



General-Purpose AC Servo
Servo Configuration Software

MODEL

MRZJW3- SETUP154E

INSTALLATION GUIDE

Thank you for choosing the Mitsubishi general-purpose AC servo Servo Configuration Software.

To optimize the use of the Servo Configuration Software, please read over this Installation Guide and the corresponding AC servo Installation Guide before using the software. After reading the Installation Guide, always place this Installation Guide in a safe place.

● Safety Instructions ●

(Always read these instructions before using the equipment.)

Do not attempt to install, operate, maintain or inspect the servo amplifier and servo motor until you have read through this Installation Guide, and appended documents carefully and can use the equipment correctly. Do not use the servo amplifier and servo motor until you have a full knowledge of the equipment, safety information and instructions.

In this Installation Guide, the safety instruction levels are classified into "WARNING" and "CAUTION".



Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.



Indicates that incorrect handling may cause hazardous conditions, resulting in medium or slight injury to personnel or may cause physical damage.

Note that the CAUTION level may lead to a serious consequence according to conditions. Please follow the instructions of both levels because they are important to personnel safety.

What must not be done and what must be done are indicated by the following diagrammatic symbols:



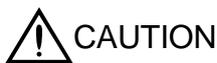
: Indicates what must not be done. For example, "No Fire" is indicated by .



: Indicates what must be done. For example, grounding is indicated by .

In this Installation Guide, instructions at a lower level than the above, instructions for other functions, and so on are classified into "POINT".

After reading this Installation Guide, always keep it accessible to the operator.



• Before executing the test mode, always read Section 2.3 "Precaution for test mode".

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1. INTRODUCTION

1. INTRODUCTION

1.1 Specifications

Using the communication function of the servo amplifier, the Servo Configuration Software allows functions, such as parameter setting change, point data maintenance, graph, program operation mode and test mode, to be implemented from a personal computer.

Servo amplifier		MR-E-A	MR-E-AG
Item			
Communication signal		Conforms to RS-232C	
Baud rate	9600bps	○	○
	19200bps	○	○
	38400bps	○	○
	57600bps	○	○
System	Station selection	○	○
	Automatic demo	○	○
Monitor	Display all · High speed monitor	○	○
	Trend graph	○	○
Alarm	Display	○	○
	History	○	○
	Amplifier data	○	○
Diagnostic	Digital I/O	○	○
	No motor rotation	○	○
	Total power-on time	○	○
	Amplifier version info	○	○
	Motor information	○	○
	Tuning data	○	○
	Automatic VC offset display	×	○
	Axis name setting	○	○
Parameters	Parameter list	○	○
	Tuning	○	○
	Change list	○	○
	Detailed information	○	○
Test	Jog	○	○
	Positioning	○	×
	Operation w/o motor	○	○
	Forced output	○	○
	Demo mode	○	×
Advanced-function	Machine analyzer	○	○
	Gain search	○	×
	Machine simulation	○	○

1. INTRODUCTION

1.2 System configuration

1.2.1 Components

To use the Servo Configuration Software, the following components are required in addition to the servo amplifier and servo motor. Configure the system according to the Installation Guide of each equipment:

Model	(Note 1) Description
(Note 2) Personal computer	IBM PC-AT compatible where the English version of Windows 95, Windows 98, Windows Me, Windows NT Workstation 4.0 or Windows 2000 Professional operates Processor: Pentium 133MHz or more (Windows 95, Windows 98, Windows NT Workstation 4.0, Windows 2000 Professional) Pentium 150MHz or more (Windows Me) Memory : 16MB or more (Windows 95), 24MB or more (Windows 98) 32MB or more (Windows Me, Windows NT Workstation 4.0, Windows 2000 Professional) Free hard disk space: 30MB or more Serial port used
OS	Windows 95, Windows 98, Windows Me, Windows NT Workstation 4.0, Windows 2000 Professional (English version)
Display	800×600 or more, connectable with the above personal computer.
Keyboard	Connectable with the above personal computer.
Mouse	Connectable with the above personal computer. Note that a serial mouse is not used.
Printer	Connectable with the above personal computer.
Communication cable	QC30R2 When this cannot be used, refer to Section 1.3.2 and fabricate.

Note 1: Windows and Windows NT are the registered trademarks of Microsoft Corporation in the United State and other countries.

2: On some personal computers, this software may not run properly.

1. INTRODUCTION

1.2.2 Communication cable

(1) Selection

Use a communication cable for connection of the personal computer and the servo amplifier. Choose the communication cable according to the shape of the RS-232C connector of the personal computer used.

POINT
<ul style="list-style-type: none"> Depending on the personal computer used, any of the following cables may be used. <p>Confirm the RS-232C connector signal carefully, refer to this section and fabricate the cable.</p>

Type	Length [m(feet)]	Servo amplifier or Interface unit	Application	Description
QC30R2	3 (9.84)	MR-E-A MR-E-AG	For IBM series (D-SUB 9 pins)	Connector: MP371/6 (Marushin Electric) Connector: DE-9SF-N Case: DE-C1-J6-S6 (Japan Aviation Electronics)

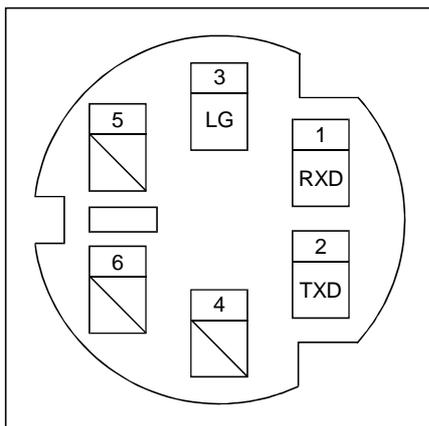


For fabrication, refer to the connection diagram in this section. When fabricating the cable, read and follow the instructions below:

- Always use a multi-core cable with a shield and connect the shield to FG securely.
- Wiring distance depends on surrounding environment but should be as short as possible.
Maximum distance is 15m(49.2feet) in environmentally good places with little noise, e.g. offices.

