (A)	•	0	•	0
11 (B)	•	0	•	
12 (C)	•	•	0	0
13 (D)	•	•	0	•
14 (E)	•	•	•	0

Signal Timing

(1) Positioning Operation [Driving to the stroke end]

(2) Positioning Operation [Driving to the intermediate position]

as the input IN0-3 when positioning is completed.

(3) Cut-off Stop (Reset Stop)

(4) Stop by the STOP Signal

(5) Alarm Reset

"*ALARM" is expressed as negative-logic circuit.

Series LECP2

Options: Actuator Cable

Programless Controller (With Stroke Study) Series LECP2

SMC

Motorless

LAT3

Step Motor Driver Series LECPA

How to Order

≜Caution

- [CE-compliant products] ① EMC compliance was tested by combining the electric actuator LE series and the LECPA 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.
- ② For the LECPA series (step motor driver), EMC compliance was tested by installing a noise filter set (LEC-NFA).

Refer to page 559 for the noise filter set. Refer to the LECPA Operation Manual for installation.

[UL-compliant products]

When conformity to UL is required, the electric actuator and driver should be used with a UL1310 Class 2 power supply.

* When controller equipped type is selected when ordering the LE series, you do not need to order this driver. * When pulse signals are open collector, order the current limiting resistor (LEC-PA-R-D) separately.

* Refer to the operation manual for using the products. Please download it via our website, http://www.smcworld.com

Precautions on blank controller (LECPA - BC)

Blank controller is a controller to which the customer can write the data of the actuator to be combined and used. Use the dedicated software (LEC-BCW) for data writing.

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

http://www.smcworld.com

Specifications

Item	LECPA	
Compatible motor	Step motor (Servo/24 VDC)	
Device averally Note 1)	Power voltage: 24 VDC ±10% Note 2)	
Power supply Note 1)	[Including motor drive power, control power, stop, lock release]	
Parallel input	5 inputs (Except photo-coupler isolation, pulse input terminal, COM terminal)	
Parallel output	9 outputs (Photo-coupler isolation)	
Pulse signal input	Maximum frequency: 60 kpps (Open collector), 200 kpps (Differential)	
Fuise signal input	Input method: 1 pulse mode (Pulse input in direction), 2 pulse mode (Pulse input in differing directions)	
Compatible encoder	Incremental A/B phase (Encoder resolution: 800 pulse/rotation)	
Serial communication	RS485 (Modbus protocol compliant)	
Memory	EEPROM	
LED indicator	LED (Green/Red) one of each	
Lock control	Forced-lock release terminal Note 3)	
Cable length [m]	I/O cable: 1.5 or less (Open collector), 5 or less (Differential), Actuator cable: 20 or less	
Cooling system	Natural air cooling	
Operating temperature range [°C]	0 to 40 (No freezing)	
Operating humidity range [%RH]	90 or less (No condensation)	
Storage temperature range [°C]	-10 to 60 (No freezing)	
Storage humidity range [%RH]	90 or less (No condensation)	
Insulation resistance [M Ω]	Between the housing and SG terminal: 50 (500 VDC)	
Weight [g]	ht [g] 120 (Screw mounting), 140 (DIN rail mounting)	

Note 1) Do not use the power supply of "inrush current prevention type" for the driver power supply. When conformity to UL is required, the electric actuator and driver should be used with a UL1310 Class 2 power supply. Note 2) The power consumption changes depending on the actuator model. Refer to the specifications of actuator for more details. Note 3) Applicable to non-magnetizing lock.

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

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

SMC

Motorless

LAT3

Series LECPA

Dimensions

SMC

Wiring Example 1

Power Supply Connector: CN1 * Power supply plug is an accessory. Applicable cable size> AWG20 (0.5 mm²), cover diameter 2.0 mm or less

CN1 Power Supply Connector Terminal for LECPA (PHOENIX CONTACT FK-MC0.5/5-ST-2.5)

Terminal name	Function	Details	
0V	Common supply (–)	M 24V terminal/C 24V terminal/EMG terminal/BK RLS terminal are common (–).	
M 24V	Motor power supply (+)	Motor power supply (+) supplied to the driver	
C 24V	Control power supply (+)	Control power supply (+) supplied to the driver	
EMG	Stop (+)	Input (+) for releasing the stop	
BK RLS	Lock release (+)	Input (+) for releasing the lock	

Power supply plug for LECPA

Wiring Example 2

Parallel I/O Connector: CN5 * When you connect a PLC, etc., to the CN5 parallel I/O connector, please use the I/O cable (LEC-CL5-□). The wiring should be changed depending on the type of the parallel I/O (NPN or PNP).

