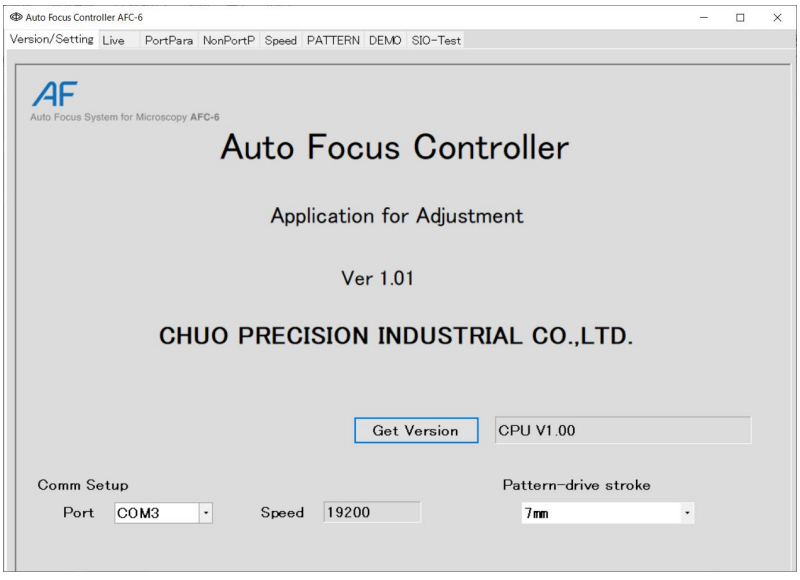
AF

Auto Focus System for Microscopy **AFC-6**

Auto Focus Controller

AFC-6

Adjustment Application Software Manual



CHUO PRECISION INDUSTRIAL CO.,LTD.

Introduction

This MANUAL describes how to use the application software program (application) to adjust settings of Auto Focus Controller AFC-6 (AFC-6) manufactured by Chuo Precision Industrial Co., Ltd.
Using this application will allow users to adjust AFC-6 settings from the computer.

Please note this manual assumes the user is eligible to perform basic operations of the computer and the OS. Kindly refer to the respective instruction manual for operating the computer and the OS. Please understand that CHUO does not provide any assistance for questions regarding the computer or the OS.
Please complete adjusting the microscope driver and optical systems before using the application.

Before using the application

- The contents of this manual and the application are subject to change without prior notice.
- Information in this manual is ensured to be accurate and reliable; however, if you find any irregularities, missing information, or have any questions regarding this manual, please contact us for further assistance.
- CHUO is not liable for any damages, losses, or any claim from a third party resulting from the use of this manual and application.
- CHUO is not responsible for any loss or lost profits caused by the data loss from computer damages, failure, repairing by third parties, or any other reasons.

Trademark

Windows 10 is a registered trademark of Microsoft Corporation.

Before installing

■ System requirements

Please confirm that the computer meets the following requirements before using this application.

- Supported OS: Windows 10 must be installed (64-bit system recommended).
- Hard disk: Available hard disk capacity of 10MB or more (required for installing).
- Equipped with RS-232C (RS-232C-USB serial conversion adapter can be used when recognized as a COM port by the above OS).
- Equipped with an optical drive (CD-ROM loadable).

⚠Caution

- This application is exclusively designed for AFC-6.
  (Not suitable for controllers other than AFC-6 nor AFC-5 mode.)
- This application may not operate normally depending on the system requirements of the computer hardware, drivers, and applications.

⚠Important

Operation confirmation test has not been run other than Windows 10 64-bit system.
Please use any OS other than Windows 10 64-bit system at the user's own risk.

Contents

1. How to install

Caution

- Please refer to the computer instruction manuals as well as this application manual when installing.
- Make sure to uninstall the application before installing it again when the application had already been installed previously. (Please refer to the Windows manual for uninstalling.)
  The name of this application is "AFC_System_Setup".

1. Turn on the computer and activate Windows

Caution

Do not connect the computer to AFC-6 before completing the installation.

2. Installing the application

① Insert the attached CD-ROM into the computer optical drive.
② Click the start button to select "Windows System Tools→PC".
③ Double click the icon of the drive with inserted CD-ROM.
④ Execute "AFC_System_Setup_Vxxx.msi" in the "AFC-6" folder. (xxx stands for the title version)
⑤ Follow the instructions on the Set Up screen to install.

Caution

Remove the CD-ROM from the computer and store it in a safe place after installing.

2. Preparation before use

Please connect both serial ports of the AFC-6 main unit and the computer with a straight cable before activating the application. Turn off the AFC-6 main unit before connecting the cables.Turn on the AFC-6 main unit after connecting the cables. Activate the application after matching the communication speed of AFC-6 and the computer.
Please refer to the "AFC-6 Instruction Manual" for connection and settings.

3. Activating the application

Either double click the shortcut icon "Shortcut to AFC_System" on the desktop created after installing, or execute "AFC_System.exe" in the install folder of the application. (Default install folder location: C:¥AFC_System) "Version/Setting screen" will be displayed after the splash screen.

Splash screen

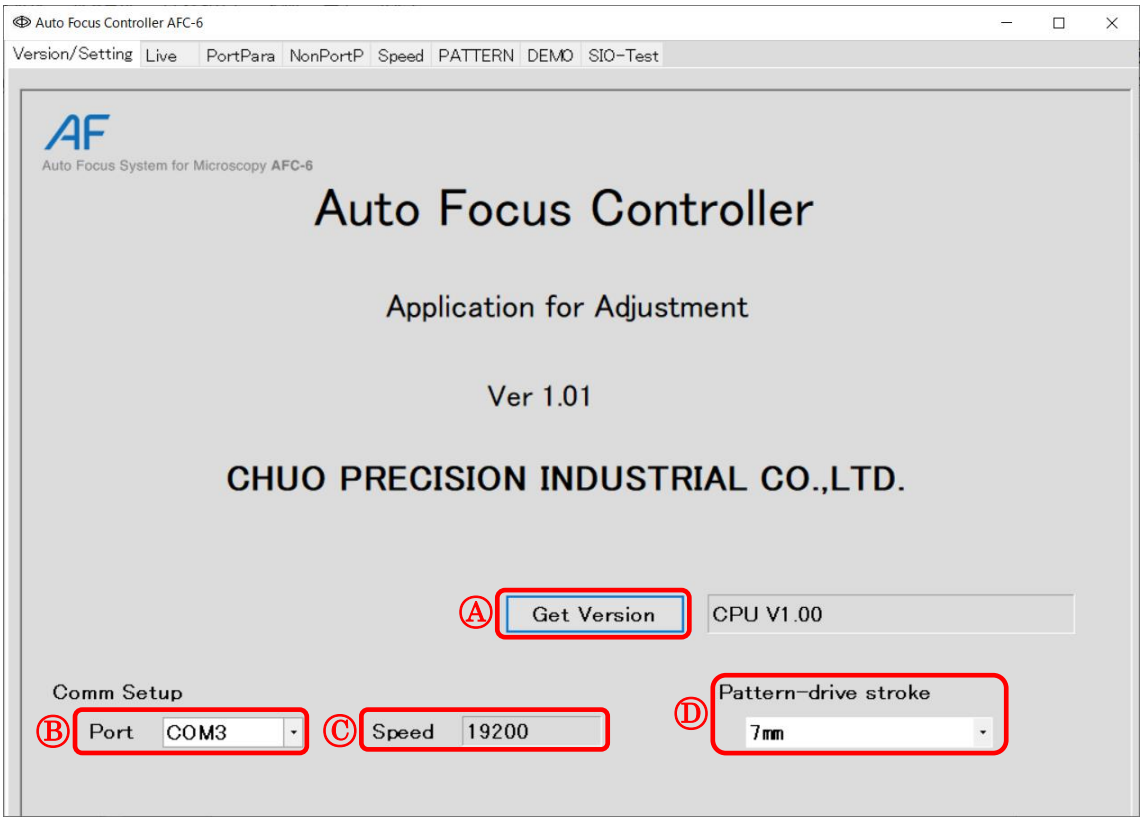
Version/Setting screen

4. Functions of each screen

(1) Version/Setting screen

Version/Setting screen will be displayed when activating the application or clicking the "Version/Setting" tab on the screen.

This screen allows users to confirm communication with AFC-6 and select the travel distance of the pattern driving unit.



Version/Setting screen

A. Get Version button

Click this button to confirm communication with the AFC-6 main unit and obtain the version of AFC-6.

Version information will be displayed in the right section when communication is successful.

"Unknown" will be displayed in the right section when it fails to obtain the information.

Restart the application to perform Comm Setup (select COM port) correctly and click the "Get Version" button when failing to communicate.

B. Display/Select COM port

Displays the currently selected COM port.

Click the drop-down list to select COM port.

Select the port connected to AFC-6 with the computer.

Error dialog box will be displayed when selecting the nonexistent COM port on the computer.

C. Communication speed display

Displays AFC-6 communication speed.

It will be displayed when successful communication is made with the AFC-6 main unit after clicking on the "Get Version" button.

D. Display/Select travel distance of pattern driving unit

Displays the currently selected travel distance for the pattern driving unit.

Click the drop-down list to select travel distance.

Select "7mm" for the standard pattern driving unit and "15mm" for the longer pattern driving unit. Select "7mm" when the pattern driving unit is not in use.

