SURUGA SEIKI

4 Axis Motion Controller
DS2000A
User's Manual

SS Motion Control
Software Manual
Ver.1.0

Index

1. Introduction

This manual explains the use of the PC application for the Suruga Seiki DS2000A motion controller ("SS Motion Controller" (SSM)). Before any use of the controller, please read this manual carefully and understand the functions of the software, fully, for the Suruga Seiki DS2000A.

Functions and use of the SSM is subject to change or upgrade without notice. The latest version is always posted on our website. Please be advised the latest version before use.

2. Software Installation

2.1 Software Download

Obtain an installation file from our WEB site.

Name	File Name	Down Load Location
Installation file	SSMotionControl-1.0.0-en.msi (English) 《U.S.A version and International version are only different in their license agreement》	Available on our website

Run the installation file, "SSMotionControl-1.0.0-en.msi", and follow the procedures.

2.2 Installation procedures

The installation proceeds a device driver and then the SSM main components. The device driver installation screen appears during the installation of the software. Follow the on-screen instructions to complete the installation.

1. Setup wizard

2. License agreement

3. Installation folder selection

4. Shortcut selection

5. Start the Installation

6. Device driver installation

7. Complete Driver Installation

8. Finish Installation

2.3   Uninstall the software

Select "Uninstall program" from the control panel and uninstall "SS Motion Control".

As for the device driver, uninstall "Windows Driver Package – Cypress (CYUSB) USB" or "Windows Driver Package – Cypress (CYUSB3) USB".

3. Connections to Controller

3.1 The operating environment

The initial setting method is different for a "single" controller and two "linked" controllers.

Name	Quantity	Remarks
(1) PC	1	Windows XP (32-bit), Windows 7 and 10
(2) USB cable	1	PC side: Type-A, Controller side: Type-B
(3) Controller	1	When a single controller is used, set the ID to "0".
	《2nd controller》	A UTP cable (LAN cable) connection
<(4) Handy Portal > (Sold separately)	1	Alternative to a PC-based data and instruction interfacing, a handy portal (DT205) is available. (Please contact our sales agent for your further inquiries).

3.2 Connection methods

● Connection for the single-controller operation

● Connection for the 2 controllers linked operation

3.3 PC-Link by USB cable

Action buttons explained

 To establish the PC-Link, click the "Connect" button on the upper right of the screen
When successfully established, the other action buttons become available.

Note: If the USB communication cannot be started, refer to "Appendix A. Troubleshooting".

 To terminate the PC-link, click the "Close" button on the upper right of the screen.
This closes the software at the same time.

Note: A program sequence will not be halt, even though, the PC-link is terminated while driving stages. Before shutting down the software, please stop a program sequence properly while the SSM running.

Screen after software startup (before the USB connection)

Screen after USB connection (two controllers linked)

4. Main Application Screen

4.1 Basic screen configuration

Display Area in detail

Display area	Name	Function
Universal	Connect	Start the PC-link Session
	Close	Terminate the PC-link and closes the SSM.
	Stop All	It halts all driven axes.
	Returning to Origin	Return the all selected axes to their origins at once.
	Home Position	Move the selected axes to their home positions at once.
	Move to Target	Move the selected axes to their destinations at once.
	Axis No.	Check boxes to specify the single or butch execution.
	Emergency Stop	On an emergency stop, the indicators turn into red dots.
	Edit (offline)	Users may edit "Program drive" tab screen without the PC-link.
Function Tab screen	Unit Configuration	Display controller configuration statuses and assign ID numbers.
	Parameter Settings	Set parameters for a connected individual motorized stage
	Motion Control	Perform manual control (jogging/inching, etc.) for each axis.
	Teaching	Input the teaching point position information.
	Program Drive	Perform program drive sequence.
	Speed Table	Set the speed table common to all axes.
	I/O Port	A graphical interface of the I/O port
Connection Status		Progress bars and driver versions are displayed.
Detail view		Display contents of the function tab.

* The common operation/emergency stop display area remains resident even when the tab screen is switched.

4.2 Universal Operation/Emergency Stop Area

The function buttons in the universal function area are shown below. Colored operation buttons are enabled, and grayed-out buttons are disabled.

Button	Description
Connect	Start the PC-Link
Close	Close the application
Stop all	Halt all axes in motion
Return to Origin (Multi-Axis Operation)	Selected axes reset to their origins
Home Position	Selected axes return to their home positions
Move to Target	Selected axes seek their positioning
Axis No.1 / Axis No.2 / Axis No.3 / Axis No.4 / Axis No.5 / Axis No.6 / Axis No.7 / Axis No.8	4 axes per controller. Total of 8 axes are selectable for the Milt-Axis operation
Emergency Stop — ID0 / ID1	Red dotted when "Emergency Stop" executed
Edit (Offline)	Off-line Editor for the "Program Drive Screen"

4.3 Screen after Connection

If the PC-Link is successful, the grayed out functions are colorized for enabling.

At the same time, "Successful" is displayed in the status bar at the bottom of the screen.

* When the connection with the PC is successful, "USB open status: Successful" is displayed.

USB:Connected CUnet:Online DLL Ver:2005 FW Ver:2010 Controller ID0 Ver:0.0.0.0 ID1 Ver:-

* When the connection with the PC fails, "USB open status: Not connected" is displayed.

USB:Not connected CUnet:Online Faild DLL Ver:2005 FW Ver:0 Controller version:-

Note: If the PC communication fails, refer to "Appendix A. Troubleshooting".

