

***Nikon***

**FN Multi Patch System**

**(for FN1 Series Microscope)**

**Software Manual**



# Introduction



Thank you for purchasing the Nikon products.

This manual describes how to install and use the FN Multi Patch System (FNMPS) software for FN1 microscope. To ensure correct use, please read this manual carefully before operating the product.

Refer to the hardware manual for detailed information about the microscope configuration and the setup procedures.

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The contents of this manual are subject to change without notice.

Although every effort has been made to ensure the accuracy of this manual, if you note any points that are unclear or incorrect, contact your nearest Nikon representative.

Read the instruction manuals provided with your microscope and computer.

## ■ Prerequisite knowledge

This manual assumes a basic familiarity with Windows. If you come across unfamiliar terms or operations while reading through this manual, consult the user's manual for your version of Windows.

## ■ About the example screens used in the manual

This manual describes various operations using Windows XP screens as examples.

Depending on the specific OS type or version, the actual appearance of the screen or operations may not correspond precisely to the example screens shown at various points throughout the manual. For information on operations or screens specific to your OS version, please consult the OS user's manual.

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# 1

## Preperation

This chapter describes hardware and software requirements for FN Multi Patch System and how to install and uninstall the software.

### 1.1

#### Hardware and Software Requirements

##### Caution

- Before installing FNMPMS, confirm that your computer meets the minimum requirements given below for memory and available hard disk space.
- Install the application software before connecting the PC and the microscope system (FN Multi Patch System).

#### Personal computer main unit

Item	Condition
CPU	Pentium IV 1.8 GHz or higher
Memory	512MB or more
Hard disk drive	100 MB or more free space
Motherboard	A USB slot or a COM port is required. An IEEE1394 port is required.
OS	Windows XP (Japanese or English version) Note) Use Windows XP Professional Service Pack 2 or later.
Others	

#### Display

Item	Condition
Resolution	1,280 x 1,024 pixels. A monitor and a video card capable of True Color output are recommended.

"FNMPMS" is not guaranteed to be compatible with all personal computers. Please contact your distributor for detailed compatibility information.

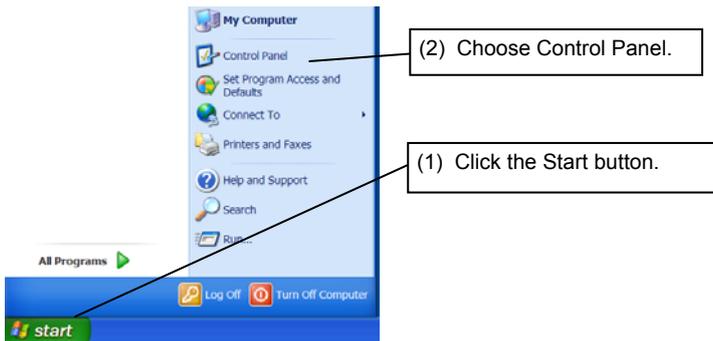
### 1.1.1 Checking RAM

Use the System Properties dialog box to check the amount of memory.

**[Memory] 512MB or more**

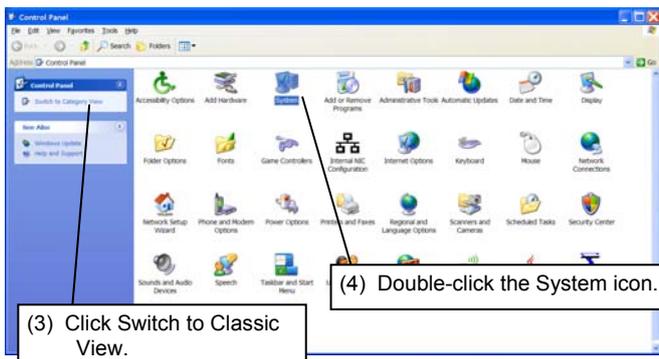
#### Procedure

##### Start menu



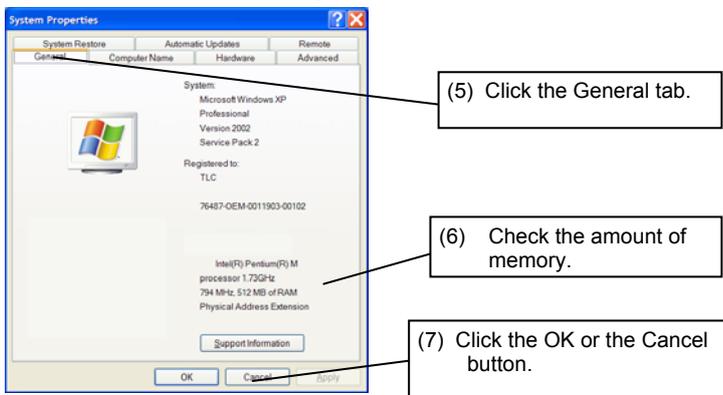
- (1) Click the Start button.
- (2) Choose Control Panel to display the Control Panel window.

##### Control Panel window



- (3) If the display on Control Panel window is not Classic View as shown in the left figure, click Switch to Classic View. The display is switched to the view as shown in the left figure.
- (4) Double-click the System icon to display the System Properties dialog box.

##### System Properties dialog box



- (5) Click the General tab of the Properties dialog box.
- (6) Check the amount of memory.
- (7) Click the OK or the Cancel button to close the System Properties dialog box.

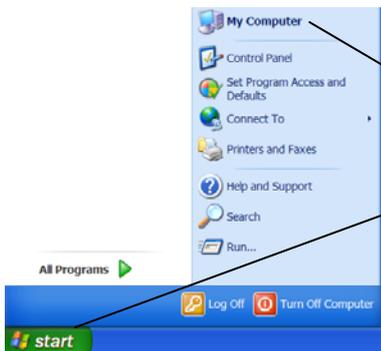
**1.1.2 Checking the Amount of Free Hard Disk Space**

The amount of free hard disk space can be confirmed in the My Computer window. If you have insufficient hard disk space, remove any unnecessary data from the hard disk to increase available free space.

**[Hard disk drive] 100 MB or more free space**

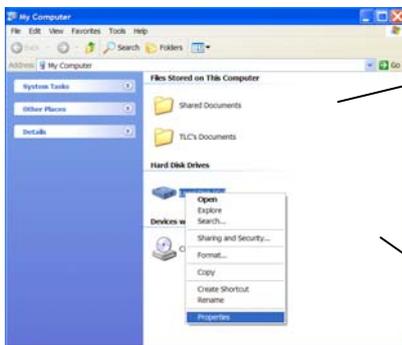
**Procedure**

**Start menu**



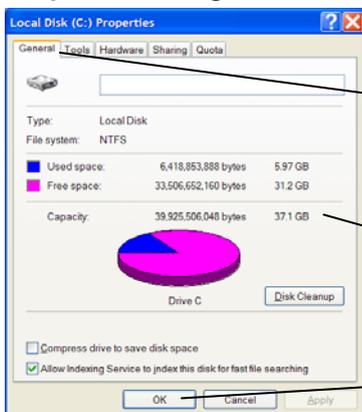
- (1) Click the Start button.
- (2) Click the My Computer icon to display the My Computer window.

**My Computer window**



- (3) Right-click on the Local Disk icon in the My Computer window to which you want to install the application.
- (4) Click Properties in the menu to display the (Drive) Properties dialog box.

**Properties dialog box of hard disk**



- (5) Click the General tab of the Properties dialog box.
- (6) Check the amount of free hard disk space.
- (7) Click the OK or the Cancel button to close the Properties dialog box of the hard disk.

## 1.2 Installing the Application Software

You are now ready to install FNMP5.

### Caution

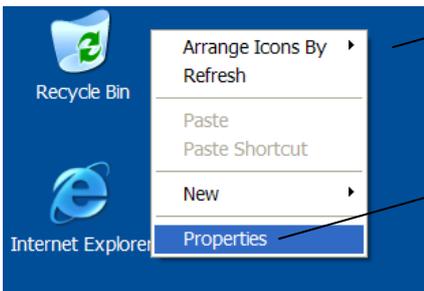
- Install the application software before connecting the PC and the microscope system.
- To install the FNMP5, you must log-in to your computer with a user account with an Administrator right.

### 1.2.1 Finishing All Other Application Software

Before installing FNMP5, finish all system-resident programs such as the screensaver and anti-virus utility.

#### Finishing the screensaver

##### Pop-up menu on the desktop

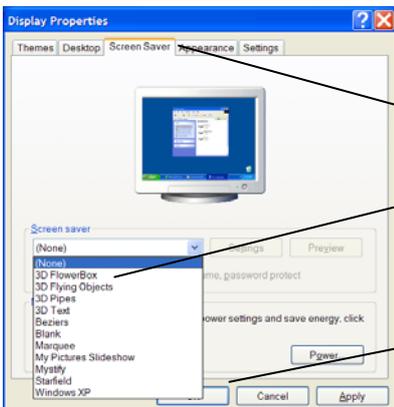


(1) Right-click on the desktop.

(2) Click Properties.

- (1) Right-click on the desktop to display a pop-up menu.
- (2) Click Properties in the pop-up menu to display the Display Properties dialog box.

##### Display Properties dialog box



(3) Click the Screen Saver tab.

(4) Select "None".

(5) Click the OK button.

- (3) Click the Screen Saver tab of the Display Properties dialog box.
- (4) Click the Screen Saver text box and select "None" from the list.
- (5) Click the OK button.

## 1.2.2 Starting the Setup Wizard

To install the application software, download and run the setup wizard and follow the on-screen instructions.

**Please download software from software/firmware of**

**<http://www.coolscope.com/eng/service/download/DLTop.aspx>.**

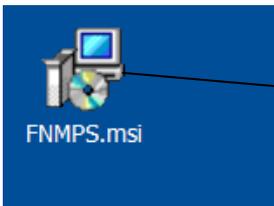
### Caution

- **To install the FNMPs, you must log-in as an Administrator.**
- **For information on uninstalling FNMPs, refer to Section 1.3, "Uninstalling the Application Software."**

The description of this section shows an example that the setup wizard is downloaded to the desktop.

## Starting the setup wizard

### Desktop



(1) Double-click the FNMPs.msi icon.

(1) Double-click the FNMPs.msi icon to display the FNMPs Setup Wizard screen.

## Installation procedure

### Setup Wizard screen



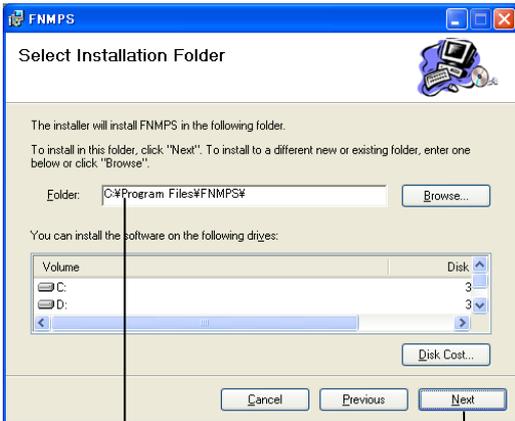
(1) Click the Next button.

The Setup Menu opens.

(1) Click the Next button.

1.2 Installing the Application Software

**Installation Folder setup screen**

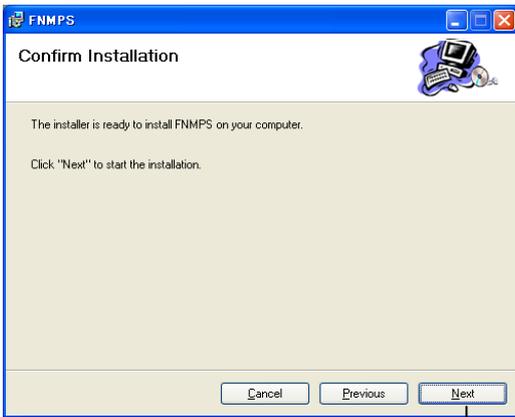


(2) Specify the folder in which to install FNMP5.

(3) Click the Next button.

- (2) Specify the folder to install FNMP5.  
The default folder is C:\Program Files\Nikon\FNMP5\. To install to a different folder, click the Browse button and select from the displayed list.
- (3) Click the Next button.

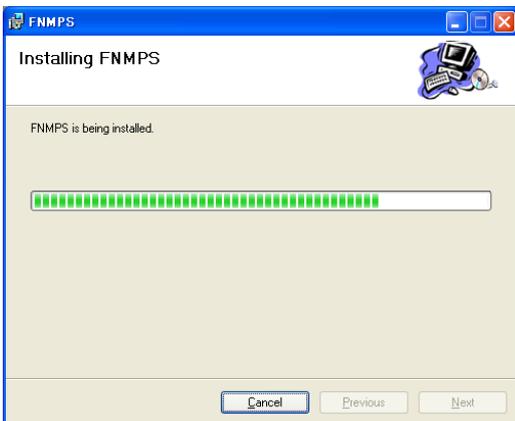
**Confirm Installation screen**



(4) Click the Next button.

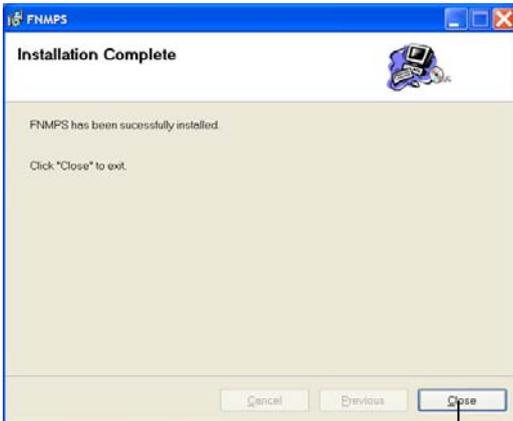
- (4) Click the Next button to install the application software.

**Screen during installation**



1.2 Installing the Application Software

**Screen when installation is complete**



(5) Click the Close button.

- (5) After installing the software, the setup wizard displays the screen shown at left. Click the Close button.

You have finished installing FNMP5.

**1.2.3 Installing Device Drivers**

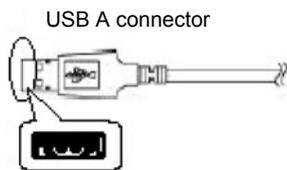
After installing FNMP5, connect the computer and the microscope system. When you connect the microscope system to your computer for the first time, the Found New Hardware Wizard will start automatically. Follow the screen messages displayed to install device drivers.

**Caution**

- To install the FNMP5, you must log-in as an Administrator.
- For information on uninstalling FNMP5, refer to Section 1.3, "Uninstalling the Application Software."

**FN1 Driver**

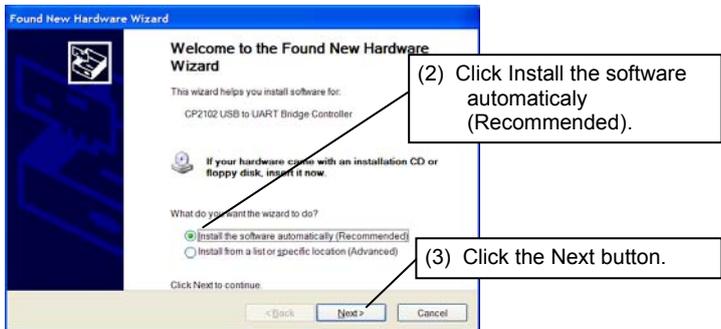
**FN1 Driver**



- (1) Plug the USB A connector of the USB cable into the connector on your PC and the other end is connected with the USB connector of the FN1 microscope control box, it turns on power, and it starts.