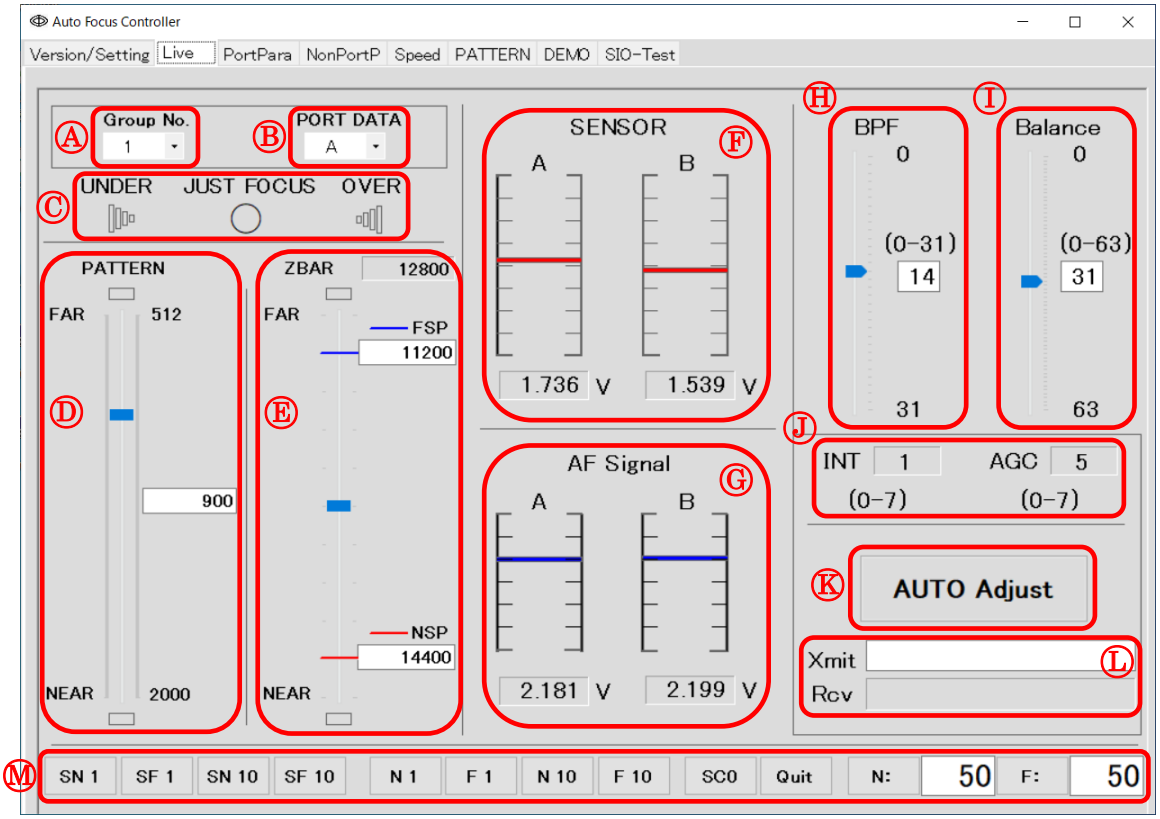
⚠Caution

Always click the "Get Version" button when activating the application.

(2) Live screen

Live screen will be displayed when clicking the "Live" tab on the screen.

This screen allows users to adjust Auto Focus settings.



Live screen

A. Display/Select port group

Displays the currently selected group.

Click the drop-down list to select group.

B. Display/Select port

Displays the currently selected port.

Click the drop-down list to select port.

C. Just focus display

Indicates just focus status with light.

D. Pattern driving unit position display/setting (only valid when using pattern driving unit)

Displays pattern driving unit position with coordinates and slider bar with respect to the FAR limit (coordinate: 512) as a reference.

Pattern driving unit travels when pressing the Enter key after changing the value in the text box or dragging the slider bar. The box areas above/bottom of the slider bar will light in red when the pattern driving unit detects the limit.

E. AF driving unit position and search range display/setting

Displays AF driving unit position (Z BAR) and search area (FSP/NSP) with coordinates and slider bar with respect to the FAR limit (coordinate: 512) as a reference. Slider bar indicates the AF driving unit position relative to the search range.

AF driving unit travels by dragging the slider bar.

Change the search range by pressing the Enter key after changing the value in the text box. Set the search range (FSP/NSP) within FSP<NSP. The box areas above/bottom of the slider bar will light in red when the AF driving unit detects the limit.

F. SENSOR display

Displays each Ach/Bch line sensor voltage with numerical values and bars.

Pay attention to the AF illumination light intensity to avoid excessive input.

G. AF Signal display

Displays each Ach/Bch line sensor AF signal with numerical values and bars.

The position is determined as just focus where each Ach/Bch bars are at the same height. To adjust the just focus position, adjust the AF pattern position to bring Ach/Bch bars at the same height after focusing on the sample observation point.

H. BPF display/setting

Displays BPF value with numerical values and slider bars.

Change the BPF value by pressing the Enter key after changing the value in the text box or dragging the slider bar.

I. Balance display/setting

Displays Balance value with numerical values and slider bars.

Change the Balance value by pressing the Enter key after changing the value in the text box or dragging the slider bar.

J. INT/AGC display

Displays INT and AGC values.

The display value changes when adjusting the BPF in item H. Refer to the following values to adjust BPF.

[Reference value: INT=0/AGC=5 – INT=1/AGC=4]

To display the current value, execute the Auto Focus operation and stop the Auto Focus operation after determining the just focus.

K. AUTO adjust button

Click this button to launch the AUTO Adjust screen (automatic adjustment screen).

This screen allows users to change settings and execute automatic adjustment. Refer to (3)AUTO Adjust screen (automatic adjustment screen) section for details.

L. Xmit/Rcv function

Input communication command and press Enter to send the communication command when the cursor is in the text box on the right side of Xmit.* Response will be displayed in the box on the right side of Rcv.

* Note that the following commands are not supported in the application Version 1.00.

ASPD、	BPOD、	SIGD、	FSPD、	NSPD、	MSPD、
STPD、	VR2D、	VR3D、	AJB、	AJF、	AJP、
RESET、	RESTA、	FW、	P、	POT	

M. Function key functions

The following functions are assigned to the keyboard function keys from "F1" to "F12".

- "F1": SN1 button [Moves pattern driving unit to NEAR direction for 1 pulse]
- "F2": SF1 button [Moves pattern driving unit to FAR direction for 1 pulse]
- "F3": SN10 button [Moves pattern driving unit to NEAR direction for 10 pulses]
- "F4": SF10 button [Moves pattern driving unit to FAR direction for 10 pulses]
- "F5": N1 button [Moves AF driving unit to NEAR direction for 1 pulse]
- "F6": F1 button [Moves AF driving unit to FAR direction for 1 pulse]
- "F7": N10 button [Moves AF driving unit to NEAR direction for 10 pulses]
- "F8": F10 button [Moves AF driving unit to FAR direction for 10 pulses]
- "F9": SC0 button [Sends communication command SC0]
- "F10": Quit button [Sends communication command Q]
- "F11": N: button [Moves AF driving unit to NEAR direction for desired pulses]
  Change the number of pulses by changing the value in the text box on the right of the button.
  Allowed value range is "1 – 9999" with the default value set at "50".
- "F12": F: button [Moves AF driving unit to FAR direction for desired pulses]
  Change the number of pulses by changing the value in the text box on the right of the button.
  Allowed value range is "1 – 9999" with the default value set at "50".

Users can perform the same operation by clicking each button on the Live screen.

Caution

This screen will be displayed only when the AFC-6 main unit is connected to the computer with successful communication. (It will not be displayed when communication with AFC-6 main unit fails.)

(3) AUTO Adjust screen (automatic adjustment screen)

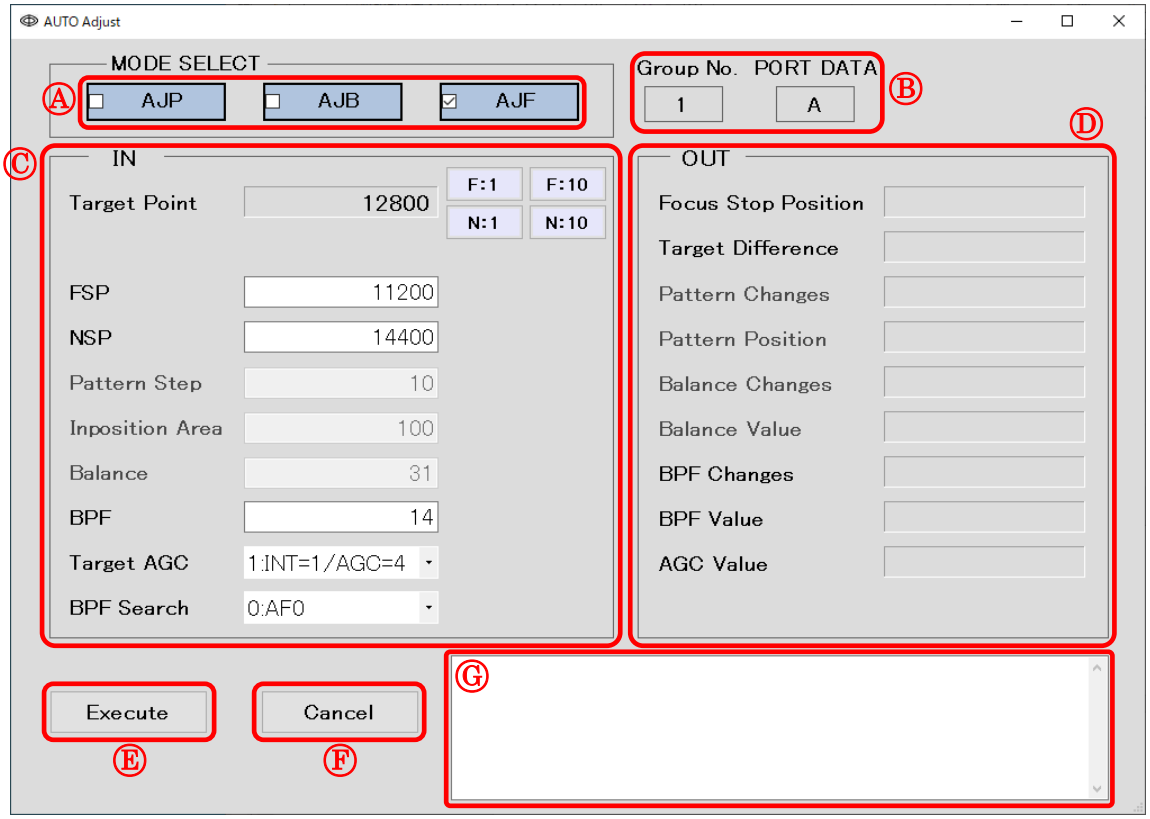
AUTO Adjust screen will be displayed when clicking the "AUTO Adjust" button on the Live screen.

This screen allows users to adjust some of the parameters automatically. AJF mode is selected as the initial screen. Parameter settings for the currently selected group/port will be changed when the operation is executed on this screen. Subject parameters for this setting change depend on the operation modes. It is recommended to save the current settings to a file before executing.

