



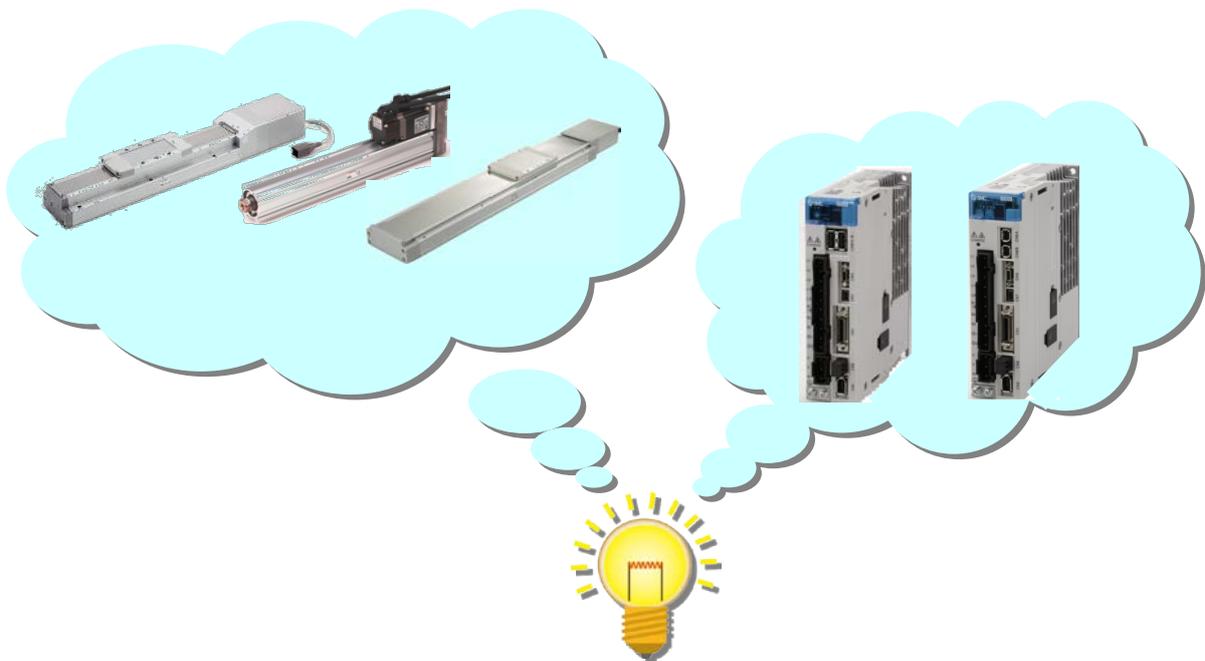
Operation Manual

PRODUCT NAME

AC Servo Motor Driver (Parameter Configuration using Setup software (SigmaWin+TM))

MODEL / Series / Product Number

LECY□ Series



SMC Corporation



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LECY□ 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.



IMPORTANT

Indicates **important** information that should be memorized, as well as precautions, such as alarm displays, that do not involve potential damage to equipment.

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.



LECY□ 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

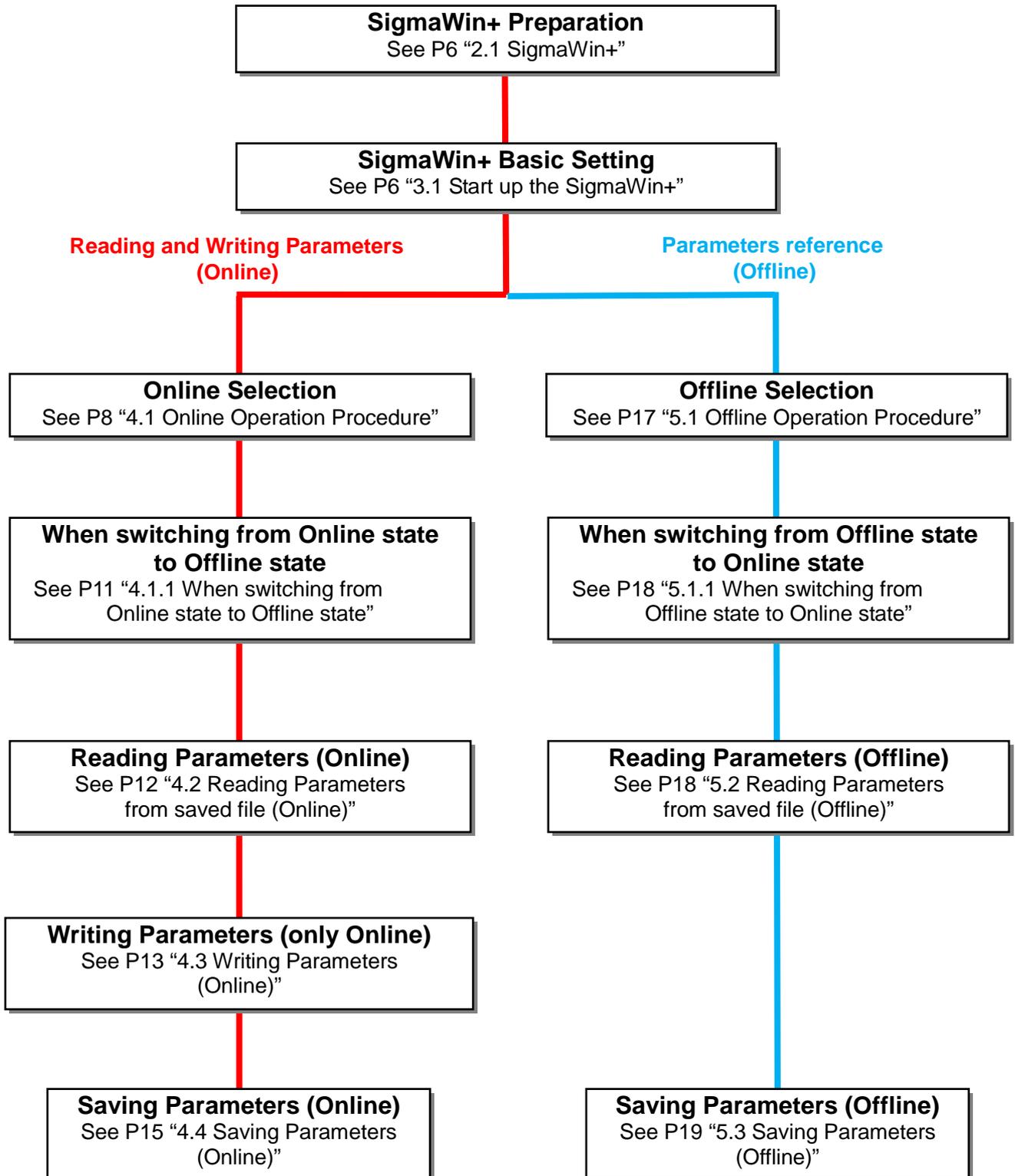
When the product is exported, strictly follow the laws required by the Ministry of Economy, Trade and Industry (Foreign Exchange and Foreign Trade Control Law).

