

AC Servo Drives Engineering Tool SigmaWin+ ONLINE MANUAL Σ -7 Component



MANUAL NO. SIEP S800001 48C

Copyright © 2014 YASKAWA ELECTRIC CORPORATION

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form, or by any means, mechanical, electronic, photocopying, recording, or otherwise, without the prior written permission of Yaskawa. No patent liability is assumed with respect to the use of the information contained herein. Moreover, because Yaskawa is constantly striving to improve its high-quality products, the information contained in this manual is subject to change without notice. Every precaution has been taken in the preparation of this manual. Nevertheless, Yaskawa assumes no responsibility for errors or omissions. Neither is any liability assumed for damages resulting from the use of the information contained in this publication.

Safety-Related Symbols

The following symbols are used in this manual according to the safety-related content. Be sure to observe text annotated with these safety symbols as their content is important.



AUTION

Indicates precautions that, if not heeded, could possibly result in loss of life or serious injury.

Indicates precautions that, if not heeded, could result in relatively serious or minor injury, damage to the product, or faulty operation.

Furthermore, items marked with $\underline{\land CAUTION}$ may have important consequences depending on the situation.

Manual Outline

This manual explains the following areas for SigmaWin+ Σ -7 component users.

- Outline of SigmaWin+ Σ -7 component functions and operation
- SigmaWin+ Σ -7 component installation/removal
- Outline of SigmaWin+ Σ -7 component functions and operation when connecting through an MP2000/MP3000-series Machine Controller (hereinafter referred to as Controller).
- How a SigmaWin+ Σ-7 component connected through a Controller differs from a conventionally connected SigmaWin+ Σ-7 component.

Related Manuals

Be sure to refer to the corresponding technical materials regarding related devices, modules, and other equipment.

Use this product only with a full understanding of its specifications, service life, and other important information.

Document Number	Document Name	
KAEP S800001 22	Machine Controller and Servo Drive Solutions Catalog	
KAEP S800001 23	AC Servo Drives Σ -7 Series	
SIEP S800001 26	Σ -7-Series AC Servo Drive Σ -7S SERVOPACK with Analog Voltage/Pulse Train References Product Manual	
SIEP S800001 27	Σ -7-Series AC Servo Drive Σ -7S SERVOPACK with MECHATROLINK-II Communications References Product Manual	
SIEP S800001 28	Σ -7-Series AC Servo Drive Σ -7S SERVOPACK with MECHATROLINK-III Communications References Product Manual	
SIEP S800001 29	Σ -7-Series AC Servo Drive Σ -7W SERVOPACK with MECHATROLINK-III Communications References Product Manual	
SIEP S800001 36	Σ-7-Series AC Servo Drive Rotary Servomotor Product Manual	
SIEP S800001 37	Σ-7-Series AC Servo Drive Linear Servomotor Product Manual	
SIEP S800001 38	Σ -7-Series AC Servo Drive Direct Drive Servomotor Product Manual	
SIEP S800001 64	Σ -7-Series AC Servo Drive Σ -7S SERVOPACK with Indexer Module Product Manual	
SIEP S800001 70	Σ -7-Series AC Servo Drive Σ -7S SERVOPACK with DeviceNet Module Product Manual	
SIEP C720829 06	AC Servo Drives Σ-V Series/Σ-V Series for Large-Capacity Models/Σ-7 Series User's Manual Safety Module	

How to Use this Manual

Meaning of Basic Terms

This manual applies the following meanings to the terms below unless otherwise specified.

Servomotor: A Σ -7-series Rotary Servomotor, Direct Drive Servomotor, or Linear Servomotor.

SERVOPACK: A Σ -7-series SERVOPACK.

Servo Drive: The combination of a Servomotor and SERVOPACK.

Servo System: A servo control system that includes the combination of a

Servo Drive with a host controller and peripheral devices.

Notes on the PC Communication Function

MECHATROLINK-II/III-compatible SERVOPACK

The SERVOPACK for MECHATROLINK-II/III can perform communications with SigmaWin+ (USB) and the host controller (MECHATROLINK-II/III).

If the SERVOPACK is used to communicate with two or three of these devices at the same time, note the following precautions.

- When parameters are written in from two or three devices, the latest parameter settings that was written is valid.
- When an operation is conducted in utility function mode (Fn $\square \square \square$) from SigmaWin+ or the host controller, the operation with other communications cannot be carried out.

Regarding Software

Usage Notes

- Use this software on one specified PC. Request a separate license to use this software on another computer.
- Copying of this software for purposes other than use as backup copies is strictly prohibited.
- Carefully store the CD-ROM (original medium) upon which this software is written.
- Reverse compiling or assembly of this software is strictly prohibited.
- Use of this software in whole or in part by a third party through transfer, exchange, resale, and so forth, is strictly prohibited without the prior agreement of Yaskawa Electric Corporation.
- Copyright and all other rights for this software are reserved by Yaskawa Electric Corporation.

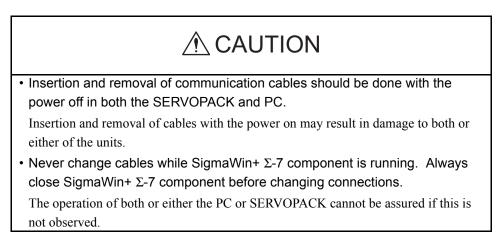
Operating Systems and Registered Trademarks

- Windows XP, Windows Vista, and Windows 7 are trademarks or registered trademarks of Microsoft Corporation in the USA and other countries.
- MECHATROLINK is a trademark of the MECHATROLINK Members Association.
- Adobe Reader is a trademark or a registered trademark of Adobe Systems Incorporated.
- Pentium is a trademark or a registered trademark of Intel Corporation.
- Ethernet is a trademark of Xerox Corporation.
- InstallShield is a registered trademark of InstallShield Software Corporation.
- Other product and company names used in this manual are the trademarks or registered trademarks of their respective company. "TM" and the ® mark do not appear with product or company names in this manual.

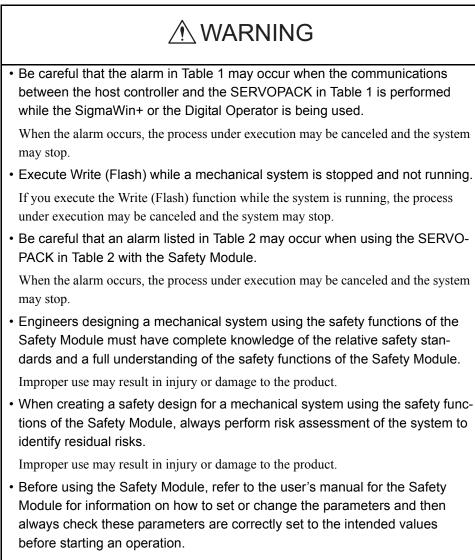
Safety Notes

The following are important cautionary items that must be observed in the wiring and use of this product.

Notes on Wiring



Usage Notes



Failure to observe this warning may result in injury or damage to the product.

SERVOPACK Model T	ΓοοΙ	Digital Operator	SigmaWin+: USB Connection
SGD7D-DDDAD (For MECHATROL Communications)	LINK	 A.95A The SERVOPACK can be used with no problem when the following functions are being executed. Monitor Alarm displays (excluding resetting alarms and clearing the alarm history) If an alarm occurs, the operation of the Safety Module will not proceed or cannot be accurately monitored. Clear the alarms to resume the operation. For details on how to clear the alarms, refer to the product manual for the SERVO-PACK being used. 	 A.95A The SERVOPACK can be used with no problem when the following functions are being executed. Editing Parameters (except for parameter initialization) Monitor Alarm displays (excluding resetting alarms and clearing the alarm history) Tracing If an alarm occurs, the operation of the Safety Module will not proceed or cannot be accurately monitored. Clear the alarms to resume the operation. For details on how to clear the alarms, refer to the product manual for the SERVO-PACK being used.

Table 1 Possible Alarms

Note: When a MECHATROLINK command is sent from the host controller, an alarm may occur during

execution of the following command: PRM_RD/PRM_WR/PPRM_WR/CONFIG/SENS_ON/ALM_RD/ALM_CLR (history)/ADJ/SENS_ON of SVCTRL/ID_RD

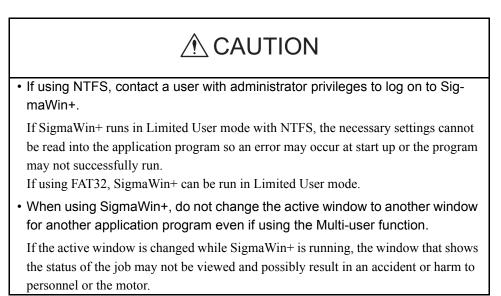
SERVOPACK	Tool	Digital	SigmaWin+:
Model		Operator	USB Connection
SGD7S+SGDV (Safety Module)		A A.C90/C91/C92/EB0 If an alarm occurs, the operation of the Safety Module will not proce cannot be accurately monitored. Clear the alarms to resume the opera For information on resetting alarms, refer to the product manual for y SERVOPACK.	

Table 2 Precautions When Using a Safety Module

• Always be sure to close SigmaWin+ Σ -7 component before turning the SER-VOPACK power off or on.

The operation of both or either the PC or SERVOPACK cannot be assured if this is not observed.

Notes on Using Windows XP



Contents

Safety-Related Symbols	
Manual Outline	
Related Manuals	
How to Use this Manual	
Notes on the PC Communication Function	
Regarding Software	
Safety Notes	

1 System Outline

1.1	Outline and Advantages of SigmaWin+ Σ -7
	Component 1-1
1.2	Configurations 1-2
1.3	Compatible Devices 1-5
1.4	System Requirements 1-6
1.5	Installing SigmaWin+ Program 1-9
1.6	Removing SigmaWin+ Program 1-15
1.7	Installing and Removing Other SigmaWin+
	Programs 1-17

2 Starting SigmaWin+

2.1 Starting SigmaWin+	. 2-1
2.1.1 From the Start Menu	. 2-1
2.1.2 From a Shortcut	. 2-1
2.2 Selecting a SERVOPACK	. 2-2
2.2.1 USB Connection	. 2-2
2.2.2 When using a Controller	. 2-5

3 SigmaWin+ Σ -7 Component Main Window

4 Operation

4.1 Changing Axes	4-1
4.2 Editing Parameters	4-4
4.2.1 Editing Parameters	
4.2.2 Editing Parameters Online	. 4-37
4.2.3 Setup Wizard	
4.2.4 Parameter Converter	. 4-85
4.3 Alarms	. 4-91
4.3.1 Displaying Alarms	. 4-91
4.3.2 Resetting Motor Type Alarms	. 4-94
4.4 Monitor	. 4-95
4.4.1 Product Information	. 4-95
4.4.2 Monitor	
4.4.3 Wiring Check	
4.4.4 Service Life Monitor	4-107
4.5 Setup	4-110
4.5.1 Setting the SERVOPACK Axis Name	4-110
4.5.2 Setting the Absolute Encoder	
4.5.3 Offset Adjustment	
4.5.4 Origin Search	
4.5.5 Write Prohibited Setting	
4.5.6 Tuning-less Level Setting	
4.5.7 Initializing Vibration Detection Level	
4.5.8 EasyFFT	
4.5.9 Reset Option Module Configuration Error4.5.10 Safety Option Module Setup Alarm Clear	
4.5.11 Resetting the SERVOPACK by Software	
4.5.12 Writing the Motor Parameters in the Scale	
4.5.13 Detecting the Polarity	
4.5.14 Setting the Zero Point Position of the Absolute Linear	
Encoder	4-157
4.6 Tracing	4-160
4.6.1 Trace Function	4-160
4.6.2 Real Time Trace Function	
4.7 Tuning	4-221
4.7.1 Moment of Inertia (Mass) Identification	
4.7.2 Autotuning with Reference Input	
4.7.3 Autotuning without Reference Input.	
4.7.4 Custom Tuning	
4.7.5 Gain Switching When Motor/Machine Is Stopped	
4.7.6 Anti-resonance Control Adjustment Function	4-260
4.7.7 Vibration Suppression Function	4-263

4.8 Test Run 4-266
4.8.1 JOG Operation
4.8.2 Program JOG Operation 4-269
4.9 Table Editing 4-273
4.9.1 Program Table Editing 4-273
4.9.2 Zone Table Editing 4-306
4.9.3 Jog Speed Table Editing 4-323
4.10 Solutions 4-340
4.10.1 Mechanical Analysis Function
4.10.2 Ripple Compensation 4-379

Appendix A Cable Between the PC and SERVOPACK

Appendix B Install File List

Appendix C USB Driver Installation

C.1	Installing the Driver	C-2
C.2	Confirming the Installation Status	C-7
C.3	Removing a USB Device	C-9

Revision History

1 System Outline

This section includes an outline of the SigmaWin+ Σ -7 component system, and explains its advantages and preparation prior to use.

1.1 Outline and Advantages of SigmaWin+ Σ -7 Component

The SigmaWin+ Σ -7 component is an engineering tool for setup and optimum SERVOPACK tuning of Yaskawa Σ -7-series AC Servo Drives.

This product provides uniform features and functions enabling everyone from beginners to persons experienced in servo tuning to easily perform connections, test runs, and tuning that are matched to the customer's machine right out of the box.

Main Functions

- Parameter editing and converting
- Display and release of generated alarms (displays appropriate to the cause and resolution method)
- Display of SERVOPACK data, such as I/O signals and the internal status, and product data
- Various setup functions such as those for the absolute encoder, and offset adjustment
- Graph displays for torque reference, speed feedback, and so on
- Analysis of the customer's machine such as mechanical analysis (FFT analysis), and inertia identification

1.2 Configurations

SigmaWin+ Σ -7 components can be connected to SERVOPACKs in either of the following two ways.

<USB Connection>

One SigmaWin+ Σ -7 component is connected to one SERVOPACK at a time. The communication cable has to be changed to connect the SigmaWin+ Σ -7 component to another SERVOPACK.

<When using a Controller>

One SigmaWin+ Σ -7 component can tune the connected SERVOPACKs through a Controller equipped with a MECHATROLINK communication cable.

When running a SigmaWin+ Σ -7 component through a Controller that is connected to multiple SERVOPACKs, there is no need to change the connection of the communication cable when switching SERVOPACK connections.

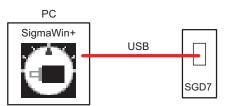
Two connection methods are possible when using a Controller.

- Ethernet
 - Connects a PC to a Controller through an Ethernet network.
- PCI bus

Connects a PC in which a Controller board is installed.

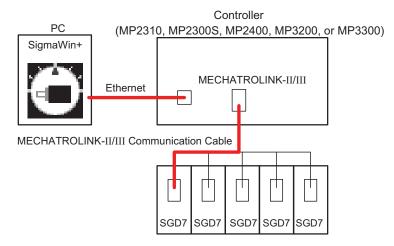
Note: Among SigmaWin+ components, only the SigmaWin+ Σ -7 component is compatible with connection of SigmaWin+ through a Controller.

USB Connection



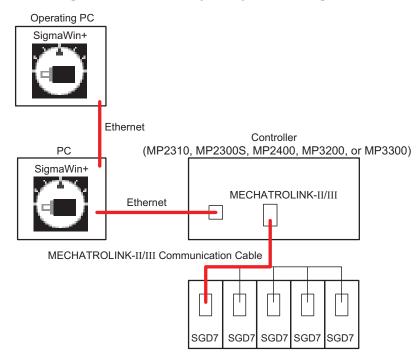
■ When using a Controller

Using Ethernet

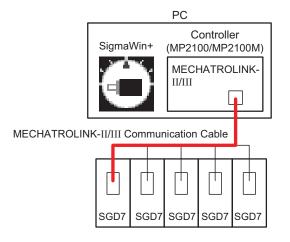


<Remote operation>

For a remote operation, the following configuration is required.

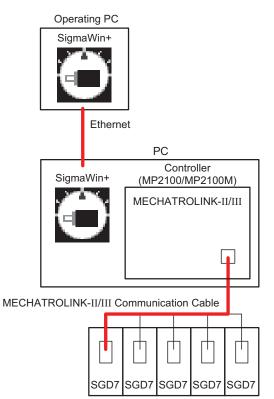


Using PCI



<Remote operation>

For a remote operation, the following configuration is required.



1.3 Compatible Devices

The SigmaWin+ Σ -7 component is compatible with the following Σ -7 SERVOPACKs.

- SGD7S-□□□A00
- SGD7S-□□□A10
- SGD7S- $\Box\Box$ A20
- SGD7S-DDDAE0
- SGD7W-□□□A20



Some SigmaWin+ Σ -7 functions may be unusable depending on the SERVOPACK type. Unusable functions will appear dimmed on the selection menu.

1.4 System Requirements

When using USB

SigmaWin+ Σ -7 component requires the following minimum system configuration.

Personal Computer (PC)	PC/AT DOS/V-compatible device Note: Operation cannot be assured on the NEC PC9821 series.	
Processor	Pentium 200MHz	
Main Memory	64MB (96MB recommended)	
Free Hard Disk Space	 At Normal Setup 450 MB min. (500 MB or greater recommended for installation) At Custom Setup Σ component: 40MB Σ-II component: 90MB SGDS component: 70MB SGDX component: 70MB Σ-V component: 70 MB min. INDEXER component: 70MB MECHATROLINK-II component: 70MB Σ-V-MD Component: 70 MB min. Σ-7 component: 70 MB min. (100MB recommended at each installation) 	
Monitor	XVGA (1024×768 or greater using a small font)	
Number of Colors	256 colors (65536 colors recommended)	
Operating System (OS)	 Windows XP * Windows Vista Windows 7 (32 bit/64 bit) 	
Communication Cables for SERVOPACK to PC Connection	USB Connection The following cable is available from Yaskawa. Contact Yaskawa if necessary. JZSP-CVS06-02-E	
Others	One or more USB interfaces CD-ROM drive (for installation only)	

* If using HotfixQ328310, SigmaWin+ may or may not be installed. If it cannot be installed, use HotfixQ329623 instead.

When using a Controller

SigmaWin+ Σ -7 component connected through a Controller requires the following minimum system configuration.

Using MECHATROLINK-II

Communication Interface	Ethernet, PCI BUS		
Controller	MP2000 or MP3000 Machine Controller		
	Controller	MECHATROLINK module	Version
	MP2100	SVB (built-in CPU)	Version 2.89 or later
	MP2100M	SVB (built-in CPU)	Version 2.89 or later
		SVB-01	Version 1.33 or later
	MP2200 CPU-03	SVB-01	Version 1.33 or later
	MP2200 CPU-04	SVB-01	Version 1.33 or later
	MP2310	SVB (built-in CPU)	Version 2.89 or later
		SVB-01	Version 1.33 or later
	MP2300S	SVB (built-in CPU)	Version 2.89 or later
		SVB-01	Version 1.33 or later
	MP2400	SVB (built-in CPU)	Version 2.89 or later
	MP3200	SVB-01	Version 1.33 or later
	MP3300	SVB-01	Version 1.33 or later
	master when you usOther required settinSet the number ofThe set number ofretry processing time	e SigmaWin+ Σ -7 comp ngs are as follows. retry to slaves to one or retry to slaves must be mes.	n of the MECHATROLINK onent through a Controller. more. greater than the number of try processing times) > 1

Communication Interface	Ethernet, PCI BU	JS	
Controller	Machine Controller MP2000/MP3000 Series		
	Controller	MECHATROLINK module	Version
	MP2100M	SVC-01	Version 1.12 or later
	MP2101M	SVC-01	Version 1.12 or later
	MP2101T	SVC (built-in CPU)	Version 2.88 or later
	MP2101TM	SVC (built-in CPU)	Version 2.88 or later
		SVC-01	Version 1.12 or later
	MP2200 CPU-03	SVC-01	Version 1.12 or later
	MP2200 CPU-04	SVC-01	Version 1.12 or later
	MP2310	SVC-01	Version 1.12 or later
	MP2300S	SVC-01	Version 1.12 or later
	MP3200	SVC (built-in CPU)	Version 1.11 or later
		SVC-01	Version 1.12 or later
	MP3300	SVC (built-in CPU)	Version 1.10 or later
		SVC-01	Version 1.10 or later
	 Enable the message communication function of the MECHATROLINK master when you use SigmaWin+ Σ-7 component through a Controller. Other required settings are as follows. Set the number of retry to slaves to one or more. The set number of retry to slaves must be greater than the number of retry processing times. 		

When Using MECHATROLINK-III Communications

1.5 Installing SigmaWin+ Program

To install SigmaWin+, run the setup file for SigmaWin+. And the installation process will begin. In this process, SigmaWin+ and the related files will be installed, or stored on the hard disk.

Operating conflicts may arise with the other programs during installation. Be sure to close all other programs before installing SigmaWin+.

Install the program using the following procedure.

- 1. Insert the CD-ROM into the CD-ROM drive (the D-drive for example).
- 2. If "Autoplay" is enabled, the installation program will automatically start when the CD-ROM is inserted.

If "Autoplay" is not enabled, either of the following methods may be used.

- On the Start menu, select **Run**. Type "D:\SETUP", and then click **OK**.
- Open the Explorer, load the CD-ROM contents, and double click "D:\SETUP.EXE".

YASKAWA SigmaWin+ English I	dition Ver.S. I I - InstallShield Wizard	×
	Welcome to the InstallShield Wiczeld for YASKAWA SigmoW Ver.5.11 The InstallSheld Wiczeld will entitel YASKAWA SignaWin+ English Edito computer. To continue, click Neel.	
InstallStide	< Back [get 2]	Cancel

A message will appear, welcoming you to the SigmaWin+ program.

3. Click Next to continue. The License Agreement window will appear.



4. Read the agreement and select "I accept the terms of the license agreement" to agree. Then click **Next** to continue. The Choose Destination Location window will appear.

VASKAWA SigmaWin+ English E Choose Destination Location Select folder where setup will in:		×	
	Initial YASKAWA SignaWen English Editor Vie 511 to M Yhogran Filer/SignaDE	Dwp.	
InstallStried	< gask [jews]	Cancel	

5. Follow the onscreen instructions to choose a destination folder to copy the SigmaWin+ file to, and click **Next** to continue.



6. Select the setup type.

<To install all components of SigmaWin+>

Choose "Complete" and click **Next**. The Select Program Folder window will appear.

YASKAWA SigmaWin+Englist Select Program Folder	Edition Ver.5.11 - Installshield Wizard	X
Please select a program folder		
	Selay will add program score to the Program Fakle Islind bolow. You may type a new Hall or select one from the existing Island Isl. Clob. Heal to continue. Program Folder: Managebolom Advancestation Advancestation Stockap The Applications	Alter name.
InstallSridd	<2,ack Next>	Cancel

<To install selected components of SigmaWin+>

(1) Choose "Custom" and click Next. The Select Features window will appear.

Select Features Select the features setup will in	dition Ver.5.11 - InstallShield Wizard	×
	Select the features you work to instal, and deneted Select the features you work to instal, and deneted SEGUE Component SEGUE Component SEGUE Component SEGUE Component	t the feature you do not want to instal Conceptor Please indext this component signado once.
festal 1966	232.13 MB of space required on the M drive 407.75 MB of space available on the M drive < Back Next >	Carost

(2) Select the components to be installed, and click **Next**. The Select Program Folder window will appear.

Select Program Folder	h Edition Ver.5.11 - Installshield Wizard 🗙
Please select a program fold	HI.
	Setup will add pergram icons to the Program Folder lated below. You may type a new tukter name, or select one from the existing folders list. Click Next to continue.
	Program Folder:
	Existing Folder: Accessories Administrative Tools
	Statup MELApplications
InstallSridd	< Back Next > Cancel

7. Select the program group to create the SigmaWin+ icon. "YE_Applications" is the default setting. After selecting the program group or folder, click **Next** to continue. The Ready to Install Program window will appear.

Ready to Install the Progr The wizard is ready to begin	dition Ver.5.11 - InstallShield Wizard	×
	Click Install to begin the mataliation. If you want to review or change any of your installation settings, waining	
InstallScient	< Back	Cancel

8. Click Install.

The PC files will be copied to PC from the CD-ROM. The percentage of the copying that has been completed will be shown.

	WA SigmaWin+English E p Status	dition Yer.S.11 - InstallShield Wizard	×
		The InstallSheld Woed is installing YASP2WA SignalWine English Edition Ver 511 Installing	
Inc	allosof		Cancel

Note: If new versions of the PC support files are needed to install SigmaWin+, a window will appear asking whether to overwrite the current version or to cancel the installation. SigmaWin+ may not run correctly if the new versions of the support files are not installed.



If SigmaWin+ has been successfully installed, the InstallShield Wizard Complete window will appear.

9. Click **Finish** to complete the setup.

1.6 Removing SigmaWin+ Program

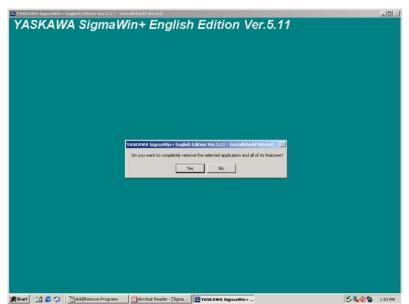
Remove the SigmaWin+ program using the following procedure.

- 1. Click the Start button, point to Settings and click Control Panel.
- 2. Click the Add/Remove Programs icon. The Add/Remove Programs Properties box appears.

Add/Remov	e Programs		_ 🗆 ×
1	Currently installed programs:	Sort by: Name	•
Change or Remove	👹 (PSON Printy: Software)		<u>^</u>
Programs	YASKAWA SigmaWin + English Edition Ver.5.11 Click here for support information.	Size Used Last Used On	310MB frequently 6/12/2008
Add New Programs	To change this program or remove it from your computer, click Change or Remove.	Change	Remove
Add/Remove			
Windows Components			
÷			
Set Program Access and Defaults			
			¥

3. Click **YASKAWA SigmaWin+ English Edition** as the program to be removed, and then click **Change/Remove**.

A confirmation message will appear asking if you are sure you want to remove the program.



4. Click **Yes** to start removing the program. When the program has been successfully removed, the following window will appear telling you that maintenance is complete.

TASLAWA SigmaWin+ h	nglish Edition Yer.S.TT - InstallShield Woard	
	Uninstall Complete	
	InstalSifedd Woard has Involved unnataling YASHAWA SignaWrin-English E shon Yet 511.	
InstallSinka	<back frink<="" td=""><td></td></back>	

5. Click **Finish** to complete the removal process.

1.7 Installing and Removing Other SigmaWin+ Programs

To change the SigmaWin+ program which is now installed, use the following procedure.

- 1. Insert the CD-ROM into the CD-ROM drive (the D-drive for example).
 - The setup maintenance program will automatically start.



2. Choose "Modify" and click Next.



The components with check boxes are currently installed.

To remove a component, clear the check box.
 Select the components to be installed and click Next.



4. Click **Finish** to complete the changing process.

2 Starting SigmaWin+

Start SigmaWin+ using the following method.

2.1 Starting SigmaWin+

Start SigmaWin+:

- from the Start menu
- from a shortcut

2.1.1 From the Start Menu

To start SigmaWin+ from the Start menu:

- 1. Click the **Start** button, and point to **Programs**.
- 2. Open the **YE_Applications** folder.
- 3. Click SigmaWin+.

2.1.2 From a Shortcut

To start SigmaWin+ from a shortcut on the desktop:

- 1. Open the YE_Applications folder on the desktop.
- 2. Click SigmaWin+.



SigmaWin+ Startup Screen

2.2 Selecting a SERVOPACK

2.2.1 USB Connection

When SigmaWin+ is initially started, the Connect dialog box appears. Enter the settings for communications between SigmaWin+ and the SERVOPACK by means of a communication port.

Online	Offline			
) USB		Controller		🕀 Search
Axis No.	Servopack	Servomotor	Option	Axis name
				Connect Cancel

Select the method to set up the SERVOPACK: online or offline. Online is the default setting.

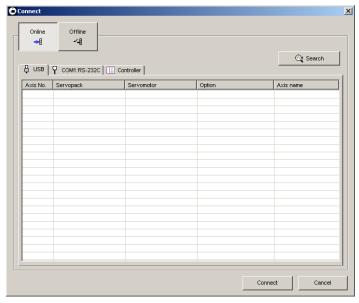
- Online: Select when setting up or tuning the servo drive with the SERVOPACK connected
- Offline: Select when editing parameters or checking screens for tracing or mechanical analysis without the SERVOPACK connected

Connec × Offline ∽-@ Online ΣΠ/ΣΠ PLUS INDEXER H Ī ilili SGDS 51/ ΣV-MD MECHATROLINK-I Starting Cancel

<When Offline is selected>

Select the SERVOPACK series and click **Starting**. The SigmaWin+ main window will appear.

<When Online is selected>



Enter the necessary settings for communication setup.

1. Click Search.

earch Condition Setting	X
Check off the target that is not needed to search	
Target Servopack Series Setting	
▼ 0 Σ7 ▼ 7 23 ▼ 0 211 ▼ 5 21/21 21 ▼ 0 211 ▼ 5 21/21 10 ▼ 0 21 ▼ 5 21 21	
BUSB VSB COM1:RS-232C CONTroller Ethernet	_
I Search	
When searching for a USB communications interface, a batch search is executed and information on all the USB connection axes of the selected series will be searched for.	
Search Cancel	

Note: SigmaWin+ is compatible with the following SERVOPACKs.

- Σ -7 Series
 - SGD7S-□□□A00
 - SGD7S-□□□A10
 - SGD7S-□□□A20
 - SGD7S-DDDAE0
 - SGD7W-□□□A20
- 2. Select SERVOPACK series and make the settings required. Click Search.

After the SERVOPACKs have been successfully connected to SigmaWin+, a list of the connected SERVOPACKs will appear on the screen.

8 use l	USB V COM1:RS-232C Controller			🗍 🖓 Search	
Axis No.	Servopack	Servomotor	Option	Axis name	
4	SGD7S-R70A20A	SGM7J-A5A7A21			

SERVOPACK Selection Box

 Select the SERVOPACK to be connected and then click Connect, or just double-click the SERVOPACK to be connected. The SigmaWin+ main window will appear. Click Cancel to close the dialog box.

If the SERVOPACK is not Displayed

If the SERVOPACK is not displayed though a SERVOPACK is connected, problems may occur in communications.

Check Item	Measure
Is the power on?	
Are the connections loose?	Fasten all communication cable connectors securely.
Was the correct communications interface (port) selected?	Make sure that the communications interface (port) connected to the communication cable is the same as the port selected during connection.
Is the axis address correct?	Check the following item for the axis address of the connected SERVOPACK.Do not use an axis address of 0.
Is a battery being used to power the PC?	Problems in communications may occur if the PC is running on batteries. Use AC power.
Is the wiring correct?	Check the communication cable wiring. For information on wiring, refer to the product manual for your SERVOPACK.
Is the communication cable the recommended length?	Shorten the cable length as much as possible. Recommended Lengths of Communication Cables USB: Maximum 5 m (30 m in total by connecting five hubs.)

Check the following items if the SERVOPACK is not displayed.



If the SERVOPACK selection box still does not appear even after checking the above items:

Communications may be impossible due to external environmental influences such as noise.

If communications are not possible even after checking all of the above items, try using a different computer.

2.2.2 When using a Controller

Ethernet

The following two connection methods are possible when using Ethernet.

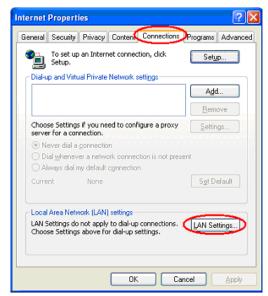
- Normal Ethernet connection
- Remote Ethernet connection

Normal Ethernet Connection

The IP address of the PC must be set before SigmaWin+ and the Controller are connected with Ethernet.

 Click the Start button, and then select Settings - Control Panel from the Start menu. Click the Internet Options icon in Control Panel.

The following dialog box will appear.



2. Select the **Connections** tab, and then click the **LAN Settings.** The following dialog box will appear.

Local Area Network (LAN) Settings
Automatic configuration Automatic configuration may override manual settings. To ensure the use of manual settings, disable automatic configuration.
Use automatic configuration script
Address
Proxy server Use a proxy server for your LAN (These settings will not apply to dial-up or VPN connections).
Address: Port: Advanced
Bypass proxy server for local addresses
OK Cancel

3. Confirm that the **Automatically detect settings** check box is not selected, and then click **OK** to close the dialog box.

 Click the Start button, and then select Settings - Control Panel from the Start menu. Click the Network Connections icon in the Control Panel. The following window will appear.

📴 Network and Dial-up Connection	s			- 🗆 ×
File Edit View Favorites Too	ols Advanced Help			1
← Back → → → 🔂 📿 Search	Bolders 🕜 History	R R X O		
Address 違 Network and Dial-up Conr	nections			• @Go
	Name 🛆	Туре	Status	Device Na
	Make New Connection			
Network and Dial-up	Local Area Connection	LAN	Network cable unplugged	Intel(R) P
Connections				
This folder contains network connections for this computer, and a wizard to help you create a new connection.				
To create a new connection, click Make New Connection.				
To open a connection, click its icon.				
To access settings and components of a connection, right-click its icon and then click Properties.				
To identify your computer on the network, click <u>Network Identification</u> .				
To add additional networking components, click <u>Add Network</u> <u>Components</u> .				
Select an item to view its description.				
	•			Þ
2 object(s)				11.

5. Select *Local Area Connection*, and then click *Change settings of this connection* in the **Network Tasks** field.

The following dialog box will appear.

🕹 Local Area Connection Properties 🛛 🔗 🔀
General Authentication Advanced
Connect using:
Broadcom 440x 10/100 Integrated C
This connection uses the following items:
Client for Microsoft Networks
File and Printer Sharing for Microsoft Networks
QoS Packet Scheduler
Internet Protocol (TCP/IP)
Install Uninstall 🚺 Properties 🗋
~ Description
Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.
Show icon in notification area when connected ✓ Notify me when this connection has limited or no connectivity
OK Cancel

6. Select the *Internet Protocol (TCP/IP)* check box in the General tab page, and then click the **Properties.**

The following dialog box will appear.

	d automatically if your network support sed to ask your network administrator f
Obtain an IP address auton OUse the following IP address	
IP address:	192.168.1.2
Sybnet mask:	255 . 255 . 255 . 0
Default gateway:	
Obtain DNS server address	s automatically
Use the following DNS service	ver addresses:
Preferred DNS server:	
Alternate DNS server:	· · ·
	Advanced

7. Select Use the following IP address, and then enter the IP address you wish to enter and "255 255 255 0" as the *Subnet mask.* Click **OK** to close the dialog box.

8. When SigmaWin+ is initially started, the **Connect** dialog box will appear. Enter the settings for communications between SigmaWin+ and the SERVOPACK by means of a communication port.

- >- []	Offlin 				
j use	COM1:R	S-232C Controller]		🕀 Search
Line nu	Axis No.	Servopack	Servomotor	Axis name	Comments for axis

9. Confirm that the **Controller** tab is displayed and click **Search**. The following window will appear.

Search Condition Setting	×
Check off the target that is not needed to search	
Target Servopack Series Setting	
▼ 0 Σ7 Γ 0 Σ0 1 23 Γ 0 Σ Π Π Σ Π Π Σ Π Σ Σ Π Σ Π Σ Π Σ Π Σ Π Σ Π Π Σ Π Σ Π Σ Π Σ Π Σ Π Σ Π Σ Π Σ Π Σ Π Σ Π Σ Π Σ Π Σ Π Σ Π Σ Π Σ Π Σ Π Σ Π Σ Π Σ Ξ Ξ Ξ Ξ Ξ Ξ Ξ Ξ Ξ Ξ Ξ Ξ Ξ Ξ Ξ Ξ Ξ Ξ Ξ Ξ Ξ Ξ Ξ Ξ Ξ Ξ Ξ Ξ Ξ Ξ Ξ Ξ Ξ Ξ Ξ <td></td>	
B USB ♥ COM1:RS-232C III Controller B thernet	
Configure the settings for communications with the controller.	
Communication port -:ETHERNET (IP:192.168.1.5) Loca	
IP.Setting	
Target IP address 192 . 168 . 1 . 1	
Option CPU 0 : Main CPU (Basic CPU Module)	
Search Controller Search	
Controller Communication Info. Module name	
	-
Search Cance	3

10. Select the IP address of Ethernet as the **Communication Port** for the Controller connection.

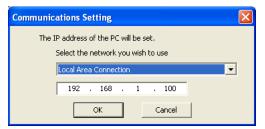
Search Condition Setting	×
Check off the target that is not needed to search	
Target Servopack Series Setting	
🔽 🖥 Σ7 🗖 🖥 ΣV 🗖	
	ΣIIINDEXER
🖁 USB 🛛 🖓 COM1:RS-232C 🛄 Controller 🖁 🚟 Ethernet	
I Search	
Auto Search C Axis Search	
Configure the settings for communications with the contr	er.
Communication port -:ETHERNET (IP:192.168.1.5) L	a
PCI[1] -:ETHERNET_(IP:192.168.1.5) L	al Area Connection
-:ETHERNET (IP:Auto) -:Remote (IP:192.168.1.5) Loca	Area Connection
Option CPU 0 : Main CPU (Basic CPU Module)	•
Search Controller Search	
Sec	cancel

<How to customize port settings>

Use the following procedure.

(1) Click IP Setting.

The following dialog box will appear.



- (2) Select a network and enter the IP address.
- (3) Click **OK** to close the dialog box.

The communication port is now available for selection.

IFO	The IP address of the connectable controller can be confirmed as follo
	응 USB 및 COM1:RS-232C III Controller 금 Ethernet
	Search Auto Search C Axis Search
	Configure the settings for communications with the controller.
	Communication port -:ETHERNET (IP:192.168.1.5) Loca
	IP Setting
	Target IP address 192 . 168 . 1 . 1
	Option CPU 0 : Main CPU (Basic CPU Module)
	Search Controller Search
	Controller Communication Info. Module name
	Cancel

1. Click Search of Controller tab.

The controller name, IP address/port, and module name will be displayed in the **Search Controller** list.

2. Confirm that the IP address selected as the **Communication port** is the same IP address shown in the **Search Controller** list.

11. Click Search.

Connectable SERVOPACKs will be found through the MECHATROLINK communication cable and the result will be displayed in the **Connect** window.

Online	Offlin				
		S-232C []] Controller			🕀 Search
Line nu	Axis No.	Servopack	Servomotor	Axis name	Comments for axis
1	1 (4-0)	SGD7S-R70A20A	SGM7J-A5A7A21		

- Note: Only controller modules that can be connected using MECHATROLINK communication cables are supported. "MP connection cannot be used for xxx." will be displayed when connected to an unsupported module (SVA module, PO module, and SVR module). The "xxx" represents a module name.
- 12. Select the SERVOPACK to be connected and then click **Connect**, or just double-click the SERVOPACK to be connected.

Remote Ethernet Connection

- 1. Perform steps 1 to 9 of the procedure for a normal Ethernet connection.
- 2. Select the communication port for the Controller connection.

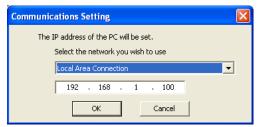
earch Condition Se	tting					2
Check off the target th	nat is not nee	ded to sea	ch			
Target Servopack S	eries Setting					
🔽 🖥 Σ7	Г	ΣV			1 Σ8	
🗖 📅 ΣΠΙ		Π ΣΠ/Σ	II PLUS			EXER
Π 🖥 Σ						
🕴 изв 🏹 сом	11:RS-232C	Contr	oller 🕂	Ethernet	1	
Search						
 Auto Search 	C 11/2 C					
 Auto search 	U AXIS S	earcri				
Configure th	e settings fo	r communic	ations with	the contr	roller.	
Communicat	ion port	:Remote (P:192.168	.1.5) Loc	al Ai 🔻	
				IP Setti	ina I	
Remote Kin	19	iateway(Ve	r7)		-	
Server Sett	ings –					
IP address		192 .	168 .	1.	200	
Port No.	1	5000				
Password	Г					
Controller S	ettinas					
Communical		THERNET[1	1		•	
Target IP a		192 .	168 .	1 .	1	
	1				_	
Option CPU) : Main CPl	J (Basic CP	U Module)	
						Control
				Se	arch	Cancel

<How to customize port settings>

Use the following procedure.

(1) Click IP Setting.

The following dialog box will appear.



- (2) Select a network and enter the IP address.
- (3) Click **OK** to close the dialog box.

The communication port is now available for selection.

3. Select *Gateway (Ver7)* as the Communication port.

- 4. Set the IP address, port number, and other required items for the server and the Controller.
- 5. Click Search.

Connectable SERVOPACKs will be found through the MECHATROLINK communication cable and the result will be displayed in the **Connect** window.

Online -	Offlin []				
A use i	COM1:R	S-232C []] Controller	1		🔍 Search
Line nu	Axis No.	Servopack	Servomotor	Axis name	Comments for axis
1	1 (4-0)	SGD7S-R70A20A	SGM7J-A5A7A21		

- Note: Only controller modules that can be connected using MECHATROLINK communication cables are supported. "MP connection cannot be used for xxx." will be displayed when connected to an unsupported module (SVA module, PO module, and SVR module). The "xxx" represents a module name.
- 6. Select the SERVOPACK to be connected and then click **Connect**, or just double-click the SERVOPACK to be connected.

PCI Connections

The following two connection methods are possible when using PCI.

- Normal PCI Connection
- Remote PCI connection

Normal PCI Connection

1. When SigmaWin+ is initially started, the **Connect** dialog box will appear.

onnect					
Online	- Offline				
		*			
-0	-0				
					🕀 Search
🖁 USB 🛛 🦞	COM1:RS	S-232C []] Controlle	er		
Line nu	Axis No.	Servopack	Servomotor	Axis name	Comments for axis
					onnect Cancel

2. Confirm that the **Controller** tab is displayed and click **Search**. The following window will appear.

Search Condition Setting	×
Check off the target that is not needed to search	
Target Servopack Series Setting	
🔽 🖥 Σ7 🗖 🛅 ΣΥ 🗖 👖 20	
B USB COM1:RS-232C Controller Ethernet	
I Search	1
Auto Search C Axis Search	
Configure the settings for communications with the controller.	
Communication port PCI[1]	
Option CPU 0 : Main CPU (Basic CPU Module)	
Search Can	cel

3. Select the communication port for the Controller connection, and click **Search**. Connectable SERVOPACKs will be found through the MECHATROLINK communication cable and the result will be displayed in the **Connect** window.

Online	Offlin				
8 use)	Р сом1:R	S-232C .Controller			🕀 Search
Line nu	Axis No.	Servopack	Servomotor	Axis name	Comments for axis
1	1 (4-0)	SGD7S-R70A20A	SGM7J-A5A7A21		
		·	· · · · · · · · · · · · · · · · · · ·		·

- Note: Only controller modules that can be connected using MECHATROLINK communication cables are supported. "MP connection cannot be used for xxx." will be displayed when connected to an unsupported module (SVA module, PO module, and SVR module). The "xxx" represents a module name.
- 4. Select the SERVOPACK to be connected and then click **Connect**, or just double-click the SERVOPACK to be connected.

Remote PCI Connection

- 1. Perform steps 1 and 2 of the procedure for a normal PCI connection.
- 2. Select the communication port for the Controller connection.

earch Condition Setting		
Check off the target that is not r	needed to search	
- Target Servopack Series Setti		
Target Servopack Series Setti Σ7	Δ ΣΥ	🗖 🖬 Z2
Γ Π ΣΠ		🗖 🗐 ΣΙΙΝDEXER
	0 0 20/201000	
🖁 USB 🛛 🖓 СОМ1:RS-232	C Controller	Ethernet
Search		
	s Search	
Configure the settings	for communications with t	the controller.
Communication port	-:Remote (IP:192.168.	1.5) Local Al
		IP Setting
Remote Kind	Gateway(Ver7)	
Server Settings	·	
IP address	192 . 168 .	1 . 200
Port No.	15000	
Password	, []	
Controller Settings	·	
Communication port	PCI[1]	-
CPU No.	1	
Option CPU	0 : Main CPU (Basic CPL	(Madula)
option of o	TO : Main CPO (Basic CPC	(Thougan
		Search Cancel

3. Set the Remote Kind Box to Gateway (Ver7).

The following dialog box will appear.

	C Controller Ethernet	
 Search Auto Search Axio 	s Search	
Configure the setting:	for communications with the controller.	
Communication port	-:Remote (IP:192.168.1.5) Local A	
	IP Setting	
Remote Kind	Gateway(Ver7)	
Server Settings		
IP address	192 . 168 . 1 . 200	
Port No.	15000	
Password		
Controller Settings		
Communication port	PCI[1]	
CPU No.	1	
Option CPU	0 : Main CPU (Basic CPU Module) 🔻	
	Search	Cancel

4. Set the IP address, port number, and other required items for the server and the Controller.

5. Click Search.

Connectable SERVOPACKs will be found through the MECHATROLINK communication cable and the result will be displayed in the **Connect** window.

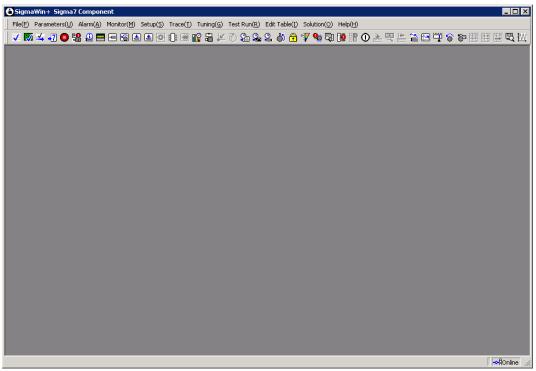
Online	Offlin				
8 use		S-232C Controller			िंदू Search
Line nu	Axis No.	Servopack	Servomotor	Axis name	Comments for axis
1	1 (4-0)	SGD7S-R70A20A	SGM7J-A5A7A21		

- Note: Only controller modules that can be connected using MECHATROLINK communication cables are supported. "MP connection cannot be used for xxx." will be displayed when connected to an unsupported module (SVA module, PO module, and SVR module). The "xxx" represents a module name.
- 6. Select the SERVOPACK to be connected and then click **Connect**, or just double-click the SERVOPACK to be connected.

3 SigmaWin+ Σ-7 Component Main Window

The SigmaWin+ Σ -7 component main window has a menu bar and a toolbar as shown in the following

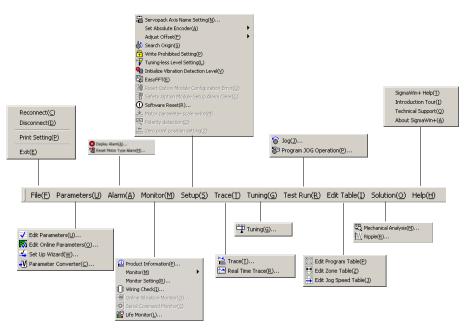
figure.



SigmaWin+ Σ-7 Component Main Window

All application functions can be accessed from the menu bar or the toolbar.

Menu Bar and Menus



SigmaWin+ Σ -7 Component Menu Bar

File menu

Connect:	Switches between Online and Offline modes or between the connected SERVOPACKs.
Disconnect:	Switches to Offline mode.
Print Setting:	Select your preferences for printing the information seen on the screen. See "Print Setting" for details on the setting method.
Exit:	Quits SigmaWin+.

Help menu

SigmaWin+ Help:	Displays a help window for SigmaWin + Σ -7 component.
Introduction Tour:	Introduces main functions of SigmaWin+ Σ -7 component.
Technical Support:	Lists local contacts.
About SigmaWin+:	Displays version information of SigmaWin+ Σ -7 component.

There are also function menus. For details, see Chapter 4.

Print Setting

In the SigmaWin+ Σ -7 component main window, click **File**, and then click **Print Setting**. The Printing Item Setting box appears.

Printing Item Setting			
Cover			
Attaching the Cover Cover Editing			
Where to Submit			
Where to Where to Submit (No.1) O Submit (No.2) O Submit (No.3)			
Item Name Setting Value			
Title			
Company Name			
Department Name Name			
Data for each function			
Parameters			
Header & Footer Printing Items			
Header Info-			
Title Parameters			
Models Info			
✓ Printing Date			
File Name			
Footer Info-			
✓ Pages			
Color Selection			
Black and White Color			
OK Cancel			

Cover

Select Attaching the Cover, and then click Cover Editing.

CUYEI					
Submitter	to Submit (No.1)	Where to Submit (I	No.2) VWhere to Su	ubmit (No.3)	Greeting Sentences
Company Name:					
Department Name:					
				_	
Name:				_	
Address:					
TEL:				_	
FAX:					
e-mail:					
Place to store for t	ne logo files + File i	name:			
				Re	eference
		ок	Cancel		

The Cover box appears, displaying the Submitter tab in front. Use the formatting options on the tabs to control the content of the cover, such as the greeting sentences and where to submit the information. After the setting is finished, click **OK**.

Printing Item Setting				
- Cover				
Attaching the Cov	/er	Co	ver Editing	
Where to Submit Where to Submit (No.1)	C Where t	to (No.2)	C Where to Submit (No.	3)
Item Name			Setting Value	e
Title	SigmaWin	200		
	Yaskawa			
Department Name				
IName	Tarou Yasi	kwa		
Data for each function	I			_
Parameters				-
	rinting Items			
Constant Number Relation of Users ✓ Name ✓ Switches Info. ✓ Unit ✓ Default Setting				
Others				
Color Selection	ite 💿	Color		
ок			Cancel	

Data for each function

Depending on which functions you select, the items that you can print will differ. Select the functions from the list.

To enter your printing preferences or specifications, click the tab whose options you want to enter or change, and enter the desired settings.

Printing Item Setting					
Cover					
Attaching the Cover Cover Editing					
Where to Submit Vhere to Submit (No.1) C Submit (No.2) C Submit (No.3)					
Item Name Setting Value					
Title Oha-					
Company Name Yaskawa					
Department Name MCKJ					
Name Tatsuvnakasaiams					
Data for each function					
Parameters					
Header Footer Printing items					
Header Info-					
Title Parameters					
Models Info.					
Printing Date					
File Name					
Footer Info					
Pages					
Color Selection					
C Black and White Color					
OK Cancel					

Color Selection

Documents can be printed in color or black and white. Select your preference.

Click OK.

Toolbar

Click an icon on the toolbar to directly select its corresponding function.

SigmaWin+ Σ -7 Component Toolbar

Toolbar Button	Function Name
¥	Parameter Editing
	Parameter Online Editing
*	Setup Wizard
→ V	Parameter Converter
٥	Alarm Display
멸	Reset Motor Type Alarm
.0	Product Information
	System Monitor
	Status Monitor
6	Motion Monitor
	Input Signal Monitor
	Output Signal Monitor
	Wiring Check
18	Service Life Monitor
Ð₽	SERVOPACK Axis Name Setting
×	Absolute Encoder Reset
3	Multi-Turn Limit Setting

Toolbar Button	Function Name
80	Speed/Torque Reference Offset Adjustment
2	Analog Monitor Output Adjustment
2	Motor Current Detection Offset Adjustment
5	Origin Search
+	Write Prohibited Setting
* 7	Tuning-less Level Setting
9 1	Initialize Vibration Detection Level
8	Easy FFT
9	Reset Option Module Configuration Error
12	Safety Option Module Setup Alarm Clear
0	Software Reset
	Motor Parameter Scale Write
F	Polarity Detection
	Setting the Zero Point Position of the Absolute Linear Encoder
-	Trace
	Real Time Trace
Ŧ	Tuning
6	JOG Operation
8	Program JOG Operation

Toolbar Button	Function Name	
	Program Table Editing	
	Zone Table Editing	
	Jog Speed Table Editing	
ď	Mechanical Analysis	
<u>wv</u>	Ripple Compensation	

4 Operation

4.1 Changing Axes

There are three different ways to edit axes. These are described in the following table.

Туре	Description
Changing axes	When you start editing, you must select the axis to edit. To edit a different axis, select the axis to edit again.
Multi-axis	You can edit all of the axes on the same window.
Unit	If you edit any axis, the same changes are applied to all axes.

Use the following procedure to change the axis to edit.

1. Start the desired function.

If the axis can be changed for the function, an **Axis Selection** dialog box will appear with a list of the axes that can be edited.

Single Axis Selection Mode





- The list will give the motors if the SigmaWin+ Σ-7 component and SERVOPACKs are connected. If a SERVOPACK and motor are connected afterward, the motor will not appear on the list. Connect the SigmaWin+ Σ-7 component to the SERVOPACKs again.
- You must be online to use the Multi-axis Selection Mode.

2. Select the axis or axes to edit.

Single Axis Selection Mode	Multi-axis Selection Mode
Axis Selection	Axis Selection
Axis - Axis Axis Axis	Axis I= AXIS#00 : SGD7W-2R8A20A I/I I= AXIS#01 : SGD7W-2R8A20A I/I I= OK Cancel



In Single Axis Selection Mode, the selected axis will be highlighted.

In Multi-axis Selection Mode, the check boxes for the selected axes will be selected.

3. Click the **OK** button.

The function editing dialog box for the selected axis appears.

	8	-Display Mode User Level	2 : Level 2 (To the adjustment.)
		Control Mode	13 : All Control Mode Custor
onstant number	Function Selection(Pn0xx-) Gain(Pn1xx-) Position(Pn2xx-) Speed(Pn3xx-)	Torque(Pn4xx-) Sequence(Pn5xx-) I/O Sign Mechatrolink(Pn8xx-) Common Parameters
No.	Name	Set value	AXIS#00 Input value
Pn000	Basic Function Selections D	·	0000H
Ddigit	Direction Selection	•	D : Use CCW as the forward direction.
1 digit	Reserved parameter (Do not change.)	•	B : Reserved parameter (Do not change.)
2digit	Reserved parameter (Do not change.)	•	0 : Reserved parameter (Do not change.)
3digit .	Rotary/Linear Startup Selection When Encoder Is Not Connected	•	B : Start as a rotary encoder.
Pn001	Application Function Selections 1	•	0000H
Ddigit	Servo OFF or Alarm Group 1 Stopping Method	•	B : Stop the motor by applying the dynamic brake.
1digit	Overtravel Stopping Method		0 : Apply the dynamic brake or coast the motor to a stop (use the stopping method set in Pn001 = n.oooX
2digit	Main Circuit Power Supply AC/DC Input Selection	•	B : Input AC power as the main circuit power supply using the L1, L2, and L3 terminals (do not use shared
3digit	Reserved parameter (Do not change.)		0 : Reserved parameter (Do not change.)
Pn002	Application Function Selections 2	•	0111H
Ddigit	MECHATROLINK Command Position and Speed Control Option	•	1 : Use TLIM as the torque limit.
1digit	Torque Control Option		1 : Ignore the setting of the speed limit for force control (VLIM).
2digit	Absolute Encoder Usage	•	1 : Use the absolute encoder as an incremental encoder.
3digit	Reserved parameter (Do not change.)		0 : Reserved parameter (Do not change.)
	Application Function Selections 6	•	0002H
0,1digit	Analog Monitor 1 Signal Selection		02 : Torque reference (1 V/100 % rated torque)
2digit	Reserved parameter (Bo not change.)	•	B : Reserved parameter (Bo not change.)
3digit	Output Axis Selections	•	D : Output the data of A axis.
Pn007	Application Function Selections 7	•	0000H
0,1digit	Analog Monitor 2 Signal Selection	•	00 : Motor speed (1 V/1,000 min-1)
2digit	Reserved parameter (Do not change.)	•	0 : Reserved parameter (Do not change.)
3digit	Output Axis Selections	•	0 : Output the data of A axis.
	Application Function Selections 8	•	4000H
Ddigit	Low Battery Voltage Alarm/Warning Selection	•	0 : Output alarm (A830) for low battery voltage.

Single Axis Selection Mode

Multi-axis Selection Mode

Function Selection(PnDxx-) Gain(Pn1xx-) Position(Pn2xx-	Control Mode		Comment Custor
Function Selection(Pn0xx-) Gain(Pn1xx-) Position(Pn2xx-) Speed(Pn3xx-)		
		Torque(Pn4xx-) Sequence(Pn5xx-) I/O Sign	Mechatrolink(Pn8xx-) Common Parameter
ame	Set value	AXIS#00 Input value	AKIS#01 Input value
	1		0000 H
			D : Use CCW as the forward direction.
	•		0 : Reserved parameter (Do not change.)
			0 : Reserved parameter (Do not change.)
	•		B : Start as a rotary encoder.
			0000 H
	•		B : Stop the motor by applying the dynamic brake.
	•		
	•		B : Input AC power as the main circuit power supply
			0 : Reserved parameter (Do not change.)
	•		0111H
	•		1 : Use TLIM as the torque limit.
	•		
	•		
	•		0 : Reserved parameter (Do not change.)
			0002H
	•		02 : Torque reference (1 \#100 % rated torque)
	•		0 : Reserved parameter (Do not change.)
	•		0 : Output the data of A axis. 0000H
	•		
	•		00 : Motor speed (1 \/1,000 min-1)
			0 : Reserved parameter (Bo not change.) 0 : Output the data of Alaxis.
	•		D : Output the data of A axis. 4000H
Low Battery Voltage Alarm/Warning Selection		4000H 0 : Output alarm (A.830) for low battery voltage.	
			0 : Output alarm (A.830) for low battery voltage.
- · · · · · · · · ·		1. <u>.</u>	
	sic Function Reletions 0 Direction Selections Reserved parameter (Da not change.) pleixation Function Selections 2 MECHATROLINK Comman Persition and Speed Control Option Reserved parameter (Da not change.) pleixation Function Selections 2 MECHATROLINK Comman Persition and Speed Control Option Reserved parameter (Da not change.) pleixation Function Selections 2 Metavolute Bioded Selection Reserved parameter (Da not change.) Dutput Axie Selections Reserved parameter (Da not change.) Dutput Axie Selections Reserved parameter (De not change.) Dutput Axie Selections Reserved parameter (De not change.) Dutput Axie Selections Reserved parameter (De not change.) Dutput Axie Selections Reserved parameter (De not change.) Dutput Axie Selections Reserved parameter (De not change.) Dutput Axie Selections Reserved parameter (De not change.) Dutput Axie Selections Reserved parameter (De not change.) Dutput Axie Selections Reserved parameter (De not change.) Dutput Axie Selections Reserved parameter (De not change.) Dutput Axie Selections Reserved parameter (De not change.) Dutput Axie Selections Reserved parameter (De not change.) Dutput Axie Selections Reserved parameter (De not change.) Dutput Axie Selections Reserved parameter (De not change.) Dutput Axie Selections Reserved parameter (De not change.) Dutput Axie Selections Reserved parameter (De not change.) Dutput Axie Selections Reserved parameter (De not change.) Dutput Axie Selections Reserved parameter (De not change.) Dutput Axie Selections Reserved parameter (De not change.) Dutput Axie Selections Reserved parameter (De not change.) Dutput Axie Selections Reserved parameter (De not change.) Dutput Axie Selections Reserved parameter (De not change.) Dutput Axie Selections Reserved parameter (De not change.) Dutp	Direction Selection - Direction Selection (Direction Selection) - Reserved parameter (Dire Into Incoder Is Nat Connacted - Brearved parameter (Dire Into Incoder Is Nat Connacted) - Brearved parameter (Dire Into Incoder Is Nat Connacted) - Brearved parameter (Dire Into Incoder Is Nat Connacted) - Direction Selection Nation Selection I - Direction Selection Selection I - Direction Function Selections I - Direction Function	Direction Selection 0 UP CCM as the forward detection. Reserved parameter (Do not change.) 0 1. Reserved parameter (Do not change.) Reserved parameter (Do not change.) 0 1. Reserved parameter (Do not change.) Reserved parameter (Do not change.) 0 1. Reserved parameter (Do not change.) Reserved parameter (Do not change.) 0 1. Start as a stray encoder. Direction Selection Whe Elocider Is Not Connected 0 1. Start as a stray encoder. Direction Selection Whe Elocider Is Not Connected 0 1. Start as a stray encoder. Direction Selection Whe Elocider Is Not Connected 0 1. Start as a stray encoder. Direction Selection Whe Elocider Is Not Connected 0 1. Start as a stray encoder. Direction Selection Whe Elocider Is Not Connected 0 1. Start Tabutas the torque Institution of the strain st

4.2 Editing Parameters

The following two methods exist for editing parameters.

- Using the Parameter Editing window
- Using the Online Parameter Editing window

4.2.1 Editing Parameters

Parameters can be displayed or edited in the Parameter Editing window. The windows differ in the Online and Offline modes.

Parameter Editing when Online

In the SigmaWin+ Σ -7 component main window, click **Parameters** and then click **Edit Parameters**. The Parameter Editing window for the online mode appears.

Check boxes		— Saves parameter data	a to a file.			
\		Prints the Param	eter Editing	window.		
\						
🚾 Paran	neter Editin	ng : SGD75-R70A00A				×
		Display Mode				
	i 🔒	A .			Display Setting	1 Import
		User Level	2 : Level 2 (To the	e adjustment.) 📃 💌		
		Control Mode	13 : All Control Mo	ide 💌	Comment	Customize
All con	stant number	Function Selection(Pn0xx-)	n1xx-) Position((Pn2xx-) Speed(Pn3xx-) Torque	(Pn4xx-) Sequence(Pn5xx-	-) I/O Sigr_
N		Name	Set value		#00 Input value	
	Pn000 Odigit	Basic Function Selections D Direction Selection		DDDDH D : Use CCW as the forward dire	ation	
	1digit	Control Method Selection	-	D : Ose CCW as the forward dire		
	2digit	Reserved parameter (Do not change.)		D : Reserved parameter (Do not		
	3digit	Rotary/Linear Startup Selection When En		D : Start as a rotary encoder.	onange.y	
	Pn001	Application Function Selections 1		0000 H		
	Ddigit	Servo OFF or Alarm Group 1 Stopping M	eth -	0 : Stop the motor by applying th	ne dvnamic brake.	
	1 digit	Overtravel Stopping Method		1 1117 4	coast the motor to a stop (use the	stopping m
	2digit	Main Circuit Power Supply AC/DC Input	Sele -		pircuit power supply using the L1, I	
	3digit	Warning Code Output Selection	•	0 : Output only alarm codes on th	he ALO1, ALO2, and ALO3 termin	als.
	Pn002	Application Function Selections 2		0000H		
	Ddigit	Speed/Position Control Option (T-REF Inp	put -	0 : Do not use T-REF.		
	1 digit	Torque Control Option (V-REF Input Alloc	atic-	0 : Do not use ₩REF.		
•	2digit	Absolute Encoder Usage	·	D : Use the absolute encoder as	an absolute encoder.	
	Select All(A	Il constant number:include not displaye	:d)		Safety Edit	✓ Edit
	itialize	Safety Initialize	ipare	Write (Fla	ash) Read	Write

Selects all parameters on the displayed tab.

Parameter Editing Window (Online Mode)

- Note: 1. Safety Edit and Safety Initialize buttons are displayed only when the SERVOPACK and Safety Module are connected.
 - 2. Write (Flash) button is displayed only when the SERVOPACK and DeviceNet Module are connected.



If another function is running that prevents editing the parameters, the cells will be displayed with a gray background.

Display Mode

-Display Mode		
User Level	2: Level 2 (To the adjustment.)	•
Control Mode	13 : All types of controls	•

The number of parameters displayed is determined by the user level and the control mode.

User Level:	1: Level 1 (To the setup/test run.) 2: Level 2 (To the adjustment.)

Control Mode: 13 modes

Display Setting

Click **Display Setting**, and the Display setting box appears. Select the information to be displayed and the size of the Parameter Editing window.

Display Setting		×
Select items to be displayed.		
Display Items		
✓ Name	🔽 Unit	
🔽 Min, Max	🔽 Default	
∟ ⊢Dialog size		
800 × 600	•	
	OK Cancel	
	OK Cancel	

Display Setting Box

Display Items

Select the information to be displayed.

Dialog Size

Select the size of the Parameter Editing window.

Click **OK** to save the changes in the display settings and to return to the Parameter Editing window. Click **Cancel** to return to the Parameter Editing window without changing the display settings.

Comment

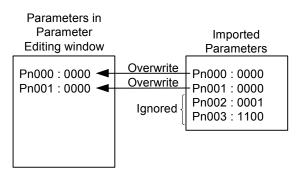
Comments can be typed or edited in the Comment box. Click **Comment**, and the Comment box appears.

Comment		×
		
		~
	ОК	Cancel

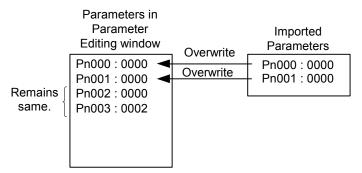
Import

Parameter settings can be transferred or imported from a stored file with the Import function. If the imported parameters differ in number from the on-screen parameters (including parameters not currently displayed), the following processing takes place.

• If the number of imported parameters is greater



• If the number of imported parameters is fewer



1. Click Import, and the Open box appears.

Open ?X Look in: YE_Applications • + • • • •	
Manual 20070423153437.usr	
File name: 20070423153437.usr Open	
Files of type: Parameter file(*.usr)	
Product Info: Sidow 4 MiAlm #	
Comment:	When the Customization infor- mation is used. check box is se- lected, the parameters set on the Customize tab in the Parameter Editing window are also imported. (See Customize for details.) The check box cannot be selected when the file has no parameter on
	the Customize tab.

Select the file to import and click the **Open** button.
 If only one axis is being used, the data will be imported.
 If more than one axis is being used, the following dialog box appears.
 Proceed to step 3.

Axis	Selection	
	Axis	
V	= AXIS#00 : SGD7W-2R8A20A	
V	⊨■ AXIS#01 : SGD7W-2R8A20A	
		-
	Cancel	

3. Select the axis for which the set values are to be imported and click the **OK** button. The data will be imported.

Customize

Only the selected parameters can be displayed on the Customize tab.

