

SV-NET CONTROLLER



SV Programmer

Software Manual

■ Introduction

Thank you very much for purchasing the SV-NET Controller.

The SV-NET Controller is a motion controller that is compliant with the Tamagawa Seiki original motion network (SV-NET). You can architect a compact motion control system by using this product in combination with our SV-NET drivers.

This manual describes how to use the SV Programmer (a programming tool designed specifically for the SV-NET Controller). The SV Programmer helps you create your own servo systems. Make sure you thoroughly understand the use and functions of the SV Programmer as well as the techniques behind the product before using it for control of your system.

■ Abbreviations

This manual uses the abbreviations shown in the following table:

Abbreviation	Meaning
SV-NET controller or controller	SV-NET Controller
SV-NET driver or driver	SV-NET driver
Servo motor or motor	AC Servo motor
Program	SV-NET Controller motion program

■ Manual Number of this Manual

Manual number: MNL000318Y00

■ Revision History

Version	Date	Item	Description	Page
1.0	2007/11/21		New	
2.0	2008/9/2	Safety Precautions	The item "Technical Personnel Dispatching Service" is added.	Safety Precautions
		Main Form	Description of the status bar is changed.	Page 4
		Controller Setup	Description of network configuration is added.	Page 42
		JOG Operation	Description of stop operation from the Tool Pane is deleted.	Page 51
		Program Grid	Description of the File Pane is added.	Page 57
			Description of the array variable list is added.	Page 66
			Descriptions of the Jog Pane and the DIO Pane are added to the Subpane.	Pages 76 and 77
			Description of starting status monitoring from the Supervision Pane, Monitor Pane, or Task Pane of the Subpane with the [Start] button is deleted.	Pages 73 to 75
			"Debug" has been changed to "Debug."	Page 59
			A list of monitor variables is added.	Page 82
		Servo Monitor	Descriptions of the oscilloscope, X-Y representation, and file are added to the Tool Pane.	Page 86
			Description of a pulldown menu is added to the description of graphical display of information.	Pages 89 and 90
		Utilities	Description of setting the Array Variable List window is added as a part of description of program grid window setting.	Page 99
			Description of label definition is added.	Pages 103 and 104
		Menu Configuration	Description of file handling items is added to the program grid.	Pages 105 and 106
			Items of forward rotation, reverse rotation, and stop operation are deleted from JOG Operation.	Pages 114 and 121
Descriptions of the oscilloscope and X-Y representation are added to the Servo Monitor.	Pages 116 and 122			

■ Safety Precautions

● Warranty

○ Period of Warranty

This warranty covers repair or replacement of the product only if the customer contacts us or returns the defective product within one year after shipment.

○ Scope of Warranty

Please note that we are not liable for any quality deterioration of the product resulting from use or storage that differs in the following manner from that described in this manual, even if the pertinent product is still under warranty:

- The product is used under any condition, in any environment, or by any method other than those described in the product specifications, manuals, or others.
- The product is modified or repaired by any person other than our service engineers.
- The product is used in a way not originally intended.
- The problem in question could not be predicted with the technology available at the time the product was shipped.

○ Limitations of Warranty

- We are not liable for any damage to others arising from our products.
- We are not liable for any results caused by programs prepared by any person other than our representatives.

● Conditions of Use

○ This product is designed and manufactured for general industrial applications. It cannot be used with equipment and systems operated under conditions where there is a risk to life.

○ This product is not intended for use in applications which require extremely high reliability.

If this product is used in any of the applications listed below, consult specifications, manuals, or other documents to narrow your questions and then contact our sales representatives.

Be sure to take necessary safety measures, including implementation of safety circuits to minimize danger in case of a failure.

- Atomic energy control equipment, spaceships, trains, airplanes, vehicle equipment, medical equipment, safety devices, and incinerators
- Systems, machines, and equipment that may endanger human life or property
- Facilities that require high reliability such as gas, water, and power utilities, and equipment used for 24-hour continuous operation
- Outdoor use or use under conditions not described in the manuals or other documents
- Other applications comparable to the above that require high reliability

○ We make continuous efforts to improve the quality and reliability of this product. However, there is always a possibility that this product may malfunction.

For the use of this product, we recommend you take numerous safety measures to prevent a malfunction of this product from propagating or escalating.

○ Program samples and application examples shown in the manuals and other documents are for reference only.

Please make sure of the safety and functions of the systems, machines, and equipment in which this product is to be used before use.

● Changes to Specifications

The specifications, manuals, data sheets, and other documents for this product may be changed as needed for improvement of performance, expansion of specifications, or addition of accessories. For the latest technical data, please contact our sales representatives.

● Upgrading

The software for the main unit of this product may be upgraded for improvement of performance or expansion of specifications.

Please check that you have the latest software version installed before use. If an update is required, consult our sales representative.

● Service Limitations

The price of this product does not include fees for dispatching technical personnel or other services.

Consult our sales representative for details if necessary.

● Technical Personnel Dispatching Service

We offer the technical personnel dispatching service for a modest fee to help customers to launch their equipment.

This service covers:

- Adjusting servo gains
- Preparing programs to operate the SV-NET controller
- Explaining how to adjust servo gains
- Explaining how to handle the SV Programmer

It will take some time to initially start equipment or implement a new system.

It is particularly recommended to use our technical personnel dispatching service if you want to implement a new system or change an existing system.

If you have any questions about service fees or details of the service, please contact our sales representative.

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Outline of This Software

What Is the SV Programmer?

The SV Programmer is PC application software that is connected to the SV-NET controller through USB.

The SV Programmer has the following functions:

- **Function to handle the parameters of the SV-NET driver**
- **Function to handle parameters of the SV-NET controller**
- **Motor test-run function**
- **Programming function**
- **Various monitoring functions**

Software Operating Environment

The following is a description of this software:

PC	PC/AT-compatible machine
Supported OS	Windows2000/XP/Vista
Required memory	256 MB or more
Hard disk	500 MB or more
Communication	USB
Required software	Microsoft .NET Framework 2.0

* Notes:

1. If Microsoft .NET Framework 2.0 is not installed on your PC, it is automatically installed by the installer.

If you do not want the automatic installation, download Microsoft .NET Framework 2.0 from the Microsoft Web site for installation on your PC.

2. If this application is executed on Windows Vista, do not use the Windows Aero function.

→ Otherwise, some functions including the monitor function may not provide proper display depending in the environment of your PC.

[*Note: For the Windows Aero function, refer to the Windows Vista manual.](#)

Starting the SV Programmer

The following is a description of how to start this software:

Operation

1. Select [SV-NET Controller Software]-[SV Programmer] from the Start menu.
 2. A splash window is displayed.
 3. "ON LINE" is displayed at [USB Status](#) in the status bar.
 4. A project file selection box is displayed.
 5. This software is now usable.
-

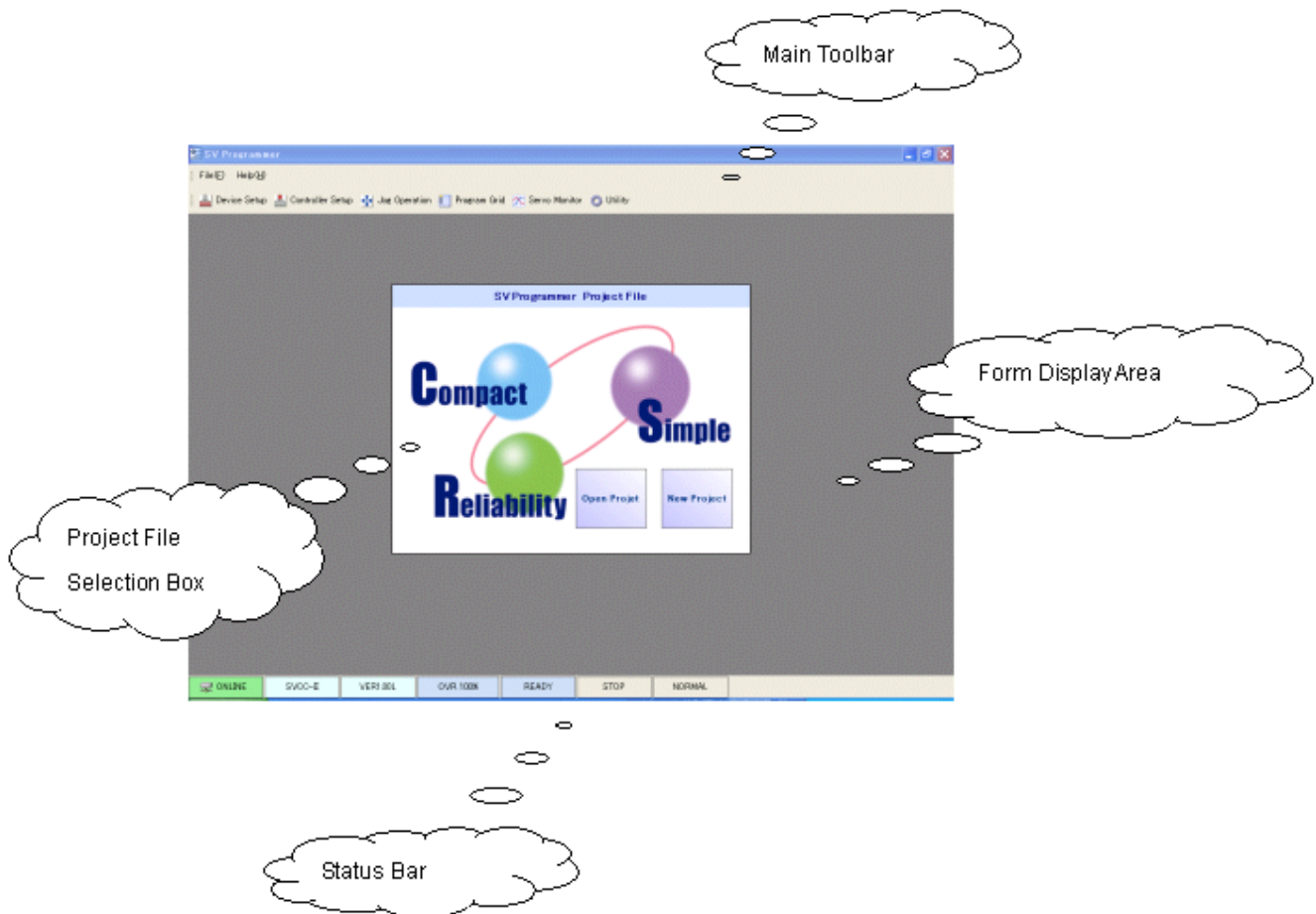
* Note:

If "ON LINE" is displayed at USB Status in the status bar, the SV-NET controller is not connected.
In this status, some functions cannot be used.

Main Form

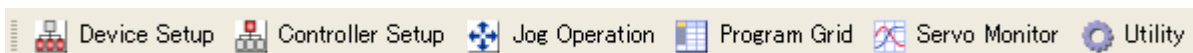
When this software is started, the main toolbar and the status bar are displayed in the initial window. When you click a button in the main toolbar, the associated window is displayed in the form display area.

Configuration of the Initial Window



Main Toolbar

When you click a button in the main toolbar, the associated form window is started.



[\[Device Setup\]](#) button

Starts [Device Setup], which allows you to reference and set parameters of the SV-NET driver.

[\[Controller Setup\]](#) button

Starts [Controller Setup], which allows you to reference and set parameters of the SV-NET controller.

[[Jog Operation](#)] button

Starts [Jog Operation], which performs a test run of the servo motor.

[[Program Grid](#)] button

Starts [Program Grid], which creates, edits, and executes a program.

[[Servo Monitor](#)] button

Starts [Servo Monitor], which monitors the feedback data of the SV-NET driver and the status of the SV-NET controller.

[[Utility](#)] button

Starts [Utility], which makes display settings and operates special functions of each window.

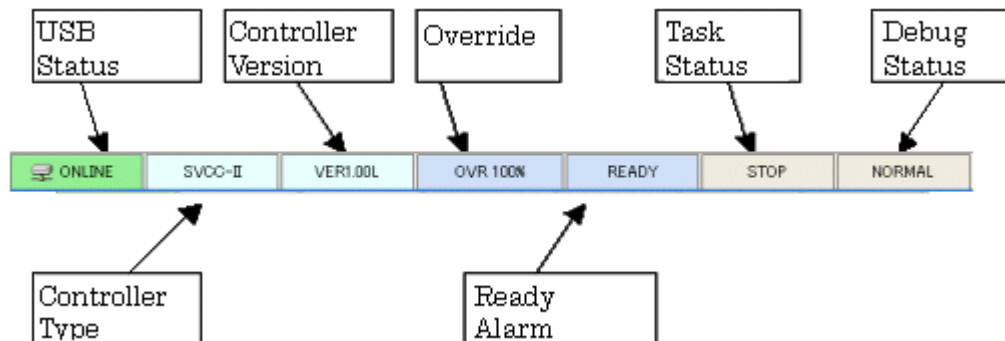
Form Display Area

The form display area is a client area where a form window is displayed.

When you click a button in the main toolbar, the associated form is displayed.

Status Bar

The status bar displays the execution status of this software as the status.



[USB Status]

Displays the connection status between the PC and the SV-NET controller.
When the two are being connected, "ON LINE" is displayed on a green background.
When the two are not connected, "OFF LINE" is displayed on a gray background.

[Controller Type]

Displays the controller type.

[Controller Version]

Displays the controller version.

[Override]

Displays the present speed override value.

[Ready Alarm Status]

Displays "Ready" on a light blue background if no alarm exists while the PC and the SV-NET controller are being connected.

Blinks "Alarm" on a pink background if an alarm exists.

[Task Status]

Displays "RUN" on a yellow background when a task is being executed.

[Debug Status]

Displays "NORMAL" if a task is executed in the normal mode; displays "DEBUG" if a task is executed in the debug mode.

[Progress Bar]

Indicates the progress of communication with the SV-NET controller.

Project File Selection Box

Selects whether to create a new project file or to read a saved project file. In the project file, the window configurations changed by the user and the folders containing the program files are recorded.

* You can operate each function of the main toolbar with no project file selected.

You do not necessarily create a project file.

Device Setup

You can reference and set parameters of the SV-NET driver.

Device Setup Functions

- **Function to obtain SV-NET controller connection information and parameters**

1. Searches for the drivers connected to the SV-NET controller.
2. Obtains the parameters of only the specified SV-NET driver.
3. Obtains the parameters of the SV-NET drivers of all axes at a time.

- **Function to manage SV-NET driver parameter files**

1. Obtains parameters from a text file.
2. Saves parameters in a text file.
3. Saves parameters in the SV-NET driver.

- **Switch Data Type Display function**

1. Displays parameter values in decimal or hexadecimal notation.

- **Switch Parameter Display function**

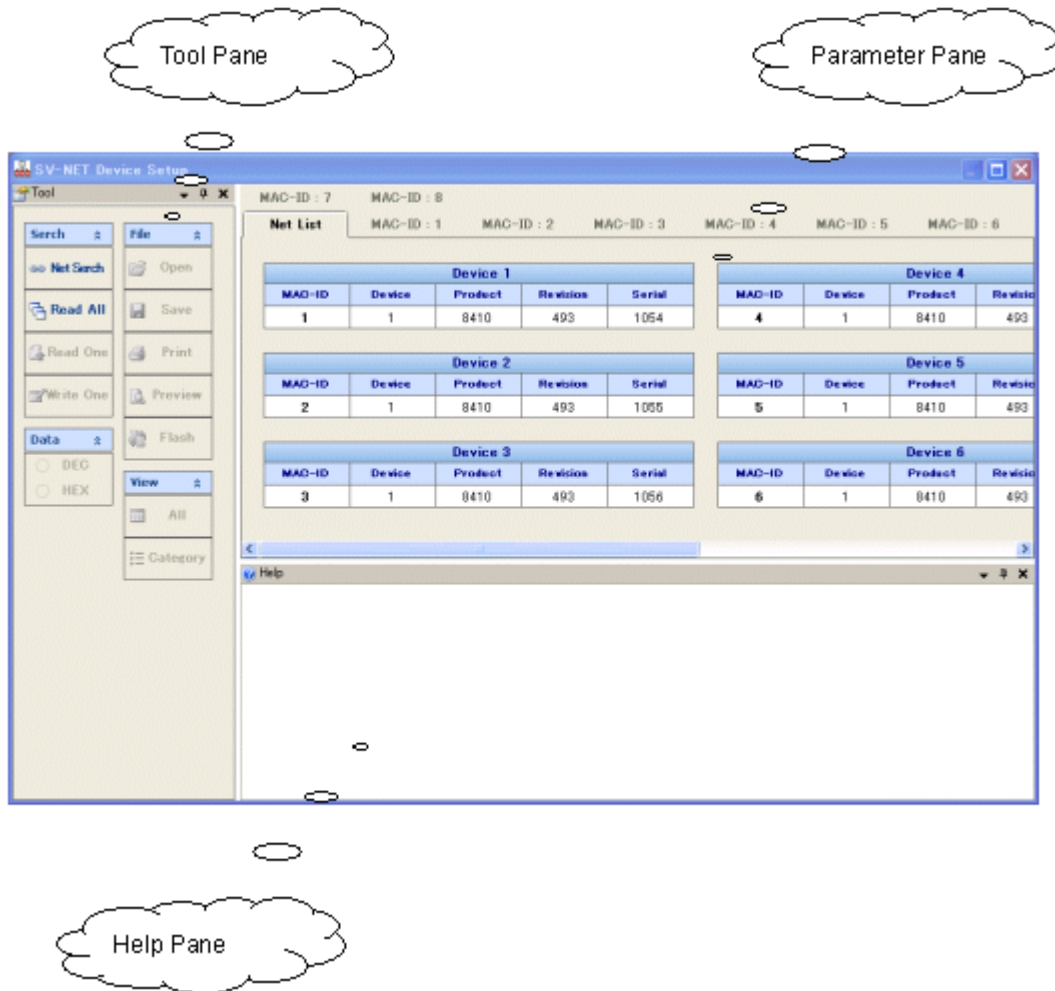
1. Displays the parameters in a list.
2. Displays parameters by categories.

- **Print function**

1. Prints the parameter list on the printer.
 2. Displays the preview of a print image.
-




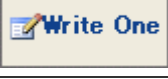
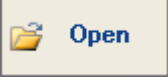
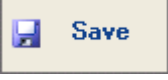



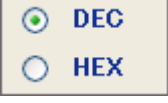


Description of the Device Setup Window

The configuration of the Device Setup window is as follows:



[Tool Pane]

The following table describes each tool button used for device setup.

Group	Button	Description of function
Search	 Net Search	Starts communication with the SV-NET controller and displays the number of presently connected axes.
	 Read All	Obtains the parameters from all the connected SV-NET drivers.
	 Read One	Obtains the parameters from the selected SV-NET driver.
	 Write One	Writes all the parameters to the selected SV-NET driver. *Note:
File	 Open	Reads a parameter file.
	 Save	Saves a parameter file.
	 Print	Prints a parameter list on the printer.
	 Preview	Displays the print image of parameters.
	 Flash	Saves parameters in the flash memory of the SV-NET driver.
Data	 DEC HEX	Displays the parameter values in decimal or hexadecimal notation.
View	 All	Displays all the parameters in a list.
	 Category	Displays parameters by categories.

*** Note:**

When you click the [Write One] button, all parameters with a rewritable data ID are changed.

Make sure that all the parameters displayed in the list are correct before clicking the [Write One] button.

-> [List of All Parameters Including Writable Parameters](#)

[Parameter Pane]

This section describes the contents of the parameter pane.

[Net List]

This page displays the product information of the presently connected SV-NET driver.

When you click a specific "Device (No.)" the detailed data of that SV-NET driver is displayed.

The screenshot shows a software interface with a 'Net List' tab selected. At the top, there are labels for MAC-ID: 7 and MAC-ID: 8. Below these are six sub-titles: MAC-ID: 1, MAC-ID: 2, MAC-ID: 3, MAC-ID: 4, MAC-ID: 5, and MAC-ID: 6. Each sub-title corresponds to a table of device information. The tables are arranged in two columns and three rows. Each table has a header row with columns for MAC-ID, Device, Product, Revision, and Serial. The data rows show MAC-ID values from 1 to 6, all with Device 1, Product 8410, and Revision 493. The Serial numbers are 1054, 1055, and 1056 for MAC-IDs 1, 2, and 3 respectively, and 493 for MAC-IDs 4, 5, and 6.