(2) Communication connector signal pin-outs

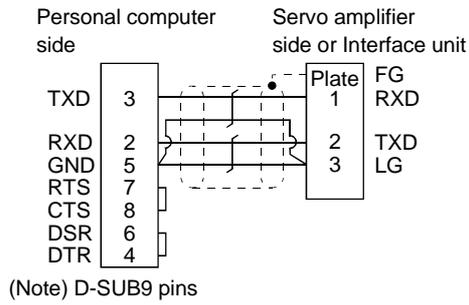
MR-E-A, MR-E-AG: (CN3) Servo amplifier side connector



1. INTRODUCTION

(3) Cable connection diagrams

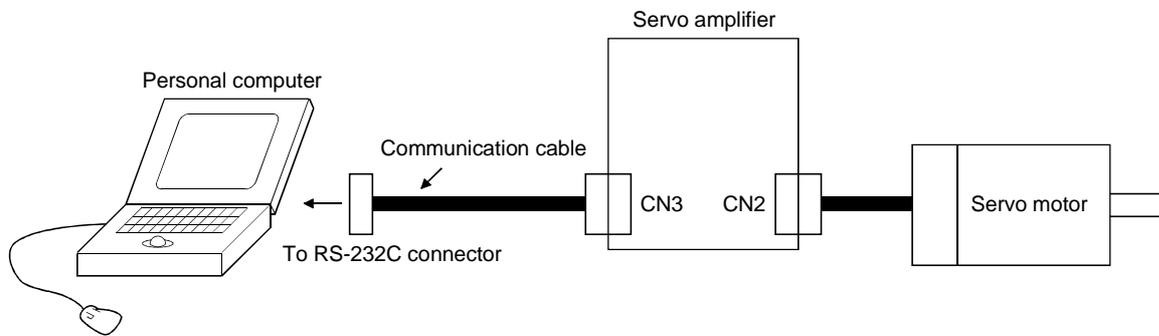
▪ QC30R2



Note. Check the RS-232C connector shape of your personal computer.

1.2.3 Configuration diagrams

(1) MR-E-A, MR-E-AG



1. INTRODUCTION

1.3 Basic terms

1) Mouse pointer

An on-screen arrow which moves with movements of the mouse.

2) Point

To move the mouse pointer to a particular item or position on the screen.

3) Click

To press and release the left button of the mouse once.

4) Double-click

To press and release the left button of the mouse twice.

5) Drag

To hold down the left button of the mouse and move the mouse.

6) Focus

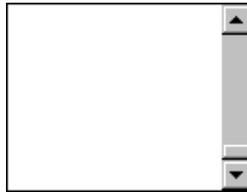
Highlights characters, button or the like when the menu or button is ready to accept an input from the keyboard.

7) Text box

Box used to enter characters.

8) List box

Box used to select one of several items.



9) Combo box

Box used to select one of several items.



10) Check box

Box used to select one or more of several items. When a choice is made a mark appears in the box.

11) Option button

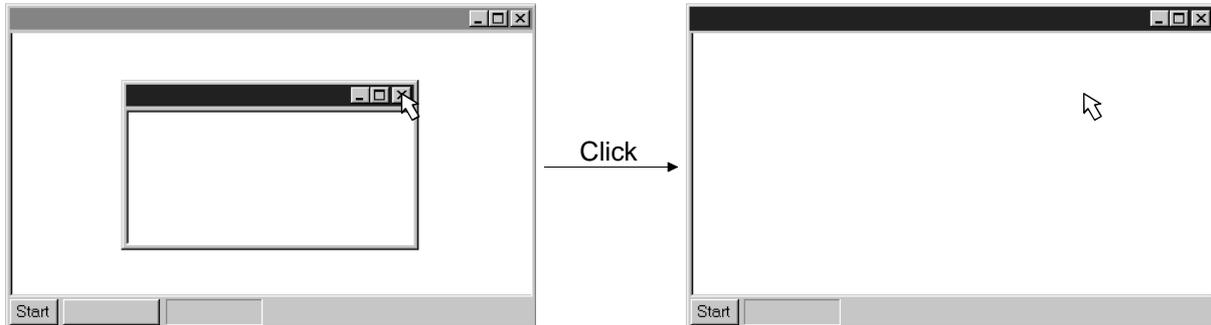
Button used to select only one of several items. When a choice is changed  moves to a new choice.

1. INTRODUCTION

1.4 Basic operations

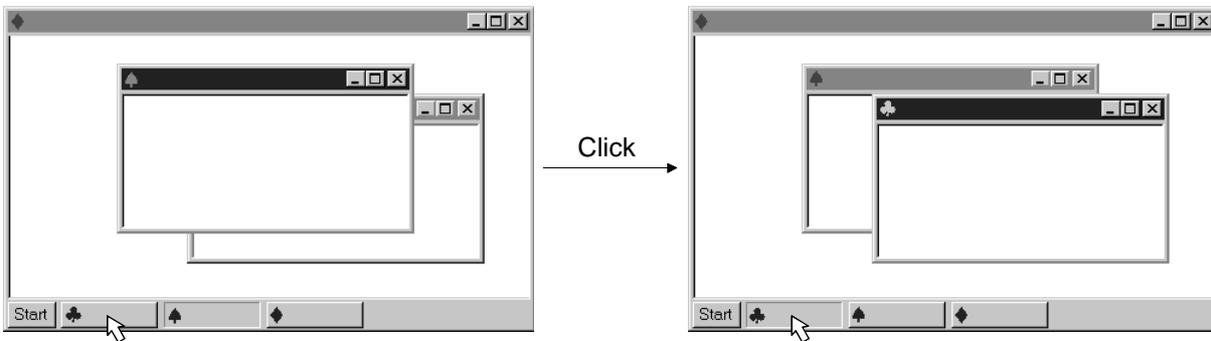
(1) Closing the window

Click the closing bottom at top right corner of the window.