Power supply CN5 24 VDC ±10% for I/O signal Terminal name Function Pin no. COM+ 24 V 1 ⊣⊢ COM-0 V 2 NP+ Pulse signal 3 NP-Pulse signal 4 Note 1) PP+ Pulse signal 5 PP-Pulse signal 6 SETUP Input 7 RESET 8 Input SVON Input 9 CLR 10 Input ΤL Input 11 TLOUT 12 Load Output WAREA 13 Load Output BUSY Output 14 Load 15 SETON Output Load INP Output 16 Load SVRE Output 17 Load ESTOP Note: Output 18 Load ALARM N 19 Load Output AREA Output 20 Load Round termin FG 0.5-5 Note 1) For pulse signal wiring method, refer to "Pulse Signal Wiring Details". Note 2) Output when the power supply of the driver is ON. (N.C.)

Input Signal

Name	Details	
COM+	Connects the power supply 24 V for input/output signal	
COM-	Connects the power supply 0 V for input/output signal	
SETUP	Instruction to return to origin	
RESET	Alarm reset	
SVON	Servo ON instruction	
CLR	Deviation reset	
TL	Instruction to pushing operation	

Pulse Signal Wiring Details

• Pulse signal output of positioning unit is differential output

• Pulse signal output of positioning unit is open collector output

Pulse signal power supply

SMC

Output Signal

Name	Details	
BUSY	Outputs when the actuator is operating	
SETON	Outputs when returning to origin	
INP	Outputs when target position is reached	
SVRE	Outputs when servo is on	
*ESTOP Note 3)	Not output when EMG stop is instructed	
*ALARM Note 3)	M Note 3) Not output when alarm is generated	
AREA Outputs within the area output setting		
WAREA Outputs within W-AREA output setting ra		
TLOUT	Outputs during pushing operation	
Note 3) Signal of negative-logic circuit ON (N.C.)		

Note) (Connect th	ne current	limiting	resistor	R in	series
t	o corresp	ond to the	pulse si	gnal volt	age.	

Pulse signal power supply voltage	Current limiting resistor R specifications	Current limiting resistor part no.
24 VDC ±10%	3.3 kΩ ±5% (0.5 W or more)	LEC-PA-R-332
5 VDC ±5%	390 Ω ±5% (0.1 W or more)	LEC-PA-R-391

LEFB LEJB Щ LEN ш Ę LESH LEPY LER Ē LEY-X5 11-LEFS 11-LEJS 25A-LECYM LECSS-T LECS Motorless LAT3

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Series LECPA

Signal Timing

Return to Origin

* "*ALARM" and "*ESTOP" are expressed as negative-logic circuit.

Positioning Operation

data, INP will turn ON, but if not, it will remain OFF.

Pushing Operation ON ΤL OFF Input • Pulse signal . ON TLOUT OFF BUSY Output . . INP 0 mm/s Speed **Pushing operation** If the current pushing force exceeds the "Trigger LV" value of the step data, INP signal will turn ON. . :

Note) If pushing operation is stopped when there is no pulse deviation, the moving part of the actuator may pulsate.

* "*ALARM" is expressed as negative-logic circuit.

Options: Actuator Cable

Series LECPA

Options

[I/O cable]

I/O cable length (L)		
1	1.5 m	
3	3 m*	
5	5 m*	

* Pulse input usable only with differential. Only 1.5 m cables usable with open collector.