1. Click **Customize**, and the Customize setting box appears. All the parameters are displayed in the Parameter candidate list.

ustomize setting	×
Please select the parameter which wants to be custom	vized.
Parameter candidate	Customaize parameter
Pn004:Reserved (Do nd change.) Pn006:Function Selection Application S\ Pn007:Function Selection Application S\ Pn007:Speed Loop Gain Pn101:Speed Loop Gain Pn103:Speed Loop Gain Pn103:Moment of Inetit Ratio Pn104:2nd Speed Loop Gain Pn104:2nd Speed Loop Gain Pn105:That Speed Loop Gain Pn106:That Speed Loop Gain Pn107:Bias Pn107:Bias Pn108:The Station Width Pn108:Theed Forward	d All dd lete te All
Pn10B:Gain Related Application Switch	J Down
Customaize name Customize	OK Cancel

- Note: If different names are given for different axes for the same parameter number, the parameter name for the axis with the lower axis address will be displayed.
- 2. Select parameters to be displayed on the **Customize** tab from the Parameter candidate list.

Parameter candidate Customaize parameter Pn000:Function Selection Basic Switch Pn001:Function Selection Application St Add All Add All	
Please select the parameter which wants to be customized.	
Parameter candidate	Customaize parameter
Pn001:Function Selection Application S	↑ Up ↓ Down
Customaize name Customize	OK Cancel
,	

3. Click **Add**, and the selected parameters will move from the Parameter candidate list to the Customize parameter list as follows.

Opens a customized file. Saves customize data to a file	Saves customize data to a file.
Customize setting Image: Seting Imag	
Parameter candidate	Customaize parameter
Pn004:Reserved (Do not change.) Pn006:Function Selection Application SV Pn007:Function Selection Application SV Pn008:Function Selection Application SV	Ph103:Moment of Inertia Ratio dd All Ph101:Speed Loop Integral Time Constant Ph102:Position Loop Gain Ph104:2nd Speed Loop Gain
Pn106:2nd Position Loop Gain Pn107:Elias Pn108:Bias Addition Width Pn108:Feed Forward Pn108:Feed Forward Filter Time Conste Pn108:Gain Related Application Switch Pn106:Mode Switch (acceleration) Pn106:Mode Switch (acceleration) Pn106:Mode Switch (acceleration) Pn106:Mode Switch (acceleration)	
Ph110:Autotuning Related Application S Ph111:Speed Feedback Compensation (
Customaize name Customize	OK Cancel
Sets a tab name for the Customize tab.	Moves the selected item down one level.
	Moves the selected item up one level.

Information not displayed in the Parameter candidate list

Select parameters in the Customize parameter list and click **Delete**. The selected parameters will move back from the Customize parameter list to the Parameter candidate list.

(Open) Button

In the Customize setting box, click the B button, and the Open dialog box appears with the customized files displayed.

Open					<u>? ×</u>
Look in: 🔂	New Folder	F	- +	È 💣	
20040728	102501.ucs 102513.ucs				
File name:	20040728102501				Open
Files of type:	customize file (*.ucs)			- E	Cancel
					111

Open Dialog Box

Click **Open** to read the designated customized file. Click **Cancel** to return to the Customize setting box.

(Save) Button

In the Customize setting box, click the \square button, and then select the storage location for the parameters displayed in the Customize parameter list of the Customize setting box.

Save As	<u>?</u> ×
Save in: 🔁 New Folder 💽 🖛 🗈 📸 📰 -	
20040728102501.ucs	
File name: 20040728102513 Save Save as type: customize file (*.ucs) Cancel	_

Save As Dialog Box

Click **Save** to store the file name designating the parameters displayed in the Customize parameter list as the customized file name. Click **Cancel** to return to the Customize setting box without saving the file.

If the file name already exists or if an already existing file is loaded and then re-saved, a warning message appears, telling you that the file name already exists, and ask if you want to replace the existing file.

Save As		×
⚠	A:\20040603235653.ucs alrea Do you want to replace it?	dy exists.
	Yes No]

Click **Yes** to overwrite the already existing file. Click **No** to return to the Customize setting box.

4. When the selection of parameters to be displayed on the **Customize** tab is completed, click **OK**. Then the Parameter Editing window appears and the selected parameters will be displayed on the **Customize** tab.

arameter Edi	iting : SGD75-R70	A20A					>
	8	-	: Level 2 (To 3 : All Control		istment.)	Display Setting	limport Customize
rque(Pn4xx-)	Sequence(Pn5xx-)	I/O Sign Mechatrol	ink(Pn8xx-)	Commo	n Parameters(PnAxx-) differ t	from constant Customize	••
No.	Name		Set value		AXIS#0	00 Input value	
Pn000	Basic Function Sel	ections 0	•		0000 H		
Ddigit	Direction Selection	n	-		D : Use CCW as the forward direc	tion.	
1 digit	Reserved param	eter (Do not change.)	-		0 : Reserved parameter (Do not o	hange.)	
2digit	Reserved param	eter (Do not change.)	-		0 : Reserved parameter (Do not o	hange.)	
3digit	Rotary/Linear Sta	artup Selection When Enc	oc -		D : Start as a rotary encoder.		
Pn101	Speed Loop Integra	al Time Constant	20.00 ms		2000		
Pn102	Position Loop Gain		40.0 /s		400		
Pn103	Moment of Inertia	Ratio	100 %		100		
Pn104	Second Speed Loop	p Gain	40.0 Hz		400		
 ✓ ✓ Select Al 	I(Customize:include I	not displayed)					v V V Edit
Initialize		Comp	are			Read	Write

Edit

The Edit dialog box appears for the selected (highlighted) parameters.

The title bar displays the extended address of the axis.

The selected parameter can be viewed and then changed in the Edit box. The Edit box differs according to the parameter selected. Click **Edit**, and the Edit box appears.

Edit AXIS#00
Pn001 Application Function Selections 1
digit 0 Servo OFF or Alarm Group 1 Stopping Method
0 : Stop the motor by applying the dynamic brake.
digit 1 Overtravel Stopping Method
0 : Apply the dynamic brake or coast the motor to a stop (use the stopping met 💌
digit 2 Main Circuit Power Supply AC/DC Input Selection
0 : Input AC power as the main circuit power supply using the L1, L2, and L3 t
digit 3 Reserved parameter (Do not change.)
0 : Reserved parameter (Do not change.)
0000 H

Safety Edit

The Safety Module parameters can be changed or initialized with the safety edit function.

1. Click the **Option (Pcxx)** tab to display a list of Safety Module parameters.

Note: Safety Module parameters (Pcxx) can also be displayed by clicking the All constant number tab.

s L	User Level 2 : Level 2 (To the adjustme	nt.) 💌		Display Se		👌 Im
	Control Mode 13 : All Control Mode	•		Comm	ient	Custor
(Pn1xx-) Pos	ition(Pn2xx-) Speed(Pn3xx-) Torque(Pn4xx-) Sequence(Pn5	xx-) I/O Sign Mech	atrolink(Pn	Bxx-) Option((Pcxx-)	differ fro
No.	Name	Input value	Unit	Set value	Min	Ma
Pc00	Basic Safety function selection Switch	0002H	-	-	-	-
Odigit	Safety Function A Selection	2 : SBB-D	-	-	-	-
1 digit	Safety Function B Selection	0 : No fu	-	-	-	-
2digit	Reserved (Do not use.)	0: Reser		-	-	-
3digit	Reserved (Do not use.)	0: Reser		-	-	-
Pc01	EDM Signal Output Select Switch	0011H	-	-	-	-
Odigit	EDM Signal A Output Setting	1 : Durin	-	-	-	-
1 digit	EDM Signal B Output Setting	1 : Durin	-	-	-	-
2digit	Reserved (Do not use.)	0: Reser		-	-	-
3digit	Reserved (Do not use.)	0: Reser		-	-	-
Pc10	Wait time to decelerate A	0	10ms	0 ms	0	10
Pc11 I	Deceleration monitoring time A	500	10ms	5000 ms	0	100
Select All(Dption(Pcxx-):include not displayed)			Safety Edit		👽 Edit
Initialize	Safety Initialize Compare			Read		Vvrit

The Safety Module Parameter list is displayed with a gray background, and **Safety Initialize** is unavailable. Safety Module parameters cannot be edited or initialized at this stage.

2. Click Safety Edit, and the Code box appears.

Code	×
Input the code.	
ОК	Cancel

é 🛛	User Level 2 : Level 2 (To the adjus Control Mode 13 : All Control Mode	stment.)		Display Set		im 🔁 اس
	T3. All Control Mode	_				
		x x				
(Pn1xx-) Po:	sition(Pn2xx-) Speed(Pn3xx-) Torque(Pn4xx-) Sequence(I	Pn5xx-) I/O Sign Mech	atrolink(Pn	Bxx-) Option(Pcxx-)	differ fro
No.	Name	Input value	Unit	Set value	Min	M
Pc00	Basic Safety function selection Switch	0002H	-	-	-	-
Odigit	Safety Function A Selection	2 : SBB-D	-	-	-	-
1 digit	Safety Function B Selection	0 : No fu	-	-	-	-
2digit	Reserved (Do not use.)	0: Reser		-	-	-
3digit	Reserved (Do not use.)	0: Reser		-	-	-
Pc01	EDM Signal Output Select Switch	0011H	-	-	-	-
Odigit	EDM Signal A Output Setting	1 : Durin	-	-	-	-
1 digit	EDM Signal B Output Setting	1 : Durin	-	-	-	-
2digit	Reserved (Do not use.)	0: Reser		-	-	-
3digit	Reserved (Do not use.)	0: Reser		-	-	-
Pc10	Wait time to decelerate A	0	10ms	0 ms	0	10
Pc11	Deceleration monitoring time A	500	10ms	5000 ms	0	10
•						
Select All(Option(Pcxx-):include not displayed)			Safety Edit		👽 Edit
				Salety Edit		

3. Enter "0000" and click **OK**. The following window appears.

The background of the Safety Module parameters list will change from gray to white. Safety Module parameters can now be edited. Also, **Safety Initialize** is now available. Note: Some Safety Module parameters are still displayed with a gray background. These parameters cannot be edited.

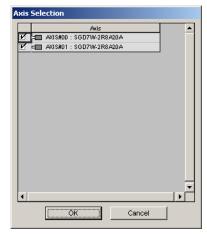
4. Select a Safety Module parameter to be edited, and then click **Edit**. The attributes of the selected parameters can be edited in the **Edit** box.

Parameter Initialization

The SERVOPACK parameters (Pnxxx) can be returned to the factory settings with the Initialize function. Return to the initial settings using the following procedure.

Note: The Safety Module parameters (Pcxx) will not be returned to their factory settings by clicking Initialize.

1. Click **Initialize**. If more than one axis is being used, the following dialog box appears. If only one axis is being used, the dialog box that is shown in step 2 appears. Proceed to step 3.



2. Select the axis to initialize and then click the **OK** button. The following dialog box appears.

Verification
Use caution when initializing parameters as some parameters may not match the target machine.
Clicking the OK button to initialize the Servopack settings.
OK

Click **Cancel** to return to the Parameter Editing window without changing the SERVOPACK settings.

3. Click OK, and the dialog box to initialize the SERVOPACK settings appears.

When Using Only One Axis

When Using More Than One Axis

	Initialize the Servopack settings
Initialize the Servopack settings	Clicking the Initialize button will initialize the Servopack settings. Object Axis : #00, #01, #02, #03
Initialize Cancel	Initialize

- If more than one axis is being used, confirm that the axis to be initialized is displayed. To select a different axis or to not initialize the axis, click the Cancel button. The Parameter Editing dialog box will appear again.
- 5. Click Initialize, and the percentage of the progress completed is shown.

Initialize				×
	Initializing			
		<mark>4</mark> 9%		

When the settings are successfully initialized, you will be prompted to verify that all parameter settings are correct for the target machine.



6. Click OK.

Safety Initialize

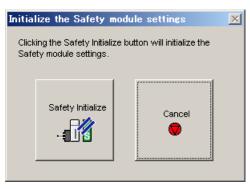
The Safety Module parameters (Pcxx) can be returned to the factory settings with the safety initialize function.

- Note: SERVOPACK parameters (Pnxxx) will not be returned to their factory settings by clicking **Safety Initialize**.
- 1. If **Safety Initialize** is unavailable, click **Safety Edit** and enter the code and change the settings so **Safety Initialize** can be used. For details, refer to *Safety Edit*.
- 2. Click **Safety Initialize**, and the Verification box appears.



Click **Cancel** to return to the Parameter Editing window without changing the Safety Module settings.

3. Click **OK**, and the dialog box for initializing the Safety Module parameters appears.



Click **Cancel** to return to the Parameter Editing window without changing the Safety Module settings.

4. Click **Safety Initialize** to start initialization, and the percentage of the progress completed is shown.

tializing			
	40%		
	tializing	dalizing 4 <mark>9</mark> %	

After the parameters are successfully initialized, the following box appears.

Paramet	er Editing
(į)	Software reset function or the power supply re-turning on because the safety parameter was changed.
	OK

5. Click OK.

Compare

The edited parameter settings can be compared with the values in the SERVOPACK for all parameters, including those not displayed, with the Compare function. Check the settings using the following procedure.

1. Click **Compare** and a message appears, confirming if you want to compare all parameter settings.

Compare 🛛 🗙
Clicking the OK button will start the comparison of all the currently edited parameters(including those not displayed) with those in the Servopack.
OK

Click **Cancel** to return to the Parameter Editing window without comparing the settings.

2. Click **OK** to start the comparison, and the percentage of the progress completed is shown.

Comparing	_	
Comparing	: Pn121	(40/91)
	42	2%

No.	Name	Servopack	Unit	AXIS#00 Input value	-
Pn000	Basic Function Selections D	0000 H	•	0001H	
Pn 100	Speed Loop Gain	400	0.1Hz	500	
Pn 101	Speed Loop Integral Time Constant	2000	0.01ms	1500	
Pn 102	Position Loop Gain	400	0.1/s	500	
٩					

When the comparison has been successfully completed, the Comparison Results box appears.

3. Click Save to save the results of the comparison.

Read

Selected parameter settings from the SERVOPACK can be read and then changed by overwriting them with the Read function. Select the check boxes of the parameters to be read.

Click the **All constant number** tab and select the **Select All (All constant number: include not displayed)** check box to select all the parameters to be read, including those not currently displayed.

Read the parameters using the following procedure.

1. Click **Read** and a message appears, confirming if you want to read the parameter settings.

Reading from Servopack	×
Reading parameters from Servopack. Clicking the OK button will overwrite the current	settings.
OK Cancel	

Click Cancel to return to the Parameter Editing window without reading the settings.

2. Click **OK** to start reading and overwriting the settings.

Write

Selected parameter settings can be saved with the Write function. Select the check boxes of the parameters to be saved.

Note: Click the **All constant number** tab and select the **Select All (All constant number: include not displayed)** check box to select all the parameters to be saved, including those not currently displayed.

The procedures to use the Write function differ depending on whether or not you are using a Safety Module or a DeviceNet Module.

When Not Using a Safety Module or a DeviceNet Module

1. Click **Write**. A Verification box listing the saved parameters will be displayed after they have been successfully saved.

No.	Name	<u>ا</u>
Pn000	Function Selection Base Switch	
Pn001	Function Selection Application Switch 1	
Pn002	Function Selection Application Switch 2	
Pn004	Reserved Parameter	
Pn005	Reserved Parameter	
Pn10B	Gain-Related Application Switches	
Pn110	Online Autotuning-Related Switches	
Pn200	Position Control Reference Type Selection Swit	
Pn201	PG Divider Ratio	
Pn202	Electronic Gearing Ratio (numerator)	
Pn203	Electronic Gearing Ratio (denominator)	
Pn205	Multi-Turn Limit Setting	
Pn206	Reserved Parameter	

٩	The following parameters are hidden parameters are hidden parameters.			ervopack
No.	Name	Value	Servopack	
Pn202	Electronic Gearing Ratio (numerator)	5	4	
Pn203 Pn204	Electronic Gearing Ratio (denominator) Position Reference Accel/Decel Time	2	1	
Clicking the	e OK button will overwrite the parameters.			

Note: Click **OK** to continue and overwrite the previous settings. Click **Cancel** to return to the Parameter Editing window without overwriting the parameters.

- 2. Click OK.
- 3. Restart the SERVOPACK to validate the new settings.

All steps are completed.

When Using a Safety Module

1. Click **Write**. A Verification box listing the saved parameters will be displayed after they have been successfully saved.

Pn000 Pn001	Function Selection Base Switch	
Pn001		
	Function Selection Application Switch 1	
Pn002	Function Selection Application Switch 2	
Pn004	Reserved Parameter	
Pn005	Reserved Parameter	
Pn10B	Gain-Related Application Switches	
Pn110	Online Autotuning-Related Switches	
Pn200	Position Control Reference Type Selection Swit	
Pn201	PG Divider Ratio	
Pn202	Electronic Gearing Ratio (numerator)	
Pn203	Electronic Gearing Ratio (denominator)	
Pn205	Multi-Turn Limit Setting	
Pn206	Reserved Parameter	-



A Verification box asking you to confirm overwriting will be displayed when the settings of the non-displayed parameters differ from the settings of the current SERVOPACK.

0.	Name	Value	Servopack	
1202	Electronic Gearing Ratio (numerator)	5	4	
1203	Electronic Gearing Ratio (denominator)	2	1	
1204	Position Reference Accel/Decel Time	1	0	

Note: Click **OK** to continue and overwrite the previous settings. Click **Cancel** to return to the Parameter Editing window without overwriting the parameters.

2. Verify the values shown in the **Input** column, and select the check boxes of the parameters whose settings are confirmed to be correct.

EDM Signal Output Select Switch	0011H			
		0010H	-	
Vait time to decelerate A	0	5	10ms	
Deceleration monitoring time A	500	505	10ms	
The monitoring speed during deceleration waiting A	0	5	min-1	
Monitoring position A	10	15	edge	
Monitoring speed A during constant speed	0	5	min-1	
Vait time to decelerate B	0	5	10ms	
Deceleration monitoring time B	500	505	10ms	
The monitoring speed during deceleration waiting B	0	5	min-1	
Monitoring position B	10	15	edge	
Monitoring speed B during constant speed	0	5	min-1	
	he monitoring speed during deceleration waiting A onitoring position A onitoring speed A during constant speed /ait time to decelerate B eceleration monitoring time B he monitoring speed during deceleration waiting B onitoring position B	he monitoring speed during deceleration waiting A 0 onitoring position A 10 ionitoring speed A during constant speed 0 /ait time to decelerate B 0 eceleration monitoring time B 500 he monitoring speed during deceleration waiting B 0 onitoring position B 10	he monitoring speed during deceleration waiting A 0 5 onitoring position A 10 15 ionitoring speed A during constant speed 0 5 /ait time to decelerate B 0 5 eceleration monitoring time B 500 505 he monitoring speed during deceleration waiting B 0 5 onitoring position B 10 15	he monitoring speed during deceleration waiting A 0 5 min-1 onitoring position A 10 15 edge ionitoring speed A during constant speed 0 5 min-1 /ait time to decelerate B 0 5 10ms eceleration monitoring time B 500 505 10ms he monitoring speed during deceleration waiting B 0 5 min-1 onitoring position B 10 15 edge

When all the check boxes of the displayed parameters are selected, the **OK** button becomes available.

3. Click OK.



Click **Cancel** to return to the Safety Module Parameter Editing window without overwriting the parameters.

4. Verify the values in the **Servo** column and select the check boxes of the parameters whose settings are correct.

No.	Name	Servo	Input	Unit	Check
Pc01	EDM Signal Output Select Switch	0010H	0010H	-	
Pc10	Wait time to decelerate A	5	5	10ms	
Pc11	Deceleration monitoring time A	505	505	10ms	
Pc12	The monitoring speed during deceleration waiting A	5	5	min-1	
Pc13	Monitoring position A	15	15	edge	
Pc14	Monitoring speed A during constant speed	5	5	min-1	
Pc20	Wait time to decelerate B	5	5	10ms	
Pc21	Deceleration monitoring time B	505	505	10ms	
Pc22	The monitoring speed during deceleration waiting B	5	5	min-1	
Pc23	Monitoring position B	15	15	edge	
Pc24	Monitoring speed B during constant speed	5	5	min-1	



When all the check boxes are selected, the **OK** button becomes available.

Servo: Shows the current settings for Safety Module parameters

Input: Shows the values set in the Parameter Editing window for the Safety Module.

5. Click OK.

INFO	

If the power needs to be restarted to enable parameter settings, a Verification box listing the saved parameters will be displayed after they have been successfully saved.

No.	Name	
Pn000	Function Selection Base Switch	
Pn001	Function Selection Application Switch 1	
Pn002	Function Selection Application Switch 2	
Pn004	Reserved Parameter	
Pn005	Reserved Parameter	
Pn10B	Gain-Related Application Switches	
Pn110	Online Autotuning-Related Switches	
Pn200	Position Control Reference Type Selection Swit	
Pn201	PG Divider Ratio	
Pn202	Electronic Gearing Ratio (numerator)	
Pn203	Electronic Gearing Ratio (denominator)	
Pn205	Multi-Turn Limit Setting	
Pn206	Reserved Parameter	
		OK.

Click OK.

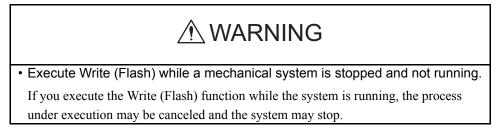
When the Safety Module parameters (Pcxx) are displayed, proceed to step 6. When only the SERVOPACK parameters (Pnxxx) are displayed, proceed to step 7.

6. Click OK.

Paramete	er Editing
i	Software reset function or the power supply re-turning on because the safety parameter was changed.
	OK

7. Restart the SERVOPACK to validate the new settings. All steps are completed.

When Using a DeviceNet Module



1. Click **Write**. A caution message will be displayed reminding you of the order of operations and asking if you want to continue.

Set Parameters
To save the DeviceNet Module parameters, execute Write, and then execute Write (Flash). If Write (Flash) is not used, the setting will be cleared when the power is turned off.
(ОК

2. Click **OK**. A Verification box listing the saved parameters will be displayed after they have been successfully saved.

Ph000 Function Selection Base Switch Ph001 Function Application Switch 1 Ph002 Function Selection Application Switch 2 Ph004 Reserved Parameter Ph005 Reserved Parameter Ph0106 Gain-Related Application Switches Ph1010 Online Autotuning-Related Switches Ph2000 Position Control Reference Type Selection Swit Ph201 PG Divider Ratio Ph202 Electronic Gearing Ratio (numerator) Ph203 Electronic Gearing Ratio (denominator)	No.	Name	
n002 Function Selection Application Switch 2 n004 Reserved Parameter n005 Reserved Parameter n108 Gain-Related Application Switches n109 Online Autotuning-Related Switches n200 Position Control Reference Type Selection Swit n201 PG Divider Ratio n202 Electronic Gearing Ratio (denominator)			
n004 Reserved Parameter n005 Reserved Parameter n108 Gain-Related Application Switches n110 Online Autotuning-Related Switches n200 Position Control Reference Type Selection Swit n201 PG Divider Ratio n202 Electronic Gearing Ratio (numerator) n203 Electronic Gearing Ratio (denominator)	n001	Function Selection Application Switch 1	
n005 Reserved Parameter n10B Gain-Related Application Switches n110 Online Autotuning-Related Switches n200 Position Control Reference Type Selection Swit n201 PG Divider Ratio n202 Electronic Gearing Ratio (numerator) n203 Electronic Gearing Ratio (denominator)			
M10B Gain-Related Application Switches n110 Online Autotuning-Related Switches n200 Position Control Reference Type Selection Swit n201 PG Divider Ratio n202 Electronic Gearing Ratio (numerator) n203 Electronic Gearing Ratio (denominator)	n004	Reserved Parameter	
Online Autotuning-Related Switches n200 Position Control Reference Type Selection Swit n201 PG Divider Ratio n202 Electronic Cearing Ratio (numerator) n203 Electronic Gearing Ratio (denominator)			
n200 Position Control Reference Type Selection Swit n201 PG Divider Ratio n202 Electronic Gearing Ratio (numerator) n203 Electronic Gearing Ratio (denominator)	n10B	Gain-Related Application Switches	
n201 PG Divider Ratio n202 Electronic Gearing Ratio (numerator) n203 Electronic Gearing Ratio (denominator)	n110	Online Autotuning-Related Switches	
n202 Electronic Gearing Ratio (numerator) n203 Electronic Gearing Ratio (denominator)	n200	Position Control Reference Type Selection Swit	
n203 Electronic Gearing Ratio (denominator)	n201	PG Divider Ratio	
	n202	Electronic Gearing Ratio (numerator)	
	n203	Electronic Gearing Ratio (denominator)	
n205 Multi-Turn Limit Setting	n205	Multi-Turn Limit Setting	
n206 Reserved Parameter	n206	Reserved Parameter	

<u>∼</u> r		
No. Name	Value	Servopack
	ing Ratio (numerator) 5	Servopack 4
	ing Ratio (denominator) 2	1
Pn204 Position Refere	nce Accel/Decel Time 1	0

Note: Click **OK** to continue and overwrite the previous settings. Click **Cancel** to return to the Parameter Editing window without overwriting the parameters.

3. Click OK.



5.

INFO

When the DeviceNet Module parameters are displayed, proceed to step 4. When only the SERVOPACK parameters are displayed, proceed to step 6.

4. Click **Write (Flash)** in the Parameter Editing window. A caution message asking if you want to continue will be displayed.

will be saved.
ccur with the servomotor and the ed to servo off status. When Write (Flash) is ind the servomotor and the SERVOPACK are off status.
Cancel

- (INFO) Click **Cancel** to return to the previous window without using the Write (Flash) function.
- 6. Restart the SERVOPACK to validate the new settings. All steps are completed.

(Save) Button

Click the 🔲 button, and then select the storage location for the parameter file displayed in the Parameter Editing window.

Save As					? ×
Save in: 🔂	YE_Applications	•	- 🗈 (* 🎟 *	
🗋 Manual					
200704231	153437.usr				
I					
File name:	20070423154230			Save	
Save as type:	Parameter file(*.usr)		•	Cance	1
Product Info:	SORV-IRSAINA				
Comment:					

Save As Dialog Box

Select one of the following file types: parameter file (*.usr) or BTO supported parameter file (*.usrs).



You can use parameter files that are saved as BTO supported parameter files (*usrs) with the BTO service.

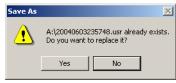
Up to 255 characters can be typed as a comment.

The default file name is the current time (yyyymmddhhmmss).

Save

Click **Save** to store the file name designating the current parameter settings. When parameters are set in the **Customize** tab, they are also saved. Click **Cancel** to return to the Parameter Editing window without saving the file.

If the file name already exists or if an already existing file is loaded and then re-saved, a warning message appears, telling you that the file name already exists, and ask if you want to replace the existing file.



Click **Yes** to overwrite the already existing file. Click **No** to return to the Parameter Editing window.

(Print) Button

The data on the Parameter Editing window can be printed.

Click the 💆 button, and the Printing Item Setting box appears.

Printing Item Setting	Printing Item Setting
Cover	Cover
Attaching the Cover Cover Editing	Attaching the Cover Cover Editing
Where to Submit Where to Submit (No.1) Submit (No.2) Submit (No.3)	Where to Submit Where to Submit (No.1) Submit (No.2) Submit (No.3)
ttem Name Setting Value	ttem Name Settinα ∀alue
Title SigmaWin 200	Title SigmaWin 200
Company Name Yaskawa	Company Name Yaskawa
Department Name MCKJ	Department Name MCKJ
Name Tarou Yaskawa	Name Tarou Yaskawa
Data for each function Parameters Header & Footer Printing items Header Info ✓ Title Parameters ✓ Models Info ✓ Printing Date ✓ File Name Footer Info ✓ Pages	Data for each function Parameters Header & Footer Printing Items Constant Number Relation of Users Image: Name Image: Name <t< th=""></t<>
Color Selection Color Selection C Black and White Color OK Cancel	Color Selection C Black and White Color C Color C Color C Color C Concel



Printing Items Tab

Printing Item Setting Box

Cover

Select Attaching the Cover, and the click Cover Editing. For details, see Chapter 3 SigmaWin+ Σ -7 Component Main Window.

Data for each function

To enter your printing preferences or specifications, click the tab whose options you want to enter or change, and enter the desired settings.

Color Selection

Documents can be printed in color or black and white. Select your preference.

🖴 Print Preview						
🛅 🎒 <u>Print</u> 🔍 🍳 🎹	✓ ▲ ▲ 1/12	🔶 🗄 Back. 🔿 Forward Ec	liting of the Printing Items			
Onterta Parameters List Comments	Parameters Downland App Parameters L			Printing Date : File Name : 20070	April 23, 2007)4231 534 37.usr	
	No.	Namie	Setting Value	Unit	Default Setting	
	Pn000 Basic F	unction Select Switch 0	0000H -		0000H	
	P n001 Basic F digt	Control Method Selection Control Method Selection Speed cortrol (analog referer Reserved (Do not change.) Inction Select Switch 1 Servo OFF or Alarm G1 Stop	nce) 0000H - Mode		0000H	
	C cligit C	Same setting as Pn001.0 (Sto AC/DC Power Input Selection Not applicable to DC power in Warning Code Output Selection	out: Input AC power supply thi		L3) terminals.	
	cligit c cligit c	1 Torque Control Option (V-REF			0000H	

After setting is finished, click **OK**. The document appears on the screen the way it will appear in print.

To print the document as is without any changes, click Print.

To return to the Printing Item Setting box and change some settings, click **Editing of the Printing Items**.

Parameter Editing when Offline

In the SigmaWin+ Σ -7 component main window, click **Parameters** and then click **Edit Parameters**.



Load From File:

Reads in existing parameters.

Select New SERVOPACK: Creates new settings for parameters.

Select the desired command and click **OK**.

<When Load from File is Selected>

The operation is the same as when the	button is clicked. See 🖻 (Open)							
Button.								
Vhen Soloct New SERVORACK is Sel	(han Salaat Naw SEDVODACK in Salaatad)							

<When Select New SERVOPACK is Selected>

The operation is the same as when the 🔲 button is clicked. See 🔲 (New) Button.

	Select	ts a new SERVOPACK.			
	0	pens files.			
		Saves parameter data	to a file.		
Check boxes		Prints the Parame	ter Editing wi	indow.	
	7 - Farameter Editing	g : SGD75-*****20A			×
		Display Mode			
		a		Display Setting	
		User Level 2:	Level 2 (To the adju	istment.)	
				Comment Customize	
		Control Mode 13	: All Control Mode	Customize	
	All constant number	Europion Selection(Pp0xx-) Gain(Pp1	(xx-) Position(Pp2x	xx-) Speed(Pn3xx-) Torque(Pn4xx-) Sequence(Pn5xx-) I/O Sigr • •	
	│				11
		Name Basic Function Selections D	Set value	AXIS#00 Input value	
	Ddigit	Direction Selection		0: Use CCW as the forward direction.	
	1 digit	Reserved parameter (Do not change.)		0 : Reserved parameter (Do not change.)	
			•	0 : Reserved parameter (Do not change.)	
	2digit	Reserved parameter (Do not change.)	-		
	3digit	Rotary/Linear Startup Selection When Enco		0 : Start as a rotary encoder.	
		Application Function Selections 1	•	0000 H	
	Ddigit	Servo OFF or Alarm Group 1 Stopping Meth	•	0 : Stop the motor by applying the dynamic brake.	
	1 digit	Overtravel Stopping Method	•	0 : Apply the dynamic brake or coast the motor to a stop (use the stopping m	
	2digit	Main Circuit Power Supply AC/DC Input Sel	i-	0 : Input AC power as the main circuit power supply using the L1, L2, and L3	
	3digit	Reserved parameter (Do not change.)	•	0 : Reserved parameter (Do not change.)	
		Application Function Selections 2	-	DD11H	
	Ddigit	MECHATROLINK Command Position and Sp	(·	1 : Use TLIM as the torque limit.	
	1 digit	Torque Control Option	-	1 : Ignore the setting of the speed limit for force control (VLIM).	
	2digit	Absolute Encoder Usage	•	0 : Use the absolute encoder as an absolute encoder.	
	3digit	External Encoder Usage	•	D : Do not use an external encoder.	
		Application Function Selections 6	•	0002H	
	D,1digit	Analog Monitor 1 Signal Selection	•	02 : Torque reference (1 W100% rated torque)	
	2digit	Reserved parameter (Do not change.)	•	D : Reserved parameter (Do not change.)	
	2 diait	Percented permeter (De net objects)		0 - Reconved parameter (De not obtained)	
	Select All(All	constant number:include not displayed)		🗸 Edit	
					1

Selects all parameters on the displayed tab.

Parameter Editing Window (Offline Mode)

(New) Button

A new SERVOPACK can be selected in the Parameter Editing - SERVOPACK Selection box using the New command. To change to a different SERVOPACK, use the following procedure.

1. Click the 🔲 button, and the Editing Parameters - Model Selection box appears.

Motor type	Rotary 💌		<u>×</u>
Servopack m SGD7S_****0 SGD7S_****0 SGD7S_****2 SGD7S_****2 SGD7S_****2	eck:	type single axis) ace single axis) face single axis) e type single axis)	Max. applicable motor capacity]
I			
Version/Sp Enter the Se (Use the dig number.)	ecial Spec. rvopack version number. ital operator to find out the ve pecial Spec. number.	ersion	Note: Select the Unknown check box to set the version to the latest.
Version/Sp Enter the Se (Use the dig number.)	rvopack version number. ital operator to find out the ve	ersion Unk	check box to set the version to

2. Select the motor type, SERVOPACK model, current [max. applicable motor capacity], and special specification numbers from the lists, and enter the version number of the SERVOPACK.

The option modules that can be mounted on the selected SERVOPACK are displayed in the **Option Module Model** field.

Select the model, version number, and special specification number of each option module.

Editing Para	meters - Model Selection		
Motor type	Rotary		
Servop	ack: <u>SGD7S- R</u>	70 * 00A	
			1
Servopack mo			rrent [Max. applicable motor capacity]
	DA(Analog/pulse-train input typ DA(MECHATROLINK-II interface		70 (0.66Arms, AC200V) [50W]
	DA(MECHATROLINK-III interface		R6 (1.6Arms, AC200V) [200W]
	DA(Command-Option module ty	pe single axis) 2R	R8 (2.8Arms, AC200V) [400W]
SGD7W-****2	0A(MECHATROLINK-III interfac		R8 (3.8Arms, AC200V) [500W]
, ⊢Version/Spa	cial Spec.	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
number.)	tal operator to find out the vers becial Spec. number.	Standard	check box to set the version to the latest.
	Reference option	Safety option	Feedback option
Option Module Model:		Unmounted (No m SGDV-OSA01A(S	
Ver.:	🔲 🗖 Unknown	🗖 🗆 🗆	Inknown
Special Spec.:]	
		OK Can	icel

3. Click **OK**. The set data will be imported, and the Parameter Editing window will appear.



Option modules

The following three option modules are available.

- Reference option module
- · Safety option module
- · Feedback option module

(Open) Button

The parameter file can be loaded in the Open box using the Open command. To load the file, use the following procedure.

1. Click the 🖻 button, and the Open box will appear.

Open		? ×
Look in: 🔂	YE_Applications 💌 🗲 🖻	- 📑 🖬 -
🗋 Manual		
200704231	L53437.usr	
File name:	20070423153437.usr	Open
r lie rianie.	20070423133437.08	Open
Files of type:	Parameter file(*.usr)	Cancel
Product Info:	2004-INBACIA	
	Customization information is used.	
Comment:		

- 2. Select the parameter file to be imported, and click **Open**.
- 3. When **Customization information is used.** check box is selected, the parameters set on the **Customize** tab in the Parameter Editing window are also imported. (See "Customize" for details.) The check box cannot be selected when the file has no parameter on the **Customize** tab.

The other operations are the same as those for parameter editing when online. See "Parameter Editing when Online."

4.2.2 Editing Parameters Online

Parameters can be viewed or edited in the Online Parameter Editing window.



- Values edited in the Online Parameter Editing box are also immediately changed in the SERVOPACK.
- If the power to the SERVOPACK is turned off or the communication between the SERVO-PACK and the SigmaWin+ is interrupted while editing parameters online, the edited values will not be saved in the SERVOPACK.
- Safety Module parameters (Pcxx) cannot be set or edited in the Online Parameter Editing box.

Edit parameters online using the following procedure.

1. In the SigmaWin+ Σ -7 component main window, click **Parameters** and then click **Edit Online Parameters**. The Online Parameter Editing box appears. The previously saved parameter settings will be displayed.

🏹 Online Parameter E	diting AXIS#1
	Setup
Pn103 Mass Ratio	
Unit %	(min-max) (0-20000)
Pn100 Speed Loop G	ain
	T T T T
Unit 0.1Hz	(min-max) (10-20000)
Pn101 Speed Loop In	tegral Time Constant
	T T T T
Unit 0.01ms	(min-max) (15-51200)
Pn000 Basic Function	Select Switch 0
	<u> </u>
Unit	(min-max)
Pn20E Electronic Gea	r Ratio (Numerator)
	<u>₽₽₽₽₽₽₽₽₽₽</u>
• • •	T T T T T T
Unit	(min-max) (1-1073741824)

Online Parameter Editing Box

2. To change the values of the settings, click the setting arrows to raise or lower the value. If an upper or lower limit is displayed, make sure that the setting is within the limit. Modified values are also immediately changed in the SERVOPACK. Clie

ck	Setup	to	view	different	parameters.
----	-------	----	------	-----------	-------------

P

Pn103 Mass Ratio % Pn100 Speed Loop Gain 0.1 Pn101 Speed Loop Integral Time Constant 0.0	t	
		SetDel
Pn101 Speed Loop Integral Time Constant 0.0	Hz	SetDel
	1 ms	SetDel
Pn000 Basic Function Select Switch 0 -		SetDel
Pn20E Electronic Gear Ratio (Numerator) -		SetDel

3. Click Set to view a parameter other than the "Moment of Inertia Ratio."

	parameter. he currently highlighted parameter)		
No.	Name	Unit	
Pn408	Force-Related Function Switches	-	
Pn409	1st Notch Filter Frequency	Hz	
Pn40A	1st Notch Filter Q Value	0.01	
Pn40B	1st Notch Filter Depth	0.001	
Pn40C	2nd Notch Filter Frequency	Hz	
Pn40D	2nd Notch Filter Q Value	0.01	
Pn40E	2nd Notch Filter Depth	0.001	
Pn40F	2nd Step 2nd Force Reference Filter	Hz	
Pn410	2nd Step 2nd Force Reference Filter	0.01	
Pn412	1st Step 2nd Force Reference Filter	0.01ms	لك
•		<u> </u>	1

4. Select the parameter to be edited, and click **OK**.

Dialog.			
No.	Name	Unit	
Pn409	1st Notch Filter Frequency	Hz	D
Pn100	Speed Loop Gain	0.1Hz	SetD
Pn101	Speed Loop Integral Time Constant	0.01ms	SetD
Pn000	Basic Function Select Switch 0	-	SetD
Pn20E	Electronic Gear Ratio (Numerator)	-	_SetD
4		• •	1

5. If there are still parameters to be edited, click Set for the parameter to be edited and set these in the same manner as the first parameter.

e t Paramete Select p Dialog.	r s arameters to be displayed in the Online Pr	arameter Editor	X	
No.	Name	Unit	1	
Pn409	1st Notch Filter Frequency	Hz	_Set _Del	
Pn40B	1st Notch Filter Depth	0.001	<u>CSet</u>	
Pn101	Speed Loop Integral Time Constant	0.01ms	_SetDel_	
Pn000	Basic Function Select Switch 0	-	_SetDel_	
Pn20E	Electronic Gear Ratio (Numerator)	-	_Set_Del_	
•				-Deletes the parameter
		ок	Cancel	displayed at left.

To view other parameters, click **Del** to delete the currently displayed parameter and then click Set.

6. Click **OK** when parameter setting is complete.

🎸 Onli	ne Parameter E	diting AXIS	#1		2
				Setup	
Pn409	1 st Notch Filter	^r Frequency			
Unit	Hz	(min-max)	(50-500	10)	
Pn40B	1st Notch Filter	r Depth			-
Unit	0.001	(min-max)	(0-1000		
Pn101	Speed Loop Inf	tegral Time Co	onstant		
Unit	0.01ms	(min-max)	(15-512		
Pn000	Basic Function	Select Switc	hΩ		-
Unit		(min-max)			
Pn20E	Electronic Gea	r Ratio (Nume	rator)		-
				 ▲ ▲ ↓ ↓ ↓ ↓	
Unit		(min-max)	101-1073	(41024)	

7. To change the values of the settings, click the setting arrows to raise or lower the value. If an upper or lower limit is displayed, make sure that the setting is within the limit. Modified values are also immediately changed in the SERVOPACK.

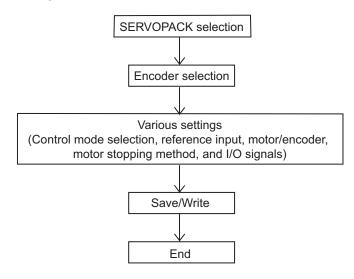
4.2.3 Setup Wizard

Setup Wizard is a function which carries out the setting of parameters using a dialog method. By following instructions on the screen to select the control mode and the I/O settings, those settings which are necessary for an operation are automatically completed.

Setup Wizard has the following features.

- Parameters can be set easily and quickly, even if you are using the SERVOPACK for the first time.
- It is possible to calculate the electronic gears automatically using the mechanical characteristics and the desired reference units (for position control).
- It is possible to select the I/O assignments while visually confirming them.

The following flowchart shows how Setup Wizard guides you through each step of parameter setting.



While Setup Wizard is open, the current settings and recommended procedures are displayed in the flowchart on the left side of the window.

Example

Servopack Selection		Control Mode Selection			
SGD7S-****20A (50W)					
Contraction					
Encoder Selection : C 17-bit incremental Fully-closed encoder : Do not use		Select the control mode you wish to use.			
		Position control with pulse train references		-	
Control Mode Selection		Mode which controls position by pulse train input reference.			
Position control with pulse train references					
Reference Input Setting					
Electronic gear ratio : 16 / 1 Positioning Completed Width : 7 [reference u	I				
Motor Encoder Setting	I				
Output pulses : 2048 [P/rev] Absolute Encoder Usage : Use the absolute	L				
Rotation (movement) direction setting : Stanc					
Log Motor Stop Method Selection					
Servo OFF, G1 alarm : Stop the motor by app					
Overtravel : Apply the dynamic brake or coa G2 alarm : Stops the motor by setting the spe					
Input signal setting : Use the standard allocal Output signal setting : Use the standard alloc					
all Save/Write	I		Apply		Cancel
				-	

The above display shows that the control mode is being selected.

Start Setup Wizard with the following procedure.

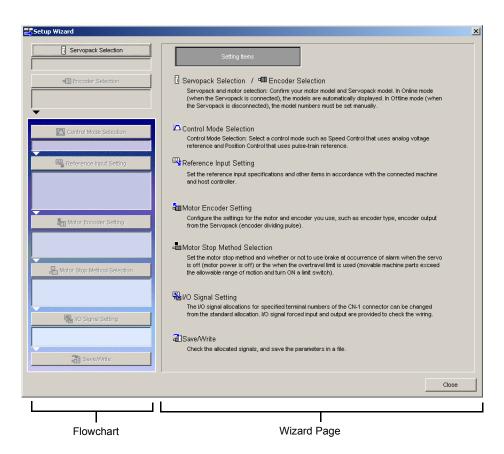


The wizard pages displayed on screen will vary in accordance with the selected SERVOPACK specifications. The wizard pages shown here are only one example.

In the SigmaWin+ Σ -7 component main window, click **Parameters** and then click **Set Up Wizard**. The Setup Wizard window will appear.



If you are online and more than one axis is being used, the following **Axis Selection** dialog box appears. First select the axes to adjust according to the **Axis Selection** dialog box. Refer to *4.1 Changing Axes* for the procedure.



Setup Wizard Window - First Wizard Page

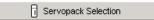
SERVOPACK selection/Encoder selection (servomotor selection):

Select these items first. When offline, first select the SERVOPACK, and then select the encoder. (When online, information on the connected SERVOPACK and encoder will be automatically set.)

Setting items other than the above:

There is no required setting order. If not set, the set value (default value when offline) of the SERVOPACK will be automatically set.

SERVOPACK Selection (only when offline)



1. Click **Servopack Selection** in the flowchart. The Servopack Selection wizard page will appear on the right.

Motor type	Rotary		
Servop		<u> </u>	1
SGD7S-***1	odei 0A(Analog/pulse-train input 0A(MECHATROLINK-II inter 0A(MECHATROLINK-III inter	type single axis) ace single axis)	rrrent [Max. applicable motor capacity]
	ecial Spec. rvopack version number. tal operator to find out the v	ersion I	Unknown Note: Select the Unknown check box to set the version the latest
number.)	pecial Spec. number.		
number.)	Reference option	Safety option	Feedback option

2. Select the motor type, SERVOPACK model, current [max. applicable motor capacity], and special specification numbers from the lists, and enter the version number of SERVOPACK.

The option modules that can be mounted on the selected SERVOPACK are displayed in the **Option Module Model** field.

- 3. Select the model, version number, and special specification number of each option module.
- 4. Click **Apply**. The display will return to the first wizard page and the set data will be written in the flowchart.



Option modules

The following three option modules are available.

- Reference option module
- Safety option module
- · Feedback option module

■ Encoder Selection (When a rotary motor is selected)

Click **Encoder Selection** in the flowchart. The Encoder Selection wizard page will appear on the right.

ully-closed encoder			
	Resolution Encoder Type	bit	¥

Serial Encoder Specifications/Serial Encoder Setting

When online: Displayed only when no motor is connected. Not displayed when a motor is connected.

When offline: Always displayed.

Fully-closed encoder

When online: Displayed only when no fully-closed encoder is connected. Only the "Use" check box is displayed when a fully-closed encoder is connected.

- When offline: Displayed only when the SERVOPACK selected on the SERVOPACK selection wizard page supports fully-closed control.
- 1. Select the serial encoder specifications from the list. When using a special or new serial encoder that is not included in the list, select **Unknown/No match** and then enter the resolution and select the encoder type in the **Serial Encoder Setting** field.
- 2. When using fully-closed control, set the fully-closed encoder to be used. This setting is valid only when the Use check box is selected. Select the serial converter unit from the list. When using a special or new serial converter unit that is not included in the list, select Unknown/No match and then enter the resolution and select the encoder type in the boxes on the right.

Encoder Selection (When a linear motor is selected)

all Encoder Selection

Click **Encoder Selection** in the flowchart. The Encoder Selection wizard page will appear on the right.

8-bit multiplier increm Unknown/No match	ental Scale	pitch divisions	bit	
	Encor	ler Type		Ŧ
Enter Linear Scale Pitc	h.			
Linear Scale F	Pitch 200	00 [0.01um]		
				Л
	Pn282 : Linear Sca	le Pitch	pitch	
	(1-6553600)		

Serial converter unit

When online: Not displayed when a linear motor is connected. Displayed only when no linear motor is connected.

When offline: Always displayed.

- 1. Select the serial converter unit from the list. When using a special or new serial converter unit that is not included in the list, select **Unknown/No match**, enter the number of scale pitch divisions, and select the encoder type in the boxes on the right.
- 2. Enter the linear scale pitch.
- 3. Click **Apply.** The display will return to the first wizard page and the set data will be written in the flowchart.

Control Mode Selection

🔼 Control Mode Selection

Click **Control Mode Selection** in the flowchart. The Control Mode Selection wizard page will appear on the right.

	Control Mode Selec	tion			
Select the	control mode you w	ish to use.			
Speed co	ntrol (analog referer	nce)		•	
Mode whit	ch controls speed b	y input of referenc	e analog voltage.	 	

Select the control mode from the list, and then click **Apply**. The display will return to the first wizard page and the set data will be written in the flowchart.

Reference Input Setting

暇 Reference Input Setting

Click Reference Input Setting in the flowchart.

The wizard page for reference input setting will vary according to the selected control mode:

- For speed control
- For position control
- For torque (force) control
- For internal set speed control
- · For zero clamp



When a control mode that includes more than one control is selected, a reference input setting for each control is required.

Control mode: Speed control

The Reference Input Setting - Speed Control wizard page appears.

Reference Input Setting - Speed Control	0
Enter the ratio between the reference voltage and speed ro Set the speed to 3000 [min-1] by reference input of 6 [V] Calculate 600 [0.01V/rated speed] Pn300: Speed Reference input Gain (150 - 3000) Information When the unit coefficient is 0.01 and 600 has been set, rated rotational speed is 6V. 600 X 0.01 = 6[V/rated rotational speed]	reference. Motor Selection SOMAS Rated speed 3000 [min-1] Reference Set this stope. Reference Voltage(V)
Enter Speed Coincidence Signal Detecting Width. Speed Coincidence Signal 10 [min-1] Detecting Width Pn503 : Speed Coincidence Signal Detecting Width (0 - 100)	Motor speed Reference speed N-CMP is output in this range.
< Bac	:k. Next ≻ Cancel

Motor Selection Rated Speed

When online: The rated speed of the connected motor is automatically set.

When offline: Select the motor model to be used from the **Motor Selection** list.

When **Unknown/No match** is selected from the list, enter the motor rated speed in the **Rated speed** box.

- 1. Set the ratio between the reference voltage and the speed reference by entering the values. When offline, select the motor model from the **Motor Selection** list. Enter the rated speed if **Unknown/No match** is selected from the list.
- 2. Click **Calculate**. The speed reference input gain will be automatically calculated and set according to the set ratio between the reference voltage [V] and the speed reference [min⁻¹].
- 3. Enter the speed coincidence signal detecting width and then click **Next** to continue setting.

	ence Input Setting - Speed Control
Enter Soft start ti	me.
Soft Start Accel	eration Time
Soft Start Decel	eration Time 0 [ms]
	Pn305 : Soft Start Acceleration Time Pn306 : Soft Start Deceleration Time
	(0-10000) (0-10000)
	Maximum speed of Servomotor
Before soft start	After soft start

4. Enter the soft start acceleration time and soft start deceleration time and then click **Apply**. The display will return to the first wizard page and the set data will be written in the flowchart.



If Control mode settings for all the selected controls are not completed Next will be displayed instead of Apply. Click Next to display the wizard page for the unset control. Make the required setting on the displayed wizard page.

Control mode: Position control

The Reference Input Setting - Position Control wizard page will appear.

use train having a combination of oth for ward rotation and reverse oth for ward rotation and reverse CM-Ve COW FOLS FOLS CM-Ve COW SIGN	 Sian + Pulse 	Forward Reference	Reverse Reference
(0W) -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12 -12	 Sign + Pulse Pulse train having a combination of both forward rotation and reverse rotation references. 		PULS
onvexid rotation: inputs a pulse train to SGN. teverse rotation: inputs a pulse train to PULS in phase A + phase B use train having a 90 degree phase ifference.	C ow+cow		
to PULS _PULS PULS PULS _PULS _PULS _PULS PULS P	Forward rotation: Inputs a pulse train into SIGN.		SIGN -I
phase A + phase B	into PULS.		1 111
	C phase A + phase B		
Pn200: Position Control Reference Form Selection Switch	Pulse train having a 90 degree phase difference.		SIGN L
	Pn200: Position Control Reference For	n Selection Switch	

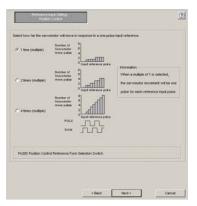
Select the pulse form of the SERVOPACK, and then click Next.
 One of the following three windows will appear, depending on the selected pulse form.

	Forward rotation Reverse rotation
Footive logic	
* Negative logic	
	Nerronae Farm Salection Switch
1200 Pusition Control H	eterence / unit seeclish (swED)

	正転征方向的指令	建転进方向口服电	
if Eint			
C RAIE			
Ph200 (028)	即指令和統選択スイッチ		

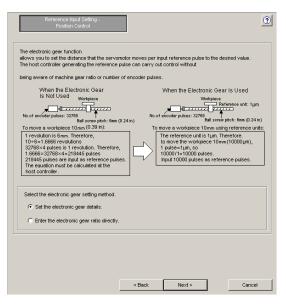
When Sign + Pulse is selected

When CW+CCW is selected

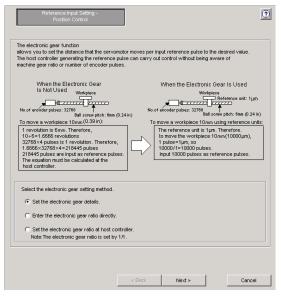


When phase A + phase B is selected

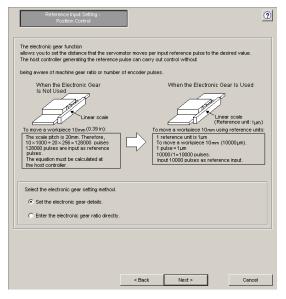
2. Select the logic type or the motor movement amount per pulse input reference, and then click **Next**.



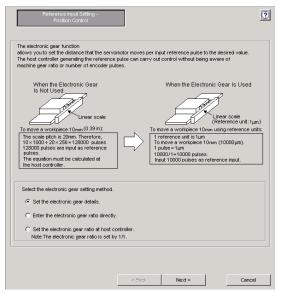
Rotary Motor/Analog Voltage and Pulse Train Reference Type SERVOPACK



Rotary Motor and SERVOPACK with MECHATROLINK-II/-III References



Linear Motor/Analog Voltage and Pulse Train Reference Type SERVOPACK



Linear Motor and SERVOPACK with MECHATROLINK-II/-III References

3. Select the electronic gear function setting method, and then click Next.

<When the Enter the electronic gear ratio directly. option is selected>

The following wizard page will appear.

Electronic Gear Ratio = 4 Pn20E Electronic Gear Ratio = 1 Pn210 0.0 Pn20E : Electronic Gear Ratio Pn210 : Electronic Gear Ratio (Numerator) (Denominator) (1 - 1073741824) (1 - 1073741824) co Enter Positioning Completed Width Positioning Completed Width Pn522 : Positioning Completed Width E	rmation tronic gear ratio setting range: 1 <= Electronic gear ratio <= 1000 e setting is out of the above range, the meter setting error (A.040) will be ut, and the Servopack will not operate ectly. Reference Motor speer Pn522 or pulse
Pn20E: Electronic Gear Ratio Pn210: Electronic Gear Ratio (Denominator) (Denominator) (Comminator) (Comminato	eed Reference Motor speed
Positioning Completed Width [Inference units]	reed Pn522
Pn522 : Positioning Completed Width	Pn522
(0-1073741824)	
< Back	

Enter the electronic gear ratio and positioning completed width, and then click **Apply**. The display will return to the first wizard page and the set data will be written in the flowchart.

• When using a fully-closed encoder

Reference Input Setting - Position Control			<u>0</u>
Electronic Gear Ratio = 1 Pn20E : Electronic Gear Ratio Pn210 : Electronic (Numerator) (Deno		Information Electronic gear ratio s 0.001 <= Electronic ge If the setting is out of 1 parameter setting error output, and the Servor correctly.	ear ratio <= 1000 the above range, the or (A.040) will be
Enter Number of sine wave pitches (cycles) p Number of sine wave pitches (cycles) per motor rotation Pn20A : Number of Ext (4 - 104857	32768 [Pitch	uRev]	tch
Enter Positioning Completed Width. Positioning Completed Width Pn522 : Positioning Comp (0 - 107374182		Reference Speed	Pn522
	< Back	Apply	Cancel

Enter the electronic gear ratio, number of sine wave pitches per motor rotation, and positioning completed width, and then click **Apply**. The display will return to the first wizard page and the set data will be written in the flowchart.



If Control mode settings for all the selected controls are not completed
 Next will be displayed instead of Apply. Click Next to display the wizard page for the unset control. Make the required setting on the displayed wizard page.

<When the Set the electronic gear details. option is selected>

One of the following wizard pages will appear.

Reference Input Setting - Position Control	Reference Input Setting - Position Control
Select the mechanical structure of the electronic gear. Ball screw Ball screw Ball screw ptch P Ball screw Cear ratio Calculates the electronic gear ratio	Select ether of the following display units. Click the Change button to chance the value. Image: Constraint of the following display units. Click the Change button to chance the value. Image: Constraint of the following display units. Click the Change button to chance the value. Image: Constraint of the following display units. Click the Change button to chance the value. Image: Constraint of the following display units. Click the Change button to chance the value form the host controller. Image: Constraint of the following display units. Click the Change button to the following display units. Click the Change button to the following display units. Click the Change button to the following display units. Click the Change button to the following display units. Click the Change button to the following display units. Click the Change button to the following display units. Click the Change button to the following display units. Click the Change button to the following display units. Click the Change button to the following display units. Click the Change button to the following display units. Click the Change button to the following display units. Click the Change button to the following display units. Click the Change button to the following display units. Click the Change button to the following display units. Click the Change button to the following display units. Click the Change button to the following display units. Click the Change button to the following display units. Click the Change button to the following display units. Click the Change button to the following display units. Click the Change button to the following display units. Click the Change button to the following display units. Click the Change button to the following display units. Click the Change button to the following display units. Click the Change button to the following display units. Click the Cha
real, preference unit and resolution. Roll feed Other	Enter Positioning Completed Width. Positioning Completed Width 7 [reference units] PnS22: Positioning Completed Width (0 - 1073741824) Cancel

When Motor type is Rotary

When Motor type is Linear

 For rotary motors, select the electronic gear mechanical structure, and then click Next. The setting procedure when the ball screw is selected is explained here. For other mechanical structures, see "■ Supplemental Information."



Difference in settings for rotary motor and linear motor

For a linear motor, the electronic gear mechanical structure selection is not required. Proceed to step 6.

Reference Input Setting - Position Control			?
Set the ball screw pitch. P = 1 mm V Information One pitch is the moving distance per ball screw. Set the gear ratio. n 1 m 1 Information When the servomotor rotates m for a load a rotation of n, the gear ratio is represented b		Ball sc	Gear ratio
	< Back	Next >	Cancel

• When using a fully-closed encoder

Reference Input Setting - Position Control	0
Set the ball screw pitch. P = 1 mm T Information One pitch is the moving distance per ball screw. Set the gear ratio. n 1 m 1 information When the servomotor rotates m for a load axis rotation of n, the gear ratio is represented by n/m.	Ball screw pitch P
Enter Linear Scale Pitch. Linear Scale Pitch 2000 [0.01µm] (1 - 6553600)	pitch
< Back	Next > Cancel

5. Enter the ball screw pitch and gear ratio, and then click **Next**.

Reference Input Setting - Position Control	?
Select either of the following display units. Click the Change button to change the value. Modify reference unit 0.01 [um] Per one rotation of load axis 100000 [Reference unit] Information Information The reference unit equals one reference pulse from the host controller. Gear ratio The electronic gear ratio becomes the value shown below. Ball screw pitch P Electronic Gear Ratio = 131072 Pn20E 1 mm	
100000 Pn210 Gear ratio 1 : 1 Pn20E Electronic Gear Ratio (Numerator) Pn210: Electronic Gear Ratio (Denominator)	
Enter Positioning Completed Width. Reference Motor spec	
Interence units] Speed	a
Pn522 : Positioning Completed Width (0 - 1073741824)	
< Back Apply Cancel	

· When using a fully-closed encoder

Enter the ball screw pitch, gear ratio, and linear scale pitch, and then click Next.

Reference Input Setting - Position Control]			
Select either of the following display units. Click t button to change the value.	the Change		Ball so	rew pitch P
reference unit 0.1 [ur	m]	Modify		
C Per one rotation of load axis 10000 [R	eference unit]	Modify		
Information The reference unit equals one reference pulse (The minimum unit of the reference sent from th			Ce	Gear ratio
The electronic gear ratio becomes the value sho	wn below.			<u></u>
12800 Pn20E			Ball screw	pitch P 1 mm
Electronic Gear Ratio = 10000 Pn210		c	Gear ratio 1 : 1	
Pn20E:Electronic Gear Ratio (Numerator) Pn20A : Number of External Encoder Pite	Pn210: Electronia	c Gear Ratio (De 50 [Pitch/Re√		
Enter Positioning Completed Width.				
Positioning Completed Width	(reference units)	R Speed	eference	Motor speed
Pn522 : Positioning Complet	ted Width	Error pulse	Pr	
(0 - 1073741824)		/COIN	j	— <u>i</u> _
	< Back	Apply	1	Cancel

- 6. Set the reference unit or number of reference units per load axis rotation. Check the displayed electronic gear ratio to see if it is correct, enter the positioning completed width, and then click **Apply**. The display will return to the first wizard page and the set data will be written in the flowchart.
- · When using a fully-closed encoder

Set the reference unit or number of reference units per load axis rotation. Check the displayed electronic gear ratio and number of external encoder pitches to see if they are correct, and then enter the positioning completed width. Click **Apply**.

The display will return to the first wizard page and the set data will be written in the flowchart.



If Control mode settings for all the selected controls are not completed

Next will be displayed instead of **Apply**. Click **Next** to display the wizard page for the unset control. Make the required setting on the displayed wizard page.

<When the Set the electronic gear ratio at host controller. option is selected>

The following wizard page will appear.

The electronic gear ratio becomes the value shown below. Electronic Gear Ratio = 1 Pn20E 1 Pn20E Pn20E: Electronic Gear Ratio Pn210: Electronic Gear Ratio (Numerator) (Denominator) Enter Positioning Completed Width. Positioning Completed Width (reference unts] Pn522: Positioning Completed Width (0 - 1073741824) Pn522: Positioning Completed Width	Reference Input Setting - Position Control			2
Positioning Completed Width reference units Speed Speed Pn522 : Positioning Completed Width Error pulse From Pn522 : Positioning Completed Width	Electronic Gear Ratio =	1 Pn20E 1 Pn210 tronic Gear Ratio	The electronic gear ratio from host controller. Please set the electronic	makes the setting gear ratio from host
	Positioning Completed Width Pn522 : Positioning Com	units] npleted Width	Speed	
< Back Apply Cancel				

Enter the electronic gear ratio and positioning completed width, and then click **Apply**. The display will return to the first wizard page and the set data will be written in the flowchart.

• When using a fully-closed encoder

Reference Input Setting - Position Control	0
The electronic gear ratio becomes the value shown below. Electronic Gear Ratio = 1 Pn20E 1 Pn210	The electronic gear ratio makes the setting from host controller.
Pn20E : Electronic Gear Ratio Pn210 : Electronic Gear Ra (Numerator) (Denominator)	tio controller after writing in the servopack.
Enter Number of sine wave pitches (cycles) per motor rotati Number of sine wave pitches (cycles) 50 per motor rotation 900 Pn20A : Number of External Encoder (4 - 1048576)	[Pitch/Rev]
Enter Positioning Completed Width. Positioning Completed Width [reference units]	Reference Motor speed
Pn522 : Positioning Completed Width (0 - 1073741824)	Error pulse
< Back	Apply Cancel

Enter the electronic gear ratio, number of sine wave pitches per motor rotation, and positioning completed width, and then click **Apply**. The display will return to the first wizard page and the set data will be written in the flowchart.



If Control mode settings for all the selected controls are not completed
 Next will be displayed instead of Apply. Click Next to display the wizard page for the unset control. Make the required setting on the displayed wizard page.

Control mode: Torque (Force) control

The Reference Input Setting - Torque (Force) Control wizard page will appear.

Reference Input Setting - Torque (Force) control			0
Enter the ratio between the reference voltage Set the torque (force) to 100 (%) by reference input of 3 [V] Calculate ▼ 30 [0.1V/rated torque] Pn400: Torque Reference input (10 - 100) Information When the unit coefficient is 0.1 and 30 has in rated torque is 3V. 30 × 0.1 = 3 [V/rated torque]	Ref	erence torque (thrust) R ated torque (thrust)	Reference voltage(V) is reference voltage set.
	< <u>B</u> ack	Арріу	Cancel

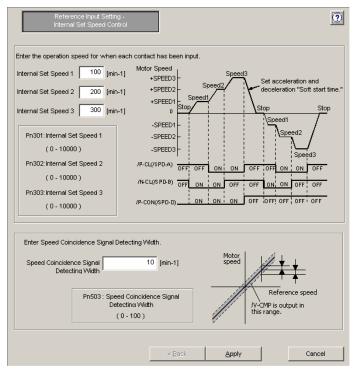
- 1. Set the ratio between the reference voltage [V] and the torque (force) reference [%] by entering the values.
- 2. Click **Calculate**. The torque reference input gain will automatically be calculated and set according to the set ratio between the reference voltage and the torque (force) reference.
- 3. Click **Apply**. The display will return to the first wizard page and the set data will be written in the flowchart.



If Control mode settings for all the selected controls are not completed Next will be displayed instead of Apply. Click Next to display the wizard page for the unset control. Make the required setting on the displayed wizard page.

Control mode: Internal set speed control

The Reference Input Setting - Internal Set Speed Control wizard page will appear.



Enter the internal set speeds 1 to 3 and the speed coincidence signal detecting width, and then click **Apply**. The display will return to the first wizard page and the set data will be written in the flowchart.



■ If Control mode settings for all the selected controls are not completed

Next will be displayed instead of **Apply**. Click **Next** to display the wizard page for the unset control. Make the required setting on the displayed wizard page.

Control mode: Zero clamp control

The Reference Input Setting - Zero Clamp wizard page will appear.

Pn501: Zero Clamp Level (0 - 10000) Information If a value larger than the maximum motor speed is entered, the maximum speed will be set.	Preset value for zero clamping /P-CON(/ZCLAMP) input Zero clamp is performed.	V-REF spe	Closed(On)

Enter the zero clamp level, and then click **Apply**. The display will return to the first wizard page and the set data will be written in the flowchart.



■ If Control mode settings for all the selected controls are not completed

Next will be displayed instead of **Apply**. Click **Next** to display the wizard page for the unset control. Make the required setting on the displayed wizard page.

Motor Encoder Setting

🌆 Motor Encoder Setting

Motor type: Rotary

1. Click **Motor Encoder Setting** in the flowchart. The Motor Encoder Setting - Dividing output setting wizard page will appear.

