Panasonic ®

Operation Manual

AC servo driver MINAS series

Set up support software

PANATERM for Multi

(For Windows® 10/Windows® 11)

Please be sure to read this manual cautiously and use this product appropriately. Especially, please be sure to read "Safety Precaution (P.2 - 3)" before using this product and use this product safely.

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REVISIONS
Revision History of Operation Manual

Date	Page	Rev	Description	Signed
July. 7, 2020		1.00	NEWLY ISSUED	-
Oct. 22, 2020	P6	1.01	Updating the month and year in the note	-
	P7-8, 10-11, 19, 22, 24, 30, 32-33, 35, 37, 40, 42, 51-53, 60, 63, 71, 74, 77, 81, 84, 89, 91, 95-97, 99-100, 102-105, 109, 111, 116, 120, 123-124, 146, 156, 164, 180-181, 197, 199-201, 204, 210		Correcting errors	
Sep. 2, 2022	P2, 5-7, 14, 18-20, 23-24, 29-30, 35-39, 109, 192, 194	1.02	Deleting a description on Wireless LAN	
	P4-6, 11-12, 20, 196, 211		Changed company name	
	P10, 191, 194		Changing ".NET Framework 3.5 SP1" to ".NET Framework 4.8"	
	P9-10		End of support for Windows 8.1 Start of support for Windows 11	

Note) The page number (Page) is the current page number at the time of revision.

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Safety Precaution

Please keep without fail

Instructions to be observed to avoid personal injury and property damage are given in the following way.
Please keep it without fail

The degree of injury and damage caused by failure in observing the instructions or improper usage is indicated in the following format.

⚠ Caution	Indicates a potentially hazardous situation which may result in injury or only property damage.

The following pictorial display explains the types of content to be protected.

🚫	This indication shows "prohibition".
❗	This indication shows "imposition" to be done.

⚠ Caution

The communication cable should not be connected or cut during the driver power supply turned on.

🚫 It may cause injury, breakdown or damage.

The communication cable should not be cut under the condition of this software turned on. Also, don't put your PC to sleep, hibernate, or screen saver.

🚫 It may cause injury, breakdown or damage.

On modifying parameters of the driver, please do it after reading the manual of the driver or technical reference carefully.

❗ It may cause injury, breakdown or damage.

Trial run screen, Z phase search screen, and Frequency characteristics screen accompanies motor operation. Please execute it after securing surrounding safety without fail.

❗ It may cause injury, breakdown or damage.

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(2) The software owned by and licensed by the third party

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1. Initially

Notes for safety issues

This software（PANATERM for Multi ,Hereinafter, it is abbreviated as PANATERM） runs on "Windows", and performs communications between personal computers and MINAS series driver.
MINAS series have functions to perform communications with commercially available personal computers with USB cables.
MINAS series drivers supporting EoE (Ethernet over EtherCAT) can make EoE communication by connecting to an Ethernet cable. And can set parameters of the drivers, or can monitor control situations using a PC screen and mouse. When using the device, also read the operation manuals and technical publications on the driver main unit.

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2. System Construction

Confirming applicable drivers

This software is for our AC servo driver MINAS series. It is not available for other products. Applicable driver's model names and series are as below.

Series		Model name	USB	EoE
MINAS A6N 2AXIS DD MINAS A6N 2AXIS LINEAR MINAS A6N 2AXIS MINAS		M * DL * * * N *	✓	
MINAS A6 Multi	Power Supply Module (PSM)	M * DMPN * 4	✓	✓
	Drive Module (DM)	M * DM * * * * B *		

Models of drivers can be identified with the character of * in the model name above.
(The characters of * are defined model by model.)

Notes 1) That is information on the day of May 2022. Please check with the shop you buy from if this software is applied to the drive you use.

Needed system construction

To use this software, equipment which satisfy the conditions below are needed. Please refer to the operation manual attached to the each equipment, and then construct the system. The software may not be operated with a different environment from recommended one.

Personal Computer (PC)

Operation system	Windows 10(32bit version, 64bit version) Windows 11(64bit version) Japanese, English(US) version of the OS above
CPU	Follow operating system recommendations
Memory	Follow operating system recommendations
Hard disk	512MB or more
Communication	USB port Wired LAN adapter Note) A wired LAN adapter is required for EoE connections.

Wired network

Physical Layer	100BASE-TX (IEEE802.3)
Baud rate	100[Mbps] (Full duplex)
Connection cable	Twisted pair CAT5e

Display

Resolution	1024×768 PIXEL or more
Color number	24bit color (True Color) or more

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\<Notes\>

- Windows is needed to be prepared by customers.
- To use different OS from ones above, customers need to check operations.
- PANATERM should be used in condition that initial setting of Windows is renewed into the newest one.
- Using with other applications, operation of PANATERM may become unstable. Please use PANATERM solely.
- All users can operate the servo driver with PANATERM. To prevent dangerous operations, do not leave the PC with PANATERM installed in a state where it can be operated by a third party.

\<Notes\>

- Not guaranteed with other OS.
- Please check the operation by customers when used with different system environment from ones above.
- This product is performing checking of operations by Windows 10 and Windows 11. The operation may be different on other versions.
- This product is not applied to indication on multiple displays.
- In case two or more PANATERM are running, operation cannot be guaranteed.
- Illustrations/screens may be different from actual cases.
- In conjunction with that Microsoft has ended all support for Windows 8.1 (United States time) Jan 10, 2023, we end support for PANATERM in Windows 8.1.

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3. Set up

Installer construction

PANATERM installer includes the data below.

Item	Folder name after installation
PANATERM main body	PANATERM_MULTI
Disk driver for USB communication	USBDriver

<Notes>
Using PANATERM installer, please install it to the hard disk of the PC. It cannot be installed to the network drive. Even with copy or other measure, it cannot be installed/setup.

Way of installation

<Advance preparation>
1 Turn on the power supply of PC and start Windows.
   (Close down other software running.)
2 Copy PANATERM installer (setup.exe) into an arbitrary folder.
3 Disconnect if the driver is connected to the PC with a USB cable.
4 Uninstall the PANATERM with the way below if PANATERM is already installed.
   From "Control Panel" > "Programs and Features", select an item starting with "PANATERM for Multi" and click "Uninstall".

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<Start install>

1 Double - click "setup.exe". Startup PANATERM Installer. Select the language (Japanese and English). And then, operate following the direction on the screen.
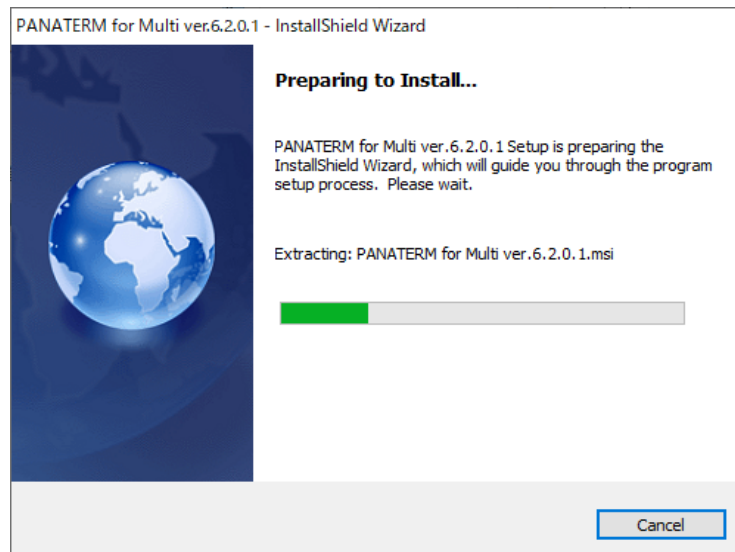
2 After completing the install, the short cut icons below will be made on the desktop.

 PANATERM for Multi

■Notes

· When an error occurs during setup, an error message will be displayed. Please refer to page 193 "Set up", and remove the cause of the error.

· Please do not turn off the power supply of the PC or start up other software before completion of the install.

· When Microsoft .NET Framework 4.8 is not installed, Installer of Microsoft .NET Framework 4.8 will start up when the installer starts. Follow the instructions to continue the installation. Follow the instruction when you are asked to restart the computer after the installation.

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· If Microsoft Visual C++ 2013 Redistributable(x86) is not installed, starting the installer activates the installer of Microsoft Visual C++ 2013 Redistributable(x86).
Follow the instructions to continue the installation. Follow the instruction when you are asked to restart the computer after the installation.
In addition, Microsoft Visual C++ 2013 Redistributable(x86) may not be installed under the following environment.
  Only Microsoft Visual C++ 2013 Redistributable (x86) was uninstalled on the PC on which Visual Studio 2013 was installed.
Make sure you have Microsoft Visual C++ 2013 Redistributable (x86) installed.

· If Microsoft Office 2010 or later or Microsoft Access Database Engine is not installed, the Microsoft Access Database Engine 2010 installer will be installed when the installer is started. Follow the instructions to continue the installation. Follow the instruction when you are asked to restart the computer after the installation.

· Selection of language on setup is to select language of setup screen. The language selection of PANATERM can be changed with "File" > "Setting" > "Culture" on the menu bar on the condition that all function windows are closed down.

<Connection to driver (Device driver setting)>

1 When you connect using a USB cable, please refer to page 18 "Connection", and connect the USB connector on the front of the driver and USB connector of the PC.
2 When the driver's power supply is turned on, pop-up appears on the task bar, and installing device driver automatically.

  Note) It is necessary to setup the device driver to each USB connector. Please setup device driver for each USB connector of using.

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4. Basic Operation

Indication of keys

General Key indications which do not rely on the models of the keyboards are used in this manual, the indication may be different. Please read the indication based on the table below.

Indication	Context
[↑][←] [↓][→]	Up down and right and left are indicated. With these keys input, selected items are changed. Selected item is highlighted.
Number (0 - 9)	Number keys are indicated. Please input the objective number.
[ESC]	On keyboards, escape keys are indicated [Esc], [ESC]. They are used to turn inputted value back to the original one.
[ENTER]	Enter keys which is indicated [Enter], [ENTER], [RETURN] on keyboards are indicated. Input when each menus are selected and executed and at the end of input of values.

Section operation way of menu

Each item is executed by left - clicking the menu item or the operation button required to select.

Each items can be executed also by highlighting the menu required to select with [↑], [→], [↓], [←] keys, and pressing [ENTER] key.

Input of value

Please input them with number keys on the keyboard.

Value data of parameter changing and so on is indicated with decimal numbers. Please input them with decimal numbers. Binary numbers and hexadecimal numbers are not available.

Value input can be cancelled with [ESC] key.

File operations

The following dialogue of file is displayed when files need to be appointing on "Read" or "Save" of parameters and so on.

<Read>

Use built-in dialogue box in PANATERM for read in parameter file, wave form graphic file or frequency character file.
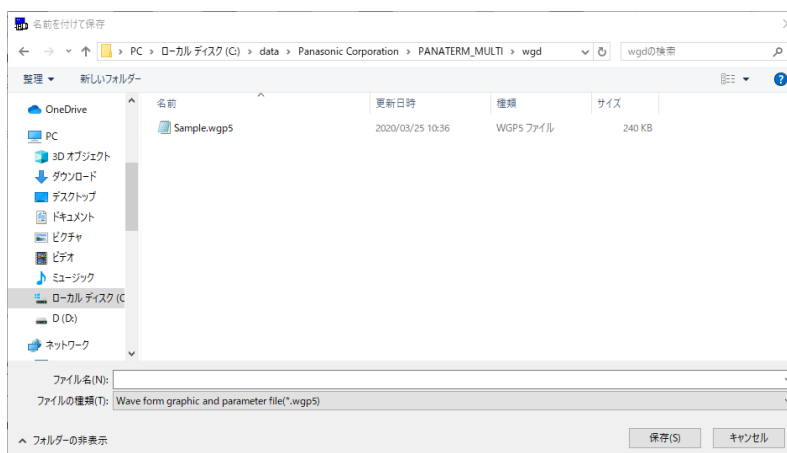This dialogue is only the objective file is displayed.
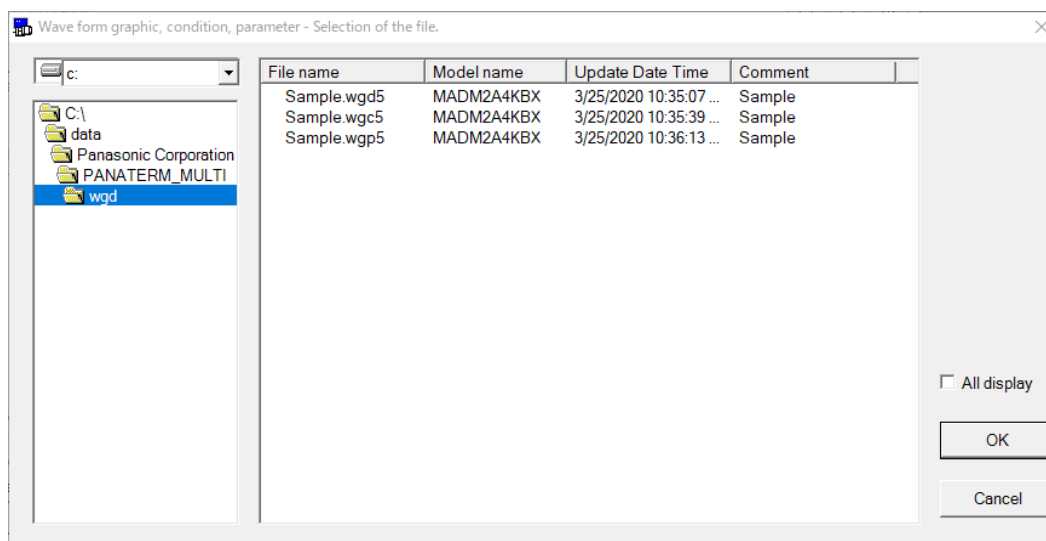
"All display"   : If you checked this, files are displayed that you didn't select series too.

Use dialogue box of Windows common dialogue box for read other file.

<Save>

Use dialogue box of Windows common dialogue box.

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\<Notes\>

  Extensions are added to files dealt with PANATERM to identify the types of each files. Please do not change the extensions. PANATERM cannot read files if their extensions are changed.

Parameter file	filename.prm5 filename.prm6 [*1]
Parameter comparison file	filename.csv
Wave form graphic measure condition file	filename.wgc5 filename.wgc6
Wave form graphic measure result file	filename.wgd5 filename.wgd6
Wave form graphic parameter and measure result file	filename.wgp5 filename.wgp6
Frequency character measure condition file	filename.fcc5
Frequency character measure result file	filename.fcd5
Frequency character parameter and measure result file	filename.fcp5
Monitor screen log file	filename.mon5 filename.mon6 [*1]
Fit gain measure result file	filename.fit5
Object data file	filename.obj6

*1 Valid only when Power Supply Module (PSM) is selected in module selection.

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Closing down way of each screen

Each screen are closed down clicking "Exit" with left button of the mouse when there is "Exit" button on the tool bar of the each screen. Also they can be closed down clicking right above of the screen.

Tool chip text

The explanations of the objective items are displayed if the mouse button is put on the displayed items.
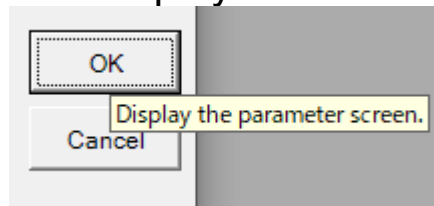
5. Start up and Close down

## Connection

Connection of USB cable (Commercialized product)

Please confirm that all power supplies of the driver and PC are turned off. Please be sure to insert USB cable.

Please refer to the driver's manual or technical reference regarding connection and setting measure with the front panel.

<In case 1 driver is connected>
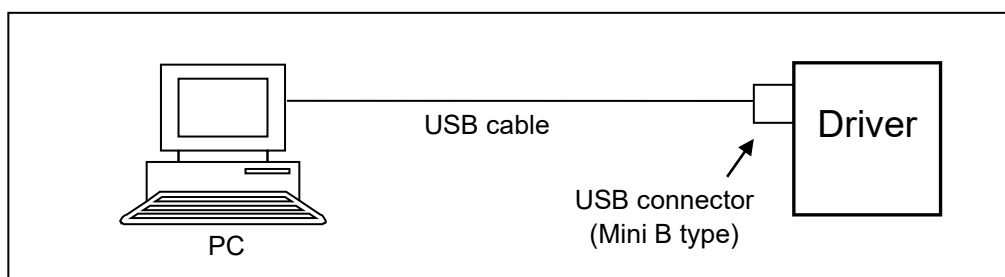
Notes 1) Regarding communication speed, it is applicable to full speed of 12 Mbps only. Actual communication speed may change largely by many causes, connection to USB equipment other than drivers, operation load condition of PC side OS, communication error caused by communication error by noise or something, driver's response speed, and so on.

Notes 2) USB cables are not prepared by our company. Please use commercialized USB cables applied to USB2.0 with shield and ferrite core for anti - noise.

Notes 3) When two or more systems are connected simultaneously in parallel the operation of PANATERM cannot be guaranteed.

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Connection of Ethernet cable (Commercialized product)

   Please confirm that all power supplies of the driver and PC are turned off. Please be sure to insert Ethernet cable.

   Please refer to the driver's manual or technical reference regarding connection.

<In case driver is connected directly>

<In case driver is connected via a controller>
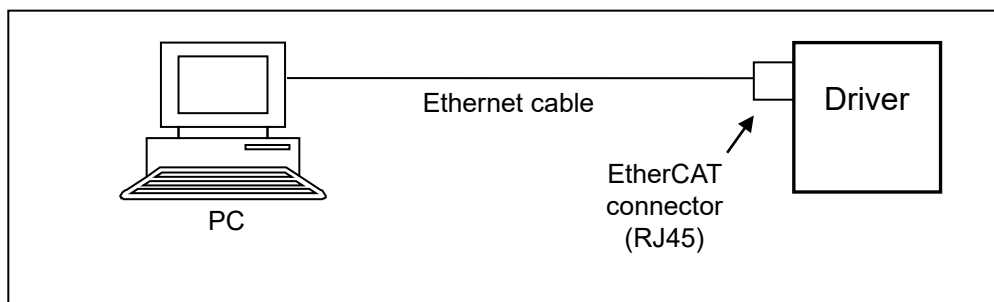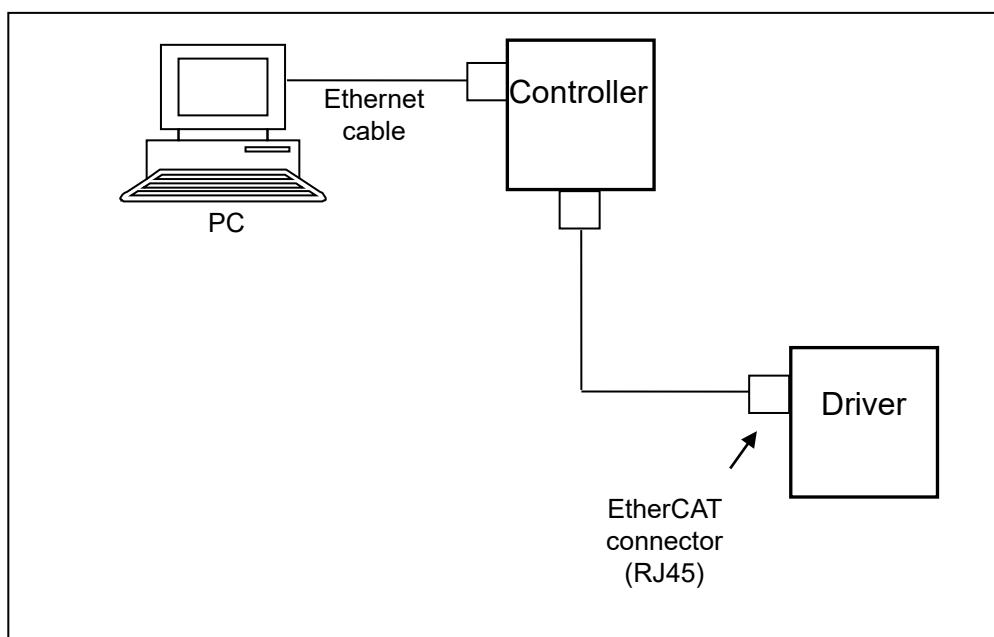
Start up of PANATERM

1 Turn on the PC, and start up Windows.
2 Turn on the driver.
3 Click the shortcut of "PANATERM for Multi" made on the desktop on the installation.
  In case of no shortcut on the desktop, select the group of "start" > "PANATERM" of Windows, and click "PANATERM for Multi" among them.
4 PANATERM main screen is displayed.

  Note) When PANATERM starts up for the first time, the indication below is displayed to copy sample data of wave form graphic or something saved in PANATERM into "My document". Choose "Continue".
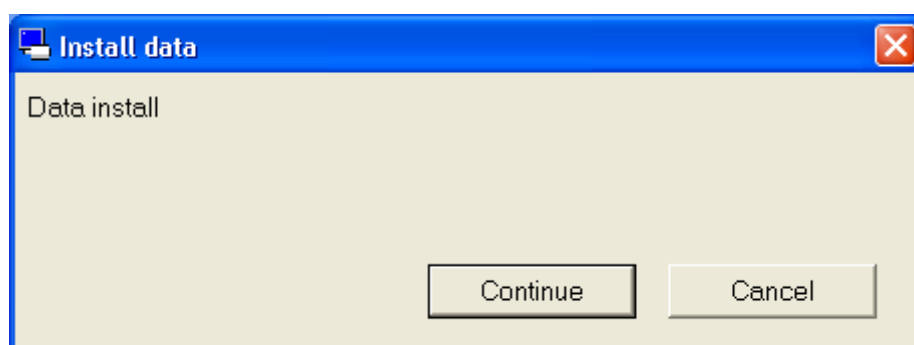
Close down of PANATERM

1 To close down PANATERM, click "File" > "Exit of PANATERM" on the menu of PANATERM screen.
  (Clicking ⊠ right end of the title bar on PANATERM screen is also same operation as "Exit of PANATERM")
2 A message to confirm closing down PANATERM is displayed.
  To close down, click "Yes", to continue PANATERM operation, click "No".

Note) Please note that if programs are closed down without saving information set or data obtained, all information would be lost.

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6. Screen Operation

Select connection with drivers

　　Starting PANATERM displays a dialog box asking if you want to start communication with a driver. The dialog box also appears when you click "Connect" from the tool bar of the main screen or when you select "File" > "Setting" > "Communication with the driver" from the menu bar of the main screen.

Selection of the communication with the driver

"STEP1: Select connection method"
  Select the connection method with the driver from the following.

  "USB"
    Communicates with the driver connected by USB.

  "EoE communication"
    Performs EoE communication with the driver to which the Ethernet cable
    is connected. EoE settings must be completed in advance.

    "EoE Settings"
      Click the "EoE Settings" button to change the network settings for EoE
      communication. Enter the IP address of the slave driver. By clicking the
      "ping" button, you can determine whether the entered IP address is valid.
      If the result of the judgment is invalid, "NG" is displayed.

  "Do not communicate with amplifier"
    You can freely edit parameters saved in a file without connecting to a
    driver. If you do not communicate with the driver, you cannot operate
    STEP2 or later, but you can operate the module selection in the "Option"
    area. Click "OK" to display the series selection screen.

"STEP2: Scan amplifier"
  Click the "Scan" button to scan the driver using the connection
  method selected in STEP1. The scan result is displayed in the list
  of STEP3. If the scan result is not displayed correctly, click the
  "Scan" button again.

"STEP3: Select amplifier"
  Select the driver you want to connect to from the scan results.
  The following operations can be performed in the selected state.

  *Option
    "Confirm amplifier connection"
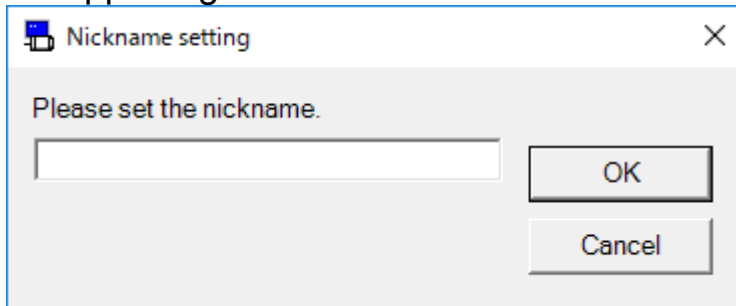   Click the "7segLED flash" button to blink the 7segLED on the front
      panel of the selected driver.
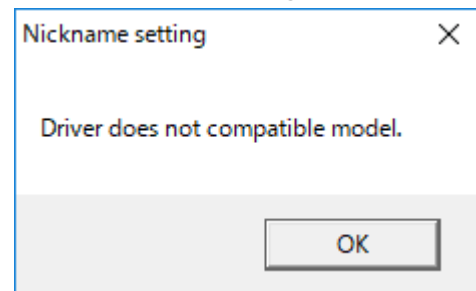
    "Change amplifier setting"
      Click the "Nickname" button to change the selected driver nickname.
      For models that support nicknames, the nickname setting screen
      appears. For models that do not support nicknames, an error dialog

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box appears.

< Supporting models >   < Non-supporting models >

| Nickname setting   ✕ | | Nickname setting   ✕ |

Supporting models dialog:
Nickname setting ✕
Please set the nickname.
[   ]   OK
                          Cancel

Non-supporting models dialog:
Nickname setting ✕
Driver does not compatible model.
                    OK

Note) Initial indication of Nickname setting screen shows blank if no nickname is set up, and the set nickname if a nickname has already been set.

Set up the nickname on Nickname setting screen and click "OK" to reflect the change in nickname, then terminate the Nickname setting screen.
Click "Cancel" to terminate Nickname setting screen without reflecting the nickname change.

"Select module"
This operation can be performed only when the "MINAS A6 Multi" series exists in the scan results of the driver. When "Drive Module" is selected, DM (Drive Module) is displayed in the scan results, and when "Power Supply Module" is selected, PSM (Power Supply Module) is displayed in the scan results. Reselect the driver you want to connect. Also, when the PSM is connected, the screen dedicated to the PSM is activated, and only the PSM parameter screen, PSM monitor screen, and PSM alarm screen can be used. (For details, refer to "PSM Parameter, Monitor, Alarm screen" (page 190).)

"Set series selection"
Select the application method of the driver series definition file used in PANATERM. If you check "Select automatically", the series definition file will be selected automatically. If you uncheck it, you can select it manually. Check "Select automatically" for normal use.

After setting the above options, click the "OK" button to start communication with the selected driver and display the main screen. However, if the "Select automatically" of "Set series selection" is unchecked, or if a driver that requires model selection (such as A6N 2AXIS) is connected, the series selection dialog will be displayed. If you click the "Cancel" button, the connection settings will be cleared, the connection screen with the driver will be terminated, and the main screen will be displayed. However, PANATERM is terminated if the driver is not connected.

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Notes 1) When there are drivers communicating, the drivers are displayed "Now Connect". To continue the communication with the drivers communicating, please click "Cancel".

Notes 2) The driver displayed as "Already Used" cannot be selected. The driver may be communicating with other applications, or it may be operating the front panel.

Notes 3) The connection screen displays the nickname set in the driver with axis information "(A-axis) or (B-axis)" added.

Series setting (When connecting to an amplifier)

When uncheck the "Select automatically" of "Set series selection" or connect the driver (A6N 2AXIS, etc.) that requires model selection, the series selection dialog is displayed. Select the series name of the driver you are using. However, if there is only one type of series, the series selection dialog will not be displayed.

1 The driver selected in STEP 3 is displayed. Select the driver series name from the drop-down list. For the correspondence between the driver part number and series, see "Confirming applicable drivers " (page 8).
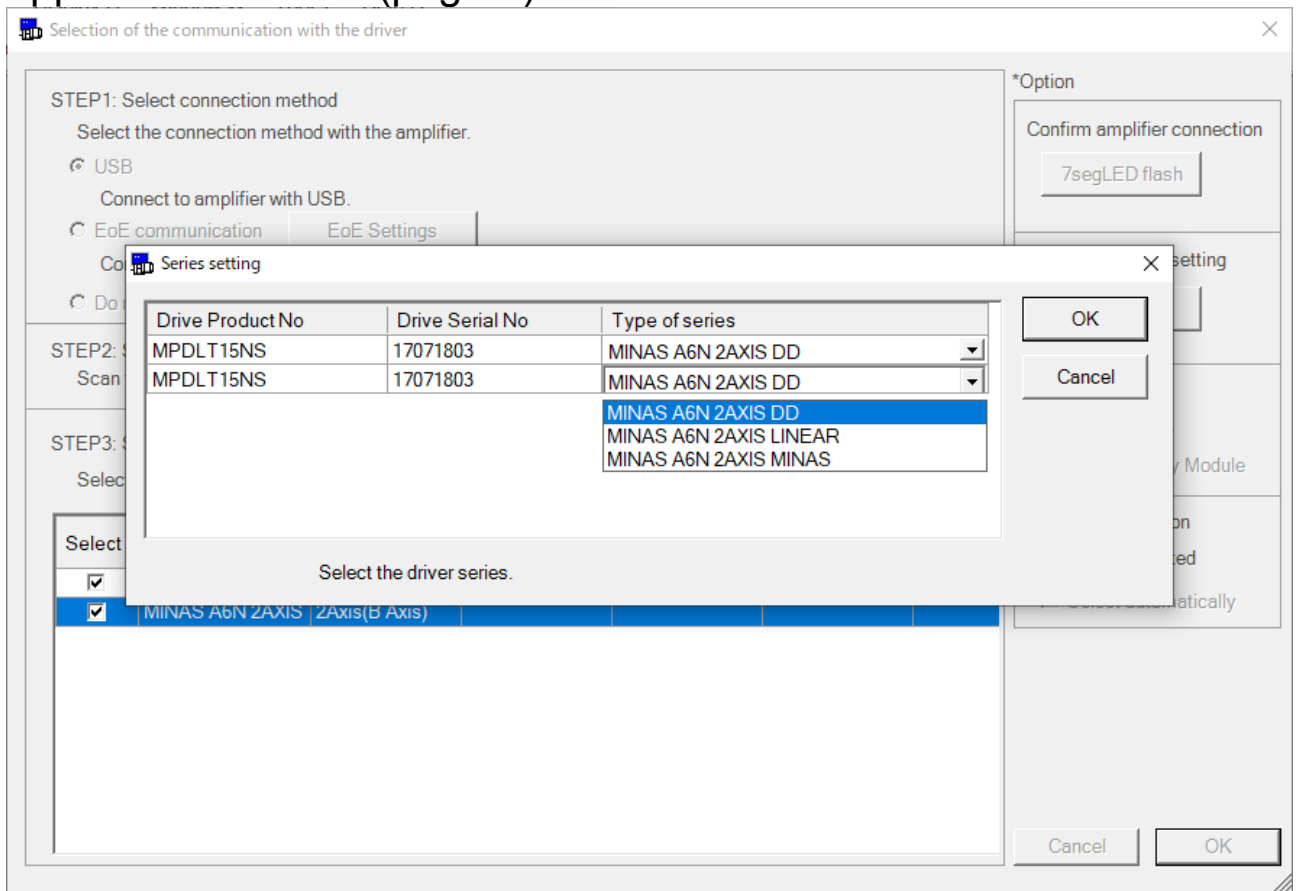
"OK"　　　 : Selected items are determined.
"Cancel" : Selected items are cancelled out.

2 The main screen is displayed and various functions can be used.

Series setting (When not connecting to an amplifier)

When select "Do not communicate with amplifier" in Step 1, select the series definition file to use.

1 Select the series name of the driver from the list.
    Regarding the combination between the driver's model and the series, please refer to page 8 "Confirming applicable drivers".
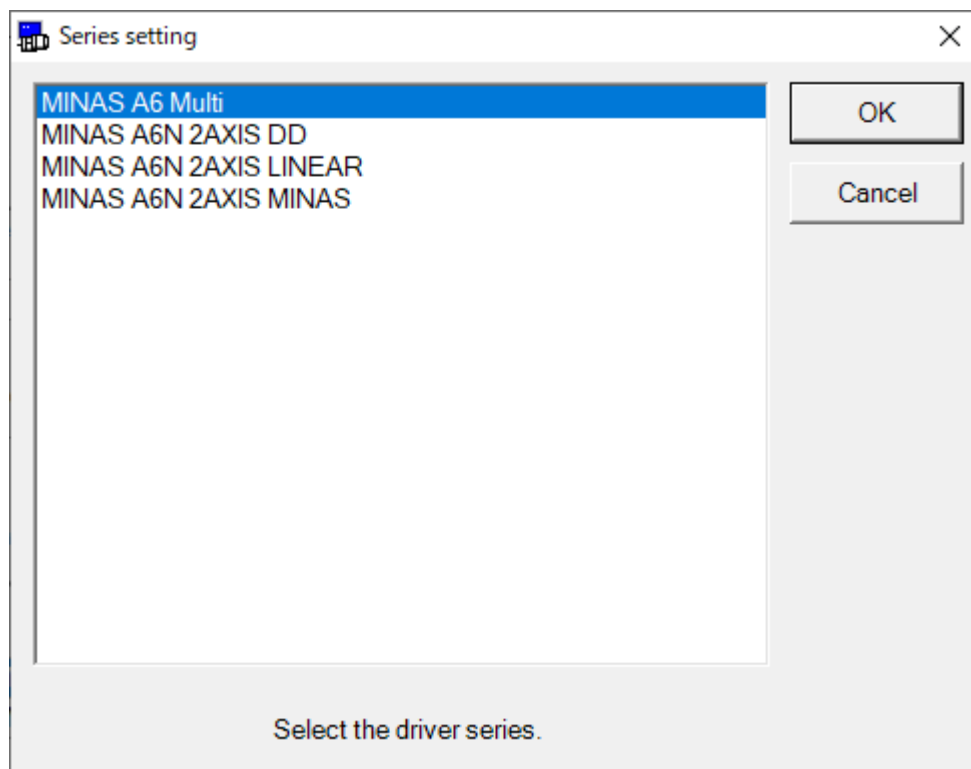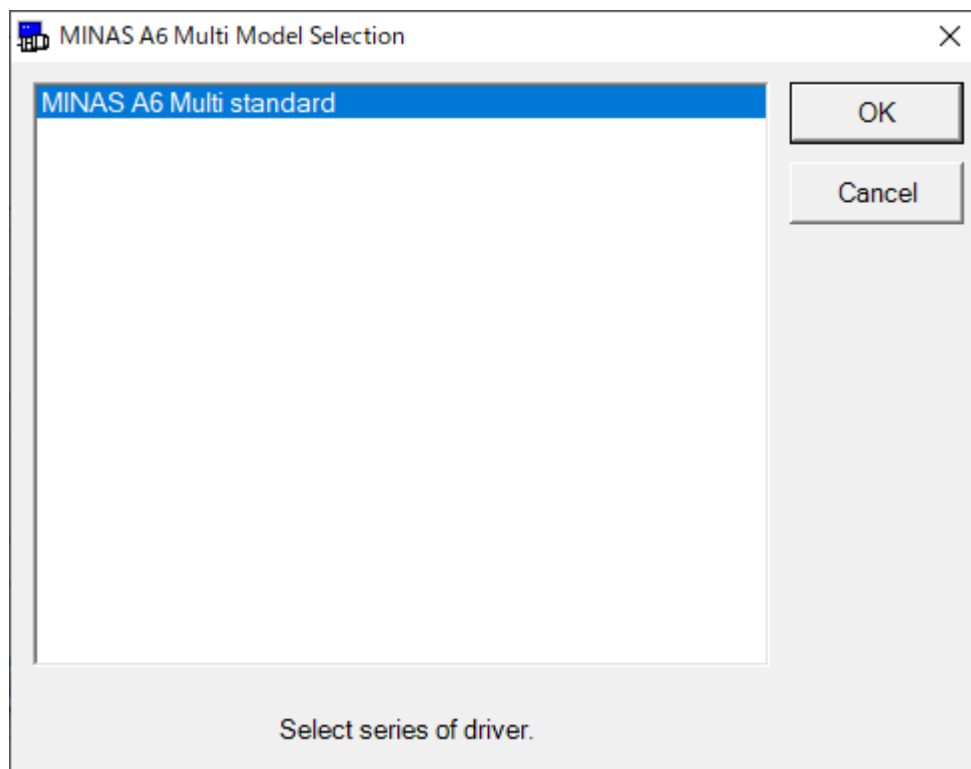

"OK"   : Selected items are determined.
"Cancel"   : Selected items are cancelled out.

Note) Even "Communication with the driver" selected, if drivers model cannot be identified automatically, series selection is executed in case of derivational model, specified model.

2 Select the driver's model from the list.

"OK" : Selected items are determined.
"Cancel" : Selected items are cancelled out.

3 The main screen is displayed and various functions can be used.

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Main screen

Once PANATERM start up, the main screen is displayed. Many PANATERM functions are used opening each function windows in this main screen. Some function windows cannot use being opened together.

You can display only valid function window.

Series		MINAS A6N 2AXIS MINAS	MINAS A6N 2AXIS DD	MINAS A6N 2AXIS LINEAR	MINAS A6 Multi (PSM)	MINAS A6 Multi (DM)
Usable function window	Parameter	✓	✓	✓	✓*2	✓
	Monitor	✓	✓	✓	✓*2	✓
	Alarm	✓	✓	✓	✓*2	✓
	Gain Tuning	✓	✓	✓		✓
	Wave form graphic	✓	✓	✓		✓
	Trial run	✓	✓	✓		✓*1
	Frequency characteristics	✓*3	✓*3	✓*3		✓*3
	Pin assign	✓	✓	✓		✓
	Trouble shooting	✓	✓	✓		✓
	Z phase search	✓				✓
	Fit gain (standard)	✓				✓
	Fit gain (2 degrees of freedom control)	✓		✓		✓
	Object Editor					✓
	Battery refresh					✓
	Deterioration diagnosis	✓	✓	✓		✓
	Magnetic pole position estimation results copying		✓	✓		

Some functions are restricted depending on software version of driver.
For details, refer to technical specification of driver.

*1 Regarding the test run during EoE communication, if the communication is unstable, the parameters cannot be changed until the communication times out, and an unsafe state may result. Please ensure sufficient safety.
*2 The screen for PSM is displayed while PSM is selected. (For details, refer to "PSM Parameter, Monitor, Alarm screen" (page 190).)
*3 Analysis after measuring frequency characteristics cannot be used with the MINAS A6 series.
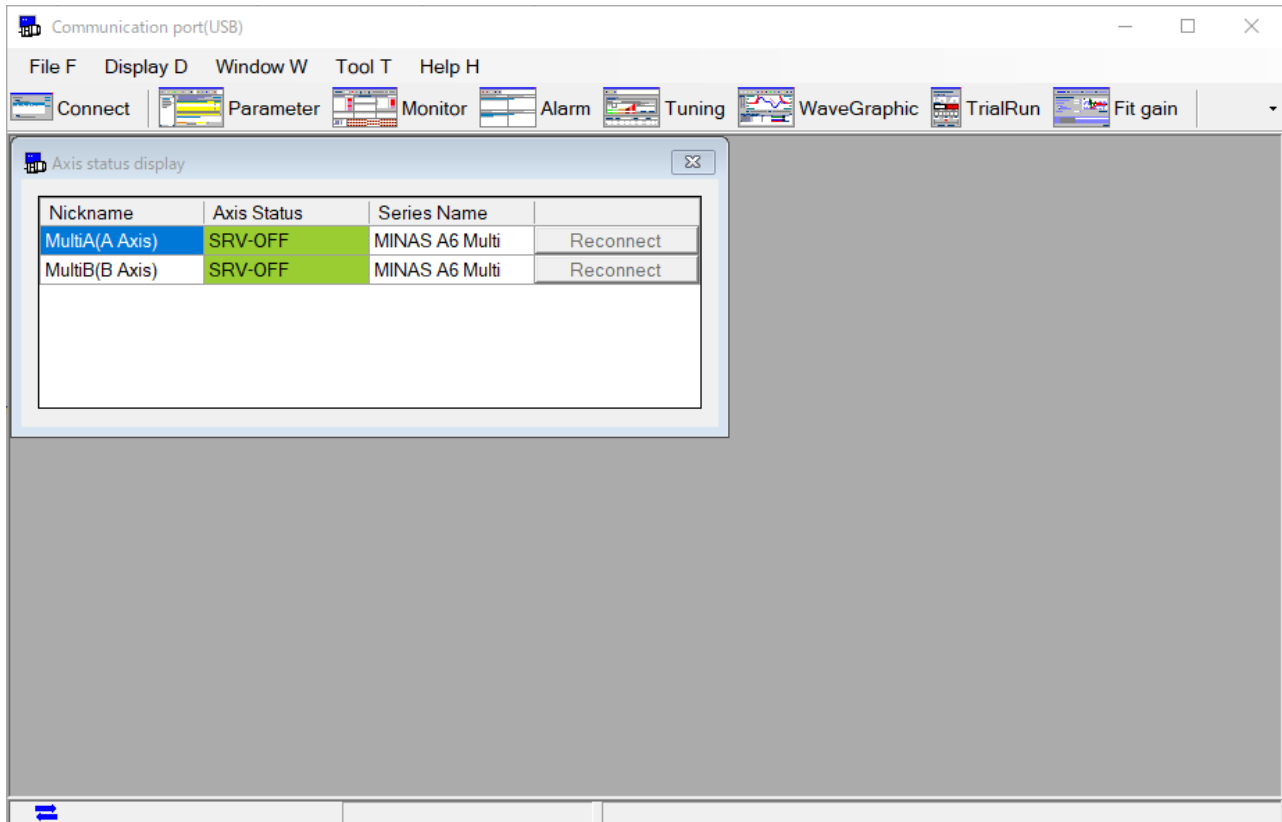
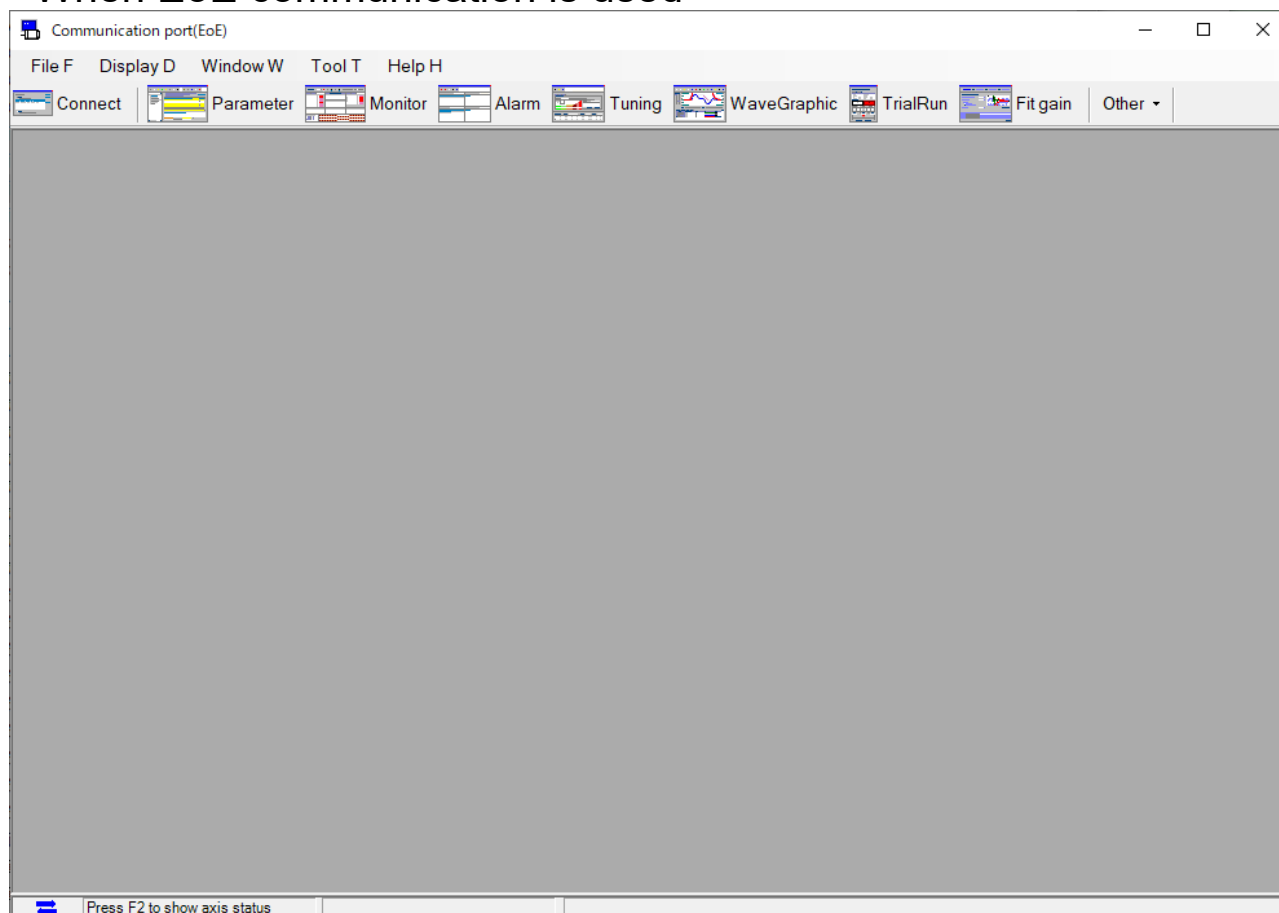<When USB communication is used>

Note) Pin assign setting screen can be operated when all other windows are closed.
Even outside the above function window, combinations in the following is cannot use.
(See the next page's table.)

	Functions that cannot be opened simultaneously
Parameter	Gain tuning, Fit gain (Standard), Fit gain (2 degrees of freedom control), Object Editor, Deterioration diagnosis, Magnetic pole position estimation results copying
Gain tuning	Parameter, Fit gain (Standard), Fit gain (2 degrees of freedom control), Object Editor, Deterioration diagnosis, Magnetic pole position estimation results copying
Trial run	Fit gain (2 degrees of freedom control), Z phase search, Magnetic pole position estimation results copying
Frequency characteristics	Fit gain (Standard), Fit gain (2 degrees of freedom control)
Z phase search	Fit gain (2 degrees of freedom control), Trial run, Magnetic pole position estimation results copying
Fit gain (Standard)	Parameter, Gain tuning, Frequency characteristics, Object Editor, Deterioration diagnosis, Magnetic pole position estimation results copying
Fit gain (2 degrees of freedom control)	Parameter, Gain tuning, Trial run, Frequency characteristics, Z phase search, Object Editor, Deterioration diagnosis, Magnetic pole position estimation results copying
Object Editor	Parameter, Gain tuning, Fit gain (Standard), Fit gain (2 degrees of freedom control) , Deterioration diagnosis, Magnetic pole position estimation results copying
Deterioration diagnosis	Parameter, Gain tuning, Fit gain (Standard), Fit gain (2 degrees of freedom control), Object Editor, Magnetic pole position estimation results copying
Magnetic pole position estimation results copying	Parameter, Gain tuning, Trial run, Fit gain (Standard), Fit gain (2 degrees of freedom control), Z phase search, Object Editor, Deterioration diagnosis

<When EoE communication is used>

Note) Pin assign setting screen can be operated when all other windows are closed.
Even outside the above function window, combinations in the following is cannot use.