Device 1				
MAC-ID	Device	Product	Revision	Serial
1	1	8410	493	1054

Device 2				
MAC-ID	Device	Product	Revision	Serial
2	1	8410	493	1055

Device 3				
MAC-ID	Device	Product	Revision	Serial
3	1	8410	493	1056

Device 4				
MAC-ID	Device	Product	Revision	Serial
4	1	8410	493	

Device 5				
MAC-ID	Device	Product	Revision	Serial
5	1	8410	493	

Device 6				
MAC-ID	Device	Product	Revision	Serial
6	1	8410	493	

Outline of Driver Product Information

<MAC-ID>

MAC-ID number of the SV-NET driver

<Device>

Device number of the device

<Product>

Product model of the SV-NET driver

<Revision>

Software version of the SV-NET driver

<Serial>

Serial number of the SV-NET driver

[MAC-ID: *] Tab Page [List Display]

This page displays the parameter list for each MAC-ID number set in the SV-NET driver.

MAC-ID : 7		MAC-ID : 8					
Net List		MAC-ID : 1	MAC-ID : 2	MAC-ID : 3	MAC-ID : 4	MAC-ID : 5	MAC-ID : 6
Data ID	Data Name	Data Value	Data Type	Data Length	Write Enable	Save Enable	
1	Device Code	1	<input type="checkbox"/>	2	NG	OK	
2	Product Code	8410	<input type="checkbox"/>	2	NG	OK	
3	Revision	493	<input type="checkbox"/>	2	NG	OK	
4	Serial Number	1054	<input type="checkbox"/>	4	NG	OK	
5	MAC-ID Default	31	<input type="checkbox"/>	1	OK	OK	
6	Baud Rate	4	<input type="checkbox"/>	1	OK	OK	
7	Reserve	0	<input type="checkbox"/>	1	NG	NG	
8	Reserve	0	<input type="checkbox"/>	2	NG	NG	
9	Reserve	0	<input type="checkbox"/>	2	NG	NG	
10	Reserve	0	<input type="checkbox"/>	2	NG	NG	
11	Reserve	0	<input type="checkbox"/>	2	NG	NG	
12	Reserve	1	<input type="checkbox"/>	2	NG	NG	
13	Reserve	1	<input type="checkbox"/>	2	NG	NG	
14	Reserve	1	<input type="checkbox"/>	2	NG	NG	
15	Reserve	8410	<input type="checkbox"/>	2	NG	NG	
16	Parameter Init	0	<input type="checkbox"/>	1	OK	NG	
17	Parameter Save	0	<input type="checkbox"/>	1	OK	NG	

Outline of Parameters

<Data ID>

Displays the parameter ID numbers.

<Data Name>

Displays the parameter names.

<Data Value>

Displays the parameter set values.

<Data Type>

Switches the notation of parameter values between decimal and hexadecimal.

(Unchecked: Decimal, Checked: Hexadecimal)

<Data Length>

Displays the length of each parameter in bytes.

<Write Enable>

“O” indicates that the parameter is rewritable; “x” indicates that the parameter is not rewritable.

<Save Enable>

“O” indicates that the parameter can be saved in the flash memory; “x” indicates that the parameter cannot be saved in the flash memory.

* Note:

The tab text on the [MAC-ID: *] Tab Page contains the MAC-ID numbers set in the SV-NET driver.

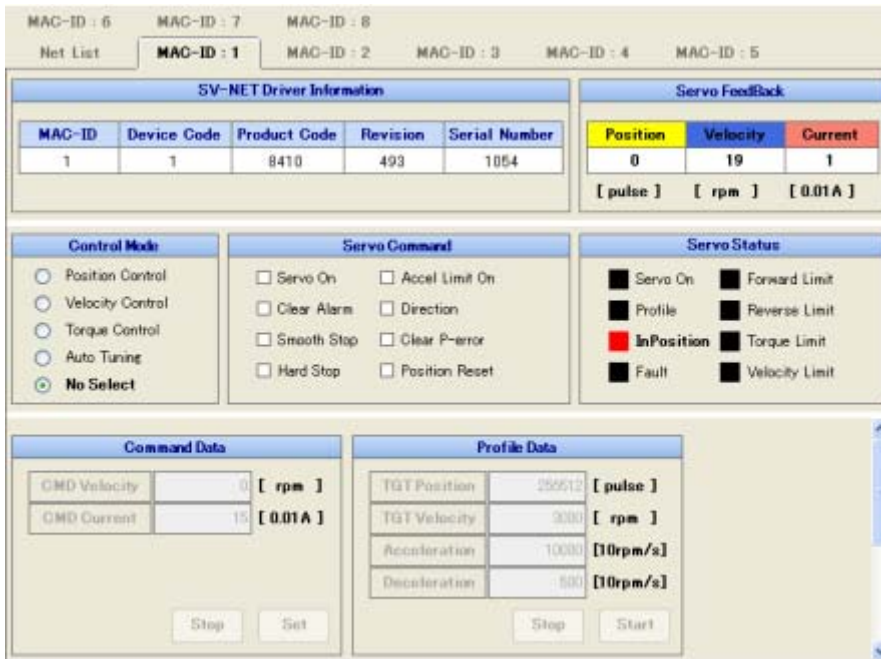
List of All Parameters Including Writable Parameters

ID	Parameter name
50	Kp1
51	Kv1
52	Ki1
53	LPF_f
54	NF_f
55	NF_d
56	Kcp1
57	Kci1
58	Phase-Advance Gain
59	Load Inertia
60	Kp2
61	Kv2
62	Ki2
70	Position Resolution_n
71	Position Resolution_m
72	Reference Direction
73	Position Feedback Select
74	Position Instruction Select
75	Velocity Instruction Select
76	Torque Instruction Select
77	InPosition Signal Range
78	Smoothing Function Select
79	Smoothing Time Constant
80	Gain Change Select
81	Gain Change Point_H
82	Gain Change Point_L
83	Soft Limit Select
84	Positive Position Limit
85	Negative Position Limit
86	Positive Current Limit
87	Negative Current Limit
88	Velocity Limit
90	Homing Type
91	Preset Value
92	Homing Start Direction

93	Homing Velocity
94	Creep Velocity
95	Bump Time
96	Bump Torque
100	Parameter IN-1
101	Parameter IN-2
102	Parameter IN-3
103	Parameter IN-4
104	Parameter IN-5
105	Parameter IN-6
110	Parameter OUT-1
111	Parameter OUT-2
118	Monitor1
119	Monitor2
120	Pulse Input Mode
121	Pulse Input Resolution_n
122	Pulse Input Resolution_m
130	Analog Velocity Scale
131	Analog Current Scale
140	Abs Mode
141	Servo Select
143	Servo Off Delay
145	Tuning-KV
146	Tuning-KI
147	Brake off Delay
148	Enable Off Time
200	Over Load
201	Over Velocity
202	Alarm Pulse1
203	Alarm Pulse2
204	Over Temp
206	Low Voltage

[MAC-ID: *] Tab Page [Category Display]

This page displays the parameters by categories for each MAC-ID number set in the SV-NET driver.



[SV-NET Driver Information]

Displays the product information of the driver.

SV-NET Driver Information				
MAC-ID	Device Code	Product Code	Revision	Serial Number
1	1	8410	493	1054

<MAC-ID>

Displays the MAC-ID of the driver. If the rotary DIP switch is set to any of the positions other than [0], the set value of the switch is displayed.

<Device Code>

Displays the type of the connected device.

<Product Code>

Displays the model of the connected device.

<Revision>

Displays the revision of the connected device.

<Serial Number>

Displays the serial number of the connected device.

[Servo FeedBack]

Displays the feedback information of the driver.

Servo FeedBack		
Position	Velocity	Current
0	-18	1
[pulse]	[rpm]	[0.01A]

<Position>

Displays the present position of the driver (unit: pulse).

<Velocity>

Displays the present speed of the driver (unit: rpm).

<Current>

Displays the present electric current of the driver (unit: 0.01 A).

[Control Mode]

Changes the control mode for the driver.

Control Mode	
<input type="radio"/>	Position Control
<input type="radio"/>	Velocity Control
<input type="radio"/>	Torque Control
<input type="radio"/>	Auto Tuning
<input checked="" type="radio"/>	No Select

<Position Control>

Sets the driver to the position control mode.

<Velocity Control>

Sets the driver to the speed control mode.

<Torque Control>

Sets the driver to the electric current control mode.

<Auto Tuning>

Sets the driver to the auto-tuning mode.

If settings are changed in the Servo ON status, tuning starts automatically.

<No Select>

Sets the driver to a mode other than the above.

[Servo Command]

You can set commands to the driver by clicking the checkboxes.

Servo Command	
<input type="checkbox"/> Servo On	<input type="checkbox"/> Accel Limit On
<input type="checkbox"/> Clear Alarm	<input type="checkbox"/> Direction
<input type="checkbox"/> Smooth Stop	<input type="checkbox"/> Clear P-error
<input type="checkbox"/> Hard Stop	<input type="checkbox"/> Position Reset

<Servo On>

Turns the servo ON.

<Clear Alarm>

Clears the driver alarm.

<Smooth Stop>

Decelerates and stops the motor rotation.

<Hard Stop>

Immediately stops the motor rotation.

<Accel Limit On>

Enables the acceleration/deceleration function in the speed control mode.

<Direction>

Changes the rotation direction.

<Clear P-error>

Clears the position deviation counter. (This counter is used when pulse strings are input.)

<Position Reset>

Resets the position information.

*** Supplementary information about “Servo Command”**

“Servo Command” contains items to which a function is added that turns those items OFF automatically after their checkboxes are checked.

These items are [Clear Alarm], [Clear P-error], and [Position Reset]. Since these items need not always be turned ON, the SV Programmer turns them OFF automatically after data is transferred to the driver.

The items [Smooth Stop], [Hard Stop], and [Accel Limit On] turn ON or OFF automatically when you click the [Stop], [Set], or [Start] button on [Command Data] and [Profile Data] described in the next section.

[Stop] button: When you click this button, [Smooth Stop] and [Accel Limit On] turn ON automatically.

[Set] button: When you click this button, [Accel Limit On] turns ON automatically; [Smooth Stop] and [Hard Stop] turn OFF automatically.

[Start] button: When you click this button, [Smooth Stop] and [Hard Stop] turn OFF automatically.

[Servo Status]

Displays the servo status. The red steady light indicates the Status ON status.

Servo Status	
■ Servo On	■ Forward Limit
■ Profile	■ Reverse Limit
■ InPosition	■ Torque Limit
■ Fault	■ Velocity Limit

<Servo On>

Turns the status ON during Servo ON.

<Profile>

Turns the status ON while profile operation is in progress.

<InPosition>

Turns the status ON when in-position is achieved.

<Fault>

Turns the status ON when an alarm is detected.

<Forward Limit>

Turns the status ON when the forward direction soft limit is reached.

<Reverse Limit>

Turns the status ON when the reverse direction soft limit is reached.

<Torque Limit>

Turns the status ON when the torque limit is reached.

<Velocity Limit>

Turns the status ON when the speed limit is reached.

[Profile Data]

Sets the profile operation. The profiling status of the servo status remains ON while the profile operation is in progress.

Profile Data		
TGT Position	256512	[pulse]
TGT Velocity	3000	[rpm]
Acceleration	10000	[10rpm/s]
Deceleration	500	[10rpm/s]

<TGT Position>

Sets the target position (ID:32) of the profile operation (unit: pulse).

<TGT Velocity>

Sets the target speed (ID:33) of the profile operation (unit: rpm).

<Acceleration>

Sets the acceleration (ID:34) of the profile operation (unit: 10 rpm/sec).

The value of ID:34 is used for both acceleration and deceleration of profile operation.

[Start] button: Starts the profile operation.

[Stop] button: Stops the profile operation.

[Servo Gain]

Sets the servo gains.

Servo Gain			
Kp1	100	LPF_f	1000
Kv1	200	NF_f	1000
Ki1	125	NF_d	1000
Load	50		

<Kp1>

Sets the position loop proportional gain 1 [1/s].

* The unit [1/s] applies when the load inertia is set properly.

<Kv1>

Sets the speed loop proportional gain 1 [1/s].

<Ki1>

Sets the speed loop integral gain 1 [1/s].

<Load>

Sets the load inertia [g•cm²].

<LPF_f>

Sets the lowpass filter frequency [Hz].

<NF_f>

Sets the notch filter center frequency [Hz].

<NF_d>

Sets the notch filter attenuation.

[Read] button: Sets the present servo gain values to the driver.

[Set] button: Sets the present servo gain values to the driver.

[Help Pane]

Descriptions of the parameters selected in the List of Parameters are displayed.



Controller Setup

You can reference and set parameters of the SV-NET controller.

Controller Setup Functions

- **Function to start SV-NET controller connection and obtain SV-NET controller parameters**

1. Starts connection with the SV-NET controller.
2. Obtains the parameters of the SV-NET controller.

- **Function to manage SV-NET controller parameter files**

1. Obtains parameters from a text file.
2. Saves parameters in a text file.
3. Saves parameters in the SV-NET controller.

- **Switch Data Type Display function**

1. Displays the parameter values in decimal or hexadecimal notation.

- **Switch Parameter Display function**

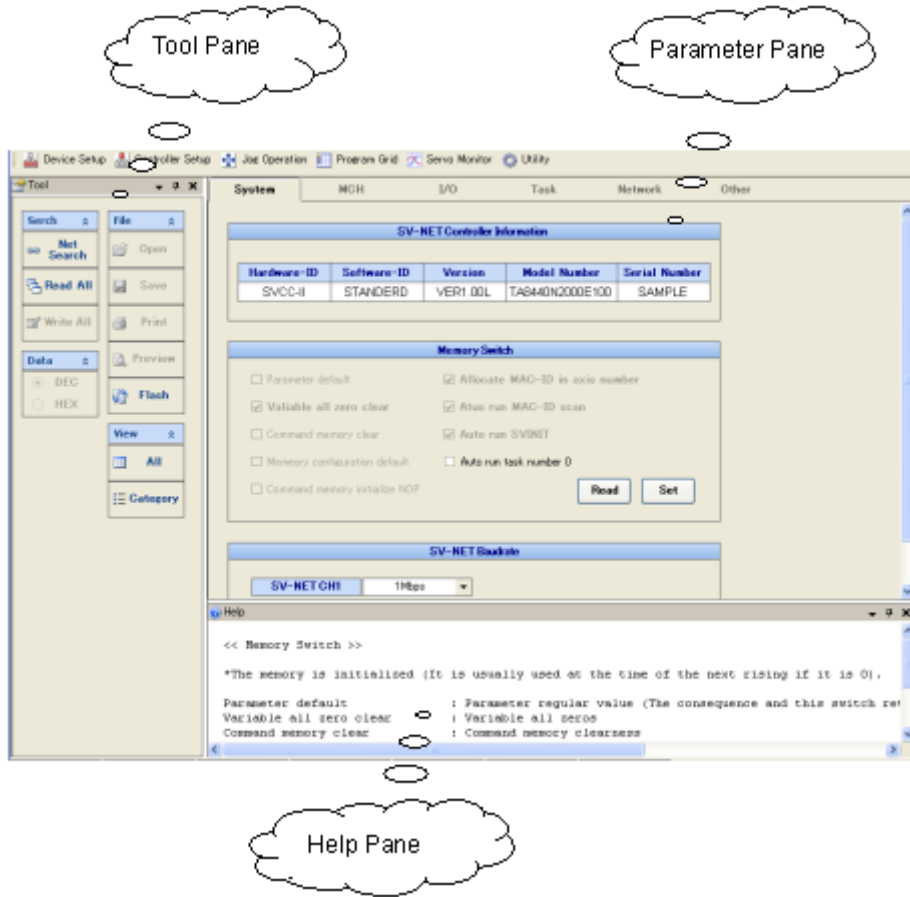
1. Displays the parameters in a list.
2. Displays parameters by categories.

- **Print function**

1. Prints the parameter list on the printer.
 2. Displays the preview of a print image.
-




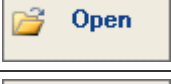


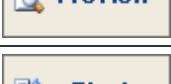
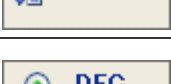


Description of the Controller Setup Window

The configuration of the Controller Setup window is as follows:



[Tool Pane]

The following table describes each tool button used for controller setup.

Group	Button	Description of function
Search	 Net Search	Starts communication with the SV-NET controller and obtains the controller product information.
	 Read All	Obtains parameters from the SV-NET controller.
	 Write All	Writes parameters to the SV-NET controller. *Note
File	 Open	Reads a parameter file.
	 Save	Saves a parameter file.
	 Print	Prints a parameter list on the printer.
	 Preview	Displays the print image of a parameter list.
	 Flash	Saves parameters in the flash memory of the SV-NET controller.
Data	<input checked="" type="radio"/> DEC <input type="radio"/> HEX	Displays parameter values in decimal or hexadecimal notation.
View	 All	Displays all the parameters in a list.
	 Category	Displays parameters by categories.

*** Note:**

When you click the [Write All] button, all parameters with a rewritable data ID are changed.

Make sure that all the parameters displayed in the list are correct before clicking the [Write All] button.

[Parameter Pane]

This section describes the contents of the parameter pane.

[System] Tab Page

[SV-NET Controller Information]

This tag page displays the product information of the SV-NET controller.

SV-NET Controller Information				
Hardware-ID	Software-ID	Version	Model Number	Serial Number
SVCC-II	STANDERD	VER1.00L	TA8440N2000E100	SAMPLE

Outline of SV-NET Controller Product Information

<Hardware-ID>

Displays the product type of the SV-NET controller.

<Software-ID>

Displays the software ID of the SV-NET controller.

<Version>

Displays the software version of the SV-NET controller.

<Model Number>

Displays the product model of the SV-NET controller.

<Serial Number>

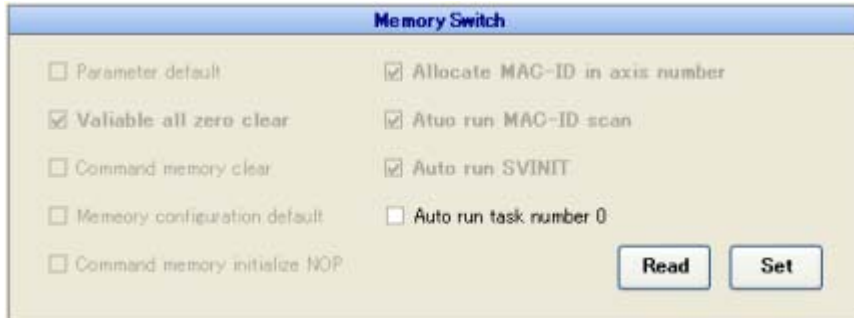
Displays the serial number of the SV-NET controller.

[Memory Switch]

You can reference and set the memory switch of the SV-NET controller.

The memory switch is used to determine the operation to be started after the SVC is powered on.

Items other than “Auto run task number 0” are inaccessible.



The screenshot shows a window titled "Memory Switch" with a light blue header. The window contains a list of configuration options, each with a checkbox. The options are arranged in two columns. The first column includes: "Parameter default" (unchecked), "Variable all zero clear" (checked), "Command memory clear" (unchecked), "Memory configuration default" (unchecked), and "Command memory initialize NOP" (unchecked). The second column includes: "Allocate MAC-ID in axis number" (checked), "Auto run MAC-ID scan" (checked), "Auto run SVINIT" (checked), and "Auto run task number 0" (unchecked). At the bottom right of the window, there are two buttons: "Read" and "Set".

Outline of Each Item

<Auto run task number 0>

Executes Task 0 automatically on startup of the SV-NET controller.

The setting of the memory switch must be saved to flash memory.

<Read>

Obtains the memory switch data.

<Set>

Sets the memory switch data.

[SV-NET Baudrate]

Sets the baud rates for the SV-NET controller.



Outline of Each Item

<SV-NET CH1>

Sets the baud rate for SV-NET Channel 1.

The baud rate options are 250 kbps, 500 kbps, and 1 Mbps.

The default value is 1 Mbps.

* Note:

The default baud rate of the SV-NET driver is 1 Mbps.

Communication is disabled if the baud rate is changed.

Ordinarily, the baud rate need not be changed.

<SV-NET CH2>

Sets the baud rate for SV-NET Channel 2.

The baud rate options are 250 kbps, 500 kbps, and 1 Mbps.

The default value is 250 Mbps.

Some SV-NET controller models do not support SV-NET Channel 2.

<Read>

Obtains the SV-NET baud rate value.

<Set>

Sets the SV-NET baud rate value.

[MCH Configuration] Tab Page

[MCH Configuration]

This tag page is used to set the mechanism configuration.

