M705E 16.12.Nx.3

Nikon

Application for Inverted Research Microscope ECLIPSE Ti2 Series

Ti2Control

Instruction Manual

(for Android)

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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- Although every effort has been made to ensure the accuracy of this manual, errors or inconsistencies might remain. If you notice any points that are unclear or incorrect, please contact your local Nikon representative.
- If you intend to use any other equipment with this product, read the manual for that equipment too.
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment 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 Android.
If you come across unfamiliar terms or operations while reading through this manual, consult the user's manual for your version of smart device.

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Reference data

Reference spectrum data of fluorescence probe in Ti2Control are provided from Takara BIO USA Inc.
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Reference spectrum data of fluorescence probe in Ti2Control are provided from Thermo Fisher Scientific Inc.
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Disclaimer

Nikon shall not be liable for any damage or problems experienced by a user or third-party caused by the use of this software.

Notes on Using “Ti2 Control”

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

1.1 Hardware and Software Requirements

CAUTION

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

CAUTION

When placing a smart device close to the laptop computer, the laptop computer may enter sleep mode depending on the combination of the smart device and the laptop computer.

Item	Specifications
Processor	Compatible with ARM
LAN	Wireless LAN: IEEE802.11ac or IEEE802.11n (IEEE802.11ac is recommended.)
RAM	1 GB or more
Storage	8 GB or more
Resolution (aspect ratio)	Tablet PC: 1920 x 1200 or more (4:3 or 16:10) Smartphone: 640 x 480 or more (4:3 or 16:9)
Recommended device	Nexus9 Nexus6P
Platform	Android OS Ver. 5.1 or later
Remarks	Installer The “Ti2Control” installer program can be downloaded from Google Play. “Ti2Control” is not guaranteed to work with all devices. Please contact your distributor for detailed compatibility information.

1.2 Installing the Application

This section describes how to install the application.

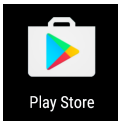
CAUTION

- Install the application before connecting the Ti2 microscope system to a smart device.
- The uninstallation procedure for “Ti2Control” is the same as that for other Android applications.

1.2.1 Installation from the Google Play

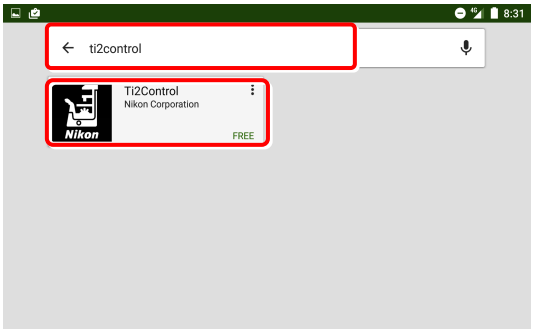
1. **Tap the [Play Store] icon on the device to access Google Play.**

▼ Installation start



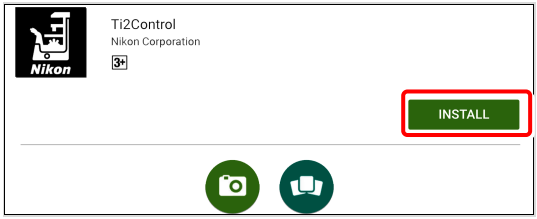
2. **Enter “Ti2 Control” in the search box.**
3. **From the search result, tap this application.**

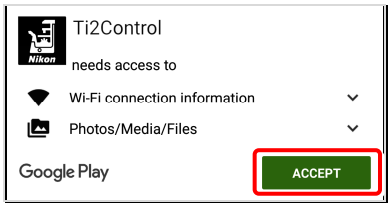
▼ Application search screen

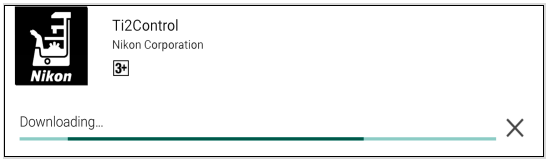


4. **Tap [INSTALL] and then [ACCEPT] to start downloading and installation.**

▼ Installation confirmation screen

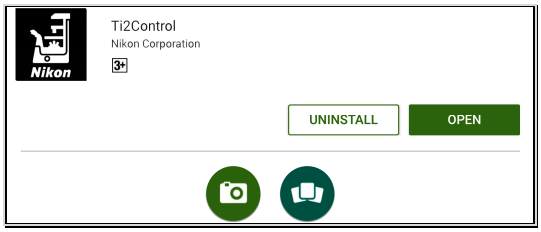






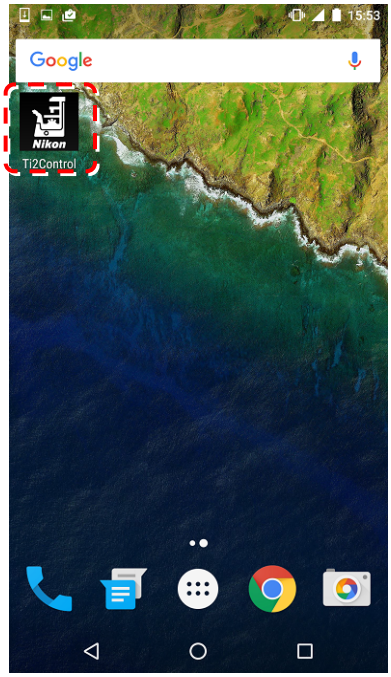
5. After installation is completed, tap [OPEN] to start the application.

▼ Starting the Application



When installation is completed, an icon appears on the home screen.

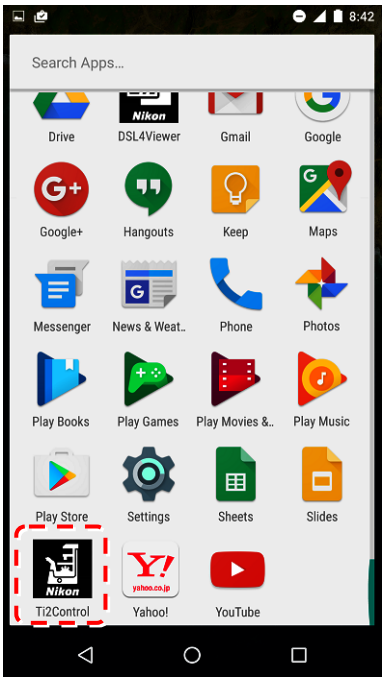
▼ Home screen of Android



If the application's icon does not appear on the home screen, tap the Drawer button. "Ti2Control" is included in the list of applications.

To display the application's icon on the home screen, hold down the "Ti2Control" icon in the list of applications in the Drawer.

▼ Android's drawer screen



1.2.2 Installation without Using Google Paly

Prepare the installer file of “Ti2Control” in your computer.

For details on how to obtain the installer, contact your local Nikon representative.

Preparation

1. Tap the [Settings] icon on the device.

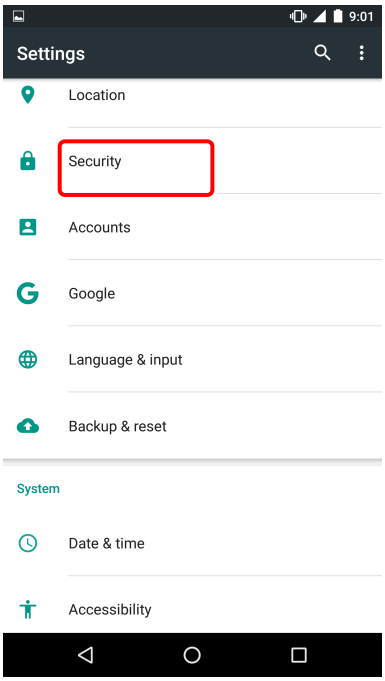
The settings screen is displayed.

▼ Preparation

2. Tap the [Security].

Security screen is displayed.

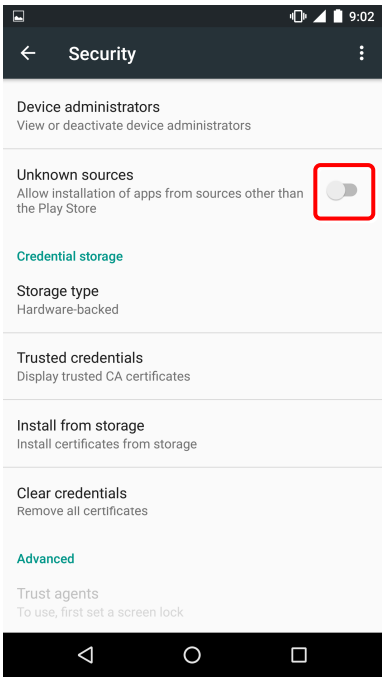
▼ Settings screen



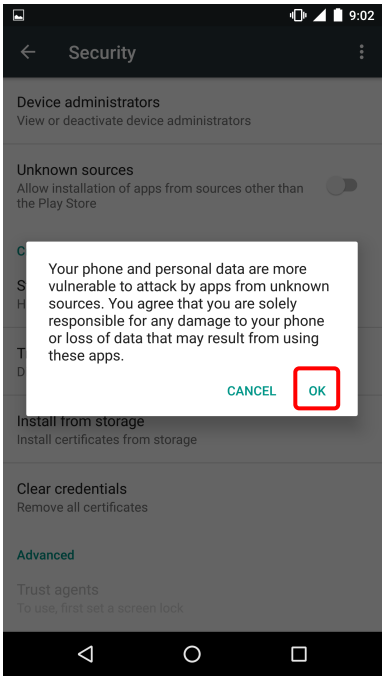
3. Turn on the [Unknown sources] switch.

The warning screen is displayed.

▼ Security screen

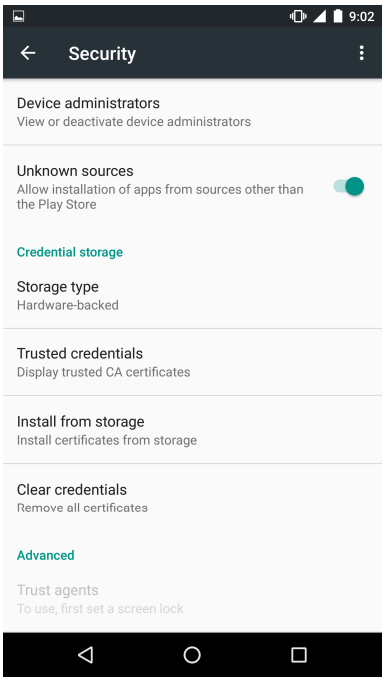


4. Tap [OK].



The [Unknown sources] switch is turned on.

This completes the preparation for the installation.



Installation of the application

> **CAUTION**
> - To install the application, a file management application (file manager) is required.
> Use a file management application (file manager) supplied with your smart device.
> - When using a Nexus series, which does not have file manager, use a free file management application for Android.

1. **Connect a smart device and the computer using a USB cable.**

   The smart device is recognized as storage from the computer.

2. **Access the smart device from the computer, and copy the installer file (*.apk) to the smart device.**

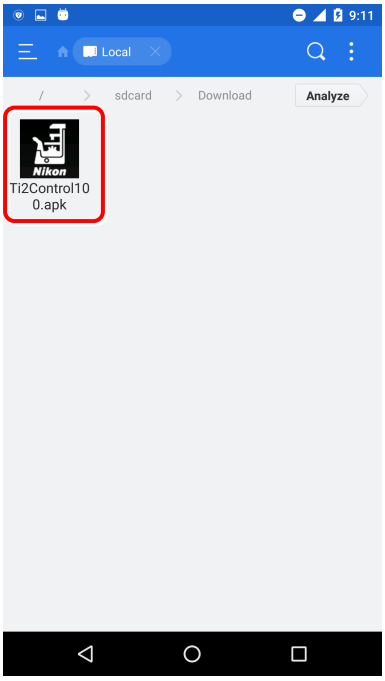
3. **Start the file manager on the smart device, and display the folder in which a copied installer is saved.**

   The free management file “ES file explorer” for Android is used as an example here.

4. **Tap the installer.**

   Properties screen is displayed.

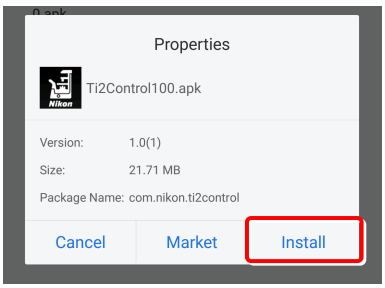
▼ Installation starts.



5. **Tap [Install].**

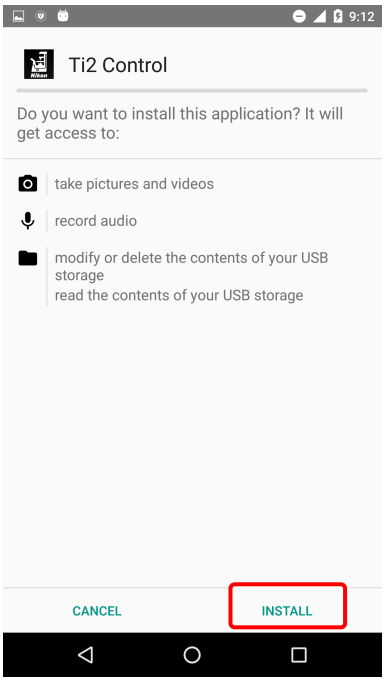
   Confirmation message is displayed.

▼ Properties



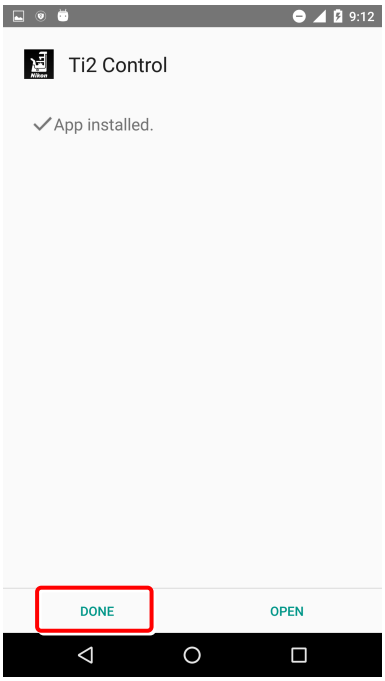
6. Tap [INSTALL].

▼ Installation starts



7. When the installation is complete, tap [DONE].

▼ Installation is complete



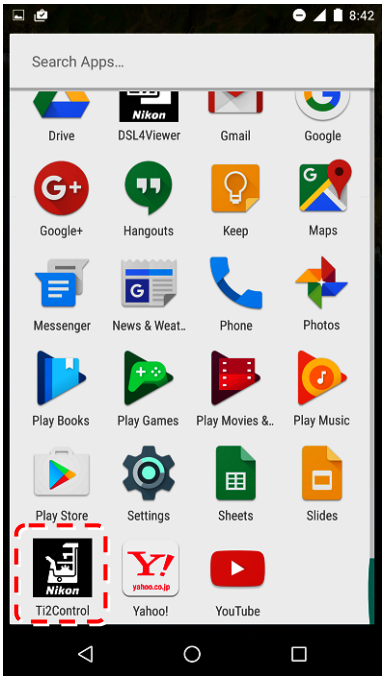
When installation is complete, an icon appears on the home screen.

▼ **Home screen of Android**

If the application's icon does not appear on the home screen, tap the Drawer button. "Ti2 Control" is included in the list of applications.

To display the application's icon on the home screen, hold down the "Ti2 Control" icon in the list of applications in the Drawer.

▼ **Android's drawer screen**



This completes the installation of "Ti2Control."

1.3 Starting the Application

This section describes how to start the application.

> **CAUTION**
>
> Using a certain Android device with mobile data and Wi-Fi data communications enabled may disconnect the connection to the Wi-Fi router not connecting to the internet.
>
> Turn off the mobile data communication of the device before using the Ti2Control.

1.3.1 Starting the Application

1. Tap the icon of the application on the home screen of the device.

"Ti2Control" starts.

> **CAUTION**
>
> For initial setup of a microscope system, use the device in landscape orientation.

> **CAUTION**
>
> If the Ti2Control screen is displayed again after recovering from the sleep or the suspend mode, or switching back from other application, the last-used screen is not displayed.
>
> Note that the Home screen of the Ti2Control is displayed instead, and the settings in the last-used screen are lost.

▼ Starting the application

1.4 Connecting the Microscope System to the LAN

After the “Ti2 Control” application installation, connect the microscope system to a wireless LAN router using a LAN cable.

Connect 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) to the LAN to enable communications between the microscope system and the smart device which is connected to the LAN via the Wi-Fi router (wireless LAN router).

> **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.

For how to connect the cable, see the Inverted Research Microscope ECLIPSE Ti2-E and Ti2-E/B Instruction Manual, or the Inverted Research Microscope ECLIPSE Ti2-A Instruction Manual.

1.4.1 Accessing the Microscope from the Device

Access the microscope system via the wireless LAN router.

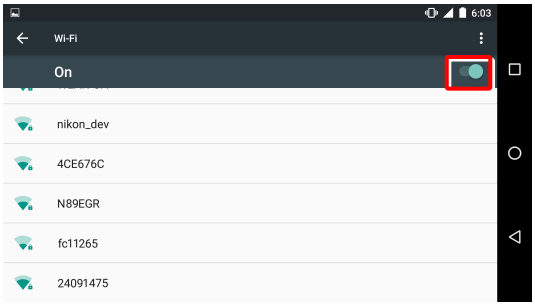
1. **Set the device's Wi-Fi setting to ON.**

   On the device, select [Settings], [Wireless and network], [Wi-Fi settings], and then set ON.

   The device will display a list of available networks.

2. **In the list of available networks, tap the wireless router to be connected to the microscope system to complete the connection.**

▼ Wi-Fi setting screen



3. **Tap the “Ti2 Control” app icon to start the application.**

▼ Starting “Ti2 Control”

The application start screen is displayed, after which the “Ti2 Control” home screen is displayed.

▼ “Ti2 Control” home screen

The “Ti2 Control” application is now ready for use.

> **CAUTION**
> To connect more than one microscope to a single wireless router, see “Multiple microscope systems are connected to a single wireless router“ in “1.4.2 Connection Procedure for Each Combination of Wireless Router and Microscope System.”

1.4.2 Connection Procedure for Each Combination of Wireless Router and Microscope System

The connection procedure differs depending on the combination of wireless router and microscope system.

A single microscope system is connected to a single wireless router

1. Tap [Settings], and then [Wi-Fi] to connect to the wireless router.

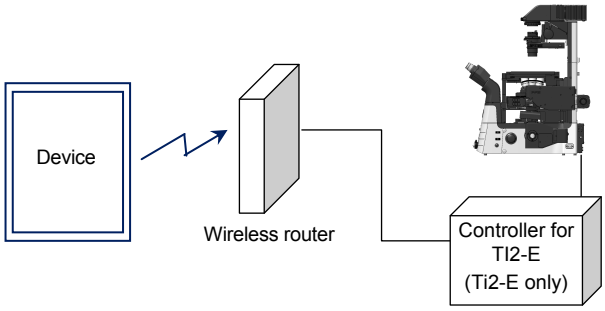
For how to connect to the wireless router, see "1.4.1 Accessing the Microscope from the Device."

2. Start the "Ti2 Control" application.

"Ti2 Control" will be connected to the microscope automatically.

If the connected microscope is already registered, operation from the device is now enabled.

▼ Connection diagram



Multiple microscope systems are connected to a single wireless router

> **CAUTION**
> When more than one microscope system is to be connected to a single wireless router, connect and configure each microscope individually.

1. Tap [Settings], and then [Wi-Fi] to connect to the wireless router.

For how to connect to the wireless router, see "1.4.1 Accessing the Microscope from the Device."

2. Start the "Ti2 Control" application.

When more than one microscope is connected to the wireless router, tap [⚙] in the upper right corner of the "Ti2 Control" application, [General], [LAN], and then [IP (Mic.)] to display a list of connected microscopes.

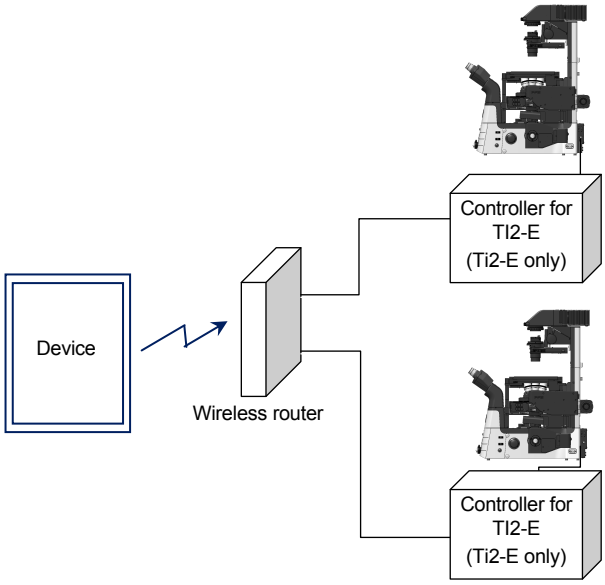
3. Select the IP address of the microscope and tap [OK].

If the connected microscope is already registered, operation from the device is now enabled.

4. To configure the next microscope, tap [⚙] in the upper right corner of the "Ti2 Control" application, and then [General] to register the microscope system and repeat steps 1 to 3.

For how to register a microscope system, see "2.2.2 Registering the Microscope System."

▼ Connection diagram



A single microscope is connected respectively to each wireless router

1. **Tap [Settings], and then [Wi-Fi] to connect to the wireless router.**

   Configure each wireless router that is connected to a microscope system via a cable.

   For how to connect to a wireless router, see “1.4.1 Accessing the Microscope from the Device.”

2. **Start the “Ti2 Control” application.**

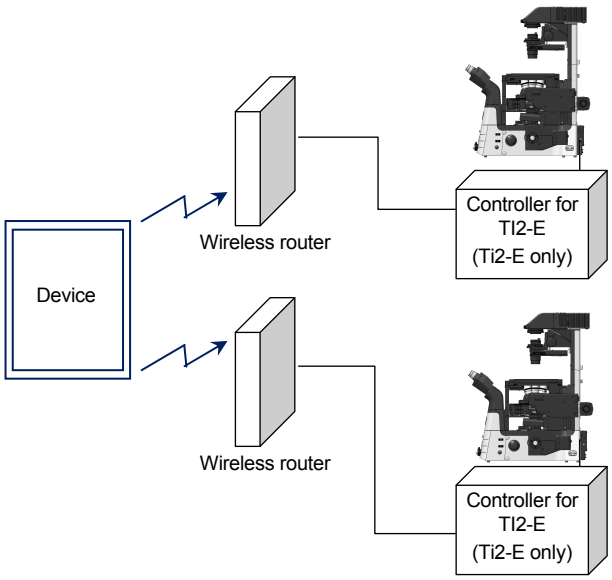
   “Ti2 Control” connects to the microscope automatically.

   If the connected microscope is already registered, operation from the device is now enabled.

3. **To make a connection setting for the next microscope, tap [⚙] in the upper right corner of the “Ti2 Control” application, and then [General] to register the microscope system. Then, repeat steps 1 and 2.**

   For how to register a microscope system, see “2.2.2 Registering the Microscope System.”

▼ Connection diagram



Multiple microscope systems are connected to each wireless router

1. **Tap [Settings], and then [Wi-Fi] to connect to the wireless router.**

   Make settings for each wireless router which is connected to a microscope system via a cable.

   For how to connect to the wireless router, see “1.4.1 Accessing the Microscope from the Device.”

2. **Start the “Ti2 Control” application.**

   When more than one microscope is connected to the wireless router, tap [⚙], [General], [LAN], and then [IP (Mic.)] to display a list of connected microscopes.

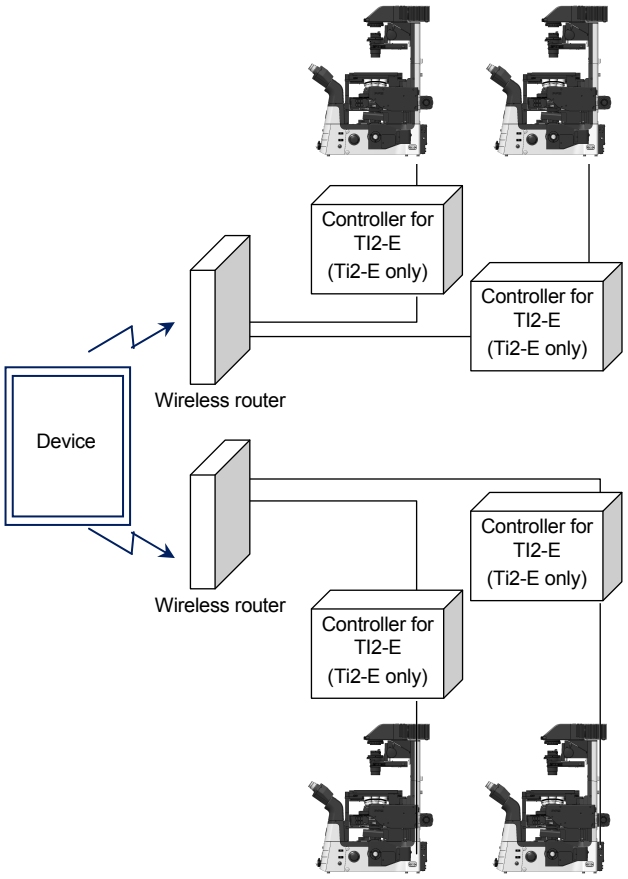
3. **Select the microscope to be connected and tap [OK].**

   If the connected microscope is already registered, operation from the device is now enabled.

4. **To configure the next microscope, tap [⚙] in the upper right corner of the “Ti2 Control” application, and then [General] to register the microscope system. Then, repeat steps 1 to 3.**

   For how to register a microscope system, see “2.2.2 Registering the Microscope System.”

