# Nikon

## Application for Inverted Research Microscope ECLIPSE Ti2 Series

# Ti2Control

## Ver.1.0.2

## Instruction Manual

## (for Windows)

# Introduction

Thank you for purchasing a Nikon product.

This manual describes how to install and use the application software "Ti2Control" for Nikon Inverted Research Microscope ECLIPSE Ti2 series.

To ensure correct usage, read this manual carefully before operating this product.

Refer to the hardware manual for detailed information on how to connect your microscope and explanations about system configuration.

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

- The images shown in this document are for reference only, and may appear somewhat different from those actual application images.

**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 personal computer.

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# Notes on Using "Ti2 Control"

- This application is used to make settings for the Ti2-E/Ti2-A, control the Ti2-E, and display the Ti2-A status.

- For the first use of the Ti2-E or Ti2-A, always perform microscope system settings with the setup function, and transfer this information to the microscope system using "SEND."

- When setup information is transferred to the microscope system, the previous information held in memory is overwritten.

- We recommend that the information (including arbitrary registrations performed with the setup function or other setting function) be assigned a filename and saved on the application side after transfer.

## Screens used in this manual

Menus and items displayed in "Ti2Control" vary depending on the microscope system configuration and the motorized devices connected.

The descriptions in this manual are mainly based on the screens of the Ti2-E.

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# Chapter

# 1

# Preparation

This chapter describes the hardware and software required for "Ti2Control" and how to install the software.

## 1.1　　　Hardware and Software Requirements

✅ **CAUTION**

Install the application before connecting your personal computer and microscope system (Ti2-E, Ti2-A).

| Item | Specifications |
|------|----------------|
| Processor | 1GHz or faster processor |
| LAN | 1000 Base-T |
| RAM | 1 GB or more (for 32-bit OS)/2 GB or more (64-bit OS) |
| Storage | There shall be 100 MB or more free space. |
| Resolution | Shall support 1280×1024-dot true color mode (recommended). |
| Video RAM | 128 MB or more |
| Platform | Windows 7 Professional SP1 or later (32-bit or 64-bit Japanese or English) <br> Windows 10 Pro (64-bit Japanese or English) |
| Remarks | Installer <br> "Ti2Control" installer program can be downloaded from the Internet. <br> "Ti2Control" is not guaranteed to be compatible with all personal computers. <br> Please contact your distributor for detailed compatibility information. |

## 1.2      Installing the Application

This section describes how to install the application.

> ✅ **CAUTION**
>
> • Be sure to install the application before connecting the Ti2 microscope system to a personal computer using a USB. Connection using a USB before the installation may disable the correct installation of the device driver, making microscope system recognition by the personal computer impossible.
>
> • To install "Ti2Control," you must log in to your personal computer with a user account with administrator rights.
>
> • The uninstallation procedure for "Ti2Control" is the same as that for other Windows applications.
>
> • Uninstalling "Ti2Control" from a personal computer in which both "Ti2Control" and NIS-Elements are installed deletes the device driver, making Ti2 microscope recognition by NIS-Elements impossible. Do not uninstall "Ti2Control" from a personal computer in which both "Ti2Control" and NIS-Elements are installed.

1. **Before installing "Ti2 Control," end all system-resident programs, such as the screen saver and anti-virus software.**

▼ **Preparing for installation**
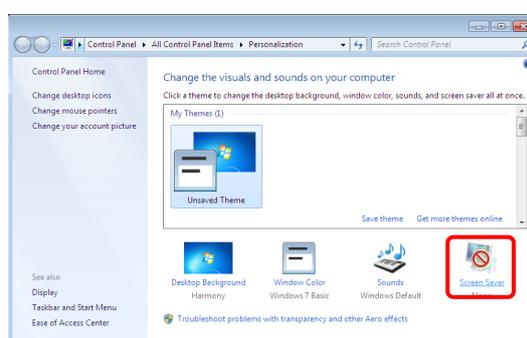


2. **Execute the setup wizard.**

   To install "Ti2 Control," start the downloaded setup wizard (setup.exe) and follow the displayed messages.

▼ **Starting the setup wizard**
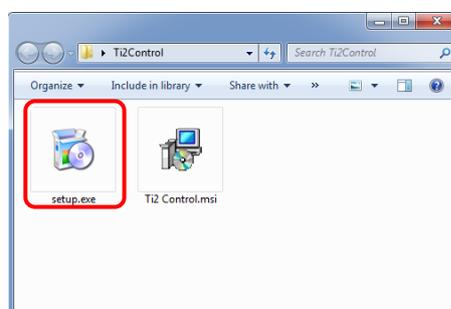


3. **The installation destination setting screen will be displayed when [Next] is clicked on the welcome screen of the setup wizard.**

▼ **Welcome screen of the setup wizard**

4. **On the installation destination setting screen, specify a folder to install "Ti2 Control."**

   The following are the default installation destination folders.

   32-bit version:    C:\Program Files\Nikon\Ti2 Control

   64-bit version:    C:\Program Files(x86)\Nikon\Ti2 Control

   To change folders, click [Browse…].

5. **Specify the user that will use "Ti2Control."**

   Everyone:        All users that will use this computer are applicable.

   Just me:         Only the user who is currently logged in is applicable.

6. **After specifying a folder, click [Next] to display the installation screen.**

7. **Click [Next] on the installation confirmation screen to start the installation.**

   If the [User Account Control] confirmation screen is displayed, click [Yes] to start the installation.

▼ **Installation destination setting screen**
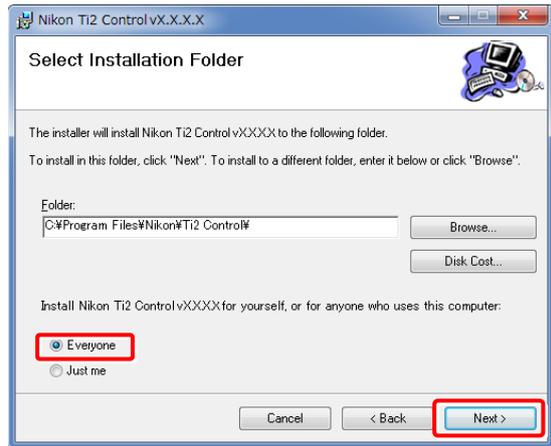


▼ **Installation screen**
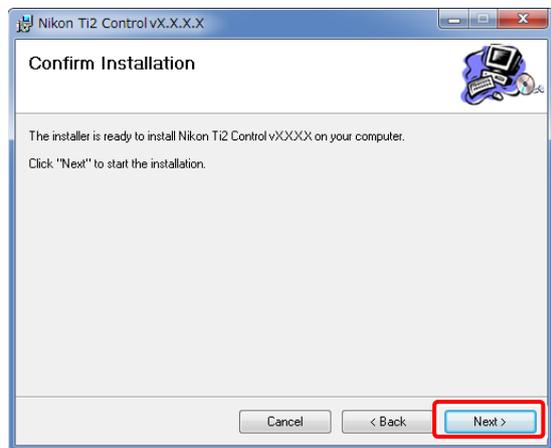


▼ **[User Account Control] confirmation screen**
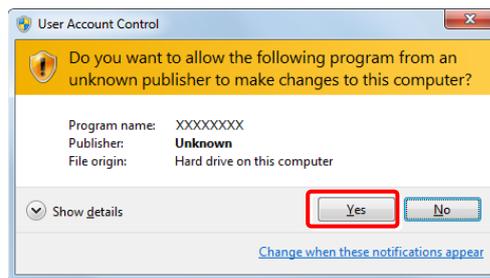
The installation progress screen appears.

▼ **Installation progress screen**
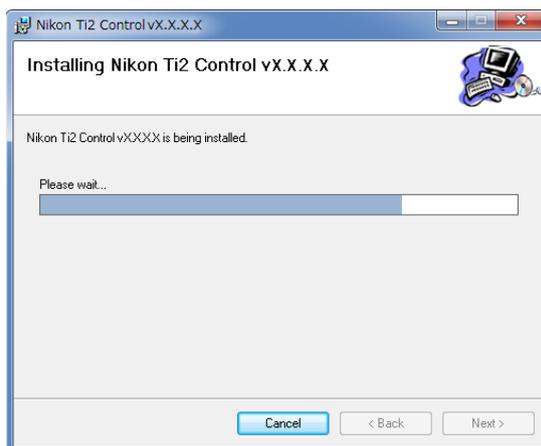
When installation is completed, the screen as shown on the left appears.
Click [Close] to end the installation procedure.

▼ **Installation Complete screen**
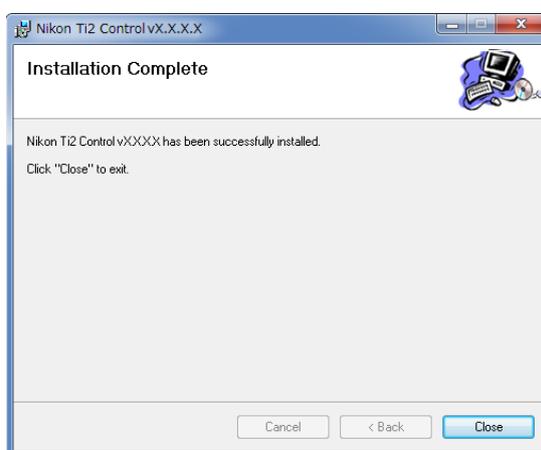
This completes the installation of "Ti2 Control."

## Installing the driver

After the "Ti2Control" installation, connect the personal computer to the microscope system (the controller for TI2-E in the case of the Ti2-E, or the microscope main body in the case of the Ti2-A) via the USB connector.

The driver will be installed automatically if the microscope system is connected to the personal computer for the first time.

1. **Connect USB connector A of the USB cable to the personal computer.**

▼ **USB connector A**

2. **Connect the other end of the cable to the USB connector of the microscope system.**

   The detection wizard start screen appears.

   After they are connected, the driver will be installed automatically.

   Installation will end.
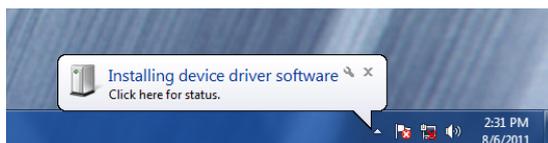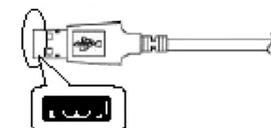
## 1.3      Starting and Exiting the Application

This section describes how to start and exit the application.

There are several ways to start or exit the application. Here is explained the typical method of starting from the [Start] menu and exiting by clicking [x] in the upper right corner of the operation screen.

### 1.3.1      Starting the Application

After making sure that the microscope system is connected to the personal computer, start the computer.

1.   **Click the [Start] button.**

2.   **Click [All Programs], [Nikon], [Ti2 Control], and then [Ti2 Control].**

     The "Ti2 Control" splash screen appears.

▼ **Starting the application**
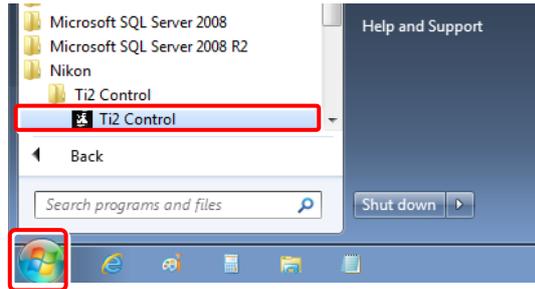


3.   **The microscope information is read and "Ti2 Control" starts.**

     ✅ **CAUTION**

     Do not unplug the USB cable that connects to the microscope after starting "Ti2 Control."

▼ **Starting the application**
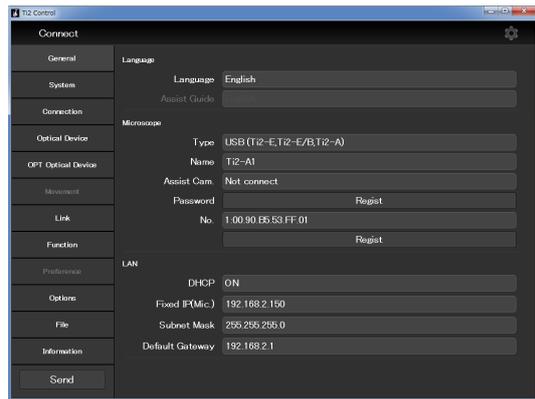


### 1.3.2      Exiting the Application

1.   **Click the [x] button in the upper right corner of the screen.**

▼ **Exiting the application**
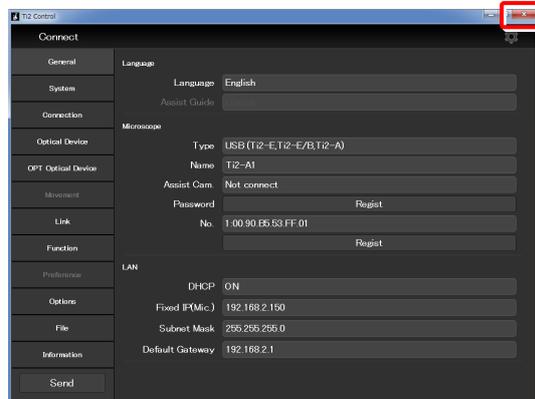
**Chapter**

# 2

# Setup

This chapter describes how to register new microscope system settings when using the "Ti2 Control" application for the first time.

When microscope system settings are changed, this setup process allows only the relevant information of the microscope system to be changed.

## 2.1 Basic Setup Operations and Screens

### 2.1.1 Configuration of the Setup Screen

■ **Setting item selection area**

Click each button to change a setting item.

■ **Setting area**

Click a desired button in the setting item selection area to change the display items and settings.

> ✅ **Differences by microscope main body**
>
> The setting items for the Ti2-E differ from those for the Ti2-A.

▼ **Configuration of the setup screen**
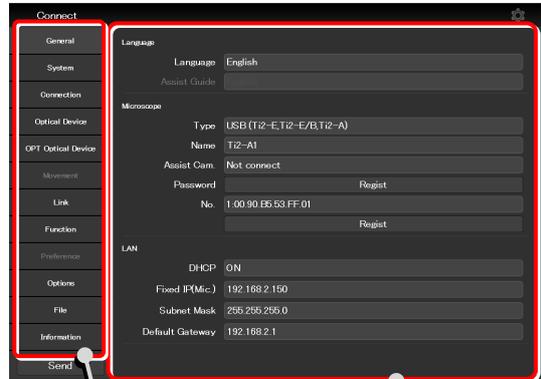


Setting item selection area          Setting area

### 2.1.2 Setting Items

The setup function consists of 12 setting screens and one button:

- [General]: Basic settings of the microscope and the application
- [System]: Display and manual registration of the microscope configuration
- [Connection]: Settings of the connection destinations of devices
- [Optical Device]: Settings of optical devices
- [OPT Optical Device]: New registration of optical devices
- [Movement]: Settings of movement (for Ti2-E only)
- [Link]: Settings of linked control
- [Function]: Assignment of functions
- [Options]: Settings of the motorized devices
- [File]: Saving and reading of settings
- [Information]: Display of the version information
- [Send] button: Transmission of the setting information to the microscope system

▼ **Setting items**
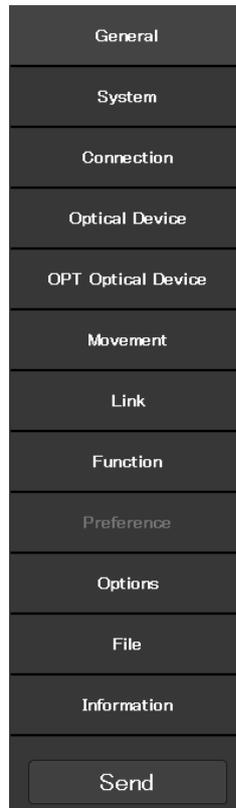
## 2.1.3     Sending Microscope System Information

■ **Sending information to the microscope system**

Click the [Send] button in the setting item selection area
to display a confirmation screen.
Click [OK] to send the information set by the application
to the microscope system.

