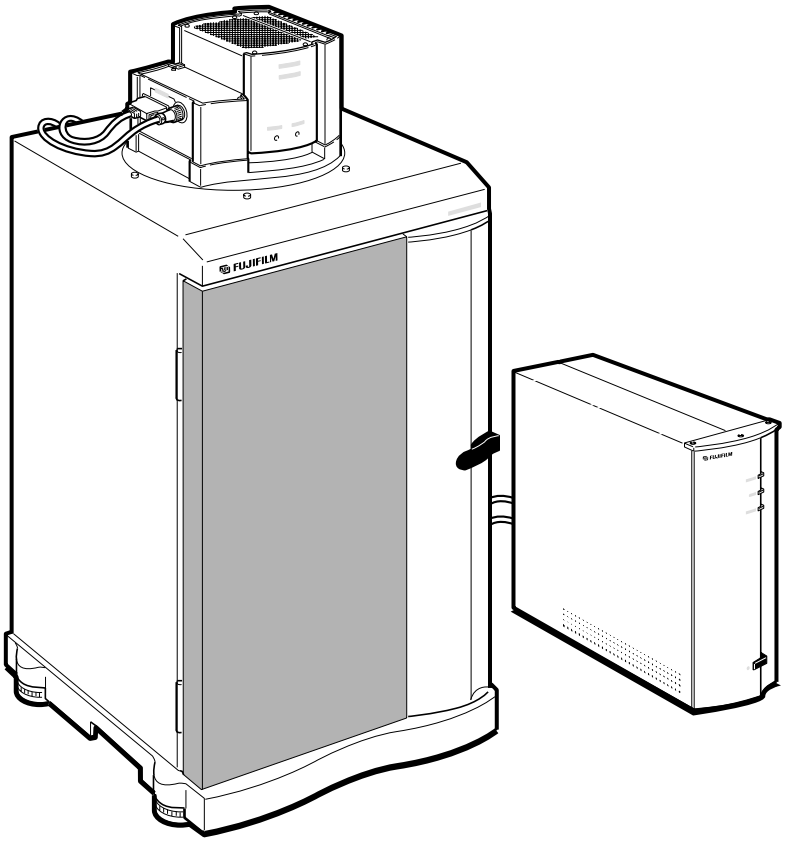
FUJIFILM

LUMINESCENT IMAGE ANALYZER
LAS-1000plus
Operation Manual



2nd Edition

2001. Oct. Version 2.0

Read this first

Thank you for purchasing the FUJIFILM Luminescent Image Analyzer LAS-1000plus.
The FUJIFILM Luminescent Image Analyzer LAS-1000plus uses a 1,300,000-pixel cooling CCD camera developed exclusively by Fuji Film and is a one-unit image analysis system that can be used for fluorescent and enzyme amplification fluorescent methods, and mainly for the chemical fluorescence method.

The "FUJIFILM Luminescent Image Analyzer LAS-1000plus Operation Manual" describes the operation methods and usage precautions for LAS-1000plus so that you will be able to utilize the functions to the utmost and bring out its full performance.
Please read this manual thoroughly before operating the LAS-1000plus.
We suggest that you keep this manual, as you may need to refer to it.

* Image Reading Software "Image Reader Lite" and "Image Reader Pro" described herein are available in both the Macintosh version and in the Windows version.
  In this manual, software operations are explained based on the Windows-version displays, but operations using the Macintosh-version software are basically the same as those for the Windows-version software.

NOTES

1 Reproduction of parts or all of the contents of this manual without permission is prohibited.
2 The contents of this manual are subject to change without notice.
3 This manual has been prepared with utmost care. However, if you have any questions or find errors, ommissions, etc., please contact us.
4 We will not be liable for any effects incurred from the use of this device.

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.
Cet appareil numérique de la classe: A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

This equipment cannot be taken to or used in a country or area where power supply specifications differ from those in the country or area where it was originally installed.

United States of America

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications.
It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment.
Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

Canada

This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus as set out in the radio interference regulations of the Canadian Department of Communications.

“Le présent appareil numérique n’émet pas de brults radioélectriques cépassant les limites applicable aux appareils numériques de la class A prescrites dans le Réglement sur le broulilage radioélectrique édicté par le ministére des Communications du Canada.”

Contents

Part
1

Safety-Related Cautions

1. Cautions Prior to Use

* Make sure to have read the Operation Manual thoroughly before using the equipment and to use the equipment properly.
* After reading the Manual, store it where it can be referred to at any time.
* Please note that the product specifications and operation manual are subject to changes without notice.

1.1 Icon Indicators

The indicators in this Operation Manual and on the equipment are to ensure that you use the equipment safely and properly. Various icon indicators have been used to prevent injury to all users and property damage from occurring. These indicators and their meanings are explained below. Continue reading this manual after thoroughly understanding their content.

⚠ WARNING	Indicates the possibility that a person could die or sustain serious injury if this indicator is ignored and the equipment is handled incorrectly.
⚠ CAUTION	Indicates that a person could sustain injury or there could be physical damage if this indicator is ignored and the equipment is handled incorrectly.

1.2 Examples of Icon Indicators

The △ indicator informs the user that the contents merit warning or caution.
The specific content of the prohibition is shown within the indicator (which on the left cautions against electric shock).

The ⃠ indicator informs the user of prohibited actions.
The specific content of the prohibition is shown within or nearby the indicator (which on the left prohibits disassembly).

The ● indicator informs the user of actions that must be performed.
The specific content of the action is shown within the indicator (which on the left instructs the user to unplug a power supply plug from an electrical outlet). Make sure to do exactly as instructed.

⚠ WARNING

* In the unlikely event that smoke can be perceived, the outside of the equipment becomes unusually hot, strange odors or noises can be perceived, etc., and the equipment is used under such abnormal conditions, fire and electric shock could result. Immediately suspend usage, turn OFF equipment power, and then unplug the power supply plug from the electrical outlet. Confirm that smoke no longer can be perceived and then contact your dealer to request repairs.

Unplug the power supply plug from the electrical outlet.

* In the unlikely event that water gets into the camera head and/or controller, first turn OFF the equipment's power supply switch, unplug the power supply plug from the electrical outlet, and then contact your dealer. Using the equipment in this condition could result in fire and electric shock.

* In the unlikely event that a foreign object gets into the dark box, camera head and/or controller, first turn OFF the equipment's power supply switch, unplug the power supply plug from the electrical outlet, and then contact your dealer. Using the equipment in this condition could result in fire and electric shock.

* In the unlikely event that the equipment is dropped and the cabinet is damaged, turn OFF the equipment's power supply switch, unplug the power supply plug from the electrical outlet, and then contact your dealer. Using the equipment in this condition could result in fire and electric shock.

* Do not remove covers of the dark box, camera head and/or controller, because inside are parts of high temperature and voltage that could result in burns or electric shock. Contact your dealer to request internal inspections, servicing, and repairs.

Disassembly prohibited

* Do not place on the dark box, camera head and/or controller vases, flowerpots, cups, cosmetics, medical supplies, containers that have water or the like in them, or small metal objects. If such items are spilled or fall into the equipment, fire and electric shock could result.

* Do not use the equipment at other than the indicated power supply voltage or fire and electric shock could result.

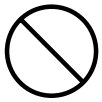
* Make sure to directly connect the power supply plug to a wall outlet (tripolar plug socket) that has a ground terminal. Extension using table taps or putting many loads on one electrical outlet could result in fire and electric shock.

Make sure to connect a ground wire.

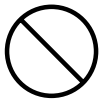
* Make sure that no water gets into the camera head and/or controller and that they do not get wet or fire and electric shock could result.

⚠ WARNING

* Do not place or drop such foreign objects as metal or flammable objects into the ventilation holes of this equipment or fire and electric shock could result.



* Make sure not to place heavy objects on the power supply cord and connection cords, and do not let them get pinned under the equipment. Cords could be damaged by this, and fire and electric shock could result. (If carpets, etc., are laid over cords and they go unnoticed, heavy objects could end up placed on them).



* If power supply cords are damaged (core wires are exposed or there is breakage), contact your dealer to request replacements. Using them in this condition could result in fire and electric shock.

* Do not place the equipment on unstable tables or on inclined surfaces or other unstable places, as the equipment could be dropped or fall, resulting in injury.

* Do not damage, process, bend excessively, twist, pull or heat power supply cords or they could be damaged, and fire and electric shock could result.

* Do not remodel the equipment or fire and electric shock could result.

* Do not use the equipment within or near a sink or fire and electric shock could result.

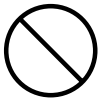
Use in water-accessing places prohibited

* If thunder can be heard, do not touch the power supply plug or electric shock could result.

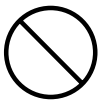
Touching prohibited

⚠ CAUTION

* Do not place the equipment in places where hot air and dust are prevalent. Doing so will not only deteriorate image quality but could cause fire and electric shock.



* Do not block up the equipment's ventilation holes. Doing so will cause the inside to fill with heat, which could result in fire.
  Refrain from using the equipment in the following ways.
  - With the equipment face up, on its side, or upside down.
  - With the equipment placed in lockers, racks, bookcases and other narrow places with poor ventilation.
  - With the equipment on surfaces covered by tablecloths or the like.

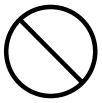


* When installing the equipment, leave at least 20cm between it and any wall. Also, to facilitate heat radiation, leave sufficient space between the equipment and other devices or the interior could become hot, resulting in fire.

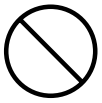
* Do not sit on the equipment. Falling, breakage, and injury could result.

* Do not place heavy objects on the equipment. If balance is lost, falling, dropping, and injury could result.

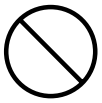
* Do not stare for a long time at the light that is emitted by the LED light source. Doing so for a short time will not result in any problem, but doing so for a long time could result impair your vision.



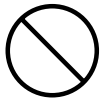
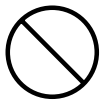
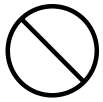
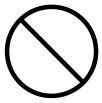
* Do not have the power supply cord near heating apparatuses. The cord's covering could melt, resulting in fire and electric shock.



* When unplugging the power supply plug and connection cords from electrical outlets, do not pull the cord itself or it could be damaged, resulting in fire and electric shock. Make sure to grasp the plug itself when unplugging a cord.



⚠ CAUTION

* Do not plug in or unplug power supply cords with wet hands or electric shock could result.	
* If the power supply plug is damaged or contact with the electrical outlet is not secure, do not use the equipment or electric shock, short circuiting, and outbreak of fire could result.	
* When moving the equipment, make sure to first turn OFF the power supply switch, unplug the power supply plug from the electrical outlet, and unplug any connecting cables between devices.	
* When carrying the equipment, do not subject it to shock or malfunction could result.	
* When making repairs, for safety purposes, make sure to unplug the power supply plug from the electrical outlet or electric shock could result.	
* If the equipment will not be used for a long time, for safety purposes, unplug the power supply plug from the electrical outlet or fire could result.	
* When installing the camera head to the dark box, use the dedicated screw holes and screws, fixating the dark box in 4 places. When installing the camera head to something other than the dedicated dark box, do not use screws over 10mm in the fixating holes for the screws. Do not conduct installation with methods other than those instructed herein or damage to the equipment and malfunction could result. // This caution does not apply to the LAS-1000plus.	
* Using dedicated cables, make secure connections to the camera head, dark box, analyzing unit personal computer, and power supply. Imperfect connection and connections made with other than the dedicated cables could result in incorrect operation and malfunction. When connecting and disconnecting cables, do so with the power OFF or incorrect operation and malfunction could result. Do not bend cables in excess, bundle them or place heavy items on them or incorrect operation and malfunction could result.	