▼ Connection diagram



1.5 Functional Configuration of the Application

This application consists of five screens:

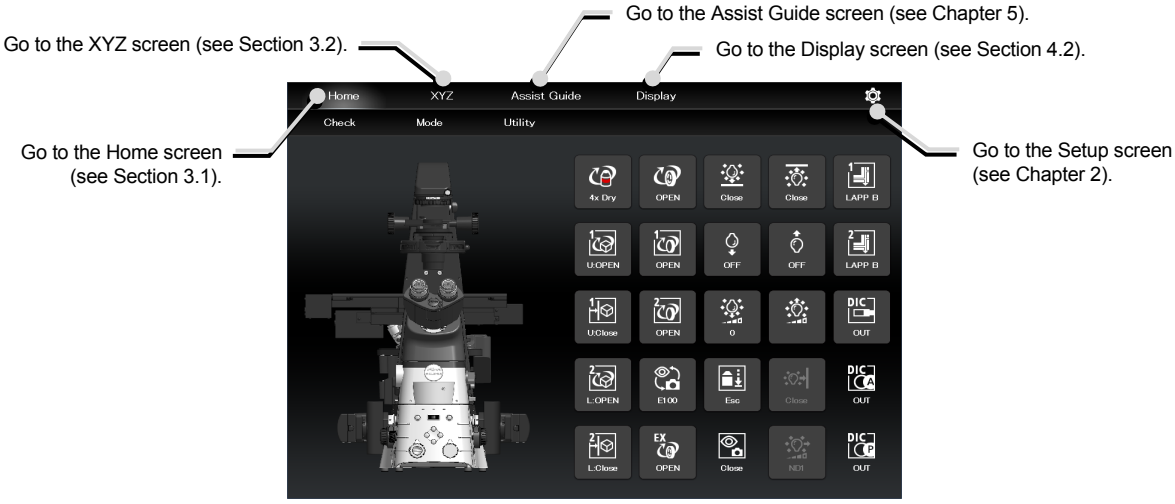
Home: Used to control the microscope.
(This function is available only for the Ti2-E. The home screen displays only the microscope status when the Ti2-A is connected.)
(See “3.1 Remote Control of the Ti2-E Microscope (Home Screen).”)

XYZ: Used to control the motorized stage (XY stage) and the focusing device (Z stage) of the microscope.
(This function is available only for the Ti2-E. The XYZ screen displays only “Live” when the Ti2-A is connected.)
(See “3.2 XYZ Control (XYZ Screen): Ti2-E Only.”)

Assist Guide: Used to display a guide for optimum setup of the microscope.
(See “Chapter 5 How to Use the Assist Guide.”)

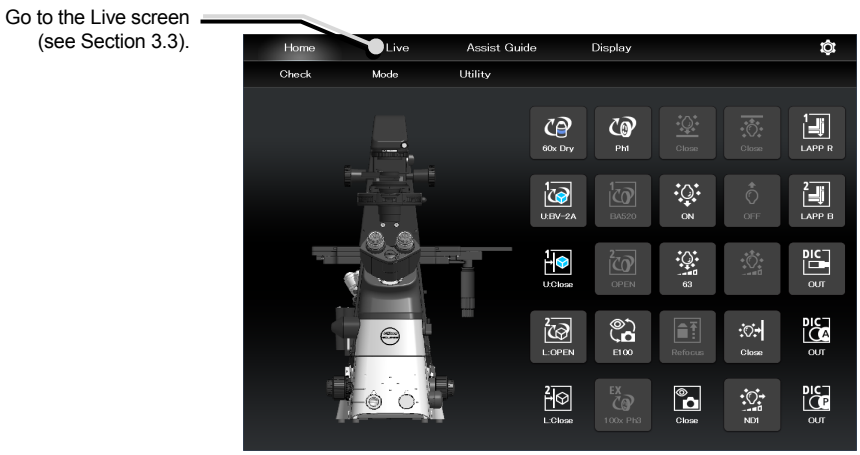
Display: Used to arrange remote control buttons. (This function is available only for the Ti2-E.)
(See “4.2 Layout of the Remote Control Button Area.”)

(Setup): Used to set up the microscope.
(See “Chapter 2 Setup.”)



Screen when the Ti2-E is connected

Live: Used to display the images of the assist camera.
(See 3.3 Live Screen: Ti2-A Only.)



Screen when the Ti2-A is connected

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.

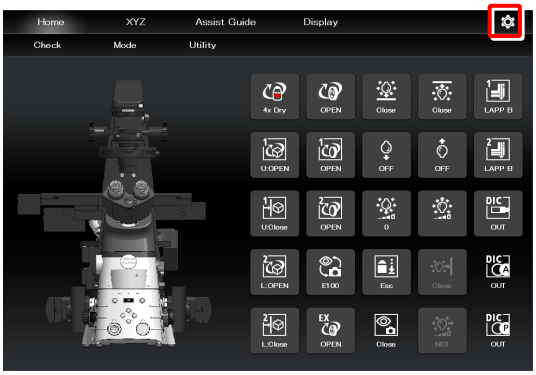
> **CAUTION**
> When more than one microscope system is connected to a single wireless router, connect and configure each microscope system individually.

2.1 Basic Setup Operations and Screens

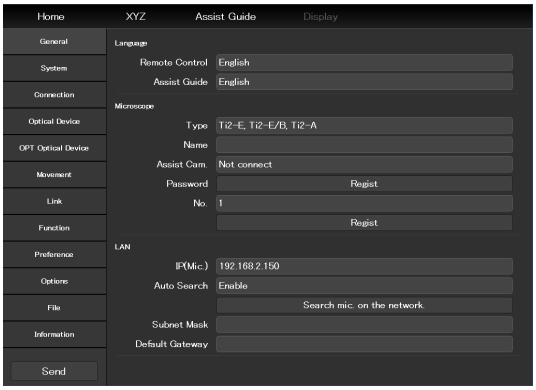
2.1.1 Starting the Setup

Tap [⚙] on the home screen or the XYZ screen (Live screen in case of the Ti2-A) to open the setup screen.

▼ **Starting the setup**



▼ **Setup screen**



2.1.2 Configuration of the Setup Screen

■ **Setting item selection area**

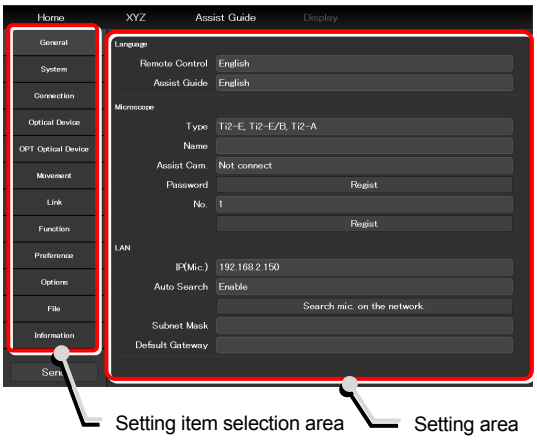
Tap each button to change a setting item.

■ **Setting area**

Tap 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**

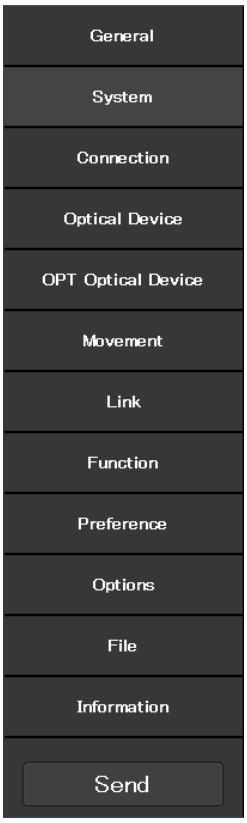


2.1.3 Setting Items

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 the movement
- [Link]: Settings of linked control
- [Function]: Assignment of functions
- [Preference]: Settings of the assist camera
- [Options]: Settings of the motorized devices
- [File]: Saving and reading of settings
- [Information]: Display of the version information
- [Send] button: Transmission the setting information to the microscope system

▼ Setting items

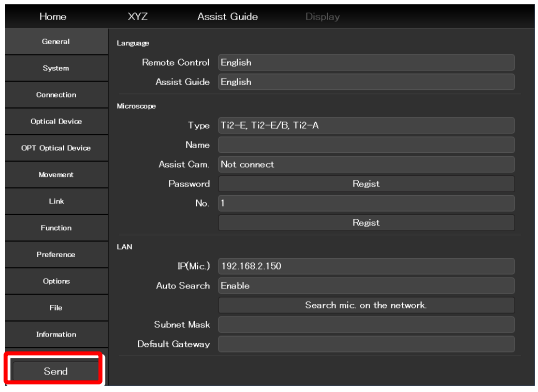


2.1.4 Sending Microscope System Information

■ Sending information to the microscope system

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

▼ Setup screen

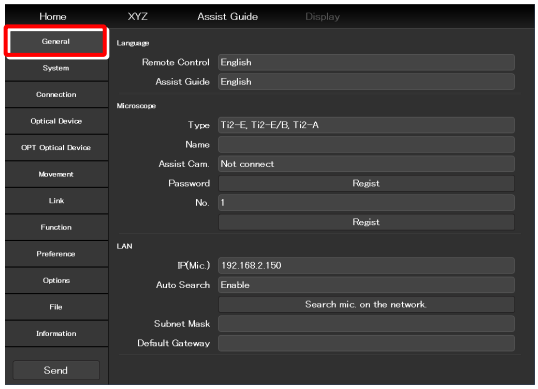


2.2 [General]: Basic Settings of the Microscope and the Application

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

1. Select [General] on 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.

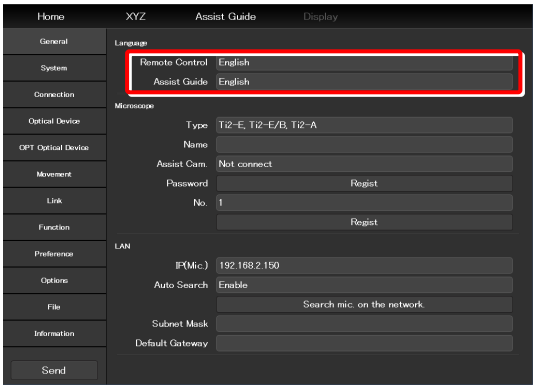
Remote Control:

Select the language used on the setting screens.

Assist Guide:

Select the language used in the Assist Guide.

▼ 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 registered name of the microscope system.

Assist Cam.:

Tap the box to display a list of MAC addresses of the assist cameras.
Tap 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, never fail 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 [ ] is tapped to access the microscope on a device 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 device side.

No.:

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

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

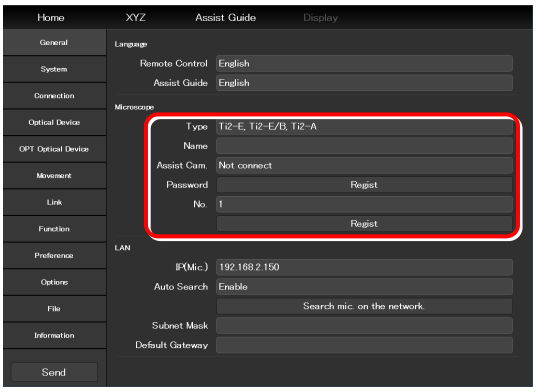
Regist button:

Tap 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



2.2.3 Setting the LAN

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

IP (Mic.):

Displays the IP address of the microscope.

If more than one microscope is connected, a list of microscopes will be displayed when the box is tapped. Select the IP address of the microscope to be used.

Auto Search:

Sets whether to automatically search the network for the IP address of the microscope and connect to the network upon “Ti2 Control” startup.
(Enable: Automatically connected)

If more than one microscope is connected, all the microscopes connected to the network are displayed. Select the IP address of the microscope to be used.

Search mic. on the network:

If more than one microscope is connected, all the microscopes connected to the network are searched for. Select the IP address of the microscope to be used.

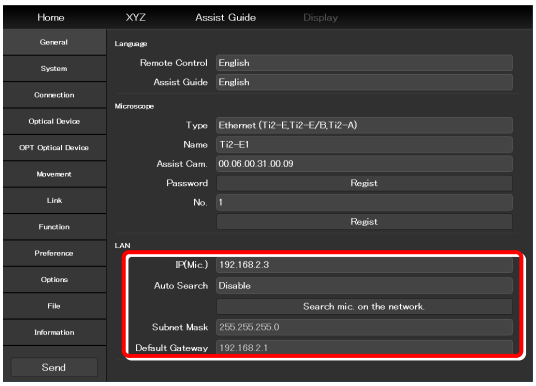
Subnet Mask:

Displays the subnet mask of the microscope.

Default Gateway:

Displays the default gateway of the microscope.

▼ Setting the LAN



CAUTION

Connection to the microscope or the assist camera may not be possible from the application depending on the wireless router (Wi-Fi) or the smart device in use.

In this case, close the application and perform the following procedure.

- On the Android device, tap [Settings], and then [Wi-Fi] to turn off the Wi-Fi. Then turn on [Wi-Fi] to connect to the wireless router.
- Restart the microscope system.

After performing the above procedure, start up the application again, and check that it can be connected to the microscope or the camera.

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

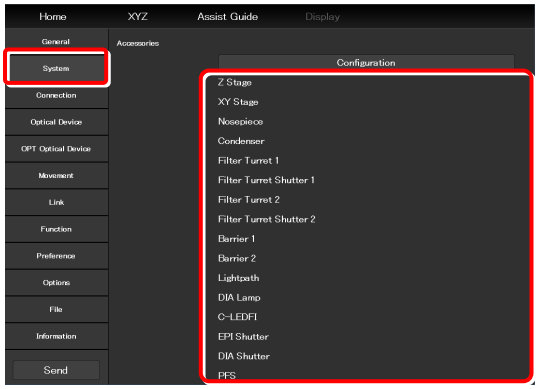
Tapping [System] displays a list of accessories mounted on the microscope system.

1. Select [System] on 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.

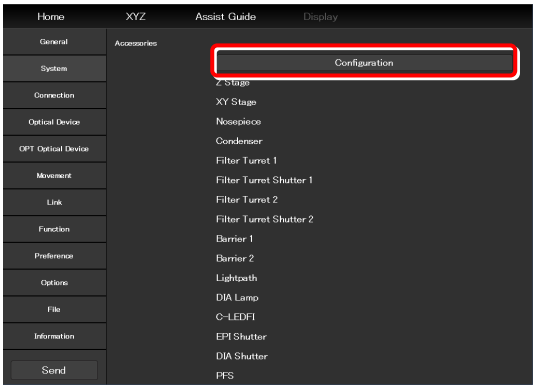
1) Disconnect the cable coming from the dia-illumination unit from the connector box on the rear surface of the microscope main body.
2) Specify [D-LH/LC Precentered Lamphouse] for the [DIA_Lamp] in the microscope configuration setting screen for manual configuration, of TI2Control.
3) Tap the [Send] 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. Tap [Configuration] in the setting item selection area.

A microscope configuration setting screen will be displayed.

▼ Manually registering the microscope configuration



2. Tap 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, tap [Stage up] to change the configuration shown in the application to the state-up configuration.

3. Tap 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. Tap [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. Tap [TOP] to register an accessory for another parts area.

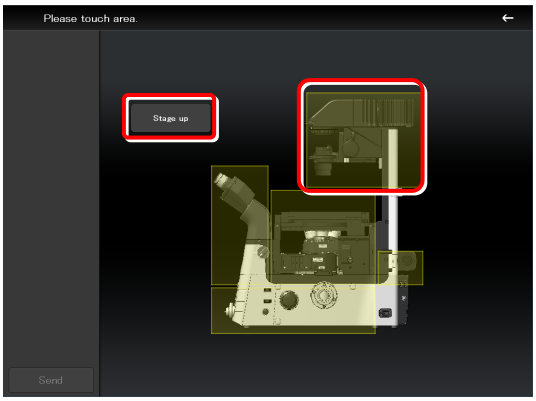
The screen will be returned to the microscope configuration setting screen.

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

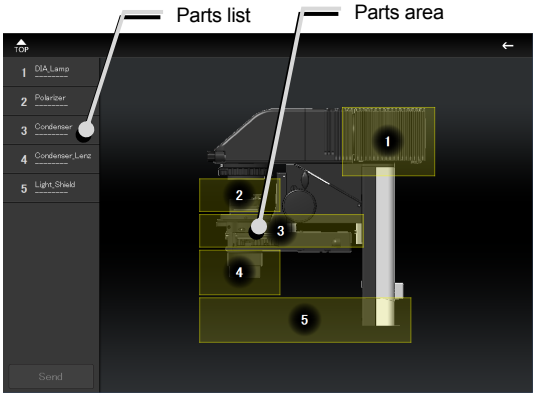
8. To finish manual registration of a microscope configuration, tap [Send] to send the registration information or tap [←].

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

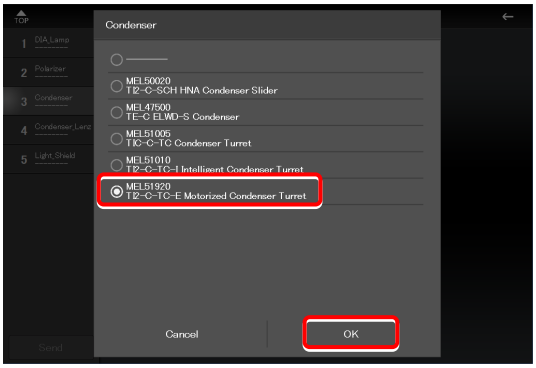
▼ Microscope configuration setting screen



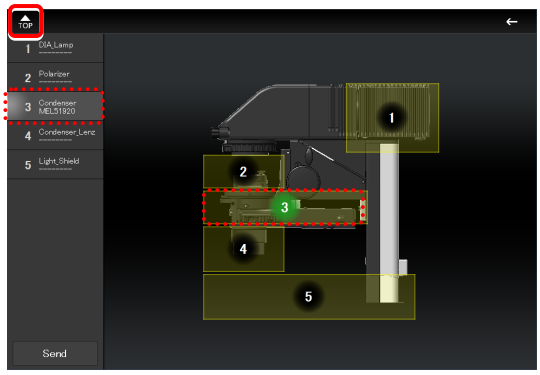
▼ Per-area registration screen



▼ Product list dialog



▼ Per-area registration screen



When using epi-illumination

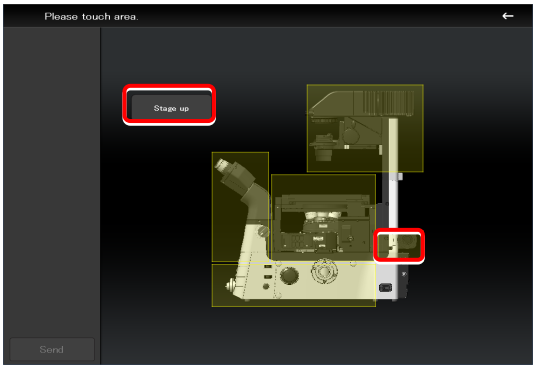
Tap the area that includes the epi-illumination attachment.

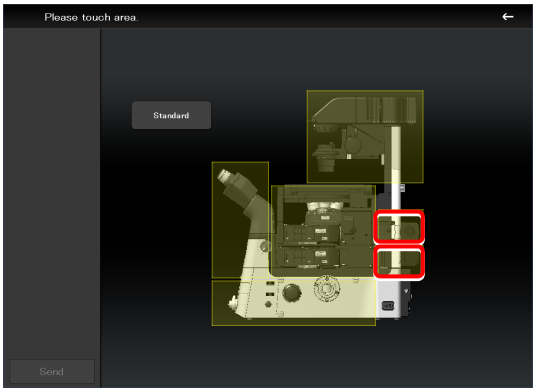
The registration screen for the epi-illumination attachment will be displayed.

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

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

▼ Registering an epi-illumination attachment





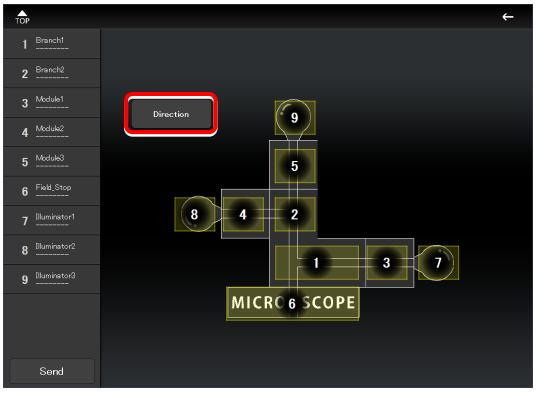
In a two-tier configuration, the upper and lower epi-illumination attachments are mounted in opposite directions. However, the application shows the two epi-illumination attachments in the same orientation.

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

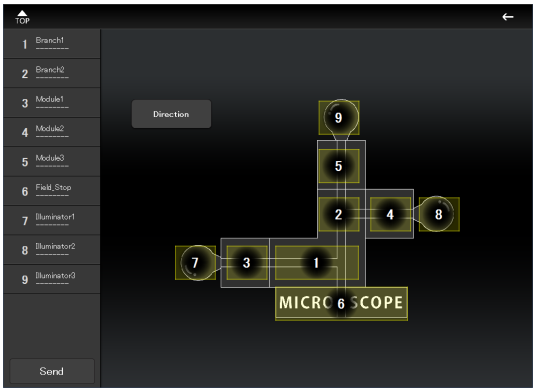
Select the epi-illumination attachment which is shown in the orientation opposite to the actual one.

Tap [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



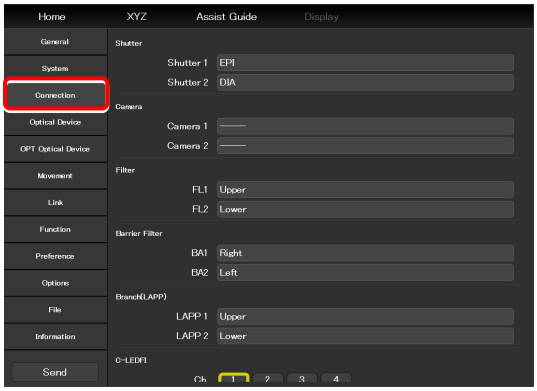
2.4 [Connection]: Setting the Connection Destinations of Devices

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] field.

Shutter 1:

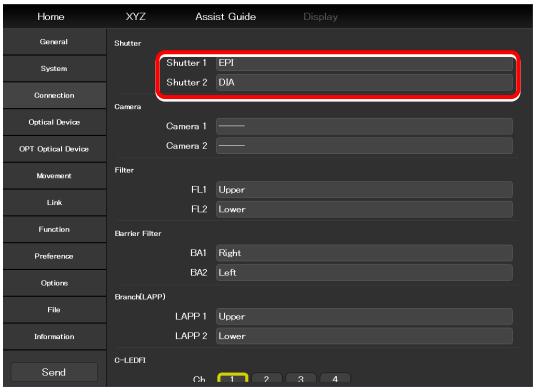
Select the mounting destination of the motorized shutter.
If no motorized shutter is mounted, select [---].

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.

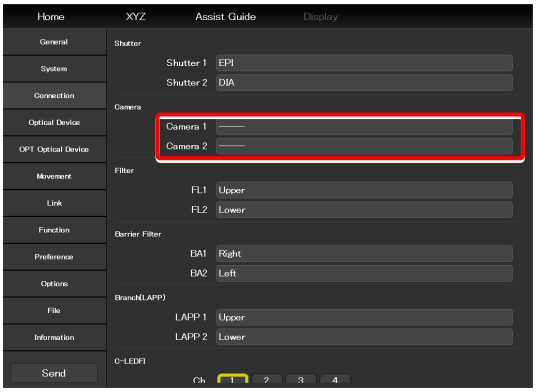
Camera 1:

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, upper tier or lower tier.

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

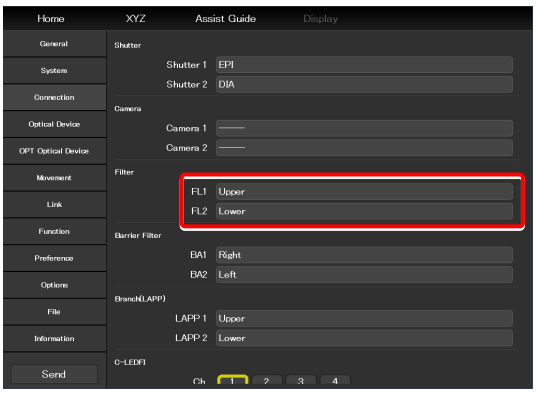
FL1:

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

FL2:

Select the location 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.

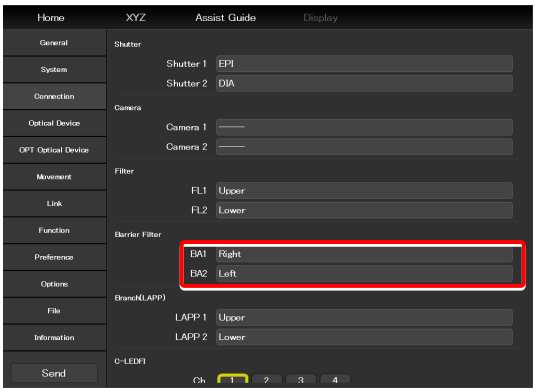
BA1:

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.

2. Set the following items in the [Branch(LAPP)Barrier Filter] field.

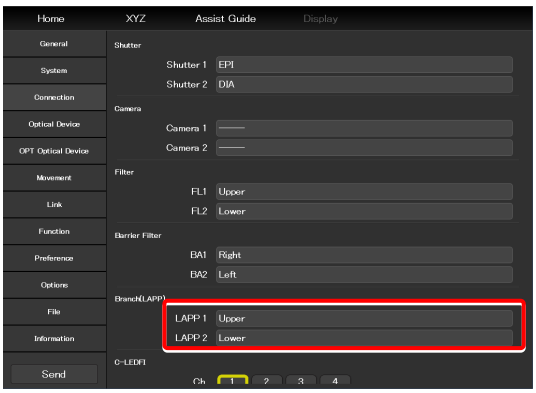
LAPP1:

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.

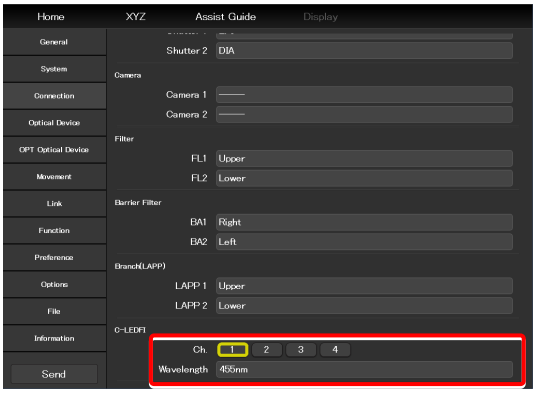
Channel:

Select the channel number of the LED.

