



Nikon

ECLIPSE

Ti-E Ti-E/B

TI-RCP Remote Control Pad

Instructions

Introduction

Thank you for purchasing a Nikon product.

This instruction manual is written for users of the TI-RCP Remote Control Pad.

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

- No part of this manual may be reproduced or transmitted in any form without prior written permission from Nikon.
- The contents of this manual are subject to change without notice.
- Although every effort has been made to ensure the accuracy of this manual, errors or inconsistencies may remain. If you note any points that are unclear or incorrect, please contact your nearest Nikon representative.
- Some of the equipment described in this manual may not be included in the set you have purchased.
- If you intend to use any other equipment with this product, read the manual for that equipment too.
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.



Safety Precautions

To ensure correct and safe operation, read this manual before using the product.

Warning and Caution Symbols Used in This Manual

Although this product is designed to be completely safe during use, incorrect usage or failure to follow the safety instructions provided may cause personal injury or property damage. Malfunctions and damage due to such mishandlings are unwarranted. To ensure correct usage, read this manual carefully before using the product. Do not discard this manual and keep it handy for easy reference.

Safety instructions in this manual are marked with the following symbols to highlight their importance. For your safety, always follow the instructions marked with these symbols.

Symbol	Meaning
 Warning	Disregarding instructions marked with this symbol may lead to serious injury or death.
 Caution	Disregarding instructions marked with this symbol may lead to injury or property damage.



Warning

1. Intended application of the product

The product is intended mainly for use in microscopic observations and in micromanipulations of living cells and tissues under the diascopic illumination and the episcopic illumination. The product is designed for the purposes of experiments and observations of cells and tissues in hospitals or laboratories in the fields of genetics, immunology, physiology, pharmacology, neurology, cellular biology, and molecular biology.

This product is an in-vitro diagnostic medical device.

2. Do not disassemble.

Disassembly may cause malfunction or electrical shock, and will lead to the forfeiture of all claims against warranty. Do not disassemble any part that is not indicated in this manual. If you experience any problem with the product, contact your nearest Nikon representative.

3. Read the instructions carefully.

To ensure safety, carefully read this manual and the manuals for other equipment used with this product. Especially be sure to follow the warnings and cautions indicated in the first of the manual.

4. Notes on handling flammable solvents

The following flammable solvents are used with the product:

- Immersion oil (Nikon Immersion Oil for oil immersion objectives)
- Absolute alcohol (ethyl alcohol or methyl alcohol for cleaning optical parts)
- Petroleum benzine (for wiping the immersion oil)
- Medical alcohol (for disinfecting the microscopy)

Never hold a flame near these solvents. To use solvent, read the instructions provided by the manufacturer and handle the solvent correctly and safely. Note the following precautions to use a solvent with the product.

- Keep solvent from the heat of the lamp, the lamphouse, and the power supply device.
- Do not bring solvent near the product or its surroundings when turning on/off the power switch or plugging/unplugging the power cord.
- Be careful not to spill solvent.



Caution

1. Turn off the power during installation, assembly, and connection/disconnection of the cords.

To prevent electric shock and fire, be sure to turn off the POWER switch of the TI-HUBC/A Hub Controller A (flip the POWER switch to the "OFF" side) and unplug the power cord when installing or assembling the product, or connecting or disconnecting the cords.

2. Do not wet the product nor allow foreign matters to intrude into the product.

Do not wet nor spill a liquid on the product to avoid malfunction, over-heating, or electric shock. If you accidentally wet or spilled a liquid on the product, immediately turn off the POWER switch of the TI-HUBC/A Hub Controller A (flip it to the "OFF" side) and unplug the power cord from the wall outlet. Then, wipe off the water with a piece of dry cloth. Also, if any foreign matter intrudes into the product, it may result in malfunctions. If any liquid or foreign matter intrudes into the product, do not use the product but contact your nearest Nikon representative.

3. Weak electromagnetic waves

The product emits weak electromagnetic waves. Do not install the product near precision electronic devices to prevent degrading their performance. If a TV or radio reception is affected, move the TV or radio set farther from the product.

4. Disposal of the product

To avoid biohazard risk, dispose of the product as contaminated equipment according to the standard procedure of your facility.

Notes on Handling the Product

1. Handle the product carefully.

Handle the product with care to avoid a physical shock or an impact.

2. Installation location and storage location

Using or storing the product under unsuitable conditions may damage it or may have an adverse effect on its performance. The following conditions must be considered for the installation location and the storage location.

- Install the product in a location with a temperature from 0 to 40 degree Celsius and a relative humidity of 85% or less (no condensation).
Store the product in a location with a temperature from -20 to 60 degree Celsius and a relative humidity of 90% or less (no condensation).
Using or storing the product in hot or humid locations may result in mold formation or condensation, performance degradation, or malfunctions.
- Install the product in a place with little dust and dirt.
- Install the product in a place with little vibrations.
- Install and store the product level on a sturdy desk or a table that can bear the weight of the product.
Install the product in a location less exposed to hazards in the event of earthquakes, or other potential disasters. If required to keep the product from falling, secure the product to the working desk or to another heavy, stable item with a strong rope or other means.
- Avoid bright locations where the product is exposed to direct sunlight.
- Install the product in a location of 10 cm or more away from the surrounding walls.
- Do not install the product in a narrow space such as a locker or a cabinet.
- Do not place anything on the product.
- Arrange the system layout so that you can remove the power cords from the AC inlet of the AC adapter connected to the TI-HUBC/A Hub Controller A in the event of an emergency.

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1

Name and Function of Each Part

The TI-RCP Remote Control Pad is connected to the TI-HUBC/A Hub Controller A to control motorized units for the ECLIPSE Ti series microscope remotely.

The buttons on the product can control Motorized Units for Ti Series. And, the LCD touch panel of the product can display conditions of the Motorized Units for Ti Series and the optical elements in use.

Additionally, the product has useful application functions such as MODE function that can memorize and restore observation conditions such as positions of the Motorized Units for Ti Series.

1.1 Appearance of the Remote Control Pad

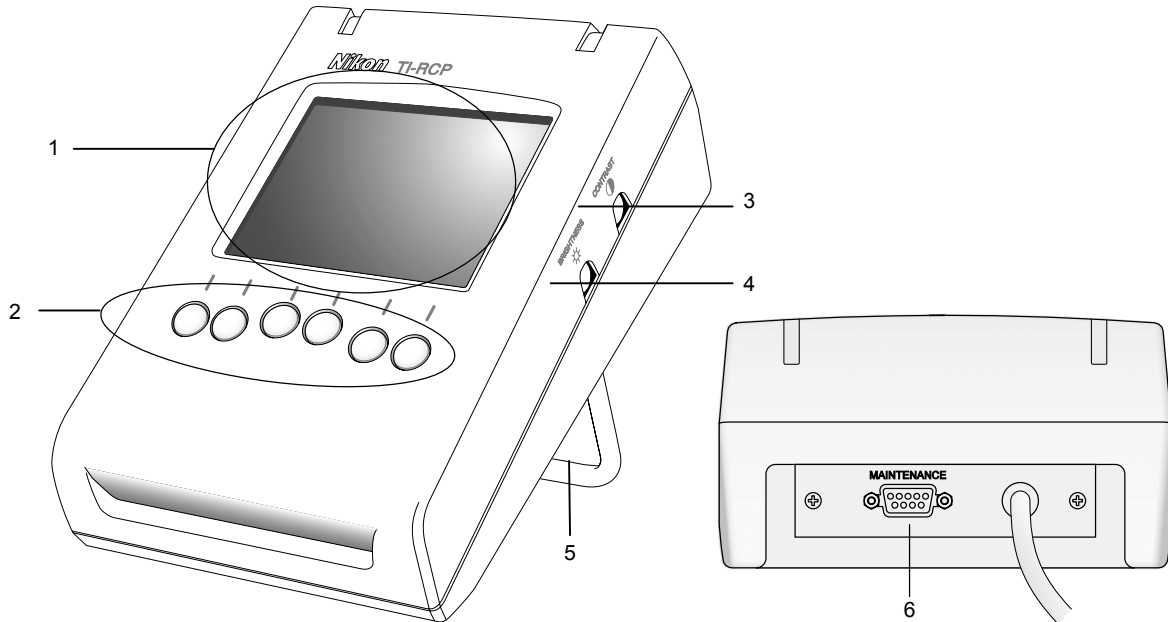


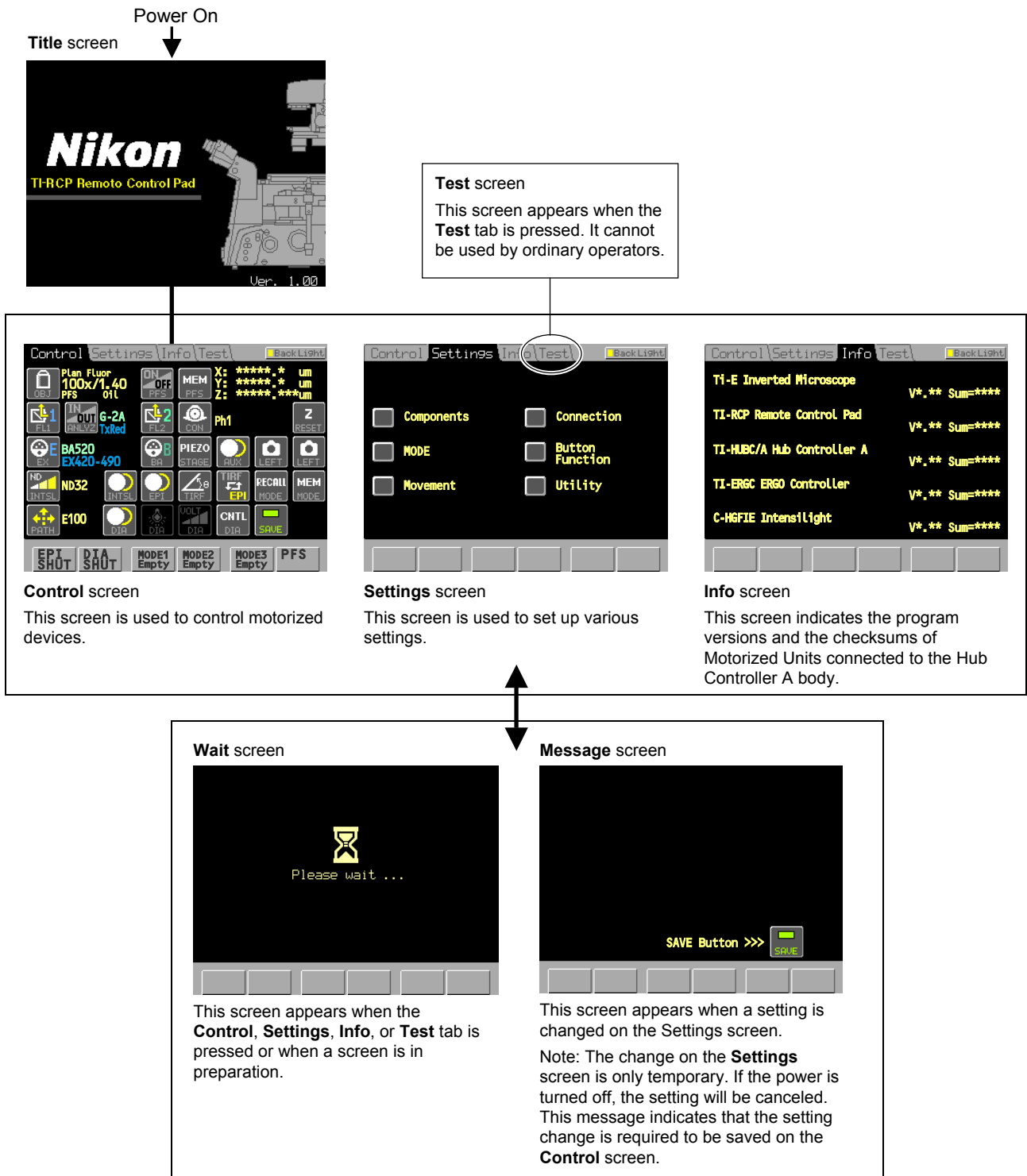
Table 1.1-1

Number	Part	Function
1	LCD touch panel	The LCD displays the operation buttons of Motorized Units for Ti Series and the conditions of Motorized Units for Ti Series and optical elements in use.
2	Function buttons	The function buttons control Motorized Units for Ti Series. Note: Any functions can be assigned to the function buttons. For details on setting, see "5.3 Assigning Functions to Buttons" in Chapter 5, "Operation Functions and Display Functions."
3	Contrast adjustment	This control adjusts the contrast of the LCD. Note: The contrast has been adjusted before shipping. If you want to adjust secular changes of the contrast, detach the dust proof cover and adjust the contrast with a flat blade screwdriver. After the adjustment, be sure to attach the dust proof cover.
4	Brightness adjustment	This control adjusts the brightness of the LCD. Note: The brightness has been adjusted before shipping. If you want to adjust secular changes of the brightness, detach the dust proof cover and adjust the contrast with a flat blade screwdriver. After the adjustment, be sure to attach the dust proof cover.
5	Remote control pad support	Pull the support to stand the body if necessary.
6	MAINTENANCE connector	This connector is provided for maintenance. Users cannot use it.

1.2 LCD Touch Panel Screen Configuration

Three main screens on LED touch panel are mainly used - Control screen, Settings screen and Info screen, - for the TI-RCP Remote Control Pad operation.

1.2.1 Overview of the LCD Screens



1.2.2 Control Screen and Button Explanation


















Control screen example




















Table 1.2-1 Indication on the touch panel

Indication	Area name	Description
(A)	Objective Lens	The Objective Lens area displays the information of the objective in the optical path.
(B)	X-axis Position	The X-axis Position area displays the X-axis position of the motorized stage.
(C)	Y-axis Position	The Y-axis Position area displays the Y-axis position of the motorized stage.
(D)	Z-axis Position	The Z-axis Position area displays the Z-axis position of the elevating section of the Ti-E or Ti-E/B.
(E)	Filter Block-1	The Filter Block-1 area displays the filter block in the optical path of the first tier of the motorized filter turret.
(F)	Filter Block-2	The Filter Block-2 area displays the filter block in the optical path of the second tier of the motorized filter turret.
(G)	Condenser Cassette	The Condenser Cassette area displays the condenser cassette in the optical path.
(H)	EX Filter	The EX Filter area displays the excitation filter in the optical path.
(I)	BA Filter	The BA Filter area displays the barrier filter in the optical path.
(J)	Intensilight ND	The Intensilight ND area displays the ND filter value of the motorized HG optical fiber light source.
(K)	Optical Path	The Optical Path area displays the optical path.

Table 1.2-2 Operation buttons on the touch panel

Button	Button name	Function
	Objective Lens	The Objective Lens button changes the objective.
	PFS	The PFS button turns on or off the perfect focus system function.
	PFS Memory	The PFS Memory button saves the offset value of the perfect focus system.
	Filter Block-1	The Filter Block-1 button changes the filter block of the first tier of the motorized filter turret.
	Analyzer	The Analyzer button inserts or removes the analyzer block.
	Filter Block-2	The Filter Block-2 button changes the filter block of the second tier of the motorized filter turret.
	Condenser Cassette	The Condenser Cassette button changes the condenser cassette.
	Z-axis Zero Reset	The Z-axis Zero Reset button resets the indication of the Z-axis position to zero.
	EX Filter	The EX Filter button changes the excitation filter.
	BA Filter	The BA Filter button changes the barrier filter.
	Piezo Z Stage	The Piezo Z Stage button controls the piezo Z stage.
	AUX Shutter	The AUX Shutter button opens or closes the auxiliary motorized shutter.
	DSC1	The DSC1 button outputs a trigger signal to the digital camera connected to the DSC1 connector to capture an image.
	DSC2	The DSC2 button outputs a trigger signal to the digital camera connected to the DSC2 connector to capture an image.
	Intensilight ND	The Intensilight ND button changes the ND filter of the motorized HG optical fiber light source.
	Intensilight Shutter	The Intensilight Shutter button opens or closes the shutter of the motorized HG optical fiber light source.
	EPI Shutter	The EPI Shutter button opens or closes the motorized shutter for the episcopic illumination.

Button	Button name	Function
	TIRF Angle	The TIRF Angle button controls the motorized TIRF illuminator in the X-axis direction.
	TIRF/EPI	The TIRF/EPI button switches the TIRF illumination and the episcopic illumination.
	MODE Recall	The MODE Recall button restores the registered Mode conditions.
	MODE Memory	The MODE Memory button opens the Mode memory screen.
	Optical Path	The Optical Path button changes the optical path.
	DIA Shutter	The DIA Shutter button opens or closes the motorized shutter for the diascope illumination.
	DIA Lamp	The DIA Lamp button turns on or off the diascope illumination lamp.
	DIA Volt	The DIA Volt button changes the voltage for the diascope illumination lamp.
	DIA Remote	The DIA Remote button enables or disables the remote control for the diascope illumination lamp.
	SAVE	The SAVE button saves the settings.
	EPI SHUT	The EPI SHUT button opens or closes the shutter for the episcopic illumination. *
	DIA SHUT	The DIA SHUT button opens or closes the shutter for the diascope illumination. *
	MODE 1	The MODE 1 button restores the MODE1 conditions. *
	MODE 2	The MODE 2 button restores the MODE2 conditions. *
	MODE 3	The MODE 3 button restores the MODE3 conditions. *
	PFS	The PFS button turns on or off the perfect focus system function. *
	Back Light	The Back Light button turns on or off the backlight of the LCD.

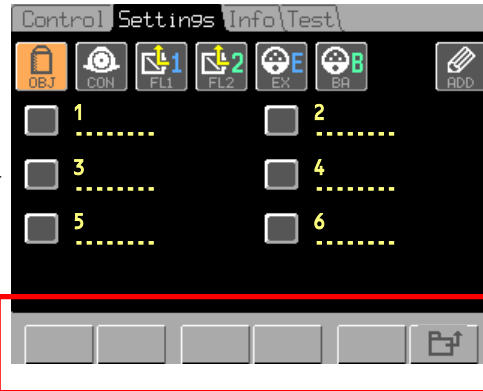
* This is the default function for this button.

Any functions can be assigned to the function buttons. For details on setting, see "5.3.1 Remote Control Pad" in "5.3 Assigning Functions to Buttons" in Chapter 5, "Operation Functions and Display Functions."

Settings screen example



Opening view of the **Settings** screen



Buttons for item selections, item settings, and screen operations

Table 1.2-3 Buttons for item selections, item settings, and screen operations

Button	Button name	Function
	[UP1]	The UP1 button selects one level higher item (sub item*).
	[RIGHT]	The RIGHT button selects the right next item.
	[DOWN1]	The DOWN1 button selects one level lower item (sub item*).
	[LEFT]	The LEFT button selects the left next item.
	[UP2]	The UP2 button selects one level higher item (main item*).
	[DOWN2]	The DOWN2 button selects one level lower item (main item*).
	[PREVIOUS]	The PREVIOUS button returns to the top level Settings screen.
	[NEXT]	The NEXT button opens the next screen.
	[BACK]	The BACK button opens the previous screen.
	[Cancel]	The CANCEL button cancels the operation and closes the screen.
	[OK]	The OK button validates the settings and closes the screen.

* This is the case where two items can be selected.

2

Settings Before Observation



Warning

- Before using the product, be sure to read the "Safety Precautions" at the beginning of this manual, and heed all of the warnings and cautions written therein.
- Also be sure to read the instruction manuals for other products used with this product such as the microscope and Motorized Units for Ti Series, and heed all of the warnings and cautions written therein.