Dividing ou	ler Setting - tput setting	Sanda J
Dividing output setting —		
Use the dividing output	.t.	
Set the number of outp	ut pulses per motor ro	tation.
2048		Set the dividing output according to the electronic cear ratio.
Pn212: Encoder Outp	ut Pulses	Example) Preset value : 16 PAO NUNUNUNU PBO NUNUNUNUNU I revolution
Set the number of out		ving setting unit.
Set value (pulses/rev.)	Setting unit	Motor speed upper limit (min-1)
Set value (pulses/rev.) 16 - 16384	Setting unit	Motor speed upper limit (min-1) 6000
	*	
16 - 16384 16386 - 32768 32772 - 65536	1	8000
16 - 16384 16386 - 32768 32772 - 65536 65544 - 131072	1 2 4 8	6000 3000 1500 750
16 - 16384 16386 - 32768 32772 - 65536	1 2 4	6000 3000 1500
16 - 16384 16386 - 32768 32772 - 65536 65544 - 131072	1 2 4 8 16 16 ge for the absolute encode	6000 3000 1500 750 375 Coder.

<when a<="" th="" using=""><th>a fully-closed</th><th>encoder></th></when>	a fully-closed	encoder>
-------------------------------------------------------------------------------	----------------	----------

Motor Encoder Setting - Dividing output setting	0
Dividing output setting Use the dividing output. Set the number of output edges per fully-closed enc 20 (1 - 4096) Pn281: Encoder Output pulse Example) Preset value : 20 PAO JUJUU	coder pitch. Image: Set the dividing output according to the electronic cear ratio. Image: Set the dividing output according to the electronic cear ratio. Image: Set the dividing output according to the electronic cear ratio. Image: Set the dividing output according to the electronic cear ratio. Image: Set the dividing output so that one image: Set the dividit so that one image: Set the dividing output so that one image: S
Absolute Encoder Setting Select the method of usage for the absolute encoder. Uses absolute encoder as an absolute encoder. Pn002: Basic Function Select Switch 2	
<	Back. Next > Cancel

Dividing output setting

Settings in this wizard page are enabled when the **Use the dividing output.** check box is selected (the check box is selected at the initial startup). Set the number of output pulses per motor rotation from the spin box. When using a fully-closed encoder, set the number of output edges per fully-closed encoder pitch from the spin box.

Alternatively, use the following automatic settings.

- For position control: Dividing output according to the reference units calculated using the electronic gear ratio
- When using a fully-closed encoder: Dividing output according to the movement amount per edge

Click Apply and the calculated dividing output will be set.

 Set the dividing output from the spin box, and select the absolute encoder usage from the list when using an absolute encoder. Then, click Next. The Motor Encoder Setting -Rotation (movement) direction setting wizard page will appear.

Motor Encoder Se Rotation (movement) dire		<u>(</u>)
Set the motor rotation (moveme	nt) direction.	
	Forward Reference Encoder output	Reverse Reference Encoder output cw () from Servopack
Standard setting	from Servopack	Ann PAO(phase A)
C Reverse Rotation (Move	Encoder output from Servopack 	Encoder output from Servopack .nnn PAO(phase A) .nnn PAO(phase B)
Pn000: Basic Function Selec	t Switch 0	
Only the motor rotation direc	ward rotation" is counterclockwise as vi tion is reversed in reverse rotation mode. Ich as analog monitor signal) from Servop	. The encoder pulse output and the
	< <u>B</u> ack	Apply Cancel

<When using a fully-closed encoder>

The Motor Encoder Setting - Fully-closed encoder usage wizard page will appear.

Select the relationship between the motor rotation direction and the fully-closed pulse direction.
Use the standard direction (COW = Count up)
C Use the reverse direction (CCW = Count down)
Pn002: Basic Function Select Switch 2
< Back Next > Cancel

Select the relationship between the motor rotation direction and the fully-closed pulse direction, and then click **Next**. The display will return to the previous wizard page (Motor Encoder Setting - Rotation (movement) direction setting).

3. Select the motor rotation (movement) direction, and then click **Apply**. The display will return to the first wizard page and the set data will be written in the flowchart.

Motor type: Linear

1. Click **Motor encoder setting** in the flowchart. The Motor Encoder Setting - Linear motor basic settings wizard page will appear.

Motor Encoder Setting - Linear motor basic settings			<u>?</u>
-Hall sensor selection(Pn080.0)			
Select "No hall sensor" if your linear motor h	nas no hall sensor.		
0:Yes		-	
-Scale direction(Pn080.1)			
Select the relationship between the linear se forward direction (direction to the cable out		and motor	
A phase progress is the order of UVW	phase.		
C B phase progress is the order of UVW	phase.		
+			
	< Back	Next >	Cancel

2. Select whether or not the linear motor has a hall sensor from the list, and select the relationship between the linear scale count up direction and the motor forward direction. Click **Next**, and the Motor Encoder Setting - Dividing output setting wizard page will appear.

Motor Encoder Setting - Dividing output setting	0
 Dividing output setting ✓ Use the dividing output. Set the number of output edges per linear scale 	le pitch.
20 ★ [Edge/pitch] (1 - 4096) Adjust Upper Limit	C Use the reference. Set the dividing output according to the electronic acer ratio. Edge/pitch
Pn281: Encoder Output pulse	 Specify the moving amount per edge. (When using a linear scale)
Example) Preset value : 20 PAO JUJUU PBO JUJUU pitch	Set the dividing output so that one 0.1 [µm] edge equals 0.1 [µm] Note: Linear scale pitch 20.00 [µm]
Absolute Encoder Setting Select the method of usage for the absolute encoder Uses absolute encoder as an absolute encoder Pn002: Basic Function Select Switch 2	
	< Back Next > Cancel

Dividing output setting

Settings in this wizard page are enabled when the **Use the dividing output.** check box is selected (the check box is selected at the initial startup). Set the number of output edges per linear scale pitch from the spin box.

Alternatively, use the following automatic settings.

- For position control: Dividing output according to the reference units calculated using the electronic gear ratio
- Dividing output according to the movement amount per edge

Click Apply and the calculated dividing output will be set.

Adjust Upper Limit

Click this button to adjust the upper limit for the dividing output setting.

 Set the dividing output from the spin box, and select the absolute encoder usage from the list when using an absolute encoder. Then, click Next. The Motor Encoder Setting -Rotation (movement) direction setting wizard page will appear.

Standard setting Standard setting Standard setting Standard setting The set of	Reference incoder output rom Servopack JLTL PAO(phase / ILTL PAO(phase f ncoder output rom Servopack JLTL PAO(phase / ILTL PAO(phase f
Standard setting Standard S	rom Servopack ภ.ภ. PAO(phase / เภ.ภ. PAO(phase f ncoder output rom Servopack ภ.ภ. PAO(phase /
Standard setting Standard setting Image: Standard setting Image: Standard setting Image: Standard setting Image: Standard setting Standard setting Standard setting Standard setting Standard setting for "forward direction" is the direction to the motor cable outlet. Only the motor movement direction is reversed in reverse direction mode. The encoder out	ILL PAO(phase E ncoder output rom Servopack JLL PAO(phase /
Reverse Rotation (Move Encoder output from Servopack from Servopack from PAO(phase A) Photo: Basic Function Select Switch 0 Information The standard setting for "forward direction" is the direction to the motor cable outlet. Only the motor movement direction is reversed in reverse direction mode. The encoder output	ncoder output rom Servopack Л_П_ PAO(phase /
C Reverse Rotation (Move from Servopack Improve Improve	rom Servopack Л.Л. PAO(phase /
Reverse Rotation (Move Information The standard setting for "forward direction" is the direction to the motor cable outlet. Only the motor movement direction is reversed in reverse direction mode. The encoder out	л.п. PAO(phase /
Pn000: Basic Function Select Switch 0 Information The standard setting for "forward direction" is the direction to the motor cable outlet. Only the motor movement direction is reversed in reverse direction mode. The encoder ou	
Information	
Information	
The standard setting for "forward direction" is the direction to the motor cable outlet. Only the motor movement direction is reversed in reverse direction mode. The encoder ou	
- Only the motor movement direction is reversed in reverse direction mode. The encoder ou	
	tout and the

4. Select the motor movement direction, and then click **Apply**. The display will return to the first wizard page and the set data will be written in the flowchart.

Motor Stop Method Selection

占 Motor Stop Method Selection

1. Click **Motor Stop Method Selection** in the flowchart. The Motor Stop Method Selection wizard page will appear.

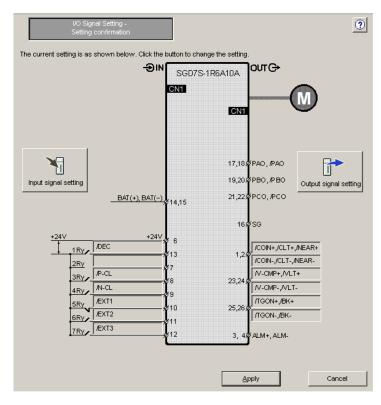
Motor Stop Method Selection	0
Motor Stop Method Selection	
Select a motor stop method.	
Servo OFF, G1 alarm(Pn001.0)	
0 : Stops the motor by applying DB (dynamic brake).	
Overtravel(Pn001.1)	
0 : Same setting as Pn001.0 (Stops the motor by applying DB or by coasting).	
G2 alarm(Pn00B.1)	
0: Stops the motor by setting the speed reference to "0".	
Information 1. Stop by dynamic brake: Stops the motor by using the dynamic brake (with short-circuiting by a circuit of Servopack). 2. Coast to a stop: Stops the motor naturally, with no brake, by using the friction resistance of the motor in operation. 3. Decelerate to stop: Stops the motor by using deceleration (braking) torque. 4. Zero Clamp Mode: Stops the motor by making the position reference zero.	
Brake setting ☐ Use the holding brake (servomotor with the holding brake).	
Apply Cancel	

2. Select the motor stop method for each of the three conditions indicated, and select or clear the check box to set whether or not to use a holding brake. Then, click **Apply**. The display will return to the first wizard page and the set data will be written in the flowchart.

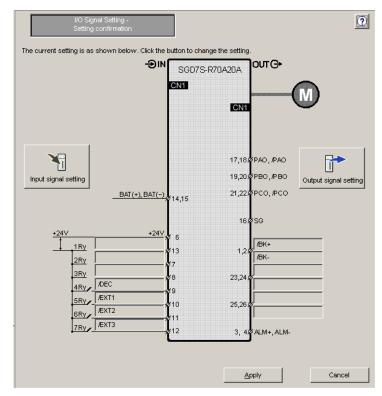
■ I/O Signal Setting

🖏 I/O Signal Setting

1. Click **I/O Signal Setting** in the flowchart. The I/O Signal Setting - Setting confirmation wizard page will appear.



SERVOPACK with MECHATROLINK-II Communications References



SERVOPACK with MECHATROLINK-III Communications References

2. Click **Input signal setting** to set input signals or **Output signal setting** to set output signals. The following wizard pages will appear for each case.

? Select the input signal allocation mode. Customize allocation Click any cell to allocate an input signal Always OFF Always ON Allocation CN1-13 CN1-7 CN1-8 CN1-9 CN1-10 CN1-12 CN1-11 P-OT Possible P-OT N-OT Possible N-OT /P-CL Possible /P-CL(L) /N-CL(L) /N-CL Possible /DEC(L) /DEC Possible /B(T1 Possible /B(T1(L) /E(T2(L) /ECT2 Possible /EXT3(L) /ECT3 Possible FSTP Possible I/O name (L) I/O name (H) Normal allocation Ph50A: Input Signal Selections 1 Ph511: Input Signal Selections 5 Reversed allocation Pn50B: Input Signal Selections 2 ОK Cancel

<Input Signal Setting Wizard Page>

SERVOPACK with MECHATROLINK-II Communications References

Allocation CN1-13 CN1-7 CN1-8 CN1-9 CN1-10 CN1-11 CN1-12 Always ON Always OF P-0T Possible P-0T(L) OF OF <						Select the	input sign:	al allocatio	n mode.					
Allocation CNI-13 CNI-17 CNI-18 CNI-10 CNI-10 CNI-11 CNI-12 ON OFI P-0T Possible P-0T(L) Image: CNI-16 CNI-10 CNI-10 CNI-10 CNI-10 CNI-11 CNI-12 ON OFI N-0T Possible N-0T(L) Image: CNI-16 CNI-10 CNI-10 CNI-10 CNI-10 CNI-10 CNI-11 CNI-12 ON OFI N-0T Possible N-0T(L) Image: CNI-10	Click any cell to allocate an input signal.					Stan	dard alloca	tion	Custom	ize alloca	ation			
N-OT Possible N-OT(L) Image: Constraint of the		Allocation	CN1-13	CN1-7	CN1-8	CN1-9	CN1-10	CN1-11	CN1-12		Aways OFF			
/P-CL Possible /P-CL(L) Image: Comparison of the comparison of t	P-OT	Possible	P-OT(L)											
Nr. CL Possible Image: Close state stat	N-OT	Possible	[N-OT(L)										
ADEC Possible ////////////////////////////////////	/P-CL	Possible			/P-CL(L)									
//Ext1 Possible //Ext1 //Ext1 //Ext2 //Ext2 //Ext2 //Ext2 //Ext2 //Ext3 //Ext3 <th ext3<="" th=""> <th ext3<="" th=""> <th <="" ext3<="" td=""><td>/N-CL</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>/N-CL</td></th></th></th>	<th ext3<="" th=""> <th <="" ext3<="" td=""><td>/N-CL</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>/N-CL</td></th></th>	<th <="" ext3<="" td=""><td>/N-CL</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>/N-CL</td></th>	<td>/N-CL</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>/N-CL</td>	/N-CL										/N-CL
/EXT2 Possible /EXT2(L) /EXT3 Possible /EXT3(L) FSTP Possible /EXT3(L) I/O name (L) Normal allocation Pn50A: Input Signal Selections 1 Pn511: Input Signal Selections 5	/DEC					/DEC(L)								
//EXT3 Possible //EXT3(L) FSTP Possible FSTP I/O name (L) Normal allocation Pn50A: Input Signal Selections 1 Pn511: Input Signal Selections 5	/B(T1	Possible					/B(T1(L)							
FSTP Possible FSTP I/O name (L) Normal allocation Pn50A: Input Signal Selections 1 Pn511: Input Signal Selections 5		Possible						/EXT2(L)						
I/O name (L) Normal allocation Pn50A: Input Signal Selections 1 Pn511: Input Signal Selections 5	/B/T2	1 OSSIDIC												
	/B(T2 /B(T3								/BT3(L)					
	/EXT3 FSTP	Possible Possible	ymal allege	tion	Dec O du la	nut Cine -!	Colocition -	4 Do 544		I Selection				
	/Extt3 FSTP I/O nam	Possible Possible ne (L) No							Input Signa		ns 5			
	/Extt3 FSTP I/O nam	Possible Possible ne (L) No							Input Signa		ns 5			
	/Extt3 FSTP I/O nam	Possible Possible ne (L) No							Input Signa		ins 5			
	/Extt3 FSTP I/O nam	Possible Possible ne (L) No							Input Signa		ins 5			

SERVOPACK with MECHATROLINK-III Communications References

Standard allocation

Input signals will be allocated by default.

The allocation is fixed to the default setting and cannot be changed.

Customize allocation

Input signals can be allocated as desired.

Click a cell and the name of the signal to be allocated will be displayed in the cell. To switch between normal allocation and reverse allocation, click the cell again. When the required input signals are allocated, click **OK**.

If all required input signals are not allocated, a confirmation message will appear. (The message shown below is an example.)



Caution			
٩	There are some signal allocation		in input
	Do you want to	change alloca	ations?
	Yes	No	

If some input signal allocations are duplicated, the following confirmation message will appear.

<Output Signal Setting Wizard Page>

/COIN	Allocation	CN1-1,2 /COIN(L)	CN1-23,24	CN1-25,26	(Do not use)	-
A/CMP	Not require		AV-CMP(L)			
/TGON	Possible		vo civil (c)	/TGON(L)		_
/S-RDY	Possible				/S-RDY	-
/CLT	Possible	/CLT(L)				
MLT	Not require		MLT(L)			-
/BK	Possible			/BK(L)		
AWARN	Possible				AWARN	
/NEAR	Possible	/NEAR(L)				
/PM	Possible					
I/O name (L) I/O name (H)		lallocation	Pn50F: Output	Signal Selection Signal Selection Signal Selection	ns 2	ut Signal Inverse

SERVOPACK with MECHATROLINK-II Communications References

/COIN	Possible	/COIN(L)			(Do not use)	4
AV-CMP	Not require		AV-CMP(L)			-
/TGON	Possible			/TGON(L)		-
/S-RDY	Possible				/S-RDY	
/CLT	Possible				/CLT	1
MLT	Not require				MIT	
/BK	Possible				/ВК	
AWARN	Possible				AWARN	
/NEAR	Possible				/NEAR	
/PM	Possible				/PM]
D name (L)	Normal a	llocation	Pn50E: Output	Signal Selection	ns 1 Pn512: Outpi	ut Sianal Inverse
	Reversed	allocation		-		ut Signal Selections
			Pn510: Output	Signal Selection	ns 3	
/PM name (L)	Possible Normal a		Pn50F: Output	Signal Selection	/PM ns 1 Pn512: Outpi ns 2 Pn514: Outpi	-
บ	Normal a	llocation	Pn50E: Output	Signal Selection	ns 1 Pn512: Outpi	ut Signal Inverse
O name (H)	Reversed	allocation		-		-
			Pn510: Output	Signal Selection	ns 3	

SERVOPACK with MECHATROLINK-III Communications References

Click a cell to allocate an output signal.

- 3. When all required signals are allocated, click **OK**. The display will return to the wizard page shown in step 1.
- 4. Click **Apply**. The display will return to the first wizard page and the set data will be written in the flowchart.

■ Save/Write

🚮 Save/Write

Save the settings using the following procedure.

The wizard page for saving/writing parameters into the SERVOPACK when online is different from the wizard page when offline.

<When online>

1. Click **Save/Write** in the flowchart. The Saving/Writing Parameters wizard page will appear.

SavingAVriting Parameters	0
Writes the set parameter into the Servopack.	
Select the writing method, and then click the Write button.	
C Write with a backup file	
Saves the current Servopack settings in a backup file, and then writes the set parameters into the Servopack.	
O Write without backup file	
Writes the set parameters into the Servopack without saving the current settings in a backup file.	
Write	
Depress the Save Button to save the setting values. (The saved parameters can be used by using the parameter edit	
Finish > Cancel	

2. Select the method of writing parameters into the SERVOPACK.

Write with a backup file

After saving the current settings of the connected SERVOPACK in a backup file, writes the parameters that have been set using the Setup Wizard in the SERVOPACK.

Write without backup file

Without saving the current settings of the connected SERVOPACK, writes the parameters that have been set using the Setup Wizard in the SERVOPACK.

Select either the **Write with a backup file** or the **Write without backup file** option, and then click **Write**. When the **Write with a backup file** option is selected, the following windows will appear.

DIDI CONTRACTOR			
	-		
and an and an and an and a second s	And	State of the state	
	19		
Transferring	: Pn498	(112/154)	

Save As			<u>? ×</u>
Save in: 🔂	YE_Applications	• 🔁	r 📰 🕶
Manual 20070423:	153437.usr		
, File <u>n</u> ame:	20070423181516bak		<u>S</u> ave
Save as <u>t</u> ype:	Parameter file(*.usr)	•	Cancel
Product Info	SIGN 4 MAIR A		
Comment			
	·		

When the **Write without backup file** option is selected, the message shown in step 3 appears.

3. Select the file name and the storage location, and then click **Save**. The following message appears asking for confirmation.

Confirmation	×
Writes into t	he Servopack.
Is this A	cceptable?
Yes	No

4. Click Yes.

Writing parameters to Servopack	×
6,-1	
Transferring : Pn300 (6/17)	
35%	
Caution	
The parameters will be enabled after cycling the main and control power.	
ОК	

- 5. Click **OK**. The display will return to the wizard page shown in step 1.
- 6. Click the \Box button to save the setting data.
- 7. Click **Finish** to quit the Setup Wizard. The following message appears asking for confirmation.

Setup Wizard	×
Completes the S	etup Wizard. OK?
Yes	No

8. Click Yes.

<When offline>

1. Click **Save/Write** in the flowchart. The Saving/Writing Parameters wizard page will appear.

Saving/Writing Parameters	2
Depress the Save Button to save the setting values. (The saved parameters can be used by using the parameter edit	
Einish >	Cancel

- 2. Click the Dutton to save the setting data.
- 3. Click **Finish** to quit the Setup Wizard. The following message appears asking for confirmation.

Setup Wizard	×
Completes the S	Setup Wizard. OK?
Yes	No

4. Click Yes.

Supplemental Information

The Reference Input Setting - Position Control wizard page will vary depending on the electronic gear mechanical structure.

Electronic Gear Mechanical Structure

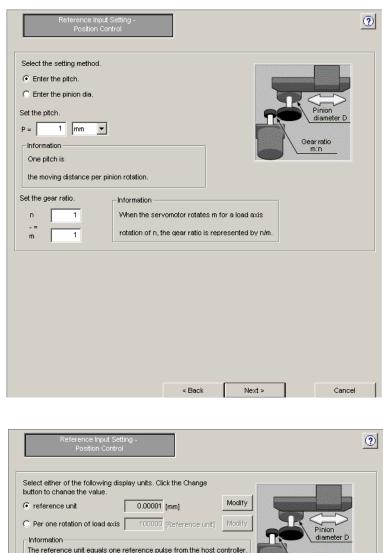
<When Round table is selected>

Reference Input Setting - Position Control	?
Set the gear ratio. n arr m arr m n n n n n n n n n n n n n n n n n n n	
< Back Next >	Cancel
Reference Input Setting - Position Control	?
Select either of the following display units. Click the Change button to change the value. (reference unit 0.01 [deg] Modify	
C Per one rotation of load axis 38000 [Reference unit] Modify Information The reference unit equals one reference pulse from the host controller. (The minimum unit of the reference sent from the host controller) Gear ratio	B
The electronic gear ratio becomes the value shown below.	
36000 Pn210 Gear ratio 1 : 1 Pn20E:Electronic Gear Ratio (Numerator) Pn210: Electronic Gear Ratio (Denominator)	
Pn20E:Electronic Gear Ratio (Numerator) Pn210: Electronic Gear Ratio (Denominator)	
Pn2DE:Electronic Gear Ratio (Numerator) Pn210: Electronic Gear Ratio (Denominator) Enter Positioning Completed Width. Positioning Completed Width. Positioning Completed Width Ireference units]	itor speed
Pn2DE:Electronic Gear Ratio (Numerator) Pn210: Electronic Gear Ratio (Denominator) Enter Positioning Completed Width. Positioning Completed Width	tor speed

<When Belt and Pulley is selected>

Reference Input Setting - Position Control	?
Select the setting method. • Enter the pitch. • Enter the pully dia. Set the pitch. P = 1 mm Information One pitch is the moving distance per pully rotation. Set the gear ratio. n n m non More the servomotor rotates m for a load axis rotation of n, the gear ratio is represented by n/m.	o
< Back Next >	Cancel

Reference Input Setting - Position Control			(?
Select either of the following display units. Obutton to change the value.		Modify	
reference unit 0.0000	-		
Per one rotation of load axis 10000	(Reference unit)	Modify	Pulley
Information The reference unit equals one reference p (The minimum unit of the reference sent fro			diameter D ear ratio
The electronic gear ratio becomes the value	shown below.		
131072 Pr	20E	Pitch P	1 mm
Electronic Gear Ratio = 100000 Pn	210	Gear ratio 1 : 1	
Pn20E:Electronic Gear Ratio (Numerator)	Pn210: Electro	nic Gear Ratio (Denominator)	
Enter Positioning Completed Width.			
Positioning Completed Width	[reference units]	Speed Speed	Motor speed
Pn522 : Positioning Cor	npleted Width	Error pulse	522
(0 - 10737418	24)	ICOIN J	— <u>i</u>
	< Back	Apply	Cancel



<When Rack and Pinion is selected>

button to change th		
reference unit	0.00001 [mm] Mo	dify
Per one rotation	of load axis 100000 [Reference unit]	dify Pinion diameter D
	t equals one reference pulse from the host contro of the reference sent from the host controller)	
The electronic gea	ratio becomes the value shown below.	
Electronic Gear R		Pitch P 1 mm
	100000 Pn210	Gear ratio 1 : 1
Enter Positioning	Completed Width.	
Positioning Comple	ed Width	Speed Reference Motor speed
	Pn522 : Positioning Completed Width	Error pulse
	(0-1073741824)	
L		

<When Roll feed is selected>

Reference Input Setting - Position Control	?
Select the setting method. © Enter the pitch. © Enter the roll dia. Set the pitch. P = 1 Information Pitch indicates the moving distance per one roll rotation. Set the gear ratio. Information n Men the servomotor rotates m for a load axis	
m 1 rotation of n, the gear ratio is represented by n/m.	

Reference input Setting - Position Control	?
Select either of the following display units. Click the Change button to chance the value. (reference unit 0.00001 [mm] Modify C Per one rotation of load axis 1000000 [Reference unit] Modify Information The reference unit equals one reference pulse from the host controller. (The minimum unit of the reference sent from the host controller) The electronic gear ratio becomes the value shown below.	
Image: Product of the state of the	
Enter Positioning Completed Width. Positioning Completed Width (reference Motor speed units) Speed	4
Pn522 : Positioning Completed Width (0 - 1073741824)	
< Back Apply Cancel	

<When Other is selected>

Reference Input Setting - Position Control	?
Select either of the following display units. Click the Change button to change the value.	
reference unit [pulse] Modify	
Information The reference unit equals one reference pulse from the host controller. (The minimum unit of the reference sent from the host controller)	
The electronic gear ratio becomes the value shown below.	
Electronic Gear Ratio = 1 Pn20E 1 rotation 131072 pulse	
Pn20E:Electronic Gear Ratio (Numerator) Pn210:Electronic Gear Ratio (Denominator)	
Enter Positioning Completed Width.	
Positioning Completed Width	ł
Pn522 : Positioning Completed Width Error pulse	
(0-1073741824) /COIN	
< Back Apply Cancel	

4.2.4 Parameter Converter

The parameter converter converts the parameter data of a Σ , Σ -II, Σ -III, or Σ -V-series SERVOPACK (hereinafter referred to as a previous Σ -series SERVOPACK) to Σ -7-series SERVOPACK-compatible parameter data. The previous Σ -series SERVOPACK parameters in the specified file will be automatically converted to Σ -7-series SERVOPACK-compatible parameters and saved in a file.

Convert parameters using the following procedure.

1. In the SigmaWin+ Σ -7 component main window, click **Parameters** and then click **Parameter Converter**.



If more than one axis is being used, the **Axis Selection** dialog box appears.

First select the axes to adjust according to the **Axis Selection** dialog box. For the procedure, refer to 4.1 Changing Axes.

7 Parameter Converter	x
The previous series parameter file will be conve Select the conversion source file and the destin	
Conversion source	Conversion destination S-7 series
File name Browse	File name Save
l Servopack model	Save the log file (csv) at the same time.
Comments	Comments
	Convert Cancel

Parameter Converter Window

2. Click Browse. The Open box will appear.

Open		? ×
Look in: 🔁	YE_Applications 💌 🗲 🖻) 💣 🎟 -
Manual		
	153437.usr 190125.usr	
Sigma2.us	r	
, File name:	Sigma2.usr	Open
Files of type:	Parameter file(*.usr)	Cancel
Product Info:	SGDH-***E	
Product Into.	Customization information is used.	
Comment:	Data of Axis X	

3. Select the conversion source, a parameter file of the previous Σ -series SERVOPACK, and then click **Open**.

The selected file is imported and the imported file name, SERVOPACK model, and comments are displayed under **Conversion source**. Also, the SERVOPACK model under **Conversion destination** is automatically set.

🖅 Parameter Converter			×		
The previous series parameter file will be converted to S-7 series parameter file. Select the conversion source file and the destination file.					
Conversion source	•	Conversion destination S-7 series			
File name Browse		File name Save			
Servopack model		Save the log file (csv) at the same time Servopack model			
SGDH-***E		SGD7S-****00A			
Comments		Comments			
Xaxis data		Xaxis data			
		Convert Cancel			

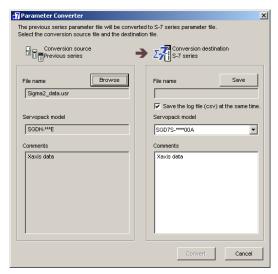
A window with the file name, SERVOPACK model, and comments on imported data displayed

If a file that	t cannot be converted is selected	
A message	will appear telling you that the selecte	ed file cannot be converted.
SigmaWi	n+ The selected parameter file cannot be converted. The parameter conversion is applicable only for the following m SGDM.+***DA SGDH.+***E(Imear) SGDS***E(Imear) SGDS***E	X. odels.
	OK)	

4. Click Save. The Save As box will appear.

Save As	? ×
Save in: 🔁 YE_Applications 💽 🖛 🛅 🖝 🖽	
Annual 20070423153437.usr	
a 20070423190125.usr a Sigma2.usr	
File name: Sigma5 Save	
Save as type: Parameter file(*.usr) Cance	el l

 Select the storage location for the converted parameter file, and then click Save. The file name, the SERVOPACK model of the conversion destination, and the comments on the conversion source file will be displayed under Conversion destination in the Parameter Converter window.



Reselect the SERVOPACK model from the **Servopack Model** list as required. (A SERVOPACK model whose capacity is equal or closest to the SERVOPACK model of conversion source will be automatically set under **Conversion destination**.)

6. Click Convert.

The parameter data for the previous Σ -series SERVOPACK will be converted to Σ -7-series SERVOPACK-compatible parameter data and saved in a newly created parameter file.

When conversion is complete, the conversion results will be displayed in the Parameter Converter window.

Adjust the settings as required.

convers	ameter file h ion results b care must be Conversion source Previous so	efore writin taken with	ng them	intothe S rameters o	ervopack. In the right. Parameter value in red :Out of automa Parameter value :Perfor shaded in yellow Adjust	nt from the default setting of the S-7 series Servopack range in S-7 series Servopack (The value will be tically set to the default of the S-7 series Servopack.) nance depends on the series for this parameter. the settings as required before the conversion result into the Servopack.
No.	Digit/bit	Value		No.	Name	Value 🔺
				Pn000	Basic Function Selections 0	0000H
Pn000	ODigit	0	==>	0Digit	Direction Selection	0:Use CCW as the forward direction.
Pn000	1Digit	0	==>	1Digit	Control Method Selection	0:Speed control with analog references
				2Digit	Reserved parameter (Do not change.)	0:Reserved parameter (Do not change.)
				3Digit	Rotary/Linear Startup Selection When Encoder Is	0:Start as a rotary encoder.
				Pn001	Application Function Selections 1	0000H
Pn001	ODigit	0	==>	0Digit	Servo OFF or Alarm Group 1 Stopping Method	0:Stop the motor by applying the dynamic brake.
Pn001	1 Digit	0	==>	1Digit	Overtravel Stopping Method	0: Apply the dynamic brake or coast the motor to
Pn001	2Digit	0	==>	2Digit	Main Circuit Power Supply AC/DC Input Selection	0:Input AC power as the main circuit power sup
Pn001	3Digit	0	==>	3Digit	Warning Code Output Selection	0:Output only alarm codes on the ALO1, ALO2,
				Pn002	Application Function Selections 2	0000H
Pn002	ODigit	0	==>	ODigit	Speed/Position Control Option (T-REF Input Alloc	0:Do not use T-REF.
Pn002	1Digit	0	==>	1Digit	Torque Control Option (V-REF Input Allocation)	0:Do not use V-REF.
Pn002	2Digit	0	==>	2Digit	Absolute Encoder Usage	0:Use the absolute encoder as an absolute enco
Pn002	3Digit	0	==>	3Digit	External Encoder Usage	0:Do not use an external encoder.
				Pn006	Application Function Selections 6	0002H
Pn003	ODigit	2	==>	0,1Digit	Analog Monitor 1 Signal Selection	02:Torque reference (1 V/100% rated torque)
	-			2Digit	Reserved parameter (Do not change.)	0:Reserved parameter (Do not change.)
				3Digit	Reserved parameter (Do not change.)	0:Reserved parameter (Do not change.)
				Pn007	Application Function Selections 7	0000H
Pn003	1Digit	0	==>	0,1Digit	Analog Monitor 2 Signal Selection	00:Motor speed (1 V/1,000 min-1)
				2Digit	Reserved parameter (Do not change.)	0:Reserved parameter (Do not change.)
				3Digit	Reserved parameter (Do not change.)	0:Reserved parameter (Do not change.)
Pn000	2Digit	0	==>	Pn010	Axis Address Selection for UART/USB Communi	0001H
	1			Pn100	Speed Loop Gain	400
4						•



When the **Save the log file (csv) at the same time.** check box is selected in the Parameter Converter window, a CSV formatted log file with the same name as the converted parameter file will be separately created in the same location as the converted parameter file.

Always check the conversion results before writing them into the Σ -7-series SERVOPACK.

Some parameter data is displayed in blue, red, or shaded in yellow to distinguish it:

- Blue: The converted value is different from the default setting of the Σ -7-series SER-VOPACK.
- Red: The converted value is out of range in the Σ -7-series SERVOPACK. (The value will automatically be set to the default value of the Σ -7-series SERVOPACK.)
- Shaded in yellow: Performance is different between the previous Σ -series SERVO-PACK and the Σ -7-series SERVOPACK.



Adjust the settings of the parameters displayed in red and shaded in yellow in the conversion results as required.

7. Click **Finish** to quit the parameter converter function.



- See "4.2 Editing Parameters" for information on how to adjust the conversion results.
- After checking and adjusting the conversion results, import the parameter settings using the parameter online editing function. See "Parameter Editing when Online" of "4.2.1 Editing Parameters" for details.



How to Read the Log File

When the **Save the log file (csv) at the same time.** check box is selected, the following CSV formatted log file will be created after conversion.

Conversion	source	data

Conversion destination data

I		I		l					
No.	Digit/bit	Value		No.	Name	Valu	ie	Unit	To be checked
PnDDD	□digit		==>	PnOOO	n000 00000000		0	00	*0
•	•	•	•	•	•		•	•	•
		Previous SERVOF /alue	ACK se	Σ-7-series		e Σ-7-seri	S	-7-series ERVOP etting ur	ACK
number Previous Σ-series SERVOPACK parameter digit (bit)		K		SERVOPA parameter	number	SERVO parame and me	ter s	et value	S

"*O" in the "To be checked" column indicates one of the following parameters.

- *1. The converted value is different from the default setting of the Σ -7-series SERVOPACK.
- *2. The converted value is out of range in the Σ -7-series SERVOPACK. (The value will automatically be set to the default value of the Σ -7-series SERVOPACK.)
- *3. The performance of the parameter is different between the previous Σ -series SERVOPACK and the Σ -7-series SERVOPACK.

4.3 Alarms

4.3.1 Displaying Alarms

Alarms can be viewed in the Alarm Display. The alarm diagnostic function is also provided to suggest possible causes of the alarm according to diagnostic alarm latch data saved just before the alarm occurrence. It will also display suggested corrective actions.

In the SigmaWin+ Σ -7 component main window, click **Alarm** and then click **Display Alarm**.

Alarm						
larm						
						1
				- 💋	Reset a:	(es.
Axis						
AXIS#00 : SGD7S-R70A2	0.6	A C90 : Encoder	Communi	oations	Error	
						Ţ
Alarm diagnosis Alarm History						
Cause				¢	Cause 1/	5 • •
		at an easter which				
Contact fault of encoder connect	or or incorre	ct encoder wiring	ι.			<u></u>
	or or incorre	ct encoder wiring	I.			×
Contact fault of encoder connect	or or incorre	ct encoder wiring	l.			×
Contact fault of encoder connect			I.			×
Contact fault of encoder connect			I. 			×
Contact fault of encoder connect						
Contact fault of encoder connect nvestigated actions Check the encoder connector cor			I.			
Contact fault of encoder connect nvestigated actions Check the encoder connector cor Corrective actions	ntact status.					
Contact fault of encoder connect nvestigated actions Check the encoder connector cor	ntact status.			tly wire	:d.	
Contact fault of encoder connect westigated actions Check the encoder connector cor corrective actions	ntact status.			tly wire	d.	
Contact fault of encoder connect westigated actions Check the encoder connector cor corrective actions Re-insert the encoder connector	ntact status.			tly wire	d.	
Contact fault of encoder connect westigated actions Check the encoder connector cor corrective actions Re-inserf the encoder connector fonitor at occurrence of alarm	ntact status. and confirm	that the encoder i		tly wire	d.	
Contact fault of encoder connect westigated actions Check the encoder connector cor iorrective actions Re-insert the encoder connector foritor at occurrence of alarm Name	ntact status. and confirm	that the encoder i		tly wire	:d.	
Contact fault of encoder connect westigated actions Check the encoder connector cor corrective actions Re-insert the encoder connector fonitor at occurrence of alarm Name Motor rotating speed	ntact status. and confirm Value 0	that the encoder i		lly wire	:d.	
Contact fault of encoder connect nvestigated actions Check the encoder connector cor Corrective actions Re-Insert the encoder connector Aonitor et occurrence of alarm	ntact status. and confirm	that the encoder i		lly wire	:d.	

Alarm Display

Alarm



The axis number and current alarm will be displayed

To clear an alarm, click **Reset** after removing the cause of the alarm. The alarm will continue until the cause is removed, and then the information on the screen will be subsequently updated.

Alarm Diagnosis Tab

Contact fault of encoder connecto	or or incorre	ct encoder wiring		2
nvestigated actions Check the encoder connector cor				
Check the encoder connector con	itaci status.			<u> </u>
	and confirm	that the encoder i	e correctiu s	wired
Re-insert the encoder connector a	and confirm	that the encoder i	s correctly v	wired.
Corrective actions Re-insert the encoder connector : Monitor at occurrence of alarm Name	and confirm	that the encoder i	s correctly \	wired.
Re-insert the encoder connector a			s correctly v	wired.
Re-insert the encoder connector : Monitor at occurrence of alarm Name	Value	Unit	s correctly v	vired.
Re-insert the encoder connector : Monitor at occurrence of alarm Name Motor rotating speed	Value	Unit min-1	s correctly v	wired.

Cause (Currently displayed page)/ (Total pages = Total of causes)

Displays the total number of possible causes of the alarm. Click the setting arrows to change the page.

Cause

Displays a possible cause of the current alarm.

Investigated actions

Displays the investigated actions of the current alarm.

Corrective actions

Displays suggested corrective actions for the current alarm.

Monitor at occurrence of alarm

Displays the data monitored just before the alarm occurrence.

Alarm History Tab

	#00 : SGD7S-R70A20A	🔀 Clear
No.	Name	Accumulate
01	A.C90 : Encoder Communications Error	580:10:27.3
02	A.D00 : Position Deviation Overflow	572:20:30.1
03	A.C90 : Encoder Communications Error	572:19:22.6
04	A.C91 : Encoder Communications Position Data Acceleration Rate Error	572:19:22.6
05	A.D00 : Position Deviation Overflow	572:19:06.4
06	A.F10 : Power Supply Line Open Phase	572:17:52.7
07	A.D00 : Position Deviation Overflow	572:05:21.0
08	A.C90 : Encoder Communications Error	572:03:26.4
09	A.F10 : Power Supply Line Open Phase	571:22:57.5
10	Normal	0:00:00.0

The SERVOPACK stores a history of the 10 most recent alarms. These are shown in order of occurrence with their alarm numbers and names.

When a new alarm occurs, it is stored as number 1, and the numbers of the other alarms are raised starting from the top of the list. For example, what was alarm number 1 now becomes number 2. The last alarm is eliminated. These numbers are changed immediately when an alarm occurs.

Click **Clear** to delete or clear the alarm history.

4.3.2 Resetting Motor Type Alarms

You can use a Σ -7-series SERVOPACK to operate either a Rotary Servomotor or a Linear Servomotor.

Once you connect the SERVOPACK to the Servomotor, information on the connected Servomotor is saved in the SERVOPACK.

If you then connect a different type of Servomotor, a Motor Type Change Detected (A.070) alarm will occur.

You can use the Reset Motor Type Alarm menu command to reset this alarm if it occurs.

Use the following procedure to reset the motor type alarm.

1. Select *Alarm – Reset Motor Type Alarm* from the menu bar of the SigmaWin+ Σ -7 component main window. The **Reset Motor Type Alarm** dialog box will be displayed.



2. Click Reset.

The following dialog box will be displayed.

😭 Reset Motor Type Alarm	
Motor type alarm is reset. The system configuration is changed by resetting it. Is it reset?	
OK Cancel	

Click Cancel to cancel resetting the motor type alarm.

3. Click OK.



4. Click **OK** and turn the power supply to the SERVOPACK OFF and ON again.

4.4 Monitor

4.4.1 Product Information

Information about the SERVOPACK and the motor can be viewed in the Product Information window.

In the SigmaWin+ Σ -7 component main window, click **Monitor** and then click **Product Information**. Information about the SERVOPACK, the motor, and the option modules will be displayed.

👲 Product Informa	tion AXIS#00		X
	Servopack/Motor	1	
	-Servopack		
		SGD7S-R70A20A	
		(MECHATROLINK-III interface single axis)	
	Soft version:		
	Special Spec.:	Standard Serial No.	
	Servomotor		
	Type:	SGM7J-A5A7A21	
	Encoder Infor	mation	
	Type:	UTTAI-B24RH	
	Resolution:	16777216 [Pulse/rev]	
	Type:	absolute	
	Soft version:	0001 Serial No.	
			1
		ок	

	Servopack/Motor	Option Card		
	Reference Opti	on Card ——		
	Type:			
	Soft version:			
	Special Spec :			
	Safety Option C	Card		
	Туре:			
iH.	Soft version:			
	Special Spec.:			
	-Feedback Optic			
	Type:	*****		
L		(Fully-closed in	nterface card)	
	Soft version:	****		Connection
	Special Spec.:	Standard		Serial No.

SERVOPACK/Motor Tab

Option Card Tab

(Displayed only when option modules are mounted) Production Information Window

Serial No.

Displays the details of the respective product information.

	. ¹ Product Information (Detail of the Servomotor)	×
Product Information (Detail of the Servopack) Type: SGD7S-R70A20A Serial No : Date of Manufacture: 2014.02	Motor type: SGM7J-ASA7A21 Serial No: Date of Manufacture: 2013.11 Encoder type: UTTAI-B24RH Serial No: Date of Manufacture: 2013.11	
	on Card details)	
	en option modules are mounted) formation (Detail) Window	

Click **OK** to return to the SigmaWin+ Σ -7 component main window.

4.4.2 Monitor

The servo system's status, SERVOPACK's status, movement, and I/O signal status can be monitored on the computer screen.

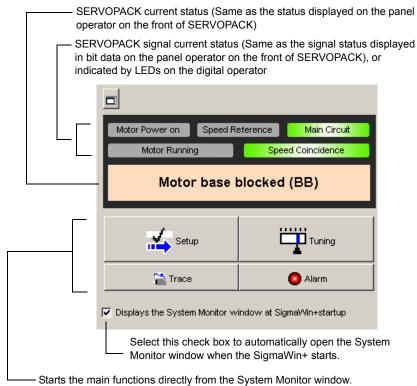
There are five types of monitor windows: System Monitor, Status Monitor, Motion Monitor, Input Signal Monitor, and the Output Signal Monitor.

The monitor windows are independent of each other, but several windows can be displayed at the same time.

Select the items to be monitored in the Monitor Item Setting Window (For System Monitor, the items to be monitored are fixed and cannot be selected.)

System Monitor

The System Monitor window will automatically open when the SigmaWin+ starts. Or, in the SigmaWin+ Σ -7 component window, click **Monitor**, point to **Monitor**, and then click **System Monitor**.





The System Monitor window is a dockable window. By clicking the \Box button, the System Monitor window can be docked in the top frame of the application's window, or can be viewed as a floating window.

Parameters(U) Alarm(A) Monitor(M) Setue(3 Set)⊞®21¥022		• © 11 11 10 × 9	<u>+ 2 0 7 (</u>		₩.
hus Monitor		× Mal	ion Monitor			_
Name	AUSIO0 Value		Name	Unit	AUSIO0 Value	
Hall sensor signal	-		Current Alarm State			
Effective gain monitor (gain settings 1 = 1, gain settings 2			Mator ratating speed	min-1		
Main Circuit			Speed reference	min-1	1	
Encoder (PGRDY)			Internal torque reference	ï		
Motor Power (Request)		- 6	Rotational angle 1 (encoder pulse	s from th encoder pulse	ur -	
Dynamic Brake (DB)		6	Rotational angle 2 (from polarity			
Rotation Direction		6	Input reference pulse speed	min-1		
Made Seitch			Position error amount	reference unit		
Speed Reference (V/Ref)		- 116	Accumulated load ratio	1		
Torque Reference (T-Ref)			Regenerative load ratio	1		
Position Reference (PULS)		- 116	Power consumed by DB resistan	- 1		
Position Reference Direction		- 116	Input reference pulse counter	reference units		
Clear Signal		- 116	Feedback pulse counter	encoder pulse		
AC Power ON			Fully Clozed Feedback Pulse Co			
Surge Current Limit Register Short Relay		- 116	Total operation time	100ms		
Regenerative Transistor			Feedback pulse counter	reference units		
Regenerative Error Detection			The current backlash compensati			
Metor Power ON		- 116	Backlash compensation setting is			
Overcurrent		- 116	Position Amplifier Error	reference units		
Origin not Passed		- 116	Absolute Encoder Multitum	and the second		
Manifad Monant of Inartis		216	Absolute Encoder Pulse in Single	Rotation pulse		
			Abcolute Encoder(lower)	relea		
put Signal Monitor		× inp.	t Signal Monitor			
Output Terminal Name Signal Name	ARISHOD Value		Input Terminal Name	Signal Name	AUDSR00 Value	
ALM	·		\$ID(CN1-13)		·	
\$01(CN1-1,2) /BK			SII(CN1-7)			
\$02(CN1-23,24)	*		\$12(CN1-8)		·	
\$03(CN1-25,26)				/DEC		
			SH(CN1-10)	/B(T1	· · · · · · · · · · · · · · · · · · ·	
			SI5(CN1-11) SI6(CN1-12)	/D/12 /D/12		

Docked System Monitor Window

		1	Motion Monitor			
	A035#00 V	sive A	Name		Unit /035#00	Usive
			Ourrent Alarm State			
ttings 1 = 1, gain settings 2			Motor rotating speed		min-1 ·	
			Speed reference		min-1 -	
			Internal torque reference		1 ·	
			Rotational angle 1 (encoder)	pulses from th	encoder pulse ur -	
			Input reference pulse speed		min-1 -	
	System M	onitor AXIS#00		1	reference units -	
				-	8 -	
					x .	
			_		¥ -	
	Motor	Power on Torque F	eference Main Circuit			
		Motor Running				
				er		
hort Relay		Mater here l	blooked (DD)			
		motor base	DIOCKED (BB)			
			1			
		1			reference units -	
		Setup	Tuning			
			-	- Fabin		_
		😭 Trace	Alarm			
Simal Name		ys the System Monitor v	andow at SigmaVVin+startup.	anal N	A05400	-
Copier North			State City in 1973			
/BK			SI1(CN1-7)			
			SI2(CN1-0)			
			SID(CN1-9)	/DEC		
			SH(CN1-10)	/B(T1		
			SIS(CN1-11)	/8/72		
	hot Falay	trings 1 = 1, gas setting 2 =	tings 1 + 1, gain nations 2 System Monitor AXIS#00 Mdor Rover on Torque R Mdor Rover R Mdor Rover on Torque R Mdor R Mdo	tings 1 * 1, gan settings 2 *	tings 1 * 1, gan settings 2 *	tings 1 = 1, gats sellings 2

Floating System Monitor Window

Status Monitor

The status monitor function monitors the SERVOPACK status.

To monitor the status of the SERVOPACK, use the following procedure.

1. In the SigmaWin+ Σ -7 component main window, click **Monitor**, point to **Monitor** and click **Status Monitor**.

Stat	us Monitor		
	Name	AXIS#00 Value	
	Hall sensor signal		
	Effective gain monitor (gain settings 1 = 1, gain settings 2	-	
	Main Circuit	•	
	Encoder (PGRDY)	-	
	Motor Power (Request)	•	
	Dynamic Brake (DB)	•	
	Rotation Direction	•	
	Mode Switch	-	
	Speed Reference (V-Ref)	•	
	Torque Reference (T-Ref)	•	
	Position Reference (PULS)	•	-
	Position Reference Direction	•	

The items which can be monitored are listed.

2. Select the items to be monitored. The current status of a selected item is displayed in "Value" column.

ŝ	Stat	us Monitor	
		Name	AXIS#00 Value
	И	Hall sensor signal	0
	И	Effective gain monitor (gain settings 1 = 1, gain settings 2	1
[И	Main Circuit	Main Circuit ON
	И	Encoder (PGRDY)	Encoder Preparation Uncomplete
	И	Motor Power (Request)	No Motor Power Request
		Dynamic Brake (DB)	•
		Rotation Direction	-
		Mode Switch	
1		Speed Reference (V-Ref)	•
		Torque Reference (T-Ref)	-
		Position Reference (PULS)	•
		Position Reference Direction	-

Motion Monitor

The motion monitor function monitors the SERVOPACK motion.

To monitor the motions of the SERVOPACK, use the following procedure.

1. In the SigmaWin+ Σ -7 component main window, click **Monitor**, point to **Monitor** and click **Motion Monitor**.

vlot	ion Monitor			
	Name	Unit	AXIS#00 Value	_
	Current Alarm State		-	
	Motor rotating speed	min-1	•	
	Speed reference	min-1	-	
	Internal torque reference	X	-	
	Rotational angle 1 (encoder pulses from the phase-C origin)	encoder pulse units	-	
	Rotational angle 2 (from polarity origin (electric angle))	deg	-	
	Input reference pulse speed	min-1	-	
	Position error amount	reference units	•	
	Accumulated load ratio	x	•	

The items which can be monitored are listed.

2. Select the items to be monitored. The current status of a selected item is displayed in the "Value" column.

Moti	lotion Monitor						
	Name	Unit	AXIS#00 Value				
r	Current Alarm State		Normal				
V	Motor rotating speed	min-1	0				
V	Speed reference	min-1	0				
	Internal torque reference	x	-				
V	Rotational angle 1 (encoder pulses from the phase-C origin)	encoder pulse units	14508058				
V	Rotational angle 2 (from polarity origin (electric angle))	deg	117				
	Input reference pulse speed	min-1	•				
	Position error amount	reference units	•				
	Accumulated load ratio	Х.	•				

Input Signal Monitor

The input signal monitor function monitors the SERVOPACK input signals.

To monitor the input signals of the SERVOPACK, use the following procedure.

1. In the SigmaWin+ Σ -7 component main window, click **Monitor**, point to **Monitor** and click **Input Signal Monitor**.

/DEC /B/T1 /B/T2	- - - - -
/DEC /B(T1) /B(T2)	• • •
/DEC /B/T1 /B/T2	•
/B/T1 /B/T2	•
/B/T2	•
/B/T3	

The items which can be monitored are listed.

2. Select the items to be monitored. The current status of a selected item is displayed in the "Value" column.

	Input Terminal Name	Signal Name	AXIS#00 Value
И	SID(CN1-13)		Hi
V	SI1(CN1-7)		Hi
V	SI2(CN1-8)		Hi
	SI3(CN1-9)	/DEC	
	SI4(CN1-10)	/BIT1	
	SI5(CN1-11)	/ECT2	-
	SI6(CN1-12)	/B/T3	

Output Signal Monitor

The output signal monitor function monitors the SERVOPACK output signals.

To monitor the output signals of the SERVOPACK, use the following procedure.

1. In the SigmaWin+ Σ -7 component main window, click **Monitor**, point to **Monitor** and click **Output Signal Monitor**.

Output Terminal Name	Signal Name	AXIS#00 Value
ALM		•
SO1(CN1-1,2)	/BK	
S02(CN1-23,24)		
SO3(CN1-25,26)		

The items which can be monitored are listed.

2. Select the items to be monitored. The current status of a selected item is displayed in the "Value" column.

✓ ALM Lo ✓ S01(CN1-1,2) /BK Hi ✓ S02(CN1-23,24) Hi . □ S03(CN1-25,26) . .		Output Terminal Name	Signal Name	AXIS#00 Value
🗹 \$02(CN1-23,24) Hi	И	ALM		ما
	И	SO1(CN1-1,2)	/ВК	Hi
□ \$03(CN1-26,26) .	V	S02(CN1-23,24)		Hi
		\$03(CN1-25,26)		

Monitor Item Setting

To select the information to be monitored, use the following procedure.

1. In the SigmaWin+ Σ -7 component main window, click **Monitor**, and then click **Monitor Setting**. The Monitor Item Setting box appears.

Monitor Item Sett	ing		×
Status	Motion	ا 🚵 Input Signal 🛛 🏝 Output Signal	
Monitor select:		Monitor selection:	
		Add all >>> Main Circuit Encoder (PGRDY) Motor Power (Request) Motor Power ON Rotating (Moving) Direction Rotation Direction Mode Switch Torque (Force) Reference (T-R Torque Reference (T-Ref) Position Reference (PLLS) Clear Signal Position Reference Direction Surge Current Link Register Sh Regenerative Error Detection AC Power ON Overcurrent Origin not Passed Ripple being corrected <i>R</i> -CON P-CON	
		OK Cancel	

The Monitor selection list displays items being monitored.

2. To hide an item, select it in the **Monitor selection** list and then click **Delete**. To display an item, select it in the **Monitor selection** list and then click **Add**.

	Monitor Item Setting	×	
	Status Motion Monitor select: Monitor selection: Deviation Counter (Position Deviatic Cumulative Load Regenerative Load Speed Reference		_ Information to be
Information not displayed in the Monitor window.	DB Resistor Consumption Power Reference Pulse Counter Add > Feedback Pulse Counter Add > Fully Closed Feedback Pulse Counter Setting maximum value of Motor me Setting maximum value of Encoder Alarm traceback time stamp No.1 Alarm traceback time stamp No.3 Alarm traceback time stamp No.3		displayed in the Monitor window
	Alarm traceback time stamp No.5 Alarm traceback time stamp No.6 Alarm traceback time stamp No.7 Alarm traceback time stamp No.8 Alarm traceback time stamp No.9 Alarm traceback time stamp No.9		Moves the selected item up one level.
			Moves the selected item down one level.
	OK		10 101.

SigmaWin+ Sigma7 Component						_ 8 >
File(E) Parameters(U) Alarm(A) Monitor(M) Setup(S) Trace(T) Tuning(G) Test Run(R) Edit	Table(I)	olution(O) Help(H)			
					- FRE FOR FOR 1	142
📝 🕅 端 🖅 🔕 🖉 🚍 📼 🖓 🗷 🖉 🗐	F 🗏 📲 📇 🔍 🖄 🛸 🌑 F	🔁 🐴 🦉	◎ 🕫 📲 🖫 🖉 🐺	🔚 🔚 🖼 🗛 😒 🤅	P == == •Q	W
Status Monitor		×M	tion Monitor			
Name	AXIS#00 Value	al∥ë	Name	Unit	AXIS#00 Value	
Hall sensor signal	AKISWOD Valde		Current Alarm State	UIIL	Normal	-
Effective gain monitor (gain settings 1 = 1, gain settings 2			Motor rotating speed	min-1	0	
Main Circuit			Speed reference	min-1	0	
Encoder (PGRDY)	<u>.</u>		Internal torque reference	1	0	
Motor Power (Request)					-	
Dynamic Brake (DB)		1	· · · ·		280	
Rotation Direction				min-1	0	
Mode Switch				reference units	-	
Speed Reference (V-Ref)			Accumulated load ratio	%	0	
Torque Reference (T-Ref)		7		× ×	0	
Position Reference (PULS)	<u>.</u>			nce %	0	
Position Reference Direction				reference units	-	
Clear Signal	-			encoder pulse u		
AC Power ON						
Surge Current Limit Register Short Relay	·			100ms	21248987	
Regenerative Transistor		i i i		reference units		
Regenerative Error Detection						
Motor Power ON						
Overcurrent			Position Amplifier Bror	reference units		
Origin not Passed			Absolute Encoder Multitum	rererere dines	0	
Identified Moment of Inertia			Absolute Encoder Pulse in Singl	e Rotation pulse	0	
Polarity being detected			Absolute Encoder(lower)	pulse	0	
Polarity identification completed			Absolute Encoder(upper)	pulse	0	
Ripple being corrected			Feedback Position(APOS)	reference units	-	
/S-ON	-					
/P-CON				reference units		
P-OT			Target Position(TPOS)	reference units		· · · · · · · · · · · · · · · · · · ·
	·	┙║╚	Target Position(TPOS)	reference units	1701301273	▼
Output Signal Monitor		ing N	ut Signal Monitor			
Output Terminal Name Signal Name	AXIS#00 Value	חוור	Input Terminal Name	Signal Name	AXIS#00 Value	
ALM			SID(CN1-13)			
S01(CN1-1,2) /BK			SI1(CN1-7)		· .	
S02(CN1-23,24)			SI2(CN1-8)			
S03(CN1-25,26)	-		SI3(CN1-9)	/DEC	•	
	·		SI4(CN1-10)	/B/T1		
			SI5(CN1-11)	/B(T2		
			SI6(CN1-12)	/E/T3		
			· · · · · · · · · · · · · · · · · · ·	·	·	
		┛║║┕				
		-				Boelie

3. Click **OK**. Monitoring of the selected items starts.

To move an item or change its settings, right-click an item and select a command.

=ile(E) Parameters(U) Alarm(A) Monitor	(M) Setup(S) Trace(I) T	uning(G) Test Run(R) Ec	lit Table(I) So	lution(O) Help(H)				
1	🕅 🎿 📲 🔕 🚇 🚍 📼 🚳 🗷	1 🛋 🐼 🗉) 🛞 🔐 🛱	i 🖉 🕿 🕾 🖉 🕌	0 🔂 👘	- 7 🎕	₩ 10 11 0 ≥ ₩ 1	= 📬 🛙	🖻 🎹 🕱 🗑	⊨ ■ ■ ■ 	W
Stat	us Monitor				[]:	* Mot	ion Monitor				
_	Name			AXIS#00 Value			Name		Unit	AXIS#00 Value	
7	Hall sensor signal		D			V	Current Alarm State		Sinc	Normal	
1	Effective gain monitor (gain settings 1 = 1,	gain settings 2	1			V	Motor rotating speed		min-1	0	
1	Main Circuit	• •	Main Circuit ON			V	Speed reference		min-1	0	
ſ	Encoder (PGRDY)		Encoder Prepara	ation Uncomplete		V	Internal torque reference		1.	0	
1	Motor Power (Request)		No Motor Power	Request		V	Rotational angle 1 (encoder pulse	s from th	encoder pulse u	12674686	
٢	Dynamic Brake (DB)		Dynamic Brakin	g ON		V	Rotational angle 2 (from polarity	origin (ele	deg	280	
٢	Rotation Direction		Forward Mode		1	V	Input reference pulse speed		min-1	0	
٢	Mode Switch		Mode Switch OF	F		V	Position error amount		reference units	0	
1	Speed Reference (V-Ref)		Speed Reference	e Not Input		V	Accumulated load ratio		r	D	
ĺ	Torque Reference (T-Ref)		Torque Referen	ce Not Input		V	Regenerative load ratio		x.	0	
	Position Reference (PULS)		Position Refere	nce Not Input		V	Power consumed by DB resistan	ce	r.	D	
	Position Reference Direction			nce Direction Negative		V	Input reference pulse counter		reference units	0	
	Clear Signal		CLEAD Course D	ot input		V	Feedback pulse counter		encoder pulse u	-23	
	AC Power ON	Up			1	V	Fully Closed Feedback Pulse Co	unter	External encode	0	
	Surge Current Limit Register Short Relay	Down		mit Register Short Relay ON		V	Total operation time		100ms	21255435	
	Regenerative Transistor			ansistor OFF	1	V	Feedback pulse counter		reference units	-1	
	Regenerative Error Detection	Help		Error Detection	1	V	The current backlash compensati	ion value	0.1reference uni	0	
	Motor Power ON	Monitor Ite	em Setting		1	V	Backlash compensation setting li	mit value	0.1reference uni	262144	
	Overcurrent -		The overlage	Detection	1	V	Position Amplifier Error		reference units	0	
	Origin not Passed		Origin passed			V	Absolute Encoder Multitum			0	
	Identified Moment of Inertia		Not Identifying	Moment of Inertia	1	V	Absolute Encoder Pulse in Single	Rotation	pulse	0	
	Polarity being detected		Polarity not dete	ected		V	Absolute Encoder(lower)		pulse	0	
	Polarity identification completed		Polarity identifie	ed .	1	V	Absolute Encoder(upper)		pulse	0	
	Ripple being corrected		Ripple correction	n not effective		V	Feedback Position(APOS)		reference units	1761351272	
	/S-ON		Servo OFF		1	V	Current Reference Position(CPO	S)	reference units	1761351309	
	/P-CON		Proportional Ope	eration Command Disabled		V	Position Error(PERR)		reference units	0	
ſ	P-0T		Allow Forward R	un		Ľ	Target Position(TPOS)		reference units	1761351272	
tţ	ut Signal Monitor					< Inpu	t Signal Monitor				
	Output Terminal Name Signal Na ALM	me	AXIS#00 Va	nne			Input Terminal Name SID(CN1-13)	Signal Na	ime	AXIS#00 Value	
	S01(CN1-1,2) /BK						SII(CN1-7)			·	
	S02(CN1-1,2) /BK S02(CN1-23,24)		•				SI(CN1-7) SI2(CN1-8)			•	
	S02(CN1-23,24) S03(CN1-25,26)					님		/DEC		·	
	303(0111-20,20)		·					/DEC /DCT1			
						님		/EATT			
								/EXT2 /EXT3			
							010(0141-12)	72010		·	

4.4.3 Wiring Check

The wiring check function is used to check the status of I/O signals between the SERVOPACK and the host controller or peripheral devices. Changing an output signal status in Forced Output mode allows you to check the operation of the host controller and peripheral devices.

To check wiring, use the following procedure.

In the SigmaWin+ Σ -7 component main window, click **Monitor** and then **Wiring Check**.



If more than one axis is being used, the Axis Selection dialog box appears.

First select the axes to adjust according to the **Axis Selection** dialog box. For the procedure, refer to *4.1 Changing Axes*.

	Model	SGD7S-R70A10A	Forced Output Mode			Hi Lo Forced Hi Forced Lo
CN1-13 JDEC	Decelerat	ion Limit Swite			Ĭ	
CN1-7 -	▶0		PAO Output OFF		PAO	
CN1-8 P-CL	No Forwa	ard External To	PBO Output OFF	6	PBO	CN1-19,20
CN1-9 N-CL	No Forwa	ard Reverse Tc	PCO Output OFF	φI	PCO	CN1-21,22
CN1-10 ÆXT1	HI No EXT1	nterrupt Reque	Positioning Incomplete		/COIN /CLT	CN1-1,2
CN1-11 ÆXT2	- Hi No EXT2 I	nterrupt Reque	Speed Non-Coincidence No Speed Limit Detected		M-CMP MLT	CN1-23,24
		nterrupt Reque	Motor Stopped Braking		/TGON /BK	CN1-25,26
CN1-12 /EXT3						

Wiring Check in Monitor Mode

Wiring check AXIS#00						×
	Model SGD7S-	R70A10A	Monitor Made		9 9 9 9	Hi Lo Forced Hi Forced Lo
CN1-13 / DEC / H		1				
CN1-8 P-CL				4	PAO	CN1-17,18 CN1-19,20
CN1-9 N-CL	No Forward Reverse To			þ	PCO	CN1-21,22
CN1-10 JEXT1	No EXT1 Interrupt Reque			•		CN1-1,2
CN1-11 JEXT2	No EXT2 Interrupt Reque			•	/V-CMP //LT	CN1-23,24
CN1-12 /EXT3	No EXT3 Interrupt Reque				ЛВК	CN1-25,26
		<u>HI</u> IO			ALM	CN1-3,4

Wiring Check in Forced Output Mode

Depending on each I/O signal status, the corresponding signal status on the screen will vary.

Monitor Mode

I/O signal status can be monitored in Monitor mode.

Input signal: Change the signal status on the host controller and check the input signal status and wiring to the SERVOPACK.

Output signal: Check the output signal status and wiring to the SERVOPACK.

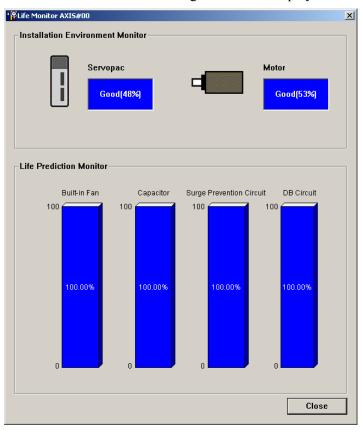
Forced Output Mode

Output signal status can be forcibly set in Forced Output mode. I/O signal status is continuously monitored also in Forced Output mode. Click **Hi** or **Lo** to set the signal status. Forced Output mode is disabled while the servo is on.

4.4.4 Service Life Monitor

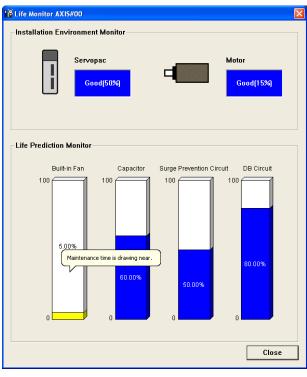
While the SigmaWin+ is online with a SERVOPACK, you can view the installation environment (product temperature) of the SERVOPACK and servomotors and the service life information for SERVOPACK parts (built-in fan, capacitor, surge-prevention circuit, and dynamic brake circuit) on the Life Monitor.

Select *Monitor* – *Life Monitor* from the menu bar of the SigmaWin+ Σ -7 component main window. The Life Monitor dialog box will be displayed.

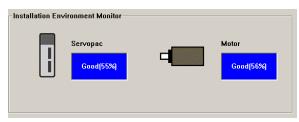


|--|

Guidance will be displayed if you move the cursor to the display position for the Installation Environment Monitor or to a bar in the graph of the Life Monitor.



Monitoring the Installation Environment



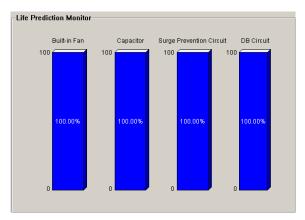
The SERVOPACK and Servomotor installation environment information is displayed. The displayed information is described in the following table.