▼ **Setup screen**

## 2.2 [General]: Basic Settings of the Microscope and the Application

The General screen allows basic settings of the microscope and the application.

1. **Select [General] from the setting item selection area.**

▼ General settings
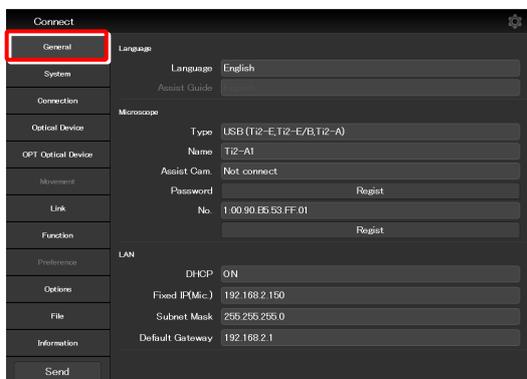


### 2.2.1 Setting the Language

Set the language of this application.

1. **Set as follows in the [Language] field.**

   **Language:**
   
   Select the language to use.

▼ Setting the language
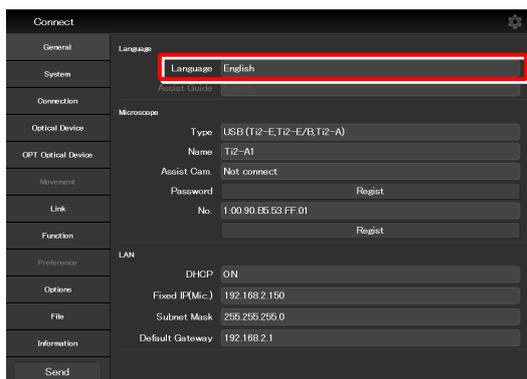
## 2.2.2    Registering the Microscope System

This section describes how to register a microscope, a password and an assist camera.

**1.    Set the following items in the [Microscope] field.**

**Type:**

Select the microscope to be connected.

**Name:**

Enter a registration name of the microscope system.

**Assist Cam.:**

Click the box to display a list of MAC addresses of the assist cameras.

Click the target MAC address and then [OK] to register the assist camera.

> ✅ **CAUTION**
>
> When an assist tube base unit is used, connect the LAN cable to the [LAN (CAM)] port at the back of the microscope main body to connect to the wireless router.

> ✅ **When registering a new microscope system**
>
> To register a new microscope system, be sure to register an assist camera too.
> When using a wireless router in this case, it is recommended to connect only one microscope system to the wireless router.

**Password:**

It is possible to make a setting so that a password is requested when accessing the microscope from a personal computer which is not registered for the microscope.

Enter any letters for the password. (Enter nothing if no password is to be set.)

No password is requested during an access if the microscope system is already registered on the personal computer.

**No.:**

Select a microscope number to be registered with the personal computer.
Up to 20 microscopes can be registered.

For each registered number, a registered name of the microscope system (or a MAC address) is displayed.

**Regist button:**

Click this button to register the connected microscope as a "trusted microscope" with a microscope number specified in "No." and save it in the device.

Connection to the microscope registered here is possible without a password.

> ✅ **CAUTION**
>
> Make sure any new microscope system is registered.

**▼ Registering the microscope system**



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## 2.2.3    Setting the LAN

**1.    Set the following items in the [LAN] field.**

**DHCP:**

Select whether to enable or disable the automatic allocation of the microscope's IP address.

**Fixed IP(Mic):**

Displays the fixed IP address of the microscope.

This IP address is not used when DHCP is enabled (ON).

**Subnet Mask:**

Allows displaying or specifying the subnet mask of the microscope.

**Default Gateway:**

Allows displaying or specifying the default gateway of the microscope.

▼ Setting the LAN

## 2.3       [System]: Display and Manual Registration of the Microscope Configuration

Clicking [System] displays a list of accessories mounted on the microscope system.

1.  **Select [System] from the setting item selection area.**

    A list of accessories connected to the microscope system will be displayed.

2.  **Confirm the items displayed in the [Configuration] field.**

▼ **Display of the microscope configuration**
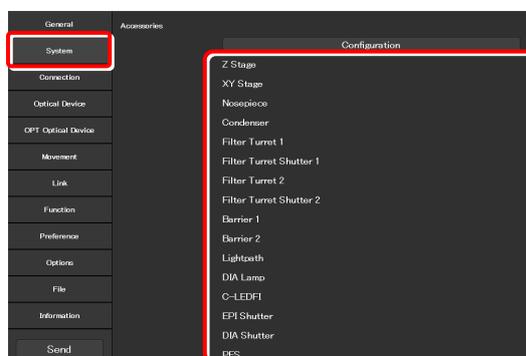


### 2.3.1       Manually Registering the Microscope Configuration

This section describes how to register the accessories which cannot be automatically detected.

The following is the basic registration procedure.
The condenser is used as an example here.

> ✅ **Using a D-LH/LC precentered lamphouse (halogen lamp) with the Ti2-A**
>
> When using a D-LH/LC precentered lamphouse as dia-illumination with the Ti2-A, manually register the lamphouse by the following procedure.
>
> 1)  Disconnect the cable coming from the dia-illumination unit from the connector box on the rear surface of the microscope main body.
>
> 2)  Specify [D-LH/LC Precentered Lamphouse] for the [DIA_Lamp] in the microscope configuration setting screen for manual configuration, of TI2Control.
>
> 3)  Tap the [Send] button in the setting item selection area to send the registration information.
>
> 4)  End the application.
>
> 5)  Power off the microscope system.
>
> 6)  Connect the cable coming from the dia-illumination unit with the connector box on the rear surface of the microscope main body.
>
> 7)  Power on the microscope system.
>
> To continue registration, start up the application.

1.  **Click [Configuration] in the setting item selection area.**

    A microscope configuration setting screen will be displayed.

▼ **Manually registering the microscope configuration**
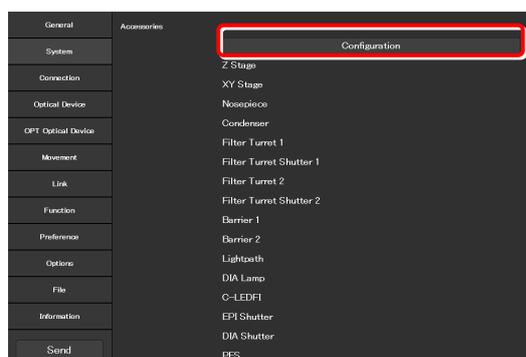
**2.    Click the area where accessory mounting information is to be registered.**

A registration screen of the area will be displayed.

> ✅ **Differences by microscope main body**
>
> The selectable areas for the Ti2-E differ from those for the Ti2-A.

> ✅ **In a stage-up configuration**
>
> In a 2-tier stage-up microscope configuration, click [Stage up] to change the configuration shown in the application to the state-up configuration.

**3.    Click a parts area or the parts list on the left.**

A list of products that can be registered for that part will be displayed.

**4.    Select the name of the product to be registered.**

**5.    Click [OK].**

A product code of the selected product will be displayed on the second line of each item in the left parts list. ("-------" will be displayed if no product is selected.)

The parts area where a product is already registered is indicated in green.

**6.    Click [TOP] to register an accessory for another parts area.**

The screen will be returned to the microscope configuration setting screen.

**7.    Repeat steps 2 to 5 for each part to be registered.**

**8.    To finish manual registration of a microscope configuration, click [Send] to send the registration information or click [⬅].**

If the edited information is not sent, the information will not be saved.

▼ **Microscope configuration setting screen**
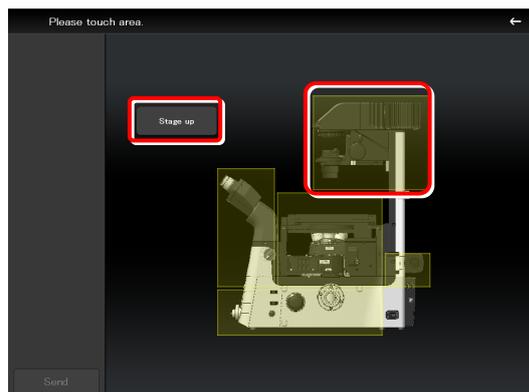


▼ **Per-area registration screen**

Parts list          Parts area
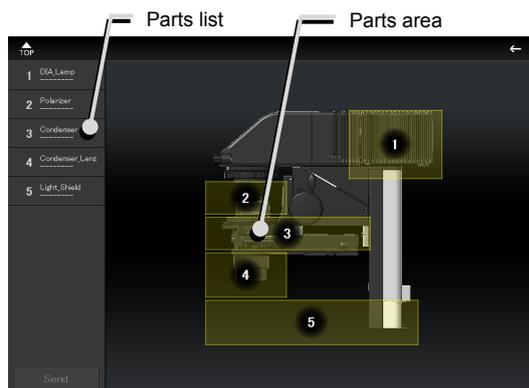


▼ **Product list dialog**
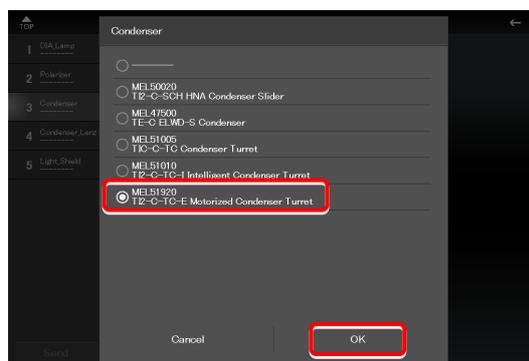


▼ **Per-area registration screen**
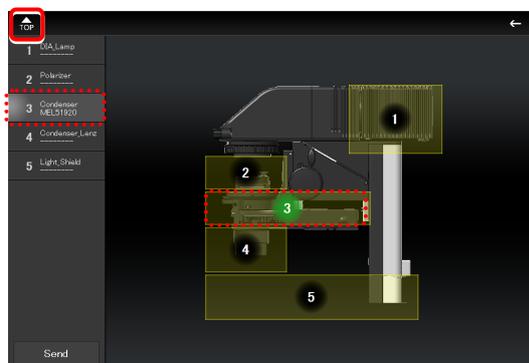
**When using epi-illumination**

Click the area that includes the epi-illumination attachment.

The registration screen for the epi-illumination attachment will be displayed.

If a stage-up kit is used, epi-illumination attachments can be mounted in two tiers.

To register two tiers of epi-illumination attachments, click [Stage up].

▼ **Registering an epi-illumination attachment**
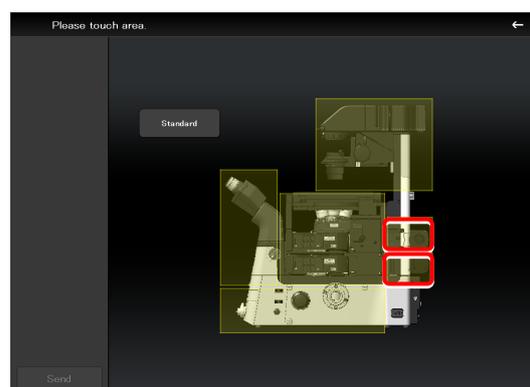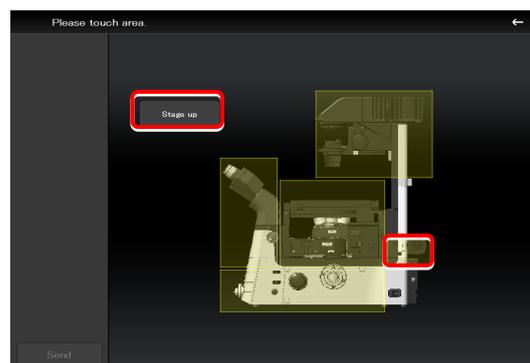




In a two-tier configuration, the upper and lower epi-illumination attachments are mounted in opposite directions. However, the application shows the two epi-illumination attachments in the same orientation.

The orientations of the two epi-illumination attachments can be shown in the same way as the actual ones by using the following procedure.

Select the epi-illumination attachment which is shown in the orientation opposite to the actual one.

Click [Direction] to invert the part orientation horizontally so that the display on the application is the same as the actual epi-illumination attachment.

▼ **Inverting the orientation of the epi-illumination attachment**
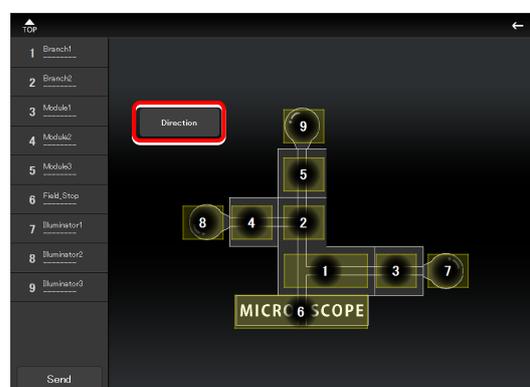


▼ **Inverted layout diagram**



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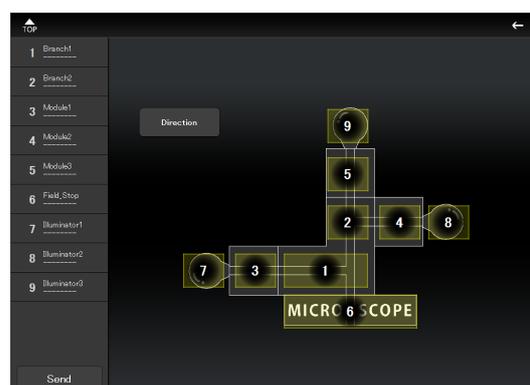
## 2.4　[Connection]: Setting the Connection Destinations of Devices

This section describes how to set the connection (mounting) destinations of devices.

1. **Select [Connection] from the setting item selection area.**

   The connection setting screen appears.

▼ **Setting the connections of devices**
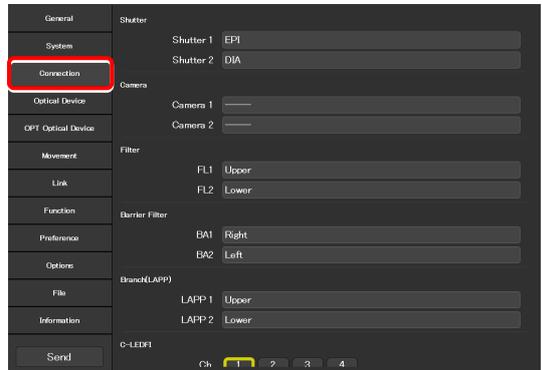


### 2.4.1　Setting the Connections of Motorized Shutters

When the NI-SH-E motorized shutter is mounted, epi-illumination (EPI), dia-illumination (DIA), or auxiliary (AUX) can be selected and set as the mounting destination.

1. **Set the following items in the [Shutter] fields.**

   **Shutter 1:**

   Select the mounting destination of the motorized shutter.
   If no motorized shutter is mounted, select [---].