Wavelength:

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

▼ Setting the C-LEDFI



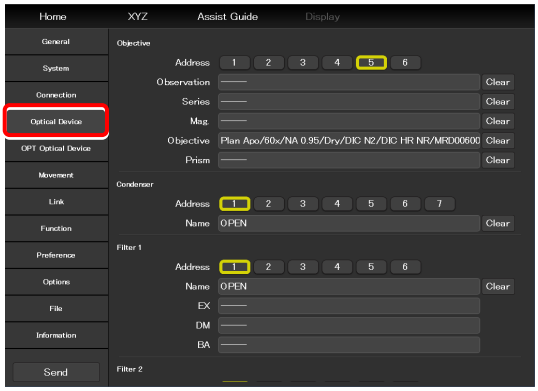
2.5 [Optical Device]: Setting the Optical Devices

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



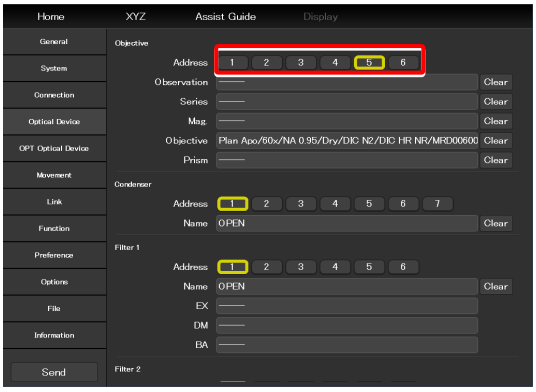
2.5.1 Setting the Nosepiece

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 “---”.)

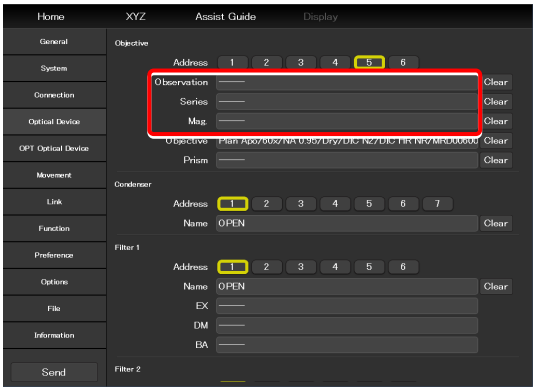
Series:

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 “---”.)

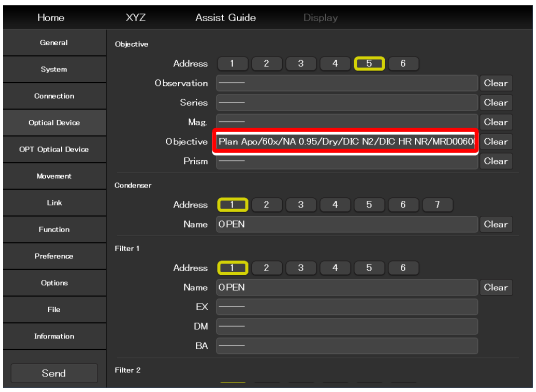
▼ Setting the nosepiece



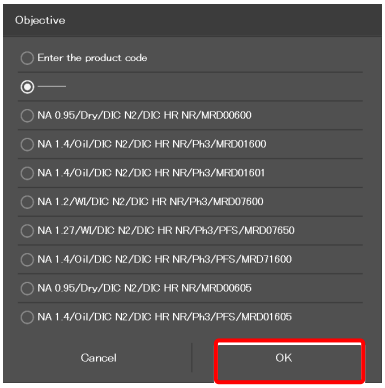
3. Tap the [Objective] field, select the target objective from the list or enter the product code, and tap [OK].

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

▼ **Setting the nosepiece**



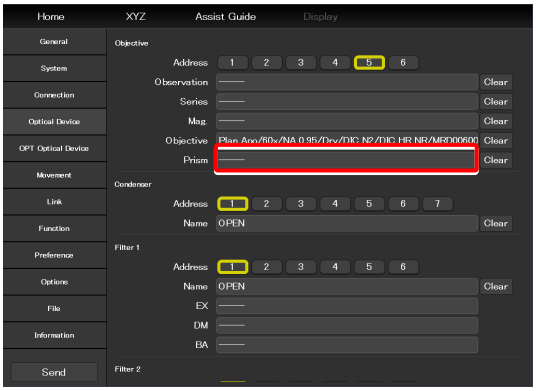
▼ **List of objectives**



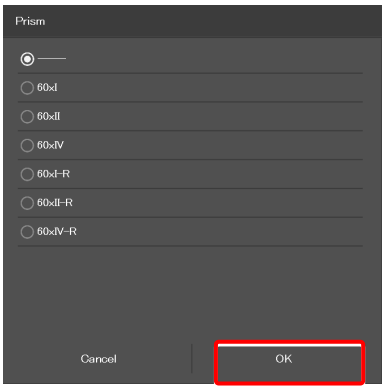
4. For DIC objectives, tap the [Prism] field, select the required objective-side DIC prism from the list, and tap [OK].

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

▼ **Setting the nosepiece**



▼ **List of prisms**



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:

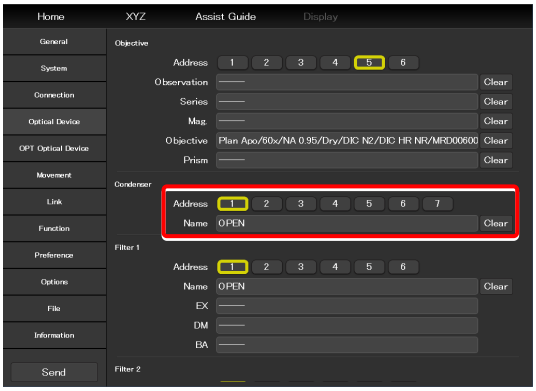
Select the address of the condenser turret for which condenser module information is to be set.

Name:

Select a condenser module name.

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

▼ 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:

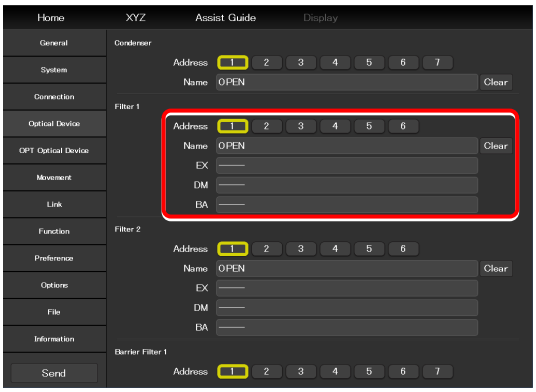
Displays the name of the dichroic mirror.

BA:

Displays the name of the BA filter.

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

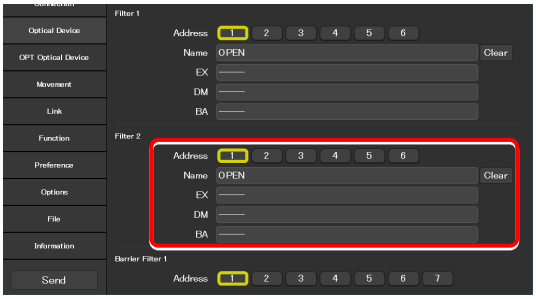
▼ Setting the filter cube



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.

▼ For the second FL turret



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:

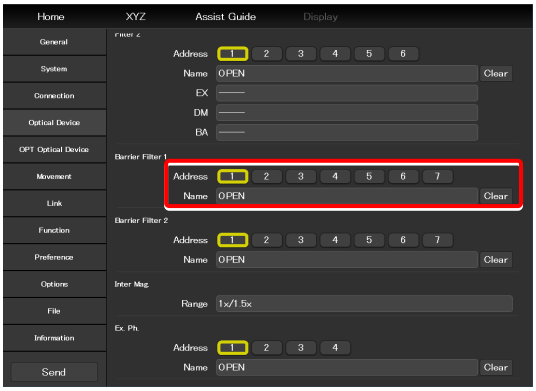
   Select the address of the BA filter wheel for which BA filter information is to be set.

   Name:

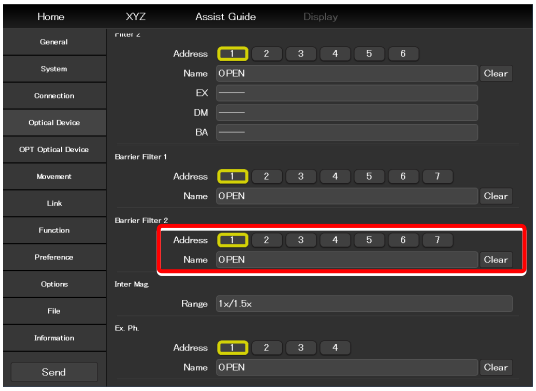
   Select a BA filter name.

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

▼ Setting barrier filter 1



▼ For the second BA filter wheel



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.

2.5.5 Setting the Intermediate Magnification

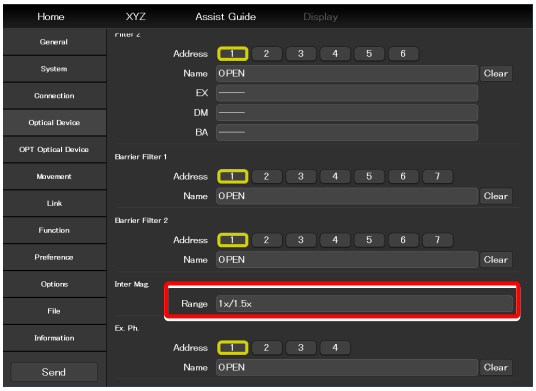
Set the intermediate magnification.

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



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:

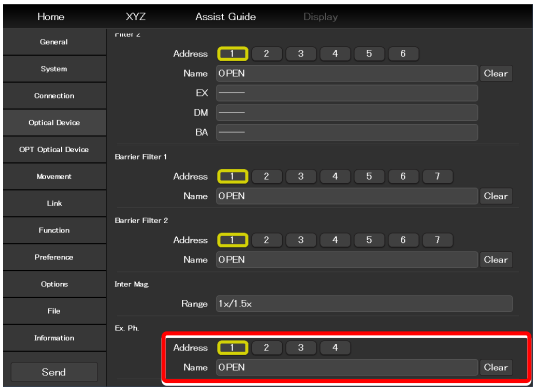
Select the address of the turret for which external phase ring information is to be set.

Name:

Select an external phase ring name.

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

▼ Setting the external phase ring



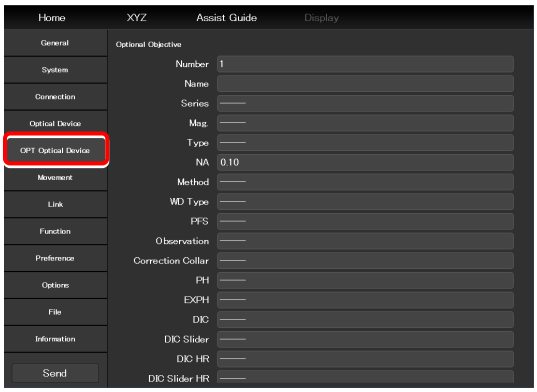
2.6 [OPT Optical Device]: Registering a New Optical Device

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



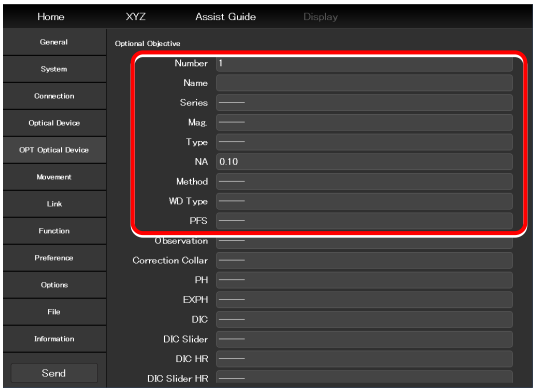
2.6.1 Registering a New Objective

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.

▼ Registering a new objective



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.

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 prism.

DIC HR:

Select a high-resolution DIC prism type.

DIC Slider HR:

Select a high-resolution objective-side DIC prism.

DF:

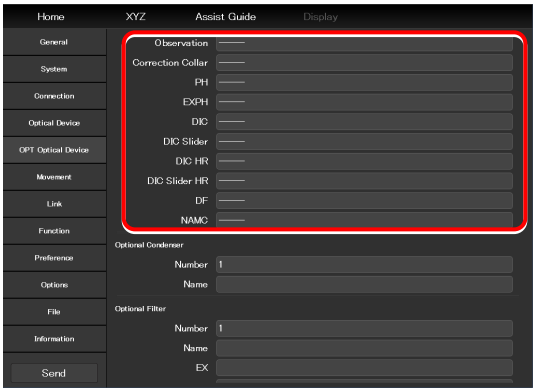
For an objective for DF microscopy, select a corresponding condenser module.

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 above.**

▼ 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:

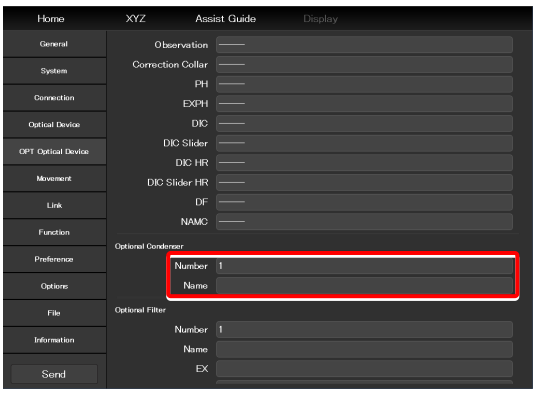
Select a number with which a new condenser module is to be registered.

Name:

Specify a name.

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

▼ Registering a new condenser module



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.

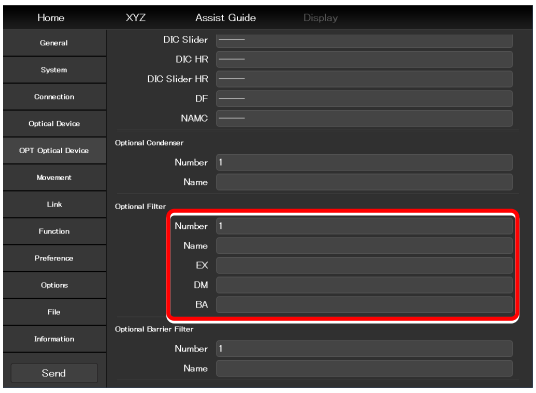
BA:

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:

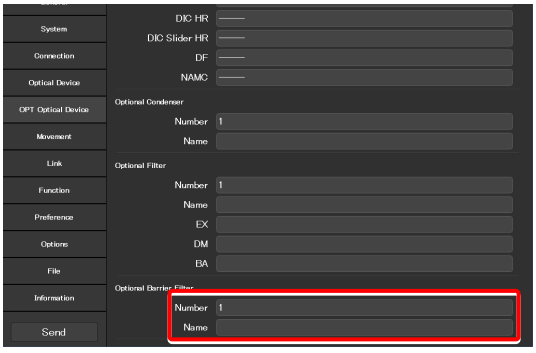
Select a number with which a new BA filter is to be registered.

Name:

Specify a name.

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

▼ Registering a new BA filter



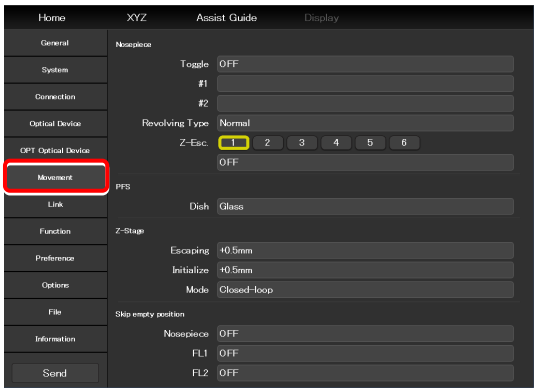
2.7 [Movement]: Setting the Movement: Ti2-E Only

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

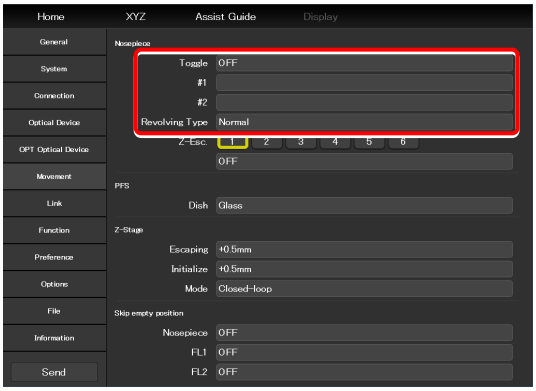


2.7.1 Setting the Motorized Nosepiece

Set the movement of the motorized nosepiece.

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

▼ Setting the motorized nosepiece



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.

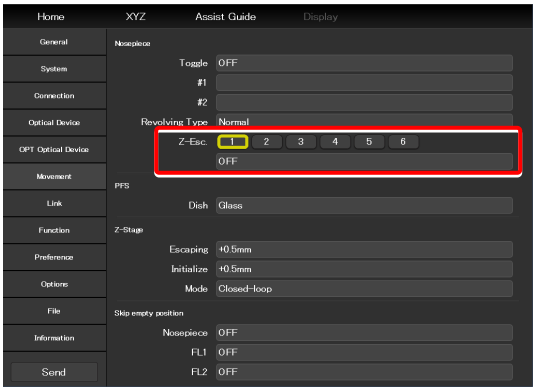
Normal:	Normal operation pattern
Shuttle:	The nosepiece moves from 1 to 6 (or 6 to 1) via all addresses.
MEP59396:	This is selected automatically when a motorized nosepiece of the motorized correction collar type is used.

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

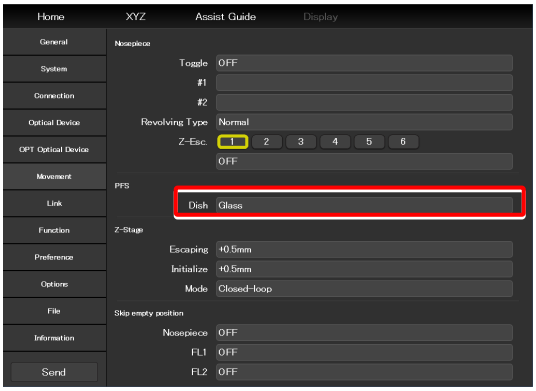
Set the type of the dish observed using the PFS.

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.

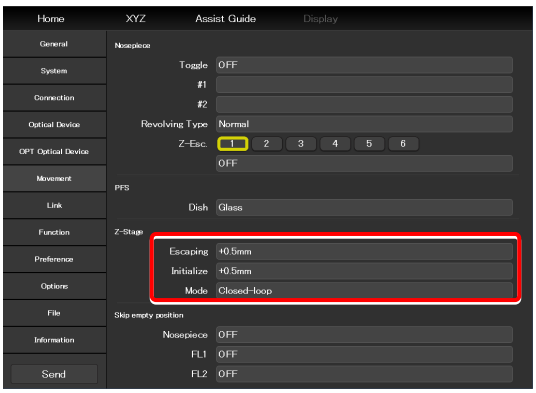
Initialize:

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



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:

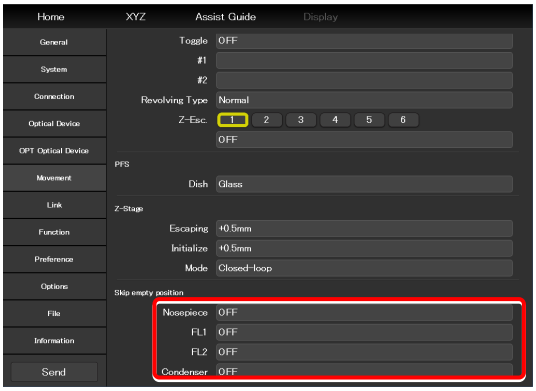
(Only when there is a second FL turret)

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



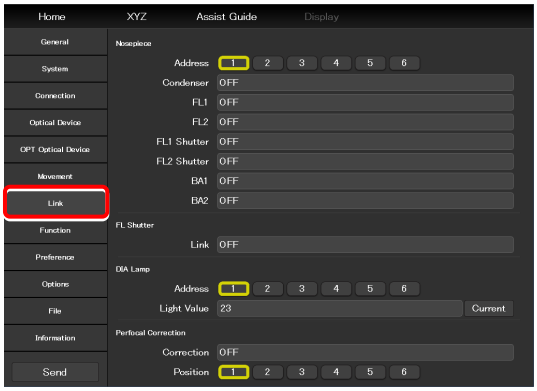
2.8 [Link]: Setting the Linking Function: Ti2-E Only

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:

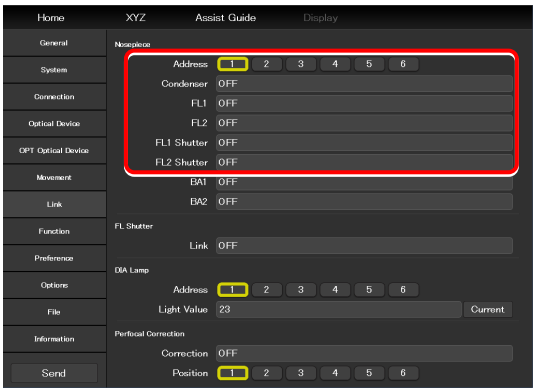
Select the state of the shutter of FL turret 1 to be linked when the objective is switched.

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.

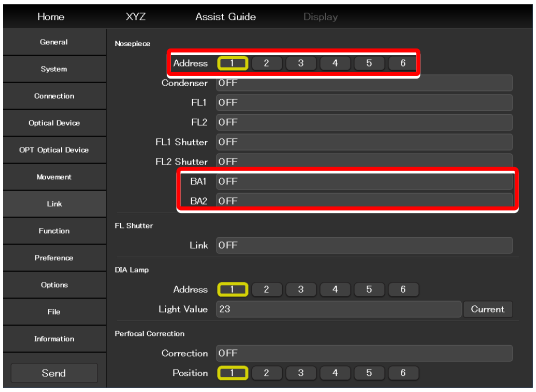
BA2:

(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

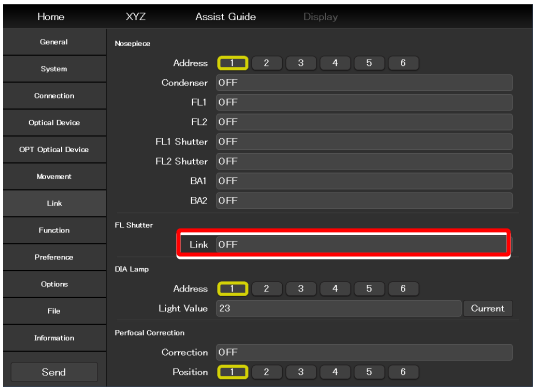
Specify whether the shutter in the FL turret is to be linked when the objective is switched.

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.

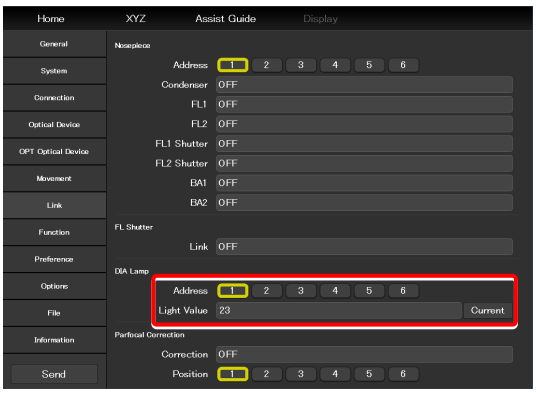
Light Value:

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.**

   Address:

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

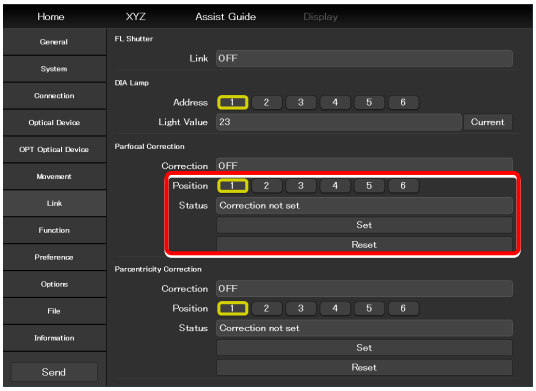
   Status:

   Indicates whether correction of the objective is set or not.

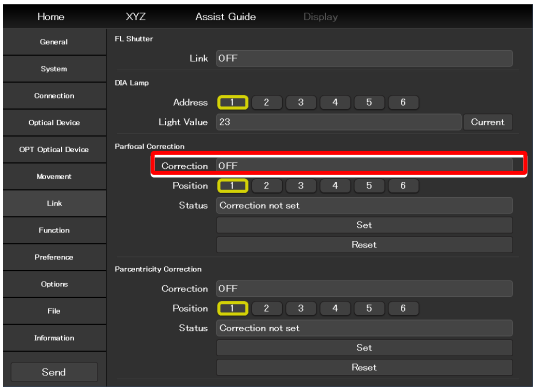
2. **Change the current objective to the maximum magnification objective on the microscope main body.**
3. **Focus on the specimen on the microscope main body.**
4. **Tap [Set].**
5. **Repeat steps 1 to 4 to set the focal position for all addresses.**
6. **Tap [Correction] to enable or disable the parfocal correction.**

> **SUPPLEMENTAL REMARKS**
>
> The coordinates set here are displayed on the [Coordinates] field of the XYZ screen. Tap [Move] to move the focusing device (Z-stage) to this position.

▼ 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.**

   Address:

   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.

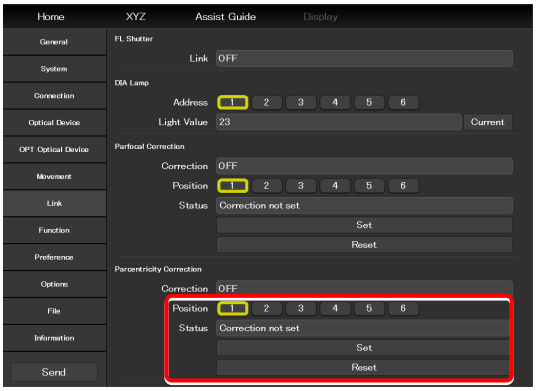
4. **Tap [Set].**

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

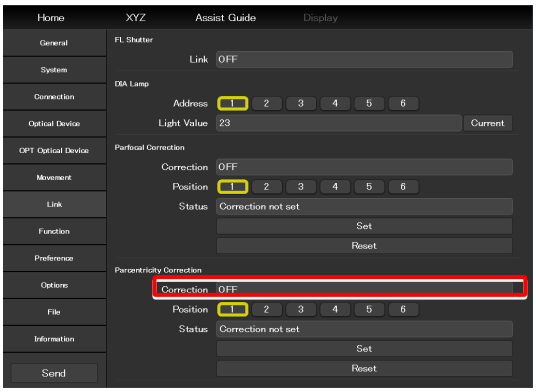
6. **Tap [Correction] to enable or disable the parcentricity correction.**

> **SUPPLEMENTAL REMARKS**
>
> The coordinates set here are displayed on the [Coordinates] field of the XYZ screen. Tap [Move] to move the XY-stage to this position.

