1 Reset convenient functions.

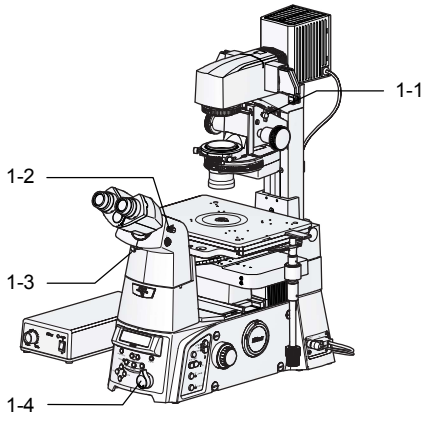


Figure 2.2-1 Resetting convenient functions

1. **Release the condenser refocusing clamp on the dia pillar illuminator by rotating it counterclockwise.**
2. **Open the shutter at the eyepiece by pushing in the shutter open/close lever on the right side of the eyepiece tube.**
3. **Move the Bertrand lens out of the optical path by moving the Bertrand lens operation lever on the front of the eyepiece tube to position "O".**
4. **Rotate the intermediate magnification selector dial on the front of the microscope to the "1x" side.**

2 Turn on the dia illuminator.

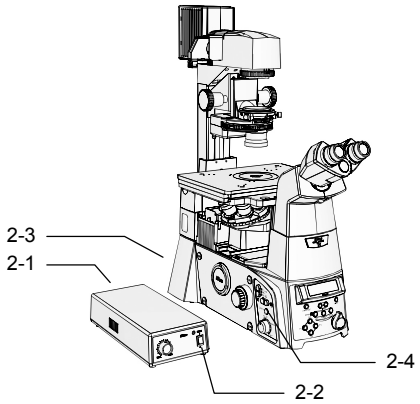


Figure 2.2-2 Turning on the dia illuminator

1. **Set the EXTERNAL switch on the back of the power supply to "ON".**
2. **Turn on the power supply by pressing the "I" side of the POWER switch on the power supply.**
3. **Turn on the Ti-E microscope by pressing the "ON" side of the POWER switch on the back of the microscope.**

   The Ti-E microscope is turned on, and the current status is displayed on the status display panel.

4 **Turn on the lamp by pressing the dia illumination lamp ON/OFF switch on the left side of the microscope.**

The display content of the status display panel can be switched between the following three screens by pressing the DISPLAY switch. Switch the screen as necessary to display the information required for the operation.

■ **Display content of the status display panel**

```
Z:     0.000um
E100 Coarse
```

• **Upper:** Z-axis position
• **Lower:** Optical path | Focus knob resolution

```
              10x/0.25
E100 Coarse   PFS:Out
```

• **Upper:** Objective data
• **Lower:** Optical path | Focus knob resolution | PFS

```
   10x Z:     0.000um
E100 Coarse   PFS:Out
```

• **Upper:** Magnification | Z-axis position
• **Lower:** Optical path | Focus knob resolution | PFS

* Additional display patterns will become available when using motorized option devices. For details of the display content, refer to the instruction manual provided with Hub Controller A.

3 Adjust the illumination for optimal color reproduction.

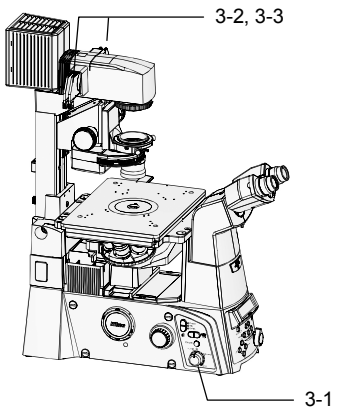


Figure 2.2-3 Adjusting the illumination

1. **Rotate the brightness control knob on the left side of the microscope to the “12 V 100 W” position.**
2. **Move the NCB11 filter on the dia pillar illuminator into the optical path.**
3. **Move the ND4 filter on the dia pillar illuminator into the optical path.**

4 Prepare the optical path.

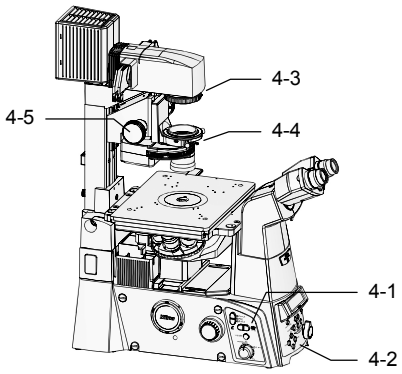


Figure 2.2-4 Setting the optical path

1. **Move the 10x objective into the optical path by pressing the Obj. switch on the left operation panel.**

   The status display panel can be used to confirm which objective is in the optical path.