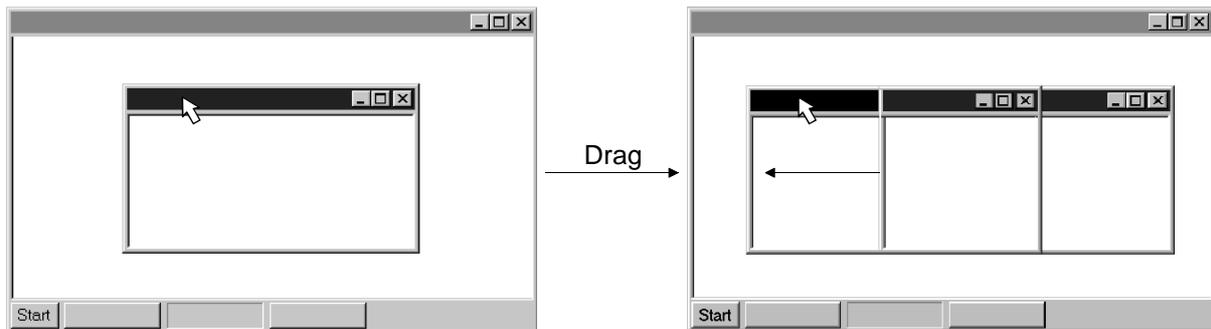
(2) Moving the focus from one window to another

Click the button of the task bar corresponding to the window to be used.



(3) Moving the window

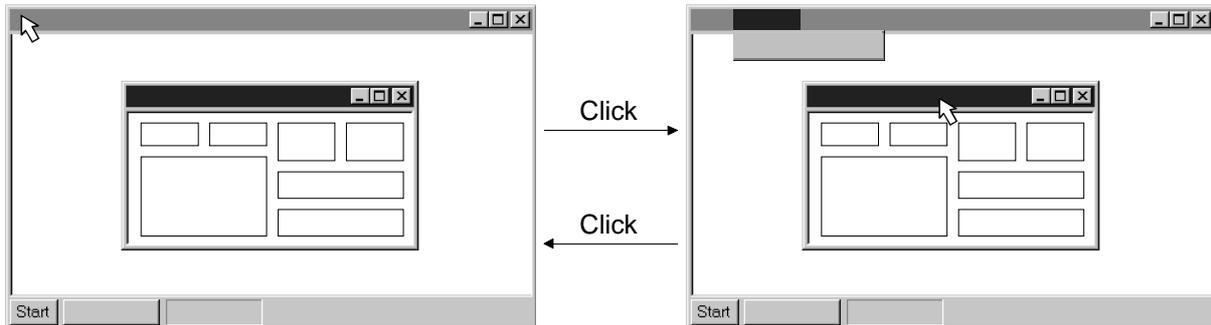
Point to the title bar, drag the window to the required position, and release the button.



1. INTRODUCTION

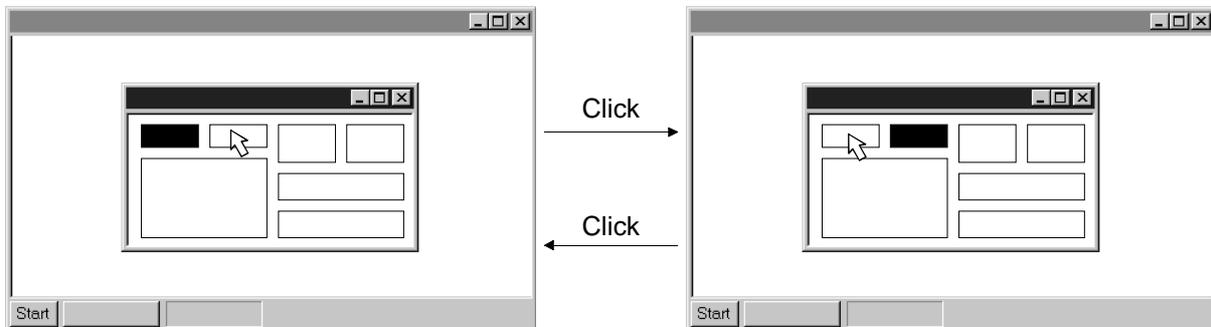
(4) Moving the focus to the menu bar

Click the menu bar. To move the focus to a window, click the window.



(5) Moving the focus inside the window

Click the object to be operated (such as a text box). When the object to be operated is a button, clicking it will start its processing.