   **Shutter 2:**

   Select the mounting destination of the second motorized shutter. If only one motorized shutter is mounted, select [---].
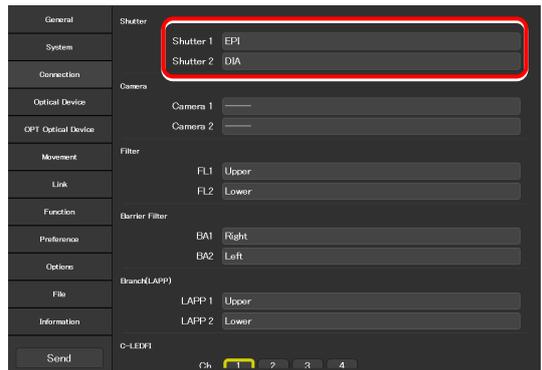
   ✓ **SUPPLEMENTAL REMARKS**

   The same value cannot be specified for [Shutter 1] and [Shutter 2].

▼ **Setting the connections of motorized shutters**

## 2.4.2    Setting the Connections of Cameras

Select and set the ports to which connected cameras are attached from [Front] (tube base unit side port), [Left] (left side port of the microscope main body), [Right] (right side port of the microscope main body), or [Aux] (back port (for the Ti2-E only), or bottom port (for the Ti2-E/B only)).

1. **Set the following items in the [Camera] field.**

    **Camera 1:**

    Select the port to which the camera is attached.
    If no camera is attached, select [---].

    **Camera 2:**

    Select the port to which the second camera is attached.
    If only one camera is attached, select [---].

▼ **Setting the connections of cameras**



## 2.4.3    Setting the Connections of FL Turrets

In a stage-up configuration, specify the location to which each FL turret is attached, the upper tier (Upper) or the lower tier (Lower).

1. **Set the following items in the [Filter] field.**

    **FL1:**

    Select the position to which the FL turret is attached.
    If no FL turret is attached, select [---].

    **FL2:**

    Select the position to which the second FL turret is attached.
    If only one FL turret is attached, select [---].

▼ **Setting the connections of FL turrets**

## 2.4.4        Setting the Connections of BA Filter Wheels: Ti2-E Only

Select and set the ports to which BA filter wheels are attached from [Left] (left side port), [Right] (right side port), or [Center] (lower tier of the stage-up kit).

**1.    Set the following items in the [Barrier Filter] field.**

    **BA1:**

        Select the port to which the BA filter wheel is attached.
        If no BA filter wheel is attached, select [---].

    **BA2:**

        Select the port to which the second BA filter wheel is attached.
        If only one BA filter wheel is attached, select [---].

**▼  Setting the connections of BA filter wheels**
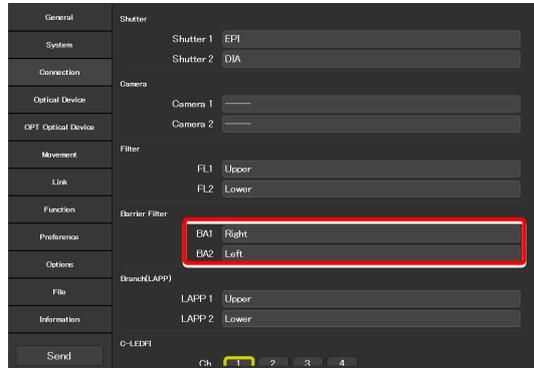


## 2.4.5        Setting the Branch(LAPP)

In a stage-up configuration, specify the location (the upper tier: Upper, or the lower tier: Lower) to which each main branch of the epi illumination attachment is attached.

**1.    Set the following items in the [Branch(LAPP)] field.**

    **LAPP1:**

        Select the position to which the main branch is attached
        If no main branch is attached, select [---].

    **LAPP2:**

        Select the position to which the second main branch is attached.
        If only one main branch is attached, select [---].

**▼  Setting the Branch(LAPP)**
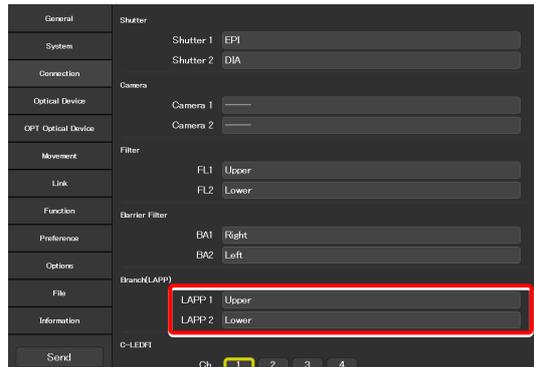


## 2.4.6        Setting the C-LEDFI Epi-fl LED Illuminator

Set the LED wavelength of each channel of the C-LEDFI epi-fl LED illuminator.

**1.    Set the following items in the [C-LEDFI] field.**

    **Ch:**

        Select the channel number of the LED.

    **Wavelength:**

        Allows displaying or specifying the wavelength of the LED selected in [Channel].

**▼  Setting the C-LEDFI**
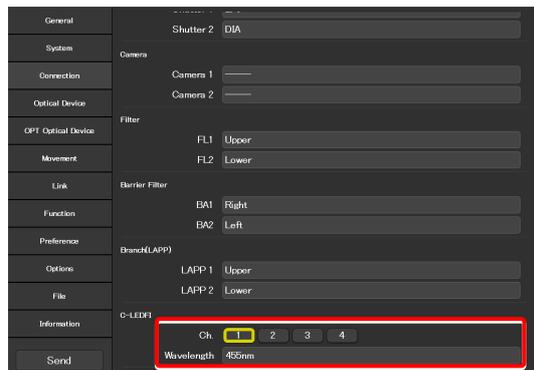
## 2.5 [Optical Device]: Setting the Optical Devices

This section describes how to set the objective, condenser module, fluorescence filter cube, barrier filter (BA filter), intermediate magnification, and external phase contrast.

1. **Select [Optical Device] from the setting item selection area.**

   The optical device setting screen appears.

▼ Setting optical devices



### 2.5.1 Setting the Nosepiece

Specify which objective is attached to each address of the nosepiece.

1. **Select the address of the nosepiece for which objective information is to be set.**

   (Be sure to select this item first.)

▼ Setting the nosepiece



2. **Set the following items.**

   Selecting [Observation], [Series] or [Mag.] displays a list of objectives that match the conditions.

   **Observation:**

   Allows a list of objectives to be narrowed down by specifying a microscopy technique.
   (If the list does not include the target microscopy technique or the microscopy technique is unknown, select "---".)

   **Series:**

   Allows a list of objectives to be narrowed down by specifying a series name.
   (If the series name is unknown, specify "---".)

   **Mag.:**

   Allows a list of objectives to be narrowed down by specifying a magnification.
   (If the magnification is unknown, specify "---".)

▼ Setting the nosepiece

**3. Click the [Objective] field, select the target objective from the list or enter the product code, and click [OK].**

The information about the objective will be registered and displayed in the [Objective] field.

▼ **Setting the nosepiece**



▼ **List of objectives**



**4. For DIC objectives, click the [DIC Slider] field, select the target objective-side DIC slider from the list, and click [OK].**

The information about the objective-side DIC slider will be registered and displayed in the [DIC Slider] field.

▼ **Setting the nosepiece**



▼ **List of DIC sliders**



**5. To register another objective, select another number in [Address] and repeat steps 1 to 4.**

## 2.5.2 Setting the Condenser Module

Specify which condenser module is attached to each address of the condenser turret.

**1. Set the following items in the [Condenser] field.**

**Address:**

Select the address of the condenser turret for which condenser module information is to be set.

**Name:**

Select a condenser module name.

**2. To register another condenser module, select another number in [Address] and repeat step 1.**

▼ **Setting the condenser module**



## 2.5.3 Setting the Filter Cube

Specify which filter cube is attached to each address of the FL turret.

**1. Set the following items in the [Filter 1] field.**

**Address:**

Select the address of the FL turret for which filter cube information is to be set.
(Select this item first.)

**Name:**

Select a filter cube name.
(When this item is selected, the other values are read automatically.)

**EX:**

Displays the name of the excitation filter.

**DM:**

Displays the name of the dichroic mirror.

**BA:**

Displays the name of the BA filter.

**2. To register another filter cube, select another number in [Address] and repeat step 1.**

✓ **SUPPLEMENTAL REMARKS**

When a stage-up kit is used, up to two FL turrets can be connected.
When two FL turrets are connected, set the [Filter 2] field too.

▼ **Setting the filter cube**



▼ **For the second FL turret**



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## 2.5.4    Setting the BA Filter: Ti2-E Only

Specify which BA filter (barrier filter) is attached to each address of the BA filter wheel.

1.  **Set the following items in the [Barrier Filter 1] field.**

    **Address:**

    Select the address of the BA filter wheel for which BA filter information is to be set.

    **Name:**

    Select a BA filter name.

2.  **To register another BA filter, select another number in [Address] and repeat step 1.**

▼ Setting barrier filter 1
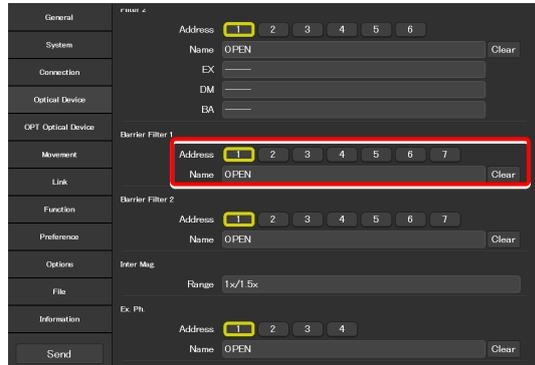


✔ **SUPPLEMENTAL REMARKS**

Up to two BA filter wheels can be connected.
When two BA filter wheels are connected, also set the [Barrier Filter 2] field.

▼ For the second BA filter wheel
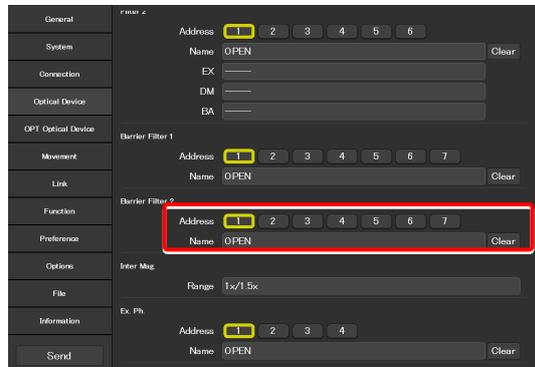


## 2.5.5    Setting the Intermediate Magnification

Set the intermediate magnification.

1.  **Set the following items in the [Inter Mag.] field.**

    **Range:**

    Select the type of intermediate magnification lens (second objective) attached.

▼ Setting the intermediate magnification



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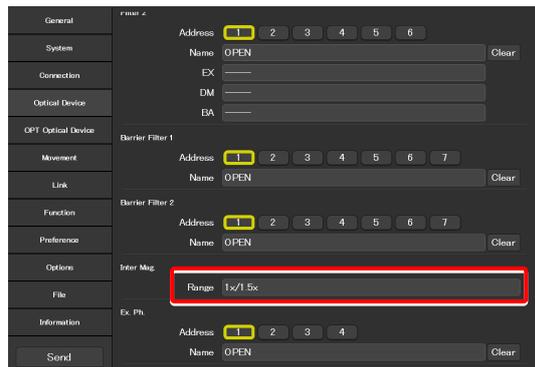
### 2.5.6    Setting the External Phase Ring: Ti2-E Only

When the motorized tube base unit for external phase contrast is used, specify which phase ring is attached to each address of the phase ring turret.

1. **Set the following items in the [Ex. Ph.] field.**

    **Address:**

    Select the address of the turret for which external phase ring information is to be set.

    **Name:**

    Select an external phase ring name.

2. **To register another external phase ring, select another number in [Address] and repeat step 1.**

▼ **Setting the external phase ring**

## 2.6 [OPT Optical Device]: Registering a New Optical Device

This section describes how to newly register an optical device not listed in the [Optical Device] setting, such as an objective, a condenser module, a filter cube, or a BA filter.

1. **Select [OPT Optical Device] from the setting item selection area.**

   The optional optical device setting screen appears.

▼ **Registering a new optical device**
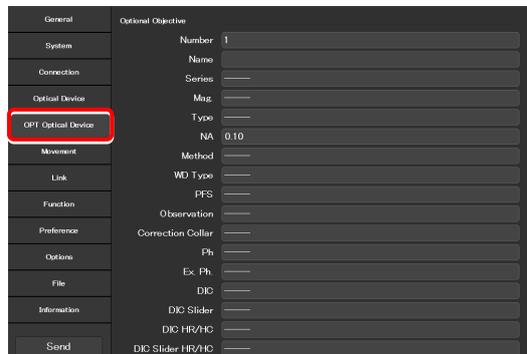


### 2.6.1 Registering a New Objective

Up to 10 new objectives can be registered.

The objectives registered here can be selected in [Objective] in [Optical Device].

1. **Set the following items in the [Optional Objective] field.**

   **Number:**

   Register the number for which new objective information is to be registered. (Up to 10 objectives can be registered.)

   **Name:**

   Specify a name.

   **Series:**

   Select the type of the objective.

   **Mag.:**

   Select the magnification of the objective.

   **Type:**

   Select the immersion liquid type of the objective.

   **NA:**

   Enter the numerical aperture (NA) of the objective.

   **Method:**

   Select the usage of the objective.

   **WD Type:**

   Select the long-working-distance type of the objective.

   **PFS:**

   Specify whether to use the PFS.

▼ **Registering a new objective**
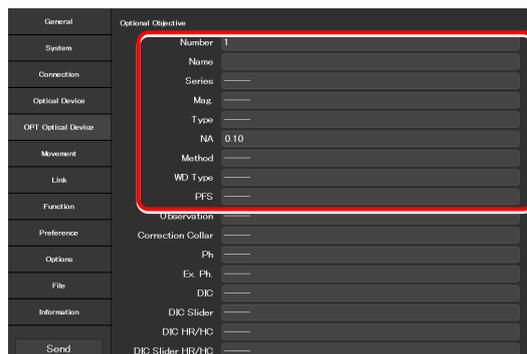
**Observation:**

Select a microscopy technique.

**Correction Collar:**

For an objective with a correction collar, choose from Manual and Motorized.

**PH:**

For a phase contrast objective, select a PH code.

**EXPH:**

For a phase contrast objective, select the magnification of the objective.

**DIC:**

For a DIC objective, select a corresponding condenser module.

**DIC Slider:**

For a DIC objective, select a corresponding objective-side DIC slider.

**DIC HR/HC:**

Select a high-resolution DIC slider type.

**DIC Slider HR/HC:**

Select a high-resolution or high- contrast objective-side DIC slider.

**DF:**

For an objective for DF microscopy, select a corresponding condenser module.

**NAMC:**

For an objective for NAMC microscopy, select a corresponding condenser module.

2.  **To register another objective, select another number in [Number] and repeat step 1.**

▼ **Registering a new objective (continued from the previous page)**



---

### 2.6.2    Registering a New Condenser Module

Up to 10 new condenser modules can be registered.

The condenser modules registered here can be selected in [Optional Condenser] in [Optical Device].

1.  **Set the following items in the [Optional Condenser] field.**

    **Number:**

    Select a number with which a new condenser module is to be registered.

    **Name:**

    Specify a name.

2.  **To register another condenser module, select another number in [Number] and repeat step 1.**

▼ **Registering a new condenser module**



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### 2.6.3    Registering a New Filter Cube

Up to 10 new filter cubes can be registered.

The filter cubes registered here can be selected in [Filter 1] (or [Filter 2]) in [Optical Device].