Installation Environment Value Range	Background Color	Text Color	Description
0% to 99%	Blue	White	Normal
100% to 114%	Yellow	Black	Somewhat hazardous
115% or higher	Red	White	Error
	Gray	Black	An error occurred in obtaining the installation environment value.*

* An error occurred in obtaining information from the SERVOPACK. Check the communications status.

Note: The displayed installation environment values were the current values when the Live Monitor dialog box was displayed.

Service Life Diagnosis



The service life information for SERVOPACK parts (built-in fan, capacitor, surgeprevention circuit, and dynamic brake circuit) is displayed on the Life Monitor. The displayed information is described in the following table.

Service Life Value Range	Background Color	Text Color	Description
10.00% to 100.00%	Blue	White	Normal
0.01% to 9.99%	Yellow	Black	It is almost time to replace the part.
0%*1	White	Black	It is time to replace the part.
	Gray	Black	An error occurred in obtaining the service life value. ^{*2}

*1. The service life values are displayed in black in the middle of the bars in the graph. The background color of the part name will change to red and the text color will change to white.

*2. An error occurred in obtaining information from the SERVOPACK. Check the communications status.

Note: The displayed service life values were the current values when the Life Monitor dialog box was displayed.

4.5 Setup

4.5.1 Setting the SERVOPACK Axis Name

The SERVOPACK axis name setting function can be used to set a SERVOPACK axis name for each SERVOPACK. The set axis name will be displayed in the search results of Connect box. (See Connect box of 2.2 Selecting a SERVOPACK.) It is easier to identify each SERVOPACK by using its axis name rather than by using its model or axis address.

1. Select *Setup – Servopack Axis Name Setting* from the menu bar of the SigmaWin+ Σ -7 component main window. The following dialog box appears.

= Ser	vopack Axis Name Setting		×
	ervopack axis name can be set. The Servo connected to the Sigma/Vin+.	pack can be identified by the name s	et
	Axis	Servopack axis name	
	4 AXIS#00 : SGD7W-2R8A20A		
	AXIS#01 : SGD7W-2R8A20A		
		-	-
	Write	max.	

2. Select the check boxes for the axis for which to change the names, enter the desired axis names in the **Servopack axis name** column, and then click the **Write** button.

	rvopack axis name can be set. The Serv connected to the SigmaWin+.	opack can be identified by the name	set
	Axis	Servopack axis name	•
V	AXIS#00 : SGD7W-2R8A20A	Axis1	
M	AXIS#01 : SGD7W-2R8A20A	Axis2	
			•
	Write	15 alphanumeric characters max.	

The axis names that you entered in the **Servopack axis name** column will be written as the axis names.

4.5.2 Setting the Absolute Encoder

Initializing the Absolute Encoder

WARNING

The absolute encoder setup function resets the multi-turn counter and the encoder alarms for a connected serial absolute encoder.

If the absolute encoder's multi-turn counter is reset to zero, the previously defined mechanical system will change to a different coordinate system.

Operating the machine in this state is extremely dangerous. Failure to observe this warning may result in personal injury and/or damage to the machine. Be sure to reset the zero point for the mechanical system after the encoder has been successfully set up.

Set up the absolute encoder in the following cases:

- At initial machine startup
- When an "Encoder Backup Alarm" has occurred
- When the SERVOPACK power has been turned off, and the encoder cable removed.

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.

Set up the absolute encoder using the following procedure.

1. In the SigmaWin+ Σ -7 component main window, click Setup, point to Set Absolute Encoder and click Reset Absolute Encoder. A warning message appears confirming if you want to continue the processing.



If more than one axis is being used, the Axis Selection dialog box appears.

First select the axes to adjust according to the **Axis Selection** dialog box. For the procedure, refer to *4.1 Changing Axes*.

Absolute Encoder Warning
The Aboslute Encoder Setup function resets the multi-turn amount of the connected serial-type absolute encoder as well as encoder alarms from the PC.
Upon resetting the absolute encoder multi-turn to "0", the mechanical system will go to a position data system differing from that used until now.
Operating the machine in this state is extremely dangerous(in the worst case, my lead to injury to person or damage to machine). Be sure to reset the zero point of the machine after completing this process.
Continue absolute encoder setup processing?
Continue

Click Cancel to return to the main window without resetting the absolute encoder.

2. Click **Continue**, and the Absolute encoder Setup box appears.

A	bsolute encoder - Setup AXI5#41	×
	Perform absolute encoder setup under the following circumstances: 1. At first start-up of the machine 2. When an "encoder backup alarm" has been generated 3. After the Servopack power has been turned OFF and the encoder cable removed	
	Absolute encoder setup can only be performed with the Restart power after setup processing is complete.	
	Alarm name Normal	
	Execute setting	

The Alarm Name box displays the code and name of the alarm that is occurring now.

3. Click **Execute setting**, and a verification message appears confirming if you want to continue although the coordinate system will change.

Setup Verification	×
Upon execution of processing, the absolute encoder is reset to "0" an go to a position data system differe	d the mechanical system will
Continue processing?	
	Continue Cancel

Click Cancel to return to the previous window without resetting the absolute encoder.

4. Click **Continue** to set up the encoder.

<If Setup is Unsuccessful>

If setting up is attempted with the servo ON, a reset conditions error occurs, and the processing is aborted.

Absolute	encoder reset conditions error
	Servo ON now. Turn the Servo OFF when resetting the absolute encoder.

Click **OK** to return to the main window.

<If Setup Completes Normally>

If the encoder is set up successfully, a warning message will appear reminding you that the coordinate system has changed and must also be reset.

Completion Warning Message
Absolute Encoder reset processing has been performed. The multi-turn amount in the absolute encoder has been to "0". Be sure to reset the mechanical system to "0" after restarting power.
ОК

5. Click **OK** to return to the main window. Restart the servo, and perform an origin search for the upper-level controller.

Setting the Multi-Turn Limit

f using an absolute detection system for machines, such as round tables, that turn in response to the number of times that the load shaft turns, reset the multi-turn data from the encoder to zero after a set number of rotations (referred to as "m"). The load shaft of the machine turns "n" times, and the motor turns "m" times.

Set the multi-turn limit to the SERVOPACK and the servomotor using the following procedure.

 In the SigmaWin+ Σ-7 component main window, click Setup, print to Set Absolute Encoder and click Multi-Turn Limit Setting. A verification message appears confirming if you want to continue although the position data will change.



If more than one axis is being used, the Axis Selection dialog box appears.

First select the axes to adjust according to the **Axis Selection** dialog box. For the procedure, refer to *4.1 Changing Axes*.

🔞 Multi-Turn Limit Setting 🛛 🛛 🕅
The position data is cleared when this function is used. Since the multi-turn (multiple rotations) limit is changed, the position data of the machine system is changed and it is very dangerous. Do you want to continue the process?
Continue

Click Cancel to return to the main window without setting the multi-turn limit.

2. Click **Continue**, and the Multi-Turn Limit Setting box appears.

🔞 Multi-Turn	Limit Se	etting			×
Multi-Turn Limit	Setting	Change			
Pn205:Multi-tur	n Limit S	etting			
65535	[rev]	\triangleright	65535		[rev]
			(0-65535	5)	
			1		
		Vriting i Servo			
	,	4			

3. Change the setting to the desired number of revolutions.

🔞 Multi-Tur	n Limit Setting	×
Multi-Turn Lir	nit Setting Change	
Pn205:Multi-t	urn Limit Setting	
65535	[rev] 🕨 [1555]	[rev]
	(0-655	35)
	Writing into the Servopack	

4. To save the settings, click Writing into the Servopack, and a warning message appears.



- 5. Click **OK** and the settings are changed to the new ones.
- After turning off the power, restart the SERVOPACK. Because only the settings for the SERVOPACK were made, the settings for the motor are still incomplete and the alarm A.CC0 Multi-turn Value Unmatched occurs.
- Return to the SigmaWin+ Σ-7 component main window. To make the settings for the motor, click Setup and then click Multi-Turn Limit Setting again. A verification message appears confirming if you want to continue although the position data will change.

🐻 Multi-Turn Limit Setting 🛛 🛛 🔊	ς.
The position data is cleared when this function is used. Since the multi-turn (multiple rotations) limit is changed, the position data of the machine system is changed and it is very dangerous. Do you want to continue the process?	
Continue Cancel	

8. Click **Continue**, and the Multi-Turn Limit Setting box appears. To change the settings, click **Re-Change**.

🔞 Multi-Tur	n Limit Setting	X
Set the multi-	turn limit value to the	e servo motor.
Pn205:Multi-t	urn Limit Setting	
1555	[rev]	Re-Change
	Writing into	
	the Motor	
	-	

9. To save the settings, click **Writing into the Motor**, and a warning message appears.

•	WARNING
	Multi-turn limit setting has been completed. Cycle (control) power. The operation can be done with the set multi-turn limit from the ne time when the power is turned on.
	It is very dangerous to operate the machine in this state. Be sure perform the original point re-setup of a machine system after power is turned on again.

10. Click **OK**.

4.5.3 Offset Adjustment

There are three types of offset adjustments.

- Speed/Torque reference offset adjustment
- · Analog monitor output adjustment
- Motor current detection offset adjustment

Adjusting Speed and Torque Reference Offset

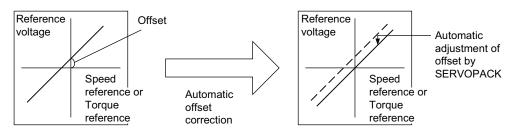
There are two types of speed/torque reference offset adjustment: Automatic and Manual.

Automatic Adjustment

When using the speed/torque control mode, the motor may turn slightly even if the analog reference voltage is set to 0V. This occurs when there is a slight (in units of mV) offset in the reference voltage of the upper-level controller or external circuit.

With this function, you can measure the offset and automatically adjust the reference voltage. Both the speed and torque references can be adjusted.

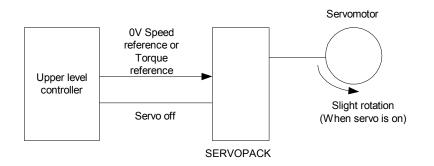
Automatically adjust the offset as follows when a voltage reference (offset) exists in either the upper-level controller or external circuit.



Once the offset has been automatically adjusted, the offset is recorded within the SERVOPACK.

Automatically adjust the offset using the following procedure.

- 1. Check that the power of the SERVOPACK is turned off.
- 2. Set the reference voltage so that it will be regarded as 0V by the upper-level controller or external circuit.



- 3. In the SigmaWin+ Σ -7 component main window, click Setup, point to Adjust Offset and click Adjust the Speed and Torque Reference Offset, and the Adjust the Speed and Torque Reference Offset box appears.
- 4. Click the Automatic Adjustment tab.

Adjust the Speed and Torque Reference Offset D
Automatic Adjustment Speed Reference Torque Re New Speed Reference Offset Torque Reference Offset Adjust

5. Click Adjust.

Adjust the Speed and Torque Reference Offse	
Automatic Adjustment Speed Reference Torque Re New Speed Reference Offset -11151 Torque Reference Offset -1 -1	

The automatically adjusted values are displayed in the New box.

Manual Adjustment

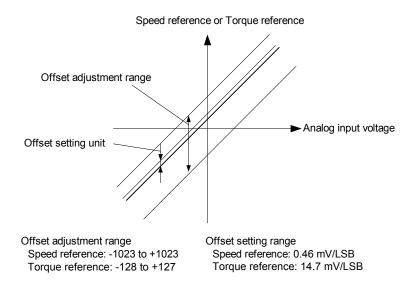
Manual adjustment of the speed/torque reference offset is a function that can be used in the speed and torque control modes. Use under the following conditions.

- When the position loop is closed in the upper-level controller and the error pulse is zero at servo lock stop
- When an offset has been purposefully set

This function may also be used when checking the offset data that had been automatically adjusted.

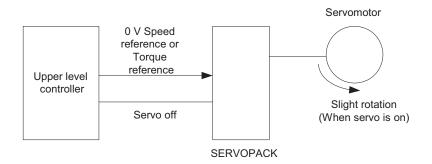
Although the basic functions are the same as those for the reference offset automatic adjustment mode, the adjustment must be done while directly inputting the offsets. Offsets can be set in both the speed reference and the torque reference.

The following diagram shows the range and setting units of the offset adjustment.



Manually adjust the offset using the following procedure.

1. Set the reference voltage so that it will be regarded as 0V by the upper-level controller or external circuit.



2. In the SigmaWin+ Σ -7 component main window, click Setup, point to Adjust Offset and click Adjust the Speed and Torque Reference Offset, and the Adjust the Speed and Torque Reference Offset box appears. Click the Speed Reference tab to adjust the speed reference; click the Torque Reference tab to adjust the torque reference. The Speed Reference tab is clicked, the following box appears.

San Adjust the Speed and Torque Reference Offset AXIS#0	х
Automatic Adjustment Speed Reference Torque Reference	
Speed Reference -8 [min-1]	
Speed Reference Offset	

3. Use the +1 and -1 buttons to adjust the settings so that the value in the "Speed Reference" box becomes zero.

🏫 Adjust the Speed and Torque Reference Offset AXIS#0	X
Automatic Adjustment Speed Reference Torque Reference	
Speed Reference 0 [min-1]	
Speed Reference Offset	

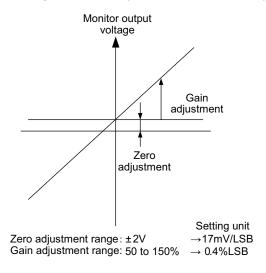
The settings for the torque reference can also be adjusted using the same procedure after clicking the **Torque Reference** tab.

Adjusting Analog Monitor Output

With this function, you can monitor the motor speed, torque reference, position error, and so on by the analog monitor output.

There are two types of analog monitor output adjustment: Zero Adjustment and Gain Adjustment.

Perform zero adjustment when correcting a error in output voltage caused by drift, or a error from the zero point caused by noise on the monitoring system. Also, perform adjust the gains when matching the sensitivity to the measurement system.



Zero Adjustment

Adjust the zero position using the following procedure.

1. In the SigmaWin+ Σ -7 component main window, click Setup, point to Adjust Offset and click Adjust the Analog Monitor Output, and the Adjust the Analog Monitor Output box appears. Click the Zero Adjustment tab.

Search Adjust the Analog Monitor Output AXIS#0
Zero Adjustment Gain Adjustment
Analog Monitor Output Offset
Channel CH1
0ffset 1 → 1 ↔
Monitor Signal Torque reference : 1V/100%

There are two channels: CH1 and CH2.

2. While watching the analog monitor, use the +1 and -1 buttons to adjust the offset.

Gain Adjustment

Adjust the gain using the following procedure.

 In the SigmaWin+ Σ-7 component main window, click Setup, point to Adjust Offset and click Adjust the Analog Monitor Output, and the Adjust the Analog Monitor Output box appears. Click the Gain Adjustment tab.

SAdjust the Analog Monitor Output AXIS#0	X
Zero Adjustment Gain Adjustment	
Analog Monitor Output Gain	
Channel CH1 💌	
Gain +1 ♂↑↑	
Monitor Signal Torque reference : 1∨/100%	

There are two channels: CH1 and CH2.

2. While watching the analog monitor, use the +1 and -1 buttons to adjust the gain.

Adjusting Motor Current Detection Offset

The offset of the motor current detection need not usually be adjusted because it is adjusted at delivery by Yaskawa. If the offset of the detection is carelessly or incorrectly set, the performance will be degraded. Use this function only when the torque ripple is obviously much larger than that of other SERVOPACKs.

Usually, the offset of the motor current detection does not have to be adjusted because it is adjusted at delivery by Yaskawa. Adjust the offset only when higher precision is needed, such as if the torque ripple error is thought to be excessive based on the current offset or if there is a need for further reduction in torque ripple.

There are two types of motor current detection offset adjustment: Automatic and Manual.

Automatic Adjustment

Automatically adjust the offset using the following procedure.

1. In the SigmaWin+ Σ -7 component main window, click **Setup**, point to **Adjust Offset** and click **Adjust the Motor Current Detection Offset**. A warning message appears confirming if you want to continue although the SERVOPACK's performance will be affected if the function is used carelessly or incorrectly.



If more than one axis is being used, the Axis Selection dialog box appears.

First select the axes to adjust according to the **Axis Selection** dialog box. For the procedure, refer to *4.1 Changing Axes*.

/	Adjust the Montor Current Detection Offset
	Normally, it is not necessary to adjust the motor current detection offset as the Servopack has already been adjusted by our company. Careless use of this function may degrade Servopack performance.
	Clicking the Continue button will start this operation.
	Continue

2. Click Continue, and then click the Automatic Adjustment tab.

Adjust the Motor Curre	ent Detection Offset AXIS#0 [
Automatic Adjustment M	anual Adjustment
U-phase Offset V-phase Offset	New 12 12 12 Adjust

3. Click Adjust.

	urrent Detection Offset AXIS#0	X
Automatic Adjustment	Manual Adjustment	
U-phase Offset V-phase Offset	12 ► 16 12 ► 12	
	Adjust	

The automatically adjusted values are displayed in the New box.

Manual Adjustment

Manually adjust the offset using the following procedure.

- 1. Turn the motor at 100 min^{-1} .
- 2. In the SigmaWin+ Σ -7 component main window, click Setup, point to Adjust Offset and click Adjust the Motor Current Detection Offset. A warning message appears confirming if you want to continue although the SERVOPACK's performance will be affected if the function is used carelessly or incorrectly.

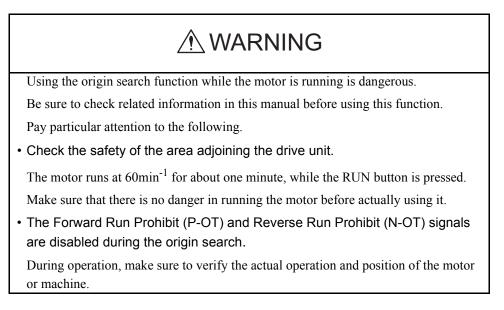
Adjust the Mon	tor Current Detec	tion Offset	×
	UTION		
as the Servopa	ck has already been	st the motor current adjusted by our con egrade Servopack p	npany.
Clicking the Con	tinue button will star	t this operation.	
	Continue	Cancel	

3. Click Continue, and then click the Manual Adjustment tab.

Adjust the Motor Current De	tection Offset AXIS#0 💌
	□⊨]
Automatic Adjustment Manual A	djustment
- Motor Current Detection Offset	
Channel U-p	hase 💌
Offset	+1 @1 -1 @↓

4. While watching the analog monitor, use the +1 and -1 buttons to adjust the offset to minimize the ripple on the torque reference monitor. The U-phase and V-phase currents must be adjusted so that they balance. Repeat the adjustment alternately between them several times.

4.5.4 Origin Search



This function moves the motor to the origin and clamps at the position. Use this function when the motor shaft needs to be aligned with the machine.

Perform an origin search using the following procedure.

1. In the SigmaWin+ Σ -7 component main window, click **Setup**, and then click **Search Origin**. A warning message appears reminding you of the dangers that are possible when using this function.



If more than one axis is being used, the **Axis Selection** dialog box appears. First select the axes to adjust according to the **Axis Selection** dialog box. For the procedure, refer to *4.1 Changing Axes*.

	rous to operate this function, because the servomotor will rotate. e sure to check the user's manual before operating.
Pay partic	ular attention to the following points:
1. Perform	safety checks around moving parts.
motor) v	romotor will actually turn at approximately 60min-1 (6min-1 with DD while clicking the FORWARD/REVERSE button. Perform this after ily checking that there is no danger from servomotor operation.
2. [Forwar	d Run Prohibit (P-OT)]/[Reverse Run Prohibit (N-OT)] is disabled.
disabled P-OT/N-0	vard Run Prohibit (P-OT)/Reverse Run Prohibit (N-OT) signals are during origin search (the servomotor will not stop even if the DT signals are passed). When operating, carefully verify the action tion of the servomotor/machine.

Click Cancel to return to the main window without performing origin search.

<When the Write Prohibited setting is ON>

If the write prohibited setting is on, the following message will appear.



Click OK, and set the write prohibited setting to off.

See "4.5.5 Write Prohibited Setting" for setting method.

2. Click **OK**, and the Origin Search box appears.

If the servo is on, an error message will appear. Make sure that the servo is off.

👌 Origin Search Axis #0	×
-Status	
Origin Search Not Exe	ecuted
Operation	
	Servo ON
Servo OFF	
Forward	Reverse
*	-74

Origin Search Box

Status

This displays the run status.

Origin Search not Executed: The motor has not turned.

Origin Search Executing:	Searching for the origin by turning forward or in reverse.
Origin Search Stopped:	The Forward or Reverse button has been released during the origin search, so the motor stopped.
Origin Search Completed:	Origin found, and the motor stopped (clamped) at the point.

Close the Origin Search box to re-execute another origin search after a one search has been completed.

Operation

On the left, shows if the servo is on or off and the corresponding LED display.

On the right, the button changes according to the servo's status. When the servo is off, the **Servo ON** button appears; when the servo is on, the **Servo OFF** button appears.

3. Click Servo ON.

💦 Origin Search Axis #0	X
Status	
Operation Servo OFF	
Forward Reverse	

4. Press **Forward** or **Reverse**. The search is performed while one of these buttons is pressed. The axis stops when the search is complete.

4.5.5 Write Prohibited Setting

The write-prohibited setting function is used to prevent the inadvertent rewriting of parameters from the digital operator. Rewriting parameters from the SigmaWin+ is allowed even if the write prohibited setting is on.

Set to ON or OFF the write prohibited setting using the following procedure.

1. In the SigmaWin+ Σ -7 component main window, click **Setup**, and then click **Write Prohibited Setting**. One of the following boxes will appear.

<If the Write Prohibited Setting is ON>

音 Write I	Prohibition Setting AXIS#00		×
	Write Prohibition Setting is ON.		
		Setting	

Click the **v** button to change the value to "0000" and click **Setting**. The write prohibited setting is off.

<If the Write Prohibited Setting is OFF>



Click the **L** button to change the value to "0001" and click **Setting**. The write prohibited setting is on.

2. A message appears, telling you that the write prohibited setting has been changed and will be effective the next time the SERVOPACK is restarted.

Write Pr	ohibited Setting 🛛 🔀
⚠	Write Prohibited Setting has changed The setting will be enabled the next power ON
	OK

Click **OK** and restart the SERVOPACK.

4.5.6 Tuning-less Level Setting

The tuning-less level setting is used to adjust the responsiveness when using the tuning-less function, which is a tuning function that requires no parameter settings.

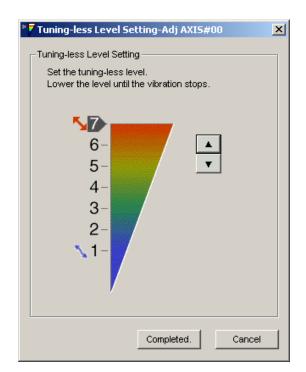
Use the following procedure to set the tuning-less level.

1. Select *Setup - Tuning-less Level Setting* from the menu bar of the SigmaWin+ Σ -7 component main window.



If more than one axis is being used, the **Axis Selection** dialog box appears.

First select the axes to adjust according to the **Axis Selection** dialog box. For the procedure, refer to *4.1 Changing Axes*.



2. Click the setting arrows to adjust the tuning-less level so that the machine does not vibrate.

The default tuning-less level setting is 4.

3. After the tuning-less level has been set so that the machine does not vibrate, click **Completed**. The adjustment results will be saved in the SERVOPACK.

4.5.7 Initializing Vibration Detection Level

This function detects vibration when a servomotor is connected to a machine and automatically adjusts the level at which vibrations are detected to output more exactly the vibration alarm (A.520) and warning (A.911).

To initialize the vibration detection level, use the following procedure.

1. In the SigmaWin+ Σ -7 component main window, click **Setup**, and then click **Initialize Vibration Detection Level**. The Initialize Vibration Detection Level box appears.



If more than one axis is being used, the **Axis Selection** dialog box appears. First select the axes to adjust according to the **Axis Selection** dialog box. For the procedure, refer to *4.1 Changing Axes*.

Tnitialize Vibration Detection Level AXIS#0	×
Setting Condition	_
Pn311 : Vibration Detection Sensibility (50 - 500)	
100 (%)	
Pn310 : Vibration Detection Switch	
nibble 0 Vibration Detection Switch	
0 : No detection.	
Detection Start	
Setting Result	
Pn312 : Vibration Detection Level	
50 [min-1]	

2. Select a percentage as the degree of vibration detection sensitivity and the vibration detection switch, and then click **Detection Start**.

Tnitialize Vibration Detection Level AXIS#0	×
Setting Condition	
Pn311 : Vibration Detection Sensibility (50 - 500)	
100 💌 [%]	
Pn310 : Vibration Detection Switch nibble 0 Vibration Detection Selection	
2 : Outputs alarm (A.520) when vibration is detected.	
Execute	
Setting Result	
Pn312 : Vibration Detection Level	
50 [min-1]	

3. Click **Execute**. The level at which the vibrations are detected is automatically adjusted, and the setting is displayed in the box on the right and saved in the SERVOPACK.

Tnitialize Vibration Detection Level AXIS#0	×
Setting Condition	
Pn311 : Vibration Detection Sensibility (50 - 500)	
100 * [%]	
Pn310 : Vibration Detection Switch nibble 0 Vibration Detection Selection	
2 : Outputs alarm (A.520) when vibration is detected.	
Setting Result	
Pn312 : Vibration Detection Level	
50 [min-1] 🕨 24 [min-1]	
When vibration exceeds a detection level 24 [min-1], Alarm(A.520) is detected.	

4.5.8 EasyFFT

Using the EasyFFT function while the motor is running is dangerous. Be sure to check related information in this manual before using this function. Pay particular attention to the following items. • Check the safety of the area adjoining the drive unit. The motor turns less than a quarter of a turn several times in the specified direction while using the EasyFFT function. Make sure that there is no danger in running the motor before actually using it. • External instructions Do not enter instructions from an external source, because this function creates instructions in the SERVOPACK and sends them to the motor.

The EasyFFT function can be used for fine frequency tuning by assigning a frequency, which is based upon the machine's characteristics, to the notch filter and setting the corresponding parameter to this frequency.

To perform an EasyFFT operation, use the following procedure.

1. In the SigmaWin+ Σ -7 component main window, click **Setup** and then click **EasyFFT**. A warning message appears, reminding you of the possible dangers.



If more than one axis is being used, the Axis Selection dialog box appears.

First select the axes to adjust according to the **Axis Selection** dialog box. For the procedure, refer to *4.1 Changing Axes*.

<u> </u>	ARNING
Be sure to	ion is a dangerous function accompanied by operation of a motor. confirm an operation manual before execution. I especially of the following points.
1.Please c	heck the safety near an operation part.
	rotates in the specified direction which are less than 1/4 rotation num two or more times by automatic operation during executing ttion.
	xecute this function after fully checking that there is no danger by n of a motor.
2. About a	n external instruction input
	put instructions from the external because this function generates ons of exclusive use in a SERVOPACK and outputs to a motor.
EasyFFT is	s started.OK?

Click **Cancel** to return to the main window without performing an EasyFFT operation.

2. Click **OK**, and the EasyFFT box appears.

iEasyFFT AXIS#0	
Servo ON/OFF operation	
Servo OFF	Servo ON
Measurement start / Stopping operation	
Measurement condition	
Stimulus signal Frequency	Start
Instruction amplitude 15 [%]	
(1 - 300) Rotation direction	1
	Analyzing frequency
Measurement result	
Detected resonance frequency	[Hz]
Optimal notch filter frequency	[Hz]
Notch filter selection	
	Measurement complete

3. Click Servo ON.

EasyFFT AXIS#0				×
-Servo ON/OFF operati	on			
Serv	o ON			Servo OFF
-Measurement start / S	topping oper	ation –		
_Measurement conditi	ion			
Stimulus signal	Frequency			Start
Instruction amplitude	50	•	[%]	
Rotation direction	(1 - 300) Forward	-		Å
	·			Analyzing frequency
Measurement result —				
Detected resonance	e frequency			[Hz]
Optimal notch filter f	requency			[Hz]
Notch filter selection	ì			
				Measurement complete

4. Select the instruction amplitude and the rotation direction, and click **Start**. The motor begins to rotate, and the measurement of the frequency starts. After the measurements have been taken, the results are displayed in the lower section of the box.

Servo ON/OFF operation Servo ON Servo ON Servo OFF Servo OFF	EasyFFT AXIS#0		1
Servo ON Measurement start / Stopping operation Measurement condition Stimulus signal Frequency Instruction amplitude 50 (1 - 300) Rotation direction Forward Measurement result Detected resonance frequency 504 (Hz) Optimal notch filter frequency	Servo ON/OFF operation		
Measurement condition Stimulus signal Frequency Instruction amplitude 50 ≥ [%] Instruction amplitude 50 ≥ [%] (1 - 300) (1 - 300) Image: Comparison of the second	Servo ON		Servo OFF
Stimulus signal Frequency Instruction amplitude 50 (1 - 300) Rotation direction Forward Measurement result Detected resonance frequency 504 (Hz) Optimal notch filter frequency	Measurement start / Stopping opera	ation	
Stimulus signal Frequency Instruction amplitude 50 (1 - 300) Rotation direction Forward Measurement result Detected resonance frequency 504 (Hz) Optimal notch filter frequency	Measurement condition		
Measurement result Detected resonance frequency S04 [Hz] Optimal notch filter frequency	Stimulus signal Frequency		Start
Rotation direction Forward Measurement result Detected resonance frequency 504 Optimal notch filter frequency		* [%]	
Detected resonance frequency 504 [Hz] Optimal notch filter frequency 554 [Hz]		•	
Optimal notch filter frequency 554 [Hz]	Measurement result		
	Detected resonance frequency	504	[Hz]
Notch filter selection The 1st step	Optimal notch filter frequency	554	[Hz]
	Notch filter selection	The 1st step	
Measurement consulation			Measurement complete

5. Click Measurement complete.

	Related Functio	n Switch nibl	ole 0 Notch	Filter Selectio	n 1
0:Disabled					
		▼			
1:Uses 1st st	ep notch filter fo	or torque refe	rence.		
lotch filter fre	quency				
9n409:1st Ste	p Notch Filter Fr	equency			
2000	[Hz]	5 54		[Hz]	
	utton, when yo	u reflect a me	asurement	result in User	Paramete
ease click a l					
lease click a l		(

6. Click **Result Writing** to assign the results as parameter settings.

4.5.9 Reset Option Module Configuration Error

When the SERVOPACK detects an option module configuration error, this function is used to reset the error.

There are three types of option modules:

- Reference module
- Safety option module
- Feedback option module

The SERVOPACK detects five kinds of option module configuration statuses: Two kinds of normal statuses as and three kinds of error statuses.

<Normal>

- Normally detected: The option module is correctly connected to the SERVOPACK.
- Not mounted: No option module is connected.

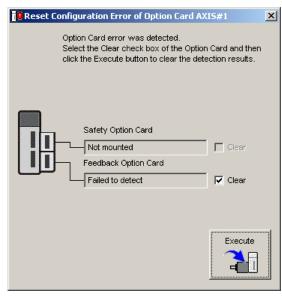
<Error>

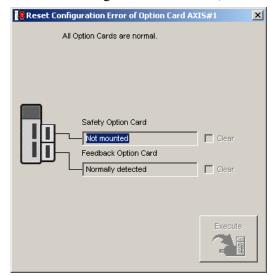
- Failed to detect: Cannot detect the previously connected option module.
- **Detection unmatched**: The detected option module is different from the previously connected option module.
- **Error detected**: An unsupported option module is connected. Or, an error occurred in communications with the option module.

Use the following procedure to reset the alarm detected in an option module.

1. Select *Setup – Reset Option Module Configuration Error* from the menu bar of the SigmaWin+ Σ -7 component main window.

If an option module error occurs when SigmaWin+ is started, the following box will appear.





If no error occurs when SigmaWin+ is started, the following box will appear.

2. Check to see if the **Clear** check box of the option module whose detection result to be cleared is selected, and then click **Execute**. A message will appear inform you that clearing the results will change the system configuration and overwrite some parameter settings, asking for your confirmation to clear the results.

Reset Configuration Error of Option Card	×
The detection results of the selected Option Cards will be cleared. Clearing the results will change the system configuration and overwrite some parameter settings. Do you want to clear the detection results?	
OK Cancel	



The detection result **Error detected** cannot be cleared. Remove the option module, or check to see if the option module is correctly mounted.

3. Click **OK**. A message will inform you that the detection results were cleared, and prompt you to turn the power off and then on again to validate the settings.

Reset Configuration Error of Option Card
The detection results of the selected Option Cards were cleared. The setting will be validated by turning the power off and then on again.
Reconnect, the SigmaWin+ to the Servopack after turning on the power.
ОК

4. Click OK.

4.5.10 Safety Option Module Setup Alarm Clear

The Safety Option Module Setup Alarm Clear function can be used to clear an alarm A.EC0 or A.EC1 when using a Safety Module.

Alarm A.EC0 or A.EC1 may occur:

- At the initial startup after mounting a Safety Module
- During initialization of Safety Module parameters (Pcxx)
- After changing any of Safety Module parameter (Pcxx) settings
- After changing the Safety-related servo parameters (Pnxxx)

<How to Clear Alarm A.EC0>

Use the following procedure to clear an alarm A.ECO.

1. Select Safety Option Module Setup Alarm Clear from Setup menu in the SigmaWin+ Σ -7 component main window.

The Safety Option Module Setup Alarm Clear box will appear.

Safety Option Module Setup Alarm Clear	×
The following Safety module alarm have been detected now. Click Execute to clear the alarm. Other Servo alarms might have been generated though it is 'Normal'. Confirm it by the Alarm Display.	
A.EC0 : Safety Module: Confirmation Alarm	1
Execute	

2. Click **Execute**, and the alarm clearing process starts.

When the alarm is successfully cleared, the following message appears.

Safety Option Module Setup Alarm Clear		×
The following Safety module alarm have been detected now Click Execute to clear the alarm. Other Servo alarms might have been generated though it is 't Confirm it by the Alarm Display.		
Normal		
	Execute	

<How to Clear Alarm A.EC1>

Use the following procedure to clear an alarm A.EC1.

1. Select Safety Option Module Setup Alarm Clear from Setup menu in the SigmaWin+ Σ -7 component main window.

The Safety Option Module Setup Alarm Clear box will appear.

Safety Option Module Setup Alarm Clear	x
The following Safety module alarm have been detected now. Click Execute to clear the alarm. Other Servo alarms might have been generated though it is 'Normal'. Confirm it by the Alarm Display.	
A.EC1 : Safety-related Servo Parameter Unmatch Alarm	
Execute	

2. Click Execute. The Parameter Confirmation box will appear.

No.	Name	Servo	Input	Unit	Check
Pc01	EDM Signal Output Select Switch	0011H	0010H	-	
Pc10	Wait time to decelerate A	0	5	10ms	
Pc11	Deceleration monitoring time A	500	505	10ms	
Pc12	The monitoring speed during deceleration waiting A	0	5	min-1	
Pc13	Monitoring position A	10	15	edge	
Pc14	Monitoring speed A during constant speed	0	5	min-1	
Pc20	Wait time to decelerate B	0	5	10ms	
Pc21	Deceleration monitoring time B	500	505	10ms	
Pc22	The monitoring speed during deceleration waiting B	0	5	min-1	
Pc23	Monitoring position B	10	15	edge	
Pc24	Monitoring speed B during constant speed	0	5	min-1	

Servo: Shows the current settings for Safety Module parameters

Input: Shows the values set in the parameter editing window for the Safety Module.

3. Verify the values shown in **the Input** column, and select the check boxes of the parameters whose settings are confirmed to be correct.

When all the check boxes of the displayed parameters are selected, the **OK** button becomes available.

	e click OK after confirming all parameters.	-	.		.
No.	Name	Servo	Input	Unit	Check
Pc01	EDM Signal Output Select Switch	0010H	0010H	-	
Pc10	Wait time to decelerate A	5	5	10ms	
Pc11	Deceleration monitoring time A	505	505	10ms	
Pc12	The monitoring speed during deceleration waiting A	5	5	min-1	
Pc13	Monitoring position A	15	15	edge	
Pc14	Monitoring speed A during constant speed	5	5	min-1	
Pc20	Wait time to decelerate B	5	5	10ms	
Pc21	Deceleration monitoring time B	505	505	10ms	
Pc22	The monitoring speed during deceleration waiting B	5	5	min-1	
Pc23	Monitoring position B	15	15	edge	
Pc24	Monitoring speed B during constant speed	5	5	min-1	

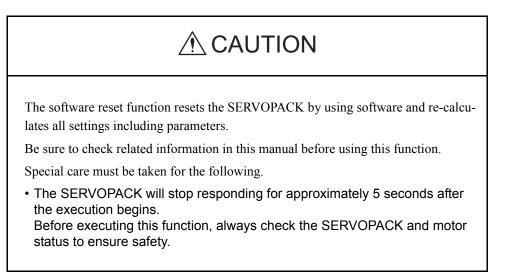
Click OK.

4. The following message appears.

Paramete	er Editing
į	Software reset function or the power supply re-turning on because the safety parameter was changed.
	OK

Click OK, and restart the SERVOPACK to validate the new settings.

4.5.11 Resetting the SERVOPACK by Software



The software reset function turns on or off the power supply to the SERVOPACK by using software.

To execute the software reset function, use the following procedure.

USB Connection

1. In the SigmaWin+ Σ -7 component main window, click **Setup** and then click **Software Reset**.

A warning message will appear, confirming if you want to continue.

After calculating the moment of inertia as described in "4.7 Tuning," the window shown in step 2 will appear.

	Software Reset X				
The software reset function resets the Servopack by using softwa and re-calculates all settings including parameters. Be sure to carefully read the SigmaWin+ Operation Manual before executing this function. Special care must be taken for the following					
	The Servopack will stop responding for approximately 5 seconds after the execution begins. Before executing this function, always check the Servopack and motor status to ensure safety.				
	Execute Cancel				

Click **Cancel** to return to the main window without executing the software reset function.

2. Click Execute. The Software Reset window will appear.



3. Click **Execute**. When execution of the software reset function is complete, a warning message will appear, asking you to reconnect the SigmaWin+ to the SERVOPACK.

Software Reset	×	
The software reset function has been completed. All settings including parameters were re-calculated. Always reconnect the SigmaWin+ to the Servopack after execution of this function.		
ок		

4. Click **OK** to close the Software Reset window. All settings including parameters have been re-calculated. Disconnect the SigmaWin+ from the SERVOPACK, and then reconnect.

■ When using a Controller

1. In the SigmaWin+ Σ -7 component main window, click **Setup** and then click **Software Reset**.

A warning message will appear, confirming if you want to continue. After calculating the moment of inertia as described in "4.6 Tuning," the **Software Reset** window shown in step 2 will appear.

Software Reset			
The software reset function resets the Servopack by usin and re-calculates all settings including parameters. Be sure to carefully read the SigmaWin+ Operation Manual executing this function. Special care must be taken for the	before		
The Servopack will stop responding for approximately 5 seconds after the execution begins. Before executing this function, always check the Servopack and motor status to ensure safety.			
Execute Cancel			

Note: Click Cancel to return to the main window without executing the software reset function.

2. Click Execute. The following message will appear.

O Software Reset AXIS#44				
The software reset function will be executed. The Servopack will stop responding for approximately 5 seconds after the fuction begins.				
Execute				
0%				
Reset MECHATROLINK communication				



When software reset is executed, communication between the Controller and the SERVOPACK is disabled, and an error is issued. MECHATROLINK communication must be reset to clear the communication error. Check *Reset MECHATROLINK communication* to reset the MECHATROLINK communication

3. When execution of the software reset function is complete, the following message will appear.



4. Click **OK** to close the **Software Reset** message. All settings including parameters have been re-calculated. Disconnect SigmaWin+ from the SERVOPACK, and then reconnect.

<MECHATROLINK Communication Reset>

MECHATROLINK Communication Reset function resets the communication with MECHATROLINK.

Only the communication of MECHATROLINK can be reset.

Communication between the Controller and the SERVOPACK can be restored by clearing the communication error that occurred between them.

 In the SigmaWin+Σ-7 component main window, click Setup and then click MECHATROLINK Communication Reset.

The following message will appear.

MECHATROLINK Communications Reset AXIS#44				
MECHATROLINK communications will be reset. After confirming that the host controller is not sending a command to the axis#44, execute this function. Communications with the axis will be also reset.				
The parameter reflected automatically are reflected in the controller. The parameter reflected automatically are reflected in controller's setting				
parameter before communications reset.				
Reset				

2. Click Reset.

The following message will appear.

MECHAT	ROLINK Communications Reset
٩	The parameter reflected automatically are reflected in controller's setting parameter. The reflected setting parameter will be cleared when controller's power supply is restarted. Please save the setting parameter in the controller with MPE720 to it is not cleared. It can be saved by Axis Setup Wizard "Axis Reflect SERVOPACK Parameter in Setting Parameter" from Axis Setup Wizard.
	The reflected parameter is as follows.
	Pn.102 => No.46 Position loop gain Pn.100 => No.47 Speed loop gain Pn.109 => No.48 Speed feedforward amends Pn.11F => No.50 Position integration time constant Pn.101 => No.52 Speed integration time constant Pn.812 => No.58 Filter time constant
	Do you want to continue?
	<u>Y</u> es <u>N</u> o

3. Click Yes.

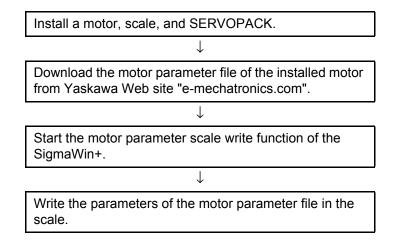
The parameters that are automatically reflected will be reflected in Controller's setting parameters (register: OWxxxx).

At the same time, the MECHATROLINK communication reset will be executed and the **MECHATROLINK Communication Reset** message will close.

4.5.12 Writing the Motor Parameters in the Scale

<u> </u>
The Motor Parameter Scale Write function rewrites data in the scale. If the data which does not suit the connected motor is rewritten, the motor may not run normally, resulting in motor overrun, etc. Be sure that the data written in the scale suits the connected motor.

Write the parameters of the motor parameter file in the scale:



Write the motor parameters in the scale using the following procedure. Download the motor parameter file of the installed motor from Yaskawa Web site "e-mechatronics.com" in advance.

1. In the SigmaWin+ Σ -7 component main window, click **Setup**, and then click **Motor Parameter Scale Write**. A warning message appears, reminding you of the possible danger.



If more than one axis is being used, the Axis Selection dialog box appears.

First select the axes to adjust according to the **Axis Selection** dialog box. For the procedure, refer to *4.1 Changing Axes*.

Motor parameter scale write	×
This function rewrites data in the scale. If the data which does not suit the connected motor is rewritten, the motor may not work normally, resulting in motor overrun, etc., and it is very dangerous. Be sure that the data written in the scale suits the connected motor	
OK Cacnel	

Click **Cancel** to return to the main window without writing motor parameters in the scale.

2. Click **OK**. The following box appears, and the SERVOPACK starts reading the parameter information from the scale.

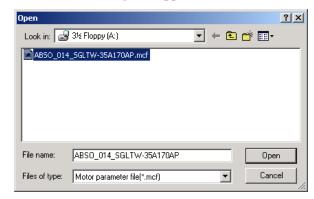
Motor parameter scale writ	e - Scale read 🛛 🔀
	····
Reading	
1	0%

When the reading was completed successfully, the following box appears.

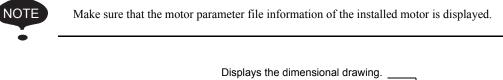
otor Parameter File	
	Ref
Motor parameter file information -	

	Outline
	- D
	- 0
	- D
<u> </u>	- 0
Туре:	A V
Aspect:	A V
Remarks:	<u> </u>
	Next > Cancel

3. Click **Ref.**, and the following box appears.



4. Select the motor parameter file downloaded from Yaskawa Web site "emechatronics.com," and then click **Open**. The motor parameter file information is displayed in the Motor parameter scale write - File select box.



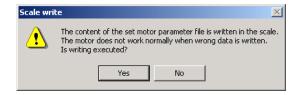
ABSO_01	4_SGLTW-35A170AP.mcf		Ref.
Aotor para	neter file information		
SGLTV	/-35A170AP		
Contract of the second		Outline - ContForce 220 ContCurrent 3.3 PeakForce 660 PeakCurrent 11.3	[N] [Arms] [N] [Arms]
Туре:	Iron-core TW The Iron-core TW linear motors are com	posed of	
Aspect:	*Yaskawa's unique construction princip the TVV linear motors negate the effects		•
Remarks:			A ¥
		Next >	Cancel

5. Click Next. The following box appears.

Motor parameter scale write - Sca The motor parameter is written in the scal Please confirm the motor which connects the following information.	le.	te
Motor parameter file information		
SGLTW-35A170AP		
	PeakForce 660 [N PeakCurrent	.rms]
Type: Iron-core TW The Iron-core TW linear m	otors are composed of	•
Aspect: *Yaskawa's unique const the TW linear motors neg		•
Remarks:		▲
	< Back Complete Can	icel

Click **Cancel** to return to the main window without writing motor parameters in the scale. Click **Back** to return to the Motor parameter scale write - File select box.

6. Click Write. The following message appears.



Click No to cancel writing.

Scale write

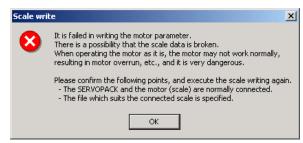
7. Click **Yes**. The following box appears, and the motor parameter scale writing starts.

< If the Motor Parameters Were Not Written Normally>

The following box appears.



Select the next step to be executed, and then click **OK**. If "The function is ended without executing writing" is selected, the following box appears.



Click **OK** to return to the main window.

< If the Motor Parameters Were Written Normally>

The following box appears.

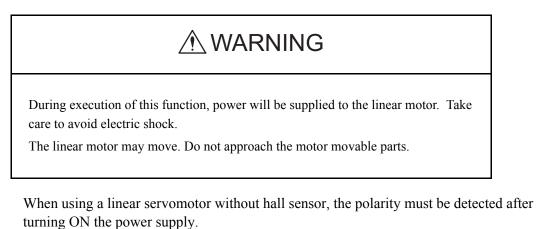
Motor parameter so The motor parameter is w Please confirm the motor the following information.	vritten in the : which conne	scale.	ling to	Write
⊢Motor parameter file int	formation —			
SGLTW-35A170	DAP			
	- Cece		Outline ContForce 220 ContCurrent 3.3 PeakForce 660 PeakCurrent 11.3	[N] [Arms] [N] [Arms]
Type: Iron-core The Iron-c		ar motors are com	oosed of	▲ ▼
		onstruction princip negate the effects		▲ ▼
Remarks:				▲ ▼
		< Back	Complete	Cancel

8. Click **Complete**, and the following box appears.

Motor parameter scale write	×
The scale writing of the motor parameter was completed. Please execute the power supply re-turning ON. The setting value will be enabled the next power ON.	
*After the next power ON, when "A.CA0:Encoder parameter error" occur, the writing of data is required separately. Please ask for the data file to our company.	
ОК	

9. Click OK. Turn OFF the power and then ON again to validate the written data.

4.5.13 Detecting the Polarity



The polarity detection function is used to detect the polarity and store the phase data in the SERVOPACK and the linear scale.

Detect the polarity using the following procedure.

1. In the SigmaWin+ Σ -7 component main window, click **Setup** and then **Polarity Detection**. A warning message appears, reminding you of the possible dangers.

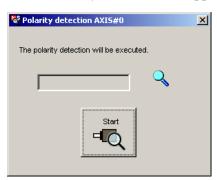


If more than one axis is being used, the **Axis Selection** dialog box appears. First select the axes to adjust according to the **Axis Selection** dialog box. For the procedure, refer to *4.1 Changing Axes*.



Click **Cancel** to return to the main window without executing the polarity detection function.

2. Click **Continue**, and the Polarity Detection box appears.



3. Click **Start**, and the polarity detection will be executed.

4.5.14 Setting the Zero Point Position of the Absolute Linear Encoder

A WARNING

The zero point position setting for the absolute linear encoder sets the current position of the connected absolute linear encoder as the zero point position.

Be sure to check related information in this manual before using this function. Note the following points:

1 Always make the settings for the mechanical system again after the zero point position setting.

Executing the zero point position setting will clear the absolute position of the connected absolute linear encoder to 0 and the previously defined mechanical system will change to a different coordinate system.

Operating the machine in this state is extremely dangerous. Failure to observe this warning may result in personal injury and/or damage to the machine.

Be sure to reset the zero point position of the mechanical system after setting the zero point position of the absolute linear encoder.

2 The following conditions must be met to set the zero point position of the absolute linear encoder.

The following conditions must be satisfied to execute the zero point position setting.

•Servo is in OFF status.

• The polarity detection has been completed.

Check the SERVOPACK status.

3 Always turn the SERVOPACK power supply OFF and ON again after setting the zero point position of the absolute linear encoder.

The new zero point position of the absolute linear encoder will be valid only after you turn the power supply OFF and ON again.

Always turn the SERVOPACK power supply OFF and ON again after setting the zero point position of the absolute linear encoder.

The zero point position of the absolute linear encoder can be set when using an absolute linear encoder supported by the SERVOPACK.

Before executing the zero point position setting of the absolute linear encoder, move the motor to the position to be set as the zero point position.

Use the following procedure to set the zero point position of the absolute linear encoder.

1. In the SigmaWin+ Σ -7 component main window, click **Setup** and then **Zero Point Position Setting**. A warning message appears, reminding you of the possible dangers.



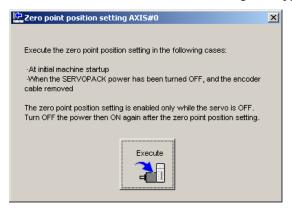
If more than one axis is being used, the **Axis Selection** dialog box appears.

First select the axes to adjust according to the **Axis Selection** dialog box. For the procedure, refer to *4.1 Changing Axes*.

Zero point position setting
The zero point position setting sets the current position to the connected absolute linear scale as the zero-point position. Always refer to the user's manual before executing this function. Note the following points:
1.Always make the settings for the mechanical system again after the zero point position setting.
The absolute position of the connected absolute linear scale is cleared to 0 and the previously defined mechanical system will change to a different coordinate system. Operating the machine in this state is extremely dangerous. Failure to observe this warning may result in personal injury and/or damage to the machine. Be sure to reset the zero point for the mechanical system after the zero point position setting.
2.Satisfy the following conditions before executing this function:
The following conditions must be satisfied to execute the zero point position setting: ·Servo is in OFF status. ·The polarity detection has been completed. Check the SERVOPACK status.
3.Always turn the SERVOPACK power OFF then ON again after the zero point position setting.
The set zero point position will be valid after turning OFF the power then ON again. Always turn OFF the SERVOPACK power then ON again after the zero point position setting.
Do you want to continue the zero point position setting?
Continue Cancel

Click the **Cancel** to cancel setting the zero point position of the absolute linear encoder. You will return to the main window.

2. Click Continue, and the Zero Point Position Setting box appears.



3. Click Execute.

Zero point position setting				
Executing the zero point position setting will clear the absolute position of the connected absolute linear scale to 0 and the previously defined mechanical system will change to a different coordinate system.				
Do you want to continue the zero point position setting?				
Continue				

Click the **Cancel** to cancel setting the zero point position of the absolute linear encoder. You will return to the previous dialog box.

4. Click **Continue**. The zero point position of the absolute linear encoder will be set and the following dialog box will be displayed.



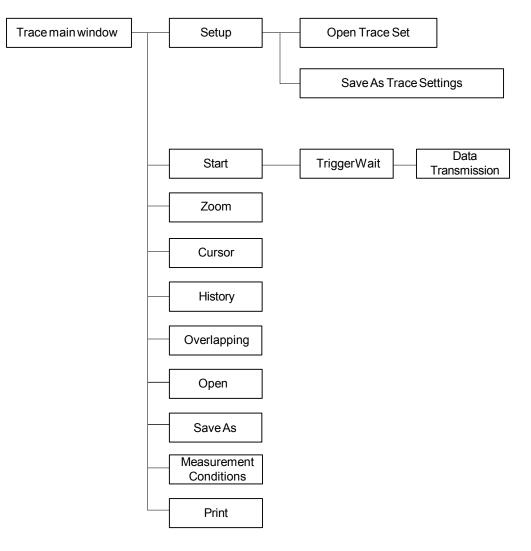
5. Click OK.

4.6 Tracing

4.6.1 Trace Function

■ Structure

The following flowchart shows how the trace function works.



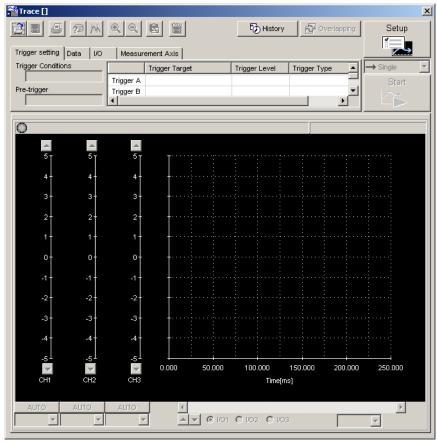


The Measurement Axis Tab Page is not shown in some of the screen captures. It will be displayed on the actual GUI.

Data Trace

Trace Main Window

In the SigmaWin+ Σ -7 component main window, click **Trace** and then click **Trace**. The Trace main window appears.



Trace Main Window

Trace Setting

In the Trace main window, click **SETUP**, and the Trace Setting box appears. Select the objects and conditions for the trace.

The settings from the previous trace, if any, are displayed.

are a	objects to be traced and trigger Select this check box to obtain more automatically set according to precise data. tem selected here. Image: Constraint of the selected here.
	Trace Setting
	Sampling Setting
	Auto Setting Monitors positioning completion (Set Sampling Time 125 - [us] × 1000 = 125.000 [ms]
	Trace Object Setting
	Measurement Axis #00 Set High-precision trace (The time required to trace will be reduced to a half.)
	Analog Trace - vertical axis (Left)
	Data 1 Feedback Speed v min-1 U0 1 /S-ON v min-1 U0 1 /S-ON v min-1 U0 2 R-CON v min-1
	Data 2 Torque Reference V V IVO 2 IP-CON V Data 3 Unsetting V V IUO 3 Unsetting V
	Trigger setting
	Trigger Conditions Trigger A
	Trigger A Trigger A
	Trigger Target No Trigger V AXIS#00 V Trigger Target No Trigger V AXIS#00 V Trigger Level 0
The item selected	Trigger Type Trigger Type Rising Edge
here is displayed	
as an option.	Display options Setting time OK Cancel

Trace Setting Box

<Sampling Setting>

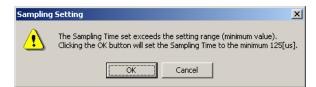
The setting for the allowable interval time for getting trace data can be made here. Data will be obtained every 250 μ s if the sampling time is set to 250 μ s. The total trace time is the sampling time multiplied by the number of data items. Use the spin button to set the time. If directly typing a value and the value is outside the acceptable range, a warning message will appear telling you that the sampling time is incorrect. The warning will vary according to the error.

1. If the typed value is larger than the maximum setting time:

Trigger Condition Setting							
The Sampling Time set exceeds the setting range (maximum value). Clicking the OK button will set the Sampling Time to the maximum 8							
	Cancel						

Click **OK** to automatically adjust the sampling time to the maximum setting. Click **Cancel** to return to the Trace Setting box without setting the sampling time.

2. If the typed value is smaller than the minimum setting time:



Click **OK** to automatically adjust the sampling time to the maximum setting. Click **Cancel** to return to the Trace Setting box without setting the sampling time.

3. If the typed value cannot be allocated in the time interval:

Trigger	Trigger Condition Setting							
	Set Sampling Time using multiples of 125[us]. Clicking the OK button will set Sampling Time to 1000[us].							
	Cancel							

Click **OK** to automatically adjust the sampling time. Click **Cancel** to return to the Trace Setting box without setting the sampling time.

<Trace Object Setting>

Measurement Axes

Click the **Set** button by the **Measurement Axis** box. The **Axis Selection** dialog box will be displayed. You can trace up to 16 data items. The number of axes that you can select according to the number of traces that are set for analog tracing or I/O tracing is as follows:

- Number of traces set to 1: 16 axes
- Number of traces set to 2: 8 axes
- Number of traces set to 3: 5 axes



• The Axis Selection dialog box will not allow you to select more than the maximum number of axes.

• The setting of the number of traces will be the largest number for either analog tracing or I/ O tracing. For example, if one analog trace is set and two I/O traces are set, the setting of the number of traces would be 2. That means that you could select up to 8 axes for analog tracing and 8 axes for I/O tracing.

Data 1/Data 2/Data 3

Select content such as "Torque Reference," "Feedback Speed," etc., identical to the analog monitor as trace objects from the data boxes. The line color for Data1/Data2/Data3 can be set here. The settings are as follows.

Name	Unit		
Not set	_		
Torque reference	%		
Feedback speed	min ⁻¹		
Reference speed	min ⁻¹		
Position reference speed	min ⁻¹		
Position error	Reference unit		
Position amplifier error	pulse		
Position error between motor and load	Reference unit		
Speed feed forward	min ⁻¹		
Torque feed forward	%		
Effective gain			
External encoder speed	min ⁻¹		

Name	Unit			
Not set	-			
Force reference	%			
Feedback speed	mm/s			
Reference speed	mm/s			
Position reference speed	mm/s			
Position error	Reference unit			
Position amplifier error	pulse			
Position error between motor and load	Reference unit			
Speed feed forward	mm/s			
Force feed forward	%			
Effective gain				

Rotary Motor

Linear Motor

I/O 1 / I/O 2 / I/O 3

Select output signals such as "/COIN" or "ALM" and input signals such as "/C-SEL," "P-OT," or "N-OT" as trace objects. The line color for I/O 1 / I/O 2 / I/O 3 can be set here.

<Trigger Setting>

A trigger is a device for designating the timing of data access. For example, it is possible to set conditions such as "After /COIN signal goes ON" or "After the speed feedback exceeds 100 min⁻¹," and thereby make detailed reference of the servo operation at the time these conditions occur.

Trigger (Trigger Conditions)

Set two trigger conditions: Trigger A and Trigger B.

By combining Trigger A and Trigger B, a total of three conditions can be set as follows.

Trigger Condition	Description
Trigger A	Trigger A is satisfied
Trigger A AND Trigger B	Both Trigger A and Trigger B are satisfied
Trigger A OR Trigger B	Either Trigger A or Trigger B is satisfied

Pre-trigger (0% to 99%)

Designate to what degree data is displayed in the graph before a trigger is applied. A trigger condition is designated by the following three items.

Trigger Target

Designate the object to which the trigger is applied. The selected objects can either be from the designated in Data 1, 2, and 3, and I/O 1, 2, and 3, or "No Trigger."

If "No Trigger" is selected, the trigger will be applied at the time the **START** button is clicked. Also the settings for "Trigger Level," "Trigger" (trigger type), and "Pre-Trigger" will be unavailable.

Torque Reference	•
No Trigger	
Feedback Speed	
Torque Reference	
/S-ON	
/P-CON	

Trigger Target Box

Trigger Level

Designate the standard for determining when the trigger starts. The units for the setting are the same as those of the trigger object selected.

The trigger level cannot be set if the trigger object is "I/O 1 / I/O 2 / I/O 3" or "No Trigger."

Trigger (Trigger Type)

Designate the trigger judgment method when the trigger is applied. Select **Rising Edge**, **Falling Edge**, **Change Edge**, **Above the Trigger** (above the trigger level) or **Below the Trigger** (below the trigger level).

	🛧 Rising Edge
	Arising Edge
	Above the Trigger
	Below the Trigger
	Trigger Type Box
Rising Edge:	The trigger is detected when the trigger object data rises from below the trigger level to above the trigger level. When the change is from LO to HI in I/O
Falling Edge:	The trigger is detected when the trigger object data falls from above the trigger level to below the trigger level. When the change is from HI to LO in I/O
Change Edge:	The trigger is detected if the trigger object crosses the "Trigger Level " in any way. When the signal level changes in I/O
Above the Trigger:	The trigger is detected when the trigger object data is above the trigger level. Cannot be selected for I/O.
Below the Trigger:	The trigger is detected when the trigger object data is below the trigger level. Cannot be selected for I/O.

Rising Edge	Falling Edge Change Edge Above the Trigger Level		Below the Trigger Level	
£.	ŕ	Ŷ	*	→

(Open) Button

In the Trace Setting box, click the 🗾 button, and the trace setting files appear.

Open	li de la companya de	? ×
Look jn:	🛃 3½ Floppy (A:)	Ī
	150437.stc 151205.stc	
File <u>n</u> ame:	20031125150437	
Files of <u>type</u> :	Trace Settings File (*.stc)	

Open Dialog Box

Click **Open** to read the designated trace setting file. Click **Cancel** to return to the Trace Setting box without reading the file.

(Save) Button

In the Trace Setting box, click the 🔲 button, and then select the storage location for the setting file shown in the Trace Setting box.

Save As					? ×
Save jn:	🛃 3½ Floppy (A:)	•	£	<u>r</u>	0-0- 5-5- 0-0-
I					
File <u>n</u> ame:	20031125151357				<u>S</u> ave
Save as <u>t</u> ype:	Trace Settings File (*.stc)		•		Cancel

Save As Dialog Box

Click **Save** to store the file name designating the current trace settings. Click **Cancel** to return to the Trace Setting box without saving the file.

If the file name already exists or if an already existing file is loaded and then re-saved, a warning message appears, telling you that the file name already exists, and asks if you want to replace the existing file.



Click **Yes** to overwrite the already existing file. Click **No** to return to the Save dialog box without saving the file.

οκ

In the Trace Setting box, click **OK** to return to the Trace main window. The trace object and trigger are updated according to the settings.

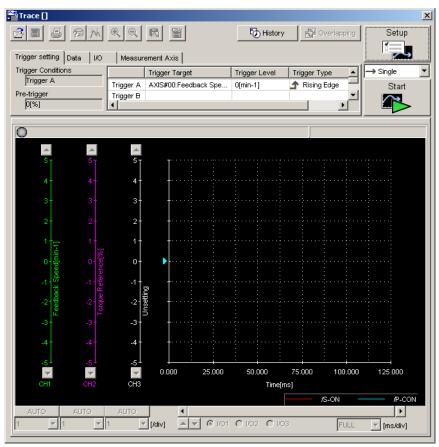
Cancel

n the Trace Setting box, click **Cancel** to return to the Trace main window without changing the settings.



If the saved file is opened using a SigmaWin+ version number that does not support Data 3 and I/O 3 for trace, the contents of only Data 1, Data 2, I/O 1 and I/O 2 are read-in.

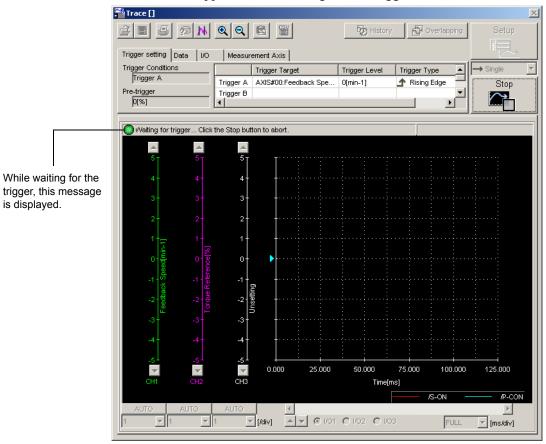
Starting the Trace



Trace Mode

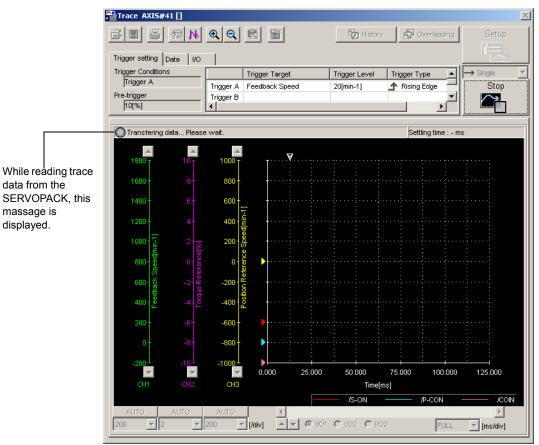
Select whether to executing tracing only one time or repeatedly from the Trace mode box.

- Single: Executes the trace process once. Waiting for the trigger -Trigger conditions are met - Graphic display, and then ends the trace.
- Continuous: Repeats the trace process until Stop is clicked.



Click **Start** in the Trace main window, and the SigmaWin+ will wait for the trigger. The window below appears while waiting for the trigger.

Window Displayed While Waiting for the Trigger



The message remains until the set trigger conditions are met. Click **Stop** to stop waiting for the trigger.

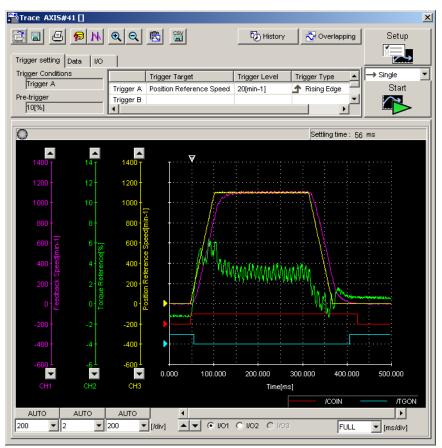
Window Displayed While Reading Trace Data from the SERVOPACK

Once the trigger condition is satisfied, the SERVOPACK starts transferring data to the SigmaWin+. When the data transfer is completed, the Trace main window appears.

- Notes 1. The trigger sometimes cannot be detected in less than 2ms due to the relationship of the detection period.
 - 2. If the sampling time is lengthened, SigmaWin may continue to wait for the trigger even after the trigger has been applied. SigmaWin waits because data for the sampling time is saved in the SERVOPACK after the trigger has been applied.

■ Trace Main Window

This Trace main window displays a graph based on the trace settings.