Settings of the following parameters will change by automatic adjustment.

- AJF mode
  - ParameterNo.001: FSP
  - ParameterNo.004: NSP
  - ParameterNo.021: BPF
  - ParameterNo.101: Target_Point
  - ParameterNo.104: Agc
  - ParameterNo.105: BpfSrch
- AJP mode
  - ParameterNo.001: FSP
  - ParameterNo.004: NSP
  - ParameterNo.021: BPF
  - ParameterNo.022: Balance
  - ParameterNo.023: Pattern-INF
  - ParameterNo.101: Target_Point
  - ParameterNo.102: Pattern_Step
  - ParameterNo.103: In-position_Area
- AJB mode
  - ParameterNo.001: FSP
  - ParameterNo.004: NSP
  - ParameterNo.021: BPF
  - ParameterNo.022: Balance
  - ParameterNo.101: Target_Point

There are limitations for automatic adjustment function, and it may not be able to perform adjustments depending on given conditions.



AUTO Adjust screen

A. Select automatic adjustment mode

Select the automatic adjustment mode to implement by clicking the check box in "MODE SELECT".

- AJP mode: Parameter No.023 "Pattern-INF" automatic adjustment (position adjustment of pattern driving unit)
- AJB mode: Parameter No.022 "Balance" automatic adjustment
- AJF mode: Parameter No.021 "BPF" automatic adjustment

Caution

- AJP mode is selectable when the pattern driving unit is used.
- AJB mode is selectable when the pattern driving unit is not used.

B. Group/Port display

Displays the currently selected group/port.

Group will be displayed in the box below "Group No.", and port below "PORT DATA".

C. Automatic adjustment parameters display/setting

Displays automatic adjustment parameters.

Change the parameter values by changing the value in the text box or selecting the values from the drop-down list. Parameters used for automatic adjustment modes are predetermined. Any other parameters that are not used in the selected mode will be displayed in gray.

D. Automatic adjustment result display

Displays results for the automatic adjustment operation.

Displayed result items for automatic adjustment modes are predetermined. Any other items that are not related to the selected mode will be displayed in gray.

E. Execute button (Abort button)

Starts automatic adjustment by clicking this button.

"Execute" changes to "Abort" when executing the automatic adjustment. Click on "Abort" button to stop automatic adjustment.

F. Cancel button

Closes automatic adjustment screen by pressing this button.

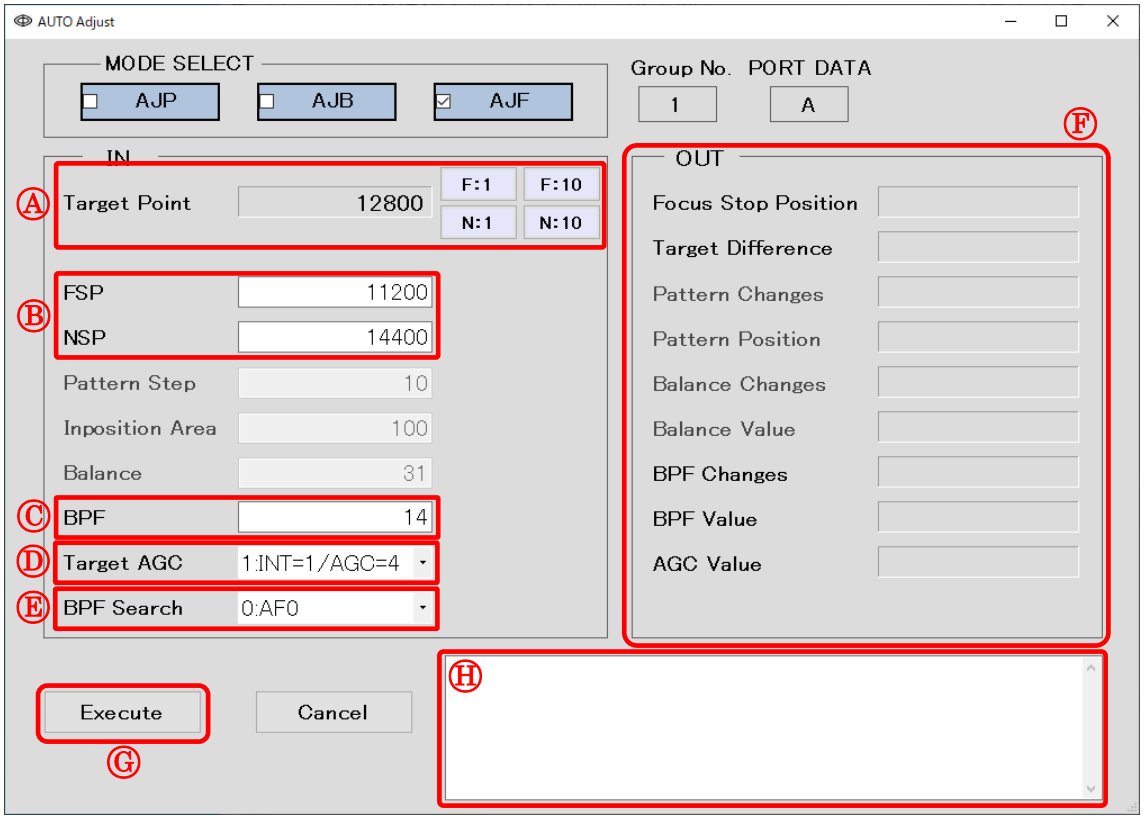
G. Log display

Displays log for the automatic adjustment.

■ AJF mode

Executes automatic adjustment after setting the conditions and clicking on the Execute button.

Click the check box on the left of AJF in the AUTO Adjust screen to select each condition.



AUTO Adjust screen [AJF mode]

A. Target point display/setting

Displays target point (target focus position).

Click the button on the right of the value (coordinate) display box for a fine adjustment of the AF driving unit position. Utilize this feature to adjust specimen (sample) focus position. Functions of each button are as follows.

- F1 button : Moves AF driving unit to FAR direction for 1 pulse
- N1 button : Moves AF driving unit to NEAR direction for 1 pulse
- F10 button : Moves AF driving unit to FAR direction for 10 pulses
- N10 button : Moves AF driving unit to NEAR direction for 10 pulses

Caution

Current position of the AF driving unit will be shown in the initial display. When there is a large deviation of focus position from the current position, return to Live screen first and click the "AUTO Adjust" button after moving the AF driving unit near the focus position.

B. Search range display/setting

Displays search range (FSP/NSP).

Change the search range (FSP/NSP) by changing the value (coordinate) in the text box. Set the search range (FSP/NSP) within FSP<NSP. Set the item A target point to be within the search range.

C. BPF display/setting

Displays BPF value.

Change the BPF value by changing the value in the text box. If there is no specified value, it is not required to change the initial value.

D. Display/select target AGC

Displays target AGC (INT/AGC).

Click the drop-down list to select target AGC (INT/AGC). BPF automatic adjustment will be performed aiming at the selected target AGC here.

E. Display/select Auto Focus operation

Displays Auto Focus operation (AF0/SC0).

Click the drop-down list to select Auto Focus operation (AF0/SC0). BPF automatic adjustment will be performed with the selected Auto Focus operation here.

F. Automatic adjustment result display

Displays results for the automatic adjustment operation.

Displayed result items are as follows.

- Focus Stop Position : Focus stop position (coordinate)
- Target Difference : Difference between focus stop position (coordinate) and target point
- Pattern Changes : N/A
- Pattern Position : N/A
- Balance Changes : N/A
- Balance Value : N/A
- BPF Changes : Number of times BPF value has changed
- BPF Value : BPF value as a result of automatic adjustment
- AGC Value : INT/AGC value as a result of automatic adjustment

G. Execute button (Abort button)

Starts automatic adjustment by clicking this button.

"Execute" changes to "Abort" when executing the automatic adjustment. Click on "Abort" button to stop automatic adjustment.

H. Log display

Displays automatic adjustment operation log.

Displayed items are as follows in log display format [FS:xxx,TD:xxx,FC:xxx,FV:xxx,IT:xxx,AC:xxx]. (xxx is numeric numbers)

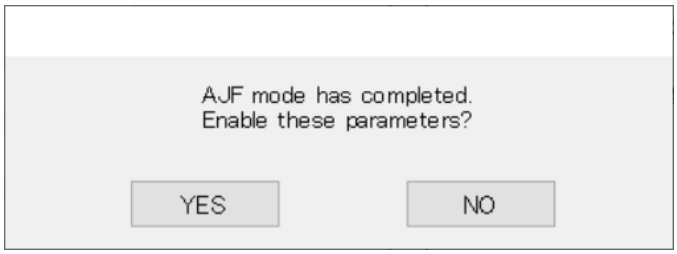
- FS : Focus stop position (coordinate)
- TD : Difference between target and focus stop position (coordinate)
- FC : Number of times BPF value has changed
- FV : BPF value
- IT : INT value
- AC : AGC value

⚠Caution

■Parameter to reflect the automatic adjustment results when completing automatic adjustment (AJF)

- Parameter No.021: BPF

Following dial box will be displayed when completing automatic adjustment successfully.



Click "YES" and BPF value changes to the value when completing automatic adjustment.

Click "NO" and BPF value recovers to the value before executing automatic adjustment.