⚠ CAUTION

* Never touch the shutter of the camera head. If the shutter becomes deformed, correct operation will not be possible.

// This caution does not apply to the LAS-1000plus.

* Do not install anything other than the attached lens and attached C-mount adapter. When using a C-mount lens, use the dedicated C-mount adapter. If an adapter other than the specified is used, malfunction could result.

// This caution does not apply to the LAS-1000plus.

* Do not connect anything other than the dedicated light source to the dark box's internal connectors.

* Do not throw the camera head and/or camera controller into fire. Explosion could result in injury or burns.

* Do not unnecessarily turn the equipment's power switch ON/OFF repeatedly or malfunction could result.

* Do not leave exposure specimens in the dark box or sample tray or malfunction could result.

2. Usage Cautions

2.1 Place of Installation

So that we may have you use the equipment normally and safely, install it in places such as the following.

* Places not subjected to direct sunlight or other strong light.
  If necessary, shield out light using curtains, blinds, and the like. The presence of strong light can cause fogging*.

  * Fogging: The phenomenon in which light leakage and other unintended light accumulate on recorded images.

* Places that can support the weight of the equipment, are subjected to little vibration, and are level and stable.

* Places with good ventilation and little dust.

Note :

In dusty environments, dirt and/or unevenness may appear on image. Moreover, cooling capacity can deteriorate.

* Places in which temperature does not suddenly change.
  Sudden heating of a cold room or moving the equipment from a low- to high-temperature place can cause water droplets (dew condensation) to form inside the equipment, resulting in incorrect shutter operation, and quality deterioration, such as image blurring.

* Places with no nearby water faucets, hot-water heaters, warmers, coolers, heaters, stoves, etc. (high-temperature, high-humidity or low-temperature, low-humidity places).

* Recommended usage environment*
  Temperature: +18°C ~ +28°C
  Humidity: 35%RH ~ 70%RH (with no dew condensation)

  * To elicit satisfactory performance, we recommend using the equipment in the environments described above.

  Using the equipment under high temperatures causes cleaning system startup to take longer and is a cause of errors.

* Avoid having objects nearby that emit strong magnetism (motors, transformers, televisions, speakers, magnets, etc.), or incorrect operation could result.

* When installing this equipment, leave at least 20cm between it and any walls. Also, to facilitate heat radiation, leave sufficient distance from other devices. Otherwise, heat could built up inside, resulting in fire.

* Do not place objects on top of the equipment or errors and malfunction could result.

2.2 Power Supply

* Conduct in the power supply under stable voltage and use it for the dedicated power supply.

* Make sure to directly connect the power supply plug to a wall outlet (tripolar plug socket) that has a ground terminal. Extension using table taps or putting many loads on one electrical outlet could result in fire and electric shock.

* Do not wire from the same power supply used by air conditioners, centrifuges, and other large devices or incorrect operation could result.

* Conduct the following inspections periodically to make sure of the following:
  - The power supply plug is inserted firmly in the electrical outlet.
  - The power supply plug and cord do not become abnormally hot.
  - The power supply cord does not have cracks or scratches in it.

2.3 Operational and Maintenance Cautions

■Operational Cautions

* Do not perform any operations that are not described in the Operation Manual.

* Turn the power supply for the controller OFF after first quitting the reading software. Turning the power OFF without first quitting the reading software could damage the cleaning system.

* Use the following procedure when unplugging the power supply plug from the electrical outlet.

  (1) Quit the reading software.

  (2) Press the power supply switch OFF.

  (3) Unplug the power supply plug.

⚠ WARNING

- In the unlikely event that smoke can be perceived, the outside of the equipment becomes unusually hot, strange odors or noises can be perceived, immediately suspend usage, turn OFF the equipment's power supply switch, and then unplug the power supply plug from the electrical outlet. Confirm that smoke no longer can be perceived and then contact your dealer to request repairs.

Unplug the power supply plug from the electrical outlet.

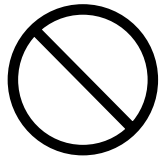
3. LED Light Source

LED Used

Blue-, Green-, Red- and White-LEDs are used in the LAS-1000plus.

⚠ CAUTION

- Do not stare at the LED light source for a long time or your vision could be impaired.



Part 2

LAS-1000plus System Configuration

1. LAS-1000plus System Hardware Configuration

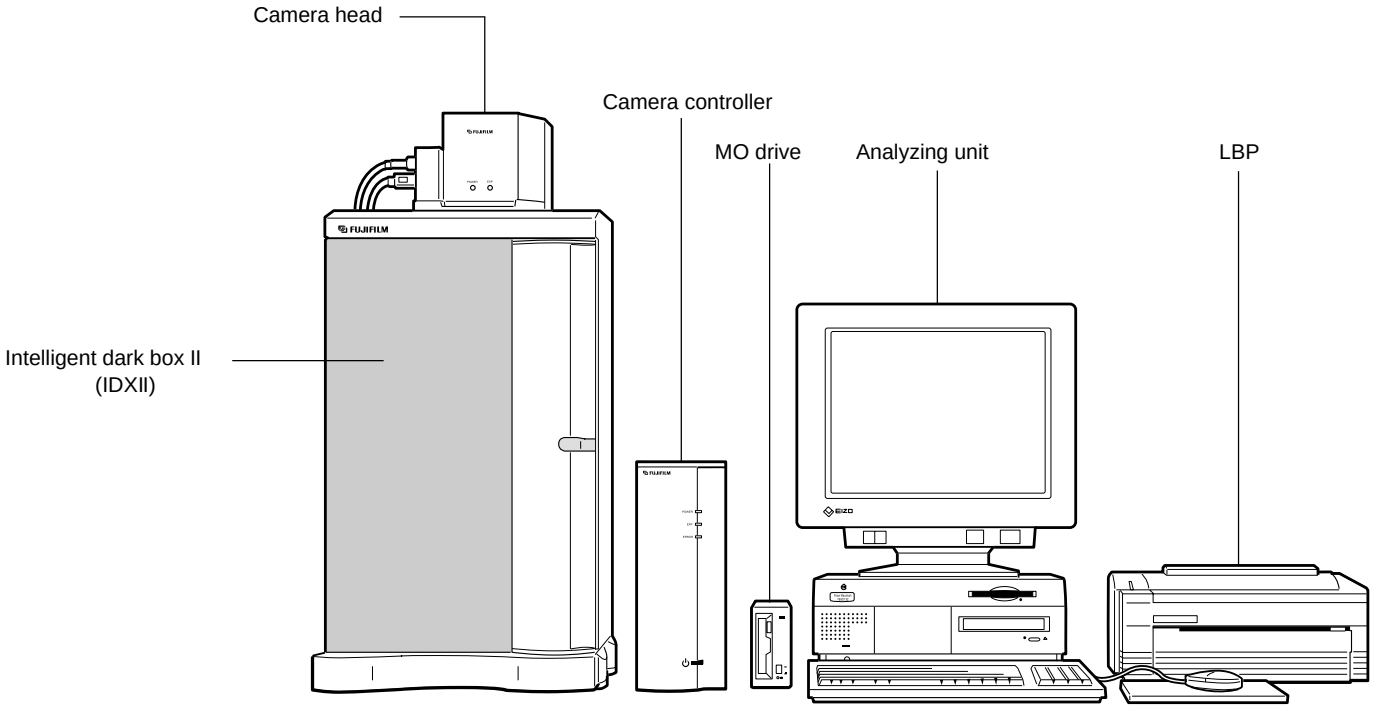


Fig. 2.1 Hardware Configuration (Example: Macintosh version)

2. Specifications

2.1 Performance Characteristics

(1) CCD: 1,300,000-pixel cooling CCD camera
Effective pixels; 1,384(H) X 922(V)-pixels
(On-chip micro lens is used.)

(2) Cooling temperature: -60° Celsius from ambient temperature Fixed at -25°C when the Image Reader LAS-1000 Lite is used.

(3) Reading noise: 20e^- (rms) typ.

(4) Dark current noise: 0.01e^-/pix·sec or less

(5) Number of gradations: At time of image recording:
14 bits (16 bits after shading correction)
At time of focalization:
8 bits

(6) Exposure time: 1/100sec - 3600sec; bulb exposure

(7) Focusing: Approx. 4 frames/sec

(8) Shading correction: Software system

(9) Lens distorsion correction: Software system

(10) Angle of field: 12cmx8cm - 25cmx25cm
(when the URF20L lens is used.)

(11) Dynamic range: 3.7 orders

(12) Maximum image capacity: 2.5MB (full-size images) / 1 image

2.2 External Dimensions and Weight

Unit		Dimensions (Width X Depth X Height)	Weight
Image input unit	Camera head	200mm X 170mm X 170mm	3.8 kg
	Camera controller	120mm X 370mm X 330mm	6.5 kg
	Dark box	430mm X 430mm X 750mm	33.4 kg *

* Tray and lens are not included. (Lens weight : 0.8 kg)

2.3 Power Requirements

(1) Input voltage: 100-120 VAC ±10% / 200-240 VAC -10% +5%
(2) Phase: Single (with 3P grounding pole)
(3) Power frequency: 50/60Hz
(4) Power consumption: 0.3kVA

2.4 Physical Environment

(1) Operating Environment
* Temperature: 15 to 30°C(△T<10°C/h)
* Humidity: 35 to 70% RH (no dew condensation)

(2) Non-operating Environment
* Temperature: -10 to 60°C
* Humidity: 20 to 90% RH (no dew condensation)

(3) Transit/Storage Environment
* Temperature: -25 to 70°C
* Humidity: 5 to 95% RH (no dew condensation)

Part 3

Software Installation

1. Introduction

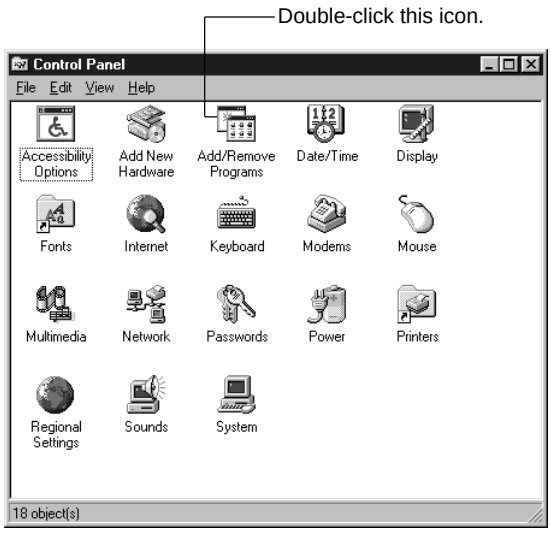
Image Reader LAS-1000 Lite is software exclusively for the LAS-1000plus system.
Image Reader LAS-1000 Pro is available for both the LAS-1000C and LAS-1000 systems.
(Image Reader LAS-1000 Lite cannot be used for these systems.)