This chapter indicates various settings before observing a specimen for the Ti-E or Ti-E/B Inverted Microscope and the TI-RCP Remote Control Pad.

2.1 Motorized units controllable with the remote control pad

Motorized units must be set up with the remote control pad. Refer to the following table and set up the installed motorized units.

Table 2.1-1

Motorized unit	Settings before use	Operations controllable with the remote control pad
TI-ND6-E Sextuple Motor DIC Nosepiece	Objective information	Objective selection
TI-ND6-PFS Perfect Focus W/ Motor Nosepiece	Objective information	Objective selection, PFS observation ON/OFF, PFS offset data registration/restoration
TI-CT-E Motorized Condenser Turret	Condenser cassette information	Condenser cassette selection
TI-FLC-E Motorized Epi-fl Filter Turret	Filter block information *	Filter block selection
TI-FLC-E/HQ Motor Epi-fl Filter Turret	Filter block information *	Filter block selection
TI-FLEW-E EX Filter Wheel	EX filter information	EX filter selection
TI-FLBW-E BA Filter Wheel	BA filter information	BA filter selection
C-HGFIE Precentered Fiber Illuminator (Motorized Operation Type)	Motorized shutter connection	Shutter control, brightness control
TI-TIRF-E Motorized Illuminator Unit	-	TIRF/epi illumination selection, illumination angle registration/restoration
Optical path	-	Optical path selection
Diascopic illumination lamp (12 V, 100 W)	-	Turning on/off the lamp, voltage control
Motorized shutter	Motorized shutter connection	Shutter control
Digital camera	Digital camera connection	Image capturing trigger signal output

* To use an analyzer block, its information must be set up too.

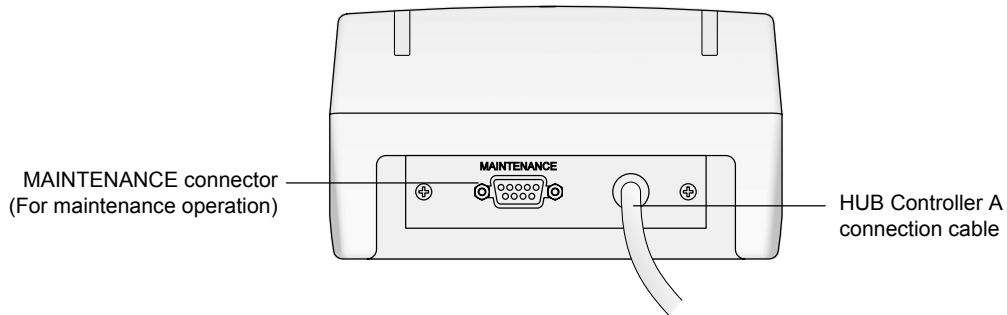
2.2 Connecting the Remote Control Pad to the Hub Controller A

Note:

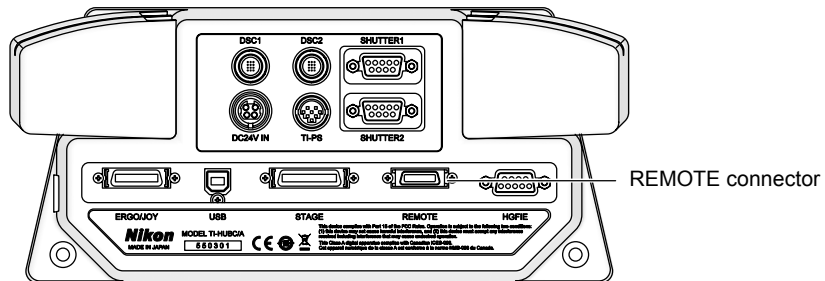
Before connecting the remote control pad, check that the POWER switch on the TI-HUBC/A Hub Controller A is set to "OFF."

Connect the hub controller A cable fixed to the remote control pad to the REMOTE connector on the TI-HUBC/A Hub Controller A body.

The hub controller A cable is used not only to transmit signals but also to supply power from the Hub Controller A to the remote control pad.



Remote control pad rear view



Hub Controller A rear view

2.3 Connecting Motorized Units to the Hub Controller A

Note:

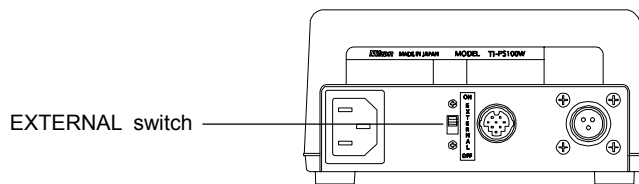
- Before connecting Motorized Units for Ti Series, check that the POWER switch of the TI-HUBC/A Hub Controller A is set to "OFF."
- When the power supply device for the diascopic illumination, the motorized shutter, the motorized HG optical fiber light source, the motorized stage, a digital camera, or the piezo Z stage is attached, check that the power switch for the device is turned off.

Connect the necessary devices of Motorized Units for Ti Series to the TI-HUBC/A Hub Controller A body and the Ti-E (or Ti-E/B) body.

For details, refer to relevant device pages in Chapter 6, "Assembly" in the "ECLIPSE Motorized Units for Ti Series Instructions" manual.

2.3.1 Setting the EXTERNAL Switch on the Power Supply Device for Diascopic Illumination to ON

Set the EXTERNAL switch on the rear of the TI-PS100W Power Supply device to "ON."



TI-PS100W power supply device rear view

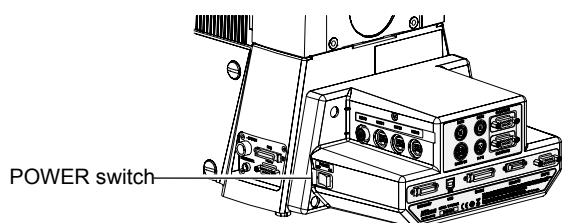
Note:

- When the EXTERNAL switch is set to "OFF," the remote control pad cannot control the diascopic illumination lamp.
- A power supply device for a lamp of 6 V and 30 W, TE-PS30W or TE-PSE30, can be connected to the Hub Controller A but such a lamp cannot be controlled on the remote control pad.

2.4 Starting Up/Shutting Down the Remote Control Pad

1 Startup procedure

The power for the remote control pad is supplied from the Hub Controller A body.



1. Turn on the power supply for the diasopic illumination lamp. When the motorized shutter, the motorized HG optical fiber light source, and/or the motorized stage is used, turn on the device(s) together.
2. Check that the AC adapter specific to the 24 VDC IN connector on the Hub Controller A body is connected and energized. And then, set the POWER switch on the Hub Controller A power supply to "ON."

When the Hub Controller A is turned on, the remote control pad starts up. The title screen is displayed on the LCD touch panel of the remote control pad. When the Ti-E or Ti-E/B and the Motorized Units for Ti Series end initialization, the control screen is displayed.

Title screen



Control screen



In the default conditions, all components such as objectives are set as "not attached." Therefore, such component areas in the Control screen display "---" symbols, indicating that the components are not attached. (See Example 1 of **Control** screen.)

Additionally, if the Ti-E or Ti-E/B is not connected to the Hub Controller A body or if any of Motorized Units is not connected, the unconnected device information is left blank. (See Example 2 of **Control** screen.)

Example 1 of **Control** screen



Example 2 of **Control** screen



2 Shut down procedure

1. Set the POWER switch on the Hub Controller A power supply to "OFF."
2. Turn off the power supply for the diascope illumination lamp. When the motorized shutter, the motorized HG optical fiber light source, and/or the motorized stage is used, turn off the device(s) together.

2.5 Setting Up the Device Information

Start up the remote control pad and set up the information of the optical elements attached to Motorized Units. The information of the optical elements is displayed on the LCD touch panel of the remote control pad.

Note:

Be sure to save the information with the SAVE button on the Control screen to accept the settings. If the product is turned off without saving information, the settings will be canceled. For details, refer to "2.5.9 Saving the Settings".

2.5.1 Objective

Set up the information of the objectives attached to the motorized nosepiece (for the TI-ND6-E Sextuple Motor DIC Nosepiece or the TI-ND6-PFS Perfect Focus W/Motor Nosepiece).

Note:

- If the motorized nosepiece is not connected, no objective information can be set up.
- When an object area in the **Control** screen shows the "-----" symbol, its socket address information is set as "not attached." In the default conditions of the application software, all address information of the motorized nosepiece is set as "not attached."

When necessary, the "Esc" function can be set for automatic retraction and refocusing.

Esc function (automatic retraction and refocusing)

When the "Esc" function is enabled, automatic retraction and refocusing will be performed in the objective switching procedure.

All objectives automatically descend to the retraction position (approximately 2 mm below the reference position). There, the nosepiece rotates to switch objectives. All objectives rise. And then, the objective in the optical path is refocused. When the objectives are switched with operations of the Ti-E or Ti-E/B microscope body or the TI-ERGC Ergo Controller, the objectives and the nosepiece move in a same manner.

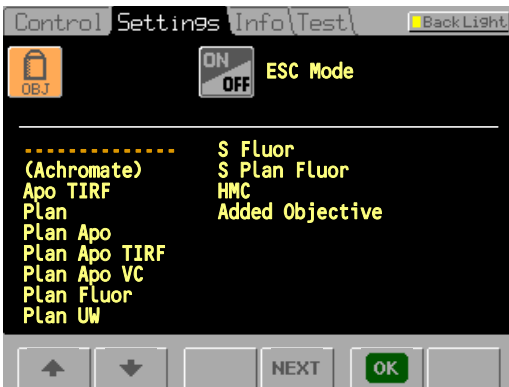
The "Esc" function is effective for cases such that the bottom plate of the container is thick and the objective and the stage are too close to change magnification and the objective is required to be lowered.



1. Press the **Settings** tab to open the opening view of the **Settings** screen.
And then, press the **Components** button.



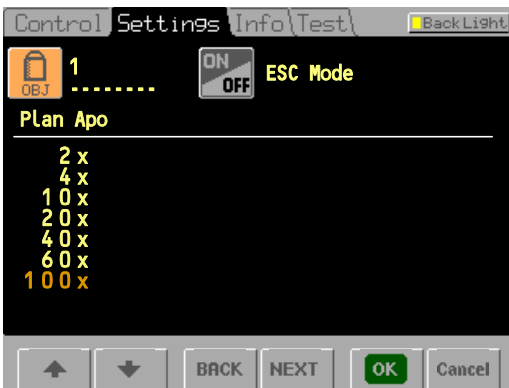
- The **Address selection** screen appears for the motorized nosepiece settings.
Press an address button to be set.



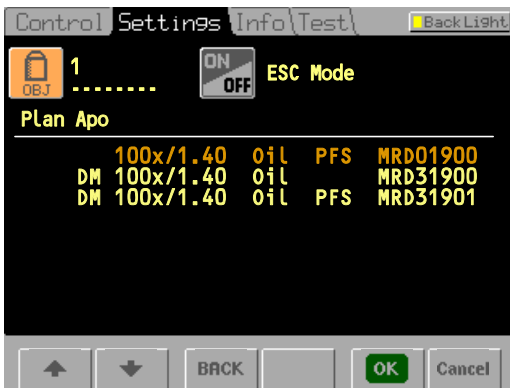
- The objective series list appears.
Select an objective series with the **UP 1** or the **DOWN 1** button.

If a desired objective is not listed, it can be added to the list. Refer to "5.1.1 Objective" in "5.1 Registering Data for Optical Elements" in Chapter 5, "Operation Functions and Display Functions."

Press the **NEXT** button.



- The objective magnifications list appears.
Select an objective magnification with the **UP 1** or the **DOWN 1** button.
Press the **NEXT** button.
To return to the objective series list, press the **BACK** button.



5. The details list appears.

Select an option for the objective details with the **UP 1** or the **DOWN 1** button.

When two or more objectives of same specifications (magnification, NA, immersion liquid, and so on) appear, check the unit digit of the product codes and select an objective with the largest number.

- To accept the selection press the **OK** button.
- To cancel the selection, press the **Cancel** button.

To return to the objective magnifications list, press the **BACK** button.



6. The **Address selection** screen appears again for the motorized nosepiece settings.

Press the **PREVIOUS** button.



7. The opening view of the **Settings** screen appears again.

2.5.2 Condenser Cassette

Set up the information of the condenser cassettes attached to the TI-CT-E Motorized Condenser Turret.

Note:

- If no motorized condenser turret is connected, the information of the condenser cassettes cannot be set up.
- When a condenser area in the **Control** screen shows the "-----" symbol, its condenser cassette address information is set as "not attached." In the default conditions of the application software, all address information of the motorized condenser turret is set as "not attached."



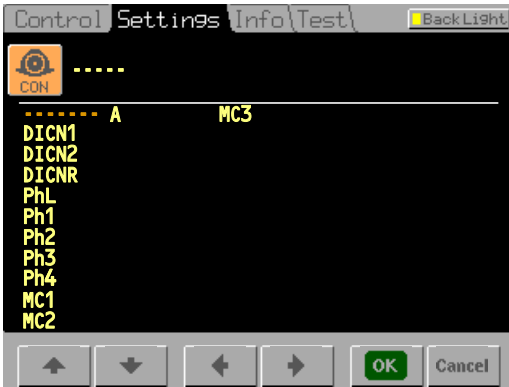
1. Press the **Settings** tab to open the opening view of the **Settings** screen.

And then, press the **Components** button.



2. Press the **CON** button (condenser) to open the **Addresses selection** screen for the motorized condenser turret settings.

Press an address button to be set on the screen.



3. A list appears.

Select a condenser cassette name with the **UP 1** or the **DOWN 1** button and the **LEFT** or the **RIGHT** button.

If a desired condenser cassette is not listed, it can be added to the list. Refer to "5.1.2 Condenser Cassette" in "5.1 Registering Data for Optical Elements" in Chapter 5, "Operation Functions and Display Functions."

- To accept the selection press the **OK** button.
- To cancel the selection, press the **Cancel** button.



4. The **Address selection** screen appears again for the motorized condenser turret settings.

Press the **PREVIOUS** button.



5. The opening view of the **Settings** screen appears again.

2.5.3 Filter Block and Analyzer Block (the First Tier of the Motorized Filter Turret)

Set up the information of the filter blocks (FL blocks) and the analyzer block attached to the first tier of the TI-FLC-E Motorized Epi-fl Filter Turret or the TI-FLC-E/HQ Motor Epi-fl Filter Turret.

Note:

- If the first tier of the motorized filter turret is not connected, the information of the filter blocks and the analyzer blocks cannot be set up.
- When a filter block area in the **Control** screen shows the "-----" symbol, its filter block address information is set as "not attached." In the default conditions of the application software, all address information of the first tier of the motorized filter turret is set as "not attached."

Additionally, to use an analyzer block, set up the information of the analyzer block too. If the information is not set, the **ANLYZ** button (analyzer) on the **Control** screen is disabled and the analyzer block cannot be inserted or removed with the **ANLYZ** button.



1. Press the **Settings** tab to open the opening view of the **Settings** screen.
And then, press the **Components** button.



2. Press the **FL1** button (filter block-1) to open the **Address selection** screen for the first tier of the motorized filter turret.
Press an address button to be set on the screen.



- A list appears.
Select a filter block name with the **UP 1** or the **DOWN 1** button and the **LEFT** or the **RIGHT** button.

If a desired filter block is not listed, it can be added to the list. Refer to "5.1.3 Filter Block" in "5.1 Registering Data for Optical Elements" in Chapter 5, "Operation Functions and Display Functions."

- To accept the selection press the **OK** button.
- To cancel the selection, press the **Cancel** button.



- The Address selection screen appears again for the settings of the first tier of the motorized filter turret.
Press the **PREVIOUS** button.



- The opening view of the **Settings** screen appears again.

2.5.4 Filter Block (the Second Tier of the Motorized Filter Turret)

Set up the information of the filter blocks (FL blocks) attached to the second tier of the TI-FLC-E Motorized Epi-fl Filter Turret or the TI-FLC-E/HQ Motor Epi-fl Filter Turret.

Note:

- Perform this setting only when using the second tier of the motorized filter turret.
- If the second tier of the motorized filter turret is not connected, the information of the filter blocks cannot be set up for the second tier.
- When a filter block area in the **Control** screen shows the "-----" symbol, its filter block address information is set as "not attached." In the default conditions of the application software, all address information of the second tier of the motorized filter turret is set as "not attached."



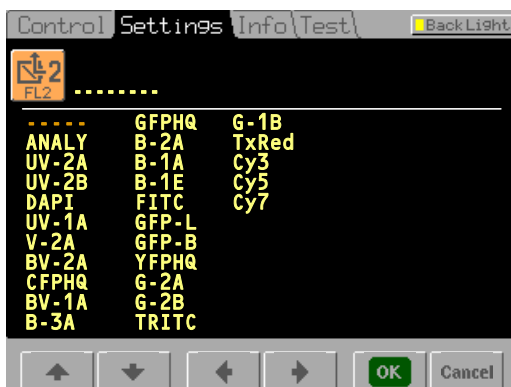
1. Press the **Settings** tab to open the opening view of the **Settings** screen.

And then, press the **Components** button.



2. Press the **FL2** button (filter block-2) to open the **Address selection** screen for the second tier of the motorized filter turret.

Press an address button to be set on the screen.



3. A list appears.
Select a filter block name with the **UP 1** or the **DOWN 1** button and the **LEFT** or the **RIGHT** button.

If a desired filter block is not listed, it can be added to the list. Refer to "5.1.3 Filter Block" in "5.1 Registering Data for Optical Elements" in Chapter 5, "Operation Functions and Display Functions."

- To accept the selection press the **OK** button.
- To cancel the selection, press the **Cancel** button.



4. The Address selection screen appears again for the settings of the second tier of the motorized filter turret.

Press the **PREVIOUS** button.



5. The opening view of the **Settings** screen appears again.

2.5.5 Excitation Filter

Set up the information of the excitation filters attached to the TI-FLEW-E EX Filter Wheel.

Note:

- If the EX filter wheel is not connected, the information of the excitation filters cannot be set up.
- When an excitation filter area in the **Control** screen shows the "-----" symbol, its excitation filter address information is set as "not attached." In the default conditions of the application software, all address information of the motorized EX filter wheel are set as "not attached."



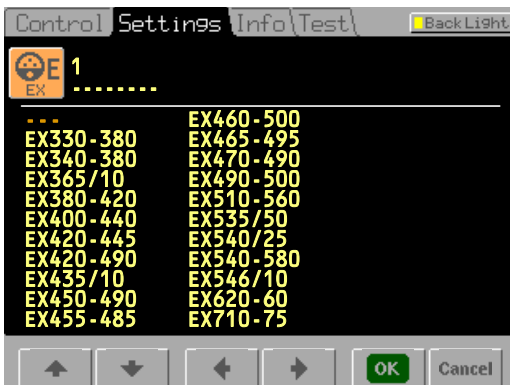
1. Press the **Settings** tab to open the opening view of the **Settings** screen.

And then, press the **Components** button.



2. Press the **EX** button (EX filter) to open the **Address selection** screen for the EX filter wheel settings.

Press an address button to be set on the screen.



3. A list appears.

Select an excitation filter name with the **UP 1** or the **DOWN 1** button and the **LEFT** or the **RIGHT** button.

If a desired excitation filter is not listed, it can be added to the list. Refer to "5.1.4 Excitation Filter" in "5.1 Registering Data for Optical Elements" in Chapter 5, "Operation Functions and Display Functions."

- To accept the selection press the **OK** button.
- To cancel the selection, press the **Cancel** button.