■ Dealing with errors

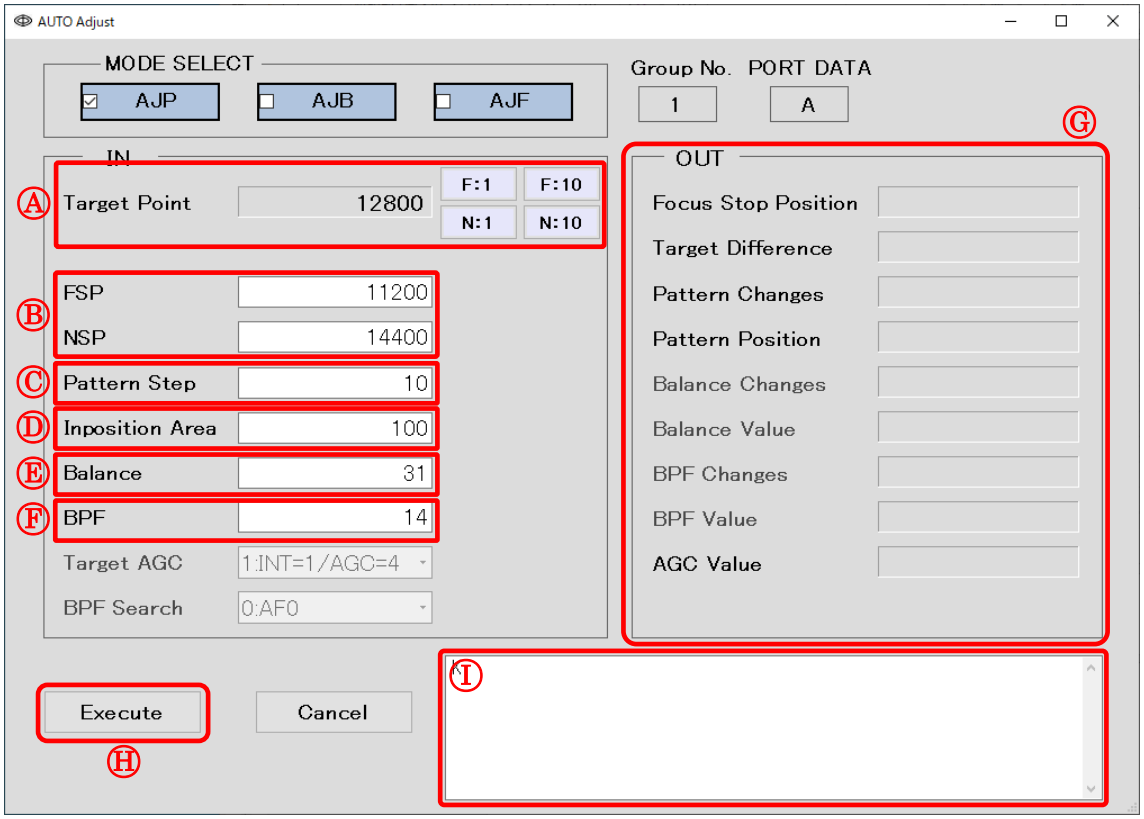
Execute again after checking driving unit and optical systems and adjusting/changing AF lighting conditions. It might be exceeding the function limit of automatic adjustment if it does not complete successfully after executing AJF multiple times.

Click on "WRITE" button on the other screen to save settings for changes made by executing automatic adjustment. Previous settings will be reverted when turning off AFC-6 without saving the settings. Refer to(4)PortPara screencreen, (5)NonPortP screen and (6)Speed screen in the later section for "WRITE" button.

■ AJP mode

Executes automatic adjustment after setting the conditions and clicking on the Execute button.

Click the check box on the left of AJP in the AUTO Adjust screen to select each condition.



AUTO Adjust screen [AJP mode]

A. Target point display/setting

Displays target point (target focus position).

Click the button on the right of value (coordinate) display box for a fine adjustment of the AF driving unit position. Utilize this feature to adjust specimen (sample) focus position. Functions of each button are as follows.

- F1 button : Moves AF driving unit to FAR direction for 1 pulse
- N1 button : Moves AF driving unit to NEAR direction for 1 pulse
- F10 button : Moves AF driving unit to FAR direction for 10 pulses
- N10 button : Moves AF driving unit to NEAR direction for 10 pulses

Caution

Current position of the AF driving unit will be shown in the initial display. When there is a large deviation of focus position from the current position, return to Live screen first and click the "AUTO Adjust" button after moving the AF driving unit near the focus position.

B. Search range display/setting

Displays search range (FSP/NSP).

Change the search range (FSP/NSP) by changing the value (coordinate) in the text box. Set the search range (FSP/NSP) within FSP<NSP. Set the item A target point to be within the search range.

C. Pattern driving unit travel distance display /setting

Displays pattern driving unit travel distance (number of steps).

Change the pattern driving unit travel distance (number of steps) by changing the value in the text box. Note that it will be more difficult to fit into the setting range of item D as the travel distance gets larger.

D. Setting range display/setting (setting range: Target Point ± In-position Area)

Displays setting range (number of pulses) for the target point.

Change the setting range by changing the value in the text box. Automatic adjustment for pattern driving unit position will be performed aiming at the selected setting range here.

E. Balance display/setting

Displays Balance value.

Change the Balance value by changing the value in the text box. Please change the value as needed.

F. BPF display/setting

Displays BPF value.

Change the BPF value by changing the value in the text box. Please change the value as needed.

G. Automatic adjustment result display

Displays results for the automatic adjustment operation.

Displayed result items are as follows.

- Focus Stop Position : Focus stop position (coordinate)
- Target Difference : Difference between focus stop position (coordinate) and target point
- Pattern Changes : Number of times pattern driving unit has traveled
- Pattern Position : Position (coordinate) of pattern driving unit
- Balance Changes : N/A
- Balance Value : N/A
- BPF Changes : N/A
- BPF Value : N/A
- AGC Value : INT/AGC value

H. Execute button (Abort button)

Starts automatic adjustment by clicking this button.

"Execute" changes to "Abort" when executing the automatic adjustment. Click on "Abort" button to stop automatic adjustment.

I. Log display

Displays automatic adjustment operation log.

Displayed items are as follows in log display format [FS:xxx,TD:xxx,FC:xxx,FV:xxx,IT:xxx,AC:xxx]. (xxx is numeric numbers)

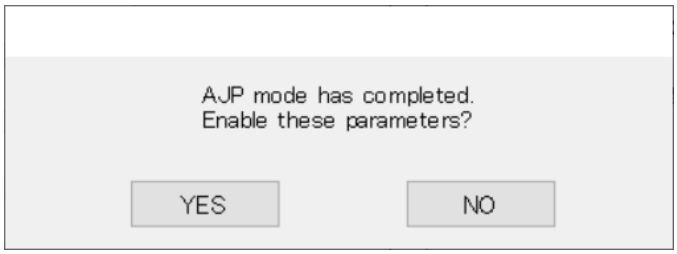
- FS : Focus stop position (coordinate)
- TD : Difference between target and focus stop position (coordinate)
- PC : Number of times pattern driving unit has traveled
- PP : Position (coordinate) of pattern driving unit
- IT : INT value
- AC : AGC value

⚠Caution

■Parameter to reflect the automatic adjustment results when completing automatic adjustment (AJP)

- Parameter No.023: Pattern-INF

Following dial box will be displayed when completing automatic adjustment successfully.



Click "YES" and Pattern-INF value changes to the value when completing automatic adjustment.

Click "NO" and Pattern-INF value recovers to the value before executing automatic adjustment, and the pattern drive unit returns HOME and travels to value of Pattern-INF.

■Dealing with errors

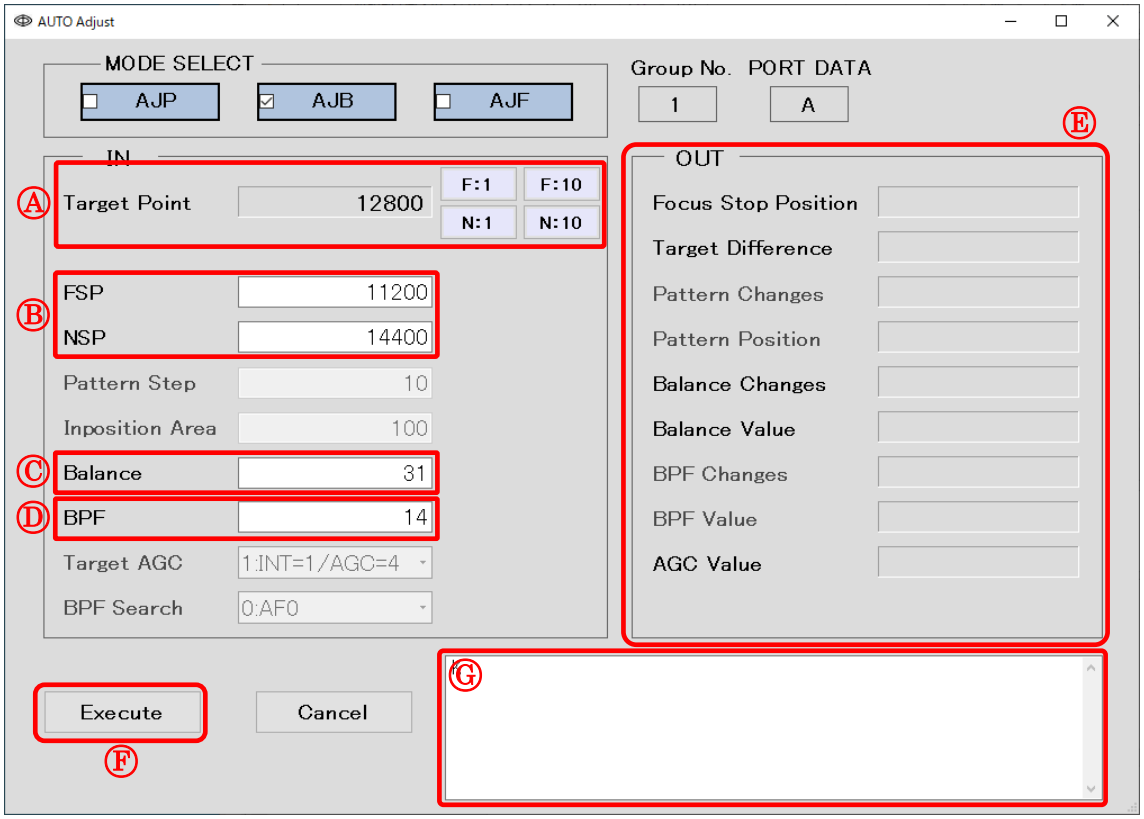
- It does not fulfill the focus condition when the target point (target focus position) is not within the search range. Execute again after changing FSP and NSP setting values.
- Setting value of Parameter No.102: Pattern_Step might be too large, or Parameter No.103: In-position_Area might be too small. Execute again after changing the setting values.
- Execute again after checking driving unit and optical systems and changing conditions above.
  It might be exceeding the function limit of automatic adjustment if it does not complete successfully after executing AJP multiple times.

