Nikon

ECLIPSE-*i* Series Microscopes

i Series Support Tools

(Software for ECLIPSE-*i* series microscopes)

Software Manual

Introduction

Thank you for purchasing this Nikon product.
This manual describes how to install and use the Nikon i Series Support Tools software for
ECLIPSE-*i* series microscopes. To ensure correct use, please read this manual carefully before
operating the product.
Refer to the hardware manual for detailed information on how to connect your microscope and
discussions of the system configuration.

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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, errors or inconsistencies may remain. If you note any points that are unclear or incorrect, please contact your nearest Nikon representative.

- Some of the equipment described in this manual may not be included in the set you have purchased.

- If you intend to use any other equipment with this product, read the manual for that equipment too.

- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

■ 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

In this manual, OS screens with different themes are used together.
Although the appearance of the screen differs between "Windows 7 Basic" and "Windows Classic", the operational procedures are the same.

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■ Disclaimer

Nikon shall not be liable for any damages and problems on user side or on a third-party side, which may result from the use of this software.

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1 Preparations

This chapter describes hardware and software requirements for Nikon i Series Support Tools and how to install and uninstall the software.

1.1 Hardware and Software Requirements

Caution

- **Before installing Nikon i Series Support Tools, confirm that your PC meets the minimum requirements given below for memory and available hard disk space.**

- **Install the application before connecting your PC and microscope system (90i, DIH-E/M).**

PC main unit

Item	Specifications
CPU	Processor of 1 GHz or higher
Memory	1 GB or more (for 32-bit OS)/2GB or more (for 64-bit OS)
Hard disk	100 MB or more free space
Video RAM	128 MB or more
OS	Windows 7 Professional SP1 or later (32-bit/64-bit, Japanese or English version)
Other	"Nikon i Series Support Tools" can be downloaded from the website. "Nikon i Series Support Tools" is not guaranteed to be compatible with all PCs. Please contact your distributor for detailed compatibility information.

Display

Item	Specifications
Resolution	1,024 x 768 pixels. A monitor/video card capable of True Color output is recommended.

1.1   Hardware and Software Requirements

| 1.1.1 | Checking Available RAM |

Check the amount of available RAM in the System Properties dialog box.

[Memory requirements] There must be at least 1 GB (32-bit OS) or 2 GB (64-bit OS).

Procedure

▼ **Start menu**
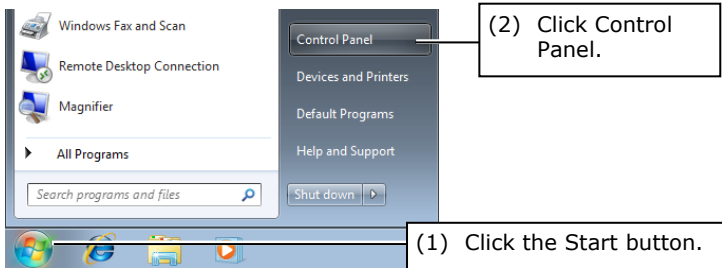
(2) Click Control Panel.

(1) Click the Start button.

(1) Click the Start button.

(2) Click Control Panel to display the Control Panel window.

▼ **Control Panel window**

(3) Double-click the System icon.
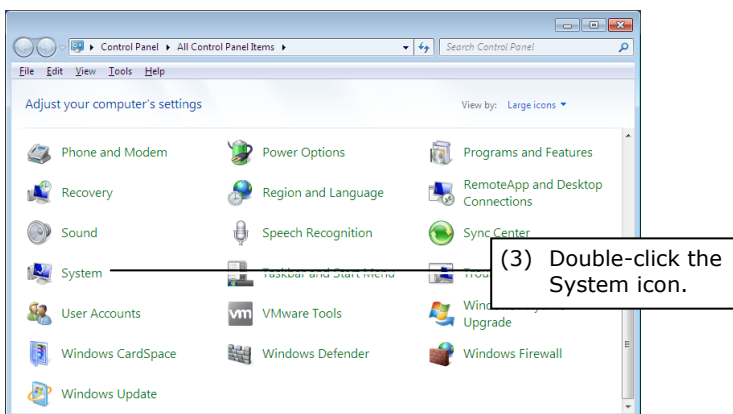
(3) Double-click the System icon in the Control Panel window.
The System Properties dialog box appears.

This figure shows the Control Panel window when Large icons is selected as the view method.

▼ **System Properties dialog box**

(4) Check the installed memory here.

(5) Click the Close button.
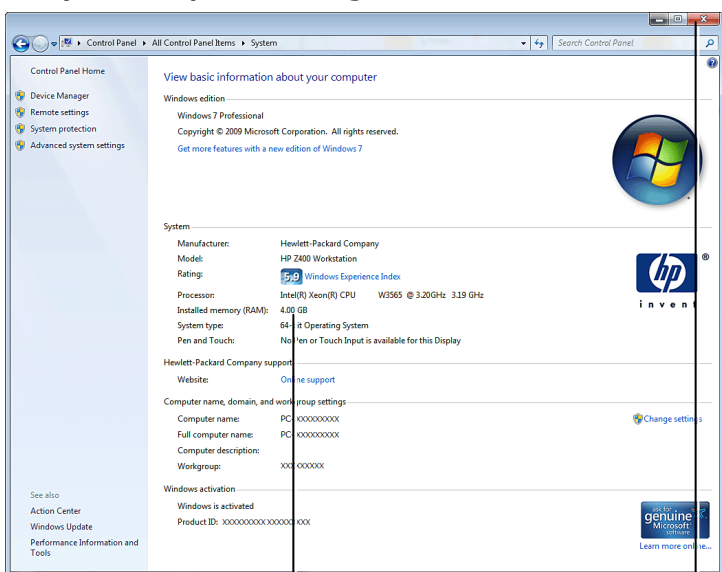
(4) Check the System Properties dialog box that installed memory for 32-bit OS is at least 1 GB or installed memory for 64-bit OS is at least 2 GB.

(5) Click the Close button to close the System Properties dialog box.

| 1.1.2 | Checking the Free Hard Disk Space |

Check the amount of free space on the hard disk in the Computer window.
If there is insufficient free space on the hard disk, increase the available free space by uninstalling any unnecessary applications.

[Hard disk] The hard disk must have at least 100 MB of free space.

Operating Procedure

▼ **Desktop**
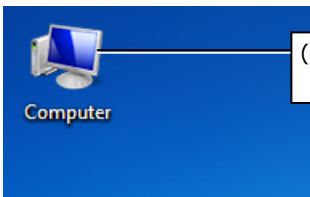
(1) Double-click the Computer icon.

(1) Double-click the Computer icon on the desktop.
The Computer window appears.

▼ **Computer window**
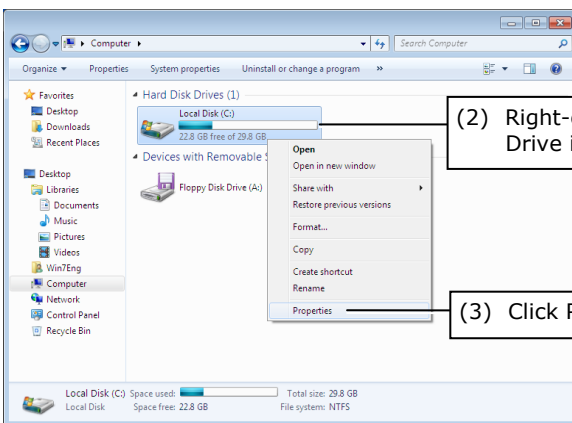
(2) Right-click on the Drive icon.

(3) Click Properties.

(2) Right-click on the Drive icon in the Computer window for the drive on which you want to install the application.

(3) Click Properties in the Shortcut menu.
The Properties dialog box for the selected drive appears.

▼ **Local Disk Properties dialog box**
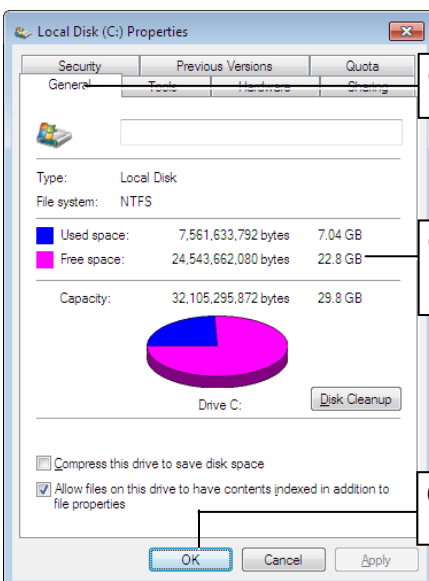
(4) Click the General tab.

(5) Check the free space on the hard disk.

(6) Click OK or Cancel button.

(4) Click the General tab of the Properties dialog box.

(5) Check that at least 100 MB of free space is available on the hard disk.

(6) Click OK or Cancel button to close the Properties dialog box.

1.2   Installing the Application

This section describes how to install the Nikon i Series Support Tools.

CAUTION

- **Install the application before connecting the microscope system to the PC.**

- **To install the Nikon i Series Support Tools, you must login to your PC with a user account with Administrator rights.**

1.2.1   Closing All Other Applications

Before installing the Nikon i Series Support Tools, close all background programs such as the screensaver and anti-virus utility.

Closing the screen saver

▼ **Shortcut menu on the desktop**

(1) Right-click on the desktop.

(2) Click Personalize.
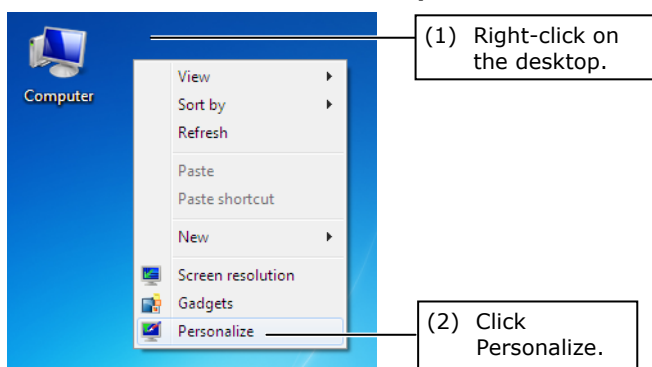
(1)   Right-click on the desktop to display a Shortcut menu.

(2)   Click Personalize in the shortcut menu. The Personalization dialog box appears.

▼ **Display Personalization dialog box**

(3) Click the Screen Saver.
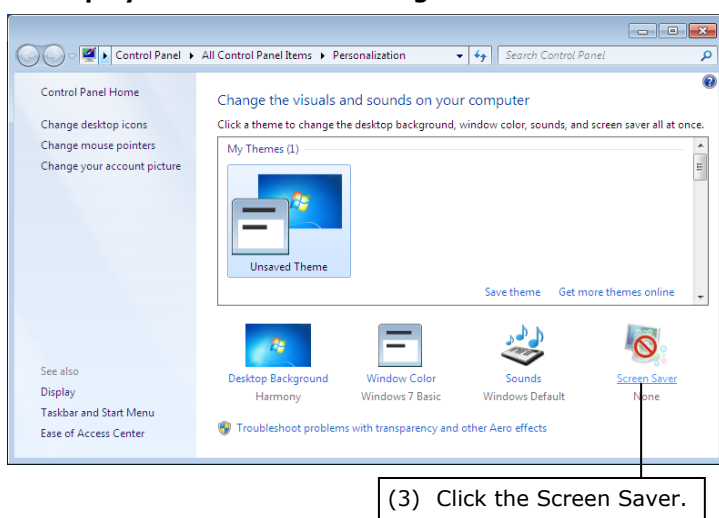
(3)   Click Screen Saver in the Personalization dialog box.
The Screen Saver Settings dialog box appears.

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1.2　Installing the Application

▼ **Screen Saver Settings dialog box**

(4) In the Screen Saver Settings dialog box, select "(None)" from the Screen saver pulldown menu.
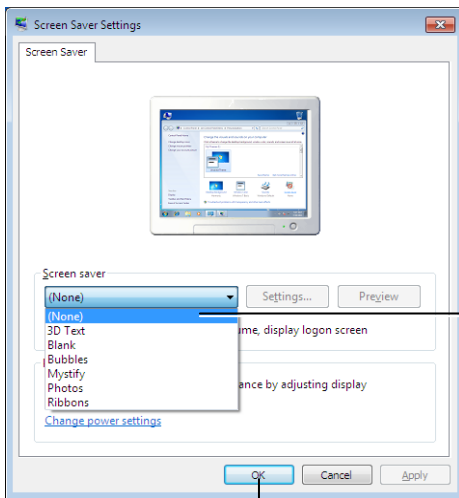
(5) Click OK button.

(4)　Select "(None)."

(5)　Click the OK button.

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1.2.2	Executing the Setup Wizard

To install the application software, execute the installer (setup.exe) downloaded from the website, then follow the on-screen instructions.

> **CAUTION**
>
> - **To install the Nikon i Series Support Tools, you must login as Administrator.**
>
> - **For information on uninstalling the Nikon i Series Support Tools, refer to Section 1.3, "Uninstalling the Application."**

Executing the setup wizard

▼ **Executing the Setup Wizard**

(1)   Double-click the Setup icon.
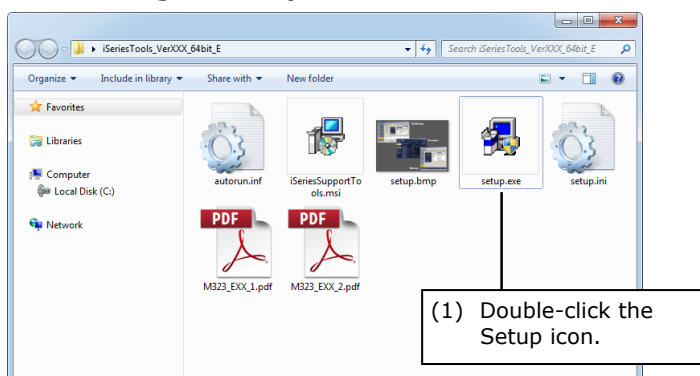
(1) Double-click the setup.exe file in the folder for the installer downloaded from the website. The Setup wizard startup dialog box appears.

▼ **User Account Control dialog box**

(2)   Click the [Yes] button
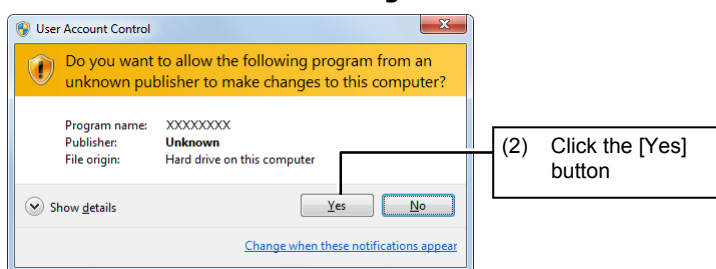
(2) If the User Account Control dialog box appears, click Yes button and then the installation starts.

▼ **User Account Control dialog box**

(3)   Select [Install Nikon i Series Support Tools].
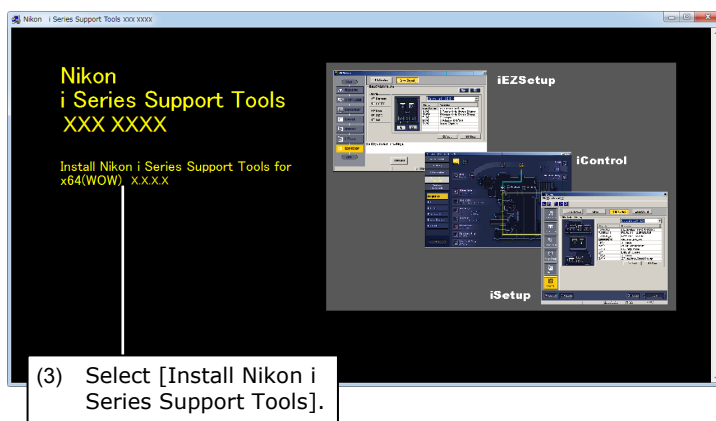
(3) Select "Install Nikon i Series Support Tools X.X.X.X" for 32-bit edition. Select "Install Nikon i Series Support Tools for x64(WOW) X.X.X.X" for 64-bit edition.

("X.X.X.X" varies with the version number.)

The setup wizard starts.

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1.2   Installing the Application

Installation procedure

▼ **Setup wizard startup screen**

(1) Click the Next button
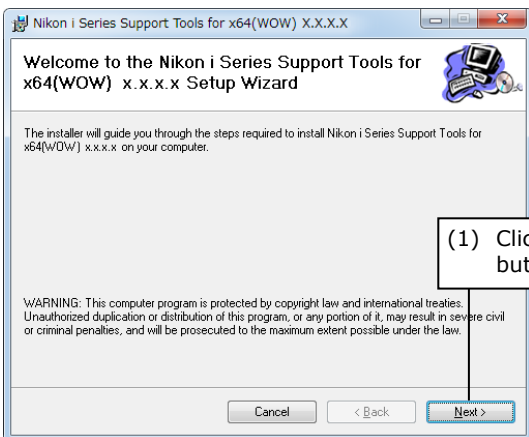
(1) Click the Next button in the Setup wizard startup screen. The Installation folder setup screen appears.

▼ **Installation folder setup screen**
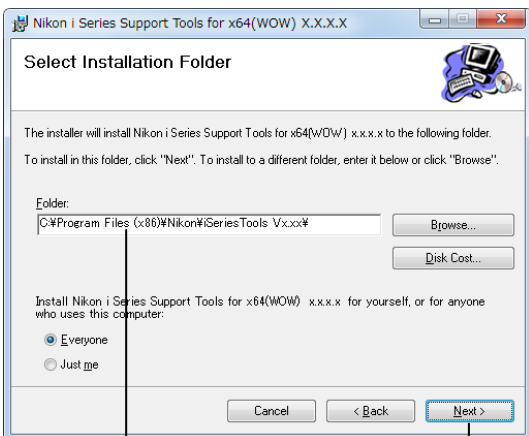
(2) Specify the folder in which to install the application files.

(3) Click the Next button.

(2) In the Installation folder setup screen, specify the folder in which the Nikon i Series Support Tools will be installed.

Shown below is the default installation folder.

For 32-bit: C:\Programs Files\Nikon\ iSeriesTools Vx.xx\

For 64-bit: C:\Programs Files (x86)\ Nikon\iSeriesTools Vx.xx\("VX.XX" varies with the version number.)

To install the software in a different folder, click the Browse... button.

(3) Select a desired folder and then click the Next button.
The Confirmation Installation screen appears.

▼ **Confirmation Installation screen**

(4) Click the Next button.
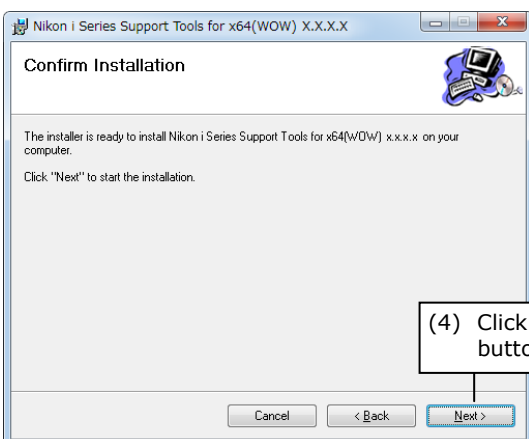
(4) Click the Next button in the Confirmation Installation screen. The software is installed in the specified folder.

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1.2 Installing the Application

▼ **Screen during installation**
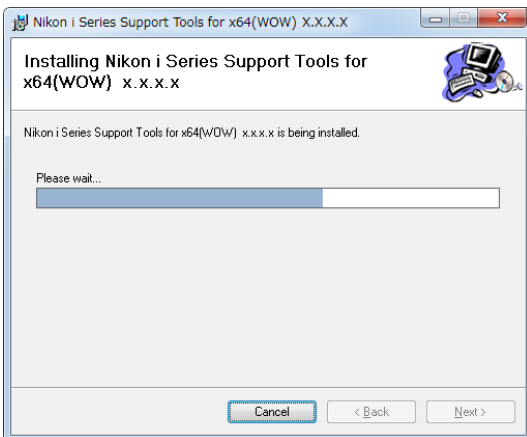
The installation progress dialog box appears.

▼ **Screen when installation is complete**
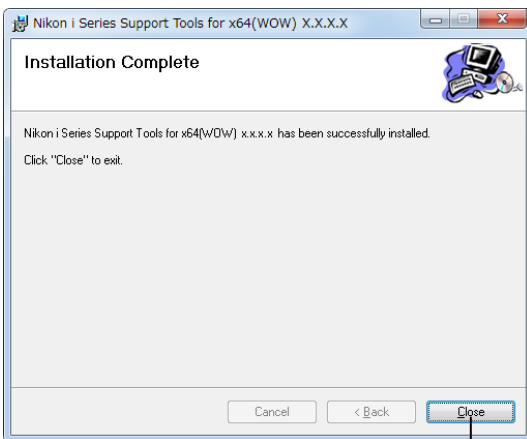
(5) After installing the software, the setup wizard displays the screen shown on the left. Click the Close button to exit the wizard.

The application is now installed.

(5) Click the Close button.

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1.2.3	Installing the Driver

After installing Nikon i Series Support Tools, connect your PC and microscope system with a USB cable.
When the system is connected to the PC for the first time, the driver is installed automatically.

▼ **USB connector**

USB A connector
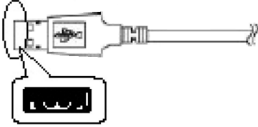
(1) Plug the USB cable's A connector into the port on the PC and the other end into the USB port on the microscope system. The Wizard startup screen appears.

Note: When the 90i is included in the system configuration, plug the other end into the USB connector of the 90i.
When the 80i is used together with the DIH (digital imaging head), plug the other end into the USB connector of the DIH.
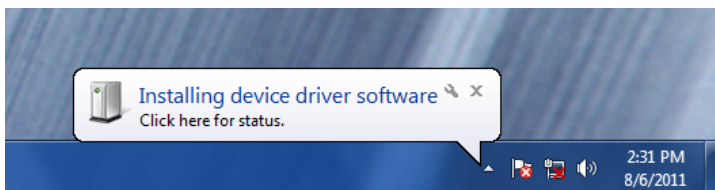
When the system is connected, the installation of the driver automatically starts.
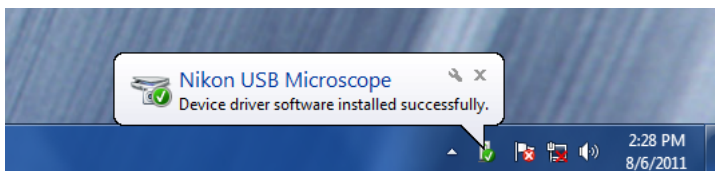
The driver is now installed.

1.3	**Uninstalling the Application**

If you no longer need Nikon i Series Support Tools and wish to uninstall it (remove it from the hard disk), uninstall it using the Programs and Features utility in the Control Panel.

┌─ **CAUTION** ─────────────────────────────────┐

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

└──┘

Uninstalling

▼ **Start menu**
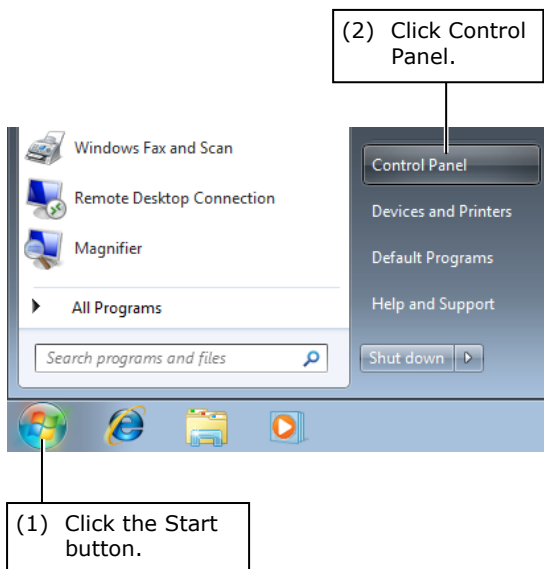
(2)　Click Control Panel.

(1)　Click the Start button.

(1)　Click the Start button.

(2)　Click Control Panel to display the Control Panel window.

▼ **Control Panel window**

(3)　Double-click the Programs and Features icon.
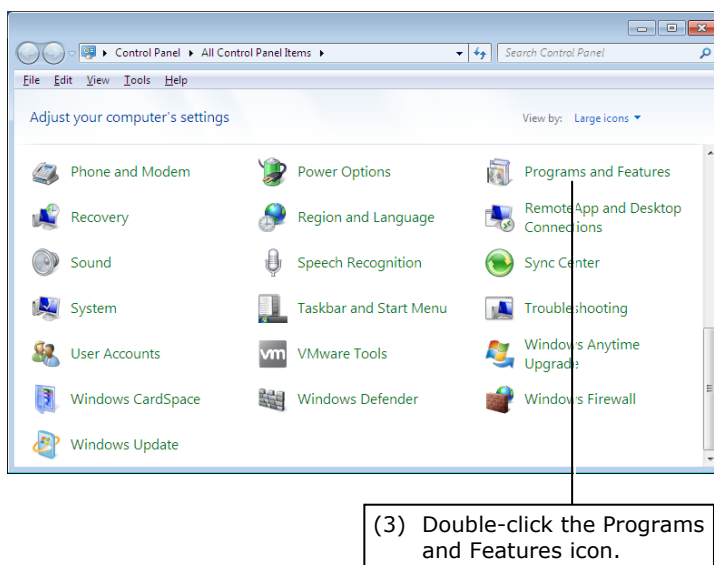
(3)　Double-click the Programs and Features icon in the Control Panel window. The dialog box for selecting a program to uninstall appears.

This figure shows the Control Panel window when Large icons is selected as the view method.

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1.3   Uninstalling the Application

▼ **Dialog box to select programs to be uninstalled**

(4)   Select "Nikon i Series Support Tools."
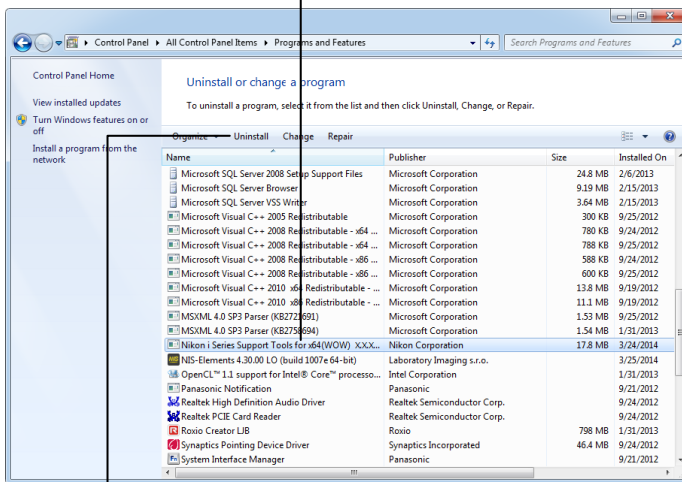
(5)   Click the Uninstall button.

(4) Select Nikon i Series Support Tools from the list in the dialog box.

(5) Click the Uninstall button.

▼ **Programs and Features dialog box**
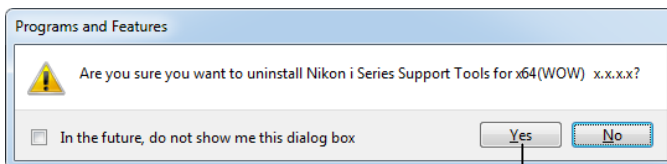
(6)   Click the Yes button.

(6) When the Programs and Features dialog box appears, click the Yes button. The Uninstallation starts.

▼ **User Account Control dialog box**
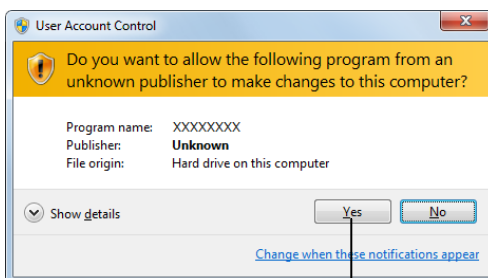
(7)   Click Yes button.

(7) If the User Account Control dialog box appears, click the Yes button. Uninstallation starts.

The uninstallation progress dialog box appears and the application is deleted from the PC.

The application is now uninstalled.

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2 i Series Support Tools Configuration

When the Nikon i Series Support Tools are installed, the following three applications are installed on the PC:

- **iEZSetup**
  When you connect the microscope system to the PC for the first time, use this application software to set the microscope system information, to send the information to the microscope system, and to register the information in the system memory. For more details on the software operation , refer to Chapter 3, "Using iEZSetup."

- **iControl**
  This tool lets you operate the microscope system from your PC. It also enables you to monitor the current status of the microscope system visually. For more information, refer to Chapter 4, "Using iControl."

- **iSetup**
  This tool lets you change the relevant information for a microscope system when the system configuration has been changed. For more information, refer to Chapter 5, "Using iSetup."

CAUTION

- **If you are using i Series Support Tools for the first time, register the microscope system information in the microscope main body using iEZSetup.**

- **Transmitted information is stored in memory on the microscope system, but transmitting new information will overwrite information previously stored in memory. Nikon recommends saving setup information made in iEZSetup or iSetup (including registration information) to a file after assigning the file an appropriate name.**

- **If you turn the microscope system OFF and then ON while using iSeries Support Tools, always quit the application and start it again.**

- **Two microscope systems (two of the following systems: single 90i, single DIH-E/M, 90i and DIH-E/M combination, or 90i and D-FL-E combination) can be connected to a single PC. Nikon secures that two microscope systems can be used at a time, but Nikon does not guarantee that three or more microscope systems properly work when connected to a PC. Please note that the microscope systems may not work properly if three or more microscope systems are connected to a PC at a time.**

- **Be sure to turn off the power for the microscope system before reconnecting or connecting a new USB connector. Connecting or reconnecting USB connectors while power is on may result in erratic microscope system operations.**

CAUTION

- **If you transmitted information on the microscope system to the microscope system side with "i Series Support Tools," you must restart the microscope system before the transmitted information takes effect. (Refer to the supplemental information provided below.) Be sure to set all information and complete the transmission before restarting the microscope system.**

- **You must restart the microscope system after any of the following operations:**

    Information setup using iEZSetup ("END Processing" in Chapter 3, "Using iEZSetup")

    Information setup using iSetup ("Transmission to the Microscope System" in Chapter 5, "Using iSetup")

    Arbitrary Microscopy method setup using iControl ("Setting Up Arbitrary Microscopy Methods" in Chapter 4, "Using iControl")

    Focus position setup for up/down motion using iControl ("Setting Up the Focus Position for Up/Down Motion" in Chapter4, "Using iControl")

- ♦ **Supplement**

    The power supply for the equipment varies with the specific system configuration in question.

    If the system configuration includes the 90i main unit, switch the power supply unit off, then back on again.

    For the 80i + DIH system configuration, switch the CBOX off, then back on again.

3 Using iEZSetup

When a microscope system is connected to a PC for the first time, use this application software to set the microscope system information, to send the information to the microscope system, and to register the information in the system memory.

3.1 iEZSetup Workflow

The iEZSetup workflow for setting the microscope system information is shown below.

Start the microscope system	Connect the microscope system to the PC using the USB cable and turn on the power to the microscope system. (It will take a maximum of 20 seconds to initialize the microscope system.) Note: For information on connecting the USB cable and starting the microscope system, refer to the instruction manual for the microscope.
Start iEZSetup	When initialization of the microscope system is complete, start iEZSetup.
Environmental setup	Enter the name of the microscope system first. Then select the Setup mode appropriate for the type of microscope system information to be set.
Set for the microscope system information settings.	Set information settings for the objectives and filter cubes attached to the microscope system. (The setting items vary depending on the microscope system configuration.)
Send the settings	Send the name of the microscopy system and other information to the microscope system. (The sent microscope system information overwrites the memory on the microscope system.)
Save the information settings in a file.	Save the name and other microscope system information to a file with assigning the file an appropriate name. (You can end iEZSetup without saving a file. But Nikon recommends saving data. The memory on the microscope system will be overwritten and lost.)
End iEZSetup	End iEZSetup.

3.1.1   Setting Item List

A list of items that can be set is shown below:

SystemName (3.4)
└── Microscope system name setup (3.4.1)

Objective (objective setup) (3.5)
├── Objective: Objective mounting setup (3.5.1)
├── Optional Obj: Objective registration (3.5.2)
└── Limit Control: Special control setup for objective switching (3.5.3)
    ├── High magnification switching limit control
    ├── Skip control
    └── Liquid immersion control

Filter Cube (filter cube setup) (3.6)
├── Filter Cube: Filter cube mounting setup (3.6.1)
├── Optional Cube: Filter cube registration (3.6.2)
└── Optional Item: Item name registration (excitation/barrier/mirror) (3.6.3)

Condenser (condenser module setup) (3.7)
├── Condenser: Condenser module mounting setup (3.7.1)
└── Optional Data: Condenser module registration (3.7.2)

Control (control-related setup) (3.8)
└── Other: Manual setup, buzzer setup, switch setup

Interlock (interlock setup) (3.9)
├── Observation: Microscopy method interlock setup (3.9.1)
├── Other: Objective interlock setup/zoom interlock setup/optical path switching interlock setup (3.9.2)
└── Offset: Compensation setup during interlocking (3.9.3)
    ├── Diascopic field diaphragm
    ├── Diascopic aperture diaphragm
    └── ND value

Z Focus (up/down focus motion setup) (3.10)
├── Escape operation setup
└── Lower limit setup

Controller (switch function assignment setup) (3.11)
├── 90i main unit switch function assignment setup (3.11.1)
└── Ergonomic Controller switch function assignment setup (3.11.2)

3.2 Starting and Ending iEZSetup

You can start and end iEZSetup in several ways.
The method explained here, using the Start menu to start and the Cancel button in the operation window to end, is a normal method.

3.2.1 Starting Up

Procedure

▼ **Start menu**

(1) Click the Start button.
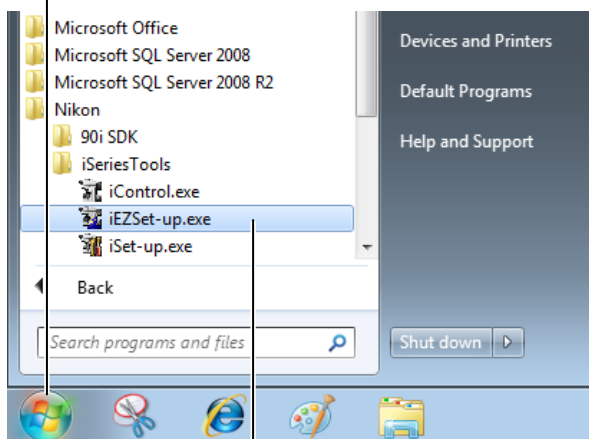
(2) Point to All Programs, Nikon, and iSeriesTools. And then, click iEZSet-up.exe.

Confirm that the microscope is connected before starting the PC.

(1) Click the Start button.

(2) Point to All Programs, Nikon, and iSeriesTools, then click iEZSet-up.exe.

CAUTION
Do not unplug the USB cable that connects the microscope with the PC while iEZSetup is running.

▼ **iEZSetup window**
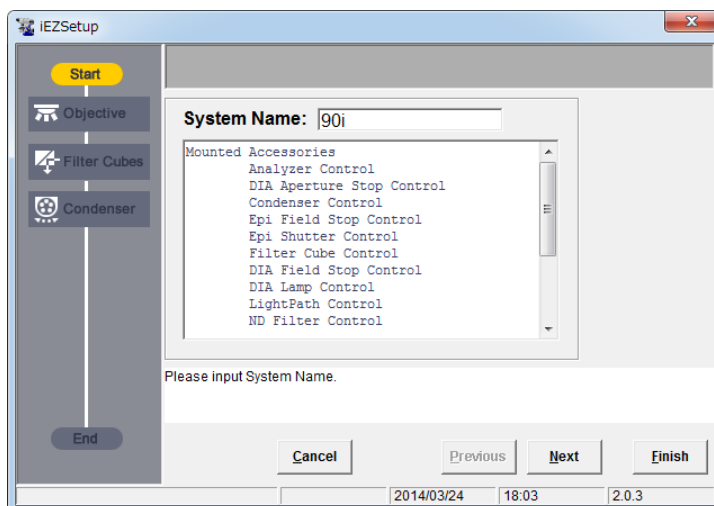
The iEZSetup starts, and then the iEZSetup main window appears.

3.2.2	Ending the Software

Procedure

▼ **iEZSetup window**
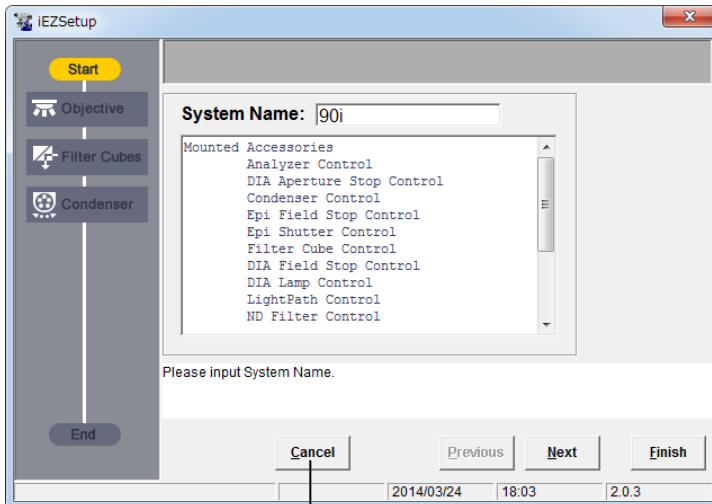
(1) Click Cancel button.

(1) Click Cancel to abort setup for iEZSetup.

(2) "Are you sure you want to quit Setup?" (or similar message) is displayed. Click the OK button to quit the application.

♦ Supplement

To transmit information to the microscope after completing setup, click the Finish button. The display will switch to the END processing screen to enable termination processing. For more information on termination processing, refer to Section 3.12, "END Processing."

| 3.3 | **Layout of the iEZSetup Window** |

The iEZSetup window consists of a flow of setup items, an explanatory text box, and a setup screen.