4. The **Address selection** screen appears again for the EX filter wheel settings.
Press the **PREVIOUS** button.



5. The opening view of the **Settings** screen appears again.

2.5.6 Barrier Filter

Set up the information of the barrier filters attached to the TI-FLBW-E BA Filter Wheel.

Note:

- If the BA filter wheel is not connected, the information of the barrier filters cannot be set up.
- When an barrier filter area in the **Control** screen shows the "----" symbol, its barrier filter address information is set as "not attached." In the default conditions of the application software, all address information of the motorized BA filter wheel is set as "not attached."



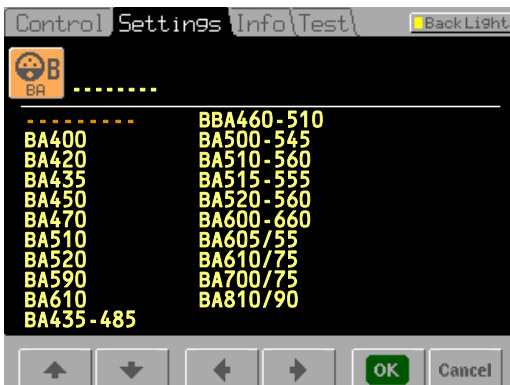
1. Press the **Settings** tab to open the opening view of the **Settings** screen.

And then, press the **Components** button.



2. Press the **BA** button (BA filter) to open the **Address selection** screen for the BA filter wheel settings.

Press an address button to be set on the screen.



3. A list appears.

Select an excitation filter name with the **UP 1** or the **DOWN 1** button and the **LEFT** or the **RIGHT** button.

If a desired barrier filter is not listed, it can be added to the list. Refer to "5.1.5 Barrier Filter" in "5.1 Registering Data for Optical Elements" in Chapter 5, "Operation Functions and Display Functions."

- To accept the selection press the **OK** button.
- To cancel the selection, press the **Cancel** button.



4. The **Address selection** screen appears again for the BA filter wheel settings.
Press the **PREVIOUS** button.



5. The opening view of the **Settings** screen appears again.

2.5.7 Motorized Shutter

When the motorized shutter is connected to the Hub Controller A, start up the remote control pad and set up the information of the motorized shutter.

Note:

- The Hub Controller A device cannot detect the connection of the motorized shutter (shutter controller). Therefore, be sure to set up the information of the motorized shutter to operate it on the remote control pad.
- **Be sure to save the information with the SAVE button on the Control screen to accept the settings. If the product is turned off without saving information, the settings will be canceled.** For details, refer to "2.5.9 Saving the Settings".



1. Press the **Settings** tab to open the opening view of the **Settings** screen.
And then, press the **Connection** button.



2. The **Port selection** screen appears for the motorized shutter settings.

When a port area shows the "---" symbol, the port address of the motorized shutter is set as "not attached."

Press the port button (the number of the SHUTTER connector of the hub controller A body) on the Port selection screen for the motorized shutter.



3. The manufacturer list and the application list appears.
Select a manufacturer with the **UP 2** or the **DOWN 2** button.
Select an application with the **UP 1** or the **DOWN 1** button.
 - To accept the selection press the **OK** button.
 - To cancel the selection, press the **Cancel** button.



4. The **Port selection** screen appears again for the motorized shutter settings.
Press the **PREVIOUS** button.



5. The opening view of the **Settings** screen appears again.

2.5.8 Digital Camera

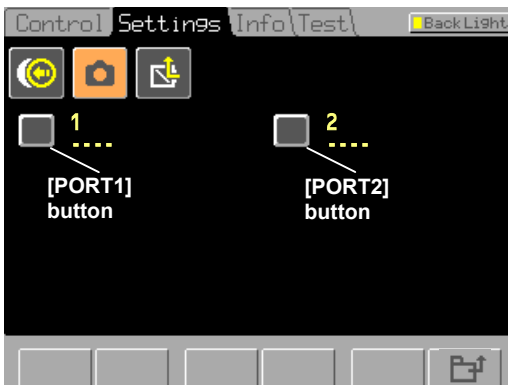
To use a digital camera connected to the Hub Controller A device, start up the remote control pad and set up the information for the digital camera. You can start capturing images on the digital camera with the remote control pad operation.

Note:

- The Hub Controller A device cannot detect the connection of the digital camera. Therefore, be sure to set up the information of the digital camera to use it. Photographing conditions such as exposure time and so on are set up with the controller of the digital camera.
- **Be sure to save the information with the SAVE button on the Control screen to accept the settings. If the product is turned off without saving information, the settings will be canceled.** For details, refer to "2.5.9 Saving the Settings".



1. Press the **Settings** tab to open the opening view of the **Settings** screen.
And then, press the **Connection** button.



2. Press the **Digital camera** button to open the **Port selection** screen for the digital camera settings.

When a port area shows the "----" symbol, the port address of the digital camera is set as "not attached."

Press the port button (the number of the DSC connector of the hub controller A body) on the Port selection screen for the digital camera.



3. The model name list and the assignment list appears. Select a manufacturer with the **UP 2** or the **DOWN 2** button.

Select an application with the **UP 1** or the **DOWN 1** button.

- To accept the selection press the **OK** button.
- To cancel the selection, press the **Cancel** button.



4. The **Port selection** screen appears again for the digital camera settings.

Press the **PREVIOUS** button.



5. The opening view of the **Settings** screen appears again.

2.5.9 Saving the Settings

If the settings on the **Settings menu** screen or on the **Control** screen are not saved, they will be canceled and the previous settings will be restored.

To save the settings, press the **SAVE** button on the **Control** screen. To use the settings temporarily (by the time the product is turned off), the save operation is not required.

Note that if no data is set up, the Save button is disabled and only its frame can be seen.

Note:

When the SAVE button is pressed, all settings after the previous registration will be saved at a time.

To save a setting individually, perform the following for each setting.



1. Press the **Control** tab to open the **Control** screen. And then, press the **SAVE** button.

The **Save** button changes as shown below during the save processing.



When saved, the Save button changes as shown below.



3

Basic Operations



Warning

- Before using the product, be sure to read the "Safety Precautions" at the beginning of this manual, and heed all of the warnings and cautions written therein.
- Also be sure to read the instruction manuals for other products used with this product such as the microscope and Motorized Units for Ti Series, and heed all of the warnings and cautions written therein.

This chapter indicates the basic operation of the TI-RCP Remote Control Pad.

- For names and functions of the remote control pad, see Chapter 1, "Name and Function of Each Part."
- For advanced operations such as the perfect focus system observation, see Chapter 4, "Advanced Operations."
- For remote control pad operations and display settings, see Chapter 5, "Operation Functions and Display Functions."
- For details about the Ti-E or Ti-E/B microscope and Motorized Units for Ti Series, see the instruction manual provided to each device.

3.1 Switching Objectives

Note:

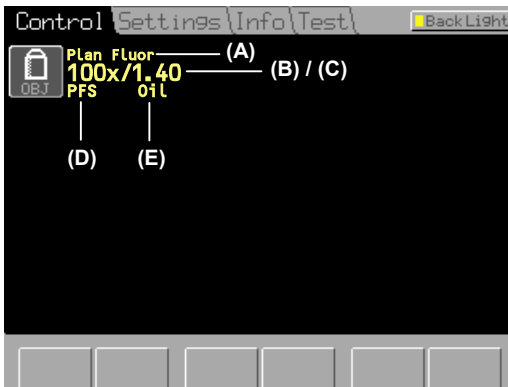
When the TI-ND6-E Sextuple Motor DIC Nosepiece or the TI-ND6-PFS Perfect Focus W/ Motor Nosepiece is not installed to the system, the **OBJ** (objective) button and objective information will not appear.

Esc function (automatic retraction and refocusing)

When the "Esc" option is enabled in the objective information and the nosepiece is rotated to change objectives, the objective in the optical path moves down to the retracting position (approximately 2 mm below the reference position) and the objective is changed to the specified one. And then, the objective position is restored.

When the objective is lowered to the retracting position by pressing the Escape switch on the right side of the microscope (the nearer position than the focus knob), only the objective is changed to the specified one regardless of the "Esc" setting. When the Refocus switch is pressed again, the objective position is restored.

For details about the "Esc" setting, refer to "2.5.1 Objective" in "2.5 Setting Up the Device Information" in Chapter 2, "Settings Before Observation."



1. Press the **Control** tab to open the **Control** screen. And then, press the **OBJ** (objective) button.

Displayed items:

- (A) Objective series name
- (B) Objective magnification
- (C) Objective NA
- (D) PFS ready or not
"PFS" appears for PFS, perfect focus system, ready objectives.
- (E) Water immersion objective or dry objective



2. The second screen appears. Press an objective button to change objectives.

- When the **-** (minus) button is pressed, the nosepiece rotates counterclockwise.
- When the **+** (plus) button is pressed, the nosepiece rotates clockwise.

Displayed items:

- (A) Objective name (code name of objective series)
- (B) Objective magnification
- (D) PFS ready or not
"PFS" appears for PFS, perfect focus system, ready objectives.
- (E) Water immersion objective or dry objective

3. Press the **X** button to close the second screen.

3.2 Switching Filter Blocks

3.2.1 Motorized FL Turret of One Tier Configuration

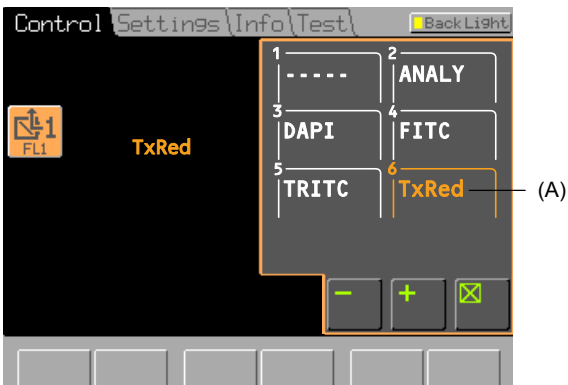
Note:

When no motorized FL turret is connected, the **FL1** (filter block 1) button and filter block names will not appear.



1. Press the **Control** tab to open the **Control** screen. And then, press the **FL1** (filter block 1) button.

Displayed item:
(A) Filter block name



2. The second screen appears. Press a filter block icon to change filter blocks.
 - When the – (minus) button is pressed, the first tier of the motorized FL turret rotates counterclockwise.
 - When the + (plus) button is pressed, the first tier of the motorized FL turret rotates clockwise.

Displayed item:
(A) Filter block name

3. Press the **X** button to close the second screen.

3.2.2 Motorized FL Turret of Two Tiers Configuration

When two motorized FL turrets are installed to the system, the [FL2] (filter block 2) button appears to control the second tier.

If the first tier of the motorized FL turret moves with the [FL2] button, change the connections on the Hub controller for the first tier and the second tier of the motorized FL turrets or change the settings with the operation buttons.

For the operation button settings, refer to "5.2 Switching Devices that can be Controller with the Operation Buttons (for Motorized Filter Turret)" in Chapter 5, "Operation Functions and Display Functions."

Note:

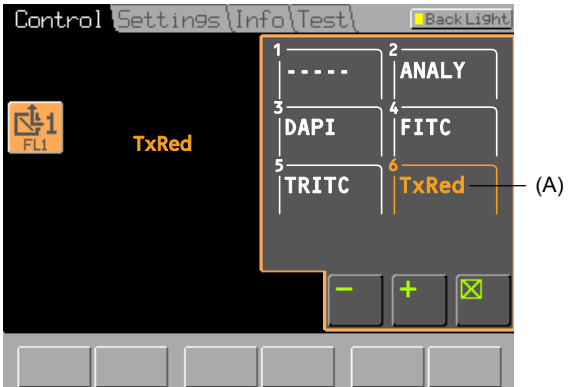
When only one motorized FL turret is installed to the system, the turret is assigned to the first tier and the [FL2] button and filter block names for the second tier will not appear.



1. Press the **Control** tab to open the **Control** screen.
 - To operate the first tier, press the **FL1** button on the **Control** screen.
 - To operate the second tier, press the **FL2** button on the **Control** screen.

Displayed item:

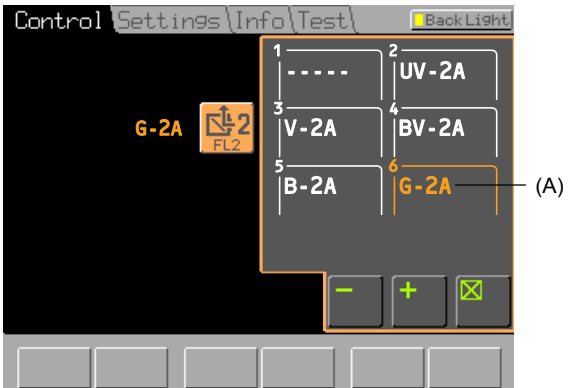
(A) Filter block name



2. When the **FL1** button is pressed, the second screen for the first tier of the Motorized FL turret appears. When the **FL2** button is pressed, the second screen for the second tier of the Motorized FL turret appears.

Press a filter block icon to change filter blocks.

- When the – (minus) button is pressed, the motorized FL turret rotates counterclockwise.
- When the + (plus) button is pressed, the motorized FL turret rotates clockwise.



Displayed item:

(A) Filter block name

3. Press the **X** button to close the second screen.

3.3 Inserting/Removing the Analyzer Block

Note:

If no motorized FL turret is installed to the system, the **ANLYZ** button will not appear.



1. Press the **Control** tab to open the **Control** screen. And then, press the **ANLYZ** (analyzer) button.

The first tier of the motorized FL turret rotates to insert/remove the analyzer block.

When the analyzer block is removed from the optical path, the immediately previous filter block is inserted into the optical path.

- Icon when the analyzer block is inserted



- Icon when the analyzer block is removed



- Icon when no analyzer block is attached to the first tier of the motorized filter turret



3.4 Switching Condenser Cassettes

Note:

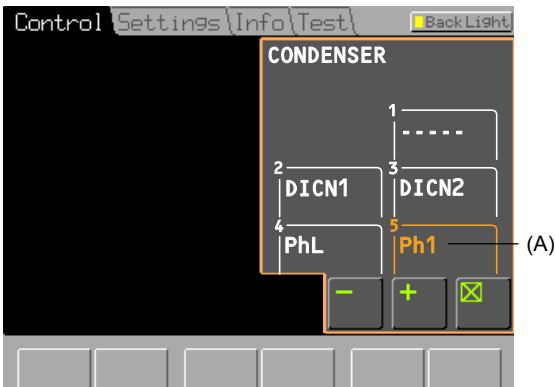
When no motorized condenser turret is connected, the **CON** (condenser cassette) button and condenser cassette names will not appear.



1. Press the **Control** tab to open the **Control** screen. And then, press the **CON** (condenser cassette) button.

Displayed item:

(A) Condenser cassette name



2. The second screen appears.

Press a condenser cassette icon to change condenser cassettes.

- When the **-** (minus) button is pressed, the motorized condenser turret rotates counterclockwise.
- When the **+** (plus) button is pressed, the motorized condenser turret rotates clockwise.

Displayed item:

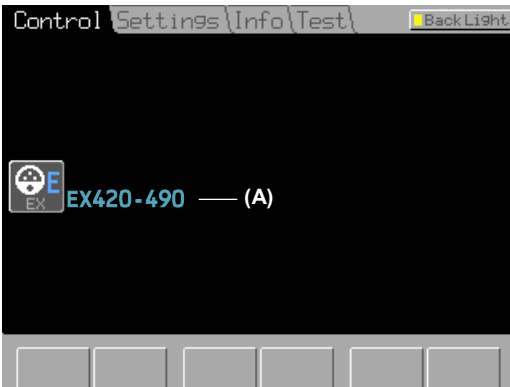
(A) Condenser cassette name

3. Press the **X** button to close the second screen.

3.5 Switching Excitation Filters

Note:

- When no motorized EX filter wheel is connected, the **EX** (excitation filter) button and the wavelength of the excitation filter will not appear.
- If an opening of the wheel comes to the optical path during the wheel rotation, bright light may be emitted to the eyesight of the operator and may be irradiated onto specimen. To prevent such an accident, close the shutter for the episcopic illumination before changing excitation filters.



1. Press the **Control** tab to open the **Control** screen. And then, press the **EX** button.

Displayed item:

(A) Wavelength of the excitation filter



2. The second screen appears. Press an EX filter icon to change excitation filters.

- When the **-** (minus) button is pressed, the motorized EX filter wheel rotates counterclockwise.
- When the **+** (plus) button is pressed, the motorized EX filter wheel rotates clockwise.

Displayed item:

(A) Wavelength of the excitation filter

3. Press the **X** button to close the second screen.

3.6 Switching Barrier Filters

Note:

When no motorized BA filter wheel is connected, the **BA** (barrier filter) button and the wavelength of the barrier filter will not appear.



1. Press the **Control** tab to open the **Control** screen. And then, press the **BA** button.

Displayed item:

(A) Wavelength of the barrier filter



2. The second screen appears. Press a BA filter icon to change barrier filters.
 - When the – (minus) button is pressed, the motorized BA filter wheel rotates counterclockwise.
 - When the + (plus) button is pressed, the motorized BA filter wheel rotates clockwise.

Displayed item:

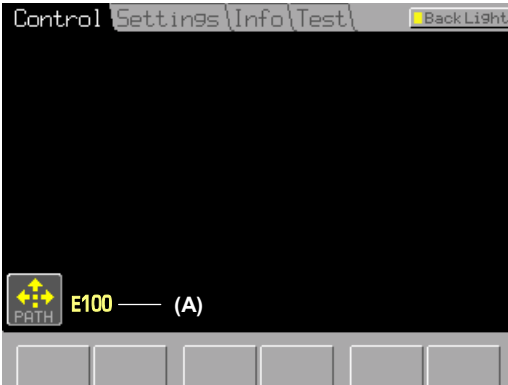
(A) Wavelength of the barrier filter

3. Press the **X** button to close the second screen.

3.7 Switching Optical Paths

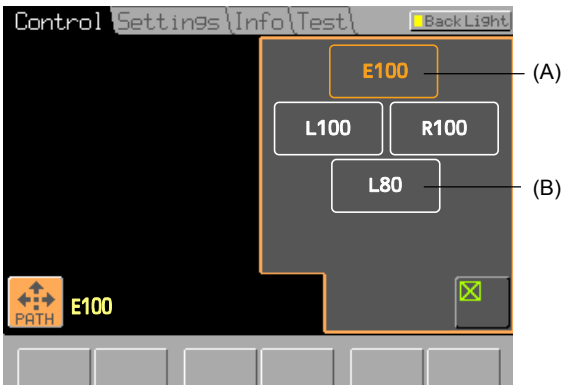
Note:

When no microscope body (Ti-E or Ti-E/B) is connected to the remote control pad, the **PATH** (optical path) button and the optical path image will not appear.



1. Press the **Control** tab to open the **Control** screen. And then, press the **PATH** button.

Displayed item:
(A) Optical path



2. The second screen appears. Press an optical path image to change optical paths.

Displayed item:
(A) Optical path
(B) "B100" for Ti-E/B microscope

3. Press the **X** button to close the second screen.

3.8 Operating the Diascopic Illumination Lamp (only for the 12 V and 100 W lamp)

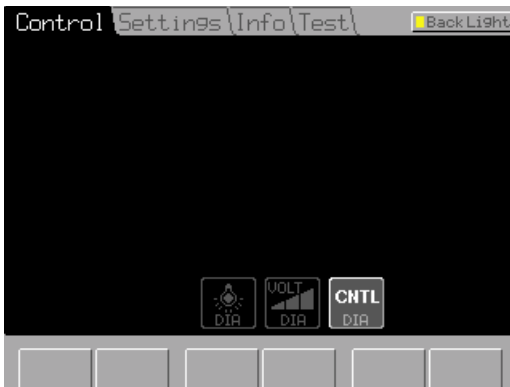
3.8.1 Enabling/Disabling the Remote Control Function

To control the diascopic illumination lamp with the remote control pad, enable the remote control function.