MCH Type / Max Axis	
MCH Type	1
Max Axis	8

Emergency Limit	
Limit Action	Ignore
DIO Number	DIO_0
LS Number	Invalid

Axis Number	
Axis 1	0
Axis 2	1
Axis 3	2
Axis 4	3
Axis 5	4
Axis 6	5
Axis 7	6
Axis 8	7

Starting Home Mode	
Home Mode	Home

Argument Check Level	
Level	Ignore

Read Set

[MCH Type / Max Axis]

<MCH Type>

Mechanism type (0: Not used; 1: Simple mechanism)

This item cannot be set.

<Max Axis>

Sets the maximum number of axes permitted to belong to the mechanism.

This item cannot be set.

[Axis Number]

Sets the driver axis number for an axis that belongs to the mechanism.

The driver axis number is different from the MAC-ID. This item cannot be set.

[Emergency Limit]

Sets the emergency stop limit.

<Limit Action>

Sets the operation after stop caused by the emergency stop limit. Select any of the following operation options:

[Options]

Ignore
Smooth
Hard
Smooth2
Hard2
Alarm + Smoth
Alarm + Hard
Alarm + Smooth2
Alarm + Hard2

<DIO Number>

Sets the DIO number to which the emergency stop limit is assigned.

<LS Number>

Sets the LS number to which the emergency stop limit is assigned by a bit pattern.

[Starting Home Mode]

Sets the origin mode at power-on.

<Home Mode>

Select any of the following mode options:

[Options]

Home
Not Home

[Argument Check Level]

Sets the move to be performed if 0 is given as the argument for speed or time.

<Level>

Select any of the following options:

[Options]

Ignore
Warning
Alarm + Smooth

[Display of Information of Each Axis by Categories]

This window is used to set each axis belonging to the mechanism.

The screenshot shows a software interface for configuring an axis, titled "Axis1". The interface is divided into several sections, each with a title and a set of controls:

- Motor Type:** Contains two input fields: "Sensor Pulse" with a value of 2048 [pulse] and "Max Speed" with a value of 5000 [rpm].
- ACC/DEC:** Contains two input fields: "Acc-Dec Time1" with a value of 200 [msec] and "Acc-Dec Time2" with a value of 200 [msec].
- Axis Type:** Contains four input fields: "Axis Type" (a dropdown menu set to "Rotation"), "Pulse Rate.n" with a value of 360000 [deg], "Pulse Rate.d" with a value of 2048 [pulse], and "Velocity Unit" with a value of 0.01%.
- Speed Limit:** Contains a "Limit Action" dropdown menu set to "Ignore", a "Speed Limit" input field with a value of 10000 [0.01%], and a "HEX" checkbox.
- Infinity Reset:** Contains an "Infinity Reset" input field with a value of 3600000 [deg] and a "HEX" checkbox.
- Positive Soft Limit:** Contains a "Limit Action" dropdown menu set to "Smooth Stop", a "+Soft Limit" input field with a value of 1879048192 [deg], and a "HEX" checkbox.
- Positive Hard Limit:** Contains a "Limit Action" dropdown menu set to "Ignore", a "DIO Number" dropdown menu set to "DIO_0", and an "LS Number" dropdown menu set to "Invalid".
- Negative Soft Limit:** Contains a "Limit Action" dropdown menu set to "Smooth Stop", a "-Soft Limit" input field with a value of -1879048192 [deg], and a "HEX" checkbox.
- Negative Hard Limit:** Contains a "Limit Action" dropdown menu set to "Ignore", a "DIO Number" dropdown menu set to "DIO_0", and an "LS Number" dropdown menu set to "Invalid".

At the bottom of the window, there are two buttons: "Read" and "Set".

[Motor Type]

<Sensor Pulse>

Sets the number of encoder pulses per rotation of the motor.

<Max Speed>

Sets the maximum speed value (unit: rpm) for the motor.

[ACC/DEC]

<ACC/DEC Time1>

Sets the length of the 1st acceleration/deceleration buffer (unit: msec).

<ACC/DEC Time2>

Sets the length of the 2nd acceleration/deceleration buffer (unit: msec).

[Axis Type]

<Axis Type>

Sets the axis type.

The instruction units are mm for the linear-motion axis and deg for the rotation axis.

Select any of the following options:

[Options]

Linear
Rotation
Linear2
Rotation2

<Pulse Rate_n>

Sets the numerator value (unit: deg or mm) for the pulse rate.

<Pulse Rate_d>

Sets the denominator value (unit: pulse) for the pulse rate.

<Velocity Unit>

Sets the speed unit.

Select any of the following options:

[Options]

0.01%
[deg/sec]
Rpm

* A speed unit of 0.01% is based on the set value for "Max Speed" of the motor type.

[Speed Limit]

<Limit Action>

Sets the move to be performed when the speed limit is reached.

Select any of the following options:

[Options]

Ignore
Smooth Stop
Hard Stop
Clamp
Warning + Clamp
Alarm + Smooth Stop
Alarm + Hard Stop

<Speed Limit>

Sets the speed limit (unit: speed unit).

<HEX>

Displays the value in hexadecimal notation.

[Positive Soft Limit]

<Limit Action>

Sets the move to be performed when the forward direction soft limit is reached.

Select any of the following options:

[Options]

Ignore
Smooth Stop
Alarm + Smooth Stop

<+Soft Limit>

Sets the forward direction soft limit (unit: instruction unit).

[Negative Soft Limit]

Limit Action>

Sets the move to be performed when the reverse direction soft limit is reached.

Select any of the following options:

[Options]

Ignore
Smooth Stop
Alarm + Smooth Stop

<-Soft Limit>

Sets the reverse direction soft limit (unit: instruction unit).

[Infinity Reset]

<Infinity Reset>

Sets the coordinate reset value for an infinite length axis. The setting is valid if the axis type is set to infinite rotation axis or infinite linear-motion axis.

[Positive Hard Limit]

<Limit Action>

Sets the move to be performed when the forward direction stroke limit is reached.

Select any of the following options:

[Options]

Ignore
Smooth Stop
Hard Stop
Alarm + Smooth Stop
Alarm + Hard Stop

<DIO Number>

Sets the DIO number to which the forward direction stroke limit is assigned.

<LS Number>

Sets the LS number to which the forward direction stroke limit is assigned by a bit pattern.

[Negative Hard Limit]

<Limit Action>

Sets the move to be performed when the reverse direction stroke limit is reached.

Select any of the following options:

[Options]

Ignore
Smooth Stop
Hard Stop
Alarm + Smooth Stop
Alarm + Hard Stop

<DIO Number>

Sets the DIO number to which the reverse direction stroke limit is assigned.

<LS Number>

Sets the LS number to which the reverse direction stroke limit is assigned by a bit pattern.

[Read]

Obtains the data of each axis.

[Set]

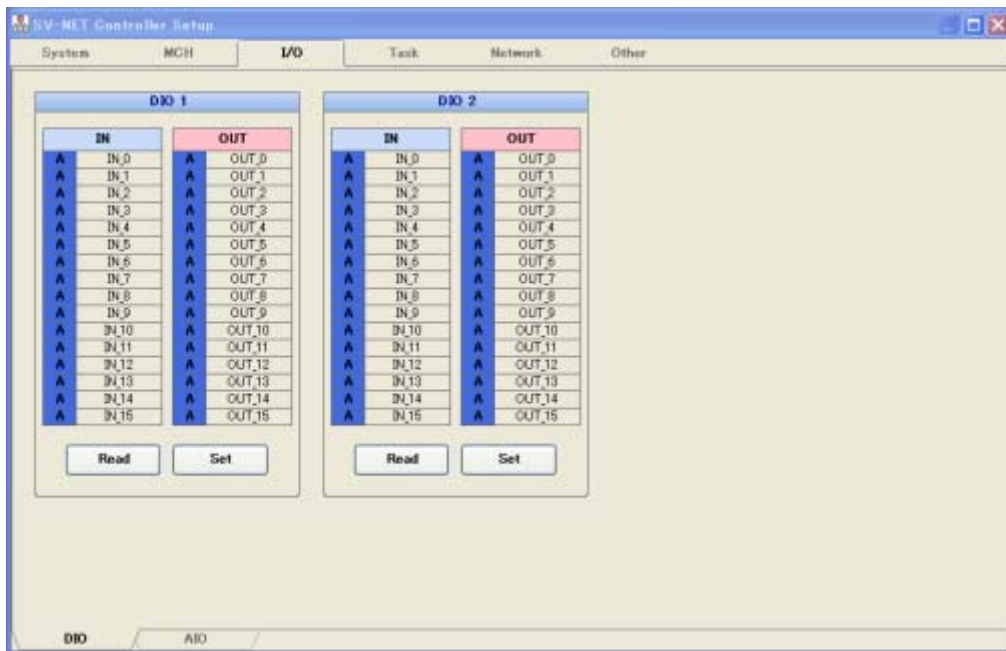
Sets the data for each axis.

* **Note:**

The axis number indicated at the top of this window is the axis number in the mechanism.

[I/O] Tab Page

This tab page displays the I/O information.



<Label [A]>

Sets inputs to contact A.

Clicking this label causes contacts A and B to switch.

<Label [B]>

Sets inputs to contact B.

Clicking this label causes contacts A and B to switch.

<Read>

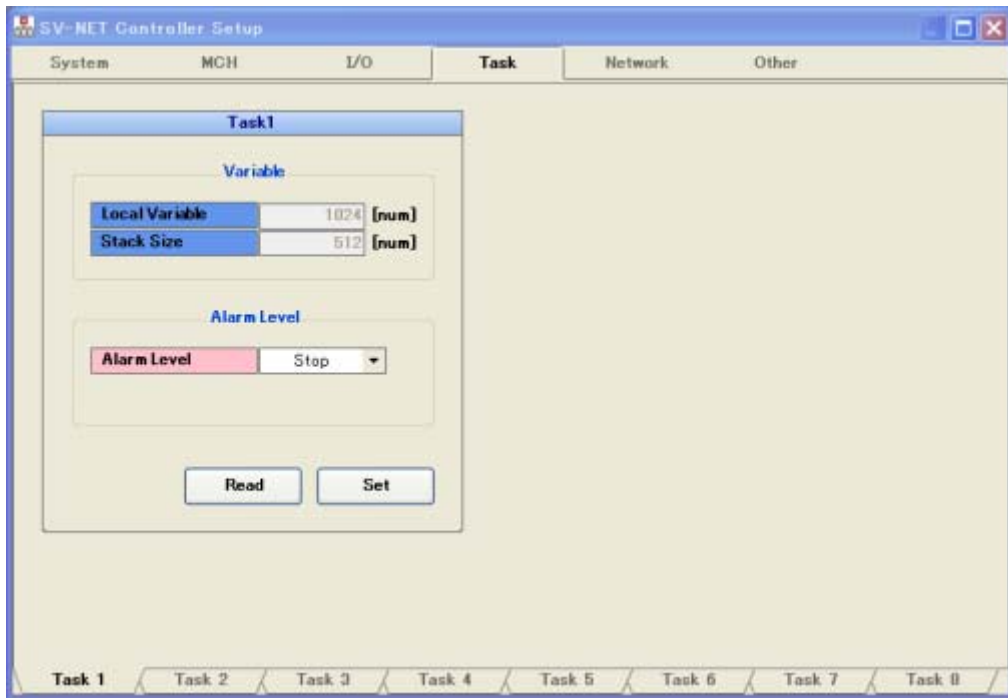
Obtains the I/O information.

<Set>

Sets the I/O information.

[Task] Tab Page

This tag page displays the task information of each axis.



<Local Variable>

Displays the number of local variables available for the task.

<Stack Size>

Displays the number of stack sizes available for the task.

<Alarm Level>

Sets the task stop operation to be performed when an alarm is issued.

Select either of the following options:

[Options]

Stop.
Run

<Read>

Obtains the task information.

<Set>

Sets the task information.

[Network] Tab Page

This tab page is used to set the RS232C communication with the connected device.

RS232C Basic Setup	
Baudrate	57600bps
Data Bit	8bit
Stop Bit	1bit
Parity	none
Alarm Action	Error happened, Not stop RS-232C commu
Protocol Type	Keyence serial communication ASCII
TimeOut	2000 [msec]
Response Wait	0 [msec]

RS232C Auto Communication Setting	
Auto Mode	Read/Write
RS232C Device Read Top Address	0 <input type="checkbox"/> HEX
RS232C Device Write Top Address	64 <input type="checkbox"/> HEX
Data Number	64
Repeat Number	1
Network Variable Read Top Address	0 <input type="checkbox"/> HEX
Network Variable Write Top Address	64 <input type="checkbox"/> HEX
Com Interval	200
Device Number1	68 <input type="checkbox"/> HEX
Device Number2	0 <input type="checkbox"/> HEX

Read Set

RS232C Basic Setup

Makes the basic settings for RS232C communication with the connected device.

<Baudrate>

Sets the communication speed.

[Settable Speeds]

9600 bps/19200 bps/38400 bps/57600 bps

<Data Bit>

Sets the data bits.

[Options]

8bit
7bit

<Stop Bit>

Sets the stop bit(s).

[Options]

1bit
2bit

<Parity>

Sets the parity.

[Options]

none
odd
even

<Alarm Action>

Sets the operation to be performed when an alarm is issued.

[Options]

Error happened, Not stop RS-232C communication
Error happened, Stop RS-232C communication

<Protocol Type>

Sets the communication protocol with the connected device.

[Options]

No Connect Equipment
Digital Memory Link (ASCII 1:1)
Keyence serial communication ASCII
Keyence serial communication Binary
MITSUBISHI GOT-A900 Type1
MITSUBISHI GOT-A900 Type2
Computer Link Type1
Computer Link Type4

<Time Out>

Sets the wait time (msec) until an alarm is issued after communication is disconnected.

<Response Wait>

Sets the reception wait time (msec).

This item must be set when the communication type is the computer link protocol.

RS232C Auto Communication Setting

Makes the settings for automatic reading and writing to and from the device area of the connected device.

<Auto Mode>

Sets the automatic send/receive mode.

[Options]

Read/Write	Always reads and writes to and from the specified device area of the connected device.
Read	Always only reads from the specified device area of the connected device.
Write	Always only writes to the specified device area of the connected device.

<RS232C Device Read Top Address>

Sets the first address of the connected device at which reading begins.

<RS232C Device Write Top Address>

Sets the first address of the connected device at which writing begins.

<Data Number>

Sets the number of data items to be read and written per communication session.

<Repeat Number>

Sets how many times read and write are repeated.

The data amount calculated by $\langle \text{Data Number} \rangle \times \langle \text{Repeat Number} \rangle$ is the total amount of read and written data.

<Network Variable Read Top Address>

Sets the starting address of the destination where the network variables are read at the time of data reading.

<Network Variable Write Top Address>

Sets the starting address of the source where the network variables are written at the time of data writing.

<Com Interval>

Sets the communication interval (msec).

<Device Number1, Device Number2>

These items are used by the computer link protocol.

Example: 1st character: D (0x44), 2nd character: not used

<Read>

Obtains the task information.

<Set>

Sets the task information.

[List of Parameters]

Displays a list of the SV-NET controller parameters.

Class Name	Class ID	Group ID	ID	Data Name	Data Value	Data Type	Write Enable
SYS_X	0x0010	0	0	Memory switch	14338	<input type="checkbox"/>	NG
SYS_X	0x0010	0	1	Basic processing period	200	<input type="checkbox"/>	NG
SYS_X	0x0010	0	2	Host command upper bo...	0	<input type="checkbox"/>	NG
SYS_X	0x0010	0	3	Host command determin...	0	<input type="checkbox"/>	NG
SYS_X	0x0010	0	4	Variable number in host...	0	<input type="checkbox"/>	NG
SYS_X	0x0010	0	5	Task number in host co...	-1	<input type="checkbox"/>	NG
SYS_X	0x0010	0	6	Reserve	0	<input type="checkbox"/>	NG
SYS_X	0x0010	0	7	Reserve	0	<input type="checkbox"/>	NG
SYS_X	0x0010	0	8	Reserve	0	<input type="checkbox"/>	NG
SYS_X	0x0010	0	9	Reserve	0	<input type="checkbox"/>	NG
SYS_X	0x0010	1	0	Model Number TA	0440	<input type="checkbox"/>	NG
SYS_X	0x0010	1	1	Model Number N	2000	<input type="checkbox"/>	NG
SYS_X	0x0010	1	2	Model Number E	100	<input type="checkbox"/>	NG
SYS_X	0x0010	1	3	Serial Number1	1395788560	<input type="checkbox"/>	NG
SYS_X	0x0010	1	4	Serial Number2	1279590400	<input type="checkbox"/>	NG
SYS_X	0x0010	1	5	Reserve	-1	<input type="checkbox"/>	NG
SYS_X	0x0010	1	6	Reserve	-1	<input type="checkbox"/>	NG
SYS_X	0x0010	1	7	Reserve	-1	<input type="checkbox"/>	NG
SYS_X	0x0010	1	8	Reserve	-1	<input type="checkbox"/>	NG
SYS_X	0x0010	1	9	Reserve	-1	<input type="checkbox"/>	NG

Outline of Parameters

<Class name>

Displays the parameter class names.

Example: SVD_1 = Axis 1 of the driver, MCH_1 = Mechanism 1

<Class ID>

Displays the class IDs of the parameters.

<Group ID>

Displays the group IDs belonging to the parameter classes.

<ID>

Displays the item IDs in the group IDs.

<Data Name>

Displays the parameter names.

<Data Value>

Displays the parameter set values.

<Data Type>

Switches the notation of parameter values between decimal and hexadecimal.

(Unchecked: Decimal, Checked: Hexadecimal)

<Write Enable>

“O” indicates that the parameter is rewritable; “x” indicates that the parameter is not rewritable.

[Help Pane]

When you place the mouse pointer on a group box, description of the associated parameter is displayed.



```
Help
Class Name : [ SYS_X ]
Class ID   : [ 0x0010 ]
Group ID   : [ 1 ]
Data ID    : [ 3 ]
Data Name  : [ Serial Number1 ]

Serial number (the first four characters)
```

JOG Operation

This window is used to perform a test run of the motor after the parameters are set by device setup and controller setup.

JOG Operation Functions

- **SV-NET controller connection**

1. Searches for the drivers connected to the SV-NET controller and displays JOG control for each of the connected axes.

- **JOG operation function**

1. Executes JOG operation (constant-speed continuous feed) for all axes.
2. Executes Servo ON, Servo OFF, and Servo FREE for all axes.

- **Speed override function**

1. Executes speed override in the range of 0% to 100%.

* The rpm of the motor is changed with respect to the reference rpm.

- **Switch JOG Control Display function**

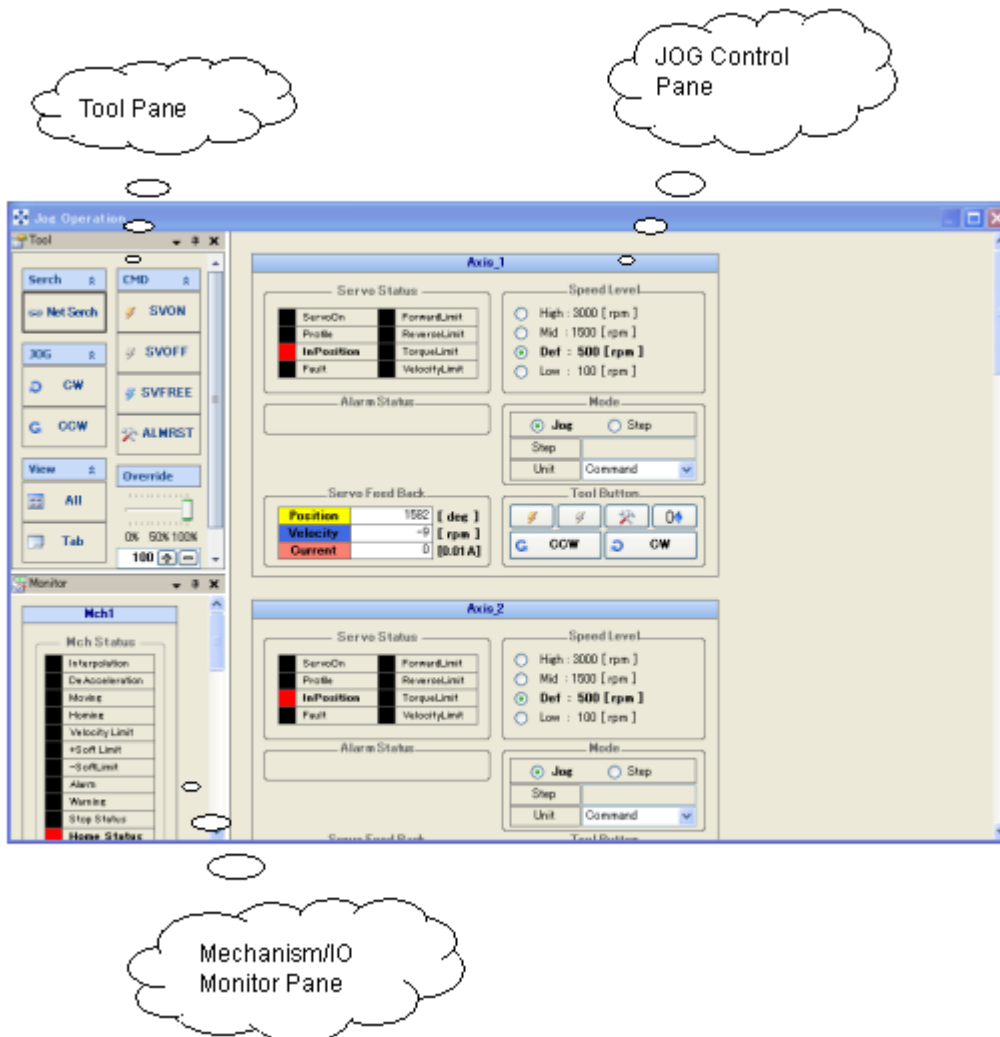
1. Switches the JOG control display for all axes and that for each axis.