4.4 Function Tabs Area

The categories in the function tabs are shown below.

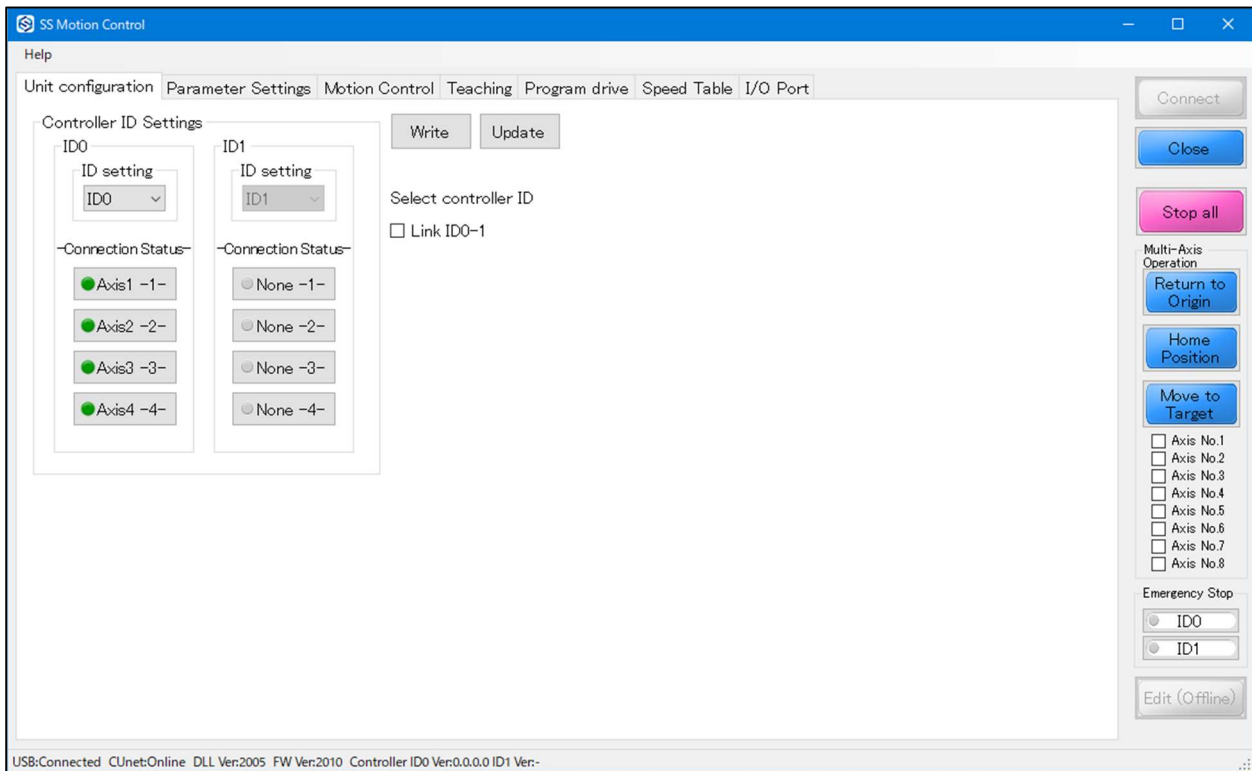| Tab Category	Screen Contents
Unit Configuration (Some restrictions)	System configuration of the SSM ● Each controller, ID0 or ID1 can be assigned [ID0 = default]. ● When two are linked, ID0 and ID1 can be assigned to either controller. Note that the same ID number cannot be occupied in the two controllers,
Parameter Settings	Mange the parameters of a connected stage
Motion Control	Manual operation can be performed for each drive axis. Operations such as enabling, specifying drive positioning, and starting/stopping movement can be obtained for each axis.
Teaching	Manage teaching positions and assignments.
Program Drive	Edit and run program sequences
Speed Table	Set the speed table to control positioning speed for each axis.
I/O Port	Display INPUT / OUTPUT status or manually manipulate output status.

5. Unit Configuration

5.1 On screen, set the ID number for single or linked controllers.

<Action button display for the single controller (4-axis) configuration>

In default, the controller ID is set to "zero" (ID0).

5.2 How to link two controllers (8-axis drive) from a factory default

1. Connect the two controllers with a LAN cable into the "Port-A*" while powering off both controllers.

2. Connect the PC to the controller assigning ID1 and turn the power on while the other is off.

3. By the SSM, assign ID1 and press the "Write" button as the screen capture shown on the below.

4. Turn off the "ID1" controller, after 10 seconds, turn back on.

5. Click "Update" button and confirm the ID as ID1. Then, turn off the ID1 controller.

6. Connect the PC to the controller dedicating ID0. Turn on the both controllers, ID0 and ID1.Click "Update" of the SSM. Confirm the ID1

Screen assigning ID1

controller is now recognized through the controller ID0 as shown left.

7. Click the check box next to the "Link ID0-1." Then, click "Write"

8. Turn off the both controllers and turn back on after 10 seconds or so.

9. On the SSM, click "Update." Confirm the "Link ID0-1" is checked.

Now, the controller ID0 recognizes the ID1 controller for a data linkage.

③　Reading the parameter data set from the controller

Read　The read parameters are those stored in the controllers, previously.

④　Writing parameter data set to the controller

Write　IMPORTANT: If any changes in the parameter settings, be sure to "Write" the changes to the controller. The controller does not recognize the software changes, automatically.

⑤　Selecting a motorized stage model and assign its axis number

Select Model　Axis No.