The diascopic illumination lamp can be controlled with the Dia illumination ON/OFF switch and the brightness control knob on the microscope body, Ti-E or Ti-E/B, if the remote control function is disabled.

Note:

If the EXTERNAL switch on the diascopic illumination power supply is set to "OFF," the diascopic illumination lamp cannot be controlled with the remote control pad or the microscope body, Ti-E or Ti-E/B. In this case, the remote control function cannot be enabled or disabled.



1. Press the Control tab to open the Control screen.
And then press the CNTL DIA button.
The remote control function toggles on or off with the button.

- When the remote control function is enabled, the **DIA** button and the **DIA VOLT** button appear as follows enabling the diascopic illumination lamp operation.

DIA button



DIA VOLT button



- When the remote control function is disabled, the **DIA** button and the **DIA VOLT** button appear as follows disabling the diascopic illumination lamp operation.

DIA button



DIA VOLT button



3.8.2 Turning On/Off the Lamp

Note:

When the remote control function is disabled for the diascopic illumination lamp, the **DIA** button does not work.



1. Press the **Control** tab to open the **Control** screen. And then press the **DIA** button.

The lamp turns on/off each time the button is pressed.

- Lamp On



- Lamp Off



3.9 Operating the Precentered Fiber Illuminator (Motorized Operation Type)

Note:

When the C-HGFIE Precentered Fiber Illuminator (motorized operation type) is not connected to the system, the **INTSL** button, the **INTSL ND** button, and the ND value will not appear.

3.9.1 Opening/Closing the Shutter



1. Press the **Control** tab to open the **Control** screen. And then, press the **INTSL** (Intensilight shutter) button.

The shutter opens/closes each time the button is pressed.

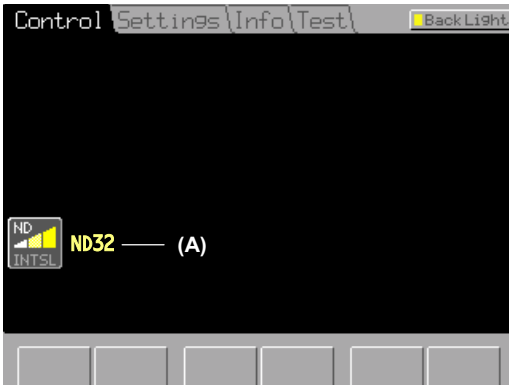
- Shutter Open



- Shutter Close



3.9.2 Adjusting the Brightness



1. Press the **Control** tab to open the **Control** screen. And then, press the **INTSL ND** (Intensilight ND value) button.

Displayed item:

(A) ND filter value



2. The second screen appears. Press an ND filter value button to change ND filters.
 - The ND filter value decreases when the **-** (minus) button is pressed.
ND32→ND16→ND8→ND4→ND2→ND1
 - The ND filter value increases when the **+** (plus) button is pressed.
ND1→ND2→ND4→ND8→ND16→ND32
3. Press the **X** button to close the second screen.

3.10 Operating the Motorized Illuminator Unit (TIRF Illuminator)

Note:

When the TI-TIRF Motorized Illuminator Unit (TIRF illuminator) is not connected to the system, the **TIRF/EPI** button and the **TIRF** button will not appear.

3.10.1 Switching the TIRF Illumination and the Episcopic Illumination



1. Press the **Control** tab to open the **Control** screen. And then, press the **TIRF/EPI** button. The illumination toggles between the TIRF illumination and the epi illumination when the button is pressed.

- TIRF illumination



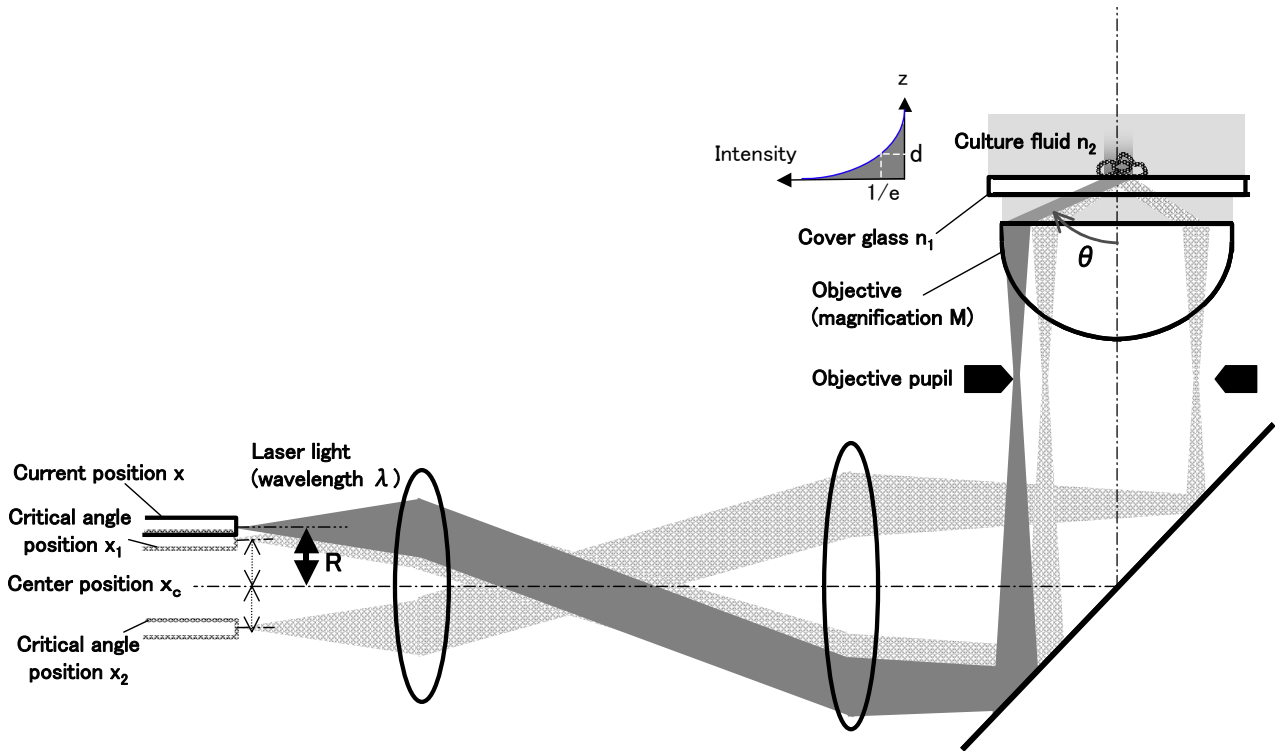
- Epi illumination



Incident light angle calculation

The following is an example to obtain the laser light incident angle to the boundary surface between the specimen and the cover glass and to obtain the depth of light energy into the specimen.

TIRF illumination angle calculation



(1) Incident angle

This section describes a simple method to detect the laser light position from the center of the optical axis.

1. Detect the center of the optical axis.
Move the laser illumination position from end to end to detect critical angle positions. (At a critical angle position, total reflection of light begins.) You can detect two critical angle positions, x_1 and x_2 . The center, x_c , of the optical axis can be obtained using the following formula (a).

Formula (a)

$$\text{Center: } x_c = (x_1 + x_2) / 2$$

2. Read the laser illumination position, x , you want to know the incident angle. When the distance of the laser illumination position from the center, x_c , is R [μm], they are expressed as the following formula. $R = x - x_c$
- Then, calculate the incident angle θ using the following formula (b): Reset the origin (zero point) at the center position, x_c . R can be read directly on the display.

Formula (b)

$$\sin\theta = 2 \times R \times M / (200000 \times n_1)$$

R : distance of the laser illumination position from the center x_c , [μm]

M : magnification of the objective

n_1 : refractive index of the cover glass

(Example: $n_1 = 1.522$ for white plate, wavelength 546 nm, and temperature 23°C)

Note:

- Actual refractive index varies depending on cover glass component, temperature, laser wavelength, and beam spot size. Besides, critical angle positions may have slight measurement errors. Therefore, the angle obtained in this step should be treated as a guideline value.
- The coefficient, 2, in the formula (b) is the optical coefficient from the laser outlet to the pupil. The coefficient, 200000, is the conversion factor to get a micron value for the second objective of $f = 200$ mm (focal length).

(2) Light energy into the specimen

The depth, d , of the light energy is expressed using the following formula (c). Where, the light energy is $1/e$. (The "e" is the base of the natural logarithm.)

Formula (c)

$$d = \lambda / \{ 4\pi \cdot [n_1^2 \times \sin^2\theta - n_2^2]^{1/2} \}$$

λ : laser wavelength

θ : incident light angle to the boundary surface between the cover glass and the culture fluid
where $\theta > \theta_c$ (θ_c is the critical angle, $\sin\theta_c = n_2 / n_1$)

n_1 : refractive index of the cover glass

n_2 : refractive index of the culture fluid

(Example: $n_2 = 1.333$ for pure water, wavelength 546 nm, and temperature 23°C)

Calculation example:

When n_1 is 1.522 and n_2 is 1.333, the critical angle θ_c is 61.1°. And, when a larger angle θ , 64°, is entered into the formula (c), d is 0.26λ . Therefore, when the laser wavelength λ is 488 nm, the depth is 127 nm.

3.10.3 Operating the Laser Outlet of the TIRF Illumination

Note:

- When the ergo controller is not installed to the system, the **TI-ERGC** button will not appear.
- When no joystick controller is connected to the Hub controller A, the **TI-ERGC** button will not appear.
- When the power is turned off, the angle adjustment will be cleared. The setting cannot be saved with the **SAVE** button on the **Control** screen.



1. Press the **Control** tab to open the **Control** screen. And then, press the **TIRF** (TIRF angle) button.



2. The second screen appears.
 - When the **TI ERGC** button is set to "On" ("On" is lit), the laser outlet can be moved with the X knob of the ergo controller.
 - When the **TI ERGC** button is set to "On" ("On" is lit), the laser outlet can be moved with the joystick of the joystick controller.
 - When the **MEMORY/RECALL** button is set to "RECALL" ("RECALL" is lit) and an (A) area is pressed, the saved angle setting can be restored. Saved angle settings are displayed in the corresponding (A) areas.
 - When the **MEMORY/RECALL** button is set to "MEMORY" ("MEMORY" is lit) and an (A) area is pressed, the current angle setting can be saved to the corresponding (A) memory and new setting value appear in the area.
 - When the **SPEED** button is pressed, the travel amount of the - (minus) button and the + (plus) button changes.

100um→5um→0.1um→100um...
 - When the **TIRF RESET** button is pressed, the current position is reset to zero. The indication changes to [0] showing that the position is displayed in a relative value. All saved positions are displayed in relative values too.

- When the – (minus) button is pressed, the laser outlet moves in the minus direction. If the **TIRF RESET** button has been pressed and the minus button is pressed, the laser outlet moves in an outward direction from the center of the optical path (the laser incident angle increases).
- When the + (plus) button is pressed, the laser outlet moves in the plus direction. If the **TIRF RESET** button has been pressed and the plus button is pressed, the laser outlet moves in an inward direction to the center of the optical path (the laser incident angle decreases).

* Refer to Figure "Example of displayed value of the TIRF laser illumination position and memory positions" in Section 3.10.2, "TIRF Illumination Operation and Incident Light Angle Calculation."

Displayed items:

(A) Angle memory

(B) Current angle setting

The position on the objective pupil surface can be obtained from multiplying the value by 0.1 μm .

3. Press the **X** button to close the second screen.

3.11 Operating the Piezo Z Stage

Note:

- When the piezo Z stage is not set up on the application software, the **PIEZO STAGE** button will not appear.
- Saved positions will be cleared when the power supply is turned off. Note that the **SAVE** button on the **Control** screen will not save the position settings.



1. Press the **Control** tab to open the **Control** screen. And then, press the **PIEZO STAGE** (piezo Z stage) button.



2. The second screen appears.
 - To clear the (C) indication to zero, press the **PIEZO RESET** button.
 - When the **MEMORY/RECALL** button is set to Recall (Recall is indicated), the saved position setting can be restored with the (A), (B), or (C) button. Saved position settings are displayed in the (A), (B), and (C) button areas.
 - When the **MEMORY/RECALL** button is set to Memory (Memory is indicated), the current position setting can be saved to the (A), (B), or (C) memory with the corresponding button. New setting appears in the corresponding button area.
 - When the **SPEED** button is pressed, the travel amount of the – (minus) button and the + (plus) button changes.

$$2.5\mu\text{m} \rightarrow 0.25\mu\text{m} \rightarrow 0.025\mu\text{m} \rightarrow 2.5\mu\text{m} \dots$$
 - When the – (minus) button is pressed, the position moves in the minus direction.
 - When the + (plus) button is pressed, the position moves in the plus direction.

Displayed items:

- (A) Position memory
- (B) Current absolute position
- (C) Current relative position

3. Press the **X** button to close the second screen.

3.12 Opening/Closing the Motorized Shutter

3.12.1 Opening/Closing the Motorized Shutter for the Episcopic Illumination

Note:

- When the motorized shutter for the episcopic illumination is not set up, the **EPI** (epi shutter) button will not appear.
- For details about the motorized shutter settings, refer to the "2.5.7 Motorized Shutter" in Chapter 2, "Settings Before Observation."



1. Press the **Control** tab to open the **Control** screen. And then, press the **EPI** (epi shutter) button. The shutter opens/closes each time the button is pressed.

- Motorized shutter Open



- Motorized shutter Close



3.12.2 Opening/Closing the Motorized Shutter for the Diascopic Illumination

Note:

- When the motorized shutter for the diascopic illumination is not set up, the **DIA** (dia shutter) button will not appear.
- For details about the motorized shutter settings, refer to the "2.5.7 Motorized Shutter" in Chapter 2, "Settings Before Observation."



1. Press the **Control** tab to open the **Control** screen. And then, press the **DIA** (dia shutter) button. The shutter opens/closes each time the button is pressed.

- Motorized shutter Open



- Motorized shutter Close



3.12.3 Opening/Closing the Auxiliary Motorized Shutter

Note:

- When the auxiliary motorized shutter is not set up, the **AUX** (auxiliary shutter) button will not appear.
- For details about the motorized shutter settings, refer to the "2.5.7 Motorized Shutter" in Chapter 2, "Settings Before Observation."



1. Press the **Control** tab to open the **Control** screen. And then, press the **AUX** (auxiliary shutter) button. The shutter opens/closes each time the button is pressed.

- Motorized shutter Open



- Motorized shutter Close



3.13 Outputting Triggers to Start Capturing Images

3.13.1 Outputting a Trigger to the Digital Camera 1 to Start Capturing Images

A trigger signal can be output to the digital camera connected to the DSC1 connector of the Hub controller A.

Note:

- When the DSC1 (digital camera 1) is not set up, the **DSC1** button will not appear.
- Digital camera settings such as the exposure time cannot be set up with this function. Settings of the digital camera controller are used for capturing images.
- For details about the digital camera settings, refer to the "2.5.8 Digital Camera" in Chapter 2, "Settings Before Observation."



1. Press the **Control** tab to open the **Control** screen. And then, press the **DSC1** button.

A trigger signal for capturing an image is output to the digital camera connected to the DSC1 connector.

3.13.2 Outputting a Trigger to the Digital Camera 2 to Start Capturing Images

A trigger signal can be output to the digital camera connected to the DSC2 connector of the Hub controller A.

Note:

- When the DSC2 (digital camera 2) is not set up, the **DSC2** button will not appear.
- Digital camera settings such as the exposure time cannot be set up with this function. Settings of the digital camera controller are used for capturing images.
- For details about the digital camera settings, refer to the "2.5.8 Digital Camera" in Chapter 2, "Settings Before Observation."



1. Press the **Control** tab to open the **Control** screen. And then, press the **DSC2** button.

A trigger signal for capturing an image is output to the digital camera connected to the DSC2 connector.

3.14 Resetting the Z-Axis Position to Zero

Note:

- When the microscope body (Ti-E or Ti-E/B) is not connected to the remote control pad, the **Z RESET** (Z-axis zero reset) button and the Z-axis position will not appear.
- The Z position indicator on the microscope body (Ti-E or Ti-E/B) is not reset to zero.



1. Press the **Control** tab to open the **Control** screen. And then, press the **Z RESET** button. The current Z-axis position is set to 0.000 um and displayed.

3.15 Turning On/Off the Backlight of the LCD

Note:

The BackLight button appears on all screens, **Control**, **Settings** and **Info**.



1. Press the **BackLight** button.
The backlight of the LCD is turned off.
To turn on the backlight, touch the LCD screen.

4

Advanced Operations



Warning

- Before using the product, be sure to read the "Safety Precautions" at the beginning of this manual, and heed all of the warnings and cautions written therein.
- Also be sure to read the instruction manuals for other products used with this product such as the microscope and Motorized Units for Ti Series, and heed all of the warnings and cautions written therein.

This chapter indicates the advanced operations of the TI-RCP Remote Control Pad.

- For names and functions of the remote control pad, see Chapter 1, "Name and Function of Each Part."
- For basic operation such as operating Motorized Units for Ti Series, see Chapter 3, "Basic Operations."
- For remote control pad operations and display settings, see Chapter 5, "Operation Functions and Display Functions."
- For details about the Ti-E or Ti-E/B microscope and Motorized Units for Ti Series, see the instruction manual provided to each device.

4.1 In-focus Observation with PFS

When the TI-ND6-PFS Perfect Focus W/ Motor Nosepiece, the PFS offset controller, and a PFS ready objective are attached to the Ti-E, in-focus observation with PFS can be performed. For installation, refer to Chapter 4, "Assembly" of the Inverted Microscope ECLIPSE Ti-E Ti-E/B Instructions manual.

Overview of in-focus observation with PFS

The PFS automatically corrects focus drift (i.e. due to thermal expansion of the stage or temperature change in the specimen) during long-term observations.

The PFS uses near-infrared rays (IR wavelength, 870nm) that do not interfere with normal observations to detect the boundary surface (interface)² between the cover glass¹ and the aqueous solution of the specimen, and corrects focus drift by automatically tracking the vertical shift of that surface.

It can be useful, for example when continuously observing or capturing changes in living cells, as it is not affected by changes in the specimen or by discoloration under fluorescent light, and is capable of maintaining the focus by compensating for minor focus shifts that may result over time or by stage movements.

*1: The "cover glass" refers to the glass on the bottom surface of a glass-bottomed dish.