▼ **iEZSetup window**

▼ **Setup item flow**
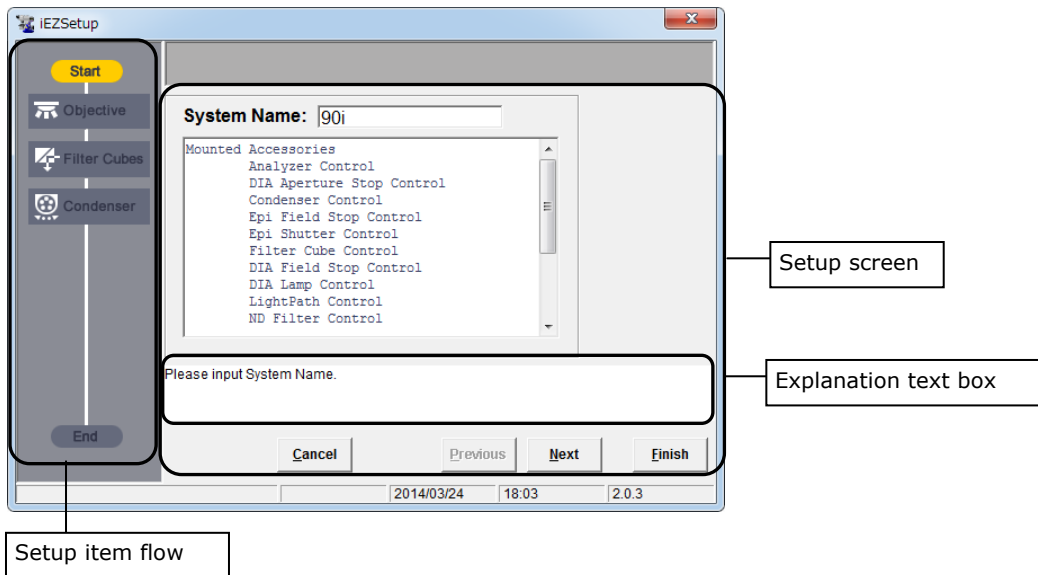
(1) Click the button for a setup item.
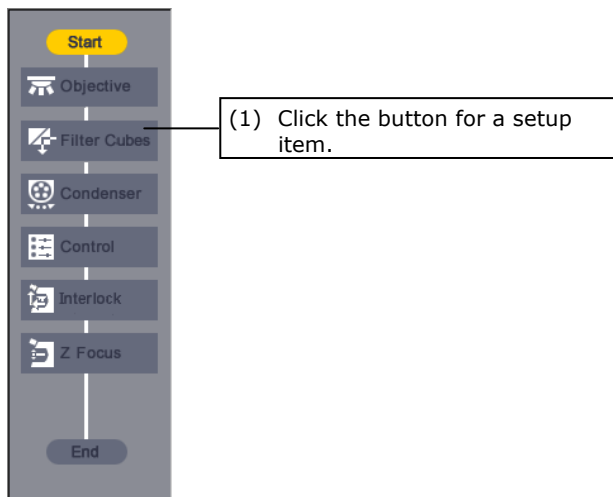
The flow of setup items shown on the left side of the window has items arranged from top to bottom in order of setup. Follow this sequence when setting items.

(1) When you click the button for any setup item, the middle part of the window changes to a setup screen for that item.

♦ Supplement
Depending on the system configuration, some items here may not need to be set, in which case the buttons for the items are disabled.

3.4   Setting Up the iEZSetup Environment

Before making various settings with iEZSetup, enter the name of the microscope system.

If multiple microscope systems are connected to a single PC, assign a name to each of the systems for identification purposes.
When you finish, select the Setup mode corresponding to the type of microscope system information to be set.

3.4.1   Entering the Name of the Microscope System

When iEZSetup is launched, a dialog box for entering the name of the microscope system shown below is displayed in the center of the screen.
In this dialog box, enter the name of the microscope system.

▼ **Dialog box for entering the name of the microscope system**

(1) Enter the name of the microscope system here.

(1)   Enter the name of the microscope system in the System Name text box. (You can enter up to 15 single-byte alphanumeric characters.)

A microscope system configuration list is displayed.
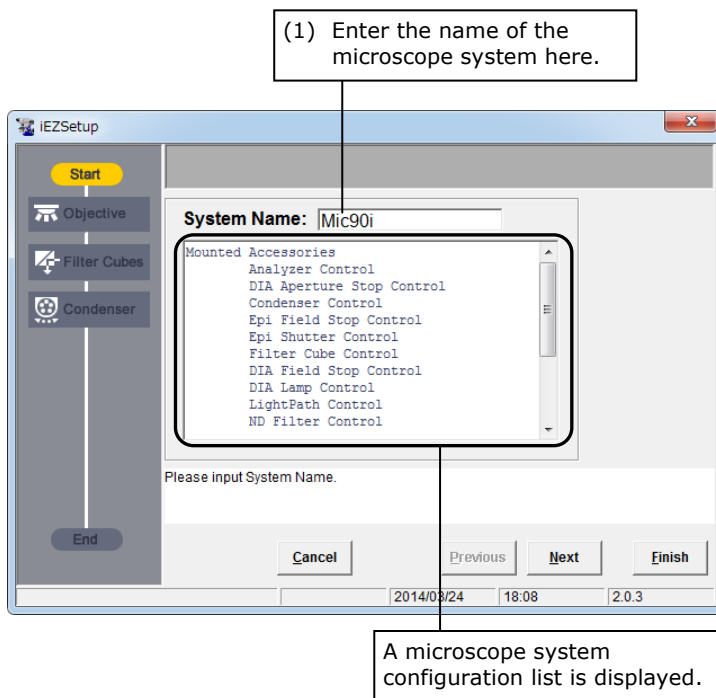
3.4.2	Selecting Setup Mode

Click the Next button in the dialog box for entering the name of the microscope system (shown above) to display the Setup mode select dialog box (shown below).
In this dialog box, select the Setup mode appropriate for the type of microscope system information to be set.

▼ **Setup mode select dialog box**

(1) Select the mode suitable to the item you want to set.
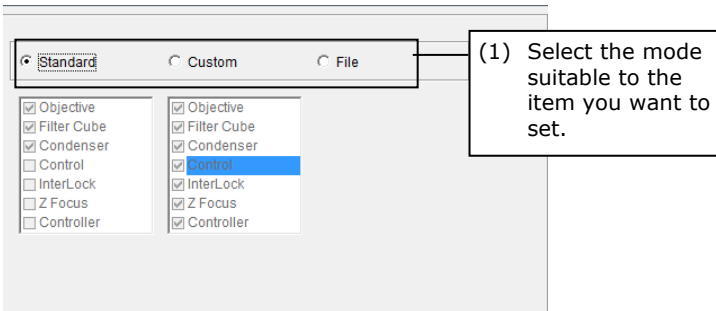
(1) There are three setup modes: Standard, Custom, and File. Each mode is detailed below.
Select the mode suitable to the item you want to set.

- Standard setup
 Depending on the microscope system configuration, the application will choose the minimum required setup items.

- Custom setup
 Will display all setup items for the user to choose from.

- File
 Lets you load a data file for microscope system information if the file is already available and if you want the same setup as with that information.

 Note: Always enter the name of the microscope system during setup; this information is not reflected automatically.

 Select a mode suitable to the items you want to set.

3.4   Setting Up the iEZSetup Environment

1. Standard setup

If you select Standard, the default setup items are displayed in a list box. These setup items cannot be changed.

▼ **Setup mode select dialog box**

(1) Select Standard.

The default setup items are displayed.
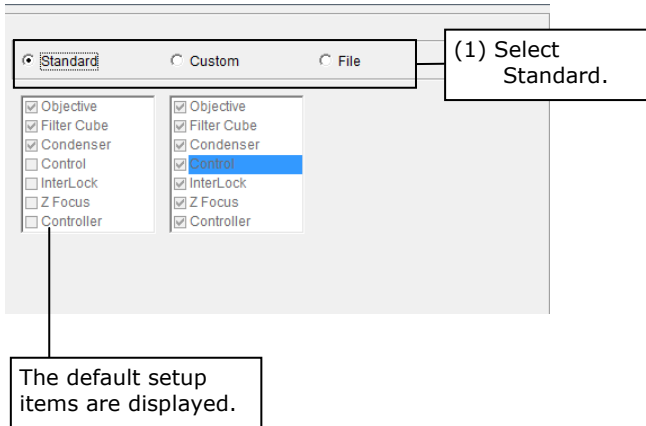
♦ Supplement
Setup items vary depending on the system configuration.

- **Setup items for a combination of 90i + DIH-E or DIH-M**

  - Objective (objective setup)
    Note: Only if a motorized or intelligent nosepiece is attached

  - Objective Limit Control (special control setup for objective switching)
    Note: Only if a motorized nosepiece is attached

  - Filter Cube (filter cube setup)

  - Condenser (condenser module setup)
    Note: Only if a motorized universal condenser is attached

- **Setup items for a combination of 80i + DIH-E**

  - Objective (objective setup)
    Note: Only if a motorized or intelligent nosepiece is attached

  - Filter Cube (filter cube setup)

- **Setup items for a combination of 80i + DIH-M**

  - Objective (objective setup)
    Note: Only if a motorized or intelligent nosepiece is attached

  - Filter Cube (filter cube setup)

- **Setup items for a combination of 80i + D-FL-E**

  - Objective (objective setup)
    Note: Only if a motorized or intelligent nosepiece is attached

  - Filter Cube (filter cube setup)

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3.4   Setting Up the iEZSetup Environment

2. Custom setup

If you select Custom, all setup items are displayed in a list box.
To add a setup item, select any item from this list (by clicking the corresponding check box).

▼ **Setup mode select dialog box**

(1)   Select Custom.

(2)   Select the desired setup item.
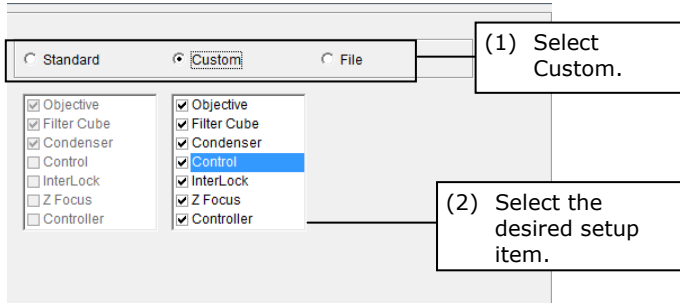
- Objective (objective setup)

- Objective Limit Control (special control setup for objective switching)
  Note: Only if a motorized nosepiece is attached

- Filter Cube (filter cube setup)

- Condenser (condenser module setup)
  Note: Only if a motorized universal condenser is attached

- Control (control-related setup)

- Interlock (interlock setup)

- Z Focus (up/down focus motion setup)

- Controller (switch function assignment setup)

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3. File read setup

You can load a data file for microscope system information if the file is already available. Loaded microscope system information can be edited in iEZSetup.

▼ **Setup mode select dialog box**
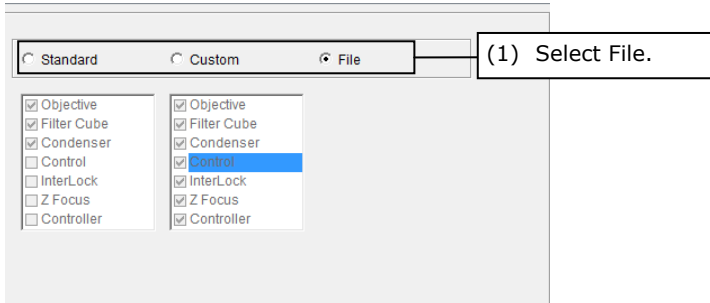
(1)   Select File.

(1) Select File in the Setup mode select dialog box to display a file select dialog box.

▼ **File select dialog box**

(2)-1
    Select a file.

(2)-2
    Click the Open button.
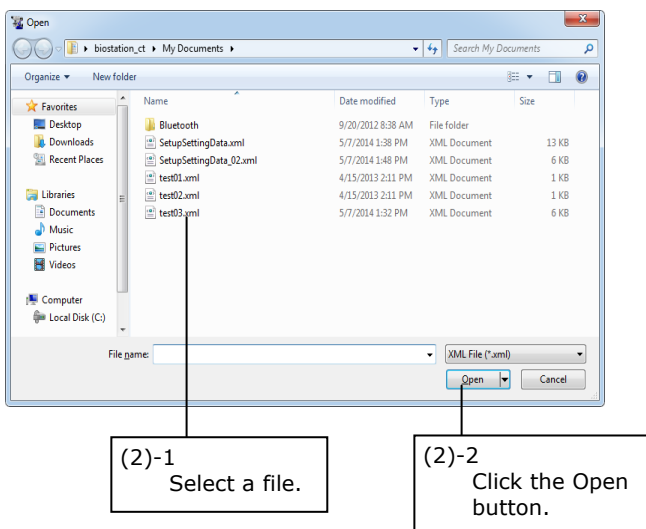
(2) Select a file (***.xml) and click the Open button to load the data.

▼ **Setup data item selection dialog box**

(3)-1
    Select setup data items.

(3)-2
    Click the OK button.
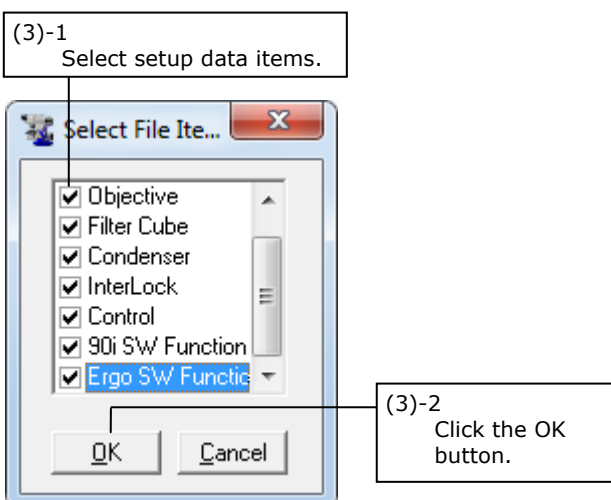
(3) The data items saved in the selected file are displayed on screen. Select the item you want to set, then click the OK button. The saved setup configuration is loaded and reflected in iEZSetup.

3.5   Setting Up the Objective

Setting up the objective lets you monitor the status of the microscope system at a glance and have microscopy method switching and objective switching interlocked.

The following information items can be set for the objective:

- **Objective mounting setup** (possible only if the motorized or intelligent nosepieces is attached to the microscope):
  Set information on the objectives mounted at each nosepiece address (hole).

- **New objective registration** (possible only if the motorized or intelligent nosepieces is attached to the microscope):
  Register information on new objectives that are not registered in the list box (up to nine pieces.)

- **Special control setup** (possible only if the 90i is included in the system configuration and if the motorized and intelligent nosepieces are attached to the microscope):
  Set up the special control when changing objectives.

3.5.1   Objective Mounting Setup

After finishing setup for the iEZSetup environment, go to the objective mounting setup dialog box by clicking the Next button, or by clicking the Objective button in the flow of setup items. In the objective mounting setup dialog box, set information on the objectives mounted at each nosepiece address.

▼ **Objective mounting setup dialog box**

The type, magnification, working distance, numerical aperture, and indicated name of the objective are displayed.

(1) Select an address.

(2) Select an objective series.

(3) Select objective information.

Change to objective setup.

Quit objective setup.
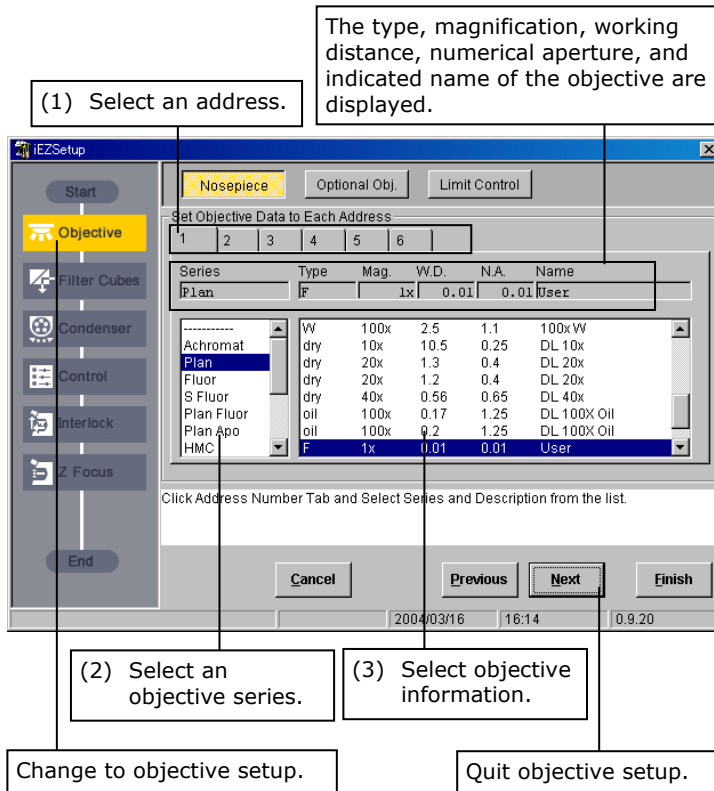
(1) From the tab, select an address for which you want to set objective information.

(2) Select the desired objective series from the series list box.

(3) When you select a series, the selected items of the objective information change. Select the desired objective information from the objective information list box.
When you select any objective information, the type, magnification, working distance, numerical aperture, and indicated name of the objective are displayed in the Type, Mag., W.D., N.A., and NAME text fields.

(4-1) When you go on to set objective information for another address, go back to Step (1) and repeat the setup procedure.

(4-2) To quit objective setup, click the Next button.

♦ Supplement
To register new objective information not registered in the series list box, click the Optional Obj. button. This changes the dialog box to the one used to register new objective information. Refer to 3.5.2, "Registering New Objectives" for more information.

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● **Combination of objectives and condenser modules (DIC prism on condenser side) for Differential Interference Contrast (DIC) microscopy**

The Differential Interference Contrast (DIC) microscopy and Differential Interference Contrast and Fluorescent simultaneous (DIC/FL) microscopy needs an objective-side DIC prism and a condenser module (condenser-side DIC prism) that correspond to the objective to be placed in the optical path.

Normally, there is only one combination of objective, objective-side DIC prism and condenser module. For some objectives, however, two combinations are available.

One combination allows standard well-balanced observation, while the other combination provides contrast-priority or resolution-priority observation. Therefore, choose the one that suits the sample to be observed. (For low magnification objectives, contrast-priority observation is available, while for high magnification objectives, resolution-priority observation is available. For details, refer to the instruction manual for the motorized universal condenser.)

The table below lists the objective that allows two combinations of the objective, objective-side DIC prism and the condenser module.
The type of condenser module to be used when one of these objectives is placed in the optical path and the observation method is changed to [DIC] or [DIC/FL] can be set in the objective mounting setup dialog box. Some objective names are followed by two selectable condenser module names. Choose an objective name with a desired condenser module name.
For the objectives that are not listed below, only one combination of the objective, objective-side DIC prism and the condenser module is available, in which case standard well-balanced observation alone is possible.

Series	Objective name	Application
Plan Fluor	20x (N2)	Standard
Plan Fluor	20x (N1)	High contrast
Plan Fluor	20x MI (N2)	Standard
Plan Fluor	20x MI (N1)	High contrast
S Fluor	20x (N2)	Standard
S Fluor	20x (N1)	High contrast
Fluor	20x W (N2)	Standard
Fluor	20x W (N1)	High contrast
Plan Apo	20x (N2)	Standard
Plan Apo	20x (N1)	High contrast
S Fluor	40x (N2)	Standard
S Fluor	40x (N1)	High contrast
Plan Fluor	40x (N2)	Standard
Plan Fluor	40x (N1)	High contrast
Plan Apo	40x (N2)	Standard
Plan Apo	40x (N1)	High contrast

Inside of ( ) : condenser module

Series	Objective name	Application
Plan Apo	60x A Oil (N2)	Standard
Plan Apo	60x A Oil (NR)	High resolution
Plan Apo	60x (N2)	Standard
Plan Apo	60x (NR)	High resolution
Fluor	60x W (N2)	Standard
Fluor	60x W (NR)	High resolution
Plan Apo	VC 60x Oil (N2)	Standard
Plan Apo	VC 60x Oil (NR)	High resolution
Plan Apo	TIRF 60x Oil (N2)	Standard
Plan Apo	TIRF 60x Oil (NR)	High resolution
Plan Apo	60x WI C (N2)	Standard
Plan Apo	60x WI C (NR)	High resolution
Plan Apo	VC 60x WI (N2)	Standard
Plan Apo	VC 60x WI (NR)	High resolution
Plan Fluor	60x C (N2)	Standard
Plan Fluor	60x C (NR)	High resolution
Plan Fluor	60x Oil Iris (N2)	Standard
Plan Fluor	60x Oil Iris (NR)	High resolution
Plan Apo	VC 100x Oil (N2)	Standard
Plan Apo	VC 100x Oil (NR)	High resolution
Plan Fluor	100x Oil (N2)	Standard
Plan Fluor	100x Oil (NR)	High resolution
Plan Apo	100x Oil (N2)	Standard
Plan Apo	100x Oil (NR)	High resolution
Plan Apo	TIRF 100x Oil (N2)	Standard
Plan Apo	TIRF 100x Oil (NR)	High resolution

| 3.5.2 | Registering New Objectives |

New objective registration is needed to register new objective information not registered in the series list box. Click the Optional Obj. button – a subsetup item button in the objective mounting setup dialog box – to display a dialog box for registering new objective information.
This dialog box allows you to register up to nine new objectives.

When registering a new objective, you can register information on seven items: Display Name, Series, Magnification, Type, Working Distance, Numerical Aperture, and Applicable Condenser Module (only when the motorized condenser module is mounted).

Note: When registering an objective for differential interference contrast or phase contrast microscopy, be sure to set information on the applicable condenser module. Condenser modules are switched automatically when objectives are changed. The control of condenser module based on the set information is performed only when the differential interference contrast (DIC), differential interference contrast and fluorescent simultaneous (DIS/FL) or phase contrast (Ph) microscopy is selected as the observation mode. When registering the objectives for one of these microscopy methods, the applicable condenser modules must be set.

For the objectives for differential interference contrast microscopy, confirm the indication on the objective barrel and set either "N1" or "N2." Some objectives for differential interference contrast microscopy not only allow observation by a standard combination (indicated on the barrel of the objective) but also support observation with high contrast or high resolution. To perform observation with high contrast or high resolution, set the corresponding condenser module ("N1" or "NR").

For the objectives for phase contrast microscopy, confirm the indication on the objective barrel and set either of "Ph1," "Ph2" or "Ph3."

For the objectives for other observation methods, there is no need to set condenser modules. Use the default setting "None."

▼ **New objective registration dialog box**

(1) Click the Optional Obj. button.
(2) Select a number.
(7) Enter a working distance and numerical aperture.
(8) Select the applicable condenser module.
(3) Enter a name.
(4) Select a series.
(5) Select a type.
(6) Select a magnification.

(1) Click the Optional Obj. button – a subsetup item button.

(2) From the tab, select a number for which you want to register objective information.

(3) Enter the name of the objective in the Name text box (using up to 15 single-byte alphanumeric characters).

(4) Select the objective series from the Series list box.

(5) Select the objective magnification from the Mag list box.

(6) Select the objective type from the Type list box.

(7) Enter the working distance and the numerical aperture of the objective in the W.D. and the N.A. text fields, respectively (up to 4 single-byte alphanumeric characters each).

(8) Select the applicable condenser module from the [DIC/Ph Condenser] combo box.

The newly registered objective is added to the selectable items in the list box in the objective mounting setup dialog box.

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3.5.3	Special Control Setup

Click Limit Control – a subsetup item button for objective setup – to display a dialog box for setting up special control. Special control setup is designed to set the following control items:

Note: Special control setup is enabled only when objectives are switched with the objective interlock turned ON. For more information on the objective interlock, refer to 4.8.11, "Objective."

- **Objective high magnification switching limit control**

  As for the nosepiece operation when changing from low to high magnification lenses, one of the following options can be set: inhibit the nosepiece rotation, rotate the nosepiece after retracting the stage, or disable control. Limit control is activated if the following requirements are met:

  (1) The objective magnification prior to switching is 2x or less.
  (2) The working distance of the objective after switching is 1 mm or less.

  ♦ Supplement
    Low-magnification objectives have a very long depth of focus, occasionally resulting in the specimen and the objective being close to each other. If, under such a condition, the objective is changed to one of higher magnification, its edge may touch the specimen. High magnification switching limit control is carried out to avoid such a problem beforehand.

- **Skip control setup**
  Set whether to skip addresses at which objectives are not attached for rotation of the nosepiece.

- **Liquid immersion control**
  If a liquid immersion lens is provided in the optical path during or following nosepiece rotation, set one of the following options: inhibit the nosepiece rotation, rotate the nosepiece after retracting the stage, or disable control. Limit control is activated in either of the following cases:

  (1) If the objective prior to switching is a liquid immersion objective
  (2) If the objective following switching is a liquid immersion objective

  ♦ Supplement
    Under the setting that the nosepiece is rotated after retracting the stage, the stage will be in the retracted status after it is retracted. To return the stage to the pre-retracted focus position for the objective, push the "Return" button. The stage will come to the original position.

▼ **Special control setup dialog box**
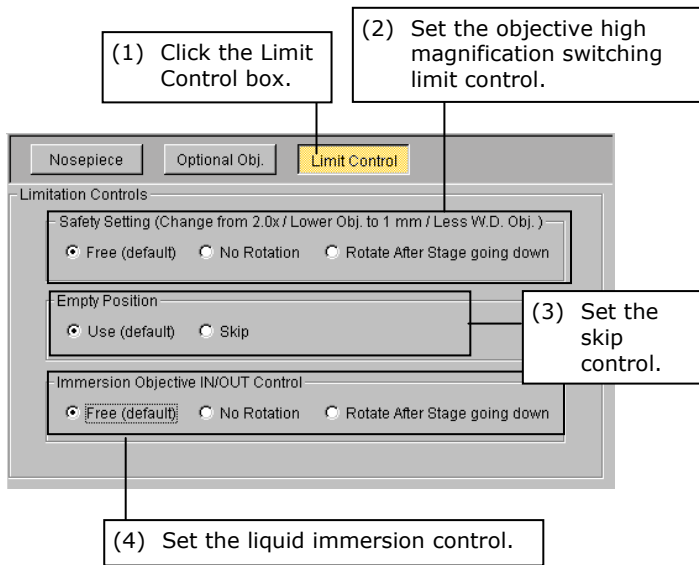
(1) Click the Limit Control box.

(2) Set the objective high magnification switching limit control.

Nosepiece   Optional Obj.   Limit Control

Limitation Controls

Safety Setting (Change from 2.0x / Lower Obj. to 1 mm / Less W.D. Obj.)
⊙ Free (default)   ○ No Rotation   ○ Rotate After Stage going down

Empty Position
⊙ Use (default)   ○ Skip

(3) Set the skip control.

Immersion Objective IN/OUT Control
⊙ Free (default)   ○ No Rotation   ○ Rotate After Stage going down

(4) Set the liquid immersion control.

(1)   Click Limit Control – a subsetup item button.

(2)   For the objective high magnification switching limit control, select Free (default), No Rotation or Rotate After Stage Going Down.

(3)   To enable skip control, select Skip. To disable, select Use (default).

(4)   For the switching limit control for liquid immersion objective, select Free (default), No Rotation or Rotate After Stage Going Down.

Note: The stage moves downward 5 mm as its retract motion. In the absence of a 5-mm margin, the stage will retract to its lowest possible position.

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3.6   Setting Up the Filter Cube

Setting up the filter cube lets you monitor the status of the microscope at a glance and interlock the filter cube when switching microscopy methods.

The following filter cube information items can be set (if the DIH-M or DIH-E is included in the microscope system configuration):

- **Filter cube mounting setup:**
  Set information on the filter cubes positioned at each filter cube address (filter cube bay).

- **New filter cube registration:**
  Register a combination of excitation filter, dichroic mirror, and barrier filter as well as the name of a filter cube comprised of that combination.

- **Name registration:**
  Register the names of the excitation filter, dichroic mirror, and barrier filter.

3.6.1	Filter Cube Mounting Setup

After finishing setting up the objective, go to the filter cube mounting setup dialog box by clicking the Next button or by clicking the Filter Cube button in the flow of setup items.
In this dialog box, set information on the filter cubes attached at each filter cube address (filter cube bay).

Note: DIA (open) is selected for address 6 as initial setting. The interlock with microscopy method switching is conducted based on this initial setting. For more information, refer to "Standard Combinations of Microscopy Methods and Interlock" in the appendix of Chapter 4.

▼ **Filter cube mounting setup dialog box**

(1) Select an address.

The names of the excitation filter, dichroic mirror, and barrier filter are displayed.

(2) Select a filter cube name.

Change to filter cube setup.

(3-2) Quit filter cube setup.
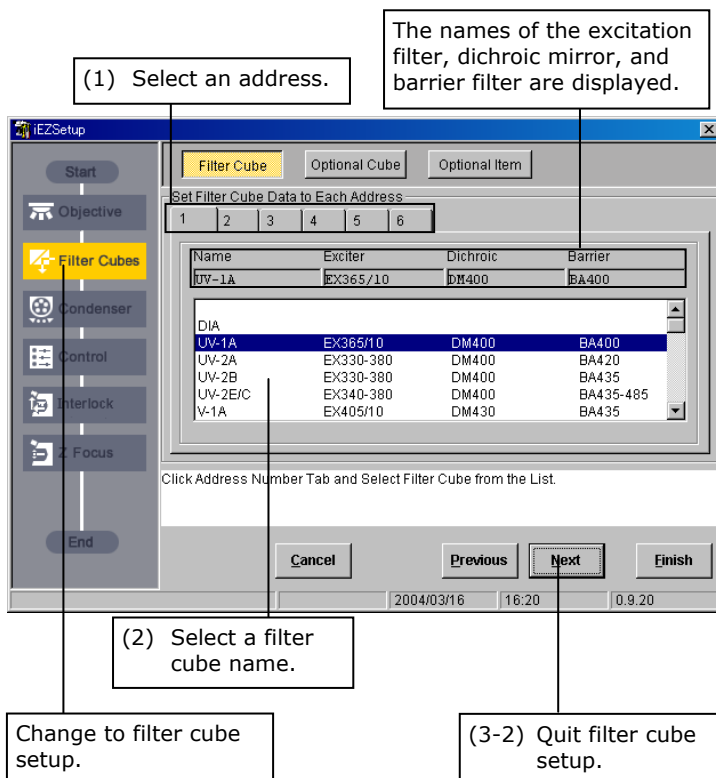
(1) From the tab, select an address for which you want to set filter cube information.

(2) Select a filter cube name from the list box.
When you select the filter cube name, the names of the excitation filter, dichroic mirror, and barrier filter are displayed in the Exciter, Dichroic, and Barrier text boxes, respectively.

(3-1) To set information for another address, go back to Step (1) and repeat the setup procedure.

(3-2) To quit filter cube setup, click the Next button.

♦ Supplement
To register a new combination of excitation filter, dichroic mirror, and barrier filter, click the Optional Cube button. The dialog box changes to the one used for registering a new filter cube. See the next page for more information.

To register a new excitation filter, dichroic mirror, or barrier filter individually, click the Optional Item button. The dialog box changes to the one used for registering item names. See Section 3.6.3 for more information.

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3.6.2	Registering New Filter Cubes

New filter cube registration is required to register a new combination of excitation filter, dichroic mirror, and barrier filter. Clicking Optional Cube – a subsetup item button for filter cube setup – displays a dialog box for registering new filter cubes.
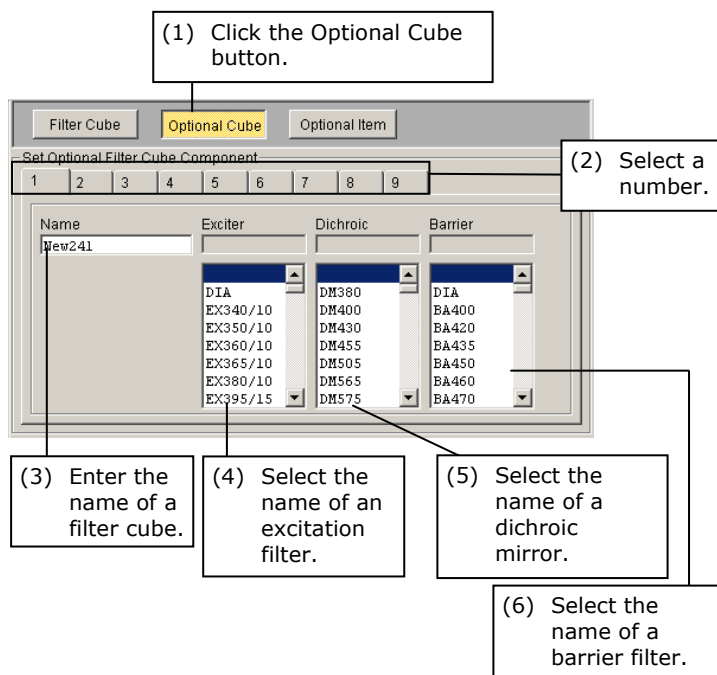
This dialog box lets you register up to nine combinations of excitation filters, dichroic mirrors, and barrier filters, and the names of up to nine filter cubes, each comprised of the combination thus specified.

▼ **New filter cube registration dialog box**

(1) Click the Optional Cube button.

(2) Select a number.

(3) Enter the name of a filter cube.

(4) Select the name of an excitation filter.

(5) Select the name of a dichroic mirror.

(6) Select the name of a barrier filter.

(1) Click the Optional Cube button – a subsetup item button.

(2) From the tab, select a number for which you want to register new filter cube information.

(3) Enter the name of the filter cube you want to set in the Name text box (up to 10 single-byte alphanumeric characters).

(4) Select the name of the excitation filter you want to set from the Exciter list box.

(5) Select the name of the dichroic mirror you want to set from the Dichroic list box.

(6) Select the name of the barrier filter you want to set from the Barrier list box.

The newly registered filter cube is added to the selectable items in the list box in the filter cube mounting setup dialog box.

♦ Supplement

To register a new excitation filter, dichroic mirror, or barrier filter individually, click the Optional Item button. The dialog box changes to the one used for registering item names. See the next page for more information.

3.6.3	Registering Item Names

Item name registration is needed to register a new excitation filter, dichroic mirror, or barrier filter individually. Click Optional Item – a subsetup item button for filter cube setup – to display a dialog box for registering item names.
This dialog box lets you register names for up to nine excitation filters, nine dichroic mirrors, and nine barrier filters.

▼ **Item name registration dialog box**

(1) Click the Optional Item button.

(2) Enter names.

Filter Cube   Optional Cube   Optional Item

Add Optional Filter Data

	Exciter	Dichroic	Barrier
1	Exciter1	Dichroic1	Barrier1
2	----------	----------	----------
3	----------	----------	----------
4	----------	----------	----------
5	----------	----------	----------
6	----------	----------	----------
7	----------	----------	----------
8	----------	----------	----------
9	----------	----------	----------

(1) Click the Optional Item button – a subsetup item button.

(2) In the Exciter, Dichroic, and Barrier text boxes here, enter the name of the excitation filter, dichroic mirror, and barrier filter you want to set (using up to 10 single-byte alphanumeric characters).

The newly registered names are added to the selectable items in the list box in the new filter cube registration dialog box.

3.7   Setting Up the Condenser Module

Condenser module setup lets you monitor the status of the microscope system at a glance and interlock the condenser module when switching microscopy methods or objectives.

The following condenser module information items can be set (only if the motorized universal condenser module is attached):

- **Condenser module mounting setup:**
  Set information on the condenser modules attached at each condenser turret address (condenser module bay).

- **New condenser module registration:**
  Register the desired name of a condenser module.

3.7.1   Condenser Module Mounting Setup

After setting up the filter cube, go to the condenser module mounting setup dialog box by clicking the Next button or by clicking the Condenser button in the flow of setup items.
In this dialog box, set information on the condenser modules attached at each condenser turret address (condenser module bay).

▼ **Condenser module mounting setup dialog box**

(1) Select an address and condenser module name.

Change to condenser module setup.

(2-2) Quit condenser module setup.
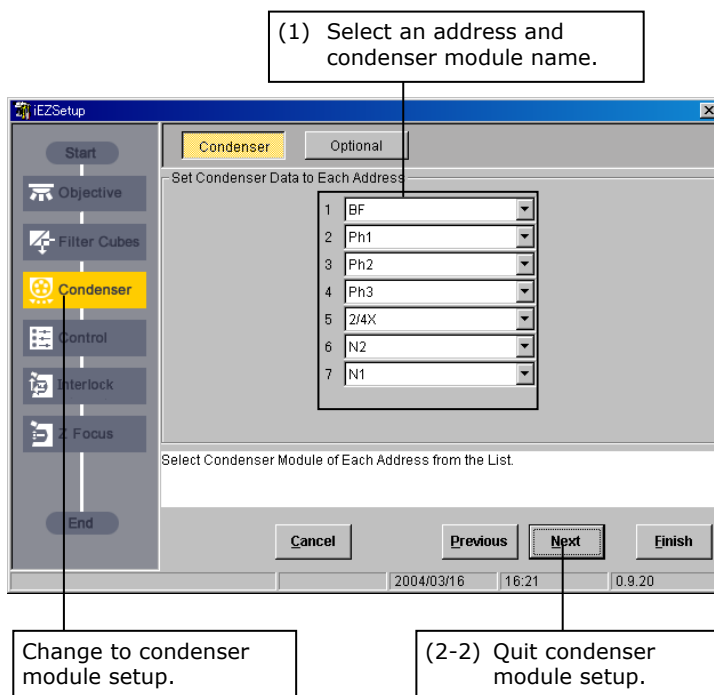
(1) Select the name of a condenser module from the combo box of the address for which you want to register condenser module information.

(2-1) To set another address, go back to Step (1) to repeat the setup procedure.

(2-2) To quit condenser module setup, click the Next button.

♦ Supplement
    To register a new condenser module, click the Optional button. The dialog box changes to the one used for registering a new condenser module. See the next page for more information.

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3.7.2   New Condenser Module Registration

New condenser module registration is needed to register a new condenser module. Click Optional – a subsetup item button for condenser module setup – to display a dialog box for registering new condenser modules.