Not selected　1

A stage type is unspecified in the beginning. Neither the controller nor the software does not recognize, automatically, which stage being connected to the controller. A user, therefore, select a matched stage model and the axis number, manually.

Selecting a stage model is also advantageous to save time because parameters which each stage uniquely possesses in advanced setting are concurrently loaded by just selecting a model from a menu.

6.2　How to select a Stage model.

1. Press the "Not selected" button on the screen area ⑤.
2. Expand the (+) node at an appropriate model category.
3. After highlighting a selecting a specific model, press the "OK" to reflect the change.

For example of a horizontal linear stage,

expand "X-axis" tree. All Suruga motorized stage horizontal types are listed in the branch. Select the one with the model product code. Asterisks, "∗", are used to generalize the model codes. They are often for stroke length or option codes; not necessary to identify a motorized model.

After the model selection being made, the button displays the matching model code as shown in below;

⑥　Software Limit

Set the Software Limit for each axis.

CWLS　　=> Software Limit on clock wise rotation.

CCWLS　　=> Software Limit on counter clock wise rotation

Check the box to activate a set of Software Limit.

Note: The unit can be changed in the Advanced Setting. (Example: mm => μm)

⑦　Home Position

Set a home position for each axis.

A home position can be obtained anywhere within the hardware/software limits.

⑧　Advanced Setting

Each Stage model has unique parameters for precision drive; such as an origin return pattern or specifying a limit sensor type. The next section introduces the advanced setting in detail.

6.3 Advanced setting >> Driver settings

Depending on the selected model, the Advanced Settings are automatically preset.

- **Type**

  Normal: Linear axis and motorized Gonio stages

  Rotary: Motorized rotary stages

  Sine motion: Special stages such as KGB / KAB

- **Unit**

  Select the unit of movement amount for each axis.

- **Travel per pulse by fullstep**

  Set the travel distance per pulse at the full step.

  The travel distance per pulse is automatically calculated from the number of divisions based on this value.

  It is highly recommended not to change the value.

- **Motion radius**

  Set the motion radius of sine motion.

- **Number of divisions (Micro-step)**

Register the number of divisions for the driver in the controller.

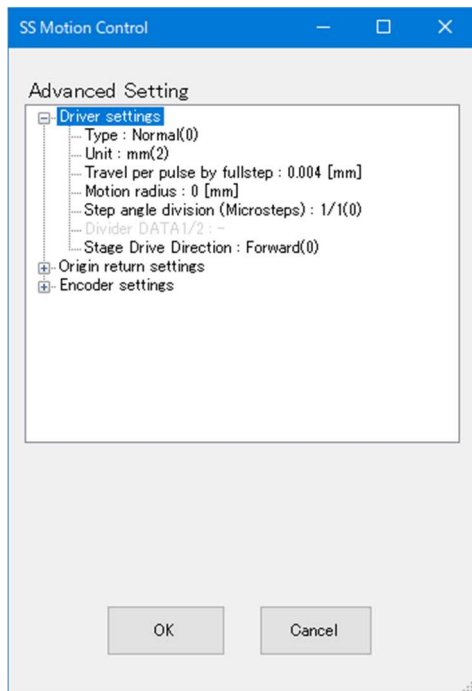The software-set number of division must be equal to attribute of the rotary encoder which resides in the motor driver inside. Open the adjustment window on the right side of the controller and find the motor driver that holds the rotary switches. This software does not automatically recognize hardware settings. Please refer to the table below for how the switch position corresponds the number of micro-step divisions

 As shown in the illustration left, the position of the arrow attributes the number of micro-step divisions

Switch position	0	1	2	3	4	5	6	7	8	9
Number of divisions	1/1	1/2	1/4	1/5	1/6	1/10	1/20	1/40	1/80	1/16

Switch position	A(10)	B(11)	C(12)	D(13)	E(14)	F(15)
Number of divisions	1/25	1/50	1/100	1/125	1/200	1/250

IMPORTANT:

For all divisions, travel distance per pulse is automatically calculated as if it's at the full step.
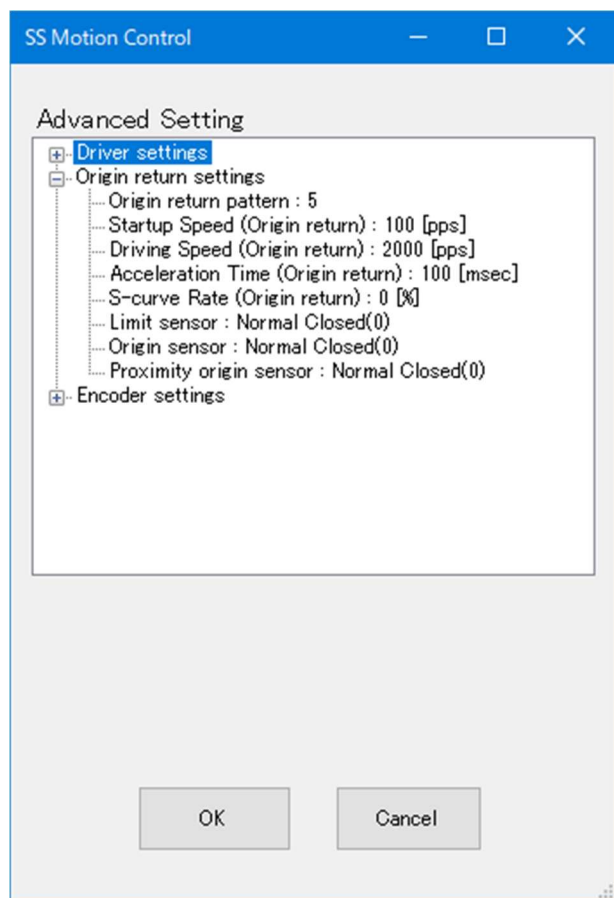
However, the maximum pulse speed in any number of divisions is limited to 500 kpps.