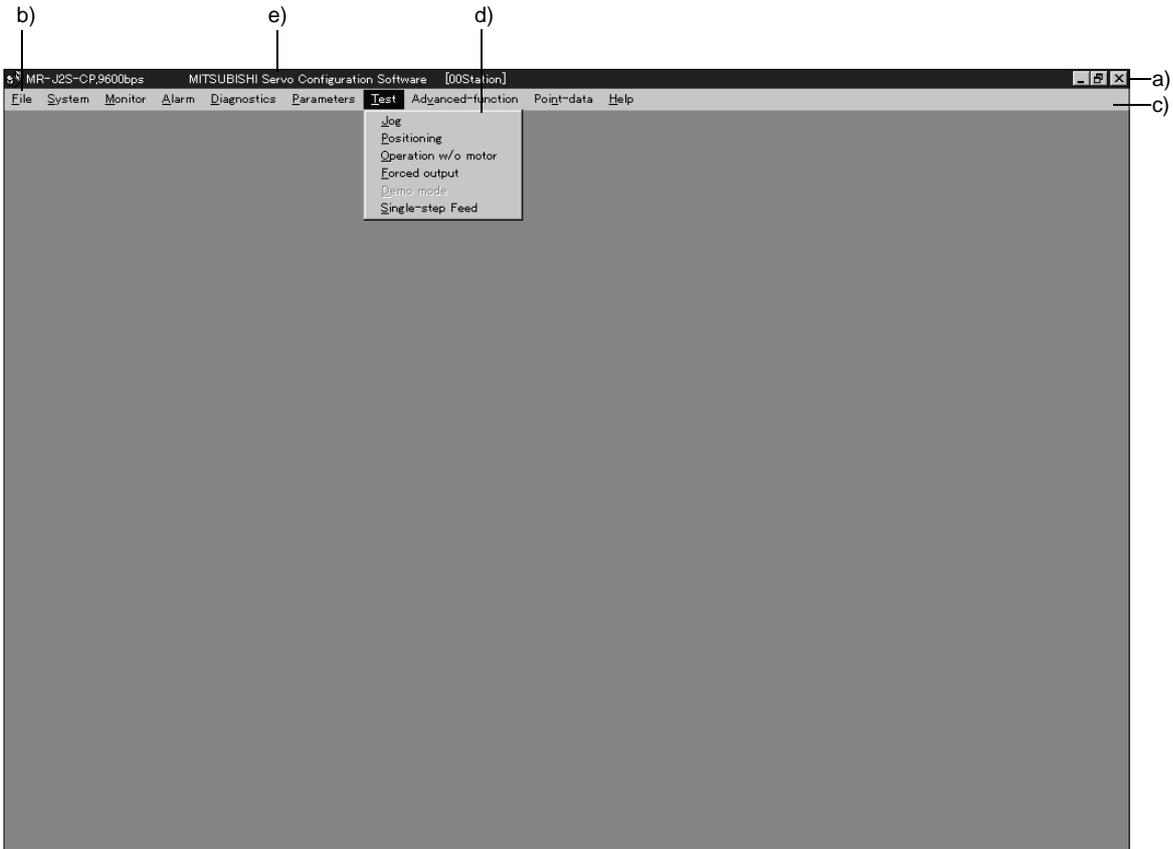
<Short-cut keys>

Any of the following short-cut keys may be used to perform operation from the keyboard:

Intended operation	Keyboard
Show help	"F1"
End program	"Alt" + "F4"
Show start menu	"Ctrl" + "Esc"
Change window	"Alt" + "Tab"
Change object	"Tab"

1. INTRODUCTION

1.5 Screen definitions



- a) Title bar
- b) Menu title
- c) Menu bar
 - Shows the menu title.
- d) Menu
 - Command menu in tier 1
- e) System setting display area
 - Shows the servo amplifier and baud rate which have been set.

1. INTRODUCTION

1.6 Installation procedure

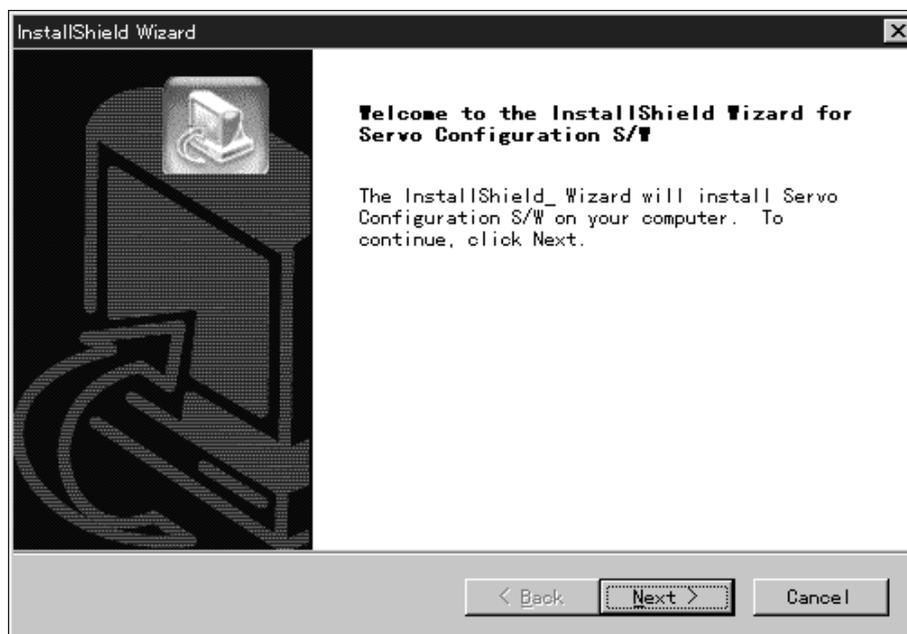
In this procedure, it is assumed that the hard disk drive of the personal computer is C and the CD drive is D.

Before running this program, always close all Windows programs.

- 1) Insert CD-ROM in Drive D (CD drive). Then, click the "Start" button of the task bar to open the start menu, specify the file name, and click "Run". When the following window has appeared, type "D:\SETUP154E\DISK1\SETUP.EXE" and click the "OK" button.



- 2) After the above window, the following window appears. Click "Next>" button.

