

Nikon

**Application for Inverted Research Microscope
ECLIPSE Ti2 Series**

Ti2 Control

Ver.1.1.0

Instruction Manual

(for Android)

Introduction

Thank you for purchasing a Nikon product.

This manual describes how to install and use the application software “Ti2 Control” 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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- The contents of this manual are subject to change without notice.
- The equipment described in this manual might differ in its appearance from that of the actual product.
- 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, see the user's manual for your smart device version.

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Reference data

Reference spectrum data of the fluorescence probe in Ti2 Control are provided from Takara BIO USA Inc. Some spectral data are copyright of Takara BIO USA, Inc. and used with permission.

Reference spectrum data of the fluorescence probe in Ti2 Control 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 file name and saved on the application side using the [Export] function in the [Import/Export] area on the setup screen.
- When controlling the microscope main body by the application other than Ti2 Control, operation from Ti2 Control on the smart device can be limited.
“Locked” is shown in red on the top right of the Ti2 Control screen on the smart device during the limiting period.
When using the Assist Guide, a message indicating the limiting period is displayed on the smart device screen if the limitation is enabled from the application other than Ti2 Control. Tap [OK] to display the top screen of the Assist Guide.

Screens used in this manual

Menus and items displayed in “Ti2 Control” vary depending on the microscope system configuration and the connected motorized devices.

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

Contents

Introduction	i
Notes on Using “Ti2 Control”	ii
Chapter 1 Preparation	1
1.1 Hardware and Software Requirements	2
1.2 Installing the Application	3
1.2.1 Installation From Google Play	3
1.2.2 Installation Without Using Google Play	3
1.2.3 Uninstallation of the Application Installed Without Using Google Play	8
1.3 Starting the Application	10
1.3.1 Starting the Application	10
1.4 Connecting the Microscope System to the LAN	11
1.4.1 Accessing the Microscope From the Device	11
1.4.2 Connection Procedure for Each Combination of Wireless Router and Microscope System	13
1.5 Functional Configuration of the Application	15
Chapter 2 Setup	16
2.1 Basic Setup Operations and Screens	17
2.1.1 Starting the Setup	17
2.1.2 Configuration of the Setup Screen	17
2.1.3 Setting Items	18
2.1.4 Sending Microscope System Information	18
2.2 [General]: Basic Settings of the Microscope and the Application	19
2.2.1 Setting the Language	19
2.2.2 Registering the Microscope System	20
2.2.3 Setting the LAN	21
2.2.4 Fixed IP Address of the Microscope	22
2.3 [System]: Display and Manual Registration of the Microscope Configuration	23
2.3.1 Manually Registering the Microscope Configuration	23
2.4 [Connection]: Setting the Connection Destinations of Devices	26
2.4.1 Setting the Connections of Motorized Shutters	26
2.4.2 Setting the Connections of Cameras	27
2.4.3 Setting the Connections of FL Turrets	27
2.4.4 Setting the Connections of BA Filter Wheels: Ti2-E Only	28
2.4.5 Setting the Branch(LAPP)	28
2.4.6 Setting the C-LEDFl Epi-fl LED Illuminator	28
2.5 [Optical Device]: Setting the Optical Devices	29
2.5.1 Setting the Nosepiece	29
2.5.2 Setting the Condenser Module	31
2.5.3 Setting the Filter Cube	31
2.5.4 Setting the BA Filter: Ti2-E Only	32
2.5.5 Setting the Intermediate Magnification	32
2.5.6 Setting the External Phase Ring: Ti2-E Only	33
2.5.7 Setting the Optical Path Name	33

2.6	[OPT Optical Device]: Registering a New Optical Device	34
2.6.1	Registering a New Objective.....	34
2.6.2	Registering a New Condenser Module	36
2.6.3	Registering a New Filter Cube	36
2.6.4	Registering a New BA Filter: Ti2-E Only	37
2.7	[Movement]: Setting the Movement: Ti2-E Only.....	38
2.7.1	Setting the Motorized Nosepiece	38
2.7.2	Setting the PFS	39
2.7.3	Setting the Focusing Device (Z-Stage)	39
2.7.4	Setting the Unallocated Address Skipping Function	40
2.8	[Link]: Setting the Linking Function: Ti2-E Only	41
2.8.1	Setting a Linked Operation When the Objective Is Switched	41
2.8.2	Setting a Linked Operation of the Shutter.....	42
2.8.3	Setting the Illumination Intensity of Dia-Illumination (DIA).....	42
2.8.4	Setting the Parfocal Correction	43
2.8.5	Setting the Parcentricity Correction	44
2.9	[Function]: Assigning Functions: Ti2-E Only.....	45
2.9.1	Setting the Function Buttons.....	45
2.9.2	Setting the FnL and FnR Indicators on the Microscope.....	46
2.9.3	Setting the LCD Display Screen of the Joystick	46
2.9.4	Setting the Shuttle Switches	47
2.10	[Assist Camera] Setting the Assist Camera	48
2.11	[Options]: Setting the Motorized Devices: For Ti2-E	49
2.11.1	Controlling Each Knob	49
2.11.2	Controlling the PFS Offset Dial	52
2.11.3	Controlling the Buttons and Switches	53
2.11.4	Controlling the LED Indicators	53
2.11.5	Other Control Items.....	54
2.11.6	Ti2-A.....	55
2.12	[Import/Export]: Importing and Exporting the Settings	56
2.12.1	Importing the Settings	56
2.12.2	Exporting the Settings.....	58
2.12.3	Changing the Setting Name.....	59
2.12.4	Deleting the Configuration File.....	60
2.13	[Information]: Version Information	61
Chapter 3	Control and Display of Each Device	62
3.1	Remote Control of the Ti2-E Microscope (Home Screen).....	63
3.1.1	Configuration of the Home Screen.....	63
3.1.2	List of Remote Control Buttons	65
3.1.3	Controlling the Objective	67
3.1.4	Controlling the Condenser	68
3.1.5	Controlling the Filter Cube	69
3.1.6	Controlling the BA Filter	70
3.1.7	Switching the Optical Path	71
3.1.8	Controlling the External Phase Ring.....	72
3.1.9	Controlling the Dia-Illumination Unit (DIA)	73
3.1.10	Opening and Closing the Shutter of the FL Turret	74
3.1.11	Opening and Closing the Motorized Epi-illumination Shutter	74

3.1.12	Opening and Closing the Motorized Dia-Illumination Shutter	74
3.1.13	Capturing Images With the Assist Camera (Only With the Assist Tube Base Unit).....	75
3.1.14	Escaping and Restoring the Objective	75
3.1.15	Indication-Only Buttons	76
3.1.16	Switching the Optical Path of Epi-Illumination	77
3.1.17	Operation When Using an LED for the Epi Illuminator	78
3.1.18	Operation When Using the Intensilight for the Epi Illuminator	79
3.2	XYZ Control (XYZ Screen): Ti2-E Only	80
3.2.1	Configuration of the XYZ Screen	81
3.2.2	Information Display Area	82
3.2.3	Remote Control Button Area	85
3.2.4	Camera Control	85
3.2.5	XYZ Operation Area	86
3.2.6	Memory	88
3.2.7	Map Mode	90
3.3	Live Screen: Ti2-A Only	92
3.3.1	Configuration of the Live Screen	92
Chapter 4	Advanced Uses	93
4.1	Check Mode	94
4.1.1	How to Use the Check Mode	94
4.2	Remote Control Button Arrangement	96
4.2.1	Remote Control Button Rearrangement	96
4.2.2	Calling the Saved Remote Control Button Arrangement	99
4.3	Registering and Recalling Modes Linked With Devices	100
4.3.1	Saving Modes Linked With Devices	100
4.3.2	Calling a Registered Mode	107
Chapter 5	How to Use the Assist Guide	109
5.1	About the Assist Guide	110
5.1.1	Assist Guide Screen (Top Screen)	110
5.1.2	Assist Guide Screen (Guiding)	110
5.2	Starting the Assist Guide	114
Chapter 6	Appendix (Ti2-E Only)	117
6.1	List of Functions Assigned to Function Buttons	118
6.1.1	Initial Setting of the Function Buttons on the Ti2-E Microscope Main Body	118
6.1.2	Initial Setting of the Function Buttons on the Joystick	118
6.1.3	Functions That Can Be Registered	118
6.2	List of Indication Functions Assigned to the LED Indicators of the Ti2-E Microscope Main Body	125
6.2.1	Indication Functions That Can Be Registered	125
6.3	List of Functions Assigned to Joystick LCD Screen	127
6.3.1	Initial Settings of LCD Display	127
6.3.2	Indication Functions That Can Be Registered	127

Chapter

1

Preparation

This chapter describes the hardware and software required for “Ti2 Control” and how to install and uninstall this application software.

1.1 Hardware and Software Requirements

⚠ 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	2GB or more
Storage	16GB or more
Resolution (aspect ratio)	Tablet PC: 1,920 x 1200 or more (4:3, 16:9 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 "Ti2 Control" installer program can be downloaded from Google Play. "Ti2 Control" 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

- The uninstallation procedure for “Ti2 Control” is the same as that for other Android applications.

Notes on updating or reinstalling the application

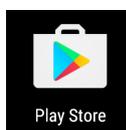
If “Ti2 Control” installed without using Google Play is in the device, first uninstall it, and then reinstall it. Otherwise the application cannot be updated.

For details, see “1.2.3 Uninstallation of the Application Installed Without Using Google Play.”

1.2.1 Installation From Google Play

- Tap the [Play Store] icon on the device to access Google Play.
- Search for “Ti2 Control” and then install it.

Installation



1.2.2 Installation Without Using Google Play

Prepare the installer file (*.apk) of “Ti2 Control” in your computer.

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

Preparation

- Tap the [Settings] icon on the device.

The setting screen appears.

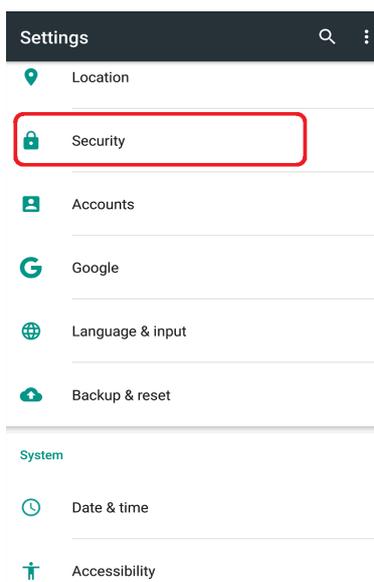
Preparation



- Tap [Security].

The Security screen appears.

Setting screen



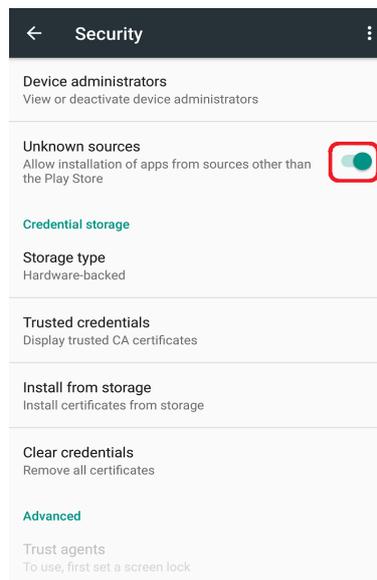
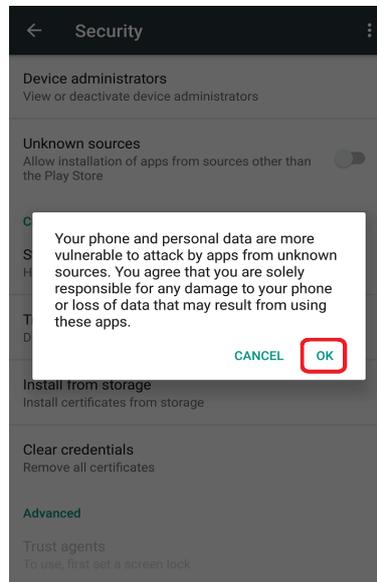
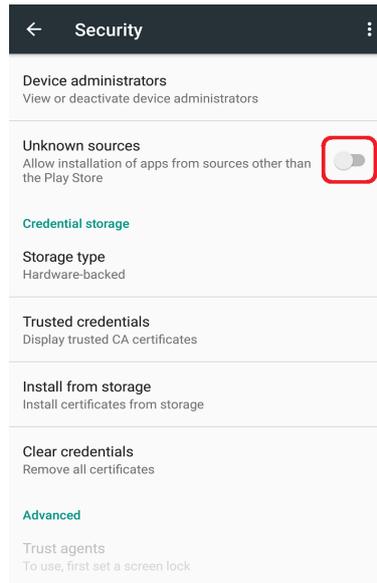
3. Turn on the [Unknown sources] switch.

The warning screen appears.

4. Tap [OK].

The [Unknown sources] switch is turned on.
This completes the preparation for the installation.

▼ Security screen



Uninstalling 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.
- Before updating or reinstalling the “Ti2 Control”, uninstall “Ti2 Control” and then reinstall it. For details on how to uninstall “Ti2 Control”, see “1.2.3 Uninstallation of the Application Installed Without Using Google Play.”

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.

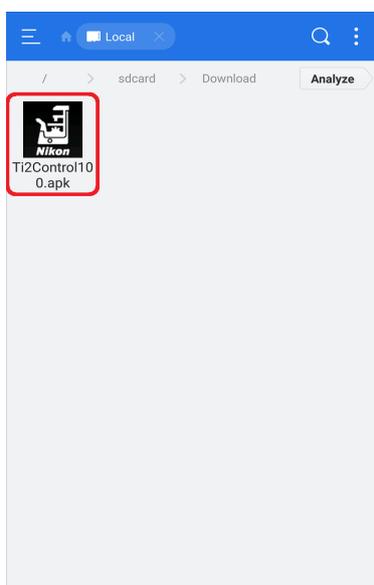
3. Start the file manager on the smart device, and display the folder in which a copied installer is saved.

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

4. Tap the installer.

The Properties screen appears.

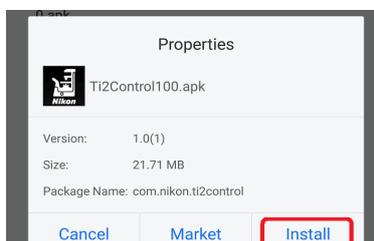
▼ Installation start



5. Tap [Install].

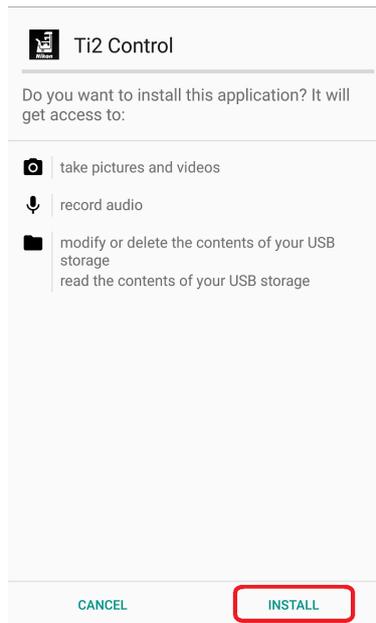
A confirmation message is displayed.

▼ Properties



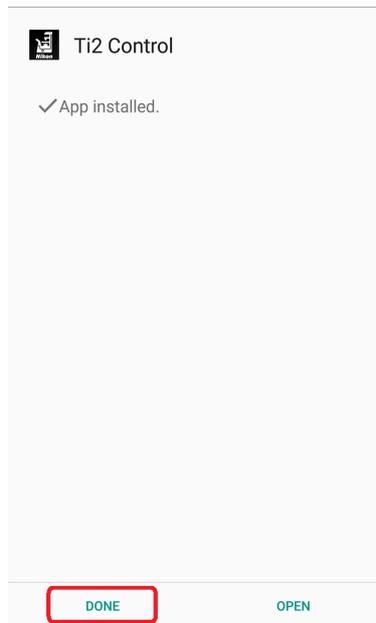
6. Tap [Install].

▼ Installation start



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

▼ Installation is complete.



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

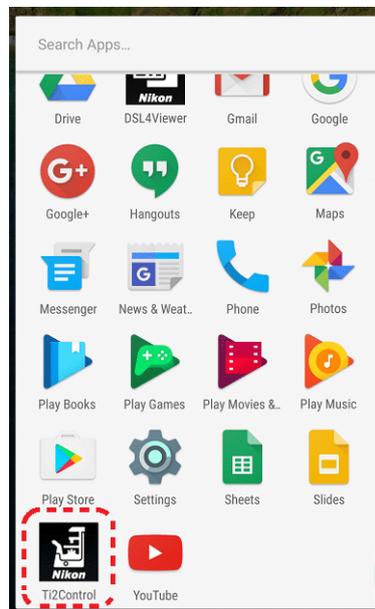
▼ Home screen of Android



If the application's icon does not appear on the home screen, tap the Drawer button. "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 "Ti2 Control."

1.2.3 Uninstallation of the Application Installed Without Using Google Play

CAUTION

The user interface and the setting procedure may vary depending on the device type and the OS version.

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

The setting screen appears.

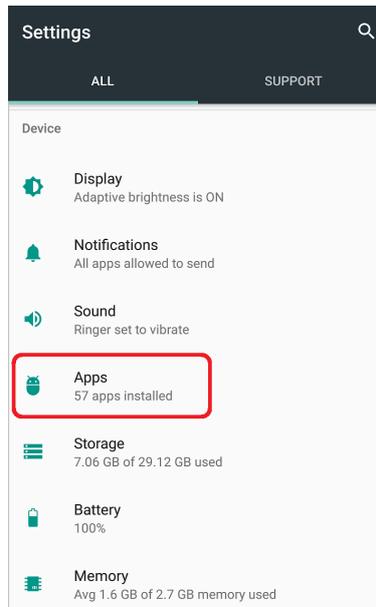
▼ Preparation



2. Tap [Apps].

The Apps screen appears.

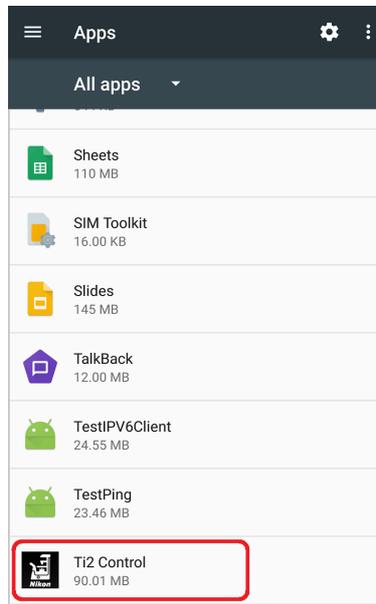
▼ Setting screen



3. In the list of application, tap [Ti2 Control].

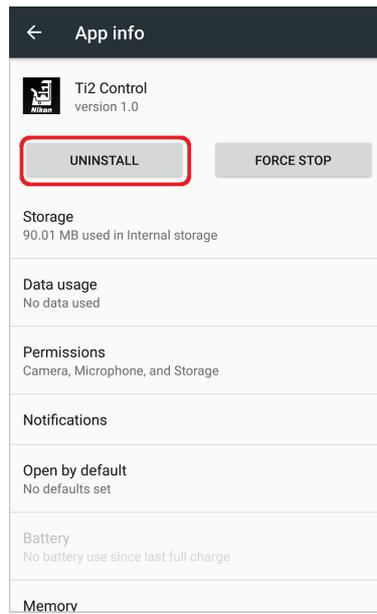
The App info screen appears.

▼ Apps screen



4. Tap [UNINSTALL].

“Ti2 Control” is uninstalled.

▼ App info screen

1.3 Starting the Application

This section describes how to start the application.

CAUTION

Using a certain smart 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 Ti2 Control.

1.3.1 Starting the Application

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

“Ti2 Control” starts.

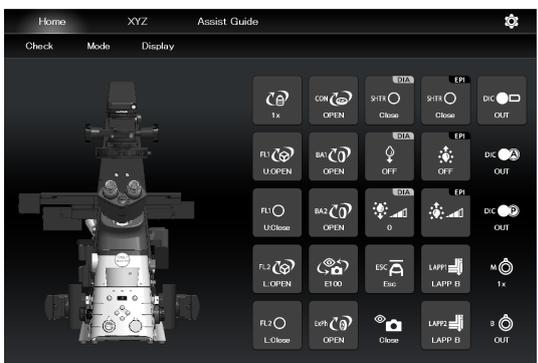
CAUTION

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

CAUTION

If the Ti2 Control 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 Ti2 Control 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], and [Wi-Fi], and then set the Wi-Fi setting to 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.

3. On the Configure Wi-Fi screen, select [Always] for [Keep Wi-Fi on during sleep].

CAUTION

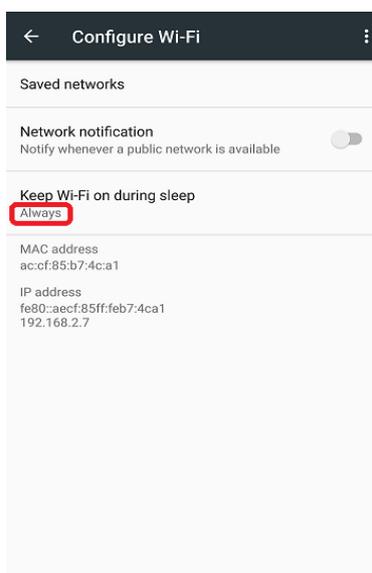
The setting procedure may vary depending on the device type and the OS version.

4. Tap the "Ti2 Control" app icon to start the application.

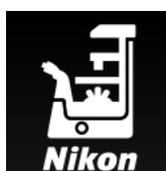
▼ Wi-Fi setting screen



▼ Wi-Fi setting screen



▼ Starting "Ti2 Control"



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

The "Ti2 Control" application is now ready for use.

▼ "Ti2 Control" home screen



✔ 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

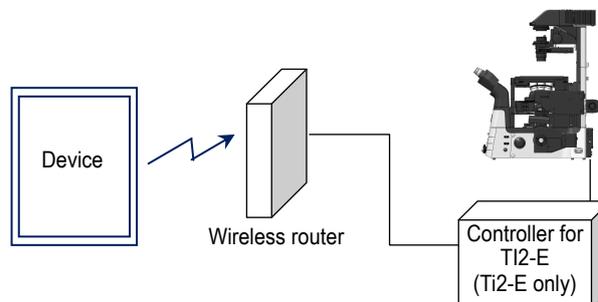
1. On the device, tap [Settings] and then [Wi-Fi] to connect to the wireless router. ▼ Connection diagram

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” is connected to the microscope automatically.

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



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. On the device, tap [Settings] and then [Wi-Fi] to connect to the wireless router. ▼ Connection diagram

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

2. Start the “Ti2 Control” application.

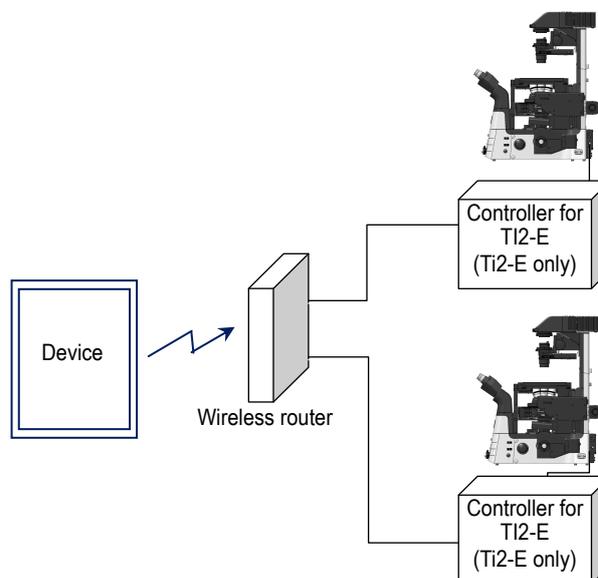
When more than one microscope is connected to the wireless router, tap  in the upper right corner of the “Ti2 Control” application, [General], [LAN], and then [IP (Mic.)] to display a list of connected microscopes.

3. Select the IP address of the microscope 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 and repeat steps 1 to 3.

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



A single microscope is connected respectively to each wireless router

1. On the device, 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 the wireless router, see “1.4.1 Accessing the Microscope From the Device.”

2. Start the “Ti2 Control” application.

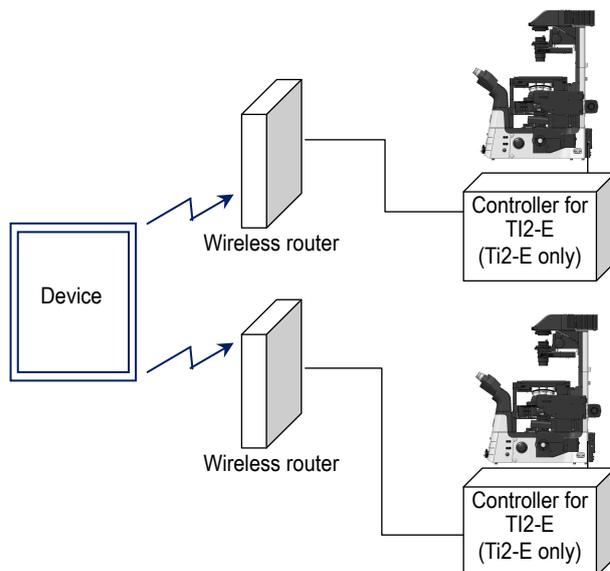
“Ti2 Control” connects to the microscope automatically.

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

3. To 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 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. On the device, 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 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.

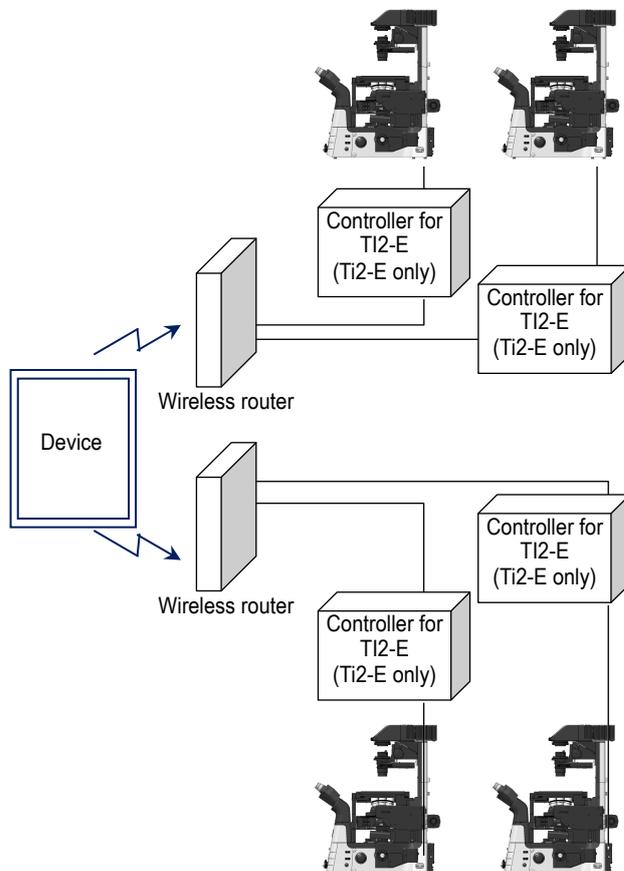
3. Select the microscope to be connected and tap [OK].