1. **Set the following items in the [Optional Filter] field.**

   **Number:**

   Select a number with which a new filter cube is to be registered.

   **Name:**

   Specify a name.

   **EX:**

   Specify an excitation filter name.

   **DM:**

   Specify a dichroic mirror name.

   **BA:**

   Specify a BA filter name.
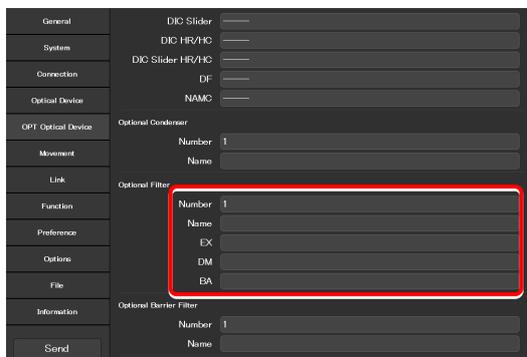
   ✔ **When specifying an excitation filter or a dichroic mirror name**

   For an excitation filter name, specify "EX" as the first two letters and then specify the wavelength information. Examples: "EX450", "EX450-490" (delimited by a hyphen) or "EX450/40" (the center wavelength and width are delimited by a slash)

   Similarly, for a BA filter name, specify "BA" as the first two letters. For a dichroic mirror name, specify "DM" as the first two letters.

2. **To register another filter cube, select another number in [Number] and repeat step 1.**

▼ **Registering a new filter cube**



### 2.6.4    Registering a New BA Filter: Ti2-E Only

Up to 10 new barrier (BA) filters can be registered.

The BA filters registered here can be selected in [Barrier Filter 1] (or [Barrier Filter 2]) in [Optical Device].

1. **Set the following items in the [Optional Barrier Filter] field.**

   **Number:**

   Select a number with which a new BA filter is to be registered.

   **Name:**

   Specify a name.

2. **To register another BA filter, select another number in [Number] and repeat step 1.**

▼ **Registering a new BA filter**
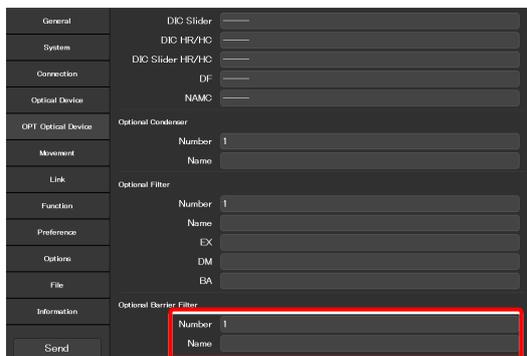
## 2.7    [Movement]: Setting the Movement: Ti2-E Only

This section describes how to set the movement of each motorized device.

1. **Select [Movement] from the setting item selection area.**

   The movement setting screen appears.

▼ **Setting the movement**



### 2.7.1    Setting the Motorized Nosepiece

Set the movement of the motorized nosepiece.

1. **Set the following items in the [Nosepiece] field.**

   **Toggle:**

   If two objectives are registered, they can be toggled using the objective changeover switch of the microscope main body.

   Assign toggle numbers (1 and 2) to the objectives. ("#1" and "#2" below allow settings for the objectives.)

   **#1:**

   Select the address of the nosepiece to which the first objective is attached.

   **#2:**

   Select the address of the nosepiece to which the second objective is attached.

   **Revolving Type:**

   Select the operating pattern of the nosepiece.

   | | |
   |---|---|
   | Normal: | Normal operation pattern |
   | Shuttle: | The nosepiece moves from 1 to 6 (or 6 to 1) via all addresses. |
   | MEP59396: | This is selected automatically when a motorized nosepiece of the motorized correction collar type is used. |

▼ **Setting the motorized nosepiece**

**Z-Esc.:**

It is possible to specify for each nosepiece address whether or not the objective is moved to the escape position when the nosepiece rotates.

Select the address of the nosepiece to which the target objective is attached.

If ON is set for an address, the objective is moved to the escape position before passing the selected address.
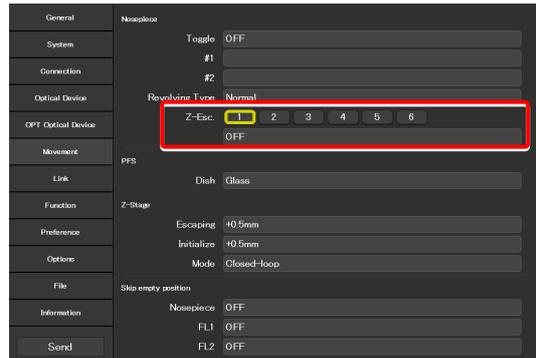


## 2.7.2    Setting the PFS

Set the type of the dish observed by using the PFS.

1.    **Set the following items in the [PFS] field.**

    **Dish:**

        Select the dish type from [Glass] and [Plastic].

▼ **Setting the PFS**
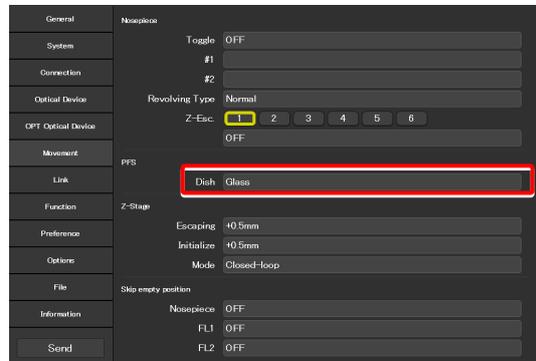


## 2.7.3    Setting the Focusing Device (Z-Stage)

Set the movement of the focusing device (Z-stage).

1.    **Set the following items in the [Z-Stage] field.**

    **Escaping:**

        Specify how far the objective is to be escaped when replacing the specimen.

    **Initialize:**

        Specify where the objective is to be stopped when the microscope system is initialized.

    **Mode:**

        Select the focusing device control method from open loop and closed loop.
        (This setting becomes effective when the controller for TI2-E is turned back on.)

▼ **Setting the focusing device**



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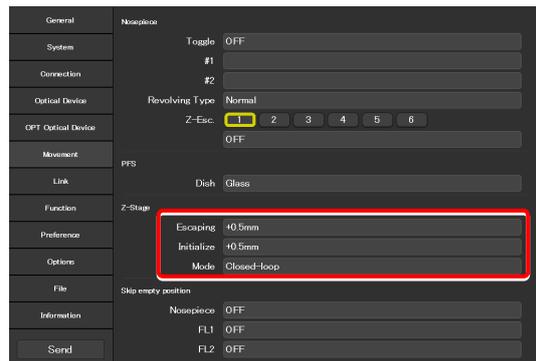
### 2.7.4    Setting the Unallocated Address Skipping Function

If there is an address for which no optical device information is set when a motorized device rotates, specify whether to skip this address.

**1. Set the following items in the [Skip empty position] field.**

**Nosepiece:**

The nosepiece rotation when there is an address for which no objective information is set can be selected.
(ON: The address for which no objective information is set is skipped.)

**FL1:**

The FL turret 1 rotation when there is an address for which no filter cube information is set can be selected.
(ON: The address for which no filter cube information is set is skipped.)

**FL2:**

(Only when there is a second FL turret)

The FL turret 2 rotation when there is an address for which no filter cube information is set can be selected.
(ON: The address for which no filter cube information is set is skipped.)

**Condenser:**

Select the condenser turret rotation when there is an address for which no condenser module information is set.
(ON: The address for which no condenser module information is set is skipped.)

▼  **Setting the unallocated address skipping function**



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## 2.8 [Link]: Setting the Linking Function: Ti2-E Only

This section describes how to set the linking (interlocking) of other motorized devices when switching the objective.

1. **Select [Link] from the setting item selection area.**

   The link control setting screen appears.

▼ **Setting linked control**
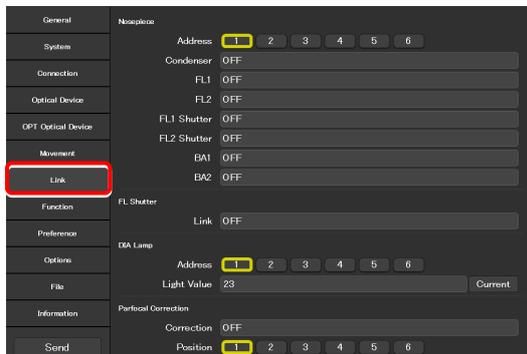


### 2.8.1 Setting a Linked Operation When the Objective Is Switched

Specify whether or not the devices are interlocked with the shuttle switches on the main body when they are depressed after the objective is switched.

1. **Set the following items in the [Nosepiece] field.**

   **Address:**

   Select the address of the nosepiece to which the target objective for link control is attached.

   **Condenser:**

   Select the condenser module to be linked when the objective is switched.

   **FL1:**

   Select the filter cube of FL turret 1 to be linked when the objective is switched.

   **FL2:**

   (Only when there is a second FL turret)

   Select the filter cube of FL turret 2 to be linked when the objective is switched.

   **FL1 Shutter:**

   Select the state of the shutter of FL turret 1 to be linked when the objective is switched.

   **FL2 Shutter:**

   (Only when there is a second FL turret)

   Select the state of the shutter of FL turret 2 to be linked when the objective is switched.

▼ **Setting a linked operation when the objective is switched**
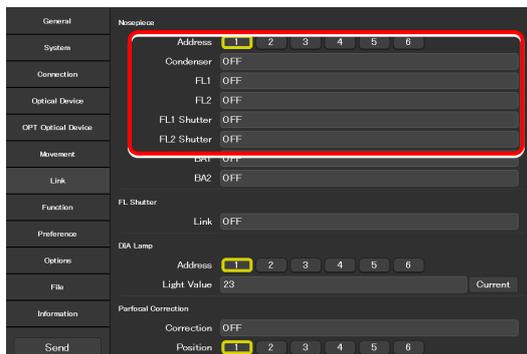
**BA1:**

Select the BA filter of BA filter wheel 1 to be linked when the objective is switched.

**BA2:**

(Only when there is a second BA filter wheel)

Select the BA filter of BA filter wheel 2 to be linked when the objective is switched.

2. **If there is another objective as the target of link control, repeat step 1.**

▼ **Setting a linked operation when the objective is switched**

---

### 2.8.2   Setting a Linked Operation of the Shutter

Specify whether the shutter in the FL turret is to be linked when the objective is switched.

1. **Set the following items in the [FL Shutter] field.**

   **Link:**

   Select [ON] to link the shutter when the objective is switched.

▼ **Setting a linked operation of the shutter**

---

### 2.8.3   Setting the Illumination Intensity of Dia-Illumination (DIA)

Specify whether diascopic LED illumination intensity is to be changed when the objective is switched.

1. **Set the following items in the [DIA Lamp] field.**

   **Address:**

   Select the address of the nosepiece to which the target objective for link control is attached.

   **Light Value:**

   Specify an illumination intensity.
   (Input range: 0 to 100)

   **Current button:**

   Allows the current value of the device to be read.

▼ **Setting the illumination intensity of dia-illumination (DIA)**

### 2.8.4        Setting the Parfocal Correction

If there is a shift in focal position when the objective is switched, this setting allows a correction.

1. **Set and confirm the following items in the [Parfocal Correction] field.**

   **Position:**
   > Select the address of the nosepiece to which the target objective is attached.

   **Status:**
   > Indicates whether the objective is corrected or not.

2. **Change the current objective to the maximum magnification objective on the microscope main body.**

3. **Focus on the specimen on the microscope main body.**

4. **Click [Set].**

5. **Repeat steps 1 to 4 to set the focal position for all addresses (positions).**

6. **Click [Correction] to enable or disable the parfocal correction.**

▼ **Setting the parfocal correction**
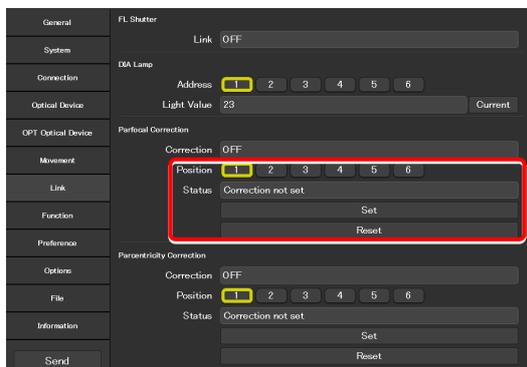


▼ **Setting the parfocal correction**
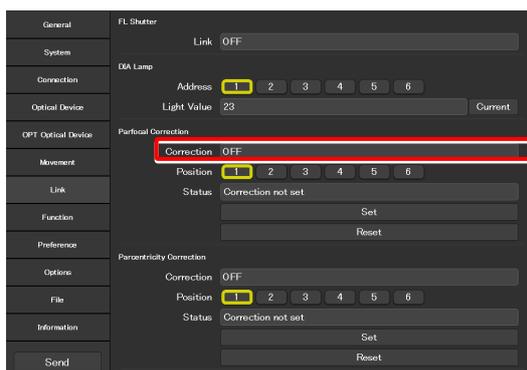
## 2.8.5        Setting the Parcentricity Correction

If there is a shift in center position when the objective is switched, this setting allows for correction.

1.  **Set and confirm the following items in the [Parcentricity Correction] field.**

    **Position:**

    Select the address of the nosepiece to which the target objective is attached.

    **Status:**

    Indicates whether correction of the objective is set or not.

2.  **Change the current objective to the maximum magnification objective on the microscope main body.**

3.  **Move the XY-stage so that an easy-to-identify object is at the center of the field of view.**

    Use this object as a mark to correct the objective at another address (position).

4.  **Click [Set].**

5.  **Repeat steps 1 to 4 to set the center position for all addresses (positions).**

6.  **Click [Correction] to enable or disable the parcentricity correction.**

▼ **Setting the parcentricity correction**
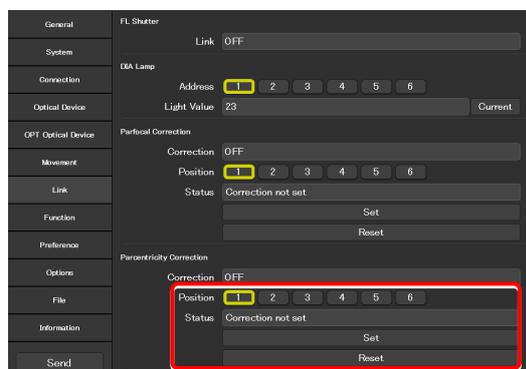


▼ **Setting the parcentricity correction**
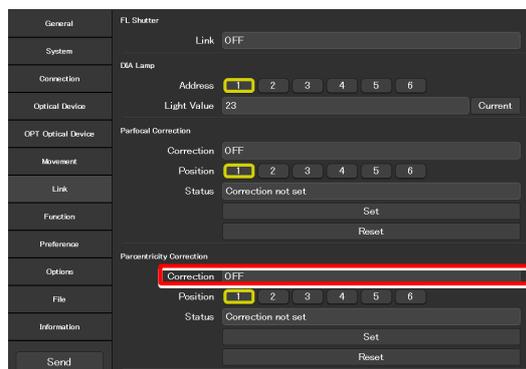
## 2.9    [Function]: Assigning Functions: Ti2-E Only

This section describes how to assign functions to the function buttons and LED indicators on the Ti2-E microscope main body, and the function buttons and LCD screen of the joystick.

1. **Select [Function] from the setting item selection area.**

   The function setting screen appears.

