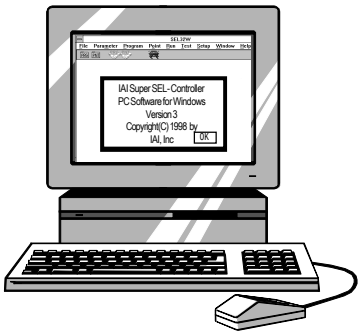
INTELLIGENT ACTUATOR

Super SEL Controller (&TT-300)
PC Interface Software (Windows)

Operating Manual



Intelligent Actuator, Inc.

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⑧ This software runs with Windows 3.1, Windows95 or Windows NT (this software does not contain Windows) and the manual is written assuming that the user already has a basic understanding of the Windows program.

Table of Contents

1 Before You Begin

1.1 Items Supplied With This Software

Please check to make sure that the following items are included in your PC software package.

① Operating manual
② 3.5-inch floppy disk of the software (2)
③ Standard RS232C cable

1.2 What You Will Need (Operating Requirements)

The following PC and accessories will be necessary to run this software program.

① A PC that runs under Windows and compatible keyboard.
② Enough memory to run Windows.
③ A monitor compatible with the PC.
④ A VGA graphic board or better.
⑤ Mouse or other pointing device and mouse driver.
⑥ Windows 3.1, Windows95, Windows NT).
⑦ A floppy disk drive unit that runs a 3.5-inch disk with 1.25 or 1.44MB capacity.
⑧ The hard disk should have 2MB or more of free memory space. (The software is run from the hard disk).
⑨ An RS232C serial port (25 or 9 pins).
⑩ A printer compatible with the PC.

1.3 Software Installation

This software is run from the hard disk. In this section, we explain how to install the software.

① Insert floppy disk 1 in the floppy disk drive.
② Execute Setup.EXE in disk 1.
③ The installation program will be executed, so simply follow the prompts that appear.
④ When the installation program is complete, if you are running Windows 3.1, a group icon called SELWIN is created and appears on the screen. Double click on this icon to begin running the software.
If you are using Windows95, or WindowsNT, an item called SELWIN is created in the start menu. Select this item to run the software.

1.4 Software Startup

① Turn off the power for the PC and the Super SEL controller, then connect the Super SEL controller to the PC with the standard RS232C cable that comes with the software.
② Turn the PC and Super SEL controller power back on, then run Windows.
③ Run the software.
- When you start the software program, on-line or off-line mode is determined by whether the Super SEL controller and the PC are connected. If you connect the controller and the PC after the program has been started, you will be unable to run it in an on-line mode.

④ The communication board selection window will open if you have 2 or more Super SEL controllers connected to the PC. Select the port to which the target controller is connected.
⑤ When you are running on-line, a window asking the number of actuator axes you are using will open so insert the appropriate number of axes.
⑥ The main menu (initial screen) will be displayed. Select the desired operation, then follow the screen prompts and input the appropriate data.

1 Before You Begin

1.5 New Functions and Applicable Controller Types

① Some of the functions in this software are not available with certain controllers. The chart below indicates the functions that are available by type of controller.

Function	Super SEL E•G	Super SEL A•B (Table Top type)
Off-line parameter printing	Available	Available
Program batch load•batch save	Available	Not Available
Check variable content	Available	Not Available
Expansion commands	Available	Not Available

② The expansion commands are not available with the Super SEL controller Type A/B or the Table Top controller. The expansion commands are listed below but please refer to the operating manual that comes with the Super SEL controller for details.

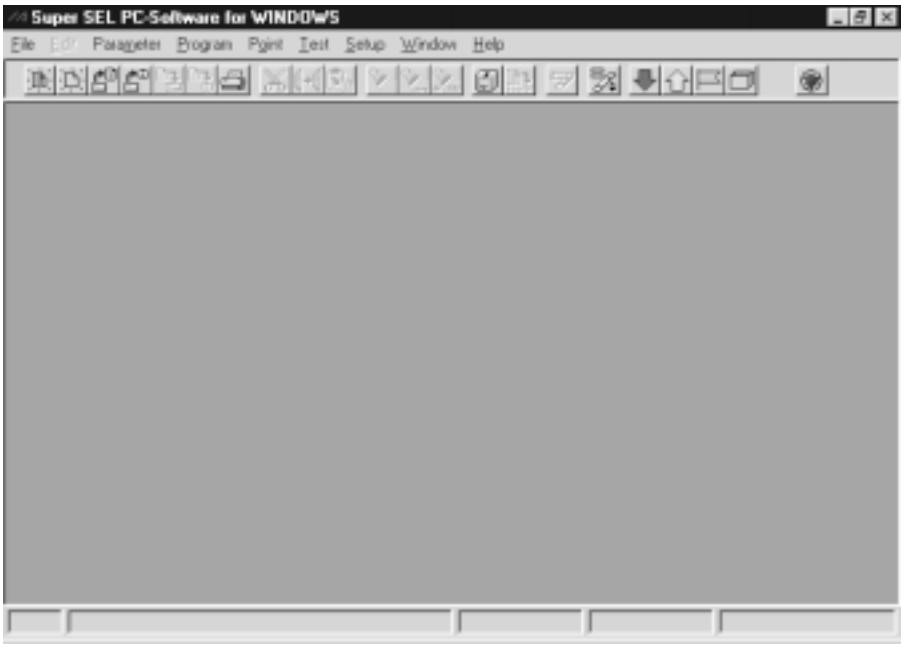
* Expansion commands
Actuator control designation (SCRV)
Actuator control command (MVPI, MVLI, AXST)
Timer command (GTTM)
Calculation command (TRAN)
Point data operation command (PAXS)
Structured IF command (IFEQ, IFNE, IFGT, IFGE, IFLT, IFLE, ELSE, EDIF, ISEQ, ISNE)
Structured DO command (DWEQ, DWNE, DWGT, DWGE, DWLT, DWLE, LEAV, ITER, EDDO)
External input output command (OPEN, CLOS, READ, WRIT, SCHA)
String command (SCPY, SCMP, SGET, SPUT, STR, STRH, VAL, VALH, SLEN)

③ Please refer to the supplement section at the end of this manual for information on data conversion for this software (Windows version) and the DOS software.

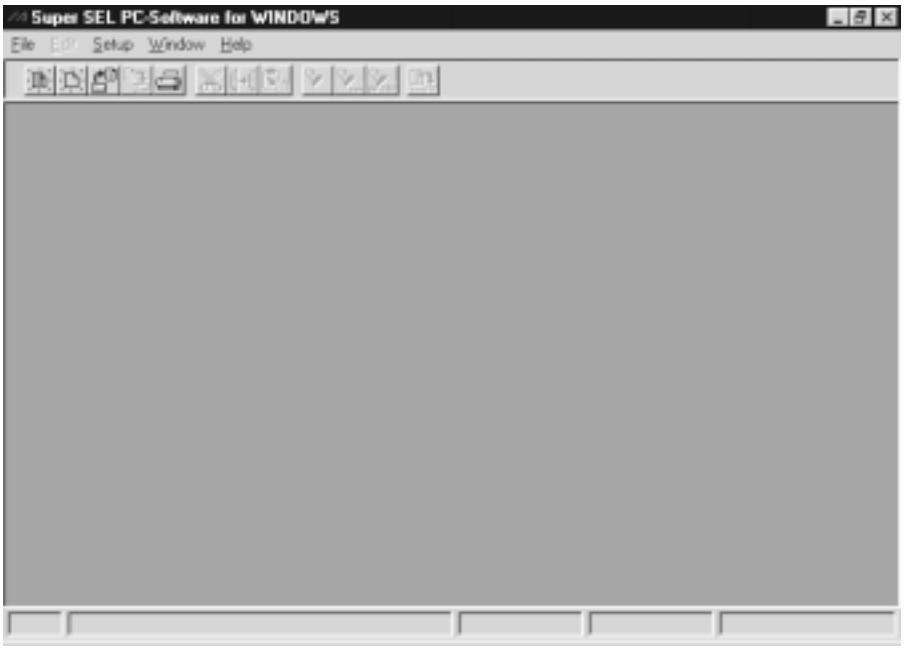
2 Menu Window

2.1 Explanation of the Menu

After you start the software, the main window appears and you will see a menu bar with 9 items and a speed bar with 23 icons displayed (initial screen: main menu).