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 and repeat steps 1 to 3.

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

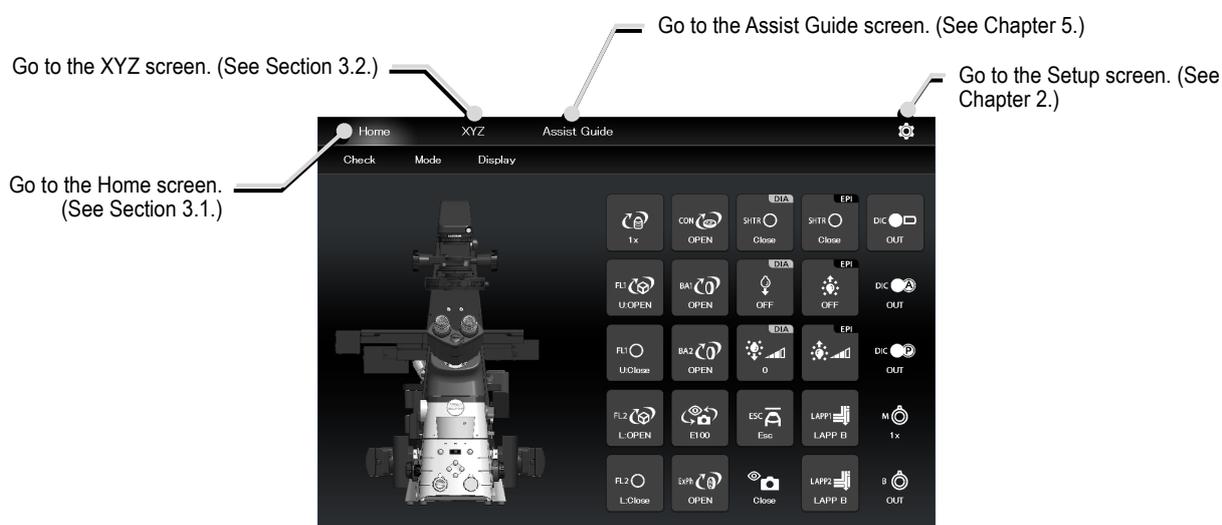
▼ Connection diagram



1.5 Functional Configuration of the Application

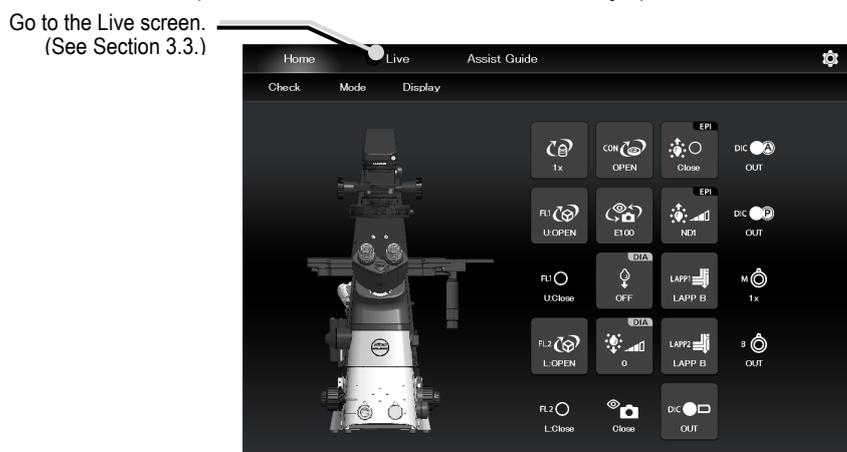
This application consists of five screens:

- 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.”)
-  **(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

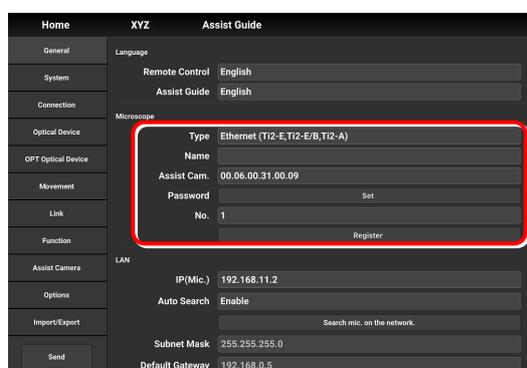
2.1.1 Starting the Setup

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

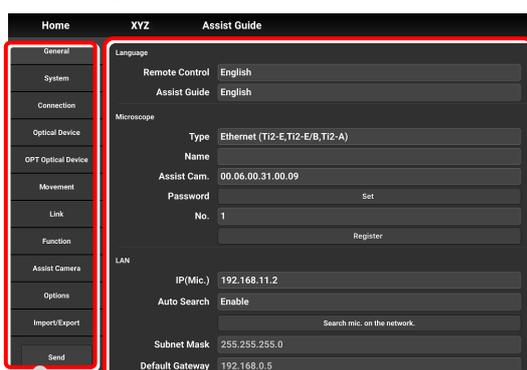
Tap each button to change a setting item.

■ 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



Setting item selection area

Setting area

2.1.3 Setting Items

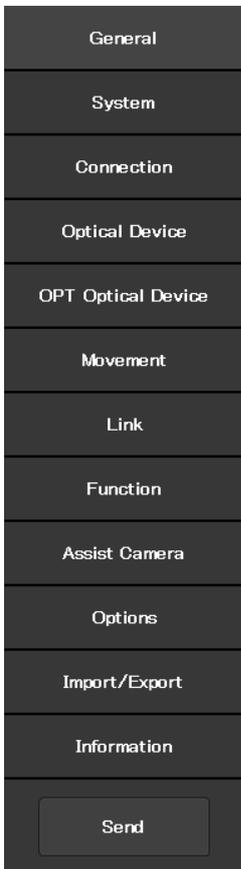
The setup function consists of 12 setting screens and one button:

✔ SUPPLEMENTAL REMARKS

Depending on the window size, not all items may be displayed.
 Scroll the setting item selection area to select [General] or [Information].

- [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]: Setting the Movement (Ti2-E Only)
- [Link]: Settings of linked control
- [Function]: Assignment of functions
- [Assist Camera]: Setting the assist camera
- [Options]: Settings of the motorized devices
- [Import/Export]: Reading and saving the settings
- [Information]: Display of the version information
- [Send]: Transmission of the setting information to the microscope system

▼ Setting items

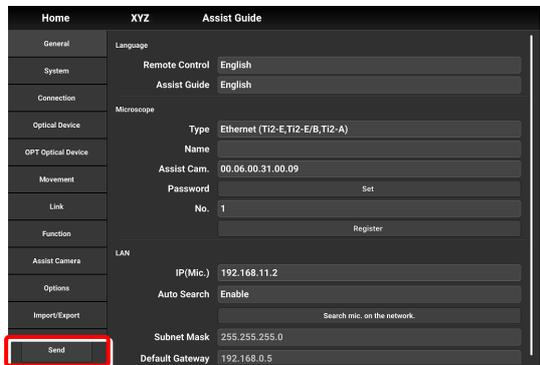


2.1.4 Sending Microscope System Information

■ Sending information to the microscope system

Tap [Send] 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] from the setting item selection area.

▼ General settings

Home	XYZ	Assist Guide
General	Language	
System	Remote Control	English
Connection	Assist Guide	English
Optical Device	Microscope	
OPT Optical Device	Type	Ethernet (T12-E,T12-E/B,T12-A)
Movement	Name	
Link	Assist Cam.	00.06.00.31.00.09
Function	Password	Set
Assist Camera	No.	1
Options		Register
Import/Export	LAN	
Send	IP(Mic.)	192.168.11.2
	Auto Search	Enable
		Search mic. on the network.
	Subnet Mask	255.255.255.0
	Default Gateway	192.168.0.5

2.2.1 Setting the Language

Set the language of this application.

1. Set as follows in the [Language] area.

Remote Control:

Select the language used on the setting screens.

Assist Guide:

Select the language used in the Assist Guide.

▼ Setting the language

Home	XYZ	Assist Guide
General	Language	
System	Remote Control	English
Connection	Assist Guide	English
Optical Device	Microscope	
OPT Optical Device	Type	Ethernet (T12-E,T12-E/B,T12-A)
Movement	Name	
Link	Assist Cam.	00.06.00.31.00.09
Function	Password	Set
Assist Camera	No.	1
Options		Register
Import/Export	LAN	
Send	IP(Mic.)	192.168.11.2
	Auto Search	Enable
		Search mic. on the network.
	Subnet Mask	255.255.255.0
	Default Gateway	192.168.0.5

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] area.

Type:

Select the microscope to be connected.

Name:

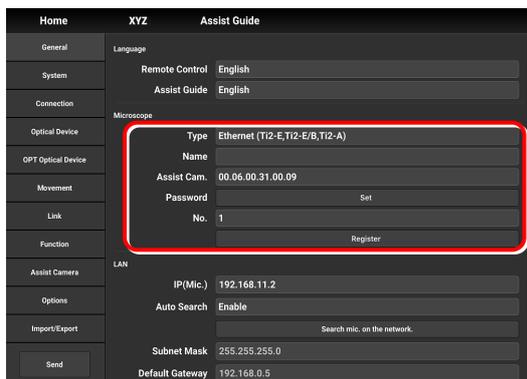
Enter a registration name of the microscope system.

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.

▼ Registering the microscope system



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.

2.2.3 Setting the LAN

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

IP (Mic.):

Allows displaying or specifying the IP address of the microscope.

If not using [Auto Search] or [Search mic. on the network], directly enter the IP address of the microscope.

To enter the fixed IP address of the microscope, see “2.2.4 Fixed IP Address of the Microscope.”

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.

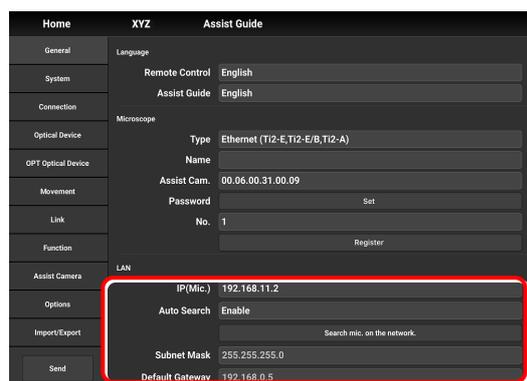
Subnet Mask:

Allows displaying or specifying the subnet mask of the microscope.

Default Gateway:

Allows displaying or specifying the default gateway of the microscope.

▼ Setting the LAN



Section	Item	Value	
General	Language	English	
	Remote Control	English	
	Assist Guide	English	
	Microscope	Type	Ethernet (Ti2-E,Ti2-E/B,Ti2-A)
		Name	
	Assist Cam.	00.06.00.31.00.09	
	Password	Set	
	No.	1	
	Register		
	LAN	IP(Mic.)	192.168.11.2
Auto Search		Enable	
Search mic. on the network			
Subnet Mask		255.255.255.0	
Default Gateway		192.168.0.5	

☑ 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 device, tap [Settings] and [Wi-Fi] to turn off the Wi-Fi, and 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.

2.2.4 Fixed IP Address of the Microscope

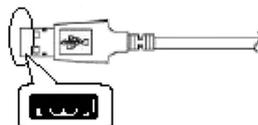
This section describes how to find the fixed IP address of the microscope.

CAUTION

The fixed IP address of the microscope can be found only by “Ti2 Control” for Windows. Perform the procedure in this section in a Windows PC.

1. Connect the Windows PC and a microscope system (a controller for Ti2-E when using Ti2-E, or a microscope main body when using Ti2-A) using a USB connector.

▼ USB connector A



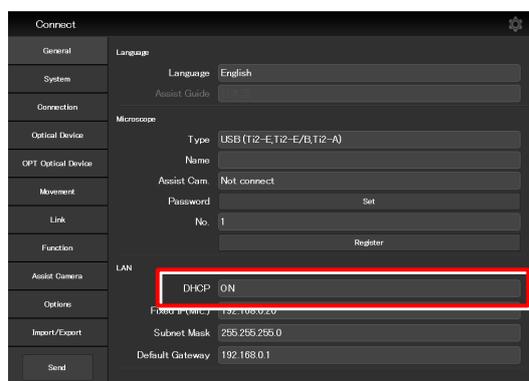
2. In the [LAN] area, set [DHCP] to OFF (disabled).

▼ Fixed IP address of the microscope

3. Take a note of the microscope’s fixed IP address displayed in the [Fixed IP(Mic)] field.

The steps in the Windows PC are complete.

Enter the noted IP address in the smart device. (See “2.2.3 Setting the LAN.”)



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

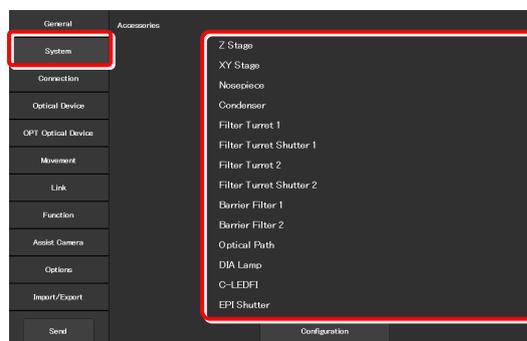
Tapping [System] displays a list of accessories mounted on the microscope system.

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

A list of accessories connected to the microscope system is displayed.

2. Confirm the items displayed in the [Accessories] area.

▼ 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) for dia-illumination 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:

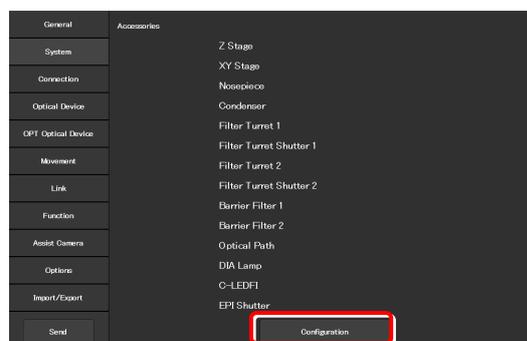
- 1) Disconnect the cable coming from the dia-illumination unit from the connector box on the rear surface of the microscope main body.
- 2) Specify [D-LH/LC Precentered Lamphouse] for the [DIA_Lamp] in the microscope configuration setting screen for manual configuration, of Ti2 Control.
- 3) Tap [Send] 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 area.

A microscope configuration setting screen appears.

▼ Manually registering the microscope configuration



2. Tap the area where accessory mounting information is to be registered.

A registration screen of the area is 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 is displayed.

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

5. Tap [OK].

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

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

6. Tap [Overall Image] to register an accessory for another parts area.

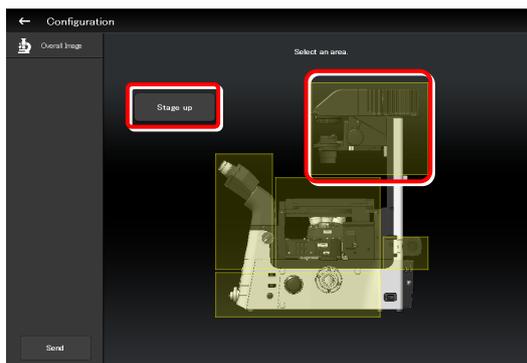
The screen returns to the microscope configuration setting screen.

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

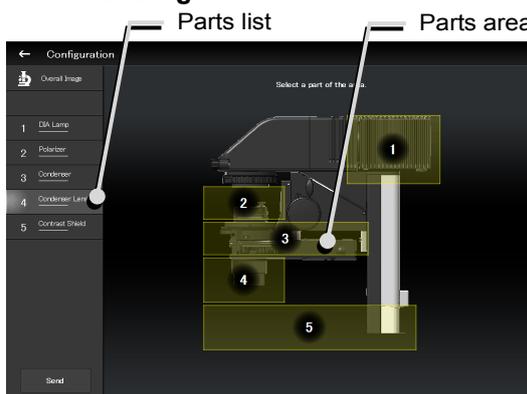
8. To finish manual registration of a microscope configuration, tap [Send] to send the registration information or tap [←].

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

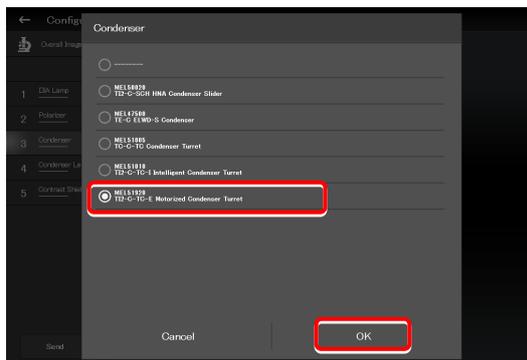
▼ Microscope configuration setting screen



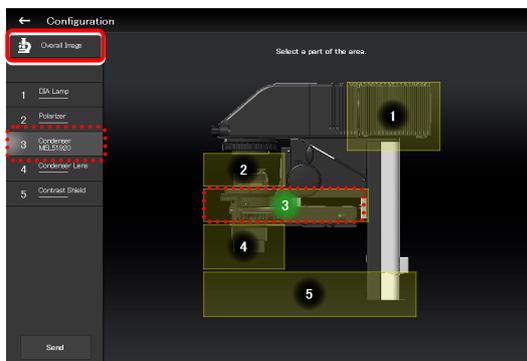
▼ Per-area registration screen



▼ Product list dialog



▼ Per-area registration screen



When using epi-illumination

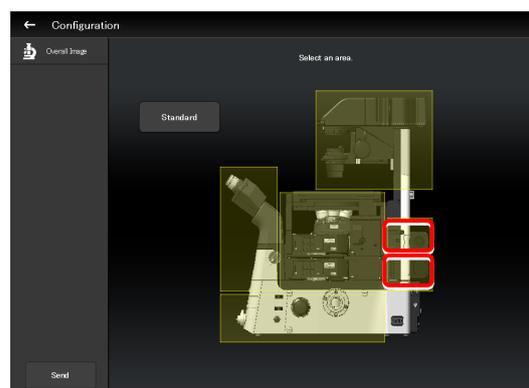
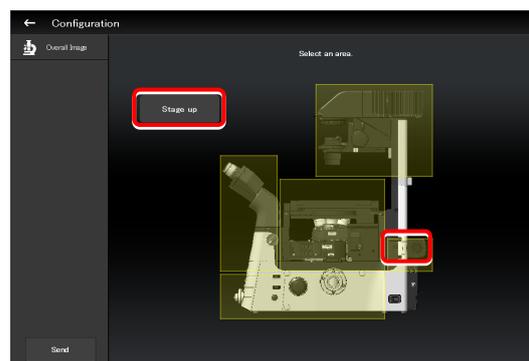
Tap the area that includes the epi-illumination attachment.

The registration screen for the epi-illumination attachment is 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



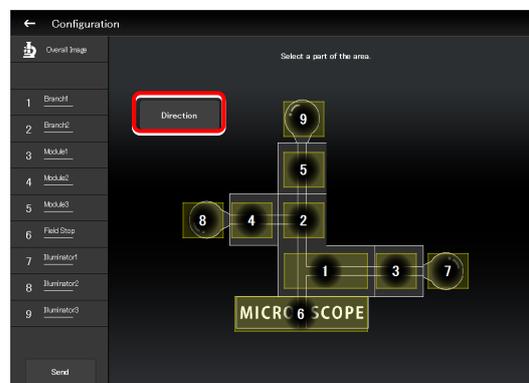
In a two-tier configuration, the upper and lower epi-illumination attachments are mounted in opposite directions. However, the application shows the two epi-illumination attachments in the same orientation.

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

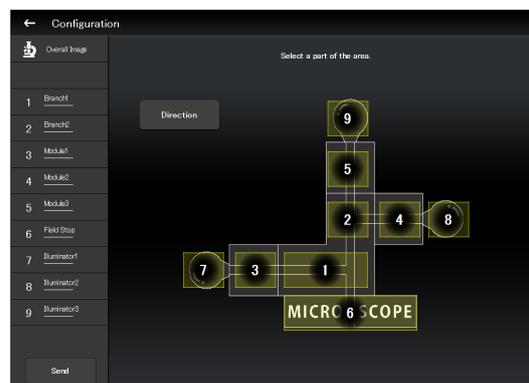
Select the epi-illumination attachment which is shown in the orientation opposite to the actual one.

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



✔ Using the T12-F-FLS Simple Epi-FL Attachment

When specifying the T12-F-FLS simple epi-fl attachment for [Branch1], set [Illuminator3] to the epi-illumination attachment.

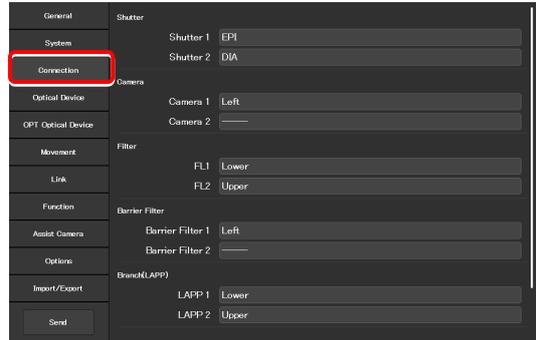
2.4 [Connection]: Setting the Connection Destinations of Devices

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] area.**

Shutter 1:

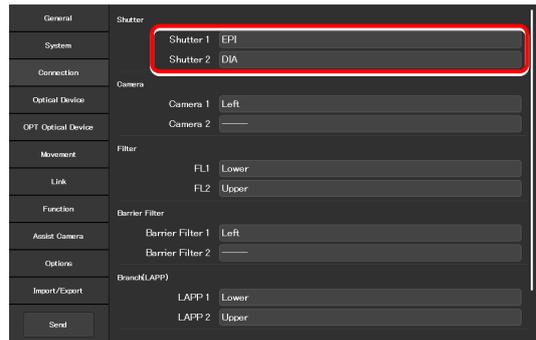
Select the mounting destination of the motorized shutter.

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 [---].

▼ Setting the connections of motorized shutters



✔ SUPPLEMENTAL REMARKS

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

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] area. ▼ Setting the connections of cameras

Camera 1:

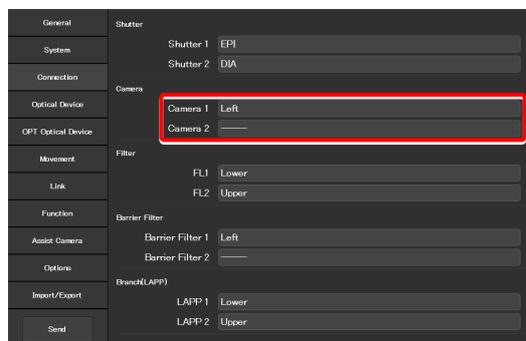
Select the port to which the camera is attached.

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 [---].



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] area. ▼ Setting the connections of FL turrets

FL1:

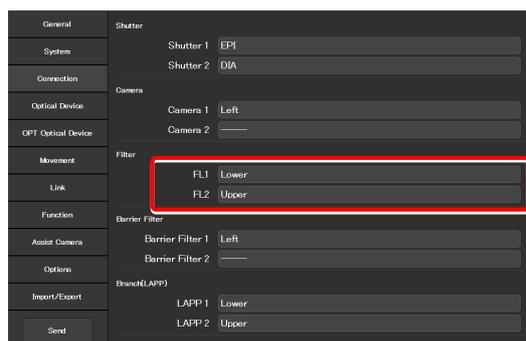
Select the location to which the FL turret is attached.

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 [---].



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] area.

BA1:

Select the port to which the BA filter wheel is attached.

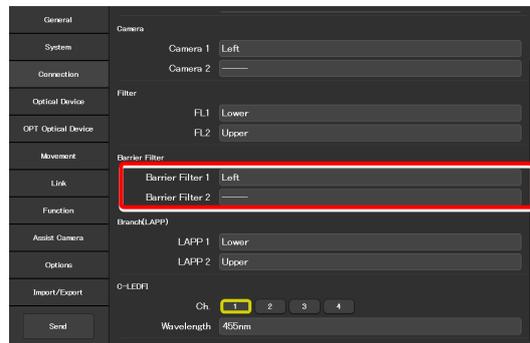
If no BA filter wheel is attached, select [---].

BA2:

Select the port to which the second BA filter wheel is attached.

If only one BA filter wheel is attached, select [---].

▼ Setting the connections of BA filter wheels



2.4.5 Setting the Branch(LAPP)

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

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

LAPP1:

Select the position to which the main branch is attached.

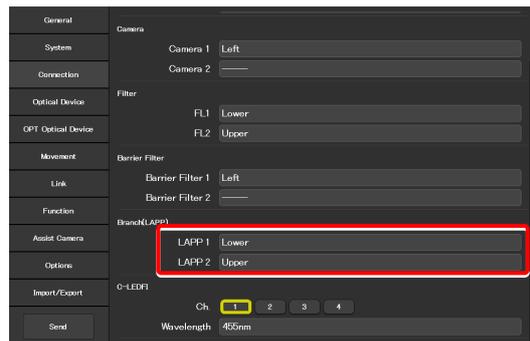
If no main branch is attached, select [---].

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-LEDFl Epi-fl LED Illuminator

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

1. Set the following items in the [C-LEDFl] area.

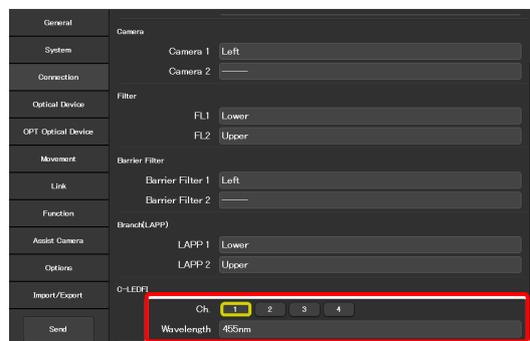
Channel:

Select the channel number of the LED.