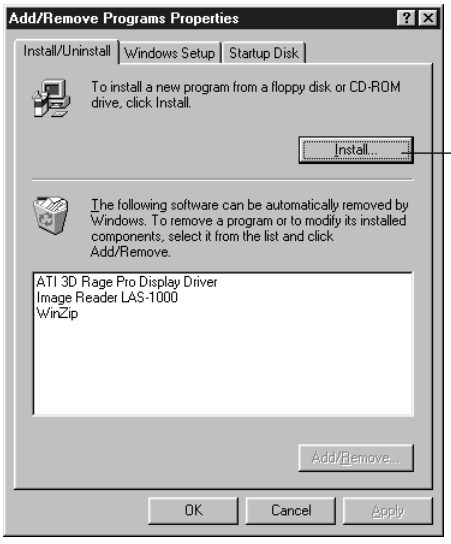
2. Software Installation and Uninstallation

2.1 Software Installation (for Windows)

1 Insert the installer CD-ROM (Image Reader LAS-1000 for Windows and Macintosh) into the CD-ROM drive.

2 Activate  located in the Control Panel and click Install... .

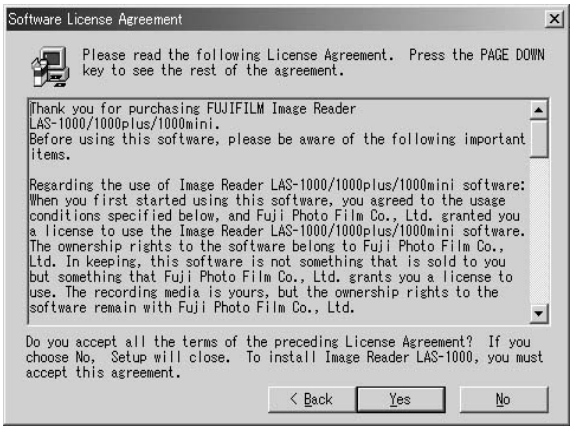




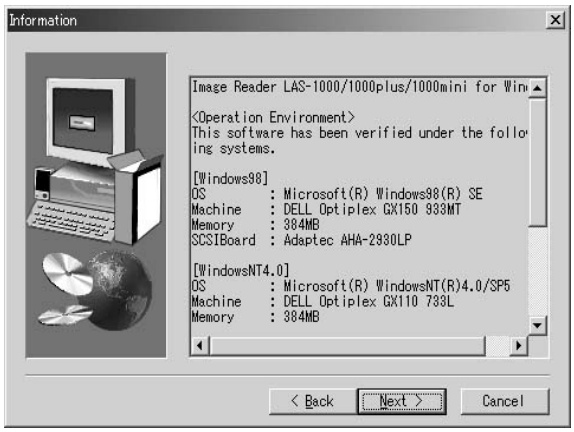
3 A dialog as the one shown below will appear. Click the Next > button.

4 Carefully read the messages, warnings, etc. appearing in the Welcome dialog below and click the Next > button to proceed to the Software License Agreement dialog.

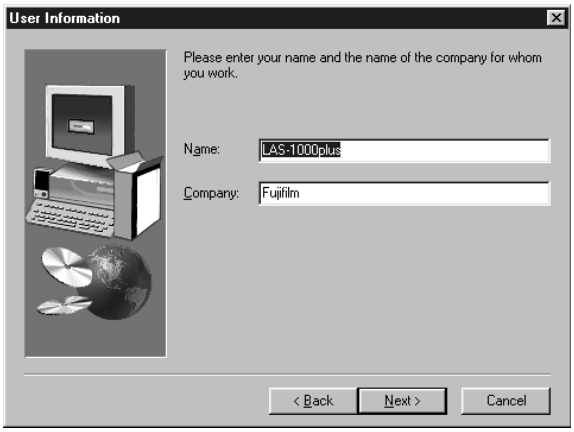
5 Carefully read details of the agreement appearing in the Software License Agreement dialog below. If you agree, press the Yes button to proceed to the Information dialog.



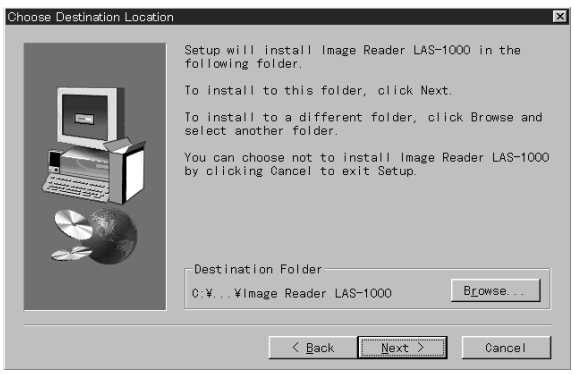
6 In the Information dialog shown below, click the Next > button to proceed to the User Information dialog.



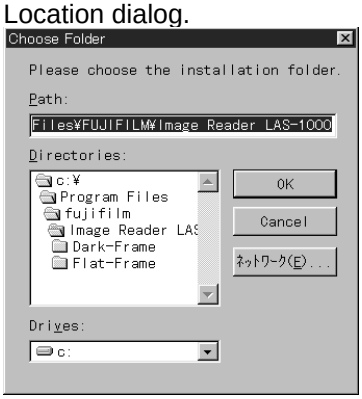
7 In the User Information dialog shown below, enter your name and company name and then click the Next > button to proceed to the Choose Destination Location dialog.



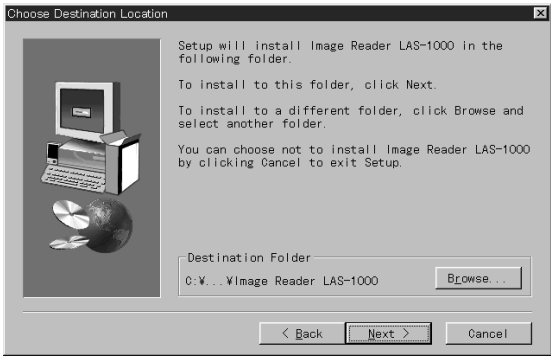
8 To change the default destination for software installation, click the Browse... button in the Choose Destination Location dialog shown below and proceed to the Choose Folder dialog.
Proceed to step 10 if the default destination need not be changed.



9 In the Choose Folder dialog shown below, specify destination for installation of the Image Reader LAS-1000 software, and press the OK button. The display will then return to the Choose Destination Location dialog.



10 In the Choose Destination Location dialog shown below, click the Next > button to proceed to the Setup Type dialog.



User's Tips:

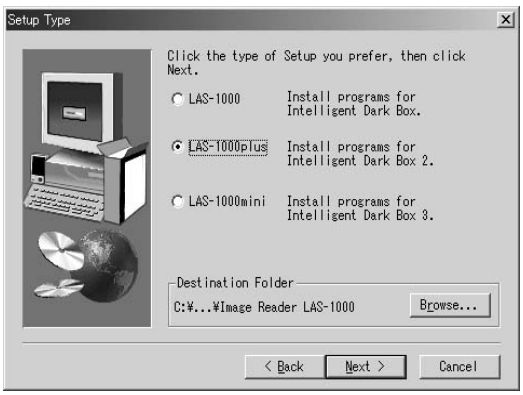
The default folder setting is: C:¥Prog...¥Fujifilm¥Image Reader

11 In the Setup Type dialog shown below, select type of the intelligent dark box (IDX) actually connected to the system. Select the LAS-1000plus

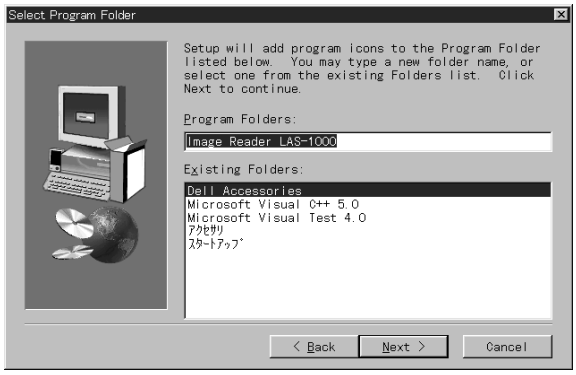
LAS-1000 -> If the IDX is connected, only Image Reader Pro will be installed.

LAS-1000plus -> If the IDXII is connected, both Image Reader Pro and Image Reader Lite will be installed.

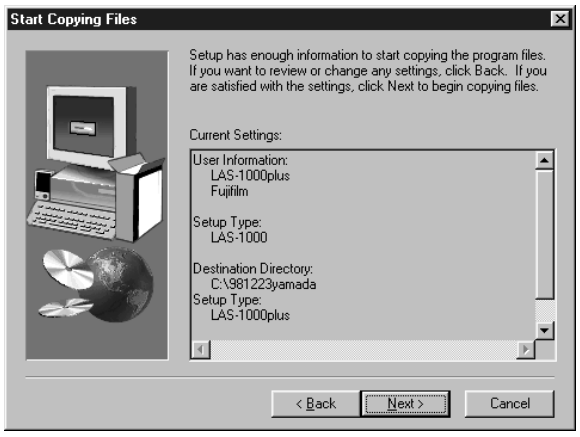
LAS-1000mini -> If the IDXII is connected, both Image Reader Pro and Image Reader Lite for LAS-1000mini will be installed.

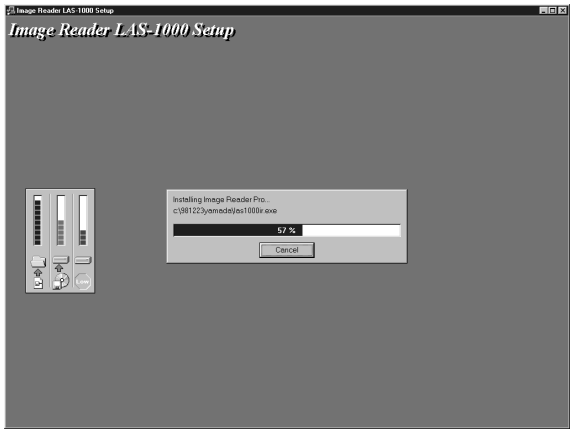


12 In the Select Program folder dialog shown below, enter program folder name for registering the startup menu and click the Next > button to proceed to the Start Copying Files dialog.

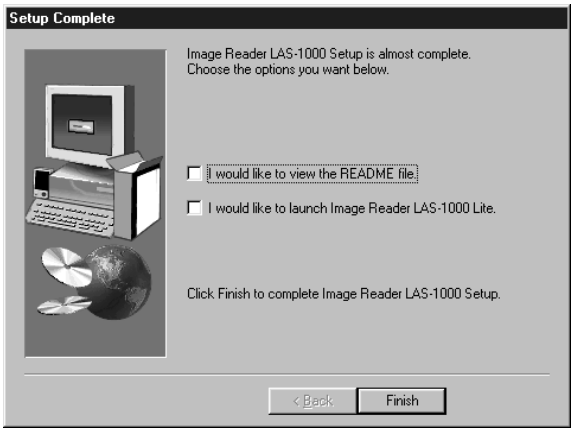


13 In the Start Copying Files dialog shown below, confirm the User Information, Setup Type and the Destination Directory (destination for installation of this software), and then click the Next > button. Software installation will begin.