This dialog box lets you register up to nine condenser modules.

▼ **Condenser module name registration dialog box**

(1)   Click the Optional button.

(2)   Enter a name.

(1)   Click the Optional button – a subsetup item button for condenser module setup.

(2)   Enter the name of a condenser module (using up to 10 single-byte alphanumeric characters).
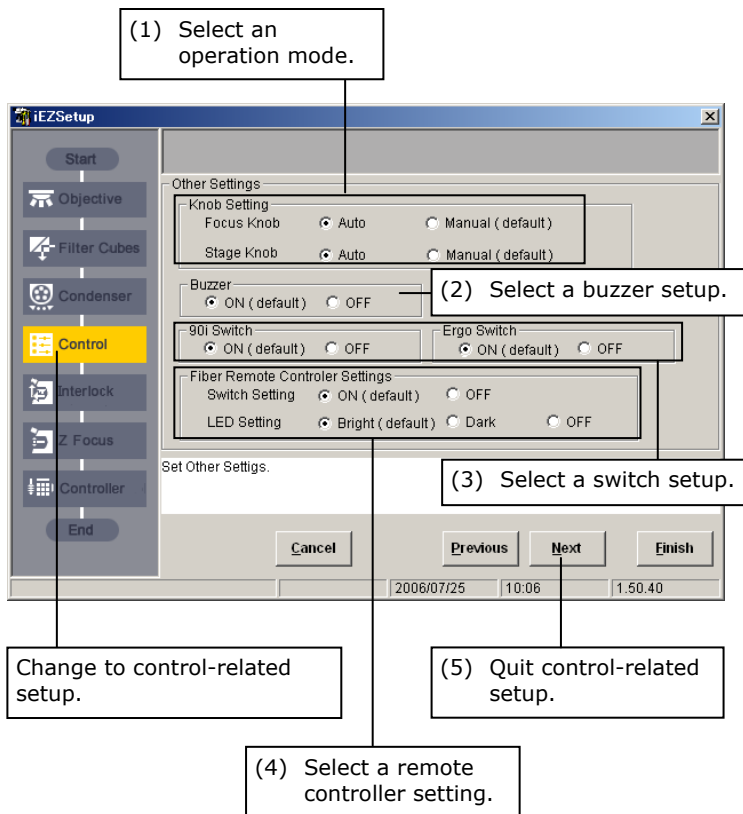
The newly registered name is added to the selectable items in the combo box in the condenser module mounting setup dialog box.

3.8   Control-Related Setup

The following control-related information items can be set:

- **Focus knob operation mode setup** (only if the 90i is included in the microscope system configuration):
  Set whether to change, on the system side, the travel per rotation of the focus knob according to the objective currently in the optical path (AUTO mode), or arbitrarily change the setting (coarse/fine/extra fine) (MANUAL mode) when controlling the up/down focus motion using the focus knob.

- **XY stage manipulating handle operation mode setup** (applies only if the motorized XY stage and Ergonomic Controller are installed):
  Set the operation mode for the XY stage manipulating handle by selecting AUTO mode (mode in which the increment moved per turn of the handle is determined on the system side by the objective in the optical path) or MANUAL mode (mode in which the operator can switch among coarse movement, fine movement, or extra fine movement).

- **Buzzer setup** (applies only if the microscope system configuration includes the 90i, DIH-E, or Ergonomic Controller):
  This setting enables or disables the buzzer tone set to sound in the event of an error or when the operator operates the switch mounted on the microscope main unit or the Ergonomic Controller. This setting applies to all devices included in the system configuration.

- **90i main unit and Ergonomic Controller switch setup** (applies only if the microscope system configuration includes the 90i or Ergonomic Controller):
  This setting enables or disables switches mounted on the microscope main unit or Ergonomic Controller.

- **Remote controller setup for the optical fiber light source** (applies only when the remote controller of the optical fiber light source is connected):
  This setting enables or disables the operation of the remote controller of the optical fiber light source and the brightness of the LED on the remote controller.

- **D-FL-E Remote Controller setup** (applies only if the microscope system configuration includes the Remote Controller for D-FL-E):
  This setting enables or disables operations from the D-FL-E Remote Controller and the brightness of the Remote Controller LED for D-FL-E.

▼ **Control-related setup dialog box**

(1) Select an
operation mode.

Change to control-related
setup.

(5) Quit control-related
setup.

(4) Select a remote
controller setting.

(2) Select a buzzer setup.

(3) Select a switch setup.

(1)   Manual handle operation mode (up/down focus motion and XY stage) Select AUTO or MANUAL (default).

Note: The manual handle operation mode is unavailable if the microscope system includes the 90i main unit with the new switch function assignment capability. If the 90i or Ergonomic Controller is assigned the "coarse/fine select" function, the operation mode is automatically set to MANUAL. Conversely, if the 90i or Ergonomic Controller is not assigned the "coarse/fine select" function, the operation mode is automatically set to AUTO.

For more information on switch function assignments for the 90i and the Ergonomic Controller, refer to Section 3.11, "Switch Function Assignments."

(2)   Set the Buzzer to ON (default) or OFF.

(3)   Select ON (default) or OFF to enable or disable the switches (mounted on the 90i main unit and the Ergonomic Controller).

(4)   For the optical fiber light source, set the remote controller settings.

Enable or disable the remote controller operation. (The default setting is ON.)

(5)   To quit control-related setup, click the Next button.

3.8   Control-Related Setup

▼ **Control-related setup dialog box**
(the microscope system includes the D-FL-E)

(1) Select Remote
     Controller settings.

(3) Select the
     buzzer setting.
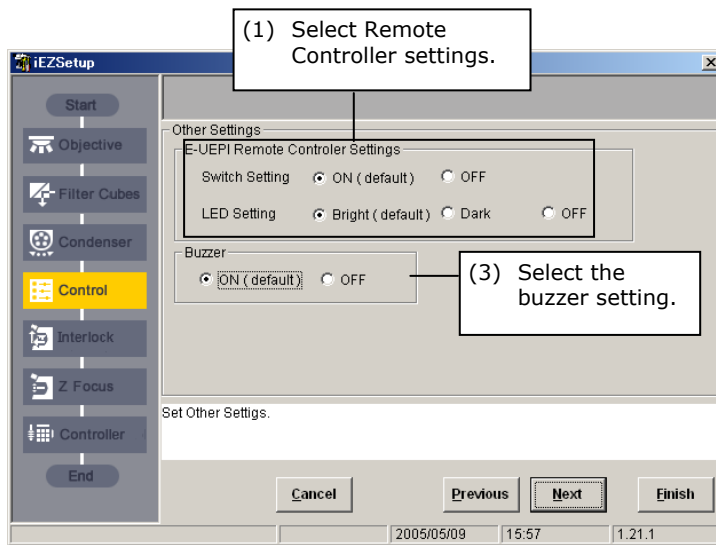
(1) Set the Switch Setting to ON (default)
when enabling operations from the D-FL-E
Remote Controller. Set the Switch Setting
to OFF when disabling.

(2) Set the brightness of the LED setting to
Bright (default), Dark or OFF.

Note: The D-FL-E Remote Controller settings
can be set only when the microscope
system includes the D-FL-E Remote
Controller.

(3) Set the Buzzer to ON (default) or OFF.

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3.9   Setting Up the Interlock

Interlock is designed to tailor various motorized attachments of the microscope system to the control conditions that best fit the microscopy method or objective used.

The following interlock information items can be set:

- **Microscopy method interlock setup** (only if the 90i, DIH-E, or D-FL-E is included in the microscope system configuration):
  Set whether to interlock each of the motorized attachments with switching of microscopy methods (ON/OFF).

  Note: Settings for the diascopic field diaphragm, ND filter, and diascopic aperture diaphragm interlock control are effective only after switching the microscopy method to a user-set arbitrary method.

- **Objective interlock setup** (only if the 90i is included in the microscope system configuration):
  Set whether to interlock each of the motorized attachments with switching of objectives (ON/OFF).

- **Optical path switching interlock setup** (only if the DIH-E is included in the microscope system configuration):
  Set whether to interlock the episcopic field diaphragm, ND filter, and diascopic field diaphragm with switching of optical paths.

- **Optical zoom interlock setup** (only if the DIH-E is included in the microscope system configuration):
  Set whether to interlock the episcopic field diaphragm, ND filter, and diascopic field diaphragm with switching of optical zoom magnifications.

- **Compensation setup**
  Control values can be compensated for across the board when the diascopic field diaphragm, diascopic aperture diaphragm, ND value, and episcopic field diaphragm are controlled through interlock. Set this compensation value.

3.9.1   Microscopy Method Interlock Setup

After finishing the control-related setup, go to the microscopy method interlock setup dialog box
by clicking the Next button or by clicking the Interlock button in the flow of setup items.

▼ **Microscopy method interlock setup dialog box**
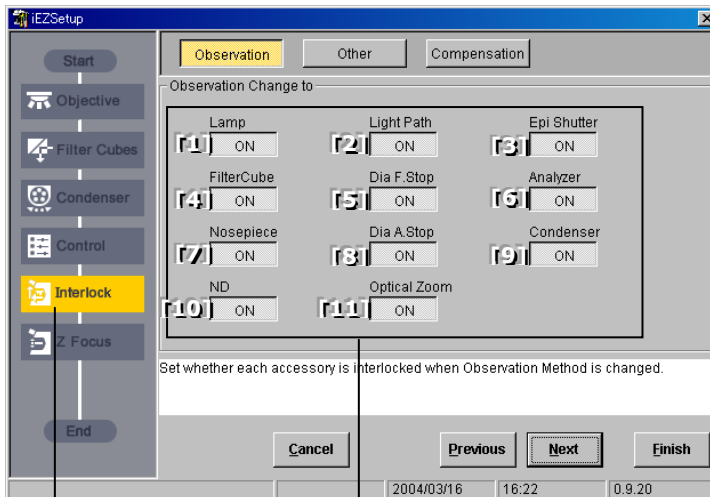
Change to
interlock setup.

(1) Click the ON/OFF button for
each motorized attachment.

(1) Set whether to turn ON or OFF each of
the motorized attachments (interlock the
attachments with microscopy method) by
clicking the ON/OFF button.
The following motorized attachments can
be set to interlock:

[1] Illumination lamp (configuration
including the 90i only)

[2] Optical path switching (configuration
including the DIH-E only)

[3] Shutter (configuration including the
DIH-E/M only)

[4] Filter cube (configuration including the
DIH-E only)

[5] Diascopic field diaphragm
(configuration including the 90i only)

[6] Analyzer (configuration including the
DIH-E only)

[7] Nosepiece (only if motorized
nosepiece is attached)

[8] Diascopic aperture diaphragm (only if
motorized condenser is attached)

[9] Condenser (only if motorized
condenser is attached)

[10] ND filter (only if motorized ND filter is
attached)

[11] Optical zoom (configuration including
the DIH-E only)

Note: Motorized attachments that can be
set to interlock vary depending on
the microscope system
configuration.

| 3.9.2 | Objective, Optical Path Switching, and Optical Zoom Interlock Setups |

After finishing the microscopy method interlock setup, go to the interlock setup dialog box for others by clicking the Next button or by clicking Other – a subsetup item button for microscopy method interlock setup.

- **Objective interlock and up/down focus motion interlock control setup (parfocal correction mode setup):**

  Select whether to perform parfocal position correction control.

  ♦ Supplement

  Although all objectives have uniform parfocal lengths, each objective has slight differences in-focus positions, for which corrections must be made. The parfocal correction function remembers slight differences in-focus positions to enable repeatable precise focusing.

  Note: To set the in-focus position, use Focus Setting in the iControl menu item "Setting." For more information, refer to 4.5.2, "Setting the Focus Position for Up/Down Motion."

- **Objective interlock and XY stage interlock control setup (center axis correction mode setup):**

  Select whether to perform center position correction control.

  ♦ Supplement

  Each objective tends to differ slightly with respect to the center axis. To correct for these slight variances, the center axis correction function remembers the various center positions.

  Note: To set the center position, use XY Setting in the iControl menu item "Setting." For more information, refer to 4.5.4, "Setting the XY Stage Center Position."

  ♦ Supplement

  Interlock controls are performed using proper control values which are calculated from the setting information including the objective on the optical path. With the compensation settings, you can multiply the control values (calculated values) by compensation rates (expressed as a percentage).

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▼ **Interlock setup dialog box for objective, optical path switching, and optical zoom**
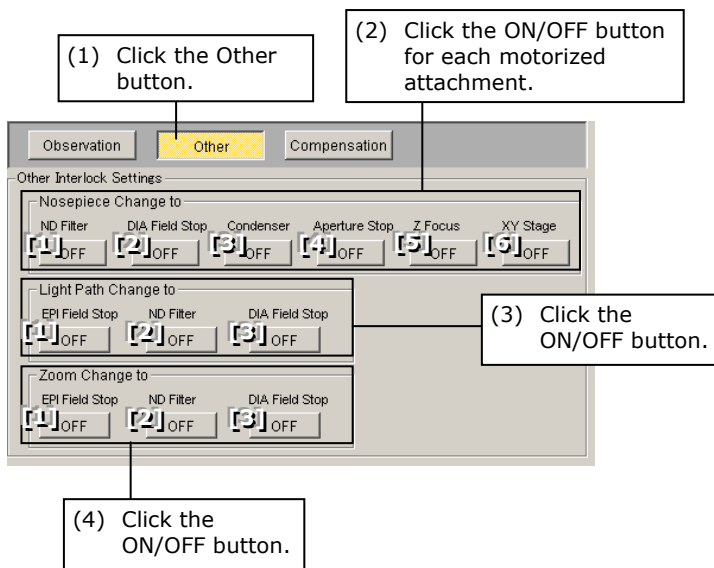
(1) Click the Other button.

(2) Click the ON/OFF button for each motorized attachment.

(3) Click the ON/OFF button.

(4) Click the ON/OFF button.

(1) Click Other – a subsetup item button.

(2) Set whether to turn ON or OFF each of the motorized attachments (interlock the attachments with objective) by clicking the ON/OFF button. The following motorized attachments can be set:

[1] ND filter (only if a motorized ND filter is attached)

[2] Diascopic field diaphragm (configuration including the 90i only)

[3] Condenser (only if a motorized condenser is attached)

[4] Diascopic aperture diaphragm (only if a motorized condenser is attached)

[5] Up/down focus motion (configuration including the 90i only)

[6] XY stage (applies only if the motorized stage is installed)

(3) Click the ON/OFF button to enable or disable interlock-control of each motorized unit with optical path switchover.

[1] Episcopic field diaphragm (applies only if the configuration includes DIH-E)

[2] ND filter (applies only if the motorized ND is installed)

[3] Diascopic field diaphragm (applies only if the configuration includes the 90i)

(4) Click the ON/OFF button to enable or disable interlock-control of each motorized unit with optical zoom.

[1] Episcopic field diaphragm (applies only if the configuration includes DIH-E)

[2] ND filter (applies only if the motorized ND is installed)

[3] Diascopic field diaphragm (applies only if the configuration includes the 90i)

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3.9.3	Compensation Setup during Interlocking

After finishing the interlock setups for objective, optical path switching, and optical zoom, go to the compensation setup dialog box by clicking the Next button or by clicking Compensation – a subsetup item button for microscopy method interlock setup.

▼ **Compensation setup dialog box**
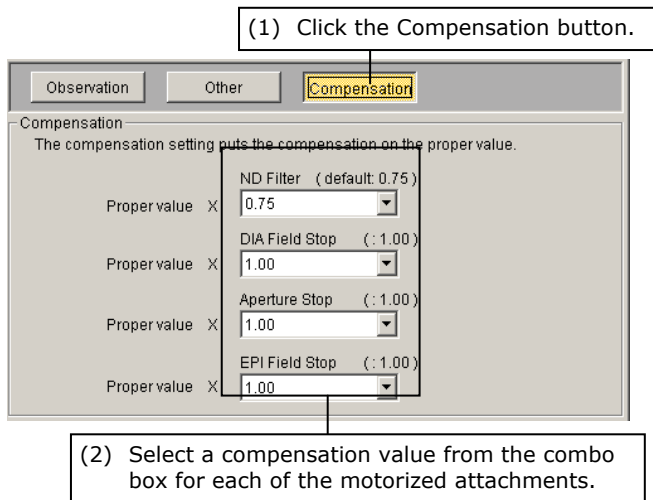
(1) Click the Compensation button.

(2) Select a compensation value from the combo box for each of the motorized attachments.

(1) Click Compensation – a subsetup item button.

(2) Select an interlock compensation value from the combo box for each of the motorized attachments.

Note: Compensation setup applies to the interlocks with microscopy method switching and objective switching.

3.10   Setting Up the Up/down Focus Motion

The following up/down focus motion information items can be set (only if the 90i is included in the microscope system configuration).

After finishing the interlock setups, go to the up/down focus motion setup dialog box by clicking the Next button or by clicking the Z Focus button in the flow of setup items.

- **Escape function (escape operation) setup:**
  Set up the unit (up/down motion (Z) and XY stage (X, Y)) to be evacuated when the escape function is used.

  ♦ Supplement
  Installing the motorized XY stage extends the escape function; in addition to the descending motion along the Z-axis, the X and Y axes can also be evacuated to their forward home positions.
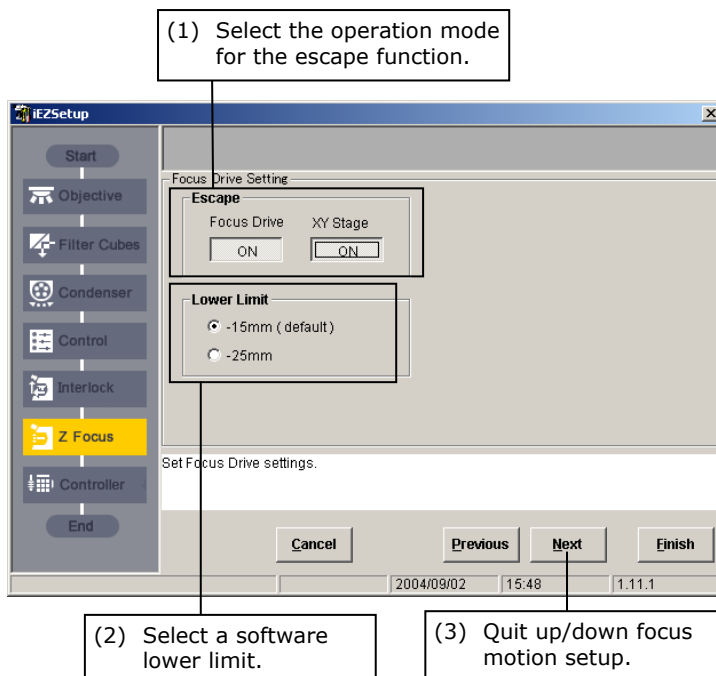
- **Software lower limit setup:**
  Set the XY stage lower limit (15 mm/25 mm) if no attachment (e.g., a condenser turret) is attached under the XY stage.

  ♦ Supplement
  The initial lower limit setting along the Z-axis, initially set to -15mm to avoid the polarizer from touching the XY stage during its mounting, can be changed to -25mm as when you want to observe a thick specimen. Exercise caution if you set the lower limit to -25mm as no mechanism is provided to avoid collision with the polarizer.

▼ **Up/down focus motion setup dialog box**

(1) Select the operation mode for the escape function.

(2) Select a software lower limit.

(3) Quit up/down focus motion setup.

(1) Escape function setup (XY stage setup is possible if the motorized XY stage is installed)

Select the unit to be evacuated (up/down motion or XY stage).

(2) Software lower limit (settable only if the motorized universal condenser module is not attached)

Select -15 mm (recommended) or -25 mm for the lower limit position.

(3) To quit the up/down focus motion setup, click the Next button.

Note: The lower limit is automatically set to -15mm when the motorized universal condenser module is attached.

3.11   Switch Function Assignments

You can set the following items as information associated with switch function assignment setup.

- **90i main unit switch function assignment:**
  This refers to assigning functions to switches mounted on the 90i main unit.

- **Ergonomic Controller switch function assignment:**
  This refers to assigning functions to switches mounted on the Ergonomic Controller.

  ♦ Supplement

  Two types of switches are mounted on the 90i and the Ergonomic Controller: a CW/CCW switch (⊞ button on the 90i and ⊞ button on the Ergonomic Controller) or a Function switch (▭ button on the 90i and ◉ button on the Ergonomic Controller). The functions that can be set differ with each switch type. Listed below are the functions that can be set for each switch type. The names of the functions in the switch function list are enclosed in parentheses.

  • CW/CCW switch functions

1: Motorized nosepiece Normal/Reverse rotation	(Objective CW/CCW)
2: Condenser Normal/Reverse rotation	(Condenser CW/CCW)
3: Filter cube Normal/Reverse rotation	(Filter Cube CW/CCW)
4: Diascopic aperture diaphragm Open/Close	(DIA Aperture Stop OPEN/CLOSE)
5: Diascopic field diaphragm Open/Close	(DIA Field Stop OPEN/CLOSE)
6: Motorized ND filter Bright/Dark	(ND Filter BRIGHT/DARK)
7: Lamp voltage Up/Down	(DIA Lamp UP/DOWN)
8: Zoom Up/Down	(Optical Zoom UP/DOWN)
9: Episcopic field diaphragm Open/Close	(Epi Field Stop OPEN/CLOSE)

  • Function switch functions

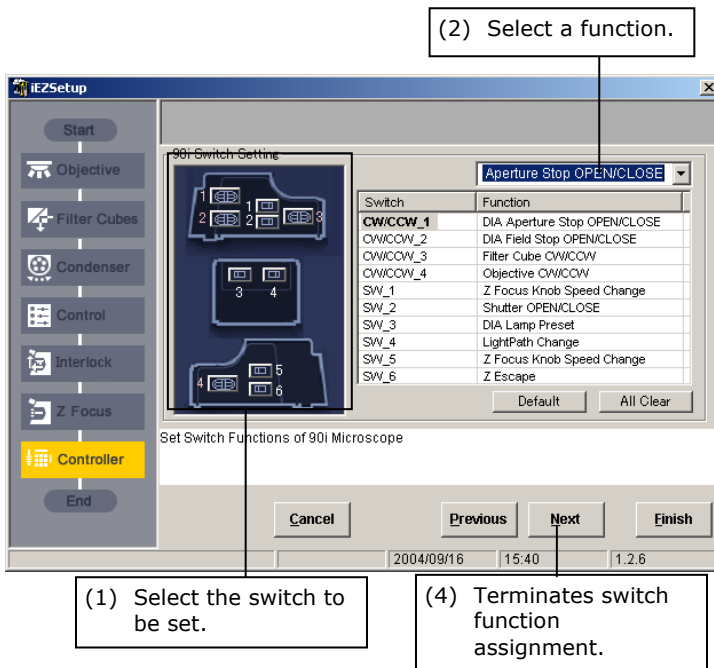 | | |
    |---|---|
    | 1: Zoom Up | (Optical Zoom UP) |
    | 2: Zoom Down | (Optical Zoom DOWN) |
    | 3: Lamp On/Off | (DIA Lamp ON/OFF) |
    | 4: Lamp 9V (Preset) setup | (DIA Lamp Preset) |
    | 5: Escape operation | (Z Escape) |
    | 6: Up/down focus knob speed change (coarse, fine, or extra fine) | (Z Focus Knob Speed Change) |
    | 7: Motorized stage knob speed change (coarse, fine, or extra fine) | (XY stage Knob Speed Change) |
    | 8: Optical path change | (Light Path Change) |
    | 9: Analyzer In/Out | (Analyzer IN/OUT) |
    | 10: Shutter Open/Close | (Shutter OPEN/CLOSE) |
    | 11: Image AF execution | (Auto Focus) |
    | 12: Capture execution | (Image Capture) |
    | 13: Differential interference contrast <-> bright field microscopy switchover | (DIC <-> Bright field) |
    | 14: DIC/fluorescent simultaneous <-> bright field microscopy switchover | (DIC/Fl. <-> Bright field) |
    | 15: Fluorescent <-> bright field microscopy switchover | (Fluorescence <-> Bright field) |
    | 16: Phase contrast <-> bright field microscopy switchover | (Phase Contrast <-> Bright field) |
    | 17: Dark field <-> bright field microscopy switchover | (Dark field <-> Bright field) |
    | 18: Arbitrary microscopy (User 1-6 type) <-> bright field microscopy switchover | (Option 1 <-> Bright field) |
    | | (Option 2 <-> Bright field) |
    | | (Option 3 <-> Bright field) |
    | | (Option 4 <-> Bright field) |
    | | (Option 5 <-> Bright field) |
    | | (Option 6 <-> Bright field) |

  Note: If you wish to assign a new function to the preset function button on the 90i, release the preset state, and then set the new function.
  When the lamp is in the preset state, the lamp brightness control knob is disabled. To enable the brightness control knob, release the preset state. You can release the preset state by changing the lamp voltage with iControl. (Refer to Section 4.8.9.)

3.11.1   Assigning 90i Main Unit Switch Functions

Click the Next button after up/down focus motion setup or click the Controller button in setup item flow. The display switches to the switch function assignment window.

▼ **90i main unit switch function assignment window**

(2) Select a function.

(1) Select the switch to be set.

(4) Terminates switch function assignment.

(1) In the switch selection frame, click the button for the switch to which you want to assign a function. The selected switch name will be highlighted in list view.

(2) From the switch function list, select the function you want to assign. The function for the selected switch displayed in list view is updated.

♦ Supplement

The same function can be assigned to multiple switches.

Note: If you assign the "Z Focus Knob Speed Change" or "XY stage Knob Speed Change" function to a switch while operation mode of the manual handle is set to Auto, the operation mode will switch automatically from Auto to Manual.

(3) To assign functions to other switches, repeat steps (1) and (2) above.

(4) To finish setting up the 90i main unit switches, click the Next button.
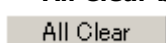
▼ **Default button**

● **To restore default switch functions**

Click the Default button. The switches will revert to their default assigned functions.

● Default settings

CW/CCW1: Diascopic aperture diaphragm Open/Close
CW/CCW2: Diascopic field diaphragm Open/Close
CW/CCW3: Filter cube CW/CCW
CW/CCW4: Motorized nosepiece CW/CCW
SW1: Stage escape function
SW2: Up/down knob coarse/fine change
SW3: Diascopic lamp preset function
SW4: DIH optical path change
SW5: Stage escape function
SW6: Up/down knob coarse/fine change

▼ **All Clear button**

● **To clear all settings**

Click the All Clear button to clear all set switch functions.

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3.11.2   Assigning Ergonomic Controller Switch Functions

Click the Next button after completing 90i switch function assignment or click the sub-setup item button labeled "Ergo Switch." This displays the Ergonomic Controller switch function assignment window.

- **Selecting switch setup mode:**

  Select switch setup mode from two choices available: Standard or Extend.

  ♦ Supplement

   Ergonomic Controller switch functions can be assigned by one of two methods: Standard and Extend modes. In Standard mode, only one function is assigned per button. In Extend mode, one switch may be assigned one of two functions on switchable sides A and B.

  Listed below are switches that can be assigned functions in the respective modes.

  • Standard (standard mode)

   1: "L" (A-side) function key switch
   2: "R" (A-side) function key switch
   3: "1" (A-side) function key switch
   4: "2" (A-side) function key switch
   5: "3" (A-side) function key switch
   6: CW/CCW (A-side) key switch
   7: CW/CCW (B-side) key switch

  • Extend (extended mode)

   1: "L" (A-side) function key switch
   2: "R" (A-side) function key switch
   3: "1" (A-side) function key switch
   4: "2" (A-side) function key switch
   5: "3" (A-side) function key switch
   6: "L" (B-side) function key switch
   7: "R" (B-side) function key switch
   8: "1" (B-side) function key switch
   9: "2" (B-side) function key switch
   10: "3" (B-side) function key switch
   11: CW/CCW (A-side) key switch
   12: CW/CCW (B-side) key switch

- **Stage manipulating handle left or right-handed setup:**

  In switch setup selection, choose Right for right-handed or Left for left-handed.
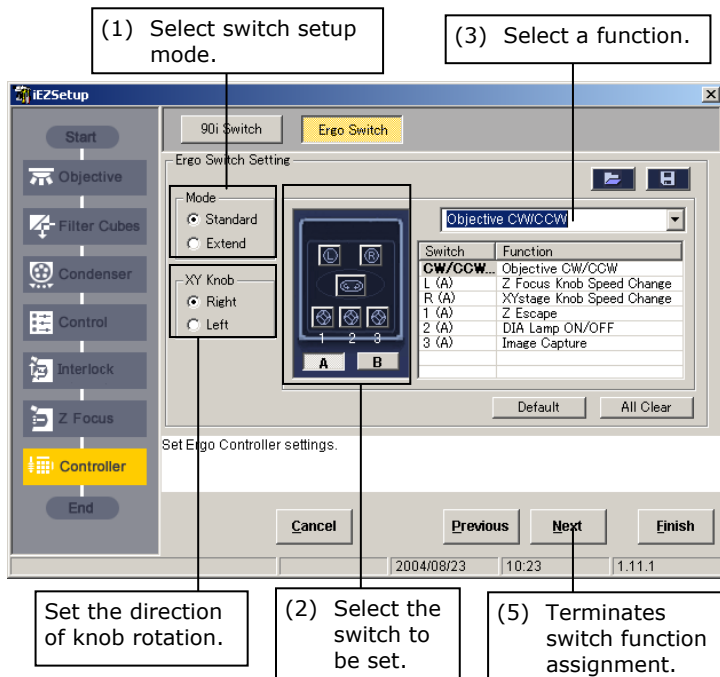
  ♦ Supplement

   Change the direction of rotation of the Ergonomic Controller stage-manipulating handle for left or right-handed operation.

- **Saving and loading switch function assignment information:**

  ♦ Supplement

   Switch function assignments can be saved to a file. Once saved, these files can be loaded to reflect specific switch function assignments.

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3.11   Switch Function Assignments

▼ **Ergonomic Controller switch function assignment window**

(1) Select switch setup mode.

(3) Select a function.

Set the direction of knob rotation.

(2) Select the switch to be set.

(5) Terminates switch function assignment.

(1)   Selecting switch setup mode
Select Standard for standard mode or Extend for extended mode.

(2)   In the switch selection frame, click the button for the switch to which you want to assign a function. The selected switch name will be highlighted in list view.

(3)   From the switch function list, select the function you want to assign. The function for the selected switch displayed in list view is updated.

♦ Supplement
The same function can be assigned to multiple switches.

Note: If you assign the "Z Focus Knob Speed Change" or "XY stage Knob Speed Change" function to a switch while the operation mode of the manual handle is set to Auto, the operation mode will switch automatically from Auto to Manual.

(4)   To assign functions to other switches, repeat steps (1) through (3) described above.

(5)   To finish setting up the Ergonomic Controller switches, click the Next button.

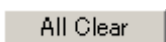▼ **Default button**

● **To restore default switch functions**

Click the Default button. The switches will revert to their default assigned functions.

• Default settings for single 90i main unit or 90i + DIH-M

CW/CCW(A): Motorized nosepiece Normal/Reverse rotation

CW/CCW(B): Condenser Normal/Reverse rotation

L: Up/down knob coarse/fine change

R: XY stage knob coarse/fine change

1: Escape operation

2: Lamp On/Off

3: Lamp 9V (Preset) setup

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• Default settings for 90i + DIH-E

    CW/CCW(A): Motorized nosepiece Normal/Reverse rotation

    CW/CCW(B): Filter cube Normal/Reverse rotation

    L: Up/down knob coarse/fine change

    R: XY stage knob coarse/fine change

    1: Option 1 <-> Bright field

    2: Lamp On/Off

    3: Shutter Open/Close

• Default settings for DIH-E

    CW/CCW(A): Filter cube Normal/Reverse rotation

    CW/CCW(B): Episcopic field diaphragm Open/Close

    L: Zoom Up

    R: Zoom Down

    1: Optical path change

    2: Analyzer In/Out

    3: Shutter Open/Close

▼ **All Clear button**

● **To clear all settings**

Click the All Clear button to clear all set switch functions.

▼ **File Save button**

● **To save the information set**

Click the File Save button to display a dialog box for saving files. In this dialog box, enter a filename (***.xml) and click the Save button.

The information set in the Ergonomic Controller switch function assignment window will be saved.
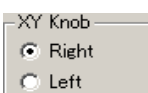
▼ **File Read button**

● **To load a saved file**

Click the File Read button to display a dialog box for loading files. In this dialog box, enter a filename (***.xml) and click the Open button.

The setup information will be reflected in the Ergonomic Controller switch function assignment window.

▼ **XY Knob direction of rotation select button**


● **Setting the direction of knob rotation**

Choose Right or Left for right or left-handed operations.

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3.12 END Processing

After completing the setup procedure, go to the END processing dialog box by clicking the Next button.
In END processing, send the name of the microscope system and the information you've set to the microscope system. The transmitted name and information are stored in memory on the microscope system side. The information you've set can be saved to a file, if desired.

▼ END processing dialog box
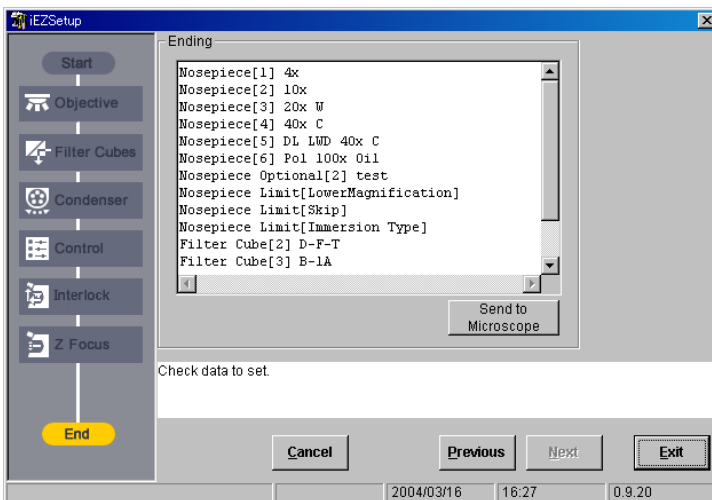

If the set contents are correct, click the Send to Microscope button.

(1) All of the information you've set is displayed in this dialog box, so check the displayed contents. If the contents you've set are correct, click the Send to Microscope button. This completes the settings, and the information set is sent to the microscope system. The transmitted name and information are stored in memory on the microscope system side.

When the software has finished sending, a save select dialog box is displayed.

♦ Supplement
Click the Previous button to correct the contents you've set and to display the setup dialog box for the last item in the flow of setup items once again.

▼ Save select dialog box
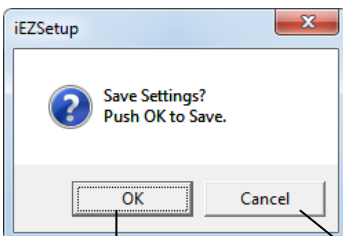
To save the set information to a file, click the OK button.

If you do not want to save the set information to a file, click the Cancel button.

(2) To save the set information to a file, click the OK button. Select a file (***.xml) from the file select dialog box displayed The set information is saved to the selected file, after which iEZSetup is closed.

If you do not want to save set information to a file, click the Cancel button. iEZSetup is closed immediately.
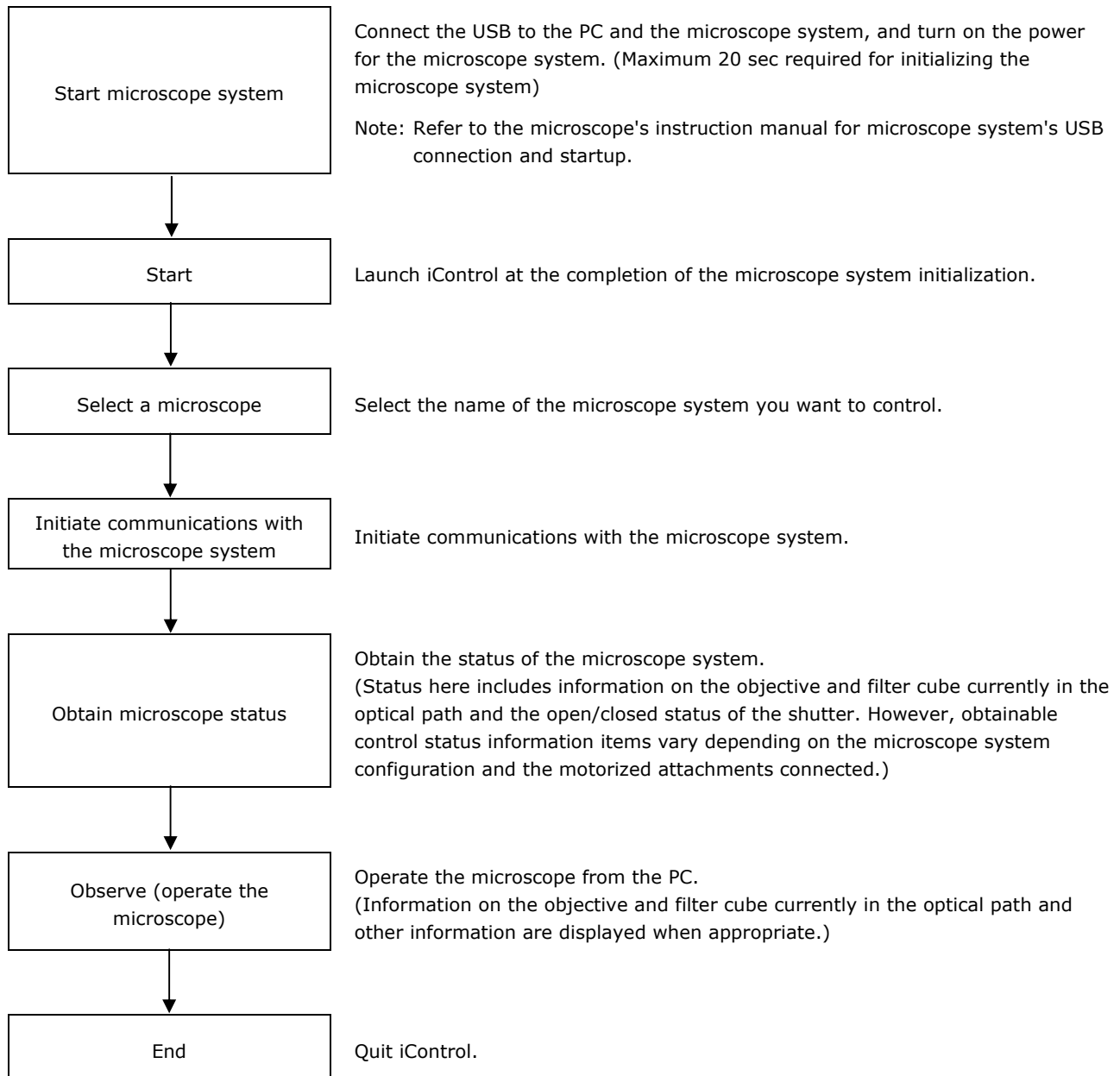
▼ File select dialog box

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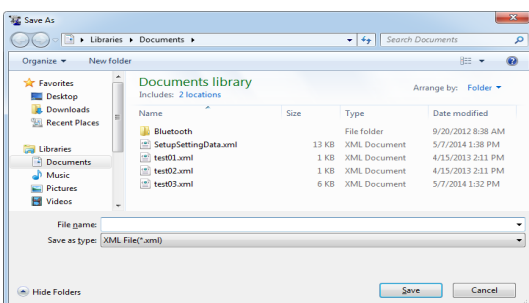
4 Using iControl

iControl, one of the i Series Support Tools, lets you monitor the status of the microscope system at a glance while performing microscopy. It also lets you operate motorized attachments.