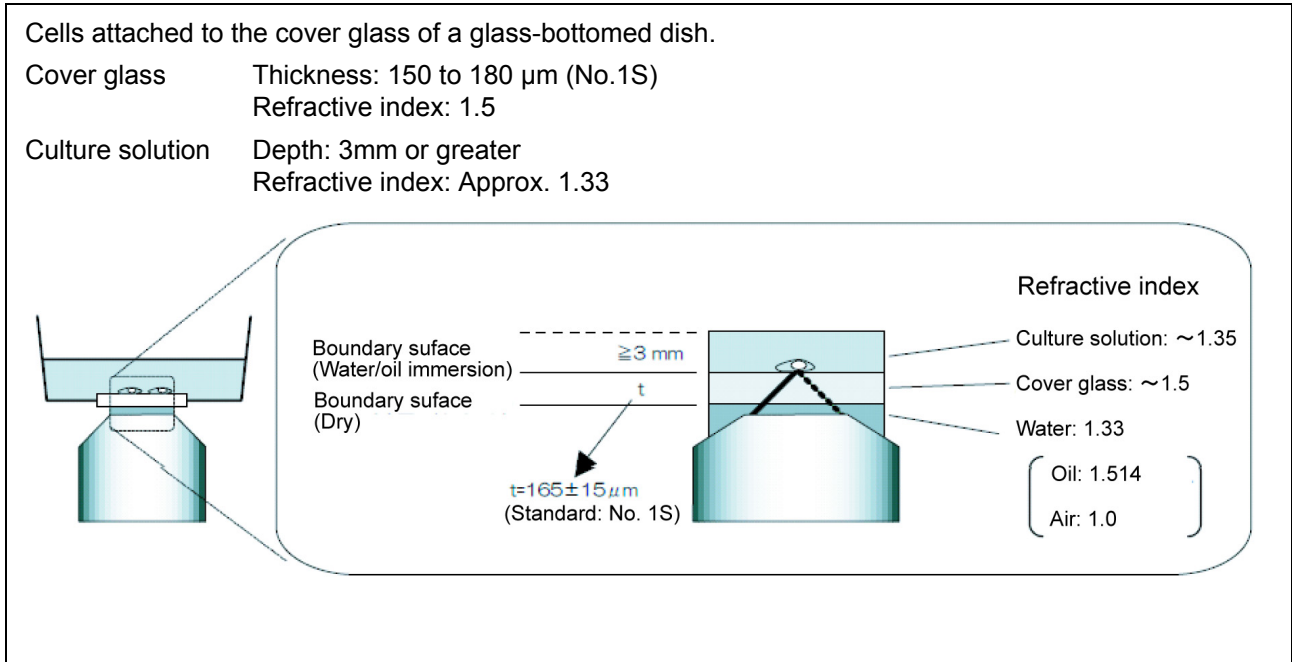
*2: When using a dry objective, the boundary surface between the cover glass and air will be detected.

Characteristics of in-focus observation

- The PFS uses infrared rays for focus correction. As infrared rays have minimal effect on the specimen, and do not interfere with fluorescent observation, the specimen can be observed in focus while performing fluorescent observation.
- The optical offset function allows for manual adjustment of the focus position.
- The vertical position (Z-axis position) of the nosepiece and the focus offset can be registered independently for each objective.
- Focus can be maintained for any target within the field of view.
- Focus can be maintained with any observation camera or method (including megascopic), unlike with the image contrast method that can only be used with certain cameras.

Supported specimens

In-focus observation can be performed for a specimen that satisfies the following conditions.



Unsupported specimens

Focus maintenance may be difficult on the following specimens, for reasons such as weak IR reflectivity or excessive scattered light.

1. Fixed specimens

In general, fixed specimens are filled with an encapsulating medium. Due to the high refractive index of this medium, the difference in the refractive index between the cover glass and the specimen is decreased. Thus, the amount of reflected light may be insufficient for surface detection.

2. Sliced specimens

Sliced specimens are thick, and scatter a large amount of light. This makes it difficult to capture the relatively small amount of reflective light from the boundary surface.

3. Specimens with large amounts of scattered or reflected light

For the same reason as described in (2) above, non-sliced specimens that scatter a large amount of light are also unsupported.

4. Cells attached to a container with a glass bottom thicker than 170 μm

When using a dry objective with a specimen in thick glass, the boundary surface may not be detectable due to insufficient offset. (The boundary surface may be detectable if using an oil immersion objective. However, use of No.1S cover glass is recommended.)

5. Plastic dishes

The use of plastic dishes is not recommended, as their boundary surfaces are not as precise as those of glass.

6. Dirty cover glasses (oil stains, dust)

The PFS corrects focus by detecting the boundary surface of the cover glass. Contaminations on the cover glass will degrade the precision of the detection. Be sure to clean the cover glasses before use.

Supported objectives

The following objectives can be used for in-focus observation with PFS. Use of other objectives will result in an error, and <PFS: ER1> will be displayed on the status display panel.

Table 4.1-1 PFS ready objective list

Device	NA	WD (mm)	Type	Device	NA	WD (mm)	Type
Apo TIRF 60xH	1.49	0.12	Oil	Plan Fluor 10x	0.3	16	Dry
Apo TIRF 100xH	1.49	0.12	Oil	Plan Fluor DLL 10x	0.3	16	Dry
Plan Apo 4x	0.2	15.7	Dry	Plan Fluor ELWD 20xC	0.45	7.6	Dry
Plan Apo 10x	0.45	4	Dry	Plan Fluor ELWD ADL20xC	0.45	7.6	Dry
Plan Apo 20x	0.75	1	Dry	Plan Fluor ELWD DM20xC	0.45	2.9	Dry
Plan Apo 40x	0.95	0.14	Dry	Plan Fluor 40x	0.75	0.72	Dry
Plan Apo DM 40x	0.95	0.14	Dry	Plan Fluor 40xH	1.3	0.2	Oil
Plan Apo 60xHA	1.4	0.21	Oil	Plan Fluor DLL 40x	0.75	0.72	Dry
Plan Apo 60xWI	1.2	0.22	WI	Plan Fluor ELWD 40xC	0.6	2.9	Dry
Plan Apo DM 60xH	1.4	0.21	Oil	Plan Fluor ELWD ADL40xC	0.6	2.9	Dry
Plan Apo DM 60xHA	1.4	0.21	Oil	Plan Fluor ELWD DM 40xC	0.6	2.9	Dry
Plan Apo 100xH	1.4	0.13	Oil	Plan Fluor 100x H	1.3	0.2	Oil
Plan Apo DM 100xH	1.4	0.13	Oil	Plan Fluor ADH 100x H	1.3	0.19	Oil
Plan Apo DM 100xH CFI	1.4	0.13	Oil	Plan Fluor DLL 100x H	1.3	0.2	Oil
Plan Apo TIRF 60xH	1.45	0.13	Oil	S Fluor 4x	0.2	15.5	Dry
Plan Apo TIRF 100xH	1.45	0.13	Oil	S Fluor 10x	0.5	1.2	Dry
Plan Apo VC 60xWI	1.2	0.27	WI	S Fluor 20x	0.75	1.00	Dry
Plan Apo VC 60xH	1.4	0.13	Oil	S Fluor DL 20x	0.75	1.00	Dry
Plan Apo VC 100xH	1.4	0.13	Oil	S Fluor 40xH	1.3	0.22	Oil
				S Fluor DL 40xC	0.9	0.3	Dry

To perform in-focus observation with PFS, you will need to register objective information to the microscope. For registration details, refer to Chapter 4, "Assembly" in the "Inverted Microscope ECLIPSE Ti-E Ti-E/B Instructions" manual.

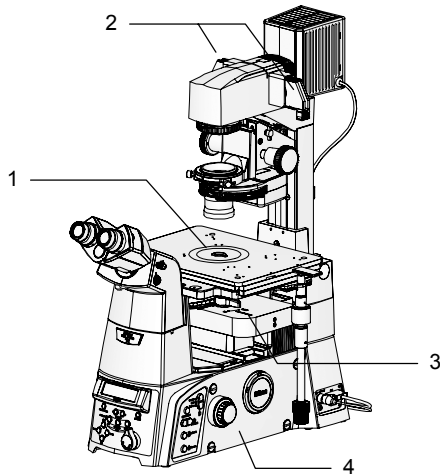
Settings for in-focus observation with PFS

The microscope body, the PFS motorized nosepiece, and the PFS offset controller must be setup and operated for PFS function. The following sections describe PFS function operations on the remote control pad and the microscope body.

4.1.1 Starting and Stopping the PFS Function

Note:

If the perfect focus unit is not attached to the Ti-E, PFS observation cannot be performed. Therefore, the PFS button will not appear.



Preparation for PFS observation



PFS button on the LCD touch panel

1. Select an objective, and place a specimen onto the stage.

Move a PFC-compatible objective into the optical path. (See "Supported objectives" on P.69)

Perform water/oil-immersion procedures as necessary.

2. Move the IR filter into the optical path.

Attach an IR filter (45mm dia.) to the filter sliders on the pillar illuminator, and then move the IR filter into the optical path.

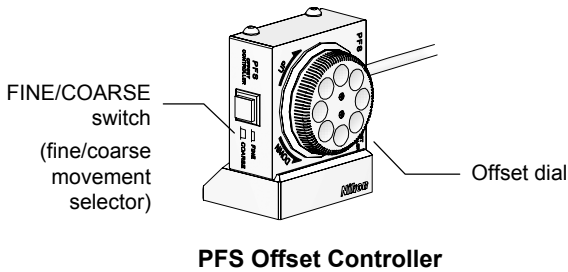
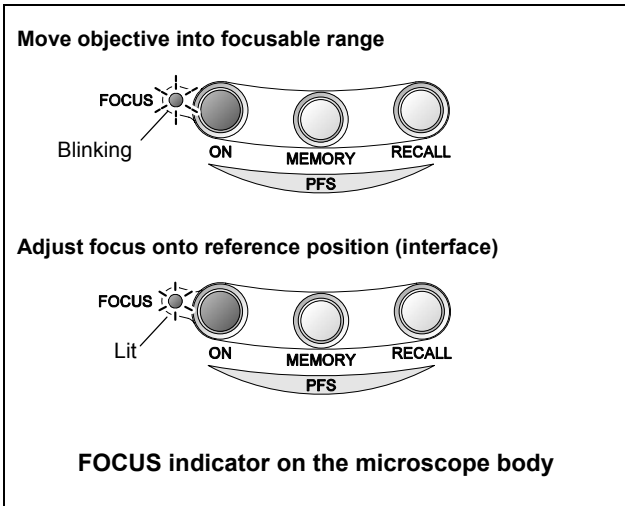
If using epi illumination, attach an IR filter (25mm dia.) to the filter sliders on the epi illuminator.

3. Move the dichroic mirror into the optical path by rotating the "dichroic mirror operation lever" on the top of the PFS nosepiece to <IN>.

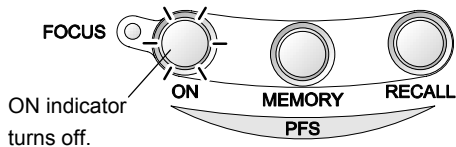
4. Adjust the focus onto the specimen by rotating the focus knobs on the microscope.

5. Press the **PFS** button on the **Control** tab of the LCD touch panel of the remote control pad to turn on the PFS indicator.

When a PFS ready objective is placed in the optical path, the PFS illuminated button lights up and PFS observation starts. The focus knobs will be disabled while the PFS function is active.



PFS button on the LCD touch panel



FOCUS indicator on the microscope body

When the objective position enters the focusing range, the FOCUS indicator on the front operation panel will begin to blink. When the focus is on the reference position (interface), the indicator will be lit.

When the PFS function is active, the focus mechanism controls automatically to maintain the focus on the reference position.

* The “focusing range” is defined for each objective, and is the region within which the PFS function can be performed for that objective.

- Adjust the focus on to the target on the specimen, by rotating the offset dial on the PFS offset controller.

In step 5, the focus is set on the reference position, not on the actual target.

To set the focus on the actual target, adjust the offset by rotating the offset dial on the PFS offset controller. For details, refer to “4.1.2 Offset Adjustment”.

- To stop the in-focus observation, press the PFS button. The PFS indicator turns off and the FOCUS indicator on the microscope turns off too.

Be sure to stop the PFS function before replacing the specimen or changing the objective.

- When observing without using the PFS function, move the dichroic mirror out of the optical path by rotating the dichotic mirror operation lever on the top of the PFS nosepiece to OUT.

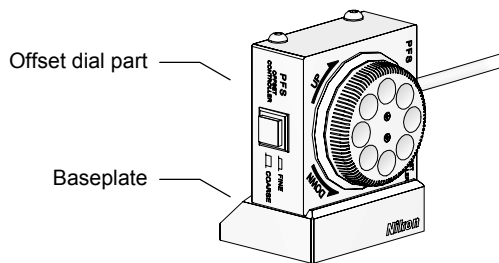
4.1.2 Offset Adjustment

When the PFS function is started, the Z-axis position of the objective will be controlled to track the vertical deviation of the interface. To shift the focus onto the desired position, rotate the offset dial on the PFS offset controller.

The offset dial moves the mirror inside the PFS nosepiece, allowing you to adjust the focus within the field of view, while maintaining the focused state.

The distance (i.e. the amount by which the focus was moved) from the reference position (interface) to the position moved to with the offset dial is referred to as the "offset". This offset will be maintained as the PFS function tracks the vertical deviation of the interface.

* The maximum offset varies depending on the objective. In particular, water/oil immersion objectives are limited in their downward offset.

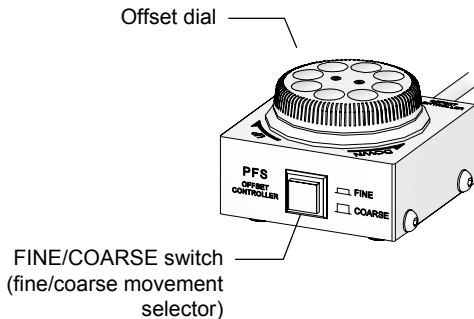


PFS Offset Controller

PFS Offset Controller Operation

The PFS offset controller has an offset dial component and a base plate that are magnetically attached.

By changing the orientation of the dial component on the base plate, the dial can be faced to the left or the right. The dial can also be faced upward, if used alone without the base plate.



Offset Adjustment

Offset Adjustment

FINE/COARSE switch

(fine/coarse movement selector):

The distance traveled by rotating the offset dial can be switched between FINE and COARSE. The selected state can be checked by whether the switch is pressed in.

Offset dial:

Adjusts the offset. Rotate clockwise to increase the offset (move the objective closer to the specimen), or counterclockwise to decrease the offset (move the objective further from the specimen).

- The offset dial is enabled only if the focus maintenance function is ON.
- When using the 4X or the 10X objective, the offset can be adjusted with fine movements only, regardless of the FINE/COARSE switch setting.

4.1.3 Registration and Restoration of Offset

The offset set during observation can be registered on the microscope. By registering the offset, the offset can be easily restored after manual adjustments.

Registering the offset

1. Start the focus maintenance function. Adjust the focus onto the target by rotating the offset dial on the PFS offset controller.
2. Press the **PFS MEM** button on the **Control** tab of the LCD touch panel of the remote control pad.



PFS MEM button on the LCD touch panel



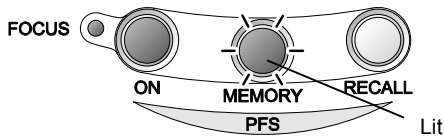
The **MEMORY** button on the LCD touch panel turns on in green. The MEMORY switch on the microscope body is lit. And the offset amount for the objective in the optical path (at the PFS motorized nosepiece address) is registered.

- The registered offset will be overwritten each time the MEMORY switch is pressed.
- The offset can be registered independently for each objective on the nosepiece (max. 6). To place a desired objective into the optical path, press the corresponding objective area on the screen.
- The registered offsets will be retained until the system is turned off.

Displayed items:

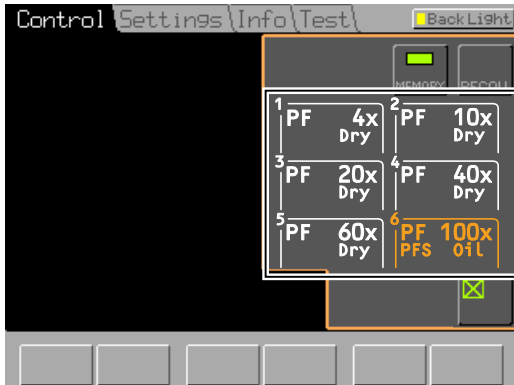
(A) Objective information (series name, magnification, NA, PFS ready or not)

3. To close the offset registration screen of the LCD touch panel, click the X button at the top right corner.



MEMORY switch on the microscope body

Restoring the offset



1. Check that the **MEMORY** button of the LCD touch panel is lit in green and the MEMORY switch on the microscope body is lit.

Note:

If the **MEMORY** button is lit in orange, no offset value has been set. Refer to the previous steps to register an offset value.

2. Press the **RECALL** button on the LCD touch panel.

The offset lens automatically moves to the registered offset position.

Manual operation with the focus knobs will be disabled during the restoration of the offset.

When no offset is registered and the **MEMORY** button is not lit, the offset lens moves to the zero position (initial position). But, the focal position may shift from the boundary surface depending on the cover glass thickness and operation environment.

Displayed items:

(A) Objective information (series name, magnification, NA, PFS ready or not)

3. To close the offset restoration screen of the LCD touch panel, click the X button at the top right corner.

4.1.4 If Objectives Are Changed during the In-focus Observation

If objectives are changed during the PFS observation, the PFS function stops and the offset lens moves as follows:

- **An offser amount is registered:**
The offset lens moves to the offset position.
- **No offset amount is registered:**
The offset lens moves to the zero position (initial position). However, the focal position may shift from the boundary surface because of the cover glass thickness and the environmental conditions.

* The offset lens moves in the same manner even if the PFS function is not used.

4.1.5 If PFS Function Does Not Start

This section describes check method and handling method on the microscope body.

If <PFS: DIS> is displayed on the status display panel

There is no reference position (interface) within the focusing range. Move the objective up and down by rotating the focus knobs. The PFS function will start once the interface enters the focusing range.

If <PFS: Out> is displayed on the status display panel

The dichroic mirror is not in the optical path. Move the dichroic mirror into the optical path by rotating the dichroic mirror operation lever to the right.

Even if the focus is set on the interface, the focus may not be set on the observation target. Operate the offset dial as necessary, as described in "7". In particular, when using a dry objective, the difference in the cover glass thickness may cause the initial position to differ from the interface. In this case, adjust the focus onto the observation target by rotating the offset dial, after the FOCUS indicator and the PFS-ON switch are lit.

Timeout function (dry objectives only)

If the interface cannot be detected within 5 seconds after pressing the PFS-ON switch to start the PFS function, the vertical movement of the objective will be stopped to prevent collision with the specimen. This is the "timeout function". For reference, the objective will move approximately 400 μm during the 5 seconds.

When the timeout function is activated, the system will beep, the PFS-ON switch will dim, and the vertical movement of the objective will stop.

If the timeout function is activated

There is no reference position (interface) within the focusing range. Manually adjust the focus onto the specimen, and then press the PFS-ON switch again.

4.2 Mode Memory Function

Mode memory function

This function is used to restore the observation conditions with just a click when observation conditions (various motorized device positions) are saved.

Up to 4 observation conditions can be registered to the memory.

Each observation condition can be named with up to four characters and shown on the screen.

Motorized devices applicable for the Mode Memory function are shown the table below. Each device can be set up individually.

Table 4.2-1 Available device list

Device name	Appearance on the screen	Saved conditions
Ti-E Inverted Microscope		Z-axis position*
	Path	Optical path
	DIA Lamp ON/OFF	Diascopic illumination lamp On/Off
	DIA Lamp Volt	Diascopic illumination lamp voltage
Piezo Z stage	Piezo Z Stage	Z-axis position*
Motorized shutter for the diascopic illumination		Shutter Open/Close
Motorized shutter for the episcopic illumination		Shutter Open/Close
Ti-TIRF-E Motorized Illumination Unit		Optical fiber emission part X position*
	TIRF/EPI	Illumination selection (TIRF/EPI)
C-HGFIE Precentered Fiber Illuminator (Motorized Operation Type)		Built-in shutter Open/Close
	INTSL ND	Brightness control ND filter
Ti-ND6-E Sextuple Motor DIC Nosepiece PFS sextuple motorized DIC nosepiece		Nosepiece position
Ti-CT-E Motorized Condenser Turret	Condenser	Condenser turret position
Motorized filter turret (first tier)	Filter Block1	Filter turret position
Motorized filter turret (second tier)	Filter Block2	Filter turret position
Ti-FLEW-E EX Filter Wheel		EX filter wheel position
Ti-FLBW-E BA Filter Wheel		BA filter wheel position

* The settings for these positions will be deselected when the power is turned off.