- **Stage Drive Direction**

Define the direction of stage movement during forward motor rotation. Regardless of linear motion, rotation, or Gonio, the forward direction is referred to as interlocked to the forward rotation of the motor.

6.4 Advanced setting >> Origin return setting

Set the return pattern, speed, and sensor input logic during origin return processing and such.

- ● **Origin return pattern**

  Refer to the table below for the pattern details.

- ● **Startup speed**

  Set initial speed of return origin

- ● **Driving Speed**

  Set speed of return origin.

- ● **Acceleration time**

  Set the accel/decel time for origin return.

- ● **S-curve rate**

  Set the S-curve rate for acceleration/deceleration.

- ● **Limit sensor input theory**

  Set the ON/OFF judgment of the sensor mounted on the automatic stage.

- ● **Origin sensor**

  Set the ON/OFF judgment of the sensor mounted on the automatic stage.

- ● **Proximity origin sensor**

  Set the ON/OFF judgment of the sensor mounted on the automatic stage.

Origin Return Type in detail

Type 0	Do not perform origin return.
Type 1	Perform edge detection to the CCW direction. Firstly, perform the CW edge detection for the NORG signal, and then, the CCW edge detection for the ORG signal.
Type 2	Perform edge detection to the CW direction. Firstly, perform the CCW edge detection for the NORG signal, and then, perform the CW edge detection to the ORG signal.
Type 3	Perform edge detection to the CCW direction, and then, the CCW edge detection for the ORG signal.
Type 4	Perform detection to the CW direction, and then, the CW edge detection to an ORG signal.
Type 5	Perform detection to the CCW direction, and then, the CWW edge detection to a CCWLS signal.
Type 6	Perform detection to the CW direction, and then, then CW edge detection to a CWLS signal.

6.5 Advanced setting >> Encoder settings

Define the specifications of the encoder connected to the back panel port.

- **Encoder**

  Set whether to read the signal from the encoder connected to the encoder port.

- **Multiplication**

  Set the multiplication number. Multiplication 1, 2, or 4 can be set.

- **Resolution ratio molecule**

  Enter the drive axis resolution/pulse.

  (Example: Resolution per pulse = 1 µm/pulse)

- **Resolution ratio denominator**

  Enter the encoder resolution/pulse.

  (Example: Encoder count per pulse = 25/pulse)

- **Encoder count direction**

  Set the plus or minus direction of the encoder.

- **Z-phase input logic**

  Set the positive or negative theoretical value of the linear or rotary encoder Z-phase input.

- **Positioning count**

  When the number of command pulses to the destination is completed, the destination may be different from the current position. If so, the system tries to match the current position with the destination by retracting or advancing the pulses (positioning).

7. Motion Control

7.1 Axis Field Activation

In the initial state, all axes for which parameter settings have been completed are disabled.

<Manual axis operation table in initial state>

Perform axis activation to enable these axis action buttons and indicators.

Axis Field Activation

Disabled   Enabled

Clicking the button can enable or disable automatic stage operation.

7.2 Field Description

An example of axis parameter area is shown below;

Indicators in detail

Name	Description
BUSY	The axis in motion
Position progress bar	The moving distance is displayed graphically.
Current position	The current position of the axis is displayed. The unit is reflected from the Advanced Setting of parameters.
ML-CCW	Mechanical limit (CCW)
SL-CCW	Software limit (CCW)
ML-CW	Mechanical limit (CW)
SL-CW	Software limit (CW)
COMP-ORG	Origin Return completed

Action buttons and input parameters in detail

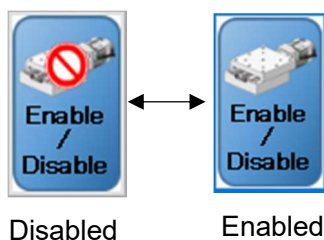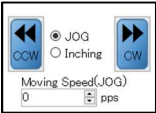| Name	Description
Run	Start driving the axis to the Destination that has been set.
Stop	Stop the axis being driven.
Destination	Specify the Destination of the axis. The unit is chosen in the Advanced Setting of parameters.
Pulse/encoder	Select the control method. Pulse => Open loop Encoder => Closed loop (encoder input required)
JOG/Inching	Select JOG or inching for CCW/CW button operation. Set the movement speed in JOG mode. Set the Moving distance in inching mode.
Movement speed (unit)	Specify the jog/inching speed.
Speed Table	Specify the speed table number.
Return to Origin	Perform origin return.
Home Position	Move to the home position.
CURON	Turn the motor on/off.

8. Teaching

Teaching Table - Enter the teaching position of each axis at the row of a point number.

Action Button in detail

Name	Description
Open	Retrieve a file saved on the PC.
Save	Save a teaching data set to the PC.
Set	Register teaching positions on the software table.
Delete	Deletes teaching points.
Go To…	Move the axis to the specified teaching point.
Read	Read the teaching position data set registered in the controller, DS2000A.
Write	Register teaching position data set in the controller, DS2000A.

