

# ***Nikon***

## **DS Camera Control Unit DS-L2**

### **DS Camera Head**

**DS-Fi1 / DS-5M / DS-2Mv / DS-2MBW**

### **DS Cooled Camera Head**

**DS-Qi1Mc / DS-Fi1c / DS-5Mc / DS-2MBWc / DS-Ri1**

## **< Quick Reference >**

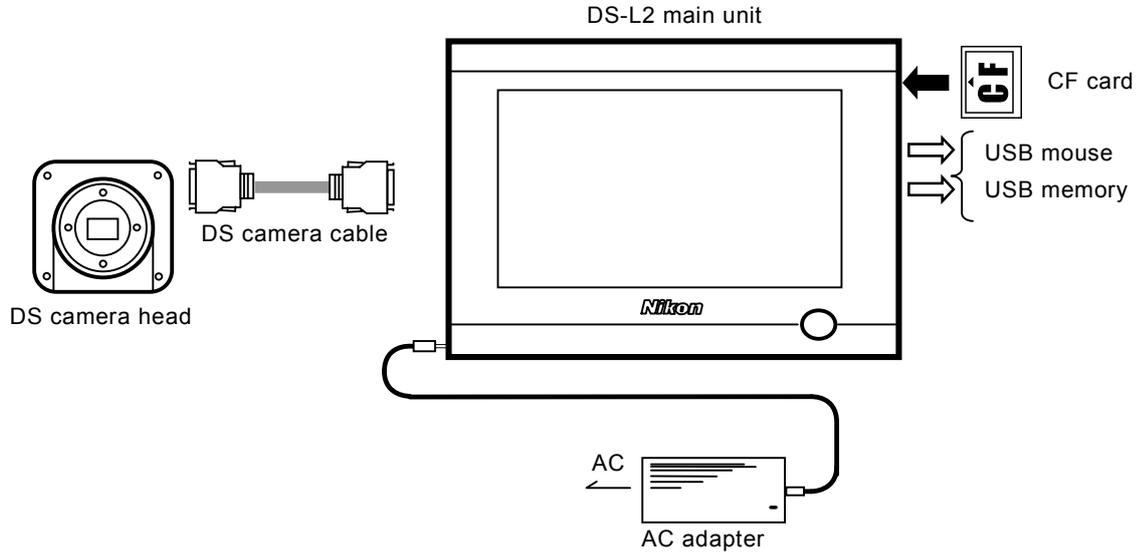
**(Ver. 4.4)**



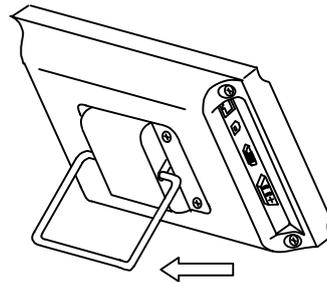
# Setup and Startup

## 1. Setting up External Equipment

Connect the DS camera head, AC adapter, and USB mouse to the DS-L2, and insert a USB memory into the USB connector, or a CF card into the CF card connector.

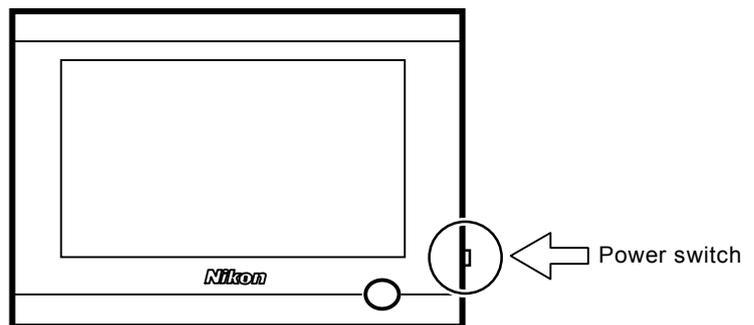


Install the DS-L2 by extracting the stand arm.



## 2. Starting

Turn on power by pressing the power switch located on the right side.