Wavelength:

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

▼ Setting the C-LEDFl



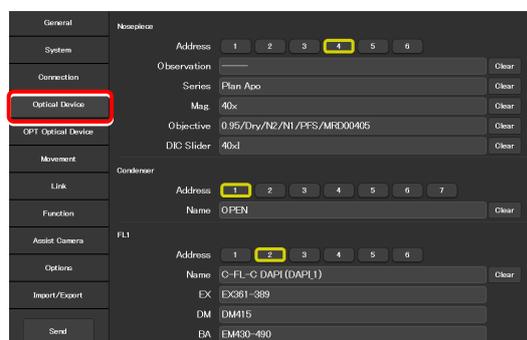
2.5 [Optical Device]: Setting the Optical Devices

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



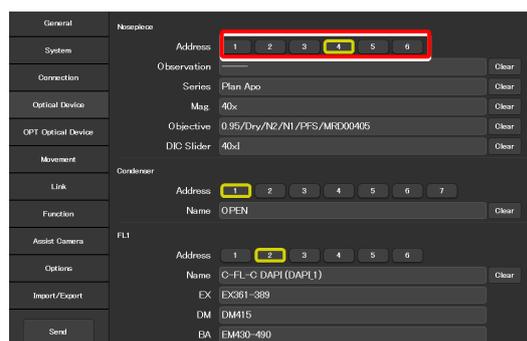
2.5.1 Setting the Nosepiece

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 "---".)

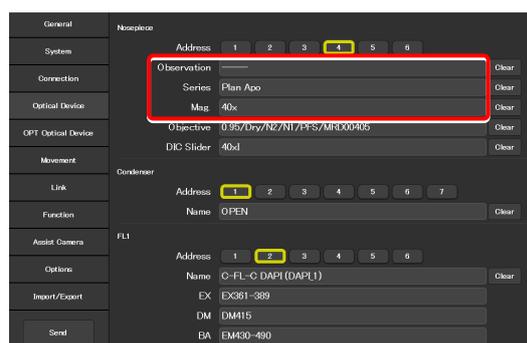
Series:

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 "---".)

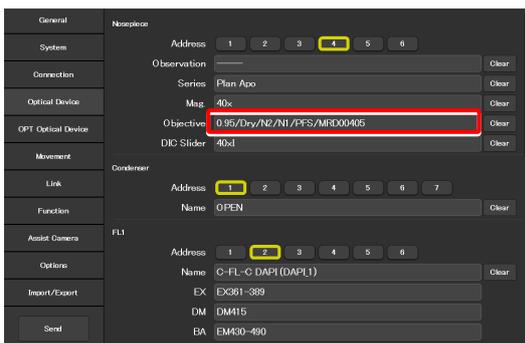
▼ Setting the nosepiece



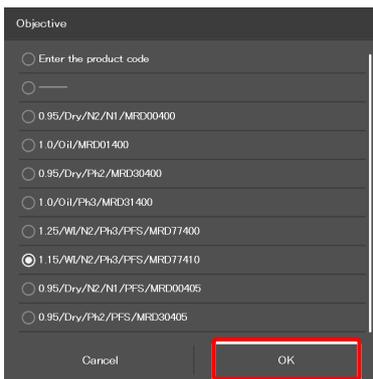
3. Tap the [Objective] field, select the target objective from the list or enter the product code, and tap [OK].

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

▼ Setting the nosepiece



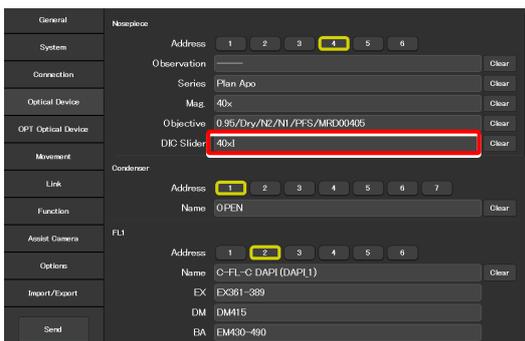
▼ List of objectives



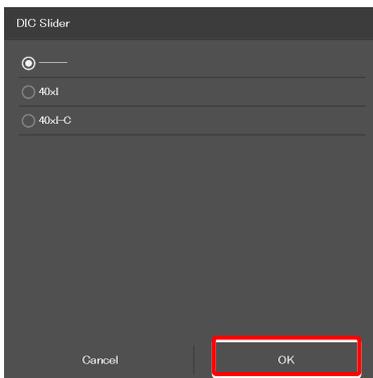
4. For DIC objectives, tap the [DIC Slider] field, select the required objective-side DIC slider from the list, and tap [OK].

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

▼ Setting the nosepiece



▼ List of DIC sliders



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

2.5.2 Setting the Condenser Module

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

1. Set the following items in the [Condenser] area.

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 [FL1] area.

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 [FL2] area 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] area.

Address:

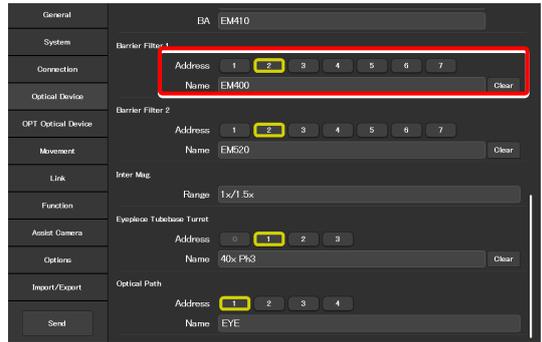
Select the address of the BA filter wheel for which BA filter information is to be set.

Name:

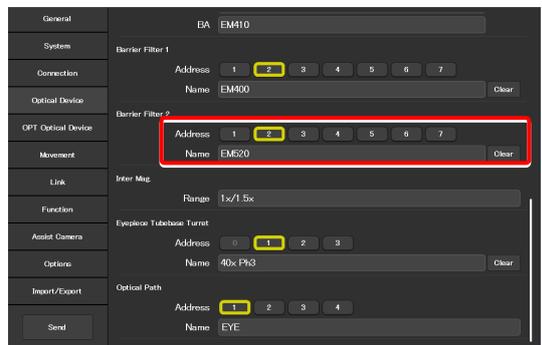
Select a BA filter name.

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] area.

2.5.5 Setting the Intermediate Magnification

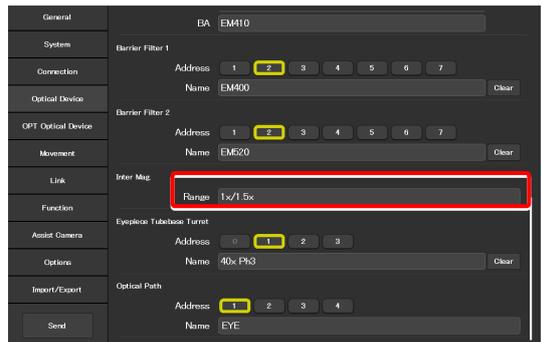
Set the intermediate magnification.

1. Set the following items in the [Inter Mag.] area.

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 [Eyepiece Tubebase Turret] area.

Address:

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

Address 0 is open, which cannot be used for the setting.

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

The screenshot shows the configuration interface for the device. The 'Eyepiece Tubebase Turret' section is expanded, showing the 'Address' field set to 2 and the 'Name' field set to '40x PK3'. A red box highlights the 'Address' and 'Name' fields.

2.5.7 Setting the Optical Path Name

Set the optical path name (output port name) to be displayed on the remote control button or the subscreen of the optical path.

1. Set the following items in the [Optical Path] area.

Address:

Select the address of the port for which the optical path name is to be set.

- 1: Eyepiece observation port
- 2: Right side port
- 3: 80% to the left side port and 20% to the eyepiece observation port (when using the Ti2-E optical path split prism or the Ti2-A E20L80)
Bottom port (when using the Ti2-E/B)
- 4: Left side port

Name:

Specify the optical path name. (Within 10 single-byte alphanumeric characters)

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

▼ Setting the optical path name

The screenshot shows the configuration interface for the device. The 'Optical Path' section is expanded, showing the 'Address' field set to 1 and the 'Name' field set to 'EYE'. A red box highlights the 'Address' and 'Name' fields.

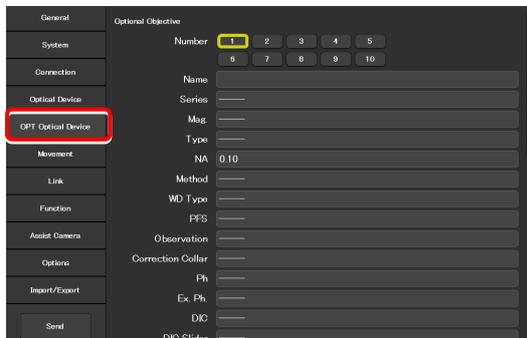
2.6 [OPT Optical Device]: Registering a New Optical Device

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] area.

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.

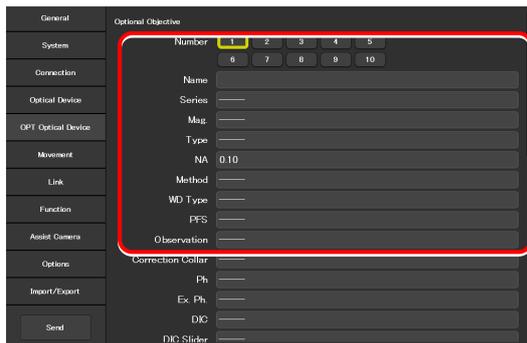
PFS:

Select whether the PFS objective is used or not.

Observation:

Select a microscopy technique.

▼ Registering a new objective



Correction Collar:

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

Ph:

For a phase contrast objective, select a PH code.

EX. Ph.:

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

DIC:

For a DIC objective, select a corresponding condenser module.

DIC Slider:

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

DIC HR/HC:

Select a high-resolution or high-contrast condenser module.

DIC Slider HR/HC:

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

DF:

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

NAMC:

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

WID:

Select whether the objective supporting the water immersion dispenser is used or not.

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

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

The screenshot shows the 'Correction Collar' section of the microscope software interface. The section is highlighted with a red box. The fields in this section are: Correction Collar, Ph, Ex. Ph, DIC, DIC Slider, DIC HR/HC, DIC Slider HR/HC, DF, NAMC, and WID. Below these fields are 'Optional Condenser' buttons numbered 1-10, with button 1 highlighted in yellow. There is also a 'Name' input field at the bottom.

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] area.

Number:

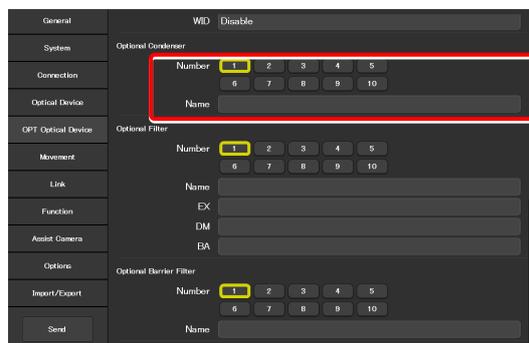
Select a number with which a new condenser module is to be registered.

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] area.

Number:

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

Name:

Specify a name.

EX:

Specify an excitation filter name.

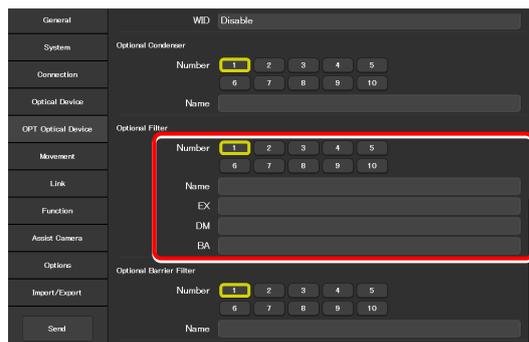
DM:

Specify a dichroic mirror name.

BA:

Specify a BA filter name.

▼ Registering a new filter cube



✔ 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.

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] area.

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

The screenshot displays the 'Optional Barrier Filter' configuration screen. On the left is a sidebar with menu items: General, System, Connection, Optical Device, OPT Optical Device, Movement, Link, Function, Assist Camera, Options, Import/Export, and Send. The main content area is titled 'Optional Barrier Filter' and includes a 'Number' field with a dropdown menu (options 1-10) and a 'Name' text input field. The 'Number' field is highlighted with a red box.

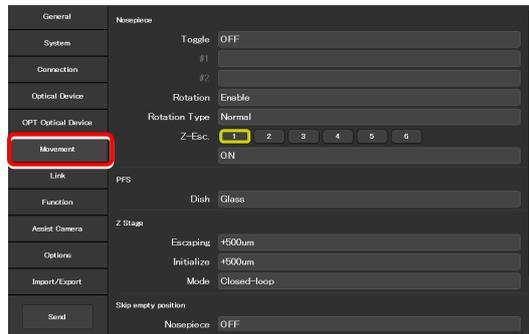
2.7 [Movement]: Setting the Movement: Ti2-E Only

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

- 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.

- Set the following items in the [Nosepiece] area.**

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.

Rotation:

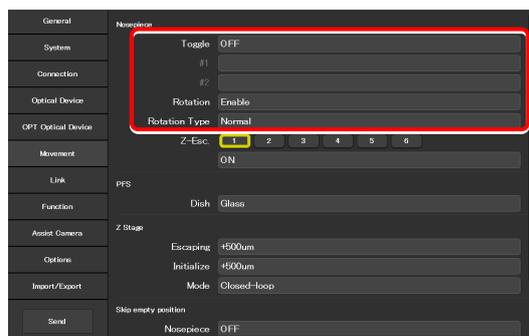
Select whether the nosepiece rotation is enabled or not.

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.
- ACC Type: This is selected automatically when a motorized nosepiece of the motorized correction collar type is used.

▼ Setting the motorized nosepiece

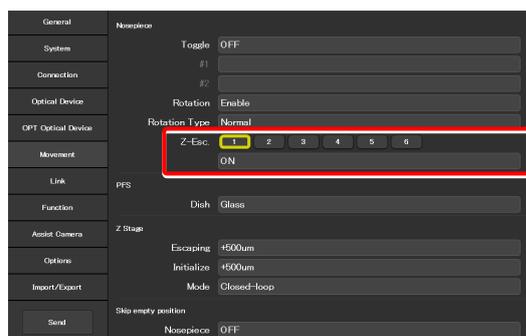


Z-Esc.:

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

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

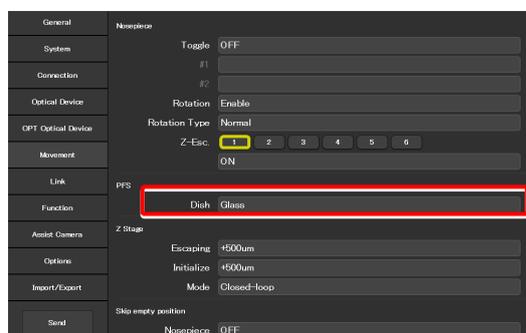
If ON is set for an address, the objective is moved to the escape position before passing the selected address.

**2.7.2 Setting the PFS**

Set the type of the dish observed using the PFS.

1. Set the following items in the [PFS] area.**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] area.**Escaping:**

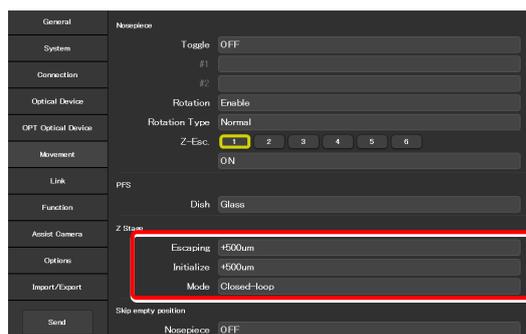
Specify how far the objective is to be escaped when replacing the specimen.

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] area.

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.)

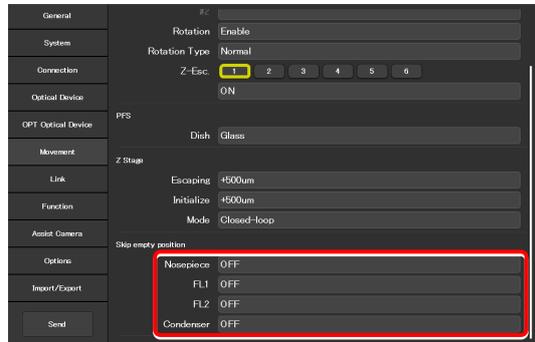
FL2:

(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



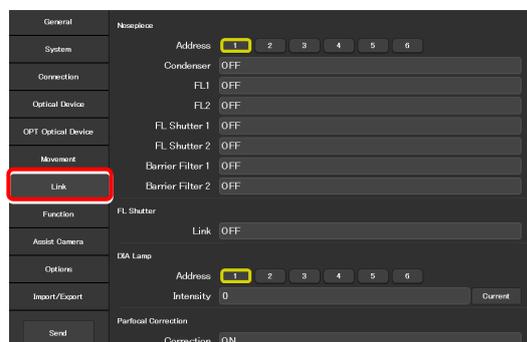
2.8 [Link]: Setting the Linking Function: Ti2-E Only

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] area.

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.

FL Shutter 1:

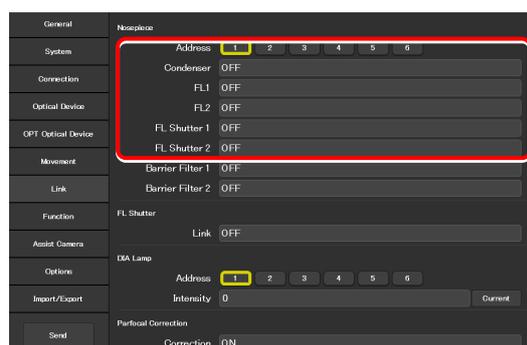
Select the state of the shutter of FL turret 1 to be linked when the objective is switched.

FL Shutter 2:

(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.

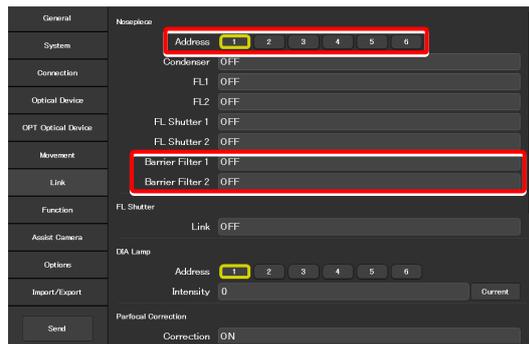
BA2:

(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.

- 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

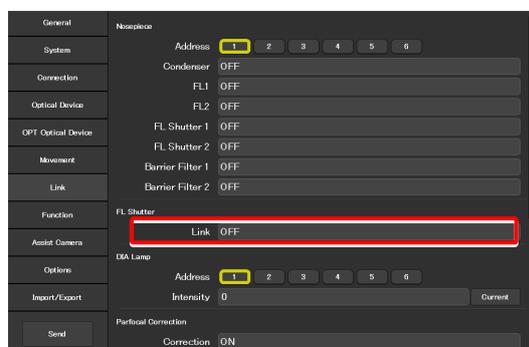
Specify whether the shutter in the FL turret is to be linked when the objective is switched.

- Set the following items in the [FL Shutter] area.**

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.

- Set the following items in the [DIA Lamp] area.**

Address:

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

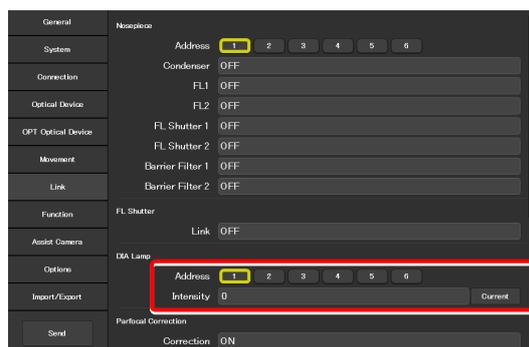
Light Value:

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] area.

Address:

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

Status:

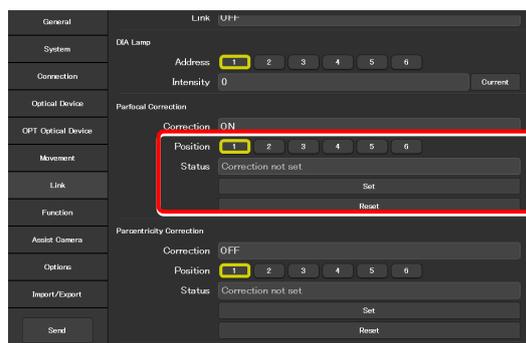
Indicates whether correction of the objective is set or not.

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.

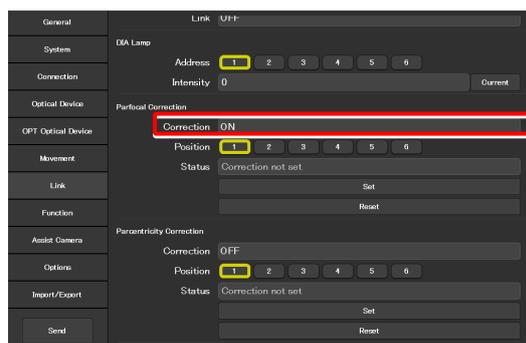
✔ SUPPLEMENTAL REMARKS

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.

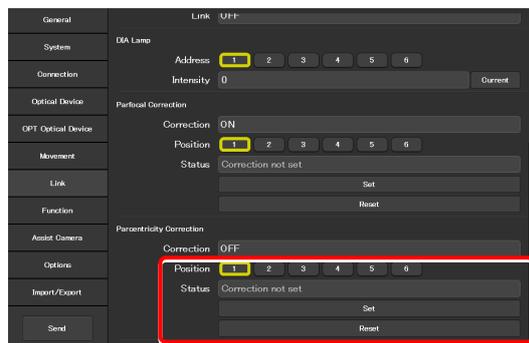
1. **Set and confirm the following items in the [Parcentricity Correction] area.**

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

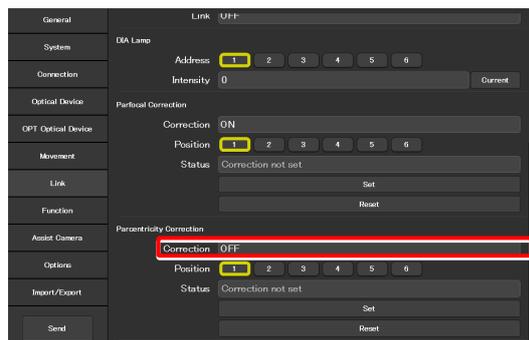
Status:
Indicates whether correction of the objective is set or not.
2. **Change the current objective to the maximum magnification objective on the microscope main body.**
3. **Move the XY-stage so that an easy-to-identify object is at the center of the field of view.**
Use this object as a mark to 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



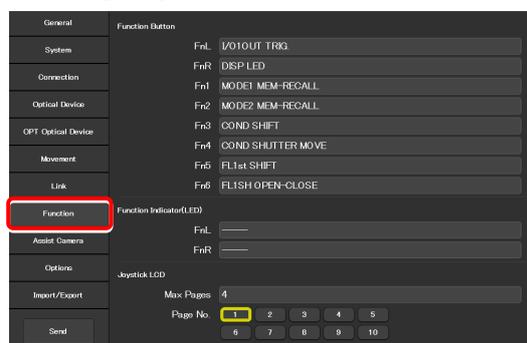
2.9 [Function]: Assigning Functions: Ti2-E Only

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.

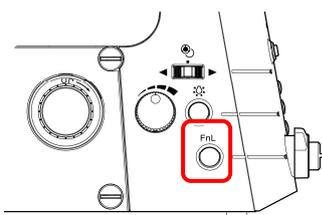
The function setting screen appears.

▼ Assigning functions

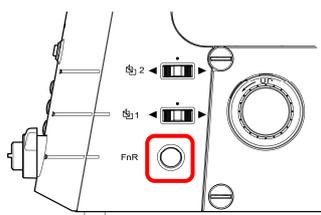


2.9.1 Setting the Function Buttons

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] area.

Select functions to be assigned to the microscope main body (FnL, FnR) and function buttons (Fn1 to Fn6) on the joystick.

2. To change the assigned function, tap the function field of the corresponding function button.

The subscreen of the function list for assignment is displayed.

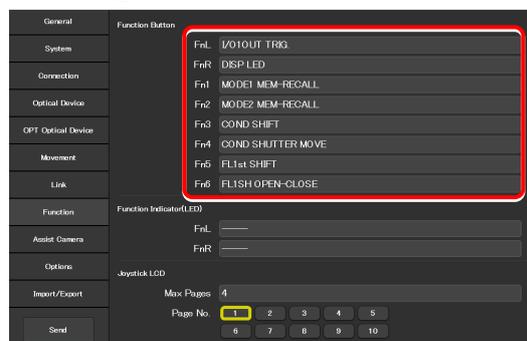
3. From the list, select the function to be assigned to the selected function button.

Selecting a group from [1] to [9] will change the functions to be displayed on the list.

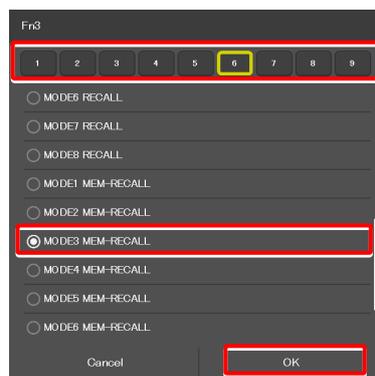
For the assignable functions, see “6.1 List of Functions Assigned to Function Buttons.”

4. Tap [OK].

▼ Setting the function buttons



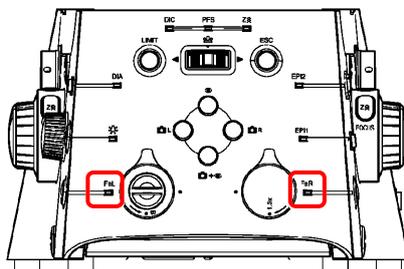
▼ Subscreen of the function list for assignment



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.



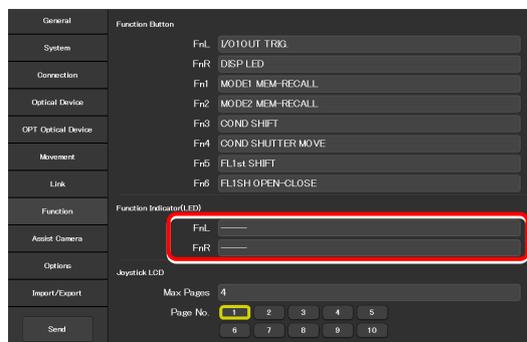
Front operation panel

1. Set the following items in the [Function Indicator(LED)] area.

Select the status indication to be assigned to the LED indicators (FnL and FnR) on the front operation panel of the microscope main body.

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] area.

Max Pages:

Set the maximum number of pages.

Page No.:

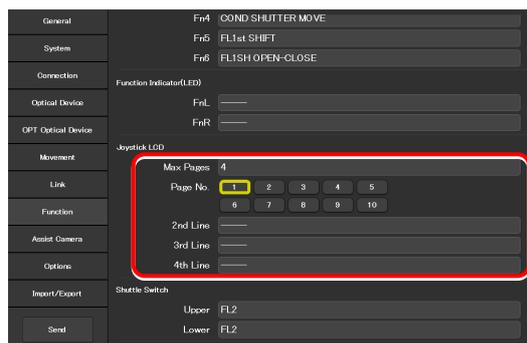
Select the target page number.