Introduction

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

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

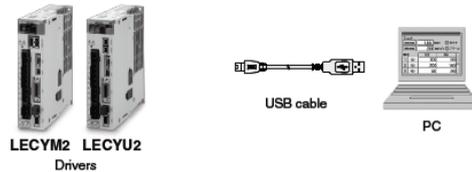
1. Flow chart



2. SigmaWin+ Preparation

This section describes the configuration procedure for main parameters using the setup software :SigmaWin+™ (hereafter, it is written as SigmaWin+). See the “LECY□ operation manual and operation manual (Simplified Edition)” for parameter details.

2.1 SigmaWin+



- *1 Please download the SigmaWin+ :Ver. 5.62 or above via SMC website.
- *2 The SigmaWin+ is a registered trademark or trademark of YASKAWA Electric Corporation.
- *3 The USB cable (LEC-JZ-CVUSB) must be purchased as an additional item.

2.1.1 USB driver Installation Method

Please install the USB driver along the USB Driver Installation (Readme_ENG.htm) of "SigmaWinPlusE" folder→"Driver"→"USB"→"Readme".

3. SigmaWin+ Basic Setting

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

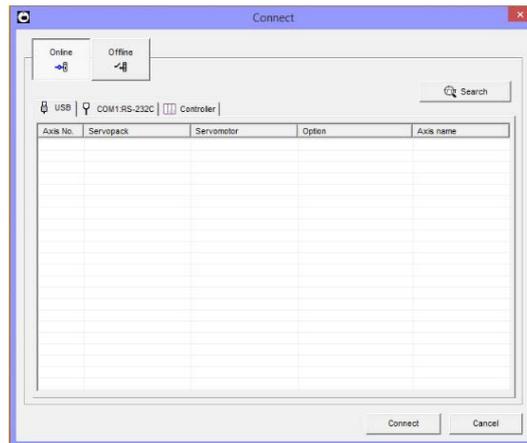
3.1 Start up the SigmaWin+

1. Connect the PC and LECY□ using the USB cable.
2. Turn on the power of the LECY□.
3. Start application “SigmaWin+”.

If you can not find it from the Start menu, please start “SigmaWinPlus” from “C:¥Program Files (x86)¥SigmaIDE¥SigmaWinPlus¥SigmaSw¥Bin”.



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



Connect window

Select the method to set up the LECY□:Online or Offline. Online is the default setting.

Online: Select when setting up or tuning the LECY□ with the LECY□ connected.

Offline: Select when editing parameters or checking screens for tracing or mechanical analysis without the LECY□ connected.

4. Online Selection (Reading and Writing Parameters)

It describes the operation procedure, reading parameters, writing parameters and saving parameters in Online.

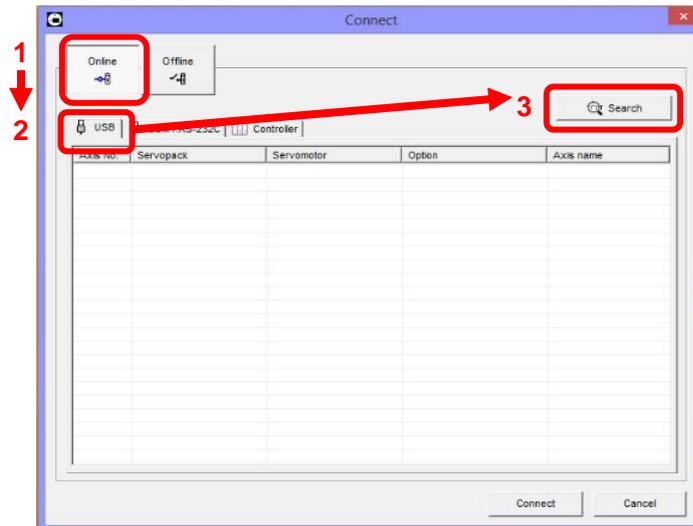
4.1 Online Operation Procedure

In advance to perform the installation of the USB driver, connect the PC and LECY□ by the USB cable, and please power ON the LECY□.

Enter the necessary settings for communication setup.

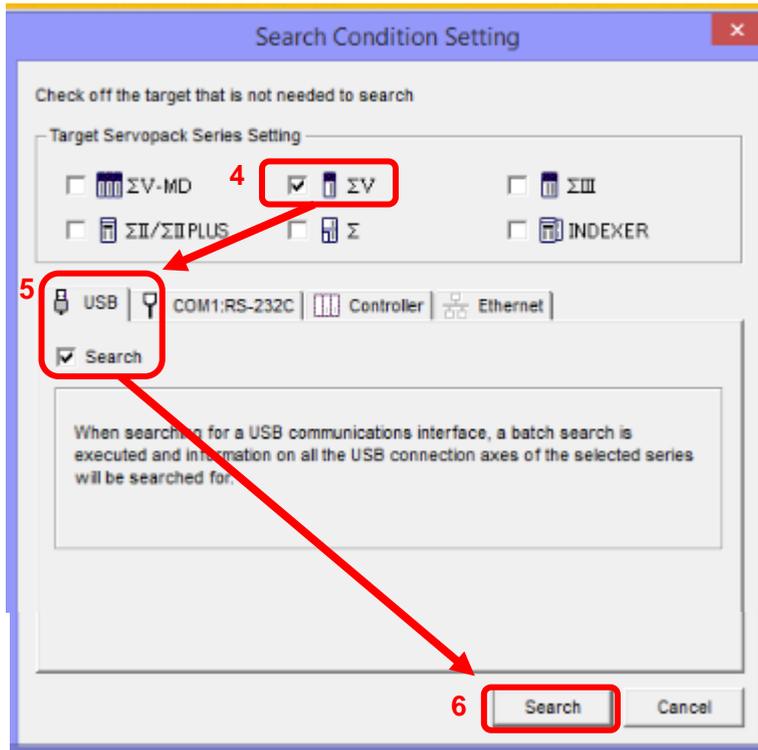
1. Select Online in the Connect window.