4.1 iControl Workflow

The following flow shows how to control your microscope system using the iControl application.

Start microscope system	Connect the USB to the PC and the microscope system, and turn on the power for the microscope system. (Maximum 20 sec required for initializing the microscope system) Note: Refer to the microscope's instruction manual for microscope system's USB connection and startup.
Start	Launch iControl at the completion of the microscope system initialization.
Select a microscope	Select the name of the microscope system you want to control.
Initiate communications with the microscope system	Initiate communications with the microscope system.
Obtain microscope status	Obtain the status of the microscope system. (Status here includes information on the objective and filter cube currently in the optical path and the open/closed status of the shutter. However, obtainable control status information items vary depending on the microscope system configuration and the motorized attachments connected.)
Observe (operate the microscope)	Operate the microscope from the PC. (Information on the objective and filter cube currently in the optical path and other information are displayed when appropriate.)
End	Quit iControl.

Use iSetup during observations to change settings. For more information, refer to Section 4.5.1.

4.2 Starting and Quitting iControl

You can start and quit iControl in several ways. A general method is described here, using the Start menu to start and the Cancel button in the operations windows to quit.

4.2.1 Starting Up

Procedure

▼ Start menu
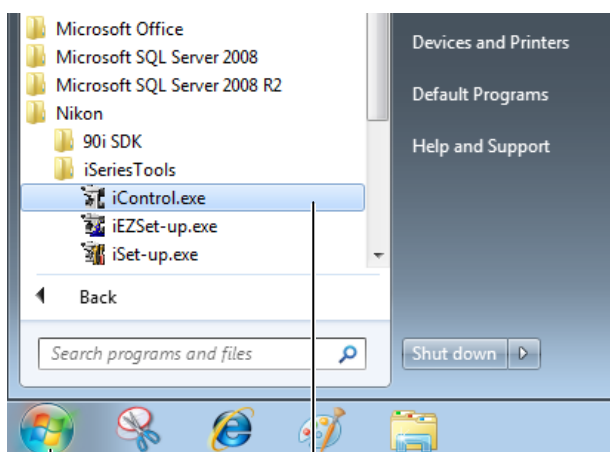
(1) Click the Start button.

(2) Point to All Programs, Nikon, and iSeriesTools. And then, click iControl.exe.

Confirm that the microscope system is connected to your PC before starting the PC.

(1) Click the Start button.

(2) Point to All Programs, Nikon, and iSeriesTools, then click iControl.exe. The iControl starts, and then the iControl main window appears.

> **CAUTION**
> Do not unplug the USB cable that connects the microscope with the PC while iControl is running.

▼ Microscope system select dialog box
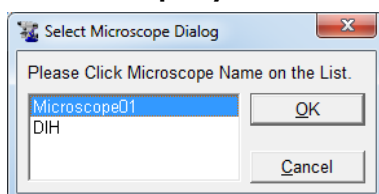
If multiple microscope systems are connected:

(1) A microscope system select dialog box is displayed. Select a desired system from the list.

(2) Click the OK button. The iControl window is displayed.

▼ iControl window

4.2.2	Quitting iControl

Procedure

▼ **iControl window**

(1) Click the Exit button.

(1) Click the Exit button.
Communications with the microscope system are terminated, closing the application.

4.3   iControl Screen Configuration

▼ iControl window (open window)

• Select the microscope system with which to communicate. Start communications. End communications.

Close button
Click this button to close the window.

Control dialog box display buttons for individual motorized attachments
Click the icon button representing a motorized attachment to display a dialog box for controlling that motorized attachment. This dialog box lets you operate the attachment.

• Start iSetup.
• Save/load a desired microscopy method.

• Acquire event log.
• Version information

• Change microscopy methods.

• Quit iControl.
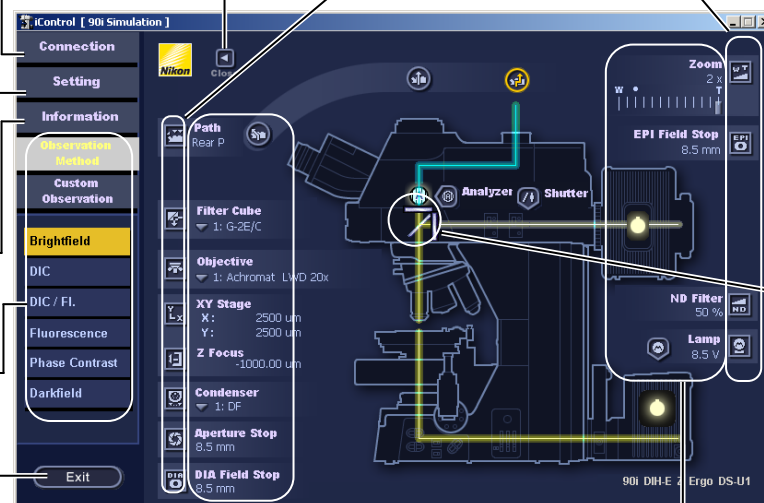
Barrier filter
The light color in the optical path after the barrier filter can be changed.

Excitation filter
The light color in the optical path after the excitation filter can be changed.

Current control status indications and motorized attachment operation buttons
The current status is displayed adjacent to the icon representing each of the motorized attachments.
Press ∇ to view the names of optical components attached to other addresses and change addresses.

▼ iControl window (open window : the microscope system includes the D-FL-E)
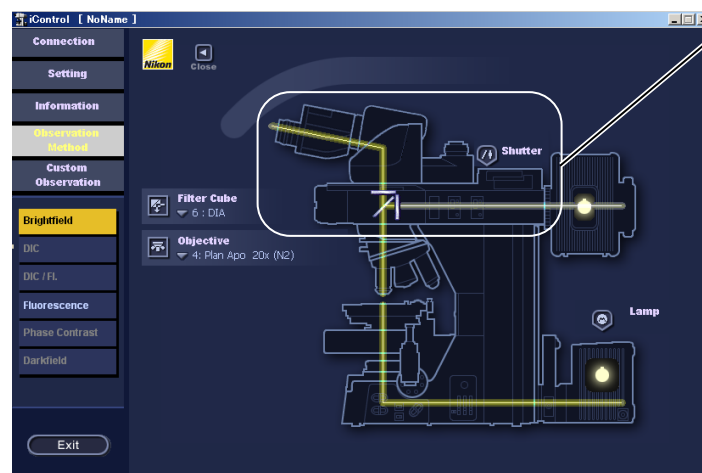
D-FL-E
When D-FL-E is mounted, the display changes.

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▼ **iControl window (open window: the microscope system includes the optical fiber light source)**
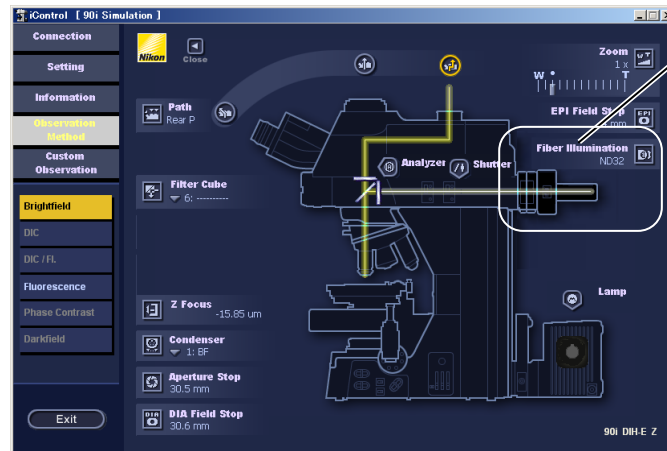
Optical fiber light source

When the optical fiber light source is connected, the display changes.

▼ **iControl window (closed window)**

- Select the microscope system with which to communicate. Start communications. End communications.
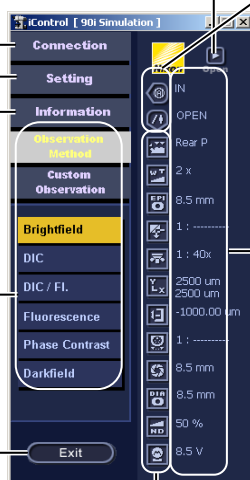
Open button
Click this button to open the window.

Analyzer IN/OUT toggle button
Click this button to toggle the analyzer IN/OUT.

Shutter OPEN/CLOSE toggle button
Click this button to toggle the shutter OPEN/CLOSE.

- Start iSetup.
- Save/load microscope control status.

- Acquire event log.
- Version information

Current control status indications

The current status is displayed adjacent to the icon representing each of the motorized attachments.

- Change microscopy methods.

- Quit iControl.

Control dialog box display buttons for individual motorized attachments
Click the icon button representing a motorized attachment to display a dialog box for controlling that motorized attachment.
This dialog box lets you operate the attachment.

A closed window consists of the icons representing each motorized attachment (i.e., subwindow display buttons) and status indications.

Click any icon to display a subwindow for the corresponding motorized attachment.

To reverse the window, click the Open button.

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4.3   iControl Screen Configuration

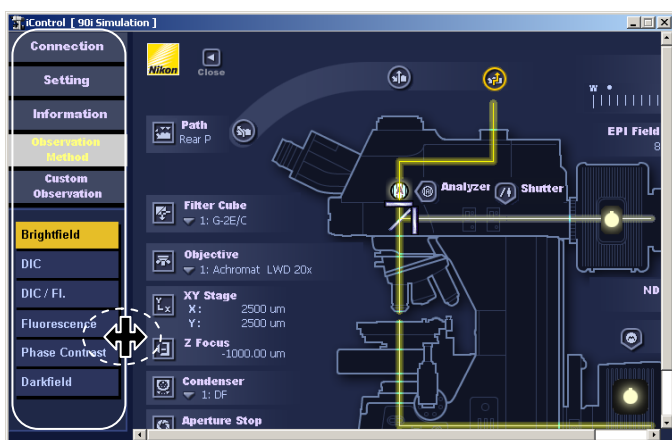| 4.3.1	Resizing the iControl Window

The iControl window consists of a control frame and a menu frame. You can change the size of each frame of the iControl window independently.

▼ **iControl window**

Menu frame   Control frame
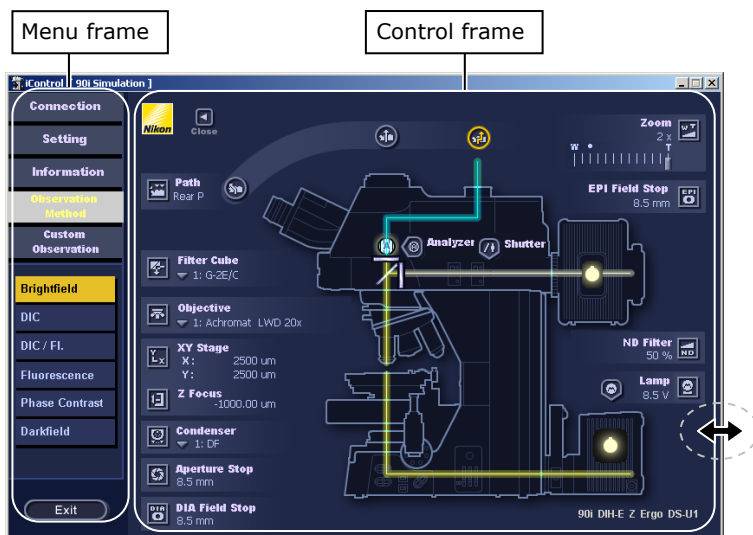
● **Resizing the control frame**

(1) Move the mouse cursor over the control frame of the iControl window. The mouse icon will change to a resize icon "<->".

(2) To resize the control frame, hold down the left mouse button while moving the mouse cursor.

● **Resizing the menu frame**

(1) Move the mouse cursor to the right edge of the menu frame of the iControl window. The mouse icon will change to a resize icon "<||>".

(2) To resize the menu frame, hold down the left mouse button while moving the mouse cursor.

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4.4   Connection

4.4.1   Starting Communications

Before you can monitor or control the status of the microscope system, you must first initiate communications between the microscope system and the PC.

▼ **Menu**

Connection

(1) Click Connection.

Setting

Information

Observation
Method

Custom
Observation

Open

(3) Click Connection, then
     Open.

Close

Read Status

90i Simulation

(2) Select the microscope
     system for
     communication.

Exit
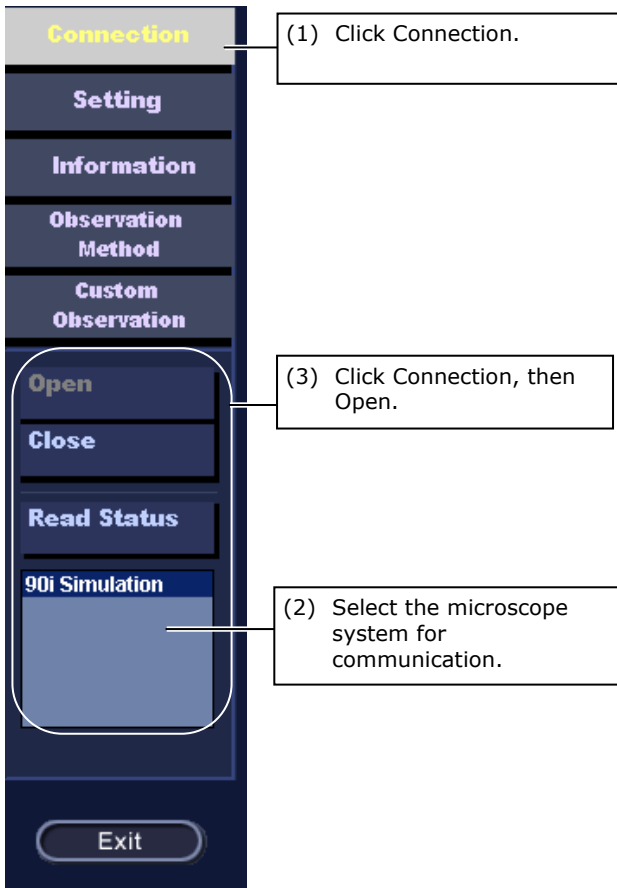
(1)   Click Connection to display the Connection menu shown to the left.

(2)   From the list box, select a microscope system you want to monitor or control.

(3)   Click Connection, then Open.
        The software will initiate communications with the selected microscope system.

(4)   To communicate with another microscope system, select the desired microscope system in the list box. The software will automatically terminate communications with the previous microscope system and initiate communications with the newly selected microscope system.

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| 4.4.2 | Obtaining the Status of the Microscope System |

If you changed the objective or filter cube mounting setup through the iSetup or iEZSetup after starting iControl, you must once again acquire the present status of the microscope system.
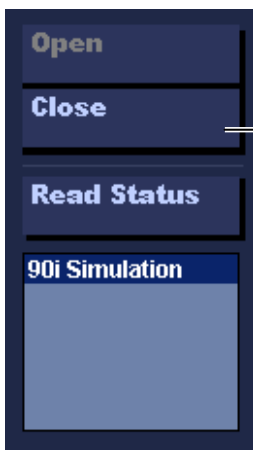
▼ **Menu**
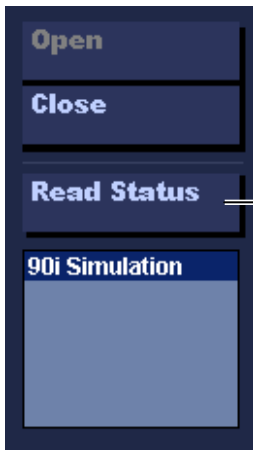
(1) Click Connection, then Read Status.

**(1)** Click Connection, then Read Status to acquire the current status of the microscope system.

| 4.4.3 | Terminating Communications |

Communications with the microscope system can be terminated from iControl.

▼ **Menu**

(1) Click Connection, then Close.

(1) Click Connection, then Close.
The software terminates the session with the microscope system.

4.5 Setting

4.5.1 Information Setting

Setting lets you invoke iSetup from within iControl to quickly set information for objectives or filter cubes.

▼ **Menu**

Connection
Setting
Information
Observation Method
Custom Observation
Setup
Focus Setting
Z Upper Limit
XY Setting

(1) Click Setting, then Setup.

(1) Click Setting, then Setup to start iSetup.

▼ **iSetup window**
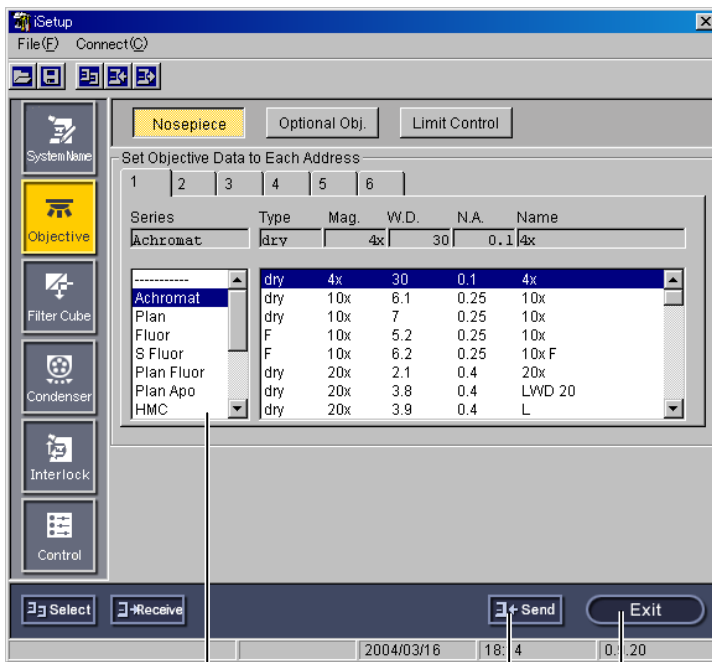
| (2) Set the necessary information. | (3) Click the Send button. | (4) Click the Exit button. |

| (5) Click Connection, then Read Status. |

(2) Set the necessary information in iSetup. For more information, refer to Chapter 5, "Using iSetup."

(3) After completing setup, click the Send button in iSetup. The settings just made are sent to the microscope system. (The new information is thereby stored in memory on the microscope system side.)

(4) Click the Exit button to terminate iSetup.

(5) Click Connection, then Read Status. The software will reacquire the status of the microscope system.

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4.5.2   Setting Up the Focus Position for Up/Down Motion

The compensation amount — the slight difference in focus position between different objectives — is stored to enable accurate reproduction.

In the focus position setup for up/down motion, the current Z-axis absolute position (focus position) is saved in association with an objective address.

Note: Focus position setup is possible only if the 90i is included in the system configuration (Focus Setting button enabled).

▼ **Menu**

(1) Click Setting, then Focus Setting.
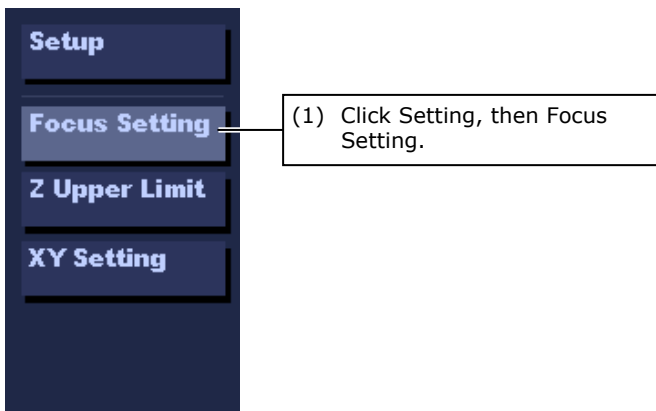
(1)   Click Setting, then Focus Setting to display a dialog box for setting up focus position.

▼ **Focus position setup window**

(2) Click an address button.

(3) Adjust to the focus position using the Z-axis position controls.

(4) Click the Memory button.

(5) Click the Close button to quit.
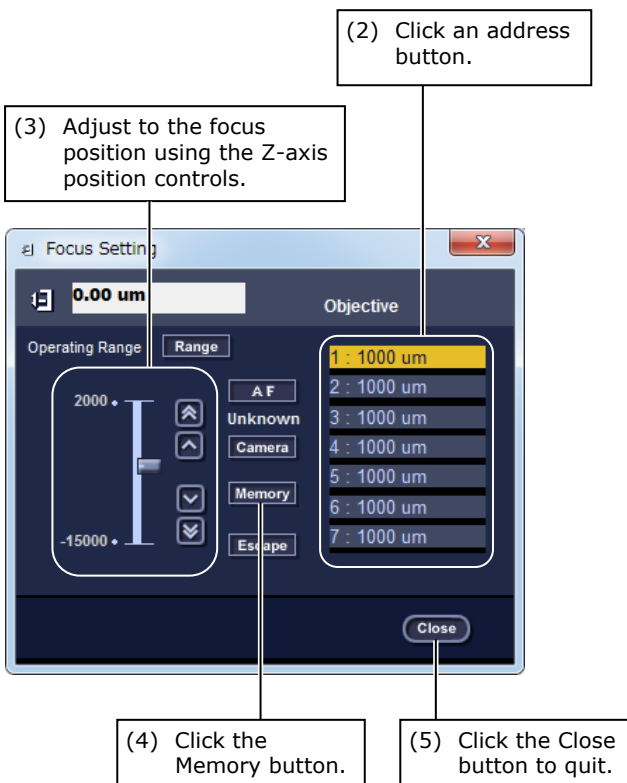
(2)   To set up a focus position in association with an objective, select an objective first. To change addresses, click the desired address button.

(3)   Move the stage to the focus position using the focus knob on the microscope or the up and down keys for moving the stage along the Z-axis.

(4)   Click Memory to register the focus position.

(5-1) To set another objective, go back to Step (2) to repeat the setup procedure.

**(5-2)** To quit focus position setup, click the Close button.

4.5.3 — Setting the Software Upper Limit

Set an upper limit to prevent contact between the sample on the stage and the objective when the up/down knob is turned.

Note: **During the actual setup of an upper limit (i.e., while the upper limit setup window is displayed and active), software upper limit control is disabled. When turning the up/down knob, be especially careful to avoid a collision between the stage and objective.**
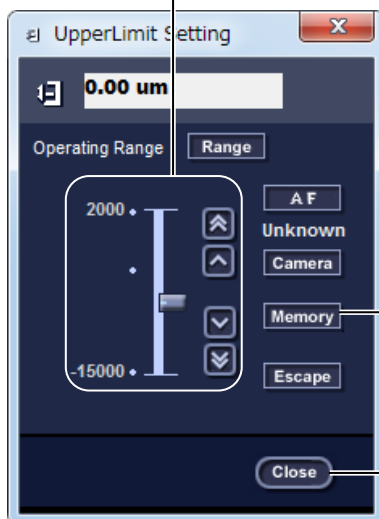
▼ **Menu**
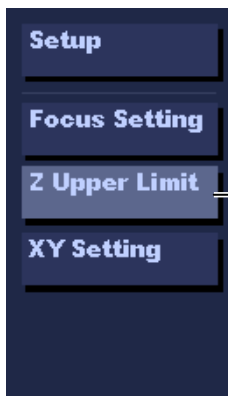
(1) Choose Setting -> Z Upper Limit.

(1) Choose Setting -> Z Upper Limit from the menu to display the software upper limit setup window.

▼ **Software upper limit setup window**

(2) Manipulate the Z operation control to adjust to the in-focus position.

(3) Click the Memory button.

(4) Click the Close button to finish.

(2) Use the focus handle of the microscope main unit or the up/down keys for Z-axis stage motion to move the stage to the upper limit position.

(3) Click the Memory button to register the upper limit position set.

(4) Click Close to complete setup.

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4.5.4	Setting the XY Stage Center Position

Center axis correction control corrects slight differences in the position of the center axis from objective to objective by storing center position information in memory for each objective.
In XY stage center position setup, the current correction value will be saved in association with the address of each objective.
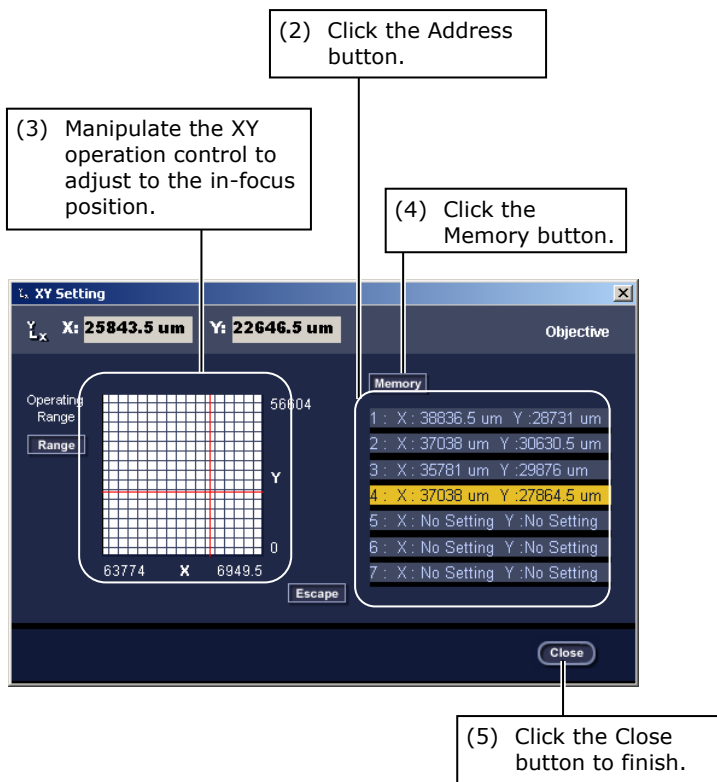
Note:XY stage center position setup is possible only if the motorized XY stage and the Ergonomic Controller are installed in the motorized unit (XY Setting button enabled).

▼ **Menu**

(1)   Choose Setting - XY Setting.
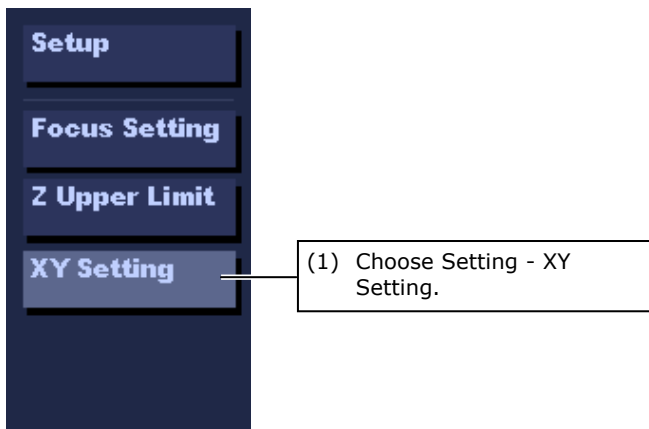
(1)   Choose Setting -> XY Setting from the menu to display the XY stage center position setup window.

▼ **XY stage center position setup window**

(2)   Click the Address button.

(3)   Manipulate the XY operation control to adjust to the in-focus position.

(4)   Click the Memory button.

(5)   Click the Close button to finish.

(2)   Set the center position of each objective, one at a time. Start by selecting a single objective. Press the Address button to change objective addresses.

(3)   Use the focus handle of the XY stage or the up/down keys for XY-direction stage motion to center the stage.

♦ Supplement
   To set the center position, first determine an arbitrary reference position for the sample. Then, using a reticle-containing eyepiece or the reticle display function of the camera display software (when performing the camera observation), move the stage until the cross-hairs center position and the reference position of the sample are superimposed.

(4)   Click Memory to register the center position.

(5-1) To set positions for other objectives, return to (2) and follow the instructions given there.

**(5-2)**Click the Close button to complete center positioning.

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4.6 Information

4.6.1 Confirmation of Event Logs

Event logs for the microscope system let you confirm operations performed during the last 100 sessions.

▼ **Menu**

Connection

Setting

Information

Observation Method

Custom Observation

Event Log

Version

90i Switch

Ergo Switch

(1) Click Information, then Event Log.

(1) Click Information, then Event Log to display an event log confirmation popup.

▼ **Event log confirmation popup**

Event Log

Do you get event log of microscope ?

Yes　No
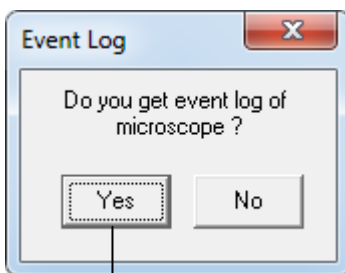
(2) Click the Yes button.

(2) Click the Yes button in the confirmation popup to write event logs for the selected microscope system to "Event.txt."

(3) After acquiring an event log, the system will automatically display the "Event.txt."

"Event.txt" is created in C:\ProgramFiles\iSeriesTools, when the application installs the default settings.

<table>
<tr><td>**4.6.2**</td><td>**Confirming Versions**</td></tr>
</table>

iControl lets you confirm version information for iSeries Support Tools and the firmware incorporated into each attachment.

▼ Menu

(1) Click Information, then Version.

(1)   Click Information, then Version to display a version information dialog box.

▼ Version Information dialog box
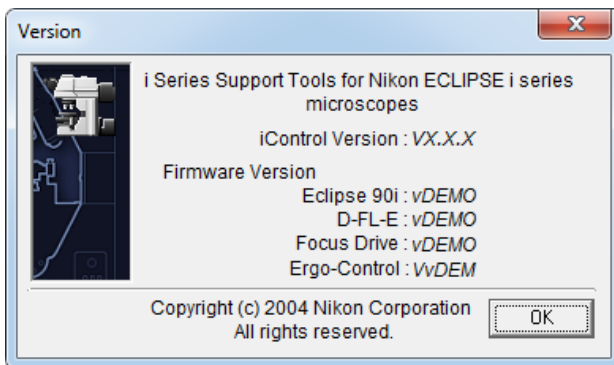
(2)   This dialog box shows the following information:

- Version of the application iSeries Support Tools
- 90i firmware
- DIH firmware
- Z drive firmware
- Ergonomic Controller version
- D-FL-E version

4.7   Changing the Optical Path Light Color

Virtually any color can be selected for the light in the optical path by adjusting the wavelength of the light exiting the excitation or barrier filter placed in the optical path during setup.

♦ Supplement

If a filter registered by initial setting in iSetup and iEZSetup is selected, the light color in the optical path will be automatically changed according to the filter wavelength.

▼ **iControl window**

Barrier filter
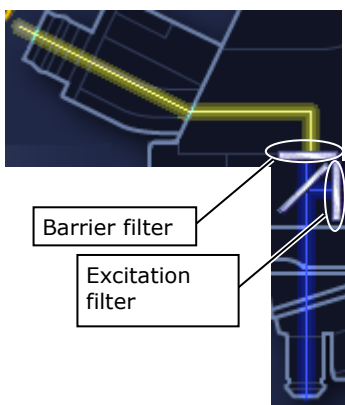
Excitation filter

(1) To change the color of the light passing through the excitation filter, click the excitation filter icon in the window to display a window for the light color in the optical path. Likewise, to change the color of the light passing through the barrier filter, click the icon for the barrier filter.

(2) The color bar shows the color of the wavelength range of the filter. Click on the color bar to change the color.

▼ **Window for the light color in the optical path**

Color bar
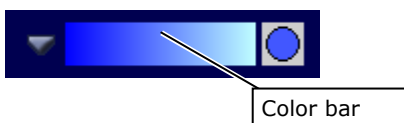
▼ **Color palette window**
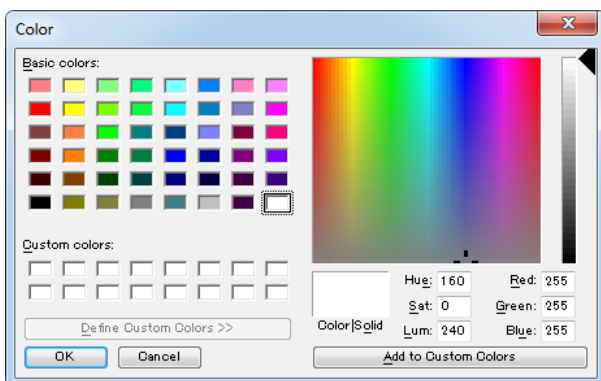
(3) Or click the ▼ to open a color palette window. Specify the desired color in this dialog box. The color of the ◯ circle changes accordingly, as a preview, changing the light color in the iControl window.

(4) Colors set in this way are automatically written to the application. The set colors are reproduced automatically the next time you launch the application.

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4.8   Motorized Attachment Controls

In this application, controllable attachments vary depending on the microscope system configuration.

The following shows a list of controllable attachments for each configuration:

- **90i + DIH-E**

  - Shutter (4.8.1)
  - Analyzer (4.8.2)
  - Optical path switching (4.8.3)
  - Episcopic field diaphragm (4.8.4)
  - Diascopic field diaphragm (4.8.5)
  - Diascopic aperture diaphragm (if motorized universal condenser module is attached) (4.8.6)
  - ND filter (only if motorized ND filter is attached) (4.8.7)
  - Optical zoom (4.8.8)
  - Illumination lamp (4.8.9)
  - Filter cube (4.8.10)
  - Nosepiece (only if motorized nosepiece is attached) (4.8.11)
  - Condenser module (if motorized universal condenser module is attached) (4.8.12)
  - Up/down focus motion (4.8.13)
  - XY stage (applies only if the motorized XY stage and the Ergonomic Controller are installed) (4.8.14)
  - Optical Fiber Illumination (Only if HG Precentered Fiber Illumination is attached) (4.8.15)

- **90i + DIH-M**

  - Shutter (4.8.1)
  - Diascopic field diaphragm (4.8.5)
  - Diascopic aperture diaphragm (if motorized universal condenser module is attached) (4.8.6)
  - ND filter (only if motorized ND filter is attached) (4.8.7)
  - Illumination lamp (4.8.9)
  - Nosepiece (only if motorized nosepiece is attached) (4.8.11)
  - Condenser module (if motorized universal condenser module is attached) (4.8.12)
  - Up/down focus motion (4.8.13)
  - XY stage (applies only if the motorized XY stage and the Ergonomic Controller are installed) (4.8.14)
  - Optical Fiber Illumination (Only if HG Precentered Fiber Illumination is attached) (4.8.15)

- **80i + DIH-E**

  - Shutter (4.8.1)
  - Analyzer (4.8.2)
  - Optical path switching (4.8.3)
  - Episcopic field diaphragm (4.8.4)
  - Optical zoom (4.8.8)
  - Filter cube (4.8.10)
  - Optical Fiber Illumination (Only if HG Precentered Fiber Illumination is attached) (4.8.15)

- **80i + DIH-M**

  - Shutter (4.8.1)
  - Optical Fiber Illumination (Only if HG Precentered Fiber Illumination is attached) (4.8.15)

- **80i + D-FL-E**

  - Shutter (4.8.1)
  - Filter cube (4.8.10)
  - Nosepiece (only if motorized nosepiece is attached) (4.8.11)
  - Optical Fiber Illumination (Only if HG Precentered Fiber Illumination is attached) (4.8.15)

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4.8.1   Shutter

▼ iControl window

Shutter button

(1) Click the ⟦shutter icon⟧ shutter button to toggle the shutter open or closed.
If closed, the shutter shuts off the optical path to the Epi-illumination.

♦ Meanings of the indications in the open window

Optical path shown: Shutter open

Shutter icon shown with optical path shut off: Shutter closed
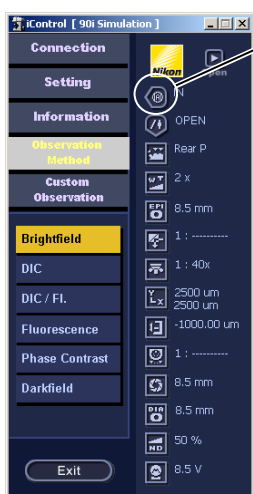
♦ Meanings of the indications in the closed window

Open: Shutter open

Close: Shutter closed

4.8.2   Analyzer

▼ **iControl window**

Analyzer button

(1) Click the [icon] analyzer button to toggle the analyzer IN or OUT.

♦ Meanings of the indications in the open window

　Analyzer icon shown in optical path: Analyzer IN

　Analyzer icon not shown: Analyzer OUT

♦ Meanings of the indications in the closed window

　IN: Analyzer IN

　OUT: Analyzer OUT

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4.8   Motorized Attachment Controls

4.8.3   Optical Path Switching

▼ iControl window
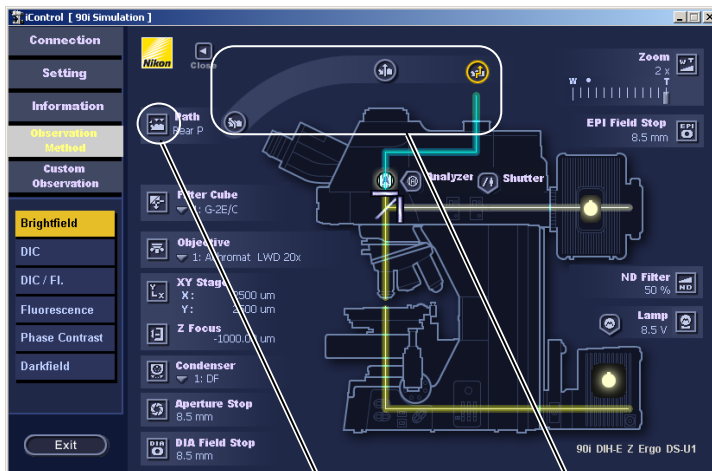
(1) Optical path selector buttons
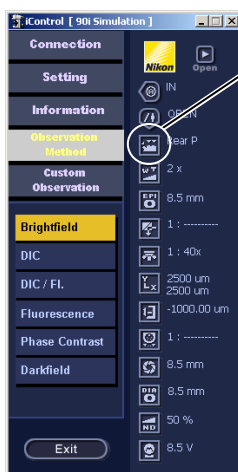
(2) Optical path controls display button

(3) Optical path switching interlock setup check box

(4) Close button

(1) Click an optical path selector button to switch optical paths.