   ■ **Display example for objective (10x, NA 0.25)**

   ```
                  10x/0.25
   E100 Coarse   PFS:Out
   ```

2. **Direct a 100% light towards the eyepiece observation port by pressing the EYE switch on the front operation panel.**

   The pressed switch will light up in green, and the port name “E100” will be displayed on the status display panel.

   ■ **Display example for output port**

   ```
   Z:     0.000um
   E100 Coarse
   ```

3. **Fully open the aperture diaphragm by rotating the aperture diaphragm knob on the dia pillar illuminator clockwise to the limit.**
4. **Fully open the aperture diaphragm by moving the aperture diaphragm open/close lever on the system condenser to the limit.**
5. **Lower the condenser mount to the limit by rotating the condenser focus knob on the dia pillar illuminator.**

- If an ELWD condenser lens is attached to the system condenser, place the condenser mount 1 cm below the upper limit.
- If using the ELWD-S condenser, position the condenser mount approximately 2 cm below the upper limit.

5 Set up for bright-field microscopy.

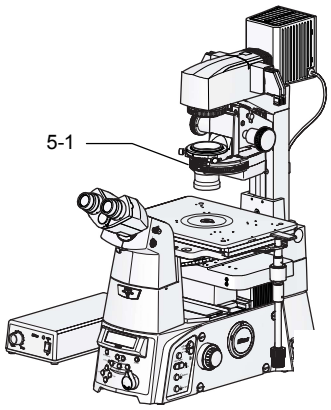


Figure 2.2-5
Selecting the condenser cassette for bright-field microscopy

1. **Move the condenser cassette for bright-field microscopy into the optical path by rotating the condenser turret to position “A”.**

6 Set specimen and adjust the focus.

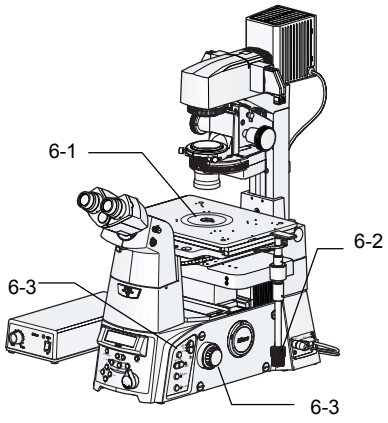


Figure 2.2-6
Setting the specimen and focusing on it

1. **Place the specimen onto the stage.**
2. **Move the stage to bring the observation target into the center of the field of view.**
3. **Look into the eyepiece. Adjust the focus onto the specimen by using the Coarse/Fine/ ExFine switches and the focus knobs on the sides of the microscope.**

   Use the Coarse/Fine/ExFine switches to change the focus knob resolution (speed of vertical movement) for easier focus adjustment. There are three resolutions: Coarse, Fine, and ExFine (extra fine). The current setting will be displayed by an indicator.

   Focus knob resolution and Z-axis position can be displayed on the status display panel.

   ■ **Display example for focus knob resolution and Z-axis position**

   ```
   Z:  124.225um
   E100 Fine
   ```

The Z-axis position information on the status display panel can be reset to zero by pressing the Z-RESET switch on the front operation panel.

By pressing the Z-RESET switch when the focus is on the specimen, you will be able to use the Z-axis position value as reference when readjusting the focus.

7 Adjust the diopters and the interpupillary distance.

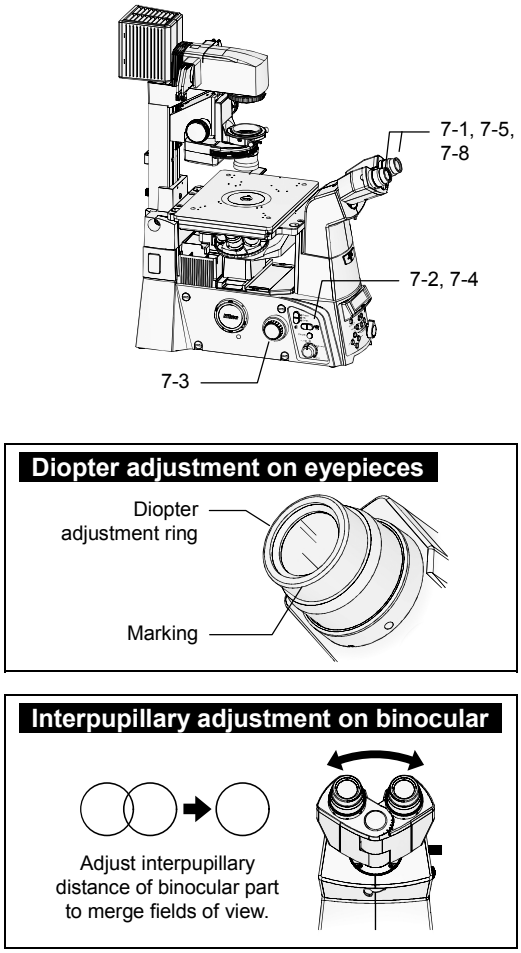


Figure 2.2-7
Diopter adjustment and interpupillary distance adjustment

1. **On each eyepiece, rotate the diopter adjustment ring to align its lower end with the marking on the eyepiece.**

   This will be the reference position for diopter adjustment.