	Functions that cannot be opened simultaneously
Parameters	Gain adjustment, Object Editor, Deterioration diagnosis
Gain adjustment	Parameters, Object Editor, Deterioration diagnosis
Object Editor	Parameters, Gain adjustment, Deterioration diagnosis
Deterioration diagnosis	Parameters, Gain adjustment, Object Editor

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Structure of main screen

(1) Title bar

(2) Menu bar

(3) Tool bar

(4) Axis status display window
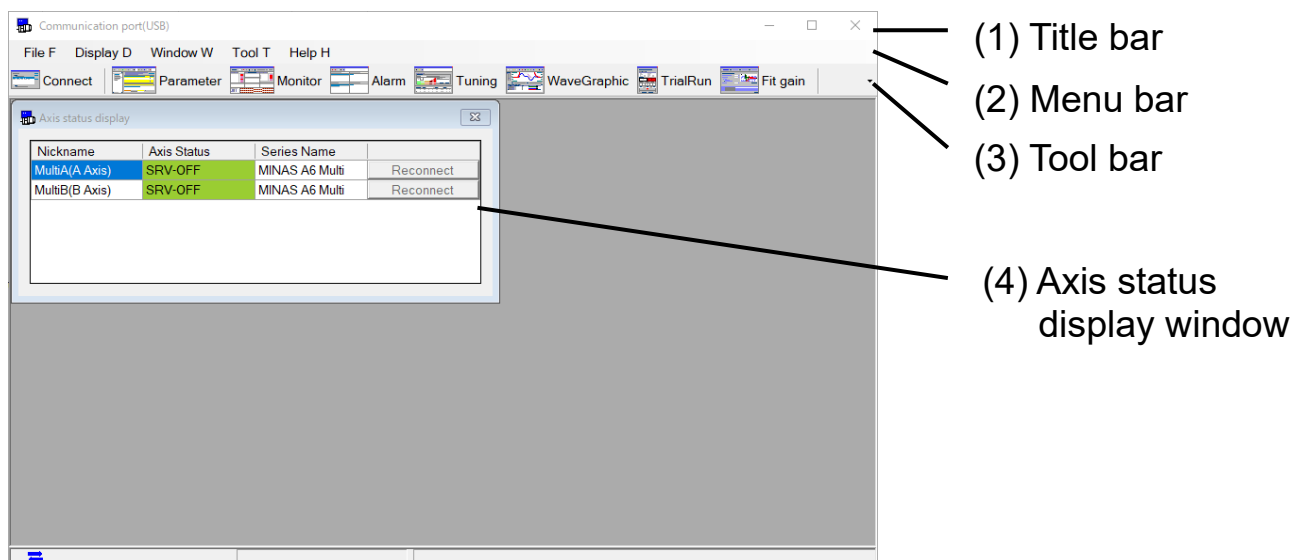
(1) Title bar

Model code and setting condition of communication port are displayed.
If it does not communicate with the driver, the series name of the driver is also displayed.

(2) Menu bar

The menu of "File", "Display", "Window", "Tool" and "Help" are displayed. Click a command name to use a command. Some commands are divided by functions. And they changes by opening each function's.
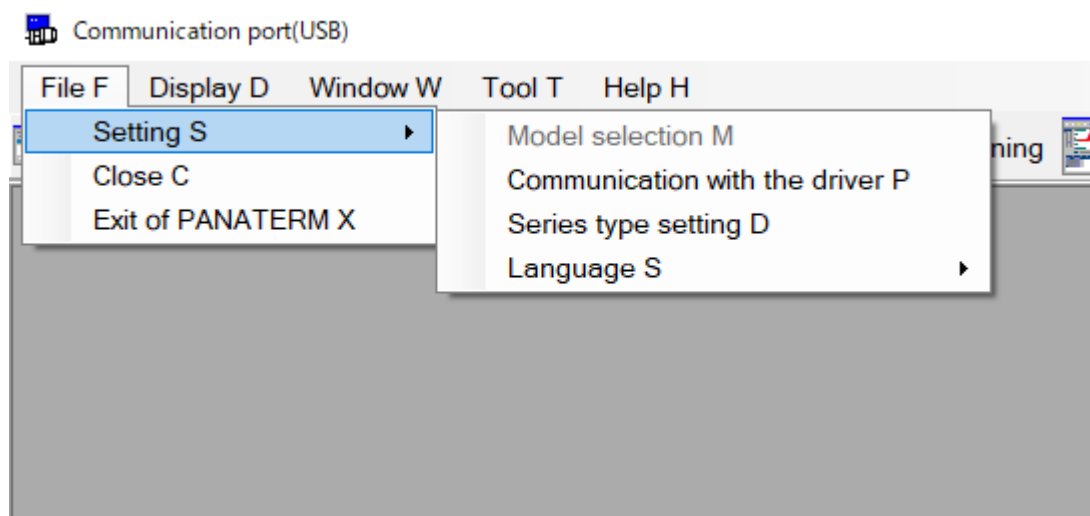
(3) Tool bar

Each function windows are called. Function windows can be called also out of the menu bar of the main screen.

Without communication with drivers, valid functions are limited.

In subsequent explanation, the functions that can call a function window with a tool bar are explained with the case using a tool bar for an example.

(4) Axis status display window

This window displays the nickname and status of each axis. Check information in this window to confirm servo on or off, the alarm condition, and the STO status for each axis. Various states and the corresponding display are as follows.

Condition	Object
Servo ON	SRV-OFF
Servo OFF	SRV-ON
Alarm	Err21.0
STO	STO

Function target axis selection screen

When a 2-axis type has been connected, press each button that invokes a function, and as a screen is displayed to select the axis for which the function is to be executed, select the applicable axis here. However, for the Parameter, the Monitor, the Alarm, the Wave form graphic, the Pin assignment setting, and the Object Editor, this function target axis selection screen is not displayed.

1   On the main screen, click the button of the function to be executed.

2   As the target axis selection screen opens as shown in the figure below, select the axis for which the function is to be executed. (The nickname given to the axis and A-axis or B-axis is displayed. If no nickname is set in the driver, the nickname is NoName.)
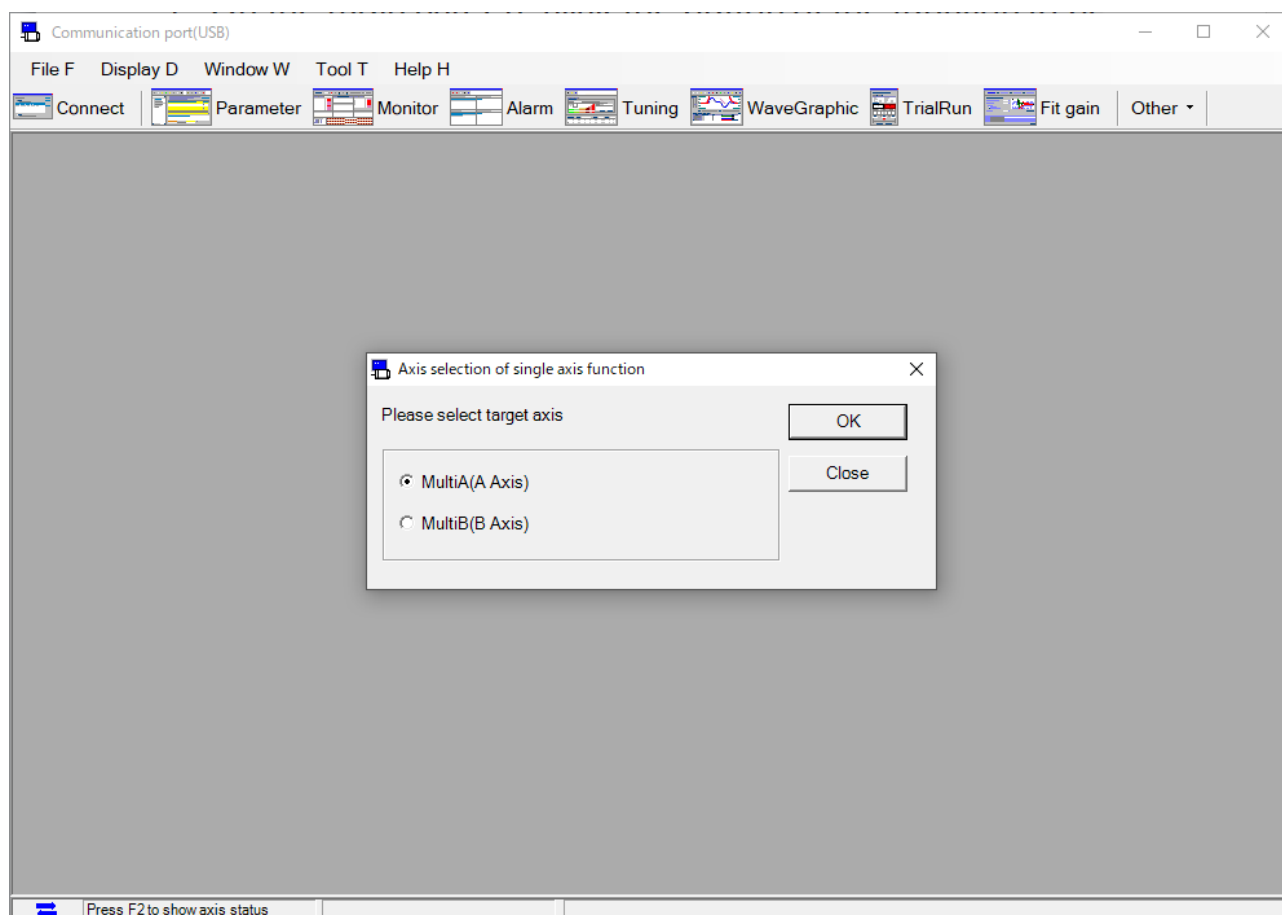
3 The screen for the selected function opens. The title bar of this selected function shows the nickname of the axis and whether it is the A-axis or the B-axis.
(The figure below shows an example for the trial operation screen.)

Trial Run - Operation Area Setting-Mult A(A Axis)

STEP1:Check of the servo on
Click "Servo Off" on the operation area setting panel and then click "Servo On".

STEP2:Interference check
Configure the parameter on the Parameter area. Then operate the motor by the JOG operation button on the operation area setting panel with confirming the motor operation.
Configure the Max / Min of motor operation area.

After completion of motor operation area, click the "Go Trial Run" button to proceed to the test operation window.

STEP3:Test operation
Operate the motor using the buttons on the test operation panel.

Item Name	Area	Value	Unit
JOG Speed	1-500	60	r/min
JOG Acc./Dec. time	1-5000	50	ms

Protect setting	Area	Value	Unit
Over-speed level setup	0-20000	120	r/min
Over-load level setup	0-115	50	%
Motor working range setup	0.1-100.0	0.5	Revolution

Operation Area Setting Panel   ☑ Auto-set (Over-speed level setup)

Servo On/Stop   ■   Servo Off(Esc Key)   ✕

JOG

Pos(+)   Neg(-)

MAX (pulse)   MOTOR (pulse)   MIN (pulse)
0   0   0

Close   Skip   Go Trial Run

Function target driver selection screen

When you press the button that calls each function when multiple drivers are connected, the function target driver selection screen is displayed. Select the driver to be operated. This screen is displayed only when the Pin assign setting or the Object Editor function is executed.

1   On the main screen, click the button of the function to be executed.

2   As the target axis selection screen opens as shown in the figure below, select the driver for which the function is to be executed.
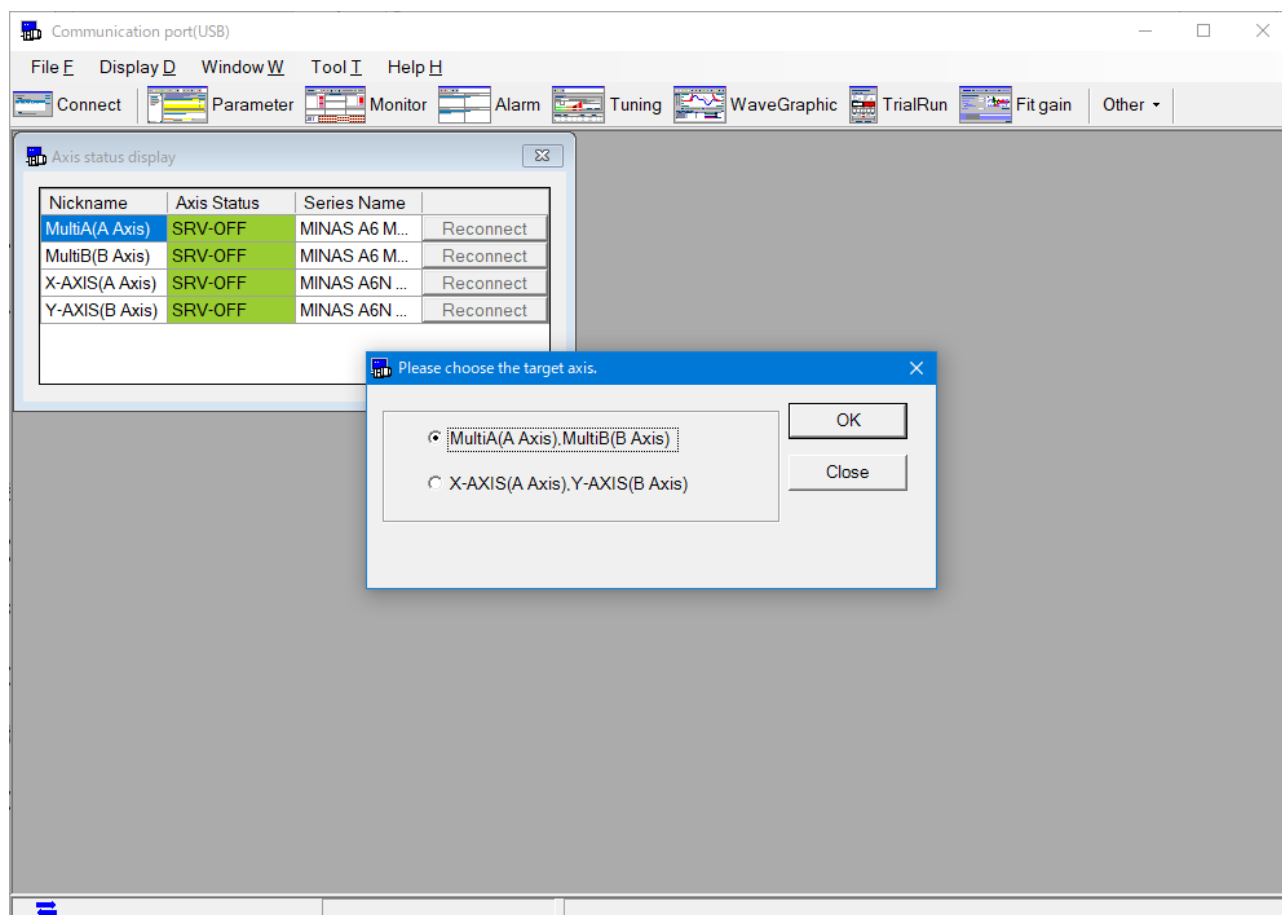
3   The screen for the selected function opens.

Series type setting screen

In a series type setting screen, you can use the driver of other series by adding a series definition to PANATERM.

Note) Please use the default setting normally.
For more information, please contact a distributor.

Open the Series type setting window
1 Start "PANATERM".
(Please refer to Article 5. Start up and Close down in details)
2 Click "File" > "Setting" > "Series type setting" of the menu bar on the main screen.
3 The Series type setting window is opened.
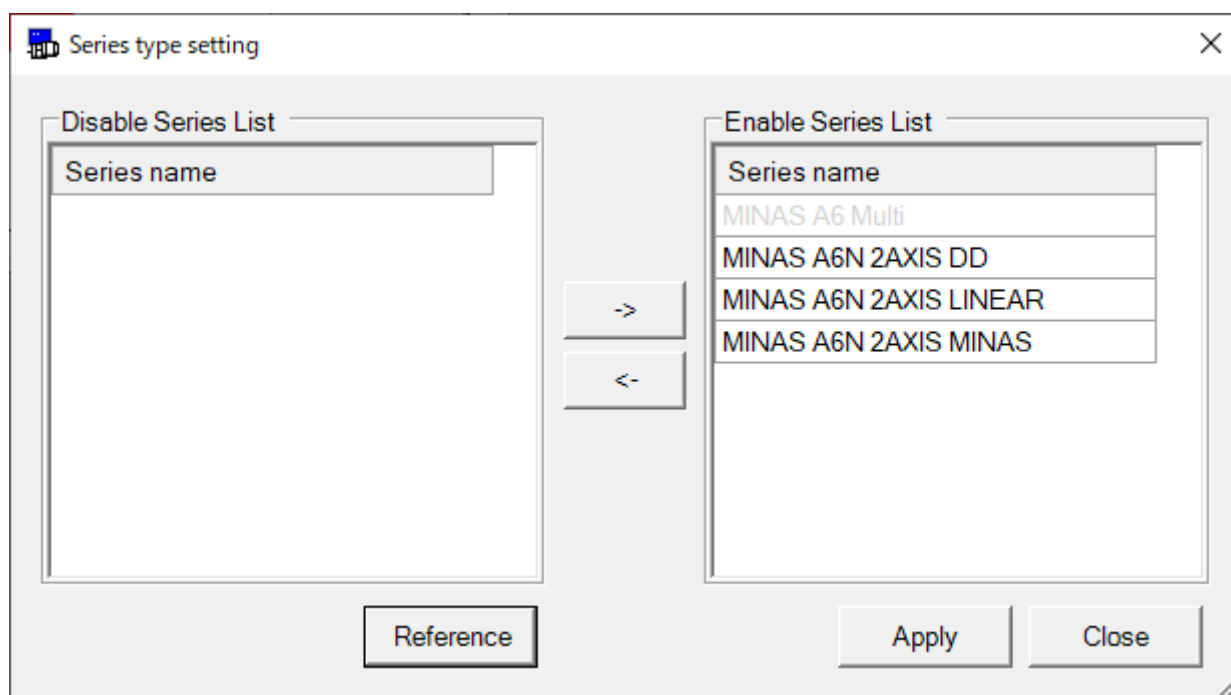
"->"   : Move selected series in "Disable Series List" to "Enable Series List".
"<-"   : Move selected series in "Enable Series List" to "Disable Series List".

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"Reference"   : You can add a new series to "Enable Series List"
                     by referring to series definition file on the PC.
"Apply"   : Apply the changes of the series definition setting.
"Close"   : Close the series type setting window.

Enable Series List

The available series are displayed.
If you double click a series in this list or select series and click "<-"
you can move it to "Disabled Series List".

Disable Series List

The unavailable series are displayed.
If you double click a series in this list or select series and click "->"
you can move it to "Enabled Series List".

Close the Series type setting window

Click "Close" button or ☒ button at top right of the screen.
If you do not run "Apply" after changing the series definition, the
exit confirmation dialog is displayed.

Adding and updating of the series definition by reference

1. If you click "Reference", the Browse For Folder dialog box is displayed, and you can select folder.

Browse For Folder ✕

Please select the Series definition.

- ∨ 📁 PANATERM_MULTI
  - ∨ 📁 ini
    - ∨ 📁 def
      - › 📁 MINAS A6 Multi
      - › 📁 MINAS A6 Multi NEW
      - › 📁 MINAS A6N 2AXIS DD
      - › 📁 MINAS A6N 2AXIS LINEAR
      - › 📁 MINAS A6N 2AXIS MINAS
      - › 📁 MINAS-A5
      - › 📁 MINAS-A5N
      - ∨ 📁 MINAS-A6
        - 📁 en
        - 📁 ja

[OK] [Cancel]
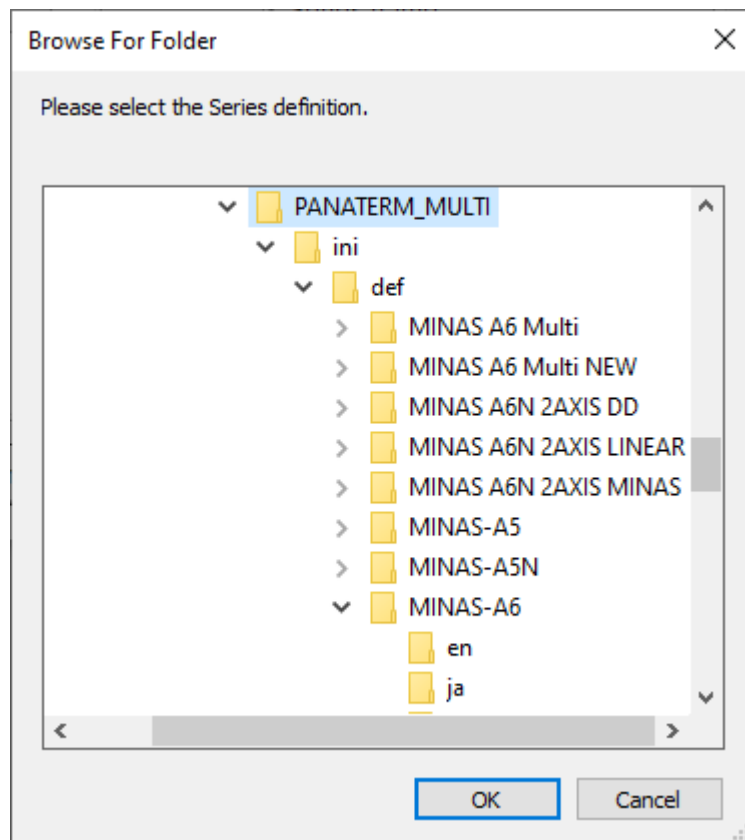
2. Click "OK" after selecting the folder.
   If selected folder has a series definition file then a confirmation dialog is displayed.
   Click "Yes" then the series definition file is added.

Are you all right ? ✕

Add the selected Series definition.

[Yes] [No]
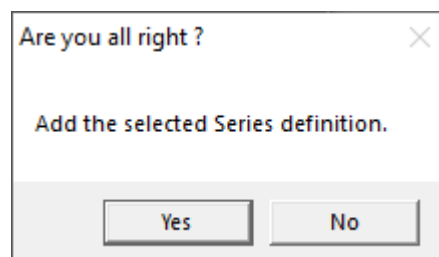
3. If adding a series definition is success, "Enable Series List" will be updated.
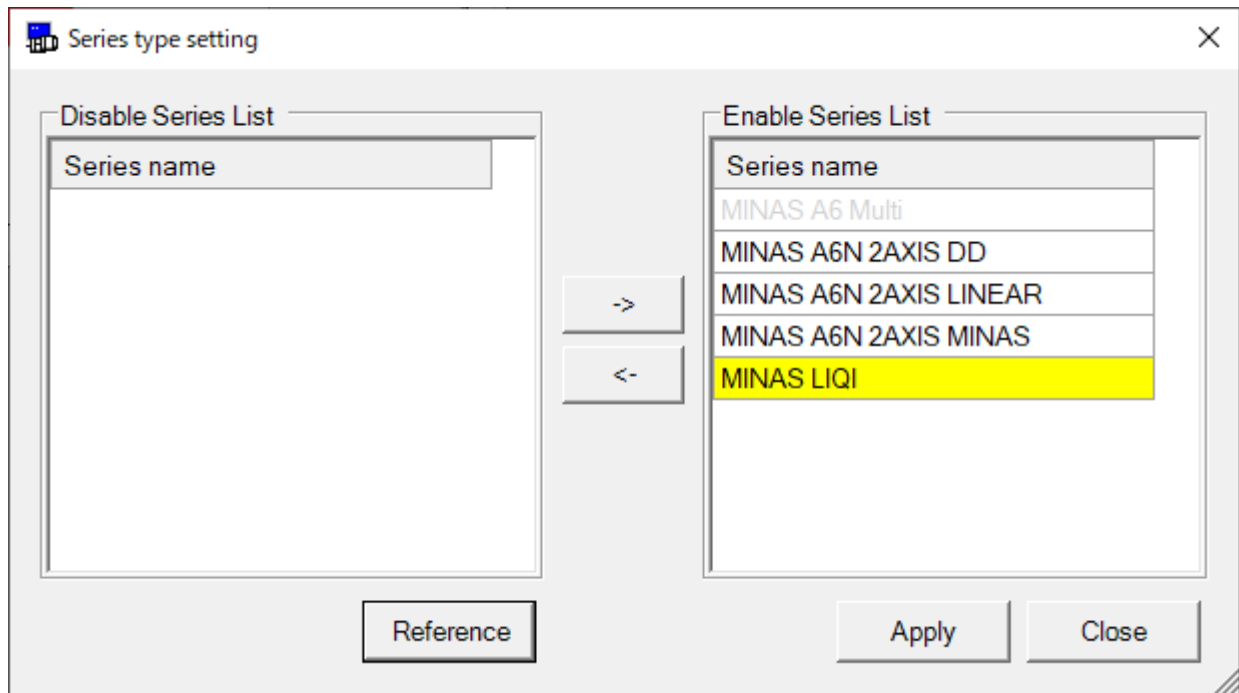
* The background color of the series definition that you added or updated will change.

4. Click "Apply", in order to enable changes of the series definition. If you change the series definition, the confirmation dialog will be displayed.
Click "Yes" then apply changes of the series definition.
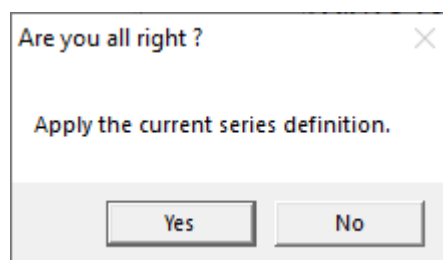
5. Completion of Series definition setting dialog will be displayed.

< When changed >

Completion of Series definition setting   ✕

Apply of the series definition is complete.

OK

< When not changed >

Completion of Series definition setting   ✕

No change in the series definition.

OK
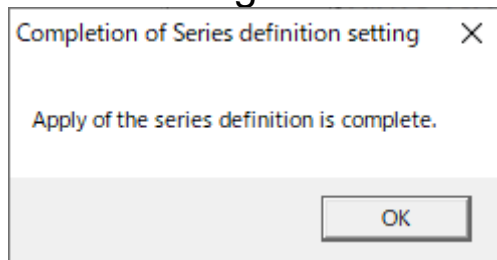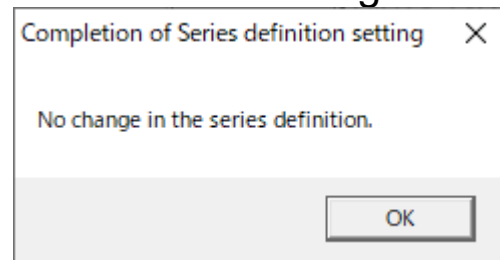
6. The series that have been added are available for selection in the series setting screen.

Series setting   ✕

MINAS A6 Multi
MINAS A6N 2AXIS DD
MINAS A6N 2AXIS LINEAR
MINAS A6N 2AXIS MINAS
MINAS LIQI

OK

Cancel

Select the driver series.
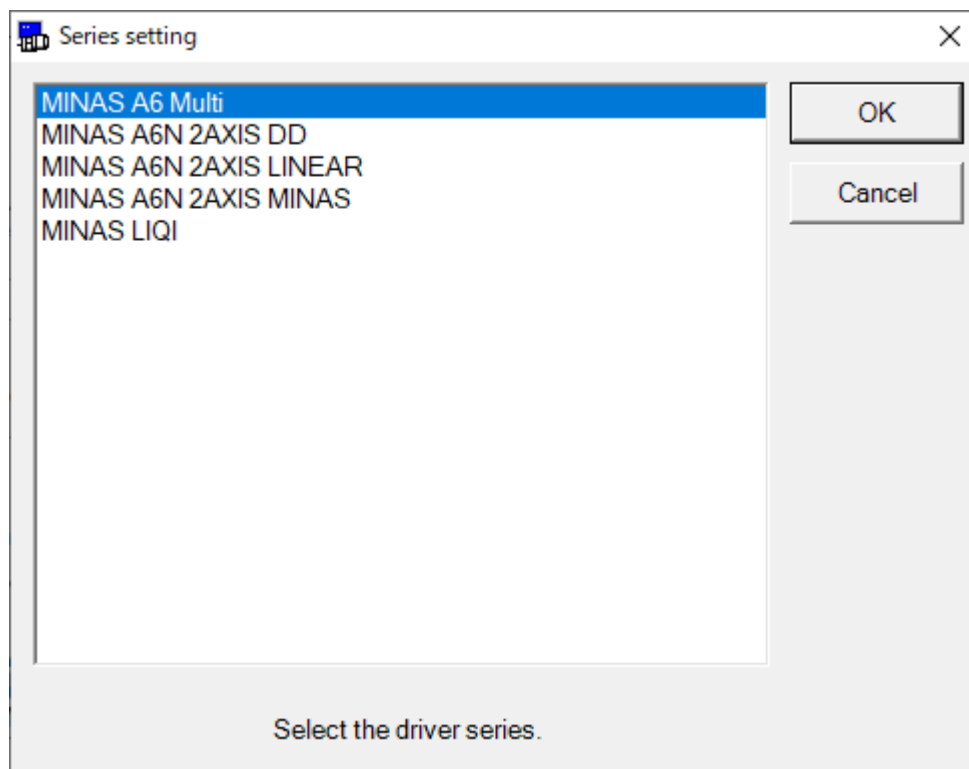
Notes 1) You cannot delete or update current selected series.
     If you want to delete or update current selected series, please retry after switching to the other series.
Notes 2) The series definition in "Disable Series List" with a yellow background color does not exist in the installation folder of PANATERM.
     So, if you delete that series, it will not be displayed "Disable Series List". If you do not have a backup, you cannot restore.
Notes 3) When you update a series definition, some of the previous settings are initialized.

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Parameter screen

In a parameter screen, parameter check of drivers, modification of parameters, saving parameters into files and some other operations on parameters are available.
The screen for PSM is displayed while PSM is selected. (For details, refer to "PSM Parameter, Monitor, Alarm screen" (page 190).)

Note) Please modify parameters with enough care after reading the driver's instruction manual or technical reference carefully, as some parameters give large effect to operations of drivers or motors.

Open the Parameter window
1 Start "PANATERM".
   (Please refer to Article 5. Start up and Close down in details)
2 Click "Parameter" of the tool bar on the main screen.
3 Selection of parameter to be read window is displayed.
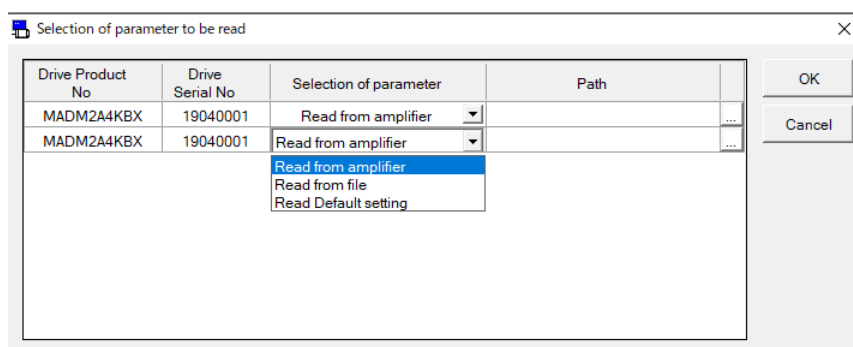
4 Select the source of read parameters for each axis and click.
   ☐ "Read - out from the driver"
      The parameters set in the driver are read communicating the driver connected. If this mode is selected, modifications of the parameter values are reflected to the driver immediately.
   ☐ "Read from the file"
      Parameter files already edited (.prm5) are read. Parameter modifications are not reflected to the driver connected unless "Transmit the parameter to the driver" is executed when they are "Read from the file".
   ☐ "Read the default"
      Default set values saved at the time of installation is read. The parameter modifications are not reflected unless "Transmit the parameter to the driver" is executed as the case of "Read from the file".

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5 Click "OK". The Parameter window is opened.
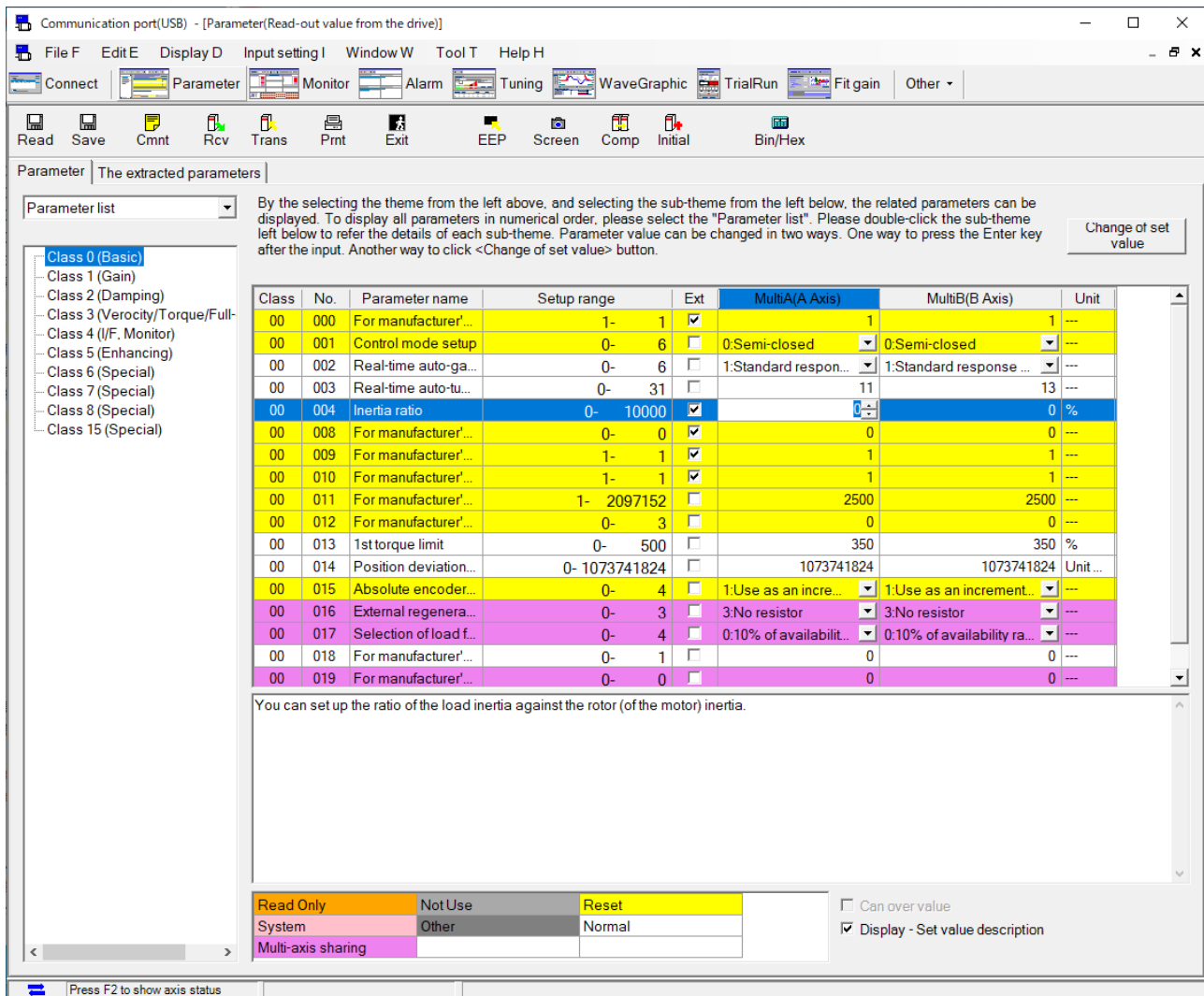
Close the Parameter window

Click 🔲 (Exit) on the tool bar.

Structure of Parameter screen

All parameters display tab

(1) Title bar
(2) Tool bar
(4) Parameter setting field
(5) Text indication box

(3) Theme selection
(6) Parameter attributes explanation
(7) Setting out of bounds is admitted
(8) Display - Set value description

Extracted parameters display tab

This tab allows the extraction and display of only parameters frequently checked and changed.

Tick the "Extract" column in the parameter setting field on the all parameters display tab to have only the ticked parameter numbers displayed on the extracted parameters tab.

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<u>About axis selection</u>

When a 2-axis type (RTEX) has been connected, A-axis and B-axis parameters are both displayed side by side. Clicking a cell of each column selects the axis of this column as the operation target. Files are saved and read and parameter names are displayed for this selected axis.

(1) Title bar   The origins of reference of parameters reference are displayed. Following buttons are used to operate windows.

	Display the window in full screen
	Close the window

(2) Tool bar   Saving, reading, some other basic operation commands on parameters are listed.

|		
	(Read)	Read parameters from a file (.prm5) for the axis currently selected as the operation target.
	(Save)	Write the parameters of the axis currently selected as the operation target to a file (.prm5).
	(Comment)	Makes comments attached to parameters files.
	(Receive)	Receive parameters of all axes.
	(Transmit)	Send parameters to the driver s of all axes.
	(Print)	Print the parameters of the axis currently selected as the operation target.
	(Exit)	Closes parameter screen.
	(EEPROM)	Write parameters to the driver's EEPROM for all axes.
	(Screen)	Captures the screen and save into a file.
	(Compare)	Compare parameters currently edited with other parameters for the axis currently selected as the operation target.
	(Initialize)	Initialize driver parameters for all axes.

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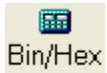
 (Binary/ Hexadecimal) Enter the number of binary and hexadecimal values of the selected setting.

(3) Theme selection

If the parameter classification is selected from the sub theme, related parameters are indicated in the parameter setting field.

Please refer to the manual of drivers or technical reference regarding the details of sub theme.
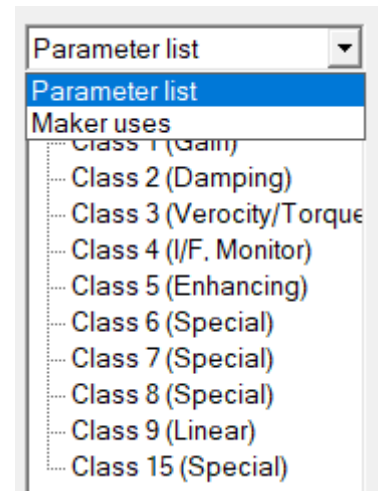
(4) Parameter setting field

Editing and setting of parameters are available.

"Class"	Parameter classifications are indicated.
"No."	Parameter numbers are indicated.
"Parameter name"	View the parameter name corresponding to the currently selected axis.
"Setup range"	View the maximum and minimum values of the setting range of the parameter corresponding to the currently selected axis.
"Set value"	Parameter value. Its value can be modified. Parameters with on the set values are set with the combo boxes. After selecting the values from the combo boxes, input the [ENTER] key or click (modification of set value). Parameters without on the set values, are inputted with the number keys directly, or modified clicking and changing the values. To set the values, input the [ENTER] key or click (modification of set value). If the [ESC] key is inputted, the value is return to the original one.
"Unit"	View the unit of parameter setting values corresponding to the currently selected axis.

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(5)   Text indication box
   It is a description of the parameters of the currently selected axis.

(6)   Parameter attributes explanation
   Explanations regarding of parameter attribute. Back ground colors of parameters indicate the attributes.

(7)   Can over value
   Without communication with drivers, if a check mark is inputted on "Can over value", settings out of bounds can be available. Setting with combo boxes is not available with check mark on "Can over value".

(8)   Display - Set value description
   The combo box and the decimal point are displayed when checking it. You can display more details of the parameters, when check on "Display - Set value description".

Comment

On saving set parameters in a file, comments can be saved together. These comments do not effect operations of the driver.

Making Comment

1 Click ▦ Cmnt (Comment) on the tool bar, and open the comment window.
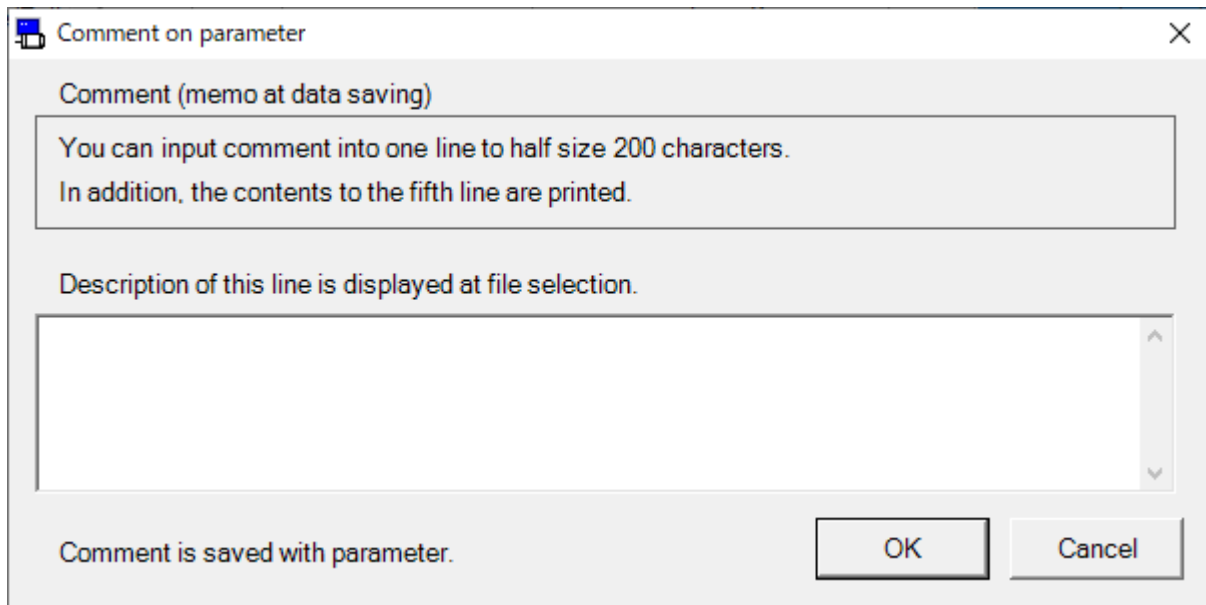
2 Click comment box and input comments.
3 After completing comment input, click "OK".

Comparison

Parameters being edited can be compared with other parameters. Comparison is performed for the axis selected as the operation target.

Comparison of parameters

1 Click [Comp] (Comparison) on the toolbar, and open the parameter comparison window.
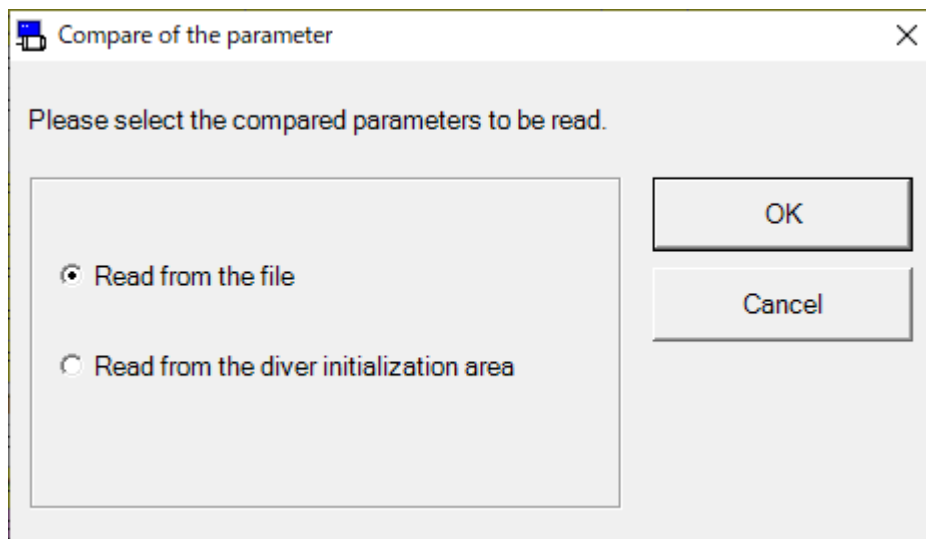
2 Select "Read from the file" or "Read from the driver initialization area", and click "OK".
   In case "Read from the file" is chosen, please select the file (.prm5) to be compared.

3 Comparison result of parameters is displayed.

Class	No.	Title	From	To
00	003	Real-time auto-tuning machine stiffness setup	11	13
00	004	Inertia ratio	0	250
00	008	For manufacturer's use	0	10000
00	009	For manufacturer's use	1	0
00	010	For manufacturer's use	1	10000
00	013	1st torque limit	350	300
00	014	Position deviation excess setup	1073741824	100000
01	000	1st gain of position loop	32.0	48.0
01	001	1st velocity loop gain	18.0	27.0
01	002	1st velocity loop integration time constant	31.0	21.0
01	004	1st torque filter time constant	1.26	0.84
01	005	2nd gain of position loop	38.0	57.0
01	006	2nd velocity loop gain	18.0	27.0
01	009	2nd torque filter time constant	1.26	0.84
02	022	Positional command smoothing filter	13.9	0.0

Compare of the parameter

Display the comparison edition(difference) at the parameters comparison.

[From] MADM2A4KBX__ 19040001 (A Axis)

[To] Sample.prm5

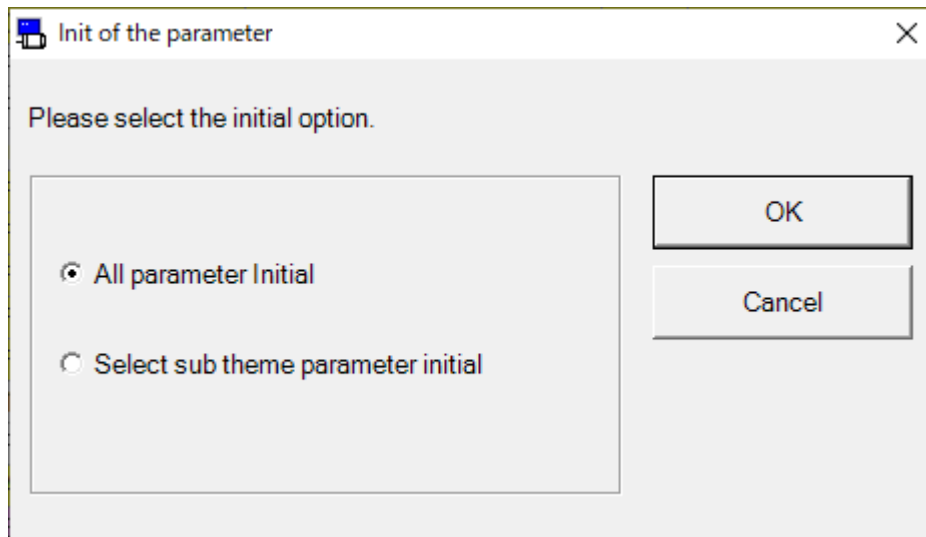☑ Decimal point is displayed

Save   OK

4 Click "Save", comparison result of parameters can be saved at a file.

Initialization

Parameters can be initialized to the default values. The initialized parameters are written to also the EEPROM. To save current parameters, please save the parameters before initialization. Initialization is performed for all axes.

