



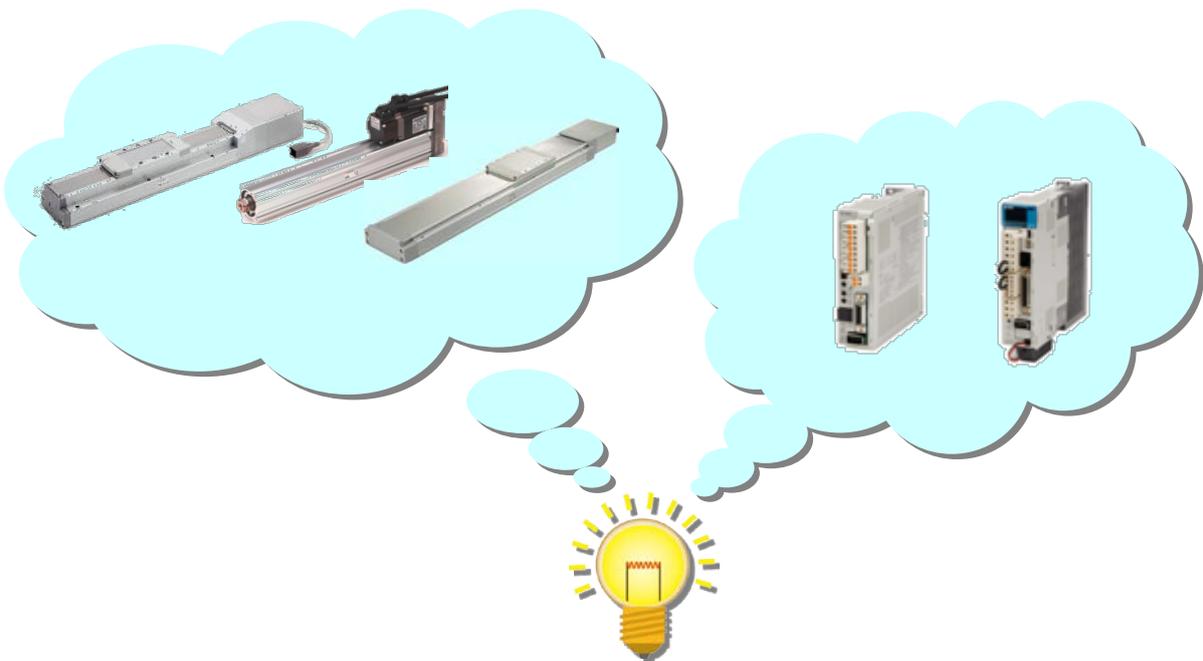
Operation Manual

PRODUCT NAME

AC Servo Motor Driver (Parameter Configuration using Setup software (MR Configurator2™))

MODEL / Series / Product Number

LECS□ Series



SMC Corporation



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LECS□ Series / Driver Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of "Caution," "Warning" or "Danger." They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC), Japan Industrial Standards (JIS)*1) and other safety regulations*2).

*1) ISO 4414: Pneumatic fluid power -- General rules relating to systems

ISO 4413: Hydraulic fluid power -- General rules relating to systems

IEC 60204-1: Safety of machinery -- Electrical equipment of machines (Part 1: General requirements)

ISO 10218-1992: Manipulating industrial robots -- Safety

JIS B 8370: General rules for pneumatic equipment.

JIS B 8361: General rules for hydraulic equipment.

JIS B 9960-1: Safety of machinery -- Electrical equipment for machines. (Part 1: General requirements)

JIS B 8433-1993: Manipulating industrial robots - Safety. etc.

*2) Labor Safety and Sanitation Law, etc.



Caution

Caution indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.



Warning

Warning indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.



Danger

Danger indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

Warning

1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results.

The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product.

This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.

The product specified here may become unsafe if handled incorrectly.

The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.

The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.

When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.

Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.

1) Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.

2) Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and lock circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.

3) An application which could have negative effects on people, property, or animals requiring special safety analysis.

4) Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

Note that the  CAUTION level may lead to a serious consequence according to conditions. Please follow the instructions of both levels because they are important to personnel safety.



LECS□ Series / Driver Safety Instructions

Caution

The product is provided for use in manufacturing industries.

The product herein described is basically provided for peaceful use in manufacturing industries.

If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.

If anything is unclear, contact your nearest sales branch.