Note) Please adjust the switch of the FN1 microscope control box to the USB side.

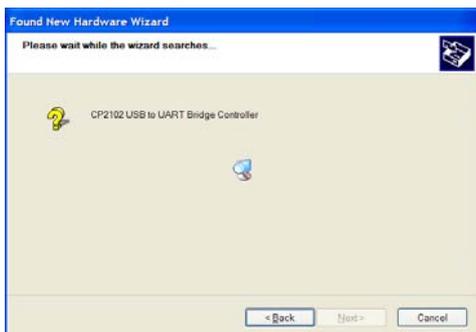
**Wizard startup screen**



Detection wizard's start screen opens to install driver.

- (2) Click Install the software automatically (Recommended).
- (3) Click the Next button.

**Screen during driver detection**



The wizard searches for the necessary device driver information.

Note) If no information is found, click Install from a list or specific location (Advanced).

Normally, select  
C:\WINDOWS\system32  
for Windows XP.

1.2 Installing the Application Software

Screen when driver detection is complete

Install the device drivers.



Files Needed screen

(4) After installing the software, the setup wizard displays the screen shown at left. Click the Finish button to exit the wizard



(4) Click the Finish button.

Wizard startup screen

Another detection wizard's start screen opens to install another driver.



(5) Click Install the software automatically (Recommended).

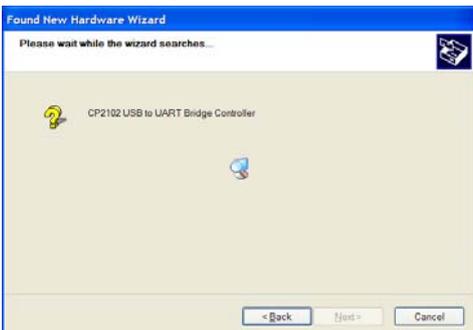
(6) Click the Next button.

(5) Click Install the software automatically (Recommended).

(6) Click the Next button.

Screen during driver detection

The wizard searches for the necessary device driver information.



Note) If no information is found, click Install from a list or specific location (Advanced).

Normally, select

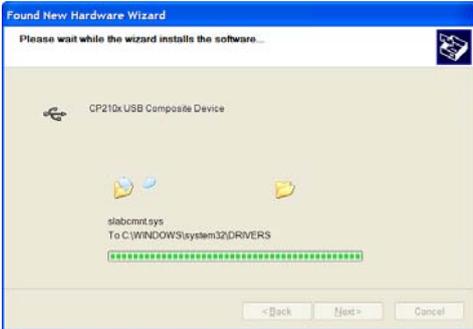
C:\WINDOWS\system32\DRIVERS

for Windows XP.

1.2 Installing the Application Software

Screen when driver detection is complete

Install the device drivers.



Files Needed screen

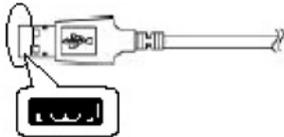
(7) After installing the software, the setup wizard displays the screen shown at left. Click the Finish button to exit the wizard  
You have finished installing the device drivers



Manipulator Driver

Manipulator Driver

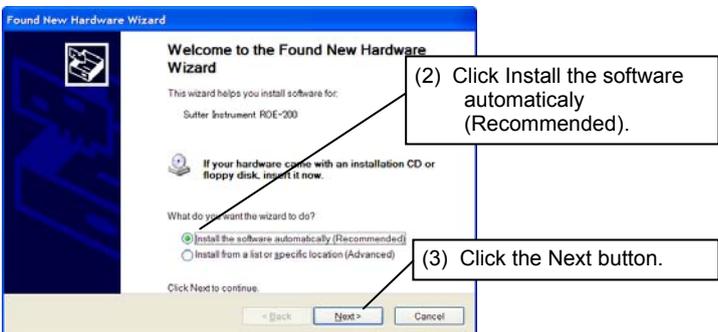
USB A connector



(1) Plug the USB A connector of the USB cable into the connector on your PC and the other end is connected with the USB connector of the Manipulator control box (ROE-200), it turns on power, and it starts.

Wizard startup screen

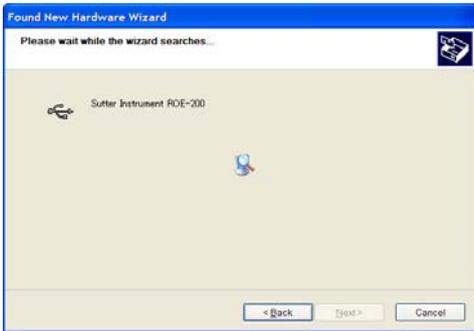
Detection wizard's start screen opens to install driver.



(2) Click Install the software automatically (Recommended).  
(3) Click the Next button.

1.2 Installing the Application Software

Screen during driver detection



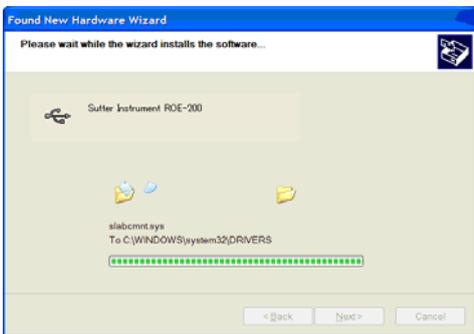
The wizard searches for the necessary device driver information.

Note) If no information is found, click Install from a list or specific location (Advanced).

Normally, select

C:\ProgramFiles\Nikon\FNMPS\Drivers\ROE200N

Screen when driver detection is complete



Install the device drivers.

Files Needed screen



(4) After installing the software, the setup wizard displays the screen shown at left. Click the Finish button to exit the wizard

You have finished installing the device drivers

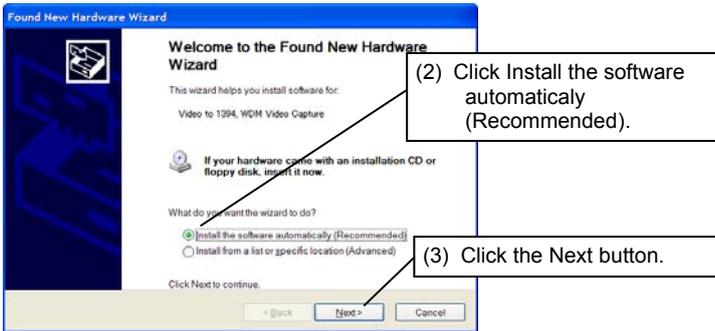
Image format conversion box Driver

Image format conversion box Driver

(1) Plug the IEEE1394 connector of the IEEE1394 cable into the connector on your PC and the other end is connected with the USB connector of the Image format conversion box, it turns on power, and it starts.

1.2 Installing the Application Software

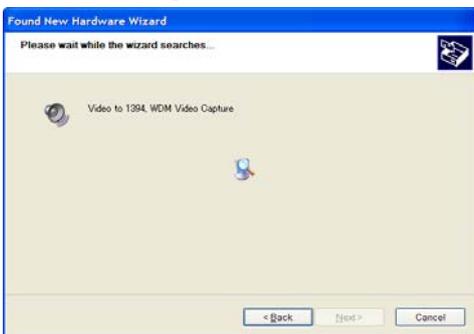
**Wizard startup screen**



Detection wizard's start screen opens to install driver.

- (2) Click Install the software automatically (Recommended).
- (3) Click the Next button.

**Screen during driver detection**



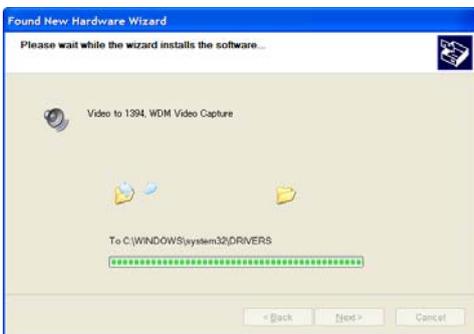
The wizard searches for the necessary device driver information.

Note) If no information is found, click Install from a list or specific location (Advanced).

Normally, select

C:\ProgramFiles\Nikon\FNMPS\Drivers\Video to 1394\data\drivers.

**Screen when driver detection is complete**



Install the device drivers.

**Files Needed screen**



- (4) After installing the software, the setup wizard displays the screen shown at left. Click the Finish button to exit the wizard

You have finished installing the device drivers

## 1.2 Installing the Application Software

**Connection with system**

In FNMP5, it can be a connection with the product of the following versions. Moreover, the one necessary for the connection is as follows.

Driver's preservation folder is below C:\Program Files\Nikon\FNMP5.

<b>Connect</b>	<b>Product</b>	<b>Necessary driver etc.</b>	<b>Driver's preservation place</b>
FN1	FN1 (Nikon)	CP210xVCPInstaller.exe (Driver)	Drivers\CP210x
Image format conversion	DFG/1394-1e (THE IMAGING SOURCE)	IC IMAGING CONTROL 2.1 (Control software) icwdmv2ftis.zip (Driver)	Drivers\Videoto1394\data\drivers Drivers\ICimagingcontrol
Manipulator	MPC-285 MPC-200N ROE-200N (SUTTER INSTRUMENT)	usbdriver.zip (Driver)	Drivers\ROE200N
USB-232C conversion	Edgeport/1	Edgeport.cab (Driver)	Drivers\edgeport
Magnescale	FN-MS (Nikon)	None	
Motor	REMOTE FOCUS ACCESSORY (Nikon INC)	None	

It is not the one to guarantee operation with all personal computers. Please inquire of the store purchased of each product about details.

## 1.3 Uninstalling the Application Software

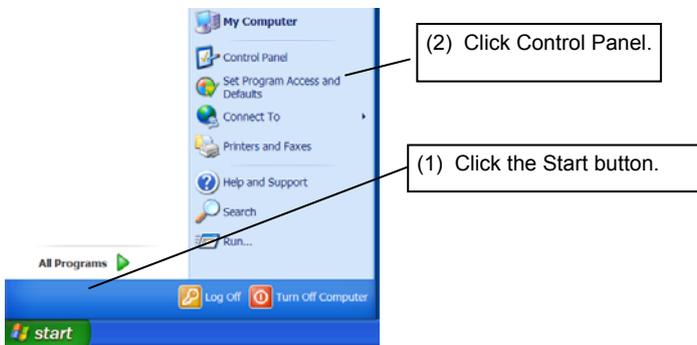
If you no longer need FNMP5 and wish to uninstall it (remove it from the hard disk drive), use Add/Remove Programs utility of the Control Panel.

(4) Click the Finish button.

- Once uninstalled, the application software cannot be used unless it is installed again.

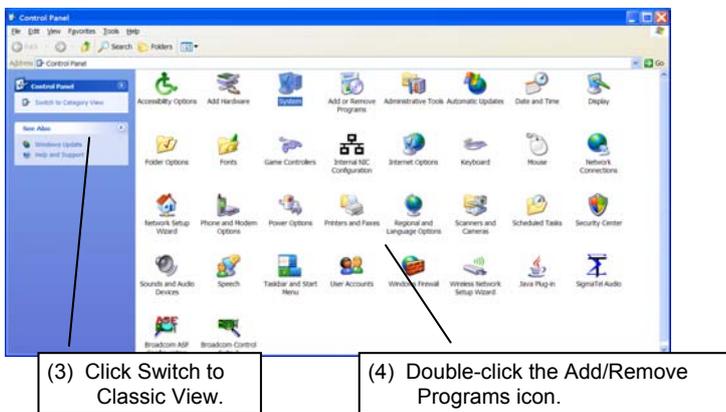
### Uninstallation procedure

#### Start menu



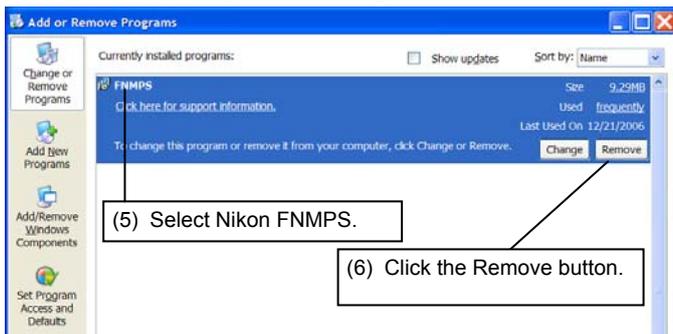
- (1) Click the Start button.
- (2) Click Control Panel to display the Control Panel window.

#### Control Panel window



- (3) If the display on Control Panel window is not Classic View as shown in the left figure, click Switch to Classic View. The display is switched to the view as shown in the left figure.
- (4) Double-click the Add/Remove Programs icon.

#### Add/Remove Programs dialog box



- (5) Select Nikon FNMP5.
- (6) Click the Remove button to uninstall the selected application software from the hard disk drive.

# 2

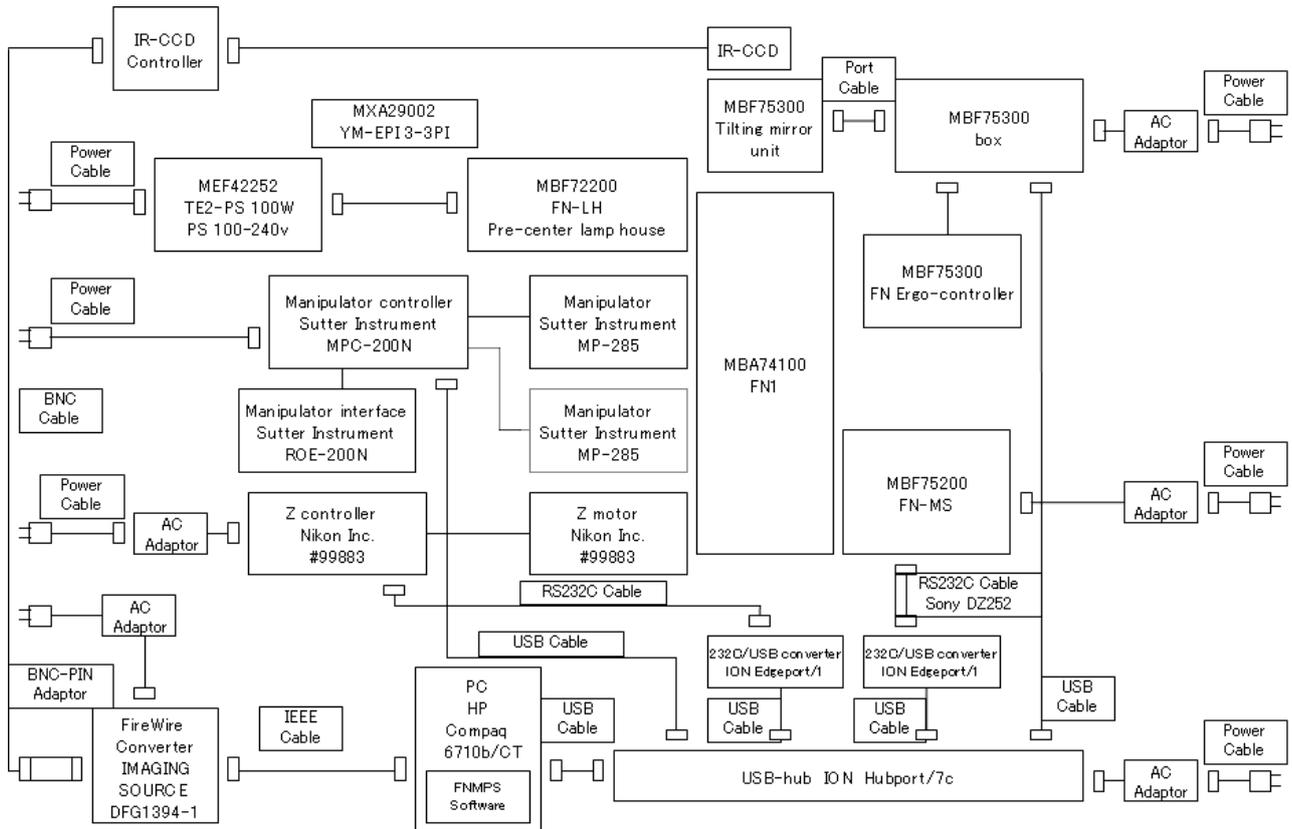
## FNMPS Operation

When you connect the PC and the microscope system for the first time, use this application software to set information for the microscope system to send the information to the microscope system, and to support experiment.