- **JOG control function**

1. Executes JOG operation (constant-speed continuous feed) for each axis.
 2. Executes step operation (fixed-distance feed) for each axis.
 3. Executes Servo ON and Servo OFF for each axis.
 4. Executes Reset Alarm for each axis.
 5. Executes Reset Position for each axis.
-








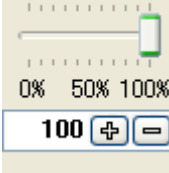


Description of the JOG Operation Window

The configuration of the JOG Operation window is as follows:



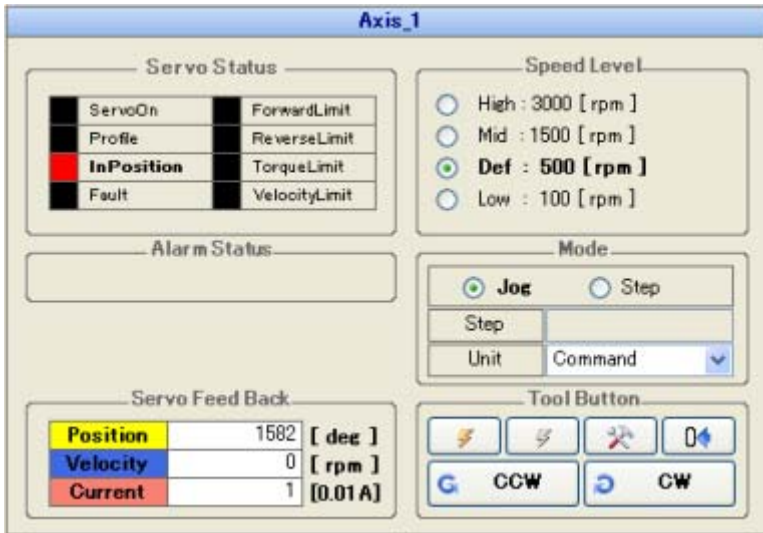
[Tool Pane]

The following table describes each tool button used for JOG operation:

Toolbar group	Button	Description of function
Search	 Net Search	Starts communication with the SV-NET controller and displays the number of currently connected axes.
CMD	 SVON	Executes Servo ON for all axes.
	 SVOFF	Executes Servo OFF for all axes.
	 SVFREE	Executes Servo FREE for all axes.
	 ALMRST	Executes Reset Alarm for all axes.
JOG	 CW	Executes JOG operation in forward direction for all axes.
	 CCW	Executes JOG operation in reverse direction for all axes.
Override		Executes speed override for all axes.
View	 All	Displays JOG control for all axes in a list.
	 Tab	Displays JOG control for each axis in tabular form.

[JOG Control Pane]

The JOG operation information pane displays JOG control for each of the axes connected to the SV-NET controller.



[Servo Status]

Displays the servo status of the SV-NET driver.

Status name	Description of status	ON	OFF
Servo On	Servo ON	■	■
Profile	Profile operation is in progress.	■	■
In Position	In-position	■	■
Fault	An alarm is detected.	■	■
Foward Limit	The forward direction soft limit is detected.	■	■
Reverse Limmit	The reverse direction soft limit is detected.	■	■
Torque Limit	The torque limit is detected.	■	■
Velocity Limit	The speed limit is detected.	■	■

[Alarm Status]

Displays the alarm status of the SV-NET driver.

[Servo Feed Back]

Displays the servo feedback information of the SV-NET driver.

Feedback name	Feedback information
Position	Present position
Velocity	Present speed
Current	Present electric current

[Speed Level]

Specifies the reference rpm of the motor (for 100% override).

Speed level	Number of rotations
	Unit: rpm
High	3000
Mid	1500
Def	500
Low	100







[Mode]

Sets the mode of test run.

Item name	Description
Jog / Step	Selects JOG operation or step operation.
Step	Inputs a move distance in step operation mode.
Unit	Changes the instruction unit for the move distance. [Command]: Instruction unit of move specified by controller setup [Pulse]: Pulse unit

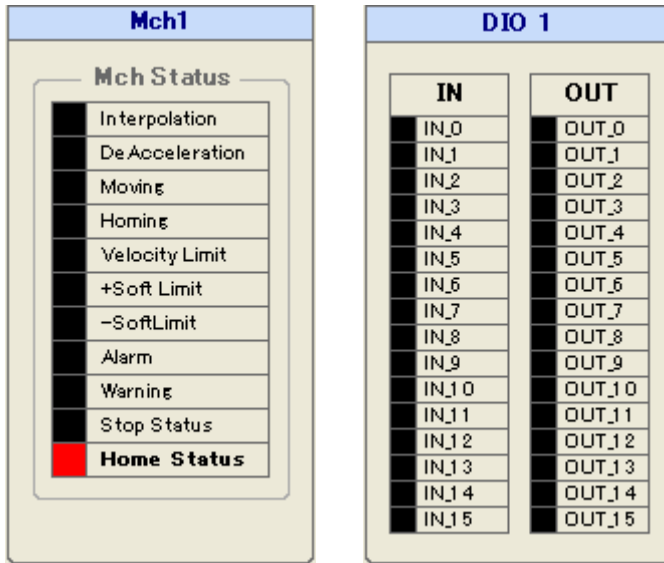
[Tool Button]

Executes an operation for the JOG control-target driver.

Button	Description
	Executes Servo ON.
	Executes Servo OFF.
	Executes Reset Alarm.
	Resets the position information.
	Rotates the motor in the forward direction. The motor remains rotating while this button is held down.
	Rotates the motor in the reverse direction. The motor remains rotating while this button is held down.

[Mechanism/IO Monitor Pane]

This pane displays the mechanism status and general I/O information of the SV-NET controller.



[MCH Status]

Status name	Description of status
Interpolation	Interpolation calculation is in progress.
De Acceleration	Acceleration/deceleration is in progress.
Moving	Axis is moving.
Homing	Homing
Velocity Limit	The speed limit is detected.
+Soft Limit	The forward direction soft limit is detected.
- Soft Limit	The reverse direction soft limit is detected.
Alarm	An alarm is detected.
Warning	A warning is detected.
Stop Status	A stop processing instruction is input.
Home Status	The origin is fixed.

[I/O Status]

Displays general I/O information of the SV-NET controller.

Status name	Description of status	ON	OFF
IN	Input status	■	■
OUT	Output status	■	■

Program Grid

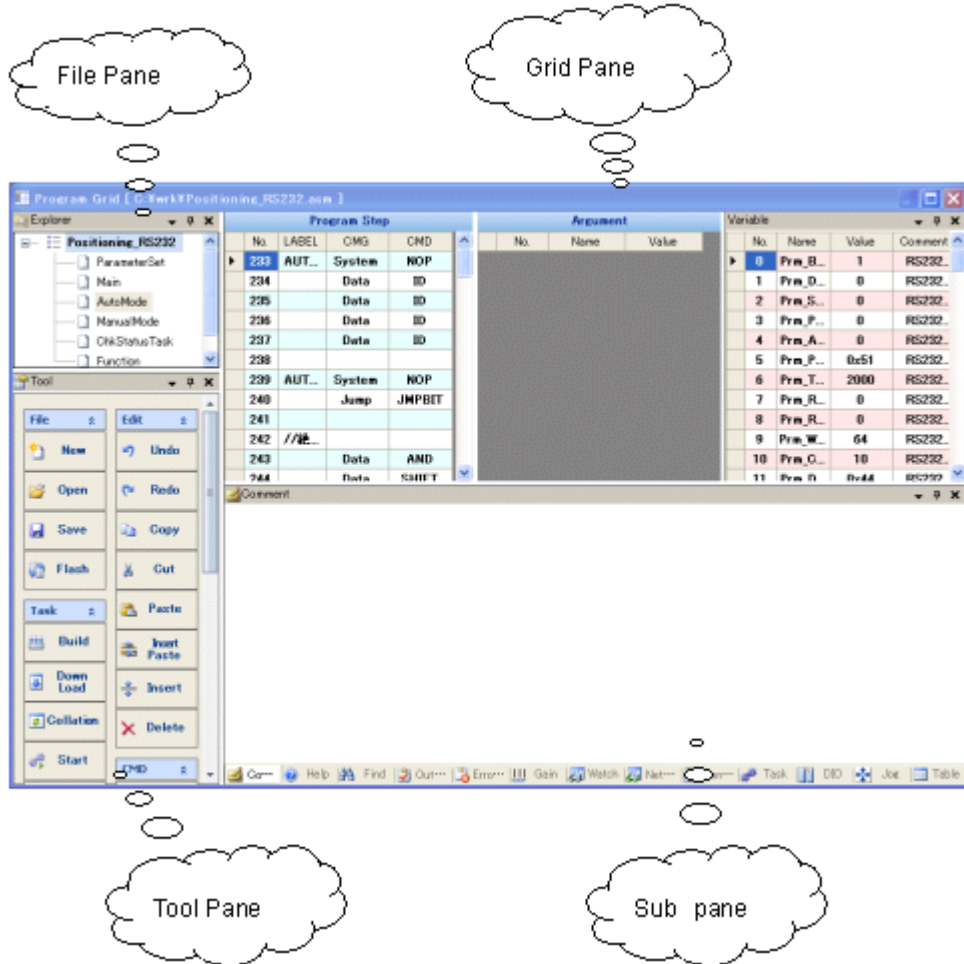
This window is used to perform operations ranging from creating to executing and debugging a program designed specifically for the SV-NET controller.

Program Grid Functions

- Program editor function
 - Program download and check function
 - Program debug function
 - Servo monitor function
 - Variable supervision function
 - Task monitor function
-

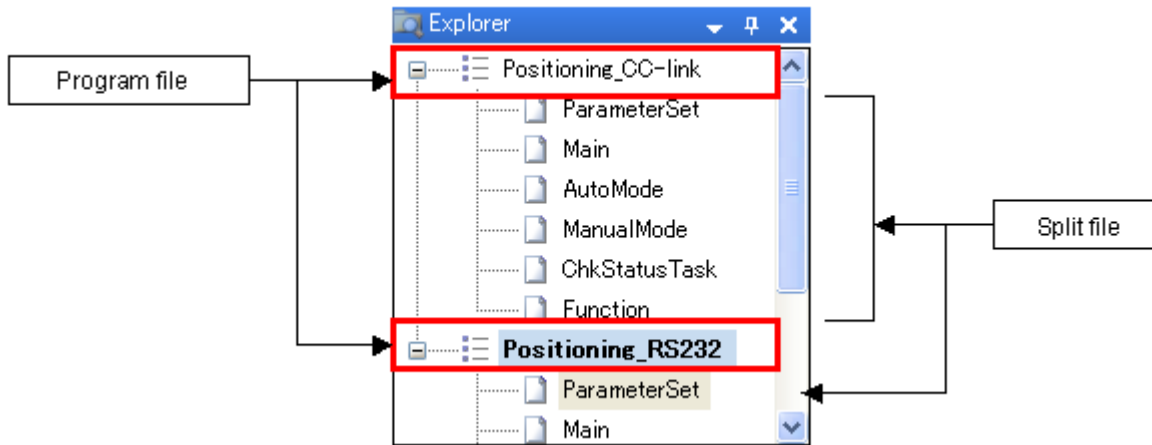
Description of the Program Grid Window

The configuration of the Program Grid window is as follows:



[File Pane]

This pane is used to create new program files and add or delete existing program files.



Program File Menu (Right Click)


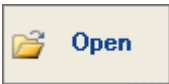
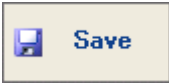

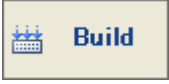




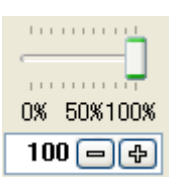
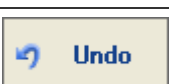



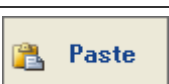
Name	Description of function
New File	Creates a new program file.
Open File	Opens an existing program file.
Save File	Saves a created program file.
Add File	Adds a program to the file pane. A maximum of four program files can be added.
Delete File	Deletes a program from the file pane.
Build	Builds a created program.
Download	Downloads the program data to the SV-NET controller after the program is built.

Split File Menu (Right Click)



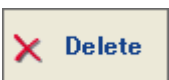






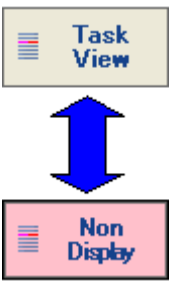
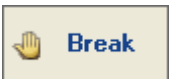


Name	Description of function
ReName	Changes the name of a split file.
Add Asm	Adds a split file to the tree. A maximum of 100 split files can be added.
Delete Asm	Deletes a split file from the tree.
Move On	Moves a split file to the upper tree.
Move Under	Moves a split file to the lower tree.


[Tool Pane]

The following table describes each tool button used for the program grid:

Group	Button	Description of function
File	 New	Creates a new program file.
	 Open	Reads an existing program file.
	 Save	Saves a program file.
	 Flash	Saves a program in the flash memory of the SV-NET controller.
Build	 Build	Builds a created program.
	 Down Load	Writes the object file to the SV-NET controller after building a program.
	 Collation	Reads a program from the SV-NET controller and checks it against the currently edited program.
	 Start	Executes a program. Starts Task 0.
	 Stop	Stops a program.
Override		Executes speed override. Speed override is possible even during program execution.
Edit	 Undo	Undoes an edit.
	 Redo	Redoes an edit.
	 Copy	Copies the selected range.
	 Cut	Cuts the selected range.
	 Paste	Pastes the copied data.

* Refer to the “Details of the Edit Functions of the Program Grid.”

	 Insert Paste	Pastes the copied data after inserting a line.				
	 Insert	Inserts a line.				
	 Delete	Deletes a line.				
CMD	 SVON	Executes Servo ON for all axes.				
	 SVOFF	Executes Servo OFF for all axes.				
	 SVFREE	Executes Servo FREE for all axes.				
	 ALMRST	Executes Reset Alarm for all axes.				
	 STOP	Executes Deceleration Stop for all axes.				
デバッグ		<p>Sets the mode of program execution.</p> <table border="1"> <tr> <td>Normal</td> <td>Normal mode of program execution</td> </tr> <tr> <td>Debug</td> <td>Mode in which the debug functions including step execution and task display are enabled. Some functions such as Edit Grid and Copy & Paste are disabled.</td> </tr> </table>	Normal	Normal mode of program execution	Debug	Mode in which the debug functions including step execution and task display are enabled. Some functions such as Edit Grid and Copy & Paste are disabled.
	Normal	Normal mode of program execution				
	Debug	Mode in which the debug functions including step execution and task display are enabled. Some functions such as Edit Grid and Copy & Paste are disabled.				
	<p>Sets the Trace Program.</p> <table border="1"> <tr> <td>Task View</td> <td>Starts Trace Program.</td> </tr> <tr> <td>Non Display</td> <td>Stops Trace Program.</td> </tr> </table>	Task View	Starts Trace Program.	Non Display	Stops Trace Program.	
Task View	Starts Trace Program.					
Non Display	Stops Trace Program.					
 Break	Sets a breakpoint in the currently selected program step. Breakpoints can be set only in Task 0.					
 Release	Resets the currently set breakpoints.					
 ReStart	Restarts the currently stopped program.					

	 Step In	Executes the currently stopped program step and stops the program before executing the following step.
--	--	--

[Grid Pane]

You can create programs by editing data in the grid pane. The grid pane consists of three grids: “Program Step Grid” to create the program instructions, “Argument List Grid” to set the detailed information for the instructions, and “Variable List Grid” to edit the variables. A maximum of 5000 program instructions can be created.

The screenshot displays three data grids in a software interface. The first grid, titled 'プログラムステップ' (Program Step Grid), lists program steps with columns for step number, label, command type, and command. The second grid, titled '引数リスト' (Argument List Grid), lists arguments with columns for argument number, argument name, and value. The third grid, titled '変数リスト' (Variable List Grid), lists variables with columns for variable number, variable name, initial value, and event.

プログラムステップ			
番号	ラベル	コマンド種類	コマンド
0		Servo	SVON
1		Timer	WAIT
2		Home	HOMES2
3		System	ACGSET
4		Task	TSTART
5			
6	//	System	END
7			
8	START	System	NOP
9		System	ACGSET
10		Movl	MOVJL
11		Pass	INPOSM
12		Timer	WAIT
13		Movl	MOVJL
14		Pass	INPOSM
15		Timer	WAIT
16		System	NOP
17		Jump	JMP0
18		System	NOP
19		System	NOP
20	t1	System	NOP
21		Data	ID
22		Data	MONGET

引数リスト		
番号	引数名	値
0	MCH	0
1	SETUP	setup

変数リスト			
番号	変数名	初期値	イベント
0	pos	7200000	
1	vel	2000	
2	acc1	50	
3	acc2	50	
4	hvl	4	
5	pos2	-360000	
6	setup	3	
7	temp	0	
8	dbe_d		
9	svd_d		
10	mch_		
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			



Program Step Grid

The program step grid displays a program list.

Program Step			
No.	LABEL	CMG	CMD
264	H_SETUP0	Jump	JNPBIT
265		Home	HOME
266			
267	H_SETUP1	Jump	JNPBIT
268		Home	HOME
269			
270	H_SETUP2	Jump	JNPBIT
271		Home	HOME
272			
273	H_SETUP3	Jump	JNPBIT
274		Home	HOME
275			

<No.>

Displays the line numbers in the program list. The program is executed in ascending order (starting from the top line).

<Label>

Sets the branch labels for branch instructions and others.

<CMG>

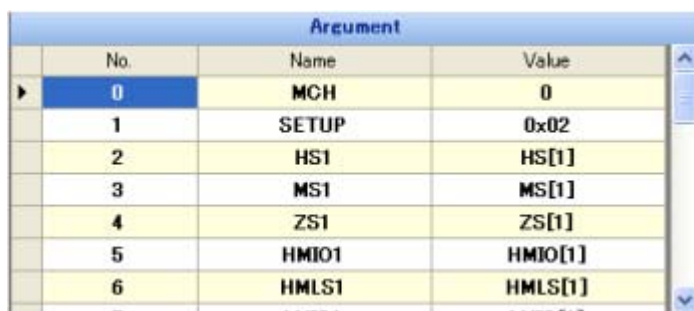
Selects the type of command. A list in which commands are categorized by types is displayed to allow you to select commands for setting a command group.

<CMD>

Displays a list of the commands selected in the "CMG" column. Commands are set when they are selected from the list.

Argument List Grid

The argument list grid is used to set the data of the command arguments.



No.	Name	Value
0	MCH	0
1	SETUP	0x02
2	HS1	HS[1]
3	MS1	MS[1]
4	ZS1	ZS[1]
5	HMIO1	HMIO[1]
6	HMLS1	HMLS[1]

<No.>

Displays the line numbers in the argument list. The number of arguments varies according to the command.

<Name>

Displays the argument names in the argument list.