2nd Line to 4th Line:

Select the function to be assigned to each line.

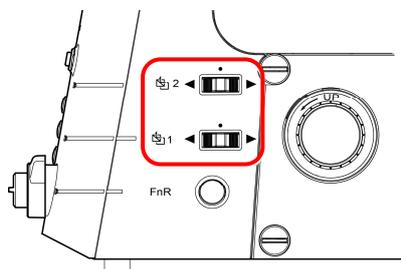
For the assignable functions, see “6.3 List of Functions Assigned to Joystick LCD Screen.”

▼ 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

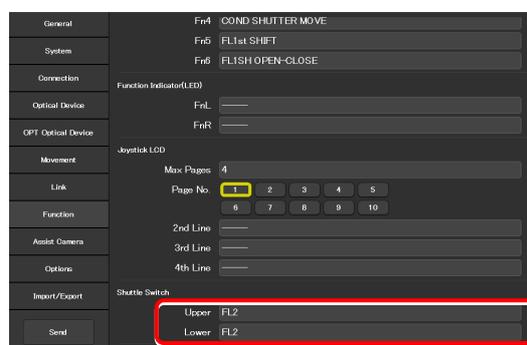
1. Set the following items in the [Shuttle Switch] area. ▼ Setting the shuttle switches

Upper:

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

Lower:

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



2.10 [Assist Camera] Setting the Assist Camera

This section describes how to set the frame rate and the field of view adjustment of the assist camera when the assist tube base unit is used.

1. Select [Assist Camera] from the setting item selection area.

The assist camera setting screen appears.

2. Set the following items in the [Assist Camera] area.

Frame Rate:

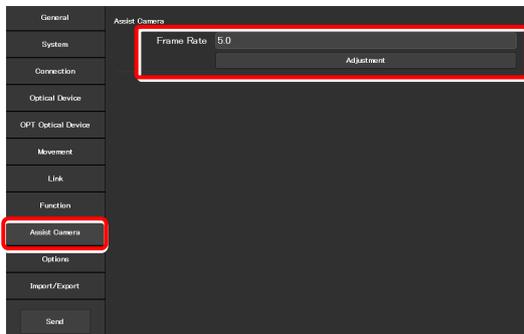
Select the frame rate of the assist camera.

Adjustment:

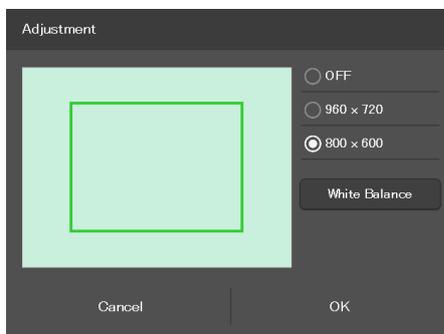
Tap this to display the Adjustment screen.

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.

▼ Setting the assist camera



▼ Adjustment screen



✔ SUPPLEMENTAL REMARKS

The field of view of the assist camera must be adjusted in each status of the Bertrand lens (in/out).

Perform the following procedure:

- 1) Adjust the field of view of the assist camera in the current Bertrand lens in/out status.
- 2) Tap [OK] in the adjustment screen to save the setting.
- 3) Turn the Bertrand lens in/out dial of the microscope main body to place/remove the lens into/from the optical path. (from Out to In or from In to Out)
- 4) Select [Assist Camera] from the setting item selection area, and then tap the [Adjustment] button to display the adjustment screen.
- 5) Adjust the field of view of the assist camera in the current Bertrand lens in/out status.
- 6) Tap [OK] in the adjustment screen to save the setting.

Note that if an attempt is made to place/remove the Bertrand lens with the adjustment screen open, an error message appears and the adjustment screen is closed.

White Balance:

Automatically adjust the white balance of the current image displayed on the screen.

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

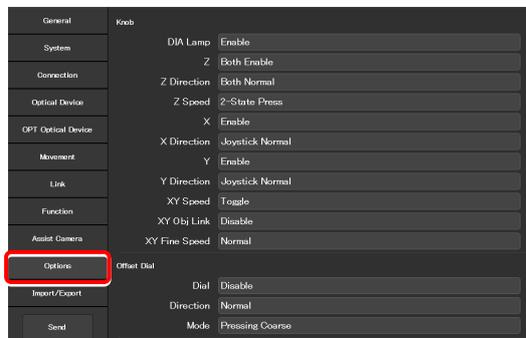
This section describes how to set the operation speed of the motorized device and whether the motorized device is to be controlled from the Ti2-E microscope main body or the joystick.

For details on the controllable functions of the Ti2-A, see “2.11.6 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.

Items to be displayed on the list depend on the firmware version of your microscope main body.

Firmware Ver.1.10 or later

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

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.

Both Disable: Both are disabled.

Ti2 Enable: Only the microscope main body is enabled.

Joystick Enable: Only the joystick is enabled.

Both Enable: Both are enabled.

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.

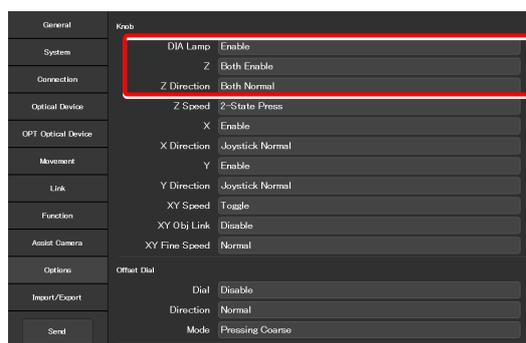
Both Invert: Both rotations are inverted.

Ti2 Normal/Joystick Invert:
Normal rotation of the microscope main body, and inverted rotation of the joystick

Ti2 Invert/Joystick Normal:
Inverted rotation of the microscope main body, and normal rotation of the joystick

Both Normal: Both rotations are normal.

▼ Setting each knob (firmware Ver.1.10 or later)



Z Speed

Select the behavior when the Z coarse-motion buttons of the microscope main body and the joystick are used.

2-State Press: Coarse motion only while the Z coarse-motion button is pressed

2-State Toggle: Switches between the coarse motion and the fine motion when the Z coarse-motion button is pressed once.

3-State: Switches among the coarse motion, the fine motion, and the ultrafine motion when the Z coarse-motion button is pressed each time.

▼ Setting each knob (firmware Ver.1.10 or later)



✔ SUPPLEMENTAL REMARKS

When 2-State Press or 2-State Toggle is selected, the movement speed of the focusing device (Z-stage) by the focus knob depends on the NA of the objective.

X:

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

X Direction:

Select the stage movement direction on the X-axis initiated by using the stage drive lever of the joystick.

Joystick Normal: The stage moves in the direction of the joystick motion.

Joystick Invert: The stage moves in the opposite direction of the joystick motion.

Y:

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

Y Direction:

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

Joystick Normal: The stage moves in the direction of the joystick motion.

Joystick Invert: The stage moves in the opposite direction of the joystick motion.

XY Speed:

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

Pressing Coarse: Coarse motion only while the button is pressed

Toggle: Switches between coarse motion and fine motion.

XY Obj Link:

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

XY Fine Speed:

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

Firmware version earlier than Ver.1.10

For details on the firmware upgrade, contact your local Nikon representative.

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

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.

Both Disable: Both are disabled.

Ti2 Enable: Only the microscope main body is enabled.

Joystick Enable: Only the joystick is enabled.

Both Enable: Both are enabled.

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.

Both Invert: Both rotations are inverted.

Ti2 Normal/Joystick Invert:
Normal rotation of the microscope main body, and inverted rotation of the joystick

Ti2 Invert/Joystick Normal:
Inverted rotation of the microscope main body, and normal rotation of the joystick

Both Normal: Both rotations are normal.

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 held down

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 at a speed according to the NA.

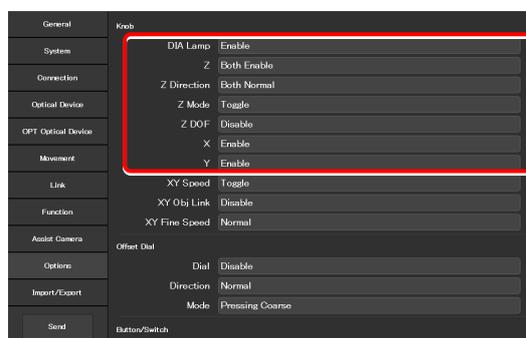
X:

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

Y:

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

▼ Setting each knob (firmware version earlier than Ver.1.10)



XY Speed:

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

Pressing Coarse: Coarse motion only while the button is pressed

Toggle: Switches between coarse motion and fine motion.

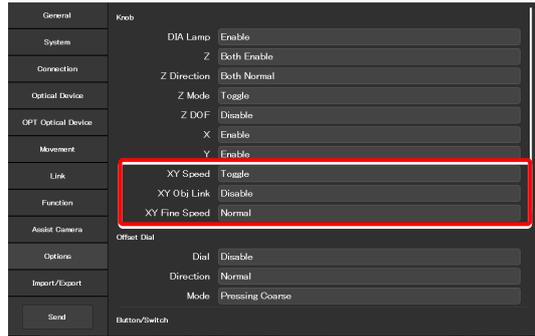
XY Obj Link:

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

XY Fine Speed:

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

▼ **Setting each knob (firmware version earlier than Ver.1.10)**



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] area.

Dial:

Enable or disable the control of the PFS offset dial.

Direction:

Select the rotation direction of the PFS offset dial.

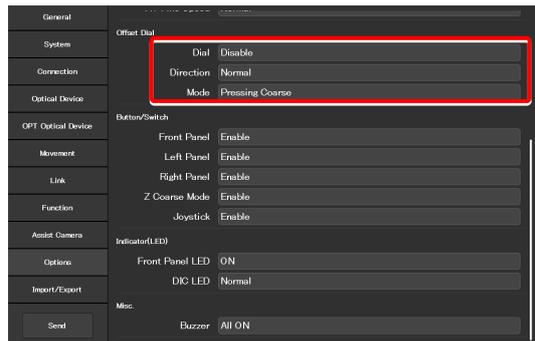
Mode:

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 Buttons and Switches

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

1. Set the following items in the [Button/Switch] area.

Front Panel:

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

Left Panel:

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

Right Panel:

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

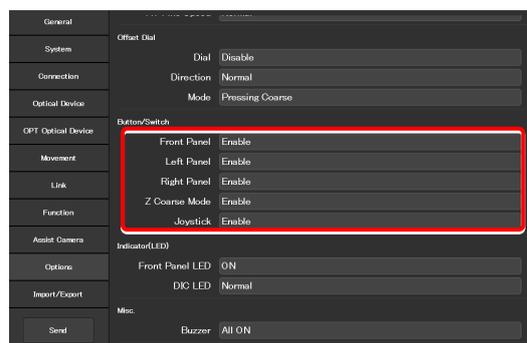
Z Coarse Mode:

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 buttons and switches



2.11.4 Controlling the LED Indicators

This section describes how to control the indicator (LED) of the microscope main body and the joystick.

1. Set the following items in the [Indicator(LED)] area.

Front Panel LED:

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

DIC LED:

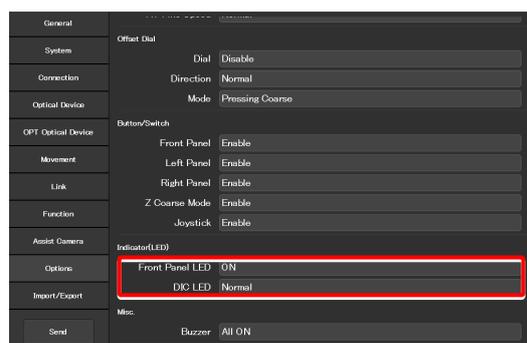
Select the behavior of the DIC indicator on the front panel of the microscope main body, which is used for identifying whether the DIC microscopy conditions are satisfied or not.

Always OFF: The indicator is always off. (It does not light nor blink even though DIC microscopy conditions are satisfied.)

ON-OFF: The indicator is lit when the DIC microscopy conditions are satisfied. (Not blinking)

Normal: The indicator is lit when the DIC microscopy conditions are satisfied, and it blinks when they are partly satisfied.

▼ Controlling the indicators (LED)



2.11.5 Other Control Items

This section describes other control items.

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

Buzzer:

Select the buzzer setting of the microscope main body.

All OFF: All buzzers are disabled.

PFS OFF: Only the PFS buzzer is disabled.

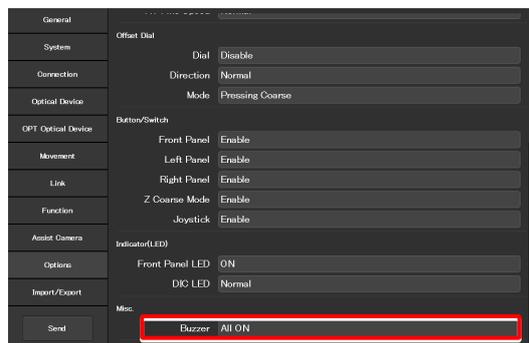
All ON: All buzzers are enabled.

✔ SUPPLEMENTAL REMARKS

When using the microscope firmware version earlier than Ver.1.10, the selection of the buzzer setting is only ON or OFF. The PFS buzzer setting is not available.

For details on the firmware upgrade, contact your local Nikon representative.

▼ Other control items



2.11.6 Ti2-A

Set the controllable functions of the Ti2-A.

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

DIA Lamp:

Enable or disable the dia-illumination brightness adjuster operation.

1. Set the following items in the [Button/Switch] area.

Left Panel:

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

2. Set the following items in the [Indicator(LED)] area.

Front Panel LED:

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

DIC LED:

Select the behavior of the DIC indicator on the front panel of the microscope main body, which is be used for identifying whether the DIC microscopy conditions are satisfied or not.

Always OFF: The indicator is always off. (It does not light nor blink even though DIC microscopy conditions are satisfied.)

ON-OFF: The indicator is lit when the DIC microscopy conditions are satisfied. (Not blinking)

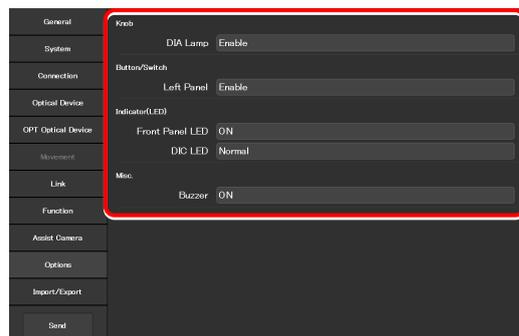
Normal: The indicator is lit when the DIC microscopy conditions are satisfied, and it blinks when they are partly satisfied.

3. Set the following items in the [Misc.] area.

Buzzer:

Enable (ON) or disable (OFF) the buzzer of the microscope main body.

▼ Settings when using the Ti2-A



2.12 [Import/Export]: Importing and Exporting the Settings

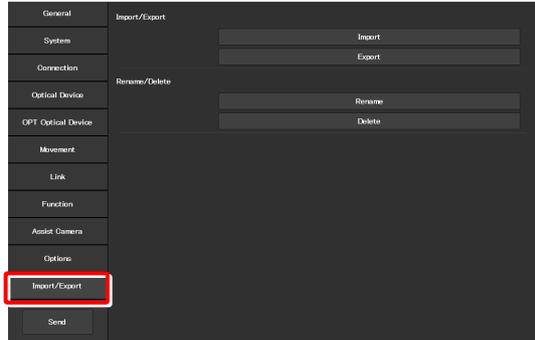
This section describes how to import and export the settings.

The settings made by using the "Ti2 Control" application can be saved (as a configuration file) in the device and imported 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 importing different configuration files.

1. Select [Import/Export] from the setting item selection area.

▼ Import and export settings

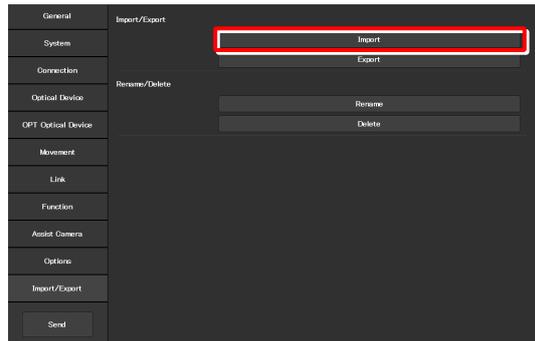


2.12.1 Importing the Settings

1. Tap [Import] in the [Import/Export] area.

The Import screen appears.

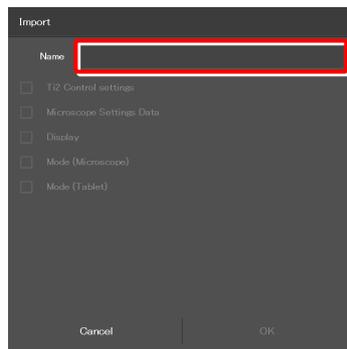
▼ Importing the settings



2. Tap [Name].

The file selection screen appears.

▼ Import screen

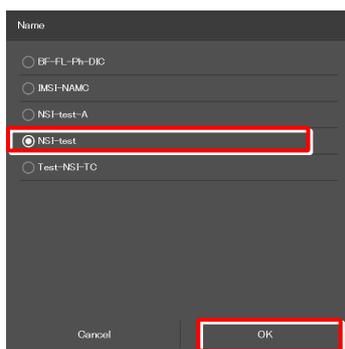


3. **Select the setting information file to be imported.**

4. **Tap [OK].**

The Import screen appears.

▼ File selection screen

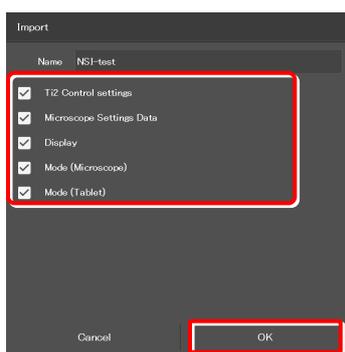


5. **Select the type of the setting information to be imported.**

6. **Tap [OK].**

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

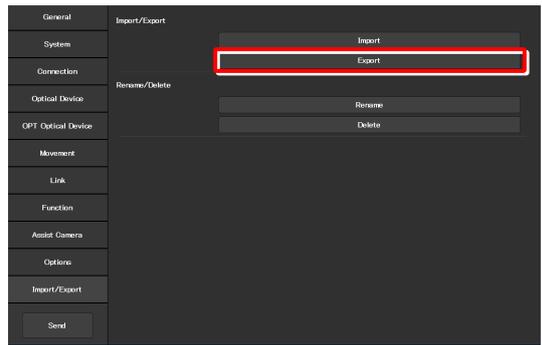
▼ Import screen



2.12.2 Exporting the Settings

1. Tap [Export] in the [Import/Export] area.

▼ Exporting the settings



2. Specify a file name in the [Name] field.

▼ Exporting the settings

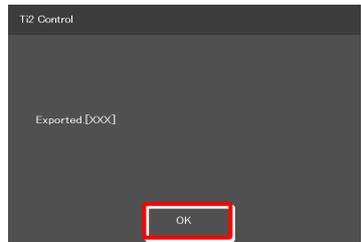


3. Tap [OK].

The setting information is exported.

4. On the export complete screen, tap [OK].

▼ Completed

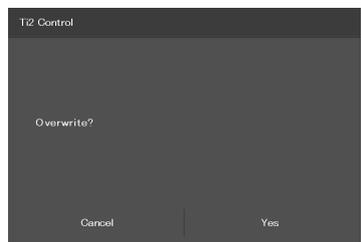


✔ SUPPLEMENTAL REMARKS

If the file name specified in step 2 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 the export.

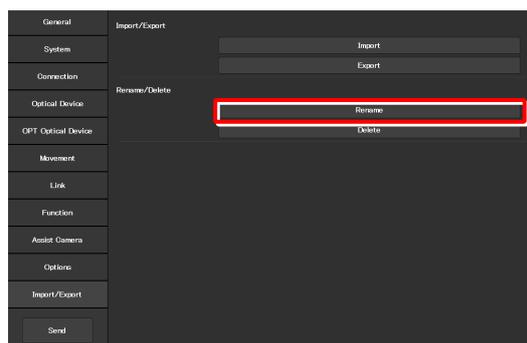
▼ Confirmation of overwriting



2.12.3 Changing the Setting Name

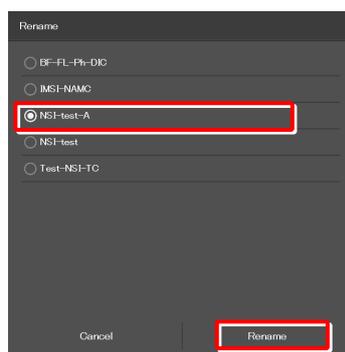
1. Tap [Rename] in the [Rename/Delete] area.
The selection screen of the file to be renamed appears.

▼ Changing the setting name



2. Select the file to be renamed.
3. Tap [Rename].
The rename screen appears.

▼ Selecting a file

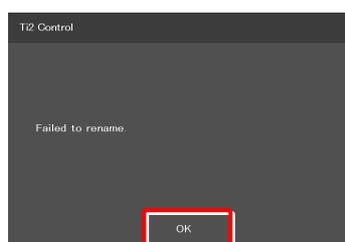


4. Specify a file name in the [Name] field.
5. Tap [OK].

▼ Rename



▼ Confirmation of overwriting



✔ SUPPLEMENTAL REMARKS

If the file name specified in step 4 already exists, the name is not saved even though [OK] is tapped.

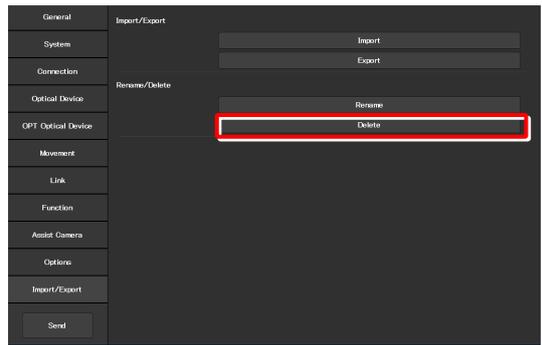
In this case, perform the procedure from step 1 again with another name.

2.12.4 Deleting the Configuration File

1. Tap [Delete] in the [Rename/Delete] area.

The file selection screen of the file to be deleted appears.

▼ Deleting the configuration file

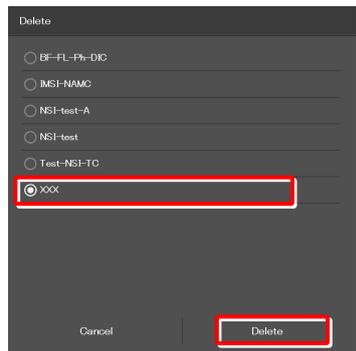


2. Select the file to be deleted.

3. Tap [Delete].

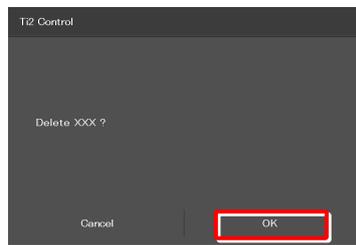
A deletion confirmation screen appears.

▼ Selecting a file



4. Tap [OK] to delete the file.

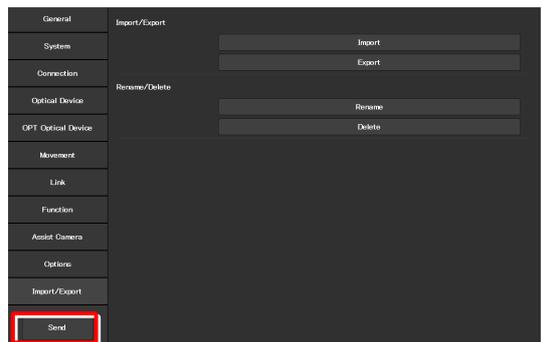
▼ Confirmation of deletion



This completes the setup procedure.

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

▼ Transmission



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] from the setting item selection area.

The application, controller and microscope main body versions are displayed.

The version information on the Ti2 series is displayed as follows:

Version:

Ti2 Control version (this application)

Microscope:

Model: Name of the currently used microscope system

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

CTRE FW: Firmware version of the controller for Ti2-E when the Ti2-E main body is in use

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

FW: Firmware version of the Ti2-A main body when the Ti2-A main body is in use

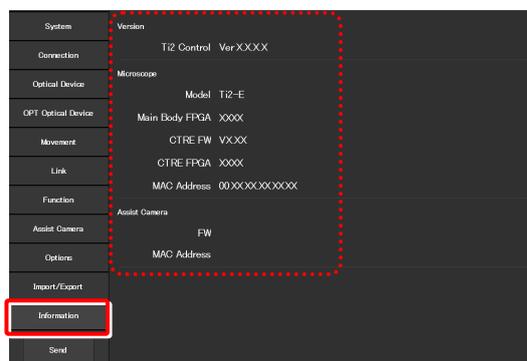
MAC Address: MAC address of the microscope main body

Assist Camera:

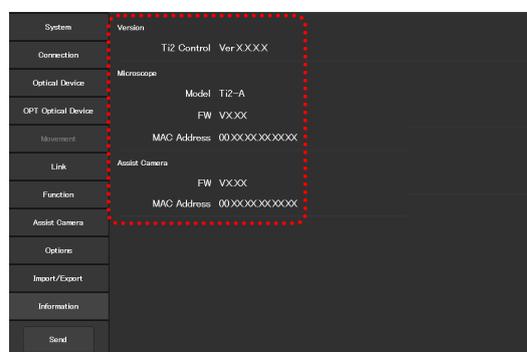
FW: Firmware version of the assist camera when the assist tube base unit is in use

MAC Address: MAC addresses of the assist camera

▼ 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 controlled. 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 operated.

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

Tapping a remote control button highlights the corresponding location to be controlled in the microscope view.

■ Remote control button area

Each button shows the current status of the devices.

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

✔ SUPPLEMENTAL REMARKS

Long-tapping each button only highlights the corresponding location of the accessory to be controlled in the microscope view, and it does not control the accessory.

■ 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.”)