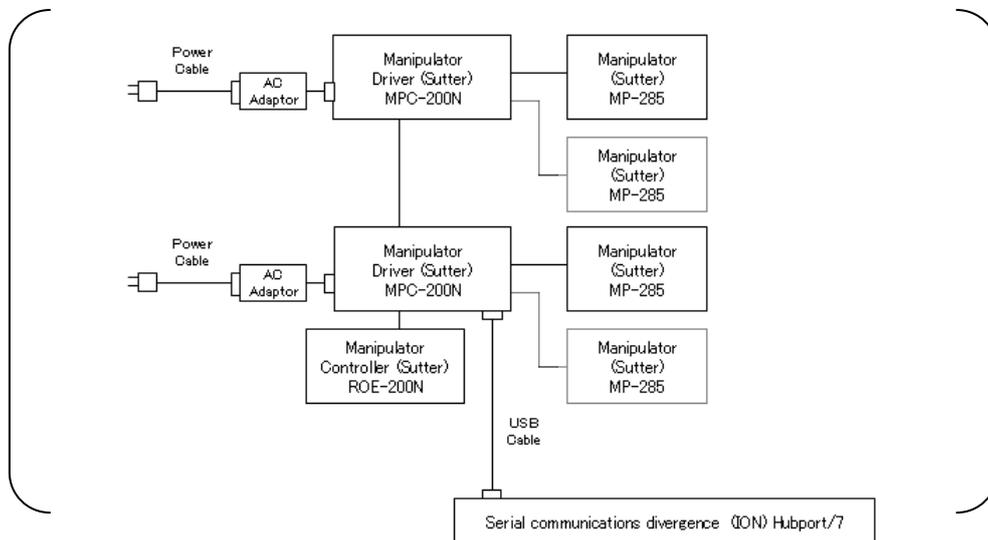
### 2.1

#### Connecting the FN1 Microscope System

For the FNMPS, connect the microscope as following procedure.



For connecting 3~4 manipulators



### 2.1.1

### Hardware Controls

The following list shows hardware controls.

#### FN1 microscope

- Viewfield setting point modification
- Viewfield movement in the X-direction and the Y-direction
- Viewfield XY-position information
- Viewfield center movement
- Change in magnification
- Disabling the ergo controller buttons

#### Manipulator

- Manipulator position information (only for the FN1 microscope with a camera)
- Manipulator set position modification (only for the FN1 microscope with a camera)
- Manipulator escape position modification (only for the FN1 microscope with a camera)
- Manipulator interlocked with the viewfield (only for the FN1 microscope with a camera)

#### Magnescale

- Position information in the focusing direction (Z-direction)

#### Z-direction motor

- Focusing direction (Z-direction) movement
- Objective escape position modification (only for the system with the Magnescale)

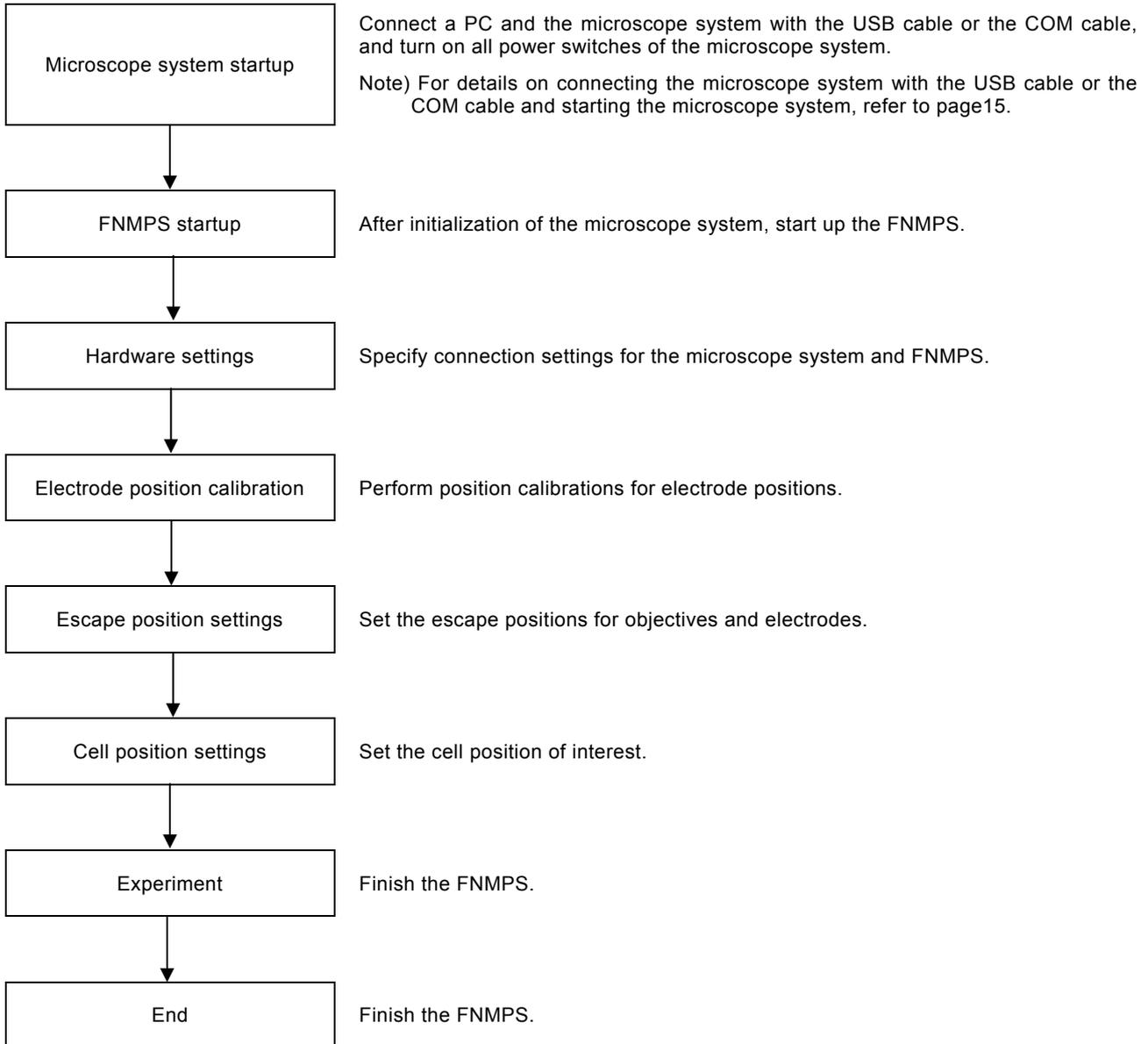
#### IEEE1394 interface convert for the camera input

- Live image display (only for the system with a camera)
- Saving images (only for the system with a camera)
- Digital zoom for the live image (only for the system with a camera)

**2.2****FNMPs Workflow**

This section indicates the FNMPs workflow for setting the microscope system.

After setting the wizard mode (refer to page 32.), follow the workflow below.



## 2.3 Starting and Ending FNMP5

You can start and end FNMP5 in several ways. A general method is explained here, using the Start menu to start and the Cancel button in the operation window to end.

### 2.3.1 Starting Up

#### Procedure

##### Start menu



(1) Click the Start button.

(2) Point to Programs, Nikon, FNMP5, and FNMP5.

After confirming that the microscope is connected to the computer and turning on the connected devices, start the FNMP5 software.

- (1) Click the Start button.
- (2) Point to Programs, Nikon, FNMP5, and FNMP5. The FNMP5 window opens.

■ Note

It is also possible to double-click the FNMP5 icon of desktop and to start

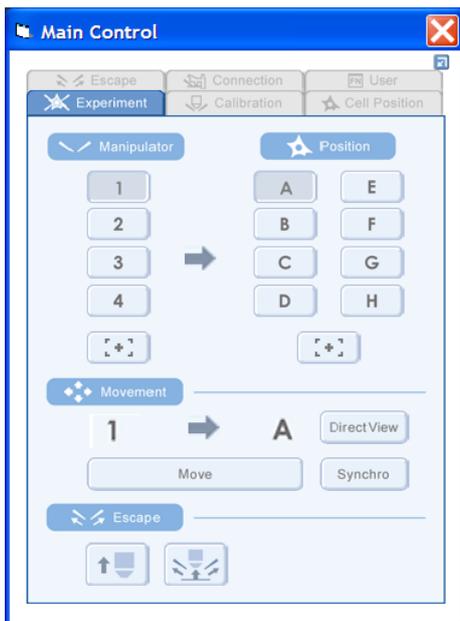
##### FNMP5 icon



Caution:

Before using the manipulator, be sure to turn on the manipulator and start the FNMP5 software.

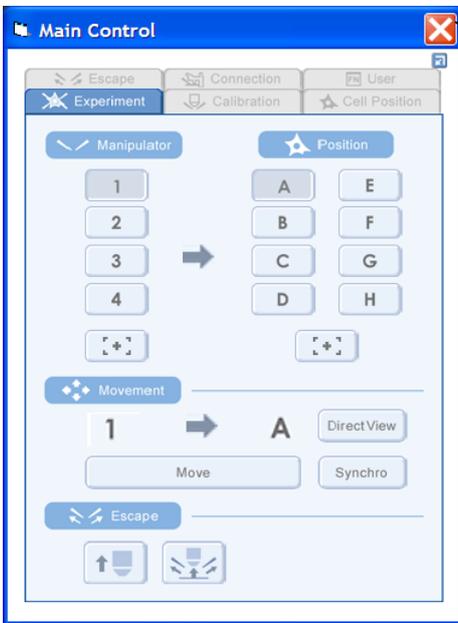
##### FNMP5 window



### 2.3.2 Ending the Software

#### Procedure

#### FNMP5 window



(1) Click the Close button.

- (1) Click the Close button to end the FNMP5 software.
- (2) A confirmation message appears. Click OK to end the software.

#### Caution:

Be sure to end the FNMP5 software before turning off the power switches of the devices connected to the system.

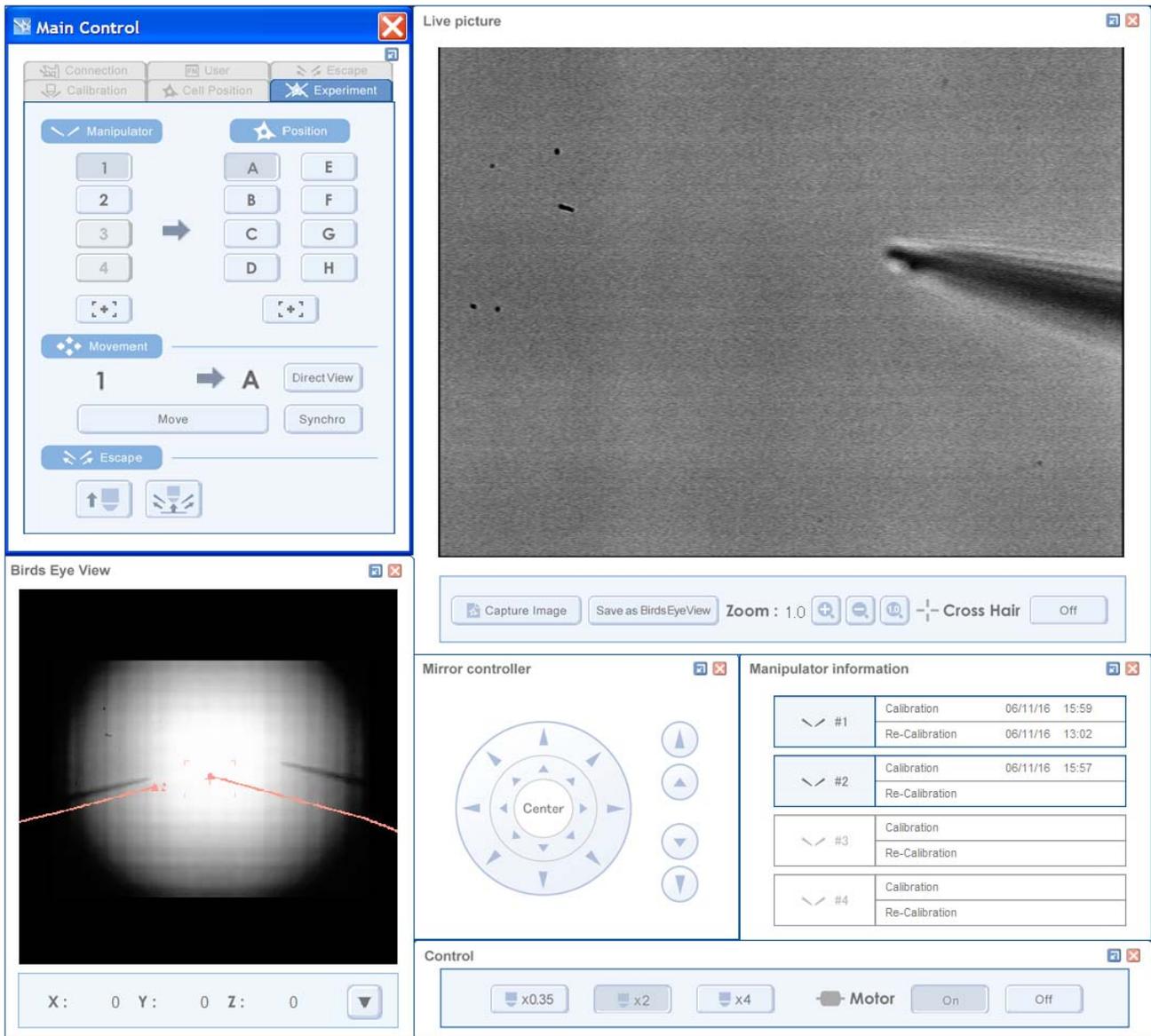
#### End confirmation window



## 2.4

### Screen Configuration of the FNMP5 Software

The screen of the FNMP5 software consists of six windows: Main Control window, Live Picture window, Birds Eye View window, Mirror Controller window, Manipulator Information window, and Control window.



**2.4.1 Settings and Operations of Each Window**

The following list shows settings and operations of each window of the FNMP5 software.