<Value>

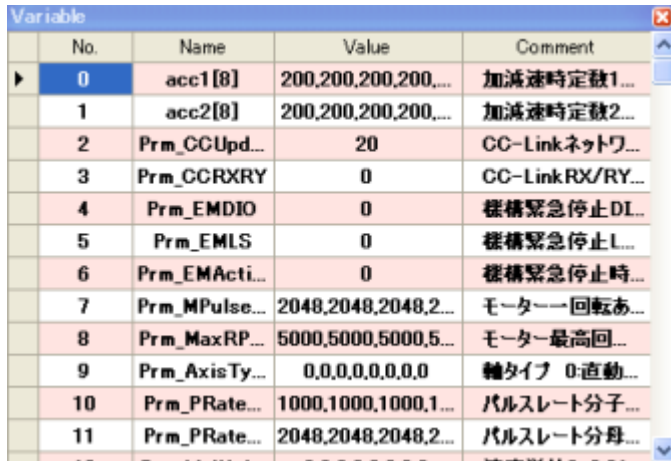
Displays argument values. Enter argument values.

Variable List Grid

The Variable List Grid displays a list of the variables to be used in the program.

The variable is a place to save numerical information.

Variables are used for the simplification of entering argument data to the argument list and for additions and subtractions of variable data in the program depending on the condition.



No.	Name	Value	Comment
0	acc1[8]	200,200,200,200,...	加減速時定数1...
1	acc2[8]	200,200,200,200,...	加減速時定数2...
2	Prm_CCUpd...	20	CC-Linkネットワ...
3	Prm_CCRXRY	0	CC-LinkRX/RX...
4	Prm_EMDIO	0	機構緊急停止DL...
5	Prm_EMLS	0	機構緊急停止L...
6	Prm_EMActi...	0	機構緊急停止時...
7	Prm_MPulse...	2048,2048,2048,2...	モーター回転あ...
8	Prm_MaxRP...	5000,5000,5000,5...	モーター最高回...
9	Prm_AxisTy...	0,0,0,0,0,0,0,0	軸タイプ 0直動...
10	Prm_PRate...	1000,1000,1000,1...	パルスレート分子...
11	Prm_PRate...	2048,2048,2048,2...	パルスレート分母...

<No.>

Displays the line numbers in the variable list.

<Name>

Displays the variable names. Enter variable names.

Restrictions on Variable Names

You can use any variable names as long as the following restrictions are observed:

- Only 1-byte alphanumeric characters and underscores (_) are allowed.
- Variable names are not case-sensitive.
- The variable name cannot begin with a numeric.
- Spaces cannot be placed in the middle of the variable name.
- Reserved words cannot be used as variable names.

Array

An array allows you to handle multiple variables in a batch.

An array can be specified by enclosing a numerical value in square brackets (example: [3]) following a variable name. This numerical value indicates the number of variables to be handled.

<Value>

Displays the initial values of variables. Only numerical values can be specified for initial values of variables.

When "[Array Variable List](#)" is selected from the menu displayed when an initial value is double-clicked or right-clicked, the Array Variable List window is displayed.

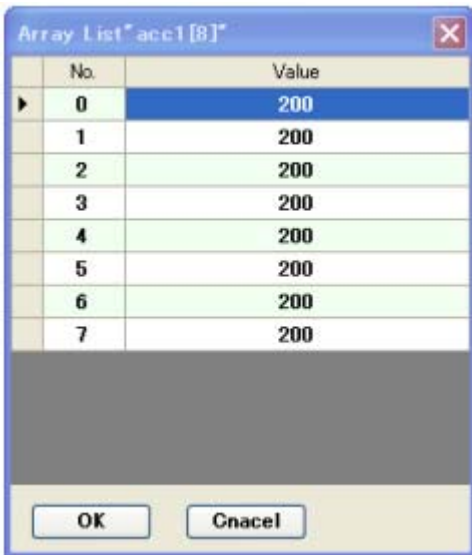
<Comment>

Displays comments. Enter comments.

Array Variable List

The array variable list allows you to edit the initial values of an array in a list.

When "Value" of a variable name defined by the Variable List Grid is double-clicked, an array variable list is displayed.



<No.>

Displays the argument numbers of the array.

<Value>

Displays the initial values stored in the array.

<OK>

Confirms the edited values.

<Cancel>

Closes the Array Variable List window without confirming the edited values.

Edit Menu (Right Click)

Name	Description of function
Copy	Copies the values of the selected lines.
Cut	Cuts the values of the selected lines.
Paste	Pastes the values of the copied or cut lines.
Insert Row	Inserts the selected lines.
Delete Row	Deletes the selected lines.

[Subpane]

The subpane has the following functions:

1. Comment Pane

The comment pane is a text editor in which comments can be input. Input comments for each program step. The comment text is automatically switched when another program step is selected.



2. Help Pane

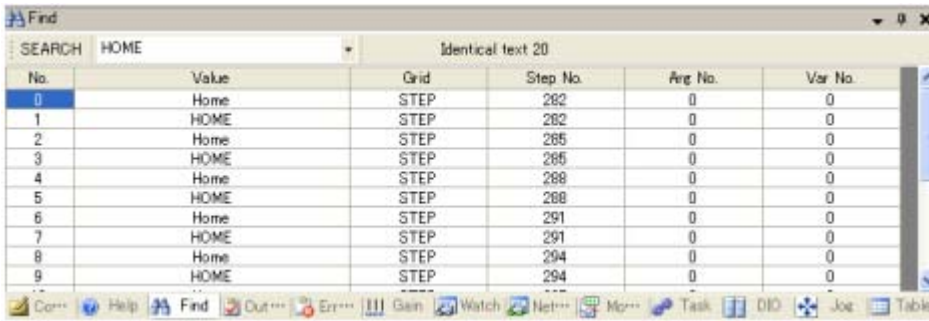
The help pane is used to display help for the currently selected command. Help information is automatically switched when another command is selected.

* Turn ON the [Help Display function](#) of “Utilities” to use this function.



3. Find Pane

The search pane is used to search a program for a character string. Enter a search string in the combo list and then click the [Find] button. For the searchable ranges, see the following table:



· Toolbar

Item name	Description
[Find] button	Starts search for the contents currently displayed in the search list box.
Search list box	Used to enter the character string to be searched for. When the list box is expanded, a list of the character strings searched for thus far is displayed.

· Grid

Item name	Description
No.	Displays the search result number.
Value	Displays the phrases containing the search string.
Grid	Displays the grids of the strings that matched the search condition.
Step No.	Displays the program line numbers of the strings that matched the search condition.
Arg No.	Displays the argument numbers of the strings that matched in the argument list.
Var No.	Displays the line numbers of the strings that matched in the variable list.

· Searchable ranges

Program step	Argument list	Variable list
Labels, command types, and commands can be searched for a character string. (Line numbers are excluded from the search range.)	Argument values can be searched for a character string. (Argument numbers and argument names are excluded from the search range.)	Variable names and initial values can be searched for a character string. (Variable line numbers and comments are excluded from the search range.)

4. Output Pane

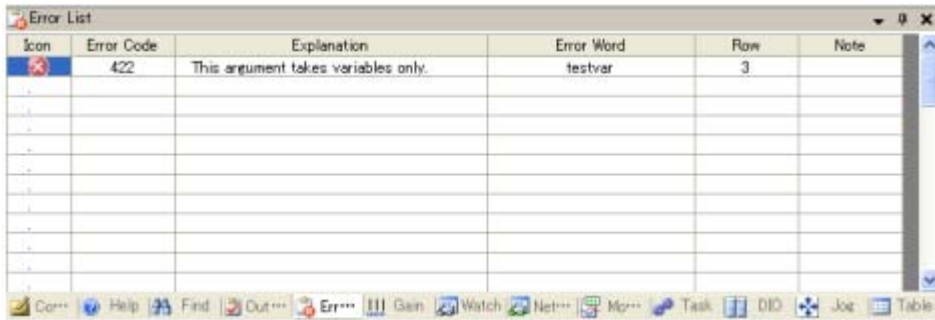
The output pane displays the results of a build and check.



5. Error Information Pane

The error information pane displays information about the errors found during a build.

Double-click the cell where the content of a build error is described, you can go to the line where the build error occurred.



· Grid

Item name	Description
Icon	Displays the error icons.
Error Code	Displays the associated error codes.
Explanation	Displays the descriptions of the error contents.
Error Word	Displays the character strings that caused the error.
Row	Displays the program line numbers in which the error occurred.
Note	Displays the supplementary explanations of the error contents.

6. Gain Pane

The gain pane is used to adjust the gain of each axis. Gains can be changed even during program execution.



· Toolbar

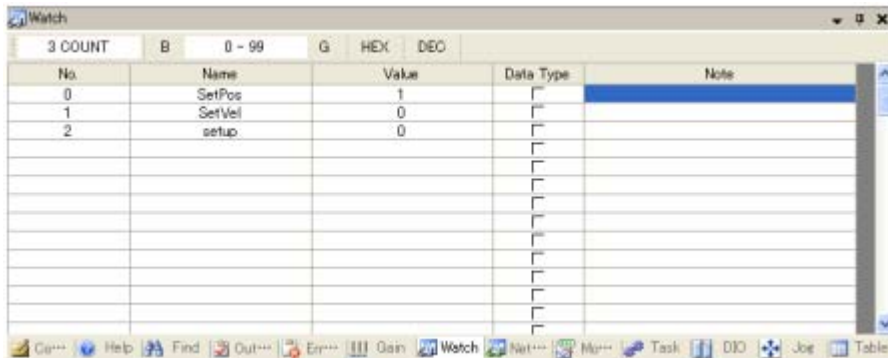
Item name	Description
Axis selection list	Selects an axis for which the gain is adjusted.
[SAVE FLASH] button	Saves the changed gain data in the flash memory of the driver. Note: Stop any running program before saving gain data.

· Slider

Item name	Description
Kp1	Changes the value of position loop proportional gain 1.
Kv1	Changes the value of speed loop proportional gain 1.
Ki1	Changes the value of speed loop integral gain 1.
LPF_f	Changes the value of the lowpass filter cutoff frequency.
NF_f	Changes the value of the notch filter center frequency.
NF_d	Changes the value of the notch filter attenuation.
Load	Changes the value of the load inertia.

7. Watch Pane

The supervision pane is used to monitor the values of variables used in the program. Variables can be monitored after the program has been downloaded.



· Toolbar

Item name	Description
COUNT	Displays the number of predefined variables.
[B] button	Up to 100 variables can be monitored at a time. This button displays the previous list. If the first list is being displayed, pressing this button has no effect.
Variable list	Displays the number of the currently displayed variable list. Variable list numbers are assigned according to the order in which the variables are defined.
[G] button	Up to 100 variables can be monitored at a time. This button displays the next list. If the last list is being displayed, pressing this button has no effect.
[HEX] button	Displays all variable values in hexadecimal notation.
[DEC] button	Displays all variable values in decimal notation.

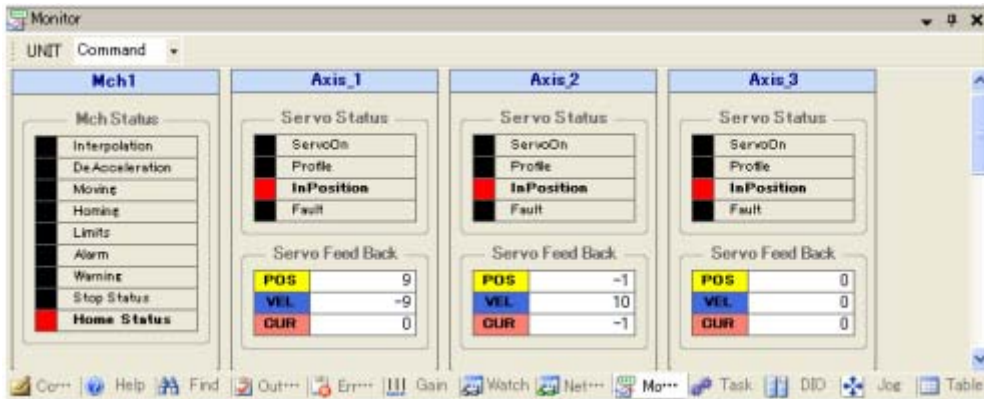
· Grid

Item name	Description
No.	Displays the variable list numbers.
Name	Displays the names of the predefined variables.
Value	Displays the variable values after data has been read.
Data Type	Switches the data type of a variable value. Checked: Hexadecimal Unchecked: Decimal
Note	Displays the comments on the variables.

8. Monitor Pane

The monitor pane is used to monitor various information items such as the feedback data of the SV-NET driver and the mechanism and I/O information of the controller.

For more information, see the [\[Servo Monitor\]](#) window.



· Toolbar

Item name	Description
UNIT	Switches the position data of the servo monitor between "Command" (controller instruction unit) and "Pulse" (pulse unit).

9. Task Pane

The task pane displays the status of each task during program execution.



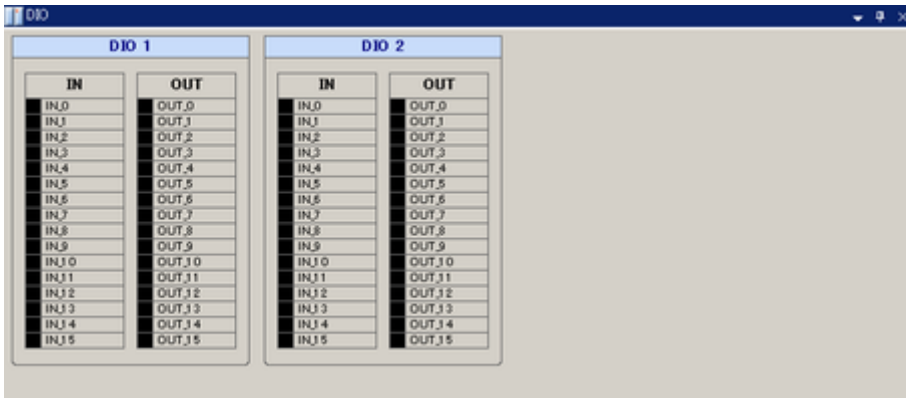
Task monitor

Monitor window	Status item	Description	
	STATUS	Displays "RUN" when the task is being executed.	
	INDEX	Displays the current index of the task.	
	STACK	Displays the current stack pointer of the task.	
	Debug Color	Description	
	Color	Displays the background color for the debug mode.	

10. DIO Pane

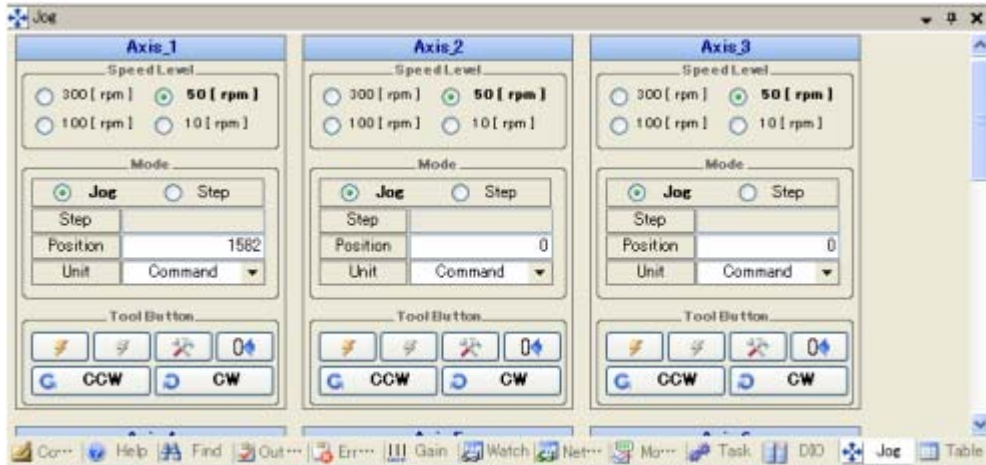
The DIO pane is used to monitor the DIO I/O statuses.

When a label in the OUT group is clicked, the status is output directly to the I/O device.



11. JOG Pane

The JOG pane is used to perform JOG operation of each axis.



- Speed Level

Selects a speed from among 10, 50, 100, and 300 rpm.

- Mode

Item name	Description
Jog / Step	Selects JOG operation or step operation.
Step	Specifies the move distance in step operation mode.
Position	Displays the current position of the motor.
Unit	Selects the display unit of the current value between “Command” (instruction unit) and “Pulse” (pulse unit).

- Tool Button

Executes an operation for the JOG control-target driver.

Button	Description
	Executes Servo ON.
	Executes Servo OFF.
	Executes Reset Alarm.
	Resets the position information.
	Rotates the motor in the forward direction. The motor remains rotating while this button is held down.
	Rotates the motor in the reverse direction. The motor remains rotating while this button is held down.

Details of the Edit Functions of the Program Grid

Results of edit operations on the program grid differ depending on the items selected for editing.

The following table shows the results of edit operations by items selected for editing:

Command	Condition	Program step	Argument list	Variable list
Copy	Select a single cell.	The step data of the selected cell line is copied.	The argument values of the selected cell are copied. (Excluding the [No.] and [Argument Name] columns.)	The selected cell is copied. (Excluding the [No.] column.)
	Select a line header.	The step data of the selected lines is copied.	The [Value] column values of the selected lines are copied.	The values of all columns except [No.] of the selected lines are copied.
	Select multiple cells. (Contiguous)	The step data of the selected cells is copied.	The argument values of the selected cells are copied. (Selection of the [No.] and [Argument Name] columns is invalid.)	The values of the selected cells are copied. (Selection of the [No.] column is invalid.)
	Select multiple cells. (Non-contiguous)	Error.	The argument values of the selected cells are copied. (Selection of the [No.] and [Argument Name] columns is invalid.)	The values of the selected cells are copied. (Selection of the [No.] column is invalid.)
	Select multiple line headers. (Contiguous)	The step data of the selected lines is copied.	The [Value] column values of the selected lines are copied.	The values of all columns except [No.] of the selected lines are copied.
	Select multiple line headers. (Non-contiguous)	Error.	The [Value] column values of the selected lines are copied.	The values of all columns except [No.] of the selected lines are copied.

Command	Condition	Program step	Argument list	Variable list
Cut	Select a single cell.	After the step data of the selected cell line has been copied, the selected line is deleted.	The argument values of the selected cell are copied. (Excluding the [No.] and [Argument Name] columns.) After the copy operation, the [Value] column value is initialized to 0.	The selected cell is copied. (Excluding the [No.] column.) After the copy operation, the values of the selected cells are cleared.
	Select a line header.	After the step data of the selected line has been copied, the selected line is deleted.	After the [Value] column value of the selected line has been copied, the [Value] column value is initialized to 0.	After the values of all columns except [No.] of the selected line have been copied, the values of the selected cells are cleared.

	Select multiple cells. (Contiguous)	After the step data of the selected cells has been copied, the selected lines are deleted.	The argument values of the selected cells are copied. (Selection of the [No.] and [Argument Name] columns is invalid.) After the copy operation, the values of the selected cells are initialized to 0.	The values of the selected cells are copied. (Selection of the [No.] column is invalid.) After the copy operation, the values of the selected cells are cleared.
	Select multiple cells. (Non-contiguous)	Error.	The argument values of the selected cells are copied. (Selection of the [No.] and [Argument Name] columns is invalid.) After the copy operation, the values of the selected cells are initialized to 0.	The values of the selected cells are copied. (Selection of the [No.] column is invalid.) After the copy operation, the values of the selected cells are cleared.
	Select multiple line headers. (Contiguous)	After the step data of the selected lines has been copied, the selected lines are deleted.	After the [Value] column values of the selected lines have been copied, they are initialized to 0.	After the values of all columns except [No.] of the selected lines have been copied, they are cleared.
	Select multiple line headers. (Non-contiguous)	Error.	After the [Value] column values of the selected lines have been copied, they are initialized to 0.	After the values of all columns except [No.] of the selected lines have been copied, they are cleared.

Command	Condition	Program step	Argument list	Variable list
Paste	Always paste data based on the position of the current cell.	The copied step data is pasted starting from the current cell.	The copied argument value data is pasted starting from the current cell. (Selection of the [No.] and [Argument Name] columns is invalid.)	The copied values are pasted starting from the current cell. (Selection of the [No.] column is invalid.)

Command	Condition	Program step	Argument list	Variable list
Insert	Insert the line of the selected cell. (If multiple cells have been selected, insert the lines of those cells.) Note that this function permits contiguous selection only. Non-contiguous selection is not permitted.	Permitted.	Invalid.	Permitted.
Delete	Delete the line of the selected cell. (If multiple cells have been selected, use the same operation as that for "Insert.")	Permitted.	Invalid.	Permitted.