Limited warranty and Disclaimer/Compliance Requirements

The product used is subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements”.

Read and accept them before using the product.

Limited warranty and Disclaimer

The warranty period of the product is 1 year in service or 1.5 years after the product is delivered.*3) Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.

For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.

This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.

Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

***3) Vacuum pads are excluded from this 1 year warranty.**

A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.

Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

When the product is exported, strictly follow the laws required by the Ministry of Economy, Trade and Industry (Foreign Exchange and Foreign Trade Control Law).

Introduction

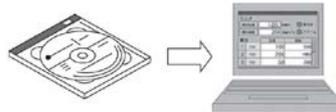
It is recommended that the operator read the operation manual and operation manual (Simplified Edition) for LECS□ prior to use.

For the handling and details of other equipment, please refer to the operation manual for used equipment.

1. Parameter Configuration using Setup software (MR Configurator2™)

This section describes the configuration procedure for main parameters using the setup software (MR Configurator2™: LEC-MRC2E). See the “LECS□ operation manual and operation manual (Simplified Edition)” for parameter details.

1.1 Setup software (MR Configurator2™)



*1 Setup software version 1.19V or above is required.

*2 The setup software (MR Configurator2™:LEC-MRC2E) must be purchased as an additional item.

*3 The USB cable (LEC-MR-J3USB) must be purchased as an additional item.

1.1.1 Installation Method

Perform installation according to the “MR Configurator2™ instruction manual” (Manual/ib0300160*.pdf) contained on the setup software (MR Configurator2™) CD-ROM. The “MR Configurator2” software will be added to the PC.

1.2 Basic driver set-up for Initial Test Drive

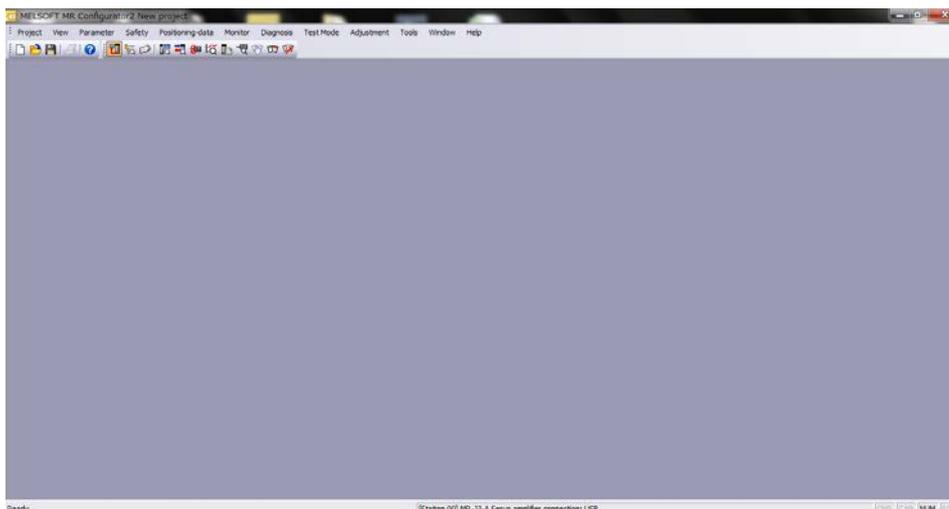
If you turn on the power supply for the first time, refer to “LECS□ operation manual and operation manual (Simplified Edition)”.

1.2.1 Start up the Setup software (MR Configurator2™)

- ① Connect the PC and LECS□ using the USB cable.
- ② Turn on the power of the LECS□.
- ③ Start application “MR Configurator2”.