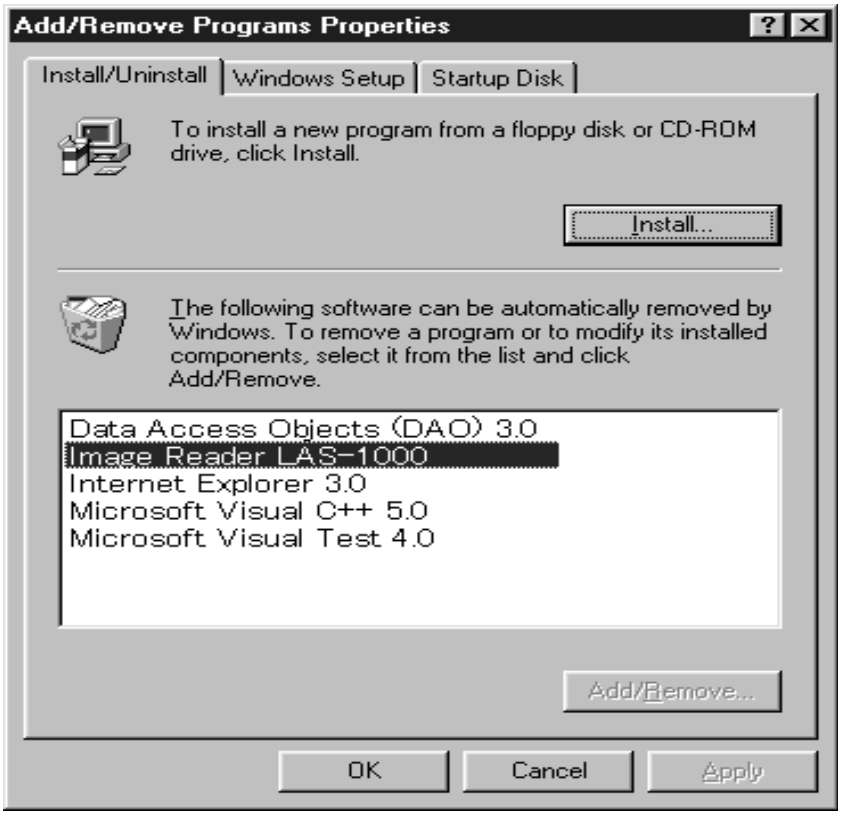
14 When software installation is completed, the following Setup Complete dialog will appear. Select items as necessary or click the Finish button to complete installation.



2.2 Software Uninstallation

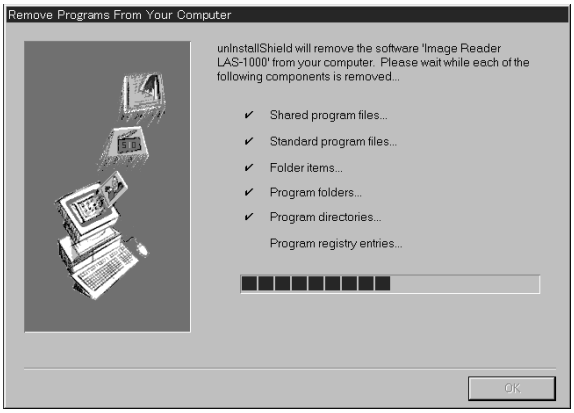
1 Open the Control Panel and double-click 

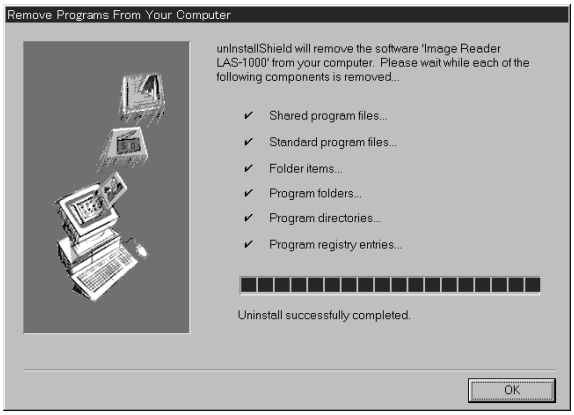
2 Select "Image Reader LAS-1000" in the dialog shown below and click the OK button.



3 The Confirm File Deletion dialog will appear. Click YES if you wish to uninstall the software. Software uninstallation will begin.

4 A dialog that indicates the progression of software uninstallation ("Remove Programs from Your Computer" dialog) will appear. When software uninstallation is completed, the OK button will change to be active. Click OK to complete uninstallation.

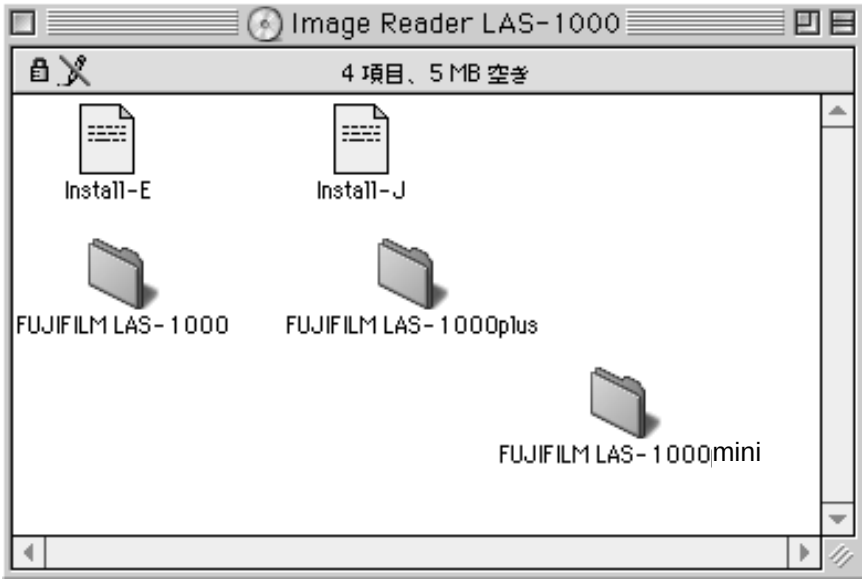




2.3 Software Installation (for the Macintosh)

1 Insert the installer CD-ROM (Image Reader LAS-1000 for Windows and Macintosh) into the CD-ROM drive.

2 If the intelligent dark box connected is the IDX, copy the FUJIFILM LAS-1000 folder onto the Macintosh HD.
If it is the IDXII, copy the FUJIFILM LAS-1000plus folder onto the same HD.



FUJIFILM LAS-1000 folder	->	Contains only Image Reader Pro.
FUJIFILM LAS-1000plus folder	->	Contains both Image Reader Pro and Image Reader Lite.
FUJIFILM LAS-1000mini folder	->	Contains both image Reader Pro and Image Reader Lite for LAS-1000mini.

Software installation will thus be completed.

3. MATROX Meteor II

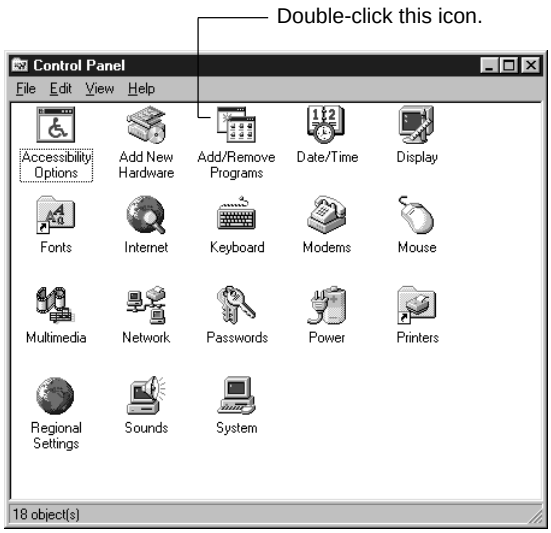
3.1 Video Board Driver Installation

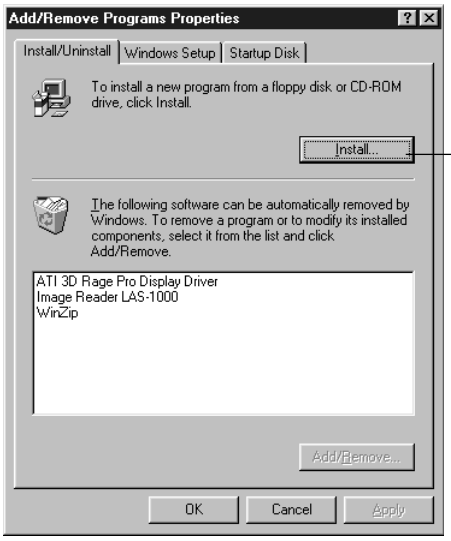
User's Tips:

The Image Reading software will not be activated unless the Meteor II driver is installed.

1 Insert the installer CD-ROM (Image Reader LAS-1000 for Windows and Macintosh) into the CD-ROM drive.

2 Activate  located in the Control Panel and click  .

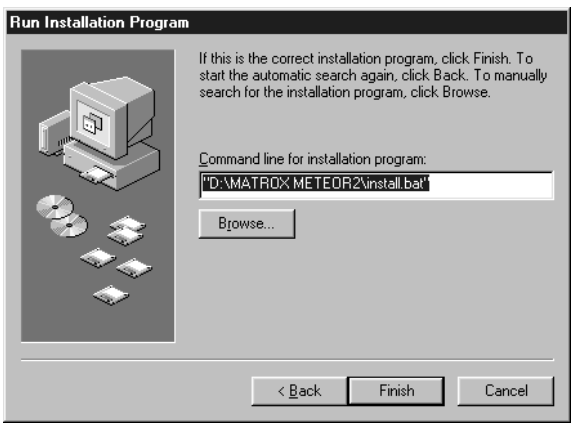




3 A dialog as the one shown below will appear. Click the Next > button.

4 Select "install.bat" contained in the MATROX METEOR2 folder.

5 Confirm the Run Installation Program dialog and then click the Finish button.

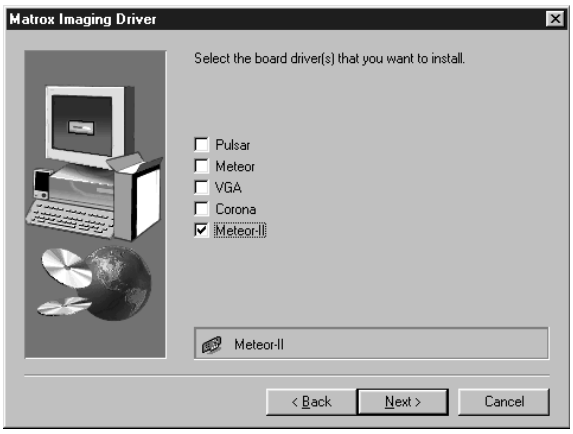


6 Confirm the Destination Folder in the Matrox Imaging Products dialog shown below.

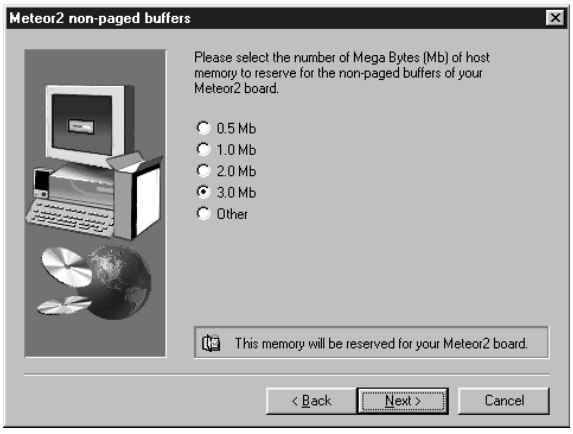
To change the destination for installation of the METEOR II driver, click the Browse... button to proceed to the Product directory dialog.