Command	Condition	Program step	Argument list	Variable list
DEL Key	Select a single cell.	The data of the selected cell is cleared. If a cell in the [Label] column is selected, the label is cleared. If one cell in either the [CMG] column or the [CMD] column is selected, the cells of both columns are cleared. (The [No.] column cannot be cleared.)	The data of the selected cell is cleared to 0. (This applies only to the [Value] column.)	The data of the selected cell is cleared. (The [No.] column cannot be cleared.)
	Select a line header.	All the values of all columns except [No.] of the selected line are cleared.	The [Value] column values of the selected line are cleared to 0.	All the values of all columns except [No.] of the selected line are cleared.
	Select multiple cells. (Contiguous)	The values of the selected cells are cleared. (For the selection of [CMG] and [CMD] columns, the same operation as that for "Select a single cell" is used.)	The same operation as that for "Select a single cell" is used.	The same operation as that for "Select a single cell" is used.
	Select multiple cells. (Non-contiguous)	All the values of all columns except [No.] of the selected line are cleared.	The [Value] column values of the selected line are cleared to 0.	All the values of all columns except [No.] of the selected line are cleared.
	Select multiple line headers. (Contiguous)	The same operation as that for "Select a line header" is used.	The same operation as that for "Select a line header" is used.	The same operation as that for "Select a line header" is used.
	Select multiple line headers. (Non-contiguous)	The same operation as that for "Select a line header" is used.	The same operation as that for "Select a line header" is used.	The same operation as that for "Select a line header" is used.

• Undo and Redo Functions

These functions are enabled for the commands shown in the following table:

No.	Program step	Argument list	Variable list	Comment
1	Edit Label Line (Including deletion by the DEL key)	Edit Argument Value (Including deletion by the DEL key)	Edit Variable Value (Including deletion by the DEL key)	Edit Comments
2	Change Command Group Combo	Paste Argument	Paste Variable	
3	Paste Step		Insert Variable Line	
4	Insert Step Line		Delete Variable Line	
5	Delete Step Line		Paste After Add Variable Line	
6	Paste After Insert Step Lines		Add Last Variable Line	
7	Add Last Step Line			

Operations Disabled in Debug Mode

The following table shows the operations that are disabled in debug mode:

Group	Operation
File	New
	Open
	Save
	Flash
Build	Build
	Download
	Collation
Edit	Undo
	Redo
	Copy
	Cut
	Paste
	Insert Paste
	Inset
	Delete

Monitor Variable

A monitor variable can be used for argument OP* of an arithmetic instruction or others. Monitor variables can cause a branch to occur in a program according to the condition of the motor. The following is a list of monitor variables:

Variable name	Description	Meaning of the index
DI[*]	Actual input	DIO number
DO[*]	Actual output	DIO number
AI[*]	Analog input	AIN_CH number
AO[*]	Analog output	AOUT_CH number
TIM[*]	Timer	Timer number
TASK_STS[*]	Task start status	Task number
SVD_CPLS[*]	Instructed position pulse (with no origin offset)	SVD number
SVD_FPLS[*]	Present position pulse (with no origin offset)	SVD number
SVD_FVEL[*]	Present actual speed (rpm)	SVD number
SVD_FCUR[*]	Present actual electric current (0.01 A)	SVD number
SVD_STS[*]	Servo status	SVD number
SVD_ALM[*]	Servo alarm	SVD number
SVD_LOAD[*]	Overload monitor (0.1%)	SVD number
SVD_TEMP[*]	Driver temperature (0.1°C)	SVD number
SVD_PWR[*]	Driving power voltage (0.1 V)	SVD number
MCH_CPLS[*][*]	Instructed position (pulses)	Mechanism number and axis number
MCH_FPLS[*] [*]	Present position (pulses)	Mechanism number and axis number
MCH_FCUR[*][*]	Present actual electric current (0.01 A)	Mechanism number and axis number
MCH_FVEL[*] [*]	Present actual speed (rpm)	Mechanism number and axis number
MCH_FSPD[*] [*]	Present actual speed (speed unit)	Mechanism number and axis number
MCH_CPOS[*][*]	Instructed position (instruction unit)	Mechanism number and axis number
MCH_FPOS[*] [*]	Present position (instruction unit)	Mechanism number and axis number
MCH_SVSTS[*] [*]	Servo status of each axis	Mechanism number and axis number
MCH_SVALM[*] [*]	Servo alarm of each axis	Mechanism number and axis number
MCH_JSTS[*] [*]	Move status of each axis	Mechanism number and axis number
MCH_STS[*]	Mechanism status	Mechanism number
MCH_ALM[*]	Mechanism alarm	Mechanism number

Shortcut Keys

The following table describes the shortcut keys available in the Program Grid window:

Key operation	Operation
CTRL+Z	Undo
CTRL+Y	Redo
CTRL+C	Copy
CTRL+X	Cut
CTRL+V	Paste
CTRL+I	Insert Paste
Insert	Inset
SHIFT + Delete	Delete
F5	Start Program
F6	Download
F7	Display Task Trace Line At Beginning
F8	Display Task Trace
F9	Set/Reset Breakpoint
F11	Step-in
F12	Switch To Debug Mode
SHIFT+F5	Stop Program

Servo Monitor

The Servo Monitor is used to execute the program created by the "Program Grid" and to monitor various information items such as the feedback data of the SV-NET driver and the mechanism and I/O information of the controller.

Servo Monitor Functions

- **Function to handle programs**

1. Executes and stops a program.

- **Monitor functions**

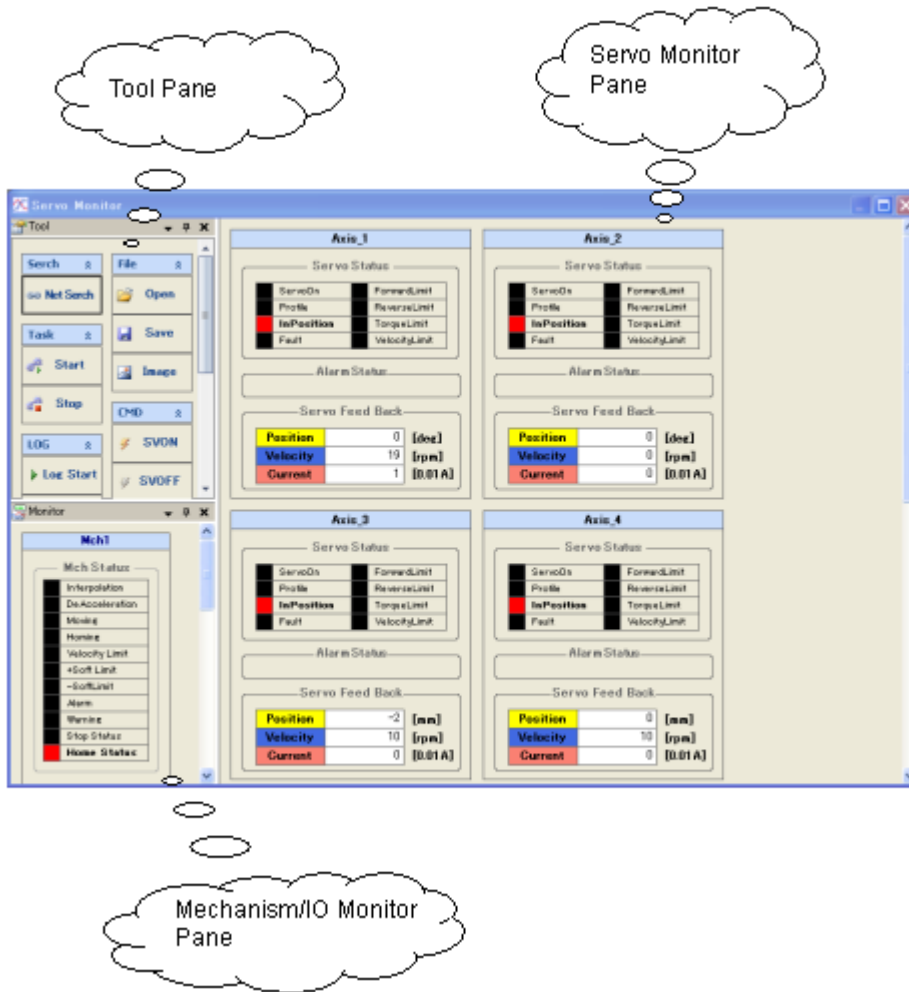
1. Function to monitor the servo status and servo feedback of each axis
2. Function to monitor the mechanism and I/O information of the SV-NET controller
3. Function to display the servo feedback data in graphical form

- **Graphical function**

1. Displays data of positions, speeds, and electric currents
 2. Changes the scale of each item.
 3. Graphically displays a maximum of three axes, allowing them to be compared.
 4. Can display the X-Y plane.
 5. Logging function (up to 8 sec at an interval of 8 msec)
 6. Real time display function on an oscilloscope
-












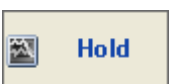

Description of the Servo Monitor Window

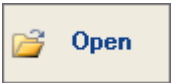






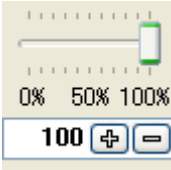
The configuration of the Servo Monitor window is as follows:



[Tool Pane]

The following table describes each tool button used for the servo monitor:

Group	Button	Description of function															
Search		Starts communication with the SV-NET controller and displays the number of currently connected axes.															
Task		Executes a program.															
		Stops a program.															
LOG	  	Starts or stops log data acquisition. <table border="1"> <tr> <td>Log Start</td> <td>Starts logging feedback data.</td> </tr> <tr> <td>Log Stop</td> <td>Stops logging feedback data to obtain the log.</td> </tr> </table>	Log Start	Starts logging feedback data.	Log Stop	Stops logging feedback data to obtain the log.											
	Log Start	Starts logging feedback data.															
	Log Stop	Stops logging feedback data to obtain the log.															
	  	Switches the monitor display. <table border="1"> <tr> <td>View Wave</td> <td>Displays log data in graphical form.</td> </tr> <tr> <td>View Form</td> <td>Displays the servo status and servo feedback information.</td> </tr> </table>	View Wave	Displays log data in graphical form.	View Form	Displays the servo status and servo feedback information.											
	View Wave	Displays log data in graphical form.															
	View Form	Displays the servo status and servo feedback information.															
	Switches graphical display to X-Y display.																
	Switches graphical display to oscilloscope display.																
	Pauses oscilloscope display.																
Unit		Sets the display unit for each monitor (position, speed, and electric current). <table border="1"> <thead> <tr> <th>Unit</th> <th>Position</th> <th>Speed</th> <th>Electric current</th> </tr> </thead> <tbody> <tr> <td>Pulse</td> <td>Pulse</td> <td>rpm</td> <td>0.01 A</td> </tr> <tr> <td rowspan="2">Command</td> <td>mm</td> <td>rpm</td> <td>0.01 A</td> </tr> <tr> <td>deg</td> <td>rpm</td> <td>0.01 A</td> </tr> </tbody> </table>	Unit	Position	Speed	Electric current	Pulse	Pulse	rpm	0.01 A	Command	mm	rpm	0.01 A	deg	rpm	0.01 A
Unit	Position	Speed	Electric current														
Pulse	Pulse	rpm	0.01 A														
Command	mm	rpm	0.01 A														
	deg	rpm	0.01 A														

File	 Open	Opens saved log data.
	 Save	Saves the obtained log data.
	 Image	Saves the present graph in an image file. Select bitmap or JPEG format as the image file format.
CMD	 SVON	Executes Servo ON for all axes.
	 SVOFF	Executes Servo OFF for all axes.
	 ALMRST	Executes Reset Alarm for all axes.
	 STOP	Executes Deceleration Stop for all axes.
Override		Executes speed override for all axes.

* Notes:

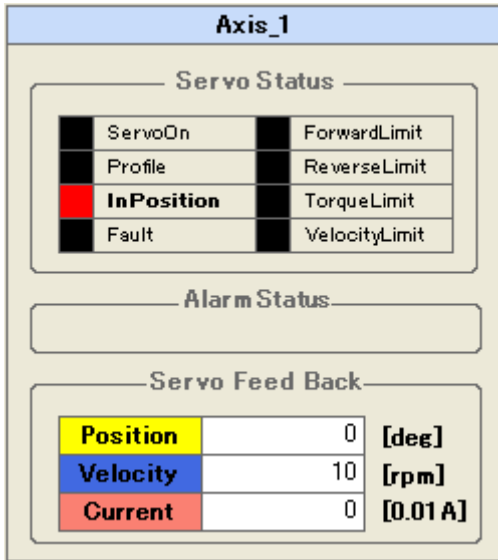
1. The [Log Start] button and the [Log Stop] button in the tool pane are disabled in graphical display mode.
2. The instruction unit changes depending on the type of the parameter value of the SV-NET controller.

[Servo Monitor Pane]

The information displayed in the servo monitor pane changes by switching between the [View Wave] and [View Form] buttons.

1. When the [View Form] button is clicked

The servo status and servo feedback information for each of the currently connected axes is displayed.



[Servo Status]

Displays the servo status of the SV-NET driver.

Status name	Description of status	ON	OFF
Servo ON	Servo ON	■	■
Profile	Profile operation is in progress.	■	■
In Position	In-position	■	■
Fault	An alarm is detected.	■	■
Forward Limit	The forward direction soft limit is detected.	■	■
Reverse Limit	The reverse direction soft limit is detected.	■	■
Torque Limit	The torque limit is detected.	■	■
Velocity Limit	The speed limit is detected.	■	■

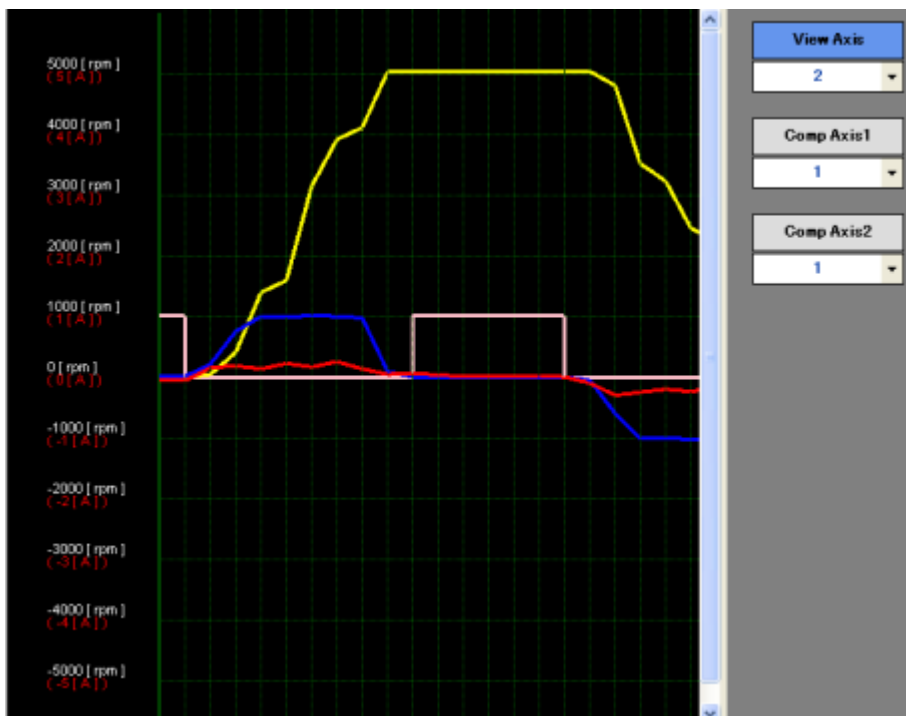
[Servo Feed Back]

Displays the servo feedback information of the SV-NET driver.

Feedback name	Feedback information
Position	Present position
Velocity	Present speed
Current	Present electric current

2. When the [View Form] button is clicked

Each information item of servo feedback is displayed in graphical form.

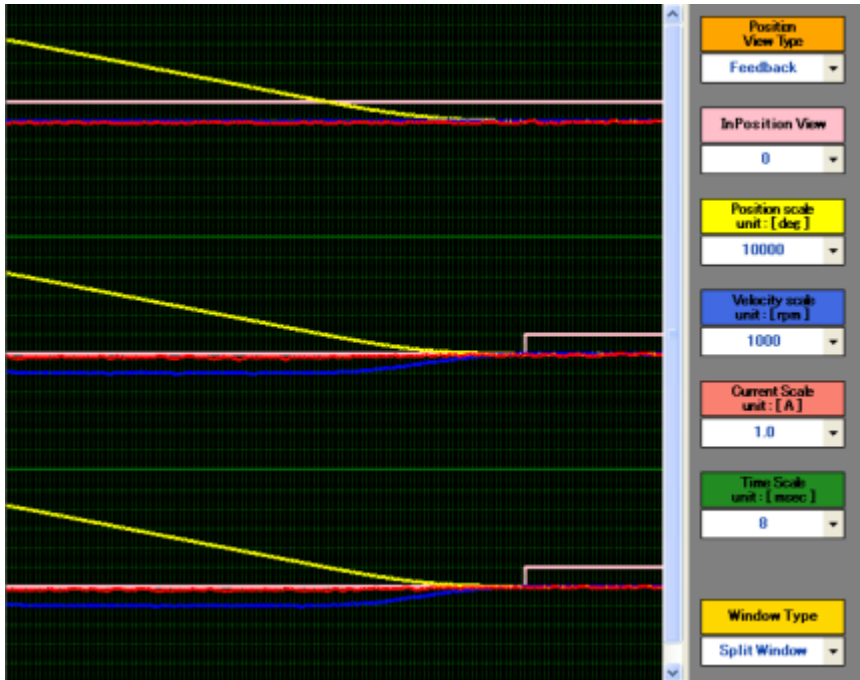


The following table describes the button of each pull-down menu used for graphical display:

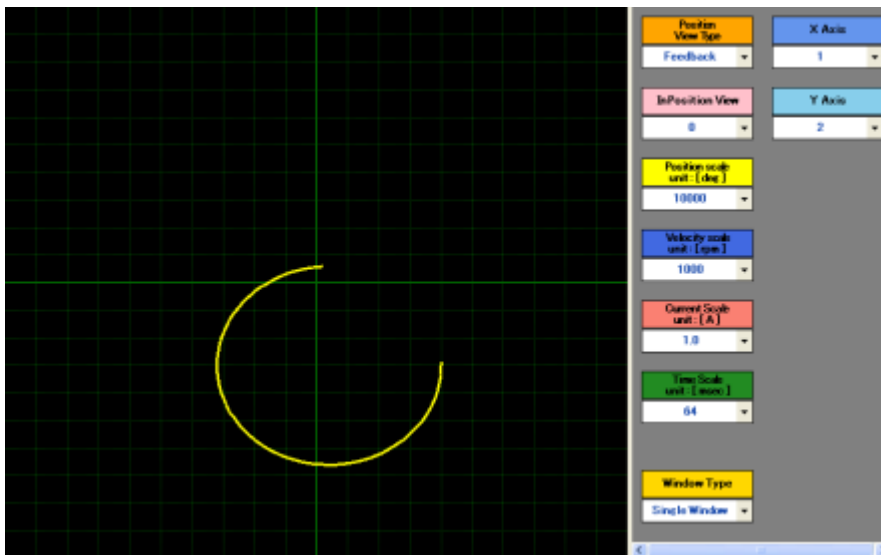
Pull-down menu	Description of function
<div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;">Position View Type</div> <div style="border: 1px solid black; padding: 2px;">Feedback</div>	<p>Specifies the display mode of position data.</p> <p>[Feedback]: Displays presently monitored position.</p> <p>[Command]: Displays the instructed position.</p> <p>[Feedback+Command]: Displays both the present position and the instructed position.</p> <p>[Command]: Displays the deviation between the present position and the instructed position.</p>
<div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;">InPosition View</div> <div style="border: 1px solid black; padding: 2px;">0</div>	<p>Specifies the display position of in-position line in the range of +4 to -4.</p>
<div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;">Position scale unit : [deg]</div> <div style="border: 1px solid black; padding: 2px;">10000</div>	<p>Sets the scale of position data.</p>
<div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;">Velocity scale unit : [rpm]</div> <div style="border: 1px solid black; padding: 2px;">1000</div>	<p>Sets the scale of speed data.</p>
<div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;">Current Scale unit : [A]</div> <div style="border: 1px solid black; padding: 2px;">1.0</div>	<p>Sets the scale of electric current data.</p>

<div style="background-color: #008000; color: white; padding: 2px; text-align: center;">Time Scale unit : [msec]</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">8 ▼</div>	Sets the scale of time interval.
<div style="background-color: #FFD700; padding: 2px; text-align: center;">Window Type</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">Single Window ▼</div>	[Single Window]: Displays [View Axis], [Comp Axis1], and [Comp Axis2] in one window. [Split Window]: Splits the display of [View Axis] and [Comp Axis1] and that of [Comp Axis2] into different windows.
<div style="background-color: #0000FF; color: white; padding: 2px; text-align: center;">View Axis</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">1 ▼</div>	Sets an axis number to be displayed in graphical form.
<div style="background-color: #A9A9A9; padding: 2px; text-align: center;">Comp Axis1</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">1 ▼</div>	Selects an axis to be compared against the axis set by [View Axis] and displays the graph by dashed line when the label part is double-clicked.
<div style="background-color: #A9A9A9; padding: 2px; text-align: center;">Comp Axis2</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">1 ▼</div>	Selects an axis to be compared against the axis set by [View Axis] and displays the graph by gray line when the label part is double-clicked.
<div style="background-color: #0000FF; color: white; padding: 2px; text-align: center;">X Axis</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">1 ▼</div>	This button is set for X-Y display. Specifies an axis number to be displayed along the X axis of the graph.
<div style="background-color: #00BFFF; padding: 2px; text-align: center;">Y Axis</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">2 ▼</div>	This button is set for X-Y display. Specifies an axis number to be displayed along the Y axis of the graph.