2. **Move the 40x objective into the optical path by pressing the Obj. switch.**

3. **Look into the left eyepiece with your left eye. Adjust the focus onto the specimen by rotating the focus knobs.**

   Use the Coarse/Fine/ExFine switches to change the focus knob resolution for easier focus adjustment.

4. **Move the 10x objective into the optical path by pressing the Obj. switch.**

5. **Look into the left eyepiece with your left eye. Adjust the focus onto the specimen by rotating the diopter adjustment ring on the left eyepiece.**

   Do not touch the focus knobs at this time.

6. **Repeat steps 2 through 5 two times.**

7. **Adjust the right eyepiece.**

   Repeat steps 2 through 6, but this time using the right eyepiece instead of the left.

8. **Adjust the interpupillary distance of the binocular part to merge the two fields of view.**

8 Re-adjust the focus.

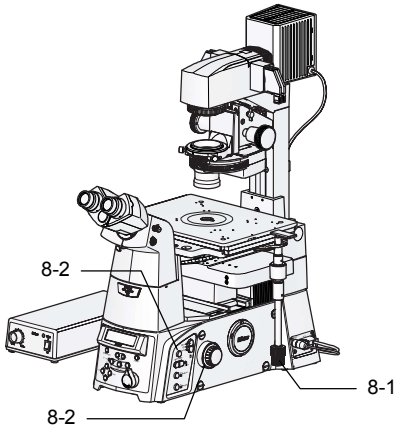


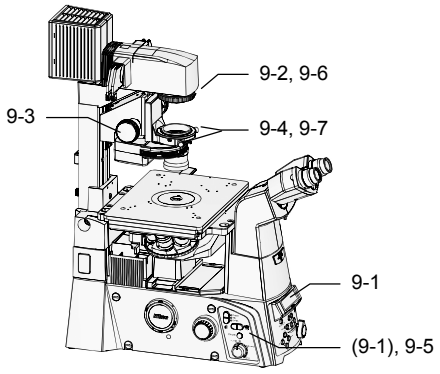
Figure 2.2-8 Focusing on the specimen again

1. **Look into the eyepiece. Move the stage to bring the observation target into the center of the field of view.**

2. **Focus on the target by rotating the focus knobs.**

   Use the Coarse/Fine/ExFine switches to change the focus knob resolution for easier focus adjustment.

9 Center the condenser.



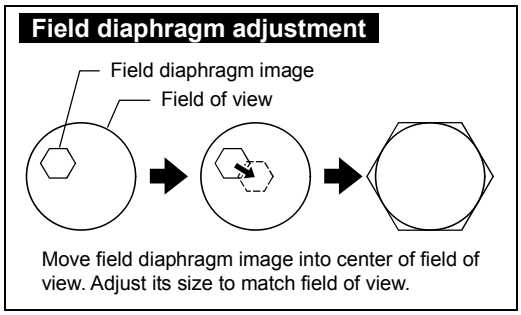


Figure 2.2-9 Centering the condenser

1. **Check that the 10x objective is in the optical path.**

   The status display panel can be used to confirm which objective is in the optical path.

   ■ **Display example for objective (10x, NA 0.25)**

   ```
                  10x/0.25
   E100 Coarse   PFS:Out
   ```

   If not, move the 10x objective into the optical path by pressing the Obj. switch on the left side of the microscope.

2. **Rotate the field diaphragm knob on the dia pillar illuminator until the field diaphragm image is visible in the field of view.**

3. **Adjust the focus onto the field diaphragm image by rotating the condenser focus knob on the dia pillar illuminator.**

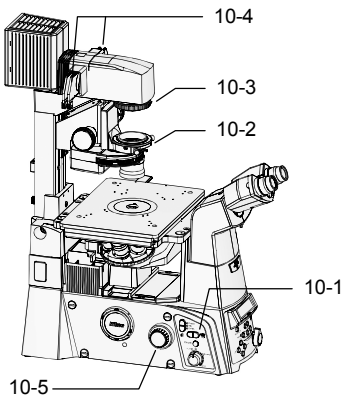
4. **Move the field diaphragm image to the center of the field of view by turning the two condenser centering screws on the dia pillar illuminator.**