Main Control window (2.5.1)

- Experiment window
  - Manipulator selection
  - Manipulator destination selection
  - Viewfield destination selection
  - Experiment
  - Synchronization mode selection
  - Direct View mode selection
  - Viewfield escape
  - Manipulator escape
- Connection window
  - Mirror connection settings
  - Mirror connection test
  - Magnescale connection settings
  - Magnescale connection test
  - Motor connection settings
  - Motor connection test
  - Camera connection settings
  - Device Manager window operation
  - Manipulator connection test
- Calibration window
  - Calibration mode selection
  - Manipulator selection
  - Calibration settings
  - Calibration data clear
- Escape window
  - Escape position settings
  - Objective escape position settings
- Cell Position window
  - Cell position settings
  - O position settings

2.4 Screen Configuration of the FNMP5 Software

- └ User window
  - └ Application mode settings
  - └ Window display settings
  - └ Offset width settings
  - └ Offset minimum value ON/OFF
  - └ Contact evasion warning ON/OFF

Live Picture window (2.5.2)

- └ Saving images
- └ Birds eye view background settings
- └ Digital zoom
- └ Cross hair display settings

Birds Eye View window (2.5.3)

- └ Birds eye view settings
- └ Viewfield coordinate display
- └ Background image contrast
- └ Background image brightness
- └ Electrode reference position display settings

Mirror Controller window (2.5.4)

- └ Viewfield movement in the X- and Y- directions
- └ Viewfield movement in the Z-direction

Manipulator Information window (2.5.5)

- └ Manipulator calibration information
- └ Manipulator re-calibration information

Control window (2.5.6)

- └ Magnification control
- └ FN motor ON/OFF

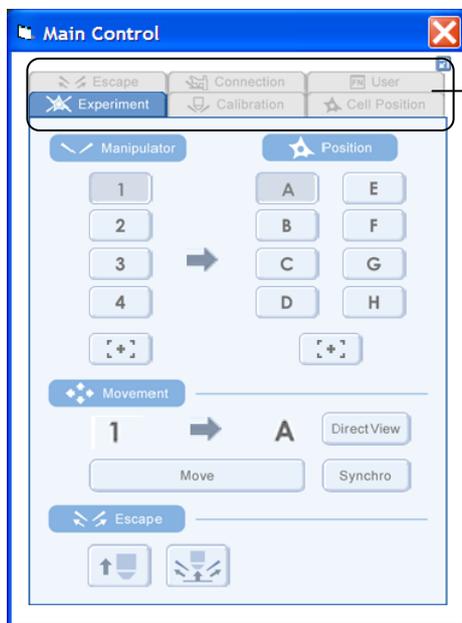
## 2.5 Operation of Each Window

The screen of the FNMP5 consists of six windows: Main Control window, Live Picture window, Birds Eye View window, Mirror Controller window, Manipulator Information window, and Control window. The FNMP5 is controlled with each window.

### 2.5.1 Operation of the Main Control Window

The Main Control window of the FNMP5 is used to perform basic operations. The Main Control window consists of six setting windows. On each setting window, the basic settings and operations are performed.

#### Main Control window



(1) Click a tab to select a setting window.

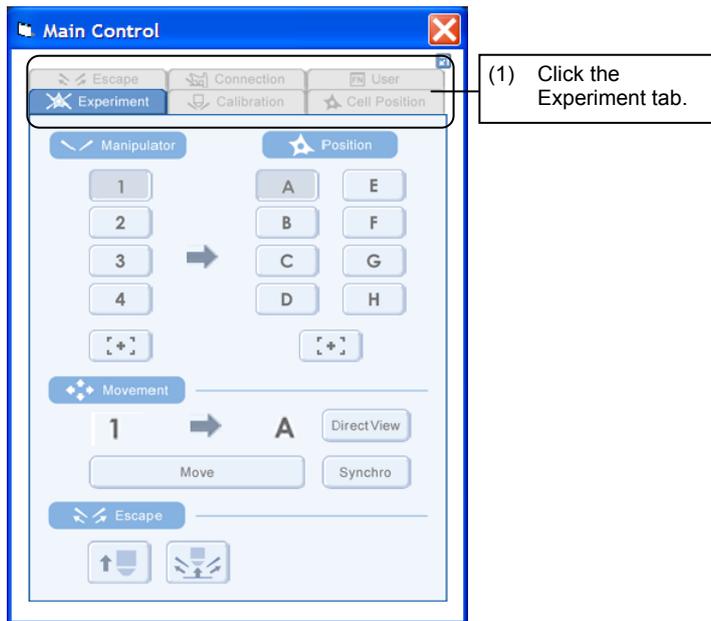
Click a tab on the top of the Main Control window to display each setting window.

(1) Click a tab to display each setting window.

■ Note

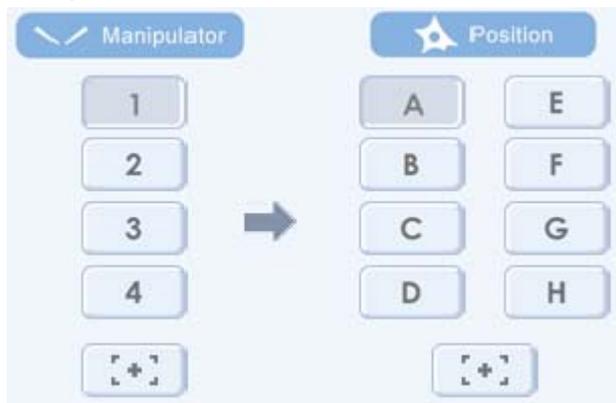
Some microscope systems may have an item that is not required to be set. In this case, the button of such item is disabled.

## 2.5 Operation of Each Window

**Experiment window**

On the Experiment window, the following operations are available: movement of manipulators, movement of the viewfield, synchronization control of the viewfield and manipulators, escape of the viewfield, and escape of manipulators.

- (1) Click the Experiment tab on the top of the Main Control window. The Experiment window is displayed.

**Manipulator/Position area**

This is the area of the Experiment window for setting details on movement.

Click one from the 1 to 4 buttons to select a manipulator (or click the viewfield button) and click one from the A to H button to select a specimen (or click the viewfield button) as a movement destination.

■ Note

If the viewfield button in the Manipulator field is selected, the viewfield button in the Position field is dimmed.

## 2.5 Operation of Each Window

**Movement area**

This is the area of the Experiment window for moving a manipulator or a viewfield.

This area shows the manipulator (or a viewfield) to be moved and the specimen (or a viewfield) that locates at the movement destination.

**Move button**

Click this button to move the manipulator to the position.

**Direct View button**

Click the Direct View button. Viewfield can be moved by selecting View button without pushing the Move button..

**Synchro button**

Click this button to synchronize the selected manipulator with the viewfield.

■ **Note**

If the magnification is x0.35, the movement operation is disabled.

**Movement area (Synchronization operation)****Escape area**

This is the Escape area of the Experiment window. Use this area to escape the objective or to escape the manipulators and the objective.

**Objective escape button**

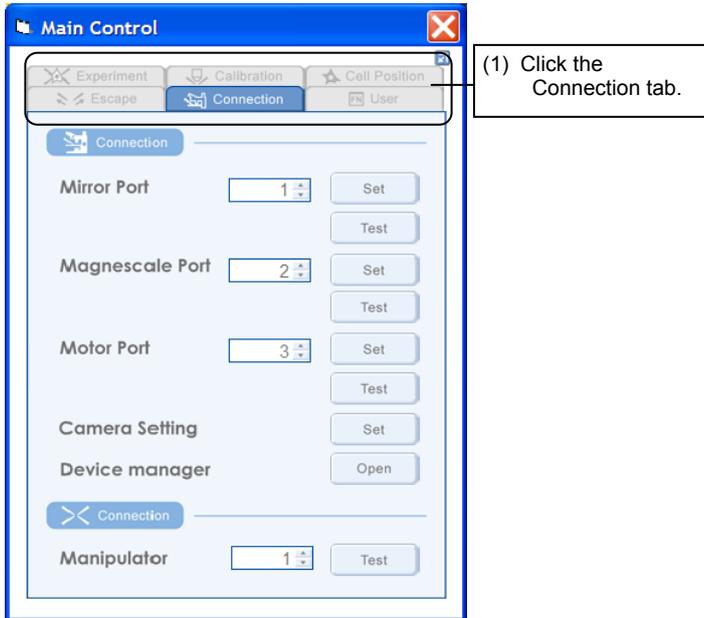
Click this button to escape the objective to the position specified on the Escape window. (See page 30.)

**Manipulator escape button**

Click this button to escape the manipulators and the objective to the position specified on the Escape window. (See page 30.)

2.5 Operation of Each Window

**Connection window**



The following operations are performed on the Connection window; connecting and testing the FN, connecting and testing the magnescale, connecting a camera, and testing manipulators.

- (1) Click the Connection tab on the top of the Main Control window to display the Connection window.

This is the area of the Connection window for assigning ports to devices.

Select a port and click Set. And then, click Test to check the connection.

Port select box

Select a port in this box.

Set button

Click this button to connect the selected port and a device. When clicking the Set button for Camera Setting, Camera Setting window opens.

Test button

Click this button to check connection of the port and each device.

Open button

Click this button to open the Device manager to see connectable ports.

■ Note

The Test buttons are displayed only when connection tests are available.

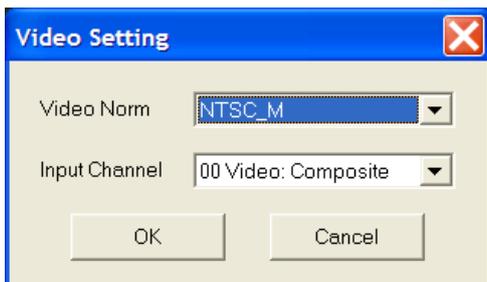
■ Note

Please set the standard of the connected camera (NTSC or PAL) to Video Norm, and set the connected terminal to Input Channel in the camera connection window.

**Connection setting area**



**Camera connection window**



2.5 Operation of Each Window

**Manipulator connection area**



This is the area of the Connection window for testing connection of manipulators.

Select a manipulator and check the connection.

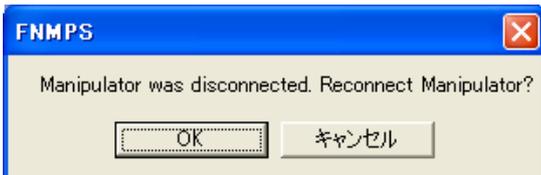
Manipulator select box

Select a manipulator to be checked in this box.

Manipulator test button

Click this button to check the connection of selected manipulator. When disconnected, confirmation window appears for reconnection.

**Reconnecting confirmation window**



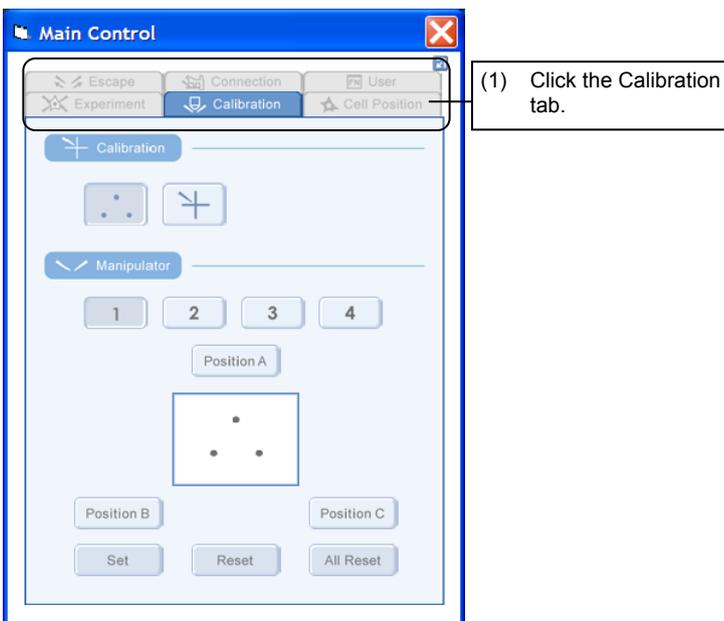
■ Note

Manipulator is connected in the startup process.

■ Note

Check the movement of manipulators on the manipulator window too because the movement is small.

**Calibration window**

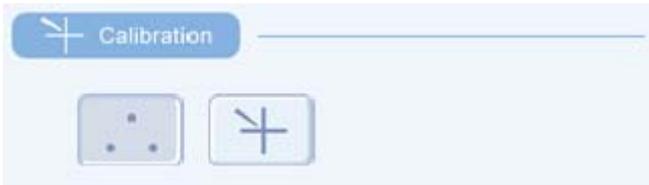


Use this window to calibrate the current position of the manipulator.

(1) Click the Calibration tab on the top of the Main Control window to display the Calibration window.

2.5 Operation of Each Window

**Calibration mode area**



This is the calibration mode area in the Calibration window for selecting a calibration mode.

Select either "normal calibration" or "simple calibration" for the electrode of the manipulator.



Normal calibration button

Select this button to perform normal calibration.



Simple calibration button

Select this button to perform simple calibration.

■ Note

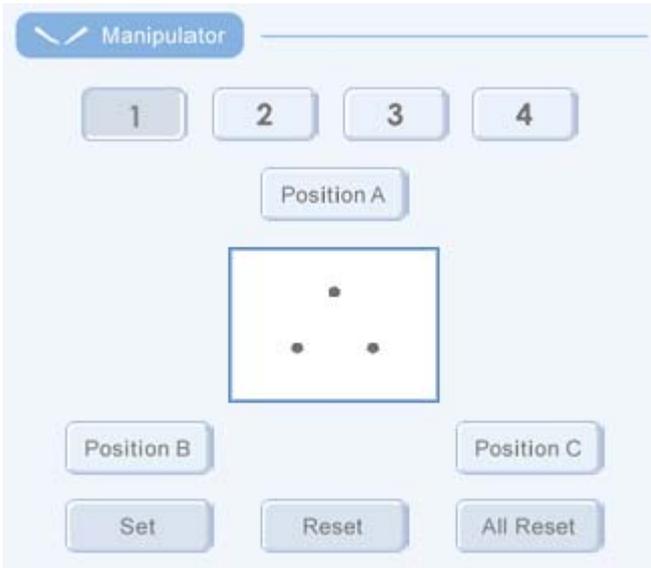
Perform the simple calibration only when replacing the electrode of the manipulator with another.

Caution:

Calibration setting cannot be reflected unless the Set button is pushed. Please make sure to push the Set button.

2.5 Operation of Each Window

**Calibration setting area (normal calibration window)**



This is the area of the Calibration window for setting details on the normal calibration.

Select a manipulator and set details on calibration while checking the live display. (Refer to page 43.) The calibration moves the needlepoint, pushes the Position button while focused on the needlepoint, and the setting is done.

**Manipulator select button**

Click a button to select a manipulator for calibration.

**Position button**

Select a position button to set the position information of the electrode of the manipulator for calibration.

**Set button**

After specifying all position information of the electrodes, click this button to set the information.

**Reset button**

Click this button to reset the calibration information of the selected manipulator.

**All Reset button**

Click this button to reset the calibration information of all manipulators.

■ Note

Set four positions (A, B, C, and Z) for calibration.

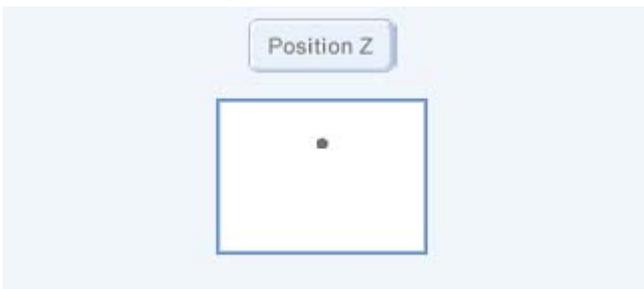
■ Note

When setting Position A, B, and C is complete, automatically Position Z setting window appears. And, when a motor is installed, the manipulator moves in the Z-direction.