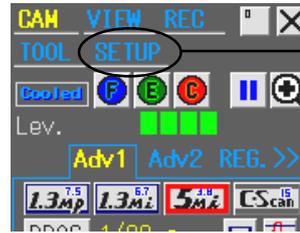


# Initial Settings

When you use the DS-L2 for the first time, set date/time, etc.

## 1. Displaying the SETUP Menu

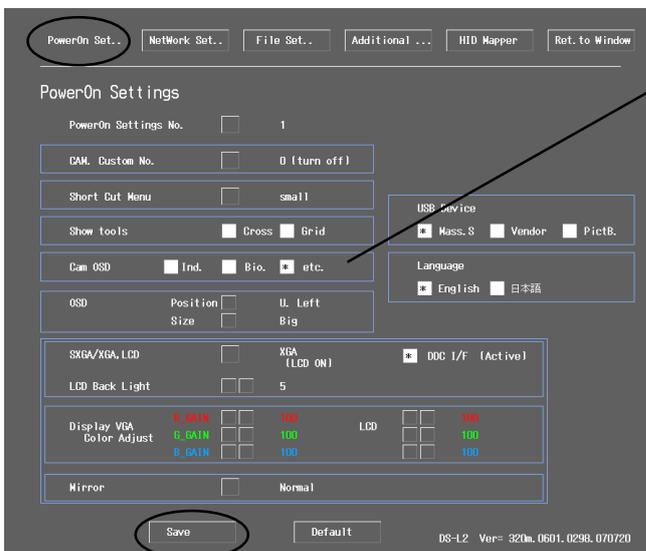
Open the **SETUP** menu by selecting the **[SETUP]** tab from the main menu.



Select the **[SETUP]** tag.

## 2. Selecting a Scene Mode Type

Select **PowerOn Set...** and specify the type of scene modes to be displayed in the main menu.



Selects a type of scene menu.

Industrial type: The CAM menu includes wafer/IC-chip, metal ceramic, circuit board, and FPD scene modes.

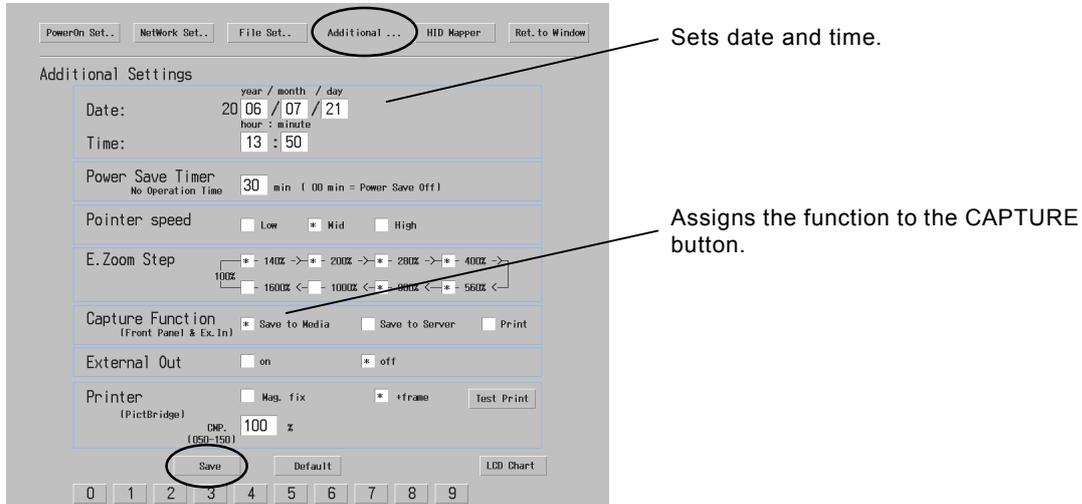
Biological type: The CAM menu includes dark field/fluorescent, bright field, differential interference/phase contrast, HE stained specimen, and enzyme labeled antibody method scene modes.

Other type: The CAM menu includes asbestos specimens (2 types) scene modes.

When finished, click **Save** to save the settings.

### 3. Setting Date and Save Destination

Select **Additional...** and set date and time. Then assign the [Save to Media] function to the CAPTURE button.