9. Program Drive

9.1 Drive Command Selection and Program Sequence

Action Button in Detail

Name	Description
Program No.	Select program bank No., (two program banks with 800 lines per program).
New	Clear the program sequence on the software screen.
Open	Open a program file saved on the PC.
Save	Save a program file to the PC.
Insert	Insert a new line between the program lines.
Delete	Delete a program line.
Run	Run an entire program sequence from the beginning.
Stop	Stop a running program sequence.
Step	Single line execution and automatically step forward.
Read	Read a program bank registered in the controller, DS2000A.
Write	Register a program bank to the controller. Note: the software does NOT register sequential command lines, promptly. "Write" must be executed to register a program bank in the controller.
Start mode	Set the program start mode after turning on the power. Normal start => Start the program on PC software or handy portal. => Automatic program start after power on

Indicators in detail

Name	Description
ID0-1 linkage	Light green when two units are linked.

9.2 Program-driven command list

Command Category	Functions	Commands	
		NOT waiting for other operations to finish	Waiting for other operations to finish
Drive	Return to Origin	GO_ORG	GOW_ORG
	Home Position	GO_HOME	GOW_HOME
	Move to Target	GO_ABS	GOW_ABS
	Relative Position Drive	GO_CW、 GO_CCW	GOW_CW、 GOW_CCW
	2 axis linear interpolation Drive	GO_LIN2	GOW_LIN2
	3 axis linear interpolation Drive	GO_LIN3	GOW_LIN3
	2 axis circular interpolation Drive	GO_CIRCW、 GO_CIRCCW	GOW_CIRCW、 GOW_CIRCCW
	Teaching position Drive	GO_TCH	GOW_TCH
	Waiting for operation to finish	WAIT_MOVE	---
Speed and Position	Speed Setting	SEL_SPEED	---
	Position Setting	SET_TGPOS	---
	Relative Position Drive amount setting	SET_RELLENGTH	---
Stop	Specified Axis Stop	STOP	---
	Stop All Axes	STOP_ALL	---
Branch	Jump	JUMP	---
	Conditional jump	IFJUMP	---
	Loop	LOOP_START LOOP_END	---
Output	Specified Port Operation	OUTP	---
	Bulk Operation of All Ports	OUTP_ALL	---
Timer	Wait time	WAIT_TIME	---

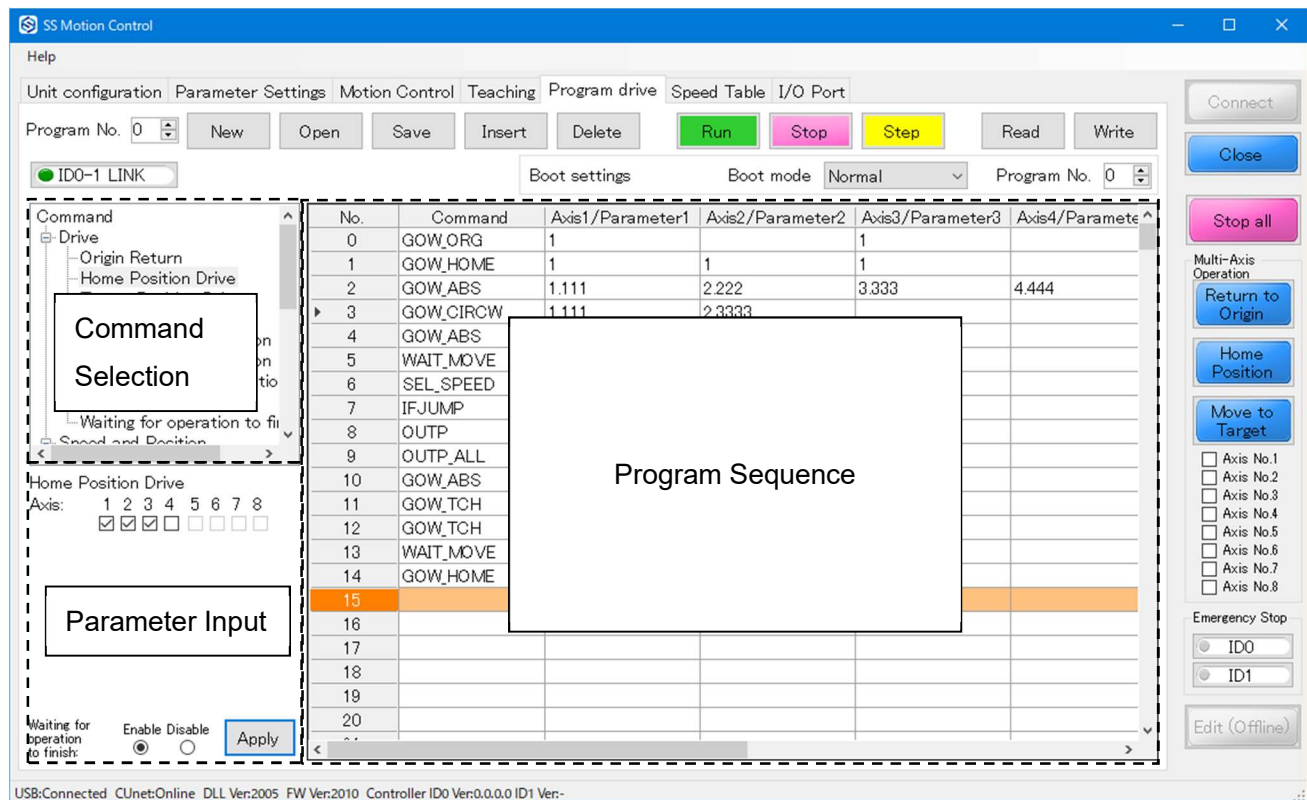# 10. Commands and parameters in detail

The programing area consists of the three sub sets as shown below.