On-Line Start Screen



Off-Line Start Screen

When the program is in off-line mode, some of the menu items and icons will not be displayed.

2 Menu Window

2.2 Explanation of the Commands

File	File operations (off-line).
New	Create new program · point data file.
Program	Open a new program edit window.
Point	Open a new point data edit window.
Open	Select and open an existing program · point data file.
Save Ctrl+S	Overwrite the file with the same name during program · point data file editing.
Save As Ctrl+A	Save the file under a different name during program · point data file editing.
Load	Select an existing program · point data file and load it to the controller.
Print	Print the selected program · point data · parameter file.
Exit	End the software program.
Edit	Auxiliary operations when editing programs · point data.
Cut Ctrl+X	Move the marked lines to the clipboard.
Copy Ctrl+C	Copy the marked lines to the clipboard.
Paste Ctrl+V	Copy the contents of the clipboard to the marked line.
Insert Ctrl+I	Insert one line at the line where the cursor is placed.
Search Ctrl+F	Define and search for a character string.
Search next Ctrl+N	Continue searching for the character string defined above.
Replace Ctrl+R	Search for the defined character string and replace it with a designated character string.
CheckErr Ctrl+E	Check for errors when editing a program.
Parameter	Functions related to parameters. (On-line)
Program	Change program parameters.
Point	Change point parameters.
Servo	Change servo parameters.
Axis	Parameters by axis.
Servo	Change servo parameters by axis.
Home	Change homing parameters by axis.
Motor	Change motor parameters by axis.
Gain	Change gain parameters by axis.
Device	Change device parameters by axis (available only with versions after 3.0).
Serial I/O	Serial I/O parameters (displayed only when an SIO board is installed).
Channel 1	Change SIO parameter for channel 1.
Channel 2	Change SIO parameter for channel 2.
High speed input	Change high speed input parameters (displayed only when a high speed input board is installed).
Save	Save parameters to the disk.
Print	Print the parameters.
Program	Functions related to the program (on-line).
Run	Execute and stop the designated program. Multiple programs can be run in parallel.
Edit	Edit the program.
Write	Write the program to the controller while editing.
Copy	Copy a program.
Delete	Delete a program.
Save	Assign a file name to the program and save.
Save All	Assign a single file name to all programs in the controller and save.
Print	Print out a program.

2 Menu Window

Point	Functions related to position data (on-line).
Edit	Edit points.
Write	Write points to the controller during edit.
GetPoint	Read current position of axis at cursor position.
Delete	Delete designated range of points.
Save	Assign a file name to points during edit and save.
Print	Print the points.
Test	Functions related to controller operation (on-line).
Servo	Perform axis status check and jog movement.
Input	Display status of input port.
Output	Display status of and change output port.
Flag	Display and change flags.
Variable	Display global variables (200~399)
Version	Display version number.
Clear	Delete parameters, programs and points.
Reset	Reset the controller.
Setup	
Printer	Set up the printer.
Window	Manage the windows displayed on screen.
Cascade	Line up the windows in an angle so they overlap.
Tile Horizontal	Arrange the windows horizontally without any overlap.
Tile Vertical	Arrange the windows vertically without any overlap.
Arrange icon	Line up the icons along the bottom of the screen.
Help	
About	Displays the software copyright and version number.

2 Menu Window

2.3 Explanation of the Speed Bar

Create a new program file.
Same function as File → New → Program.

Create a new point file.
Same function as File → New → Point.

Edit a file.
Same function as File → Open.

Load to controller.
Same function as File → Load.

Save edits to the file.
Same function as File → Save or File → SaveAs.

Write edits to the controller.
Same function as Program → Write or Point → Write.

Print file.
Same function as File → Print.

Cut (move) selected range to the clipboard.
Same function as Edit → Cut.

Copy selected range to the clipboard.
Same function as Edit → Copy.

Paste the contents of the clipboard.
Same function as Edit → Paste.

Search for character string.
Same function as Edit → Search.

Perform next search for designated character string.
Same function as Edit → Search Next.

2 Menu Window

Replace designated character string with another designated character string.
Same function as Edit → Replace.

Open program run window.
Same function as Program → Run.

Check program
Same function as Edit → CheckErr.

Get current position of axis as point data.
Same function as Point → Get Point.

Operate and display status of axis.
Same function as Test → Servo.

Display input port status.
Same function as Test → Input.

Display output port status.
Same function as Test → Output.

Display flag status.
Same function as Test → Flag.

Display content of global variable.
Same function as Test → Variable.

Reset controller.
Same function as Test → Reset.

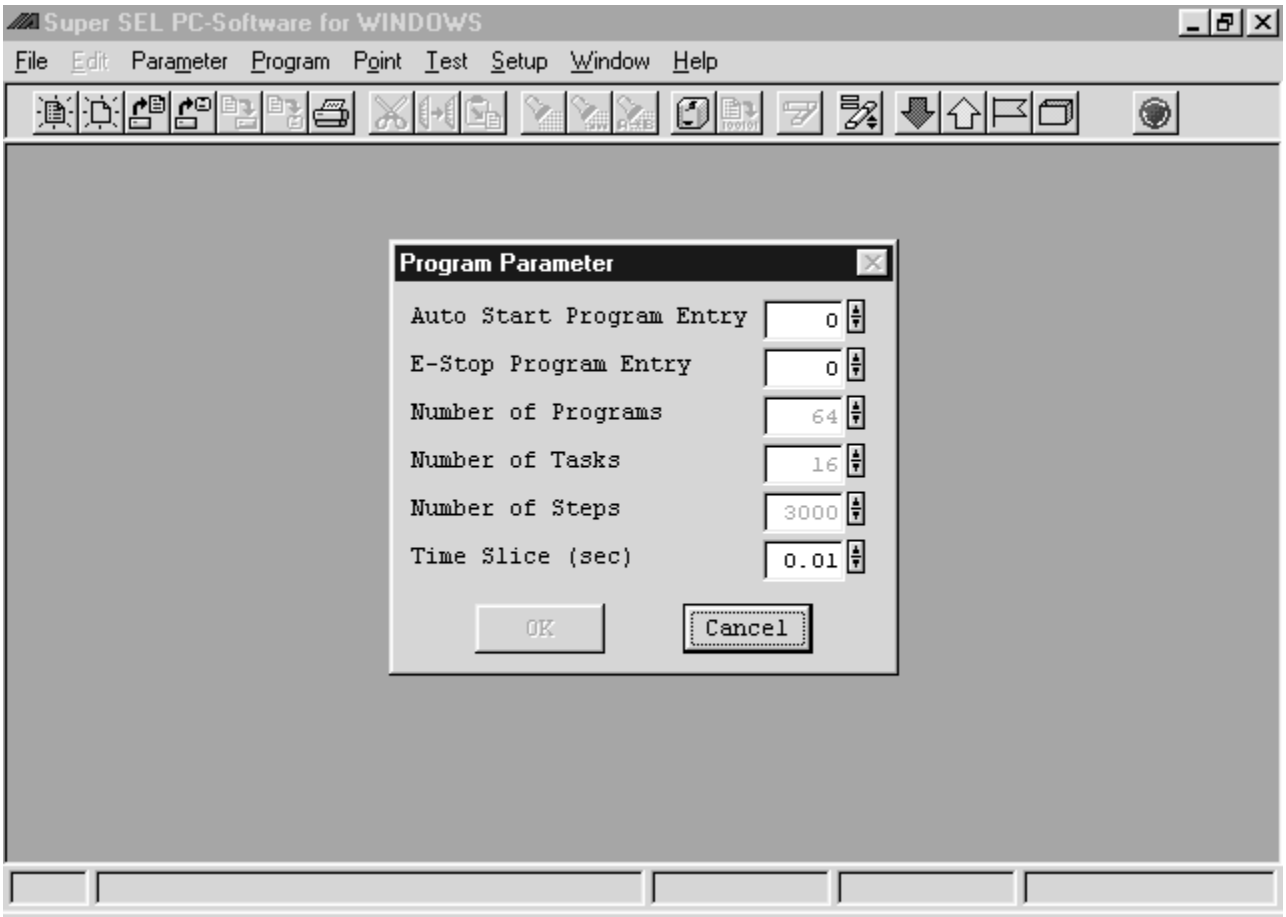
3 Parameter Window

3.1 Program Parameters

① From the menu, select Parameter → Program.