Trace Main Window

Toolbar



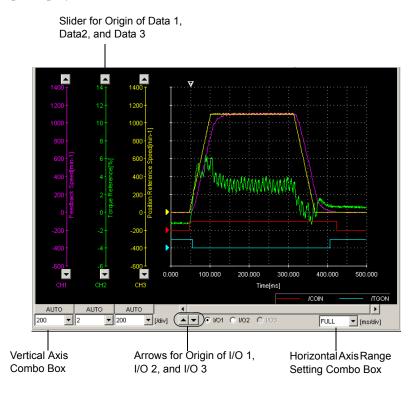
Trace Main Window Toolbar

Load the trace data file.
Save a copy of the on-screen trace graph to a specified file.
Print the Trace main window.
View the conditions to measure the trace.
View the information for the location where a cursor is shown.
Enlarge the view of a selected area. Can trace with the enlarged view.
Restore the area shown in the window to its usual size.
Copy the displayed screen to the clipboard.
Save on-screen trace graph in CSV format.

See "
Toolbar Details" for details on the toolbar buttons.

Trace Graph Display Field

Buttons, arrows, boxes, and sliders to control the graph display are provided on the trace graph display field.

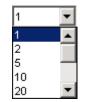


Trace Graph Display Field

Vertical Axis Scale

Select a vertical axis scale for Data 1, Data 2, and Data 3 from the vertical axis combo box. It is not possible to input a scale by typing the value.

If the **AUTO** button is clicked, a scale will be automatically selected so that all of the data can be shown in the graph.

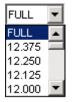


Vertical Axis Combo Box

Horizontal Axis Range

Select a horizontal axis range for the time axis from the box. The time is measured in "ms." The range must be selected from the list.

If FULL is selected, all of the data will be automatically adjusted so that the entire horizontal axis can be displayed. When the window is too small to show all of the horizontal axis, a horizontal scroll bar is displayed to allow you to view all of the axis.



Horizontal Axis Range Box

INFO	
Grid Line	
	The center of the grid becomes the HI position.
Origin Mark →Grid Line	

History

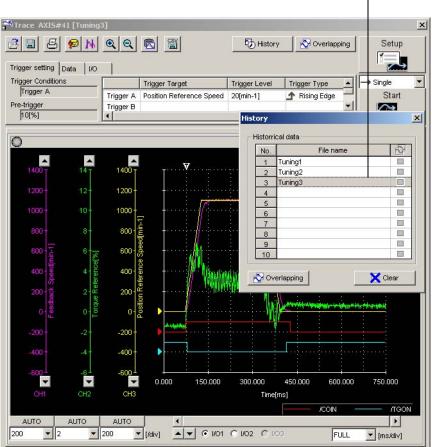
The data that had been traced and the trace data that had been called from the files are listed in order from the oldest in the History box. "Unsaved" is displayed for the trace data that have not been saved. Up to 10 data can be saved and displayed. When more than 10 data have been traced or called, the older data are cleared. The history save and display function is enabled only when the trace function is being executed. Therefore, the historical data is cleared when exiting the trace function.

Click **History** to display the History box.

If you click **History** while the overlapping function is effective, the overlapping function is canceled and the "Overlapping data" in the Overlapping box disappears.

See "Overlapping" for details on overlapping function.

The information of the file selected and highlighted here are displayed in the Trace main window.



Historical Data

The information of the file selected and highlighted here are displayed in the Trace main window.

Overlapping

Click **Overlapping** so that the overlapping function is effective, and the Overlapping box appears. See "Overlapping" for details.

Clear

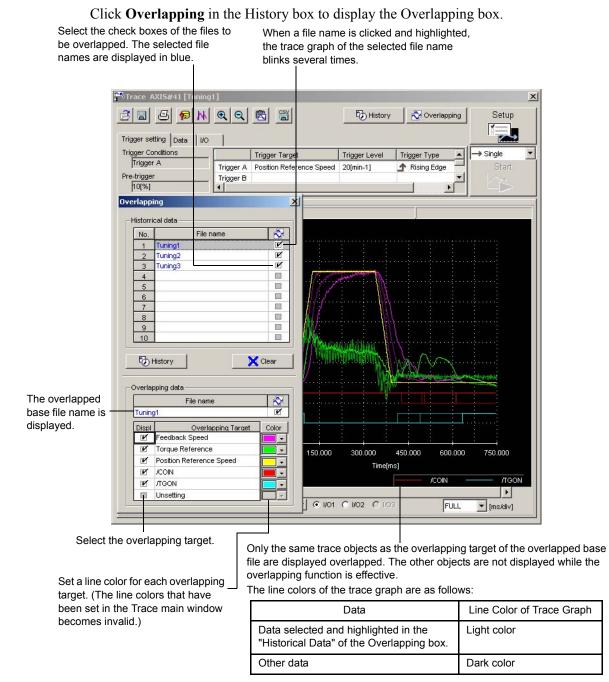
Clears all the historical data displayed in the History box and the data displayed in the Trace main window.

"Unsaved" is displayed in the "Historical data" of the History box for the trace data that have not been saved. When trying to select other data without saving, a message appears confirming if you want to save the trace data.



Overlapping

The graph of the trace data that have been called from the file and the data that have been traced are displayed overlapped. The trace objects of each file can be compared on the graphic display.



Historical Data

Select a check box of the file to overlap the graph. More than one data can be selected.

History

Click **History** to cancel the overlapping function. The Overlapping box disappears, and the History box appears.

Clear

Click **Clear** to clear all the historical data displayed in the "Historical Data" and the data displayed in the Trace main window.

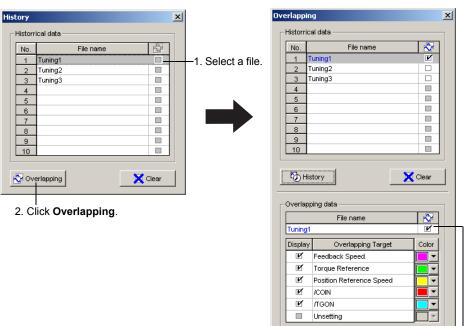
Overlapping Data

The overlapped base file in the "File name" of the "Historical data" is displayed in the "File name" of the "Overlapping data." The trace objects of the overlapped base file are displayed in the "Overlapping Target" and the relevant "Display" check boxes are selected. Select or clear the check boxes to select the objects to be displayed overlapped on the graph.

If the trace is executed by clicking **SETUP** in the Trace main window, the same objects as those of the base file are set automatically and cannot be changed.

<Basic File Setting Procedure>

- When opening the Overlapping box from the History box
- 1. Select a file from the "Historical data" in the History box.
- 2. Click **Overlapping**, and the selected file name is displayed in "File name" of the "Overlapping data" of the Overlapping box as the base file. A check mark is displayed for the base file name both in the "Historical data" and the "Overlapping data."



The selected file is displayed as the base file.

• When opening the Overlapping box by clicking **Overlapping** in the Trace main window

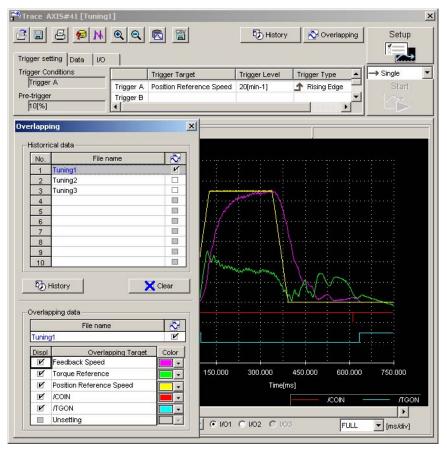
The file displayed in the Trace main window is set as the base file automatically.

Operation Example of Overlapping Function

An operation example of overlapping function is given below.

1. Select a file to be the base file from the "Historical data" in the History box, and then click **Overlapping**.

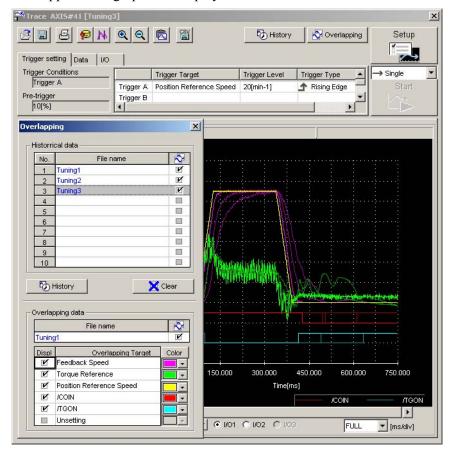
The Overlapping box appears and the selected base file name is displayed in the "File name" of the "Overlapping data." The information of the base file are displayed in the Trace main window. The trace objects of the base file are displayed in the "Overlapping Target" of the "Overlapping data."



When online, if the overlapping targets different from the trace objects set in the Trace Setting box are selected, the following message appears.

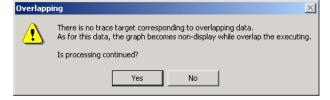
Overlapp	ing X
⚠	A trace target different from the trace setting present was specified for the overlapping target. Executing overlaps, the trace execution is an enable only in the same data as the overlapping target. Please confirm the trace setting at trace execution time.
	ОК

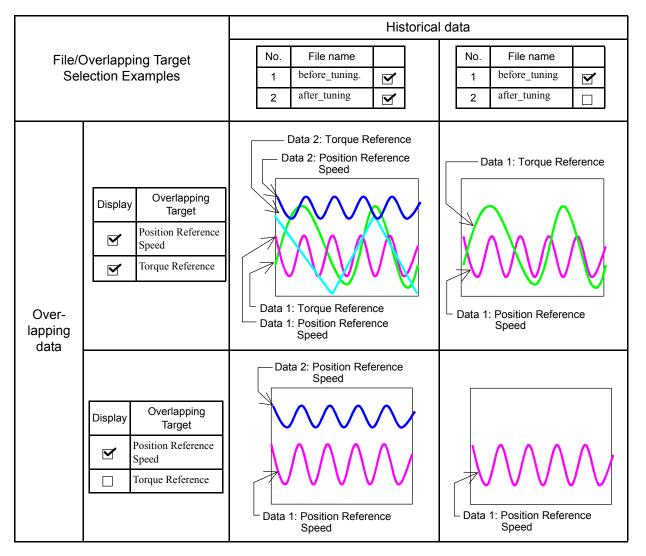
Select the check boxes of the files to overlap over the base file from the "Historical data." More than one check box can be selected. A check box for a file without the same overlapping targets as those of the base file cannot be selected. The overlapped trace graphs are displayed in the Trace main window.



The objects to be displayed overlapped on the graph can be selected by selecting or clearing the "Display" check boxes for the "Overlapping Target" of the "Overlapping data."

When having newly loaded a file to overlap by clicking the (Open) button, the file name is automatically displayed with the check box selected in the "File name" of the "Historical data" and the trace graph is overlapped over the graph of the base file. If a file without the same overlapping targets as those of the base file tries to be loaded, the following message appears.





The following table shows four display examples of overlapped graphs.

Optional Display

When the Display options check box is selected in the Trace Setting box, an optional data is displace. When not selected, no optional data is displayed.

The following data can be optionally displayed.

Settling Time

The settling time calculated from waveform is displayed.

If the settling time could not be calculated, "-" is displayed.



To display the settling time, set one of the data settings in the **Analog Trace - vertical axis** (Left) area to **Position Reference Speed** and set one of the I/O settings in the I/O area to /COIN in the **Trace Setting** dialog box.

If these settings are not made, the settling time will not be displayed correctly.

Data Tab

The trace objects and line colors of Data 1, Data 2, and Data 3 designated in the Trace Setting box are displayed. The line color can be changed in this tab page.

Select whether the trace graph of Data 1, Data 2, or Data 3 is to be displayed or not.





I/O Tab

The trace objects and line colors of I/O 1, I/O 2, and I/O 3 designated in the Trace Setting box are displayed. The line color can be changed in this tab page.

Select whether the trace graph of I/O 1, I/O 2, or I/O 3 is to be displayed or not.

Trigger setting Data	I/O M	leasurement Axis	
1/01 /S-ON	_	1/02 ∫∕₽-CON	1/03 /COIN
💿 Display 🛛 🕥 Hidde	n	🕲 Display 🛛 🕒 Hidden	🕲 Display 🕘 Hidden



Measurement Axis Tab

This tab page displays the axis numbers of the axes that were traced.

Select the check boxes to display the trace graphs for those axes. Clear the check boxes to hide the trace graphs for those axes.



Trigger Setting

This displays the trigger settings in the Trace Setting box.

The trigger level is blank if an I/O trace is the trigger condition.

Trigger setting Data I/O	Measur	ement Axis		
Trigger Conditions		Trigger Target	Trigger Level	Trigger Type 🔺
Trigger A	Trigger A	AXIS#00:Feedback Spe	20[min-1]	🛧 Rising Edge 💻
Pre-trigger	Trigger B			
10[%]	 ▲			

Toolbar Details

(Open) Button

The trace data file can be loaded in the Open dialog box. To load the file, click the *button*. The Open dialog box appears.

Open					?	х
Look jn:	🔁 TraceData	•	£	Č		
) 20010514) 20010514						
File <u>n</u> ame:					<u>O</u> pen	1
Files of type:	Trace Data File (*.std)		•		Cancel	1
<u>C</u> omment:						_

When the 🗾 Button is Clicked in the Trace Main Window

Open

Click **Open** to load the selected trace file.

Cancel

Click **Cancel** to return to the Trace main window without loading the file.

(Save As) Button

The on-screen trace graph can be saved to a file. To save the graph, click the 📕 button. The Save As dialog box appears.

Save As			? ×
Savejn:	🔄 TraceData	- 🗈 🖸	* 🔳
■ 200105140 ■ 200105141			
File <u>n</u> ame:	20010514102121.std		<u>S</u> ave
Save as <u>t</u> ype:	Trace Data File (*.std)	•	Cancel
<u>C</u> omment:			
	1		

When the 📕 Button is Clicked in the Trace Main Window

Up to 255 characters can be typed as a comment.

The default file name is the current time (yyyymmddhhmmss).

Save

Click Save to save the data to the selected trace file. Automatically returns to the Trace main window when no file is selected.

If the file name already exists or if an already existing file is loaded and then re-saved, a warning message appears, telling you that the file name already exists, and asks if you want to replace the existing file.



Click Yes to overwrite the already existing file. Click No to return to the Save As dialog box without saving the file.

Cancel

Click Cancel to return to the Trace main window.



If the saved file is opened using a SigmaWin+ version number that does not support Data 3 and I/O 3 for trace, the contents of only Data 1, Data 2, I/O 1 and I/O 2 are read-in.

(Print) Button

The graph and data on the Trace main window can be printed. To print the graph and data,

click the *button*. The Printing Item Setting dialog box appears.

Printing Item Setting	
-Cover	
Attaching the Co	over Cover Editing
Where to Submit Where to Submit (No.1)	C Where to Submit (No.2) C Submit (No.3)
Item Name	Setting Value
Title	Servo Tuning
Company Name	Yaskawa
Department Name	MCKJ
Name	Taro Yaskawa
Data for each functio	V
Header Info-	
Title Tr	acing
Models Info	
Printing Date	
🔽 File Name	
Footer Info-	
Pages	
Color Selection	
C Black and W	hite 🖲 Color
ок	Cancel

Header & Footer Tab

Attaching the Co	iver	Cover Editing	
Where to Submit Where to Submit (No.1)	C Where Submit (to Where to (No.2) Submit (No.3)	
Item Name		Setting Value	
Title	Servo Tuning	g	
Company Name	Yaskawa		_
Department Name	MCKJ		
Name	Taro Yaskav	wa	
Tracing Header & Footer		<u></u>	1
Trigger Sett	Date of the Da		
Constant Number F	Date of the Da	sers	
Acquisition Constant Number f Parameters V Name Switche	Date of the Date o		
Constant Number F Parameters	Date of the Date o	sers	
Acquisition Constant Number F Varameters Varameters Switche Others	Date of the Da Relation of Us s Info	sers	

Printing Items Tab When the Overlapping Function Is Not Effective

Printing Item Setting
Cover
Attaching the Cover Cover Editing
Where to Submit C Where to Submit (No.1) C Submit (No.2) C Submit (No.3)
tem Name Setting Value
Title Servo Tuning
Company Name Yaskawa
Department Name MCKJ
Name Taro Yaskawa
Data for each function
Header & Footer Printing Items
Overlapping ✓ overlapping Graph Relations
Graph Totalan's Trigger Setting Acquisition Date of the Data Constant Number Relation of Users
✓ Parameters
🔽 Name 🔽 Unit
Switches Info 🔽 Default Setting
Others-
Color Selection C Black and White © Color
OK Cancel

Printing Items Tab When the Overlapping Function Is Effective

Cover

Select Attaching the Cover, and the click Cover Editing. For details, see Chapter 3.

Data for each function

To enter your printing preferences or specifications, click the tab whose options you want to enter or change, and enter the desired settings.

Overlapping

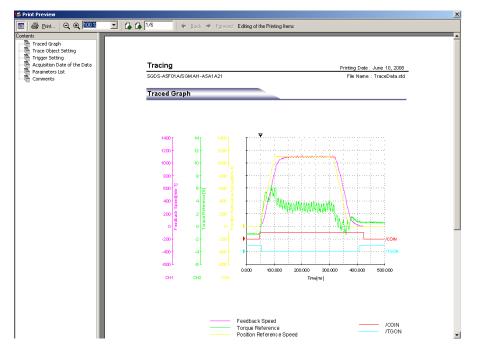
Selecting the **overlapping** check box prints not only the overlapped trace graph but also each trace graph before overlapping. Click to clear the check box and only the overlapped trace graph is printed.

Color Selection

Documents can be printed in color or black and white. Select your preference.

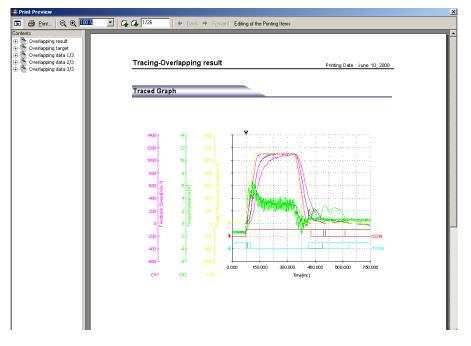
After setting is finished, click **OK**. The document appears on the screen the way it will appear in print.

<When the Overlapping Function Is Not Effective>



<When the Overlapping Function Is Effective>

The following overlapped trace graph is displayed first, and then each trace graph before overlapping is displayed.



To print the document as is without any changes, click **Print**.

To return to the Printing Item Setting dialog box and change some settings, click **Editing of the Printing Items**.

(Measurement Conditions) Button

The conditions for measuring the trace can be viewed. To view the conditions, click the

button. The Measurement Condition dialog box appears. If not already selected, click the **Measurement Conditions** tab to view the conditions for measuring the trace.

Measure	ement	Condition	5			×
Measur	ement (Conditions	Comment Para	meters		
	b ⊓	uning1.std				
Date	&Time:	:	2004/06/02 11:59	9:00		
Serv	opack:	:	SGDS-A5F01A			
Serv	omotor	: :	SGMAH-A5A1A2	21		
Trac	e Settir	ıg:				-
	1	Vame	Tar	get	Color	
	D	eta 1	Feedback Speed	k l		
	D	ata 2	Torque Referen	ce		
	D)ata 3	Position Referer	ice Speed		
		1/01	/COIN			
		1/0 2	ЛGON			
		I/O 3	Unsetting			
Trigg	jer setti Trigg	er Condition				
		Trigger Tai	rget	Trigger Level	Trigger D	etec
_	lger A	Position Re	eference Speed	20[min-1]	🛧 Rising	Edi
Trig	iger B					Þ
			10[%] 750[us]x1000=7:	50.000[ms]		
				ок	Cance	:

Measurement Conditions Tab

No.	Name	Value	Unit
Pn000	Function Selection Basic Sv	0010H	-
Pn001	Function Selection Application	0000H	-
Pn002	Function Selection Application	0000H	-
Pn003	Function Selection Application	0002H	-
Pn004	Function Selection Application	0000H	-
Pn005	Fixed Parameter (Do not cha	0000H	-
Pn100	Speed Loop Gain	40	Hz
Pn101	Speed Loop Integral Time Co	2000	0.01ms
Pn102	Position Loop Gain	40	1 <i>i</i> s
Pn103	Moment of Inertia Ratio	0	%
Pn104	2nd Speed Loop Gain	40	Hz
Pn105	2nd Speed Loop Integral Tim	2000	0.01ms
Pn106	2nd Position Loop Gain	40	1 <i>i</i> s
Pn107	Bias	0	min-1
Pn108	Bias Width Addition	7	reference un
Pn109	Feed-forward	0	%
Pn10A	Feed-forward Filter Time Co	0	0.01ms
Pn10B	Gain-related Application Sw	0000H	-
Pn10C	Mode Switch Torque Refere	200	%
Pn10D	Mode Switch Speed Referen	0	min-1
Pn10E	Mode Switch Acceleration	0	10(min-1)/s
Pn10F	Mode Switch Error Pulse	0	reference un
Pn110	Online Autotuning Switches	0010H	-
Pn111	Speed Feedback Compensa	100	%
Po112	Fixed Peremeter (Do not che	100	96

Parameter Tab

Neasurement Conditions
Measurement Conditions Comment Parameters
OK Cancel

Comment Tab

Click the **Comment** tab and type any comments.

ΟΚ

Click **OK** to save comments and return to the Trace main window.

Cancel

Click **Cancel** to return to the Trace main window without saving the comments.

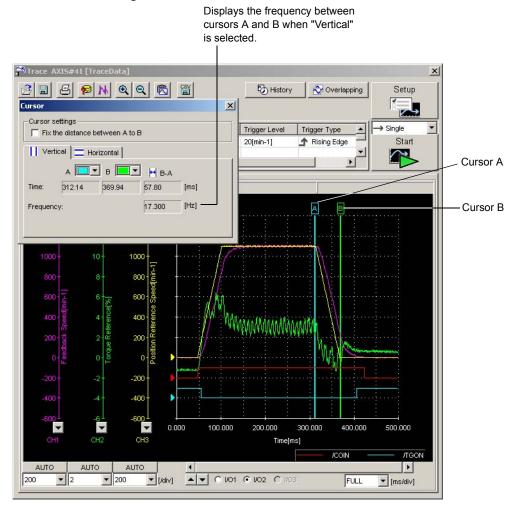
\rm (Cursor) Button

The information for the location where a cursor is shown can be viewed. Information for the cursor locations A and B can be viewed.

The color of cursor locations A and B can be changed.

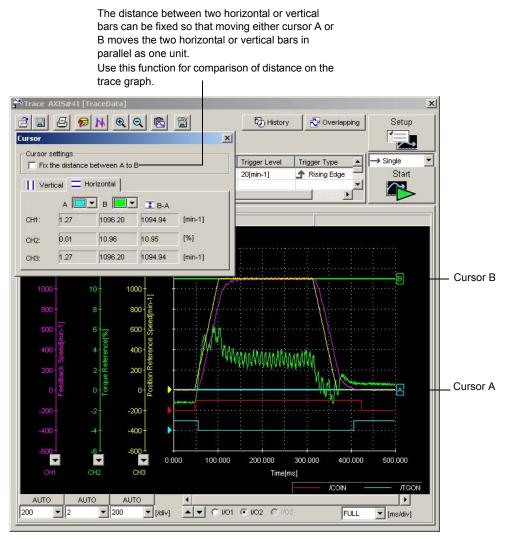
Display the data using the following procedure.

- 1. Click the button. The Cursor setting box appears and two vertical bars will be displayed on the trace graph.
- 2. Move each cursor. As you move each cursor, the data changes in the "Cursor" of the Cursor setting box.



3. To view the trace target, select **Horizontal** in the Cursor setting box. Two horizontal bars (A and B) will be displayed.

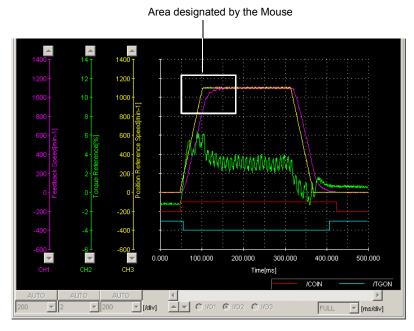
4. Move each cursor. As you move each cursor, the data changes on the Cursor setting box.



🔍 (Zoom) Button

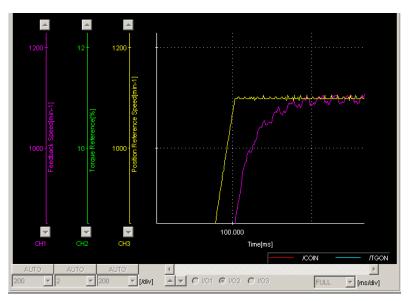
A view of an area selected by the mouse can be magnified. Zoom in on an area using the following procedure.

- 1. Click the 🔍 button.
- 2. Position the mouse at one corner of the area you want to select, and drag to the opposite corner. A line will appear around the selected area.



Area to be Magnified

3. Release the left mouse button. The selected area of the graph is enlarged.



Magnified Area

4. Click the \bigcirc button to view the original graph.



If you use the Zoom button before clicking **Start** on the Trace main window, the trace graph will be displayed while the designated area is still enlarged. This is effective when doing a serial trace.

🖄 (Clipboard Copy) Button

The displayed screen can be copied to the clipboard. It can be exported to Word or Excel by using this button.

Click the button, and the Clipboard Copy dialog box appears.

ind stored in the clip	board.	
-Area to be copied		
Copy only	the graph.	
C Copy whole dialog box.		
Graph display color selection		
 Color 	C Black and white	
🔲 White backgr	ound	

Area to be copied

Select the area to be copied to the clipboard.

Graph display color selection

Select the graph and background color. The graph can be clearly printed when the **Black** and white option or the White background check box is selected.

ΟΚ

Click **OK** to copy the selected area to the clipboard.

Cancel

Click Cancel to return to the Trace main window.



The on-screen trace graph can be saved in CSV format. The trace data can be edited by

Excel. Click the 🔛 button. The Save As dialog box appears.

Save As Save in: 🔁	TraceData	▼ ← € (<u>?×</u> ∰•
		_	
	T		
File name:	Tune1		Save
Save as type:	CSV file (*.csv)	•	Cancel
Comment:			
	с		///

When the 📓 Button is Clicked in the Trace Main Window

Up to 255 characters can be typed as a comment.

The default file name is the current time (yyyymmddhhmmss).

Save

Click Save to save the data to the selected CSV file.

If the file name already exists or if an already existing file is loaded and then re-saved, a warning message appears, telling you that the file name already exists, and asks if you want to replace the existing file.

Save As		X
⚠	A:\200406012 Do you want t	232051.csv already exists. to replace it?
	Yes	No

Click **Yes** to overwrite the already existing file. Click **No** to return to the Save As dialog box without saving the file.

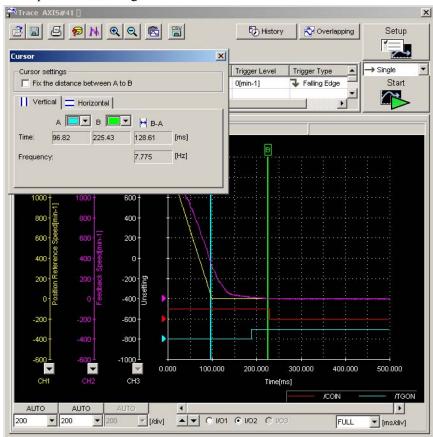
Cancel

Click **Cancel** to return to the Trace main window.

An Example of Using the Trace Function

In this example of how to adjust the servo using the trace function, the positioning completed time is being reduced. The positioning completed time is the time from the completion of the command until the /COIN signal is formed.

1. Click the **k** (Cursor) button in the Trace main window. Check the positioning completed time using the cursor.



This graph shows the results of a trace carried out using the factory settings. (Pn100: speed loop gain = 400 [0.1 Hz]; Pn101: speed loop integral time constant = 2000 [0.01 ms]; Pn102: positioning loop gain = 400 [0.1/s].

Trace object: Data 1 = Position Reference Speed

Data 2 = Speed feedback

I/O 1 = /COIN signal (positioning completed)

I/O 2 = /TGON signal (motor running)

Trigger conditions: Falling edge of reference pulse speed 0 min⁻¹ Pre-trigger: 20%

(We are using this setting to trigger the completion of the command.)

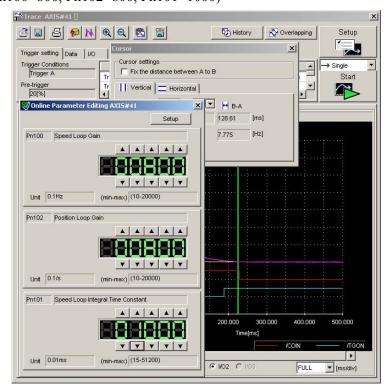
When in this condition, the positioning completed time is 128 ms

2. To adjust the positioning completed time, modify the values of the parameters.

Trace AXIS#41 [× 2 8 5 9 M Q Q 🖻 🖀 History 🛛 🔊 Overlapping Setup × ~ Trigger setting Data 1/0 Cursor settings Trigger Conditions → Single Fix the distance between A to B Start dae Pre-trigger 20[%] Vertical Horizontal Н В-А × 💹 Online Parameter Editi a AXIS#41 128.61 [ms] Setup 7.775 [Hz] Pn100 Speed Loop Gain 88488 **T T T T** Unit 0.1Hz (min-max) (10-20000) Pn102 Position Loop Gain A | **T T T T** (min-max) (10-20000) Unit 0.1/s Pn101 Speed Loop Integral Time Constant 200.000 300.000 400.000 500.000 Time[ms] T T T T T • (min-max) (15-51200) Unit 0.01ms @ 1/02 C 1/0 FULL ▼ [ms/div]

Click the 🔯 button to view Online Parameter Editing box.

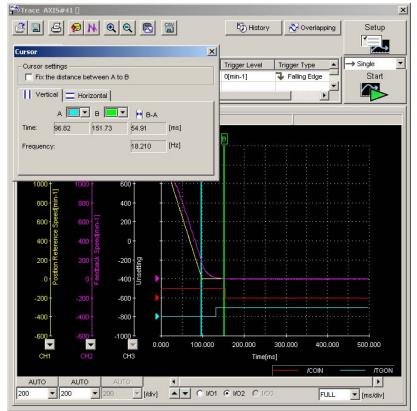
 Click the ▲ or ▼ button to raise or lower the gain. (Pn100=800, Pn102=800, Pn101=1000)



4. Check the positioning completed time on the Trace main window.

The positioning completed time has been reduced to 55 ms.

Because the machine is still not vibrating, increase the gain some more.

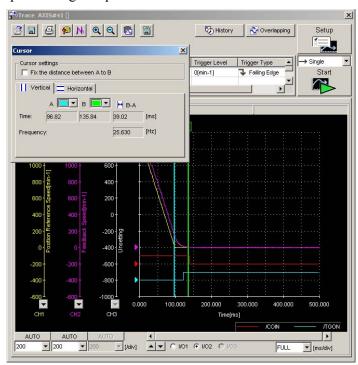


5. Click the 😺 button to view the Online Parameter Editing box again and then change the values.

		.	
<u> 2 5 6 k qq 5 3</u>	History	Overlapping	Setup
Trigger setting Data 1/O		×	
Trigger Conditions	A to D		→ Single
	A100		Start
Pre-trigger Tri Vertical Horizontal 20[%] Image: Comparison of the second			
Online Parameter Editing AXIS#41	Р		-
Setup	54.91 [ms]		
Pn100 Speed Loop Gain	18.210 [Hz]		
T T T T			
Unit 0.1Hz (min-max) (10-20000)			
Pn102 Position Loop Gain	•••••••		
Y Y Y Y			
Unit 0.1/s (min-max) (10-20000)			
Pn101 Speed Loop Integral Time Constant			
	200.000 300.0	00 400.000	500.000
	Time[ms]		
T T T T		— <i>I</i> COIN —	— лас
Unit 0.01ms (min-max) (15-51200)		- Incore a	
	1 102 10103	FULL	▼ [ms/div]

(Pn100=1000, Pn102=1000, Pn101=800)

6. Check the positioning completed time on the Trace main window. The positioning completed time has been reduced to 39 ms.



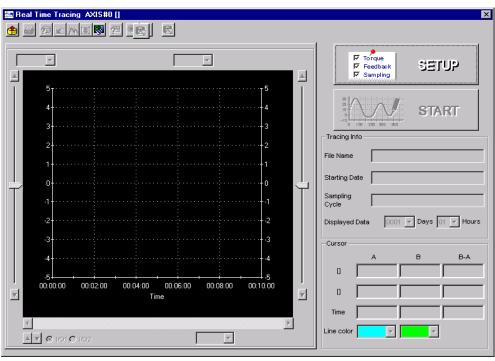
7. Repeat steps 2 to 4 until you get the target positioning completed time.

4.6.2 Real Time Trace Function

Data Trace

Main Window

In the SigmaWin+ Σ -7 component main window, click **Trace**, and then click **Real Time Trace**, and the Real Time Tracing main window appears.



Real Time Tracing Main Window

Real Time Trace Settings

In the Real Time Tracing main window, click **SETUP**, and the Real Time Trace Setting box appears. Select the objects and conditions for the trace.

The settings from the previous trace, if any, are displayed.

Trace Setting	×
Trace Object Setting Object Data trace 1 Torque Reference	Line Sampling cycle 20 × [ms]
Data trace 2 Feedback Speed I/O 1 /TGON	Not Saved Setting
	↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓
	OK

Real Time Trace Setting Box

<Trace Object Settings>

The settings for the trace objects, or targets can be made here.

Data 1/Data 2

Select content such as "Torque Reference", "Speed Feedback", etc., identical to the analog monitor as trace objects from the data boxes.

I/O 1 / I/O 2

Select output signals such as "/COIN" or "ALM" and input signals such as "/C-SEL", "P-OT", or "N-OT" as trace objects.

Line

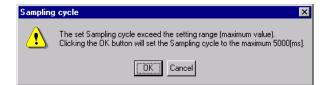
Select a line color for data 1 and 2 and I/O 1 and 2.

<Sampling Cycle>

The setting for the allowable interval time for getting trace data can be made here. Data will be obtained every 20 ms if the sampling cycle is set to 20 ms. Use the spin button to set the time.

If directly typing a value, and the value is outside the acceptable range, a warning message will appear telling you that the sampling time is incorrect. The warning will vary according to the error.

1. If the typed value is larger than the setting range:



Click **OK** to automatically adjust the sampling cycle within the setting range. Click **Cancel** to return to the Real Time Trace Setting box without setting the sampling cycle.

2. If the typed value is smaller than the setting range:

Sampling	j cycle X
⚠	The set Sampling cycle exceed the setting range (minimum value). Clicking the OK button will set the Sampling cycle to the minimum 20[ms].
	Cancel

Click **OK** to automatically adjust the sampling cycle within the setting range. Click **Cancel** to return to the Real Time Trace Setting box without setting the sampling cycle.

3. If the typed value cannot be allocated in the time interval:

Sampling	j cycle 🗙
⚠	Set Sampling cycle in multiple of 2[ms]. Clicking the OK button will set Sampling cycle to 20[ms].
	Cancel

Click **OK** to automatically adjust the sampling cycle. Click **Cancel** to return to the Real Time Trace Setting box without setting the sampling cycle.

<Saves File>

Select whether or not saves the trace data.

Not to save the data, select the Not Saved check box.

To save the data, clear the **Not Saved** check box, and click **Setting**. The Setting the File Name dialog box appears.

Setting the F	File Name	? ×
Save jn:	YE_Applications	
20011119	9131442.rtd	
20011119	9131458.rtd	
1		
File <u>n</u> ame:	20011119131518 OK	
Save as type:	e: Real-Time Tracing File (*.rtd)	:
Comments In		
Commentes in		

Setting the File Name Dialog Box

Click **OK** to store the file name designating the current trace settings. Click **Cancel** to return to the Real Time Trace Setting box without saving the file.

If the file name already exists or if an already existing file is loaded and then re-saved, a warning message appears, telling you that the file name already exists, and asks if you want to replace the existing file.



Click **Yes** to overwrite the already existing file. Click **No** to return to the Setting the File Name dialog box without saving the file.

ΟΚ

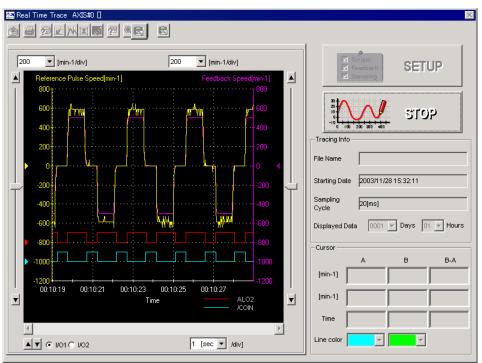
In the Real Time Trace Setting box, click **OK** to return to the Real Time Tracing main window. The trace object and trigger are updated according to the settings.

Cancel

In the Real Time Trace Setting box, click **Cancel** to return to the Real Time Tracing main window without changing the settings.

■ Starting the Trace

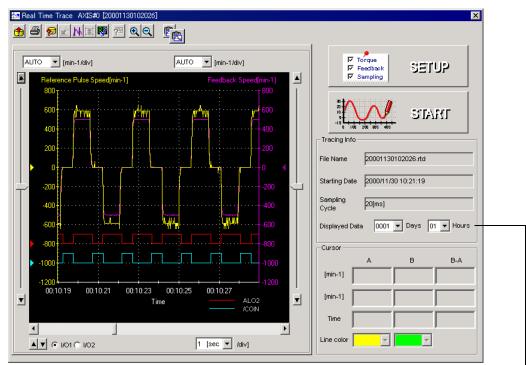
In the Real Time Tracing main window, click START to start trace.



To stop a trace, click STOP.

Main Window

This Real Time Tracing main window displays a graph based on the trace settings.



Displays information about when the trace started. In this example for the displayed data, "0001" means that it is the first day of the trace and "01" means that the trace has been running for its first hour.

Real Time Tracing Main Window

Toolbar

The position of the toolbar can be adjusted, and the on-screen display type selected.



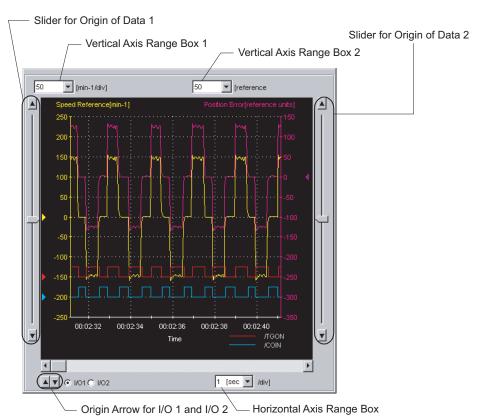
Real Time Tracing Main Window Toolbar

Toolbar Button	Click this button to:
-	Load the trace data file.
Open	
9	Print the Real Time Tracing main window.
Print	
1	View the conditions to measure the trace.
Measurement Conditions	
1th	View the information for the location where a cursor is shown.
Cursor	
	View the Parameter Online Editing box. For details, see 4.2.2 Editing Parameters Online.
Parameter Online Editing	
Q	Enlarge the view of a selected area.
Zoom In	
Q	Restore the area shown in the window to its usual size.
Return	
	Copy the displayed screen to the clipboard.
Clipboard Copy	

See "
Toolbar Details" for details on the toolbar buttons.

Trace Object Graph

In the graph, you can view the trace objects designated in the Real Time Trace Setting box.



Trace Object Graph

Vertical Axis Range

Select a vertical axis range for both Data 1 and Data 2 from the corresponding box.

If AUTO is selected, the range widths will be automatically adjusted so that all of the data can be shown in the graph.

The range must be selected from the list.

200	•
AUTO	
1	
5	
10	-

Vertical Axis Range Box

Horizontal Axis Range

Select a horizontal axis range for the time axis from the box. The time is measured in "sec" or "min." The range must be selected from the list.



Horizontal Axis Range Box

INFO I I/O Grace Graph	
Grid Line	
Origin Mark →Grid Line	The center of the grid becomes the HI position.

Toolbar Details

🇯 (Open) Button

The trace data file can be loaded in the Open dialog box. To load the file, click the 🙂 button. The Open dialog box appears.

Look jn: 3½ Floppy (A:)	Open		? ×
File name: <u>Open</u> Files of type: Real-Time Tracing File (".ttd)	Look jn:	🛃 3½ Floppy (A:)	<u> </u>
Files of type: Real-Time Tracing File (*.ttd)	RTTraceD	ata.rtd	
Files of type: Real-Time Tracing File (*.ttd)			
Files of type: Real-Time Tracing File (*.ttd)			
Files of type: Real-Time Tracing File (*.ttd)			
Files of type: Real-Time Tracing File (*.ttd)			
Files of type: Real-Time Tracing File (*.ttd)	I		
	File <u>n</u> ame:		<u>O</u> pen
Comments Info.	Files of type:	Real-Time Tracing File (*.rtd)	Cancel
	Comments Info	o.	-
)			

When the 🕚 Button is Clicked in the Main Window

Open

Click **Open** to load the selected trace file. Returns to the main window if nothing is selected.

Cancel

Click Cancel to return to the main window without loading the file.

(Print) Button

The graph and data on the Real Time Tracing main window can be printed. To print the graph and data, click the 🕑 button. The Printing Item Setting dialog box appears.

Printing Item Setting	Printing Item Setting
Cover	Cover
Attaching the Cover Cover Editing	Attaching the Cover Cover Editing
Where to Submit Where to Where to Submit (No.1) Submit (No.2) Where to	Where to Submit Submit (No.1) Submit (No.2) Submit (No.3)
Item Name Setting Value	Item Name Setting Value
Title SigmaWin 200	Title SigmaWin 200
Company Name Yaskawa	Company Name Yaskawa
Department Name MCKJ	Department Name MCKJ
Name Tarou Yaskawa	Name Tarou Yaskawa
Data for each function	Data for each function
Real-Time Tracing	Real-Time Tracing
Header Footer Printing Items	Header Footer Printing items
Header Info	Graph Relations
Title Real-Time Tracing	Tracing Info.
Models Info.	Constant Number Relation of Users
Printing Date	🔽 Parameters 🔽 Name
I File Name	Switches Info.
	🔽 Unit
	☑ Default Setting
Footer Info	Others
Pages	Comments
	Color Selection
C Black and White Color	C Black and White C Color
OK Cancel	OK Cancel

Header & Footer Tab

Printing Item Tab

Printing Item Setting Box

Cover

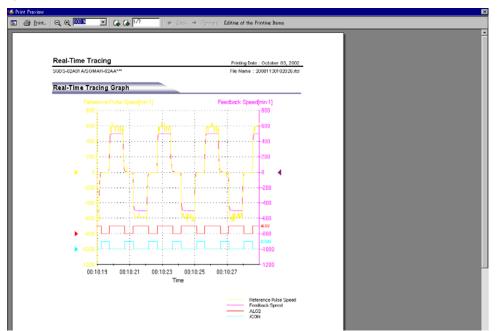
Select Attaching the Cover, and the click Cover Editing. For details, see Chapter 3 SigmaWin+ Σ -7 Component Main Window.

Data for each function

To enter your printing preferences or specifications, click the tab whose options you want to enter or change, and enter the desired settings.

Color Selection

Documents can be printed in color or black and white. Select your reference.



After setting is finished, click **OK**. The document appears on the screen the way it will appear in print.

To print the document as it is without any changes, click **Print**.

To return to the Printing Item Setting dialog box and change some settings, click **Editing of the Printing Items**.

(Measurement Conditions) Button

The conditions for measuring the trace can be viewed. To view the conditions, click the

button. The Measurement Condition dialog box appears. The Measurement Condition dialog box appears. If not already selected, click the **Measurement Conditions** tab to view the conditions for measuring the trace.

Measurement [) ata						×
Measurement I	Data C	commer	n ts Pa	rameters	1		
B							
Servopack			SGD	S-A5A01/	а,		
Servomoto	r:		SGM	AH-A5A1	A21		
Trace Sett	ing:						
Nar				irget		Line	
Data			Referen				
Data	2 Fe	edbac	k Spee	d			
I/O 1	\sim	-CMP					
I/O 2	Л	GON					
Tracing Inf	o:						
File Nam	•	:					
Starting I	Date	: 2	002/10/	/03 14:34:	18		
Sampling	Cycle	: 1	0[ms]				
Displaye	d Data	: 0	001 Da	iys O1 Ho	ours		
					ОК		ancel

Measurement Condition Tab

asureme	nt Conditions Comment Pa	rameters	
No.	Name	Value	Unit 🔺
Pn000	Function Selection Basic Sv	0010H	
Pn001	Function Selection Application	0000H	-
Pn002	Function Selection Application	0000H	-
Pn003	Function Selection Application	0002H	-
Pn004	Function Selection Application	0000H	-
Pn005	Fixed Parameter (Do not cha	0000H	-
Pn100	Speed Loop Gain	40	Hz
Pn101	Speed Loop Integral Time Co	2000	0.01ms
Pn102	Position Loop Gain	40	1/s
Pn103	Moment of Inertia Ratio	0	%
Pn104	2nd Speed Loop Gain	40	Hz
Pn105	2nd Speed Loop Integral Tim	2000	0.01ms
Pn106	2nd Position Loop Gain	40	1/s
Pn107	Bias	0	min-1
Pn108	Bias Width Addition	7	reference un
Pn109	Feed-forward	0	%
Pn10A	Feed-forward Filter Time Co	0	0.01ms
Pn10B	Gain-related Application Sw	0000H	-
Pn10C	Mode Switch Torque Refere	200	%
Pn10D	Mode Switch Speed Refere	0	min-1
Pn10E	Mode Switch Acceleration	0	10(min-1)/s
Pn10F	Mode Switch Error Pulse	0	reference un
Pn110	Online Autotuning Switches	0010H	-
Pn111	Speed Feedback Compensa	100	%
Pn110	Fixed Parameter (Do not cha	100	∞. ▼

Parameter Tab

Measurement Data		2	×
Measurement Data	Comments	Perometero I	
Measurement Data	commonito	raialleleis	L
I			
		1	7

Comments Tab

Click the Comments tab and type any comments

ΟΚ

Click OK to save comments and return to the Real Time Tracing main window.

Cancel

Click **Cancel** to return to the Real Time Tracing main window without saving the comments.

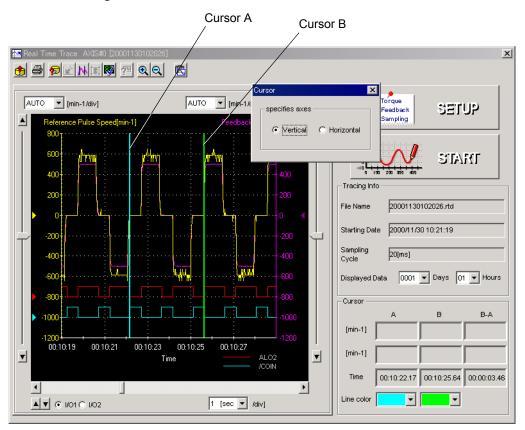
🔣 (Cursor) Button

The information for the location where a cursor is shown can be viewed. Information for the cursor locations A and B can be viewed.

The color of cursor locations A and B can be changed.

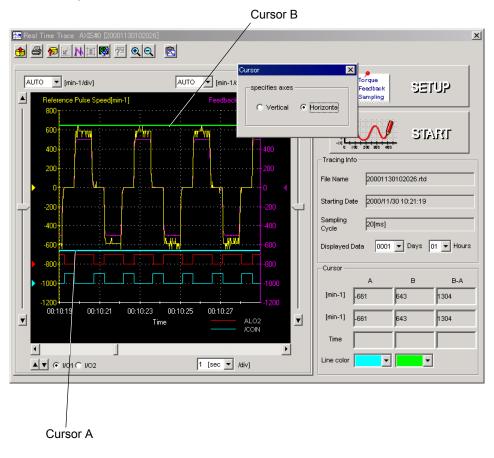
Display the data using the following procedure.

- 1. Click the **b** button. Two vertical bars will be displayed.
- 2. Move each cursor. As you move each cursor, the data changes in the cursor box in the lower right of the window.



3. To view the speed data, select **Horizontal** in the Cursor Setting box. Two horizontal bars will be displayed.

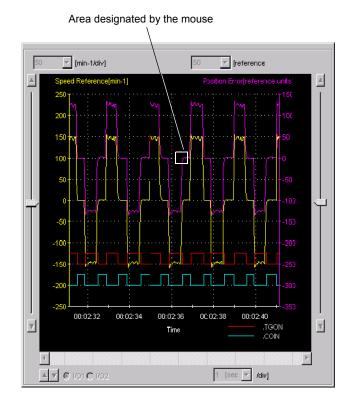
4. Move each cursor. As you move each cursor, the data changes in the cursor box in the lower right of the window.



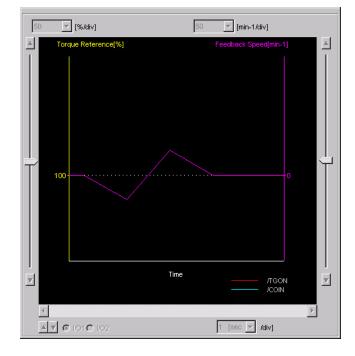
🔍 (Zoom In) Button

A view of an area selected by the mouse can be magnified. Zoom in on an area using the following procedure.

- 1. Click the 🔍 button.
- 2. Position the mouse at one corner of the area you want to select, and drag to the opposite corner. A line will appear around the selected area.



Area to be Magnified



3. Release the left mouse button. The selected area of the graph is enlarged.

Magnified Area

4. Click the \bigcirc button to view the original graph.

🖄 (Clipboard Copy) Button

The displayed screen can be copied to the clipboard. It can be exported to Word or Excel by using this button.

Click the 🖾 button, and the Clipboard Copy dialog box appears.



Select the area to be copied to the clipboard.

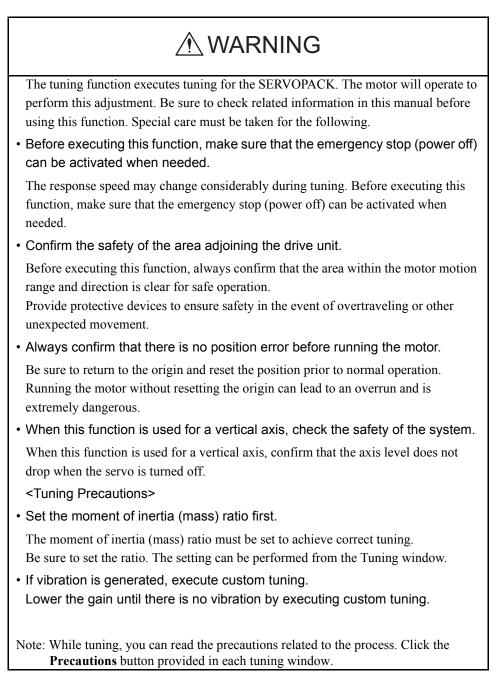
ΟΚ

Click **OK** to copy the selected area to the clipboard.

Cancel

Click **Cancel** to return to the main window.

4.7 Tuning

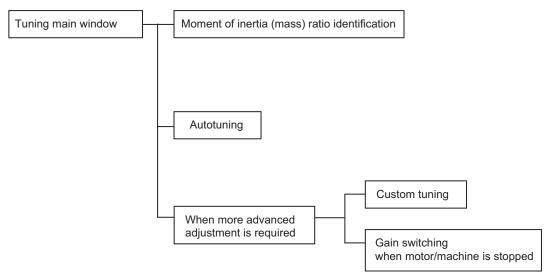


The tuning function allows you to smoothly carry out tuning of your servo system.

The tuning function calculates the moment of inertia ratio and sets a servo gain suitable for the machine characteristics. The optimal gain is set to avoid vibrations.

Structure

The following flowchart shows how the tuning function works.



Set the moment of inertia ratio first, and select autotuning to execute.

If more advanced adjustment is required after autotuning, execute custom tuning.

To reduce vibrations when the motor or machine is stopped, execute Gain switching while the motor/machine is stopped.

Tuning Main Window

Open the Tuning main window using the following procedure.

1. In the SigmaWin+ Σ -7 component main window, click **Tuning** and then click **Tuning**.



If more than one axis is being used, the **Axis Selection** dialog box appears. First select the axes to adjust according to the **Axis Selection** dialog box. For the procedure, refer to *4.1 Changing Axes*.

ning
A
This function executes tuning for the Servopack. Using this function while the motor is running is dangerous. Be sure to carefully read the SigmaWin+ Operation Manual before executing this function. Special care must be taken for the following.
<safety precautions=""></safety>
 Before executing this function, make sure that the emergency stop (power off) can be activated when needed.
The response speed may change considerably during tuning.
Before executing this function, make sure that the emergency stop (power off) can be activated when needed.
2. Confirm the safety of the area adjoining the drive unit.
Before executing this function, always confirm that the area within the motor motion range
and direction is clear for safe operation. Provide protective devices to ensure safety in
the event of overtraveling or other unexpected movement.
Always confirm that there is no position error before running the motor.
Be sure to return to the origin and reset the position prior to normal operation.
Running the motor without resetting the origin can lead to an overrun and is extremely dangerous.
4. When the moment of inertia (mass) identification function is used for a vertical axis,
check the safety of the system.
When the moment of inertia (mass) identification function is used for a vertical axis,
confirm that the axis level does not drop when the servo is turned off.
<tuning precautions=""></tuning>
5. Set the moment of inertia (mass) ratio first.
The moment of intertia (mass) ratio must be set to achieve correct tuning.
Be sure to set the ratio. The setting can be performed from the Tuning window.
5. If vibration is generated, execute custom tuning.
Lower the gain until there is no vibration by executing custom tuning.
Note: While tuning, you can read the precautions related to the process.
Click the Precautions button provided in each tuning window.
Execute Cancel

Click **Cancel** to return to the SigmaWin+ Σ -7 component main window without executing tuning.

2. Click **Execute**. The Tuning main window appears.

Tuning	×
Set the moment of inertia (mass) ratio before executing autotuning.	Precautions
Moment of inertia (mass) ratio identification Pn103 : Moment of Inertia Ratio Execute. 100 % Edit	
Autotuning Reference input from host controller © Position reference input © No reference input	
Advanced adjustment	Finish

Tuning Main Window

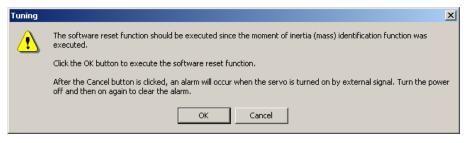
Moment of Inertia Identification

When automatically setting the moment of inertia ratio:

Click **Execute** in the main window, and the moment of inertia identification process will start.

See "4.7.1 Moment of Inertia (Mass) Identification" for details on moment of inertia identification.

When the moment of inertia is identified, a message will ask you to execute software reset.



Click **OK** to execute software reset. See "4.5.11 Resetting the SERVOPACK by Software" for the software reset function.

When manually setting the moment of inertia ratio:

Click Edit and enter a value in the input field. Click OK.

Autotuning

Select the **Position reference input** or **No reference input** option under **Reference input from host controller**, and then click **Autotuning**.

Autotuning with reference input (when the **Position reference input** option is selected):

The servo gain is automatically adjusted while running the motor by the reference from the host controller. If vibration is generated during adjustment, the vibration suppression function can be used. See "4.7.2 Autotuning with Reference Input" for details.

Autotuning without reference input (When the **No reference input** option is selected):

The servo gain is automatically adjusted while running the motor by the SERVOPACK internal reference (auto-run). See "4.7.3 Autotuning without Reference Input" for details.

When More Advanced Adjustment is Required after Autotuning

Click **Advanced adjustment** when more advanced adjustment is required after autotuning. The Tuning box will appear.

Tuning		×
Click the button of the function to be executed.		
Manually adjust gain and vibration.	¢	Custom tuning
Suppress vibration by decreasing gain	¢	Gain switching

Custom tuning

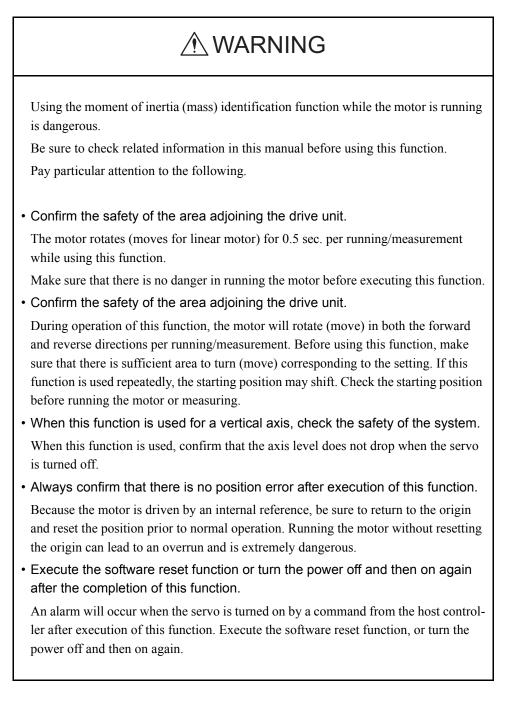
The gain can be manually adjusted. If vibration is generated during adjustment, the antiresonance control adjustment function and vibration suppression function can be used. See "4.7.4 Custom Tuning" for details.

Gain switching

The settings to suppress vibration while the motor and machine are stopped can be made. See "4.7.5 Gain Switching When Motor/Machine Is Stopped" for details.

When tuning is completed, click **Finish** to quit the tuning function.

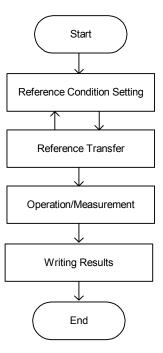
4.7.1 Moment of Inertia (Mass) Identification



Load moment of inertia (mass) can be regarded as a standard parameter when adjusting control parameters. Although the load moment of inertia (mass) ratio can be derived by calculation based on the mass and structure of the machine components, this is a very cumbersome operation in which deriving correct values for the complex structures of today's machines is very difficult.

The moment of inertia (mass) identification method of SigmaWin+ Σ -7 component can obtain accurate and high-quality moment of inertia (mass) values simply by running the motor several times forward and backward.

The following flowchart shows how the moment of inertia (mass) is identified.



Moment of Inertia (Mass) Identification Boxes

Open the moment of inertia (mass) identification boxes using the following procedure. Click **Execute** in the Tuning main window. The Condition Setting box will appear. The boxes displayed here are those displayed when using a rotary motor.

Setting the Conditions

Set the conditions for identifying moment of inertia (mass) in the Condition Setting box.

Condition Setting AXIS#1	×
Condition Reference Operation / Setting Transmission Measuremer	nt ➡
Please set the following conditions for Moment of Inertia Ider	tification.
Speed Loop Setting Pn100:Speed Loop Gain 400 [0.1Hz] Edit Pn101:Speed Loop Integral Time Constant	Reference Selection ±1000min-1(2.50 turns MAX)
2000 [0.01ms]	Detailed Setting(limitation in operation)
Identification start level [300 [%]	Acceleration (5000.00 - 45836.62) [min-1/s]
	Speed ± 1000.00
The Moment of Inertia Ratio can not be identified correctly under the following cases:	(9.16 - 1100.00) [min-1]
1. When the torque limit is active Please see the Setting Help in detail.	Moving distance
Execute the software reset function, or turn the power off and then on after completion of execution.	
	< Back Next > Cancel

Condition Setting Box

Speed Loop Setting

Set the speed loop gain and integral time constant.

Edit

Click Edit to view the Speed Loop-Related Setting Change box.

Identification Start Level

Set the moment of inertia (mass) identification start level.

Help

Click **Help** to open the window for guidelines on the reference condition settings. See <Guidelines for Reference Condition Settings> for details.

Reference Selection

Select the reference pattern for identifying the moment of inertia (mass). (Recommended method.)

Detailed Setting

Create the reference pattern for setting the moment of inertia (mass) by changing the values with the slider or by directly entering the values.

Next>

Click Next to view the Reference Transmission box.

Cancel

Click Cancel to return to the main window without changing the conditions.

Confirm

Click **Confirm** to view the reference wave.

Reference confirmal	ion			×
Moving distance 2	.50	[rota]		
Driving pattern				
	2			
- * T1 *				
V:Speed		1000.00	[min-1]	
T1:Acceleration T	ine	50	[ms]	
T2:Constant-spee	d time	100	[ms]	
Total moving time		400	[ms]	
OK				

<Guidelines for Reference Condition Settings>

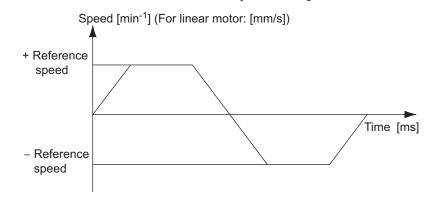
- Run the motor to measure the load's inertial moment (mass) of the mechanism to compare it with the rotor's inertial moment (coil assembly mass for linear motor) of the motor in the moment of inertia (mass) ratio.
- Set the driving mode, reference pattern (maximum acceleration, maximum speed, and maximum moving distance), and parameters related to the speed loop.
- Accurate measurement of the moment of inertia (mass) ratio depends on the settings. See the measurement results to determine the proper settings. See the following guidelines for each setting.

Reference Selection

The motor turns (moves) with the references as shown in the following graph for a forward run and a reverse run. The following references are for a rotation (movement) in a forward run. Select a reference pattern from the Reference Selection box (recommended method) or create the reference pattern by directly entering the values.

As the setting for maximum acceleration increases, the accuracy of the inertia identification tends to improve.

Consider the pulley diameter or the speed reduction ratio such as the ball screw pitches, and set the maximum acceleration within the operable range.





- The amount of movement is the value for each operation (a forward run or a reverse run). After several operations, the operation starting position may have moved in either direction. Confirm the operable range before each measurement and operation.
- Certain settings for the parameters or inertia size of the mechanism may result in overshooting or undershooting, and cause the speed to temporarily exceed the maximum speed. Allow a margin when making the settings.

Speed Loop Setting

If the response of the speed loop is poor, the moment of inertia (mass) ratio cannot be measured accurately.

The speed loop setting to get the required response for the moment of inertia (mass) setting is already set to the default setting. Normally, this setting does not have to be changed.

If this speed loop gain is too high, and is causing excitation in the mechanism, lower the setting. However, do not set it to a value that is higher than the default setting.

Identification Start Level

With a heavy load or low-rigidity machine, torque limit may be applied and the moment of inertia identification may fail.

In this case, double the identification start level and execute identification again.



If the moment of inertia (mass) ratio cannot be measured accurately

If the torque (force) is limited, the moment of inertia (mass) ratio identification cannot be made correctly. Adjust the setting of the limit or decrease the acceleration in Reference Selection so that the torque (force) will not be limited.

For information on torque (force) limiting, refer to the section on torque (force) limiting in the product manual for your SERVOPACK.

Reference Transmission

Transfer the reference conditions to the SERVOPACK. Click **Start** in the Reference Transmission box to begin the transfer.

eference Tran Condition Setting	nsmissi ••	on AXIS#0 Reference Transmission	••	Operation / Measurement		Write Results
Tran	sferring l	Reference Condit	ions to	the Servopack.		Start Cancel
						9
					♪	
				0%	;	
						Cancel

Reference Transmission Box

Start

Click to **Start** to transfer the reference conditions to the SERVOPACK. A progress bar displays the progress status of the transfer.

Cancel

The **Cancel** button is available only during the transfer to the SERVOPACK. After the transmission is finished, it is unavailable and cannot be selected.

Next>

The **Next** button is available if the data is transferred successfully. If an error occurs or if the transmission is interrupted, it is unavailable and cannot be selected.

Click Next to view the Operation/Measurement box.

<Back

Click **Back** to return to the Condition Setting box. The **Back** button is unavailable during a data transfer.

Cancel

Click Cancel to stop processing and return to the main window.

After the data has been successfully transferred, click **Next**, and the Operation/ Measurement box appears.

Operation/Measurement

In the Operation/Measurement box, run and measure the actual motor. Measurements are taken two to seven times and then verified.

Run the motor and take measurements using the following procedure.

1. Click Servo ON to turn on the servo power.

Poperation/Measu	rement AXIS#1			×
Condition 🔫	, Reference Transmission	⊪ Operation / ⊪→ W Measurement	/rite Results	Precautions
1Count	Identificatio	on/Fwd MeasurementPr	rep. Complete	
Servo ON/OFF op		Run Forward		everse
				Moment of Inertia Ratio prior to Identifying [300 [%] [%] Identified Moment of Inertia Ratio [%]
		0%		
			< <u>B</u> ack <u>N</u>	ext > Cancel

2. Click **Forward** to take measurements by turning (moving) the motor forward. After the measurements and the data transmission are finished, the following window appears.



3. Click **Reverse** to take measurements by turning (moving) the motor in reverse. After the measurements and the data transmission are finished, the following window appears.



4. Repeat steps 2 through 3 until all the measurements have been taken.

The actual number of times the measurements have been taken is displayed in the upper left part on the screen.

The progress bar displays the percentage of data that has been transferred.1

- 5. After the measurement has been successfully completed, click **Servo ON** to turn to the servo OFF status.
- 6. Click Next, and the Write Results box appears.

When **Next** is clicked without turning to the servo OFF status, the following message appears.

Moment	of Inertia	Identification	×
⚠	It turns th	ne Servo OFF.	
	ОК	Cancel	

Click **OK** to turn to the servo OFF status.

Writing Results

In the Write Results box, set the moment of inertia (mass) ratio calculated in the operation/ measurement to the parameters.

w	rite Results AXI	S#0					
	Condition Setting	•	Reference Transmission	••	Operation / Measurement	•	Write Results
	Write	s th	ie Identified	l Mo	ment of In	ertia I	Ratio.
					- 	5	
			Identified Mome 426	nt of Ir	nertia Ratio	•	Pn103 : Moment of Inertia Ratio 0 [%]
					Writing I	Results	
							< <u>B</u> ack <u>E</u> inish Cancel

Write Results Box

Identified Moment of Inertia (Mass) Ratio

Displays the moment of inertia (mass) ratio calculated in the operation/measurement.

Writing Results

Click **Writing Results** to assign the value displayed in the identified moment of inertia (mass) ratio to SERVOPACK parameter Pn103.

Pn103: Moment of Inertia (Mass) Ratio

Displays the value assigned to the parameter.

Click **Write Results**, and the new ratio calculated from the operation/measurement will be displayed.