(2) Click the [icon] optical path controls display button to display the optical path controls. Click an optical path selector button on the optical path controls to change optical paths.

Note: For the 90i, when optical paths are switched, the diascopic field diaphragm is adjusted to the appropriate state.

(3) Optical path interlocked change
Select or deselect the Link check box to turn optical path interlock control on or off. To control the units in sync with optical path switchover, select the Link check box. The total magnification based on the objective and optical zoom will change as you switch optical paths. The units listed below will be interlock-controlled according to total magnification.

(1) Episcopic field diaphragm

(2) Diascopic field diaphragm (applies only if the configuration includes the 90i)

(3) Motorized ND (applies only if the motorized ND is installed)

(4) Click the Close button to close the controls.

♦ Meanings of the indications in the open and closed windows and the optical path controls

Binocular: Binocular section

Front P: Front port

Rear P: Rear port

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4.8.4   Episcopic Field Diaphragm

▼ **iControl window**

(1) Display button for episcopic field diaphragm controls

(2) Scroll bar, and enlarge and reduce buttons for adjusting the field diaphragm diameter

(3) Close button

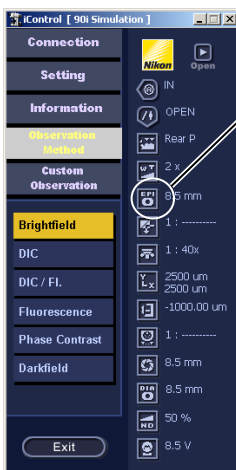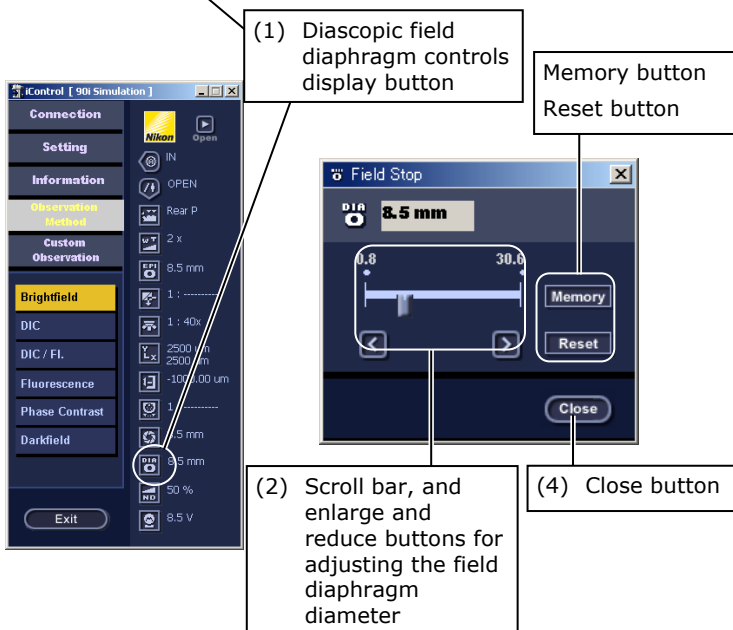**(1)** Click the [EPI] episcopic field diaphragm controls display button to display the controls.

(2) To adjust the field diaphragm diameter, move the scroll bar or click the enlarge and reduce buttons. (The enlarge and reduce buttons let you adjust the diameter in minimum steps.)

(3) Click the Close button to close the controls.

♦ Display item in the open and closed windows and the episcopic field diaphragm controls

Field diaphragm diameter
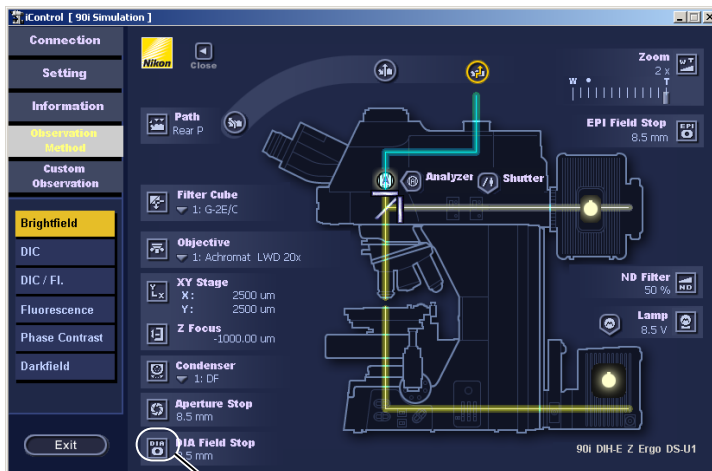
4.8.5   Diascopic Field Diaphragm

▼ **iControl window**

(1) Diascopic field diaphragm controls display button

Memory button
Reset button

(2) Scroll bar, and enlarge and reduce buttons for adjusting the field diaphragm diameter

(4) Close button

(1) Click the [DIA] diascopic field diaphragm controls display button to display the controls.

(2) To adjust the field diaphragm diameter, move the scroll bar or click the enlarge and reduce buttons. (The enlarge and reduce buttons let you adjust the diameter in minimum steps.)

(3-1) Memory function
(enabled when an arbitrary microscopy method is selected)

This function saves the current diaphragm diameter. When saved, the stored position is indicated by the icon on the scroll bar. (The current position is saved in association with the current microscopy method and nosepiece address.)

♦ Supplement
If User Memory is selected as the control method for the diascopic field diaphragm while using an arbitrary microscopy method (User Options 1 to 6), control will be performed based on this saved value.

For setting up selectable control methods, refer to Section 4.9.1, "Setting Up Arbitrary Microscopy Methods."

Note: The value stored for an arbitrary microscopy method using the Memory function is saved to the microscopy system.

(3-2) Reset function

Click the Reset button to reset to the saved diaphragm diameter.
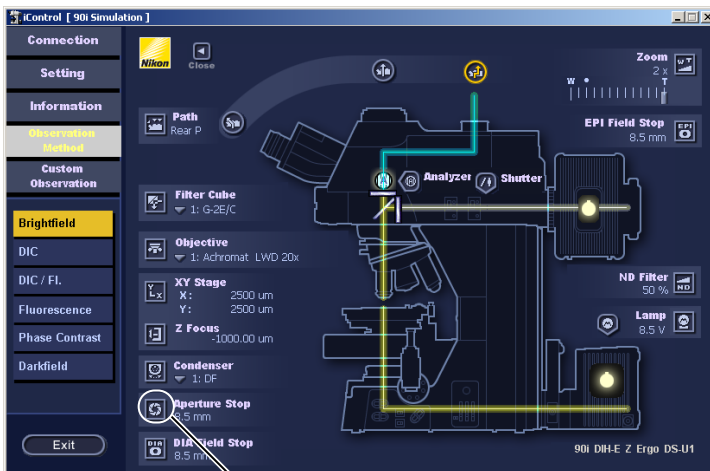
(4) Click the Close button to close the controls.

♦ Display item in the open and closed windows and the diascopic field diaphragm controls
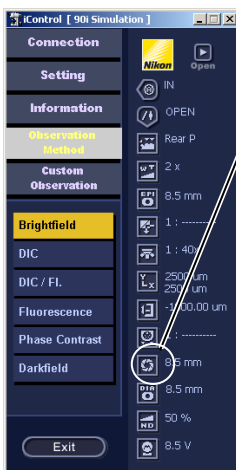
Field diaphragm diameter
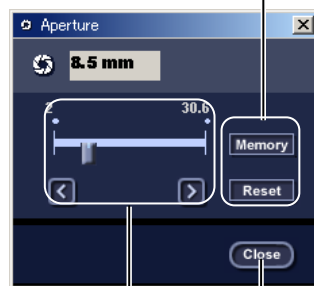
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4.8.6	Diascopic Aperture Diaphragm

▼ **iControl window**

(1) Diascopic aperture diaphragm controls display button

Memory button
Reset button

(2) Scroll bar, and enlarge and reduce buttons for adjusting the aperture diaphragm diameter

(4) Close button

(1) Click the [icon] diascopic aperture diaphragm controls display button to display the controls.

(2) To adjust the aperture diaphragm diameter, move the scroll bar or click the enlarge and reduce buttons. (The enlarge and reduce buttons let you adjust the diameter in minimum steps.)

(3-1) Memory function
(enabled when an arbitrary microscopy method is selected)

This function saves the current diaphragm diameter. When saved, the stored position is indicated by the icon on the scroll bar. (The current position is saved in association with the current microscopy method and the nosepiece address.)

♦ Supplement
If User Memory is selected as the control method for the diascopic aperture diaphragm while using an arbitrary microscopy method (User Options 1 to 6), control will be performed based on this saved value.

For setting up selectable control methods, refer to Section 4.9.1, "Setting Up Arbitrary Microscopy Methods."

Note: The value stored for an arbitrary microscopy method using the Memory function is saved to the microscopy system.

(3-2) Reset function

Click the Reset button to reset to the saved diaphragm diameter.

(4) Click the Close button to close the controls.

♦ Display item in the open and closed windows and the diascopic aperture diaphragm controls
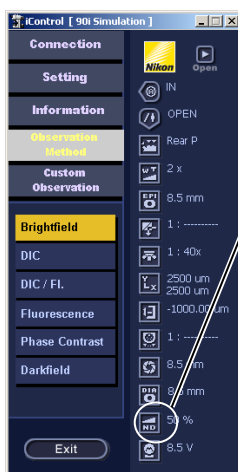
Aperture diaphragm diameter
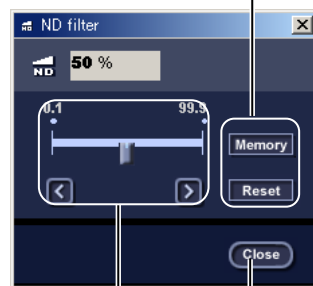
4.8.7   ND Filter

▼ **iControl window**

(1) ND filter controls display button

Memory button
Reset button

(2) Scroll bar, and enlarge and reduce buttons for adjusting the ND filter

(4) Close button

(1) Click the [icon] ND filter controls display button to display the controls.

(2) To adjust the ND filter, move the scroll bar or click the enlarge and reduce buttons. (The enlarge and reduce buttons let you adjust the ND value in minimum steps.)

(3-1) Memory function
(enabled when an arbitrary microscopy method is selected)

This function saves the current ND value. When saved, the stored position is indicated by the icon on the scroll bar. (The current position is saved in association with the current microscopy method and the nosepiece address.)

♦ Supplement
If User Memory is selected as the control method for the ND filter while using an arbitrary microscopy method (User Options 1 to 6), control will be performed based on this saved value.

For setting up selectable control methods, refer to Section 4.9.1, "Setting Up Arbitrary Microscopy Methods."

Note: The value stored for an arbitrary microscopy method using the Memory function is saved to the microscopy system.

(3-2) Reset function

Click the Reset button to reset to the saved ND value.

(4) Click the Close button to close the controls.

♦ Display item in the open and closed windows and the ND filter controls
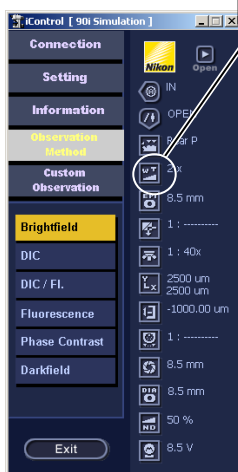
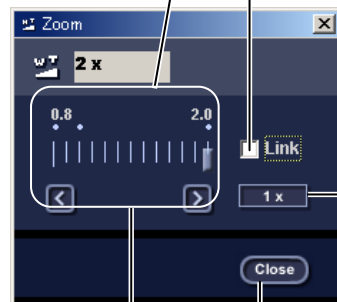ND value (%)

4.8.8   Optical Zoom

▼ **iControl window**

(1) Optical zoom controls display button

(3-1) Link checkbox

(2) Scroll bar, and enlarge and reduce buttons for adjusting the optical zoom

(3-2) 1x button

(4) Close button

(1) Click the [icon] optical zoom controls display button to display the controls.

(2) To adjust the optical zoom, move the scroll bar in the iControl window or that on the optical zoom controls, or click the enlarge and reduce buttons. (The enlarge and reduce buttons let you adjust the optical zoom in minimum steps.)

(3-1) Optical zoom interlocked change
Select or deselect the Link check box to enable or disable optical zoom interlock control. To control the units in sync with optical zoom switchover, select the Link check box. The total magnification based on the objective and optical zoom changes as you adjust the optical zoom. The units listed below will be interlock-controlled according to total magnification.

(1) Episcopic field diaphragm

(2) Diascopic field diaphragm (applies only if the configuration includes the 90i)

(3) Motorized ND (applies only if the motorized ND is installed)

Note: Interlock with optical zoom is enabled only when Rear P is selected as the optical path.

(3-2) Click the 1x button to change the zoom magnification to 1x.

(4) Click the Close button to close the controls.

♦ Display item in the open and closed windows and the optical zoom controls

Magnification
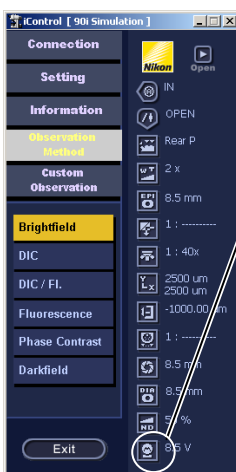
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4.8.9   Diascopic Illumination Lamp

▼ **iControl window**

(1) Illumination lamp controls display button

(2) On button

(3-1) Scroll bar, and up and down buttons for adjusting the lamp voltage

(3-2) Preset button

(4) Close button

(1) Click the [icon] illumination controls display button to display the controls.

(2) To turn ON or OFF the power for the illumination lamp, use the On button on the illumination lamp control or the [icon] button in the iControl window.

(3-1) To adjust the lamp voltage, move the scroll bar or click the up and down buttons on the illumination lamp controls. (The up and down buttons let you adjust the voltage in minimum steps.)

(3-2) Click the Preset button to change to the preset voltage.

(4) Click the Close button to close the controls.

♦ Display item in the open and closed windows and the illumination lamp controls

   Lamp voltage

4.8.10   Filter Cube

▼ iControl window

(1) Filter cube controls display button

Name display text

(2) Filter cube address buttons

(3) Close button
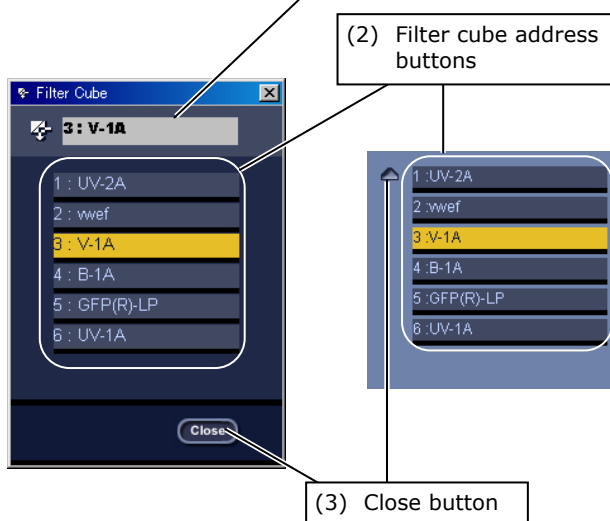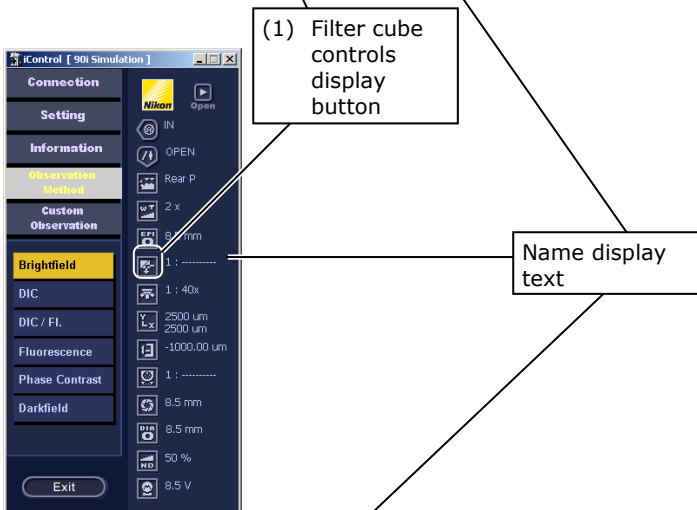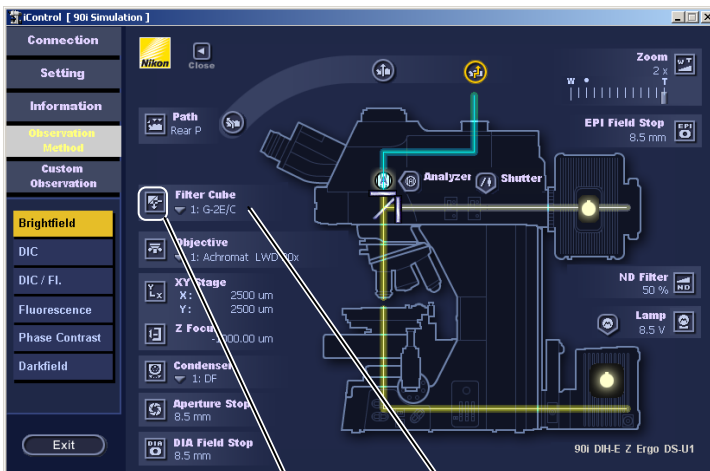
(1) Click the [icon] filter cube button or the

[icon] button to display the filter cube controls.

(2) To change filter cube addresses, click an address button. The address buttons are in one-to-one correspondence with the addresses, letting you directly specify a desired filter cube.

(3) Click the Close button or the [icon] button to close the controls.

♦ Display items in the open and closed windows and the filter cube controls

Filter cube names

♦ Display items in the tool-tip text (place the mouse cursor over the name display text to display)

Names of the excitation filter, dichroic mirror, and barrier filter

4.8　Motorized Attachment Controls

4.8.11　Objective

▼ **iControl window**

(1) Objective controls display button

Name display text

(2) Nosepiece address buttons

(3) Link checkbox

(3) Link checkbox
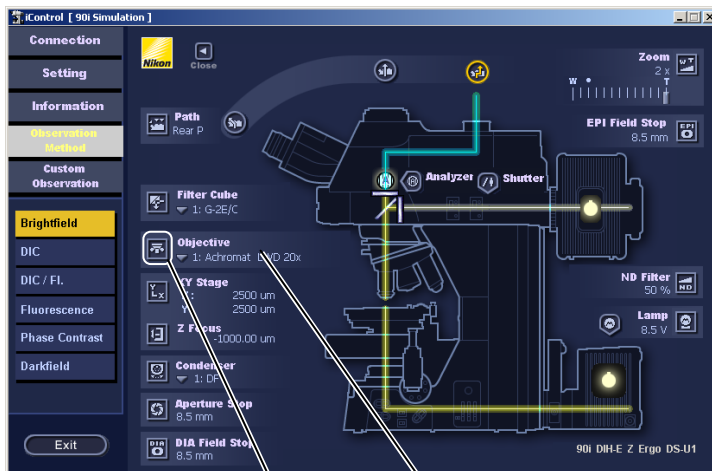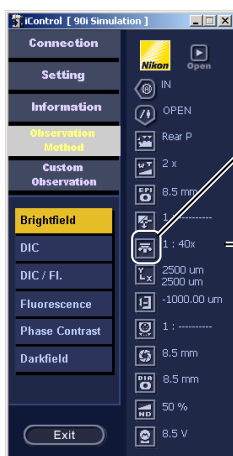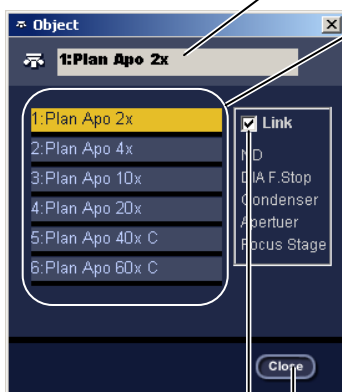
(4) Close button
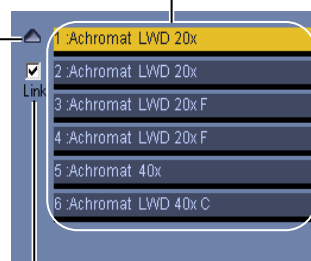
(1) Click the [icon] objective controls display button or the [icon] button to display the objective controls.

(2) To change nosepiece addresses, click an address button. The address buttons are in one-to-one correspondence with the addresses, letting you directly specify a desired objective.

(3) Interlock with switching of objectives

Check or uncheck the Link checkbox to toggle the objective switching interlock ON or OFF. To control the attachments while switching nosepiece addresses, check the Link checkbox. To switch nosepiece addresses independently, uncheck the checkbox.

For information on the attachment interlocks, refer to Section 5.10.

(4) Click the Close button or the [icon] button to close the controls.

♦ Display items in the open and closed windows and the objective controls

　Objective names, magnifications

♦ Display items in the open window and in the tool-tip text of the controls (place the mouse cursor over the name display text to display)

　Working Distance

　Numerical Aperture

♦ Display items in the tool-tip text of the closed window (place the mouse cursor over the name display text to display)

　Objective names, W.D., N.A

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4.8.12   Condenser Module

▼ **iControl window**
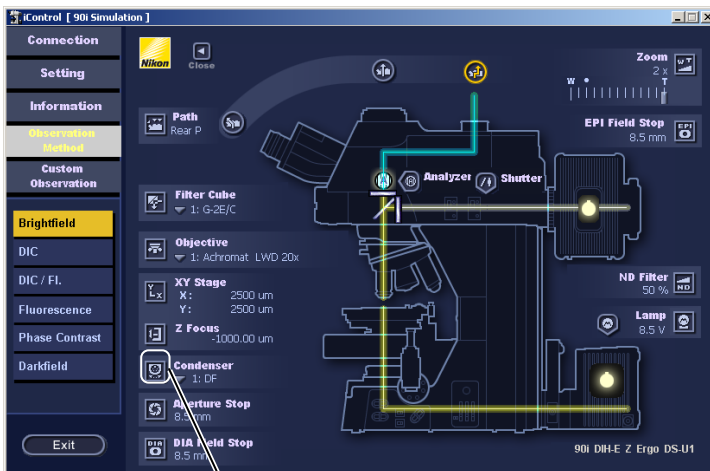
(1) Condenser module controls display button

(2) Condenser module address buttons

(3) Close button

(1) Click the [icon] condenser module controls display button or the [icon] button to display the controls.

(2) To change condenser turret addresses, click an address button. The address buttons are in one-to-one correspondence with the addresses, letting you directly specify a desired condenser module.

(3) Click the Close button or the [icon] button to close the controls.

♦ Display item in the open and closed windows and the condenser module controls

  Condenser module names

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| 4.8.13 | Up/Down Focus Motion |

▼ iControl window
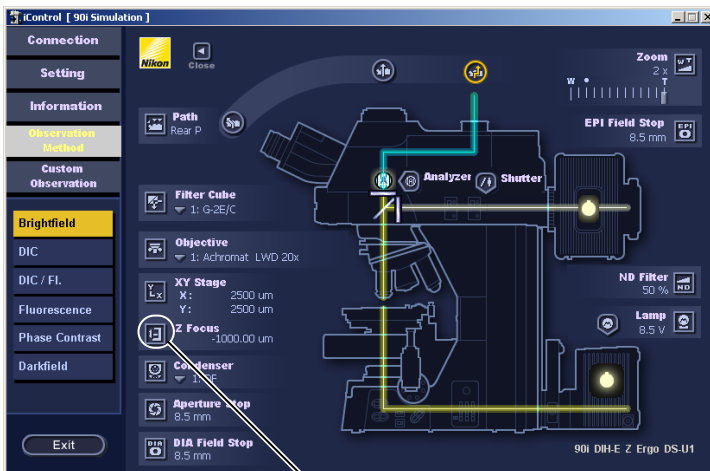
(1) Up/down focus
motion controls
display button
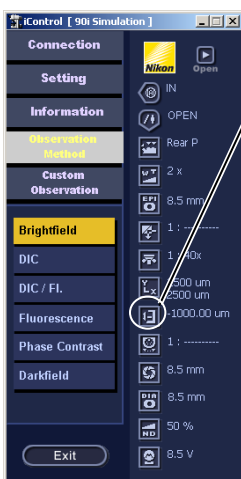
(2-3)
Escape button

(2-1)
Scroll bar, and
up and down
buttons for
adjusting the
Z-axis position

(3) Close button

(1)   Click the up/down focus motion controls display button to display the controls.

(2-1) Moving the stage

To adjust the focus position, move the scroll bar on the controls or click the up and down buttons. (The UP and DOWN buttons move the focus position by the smallest possible increment.)

(2-2) Using the mouse wheel to move the stage

With the mouse cursor located over up/down focus motion control, turn the wheel up to move the stage in the positive Z-axis direction. Or, turn the wheel down to move the stage in the negative Z-axis direction.

Note: If the mouse cursor is out of the active frame of the up/down focus motion control, the system will not respond to the mouse wheel.

(2-3) Retracting/restoring the stage

Click the Escape button to move the stage to the retract position. After retraction, the button changes to "Return."

Click the Return button to restore the stage to its initial position.

Note: The stage makes its escape motion only when there is a 5.5-mm margin or more from the current position to the lower limit. The stage does not make the escape motion if the available margin is less than 5.5 mm.

Note: When the "Rotate After Stage going down" is selected in the "Special Control Setup" of the liquid immersion control, you can return the stage to the original position by clicking the [Return] button after retracting the stage.

(3)   Click the Close button to close the controls.

♦ Display item in the open and closed windows and the Focus Drive controls

Z-axis position

4.8   Motorized Attachment Controls

▼ **Up/down focus motion control window**

(2) AF button
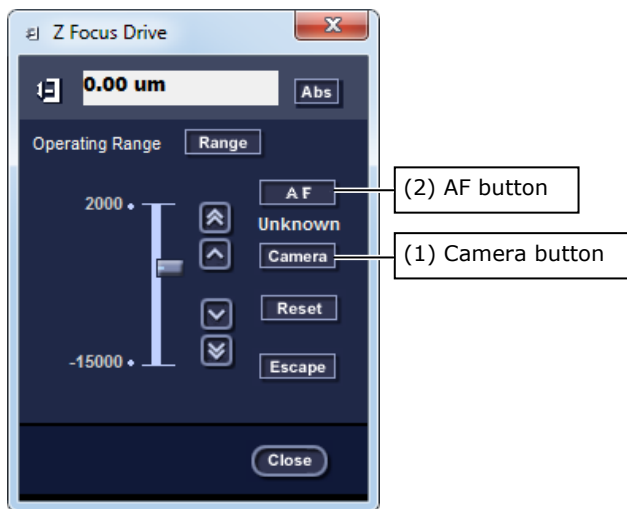
(1) Camera button

● **Autofocus (AF)**

(1)   Click the Camera button to open the Select Camera Dialog box. Select the camera name to be used.

(2)   Click the AF button to focus on the image automatically.

Note: The AF button can be used only when the 90i and the DS-5M/Fi1 camera are connected to the system.

If you are using the AF button for the first time after replacing samples, use an objective of 4x or less. Additionally, make sure the microscopy target is at the center of the field of view.

♦ Supplement
For more information on connecting the 90i and the DS-5M/Fi1 camera and autofocus operations, refer to the Appendix, "Description of the Autofocus Function."

▼ **Select Camera Dialog box**
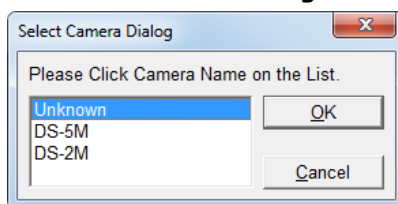
For the DS-U1/U2/L2, the following must be done after clicking the Camera button.

(1)   The Select Camera Dialog box appears. Select the camera name to be used from the list.

(2)   Click the OK button. The specified camera will be displayed in the Up/down focus motion control window.

Note: When the DS-U2 or DS-L2 camera is connected, the OK button is enabled only for the connected camera.

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▼ Scroll bar operational range setup window

(1), (4)
Range button

(2), (3)
Setup scroll bar

▼ Up/down focus motion control window

Abs button

Reset button
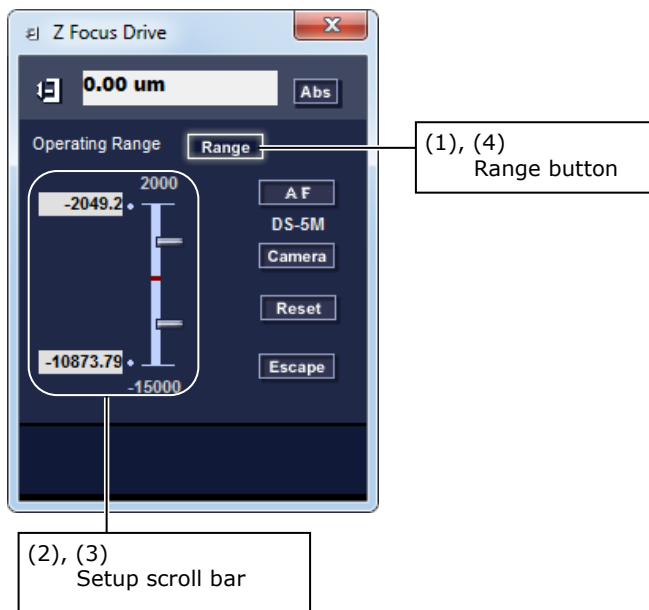
● Scroll bar operational range setup

You can adjust the scroll bar operational range by setting maximum and the minimum positions.

(1) Click the ⬛Range⬛ Range button to go to the scroll bar operational range setup window.

(2) Use the maximum position cursor on the scroll bar to set the maximum position. The value displayed for the maximum position is updated as you move the cursor.

(3) Use the minimum position cursor on the scroll bar to set the minimum position. The value displayed for the minimum position is updated as you move the cursor.

(4) Click the Range button once again to complete setup.
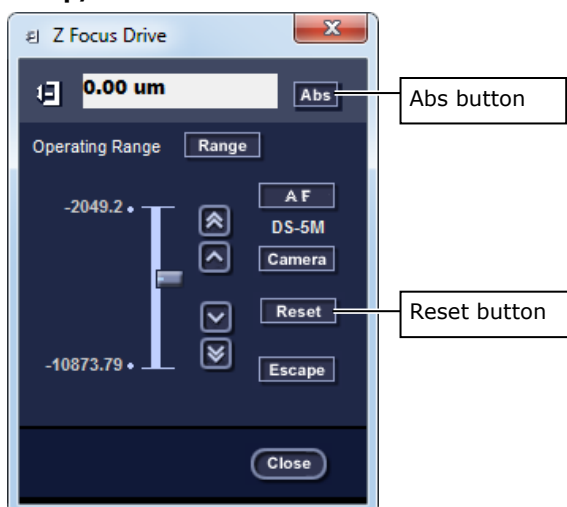
● Resetting the Z counter

The current up/down focus position can be set as the reference position (0.00 mm). The up/down focus position will be indicated relative to the set position.

(1) Click the ⬛Reset⬛ Reset button to set the current up/down focus position as the reference position.

♦ Supplement
When you set the reference position, the indicated maximum and minimum values for the up/down focus position scroll bar change to values referring to the reference position.

(2) Click the ⬛Abs⬛ Abs button to reset the reference position. The value displayed for the up/down focus position reverts to the value corresponding to the absolute position.

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4.8.14	**XY Stage**

▼ **iControl window**
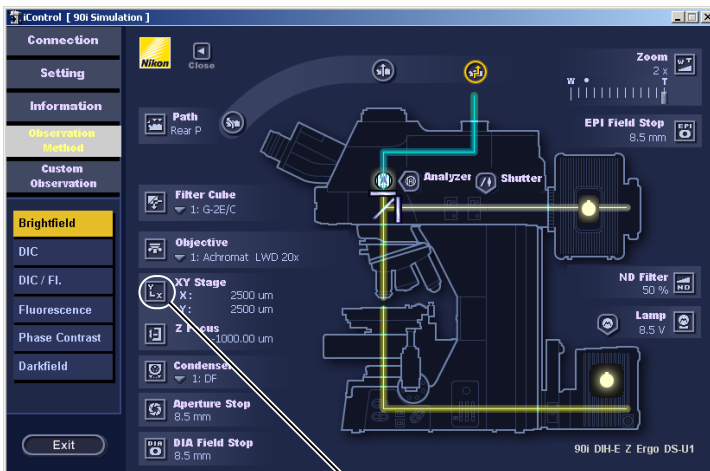
(1) XY stage control indication button

(2-2) Escape button

Virtual stage
(2-1)
Click the left mouse button.
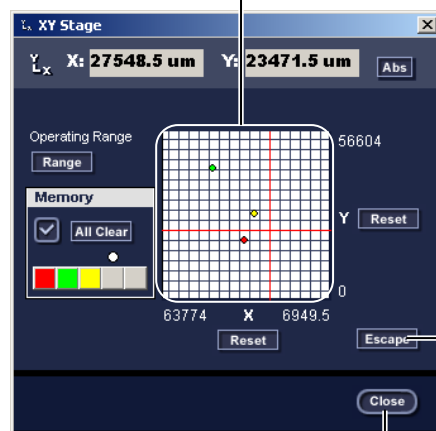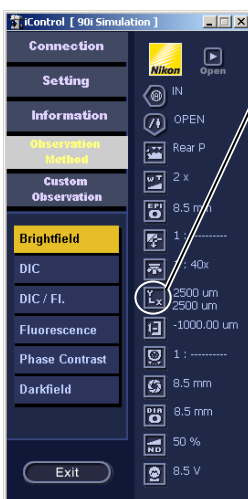
(3) Close button

(1) Click the ⟦Y L x⟧ XY stage control indication button to display the control.

(2-1) Direct movement on a virtual stage

The virtual stage indicates the range of stage operations in terms of absolute coordinates from the stage center. Click the left mouse button on the virtual stage to move the stage to that position.

(2-2) Evacuating and returning the stage

Click the Escape button to move the stage to the escape position. After the stage has been evacuated, the button indication changes to Return.
Click the Return button to return the stage to its previous position.

Note: The actual operation performed when Escape is activated is determined by the Escape function setup.

You can assign different Escape function actions in the up/down focus motion setup window. Refer to "5.11.1 Setting Up the Up/Down Focus Motion" in iSetup or "3.10 Setting Up the Up/down Focus Motion" in or iEZSetup.

(3) Click the Close button to close the control.

♦ Open window, close window, and XY stage control display items

X-axis position, Y-axis position

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▼ **XY stage control window**

Memory function

▼ **Scroll bar operational range setup window**

(1), (4)
Range button

(2), (3)
Setup scroll bar
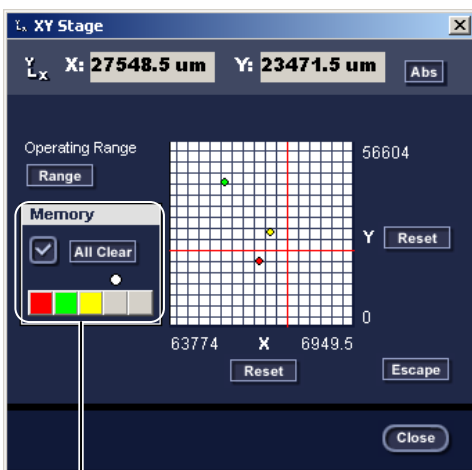
● **Stage position memory function (Memory)**

This function lets you store any stage position in memory. You also can return the stage to a position stored in memory.

(1) Click the [✓] check button to store the current stage position in memory. The memorized position is indicated on a virtual stage. (Up to five positions can be stored in memory.)

(2) To return the stage position to a memorized position, click the button with the color corresponding to the marked position to which you want the stage to return.

♦ Supplement
Click the [All Clear] All Clear button to clear all memorized positions.
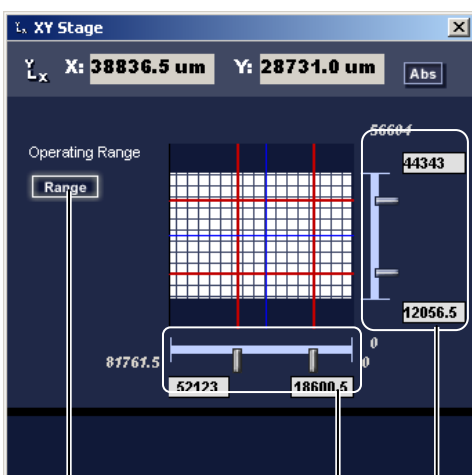
● **Stage operational range setup**

Set maximum and minimum positions to specify an operational range.

(1) Click the [Range] Range button to go to the scroll bar operational range setup window.

(2) Move the maximum and minimum position cursors on the X-axis scroll bar to set maximum and minimum positions for stage movement along the X-axis. The value corresponding to the current cursor position is updated and displayed.

(3) Move the maximum and minimum position cursors on the Y-axis scroll bar to set maximum and minimum positions for stage movement along the Y-axis. The value corresponding to the current cursor position is updated and displayed.

(4) Click the Range button once again to return you to the XY stage control screen.