When Online is selected, the window below will be displayed.



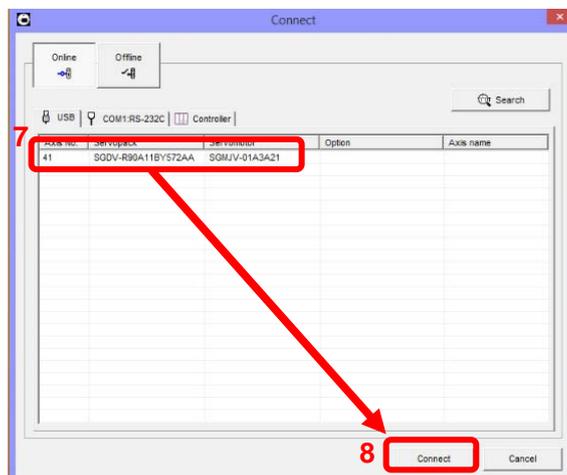
2. Select the USB tab.
3. Click "Search".

The “Search Condition Setting” window will be displayed.



4. Select the ΣV series.
5. Select Search of the USB tab.
6. Click “Search”.

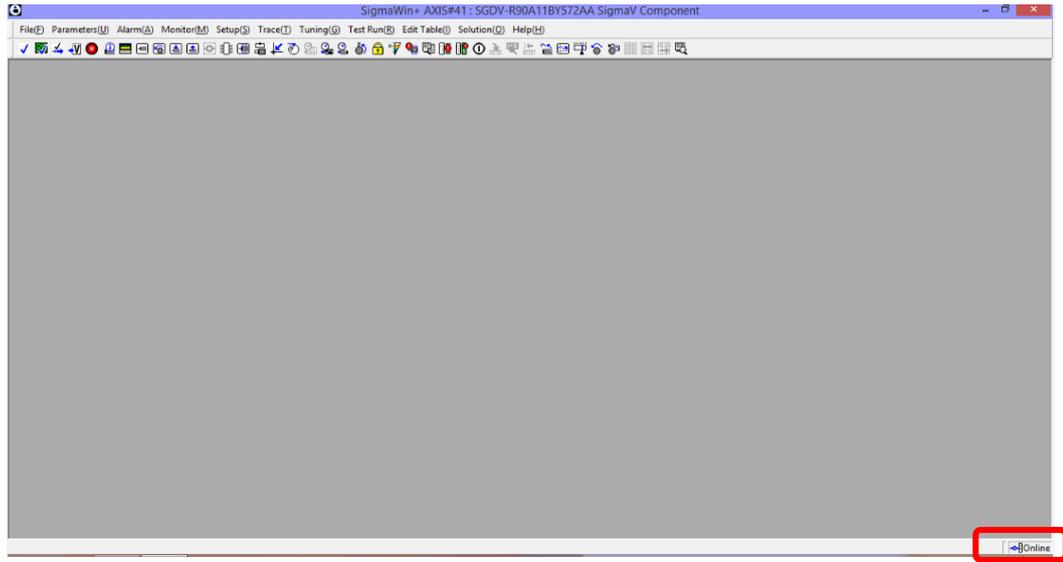
After the LECY□ have been successfully connected to SigmaWin+, a list of the connected LECY□ will be displayed on the window.



Connect window

7. Select the driver to be connected.
8. Click “Connect” or just double-click the driver to be connected. The SigmaWin+ main window will be displayed. Click Cancel to close the dialog box.

Online state, you can check the display in the lower right part of the SigmaWin+ main window.



SigmaWin+ main window (Online)

(Zoom)



IMPORTANT

When starting the machine for the first time, setting up and reinitialization of the absolute encoder are necessary. When the absolute encoder is used as the incremental encoder, it is unnecessary.

In the SigmaWin+ main window, click Setup(S), point to Set Absolute Encoder(A) and click Reset Absolute Encoder(A).

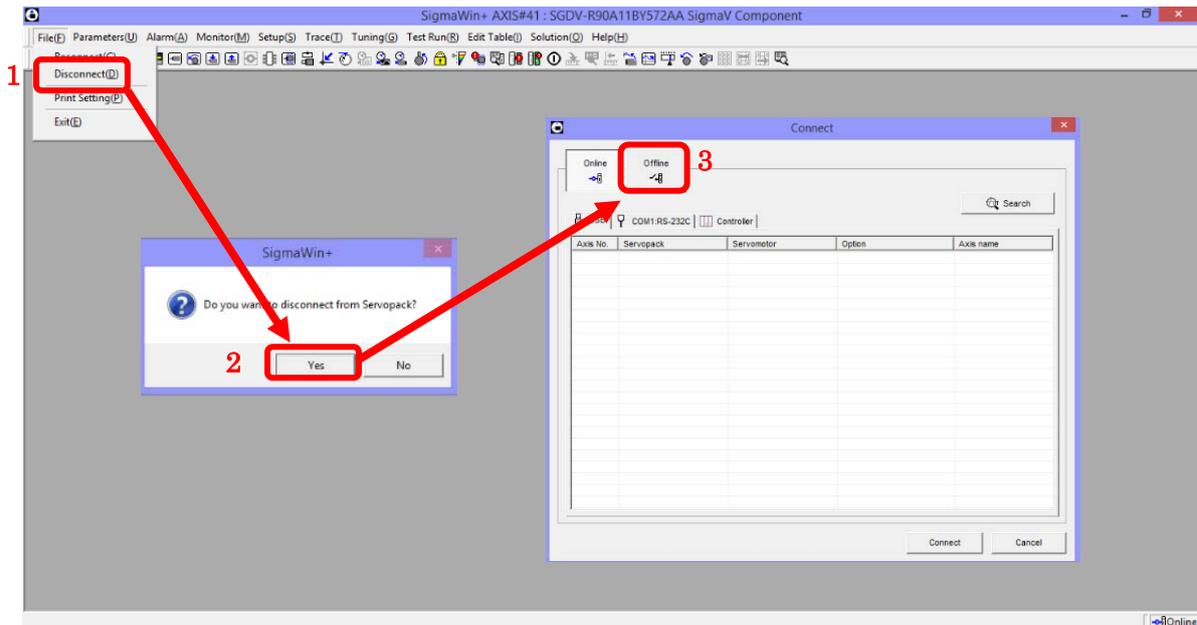
The absolute encoder can only be set up while the servo is off. Turn the power back on after the encoder has been successfully set up.