7 The destination for installation of the METEOR II driver can be changed in the Product directory dialog shown below.

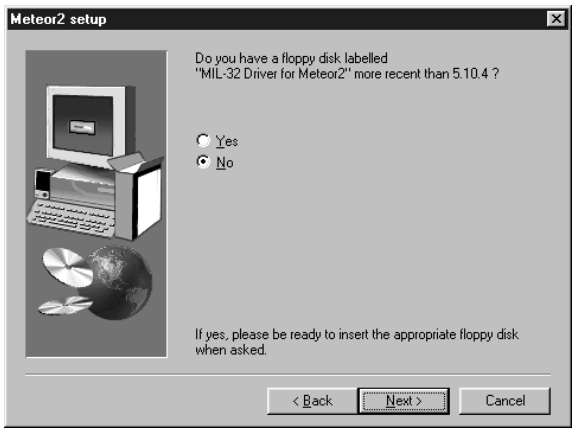
8 In the Matrox Imaging Driver dialog shown below, click "Meteor-II" to check it, and then the Next > button.



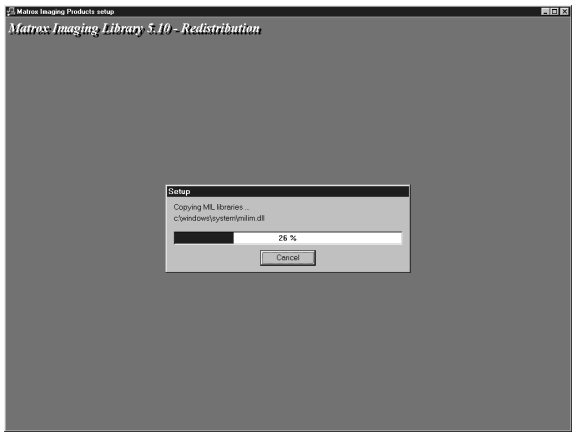
9 In the Meteor2 non-paged buffers dialog shown below, click "3.0Mb" to check it, and then the Next > button.



10 In the Meteor2 setup dialog shown below, click "No" to check it, and then the Next > button.



11 If OK is clicked in the Matrox Imaging Products redistribution dialog, driver installation will begin.



12 When driver installation is completed, the following Matrox Imaging Products - Redistribution setup dialog will appear.

13 Driver installation will thus be completed. When using the MeteorII functions, click the Finish button to complete installation, and then rebooot the Computer.

Part
4

Operations I
(Image Reader LAS-1000 Lite)

Explained in this section are operation methods, using the image reading software "Image Reader LAS-1000 Lite," for detecting samples that emit chemiluminescence, fluorescence and enzyme amplification fluorescence, and stained gels and film samples.

1. Startup

1 Turn ON the power supply.

Power supply for the camera controller and peripheral devices of the computer. Then, turn ON the power supply for the computer itself.

Note

Be sure to turn ON the power to the camera controller first, otherwise the camera controller sometimes cannot be recognized.

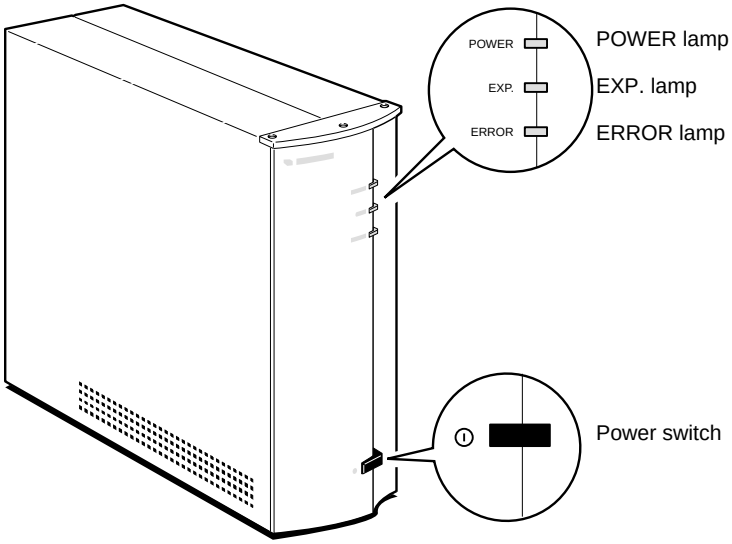


Fig. 4.1 Turning camera controller power ON

User's Tip:

After a few minutes, the Image Input Unit will be able to read. With the power ON, the camera's cooling temperature will automatically be cooled to –20°C.

Cooling temperature will then be cooled further to –25°C when the Image Reader has been activated.

* Image Reader LAS-1000 Lite can be operated only in the IDXII-connected LAS-1000plus system.

2 Activate the image reading software, "Image Reader LAS-1000 Lite."

On the computer, activate the image reading software, "Image Reader LAS-1000 Lite," . After the opening dialog has been displayed, this software will be activated.

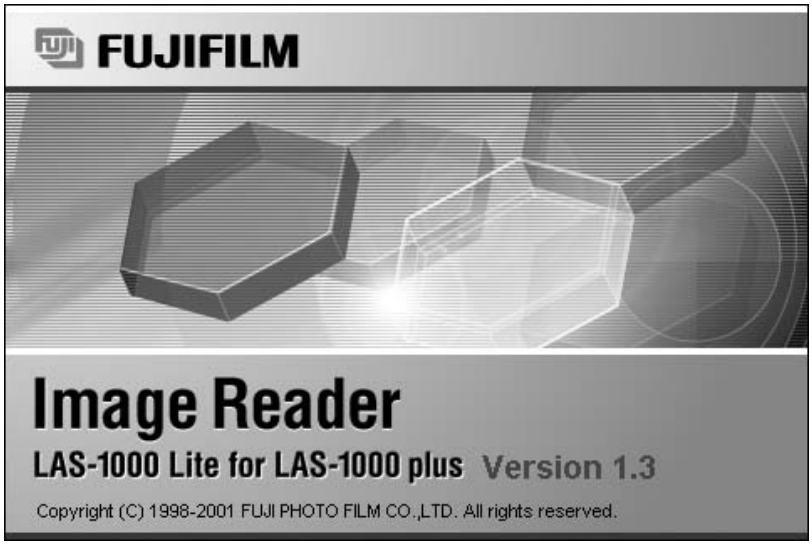


Fig. 4.2 Opening dialog

User's Tip:

1. A correction filter can be created when the software is activated. In this case, wait for a while.
2. Software operation will be possible when Cooling is READY on the display.

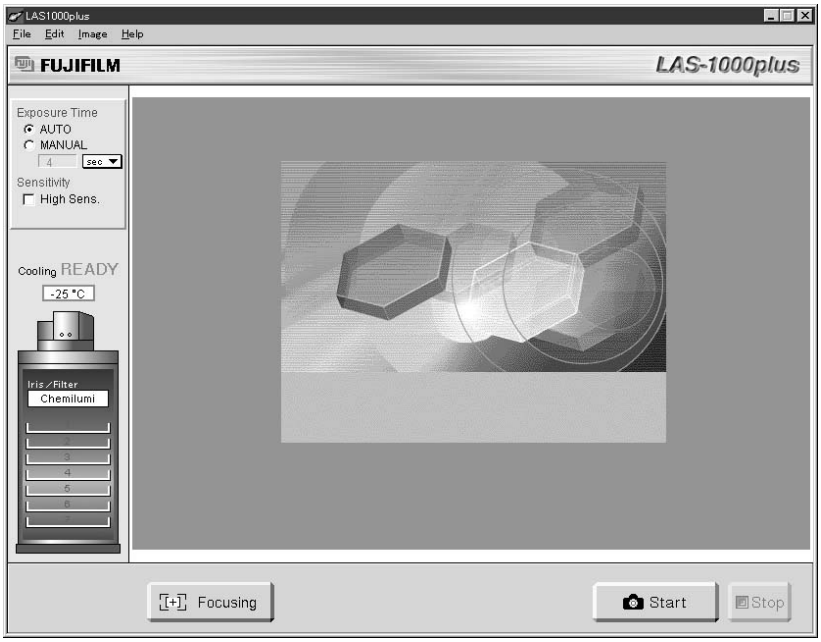


Fig. 4.3 Screen display right after software has been activated

2. Window Configuration

The window right after the software has been activated will be as shown below.

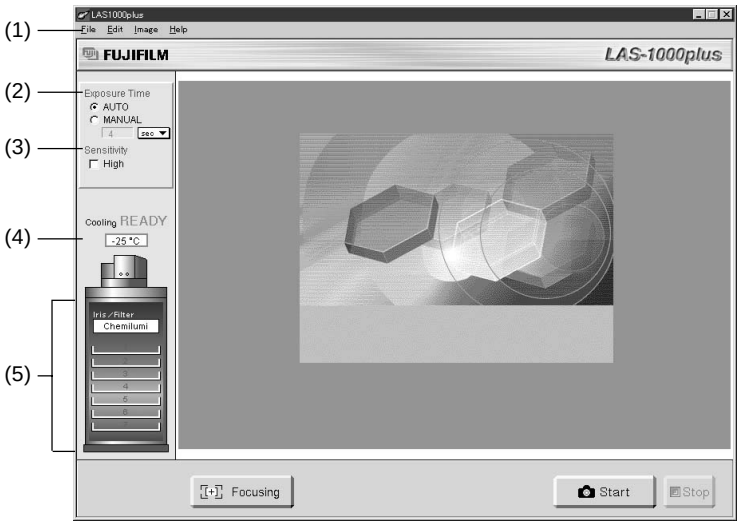


Fig.4.4 Window configuration (right after the software has been activated)

(1) Menu display

Save...	Saves images. (See step 9-6.)
Page Setup...	Sets up page layout.
Print...	Prints images to the LBP. (See step 9-3.)
Print PG	Prints images to the Pictrography. (See step 9-4.)
Exit	Exits from this software.

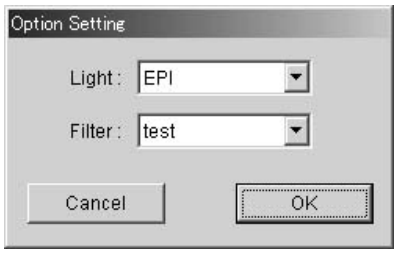
Option Setting... Allows selection of light source and filter type after selecting the Option mode for a photography mode.

Remember to complete the tasks shown below before selecting the type of filter.

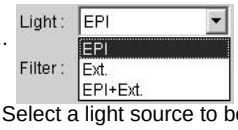
For Windows user:
Create a text file named <FILTER.TXT> in the Image Reader LAS-1000 Folder. (in the same hierarchy as the readme.txt). The extension <.txt> will be automatically in cluded when the WordPad is used.
The file name <FILTER> may be either uppercase or lowercase letters. In the text file, include a name of filter (user definable) installed in the Dark Box II as Option filter in the "harf width" alphanumeric characters.

For Macintosh user:
Create a text file named <FILTER.TXT> in the Image Reader LAS-1000 Folder (in the same hierarchy as the readme.txt) with the Simple Text or other appropriate text editor. Remember to attach the extension <.txt>.
The file name <FILTER> may be either uppercase or lowercase letters. In the text file, include a name of filter (user definable) installed in the Dark Box II as Option filtter in the "harf width" alphanumeric characters.

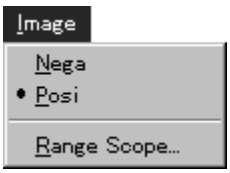
Setting method of Option Setting



Light.....



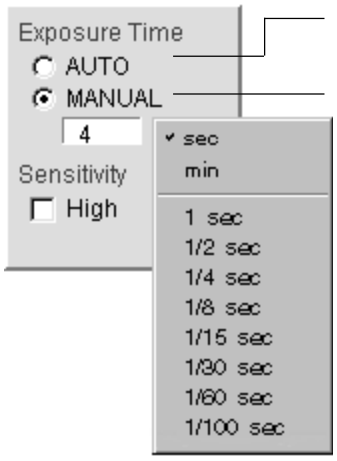
Select a light source to be used as Option mode from the pull-down menu.
EPI.....Select this option to use the vertical illumination incorporated in the IDXII.
Ext.....Select this option to use any external (transmitted) light source.
EPI+Ext.....Select this option to use the vertical light source and any external light source concurrently.
Filter.....Select a name of filter installed as Option filter.