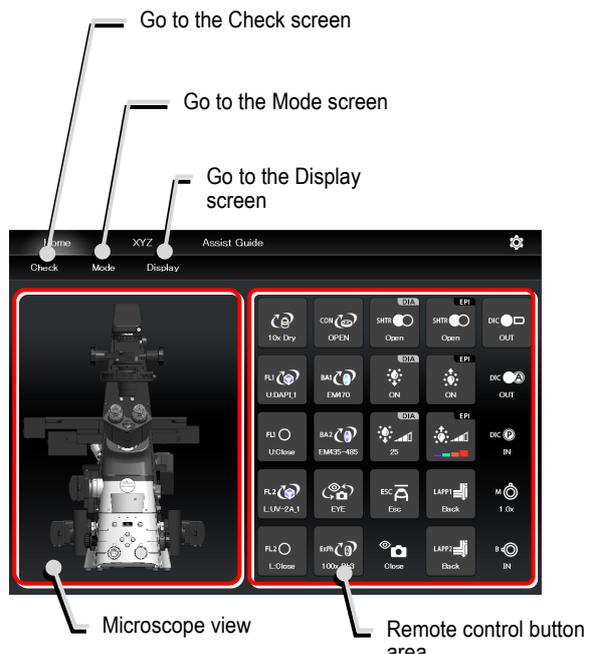
■ Mode

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.”)

■ Display

The Display screen allows the user to arrange the remote control buttons. (See “4.2 Remote Control Button Arrangement.”)

▼ Configuration of the home screen

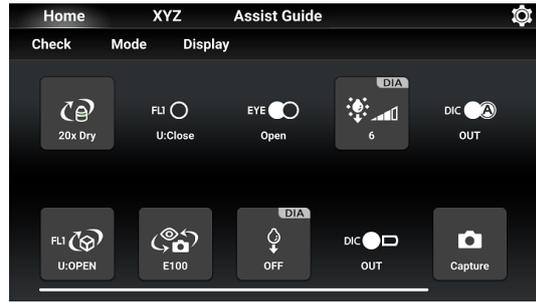


When operating “Ti2 Control” from a smartphone

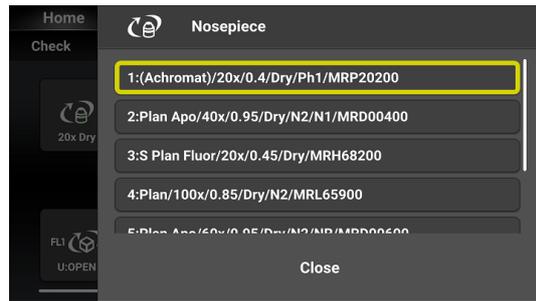
When a smartphone is used, the microscope view is not displayed on the home screen.

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 "3.1.17 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 "3.1.17 Operation When Using an LED for the Epi Illuminator.")
 	Opening and closing the Intensilight shutter (See "Opening and closing the Intensilight shutter" in "3.1.18 Operation When Using the Intensilight for the Epi Illuminator.")		Switching the Intensilight ND filter (See "Switching the Intensilight ND filter" in "3.1.18 Operation When Using the Intensilight for the Epi Illuminator.")
	Switching the optical path of epi-illumination 1 (See "3.1.16 Switching the Optical Path of Epi-Illumination.")		Switching the optical path of epi-illumination 2 (See "3.1.16 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 slider in/out status (See “3.1.15 Indication-Only Buttons.”)		Capturing images through the assist camera (See “3.1.13 Capturing Images With the Assist Camera (Only With the Assist Tube Base Unit).”)
	Displaying the analyzer in/out status (See “3.1.15 Indication-Only Buttons.”)		
	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.

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.”
5. Tap [Close] to close the objective changeover subscreen.

✔ SUPPLEMENTAL REMARKS

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

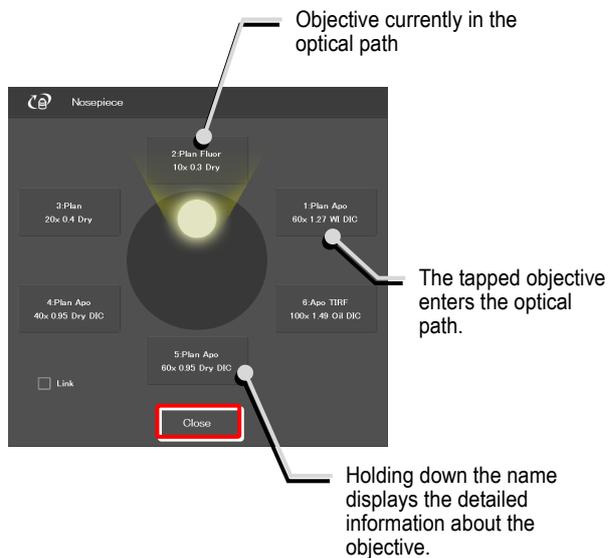
Tap [OK] at the bottom of the screen to send the changed information to the microscope.

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

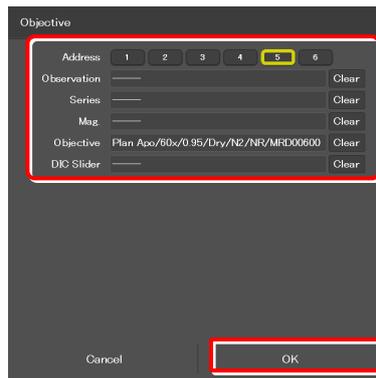
▼ Switching the objective



▼ Objective changeover subscreen



▼ Objective detailed information screen



3.1.4 Controlling the Condenser

1. Tap the button shown below.

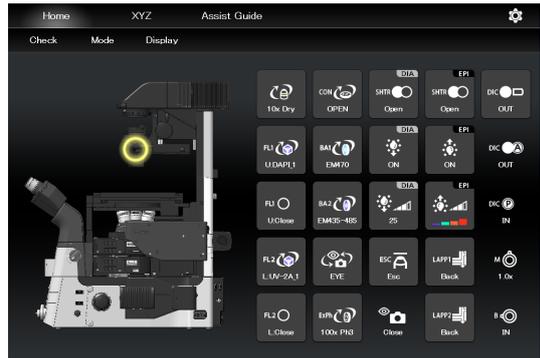


The condenser module changeover subscreen appears.

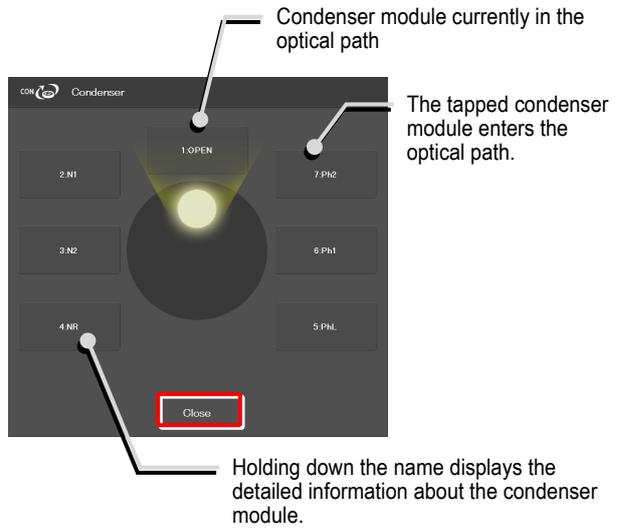
2. To switch the condenser module, tap the name of the module to be used.
3. When the name of the condenser module to be used is held down, the detailed information about the module is shown.
4. Tap [Close] to close the condenser module changeover subscreen.

✔ 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.”

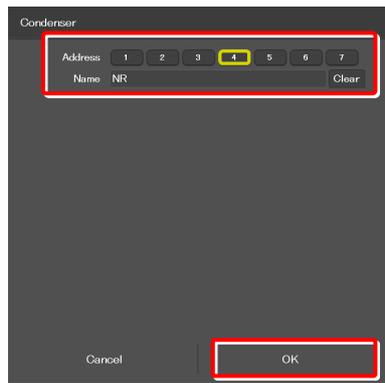
Switching the condenser module



Condenser module changeover subscreen



Condenser module detailed information screen



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.
4. Tap [Close] to close the filter cube changeover subscreen.

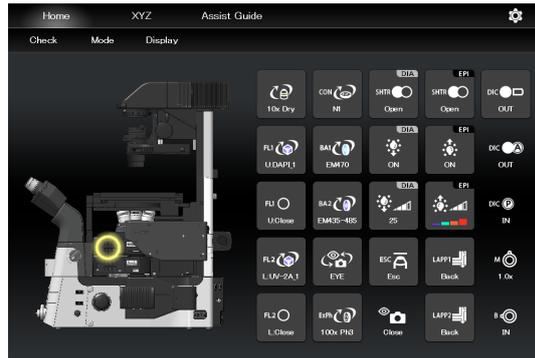
✔ SUPPLEMENTAL REMARKS

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

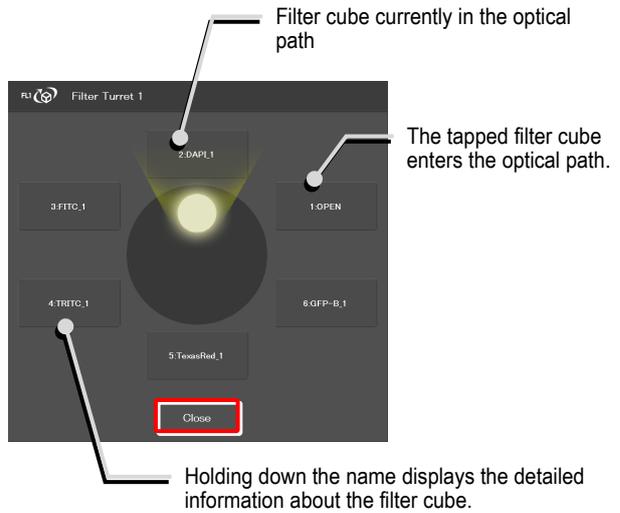
Tap [OK] at the bottom of the screen to send the changed information to the microscope.

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

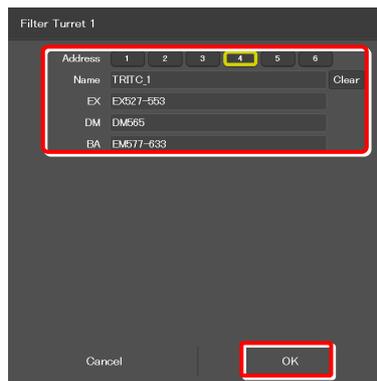
▼ Switching the filter cube



▼ Filter cube changeover subscreen



▼ Filter cube detailed information screen



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.

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

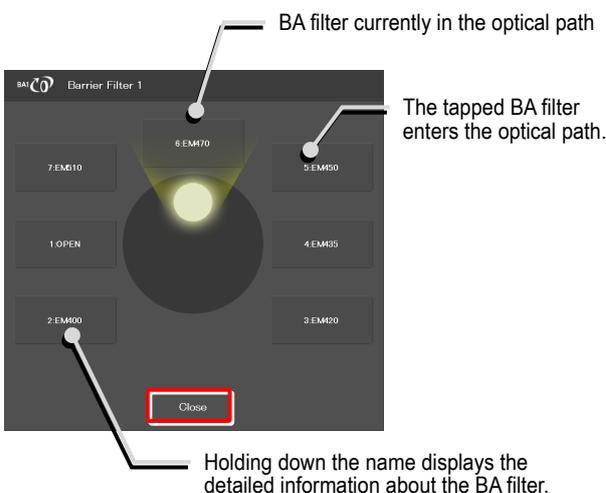
3. When the name of the BA filter to be used is held down, the detailed information about the BA filter is shown.

4. Tap [Close] to close the BA filter changeover subscreen.

Switching the BA filter



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



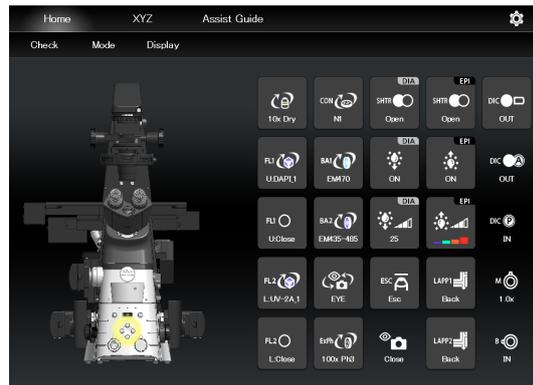
3.1.7 Switching the Optical Path

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.

✓ SUPPLEMENTAL REMARKS

The output port name of the optical path set in “2.5.7 Setting the Optical Path Name” is displayed.

1: Eyepiece observation port (Default: EYE)

An optical output port for visually observing a microscope image through a binocular part of a tube.

(Switch the output port to [1] Eyepiece observation port to output the image to the assist camera when using the assist tube base unit.)

2: Right side port (Default: R100)

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

3: AUX (Default: L80) (on the Ti2-A or the 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.

3: Bottom port (Default: B100) (on the Ti2-E/B)

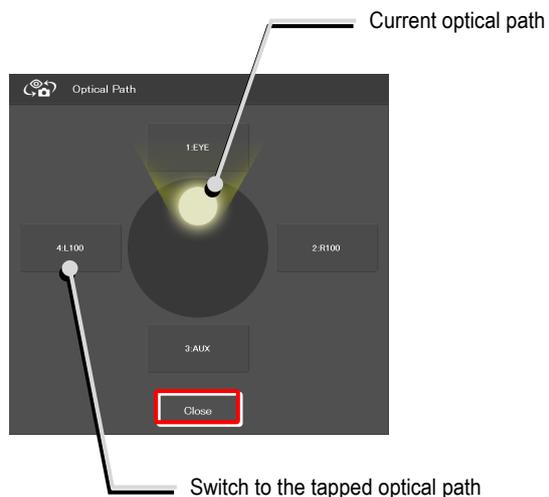
An optical image output port at the bottom of the microscope.

4: Left side port (Default: L100)

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

3. Tap [Close] to close the optical path changeover subscreen.

▼ Optical path changeover subscreen



3.1.8 Controlling the External Phase Ring

1. Tap the button shown below.



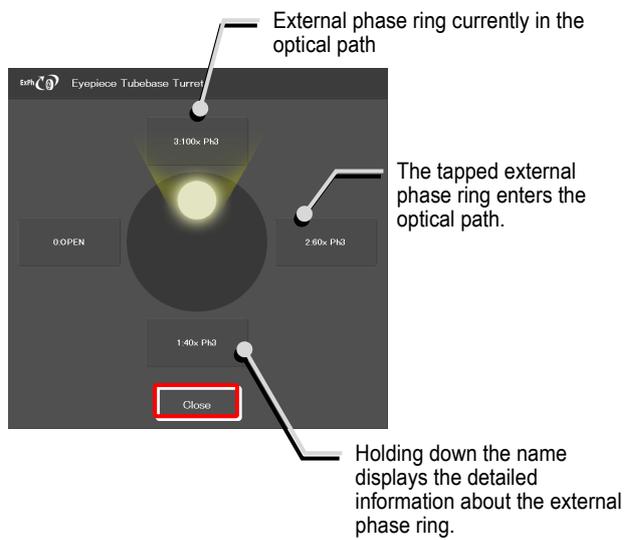
The external phase ring changeover subscreen appears.

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.
4. Tap [Close] to close the external phase ring changeover subscreen.

Switching the external phase ring



External phase ring changeover subscreen



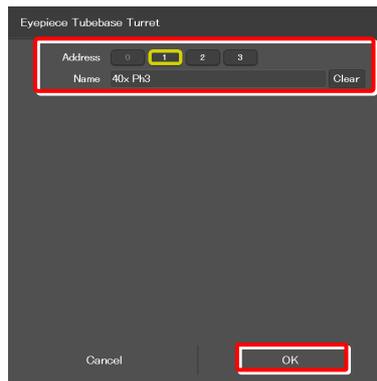
✓ SUPPLEMENTAL REMARKS

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.”

External phase ring detailed information screen



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.

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

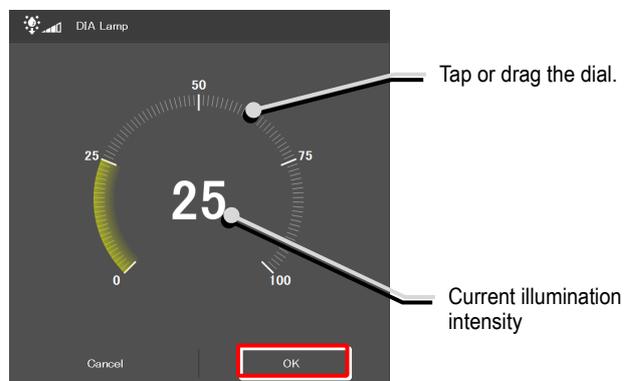
3. Tap [Close] to close the dia-illumination intensity adjustment subscreen.

Tap [Cancel] to reset the intensity to that before the subscreen is opened, and to close the screen.

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



▼ Dia-illumination intensity adjustment subscreen



Turning on or off the dia-illumination (DIA)

1. Tap the buttons shown below.

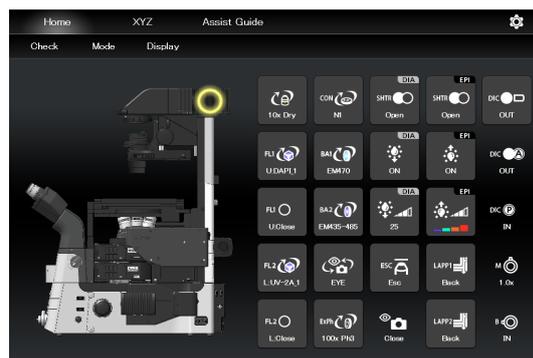


Lit. The LED is turned off when this button is tapped.



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

▼ 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

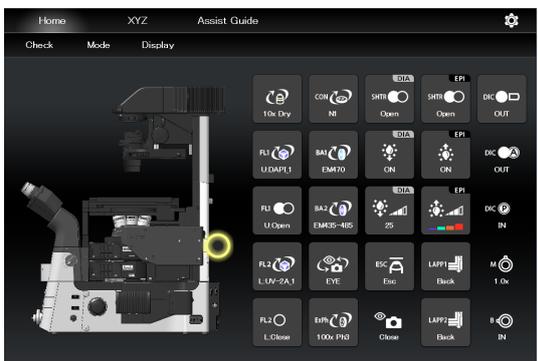
When a motorized epi-illumination shutter is used, the shutter can be opened or closed from the application.

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 diasopic 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 With the Assist Camera (Only With the Assist Tube Base Unit)

1. Tap the button shown below.



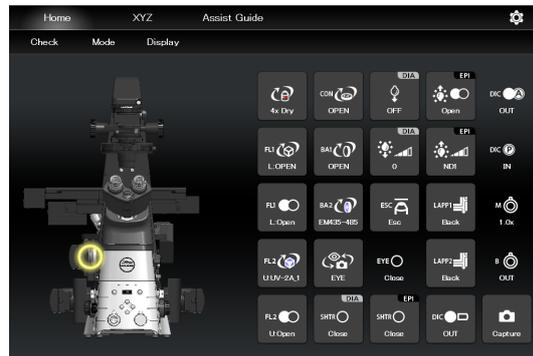
The images through the assist camera are captured.

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.

✓ SUPPLEMENTAL REMARKS

The captured images are saved in the [Ti2Control] folder displayed by tapping [Pictures] on the smart device. The saved images can be viewed by the image viewer application.

- ▼ 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 "Do you want to move the objective to original position Z?" appears. The Import screen 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.

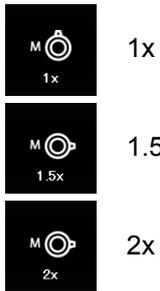
- ▼ Escaping and restoring the objective



3.1.15 Indication-Only Buttons

The following are indication-only buttons.

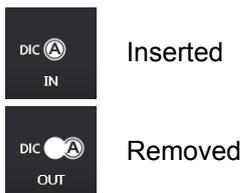
Indicates the current intermediate magnification.



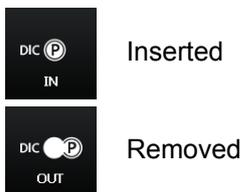
Indicates the objective-side DIC slider in/out status.



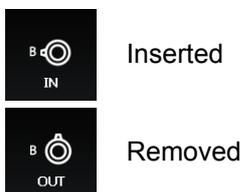
Indicates the DIC analyzer slider in/out status.



Indicates the DIC polarizer in/out status.



Indicates the Bertrand lens in/out status.



✓ SUPPLEMENTAL REMARKS

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

3.1.16 Switching the Optical Path of Epi-Illumination

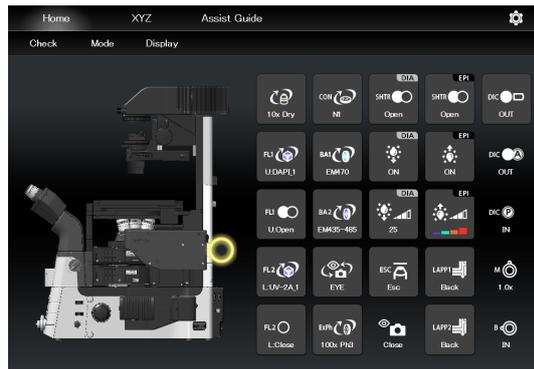
1. Tap the buttons shown below.



(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

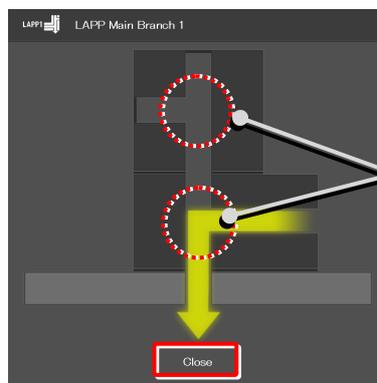


2. Tap a branching point of the optical path displayed on the subscreen.

The optical path is switched.

3. Tap [Close] to close the epi-illumination control subscreen.

▼ Epi-illumination control subscreen



Branching points of the optical path

Microscope main body side

3.1.17 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.



All LEDs are off.



Each LED is on.

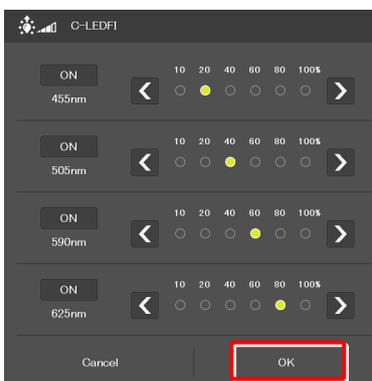
The C-LEDFI control subscreen appears showing the on/off state, the wavelength and the illumination intensity of each LED.

▼ C-LEDFI control



2. Tapping the [OFF] indication button turns the corresponding LED on. Tapping the [ON] indication button turns it off.
3. Tap [<] and [>] to set the illumination intensity per LED.
4. Tap [OK] to save 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



3.1.18 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.

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

▼ 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 [**<**] or [**>**].
3. Tap [**OK**] to save the ND filter change.

▼ 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.

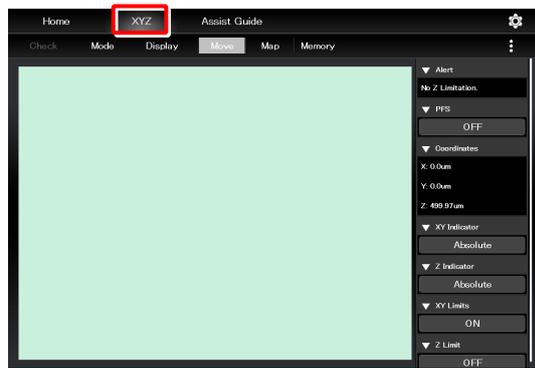
This section describes the functions specific to the XYZ screen.

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 display area of the screen.

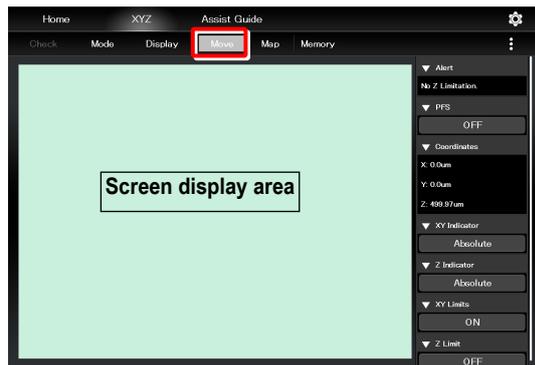
⚠ CAUTION

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. Retry live image reception by following the message.

If this error still persists after several attempts, contact your local Nikon representative.

▼ XYZ screen (Move mode)



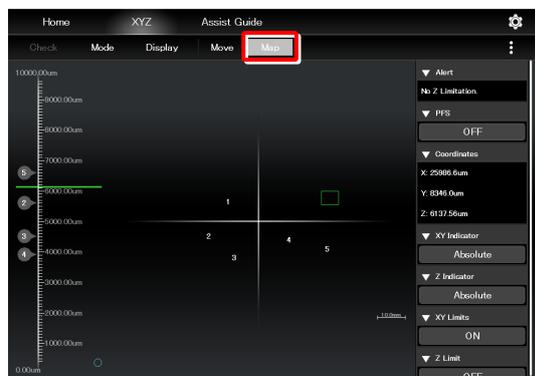
3. Tap [Map].

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)

Select an item from the submenu displayed by tapping this button to switch the display on the right side of the screen.

Hide:

Select [Hide] to hide the remote control button area and the information display area.

Information:

Select [Information] to show the information display area.

Microscope Control:

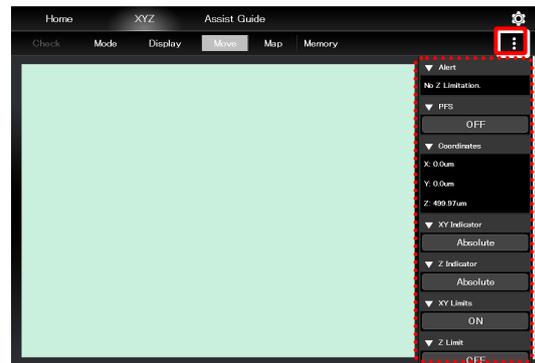
Select [Microscope Control] to show the remote control button area.

Camera Control:

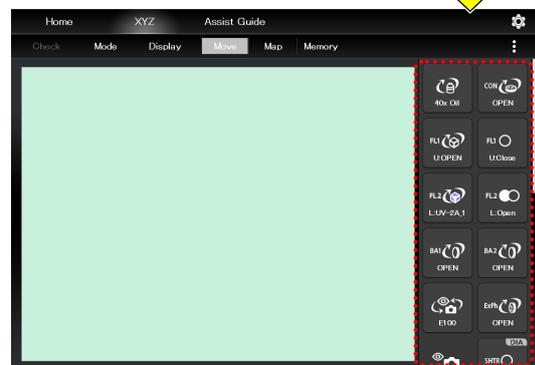
Select [Camera Control] to show the adjustment screen of the assist camera image.

In this screen, white balance can be adjusted and the FOV of the assist camera can be adjusted to be in the same position and the size as the FOV of the binocular part.

▼ Information display area



▼ Remote control button area



■ 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.”