When finished, click **Save** to save the settings.

#### 4. Specifying the Save Folder and File names

Select **File Set...** and name the folder and file where you want to save photographed images.

The screenshot shows the 'File Settings' dialog box with the following fields and options:

- Media Dir:** Prefix: IMGBOX (CF, USB Memory) / Auto Create:  Auto ( /FFYYMMDD )
- FTP Dir:** Prefix: FTPBOX (max 8 char.) / Auto Create:  Auto ( /FFYYMMDD ) (prefix(2)-Year-Month-Day)
- File Name:** Prefix+ Num.: DSL2 (max 4 char.) / Auto Create:  Auto ( /DDHHMMSS Day-Hour-Min.-Sec. )
- Format:** Format  C: FAT32 255 MB

Buttons: Save, Default. Keyboard: skip, 0-9, A-M, N-Z.

Names a save folder.

##### To specify a folder name:

In the [Media Dir] field, specify a folder name of up to eight characters. If the [Auto] check box is checked, a folder will be automatically created based on the save date. (The folder name consists of the two first characters specified in the [Media Dir] field, followed by six characters denoting the date.)

Names a save file.

##### To specify a file name:

Specify the first string of up to four characters. This string will be followed by an automatically assigned serial number, which together form the name of the save file.

If the [Auto] check box is checked, the name of the file name will consist of eight characters representing the day, hours, minutes, and seconds.

When finished, click **Save** to save the settings.

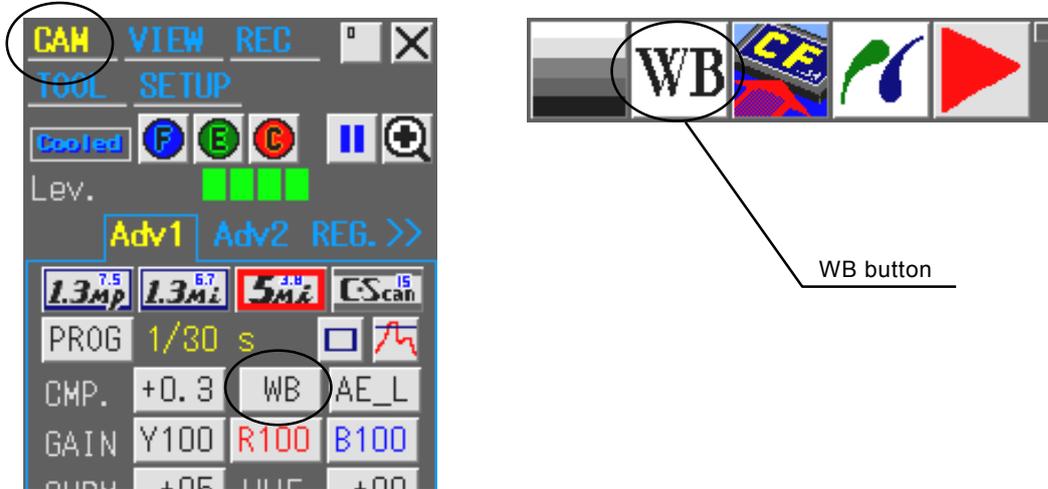
Finally, click **Ret. to Window** in the top right of the window to return to the original image view.