▼ **Setting the parcentricity correction**



▼ **Setting the parcentricity correction**



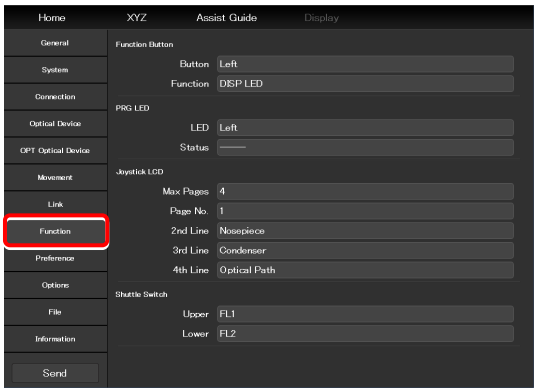
2.9 [Function]: Assigning Functions: Ti2-E Only

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.

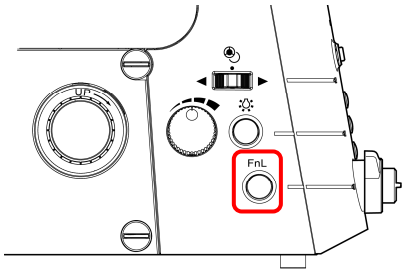
The function setting screen appears.

▼ Assigning functions

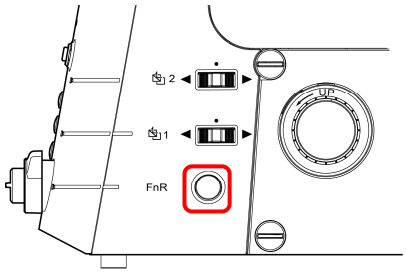


2.9.1 Setting the Function Buttons

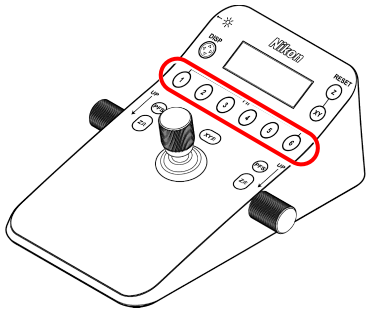
Assign functions to the function buttons (FnL and FnR buttons on the operation panels on the right and left sides) on the Ti2-E microscope main body, and the function buttons of the joystick.



Left operation panel



Right operation panel



Joystick

1. Set the following items in the [Function Button] field.

Function Button:

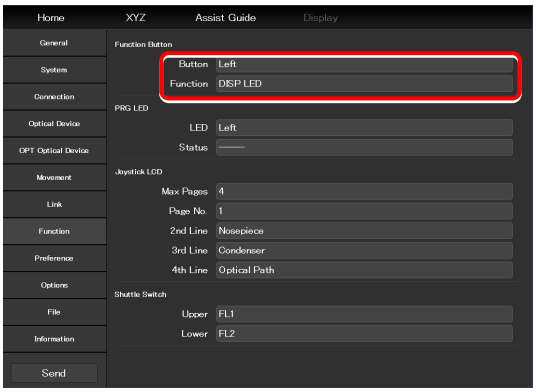
Select the position of the target function button on the microscope main body or the joystick.

Function:

Select the function to be assigned.

For the assignable functions, see “6.1 List of Functions Assigned to Function Buttons.”

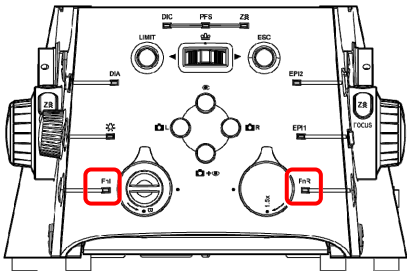
▼ Setting the function buttons of the microscope



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:

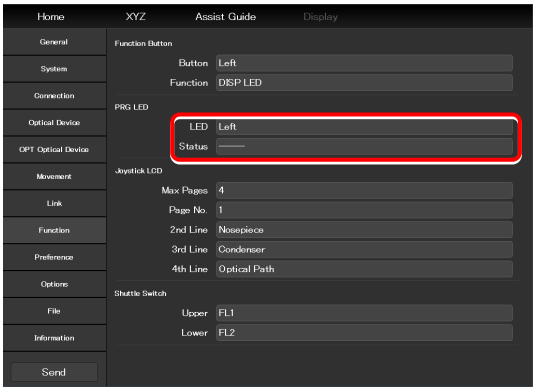
Select the position of the LED indicator on the microscope main body for which the operating status indication is enabled.

Status:

Select the function whose operating status is to be indicated.

For the assignable indication functions, see “6.2 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.:

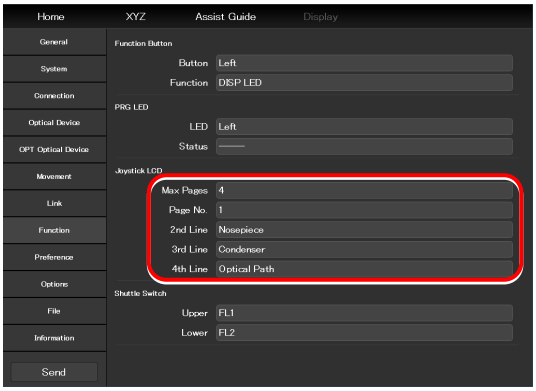
Select the target page number.

2nd Line to 4th Line:

Select the function to be assigned to each line.

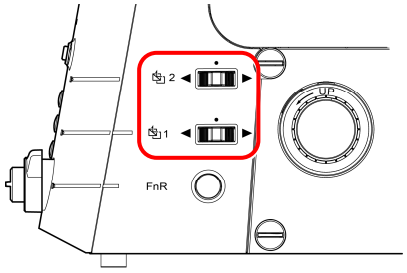
For the assignable functions, see “6.3 List of Functions Assigned to Joystick LCD Screen.”

▼ 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.

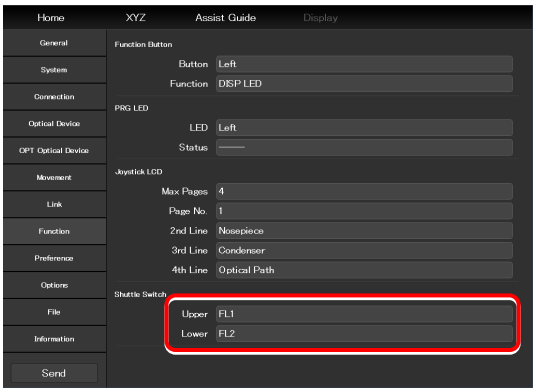
Upper:

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:

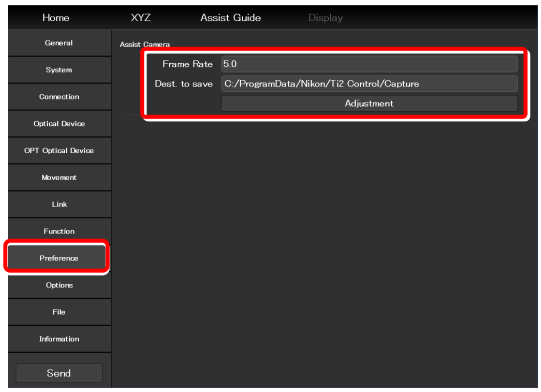
When [Adjustment] is tapped, the Adjustment screen will be displayed.

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.

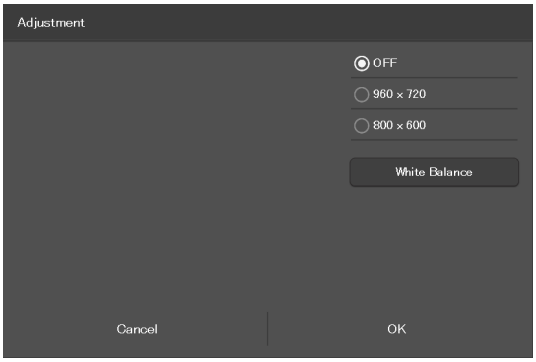
White Balance:

Automatically adjust the white balance.

▼ Setting the assist camera



▼ Adjustment screen



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

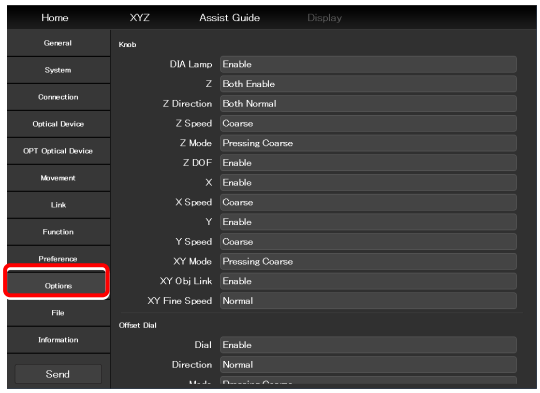
This section describes how to set the operation speed of the motorized device and whether the motorized device is to be controlled from the Ti2-E microscope main body or the joystick.

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

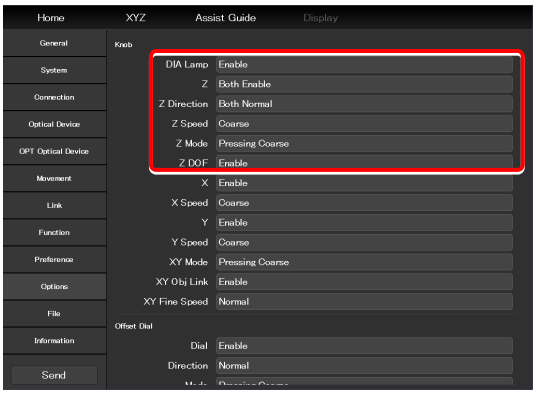


2.11.1 Controlling Each Knob

This section describes how to control each knob.

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

▼ Setting each knob



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.

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 being pressed
Toggle:	Switches between coarse motion and fine motion.

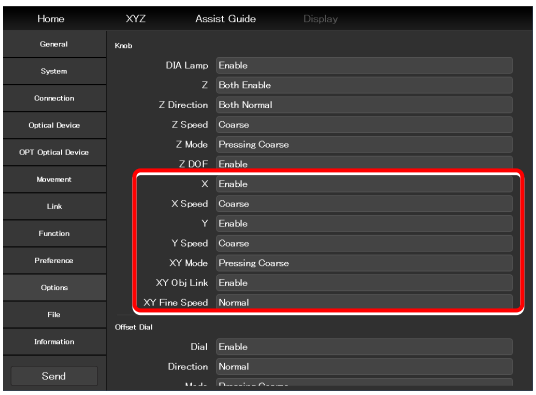
XY Obj Link:

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:

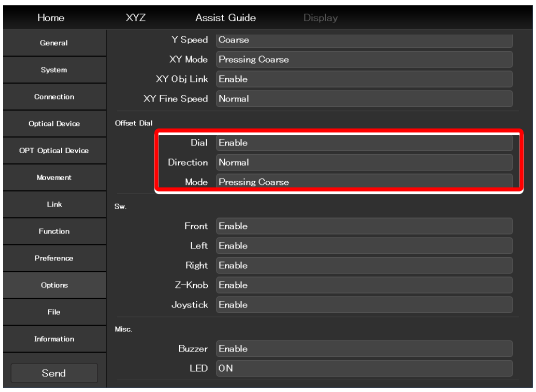
Select the rotation direction of the PFS offset dial.

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.

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.

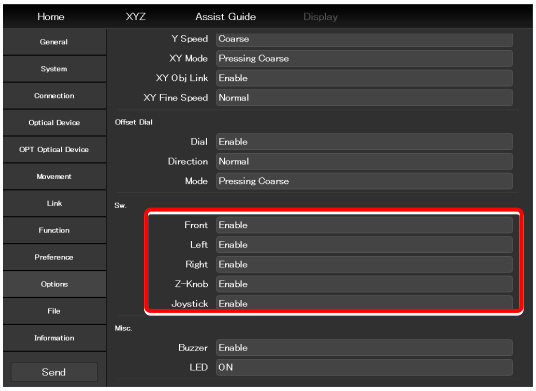
Z-Knob:

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.

▼ Controlling the switches



2.11.4 Other Control Items

This section describes other control items.

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

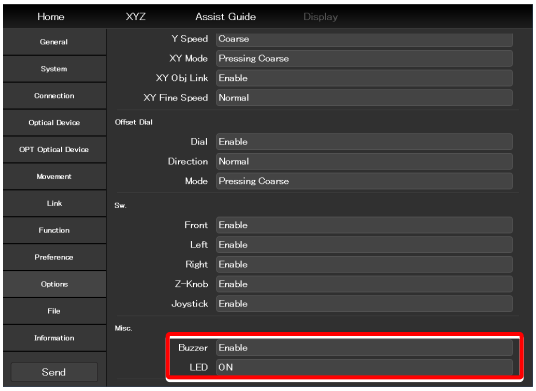
Buzzer:

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



2.11.5 Ti2-A

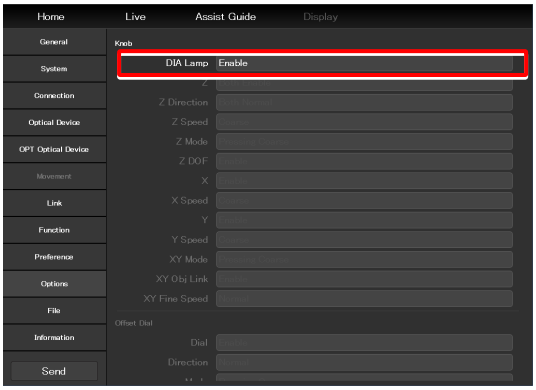
Set the controllable functions of the TI2-A.

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

DIA Lamp:

Enable or disable the dia-illumination brightness adjuster operation.

▼ **Setting each knob**

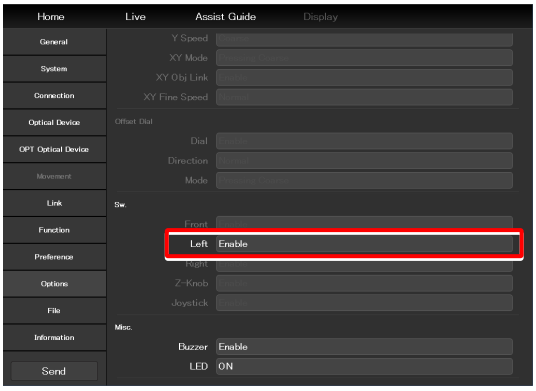


2. Set the following items in the [Sw.] field.

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.

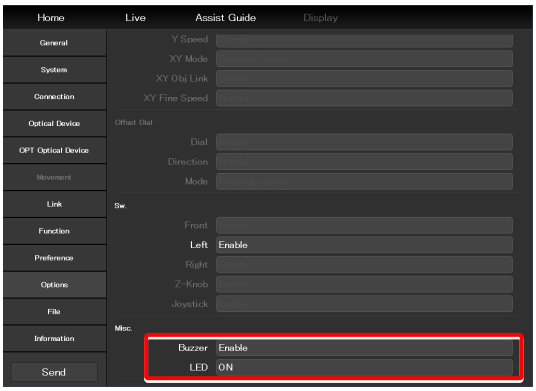
Buzzer:

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

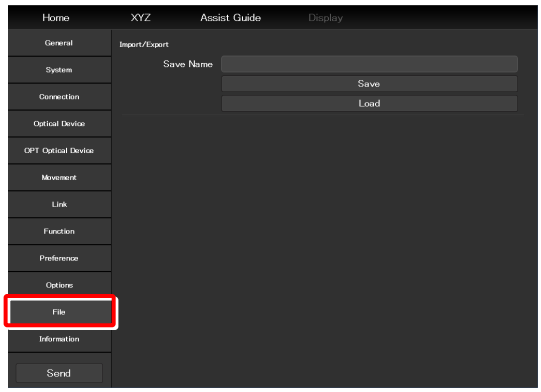
This section describes how to save or read settings.

The settings made by using the “Ti2 Control” application can be saved (as a configuration file) in the device 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.

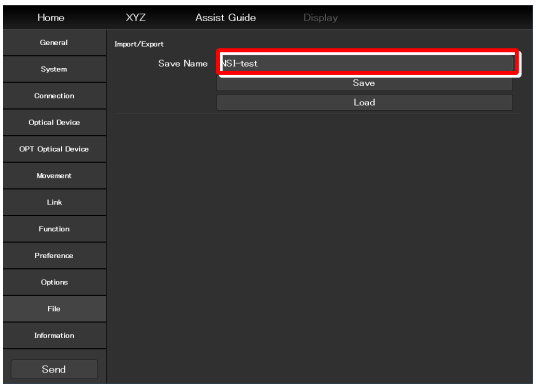
▼ **Setting a file**



2.12.1 Saving the Settings

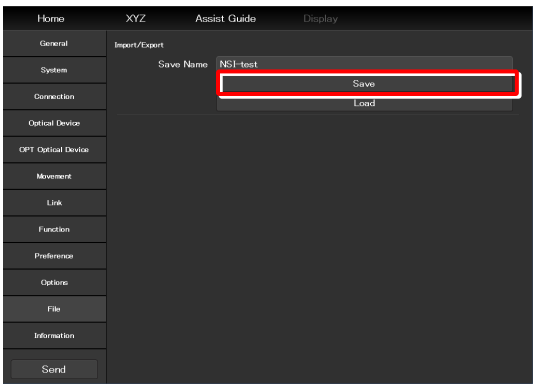
1. Specify a file name in [Save Name] in the [Import/Export] field.

▼ **Saving the settings**



2. Tap [Save].

The setting information will be saved.



SUPPLEMENTAL REMARKS

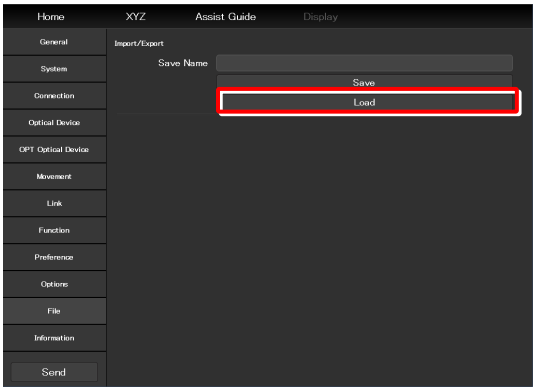
If the file name specified in step 1 already exists, a confirmation message appears after [Save] is tapped, asking whether the file is to be overwritten.
Tap [Yes] to overwrite the file or [Cancel] to cancel saving the file.

2.12.2 Reading the Settings

1. Tap [Load] in the [Import/Export] field.

The file selection screen appears.

▼ **Reading the settings**

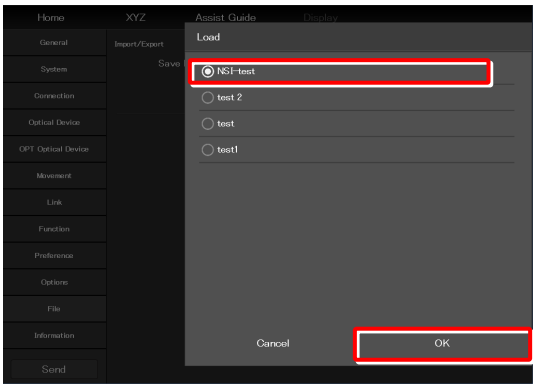


2. Select the setting information to be loaded.

3. Tap [OK].

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

▼ **File selection screen**

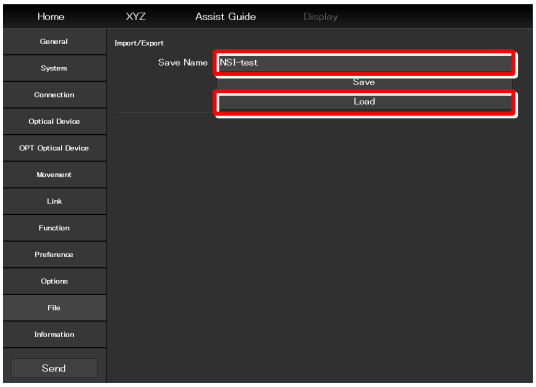


SUPPLEMENTAL REMARKS

When a file name is specified in [Save Name] and [Load] is tapped, 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.

Tap [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 following version information will be displayed for the Ti2 series.

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

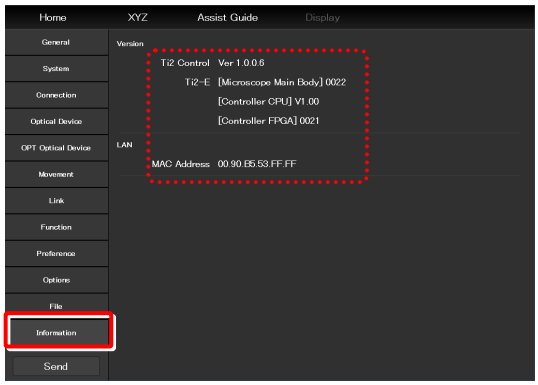
Ti2-A:

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

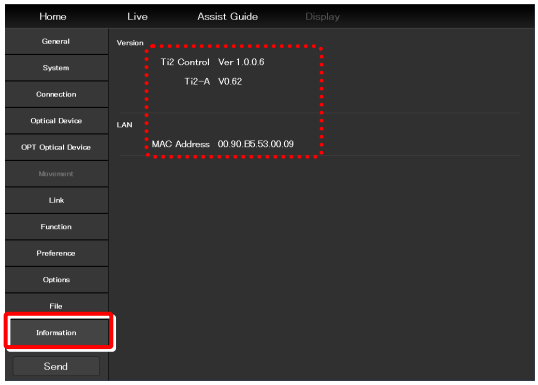
MAC Address:

MAC address of the currently used microscope system

▼ Version information (For Ti2-E)



▼ Version information (For Ti2-A)



Chapter
3

Control and Display of Each Device

This chapter describes how to operate the Ti2-E microscope from the application.

> **Differences by microscope main body**
> When the Ti2-A is connected, the microscope and devices cannot be operated. In this case, this application only shows the status of the microscope.

3.1 Remote Control of the Ti2-E Microscope (Home Screen)

The home screen allows the user to control the Ti2-E microscope main body.
For the Ti2-A, the current status of the microscope is only displayed. The microscope cannot be controlled.

1. Tap [Home].

The home screen appears.

The view of the microscope on the left side of the screen shows the locations to be controlled.

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

▼ **Home screen**

3.1.1 Configuration of the Home Screen

■ **View of the microscope**

When a remote control button is tapped, the corresponding location to be controlled is highlighted.

■ **Remote control button area**

Tapping each button allows the user to control the corresponding device of the microscope main body.

■ **Check**

The Check screen allows the user to check if a specimen can be observed properly by the specified microscopy technique.
(See “4.1 Check Mode.”)

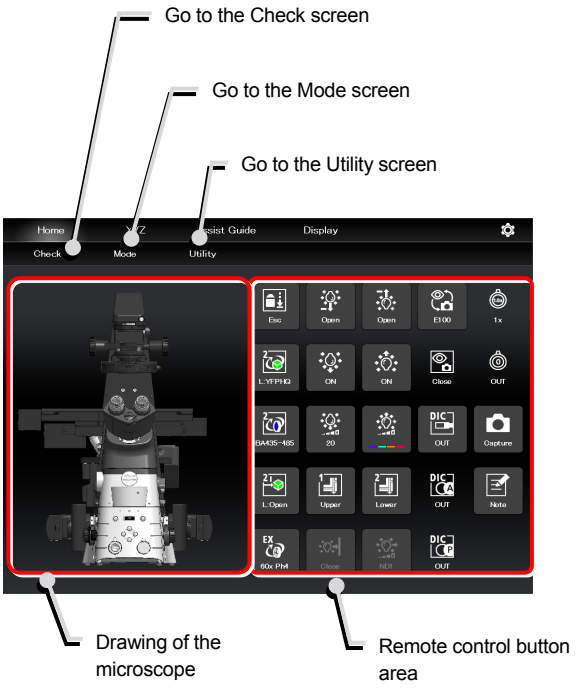
■ **Mode**

The Mode screen allows the user to register modes of motorized devices and place them in the registered statuses just by selecting a mode.
(See “4.3 Registering and Recalling Modes Linked with Devices.”)

■ **Utility**

The Utility screen allows the user to copy (to another smart device) the information in the setup screen, the customized remote control button layout, and the user-customized information of the Assist Guide.
(See “4.4 Utilities.”)

▼ **Configuration of the home screen**

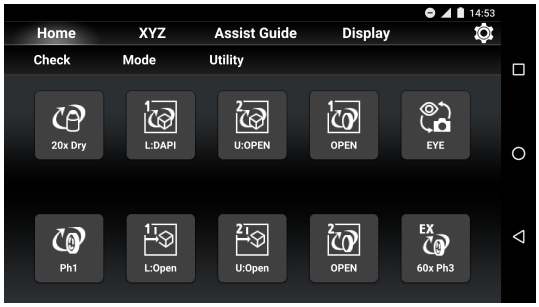


When operating “Ti2 Control” from a smartphone

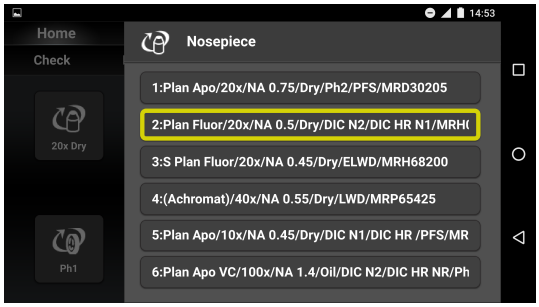
When a smartphone is used, the drawing of the microscope is not displayed on the home screen.

Also, no drawing of a turret is displayed on the subscreen opened when a remote control button is tapped. Only a list is displayed.

▼ **Screen of a smartphone**

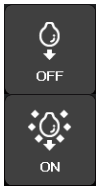
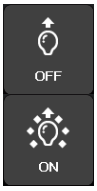


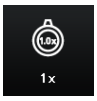
▼ **Subscreen when a smartphone is used**



3.1.2 List of Remote Control Buttons

The table below gives an overview of each remote control button and the section numbers to be referred to.