② The program parameter window opens.
Select the appropriate parameter and correct the value.
The values for number of programs, number of tasks, number of steps are semi-transparent. These are intrinsic to the controller and therefore cannot be changed.

③ After entering corrections, click OK and the program parameter write window opens. Click Yes to write the changes to the controller. Click No to end the operation without saving changes.
It is necessary to reset the controller to make the parameter changes effective.



Above, we explained the program parameters but the operation is the same for other parameters with the exception of those for serial I/O.

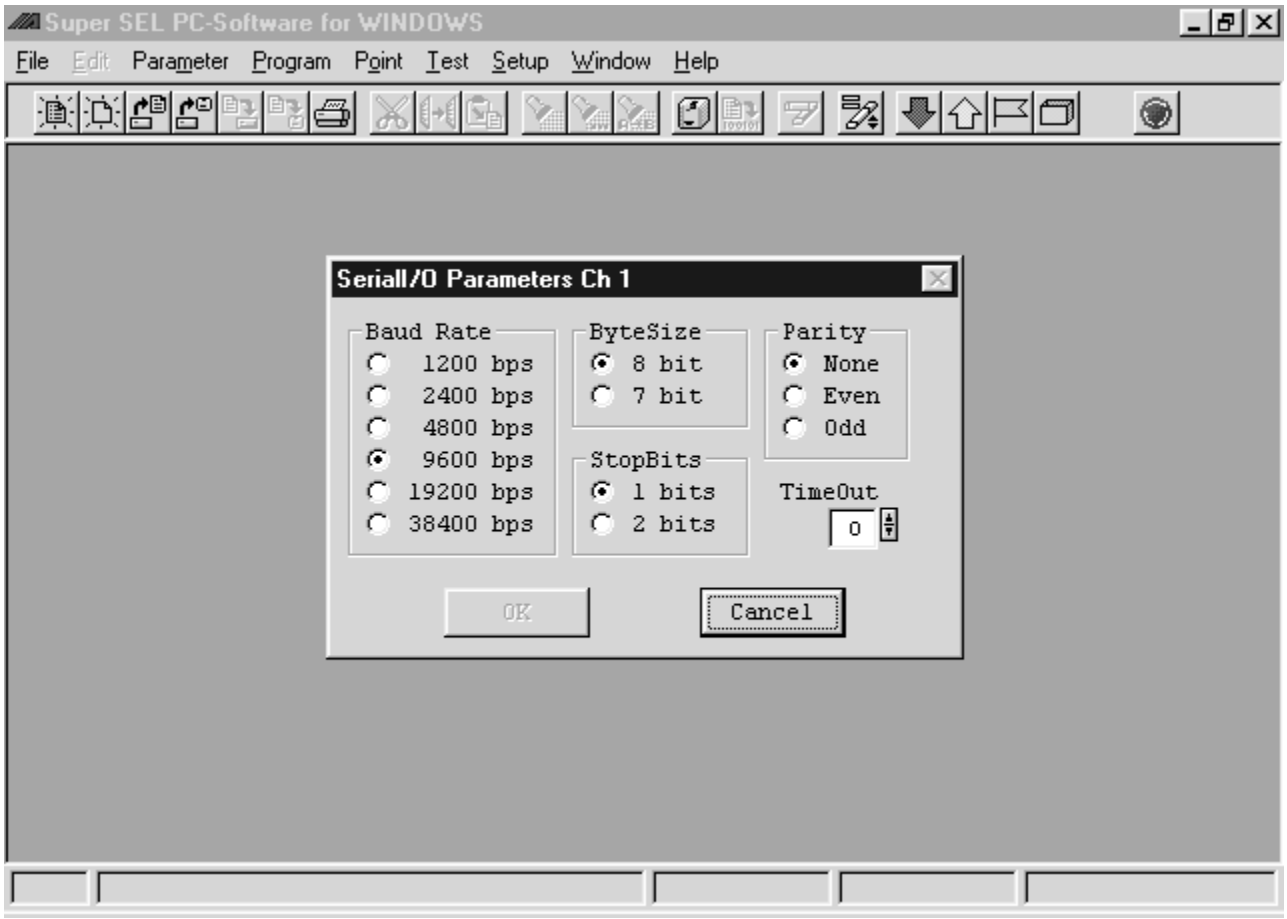
3 Parameter Window

3.2 Serial I/O Parameters

① From the menu, select Parameter → Serial I/O → Channel 1 or Channel 2.

② The Serial I/O Parameter window opens.
Select the appropriate parameter, mark the correct value for the communication target, then set the TimeOut.

③ After entering corrections, click OK and the serial I/O parameter write window opens. Click Yes to write the changes to the controller. Click Cancel to end the operation without saving changes.
It is necessary to reset the controller to make the parameter changes effective.

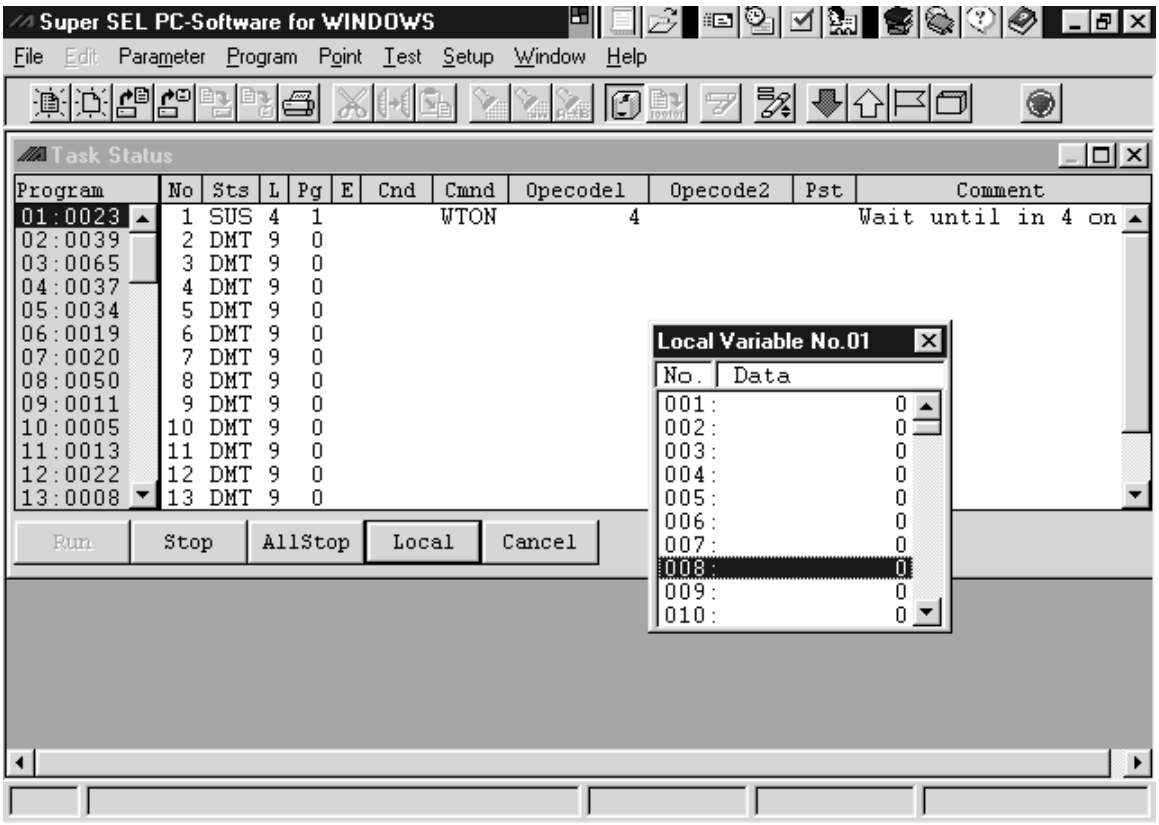


4 Program Run Window

① From the menu, select Program → Run.