- Example of a graph in which three axes are compared

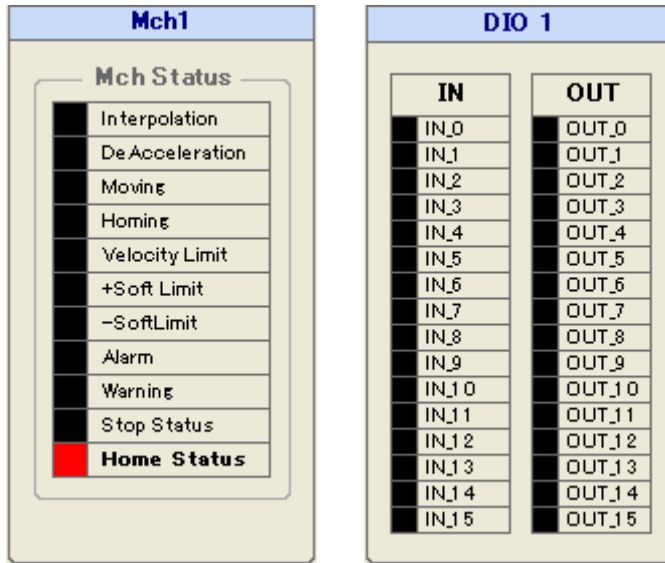


- Example of X-Y display (arc interpolation move)



[Mechanism/IO Monitor Pane]

This pane displays the mechanism status and general I/O information of the SV-NET controller.



[MCH Status]

Status name	Description of status
Interpolation	Interpolation calculation is in progress.
DeAcceleration	Acceleration/deceleration is in progress.
Moving	Axis is moving.
Homing	Homing
Velocity Limit	The speed limit is detected.
+ Soft Limit	The forward direction soft limit is detected.
- Soft Limit	The reverse direction soft limit is detected.
Alarm	An alarm is detected.
Warning	A warning is detected.
Stop Status	A stop processing instruction is input.
Home Status	The origin is fixed.

[I/OStatus]

Displays general I/O information of the SV-NET controller.

Status name	Description of status	ON	OFF
IN	Input status	■	■
OUT	Output status	■	■

Utilities

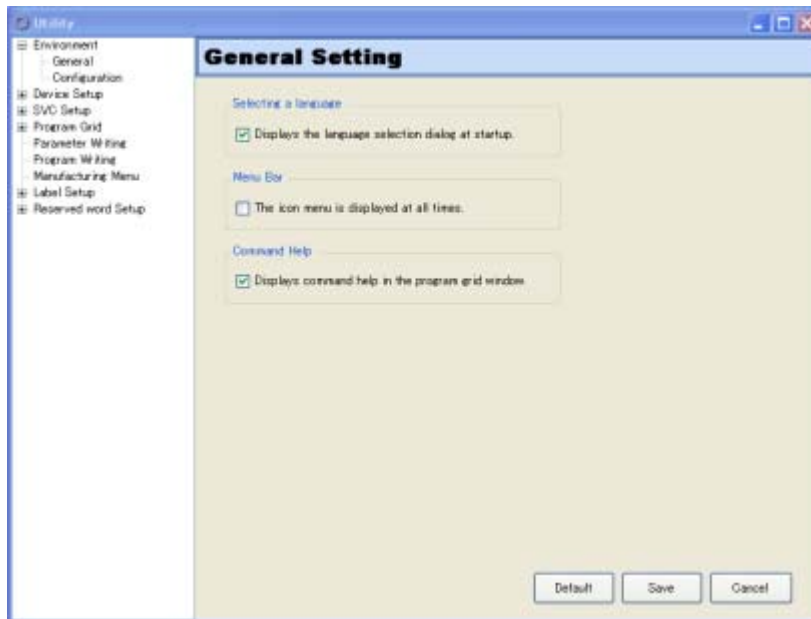
This software includes utilities for customization of each window and handling of special functions.

Utility Functions

- Customizing each window
 - Setting forced parameter write
 - Writing an SV-NET controller program
-

Description of the Utility Window

The configuration of the Utility window is as follows:



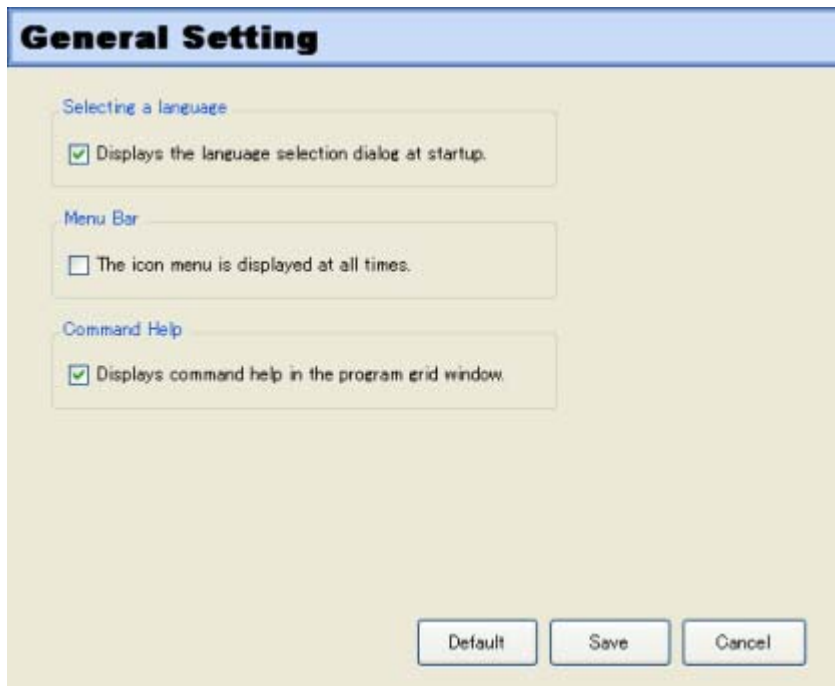
Contents of the menu

- [Environment](#)
 - [Device Setup](#)
 - [SVC Setup](#)
 - [Program Grid](#)
 - [Parameter Writing](#)
 - [Program Writing](#)
 - [Label Setup](#)
-

Environment

This utility sets the general configuration of this software.

· General Setting



· Selecting a language

<Displays the language selection dialog at startup>

Displays a language selection dialog box at startup.

· Menu Bar

<The icon menu is displayed at all times.>

Always displays the toolbar of each window.

· Command Help

<Displays command help in the program grid window>

Displays command help in the help pane of the program grid.

· Default

Resets all changes made in the Utility window to their defaults.

· Save

Saves the changed values.

· Cancel

Closes the Utility window. Changed values are not saved.

· **Controller Configuration**

SV-NET Controller Configuration

CPU Type

SV Controller CPU Type: SVCC

Enhancing Type

Enhancing Board1: NONE

Enhancing Board2: NONE

Enhancing Board3: NONE

Enhancing Board4: NONE

· **CPU Type**

<SV Controller CPU Type>

Selects the CPU type of the SV Controller from among SVCT, SVCC, and SVCW.

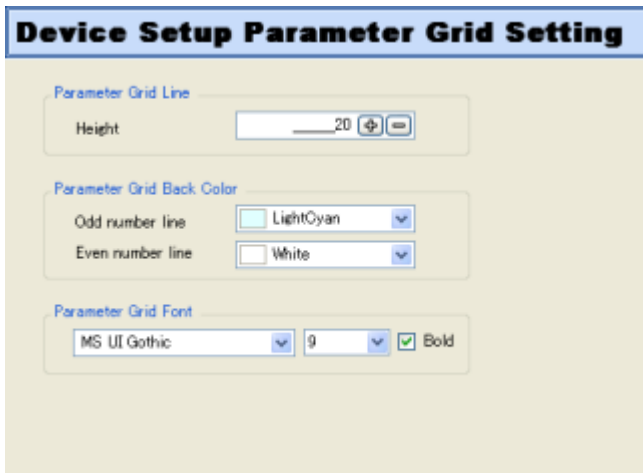
· **Enhancing Type**

<Enhancing Board1-4>

Sets each expansion board.

Setting the Device Setup Window

Device Setup You can set the parameter list grid window for device setup.



· Parameter Grid Line

<Height>

Adjust the height of the parameter list grid.

· Parameter Grid Back Color

<Odd number line>

Changes the background color for the odd-numbered lines of the parameter list grid.

<Even number line>

Changes the background color for the even-numbered lines of the parameter list grid.

· Parameter Grid Font

Changes the type and size of the font used in the parameter list grid.

Press the "Save" button to enable the changed settings.

Setting the SVC Setup Window

SVC Setup You can set the parameter list grid window for controller setup.

The description of the set items is the same as that for [Parameter List Grid Window for Device Setup](#).

Setting the Program Grid Window

1. Program Step Grid

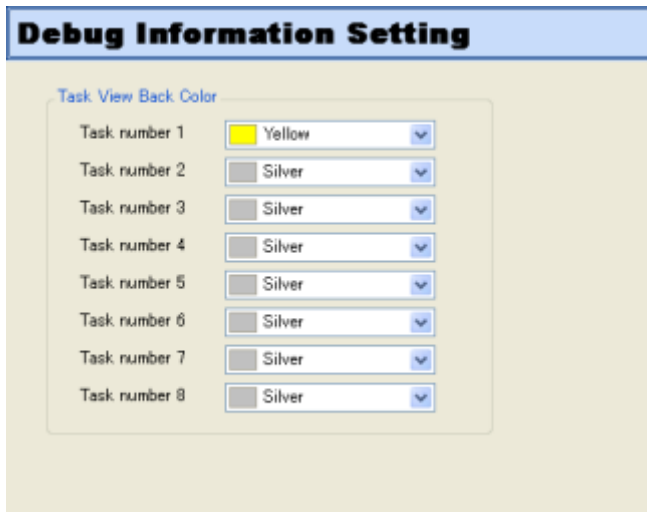
2. Argument List Grid

3. Variable List Grid

Program Grid You can set each grid window in the program grid.

The description of the set items is the same as that for [Parameter List Grid Window for Device Setup](#).

4. Debug



You can set the display colors for Program Tasks 1 to 8.

Press the "Save" button to enable the changed settings.

5. Array Variable List

You can set the array variable list window.

The description of the set items is the same as that for [Parameter List Grid Window for Device Setup](#).

* Note:

After you changed settings of the Device Setup, SVC Setup, or Program Grid window, close the window and open it again for those changes to take effect.

Parameter Writing

Parameters of the SV-NET drivers and SV-NET controller, which are normally write-disabled, can be write-enabled forcibly.



The image shows a dialog box titled "Parameter Writing" with a blue header. Below the header, the text "Parameter compulsion writing" is displayed in blue. The dialog contains a "Password" label followed by a text input field and an "Authentication" button.

Press the "Authentication" button and then the "OK" button after entering a password, and the Forced Write Parameters function is enabled.

Program Writing

The firmware for the main unit of the SV-NET controller can be upgraded by using this function. Use the serial port for this purpose.

Program Writing

Communication setting

COM Port: COM1

Baud Rate: 57600bps

The program file is opened.

Program writing.

· Communication setting

<COM Port>

Select the port number for data transfer from among COM1 to COM16.

<Baud Rate>

Select the transfer speed from among the following values.

-> 9600 bps, 19200 bps, 57600 bps

· The program file is opened

Select the program file of the SV-NET controller main unit firmware.

· Program writing

Writes the program file to the SV-NET controller.

Manufacturing Menu

This function cannot be used.

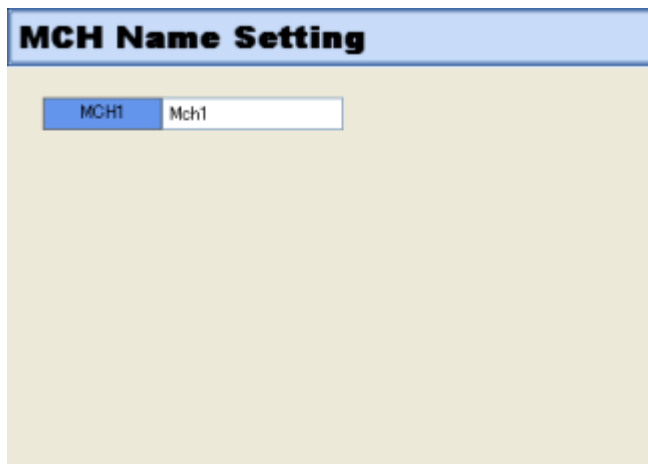
Label Setup

You can define mechanism names, task names, names of individual I/O bits, and axis names.

MCH Name Setting

Sets a mechanism name.

The mechanism name for the mechanism status is changed.

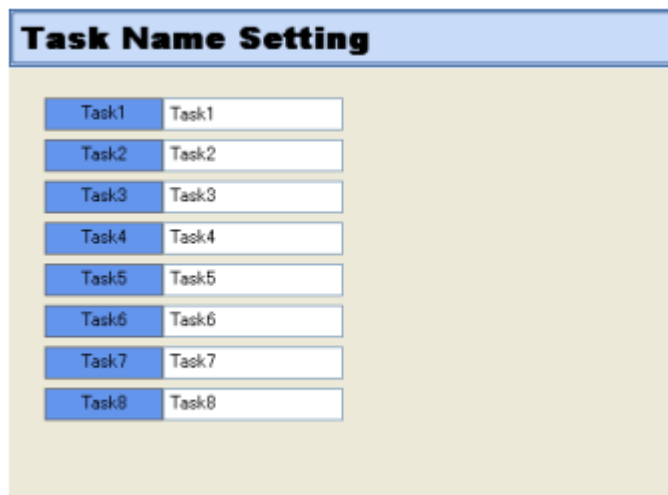


The screenshot shows a dialog box titled "MCH Name Setting". It contains a single row with a blue header cell labeled "MCH1" and a text input field containing the value "Mch1".

Task Name Setting

Sets task names.

The task names in the program grid are changed.



The screenshot shows a dialog box titled "Task Name Setting". It contains eight rows, each with a blue header cell and a text input field. The header cells are labeled "Task1" through "Task8", and the input fields contain the corresponding task names: "Task1", "Task2", "Task3", "Task4", "Task5", "Task6", "Task7", and "Task8".

I/O Name Setting

Sets the names of individual I/O bits.

The bit names for I/O status are changed.

DIO 1			
IN		OUT	
0	IN_0	0	OUT_0
1	IN_1	1	OUT_1
2	IN_2	2	OUT_2
3	IN_3	3	OUT_3
4	IN_4	4	OUT_4
5	IN_5	5	OUT_5
6	IN_6	6	OUT_6
7	IN_7	7	OUT_7
8	IN_8	8	OUT_8
9	IN_9	9	OUT_9
10	IN_10	10	OUT_10
11	IN_11	11	OUT_11
12	IN_12	12	OUT_12
13	IN_13	13	OUT_13
14	IN_14	14	OUT_14
15	IN_15	15	OUT_15

DIO AIO

Axis Name Setting

Sets axis names.

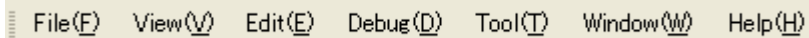
The axis names in the Program Grid, JOG Operation, and Servo Monitor windows are changed.

Axis1	Axis_1
Axis2	Axis_2
Axis3	Axis_3
Axis4	Axis_4
Axis5	Axis_5
Axis6	Axis_6
Axis7	Axis_7
Axis8	Axis_8

Menu Configuration

This section describes the functions selectable by the menu bar and the toolbar.

Menu Bar Functions



File(F) View(V) Edit(E) Debug(D) Tool(T) Window(W) Help(H)

File

· Project File -> New

Discards the current project file and creates a new one.

· Project File -> Open

Opens a saved project file.

· Project File -> Save

Saves the current project file.

· Project File -> Save as

Saves the present project file under a specified name.

· Program File -> New

Creates a new program file.

-> Window to be used: Program Grid

· Program File -> Open

Opens an existing program file.

-> Window to be used: Program Grid

· Program File -> Save

Saves a created program file.

-> Window to be used: Program Grid

· Program File -> Add

Adds a program to the file pane.

-> Window to be used: Program Grid

- Program File -> Delete
Deletes a program from the file pane.
-> Window to be used: Program Grid

- Program File -> ReName
Changes the name of a program file.
-> Window to be used: Program Grid

- Program File -> Add Asm
Adds a split file to the tree.
-> Window to be used: Program Grid

- Program File -> Delete Asm
Deletes a split file from the tree.
-> Window to be used: Program Grid

- Program File -> Move On
Moves a split file to the upper tree.
-> Window to be used: Program Grid

- Program File -> Move Under
Moves a split file to the lower tree.
-> Window to be used: Program Grid

- Program File -> Save Flash
Saves a program file in the flash memory of the SV-NET controller.
-> Window to be used: Program Grid

- Log File -> Open
Reads a saved log file and displays it in graphical form.
-> Window to be used: Servo Monitor

- Log File -> Save
Saves the obtained log data in a file.
-> Window to be used: Servo Monitor

- Log File -> Image
Saves the current graph in an image file.
-> Window to be used: Servo Monitor

- Exit

Exit the SV Programmer.

- Recent File -> Project Name

Selects and opens a recently used project file.

View

· Icon Menu

Toggles the display of the toolbar ON and OFF.

The change is reflected on all target windows.

-> Windows to be used: Device Setup, Controller Setup, JOG Operation, Program Grid, Servo Monitor

· File Explorer

Toggles the display of the supervise tab of the Program Grid ON and OFF.

-> Window to be used: Program Grid

· Tool Explorer

Toggles the display of the toolbar of the currently handled window ON and OFF.

-> Windows to be used: Device Setup, Controller Setup, JOG Operation, Program Grid, Servo Monitor

· Variable List

Toggles the display of the variable list of the Program Grid ON and OFF.

-> Window to be used: Program Grid

· Comment

Toggles the display of the comment tab of the Program Grid ON and OFF.

-> Window to be used: Program Grid

· Help

Toggles the display of the help tab of the Program Grid ON and OFF.

-> Window to be used: Program Grid

· Find

Toggles the display of the search tab of the Program Grid ON and OFF.

-> Window to be used: Program Grid

· Output

Toggles the display of the output tab of the Program Grid ON and OFF.

-> Window to be used: Program Grid

· Error List

Toggles the display of the error information tab of the Program Grid ON and OFF.

-> Window to be used: Program Grid

· Gain

Toggles the display of the gain tab of the Program Grid ON and OFF.

-> Window to be used: Program Grid

· Watch

Toggles the display of the supervise tab of the Program Grid ON and OFF.

-> Window to be used: Program Grid

· Monitor

Toggles the display of the monitor tab of the Program Grid ON and OFF.

-> Window to be used: Program Grid

· Task

Toggles the display of the task tab of the Program Grid ON and OFF.

-> Window to be used: Program Grid

· DIO

Toggles the display of the DIO tab of the Program Grid ON and OFF.

-> Window to be used: Program Grid

· Jog

Toggles the display of the JOG tab of the Program Grid ON and OFF.

-> Window to be used: Program Grid

· Tool Collapse

Reduces the size of the group box in the tool pane of the currently handled window.

-> Windows to be used: Device Setup, Controller Setup, JOG Operation, Program Grid, Servo Monitor

· Tool Expand

Expands the group box in the tool pane of the currently handled window.

-> Windows to be used: Device Setup, Controller Setup, JOG Operation, Program Grid, Servo Monitor

Edit

This menu item allows you to edit the program grid.

- [Undo](#)

Undoes the last edit.

- [Redo](#)

Cancel the last “Undo” operation.

- [Copy](#)

Copies the currently selected program steps, variables, and arguments.