Button	Functional overview and reference	Button	Functional overview and reference
	Switching of objectives (See “3.1.3 Controlling the Objective.”)		**Escaping and restoring the objective** (See “3.1.14 Escaping and Restoring the Objective.”)
	Switching the filter cube of FL turret 1 (See “3.1.5 Controlling the Filter Cube.”)		**Switching the filter cube of FL turret 2** (See “3.1.5 Controlling the Filter Cube.”)
	Opening and closing the shutter of FL turret 1 (See “3.1.10 Opening and Closing the Shutter of the FL Turret.”)		**Opening and closing the shutter of FL turret 2** (See “3.1.10 Opening and Closing the Shutter of the FL Turret.”)
	Switching the barrier filter of BA filter wheel 1 (See “3.1.6 Controlling the BA Filter.”)		**Switching the barrier filter of BA filter wheel 2** (See “3.1.6 Controlling the BA Filter.”)
	Opening and closing the motorized dia-illumination shutter (See “3.1.12 Opening and Closing the Motorized Dia-Illumination Shutter.”)		**Opening and closing the motorized epi-illumination shutter** (See “3.1.11 Opening and Closing the Motorized Epi-Illumination Shutter.”)
	Adjusting the illumination intensity of dia-illumination (See “Adjusting the illumination intensity of dia-illumination (DIA)“ in “3.1.9 Controlling the Dia-Illumination Unit (DIA).”)		**Adjusting the epi-illumination LED by wavelength** (See “Selecting an LED to be used“ in “3.1.18 Operation When Using an LED for the Epi Illuminator.”)
	**Turning on and off the dia-illumination** (See “Turning on or off the dia-illumination (DIA)“ in “3.1.9 Controlling the Dia-Illumination Unit (DIA).”)		**Turning on and off the epi-illumination LED** (See “Turning on or off the LED“ in “3.1.18 Operation When Using an LED for the Epi Illuminator.”)
	Opening and closing the Intensilight shutter (See “Opening and closing the Intensilight shutter“ in “3.1.19 Operation When Using the Intensilight for the Epi Illuminator.”)		**Switching the Intensilight ND filter** (See “Switching the Intensilight ND filter“ in “3.1.19 Operation When Using the Intensilight for the Epi Illuminator.”)
	Switching the optical path of epi-illumination 1 (See “3.1.17 Switching the Optical Path of Epi-Illumination.”)		**Switching the optical path of epi-illumination 2** (See “3.1.17 Switching the Optical Path of Epi-Illumination.”)
	Switching the condenser module (See “3.1.4 Controlling the Condenser.”)		**Switching the external phase ring** (See “3.1.8 Controlling the External Phase Ring.”)

Button	Functional overview and reference	Button	Functional overview and reference
	Switching the optical path (See “3.1.7 Switching the Optical Path.”)		**Displaying the intermediate magnification status** (See “3.1.15 Indication-Only Buttons.”)
	Displaying the opened/closed status of the shutter of the tube base unit (See “3.1.15 Indication-Only Buttons.”)		**Displaying the Bertrand lens in/out status** (See “3.1.15 Indication-Only Buttons.”)
	Displaying the objective-side DIC prism in/out status (See “3.1.15 Indication-Only Buttons.”)		**Capturing images through the assist camera** (See “3.1.13 Capturing Images Through the Assist Camera.”)
	Displaying the analyzer in/out status (See “3.1.15 Indication-Only Buttons.”)		**Note function** (See “3.1.16 Note Function.”)
	Displaying the polarizer in/out status (See “3.1.15 Indication-Only Buttons.”)		

3.1.3 Controlling the Objective

1. Tap the button shown below.

The objective changeover subscreen appears.

▼ Switching the objective

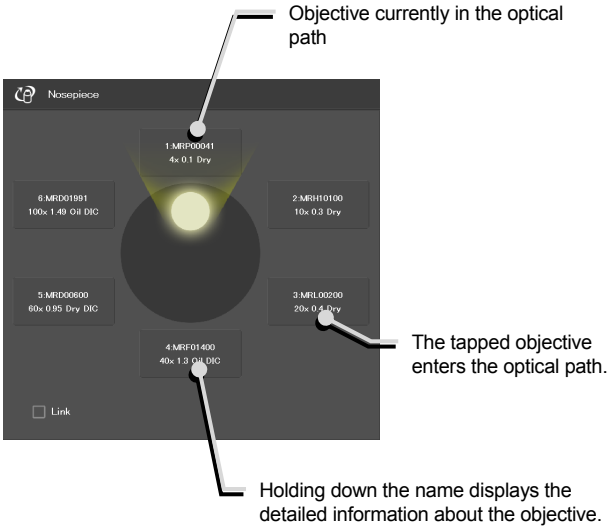
2. To switch the objective, tap the name of the objective to be used.

3. When the name of the objective to be used is held down, the detailed information about the objective is shown.

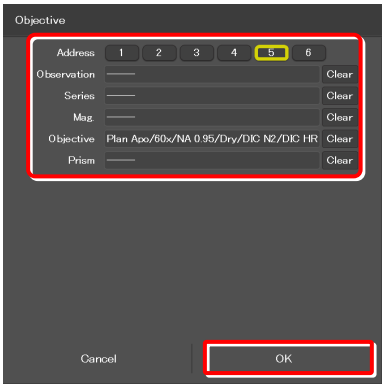
4. When the [Link] check box is selected, the linked control function is enabled.

For the linked control function, see “2.8 [Link]: Setting the Linking Function: Ti2-E Only.”

▼ Objective changeover subscreen



▼ Objective detailed information screen



SUPPLEMENTAL REMARKS

The displayed detailed information about the objective can be changed by tapping each item.

Tap [OK] at the bottom of the screen to send the changed information to the microscope.

For how to change information about objectives, see “2.5.1 Setting the Nosepiece.”

3.1.4 Controlling the Condenser

1. Tap the button shown below.

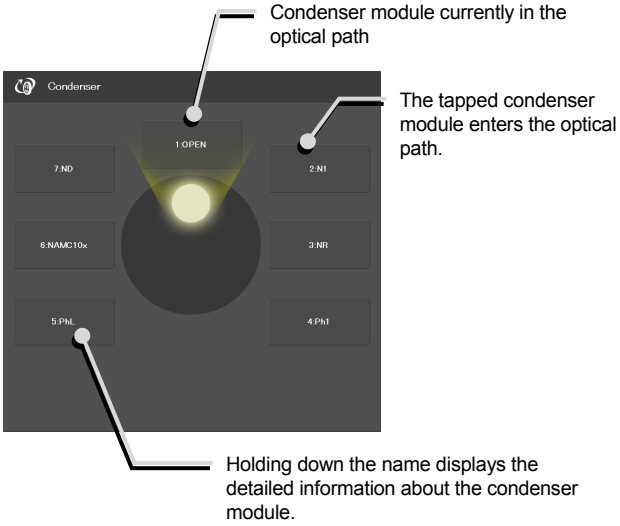
The condenser module changeover subscreen appears.

2. To switch the condenser module, tap the name of the module to be used.

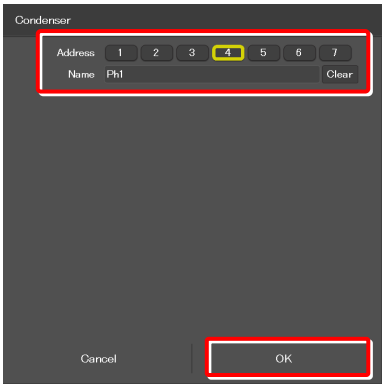
3. When the name of the condenser module to be used is held down, the detailed information about the module is shown.

▼ Switching the condenser module

▼ Condenser module changeover subscreen



▼ Condenser module detailed information screen



SUPPLEMENTAL REMARKS

Detailed information about the condenser module can be changed by tapping each item.

Tap [OK] at the bottom of the screen to send the changed information to the microscope.

For how to change information about condenser modules, see “2.5.2 Setting the Condenser Module.”

3.1.5 Controlling the Filter Cube

1. Tap the buttons shown below.

(Tap this button to control the second FL turret.)

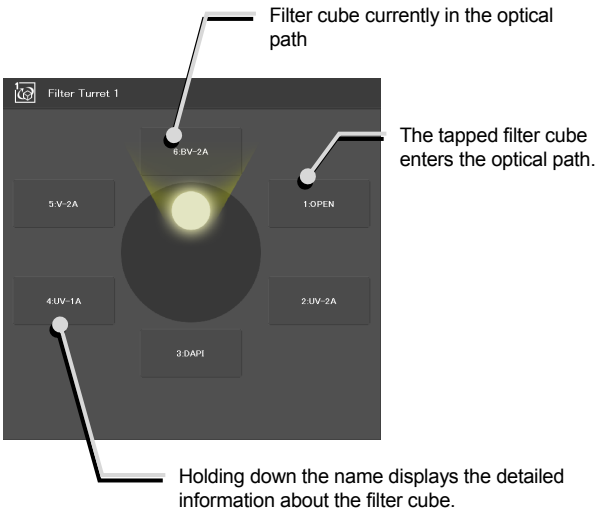
The filter cube changeover subscreen appears.

2. To switch the filter cube, tap the name of the filter cube to be used.

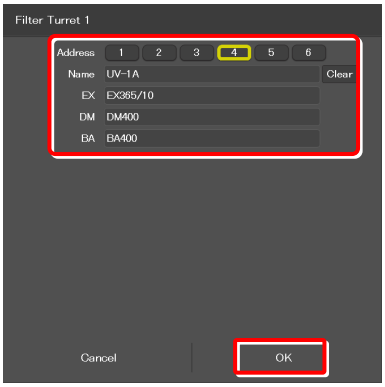
3. When the name of the filter cube to be used is held down, the detailed information about the filter cube is shown.

▼ Switching the filter cube

▼ Filter cube changeover subscreen



▼ Filter cube detailed information screen



SUPPLEMENTAL REMARKS

Detailed information about the filter cube can be changed by tapping each item.
Tap [OK] at the bottom of the screen to send the changed information to the microscope.

For how to change information about filter cubes, see “2.5.3 Setting the Filter Cube.”

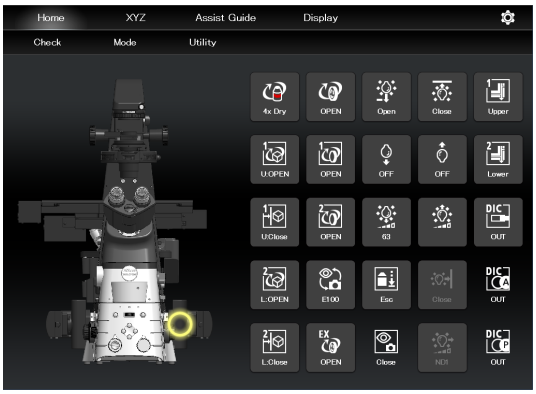
3.1.6 Controlling the BA Filter

1. Tap the buttons shown below.

(Tap this button to control the second BA filter turret.)

The BA filter changeover subscreen appears.

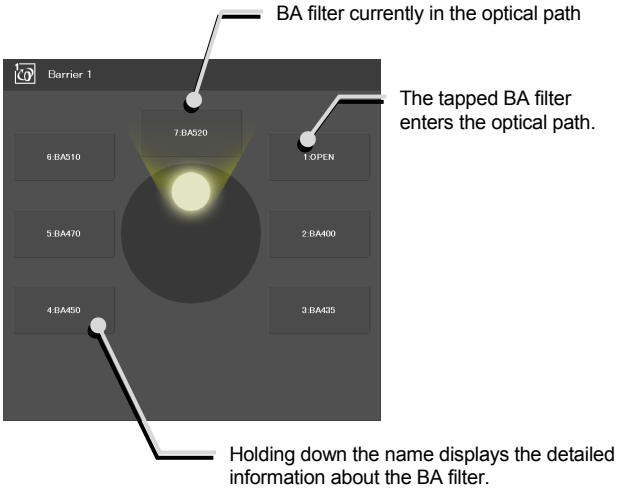
▼ Switching the BA filter



2. To switch the BA filter, tap the name of the BA filter to be used.

3. When the name of the BA filter to be used is held down, the detailed information about the BA filter is shown.

▼ BA filter changeover subscreen



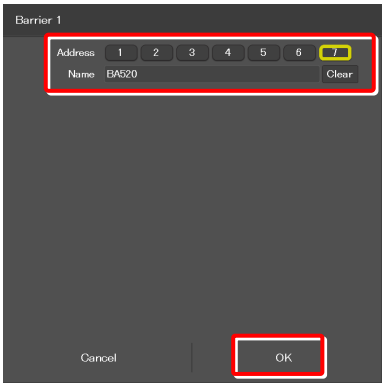
SUPPLEMENTAL REMARKS

Detailed information about the BA filter can be changed by tapping each item.

Tap [OK] at the bottom of the screen to send the changed information to the microscope.

For how to change information about BA filters, see "2.5.4 Setting the BA Filter: Ti2-E Only."

▼ BA filter detailed information screen

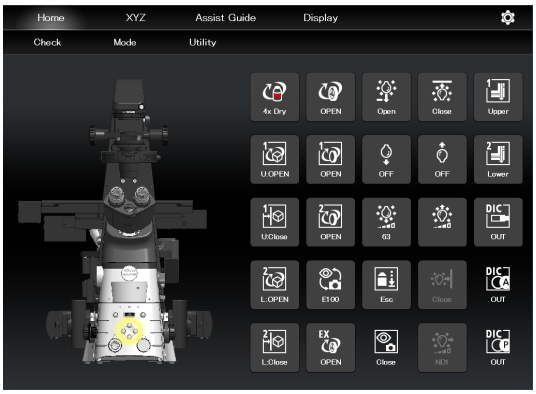


3.1.7 Switching the Optical Path

1. Tap the button shown below.

The optical path changeover subscreen appears.

▼ Switching the optical path



2. To switch the optical path, tap the target output port.

E100: Eyepiece observation port

An optical output port for visually observing a microscope image through a binocular part of a tube. (Switch the output port to E100 to output the image to the assist camera when using the assist tube base unit.)

R100: Right side port

An optical output port for a microscope image on the right side of the microscope. (Microscopy camera, BA filter wheel, photometer sensor, etc.)

L100: Left side port

An optical output port for a microscope image on the left side of the microscope. (Microscopy camera, BA filter wheel, confocal head, photometer sensor, etc.)

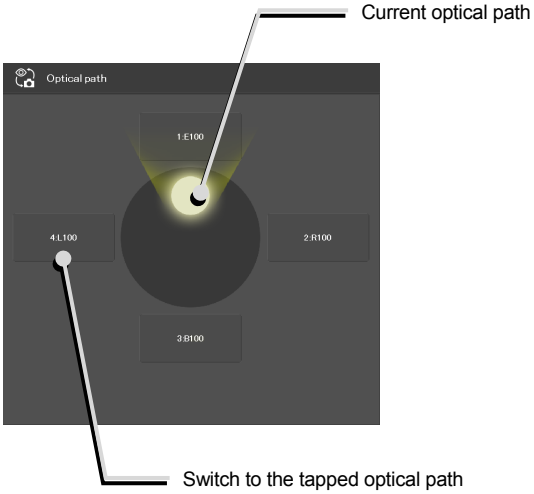
L80: (only in the case of Ti2-E)

80% of a microscope image is output to the optical output port on the left side of the microscope, and 20% is output to the eyepiece observation port.

B100: (only in the case of Ti2-E/B)

An optical image output port at the bottom of the microscope.

▼ Optical path changeover subscreen



3.1.8 Controlling the External Phase Ring

1. Tap the button shown below.

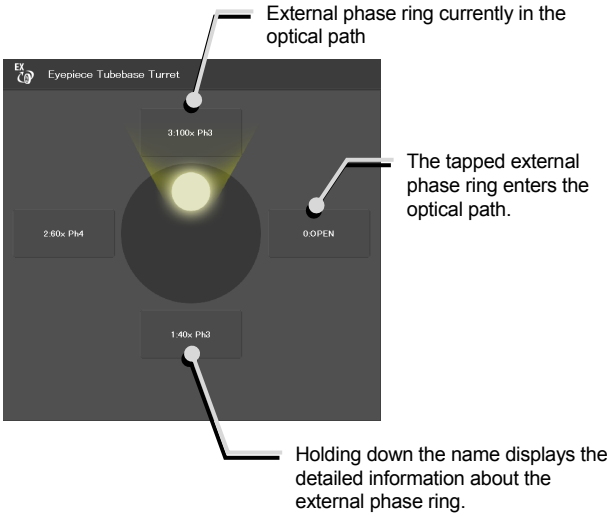
The external phase ring changeover subscreen appears.

▼ Switching the external phase ring

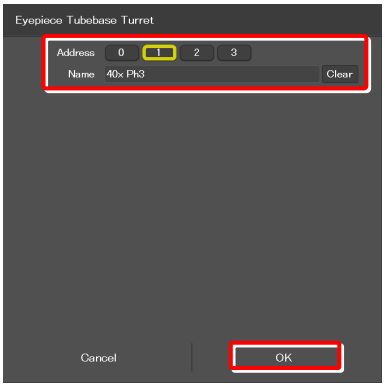
2. To switch the external phase ring, tap the name of the external phase ring to be used.

3. When the name of the external phase ring to be used is held down, the detailed information about the external phase ring is shown.

▼ External phase ring changeover subscreen



▼ External phase ring detailed information screen



SUPPLEMENTAL REMARKS

The displayed detailed information about the external phase ring can be changed by tapping each item.

Tap [OK] at the bottom of the screen to send the changed information to the microscope.

For how to change information about external phase rings, see “2.5.6 Setting the External Phase Ring: Ti2-E Only.”

3.1.9 Controlling the Dia-Illumination Unit (DIA)

Adjusting the illumination intensity of dia-illumination (DIA)

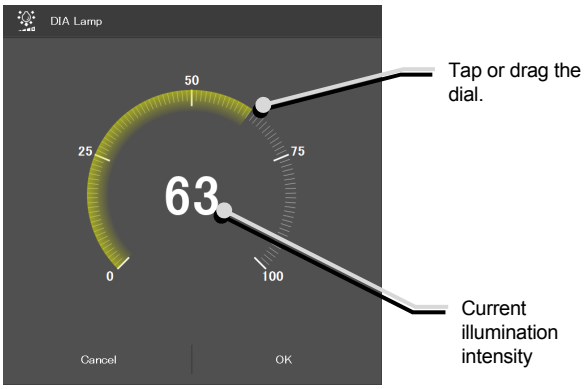
1. Tap the button shown below.

The dia-illumination intensity adjustment subscreen appears.

▼ Adjusting the illumination intensity of dia-illumination (DIA)

2. To adjust the illumination intensity, tap the dial in the center or drag the vicinity of the dial.

▼ Dia-illumination intensity adjustment subscreen



Turning on or off the dia-illumination (DIA)

3. Tap the buttons shown below.

Lit. The LED is turned off when this button is tapped.

Extinguished. The LED is turned on when this button is tapped.

▼ Controlling the dia-illumination (DIA)

3.1.10 Opening and Closing the Shutter of the FL Turret

When a motorized FL turret is used, the shutter of the FL turret can be opened or closed from the application.

1. Tap the buttons shown below.

The shutter of the FL turret is open. The shutter closes when this button is tapped.

The shutter of the FL turret is closed. The shutter opens when this button is tapped.

To control the second FL turret:

The shutter of the FL turret is open. The shutter closes when this button is tapped.

The shutter of the FL turret is closed. The shutter opens when this button is tapped.

▼ Opening and closing the shutter of the FL turret

3.1.11 Opening and Closing the Motorized Epi-Illumination Shutter

When a motorized epi-illumination shutter is used, the shutter can be opened or closed from the application.

1. Tap the buttons shown below.

The motorized epi-illumination shutter is open. The shutter closes when this button is tapped.

The motorized epi-illumination shutter is closed. The shutter opens when this button is tapped.

▼ Opening and closing the motorized epi-illumination shutter

3.1.12 Opening and Closing the Motorized Dia-Illumination Shutter

When a motorized dia-illumination shutter is used, the shutter can be opened or closed from the application.

1. Tap the buttons shown below.

The dia-illumination shutter is open. The shutter closes when this button is tapped.

The dia-illumination shutter is closed. The shutter opens when this button is tapped.

The dia-illumination shutter is closed, the LED of the diascopic illuminator can be prevented from emitting autofluorescence due to excitation light for epi fluorescence observation.

▼ Opening and closing the dia-illumination shutter

3.1.13 Capturing Images Through the Assist Camera

1. Tap the button shown below.

The images through the assist camera are captured.

If the optical path is switched to E100, the images through the assist camera are captured and saved in the storage in the smart device.

▼ Capturing images through the assist camera

3.1.14 Escaping and Restoring the Objective

1. Tap the buttons shown below.

Lowers the objective temporarily to the escape position.

Restores the objective to the original position.

SUPPLEMENTAL REMARKS

Turning the focus knob does not move the focusing device while the objective is at the escape position.

If is tapped while the objective is at the escape position, a confirmation message “Move to Z-Refocus position?” appears.

Tap [Move] to move the objective to original position Z.

Tap [No] to allow the focus knob to be used without returning the objective to original position Z.

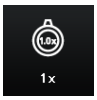
In this case, the position in which the focus knobs are stopped is then stored as the new focal position.

▼ Escaping and restoring the objective

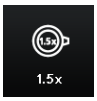
3.1.15 Indication-Only Buttons

The following are indication-only buttons.

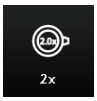
Indicates the current intermediate magnification.



1x



1.5x



2x

Indicates the objective-side DIC prism in/out status.

Inserted

Removed

Indicates the DIC analyzer slider in/out status.

Inserted

Removed

Indicates the DIC polarizer in/out status.

Inserted

Removed

Indicates the Bertrand lens in/out status.

Inserted

Removed

SUPPLEMENTAL REMARKS

If an indication-only button is tapped, the location of the module is indicated in the left microscope drawing.

3.1.16 Note Function

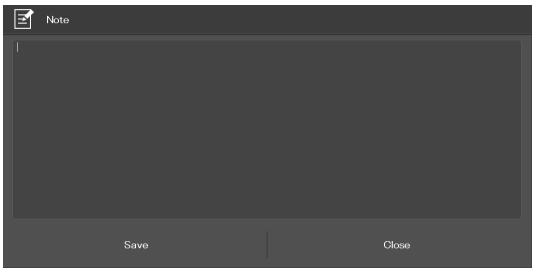
1. Tap the button shown below.

The Note screen appears, allowing the user to take notes.
The user can enter a note using the keyboard.

▼ Note

The following information is saved in the Note screen although it is not displayed.

▼ Note screen



■ Default items

- Date
- Type of dia-illumination (LED/halogen) and current brightness (value displayed in the brightness adjustment subscreen)
- Polarizer in/out
- Nosepiece address, objective information, DIC slider in/out
- Condenser turret address and condenser name
- Upper FL turret position and filter cube information
- Lower FL turret position and filter cube information
- Upper BA filter turret position and BA filter information
- Lower BA filter turret position and BA filter information
- Variable magnification lens (1x, 1.5x or 2x)
- Camera port position and camera head name
- Type of epi-illumination (Intensilight, LED or 100W mercury lamp)
- ND value in the case of Intensilight
  Illumination intensity and wavelength in the case of LED

2. Tap [Save].

The entered note is saved in the smart device.

3.1.17 Switching the Optical Path of Epi-Illumination

1. Tap the buttons shown below.

(Also tap this button in a stage-up configuration.)

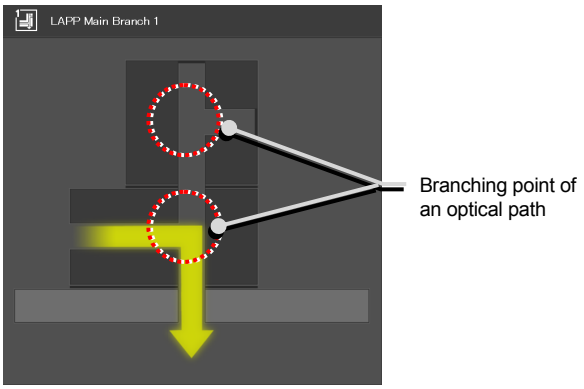
The epi-illumination control subscreen appears, showing the optical path currently in use.

▼ Epi-illumination control

2. Tap the branching point of an optical path displayed on the subscreen.

The optical path will be switched.

▼ Epi-illumination control subscreen



Microscope main body side

3.1.18 Operation When Using an LED for the Epi Illuminator

The epi-fl LED illuminator (C-LEDFI) has built-in LEDs for each excitation wavelength. The LEDs can be turned on or off and the brightness can be adjusted to achieve illumination with the specified wavelength.

Selecting an LED to be used

1. Tap the buttons shown below.

The C-LEDFI control subscreen appears showing the on/off state, the wavelength and the illumination intensity of each LED.

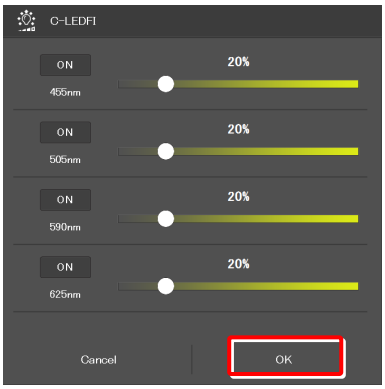
▼ C-LEDFI control

2. Tapping the [OFF] indication button turns the corresponding LED on. Tapping the [ON] indication button turns it off.

3. The illumination intensity of each LED can be changed by tapping or dragging the slider.

4. Tap [OK] to confirm the C-LEDFI control.

▼ C-LEDFI control subscreen



Turning on or off the LED

1. Tap the buttons shown below.

Lit. The LED is turned off when this button is tapped.

Extinguished. The LED is turned on when this button is tapped.

The LEDs set above on the C-LEDFI control subscreen are turned on or off.

▼ C-LEDFI control

3.1.19 Operation When Using the Intensilight for the Epi Illuminator

When the motorized Intensilight (motorized HG precentered fiber illuminator (C-HGFIE)) is used as the epi illuminator, the shutter can be opened or closed and the ND filter attached to the Intensilight can be switched.

Opening and closing the Intensilight shutter

1. Tap the buttons shown below.

Indicates that the Intensilight shutter is open. The shutter closes when this button is tapped.

Indicates that the Intensilight shutter is closed. The shutter opens when this button is tapped.

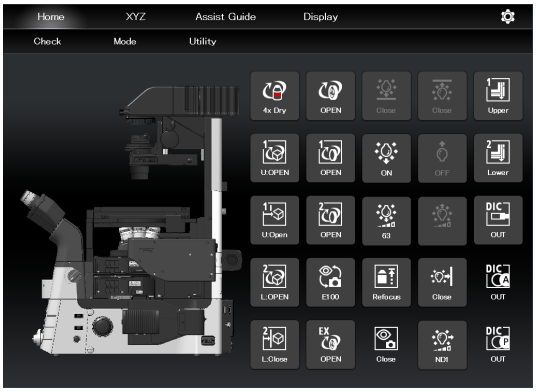
▼ Opening and closing the Intensilight shutter

Switching the Intensilight ND filter

1. Tap the button shown below.

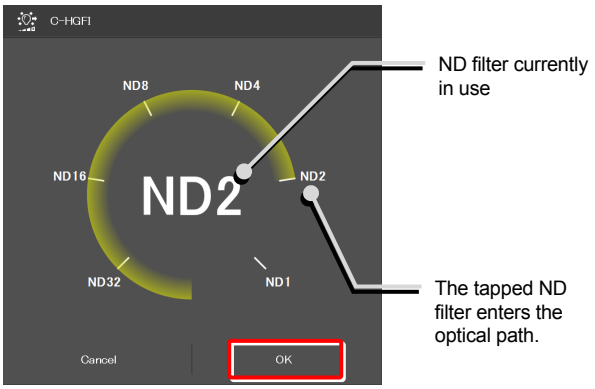
The ND filter changeover subscreen appears.