Nega	Displays images on negative. (See step 9-1.)
Posi	Displays images on positive. (See step 9-1.)
Range Scope	Adjusts image gradations. (See step 9-2.)

About.... Displays the opening dialog.

(2) Sets the exposure time.



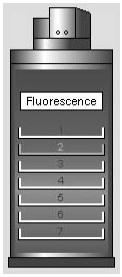
The optimum exposure time will be automatically set by the software.

The exposure time can be set as desired (up to 60 minutes) from the pull-down menu.

(3) Selects sensitivity. When "High" is selected, binning processing will be performed allowing exposure sensitivity to be higher than for normal exposure. (In the Digitize mode, selection of sensitivityis set disabled.)

(4) Displays that CCD cooling temperature is good for exposure.
Exposure will be disabled when "WAIT" is displayed. Wait until "READY" appears.

(5) Displays in green the exposure mode selected and the number of the stage on which the tray has been set.



Indicates that exposure of fluorescence samples is selected.
(Displayed in blue.)

Indicates that exposure of chemiluminescence samples is selected.
(Displayed in black.)

Indicates that exposure of stained gels/film samples using the incident light method (EPI) is selected.
(Gradations appearing on the top)

Indicates that exposure of stained gels/film samples using the transmitted light method (DIA) is selected.
(Gradations appearing at the bottom)

Indicates that exposure of fluorescence samples using the optional filter is selected.
(Displayed in blue.)

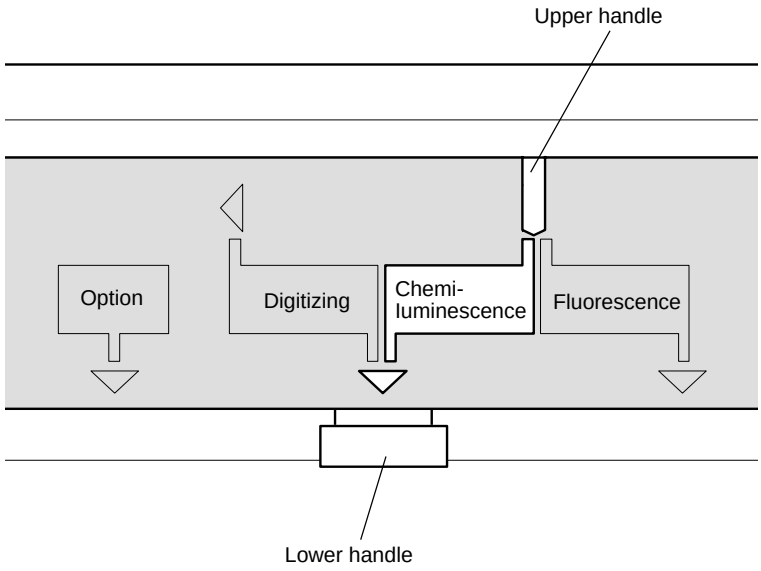
Indicates selection of exposure of fluorescent samples using an option filter and external (transmitted) light source. (The bottom should be shownin pu ple gradations.)

Indicates selection of exposure of fluorescent samples using an option filter, vertical illumination and external light source. (The sould be shown in blue and the bottom in purple gradations.)

3. Exposing Chemiluminescence Samples

1 Make sure that the entire system has been activated normally.

2 Open the IDXII door and attach the upper and lower handles for exposure of chemiluminescence samples.



3 Select the tray position in accordance with the size of the sample.

Angle of field

Inside the intelligent dark box, there are 7 stages of tray rails, making it possible to change the height of the sample tray depending on the position it is inserted in.

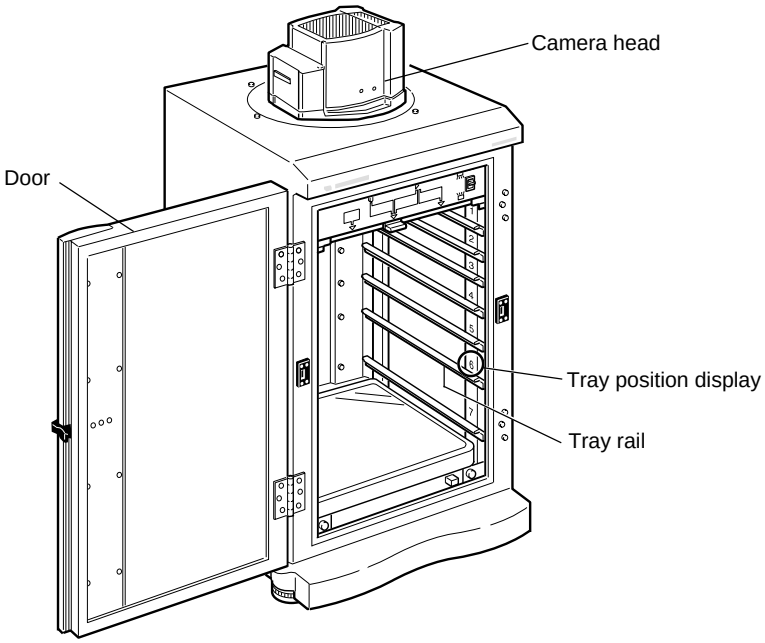


Fig. 4.5 7 stages of the tray position

This allows the size of the field of view (angle of field) to be changed so that the sample can be read on screen at the optimal size.
Size of the field of view, which depends on the height, corresponds to the 7 stages as follows.

Tray rail	High-sensitivity lens
1	7 X 11 cm
2	9 X 14 cm
3	12 X 18 cm
4	14 X 21 cm
5	17 X 25 cm
6	20 X 25 cm
7	25 X 25 cm

Shown on the next page are actual sample sizes, 1 ~ 5, when using the high-sensitivity lens.

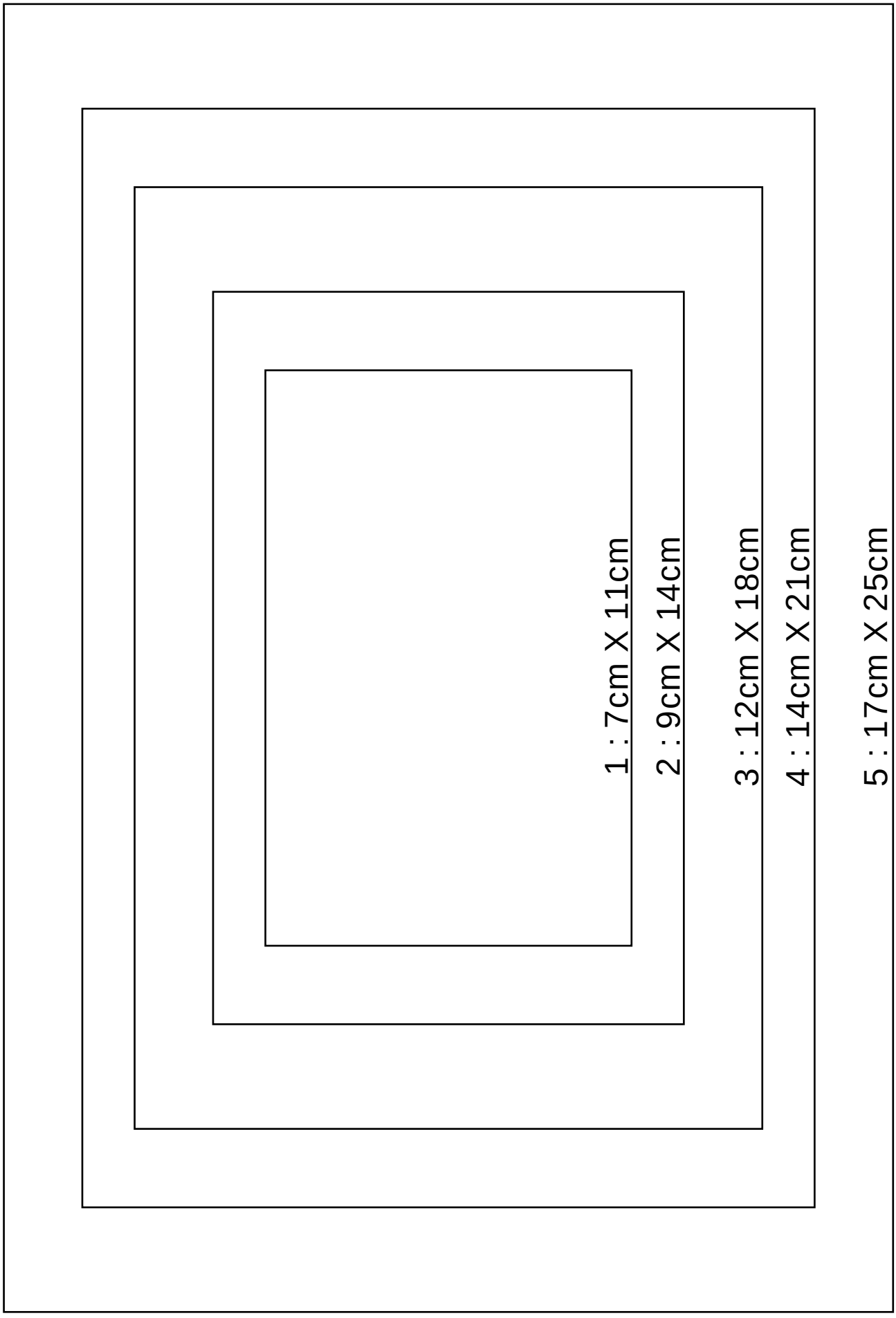
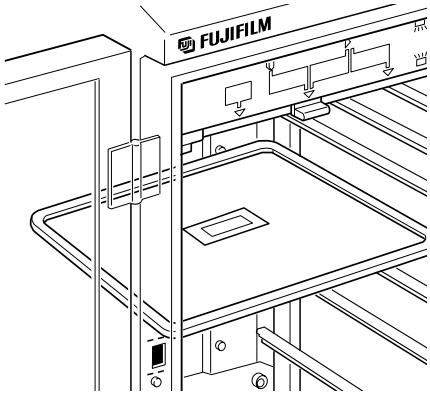


Fig. 4.6 Differences in angle of view (field of view), depending on the height of the sample tray (actual size)

4 Place the sample on the sample tray and set it on the tray rails selected. Shut the door.

User's Tips :

The trays are marked with angle of field for each tray position.



5 Adjust the focus.

Click Focusing located at the bottom of the window.
The focusing screen shown below will appear. While observing the image, adjust the focus using the "Brightness" and "Adjust" (focusing) buttons. Once the optimum image has been obtained, click the Return button. This will return the display to the previous screen.