Click on "WRITE" button on the other screen to save settings for changes made by executing automatic adjustment. Previous settings will be reverted when turning off AFC-6 without saving the settings. Refer to(4)PortPara screencreen, (5)NonPortP screen and (6)Speed screen in the later section for "WRITE" button.

■ AJB mode

Executes automatic adjustment after setting the conditions and clicking on the Execute button.

Click the check box on the left of AJB in the AUTO Adjust screen to select each condition.



AUTO Adjust screen [AJB mode]

A. Target point display/setting

Displays target point (target focus position).

Click the button on the right of value (coordinate) display box for a fine adjustment of the AF driving unit position. Utilize this feature to adjust specimen (sample) focus position. Functions of each button are as follows.

- F1 button : Moves AF driving unit to FAR direction for 1 pulse
- N1 button : Moves AF driving unit to NEAR direction for 1 pulse
- F10 button : Moves AF driving unit to FAR direction for 10 pulses
- N10 button : Moves AF driving unit to NEAR direction for 10 pulses

Caution

Current position of the AF driving unit will be shown in the initial display. When there is a large deviation of focus position from the current position, return to Live screen first and click the "AUTO Adjust" button after moving the AF driving unit near the focus position.

B. Search range display/setting

Displays search range (FSP/NSP).

Change the search range (FSP/NSP) by changing the value (coordinate) in the text box. Set the search range (FSP/NSP) within FSP<NSP. Set the item A target point to be within the search range.

C. Balance display/setting

Displays Balance value.

Change the Balance value by changing the value in the text box. If there is no specified value, it is not required to change the initial value.

D. BPF display/setting

Displays BPF value.

Change the BPF value by changing the value in the text box. Please change the value as needed.

E. Automatic adjustment result display

Displays results for the automatic adjustment operation.

Displayed result items are as follows.

- Focus Stop Position : Focus stop position (coordinate)
- Target Difference : Difference between focus stop position (coordinate) and target point
- Pattern Changes : N/A
- Pattern Position : N/A
- Balance Changes : Number of times Balance value has changed
- Balance Value : Balance value
- BPF Changes : N/A
- BPF Value : N/A
- AGC Value : INT/AGC value

F. Execute button (Abort button)

Starts automatic adjustment by clicking this button.

"Execute" changes to "Abort" when executing the automatic adjustment. Click on "Abort" button to stop automatic adjustment.

G. Log display

Displays automatic adjustment operation log.

Displayed items are as follows in log display format [FS:xxx,TD:xxx,FC:xxx,FV:xxx,IT:xxx,AC:xxx]. (xxx is numeric numbers)

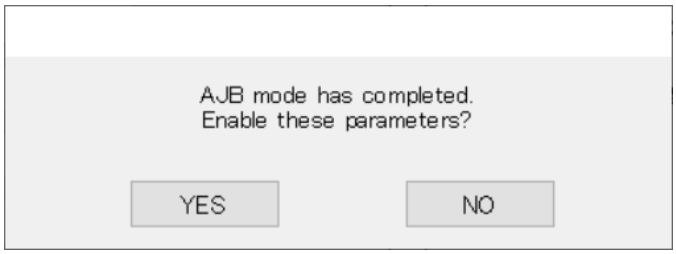
- FS : Focus stop position (coordinate)
- TD : Difference between target and focus stop position (coordinate)
- BC : Number of times Balance value has changed
- BV : Balance value
- IT : INT value
- AC : AGC value

Caution

■Parameter to reflect the automatic adjustment results when completing automatic adjustment (AJB)

●Parameter No.022: Balance

Following dial box will be displayed when completing automatic adjustment successfully.



Click "YES" and Balance value changes to the value when completing automatic adjustment.

Click "NO" and Balance value recovers to the value before executing automatic adjustment.

■ Dealing with errors

Execute again after checking driving unit and optical systems and adjusting/changing AF lighting conditions. It might be exceeding the function limit of automatic adjustment if it does not complete successfully after executing AJF multiple times.

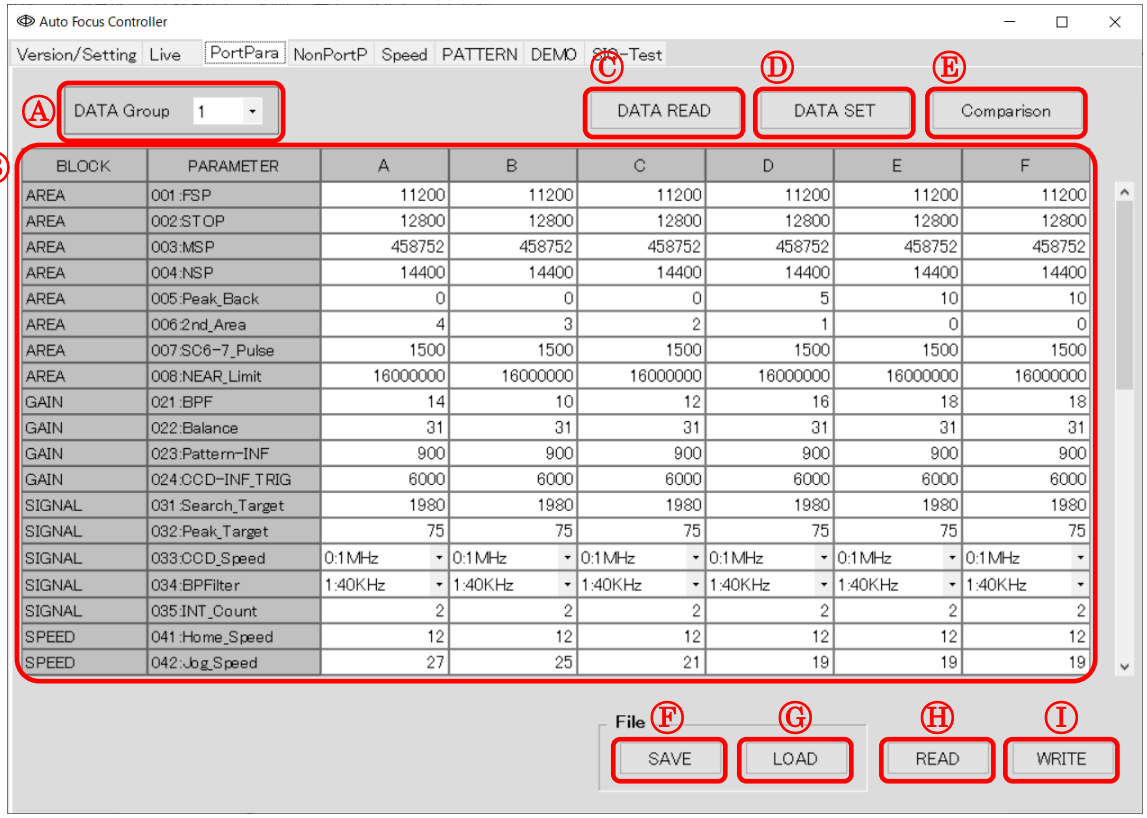
Click on "WRITE" button on the other screen to save settings for changes made by executing automatic adjustment. Previous settings will be reverted when turning off AFC-6 without saving the settings.

Refer to(4)PortPara screencreen, (5)NonPortP screen and (6)Speed screen in the later section for "WRITE" button.

(4) PortPara screen

PortPara screen will be displayed when clicking the “PortPara” tab on the screen.

This screen allows users to adjust port parameter settings. Please refer to the "AFC-6 Instruction Manual" for port parameter details.



PortPara screen

A. Display/Select port group

Displays the currently selected group.

Click the drop-down list to select group.

B. Port parameter display/setting

Displays port parameter of the currently selected group.

Value will be displayed in red when changing the value in the text box. Press Enter key to activate the value, and the display will change into black. The display will remain in red as the value is not activated after pressing the Enter key if the setting value is invalid.

Some parameters have a drop-down list instead of the text box. Click on the drop-down list to select values and change parameter values. Users can use the keyboard to move the cursor between and within text boxes.

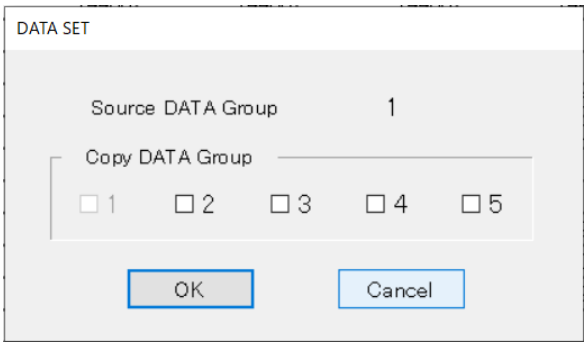
- "↑ Cursor key" : moves cursor upwards between text boxes (lines)
- "↓ Cursor key" : moves cursor downwards between text boxes (lines)
- "→ Cursor key" : moves cursor to the right within text box
- "← Cursor key" : moves cursor to the left within text box
- "Tab key" : moves cursor to the right between text boxes (lines)
- "Shift＋Tab key" : moves cursor to the left between text boxes (lines)

C. DATA READ button

Click the button to display port parameter of the currently selected group by reading from the AFC-6 main unit.

D. DATA SET button

Click the button to display "DATA SET" dialog box and copy the port parameter of the currently selected group to other groups.



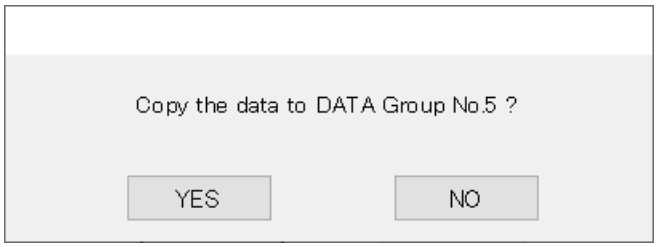
◆ Source DATA Group : Displays copy source group (currently selected group)

◆ Copy DATA Group : Select group to copy port parameter (Click the check box to select group(s))

Final confirmation dialog box will be displayed as follows after clicking "OK".

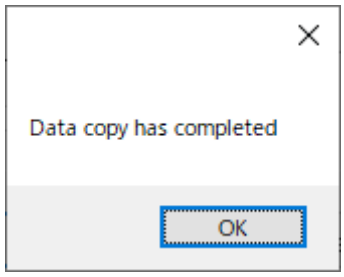
Closes the "DATA SET" dialog box when clicking on "Cancel".