Note:

After setting, be sure to save the settings with the SAVE button on the Control screen. If the product is turned off without saving information, the settings will be canceled. For details on saving, refer to "2.5.9 Saving the Settings."

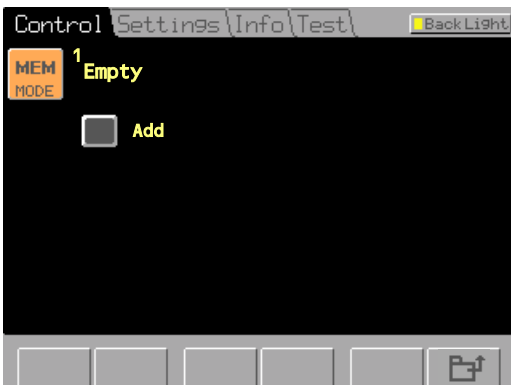
4.2.1 Saving Observation Conditions



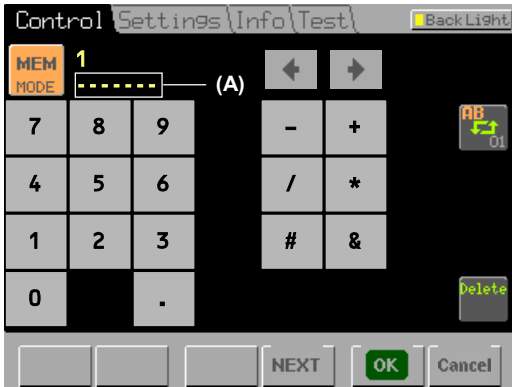
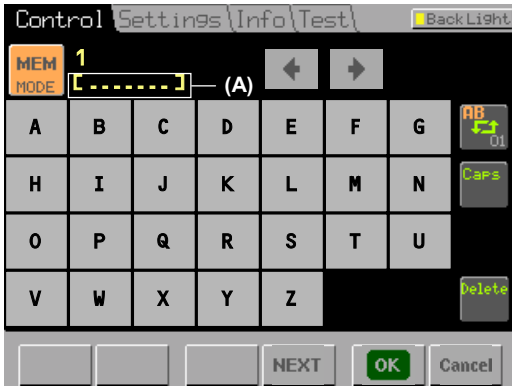
1. Press the **Control** tab to open the **Control** screen. And then, press the **MODE MEM** (MODE memory) button.



2. The mode memory selection screen appears. Press one of the **1** to **4** buttons to select the memory to save the current observation conditions.



3. When a blank memory is selected, the new registration screen appears. Press the **Add** button to add a new setting.



4. Memory mode name entry

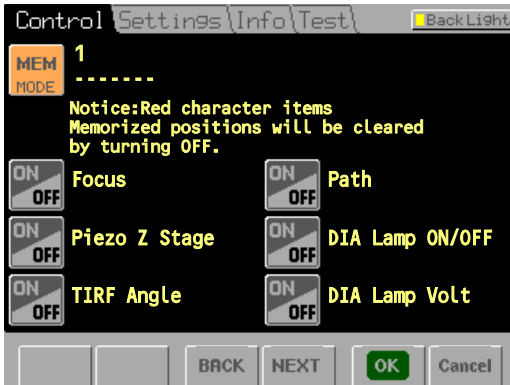
Enter the memory mode name with the software keyboard shown on the LCD touch panel.

- To move the cursor in the name entry to the left, press the left arrow button. [←]
- To move the cursor in the name entry to the right, press the right arrow button. [→]
- To change the alphabetic characters and the numeric characters, press the **AB/01** button.
- To toggle case of the alphabetic characters, press the **Caps** button on the alphabetic character keyboard.
- To delete the character on the cursor in the name entry, press the **Delete** button.
- To accept the name, press the **OK** button. The screen changes to the next step shown in the next page (Step 5 in Section 4.2.1, "Saving Observation Conditions.")
- To cancel the name, press the **Cancel** button. The screen changes to the Step 2 shown in the previous page (Step 2 in Section 4.2.1, "Saving Observation Conditions.")

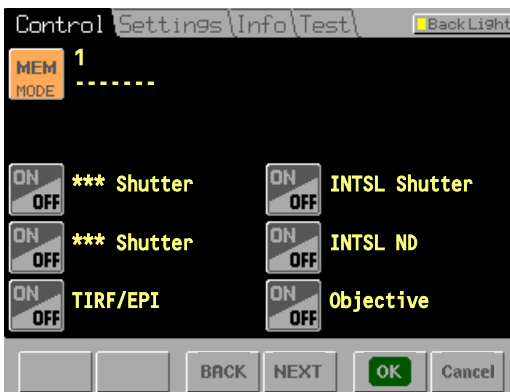
Displayed item:

(A) Name entry: The entered name is displayed here.

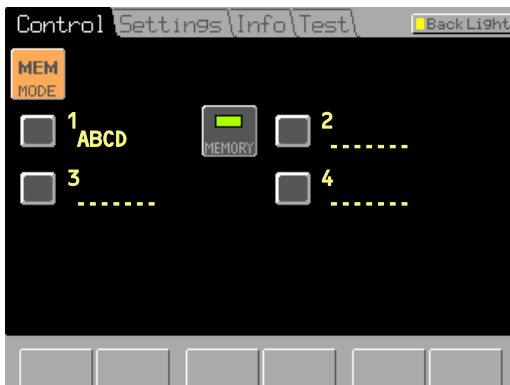
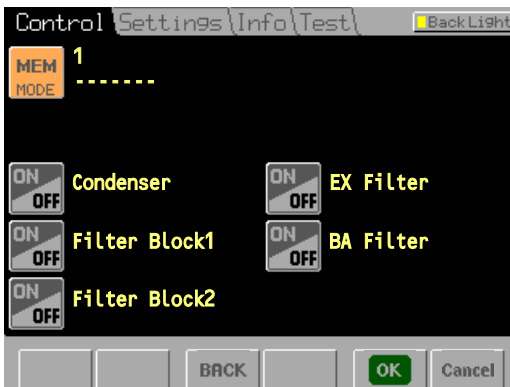
First Screen



Second Screen



Third Screen



5. Select the motorized device to be saved.
All devices are set to "OFF" (deselected) by default.
Total of 17 devices are shown on three screens.

- Press the **ON/OFF** button.
The motorized device is selected/deselected each time the button is pressed.
- Press the **NEXT** button to show the next screen.
- Press the **BACK** button to show the previous screen.
- To accept the selection of the motorized devices, press the **OK** button. The mode memory selection screen appears.
- To cancel the selection of the motorized devices, press the **Cancel** button. The mode memory selection screen appears.

ON/OFF button appearance

- Save (On)
- Not save (Off)



Note:

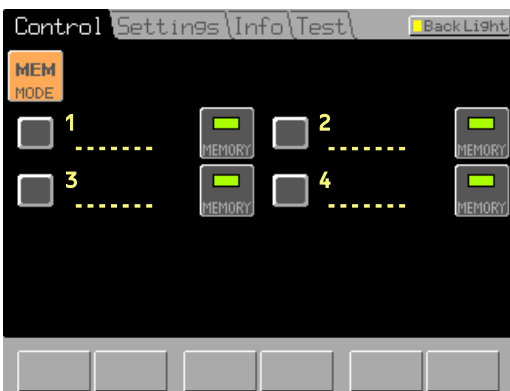
Motorized devices not connected to the system are dimmed and their ON/OFF buttons will not appear.

6. Press the **MEMORY** button to register the current device settings.

4.2.2 Overwriting Observation Conditions



1. Press the **Control** tab to open the **Control** screen. And then, press the **MODE MEM** (MODE memory) button.



2. **Memory selection**
 - (1) To change only the positions of motorized devices (the memory mode name and the device selections are not changed), press the corresponding **MEMORY** button. Current positions of motorized devices are saved to memory.
 - (2) To change the memory mode name or device selections, press the corresponding memory button of 1 to 4.

MEMORY button appearance:

Normal



Condition saving is in progress.



3. **Selecting Overwrite/Delete**
Press the **Modify** button.
4. The subsequent operations are the same as that of Step 4 in the previous section, "4.2.1 Saving Observation Conditions."

Note:

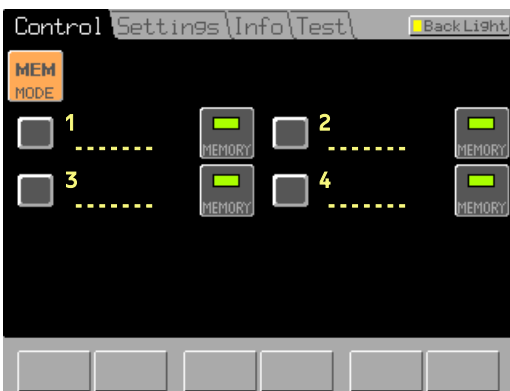
When a selection of motorized devices is changed, press the **MEMORY** button on the Memory selection screen to register the current settings of the motorized devices.

For example, registered settings will be restored in the following case: A motorized device is enabled and its conditions are registered. The motorized device is disabled. And then the motorized device is enabled again.

4.2.3 Deleting Observation Conditions



1. Press the **Control** tab to open the **Control** screen. And then, press the **MODE MEM** (MODE memory) button.



2. Press one of the 1 to 4 buttons to select the memory to be deleted.



3. Press the **Delete** button.



4. A confirmation message appears.
 - To delete the memory of the observation conditions, press the OK button. The screen of Step 2 in this section appears again.
 - To cancel the deletion of the memory, press the Cancel button. The screen of Step 2 in this section appears again.

Note:

When the system control goes to Step, the deleted memory appears as "Empty" and the **MEMORY** button does not appear.

4.3 Parfocal Correction Function

Parfocal Correction

With this function, focal positions of objectives are saved and restored to compensate deviations of the focal positions from changing objectives.

The parfocal correction function does not work if the objective is retracted with the Escape switch on the right of the microscope body (Ti-E or Ti-E/B).

Note:

- **After setting, be sure to save the settings with the SAVE button on the Control screen. If the product is turned off without saving information, the settings will be canceled.** For details on saving, refer to "2.5.9 Saving the Settings."
- For an address of no objective attached, the same focal position as the adjacent address must be set.
If no focal position is set for an address and the nosepiece is rotated from the non-set address to a set address, the parfocal correction function does not work.

4.3.1 Setting up the Focal Position

When focal positions of the objectives are set up, the parfocal correction function works correctly in changing objectives. Be sure to set up focal positions to enable the parfocal correction function.



1. First, turn off the parfocal correction function.
If the parfocal correction function is not turned off, no focal position can be set.

Press the **Settings** tab to open the opening view of the **Settings** screen.

And then, press the **Movement** button.



2. The **ALF** screen appears.
Press the **Auto Link Focus ON/OFF** button.



3. Press the **ON/OFF** button to enable/disable the function.
The button toggles the parfocal correction function mode on and off.

To disable the correction function, display the following icon.



Press the **OK** button.

Note:

If the OK button is not pressed, the function is not disabled.



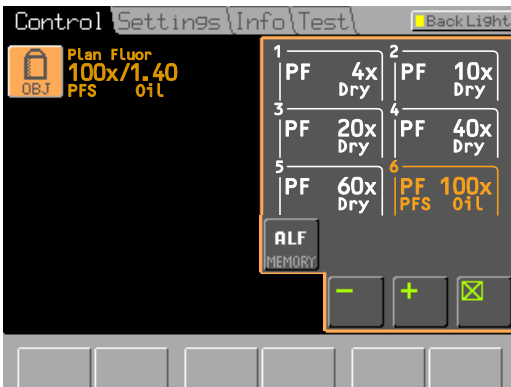
4. The **ALF** screen appears.
Press the **PREVIOUS** button.



5. The opening view of the **Settings** screen appears.
Press the **Control** tab to open the **Control** screen.



6. Press the **OBJ** (objective) button.



7. The **OBJECTIVE** screen appears. Press the **ALF MEMORY** button.

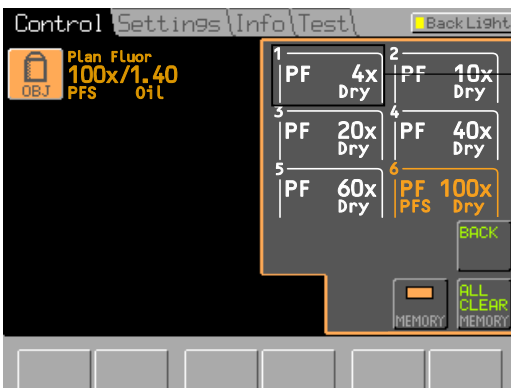
Note:

When the parfocal correction function is enabled, the **ALF ON** button appears in place of **ALF MEMORY**.

ALF MEMORY button



ALF ON button

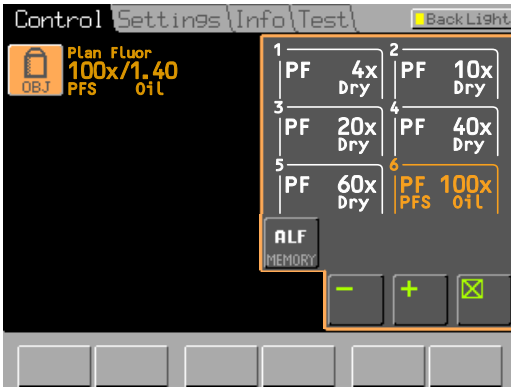


8. **Setting up the focal position**

- (1) Press the **ALF CLEAR** button.
- (2) Press the (A) area to select the address number 1 objective of the motorized nosepiece.
- (3) Focus on the specimen with the focus knob on the microscope body.
- (4) Press the **MEMORY** button to save the focal position for the address number 1 of the nosepiece.

Save focal positions for address number 2 to 6 of the nosepiece in the same manner.

When focal positions for all addresses are saved, press the **BACK** button.



- The **OBJECTIVE** screen appears again.
Press the **X** button to close the **Objective** screen.



- Press the **SAVE** button on the **Control** screen to save the focal positions.
This is the end of the focal position setup.

To enable the parfocal correction function, it must be turned on.

Refer to the next step, "Turning on/off the parfocal correction function."

4.3.2 Turning on/off the parfocal correction function



- Press the **Settings** tab to open the opening view of the **Settings** screen.
And then, press the **Movement** button.



- The **ALF** screen appears.
Press the **Auto Link Focus ON/OFF** button.



3. Press the **ON/OFF** button to enable/disable the function.

The button toggles the parfocal correction function mode on and off.

To enable the function, display the following icon.



To disable the function, display the following icon.



Press the **OK** button.

Note:

If the OK button is not pressed, the function is not disabled.

4. The **ALF** screen appears.
Press the **PREVIOUS** button.



5. The opening view of the **Settings** screen appears.
Press the **Control** tab.



6. Press the **SAVE** button on the **Control** screen to save the settings.



4.4 Rotation Stop Function

Rotation Stop Function

This function is used to prohibit the rotation of the motorized nosepiece when its position is higher than the specified position in the Z-axis. The specified upper limit position is applied to all addresses of the motorized nosepiece.

This function is cleared if the power is turned off. The settings are not saved with the **SAVE** button on the **Control** screen.

Note:

- The motorized nosepiece may rotate near the set position because the vertical position may shift by vibrations.
- If this function is enabled and the nosepiece position is higher than the specified position, the nosepiece does not rotate.

4.4.1 Enabling the Rotation Stop Function



1. Press the **Settings** tab to open the opening view of the **Settings** screen.
And then, press the **Movement** button.



2. The **ALF** screen appears.
Press the **REVO** (rotation stopper) button.



3. The **Rotation Stopper** screen appears.
Press the **Rotation Stopper ON/OFF** button.



4. Press the **ON/OFF** button to enable/disable the function.
The button toggles the rotation stop function mode on and off.

To enable the function, display the following icon.



- Press the **OK** button to accept the rotation stop function settings. The **Rotation Stopper** screen appears again.
- Press the **Cancel** button to cancel the settings. The **Rotation Stopper** screen appears again.

4.4.2 Disabling the Rotation Stop Function



1. Press the **Settings** tab to open the opening view of the **Settings** screen.
And then, press the **Movement** button.



2. The **ALF** screen appears.
Press the **REVO** (rotation stopper) button.



3. The **Rotation Stopper** screen appears.
Press the **Rotation Stopper ON/OFF** button.



4. Press the **ON/OFF** button to enable/disable the function.
The button toggles the function mode on and off.
To disable the function, display the following icon.



- Press the **OK** button to disable the rotation stop function settings. The **Rotation Stopper** screen appears again.
- Press the **Cancel** button to cancel the settings. The **Rotation Stopper** screen appears again.

5

Operation Functions and Display Functions



Warning

- Before using the product, be sure to read the "Safety Precautions" at the beginning of this manual, and heed all of the warnings and cautions written therein.
- Also be sure to read the instruction manuals for other products used with this product such as the microscope and Motorized Units for Ti Series, and heed all of the warnings and cautions written therein.

This chapter indicates the operation functions and the display functions for the TI-RCP Remote Control Pad.

- For names and functions of the remote control pad, see Chapter 1, "Name and Function of Each Part."
- For basic operation such as operating a Motorized Units for Ti Series, see Chapter 3, "Basic Operations."
- For advanced operations such as the perfect focus system observation, see Chapter 4, "Advanced Operations."
- For details about the Ti-E or Ti-E/B microscope and Motorized Units for Ti Series, see the instruction manual provided to each device.

5.1 Registering Data for Optical Elements

Note:

After setting, be sure to save the settings with the SAVE button on the Control screen. If the product is turned off without saving information, the settings will be canceled. For details on saving, refer to "2.5.9 Saving the Settings."

5.1.1 Objective

The system can save up to 10 arbitrarily objective data.

Note:

When the relevant objective is not attached to the nosepiece but is to be registered, save it as an arbitrarily objective.



1. Press the **Settings** tab to open the opening view of the **Settings** screen.

And then, press the **Components** button.



2. The **OBJECTIVE** screen appears.

Press the **ADD** button.

First Screen



Second Screen



3. Memory selection

Select a memory area to save an arbitrarily data from between memory number 1 to 10.

Ten memory areas are available and they are shown on the first screen or on the second screen.

- Press the **NEXT** button to show the second screen.
- Press the **BACK** button to show the first screen.
- Press the **PREVIOUS** button to show the **OBJECTIVE** screen.



4. New registration

When a new memory is selected, the new registration screen appears.

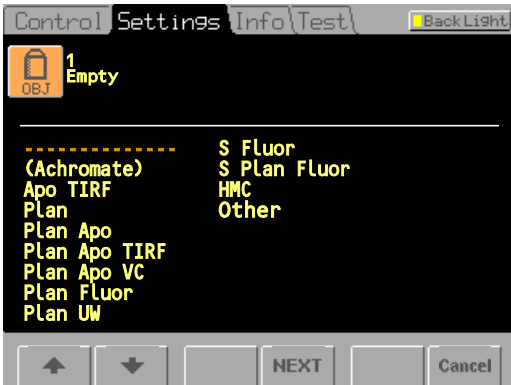
Press the Add button to proceed to Step 5.