▼ Switching the ND filter



2. To switch the ND filter, tap the name of the ND filter to be used and then tap [OK].

▼ ND filter changeover subscreen



3.2 XYZ Control (XYZ Screen): Ti2-E Only

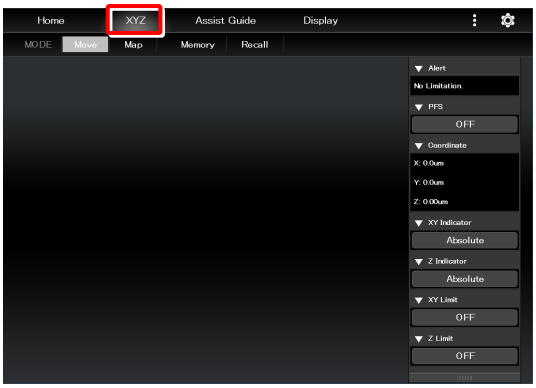
The motorized stage (XY) and the focusing device (Z) can be operated by using the displayed buttons and the operation area of the XYZ screen.

The XYZ screen displays some functions in common with the home screen.
This section describes the functions specific to the XYZ screen.
For the functions common with the home screen, see “3.1 Remote Control of the Ti2-E Microscope (Home Screen).”

1. Tap [XYZ].

The XYZ screen appears.

▼ **XYZ screen**



2. Tap [Move].

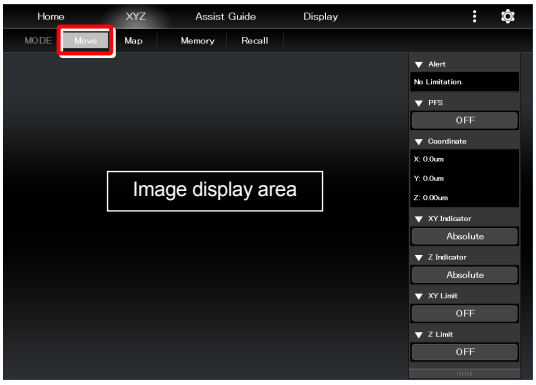
The XYZ screen is placed in Move mode.

For the functions and operation procedure, see the following sections.

If an assist tube base unit is mounted, an image of the assist camera is displayed in the image display area.

> **CAUTION**
>
> Even though the assist tube base unit is mounted, the live image from the assist camera may not be displayed in the image display area.
>
> If live image reception fails, a message dialog appears. Follow the message to retry live image reception.
>
> If this error still persists after several attempts, contact your local Nikon representative.

▼ **XYZ screen (Move mode)**



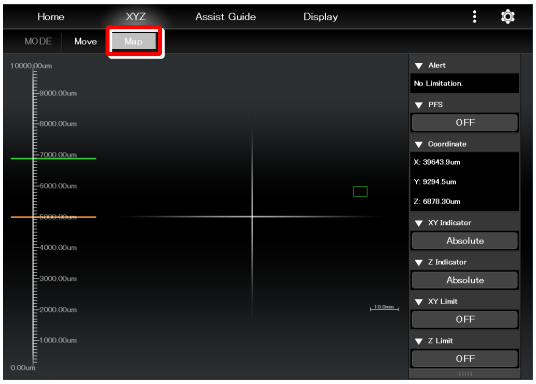
3. Tap [Map].

The XYZ screen is placed in Map mode.

For the functions and operation procedure common to Move mode, see the following sections.

For the functions and operation procedure specific to Map mode, see “3.2.7 Map Mode.”

▼ **XYZ screen (Map mode)**



3.2.1 Configuration of the XYZ Screen

This section describes the basic configuration of the XYZ screen.

■ **[Display changeover**

Switches between the remote control button display and the information display on the right side of the screen.

■ **Swiping the display area**

The items displayed in the display area can be scrolled by swiping the area up or down.

■ **Information display area**

Displays the information about the motorized stage (XY) or the focusing device (Z).
For details, see “3.2.2 Information Display Area.”

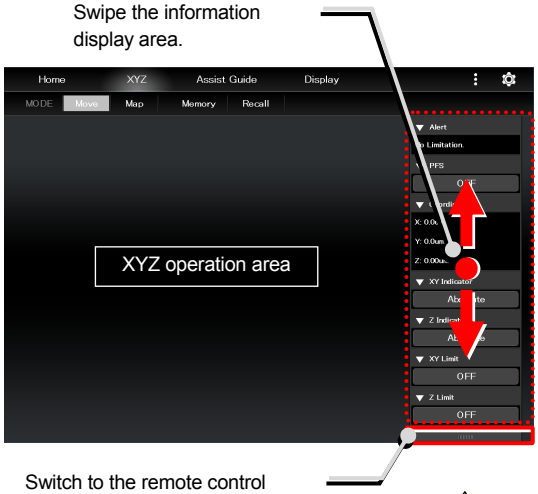
■ **Remote control button area**

Tapping each button allows the user to control the corresponding device of the microscope main body.
For details, see “3.2.3 Remote Control Button Area.”

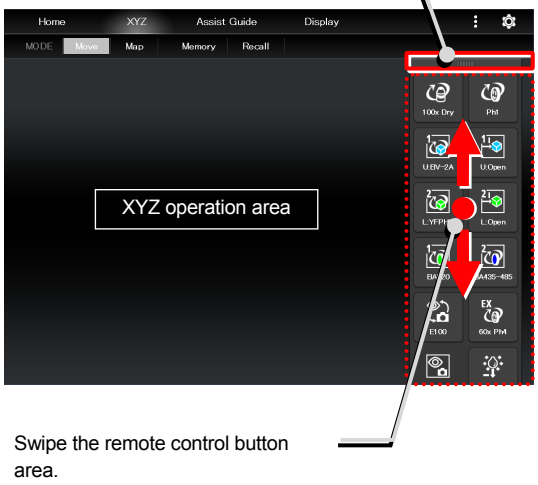
■ **XYZ operation area**

For details, see “3.2.4 XYZ Operation Area.”

▼ **Information display area**



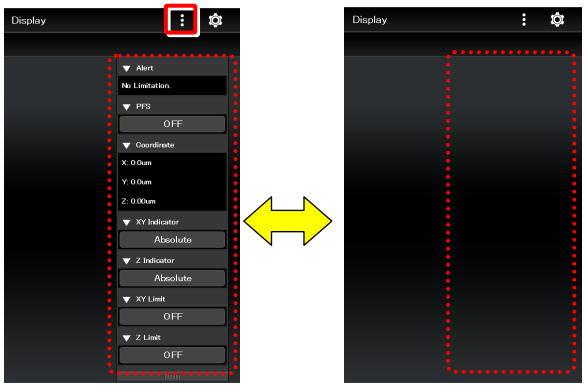
▼ **Remote control button area**



■ **[Display or hide**

Displays or hides the remote control button area or the information display area.

▼ **Display or hide**



3.2.2 Information Display Area

This area displays the information about the motorized stage (XY) or the focusing device (Z).

> **SUPPLEMENTAL REMARKS**
>
> The display of detailed information can be collapsed by tapping ▼ on the title of each item.
>
> The collapsed information can be expanded by tapping ▲.

Alert:

Displays the recent alert information.

PFS:

Displays the on/off state of the PFS.
The on/off state can be switched by tapping the on/off state indication button.

Coordinates:

Displays the coordinates of the motorized stage (XY) and the focusing device (Z).

XY Indicator:

Switches the coordinate indication for the motorized stage (XY) between the absolute value and the relative value.

> **SUPPLEMENTAL REMARKS**
>
> The relative indication of the XY indicator is a function to display the relative coordinates, considering the position when the RESET-XY button of the joystick is pressed, as the origin.

Z Indicator:

Switches the coordinate indication for the focusing device (Z) between the absolute value and the relative value.

> **SUPPLEMENTAL REMARKS**
>
> The relative indication of the Z indicator is a function to display the relative coordinates, considering the position when the button of the joystick is pressed, as the origin.

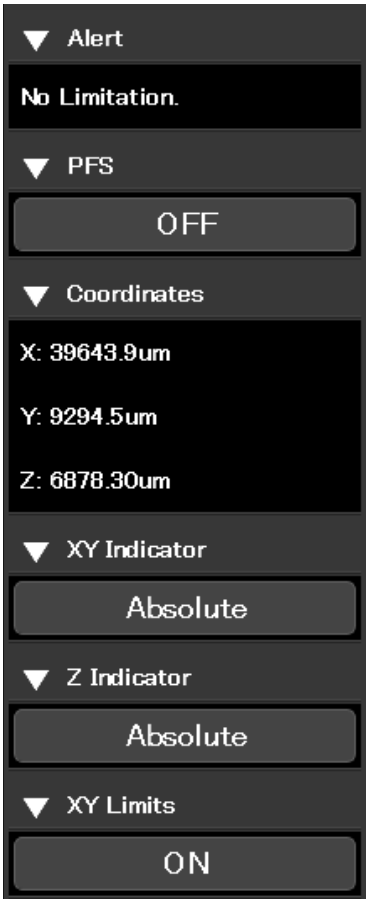
XY Limits:

Indicates the on/off state of the software limits on the motorized stage (XY).

The on/off state can be switched by tapping the on/off state indication button.

The XY Limit subscreen appears when the on/off state indication button is held down.

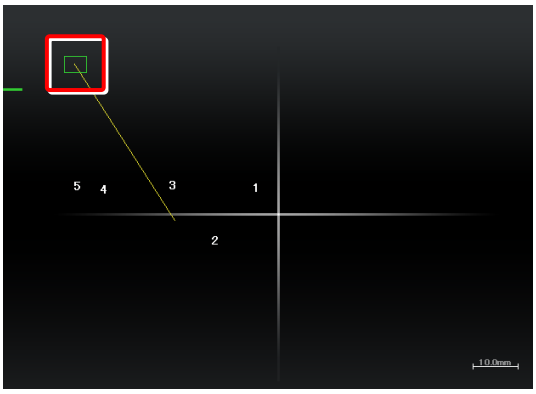
▼ Information display area



This subscreen allows the user to set the XY software limits.

1) Move the motorized stage to the position (X: left side, Y: far side) to be set as a software limit on the top left.

▼ Setting the XY Limit

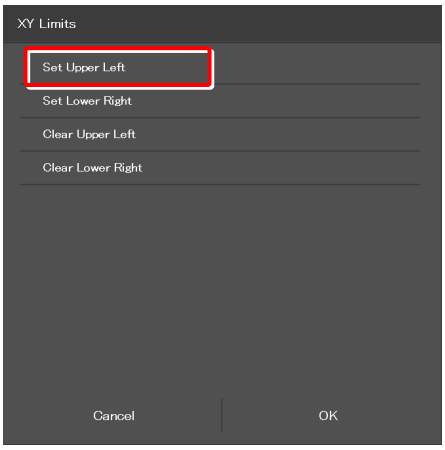


2) Select [Set Upper Left].

The current XY coordinates can be set as XY software limits.

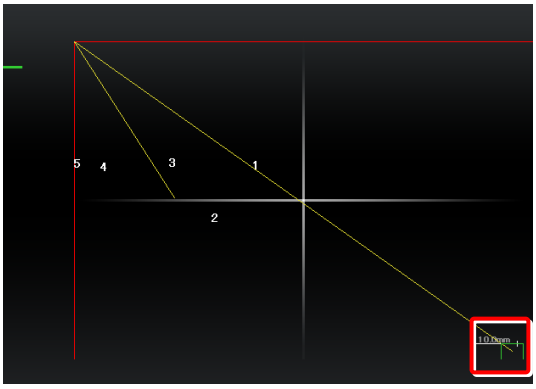
The specified software limits can be cleared by selecting [Clear Upper Left].

▼ XY Limit subscreen



3) Move the motorized stage to the position (X: right side, Y: front side) to be set as a software limit on the bottom right.

▼ Setting the XY Limit

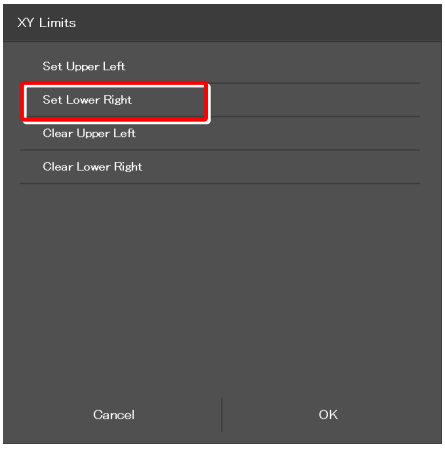


4) Select [Set Lower Right].

The current XY coordinates can be set as XY software limits.

The specified software limits can be cleared by selecting [Clear Lower Right].

▼ XY Limit subscreen



Z Limit:

Indicates the on/off state of the software limits on the focusing device (Z).

The on/off state can be switched by tapping the on/off state indication button.

The Z Limit subscreen appears when the on/off state indication button is held down.

This subscreen allows the user to set the Z software limit.

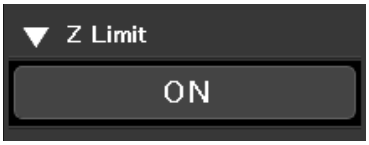
1) Raise the focusing device (Z) to the position to be set as the upper limit.

2) Select [Set Upper].

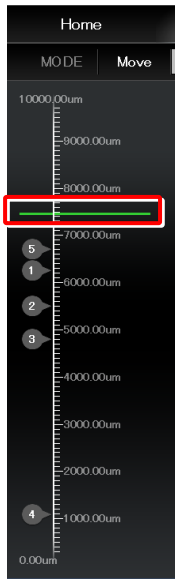
The current Z coordinate can be set as the Z software upper limit.

The specified software limits can be cleared by selecting [Clear Upper].

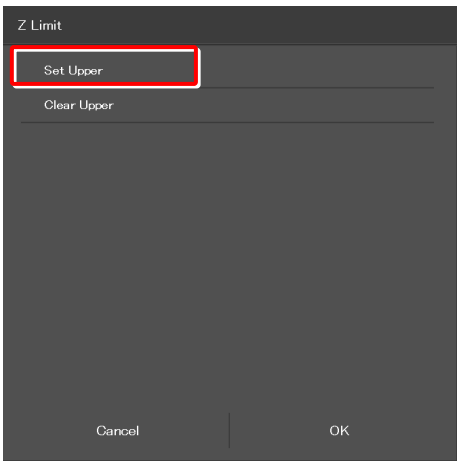
▼ Information display area (continued from the previous page)



▼ Setting the Z Limit



▼ Z Limit subscreen



3.2.3 Remote Control Button Area

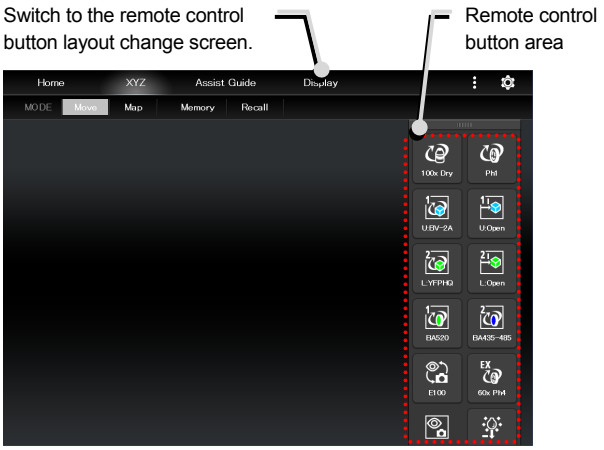
Each motorized device of the microscope main body can be controlled from the remote control button area.

■ Remote control button area

Tapping each button allows the user to control the corresponding motorized device of the microscope main body.

The layout of remote control buttons can be changed freely in the display screen.
For details, see “4.2 Layout of the Remote Control Button Area.”

▼ Remote control button area



3.2.4 XYZ Operation Area

This area allows the focusing device (Z) or the motorized stage (XY) to be moved.

If an assist tube base unit is mounted, an image of the assist camera is displayed.

■ Controlling the focusing device (Z)

The focusing device (Z) can be moved by dragging or swiping the XYZ operation area with two fingers up and down.

Dragging or swiping up:

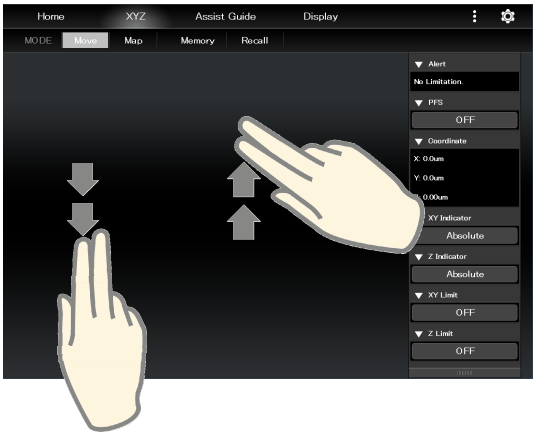
Moves the focusing device (Z) up.

Dragging or swiping down:

Moves the focusing device (Z) down.

> **SUPPLEMENTAL REMARKS**
>
> If [Z Limit] is set and it is ON, the focusing device can move only within the coordinates of the specified upper and lower software limits.
>
> The software limit in the Z direction is indicated by a red line in the XYZ operation area.

▼ XYZ operation area



■ Controlling the motorized stage (XY):

The motorized stage (XY) can be moved by dragging or swiping the XYZ operation area with one finger up or down, or to the right or left.

Dragging:

Dragging up: Moves the Y stage to the back.

Dragging down: Moves the Y stage to the front.

Dragging to the right: Moves the X stage to the right.

Dragging to the left: Moves the X stage to the left.

The motorized stage (XY) can be moved by dragging in the XYZ operation area with one finger up or down, or to the right or left within 0.5 second after tapping the area.

Swiping:

Swiping up: Moves the Y stage to the back by one field of view.

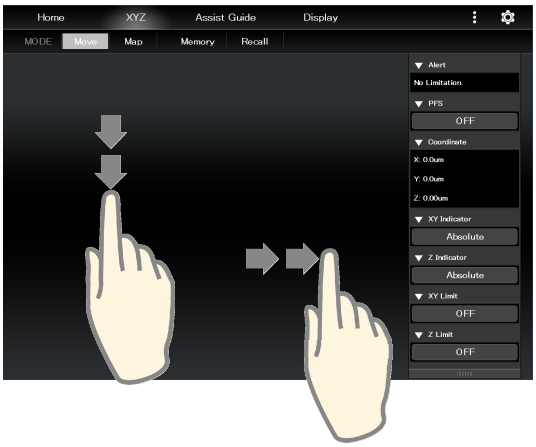
Swiping down: Moves the Y stage to the front by one field of view.

Swiping to the right: Moves the X stage to the right by one field of view.

Swiping to the left: Moves the X stage to the left by one field of view.

> **SUPPLEMENTAL REMARKS**
>
> If [XY Limit] is set and it is ON, the motorized stage (XY) can move only within the coordinates of the specified upper and lower software limits.
>
> The software limits in the XY directions are indicated by red lines in the XYZ operation area.

▼ XYZ operation area



3.2.5 Memory

The memory can save up to ten coordinates of the motorized stage (XY) and the focusing device (Z).

1. **Tap [Memory] on the XYZ screen.**

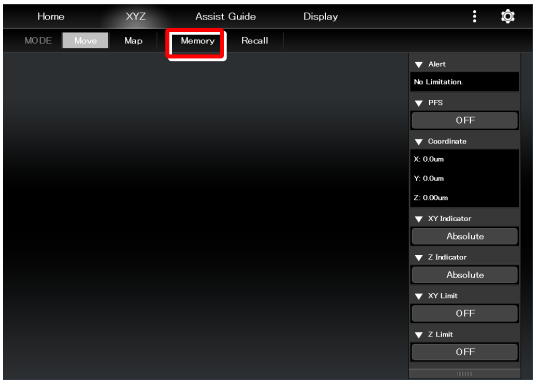
   A list of ten numbers will appear.

2. **Tap the number with which coordinates are to be saved, and then tap [OK].**

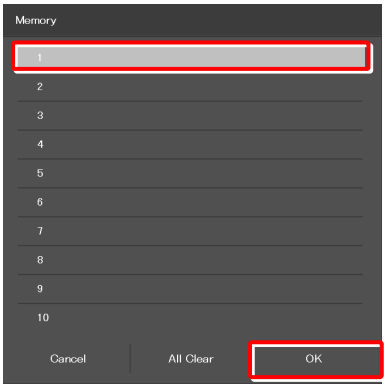
   The coordinates will be saved with the tapped number.

   To erase all saved coordinates, tap [All Clear].

▼ Memory



▼ Memory subscreen



3.2.6 Recall

The recall function allows the motorized stage (XY) and the focusing device (Z) to be moved to the coordinates saved in memory.

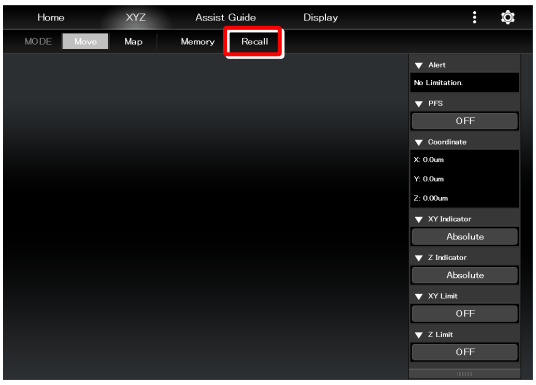
1. Tap [Recall] on the XYZ screen.

A list of saved coordinates will appear on the subscreen.

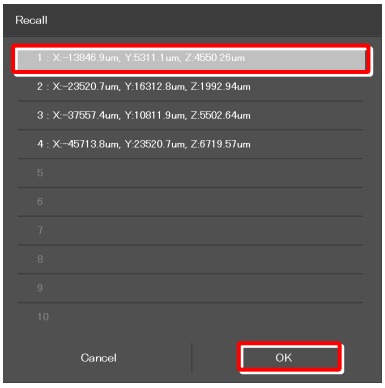
2. Tap the coordinates to be moved, and then tap [OK].

A list of stages to be moved will appear.

▼ Recall



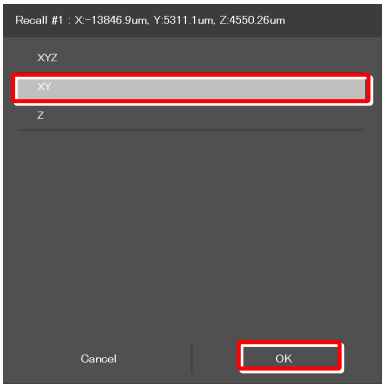
▼ Recall subscreen



3. Tap the stage to be moved, and then tap [OK].

(Z = focusing device, XY = motorized stage, XYZ = both)

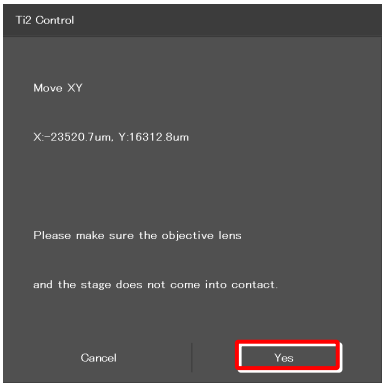
A movement confirmation message will appear.



4. After making sure that the objective does not touch the stage, tap [Yes].

The specified stage will move.

The stage does not move and the screen will go back to the Move mode screen if [Cancel] is tapped.



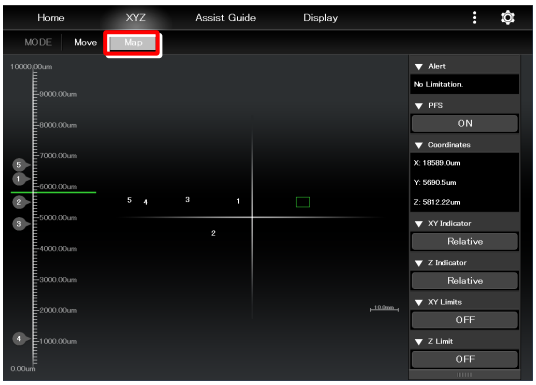
3.2.7 Map Mode

The Map mode screen allows the user to know which position in the movable area of the focusing device (Z) or the motorized stage (XY) the user is observing.

1. Tap [Map] on the XYZ screen.

The Map mode screen appears.

▼ Map mode screen



Displaying the Map mode screen

■ Position display area of the motorized stage (XY)

Green rectangle:

Shows the approximate size and position of the current field of view.

Red solid line:

Shows the XY limits.

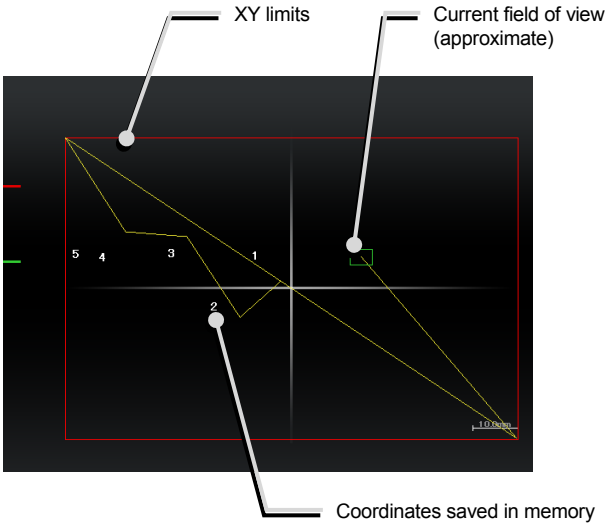
Numbers:

Show the coordinates saved in memory.

Yellow solid line:

Shows the trace of the XY stage movement.

▼ Position display area of the motorized stage (XY)



■ Position display area of the focusing device (Z)

Green solid line:

Shows the current Z position.