4.1.1 When switching from Online state to Offline state

It describes the operation when switching from Online state to Offline state.

1. In the main window, close all the windows that are open, such as "Parameter Editing" window. From the menu bar of the main window, click "File(F)"-"Disconnect(D)".
2. Click "Yes".
"Connecting" window will be displayed.
3. Select "Offline".

Subsequent offline operation procedure, refer to Section 5.1. Please perform the operation up to a portion where the main window of Offline is displayed.

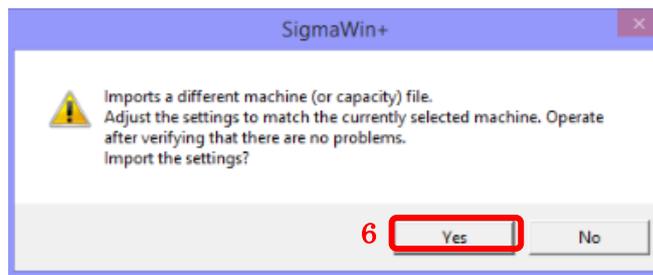
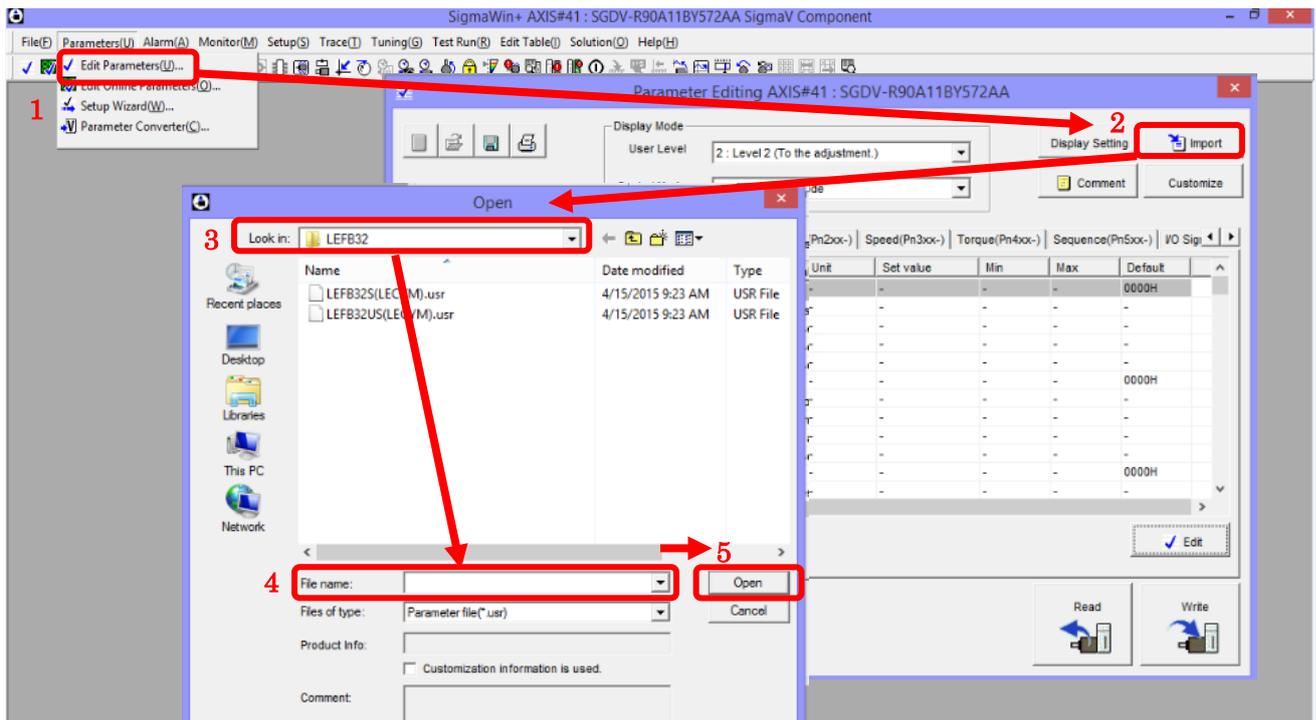


4.2 Reading Parameters from saved file (Online)

It describes the method of reading parameters from saved file to SigmaWin+ in Online.

When reading the current parameters from LECY□ to SigmaWin+ in Online, refer to Section 4.4.1.

1. From the menu bar, click “Parameters(U)”-“Edit Parameters(U)”.
The “Parameter Editing” window will be displayed.
2. Click “Import”.
The “Open” window will be displayed.
3. Please specify location of the file.
4. Please select the file you wish to import parameters [.usr].
5. Click “Open”.
6. If you import a different machine (or capacity) file, click “Yes”.
Parameter will be read, the “Parameter Editing” window will be overwritten.