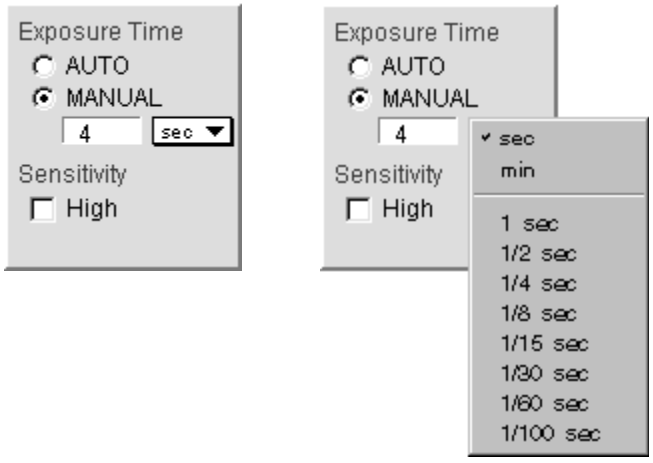
User's Tip:

1. If the mouse cursor is placed inside the image, the cursor shape will change to . If the cursor is clicked while is appearing, the image will be magnified 4 times as large as the original size. (If the cursor is clicked again, the image will be displayed in its original size.) "Brightness" and/or "Adjust" (focusing) processing are possible on the magnified image.
2. The focus position undergone fine adjustment with "Adjust" (focusing) processing will be recorded using the Return button, which can be used for next exposure.

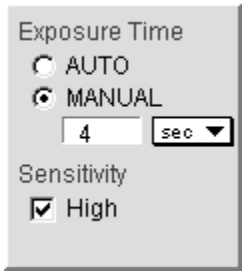
6 Set the exposure time.

If "AUTO" is selected, appropriate exposure time of the sample will be set automatically by the software.

To manually set the exposure time, place the mouse cursor in the input column and enter the value (1/100 sec. to 60 min.) directly from the keyboard or set it arbitrarily using the pull-down menu.



7 High-sensitivity mode can be selected. (Binning processing)



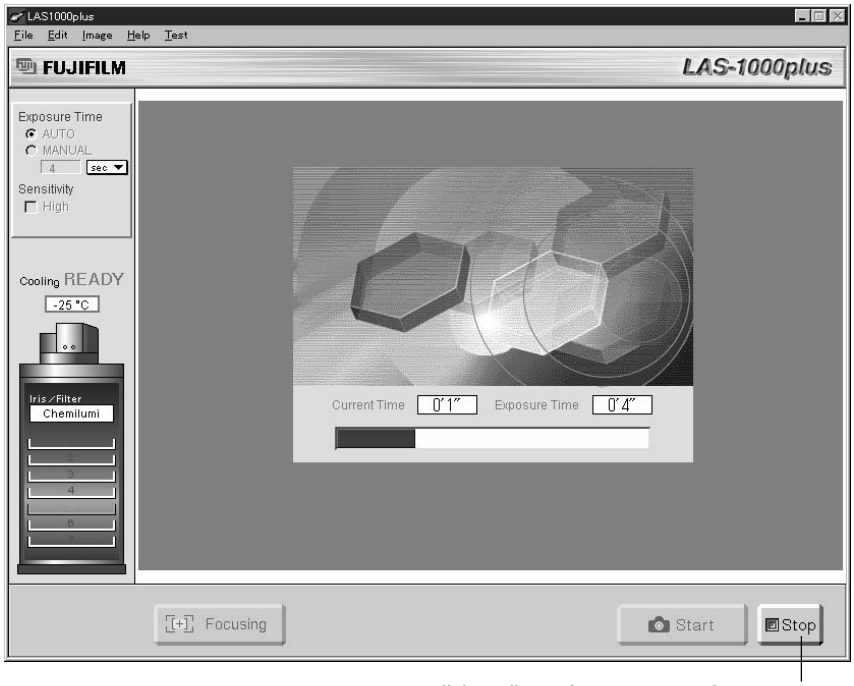
Click ☐ at the left of "High" to have it selected ☑, as required.

User's Tip:

1. High-sensitivity mode is the binning processing function combined with the image processing function.
2. Binning processing digitizes image data after subjecting it to analog processing taking 4 pixels (2 X 2 pixels) as 1 pixel. Though binning processing decreases overall image resolution, it increases sensitivity.
3. In high-sensitivity mode, coarse image due to decreased resolution will be corrected by the software.

8 Start exposure.

Click the Start button. Exposure progression display as shown below will appear to start exposure.

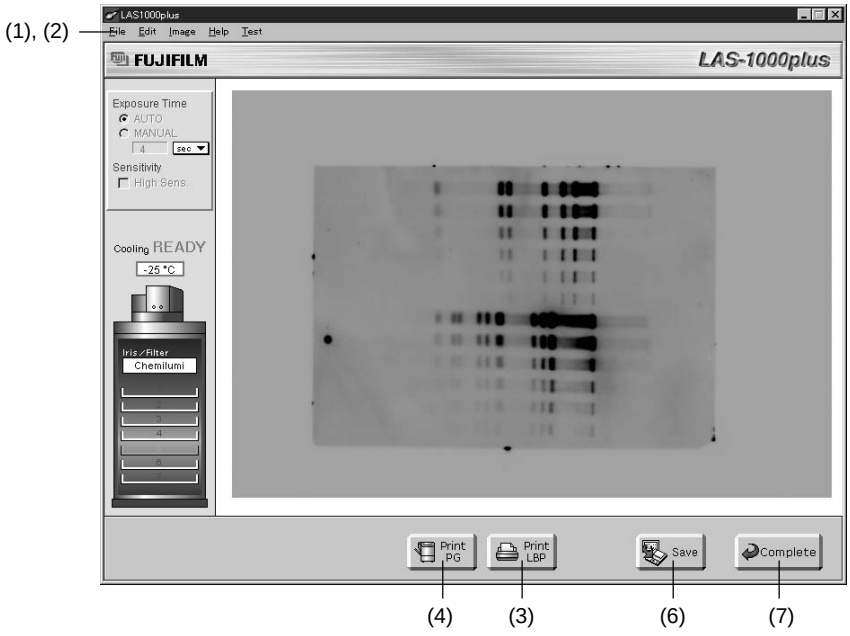


Click to discontinue exposure for any reason.

9 Processing after exposure has been completed.

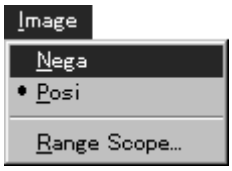
After the completion of exposure, a display as the one shown below will appear.
The following 5 kinds of operations are possible on the display.

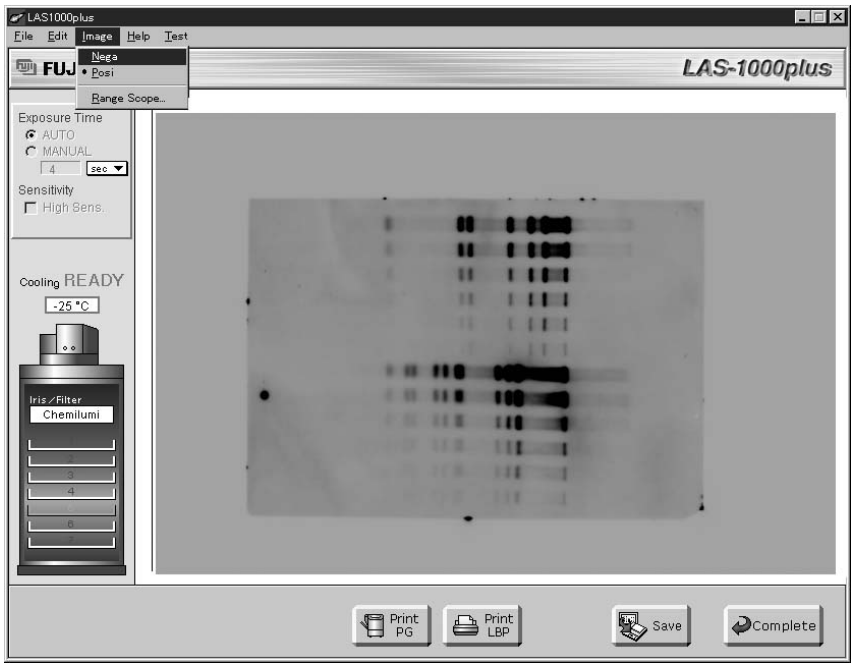
(1)	Selecting negative or positive	See step 9-1.
(2)	Adjusting gradations using the Range Scope function	See step 9-2.
(3)	Printing images to the LBP	See step 9-3.
(4)	Printing images to the Pictrography	See step 9-4.
(5)	Printing images to the video printer (no button on the display)	See step 9-5.
(6)	Saving images	See step 9-6.
(7)	Returning to the top screen after quitting	See step 9-7.

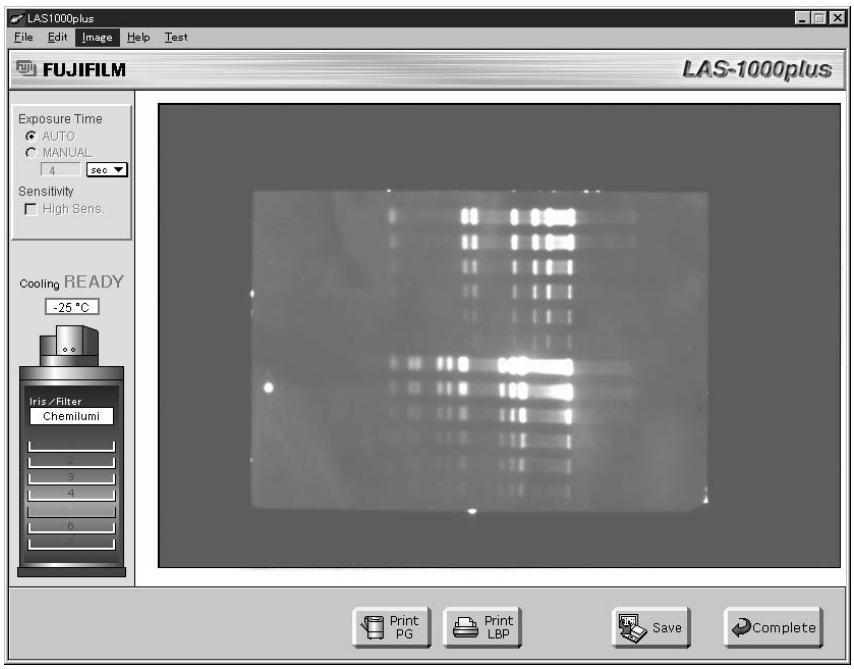


9-1 Selecting negative or positive

Select "Nega" or "Posi" from the Image menu.