Pin	Insulation	Dot	Dot
no.	color	mark	color
1	Light brown		Black
2	Light brown		Red
3	Yellow		Black
4	Yellow		Red
5	Light green		Black
6	Light green		Red
7	Gray		Black
8	Gray		Red
9	White		Black
10	White		Red
11	Light brown		Black

Pin	Insulation	Dot	Dot
no.	color	mark	color
12	Light brown		Red
13	Yellow		Black
14	Yellow		Red
15	Light green		Black
16	Light green		Red
17	Gray		Black
18	Gray		Red
19	White		Black
20	White		Red
Round terminal 0.5-5	Green		

[Noise filter set] Step Motor Driver (Pulse Input Type)

LEC-NFA

Contents of the set: 2 noise filters (Manufactured by WURTH ELEKTRONIK: 74271222)

(12.5)

* Refer to the LECPA series Operation Manual for installation.

[Current limiting resistor]

This optional resistor (LEC-PA-R- \Box) is used when the pulse signal output of the positioning unit is open collector output.

Current limiting resistor

	Symbol	Resistance	Pulse signal power supply voltage	
ĺ	332	3.3 kΩ ±5%	24 VDC ±10%	
	391	390 Ω ±5%	5 VDC ±5%	

 Select a current limiting resistor that corresponds to the pulse signal power supply voltage.

* For the LEC-PA-R-□, two pieces are shipped as a set.

Series LEC Windows®XP, Windows®7 compatible Controller Setting Kit/LEC-W2

How to Order

Controller setting kit (Japanese and English are available.)

Contents

	Description	Model*		
1	Controller setting software (CD-ROM)	LEC-W2-S		
2	Communication cable	LEC-W2-C		
3	USB cable (between the PC and the communication cable)	LEC-W2-U		
Can be ordered separately.				

Compatible Controller/Driver

Step data input type
Pulse input type
CC-Link direct input type

Series LECP6/Series LECA6 Series LECPA Series LECPMJ

Hardware Requirements

OS	IBM PC/AT compatible machine running Windows [®] XP (32-bit), Windows [®] 7 (32-bit and 64-bit), Windows [®] 8.1 (32-bit and 64-bit).
Communication interface	USB 1.1 or USB 2.0 ports
Display	XGA (1024 x 768) or more

* Windows®XP, Windows®7 and Windows®8.1 are registered trademarks of Microsoft Corporation in the United States.

* Refer to SMC website for version upgrade information, http://www.smcworld.com

Screen Example

Easy mode screen example

Easy operation and simple setting

- Allowing to set and display actuator step data such as position, speed, force, etc.
- Setting of step data and test drive can be performed on the same page.
- Can be used to jog and move at a constant rate.

Normal mode screen example

Detailed setting

- Step data can be set in detail.
- Signals and terminal status can be monitored.
- Parameters can be set.
- JOG and constant rate movement, return to origin, test drive and testing of forced output can be performed.

Series LEC **Teaching Box/LEC-T1**

How to Order

* The displayed language can be changed to English or Japanese.

Specifications

Standard functions	Switch	
 Chinese character display 	Cable length [m]	
 Stop switch is provided. 	Enclosure	

Option

• Enable switch is provided.

Description
Stop switch, Enable switch (Option)
3
IP64 (Except connector)
5 to 50
90 or less (No condensation)
350 (Except cable)

[CE-compliant products] The EMC compliance of the teaching box was tested with the LECP6 series step motor controller

(servo/24 VDC) and an applicable actuator. [UL-compliant products]

When conformity to UL is required, the electric actuator and driver should be used with a UL1310 Class 2 power supply.

Easy Mode

Function	Details
Step data	 Setting of step data
Jog	Jog operationReturn to origin
Test	 1 step operation ^{Note 1)} Return to origin
Monitor	 Display of axis and step data no. Display of two items selected from Position, Speed, Force.
ALM	Active alarm displayAlarm reset
TB setting	 Reconnection of axis (Ver. 1.**) Displayed language setting (Ver. 2.**) Setting of easy/normal mode Setting step data and selection of items from easy mode monitor