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4.8   Motorized Attachment Controls

▼ XY stage control window

Abs button
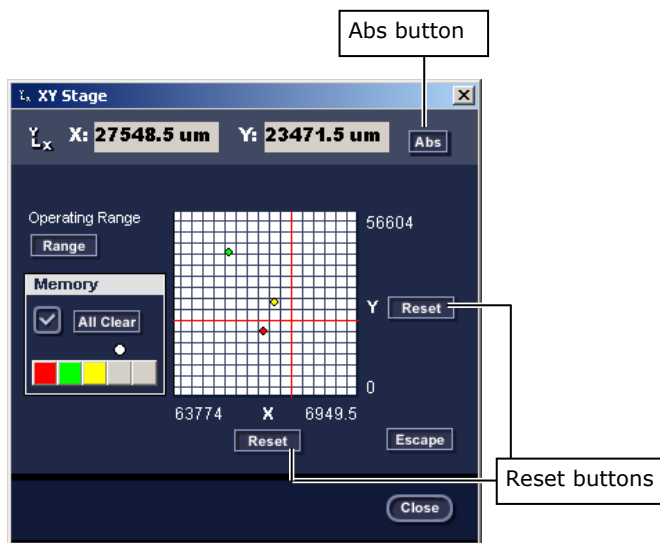
Reset buttons

● Resetting the X and Y counters

You can set the current stage position as the reference position. Stage positions will be indicated relative to the set position.

(1) Click the [Reset] Reset button to set the current X and Y positions as the reference position.

♦ Supplement
Setting a reference position changes the indicated maximum and minimum values for stage position to values relative to the reference position.

(2) Click the [Abs] Abs button to reset the reference position to absolute position display.

▼ XY stage control window
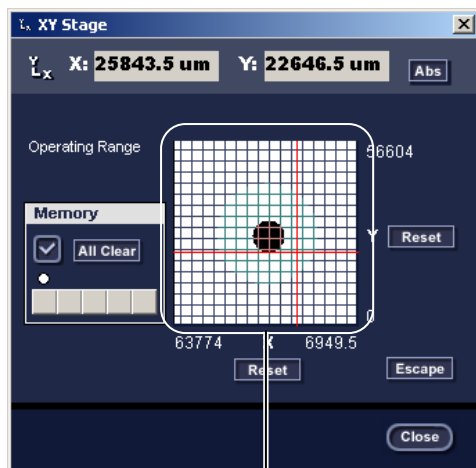
Auto scroll function
Click the right mouse button.

● Mouse operation based auto scroll function

On the virtual stage, move the mouse cursor in the direction in which you want to move the stage.

(1) Click the right mouse button on the virtual stage to recenter the virtual stage at that position. The current position of the stage is indicated by a circle, with the auto scroll function enabled.

(2) The stage moves as you move the mouse cursor over the lattice. The direction and speed of stage movement are determined by the center of the circle and the mouse cursor position. The farther the cursor position from the circle, the faster stage movement. The stage stops moving if you move the mouse cursor over the circle perimeter.

(3) To complete stage movement using the auto scroll function, click the right mouse button once again on the virtual stage. The displayed image of the virtual stage reverts to its previous state.

♦ Supplement
Moving the mouse cursor beyond the boundaries of the virtual stage will disable the auto scroll function.

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4.8.15   Optical Fiber Illumination

▼ **iControl window**

(1) Fiber Illumination control indication button

(2-1) Shutter button

(2-2) ND filter buttons

(2-3) Auto reverse function check box and the preset time

(3) Close button
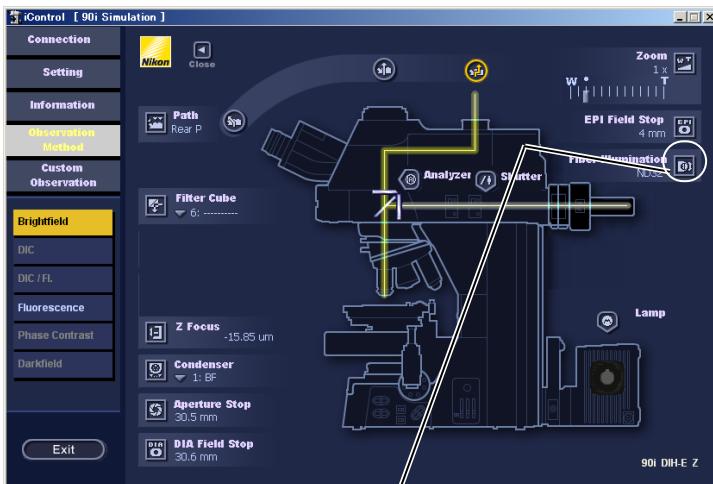
(1)   Click the [ ] Fiber Illumination control indication button to display the control.

(2-1) To open/close the shutter for the optical fiber illumination, click the Shutter button on the Fiber Illumination control.

(2-2) To adjust the brightness of the optical fiber illumination, click an ND button on the Fiber Illumination control.

(2-3) When the Enable check box of the Auto reverse function is checked and the shutter is opened/closed, the shutter status will be inverted after the preset time.

(3)   Click the Close button to close the control.

♦ Open window, close window, and XY stage control display items
   ND filter for the optical fiber illumination
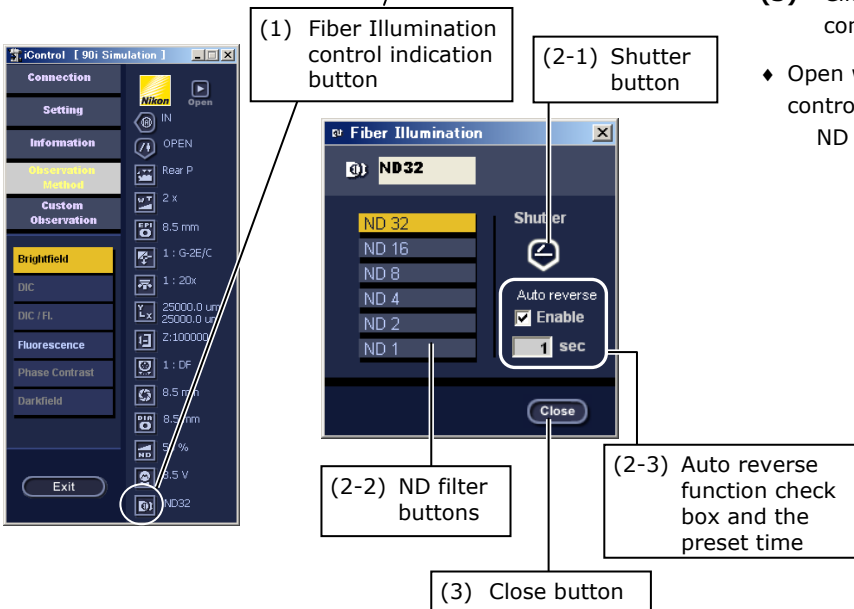
4.9   Switching Microscopy Methods

Microscopy method selector buttons in the iControl window let you change microscopy methods.

Note: Interlock with any of the six microscopy methods, namely, bright-field observation, DIC observation, DIC/epi-fl observation, epi-fl observation, phase contrast observation, and dark-field observation, is enabled only with a combination of 90i + DIH-E + motorized universal condenser module. And, switching interlock between following two microscopy methods, bright-field observation and epi-fl observation, is also enabled for the combination of 80i +D-FL-E.

Interlock with any of the arbitrary microscopy methods is unavailable only with the combination of 80i + DIH-M. It can be enabled with all other combinations.

▼ **Microscopy method menu**

(1-1) Click a microscopy method button.

(2-1) Arbitrary microscopy methods display button

(1-2) Click the button representing the desired microscopy method.
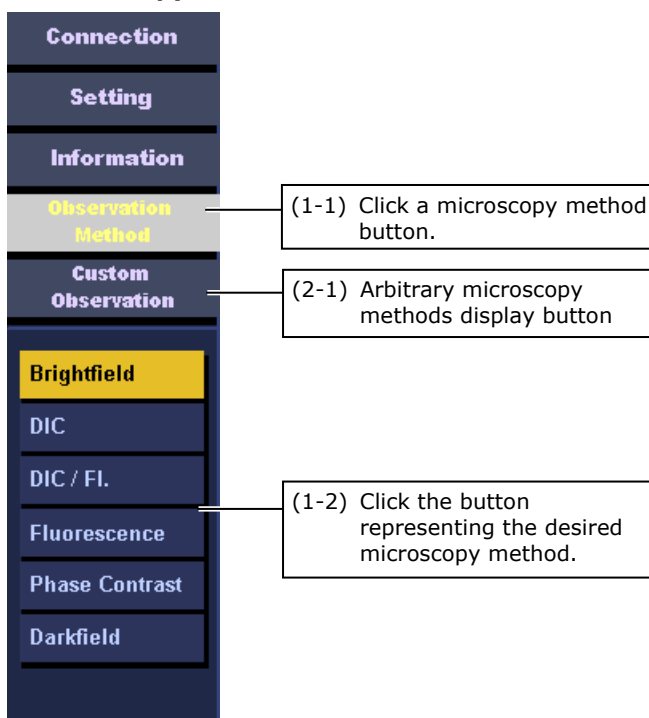
● **Changing microscopy methods**

(1-1) Click a microscopy method button.

♦ Supplement
For control positions of each of the motorized attachments during microscopy method switching, refer to "Standard Combinations of Microscopy Methods and Interlock" in the appendix.

(1-2) Click the button representing the desired microscopy method.

▼ **Arbitrary microscopy method menu**

(2-2) Click an arbitrary microscopy method name button.
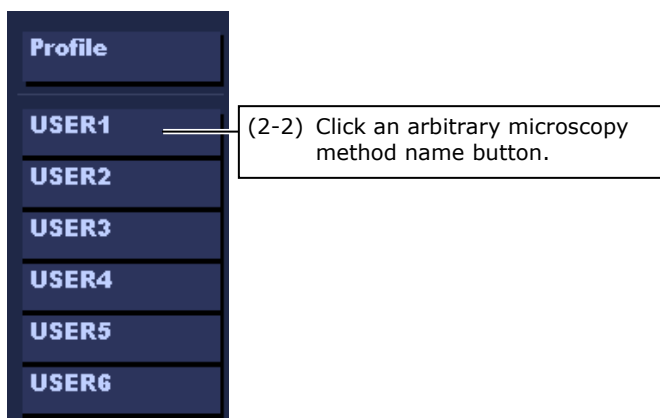
● **Changing to an arbitrary microscopy method**

(2-1) To change microscopy methods to a previously defined custom method, click the Custom Observation button. The arbitrary microscopy method menu shown to the left is displayed.

(2-2) Click an arbitrary microscopy method name button.

Note: An arbitrary microscopy method must be defined before it can be used. Click the Profile button to go to the arbitrary microscopy method setup (Profile setup) window. For more information, refer to Section 4.9.1, "Setting Up Arbitrary Microscopy Methods" in the following pages.

4.9.1   Setting Up Arbitrary Microscopy Methods (Setting Up the Profile)

A total of 12 different microscopy methods are available to choose from in this application, namely, bright-field observation, DIC observation, DIC/epi-fl observation, epi-fl observation, phase contrast observation, dark-field observation, and User Options 1 to 6. Of these, microscopy method names and methods can be arbitrarily set in User Options 1 to 6. The set microscopy methods can be saved to a file or the microscope system.

Note: You cannot set up arbitrary microscopy methods if the system consists of the 80i and the DIH-M. (In this case, the Profile button is disabled.)

Arbitrary microscopy method data registered in the microscope system loads only when the profile setup window is displayed by clicking Profile. To display registered data again, close the profile setup window and then display the window again.

▼ **Menu**
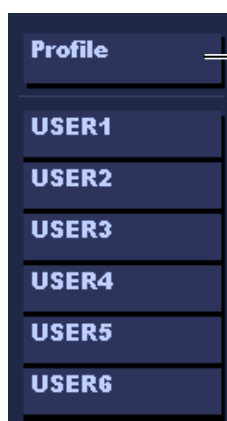
(1) Click Custom Observation, then Profile.

(1) Click Custom Observation, then Profile to display the profile setup window.

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▼ **Profile window**

(2) From the tab, select a microscopy method.

To acquire the current control information, click the Receive button.

(3) Set the required information.

(4) To register a microscopy method, click the Send button.

(5) Terminate the setup.

To acquire the saved data, click the Read button.

To save the setup data, click the Save button.

▼ **Acquiring current control information**

▼ **Acquiring saved data and saving setup data**
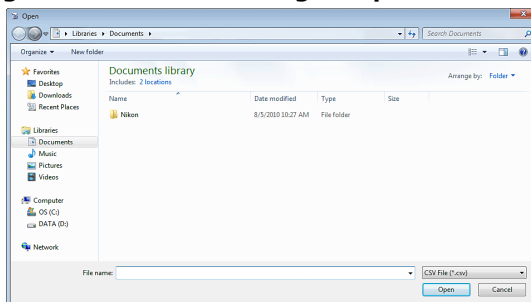
(1) While the Profile setup window is displayed, load the data registered in the microscope system. The loaded data will be reflected in the setup window.

Note: Setup information will be reflected only for the motorized attachments connected.

(2) From the tab, select the microscopy method you want to set.

(3) Set the following information:

[1] Name of the microscopy method
[2] Nosepiece address
[3] Condenser module control method
[4] Lamp voltage
[5] Diascopic aperture diaphragm control method
[6] Diascopic field diaphragm control method
[7] ND filter control method
[8] Optical path
[9] Filter cube address
[10] Shutter Open/Close
[11] Zoom magnification
[12] Analyzer IN/OUT

(4) Click the Send button to register the microscopy method in the microscope system. When you want to register all microscopy methods, check ALL, then click the Send button.

(5) Click the Close button to quit the arbitrary microscopy method setup.

♦ Supplement
Loading current control information
Click the Receive button. This will load the information from the microscope, reflecting the information in the setup window.

♦ Supplement
Loading saved data
Click the Read button to display a file select window. Select a file (***.CSV) to load the information and reflect it in the setup window.

Saving setup data
Click the Save button to display a file select window. Select a file (***.CSV) to save the information.

4.9.1.1   Aperture Diaphragm, Field Diaphragm, and ND Filter Control Methods

▼ **Menu**

Select a setup item.

Control position registered with the Memory function

(1) Click the list boxes for aperture diaphragm, field diaphragm, and ND filter control methods in the Profile window to select a control method.

- **Not Move**
  Cancels the interlock with switching of microscopy methods. Auto control is disabled after a change in microscopy method.

- **Objective**
  Performs control by the same method as for the interlock with switching of objectives.

- **User Memory**
  Performs control using the values saved, in association with the microscopy method and the nosepiece address, using the Memory function on the aperture diaphragm, field diaphragm, and ND filter controls.

Note: To register a control position using the Memory function, refer to Sections "4.8.5 Diascopic Field Diaphragm" to "4.8.7 ND Filter".

- **All Open** (aperture and field diaphragms only)
  Selects the maximum diaphragm diameter.

4.9.1.2   Condenser Module Control Method

▼ **Menu**
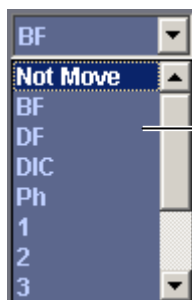
Select a setup item.

(1) Click the list box for condenser module control method/position to select a control method.

- **Not Move**
  Cancels the interlock with switching of microscopy methods. Auto control is disabled after a change in microscopy method.

- **BF, DF, DIC, and Ph**
  Specify a control method by selecting a microscopy method.

Note: Interlock is disabled if the selected microscopy method does not match the objective type registered for the selected nosepiece address.

- **Condenser module address (1-7)**
  Specify the condenser module control method with an address.
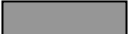
Appendix   Standard Combinations of Microscopy Methods and Interlock

Appendix   Standard Combinations of Microscopy Methods and Interlock

Shown below is a table listing operations of motorized attachments interlocked with a microscopy method.

	90i					Universal condenser		Nose piece	DIH-E						D-FL-E	
	Diascopic lamp	XY stage	ND filter	Field diaphragm	Z-axis	Turret	Aperture diaphragm	Switching	Filter cube	Field diaphragm	Shutter	Analyzer	Optical path switching	Zoom	Filter cube	Shutter
Bright-field	ON	Interlocked w/ objective	Interlocked w/ objective	Interlocked w/ objective	Interlocked w/ objective	BF/ 2-4x	Interlocked w/ objective	-	Address 6 (DIA)	-	CLOSE	OUT	-	-	Address 6 (DIA)	CLOSE
DIC	ON	Interlocked w/ objective	Interlocked w/ objective	Interlocked w/ objective	Interlocked w/ objective	DIC 1/2	Interlocked w/ objective	-	Address 6 (DIA)	-	CLOSE	IN	-	-	-	-
DIC/ epi-fl	ON	Interlocked w/ objective	Interlocked w/ objective	Interlocked w/ objective	Interlocked w/ objective	DIC 1/2	Interlocked w/ objective	-	Address 1	Interlocked w/ zoom	OPEN	IN	-	-	-	-
Epi-fl	OFF	Interlocked w/ objective	Interlocked w/ objective	-	Interlocked w/ objective	BF/ 2-4x	-	-	Address 1	Interlocked w/ zoom	OPEN	OUT	-	-	Address 1	OPEN
Phase contrast	ON	Interlocked w/ objective	Interlocked w/ objective	Interlocked w/ objective	Interlocked w/ objective	Ph 1/2/3	Fully open	-	Address 6 (DIA)	-	CLOSE	OUT	-	-	-	-
Dark-field	ON	Interlocked w/ objective	Interlocked w/ objective	Interlocked w/ objective	Interlocked w/ objective	DF/ 2-4x	Fully open	-	Address 6 (DIA)	-	CLOSE	OUT	-	-	-	-
Arbitrary (profile setup)	Setting possible	-	Setting possible	Setting possible	-	Setting possible	Setting possible	Setting possible	Setting possible	Setting possible	Setting possible	Setting possible	Setting possible	Setting possible	Setting possible	Setting possible

"-" means not interlocked.

Fixed: Not user-changeable

Triggers the interlock

Interlocked w/ objective: Sets appropriate status according to the selected DIH optical path and the total magnification combining those of the objective and the zoom (interlocked with objective alone in the absence of the DIH).

Interlocked w/ zoom: Sets appropriate status according to the selected zoom status.

Appendix   Standard Combinations of Microscopy Methods and Interlock

● **Bright-field microscopy**

▼ **iControl window**

(1) Click the microscopy method button.

(2) Change objectives.

(1) Click the microscopy method (Bright Field) button. The following attachments are interlocked:

Diascopic lamp: ON
U-Condenser: BF/2-4x
Filter cube: Address 6 (DIA)
Shutter: CLOSE
Analyzer: OUT

(2) Select an objective. The following attachments are interlocked with objective:

Diascopic field diaphragm
Diascopic aperture diaphragm
ND filter
Up/down focus motion (only if the focus position is set up)
XY stage (interlocked only if you've set the XY stage center position)

(3) Manipulate the attachments in the broken line frame as necessary.

(4) Make the following adjustments on the microscope main unit:

- Achieve focus with and center the condenser.
- Remove the DIC prism for objectives from the optical path (if one is attached).
- Remove the polarizer from the optical path (if one is attached).
- Remove the lambda plate from the optical path (if one is attached).
- Attach and detach the ND and NCB filters.

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● **DIC microscopy**

▼ **iControl window**

(1) Click the microscopy method button.

(2) Change objectives.

(1) Click the microscopy method (DIC) button. The following attachments are interlocked:

Diascopic lamp: ON
U-Condenser: DIC1/2
Filter cube: Address 6 (DIA)
Shutter: CLOSE
Analyzer: IN

(2) Select an objective. The following attachments are interlocked with objective:

Diascopic field diaphragm
Diascopic aperture diaphragm
ND filter
Up/down focus motion (only if the focus position is set up)
XY stage (interlocked only if you've set the XY stage center position)

(3) Manipulate the attachments in the broken line frame as necessary.

(4) Make the following adjustments on the microscope main unit:

- Achieve focus with and center the condenser.
- Bring the DIC prism for objectives into the optical path.
- Bring the polarizer into the optical path.
- Adjust the polarizer orientation.
- Bring the lambda plate into the optical path (if necessary).
- Attach and detach the ND and NCB filters.

Appendix   Standard Combinations of Microscopy Methods and Interlock

• DIC/epi-fl microscopy

▼ iControl window

| (1) | Click the microscopy method button. |
| (2) | Change objectives. |

(1) Click the microscopy method (DIC / FL) button. The following attachments are interlocked:

Diascopic lamp: ON
U-Condenser: DIC1/2
Filter cube: Address 1
Shutter: OPEN
Analyzer: IN

(2) Select an objective. The following attachments are interlocked with objective:

Diascopic field diaphragm
Diascopic aperture diaphragm
ND filter
Up/down focus motion (only if the focus position is set up)
XY stage (interlocked only if you've set the XY stage center position)

(3) Manipulate the attachments in the broken line frame as necessary.

(4) Make the following adjustments on the microscope main unit:

• Center the lamp for episcopic light source
• Achieve focus with and center the condenser.
• Bring the DIC prism for objectives into the optical path.
• Bring the polarizer into the optical path.
• Adjust the polarizer orientation.
• Bring the lambda plate into the optical path (if necessary).
• Attach and detach the ND and NCB filters.

● **Epi-fl microscopy**

▼ **iControl window**

(1) Click the microscopy method button.

(2) Change objectives.

(1) Click the microscopy method (Fluorescence) button. The following attachments are interlocked:

Diascopic lamp: OFF
U-Condenser: BF/2-4x
Filter cube: Address 1
Shutter: OPEN
Analyzer: OUT

(2) Select an objective. The following attachments are interlocked with objective:

ND filter
Up/down focus motion (only if the focus position is set up)
XY stage (interlocked only if you've set the XY stage center position)

(3) Manipulate the attachments in the broken line frame as necessary.

(4) Make the following adjustments on the microscope main unit:

• Center the lamp for episcopic light source
• Remove the DIC prism for objectives from the optical path (if one is attached).
• Remove the lambda plate from the optical path (if one is attached).

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• **Phase contrast microscopy**

▼ **iControl window**

(1) Click the microscopy method button.

(2) Change objectives.

(1) Click the microscopy method (Phase contrast) button. The following attachments are interlocked:

Diascopic lamp: ON
U-Condenser: PH1/2/3
Filter cube: Address 6 (DIA)
Shutter: CLOSE
Analyzer: OUT
Aperture diaphragm: Fully open

(2) Select an objective. The following attachments are interlocked with objective:

Diascopic field diaphragm
ND filter
Up/down focus motion (only if the focus position is set up)
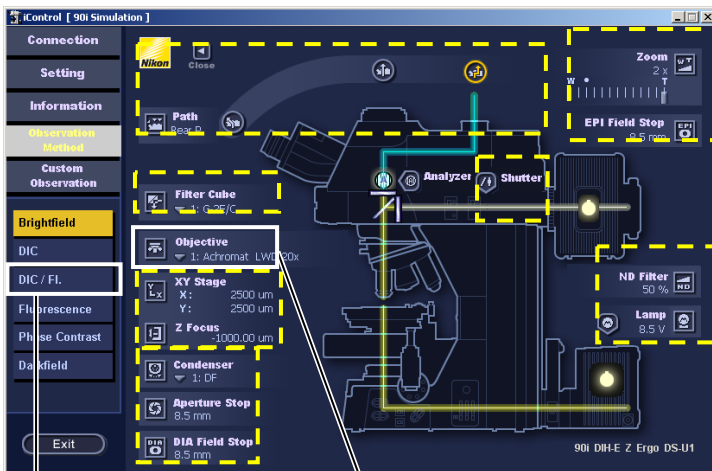XY stage (interlocked only if you've set the XY stage center position)

(3) Manipulate the attachments in the broken line frame as necessary.

(4) Make the following adjustments on the microscope main unit:

- Center the Ph annular diaphragm.
- Remove the DIC prism for objectives from the optical path (if one is attached).
- Remove the polarizer from the optical path (if one is attached).
- Remove the lambda plate from the optical path (if one is attached).
- Attach and detach the ND and NCB filters.

Appendix   Standard Combinations of Microscopy Methods and Interlock

• **Dark-field microscopy**

▼ **iControl window**

(1) Click the microscopy method button.

(2) Change objectives.

(1) Click the microscopy method (Darkfield) button. The following attachments are interlocked:

Diascopic lamp: ON
U-Condenser: DIC 2/2-4x
Filter cube: Address 6 (DIA)
Shutter: CLOSE
Analyzer: OUT
Aperture diaphragm: Fully open

(2) Select an objective. The following attachments are interlocked with objective:

Diascopic field diaphragm
ND filter
Up/down focus motion (only if the focus position is set up)
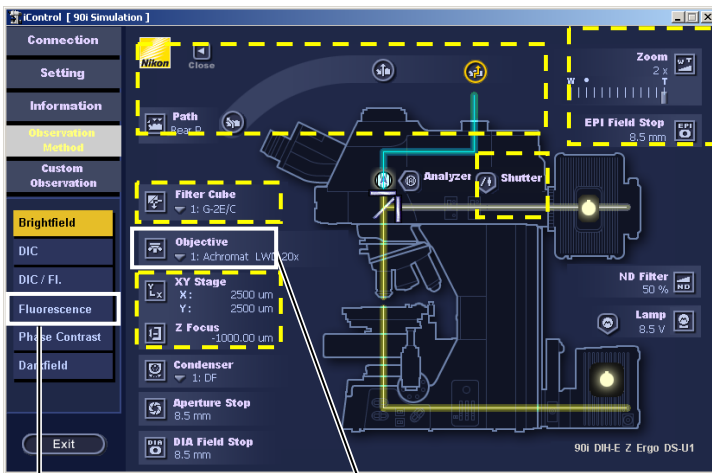XY stage (interlocked only if you've set the XY stage center position)

(3) Manipulate the attachments in the broken line frame as necessary.

(4) Make the following adjustments on the microscope main unit:

- Achieve focus with and center the condenser.
- Remove the DIC prism for objectives from the optical path (if one is attached).
- Remove the polarizer from the optical path (if one is attached).
- Remove the lambda plate from the optical path (if one is attached).
- Attach and detach the ND and NCB filters.

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Appendix   Description of the Autofocus Function

The following shows precautions for using the autofocus function, announcement messages appearing while the function is used, and the connection of 90i and DS-5M/Fi1.

- If you use the AF button for the first time after specimen replacement, always use an objective of 4x or less. (High magnification will narrow the autofocus search area.) Also be sure to use the AF button with the target under observation located at the center of the view field.

- If you are unable to focus the image, move the specimen to display a high contrast area of the specimen at the center of the view field, then click the AF button again.

- In addition to the above, the following conditions are essential for autofucusing.

Applicable specimen	Cover-glass-attached specimen slide (slide glass + specimen slice thickness: 0.9mm min. 1.7mm max.) The autofocusing may fail on some low contrasted samples due to insufficient contrast.
Applicable slide glass	Thickness: 1.2mm max. (compliant with JIS R3703-1998 or ISO 8037)
Applicable cover glass	Thickness: No. 1=0.17mm, No. 1-S=0.18mm max. (compliant with JIS R3702-1996 or ISO 8255)
Applicable objective	1x – 100x (NA 0.03 – 0.95) (phase contrast, liquid immersion, polarizing, Hoffman, multi-immersion, and industrial objectives not allowed)
Microscopy method	Bright-field microscopy
DS-5M/Fi1 + ACT-2U settings	Scene mode: BF Exposure time: Under AE setting, the exposure time should come within 1/120 to 1/350 (in 1.3 Mp display mode) when the sample is nearly in focus. (Adjust with ND filters, etc.)

Autofocus Message Table

Message	Description
Now Focusing	Autofocusing now. Do not change the microscopy conditions.
Complete	Autofocusing complete.
Complete Low Contrast	Sample lacking sufficient contrast for autofocusing. Slight focal difference may take place in some conditions. Perform manual focusing if this happens.

Appendix   Description of the Autofocus Function

Message	Description
Warning Exposure Over	Microscopy condition is too bright. Focusing stops at the original position for the autofocus. Use the autofocus function under following conditions set on the DS-5M/Fi1 + ACT-2U (when the sample is nearly in focus). Scene mode: BF Exposure time: Under AE setting, the exposure time should come within 1/120 to 1/350 (in 1.3 MP display mode) when the sample is nearly in focus. (Adjust with ND filters, etc.) Check the camera settings (such as Scene mode and Display mode) on the ACT-2U (the application software for digital cameras).
Warning Exposure Under	Microscopy condition is too dark. Focusing stops at the original position for the autofocus. Use the autofocus function under following conditions set on the DS-5M/Fi1 + ACT-2U (when the sample is nearly in focus). Scene mode: BF Exposure time: Under AE setting, the exposure time should come within 1/120 to 1/350 (in 1.3 MP display mode) when the sample is nearly in focus. (Adjust with ND filters, etc.) Check the camera settings (such as Scene mode and Display mode) on the ACT-2U (the application software for digital cameras).
Error	In the event of an error, one of the status codes (00–FF) will be displayed on the screen. (For more information, refer to the 90i Instructions, "Troubleshooting.")

Connection of 90i and DS-5M/Fi1

The autofocusing function can be used only when 90i and DS-5M/Fi1 are connected as follows.
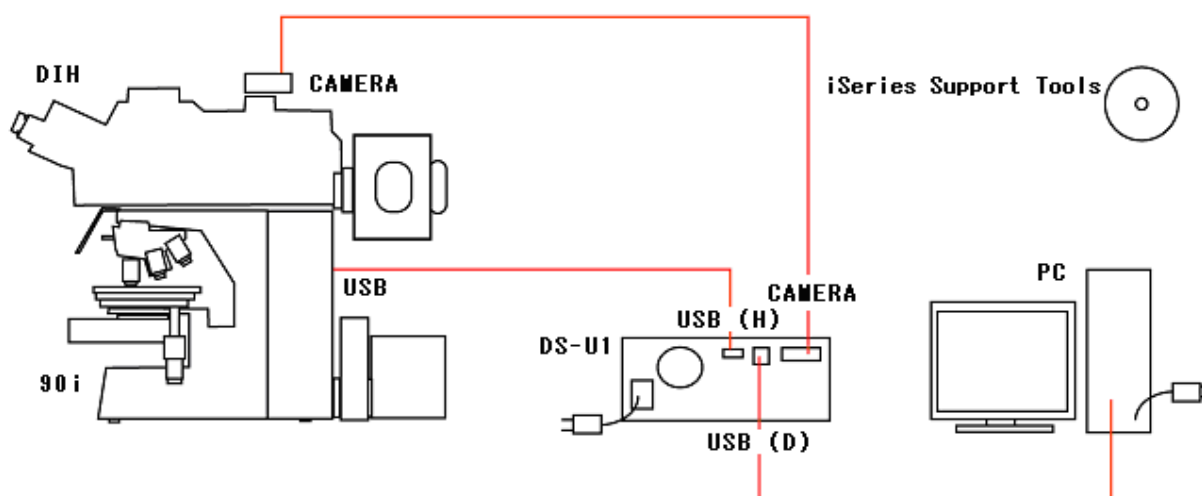
5 Using iSetup

iSetup lets you modify microscope system information only where changes are made to the microscope system setups.

5.1 iSetup Workflow

Shown below is the iSetup workflow required to set information for the microscope system.

Start	Launch iSetup.
Initiate communications with the microscope system	Initiate communications with the microscope system.
Obtain information on the microscope system	Load information directly from the microscope system or from an existing file.
Set microscope system information	Set the objective or filter cube used in the microscope system and other necessary information. (Settable items vary depending on the microscope system configuration.)
Send setup content	Send the name of the microscopy system and other information just set to the microscope system side. (The information is saved to memory on the microscope system side, overwriting any previous information.)
Save information setup file	Save the name and other microscope system information settings just made to a file after assigning the file an appropriate name. (Although you will be allowed to quit without doing so, we recommend saving this data to a file before quitting the application; information stored in memory on the microscope system side is subject to overwriting.)
End	Quit iSetup.

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5.1.1   Settable Item List

Shown below is a list of items that can be set using iSetup:

System Name (5.6)
└── Microscope system name setup

Objective (objective setup) (5.7)
├── Objective: Objective mounting setup (5.7.1)
├── Optional Obj: Objective registration (5.7.2)
└── Limit Control: Special control setup for objective switching (5.7.3)
　　├── High magnification switching limit control
　　├── Skip control
　　└── Liquid immersion control

Filter Cube (filter cube setup) (5.8)
├── Filter Cube: Filter cube mounting setup (5.8.1)
├── Optional Cube: Filter cube registration (5.8.2)
└── Optional Item: Item name registration (excitation/barrier/mirror) (5.8.3)

Condenser (condenser module setup) (5.9)
├── Condenser: Condenser module mounting setup (5.9.1)
└── Optional Data: Condenser module registration (5.9.2)

Interlock (interlock setup) (5.10)
├── Observation: Microscopy method interlock setup (5.10.1)
├── Other: Objective interlock setup/zoom interlock setup/optical path switching interlock setup (5.10.2)
└── Offset: Compensation setup during interlocking (5.10.3)
　　├── Diascopic field diaphragm
　　├── Diascopic aperture diaphragm
　　└── ND value

Control (other setups) (5.11)
├── Focus Drive: Up/down focus motion setup (5.11.1)
│　├── Software lower limit setup
│　└── Escape operation setup
├── Other: Manual setup, buzzer setup, switch setup (5.11.2)
├── 90i main unit switch function assignment setup (5.11.3)
└── Ergonomic Controller switch function assignment setup (5.11.4)

5.2 Starting and Quitting iSetup

You can start and quit iSetup in several ways. A general method is described here, using the Start menu and the Cancel button in the operations window to quit.
To start iSetup from within iControl, refer to Section 4.5.1.

5.2.1 Starting Up

Procedure
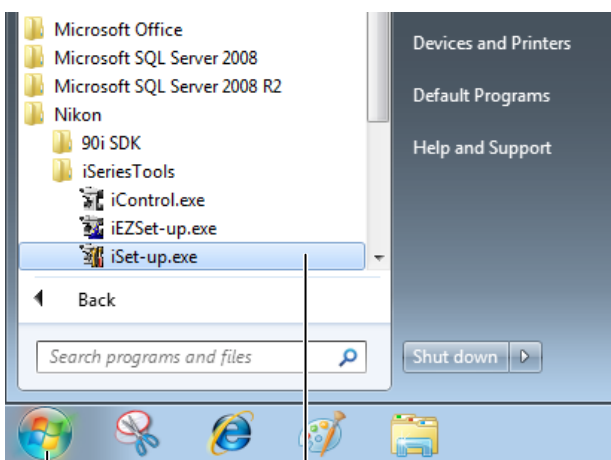
▼ Start menu

(1) Click the Start button.

(2) Point to All Programs, Nikon, and iSeriesTools, then click iSet-up.exe.

Confirm that the microscope is connected to your PC before starting the PC.

(1) Click the Start button.

(2) Point to All Programs, Nikon, and iSeriesTools, then click iSet-up.exe.
The iSetup starts, and then the iSetup main window appears.

CAUTION

Do not unplug the USB cable that connects the microscope with the PC while iSetup is running.

▼ iSetup window

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5.2　Starting and Quitting iSetup
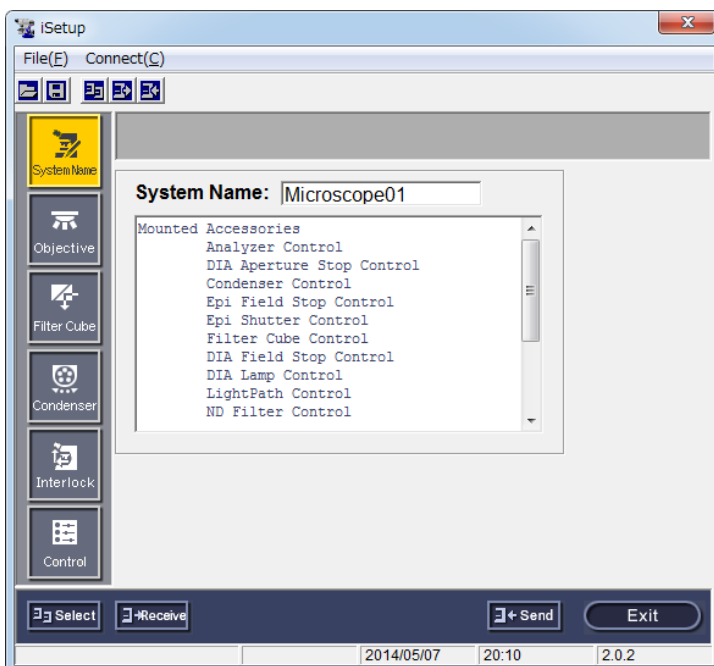
5.2.2　Quitting iSetup

Procedure

▼ **iSetup window**

(1) Click the Exit button.
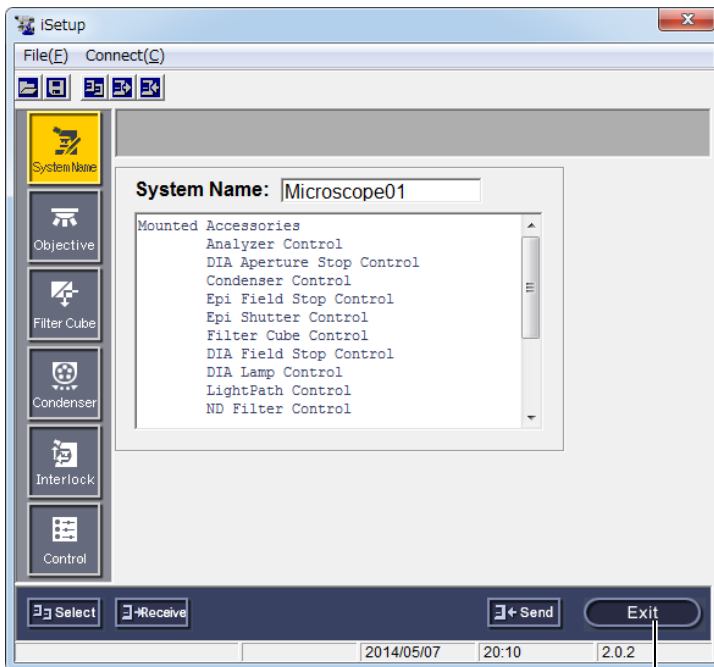
(1)　Click the Exit button.
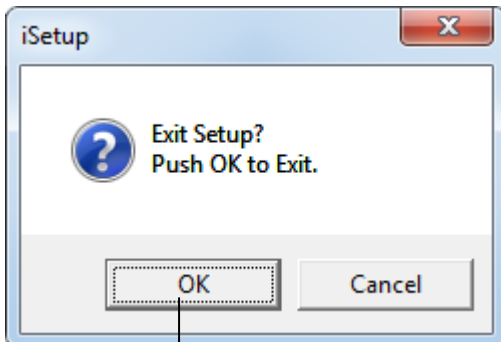
(2) Click the OK button to quit the application.