▼ **Assigning functions**
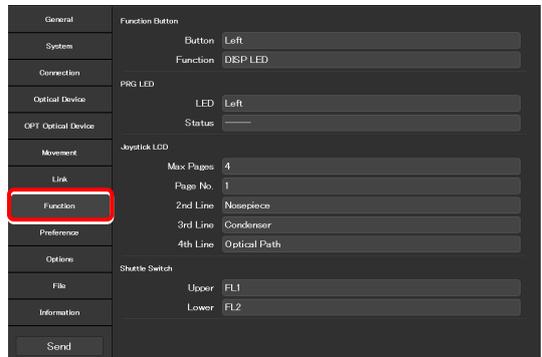


### 2.9.1    Setting the Function Buttons

Assign functions to the function buttons (FnL and FnR buttons on the operation panels on the right and left sides) on the Ti2-E microscope main body, and the function buttons of the joystick.
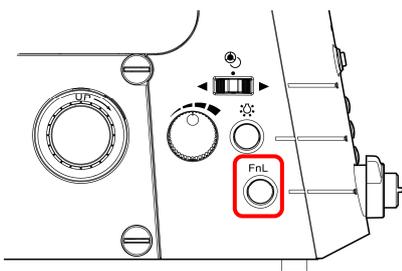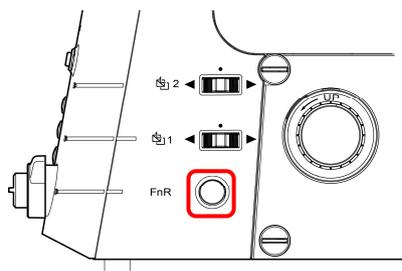


| Left operation panel | Right operation panel | Joystick |
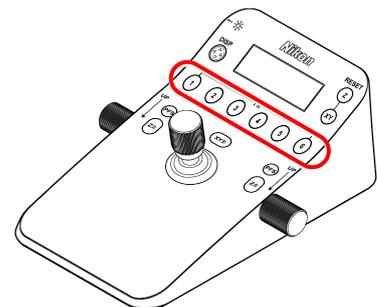
1. **Set the following items in the [Function Button] field.**

   **Function Button:**

   Select the position of the target function button on the microscope main body or the joystick.

   **Function:**

   Select the function to be assigned.

   For the assignable functions, see "3.1    List of Functions Assigned to Function Buttons."

▼ **Setting the function buttons of the microscope**
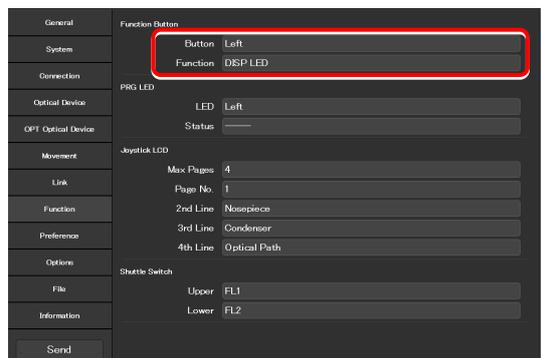
## 2.9.2    Setting the FnL and FnR Indicators on the Microscope

Assign the operating status of an arbitrary function to the FnL or FnR LED indicator on the front operation panel of the Ti2-E microscope main body.

In the initial state, no function is assigned to the FnL and FnR indicators. The indicators do not light unless functions are assigned to them.
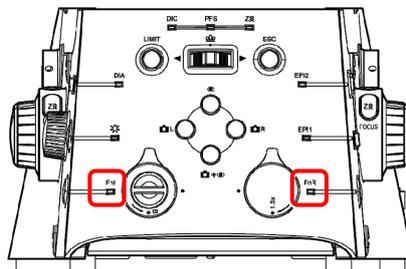


**Front operation panel**

1.    **Set the following items in the [PRG LED] field.**

    **LED:**

      Select the position of the LED indicator on the microscope main body for which the operating status indication is enabled.

    **Status:**

      Select the function whose operating status is to be indicated.

      For the assignable indication functions, see "3.2 List of Indication Functions Assigned to the LED Indicators of the Ti2-E Microscope Main Body."

▼ **Setting the LED indicators**



## 2.9.3    Setting the LCD Display Screen of the Joystick

Set the function to be displayed on each LCD screen page of the joystick.

1.    **Set the following items in the [Joystick LCD] field.**

    **Max Pages:**

      Set the maximum number of pages.

    **Page No.:**

      Select the target page number.

    **2nd Line to 4th Line:**

      Select the function to be assigned to each line.

      For the assignable functions, see "3.3 List of Functions Assigned to Joystick LCD Screen."

▼ **Setting the LCD display screen of the joystick**

## 2.9.4      Setting the Shuttle Switches

The motorized FL turrets (1st and 2nd), barrier filters (1st and 2nd), or external Ph turret operation functions can be assigned to shuttle switches 1 and 2 of the Ti2-E microscope main body. (The default setting is the filter cube switches.)
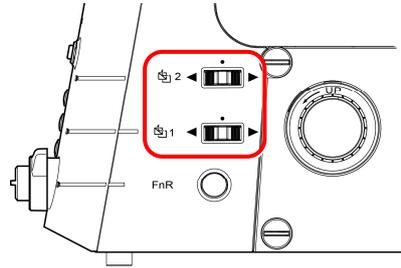


**Right operation panel**

**1.    Set the following items in the [Shuttle Switch] fields.**

   **Upper:**

   Assign another operation function to shuttle switch 1 of the microscope main body.

   **Lower:**

   Assign another operation function to shuttle switch 2 of the microscope main body.

▼ **Setting the shuttle switches**
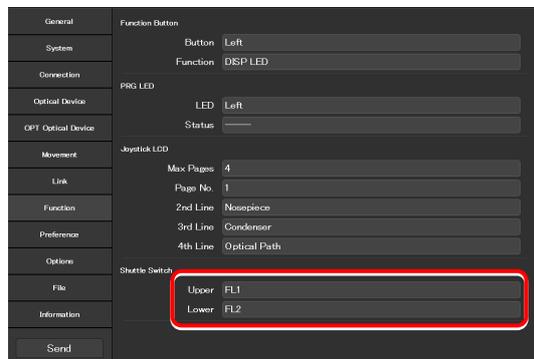
## 2.10    [Preference]: Setting the Assist Camera

This section describes how to set the destination to save the frame rate and images of the assist camera when the assist tube base unit is used.

1.  **Select [Preference] from the setting item selection area.**

    The assist camera setting screen appears.

2.  **Set the following items in the [Assist Camera] field.**

    **Frame Rate:**

    Select the frame rate of the assist camera.

    **Dest. to save:**

    Specify where the image data is to be saved (path to the folder), when an image is obtained by tapping the capture button.

    **Adjustment:**

    When [Adjustment] is tapped, the Adjustment screen will be displayed.

    The Adjustment screen allows the field of view of the assist camera to be adjusted to the same position and size of the field of view of the binocular part.

    **White Balance:**

    Automatically adjust the white balance.

▼ **Setting the assist camera**



▼ **Adjustment screen**



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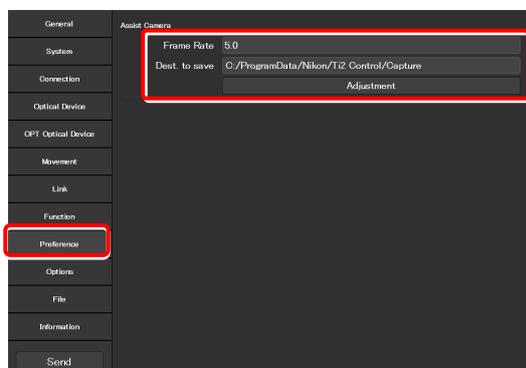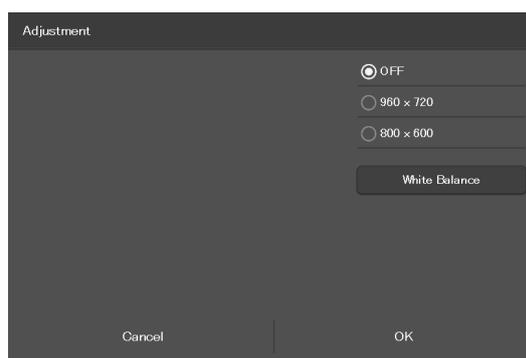
## 2.11    [Options]: Setting the Motorized Devices: For Ti2-E

This section describes how to set the operation speed of the motorized device and whether the motorized device is to be controlled from the Ti2-E microscope main body or the joystick.

For details on the controllable functions of the Ti2-A, see "2.11.5    Ti2-A."

1.  **Select [Options] from the setting item selection area.**

    The motorized device setting screen appears.

▼ **Setting the motorized devices**
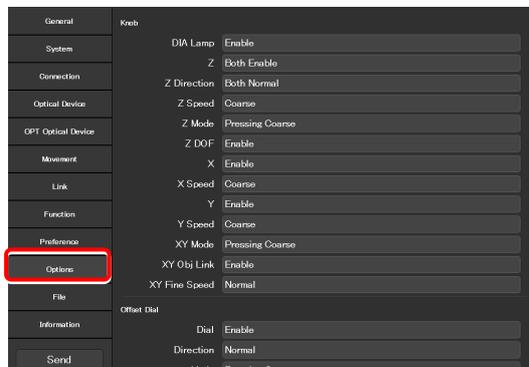


### 2.11.1    Controlling Each Knob

This section describes how to control each knob.

1.  **Set the following items in the [Knob] field.**

    **DIA Lamp:**

    Enable or disable the dia-illumination brightness adjuster operation.

    **Z:**

    Enable or disable the focusing device (Z-stage) control by the focus knob of the microscope main body or the joystick.

    **Z Direction:**

    Select the rotation direction of the focus knob and the moving direction of the focusing device (Z-stage) of the microscope main body and joystick.

    **Z Speed:**

    Select the movement speed of the focusing device (Z-stage), initiated by the focus knob of the microscope main body or joystick.

    **Z Mode:**

    Select the behavior when the Z coarse-motion button of the joystick is used.

    | Pressing Coarse: | Coarse motion only while the button is pressed |
    |---|---|
    | Toggle: | Switches between coarse motion and fine motion. |

    **Z DOF:**

    Specify whether to make the focusing device (Z-stage) move by the focus knob of the microscope main body or the joystick according to the NA.

▼ **Setting each knob**
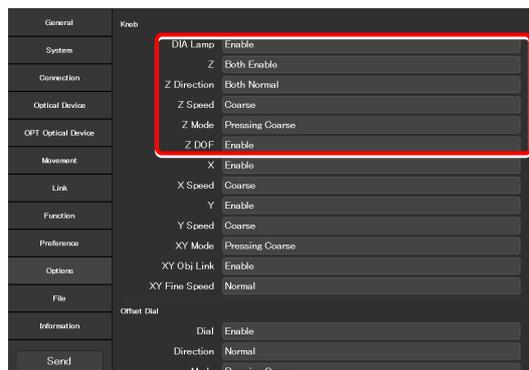
**X:**

Enable or disable the control in the X-axis direction of the stage by using the stage drive lever of the joystick.

**X Speed:**

Select the movement speed in the X-axis direction of the stage by using the stage drive lever of the joystick.

**Y:**

Enable or disable the control in the Y-axis direction of the stage by using the stage drive lever of the joystick.

**Y Speed:**

Select the speed of the movement in the Y-axis direction of the stage initiated by using the stage drive lever of the joystick.

**XY Mode:**

Select the behavior when the XY coarse-motion button of the joystick is used.

Pressing Coarse:　Coarse motion only while the button is pressed

Toggle:　Switches between coarse motion and fine motion.

**XY Obj Link:**

Specify whether the speed of the XY stage is to be changed according to the magnification of the objective.

**XY Fine Speed:**

When "Normal" is selected, the XY stage moves in normal fine motion. When "Low" is selected, it moves in finer motion than "Normal".

▼ **Setting each knob (Continued from the previous page)**
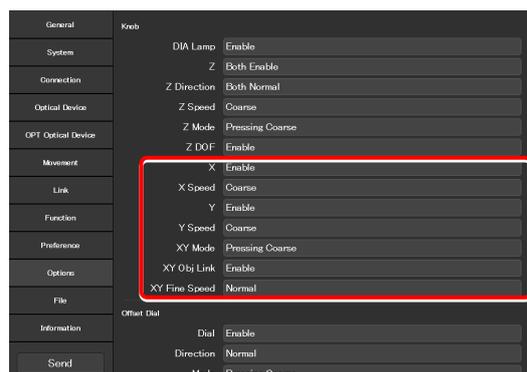


## 2.11.2　Controlling the PFS Offset Dial

This section describes how to control the PFS offset dial.

1.　**Set the following items in the [Offset Dial] field.**

**Dial:**

Enable or disable the control of the PFS offset dial.

**Direction:**

Select the rotation direction of the PFS offset dial.

**Mode:**

Select the behavior when the Z coarse-motion button of the offset dial is used.

Pressing Coarse:　Coarse motion only while the button is pressed

Toggle:　Switches between coarse motion and fine motion.

▼ **Setting the offset dial**
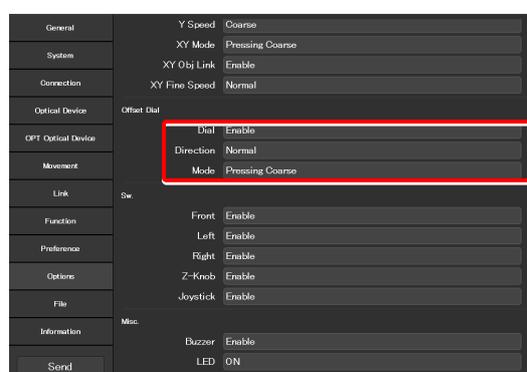
### 2.11.3    Controlling the Switches

This section describes how to control each button (switch) of the microscope main body and joystick.

**1.    Set the following items in the [Sw.] field.**

▼ **Controlling the switches**



**Front:**

Enable or disable operation by the buttons or switches on the front operation panel of the microscope main body.

**Left:**

Enable or disable operation by the buttons or switches on the left operation panel of the microscope main body.

**Right:**

Enable or disable operation by the buttons or switches on the right operation panel of the microscope main body.

**Z-Knob:**

Enable or disable operation by the Z coarse-motion button of the focus knob on the both sides of the microscope main body.

**Joystick:**

Enable or disable operation by the buttons of the joystick.
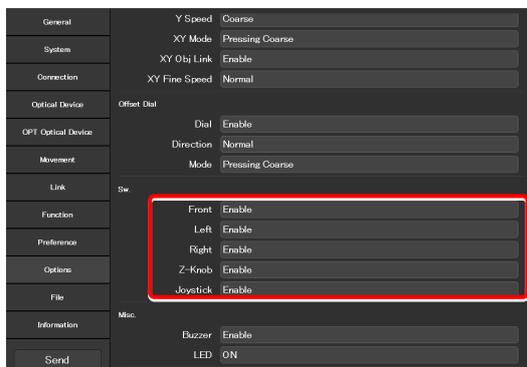
### 2.11.4    Other Control Items

This section describes other control items.

**1.    Set the following items in the [Misc.] field.**

▼ **Other control items**



**Buzzer:**

Enable or disable the buzzer of the microscope main body.

**LED**

Turn on or off the LED of the microscope main body.

## 2.11.5      Ti2-A

Set the controllable functions of the TI2-A.

**1.    Set the following items in the [Knob] field.**

**DIA Lamp:**

Enable or disable the dia-illumination brightness adjuster operation.