Overwriting or deleting data

When a used memory is selected, the overwrite/delete screen appears.



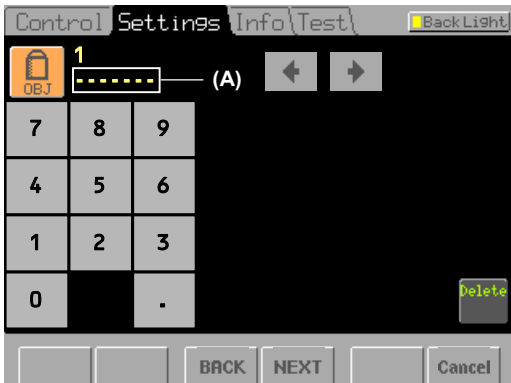
- Press the **Modify** button to overwrite data and proceed to Step 5.
- Press the **Delete** button to delete data and proceed to Step 11.



5. Select an objective series with the **UP 1** or the **DOWN 1** button.
And then, press the **NEXT** button.



6. Select a magnification with the **UP 1** or the **DOWN 1** button.
Press the **NEXT** button to proceed to Step 8.
Press the **BACK** button to return to Step 6.



7. **NA entry**
Enter the numerical aperture (NA) of the objective with the software keyboard shown on the LCD touch panel.
 - To move the cursor in the NA entry to the left, press the left arrow button. [←]
 - To move the cursor in the NA entry to the right, press the right arrow button. [→]
 - To delete the character on the cursor in the NA entry, press the **Delete** button.
 - Press the **BACK** button to show the first screen.
 - Press the **NEXT** button to show the second screen.
 - To cancel the selection and the entry, press the **Cancel** button. The step 3 screen appears.

Displayed item:

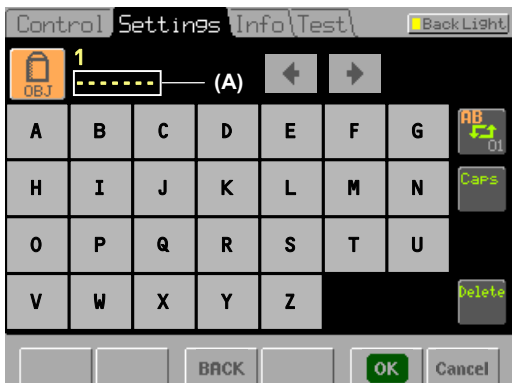
(A) NA entry: The entered NA appears here.



8. Select a medium between the objective and the specimen with the **UP 1** or the **DOWN 1** button. Press the **NEXT** button to proceed to Step 10. Press the **BACK** button to return to Step 8.



9. Enable or disable the PFS observation function with the **UP 1** or the **DOWN 1** button. Press the **NEXT** button to proceed to Step 11. Press the **BACK** button to return to Step 9.



10. Product code entry

Enter the product code of the objective with the software keyboard shown on the LCD touch panel.

- To move the cursor in the product code entry to the left, press the left arrow button. [←]
- To move the cursor in the product code entry to the right, press the right arrow button. [→]
- To change the alphabetic characters and the numeric characters, press the **AB/O1** button.
- To toggle case of the alphabetic characters, press the **Caps** button on the alphabetic character keyboard.
- To delete the character on the cursor in the product code entry, press the **Delete** button.
- Press the **BACK** button to show the first screen.
- Press the **NEXT** button to show the second screen.
- To accept the selection and the entry, press the **OK** button. The step 3 screen appears.
- To cancel the selection and the entry, press the **Cancel** button. The step 3 screen appears.

Displayed item:

(A) Product code: The entered product code appears here.



11. Registration deletion

When the **Delete** button is pressed in Step 4, a confirmation dialog box appears.

- To delete the memory of the objective data, press the **OK** button. The screen of Step 3 in this section appears again.
- To cancel the deletion, press the **Cancel** button. The screen of Step 3 in this section appears again.

5.1.2 Condenser Cassette

The system can save up to 10 arbitrarily condenser cassette data.

Note:

When the relevant condenser cassette is not attached to the system but is to be registered, save it as an arbitrarily condenser cassette.



1. Press the **Settings** tab to open the opening view of the **Settings** screen.

And then, press the **Components** button.



2. Press the **CON** (condenser) button to open the **CONDENSER** screen.

And then, press the **ADD** button.

First Screen



Second Screen



3. Memory selection

Select a memory area to save an arbitrarily data from between memory number 1 to 10.

Ten memory areas are available and they are shown on the first screen or on the second screen.

- Press the **NEXT** button to show the second screen.
- Press the **BACK** button to show the first screen.
- Press the **PREVIOUS** button to show the **CONDENSER** screen.



4. New registration

When a new memory is selected, the new registration screen appears.

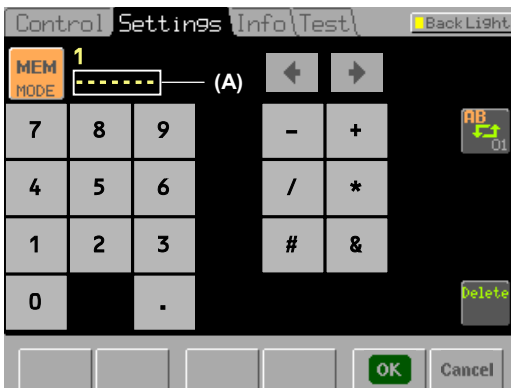
Press the **Add** button to proceed to Step 5.



Overwriting or deleting data

When a used memory is selected, the overwrite/delete screen appears.

- Press the **Modify** button to overwrite data and proceed to Step 5.
- Press the **Delete** button to delete data and proceed to Step 6.



5. Condenser cassette entry

Enter the condenser cassette name with the software keyboard shown on the LCD touch panel.

- To move the cursor in the name entry to the left, press the left arrow button. [←]
- To move the cursor in the name entry to the right, press the right arrow button. [→]
- To change the alphabetic characters and the numeric characters, press the **AB/01** button.
- To toggle case of the alphabetic characters, press the **Caps** button on the alphabetic character keyboard.
- To delete the character on the cursor in the name entry, press the **Delete** button.
- To accept the selection and the entry, press the **OK** button. The step 3 screen appears.
- To cancel the selection and the entry, press the **Cancel** button. The step 3 screen appears.

Displayed item:

(A) Name entry: The entered name appears here.

6. Registration deletion

When the Delete button is pressed in Step 4, a confirmation dialog box appears.

- To delete the memory of the objective data, press the **OK** button. The screen of Step 3 in this section appears again.
- To cancel the deletion, press the **Cancel** button. The screen of Step 3 in this section appears again.

5.1.3 Filter Block

The system can save up to 10 arbitrarily filter block data.

Note:

- When the relevant filter block is not attached to the system but is to be registered, save it as an arbitrarily filter block.
- When two motorized FL turrets are installed to the system, arbitrarily filter block data is used in common for both motorized FL turrets.



1. Press the **Settings** tab to open the opening view of the **Settings** screen.

And then, press the **Components** button.



2. Press the **FL1** button to open the **FL1** screen. Press the **ADD** button.

First Screen



Second Screen



3. Memory selection

Select a memory area to save an arbitrarily data from between memory number 1 to 10.

Ten memory areas are available and they are shown on the first screen or on the second screen.

- Press the **NEXT** button to show the second screen.
- Press the **BACK** button to show the first screen.
- Press the **PREVIOUS** button to show the **FL1** screen.



4. New registration

When a new memory is selected, the new registration screen appears.

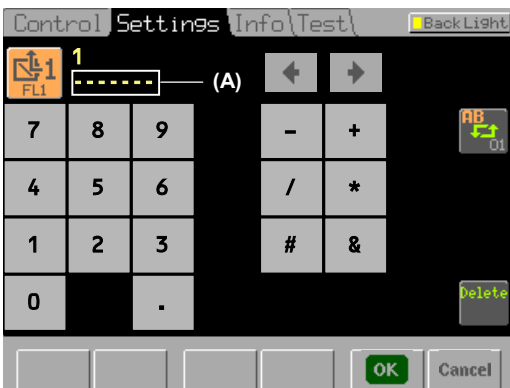
Press the **Add** button to proceed to Step 5.



Overwriting or deleting data

When a used memory is selected, the overwrite/delete screen appears.

- Press the **Modify** button to overwrite data and proceed to Step 5.
- Press the **Delete** button to delete data and proceed to Step 6.



5. Filter block name entry

Enter the filter block name with the software keyboard shown on the LCD touch panel.

- To move the cursor in the name entry to the left, press the left arrow button. [←]
- To move the cursor in the name entry to the right, press the right arrow button. [→]
- To change the alphabetic characters and the numeric characters, press the **AB/01** button.
- To toggle case of the alphabetic characters, press the **Caps** button on the alphabetic character keyboard.
- To delete the character on the cursor in the name entry, press the **Delete** button.
- To accept the entry, press the **OK** button. The step 3 screen appears.
- To cancel the entry, press the **Cancel** button. The step 3 screen appears.

Displayed item:

(A) Name entry: The entered name appears here.

6. Registration deletion

When the Delete button is pressed in Step 4, a confirmation dialog box appears.

- To delete the memory of the objective data, press the **OK** button. The screen of Step 3 in this section appears again.
- To cancel the deletion, press the **Cancel** button. The screen of Step 3 in this section appears again.

5.1.4 Excitation Filter

The system can save up to 10 arbitrarily excitation filter data.

Note:

When the relevant excitation filter is not attached to the system but is to be registered, save it as an arbitrarily excitation filter.



1. Press the **Settings** tab to open the opening view of the **Settings** screen.

And then, press the **Components** button.



2. Press the **EX** (excitation filter) button to open the **EX** screen.

And then, press the **ADD** button.

First Screen



Second Screen



3. Memory selection

Select a memory area to save an arbitrarily data from between memory number 1 to 10.

Ten memory areas are available and they are shown on the first screen or on the second screen.

- Press the **NEXT** button to show the second screen.
- Press the **BACK** button to show the first screen.
- Press the **PREVIOUS** button to show the **EX** screen.

4. New registration

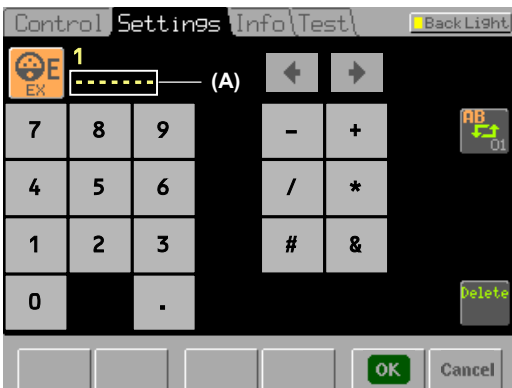
When a new memory is selected, the new registration screen appears.

Press the **Add** button to proceed to Step 5.

Overwriting or deleting data

When a used memory is selected, the overwrite/delete screen appears.

- Press the **Modify** button to overwrite data and proceed to Step 5.
- Press the **Delete** button to delete data and proceed to Step 6.



5. Excitation filter wavelength entry

Enter the excitation filter wavelength with the software keyboard shown on the LCD touch panel.

- To move the cursor in the wavelength entry to the left, press the left arrow button. [←]
- To move the cursor in the wavelength entry to the right, press the right arrow button. [→]
- To change the alphabetic characters and the numeric characters, press the **AB/01** button.
- To toggle case of the alphabetic characters, press the **Caps** button on the alphabetic character keyboard.
- To delete the character on the cursor in the wavelength entry, press the **Delete** button.
- To accept the entry, press the **OK** button. The step 3 screen appears.
- To cancel the entry, press the **Cancel** button. The step 3 screen appears.

Displayed item:

(A) Wavelength entry: The entered wavelength appears here.

6. Registration deletion

When the Delete button is pressed in Step 4, a confirmation dialog box appears.

- To delete the memory of the objective data, press the **OK** button. The screen of Step 3 (memory selection) appears again.
- To cancel the deletion, press the **Cancel** button. The screen of Step 3 (memory selection) appears again.

5.1.5 Barrier Filter

The system can save up to 10 arbitrarily barrier filter data.

Note:

When the relevant barrier filter is not attached to the system but is to be registered, save it as an arbitrarily barrier filter.



1. Press the **Settings** tab to open the opening view of the **Settings** screen.

And then, press the **Components** button.



2. Press the **BA** (barrier filter) button to open the **BA** screen.

And then, press the **ADD** button.

First Screen



Second Screen



3. Memory selection

Select a memory area to save an arbitrarily data from between memory number 1 to 10.

Ten memory areas are available and they are shown on the first screen or on the second screen.

- Press the **NEXT** button to show the second screen.
- Press the **BACK** button to show the first screen.
- Press the **PREVIOUS** button to show the **BA** screen.

4. New registration

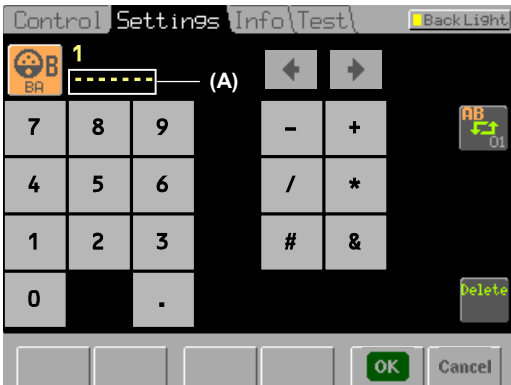
When a new memory is selected, the new registration screen appears.

Press the **Add** button to proceed to Step 5.

Overwriting or deleting data

When a used memory is selected, the overwrite/delete screen appears.

- Press the **Modify** button to overwrite data and proceed to Step 5.
- Press the **Delete** button to delete data and proceed to Step 6.



5. Barrier filter wavelength entry

Enter the barrier filter wavelength with the software keyboard shown on the LCD touch panel.

- To move the cursor in the wavelength entry to the left, press the left arrow button. [←]
- To move the cursor in the wavelength entry to the right, press the right arrow button. [→]
- To change the alphabetic characters and the numeric characters, press the **AB/01** button.
- To toggle case of the alphabetic characters, press the **Caps** button on the alphabetic character keyboard.
- To delete the character on the cursor in the wavelength entry, press the **Delete** button.
- To accept the entry, press the **OK** button. The step 3 screen appears.
- To cancel the entry, press the **Cancel** button. The step 3 screen appears.

Displayed item:

- (A) Wavelength entry: The entered wavelength appears here.

6. Registration deletion

When the Delete button is pressed in Step 4, a confirmation dialog box appears.

- (1) To delete the memory of the objective data, press the **OK** button. The screen of Step 3 (memory selection) appears again.
- (2) To cancel the deletion, press the **Cancel** button. The screen of Step 3 (memory selection) appears again.

5.2 Switching Devices that can be Controlled with the Operation Buttons (for Motorized FL Turret)

When two motorized FL turrets are installed to the system, the **FL2** (filter block 2) button appears to control the second tier.

But the first tier of the motorized FL turret may move with the **FL2** button if the first and the second tiers are connected to the HUB controller A inversely.

Perform the following to inverse the operation buttons, the **FL1** (filter block 1) button and the **FL2** (filter block 2) button without disconnecting and connecting the cables to the HUB controller A.

Note:

- When the operation buttons and the devices match, do not perform the following.
- **After setting, be sure to save the settings with the SAVE button on the Control screen. If the product is turned off without saving information, the settings will be canceled.** For details on saving, refer to Section 2.5.9, "Saving the Settings."



1. Press the **Settings** tab to open the opening view of the **Settings** screen.

And then, press the **Connection** button.



2. Press the **Filter** button.



3. Press the **Exchange Filter Turret Connection** button.



4. A confirmation message appears.

- To apply the setting, press the **OK** button.
- To cancel the setting, press the **Cancel** button.



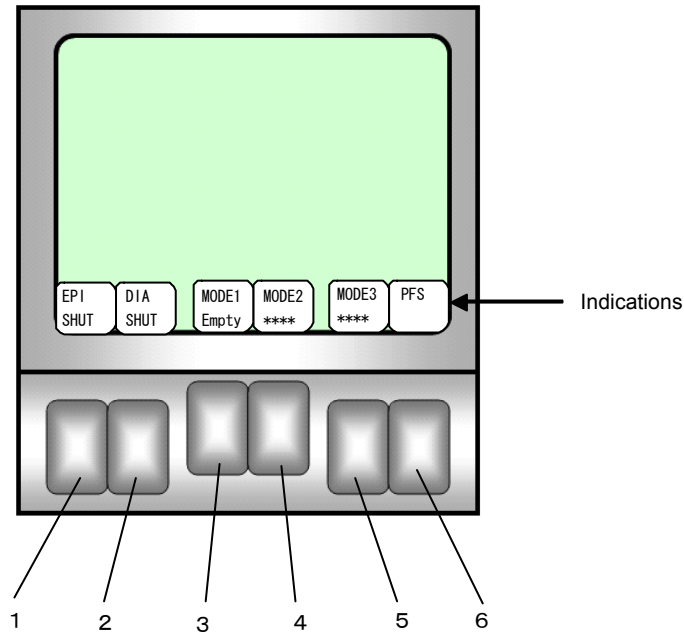
5. Press the **PREVIOUS** button to show the opening view of the **Settings** screen.



5.3 Assigning Functions to Buttons

5.3.1 Remote Control Pad

Six function buttons on the remote control pad can be assigned to arbitrary functions. The default settings are shown below. Change the settings if necessary.



Number	Button name	Indications on the screen (upper row/lower row)	Function
1	EPI Shutter	EPI/SHUT	Shutter Open/Close for episcopic illumination
2	DIA Shutter	DIA/SHUT	Shutter Open/Close for diascopic illumination
3	MODE 1 *	MODE1/****(name saved in Step 4 in Section 4.2.1.)*	Observation condition saved to MODE1
4	MODE2*	MODE2/****(name saved in Step 4 in Section 4.2.1.)*	Observation condition saved to MODE2
5	MODE3*	MODE3/****(name saved in Step 4 in Section 4.2.1.)*	Observation condition saved to MODE3
6	PFS	PFS/none	PFS On/Off

* When no observation condition is saved to MODE1, MODE2, or MODE3, the indication of "Empty" appears in the lower row. In this case, no motorized units moves with this button.

Note:

After setting, be sure to save the settings with the SAVE button on the Control screen. If the product is turned off without saving information, the settings will be canceled. For details on saving, refer to "2.5.9 Saving the Settings."



1. Press the **Settings** tab to open the opening view of the **Settings** screen.
And then, press the **Button/Function** button.



2. The button selection screen appears.
Select a button to be assigned.



3. The device list and the function list appears.
 - Select a device with the **UP 2** or the **DOWN 2** button.
 - Select a function with the **UP 1** or the **DOWN 1** button.
 - To apply the setting, press the **OK** button.
 - To cancel the setting, press the **Cancel** button.

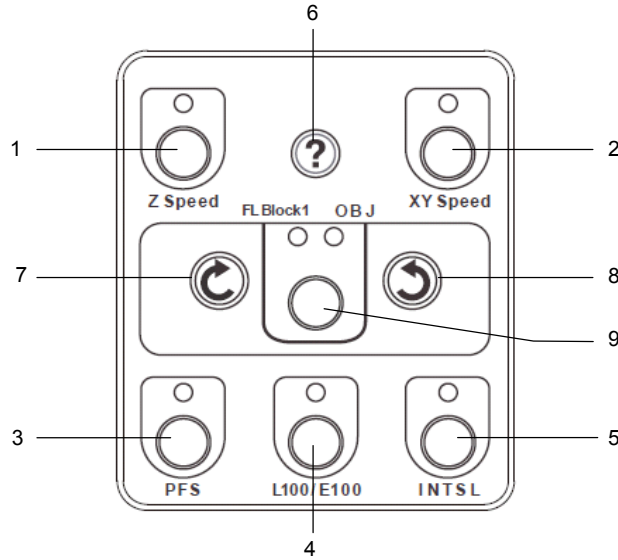




4. The button selection screen appears again.
Press the **PREVIOUS** button to show the opening view of the **Settings** screen.