**Caution:**

Please do not move view when focusing it on the calibration and the needlepoint. It is not likely to be able to calibrate correctly..

**Calibration setting area (normal calibration window : Z)**

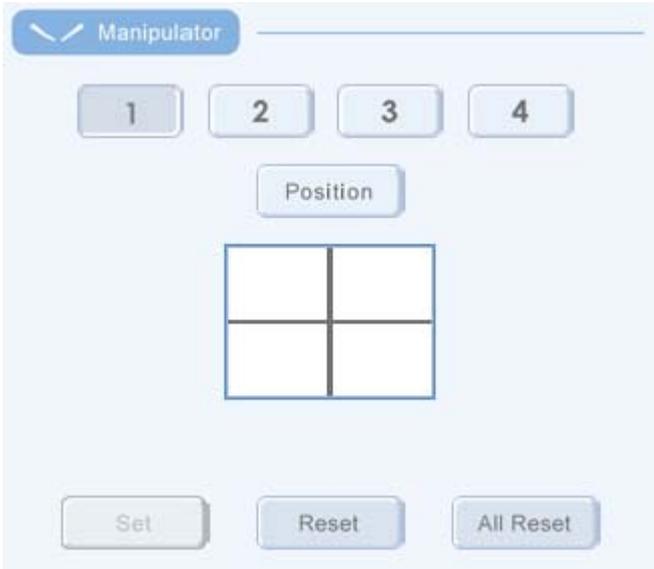


**Calibration setting mark (Live Picture window)**



2.5 Operation of Each Window

**Calibration setting area (simple calibration window)**



This is the area of the Calibration window for setting details on the simple calibration.

Select a manipulator and set details on calibration while checking the live display. (Refer to page 44.) The calibration moves the needlepoint, pushes the Position button while focused on the needlepoint, and the setting is done.

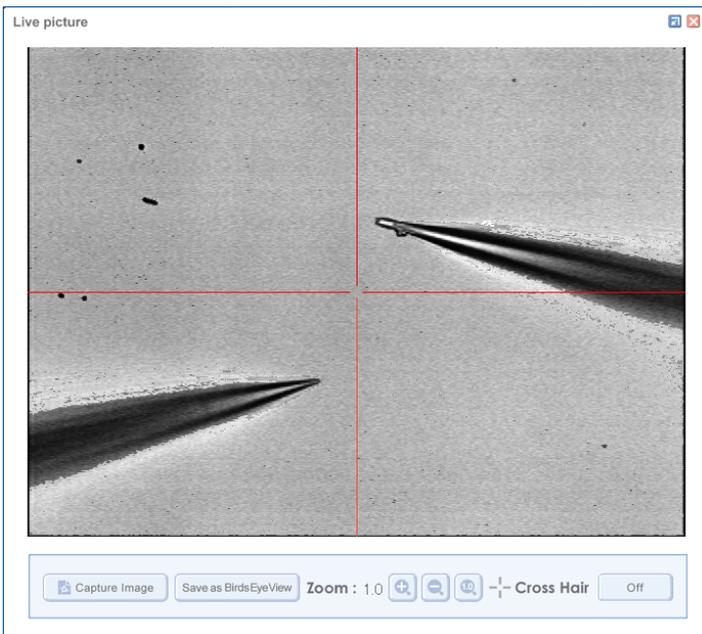
**Manipulator select button**

Click a button to select a manipulator for calibration.

**Position button**

Select a position button to set the position information of the electrode of the manipulator for calibration.

**Calibration setting mark (Live Picture window)**



**Set button**

After specifying all position information of the electrode, click this button to set the information.

**Reset button**

Click this button to reset the calibration information of the selected manipulator.

**All Reset button**

Click this button to reset the calibration information of all manipulators.

■ Note

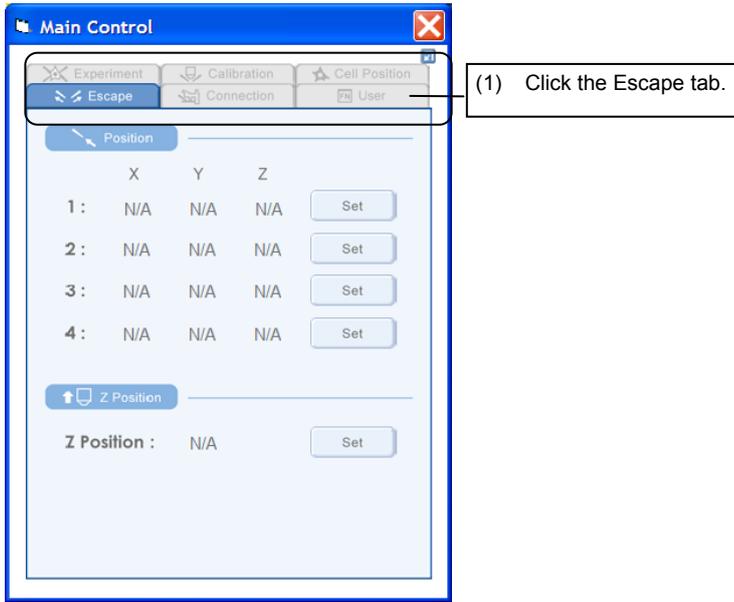
Set only Position A for the simple calibration.

■ Note

The simple calibration uses information of the normal calibration. Therefore the simple calibration is enabled for a manipulator calibrated with the normal calibration at least once.

2.5 Operation of Each Window

**Escape window**



On this window, escape positions are specified for the manipulators and the objective.

(1) Click the Escape tab on the top of the Main Control window to display the Escape window.

■ Note

If the position is not specified, N/A (Not Available) is displayed.

**Manipulator escape position setting area**



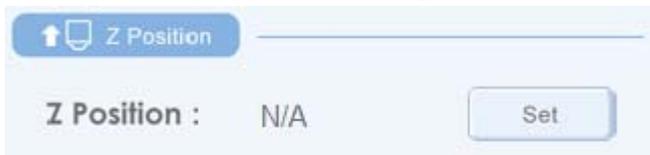
This is the area of the Escape window for setting escape position of a manipulator.

After moving the electrode of the manipulator to the escape position, set the position.

Set button

Click this button to set the current position as the escape position for the electrode of the manipulator.

**Objective escape position setting area**



This is the area of the Escape window for setting escape position of the objective.

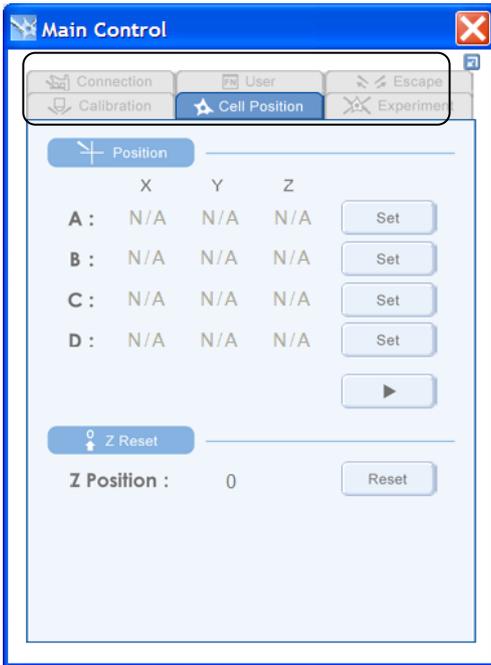
After moving the objective to the escape position, set the position.

Set button

Click this button to set the current position of the objective as the escape position.

2.5 Operation of Each Window

**Cell Position window**



On the Cell Position window, cell positions and a zero-position are specified.

- (1) Click the Cell Position tab on the top of the Main Control window to display the Cell Position window.

■ Note

If the position is not specified, N/A (Not Available) is displayed.

**Cell position setting**



This is the area of the Cell Position window for setting cell position.

After moving the viewfield to a cell position, set the position.

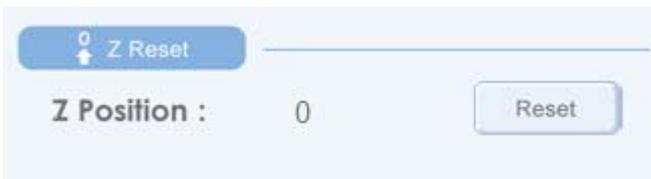
Set button

Click this button to set the current viewfield position as a cell position. The settings are displayed.

Arrow button

Click this button to select a cell setting position from A to D or from E to H.

**Zero-position setting**



This is the area of the Cell Position window for setting a zero-position, or an origin.

After moving the objective to the zero-position, set the position.

Reset button

Click this button to reset the zero-position and set the current viewfield position as zero-position.

2.5 Operation of Each Window

**User window**



(1) Click the User tab.

The following operations are performed on the User window; selecting application mode, opening and closing the window, setting an offset width, offset minimum value ON/OFF, and contact evasion warning ON/OFF.

- (1) Click the User tab on the top of the Main Control window to display the User window.

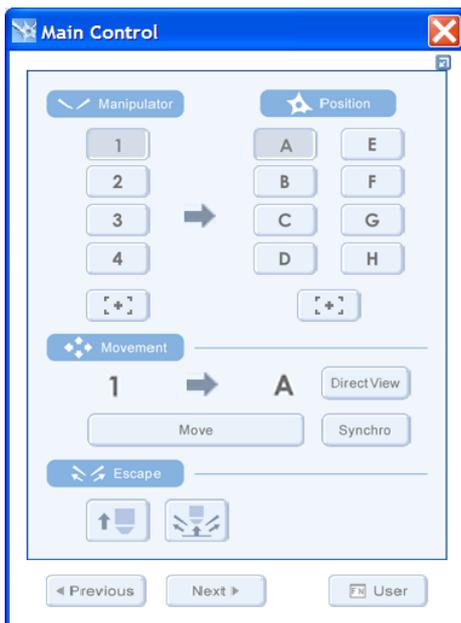
**Application mode selection area**



This is the area of the User window for selecting an application mode.

Select an application mode from the normal mode or the wizard mode. The normal mode enables to perform setting freely. The wizard mode enables to perform setting according to a predetermined procedure.

**Wizewrd mode window**



 Normal mode button

Click this button to perform setting with the normal mode.

 Wizard mode button

Click this button to perform setting with the wizard mode.

■ Note

The wizard mode is a mode set along the flow of the setting (Refer to page 16). It sets it while advancing the screen with the Previous button and the Next button.

## 2.5 Operation of Each Window

**Windows open/close area**

This is the area of the User window for opening or closing the window.

Use this area to open the windows other than the main window.

**Live button**

Click this button to open or close the Live picture window.

**BirdsEyeView button**

Click this button to open or close the Birds Eye View window.

**Mirror button**

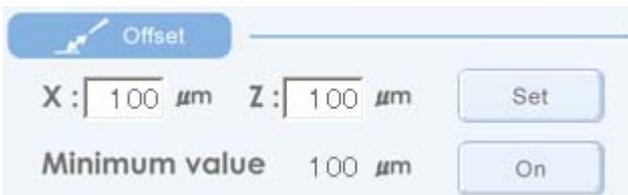
Click this button to open or close the Mirror controller window.

**Manipulator button**

Click this button to open or close the Manipulator information window.

**Control button**

Click this button to open or close the Control window.

**Offset setting area**

This is the area of the User window for setting the offset value and disabling the minimum value restriction.

Specify the offset value to move the manipulator by the specified offset value. It can prevent cells from being damaged.

**Offset Set button**

Click this button to set the X and the Z offset values.

**Z Offset Minimum value On/Off button**

Click this button to enable the minimum value restriction (100 μm). If the minimum value restriction is disabled, a value less than 100 μm can be set.

2.5 Operation of Each Window

**Contact evasion warning setting area**



This is the area of the User window to enable or disable the Contact evasion warning.

A warning will be issued with this function if two electrodes come into contact while moving manipulators to cell positions.

**On/Off button**

Click this button to enable the Contact evasion warning for electrodes.

■ **Note**

When the needle seems to come in contact while synchronization is operating, the message of attention is displayed, and the synchronization operation is released.

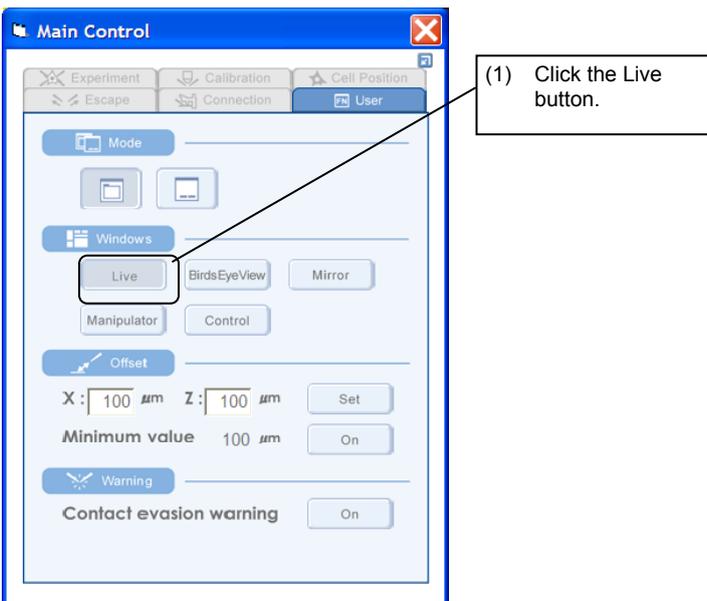
**Caution:**

When the needle is move manually, the message of attention is not displayed.

**2.5.2 Operation of the Live Display Window**

The Live picture window of the FNMP5 shows the live image taken with a camera. Open the window via the User window of the Main Control window.

**Main Control window**



Click the Live button on the User window of the Main Control window to display the Live picture window.

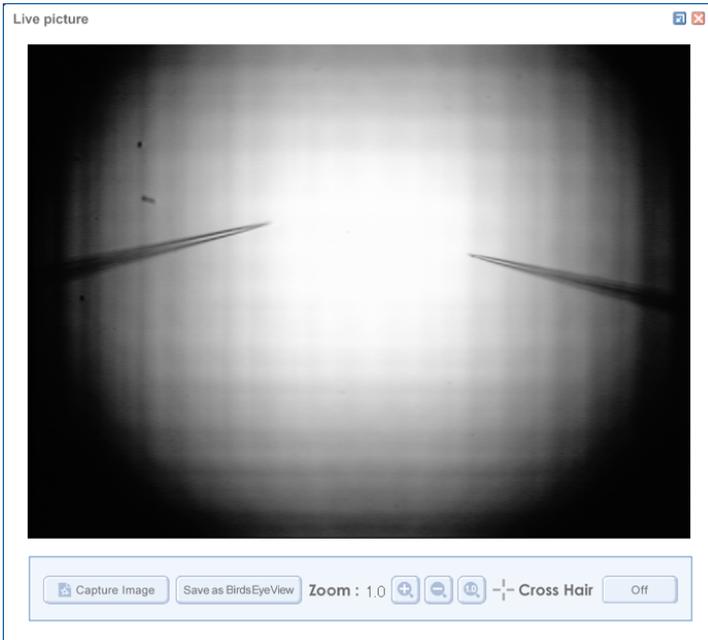
- (1) Click the Live button on the User window of the Main Control window to display the Live picture window.