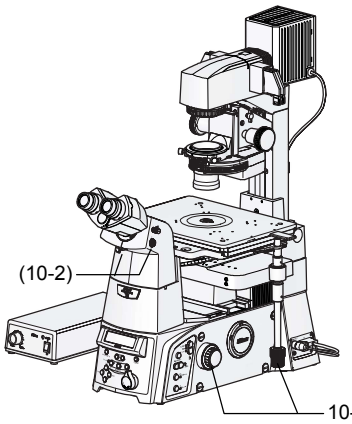
5. **Move the 40x objective into the optical path by pressing the Obj. switch.**

6. **Adjust the size of the field diaphragm image to closely match the size of the field of view, by rotating the field diaphragm knob on the dia pillar illuminator.**

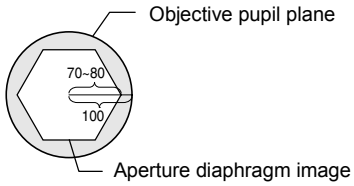
7. **Move the field diaphragm image to the center of the field of view by turning the two condenser centering screws on the dia pillar illuminator.**

10 Observe the specimen.





Aperture diaphragm adjustment



Adjust the size of the aperture diaphragm image to 70-80% the size of the objective pupil plane.

Figure 2.2-10 Observing the specimen

1. **Move an objective with the desired magnification into the optical path by pressing the Obj. switch.**
2. **Adjust the size of the aperture diaphragm to "70-80% the size of the NA of the objective" by moving the aperture diaphragm open/close lever on the system condenser.**

   Move the Bertrand lens into the optical path by moving the Bertrand lens in/out lever on the eyepiece tube to position "B". This will allow you to observe the objective pupil plane and the aperture diaphragm image. Adjust the focus by rotating the Bertrand lens focusing knob on the right side of the eyepiece tube, and then adjust the size of the aperture diaphragm image to 70-80% the size of the objective pupil plane.

   When done, move the Bertrand lens out of the optical path by moving the operation lever to position "O".
3. **Adjust the size of the field diaphragm image to closely match the size of the field of view, by rotating the field diaphragm knob on the dia pillar illuminator.**
4. **Adjust the brightness for the field of view by moving the ND filters on the dia pillar illuminator in and out of the optical path.**

If color reproducibility is not required, brightness adjustment can be performed by changing the lamp voltage with the brightness control knob on the left side of the microscope.

5. **Move the stage to bring the observation target into the center of the field of view. Adjust the focus by rotating the focus knobs.**

11 Change the specimen.

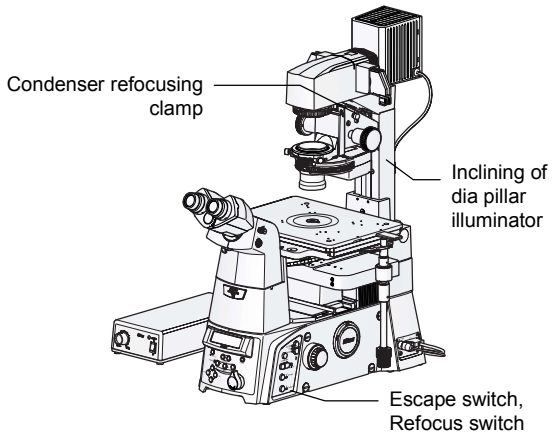


Figure 2.2-11 Changing the specimen

Use the following functions as necessary.

- **Inclining of dia pillar illuminator**

  When using the 100W dia pillar illuminator, the entire dia pillar illuminator can be inclined backward by loosening the fixing knob on its back side, so as to secure more working space.

- **Escape switch, Refocus switch**

  If there is a need to lower the objective, the objective can be retracted temporarily by pressing the Escape switch on the right operation panel.

  To return the objective to approximately the same height, press the Refocus switch without rotating the focus knobs.

- **Condenser refocusing clamp**

  If there is a need to move the condenser up and down, tighten the condenser refocusing clamp before moving the condenser. This will make it easier to restore the condenser to the original position.

12 End the observation.

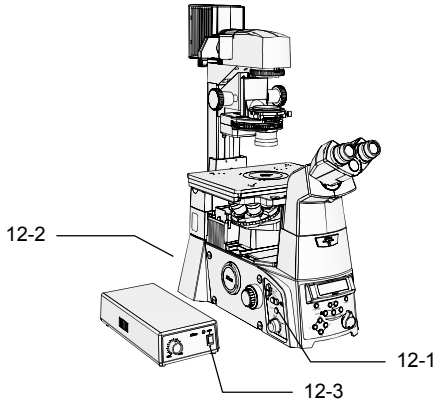


Figure 2.2-12 Ending the observation

1. **Turn off the dia illumination by pressing the dia illumination lamp ON/OFF switch on the left side of the microscope.**
2. **Turn off the microscope by pressing the "OFF" side of the POWER switch on the back of the microscope.**
3. **Turn off the power supply by pressing the "O" side of the POWER switch on the power supply.**

If placing a cover on the microscope, wait until the lamp has cooled sufficiently.