② The task status window is displayed and has the following items.

Program	Displays program no. and number of steps. Select program to execute from this column.
No.	Displays the task no.
Sts	Displays the program status.
L	Displays the task level.
Pg	Displays the program no. currently running.
E ~ Comment	Displays the step currently being executed. Each of these items is the same as in program edit.



③ The following buttons appear at the bottom of this screen.

Run	Runs the program selected in the program list.
Stop	Stops the program selected in the task list.
AllStop	Stops all programs currently running.
Local	Opens the local variable window for the program selected from the task list that is currently running.
Cancel	Closes the window. Even if you close the window, the program currently running does not stop.

5 Program Edit Window

5.1 Explanation of Items in Program Edit Window

① From the menu, select Program → Edit.

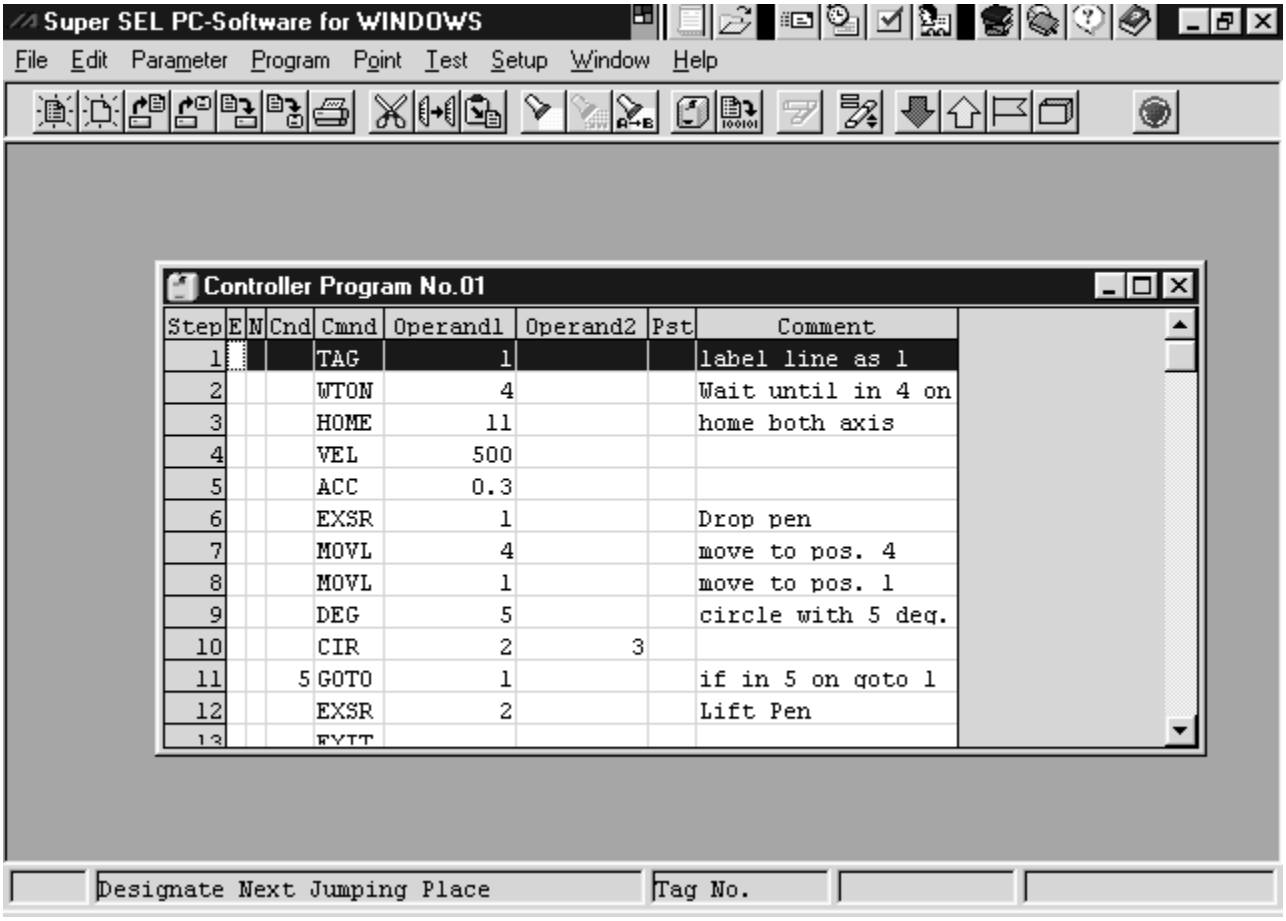
② The program selection window is displayed. Select the program you wish to edit, then click OK.

③ The controller program window opens and has the following items.

Step	Displays the program line number. No input is required.
E	Specify expansion condition using A or O. A = And, O = Or.
N	Designate the reverse input condition. Specifying N reverses the condition. N = Not
Cnd	Designate the input condition. Designate the input/output port and flag. Range is 1~999.
Cmnd	Designate the command. Input by typing the command directly from the keyboard or double-click to call up the program command list and make a selection. If you key one or more characters of the desired command before double-clicking on the Cmnd box, the cursor will be at the corresponding command in the program command list. Hit Enter or double-click on the desired command to enter the command.
Operand 1, 2	Given below is the data that can be entered in this column. Numerical values Numbers such as input/output · flag · variable no., column no., tag no., subroutine no., axis no., position no., program no., task level, source no., channel no., etc. are entered directly. Variables For items where numeric data is designated, numbers can be designated indirectly by entering a variable no. For example, if 10 is in variable 1, designating *1 is the same as designating 10. Axis pattern Specify the axis using binary notation. 0 = not selected, 1 = selected. Character string Data enclosed in ‘ ’ marks is considered a character string.
Pst	Indicates the output port or flag that is turned ON when the conditions of each command are met. The number range that can be entered is 300~999.
Comment	You can add program notes up to 18 characters here. This is useful in creating a program that is easy to read. This column can be used by itself or left blank as required.

④ Place the cursor at the comment column, then press Enter to move to the next line.

5 Program Edit Window



Step	E	N	Cnd	Cmnd	Operand1	Operand2	Pst	Comment
1				TAG	1			label line as 1
2				WTON	4			Wait until in 4 on
3				HOME	11			home both axis
4				VEL	500			
5				ACC	0.3			
6				EXSR	1			Drop pen
7				MOVL	4			move to pos. 4
8				MOVL	1			move to pos. 1
9				DEG	5			circle with 5 deg.
10				CIR	2	3		
11			5	GOTO	1			if in 5 on goto 1
12				EXSR	2			Lift Pen
13				EXIT				