Command selection - Select a command according to the purpose of the sequence.

Parameter input - Enter the parameters required for the selected command. For details, refer to "Drive Command" in the next section.

Program sequence - The entered commands with parameters are displayed.

10.1 Drive commands in detail

10.1.1. Origin Return

Axis: Check the box to select a target axis.

Waiting for operation to finish: Specify whether reached axes wait for other axes to finish their operations. If disable, a specified axis executes a next command ahead.

Example of "Origin Return"

No.	Command	Axis1/Parameter1	Axis2/Parameter2	Axis3/Parameter3	Axis4/Parameter4
0	GOW_ORG	1		1	

10.1.2. Home Position Drive

Axis: Check the box to select a target axis.

Waiting for operation to finish: Specify whether reached axes wait for other axes to finish their operations. If disable, a specified axis executes a next command ahead.

Example of "Origin Return"

No.	Command	Axis1/Parameter1	Axis2/Parameter2	Axis3/Parameter3	Axis4/Parameter4
0	GOW_ORG	1		1	

10.1.3. Target Position Drive

Absolute position: Specify an absolute coordinate position respect to the origin. A blank or enter "0" means no command execution on the line of sequence.

Waiting for operation to finish: Specify whether reached axes wait for other axes to finish their operations. If disable, a specified axis executes a next command ahead.

Example of "Origin Return"

No.	Command	Axis1/Parameter1	Axis2/Parameter2	Axis3/Parameter3	Axis4/Parameter4
0	GOW_ABS	5	5		

10.1.4. Relative Position Drive

Specify the amount of relative movement from a stop position. Relative Position Drive is performed in two steps as follows.

Step 1. "Relative position drive"

Step 2. "Relative position drive"

Positive integer: Specify the amount of relative distance from their current stop position. Only a positive integer value is applicable because a direction is specified in the step 2.

Axis: Check the box to select a target axis.

Moving direction: Specify the movement direction which is either CCW or CW.

Waiting for operation to finish: Specify whether reached axes wait for other axes to finish their operations. If disable, a specified axis executes a next command ahead.

Example of "Relative Position Drive" command

If the rotation direction of the relative position drive differs depending on the axis, specify it in two lines.

No.	Command	Axis1/Parameter1	Axis2/Parameter2	Axis3/Parameter3
0	SET_RELLENGTH	1.111	2.222	3.333
1	GO_CCW	1		1
2	GOW_CW	1		1

⟸ Step 1. Relative position drive amount setting

⟸ Step 2. Relative position drive axis specification/Drive direction

10.1.5. Axis Linear Interpolation Drive

Set the linear interpolation drive with specified 2 axes.

Absolute position: Specify the absolute coordinate positions respect to the origins. A blank is not applicable.

Waiting for operation to finish: Specify whether reached axes wait for other axes to finish their operations. If disable, a specified axis executes a next command ahead.

Example of "2 axis Interpolation Drive" command

No.	Command	Axis1/Parameter1	Axis2/Parameter2
0	GO_LIN2	1.111	2.222

10.1.6. Axis Linear Interpolation Drive

Absolute position: Specify the absolute coordinate positions respect to the origins. A blank is not applicable.

Waiting for operation to finish: Specify whether reached axes wait for other axes to finish their operations. If disable, a specified axis executes a next command ahead.

Example of "3 axis Interpolation Drive" command

No.	Command	Axis1/Parameter1	Axis2/Parameter2	Axis3/Parameter3
0	GOW_LIN3	1.111	2.222	3.333

10.1.7. 2-axis Circular Interpolation Drive

2-axis circular interpolation drive setting is performed in 2 steps.

Step 1. Target Position Drive → Step 2. Circular Interpolation Drive

Absolute position: Specify the absolute coordinate positions respect to their origins. A blank is not applicable.

Arc center: Specify the center coordinates of the arc. The number of axes specified at this time is two.

Movement direction: Specify the movement direction.

Waiting for operation to finish: Specify whether reached axes wait for other axes to finish their operations. If disable, a specified axis executes a next command ahead.

Example of "2-axis Circular Interpolation Drive" command

No.	Command	Axis1/Parameter1	Axis2/Parameter2	
0	GOW_ABS	1.111	2.222	⇐ Step 1. Target Position Drive
1	GOW_CIRCW	3.333	4.444	⇐ Step 2. Circular interpolation drive

10.1.8. Teaching Position Drive

Teaching point No. : Specify a teaching point number preset on the "Teaching point" table (see the section 8).

Waiting for operation to finish: Specify whether reached axes wait for other axes to finish their operations. If disable, a specified axis executes a next command ahead.

Example of "Teaching Position Drive" command

No.	Command	Axis1/Parameter1	Axis2/Parameter2	Axis3/Paramete
0	GOW_TCH	1		

Corresponding teaching point in teach table

Point	Axis No.1	Axis No.2	Axis No.3	Axis No.4
0	1.112	2.224	0	0
1	3.332	4.44	0	0

The axis 1 and 2 read the absolute position value for their positioning.

10.1.9. Wait for Operation to Finish

Axis: Check the box to select a target axis.