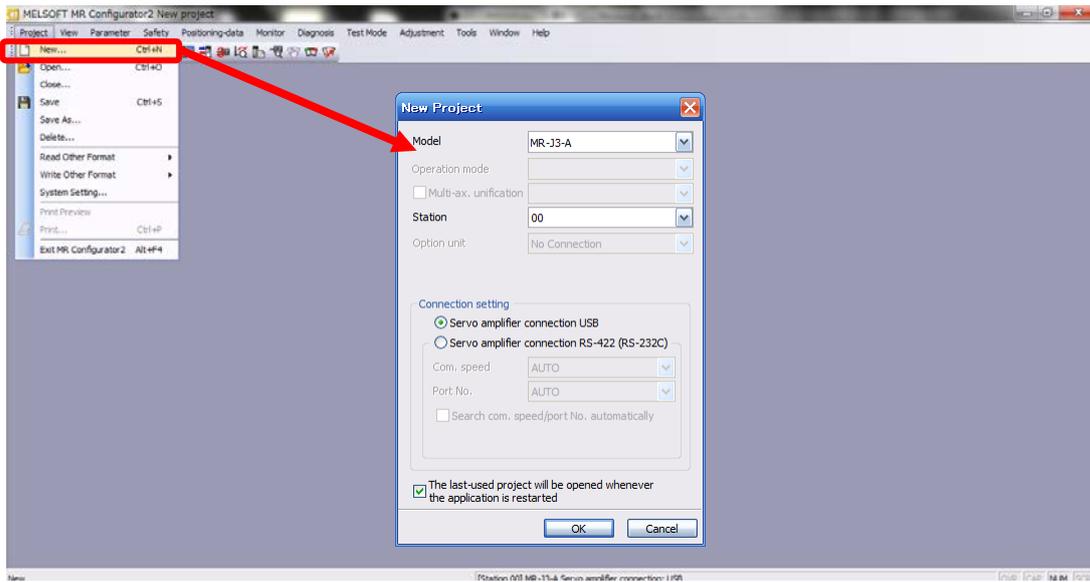


Once the application starts, the screen below will be displayed.



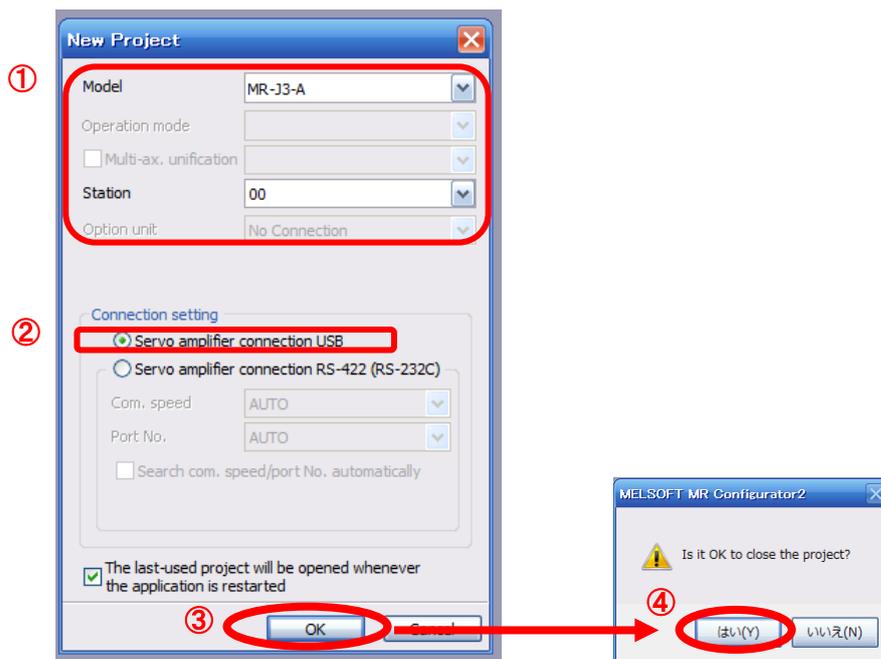
1.2.2 “System Settings”

- ① From “Project” menu select “New”, the “New project” window will be displayed.



1.2.3 Model Selection

- ① The Mitsubishi Electric Corporation series will be displayed in the model selection list. Please select MR-JN-A if using the LECSA.
MR-J3-A if using the LECSB.
MR-J3-T if using the LECSA.
MR-J3-B if using the LECSB.
MR-J4-B if using the LECSA-T.
- ② Please select “servo amplifier connection USB” as the communication device.
- ③ Click OK.
- ④ Click OK.



1.2.4 Driver ON LINE Check

Check that the driver is enabled (ONLINE).



Check that the “ONLINE/OFFLINE” icon is displayed “  ”.

It is OFFLINE when displayed as “  ”.

* For OFFLine, PC and amplifier aren't communicating. Confirm the following points.

- Is amplifier's power supply turning on?
- Are PC and amplifier connected with the USB cable?
- Is the USB driver installed?
- Is the setting of “Port” for USB connection corresponding?