# Photographing

## 1. Preparations Before Photographing

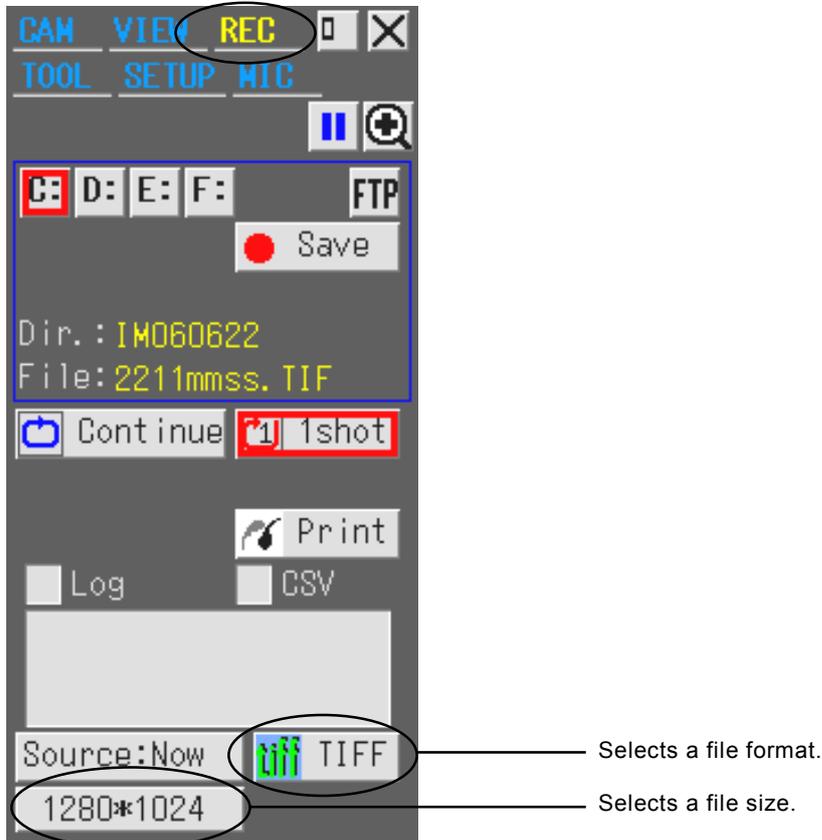
### 1.1 Adjusting White Balance

To adjust white balance, observe an evenly white subject, such as the transparent part of a preparation. With this subject, select [CAM] from the main menu and click **WB** on the CMP. row, or click the WB button in the shortcut menu.



### 1.2 Setting File Format and Size

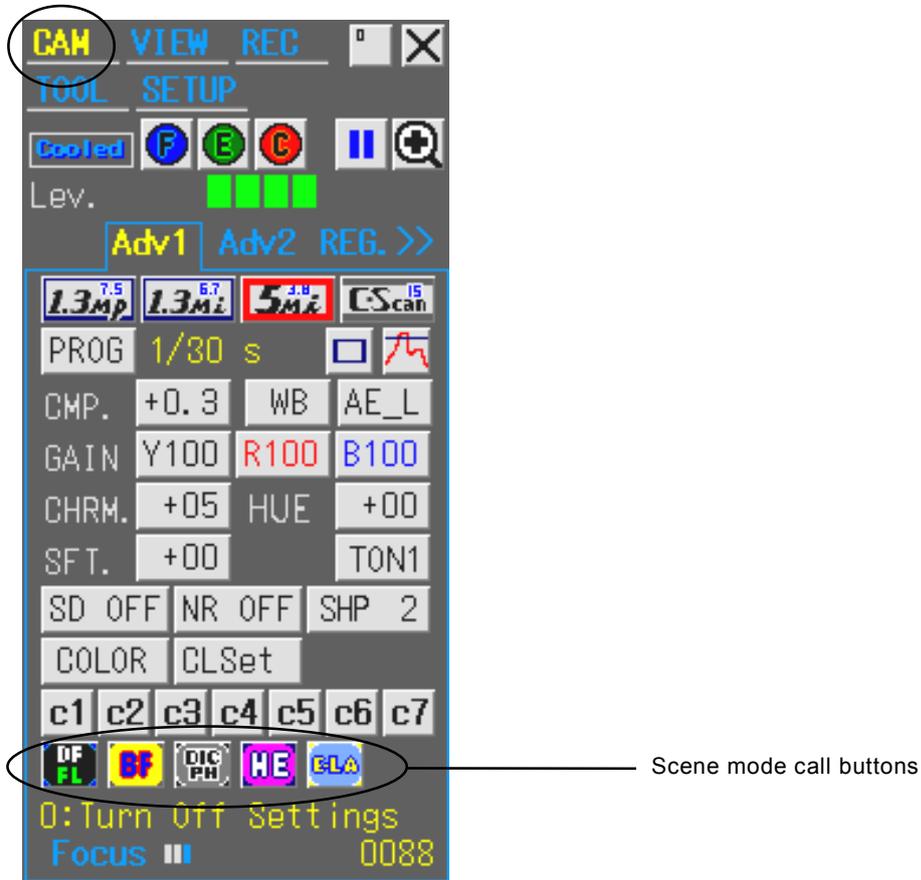
Use [REC] in the main menu to select the format and size of the file you want for photographing images.