*Displayed contents are based on selected items in "DATA SET" dialog box.



Click "YES" to start copying data, and the following dialog box will be displayed after completing, and click “OK”.

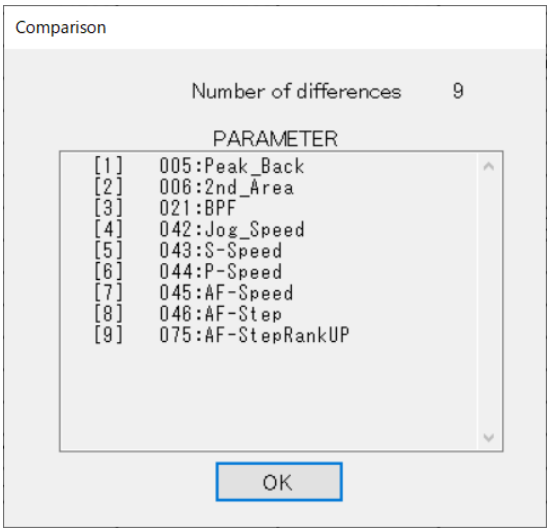
Closes "DATA SET" dialog box and final confirmation dialog box when clicking on "NO".



E. Comparison button

Click on the button to display "Comparison" dialog box and check the value comparing results of ports A to F for the currently selected group. Displays parameter number and name when there are parameters with different setting values from A to F ports. (No display will be shown for parameters with the same value for ports A through F.)

Click "OK" to close " Comparison" dialog box.



◆ Number of differences : Total number of parameters with different setting values from A to F ports.

◆ PARAMETER : parameter number and name with different setting values from A to F ports.

F. SAVE button

Click on the button to display "Select the save file" dialog box and save parameter settings displayed on the application screen to a file.Saved format is MST file (.mst).

Saved parameters are the displayed parameters in PortPara screen, NonPortP screen, and Speed screen described in the later section.

G. LOAD button

Click on the button to display "Select the load file" dialog box and load settings from the file saved with the SAVE button in item F.

H. READ button

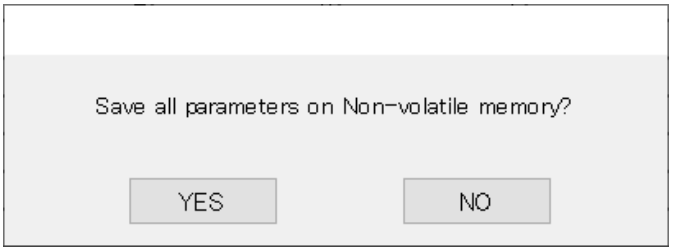
Click the button to display parameters in the application screen by reading from the AFC-6 main unit.

I. WRITE button

Click the button to display the following dialog box.

Click "YES" to write all settings displayed on the application screen to the AFC-6 main unit.

Click "NO" to abort the writing operation.



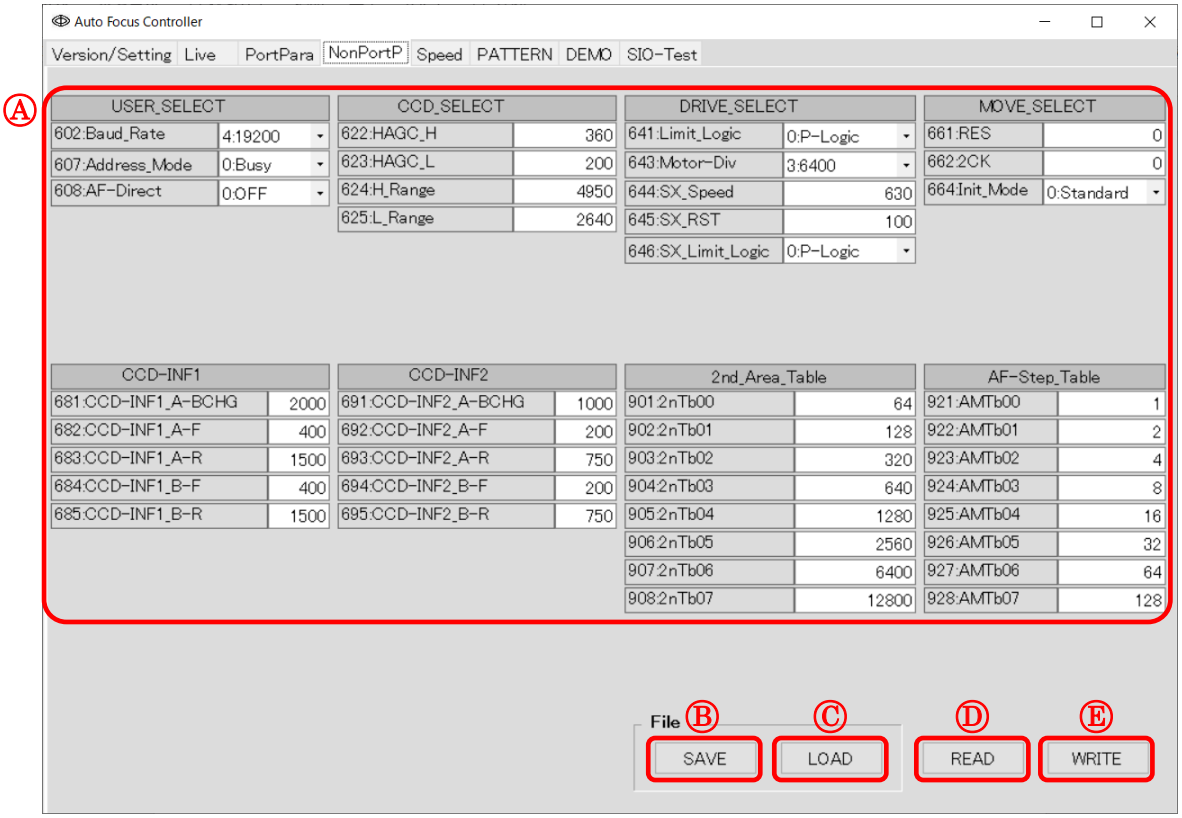
Caution

- Always click "WRITE" button before exiting the application when settings are changed.
  Previous settings will be reverted when turning off AFC-6 without clicking "WRITE" button.
- Settings saved to the file with "SAVE" button are the values displayed in the adjustment software, not the AFC-6 main unit settings. To save AFC-6 main unit settings to a file, click "READ" button first to read AFC-6 main unit parameters into the adjustment software, then click "SAVE" button.

(5) NonPortP screen

NonPortP screen will be displayed when clicking the "NonPortP" tab on the screen.

This screen allows users to adjust system parameter settings. Please refer to the "AFC-6 Instruction Manual" for system parameter details.



NonPortP screen

A. System parameter display/setting

Displays system parameter.

Value will be displayed in red when changing the value in the text box. Press Enter key to activate the value, and the display will change into black. The display will remain in red as the value is not activated after pressing the Enter key if the setting value is invalid.

Some parameters have a drop-down list instead of the text box. Click on the drop-down list to select values and change parameter values.

Users can use the keyboard to move the cursor between and within text boxes.

- "↑ Cursor key" : moves cursor upwards between text boxes (lines)
- "↓ Cursor key" : moves cursor downwards between text boxes (lines)
- "→ Cursor key" : moves cursor to the right within text box
- "← Cursor key" : moves cursor to the left within text box
- "Tab key" : moves cursor to the right between text boxes (lines)
- "Shift＋Tab key" : moves cursor to the left between text boxes (lines)

B. SAVE button

Click on the button to display "Select the save file" dialog box and save parameter settings displayed on the application screen to a file.

Saved format is MST file (.mst).

Saved parameters are the displayed parameters in NonPortP screen, PortPara screen described in the earlier section, and Speed screen described in the later section.

C. LOAD button

Click on the button to display "Select the load file" dialog box and load settings from the file saved with the SAVE button in item B.

D. READ button

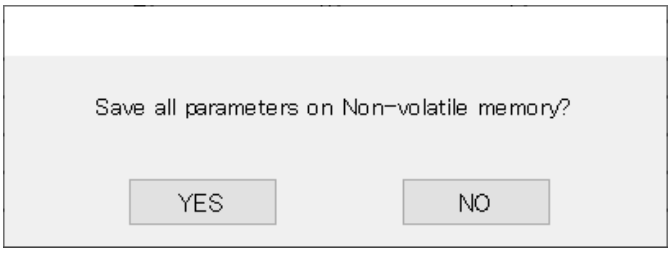
Click the button to display parameters in the application screen by reading from the AFC-6 main unit.

E. WRITE button

Click the button to display the following dialog box.

Click "YES" to write all settings displayed on the application screen to the AFC-6 main unit.

Click "NO" to abort the writing operation.