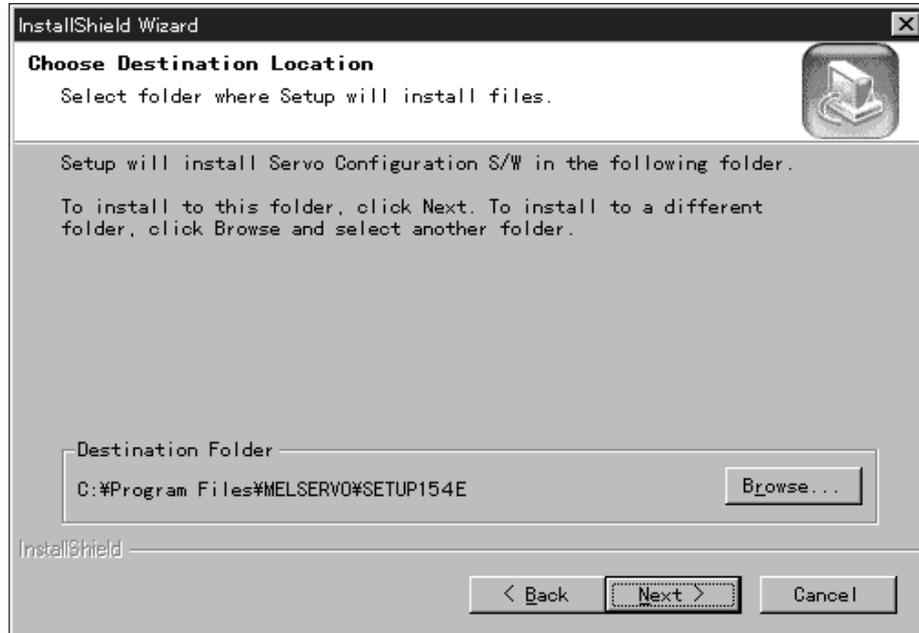


1. INTRODUCTION

- 3) The User Information screen appears. Type your full name and company name and click “Next>” button.

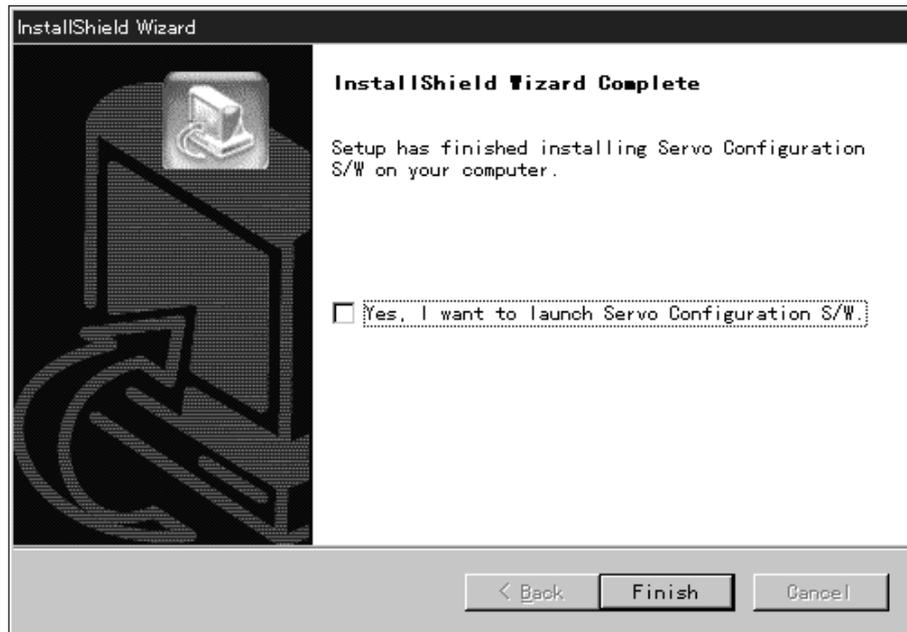


- 4) The Choose Destination Location screen appears. When you specify the destination folder and click “Next>” button, installation starts.



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5) When installation ends, any of the following screens appears. Click the “Finish” button to exit from Setup.



POINT

- In the corresponding window, to stop installation, click the “Cancel” button or press the “Escape”.

2. HOW TO USE THE SOFTWARE

2. HOW TO USE THE SOFTWARE

2.1 Operation

The method of selecting the command is the operation procedures using the mouse.
Unavailable commands are grayed out.

2.1.1 Start-up

- 1) Click the "Start" button of the task bar to open the menu.
- 2) Point to submenu, "SETUP_Software" from "Programs".
- 3) Click "SETUP154E".

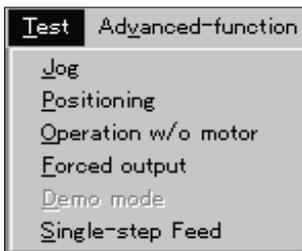
2.1.2 Command selection procedures

1. Clicking method

- 1) Click the menu title on the menu bar to open the menu.
- 2) Point to and click the command to be selected.

2. Dragging method

Point to the menu title on the menu bar, hold down the left button and drag the mouse to the command to be selected, and release the button.



2. HOW TO USE THE SOFTWARE

2.1.3 Operation procedures within the window

Within the operation window, enter data and/or press the button.

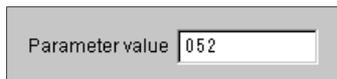
(1) Pressing a button

Click the button in the window.



(2) Entering data

Click the setting area to move the focus there, and enter data from the keyboard.



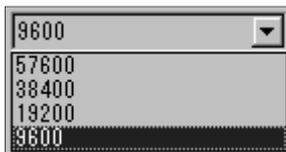
(3) Selecting data

Click the data to be selected.



(4) Selecting the combo box data, etc.

- 1) Click  on the right of the setting portion to open the combo box.
- 2) Make selection by clicking the data or like to be chosen.