<Back

The **Back** button is unavailable.

Cancel

Click **Cancel** to return to the main window.

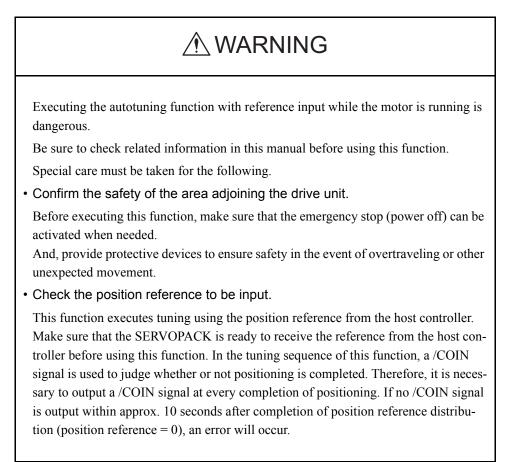
Finish

Click **Finish**, and a warning message appears reminding you to reset the origin position. (No warning message appears when the Write Results box has been opened from the Tuning main window.)

Moment of Inertia Identification	×
Be sure to reset the position before normal operation. Because the motor is driven by an internal reference, be sure to perform home return and reset the position prior to normal operation. Performing servomotor operation without reset is extremely dangerous as it may lead to runaway, etc.	
ок	

Click **OK** to return to the SigmaWin+ Σ -7 component Main window. If Pn103 (Moment of Inertia (Mass) Ratio) has been changed, that new value will remain.

4.7.2 Autotuning with Reference Input



This autotuning uses reference inputs from the host controller, and sets a servo gain suitable for the machine characteristics. The gain is set as high as possible to avoid vibrations.

To execute autotuning using reference inputs from the host controller, use the following procedure.

1. Select the **Position reference input** option under **Reference input from host controller** in the Tuning main window, and then click **Autotuning**. The Autotuning-Setting Conditions box will appear.

Autotuning - Setting Conditions AXIS#1	×
Set conditions.	
Mode selection	
2:For positioning	
A gain adjustment specialized for positioning will be executed. In addition, the following automatic adjustments can be executed:	
Model following control, notch filter, anti-resonance control, and vibration suppression.	
- Mechanism selection	_
2:Ball screw mechanism or linear motor	
Executes adjustment suitable for relatively high-rigidity mechanism,	
such as a ball screw or linear motor. Select this type if there is no applicable mechanism.	
Tuning parameters	
Start tuning using the default settings.	
Contracting doing the default settings.	
Next > Cancel	1

 Select the mode from the Mode selection combo box and the mechanism from Mechanism selection combo box, and then click Next. The Autotuning-Moment of Inertia Ratio Setting box will appear. When the Start tuning using the default settings. check box is selected in the Autotuning-Setting Conditions box, tuning will be executed using tuning parameters set to the default value.

Autotuning - Moment of Inertia RatioSet	×
If Moment of Inertia Ratio is not correctly set, vibration may be generated.	
Is Moment of Inertia Ratio correctly set?	
Pn103 : Moment of Inertia Ratio (0 - 20000)	
100 [%]	
< Back Next > Cancel	

3. Enter the correct moment of inertia ratio and then click **Next**. The following window will appear.

Autotuning - Automatic sel	tting AXIS#1	X
Waiting for execution	Tuning Turn the servo on, input the reference from the host controller, and then click the Start button.	
Oscillation level measurement	Start tuning	
Gain search behaviour evaluation		
Tuning completed	Mode selection	
	2:For positioning	
QNotch filter	Mechanism selection	
OAnti-res Adj OVib Suppress	2:Ball screw mechanism or linear motor	
Precautions	< Back Finish Cancel	

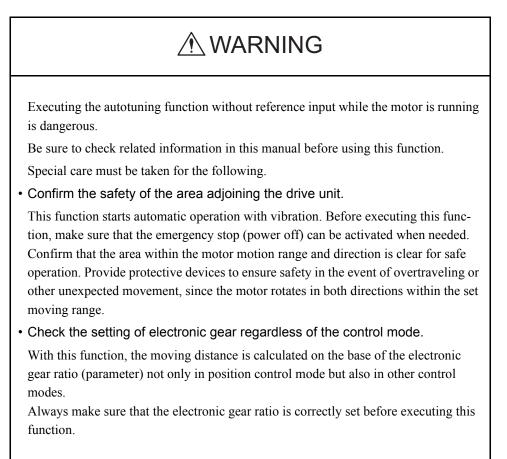
4. Turn the servo on and then input the reference from the host controller. Click **Start tuning** to start tuning.

Autotuning - Automatic s	etting AXIS#1	×
Waiting for execution	Tuning Executing tuning (Input the reference.)	
Oscillation level measurement	Cancel	
Gain search behaviour evaluation		
Tuning completed	Mode selection	
ONotch filter OAnti-res Adj OVib Suppress	2:For positioning Mechanism selection 2:Ball screw mechanism or linear motor	
Precautions	< Back Finish Cancel	

Vibration generated during tuning is automatically detected and the optimum setting for the detected vibration will be made. When setting is completed, the LED indicator lamps (bottom left of the box) of the functions used for the setting will light up.

5. When tuning is complete, click **Finish**. The results of tuning will be written in the parameters.

4.7.3 Autotuning without Reference Input



This autotuning sets a servo gain suitable for the machine characteristics. The gain is set as high as possible for auto run within the set range to avoid vibration.

Two methods are available to stop autotuning without reference input while the motor is running, and the motor will stop according to the method selected. Make sure to select the best method for the situation.

- If the SERVO OFF button is used, the motor will stop according to the stopping method after servo off specified by the parameters.
- If the CANCEL button is used, the motor will decelerate to a stop and then enter a zero clamp state.

Note: The CANCEL button may not be used with some SERVOPACKs.

To execute autotuning without using a reference input, use the following procedure.

1. Select the **No reference input** option under **Reference input from host controller** in the Tuning main window, and then click **Autotuning**. The Autotuning-Setting Conditions box will appear.

Autotuning - Setting Condition	s AXIS#1	×			
Set conditions.					
Switching the load moment of intert	ia (load mass) identifica	ation			
1:A moment of inertia is not prese	umed.	•			
Mode selection					
2:For positioning		•			
A gain adjustment specialized for following automatic adjustments of notch filter, anti-resonance contro	can be executed: Model	following control,			
Mechanism selection					
2:Ball screw mechanism or linear	r motor	•			
	Executes adjustment suitable for relatively high-rigidity mechanism, such as a ball screw or linear motor. Select this type if there is no applicable mechanism.				
Distance					
The moving range from the currer	nt value is specified.				
98 X 1000 =	98000	[reference units]			
(-99990 - 99990) (Cathian involtid annual - 24 - 24)	2.9	[Rotation]			
(Setting invalid range : -31 - 31)					
Tuning parameters					
Start tuning using the default s	ettings.				
	Next >	Cancel			

2. Select whether or not to use the load moment of inertia (load mass) identification from the **Switching the load moment of inertia (load mass) identification** box, the mode from the **Mode selection** box, the mechanism from the **Mechanism selection** box, and enter the moving distance. Then, click **Next**.

When the **Start tuning using the default settings.** check box is selected in the Autotuning-Setting Conditions box, tuning will be executed using the tuning parameters set to the default values.

Waiting for execution Servo ON/OFF operation Oscillation level measurement Servo OFF	Autotuning - Automatic settin	g AXIS#1	×
Tuning	Waiting for execution	Servo OFF	
Gain search behaviour evaluation Start tuning Tuning completed Mode selection 2:For positioning 1	Gain search behaviour evaluation	Start tuning	
Mechanism selection 2:Ball screw mechanism or linear motor Distance ONotch filter Anti-res Adj Vib Suppress Precautions < Back	Anti-res Adj Vib Suppress	2:Ball screw mechanism or linear motor Distance 98000 [reference units] 2.9 [Rotation]	

1	-		_
Autotuning - Automatic sel	tting AXIS#1		×
Waiting for execution	Servo ON/OFF operatio	Servo OFF	
Oscillation level measurement	Servo		
	-Tuning		
Gain search behaviour evaluation		Start tuning	
Tuning completed	Mode selection 2:For positioning		
	Mechanism selection	n	
	2:Ball screw mecha	anism or linear motor	
	Distance		
Notch filter	98000	[reference units]	
OAnti-res Adj Vib Suppress	2.9	[Rotation]	
Precautions	< Back	Finish Cancel	

3. Click Servo ON. The following box will appear.

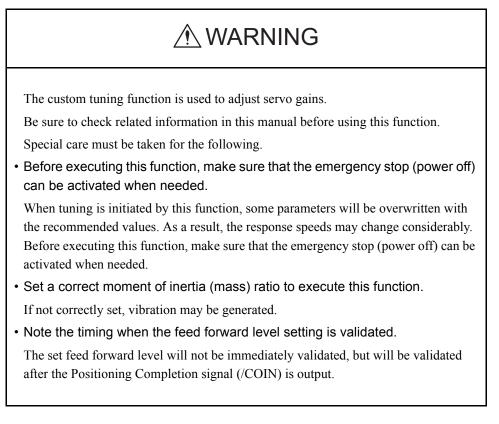
4. Click **Start tuning**. The motor will start rotating and tuning will commence.

Waiting for execution	Servo ON/OFF operation
-	Servo ON
Oscillation level measurement	
	- Tuning
Gain search behaviour evaluation	Cancel
Tuning completed	Mode selection
Tuning completed	
Tuning completed	Mode selection
Tuning completed	Mode selection 2:For positioning
	Mode selection 2:For positioning Mechanism selection 2:Ball screw mechanism or linear motor Distance
Notch filter	Mode selection 2:For positioning Mechanism selection 2:Ball screw mechanism or linear motor
	Mode selection 2:For positioning Mechanism selection 2:Ball screw mechanism or linear motor Distance

Vibration generated during tuning is automatically detected, and the optimum setting for the detected vibration will be made. When the setting is complete, the LED indicator lamps (bottom left of the box) of the functions used for the setting will light up.

5. When tuning is completed, click **Finish**. The results of tuning will be written in the parameters.

4.7.4 Custom Tuning



This custom tuning adjusts servo gains by manually adjusting the feed forward level and feedback level. If vibration is detected during tuning, the anti-resonance control adjustment function and the vibration suppression function can be used. Use custom tuning for fine adjustment of gains as well as for autotuning.

Either one of the following two methods of custom tunings can be executed by selecting the tuning mode.

When the **tuning mode** is set to **0** (servo gains with priority given to stability) or **1** (servo gains with priority given to response)

This custom tuning enables multiple servo gains to be set to stable conditions merely by manipulating one tuning level. If vibration is detected during tuning, the notch filter/anti-resonance control auto setting function is provided to suppress it. The anti-resonance control adjustment function can also be manually set during tuning.

When the **turning mode** is set to **2 (servo gains with priority given to positioning application)** or **3 (servo gains with priority given to prevention of overshooting in positioning applications)**

This custom tuning enables not only multiple servo gains to be set to stable conditions but also realizes reduction of positioning time by manipulating two tuning levels. This tuning uses the following-model control to reduce positioning time. In addition to the notch filter/ anti-resonance control auto setting function in case of vibration occurrence during tuning, a function to automatically set friction compensation is provided. The anti-resonance control adjustment function and the vibration suppression function can also be manually set during tuning.



Autotuning can be executed as the final step to keep balance among servo gains.

^{4]} Custom Tuning - Adust	AXIS#1
Tuning mode Mechanism selection Friction compensation Gain status	0 : Set servo gains with priority given to stability. 2 : Ball screw mechanism or linear motor Enable 1 gain
Tuning level adjustment Setting the tuning level too high can cause vibration or abnormal noise. Finish	Tuning level. Tuning level. Tuning level Tuning level (1 - 2000) Tuning level Back E (1 - 2000)
	Auto-setting Notch filter Vibration not detected Uib Detect 1 step inactive Cancel Anti-res Ctrl Adj Vibration not detected Anti-res Adj inactive Cancel Anti-res Ctrl Adj
Precautions	Back To Autotuing Completed. Cancel

Custom Tuning - Adjust Box when Tuning Mode is Set to 0 or 1

Custom Tuning - Adust	AXIS#1						<u>_ 8 ×</u>
Tuning mode	2 : Set set	rvo gains	for positia	ning applicat	ion.		
Mechanism selection	2 : Ball sc	rew mech	nanism or l	linear motor			
Friction compensation	Disable						
Gain status	1 gain						
	- Tuning level						
•	Set the tuning le						
FF level adjustment	Feed forward le					ſ	
rr lever adjustment						Back	
Increase until							
overshooting occurs.				- 2000)		<u> </u>	
			(i	- 2000)			
• • • • • • • • • • • • • • • • • • •	Feedback level	(FB)					
FB level adjustment							
r biever aujustment		0	, , , , , , , , , , , , , , , , , , ,				
Increase until			(1	- 2000)			
overshooting disappears.	-Auto-setting						
	-	Allowether	not detec	te d			1
	Notch filter	Vibration		neu I	\bigcirc	Vib Dete	ct
Response level OK?	1 step		inactive	Cancel	\prec		
No	2 step		inactive			<u> </u>	 II
Yes	entine chul ed			te d			
• • • • • • • • • • • • • • • • • • •	Anti-res Ctrl Ad) Vibration					
Finish	Anti-res Adj		inactive	Cancel		Anti-res Ctr	l Adj
	Vib Suppressi Frequency 1	ion	inactive	Cancel		Vib Suppre	ess
	Frequency 1	Γ	hidenve	Santoar			
Precautions		Bac	k T	o Autotuing	Complete	d. Cano	el
					· · · ·		

Custom Tuning - Adjust Box When Tuning Mode is Set to 2 or 3

Execute custom tuning using the following procedure.

The procedure described here is for when the tuning mode is set to 2 (servo gains with priority given to positioning application).

1. Click **Advanced adjustment** in the Tuning main window, and then click **Custom tuning** in the Tuning box that will appear. The Custom Tuning - Mode selection box will appear.

Custom Tuning - Mode selection AXIS#1	×			
Tuning mode				
2:Set servo gains for positioning application.	-			
O:Set servo gains with priority given to stability. Overshoot will rarely occur since priority is given to stability. In addition to gain adjustments, the notch filter and anti-resonance control (except for torque (force) control) can be adjusted.				
1:Set servo gains with priority given to response. Overshoot may occur since priority is given to responsiveness. In addition to gain adjustments, the notch filter and anti-resonance control (except for torque (force) control) can be adjusted.	-			
Mechanism selection				
2:Ball screw mechanism or linear motor	-			
Executes adjustment suitable for relatively high-rigidity mechanism, such as a ball screw or linear motor. Select this type if there is no applicable	•			
- Option				
Friction compensation				
Next Canc	el			

The tuning modes that can be selected will vary according to the SERVOPACK setting.

 Select the tuning mode from the **Tuning mode** box and the mechanism from the Mechanism selection box, and then click Next. The Friction compensation option is available only when the tuning mode is set to 0 or 1.

The Custom Tuning - Moment of Inertia Ratio Set box will appear.

Custom Tuning - Moment of Inertia RatioSet			
When Moment of Inertia Ratio is not correctly set, vibration may be generated.			
Is Moment of Inertia Ratio correctly set?			
Pn103 : Moment of Inertia Ratio (0 - 20000) 0 [%]			
Back Next Cancel			

Enter the correct moment of inertia ratio.

3. Click Next. The Custom Tuning - Adjust box will appear.

¹ Custom Tuning - Adust	AXI5#1		
Tuning mode	2: Set servo gains for positioning application.		
Mechanism selection	2 : Ball screw mechanism or linear motor		
Friction compensation	Enable		
Gain status	1 gain		
FF level adjustment Increase until overshooting occurs.	Tuning level Set the tuning level and start the tuning. Feed forward level (FF)		
FB level adjustment	Feedback level (FB)		
l l	Auto-setting		
Response level DK?	Notch filter 1 step 2 step inactive Cancel Vib Detect		
Yes Finish	Anti-res Ctrl Adj Anti-res Adj Anti-res Ctrl Adj Anti-res Ctrl Adj		
Finish	Vib Suppression Frequency 1 inactive Cancel Vib Suppress		
Precautions	Back To Autotuing Completed. Cancel		

4. Turn the servo on and input the reference from the host controller. Then, click **Start tuning** to begin tuning.

Custom Tuning - Adust	AXIS#1		
Tuning mode	2: Set servo gains for positioning application.		
Mechanism selection	2 : Ball screw mechanism or linear motor		
Friction compensation	Enable		
Gain status	1 gain		
+	Tuning level		
	Set the tuning level.		
FF level adjustment	Feed forward level (FF)		
Increase until			
overshooting occurs.			
	(1 - 2000)		
↓	Feedback level (FB)		
, The second sec			
FB level adjustment			
Increase until	(1 - 2000)		
overshooting disappears.	, <i>,</i> , ,		
1	Auto-setting		
*	Notch filter Vibration not detected Vib Detect		
Response level OK?	1 step inactive Cancel		
	2 step inactive Candel		
Yes			
	Anti-res Ctrl Adj Vibration not detected		
	Anti-res Adj inactive Cancel Anti-res Ctrl Adj		
Finish			
	Vib Suppression		
	Frequency 1 inactive Cancel Vib Suppress		
Precautions	Back To Autotuing Completed. Cancel		
Fredautions	Date: To Autotuning Completed. Cancel		

5. Change the feed forward level by clicking the setting arrows. Continue to raise the level until an overshoot occurs.



The set feed forward level will not be applied until the Positioning Completion signal /COIN is output.

When the tuning mode is set to 0 or 1, change the tuning level by clicking the setting arrows.

Custom Tuning - Adust	AXIS#1
Tuning mode	0 : Set servo gains with priority given to stability.
Mechanism selection	2 : Ball screw mechanism or linear motor
Friction compensation	Enable
Gain status	1 gain
	Tuning level
Tuning level adjustment Setting the tuning level too high can cause vibration or abnormal noise.	Set the tuning level. Tuning level Back Tuning level (1 - 2000)
Finish	
	Auto-setting
	Notch filter Vibration not detected
	1 step inactive
	2 step inactive Cancel
	Anti-res Ctrl Adj Vibration not detected
	Anti-res Adj inactive Cancel Anti-res Ctrl Adj
	Anti-Les cui Adj
	Back To Autotuing Completed. Cancel

6. Change the feedback level by clicking the setting arrows. Continue to raise the level until no overshoot occurs.

Custom Tuning - Adust	AXIS#1	×		
Tuning mode	2 : Set servo gains for positioning application.	-		
Mechanism selection	2 : Ball screw mechanism or linear motor			
Friction compensation	Enable			
Gain status	1 gain			
	Tuning level	_		
	Set the tuning level.			
FF level adjustment	Feed forward level (FF)			
Increase until				
overshooting occurs.				
	(1 - 2000)			
↓	Feedback level (FB)			
FB level adjustment				
Increase until	(1 - 2000)			
overshooting disappears.	Auto-setting			
↓	Notch filter Vibration not detected	1		
	Vib Detect			
Response level OK?	1 step inactive Cancel			
No				
Yes	Anti-res Ctrl Adj Vibration not detected			
	Anti-res Adj inactive Cancel Anti-res Ctrl Adj	1		
Finish		-		
	Vib Suppression Evenuence 1 Vib Suppress Vib Suppress			
	Frequency 1 inactive Cancel Vib Suppress			
Precautions	Back To Autotuing Completed. Cancel	1		
		1		

Repeat steps 5 and 6 to continue tuning.

The notch filter/anti-resonance control auto setting function, the anti-resonance control adjustment function, the vibration suppression function, or autotuning with reference input can be used as required.

See "Functions To Suppress Vibration" for details.

To reset to the original settings and status, click **Back**.

7. When tuning is complete, click **Completed**. The settings will be written in the SERVOPACK.

Functions To Suppress Vibration

<Notch Filter/Anti-resonance Control Adjustment Auto Setting Function>

For vibration frequencies above 1,000 Hz when servo gains are increased, the notch filter auto setting function provides effective suppression. For vibration frequencies between 100 and 1,000 Hz, the anti-resonance control adjustment auto setting function is effective.

Auto Setting

To use auto setting, enable the notch filter/anti-resonance control adjustment auto setting function by using parameters.

During tuning, the notch filter frequency (anti-resonance control frequency for the antiresonance control adjustment auto setting function) effective for the detected vibration is automatically set and displayed in **1 step** or **2 step** (in **Anti-res Adj** when using the antiresonance control adjustment auto setting function).

^d Custom Tuning - Adust	AXIS#1	2	
Tuning mode	2: Set servo gains for positioning application.		
Mechanism selection	2 : Ball screw mechanism or linear motor		
Friction compensation	Enable		
Gain status	1 gain	1	
	-Tuning level	5	
· · · · · · · · · · · · · · · · · · ·	Set the tuning level.		
FF level adjustment	Feed forward level (FF)		
Increase until			
overshooting occurs.			
	(1 - 2000)		
L L	Feedback level (FB)		
FB level adjustment			
Increase until	Y Y		
overshooting disappears.	(1 - 2000)		
1	-Auto-setting	5	
+	Notch filter 2 step setting completed		
\sim	1 step		
Response level OK?	2 step 1260Hz active Cancel		
		1	
Yes	Anti-res Ctrl Adj Vibration not detected		
	Anti-res Adj inactive Cancel Anti-res Ctrl Adj	ı I	
Finish	Anti-res cur Auj	1	
	Vib Suppression		
	Frequency 1 inactive Cancel Vib Suppress		
Precautions	Back To Autotuing Completed. Cancel		

Window with Notch Filter Automatically Set

Cancel

If the automatically set notch filter frequency (or anti-resonance control frequency) does not effectively suppress vibration, click **Cancel** to reset to the preceding frequency. When the frequency is reset, wibration detection will restart

When the frequency is reset, vibration detection will restart.

Vib Detect (vibration detection)

While the notch filter/anti-resonance control adjustment auto setting function is enabled, click **Vib Detect** (vibration detection) to manually detect vibration. The SERVOPACK detects vibration at the moment **Vib Detect** (vibration detection) is clicked, and the notch filter frequency (or anti-resonance control frequency) effective for the detected vibration is set and displayed in **1 step** or **2 step** (or in **Anti-res Adj**). Manual vibration detection can also be executed when the SERVOPACK does not detect vibration.

Anti-res Ctrl Adj (anti-resonance control)

Click **Anti-res Ctrl Adj** (anti-resonance control) to execute the anti-resonance control function if further adjustment is required. See "4.7.6 Anti-resonance Control Adjustment Function" for details.

<Vibration Suppression Function>

This function is used to suppress low-frequency (1 to 100 Hz) vibrations for which neither the notch filter nor anti-resonance control adjustment functions are effective. When a vibration for which the vibration suppression function can be used is detected, the **Vib Suppress** (vibration suppression) button will blink.

Vib suppress (vibration suppression)

Click **Vib suppress** (vibration suppression) to execute the vibration suppression function. See "4.7.7 Vibration Suppression Function" for details.

<Autotuning with Reference Input>

To Autotuning

Click **To Autotuning** to execute autotuning using reference inputs from the host controller. See "4.7.2 Autotuning with Reference Input" for details.

4.7.5 Gain Switching When Motor/Machine Is Stopped

After servo gains have been increased by tuning, vibration will not be generated while the motor/machine is running. However, vibration may be generated when the motor/machine is stopped. This function suppresses vibrations generated when the motor/machine is stopped by automatically reducing internal servo gains. The reduced servo gains will automatically be reset to the original set values when the motor/machine starts running again.

To perform gain switching, use the following procedure.

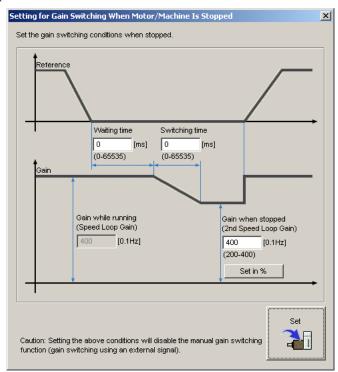
1. In the Tuning main window, click **Advanced adjustment** and then click **Gain switching**. A message will appear, asking for confirmation to execute the function.

Setting for Gain Switching When N	1otor/Machine Is Stopped 🔀
Executing this function will dis Do you want to execute this fu	
Execute	Cancel

When the gain switching function is already effective, a message will inform you that the function is already effective, and ask for confirmation to execute.

Setting for Gain Switching When Motor/Machine Is Stopped 🔀				
The automatic gain switching Executing this function here w Do you want to execute this fu	vill overwrite the gain setting.			
Execute	Cancel			

2. Click **Execute**. The Setting for Gain Switching When Motor/Machine Is Stopped box will appear.



Waiting time

Enter the period of time from the moment the position reference becomes zero until the gain switching starts.

Switching time

Enter the period of time required to switch the gain from the value when the motor/machine is running to the value when the motor/machine is stopped.

Gain when stopped (2nd Speed Loop Gain)

Enter a value from 50% to 100% of the gain when the motor/machine is running (speed loop gain).

Set in %

If you want to set the gain when the motor/machine is stopped (2nd speed loop gain) as a percentage of the gain when the motor/machine is running (speed loop gain), click **Set in** %. The box for setting the gain as a percentage will appear.

Setting for Gain Switching When Motor/Machine Is Stopped	×
Set the gain when the motor/machine is stopped to	
80 [%] of the gain when the motor/machine is running.	
(50 - 100)	
OK Cancel	

Enter a percentage, and then click **OK**. The gain when the motor/machine is stopped (2nd speed loop gain) will be automatically calculated according to the set percentage and displayed in the previous box.

3. When the setting is complete, click **Set**. The set values will be written in the SERVOPACK.

4.7.6 Anti-resonance Control Adjustment Function

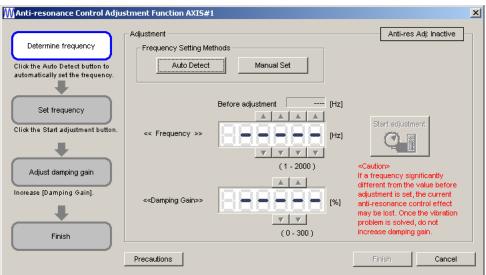
ACAUTION The anti-resonance control adjustment function supports the adjustment of anti-resonance control effective for vibration frequencies from 100 to 1,000 Hz when servo gain is increased. Be sure to check related information in this manual before using this function. Special care must be taken for the following. · Before executing this function, make sure that the emergency stop (power off) can be activated when needed. This function will automatically set parameters when used. As a result, the response speeds may change considerably after execution. Before executing this function, make sure that the emergency stop (power off) can be activated when needed. • The moment of inertia (mass) must be correctly set to execute this function. If it is not correctly set, satisfactory anti-resonance control cannot be achieved. This function is generally only used to adjust the servo gain, as you should avoid considerable change in the frequency. If the frequency is changed while the anti-resonance control adjustment function is being used, the current anti-resonance control effect will be lost. Care must be taken when automatic frequency detection is executed in Auto Detect mode. · If vibration cannot be suppressed by executing this function, cancel execution and reduce the servo gain by other methods such as custom tuning. · Use an adjustment method such as custom tuning to improve response characteristics after executing this function. When the servo gain is increased during an adjustment such as custom tuning, vibration may be generated again. In this case, execute the anti-resonance control adjustment function again for fine adjustment.

The anti-resonance control adjustment function supports the adjustment of anti-resonance control effective for vibration frequencies from 100 to 1,000 Hz when servo gain is increased. Vibration can be suppressed by setting vibration frequency by auto detection or by manual setting to adjust damping gain. Input a reference and execute this function when there is vibration.

X

To execute the anti-resonance control adjustment function, use the following procedure.

1. In the Tuning main window, click **Advanced adjustment**, **Custom tuning**, and then **Anti-resonance control**. The Anti-resonance Control Adjustment Function box will appear.



2. Click Auto Detect or Manual Set to set the frequency.

MAnti-resonance Control Adjustment Function AXIS#1

Determine frequency Click the Auto Detect button to automatically set the frequency.	Adjustment	Manual Set	Anti-res Adj: Inactive
Set frequency Click the Start adjustment button.	<< Frequency >>	Before adjustment 580 [Hz]	Start adjustment
Adjust damping gain Increase (Damping Gain).	< <damping gain="">></damping>	(1-2000)	<caution> If a frequency significantly different from the value before adjustment is set, the current anti-resonance control effect may be lost. Once the vibration problem is solved, do not increase damping gain.</caution>
	Precautions		Finish Cancel

Auto Detect

Click **Auto Detect**. The SERVOPACK will automatically analyze the frequency and set the optimum frequency.

Manual Set

Click **Manual Set** to view the currently set frequency. When the anti-resonance control adjustment function is not effective, the displayed frequency can be manually adjusted by clicking the setting arrows.

Use this setting method if the frequency is already known.

3. Click Start adjustment.

MAnti-resonance Control Adju	stment Function AXIS#	1				×
Determine frequency Click the Auto Detect button to automatically set the frequency.	- Adjustment	thods Manual Set		Anti-re	s Adj: Active –	
Set frequency Click the Start adjustment button.	<< Frequency >>	Before adjustment	580 [Hz]	Reset		
Adjust damping gain Increase (Damping Gain).	< <damping gain="">></damping>	(1-2		<caution> If a frequency sig different from the adjustment is set anti-resonance c may be lost. Onci problem is solved increase damping</caution>	value before the current ontrol effect the vibration l, do not	
	Precautions			Finish	Cancel	

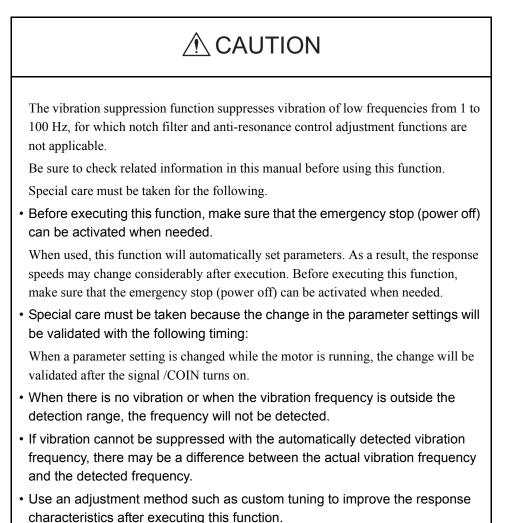
4. Adjust the damping gain by clicking the setting arrows.

N Anti-resonance Control Adju	stment Function AXIS#	1		×
Determine frequency	Adjustment	sthods	Anti-res Adj: Active	
Click the Auto Detect button to automatically set the frequency.	Auto Detect	Manual Set		
Set frequency		Before adjustment 580 [Hz		
Click the Start adjustment button.	<< Frequency >>		z] Reset	
Adjust damping gain		(1 - 2000)	<caution> If a frequency significantly different from the value before</caution>	
Increase (Damping Gain).	< <damping gain="">></damping>		may be lost. Once the vibration problem is solved, do not	
Finish	Precautions	(0-300)	increase damping gain. Finish Cancel	
	Precautions		Finish Cancel	

Click Reset to reset the settings to their original values during adjustment.

5. When the adjustment is complete, click **Finish**. The set values will be written in the SERVOPACK.

4.7.7 Vibration Suppression Function



The vibration suppression function is a support function mainly used to suppress transitory vibration of low frequencies from 1 to 100 Hz generated by impact when the motor/ machine is stopped. This function is effective for vibration frequencies for which notch filter and anti-resonance control adjustment functions are not applicable. Input a reference and execute this function when there is vibration.

To execute the vibration suppression function, use the following procedure.

1. In the Tuning main window, click **Custom tuning**, and then **Vibration suppression**. The Vibration Suppression Function box will appear.

Vibration Suppression Function	nAXI5#1	×
Determine the frequency for setting.	Adjustment Vib Suppression: Inac	tive
Ior second.	Residual Vibration Frequency 14.7 [Hz]	
Click the Import button. Manual setting is also possible. Set the frequency.		
Click the Set button. If the vibration problem could not be solved, finely adjust the frequency and then click the Set button again.	Set frequency	
Finish	(1.0 - 100.0) Click the Set button.	
	Precautions Finish Can	cel

2. Click **Import**, or set the frequency by clicking the setting arrows.

Import

Click **Import** to set the monitored residual vibration frequency as the set frequency. (This function is valid only when the residual vibration frequency is between 1.0 and 100.0.)

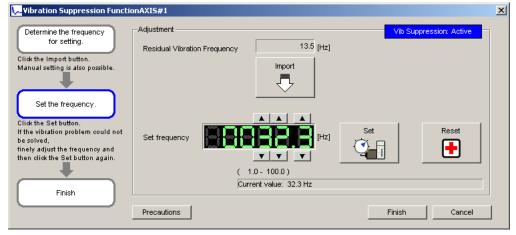
The set frequency can be manually adjusted by clicking the setting arrows.

Vibration Suppression Function	nAXIS#1	×
Determine the frequency for setting.	Adjustment Vib Suppression: Inactive Residual Vibration Frequency 14.7 [Hz]	
Click the Import button. Manual setting is also possible. Set the frequency.		
Click the Set button. If the vibration problem could not be solved, finely adjust the frequency and then click the Set button again.	Set frequency	
Finish	Click the Set button. Precautions Finish Cancel	

3. Click Set.

😾 Vibration Suppression Functi	onAXIS#1					×
Determine the frequency for setting. Click the Import button. Manual setting is also possible. Set the frequency. Click the Set button. If the vibration problem could not be solved. Tinely adjust the frequency and then click the Set button again.	Adjustment Residual Vibration	13.5 [r Import	tz] tz]	Vib Suppre	Reset	
	Precautions			Finish	Cancel	

If there is still vibration, fine-adjust the set frequency by clicking the setting arrows, and then click **Set** again.

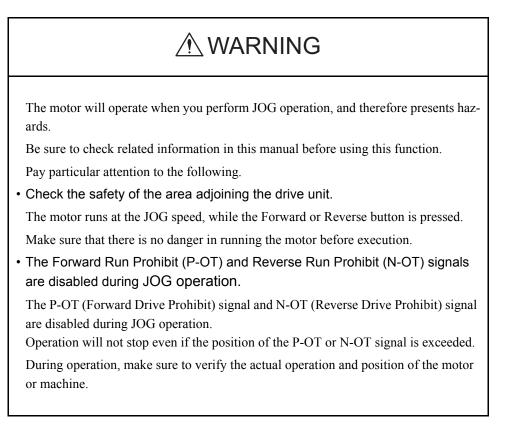


Click Reset to reset the frequency to the original value during adjustment.

4. When vibration is suppressed, click **Finish**. The set frequency will be written in the SERVOPACK.

4.8 Test Run

4.8.1 JOG Operation



This function turns the motor at the set JOG speed. The rotational direction and the speed setting can be verified without connecting an upper-level controller.

Use the following procedure to perform JOG operation.

1. Select *Test Run - Jog* from the menu bar of the SigmaWin+ Σ -7 component main window. The following dialog box will be displayed.

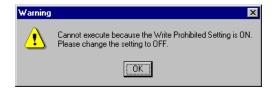
If more than one axis is being used, the **Axis Selection** dialog box appears. First select the axes to adjust according to the **Axis Selection** dialog box. For the procedure, refer to *4.1 Changing Axes*.

lt is da	ngerous to operate this function, because the servomotor will rotate.
	s be sure to check the user's manual before operating.
Pay pa	articular attention to the following points:
1. Per	orm safety checks around moving parts.
the .	le the operation button is being depressed, the servomotor will run at IOG speed set. Execute after having confirmed that servomotor ation will present no danger.
2. [For	ward Run Prohibit (P-OT)]/[Reverse Run Prohibit (N-OT)] is disabled.
disa sign	Forward Run Prohibit (P-OT)/Reverse Run Prohibit (N-OT) signals are oled during JOG (the servomotor will not stop even if the P-OT/N-OT als are passed). When operating, carefully verify the action and positio e servomotor/machine.

Click **Cancel** to return to the main window without performing JOG operation. You will return to the main window.

<When the Write Prohibited Setting is ON>

If the write prohibited setting is ON, the following message will appear.



Click OK, and set the write prohibited setting to OFF.

See "4.5.5 Write Prohibited Setting" for setting method.

2. Click **OK**. The JOG Operation Dialog Box will be displayed.

If the servo is on, an error message will appear. Make sure that the servo is off.

爷 JOG Operation AXIS#00		×
JOG Speed Setting		
Pn304 : Jogging Speed		
100	[min-1] Edit	
Operation		
Servo OFF	Servo ON	
Forward	Reverse	

Pn304: JOG Speed

Parameter Pn304 displays the JOG speed. Click Edit to change the JOG speed.

Operation

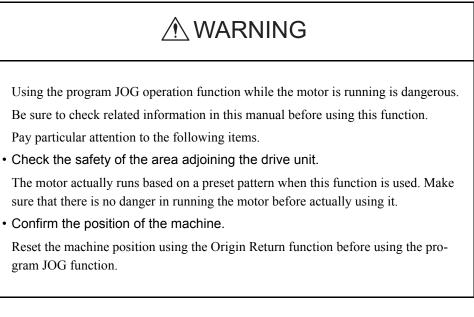
On the left, shows if the servo is on or off and the corresponding LED display. On the right, the button changes according to the servo's status. When the servo is off, the **Servo ON** button appears; when the servo is on, **Servo OFF** button appears.

- 3. Check the JOG speed. To change the JOG speed, click Edit.
- 4. Click Servo ON.

SIG Operation AXIS#00		x
JOG Speed Setting		1
Pn304 : Jogging Speed		
100	[min-1] Edit	
Operation]
Servo ON	Servo OFF	
Forward	Reverse	

5. Press **Forward** or **Reverse**. A JOG operation is performed only while one of these buttons is pressed.

4.8.2 Program JOG Operation



This function allows automatic operation determined by the preset pattern of operation.



Two methods are available to stop program JOG operation while the motor is running, and the motor will stop according to the method selected. Make sure to select the best method for the situation.

- If the Servo OFF button is used, the motor stops according to the stopping method after servo off specified by the parameters.
- If the Cancel button is used, the motor coasts to a stop and then enters a zero clamp state.

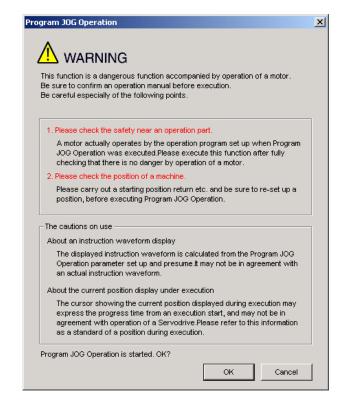
Note: The Cancel button may not be used with some SERVOPACKs.

To perform the JOG operation for a particular pattern, use the following procedure.

1. In the SigmaWin+ Σ -7 component main window, click **Test Run** and then click **Program JOG Operation**. A warning message appears, reminding you of the possible dangers.

INFO(

If more than one axis is being used, the **Axis Selection** dialog box appears. First select the axes to adjust according to the **Axis Selection** dialog box. For the procedure, refer to *4.1 Changing Axes*.



Click Cancel to return to the main window without performing program JOG operation.

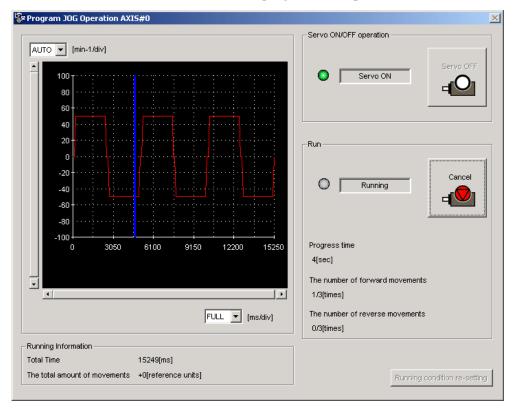
ogram JOG Operation AXIS#1	
	Running Condition
UTO 🔽 [min-1/div]	Pn531:Program JOG Movement Distance
	32768 [reference units] (1-1073741824)
1000 T	Pn533:Program JOG Movement Speed
800	
600	500 [min-1] (1-10000)
	Pn534:Program JOG Acceleration/Deceleration Time
400	100 [ms] (2-10000)
200	
o	Pn535:Program JOG Waiting Time
-200	100 [ms] (0-10000)
	Pn536:Number of Times of Program JOG Movement
-400	3 [times] (0-1000) (0: Infinite)
-600	[[[[[[[[[[[[[[[[[[[
-800	Pn530.0:Program JOG Operasion Related Switch
	4 : (Waiting:Pn535 -> Forward:Pn531 -> Waiting: 🔻
-1000	
0 2004 0100 1002 10210 12110	
	Apply
FULL 🗾 [ms/div]	, uddo
ning Information	
al Time 12771[ms]	
total amount of movements +0[reference units]	
	Run

2. Click OK, and the Running Condition Setting box appears.

3. Set the running conditions and click **Apply**. The graph for the operation pattern is displayed.

AUTO V [min-1/div]	- Servo ON/OFF operation-
	Servo OFF
40 20 0 -20 -20 -40	Run Execute
	Progress time 0[sec]
	The number of forward movements 0/3[times]
FULL [ms/div]	The number of reverse movements 0/3[times]
unning Information]
he total amount of movements +0[reference units]	Running condition re-setting

4. Click **Run** and the Program JOG Operation box appears.



5. Click Servo ON and Execute. The program JOG operation starts.

4.9 Table Editing

4.9.1 Program Table Editing

Programs can be viewed and edited in the Program Table Editing window. Create programs by setting the individual program steps (one row in the table is a program step). The INDEXER option module runs the program (steps) that is in the program table in accordance with a reference from the upper-level controller.

The windows differ in the Online and Offline modes.

When Online

In the SigmaWin+ Σ -7 component main window, click **Table** and then click **Edit Program Table**. The Program Table Editing window appears.

	Saves the program table data.										
	Prints the Program Table Editing window.										
	Splits the specified area into a specified number of stations at equal intervals.										
nog	ram Table I	Editing AX	IS#1:SGDV-1R	t6AE1A/Opt	ion Board						×
	ê 🖪	8	🏨 Station s	plit						Commer	
STEF	POS	SPD	RDST	RSPD	ACC	DEC	POUT	EVENT	LOOP	NEXT	
0	+INFIN	1000	25000	3000	:	:	::NAZ:NA	ITO	1	END	
1	-INFIN:	5000	-	1000	5000	5000	:::::::	ITO	1	END	
2	A+1200	1000	60000	1000	:	:	:::::::	ITO	1	END	
3	-	1000	-	4000	:	:		ITO	1	END	
4	S+1200	3000	-	1000	:	:	NA: AA: :Z	ITO	1	END	
5	A+1200	1000	-	1000	5000	78000		ITO	1	END	
6	+INFIN:	1000	-	5000	:	:	:::::::	ITO	1	END	
7	-INFIN:	2000	-	1000	:	:	Z:NAZ:NA	ITO	1	END	
8		1000	-	1000	:	:		ITO	1	END	
9	S+50001	1000	-	1000	:	:		ITO	1	END	
10		1000	-	1000	100000	70000	:::::::	ITO	1	END	
11	+INFIN:		-	1000	:	:	:::::::	ITO	1	END	
12	-INFIN:		-	1000	:	:	:::::::	ITO	1	END	
13	A+55001		-	1000	:	:		ITO	1	END	
14	STOP	1000	-	1000	1.1	1		ITO	1	END	•
	Initial	ize	Save					Read		Write	

Program Table Editing Window (Online Mode)

STEP	POS	SPD	RDST	RSPD	ACC	DEC	POUT	EVENT	LOOP	NEXT 🔺
0	I+1200008	50000	80800	5080	1080	1000	ANHNN	ITO	1	EMB
1	1+150000	7500	200000	\$0000	$\langle \rangle$	2000	AANNN	(TO)	1	ÉND
2	I-600000	20000	40000	2000		1000	NNANN	IT500	3	3
3	I+600000	30000	60000	1000	2000	:	NANAN	IT500	4	END
4	≜ +0	50000	-	1000	:	:	ZZZZZ	DT250	1	5
5	A+2000000	50000		1000		:	ZZZZZ	DT250	1	6
6	≜ +0 (A)	250(0 B)	- (C)	1000(D)	(E)	F)	$ZZ \overline{G}$	ITO(H)	1(1)	END(J)
7	+INFINITE	45009	\downarrow	1000	\$000	1500	NNNN	T2008	$1 \cup$	8
8	+INFINITE	500	-	1000	:	:	NAAAN	T500	1	9
9	-INFINITE	1000	-	1000	:	:	ANNNA	T750	1	10
10	-INFINITE	20000	-	1000		-	NANAN	T1500	1	11
11	\$TOP	1000	-	1000	:	:	NNNNN	ITO	1	END
12	+INFINITE	20000	50000	7500	:	:	NNNAN	T3500	1	13
13	\$TOP	1000	-	1000	:	:	:::::	ITO	1	END
14	t +50000 /	\$0000 \	f)	1000 /	η,		<u></u>	ито /	2	15
15	I-\$0000	28000	-	1000	:			ÌTI	2	18 -
•										•

Box A: POS

The positioning target position can be changed in this box. Double click any cell in the box, and the Target Position Reservation box appears.

	Target Postion Reservation	2	×
Displays the current setting.	1+1200000		
	Target Position	Position / Distance 1200000 [reference units] (-99999999 - 99999999)	
		OK Cancel	

Select the target position. The following table shows the six items that can be selected.

Selection Items	Display
Absolute position	A ±Position
Relative distance	I ±Distance
Infinity (Positive direction)	+INFINITE
Infinity (Negative direction)	-INFINITE
Stop	STOP
Serial stop	S + Position
Without reference	-

If "Absolute position," "Relative distance," or "Serial stop" is selected, type a number in the Position/Distance column.

Click **OK** to save the changes and return to the Program Table Editing window.

Box B: SPD

The speed can be typed directly in this box.

Box C: RDST

The registration relative distance can be set in this box. Double click any cell in the box, and the Registration Relative Position box appears.

Registration Relative Position	×
✓ No registration	
Registration Relative Position	
- [reference units]	
(0 - 99999999)	
Саг	ncel

Click OK to return to the Program Table Editing window without registration.

Do not select "No Registration" to register a relative position. Type the registration relative position.

Registration Relative Position	×
No registration	
Registration Relative Position	
80000 [reference units]	
(0 - 9999999)	
Cano	el

Click OK.

Box D: RSPD

The registration speed can be typed directly in this box.

Box E: ACC Box F: DEC

The acceleration and deceleration speeds can be set in this box. Double click any cell in one of these boxes, and the Acceleration and Deceleration box appears.

Acceleration/Deceleration	×
Acceleration	Deceleration
Acceleration	Deceleration
(1 - 99999999)	(1 - 99999999)
[1000reference units/min/ms]	[1000reference units/min/ms]
	OK Cancel

To set the same acceleration or deceleration speed as in the previous step, select "Same as previous step" and click **OK**.

To set a new speed, clear the previous setting by clicking "Same as previous step" to remove the checkmark. Then, type the new setting in the Acceleration or Deceleration box and click **OK**.

Box G: POUT

The output signals 0 to 7 can be set in this box. Double click any cell in the box, and the Output Signal box appears.

	Output Signal	×
Displays the current settings. The		
setting for output signal 0 is shown at	Output signal 0	Same as previous step
the far right, and	Output signal 1	Same as previous step 💌
that for output	Output signal 2	Same as previous step 💌
signal 7 at the far left.	Output signal 3	Same as previous step 💌
	Output signal 4	Same as previous step 💌
	Output signal 5	Same as previous step 💌
	Output signal 6	Same as previous step 💌
	Output signal 7	Same as previous step 💌
		OK Cancel

Select the output timing for the output signals. The following table shows the four items that can be selected.

Selection Items	Description	Display
Active	Always Active.	А
Not Active	Always Inactive.	Ν
Same as previous step	Continues previous state.	:
Zone	Sets a zone signal (Z0 to Z4) corre- sponding to the column.	Z

Ex.: The "ANN : ZZ : N" display shows the following settings.

Output Signal 0: Not Active

Output Signal 1: Same as previous step

Output Signal 2: Zone Signal Z2

Output Signal 3: Zone Signal Z3

Output Signal 4: Same as previous step

Output Signal 5: Not Active

Output Signal 6: Not Active

Output Signal 7: Active

Click **OK** to save the settings and return to the Program Table Editing window.

Box H: EVENT

The conditions can be set in this box. Double click any cell in the box, and the Event box appears.

Event	×	(
NTO		
Condition	Wait time	
NEAR	0 [ms]	
	(0 - 99999)	
	OK Cancel	

Select the conditions. The following table shows the items that can be selected.

Selection Items	Description	Display
Positioning Comple-	Establish conditions for INPOSITION	Ι
tion	band	
NEAR	Establish conditions for NEAR band	Ν
Command Issuance	Establish conditions for command issu-	D
Completion	ance completion	
SEL0, SEL1,	Establish conditions at signal (SEL0,	SEL0, SEL1,
	SEL1,) ON	
Wait Time	Establish conditions after a designated	T Wait Time
	wait time	
Same as previous	Use the same conditions as the previous	:
step	step	

If a item other than "same as previous step" is selected, type a wait time.

Click **OK** to save the settings and return to the Program Table Editing window.

Box I: LOOP

The number of times a step that is to be carried out can be typed directly in this box.

Box J: NEXT

The next step can be designated in this box. Double click any cell in the box, and the Next Step box appears.

Next Step	×
Complete	
Next step number	
(0 - 255)	
Cance	:

If the program ends in this step, select "Complete," and then click OK.

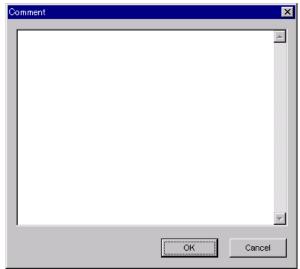
If the program continues, do not select "Complete," and type the number of the next step.

Next Step	x
Complete Next step number	
(0 - 255)	
OK Cancel	

Click OK to save the settings and return to the Program Table Editing window.

Comment

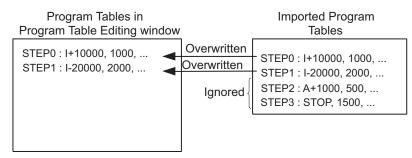
Comments can be typed or edited in the Comment box. Click **Comment**, and the Comment box appears.



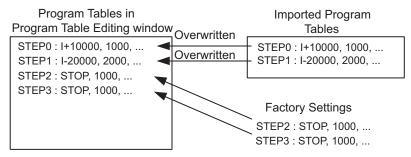
Import

Program table settings can be transferred or imported from a stored file with the Import function. If the imported program tables differ in number from the on-screen program tables, the following processing takes place.

• If the number of imported program tables is greater



• If the number of imported program tables is fewer



1. Click Import, and the Open box appears.

Open					? ×
Look jn:	YE_Applications	•	£	d	
20010313	102203.pgt				
File <u>n</u> ame:					<u>O</u> pen
Files of <u>t</u> ype:	Program table file(*.pgt)		•		Cancel
Product info	SGDH-A3BE/JUSP-NS600				
<u>C</u> omment:					

2. Select the file to be transferred, and click **Open**.

Write

The program tables can be written to the SERVOPACK with the Write function. Click **Write**, and a warning message will appear reminding you that the data erased if the power is turned off.



Click OK to write in the data.

Click Cancel to return to the Program Table Editing window without writing in the data.

<Differences Between Write and Save>

- Write: Saves table data to the SERVOPACK in temporary storage. The data in the table is deleted when the power is turned OFF.
- **Save**: Saves the data in the table that is stored in the SERVOPACK memory to the flash memory. The data for the tables remains unchanged if power is turned off.

Read

The program tables can be read within the connected SERVOPACK with the Read function. Click **Read**, and a message will appear, confirming if you want to read the table data.



Click **OK** to start reading and overwriting the table data.

Click Cancel to return to the Program Table Editing window without reading the table data.

Save

The data in the table can be saved to the flash memory with the Save function. Click **Save**, and a warning message will appear reminding you that the data may different than that of the SERVOPACK.



Click **Cancel** to return to the Program Table Editing window. Then by clicking **Write**, write program table that is currently displayed but has not been stored into the SERVOPACK.

If already saved in temporary storage, click OK. A conformation message appears.

Save Table	х
Saves table data into flash memory. Continue this process?	
OK Cancel	

Click **OK** to save the data.

Click Cancel to return to the Program Table Editing window without saving the data.

Initialize

The settings of the SERVOPACK can be returned to the factory settings with the Initialize function. Click **Initialize**, and a verification message appears.

Initialize		\times
Returns to factory settings. When this function is impleme which has been saved is era Is this acceptable?	•	9
Initialize	Cancel	

Click Initialize to initialize the program tables.

Click Cancel to return to the Program Table Editing window without changing the settings.

Station Split Station Split Button

A specified number of stations at equal intervals can be created between specified positions. And each station position can be allocated to the program table.

Two types of station splits are available: linear and rotation. The window differs in accordance with the method of moving the load.

Click the Station Split button, station split , and the Station Split Selection box appears.

< Linear Movement of Loads >

Station split selection	×
Because the method of moving the load is set to the Linear type division becomes a Linear station split.	
Please set up a change of rotation/linear type by "Pn81A:Moving mode".	
Next> Car	ncel

1. Click Next.

Linear station split	×
Start position End position Station2 Station1 Station1 Station0 Station2 Station1 Station1 Station0	Range setting Condition setting Select the starting and ending point. Select the starting point and interval. Start position -99999999 [reference units] (-99999999) End position 99999999 [reference units] (-99999999) End position 99999999 [reference units] (-99999999) Station number [256 (2 - 256) Positioning speed [1000 [1000reference (1 - 9999999) [1000reference (1 - 9999999)
-	<back cancel<="" ok="" td=""></back>

2. Type the values for the settings and click **OK**. The Program Table Editing window will appear.

ese Prog	ram Table Editing A			on Board						×
	ê 🖪 🖪	🚊 Station s							📴 Commen	it
									🔠 Import	
STEF	P POS SPD	RDST	RSPD	ACC	DEC	POUT	EVENT	LOOP	NEXT	
0	A-9999 1000	-	1000				ITO	1	END	
1	A-99211000	—	1000	:	1	111111111	ITO	1	END	
2	A-9843 1000	—	1000	:	1	111111111	ITO	1	END	
3	A-9764 1000	-	1000	:	1	111111111	ITO	1	END	
4	A-9686:1000	-	1000	:	1		ITO	1	END	
5	A-9607 1000	-	1000	:	:	11111111	ITO	1	END	
6	A-9529 1000	-	1000	:	:	11111111	ITO	1	END	
7	A-9450 1000	-	1000	1	:	11111111	ITO	1	END	
8	A-9372 1000	-	1000	:	:	111111111	ITO	1	END	
9	A-9294 1000	-	1000	:	:	111111111	ITO	1	END	
10	A-9215 1000	-	1000	:	:	111111111	ITO	1	END	
11	A-9137:1000	-	1000	1	:	111111111	ITO	1	END	
12	A-9058 1000	-	1000	1	1		ITO	1	END	
13	A-8980 1000	-	1000	:	:	111111111	ITO	1	END	
14	A-8901 1000	-	1000	1		111111111	ITO	1	END	•
	Initialize	Save					Read		Write	

< Rotational Movement of Loads >

Station split selection	×				
Because the method of moving the load is set to the Rotary type division becomes a Rotary station split.					
Please set up a change of rotation/linear type by "Pn81A:Moving mode".					
(<u>N</u> ext> Cance					

1. Click Next.

Rotary station split	×
Starting position Station0 Station1 Station2	Range setting Condition setting Condition setting Condition setting Select tone load axis rotation from the starting point. Select the starting and ending point. Select the starting point and interval. Start position -99999999 [reference units] (-99999999 - 99999999)
It creates a number of the stations specified on the load axis at equal intervals, and allot the station number to the program step. In position at the specified position by specify the program step.	Station number
Beginning 99999999 [reference units] End 99999999 [reference units]	(2 - 256) Positioning speed 1000 [1000reference (1 - 99999999) units/min]
I	<back cancel<="" ok="" td=""></back>

2. Type the values for the settings and click **OK**. The Program Table Editing window will appear.

Prog	ogram Table Editing AXIS#1 : SGDY-1R6AE1A/Option Board										
	ê 🖪	8	🚊 Station sp				Comment				
STEF	POS	SPD	RDST	RSPD	ACC	DEC	POUT	EVENT	LOOP	NEXT	
0	A-9999	1000	-	1000	:	:		ITO	1	END	
1	A-9921	1000	-	1000	1	1		ITO	1	END	
2	A-9843	1000	-	1000	1.00	1	11111111	ITO	1	END	
3	A-9765)	1000	—	1000	1	:	111111111	ITO	1	END	
4	A-9687	1000	—	1000		:	11111111	ITO	1	END	
5	A-9609:		—	1000	:	:	111111111	ITO	1	END	
6	A-9531;		—	1000	1	:	111111111	ITO	1	END	
7	A-9453;	1000	—	1000	1	:	111111111	ITO	1	END	
8	A-9374	1000	-	1000	1	:	111111111	ITO	1	END	
9	A-9296	1000	-	1000	:	:	111111111	ITO	1	END	
10	A-9218	1000	-	1000	1	:	11111111	ITO	1	END	
11	A-9140		—	1000	1	:	111111111	ITO	1	END	
12	A-9062		-	1000	1	:	111111111	ITO	1	END	
13	A-8984:		-	1000	:	:	111111111	ITO	1	END	
14	A-8906;	1000	-	1000	:	1	111111111	ITO	1	END	-
	Initial	ize	Save]				Read		Write	

(Print) Button

The data on the Program Table Editing window can be printed. To print the data, click the

Printing Item Setting	Printing Item Setting
Cover	Cover
Attaching the Cover Editing	Attaching the Cover Cover Editing
Where to Submit Vitriere to Submit (No.1) Vitriere to Submit (No.2) Vitriere to Submit (No.3)	Where to Submit Where to Submit (No.1) O Where to Submit (No.2) O Where to Submit (No.3)
Item Name Setting Value Title Company Name Department Name Name	Item Name Setting Value Title Company Name Department Name Name
Data for each function	Data for each function
Program Table Header & Footer Printing items Header Info Title Models Info Printing Date File Name Footer Info Pages	Program Table Header & Footer Program Table Printing Items Program Table Print Range © Print all STEP. © Print only STEP which defined program. © Select the Print STEP. Start End Others Image: Comments
Color Selection © Black and White C Color	Color Selection
OK Cancel	OK Cancel

button. The Printing Item Setting dialog box appears.



Printing Items Tab

Printing Item Setting Box

Cover

Select Attaching the Cover, and the click Cover Editing. For details, see Chapter 3.

Data for each function

To enter your printing preferences or specifications, click the tab whose options you want to enter or change, and enter the desired settings.

Color Selection

Documents can be printed in color or black and white. Select your preference.

After setting is finished, click **OK**. The document appears on the screen the way it will appear in print.

eviev	*										
rint.	. Q	Q 100 %	- 4	. 👍 1/3	-	<u>B</u> ack ⇒	Forward E	liting of t	he Printing It	ems	
		gram Tab						Prin	ting Date : M		
	SGDH	-A5BE/JUSP	N S601						File	Name :	
	Pro	gram Tabl	e								
	STEP	POS	SPD	RDST	RSPD	R	SPD :	×1000r	ce units) eference un eference un EVENT	its/min/r	
		STOP	1000		1000				ITO		END
	1	STOP	1000		1000	:	:		ITO		END
	2	STOP	1000	-	1000	:	:		ITO	1	END
	3	STOP	1000	-	1000	:	:		ITO	1	END
	4	STOP	1000	-	1000	:	:		ITO	1	END
	5	STOP	1000	-	1000	:	:		ITO	1	END
	6	STOP	1000	-	1000	:	:		ITO	1	END
	7	STOP	1000	-	1000	:	:		IT0	1	END
	8	STOP	1000	-	1000	:	:		ITO	1	END
	9	STOP	1000	-	1000	1	1		ITO	1	END
		STOP									END

To print the document as is without any changes, click **Print**.

To return to the Printing Item Setting dialog box and change some settings, click **Editing of the Printing Items**.

When Offline

In the SigmaWin+ Σ -7 component main window, click **Table** and then click **Edit Program Table**. The Program Table Editing box appears.



Load From File: Reads existing data.

Select New SERVOPACK: Creates new data.

Select the desired command and click OK.

<When "Load from File" is Selected>

When "Load from File" is selected, the Open box appears.

Open				? ×
Look jn:	YE_Applications	•	E	* 🔳
20010313	102203.pgt			
File <u>n</u> ame:	[<u>O</u> pen
Files of <u>type</u> :	Program table file(*.pgt)		•	Cancel
Product info				
<u>C</u> omment:				

Select the data to be imported, and click **Open**.

< When "Select New SERVOPACK" is Selected >

1. When "Select New SERVOPACK" is selected, the SERVOPACK Selection box appears.

Servopack Sel				X				
Servop Servopack mo	ack: ***** _ *		ent [Max. applicable :	notor capacity]				
Enter the Ser	Version/Special Spec. Enter the Servopack version number. (Use the digital operator to find out the version number.) Unknown number.) Note: Select the Unknown check box to set the version to the latest.							
		J Safety option	Eeedh	ack option				
Option Module Model:								
Ver.:	Unknown	Unk	nown	Unknown				
Special Spec.:	· · · · · · · · · · · · · · · · · · ·] [~	V				
	OK Cancel							

2. Select the SERVOPACK model and current [max. applicable motor capacity].

Servopack Sel	ection								
Motor type	Motor type Rotary								
Servop	ack: <u>SGD7S-</u> F	R90 * E0A							
Servopack mo	Servopack model Current [Max. applicable motor capacity]								
SGD7S-***E	SGD7S-****E0A(Command-Option module type single axis) R70 (0.66Arms, AC200V) [50W]								
	R90 (0.91 Arms, AC200V) [100W] 1R6 (1.6Arms, AC200V) [200W]								
		3R	8 (2.8Arms, AC200V) [400VV] 8 (3.8Arms, AC200V) [500VV]						
I ⊢Version/Spe	cial Spec.	120	25 (5 5 0 ymp - 0 C200) () 1750000						
	vopack version number. tal operator to find out the ver:	sion	Unknown Note: Select the Unknown check box to set the version to the latest.						
Select the Sp	pecial Spec. number.	Standard	•						
	Reference option	Safety option	Feedback option						
Option Module Model:	Dption Module SGDV-OCA03A(INDEXER) Unmounted (No match) Inmounted (No match)								
Ver.:	0000 🗖 Unknown		nknown						
Special Spec.:	Standard	•	Y						
	OK Cancel								

3. Type the version number of the SERVOPACK.

If the version number is unknown, select Unknown.

- 4. Select the specifications of the SERVOPACK.
- 5. Select the reference option module. Select SGDV-OCA03A (INDEXER).

ervopack Sel	ection		×					
Motor type	Rotary							
Servop	ack: SGD7S-	R90 * E0A						
Servopack mo		Current Bi	tax. applicable motor capacity]					
	DA(Command-Option module	type single axis) R70 (0.66	6Arms, AC200V) [50VV]					
	R90 (0.91Arms, AC200V) (100W) 1R6 (1.6Arms, AC200V) [200W]							
		2R8 (2.8/	Arms, AC200V) [400W]					
			Arms, AC200V) [500W]					
-Version/Spe	cial Spec.							
	vopack version number. al operator to find out the ve		nown Note: Select the Unknown check box to set the version to the latest.					
Select the Sp	ecial Spec. number.	Standard	-					
	Reference option	Safety option	Feedback option					
Option Module Model:	SGDV-OCA03A(INDEXER)	Unmounted (No match) SGDV-OSA01A(Safety)	Module SGDV-OFA01A(Fully-close					
Model:		SODY-OSACTA(Salety)	SGDV-OFB01A(Feedback(
			SGDV-OFB03A(Feedback()					
	I							
Ver.:	0000 🗌 Unknown	Unknow	n 0000 🗖 Unknown					
Special Spec.:	Standard	•	Standard					
		OK Cancel]					

6. Type the version number of the reference option module. If the version number is unknown, select **Unknown**. 7. Select the specifications of the reference option module, and then click **OK**. The data will be imported, and the Program Table Editing window will appear.