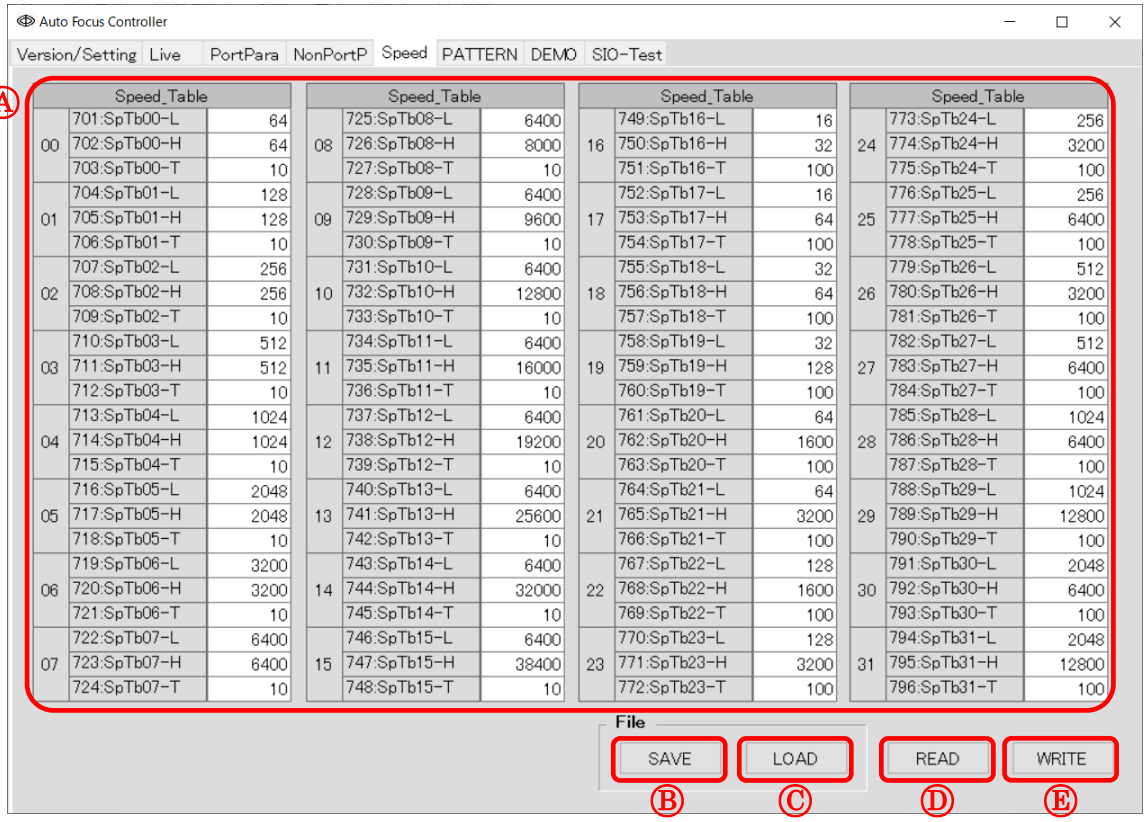
⚠Caution

- Always click "WRITE" button before exiting the application when settings are changed.
  Previous settings will be reverted when turning off AFC-6 without clicking "WRITE" button.
- Settings saved to the file with "SAVE" button are the values displayed in the adjustment software, not the AFC-6 main unit settings. To save AFC-6 main unit settings to a file, click "READ" button first to read AFC-6 main unit parameters into the adjustment software, then click "SAVE" button.

(6) Speed screen

Speed screen will be displayed when clicking the "Speed" tab on the screen.

This screen allows users to adjust Speed_Table parameter settings. Please refer to the "AFC-6 Instruction Manual" for Speed_Table parameter details.



Speed screen

A. Speed_Table parameter display/setting

Displays Speed_Table parameter.

Value will be displayed in red when changing the value in the text box. Press Enter key to activate the value, and the display will change into black. The display will remain in red as the value is not activated after pressing the Enter key if the setting value is invalid.

Users can use the keyboard to move the cursor between and within text boxes.

- "↑ Cursor key" : moves cursor upwards between text boxes (lines)
- "↓ Cursor key" : moves cursor downwards between text boxes (lines)
- "→ Cursor key" : moves cursor to the right within text box
- "← Cursor key" : moves cursor to the left within text box
- "Tab key" : moves cursor to the right between text boxes (lines)
- "Shift＋Tab key" : moves cursor to the left between text boxes (lines)

B. SAVE button

Click on the button to display "Select the save file" dialog box and save parameter settings displayed on the application screen to a file. Saved format is MST file (.mst).

Saved parameters are the displayed parameters in Speed screen, PortPara screen, and NonPortP screen described in the earlier section.

C. LOAD button

Click on the button to display "Select the load file" dialog box and load settings from the file saved with the SAVE button in item B.

D. READ button

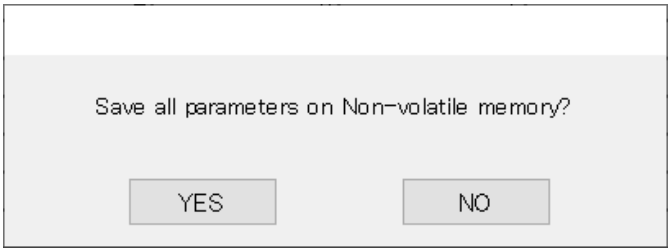
Click the button to display parameters in the application screen by reading from the AFC-6 main unit.

E. WRITE button

Click the button to display the following dialog box.

Click "YES" to write all settings displayed on the application screen to the AFC-6 main unit.

Click "NO" to abort the writing operation.



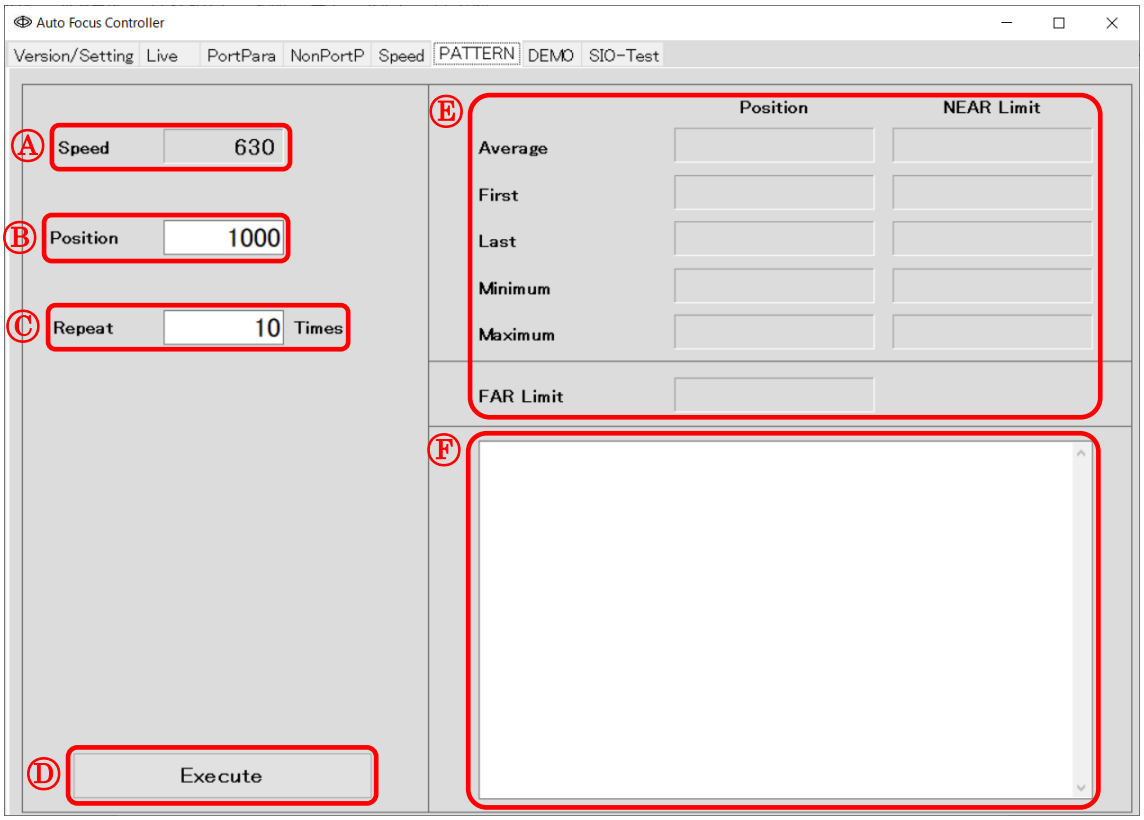
⚠Caution

- Always click "WRITE" button before exiting the application when settings are changed.
  Previous settings will be reverted when turning off AFC-6 without clicking "WRITE" button.
- Settings saved to the file with "SAVE" button are the values displayed in the adjustment software, not the AFC-6 main unit settings. To save AFC-6 main unit settings to a file, click "READ" button first to read AFC-6 main unit parameters into the adjustment software, then click "SAVE" button.

(7) PATTERN screen

PATTERN screen will be displayed when clicking the "PATTERN" tab on the screen.

This screen allows users to confirm the operation of the pattern driving unit. Results will be displayed for operations on this screen when executing a set number of reciprocating operation between the set travel position and NEAR limit. (only valid when using pattern driving unit)



PATTERN screen

A. Pattern driving unit speed display

Displays pattern driving unit travel speed. (Parameter No.644: SX_Speed)

B. Travel position display/setting for reciprocating operation

Displays pattern driving unit travel position (coordinate) with respect to the FAR limit (coordinate: 512) as a reference.

Change the value in the text box to change travel position (coordinate). Reciprocating operation will be executed between NEAR limit and the position (coordinate) set here.

C. Execution count display/setting of reciprocating operation

Displays execution count for reciprocating operation.

Change the value in the text box to change the execution count.

D. Execute button (Abort button)

Pattern driving unit starts operation by clicking this button. Travels to FAR limit first prior to the reciprocating operation.

"Execute" changes to "Abort" when the pattern driving unit is under operation. Click on "Abort" button to stop the pattern driving unit.

E. Operation result display

Displays operation results for pattern driving unit.

"Position" indicates travel position (coordinate) set in item B, and "NEAR Limit" indicates the position (coordinate) where NEAR limit was detected. Displayed result items are as follows.

- Average : Average value of travel position (coordinate) for reciprocating operation
- First : First travel position (coordinate) for reciprocating operation
- Last : Last travel position (coordinate) for reciprocating operation
- Minimum : Minimum value of travel position (coordinate) for reciprocating operation
- Maximum : Maximum value of travel position (coordinate) for reciprocating operation

"FAR Limit" displays the position (coordinate) where FAR limit was detected.

F. Log display

Displays pattern driving unit operation log.

Displays single one-way operation in one line; a single reciprocating operation will be displayed in two lines.

Log displays positions (coordinates) of turning point for "Position" or "NearLimit," respectively. Displayed items are as follows in log display format [AAA：BBB = CCC].