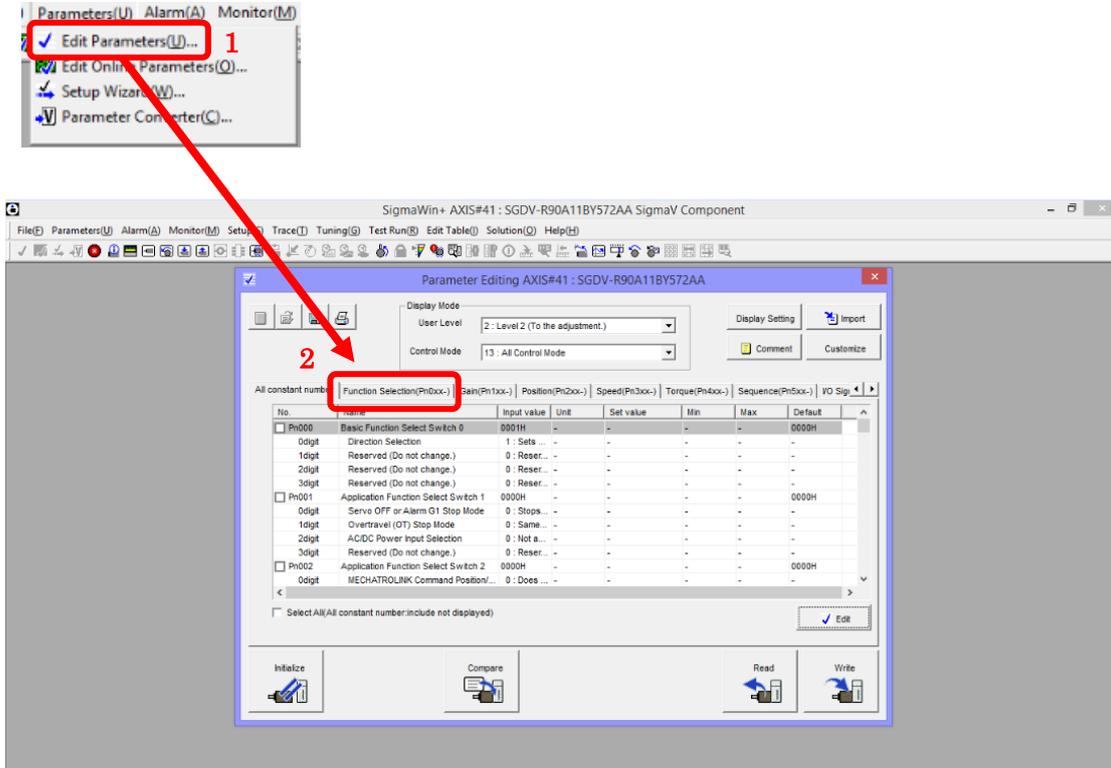


4.3 Writing Parameters (Online)

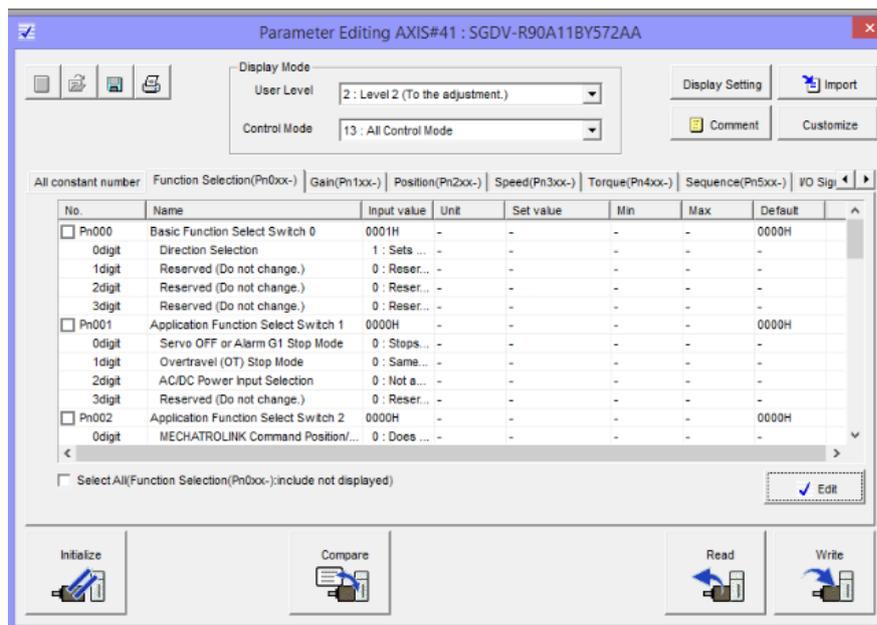
It describes the writing parameters from SigmaWin+ to LECY□ in Online.

Writing parameters to the LECY□ has done in Online. It can not be done in Offline

1. From the menu bar, click "Parameters(U)"-"Edit Parameters(U)".
The "Parameter Editing" window will be displayed.



2. If you click on each item, such as "Function selection(Pn0xx-)" will be displayed parameter list of each item. If you select the "Function Selection (Pn0xx-)", it will be displayed as follows.



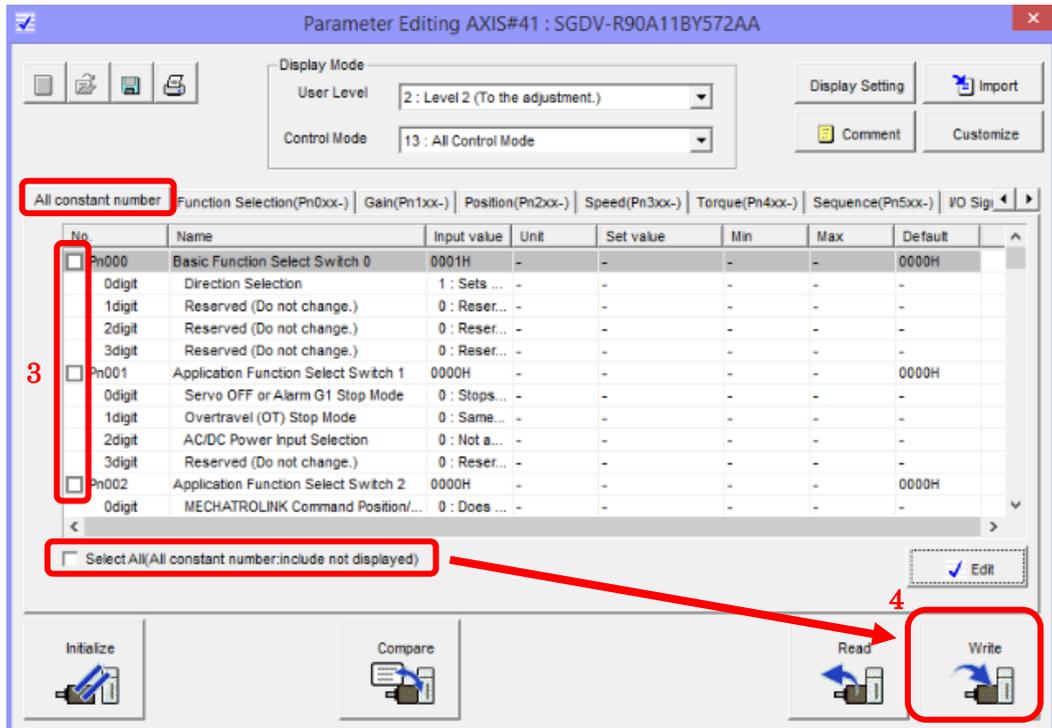
For details of each parameter, refer to LECY□ "Instruction Manual" and "Instruction Manual (simplified version)".

3. Please check to be written parameters of the target No.

If you write all of parameters, select All constant number tab and put the check in Select All(All constant number:include not displayed).

4. Click "Write".

5. Turn the power OFF and ON again. The parameter is enabled.



Please change the parameter values according to usage.

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

Refer to "LECY□ operation manual (Simplified Edition)" for details of parameters recommended value of each actuator.