Menu Operations Flowchart

Normal Mode

Function	Details
Step data	Step data setting
Parameter	Parameters setting
Test	 Jog operation/Constant rate movement Return to origin Test drive Note 1) (Specify a maximum of 5 step data and operate.) Forced output (Forced signal output, Forced terminal output) Note 2)
Monitor	 Drive monitor Output signal monitor Note 2) Input signal monitor Note 2) Output terminal monitor Input terminal monitor
ALM	 Active alarm display (Alarm reset) Alarm log record display
File	 Data saving Save the step data and parameters of the driver which is being used for communication (it is possible to save four files, with one set of step data and parameters defined as one file). Load to driver Loads the data which is saved in the teaching box to the driver which is being used for communication. Delete the saved data. File protection (Ver. 2.**)
TB setting	 Display setting (Easy/Normal mode) Language setting (Japanese/English) Backlight setting LCD contrast setting Beep sound setting Max. connection axis Distance unit (mm/inch)

Dimensions

No.	Description	Function		
1	LCD	A screen of liquid crystal display (with backlight)		
2	Ring	A ring for hanging the teaching box		
3	Stop switchWhen switch is pushed in, the switch locks and stops. The lock is released when it is turned to the right.			
4	Stop switch guard	A guard for the stop switch		
5	Enable switch (Option)	Prevents unintentional operation (unexpected operation) of the jog test function. Other functions such as data change are not covered.		
6	Key switch	Switch for each input		
7	Cable	Length: 3 meters		
8	Connector	A connector connected to CN4 of the driver		

Motorless

LAT3

CC-Link Direct Input Type Step Motor Controller Series LECPMJ

How to Order

Confirm that the combination of the controller and the actuator is correct.

1 Check the actuator label for model number. This matches the controller.

* Refer to the operation manual for using the products. Please download it via our website, http://www.smcworld.com

Precautions on blank controller (LECPMJD-BC)

Blank controller is a controller to which the customer can write the data of the actuator to be combined and used. Use the dedicated software (LEC-BCW) for data writing.

Please download the dedicated software (LEC-BCW) via our website.

Order the controller setting kit (LEC-W2) separately to use this software.

SMC website: http://www.smcworld.com

Step Motor Controller (CC-Link Direct Input Type) Series LECPMJ

Specifications

		Item	LECPMJ					
Co	mpatible mot	or	Step motor (Servo/24 VDC)					
Po	ver supply No	te 1)	Power voltage: 24 VDC ±10% Note 2)					
Co	npatible enco	oder	Incremental A/B phase (800 pulse/rotation)					
ns	Fieldbus				CC-Link	Ver. 1.10		
atio	Communica	tion speed [bps]			156 k/625 k/2.	5 M/5 M/10 M		
fice	Communica	tion method			Broadca	st polling		
eci	Station type				Remote de	vice station		
ication sp	I/O occupati	on area	1 station (Input 32 points/4 words (Output 32 points/4 words)		2 stations (Input 64 points/8 words Output 64 points/8 words)		4 stations (Input 128 points/16 words (Output 128 points/16 words)	
nn	Applicable c	ommunication cable		CC-Link Ver. 1.10 c	compliant cable (Sh	ielded 3-core twiste	d pair cable) ^{Note 3)}	
Maximum Communication speed [bps] 156 k 625 k		2.5 M	5 M	10 M				
ပိ	cable length	Total cable length [m]	1200	900	400	160	100	
Serial communication		RS485 (Modbus protocol)						
Memory		EEPROM						
LE) indicator		PWR, ALM, L ERR, L RUN					
Lo	k control				Forced-lock relea	se terminal Note 4)		
Cal	ole length [m]			Actuator cab	le: 20 or less		
Co	oling system				Natural a	ir cooling		
Op	erating tempe	erature range [°C]			0 to 40 (No	o freezing)		
Ор	erating humic	dity range [%RH]	90 or less (No condensation)					
Sto	rage tempera	ature range [°C]	-10 to 60 (No freezing)					
Sto	rage humidit	y range [%RH]	90 or less (No condensation)					
Ins	ulation resist	ance [MΩ]	Between all of external terminals and the case 50 (500 VDC)				ase	
We	ight [g]			170	(Screw mounting),	190 (DIN rail mount	ing)	

Note 1) Do not use the power supply of "inrush current prevention type" for the controller power supply.

When conformity to UL is required, the electric actuator and controller should be used with a UL1310 Class 2 power supply.

Note 2) The power consumption changes depending on the actuator model. Refer to the specifications of actuator for more details.