Initialization of parameters

1 Click Initial (Initialization) and open the initialization window.

```
┌─────────────────────────────────────────────────────────┐
│ 🔲 Init of the parameter                              ×  │
│                                                          │
│ Please select the initial option.                       │
│  ┌──────────────────────────────┐  ┌─────────────────┐  │
│  │                              │  │       OK        │  │
│  │   ⦿ All parameter Initial    │  └─────────────────┘  │
│  │                              │  ┌─────────────────┐  │
│  │   ○ Select sub theme parameter initial│  Cancel    │  │
│  │                              │  └─────────────────┘  │
│  └──────────────────────────────┘                       │
└─────────────────────────────────────────────────────────┘
```

2 Select "All parameter initial" or "Select sub theme parameter initial", and click "OK".

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3 Set "Change Flag".

Change flag	Class	No.	Title	Multi(A Axis)	
				Before the change	After the change
☑	00	000	Operating direction setup	0	1
☑	00	001	For manufacturer's use	2	0
☑	00	002	Real-time auto-gain tuning setup	1	0
☑	00	004	Inertia ratio	0	250
☑	00	013	1st torque limit	350	100
☑	00	014	Position deviation excess setup	1073741824	0
☑	00	016	External regenerative resistor setup	3	0
☑	01	005	2nd gain of position loop	57.0	48.0
☑	01	007	2nd time constant of velocity loop integration	1000.0	21.0
☑	01	010	Velocity feed forward gain	30.0	100.0
☑	01	011	Velocity feed forward filter	0.50	0.00
☑	01	012	Torque feed forward gain	0.0	100.0
☑	01	016	Delay time of position control switching	5.0	1.0
☑	01	017	Level of position control switching	50	0
☑	01	018	Hysteresis at position control switching	33	0
☑	01	019	Position gain switching time	3.3	1.0
☑	01	024	For manufacturer's use	0	3
☑	01	026	For manufacturer's use	0	10
☑	01	027	For manufacturer's use	0	10
☑	03	029	For manufacturer's use	0	1
☑	04	001	SI2 input selection	536870912	545358209

Writing to EEPROM

Parameters in the table below are changed. Do you write the changes to EEPROM ?
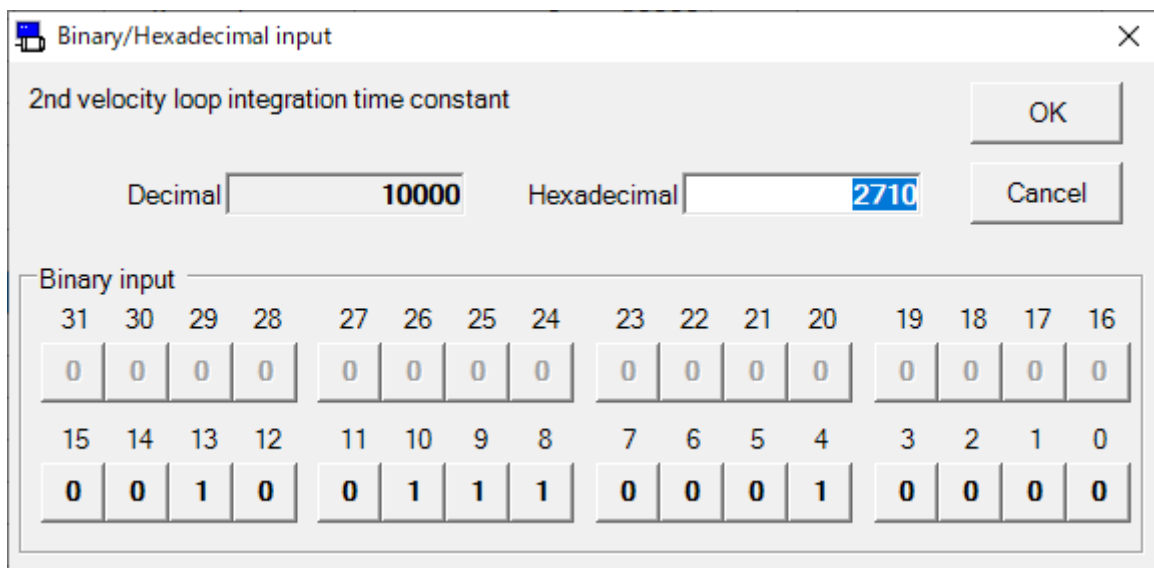
OK

Cancel

☑ Decimal point is displayed

4 Click "OK" Button.

Binary/Hexadecimal

You can enter binary or hexadecimal values for the selected parameter.

Entered in binary/hexadecimal

1 Click ⊞Bin/Hex (Binary/Hexadecimal) and open the Binary/Hexadecimal input window.

2 When you enter hexadecimal numbers, please press the [ENTER] key after typing. When you enter binary numbers, please press the button for corresponding to each bit.

 * If you enter beyond the parameter ranges is displayed within the limited value of the bottom of the decimal.

3 After completing value input, click "OK".

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Notes 1) Please refer to the manual of the driver or technical reference for details of each parameter's function and so on.

Notes 2) Even if parameters are sent to the driver, parameters are turned to the original value before modification if the power supply of the driver is turned off without writing to EEPROM of the driver. Parameter modifications list are displayed on EEPROM writing. Please check the modification carefully.

Notes 3) Do not turn off the power supply of the PC during writing to EEPROM of the driver. Data context cannot be guaranteed if the power supply is turned off during writing.

Notes 4) Some parameters become valid after modifications to the new data, writing EEPROM, and power supply reset. (On inputting, that issue is displayed. Please refer to the manual of the driver or technical reference and confirm on the objective parameters)

Notes 5) Parameter screen indication may be different from the actual parameter value of the driver in case PANATERM function windows which change the parameters (ex. Trial Run, Pin Assign, Analog Input) is opened. In such case, press the reception button and update the parameter of the driver to the latest one.

Notes 6) The parameter screen cannot open during opening some screens. For more information please refer to page 198 "Parameter screen behavior".

Notes 7) Transmission, reception, and EEPROM writing are performed for all axes regardless of axis selection.

Notes 8) The parameters of multi-axis shared attributes change in the manner in which the A-axis and the B-axis are linked. (For example, if A-axis parameters are changed, the values of the B-axis will be the same in synchronization.) However, if a certain operation such as reading from a file is executed, the internal parameters of the driver stay unchanged and only the parameters displayed on the parameter screen change, and thus synchronization on the parameter screen is not ensured and a mismatch with the internal parameters of the driver may also occur.

Notes 9) If the transmission button is pressed in a situation where parameters are different between the A-axis and the B-axis due to the phenomenon of Note 8, the setting values of the B-axis will be effective.

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Monitor screen

You can display and check the operation conditions of Driver and motor, in - out put signal and internal status. And you can record the monitoring data in long times and play it back on the screen. Note that the monitor screen displays information with respect to both the axes in a batch even when a 2-axis type (RTEX) has been connected and the axis selection screen is not displayed. The screen for PSM is displayed while PSM is selected. (For details, refer to "PSM Parameter, Monitor, Alarm screen" (page 190).)

Open the Monitor window

1 Start "PANATERM".
   (Please refer to Article 5. Start up and Close down in details)
2 Click "Monitor" of the tool bar on the main screen.
3 The Monitor window is opened.

Close the Monitor window

Click ☒ of upright on the window.

Structure of Monitor screen

Indication of signal name is different in the motor model.

- (1) Title bar
- (2) Log function
- (3) Monitor contents displayed area
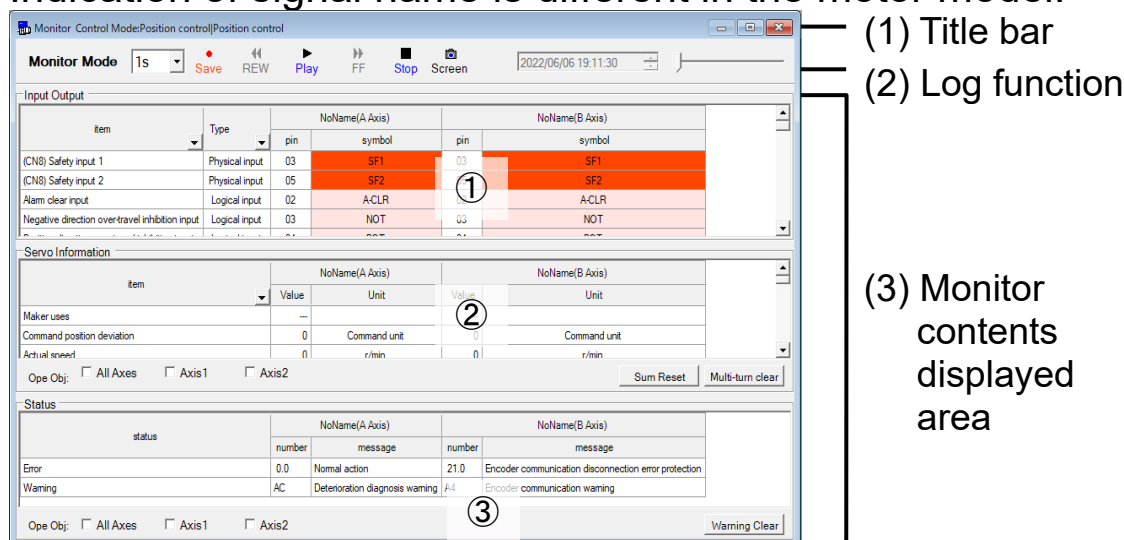
(1) Title bar — Control mode is displayed.
You can operate window.

(2) Log function
You can record log of monitoring contents and play it back.

Monitor mode	(Display of operating conditions)	Display the log operating function.
`1S`	(Setting the communication of Opening time)	Set the communication of opening time between Driver and PC. You can chose 1s, 5s or 10s.
Save	(Start Log file output)	Start Log file output. Log files are saved as separate files by axis.
REW	(Rewind)	Rewind log file which is playing it back. You can shoes 2 times, 4 times, 8 times or 16 times.
Play / Pause	(Play back) /(Pause)	Select Log file and play back/stop. When this button is effective, a log file can be specified by drag and drop. The log can show information only for one axis.
FF	(Fast forward)	Fast forward Log file. You can choose two times, 4 times, 8 times or 16times.

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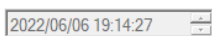
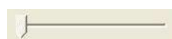|		
■ / ■ Stop / Start	(Stop)/(Start)	Stop/Restart of Monitoring operation. When you record Log and restart it, Record and restart is finalized.
📷 Screen	(Screen)	Captures the screen and save into a file.
2022/06/06 19:14:27	(Display of Time)	Display the present time. When you are play it back, recorded time is displayed.
(Slider)	(Slider)	Display the present time in all log data.

(3) Monitoring Contents display area
Display monitoring information.

1. I/O signal conditions monitoring
   Display I/O signal condition. This area displays "Physical input," "Logic input," "Physical output," and "Logic output."
   Physical input - Display Input signal condition of Driver.
     Red : COM (-) connection
     Pink: Open
   Logic input - Display signal condition of Driver.
     Red : Active
     Pink: Inactive
   Physical output - Display output signal condition of Driver.
     Red : Output Transistor ON
     Pink: Output Transistor OFF
   Logical output - Display signal condition of Driver.
     Red : Active
     Pink: Inactive

2. Servo information monitor
   This area displays the internal state of the driver, the sum of command, encoder, and external scale pulses taken into the driver, and encoder and external scale information.
   The operation target check box selects the operation target axis of "Sum Reset" and "Multi-turn clear". If you execute each operation in the unselected state, an error dialog will be displayed.

   "Sum Reset" is a toggle button that lets PANATERM store the sum of three pulse values as an offset value for the axis

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ticked as the operation target when it is pressed. Subsequently, values obtained by subtracting this offset value are displayed. If you again click it, Offset value is clear and display the Pulse count total itself from original driver.

Clicking "Multi-turn clear" clears the multi-turn data stored in the encoder of the axis ticked as the operation target to "0" and clears all encoder errors.

Note) Please refer to the remarks when you use multi-turn clear. And it is necessary for you to restart when you clear the encoder error.

3. Alarm / Warning Monitoring

Display present alarm and warning of driver.
Clicking "Clear warning" can clear the current alarm and warning for the axis ticked as the operation target.

(4) Monitor item selection window

Clicking ▼ on the input/output signal status monitor or servo information monitor displays the display item selection screen as shown in the figure below. Here, tick only the items to be monitored and click "OK," and you will return to the monitor screen, where only the selected items are displayed.
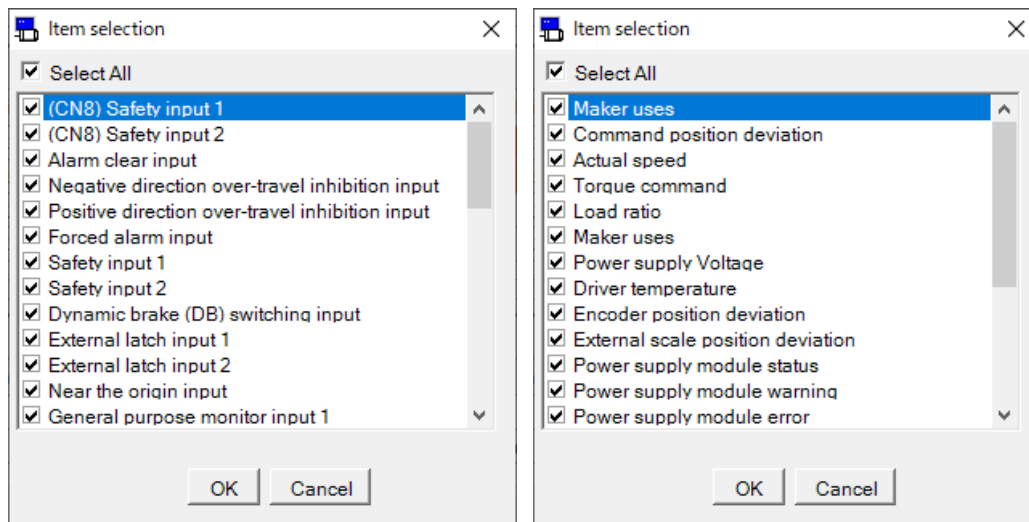
Notes 1) Using USB communication as data receipt between Driver and PC, there are accidental errors, delay of display value on the screen, recoded monitoring value, and time on the log file and actual driver value and recoded time.

Notes 2) There are accidental errors of recoded time between monitoring display, recoded log file and many data in a time. If you need more detail information, please refer to the wave graphic.

Notes 3) The (+) and (-) symbols are not displayed even if the polarity is present.

Notes 4) Monitoring function is not precious measurement instrument. Monitoring display shall be used as rough estimate.

Notes 5) There is no temporal simultaneity in A-axis and B-axis monitor values. To view more accurate information, use the waveform graphic.

Notes 6) The monitor screen cannot open during opening some screens. For more information please refer to page 199 "Monitor screen behavior".

Notes 7) Parameter changes such as physical input and physical output are not reflected immediately. It will be reflected by restarting the monitor screen.

Notes 8) Physical input and physical output signal names are displayed according to the current parameter settings.

Alarm screen

In case that driver's front panel LED is flashing like that Motor is not operative etc., you can check the error conditions.
Note that the alarm screen displays information with respect to both the axes in a batch even when a 2-axis type (RTEX) has been connected and the axis selection screen is not displayed. The screen for PSM is displayed while PSM is selected. (For details, refer to "PSM Parameter, Monitor, Alarm screen" (page 190).)

Open the Alarm window

1 Start "PANATERM".
(Please refer to Article 5. Start up and Close down in details)
2 Click "Alarm" of the tool bar on the main screen.
3 When not communicating with driver, the selection screen of a parameter is displayed. Please select the parameter file saved when alarm was reported.
4 The Alarm window is opened.

<When communication with driver>

<When not communication with driver>

Close the Alarm window

Click ![Exit] (Exit) on the tool bar.

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Structure of Alarm screen

Now Happened Error / Warning display
This is displayed when communication with driver only.

- (1) Title bar
- (2) Tool bar
- (3) Tab
- (4) Present Error Display area
- (5) Warning Display area
- (6) Cause and action display window

Past Error History display

- (1) Title bar
- (2) Tool bar
- (3) Tab
- (7) Error Record Display area
- (6) Cause and action display window

(1) Title bar　　　　You can operate this window.

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(2) Tool bar

選択軸エラークリア	(Selected axis error clear)	Only for the axis whose corresponding check box in the current alarm display area is ticked, the current alarm can be cleared. Removing the cause of errors, you click this button, present error is clear and it operates correctly. However, you cannot delete the error that you cannot clear by alarm clear input signal. Please turn off the driver and remove the cause of error, please turn on the electric power again. This button can be pressed only while the "Current error and warning tab" is displayed.
全軸エラークリア	(All axes error clear)	The current alarm with respect to all axes can be cleared. Removing the cause of errors, you click this button, present error is clear and it operates correctly. However, you cannot delete the error that you cannot clear by alarm clear input signal. Please turn off the driver and remove the cause of error, please turn on the electric power again. This button can be pressed only while the "Current error and warning tab" is displayed.
選択軸履歴クリア	(Selected axis history clear)	The error history can be cleared only for the axis whose corresponding check box in the error history display area is ticked.This button can be pressed only while the "Past error history tab" is displayed.
全軸履歴クリア	(All axes history clear)	The error history of all axes can be cleared. This button can be pressed only while the "Past error history tab" is displayed.
Prnt	(Print)	Print out the information about the errors.
Exit	(Exit)	Close the Alarm window.
Screen	(Screen)	Capture the screen and record the screen into the file.

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(3) Tab
Switch the display of "Now Error / Warning" and
"Past Error History"

(4) Now Happened Error display area
1. Display present all happening error numbers and names.
Displayed error on the top is an error displayed on the front panel.
2. Display the motor internal conditions on the selected alarm happening.

(5) Warning display area
Display all present happening warning numbers and names.

(6) Cause and action display window
The cause and action of the selected error or warning for the selected axis are displayed.

(7)Error record display area
1. Display error record order, error number and error names.
2. Display the motor internal conditions on the selected alarm happening.

Notes 1) There are some errors, which is tripped, but is not left as error record. Please refer to the driver manual or technical reference.

Notes 2) Error records are saved up to 14 times. If errors happen over 14 times, oldest record is deleted in order.

Notes 3) Internal conditions of motor is recorded up to 3 times when the past error history is saved on alarm happening. When the alarm is generated immediately after turning on of the power supply, an internal state of the motor might not be able to be acquired standardly.

Notes 4) The alarm screen cannot open during opening some screens. For more information please refer to page 200 "Alarm screen behavior".

Notes 5) The control mode in the motor internal state at the time of the alarm indicates the state in the driver and does not match Pr0.01 of the driver.

Gain Tuning screen

You can adjust servo gain parameter with the driver's auto adjustment function. And you can use easy monitoring that automatically measures the tuning index.

Note) If you adjust auto adjustment function of the driver please refer to application scope and remarks specified in the driver manual or technical reference.
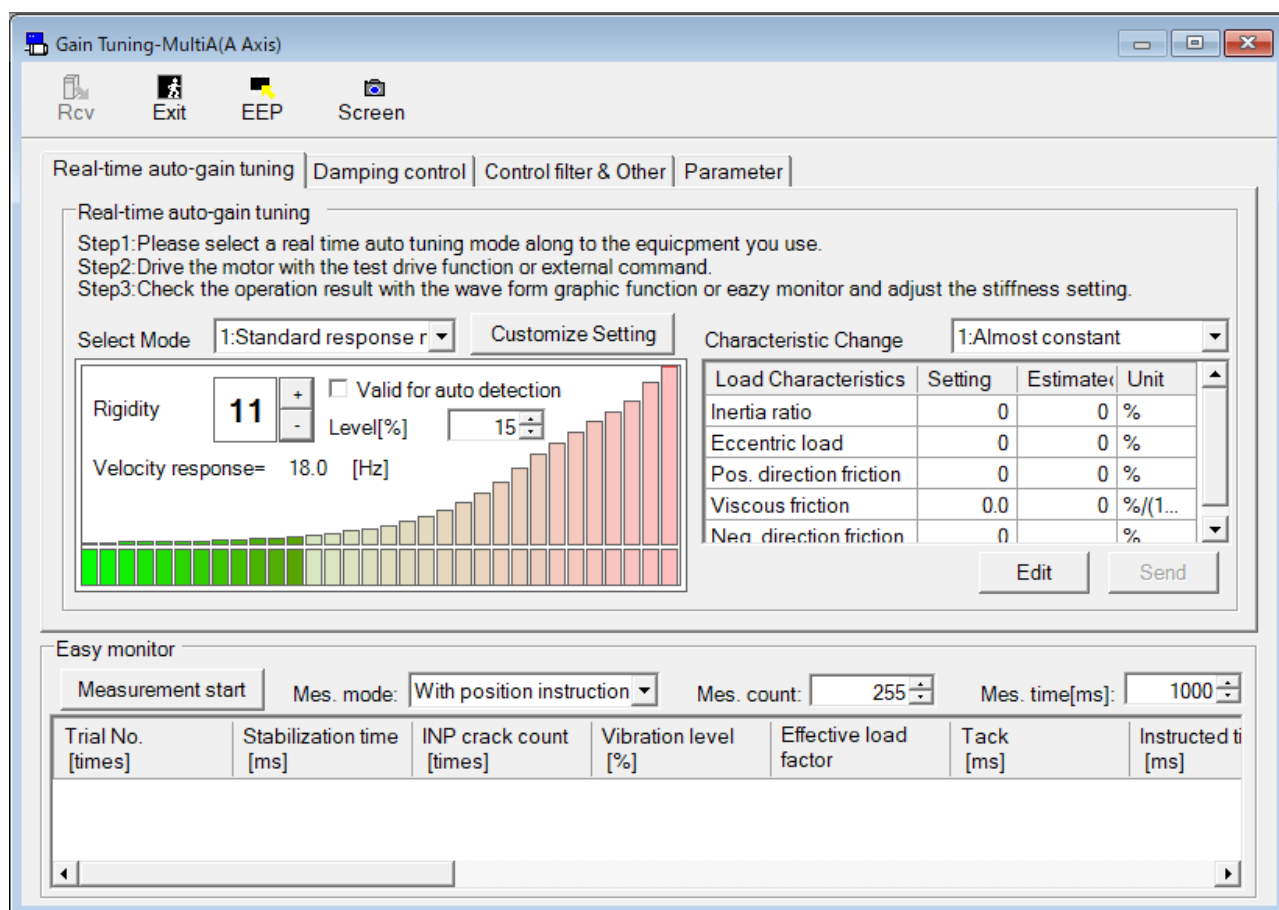
Open the Gain Tuning window

1 Start "PANATERM".
   (Please refer to Article 5. Start up and Close down in details)
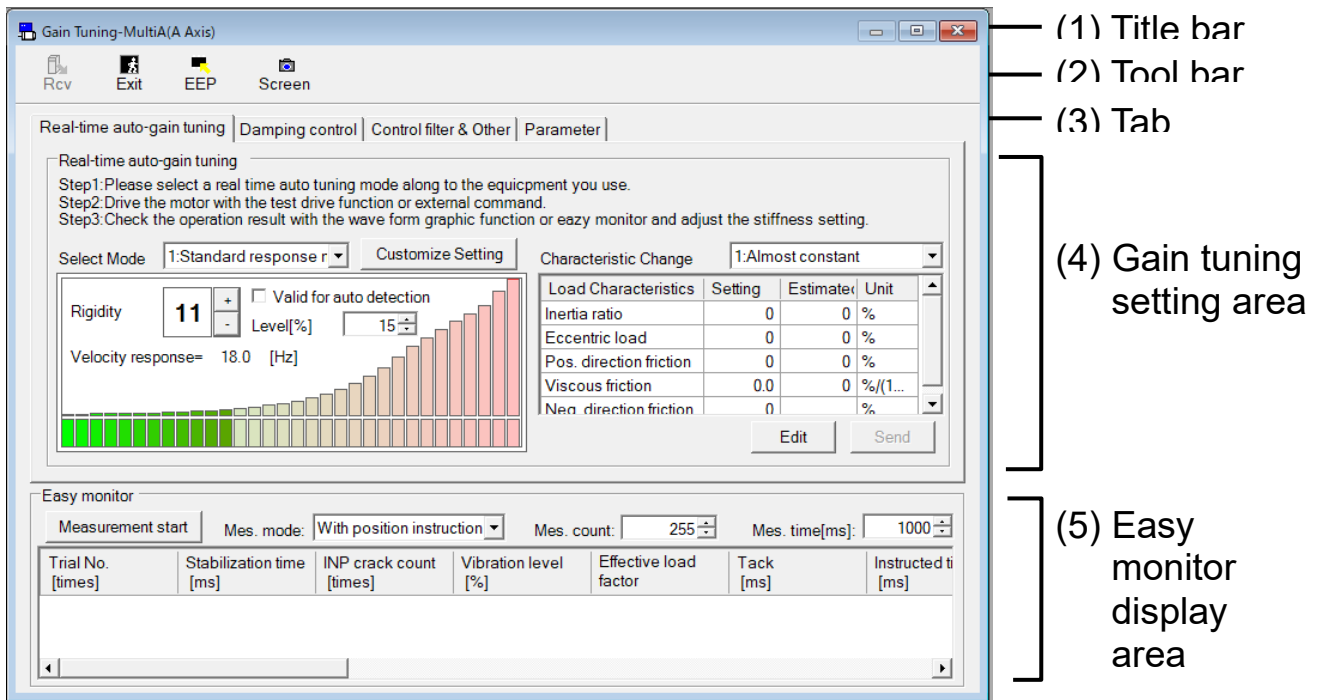2 Click "Tuning" of the tool bar on the main screen.
3 The Gain Tuning window is opened.

Close the Gain Tuning window

Click [Exit icon] (Exit) on the tool bar.

Structure of Gain Tuning screen

(1) Title bar
(2) Tool bar
(3) Tab
(4) Gain tuning setting area
(5) Easy monitor display area

(1) Title bar	You can operate this window.

(2) Tool bar

	(Receive)	Receives parameters from the driver.
	(Exit)	Close the gain tuning window.
	(EEPROM)	Write parameter value to EEPROM of driver.
	(Screen)	Capture the screen and record it to the file.

(3) Tab
　Switch Gain tuning setting area display to "Real time auto-gain tuning", "Damping control", "Control filter & Other", "Parameter".

(4) Gain tuning setting area
　You can perform Real time auto-gain tuning, Adaptive filter, Damping control, Control filter and the parameter setting.

(5) Easy monitor display area
　You can measure the tuning index easily.

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Method of performance of real time auto-gain tuning

1 Select a tab of "Real-time auto-gain tuning".

2 In accordance with the usage of your machine, you can change
   the "Select Mode" and "Rigidity".
   If you select "6: Fitgain mode" in "Select Mode", you can specify
   the detail function individually. In "Customized Setting", "Real time
   Auto Tuning Custom Setting" window will open, please set the
   conditions.
   * If you open customized setting window and push OK, at the same time,
      mode selection is changed to "6: Fitgain mode".
   * "Real time Auto Tuning Custom Setting" are not available in 2 degrees
      of freedom control mode.

3 You can operate the motor using "Trial Run" of PANATERM or external command. If motor revolves, presumed value of load characteristics is displayed.
4 Using wave graphic function of PANATERM or easy monitor, you can check the result of moving of motor and adjust the "Rigidity" setting. "Rigidity" setting can be performed by right side of figures ⊞ (+) or ⊟ (-).

Valid for auto detection
On the conditions that Gain Tuning screen is open, and the mode setting is from 1 to 4, you can use auto suppression of oscillation. Checking this check box, the rigidity setting is automatically down on motor oscillation happenings, and motor oscillation is suppressed.

Change of parameter about load characteristics

If you manually change the parameter of load characteristic, please click "Edit" button and change the setting value. After changing, you click "Send" button, all parameter shall be transmitted to driver. During editing, the block display is not renewed. Please click the "Monitor" button to restart monitoring.

Setting method of adaptive filter

1 Select the tab of "Damping control".

2 For the adaptive filter to be effective, please change "1:1 filter is valid" or "2: 2 filters are valid". If the vibration happens in motor speed, other figures except for 5000[Hz] as "Resonance Vibration Frequency" are displayed. And 3rd or 4th notch filter is automatically set.

3 If you want to clear the adaptive result, please change the "Filter Mode" to "4: Clear result of adaptation".

* "Resonance Vibration Frequency" display shows the latest frequency when the vibration is detected by adaptive operation.

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Resonance frequency measurement mode

1 If you measure only the resonance frequency without notch filter setting, please change Adaptive filter mode to "3: Resonance frequency measurement".

2 If the vibration happens in motor speed, the figures except for 5000[Hz] as "Resonance Vibration Frequency".
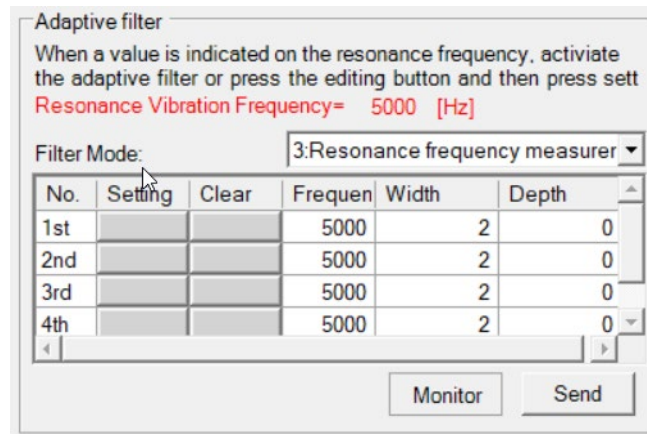
3 If you set this frequency with notch filter, after push the "Edit" button, please click the "setting" button, check the contents of following confirmation screen and click "OK".
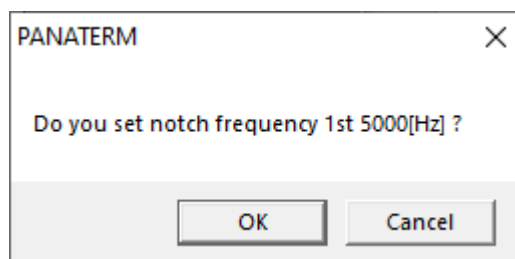
4 If you clear resonance frequency you set, after push the "Edit" button, please click the "Clear" button whose number you want to clear. As same confirmation screen is displayed, if ok, please click the "OK" button.

Change of parameter about Notch filter etc.

If you need to manually change the parameter about notch filter etc., please click "Edit" button and change the setting value. After changing them, if you click "Send" button and all parameter in this block shall be transmitted to the driver. During editing, as the display of this block is not renewed, please click "Monitor" button again.

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Setting method of damping control
1 Select the tab of "Damping control".

2 You can use max 2 sets of filters in damping control at the same time. You can set which one is effective according to the operation conditions from the 4 sets of "Damping control" setting.
Note) Please refer to the driver manual or technical reference as to this parameter specification.

3 When you operate the positioning by position control or full closed control, trial operation function or external command, if the vibration in position deviation at settling time, the other figures except for 0.0[Hz] shall be displayed in "Vibration Frequency".

4 If you want to suppress this vibration, after push the "Edit" button, please click "setting "button next to effective vibration filter number in operation.

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5 As the confirmation screen of vibration frequency setting, if ok, please click "OK".

```
PANATERM                                          ×

Do you set vibration suppression frequency 1st  0.0[Hz] ?

                              OK            Cancel
```
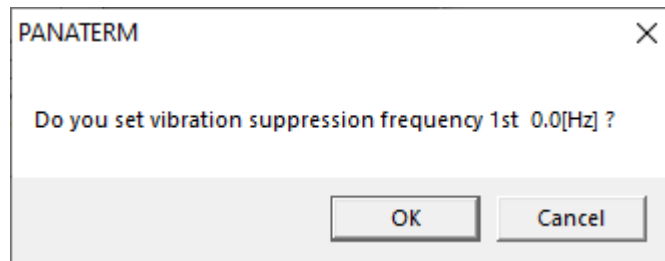
6 If you clear vibration frequency you set, after push the "Edit" button, please click "Clear" button whose number you want to clear. If ok, please click "OK" button.

Change of vibration control parameter

If you manually change the damping control parameter, please click "Edit" button and change the setting value. After change of them, you click "Send" button, all parameter in this block shall be transmitted to the driver. During editing, as this block display is not renewed, please click "Monitor" button again.

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Setting method of Position command filter

1 Select the tab of "Command filter & Other".

| Real-time auto-gain tuning | Damping control | Control filter & Other | Parameter |

Control filter

The first order lag against the command, FIR type smoothing filter settings are executed.

Type	Set value	Unit		
FIR filter setup	0.0	ms		Monitor
Smoothing filter setup	13.9	ms		Send

2 If you change the parameter of position command filter, please click "Edit" button and change the setting value.

Control filter

The first order lag against the command, FIR type smoothing filter settings are executed.

Type	Set value	Unit		
FIR filter setup	0.0	ms		Monitor
Smoothing filter setup	13.9	ms		Send

3 After changing them, when you click "Send" button, all parameter in this block shall be transmitted to the driver. During editing, as this block display is not renewed, please click "Monitor" button again.

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Manual setting method of the gain tuning parameter

1 Select the tab of "Real-Time auto-gain tuning", and select the mode of "0: Invalid".

2 Select the tab of "Parameter".

3 Please select the setting value of parameter you want to edit. After changing the setting value of the parameter you want to edit, enter the [ENTER] key or click the "Change of the value" button.
Note) Only the parameter that checks "Extract" is displayed when "Only the extraction parameter is displayed" is checked.

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Measurement the tuning index by easy monitor

1 Set the "Mes. Mode", "Mes. Count" and "Mes. time[ms]".

    "Mes. mode"   :   Set the measurement mode.

       With position instruction: Measure the tuning index from the start of position commanded to next start of position command or shorter measurement time.

       Uniformity time   : Measure the tuning index from the each time data set by measurement time.

       With speed instruction   : Measure the tuning index from the start of speed command to next start of speed command or shorter measurement time.

    "Mes. count"   :   Set the measured number of time.

    "Mes. time[ms]" : Set the maximum measuring time period [ms].

2 Click "Measurement start"

    Note) If you click "Measurement start", the displayed index shall be cleared.

3 The measured results shall be renewed until the trial No. meets the measured number of time, or you click "Measurement stop".

【Monitoring Item】
The tuning indices are as below.

Stabilization time	Times [ms] from the finalization of positioning command passing to the range of completion of positioning of the position deviation. Or times[ms] from the below speed command still value to Zero speed range of Motor speed
INP crack count	Count [times] is a number in which two times (the on signal that entered range of in-position first and the off signal when starting) are pulled from the number of times into which INP1 output changes between tact.
Vibration level	Conversion value from vibration level to torque value[%]
Effective load factor	Torque command effective value among tact[%]
Tact	Measured time[ms] for one trial
Instructed time	Time[ms] from the trial start to final position command or the time by detecting more than speed command sill value
Speed zero cross	Count [times] is a number in which two times (the on signal that entered range of in-position first and the off signal when starting) are pulled from the number of times into which ZSP output changes between tact.
Instructed speed min	Command speed minimum value [r/min] during trial
Instructed speed max	Command speed maximum value [r/min] during trial
Motor speed min	Motor speed minimum value [r/min] during trail
Motor speed max	Motor speed maximum value [r/min] during trail
Torque instruction min	Torque command minimum value [%] during trial
Torque instruction max	Torque command maximum value [%] during trial
Pos. following error min	Positioning deviation minimum value during trial [Command unit]
Pos. following error max	Positioning deviation maximum value during trial [Command unit]

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The following indicators are displayed only for models that support 2 degrees of freedom control.

Micro vibration count	The number of times that the mark of actual speed with a blind sector changed [Times]
Overshoot	The overshoot amount of an instruction position deviation [Command unit]
Command movement	The amount of instruction position change between tact [Command unit]
INP crack count of settling	The number of times of an INP crack after instruction ejection [Times]

Notes 1) If you click "Measurement start" or servo on the driver during the measurement, Trial No. shall be starting from 1.

Notes 2) If the measurement time is shorter than the tact, there is possibility that the results of settling time etc. are not correctly measured. Please assure the enough measurement time.

Notes 3) If you record the monitoring results, please select the cell of the monitoring result you need to record and select "Ctrl+C" and make a copy. Please paste and record the table calculation soft or text editor.

Notes 4) If you operate it with quicker tact by the 1s of easy monitor interval, trial No. may be skipped value. Please operate it with more than 1 s of tact command as long as possible.

Notes 5) Parameter set on this screen is inputted into Driver. As PANATERM does not maintain this value, please perform the recording it to EEPROM of driver after completion of adjustment.

Notes 6) The gain tuning screen cannot open during opening some screens. For more information please refer to page 200 "Gain tuning screen behavior".

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Wave form graphic screen

You can measure the motor operative waveform and display the results by the graphic. And these measurement conditions, results and parameters can be recorded in the wave form data file.
Note that the waveform graphic screen displays information with respect to both the axes in a batch even when a 2-axis type has been connected and the axis selection screen is not displayed.

Open the Wave form graphic window

1 Start "PANATERM".
   (Please refer to Article 5. Start up and Close down in details)
2 Click "Wave Graphic" of the tool bar on the main screen.
3 The Wave form graphic window is opened.
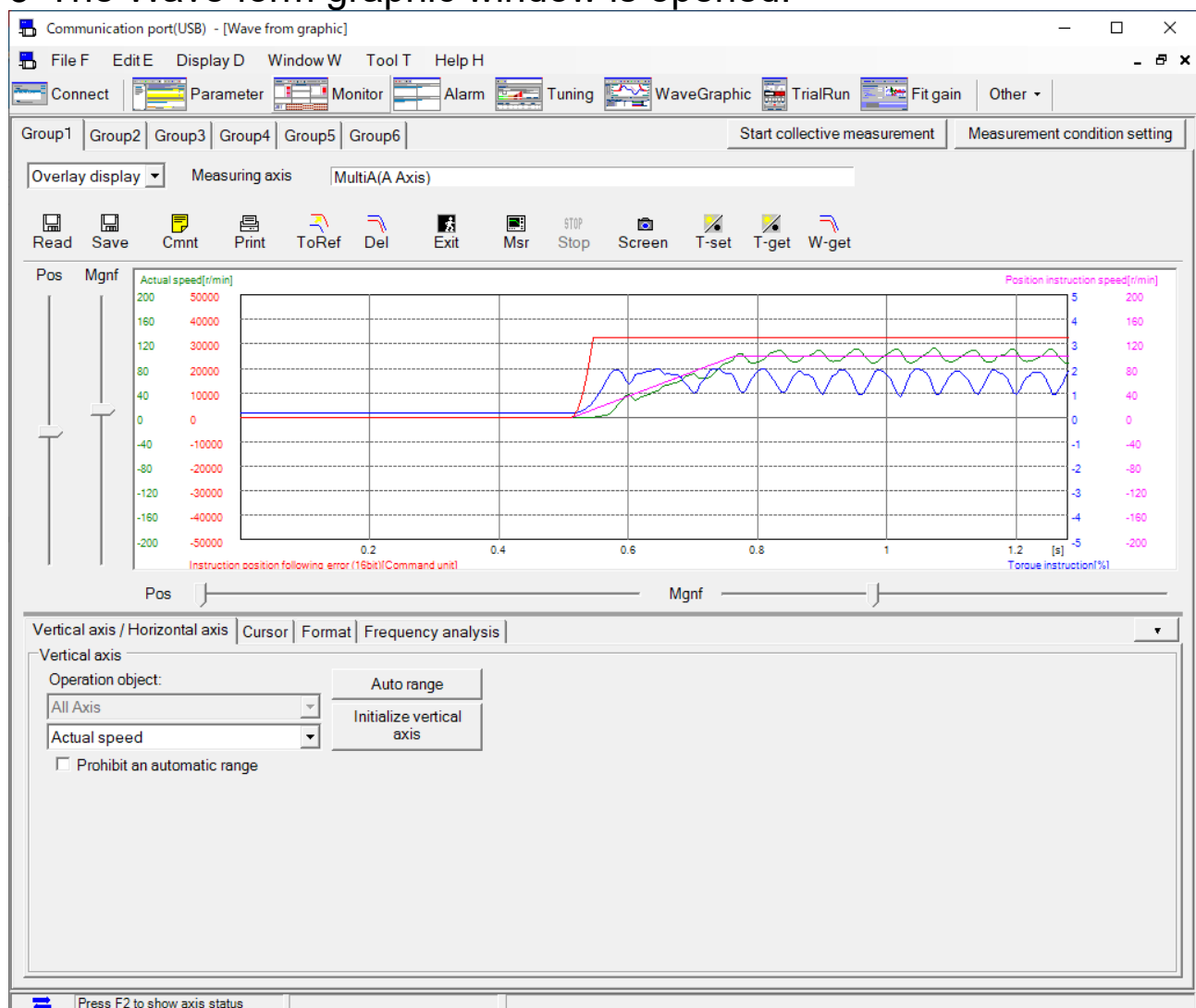
Close the Wave form graphic window

Click ![Exit] (Exit) on the tool bar.

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Structure of Wave form graphic screen
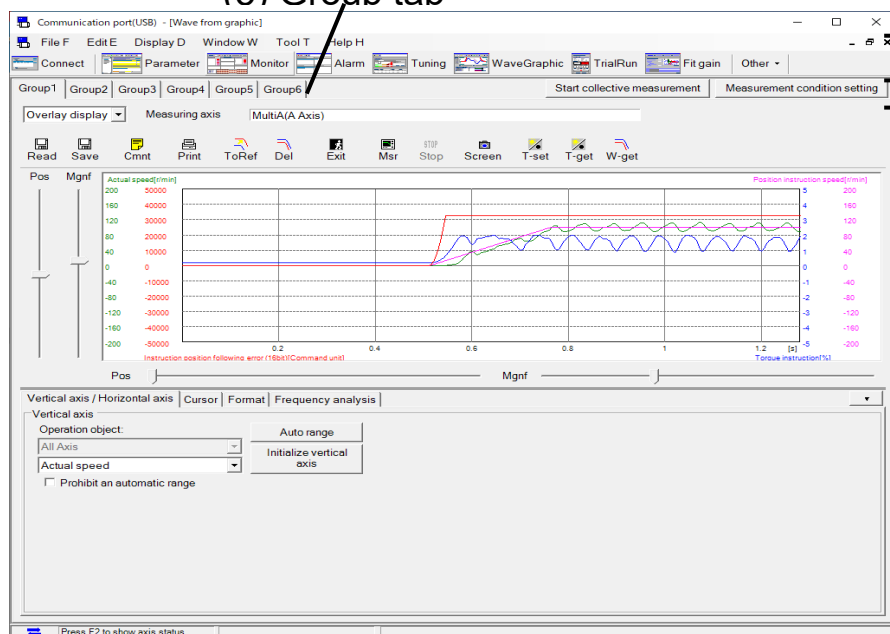
(1) Title bar

(2) Tool bar

(3) Waveform graphic display area

(4) Waveform graphic setting area

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About 2-axis type waveform graphic display

When measuring and acquiring, the waveform is displayed for each group. The displayed groups can be switched by selecting the tab. The group can be set from "Axis grouping setting" described later. The display method of the waveforms of the axes set in the same group can be switched by selecting "Overlay display" or "Tile display".