1.3 Loading Parameters

- ① From the “Parameter Setting” window in the setup software, select “Open”.
- ② Please specify location of the file.
- ③ Please select the file you wish to import parameters [.prm2].
- ④ Click “Open”.

Parameters will be loaded.



1.4 Parameter writing (PC → LECS□(Driver))

- ① From the “Parameter” menu select “Parameter Setting”, the “parameter setting” window will open.
- ② The explanation of the parameter item is displayed in “MR2 Help”.
(When it is not displayed, from the “View” menu select “Docking window” – “Docking Help”.)

The screenshot shows the MELSOFT MR Configurator interface. The 'Parameter Setting' window is open, displaying the 'Common - Basic' tab. The 'MR2 Help' window is docked at the bottom, showing the 'CONTROL MODE' section. The 'MR2 Help' window contains the following text:

CONTROL MODE

Select the control mode of servo amplifier.
Also, select control loop of servo amplifier and max. torque of HF-KP motor. (Only for MR-J3-A)

- ③ When each item of “List display” is clicked, “Parameter list” screen along each item is displayed. When “Basic” is selected, it is displayed as follows.

No.	Abbr.	Name	Units	Setting range	Axis 1
PA01	*STY	Control mode		0000-0F55	0000
PA02	*REG	Regenerative option		0000-71FF	0000
PA03	*ABS	Absolute position detection system		0000-0004	0000
PA04	*AOP1	Function selection A-1		0000-F031	0000
PA05	*FBP	Number of command input pulses per revolution		0-0 / 1000-50000	0
PA06	CMX	Elec. gear numerator (Cmd. pls. mult. factor num.)		1-1048576	1
PA07	CDV	Elec. gear denominator (Cmd. pls. mult. factor den.)		1-1048576	1
PA08	ATU	Auto tuning mode		0000-0003	0001
PA09	RSP	Auto tuning response		1-32	12
PA10	INP	In-position range	pulse	0-65535	100
PA11	TLP	Forward rotation torque limit	%	0.0-100.0	100.0
PA12	TLN	Reverse rotation torque limit	%	0.0-100.0	100.0
PA13	*PLSS	Command pulse input status		0000-0812	0000
PA14	*POL	Rotation direction selection		0-1	0
PA15	*ENR	Encoder output pulse	pulse/rev	1-1048576	4000
PA16	*ENR2	For manufacturer setting		0000-FFFF	0000
PA17	*MSR	For manufacturer setting		0000-FFFF	0000
PA18	*MTY	For manufacturer setting		0000-FFFF	0000
PA19	*BLK	Parameter block		0000-FFFF	000C

Refer to "LECS□ operation manual and operation manual (Simplified Edition)", for details of each parameter.

- ④ Click on the "Single Axis Write" button.
- ⑤ Turn the power OFF and ON again. The Parameter is then enabled.

Basic						Selected Items Write	Single Axis Write
No.	Abbr.	Name	Units	Setting range	Axis1		
PA01	*STY	Control mode		0000-0F55	0000		
PA02	*REG	Regenerative option		0000-71FF	0000		
PA03	*ABS	Absolute position detection system		0000-0004	0000		

Please set the parameters for each actuator.
Please change the parameter values according to usage.

Refer to "LECS□ operation manual and operation manual (Simplified Edition)" for details of each parameter and how to change method.

Refer to "LECS□ Operation Manual (Simplified Edition)" for details of parameters recommended value of each actuator.