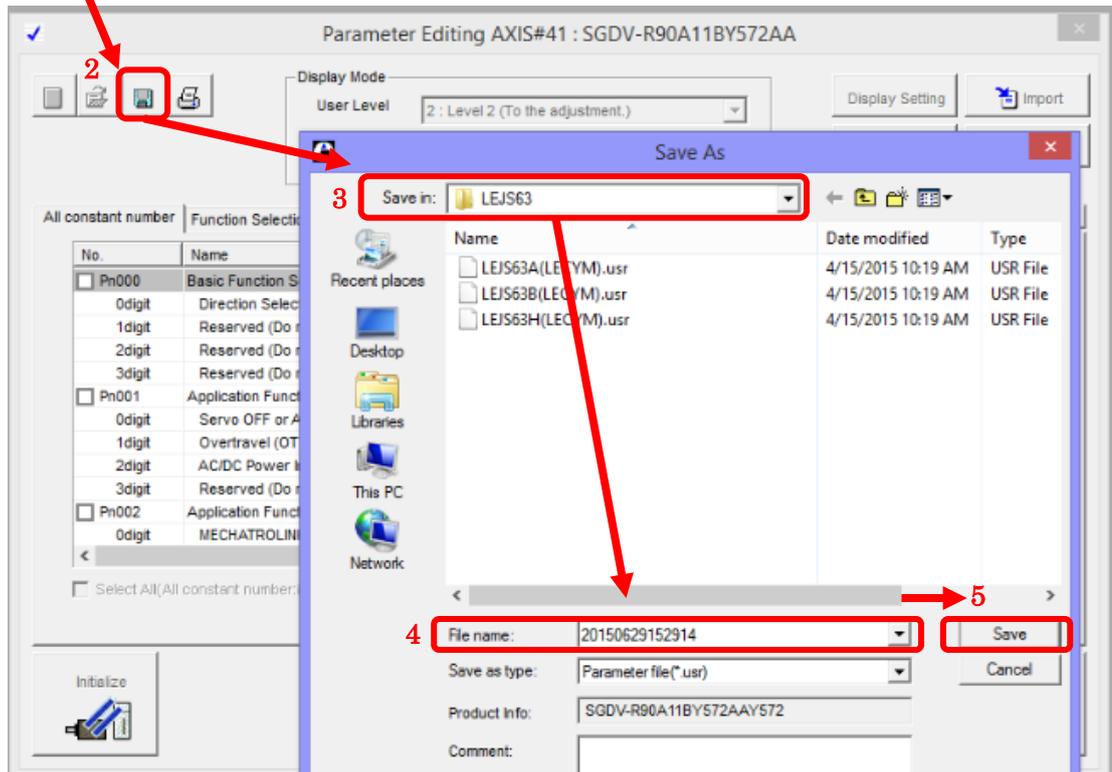
4.4 Saving Parameters (Online)

Saving parameters has done in Online or Offline.

1. From the menu bar, click "Parameters(U)"-"Edit Parameters(U)".
The "Parameter editing" window will be displayed.
2. Click the button to save of the "Parameter Editing" window.
"Save as" window will be displayed.
3. Please specify location to be saved.
4. Please enter any file name.
5. Click "Save".

Saved file

.usr	Settings files for parameters.
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* When saving the current parameters of LECY□, please read the current parameters from the LECY□.
For the reading parameters method from LECY□ to SigmaWin+, refer to Section 4.4.1.

4.4.1 Reading Parameters from LECY□ (Online)

When reading parameters from the LECY□ to the SigmaWin+, please do “Read”.

Reading parameters from the LECY□ to the SigmaWin+ has done in Online. It can not be done in Offline.

1. From the menu bar, click “Parameters(U)”-“Edit Parameters(U)”.

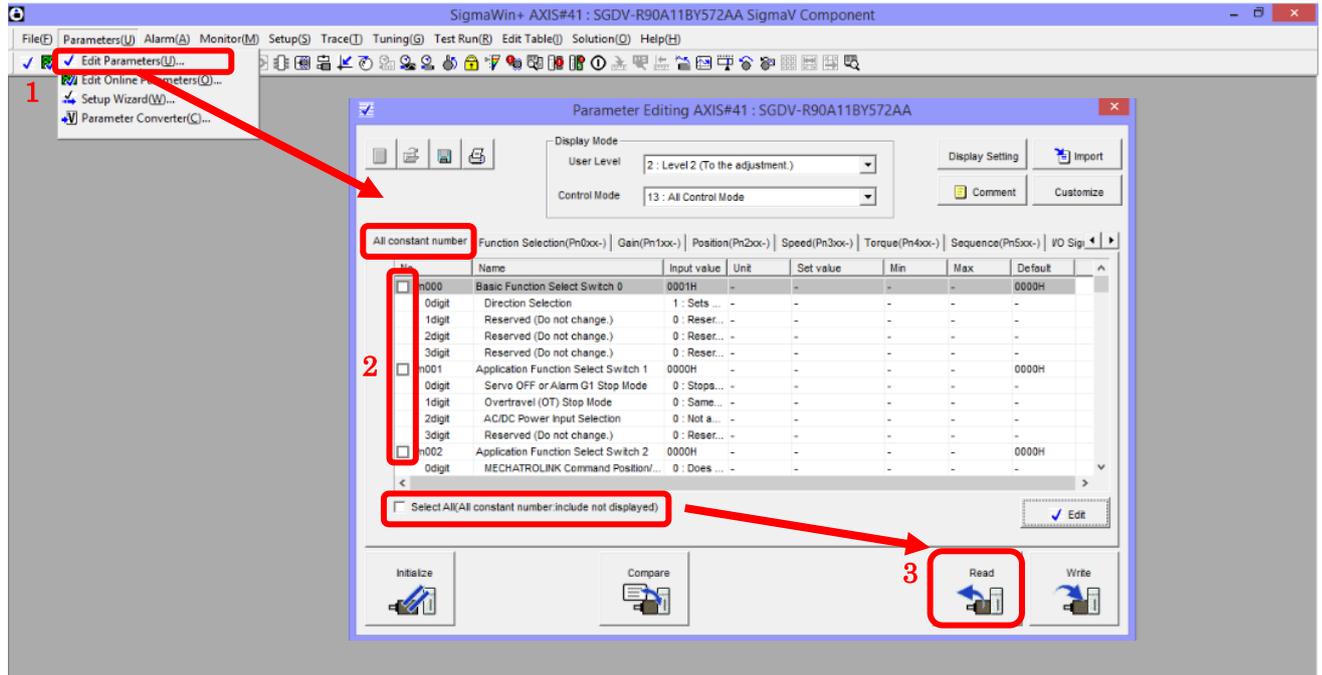
The “Edit Parameters” window will be displayed.