▼  **Setting each knob**
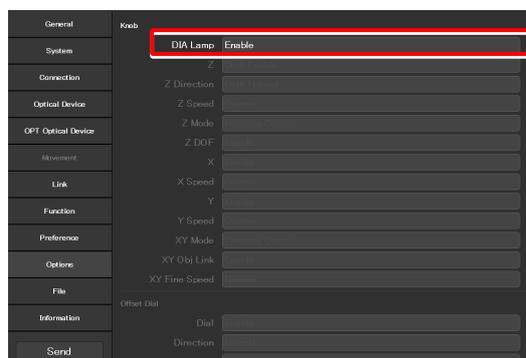


**2.    Set the following items in the [Sw.] field.**

**Left:**

Enable or disable operation by the buttons or switches on the left operation panel of the microscope main body.

▼  **Controlling the switches**
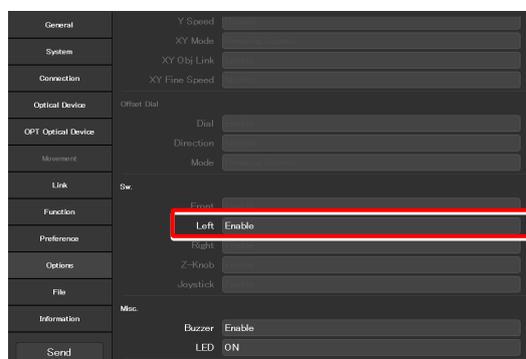


**3.    Set the following items in the [Misc.] field.**

**Buzzer:**

Enable or disable the buzzer of the microscope main body.

**LED:**

Turn on or off the LED of the microscope main body.

▼  **Other control items**
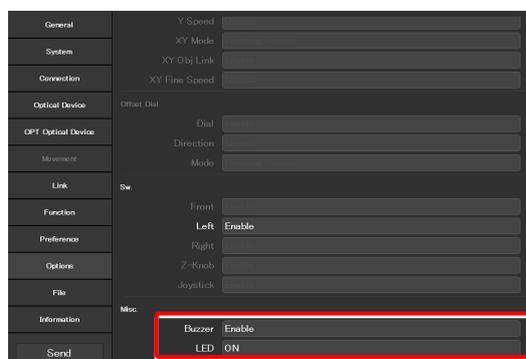
# 2.12　[File]: Saving and Reading Settings

This section describes how to save or read settings.

The settings made by using the "Ti2 Control" application can be saved (as a configuration file) in the personal computer and read later.

More than one configuration file can be saved, with a file for each user. The settings of the microscope system can be changed by reading different configuration files.

1.　**Select [File] from the setting item selection area.**

▼  **Setting a file**
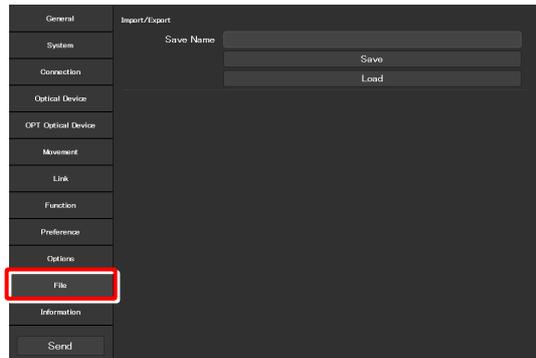


## 2.12.1　Saving the Settings

1.　**Specify a file name in [Save Name] in the [Import/Export] field.**

▼  **Saving the settings**
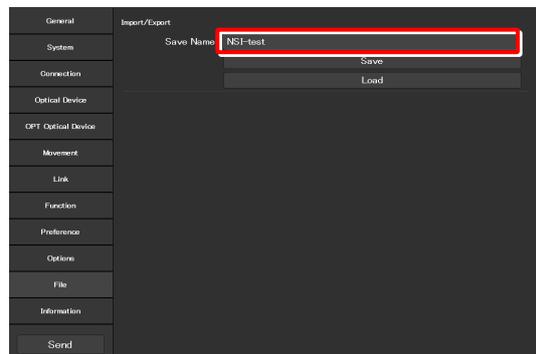


2.　**Click [Save].**

The setting information will be saved.

> ✅ **SUPPLEMENTAL REMARKS**
>
> If the file name specified in step 1 already exists, a confirmation message appears after [Save] is clicked, asking whether the file is to be overwritten.
> Click [Yes] to overwrite the file or [Cancel] to cancel saving the file.
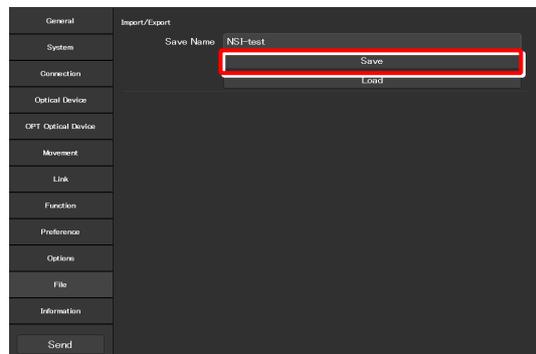
## 2.12.2    Reading the Settings

**1.    Click [Load] in the [Import/Export] field.**

The file selection screen appears.

▼  **Reading the settings**
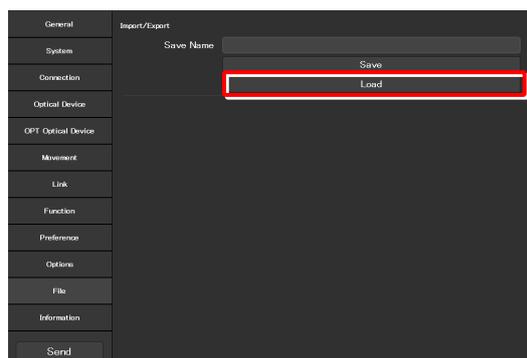


**2.    Select the setting information to be loaded.**

**3.    Click [OK].**

The setting information that is saved is loaded and reflected on each setting screen.

▼  **File selection screen**
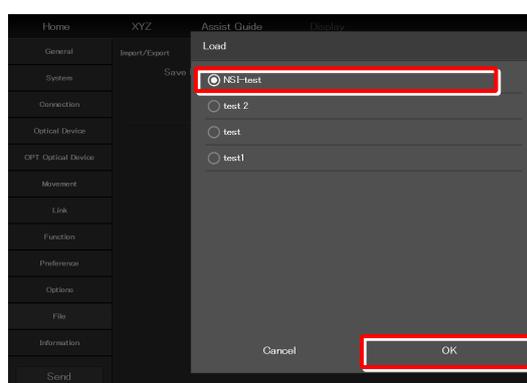


✅  **SUPPLEMENTAL REMARKS**

When a file name is specified in [Save Name] and [Load] is clicked, setting information is loaded and reflected on each setting screen if the specified file exists.

If the specified file does not exist at this time, a file selection screen will appear. Specify a file.

▼  **Reading the settings**
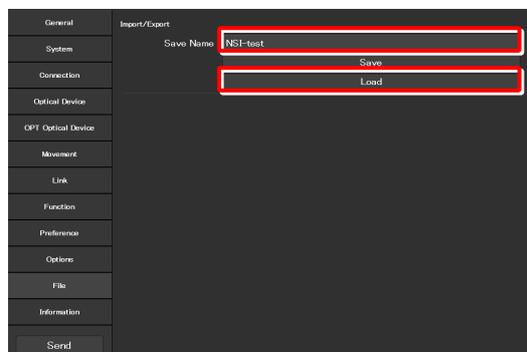


This completes the setup procedure.

Click [Send] in the setting item selection area to send the setting information to the microscope.

## 2.13     [Information]: Version Information

This section describes how to confirm the version of the application and the controller for the microscope.

**1.   Select [Information] on the setting item selection area.**

The version of the application, the controller and the microscope main body will be displayed.

The version information on each Ti2 series microscope will be displayed.

**Ti2 Control:**

Version of this application

**Ti2-E [Microscope Main Body]:**

FPGA version of the Ti2-E main body when the Ti2-E main body is in use

**[Controller CPU]:**

CPU version of the controller for TI2-E when the Ti2-E main body is in use

**[Controller FPGA]:**

FPGA version of the controller for TI2-E when the Ti2-E main body is in use

**Ti2-A:**

CPU version of the Ti2-A main body when the Ti2-A main body is in use

**MAC Address:**

MAC address of the currently used microscope system

▼  **Version information (For Ti2-E)**
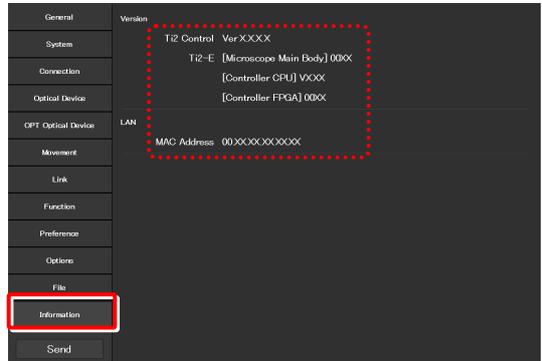


▼  **Version information (For Ti2-A)**



44
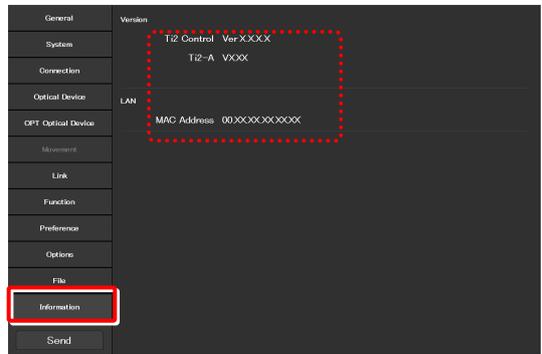
**Chapter**

# 3

# Appendix (Ti2-E Only)

This chapter lists the functions assigned to function buttons on the Ti2-E microscope main body and the joystick.

# 3.1        List of Functions Assigned to Function Buttons

## 3.1.1        Initial Setting of the Function Buttons on the Ti2-E Microscope Main Body

The table below lists the default functions assigned to the function buttons on the Ti2-E microscope main body.

| Button name | Indicated name | Functional overview |
|---|---|---|
| FnR button | I/O1OUT TRIG. | Trigger output of digital I/O channel 1 |
| FnL button | DISP LED | Turns on or off the LED indicators on the front of the microscope main body. |

## 3.1.2        Initial Setting of the Function Buttons on the Joystick

The table below lists the default functions assigned to the function buttons on the joystick.

| Button name | Indicated name | Functional overview |
|---|---|---|
| Fn1 | MODE1 MEM-RECALL | Memorizes and recalls Mode 1. |
| Fn2 | MODE2 MEM-RECALL | Memorizes and recalls Mode 2. |
| Fn3 | COND SHIFT | Shifts the condenser. |
| Fn4 | COND SHUTTER MOVE | Shifts the condenser shutter address. |
| Fn5 | FL1st SHIFT | Shifts FL turret 1. |
| Fn6 | FL1SH OPEN-CLOSE | Opens or closes FL turret 1 shutter. |

## 3.1.3        Functions That Can Be Registered

The table below lists the functions that can be assigned to the function buttons on the Ti2-E microscope main body and the joystick. All these functions can be assigned from "Ti2 Control."

| No. | ID | Indicated name | Functional overview | Operations that can be set from the joystick (✓✓ indicates the default.) | |
|---|---|---|---|---|---|
| | | | | Fn1 to 6 buttons on the joystick | FnL/FnR button on the microscope main body |
| 1 | 0 | ------- (NULL) | Nothing is to be set. | ✓ | ✓ |
| 2 | 10 | REVO SHIFT | Move the joystick to the left in the X direction while pressing the button: Turns the nosepiece clockwise.<br>Move the joystick to the right in the X direction while pressing the button: Turns the nosepiece counterclockwise. | ✓ | |
| 3 | 11 | REVO 1 | Moves to nosepiece address 1. | | |
| 4 | 12 | REVO 2 | Moves to nosepiece address 2. | | |
| 5 | 13 | REVO 3 | Moves to nosepiece address 3. | | |
| 6 | 14 | REVO 4 | Moves to nosepiece address 4. | | |
| 7 | 15 | REVO 5 | Moves to nosepiece address 5. | | |
| 8 | 16 | REVO 6 | Moves to nosepiece address 6. | | |
| 9 | 18 | REVO CW | Turns the nosepiece clockwise. | | |
| 10 | 19 | REVO CCW | Turns the nosepiece counterclockwise. | | |
| 11 | 20 | COND SHIFT | Move the joystick to the left in the X direction while pressing the button: Turns the condenser clockwise.<br>Move the joystick to the right in the X direction while pressing the button: Turns the condenser counterclockwise. | ✓✓ (Fn3) | |
| 12 | 21 | COND 1 | Moves to condenser address 1. | | |
| 13 | 22 | COND 2 | Moves to condenser address 2. | | |
| 14 | 23 | COND 3 | Moves to condenser address 3. | | |
| 15 | 24 | COND 4 | Moves to condenser address 4. | | |
| 16 | 25 | COND 5 | Moves to condenser address 5. | | |
| 17 | 26 | COND 6 | Moves to condenser address 6. | | |

| No. | ID | Indicated name | Functional overview | Operations that can be set from the joystick (✓✓ indicates the default.) | |
|---|---|---|---|---|---|
| | | | | Fn1 to 6 buttons on the joystick | FnL/FnR button on the microscope main body |
| 18 | 27 | COND 7 | Moves to condenser address 7. | | |
| 19 | 28 | COND CW | Turns the condenser clockwise. | | |
| 20 | 29 | COND CCW | Turns the condenser counterclockwise. | | |
| 21 | 30 | FL1st SHIFT | Move the joystick to the left in the X direction while pressing the button: Turns FL turret 1 clockwise. Move the joystick to the right in the X direction while pressing the button: Turns FL turret 1 counterclockwise. | ✓✓ (Fn5) | |
| 22 | 31 | FL1st 1 | Moves FL turret 1 to address 1. | | |
| 23 | 32 | FL1st 2 | Moves FL turret 1 to address 2. | | |
| 24 | 33 | FL1st 3 | Moves FL turret 1 to address 3. | | |
| 25 | 34 | FL1st 4 | Moves FL turret 1 to address 4. | | |
| 26 | 35 | FL1st 5 | Moves to address 5 of FL turret 1. | | |
| 27 | 36 | FL1st 6 | Moves to address 6 of FL turret 1. | | |
| 28 | 38 | FL1st CW | Turns FL turret 1 clockwise. | | |
| 29 | 39 | FL1st CCW | Turns FL turret 1 counterclockwise. | | |
| 30 | 40 | FL2nd SHIFT | Move the joystick to the left in the X direction while pressing the button: Turns FL turret 2 clockwise. Move the joystick to the right in the X direction while pressing the button: Turns FL turret 2 counterclockwise. | ✓ | |
| 31 | 41 | FL2nd 1 | Moves FL turret 2 to address 1. | | |
| 32 | 42 | FL2nd 2 | Moves FL turret 2 to address 2. | | |
| 33 | 43 | FL2nd 3 | Moves FL turret 2 to address 3. | | |
| 34 | 44 | FL2nd 4 | Moves FL turret 2 to address 4. | | |
| 35 | 45 | FL2nd 5 | Moves FL turret 2 to address 5. | | |
| 36 | 46 | FL2nd 6 | Moves FL turret 2 to address 6. | | |
| 37 | 48 | FL2nd CW | Turns FL turret 2 clockwise. | | |
| 38 | 49 | FL2nd CCW | Turns FL turret 2 counterclockwise. | | |
| 39 | 50 | BA1st SHIFT | Move the joystick to the left in the X direction while pressing the button: Turns BA filter wheel 1 clockwise. Move the joystick to the right in the X direction while pressing the button: Turns BA filter wheel 1 counterclockwise. | ✓ | |
| 40 | 51 | BA1st 1 | Moves BA filter wheel 1 to address 1. | | |
| 41 | 52 | BA1st 2 | Moves BA filter wheel 1 to address 2. | | |
| 42 | 53 | BA1st 3 | Moves BA filter wheel 1 to address 3. | | |
| 43 | 54 | BA1st 4 | Moves BA filter wheel 1 to address 4. | | |
| 44 | 55 | BA1st 5 | Moves BA filter wheel 1 to address 5. | | |
| 45 | 56 | BA1st 6 | Moves BA filter wheel 1 to address 6. | | |
| 46 | 57 | BA1st 7 | Moves BA filter wheel 1 to address 7. | | |
| 47 | 58 | BA1st CW | Turns BA filter wheel 1 clockwise. | | ✓ |
| 48 | 59 | BA1st CCW | Turns BA filter wheel 1 counterclockwise. | | ✓ |
| 49 | 60 | BA2nd SHIFT | Move the joystick to the left in the X direction while pressing the button: Turns BA filter wheel 2 clockwise. Move the joystick to the right in the X direction while pressing the button: Turns BA filter wheel 1 counterclockwise. | ✓ | |
| 50 | 61 | BA2nd 1 | Moves BA filter wheel 2 to address 1. | | |
| 51 | 62 | BA2nd 2 | Moves BA filter wheel 2 to address 2. | | |
| 52 | 63 | BA2nd 3 | Moves BA filter wheel 2 to address 3. | | |
| 53 | 64 | BA2nd 4 | Moves BA filter wheel 2 to address 4. | | |
| 54 | 65 | BA2nd 5 | Moves BA filter wheel 2 to address 5. | | |