＜When overlay display＞

Select "Overlay display"

<When tile display>
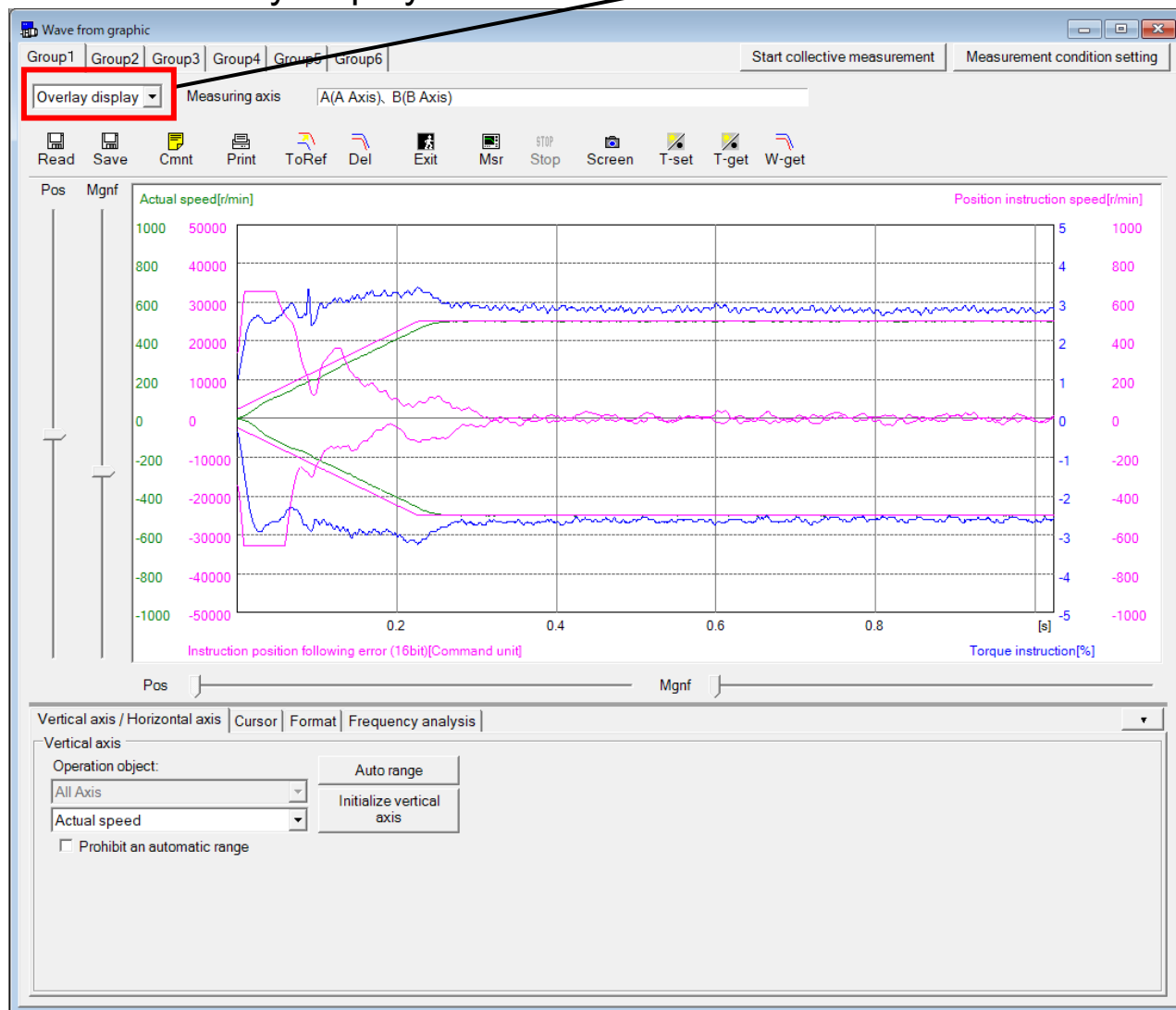
Select "Tile display"
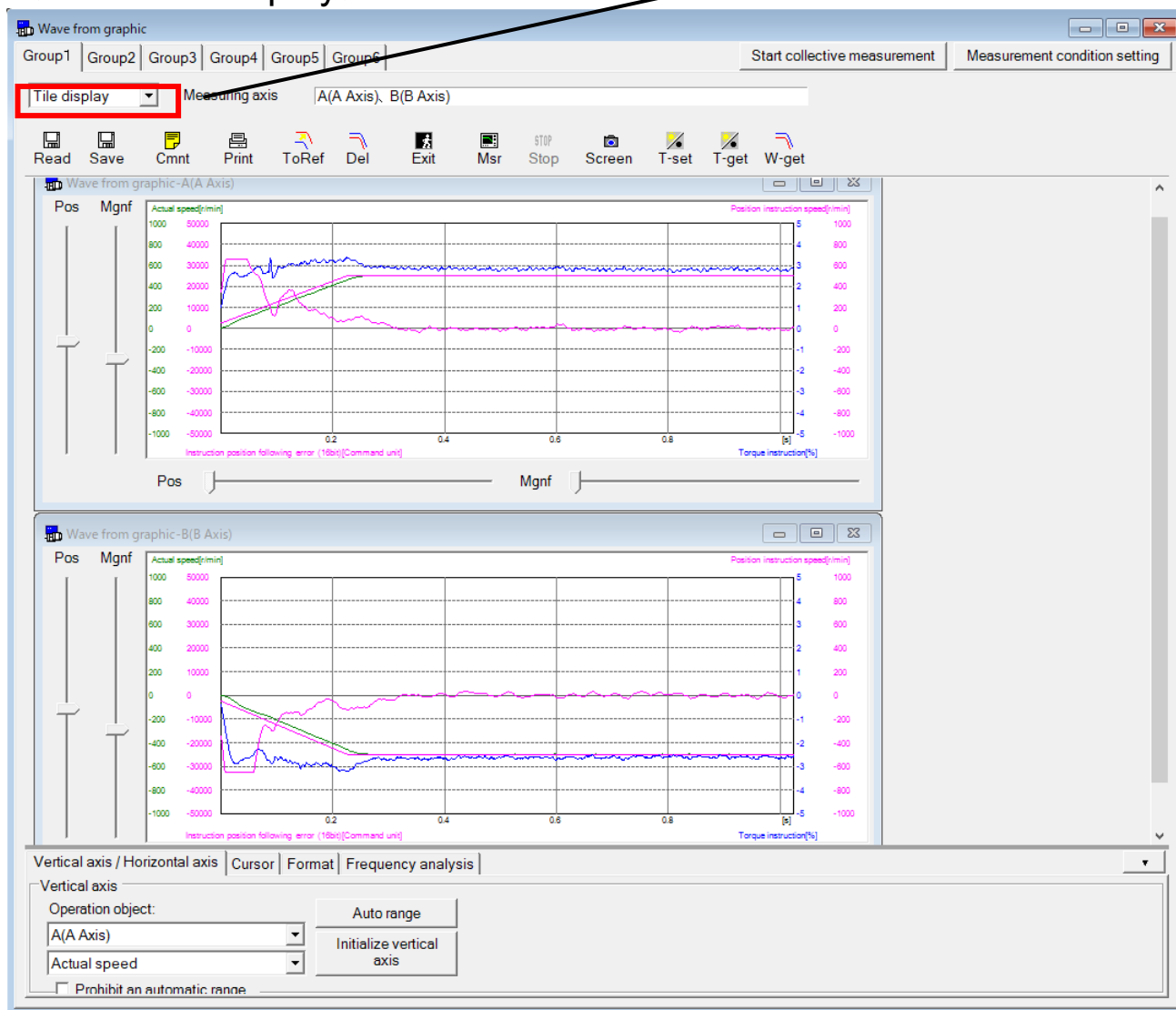
*It is not possible to switch to a group that is not axis grouped.

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(1) Title bar   You can operate title bar window.

(2) Tool bar   The operation commands are listed up.

	(Read)	Read the file to record the measurement data. If there are two or more axes in the selected group, the axis selection dialog will be displayed. Select the target axis. You can also specify file loading by dragging and dropping.
Read		
Save	(Save)	Save the measurement data into the file. If there are two or more axes in the selected group, the axis selection dialog will be displayed. Select the target axis.
Cmnt	(Comment)	Make the comments to be attached on the wave form graphic file. If there are two or more axes in the selected group, the axis selection dialog will be displayed. Select the target axis.
Prnt	(Print)	Print out the results of wave form graphic measurement. If there are two or more axes in the selected group, the axis selection dialog will be displayed. Select the target axis. (Even in the case of overlay display, only the target axis is printed.)
ToRef	(Copy to reference)	Make a copy of observed wave form to reference wave form. If there are two or more axes in the selected group, the axis selection dialog will be displayed. Select the target axis.
Del	(Delete the reference)	Delete the reference wave form. If there are two or more axes in the selected group, the axis selection dialog will be displayed. Select the target axis.
Exit	(Close)	Close the wave form graphic window
Msr	(Measurement)	Start waveform graphic measurement, and waiting until the measurement conditions are satisfied, perform a sequence of actions to acquire and display the measurement results from the driver. This operation measures and acquires the waveforms of all axes of the selected group.

Also, measure the waveforms of all axes in all groups by pressing the "Start collective measurement" button. |
| **STOP** **Stop** | (Stop) | Stop the wave form graphic measurement |

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Screen (Screen)	Capture the screen and record the file
T-set (Trigger set)	Set the measurement conditions to driver and start measurement. This operation sets measurement conditions for all axes in the selected group.
T-get (Trigger acquisition)	Acquire and display the measurement conditions set in the driver. This operation acquires measurement conditions of all axes in the selected group.
W-get (Wave data acquisition)	The measurement results and the measurement conditions are acquired and displayed from driver. This operation acquires and displays measurement results and measurement conditions of all axes in the selected group.

(3) Waveform graphic display area

In accordance with setting contents on (4) Wave form graphic operation setting area, the operation wave form of the measurement subject is displayed.

(4) Waveform graphic setting area

Designate the graphic display conditions and select the tab and set each items.

If you click the upper right ▾ of waveform graphic setting area, the wave form graphic setting area shall be hided. If you click ▴, wave graphic setting area shall be displayed again. You can record these measurement conditions in the file.

Note) Please refer to the "Record and loading of wave form graphic measurement conditions" about the record method.

(5) Group tab

The displayed groups can be switched by selecting the tab. The group can be set from "Axis grouping setting" described later.

"Start collective measurement (Collective stop)" button:
Start measuring waveform graphic of all groups. Press this button to switch to the "Collective stop" button. When you click the "Collective stop" button, the waveform graphic measurement of all groups is stopped.

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"Measurement condition setting" button:
Change the measurement condition settings. For details on the setting method, refer to the following.

<u>Operation of the wave form graphic display area</u>
In the wave form graphic display area, you can enlarge or scale down the graphic display with following pointed out mouse pointer and horizontal / vertical slider bar.

(1) In case you use mouth pointer
Use the mouse pointer when you enlarge or scale down overall wave form.

If you select the tab of "Vertical axis / Horizontal axis", "Format", Mouse pointer is a reading glass icon. At that time, following operation is effective.

Left click   : enlarge the position of mouth pointer
Right click : scale down the position of mouth pointer
Left Drag   : enlarge the selected rectangle scope
Right Drag : Moving the waveform up and down or right and left

When you select tab of "Cursor", Mouse pointer is Star icon. At that time, the following operation is effective.

Left click   : designate the position of cursor 1
Right click : designate the position of cursor 2
Drag   : enlarge the selected rectangle scope

When mouth pointer is near cursor, it shall be arrow icon. At that time, the following operation is effective.

Drag   : move the nearby cursor

(2) In case that you use slider bar

By operation of the slider bar on wave graphic display area right edge (vertical axis), you can enlarge, scale down, move only the selected operation wave form subjects by tab.

Vertical axis "Pos" Slider bar:
> If you drag the bar upright, operated subject wave form display is moving up, if you drag it down, the wave form is also moving down. And if you click the bar up and down, or if you push the key [↑] [↓] on the selected conditions of slider bar, the wave form is moving by one scale on vertical axis

Vertical axis "Mgnf" Slider bar:
> If you drag the bar up, you can enlarge the operation subject vertical axis on the center of the screen. If you drag it down, it is to scale down.

If you operate the low edge (horizontal axis) slider bar, you can enlarge / scale down / move the time axis of total wave form.

Horizontal axis "Pos" Slider bar:
> If you drag the bar to the right side, the overall wave form is moving to the left, the wave form is moving to the right. If you click the left right of the bar or push the key [←] [→] in the selected slider bar condition, you can move the wave form left right by 1/32 on the screen.

Horizontal axis "Mgnf" Slider bar:
> If you drag the bar to the right, you can enlarge the operation subject horizontal axis on the middle of the screen. If you drag it to the left, it shall be scaled down.

Notes 1) If you cannot find the wave form, it cannot be displayed so well, please push the "Auto range" button of "Vertical axis / Horizontal axis" tab and bring back to the overall display.

Notes 2) When you confirm the detail data of signal size 32 bits, once you display the overall wave form and move the part you want to watch to the middle of the screen with position slider.

(3) When using the mouse wheel
   Operate the mouse wheel when the mouse pointer is on the
   waveform graphic display area to move up and down and
   enlarge or reduce the waveform.

   Rotate the mouse wheel：Allows you to move up and down the waveform.

   Rotate the mouse wheel while holding down the Shift key:
                    Allows you to enlarge or reduce the waveform.

About the measurement condition setting screen
To change the measurement condition settings, press the measurement condition setting button shown in the figure below to display the measurement condition setting screen.
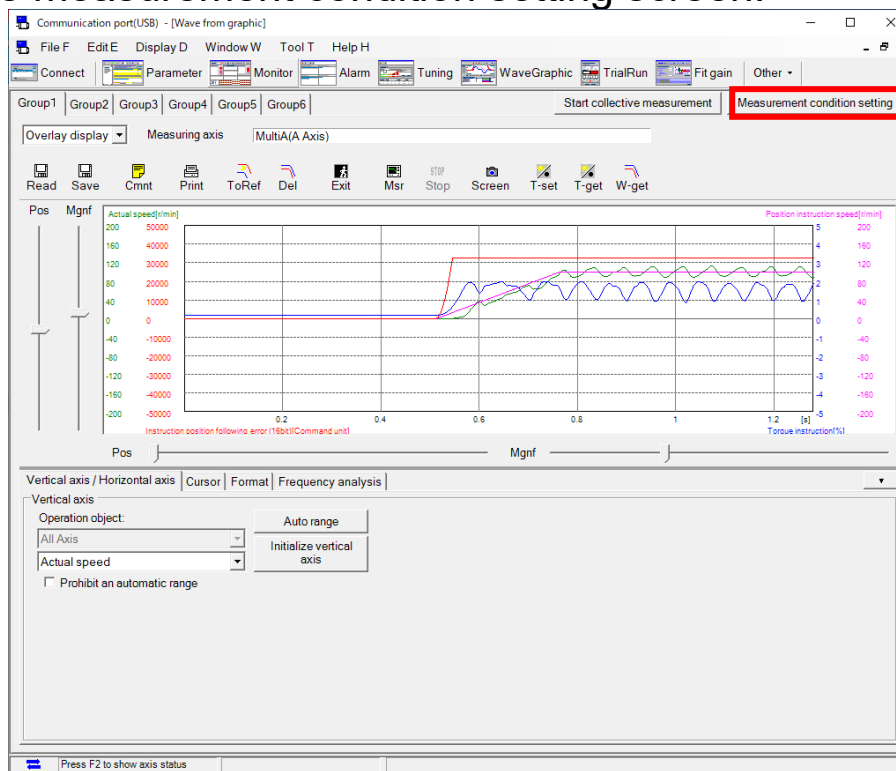
The measurement condition setting screen is as shown in the figure below. Here, specify measurement items, trigger conditions, and the sampling period.
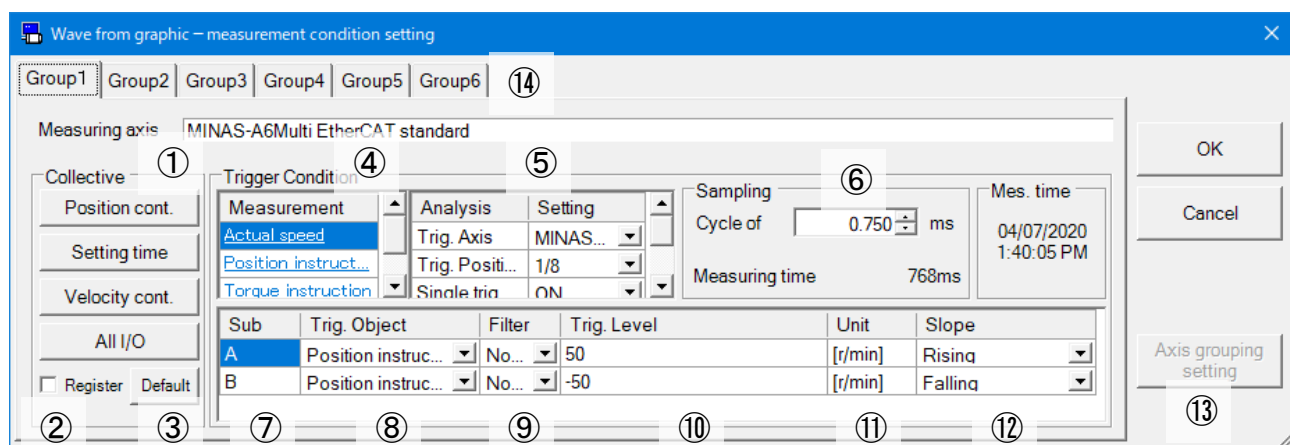
"Collective"
1. Setting button:
   The measurement condition is set from the wave form graphic file registered in button.

2. Register:

When you check "Register" and push the button that registers, selection of the file window is displayed. Please select the file where the measurement condition that you want to register is included.

3. Default:

The content of each setting button is read from the following files.

Position cont. : Measure the signal related to position control as position command speed trigger.

Settling time : Measure a signal related to the measurement of settling time as a trigger of position command passing completion.

Speed cont. : Measure a signal related to the speed control as a trigger of the speed control command.

All I/O : Measure the analog input and physical input / output signal without trigger

"Measurement condition"

4. Measurement item:

You can measure the subject that you want to measure in your choice. If you double click the measurement items, you can open the window of the "Measure Item Select". The number of measurement item selections can be selected up to the MAX value of the signal size described in the measurement item selection window.
(However, digital signal can be selected up to 16[BIT])
If you select the digital signal on the measurement items, analog signal and digital signal shall be displayed on the wave form graphic display area.

Measurement	Signal
Internal position instruc...	16
Speed control instructi...	16
Encoder position follo...	16
Full close position follo...	16
Hybrid following error (...	16
Voltage between P an...	16
Maker uses	16
Overload factor	16
Positive direction torqu...	16
Negative direction torq...	16

Measurement item	Signal
Actual speed	16
Position instruction sp...	16
Torque instruction	16
Instruction position foll...	16

Signal Size Total 64 [bit]   Max: 128

5. Trigger setting: Perform the setting related to the trigger.
- ・Trig. Axis - Select whether the A-axis measurement value or the B-axis measurement value acts as a trigger (which axis is to be the trigger master). The subsequent trigger settings are for the axis selected here.

[Supplement]
With respect to waveform graphics of a 2-axis type (RTEX), the trigger also acts on the axis that is not the trigger master (slave axis) in synchronization with a trigger on the trigger master axis and the waveforms of both the axes are measured. This "trigger target axis" setting is an item to set which axis is the trigger master axis.

- ・Trig. Position - Set the trigger happening position during the measured period.
- ・Single trigger - When single trigger is on, the measurement can be performed only one time. If it is "Off", until you click "Stop" button, we will continuously perform the measurement.
- ・Trig. Condition - Set the trigger conditions.
- ・Data average - Set the enable / disable of the data averaging function during the measurement.
- * Data average can be set only when sampling cycle expansion is supported.

6. Sampling: Set the sampling cycle. (When sampling cycle expansion is supported, the sampling setting method changes from the slider method, enabling the setting of a longer sampling cycle.)
7. Sub: You can set the trigger conditions to 2 kinds (A / B).
8. Trig. Object: Set the trigger subjects. You can select one of the analog signal or digital signal.
9. Filter : Set the filter the number of the time for the subjected number of the times signal. Depending on the trigger subjects, there are the items that you cannot set. If you cannot set the filter, "---" is displayed.
10. Trig. Level: Set the level of the trigger. If the trigger subject is analog signal, it is displayed by figures. If it is digital signal, it sets ON / OFF.

11. Unit: Display the trigger subjected unit to be selected.

12. Slope: Set the slope to be triggered. You can select it from "Leading", "Trailing", "Matched", "Mismatched", "Greater", "Less".

 * If you use digital signal for trigger subject, slope setting is "Matched" or "Mismatched".

13. Axis grouping setting:

Assign the axis of the connected driver to each group. When you press the axis grouping setting button, the axes of the connected driver are displayed as shown in the figure below.

Axis Group Setting — □ ×

Group1	Group2	Group3	Group4	Group5	Group6
MultiA(A Axis)	MultiB(B Axis)	X-AXIS(A Axis)			
		Y-AXIS(B Axis)			

OK   Cancel

Drag and drop each axis to move between groups and set.

Axis Group Setting — □ ×

Group1	Group2	Group3	Group4	Group5	Group6
MultiA(A Axis)		MultiB(B Axis)		X-AXIS(A Axis)	
				Y-AXIS(B Axis)	

OK   Cancel

 * One axis can be assigned to each group. However, if you are using the A6N 2AXIS series, it will be split into two axes.

 * In case of A6N 2AXIS series, it cannot be set for each axis, and both axes belong to the same group.

14. Group tab:

>　The display can be switched to the group set in the axis grouping setting.

>　* It is not possible to switch to a group for which no axis has been set, and the message "The axis has not been set." is displayed.
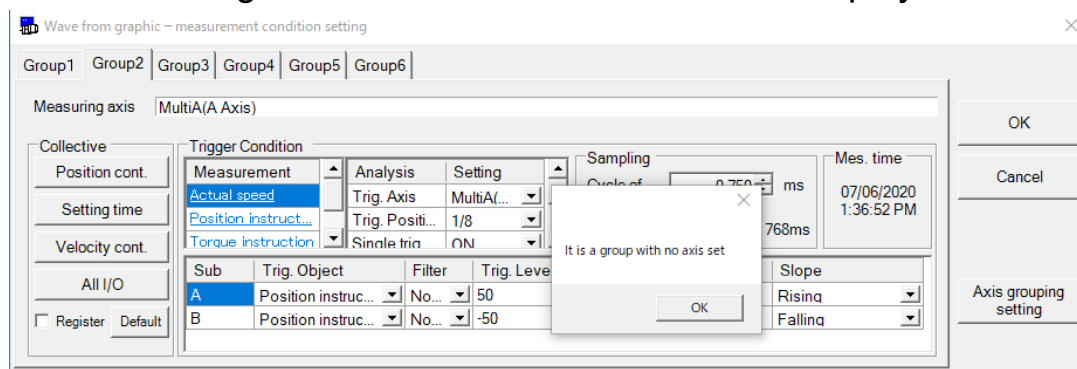
>　* In case of A6N 2AXIS series, it cannot be set for each axis, and both axes belong to the same group.

「OK button」
Press this to reflect the set measurement conditions and return to the waveform graphic screen. At the same time, this clears the waveform graphic display area containing the waveform displayed before the measurement condition setting screen was opened.

「Cancel button」
Press this to cancel the set measurement conditions and return to the waveform graphic screen.

Wave form graphic setting area
<Vertical axis / Horizontal axis Tab>
Designate the wave form graphic conditions
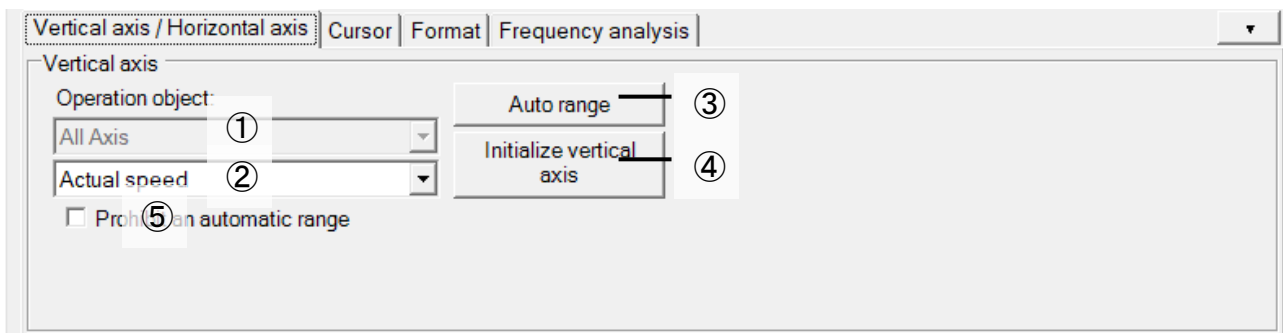
①Operation target axis selection: Selects the axis to be the operation target for auto-range and vertical axis origin return operations. Only in the side-by-side display mode, this item can be selected from A-axis, B-axis, and All axes in a batch.

②Operation target item selection: Selects the waveform of the operation target item for which the position and magnification are specified through auto-range, vertical axis origin return, and vertical axis slider bar operations. You can use analogue signal only. All items in a batch is also selectable.

③Auto range button：It automatically adjusts the vertical axis position and magnification to the optimum values for screen display for the waveform specified for the operation target axis and operation target item. And minimum (display all data) of horizontal magnification is set. (For the horizontal axis, all the waveforms of the axes selected for the operation target axes are auto-ranged.)

④Initialize vertical axis button: Moves the waveform specified for the operation target axis and operation target item in a manner that the 0 position is placed in the center of the screen keeping the magnification of the vertical axis unchanged.

⑤Prohibit an automatic range check box: If you check the mark, Auto range is prohibited at the measurement. When measurement conditions are the same, the auto range of a horizontal axis is also forbidden. If there is no check mark, Auto range shall be performed on the wave from each graphic measurement.

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\<Cursor Tab\>

Display cursor and the measured value of cursor 1 and cursor 2.

			Obsrv/F	Unit	Cursor1	Cursor2	Cursor1-Cursor2	Value	Max	Min	Error
		Time	---	ms	640.0	3835.0	3195.0	---	---	---	---
	MultiA(A Axis)	Actual speed	Obsrv	[r/m...	42	110	68	99	113	42	10.2
	MultiA(A Axis)	Position	Obsrv	[r/m...	51	100	49	99	100	51	5.6
	MultiA(A Axis)	Torque	Obsrv	[%]	1.95	1.00	-0.95	1.55	2.05	0.80	0.35
	MultiA(A Axis)	Instruction	Obsrv	[Co...	32767	32767	0	327...	327...	327...	0.0

Tabs: Vertical axis / Horizontal axis | Cursor | Format | Frequency analysis

☑ Display cursor
Cursor 1 ◄ ❘ ►
Cursor 2 ◄ ❘ ►
Cursor 1 to the trigger position
Smoothing: 3

「Display cursor」 Tick off to enable the display of cursor 1 and cursor 2.

「Cursor1」 The cursor 1 position can be moved. The position can also be specified with the left mouse button. The cursor can also be clicked and moved.

「Cursor2」 The cursor 2 position can be moved. The position can also be specified with the left mouse button. The cursor can also be clicked and moved.

「Value display」 The value of the selected measurement item is displayed.
①"Obsrv / Ref": It show whether the waveform is the observed one or a reference.
②Unit   : The unit of the selected item is displayed.
③Cursor1 : The cursor 1 time value of the selected item is displayed.
④Cursor2 : The cursor 2 time value of the selected item is displayed.
⑤Cursor1 - Cursor2
              : It shows the difference between the cursor 1 value and the cursor 2 value of the selected measurement item.
⑥RMS value : The effective value of the section from cursor 1 to cursor 2 of the selected measurement item is displayed.
              If "Display" is not ticked, the effective value of all sections will be displayed.

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⑦Maximum value : The maximum value of the section from cursor 1 to cursor 2 of the selected measurement item is displayed. If "Display" is not ticked, the maximum value of all sections will be displayed.

⑧Minimum value : The minimum value of the section from cursor 1 to cursor 2 of the selected measurement item is displayed. If "Display" is not ticked, the minimum value of all sections will be displayed.

⑨Standard deviation

: The standard deviation of the section from cursor 1 to cursor 2 of the selected measurement item is displayed. If "Display" is not ticked, the standard deviation of all sections will be displayed.

"Cursor 1 to trigger position"

Allows you to move the cursor 1 to the position specified under "Trigger conditions."

"Smoothing" Analog signals are passed through a moving average filter, and the signals are smoothed and displayed.

※Only the analog signals for which a filter can be set are smoothed when they are targeted for triggering. Be aware that analog data and digital data without filters will no longer be synchronous.

※Even if the waveform is smoothed with this setting, the data display on the cursor tab is based on the data before smoothing.

\<Format Tab\>

Set the waveform display format for each axis and each measurement item.

Measuring axis	Measurement item	Obsrv/Ref	Display	Color	Bold	Measurement time
Vertical axis / Horizontal axis Cursor Format Frequency analysis						▼
NoName(A Axis)	Actual speed	Obsrv	☐		—	10/19/2020 2:49:36 ...
NoName(A Axis)	Position	Obsrv	☐		—	10/19/2020 2:49:36 ...
NoName(A Axis)	Torque	Obsrv	☐		—	10/19/2020 2:49:36 ...
NoName(A Axis)	Instruction	Obsrv	☐		—	10/19/2020 2:49:36 ...
		①	②	③	④	⑤

"Measurement item"

Selected measurement item is displayed.

①"Obsrv / Ref" : It shows whether the waveform is the observed one or a reference.

②"Display"   : Tick off for the display of the waveform.

③"Color"   : Set the color of the waveform of a measurement item. Double-click the color part of each measurement item to select a color.

④"Bold"   : Sets the thickness of the waveform of a measurement item. Double-click the line part of each measurement item to change the thickness.

⑤Measurement time : Shows the waveform measuring time.

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<Frequency analysis tab>

Perform the discrete Fourier transform on the waveform displayed in the waveform graphic area and analyzes the strength of each frequency component.
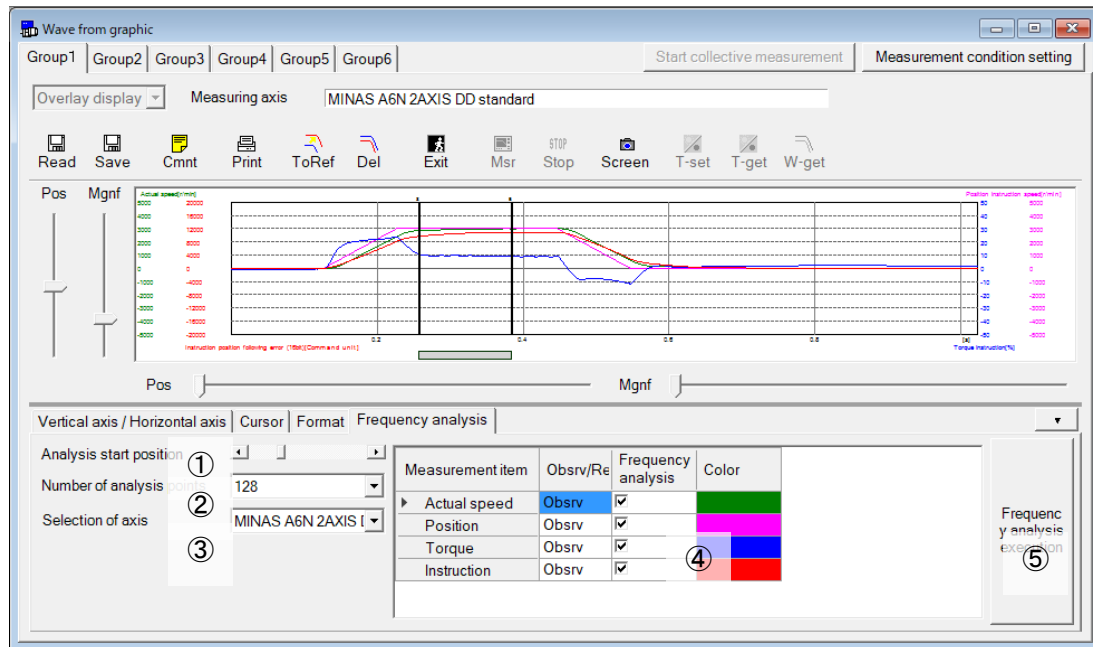
①Analysis start position:
Set the analysis start position of the waveform for frequency analysis.

②Number of analysis point:
Select the number of analysis points (data range) from the analysis start position.

③Selection of axis:
Select the target axis for frequency analysis.

④Frequency analysis item:
Selects the item for which a frequency analysis is to be performed.

⑤Execute frequency analysis:
Performs a frequency analysis and displays the results in a separate window if this button is pressed.

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<Waveform graphic frequency analysis results>
The waveform graphic frequency analysis results are displayed on the screen below.
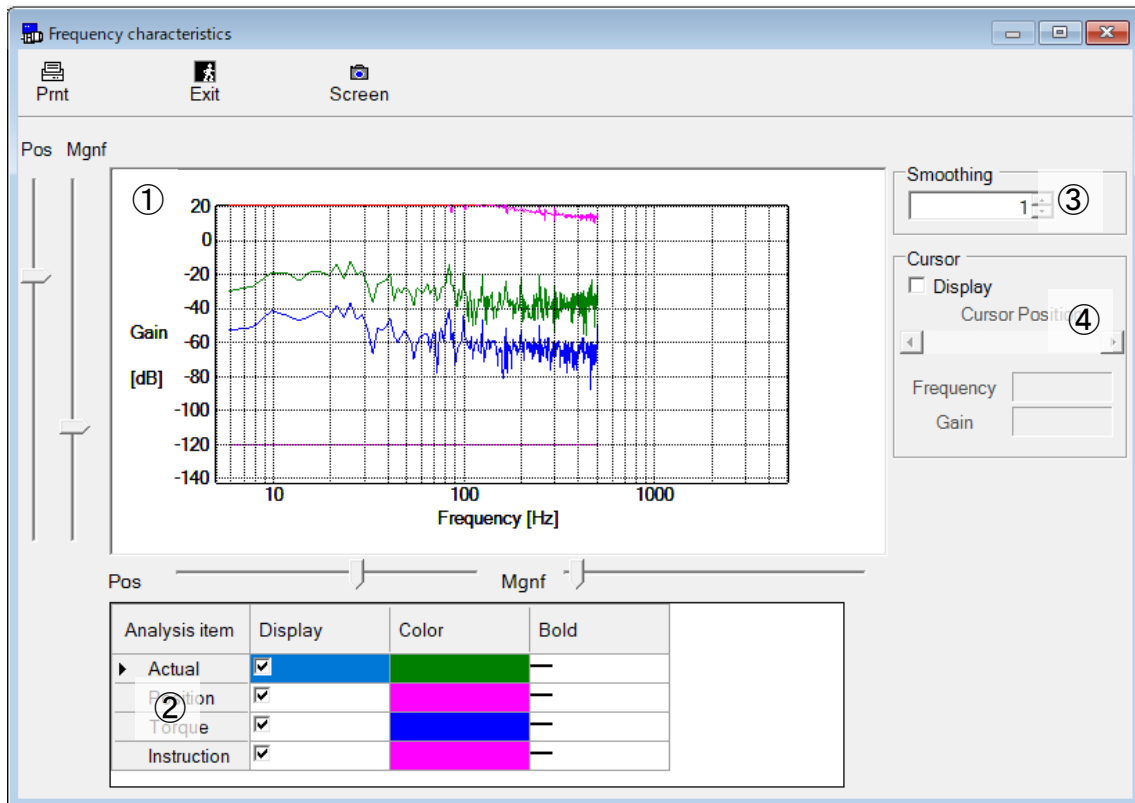
①Frequency analysis result display:
Shows the frequency analysis result for each waveform data.

②Display format setting:
Allows you to set the presence of display, color, and thickness of each analysis result waveform.

③Smoothing:
Configures the smoothing setting of frequency analysis result waveforms.

④Cursor:
Applies the cursor to the waveform of the item selected in the display format setting and shows the frequency and gain value in the cursor position if cursor display is enabled.

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
[Supplement]
Due to the theoretical constraints of the discrete Fourier transform, the maximum value and resolution of analyzable frequencies depend on the sampling period of waveform data and the number of analysis data points. Specifically, assuming that the sampling period of waveform data is Δt, the number of data points is N, and the maximum value of analyzable frequencies is Fmax, and the resolution is ΔF, it is expressed by the following relational expression.

$$Fmax = 1/(2 \Delta t)$$
$$\Delta F = (2Fmax)/N$$

Measurement of wave form graphic

1 Specifie waveform graphic measurement items and conditions.
2 Click 🖳 (Measure) of the tool bar.
   When the measurement is started, the transfer status bar changes.
   Notes 1) If "T-set" or "Msr" (Measure) button is once clicked, even if you close the wave form graphic display or exit the PANATERM, the driver continues measurement by the trigger condition last set. In this case, the measured data which is trigged by the setting is acquired by pushed the "W-get" button. But if the driver is yet waiting for trigger, displayed communication error dialog box.
   Notes 2) When wave form graphic display is closed, measurement condition is saved, and same condition is applied next time, Except Exit of PANATERM or Communication error.

Reference data

1 After measuring wave form graphic, click 📈 (To Reference) button on the tool bar, and observed data is copied to reference data.
2 Check the "Display" of Reference data from "Format" tab and reference data can be displayed on screen.
   Notes 1) The reference data is registered up to 10 sets. Reference 10 will be overwritten if copying is done with all reference waveforms filled.
   Notes 2) When measurement item is changed, the reference data is cleared.
   Notes 3) The time (horizontal) scale of reference data is fixed at the condition of measurement. Don't read the reference data which has different time scale from wave file.

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Save and read the wave graphic data

It is possible to use, and to refer when the parameter setting value at the measurement condition, the result of a measurement, and that time specified when measuring it is preserved in the file, and the measurement is executed again under this condition.

    Wave graphic data file   : ***.wgd5 or ***.wgd6
    Wave graphic condition file   : ***.wgc5 or ***.wgc6
    Wave graphic data and parameter file   : ***.wgp5 or ***.wgp6
*   When sampling cycle expansion is supported, files are saved with extensions wgd6, wgc6, and wgp6.

Save to wave graphic data
1 Click "Save" button from tool bar.
2 "Save the wave form graphic data" window is displayed.
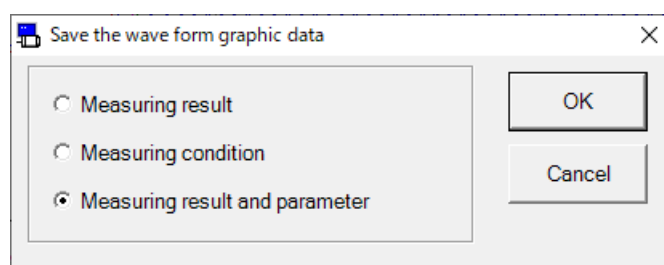
3 Select the save item, and click "OK" button.
4 Comment input window is displayed.
  （Figure below provided in the case of measurement result and parameter selection）
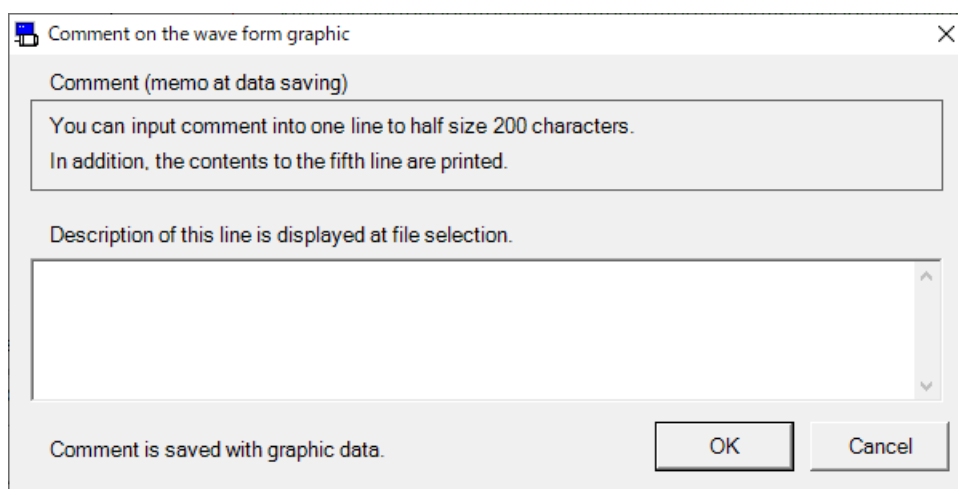
5 Click "OK" button, and the file dialog is displayed.

6 In the file dialog, specify the name of the file that you want to save.
7 Click "Save" button.

Read from wave graphic data
1 Click "Read" button from tool bar.
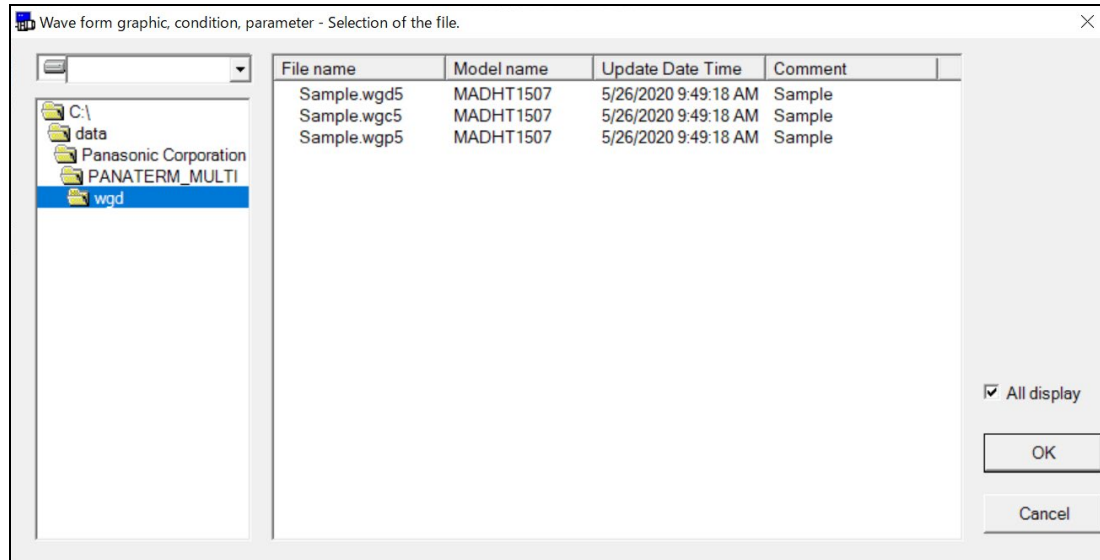
2 Select data file to read.
3 Click "OK" button.
4 Window for "Read the wave form graphic data" will appear.
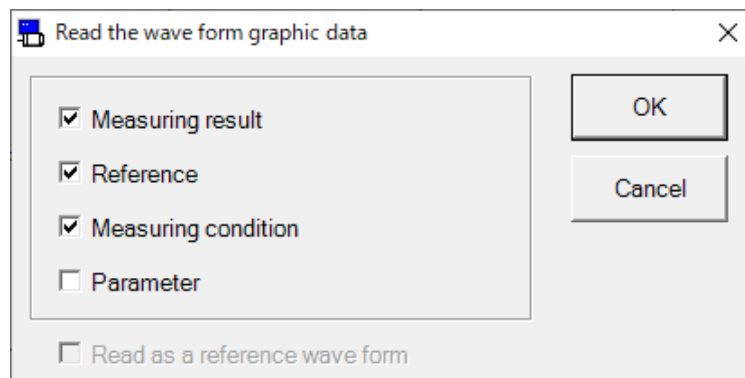
5 Put checks on the items you would like to read, and click "OK". The saved waveform for measurement result can be read as reference, if "Read as a reference wave form" is selected. However the measured condition, and parameters cannot be read, if this is selected.
6 Content that was selected will be read.

[Supplement]
Save the waveform graphic data in a separate file for each axis. When a waveform has been displayed on an irrelevant axis at the time of reading, if the measurement conditions differ from those of the file to be read, the waveform is cleared. (If the measurement conditions are the same, the waveform is displayed without being cleared.)

Notes 1) The detail of wave form data is referred the driver operation manual or technical reference.
Notes 2) When sampling cycle is not set minimum value, a part of analog signal are smoothing by the driver.
Notes 3) The aliasing might be caused and an actually different shape of waves be seen, when sampling cycle is longer than vibration data.
Notes 4) The communication error is displayed when the driver power supply is off while wave form graphic is measuring. Please close wave form graphic display.
Notes 5) The wave form graphic function is not precious measurement instrument. The wave form graphic data shall be used as rough estimate.
Notes 6) "Mes. time" (Measure time) display is the time of receive the wave form data from the driver. Note that the time is not the time of trigger time.
Notes 7) The wave form graphic screen cannot open during opening some screens. For more information please refer to page 202 "Wave form graphic screen behavior".
Notes 8) In the case of network type, if a network is established in the state of trigger standby, the detected trigger position may shift.

Trial run screen

Motor can be operated as test only with the Drive, and without connecting to the master level equipment.

Note) Parameter settings and Driver's gain tuning will be needed even at the trial run. Please read the operation manual or technical reference to understand the manual content prior to this operation.
Note) Test run operation during EoE communication is very dangerous. Make sure to check the safety thoroughly before conducting a test run. In addition, there is a risk that EoE will not accept user operations until it is forcibly stopped due to a timeout, resulting in unsafe operation.

Open the Trial Run window
1 Start "PANATERM".
   (Please refer to Article 5. Start up and Close down in details)
2 Click "Trial Run" of the tool bar on the main screen.
3 The Trial Run window is opened.

Trial Run - Operation Area Setting-MultiA(A Axis)

STEP1: Check of the servo on
Click "Servo Off" on the operation area setting panel and then click "Servo On".

Item Name	Area	Value	Unit
JOG Speed	1-500	60	r/min
JOG Acc./Dec. time	1-5000	50	ms

Protect setting	Area	Value	Unit
Over-speed level setup	0-20000	120	r/min
Over-load level setup	0-115	50	%
Motor working range setup	0.1-100.0	0.5	Revolution

STEP2: Interference check
Configure the parameter on the Parameter area. Then operate the motor by the JOG operation button on the operation area setting panel with confirming the motor operation.
Configure the Max / Min of motor operation area.

After completion of motor operation area, click the "Go Trial Run" button to proceed to the test operation window.

STEP3: Test operation
Operate the motor using the buttons on the test operation panel.

Operation Area Setting Panel   ☑ Auto-set (Over-speed level setup)

Servo On/Stop   ■   Servo Off(Esc Key)   ✕

JOG

Pos(+)   Neg(-)

MAX (pulse)   MOTOR (pulse)   MIN (pulse)
0   0   0

Close   Skip   Go Trial Run

Close the Trial Run window
   Click "Close" button on the window.