- [Cut](#)

Cuts the currently selected program steps, variables, and arguments.

- [Paste](#)

Pastes the copied or cut data to the currently selected items.

The currently selected items are overwritten.

- [Insert Paste](#)

Inserts and pastes the copied or cut program list to the currently selected steps.

- [Insert](#)

Inserts blank step lines into the currently selected program step.

Inserts blank lines into the currently selected variable list.

- [Delete](#)

Deletes the currently selected program step lines.

Deletes the currently selected variable list lines.

Debug

This menu item allows you to debug the program grid.

- [Program Mode](#) -> [Normal / Debug](#)

Changes the program mode.

- [Task View](#)

Selects display or non-display of task in debug mode.

- [Break Point](#)

Sets a breakpoint in the currently selected program step.

- [Break Release](#)

Resets the currently set breakpoints.

- [Restart](#)

Restarts the currently stopped program.


- [Step In](#)


Executes the currently stopped program step and stops the program before executing the following step.


Tool


This menu item allows you to execute the content of the tool pane of the currently handled window.


<During Device Setup Operation>


-  Connect to SV-NET Controller
Refer to [[Net Search](#)] in the tool pane of the Device Setup window.


-  Read Parameters for All Axes
Refer to [[Read All](#)] in the tool pane of the Device Setup window.


-  Read Parameters
Refer to [[Read One](#)] in the tool pane of the Device Setup window.


-  Write Parameters
Refer to [[Write One](#)] in the tool pane of the Device Setup window.

-  Parameter File -> Open
Refer to [[Open](#)] in the tool pane of the Device Setup window.

-  Parameter File -> Save
Refer to [[Save](#)] in the tool pane of the Device Setup window.


-  Parameter File -> FLASH Memory Save
Refer to [[Flash](#)] in the tool pane of the Device Setup window.


-  Display Category
Refer to [[Category](#)] in the tool pane of the Device Setup window.


-  Display List
Refer to [[All](#)] in the tool pane of the Device Setup window.


- Switch Parameter Display -> Decimal/hexadecimal
Refer to [[Data](#)] in the tool pane of the Device Setup window.


<During Controller Setup Operation>


-  Connect to SV-NET Controller
Refer to [[Net Search](#)] in the tool pane of the Controller Setup window.


-  Read Parameters
Refer to [[Read All](#)] in the tool pane of the Controller Setup window.


-  Write Parameters
Refer to [[Write All](#)] in the tool pane of the Controller Setup window.

-  Open Parameter File -> Open
Refer to [[Open](#)] in the tool pane of the Controller Setup window.

-  Parameter File -> Save
Refer to [[Save](#)] in the tool pane of the Controller Setup window.








-  Parameter File -> FLASH Memory Save
Refer to [[Flash](#)] in the tool pane of the Controller Setup window.

-  Display Category
Refer to [[Category](#)] in the tool pane of the Controller Setup window.







-  Display List
Refer to [[All](#)] in the tool pane of the Controller Setup window.

- Switch Parameter Display -> Decimal/hexadecimal
Refer to [[Data](#)] in the tool pane of the Controller Setup window.













<During JOG Operation>


-  Connect to SV-NET Controller
Refer to [[Net Search](#)] in the tool pane of the JOG Operation window.
-  Operate Servo -> Servo ON
Refer to [[SV ON](#)] in the tool pane of the JOG Operation window.
-  Operate Servo -> Servo OFF
Refer to [[SV OFF](#)] in the tool pane of the JOG Operation window.
-  Operate Servo -> Servo FREE
Refer to [[SV FREE](#)] in the tool pane of the JOG Operation window.
-  Operate Servo -> Reset Alarm
Refer to [[ALM RST](#)] in the tool pane of the JOG Operation window.
-  Display Each Axis
Refer to [[Tab](#)] in the tool pane of the JOG Operation window.
-  Display All Axes
Refer to [[All](#)] in the tool pane of the JOG Operation window.

<During Program Grid Operation>

-  Task -> Build
Refer to [[Build](#)] in the tool pane of the Program Grid window.
-  Task -> Download
Refer to [[Download](#)] in the tool pane of the Program Grid window.
-  Task -> Check
Refer to [[Collation](#)] in the tool pane of the Program Grid window.
-  Task -> Execute Program
Refer to [[Start](#)] in the tool pane of the Program Grid window.
-  Task -> Stop Program
Refer to [[Stop](#)] in the tool pane of the Program Grid window.
-  Servo Command -> Servo ON
Refer to [[SV ON](#)] in the tool pane of the Program Grid window.
-  Servo Command -> Servo OFF
Refer to [[SV OFF](#)] in the tool pane of the Program Grid window.
-  Servo Command -> Servo FREE
Refer to [[SV FREE](#)] in the tool pane of the Program Grid window.
-  Servo Command -> Reset Alarm
Refer to [[ALM RST](#)] in the tool pane of the Program Grid window.
-  Servo Command -> Deceleration Stop
Refer to [[Stop](#)] in the tool pane of the Program Grid window.

<During Servo Monitor Operation>

-  Connect to SV-NET Controller
Refer to [[Net Search](#)] in the tool pane of the Servo Monitor window.
-  Execute Program
Refer to [[Start](#)] under the “Task” group in the tool pane of the Servo Monitor window.
-  Stop Program
Refer to [[Stop](#)] under the “Task” group in the tool pane of the Servo Monitor window.
-  Operate Servo -> Servo ON for All Axes
Refer to [[SV ON](#)] in the tool pane of the Servo Monitor window.
-  Operate Servo -> Servo OFF for All Axes
Refer to [[SV OFF](#)] in the tool pane of the Servo Monitor window.
-  Operate Servo -> Reset Alarm for All Axes
Refer to [[ALM RST](#)] in the tool pane of the Servo Monitor window.
-  Operate Servo -> Deceleration Stop
Refer to [[Stop](#)] in the tool pane of the Servo Monitor window.
-  Operate Log -> Start Log
Refer to [[Log Start](#)] in the tool pane of the Servo Monitor window.
-  Operate Log -> Stop Log
Refer to [[Log Stop](#)] in the tool pane of the Servo Monitor window.
-  Operate Log -> Graph
Refer to [[View Wave](#)] in the tool pane of the Servo Monitor window.
-  Operate Log -> X-Y Display
Refer to [[View X-Y](#)] in the tool pane of the Servo Monitor window.
-  Operate Log -> Oscilloscope
Refer to [[Oscillo](#)] in the tool pane of the Servo Monitor window.

·  Operate Log -> Pause

Refer to [\[Hold\]](#) in the tool pane of the Servo Monitor window.

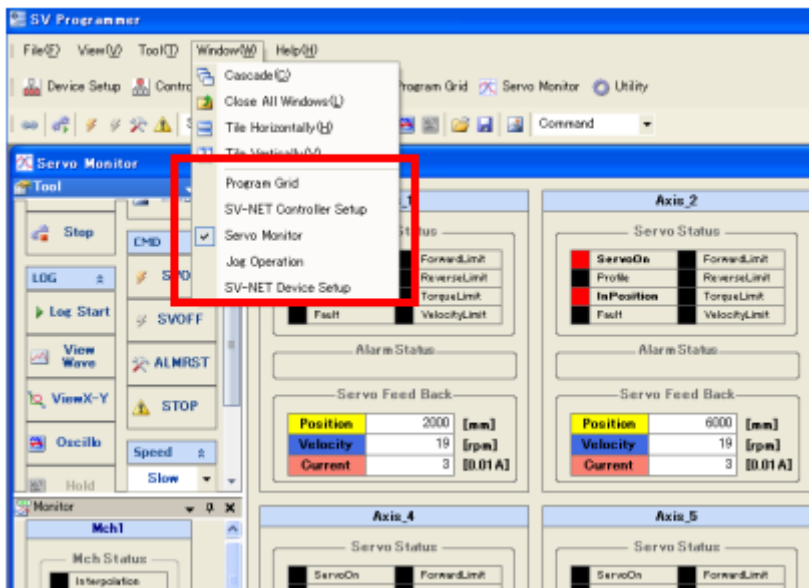
· Monitor Unit

Refer to [\[Unit\]](#) in the tool pane of the Servo Monitor window.

Window

This menu item allows you to change the configuration of the currently displayed window.

- Cascade
Cascades windows from the upper left corner.
- Close All Windows
Closes all windows.
- Tile Vertically
Tiles windows vertically.
- Tile Horizontally
Tiles windows horizontally.
- A checkmark is placed next to the window currently in use.
Displays the selected window in the forefront.



Help

This menu item allows you to display the help menu.

- Contents

Starts the help function to display the contents.

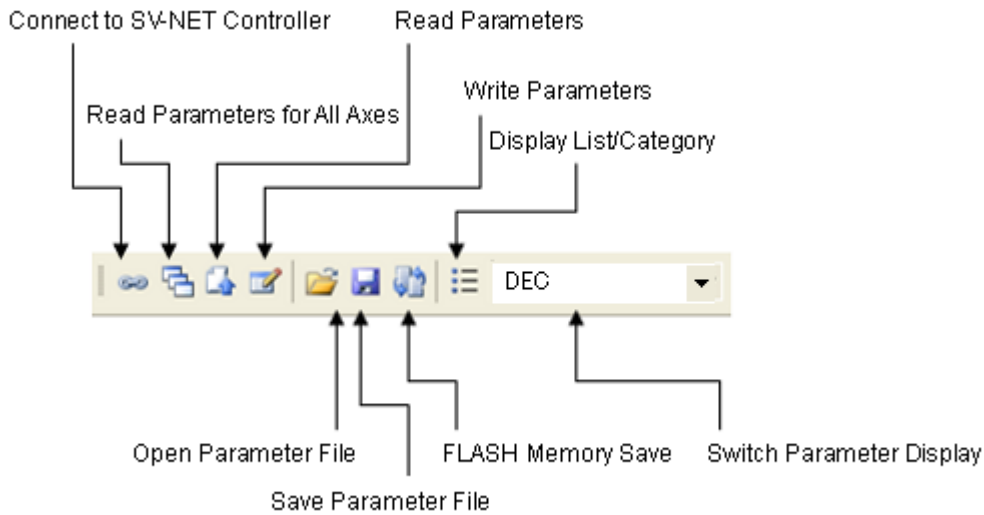
- About SV Programmer

Displays the version of this software.

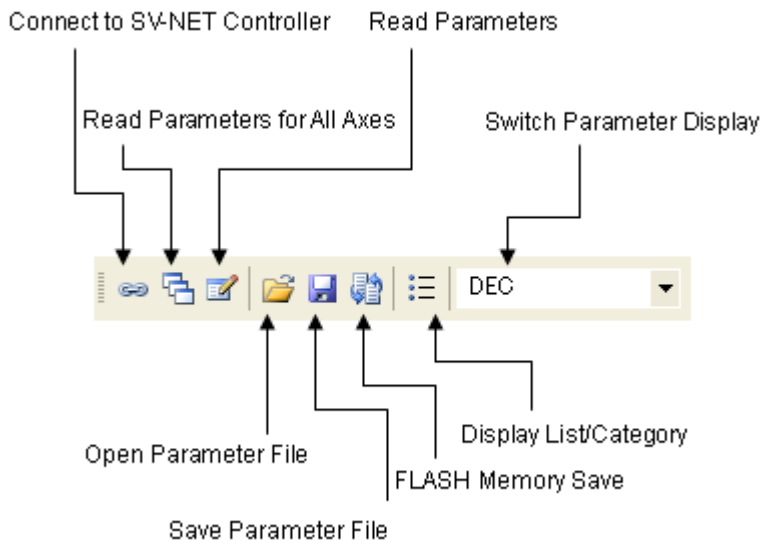
Toolbar Functions

This section shows the icons associated with the functions contained in “Tool” of the menu bar.

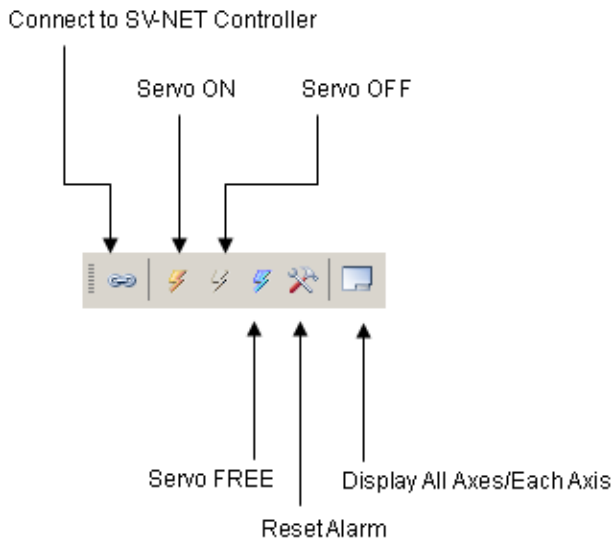
Device Setup Toolbar



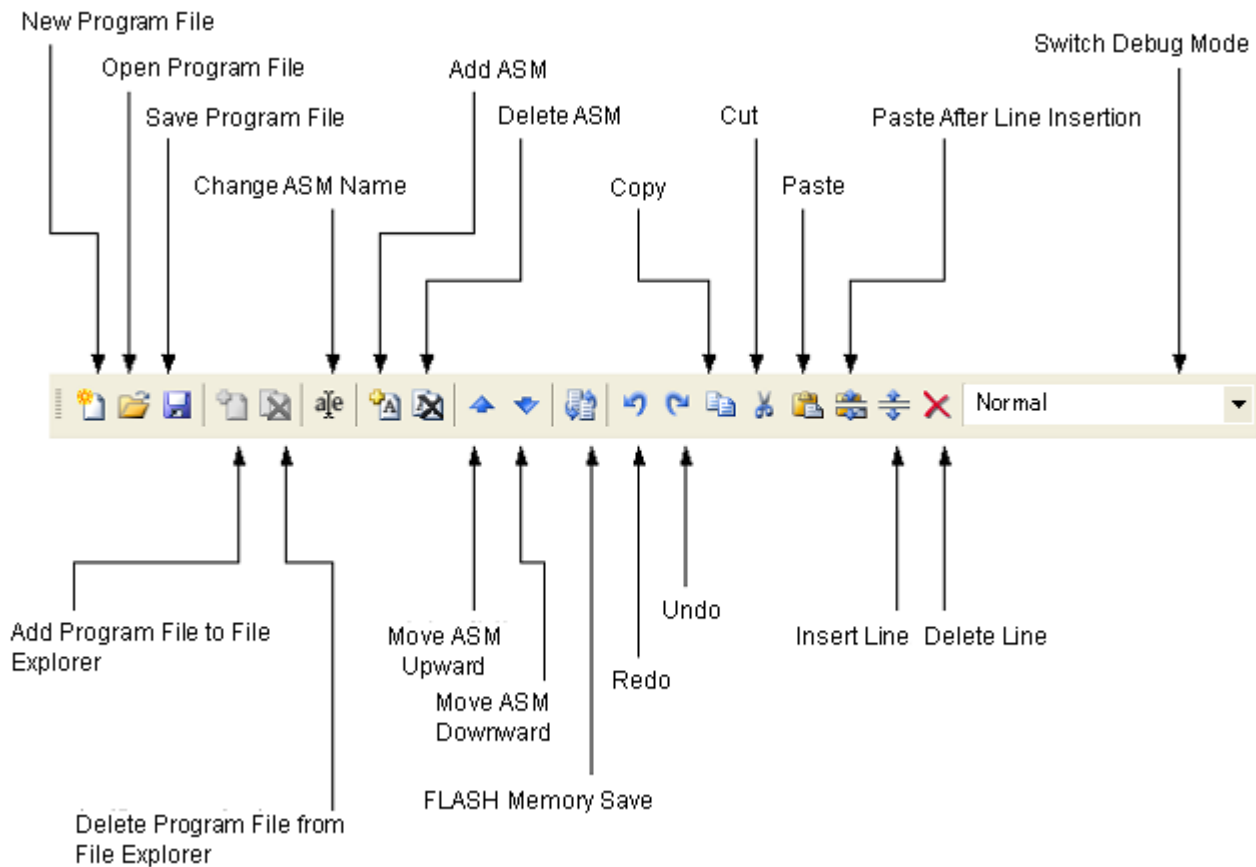
Controller Setup Toolbar



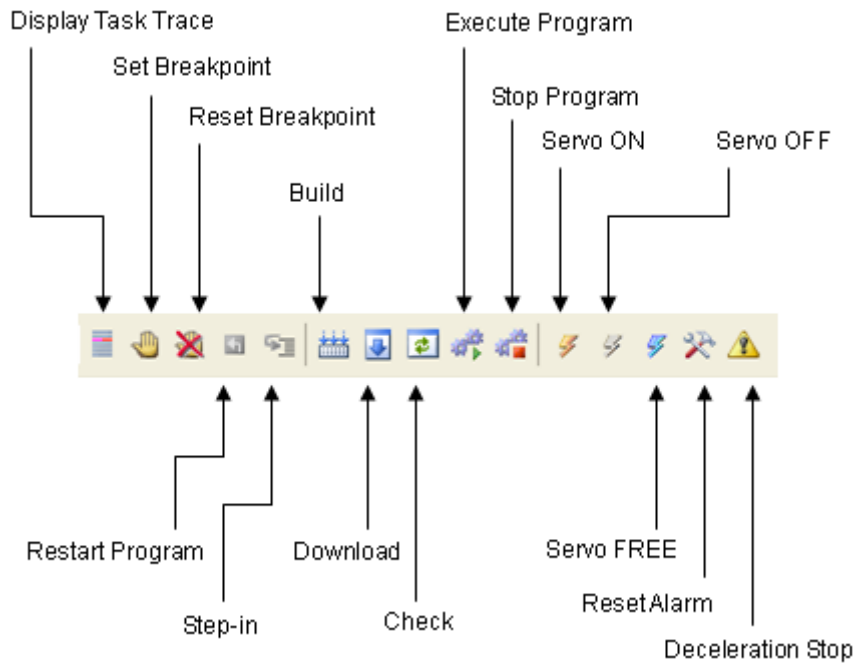
JOG Operation Toolbar



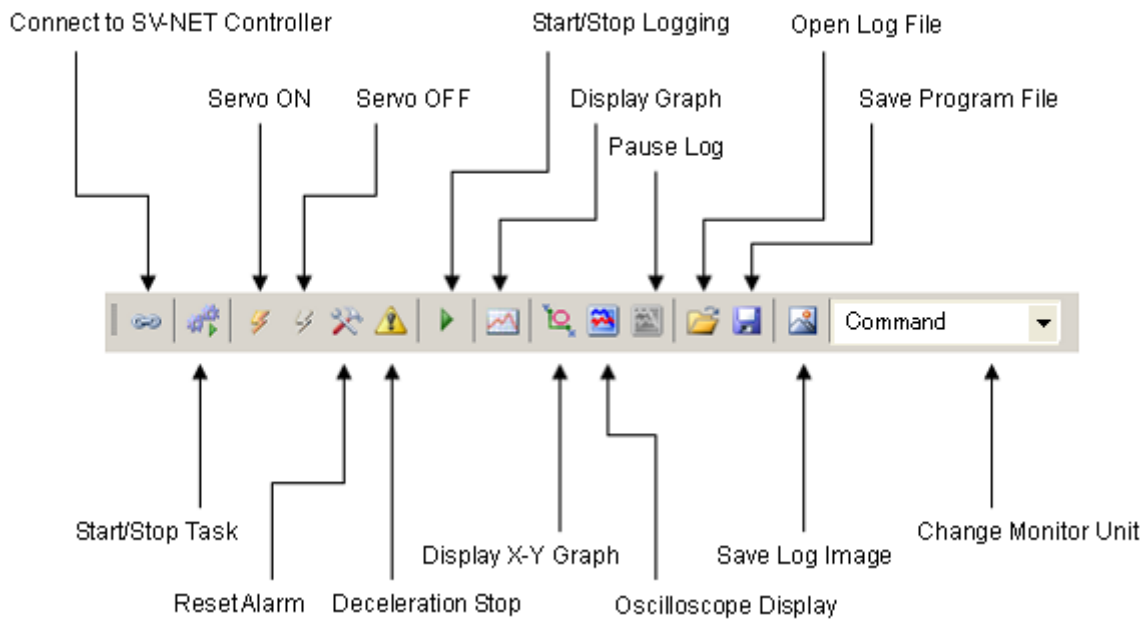
Program Grid Toolbar (1/2)



Program Grid Toolbar (2/2)



Servo Monitor Toolbar



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Please note that this manual may be changed without prior notice.

Manual number: MNL000318Y00

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