## 2. Photographing

### 2.1 Selecting a Scene Mode

The [CAM] menu in the main menu provides scene mode call buttons, allowing you to select a scene mode appropriate for the specimen to be photographed.



For details of scene modes, see the following.

#### ● Industrial specimen scene modes



##### [Wafer IC-chip]

Suitable for wafer or IC chip.



##### [Metal Ceramic]

Bright parts of a metal specimen are expressed as white, and dark parts are expressed as transparent.

This mode can also be used for ceramic and plastic specimens.



##### [Circuit Board]

Suitable for photographing of mounting defects on a part-mounted circuit board.

Clipping of highlights in component leads and solder joints are suppressed, allowing defects to be easily detected.

This mode is also suitable for high-contrast subjects such as gears and other metal components.



**[FPD] :**

This mode is suitable for photographing the color filters for flat display devices, such as liquid crystal display and plasma display.

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\* On FPD scene mode, better color reproduction could be obtained by setting color temperature of the display to 5000K, which is close to the lamp temperature of microscope, when you display images on an external screen. If setting the color temperature on the display is difficult, a better result could also be obtained by setting B of the color balance adjustment to 80. However, there would be a difference in histogram curve even after white balance adjustment.

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● **Biological specimen scene modes**



**[DF / FL] : Dark field photography/fluorescent photography**

Use this mode to photograph a dark subject.

The camera operability for position or focus adjustment is improved by increasing the camera's sensitivity. High-resolution images can be obtained from the photographed data.



**[BF] : Bright field photography**

Intended for general stained specimens.

In the case of EVG staining, a good result may be obtained by setting R of the color balance adjustment to 94.



**[DIC / PH]**

Contrast is enhanced for differential interference and phase contrast photography purposes.



**[HE]**

Provided for photographing of HE stained specimens.

This mode is optimized for color reproduction specific to HE.



**[ELA]**

Provided for photographing of ELA (Enzyme labeled antibody method).

This mode is optimized for color reproduction specific to DAB.

● **Other scene modes**



**[Asbestos / Red]**

Provided for photographing of asbestos specimens.

This mode is optimized for the colors specific to chrysotile (immersed in a liquid with refractive index of 1.550), crocidolite (immersed in a liquid with refractive index of 1.680), and amosite (immersed in a liquid with refractive index of 1.680).



**[Asbestos / Blue]**

Provided for photographing of asbestos specimens.

This mode is optimized for the colors specific to crocidolite (immersed in a liquid with refractive index of 1.700).

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\* Using DS-5M or DS-5Mc may cause poorer reproducibility than using DS-Fi1, DS-Fi1c, DS-2Mv or DS-Ri1 for some asbestos specimen. We recommend using DS-Fi1, DS-Fi1c, DS-2Mv or DS-Ri1 for asbestos observation.

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## 2.2 Adjusting Brightness

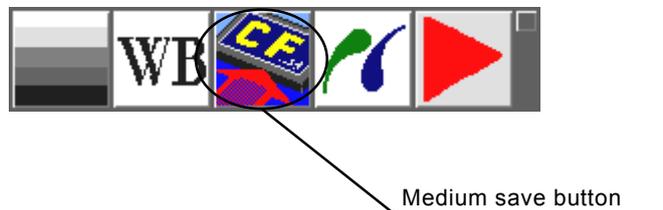
To adjust brightness, select [CAM] from the main menu and click **+0.3** on the **CMP.** row, or click the exposure compensation button in the shortcut menu.



When you click the exposure compensation button, its design changes to .  
Click the  or  button to adjust the brightness.