| No. | ID | Indicated name | Functional overview | Operations that can be set from the joystick (✓✓ indicates the default.) | |
|---|---|---|---|---|---|
| | | | | Fn1 to 6 buttons on the joystick | FnL/FnR button on the microscope main body |
| 55 | 66 | BA2nd 6 | Moves BA filter wheel 2 to address 6. | | |
| 56 | 67 | BA2nd 7 | Moves BA filter wheel 2 to address 7. | | |
| 57 | 68 | BA2nd CW | Turns BA filter wheel 2 clockwise. | | ✓ |
| 58 | 69 | BA2nd CCW | Turns BA filter wheel 2 counterclockwise. | | ✓ |
| 59 | 70 | PATH SHIFT | Move the joystick along the XY direction of the joystick while pressing the button for optical path switching: X+: R100, X-: L100, Y+: EYE, Y-: AUX | ✓ | |
| 60 | 71 | PATH EYE | Switches the optical path to EYE. | | |
| 61 | 72 | PATH R100 | Switches the optical path to R100. | | |
| 62 | 73 | PATH L100 | Switches the optical path to L100. | | |
| 63 | 74 | PATH AUX | Switches the optical path to AUX. | | |
| 64 | 75 | PATH EYE-R100 | Toggles the optical path between EYE and R100. | | |
| 65 | 76 | PATH EYE-L100 | Toggles the optical path between EYE and L100. | | |
| 66 | 77 | PATH EYE-AUX | Toggles the optical path between EYE and AUX. | | |
| 67 | 78 | PATH R100-L100 | Toggles the optical path between R100 and L100. | | |
| 68 | 79 | PATH R100-AUX | Toggles the optical path between R100 and AUX. | | |
| 69 | 80 | PATH L100-AUX | Toggles the optical path between L100 and AUX. | | |
| 70 | 81 | PATH ALL | Switches the optical path from EYE to R100, AUX, L100 and then back to EYE. | | |
| 71 | 92 | Z ZERO RESET | Resets the elevating movement (Z-axis coordinate) to 0. | | |
| 72 | 93 | Z ESCAPE-REFOCUS | Toggles the elevating movement between escape and restore positions. | ✓ | |
| 73 | 94 | Z ESCAPE | Places the elevating section in the escape position. | | |
| 74 | 95 | Z REFOCUS | Restores the elevating section to the original position. | | |
| 75 | 96 | Z LIMIT | Sets or releases the software limit (Z limit) on the elevating section. | | |
| 76 | 102 | X ZERO RESET | Resets the XY stage (X-axis coordinate) to 0. | | |
| 77 | 103 | Y ZERO RESET | Resets the XY stage (Y-axis coordinate) to 0. | | |
| 78 | 104 | XY ZERO RESET | Resets the XY stage (XY-axis coordinates) to 0. | | |
| 79 | 105 | XY CONSTANT SPEED | Turns on or off the joystick constant speed mode for the XY stage. | ✓ | |
| 80 | 106 | XY JOYFINESPEED | Sets the joystick fine speed for the XY stage to normal or low speed. | ✓ | |
| 81 | 111 | SH1 OPEN-CLOSE | Opens or closes motorized shutter 1. | ✓ | ✓ |
| 82 | 112 | SH2 OPEN-CLOSE | Opens or closes motorized shutter 2. | ✓ | ✓ |
| 83 | 113 | FL1SH OPEN-CLOSE | Opens or closes FL turret 1 shutter. | ✓✓ (Fn6) | |
| 84 | 114 | FL2SH OPEN-CLOSE | Opens or closes FL turret 2 shutter. | ✓ | |
| 85 | 115 | COND SHUTTER MOVE | Moves the condenser shutter position. | ✓✓ (Fn4) | |
| 86 | 120 | LED SHIFT | Adjusts brightness by turning the focus knobs while pressing the button. | ✓ | |
| 87 | 121 | LED ON-OFF | Turns on and off diascopic LED illumination. | ✓ | |
| 88 | 122 | LED UP | Increases the illumination intensity of diascopic LED illumination. | | |
| 89 | 123 | LED DOWN | Decreases the illumination intensity of diascopic LED illumination. | | |
| 90 | 124 | HALOGEN SHIFT | Adjusts brightness by turning the focus knobs while pressing the button. | ✓ | |
| 91 | 125 | HALOGEN ON-OFF | Turns on and off halogen dia-illumination. | ✓ | |

| No. | ID | Indicated name | Functional overview | Fn1 to 6 buttons on the joystick | FnL/FnR button on the microscope main body |
|---|---|---|---|---|---|
| | | | | **Operations that can be set from the joystick (✓✓ indicates the default.)** | |
| 92 | 126 | HALOGEN UP | Increases the illumination intensity of halogen dia-illumination. | | |
| 93 | 127 | HALOGEN DOWN | Decreases the illumination intensity of halogen dia-illumination. | | |
| 94 | 131 | PFS ON-OFF | Turns on or off PFS4. | | |
| 95 | 132 | PFS DM | Brings the PFS dichroic mirror to the IN or OUT position. | ✓ | |
| 96 | 133 | PFS OFFSET ZERO | Moves the offset lens to offset 0 position. | | ✓ |
| 97 | 134 | PFS LED OFF | Turns on or off the PFS LED. | | |
| 98 | 137 | OLSP COARSE-FINE | Switches the PFS4 offset knob between coarse motion and fine motion. | | |
| 99 | 140 | TUBEBASE SHIFT | Move the joystick to the left in the X direction while pressing the button: Turns the tube base's external Ph turret clockwise. Move the joystick to the right in the X direction while pressing the button: Turns the tube base's external Ph turret counterclockwise. | ✓ | |
| 100 | 141 | TUBEBASE 1 | Moves the tube base's external Ph turret to address 1. | | |
| 101 | 142 | TUBEBASE 2 | Moves the tube base's external Ph turret to address 2. | | |
| 102 | 143 | TUBEBASE 3 | Moves the tube base's external Ph turret to address 3. | | |
| 103 | 144 | TUBEBASE 4 | Moves the tube base's external Ph turret to address 4. | | |
| 104 | 148 | TUBEBASE CW | Turns the tube base's external Ph turret clockwise. | | ✓ |
| 105 | 149 | TUBEBASE CCW | Turns the tube base's external Ph turret counterclockwise. | | ✓ |
| 106 | 151 | MBRANCH1st IN-OUT | Brings the epi-illumination attachment's Lapp main branch 1 to the IN or OUT position. | ✓ | ✓ |
| 107 | 152 | MBRANCH2nd IN-OUT | Brings the epi-illumination attachment's Lapp main branch 2 to the IN or OUT position. | ✓ | ✓ |
| 108 | 153 | SBRANCH IN-OUT | Brings the epi-illumination attachment's Lapp sub branch to the IN or OUT position. | ✓ | ✓ |
| 109 | 161 | EPILED UNIT#1 | Selects LED unit #1 of the epi-fl LED illuminator. | | |
| 110 | 162 | EPILED UNIT#2 | Selects LED unit #2 of the epi-fl LED illuminator. | | |
| 111 | 163 | EPILED UNIT#3 | Selects LED unit #3 of the epi-fl LED illuminator. | | |
| 112 | 164 | EPILED UNIT#4 | Selects LED unit #4 of the epi-fl LED illuminator. | | |
| 113 | 165 | EPILED UNIT ALL | Switches the LED unit of the epi-fl LED illuminator from #1 to #2, #3, #4, and then back to #1. | | |
| 114 | 166 | EPILED UP | Increases the illumination intensity of the selected LED unit of the epi-fl LED illuminator. | | |
| 115 | 167 | EPILED DOWN | Decreases the illumination intensity of the selected LED unit of the epi-fl LED illuminator. | | |
| 116 | 168 | EPILED ON-OFF | Turns on or off the selected LED unit of the epi-fl LED illuminator. | | |
| 117 | 170 | INTSL SHIFT | Move the joystick to the left in the X direction while pressing the button: Turns the ND clockwise. Move the joystick to the right in the X direction while pressing the button: Turns the ND counterclockwise. | | |
| 118 | 171 | INTSL ND CW | Turns the IntensiLight ND clockwise. | | |
| 119 | 172 | INTSL ND CCW | Turns the IntensiLight ND counterclockwise. | | |
| 120 | 173 | INT.SH OPEN-CLOSE | Opens or closes the IntensiLight shutter. | | |
| 121 | 180 | CORCOL SHIFT | Moves the motorized correction collar in the +/- direction when the focus knobs are turned while the button is pressed. | ✓ | |
| 122 | 191 | MODE1 MEMORY | Memorizes Mode 1 setting. | | |
| 123 | 192 | MODE2 MEMORY | Memorizes Mode 2 setting. | | |
| 124 | 193 | MODE3 MEMORY | Memorizes Mode 3 setting. | | |
| 125 | 194 | MODE4 MEMORY | Memorize Mode 4 setting. | | |

| No. | ID | Indicated name | Functional overview | Operations that can be set from the joystick (✓✓ indicates the default.) | |
|---|---|---|---|---|---|
| | | | | Fn1 to 6 buttons on the joystick | FnL/FnR button on the microscope main body |
| 126 | 195 | MODE5 MEMORY | Memorizes Mode 5 setting. | | |
| 127 | 196 | MODE6 MEMORY | Memorizes Mode 6 setting. | | |
| 128 | 197 | MODE7 MEMORY | Memorizes Mode 7 setting. | | |
| 129 | 198 | MODE8 MEMORY | Memorizes Mode 8 setting. | | |
| 130 | 201 | MODE1 RECALL | Recalls Mode 1 setting. | | |
| 131 | 202 | MODE2 RECALL | Recalls Mode 2 setting. | | |
| 132 | 203 | MODE3 RECALL | Recalls Mode 3 setting. | | |
| 133 | 204 | MODE4 RECALL | Recalls Mode 4 setting. | | |
| 134 | 205 | MODE5 RECALL | Recalls Mode 5 setting. | | |
| 135 | 206 | MODE6 RECALL | Recalls Mode 6 setting. | | |
| 136 | 207 | MODE7 RECALL | Recalls Mode 7 setting. | | |
| 137 | 208 | MODE8 RECALL | Recalls Mode 8 setting. | | |
| 138 | 211 | MODE1 MEM-RECALL | Short press: Recalls Mode 1 setting.<br>Long press: Memorizes Mode 1 setting. | ✓✓ (Fn1) | ✓ |
| 139 | 212 | MODE2 MEM-RECALL | Short press: Recalls Mode 2 setting.<br>Long press: Memorizes Mode 2 setting. | ✓✓ (Fn2) | ✓ |
| 140 | 213 | MODE3 MEM-RECALL | Short press: Recalls Mode 3 setting.<br>Long press: Memorizes Mode 3 setting. | ✓ | ✓ |
| 141 | 214 | MODE4 MEM-RECALL | Short press: Recalls Mode 4 setting.<br>Long press: Memorizes Mode 4 setting. | ✓ | ✓ |
| 142 | 215 | MODE5 MEM-RECALL | Short press: Recalls Mode 5 setting.<br>Long press: Memorizes Mode 5 setting. | | |
| 143 | 216 | MODE6 MEM-RECALL | Short press: Recalls Mode 6 setting.<br>Long press: Memorizes Mode 6 setting. | | |
| 144 | 217 | MODE7 MEM-RECALL | Short press: Recalls Mode 7 setting.<br>Long press: Memorizes Mode 7 setting. | | |
| 145 | 218 | MODE8 MEM-RECALL | Short press: Recalls Mode 8 setting.<br>Long press: Memorizes Mode 8 setting. | | |
| 146 | 221 | I/O1OUT TRIG. | Trigger output of control box I/O channel 1 | ✓ | ✓ (FnR) |
| 147 | 222 | I/O2OUT TRIG. | Trigger output of control box I/O channel 2 | ✓ | ✓ |
| 148 | 223 | I/O3OUT TRIG. | Trigger output of control box I/O channel 3 | | |
| 149 | 224 | I/O4OUT TRIG. | Trigger output of control box I/O channel 4 | | |
| 150 | 225 | I/O5OUT TRIG. | Trigger output of control box I/O channel 5 | | |
| 151 | 226 | I/O6OUT TRIG. | Trigger output of control box I/O channel 6 | | |
| 152 | 227 | I/O7OUT TRIG. | Trigger output of control box I/O channel 7 | | |
| 153 | 228 | I/O8OUT TRIG. | Trigger output of control box I/O channel 8 | | |
| 154 | 231 | I/O1OUT TOGGLE | Switches the control box I/O channel 1 output between High and Low. | ✓ | ✓ |
| 155 | 232 | I/O2OUT TOGGLE | Switches the control box I/O channel 2 output between High and Low. | ✓ | ✓ |
| 156 | 233 | I/O3OUT TOGGLE | Switches the control box I/O channel 3 output between High and Low. | | |
| 157 | 234 | I/O4OUT TOGGLE | Switches the control box I/O channel 4 output between High and Low. | | |
| 158 | 235 | I/O5OUT TOGGLE | Switches the control box I/O channel 5 output between High and Low. | | |
| 159 | 236 | I/O6OUT TOGGLE | Switches the control box I/O channel 6 output between High and Low. | | |
| 160 | 237 | I/O7OUT TOGGLE | Switches the control box I/O channel 7 output between High and Low. | | |
| 161 | 238 | I/O8OUT TOGGLE | Switches the control box I/O channel 8 output between High and Low. | | |