Red solid line:

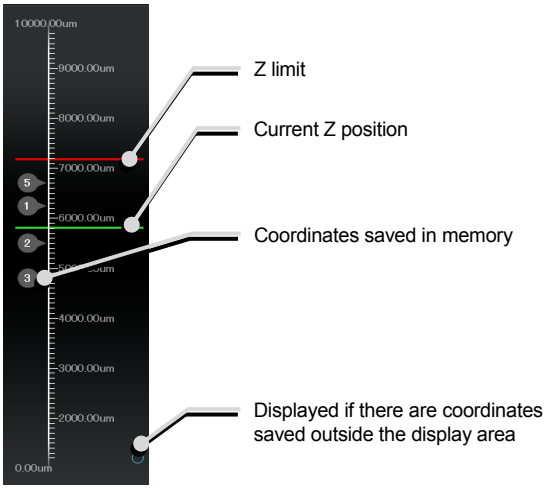
Shows the Z limit.

Numbers:

Show the coordinates saved in memory.

If there are coordinates saved outside the display area, a circle is displayed in the upper or lower end of the display area.

▼ Position display area of the motorized stage (XY)



Map mode operation

■ Operation in the position display area of the motorized stage (XY)

Double tapping:

Allows the XY position to move fast.

A movement confirmation message will be displayed when the position display area is double-tapped.

Tap [Yes] to move the motorized stage to the double-tapped position.

> **CAUTION**
>
> If the XY limits are turned off, an alert message appears to make sure that the objective will not touch the stage.

Long tapping:

The full-stroke range will be displayed over the entire screen.

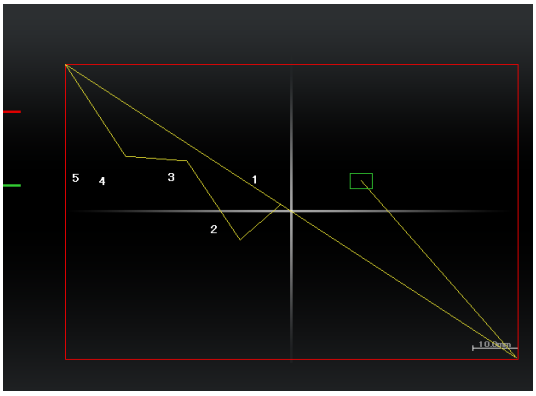
Pinch in and pinch out:

Pinch out for a zoom in view and pinch in for a zoom out view.

Dragging/Swiping:

Moves the displayed screen.

▼ Position display area of the motorized stage (XY)



■ Operation in the position display area of the focusing device (Z)

Double tapping:

Allows the Z position to move fast.

A movement confirmation message will be displayed when the position display area is double-tapped.

Tap [Yes] to move the focusing device to the double-tapped position.

Long tapping:

The full-stroke range will be displayed over the entire screen.

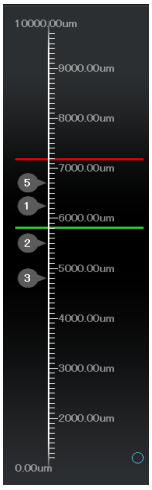
Pinch in and pinch out:

Pinch out for a zoom in view and pinch in for a zoom out view.

Dragging/Swiping:

Moves the displayed screen.

▼ Position display area of the focusing device (Z)



3.3 Live Screen: Ti2-A Only

When Ti2-A is used, a live image of the assist camera will be displayed on the Live screen.

3.3.1 Configuration of the Live Screen

This section describes the basic configuration of the Live screen.

■ **Remote control button area**

Shows the state of each device of the microscope main body.
For details, see “3.2.3 Remote Control Button Area.”

■ **Swiping the remote control button area**

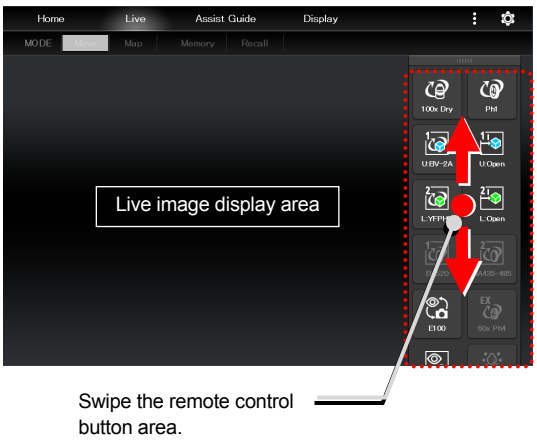
The items displayed in the remote control button area can be scrolled by swiping the area up or down.

■ **Live image display area**

Displays the live image of the assist camera.

> **CAUTION**
>
> Even though the assist tube base unit is mounted, the live image from the assist camera may not be displayed in the live image display area.
>
> If live image reception fails, a message dialog appears. Follow the message to retry live image reception.
>
> If this error still persists after several attempts, contact your local Nikon representative.

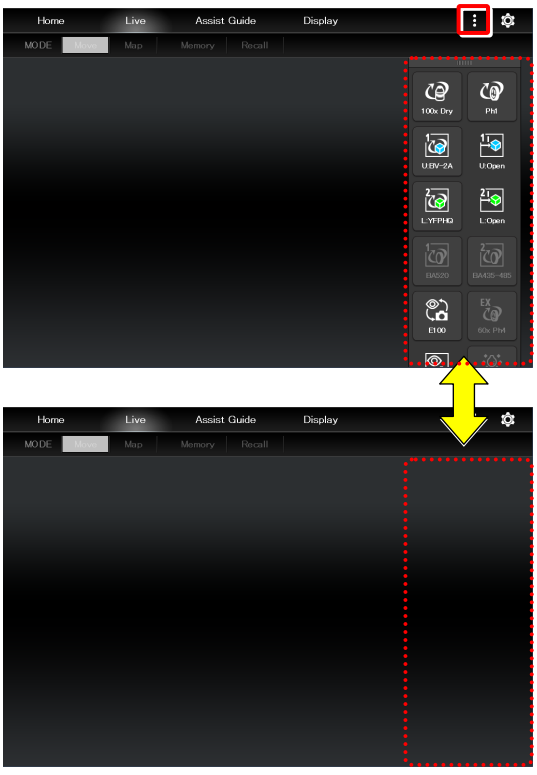
▼ **Remote control button area**



■ **[Display or hide]**

Displays or hides the remote control button area.

▼ **Display or hide**



Chapter
4

Advanced Uses

This chapter describes advanced uses of “Ti2 Control” to control the microscope.

4.1 Check Mode

The check mode allows the user to check if a specimen can be observed properly by the specified microscopy technique.

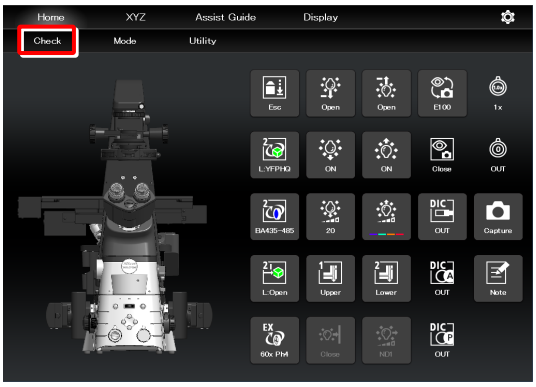
> **CAUTION**
> If a microscopy technique is added through a remote control button layout change, the check mode is unavailable unless the state is saved.

4.1.1 How to Use the Check Mode

1. Tap [Check] on the home screen.

A list of microscopy techniques will be displayed.

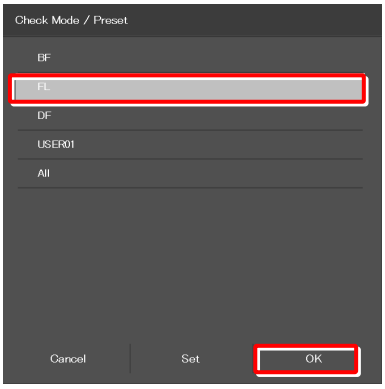
▼ **Starting the check mode**



2. Select a microscopy technique to be checked and tap [OK].

The layout of the remote control button area is changed to suit the selected microscopy technique and the checking process starts.

▼ **Selecting the microscopy technique to be checked**



[Check] in the menu field is shown in red or green in check mode.

If an accessory not suitable for the microscopy technique is in the optical path or it is in a state not suitable for the microscopy technique, [Check] in the menu field is shown in red and the mark is placed on the remote control button for the accessory.

If a motorized device not suitable for the microscopy technique is in the optical path or it is in a state not suitable for the microscopy technique, it is automatically moved to an optimal position.

▼ **Home screen in check mode**

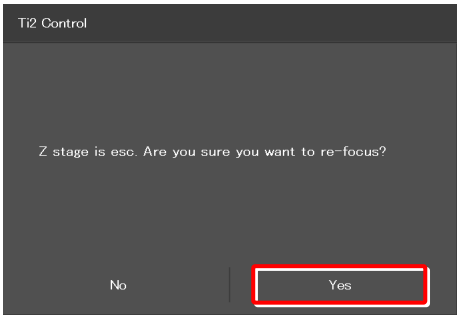
3. **Tap the remote control button with the mark and change it to the state suitable for the microscopy technique.**

If the microscope system is in a state suitable for the microscopy technique, [Check] in the menu field is shown in green.

SUPPLEMENTAL REMARKS

If the focusing device (Z stage) is at the escape position when [OK] is tapped after a microscopy technique is selected, a message appears asking if the objective is to be restored to the original position.

To start the check mode, tap [Yes] to restore the objective to the original position.
If [No] is tapped, a message saying that the check mode cannot be started appears and the screen returns to the home screen.



SUPPLEMENTAL REMARKS

To cancel the check mode, tap [Check] once again.

4.2 Layout of the Remote Control Button Area

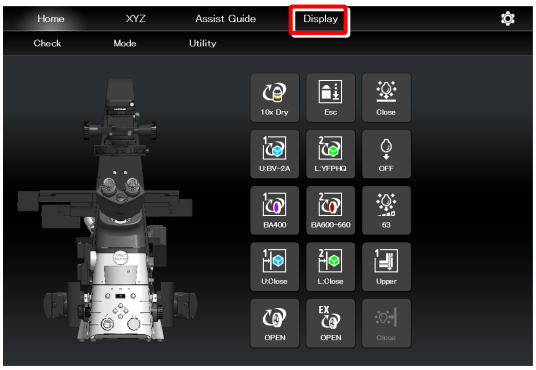
The layout of the remote control button area can be changed freely and can be registered as a preset configuration.

4.2.1 Customizing (or Presetting) the Layout of the Remote Control Button Area

1. Tap [Display] in the upper right of the home or XYZ screen.

The remote control button layout change screen appears.

▼ **Starting changing the layout of the remote control button area**



2. Select the desired button from a group of selectable buttons at the bottom of the screen.

The displayed button group can be scrolled by swiping the area to the right or the left.

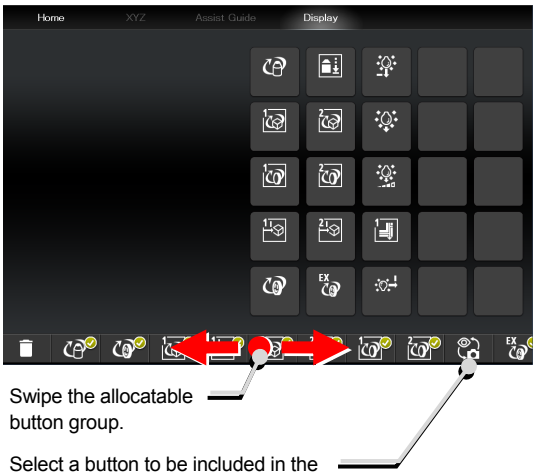
The selected button is highlighted in a yellow frame.

The button already been allocated has a check mark in the upper right corner of the button.

Example: (not allocated yet) → (already allocated)

> **SUPPLEMENTAL REMARKS**
>
> For a functional overview of each remote control button, see “3.1.2 List of Remote Control Buttons.”

▼ **Remote control button layout change screen**



3. Tap the location where the selected button is to be placed.

The button is displayed in the tapped location.

(The button can also be placed in a desired location by tapping the location first and then tapping the desired button from the bottom of the screen.)

▼ **Allocating a button**

4. **To delete a button from the remote control button area, tap the button.**

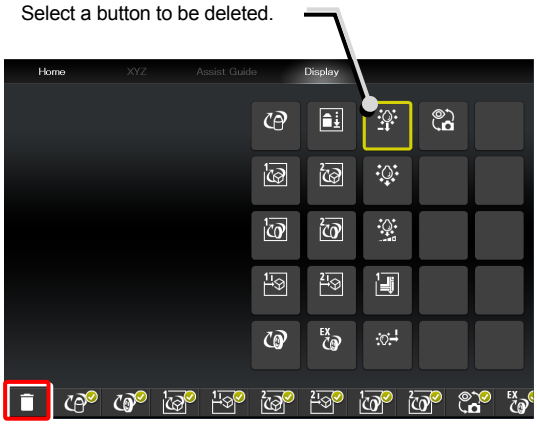
   A selected button is highlighted in a yellow frame.

5. **Tap [ ].**

   The selected button will be deleted.

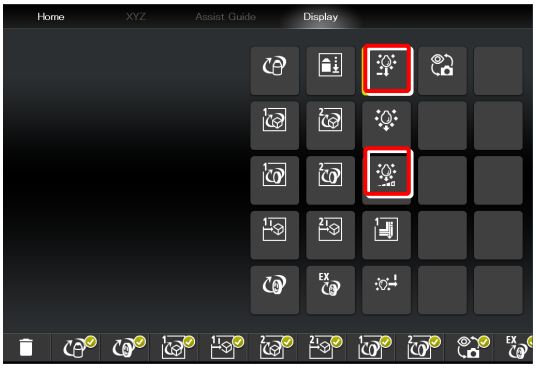
   (The button can also be deleted by tapping [ ] first, and then tapping the button to be deleted.)

▼ **Deleting a button**



6. **To swap the locations of buttons, tap the buttons to be swapped.**

▼ **Swapping buttons**



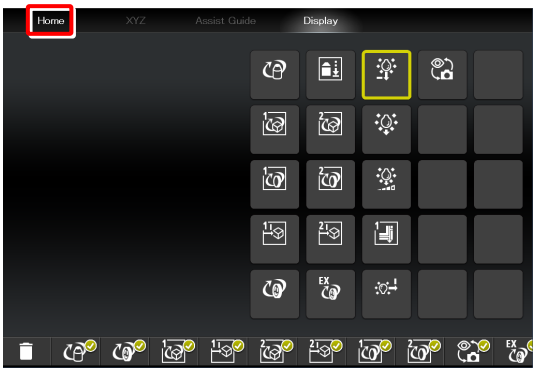
7. **After placing all buttons, tap [Home] or [XYZ].**

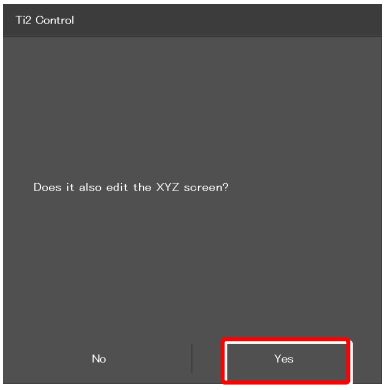
   The message “Do you also want to edit the XYZ (or home) screen?” appears.

8. **Tap [Yes] to customize the XYZ screen.**

   The remote control button layout change screen for the XYZ or home screen appears.

▼ **Saving the remote control button area layout change**





9. Customize the button layout for the XYZ or home screen by using the same procedure.

10. After placing all buttons, tap [Home] or [XYZ].

The Save Custom screen appears.

▼ Saving the remote control button area layout change for the XYZ screen

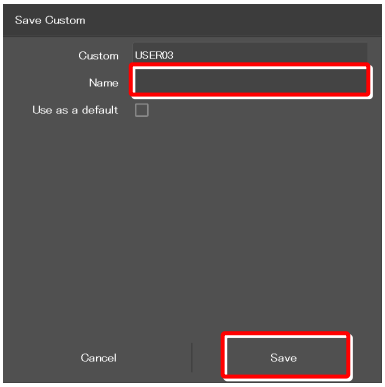
11. To save the customized remote control button layout, specify a name and tap [Save].

The customized remote button layout is registered as a preset remote control button configuration.

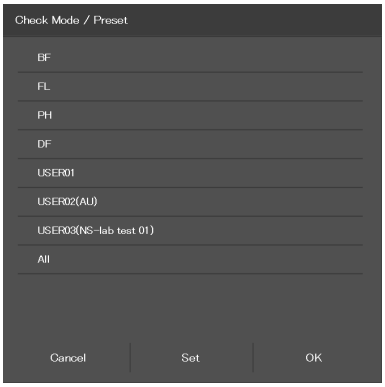
(The name specified here is displayed in the Check Mode list.)

> **SUPPLEMENTAL REMARKS**
>
> If the “Use as a default” check box is selected in the Save Custom screen, this layout becomes the default button layout.

▼ Save Custom screen



▼ Check Mode list

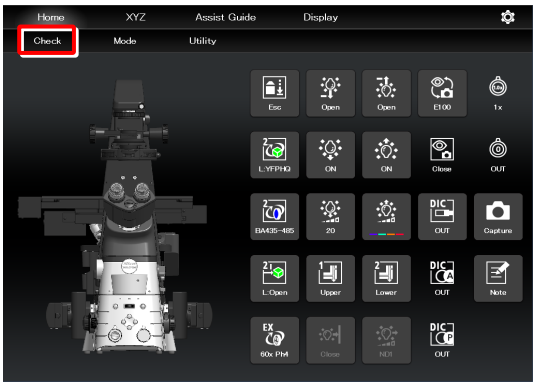


4.2.2 Calling the Remote Control Button Layout from the Preset Configuration

1. Tap [Check] on the home screen.

A list of preset configurations will be displayed.

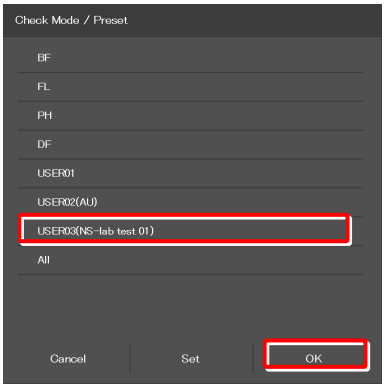
▼ **Calling button layouts**



2. Select a preset remote control button configuration from the list and tap [OK].

The selected preset button configuration is shown.

▼ **Selecting a preset configuration**



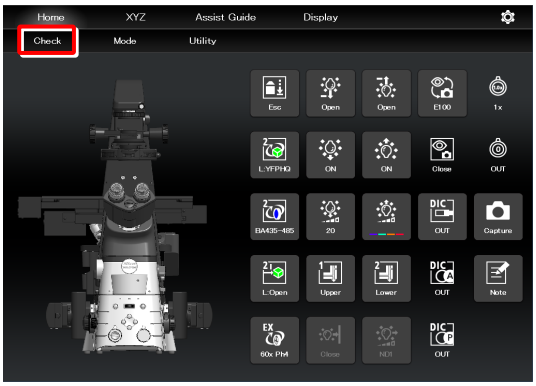
4.2.3 Saving the Current State to a Preset Configuration

The current state can be saved to a preset configuration.

1. Tap [Check] on the home screen.

A list of microscopy techniques is displayed.

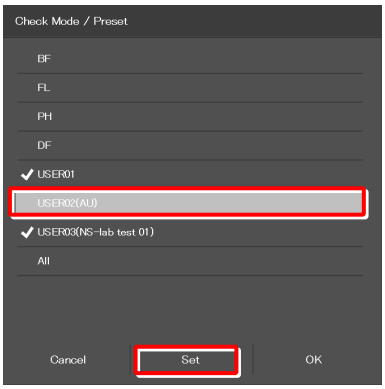
▼ **Saving the current state to the preset configuration**



2. From the list, select a preset configuration for which the current microscope state is to be saved, and then tap [Set].

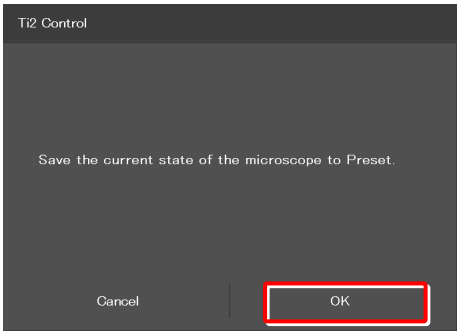
A confirmation screen is displayed.

▼ **Selecting a preset configuration**



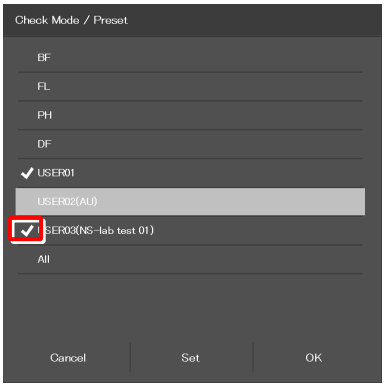
The “Save the current state of the microscope to Preset” message appears.
Tap [Yes] to save the current state, or tap [Cancel] to not save it.

▼ **Saving the current state**



A check mark (✔) is shown on the left side of the preset configuration for which the current state is saved.

▼ **Preset configuration for which the current state is saved**



4.3 Registering and Recalling Modes Linked with Devices

The Mode screen allows the user to place the motorized devices in the registered state.

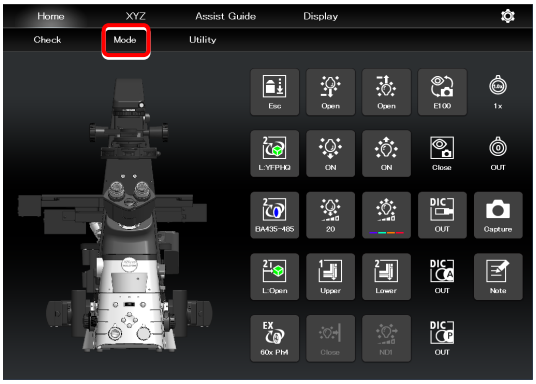
4.3.1 Registering Modes Linked with Devices

By registering different observation conditions for the mode linkage function, an observation condition can be called just by switching the mode.

1. Tap [Mode] on the home screen.

The Mode linkage screen appears.

▼ Setting mode linkage



2. From the displayed list, tap the mode to be saved (MD1 to MD8 are defaults).

3. Tap [Set].

The subscreen appears.

4. Edit the name and tap [OK] to save the setting.

▼ Mode linkage screen

5. Set the following items.

▼ Setting the devices and operation to be linked

Current:

Reads the current state of the system.

Name:

Specify the name for the mode to be registered. (Up to eight characters can be used.)

Nosepiece:

Select the address of the motorized nosepiece. (No linked operation is performed if "---" is selected.)

Condenser:

Select the address of the condenser turret. (No linked operation is performed if "---" is selected.)

FL1:

Select the address of FL turret 1 that has the filter cube to be used. (No linked operation is performed if "---" is selected.)

FL2:

If there is a second FL turret in a stage-up configuration, select the address of FL turret 2 that has the filter cube to be used.
(No linked operation is performed if "---" is selected.)

FL1 Shutter:

Specify whether the shutter of FL turret 1 is to be open or closed.
(No linked operation is performed if "---" is selected.)

FL2 Shutter:

If there is a second FL turret in a stage-up configuration, specify whether the shutter of FL turret 2 is to be open or closed. (No linked operation is performed if "---" is selected.)

BA1:

Select the address of BA filter wheel 1 that has the BA filter to be used.
(No linked operation is performed if "---" is selected.)

BA2:

If there is a second BA filter wheel in a stage-up configuration, select the address of BA filter wheel 2 that has the BA filter to be used.
(No linked operation is performed if "---" is selected.)

Optical Path:

Select an optical path.
(No linked operation is performed if "---" is selected.)

Shutter 1:

Select the state of motorized shutter 1 of the illumination attachment.
(No linked operation is performed if "---" is selected.)

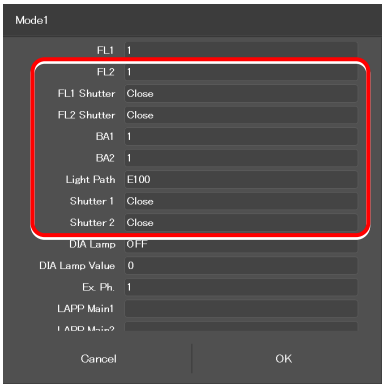
The connection destination of the motorized shutter set in [Shutter 1] can be confirmed in the [Shutter] field. Tap [⚙] to display the setup screen, and then tap [Connection].

Shutter 2:

Select the state of motorized shutter 2 of the illumination attachment.
(No linked operation is performed if "---" is selected.)

The connection destination of the motorized shutter set in [Shutter 2] can be confirmed in the [Shutter] field. Tap [⚙] to display the setup screen, and then tap [Connection].

▼ Setting the devices and operation to be linked (continued from the previous page)



DIA Lamp:

Select the state (on or off) of the dia-illumination.
(No linked operation is performed if "---" is selected.)

DIA Lamp Value:

Specify the illumination intensity of the dia-illumination.
(The input range is 0 to 255. No linked operation is performed if nothing is entered.)

Ex. Ph.:

Select the address of the turret for the tube base unit for external phase contrast.
(No linked operation is performed if "---" is selected.)

LAPP Main1:

Select the optical path of main branch 1 of the epi-illumination attachment.
(No linked operation is performed if "---" is selected.)

LAPP Main2:

Select the optical path of main branch 2 when the upper and lower epi-illumination attachments are provided in a stage-up configuration.
(No linked operation is performed if "---" is selected.)

LAPP Sub:

Select the optical path of the sub-branch of the epi-illumination attachment.
(No linked operation is performed if "---" is selected.)

Correction Collar:

Allows displaying or specifying the position of the correction collar.

Inter Mag.:

Select an intermediate magnification value.

DIC Prism:

Select the DIC prism in/out status.

DIC Polarizer:

Select the DIC polarizer in/out status.

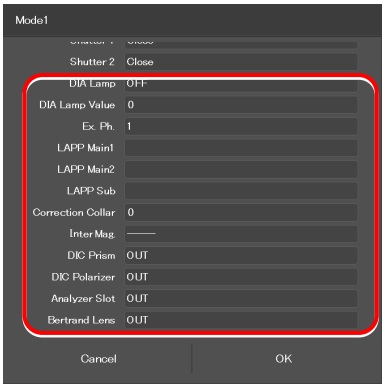
Analyzer Slot:

Select the analyzer slider in/out status.

Bertrand Lens:

Select the Bertrand lens in/out status.

▼ Setting the devices and operation to be linked (continued from the previous page)



4.3.2 Calling a Registered Mode

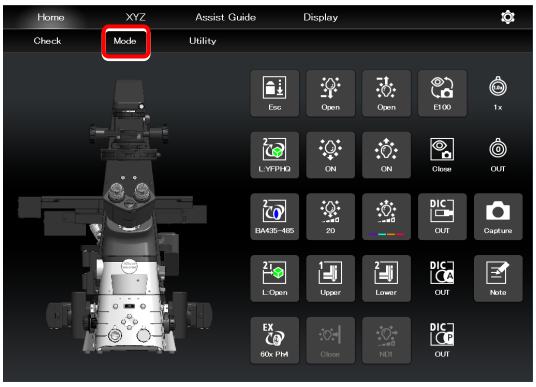
The registered mode can be called to switch the system to the desired control state.