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Structure of Trial Run screen

Operation Area Setting window
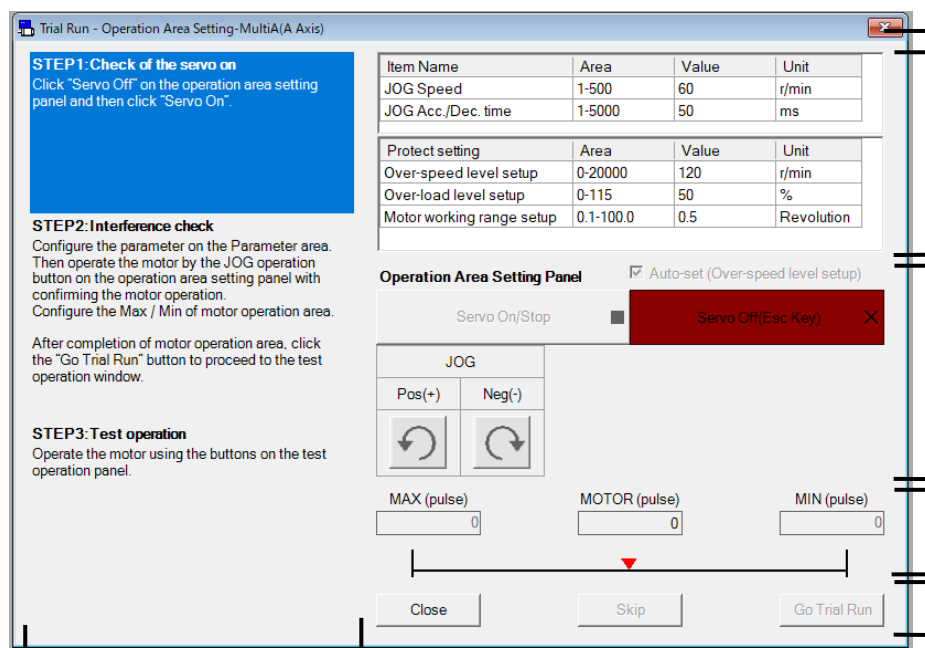
(1) Title bar

(2) Related parameter

(3) Operation area setting panel

(4) Motor position data

(5) Operation button

(6) How to operation area

Test Operation window (Standard type)
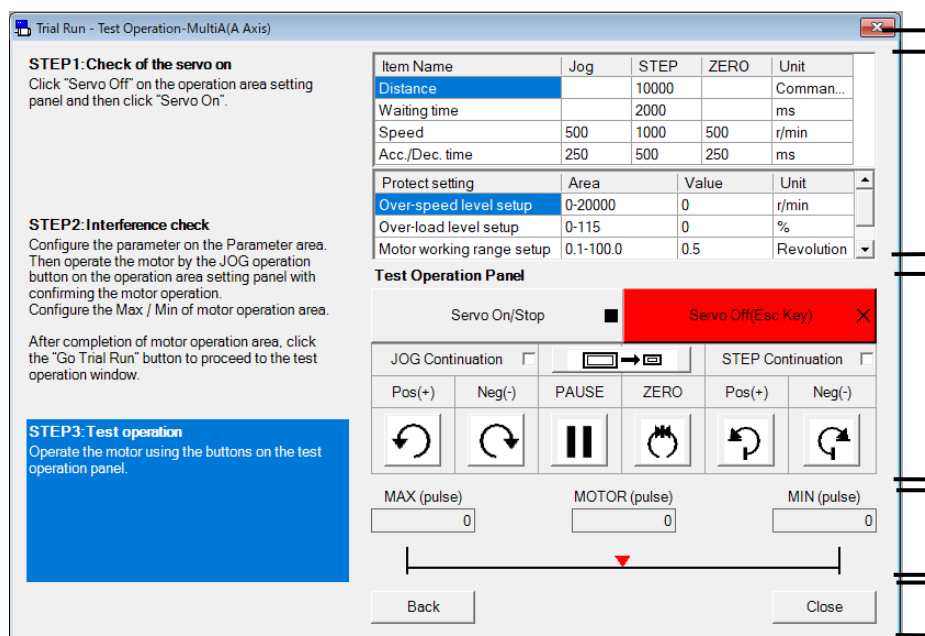
(1) Title bar

(2) Related parameter

(7) Test operation panel

(4) Motor position data

(5) Operation button

Test Operation window (Shrink type)
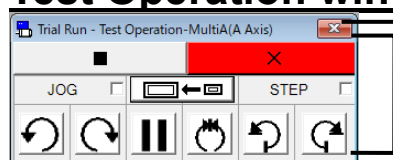
(1) Title bar

(7) Test operation panel

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(1) Title bar   Window can be operated.

(2) Related parameter

   Speed and Acc./Dec. time can be operated at the Operation area settings window. Speed, Acc./Dec. time, moving length, waiting time properties of JOG/STEP/ZERO can be set.

   Protection function setting related amp parameters are also displayed.
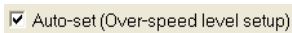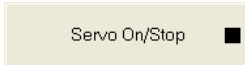
   Notes 1) These parameters will be in PANATERM's default setting, when the Operation Area Setting window is opened. But these will be set the value before opening a Trial run, when the Test Operation window is opened.

   Notes 2) Change of setting value will be reflected to the drive at the start of test operation.

   Notes 3) Protection function setting will return back to the value before opening the window, when the Operation Area Setting window or the Test operation window is closed.

(3) Operation area setting panel

Test operation can be done with the button below

|		
	Auto-set (Over-speed level setup)	If a check is put in, over-speed level will be changed the twice of JOG speed.
	Servo On / Immediate stop	Turn on the servo feature of motor.
	Servo Off	Turn off the servo feature of motor. Note) Servo feature can be turned off by the ESC key when the window is active.
	JOG Positive(+)	JOG operation can be done to the plus direction when JOG Positive (+) is pressed, and minus direction when the JOG Negative (-) is pressed with the speed on setting.
	JOG Negative(-)	

(4) Motor position information area

   MAX   : Maximum operation area
   MOTOR: Current position
   MIN   : Minimum operation area

   * The current motor position will be the command unit value assuming that the servo-on position is 0.

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(5) Operation button

Close   : Close operation area configuration or test operation feature.

Skip   : Test operate without operation area being configured.

Go Trial Run : Test operate based on configuration.

Back   : Stop test operation, and return to operation area configuration. Test operation window.

(6) How to operation area

This area displays the explanation of the operation method.

(7) Test Operation panel

Test operation can be done with the button below
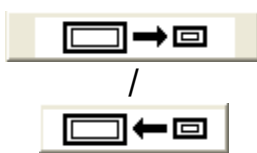
/	Change to shrink type / Change to standard type	A test run screen is changed from standard type to shrink type. Or it is changed from shrink type to standard type.
	Servo On / Immediate stop	Servo function will be turned on. When motor is in "Servo On" condition, this button will enable an immediate stop or continuous operation.
	Servo off	Servo function will be turned off. When window is active the Servo function will be turned off when ESC key is pressed.
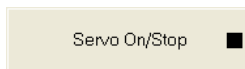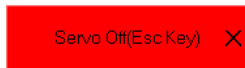
⟲	JOG Positive(+)	■When check is not on "JOG Cont", then JOG operation will be active when button is pressed, and will be inactive when button is not pressed.
⟳	JOG Negative(-)	■If check is on the "JOG Cont" button, then JOG operation will continue until operation area becomes Max/Min. when button is pressed once. ・When "Servo On/Stop" is pressed, then motor will immediately stop without time to descend the speed. ・When "Pause" is pressed, then motor will stop after descending the speed. Time to descend the speed until stopping the rotation will vary depending on time needed. Note) If you would like to cancel the JOG continuous operation, then "Pause" the motor, and then press "Servo On/Stop" button.
❚❚ / ▶	PAUSE	Motor will pause and continue the operation.
⟲	ZERO	Motor will Step operate until the 0 position.

	STEP Positive(+) STEP Negative(-)	■If check is not in the "STEP Cont" checkbox; Step operation will continue when for the configured operation distance when the button is pressed. ・Motor will immediately stop without speed deceleration time, when the "Servo On/Stop" button is clicked during rotation. ・Motor will pause after speed deceleration when "PAUSE" button is clicked. When "PAUSE" button is clicked again, then motor will operate towards the targeted position set before pausing. ■When check is on the "STEP Cont" checkbox ; When the button is clicked once, then the motor will operate the "Step operation" for the configured distance to the designated direction, and then operate for same distance to the opposite direction, which will continue this back and forth operation. ・When "Servo On/Stop" button is clicked during this continuous operation, the motor will stop without deceleration time, and cancel the continuous operation. ・When "PAUSE" button is clicked during the same continuous operation, then the motor will pause and will continue on with the operation when the button is clicked again. Note) Push "Servo On/Stop" button after "PAUSE" button and STEP continuous operation can be canceled.

Maneuvering Test operation

1 Click "Servo Off" on test operation panel at Operation area settings window, and then click "Servo ON" (STEP 1)
   If there are alarms or errors occurring at this step, eliminate the cause, clear the alarm, and then re - start from step 1.

2 Configure the parameter on the Parameter area. Then operate the motor by the JOG operation button on the test operation panel with confirming the motor operation.
   Configure the Max / Min. of motor operation area. (STEP 2)

3 After completion of motor operation area, click the "Next" button to proceed to the test operation window.

4 Operate the motor using the buttons on the test operation panel on the test operation window. (STEP 3)

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Notes 1) If warning or error occurs when the trial run window is open, then the communication error will appear on screen.

Notes 2) When open the trial run window, the parameter of protection function setting changes into a default value. When close the trial run window, it returns to the value before it opens. Therefore, please note that the argument value changed on trial run screen might be displayed when the parameter is written from other screens while the trial running.
Moreover, the parameter changed on the trial run screen is not preserved.

Notes 3) When "Go Trial Run" button is clicked without the operation area configured, and then the error will appear on screen. Please configure the operation area going by what specified above.

Notes 4) Please be noted that the configured operation area will be canceled, and there will be no limit to the operation area during the test operation.

Notes 5) Operation area will be cleared when "Servo OFF" is clicked.

Notes 6) When "Close" button is clicked when the Servo is ON, then the Drive Servo will be turned OFF, and test operation will be stopped.

Notes 7) When "Servo OFF" or "Back" is clicked, then the Drive Servo will be turned OFF, and operation area will be cleared.

Notes 8) The trial run screen cannot open during opening some screens. For more information please refer to page 203 "Trial run screen behavior".

Notes 9) When drive is not in ready status (Alarm or Main power source is cut off), drive is used for other processing, or Servo ON is input from outside, then the trial run window will not be able to open or error will be on screen during execution. Please re - execute after these status is eliminated, and the trial run window is closed.

Frequency characteristics screen

Measures the wavelength characteristics including the load, and shows the result in bode plot Mechanical resonance point or response time can be measured. In addition, the measured result can be saved as file.

Note) Please check with the operation manual or the specification document.
Please execute the measurement in the condition that servo-off can be made anytime as a precaution.
This function should not be used in the case that blistering movement of a motor may break the machine.
Please execute the measurement in the condition of as low gain as possible.
Please note that large setting of offset value may cause exceeding movement limitation.

Open the Frequency characteristics window

1 Start "PANATERM".
   (Please refer to Article 5. Start up and Close down in details)
2 Click "Other" > "Frequency Response" of the tool bar on the main screen.
3 The Frequency characteristics window is opened.
   (The figure of the next page)
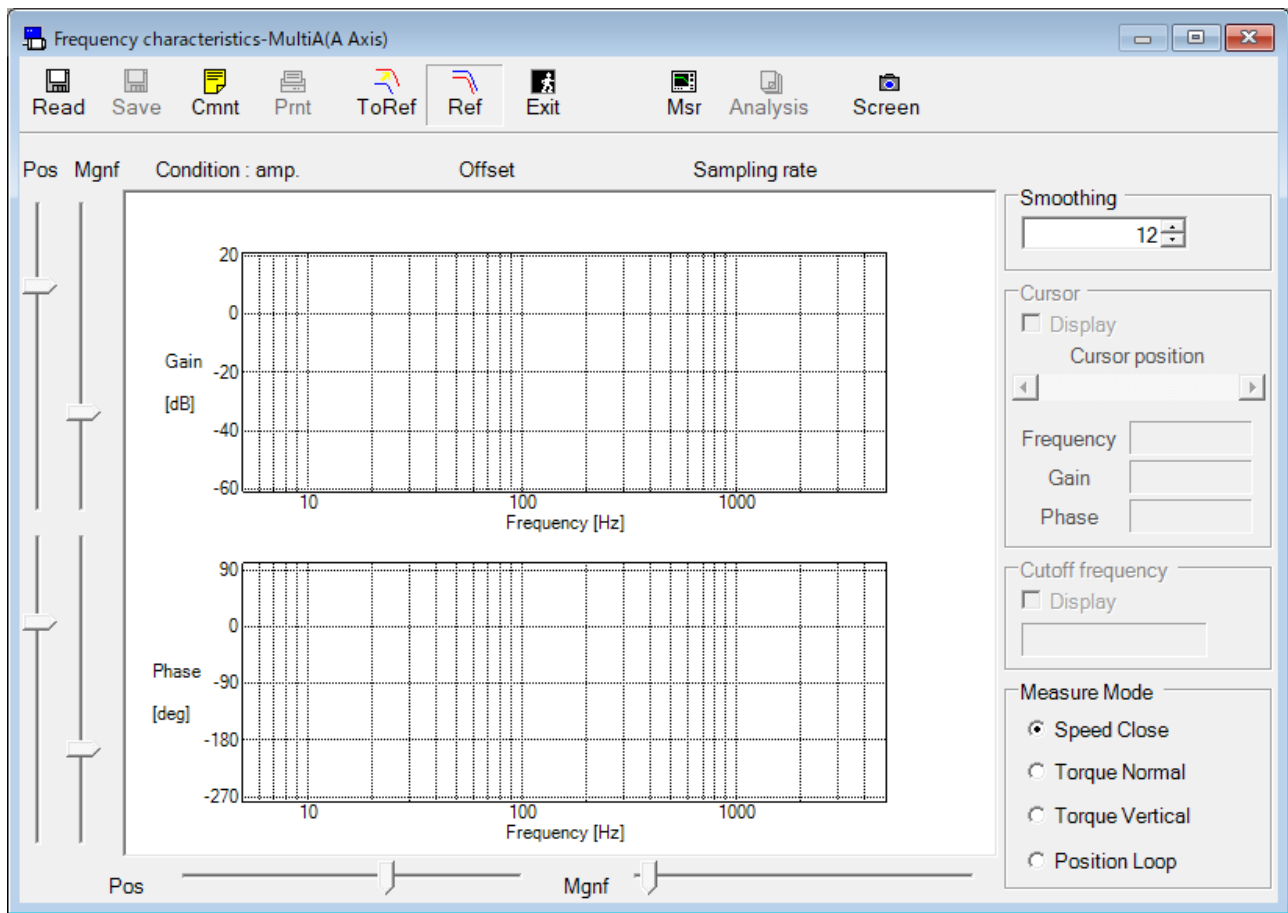
Close the Frequency characteristics window

Click (Exit) on the tool bar.

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Structure of Frequency characteristic screen

(1) Title bar

(2) Tool bar

(3)Content
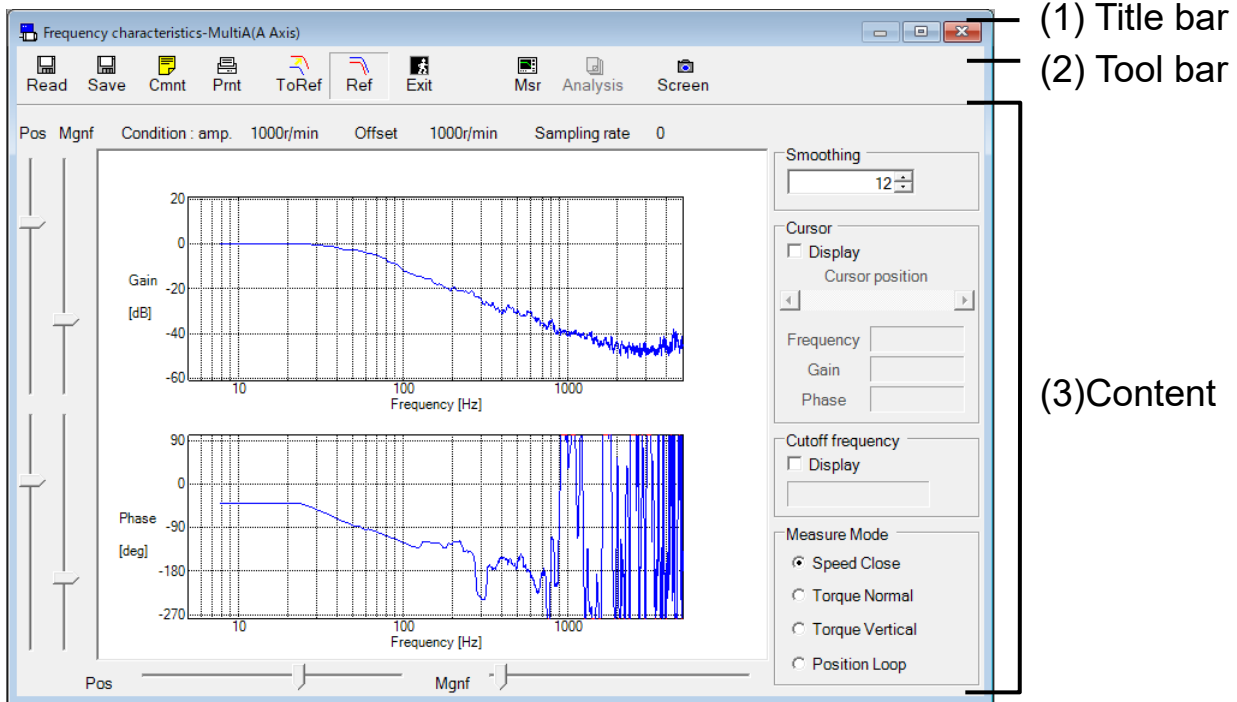
(1) Title bar
You can operate this window.

(2) Tool bar
Operation command such as Frequency characteristics measurement is on this bar.

Read	(Read)	Read frequency characteristics data. When this button is effective, a file can be specified by drag and drop.
Save	(Save)	Saves the frequency characteristics data.
Cmnt	(Comment)	Write comments to the Frequency characteristics file.
Prnt	(Print)	Print Bode plot.
ToRef	(Copy)	Copy measured wavelength to referenced wavelength.
Ref	(Reference)	Turn ON/OFF screen of reference wavelength.
Exit	(Exit)	Close Frequency characteristics window.

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Msr	(Measure)	Measure Frequency characteristics.
Analysis	(Analysis)	Analyze frequency characteristics.
Screen	(Screen)	Capture screen and save as file.

(3) Content area

Graph option

Configure items related to graph appearance or operation

Smoothing	Configure level of smoothing
Cursor	Switch appearance/disappear of cursor on screen
Cut off frequency	Shows frequency[Hz] which will enable Gain - 3db
Measurement mode	Configure measurement mode.
Speed close loop characteristics	Measure frequency response from Speed input to motor speed.
Torque speed (Standard)	Measure frequency response from Torque input to Motor speed
Torque speed (Vertical)	Measure frequency response from Torque input to Motor speed. This function is used in loads that are asymmetric such as in vertical angle.
Position Loop	Measures the position loop frequency characteristics from Torque input to Motor speed.

Vertical axis slider

Change "position" and "magnification" of vertical axis of bode plot.

Horizontal axis slider

Change "position" and "magnification" of horizontal axis of bode plot.

Bode plot

Creates bode plot of measured Frequency characteristics data.

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Measurement of Frequency characteristics

Click "Measure" on Frequency characteristics window, and then measurement window will open.

(1) Notification area

(3) Operation button

(2) Input field for measurement condition
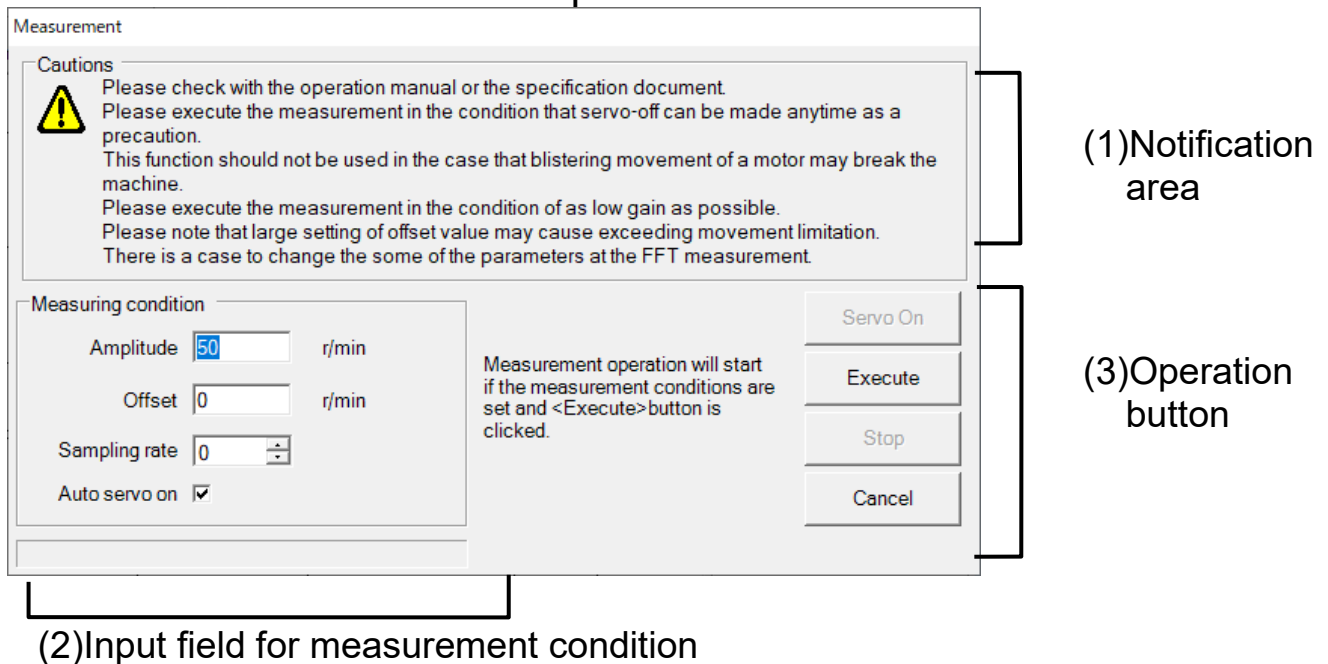
1 Please confirm the content that is on the (1) notification area.

2 Specify (2) Measurement condition.

"Variation"   The amplitude of noise waveform applied to the velocity command or the torque command is set when measurement of frequency characteristics.

* When the measurement mode is "speed closed-loop characteristics," the sum of amplitude and offset is limited to a range not exceeding 5000 r/min. When the measurement mode is "torque speed," it is limited to the range not exceeding 100%.
* When variation is increased the measurement will increase, however torque will be saturation, and torque precision will decrease. Please start with small values and increase with steps accordingly to the measurement result.

"Offset"   The offset of noise waveform applied to the velocity command or the torque command is set when measurement of frequency characteristics.

* Sum of variation and offset will be limited to 5,000r/min. When measurement mode is in Torque Speed, then setting is not possible.

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* Motor will operate with offset being the average speed command during the measurement. Polarity of "+" is CW, and "-" is CCW. A good measurement result can be taken if the motor is rotating into one direction, while the offset is configured over the value of variation. However, please be careful when the "Rotation" is narrow, because the rotation may exceed the "Rotation". Rotation of motor can be calculated by the below formula. Please confirm that the "Rotation" will not be exceeded before starting the measurement.

Rotation [r] = Offset [r/min] x 0.017 x (Sampling rate +1)

"Sampling rate" Can be configured to values from 0 to 7

* When sampling rate is large, then the measurement precision of low frequency will increase, however the measurement time will be longer. If small, then measurement precision of high frequency will increase. Please start from "0", and adjust accordingly to the measurement result.
* When sampling rate is over 1, then the aliasing may occur.

"Auto servo on" The driver does servo-on by automatic operation when measurement of frequency characteristics when "Auto servo on" is checked.

    * In the case of standard type, please do not check it when servo-on by an external input.
In the case of network type, please do not check it when brake release operation is being performed by host device.

3 When the "Servo on" of (3) operation button is invalid, or when not displayed, please move on to the next.
When the "Servo on" is valid, please click on "Servo on". Caution windows will appear. Confirm the window message carefully, and click "Execute". To cancel, click "Cancel".
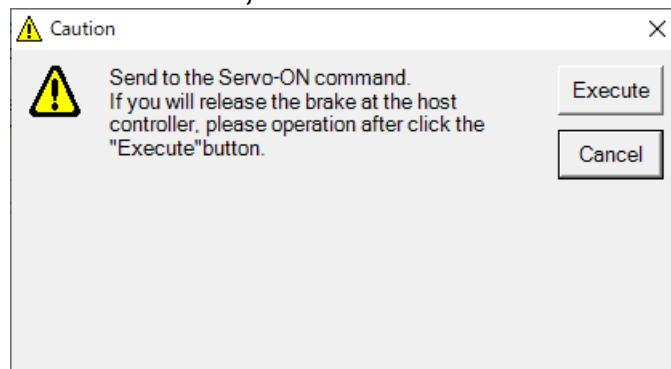
"Execute" of (3) operation button becomes effective after servo-on.
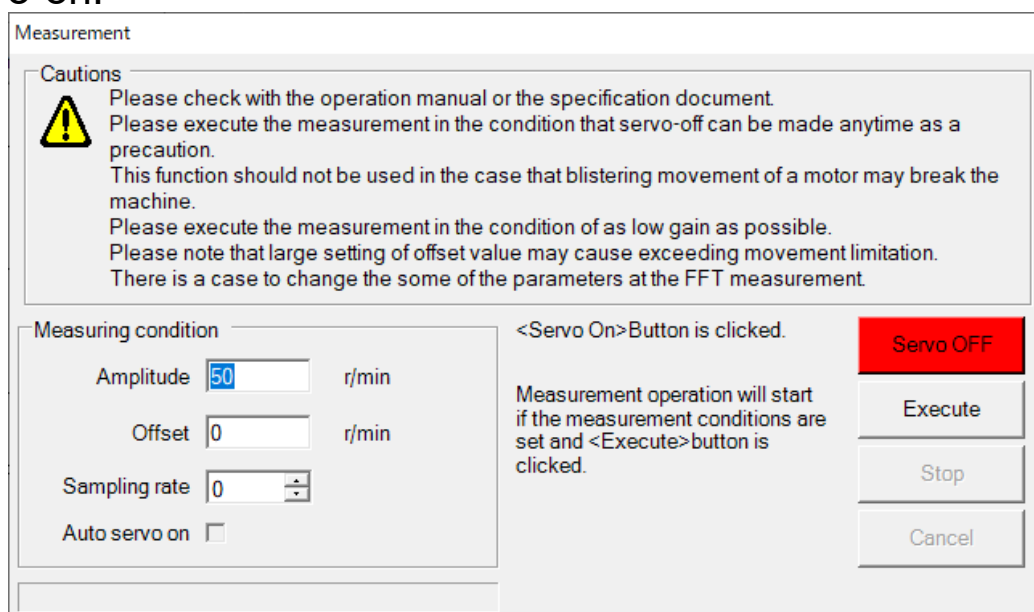
When using the host device for brake operations, release the brake after turning on the servo.

4 Click on "Execute" on the (3) operation button, and notification window at resonance measure will appear. Confirm the window message carefully, and click "Execute".

Notes on the resonance measuring   ×

⚠ The measurement of the machine resonance should be executed in the condition of low gain.(Lower the value of "position roop gain" and "velocity roop gain",and raise the value of "velocity roop integration time constant")

Execute

Cancel

☐ No display of this window hereafter

5 Caution windows will appear.
    To turn on the servo by external input, turn on the servo.
    Click "Execute" after servo-on, the measurement will start.
    To cancel, click "Cancel".
        * If you want to cancel while the measurement is in progress, click the "Stop" operation button in (3).
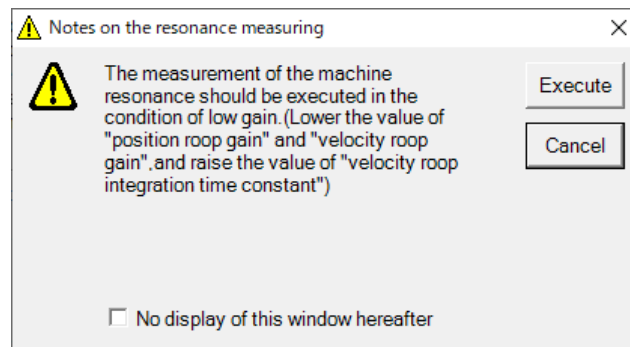
Caution   ×

⚠ During the measuring,the motor rotates and the work moves in a large way.
If there is an unbalanced load such as the vertical axis, there is a possibility of falling when you measure Torque Normal mode.
The measuring should be executed on the condition that servo-off can be made anytime as a precaution.

Execute

Cancel
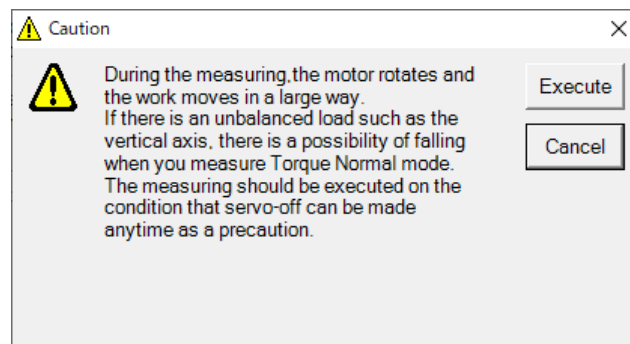
6 A measurement window closes automatically after the completion of measurement. Please click "Servo off", when you do not close. When using the host device for brake operations, apply a brake before turning off the servo.

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Measurement

Cautions

⚠️ Please check with the operation manual or the specification document.
Please execute the measurement in the condition that servo-off can be made anytime as a precaution.
This function should not be used in the case that blistering movement of a motor may break the machine.
Please execute the measurement in the condition of as low gain as possible.
Please note that large setting of offset value may cause exceeding movement limitation.
There is a case to change the some of the parameters at the FFT measurement.

Measuring condition

Amplitude	50	r/min
Offset	0	r/min
Sampling rate	0	
Auto servo on	☐	

\<Servo On\>Button is clicked.

Measurement operation will start if the measurement conditions are set and \<Execute\>button is clicked.
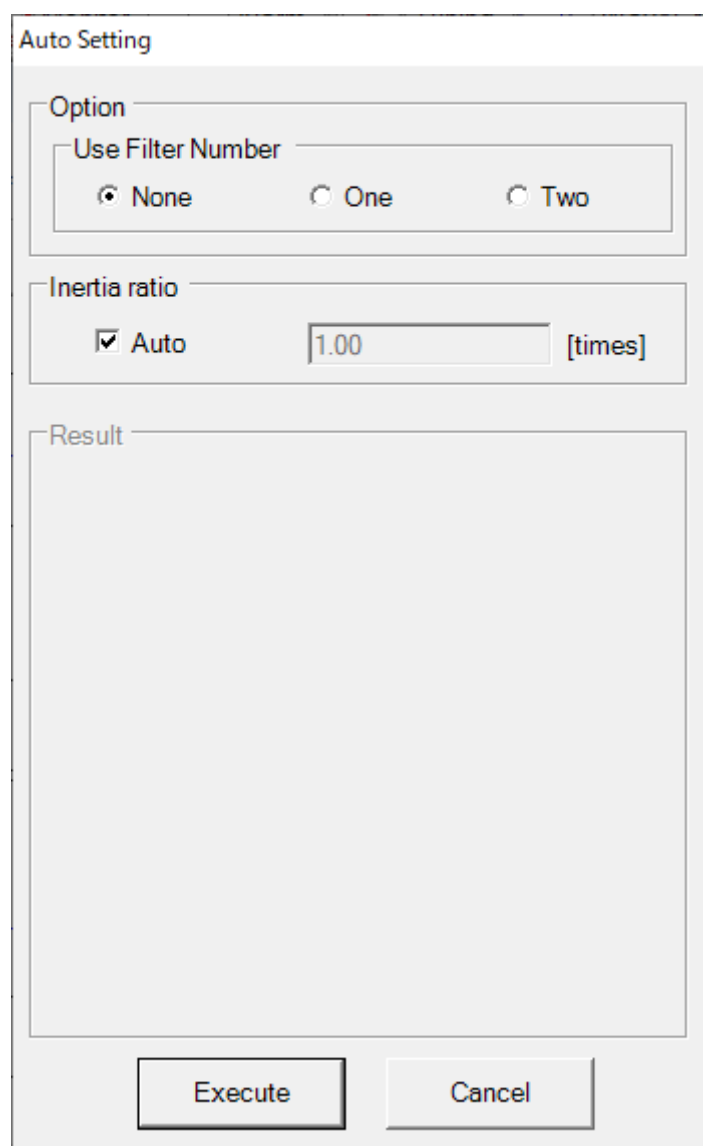
| Servo OFF |
| Execute |
| Stop |
| Cancel |

Measurement completed.

Analysis of frequency characteristics

1 Gain automatic adjustment window will open, when "Analysis" button of Frequency characteristics window is clicked.

* This function can't be used with MINAS A6 series.
* Analysis can be done when communication with drive is connected, and after measurement is done at measurement mode "Torque Speed". (Standard analysis cannot be done when communication is not connected)

```
Auto Setting

┌─Option──────────────────────────────────┐
│ ┌─Use Filter Number─────────────────────┐ │
│ │  ⊙ None      ○ One        ○ Two       │ │
│ └───────────────────────────────────────┘ │
│                                           │
│ ┌─Inertia ratio─────────────────────────┐ │
│ │  ☑ Auto      [1.00        ]  [times]  │ │
│ └───────────────────────────────────────┘ │
│                                           │
│ ┌─Result────────────────────────────────┐ │
│ │                                       │ │
│ │                                       │ │
│ │                                       │ │
│ │                                       │ │
│ │                                       │ │
│ │                                       │ │
│ │                                       │ │
│ │                                       │ │
│ └───────────────────────────────────────┘ │
│                                           │
│    [ Execute ]        [ Cancel ]          │
└───────────────────────────────────────────┘
```

2 Configure number of notch filter that will be used at analysis option.
3 Configure Inertia ratio. If inertia ratio is to be automatically assumed from the result of frequency characteristics measurement, then put the check on the automatic adjustment checkbox.

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4 After "Execute" button is clicked, recommended control parameter will appear on the analysis result, and resonance & anti - resonance frequency and it's opposite will appear on the bode plot frequency characteristics. (Yellow : Resonance, Green : Anti - resonance)

Auto Setting

Option
  Use Filter Number
  ⦿ None   ○ One   ○ Two

Inertia ratio
  ☑ Auto   1.00   [times]

Result

Gain of position loop [rad/s]	0
Gain of velocity loop [Hz]	0
Velocity loop integration [ms]	0
Torque filter [0.01ms]	0
1st notch frequency [Hz]	0
2nd notch frequency [Hz]	0
Inertia ratio [%]	0

Ant	Resonance

[Execute]   [Cancel]

5 Close "Cancel" to close the Gain automatic adjustment window from the frequency characteristics.

Save or reading frequency characteristics data

　Measurement condition, result and parameter values at the time of measurement can be saved as file, and used again to measure with same condition, or read for reference.
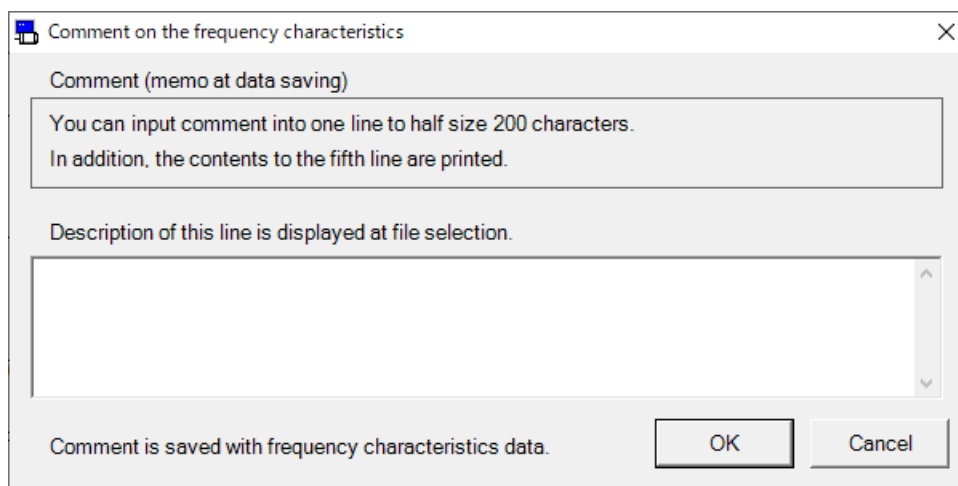
Frequency characteristics measurement result file　　　　　　: ***.fcd5
Frequency characteristics measurement condition file　　　　　: ***.fcc5
Frequency characteristics measurement result & parameter file: ***.fcp5

Saving frequency characteristics data
1　Click "Save" in toolbar.
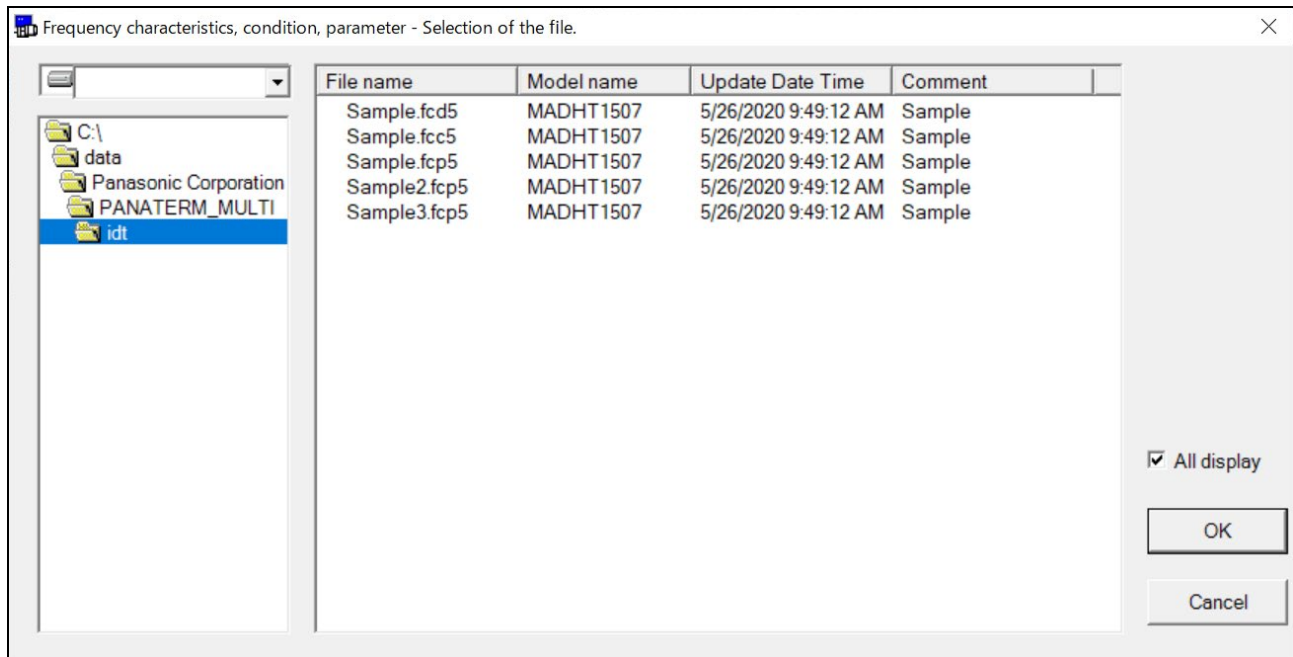2　Saving frequency characteristics data window will appear.
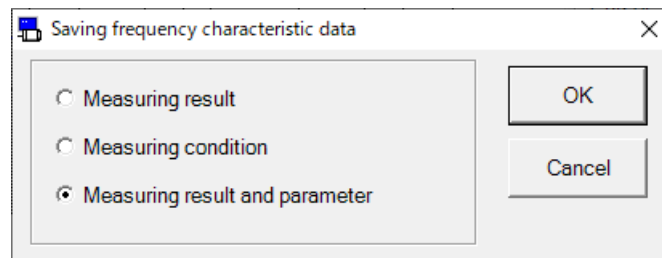
3　Select items to save, and click "OK".
4　Comment window will appear.
　　（Figure below provided in the case of measurement result and parameter selection）

5　Click "OK", and file dialogue will appear.
6　Input the file name to save, in this file dialogue
7　Click "Save".

Reading Frequency characteristics data

1 Click "Read" on the toolbar.

2 Select file name to read.
3 Click "OK"
4 Frequency characteristics read window will appear.
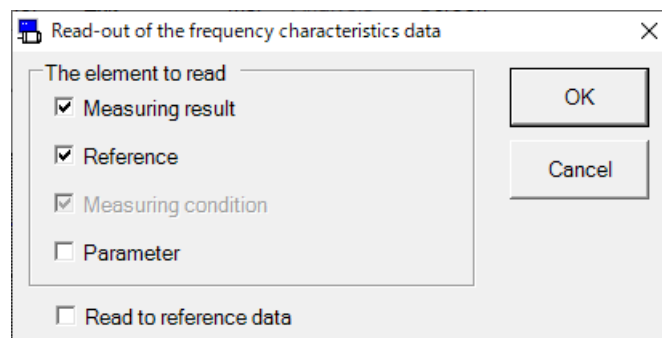
5 Select the content to read, and click "OK"
  When check is put on "Read as reference data" you can read the saved measurement result as reference data.
  However, when the data is read as reference, the parameters will not be read. Also, data that are not once saved will not be read.
6 Content with check put on will be read.

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Notes 1) For caution please execute measurement with condition where Servo can be turned on immediately.

Notes 2) Please measure the resonance of the machine, with the gain brought down to the minimum.

Notes 3) Gain will be fixed to "1" at Frequency characteristics measurement.

Notes 4) The frequency characteristics screen cannot open during opening some screens. For more information please refer to page 205 "Frequency characteristics screen behavior".

Notes 5) Result of frequency characteristics measurement can vary or show a mistaken value depending on characteristics of the equipment or measuring condition. Please take the analysis result of this feature as reference of gain adjustment.

Pin assign setting screen

Assignment of input/output pin can be configured.

Open the Pin assign setting window
1 Start "PANATERM".
   (Please refer to Article 5. Start up and Close down in details)
2 Click "Other" > "Pin Assign" of the tool bar on the main screen.
3 When not communicating with driver, the selection screen of a
   parameter is displayed. Please choose the parameter file to edit.
4 The Pin assign setting window is opened.

<When communication with driver>

Pin Assign-MultiA(A Axis),MultiB(B Axis)

Input

Pin Number	Position / Full-closed control	Velocity control	Torque control	Assignment axis
05 (SI1)	Invalid	Invalid	Invalid	B Axis
07 (SI2)	Invalid	Invalid	Invalid	B Axis
08 (SI3)	Invalid	Invalid	Invalid	A Axis
09 (SI4)	Invalid	Invalid	Invalid	A Axis
10 (SI5)	Invalid	Invalid	Invalid	A Axis
11 (SI6)	Invalid	Invalid	Invalid	A Axis
12 (SI7)	Invalid	Invalid	Invalid	A Axis
13 (SI8)	Invalid	Invalid	Invalid	A Axis

Output

Pin Number	Position / Full-closed control	Velocity control	Torque control	Assignment axis
01/02 (SO1)	ALM	ALM	ALM	All Axis(AND)
25/26 (SO2)	ZSP	Invalid	Invalid	B Axis

Apply   Close

"Apply"   : Sends pin assign setting to the driver.
"Close"   : Close the pin assign setting window.

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<When not communication with driver>

Pin Assign - 20190820174339.prm5

Input

Pin Number	Position / Full-closed control	Velocity control	Torque control	Assignment axis
05 (SI1)	HOME_ConnectA	HOME_ConnectA	HOME_ConnectA	B Axis
07 (SI2)	POT_ConnectA	POT_ConnectA	POT_ConnectA	B Axis
08 (SI3)	NOT_ConnectA	NOT_ConnectA	NOT_ConnectA	B Axis
09 (SI4)	SI-MON4_ConnectA	SI-MON4_ConnectA	SI-MON4_ConnectA	All Axis
10 (SI5)	HOME_ConnectA	HOME_ConnectA	HOME_ConnectA	A Axis
11 (SI6)	POT_ConnectA	POT_ConnectA	POT_ConnectA	A Axis
12 (SI7)	NOT_ConnectA	NOT_ConnectA	NOT_ConnectA	A Axis
13 (SI8)	SI-MON5_ConnectA	SI-MON5_ConnectA	SI-MON5_ConnectA	All Axis

Output

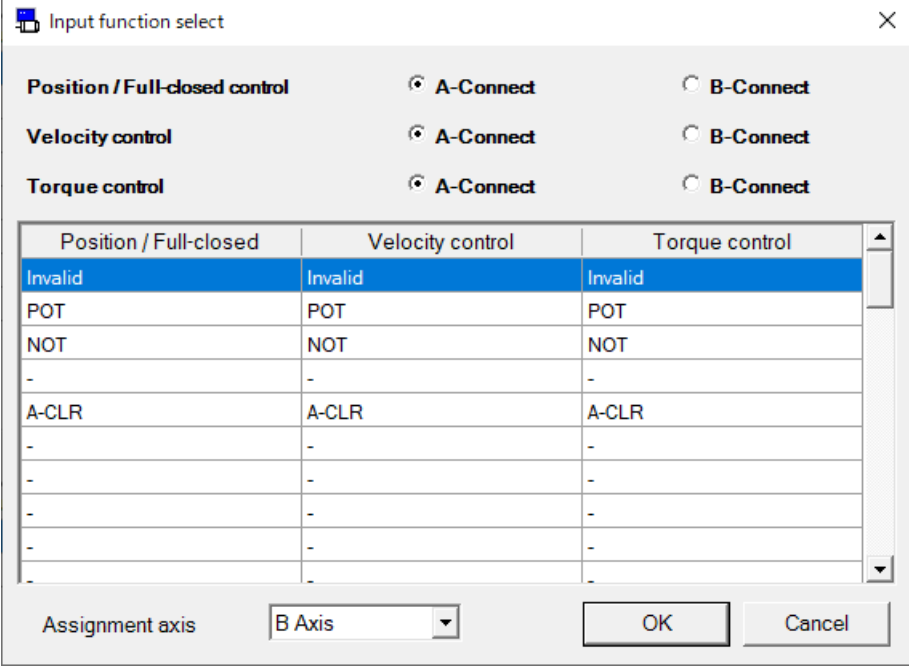| Pin Number	Position / Full-closed control	Velocity control	Torque control	Assignment axis
01/02 (SO1)	WARN1	WARN1	WARN1	A Axis
25/26 (SO2)	WARN1	WARN1	WARN1	B Axis

Save   Close

"Save"   : Writes pin assign setting to the parameter files (.prm5).
"Close"   : Close the pin assign setting window.