2. Please check to be read parameters of the target No.

If you read all of parameters, select All constant number tab and put the check in Select All (All constant number:include not displayed).

3. Click “Read”.

Parameter will be read, the "Parameter Editing" window will be overwritten.



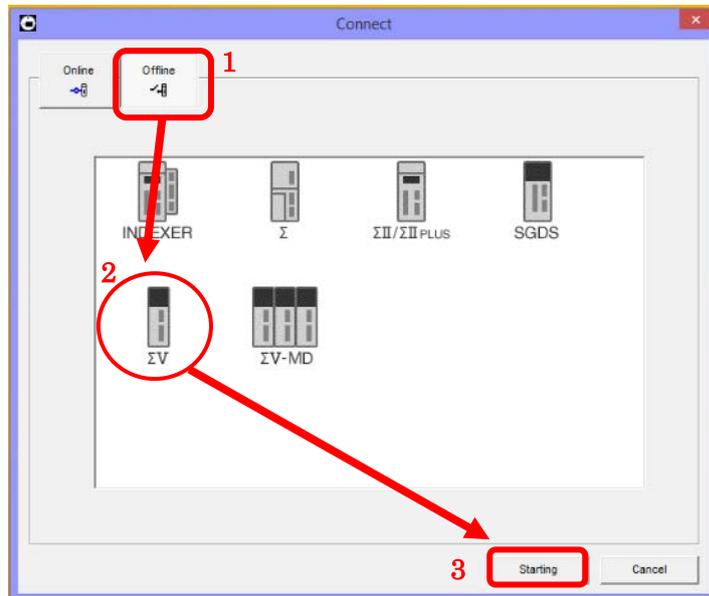
5. Offline Selection (Parameters reference)

It describes the operation procedure, reading parameters and saving parameters in Offline. Writing parameters can not be done in Offline.

5.1 Offline Operation Procedure

1. Select Offline in the Connect window.

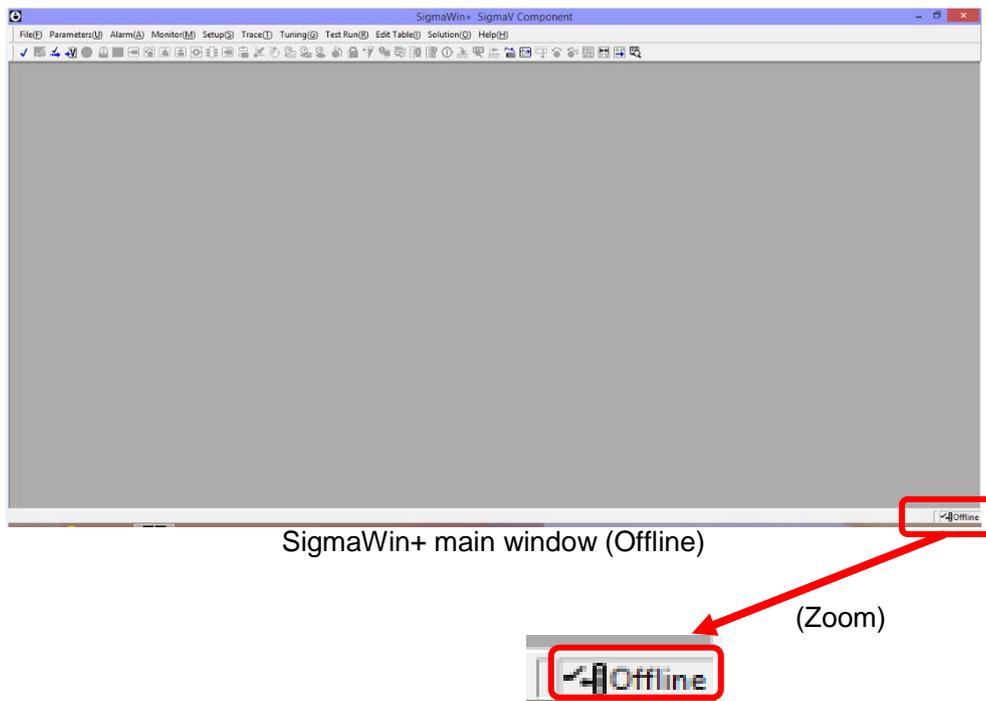
When Offline is selected, the window below will be displayed.



2. Select ΣV series.

3. Click "Starting". The SigmaWin+ main window will be displayed.

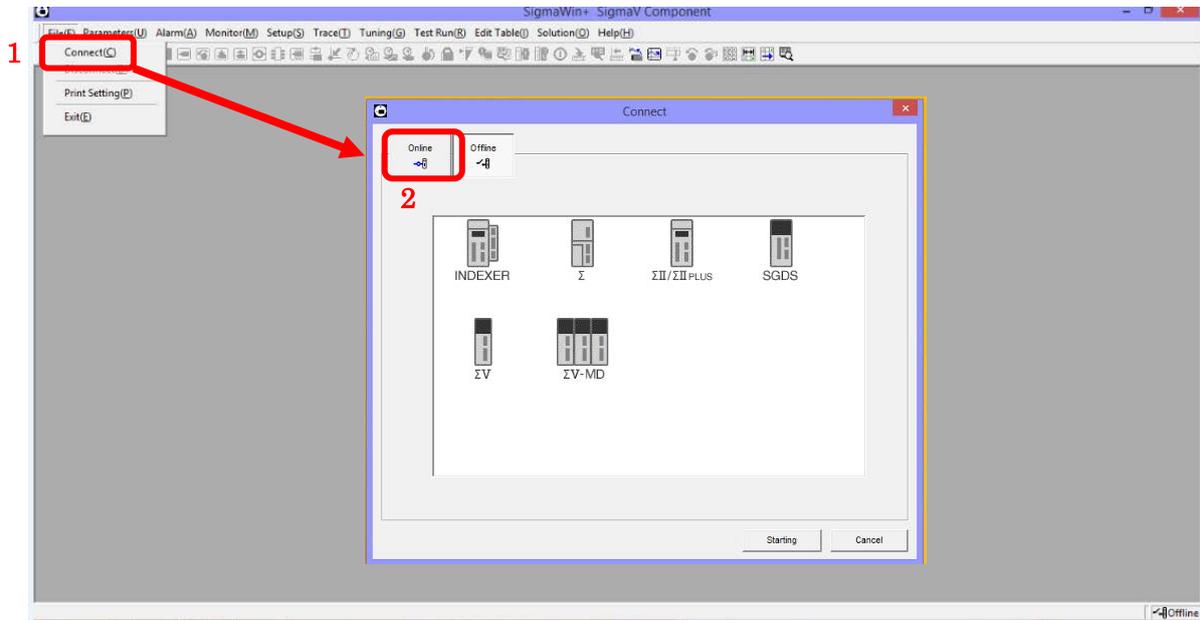
Offline state, you can check the display in the lower right part of the SigmaWin+ main window.