			—— Prints t	the prograi he Prograr he specifie	d area into a	ling window.	umber of station	ns at equal	intervals	5.
			Station :		34					Commer
ΓEΡ	POS	SPD	RDST	RSPD	ACC	DEC	POUT	EVENT	LOOP	NEXT
0	STOP	1000	-	1000	ACC	DEC	POUT	ITO	1	END
0 1	STOP STOP	1000 1000	-	1000	ACC	DEC	POUT	ITO ITO	LOOP	END END
0 1 2	STOP STOP STOP	1000 1000 1000	-	1000 1000 1000	ACC	DEC		ITO ITO ITO	LOOP 1 1 1 1 1 1	END END END
0 1 2 3	STOP STOP STOP STOP	1000 1000 1000 1000		1000 1000 1000 1000	ACC	DEC	POUT	ITO ITO ITO ITO	LOOP 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	END END END END
0 1 2 3 4	STOP STOP STOP STOP STOP	1000 1000 1000 1000 1000	-	1000 1000 1000 1000 1000	ACC : : : : : : : : : : : : : : : : : :	DEC		ITO ITO ITO ITO ITO ITO	LOOP 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	END END END END END
0 1 2 3 4 5	STOP STOP STOP STOP STOP STOP	1000 1000 1000 1000 1000 1000		1000 1000 1000 1000 1000 1000	ACC	DEC		ITO ITO ITO ITO ITO ITO ITO	LOOP 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	END END END END END END
0 1 2 3 4 5 6	STOP STOP STOP STOP STOP STOP STOP	1000 1000 1000 1000 1000 1000 1000		1000 1000 1000 1000 1000 1000 1000	ACC	DEC		ITO ITO ITO ITO ITO ITO ITO ITO	LOOP 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	END END END END END END END
0 1 2 3 4 5 6 7	STOP STOP STOP STOP STOP STOP	1000 1000 1000 1000 1000 1000		1000 1000 1000 1000 1000 1000	ACC : : : : : : : : : : : : : : : : : :	DEC		ITO ITO ITO ITO ITO ITO ITO ITO ITO	LOOP 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	END END END END END END
0 1 2 3 4 5 6 7 8	STOP STOP STOP STOP STOP STOP STOP STOP	1000 1000 1000 1000 1000 1000 1000 100		1000 1000 1000 1000 1000 1000 1000 100	ACC	DEC		IT0 IT0 IT0 IT0 IT0 IT0 IT0 IT0 IT0 IT0	100P 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	END END END END END END END END END
0 1 2 3 4 5 6 7 8 9	STOP STOP STOP STOP STOP STOP STOP STOP	1000 1000 1000 1000 1000 1000 1000 100		1000 1000 1000 1000 1000 1000 1000 100	ACC	DEC		ITO ITO ITO ITO ITO ITO ITO ITO ITO	100P 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	END END END END END END END END END END
0 1 2 3 4 5 6 7 8 8 9 .0	STOP STOP STOP STOP STOP STOP STOP STOP	1000 1000 1000 1000 1000 1000 1000 100		1000 1000 1000 1000 1000 1000 1000 100	ACC	DEC		IT0 IT0 IT0 IT0 IT0 IT0 IT0 IT0 IT0 IT0	LOOP 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	END END END END END END END END END END
0 1 2 3 4 5 6 7 8 9 10 11	STOP STOP STOP STOP STOP STOP STOP STOP	1000 1000 1000 1000 1000 1000 1000 100		1000 1000 1000 1000 1000 1000 1000 100	ACC	DEC		IT0 IT0	LOOP 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	END END END END END END END END END END
0 1 2 3 4 5 6 7 8 9 10 11 12	STOP STOP STOP STOP STOP STOP STOP STOP	1000 1000 1000 1000 1000 1000 1000 100		$\begin{array}{c} 1000\\ 1000\\ 1000\\ 1000\\ 1000\\ 1000\\ 1000\\ 1000\\ 1000\\ 1000\\ 1000\\ 1000\\ 1000\\ 1000\\ 1000\\ 1000\\ \end{array}$	ACC	DEC DEC		IT0 IT0 IT0 IT0 IT0 IT0 IT0 IT0 IT0 IT0	LOOP 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	END END END END END END END END END END

Program Table Editing Window (Offline Mode)

Default values are displayed in gray. The settings in this window are all gray as they are default settings.

STEP	POS	SPD	RDST	RSPD	ACC	DEC	POUT	EVENT	LOOP	NEXT
0		1/00		1/00					$\langle \ \rangle$	EV
1	STOP	1000	(-)	4000	(:)	(*)	(:::::)	ITO	(1	END
2	STOP	1000	-	1000	:	1	:::::	ITO	1	END
3	STOP	1000	_	1000	1	1	:::::	ITO	1	END
4	STOP	1000	_	1000	:	2	:::::	ITO	1	END
5	STOP	1000	_	1000	:	1	:::::	ITO	1	END
6	STOP	1000	-	1000	:	1	:::::	ITO	1	END
7	5TO(A)	(B)	(C)	(D)	Ê (Ê)	E E	(G)	H H		J
8	STOP	1000	- 0				\odot		$1 \cup$	END V
9	STOP	1000	-	1000	1	1		ITO	1	END
10		1000	-	1000	1	1	11111	ITO	1	END
11	STOP	1000	-	1000	1	1	11111	ITO	1	END
12	STOP	1000	-	1000	1	1	:::::	ITO	1	END
13	STOP	1000	-	1000	:	1		ITO	1	END
14	FIOP	1000	Ę/	1000	$\langle $	()	<u> </u>	TTO	<u>\</u>	END /
15	SNP	100		1					1	

Box A: POS

The positioning target position can be changed in this box. Double click any cell, and the Target Position Reservation box appears.

	Target Postion Reservation	×
Displays the current setting.	I+1200000	
	Target Position	Position / Distance 1200000 [reference units] (-999999999 - 99999999)
		OK

Select the target position. The following table shows the six items that can be selected.

Selection Items	Display
Absolute Position	A ±Position
Relative Distance	I ±Distance
Infinity (Positive direction)	+INFINITE
Infinity (Negative direction)	-INFINITE
Stop	STOP
Serial Stop	S + Position
Without reference	-

If "Absolute Position," "Relative Distance," or "Serial Stop" is selected, type a number in the Position/Distance column.

Click OK to save the changes and return to the Program Table Editing window.

Box B: SPD

The speed can be typed directly in this box.

Box C: RDST

The registration relative distance can be set in this box. Double click any cell, and the Registration Relative Position box appears.

Registration Relative Position	×
No registration	
Registration Relative Position	
(0 - 99999999)	
OK	

Click OK to return to the Program Table Editing window without registration.

Do not select "No Registration" to register a relative position. Type the registration relative position.

Registration Relative Position	×
No registration	
Registration Relative Position 80000 [reference units] (0 - 99999999)	
	ncel

Click OK.

Box D: RSPD

The registration speed can be typed directly in this box.

Box E: ACC Box F: DEC

The acceleration and deceleration speeds can be set in this box. Double click any cell in one of these boxes, and the Acceleration and Deceleration box appears.

Acceleration/ Deceleration	×
Acceleration	Deceleration
Same as previous step	☑ Same as previous step
Acceleration	Deceleration
(1 - 99999999)	(1 - 99999999)
[x1000reference units/min/ms]	[x1000reference units/min/ms]
	OK Cancel

To set the same acceleration or deceleration speed as in the previous step, select "Same as previous step" and click **OK**.

To set a new speed, clear the previous setting by clicking "Same as previous step" to remove the checkmark. Then, type the new setting in the Acceleration or Deceleration box and click **OK**.

Box G: POUT

The output signals 0 to 7 can be set in this box. Double click any cell in the box, and the Output Signal box appears.

	Output Signal	×
Displays the current settings. The		
setting for output signal 0 is shown at the far left, and that	Output signal 0 Same as previous step	
for output signal 7 at the far right.	Output signal 1 Same as previous step	
	Output signal 2 Same as previous step	
	Output signal 3 Same as previous step	
	Output signal 4 Same as previous step	
	OK	

Select the output timing for the output signals. The following table shows the four items that can be selected.

Selection Items	Description	Display	
Active	Always Active.	А	
Not Active	Always Inactive.	Ν	
Same as previous step	Continues previous state.	:	
Zone	Sets a zone signal (Z0 to Z4) corre- sponding to the column.	Ζ	

Ex.: The "ANN : ZZ : N" display shows the following settings.

Output Signal 0: Not Active

Output Signal 1: Same as previous step

Output Signal 2: Zone Signal Z2

Output Signal 3: Zone Signal Z3

Output Signal 4: Same as previous step

Output Signal 5: Not Active

Output Signal 6: Not Active

Output Signal 7: Active

Click OK to save the settings and return to the Program Table Editing window.

Box H: EVENT

The conditions can be set in this box. Double click any cell in the box, and the Event box appears.

Event				×
Condition NEAR	×	Wait time 0 (0 - 9	[ms] 19999)	
		ок	Cancel]

Select the conditions. The following table shows the ten items that can be selected.

Selection Items	Description	Display
Positioning Comple-	Establish conditions for INPOSITION	Ι
tion	band	
NEAR	Establish conditions for NEAR band	Ν
Command Issuance Completion	Establish conditions for command issuance completion	D
SEL0, SEL1,	Establish conditions at signal (SEL0, SEL1,) ON	SEL0, SEL1,
Wait Time	Establish conditions after a designated wait time	T Wait Time
Same as previous step	Use the same conditions as the previous step	:

If a item other than "same as previous step" is selected, type a wait time.

Click **OK** to save the settings and return to the Program Table Editing window.

Box I: LOOP

The number of times a step that is to be carried out can be typed directly in this box.

Box J: NEXT

The next step can be designated in this box. Double click any cell in the box, and the Next Step box appears.

Ne	xt Step	J
	Complete Next step number END	
	(0 - 255)	
	OK Cancel	

If the program ends in this step, select "Complete," and then click OK.

If the program continues, do not select "Complete," and type the number of the next step.

Next	Step	×
	Complete	
	Next step number	
	(0 - 255)	
	ок с	ancel

Click OK to save the settings and return to the Program Table Editing window.

(Open) Button

The parameters file can be loaded in the Open box. To load the file, use the following procedure.

1. Click the 📄 button, and the Open box appears.

Open					? ×
Look jn:	YE_Applications	•	£	C	
20010313	1102203.pgt				
					1
File <u>n</u> ame:					<u>O</u> pen
Files of <u>type</u> :	Program table file(*.pgt)		•		Cancel
Product info	SGDH-A3BE/JUSP-NS600				
<u>C</u> omment:					

2. Select the name of the file to be imported, and click **Open**.

(New) Button

A new SERVOPACK and option module can be selected in the SERVOPACK Selection box using the New command. To change to a different SERVOPACK or option module, use the following procedure.

1. Click the 🔲 button, and the SERVOPACK Selection box appears.

ervopack Sele	ection Rotary		
Servop	ack:	*** * ****	
Servopack mo	odel	Current	Max. applicable motor capacity]
SGD7S-***E	DA(Command-Option module t		
(Use the digit number.)	icial Spec. vopack version number. tal operator to find out the ver becial Spec. number.	ision	nown Note: Select the Unknown check box to set the version to the latest.
	Reference option	Safety option	Feedback option
Option Module Model:			
Ver.:	Unknown	Unknov	vn 🗖 Unknown
Special Spec.:		-	
		OK	

2. Select the SERVOPACK model and current [max. applicable motor capacity].

ervopack Sele	ection		×							
Motor type	Rotary									
Servop	ack: SGD7S-	R90 * E0A								
		<u> </u>								
Servopack model Current [Max. applicable motor capacity] SGD75-***E0A(Command-Option module type single axis) R70 (0.66Arms, AC200V) [50W]										
00010- 2	SGD/S-***EUA(Command-Option module type single axis) R/0 (0.66Arms, AC200V) [50W] R90 (0.91Arms, AC200V) [100W]									
			Arms, AC200V) [200W] Arms, AC200V) [400W]							
		3R8 (3.8	Arms, AC200V) [500W]							
- Version/Spe	cial Spec.	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,								
	Enter the Servopack version number. (Use the digital operator to find out the version number.) Unknown Note: Select the Unknown check box to set the version to the latest.									
Select the Sp	becial Spec. number.	Standard	•							
	Reference option	Safety option	Feedback option							
Option Module	SGDV-OCA03A(INDEXER)	Unmounted (No match)								
Model:		SGDV-OSA01A(Safety	Module SGDV-OFA01A(Fully-close SGDV-OFB01A(Feedback(
			SGDV-OFB03A(Feedback()							
	I									
Ver.:	0000 🗌 🗍 Unknown	Unknow	/n 🔲 🗖 Unknown							
Special Spec.:	Standard	•	Y							
		OK Cancel]							

3. Type the version number of the SERVOPACK.

If the version number is unknown, select Unknown.

- 4. Select the specifications of the SERVOPACK.
- 5. Select the reference option module. Select SGDV-OCA03A (INDEXER).

Servopack Sele	ection		×						
Motor type	Rotary								
Servop	ack: <u>SGD7S-</u> F	R90 * E0A							
			· · · · · · · · · · · · · · · · · · ·						
Servopack model Current [Max. applicable motor capacity] SGD7S-***E0A(Command-Option module type single axis) R70 (0.66Arms, AC200V) [50W]									
		R90 (0.9	11 Arms, AC200V) (100W)						
			Arms, AC200V) [200W] Arms, AC200V) [400W]						
			Arms, AC200V) [500W]						
Version/Spe	cial Spec.								
	Enter the Servopack version number. (Use the digital operator to find out the version number.) number.)								
Select the Sp	ecial Spec. number.	Standard	-						
	Reference option	Safety option	Feedback option						
Option Module Model:	SGDV-OCA03A(INDEXER)	Unmounted (No match) SGDV-OSA01A(Safety	/Module SGDV-OFA01A(Fully-close						
			SGDV-OFB01A(Feedback() SGDV-OFB03A(Feedback()						
		•							
Ver.:	0000 🗌 Unknown	Unknov							
Special Spec.:	Standard	•	Standard						
		OK Cancel]						

6. Type the version number of the reference option module.

If the version number is unknown, select Unknown.

7. Select the specifications of the reference option module, and then click **OK**. The data will be imported, and the Program Table Editing window will appear.

(Print) Button

The data on the Program Table Editing window can be printed. To print the data, click the

button. The Printing Item Setting dialog box appears.

Printing Item Setting	Printing Item Setting
Cover	Cover
Cover Editing	Attaching the Cover Cover Editing
Where to Submit C Where to Submit (No.1) C Where to Submit (No.2) C Where to Submit (No.3)	Where to Submit Where to Submit (No.1) O Submit (No.2) O Submit (No.3)
Item Name Setting Value	Item Name Setting Value
Company Name	Company Name
Department Name	Department Name
Name	Name
Data for each function	Data for each function
Program Table	Program Table
Header & Footer Printing Items	Header & Footer Printing Items
Header Info-	Program Table Print Range
✓ Title Program Table	Print all STEP.
Models Info	C Print only STEP which defined program.
Printing Date	C Select the Print STEP. Start End
🔽 File Name	Others
Footer Info	Comments
✓ Pages	
Color Selection	Color Selection
Black and White C Color	Black and White Color
OK Cancel	OK Cancel

Header & Footer Tab

Printing Items Tab

Printing Item Setting Box

Cover

Select Attaching the Cover, and the click Cover Editing. For details, see Chapter 3.

Data for each function

To enter your printing preferences or specifications, click the tab whose options you want to enter or change, and enter the desired settings.

Color Selection

Documents can be printed in color or black and white. Select your preference.

After setting is finished, click **OK**. The document appears on the screen the way it will appear in print.

🖨 Print Preview	٧													
🔟 🥔 <u>P</u> rint.	. Q	Q 100%	- 4	1/3	+	<u>B</u> ack ⇒	Forward E	diting of I	the Printing It	ems				
												1		
	Pro	gram Tab	le					Dvie	nting Date : N	larch 05	2002			
		-A5BE/JUSP						FIL		Name :				
	Pro	gram Tabl	e											
						[Unut] P	08 :	[referen	ce units]					
						SI	PD :	(x1000r	eference un	its/min]				
						R	DST :	(referen	ce units]					
						R	SPD :	(x1000r	eference un	its/min]				
						A	CC/DEC :	(x1000r	eference un	its/min/r	ms)			
	STEF	POS	SPD	RDST	RSPD	ACC	DEC	POUT	EVENT	LOOP	NEXT			
	0	STOP	1000	·	1000	:	:		ITO	1	END			
	1	STOP	1000	-	1000	:	:		ITO	1	END			
	2	STOP	1000	-	1000	:	:		ITO	1	END			
	3	STOP	1000	-	1000	:	:		ITO	1	END			
	4	STOP	1000	-	1000	:	:		ITO	1	END			
	5	STOP	1000	-	1000	:	:		ITO	1	END			
	6	STOP	1000	-	1000	1	:		ITO	1	END			
	7	STOP	1000	-	1000	:	1		ITO	1	END			
	8	STOP	1000	-	1000	:	1		ITO		END			
	9	STOP	1000	-	1000	1	:		ITO	1	END			
1	10	STOP	1000	-	1000				ITO	1	END			

To print the document as is without any changes, click **Print**.

To return to the Printing Item Setting dialog box and change some settings, click **Editing of the Printing Items**.

Station Split Station Split Button

A specified number of stations at equal intervals can be created between specified positions. And each station position can be allocated to the program table.

Click the Station Split button, 🖉 Station Split , and the Station Split Selection box appears.



Select the split method, and click OK.

< When Linear is selected >

Linear station split	X
Start position End position Station2 Station1 Station0	Range setting Condition setting Select the starting and ending point. Select the starting point and interval. Start position -99999999 [reference units] (-999999999 - 99999999) End position
It creates a number of stations specified between the starting position and the end position at equal intervals, and allot the station number to the program step. In position at the specified position by specify the program step.	End position 99999999 [reference units] (-99999999 - 99999999) Station number 256 (2 - 256)
	Positioning speed 1000 [1000reference (1 - 99999999) units/min]

Type the values for the settings and click **OK**. The Program Table Editing window will appear.

	2 8	8	🏨 Station s	1						Commer
TEP	POS	SPD	RDST	RSPD	ACC	DEC	POUT	EVENT	LOOP	NEXT
0	A-9999	1000	—	1000	:	:		ITO	1	END
1	A-9921!	1000	-	1000	:	:		ITO	1	END
2	A-9843	1000	-	1000	:	:	111111111	ITO	1	END
3	A-9764	1000	-	1000	:	:	111111111	ITO	1	END
4	A-9686:	1000	-	1000	:	:	1111111111	ITO	1	END
5	A-9607	1000	-	1000	:	:		ITO	1	END
6	A-9529	1000	-	1000	:	:		ITO	1	END
7	A-9450	1000	-	1000	:	:		ITO	1	END
8	A-9372	1000	-	1000	:	:		ITO	1	END
9	A-9294	1000	-	1000				ITO	1	END
10	A-9215		-	1000	:	1		ITO	1	END
11	A-9137		_	1000		1		ITO	1	END
12	A-9058		_	1000				ITO	1	END
13	A-8980:		_	1000				ITO	1	END
	A-8901		_	1000				ITO		END

< When Rotary is selected >

Load axis data setting	×
Please set the begging and end one load axis rotation.	f of the motor which needs
	Beginning 0 [reference units]
	(-999999999 - 99999999) end 99 [reference units]
	(-99999999 - 99999999)
< <u>B</u> ack	Next> Cancel

1. Type the beginning and end of the motor which needs one rotation of load axis, and click **Next**.

Rotary station split	×
Starting position Station0 Station1 Station2	Range setting Condition setting Select one load axis rotation from the starting point. Select the starting and ending point. Select the starting point and interval. Start position 99999999 [reference units] (-99999999 - 9999999)
It creates a number of the stations specified on the load axis at equal intervals, and allot the station number to the program step. In position at the specified position by specify the program step.	Station number
Beginning -99999999 [reference units]	(2 - 256)
End 999999999 [reference units]	Positioning speed 1000 [1000reference (1 - 99999999) units/min]
	<back cancel<="" ok="" td=""></back>

2. Type the values for the settings and click **OK**. The Program Table Editing window will appear.

響 Program Table Editing : SGDY-****E1A/SGDY-OCA03A											
	2 8	8	🚆 Station sp	lit						Commen	
STEP	POS	SPD	RDST	RSPD	ACC	DEC	POUT	EVENT	LOOP	NEXT	▲
0	A-9999	1000	-	1000				ITO	1	END	
1	A-9921		-	1000	:		111111111	ITO	1	END	
2	A-9843		-	1000	:	1	111111111	ITO	1	END	
3	A-9765)		-	1000	:	:	111111111	ITO	1	END	
4	A-9687		-	1000	:	:		ITO	1	END	
5	A-9609:		-	1000	:	:	111111111	ITO	1	END	
6	A-9531;		-	1000	:	:	111111111	ITO	1	END	
7	A-9453		-	1000	1	1	111111111	ITO	1	END	
8	A-9374		-	1000	1	1	111111111	ITO	1	END	
9	A-9296		-	1000	1	1	111111111	ITO	1	END	
10	A-9218		-	1000	:	:	111111111	ITO	1	END	
11	A-9140		-	1000	:	1	111111111	ITO	1	END	
12	A-9062		-	1000	:		111111111	ITO	1	END	
13	A-8984:		-	1000	1	1		ITO	1	END	
14	A-8906;	1000	-	1000	1	1	111111111	ITO	1	END	-

Comment

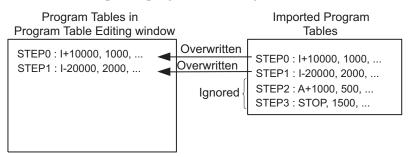
Comments can be typed or edited in the Comment box. Click **Comment**, and the Comment box appears.

Comment			×
	 		
			7
		ОК	Cancel
		3	

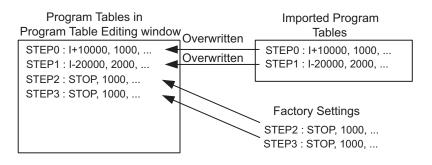
Import

Program table settings can be transferred or imported from a stored file with the Import function. If the imported program tables differ in number from the on-screen program tables, the following processing takes place.

• If the number of imported program tables is greater



• If the number of imported program tables is fewer



1. Click **Import**, and the Open box appears.

Open			? ×
Look jn:	YE_Applications	•	<u>e</u>
200103131	02203.pgt		
File <u>n</u> ame:			<u>O</u> pen
Files of type:	Program table file(*.pgt)	•	Cancel
Product info			
<u>C</u> omment:			
	1		

2. Select the file to be transferred, and click **Open**.

4.9.2 Zone Table Editing

Zones can be viewed and edited in the Zone Table Editing window. Designate a zone by setting the starting and ending positions of the zone. The INDEXER option module will send five output signals (/POUT0 to /POUT4) corresponding to the zone of the current position according to the zone table.

The windows differ in the Online and Offline modes.

When Online

In the SigmaWin+ Σ -7 component main window, click **Table** and then click **Edit Zone Table**. The Zone Table Editing window appears.

Saves the zone table data.	
Prints the Zone Table Editing window.	
Zone Table Editing AXIS#1: SGDV-1R6AE1A/Option Board	×
Unit: [reference units]	
ID Z4 Z3 Z2 Z1 Z0 ZONEN ZONEP	
5 🛛 🔿 🔿 🔿 🔿 0	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	
	Comment
O Active O Non-Active	🗎 Import
Initialize Save Read	Write
	-

Zone Table Editing Window (Online Mode)

Thirty-two types of zones can be set. The five signals (Z0 to Z4) correspond to the following: Z0 = /POUT0, Z1 = /POUT1, Z2 = /POUT2, Z3 = /POUT3, Z4 = /POUT4.

Box A: ZONEN

The zone starting position (ZONEN) can be designated directly in this box.

Box B: ZONEP

The zone ending position (ZONEP) can be designated directly in this box.

Comment

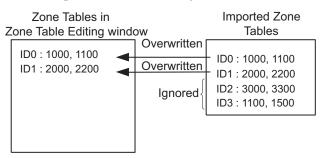
Comments can be typed or edited in the Comment box. Click **Comment**, and the Comment box appears.

Comment		×
		A
		~
,	2000	
	OK	Cancel

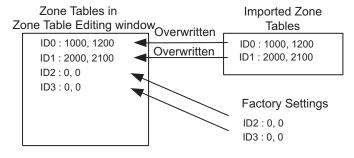
Import

Zone table settings can be transferred or imported from a stored file with the Import function. If the imported zone tables differ in number from the on-screen zone tables, the following processing takes place.

• If the number of imported zone tables is greater



• If the number of imported zone tables is fewer



1. Click Import and the Open box appears.

Open	? ×
Look jn: 🗋	YE_Applications 💽 🗢 🛅 📅
E 200903200	174303
, File <u>n</u> ame:	20090320074303
Files of type:	Zone table file(*.znt)
Product Info	SGDV-1R6AE1A/Option Board
<u>C</u> omment:	

2. Select the file to be transferred, and click **Open**.

Write

The program tables can be written to the SERVOPACK with the Write function. Click **Write**, and a warning message will appear reminding you that the data erased if the power is turned off.



Click **OK** to write in the data.

Click Cancel to return to the Zone Table Editing window without writing in the data.

<Differences Between Write and Save>

Write: Saves table data to the SERVOPACK in temporary storage. The data in the table is deleted when the power is turned OFF.

Save: Saves the data in the table that is stored in the SERVOPACK memory to the flash memory. The data for the tables remains unchanged if power is turned off.

Read

The zone tables can be read within the connected SERVOPACK with the Read function. Click **Read**, and a message will appear, confirming if you want to read the table data.



Click **OK** to start reading and overwriting the table data.

Click Cancel to return to the Zone Table Editing window without reading the table data.

Save

The data in the table can be saved to the flash memory with the Save function. Click **Save**, and a warning message will appear reminding you that the data may different than that of the SERVOPACK.

Save	×
Since the table being displayed at present is being edited or setting values are being loaded, there is a possibility that there are differences with data in the Servopack. When the table data being edited is saved in the table, carry out this function after having implemented "Write".	
OK	

Click **Cancel** to return to the Zone Table Editing window. Then by clicking **Write**, write zone table that is currently displayed but has not been stored into the SERVOPACK.

If already saved in temporary storage, click OK. A conformation message appears.

Save	×
	N
Saves the table data i Continue this process	· · · ·
ОК	Cancel

Click **OK** to save the data.

Click Cancel to return to the Zone Table Editing window without saving the data.

Initialize

The settings of the SERVOPACK can be returned to the factory settings with the Initialize function. Click **Initialize**, and a verification message appears.

Initialize		\times
Returns to factory setting When this function is impl which has been saved is Is this acceptable?	emented, the table c	lata
Initialize	Cancel	

Click **Initialize** to initialize the zone tables.

Click Cancel to return to the Zone Table Editing window without changing the settings.

(Print) Button

9

The data on the Zone Table Editing window can be printed. To print the data, click the

button. The Trinting frem Setting during box uppeurs.	button.	The Printing Item Setting dialog box appea	ars.
-------------------------------------------------------	---------	--------------------------------------------	------

Printing Item Setting	Printing Item Setting
Cover	Cover
Attaching the Cover Cover Editing	Attaching the Cover Cover Editing
Where to Submit C Where to Submit (No.1) O Where to Submit (No.2) O Submit (No.3)	Where to Submit VMere to Submit (Norl) O Submit (Norl) O Submit (Norl)
Item Name Setting Value	Item Name Setting Value
Company Name	Company Name
Department Name Name	Department Name Name
Data for each function	Data for each function
Zone Table	Zone Table
Header & Footer Printing Items	Header & Footer Printing items
Header Info	
Title Zone Table	Others
Models Info	
Printing Date	
File Name	
Footer Info	
	Color Selection
Color Selection Selection Selection O Color	Color Selection Generative C Color
OK Cancel	OK Cancel

Header & Footer Tab

Printing Items Tab

Printing Item Setting Box

Cover

Select Attaching the Cover, and the click Cover Editing. For details, see Chapter 3.

Data for each function

To enter your printing preferences or specifications, click the tab whose options you want to enter or change, and enter the desired settings.

Color Selection

Documents can be printed in color or black and white. Select your preference.

After setting is finished, click **OK**. The document appears on the screen the way it will appear in print.

🚔 Print Preview									×
🛅 🎒 <u>Print</u> 🔍 🍳 🏧 💌	G G 1/1			ick 🔿	Forwa	ard Edi	iting of the Printing Items		
Contents	Zone Tab SGDV-1R6AE1 /SGMAS-01AC	A/Optio	n Board	1				Printing Date : March 20, 2009 File Name : 20090320074303.zm	
	Zone Tabl	e					Unit: (refer	ence units)	·
	ID	Z4	Z3	Z2	Z1	ZO	ZONEN	ZONEP	
	0						0	0	
	1					Х	0	0	
	2				Х		0	0	
	3				Х	Х	0	0	
	4			Х			0	0	
	5			Х		Х	0	0	
	6			Х	Х		0	0	
	7			Х	Х	X	0	0	
	8		Х				0	0	
	9		X			X	0	0	

To print the document as is without any changes, click **Print**.

To return to the Printing Item Setting dialog box and change some settings, click **Editing of the Printing Items**.

When Offline

In the SigmaWin+ Σ -7 component main window, click **Table** and then click **Edit Zone Table**. The Zone Table Editing box appears.



Load From File: Reads existing data.

Select New SERVOPACK: Creates new data.

Select the desired command and click OK.

<When "Load from File" is Selected>

When "Load from File" is selected, the Open box appears.

Open			? ×
Look jn: 🗋	YE_Applications	• 🔁	
■ 20090320	074303		
File <u>n</u> ame:	20090320074303		<u>O</u> pen
Files of type:	Zone table file(*.znt)	▼	Cancel
Product Info			
<u>C</u> omment:			

Select the data to be imported, and click **Open**.

< When "Select New SERVOPACK" is Selected >

1. When "Select New SERVOPACK" is selected, the SERVOPACK Selection box appears.

Servopack Sel	ection		X
Motor type	Rotary 💌		
Servop	ack:	*** * ****	
Servopack mo	odel	Current [Max. applicable motor capacity]
SGD7S-****E	DA(Command-Option module	type single axis)	
(Use the digit number.)	icial Spec. vopack version number. tal operator to find out the ve becial Spec. number.	ersion	nown Note: Select the Unknown check box to set the version to the latest.
	Reference option	Safety option	Feedback option
Option Module Model:			
Ver.:	Unknown	Unknov	vn 🔲 🗖 Unknown
Special Spec.:		•	•
		OK	

2. Select the SERVOPACK model and current [max. applicable motor capacity].

Servopack Selection	×
Motor type Rotary	
Servopack: SGD7S- R90 * E0A	
	alala madau asu situ l
Servopack model Current [Max. applic SGD7S-****E0A(Command-Option module type single axis) R70 (0.66Arms, A0	able motor capacity]
R90 (0.91 Arms, A0	200V) [100V)
1R6 (1.6Arms, AC2 2R8 (2.8Arms, AC2	
3R8 (3.8Arms, AC2	200V) [500W]
Version/Special Spec.	0001/01750444
(Use the digital operator to find out the version che	e: Select the Unknown eck box to set the version to latest.
Reference option Safety option F	eedback option
Model: SGDV-OSA01A(SafetyModule S	Jnmounted (No match) SGDV-OFA01 A(Fully-close SGDV-OFB01 A(Feedback(SGDV-OFB03A(Feedback(
Ver.: 0000 Unknown	Unknown
Special Spec .: Standard	¥
OK	

3. Type the version number of the SERVOPACK.

If the version number is unknown, select Unknown.

- 4. Select the specifications of the SERVOPACK.
- 5. Select the reference option module. Select SGDV-OCA03A (INDEXER).

ervopack Sel	ection		×
Motor type	Rotary		
Servop	ack: SGD7S-	R90 * E0A	
Servopack mo	udel	Current II	Max. applicable motor capacity]
	DA(Command-Option module	type single axis) R70 (0.6	i6Arms, AC200V) [50W]
			11Arms, AC200V) [100W]
		2R8 (2.8	Arms, AC200V) [400W]
			Arms, AC200V) [500W]
Version/Spe			
	vopack version number. al operator to find out the ve		nown Note: Select the Unknown check box to set the version to the latest.
Select the Sp	ecial Spec. number.	Standard	•
	Reference option	Safety option	Feedback option
Option Module	SGDV-OCA03A(INDEXER)	Unmounted (No match) SGDV-OSA01A(Safety	
Model:		SGDV-USAUTA(Satet)	Module SGDV-OFA01A(Fully-close SGDV-OFB01A(Feedback(
			SGDV-OFB03A(Feedback(
	I		
Ver.:	0000 🗌 Unknown	Unknow	m 0000 🗌 Unknown
Special Spec.:	Standard	•	Standard
		OK Cancel]

Type the version number of the reference option module.
 If the version number is unknown, select Unknown.

7. Select the specifications of the reference option module, and then click **OK**. The data will be imported, and the Zone Table Editing window will appear.

	— Selects a new SI	ERVOPACK and optio	n module.
	—Opens files.		
	— Saves the zone t	able data.	
		able Editing window.	
7997		-	
🔛 Zone Table Editing : SG	DV-****E1A/SGDV-OCA03	A	×
02302			
	Unit: [reference (units]	
D Z4 Z3 Z2 Z1	ZO ZONEN	ZONEP	
20000	O 0	q	
30000	o p	d d	
4 0 0 0 0	O p O p		
6 0 0 0 0	© p	0	
7 0 0 0 0	• (A)	(B)	
10 0 0 0 0	O p	d	
11 0 0 0 0	0 P	0	
12 O O O O 13 O O O O	 ○ p ○ p 	d	
15 🔘 🗿 🗿 🔘			Comment
O Active	O Non-Active		🔁 Import
L			

Zone Table Editing Window (Offline Mode)

Box A: ZONEN

The zone starting position (ZONEN) can be designated directly in this box.

Box B: ZONEP

The zone ending position (ZONEP) can be designated directly in this box.

(Open) Button

Ê

The parameter file can be loaded in the Open box. To load the file, use the following procedure.

1. Click the 🛃 button, and the Open box appears.

Open	<u>? ×</u>
Look jn: 🚺	YE_Applications 💽 🗢 🛍 📅 📰 •
20090320	074303
, File <u>n</u> ame:	20090320074303
Files of <u>type</u> :	Zone table file(*.znt)
Product Info	
<u>C</u> omment:	

2. Select the name of the file to be imported, and click **Open**.

(New) Button

A new SERVOPACK and option module can be selected in the SERVOPACK Selection box using the New command. To change to a different SERVOPACK or option module, use the following procedure.

1. Click the D button, and the SERVOPACK Selection box appears.

ervopack Sel	ection				×
Motor type	🗨 Rotary 🗾				
Servop	ack:				
Servopack mo	odel		 Curre⊓t [Max. ap	oplicable motor capacity]	
SGD7S-****E	0A(Command-Option module ty	pe single axis)			
(Use the digit	ecial Spec. vopack version number. tal operator to find out the vers	ion		Note: Select the Unknown check box to set the version to	,
number.) Select the Sp	becial Spec. number.		Ţ	the latest.	
	Reference option	Safety option		Feedback option	
Option Module Model:					
Ver.:	Unknown		Unknown	Unknown	
Special Spec.:]	Ţ		2
		OK (Cancel		

2. Select the SERVOPACK model and current [max. applicable motor capacity].

Servopack Sele	ection		×
Motor type	🗨 Rotary 💌		
Servopa	ack: <u>SGD7S-</u> RS	90 * EOA	
Servopack mo	-dol	Current	[Max. applicable motor capacity]
	uei)A(Command-Option module ty;		66Arms, AC200V) [50W]
		R90 (0.	91Arms, AC200V) [100W]
			6Arms, AC200V) [200W] 8Arms, AC200V) [400W]
			8Arms, AC200V) [500W]
-Version/Spe	cial Spec.		
	vopack version number. al operator to find out the versi		known Note: Select the Unknown check box to set the version to the latest.
Select the Sp	ecial Spec. number.	Standard	•
	Reference option	Safety option	Feedback option
Option Module	SGDV-OCA03A(INDEXER)	Unmounted (No match SGDV-OSA01A(Safe	
Model:		SODV-OSAUTA(Sale	SGDV-OFB01A(Feedback(
			SGDV-OFB03A(Feedback()
	I		
Ver.:	0000 🗌 Unknown	🗖 Unkno	wn 🗖 Unknown
Special Spec.:	Standard		Y
		OK Cancel	

3. Type the version number of the SERVOPACK.

If the version number is unknown, select Unknown.

- 4. Select the specifications of the SERVOPACK.
- 5. Select the reference option module. Select SGDV-OCA03A (INDEXER).

ervopack Sele	ection		×
Motor type	🗨 Rotary 💌		
Servopa	ack: SGD7S-	R90 * E0A	
Servopack mo		Curvert D	fax. applicable motor capacity]
	DA(Command-Option module	e type single axis) R70 (0.6	5Arms, AC200V) [50W]
			1Arms, AC200V) [100W]
		2R8 (2.8	Arms, AC200V) [400W]
			Arms, AC200V) [500W]
Version/Spe	cial Spec.		
	vopack version number. tal operator to find out the v		nown Note: Select the Unknown check box to set the version to the latest.
Select the Sp	becial Spec. number.	Standard	•
	Reference option	Safety option	Feedback option
Option Module Model:	SGDV-OCA03A(INDEXER) Unmounted (No match) SGDV-OSA01A(Safety	
			SGDV-OFB01A(Feedback() SGDV-OFB03A(Feedback()
		•	
Ver.:	0000 🗌 Unknown	Unknow	n 0000 🗖 Unknown
Special Spec.:	Standard	•	Standard

6. Type the version number of the reference option module.

If the version number is unknown, select Unknown.

7. Select the specifications of the reference option module, and then click **OK**. The data will be imported, and the Zone Table Editing window will appear.

(Print) Button

The data on the Zone Table Editing window can be printed. To print the data, click the

button. The Printing Item Setting dialog box appears.

Printing Item Setting	Printing Item Setting
Cover	Cover
Cover Editing	Attaching the Cover Cover Editing
Where to Submit Where to Submit (No.1) Vithere to Submit (No.2) Submit (No.3) Item Name Setting Value	Where to Submit Where to Submit (No.1) Vivere to Submit (No.2) Vivere to Submit (No.3) Vivere to Submit (No.3) Vivere to
Title Company Name	Title Company Name
Department Name Name	Department Name Name
Data for each function	Data for each function
Header & Footer Printing Items	Header & Footer Printing items
Header Info	Others
Models Info	Comments
✓ Printing Date	
🔽 File Name	
Footer Info	
Pages	
Color Selection	Color Selection
Black and White C Color	Black and White C Color
OK Cancel	OK Cancel

Header & Footer Tab

Printing Items Tab

Printing Item Setting Box

Cover

Select Attaching the Cover, and the click Cover Editing. For details, see Chapter 3.

Data for each function

To enter your printing preferences or specifications, click the tab whose options you want to enter or change, and enter the desired settings.

Color Selection

Documents can be printed in color or black and white. Select your preference.

After setting is finished, click **OK**. The document appears on the screen the way it will appear in print.

Print Preview									
🖨 Erint	0.0	100 %	2	- (4 6	1/1		🗢 Back 🔿 Forward Editi	ng of the Printing Items
_				_		,			
	Zone 1	Гаbl	e						Printing Date : March 05, 20
	SGDH-A5	BE/JL	USP-NS	5601					File Name :
	Zone T	able	e	_	_	_			
	_	ID	74	70	70	74	70	Unit: [refere	nce units] ZONEP
		ID 0	Z4	Z3	Z2	Z1	ZO	ZONEN	0
	-	1						0	0
	-	2				X		0	0
		3				X	X	0	0
		4			Х			0	0
		5			Х		Х	0	0
		6			Х	Х		0	0
		7			Х	Х	Х	0	0
		8		Х				0	0
		9		х				0	0
		10		X		X		0	0
		11		X	N	х		0	0
		12 13		X	X			0	0
		14		×	×	×			0

To print the document as is without any changes, click **Print**.

To return to the Printing Item Setting dialog box and change some settings, click **Editing of the Printing Items**.

Comment

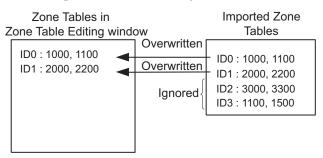
Comments can be typed or edited in the Comment box. Click **Comment**, and the Comment box appears.

Comment		×
		A
		~
	2	
	OK	Cancel

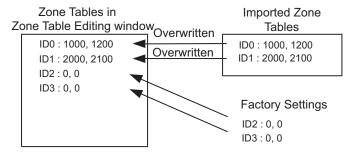
Import

Zone table settings can be transferred or imported from a stored file with the Import function. If the imported zone tables differ in number from the on-screen zone tables, the following processing takes place.

• If the number of imported zone tables is greater



• If the number of imported zone tables is fewer



1. Click **Import** and the Open box appears.

2. Select the file to be transferred, and click **Open**.

4.9.3 Jog Speed Table Editing

The jog speeds can be viewed and edited in the Jog Speed Table Editing window. The INDEXER option module changes the speed to the corresponding jog speed in the jog speed table in accordance with the combination of input signals, /JOG0 to /JOG3. The windows differ in the Online and Offline modes.

When Online

In the SigmaWin+ Σ -7 component main window, click **Table** and then click **Edit Jog Speed Table**. The Jog Speed Table Editing window appears.

Saves the jog speed table data.					
Prints the Jog Speed Table Editing window.					
💾 Jog Speed Table Editing AXIS#1 : SGDV-1R6AE1A/Option Board	×				
Unit: [x1000reference units/min]					
ID J3 J2 J1 J0 JSPD					
0 0 0 0 1920					
9 0 0 0 0 1000					
10 💿 💿 💿 1000					
11 💿 🔘 💿 💿 1000					
12 💿 💿 💿 1000					
	Comment				
O Active O Non-Active	👌 Import				
Initialize Save Read	Write				
	-				

Jog Speed Table Editing Window (Online Mode)

Sixteen types of jog speed can be set. The four signals (J0 to J3) correspond to the following: J0 = /JOG0, J1 = /JOG1, J2 = /JOG2, J3 = /JOG3.

Box A: JSPD

The jog speed can be typed directly in this box.

Comment

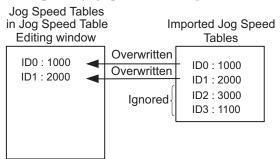
Comments can be typed or edited in the Comment box. Click **Comment**, and the Comment box appears.

Comment			×
			<u> </u>
			7
		ОК	Cancel
		[0K	Cancer

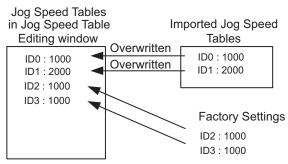
Import

Jog speed table settings can be transferred or imported from a stored file with the Import function. If the imported jog speed tables differ in number from the on-screen jog speed tables, the following processing takes place.

• If the number of imported jog speed tables is greater



• If the number of imported jog speed tables is fewer



1. Clicking Import and the Open box appears.

Open				<u>? ×</u>
Look in: 🔁	YE_Applications	• 🗕 🗈	r 🗄 📩	
20090320	075628.jgt			
File <u>n</u> ame:	20090320075628		<u>O</u> pen	
Files of type:	Jog speed table file(*.jgt)	•	Cance	9
Product Info	SGDV-1R6AE1A/Option Board			
<u>C</u> omment:				

2. Select the file to be transferred, and click **Open**.

Write

The program tables can be written to the SERVOPACK with the Write function. Click **Write**, and a warning message will appear reminding you that the data erased if the power is turned off.

Write	×
Writes the table data being edited into the Servopack. When the power is turned OFF after this has been carried out, the data is erased. When saving is necessary, save to a file or implement this function. Thereafter, implement saving of the table.	
Cancel	

Click **OK** to write in the data.

Click Cancel to return to the Jog Speed Table Editing window without writing in the data.

<Differences Between Write and Save>

- Write: Saves table data to the SERVOPACK in temporary storage. The data in the table is deleted when the power is turned OFF.
- **Save**: Saves the data in the table that is stored in the SERVOPACK memory to the flash memory. The data for the tables remains unchanged if power is turned off.

Read

The jog speed tables can be read within the connected SERVOPACK with the Read function. Click **Read**, and a message will appear, confirming if you want to read the table data.

Read 🗙	I
Reads table data. The table data being edited is overwritten. Is this acceptable?	
Cancel	

Click **OK** to start reading and overwriting the table data.

Click **Cancel** to return to the Jog Speed Table Editing window without reading the table data.

Save

The data in the table can be saved to the flash memory with the Save function. Click **Save**, and a warning message will appear reminding you that the data may different than that of the SERVOPACK.

Save 🗙					
Since the table being displayed at present is being edited or setting values are being loaded, there is a possibility that there are differences with data in the Servopack. When the table data being edited is saved in the table, carry out this function after having implemented "Write".					
Cancel					

Click **Cancel** to return to the Jog Speed Table Editing window. Then by clicking **Write**, write jog speed table that is currently displayed but has not been stored into the SERVOPACK.

If already saved in temporary storage, click OK. A conformation message appears.

Save	×
Saves the table data into flash memory. Continue this process?	
OK Cancel	

Click **OK** to save the data.

Click Cancel to return to the Jog Speed Table Editing window without saving the data.

Initialize

The settings of the SERVOPACK can be returned to the factory settings with the Initialize function. Click **Initialize**, and a verification message appears.

Initialize		\times
Returns to factory settings. When this function is impleme which has been saved is era Is this acceptable?		a
Initialize	Cancel	

Click Initialize to initialize the jog speed tables.

Click **Cancel** to return to the Jog Speed Table Editing window without changing the settings.

(Print) Button

the

The data on the Jog Speed Table Editing window can be printed. To print the data, click

button. The Printing Item Setting dialog box appears.

Printing Item Setting	Printing Item Setting
Cover	Cover
Cover Editing	Cover Editing
Where to Submit C Where to Submit (No.1) C Where to Submit (No.2) C Where to Submit (No.3)	Where to Submit C Where to Submit (No.1) C Submit (No.2) C Submit (No.3)
Item Name Setting Value Title Company Name	Item Name Setting Value Title Company Name
Department Name Name	Department Name Name
Data for each function	Data for each function
Jog Speed Table	Header & Footer Printing Items
Header Info	Others
Models Info	Comments
✓ Printing Date	
🔽 File Name	
Footer Info	
₩ Pages	
Color Selection	Color Selection
Black and White C Color	Color Color
OK Cancel	OK Cancel



Printing Items Tab

Printing Item Setting Box

Cover

Select Attaching the Cover, and the click Cover Editing. For details, see Chapter 3.

Data for each function

To enter your printing preferences or specifications, click the tab whose options you want to enter or change, and enter the desired settings.

Color Selection

Documents can be printed in color or black and white. Select your preference.

After setting is finished, click **OK**. The document appears on the screen the way it will appear in print.

🚔 Print Preview							<u>×</u>
🛅 🖨 Brint Q. Q. 🎫	🔳 🕼 🕼 🕅		♠ B	ack 🕈	Forw	ard Editing of the Printing Items	
Contents	Jog Spee	ed Tab	ole			Printing De	te : March 20, 2009
	SGDV-1R6AE /SGMAS-01A Jog Spee	CA21		1	_		20090320075628.jgt
						Unit: [x1000reference units/min]	
	ID	J3	J2	J1	JO	JSPD	
	0					1000	-
	1	-			X	1000	-
	2	-		X		1000	-
	3		х	Х	Х	1000	-
	4	-	×		X	1000	-
	6	-	X	x	^	1000	-
	7	-	X	X	X	1000	-
	8	X	^			1000	-
	9	X			x	1000	-
	3	~				1000	-

To print the document as is without any changes, click **Print**.

To return to the Printing Item Setting dialog box and change some settings, click **Editing of the Printing Items**.

When Offline

In the SigmaWin+ INDEXER component main window, click **Table** and then click **Edit Jog Speed Table**. The Jog Speed Table Editing box appears.

Jog Speed Table Editing	×
Loads the jog speed table. Please select from the following.	
Load from File.	
C Select New Servopack.	
OK Cancel	

Load From File: Reads existing data.

Select New SERVOPACK: Creates new data.

Select the desired command and click OK.

<When "Load from File" is Selected>

When "Load from File" is selected, the Open box appears.

Open					<u>?</u> ×
Look jn: 🔂	YE_Applications	-	🕂 🔁 (-111	
200903200	75628.jgt				
File <u>n</u> ame:	20090320075628			<u>O</u> per	
Files of type:	Jog speed table file(*.jgt)		•	Cance	el
Product Info	SGDV-1R6AE1A/Option Board				
<u>C</u> omment:					
	,				

Select the data to be imported, and click **Open**.

< When "Select New SERVOPACK" is Selected >

1. When "Select New SERVOPACK" is selected, the SERVOPACK Selection box appears.

Servopack Sele	ection				×
Motor type	🗨 Rotary 💌				
Servopa	ack: ***** _ *	** * ****			
			1		
Servopack mo SGD7S-****E	idel DA(Command-Option module ty		urrent [Max. appli	cable motor capacity]	_
Version/Spe	cial Spec.				
	vopack version number. al operator to find out the vers		ch	ite: Select the Unknown eck box to set the version t	0
number.)	- i-l Constanting		the	elatest.	
Select the Sp	ecial Spec. number.	<u> </u>	V		
	Reference option	Safety option	F	Feedback option	
Option Module Model:					
incae.					
]		
Ver.:	Unknown		Jnknown	🗖 Unknown	
Special Spec.:	<u>_</u>]	<u>_</u>		-
			ncel		

2. Select the SERVOPACK model and current [max. applicable motor capacity].

ervopack Sel	ection		×
Motor type	🗨 Rotary 💌		
Servop	ack: SGD7S-	R90 * E0A	
		<u> </u>	
Servopack mo	idel DA(Command-Option module		Max. applicable motor capacity] 6Arms, AC200V) [50W]
SGD7S-****E	DA(Command-Option module		1Arms, AC200V) [100V/]
			Arms, AC200V) [200W]
			Arms, AC200V) [400W] Arms, AC200V) [500W]
I			
-Version/Spe	cial Spec.		
	vopack version number. al operator to find out the ve		nown Note: Select the Unknown check box to set the version to the latest.
Select the Sp	ecial Spec. number.	Standard	•
	Reference option	Safety option	Feedback option
Option Module Model:	SGDV-OCA03A(INDEXER)	Unmounted (No match) SGDV-OSA01A(Safety	Module SGDV-OFA01A(Fully-close
wodei.			SGDV-OFB01A(Feedback(
			SGDV-OFB03A(Feedback()
	J	•	
Ver.:		Unknow	n 🗖 🗖 Unknown
Special Spec.:	Standard	•	Y
		OK Cancel]

3. Type the version number of the SERVOPACK.

If the version number is unknown, select Unknown.

- 4. Select the specifications of the SERVOPACK.
- 5. Select the reference option module. Select SGDV-OCA03A (INDEXER).

Servopack Sel	ection		×	
Motor type	Rotary			
Servop	ack: SGD7S-	R90 * E0A		
Servopack mo	ndel	Current	Max, applicable motor capacity]	
	DA(Command-Option module		6Arms, AC200V) [50W]	
			11 Arms, AC200V) [100W]	
		2R8 (2.8	Arms, AC200V) [400W]	
			Arms, AC200V) [500W]	
Version/Spe	cial Spec.			
	vopack version number. tal operator to find out the ve		nown Note: Select the Unknown check box to set the version to the latest.	
Select the Sp	becial Spec. number.	Standard	•	
	Reference option	Safety option	Feedback option	
Option Module	SGDV-OCA03A(INDEXER)			
Model:		SGDV-OSA01A(Safet	/Module SGDV-OFA01A(Fully-close SGDV-OFB01A(Feedback(
			SGDV-OFB03A(Feedback(
		•		
Ver.:	0000 🗌 🗆 Unknown	Unknov	Vin 0000 🗖 Unknown	
Special Spec.:	Standard	•	Standard	
OK Cancel				

6. Type the version number of the reference option module. If the version number is unknown, select **Unknown**. 7. Select the specifications of the reference option module, and then click **OK**. The data will be imported, and the Jog Speed Table Editing window will appear.

	Selects a new SERVOPACK and option module.						
	Opens files.						
			Γ			—Saves the jog speed table data.	
				ſ		 Prints the Jog Speed Table Editing window. 	
							Level.
□	log S	peed	1 Tat	ole Eo	liting	g: SGDV-****E1A/SGDV-OCA03A	×
		a.			7		
		2			3		
						Unit: [×1000reference units/min]	
	ID	J3	J2	J1	JO	JSPD	
	0	0	0	0	0	1980	
	1	\odot	۲	\odot	٥	1000	
	2	\odot	\odot	۲	\odot	1000	
	3	\odot	0	\odot	_	1000	
	4	\odot	0	\odot	\odot	1000	
	5	\odot	۲	\odot	۲	1000	
	6	\odot	۲	٢	~	1000	
	7	\odot	٢	٢	۲	1000 (A)	
	8	\odot	\odot	\odot	\odot	1000	
	9	\odot	\odot	\odot	۲	1000	
	10	\odot	\odot	۲		1000	
	11	\odot	\odot	۲	_	1000	
	12	\odot	۲	\odot	\odot	1000	
	13	\odot	٢	\odot	۲	1000	
	14	\odot	٢	٢	\odot	1000	
	15	0	0	۲	0	1089 Comme	ent
		0,	Activ	e	C	Non-Active	t

Jog Speed Table Editing Window (Offline Mode)

Box A: JSPD

The jog speed can be typed directly in this box.

(Open) Button

The parameter file can be loaded in the Open box. To load the file, use the following procedure.

1. Click the 🛃 button, and the Open box appears.

Open			? X
Look in: 🔂	YE_Applications	💌 🗧 🛍 I	-111
20090320	075628.jgt		
, File <u>n</u> ame:	20090320075628		<u>O</u> pen
Files of type:	Jog speed table file(*.jgt)	•	Cancel
Product Info	SGDV-1R6AE1A/Option Board		
<u>C</u> omment:			

2. Select the name of the file to be imported, and click **Open**.

(New) Button

A new SERVOPACK and option module can be selected in the SERVOPACK Selection box using the New command. To change to a different SERVOPACK or option module, use the following procedure.

1. Click the D button, and the SERVOPACK Selection box appears.

	ection		
Motor type	Rotary		
Servop	ack:	*** * ****	
Servopack m			[Max. applicable motor capacity]
-	0A(Command-Option modu		max, applicable meter copacity]
Version/Spe	ecial Spec. rvopack version number.		known Note: Select the Unknown
	tal operator to find out the	version	check box to set the version to the latest.
Select the Sp	pecial Spec. number.		₽.
	Reference option	Safety option	Feedback option
	Reference option	Safety option	Feedback option
	Reference option	Safety option	Feedback option
Model:			
Option Module Model: Ver.:	Reference option		
Model:			

2. Select the SERVOPACK model and current [max. applicable motor capacity].

Servopack Sel	ection		×
Motor type	Rotary 💌		
Servop	ack: <u>SGD7S-</u>	R90 * E0A	
Servopack mo	odel DA(Command-Option module		Max. applicable motor capacity] 66Arms, AC200V) [50VV]
		1R6 (1.6 2R8 (2.6 3R8 (3.6	31 Arms, AC200V) [100W] SArms, AC200V) [200W] 3Arms, AC200V) [400W] 3Arms, AC200V) [400W] 5Arms, AC200V) [500W]
-Version/Spe	ecial Spec.		
	rvopack version number. tal operator to find out the ve		known Note: Select the Unknown check box to set the version to the latest.
Select the Sp	becial Spec. number.	Standard	•
	Reference option	Safety option	Feedback option
Option Module Model:	SGDV-OCA03A(INDEXER)	Unmounted (No match) SGDV-OSA01A(Safety	
Ver.:	0000 🗖 Unknown	Unknov	vn 🔲 🗖 Unknown
Special Spec.:	Standard	•	v
		OK Cancel	

3. Type the version number of the SERVOPACK.

If the version number is unknown, select Unknown.

4. Select the specifications of the SERVOPACK.

5. Select the reference option module. Select *SGDV-OCA03A (INDEXER)*.

Servopack Sel	ection		×
Motor type	Rotary		
Servop	ack: <u>SGD7S-</u> F	R90 * E0A	
		<u> </u>	
Servopack mo			Max. applicable motor capacity]
SGD7S-****E	0A(Command-Option module t		6Arms, AC200V) [50W]
			Arms, AC200V) [200V/]
			Arms, AC200V) [400W]
			Arms, AC200V) [500W]
Version/Spe	cial Spec.		
(Use the digi number.)	vopack version number. tal operator to find out the ver becial Spec. number.		nown Note: Select the Unknown check box to set the version to the latest.
	Reference option	Safety option	Feedback option
Option Module Model:	SGDV-OCA03A(INDEXER)	Unmounted (No match) SGDV-OSA01A(Safety	Module SGDV-OFA01A(Fully-close SGDV-OFB01A(Fedback(SGDV-OFB03A(Feedback()
Ver.:	0000 🗌 Unknown	Unknow	n 0000 🗖 Unknown
Special Spec.:	Standard	•	Standard •
		OK Cancel]

6. Type the version number of the reference option module.

If the version number is unknown, select Unknown.

7. Select the specifications of the reference option module, and then click **OK**. The data will be imported, and the Jog Speed Editing window will appear.

🥌 (Print) Button	
The data on the Jog Speed Table Editing	window ca
the 🥌 button. The Printing Item Settin	ng dialog b
nting Item Setting	Printing Item Se
Cover	Cover
Cover Editing	Attaching

5	(Print)	Button
---	---------	--------

Pri

in be printed. To print the data, click

≝ ≱	button.	The Printing	Item Setting	dialog boy	appears.
------------	---------	--------------	--------------	------------	----------

inting Item Setting	Printing Item Setting
Cover	Cover
Attaching the Cover Cover Editing	Attaching the Cover Cover Editing
Where to Submit O Where to Submit (No.1) O Where to Submit (No.2) O Submit (No.3)	Where to Submit C Where to Submit (No.1) C Where to Submit (No.2) C Where to Submit (No.2)
Item Name Setting Value	Item Name Setting Value
Title	Title
Company Name Department Name	Company Name Department Name
Name	Name
Data for each function	Data for each function
Jog Speed Table	Jog Speed Table
Header & Footer Printing Items	Header & Footer Printing Items
Header Info	
Title Jog Speed Table	Others
Models Info	Comments
Printing Date	
🔽 File Name	
Footer Info-	
✓ Pages	
Color Selection	Color Selection
Black and White O Color	Black and White C Color
OK	OK Cancel

Header & Footer Tab

Printing Items Tab

Printing Item Setting Box

Cover

Select Attaching the Cover, and the click Cover Editing. For details, see Chapter 3.

Data for each function

To enter your printing preferences or specifications, click the tab whose options you want to enter or change, and enter the desired settings.

Color Selection

Documents can be printed in color or black and white. Select your preference.

After setting is finished, click **OK**. The document appears on the screen the way it will appear in print.

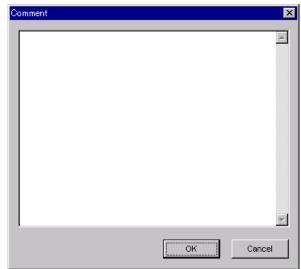
🖨 Print Preview										
🛅 🎒 Brint 🔍 🔍 🏧	I 🔓 🕼 🕅	+	Back 🚽	Forw	ard Editing of the Printing Items					
Contents										
Jog Speed Table										
Comments										
	Jog Speed Table Printing Date : Mar									
	SGDV-****E1A/S	SGD V-OCA		File Name :						
	Jog Speed Table									
	Unit. (x1000reference units/min)									
	ID	J3 J2	J1	JO	JSPD					
	0			X	1000					
	2		X	<u> </u>	1000					
	3		X	X	1000					
	4	X	+ ~		1000					
	5	X		X	1000					
	6	X	X		1000					
	7	X	X	Х	1000					
	8	Х			1000					
	9	х		Х	1000					
	10	х	X		1000					
1	44	V		V	4000					

To print the document as is without any changes, click **Print**.

To return to the Printing Item Setting dialog box and change some settings, click **Editing of the Printing Items**.

Comment

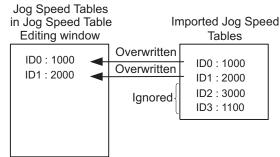
Comments can be typed or edited in the Comment box. Click **Comment**, and the Comment box appears.



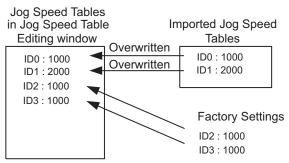
Import

Jog speed table settings can be transferred or imported from a stored file with the Import function. If the imported jog speed tables differ in number from the on-screen jog speed tables, the following processing takes place.

• If the number of imported jog speed tables is greater



• If the number of imported jog speed tables is fewer



1. Click Import and the Open box appears.

		? ×
Applications	- + 🗈	-* 🎟 -
28.jgt		
Type: JGT File Size: 824 bytes		
90320075628		<u>O</u> pen
) speed table file(*.jgt)	•	Cancel
DV-1R6AE1A/Option Board		
	8. jgt Type: JGT File Size: 824 bytes 90320075628 speed table file(*.jgt)	13. jgt Type: JGT File Size: 824 bytes 90320075628 speed table file(";gt)

2. Select the file to be transferred, and click **Open**.

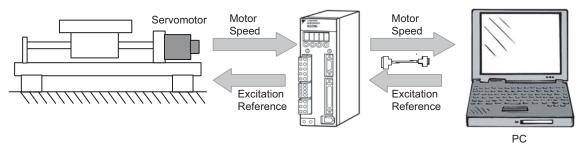
4.10 Solutions

4.10.1 Mechanical Analysis Function

Function Outline

Mechanical Analysis

This function measures the frequency characteristics of a mechanical system where a SERVOPACK is connected to a PC. It enables the measurement of mechanical frequency characteristics without the use of special equipment.



The function applies a mechanical excitation from the motor and measures the speed frequency characteristics in relation to the motor torque (force for linear motor). This allows the function to ascertain the resonance of the mechanical system from the measured frequency characteristics.

This function ascertains the mechanical resonance and uses it as a reference for servo tuning and mechanical changes. Study of mechanical changes is necessary because the servo performance cannot be fully realized according to the machine rigidity. This will become a direction (reference value) for adjustment of parameters such as those for servo rigidity, and the torque (force) filter time constant, in servo tuning. Also, it will be used for the notch filter setting and parameter inputs (Pn110 and later) used in high-speed machine positioning such as the machine control functions. For specific application procedures, refer to the product manual for your SERVOPACK.

4-340

WARNING

Using the mechanical analysis function while the motor is running is dangerous.

Be sure to check related information in this manual before using this function.

Pay particular attention to the following.

• Check the safety of the area adjoining the drive units.

The motor runs for 2 sec. maximum per excitation/measurement while using this function.

Make sure that there is no danger in running the motor before execution.

· Correctly set the allowable rotation (movement).

Damage to the machine due to overrun, etc., may result if this is not set properly.

Also, there is a limit to the allowable rotation (movement) per excitation/measurement. The excitation starting position may deviate if excitation is performed multiple times. Be sure to check this before excitation/measurement.

• When the mechanical analysis function is used for a vertical axis, check the safety of the system.

When the mechanical analysis function is used for a vertical axis, select **Vertical mode** from Driving Mode Selection and confirm that the axis level does not drop when the servo is turned off.

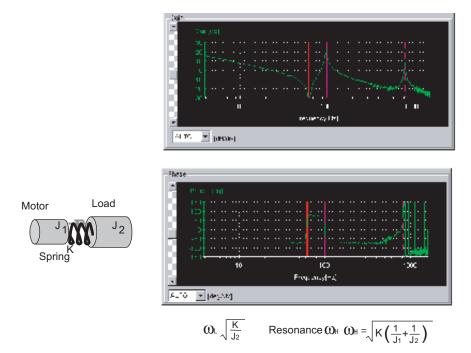
• Always reset the origin after quitting the mechanical analysis function.

The mechanical analysis function causes the position to deviate because it executes motor excitation by the torque (force) reference. After quitting this function, be sure to return to the origin and reset the position before regular operation of the motor. Running the motor without resetting the origin can lead to an overrun and is extremely dangerous.

Frequency Characteristics

The analysis function ascertains machine characteristics by applying an excitation to the machine using the motor, and measuring the frequency characteristics from the torque (force) to the motor speed. In a typical machine the resonance frequency becomes clear if the gain and phase are graphed (Bode Plot) as shown in Figure below. The Bode Plots show the size of the response of the machine to which the torque (force) is applied (gain), and the phase delay (phase) of the response for each frequency. The machine resonance frequency can be ascertained from the maximum frequency of the valleys (anti-resonance) and peaks (resonance) of the gain and the phase delay.

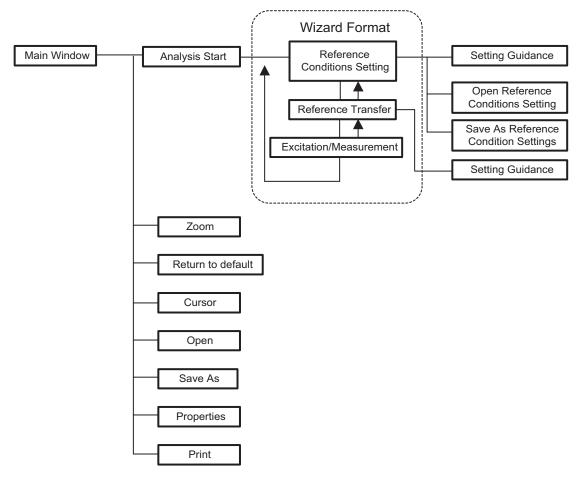
In a motor unit and rigid machine the gain and phase change gradually in the board line.



Frequency Characteristics of the Inertia Model

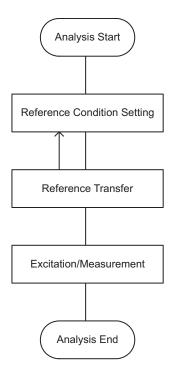
■ Structure

The following flowchart shows how the mechanical analysis function works.



Analysis

A mechanical analysis wizard will lead you through the steps of analyzing a connected SERVOPACK. The following flowchart shows the steps involved in analyzing the frequency characteristics.



Main Window

Open the main window of the mechanical analysis function using the following procedure.

In the SigmaWin+ Σ -7 component main window, click **Solution**, and then click

Mechanical Analysis. A warning message appears reminding you of the dangers that are possible when using this operation.

(Although the following windows describe the rotary motor, all instructions, warnings etc. apply to both rotary and linear motors.)

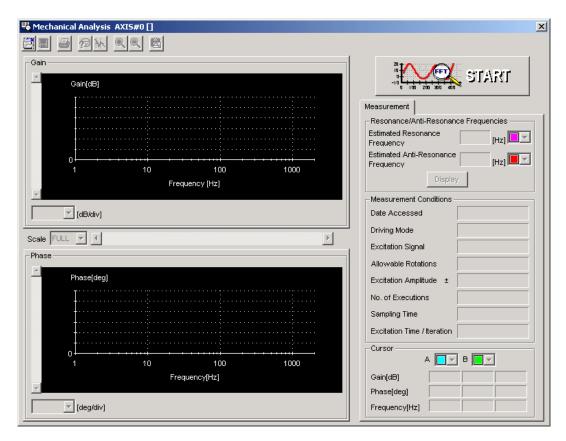


If more than one axis is being used, the **Axis Selection** dialog box appears. First select the axes to adjust according to the **Axis Selection** dialog box. For the procedure, refer to *4.1 Changing Axes*.

Always be sur	to operate this function, because the servomotor will rotate. e to check the user's manual before operating. attention to the following points:
I . Check the safety	around moving parts.
the execution of t	vill turn for up to 2 sec. for each Excitation/Measurement during his function. adequately verifying that there is no danger from servomotor
2. Set an appropria	te allowable rotations.
Moreover, the All The excitation sta	nay lead to damage of the machine due to overrun, etc. owable Rotations is the limit to each Excitation/Measurement. rting point may shift if excited multiple times. this before Excitation/Measurement.
3. Please confirm th	e safety of the system when used in a vertical axis.
	rtical mode" when you use this function with a vertical axis. confirm it is a system that doesn't fall when it is servo OFF.
4. Always be sure	to perform position reset after closing this function.
return and reset t	or is driven by an internal reference, be sure to perform home he position prior to normal operation. motor operation without reset is extremely dangerous as it may etc.