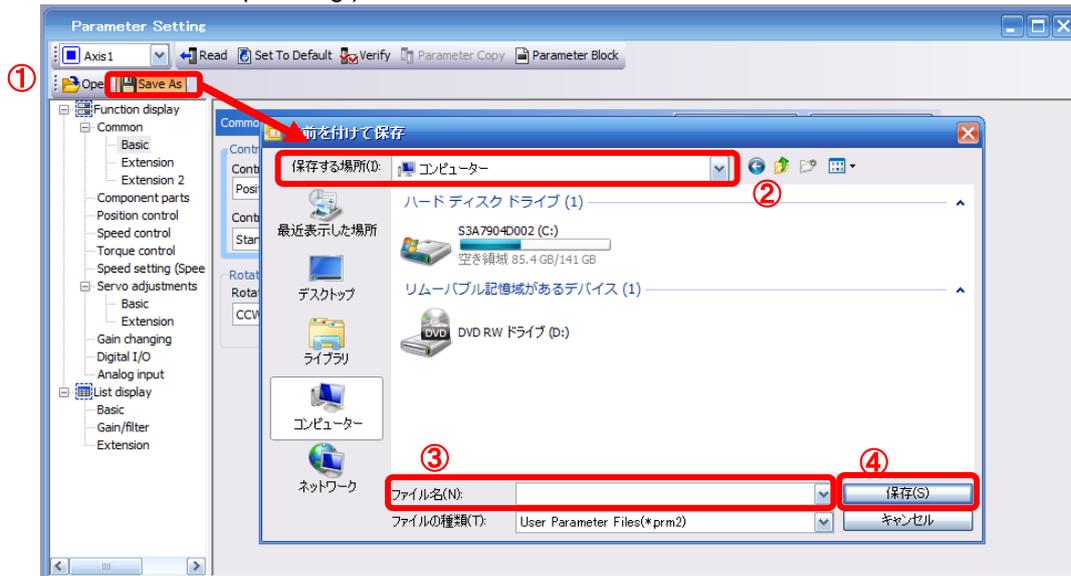
1.5 Saving Parameters

- ① From the “Parameter Setting” window in the setup software, select “Save As”.
- ② Please specify location to be saved.
- ③ Please enter any file name.
- ④ Click “Save”.

Files Saved

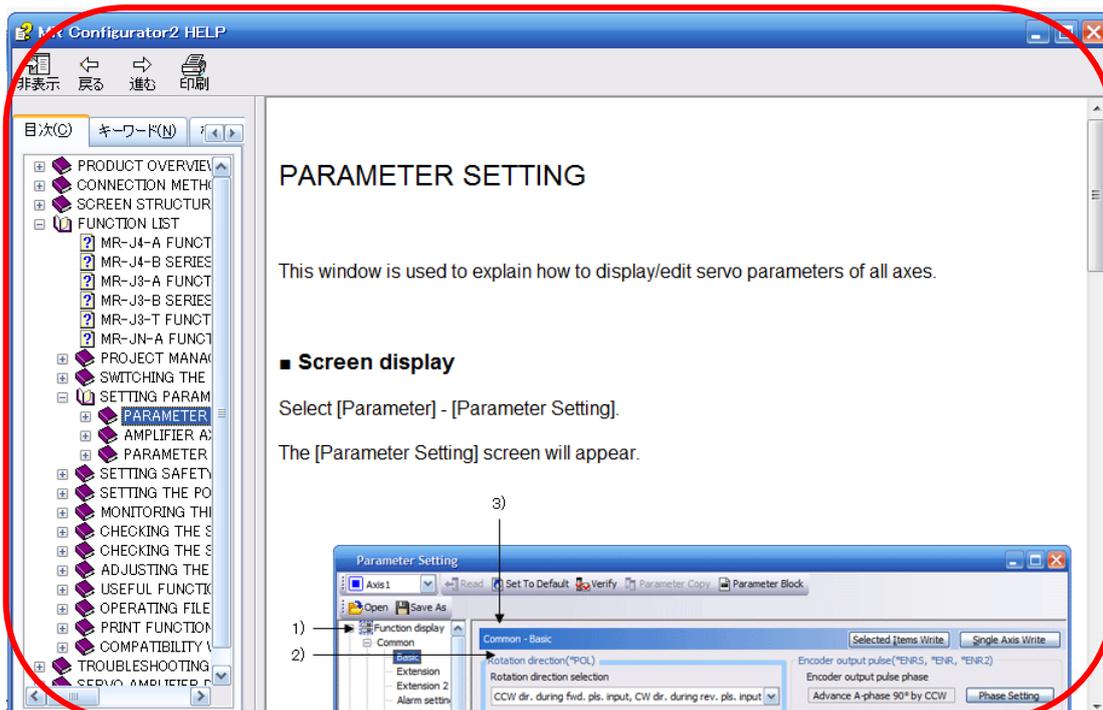
.prm2	Settings files for parameters.
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* Note Always upload current parameters from the driver to the software before saving.
(See Section 1.3 for uploading.)



1.6 Help Function

By selecting “MR Configurator2 Help” in “Help” from any window of the setup software, a “HELP” screen will be shown.



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Note: Specifications are subject to change without prior notice and any obligation on the part of the manufacturer.
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