(2)　A conformation message box is displayed asking if you want to quit the application. Click OK to terminate communications with the microscope system and quit the application.

5.3   iSetup Screen Configuration

The iSetup window consists of the main setup item buttons, subsetup item buttons, and a setup screen.

▼ iSetup window

Subsetup item buttons

Setup screen

Main setup item buttons

▼ Main setup item buttons
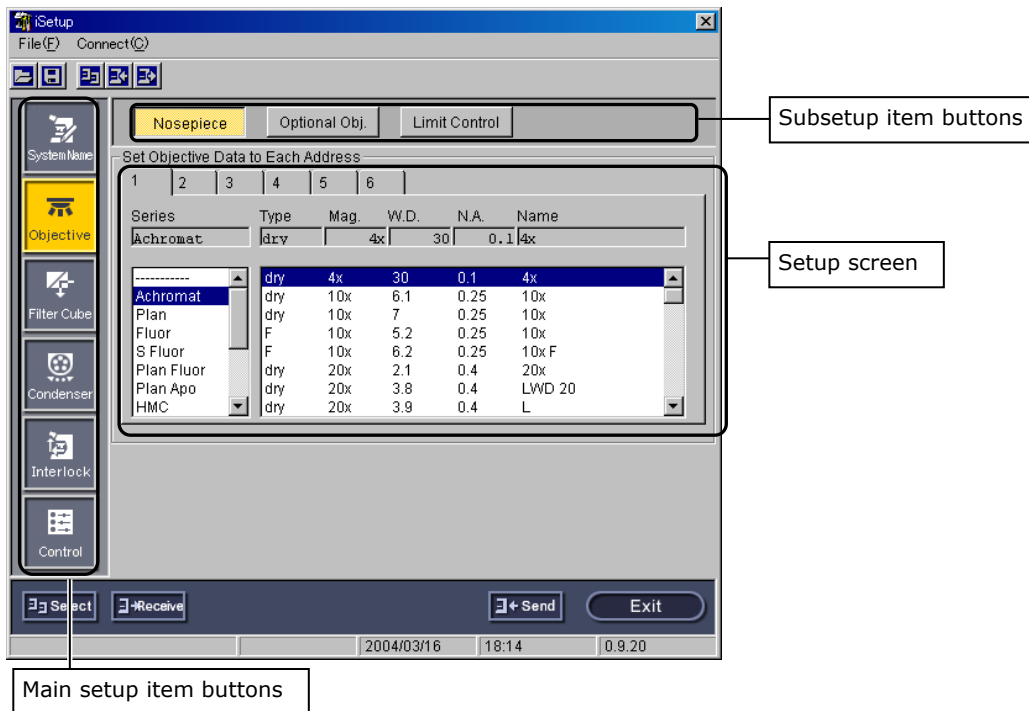
(1) Click a setup item button.
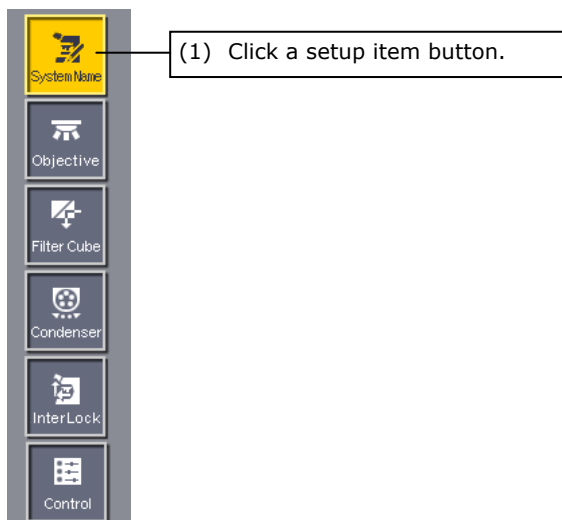
(1) If you click the button for any setup item, the middle part of the window changes to a setup screen for that item.

♦ Supplement

Depending on the system configuration, some of the items here do not need to be set. If so, the corresponding buttons are disabled.

<table>
<tr><td>5.4</td><td></td></tr>
</table>

5.4	**Starting Communications with the Microscope System**

Before you can send information that has been set using iSetup to the microscope system, you must first initiate communications with the microscope system. You must also initiate communications with the microscope system to load the current status of the microscope system into iSetup.

The microscope system information just set should be sent to the microscope system to have it written to memory on the microscope system side.

You can also save this information to a file.

5.4.1	**Initiating Communications and Changing the Destination in iSetup**

▼ **Microscope system select dialog box**
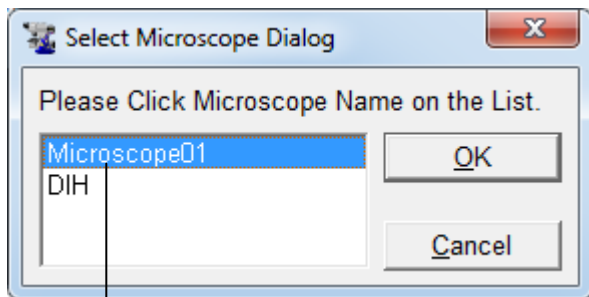
(1) Select a system name.

(1) Click the Select button found left below in the iSetup window to display a microscope system select dialog box.
In this dialog box, select the name of the microscope system for which you want to obtain information.
The software will begin communication with the selected microscope system.
If the software was in mid-session with another microscope system, it automatically closes that session and opens communications with the newly selected microscope system.

5.4.2	**Starting Communication from iControl**

If you invoked iSetup from iControl, you can use the iControl menu to initiate communications. For more information, refer to Section 4.4, "Connection."

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5.5   Selecting Setup Modes

You can set information in iSetup in two ways. Choose the one best suited to your purpose.

1. Load microscope system information and make corrections only where necessary
   (if information has been already set with iEZSetup).

2. Load and correct an existing file.

5.5.1   Loading Microscope System Information and Making Corrections Only Where Necessary

▼ **iSetup window**
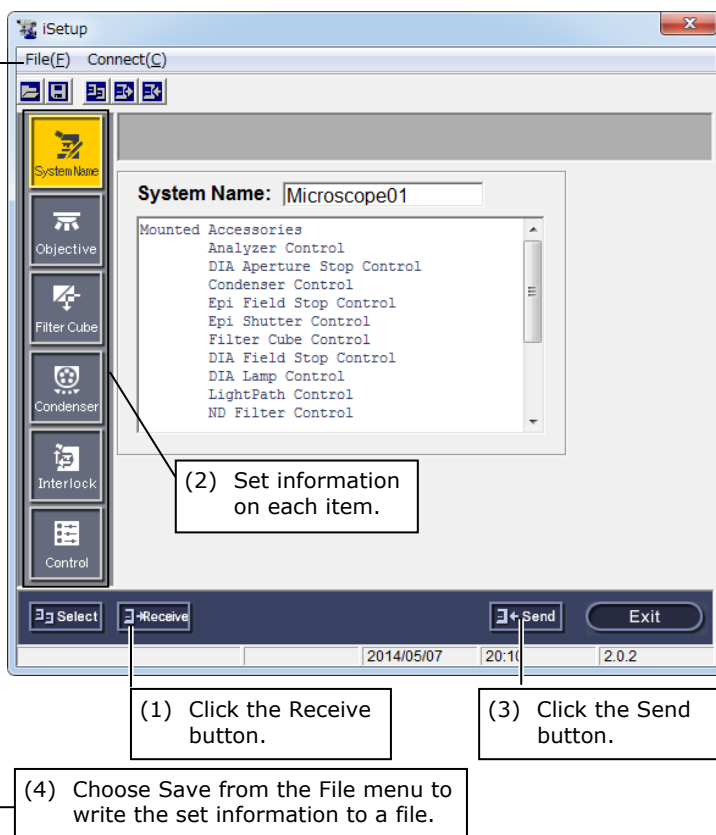
(1) Click the Receive button.
The information stored in the memory of the microscope system is loaded and reflected in the iSetup window.

(2) Click the button for the main setup item that needs corrections on the left side of the window and make corrections in the setup screen.

(3) After modifying the information, click the Send button to send the information just set to the microscope system. The transmitted name and information are stored in memory on the microscope system side. (This overwrites all information that can be set, not just the specific items that were changed.)

(4) Choose Save from the File menu of the window to save the set information to a file.

(2) Set information on each item.

(1) Click the Receive button.

(3) Click the Send button.

(4) Choose Save from the File menu to write the set information to a file.

5.5.2	Loading and Correcting an Existing File

You can load any existing microscope system information data file into iSetup for correction or modifications.

▼ **iSetup window**

(3) Set information on each item.

(1) Choose Open from the File menu.

(4) Click the Send button.

(5) To save the set information to a file, choose Save from the File menu.
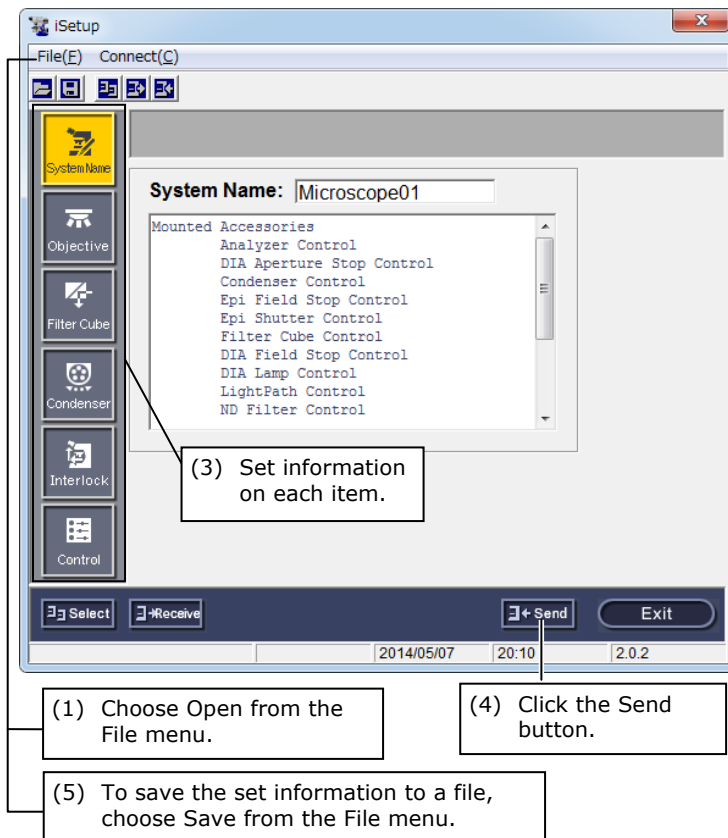
(1) Choose Open from the File menu and select the file (***.xml) in which the information was saved.

(2) The setup data item select window will open, showing the data items saved to the selected file. Select a data item and click the OK button to load the settings into iSetup.

(3) Click the button for any main setup item on the left side of the window. In the ensuing dialog box, set the information you want to correct for that item. Set information on other applicable items.

(4) After modifying the information, click the Send button to send the information just set to the microscope system. The transmitted name and information are stored in memory on the microscope system side. (This overwrites all information that can be set, not just the specific items that were changed.)

(5) Choose Save from the File menu of the window to save the set information to a file.

▼ **Setup data item select window**

(2)-1 Select the setup data item.

(2)-2 Click the OK button.

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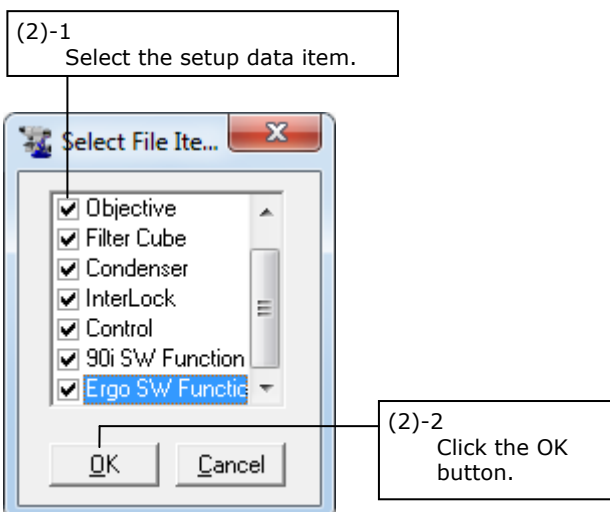
5.6	**Entering the Name of a Microscope System**

If multiple microscope systems are connected to a single PC, assign a name to each of the systems for identification purposes.

Clicking the System Name button in the iSetup window displays a dialog box for entering the name of a microscope system.
Use this dialog box to enter the name of a microscope system.

▼ **Microscope system name input dialog box**

(1) Click the System Name button. If you loaded information from a microscope system, the status of any peripheral motorized attachments connected to the system is also displayed.

(2) Enter the name of a microscope system in the System Name text box (using up to 15 single-byte alphanumeric characters).
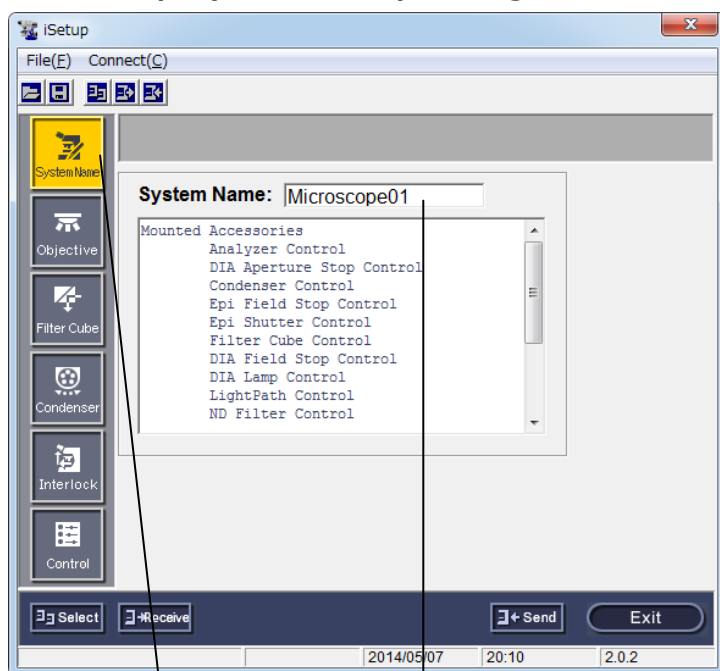
(1) Click the System Name button.

(2) Enter the name of a microscope system.

5.7   Setting Up the Objective

Setting up the objective lets you monitor the status of the microscope system at a glance and have microscopy method switching and objective switching interlocked.

The following information items can be set for the objective:

- **Objective mounting setup** (possible only if the motorized or intelligent nosepiece is attached):
  Set information on the objectives mounted at each nosepiece address (hole).

- **New objective registration** (possible only if the motorized or intelligent nosepiece is attached):
  Register information on new objectives that are not registered in the list box (up to nine pieces.)

- **Special control setup** (possible only if the 90i is included in the system configuration and if the motorized or intelligent nosepiece is attached to the microscope):
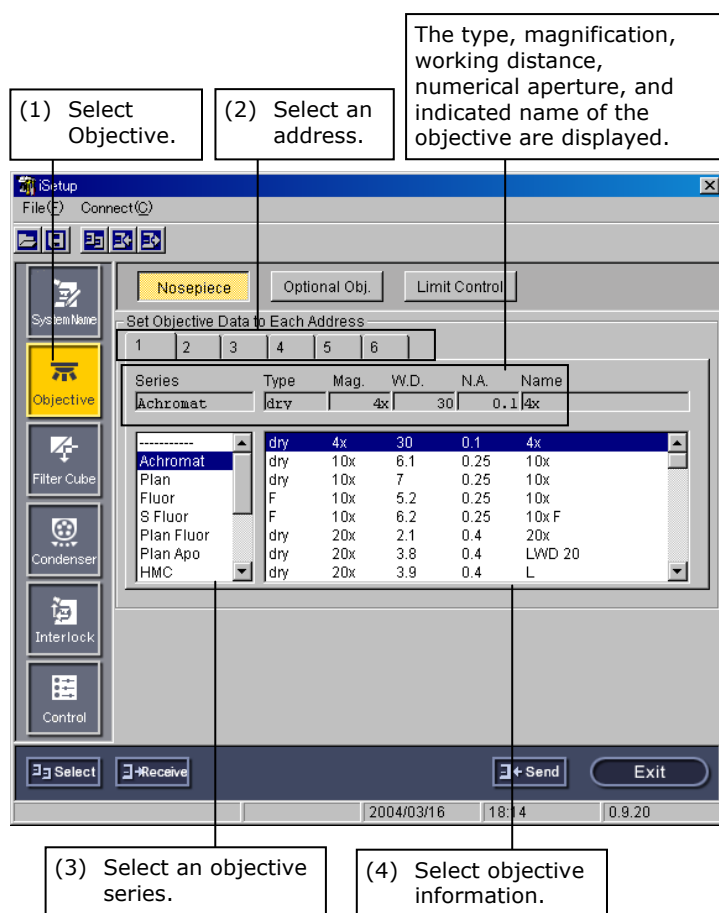 Set up the special control when changing objectives.

5.7.1   Objective Mounting Setup

Clicking the Objective button – a main setup item button – displays the objective mounting setup dialog box.
In the objective mounting setup dialog box, set information on the objectives mounted at each nosepiece address.

▼ **Objective mounting setup dialog box**

(1) Select Objective.

(2) Select an address.

The type, magnification, working distance, numerical aperture, and indicated name of the objective are displayed.

(3) Select an objective series.

(4) Select objective information.

(1) Click the Objective button – a main setup item button.

(2) From the tab, select an address for which you want to set objective information.

(3) Select the desired objective series from the series list box.

(4) When you select a series, the selected items of the objective information change. Select the desired objective information from the objective information list box.
When you select any objective information, the type, magnification, working distance, numerical aperture, and indicated name of the objective are displayed in the Type, Mag., W.D., N.A., and NAME text fields.

(5) When you go on to set objective information for another address, go back to Step (2) and repeat the setup procedure.

♦ Supplement
To register new objective information not registered in the series list box, click the Optional Obj. button– a subsetup item button. This changes the dialog box to the one used to register new objective information. Refer to "5.7.2 Registering New Objectives" for more information.

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● **Combination of objectives and condenser modules (DIC prism on condenser side) for Differential Interference Contrast (DIC) microscopy**

The Differential Interference Contrast (DIC) microscopy and Differential Interference Contrast and Fluorescent simultaneous (DIC/FL) microscopy needs an objective-side DIC prism and a condenser module (condenser-side DIC prism) that correspond to the objective to be placed in the optical path.

Normally, there is only one combination of objective, objective-side DIC prism and condenser module. For some objectives, however, two combinations are available.

One combination allows standard well-balanced observation, while the other combination provides contrast-priority or resolution-priority observation. Therefore, choose the one that suits the sample to be observed. (For low magnification objectives, contrast-priority observation is available, while for high magnification objectives, resolution-priority observation is available. For details, refer to the instruction manual for the motorized universal condenser.)

The table below lists the objective that allows two combinations of the objective, objective-side DIC prism and the condenser module.
The type of condenser module to be used when one of these objectives is placed in the optical path and the observation method is changed to [DIC] or [DIC/FL] can be set in the objective mounting setup dialog box. Some objective names are followed by two selectable condenser module names. Choose an objective name with a desired condenser module name.
For the objectives that are not listed below, only one combination of the objective, objective-side DIC prism and the condenser module is available, in which case standard well-balanced observation alone is possible.

Series	Objective name	Application
Plan Fluor	20x (N2)	Standard
Plan Fluor	20x (N1)	High contrast
Plan Fluor	20x Ml (N2)	Standard
Plan Fluor	20x Ml (N1)	High contrast
S Fluor	20x (N2)	Standard
S Fluor	20x (N1)	High contrast
Fluor	20x W (N2)	Standard
Fluor	20x W (N1)	High contrast
Plan Apo	20x (N2)	Standard
Plan Apo	20x (N1)	High contrast
S Fluor	40x (N2)	Standard
S Fluor	40x (N1)	High contrast
Plan Fluor	40x (N2)	Standard
Plan Fluor	40x (N1)	High contrast
Plan Apo	40x (N2)	Standard
Plan Apo	40x (N1)	High contrast

Inside of ( ) :   condenser module

Series	Objective name	Application
Plan Apo	60x A Oil (N2)	Standard
Plan Apo	60x A Oil (NR)	High resolution
Plan Apo	60x (N2)	Standard
Plan Apo	60x (NR)	High resolution
Fluor	60x W (N2)	Standard
Fluor	60x W (NR)	High resolution
Plan Apo	VC 60x Oil (N2)	Standard
Plan Apo	VC 60x Oil (NR)	High resolution
Plan Apo	TIRF 60x Oil (N2)	Standard
Plan Apo	TIRF 60x Oil (NR)	High resolution
Plan Apo	60x WI C (N2)	Standard
Plan Apo	60x WI C (NR)	High resolution
Plan Apo	VC 60x WI (N2)	Standard
Plan Apo	VC 60x WI (NR)	High resolution
Plan Fluor	60x C (N2)	Standard
Plan Fluor	60x C (NR)	High resolution
Plan Fluor	60x Oil Iris (N2)	Standard
Plan Fluor	60x Oil Iris (NR)	High resolution
Plan Apo	VC 100x Oil (N2)	Standard
Plan Apo	VC 100x Oil (NR)	High resolution
Plan Fluor	100x Oil (N2)	Standard
Plan Fluor	100x Oil (NR)	High resolution
Plan Apo	100x Oil (N2)	Standard
Plan Apo	100x Oil (NR)	High resolution
Plan Apo	TIRF 100x Oil (N2)	Standard
Plan Apo	TIRF 100x Oil (NR)	High resolution

5.7.2   Registering New Objectives

New objective registration is needed to register new objective information not registered in the series list box. Click the Optional Obj. button – a subsetup item button in the objective mounting setup dialog box – to display a dialog box for registering new objective information.
This dialog box allows you to register up to nine new objectives.

When registering a new objective, you can register information on seven items: Display Name, Series, Magnification, Type, Working Distance, Numerical Aperture, and Applicable Condenser Module (only when the motorized condenser module is mounted).

Note: When registering an objective for differential interference contrast or phase contrast microscopy, be sure to set information on the applicable condenser module. Condenser modules are switched automatically when objectives are changed. The control of condenser module based on the set information is performed only when the differential interference contrast (DIC), differential interference contrast and fluorescent simultaneous (DIS/FL) or phase contrast (Ph) microscopy is selected as the observation mode. When registering the objectives for one of these microscopy methods, the applicable condenser modules must be set.

For the objectives for differential interference contrast microscopy, confirm the indication on the objective barrel and set either "N1" or "N2." Some objectives for differential interference contrast microscopy not only allow observation by a standard combination (indicated on the barrel of the objective) but also support observation with high contrast or high resolution. To perform observation with high contrast or high resolution, set the corresponding condenser module ("N1" or "NR").

For the objectives for phase contrast microscopy, confirm the indication on the objective barrel and set either of "Ph1," "Ph2" or "Ph3."

For the objectives for other observation methods, there is no need to set condenser modules. Use the default setting "None."

▼ **New objective registration dialog box**

(1) Click the Optional Obj. button.
(2) Select a number.
(7) Enter a working distance and numerical aperture.
(8) Select the applicable condenser module.
(3) Enter a name.
(4) Select a series.
(5) Select a type.
(6) Select a magnification.

(1)   Click the Optional Obj. button – a subsetup item button.

(2)   From the tab, select a number for which you want to register objective information.

(3)   Enter the name of the objective in the Name text box (using up to 15 single-byte alphanumeric characters).

(4)   Select the objective series from the Series list box.

(5)   Select the objective type from the Type list box.

(6)   Select the objective magnification from the Mag list box.

(7)   Enter the working distance and the numerical aperture of the objective in the W.D. and the N.A. text fields, respectively (up to 4 single-byte alphanumeric characters each).

(8)   Select the applicable condenser module from the [DIC/Ph Condenser] combo box.

The newly registered objective is added to the selectable items in the list box in the objective mounting setup dialog box.

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5.7.3	Special Control Setup

Click Limit Control – a subsetup item button for objective setup – to display a dialog box for setting up special control.

Special control setup is designed to set the following control items:

Note: Special control setup is enabled only when objectives are switched with the objective interlock turned ON. For more information on the objective interlock, refer to "4.8.11 Objective."

- **Objective high magnification switching limit control**

  As for the nosepiece operation when changing from low to high magnification lenses, one of the following options can be set: inhibit the nosepiece rotation, rotate the nosepiece after retracting the stage, or disable control. Limit control is activated if the following requirements are met:

  (1) The objective magnification prior to switching is 2x or less.

  (2) The working distance of the objective after switching is 1 mm or less.

  ♦ Supplement

  Low-magnification objectives have a very long depth of focus, occasionally resulting in the specimen and the objective being close to each other. If, under such a condition, the objective is changed to a high magnification, its edge may touch the specimen. High magnification switching limit control is carried out to avoid such a problem beforehand.

- **Skip control setup**

  Set whether to skip addresses at which objectives are not attached for rotation of the nosepiece.
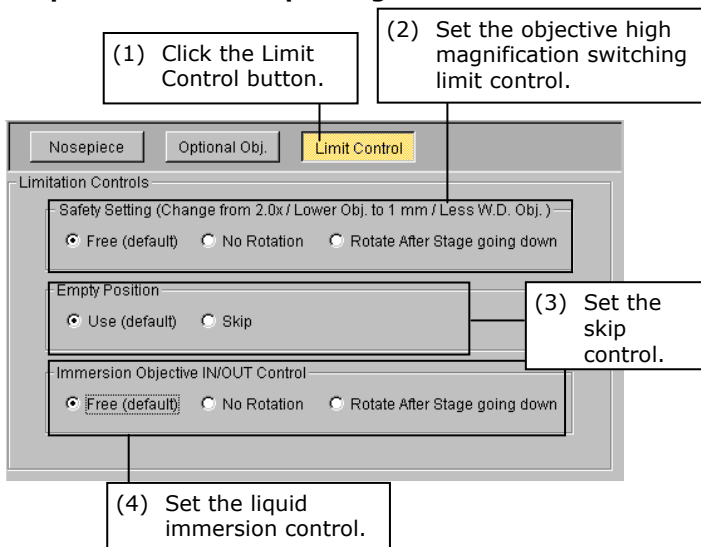
- **Liquid immersion control**

  If a liquid immersion lens is provided in the optical path during or following nosepiece rotation, set one of the following options: inhibit the nosepiece rotation, rotate the nosepiece after retracting the stage, or disable control. Limit control is activated in either of the following cases:

  (1) If the objective prior to switching is a liquid immersion objective

  (2) If the objective following switching is a liquid immersion objective

  ♦ Supplement

  Under the setting that the nosepiece is rotated after retracting the stage, the stage will be in the retracted status after it is retracted. To return the stage to the pre-retracted focus position for the objective, push the "Return" button. The stage will come to the original position.

5.7   Setting Up the Objective

▼ **Special control setup dialog box**

(1) Click the Limit Control button.

(2) Set the objective high magnification switching limit control.

Nosepiece	Optional Obj.	Limit Control

Limitation Controls

Safety Setting (Change from 2.0x / Lower Obj. to 1 mm / Less W.D. Obj.)
⊙ Free (default)   ○ No Rotation   ○ Rotate After Stage going down

Empty Position
⊙ Use (default)   ○ Skip

(3) Set the skip control.

Immersion Objective IN/OUT Control
⊙ Free (default)   ○ No Rotation   ○ Rotate After Stage going down

(4) Set the liquid immersion control.

(1) Click Limit Control – a subsetup item button.

(2) For the objective high magnification switching limit control, select Free (default), No Rotation or Rotate After Stage Going Down.

(3) To enable skip control, select Skip. To disable, select Use (default).

(4) For the switching limit control for liquid immersion objective, select Free (default), No Rotation or Rotate After Stage Going Down.

Note: The stage moves downward 5 mm as its retract motion. In the absence of a 5-mm margin, the stage will retract to its lowest possible position.

5.8	Setting Up the Filter Cube

Setting up the filter cube lets you monitor the status of the microscope system at a glance and interlock the filter cube when switching microscopy methods.

The following filter cube information items can be set (if the DIH-M or DIH-E is included in the microscope system configuration):

- **Filter cube mounting setup:**
  Set information on the filter cubes positioned at each filter cube address (filter cube bay).

- **New filter cube registration:**
  Register a combination of excitation filter, dichroic mirror, and barrier filter as well as the name of a filter cube comprised of that combination.

- **Name registration:**
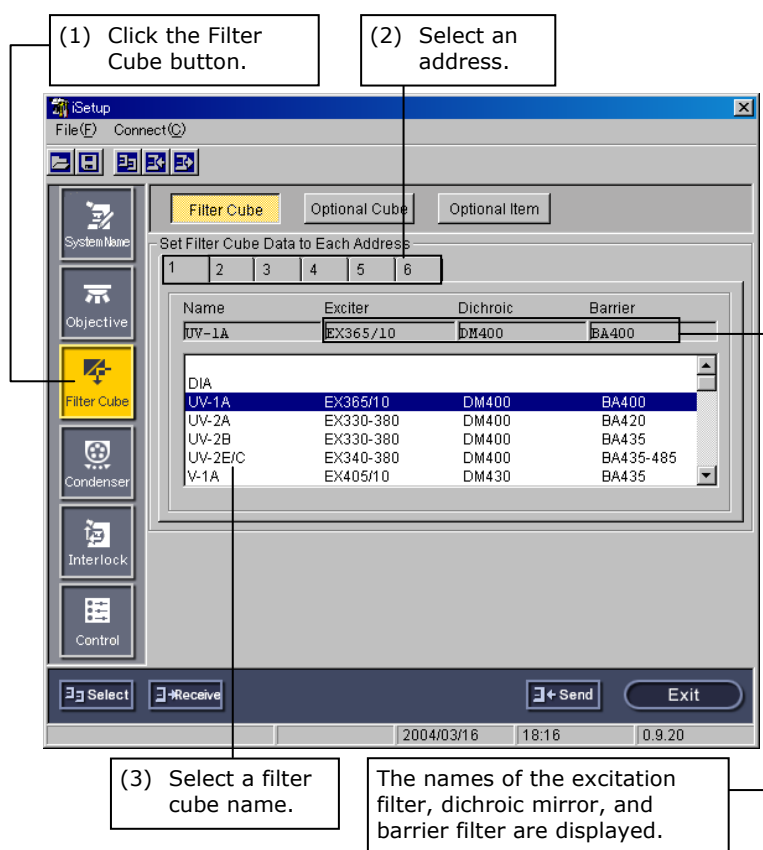 Register the names of the excitation filter, dichroic mirror, and barrier filter.

| 5.8.1 | Filter Cube Mounting Setup |

Clicking the Filter Cube button – a main setup item button – displays the filter cube mounting setup dialog box. In this dialog box, set information on the filter cubes attached at each filter cube address (filter cube bay).

Note: DIA (open) is selected for address 6 as initial setting. The interlock with microscopy method switching is conducted based on this initial setting. For more information, refer to "Standard Combinations of Microscopy Methods and Interlock" in the appendix of Chapter 4.

▼ **Filter cube mounting setup dialog box**

(1) Click the Filter Cube button.

(2) Select an address.

(3) Select a filter cube name.

The names of the excitation filter, dichroic mirror, and barrier filter are displayed.

(1) Click the Filter Cube button – a main setup item button.

(2) From the tab, select an address for which you want to set filter cube information.

(3) Select a filter cube name from the list box.
When you select the filter cube name, the names of the excitation filter, dichroic mirror, and barrier filter are displayed in the Exciter, Dichroic, and Barrier text boxes, respectively.

(4) To set information for another address, go back to Step (2) and repeat the setup procedure.

♦ Supplement
To register a new combination of excitation filter, dichroic mirror, and barrier filter, click the Optional Cube button. The dialog box changes to the one used for registering a new filter cube. See the next page for more information.

To register a new excitation filter, dichroic mirror, or barrier filter individually, click the Optional Item button. The dialog box changes to the one used for registering item names. See Section 5.8.3 for more information.
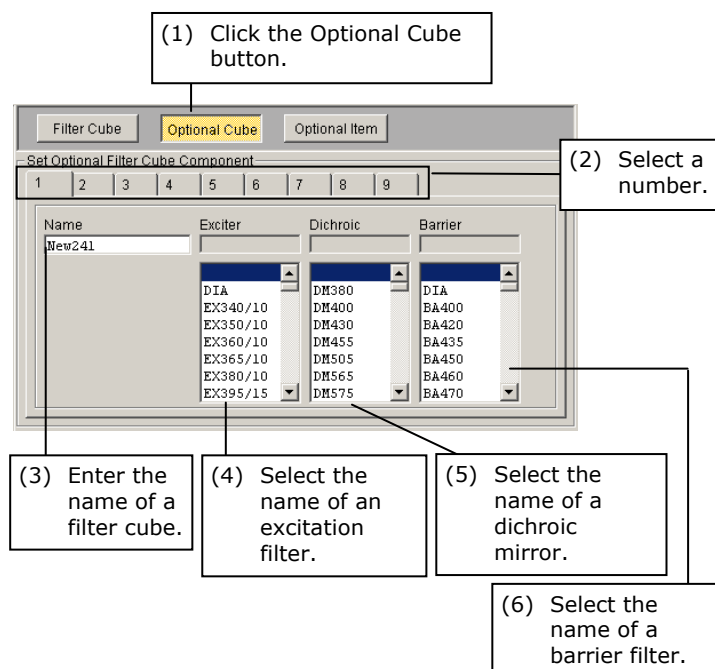
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5.8.2   Registering New Filter Cubes

New filter cube registration is required to register a new combination of excitation filter, dichroic mirror, and barrier filter. Clicking Optional Cube – a subsetup item button in the filter cube mounting setup dialog box – displays a dialog box for registering new filter cubes.
This dialog box lets you register up to nine combinations of excitation filters, dichroic mirrors, and barrier filters, and the names of up to nine filter cubes, each comprised of the combination thus specified.

▼ New filter cube registration dialog box

(1) Click the Optional Cube button.

(2) Select a number.

(3) Enter the name of a filter cube.

(4) Select the name of an excitation filter.

(5) Select the name of a dichroic mirror.

(6) Select the name of a barrier filter.

(1) Click the Optional Cube button – a subsetup item button.

(2) From the tab, select a number for which you want to register new filter cube information.

(3) Enter the name of the filter cube you want to set in the Name text box (up to 10 single-byte alphanumeric characters).

(4) Select the name of the excitation filter you want to set from the Exciter list box.

(5) Select the name of the dichroic mirror you want to set from the Dichroic list box.

(6) Select the name of the barrier filter you want to set from the Barrier list box.

The newly registered filter cube is added to the selectable items in the list box in the filter cube mounting setup dialog box.

♦ Supplement
To register a new excitation filter, dichroic mirror, or barrier filter individually, click the Optional Item button. The dialog box changes to the one used for registering item names. See the next page for more information.

5.8.3	Registering Item Names

Item name registration is needed to register a new excitation filter, dichroic mirror, or barrier filter individually. Click Optional Item – a subsetup item button in the filter cube mounting setup dialog box– to display a dialog box for registering item names.
This dialog box lets you register names for up to nine excitation filters, nine dichroic mirrors, and nine barrier filters.

▼ **Item name registration dialog box**

(1) Click the Optional Item button – a subsetup item button.

(2) In the Exciter, Dichroic, and Barrier text boxes here, enter the name of the excitation filter, dichroic mirror, and barrier filter you want to set (using up to 10 single-byte alphanumeric characters).

The newly registered names are added to the selectable items in the list box in the new filter cube registration dialog box.

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5.9   Setting Up the Condenser Module

Condenser module setup lets you monitor the status of the microscope system at a glance and interlock the condenser module when switching microscopy methods or objectives.

The following condenser module information items can be set (only if the motorized universal condenser module is attached to the microscope):

- **Condenser module mounting setup:**
  Set information on the condenser modules attached at each condenser turret address (condenser module bay).

- **New condenser module registration**
  Register the desired name of a condenser module.

5.9.1   Condenser Module Mounting Setup

Clicking the Condenser button – a main setup item button – displays the condenser module mounting setup dialog box.

▼ **Condenser module mounting setup dialog box**

(1) Click the Condenser button.
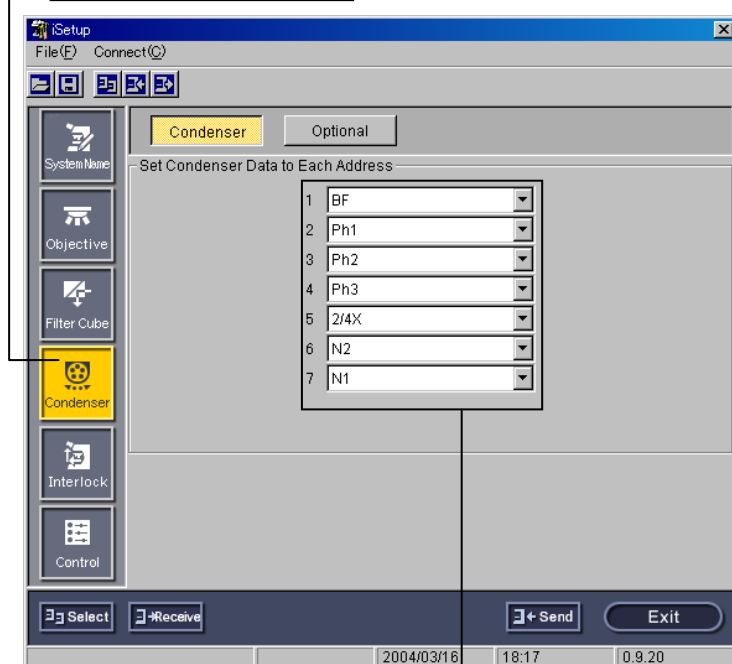
(2) Select an address and condenser module name.

(1) Click the Condenser button – a main setup item button.