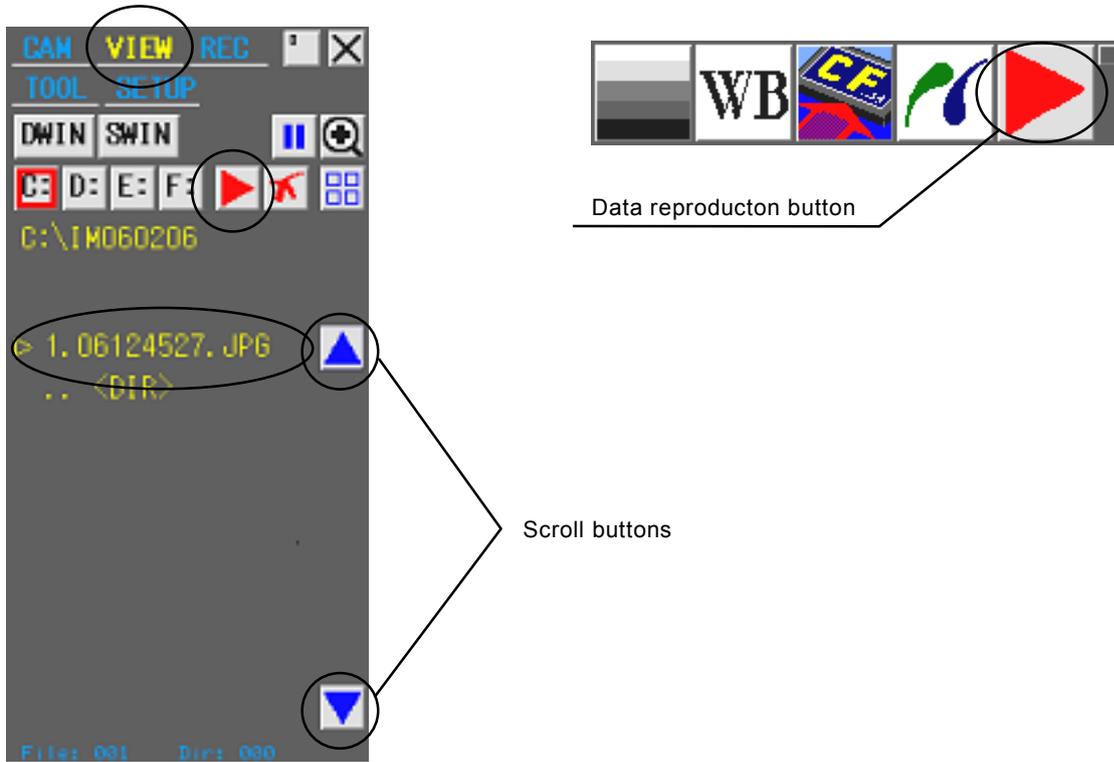
## 2.3 Photographing

To photograph and save an image, select [CAM] from the main menu and click  , or click the Medium save button.



### 3. Reviewing a Saved Image

To review (display) a photographed image, click [VIEW] on the main menu and select the desired file name. Alternatively, move the desired file name to the top by clicking scroll buttons and click , or click the data reproduction button in the shortcut menu.