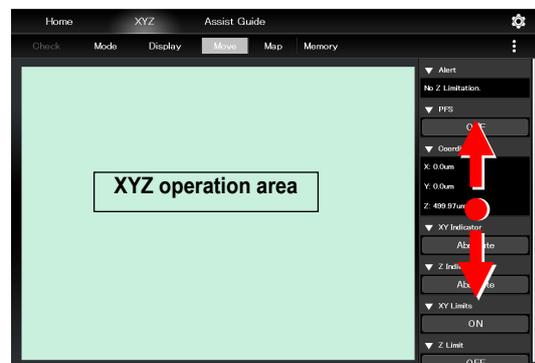
■ Remote control button area

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.”

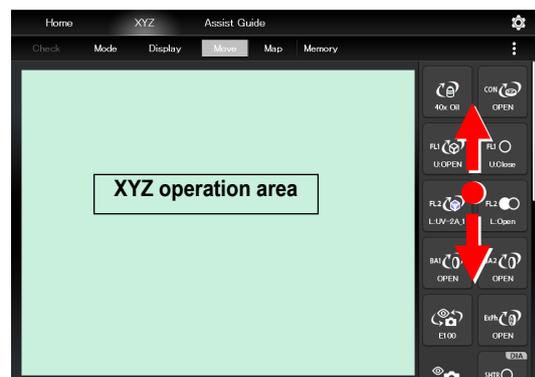
■ XYZ operation area

For details, see “3.2.5 XYZ Operation Area.”

▼ Information display area



▼ Remote control button area



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 ▲.

Select [Information] from the submenu displayed by tapping  to switch the display area on the right side.

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 RESET-Z 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.

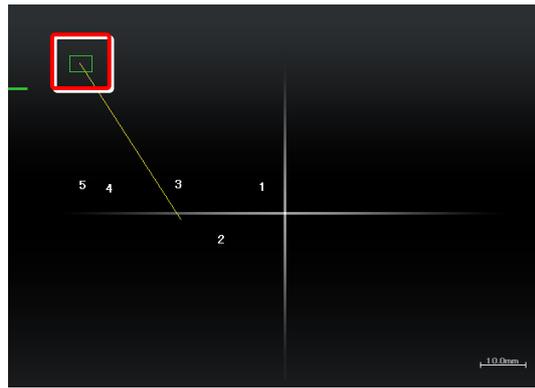
▼ Information display area



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

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**

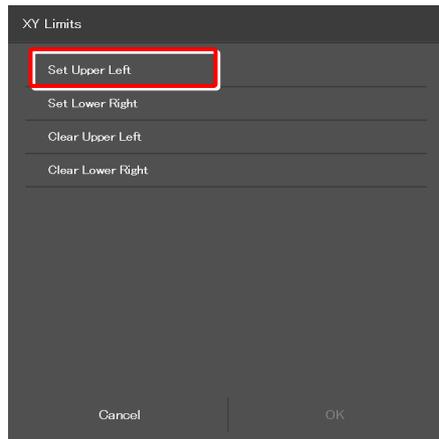


Select [Set Upper Left].

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

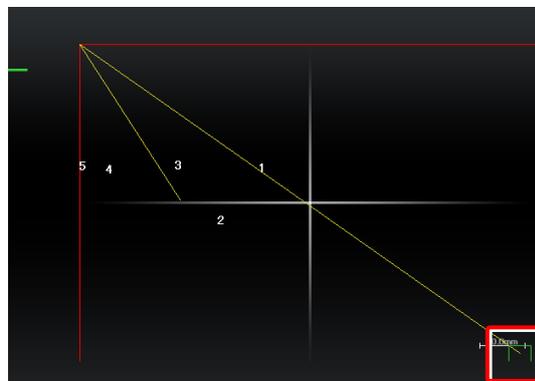
The specified software limits can be cleared by selecting [Clear Upper Left].

▼ **XY Limit subscreen**



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**

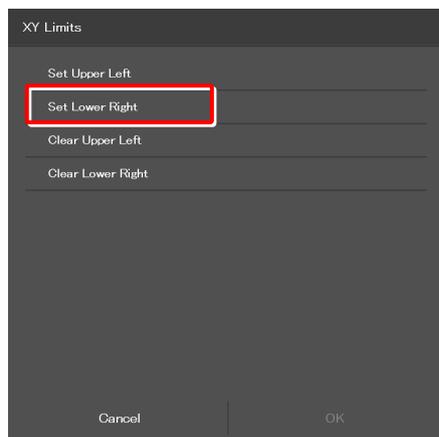


Select [Set Lower Right].

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.

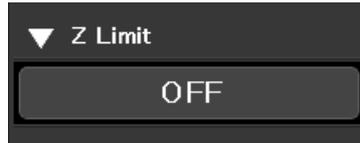
This subscreen allows the user to set the Z software limit.

- 1) Raise the focusing device (Z) to the position to be set as the upper limit.
- 2) Select [Set Upper].

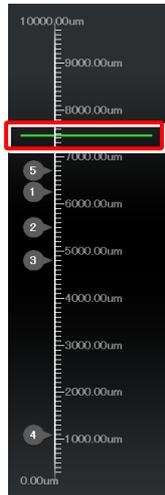
The current Z coordinate can be set as the Z software upper limit.

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

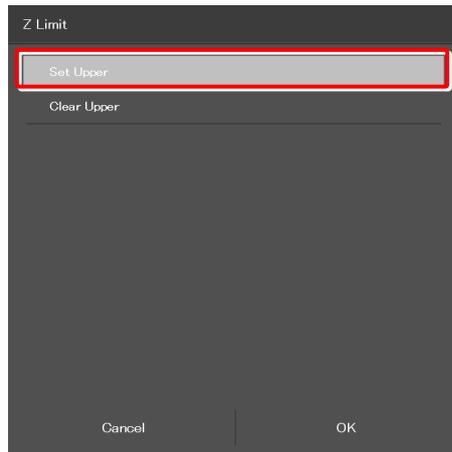
▼ Information display area (continued from the previous page)



▼ Setting the Z Limit



▼ XY 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.

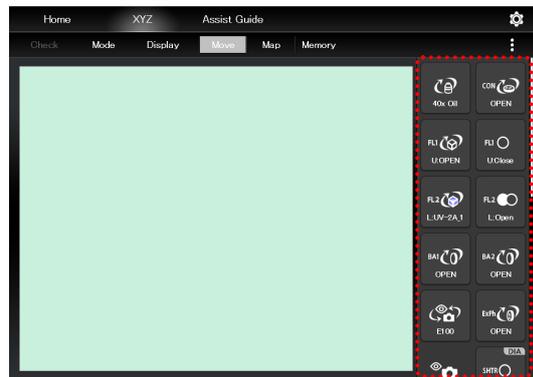
Select [Microscope Control] from the submenu displayed by tapping .

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 Remote Control Button Arrangement.”

Remote control button area



3.2.4 Camera Control

Display the adjustment screen of the assist camera.

Select [Camera Control] from the submenu displayed by tapping .

Setting area

Frame Rate:

Tap this to display the frame rate selection screen.
Select the frame rate of the assist camera.

ROI:

Tap this to display the Adjustment screen.
This screen allows the adjustment of the size and the position of the FOV of the assist camera.
For details, see “2.10 [Assist Camera] Setting the Assist Camera.”

Control area

White Balance:

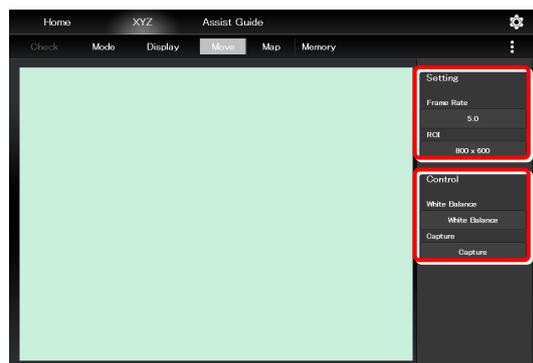
Automatically adjust the white balance of the current image displayed on the screen.

Capture:

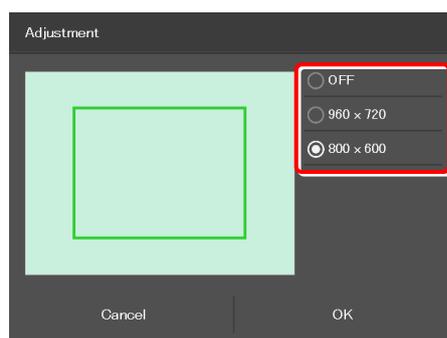
Tap this to capture the image with the assist camera.

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.

Camera control



Adjustment screen



SUPPLEMENTAL REMARKS

The captured images are saved in the [Ti2Control] folder displayed by tapping [Pictures] on the smart device. The saved images can be viewed by the image viewer application.

3.2.5 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)

When the PFS is turned OFF, 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:

Swiping with two fingers moves the focusing device (Z) up a constant amount.

Dragging with two fingers moves the focusing device (Z) up by the amount of movement.

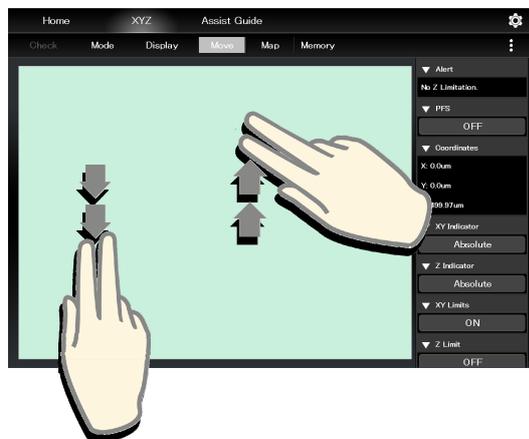
Dragging or swiping down:

Swiping with two fingers moves the focusing device (Z) down a constant amount.

Dragging with two fingers moves the focusing device (Z) down by the amount of movement.

When the PFS is turned ON, the focusing device (Z) can be moved by the offset amount by dragging the XYZ operation area with two fingers up and down.

▼ XYZ operation area



✔ 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.

■ 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.

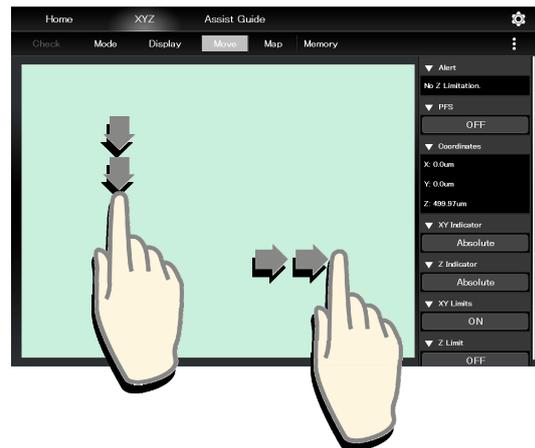
Swiping to the left: Moves the X stage to the left by one field of view.

✔ 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



3.2.6 Memory

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

The motorized stage (XY) and the focusing device (Z) can be moved to the recalled coordinates which were saved in memory.

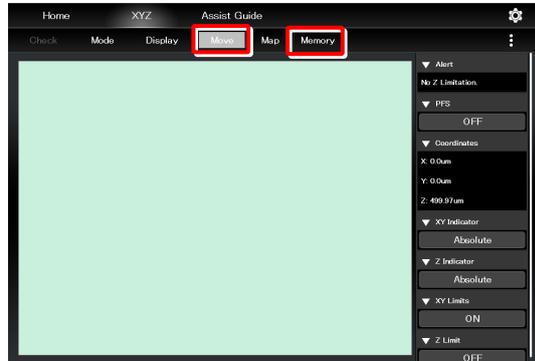
1. Tap [Move] on the XYZ screen.

The screen in Move mode appears.

2. Tap [Memory].

The Memory subscreen appears.

▼ Memory



Saving the coordinates in memory (Memory)

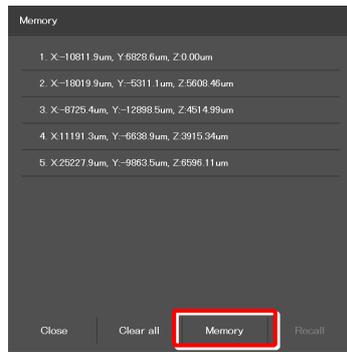
1. Tap [Memory] on the Memory subscreen.

The coordinates of the current motorized stage (XY) and the focusing device (Z) are saved in memory.

✔ SUPPLEMENTAL REMARKS

If more than 10 coordinate points are already saved in memory, no more coordinate points can be saved.

▼ Memory subscreen

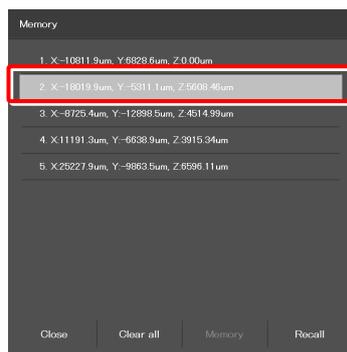


Deleting the selected coordinates

1. Long-tap the coordinates to be deleted on the Memory subscreen.

A deletion confirmation message is displayed.

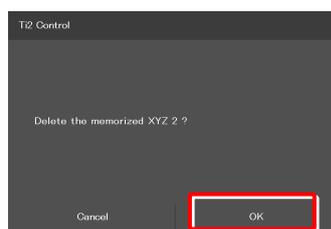
▼ Memory subscreen



2. Tap [OK].

The selected coordinates are deleted.

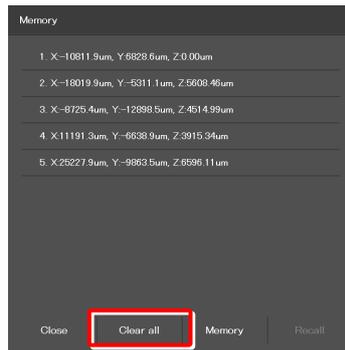
▼ Confirmation of deletion



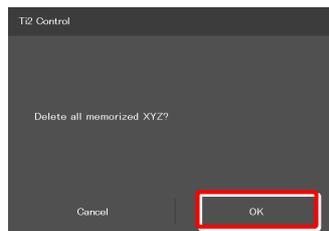
Deleting all coordinates

1. Tap [Clear all] on the Memory subscreen.
A deletion confirmation message is displayed.
2. Tap [OK].
All coordinates saved in memory are deleted.

▼ Memory subscreen



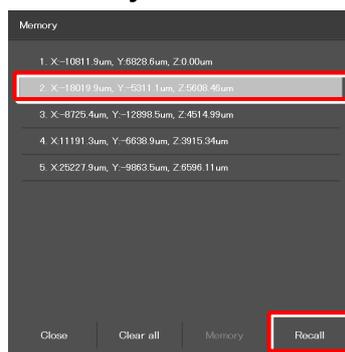
▼ Confirmation of deletion



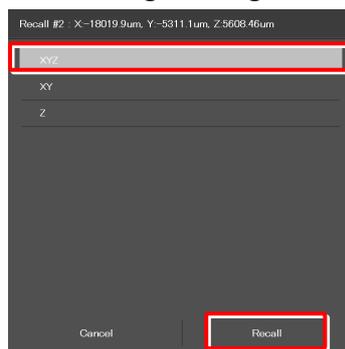
Moving the stage to the coordinate point saved in memory (Recall)

1. Tap the coordinates to be recalled on the Memory subscreen.
2. Tap [Recall] at the bottom of the Memory subscreen.
A list of stages to be moved will appear.
3. Select the stage to be moved, and then tap [Recall].
(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.

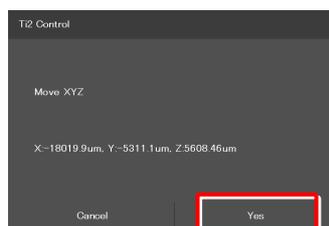
▼ Memory subscreen



▼ Selecting the stage to be moved



▼ Confirmation of movement



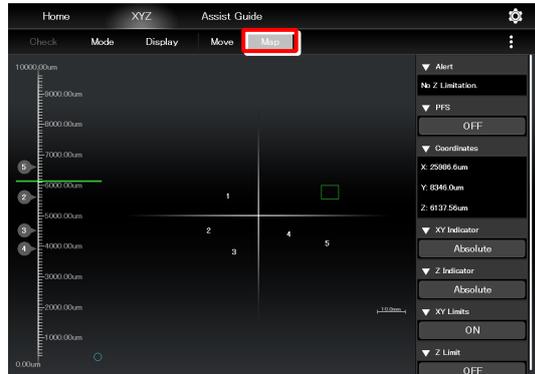
3.2.7 Map Mode

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.

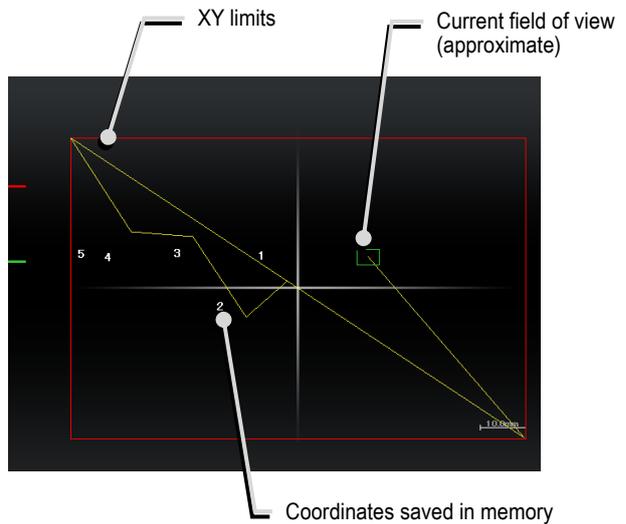
Numbers:

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.

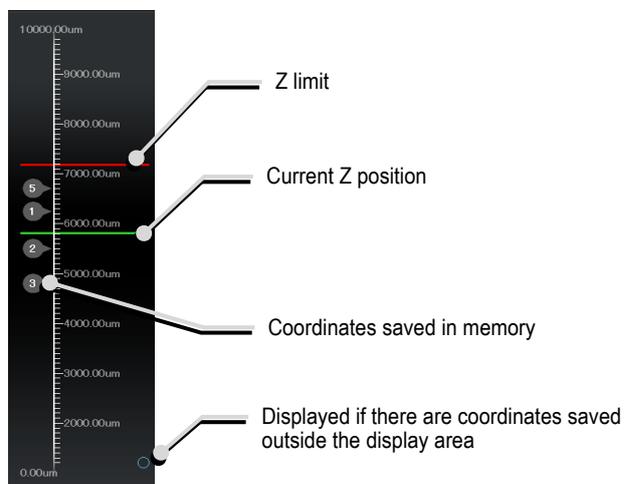
Red solid line:

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 is 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 is 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.

✔ SUPPLEMENTAL REMARKS



Tapping this button in the remote control button area deletes the yellow lines (trace of the XY stage movement) displayed on the Map mode screen.

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

Double tapping:

Allows the Z position to move fast.

A movement confirmation message is 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 is displayed over the entire screen.

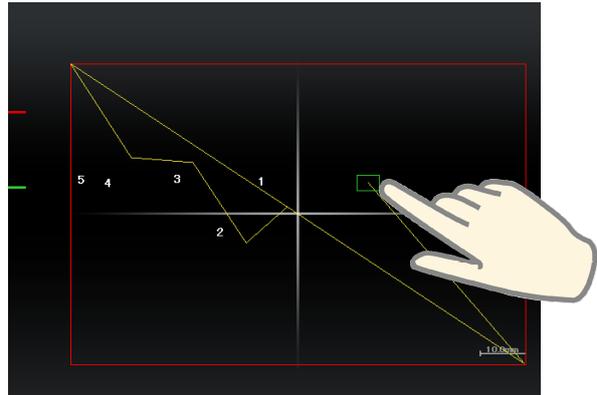
Pinch in and pinch out:

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

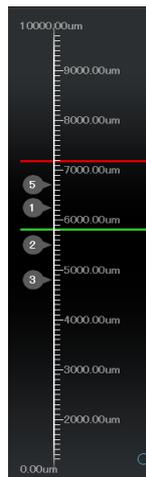
Dragging/swiping:

Moves the displayed screen.

▼ Position display area of the motorized stage (XY)



▼ 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 is 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. Retry live image reception by following the message.

If this error still persists after several attempts, contact your local Nikon representative.

ⓘ (Display changeover)

Select an item from the submenu displayed by tapping this button to show or hide the remote control button area.

Hide:

Select [Hide] to hide the remote control button area.

Microscope Control:

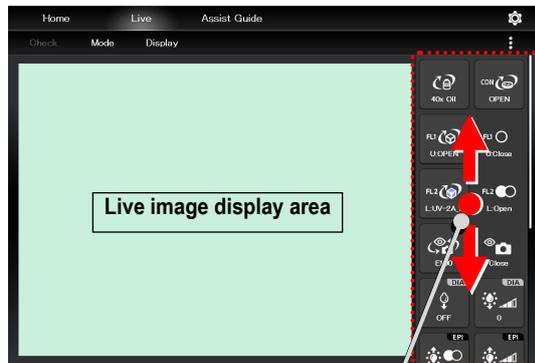
Select [Microscope Control] to show the remote control button area.

Camera Control:

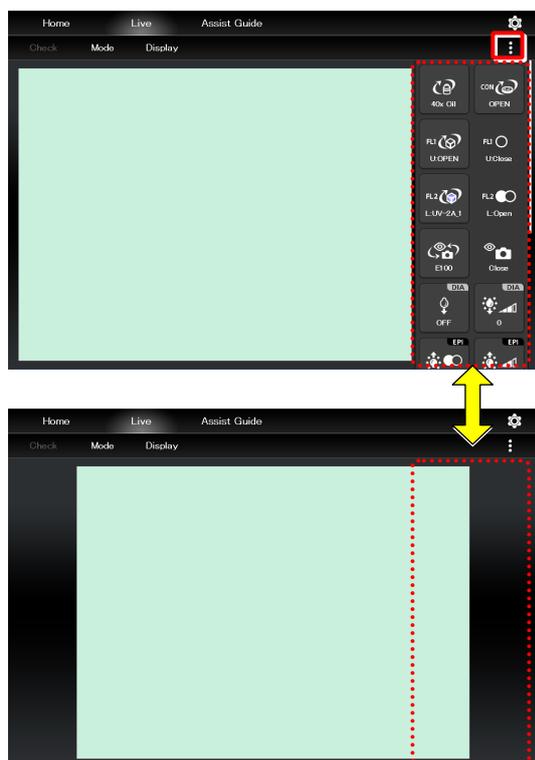
Select [Camera Control] to show the adjustment screen of the assist camera image.

In this screen, white balance can be adjusted and the FOV of the assist camera can be adjusted to be in the same position and the size as the FOV of the binocular part.

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.

4.1.1 How to Use the Check Mode

1. Tap [Check] on the home screen.

A list of microscopy techniques is displayed.

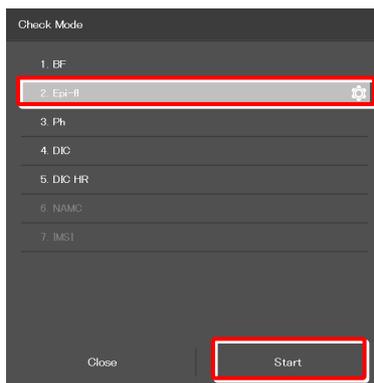
▼ Starting the check mode



2. Select the microscopy technique for the check, and then tap [Start].

The home screen in check mode is displayed, and the buttons are arranged to be suitable for the selected microscopy technique.

▼ Selecting the microscopy technique to be checked



✔ SUPPLEMENTAL REMARKS

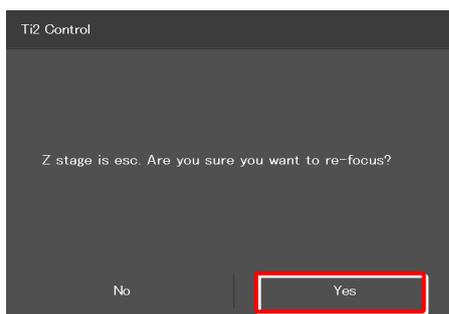
Only the available microscopy techniques, based on the mounted accessories, are selectable on the screen.

✔ SUPPLEMENTAL REMARKS

If the focusing device (Z stage) is at the escape position when [Start] 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.



During check mode, [Check] in the menu field is switched to the name of the selected microscopy technique, which is shown in red or green.

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, the [name of the microscopy technique] in the menu field is shown in red and the  mark is placed on the remote control button for the accessory.

If an objective not suitable for the microscopy technique is in the optical path, the  mark is placed on only the remote control button for the objective even when other accessories are in the state not suitable for the microscopy technique. After the objective is replaced with a suitable objective, the  mark is placed on the remote control button for the accessories not suitable for the microscopy technique.

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 changed to an optimal state.

When the microscope system is in a state suitable for the microscopy technique, the [name of the microscopy technique] is shown in green.

3. Tap the remote control button with the  mark.

The corresponding accessory state is changed to the optimal state, or a subscreen to change the state is displayed.

When the subscreen appears, select an item suitable for the microscopy technique.

The item suitable for the microscopy technique is indicated by the green frame.

✔ SUPPLEMENTAL REMARKS

To cancel the check mode, tap the [microscopy technique name].

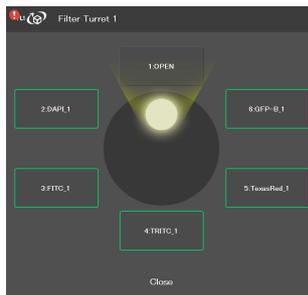
▼ Home screen in check mode



▼ Home screen in check mode



▼ Subscreen



4.2 Remote Control Button Arrangement

The remote control buttons can be arranged freely and this can be registered as a remote control button layout.

4.2.1 Remote Control Button Rearrangement

1. Tap [Display] on the home screen or the XYZ screen (or the Live screen when the Ti2-A is connected).

A selection list is displayed.

✓ SUPPLEMENTAL REMARKS

The remote control button layout is managed separately on the home screen and the XYZ screen (and on the Live screen when the Ti2-A is connected).

The selection list screen to be displayed next depends on which screen [Display] was tapped on.

▼ Starting remote control button rearrangement



2. To create a new remote control button layout, tap [+].

The remote control button rearrangement screen appears.

✓ SUPPLEMENTAL REMARKS

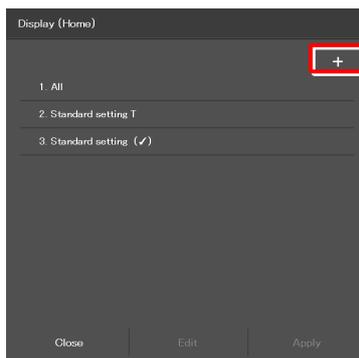
A mark (✓) is displayed next to the name of the current remote control button layout.