Note 3) If the system comprises of both CC-Link Ver. 1.00 and Ver. 1.10 compliant cables, Ver. 1.00 specifications are applied to the maximum communication cable length and the cable length between stations.

Note 4) Applicable to non-magnetizing lock.

Mode explanation

Mode type	Description
Single numeric parameter	Can define numerical data in the Movement MOD and another item in the step data directly from the PLC when starting operation by specifying a registered step data No.
Half numeric parameters	Can define numerical data in the Movement MOD, Speed, Position, Acceleration/Pushing force, Pushing speed, or Deceleration/ Trigger LV in the step data directly from the PLC when starting operation by specifying a registered step data No.
Full numeric parameters	Can define numerical data in all step data items, Movement MOD, Speed, Position, Acceleration, Pushing speed, Pushing force, Deceleration, Trigger LV, Moving force, Area 1, Area 2, and In position, directly from the PLC to start operation.

Function that can be executed in each mode

Mode setting [Number of occupied stations] Note 5)	Single numeric parameter [1]	Full numeric parameters [4]	
Step no. defining operation		0	
Numerical data defining operation		0	
Number of definable numerical data items	1	6	12
Monitor of position/speed		0	
Step data editing		O Note 6)	
Max. number of connectable controllers Note 7)	42	32	16

Note 5) The modes can be set by registering the number of occupied stations with basic parameter "Option setting 1" of the controller.

Note 6) It is possible to edit it from teaching box/controller setting software for "Single numeric parameter". It is possible to edit it from teaching box/ controller setting software and PLC (CC-Link) for "Half numeric parameters" and "Full numeric parameters".

Note 7) Maximum number of units specified in CC-Link communication specifications.

Series LECPMJ

Specifications

Modifiable step data item in each mode

Numerical data modifiable items

						Step da	ata item					
Mode setting	Movement MOD	Speed	Position	Acceleration	Pushing force	Pushing speed	Deceleration	Trigger LV	Moving force	Area 1	Area 2	In position
Single numeric parameter	•	•				Only one item ranging	can be changed from Speed to In	from 11 items, position.				
Half numeric parameters	•	•	•	Only one item car Acceleration/	be changed from Pushing force.	•	Only one item car Deceleratio	h be changed from n/Trigger LV.				
Full numeric parameters	•	•	•	•	•	•	•	•	•	•	•	•

Note) Step data items, except items that have been changed, reference data registered in the controller. Note) Refer to the LECPMJ operation manual for details of the step data items.

Operation example: Single numeric parameter

Operation ① [Return to origin]	After the servo is turned ON and the SETUP signal is sent, the return to origin will start. After returning to the origin position, the SETON and INP signals are output.	0 Absolute	e: 200
Operation ② [Specify Step No.2 to input the DRIVE signal.]	Sten data No. defining operation	200 – Absolute	e: 100
Operation ③ [Specify Step No.1 to input the DRIVE signal.]	The operation starts by specifying a registered step data No. to input the DRIVE signal.	100 – Absoluti	te: 10
Operation ④ [Specify Step No.0 to input the DRIVE signal.]	Numerical data defining appretion	10 <	ə: 150
Operation (5 [Define numerical data in the Movement MOD and Position in Step No.1.] • Movement MOD: 2 (Relative) and Position: 150 are defined from the PLC.	The operation starts by changing the Movement MOD and Position in step data No.1 temporarily by defining numerical data from the PLC.	160 🗲	400
Operation 6 [Specify Step No.1 to input the DRIVE signal.]	Step data No. defining operation The operation starts by specifying a registered step data No. to input the DRIVE signal. * Change of numerical values when defining numerical data will not affect the registered step data.	100 -	3: 100

Step Motor Controller (CC-Link Direct Input Type) Series LECPMJ

Dimensions

EMG

BK RLS

ontrol power supply (+)	Control power supply (+) supplied to the driver
Stop (+)	Input (+) for releasing the stop
Lock release (+)	Input (+) for releasing the lock
	SMC

M 24V

υ

2 24V

EMG BK RLS

Series LEC Windows®XP, Windows®7 compatible Controller Setting Kit/LEC-W2

How to Order

LEC-<u>W2</u>

Controller setting kit (Japanese and English are available.)