(5) Pressing the option button

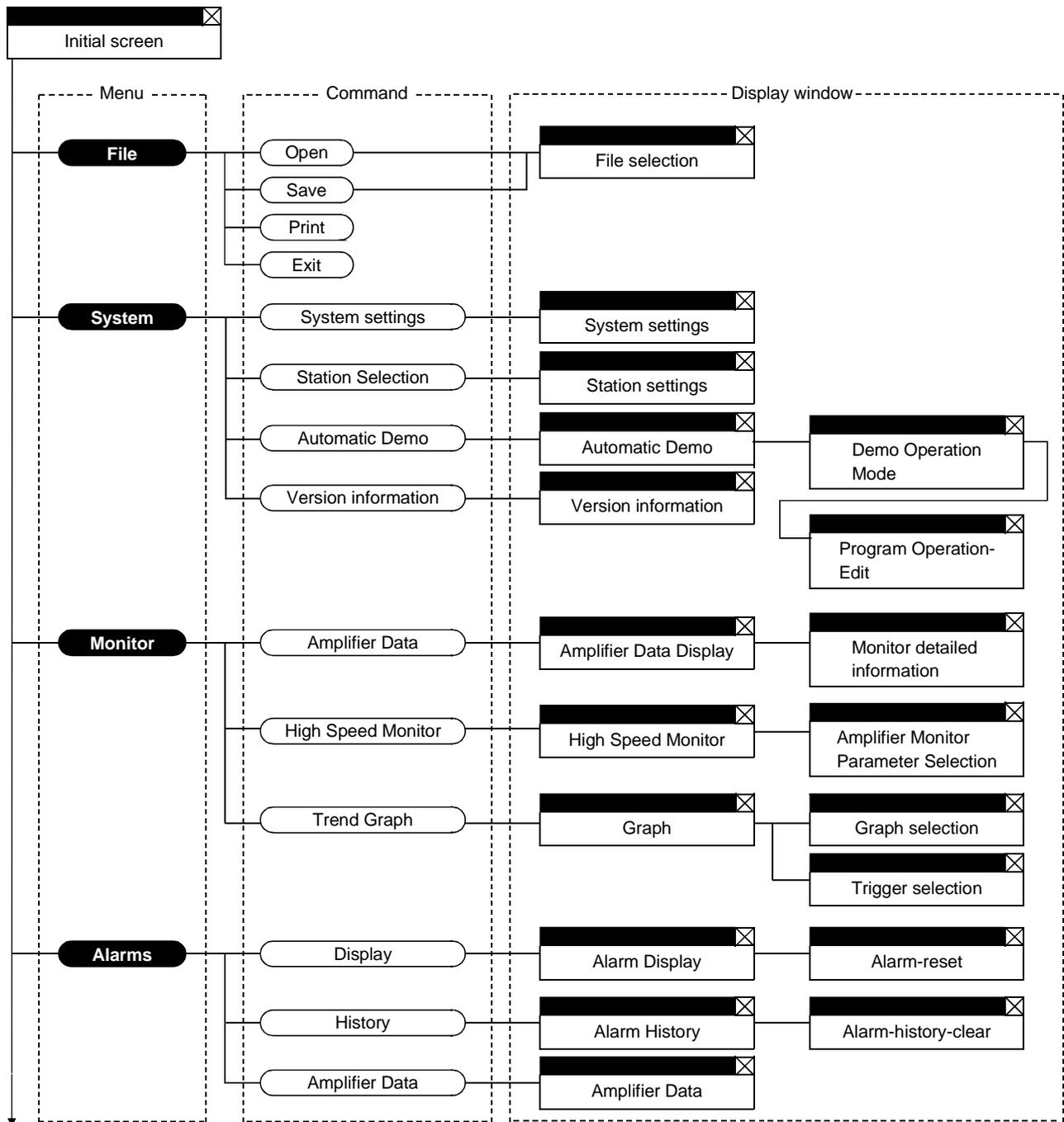
Click the item or button.



2. HOW TO USE THE SOFTWARE

2.2 Commands and display windows

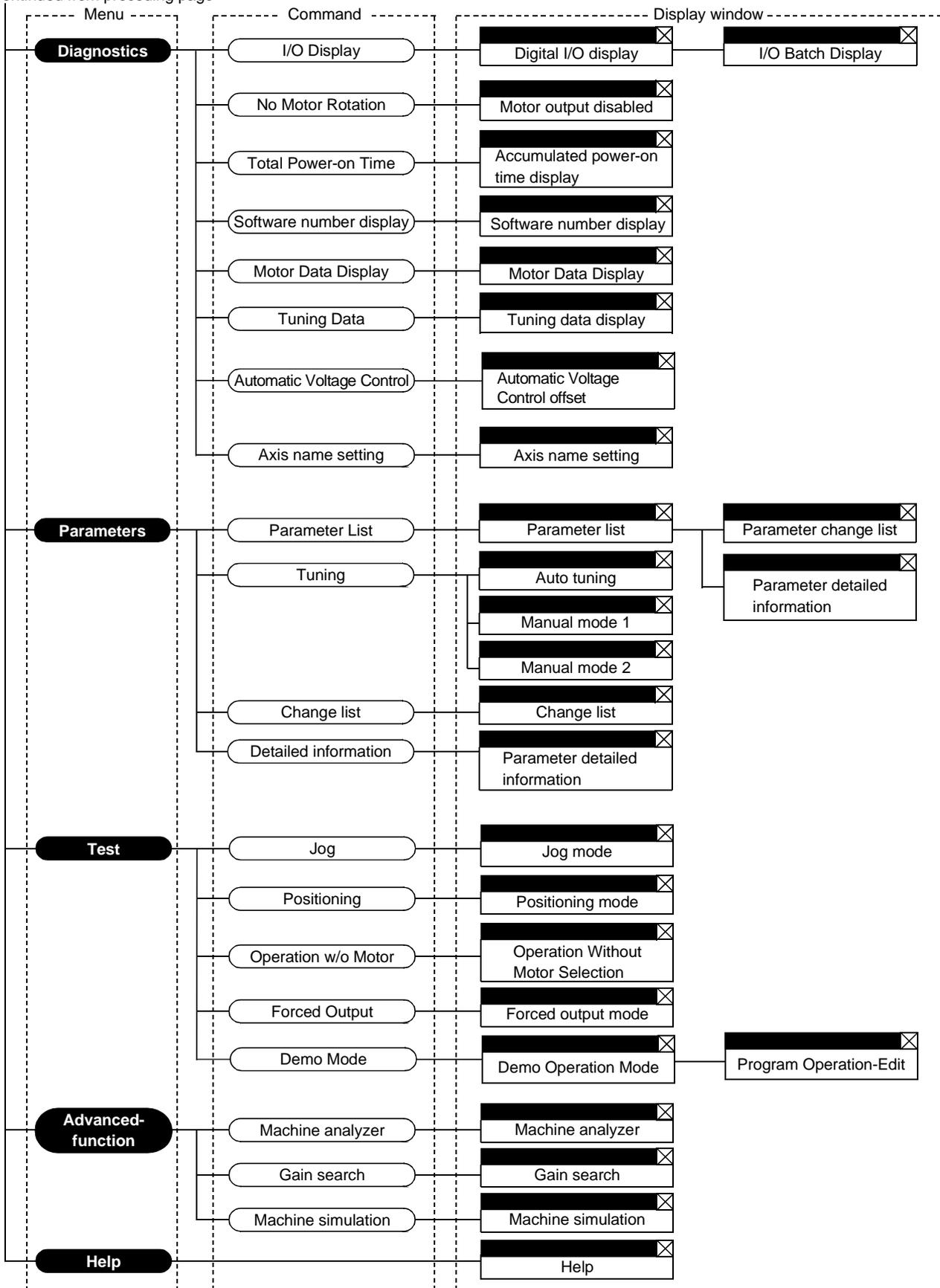
The following diagram shows a sequence of commands and windows.