| No. | ID | Indicated name | Functional overview | Operations that can be set from the joystick (✓✓ indicates the default.) | |
|---|---|---|---|---|---|
| | | | | Fn1 to 6 buttons on the joystick | FnL/FnR button on the microscope main body |
| 162 | 241 | I/O1OUT PUSH | Drives the control box I/O channel 1 output. High when pushed. | ✓ | ✓ |
| 163 | 242 | I/O2OUT PUSH | Drives the control box I/O channel 2 output. High when pushed. | ✓ | ✓ |
| 164 | 243 | I/O3OUT PUSH | Drives the control box I/O channel 3 output. High when pushed. | | |
| 165 | 244 | I/O4OUT PUSH | Drives the control box I/O channel 4 output. High when pushed. | | |
| 166 | 245 | I/O5OUT PUSH | Drives the control box I/O channel 5 output. High when pushed. | | |
| 167 | 246 | I/O6OUT PUSH | Drives the control box I/O channel 6 output. High when pushed. | | |
| 168 | 247 | I/O7OUT PUSH | Drives the control box I/O channel 7 output. High when pushed. | | |
| 169 | 248 | I/O8OUT PUSH | Drives the control box I/O channel 8 output. High when pushed. | | |
| 170 | 251 | EXI/O1OUT TRIG. | Trigger output of extension box I/O channel 1 | | |
| 171 | 252 | EXI/O2OUT TRIG. | Trigger output of extension box I/O channel 2 | | |
| 172 | 253 | EXI/O3OUT TRIG. | Trigger output of extension box I/O channel 3 | | |
| 173 | 254 | EXI/O4OUT TRIG. | Trigger output of extension box I/O channel 4 | | |
| 174 | 255 | EXI/O5OUT TRIG. | Trigger output of extension box I/O channel 5 | | |
| 175 | 256 | EXI/O6OUT TRIG. | Trigger output of extension box I/O channel 6 | | |
| 176 | 257 | EXI/O7OUT TRIG. | Trigger output of extension box I/O channel 7 | | |
| 177 | 258 | EXI/O8OUT TRIG. | Trigger output of extension box I/O channel 8 | | |
| 178 | 259 | EXI/O9OUT TRIG. | Trigger output of extension box I/O channel 9 | | |
| 179 | 260 | EXI/O10OUT TRIG. | Trigger output of extension box I/O channel 10 | | |
| 180 | 261 | EXI/O11OUT TRIG. | Trigger output of extension box I/O channel 11 | | |
| 181 | 262 | EXI/O12OUT TRIG. | Trigger output of extension box I/O channel 12 | | |
| 182 | 263 | EXI/O13OUT TRIG. | Trigger output of extension box I/O channel 13 | | |
| 183 | 264 | EXI/O14OUT TRIG. | Trigger output of extension box I/O channel 14 | | |
| 184 | 265 | EXI/O15OUT TRIG. | Trigger output of extension box I/O channel 15 | | |
| 185 | 266 | EXI/O16OUT TRIG. | Trigger output of extension box I/O channel 16 | | |
| 186 | 271 | EXI/O1OUT TOGGLE | Switches the extension box I/O channel 1 output between High and Low. | | |
| 187 | 272 | EXI/O2OUT TOGGLE | Switches the extension box I/O channel 2 output between High and Low. | | |
| 188 | 273 | EXI/O3OUT TOGGLE | Switches the extension box I/O channel 3 output between High and Low. | | |
| 189 | 274 | EXI/O4OUT TOGGLE | Switches the extension box I/O channel 4 output between High and Low. | | |
| 190 | 275 | EXI/O5OUT TOGGLE | Switches the extension box I/O channel 5 output between High and Low. | | |
| 191 | 276 | EXI/O6OUT TOGGLE | Switches the extension box I/O channel 6 output between High and Low. | | |
| 192 | 277 | EXI/O7OUT TOGGLE | Switches the extension box I/O channel 7 output between High and Low. | | |
| 193 | 278 | EXI/O8OUT TOGGLE | Switches the extension box I/O channel 8 output between High and Low. | | |
| 194 | 279 | EXI/O9OUT TOGGLE | Switches the extension box I/O channel 9 output between High and Low. | | |
| 195 | 280 | EXI/O10OUT TOGGLE | Switches the extension box I/O channel 10 output between High and Low. | | |
| 196 | 281 | EXI/O11OUT TOGGLE | Switches the extension box I/O channel 11 output between High and Low. | | |

| No. | ID | Indicated name | Functional overview | Operations that can be set from the joystick (✓✓ indicates the default.) | |
|---|---|---|---|---|---|
| | | | | Fn1 to 6 buttons on the joystick | FnL/FnR button on the microscope main body |
| 197 | 282 | EXI/O12OUT TOGGLE | Switches the extension box I/O channel 12 output between High and Low. | | |
| 198 | 283 | EXI/O13OUT TOGGLE | Switches the extension box I/O channel 13 output between High and Low. | | |
| 199 | 284 | EXI/O14OUT TOGGLE | Switches the extension box I/O channel 14 output between High and Low. | | |
| 200 | 285 | EXI/O15OUT TOGGLE | Switches the extension box I/O channel 15 output between High and Low. | | |
| 201 | 286 | EXI/O16OUT TOGGLE | Switches the extension box I/O channel 16 output between High and Low. | | |
| 202 | 291 | EXI/O1OUT PUSH | Drives the extension box I/O channel 1 output. High when pushed. | | |
| 203 | 292 | EXI/O2OUT PUSH | Drives the extension box I/O channel 2 output. High when pushed. | | |
| 204 | 293 | EXI/O3OUT PUSH | Drives the extension box I/O channel 3 output. High when pushed. | | |
| 205 | 294 | EXI/O4OUT PUSH | Drives the extension box I/O channel 4 output. High when pushed. | | |
| 206 | 295 | EXI/O5OUT PUSH | Drives the extension box I/O channel 5 output. High when pushed. | | |
| 207 | 296 | EXI/O6OUT PUSH | Drives the extension box I/O channel 6 output. High when pushed. | | |
| 208 | 297 | EXI/O7OUT PUSH | Drives the extension box I/O channel 7 output. High when pushed. | | |
| 209 | 298 | EXI/O8OUT PUSH | Drives the extension box I/O channel 8 output. High when pushed. | | |
| 210 | 299 | EXI/O9OUT PUSH | Drives the extension box I/O channel 9 output. High when pushed. | | |
| 211 | 300 | EXI/O10OUT PUSH | Drives the extension box I/O channel 10 output. High when pushed. | | |
| 212 | 301 | EXI/O11OUT PUSH | Drives the extension box I/O channel 11 output. High when pushed. | | |
| 213 | 302 | EXI/O12OUT PUSH | Drives the extension box I/O channel 12 output. High when pushed. | | |
| 214 | 303 | EXI/O13OUT PUSH | Drives the extension box I/O channel 13 output. High when pushed. | | |
| 215 | 304 | EXI/O14OUT PUSH | Drives the extension box I/O channel 14 output. High when pushed. | | |
| 216 | 305 | EXI/O15OUT PUSH | Drives the extension box I/O channel 15 output. High when pushed. | | |
| 217 | 306 | EXI/O16OUT PUSH | Drives the extension box I/O channel 16 output. High when pushed. | | |
| 218 | 311 | DISP LED | Turns on or off the LED indicators on the front of the microscope main body. | ✓ | ✓✓ (FnL) |
| 219 | 312 | OBJ COMBINATION | Linked operation of the nosepiece and optical devices | | |

## 3.2　List of Indication Functions Assigned to the LED Indicators of the Ti2-E Microscope Main Body

### 3.2.1　Indication Functions That Can Be Registered

The table below lists the LED indications that can be assigned to the FnL and FnR indicators on the Ti2-E microscope main body.

| No. | Indicated name | Functional overview | States when set |
|---|---|---|---|
| 1 | ------- | Nothing is to be set. | None |
| 2 | Shutter 1 Open/Close Status | Shutter 1 open/closed status | Lit: Open, Extinguished: Closed |
| 3 | Shutter 2 Open/Close Status | Shutter 2 open/closed status | Lit: Open, Extinguished: Closed |
| 4 | Main Branch 1 IN/OUT Status | Main branch 1 status | Lit: In, Extinguished: Out |
| 5 | Main Branch 2 IN/OUT Status | Main branch 2 status | Lit: In, Extinguished: Out |
| 6 | Sub Branch IN/OUT Status | Sub branch status | Lit: In, Extinguished: Out |
| 7 | C-LEDFI ON/OFF Status | Selected LED unit status of the epi-fl LED illuminator | Lit: On, Extinguished: Off |
| 8 | Intensilight Shutter Open/Close Status | Intensilight shutter status | Lit: Open, Extinguished: Closed |
| 9 | DIC Polarizer IN/OUT Status | DIC polarizer status | Lit: In, Extinguished: Out |
| 10 | DIC Analyzer IN/OUT Status | Analyzer slot status | Lit: In, Extinguished: Out |
| 11 | Optical Zoom 1.5x/1x Status | Intermediate magnification | Lit: 1.5x, Extinguished: 1x |
| 12 | Eyepiece Tubebase Camera Port IN/OUT Status | Tube base unit camera port status | Lit: EYE (motorized tube and port tube) with assist tube open<br>Extinguished: DSC (motorized tube and port tube) with assist tube closed |
| 13 | Bertrand Lens IN/OUT Status | Bertrand lens status | Lit: In, Extinguished: Out |
| 14 | Assist Camera ON/OFF Status | Assist camera power status | Lit: On, Extinguished: Off |
| 15 | Control Box I/O 1 Output Hi/Low Status | Control box I/O channel 1 output status | Lit: High, Extinguished: Low |
| 16 | Control Box I/O 2 Output Hi/Low Status | Control box I/O channel 2 output status | Lit: High, Extinguished: Low |
| 17 | Control Box I/O 3 Output Hi/Low Status | Control box I/O channel 3 output status | Lit: High, Extinguished: Low |
| 18 | Control Box I/O 4 Output Hi/Low Status | Control box I/O channel 4 output status | Lit: High, Extinguished: Low |
| 19 | Control Box I/O 5 Output Hi/Low Status | Control box I/O channel 5 output status | Lit: High, Extinguished: Low |
| 20 | Control Box I/O 6 Output Hi/Low Status | Control box I/O channel 6 output status | Lit: High, Extinguished: Low |
| 21 | Control Box I/O 7 Output Hi/Low Status | Control box I/O channel 7 output status | Lit: High, Extinguished: Low |
| 22 | Control Box I/O 8 Output Hi/Low Status | Control box I/O channel 8 output status | Lit: High, Extinguished: Low |
| 23 | Extension I/O Box I/O 01 Output Hi/Low Status | Extension box I/O channel 1 output status | Lit: High, Extinguished: Low |
| 24 | Extension I/O Box I/O 02 Output Hi/Low Status | Extension box I/O channel 2 output status | Lit: High, Extinguished: Low |
| 25 | Extension I/O Box I/O 03 Output Hi/Low Status | Extension box I/O channel 3 output status | Lit: High, Extinguished: Low |
| 26 | Extension I/O Box I/O 04 Output Hi/Low Status | Extension box I/O channel 4 output status | Lit: High, Extinguished: Low |
| 27 | Extension I/O Box I/O 05 Output Hi/Low Status | Extension box I/O channel 5 output status | Lit: High, Extinguished: Low |
| 28 | Extension I/O Box I/O 06 Output Hi/Low Status | Extension box I/O channel 6 output status | Lit: High, Extinguished: Low |
| 29 | Extension I/O Box I/O 07 Output Hi/Low Status | Extension box I/O channel 7 output status | Lit: High, Extinguished: Low |
| 30 | Extension I/O Box I/O 08 Output Hi/Low Status | Extension box I/O channel 8 output status | Lit: High, Extinguished: Low |
| 31 | Extension I/O Box I/O 09 Output Hi/Low Status | Extension box I/O channel 9 output status | Lit: High, Extinguished: Low |
| 32 | Extension I/O Box I/O 10 Output Hi/Low Status | Extension box I/O channel 10 output status | Lit: High, Extinguished: Low |
| 33 | Extension I/O Box I/O 11 Output Hi/Low Status | Extension box I/O channel 11 output status | Lit: High, Extinguished: Low |
| 34 | Extension I/O Box I/O 12 Output Hi/Low Status | Extension box I/O channel 12 output status | Lit: High, Extinguished: Low |

| No. | Indicated name | Functional overview | States when set |
|---|---|---|---|
| 35 | Extension I/O Box I/O 13 Output Hi/Low Status | Extension box I/O channel 13 output status | Lit: High, Extinguished: Low |
| 36 | Extension I/O Box I/O 14 Output Hi/Low Status | Extension box I/O channel 14 output status | Lit: High, Extinguished: Low |
| 37 | Extension I/O Box I/O 15 Output Hi/Low Status | Extension box I/O channel 15 output status | Lit: High, Extinguished: Low |
| 38 | Extension I/O Box I/O 16 Output Hi/Low Status | Extension box I/O channel 16 output status | Lit: High, Extinguished: Low |

## 3.3    List of Functions Assigned to Joystick LCD Screen

### 3.3.1    Initial Settings of LCD Display

The table below lists the default indication functions assigned to the LCD screen on the joystick.

In the initial setting, the LCD screen of the joystick has four pages.

| Page | Line | Indicated name | Functional overview |
|---|---|---|---|
| Page 1 | 2nd line | Nosepiece | Information about objectives |
| | 3rd line | Condenser | Information about condensers |
| | 4th line | Optical Path | Information about optical path switching |
| Page 2 | 2nd line | FL1 | Information about FL turret 1 |
| | 3rd line | Inter Mag. | Information about intermediate magnification |
| | 4th line | Bertrand Lens | Information about the Bertrand lens |
| Page 3 | 2nd line | DIC Prism | Information about the DIC slider |
| | 3rd line | DIC Polarizer/Analyzer Slot | Information about the DIC polarizer and analyzer slot |
| | 4th line | ------- | (Nothing is set.) |
| Page 4 | 2nd line | DIA Lamp | Information about LED dia-illumination |
| | 3rd line | C-LEDFI | Information about the Epi-fl LED |
| | 4th line | C-HGFI | Information about the Intensilight |

### 3.3.2    Indication Functions That Can Be Registered

The table below lists the functions that can be assigned to the LCD screen on the joystick.

| No. | Indicated name | Functional overview |
|---|---|---|
| 1 | ------- | (Nothing is set.) |
| 2 | Nosepiece | Information about objectives |
| 3 | Condenser | Information about condensers |
| 4 | FL1 | Information about FL turret 1 |
| 5 | FL2 | Information about FL turret 2 |
| 6 | BA1 | Information about BA filter wheel 1 |
| 7 | BA2 | Information about BA filter wheel 2 |
| 8 | Optical Path | Information about optical path switching |
| 9 | Eyepiece Tubebase | Information about the tube base unit camera port |
| 10 | LAPP Main Branch 1 | Main branch 1 (epi-illumination information) |
| 11 | LAPP Main Branch 2 | Main branch 2 (epi-illumination information) |
| 12 | LAPP Sub Branch | Sub-branch (epi-illumination information) |
| 13 | Shutter | Information about the motorized shutter |
| 14 | DIA Lamp | Information about LED dia-illumination |
| 15 | DIC Prism | Information about the DIC slider |
| 16 | DIC Polarizer/Analyzer Slot | Information about the DIC polarizer and analyzer slot |
| 17 | Inter Mag. | Information about intermediate magnification |
| 18 | Bertrand Lens | Information about the Bertrand lens |
| 19 | C-LEDFI | Information about the Epi-fl LED |
| 20 | C-HGFI | Information about the Intensilight |