(2) Select the name of a condenser module from the combo box of the address for which you want to register condenser module information.

♦ Supplement

To register a new condenser module, click the Optional Data button. The dialog box changes to the one used for registering a new condenser module. See the next page for more information.

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5.9.2	New Condenser Module Registration

New condenser module registration is needed to register a new condenser module. Click Optional Data – a subsetup item button – to display a dialog box for registering new condenser modules. This dialog box lets you register up to nine condenser modules.

▼ **Condenser module name registration dialog box**

(1) Click the Optional Data button.

(2) Enter a name.

(1) Click the Optional Data button – a subsetup item button.

(2) Enter the name of a condenser module (using up to 10 single-byte alphanumeric characters).

The newly registered name is added to the selectable items in the combo box in the condenser module mounting setup dialog box.

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5.10   Setting Up the Interlock

Interlock is designed to tailor various motorized attachments of the microscope system to the control conditions that best fit the microscopy method and objective used.

The following interlock information items can be set:

- **Microscopy method interlock setup** (only if the 90i, DIH-E, or D-FL-E is included in the microscope system configuration):
  Set whether to interlock each of the motorized attachments when switching microscopy methods (ON/OFF).

  Note: Settings for the diascopic field diaphragm, ND filter, and diascopic aperture diaphragm interlock control are effective only after switching the microscopy method to a user-set arbitrary method.

- **Objective interlock setup** (only if the 90i is included in the microscope system configuration):
  Set whether to interlock each of the motorized attachments when switching objectives (ON/OFF).

- **Optical path switching interlock setup** (only if the DIH-E is included in the microscope system configuration):
  Set whether to interlock the episcopic field diaphragm, ND filter, and diascopic field diaphragm when switching optical paths.

- **Optical zoom interlock setup** (only if the DIH-E is included in the microscope system configuration):
  Set whether to interlock the episcopic field diaphragm, ND filter, and diascopic field diaphragm when switching optical zoom magnifications.

- **Compensation setup**
  Control values can be compensated for across the board when the diascopic field diaphragm, diascopic aperture diaphragm, ND value, and episcopic field diaphragm are controlled through interlock. Set this compensation value.

  ♦ Supplement
    Interlock controls are performed using proper control values which are calculated from information the setting including the objective on the optical path. With the compensation settings, you can multiply the control values (calculated values) by compensation rates (expressed as a percentage).

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5.10.1   Microscopy Method Interlock Setup

Clicking the Interlock button – a main setup item button – displays the microscopy method interlock setup dialog box.

▼ **Microscopy method interlock setup dialog box**
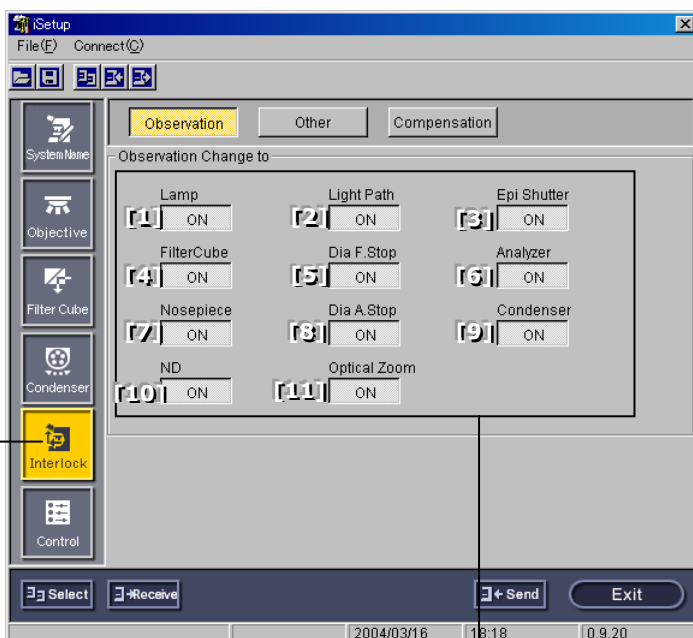
(1) Click the Interlock button.

(2) Click the ON/OFF button for each of the motorized attachments.

(1) Click the Interlock button – a main setup item button.

(2) Set whether to turn ON or OFF each of the motorized attachments (interlock the attachments with microscopy method) by clicking the ON/OFF button.
The following motorized attachments can be set to interlock:

　[1]　Illumination lamp (configuration including the 90i only)

　[2]　Optical path switching (configuration including the DIH-E only)

　[3]　Shutter (configuration including the DIH-E/M only)

　[4]　Filter cube (configuration including the DIH-E only)

　[5]　Diascopic field diaphragm (configuration including the 90i only)

　[6]　Analyzer (configuration including the DIH-E only)

　[7]　Nosepiece (only if motorized nosepiece is attached)

　[8]　Diascopic aperture diaphragm (only if motorized condenser is attached)

　[9]　Condenser (only if motorized condenser is attached)

　[10]　ND filter (only if motorized ND filter is attached)

　[11]　Optical zoom (configuration including the DIH-E only)

Note: Motorized attachments that can be set to interlock vary depending on the microscope system configuration.

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5.10.2   Objective, Optical Path Switching, and Optical Zoom Interlock Setups

Clicking Other – a subsetup item button in the microscopy method interlock setup dialog box – displays the interlock setup dialog box for others.

- **Objective interlock and up/down focus motion interlock control setup (parfocal correction mode setup):**

  Select whether to perform parfocal position correction control.

  ♦ Supplement

  Although all objectives have uniform parfocal lengths, each objective has slight differences in-focus positions, for which corrections must be made. The parfocal correction function remembers slight differences in-focus positions to enable repeatable precise focusing.

  Note: To set the in-focus position, use Focus Setting in the iControl menu item "Setting." For more information, refer to 4.5.2, "Setting the Focus Position for Up/Down Motion."

- **Objective interlock and XY stage interlock control setup (center axis correction mode setup):**

  Select whether to perform center position correction control.

  ♦ Supplement

  Each objective tends to differ slightly with respect to the center axis. To correct for these slight variances, the center axis correction function remembers the various center positions.

  Note: To set the center position, use XY Setting in the iControl menu item "Setting." For more information, refer to 4.5.4, "Setting the XY Stage Center Position."

▼ **Interlock setup dialog box for others**

(1) Click the Other button.

(2) Click the ON/OFF button for each motorized attachment.

(3) Click the ON/OFF button.

(4) Click the ON/OFF button.

(1) Click Other – a subsetup item button.

(2) Set whether to turn ON or OFF each of the motorized attachments (interlock the attachments with objective) by clicking the ON/OFF button. The following motorized attachments can be set:

[1] ND filter (only if motorized ND filter is attached)

[2] Diascopic field diaphragm (configuration including the 90i only)

[3] Condenser (only if a motorized condenser is attached)

[4] Diascopic aperture diaphragm (only if a motorized condenser is attached)

[5] Up/down focus motion (configuration including the 90i only)

[6] XY stage (applies only if the motorized stage is installed)

(3) Click the ON/OFF button to enable or disable interlock-control of each motorized unit with optical path switchover.

[1] Episcopic field diaphragm (applies only if the configuration includes DIH-E)

[2] ND filter (applies only if the motorized ND is installed)

[3] Diascopic field diaphragm (applies only if the configuration includes the 90i)

(4) Click the ON/OFF button to enable or disable interlock-control of each motorized unit with optical zoom.

[1] Episcopic field diaphragm (applies only if the configuration includes DIH-E)

[2] ND filter (applies only if the motorized ND is installed)

[3] Diascopic field diaphragm (applies only if the configuration includes the 90i)

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5.10.3	Compensation Setup during Interlocking

Clicking Compensation – a subsetup item button in the microscopy method interlock setup dialog box – displays the compensation setup dialog box.

▼ **Compensation setup dialog box**

(1) Click the Compensation button.

(2) Select a compensation value from the combo box for each of the motorized attachments.

(1) Click Compensation – a subsetup item button.

(2) Select an interlock compensation value from the combo box for each of the motorized attachments.

Note: Compensation setup applies to the interlocks with microscopy method switching and objective switching.

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5.11	**Control-Related Setup**

The following control-related information items can be set:

- **Up/down focus motion setup** (applies only if the microscope system configuration includes the 90i):
  Set the software lower limit and escape function operations.

- **Other control related setup** (applies only if the microscope system configuration includes the 90i or DIH-E):

  - Focus handle operation mode setup (applies only if the microscope system configuration includes the 90i)

  - XY stage manipulating handle operation mode setup (applies only if the motorized XY stage and the Ergonomic Controller are installed)

  - Buzzer setup (applies only if the microscope system configuration includes the 90i or DIH-E)

  - Switch setup

  - 90i main unit and Ergonomic Controller switch setup (applies only if the microscope system configuration includes the 90i or Ergonomic Controller)

- **90i main unit switch function assignment**
  Set function assignments for the switches mounted on the 90i main unit.

- **Ergonomic Controller switch function assignment**
  Set function assignments for the switches mounted on the Ergonomic Controller.

5.11.1   Setting Up the Up/Down Focus Motion

Click the sub-setup item button "Focus Drive" to display the up/down focus motion setup window.

The following up/down focus motion information items can be set (only if the 90i is included in the microscope system configuration):

- **Escape function (escape operation) setup:**
  Set up the unit (up/down motion (Z) and XY stage (X, Y)) to be evacuated when the escape function is used.

  ♦ Supplement
  Installing the motorized XY stage extends the escape function; in addition to the descending motion along the Z-axis, the X and Y axes can also be evacuated to their forward home positions.

- **Software lower limit setup:**
  Set the XY stage lower limit (15 mm/25 mm) if no attachment (e.g., a condenser turret) is attached under the XY stage.

  ♦ Supplement
  The initial lower limit setting along the Z-axis, initially set to -15mm to avoid the polarizer from touching the XY stage during its mounting, can be changed to -25mm as when you want to observe a thick specimen. Exercise caution if you set the lower limit to -25mm as no mechanism is provided to avoid collision with the polarizer.

▼ **Up/down focus motion setup dialog box**

(2) Select the operation mode for the escape function

(1) Click the Control button.

(3) Select a software lower limit.

(1) Click the Control button – a main setup item button.

(2) Escape function setup (XY stage setup is possible if the motorized XY stage is installed)

Select the unit to be evacuated (up/down motion or XY stage).

(3) Software lower limit (settable only if the motorized universal condenser module is not attached)

Select -15 mm (recommended) or -25 mm (max. lower limit position) for the lower limit position.

Note: The lower limit is automatically set to -15mm when the motorized universal condenser module is attached.
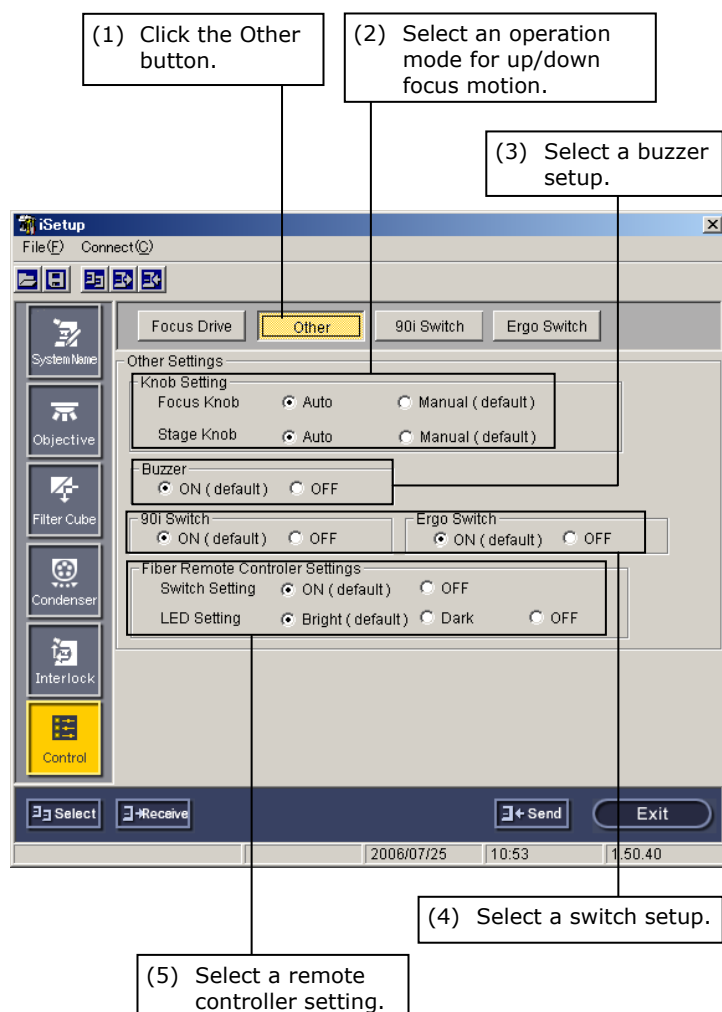
5.11.2	Other Setup

Clicking Other – a subsetup item button – displays a setup dialog box for other control.

The following control-related information items can be set (only when the 90i or DIH-E is included in the microscope system configuration):

- **Focus knob operation mode setup** (only if the 90i is included in the microscope system configuration):
  Set whether to change, on the system side, the travel per rotation of the focus knob according to the objective currently in the optical path (AUTO mode), or arbitrarily change the setting (coarse/fine/extra fine) (MANUAL mode) when controlling the up/down focus motion using the focus knob.

- **XY stage manipulating handle operation mode setup** (applies only if the motorized XY stage and Ergonomic Controller are installed):
  Set the operation mode for the XY stage manipulating handle by selecting AUTO mode (mode in which the increment moved per turn of the handle is determined on the system side by the objective in the optical path) or MANUAL mode (mode in which the operator can switch among coarse movement, fine movement, or extra fine movement).

- **Buzzer setup** (only if the 90i or DIH-E is included in the microscope system configuration):
  Set whether to sound the buzzer when operating the switches on the microscope or if an error occurs.

- **Switch setup:**
  Set whether to enable/disable operations of switches on the microscope.

- **90i main unit and Ergonomic Controller switch setup** (applies only if the microscope system configuration includes the 90i or Ergonomic Controller):
  This setting enables or disables switches mounted on the microscope main unit or Ergonomic Controller.

- **D-FL-E Remote Controller setup** (applies only if the microscope system configuration includes the Remote Controller for D-FL-E):
  This setting enables or disables operation from the D-FL-E Remote Controller and the brightness of the Remote Controller LED for D-FL-E.

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▼ **Control-related setup dialog box**

(1) Click the Other button.

(2) Select an operation mode for up/down focus motion.

(3) Select a buzzer setup.

```
iSetup                                                    ×
File(F)   Connect(C)

[icons]

          Focus Drive    Other      90i Switch   Ergo Switch
 System Name  ┌Other Settings──────────────────────────────┐
              │ ┌Knob Setting─────────────────────────────┐ │
 Objective    │ │ Focus Knob    ⊙ Auto      ○ Manual ( default ) │ │
              │ │ Stage Knob    ⊙ Auto      ○ Manual ( default ) │ │
 Filter Cube  │ └─────────────────────────────────────────┘ │
              │ ┌Buzzer───────────────────────┐              │
              │ │ ⊙ ON ( default )   ○ OFF     │              │
 Condenser    │ └─────────────────────────────┘              │
              │ ┌90i Switch──────┐ ┌Ergo Switch──────────┐    │
              │ │⊙ ON ( default )│ │⊙ ON ( default )  ○ OFF│   │
 Interlock    │ │         ○ OFF  │ └─────────────────────┘    │
              │ └────────────────┘                           │
              │ ┌Fiber Remote Controler Settings───────────┐ │
 Control      │ │ Switch Setting  ⊙ ON ( default )  ○ OFF   │ │
              │ │ LED Setting  ⊙ Bright ( default ) ○ Dark  ○ OFF │ │
              │ └─────────────────────────────────────────┘ │
              └─────────────────────────────────────────────┘

 [Select]  [Receive]                      [Send]   [ Exit ]
                        2006/07/25   10:53   1.50.40
```

(4) Select a switch setup.

(5) Select a remote controller setting.

(1) Click the Other button – a subsetup item button.

(2) Manual handle operation mode (up/down focus motion and XY stage) Select AUTO or MANUAL (default).

Note: The manual handle operation mode is unavailable if the microscope system includes the 90i main unit with the new capability of switch function assignments. If the 90i or Ergonomic Controller is assigned the "coarse/fine select" function, the operation mode is automatically set to MANUAL. Conversely, if the 90i or Ergonomic Controller is not assigned the "coarse/fine select" function, the operation mode is automatically set to AUTO.

For more information on switch function assignments for the 90i and the Ergonomic Controller, refer to Sections 5.11.3, "90i Main Unit Switch Function Assignment Setup" and 5.11.4, "Assigning Ergonomic Controller Switch Functions."

(3) Set the Buzzer to ON (default) or OFF.

(4) Select ON (default) or OFF to enable or disable the switches (mounted on the 90i main unit and the Ergonomic Controller).

(5) For the optical fiber light source, set the remote controller settings.

Enable or disable the remote controller operation. (The default setting is ON.)

5.11   Control-Related Setup

▼ Control-related setup dialog box
(the microscope system includes the D-FL-E)

(1) Click the Other button.

(2) Select Remote Controller settings.

(3) Select the buzzer setting.
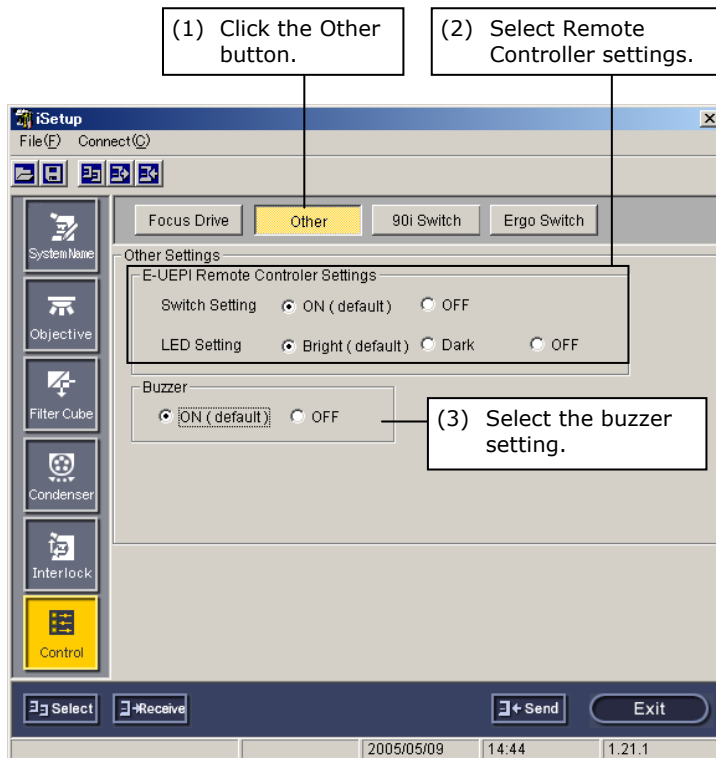
(1) Click the Other button in the subsetup item buttons.

(2) Set the Switching Setting to ON (default) when enabling operations from the D-FL-E Remote Controller. Set the Switch Setting to OFF when disabling.

(3) Set the brightness of the LED setting to Bright (default), Dark or OFF.

Note: The D-FL-E Remote Controller setting can be set only when the microscope system includes the D-FL-E Remote Controller.

(4) Set the Buzzer to ON (default) or OFF.

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5.11.3   90i Main Unit Switch Function Assignment Setup

Click the sub-setup item button "90i Switch" to display the switch function assignment setup screen.

Two types of switches are mounted on the 90i: CW/CCW switches (⊟ buttons) and Function switches (▢). The types of functions that can be set differ with each switch type. Listed below are the functions that can be set for each switch type. The names of the functions in the switch function list are enclosed in parentheses.

- CW/CCW switch functions
    1: Motorized nosepiece Normal/Reverse rotation   (Objective CW/CCW)
    2: Condenser Normal/Reverse rotation   (Condenser CW/CCW)
    3: Filter cube Normal/Reverse rotation   (Filter Cube CW/CCW)
    4: Diascopic aperture diaphragm Open/Close   (DIA Aperture Stop OPEN/CLOSE)
    5: Diascopic field diaphragm Open/Close   (DIA Field Stop OPEN/CLOSE)
    6: Motorized ND filter Bright/Dark   (ND Filter BRIGHT/DARK)
    7: Lamp voltage Up/Down   (DIA Lamp UP/DOWN)
    8: Zoom Up/Down   (Optical Zoom UP/DOWN)
    9: Episcopic field diaphragm Open/Close   (Epi Field Stop OPEN/CLOSE)

- Function switch functions
    1: Zoom Up   (Optical Zoom UP)
    2: Zoom Down   (Optical Zoom DOWN)
    3: Lamp On/Off   (DIA Lamp ON/OFF)
    4: Lamp 9V (Preset) setup   (DIA Lamp Preset)
    5: Escape operation   (Z Escape)
    6: Up/down focus knob speed change (coarse, fine, or extra fine)
                                                                                          (Z Focus Knob Speed Change)
    7: Motorized stage knob speed change (coarse, fine, or extra fine)
                                                                                          (XY stage Knob Speed Change)
    8: Optical path change   (Light Path Change)
    9: Analyzer In/Out   (Analyzer IN/OUT)
    10: Shutter Open/Close   (Shutter OPEN/CLOSE)
    11: Image AF execution   (Auto Focus)
    12: Capture execution   (Image Capture)
    13: Differential interference contrast <-> bright field microscopy switchover
                                                                                          (DIC <-> Bright field)
    14: DIC/fluorescent simultaneous <-> bright field microscopy switchover
                                                                                          (DIC/Fl. <-> Bright field)
    15: Fluorescent <-> bright field microscopy switchover
                                                                                          (Fluorescence <-> Bright field)
    16: Phase contrast <-> bright field microscopy switchover
                                                                                          (Phase Contrast <-> Bright field)
    17: Dark field <-> bright field microscopy switchover
                                                                                          (Dark field <-> Bright field)
    18: Arbitrary microscopy (User 1-6 type) <-> bright field microscopy switchover
                                                                                          (Option 1 <-> Bright field)
                                                                                          (Option 2 <-> Bright field)
                                                                                          (Option 3 <-> Bright field)
                                                                                          (Option 4 <-> Bright field)
                                                                                          (Option 5 <-> Bright field)
                                                                                          (Option 6 <-> Bright field)

Note: If you wish to assign a new function to the preset function button on the 90i, release the preset state, and then set the new function.
When the lamp is in the preset state, the lamp brightness control knob is disabled.
To enable the brightness control knob, release the preset state. You can release the preset state by changing the lamp voltage with iControl. (Refer to Section 4.8.9.)

▼ **90i main unit switch function assignment window**

(2) Select a function.

(1) Select the switch to be set.

(1) In the switch selection frame, click the button for the switch to which you want to assign a function. The selected switch name will be highlighted in list view.

(2) From the switch function list, select the function you want to assign. The function for the selected switch displayed in list view is updated.

♦ Supplement

The same function can be assigned to multiple switches.

Note: If you assign the "Z Focus Knob Speed Change" or "XY stage Knob Speed Change" function to a switch while operation mode of the manual handle is set to Auto, the operation mode will switch automatically from Auto to Manual.

(3) To assign functions to other switches, repeat steps (1) and (2) above.

▼ **Default button**
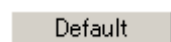
● **To restore default switch functions**

Click the Default button. The switches will revert to their default assigned functions.

• Default settings

CW/CCW1: Diascopic aperture diaphragm Open/Close
CW/CCW2: Diascopic field diaphragm Open/Close
CW/CCW3: Filter cube CW/CCW
CW/CCW4: Motorized nosepiece CW/CCW
SW1: Stage escape function
SW2: Up/down knob coarse/fine change
SW3: Diascopic lamp preset function
SW4: DIH optical path change
SW5: Stage escape function
SW6: Up/down knob coarse/fine change

▼ **All Clear button**

● **To clear all settings**

Click the All Clear button to clear all set switch functions.

5.11.4   Assigning Ergonomic Controller Switch Functions

Click the sub-setup item button labeled "Ergo Switch." This displays the Ergonomic Controller switch function assignment window.

The switch functions assigned to the Ergonomic Controller are identical to those assigned to the 90i main unit. For more information on switch functions, refer to Section 5.11.3, "90i Main Unit Switch Function Assignment Setup."

- **Selecting switch setup mode:**
  Select switch setup mode from two choices available: Standard or Extend.

  ♦ Supplement
    Ergonomic Controller switch functions can be assigned by one of two methods: Standard and Extend modes. In Standard mode, only one function is assigned per button. In Extended mode, one switch may be assigned one of two functions on switchable sides A and B.

  Listed below are switches that can be assigned functions in the respective modes.

  • Standard (standard mode)
      1: "L" (A-side) function key switch
      2: "R" (A-side) function key switch
      3: "1" (A-side) function key switch
      4: "2" (A-side) function key switch
      5: "3" (A-side) function key switch
      6: CW/CCW (A-side) key switch
      7: CW/CCW (B-side) key switch

  • Extend (extended mode)
      1: "L" (A-side) function key switch
      2: "R" (A-side) function key switch
      3: "1" (A-side) function key switch
      4: "2" (A-side) function key switch
      5: "3" (A-side) function key switch
      6: "L" (B-side) function key switch
      7: "R" (B-side) function key switch
      8: "1" (B-side) function key switch
      9: "2" (B-side) function key switch
      10: "3" (B-side) function key switch
      11: CW/CCW (A-side) key switch
      12: CW/CCW (B-side) key switch

- **Stage manipulating handle left or right-handed setup:**
  In switch setup selection, choose Right for right-handed or Left for left-handed.

  ♦ Supplement
    Change the direction of rotation of the Ergonomic Controller stage-manipulating handle for left or right-handed operation.

- **Saving and loading switch function assignment information:**

  ♦ Supplement
    Switch function assignments can be saved to a file. Once saved, these files can be loaded to reflect specific switch function assignments.

▼ **Ergonomic Controller switch function assignment window**

▼ **Default button**

(1) Selecting switch setup mode
Select Standard for standard mode or Extend for extended mode.

(2) In the switch selection frame, click the button for the switch to which you want to assign a function. The selected switch name will be highlighted in list view.

(3) From the switch function list, select the function you want to assign. The function for the selected switch displayed in list view is updated.

♦ Supplement
The same function can be assigned to multiple switches.
Note: If you assign the "Z Focus Knob Speed Change" or "XY stage Knob Speed Change" function to a switch while the operation mode of the manual handle is set to Auto, the operation mode will switch automatically from Auto to Manual.

(4) To assign functions to other switches, repeat steps (1) through (3) described above.

● **To restore default switch functions**
Click the Default button. The switches will revert to their default assigned functions.

• Default settings for single 90i main unit or 90i + DIH-M

CW/CCW(A): Motorized nosepiece Normal/Reverse rotation
CW/CCW(B): Condenser Normal/Reverse rotation
L: Up/down knob coarse/fine change
R: XY stage knob coarse/fine change
1: Escape operation
2: Lamp On/Off
3: Lamp 9V (Preset) setup

• Default settings for 90i + DIH-E

CW/CCW(A): Motorized nosepiece Normal/Reverse rotation
CW/CCW(B): Filter cube Normal/Reverse rotation
L: Up/down knob coarse/fine change
R: XY stage knob coarse/fine change
1: Option 1 <-> Bright field
2: Lamp On/Off
3: Shutter Open/Close

• Default settings for DIH-E

CW/CCW(A): Filter cube Normal/Reverse rotation
CW/CCW(B): Episcopic field diaphragm Open/Close
L: Zoom Up
R: Zoom Down
1: Optical path change
2: Analyzer In/Out
3: Shutter Open/Close

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▼ **All Clear button**

● To clear all settings

Click the All Clear button to clear all set switch functions.

▼ **File save button**

● To save the information set

Click the File Save button to display a dialog box for saving files. In this dialog box, enter a filename (***.xml) and click the Save button.

The information set in the Ergonomic Controller switch function assignment window will be saved.

▼ **File read button**

● To load a saved file

Click the File Read button to display a dialog box for loading files. In this dialog box, enter a filename (***.xml) and click the Open button.

The setup information will be reflected in the Ergonomic Controller switch function assignment window.

▼ **XY Knob direction of rotation select button**

● Setting the direction of knob rotation

Choose Right or Left for right or left-handed operations.

5.12   Reflecting and Saving Settings

To enable information set with iSetup, you need to send all the information to the microscope system. The microscope system will overwrite any previous information, saving the transmitted information. The information you've set can be saved to a file if desired.

5.12.1   Transmission to the Microscope System

When you thoroughly finish setting up necessary information, send it to the microscope system for storage in memory on the microscope system side.

▼ **iSetup window**

(1) Click the Send button.
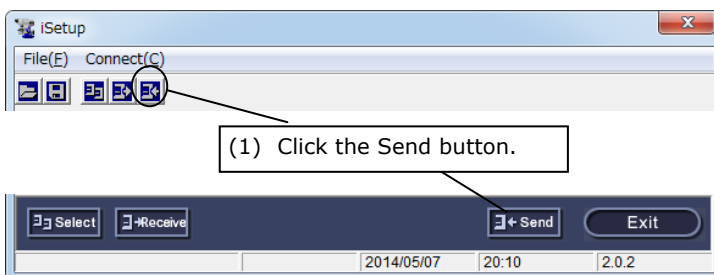
(1) Click the Send button.
The name of the microscope system and all related information will be sent to the microscope system side. The transmitted name and information are stored in memory on the microscope system side, thus overwriting any previous information.

5.12.2   Saving Microscope System Information

You can save microscope system information you've set with iSetup to a file for later use.

▼ **iSetup window**

(1) Click the Save button.
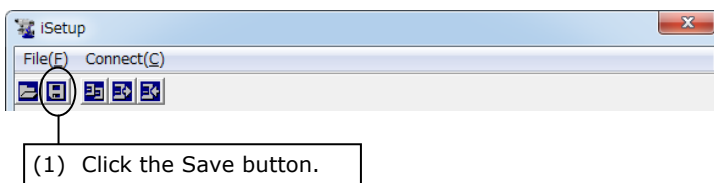
(1) Click the Save button.
A file select window is displayed. Select a file (***.xml) and save the setup information.

▼ **File select dialog box**

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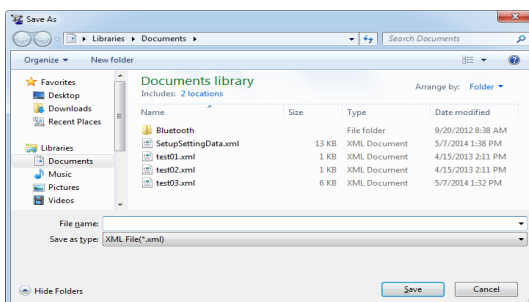
En Symbol for separate collection applicable in European countries

This symbol indicates that this product is to be collected separately.
The following apply only to users in European countries.
- This product is designated for separate collection at an appropriate collection point. Do not dispose of as household waste.
- For more information, contact the retailer or the local authorities in charge of waste management.

De Symbol für getrennte Wertstoff-/Schadstoffsammlung in europäischen Ländern

Dieses Symbol zeigt an, dass dieses Produkt separat entsorgt werden muss.
Folgendes gilt für Verbraucher in europäischen Ländern:
- Dieses Produkt darf nur separat an einer geeigneten Sammelstelle entsorgt werden. Eine Entsorgung im Hausmüll ist unzulässig.
- Wenden Sie sich für nähere Informationen bitte an Ihren Händler oder die örtlich für Abfallsorgung zuständigen Behörden.

Fr Symbole pour la collecte sélective applicable aux pays européens

Ce symbole indique que ce produit doit être collecté séparément.
Les mesures suivantes concernent uniquement les utilisateurs européens.
- Ce produit doit être jeté séparément dans un point de collecte approprié. Ne jetez pas ce produit dans une poubelle réservée aux ordures ménagères.
- Pour plus d'information, contactez le détaillant ou les autorités locales responsables de la gestion des ordures.

Es Símbolo para recogida separada aplicable en países Europeos

Este símbolo indica que este producto se recogerá por separado.
Lo siguiente sólo se aplicará en países Europeos.
- Este producto ha sido designado para su recogida en un punto de almacenamiento apropiado. No lo tire como un desecho doméstico.
- Para más información, contacte con el vendedor o autoridades locales al cargo de la gestión de residuos.

Dk Symbol for special bortskaffelse af denne type produkter i de europæiske lande

Dette symbol angiver, at dette produkt skal bortskaffes specielt.
Det efterfølgende er kun til forbrugere i de europæiske lande.
- Dette produkt skal bortskaffes på fx en genbrugsplads ed .lign. Det må ikke smides væk som normalt husholdningsaffald.
- For yderligere information kontakt din forhandler eller de lokale myndigheder, som fx teknisk forvaltning.

Nl Symbool voor gescheiden inzameling zoals dat wordt gebruikt in Europese landen

Dit symbool betekent dat dit product apart moet worden ingezameld.
Het volgende is alleen van toepassing op gebruikers in Europa
- Dit product dient gescheiden ingezameld te worden op een daartoe bestemd inzamelpunt. Niet weggooien bij het normale huisvuil.
- Neem voor meer informatie contact op met het verkooppunt, of met de lokale instantie die verantwoordelijk is voor het verwerken van afval.

Pt Símbolo para recolha de resíduos em separado utilizado nos países Europeus

Este símbolo indica que este produto é para ser recolhido separadamente.
Esta norma aplica-se só para os utilizadores nos países Europeus.
- Este produto está designado para recolha de resíduos em separado num recipiente apropriado. Não deitar no caixote do lixo doméstico.
- Para mais informações, contactar o revendedor ou as autoridades locais responsáveis pela gestão dos resíduos.

It Simbolo per la raccolta differenziata applicabile nei paesi europei

Questo simbolo indica che il prodotto va smaltito separatamente.
La normativa che segue si applica soltanto agli utenti dei paesi europei.
- Il prodotto è designato per lo smaltimento separato negli appositi punti di raccolta. Non gettare insieme ai rifiuti domestici.
- Per maggiori informazioni, consultare il rivenditore o gli enti locali incaricati della gestione dei rifiuti.

No Symbol for kildesortering i europeiske land

Dette symbolet indikerer at produktet skal kildesorteres.
De nedenstående punktene gjelder for alle europeiske brukere.
- Dette produktet skal kildesorteres og innleveres til dedikerte innsamlingspunkter. Må ikke kastes med normalt husholdningsavfall.
- For mer informasjon, ta kontakt med din forhandler eller lokale myndigheter.

Se Symbol för separat upphämtning i euopeiska länder

Den här symbolen anger att produkten måste hämtas separat.
Följande gäller bara användare i europeiska länder.
- Den här produkten är avsedd för separat upphämtning vid ett lämpligt uppsamlingsställe. Produkten får inte kastas i hushållsavfall.
- För mer information, kontakta återförsäljaren eller de lokala myndigheter som ansvarar för avfallshantering.

Fi Erillisen keräyksen merkki Euroopan maissa

Tämä merkki osoittaa, että tuote kerätään erikseen.
Seuraavat maininnat koskevat vain eurooppalaisia käyttäjiä.
- Tämä tuote kerätään erikseen asianmukaisista keräyspisteistä. Älä hävitä tuotetta talousjätteiden mukana.
- Lisätietoja saat jälleenmyyjältä tai paikallisilta jätehuoltoviranomaisilta.

Ru Символ сортировки мусора, использующийся в европейских странах

Данный символ означает, что этот продукт должен утилизироваться отдельно от других.
Приведенная ниже информация касается только пользователей из стран Европы.
- Данный продукт должен утилизироваться отдельно от других в соответствующих приемных пунктах. Не выбрасывайте данный продукт вместе с бытовым мусором.
- Дополнительную информацию Вы можете получить у продавца или у местных властей, отвечающих за утилизацию мусора.

Gr Σύμβολο για την ξεχωριστή αποκομιδή απορριμμάτων στις Ευρωπαϊκές χώρες

Αυτό το σύμβολο υποδηλώνει ότι η αποκομιδή αυτού του προϊόντος πρέπει να γίνει ξεχωριστά.
Τα κάτωθι απευθύνονται μόνο σε Ευρωπαίους χρήστες.
- Αυτό το προϊόν είναι σχεδιασμένο έτσι ώστε να γίνεται η αποκομιδή του σε ειδικά σημεία. Μην το πετάτε μαζί με τα υπόλοιπα απορρίμματα.
- Για περισσότερες πληροφορίες, επικοινωνήστε με τον διανομέα του προϊόντος ή με τις υπεύθυνες τοπικές αρχές για θέματα διαχείρισης απορριμμάτων.

Pl Symbol oznaczający segregowanie odpadów, stosowany w krajach Europy

Ten symbol oznacza, że produkt musi być wyrzucany oddzielnie.
Poniższe uwagi mają zastosowanie tylko dla użytkowników z Europy.
- Ten produkt jest przeznaczony do oddzielnej utylizacji i powinien być dostarczony do odpowiedniego punktu zbierającego odpady. Nie należy go wyrzucać z odpadami gospodarstwa domowego.
- Aby uzyskać więcej informacji, należy skontaktować się z przedstawicielem przedsiębiorstwa lub lokalnymi władzami odpowiedzialnymi za zarządzanie odpadami.

Hu Európai országokban érvénes "Elkülönített hulladékgyűjtés" jelzése

Ez a jelzés azt jelenti, hogy ezt a terméket elkülönítve kell gyűjteni.
Az alábbiak csak az európai országokban élő felhasználókra érvényes.
- Ezt a terméket a megfelelő hulladékgyűjtőhelyen, elkülönítve kell gyűjteni. Ne dobja ki háztartási hulladékként.
- További információkért forduljon a forgalmazóhoz, vagy a helyi hatóság hulladékgyűjtésért felelős részlegéhez.

Cz Symbol pro oddělený sběr odpadu platný v evropských zemích

Tento symbol znamená, že tento produkt se má odkládat odděleně.
Následující pokyny platí pro uživatele z evropských zemí.
- Tento produkt se má odkládat na místě sběru k tomuto účelu určeném. Neodhazujte spolu s domácím odpadem.
- Více informací o způsobu zacházení s nebezpečným odpadem vám podá příslušná místní instituce.

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Jp ヨーロッパにおける廃棄物個別回収のシンボルマーク

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