■ **Note**

If a camera is not connected, connect a camera on the Connect window of the Main Control window.

2.5 Operation of Each Window

**Live picture window**



The following operations are performed on the Live picture window; saving images, saving Birds Eye View background, performing digital zoom, and setting display of the image center.

**Capture Image button**

Click this button to save the current image.

**Save as Birds Eye View button**

Click this button to save the image as Birds Eye View background.

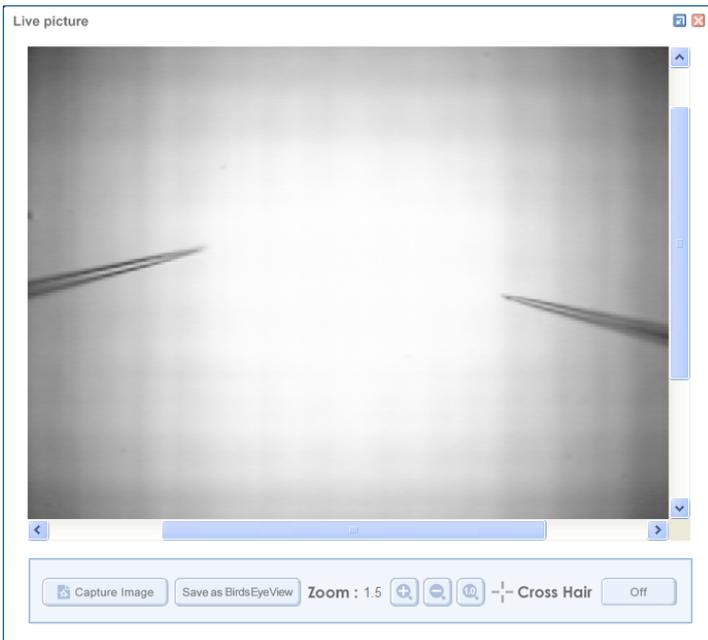
**Zoom +/-1.0 buttons**

Click these buttons to perform digital zoom. The current magnification is shown.

**Cross Hair button**

Click this button to display cross hairs at the center of the image.

**Live picture window: Zoom condition**



■ Note

The Save as Birds View button is enabled only when the magnification is 0.35x.

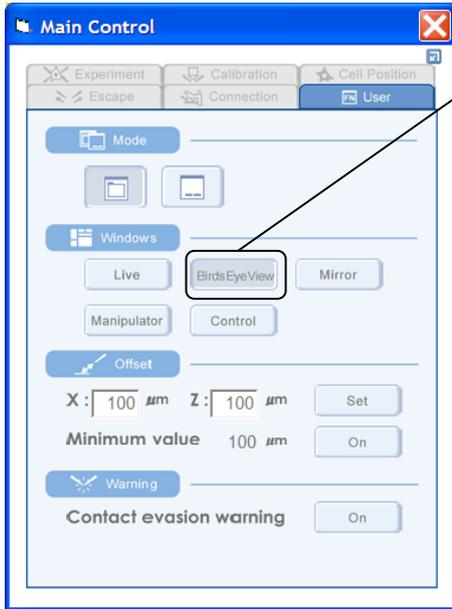
■ Note

The zoom range is from 1x to 3x. When the image is zoomed, a scroll bar appears on the right side and the bottom. With these bars, display position of the image can be changed.

### 2.5.3 Operation of the Birds Eye View Window

The Birds Eye View window of the FNMP5 shows current position and setting information of an electrode or a viewfield. Open the window via the User window of the Main Control window.

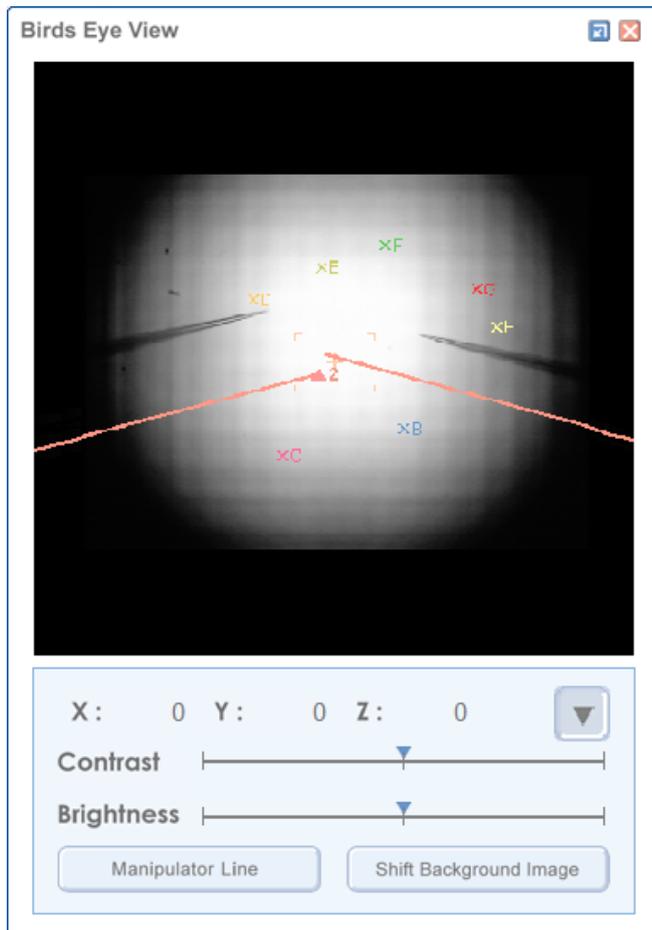
#### Main Control window



Click the Birds Eye View button on the User window of the Main Control window to display the Birds Eye View window.

(1) Click the Birds Eye View button on the User window of the Main Control window to display the Birds Eye View window.

## 2.5 Operation of Each Window

**Birds Eye View window**

The following operations are performed on the Birds Eye View window; displaying the birds eye view, displaying the current viewfield coordinates, changing background contrast, changing background brightness, and displaying an electrode of the manipulator.

**Birds Eye View**

An electrode position is shown in the viewfield as a number, 1 to 4. When an up-arrow or down-arrow is displayed at the electrode position, it indicates the electrode tip vertical position compared with the focal plane. When the electrode locates at the height of the focal plane, a circle is displayed. A cell position is displayed as a character of A to H. The viewfield area is indicated around the cross hairs.

 Details setting button

Use this button to show a setting area for the contrast, the brightness, and the display of electrodes of the manipulator. This button switches the size of display and shows the setting area.

**Contrast scroll bar**

Use this bar to adjust the background contrast.

**Brightness scroll bar**

Use this bar to adjust the background brightness.

**Manipulator Line button**

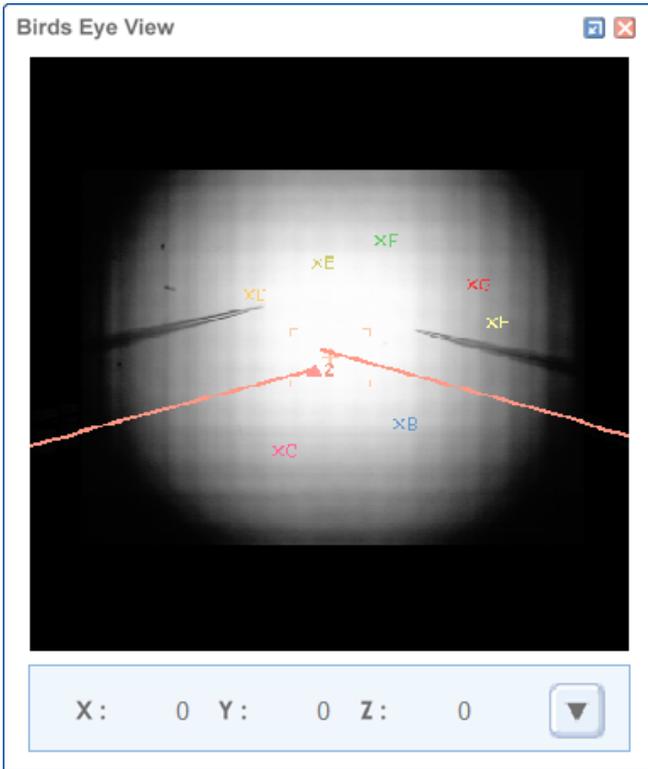
Click this button to display lines of electrodes of the manipulator.

**Shift Background Image button**

It is a function to change the center of the background image. The center of the background image can be changed by clicking the desirable center point while pushing the button.

2.5 Operation of Each Window

**Birds Eye View : Birds Eye View window: mini condition**



■ Note

The Save as Birds Eye View button is enabled only when the magnification is x0.35.

■ Note

If the magnification of the FN is changed to x0.35, the view field does not change but the view field area before the magnification change to x0.35 remains in the display.

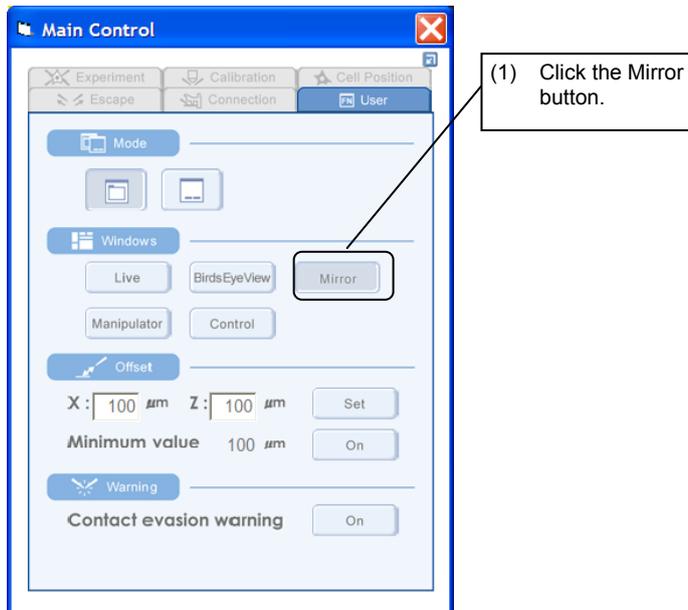
Caution:

The gap is caused in the Birds Eye View display window depending on the state of the calibration. Please continue while confirming it.

### 2.5.4 Operation of the Mirror Controller Window

The Mirror controller window of the FNMP5 is used to move the viewfield. Open the window via the User window of the Main Control window.

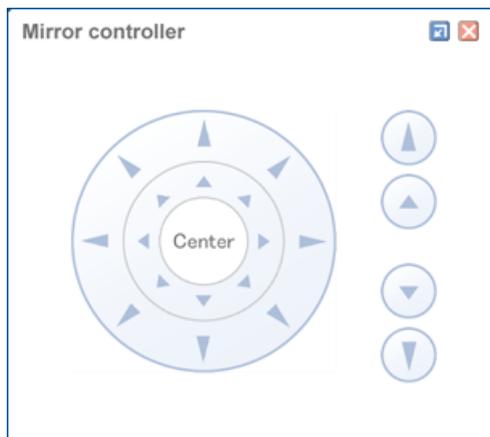
#### Main Control window



Click the Mirror button on the User window of the Main Control window to display the Mirror controller window.

(1) Click the Mirror button on the User window of the Main Control window to display the Mirror controller window.

#### Mirror controller window



On the Mirror controller window, the viewfield is moved in the X-, Y-, and Z-directions.

#### XY buttons

Use these buttons to move the viewfield in eight directions on the X-Y plane. Click Center to move the viewfield to the position of origin. (X, Y) = (0, 0).

#### Z button

Click this button to move the viewfield in the vertical direction.

#### ■ Note

When the magnification is x0.35, the XY buttons are disabled.

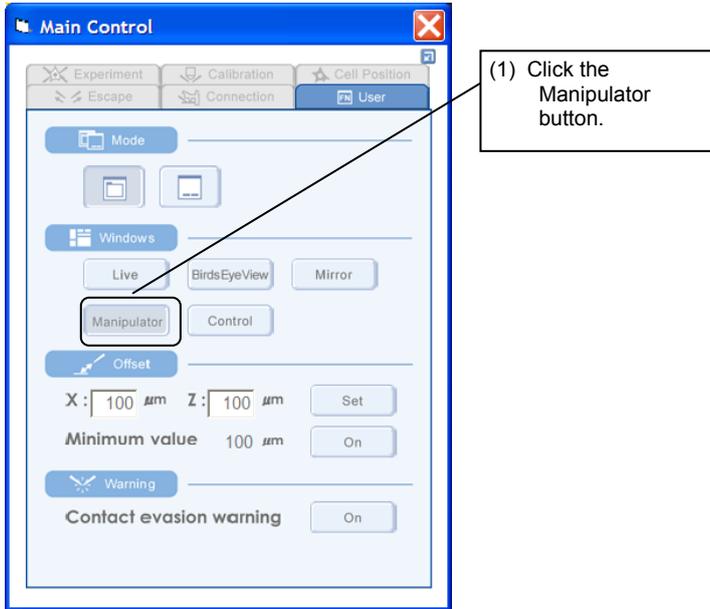
#### ■ Note

When the FN is connected, the XY buttons are enabled. When a motor is connected, the Z button is enabled.

**2.5.5 Operation of the Manipulator Information Window**

The Manipulator information window of the FNMPS shows the calibration information of the manipulators. Open the window via the User window of the Main Control window.

**Main Control window**



Click the Manipulator button on the User window of the Main Control window to display the Manipulator information window.

- (1) Click the Manipulator button on the User window of the Main Control window to display the Manipulator information window.

**Manipulator information window**

The screenshot shows the 'Manipulator information' window. It contains a table with four rows, one for each manipulator (#1 to #4). Each row has a 'Calibration' column and a 'Re-Calibration' column. The 'Calibration' column contains the date and time of the last calibration. The 'Re-Calibration' column is currently empty for all manipulators.

Manipulator	Calibration	Re-Calibration
#1	06/11/09 14:58	06/11/09 18:03
#2	06/11/09 14:52	
#3	06/11/09 14:55	
#4		

The Manipulator information window shows the calibration and re-calibration information of the manipulators.

**Calibration column**

Calibration date and time of the manipulator is shown in this column.

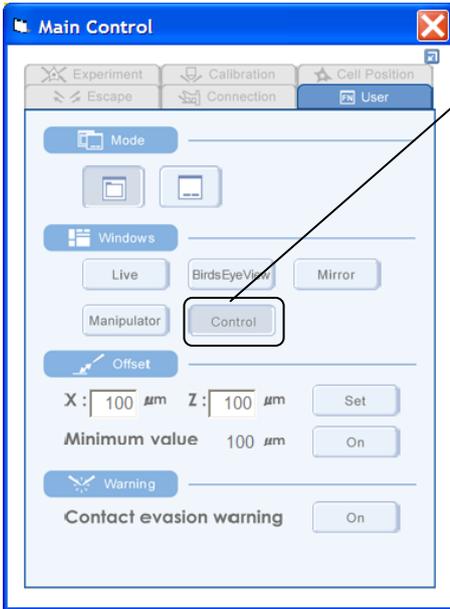
**Re-Calibration column**

Re-calibration date and time of the manipulator is shown in this column.

**2.5.6 Operation of the FN Control Window**

The FN Control window of the FNMP5 is used to control the FN. Open the window via the User window of the Main Control window.