5.3.2 Ergo Controller

Buttons on the Ergo Controller can be assigned to arbitrary functions. The default settings are shown below. Change the settings if necessary.



No.	Button name	Function
1	Z Speed	Switches the focusing knob operating mode between coarse, fine, and extra fine. (Indicator off: coarse; lit: fine; blinking: extra fine)
2	XY Speed	Switches the stage knob operating mode between coarse, fine, and extra fine. (Indicator off: coarse; lit: fine; blinking: extra fine)
3	PFS	Turns the PFS on or off (indicator lit: PFS on; off: PFS off)
4	L100/E100	Switches the optical path between Left port 100% and microscopy port 100% (Indicator lit: E100; blinking: L100, off: other)
5	INTSL	Opens and closes the shutter for the Precentered Fiber Illuminator (Indicator lit: closed; off: open)
6	?	Displays current button assignments of the Ergo Controller on the PC monitor
7		Rotates clockwise (select what to rotate using button 9)
8		Rotates counterclockwise (select what to rotate using button 9)
9	FL Block1/OBJ	Selects what to rotate using buttons 7 and 8 (indicator lit: operation target) <ul style="list-style-type: none"> - FL Block1 Motorized FL turret (first tier) - OBJ Motorized nosepiece or Perfect Focus W/ Motor Nosepiece



1. Press the **Settings** tab to open the opening view of the **Settings** screen.
Press the **Button/Function** button. And the press the **TI-ERGC** button.



2. The button selection screen appears.
Select a button to be assigned.

Note:

The A and the B buttons can be assigned to rotatable motorized units only.



3. **Assigning numerical buttons (1 to 5)**

The device list and the function list appears.

- Select a device with the **UP 2** or the **DOWN 2** button.
- Select a function with the **UP 1** or the **DOWN 1** button.
- To apply the setting, press the **OK** button.
- To cancel the setting, press the **Cancel** button.



Assigning alphabetical buttons (A and B)

The device list appears.

- Select a device with the **UP 1** or the **DOWN 1** button.
- To apply the setting, press the **OK** button.
- To cancel the setting, press the **Cancel** button.



4. The button selection screen appears again.
Press the **PREVIOUS** button to return to the opening view of the **Settings** screen.



5.4 Turing On/Off Beep Sounds

Beep sounds for operation buttons can be turned on/off.

Note:
After setting, be sure to save the settings with the SAVE button on the Control screen. If the product is turned off without saving information, the settings will be canceled. For details on saving, refer to "2.5.9 Saving the Settings."

5.4.1 Remote Control Pad



1. Press the **Settings** tab to open the opening view of the **Settings** screen.
 And then, press the **Utility** button.



2. Press the **Buzzer ON/OFF** button.



3. Press the **Ti-RCP ON/OFF** button.
 The beep sounds turns on or off with the button.
 - To apply the setting, press the **OK** button.
 - To cancel the setting, press the **Cancel** button.

- Button appearance for beep On



- Button appearance for beep Off





4. Press the **PREVIOUS** button to return to the opening view of the **Settings** screen.



5.4.2 Ti-E



1. Press the **Settings** tab to open the opening view of the **Settings** screen.
And then, press the **Utility** button.



2. Press the **Buzzer ON/OFF** button.



3. Press the **Ti-E ON/OFF** button.
The beep sounds turns on or off with the button.
 - To apply the setting, press the **OK** button.
 - To cancel the setting, press the **Cancel** button.

- Button appearance for beep On



- Button appearance for beep Off





4. Press the **PREVIOUS** button to return to the opening view of the **Settings** screen.



5.4.3 Ergo Controller



1. Press the **Settings** tab to open the opening view of the **Settings** screen.
And then, press the **Utility** button.



2. Press the **Buzzer ON/OFF** button.



3. Press the **TI-ERGC ON/OFF** button.
The beep sounds turns on or off with the button.
 - To apply the setting, press the **OK** button.
 - To cancel the setting, press the **Cancel** button.

- Button appearance for beep On



- Button appearance for beep Off





4. Press the **PREVIOUS** button to return to the opening view of the **Settings** screen.



5.5 Setting Up a Color for Icons

A color for icons on the LCD of the remote control pad can be changed to gray, blue, or light blue. Select a easily viewable color for your convenience. The default color is gray.

Note:

After setting, be sure to save the settings with the SAVE button on the Control screen. If the product is turned off without saving information, the settings will be canceled. For details on saving, refer to "2.5.9 Saving the Settings."



1. Press the **Settings** tab to open the **Settings** screen. And then, press the **Utility** button.



2. Press the **TI-RCP** button.



3. Press the **Icon Color** button.



4. Press a color button (**Gray**, **Blue**, or **Light Blue**) to be used.
 - To apply the setting, press the **OK** button.
 - To cancel the setting, press the **Cancel** button.



5. Press the **PREVIOUS** button to return to the opening view of the **Settings** screen.



5.6 Setting Up the LCD Panel Appearance on the Microscope Body (Ti-E or Ti-E/B)

The LCD panel (status display panel) appearance on the microscope body (Ti-E or Ti-E/B) at power-on can be changed.

Note:

After setting, be sure to save the settings with the SAVE button on the Control screen. If the product is turned off without saving information, the settings will be canceled. For details on saving, refer to "2.5.9 Saving the Settings."



1. Press the **Settings** tab to open the opening view of the **Settings** screen.

And then, press the **Utility** button.



2. Press the **Ti-E** button.



3. Press the **Ti-E VFD Display** button.



4. Change the LCD panel appearance with the DISPLAY switch on the microscope body.
 - To apply the setting, press the **OK** button.
 - To cancel the setting, press the **Cancel** button.



5. Press the **PREVIOUS** button to return to the opening view of the **Settings** screen.



5.7 Setting up the Control Method for the Elevating Section

The control method for the elevating section can be selected from the focus knob on the Ti-E, the Ergo Controller, and the focus knob on the Ti-E and the Ergo Controller.

The default setting is the focus knob on the Ti-E and the Ergo Controller. Change the settings if necessary.

Note:
After setting, be sure to save the settings with the SAVE button on the Control screen. If the product is turned off without saving information, the settings will be canceled. For details on saving, refer to "2.5.9 Saving the Settings."



1. Press the **Settings** tab to open the opening view of the **Settings** screen.
 And then, press the **Utility** button.



2. Press the **Z CNTRL** button.



3. Press the **Z Control** button.



4. Select an option from "Ti-E" (the focus knob on the Ti-E), "TI-ERGC" (the Ergo Controller), and "Ti-E and TI-ERGC" (the focus knob on the Ti-E and the Ergo Controller).
 - To apply the setting, press the **OK** button.
 - To cancel the setting, press the **Cancel** button.



5. Press the **PREVIOUS** button to return to the opening view of the **Settings** screen.



5.8 Setting up the Display Time of Messages

Messages appear when the remote control pad is operated.

The display time of messages are set to a time for normal readings. But it can be modified if necessary.

Note:

After setting, be sure to save the settings with the SAVE button on the Control screen. If the product is turned off without saving information, the settings will be canceled. For details on saving, refer to "2.5.9 Saving the Settings."



1. Press the **Settings** tab to open the opening view of the **Settings** screen.
And then, press the **Utility** button.



2. Press the **TI-RCP** button.



3. Press the **Message Speed** button.



4. Select an option from "Short," "Middle," and "Long."
 - To apply the setting, press the **OK** button.
 - To cancel the setting, press the **Cancel** button.



5. Press the **PREVIOUS** button to return to the opening view of the **Settings** screen.



5.9 Displaying the Program Version

Program versions of motorized devices connected to the Ti-E and the HUB controller A can be displayed.

Note:

When the joy stick controller is attached, its version number appears in place of the Ergo Controller.



1. Press the **Info** tab to open the **Info** screen.

6

Troubleshooting

Misuse of the product may adversely affect the product performance, even if the product is not damaged. If any of the following troubles occurs, be sure to check the following table for possible causes before requesting a service.

For problems not listed below and in case the problem persists, disconnect the device and contact your local Nikon representative.

Troubles on Starting Up the Remote Control Pad

Trouble	Cause	Countermeasure
The remote control pad does not start. (The screen freezes with the title screen displayed.)	The Ti-E or Ti-E/B is not connected to the Hub Controller A body correctly.	Set the POWER switch on the Hub Controller A body to "OFF." Disconnect and connect the Ti-E or the Ti-E/B to the Hub Controller A again. See "2.3 Connecting Motorized Units to the Hub Controller A" on Chapter 2, "Settings Before Observation."
	The Power switch on the Ti-E or Ti-E/B microscope body is not turned on.	Set the POWER switches on the Hub Controller A body and the microscope body to "OFF."
The remote control pad does not start. (The title screen does not appear.)	The remote control pad is not connected to the Hub Controller A body correctly.	Set the POWER switch on the Hub Controller A body to "OFF." Disconnect and connect the remote control pad to the Hub Controller A body again. See "2.2 Connecting the Remote Control Pad to the Hub Controller A" on Chapter 2, "Settings Before Observation."

Troubles on Device Settings

Trouble	Cause	Countermeasure
Device settings return to the previous settings when turned off and on.	The settings are not saved with the SAVE button on the Control screen.	Press the SAVE button on the Control screen to save the settings. See "2.5.9 Saving the Settings" in Chapter 2, "Settings Before Observation."

Troubles on Button Operations

Trouble	Cause	Countermeasure
Operation buttons for a motorized unit do not appear. (buttons for other than the motorized shutter and the digital camera)	The motorized unit is not connected to the Hub Controller A body correctly.	Set the POWER switch on the Hub Controller A body to "OFF." Disconnect and connect the motorized unit to the Hub Controller A body again. See "2.3 Connecting Motorized Units to the Hub Controller A" on Chapter 2, "Settings Before Observation."
The operation buttons for the motorized shutter do not appear.	The information of the motorized shutter has not been set up yet.	Set up the motorized shutter settings. See "2.5.7 Motorized Shutter" in Chapter 2, "Settings Before Observation."

Trouble	Cause	Countermeasure
The operation buttons for the digital camera do not appear.	The information of the digital camera has not been set yet.	Set up the digital camera settings. See "2.5.8 Digital Camera" in Chapter 2, "Settings Before Observation."
The operation button of the analyzer block is disabled. Only its frame of the button can be seen.	The information of the analyzer block has not been set up for the first tier of the motorized filter turret.	Set up the analyzer block settings for the first tier of the motorized filter turret. See "2.5.3 Filter Block and Analyzer Block (the First Tier of the Motorized Filter Turret)" of "2.5 Setting Up the Device Information" on Chapter 2, "Settings Before Observation."
No beep sounds when operating any button.	The beep sound is disabled.	Enable the beep sound. Refer to "5.4 Turing On/Off Beep Sounds" in Chapter 5, "Operation Functions and Display Functions."

Troubles on the Remote Control for the Motorized Units

Trouble	Cause	Countermeasure
The motorized shutter does not work.	The motorized shutter is not connected to the HUB controller A body correctly.	Set the POWER switches on the Hub Controller A body and the motorized shutter to "OFF." Disconnect and connect the motorized shutter to the Hub Controller A body again. See "2.3 Connecting Motorized Units to the Hub Controller A" on Chapter 2, "Settings Before Observation."
	The motorized shutter and the Hub Controller A body are connected in a manner not matching with the data settings.	Check the connection of the motorized shutter and the Hub Controller A and change the data settings. See "2.5.7 Motorized Shutter" in Chapter 2, "Settings Before Observation."
The digital camera does not start capturing images.	The digital camera is not connected to the Hub Controller A body correctly.	Set the POWER switch on the Hub Controller A body to "OFF." Disconnect and connect the digital camera to the Hub Controller A body again. See "2.3 Connecting Motorized Units to the Hub Controller A" on Chapter 2, "Settings Before Observation."
	The digital camera and the Hub Controller A body are connected in a manner not matching with the data settings.	Check the connection of the digital camera and the Hub Controller A and change the data settings. See "2.5.8 Digital Camera" in Chapter 2, "Settings Before Observation."
The motorized nosepiece does not rotate when the elevating section is located at some positions.	The rotation stop function (Rotation Stopper) is enabled for the motorized nosepiece.	Disable the rotation stop function. See "4.4.2 Disabling the Rotation Stop Function" in Chapter 4, "Rotation Stop Function."

Trouble	Cause	Countermeasure
The diascope illumination lamp cannot be turned on or off.	The EXTERNAL switch on the power supply device for the diascope illumination lamp is set to "OFF."	Set the EXTERNAL switch on the power supply device for the diascope illumination lamp to "ON." See "2.3.1 Setting the EXTERNAL Switch on the Power Supply Device for Diascope Illumination to ON." of "2.3 Connecting Motorized Units to the Hub Controller A " in Chapter 2, "Settings Before Observation."
	The remote control function is disabled.	Enable the remote control function. See "3.8.1 Enabling/Disabling the Remote Control Function" of "3.8 Operating the Diascope Illumination Lamp" in Chapter 3, "Basic Operations."
The voltage for the diascope illumination lamp cannot be adjusted.	The EXTERNAL switch on the power supply device for the diascope illumination lamp is set to "OFF."	Set the EXTERNAL switch on the power supply device for the diascope illumination lamp to "ON." See "2.3.1 Setting the EXTERNAL Switch on the Power Supply Device for Diascope Illumination to ON." of "2.3 Connecting Motorized Units to the Hub Controller A " in Chapter 2, "Settings Before Observation."
	The remote control function is disabled.	Enable the remote control function. See "3.8.1 Enabling/Disabling the Remote Control Function" of "3.8 Operating the Diascope Illumination Lamp" in Chapter 3, "Basic Operations."
	The diascope illumination lamp is turned off.	Turn on the diascope illumination lamp. See "3.8.2 Turning On/Off the Lamp" of "3.8 Operating the Diascope Illumination Lamp" in Chapter 3, "Basic Operations."

Troubles on Displaying the Motorized Device Conditions

Trouble	Cause	Countermeasure
No objective condition appears.	The motorized nosepiece is not connected to the Hub Controller A body correctly.	Set the POWER switch on the Hub Controller A body to "OFF." Disconnect and connect the motorized nosepiece to the Hub Controller A body again. See "2.3 Connecting Motorized Units to the Hub Controller A" on Chapter 2, "Settings Before Observation."
	The Perfect Focus W/Motor Nosepiece is not attached to the microscope body correctly.	Set the POWER switch on the Hub Controller A body to "OFF." Detach and attach the Perfect Focus W/Motor Nosepiece to the Ti-E or Ti-E/B microscope body again.

Trouble	Cause	Countermeasure
No condenser cassette condition appears.	The motorized condenser turret is not connected to the Hub Controller A body correctly.	Set the POWER switch on the Hub Controller A body to "OFF." Disconnect and connect the motorized condenser turret to the Hub Controller A body again. See "2.3 Connecting Motorized Units to the Hub Controller A" on Chapter 2, "Settings Before Observation."
No filter block condition appears. (for the first tier of the motorized filter turret)	The first tier of the motorized filter turret is not connected to the Hub Controller A body correctly.	Set the POWER switch on the Hub Controller A body to "OFF." Disconnect and connect the first tier of the motorized filter turret to the Hub Controller A body again. See "2.3 Connecting Motorized Units to the Hub Controller A" on Chapter 2, "Settings Before Observation."
No filter block condition appears. (for the second tier of the motorized filter turret)	The second tier of the motorized filter turret is not connected to the Hub Controller A body correctly.	Set the POWER switch on the the Hub Controller A body to "OFF." Disconnect and connect the second tier of the motorized filter turret to the Hub Controller A body again. See "2.3 Connecting Motorized Units to the Hub Controller A" on Chapter 2, "Settings Before Observation."
No excitation filter condition appears.	The motorized excitation filter wheel is not connected to the Hub Controller A body correctly.	Set the POWER switch on the Hub Controller A body to "OFF." Disconnect and connect the motorized excitation filter wheel to the Hub Controller A body again. See "2.3 Connecting Motorized Units to the Hub Controller A" on Chapter 2, "Settings Before Observation."
No barrier filter condition appears.	The motorized barrier filter wheel is not connected to the Hub Controller A body correctly.	Set the POWER switch on the Hub Controller A body to "OFF." Disconnect and connect the motorized barrier filter wheel to the Hub Controller A body again. See "2.3 Connecting Motorized Units to the Hub Controller A" on Chapter 2, "Settings Before Observation."
The Z-axis position does not appear.	The Ti-E or the Ti-E/B is not connected to the Hub Controller A body correctly.	Set the POWER switch on the Hub Controller A body to "OFF." Disconnect and connect the Ti-E or the Ti-E/B to the Hub Controller A again. See "2.3 Connecting Motorized Units to the Hub Controller A" on Chapter 2, "Settings Before Observation."
The optical path condition does not appear.	The Ti-E or the Ti-E/B is not connected to the Hub Controller A body correctly.	Set the POWER switch on the Hub Controller A body to "OFF." Disconnect and connect the Ti-E or the Ti-E/B to the Hub Controller A again. See "2.3 Connecting Motorized Units to the Hub Controller A" on Chapter 2, "Settings Before Observation."

7

Daily Maintenance

Cleaning

- We recommend that you use a silicon cloth to clean the product.
- For persistent dirt, dampen a piece of gauze with neutral detergent and wipe gently.
- Use of organic solvent could result in discoloration of the plastic parts.

Decontamination

- We recommend that you use 70% medical alcohol for disinfecting the product.
- If a specimen is spilt onto the microscope, check to determine whether the specimen is hazardous. If the specimen is hazardous, follow your standard facility procedures.
- Use of organic solvent could result in discoloration of the plastic parts.

Storage

- Store the product in a dry place where mold is not likely to form.
- Cool down the product sufficiently. Disconnect cables. And then, store the product in accordance with the storage conditions described in Chapter 8, "Specifications."

Periodical Inspection (Charged)

Periodical inspections (expenses charged) are recommended in order to maintain the performance of the product. Contact your nearest Nikon representative for detailed information.

8

Specifications

System configuration	Ti-E or Ti-E/B, TI-HUBC/A Hub Controller A, and TI-RCP Remote Control Pad
Dimensions (TI-RCP)	147 (W) x 223 (D) x 85 (H) mm
Mass (TI-RCP)	1.9 kg
Operating conditions	Temperature: 0 to 40°C Relative humidity: 85% RH maximum with no condensation Altitude: 2000 m maximum Pollution degree: Degree 2 Installation category: Category II Indoor use only
Transport conditions and storage conditions	Temperature: -20 to +60°C Relative humidity: 90% RH maximum with no condensation
Safety Standards Compliance	<ul style="list-style-type: none"> • This is a UL listed product. • This product meets FCC Part 15B Class A requirements: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. • This product complies with Canadian EMI. (ICES-003 Class A) This Class A digital apparatus complies with Canadian ICES-003. Cet appareil numérique de classe A est conforme à la norme NMB-003 du Canada. • CE marking <ul style="list-style-type: none"> • This product meets EU IVD Directive requirements. (GM-approved: in vitro diagnostic medical device) • This product meets EU Low Voltage Directive requirements. • This product meets EU EMC Directive requirements. (EN61326) • This product complies with Australian EMC. (AS/NZS C1SPR11)