- AAA: Number of counts of pattern driving unit operation
  (displays how many times the operation is executed)
- BBB: Displays Position or NearLimit
- CCC: Travel position (coordinate)

Caution

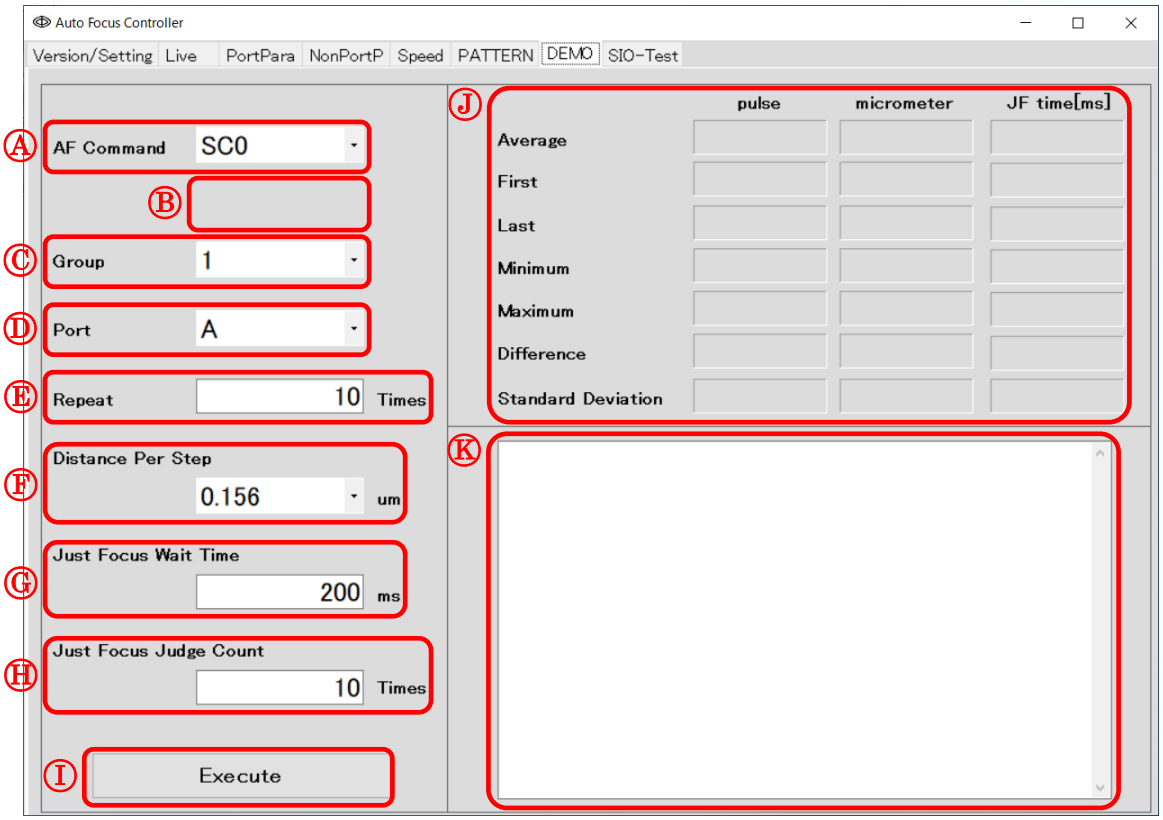
Pattern driving unit position (coordinate) of the currently selected group/port changes when the operation is executed on this screen. Change settings to the other group/port and go back to the original group/port to return to the position (coordinates) before execution.

Note that the above method is not applicable for restoring when pattern driving unit position (coordinate), which has been changed after executing the operation, is written to AFC-6 main unit with "WRITE" button.

(8) DEMO screen

DEMO screen will be displayed when clicking the "DEMO" tab on the screen.

This screen allows users to confirm Auto Focus operation. Results will be displayed for operations on this screen when executing a set number of Auto Focus operation. Please refer to the "AFC-6 Instruction Manual" for Auto Focus operation details.



DEMO screen

A. Display/Select Auto Focus operation

Displays the currently selected Auto Focus operation.

Click the drop-down list to select Auto Focus operation.

B. Display/Select Auto Focus operation travel distance

Text box will be displayed here where "SC6", "SC7", "PF", or "PN" is selected for the Auto Focus operation in item A. Enter the value in the displayed text box to set the travel distance, and the value becomes as the Auto Focus operation range.

C. Display/Select port group

Displays the currently selected group.

Click the drop-down list to select group.

D. Display/Select port

Displays the currently selected port.

Click the drop-down list to select port.

E. Execution count display/setting of Auto Focus operation

Displays execution count for Auto Focus operation.

Change the value in the text box to change the execution count.

F. Display/Select AF driving unit resolution

Displays the currently selected AF driving unit resolution.

Click the drop-down list to select resolution where it is indicated in CHUO standard AF drive unit.

G. Waiting time display/setting after the just focus determination

Displays waiting time after the just focus determination.

Change the value in the text box to change the waiting time. Waits for the time set here after just focus determination and executes the next Auto Focus operation after the waiting time has passed. The operation will be terminated after the waiting time for the last Auto Focus operation.

H. Count display/setting of just focus determination

Displays execution count for just focus determination.

Change the value in the text box to change the execution count. Just focus is determined after receiving the number of J responses set here.

I. Execute button (Abort button)

Starts Auto Focus operation by clicking this button.

"Execute" changes to "Abort" when executing the Auto Focus operation. Click on "Abort" button to stop the Auto Focus operation.

J. Operation result display

Displays operation results for Auto Focus operation.

"Pulse" indicates coordinate (number of pulses) of just focus position, "micrometer" indicates coordinate (number of pulses) of just focus position converted into micrometer, and "JF time" indicates the time required to determine just focus. Displayed result items are as follows.

- Average : Average value of just focus position and determination time
- First : First just focus position and determination time
- Last : Last just focus position and determination time
- Minimum : Minimum value of just focus position and determination time
- Maximum : Maximum value of just focus position and determination time
- Difference : Difference between the minimum and maximum value of just focus position and determination time
- Standard Deviation : Standard deviation value of just focus position and determination time

K. Log display

Displays Auto Focus operation log.

Displays single Auto Focus operation in one line. Log displays Auto Focus status, just focus position (coordinate), and just focus determination time, respectively.

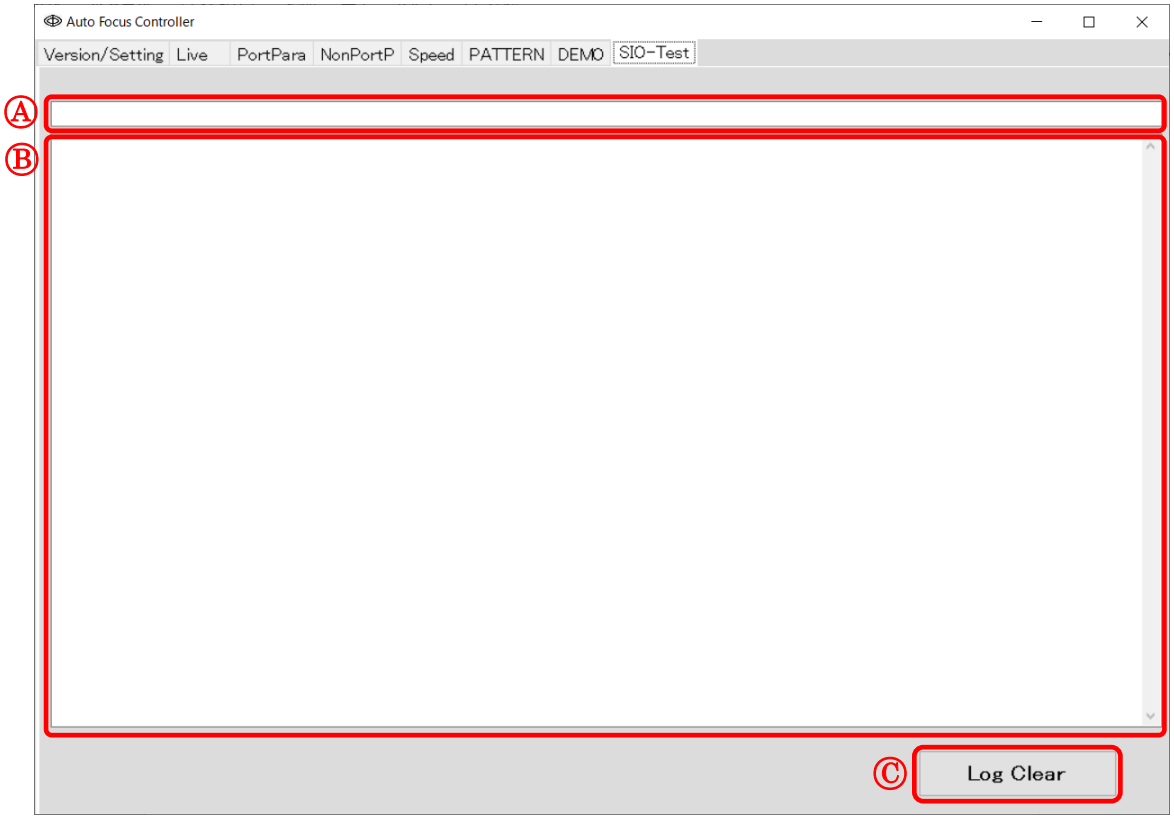
Displayed items are as follows in log display format [AAA : BBB : CCC : DDD].

- AAA : Number of counts for Auto Focus operation (displays how many times the operation is executed)
- BBB : Displays Auto Focus status
  - When Parameter No.608 setting is "0:OFF": J
  - When Parameter No.608 setting is "1:ON": JF/JN
- CCC : Just focus position (coordinate)
- DDD : Just focus determination time

(9) SIO-Test screen

SIO-Test screen will be displayed when clicking the "SIO-Test" tab on the screen.

This screen allows users to send communication commands and display responses. Please refer to the "AFC-6 Instruction Manual" for communication command details.



SIO-Test screen

A. Send communication command

Input communication command in the text box and press Enter key to send.

Sent communication commands are recorded up to five commands. Press " ↑ Cursor key" to display them.

When five sent communication commands are recorded, sending a new communication command will update the history and delete the oldest communication command record.

B. Response display (log)

Displays communication command sent in item A and its response.

Displayed items are as follows in log display format [AAA：BBB].

- AAA: Sent communication command
- BBB: Response for the sent communication command

C. Log Clear button

Click this button to delete the response display (log) in item B.

Auto Focus Controller AFC-6

Adjustment Application Software Manual Ver. 1.0

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CHUO PRECISION INDUSTRIAL CO.,LTD.

Sales Division
Oikawa Bldg 3F, 1-5 Kanda Awajicho, Chiyoda-ku, Tokyo, 101-0063, Japan
TEL: +81-3-3257-1911　FAX: +81-3-3257-1915

A002-K020