Example of "Wait for Operation to Finish" command

No.	Command	Axis1/Parameter1	Axis2/Parameter2	Axis3/Parameter3	Axis4/Paramete
0	WAIT_MOVE	1	1	1	

10.1.10. Speed Specification

Speed Setting: Specify the speed table number in which is in the "Speed table". Any blank axis reflects no change to the speed of an axis or the default speed.

Example of "Wait for Operation to Finish" command

No.	Command	Axis1/Parameter1	Axis2/Parameter2	Axis3/Parameter3	Axis4/Parameter4
0	SEL_SPEED	4	4		6

10.1.11. Specified Axis Stop

Specified Axis Stop

Axis: 1 2 3 4 5 6 7 8
☑ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Apply

Axis: Specify the axis to be stopped.

Example of "specified axis stop" command

No.	Command	Axis1/Parameter1	Axis2/Parameter2	Axis3/Parame
0	GOW_ABS	10	10	
1	GO_ABS	10	15	
▷ 2	STOP	1		
3	GO_ABS	5		

10.1.12. All Axis Stop

All Axis Stop

Apply

All axes are stopped at once.

Note: If "No" is specified for "Waiting for operation to finish" in the command execution on the previous line, all axes are stopped immediately after the previous line is executed.

Example of "All Axis Stop" command

No.	Command	Axis1/Parameter1	Axis2/Parameter2	Axis3/Parameter3
0	GOW_HOME	1	1	1
1	GOW_ABS	1.111	2.222	3.333
▷ 2	STOP_ALL			

10.1.13. Jump

Jump

Jump to Line: [1] ▲▼

Apply

Jump to Line: Specify the jump destination line number.

Example of "Jump" command (jump from line 4 to line 1)

No.	Command	Axis1/Parameter1	Axis2/Parameter2
0	GO_HOME	1	1
▶1	GO_ABS	1.111	2.222
2	GO_ABS	3.333	4.444
● 3	JUMP	1	

10.1.14. Conditional Jump

An input state triggers the conditional jump to change the course of the sequential command executions.

Input port number: Specify the input port number individually.

Input state: Jump to the specified line number if the state of the specified input port number matches the specified input state.

Jump to Line: Specify a line number as a jump destination

Example of "Conditional Jump"

No.	Command	Axis1/Parameter1	Axis2/Parameter2	Axis3/Parameter3	A
0	GO_HOME	1	1	1	
1	GOW_ABS	1.111	2.222	3.333	
2	GO_ABS	4.444	5.555	6.666	
3	IFJUMP	3	1	0	

Input of 3rd bit is ON.

10.1.15. Loop

Loop Count: The commands from LOOP_START to LOOP_END repeatedly run the specified number of times.

Example of "Loop" command (repeat the same command 3 times)

No.	Command	Axis1/Parameter1	Axis2/Parameter2
0	GO_HOME	1	1
1	LOOP_START	3	
2	GO_ABS	1.111	2.222
3	GO_ABS	3.333	4.444
4	LOOP_END		

x3

10.1.16. Specified Output Port Operation

Output port number: Specify the target port number.

Output state: Specify the output state (ON:1 / OFF:0)

Example of "Specified Output Port Operation"

No.	Command	Axis1/Parameter1	Axis2/Parameter2
0	OUTP	6	1

10.1.17. All Output Port Operation

Output Port Number: Specify the state numbers of multiple output ports.

Check mark: ON / Non-check mark: OFF

Example of "Specified Output Port Operation"

No.	Command	Axis1/Parameter1	Axis2/Parameter2	Axis3/Parameter3
0	OUTP_ALL	164	255	0

10.1.18. Timer

Specify the waiting time until the next command execution in milliseconds.

Wait time: Set the waiting time. The next command execution can be stopped up to 999,999 milliseconds.

Example of "Specified Output Port Operation"

No.	Command	Axis1/Parameter1	Axis2/Parameter2	Axis3/Parameter3	A
0	WAIT_TIME	20			

11. Speed Table

A total of 15 speed definitions can be defined in the speed table as shown blow. The items of each table include parameters such as the initial speed, and the speed and acceleration/deceleration settings for each axis can be selected from the table.
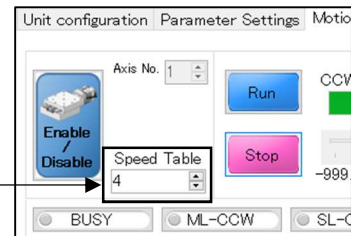
Configurable Speed Table

Table No.	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Initial Speed[pps]	10	50	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Final Speed[pps]	10	50	100	500	1000	2000	5000	10000	20000	50000	75000	75000	90000	90000	100000	100000
Acceleration Time[msec]	1	1	1	100	100	100	100	100	100	100	100	200	100	200	100	200
S-curve Rate[%]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Individual Speed Setting

The speed table reflecting the Motion Control

The "Motion Control" tab

11.1 How to change the speed of each axis:

Method 1. Specify individually on the speed table section of the "Motion Control" tab.