> **SUPPLEMENTAL REMARKS**
>
> The state of each device is shown when the mode to be called is tapped if the Ti2-A is in use. A mark is placed on the button corresponding to the device whose state is different from the registered one.

1. Tap [Mode] on the home screen.

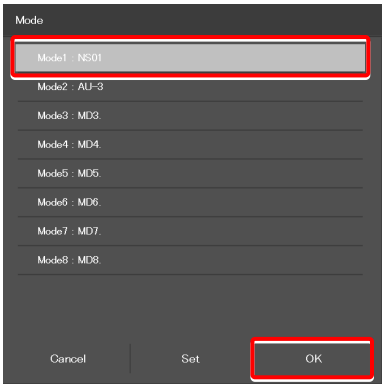
The Mode linkage screen appears.

▼ **Calling mode-linked operation**



2. From the displayed list, tap the mode to be called.

▼ **Mode-linked operation calling screen**



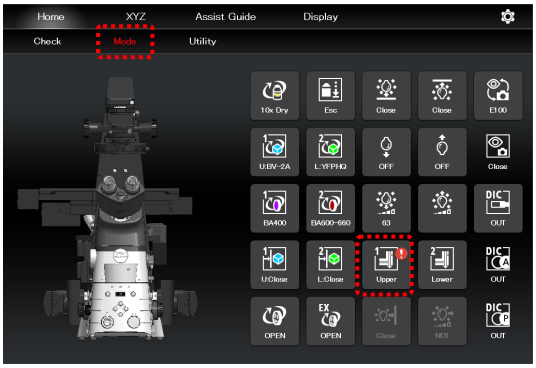
3. Tap [OK].

The registered mode is read.

During a mode-linked operation, [Mode] in the menu field is shown in red.

If an accessory not suitable for the registered mode is in the optical path, or it is in a state not suitable for the registered mode, a mark is placed on the remote control button for the accessory.

▼ **Home screen in mode-linked operation**



> **SUPPLEMENTAL REMARKS**
>
> To cancel the mode-linked operation, tap [Mode] once again.

4.4 Utilities

The Utility screen allows the user to copy the information set in the setup screen, the customized remote control button layout, and the user-customized information of the Assist Guide to another smart device.

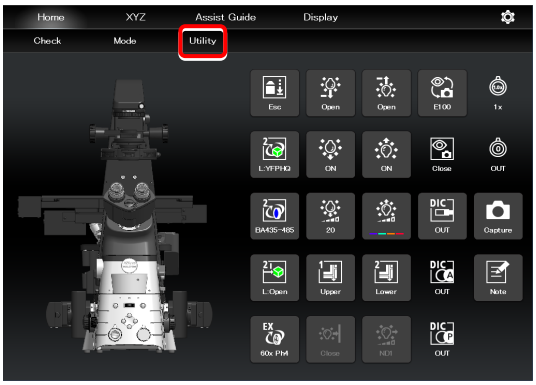
> **CAUTION**
> If the screen resolution of the sender's smart device differs from that of the receiver's smart device, the button layout may not be displayed properly.

4.4.1 Transmission

1. Tap [Utility] on the home screen.

The Copy screen appears.

▼ **Sending the setting information**



2. Tap [Send], and then tap [OK].

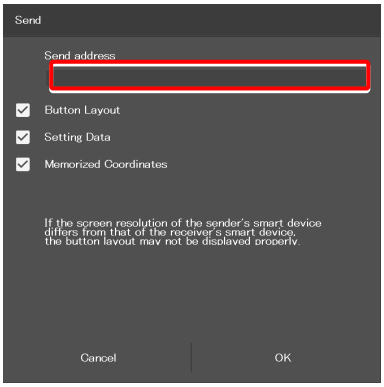
A transmission setting screen appears.

▼ **Transmission setting**

3. Specify [Send address].

> **CAUTION**
> Before using this function, the IP address of the destination smart device must be confirmed.

▼ **Transmission setting screen**



4. Confirm the contents to be sent and uncheck the check boxes for unnecessary items.

The following items can be sent.

Button Layout:

Preset configuration of the remote control button area

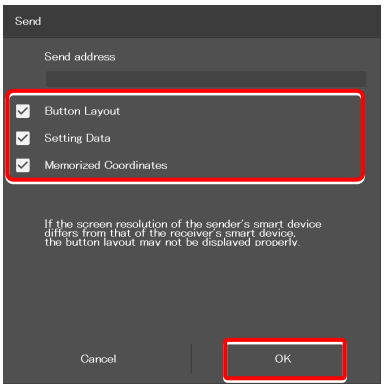
Setting Data:

All setting information set in the setup screen

Memorized Coordinates:

XYZ coordinates memorized in the XYZ Move screen

▼ Transmission setting screen



5. Tap [OK].

The remote host will be connected.

If the transmission destination device is ready to receive, transmission of the setting information starts.

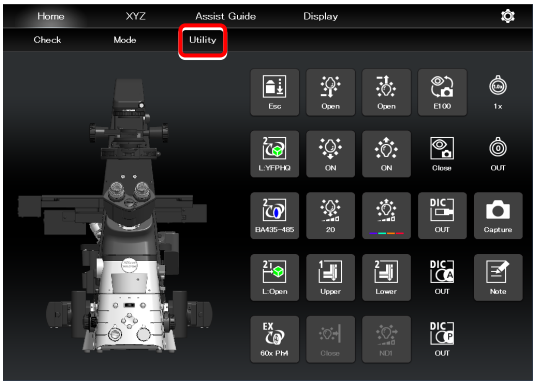
4.4.2 Reception

The setting information of another smart device can be copied to the user's smart device.

1. Tap [Utility] on the home screen.

The Copy screen appears.

▼ **Receiving the setting information**



2. Tap [Receive], and then tap [OK].

The waiting for connection screen appears.

▼ **Reception setting**

3. Send information from the sender's smart device.

After all information is received, information reception will start and the screen returns to the home screen.

Tap [Cancel] to cancel the reception. All received information is erased and the screen returns to the home screen.

▼ **Waiting for connection screen**

Chapter 5

How to Use the Assist Guide

This chapter describes how to use the Assist Guide.

5.1 About the Assist Guide

The Assist Guide is the function that helps to put the microscope in an optimum observation state.

5.1.1 Assist Guide Screen (Top Screen)

Each Assist Guide screen has the following buttons:

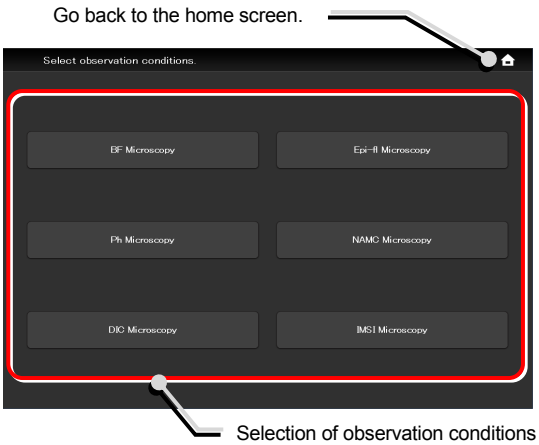
■ **(Home)**

Go back to the home screen.

■ **Selection of observation conditions**

The screen changes to an Assist Guide screen based on the tapped observation condition.

▼ **Assist Guide screen configuration (top)**



5.1.2 Assist Guide Screen (Guiding)

■ **(Top)**

Go back to the Assist Guide screen (Top).

■ **(Break)**

Tapping this button suspends the guide and displays the message “Taking a break”.

Tapping [OK] resumes the guide.

■ **Guide items**

Show guide item overviews.
Guidance can be started from the tapped item.

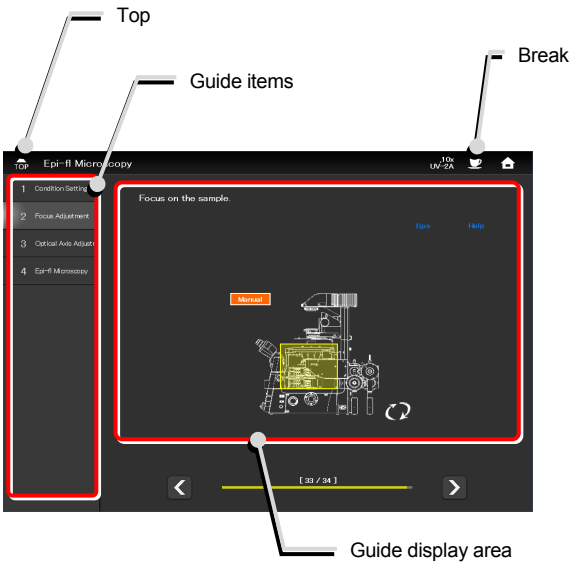
■ **Guide display area**

Guidance content is displayed.

Tapping the image in the center of the screen enlarges it. Tapping the image again restores the original size.

> **When using the assist tube base unit**
>
> If an assist tube base unit is in use, a live image of the assist camera is displayed on the left side of the guide display area.
> Tapping the image enlarges it. Tapping the image again restores the original size.

▼ **Assist Guide screen configuration (guiding)**

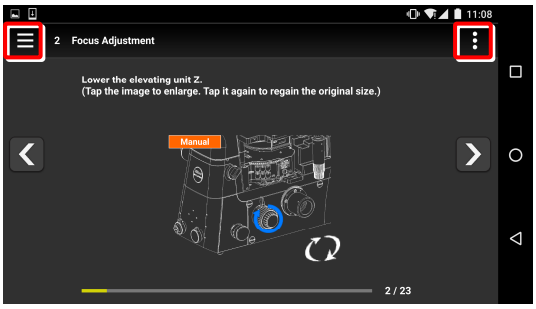


When using a smartphone

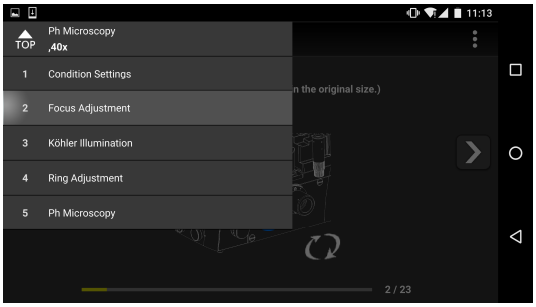
To display the Top icon and guide items, tap [Menu] ( ).

To display the Home and Break icons, tap [Setting] ( ).

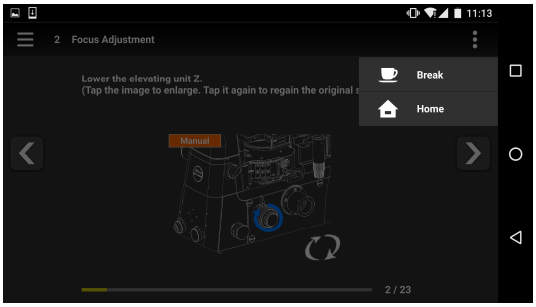
▼ Screen when using a smartphone



▼ Menu display when using a smartphone



▼ Setting display when using a smartphone



■ Page change and motorized device operation

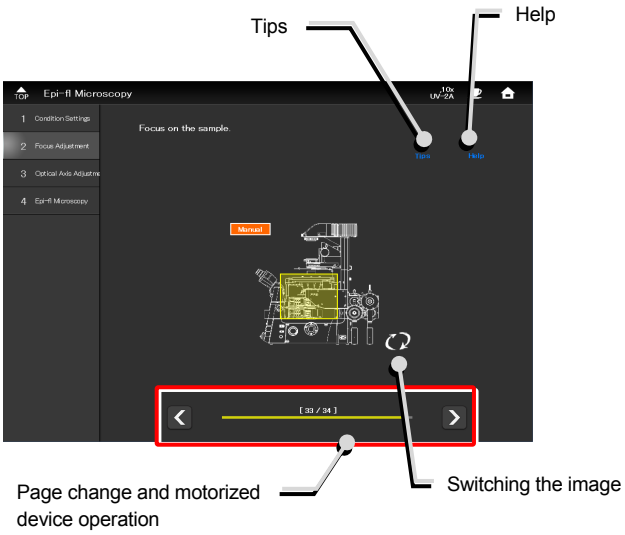
The arrows ([<] and [>]) at the ends of the scroll bar at the bottom of the screen allow the user to go to a desired page.

When the Ti2-E is used and Motorized is displayed on the screen, tap [AUTO] to automatically control the motorized devices in accordance with the guide.

If Motorized or Intelligent is displayed and when the devices are in the correct positions, [>] (go to the next page) is enabled.

> **When using motorized or intelligent accessories**
>
> The associated guide screen is skipped and the next guide screen appears when accessories with the status detection function (motorized or intelligent accessories) are mounted and their settings are correct.
>
> If a correctly set accessory is operated by mistake, the associated guide screen re-appears.

▼ Switching the screen



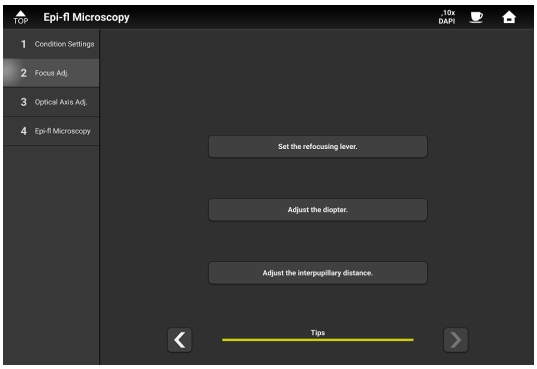
■ (Switching the image)

Allows the image to be switched between the entire image and an image showing which location should be operated.

■ Tips

Displays tips.

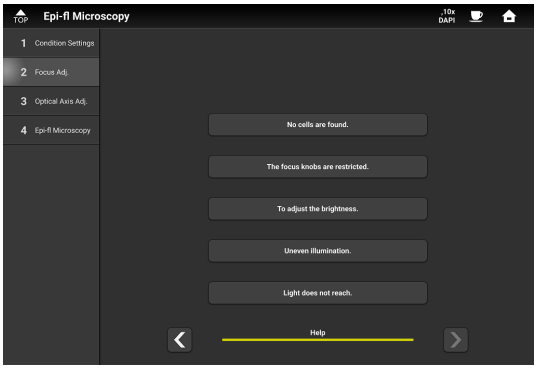
▼ Tips screen



■ Help

Displays the help screen which shows a solution when adjustment is unsuccessful.

▼ Help screen

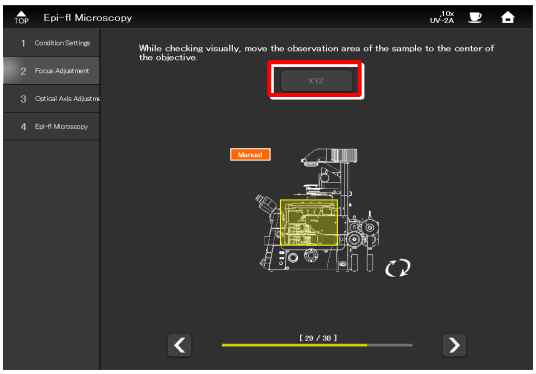


■ XYZ

Tapping [XYZ] in the guide screen for the motorized stage changes the screen to the XYZ screen.

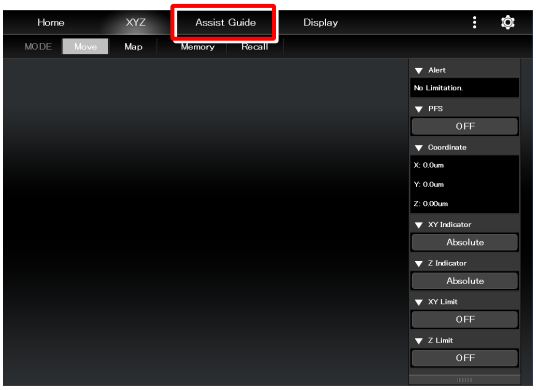
For how to operate the XYZ screen, see “3.2 XYZ Control (XYZ Screen): Ti2-E Only.”

▼ Calling the XYZ screen



To return to the Assist Guide screen for the XYZ screen, tap [Assist Guide].

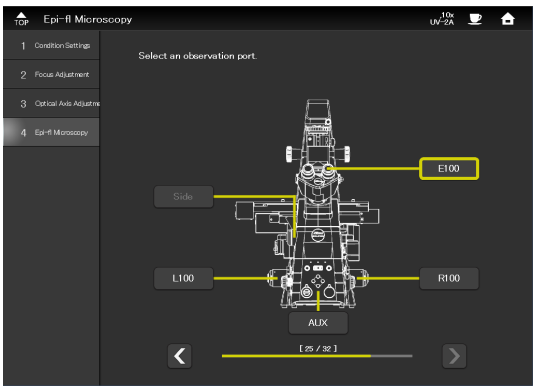
▼ Going back to the Assist Guide screen from the XYZ screen



■ Optical path selection

Select an optical path used for observation.
The next page appears when an optical path is selected.

▼ Optical path selection screen



5.2 Starting the Assist Guide

Guidance will start after conditions for the target microscopy technique are set.

The conditions to be set differ depending on the microscopy technique. Set the conditions according to the guidance displayed.

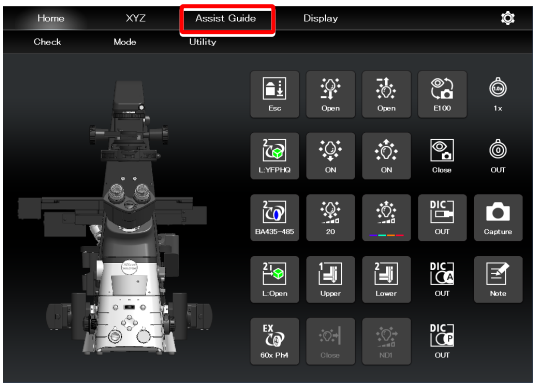
> **CAUTION**
>
> Before starting the Assist Guide, the microscope configuration and optical devices (such as objectives) must be registered.
>
> For how to set the microscope configuration, see “2.3 [System]: Display and Manual Registration of the Microscope Configuration.” For how to make settings for optical devices, see “2.5 [Optical Device]: Setting the Optical Devices.”

The basic condition setting process is shown as follows.

1. Tap [Assist Guide].

The Assist Guide screen appears.

▼ **Starting the Assist Guide**



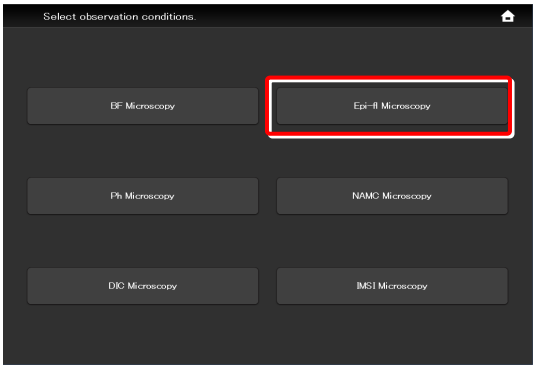
2. Select a microscopy technique (observation conditions).

After a microscopy technique is selected, the microscope setting guide sequence starts according to the selected microscopy technique.

(The succeeding steps are the same for all microscopy techniques. Here, epi-fl microscopy is used as an example.)

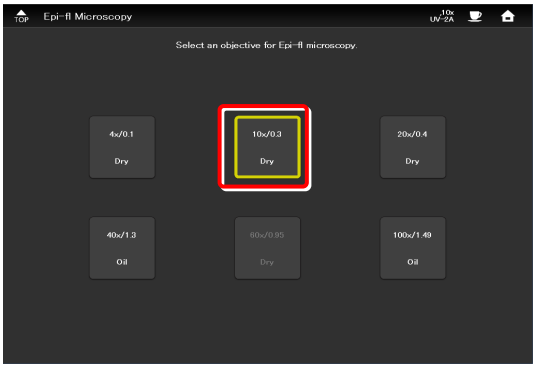
> **CAUTION**
>
> If there are inappropriate settings for the selected microscopy technique, a message is displayed.
> In this case, correct the settings according to the message.

▼ **Selection of observation conditions**



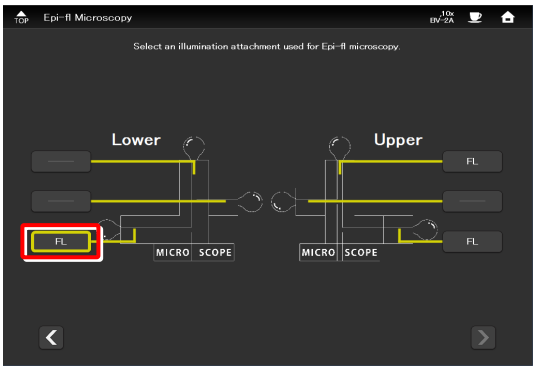
3. Select an objective to be used for observation.

▼ **Selecting an objective for observation**



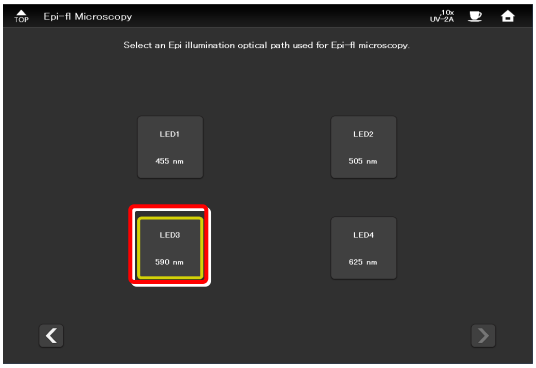
4. Select an optical path used for observation.

▼ **Selecting an illumination attachment**



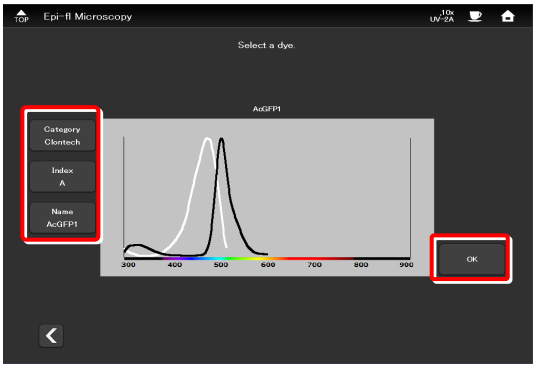
5. Select the wavelength of the light source used for epi-fl microscopy.

▼ **Selecting a light source wavelength**



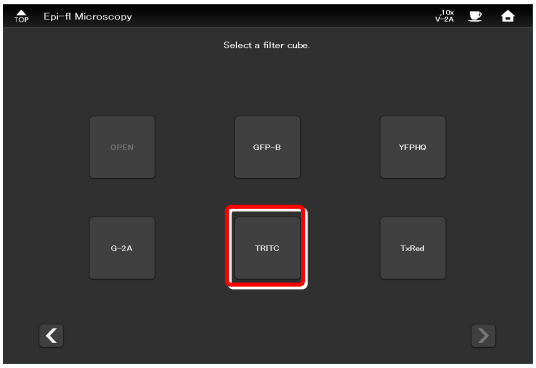
6. Select a dye and tap [OK].

▼ **Selecting a dye**



7. Select a filter cube.

▼ **Selecting a filter cube**

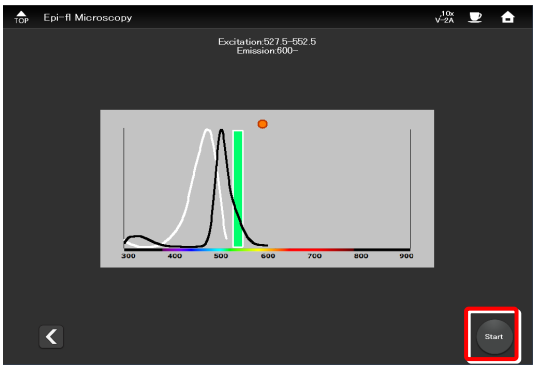


This completes the condition settings.

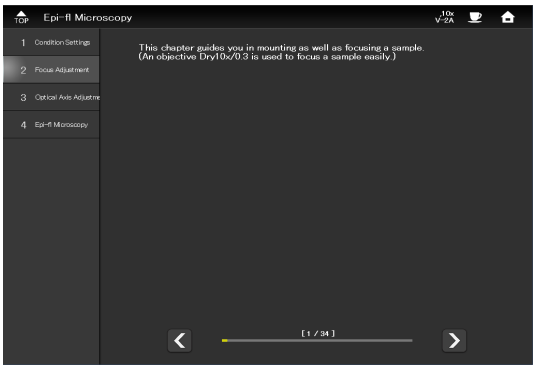
Tapping [Start] starts the guide.

After this, operate the microscope according to the message displayed on the screen.

▼ **Completing the condition settings**



▼ **Starting the Assist Guide**



CAUTION

To connect the microscope's LAN cable or the LAN cable of the wireless router, which is connected to the microscope, to a corporate network, consult with the network administrator.

(It is not recommended to connect to a corporate network because a large number of packets flow into the LAN when the assist camera is used.)

Chapter 6

Appendix (Ti2-E Only)

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

6.1 List of Functions Assigned to Function Buttons

6.1.1 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.

6.1.2 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.

6.1.3 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. 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. 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	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
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. Long press: Memorizes Mode 1 setting.	✓✓ (Fn1)	✓
139	212	MODE2 MEM-RECALL	Short press: Recalls Mode 2 setting. Long press: Memorizes Mode 2 setting.	✓✓ (Fn2)	✓
140	213	MODE3 MEM-RECALL	Short press: Recalls Mode 3 setting. Long press: Memorizes Mode 3 setting.	✓	✓
141	214	MODE4 MEM-RECALL	Short press: Recalls Mode 4 setting. Long press: Memorizes Mode 4 setting.	✓	✓
142	215	MODE5 MEM-RECALL	Short press: Recalls Mode 5 setting. Long press: Memorizes Mode 5 setting.		
143	216	MODE6 MEM-RECALL	Short press: Recalls Mode 6 setting. Long press: Memorizes Mode 6 setting.		
144	217	MODE7 MEM-RECALL	Short press: Recalls Mode 7 setting. Long press: Memorizes Mode 7 setting.		
145	218	MODE8 MEM-RECALL	Short press: Recalls Mode 8 setting. 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		

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

6.2.1 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 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

6.3 List of Functions Assigned to Joystick LCD Screen

6.3.1 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 prism
	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

6.3.2 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 prism
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