# Measurement

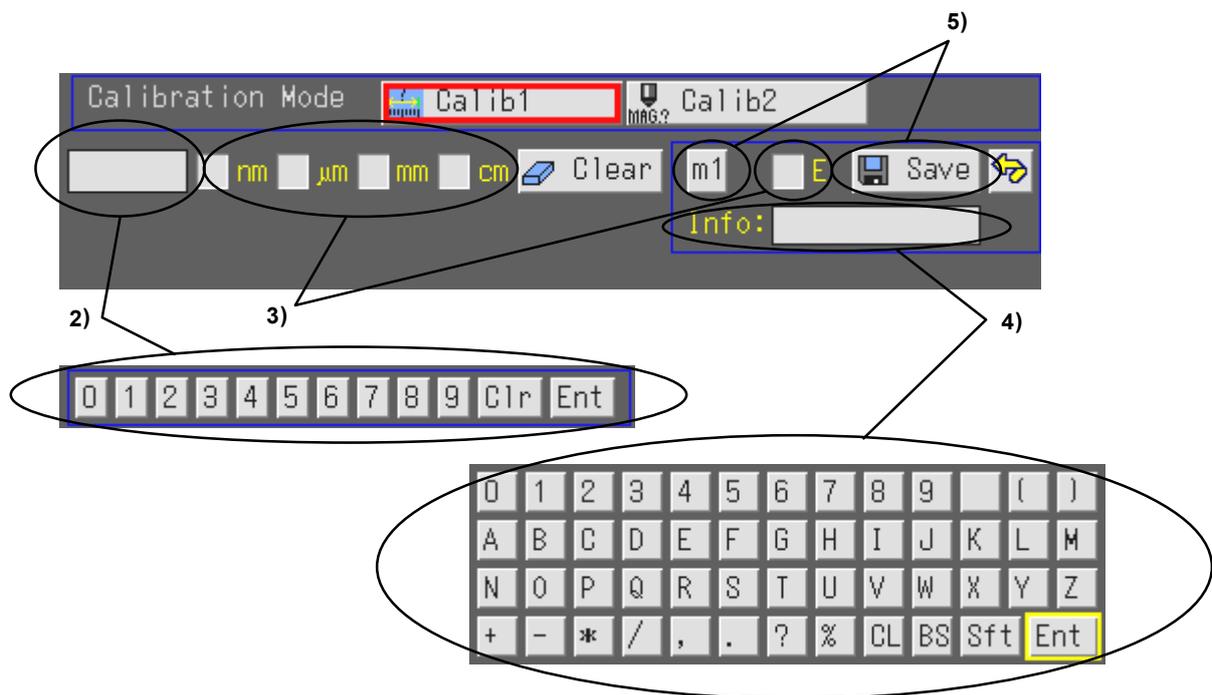
## 1. Performing Calibration and Saving Values

In the main menu, select [TOOL] - [REG>>] - [OTHER]. Click  , and then select the desired calibration mode:  or  .

### 1.1 Manual Mode

Calibration in this mode is performed based on the value converted from the known length of a scale (for example, an objective micrometer).

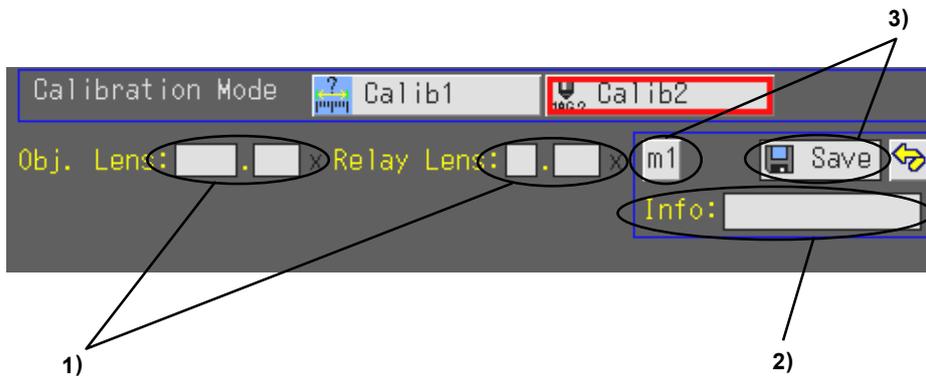
- 1) Specify, by clicking, the start point and end point of the displayed micrometer.
- 2) Click in the numeric display field, and using the soft keyboard that appears, enter the actual length between the points specified in step 1), and then click  to fix the entry.
- 3) Select the desired unit of measurement. Remove any check mark that may be shown in the  field.
- 4) Click in the [Info] field, and using the soft keyboard that appears, enter a comment (\*), and then click  to fix the entry.
- 5) Select the desired save destination number. Finally, click  .



## 1.2 Optical Mode

Calibration in this mode is performed based on the value converted from the magnifications of the objective and relay lenses.