Method 2. Make settings for a single axis or multiple axes on the "Program Drive" screen shown below;

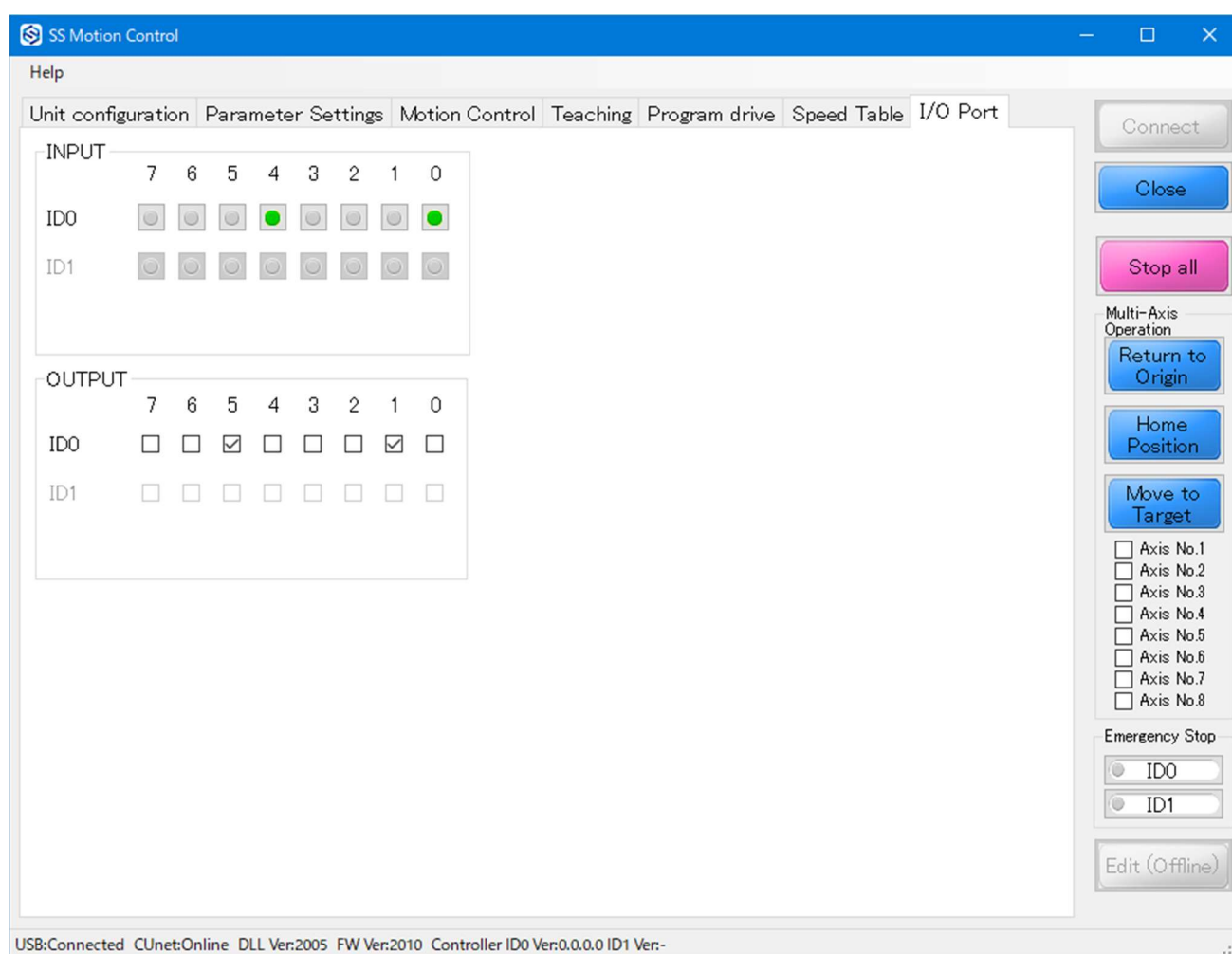The speed table numbers are referred to the speed table.

11.2 Cautions on a model change and the speed table

The speed table is a software wide setting for all motorized stages connecting to the controller. Thus, a user should be advised to pay a particular attention to which speed table number is used for which type of stage. For example, a speed suitable for a liner stage may be hazardous on a goniometer stage.

A user should also be cautious on the changes made in the speed table. It is a good example that the SSM software holds its own default speed table and read it every time being started. Thus, it seems that the software did not reflect a change made previously. A user should be accustomed to read actual configurations in the controller at the software start-up.

12. I/O Port

On this tab screen, the user can check the status of the I/O port on the back panel. The output signal can also be operated on this tab screen in the same way as in "Program Drive".

13. Appendix

Appendix A. Troubleshooting

When this happens		Check here
Connect	Connection fails after operating the connect button.	・ Is the USB cable between the PC and master controller properly connected? ・ Is the USB driver set up correctly on the PC?
	The connected stage is not displayed on the unit configuration screen.	・ Is the LAN cable between the controllers properly connected? ・ Is the axis number set correctly on the rotary switch of the controller?
Operation restrictions	Tab selection and parameter settings screen operations are disabled.	・ Is the USB connected? ・ Is the USB communication successful? Refer to: Successful/Failed in Section 4-4
	The Destination specification and start operation are disabled on the motion control screen.	・ Is the stage of the corresponding axis number enabled? (It is disabled if the prohibition mark is displayed on the enable/disable button.) Refer to: Motion control axis enable/disable button in Section 5-1

Software Updates

SS Motion Software Update History

Version	Date	What's News
1.0.0.0	2019.06.30	First published
1.0.0.0	2019.08.30	WEB download service starts
1.0.0.1	2019.11.15	Issues fixed: ✓ Data exchange troubles between DS2000A and DT205 ✓ Rarely interpolation cannot be executed form a point of origin.
1.0.1.1	2019.12.04	Issues fixed: ✓ The conditional jump with I/O causes unexpected result. ✓ New model presets are patched: Gonio-KGB06 series and KRE103560

English Software User's Manual Updates

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1.0	2020.01.30	First published

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