To next page

2. HOW TO USE THE SOFTWARE

Continued from preceding page



2. HOW TO USE THE SOFTWARE

2.3 Precautions for test mode

⚠ WARNING

- Always touch the switches with dry hands. You may get an electric shock if you touch them with wet hands.
- Always operate the equipment with the front cover installed. Removing the front cover will expose the terminals and charged area having high voltages, which may lead to an electric shock.
- Keep the front cover closed while power is on the equipment is running. Otherwise, you may get an electric shock.

⚠ CAUTION

- Before starting operation, make sure that the parameters are set to correct values. Depending on machines, they may operate unpredictably.
- While power is on or for some time after power-off, keep clear of the servo amplifier's heat sink and regenerative brake resistor, the servo motor, etc. as they may be high temperatures. Otherwise, you may get burned.

(1) Servo on

In the Jog, Positioning, Demo Mode or Single-step Feed available in the Test, the servo amplifier's digital input signal SON is automatically switched on in the servo amplifier to start operation, independently of the ON/OFF status of SON. Also, any external command pulse or input signal (except emergency stop) is not accepted until the test mode window is closed to terminate the command.

SON is automatically switched on by the following operation:

Test mode	Mouse
Jog	Click the "Forward" or "Reverse" button. The servo motor rotates while you are clicking the button.
Positioning	Click the "Forward" or "Reverse" button.
Demo Mode	Click the "Start" button.

(2) Stop

POINT

- To make an emergency stop, switch off the emergency stop signal of the servo amplifier or shut off the input power.

1) Perform the following operation to stop the test mode:

Test mode	Mouse
Jog	Click the "Pause" button.
Positioning	Click the "Pause" button.
Demo Mode	Click the "Reset" button.

2) The servo motor will stop if either of the following situations occurs in the test mode:

- The communication cable is disconnected.
- If the window is dragged or the other menu is opened, communication between the personal computer and the servo amplifier may be suspended temporarily, stopping the servo motor temporarily.

2. HOW TO USE THE SOFTWARE

2.4 Simple language for program operation

The language used in the program operation-edit window will be described below.

2.4.1 Language

The chart below describes the commands in the program operation-edit window to execute the program operation mode, in which the MR-E-A goes into the position control mode.

Describe a program in upper case characters and Enter or Return at the end of a line. Up to 300 lines may be described.