**Main Control window**



(1) Click the Control button.

Click the Control button on the User window of the Main Control window to display the FN Control window.

(1) Click the Control button on the User window of the Main Control window to display the FN Control window.

**FN Control window**



The FN Control window is used to switch the magnification and to turn on or off the FN motor.

**Magnification button**

Click a magnification button to switch to the magnification indicated on the button.

**Motor On and Off buttons**

Click these buttons to turn on or off the FN motor. When the FN motor is turned off, the FN does not work.

# 3

## How to Use FNMPs

This chapter explains basic use of FN Multi Patch System.

### 3.1

#### To use of the FNMPs

This section indicates the main intended applications of the FNMPs including required settings.

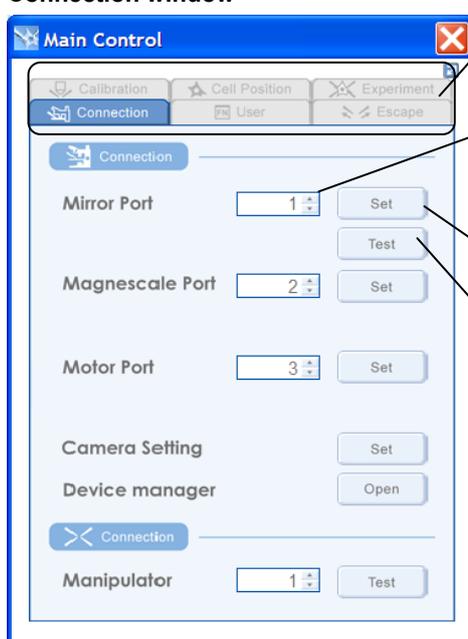
Before starting up the FNMPs, connect the PC and the microscope system with the USB cable or the COM cable, and turn on all power switches of the microscope system.

#### 3.1.1

#### Connection

Before starting up the FNMPs, connect all devices.

##### Connection window



(1) Click the Connection tab.

(2) Select a port number to connect a device.

(3) Connect a device and a port.

(4) Test the connection.

(1) Click the Connection tab on the top of the Main Control window to display the Connection window.

(2) Select a port number to connect a device.

(3) Click the Set button to connect the device and the port.

(4) When no error message appears, click the Test button to check the connection. (Mirror: magnification change, Magnescale: comparison with indicated value, Motor: fine movement, Manipulator: fine movement)

##### ■ Note

If an appropriate port for connection is unknown, click the Open button of the Device manager to open the Device Manager window, click the plus sign next to the Port (COM and LPT) node, and check the communication port.

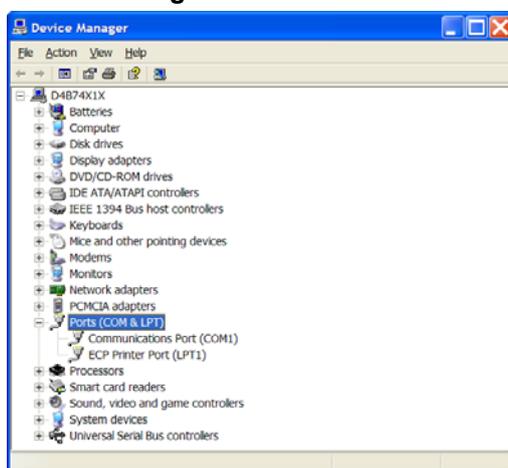
##### ■ Note

Manipulators are connected at the startup procedure. Click the Test button to finely move the manipulator for testing connection.

##### ■ Note

When the Set button of the Camera Setting is clicked, new window opens. Set up the camera in the window.

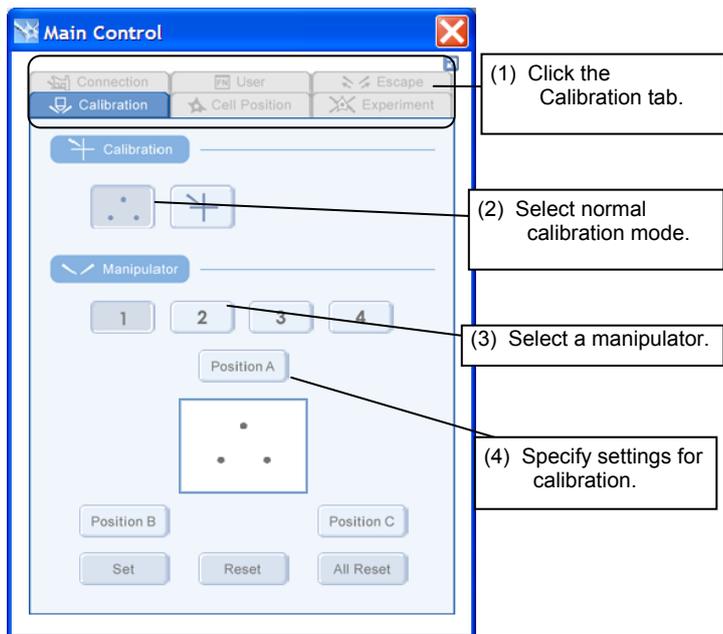
##### Device Manager window



**3.1.2 Position Calibration for Electrodes (Normal Calibration)**

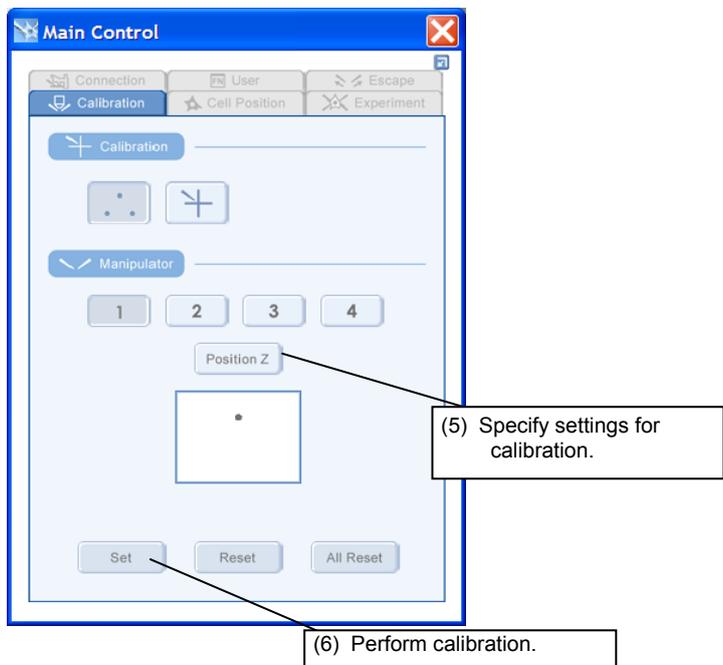
The electrodes of manipulators must be calibrated for their position on the microscope system. After the calibration, the electrodes positions indicated in the Birds Eye View window come to the correct positions.

**Calibration window**



- (1) Click the Calibration tab on the top of the Main Control window to display the Calibration window.
- (2) Select normal calibration mode to perform the normal calibration.
- (3) Select a manipulator to be calibrated.
- (4) Place the tip of the electrode at the center of the cross hairs on the live display and click the Position button of the position.
- (5) Repeat the positioning for Position A, B, and C. And then, move up the objective and perform position calibration for the Z-coordinate.
- (6) When all position settings are complete, the calibration procedure is ready. Click the Set button to start the calibration.

**Calibration window : Position Z**



- Note
 

If a motor is connected, the objective automatically moves up when positioning for the Z-coordinate. After that, please move the manipulator (not object lens) so that the needlepoint is in focus at cross hairs (calibration position) display position.

- Note
 

On the live display of the Calibration window, cross hairs (calibration position) are automatically displayed.

**Caution:**

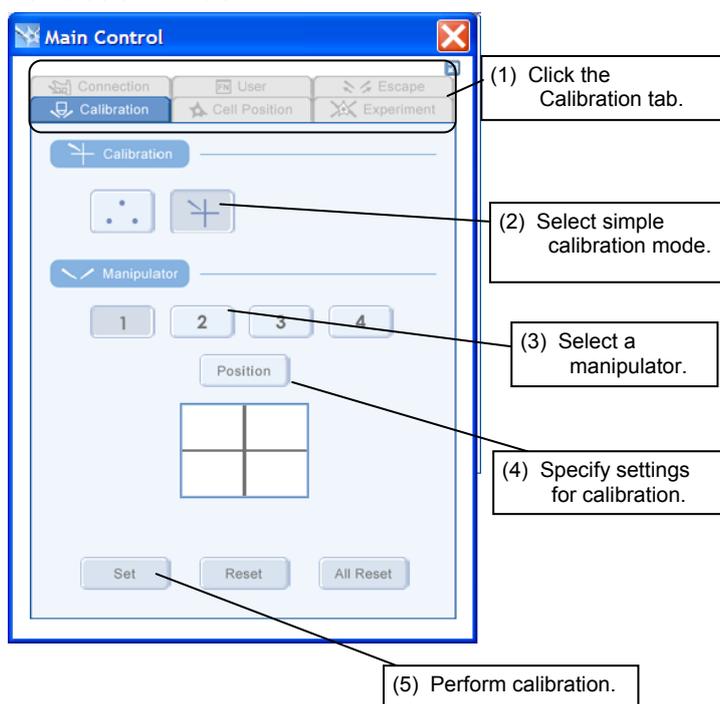
If the Set button is not pushed, the calibration setting is not reflected. Please set the Set button pushing.

### 3.1.3 Position Calibration for Electrodes (Simple Calibration)

The electrodes of manipulators must be calibrated for their position on the microscope system. After the calibration, the electrodes positions indicated in the Birds Eye View window come to the correct positions.

The simple calibration is useful in such a case that the manipulator body is not moved but the electrode is replaced after the normal calibration. If the manipulator body is moved, perform the normal calibration.

#### Calibration window



- (1) Click the Calibration tab on the top of the Main Control window to display the Calibration window.
- (2) Select the simple calibration mode to perform the simple calibration.
- (3) Select a manipulator.
- (4) Place the tip of an electrode at the center of the cross hairs on the live display and click the Position button of the place.
- (5) When all position settings are complete, the calibration procedure is ready. Click the Set button to start the calibration.

■ Note

The simple calibration can be applied only for the manipulator calibrated with the Normal calibration.

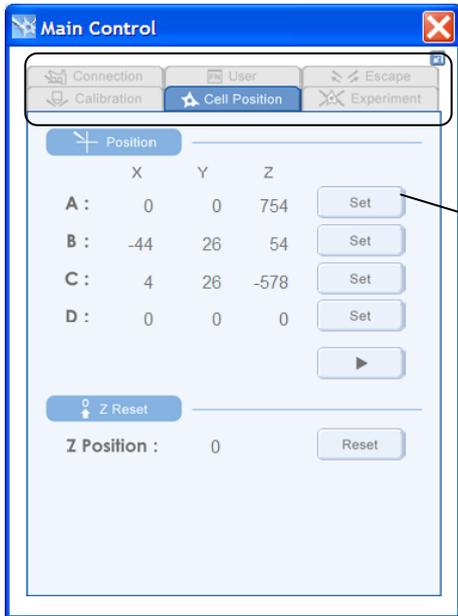
■ Note

On the simple calibration mode, cross hairs are automatically displayed on the live display of the Calibration window indicating the calibration position.

**3.1.4 Viewfield Movement to Cell Positions**

The viewfield can be moved to a cell position when some positions are set as described in this section. Up to eight positions can be set for the destination of the movement.

**Cell Position window**



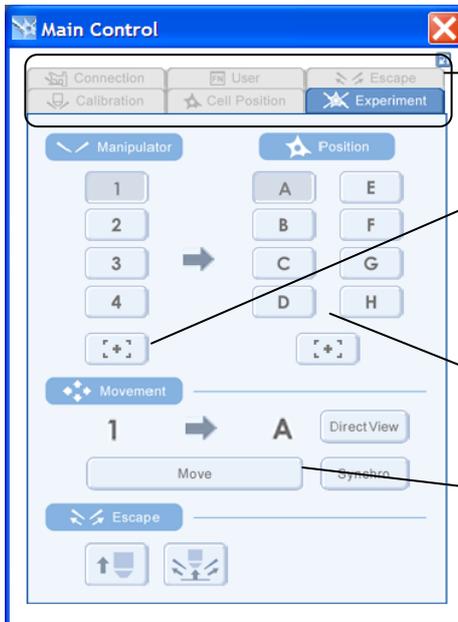
(1) Click the Cell Position tab.

(2) Move the viewfield and click the Set button.

- (1) Click the Cell Position tab on the top of the Main Control window to display the Cell Position window.
- (2) Move the viewfield manually so that its center is placed at the target cell position. Click the Set button to accept the setting.

■ Note  
Up to eight cell positions (A to H) can be set.

**Experiment window**



(3) Click the Experiment tab.

(4) Click the viewfield button to move.

(5) Select a cell position as a destination.

(6) Click the Move button.

- (3) Click the Experiment tab on the top of the Main Control window. The Experiment window appears.
- (4) Click the viewfield button.
- (5) Select a cell position as the destination.
- (6) Click the Move button to move the viewfield automatically.

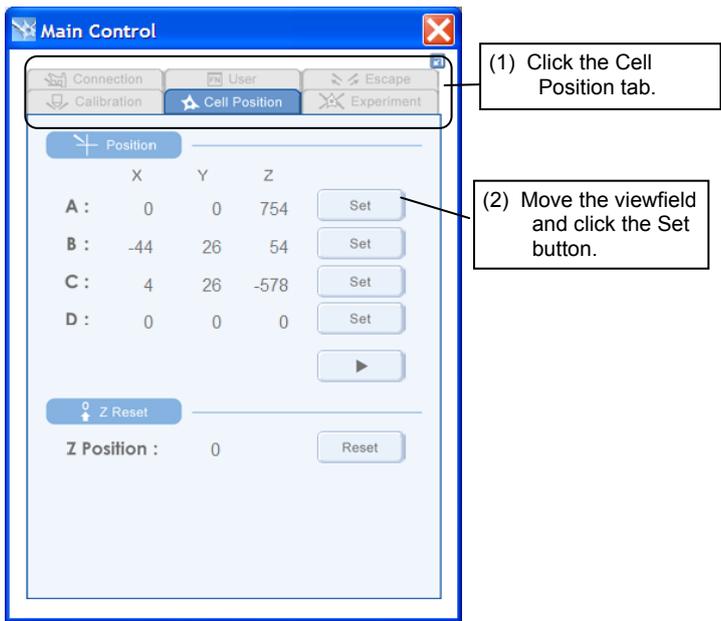
■ Note  
When the Direct View is turned on, the viewfield moves automatically without the Move button operation.

■ Note  
When the magnification is x0.35, the viewfield does not move.

### 3.1.5 Electrode Movement to Cell Positions

An Electrode can be moved to a cell position when some positions are set as described in this section. Up to eight positions can be set for the destination of the movement. To move an electrode with this function, it must be calibrated beforehand.