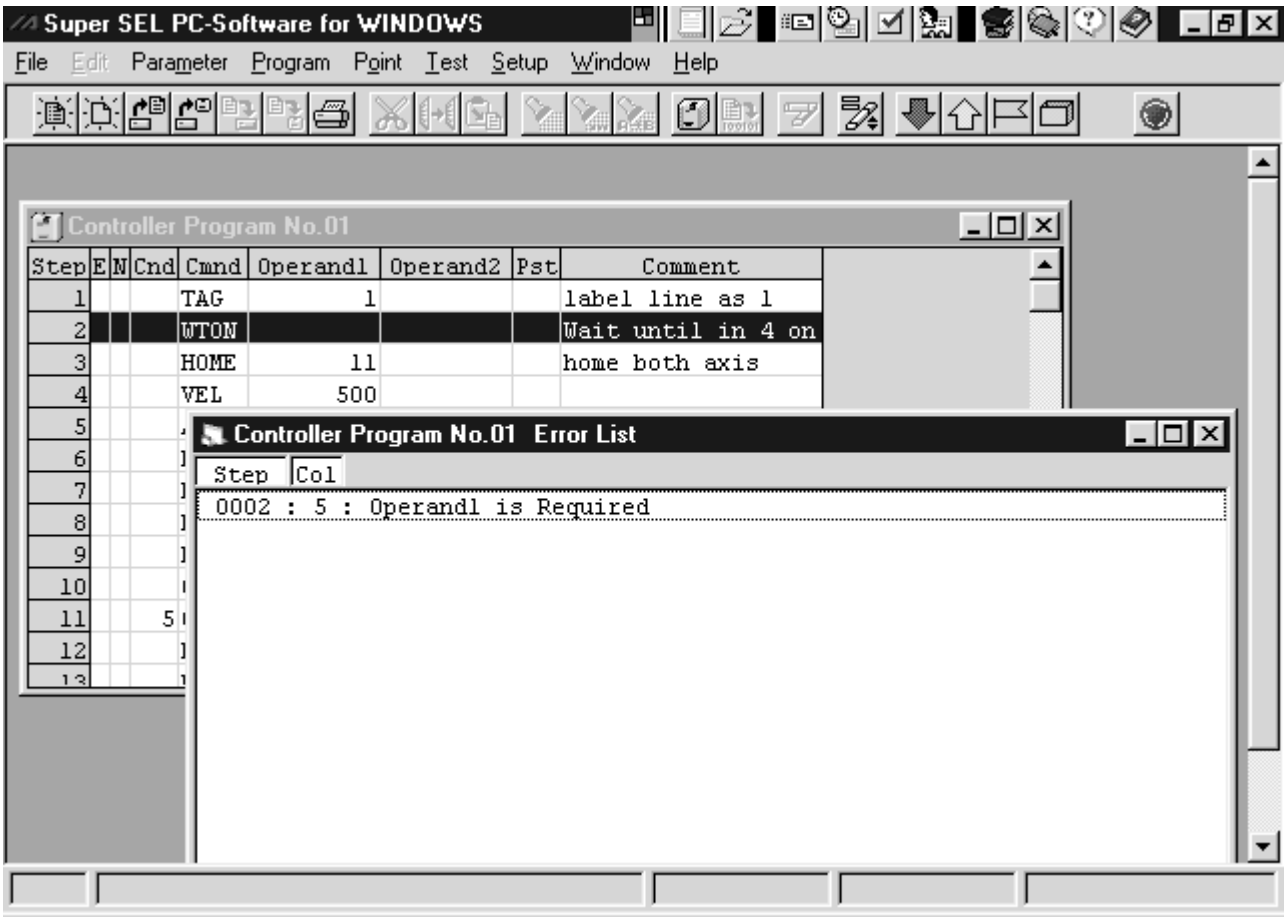
Note: When you click on the command line, a description and name of the command appears at the bottom of the screen.

5 Program Edit Window

5.2 Explanation of the Error Check Window

① From the menu, select Edit → CheckErr.

② When you run the program error check, an error list will be displayed if there are any errors in the program. The error list shows the line number and column number where the error is located. Double-clicking on an error item moves the cursor to the corresponding position in the program display.



5 Program Edit Window

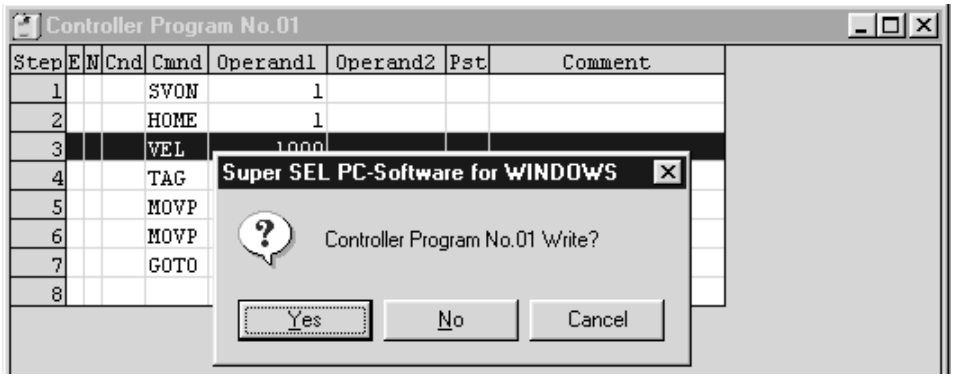
5.3 Program Save and Edit Completion

① File → Save
Save the program to a file.
Note: If no name is assigned to the file, the operation will be the same as for ② following.

② File → Save As
Assign a name to the program and save.

③ Program → Write
Save the program to the controller. This is available only when editing a program.
Note: If there is an error in the program, the error window will be displayed.

④ Closing the program edit window.
When you close the program after editing, the following message appears.



Yes Program is changed and operation ends. The program is written to the place where it was stored.

No The changes are cancelled and operation ends.

Cancel Program close is cancelled and editing continues.

Note: When saving a program, the program error check is executed automatically. If there is an error, the save operation will end.

6 Program Selection Window

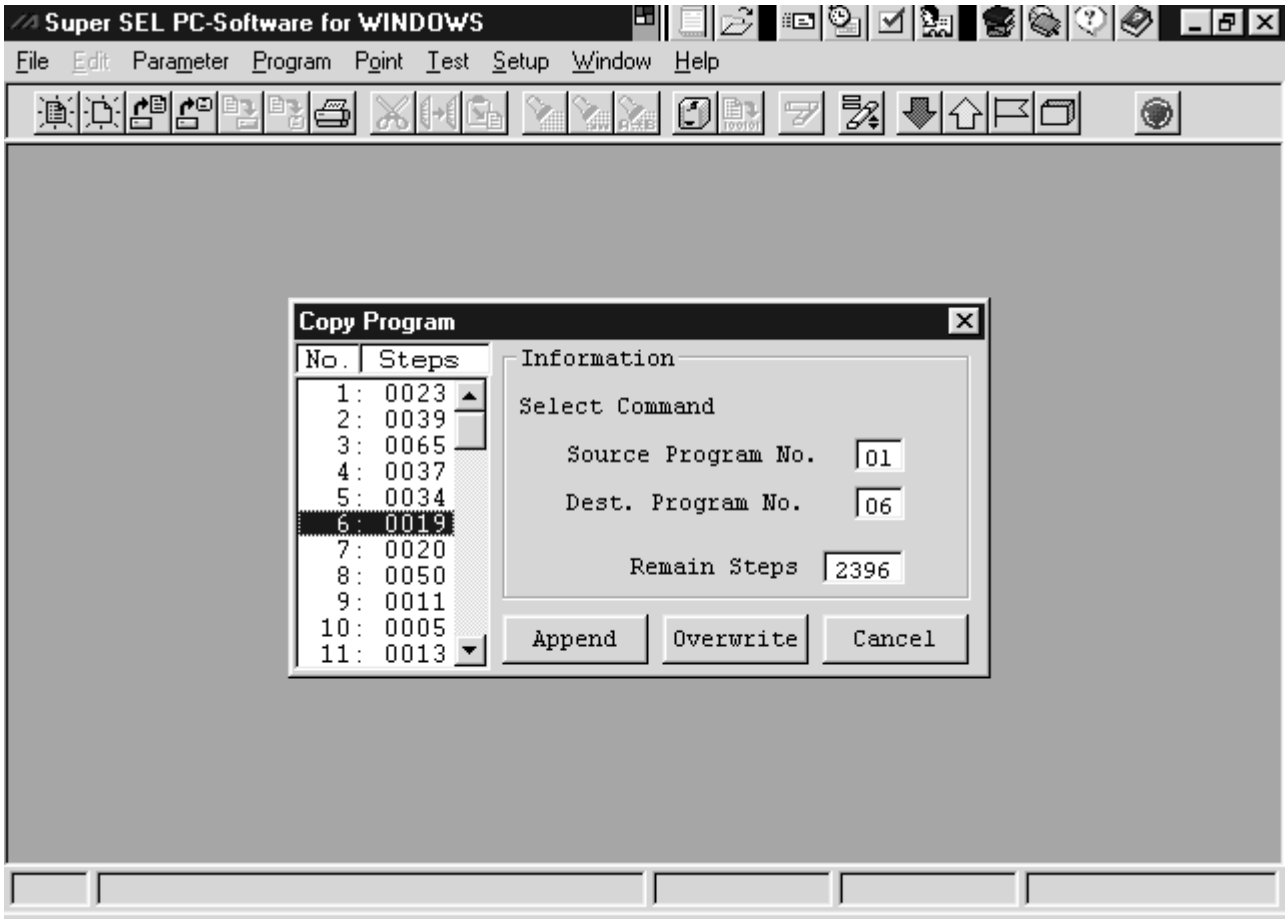
6.1 Program Copy

① From the menu, select Program → Copy.