✓ SUPPLEMENTAL REMARKS

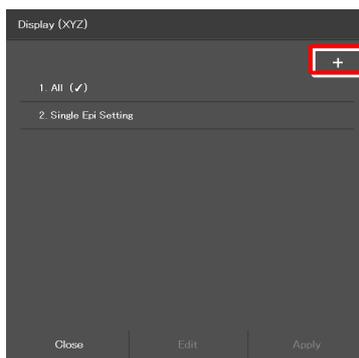
To edit the created remote control button layout, select the corresponding layout, and then tap [Edit].

Note that the layout cannot be saved with a different name when [Edit] is selected.

▼ Selection list screen - Display (Home)



▼ Selection list screen - Display (XYZ)



3. **Select the desired button from a group of arrangeable buttons on the left side 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, which has already been arranged, has a check mark in the upper right corner of the button.

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

✓ SUPPLEMENTAL REMARKS

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

4. **On the arrangement screen on the right, tap the position to place the selected button.**

The button is displayed at the tapped position.

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

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

A selected button is highlighted in a yellow frame.

6. **Tap .**

The selected button is deleted.

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

7. **To swap the buttons, tap the buttons to be swapped.**

▼ Remote control button rearrangement screen

Select the button to be included in the remote control button area.



Swipe the allocatable button group.

▼ Allocating a button

Select the position to place the selected button.

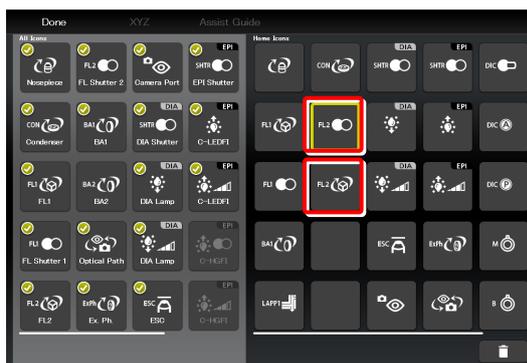


▼ Deleting a button

Select the button to be deleted.



▼ Swapping buttons



8. After arranging all buttons, tap [Done].

The save display screen appears.

▼ Saving the rearranged remote control button layout



9. To save the customized button arrangement as a remote control button layout, specify a name in the [Name] field, and then tap [Save].

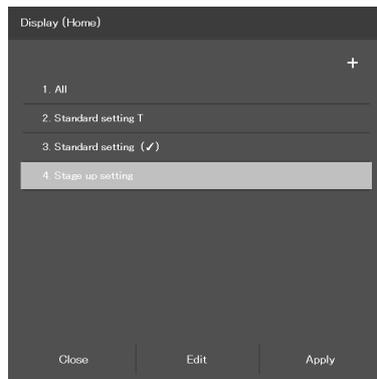
Use within 20 single-byte alphanumeric characters for the name.

The customized button arrangement is registered as a remote control button layout.

▼ Save Display screen



▼ Selection list screen

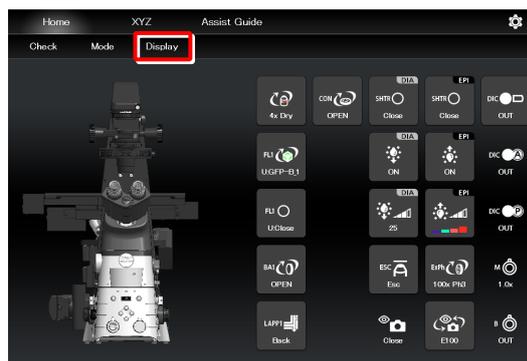


4.2.2 Calling the Saved Remote Control Button Arrangement

1. Tap [Display] on the home screen or the XYZ screen.

The selection list is displayed.

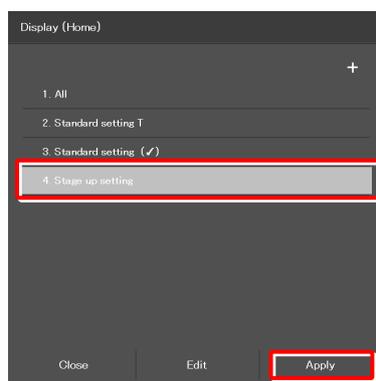
▼ Calling the button arrangement



2. Select the name of the remote control button layout from the list, and then tap [Apply] to arrange the remote control buttons accordingly.

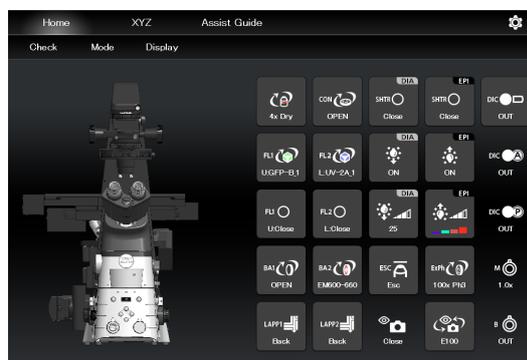
The remote control buttons are arranged according to the registered button layout.

▼ Selecting a remote control button layout



✓ SUPPLEMENTAL REMARKS

Selecting [ALL] and then tapping [Apply] displays all remote control buttons that can be displayed.



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 Saving Modes Linked With Devices

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

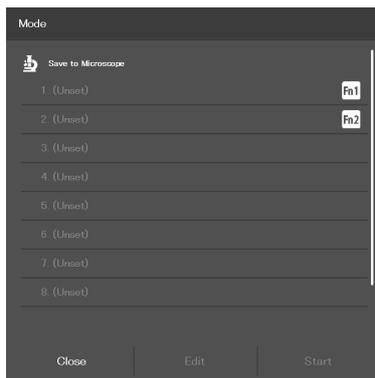
1. Tap [Mode] on the home screen.

The Mode screen appears.

▼ Setting the mode



▼ Mode screen

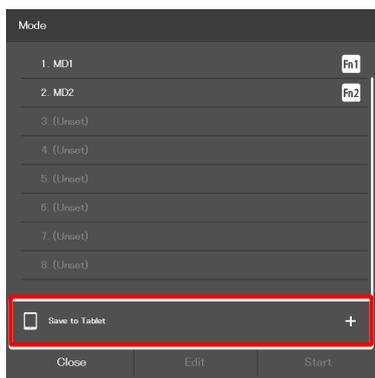


A mode can be saved in the tablet by tapping [+] on the right to the tablet field displayed by scrolling down the screen.

The setting requirements differ depending on where the mode is saved: in the microscope or in the tablet.

For details, see the following pages.

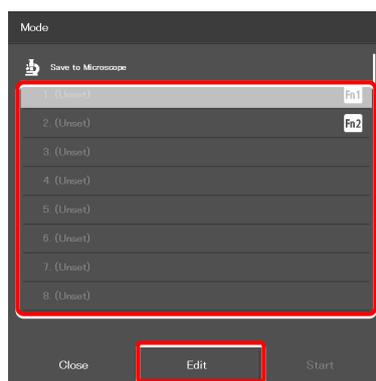
▼ Saving location of the mode



Setting the devices and operation to be linked (saved in the microscope)

1. From the displayed list, tap the number of the mode to be saved.
2. Tap [Edit].
The mode setting subscreen appears.

▼ Mode screen



3. Set the following items.

Current:

Tap this to read the current state of the system.

Clear all:

Tap this to clear all displayed values.

Name:

Specify the name for the mode to be registered.
(Up to 14 single-byte alphanumeric 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.)

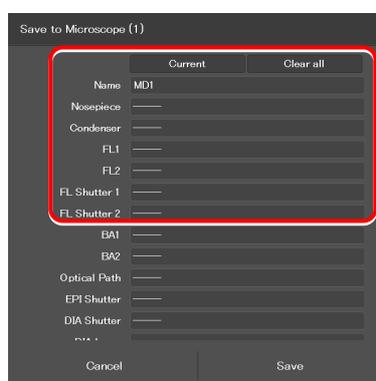
FL Shutter 1:

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

FL Shutter 2:

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.)

▼ Mode setting (saved in the microscope)



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.)

EPI Shutter:

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

DIA Shutter:

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

DIA Lamp:

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

Light Value:

Specify the illumination intensity of the dia-illumination.
(The input range is 0 to 100. 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:

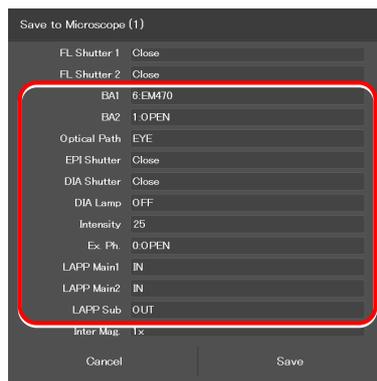
Select the optical path of main branch 1 of the epi-illumination attachment.
(No linked operation is performed if "---" is selected.)

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.)

▼ Mode setting (saved in the microscope) (Cont.)

Inter Mag.:

Select an intermediate magnification value.

DIC slider:

Select the DIC slider in/out status.

DIC Polarizer:

Select the DIC polarizer in/out status.

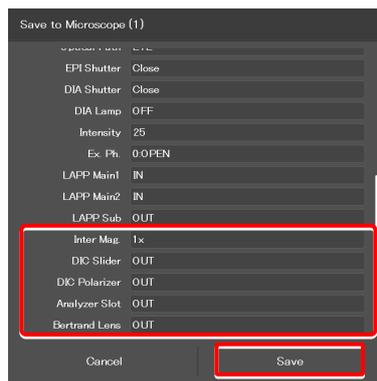
Analyzer Slot:

Select the analyzer slider in/out status.

Bertrand Lens:

Select the Bertrand lens in/out status.

▼ Mode setting (saved in the microscope) (Cont.)



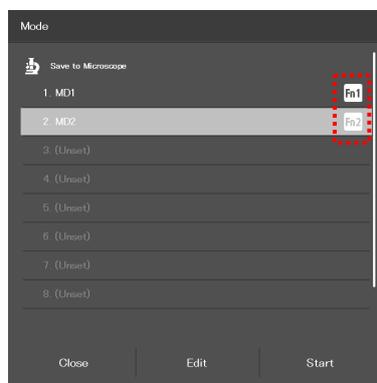
4. Tap [Save] to save the setting.

✔ SUPPLEMENTAL REMARKS

To assign the saved mode to the function buttons of the microscope or the joystick, see “2.9.1 Setting the Function Buttons.”

When the mode is assigned to the function button, the icon of the function button is displayed at the right end of the mode name field on the Mode screen.

▼ Mode assignment to function buttons

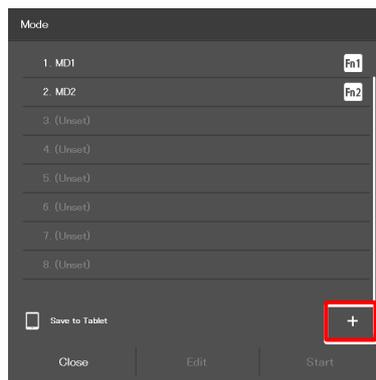


Setting the devices and operation to be linked (saved in the tablet)

1. Scroll down the screen, and tap [+] on the right to the tablet field.

The mode setting subscreen appears.

▼ Mode screen



2. Set the following items.

Current:

Tap this to read the current state of the system.

Clear all:

Tap this to clear all displayed values.

Name:

Specify the name for the mode to be registered. (Up to 14 single-byte alphanumeric characters can be used.)

Nosepiece:

Select an objective to be used.
(No linked operation is performed if "---" is selected.)

Condenser:

Select the condenser to be used.
(No linked operation is performed if "---" is selected.)

FL1:

Select 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 filter cube to be used.
(No linked operation is performed if "---" is selected.)

FL Shutter 1:

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

FL Shutter 2:

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.)

▼ Mode setting (saved in the tablet)



BA1:

Select the BA filter to be used. (No linked operation is performed if "---" is selected.)

BA2:

If there is a second BA filter wheel, select 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.)

EPI Shutter:

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

DIA Shutter:

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

DIA Lamp:

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

Light Value:

Specify the illumination intensity of the dia-illumination. (The input range is 0 to 100. No linked operation is performed if nothing is entered.)

C-LEDFl Ch:1:

Select the state (on or off) of channel 1 of the C-LEDFl epi-fl LED illuminator. (No linked operation is performed if "---" is selected.)

Light Value:

Select the illumination intensity of channel 1 of the C-LEDFl epi-fl LED illuminator. (No linked operation is performed if "---" is selected.)

Ch:2:

Select the state (on or off) of channel 2 of dia-illumination. (No linked operation is performed if "---" is selected.)

Light Value:

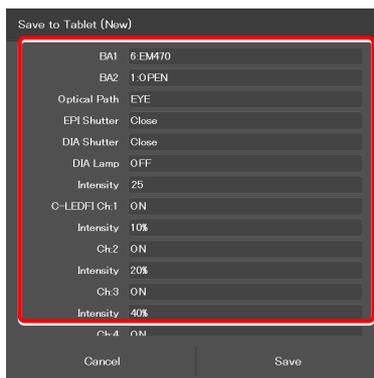
Select the illumination intensity of channel 2 of the C-LEDFl epi-fl LED illuminator. (No linked operation is performed if "---" is selected.)

Ch:3:

Select the state (on or off) of channel 3 of dia-illumination. (No linked operation is performed if "---" is selected.)

Light Value:

Select the illumination intensity of channel 3 of the C-LEDFl epi-fl LED illuminator. (No linked operation is performed if "---" is selected.)

▼ Mode setting (saved in the tablet) (Cont.)

Ch:4:

Select the state (on or off) of channel 4 of dia-illumination. (No linked operation is performed if "---" is selected.)

Light Value:

Select the illumination intensity of channel 4 of the C-LEDFI epi-fl LED illuminator. (No linked operation is performed if "---" is selected.)

Eyepiece Shutter:

Displayed when the assist tube base unit is used. Select the state (open or closed) of the shutter in the optical path to the binocular part. (No linked operation is performed if "---" is selected.)

Observation port:

Displayed when the tube base unit for external phase contrast or the eyepiece tube base unit with port is used. Select the optical output port (observation port) of the tube base unit. (No linked operation is performed if "---" is selected.)

Ex. Ph.:

Select the external phase ring to be used when the tube base unit for external phase contrast is used. (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.)

Inter Mag.:

Select an intermediate magnification value.

DIC slider:

Select the DIC slider in/out status.

DIC Polarizer:

Select the DIC polarizer in/out status.

Analyzer Slot:

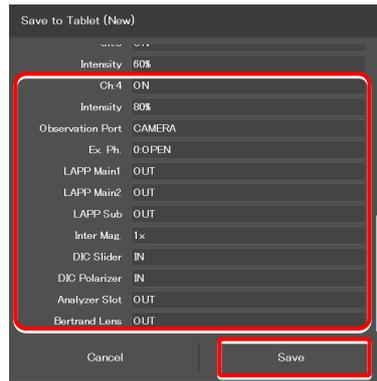
Select the analyzer slider in/out status.

Bertrand Lens:

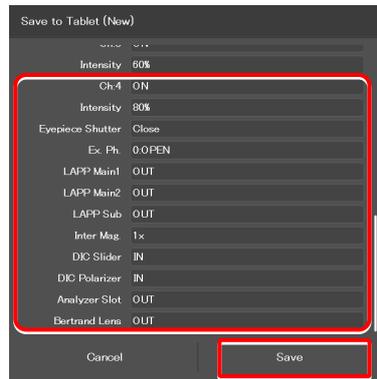
Select the Bertrand lens in/out status.

3. Tap [Save] to save the setting.

▼ Mode setting (saved in the tablet) (Cont.)



▼ Mode setting (saved in the tablet) (when using the assist tube base unit)



4.3.2 Calling a Registered Mode

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

✔ SUPPLEMENTAL REMARKS

When the Ti2-A is in use, the state of each device is shown when the mode to be called is tapped. A  mark is placed on the right to the button corresponding to the device whose state is different from the registered state.

1. Tap [Mode] on the home screen.

The Mode linkage screen appears.

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

3. Tap [Start].

The registered mode is read.

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

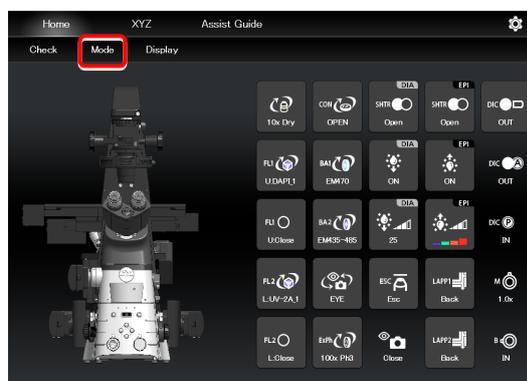
The state of the motorized device is automatically changed to the state registered in the mode, and [Mode] is shown in green.

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, and [Mode] is shown in red.

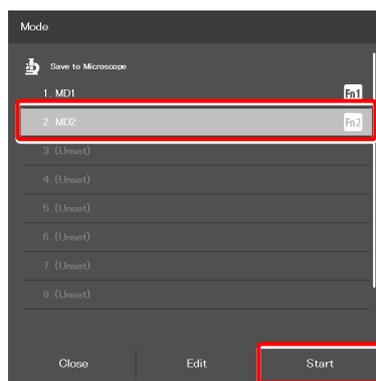
✔ SUPPLEMENTAL REMARKS

To cancel the mode-linked operation, tap [Mode] once again.

▼ Calling mode-linked operation



▼ Mode-linked operation calling screen



▼ Home screen in mode-linked operation



4. Tap the remote control button with the mark.

The state of the associated accessory is changed to the state registered in the mode, or a subscreen for the change is displayed.

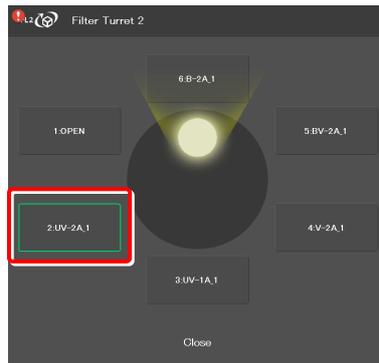
On the subscreen, select the item registered in the mode.

The item registered in the mode is shown by the red frame.

▼ Screen during mode-linked operation



▼ Subscreen



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.

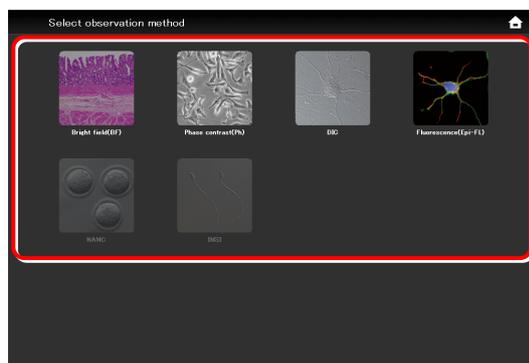
- **Selecting the microscopy technique**

The screen changes to an Assist Guide screen based on the tapped microscopy technique.

✔ **SUPPLEMENTAL REMARKS**

Only the available microscopy techniques, based on the mounted accessories, are selectable on the screen.

▼ 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.

✔ **SUPPLEMENTAL REMARKS**

Tap  to close the motorized shutters. When tapping [OK] to resume the guide, the shutters are also resumed to the original states.

- **Guide items**

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

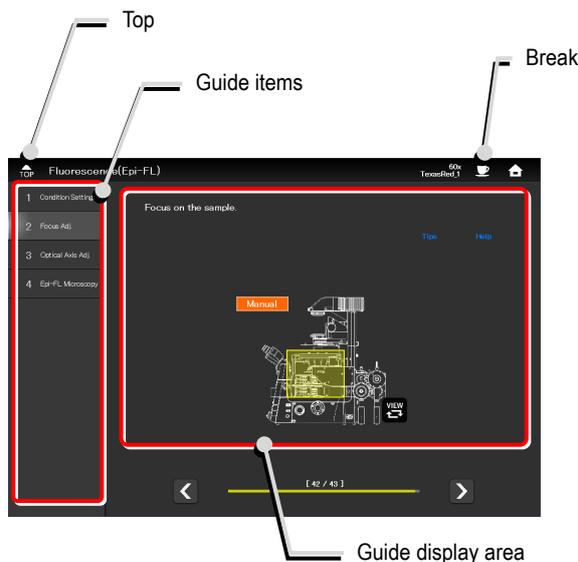
- **Guide display area**

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)

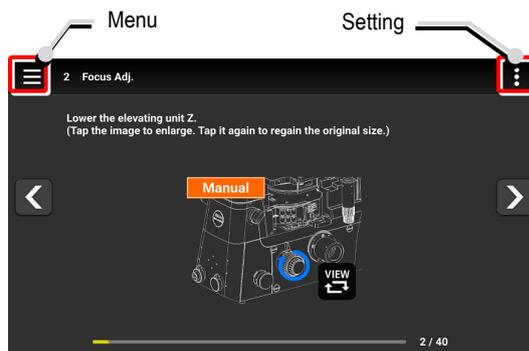


✔ **When using a smartphone**

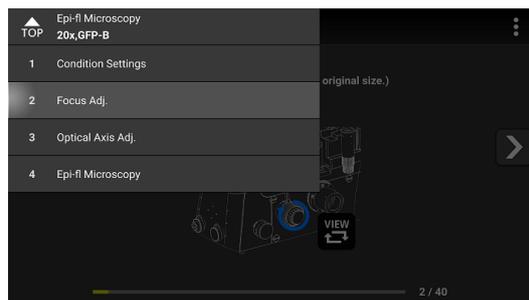
To display the Top icon and guide items, tap [Menu] (☰).

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

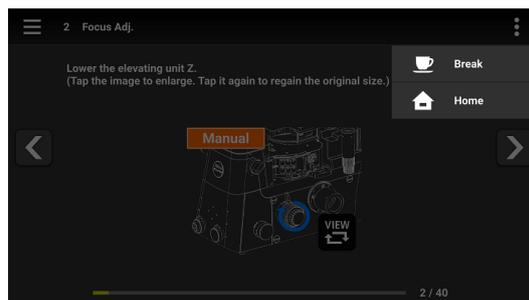
▼ **Screen when using a smartphone**



▼ **Menu display when using a smartphone**



▼ **Setting display when using a smartphone**



■ **Page change and motorized device operation**

The page transition is displayed on the screen. The previous page or the next page is displayed using the arrows ([<] and [>]).

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 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.

■ **VIEW (Switching the displayed image)**

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

■ **Tips**

Displays tips.

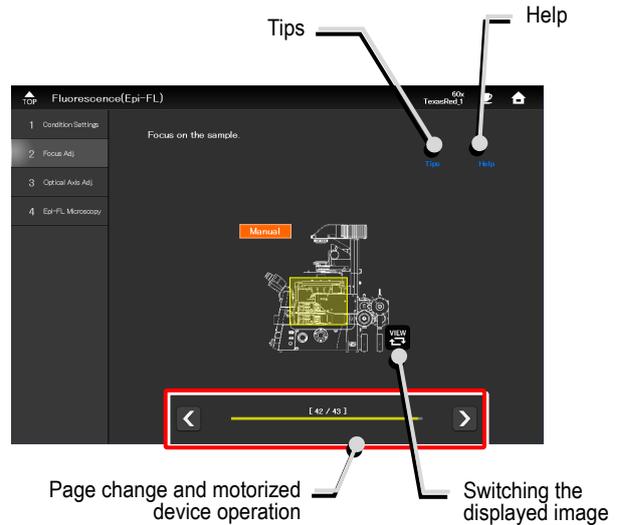
Tap [<] to go back to the guide.

■ **Help**

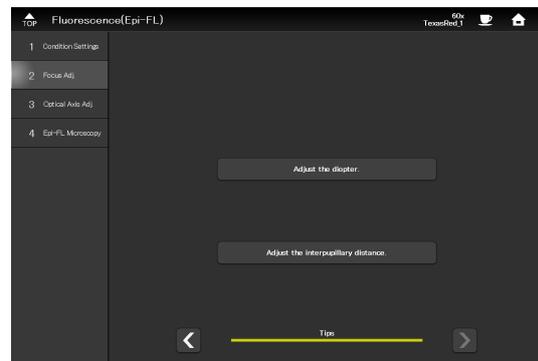
Displays the help screen which shows a solution when adjustment is unsuccessful.

Tap [<] to go back to the guide.

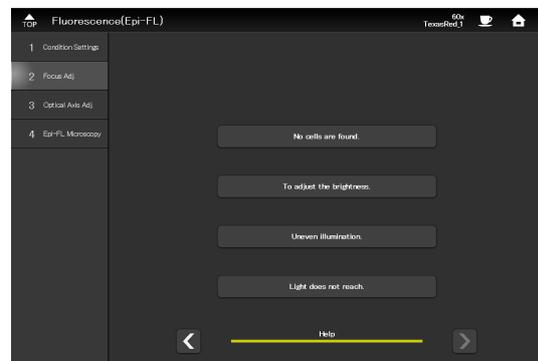
▼ **Switching the screen**



▼ **Tips screen**



▼ **Help screen**



■ XYZ

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

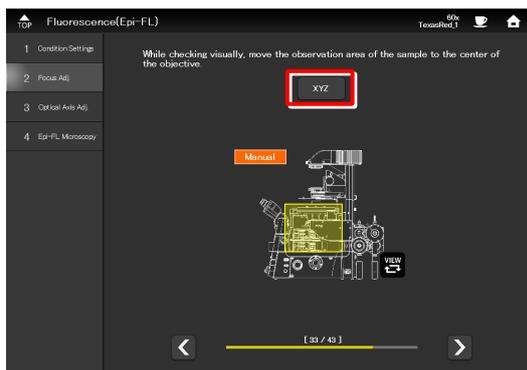
For how to operate the XYZ screen, see “3.2 XYZ Control (XYZ Screen): Ti2-E Only.”

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

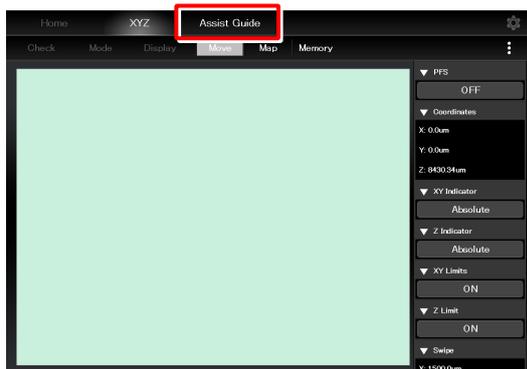
■ Optical path selection

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

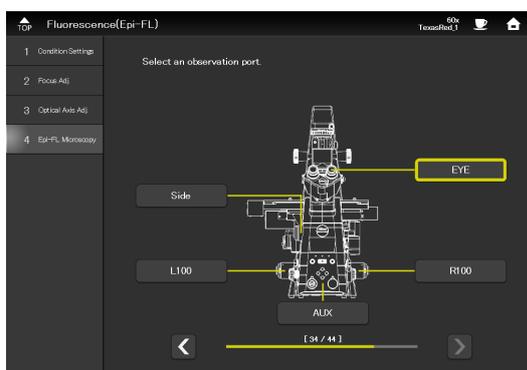
▼ Calling the XYZ screen



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



▼ 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.