#### Cell Position window

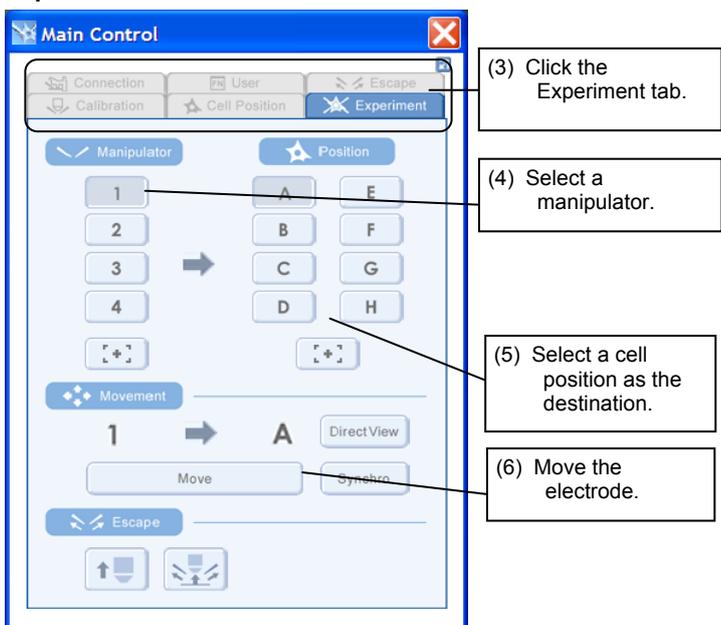


- (1) Click the Cell Position tab on the top of the Main Control window to display the Cell Position window.
- (2) Move the viewfield manually so that its center is placed at the target cell position. Click the Set button to accept the setting.

■ Note

Up to eight cell positions (A to H) can be set.

#### Experiment window



- (3) Click the Experiment tab on the top of the Main Control window. The Experiment window appears.
- (4) Select a manipulator to move.
- (5) Select a cell position as the destination.
- (6) Click the Move button to move the electrode.

■ Note

After the movement of the electrode, the viewfield button is selected.

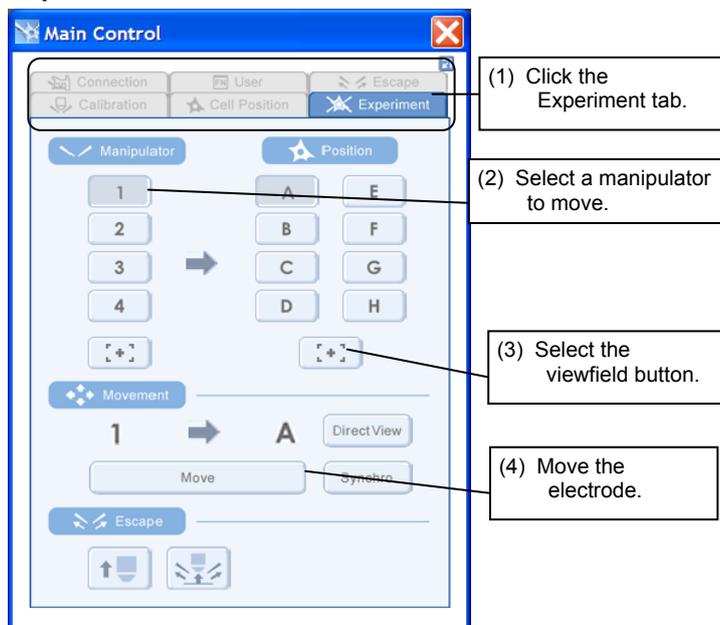
Caution:

Do not select and move the manipulator that has not calibrated yet.

### 3.1.6 Electrode Movement to the Viewfield

An Electrode can be moved into the viewfield. To move an electrode with this function, it must be calibrated beforehand.

#### Experiment window



- (1) Click the Experiment tab on the top of the Main Control window. The Experiment window is displayed.
- (2) Select a manipulator to move.
- (3) Select the viewfield button.
- (4) Click the Move button to move the electrode.

#### ■ Note

After the movement of the electrode, the viewfield button is selected.

#### Caution:

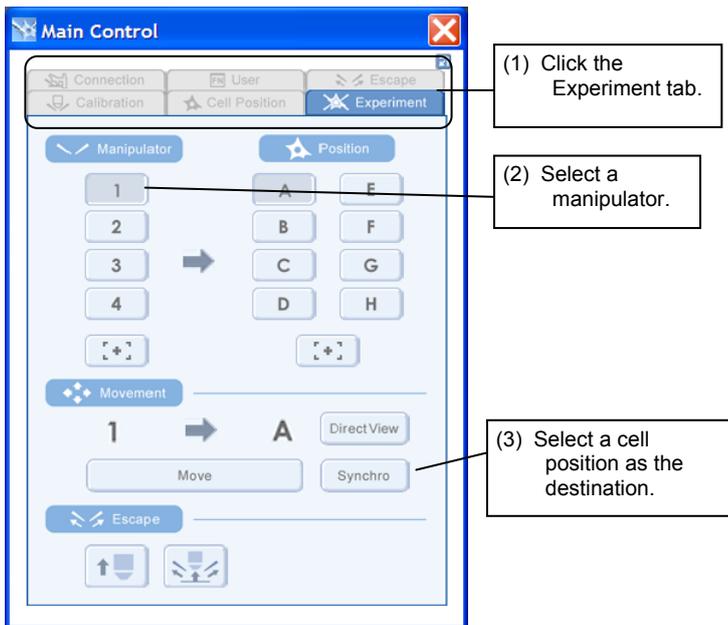
Do not select and move the manipulator that has not calibrated yet.

## 3.1.7

## Synchronization Between an Electrode and the Viewfield

An electrode can be moved interlocked with the viewfield operation. Move the viewfield manually. The electrode moves in synchronization with the viewfield. To use this function, the electrode must be calibrated beforehand.

## Experiment window



(1) Click the Experiment tab on the top of the Main Control window. The Experiment window appears.

(2) Select a manipulator to move.

(3) Click the Synchro button. And then move the viewfield manually.

■ Note

Other operations are disabled when this function is used. Turn off the Synchro button and then perform other operations.

■ Note

The position of the needle shifts according to the state of the calibration while synchronization is operating. In that case, please return the needle to the position of hope and continue the synchronization operation. Moreover, there is a possibility that warning of the contact evasion etc. is displayed according to the state of the calibration.

■ Note

When the needle seems to come in contact while synchronization is operating, the message of attention is displayed, and the synchronization operation is released.

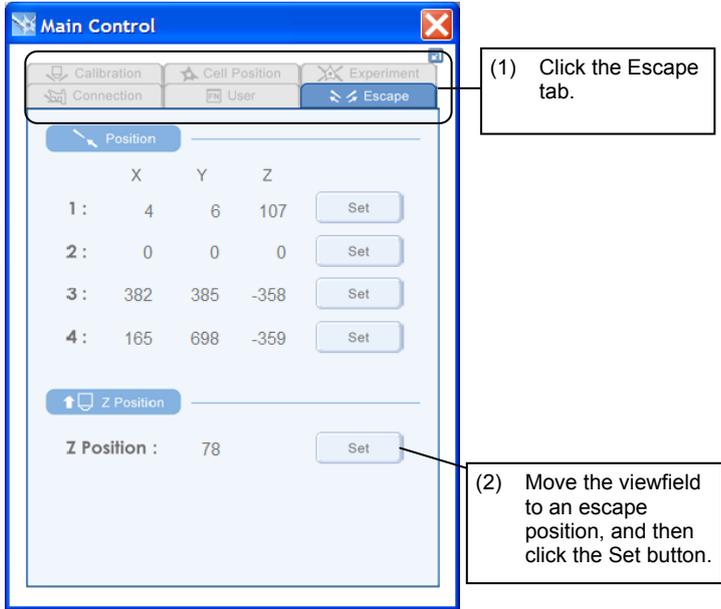
Caution:

Do not select and move the manipulator that has not calibrated yet.

**3.1.8 Viewfield Retraction**

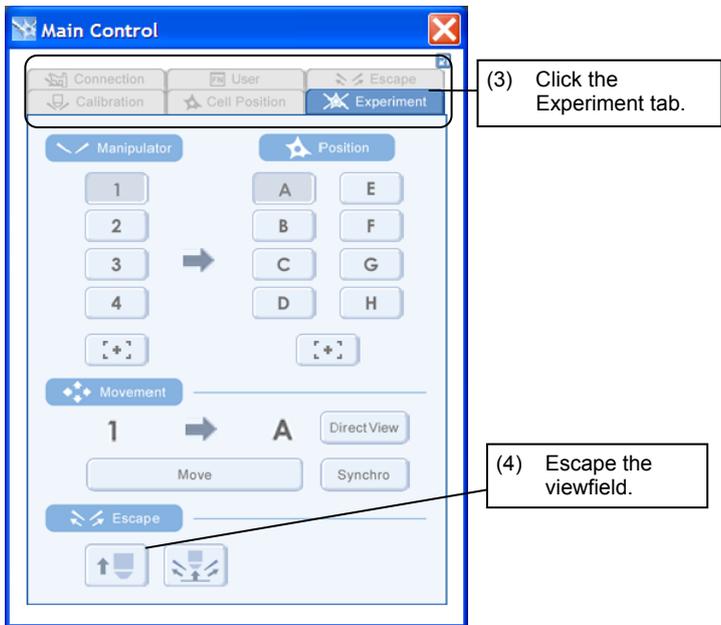
The objective can be retracted to a predetermined position. This function is available when a motor and a magescale are attached.

**Escape window**



- (1) Click the Escape tab on the top of the Main Control window to display the Escape window.
- (2) Move the viewfield to an escape position and click the Set button to set the position.

**Experiment window**



- (3) Click the Experiment tab on the top of the Main Control window. The Experiment window is displayed.
- (4) Click the escape mode (left button) to escape the viewfield.

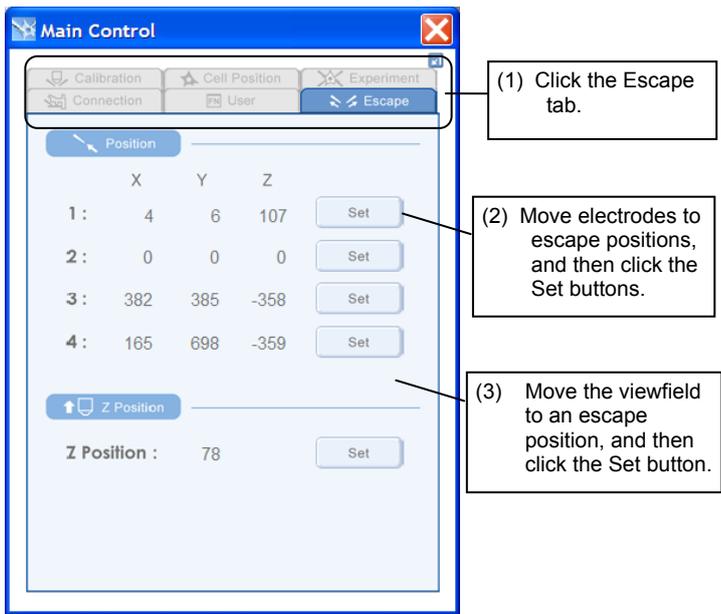
■ Note

This function is available when a motor and a magescale are attached.

**3.1.9 Viewfield and Electrodes Retraction**

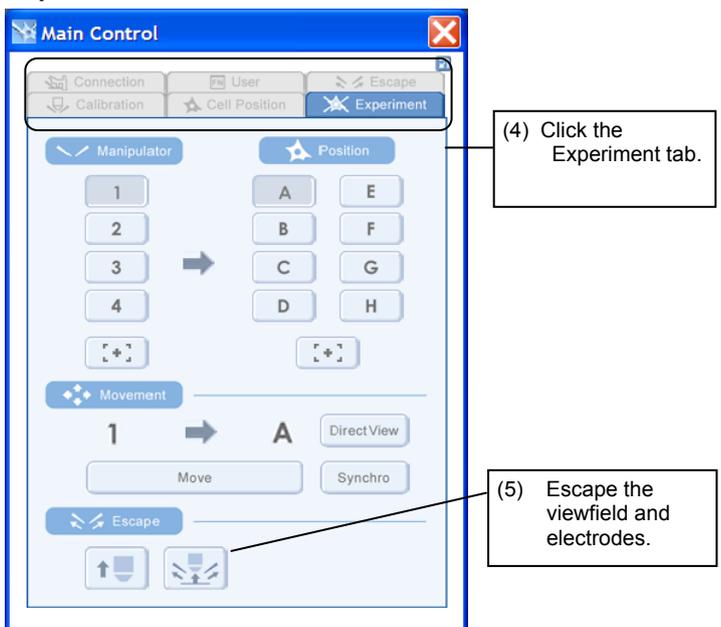
The objective and electrodes can be retracted to predetermined positions. This function is available when a motor and a magnescale are attached. Note that only the calibrated electrodes are retracted with this function.

**Escape window**



- (1) Click the Escape tab on the top of the Main Control window to display the Escape window.
- (2) Move electrodes to escape positions, and then click the Set buttons to set the positions.
- (3) Move the viewfield to an escape position and click the Set button to set the position.

**Experiment window**



- (4) Click the Experiment tab on the top of the Main Control window. The Experiment window is displayed.
- (5) Select the escape mode (right button) to escape the viewfield and electrodes.

■ Note

This function is available when a motor and a magnescale are attached.

Caution:

Do not select and move the manipulator that has not calibrated yet.

## Troubleshooting

### 1. What is the Calibration method?

Calibration is a process to match XYZ coordinates of the manipulator and the microscope. For calibration method (page27 to page29), please move the electrode to the center of the cross hair displayed on the Live screen and focus it at the needlepoint. Please do not move view while calibrating. Please follow this procedure at four points for the normal calibration and one point for the simple calibration. Please make sure to click the Set button when setting at all points are completed. Please install the camera so that the top of camera is placed on the eyepiece side. (Please see the FNMPs manual for detail.) In case it is wrongly installed, calibrations will be registered improperly and electrodes might contact with the surroundings causing damages.

### 2. Position of the needlepoint cannot be displayed correctly.

Position of the needle is displayed after calibration. When it is not displayed in the Birds Eye View even if the calibration is completed and the needlepoint is put within the visual field, please execute the normal calibration again.

### 3. Re-calibration cannot be done correctly

Re-calibration is the work that can be done to the electrode that was calibrated once. It is normally done at the time of changing the electrode. Please move the needlepoint to the center of the Live screen and calibrate. Please do the normal calibration over again when factors other than the electrode, including the Manipulator installation position or angles, have been changed while exchanging the electrode.

### 4. Synchronization operation cannot be done.

In Synchronization, the electrode moves when view is moved. View doesn't move even if the electrode is moved. Please note that the needle outside the view is also synchronized. The gap might be caused during operation although synchronization is done by using calibration information. When the electrode is shifted, please return it to the desirable position manually.

### 5. Background of the Birds Eye View display window is shifted.

The gap can be corrected by moving the background of the birds eye view window. Please click the desirable position for the center of the background while pushing the Shift Background Image button (P37) in the birds eye view window. Adjust the view to the center position (position of  $X=0$  and  $Y=0$ ) with  $x2.0$ . Move the needle so that it is in focus, change it to  $x0.35$ , and save the background. Move the center for that background. With this process, the gap of the background can be corrected more accurately.

### 6. Electrode does not move to the specified position.

For moving the electrode, please select CellPosition and Manipulator on the experiment screen and use the Move button. It moves to the position by shifting by the same amount as the offset specified in the User window. Please confirm the calibration when it does not move to the right place. Moreover, please invalidate the offset limit by setting the offset to 0 when the offset is unnecessary.