② The program copy window opens. Double-click on the program number you wish to copy and this number appears in the source program number box in the information dialog box.

③ Double-click on the program number you wish to copy the program to and this number will appear in the dest. program no. in the information dialog box. Select one of the following options by clicking on that button.

Append	Copy the source program at the end of the destination program.
Overwrite	Copy the source program to the destination program after deleting the existing program.
Cancel	Cancel the operation.



6 Program Selection Window

6.2 Program Delete

① From the menu, select Program → Delete.

② The program delete window is displayed. Click on the program number you wish to delete and this number will appear in the delete program no. box in the information dialog box.

③ Click on the cancel button to delete the program.

7 Point Edit Window

7.1 Explanation of the Items in the Point Edit Window

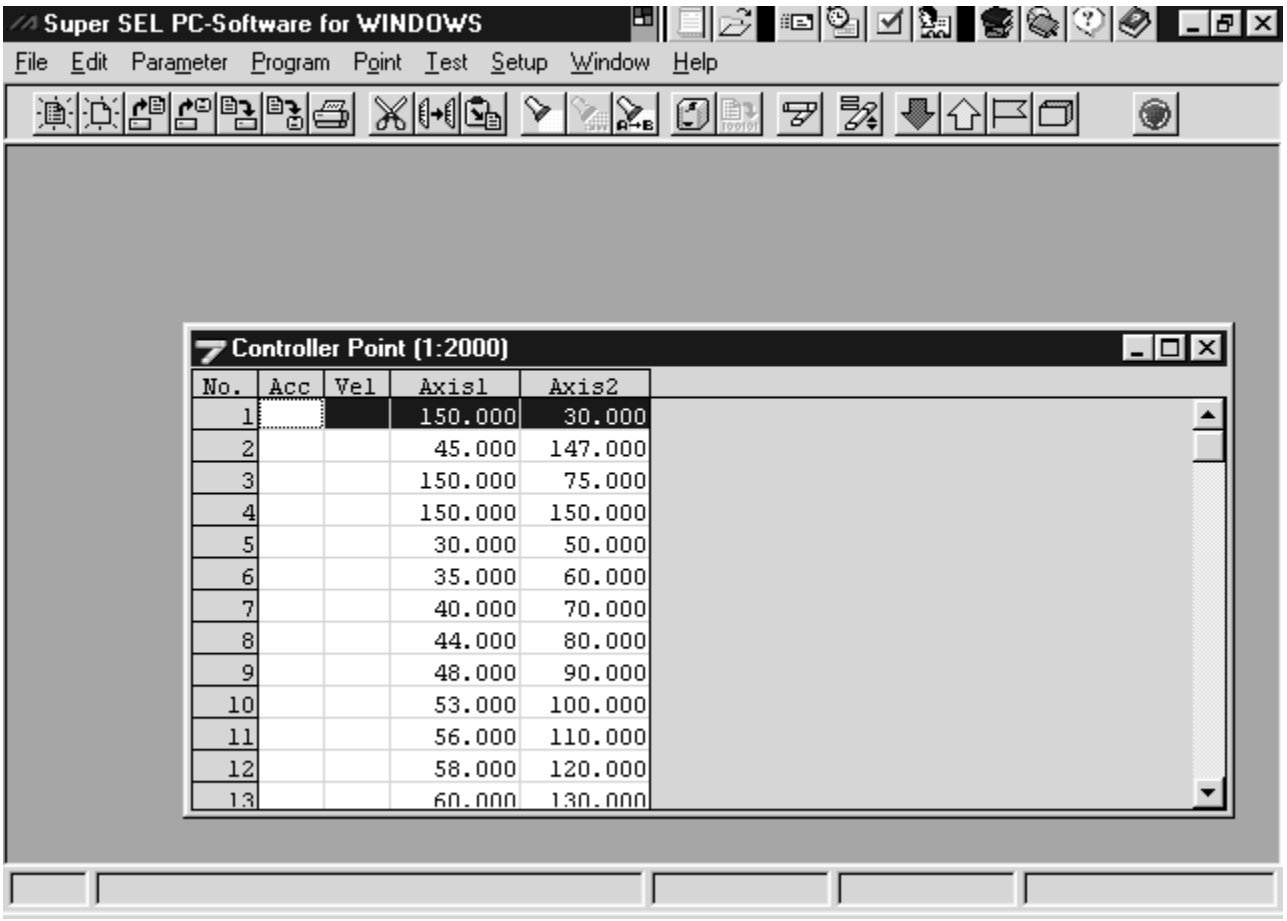
① From the menu select Point Edit.

② The point data selection window appears. Select the range of point numbers to be edited and click OK.

③ The controller point data window appears and has the following items.

No.	This is the point number. Data input is not required.
ACC	Specifies acceleration. The setting range is from 0.01 to the maximum acceleration in the servo parameter.
Vel	Specifies velocity. The setting range is from 1 to the maximum velocity in the servo parameter.
Axis 1~8	Specify the position of each axis. The setting range is -9999.999~9999.999.

④ Place the cursor at the last axis and press enter to move to the next line.



No.	Acc	Vel	Axis1	Axis2
1			150.000	30.000
2			45.000	147.000
3			150.000	75.000
4			150.000	150.000
5			30.000	50.000
6			35.000	60.000
7			40.000	70.000
8			44.000	80.000
9			48.000	90.000
10			53.000	100.000
11			56.000	110.000
12			58.000	120.000
13			60.000	130.000

7 Point Edit Window

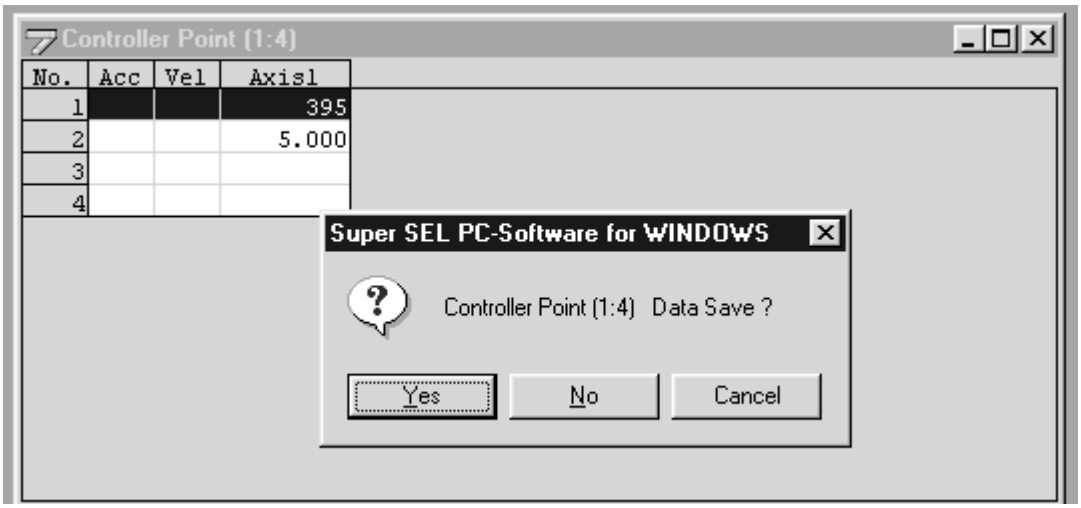
7.2 Point Save and Edit Completion

① File → Save
Save the point to a file.
Note: If no name is assigned to the file, the operation will be the same as for ② following.