- 1) For each of the objective lens and relay lens, click in the magnification field. When the soft keyboard appears, enter the magnification, and then click **Ent** to fix the entry.
- 2) Click in the [Info] field, and using the soft keyboard that appears, enter a comment (\*), and then click **Ent** to fix the entry.
- 3) Select the desired save destination number. Finally, click **Save** .

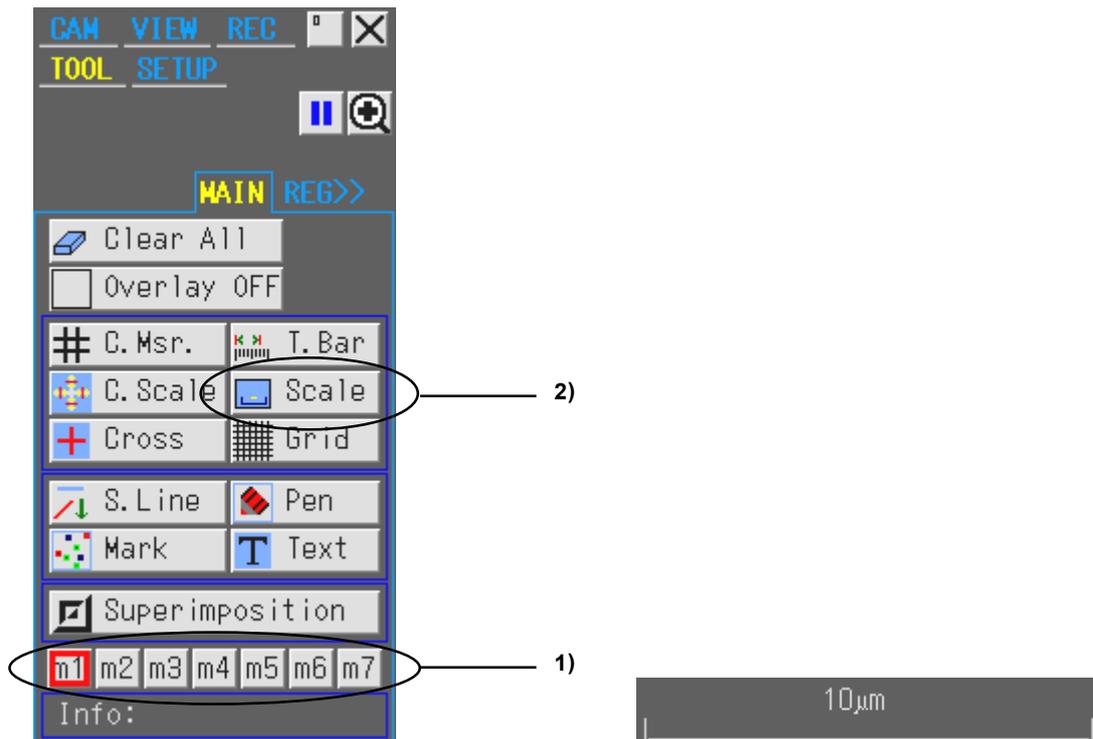


(\*) The comment is saved as a name for m1 through m7 as specified by selecting [TOOL] - [MAIN].

## 2. Displaying a Scale

In the main menu, select [TOOL] and select **Scale** . A scale appears, allowing you to measure the approximate size of the subject.

- 1) From [TOOL] in the main menu, select the calibration number you want to use, by clicking one of the options **m1** to **m7** .
- 2) Select **Scale** to display the scale in the lower right of the screen.



The scale length and color can be changed:

- 1) Select **Scale** in the main menu, move the cursor over the displayed scale and left-click the mouse.
- 2) A menu for changing the scale length and color appears.



- 3) To change the length, enter the desired value using the software keyboard, and then press **Ent**.
- 4) To change the color, select one from the six colors: red, green, yellow, blue, white, and black.

\* The unit cannot be changed. If you change the scale length to a value out of the display range, the scale will be displayed as a length multiplied or divided by a factor of 10, resulting in 10x, 100x, ..., or 1/10, 1/100, ....

To render the scale in the saved image or a printout, use the main menu and select [TOOL] - [REG>>] - [OTHER]. In the [Paste to Image] area, add a checkmark to [Scale].