5.1.1 When switching from Offline state to Online state

It describes the operation when switching from Offline state to Online state.

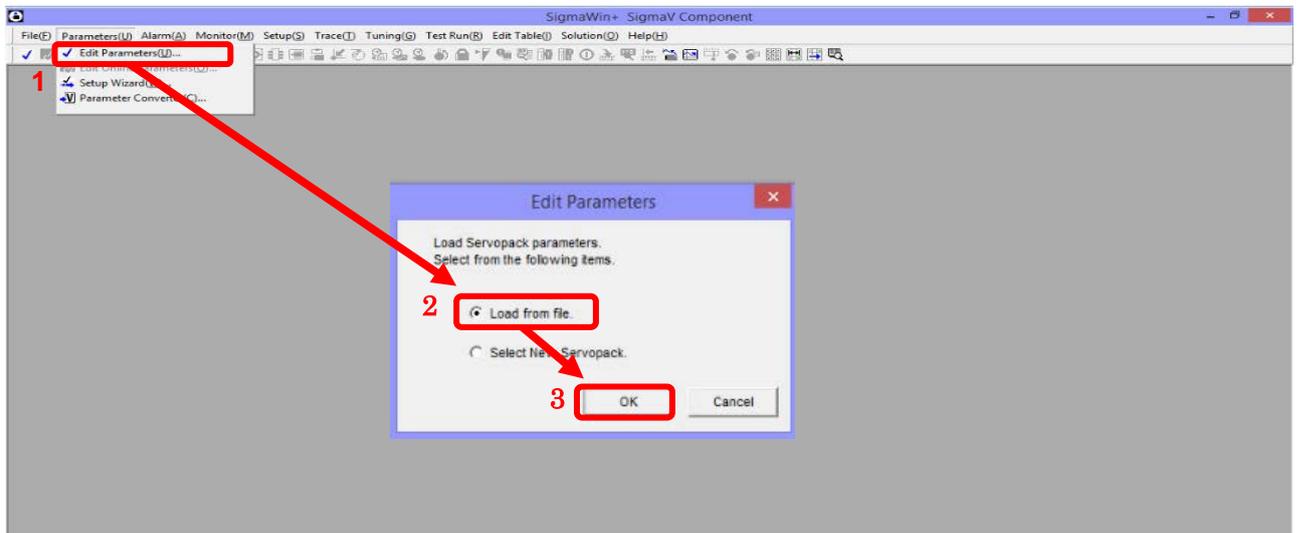
1. In the main window, close all windows that are open, such as "Parameter Editing" window.
From the menu bar of the main window, click "File(F)"-"Connect(C)".
"Connecting" window will be displayed.
2. Select "Online".
Subsequent online operation procedure, refer to Section 4.1. Please perform the operation up to a portion where the main window of Online is displayed.



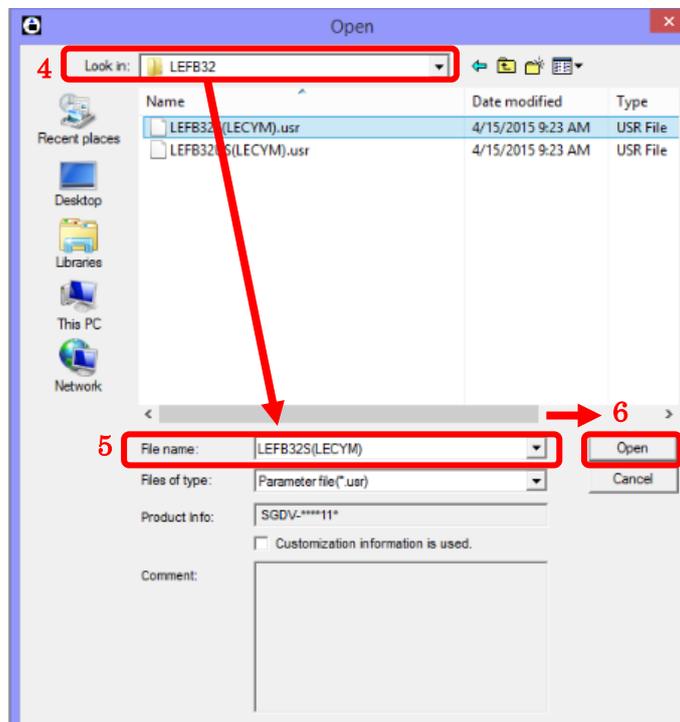
5.2 Reading Parameters from saved file (Offline)

It describes the reading parameters from saved file to SigmaWin+ in Offline.

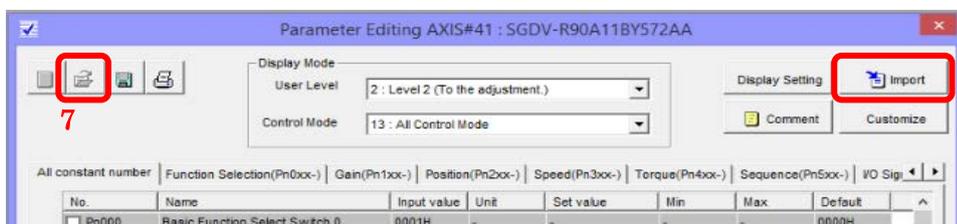
1. From the menu bar, click "Parameters(U)"-"Edit Parameters(U)".
The "Edit Parameters" window will be displayed.
2. Select the Load from file.
3. Click "OK".
"Open" window will be displayed.



4. Please specify location of the file.
 5. Please select the file you wish to import parameters [.usr].
 6. Click "Open".
- The "Parameter Editing" window will appear, parameters will be read.



7. For reading a new file, click the button to open or Import of the "Parameter Editing" window, "Open" window appears. Please select a new file.



5.3 Saving Parameters (Offline)

Saving parameters has done in Offline or Online. For the saving parameters from SigmaWin+ to file destination, refer to Section 4.4.

Revision history
No.LEC-OM09601 Sep/2015 1st printing

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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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