Configurations of pin assign setting
1 Double click the row of pin number to configure
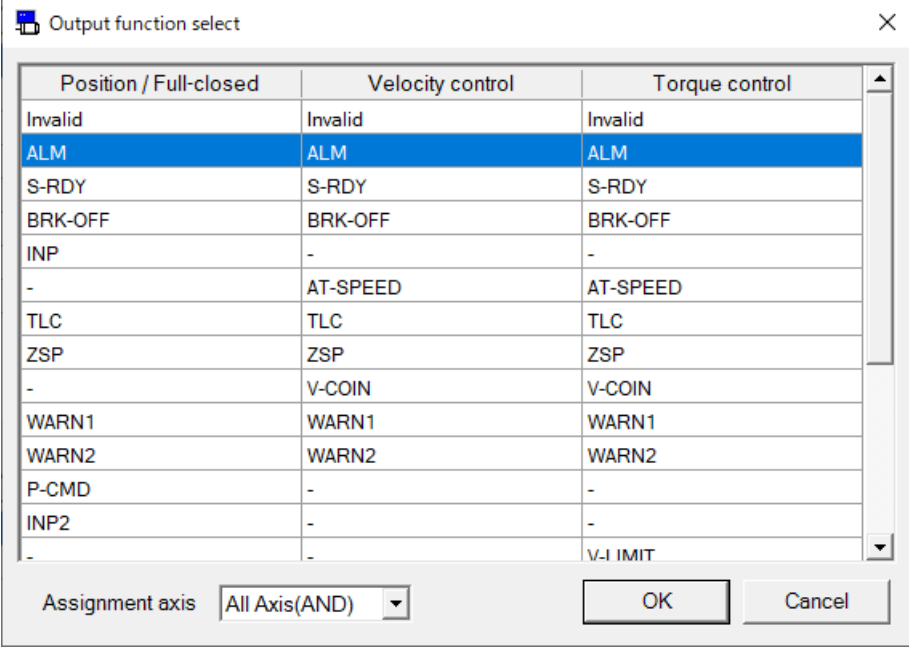2 Function select windows will appear

<Input Signal>

Input function select			✕

Position / Full-closed control	⊙ A-Connect	○ B-Connect
Velocity control	⊙ A-Connect	○ B-Connect
Torque control	⊙ A-Connect	○ B-Connect

Position / Full-closed	Velocity control	Torque control
Invalid	Invalid	Invalid
POT	POT	POT
NOT	NOT	NOT
-	-	-
A-CLR	A-CLR	A-CLR
-	-	-
-	-	-
-	-	-
-	-	-

Assignment axis: B Axis   OK   Cancel

<Output Signal>

Output function select			✕

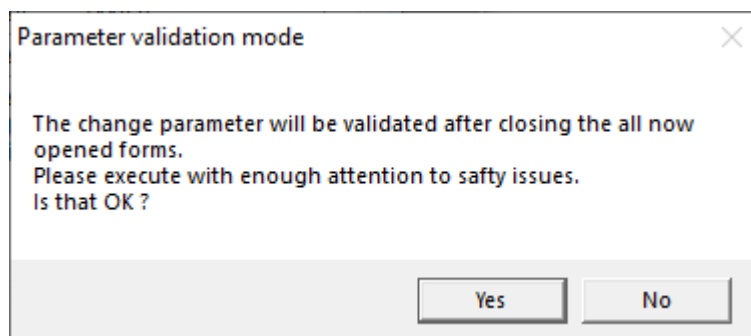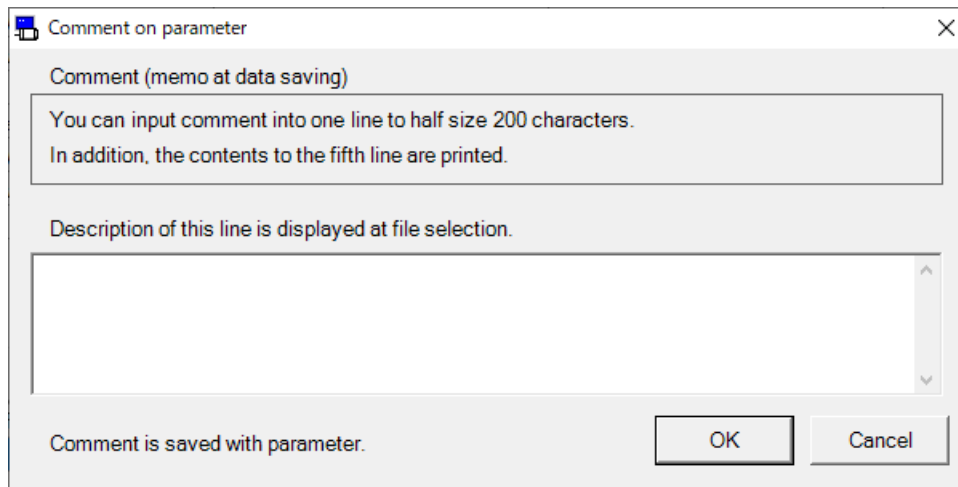| Position / Full-closed	Velocity control	Torque control
Invalid	Invalid	Invalid
ALM	ALM	ALM
S-RDY	S-RDY	S-RDY
BRK-OFF	BRK-OFF	BRK-OFF
INP	-	-
-	AT-SPEED	AT-SPEED
TLC	TLC	TLC
ZSP	ZSP	ZSP
-	V-COIN	V-COIN
WARN1	WARN1	WARN1
WARN2	WARN2	WARN2
P-CMD	-	-
INP2	-	-
-	-	V-LIMIT

Assignment axis: All Axis(AND)   OK   Cancel

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3 For each control mode, select the function to be assigned to the pin, the contact method (input function selection only), and the assignment axis.
4 When "OK" is clicked at function selection window, window will go back to pin assign setting window.
5 When communication with driver, click on to "Apply", and a screen to confirm prior to writing the drive will appear. Click "OK", and parameters will be written onto the EEPROM of Drive. If "Cancel" is clicked, then the parameter will not be written on the Drive's EEPROM.

PANATERM	✕
May the pin assign be written into the driver ?	
OK	Cancel
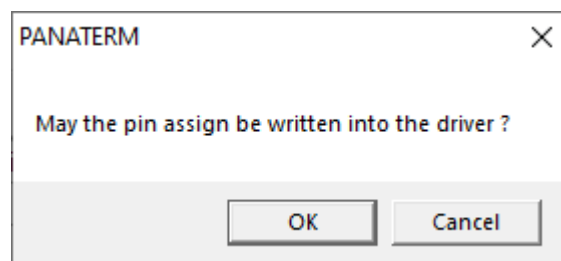
After writing to the EEPROM is completed, a screen is displayed to confirm the restart of the driver. Click "Yes" to close the pin assignment setting screen and restart the driver. Click "No" not to restart the driver.

Parameter validation mode	✕
The change parameter will be validated after closing the all now opened forms. Please execute with enough attention to safty issues. Is that OK ?	
Yes	No

6 When not communication with driver, click on to "Save", and a comment screen will appear.

A click of "OK" will display a file dialog. Please save to a file.

Notes 1) The pin assign setting screen can be operated when all other windows are closed. For more information please refer to page 206 "Pin assign setting screen behavior".

Notes 2) Configuration of connection is needed for input signal. Please also unify a point of contact, when you assign the same signal to two or more control modes. For details of signal, please review the drive's operation manual or technical reference.

Notes 3) As to input signals, the same signal cannot be assigned (set redundantly) to multiple pins of the same axis. For example, it is possible to assign the B-axis POT signal to SI2 and assign the A-axis POT signal to SI6, but it is impossible to assign the B-axis POT signal to SI2 and the B-axis POT signal also to SI 6. (It is also impossible in the case of all axes on one side.) However, as to output signals, redundant setting is permitted. Moreover, when you assign the same signal to two or more control modes, please assign to the same pin.

Notes 4) New pin assign configuration will not be active unless the drive is rebooted.

Notes 5) An error message is displayed when a setup which cannot be assigned is performed. Please change a setup according to directions of a screen. Please read the operation manual of driver or technical reference about the details of a setup which cannot be assigned.
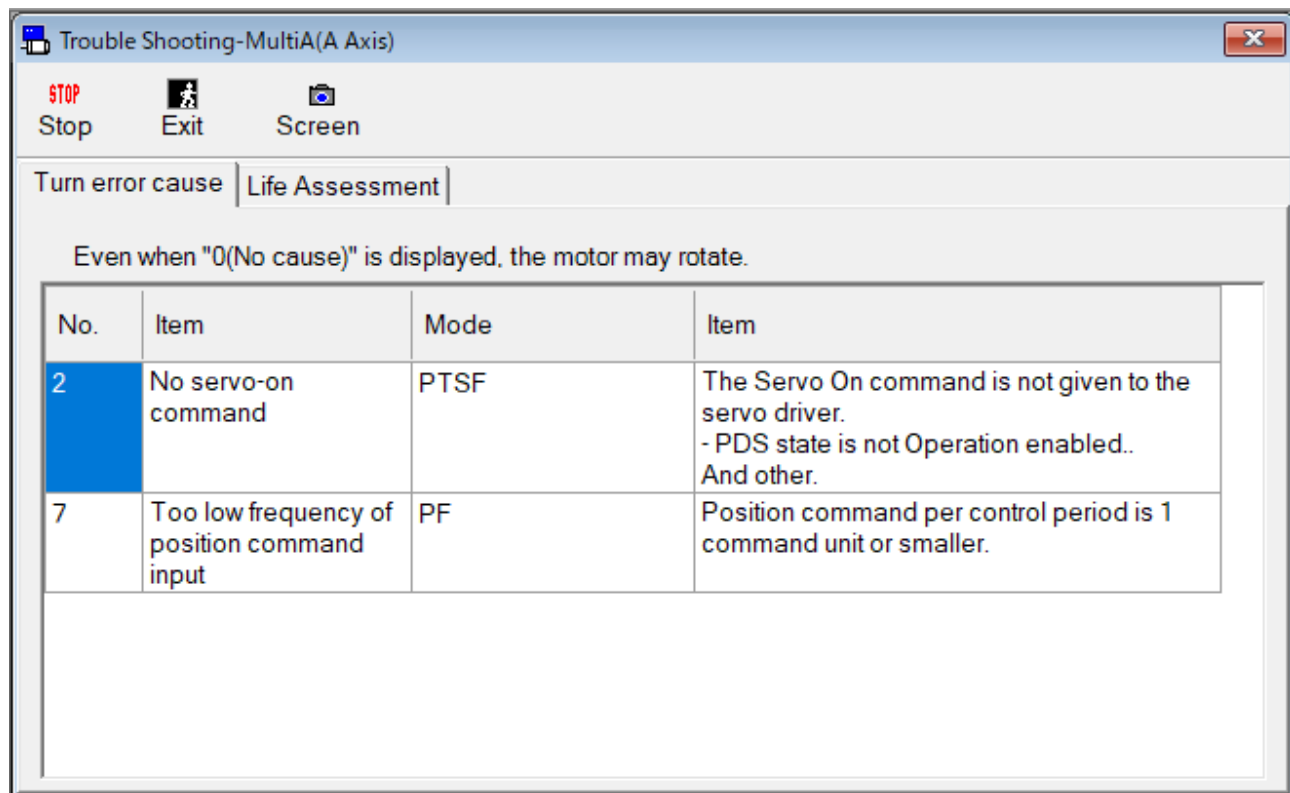
Trouble shooting screen

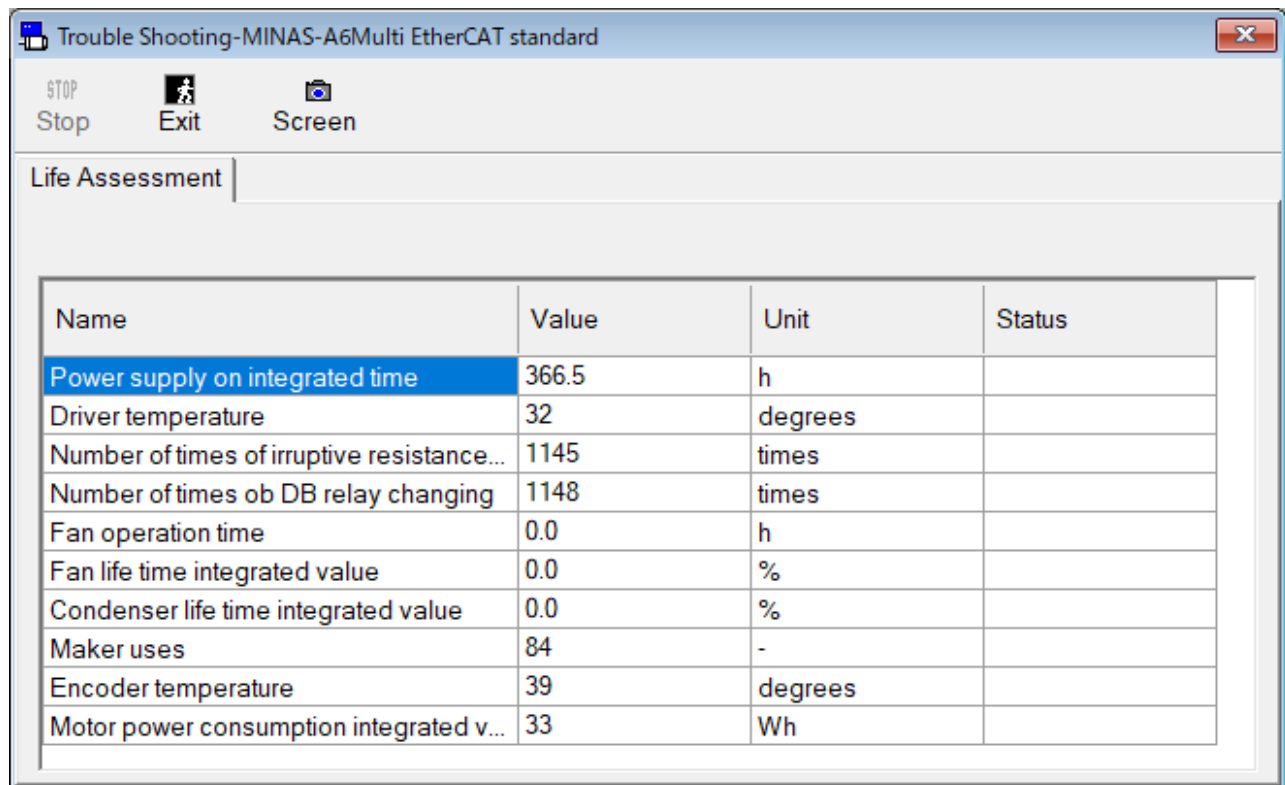Elements causing motor not to rotate or drive's lifetime can be indicated this screen.

Open the Trouble shooting window

1 Start "PANATERM".
  (Please refer to Article 5. Start up and Close down in details)
2 Click "Other" > "Trouble shooting" on the tool bar of the main screen.
3 When not communicating with driver, the selection screen of a parameter is displayed. Please select the parameter file.
4 The Trouble shooting window is opened.

\<When communication with driver\>

Trouble Shooting-MultiA(A Axis)

Stop   Exit   Screen

| Turn error cause | Life Assessment |

Even when "0(No cause)" is displayed, the motor may rotate.

No.	Item	Mode	Item
2	No servo-on command	PTSF	The Servo On command is not given to the servo driver. - PDS state is not Operation enabled.. And other.
7	Too low frequency of position command input	PF	Position command per control period is 1 command unit or smaller.

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<When not communication with driver>

Close the Trouble shooting window

Click [Exit] (Exit) on the tool bar.

Structure of trouble shooting window

Turn error cause display
This is displayed when communication with driver only.

Trouble Shooting-MultiA(A Axis)	(1) Title bar
STOP Stop / Exit / Screen	(2) Tool bar
Turn error cause / Life Assessment	(3) Tab

Even when "0(No cause)" is displayed, the motor may rotate.

No.	Item	Mode	Item
2	No servo-on command	PTSF	The Servo On command is not given to the servo driver. - PDS state is not Operation enabled.. And other.
7	Too low frequency of position command input	PF	Position command per control period is 1 command unit or smaller.

(4) Content area

Life Assessment display

Trouble Shooting-MultiA(A Axis)	(1) Title bar
STOP Stop / Exit / Screen	(2) Tool bar
Turn error cause / Life Assessment	(3) Tab

Name	Value	Unit	Status
Power supply on integrated time	430.0	h	
Driver temperature	35	degrees	
Number of times of irruptive resistance...	678	times	
Number of times ob DB relay changing	620	times	
Fan operation time	7.0	h	
Fan life time integrated value	0.0	%	
Condenser life time integrated value	0.0	%	
Maker uses	100	-	
Encoder temperature	35	degrees	
Motor power consumption integrated v...	0	Wh	

(4) Content area

Communication error
This is displayed when communication with driver only.

Trouble Shooting-BBB(B Axis)	(1) Title bar
STOP Stop / Exit / Screen	(2) Tool bar
Turn error cause / Life Assessment / Communication error	(3) Tab

Name	Value	Unit	Status
RTEX continues communication error1...	0	-	
RTEX continues communication error2...	0	-	
RTEX communication timeout error cu...	0	-	
RTEX cyclic data error cumulative cou...	0	-	
RTEX update counter error cumulative...	0	-	

(4) Content area

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(1) Title bar
Window operation can be done

(2) Tool bar
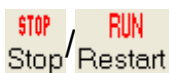
 Stop/Restart   Stop/Restart update of trouble shooting window.

 Exit   Close trouble shooting window.

 Screen   Capture screen and save as file.

(3) Tab
Switch to "Turn error cause", "Life Assessment", or "Communication error".

(4) Content area
<u>"Turn error cause"</u>
Indicates element is being obstacle to rotation.
*   There will be cases where "0" (No element) is indicated even with the motor rotating.

<u>"Life Assessment"</u>
Indicates element is lifetime evaluation.
The judged result will appear on the status as colored depending on the judged lifetime.
    Green : Drive to be within standard operation.
    Yellow : Drive is close to replacement
    Red   : Drive suggested for replacement
    White : Judged level is out of configured range

*   Accuracy of evaluated lifetime's accuracy may be lowered when in application with control electricity being shutdown frequently, because the lifetime information is saved in 30 minute cycle. Drive may operate standardly even if the status is red. Please refer to this result as reference.

<u>"Communication error"</u>
Indicates element is RTEX communication error counter information.
*   Communication error tab is displayed during communicating with network type driver corresponding the RTEX communication error counter monitoring function.

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Notes 1) The trouble shooting screen cannot open during opening some screens. For more information please refer to page 206 "Trouble shooting screen behavior".

Z phase search screen

Will turn the Servo On automatically without input, and rotate motor to reach the point where Z phase output will turn on.

Note) Please make sure that the notification and implementation area written on the drive's operation manual or technical reference before using this feature.

It is very dangerous when connecting the motor to load with Servo being ON after Z phase search, because of the drastic change of inertia ratio may occur making the motor to have resonance. Please make sure that the Servo is turned OFF. Also, have the main power turned off, or have motor wire pulled off, to disable the motor's ability to rotate, and then conduct the operation.
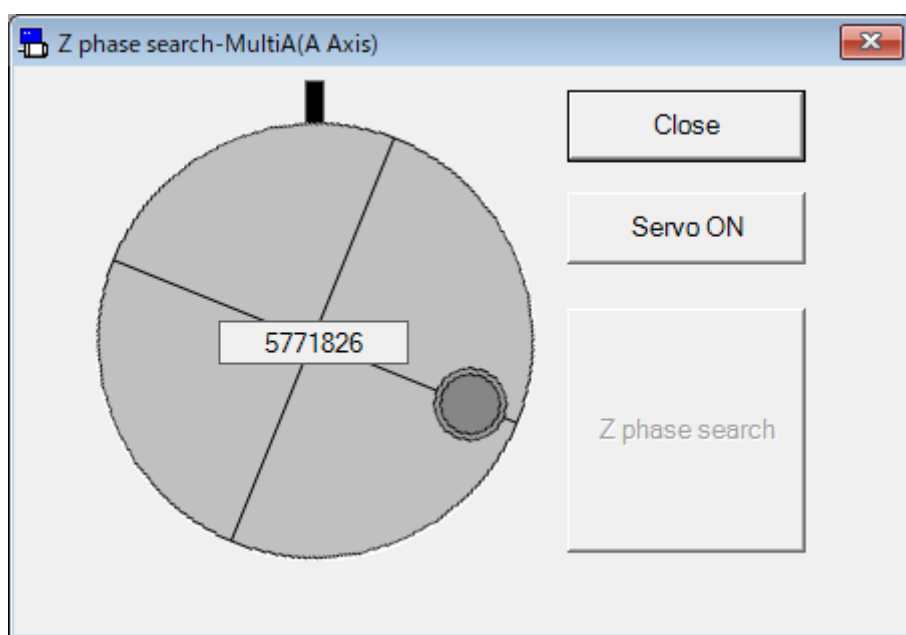
Open the Z phase search window

1 Start "PANATERM".
  (Please refer to Article 5. Start up and Close down in details)
2 Click "Other" > "Z phase search" of the tool bar on the main screen.
3 The Z phase search window is opened.

  * Z phase search window cannot be used when Trial run window is opened, front panel is used, or Servo is turned ON by input from outside. Close the trial run function and front panel is free before using the Z phase search window.
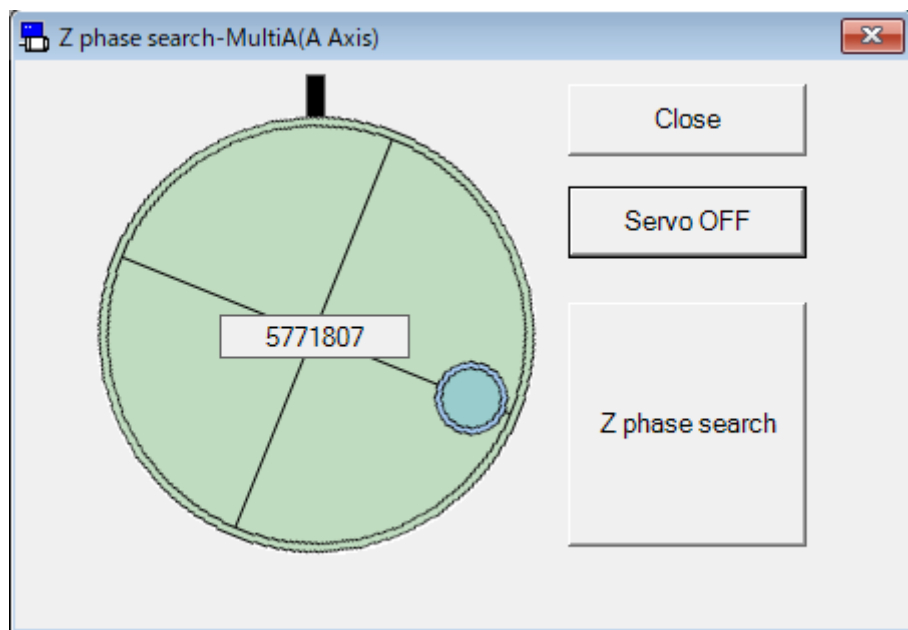
Close the Z phase search window
Click "Close" on the Z phase search window.

Procedure for Z phase search
1 Click "Servo ON".
2 Click "Z phase search".
3 Motor will rotate in CCW direction towards Z phase at 60 r/min speed.

Notes 1) For caution, please have the motor ready for power shutdown when conducting the above.

Notes 2) The Z phase search screen cannot open during opening some screens. For more information please refer to page 207 "Z phase search screen behavior".

Notes 3) When drive is not in ready status (Alarm or Main power source is cut off), front panel is used except for monitor mode, or Servo ON is input from outside, then the Z phase search window will not be able to open or error will be on screen during execution. Please re - execute after these status is eliminated, and the Z phase search window is closed.

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Fit gain screen (Standard)

Explore the best gain settings automatically by repeating the positioning between two points.

Note) The fit gain function is rigidity and mode at real-time auto-gain tuning may oscillate for a short time in the course of raising the load. May be suppressed by the adaptive filter and auto-oscillation detection, just in case, on ensuring the safety of the operating range, please execute in the condition that servo-off can be made anytime as a precaution. Please refer to application scope and remarks specified in the driver manual or technical reference. When using some specified models, the fit gain function may be disabled. For more information, please contact the customer technical assistance.

Open the Fit gain window
1 Start "PANATERM".
  (Please refer to Article 5. Start up and Close down in details)
2 Click "Fit gain" of the tool bar on the main screen.
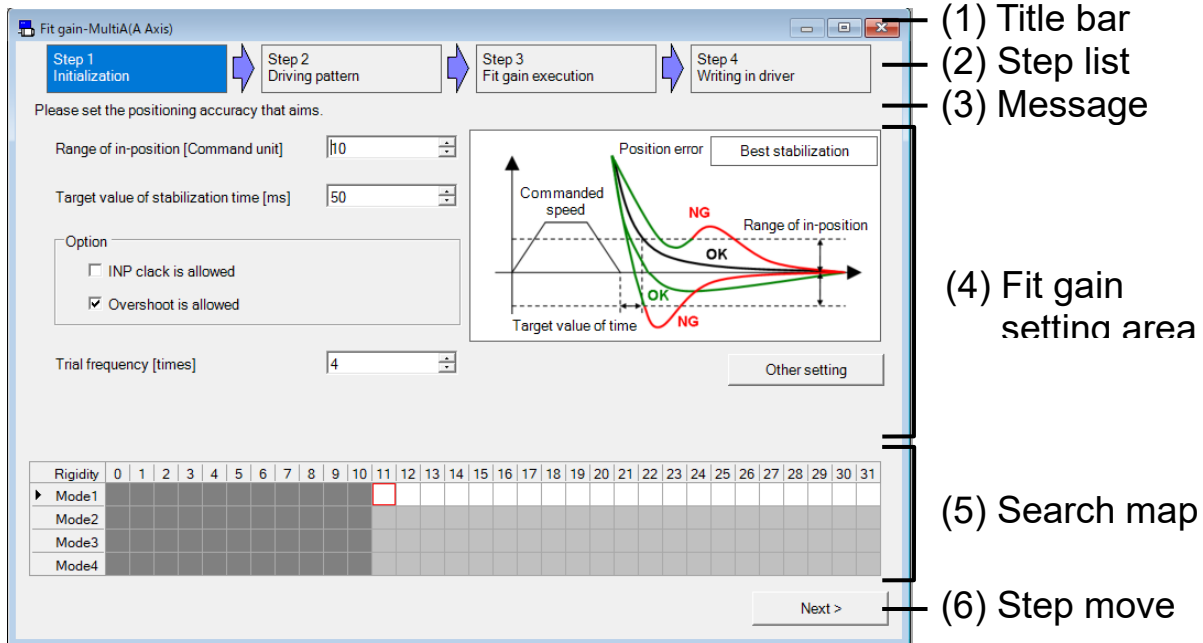3 The Fit gain window is opened. (The figure of the next page)

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* If the log on of fit gain window is opened, please select "Standard position control".

* The fit gain window cannot be used when velocity control mode and torque control mode.

Close the Fit gain window

Click ⊠ of upright on the window.

Structure of Fit gain Screen

(1) Title bar
(2) Step list
(3) Message

(4) Fit gain
setting area

(5) Search map

(6) Step move

(1) Title bar
You can operate window.

(2) Step list
The position seen from the whole of a present step is displayed.

(3) Message
An easy explanation of the content set in a present step is displayed.

(4) Fit gain setting area
You can set from step 1 to step 4.

(5) Search map
A combination of rigidity and mode is displayed.
Each cell is displayed in a number of actual trials.
In addition, background color changes the meaning.
  White: Explore   Silver: Unexplored   Gray: Excluded
  Lime: Completion   Red: Vibration detection   Fuchsia: Failed

(6) Step move
Switch to present step.
  "Back"   The previous step is displayed.
  "Next"   The next step is displayed.
 "Finish"   Close the fit gain window.

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Applicable condition of fit gain

The fit gain must satisfy following conditions in order to execute.

· Real-time auto-tuning can be applied to the load and driving pattern.
(The velocity more than 100[r/min], the acceleration more than 2000[r/min/s], the time more than 50[ms], and so on. For more information please refer to the driver manual or technical reference.)

· When you move the load, easy monitor on the gain tuning screen will must be updated correctly.
(Command interval must be at least 1.5 seconds, Stabilization time can measure, and so on.)

· Adaptive filter can be applied the load and driving pattern.
(Nonlinear effect is small, the acceleration less than 30000[r/min/s], and so on. For more information please refer to the driver manual or technical reference.)

· In addition, must work correctly in a state of motor control.

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Method of performance of fit gain

1 Please set the positioning accuracy (Range of in-position, Target value of stabilization time) that aims.
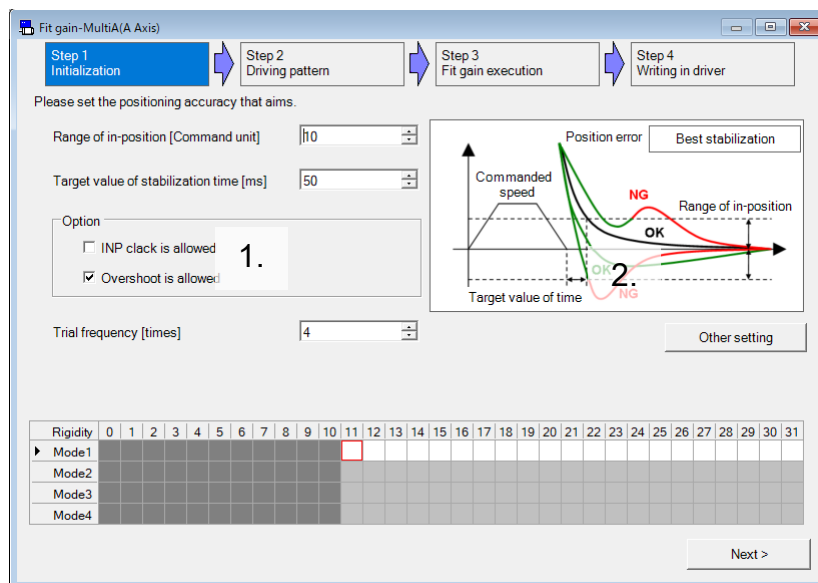
1. Setting item: Set the positioning accuracy that aims.
   "Range of in-position"
       Set the range of in-position.
   "Target value of stabilization time"
       Set the target value of stabilization time.
   "Option": Specify the conditions of auto-search.
       INP clack is allowed:
           Adjustment index measure data for the shorter one either of the
           following time. That time from start of command to next start of
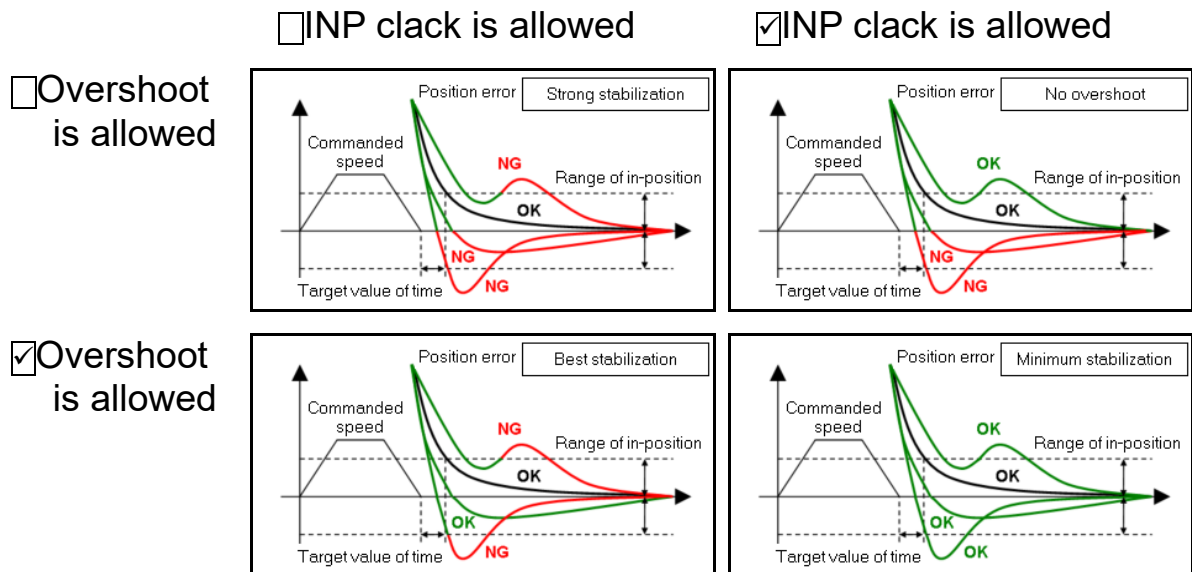   command or measurement time.
       Overshoot is allowed:
           Adjustment index measure data for measurement time.
   "Trial frequency"
       Set the number of repeat to try for a combination of machine
       rigidity and mode.

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2. Information figure: Switched according to "Option".

	☐INP clack is allowed	☑INP clack is allowed

2 If you change the permissible vibration level, initial rigidity and initial mode, click "Other setting" button and set its.

"Permissible vibration level"
    Set the permissible vibration level.
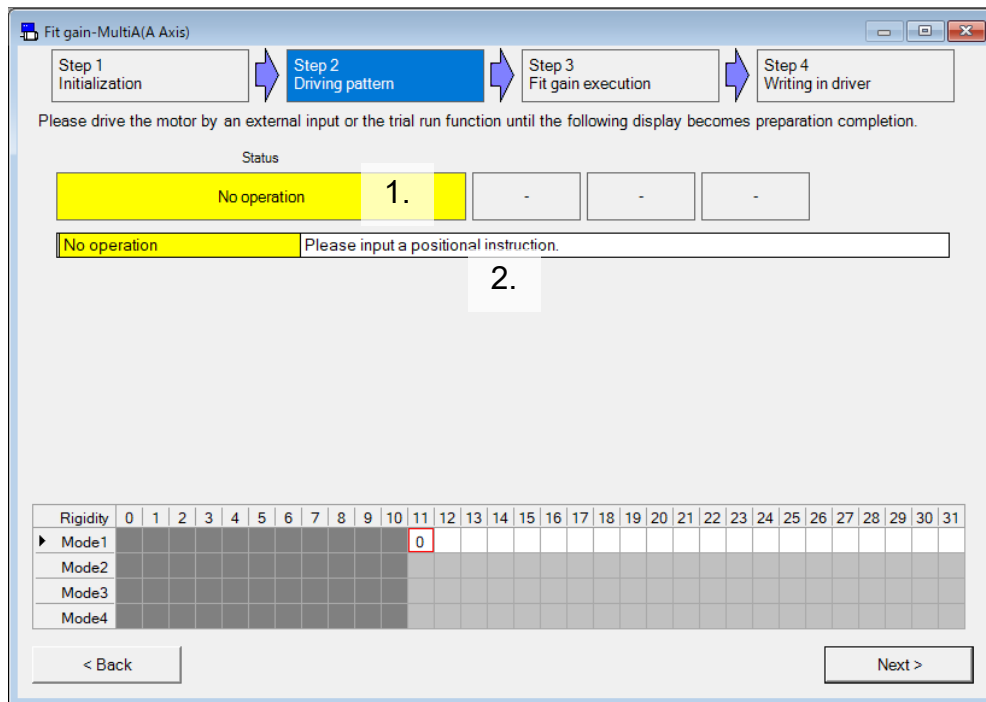"Initial rigidity"
    Set the real-time auto tuning rigidity of first measurement.
"Initial mode"
    Set the real-time auto tuning mode of first measurement.
3 Please "Next" button click when you are finished setting, and go to Step 2.

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4 Please drive the motor by an external command input or test drive function to confirm the driving pattern.

1. Status: The current status and the value associated with it are displayed.

2. Details: The current status and specific instructions to do next.

| Status	Back color	Instructions
No operation	Yellow	Please input a positional instruction.
Trying	Yellow	Please repeat the operation command.
Search of initial rigidity	Yellow	Search of initial rigidity. Please repeat the operation command.
Fit gain preparation completion	Lime	Please move to the fit gain execution screen of STEP3 with a lower right button.
Stabilization time measurement failed	Fuchsia	Stabilization time measurement failed. Please do the following measures. - Please lengthen waiting time from the disbursement completion of a positional instruction to the following instruction input. - Please return to STEP1, and lower the initial stiffness below a left, present rigidity. - Please return to STEP1, and widen the range of the positioning completion.

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Status	Back color	Instructions
Effective load factor excessive	Fuchsia	The effect load factor of one operation is 80[%] or more. Please lower a left, maximum load factor referring to the following measures. - The acceleration and deceleration is made gradual. (The addition and subtraction velocity time is lengthened, and maximum speed is lowered.) - The dormant period of a positional instruction is lengthened. - The load is reduced. - The turbulence power (friction and offset load) is reduced.
Tack is short	Fuchsia	In the fit gain, time (tack) from a certain instruction input to the following instruction input is more necessary than that of short 1.5[s]. Please lengthen a left, minimum baton referring to the following measures. - The dormant period of a positional instruction is lengthened. - The instruction time is lengthened.
Instructed time is short	Fuchsia	In the fit gain, time that the instruction is continuously input (instruction time) is necessary for 0.1[s] or more. Please lengthen the left, minimum instruction time referring to the following measures. - Moved distance is lengthened. - The addition and subtraction velocity time is lengthened. - Maximum speed is raised.
Instructed speed is short	Fuchsia	In the fit gain, the instruction speed should be -500[r/min] or less and 500[r/min] or more. Please enlarge the absolute value at a left maximum and the minimum instruction speed referring to the following measures. - Maximum speed is raised. - Moved distance is lengthened. - The addition and subtraction velocity time is shortened.
Motor speed is short	Fuchsia	In the fit gain, the motor speed should be -500[r/min] or less and be 500[r/min] or more. Please enlarge the absolute value at a left maximum and the minimum motor speed referring to the following measures. - Maximum speed is raised. - Moved distance is lengthened. - The addition and subtraction velocity time is shortened. - Please return to STEP1, and lower the initial stiffness below a left, present rigidity. - Please return to STEP1, and an initial mode is assumed to be one.

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Status	Back color	Instructions
Torque is saturated	Fuchsia	The torque instruction is saturated. Please reduce the absolute value of the maximum and the minimum torque instruction in the left referring to the following measures. - The acceleration and deceleration is made gradual. (The addition and subtraction velocity time is lengthened, and maximum speed is lowered.) - The load is reduced. - The turbulence power (friction and offset load) is reduced. - The torque limit switch is assumed to be invalid (the first fixation), and it enlarges it within the range where the first torque limit can be allowed with the equipment.
Real time estimation doesn't operate	Fuchsia	The load estimate of the real time auto tuning should operate standardly to execute the fit gain. Please meet the real time presumption operation requirement (*1) referring to the following measures. *1 The motor speed continues and the acceleration and deceleration continues 100[r/min] or more and the condition of 2000[r/min/s] or more continues and 50[ms] or more continues. - Maximum speed is raised. - The addition and subtraction velocity time is shortened securing 50[ms] or more. - Moved distance is lengthened. - Please return to STEP1, and lower the initial stiffness below a left, present rigidity.

5 Status is "Fit gain preparation completion" appears in, "Next" button click, and go to step 3.

6 Click "Fit gain start" button, please wait the measurement is completed.

* First of all, the fit gain function is performed search operation of rigidity. The search operation of rigidity repeats the same operation of the following. Setting of rigidity repeatedly measures a specified number of "Trial frequency". And increase the setting of rigidity one. When stabilization time satisfied targets or oscillation of the motor detected, the fit gain function transition the search operation of mode. The search operation of mode could make the measurement while changing the mode in the range of measurement rigidity.

* The Load may oscillate in short. Just in case, on ensuring the safety of the operating range, please execute in the condition that servo-off can be made anytime as a precaution.

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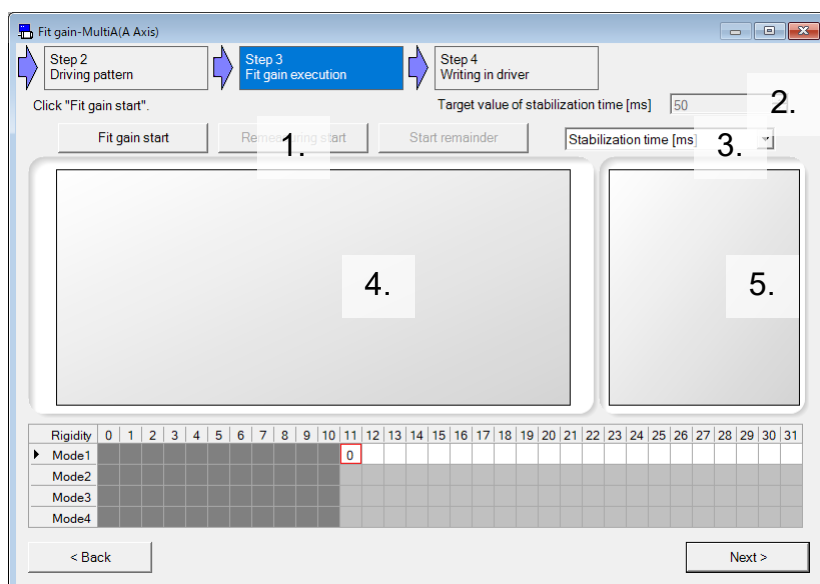
1. Measurement button

"Fit gain start" : Start to measure from "Initial rigidity" and "Initial mode" configuration.

"Remeasuring start" : Measure the rigidity and mode settings selected on the search map. This button is available after the search operation of rigidity.

"Start remainder" : Measure the rigidity and mode combination not measured. This button is available from end of the search operation of rigidity to end of the search operation of mode.

2. Stabilization time
Displays "Target value of stabilization time" set in Step 1.

3. Select index
Select index to display the chart. Index can be selected the same content of Monitoring Item (refer to page 77) of the Gain Tuning screen.

4. Chart of index data for each setting of rigidity
In the result of the search operation of rigidity, selected index by "3. Select index" is displayed. If measurement data is not, it is not displayed.

5. Chart of index data for each setting of mode
  In the result of the search operation of mode, selected index by "3. Select index" is displayed. It is not displayed until the end of the search operation of rigidity.

  * Click on the "Search map" after measurement, measurement results can be displayed according to the rigidity it clicked.

7 When measure is completed, measurement completed screen is displayed. Please click "OK".
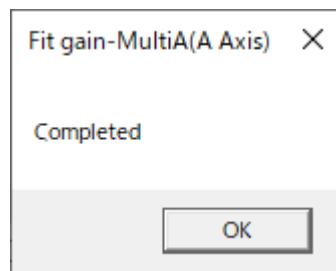
8 When measurement completed screen is closed, please "Next" button click, and go to Step 4.

9　Please select rigidity and mode combination while referring to the recommendation data.
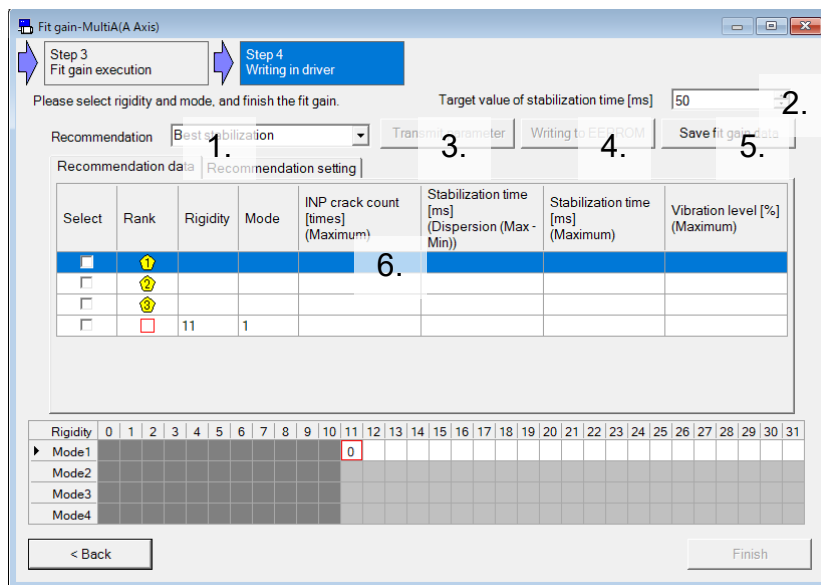
1. Recommendation

　You can refine the measurement data by rigidity and mode combination in Step 3 to the specified conditions. You can also sort it. Recommendation data tab displays the top three results.
"Best stabilization"
　　It find stabilization time stable configuration without INP crack.
"No overshoot"
　　It find stabilization time stable configuration without overshoot.
"Strong stabilization"
　　It find stabilization time stable configuration without INP crack and overshoot.
"Minimum stabilization"
　　It finds the minimum stabilization time configuration.
"Manual setting"
　　Use what you specify in the Recommendation setting tab.

2. Target value of stabilization time
　Displays the "Target value of stabilization time" set in Step 1. It can be changed at Step 4.

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3. Transmit parameter
   Send to the driver to setting is checked. If the setting is sent, it will be disabled.

4. Writing to EEPROM
   Write parameters to EEPROM of the driver. If you do not transmit parameter, it will be disabled.

5. Save fit gain data
   Write parameters to fit gain measure result file (.fit5) to index data measured.

6. Tab
   Switch to "Recommendation data" or "Recommendation setting".

   \<Recommendation data\>

1. Select
   Please select setting to send to the driver.
2. Rank
   Displays rank of recommendation data. The rigidity and mode setting selected on the search map is displayed in line 4.
3. Rigidity
   Rigidity of recommendation data is displayed.
4. Mode
   Mode of recommendation data is displayed.
5. Index data
   Index of recommendation data is displayed. For more information please refer to Recommendation setting.

<Recommendation setting>

Index	Stabilization time [ms ▾]	Stabilization time [ms ▾]	INP crack count [time ▾]	Vibration level [%] ▾
Extraction	Minimum	Dispersion (Max - Min ▾)	Maximum	Maximum
Sort	Ascending	Ascending	Ascending	Ascending
Restriction	0 ▾	- ▾	0 ▾	- ▾	0 ▾	- ▾	0 ▾	- ▾

"Index"
    Specify the target index to refine and be sort.
"Extraction"
    Specify the kind of value to use to sort and refine.
    You can select "Minimum", "Maximum", "Average", "Dispersion (Max –
    Min)" and "Standard deviation".
"Sort"
    Use to determine the rank of the recommendation data.
    You can select "- (Not set)", "Ascending" and "Descending".
    In the following cases, the data on the larger rigidity and mode is
   given priority. It is if the same value or if you select "- (Not set)" on all.
"Restriction"
    Use to refine recommendation data.
    You can select "- (Not set)", "Greater" and "Less".

* Maximum of stabilization time is greater than target value of stabilization
   time is not displayed.

* You should select "Manual setting" in Step 4 "Recommendation" to
   change the recommendation setting.

10 Click "Transmit parameter" and "Writing to EEPROM", save
    setting to driver.

11 Click "Finish", the Exit of fit gain window is displayed.
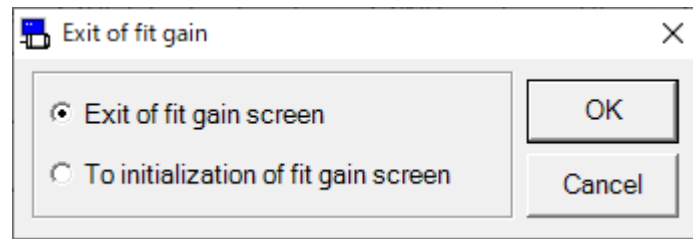
□"Exit of fit gain screen"
　　Close the fit gain window.
□"To initialization of fit gain screen"
　　Start again from scratch. Current settings are cleared.