② File → Save As
Assign a file name to the point and save.

③ Point → Write
Save the points to the controller. This is available only when editing a program.

④ Closing the point edit window.
When you close the point edit window after editing, the following message appears.



Yes Point is changed and operation ends. The point is written to the place where it was stored.

No The changes are cancelled and operation ends.

Cancel Point close is cancelled and editing continues.

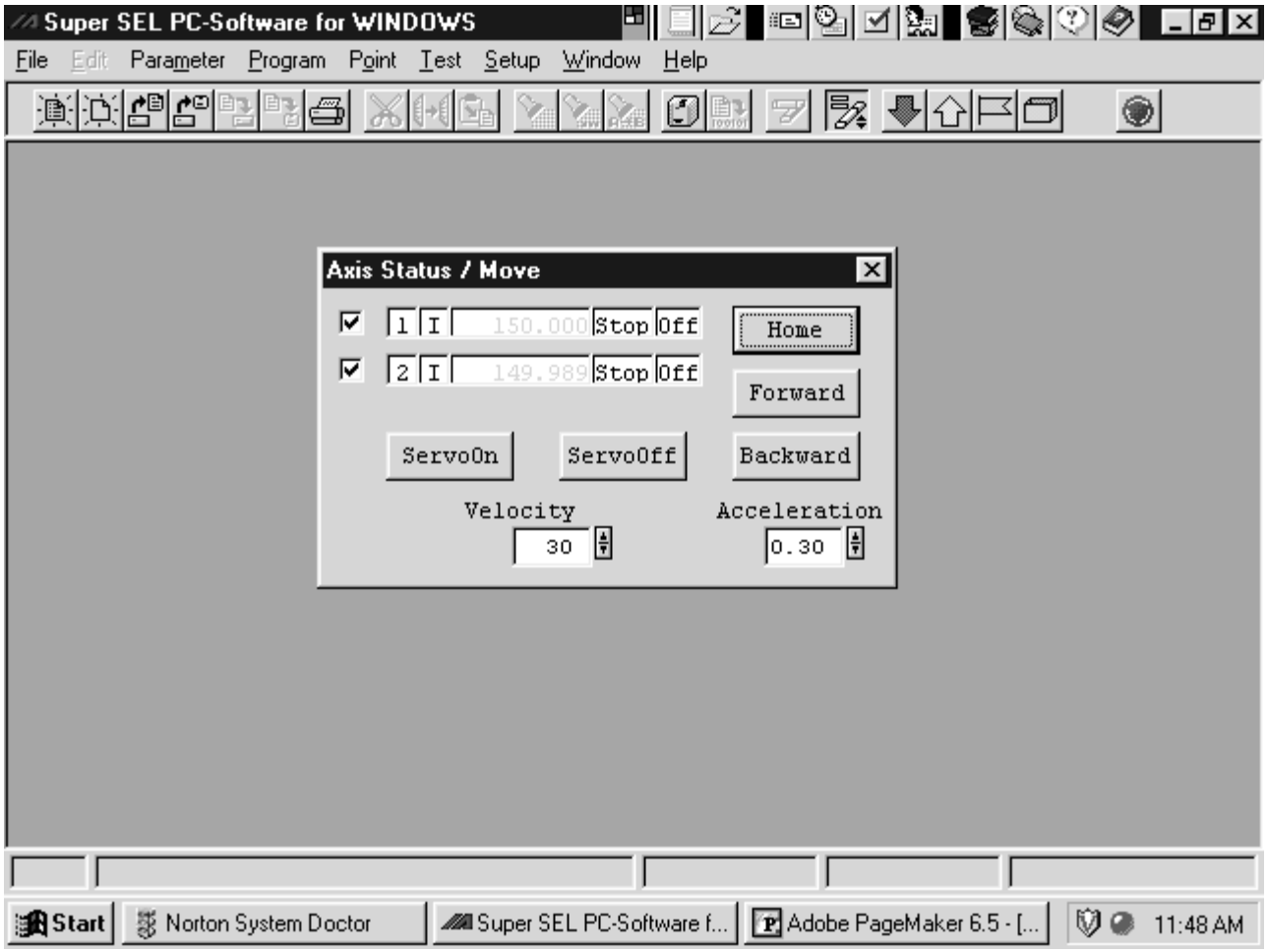
8 Axis Status · Move Window

① From the menu, select Test → Servo.

② The axis status · move window is displayed.
The axis selection switch, axis no., current position and status are displayed. From the menu, select Point → Edit to open the point edit window (controller point data). Select Point → GetPoint to obtain the current position of the axis.

Click on the forward/backward switch to move the axis or axes that was designated with the axis status selection switch.

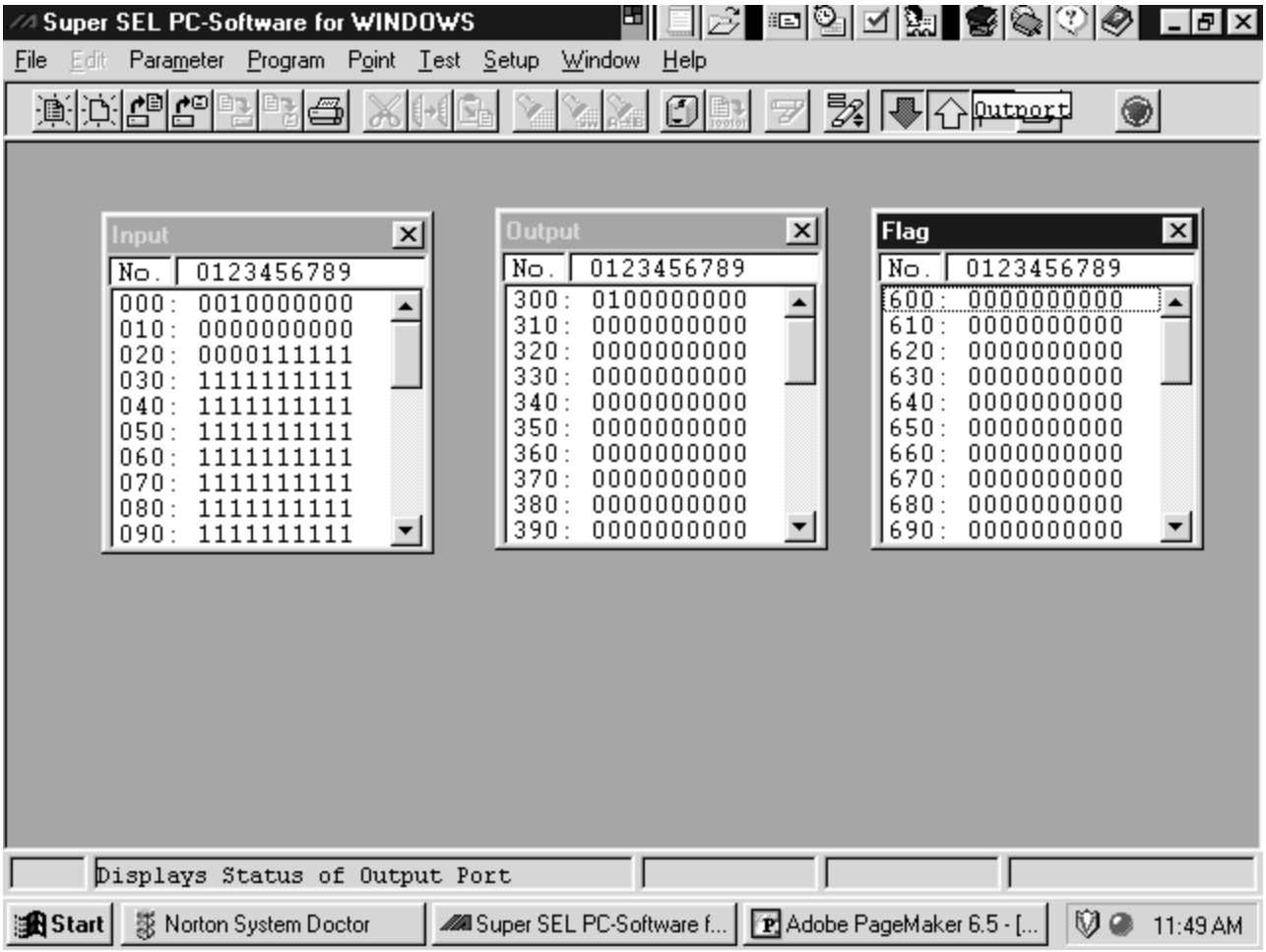
Home	The designated axis homes.
Forward/Backward	Start axis jog movement. The axis moves while this switch is pressed.
Servo ON/OFF	Turn the servo ON and OFF.
Acceleration	Set the acceleration for axis movement.
Velocity	Set the velocity for axis movement.