Contents

Description		Model*
1	Controller setting software (CD-ROM)	LEC-W2-S
2	Communication cable	LEC-W2-C
3	USB cable (between the PC and the communication cable)	LEC-W2-U
-		

* Can be ordered separately.

Compatible Controller/Driver

Step data input type
Pulse input type
CC-Link direct input type

Series LECP6/Series LECA6 Series LECPA Series LECPMJ

Hardware Requirements

OS	IBM PC/AT compatible machine running Windows [®] XP (32-bit), Windows [®] 7 (32-bit and 64-bit), Windows [®] 8.1 (32-bit and 64-bit).
Communication interface	USB 1.1 or USB 2.0 ports
Display	XGA (1024 x 768) or more

* Windows®XP, Windows®7 and Windows®8.1 are registered trademarks of Microsoft Corporation in the United States.

* Refer to SMC website for version upgrade information, http://www.smcworld.com

Screen Example

Easy mode screen example

Easy operation and simple setting

- Allowing to set and display actuator step data such as position, speed, force, etc.
- Setting of step data and test drive can be performed on the same page.
- Can be used to jog and move at a constant rate.

Normal mode screen example

Detailed setting

- Step data can be set in detail.
- Signals and terminal status can be monitored.
- Parameters can be set.

SMC

 JOG and constant rate movement, return to origin, test drive and testing of forced output can be performed.

Series LEC Teaching Box/LEC-T1

Specifications

Stand	ard f	unc	tions	

- Chinese character display
- Stop switch is provided.

Option

• Enable switch is provided.

Item	Description
Switch	Stop switch, Enable switch (Option)
Cable length [m]	3
Enclosure	IP64 (Except connector)
Operating temperature range [°C]	5 to 50
Operating humidity range [%RH]	90 or less (No condensation)
Weight [g]	350 (Except cable)
CE-compliant products]	

The EMC compliance of the teaching box was tested with the LECP6 series step motor controller (servo/24 VDC) and an applicable actuator. [UL-compliant products]

When conformity to UL is required, the electric actuator and controller should be used with a UL1310 Class 2 power supply.

Easy Mode

Function	Details
Step data	 Setting of step data
Jog	Jog operationReturn to origin
Test	 1 step operation Return to origin
Monitor	 Display of axis and step data no. Display of two items selected from Position, Speed, Force.
ALM	Active alarm displayAlarm reset
TB setting	 Reconnection of axis (Ver. 1.**) Displayed language setting (Ver. 2.**) Setting of easy/normal mode Setting step data and selection of items from easy mode monitor

Menu Operations Flowchart

Series LEC

Normal Mode

Function	Details
Step data	Step data setting
Parameter	Parameters setting
Test	 Jog operation/Constant rate movement Return to origin Test drive (Specify a maximum of 5 step data and operate.) Forced output (Forced signal output, Forced terminal output)
Monitor	 Drive monitor Output signal monitor Input signal monitor Output terminal monitor Input terminal monitor
ALM	 Active alarm display (Alarm reset) Alarm log record display
File	 Data saving Save the step data and parameters of the controller which is being used for communication (it is possible to save four files, with one set of step data and parameters defined as one file). Load to controller Loads the data which is saved in the teaching box to the controller which is being used for communication. Delete the saved data. File protection (Ver. 2.**)
TB setting	 Display setting (Easy/Normal mode) Language setting (Japanese/English) Backlight setting LCD contrast setting Beep sound setting Max. connection axis Distance unit (mm/inch)
Reconnect	Reconnection of axis

Menu Operations Flowchart

Menu

Step data Parameter

TB setting

Reconnect

Monitor

Test

ALM File

Dimensions

No.	Description	Function	
1	LCD	A screen of liquid crystal display (with backlight)	
2	Ring	A ring for hanging the teaching box	
3	Stop switch	When switch is pushed in, the switch locks and stops. The lock is released when it is turned to the right.	
4	Stop switch guard	A guard for the stop switch	
5	Enable switch (Option)	Prevents unintentional operation (unexpected operation) of the jog test function. Other functions such as data change are not covered.	
6	Key switch	Switch for each input	
7	Cable	Length: 3 meters	
8	Connector	A connector connected to CN4 of the controller	

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