Notes 1) Please refer to application scope and remarks specified in the driver manual or technical reference.
Notes 2) Parameter set on this screen is inputted into Driver. As PANATERM does not maintain this value, please perform the recording it to EEPROM of driver after completion of adjustment.
Notes 3) Parameter settings will be needed even at the fit gain. Please read the operation manual or technical reference to understand the manual content prior to this operation.
Notes 4) The fit gain screen cannot open during opening some screens. For more information please refer to page 208 "Fit gain screen (Standard) behavior".

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# Fit gain screen (2 degrees of freedom control)

Explore the best gain settings automatically by repeating the positioning between two points. The fit gain function corresponding to 2 degree of freedom control generates a pattern of operation automatically by a test run function, and carries out full automatic adjustment of the load-characteristics and rigid setup / instruction response setup.

Note) The fit gain function is rigidity and mode at real-time auto-gain tuning may oscillate for a short time in the course of raising the load. May be suppressed by the adaptive filter and auto-oscillation detection, just in case, on ensuring the safety of the operating range, please execute in the condition that servo-off can be made anytime as a precaution. Please refer to application scope and remarks specified in the driver manual or technical reference. When using some specified models, the fit gain function may be disabled. For more information, please contact the customer technical assistance.

Open the Fit gain window
1 Start "PANATERM".
   (Please refer to Article 5. Start up and Close down in details)
2 Click "Fit gain" of the tool bar on the main screen.
3 The Log on of fit gain window is opened.
   Please select "2-DOF position control" and "Next" button click.
   (The figure of the next page)

   * If the motor type connected to driver and Fit gain function setting
      (Standard / Linear) do not match then, the following dialog is displayed
      and the fit gain function cannot be executed.
      In that case, please use the after changing the combination of driver
   and selected series is correct.

Log on of the Fit gain screen	×
The motor type connected to driver and Fit gain function setting do not match. Can not open the Fit gain.	
	OK

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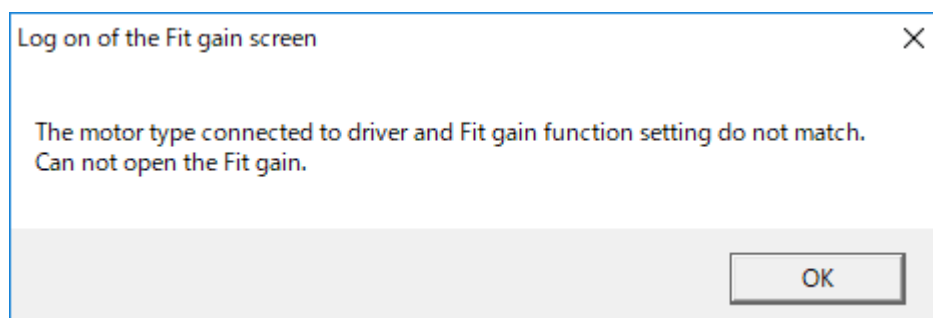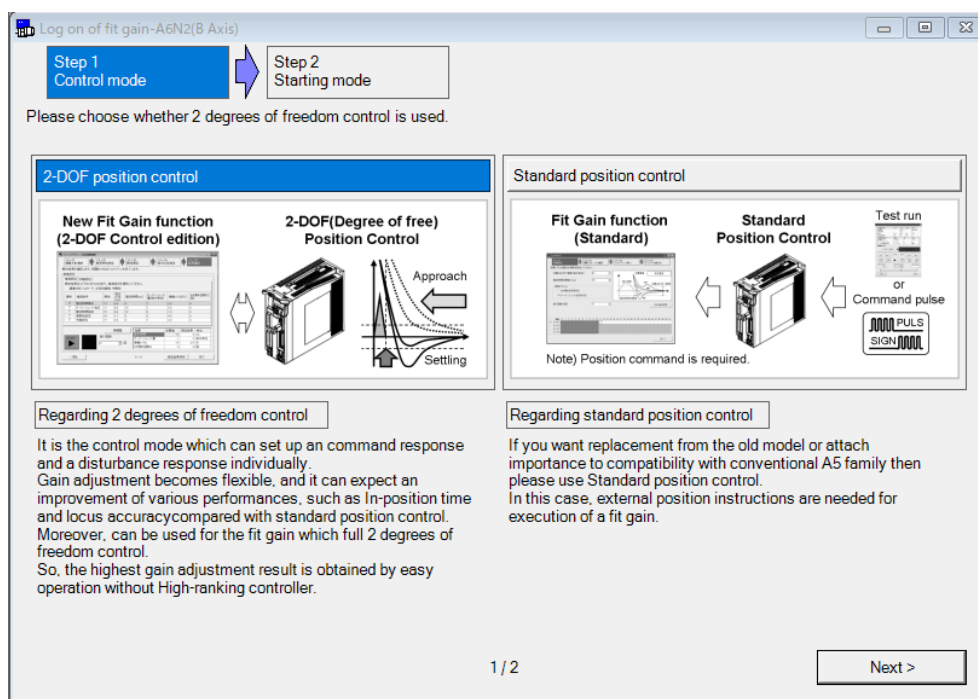
* When you select "Standard position control", a standard fit gain window is opened.

* The log on of fit gain window cannot be used when velocity control mode and torque control mode. When full closed control mode, a standard fit gain window is opened.
  If the driver is Linear and DD Control Drive, the fit gain function cannot be used except for position control.

* When not communicating with driver, the selection screen of the fit gain measure result file is displayed. Please select the measure result, and the fit gain data window is opened.

* If the driver is Linear and DD Control Drive, Standard position control is not displayed.
  Only 2-DOF position control is displayed.

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* "Drive reset" is inserted when selection changes into "2-DOF position control" from "Standard position control". Please follow the instructions on the screen.
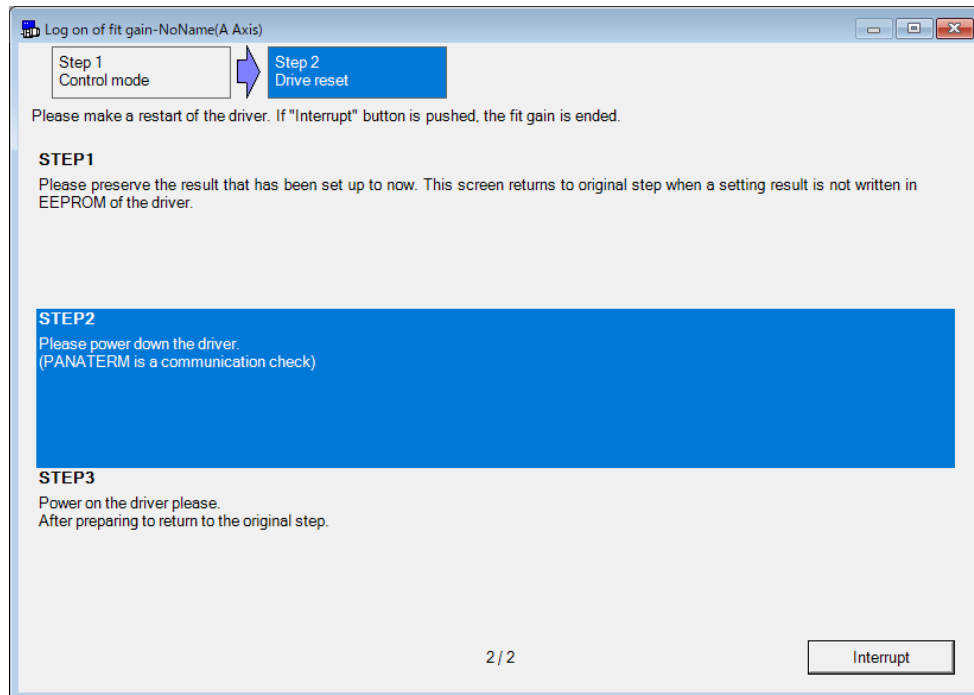
4 Please select fit gain with 2 degrees of freedom control, and "Finish" button click.
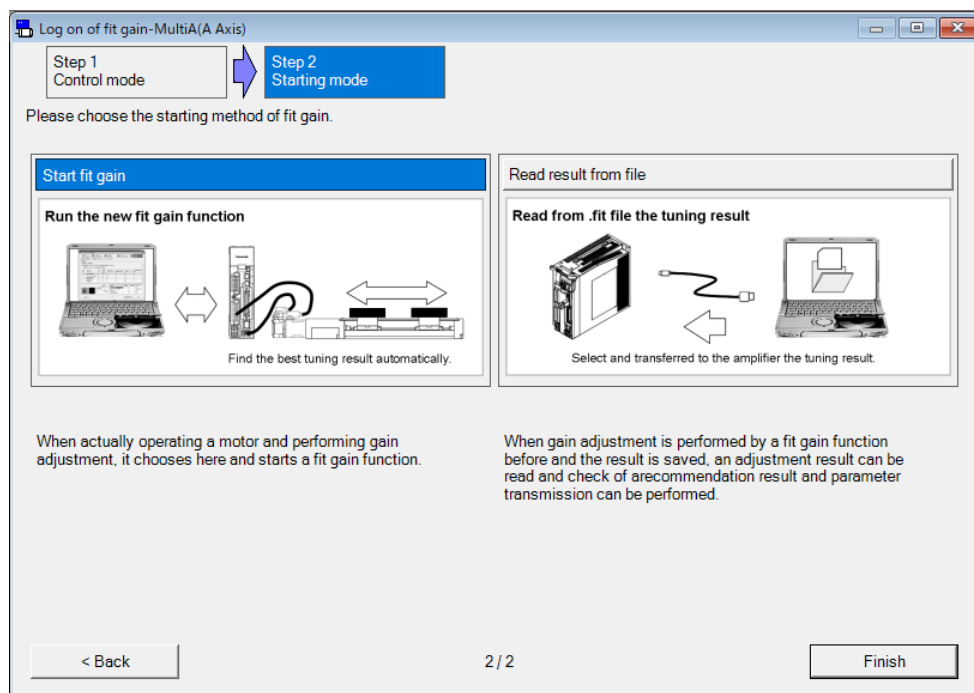
5 If you select "Start fit gain", the fit gain (2-DOF control) window is opened.
If you select "Read result from file", selection screen of the fit gain measure result file is displayed. Please select the measure result, and the fit gain data window is opened.

<When select "Start fit gain">

<When select "Read result from file">

Close the Fit gain window

Click of upright on the window.

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Structure of Fit gain Screen

(1) Title bar
(2) Step list
(3) Message
(4) Fit gain operation area
(5) Step move

(1) Title bar
   You can operate window.

(2) Step list
   The position seen from the whole of a present step is displayed.

(3) Message
   An easy explanation of the content set in a present step is displayed.

(4) Fit gain operation area
   Steps 1-5 can be operated.

(5) Step move
   Switch to present step.
   "Back"   The previous step is displayed.
   "Next"   The next step is displayed.
   "Finish"   Close the fit gain window.

Method of performance of fit gain

Step 1: Select objective
Select objective of servo adjustment.

1. Search system selection

   Select search system.

   "Full search"

   Measure Index by combining of rigidity setting and command response setting, and optimum setting is selected according to the search conditions.

2. Mode

   Select "Response preferentially", "Balanced" and "Stability preferentially".

   "Response preferentially"

   Adjusting servo which set much store on the response is performed. Resonance and friction characteristic are positively compensated using the adaptive filter and friction compensation.

   "Balanced"

   Adjusting servo which was able to balance a response and stability is performed. Using the adaptive filter, resonance characteristic is controlled positively.

   "Stability preferentially"

   Adjusting servo which set much store on the stability is performed. Fundamental adjustment which does not use the adaptive filter and friction compensation is performed.

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3. Machine

Rigidity is selected from "High", "Middle" and "Low".

"High rigidity"
Servo adjustment is performed by setup of equipment with high rigidity, such as coupling direct connection. Initial rigidity is made high and adjustment which raises rigidity as much as possible is performed.

"Middle rigidity"
Servo adjustment is performed by setup of equipment with medium degrees rigidity, such as a ball screw. Initial rigidity is made into a medium degree and it searches in the moderate rigidity range.

"Low rigidity"
Servo adjustment is performed by setting of equipment with low rigidity, such as belt driving. Initial rigidity is made low and adjustment which raises rigidity as much as possible is performed.

4. Width of positioning completion

Set the accuracy of positioning in command unit.
If don't need the index of positioning like a CP control then please set initial value.

1 Please set the objective (Search system, Mode, Machine) and width positioning completion.
2 Please "Next" button click when you are finished setting, and go to Step 2.

Step 2: Measure load
Measure the load character.

1 Click on "SRV ON" button, and the caution window will appear. Confirm the window message carefully, and click "OK".
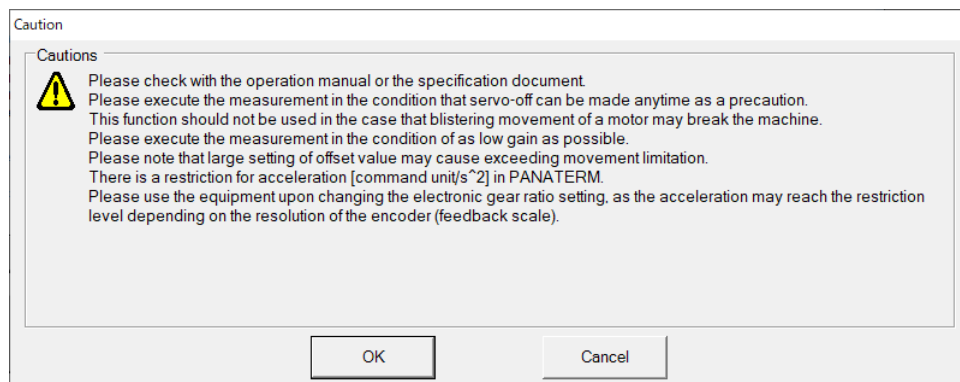
2 Please move load by (Positive) and (Negative), and set up a working range.

3 Please set direction, movement and trial frequency and click button.

4 When measure is completed, measurement completed screen is displayed. Please click "OK".
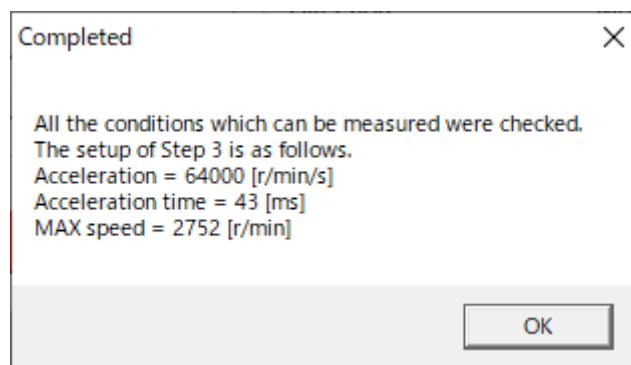
5 When measurement completed screen is close, please "Next" button click, and go to Step 3.

Step 3: Measure rigidity

The operation for each rigidity setting is measured.
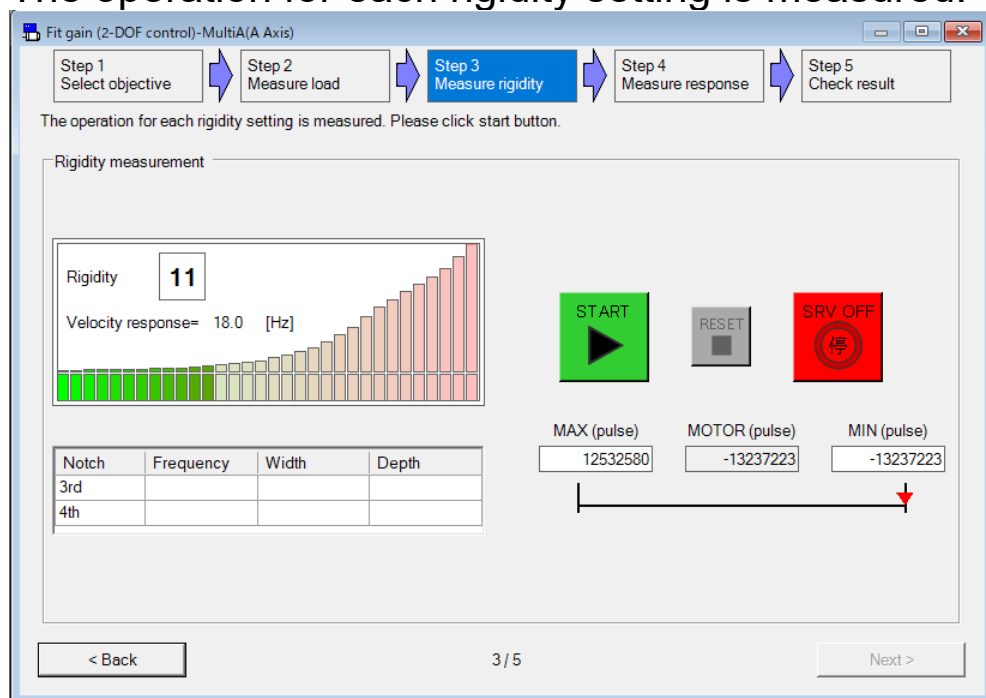
1 Click [START] button, please wait the measurement is completed.

* The Load may oscillate in short. Just in case, on ensuring the safety of the operating range, please execute in the condition that servo-off can be made anytime as a precaution.

2 When measure is completed, measurement completed screen is displayed. Please click "OK".
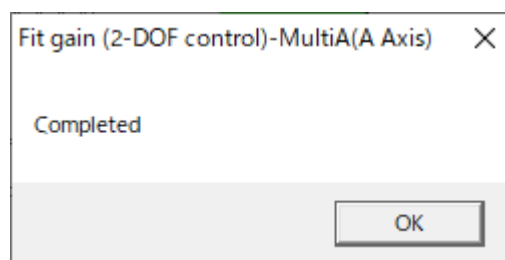
3 When measurement completed screen is close, please "Next" button click, and go to Step 4.

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Step 4: Measure response

Measure the command response.

1 Please select internal command or external command if needed. In internal command, please set waiting time, speed, acceleration and deceleration time, direction and distance.

   * Initial setting is an operation pattern of the internal command in Step 3.

   * When external command is selected, select command cannot return to internal command. Please be careful.

2 Please click ![START] button after setting trial frequency, and wait the measurement is completed.

3 When measure is completed, measurement completed screen is displayed. Please click "OK".
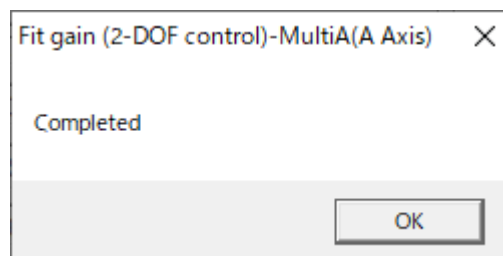
4 When measurement completed screen is closed, please "Next" button click, and go to Step 5.

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Step 5: Check result
Check the result.
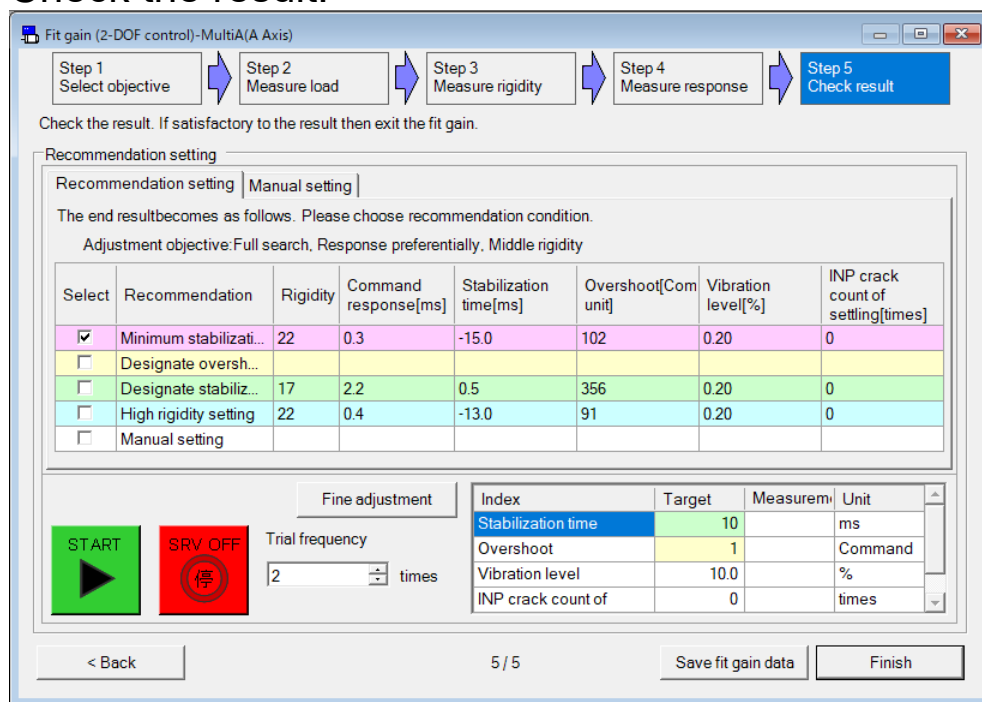
1 Please check a measurement result and put a check into recommendation conditions suitable for use.

2 Click button, perform test run and check a measurement result if needed.

3 Click "Save fit gain data", and please save the measurement result of all the steps.

   * The saved file can perform check of a recommendation setting, and send to driver by selecting "Read result from file" as the start-up of fit gain.

4 Click "Finish", the exit of fit gain screen is displayed. Please click "Yes".

5 When exit of fit gain screen is closed, and writing to EEPROM window will appear. Please click "OK".

Recommendation setting

(1) Tab
   Switch to "Recommendation setting" or "Manual setting".
<Recommendation setting>
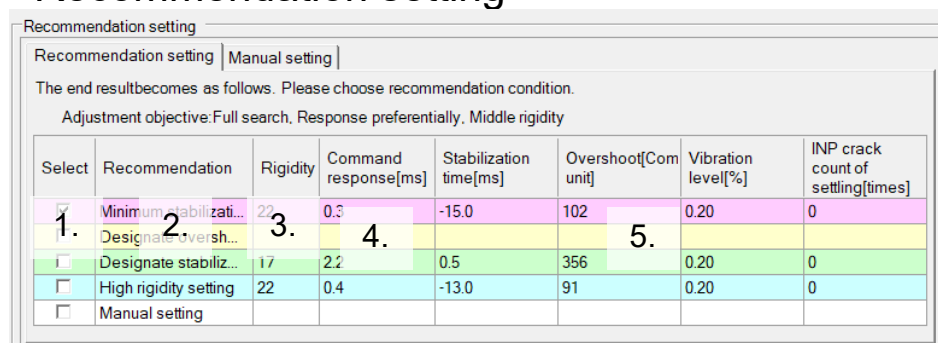
   1. Select
      Please select setting to send to the driver.
   2. Recommendation
      The name of recommendation conditions is displayed.
   3. Rigidity
      Rigidity of recommendation data is displayed.
   4. Command response
      Command response of recommendation data is displayed.
   5. Index data
      Index of recommendation data is displayed.

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\<Manual setting\>

Recommendation setting

| Recommendation setting | Manual setting | | | | | 4. |

The last setup is chosen from combination measurement result of all the rigidity and responses.
Please push a Transfer button, after cell select selection.

1. 2. **Transfer**

| Stabilization time [ms] ▼ | Average | ▼ | Normal | ☐ INP clack | ☐ Micro vibration | ☐ Vibration |

Command resp...	Rigidity17	Rigidity18	Rigidity19	Rigidity20	Rigidity21	Rigidity22
2.2	1.0	0.0	0.0 3.	0.0	0.0	0.0
1.5	-1.5	-2.0	-2.0	-3.0	-3.0	-3.0
0.9	-4.5	-5.0	-5.5	-6.0	-6.0	-7.0
0.6	-7.0	-7.5	-8.0	-9.0	-9.0	-10.0
0.4	-11.0	-10.5	-10.5	-12.0	-12.0	-13.0
0.3	-13.0	-13.5	-12.5	-14.0	-14.0	-15.0

1. Index
   Specify the target index to.
2. Extraction
   Specify the kind of value to use to. You can select "Minimum", "Maximum", "Average", "Dispersion (Max – Min)" and "Standard deviation".
3. Index data
   Index data corresponding to the combination of rigidity and command response is displayed.
4. Transfer
   The contents of the cell selected by "3." are sending to the driver.

(2) Test runs area
Test run is performed.
1. Test run
   Test run is performed using the same operation pattern as Step 4.

   * When having selected external command, please drive a motor by external command after button is clicked.

2. Emergency stop
   Do emergency stop by cut off electricity to a motor.

   * This becomes invalid when an external command is selected. Please use an external servo-on input etc. and enable it to perform an emergency stop.

3. Fine adjustment
   Can do fine adjustment from recommendation conditions.
4. Trial frequency
   Specifies the trial frequency when test run.
5. Measurement result
   Measurement result of test run is displayed.

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(3) Save fit gain data button
The measurement result of all the steps is saved. The saved file can perform check of a recommendation setting, and send to driver by selecting "Read result from file" as the start-up of fit gain.

Fine adjustment
According to change of a preset value, a parameter is sent to driver.

Index	Recommend	Setting	Unit	Adjustment objective	Notice
Reduce Stabilization time					
FIR type smoothing	1.0	1.0	ms	Turn down	Operation noise: Up
Command smoothing filter	0.3	0.3	ms	Turn down	Operation noise : Up Overshoot : Up
Reduce of Overshoot					
Velocity feed forward gain	100.0	100.0	%	Turn down	Stabilization time : Long
Viscous friction gain	0	0	%/(10000r/min)	Turn up	Stabilization time : Long
Position 3rd gain scaling factor	100	100	%	Turn up	Stabilization noize : Up Performance : Down
Position 3rd gain valid time	6	0	ms	Recommendation	Stabilization noize : Up Performance : Down
Reduce of Minute vibration					
Depth margin	3.0	3.0	dB	Turn up	Performance : Down
Suppress of Tip vibration					
Damping frequency	0.0	0.0	Hz	Recommendation or Vibration frequency	Stabilization time : Long
Damping depth	0	0		Search optimum point	Performance : Down
Damping filter	0.0	0.0	Hz	Turn up (Reduce of Delay)	Performance : Down Torque is saturated

"Close"   : Activate the change, and exit the screen.
"Cancel"   : Inactivate the change, and exit the screen.

Structure of Fit gain data Screen

(1) Title bar
(2) Tool bar
(3) Target value setting
(4) Tab
(5) Measurement information area
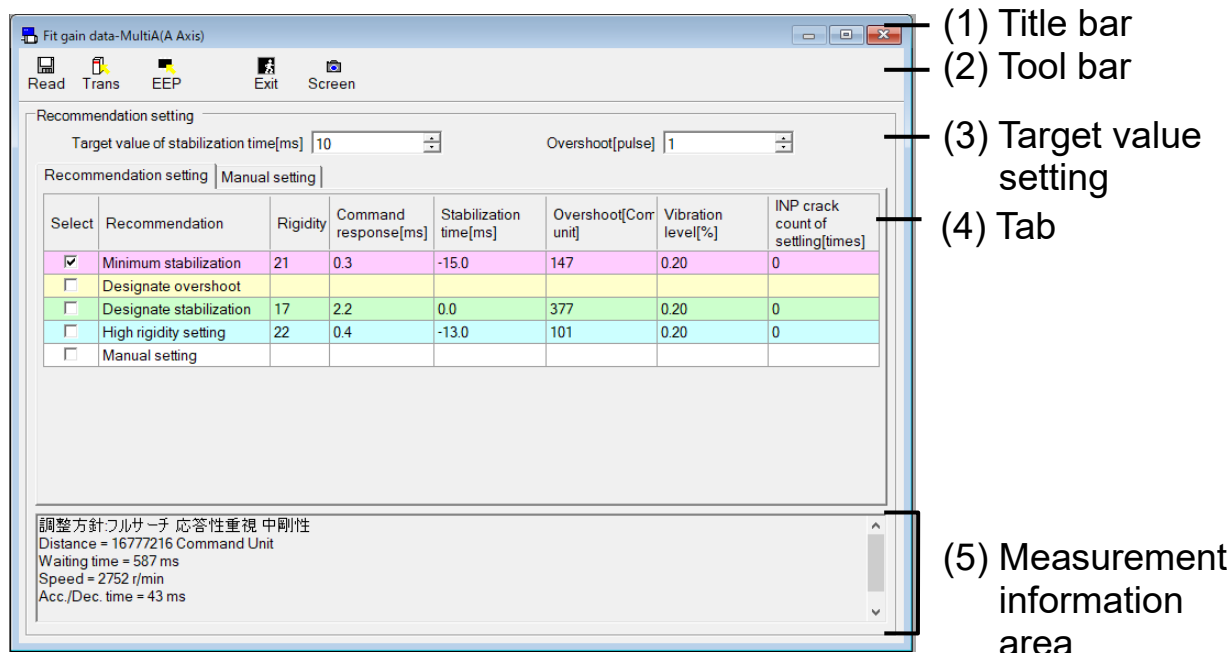
(1) Title bar
You can operate window.

(2) Tool bar

Read	(Read)	Reads fit gain measure result from files (.fit5). When this button is effective, a fit gain measure result file can be specified by drag and drop.
Trans	(Transmit)	Sends parameters to the drivers.
EEP	(EEPROM)	Write parameters to EEPROM of the driver.
Exit	(Exit)	Closes fit gain data screen.
Screen	(Screen)	Captures the screen and save into a file.

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(3) Target value setting
"Target value of stabilization time"
   Set the target value of stabilization time.
"Overshoot"
   Set the target value of overshoot.

(4) Tab
   Switch to "Recommendation setting" or "Manual setting".
<Recommendation setting>

	Select	Recommendation	Rigidity	Command response[ms]	Stabilization time[ms]	Overshoot[Com unit]	Vibration level[%]	INP crack count of settling[times]
☑		Minimum stabilization	21	0.3	-15.0	147	0.20	0
☐		Designate overshoot						
☐		Designate stabilization	17	2.2	0.0	377	0.20	0
☐		High rigidity setting	22	0.4	-13.0	101	0.20	0
☐		Manual setting						

1. Select
   Please select setting to send to the driver.
2. Recommendation
   The name of recommendation conditions is displayed.
3. Rigidity
   Rigidity of recommendation data is displayed.
4. Command response
   Command response of recommendation data is displayed.
5. Index data
   Index of recommendation data is displayed.

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\<Manual setting\>

Command resp...	Rigidity17	Rigidity18	Rigidity19	Rigidity20	Rigidity21	Rigidity22
2.2	1.0	0.0	0.0	0.0	0.0	0.0
1.5	-1.5	-2.0	-2.0	-3.0	-3.0	-3.0
0.9	-4.5	-5.0	-5.5	-6.0	-6.0	-7.0
0.6	-7.0	-7.5	-8.0	-9.0	-9.0	-10.0
0.4	-11.0	-10.5	-10.5	-12.0	-12.0	-13.0
0.3	-13.0	-13.5	-12.5	-14.0	-14.0	-15.0

1. Index
   Specify the target index to.
2. Extraction
   Specify the kind of value to use to. You can select "Minimum", "Maximum", "Average", "Dispersion (Max – Min)" and "Standard deviation".
3. Index data
   Index data corresponding to the combination of rigidity and command response is displayed.

(5) Measurement information area
   Objective of servo adjustment and operation pattern at the time of measurement are displayed.

Notes 1) Please refer to application scope and remarks specified in the driver manual or technical reference.
Notes 2) Parameter set on this screen is inputted into Driver. As PANATERM does not maintain this value, please perform the recording it to EEPROM of driver after completion of adjustment.
Notes 3) Parameter settings will be needed even at the fit gain. Please read the operation manual or technical reference to understand the manual content prior to this operation.
Notes 4) The fit gain screen cannot open during opening some screens. For more information please refer to page 209 "Fit gain screen (2 degrees of freedom control) behavior".

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Object Editor screen

Realize easier troubleshooting without connecting to the host controller by displaying and editing the object list of the driver.

Note) Please modify objects with enough care after reading the driver's instruction manual or technical reference carefully, as some objects give large effect to operations of drivers or motors.

Open the Object Editor window
1 Start "PANATERM".
   (Please refer to Article 5. Start up and Close down in details)
2 Click "Other" > "Object Editor" of the tool bar on the main screen.
3 Selection of object to be read window is displayed.

<When communication with driver>

Selection of object to be read   ×

- ⦿ Read-out from the driver
- ○ Read from the file
- ○ Read the default

OK

Cancel

<When not communication with driver>

Selection of object to be read   ×

- ○ Read-out from the driver
- ⦿ Read from the file
- ○ Read the default

OK

Cancel
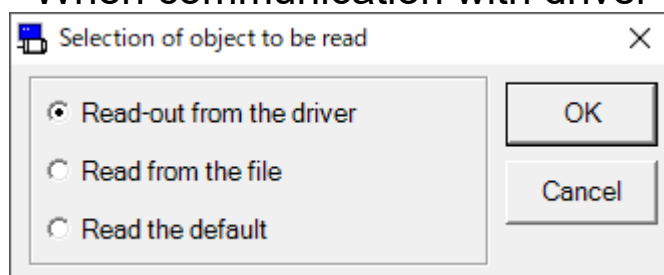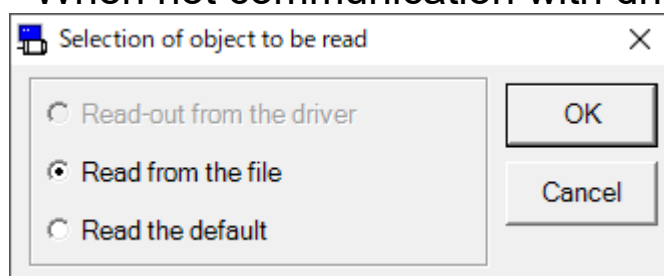
4 Select the origin of objects, and click.

□"Read - out from the driver"

The objects set in the driver are read communicating the driver connected. If this mode is selected, modifications of the object values are reflected to the driver immediately.

□"Read from the file"

Object Data files already edited (.obj6) are read. Object modifications are not reflected to the driver connected unless "Transmit the object to the driver" is executed when they are "Read from the file".

□"Read the default"

Default set values saved at the time of installation is read. The object modifications are not reflected unless "Transmit the object to the driver" is executed as the case of "Read from the file".

5 Click "OK". The Object Editor window is opened.
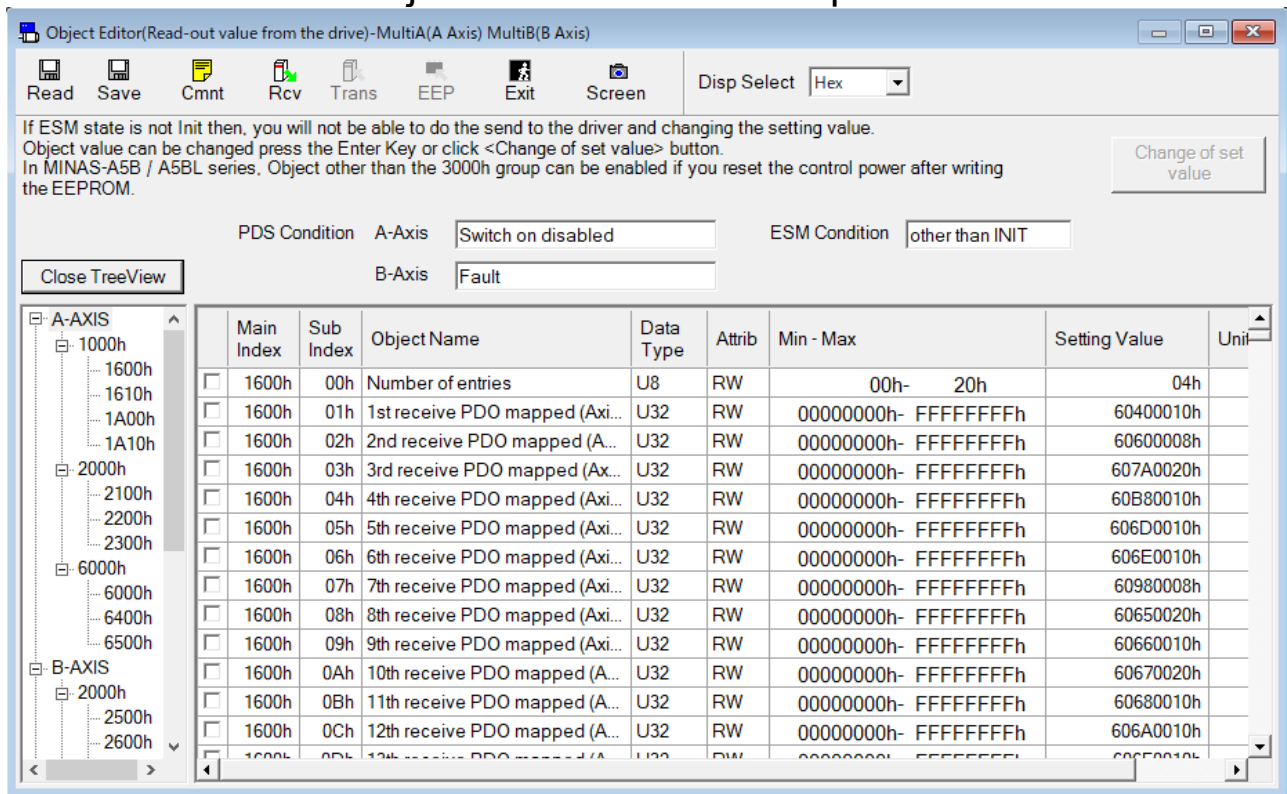
<u>Close the Object Editor window</u>

Click (Exit) on the tool bar.

Structure of Object Editor screen

(1)Title bar
(2)Tool bar
(3)Condition monitor
(5)Object setting field
(4)Object Tree
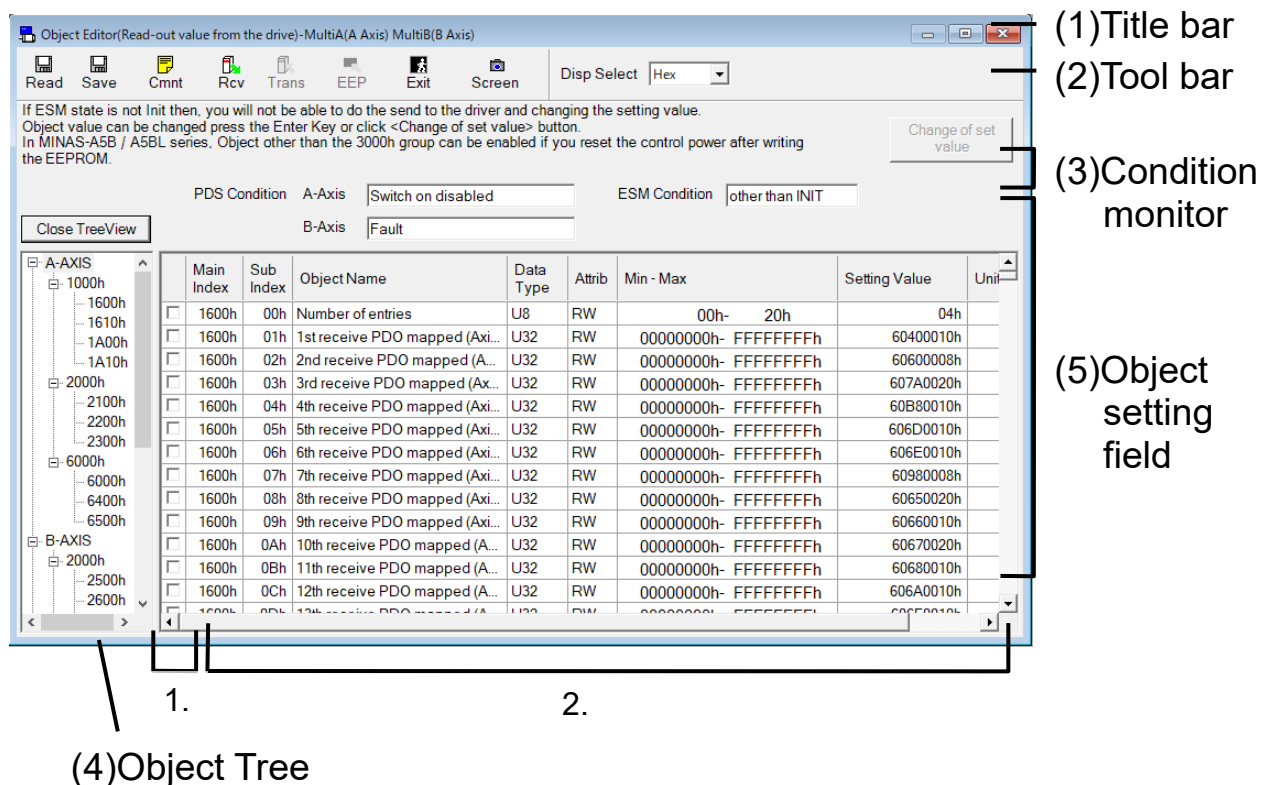
(1) Title bar

The origins of reference of objects reference are displayed.
Following buttons are used to operate windows.

Button	Description
(full screen icon)	Display the window in full screen
(close icon)	Close the window

(2) Tool bar

Saving, reading, some other basic operation commands on objects are listed.

Button	Description
Read (Read)	Reads objects from files (.obj6). When this button is effective, an object file can be specified by drag and drop.
Save (Save)	Writes objects to files (.obj6).
Cmnt (Comment)	Makes comments attached to objects files.
Rcv (Receive)	Receives objects from the driver.

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 (Transmit)   Sends objects to the driver.

 (EEPROM)   Write objects to EEPROM of the driver.

 (Exit)   Closes object editor screen.

 (Screen)   Captures the screen and save into a file.

 (Disp Select)   Change the numerical display of objects being displayed.
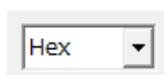
Hex: Displayed in hexadecimal, add "h" to the end of the number.

Dec: Displayed in decimal number, and sign is set.

Bin : Displayed in binary number, add "b" to the end of the number. Min-Max columns are displayed in hexadecimal.

(3) Condition monitor

(PDS Condition)   Show the PDS Condition of the Driver.
The condition is changed depending on the value of the object of 6041h-00h.
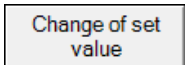
(ESM Condition)   It shows condition whether rewriting objects in the driver is possible or not.

<When communication with driver>

INIT   In this condition, you can rewrite the driver object.
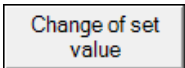
 is displayed next to , and becomes possible to edit and send the object setting value.

other than INIT   In this condition, you cannot rewrite the driver object.
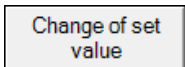
 is not displayed next to , and becomes impossible to edit and send the object setting value.

<When not communication with driver>

\-   is displayed next to , and becomes possible to edit and send the object setting value.

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(4) Object Tree
If you select a node from the object tree, related objects are displayed at object setting field.
If you click "Close TreeView" / "Disp TreeView" button, switch the Hide / Show of Object tree.
If you select a parent node, objects of all the child nodes are displayed which following selected parent node.
If you select a child node, objects of the selected node are displayed.
If you select "Extraction", the extracted objects are displayed .
The objects selected in the object setting field are displayed.
Refer to the instruction manual of the driver or technical reference for more information about each object.
Note) If you receive or transmit the object during the extraction display, targets are only extracted objects.
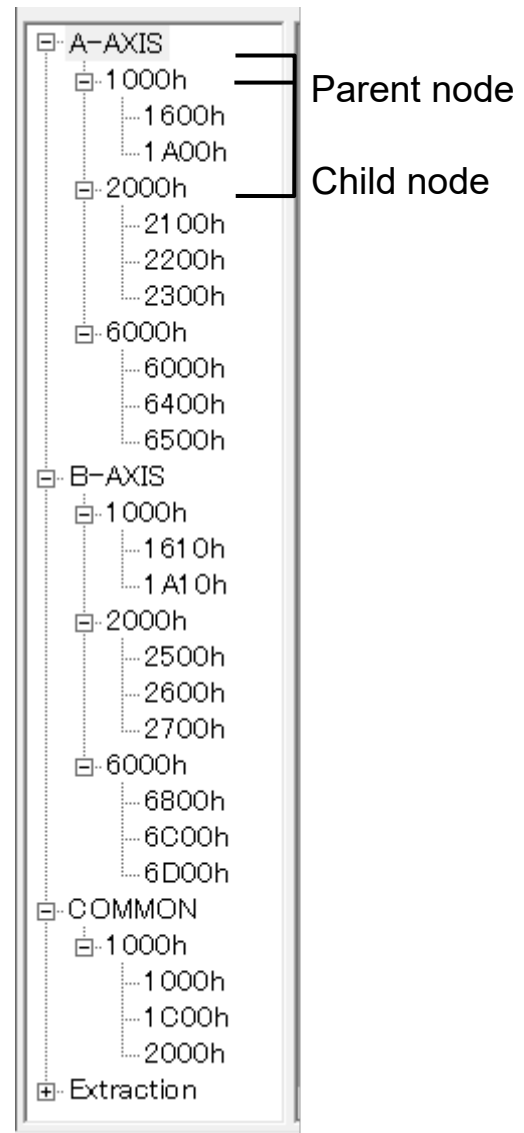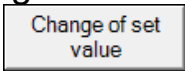
(5) Object setting field
 1. Extraction selection check box
    It is possible to extract the object by checking ON.
    Extraction selection is saved at the end of object editor, and read automatically when the object editor startup.

2. You can edit and set the object.

"Main Index"   Show the Main Index of the object.

"Sub Index"   Show the Sub Index of the object.

"Object Name"   Show the Object Name.

"Data Type"   Show the Data Type of the object.
         I8 : Integer 8
         I16 : Integer 16
         I32 : Integer 32
         U8 : Unsigned 8
         U16 : Unsigned 16
         U32 : Unsigned 32
         Bool : Boolean
         OS : Octet String
         VS : Visible String

"Attrib"   Show the attribute of the object.
         RO : Read-Only attribute
         RW : Read-Write attribute

"MIN-MAX"   Show the setting range of the object.
         If "Data Type" is OS or VS, setting range is not displayed.

"Setting Value"   Show the setting value of the object.
         If "Attrib" is RW and "Setting Value" is number, you can
         change the setting value of the object.
         Depending on the choice of "Disp Select", there is an input
         limit.
         Hex : 0 to 9, "A" to "F"
         (after editing, "h" is automatically added to the end.)
         Dec : 0 to 9, "-"sign
         Bin : 0 to 1
         (after editing, "b" is automatically added to the end.)
         After changing the setting value, the change is reflected by

         pressing the [ENTER] key or clicking the [Change of set value]
         (Change of set value).
         Press the [ESC] key to return to the original value.