9 Input/Output Port · Flag Window

① From the menu, select Test → Input, Output, or Flag.

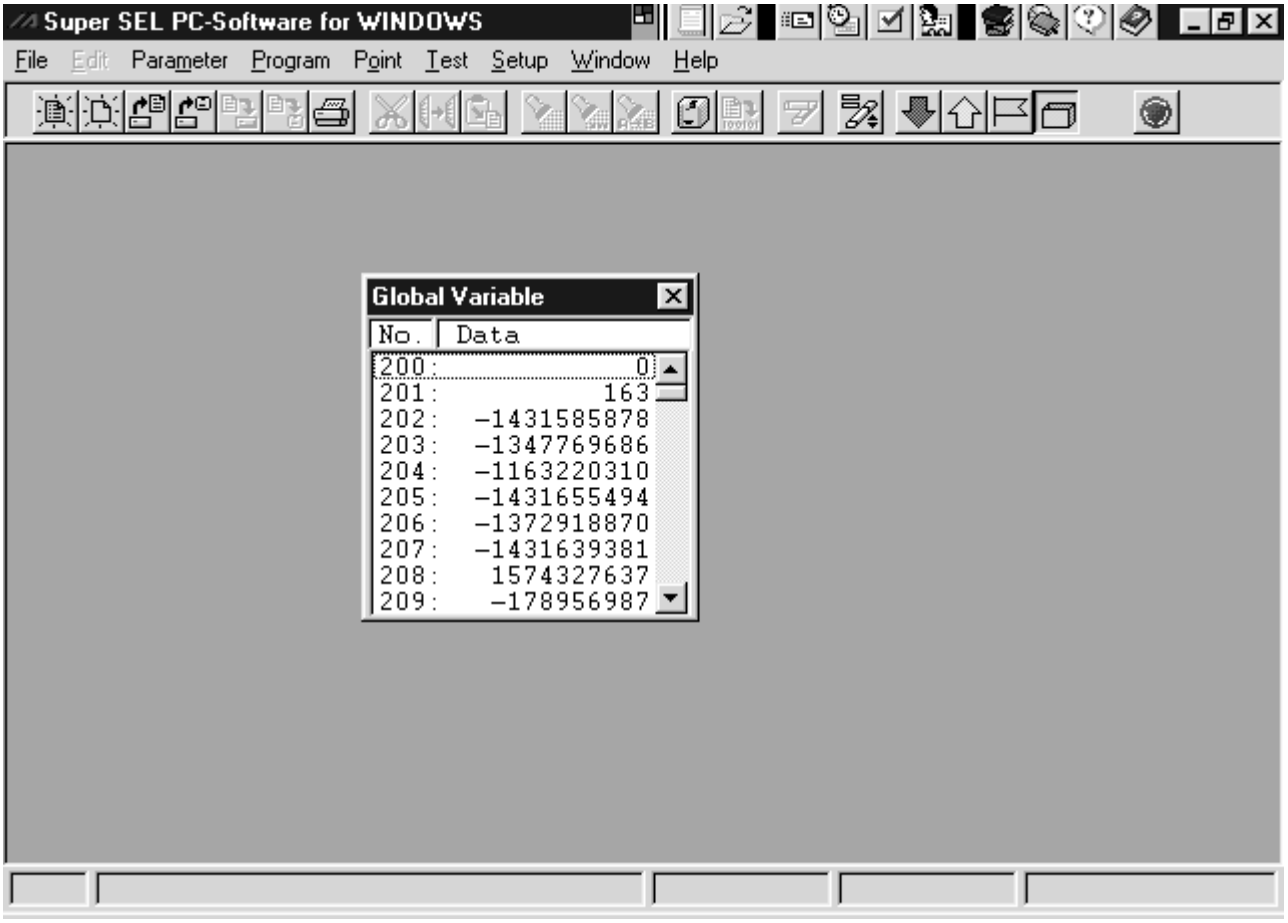
② The input, output and flag windows are displayed. These windows display the current value of the input port, output port and flag. For output port and flag, you can force the status ON/OFF by double clicking on the desired output port or flag.



10 Global Variable Window

① From the menu, select Test → Variable.

② The global variable window opens and the value for the current global variable is displayed.



11 Clear Memory Window

① From the menu, select Test → Clear.

② The clear memory window opens.
Mark the item to initialize from parameter, program or point and click OK. If parameter is selected, all parameters, programs and points are deleted. After resetting the controller, default parameters are used by the controller.

Note: ***Be certain that you wish to clear controller memory as there is no confirmation after you click the OK button.***

Supplement

Super SEL Controller PC Interface Software Windows Version, Additional Applications

Introduction

Those who have been using the Super SEL Controller PC Interface Software DOS version may find some inconvenience in using the Windows version since the data formats are not compatible. Because of this, we have prepared a data conversion software (CONV.EXE) for your use.

Please be careful to note that this additional software (CONV.EXE) is designed to run in DOS, not Windows. If you intend to use this converter all the time, you can run the file from any location if you set up a path to the directory where the (CONV.EXE) file resides. To set up the path, add the string given below to the (AUTOEXEC.BAT) file in the root directory.

PATH=A:\SEL32WIN;%PATH%

In this example, the file resides in the root directory called SEL32WIN located in the A drive. (If your SEL32WIN program is stored in a different drive, change the name accordingly).

Data Converter - How to Use CONV.EXE

CONV.EXE is a program that is run from DOS and allows conversion of IAI data files from DOS format to the Windows format and vice versa. Exit Windows or run the program from the DOS window.

To use, enter the following at the command line,

CONV.EXE file name.extension

During this operation the type of data is distinguished by the extension so please make sure to include the extension when entering the file name. The data type and extension are as follows.

Type of file	DOS	Windows
Parameter file	*.PAR	*.PRM
Program file	*.F32	*.PRG
Collective save program file	*.X32	*.ALL
Point file	*.P32	*.PNT

The name of the converted file will be the original file with an extension corresponding to the new data type. If that file name is the same as another existing file, the following prompt will appear.

...FileName.EXT exists, Overwrite OK [Y: yes] ?

If it is okay to overwrite the existing file, press Y. If you press any other key, the program will end without converting the file or it will move on to the next file to be converted.

You can use the wild cards * and ? to designate the file.

* = any character string and ? = any character.

Supplement

Examples:

CONV.EXE Data1.F32
: Converts the file named Data1.F32 in DOS to a file named Data1.PRG in Windows.

CONV.EXE*.P32
: Converts all DOS point files in the current directory to Windows files of the same name but with the extension .PNT.

CONV.EXE D*.X32
: Converts all DOS collective program files in the current directory that begin with the letter D to Windows collective program files of the same name but with the extension .ALL.

CONV.EXE Data?.PAR
: Converts all DOS program files in the current directory with the name of Data + 1 character (Data1, Data2, etc.) to Windows files of the same name but with the extension .PRM.

CONV.EXE Data1.F32 Data1.PNT Data1.PAR
: Converts Data1.F32 and Data1.PAR from a DOS to a Windows file and Data1.PNT from a Windows to a DOS file.

CONV.EXE*.*
: Converts all DOS files in the current directory to Windows files with the same name (the extension is converted).

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