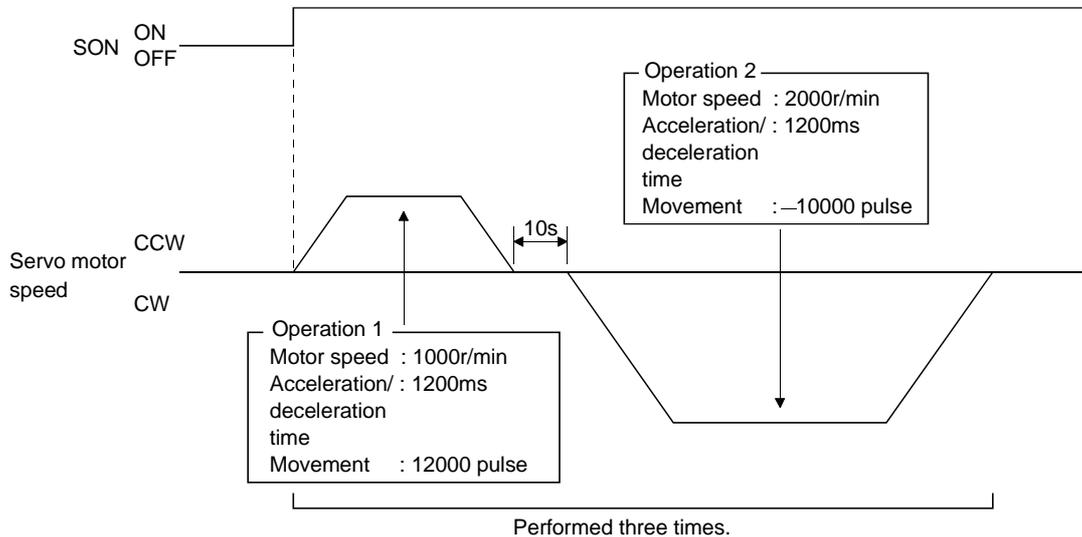
Command	Name	Setting (**: Set value)	Setting range	Unit	Description																												
SPN	Feedrate	SPN (**)	0 to permissible instantaneous speed	r/min	Used to set the command speed given to the servo motor for positioning. The set value should be not more than the permissible speed of the servo motor used.																												
STC	Acceleration/deceleration time	STC (**)	0 to 50000	ms	Used to set the acceleration/deceleration time. (Time required to reach the rated speed of the corresponding servo motor)																												
MOV	Move command	MOV (**)	-9999999 to 9999999	pulse	Used to execute movement by the preset pulses. Positioning operation is performed with the set values of the feedrate (SPN) and acceleration /deceleration time (STC). No symbol: CCW rotation, -: CW rotation																												
SYNC	Waiting external signal to switch on	SYNC (**)	As listed in the table at right.		Used to hold the next operation until the preset digital input signal (DI) of the servo amplifier switches on. By setting 99, the next operation will be performed unconditionally. Set the input signal as listed below: For the MR-E-A, any signal not allocated by signal assignment in the position control mode using parameters No. 43 to 47 will be invalid if it is selected. <table border="1" data-bbox="906 1240 1417 1680"> <thead> <tr> <th>Set Value</th> <th>MR-E-A</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>SON</td> </tr> <tr> <td>1</td> <td>LSP</td> </tr> <tr> <td>2</td> <td>LSN</td> </tr> <tr> <td>3</td> <td></td> </tr> <tr> <td>4</td> <td></td> </tr> <tr> <td>5</td> <td>PC</td> </tr> <tr> <td>6</td> <td>RES</td> </tr> <tr> <td>7</td> <td>CR</td> </tr> <tr> <td>8</td> <td></td> </tr> <tr> <td>9</td> <td></td> </tr> <tr> <td>10</td> <td></td> </tr> <tr> <td>11</td> <td></td> </tr> <tr> <td>99</td> <td>Unconditional</td> </tr> </tbody> </table>	Set Value	MR-E-A	0	SON	1	LSP	2	LSN	3		4		5	PC	6	RES	7	CR	8		9		10		11		99	Unconditional
Set Value	MR-E-A																																
0	SON																																
1	LSP																																
2	LSN																																
3																																	
4																																	
5	PC																																
6	RES																																
7	CR																																
8																																	
9																																	
10																																	
11																																	
99	Unconditional																																
TIM	Dwell command time	TIM (**)	1 to 50	s	Used to hold the next operation until the preset time elapses.																												
TIMES	Program count command	TIMES (**)	1 to 99	Times	Used to specify the number of cycles or times (from TIMES to STOP) that the positioning is to be repeated. Enter the TIMES (**) at the beginning and STOP at the end of a cycle. Not required for one positioning cycle.																												
STOP	Program stop				Used to stop the program being executed. Need not be described on the last line.																												

2. HOW TO USE THE SOFTWARE

2.4.2 Program example

As soon as the “Start” button is clicked, SON is switched on automatically to start operation.

Timing chart



Program

TIMES (3) Repeats the program up to STOP three times.

SYNC (0) Holds the program from running until the input signal with the set value of 0 (SON) switches on.

SPN (1000) Sets the command speed to 1000r/min.

STC (1200) Sets the acceleration/deceleration time to 1200ms.

MOV (12000) Executes movement by 12000 pulses in the CCW direction.

TIM (10) Hold the next operation for 10s.

SPN (2000) Sets the command speed to 2000r/min.

MOV (-100000) Executes movement by 100000 pulses in the CW direction.

STOP

} Operation 1

} Operation 2

In this example, the acceleration/deceleration time in Operations 1 and 2 are the same.

In this case, the acceleration/deceleration time in Operation 2 need not be set. In this way, set values different from those in the preceding operation need only be described in the operation program.

2.4.3 Instruction

When the program operation mode is executed with the program operation mode window and another window (Amplifier Data Display window) being displayed at the same time, the program may progress slower, making the dwell command time longer than the set value.

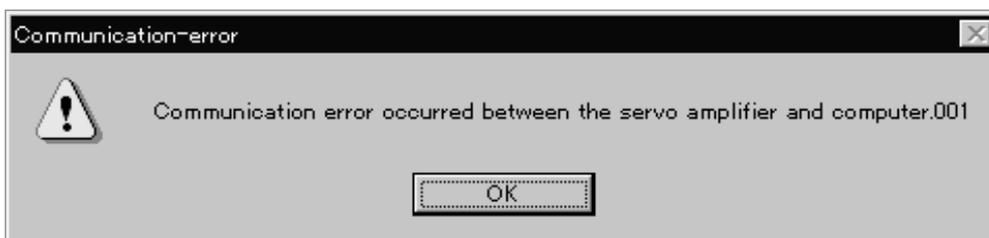
3. TROUBLESHOOTING

3. TROUBLESHOOTING

3.1 Communication error

If communication between the personal computer and the servo amplifier is suspended and the communication error as shown in the following window occurs, check the code on the right of the error message and remove its cause.

<Possible cause> Noise entry, hard disk fault, wiring fault, etc.



Code	Definition
001	Parity error occurred in the data sent from the personal computer.
002	Checksum error occurred in the data sent from the personal computer.
003	Character not given in the specifications was sent to the servo amplifier.
004	Command not given in the specifications was sent to the servo amplifier.
005	Data number not given in the specifications was sent to the servo amplifier. Data outside the permissible range was sent to the servo amplifier.
None	Checksum error occurred in the data received by the personal computer.

3.2 Screen unprintable

If a screen is not printed after printing is started, open the Windows setup window and change the display setting to 256 colors or less.

MODEL	
MODEL CODE	



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