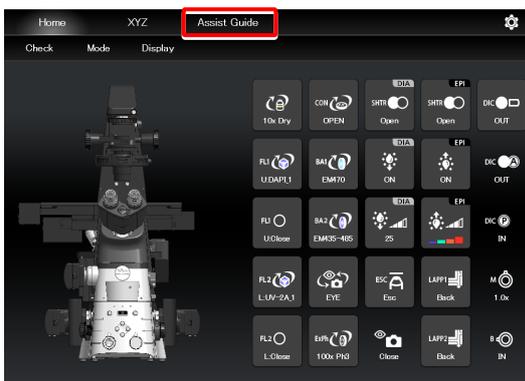
For how to set the microscope configuration, see “2.3 [System]: Display and Manual Registration of the Microscope Configuration.” For how to make settings for optical devices, see “2.5 [Optical Device]: Setting the Optical Devices.”

The basic condition setting process is shown as follows.

1. Tap [Assist Guide].

The Assist Guide screen appears.

▼ Starting the Assist Guide

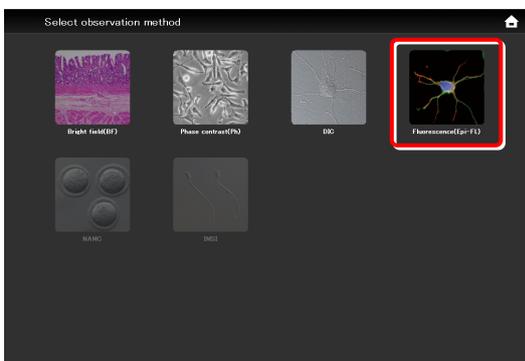


2. Select a microscopy technique.

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.)

▼ Selecting a microscopy technique

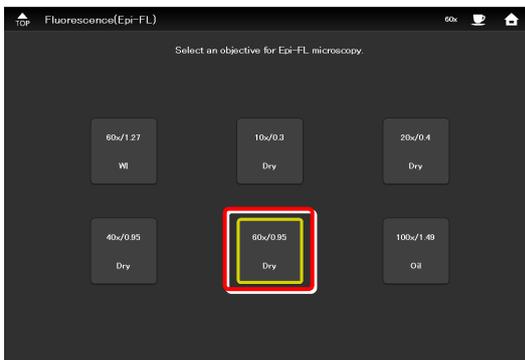


SUPPLEMENTAL REMARKS

Only the available microscopy techniques, based on the mounted accessories, are selectable on the screen.

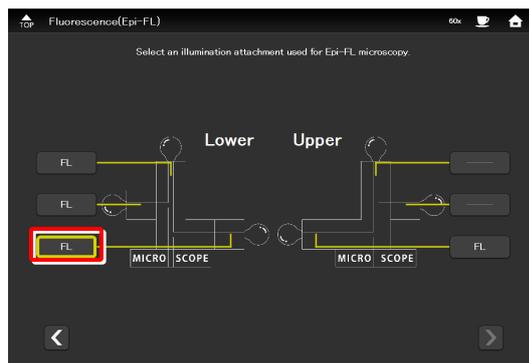
3. Select the objective to be used for observation.

▼ Selecting an objective for observation



4. Select an optical path used for observation.

▼ Selecting an illumination attachment



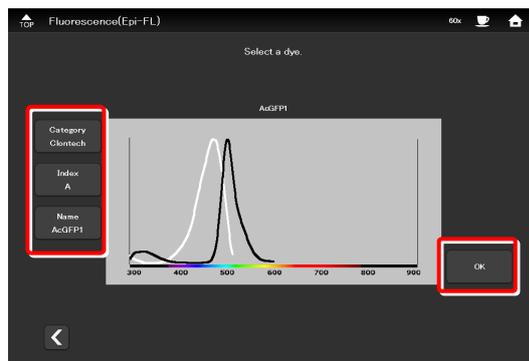
5. Select the wavelength of the light source used for epi-fl microscopy.

▼ Selecting a light source wavelength



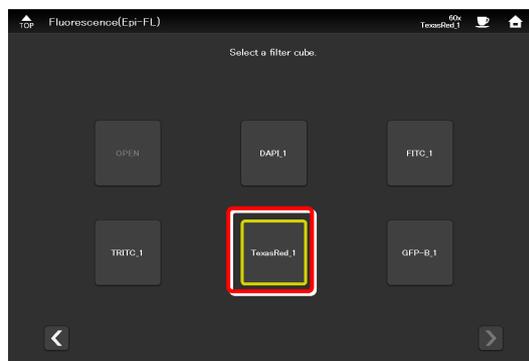
6. Select a dye and tap [OK].

▼ Selecting a dye



7. Select a filter cube.

▼ Selecting a filter cube

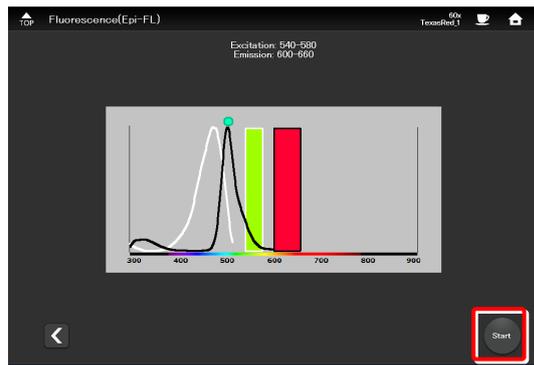


This completes the condition settings.

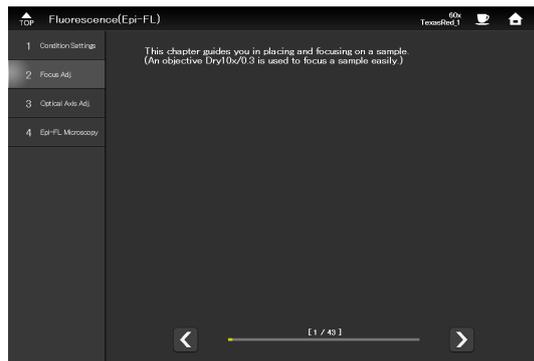
Tapping [Start] starts the guide.

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.	Group	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	1	----- (NULL)	Nothing is to be set.	✓	✓
2	1	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	1	REVO 1	Moves to nosepiece address 1.		
4	1	REVO 2	Moves to nosepiece address 2.		
5	1	REVO 3	Moves to nosepiece address 3.		
6	1	REVO 4	Moves to nosepiece address 4.		
7	1	REVO 5	Moves to nosepiece address 5.		
8	1	REVO 6	Moves to nosepiece address 6.		
9	1	REVO CW	Turns the nosepiece clockwise.		
10	1	REVO CCW	Turns the nosepiece counterclockwise.		
11	1	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	1	COND 1	Moves to condenser address 1.		
13	1	COND 2	Moves to condenser address 2.		
14	1	COND 3	Moves to condenser address 3.		
15	1	COND 4	Moves to condenser address 4.		
16	1	COND 5	Moves to condenser address 5.		

No.	Group	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
17	1	COND 6	Moves to condenser address 6.		
18	1	COND 7	Moves to condenser address 7.		
19	1	COND CW	Turns the condenser clockwise.		
20	1	COND CCW	Turns the condenser counterclockwise.		
21	2	FL1st SHIFT	Move the joystick to the left in the X direction while holding down the button: Turns FL turret 1 clockwise. Move the joystick to the right in the X direction while holding down the button: Turns FL turret 1 counterclockwise.	✓✓ (Fn5)	
22	2	FL1st 1	Moves FL turret 1 to address 1.		
23	2	FL1st 2	Moves FL turret 1 to address 2.		
24	2	FL1st 3	Moves FL turret 1 to address 3.		
25	2	FL1st 4	Moves FL turret 1 to address 4.		
26	2	FL1st 5	Moves FL turret 1 to address 5.		
27	2	FL1st 6	Moves FL turret 1 to address 6.		
28	2	FL1st CW	Turns FL turret 1 clockwise.		
29	2	FL1st CCW	Turns FL turret 1 counterclockwise.		
30	2	FL2nd SHIFT	Move the joystick to the left in the X direction while holding down the button: Turns FL turret 2 clockwise. Move the joystick to the right in the X direction while holding down the button: Turns FL turret 2 counterclockwise.	✓	
31	2	FL2nd 1	Moves FL turret 2 to address 1.		
32	2	FL2nd 2	Moves FL turret 2 to address 2.		
33	2	FL2nd 3	Moves FL turret 2 to address 3.		
34	2	FL2nd 4	Moves FL turret 2 to address 4.		
35	2	FL2nd 5	Moves FL turret 2 to address 5.		
36	2	FL2nd 6	Moves FL turret 2 to address 6.		
37	2	FL2nd CW	Turns FL turret 2 clockwise.		
38	2	FL2nd CCW	Turns FL turret 2 counterclockwise.		
39	2	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	2	BA1st 1	Moves BA filter wheel 1 to address 1.		
41	2	BA1st 2	Moves BA filter wheel 1 to address 2.		
42	2	BA1st 3	Moves BA filter wheel 1 to address 3.		
43	2	BA1st 4	Moves BA filter wheel 1 to address 4.		
44	2	BA1st 5	Moves BA filter wheel 1 to address 5.		
45	2	BA1st 6	Moves BA filter wheel 1 to address 6.		
46	2	BA1st 7	Moves BA filter wheel 1 to address 7.		
47	2	BA1st CW	Turns BA filter wheel 1 clockwise.		✓
48	2	BA1st CCW	Turns BA filter wheel 1 counterclockwise.		✓
49	2	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 2 counterclockwise.	✓	
50	2	BA2nd 1	Moves BA filter wheel 2 to address 1.		
51	2	BA2nd 2	Moves BA filter wheel 2 to address 2.		
52	2	BA2nd 3	Moves BA filter wheel 2 to address 3.		

No.	Group	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
53	2	BA2nd 4	Moves BA filter wheel 2 to address 4.		
54	2	BA2nd 5	Moves BA filter wheel 2 to address 5.		
55	2	BA2nd 6	Moves BA filter wheel 2 to address 6.		
56	2	BA2nd 7	Moves BA filter wheel 2 to address 7.		
57	2	BA2nd CW	Turns BA filter wheel 2 clockwise.		✓
58	2	BA2nd CCW	Turns BA filter wheel 2 counterclockwise.		✓
59	3	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-: L80	✓	
60	3	PATH EYE	Switches the optical path to EYE.		
61	3	PATH R100	Switches the optical path to R100.		
62	3	PATH L100	Switches the optical path to L100.		
63	3	PATH AUX	Switches the optical path to AUX.		
64	3	PATH EYE-R100	Toggles the optical path between EYE and R100.		
65	3	PATH EYE-L100	Toggles the optical path between EYE and L100.		
66	3	PATH EYE-AUX	Toggles the optical path between EYE and AUX.		
67	3	PATH R100-L100	Toggles the optical path between R100 and L100.		
68	3	PATH R100-AUX	Toggles the optical path between R100 and AUX.		
69	3	PATH L100-AUX	Toggles the optical path between L100 and AUX.		
70	3	PATH ALL	Switches the optical path from EYE to R100, AUX, L100 and then back to EYE.		
71	3	Z SPEED CHANGE	Switches the Z-movement between fine and coarse.		
72	3	Z ZERO RESET	Resets the elevating movement (Z-axis coordinate) to 0.		
73	3	Z ESCAPE-REFOCUS	Toggles the elevating movement between escape and original positions.	✓	
74	3	Z ESCAPE	Places the elevating section in the escape position.		
75	3	Z REFOCUS	Restores the elevating section in the original position.		
76	3	Z LIMIT	Sets or releases the software limit (Z limit) on the elevating section.		
77	3	XY SPEED CHANGE	Switches the XY-movement between fine and coarse.		
78	3	X ZERO RESET	Resets the XY stage (X-axis coordinate) to 0.		
79	3	Y ZERO RESET	Resets the XY stage (Y-axis coordinate) to 0.		
80	3	XY ZERO RESET	Resets the XY stage (XY-axis coordinates) to 0.		
81	3	XY CONSTANT SPEED	Turns on or off the joystick constant speed mode for the XY stage.	✓	
82	3	XY JOYFINESPEED	Sets the joystick fine speed for the XY stage to normal or low speed.	✓	
83	4	SH1 OPEN-CLOSE	Opens or closes motorized shutter 1.	✓	✓
84	4	SH2 OPEN-CLOSE	Opens or closes motorized shutter 2.	✓	✓
85	4	FL1SH OPEN-CLOSE	Opens or closes FL turret 1 shutter.	✓✓ (Fn6)	
86	4	FL2SH OPEN-CLOSE	Opens or closes FL turret 2 shutter.	✓	
87	4	COND SHUTTER MOVE	Moves the condenser shutter position.	✓✓ (Fn4)	
88	4	LED SHIFT	Adjusts brightness by turning the focus knobs while pressing the button.	✓	
89	4	LED ON-OFF	Turns on and off diascope LED illumination.		
90	4	LED UP	Increases the illumination intensity of diascope LED illumination.		
91	4	LED DOWN	Decreases the illumination intensity of diascope LED illumination.		
92	4	HALOGEN SHIFT	Adjusts brightness by turning the focus knobs while pressing the button.	✓	

No.	Group	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
93	4	HALOGEN ON-OFF	Turns on and off halogen dia-illumination.		
94	4	HALOGEN UP	Increases the illumination intensity of halogen dia-illumination.		
95	4	HALOGEN DOWN	Decreases the illumination intensity of halogen dia-illumination.		
96	4	PFS ON-OFF	Turns on or off PFS4.		
97	4	PFS DM	Brings the PFS dichroic mirror to the IN or OUT position.	✓	
98	4	PFS OFFSET ZERO	Offset lens: Moves the offset lens to offset 0 position.		✓
99	4	PFS LED OFF	Turns on or off the PFS LED.		
100	4	OLSP COARSE-FINE	Switches the PFS4 offset knob between coarse motion and fine motion.		
101	5	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.	✓	
102	5	TUBEBASE 1	Moves the tube base's external Ph turret to address 1.		
103	5	TUBEBASE 2	Moves the tube base's external Ph turret to address 2.		
104	5	TUBEBASE 3	Moves the tube base's external Ph turret to address 3.		
105	5	TUBEBASE 4	Moves the tube base's external Ph turret to address 4.		
106	5	TUBEBASE CW	Turns the tube base's external Ph turret clockwise.		✓
107	5	TUBEBASE CCW	Turns the tube base's external Ph turret counterclockwise.		✓
108	5	MBRANCH1st IN-OUT	Brings the epi-illumination attachment's Lapp main branch 1 to the IN or OUT position.	✓	✓
109	5	MBRANCH2nd IN-OUT	Brings the epi-illumination attachment's Lapp main branch 2 to the IN or OUT position.	✓	✓
110	5	SBRANCH IN-OUT	Brings the epi-illumination attachment's Lapp sub-branch to the IN or OUT position.	✓	✓
111	5	EPILED UNIT#1	Selects LED unit #1 of the epi-fl LED illuminator.		
112	5	EPILED UNIT#2	Selects LED unit #2 of the epi-fl LED illuminator.		
113	5	EPILED UNIT#3	Selects LED unit #3 of the epi-fl LED illuminator.		
114	5	EPILED UNIT#4	Selects LED unit #4 of the epi-fl LED illuminator.		
115	5	EPILED UNIT ALL	Switches LED unit of the epi-fl LED illuminator from #1 to #2, #3, #4, and then back to #1.		
116	5	EPILED UP	Increases the illumination intensity of the selected LED unit of the epi-fl LED illuminator.		
117	5	EPILED DOWN	Decreases the illumination intensity of the selected LED unit of the epi-fl LED illuminator.		
118	5	EPILED ON-OFF	Turns on or off the selected LED unit of the epi-fl LED illuminator.		
119	5	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.		
120	5	INTSL ND CW	Turns the Intensilight ND clockwise.		
121	5	INTSL ND CCW	Turns the Intensilight ND counterclockwise.		
122	5	INT.SH OPEN-CLOSE	Opens or closes the Intensilight shutter.		
123	5	CORCOL SHIFT	Moves the motorized correction collar in the +/- direction when the focus knobs are turned while the button is pressed.	✓	
124	6	MODE1 MEMORY	Memorizes Mode 1 setting.		
125	6	MODE2 MEMORY	Memorizes Mode 2 setting.		
126	6	MODE3 MEMORY	Memorizes Mode 3 setting.		
127	6	MODE4 MEMORY	Memorize Mode 4 setting.		

No.	Group	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
128	6	MODE5 MEMORY	Memorizes Mode 5 setting.		
129	6	MODE6 MEMORY	Memorizes Mode 6 setting.		
130	6	MODE7 MEMORY	Memorizes Mode 7 setting.		
131	6	MODE8 MEMORY	Memorizes Mode 8 setting.		
132	6	MODE1 RECALL	Recalls Mode 1 setting.		
133	6	MODE2 RECALL	Recalls Mode 2 setting.		
134	6	MODE3 RECALL	Recalls Mode 3 setting.		
135	6	MODE4 RECALL	Recalls Mode 4 setting.		
136	6	MODE5 RECALL	Recalls Mode 5 setting.		
137	6	MODE6 RECALL	Recalls Mode 6 setting.		
138	6	MODE7 RECALL	Recalls Mode 7 setting.		
139	6	MODE8 RECALL	Recalls Mode 8 setting.		
140	6	MODE1 MEM-RECALL	Short press: Recalls Mode 1 setting. Long press: Memorizes Mode 1 setting.	✓✓ (Fn1)	✓
141	6	MODE2 MEM-RECALL	Short press: Recalls Mode 2 setting. Long press: Memorizes Mode 2 setting.	✓✓ (Fn2)	✓
142	6	MODE3 MEM-RECALL	Short press: Recalls Mode 3 setting. Long press: Memorizes Mode 3 setting.	✓	✓
143	6	MODE4 MEM-RECALL	Short press: Recalls Mode 4 setting. Long press: Memorizes Mode 4 setting.	✓	✓
144	6	MODE5 MEM-RECALL	Short press: Recalls Mode 5 setting. Long press: Memorizes Mode 5 setting.		
145	6	MODE6 MEM-RECALL	Short press: Recalls Mode 6 setting. Long press: Memorizes Mode 6 setting.		
146	6	MODE7 MEM-RECALL	Short press: Recalls Mode 7 setting. Long press: Memorizes Mode 7 setting.		
147	6	MODE8 MEM-RECALL	Short press: Recalls Mode 8 setting. Long press: Memorizes Mode 8 setting.		
148	7	I/O1OUT TRIG.	Trigger output of control box I/O channel 1	✓	✓✓ (FnR)
149	7	I/O2OUT TRIG.	Trigger output of control box I/O channel 2	✓	✓
150	7	I/O3OUT TRIG.	Trigger output of control box I/O channel 3		
151	7	I/O4OUT TRIG.	Trigger output of control box I/O channel 4		
152	7	I/O5OUT TRIG.	Trigger output of control box I/O channel 5		
153	7	I/O6OUT TRIG.	Trigger output of control box I/O channel 6		
154	7	I/O7OUT TRIG.	Trigger output of control box I/O channel 7		
155	7	I/O8OUT TRIG.	Trigger output of control box I/O channel 8		
156	7	I/O1OUT TOGGLE	Switches the control box I/O channel 1 output between High and Low.	✓	✓
157	7	I/O2OUT TOGGLE	Switches the control box I/O channel 2 output between High and Low.	✓	✓
158	7	I/O3OUT TOGGLE	Switches the control box I/O channel 3 output between High and Low.		
159	7	I/O4OUT TOGGLE	Switches the control box I/O channel 4 output between High and Low.		
160	7	I/O5OUT TOGGLE	Switches the control box I/O channel 5 output between High and Low.		
161	7	I/O6OUT TOGGLE	Switches the control box I/O channel 6 output between High and Low.		
162	7	I/O7OUT TOGGLE	Switches the control box I/O channel 7 output between High and Low.		
163	7	I/O8OUT TOGGLE	Switches the control box I/O channel 8 output between High and Low.		

No.	Group	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
164	7	I/O1OUT PUSH	Drives the control box I/O channel 1 output. High when pushed	✓	✓
165	7	I/O2OUT PUSH	Drives the control box I/O channel 2 output. High when pushed	✓	✓
166	7	I/O3OUT PUSH	Drives the control box I/O channel 3 output. High when pushed		
167	7	I/O4OUT PUSH	Drives the control box I/O channel 4 output. High when pushed		
168	7	I/O5OUT PUSH	Drives the control box I/O channel 5 output. High when pushed		
169	7	I/O6OUT PUSH	Drives the control box I/O channel 6 output. High when pushed		
170	7	I/O7OUT PUSH	Drives the control box I/O channel 7 output. High when pushed		
171	7	I/O8OUT PUSH	Drives the control box I/O channel 8 output. High when pushed		
172	8	EXI/O1OUT TRIG.	Trigger output of extension box I/O channel 1		
173	8	EXI/O2OUT TRIG.	Trigger output of extension box I/O channel 2		
174	8	EXI/O3OUT TRIG.	Trigger output of extension box I/O channel 3		
175	8	EXI/O4OUT TRIG.	Trigger output of extension box I/O channel 4		
176	8	EXI/O5OUT TRIG.	Trigger output of extension box I/O channel 5		
177	8	EXI/O6OUT TRIG.	Trigger output of extension box I/O channel 6		
178	8	EXI/O7OUT TRIG.	Trigger output of extension box I/O channel 7		
179	8	EXI/O8OUT TRIG.	Trigger output of extension box I/O channel 8		
180	8	EXI/O9OUT TRIG.	Trigger output of extension box I/O channel 9		
181	8	EXI/O10OUT TRIG.	Trigger output of extension box I/O channel 10		
182	8	EXI/O11OUT TRIG.	Trigger output of extension box I/O channel 11		
183	8	EXI/O12OUT TRIG.	Trigger output of extension box I/O channel 12		
184	8	EXI/O13OUT TRIG.	Trigger output of extension box I/O channel 13		
185	8	EXI/O14OUT TRIG.	Trigger output of extension box I/O channel 14		
186	8	EXI/O15OUT TRIG.	Trigger output of extension box I/O channel 15		
187	8	EXI/O16OUT TRIG.	Trigger output of extension box I/O channel 16		
188	8	EXI/O1OUT TOGGLE	Switches the extension box I/O channel 1 output between High and Low.		
189	8	EXI/O2OUT TOGGLE	Switches the extension box I/O channel 2 output between High and Low.		
190	8	EXI/O3OUT TOGGLE	Switches the extension box I/O channel 3 output between High and Low.		
191	8	EXI/O4OUT TOGGLE	Switches the extension box I/O channel 4 output between High and Low.		
192	8	EXI/O5OUT TOGGLE	Switches the extension box I/O channel 5 output between High and Low.		
193	8	EXI/O6OUT TOGGLE	Switches the extension box I/O channel 6 output between High and Low.		
194	8	EXI/O7OUT TOGGLE	Switches the extension box I/O channel 7 output between High and Low.		
195	8	EXI/O8OUT TOGGLE	Switches the extension box I/O channel 8 output between High and Low.		
196	8	EXI/O9OUT TOGGLE	Switches the extension box I/O channel 9 output between High and Low.		
197	8	EXI/O10OUT TOGGLE	Switches the extension box I/O channel 10 output between High and Low.		
198	8	EXI/O11OUT TOGGLE	Switches the extension box I/O channel 11 output between High and Low.		
199	8	EXI/O12OUT TOGGLE	Switches the extension box I/O channel 12 output between High and Low.		
200	8	EXI/O13OUT TOGGLE	Switches the extension box I/O channel 13 output between High and Low.		

No.	Group	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
201	8	EXI/O14OUT TOGGLE	Switches the extension box I/O channel 14 output between High and Low.		
202	8	EXI/O15OUT TOGGLE	Switches the extension box I/O channel 15 output between High and Low.		
203	8	EXI/O16OUT TOGGLE	Switches the extension box I/O channel 16 output between High and Low.		
204	9	EXI/O1OUT PUSH	Drives the extension box I/O channel 1 output. High when pushed.		
205	9	EXI/O2OUT PUSH	Drives the extension box I/O channel 2 output. High when pushed.		
206	9	EXI/O3OUT PUSH	Drives the extension box I/O channel 3 output. High when pushed.		
207	9	EXI/O4OUT PUSH	Drives the extension box I/O channel 4 output. High when pushed.		
208	9	EXI/O5OUT PUSH	Drives the extension box I/O channel 5 output. High when pushed.		
209	9	EXI/O6OUT PUSH	Drives the extension box I/O channel 6 output. High when pushed.		
210	9	EXI/O7OUT PUSH	Drives the extension box I/O channel 7 output. High when pushed.		
211	9	EXI/O8OUT PUSH	Drives the extension box I/O channel 8 output. High when pushed.		
212	9	EXI/O9OUT PUSH	Drives the extension box I/O channel 9 output. High when pushed.		
213	9	EXI/O10OUT PUSH	Drives the extension box I/O channel 10 output. High when pushed.		
214	9	EXI/O11OUT PUSH	Drives the extension box I/O channel 11 output. High when pushed.		
215	9	EXI/O12OUT PUSH	Drives the extension box I/O channel 12 output. High when pushed.		
216	9	EXI/O13OUT PUSH	Drives the extension box I/O channel 13 output. High when pushed.		
217	9	EXI/O14OUT PUSH	Drives the extension box I/O channel 14 output. High when pushed.		
218	9	EXI/O15OUT PUSH	Drives the extension box I/O channel 15 output. High when pushed.		
219	9	EXI/O16OUT PUSH	Drives the extension box I/O channel 16 output. High when pushed.		
220	9	DISP LED	Turns on or off the LED indicators on the front of the microscope main body.	✓	✓✓ (FnL)
221	9	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-LEDFl 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

No.	Indicated name	Functional overview	States when set
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
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 slider
	3rd line	DIC Polarizer/Analyzer Slot	Information about the DIC polarizer and analyzer slot
	4th line	-----	Nothing is set.
Page 4	2nd line	DIA Lamp	Information about LED dia-illumination
	3rd line	C-LEDFl	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 slider
16	DIC Polarizer/Analyzer Slot	Information about the DIC polarizer and analyzer slot
17	Inter Mag.	Information about intermediate magnification
18	Bertrand Lens	Information about the Bertrand lens
19	C-LEDFl	Information about the Epi-fl LED
20	C-HGFI	Information about the Intensilight