"Units"   Show the unit of the setting value of the object.

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Comment

On saving set objects in a file, comments can be saved together. These comments do not effect operations of the driver.

Making Comment

1 Click Cmnt (Comment) on the tool bar, and open the comment window.

```
Comment on object editor                                    ✕

Comment (memo at data saving)
┌─────────────────────────────────────────────────────────┐
│ You can input comment into one line to half size 200 characters. │
│ In addition, the contents to the fifth line are printed. │
└─────────────────────────────────────────────────────────┘

Description of this line is displayed at file selection.
┌─────────────────────────────────────────────────────┬──┐
│                                                     │ ∧ │
│                                                     │   │
│                                                     │   │
│                                                     │ ∨ │
└─────────────────────────────────────────────────────┴──┘

Comment is saved with object data.        [  OK  ]  [ Cancel ]
```

2 Click comment box and input comments.
3 After completing comment input, click "OK".

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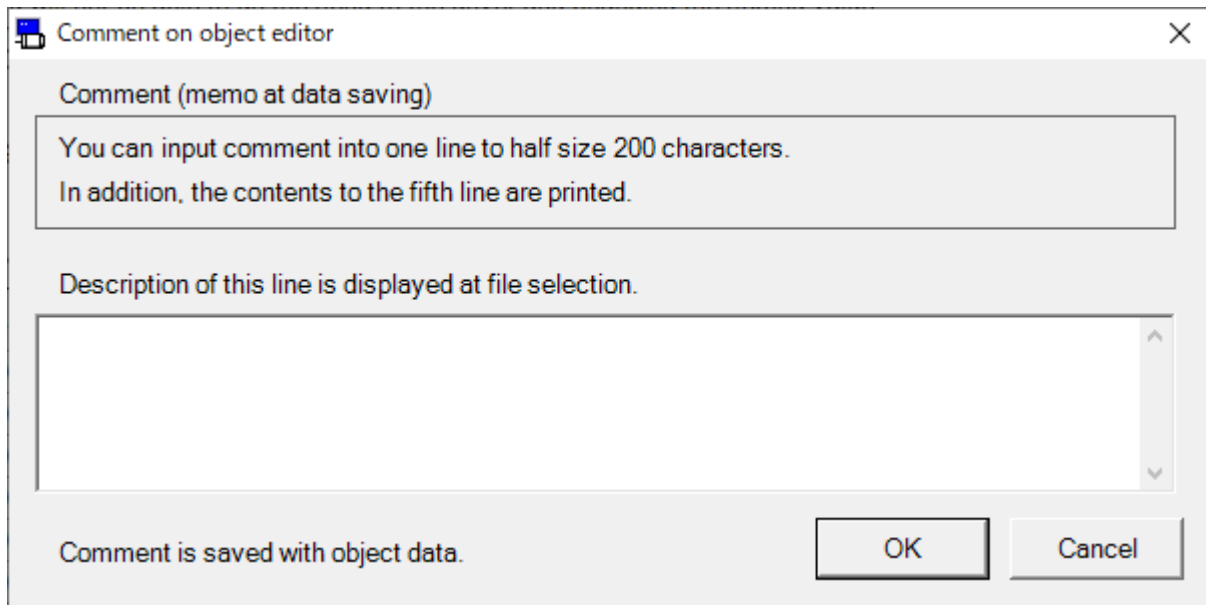
Notes 1) Please refer to the manual of the driver or technical reference for details of each object's function and so on.

Notes 2) Even if objects are sent to the driver, objects are turned to the original value before modification if the power supply of the driver is turned off without writing to EEPROM of the driver. Object modifications list are displayed on EEPROM writing. Please check the modification carefully.

Notes 3) Do not turn off the power supply of the PC during writing to EEPROM of the driver. Data context cannot be guaranteed if the power supply is turned off during writing.

Notes 4) Some objects become valid after modifications to the new data, writing EEPROM, and power supply reset. (On inputting, that issue is displayed. Please refer to the manual of the driver or technical reference and confirm on the objects)

Notes 5) Object editor screen indication may be different from the actual object value of the driver in case PANATERM function windows which change the objects (ex. Trial Run, Pin Assign, Analog Input) is opened. In such case, press the reception button and update the object of the driver to the latest one.

Notes 6) If you cannot edit object value during the communication with driver, the driver may be in condition which is not rewritable. In this case, please check "ESM Condition" is "INIT" and also the driver is in condition which is rewritable.

Notes 7) The object editor screen cannot open during opening some screens. For more information please refer to page 210 "Object editor screen behavior".

Battery Refresh screen

Will perform a battery forced discharge of the encoder.

Note) Battery refresh can be executed only by the corresponding encoder.
      Please note that there is a possibility that the battery alarm occurs
      during the refresh operation.

Open the Battery refresh window
1 Start "PANATERM".
   (Please refer to Article 5. Start up and Close down in details)
2 Click "Other" > "Battery Refresh" of the tool bar on the main
   screen.
3 The Battery Refresh window is opened.
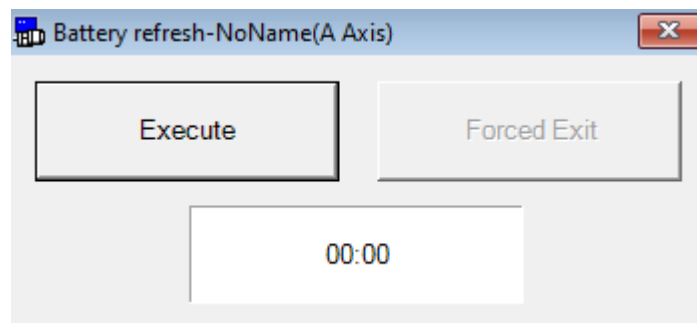
Close the Battery refresh window
   Click ⊠ of upright on the window

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Procedure for Battery refresh

1 Click "Execute".

2 Confirmation dialog is displayed.
Click "OK" then Battery refresh is executed.

PANATERM ✕

Transmit the battery refresh command.
Travel time is about 5 minutes.

| OK | Cancel |
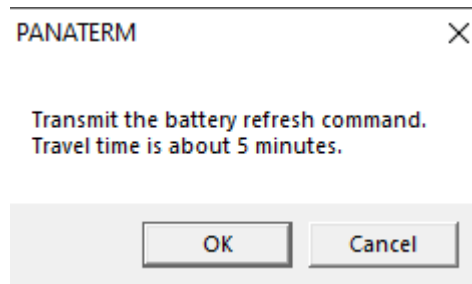
3 The remaining time is displayed as "05:00".
Will be gradually countdown.

Battery refresh-NoName(A Axis) ✕

| Execute | Forced Exit |

04:57
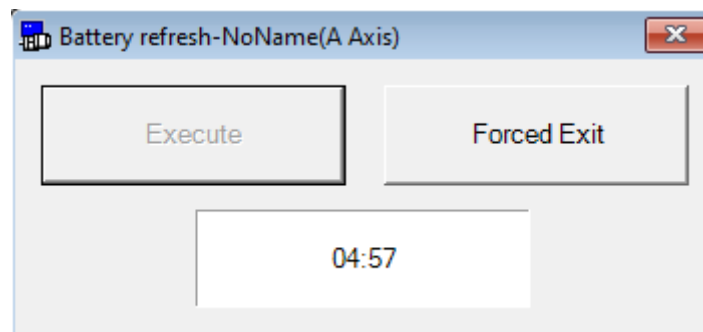
4 When the remaining time reaches "00:00", the battery refresh is complete.

PANATERM ✕

Battery refresh is complete.

OK
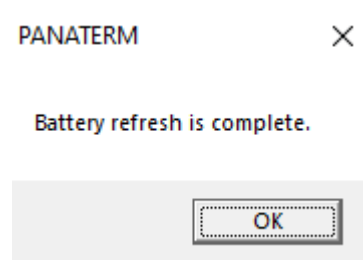
Interruption of Battery refresh

Click "Forced Exit" then exit forcibly battery refresh.

Notes 1) Remaining time of the countdown after the battery refresh execution, please note that after the end of the battery refresh screen is also continuing.

Notes 2) The battery refresh screen cannot open during opening some screens. For more information please refer to page 211 "Battery refresh screen behavior".


Deterioration diagnosis screen

You can display and check the deterioration and aging state of the equipment from the detection apparatus capable of information by the motor.

Open the Deterioration diagnosis window
1 Start "PANATERM".
   (Please refer to Article 5. Start up and Close down in details)
2 Click "Other" > "Deterioration diagnosis" of the tool bar on the main screen.
3 The Deterioration diagnosis window is opened.

Close the Deterioration diagnosis window
   Click [Exit] (Exit) on the tool bar.

Structure of Deterioration diagnosis screen

(2)Tool bar

(1)Title bar

(3)Diagnosis function setting field

(4)Load factor estimated area

(5)Torque command estimated area
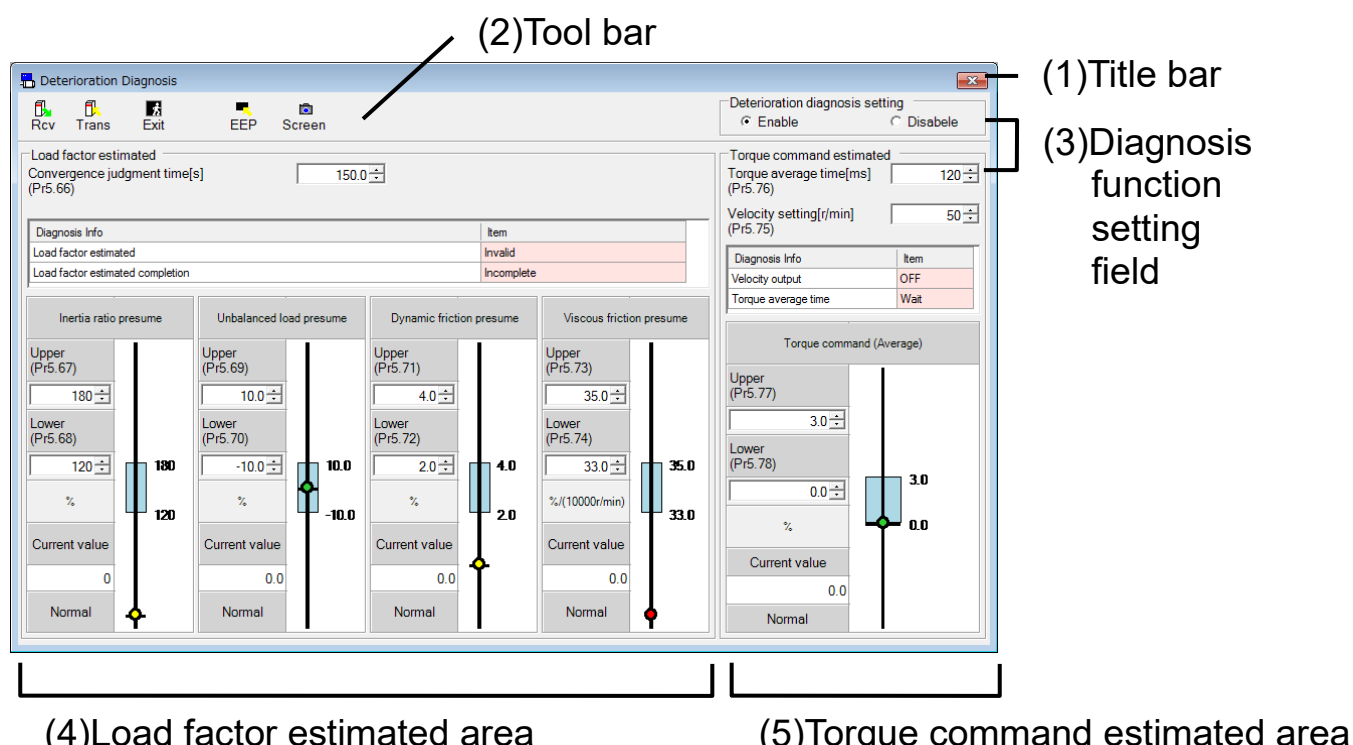
(1) Title bar
You can operate window.

(2) Tool bar
Receiving, transmitting, some other basic operation commands on parameters are listed.

Icon	Label	Description
Rcv	(Receive)	Receives parameters from the driver.
Trans	(Transmit)	Sends parameters to the driver.
Exit	(Exit)	Closes parameter screen.
EEP	(EEPROM)	Write parameters to EEPROM of the driver.
Screen	(Screen)	Captures the screen and save into a file.

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(3) Diagnosis function setting field

To enable / disable the deterioration diagnosis function.
When the screen is displayed, it is set to the current state of the driver.

Deterioration diagnosis setting
● Enable   ○ Disabele

Enabled   : Deterioration diagnosis function is enabled.
Disabled   : Deterioration diagnosis function is disabled.

(4) Load factor estimated area

It displays the estimated information about the load characteristics.

1. **Estimated information setting**
   Set the estimated condition of the load factor estimation.
   "Convergence judgment time"
   Sets time for deemed convergence of real-time auto tuning load characteristics estimate.

2. **Diagnosis information Monitor**
   Display the diagnostic status of the load characteristics estimation.
   "Load factor estimated"
   Display the load factor estimated of real time auto tuning indicates whether valid.

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"Load factor estimated completion"
    If load factor estimate is valid and it was possible that the data
    necessary to estimate is to get more than convergence determination
    time, will be completed.

3. Diagnostic slider
Display the slider that indicates the diagnostic state of
deterioration diagnostic information related to the load factor.
    "Inertia ratio presume"
        Display the diagnostic state of inertia ratio.
    "Unbalanced load presume"
        Display the diagnostic state of unbalanced load.
    "Dynamic friction presume"
        Display the diagnostic state of dynamic friction.
    "Viscous friction presume"
        Display the diagnostic state of viscous friction.

(5) Torque command estimated area
It displays the estimated information about the torque command.

Torque command estimated	
Torque average time[ms] (Pr5.76)	120
Velocity setting[r/min] (Pr5.75)	50

Diagnosis Info	Item
Velocity output	OFF
Torque average time	Wait

Torque command (Average)

Upper (Pr5.77)	
	3.0
Lower (Pr5.78)	
	0.0
%	
Current value	
	0.0
Normal	

3.0

0.0

1. Estimated information setting
Set the estimated condition of the torque command estimation.
"Torque average time"
Sets time required to compute the torque command average (weighted frequency).
"Velocity setting"
Sets deterioration diagnosis velocity output (V-DIAG).

2. Diagnosis information Monitor
Display the diagnostic status of the torque command estimation.
"Velocity output"
It turned on when the motor speed matches the velocity setting.
"Torque average time"
It will be completed when the velocity output is on and has passed more than the torque average time.

3. Diagnostic slider
Display the slider that indicates the diagnostic state of deterioration diagnostic information related to the torque command.
"Torque command (Average)"
Display the diagnostic state of torque command (average).

Structure of Diagnostic slider

Diagnostic slider is composed of the following elements.
Warning during the occurrence of the deterioration diagnostic information of interest, background color as a warning display is displayed in red.

	Display
(Diagnosis information)	Display the name of diagnosis information.
(Upper value display) (Lower value display)	Set upper limit and lower limit of diagnosis information. Upper values and Lower values, are inputted with the number keys directly, or modified clicking and changing the values from each setting area. To set the values, input the [ENTER] key or click (Transmit) on Toolbar.
(Unit display)	Display the unit of diagnosis information.
(Current value display)	Display the current value of diagnostic information acquired from the driver.
(Warning display)	Display the occurrence of deterioration diagnosis warning.
(Slider display)	Display estimation result of diagnosis information with slider. The drawing range of the slider changes according to the setting of the upper limit value and lower limit value.

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Current value	Display the current value of diagnostic information with ◯. In the limit range :Displayed as 🟢 Out the limit range :Displayed as 🟡 Out the drawing range :Displayed as 🔴
Upper value	Display the upper limit value of diagnostic information. If lower limit value > upper limit value then, it not displayed.
Lower value	Display the lower limit value of diagnostic information. If lower limit value > upper limit value then, it not displayed.
Limited range	Display the limit range by the upper limit value and lower limit value. If deterioration diagnosis function is enabled and the current value exceeds the limit range, diagnosis warning will be generated. If lower limit value > upper limit value then, it not displayed.
Origin position	Display the position of the current value = 0. It is not displayed when there is no 0 position within the drawing area.

Notes 1) Please refer to the manual of the driver or technical reference for details of each parameter's function and so on.

Notes 2) Even if parameters are sent to the driver, parameters are turned to the original value before modification if the power supply of the driver is turned off without writing to EEPROM of the driver. Parameter modifications list are displayed on EEPROM writing. Please check the modification carefully.

Notes 3) Do not turn off the power supply of the PC during writing to EEPROM of the driver. Data context cannot be guaranteed if the power supply is turned off during writing.

Notes 4) The deterioration diagnosis screen cannot open during opening some screens. For more information please refer to page 211 "Deterioration diagnosis screen behavior".

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Magnetic pole position estimation results copying screen

Set the magnetic pole position estimation results based on the parameter file.

Note) Magnetic pole position estimation results copying function is assumed to exchange only driver without changing the combination of linear motor and feedback scale.
Make sure that the copy source and copy destination driver are the same device.
Otherwise the magnetic pole position will be shifted, motor cannot be controlled normally.

Open the Magnetic pole position estimation results copying window

1 Start "PANATERM".
(Please refer to Article 5. Start up and Close down in details)
2 Click "Other" > "Magnetic pole position estimation results copying" of the tool bar on the main screen.
3 The Magnetic pole position estimation results copying window is opened.
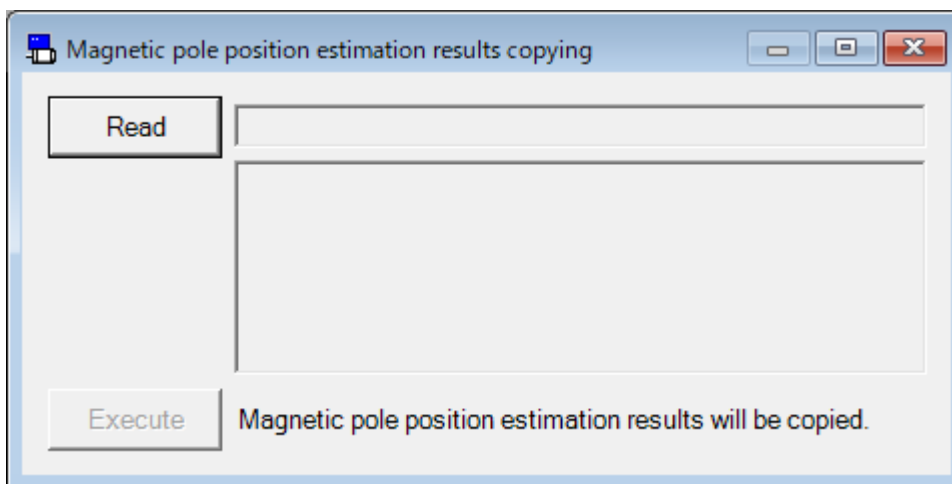
Close the Magnetic pole position estimation results copying window

Click ❌ of upright on the window

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Magnetic pole position estimation results copying is executed

1   Click "Read" button.
2   Select the copy source parameter file.
3   Click "Execute" button.
4   Caution windows will appear. Confirm the window message carefully, and click "Execute".

⚠ Caution   ✕

⚠ If a wrong file is selected, incorrect magnetic pole position estimation results will be copied and the motor may run away. Pay careful attention. Execute copying?

Execute

Cancel
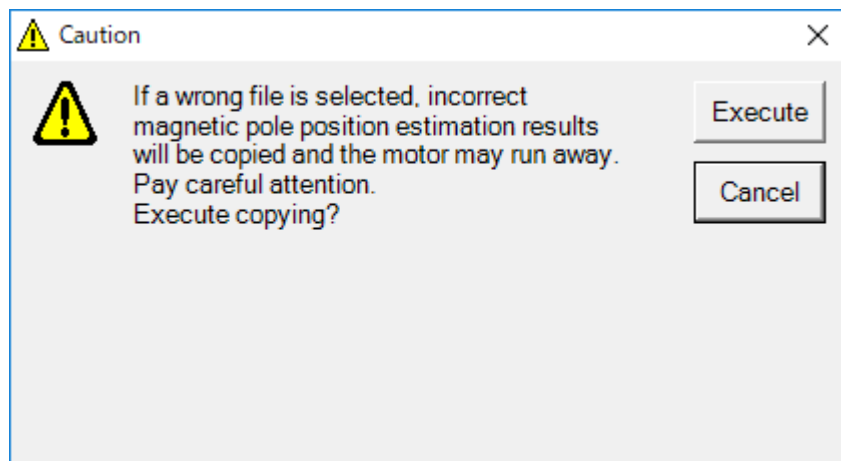
Notes 1) The Magnetic pole position estimation results copying screen cannot open during opening some screens. For more information please refer to page 211 "Magnetic pole position estimation results copying screen behavior".

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PSM Parameter, Monitor, Alarm screen

PSM (Power Supply Module) parameters, monitors, and alarms can be set and displayed.

PSM Parameter screen

PSM parameters can be set. Click "EEP" to save the changed parameters to EEPROM. Click "Initialize" to return to the factory settings.

PSM Monitor screen
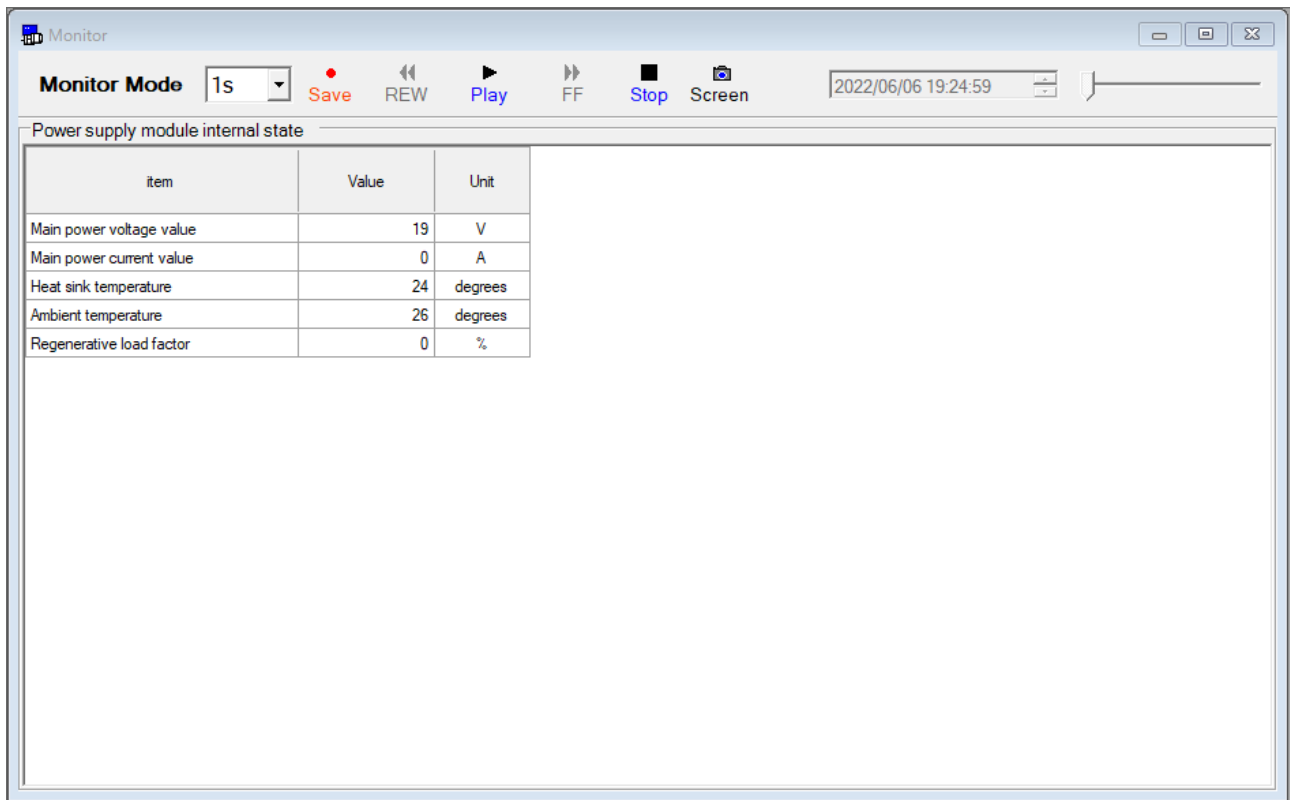
PSM status can be monitored.

Notes 1) The display items of the PSM internal status may not be displayed depending of the driver. For more Information please refer to page 199 "Monitor screen behavior".

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PSM Alarm screen

PSM alarm can be checked. You can check the current alarm occurrence status and alarm history. The alarm history can also be cleared.
* Since the current PSM alarms have only the alarms that cannot be cleared, you cannot clear the current alarms by clicking "Clear" on PANATERM.

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7. Trouble shooting

Set up

Stop setup
→Please review the system requirements, and make sure that the computer fulfils the required condition. Please especially note the operation system's service package.
→Installer is different for 32 bit or 64 bit versions of Windows. Please use the correct installer.
→If there is a problem installing the Microsoft .NET Framework, then stop PANATERM's installation, install Microsoft .NET Framework 4.8 directly from Microsoft homepage, and then try re - installing PANATERM.
→If the installation of Microsoft Visual C++ 2013 Redistributable(x86) fails, stop the installation of PANATERM and install Microsoft Visual C++ 2013 Redistributable(x86) in your computer directly from the Microsoft website, and then start the PANATERM installer again.
→If the installation of Microsoft Access Database Engine fails, stop the installation of PANATERM and install Microsoft Access Database Engine 2010 in your computer directly from the Microsoft website, and then start the PANATERM installer again.
→As a result of download failure, there is a possibility that the installer has broken. Please download again after clearing cash of a browser.

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Failed to install [PANATERM USB Driver]

Failed to install [PANATERM USB Driver]
→After uninstalling PANATERM, please refer to the following procedure to disable the driver signature and then re-install PANATERM. 1. Press "Windows" + "r" key to open [Run] dialog. 2. Enter "cmd" in the [Run] dialog,and then click the [OK] button. 3. After starting the Command Prompt, enter "Shutdown /r /o /t 0", press "enter" key, and restart the computer. 4. On the "Choose an option" screen, select [Troubleshoot]→ [Advanced options]→ [Startup Settings]→ [Restart]. 5. On the "Startup Settings" screen, press "F7" key (Disable driver signature enforcement). 6. After starting the computer, execute the installation. * When you restart the computer, the driver signature returns to the valid state. * The procedure may vary depending on the operating system.

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Communication

Drive name does not appear on the USB connection window after starting up PANATERM.
→Control electricity of the Drive may not be activated.
→Connection of USB communication cable may be loose, the cable itself may be damaged, or the correct cable may not be used.
→USB port of PC may not be functioning standardly. Please confirm this by the operating manual of the PC.
→Confirm that the network setting of your computer is correct and functioning normally. (Refer to the operation manual of your computer.)
→USB driver may not be installed correctly.

"Cannot detect the communication port or the drive." is displayed and it cannot communicate.
→Control electricity of the Drive may not be activated.
→Connection of cable may be loose, the cable itself may be damaged, or the correct cable may not be used.
→Communication port (USB or LAN port) of PC may not be functioning standardly. Please confirm this by the operating manual of the PC.
→Confirm that the network setting of your computer is correct and functioning normally. (Refer to the operation manual of your computer.)
→Driver may not be installed correctly.

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Printing

Cannot print.
→Printer may not be connected properly, or printer driver may not be functioning properly. `This can be confirmed by printing the test page.
→Document size may not be configured correctly. PANATERM can be printed only to the size of A4 or Letter size. Please confirm the printer property of PC.
→If there are too many characters on a line, it may be out of the print range. Divide it into multiple lines so that it fits in the number of printable characters.

Uninstall

Unable to uninstall PANATERM
→File created not by PANATERM may be included in the same folder where PANATERM data file is included, In this case, the files will be protected, and uninstall cannot be completed.

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PANATERM behavior

Response of PANATERM is slow. Operation is slow.
→Close window that are not in use. All windows that are hiding behind active windows are still active and are communicating with the Drive periodically.
→Other equipment may be connected to USB. If so, then please lighten the load for USB connection by e.g. stop the other equipment's operation.

Window is out of the screen, and is hard to see.
→Size of screen may not be configured properly. Please configure the screen size larger than 1,024 x 768.

Cannot open window. Display of the icon is strange.
→Memory may be lacking. Please close down PANATERM, other applications that are not in use, and/or reboot the PC, and then start up the PANATERM again.

Text on the screen is missing.
→Changing the scaling size with the Windows deprecated "Custom Scaling" may result in a missing view. Disable custom settings.

PANATERM is not reacting anymore
→Close down PANATERM by pressing [CTRL]+[ALT]+[DEL] keys
→The error dialog may be displayed on the back of the screen. Press the [ALT]+[TAB] keys and select the error dialog.

PANATERM had closed down suddenly
→Start up the PANATERM again.

Cannot start PANATERM
→It has failed to install .NET Framework. Install .NET Framework 4.8 directly from Microsoft homepage, and then try re - installing PANATERM.
→When installing to the Program Files folder, it has failed series definition setting. Please re - install PANATERM after remove of the following folder. [System Drive]:Users\[User Name]\AppData\Local\VirtualStore\Program Files\Panasonic Industry\MINAS\PANATERM_MULTI\ini\def
→If Windows update for November 2017 has not been executed, it may become impossible to start up the system. Refer to Microsoft website and execute Windows Update, then restart PANATERM.

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Parameter screen behavior

Cannot open the parameter screen
→The parameter screen cannot be opened simultaneously with the gain tuning screen, the pin assign setting screen, the fit gain screen (Standard), the fit gain screen (2 degrees of freedom control), the object editor screen, the deterioration diagnosis screen, and the magnetic pole position estimation results copying screen. Please close these screens first.

Parameter value returns back to the original
→Procedure to change parameter may not have been completed. This may happen if you select other parameter or switch windows without pressing [ENTER] key or "Change of set value" button. Please make sure of your operations.
→If the parameter value is read from the file, changed parameters are not sent to the driver. If you want to send then please click the "Trans" button.

Changed parameter after EEPROM over write does not match to the change
→Parameter may be changed by other windows that will change parameter. Please click "Rcv" button to update the parameter value.

The explanation of parameter is unkind. Cannot you display it in detail?
→Please double-click the item with underline on the left sub-themes tree. Related to the page of the operation manual of driver is displayed.
→Please check on "Display - Set value description" on the lower right of the screen. Information according to each value is displayed. Or else value with decimal point is displayed.

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Monitor screen behavior

Cannot open the monitor screen
→The monitor screen cannot be opened simultaneously with the pin assign setting screen, the setup wizard and the RTEX setup screen. Please close these screens first.

Monitor screen does not change
→Stop button may be clicked. If condition indicated on upper left corner states "Monitor stopped" then click the "Start" button on toolbar.
→Communication with the drive may be severed and may be off line. Please confirm if the unconnected mark is on the left side of status bar at the lowest portion of PANATERM screen.

The display items in the monitor content display area change depending on the driver.
→If the driver software version is out of date, unsupported items will not be displayed. Please use new software version of the driver

Alarm screen behavior

Cannot open the alarm screen
→The alarm screen cannot be opened simultaneously with the pin assign setting screen, the setup wizard and the RTEX setup screen. Please close these screens first.

Error log does not appear
→When error has never occurred or if the log has been cleared once, the error log will not appear.
→Additional information that appears on lower left portion only contains error that occurred 1 time to 3 times before. If additional information for older error is needed, then please select error log number at the upper left portion of window.
→Errors that were not presumed will not leave log even the error occurred. In this case, the log will not be kept, and therefore will not appear.

Gain tuning screen behavior

Cannot open the gain tuning screen
→The gain tuning screen cannot be opened simultaneously with the parameter screen, the pin assign setting screen, the fit gain screen (Standard), the fit gain screen (2 degrees of freedom control), the object editor screen, the deterioration diagnosis screen and the magnetic pole position estimation results copying screen. Please close these screens first.
→The gain tuning screen cannot be displayed communication with the driver is severed. Please confirm if the unconnected mark is on the left side of status bar at the lowest portion of PANATERM screen.

Automatic resonance suppression function does not activate effectively
→When mode 1 to 4 is selected for Real time auto tuning; automatic resonance suppression function will be active. Please configure the resonance detection level with reviewing the peak value of vibration by the monitor measurement, and put check on the checkbox.

Assumes value of load characteristics does not change
→Mode of real time auto tuning is "0", or least - squares estimation of customize setting is invalid. Please select mode between 1 and 5, or valid the least - squares estimation at customize setting.
→If characteristics variation is set as "0: No Change" then the load characteristics estimation is stopped. Please set a value from 1 to 3.

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Resonance frequency appears as default value 5,000Hz
→When resonance level is small, or does not continue for long time, and then the resonance frequency may not change from 5,000Hz. Please use the graphic wave function to read resonance frequency directly from motor speed or torque command wave, and set notch filter.

Resonance frequency appears as default value 0.0Hz
→When resonance level is small or does not continue for long time, resonance frequency may not appear changed. Please use wave graphic function to set resonance suppression control setting by measuring position deviation to read resonance frequency directly.

Cannot use clear button of resonance suppression setting
→Please click "edit" button of the applicable window. When setting/clear button is clocked, the changed setting value will be transmitted to the drive automatically.

Simplified monitor does not update
→When drive Servo is OFF, measurement will stop also. Please turn ON the Servo and click "Start measurement" button again.
→Simplified monitor will stop when test run No. reaches the measurement number. When you need to continue the measurement, then please click on the "Start measurement" button again.

Parameter cannot be set manually
→Please click on the "edit" button to enable editing. Also, please click on the "Send" button to write the parameter to drive value when after the parameter was changed.

Wave form graphic screen behavior

Cannot open the wave form graphic screen
→The wave form graphic screen cannot be opened simultaneously with the pin assign setting screen, the setup wizard and the RTEX setup screen. Please close these screens first.

Wave data does not appear
→Trigger condition may not be satisfied. Please confirm trigger condition, or click on measure button with no trigger condition. However, if measurement is done without trigger condition is done, and then portion of measurement condition will be cleared. Also, please be noted that trigger will not be active if both sub condition is not satisfied when trigger condition is "A and B".

Reference wave does not appear
→Referential wave will not appear even when the "Copy" button is clicked. Please put a check in the checkbox to the referential wave you would like to see on screen at the "Format" tab on lower portion.
→When copied referential wave data exceeds 10 data, then the newly copied wave data will be over written to the referenced previous 20 data. Please delete the unnecessary reference wave data to make the data number within 10 data.

Wave graphic data cannot be selected
→Please select one of the measurement items inside the measurement item tab's measurement condition, and open the measurement item selection window.

Digital data cannot be triggered
→When digital data is selected at applicable trigger, then use at either trigger slope being "Matched" or "Unmatched".

The P-N voltage is not triggered. Or an unintended trigger is triggered.
→In the case of the M-frame driver, the trigger may not be activated as expected because the PN voltage is handled as a decimal number inside the driver. In that case, do not use the trigger slope match or mismatch, and adjust the trigger level by 1V.

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Wave data does not appear even "W-get" button is clicked
→Trigger condition of drive may not be satisfied or configured. Please reconfirm trigger condition by clicking the "T-Get" button, with confirming that the actual operation is satisfying the trigger condition.

A trigger position shifts
→In the case of network type, if a network is established in the state of trigger standby, the detected trigger position may shift.

The waveform graphic cannot be loaded.
→Data for expanded sampling cycles (extension: wgd6, wgc6, and wgp6) cannot be loaded if the connected device or the selected series does not support the expanded function. Try loading it again after connecting a device or selecting a series that supports the expanded function.

Trial run screen behavior

Cannot open the trial run screen
→The trial run screen cannot be opened simultaneously with the pin assign setting screen, the Z phase search screen, the setup wizard, the fit gain screen (2 degrees of freedom control) the RTEX setup screen, and the magnetic pole position estimation results copying screen. Please close these screens first.
→Drive is not in ready status (Alarm or Main power source is cut off), front panel is used except for monitor mode, network is established, or Servo ON is input from outside. Please re - execute after these status is eliminated, and the trial run screen is closed.
→The trial run screen cannot be displayed communication with the driver is severed. Please confirm if the unconnected mark is on the left side of status bar at the lowest portion of PANATERM screen.

Error happens frequently
→At the operation area setting window, the drive will automatically set the safety function to default setting; Over speed level 600r/min, Over load level 50%, Software limit setting 1 revolution. Please try with tuning the gain, changing operation command, and/or changing protection function on operation area setting window.
→The setting of the speed exceeds the maximum speed of the motor. Please set the speed below maximum speed of the motor.

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Operation will stop shortly
→The JOG or STEP button at operation area setting window, or JOG button (un - continuous) at Test operation window will operate the motor when only during the button is clicked.
→If motion at step operation is smaller than expected and then please understand that this setting is set by command times, and therefore the motor rotation operation will vary by electrical gear ratio. Please change the setting.
→If limitation of operation area at test operation window is the issue, then please moves to test operation window by skip button if operation limit is not needed, or return to the operation area setting window to reconfigure the operation area.
→A working range cannot be set up more than the range of -1,073,741,823 to 1,073,741,823.

Operation doesn't reach at the speed

→The acceleration is limited 10,000 to 327,670,000. Please set it within the range, referring to the following equations.
[Position Control]
    Acceleration [command unit/s2] = Speed [r/min] / 60 x encoder resolution
                                        / Electronic gear ratio / Acceleration time [s]
[Full close control]
    Acceleration [command unit/s2] = Speed [r/min] / 60 x encoder resolution
        / External scale frequency division ratio / Electronic gear ratio / Acceleration time [s]
[Linear motor]
    Acceleration [command unit/s2] = (Speed [mm/s] x scale resolution) x 10^6
                                        / Electronic gear ratio / Acceleration time [s]

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Frequency characteristics screen behavior

Cannot open the frequency characteristics screen
→The frequency characteristics screen cannot be opened simultaneously with the pin assign setting screen, the fit gain screen (Standard), the fit gain screen (2 degrees of freedom control). Please close these screens first.

Cannot measure frequency response. The result of measurement is wrong.
→The servo on input is necessary. Please confirm the motor is in the state of servo on.
→No condition that the motor works standard it, it is not likely to be able to measure it well. Please confirm a torque limitation and driving prohibition the functions etc.
→The frequency response measurement result changes greatly depending on the measurement condition. Please measure it when you measure the speed closed-loop characteristic on the condition that the motor doesn't stop as amplitude = offset absolute value though range of motion is noted. Moreover, please measure the amplitude setting from a small value as much as possible for the first time within the range where the torque saturation is not generated, and affects the equipment negatively by a big setting.
→When a nonlinear characteristic like the backlash and the dead-band, etc. exists in the equipment, it is likely not to become a value that changes the resonance frequency, and is correct by the amplitude setting and the offset setting.
→In the case of network type, if a network is established, it cannot measure frequency response. Please retry after making the network unestablished.

Frequency response cannot analyze.
→Analysis can be used when driver and a communication state are being continued after measurement by "Torque speed" mode.
→Analysis after frequency characteristic measurement cannot be used with the MINAS A6 series.

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Pin assign setting screen behavior

Cannot open the pin assign setting screen
→The pin assign setting screen cannot be opened simultaneously with all other screens. Please close all other screens first.

The setting change of the pin assign screen is not reflected in the driver operation.
→It is necessary to reset the driver. Please turn it on again after turning off the control source of the driver once.
→In the case of network type, if a network is established, the change of the pin assign setting is not reflected. Please retry after making the network unestablished.

Trouble shooting screen behavior

Cannot open the trouble shooting screen
→The trouble shooting screen cannot be opened simultaneously with the pin assign setting screen, the setup wizard and the RTEX setup screen. Please close these screens first.

The factor that doesn't rotate doesn't occasionally disappear.
→Please execute it in order with young number when you do measures because another factor might be generated by a certain factor.

The content of the longevity diagnosis might return to the origin.
→Longevity information is recorded only every 30 minutes. Please confirm time that the control source of the driver is energized.

The Communication error tab is not displayed.
→The Communication error tab is displayed only when the connected driver is of a network type that supports the monitoring of the RTEX communication error counter.

Z phase search screen behavior

Cannot open the Z phase search screen
→The Z phase search screen cannot be opened simultaneously with the trial run screen, the pin assign setting screen, the fit gain screen (2 degrees of freedom control) and the magnetic pole position estimation results copying screen. Please close these screens first.
→Drive is not in ready status (Alarm or Main power source is cut off), front panel is used except for monitor mode, network is established, or Servo ON is input from outside. Please re - execute after these status is eliminated, and the Z phase search screen is closed.
→The Z phase search screen cannot be displayed communication with the driver is severed. Please confirm if the unconnected mark is on the left side of status bar at the lowest portion of PANATERM screen.

When the power supply of the driver is turned on, the numerical value at the center is not changed as -1.
→Because single-turn data is not decided until the first Z phase is detected when the motor equipped with the encoder of an incremental type is used, the display becomes -1. The numerical value at the center comes to take a value nonnegative from 0 to single-turn data maximum value by executing Z phase search.

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Fit gain screen (Standard) behavior

Cannot open the fit gain screen
→The fit gain screen (Standard) cannot be opened simultaneously with the parameter screen, the gain tuning screen, the frequency characteristics screen, the pin assign setting screen, the object editor screen, the deterioration diagnosis screen and the magnetic pole position estimation results copying screen. Please close these screens first.
→The fit gain screen (Standard) cannot be used velocity control mode and torque control mode.
→The fit gain screen (Standard) cannot be displayed except the case of communication with the driver. Please confirm if the unconnected mark is on the left side of status bar at the lowest portion of PANATERM screen.

Proceed to Step 2
→Please change the driving pattern according to the instructions.
→Please check behavior of real-time auto-tuning on the gain tuning screen.
→Please check behavior of easy monitor on the gain tuning screen.
→Try increasing Initial rigidity on the Other setting of Step 1. Or else try decreasing it.
→Try increasing Permissible vibration level on the Other setting of Step 1. Or else try decreasing it.

Ranking is not displayed in Step 4
→There is no data that satisfies the restrictions determined by the "Recommendation". Please review the "Recommendation" and Recommendation setting.
→There is no data below the Target value of stabilization time. Please increase the Target value of stabilization time.
→It may exist in the Recommendation data below Initial rigidity. After returning to Step 1, please decrease Initial rigidity on the Other setting to measure again.

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Fit gain screen (2 degrees of freedom control) behavior

Cannot open the fit gain screen (2 degrees of freedom control)
→The fit gain screen (2 degree of freedom control compatible) cannot be opened simultaneously with the parameter screen, the gain tuning screen, the frequency characteristics screen, the pin assign setting screen, the object editor screen, the deterioration diagnosis screen and the magnetic pole position estimation results copying screen. Please close these screens first.
→The fit gain screen (2 degrees of freedom control) cannot be used velocity control mode, torque control mode and full close control mode.
→The fit gain screen (2 degrees of freedom control) can be displayed only when the combination of driver and selected series is correct.
→The fit gain screen (2 degrees of freedom control) is supported only linear type (LINEAR) when the driver is Linear and DD Control Drive. Rotary type (DD) is not supported.

Cannot open the log on of fit gain screen
→The log on of fit gain screen cannot be displayed except the case of communication with the driver. Please confirm if the unconnected mark is on the left side of status bar at the lowest portion of PANATERM screen.
→The log on of fit gain screen can be displayed only when driver have 2 degrees of freedom control.

Proceed to Step 2
→Please check the load condition.
→If the driver is Linear and DD Control Drive, please review the parameter settings of motor inertia (Mass of motor's movable section), Rated motor torque (Rated motor thrust).
→Try increasing Initial rigidity on the Machine setting of Step 1. Or else try decreasing it.
→Please change the Mode setting of Step 1 to Balanced or Stability preferentially. Or else try decreasing it.

Object editor screen behavior

Cannot open the object editor screen
→The object editor screen cannot be opened simultaneously with the parameter screen, the gain tuning screen, the pin assign setting screen, the fit gain screen (Standard) and the fit gain screen (2 degrees of freedom control), the deterioration diagnosis screen and the magnetic pole position estimation results copying screen. Please close these screens first.
→Object editor screen can be displayed only if the series with uses the EtherCAT Communication is selected.

Cannot transmit and edit object value
→Please check that "ESM Condition" is "INIT" and is displayed at the next to the "Change of set value" button.
→Please check object attribute is RW at column of "Attrib".

Object value returns back to original
→Procedure to change object may not have been completed. This may happen if you select other object or switch windows without pressing [ENTER] key or "Change of set value" button. Please make sure of your operations.
→If the object value is read from the file, changed objects are not sent to the driver. If you want to send then please click the "Trans" button.

Changed object after EEPROM over write does not match to the change
→The object may be changed by other windows that will change parameter. Please click "Rcv" button to update the object value.
→The some of the objects may not displayed in the Writing to EEPROM screen if you change.
→The some of the objects may be changed in conjunction. These objects will be applied last changes.

Battery refresh screen behavior

Cannot open the battery refresh screen
→The battery refresh screen cannot be opened simultaneously with the pin assign setting screen. Please close these screens first.
→The battery refresh screen cannot be displayed communication with the driver is severed. Please confirm if the unconnected mark is on the left side of status bar at the lowest portion of PANATERM screen.

Cannot execute the battery refresh.
→Battery refresh can be executed in the case of a combination of control mode and the encoder that support.

Deterioration diagnosis screen behavior

Cannot open the deterioration diagnosis screen
→The deterioration diagnosis screen cannot be opened simultaneously with the parameter screen, the gain tuning screen, the trial run screen, the frequency characteristics screen, the pin assign setting screen, Z phase search screen, the fit gain screen (Standard), the fit gain screen (2 degrees of freedom control), the object editor screen and the magnetic pole position estimation results copying screen. Please close these screens first.
→The deterioration diagnosis screen cannot be displayed communication with the driver is severed. Please confirm if the unconnected mark is on the left side of status bar at the lowest portion of PANATERM screen.

Magnetic pole position estimation results copying screen behavior

Cannot open the Magnetic pole position estimation results copying screen.
→The magnetic pole position estimation results copying screen cannot be opened simultaneously with the parameter screen, the gain tuning screen, the trial run screen, the pin assign setting screen, the analogue input adjustment screen, the Z phase search screen, the fit gain screen (Standard), the fit gain screen (2 degrees of freedom control), the object editor screen, the deterioration diagnosis screen. Please close these screens first.

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After-Sale Service

Technical information

Technical information of this product (Operating Instructions, CAD data) can be downloaded and consulting questions from the following web site.
https://industrial.panasonic.com/ac/e/

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