Click **Cancel** to return to the SigmaWin+ Σ -7 component main window without carrying out mechanical analysis.

Click **OK**, and the Mechanical Analysis main window appears.



Mechanical Analysis Main Window

Reference Condition Setting

In the Mechanical Analysis main window, click **START**, and the Reference Conditions Setting box appears. Select the conditions for exciting the machine with the motor and measuring the frequency characteristics.

Mechanical Analysis (Reference Conditions Setting)	X
Reference Reference Excitation / Conditions Setting Transmission Measurement	
Please set Reference Conditions for analysis. Setting Help Driving Mode Selection Herizontal mode Image: Horizontal mode Vertical mode Sampling Time Measurement Frequency 250 Image: Line color Setting Help Help Measurement Frequency Excitation Time/Iteration 250 Image: Line color Setting Help Help Measurement Frequency Excitation Time/Iteration 250 Image: Line color Image: Line color Image: Line color	r
< Back Next > Can	cel

Reference Conditions Setting Box

Driving Mode Selection

Horizontal mode: Excite the motor with the torque control.

Do not use this mode for the vertical axis. The load may droop.

Vertical mode: Excite the motor with the position control.

The servo ON status is maintained during the motor run/measurement. The SERVOPACK will not turn to servo OFF status automatically.

Use this mode for the vertical axis. A control such as notch filter is applied to this mode, so the characteristics differ from those of the horizontal mode.

• Always confirm that the gain setting is stable before starting operation in vertical mode. Because position control is applied in vertical mode, the motor may vibrate if not stable.

Sampling Time/Measurement Frequency/Excitation Time

Select a sampling time. The sampling time must be selected from the list. The shorter the sampling time, the higher the measurable frequency and the shorter the excitation time will be. If the sampling time is shortened, however, the frequency resolution will be degraded and the measurement accuracy, particularly at low frequencies, will be lowered. The sampling time determines the measured frequency and excitation time. First, select a short sampling time, and then determine the best sampling time while checking the measurement results.

Excitation Signal

The type of excitation signal is assumed to be only cycle wave.

Excitation Amplitude (1 to 300%)

Select the size of the reference amplitude applying excitation to the motor as a percentage of the ratio of size to rated torque (force). A larger excitation amplitude tends to give more correct measurements, but an excessively large amplitude can cause overspeed (A.510) and overcurrent (A.100) alarms. Problems with the load inertia (mass for linear motor) and the balance would cause the alarms to occur, and accurate measurements would be impossible. Also, the excitation amplitude must be set to a value below the "Torque (Force) Limit". Remember that the accurate measurement is not possible if the torque (force) is restricted during excitation.

For information on torque (force) limiting, refer to the product manual for your SERVOPACK.

Allowable Rotations (1 to 1000) (Allowable Movements (1 to 1000 mm) for linear motor)

Select the limit of motor rotations (movements) during measurement. If the allowable number of rotations (movements) is exceeded, the motor will stop by zero clamp function and measurements will be halted. Consider the deceleration ratios for the pulley radius, ball screws, and so on, and then select a number of motor rotations (movements). When reducing the number of motor rotations (movements), also reduce the excitation amplitude and the sampling time.

- The allowable rotations (movements) is a restriction for each excitation period. In multiple excitation applications, the excitation start position might shift. Check the range of motion each time excitation is applied.
- Detection of the allowable rotation (movement) in the SERVOPACK may be delayed by a maximum of 2 ms. If so, operation may exceed the settings due to factors such as inertia (mass) size and interference from speed. Include a margin when setting the allowable number of rotations (movements).

No. of Measurements (1 to 5 sets)

Select the number of times that the measurements should be taken to get an average of the measurements. One set is a back-and-forth operation that starts excitation or measurement from the forward side and excitation/measurement from the reverse side. More measurement iterations tends to yield more accurate measurements, but the time required for measurement increases.

Line Color

Select the colors of the lines used in the graph of the measurement results.

Open

In the Reference Conditions Setting box, click **Open**, and the reference conditions files are displayed.

Open	? ×
Look in: 🔁 YE_Applications 💌 🗈 📸	
File name: Oper	
Files of type: Reference Conditions Setting File (*.myc) Cance	el

Open Dialog Box

Click **Open** to read the designated reference conditions setting file. Click **Cancel** to return to the Reference Conditions Setting box without reading the file.

Save

In the Reference Conditions Setting box, click **Save**, and then select the storage location for the setting file shown in the Reference Conditions Setting box.

Save As			? ×
Save jn:	🔁 YE_Applications 💽 🤦		•-•- •-•-
I			
File <u>n</u> ame:	20001115173839		<u>S</u> ave
Save as <u>t</u> ype:	Reference Conditions Setting File (*.myc)	J 🗌	Cancel

Save As Dialog Box

Click **Save** to store the file name designating the current reference conditions. Click **Cancel** to return to the Reference Conditions Setting box without saving the file.

If the file name already exists or if an already existing file is loaded and then re-saved, a warning message appears, telling you that the file name already exists, and asks if you want to replace the existing file.

Save As	×
	C:\WINNT\Profiles\All Users\Desktop\YE_Applications\20001115173839.myc already exists. Do you want to replace it?
	Yes

Click **Yes** to overwrite the already existing file. Click **No** to return to the Save As dialog box without saving the file.

Help

Click **Help** to open the window for guidelines on the reference condition settings. See <Guidelines for Reference Condition Settings> for details.

Next>

Click Next to view the Reference Transmission box.

<Back/Cancel

Click Back or Cancel to return to the Mechanical Analysis main window.

After the setup has been successfully completed, click **Next**, and the Reference Transmission box appears.

<Guidelines for Reference Condition Settings>

- Run the motor to excite the machine and measure the frequency characteristics.
- Set Driving Mode, Sampling Time, Excitation Amplitude, and No. of Measurements.
- Accurate measurement of the frequency characteristics depends on the settings. See the measurement results to determine the proper settings. See the guidelines for each setting.
- The number of **Allowable Rotations (Movements)** must be set so that measurements can be taken safely. Set the motor revolutions (movements) so the setting is within the operable range.

Driving Mode Selection

Horizontal mode is used to run a motor with torque control, and Vertical mode is used with position control.

Use Vertical mode for a vertical axis to prevent the load from dropping (shifting).

A control such as notch filter is applied to Vertical mode, so the characteristics differ from those of Horizontal mode.

Sampling Time [µs] (Measurement Frequency [Hz], Excitation Time [ms])

As sampling time is shortened, the higher the frequencies are that can be measured and the shorter the excitation time becomes. However, frequency resolution will deteriorate. Measurement accuracy becomes especially poor at low measuring frequencies. Measuring frequency and excitation time depend on the sampling time. First, set the sampling time to a certain small value. Then see the results of the measurement and determine the proper sampling time.

Excitation Signal: Cycle Wave (fixed)

Excites the machine with a cycle wave.

Excitation Amplitude [±%/Rated torque (force)] Range: 1% to 300%

Select the size of the reference amplitude applying excitation to the machine as a percentage of the ratio of size to rated torque (force).

A larger excitation amplitude tends to give more accurate measurements, but an excessively large amplitude can cause overspeed (A.510) and overcurrent (A.100) alarms. Problems with the load inertia (mass) and the balance would cause the alarms to occur, and accurate measurements would be impossible.

Also, the excitation amplitude must be set to a value below the "Torque (Force) Limit." Remember that accurate measurement is not possible if the torque (force) is restricted during excitation.

For information on torque (force) limiting, refer to the product manual for your SERVOPACK.

Allowable Rotations [Rotation] Range: ± 1 to 1000 Rotations Allowable Movements [mm] Range: ± 1 to 1000 mm (for linear motors)

Select the limit for motor rotations (movements) during measurement. If the allowable number of rotations (movements) is exceeded, the motor will stop by zero clamp function and measurement will be halted.

Consider the deceleration ratios for the pulley radius, ball screws, and so on, and then select a number of motor rotations (movements).

When reducing the number of motor rotations (movements), also reduce the excitation amplitude and the sampling time.

- The allowable rotations (movements) is a restriction for each excitation period. In multiple excitation applications, the excitation start position might shift. Check the range of motion each time excitation is applied.
- Detection of the allowable rotation (movement) in the SERVOPACK may be delayed by a maximum of 2 ms. If so, operation may exceed the settings due to factors such as inertia (mass) size and interference from speed. Include a margin when setting the allowable number of rotations (movements).

No. of Measurements [Set] Range: 1 to 5

Select the number of times that the measurements should be taken to get an average of the measurements. One set is a back-and-forth operation that starts excitation or measurement from the forward side and excitation/measurement from the reverse side. More measurement repetitions tend to yield more accurate measurements, but the time required for measurement will increase.

Line Color

Select the colors of the lines used in the graph of the measurement results.

Reference Transmission

In the Reference Transmission box, transfer the reference conditions to the SERVOPACK. Click **Start** to begin the transfer.

Mechanical Analysis (Reference Transmission)	
Reference Reference Excitation / Conditions Setting Transmission Measurement	1
Transferring Reference Conditions to the Servopack.	
37%	
< <u>B</u> ack. <u>N</u> ext >	Cancel

Reference Transmission Box

Start

Click Start to transfer the reference conditions to the SERVOPACK. A progress bar displays the progress status of the transfer.

Cancel

The Cancel button is available only during the transfer to the SERVOPACK. After the transmission is finished, it is unavailable and cannot be selected.

Next>

The Next button is available if the data is transferred successfully. If an error occurs or if the transmission is interrupted, it is unavailable and cannot be selected.

Click Next to view the Excitation/Measurement box.

<Back

Click **Back** to return to the Reference Conditions Setting box. The Back button is unavailable during a data transfer.

Cancel

Click **Cancel** to stop processing and return to the main window without transferring the reference conditions.

After the data has been successfully transferred, click **Next**, and the Excitation/ Measurement box appears.

Excitation/Measurement

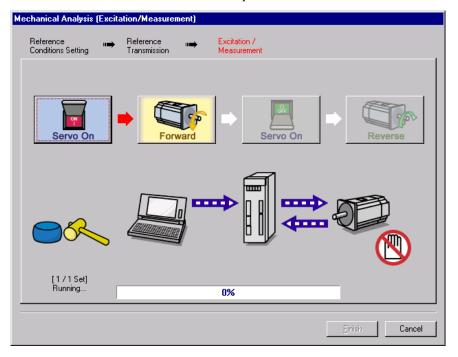
Note: Strange noises may be made by the motor during excitation or measurement, but this is not unusual and it is not a mechanical error.

In the Excitation/Measurement box, excite the actual motor and take measurements. The measurement will be taken the number of times designated in the Reference Conditions Setting box.

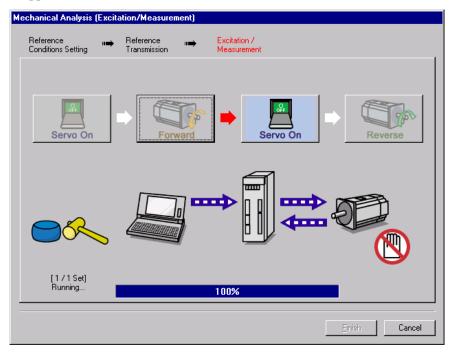
Excite the motor and take measurements using the following procedure.

<For horizontal mode>

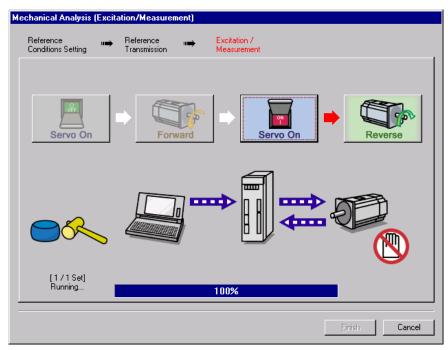
1. Click Servo ON to turn on the servo power.



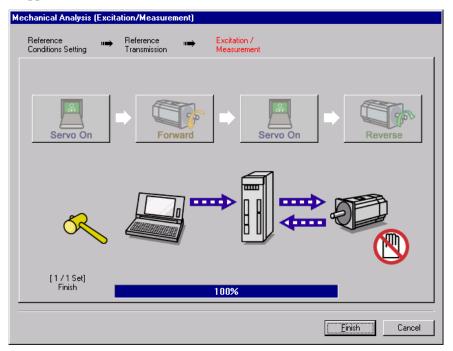
2. Click **Forward** to take measurements by turning (moving) the motor forward. After the measurements and the data transmission are finished, the following window appears.



3. Click Servo ON to turn on the servo power.



4. Click **Reverse** to take measurements by turning (moving) the motor in reverse. After the measurements and the data transmission are finished, the following window appears.



5. Repeat steps 1 through 4 until all the measurements have been taken the specified number of times.

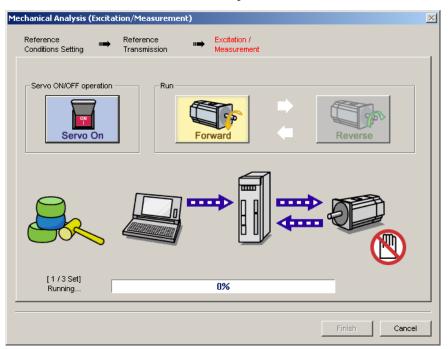
The actual number of times the measurements have been taken is displayed in the lower left part on the screen.

The progress bar displays the transfer status of the current batch.

6. After the measurement has been successfully completed, click **Finish** to return to the main window.

<For vertical mode>

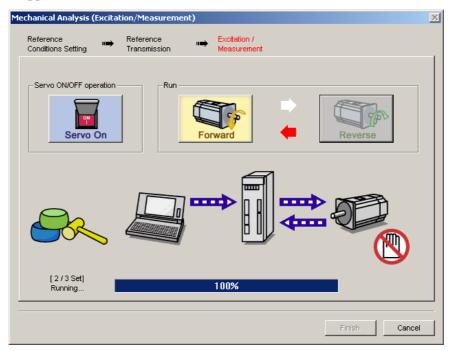
1. Click Servo ON to turn on the servo power.



2. Click **Forward** to take measurements by turning (moving) the motor forward. After the measurements and the data transmission are finished, the following window appears.



3. Click **Reverse** to take measurements by turning (moving) the motor in reverse. After the measurements and the data transmission are finished, the following window appears.



4. Repeat steps 1 through 3 until all the measurements have been taken.

The actual number of times the measurements have been taken is displayed in the lower left part on the screen.

The progress bar displays the transfer status of the current batch.

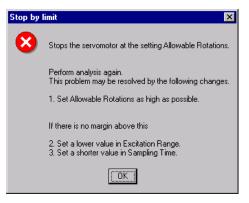
- 5. After the measurement has been successfully completed, click **Servo ON** to turn to the servo OFF status.
- 6. Click **Finish** to return to the main window.

When **Finish** is clicked without turning to servo OFF status, the following window appears.

Mechanical Anal	ysis 🗙
It turn	s the Servo OFF.
ОК	Cancel

Click **OK** to turn to servo OFF status.

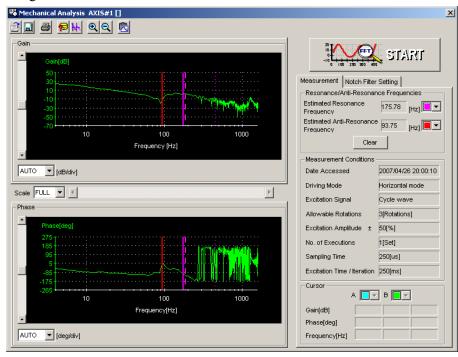
For both the horizontal and vertical modes, if the motor stops because the excitation was excessive, an error message appears prompting you to change the settings.

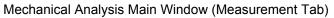


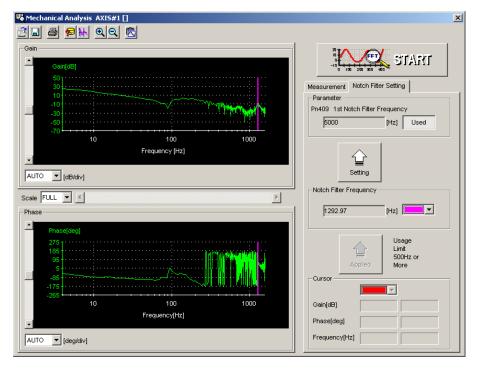
Click **OK** to stop taking measurements and return to the main window.

Main Window

The Mechanical Analysis main window displays the analysis results. To view the conditions in which the analysis was done, click the Measurement tab or the Notch Filter Setting tab.

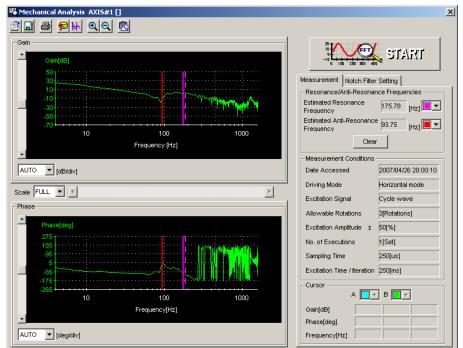


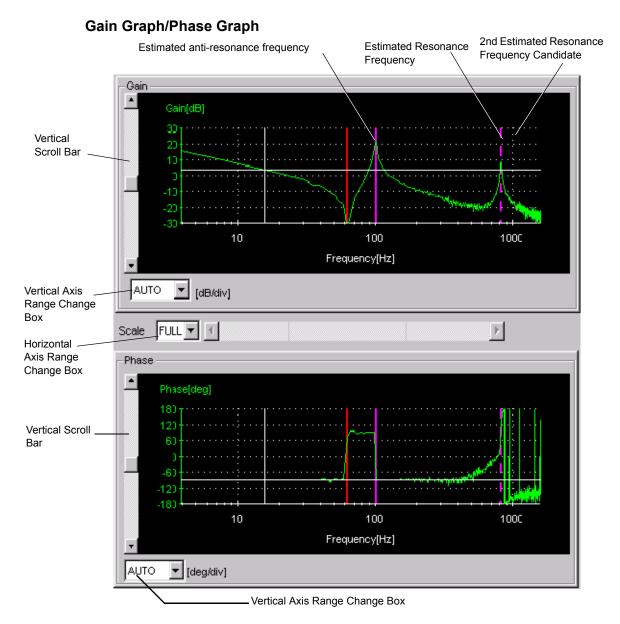




Mechanical Analysis Main Window (Notch Filter Setting Tab)

Measurement Tab





Gain Graph and Phase Graph

Vertical Axis Range Change Box/Vertical Scroll Bar

The individual range for the vertical axis for both the gain graph and the phase graph can be set.

Select the range from the corresponding box. The units for the gain graph are "dB" and the units for the phase graph are "deg."

If AUTO is selected, the range widths will be automatically adjusted so that all of the data can be shown in the graph. When the window is too small to show all of the vertical axis, a vertical scroll bar is displayed to allow you to view all of the axis.

The range must be selected from the list.

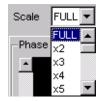


Vertical Axis Range Change Box

Horizontal Axis Range Change Box/Horizontal Scroll Bar

The horizontal axis range is for both the gain graph and the phase graph, and so is displayed with a multiple. The unit of both the gain and phase graph is "Hz."

If FULL is selected, all of the data will be automatically adjusted so that the entire horizontal axis can be displayed. When the window is too small to show all of the horizontal axis, a horizontal scroll bar is displayed to allow you to view all of the axis



Horizontal Axis Range Change Box

Resonance/Anti-Resonance

In case that the estimated model is double inertia model, the corresponding text boxes display the estimated resonance and anti-resonance frequencies. The cursor shows the positions of the estimated resonance and anti-resonance frequencies on the graph.

If the estimated candidate differs from the resonance point, a maximum of two can be displayed. The candidates are displayed with various lines to identify them.

2nd Estimated resonance frequency candidate: Long dotted line (_____)

3rd Estimated resonance frequency candidate: Dash-dot line

(-----)

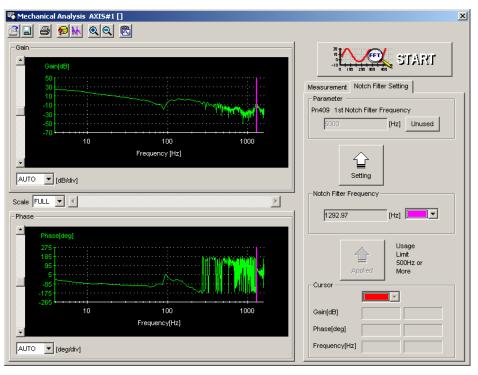
Click Clear to delete the values for the estimated resonance and

anti-resonance frequencies. When the frequencies are deleted, the cursors representing their values on the graphs are also deleted. The 2nd and 3rd candidates for the estimated resonance frequency are also deleted.

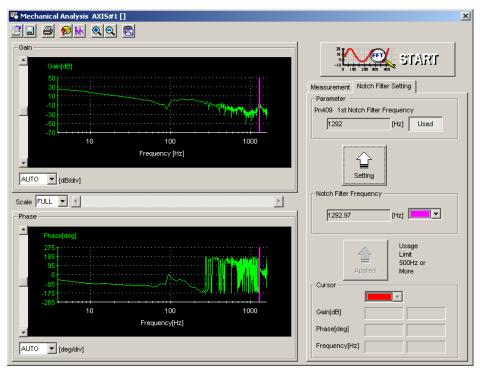
In case that the estimated model is rigid model, the estimated resonance and anti-resonance frequencies are not displayed. In this case, the following message appears when **Display** is clicked.

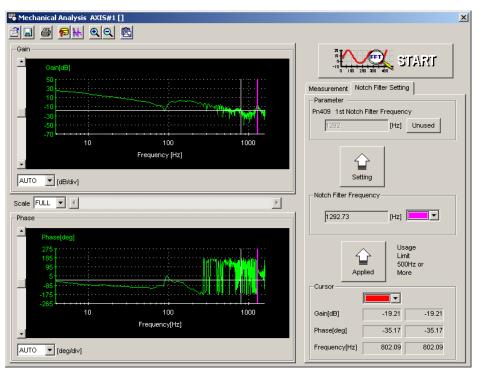


Notch Filter Setting Tab



The notch filter frequency is calculated automatically and displayed in the column of the "Notch Filter Frequency." Click **Setting** and new frequency, which is compensated for digitalization, is displayed in the column of the "Pn409: Notch Filter Frequency."





The notch filter frequency can also be set by using the cursor. See "
Toolbar Details" for details on the cursor.

Toolbar



Mechanical Analysis Window Toolbar

Toolbar Button	Click this button to:
2	Load the mechanical analysis data file.
Open	
	Save a copy of the on-screen gain graph and phase graph to a specified file.
Save As	
a	Print the Mechanical Analysis main window.
Print	
ø	View the conditions to measure the mechanical analysis.
Measurement Conditions	
bk	View the information for the location where a cursor is shown.
Cursor	
Q	Enlarge the view of a selected area.
Zoom In	
Q	Restore the area shown in the window to its usual size.
Return	
殿	Copy the displayed screen to the clipboard.
Clipboard Copy	

See "
Toolbar Details" for details on the toolbar buttons.

Toolbar Details

蔖 (Open) Button

The mechanical analysis data file can be loaded in the Open dialog box. To load the file,

click the 🗾 button. The Open dialog box appears.

Open					?	>
Look jn:	TE_Applications	-	£	e ř	0-0- 0-0- 0-0-	
E 20001106 E 20001106 E 20001106 E	1 14119.myd 152538.myd					
File <u>n</u> ame:	20001106114119.myd				<u>O</u> pen	
Files of <u>type</u> :	Measurement Results File (*.myd)		•		Cancel	
<u>C</u> omment:	test					
	1					

When the 🗾 Button is Clicked in the Main Window

Open

Click **Open** to load the selected measurement results data file.

Cancel

Click **Cancel** to return to the main window without loading the file.

(Save As) Button

he on-screen measurement results gain graph and phase graph can be saved to a file. To

save the graph, click the 📃 button. The Save As dialog box appears.

Save As					? ×
Save jn:	TE_Applications	-	£	<u> </u>	9-9- 9-9- 9-9-
罰 20001106 罰 20001106	114119.myd 152538.myd				
File <u>n</u> ame:					<u>S</u> ave
Save as <u>type:</u> <u>C</u> omment:	Measurement Results File (*.myd)		<u> </u>	L	Cancel
<u>_</u>					

When the 📃 Button is Clicked in the Main Window

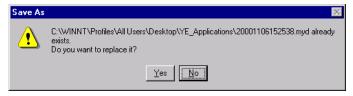
Up to 256 characters can be typed as a comment.

The default file name is the current time (yyyymmddhhmmss).

Save

lick Save to save the data to a designated measurement results data file.

If the file name already exists or if an already existing file is loaded and then re-saved, a warning message appears, telling you that the file name already exists, and asks if you want to replace the existing file.



Click **Yes** to overwrite the already existing file. Click **No** to return to the Save As dialog box without saving the file.

Cancel

Click to **Cancel** to return to the main window.

🕘 (Print) Button

The graph and data on the Mechanical Analysis main window can be printed. To print the

graph and data, click the 🥌 button. The Printing Item Setting dialog box appears.

Printing Item Setting	Printing Item Setting
Cover	Cover
Attaching the Cover Cover Editing	Attaching the Cover Cover Editing
Where to Submit Where to Submit (No.1) Where to Submit (No.2) Item Name Settino Value Title SigmaWin 200 Company Name Yaskawa Department Name MCKJ Name Tarou Yaskawa	Where to Submit Where to Submit (No.1) Where to Submit (No.2) Where to Submit (No.3) Item Name Setting Value Title SigmaWin 200 Company Name Yaskawa Department Name MCKJ Name Tarou Yaskawa
Data for each function Mechanical Analysis Header Footer Printing Items Header Info If Itle Mechanical Analysis Models Info. Printing Date File Name Footer Info If Pages	Data for each function Mechanical Analysis Header Footer Printing Items Graph Relations ✓ Resonance/Anti-Resonance ✓ Notch Filters Info. ✓ Measurement Conditions ✓ Acquisition Date of the Data Others ✓ ✓ Comments
C Black and White C Color OK Cancel	C Black and White Color OK Cancel

Header Footer Tab

Printing Items Tab

Cover

Select Attaching the Cover, and the click Cover Editing. For details, see Chapter 3.

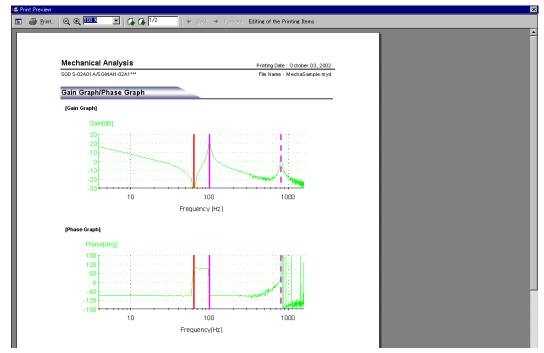
Printing Item Setting Box

Data for each function

To enter your printing preferences or specifications, click the tab whose options you want to enter or change, and enter the desired settings.

Color Selection

Documents can be printed in color or black and white. Select your preference.



After setting is finished, click **OK**. The document appears on the screen the way it will appear in print.

To print the document as is without any changes, click **Print**.

To return to the Printing Item Setting box and change some settings, click **Editing of the Printing Items**.

(Measurement Conditions) Button

The conditions for measuring the mechanical analysis can be viewed. To view the

conditions, click the 😰 button. The Measurement Conditions dialog box appears. If not already selected, click the **Measurement Conditions** tab to view the conditions for measuring the mechanical analysis.

Measurement Conditions	×	
Measurement Conditions Comment		
16		
Date&Time:	2005/03/23 20:59:12	
Servopack:	SGDS-02A01A	
Servomotor:	SGMAS-02ACA21	
Sampling Time:		
Excitation Time / Iteration:	250[us]	
Estimated Resonance Frequency:	1359.38[Hz]	
Estimated Anti-Resonance Frequency:	1019.53[Hz]	
Notch Filter Frequency:	1359.38[Hz]	
Reference Conditions		
Driving Mode:	Horizontal mode	
Excitation Signal:	Cycle wave	
Allowable Rotations:	3[Rotations]	
Excitation Amplitude:	±50[%]	
No. of Executions:	1[Set]	
Line Color:		
	OK Cancel	

Measurement Conditions Tab

leasurement Conditions		×
La mi Commont		
Measurement Conditions Comment		
	ок	Cancel

Comments Tab

Click the **Comments** tab and type any comments.

οκ

Click **OK** to save comments and return to the Mechanical Analysis main window.

Cancel

Click **Cancel** to return to the Mechanical Analysis main window without saving the comments.

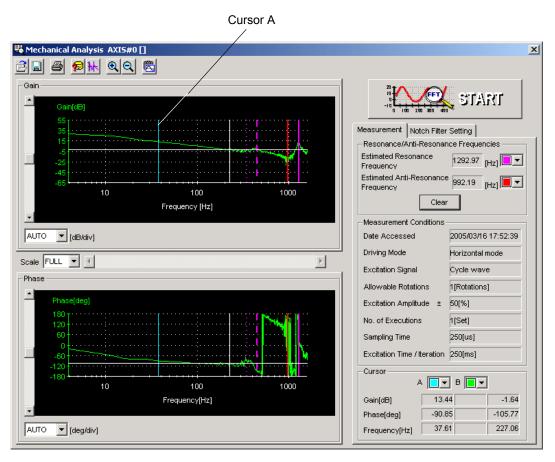
\rm (Cursor) Button

The information for the location where the vertical and horizontal cursor bars intersect can be viewed. Information for the cursor locations A and B can be viewed.

The color of cursor location A and cursor location B can be changed.

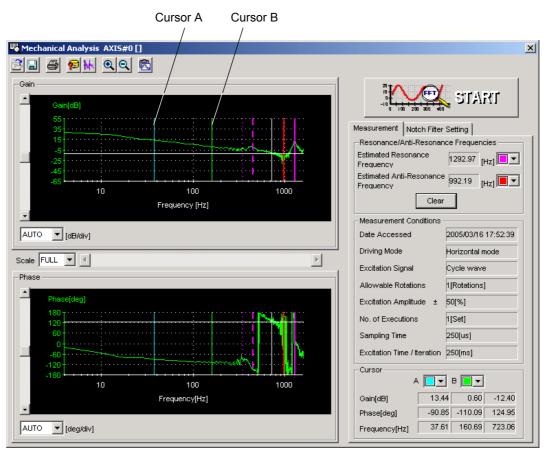
Display the data using the following procedure.

- 1. Click the **button**. The cursor changes into a crosshairs pointer.
- 2. To confirm the location of the cursor, click the intersection point of the cursor bars and the information related to its location is shown in the cursor location A box in the lower right of the window.



Cursor A Selection Mode

3. Next, confirm the cursor location B. Click the intersection point and the information related to its location is shown in cursor location B box in the lower right of the window.



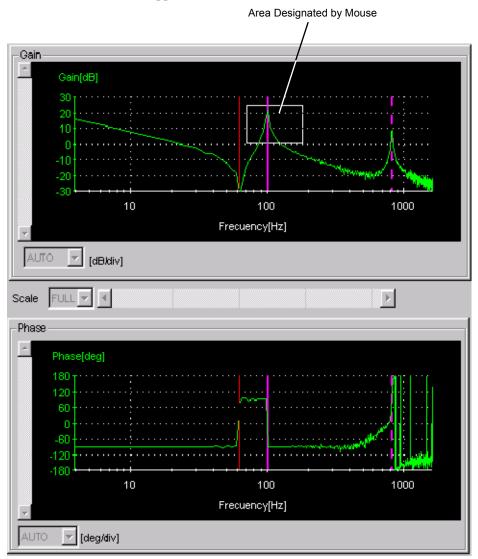
Cursor B Selection Mode

- 4. If you move the cursor bar with the mouse to another location and then click the intersection point, the information in the cursor location A box changes to represent the new location.
- 5. The next time you move the cursor bar and click the intersection point, the information in the cursor location B box changes and so on every time the location changes.

🔍 (Zoom) Button

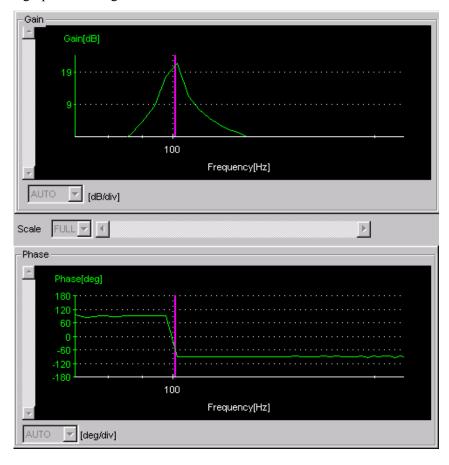
A view of an area selected by the mouse can be magnified. Zoom in on an area using the following procedure.

- 1. Click the 🔍 button.
- 2. Position the mouse at one corner of the area you want to select, and drag to the opposite corner. A line will appear around the selected area.



Area to be Magnified

3. Release the left mouse button. The selected area of the phase graph as well as the gain graph are enlarged.



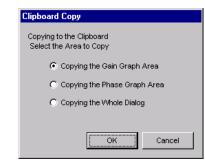
Magnified Area

4. Click the 🔍 button to view the original graph.

🖄 (Clipboard Copy) Button

The displayed screen can be copied to the clipboard. It can be exported to Word or Excel by using this button.

Click the 🖾 button, and the Clipboard Copy dialog box appears.



Select the area to be copied to the clipboard.

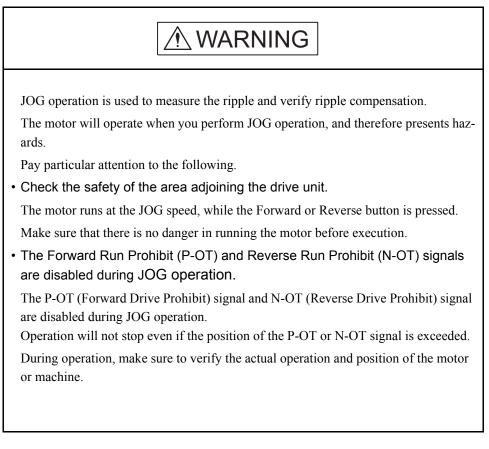
οκ

Click **OK** to copy the selected area to the clipboard.

Cancel

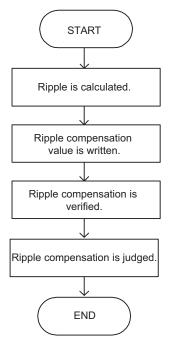
Click Cancel to return to the main window.

4.10.2 Ripple Compensation



There is a small amount of ripple (variation) in the motor speed. You can use the ripple compensation to suppress motor speed ripple.

An outline of the ripple compensation procedure is given below.



Use the following procedure to perform ripple compensation.

1. Select *Solution - Ripple* from the menu bar of the SigmaWin+ Σ -7 component main window.

The following window will be displayed.

	rous to operate this function, because the servomotor will rotate. a sure to check the user's manual before operating.
1. Perform	safety checks around moving parts.
the JOG	e operation button is being depressed, the servomotor will run at speed set. Execute after having confirmed that servomotor n will present no danger.
2. [Forwa	d Run Prohibit (P-OT)]/[Reverse Run Prohibit (N-OT)] is disabled.
disabled P-OT/N-(vard Run Prohibit (P-OT)/Reverse Run Prohibit (N-OT) signals are during JOG operation (the servomotor will not stop even if the DT signals are passed). When operating, carefully verify the d position of the servomotor/machine.

Click **Cancel** to return to the main window without performing ripple compensation. You will return to the main window.

Parameter Write Prohibition

If writing the parameters has been prohibited, the following dialog box will be displayed.



Click OK to clear the parameter write prohibition.

Refer to 4.5.5 *Write Prohibited Setting* for details on clearing the parameter write prohibition.

2. Click OK.

The following Ripple Compensation dialog box will be displayed.

	下来来	Measurement Pn304 : Jogging Speed
v [Aliv]	[Aiv]	500 [min-1] Edit Please execute by 100(min-1) or less.
5	5	Serve OFF Serve ON
3		Forward Reverse
0		+0 0-
4		-Writing Results
3		1

3. Click Edit.

The following dialog box will be displayed.

Edit AXIS#00		×
Pn304 Jo	ging Speed	
Input value	500 min-1	
	,	
	OK	

- 4. Set the JOG speed in the **Input value** Box.
- 5. Click OK.

The Ripple Compensation dialog box will be displayed again.

6. Click Servo ON.

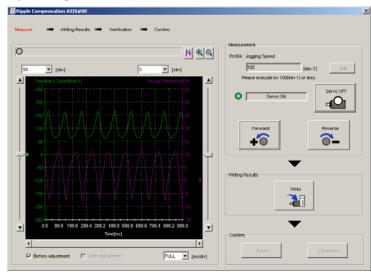
- Measurement	
Pn304 : Jogging Speed	[min-1] Edit
Please execute by 100[min-1]	or less.
Servo ON	Servo OFF
Forward	Reverse

The Measurement Area will be displayed as shown below.

7. Click Forward or Reverse.

The motor will operate at the JOG speed while the button is clicked.

The feedback speed and torque reference graph will be displayed in the trace area during JOG operation.



NOTE

If the ripple measurement time (i.e., the JOG operation time) is too short, ripple measurement will not be completed. If the measurement is not completed, the following message dialog box will be displayed.

Click **OK** and redo the measurement.

Ripple Co	mpensation X
<u>.</u>	Operation was interrupted during measurement. Please redo measurement.
	OK

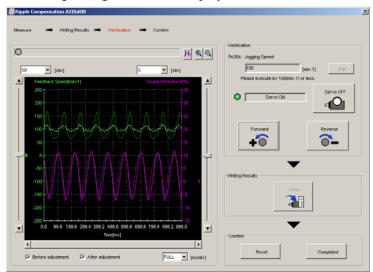
8. Click Write.

The following dialog box will be displayed.



9. Click OK.

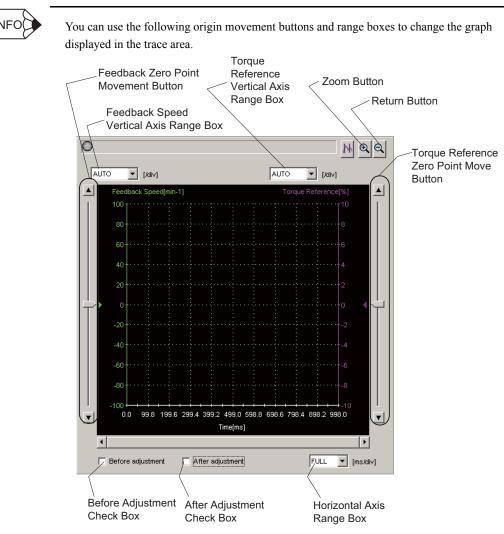
The following dialog box will be displayed.



10. Click Forward or Reverse.

The motor will operate at the JOG speed while the button is clicked.

The feedback speed and torque reference graph after ripple compensation will be displayed in the trace area.



Vertical Axis Ranges

You can set the scales for the feedback speed and torque reference. Select the desired ranges from the boxes. You cannot enter numeric values directly.

If you select **AUTO**, the optimum value will be selected in the box so that all of the data fits within the display area of the graph and the range width will be adjusted.



Vertical Axis Range Box

Horizontal Axis (Time Axis) Range

Select the horizontal axis range from the box. The unit is milliseconds. You cannot enter numeric values directly.

If you select **FULL**, the value will be adjusted automatically so that all of the data fills the display on the horizontal axis.



Horizontal Axis Range Box

Before Adjustment Check Box

If you select this check box, the graph from before ripple compensation adjustment will be displayed.

If you clear the selection, the graph from before ripple compensation adjustment will be hidden.

After Adjustment Check Box

If you select this check box, the graph from after ripple compensation adjustment will be displayed.

If you clear the selection, the graph from after ripple compensation adjustment will be hidden.

(Zoom) Button

Click the Button and then specific an area with the mouse to enlarge that area.

Click the *Q* Button to return to the original display.

11. If the results of ripple compensation verification are acceptable, click **Completed** to end verification of the ripple compensation.



If the results of ripple compensation verification are not acceptable, click **Reset** to return the ripple compensation that is written in the SERVOPACK to the original set value.

If ripple compensation is necessary, repeat the procedure from step 7.

Appendix A Cable Between the PC and SERVOPACK

Use a USB cable to connect the computer to the SERVOPACK.

USB Cable

The following cable is available from Yaskawa. Contact Yaskawa if necessary. JZSP-CVS06-02-E

Communications Specifications

The communication specifications are as follows:

Item	Specifications	Remarks
Complied Standards	USB2.0 full-speed function	
Bus Speed	Full speed (12 Mbps)	
Format	Asynchronous serial	
Communications Type	Half-duplex communications	
No. of Connectable	USB host: 1, slaves: 127	Including hubs
Devices		
Cable Length	5 m at full speed	
	(30 m max. at full speed by connecting five hubs)	
Connector Type	Series mini B plug	
Power Supply	Self-powered method	Supplied from the SERVO-
		PACK power supply

Appendix B Install File List

SigmaWin+ Σ -7 component installs the following files into two directories on the PC. The application default installation directories are as follows.

Main application file	
Microsoft foundation support file	
DAO support file	
Tool OCX	C:\Program Files\SigmaIDE\SigmaWinPlus\SigmaWinI
Electronic manual	
VisualBasic runtime library	
Others	
USB driver	C:\Program Files\SigmaIDE\SigmaWinPlus\Driver

Main Application Files

File Name	Function	Installation Directory
SIGMAFUNCEXECUTOR.exe	Executable Module (EXE)	Application Directory\Bin
SIGMAWINF7.exe	Executable Module (EXE)	Application Directory\Bin
YEPRN.exe	Executable Module (EXE)	Application Directory\Bin
BASELIB.dll	Executable Module (DLL)	Application Directory\Bin
CMIF.dll	Executable Module (DLL)	Application Directory\Bin
COMMMBUS.dll	Executable Module (DLL)	Application Directory\Bin
CYELIB.dll	Executable Module (DLL)	Application Directory\Bin
IFDCM.dll	Executable Module (DLL)	Application Directory\Bin
IFDCOM.dll	Executable Module (DLL)	Application Directory\Bin
IFDUSB.dll	Executable Module (DLL)	Application Directory\Bin
SVAATEX.dll	Executable Module (DLL)	Application Directory\Bin
SVADJUST.dll	Executable Module (DLL)	Application Directory\Bin
SVADVTUNE2.dll	Executable Module (DLL)	Application Directory\Bin
SVALARM.dll	Executable Module (DLL)	Application Directory\Bin
SVAXISNAME.dll	Executable Module (DLL)	Application Directory\Bin
SVBASE.dll	Executable Module (DLL)	Application Directory\Bin
SVCHART.dll	Executable Module (DLL)	Application Directory\Bin
SVCONNECT.dll	Executable Module (DLL)	Application Directory\Bin

File Name	Function	Installation Directory
SVDAMPING1.dll	Executable Module (DLL)	Application Directory\Bin
SVDAMPING2.dll	Executable Module (DLL)	Application Directory\Bin
SVDETVIB.dll	Executable Module (DLL)	Application Directory\Bin
SVEASYFFT.dll	Executable Module (DLL)	Application Directory\Bin
SVENCABS.dll	Executable Module (DLL)	Application Directory\Bin
SVGAINSW.dll	Executable Module (DLL)	Application Directory\Bin
SVGRAPH.dll	Executable Module (DLL)	Application Directory\Bin
SVINERTIA.dll	Executable Module (DLL)	Application Directory\Bin
SVINFO.dll	Executable Module (DLL)	Application Directory\Bin
SVJOG.dll	Executable Module (DLL)	Application Directory\Bin
SVLIB.dll	Executable Module (DLL)	Application Directory\Bin
SVLIBC.dll	Executable Module (DLL)	Application Directory\Bin
SVMECHA.dll	Executable Module (DLL)	Application Directory\Bin
SVMON.dll	Executable Module (DLL)	Application Directory\Bin
SVMONIO.dll	Executable Module (DLL)	Application Directory\Bin
SVMOTORSCALE.dll	Executable Module (DLL)	Application Directory\Bin
SVMONSETTING.dll	Executable Module (DLL)	Application Directory\Bin
SVMULTITURN.dll	Executable Module (DLL)	Application Directory\Bin
SVONEPARA.dll	Executable Module (DLL)	Application Directory\Bin
SVOPCARD.dll	Executable Module (DLL)	Application Directory\Bin
SVPASSWORD.dll	Executable Module (DLL)	Application Directory\Bin
SVPOLEDETECT.dll	Executable Module (DLL)	Application Directory\Bin
SVPRGJOG.dll	Executable Module (DLL)	Application Directory\Bin
SVPLUSRES.dll	Executable Module (DLL)	Application Directory\Bin
SVPRN.dll	Executable Module (DLL)	Application Directory\Bin
SVREALTRACE.dll	Executable Module (DLL)	Application Directory\Bin
SVRESPONSE LEVELSET.dll	Executable Module (DLL)	Application Directory\Bin
SVRIPPLE.dll	Executable Module (DLL)	Application Directory\Bin

Main Application Files (cont'd)

File Name	Function	Installation Directory
SVSRESET.dll	Executable Module (DLL)	Application Directory\Bin
SVTRACE.dll	Executable Module (DLL)	Application Directory\Bin
SVTUNINGGUIDE.dll	Executable Module (DLL)	Application Directory\Bin
SVUPWIZARD.dll	Executable Module (DLL)	Application Directory\Bin
SVUSER.dll	Executable Module (DLL)	Application Directory\Bin
SVUSERCONVERT.dll	Executable Module (DLL)	Application Directory\Bin
SVUSERDIRECT.dll	Executable Module (DLL)	Application Directory\Bin
SVUSERLIB.dll	Executable Module (DLL)	Application Directory\Bin
SVVIBMON.dll	Executable Module (DLL)	Application Directory\Bin
SVZEROPOS.dll	Executable Module (DLL)	Application Directory\Bin
YECIPHER.dll	Executable Module (DLL)	Application Directory\Bin
YECMLIB.dll	Executable Module (DLL)	Application Directory\Bin
YEDBASE.dll	Executable Module (DLL)	Application Directory\Bin
YESIGMA.dll	Executable Module (DLL)	Application Directory\Bin
IDEINFOJ.mdb	Database File	Application Directory\Bin
SIGMAIDE.atb	SigmaWin+ Σ-7 Component Menu File	Application Directory\Bin\Dat\ ToolBar
SIGMAFUNCINFO.swi	Component Information File	Application Directory\Bin\Dat
SIGMATOUR.chm	Help File	Application Directory\Help
BASEORIGINL.bmp	Bitmap File for SvTrace	Application Directory\Bin\Dat\Bmp
BASEORIGINR.bmp	Bitmap File for SvTrace	Application Directory\Bin\Dat\Bmp
BASEOVERLAP.bmp	Bitmap File for SvTrace	Application Directory\Bin\Dat\Bmp
BASETARGETLINE.bmp	Bitmap File for SvTrace	Application Directory\Bin\Dat\Bmp
BASETRIGGER.bmp	Bitmap File for SvTrace	Application Directory\Bin\Dat\Bmp
ORG_BLUE_LEFT.bmp	Bitmap File for SvTrace	Application Directory\Bin\Dat\Bmp
ORG_BLUE_LEFT_ PRINTC.bmp	Bitmap File for SvTrace	Application Directory\Bin\Dat\Bmp
ORG_BLUE_RIGHT.bmp	Bitmap File for SvTrace	Application Directory\Bin\Dat\Bmp
ORG_BLUE_RIGHT_ PRINTC.bmp	Bitmap File for SvTrace	Application Directory\Bin\Dat\Bmp

Main Application Files (cont'd)

File Name	Function	Installation Directory
ORG_DARKGREEN_ LEFT.bmp	Bitmap File for SvTrace	Application Directory\Bin\Dat\Bmp
ORG_DARKGREEN_ LEFT_PRINTC.bmp	Bitmap File for SvTrace	Application Directory\Bin\Dat\Bmp
ORG_DARKGREEN_ RIGHT.bmp	Bitmap File for SvTrace	Application Directory\Bin\Dat\Bmp
ORG_DARKGREEN_ RIGHT_PRINTC.bmp	Bitmap File for SvTrace	Application Directory\Bin\Dat\Bmp
ORG_GREEN_LEFT.bmp	Bitmap File for SvTrace	Application Directory\Bin\Dat\Bmp
ORG_GREEN_LEFT_ PRINTC.bmp	Bitmap File for SvTrace	Application Directory\Bin\Dat\Bmp
ORG_GREEN_RIGHT. bmp	Bitmap File for SvTrace	Application Directory\Bin\Dat\Bmp
ORG_GREEN_RIGHT_ PRINTC.bmp	Bitmap File for SvTrace	Application Directory\Bin\Dat\Bmp
ORG_PERPLE_LEFT.bmp	Bitmap File for SvTrace	Application Directory\Bin\Dat\Bmp
ORG_PERPLE_LEFT_ PRINTC.bmp	Bitmap File for SvTrace	Application Directory\Bin\Dat\Bmp
ORG_PERPLE_RIGHT. bmp	Bitmap File for SvTrace	Application Directory\Bin\Dat\Bmp
ORG_PERPLE_RIGHT_ PRINTC.bmp	Bitmap File for SvTrace	Application Directory\Bin\Dat\Bmp
ORG_PINK_LEFT.bmp	Bitmap File for SvTrace	Application Directory\Bin\Dat\Bmp
ORG_PINK_LEFT_ PRINTC.bmp	Bitmap File for SvTrace	Application Directory\Bin\Dat\Bmp
ORG_PINK_RIGHT.bmp	Bitmap File for SvTrace	Application Directory\Bin\Dat\Bmp
ORG_PINK_RIGHT_ PRINTC.bmp	Bitmap File for SvTrace	Application Directory\Bin\Dat\Bmp
ORG_PRINT_LEFT.bmp	Bitmap File for SvTrace	Application Directory\Bin\Dat\Bmp
ORG_PRINT_RIGHT.bmp	Bitmap File for SvTrace	Application Directory\Bin\Dat\Bmp
ORG_RED_LEFT.bmp	Bitmap File for SvTrace	Application Directory\Bin\Dat\Bmp
ORG_RED_LEFT_ PRINTC.bmp	Bitmap File for SvTrace	Application Directory\Bin\Dat\Bmp
ORG_RED_RIGHT.bmp	Bitmap File for SvTrace	Application Directory\Bin\Dat\Bmp

File Name	Function	Installation Directory
ORG_RED_RIGHT_ PRINTC.bmp	Bitmap File for SvTrace	Application Directory\Bin\Dat\Bmp
ORG_SYAN_LEFT.bmp	Bitmap File for SvTrace	Application Directory\Bin\Dat\Bmp
ORG_SYAN_LEFT_ PRINTC.bmp	Bitmap File for SvTrace	Application Directory\Bin\Dat\Bmp
ORG_SYAN_RIGHT.bmp	Bitmap File for SvTrace	Application Directory\Bin\Dat\Bmp
ORG_SYAN_RIGHT_ PRINTC.bmp	Bitmap File for SvTrace	Application Directory\Bin\Dat\Bmp
ORG_YELLOW_LEFT. bmp	Bitmap File for SvTrace	Application Directory\Bin\Dat\Bmp
ORG_YELLOW_LEFT_ PRINTC.bmp	Bitmap File for SvTrace	Application Directory\Bin\Dat\Bmp
ORG_YELLOW_RIGHT. bmp	Bitmap File for SvTrace	Application Directory\Bin\Dat\Bmp
ORG_YELLOW_RIGHT_ PRINTC.bmp	Bitmap File for SvTrace	Application Directory\Bin\Dat\Bmp

Main Application Files (cont'd)

Microsoft Foundation Support File

File Name	Function	Installation Directory
MFC71.dll	MFC Core Code	Application Directory\Bin Windows System Directory
MSVCP71.dll	C Runtime Library	Application Directory\Bin Windows System Directory
MSVCR71.dll	C Runtime Library	Application Directory\Bin Windows System Directory
MFC71LOC.dll	MFC locale DLL	Application Directory\Bin
ODBC32.dll	MFC DLL	Application Directory\Bin
OLEPRO32.dll	Microsoft OLE Property Support DLL	Windows System Directory
OLEAUT32.dll	Automation Support DLL	Windows System Directory

DAO Support File

File Name	Function	Installation Directory
DAO360.dll	DAO DLL	DAO Directory

Tool OCX

File Name	Function	Installation Directory
SPR32X30.ocx	Spreadsheet OCX *1	Windows System Directory
OLCH2X32.ocx	Olectrachart 2D *2	Windows System Directory
SSTBARS2.ocx	Active Tool Bar *3	Windows System Directory
ACTRPT15J.dll	Active Report DLL ^{*4}	Windows System Directory
FPSPR30.ocx	Spreadsheet OCX *1	Windows System Directory

*1. SPREAD

Copyright (C) 1999 FarPoint Technologies, Inc.

*2. Olectra Chart

Copyright (C) APEX Software Corporation

*3. ActiveToolBar Plus Copyright (C) 2000 Sheridan Software Systems, Inc.

*4. ActiveReports

Copyright (C) 2000 Data Dynamics, Ltd.

Electronic Manual

File Name	Function	Installation Directory
SIGMAWINF7.pdf Electronic Manual		Application Directory\Help

VisualBasic Runtime Library and Others

File Name	Function	Installation Directory
MSVBVM60.dll	Visual Basic Runtime Library	Windows System Directory
VB6JP.dll	Visual Basic locale DLL	Windows System Directory
TABCTL32.ocx	Tab Control OCX	Windows System Directory
COMDLG32.ocx	Common Dialog OCX	Windows System Directory
7-ZIP32.dll	Archiver DLL	Windows System Directory

File Name	Function	Installation Directory
CPUSB.sys	USB Driver (for x86)	Driver Directory\USB
CPUSB2K.inf	USB Driver (for x86)	Driver Directory\USB
CPUSB.sys	USB Driver (for x64)	Driver Directory\USB\x64
CPUSB2K.inf	USB Driver (for x64)	Driver Directory\USB\x64
CPUSB.cat	USB Driver (for x64)	Driver Directory\USB\x64

Appendix C USB Driver Installation

This section describes how to install the USB driver software for SERVOPACK.

The SERVOPACK USB driver cannot be installed by using the SigmaWin+ installer.

When a SigmaWin+ equipped PC is connected to the SERVOPACK through a USB connection, use the following procedure to install the USB driver.

The installation method will vary depending on the operating system (hereinafter referred to as OS). Use the correct procedure for your OS.

The installation procedure is explained assuming that the SigmaWin+ installed folder directory is "C:\Program Files\SigmaIDE" and that the CD-ROM drive is D drive. Use the folder directory and drive according to the settings of your PC.

C.1 Installing the Driver

For Windows 7/Vista

- For Windows XP
- C.2 Confirming the Installation Status
- C.3 Removing a USB Device

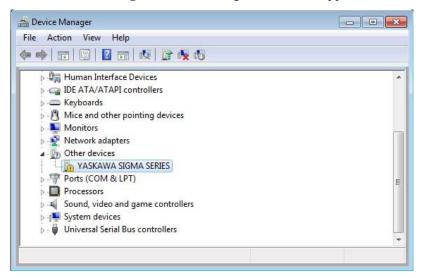
C.1 Installing the Driver

■ For Windows 7/Vista

- 1. Turn on the power to the PC to start Windows 7 or Vista.
- 2. Confirm that SigmaWin+ has been installed. If it has not yet been installed, follow the procedures described in "1.5 Installing SigmaWin+ Program".
- 3. Connect the SERVOPACK to the PC using a USB cable, and then turn on the power to the SERVOPACK. The following message will appear.

Driver Software Installation	—
Device driver software was not successful	y installed
YASKAWA SIGMA SERIES XNo d	river found
You can change your setting to automatically search W Change setting	indows Update for drivers
What can I do if my device did not install properly?	
	Close

- 4. Click Close.
- 5. On the **Start** menu, right-click **Computer** and select **Properties**. The property window will appear.
- 6. Select Device Manager. The following window will appear.



7. Right-click YASKAWA SIGMA SERIES and select Update Drive Software...

8. Select Browse my computer for driver software.

The following window will appear.

ыоч	vse for driver sof	ftware on your comp	uter	
Searc	h for driver software ir	n this location:		
D:\D	river\USB		•	Browse
•		n a list of device drive talled driver software comp category as the device.		

9. Select the Include subfolders check box. Click Browse to select the folder.

< For Windows 7 (32 bit) or Windows Vista >

"C:\Program Files\SigmaIDE\SigmaWinPlus\Driver\USB"

< For Windows 7 (64 bit) >

"C:\Program Files (x86)\SigmaIDE\SigmaWinPlus\Driver\USB\x64"

10. Click Next.

Installation starts by copying the necessary files. Wait until a message appears informing you that the installation is finished.

< If a Security Error Message is Displayed >

Select Install this driver software anyway.



11. When the installation is finished, click Close.

This completes the driver installation.

■ For Windows XP

- 1. Turn on the power to the PC to start Windows XP.
- 2. Confirm that SigmaWin+ has been installed. If it has not yet been installed, follow the procedures described in "1.5 Installing SigmaWin+ Program."
- 3. Connect the SERVOPACK to the PC using a USB cable, and then turn on the power to the SERVOPACK. The Found New Hardware Wizard will appear.

Found New Hardware Wizard		
	Welcome to the Found New Hardware Wizard	
	This wizard helps you install software for:	
	SIGMA Series USB Device	
	If your hardware came with an installation CD or floppy disk, insert it now.	
	What do you want the wizard to do?	
	Install the software automatically (Recommended)	
	 Install from a list or specific location (Advanced) 	
	Click Next to continue.	
	< Back Next > Cancel	

4. Confirm that the **Install from a list or specified location [Advanced]** option is selected, and then click **Next**.

The next Wizard will appear.

Found New Hardware Wizard		
Please choose your search and installation options.		
⊙ Search for the best driver in these locations.		
Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.		
Search removable media (floppy, CD-ROM)		
✓ Include this location in the search:		
D:\Drivert\USB Browse		
O Don't search. I will choose the driver to install.		
Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.		
< <u>B</u> ack <u>N</u> ext > Cancel		

- 5. Select the Search for the best driver in these locations. option and then select the Include this location in the search: check box. Click Browse to select the folder "C:\Program Files\SigmaIDE\SigmaWinPlus\Driver\USB."
- 6. Click Next.

The Wizard starts installation by copying the necessary files. Wait until a message appears informing you that the installation is finished.

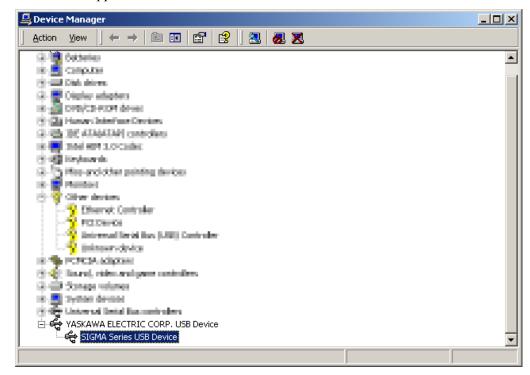
Found New Hardware Wizard		
	Completing the Found New Hardware Wizard	
	The wizard has finished installing the software for:	
	SIGMA Series USB Device	
	Click Finish to close the wizard.	
	< Back Finish Cancel	

7. When the installation is finished, click **Finish**. This completes the driver installation.

C.2 Confirming the Installation Status

Use the following procedure to make sure that the system recognizes the SERVOPACK as a USB device and that the USB driver is installed correctly.

- 1. Click the Start button, point to Settings, and click Control Panel.
- 2. Double-click the System icon. The System Properties window will appear.
- 3. Click the **Hardware** tab and then click **Device Manager**. The Device Manager window will appear.



4. Double-click SIGMA Series USB Device in the YASKAWA ELECTRIC CORP. USB Device folder. The SIGMA Series USB Device Properties window will appear.

SIGMA Series USB Device Properties			<u>? ×</u>	
General	Driver			
¢	SIGMA Series USB Device			
	Device type:	YASKAWA ELI	ECTRIC CORP. L	JSB Device
	Manufacturer:	YASKAWA ELE	ECTRIC CORPOR	RATION
	Location:	YASKAWA SIG	IMA SERIES	
Device status This device is working properly. If you are having problems with this device, click Troubleshooter to start the troubleshooter. Troubleshooter				
Device Use this	usage: s device (enable)			_
			ОК	Cancel

5. Make sure "This device is working properly." is displayed in the **Device status** field.

When "This device is working properly." is displayed, the SERVOPACK is ready to be used through a USB connection. If it is not displayed, reinstall the USB driver.

C.3 Removing a USB Device

While the power supply to the PC is on, remove the USB cable from the USB port on either the PC or the SERVOPACK. Or, turn off the power to the SERVOPACK. On the screen of Windows XP, an external device disconnection confirmation will appear. Safely remove the device using the following procedure.

1. Double-click the **Safely Remove Hardware** icon in the taskbar in the bottom right corner.



The Unplug or Eject Hardware window will appear.

🍝 Unplu	ıg or Eject Hardware		<u>?</u> ×
\$	Select the device you want to unplug o Windows notifies you that it is safe to o computer.		
Hardwa	re devices:		
چې sıo	SMA Series USB Device		
SIGMA	Series USB Device at YASKAWA SIGM	A SERIES	
		Properties	Stop
🔽 Disp	olay device components		
🔽 Sho	w Unplug/Eject icon on the taskbar		Close

2. Select "SIGMA Series USB Device" in the **Hardware devices:** field, and then click **Stop.**

Stop a Hardware device	<u>?</u> ×
Confirm devices to be stopped, Cl	hoose OK to continue.
Windows will attempt to stop the f stopped they may be removed sal	ollowing devices. After the devices are fely.
🛱 SIGMA Series USB Device	
	OK Cancel

3. Confirm that the "SIGMA Series USB Device" is selected, and then click **OK**.

4. The processing to remove the selected device will be carried out and a message will appear informing you that the device can be safely removed.

The cable can then be safely removed or the power to the SERVOPACK can be safely turned off.

Revision History

The revision dates and numbers of the revised manuals are given on the bottom of the back cover.

MANUAL NO. SIEP S800001 48B <1> Published in Japan September 2014 Date of publication

Date of Publication	Rev. No.	Section	Revised Content
November 2015	<2>	Front cover	Revision: Format
		1.4	Revision: Information on Machine Controllers that support MECHATROLINK-II communica- tions
		Back cover	Revision: Format and address
September 2014	<1>	Preface	Addition: Related manuals
		All chapters	Addition: Information on Σ -7S Command Option Attachable-type SERVOPACKs, Indexer Module, DeviceNet Module, and Safety Module.
		4.9	Addition of section: Editing Tables
		Back cover	Change: Address
May 2014	-	-	First edition

AC Servo Drives Engineering Tool SigmaWin+ **ONLINE MANUAL** Σ -7 Component

IRUMA BUSINESS CENTER (SOLUTION CENTER)

480, Kamifujisawa, Iruma, Saitama, 358-8555, Japan Phone 81-4-2962-5151 Fax 81-4-2962-6138 http://www.yaskawa.co.jp

YASKAWA AMERICA, INC.

2121, Norman Drive South, Waukegan, IL 60085, U.S.A. Phone 1-800-YASKAWA (927-5292) or 1-847-887-7000 Fax 1-847-887-7310 http://www.yaskawa.com

YASKAWA ELÉTRICO DO BRASIL LTDA.

777, Avenida Piraporinha, Diadema, São Paulo, 09950-000, Brasil Phone 55-11-3585-1100 Fax 55-11-3585-1187 http://www.yaskawa.com.br

YASKAWA EUROPE GmbH

185, Hauptstraβe, Eschborn, 65760, Germany Phone 49-6196-569-300 Fax 49-6196-569-398 http://www.yaskawa.eu.com

YASKAWA ELECTRIC KOREA CORPORATION

9F, Kyobo Securities Bldg. 26-4, Yeouido-dong, Yeongdeungpo-gu, Seoul, 150-737, Korea Phone 82-2-784-7844 Fax 82-2-784-8495 http://www.yaskawa.co.kr

YASKAWA ELECTRIC (SINGAPORE) PTE. LTD.

151, Lorong Chuan, #04-02A, New Tech Park, 556741, Singapore Phone 65-6282-3003 Fax 65-6289-3003 http://www.yaskawa.com.sg

YASKAWA ELECTRIC (THAILAND) CO., LTD. 59, 1st-5th Floor, Flourish Building, Soi Ratchadapisek 18, Ratchadapisek Road, Huaykwang, Bangkok, 10310, Thailand Phone 66-2-017-0099 Fax 66-2-017-0799 http://www.yaskawa.co.th

YASKAWA ELECTRIC (CHINA) CO., LTD. 22F, One Corporate Avenue, No.222, Hubin Road, Shanghai, 200021, China Phone 86-21-5385-2200 Fax 86-21-5385-3299 http://www.yaskawa.com.cn

YASKAWA ELECTRIC (CHINA) CO., LTD. BEIJING OFFICE Room 1011, Tower W3 Oriental Plaza, No.1, East Chang An Ave.,

Dong Cheng District, Beijing, 100738, China Phone 86-10-8518-4086 Fax 86-10-8518-4082

YASKAWA ELECTRIC TAIWAN CORPORATION

9F, 16, Nanking E. Rd., Sec. 3, Taipei, 104, Taiwar Phone 886-2-2502-5003 Fax 886-2-2505-1280



YASKAWA ELECTRIC CORPORATION

In the event that the end user of this product is to be the military and said product is to be employed in any weapons systems or the manufacture thereof, the export will fall under the relevant regulations as stipulated in the Foreign Exchange and Foreign Trade Regulations. Therefore, be sure to follow all procedures and submit all relevant documentation according to any and all rules, regulations and laws that may apply. Specifications are subject to change without notice for ongoing product modifications and improvements

© 2014-2015 YASKAWA ELECTRIC CORPORATION

MANUAL NO. SIEP S800001 48C <2>-0 Published in Japan November 2015 15-8-11 Original instructions