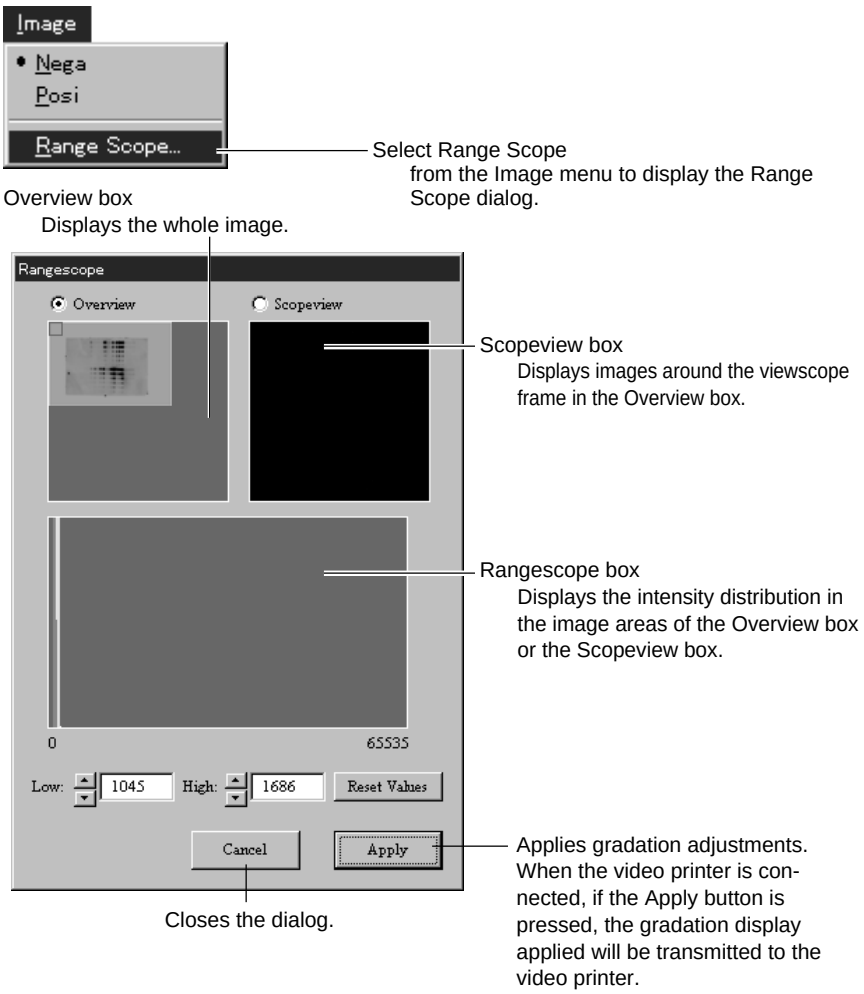
9-2 Adjusting gradations using the Range Scope function

User's Tip:

Range Scope is the function for enhancing gradations on an image file by arbitrarily selecting gradation areas that should be displayed. This function can be used effectively when gradation levels are concentrated in narrow ranges.

Note :

This function changes only gradations viewed on the monitor and does not change pixel intensity of image data.



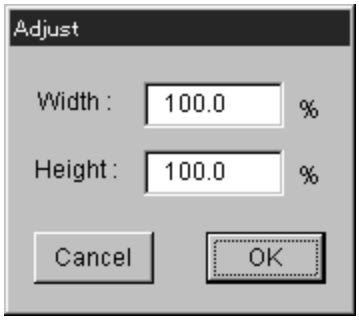
Gradation adjustment : Gradations can be adjusted using either of the following 2 methods.

(1) After adjusting the upper-limit and lower-limit bars (blue/red) in the Rangescope box by dragging the mouse, click the Apply button.

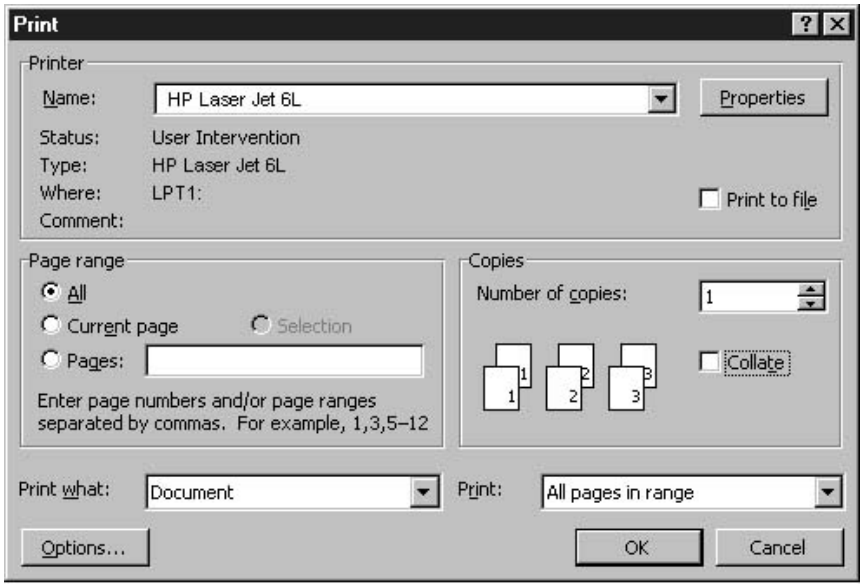
(2) After gradation adjustments by clicking the adjustment dial or by entering values directly from the keyboard with the cursor placed in the input column, click the Apply button.

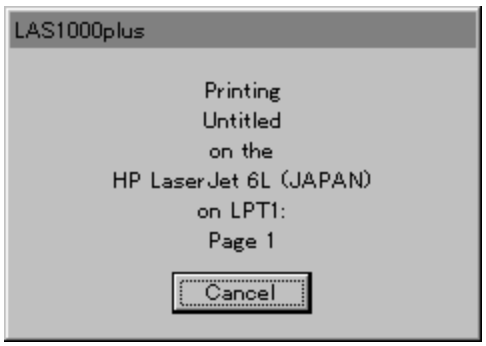
9-3 Printing images to the LBP

If Print LBP is clicked, the Adjust dialog shown below will appear. Set the width and height reduction ratios and then click OK.



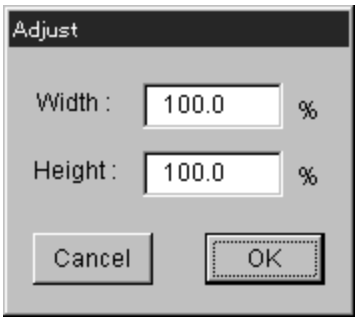
The Print dialog shown below will appear. Set items as necessary and OK. Printing will begin.





9-4 Printing images to the Pictrography

If Print PG is clicked, the Adjust dialog shown below will appear. Set the width and height reduction ratios and then click OK. Printing will begin.



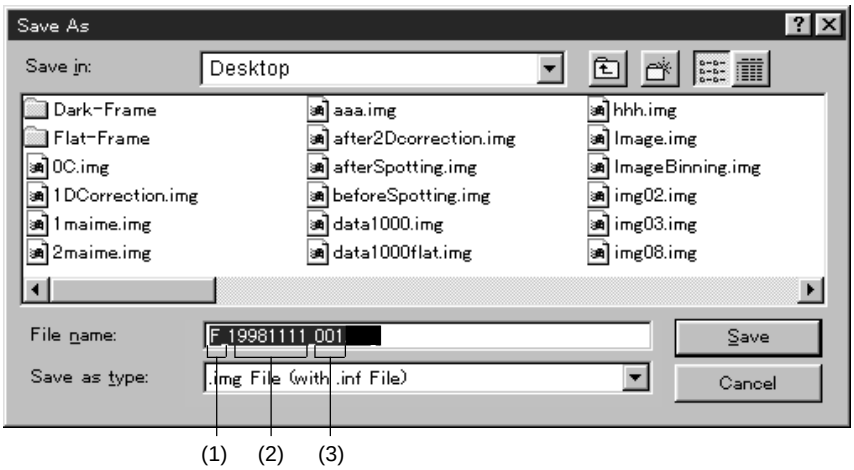
9-5 Printing to the video printer (When optional video printer is connected)

If the video printer's print button is clicked, images will be printed from the video printer.

* Print output to the video printer does not reflect preset corrections. Gradations on an evenly enhanced image can look unnatural. In this case, adjust gradations using the Range Scope function.

9-6 Saving images

If Save is clicked, the File Save dialog shown below will appear.



File names will be given automatically. Automatically given file names can be changed as desired.

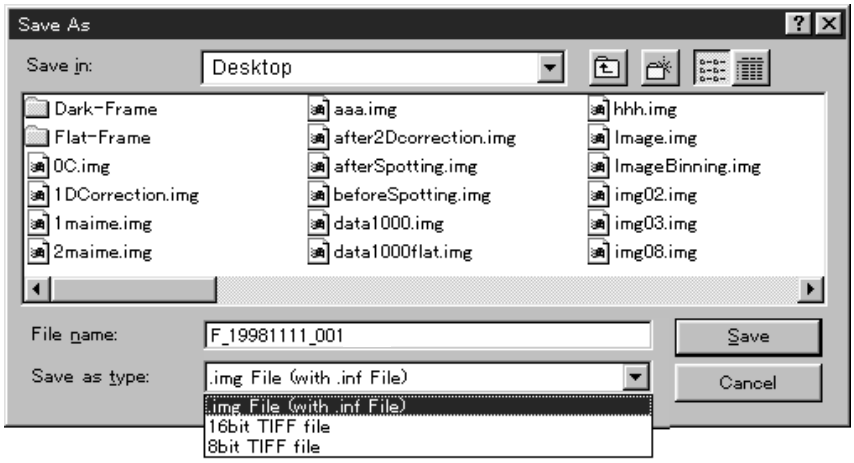
Elements of a file name in the sample above are as follows.

(1) F : Fluorescence (Fluorescence sample)
C : Chemiluminescence (Chemiluminescence sample)
D : Digitizing (Stained gel/film sample)

(2) Date of exposure

(3) Image number (serial number of the day)

File types can be selected from the pull-down menu shown below.



16bit TIFF file ...Stores the file in the format of 16-bit tiff file.
8bit TIFF file ...Stores the file in the format of 8-bit tiff file.
For the 8bit file, an area selected by the adjust bar in the Range scope will be in 8-bit format.

To save a file, specify destination and click Save.

User's Tip:

A file that have the extension of ".img" is the image file. The image information file (.inf) will also be created at the same time as when the image file is created.
Deleting an ".inf" file from the hard disk will cause problems with the ".img" file created as a pair.

9-7 Returning to the top screen after quitting

If Complete is clicked, the display will return to the top screen.

* Changing the tray position and/or exposure mode on the display after completion of exposure will not update such information. Information updating is possible only when the display has returned to the top screen by clicking Complete Complete.

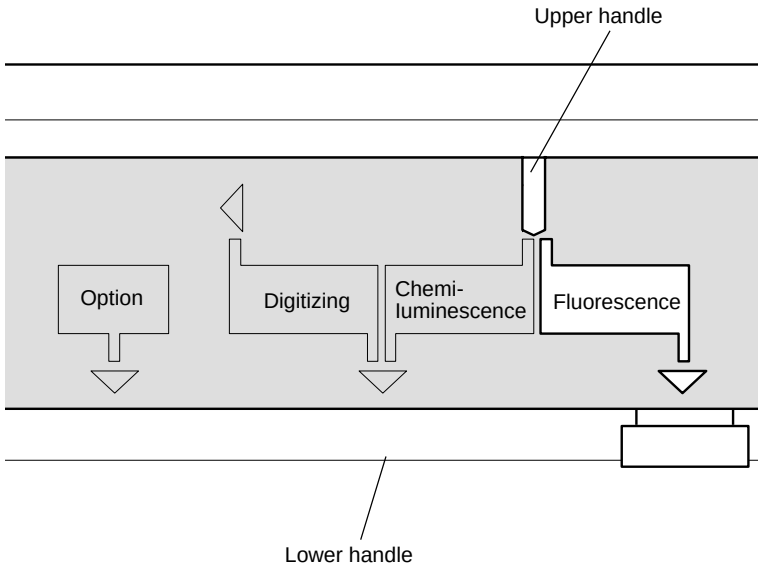
10 Quitting software

Select "Exit" from the File menu on the top screen. This will quit software.

4. Exposing Fluorescent Samples or Enzyme Amplification Fluorescent Samples (Fluorescence)

1 Make sure that the entire system has been activated normally.

2 Open the IDXII door and attach the upper and lower handles for exposure of fluorescent samples.



3 Select the tray position in accordance with the size of the sample.

Angle of field

Inside the intelligent dark box, there are 7 stages of tray rails, making it possible to change the height of the sample tray depending on the position it is inserted in.

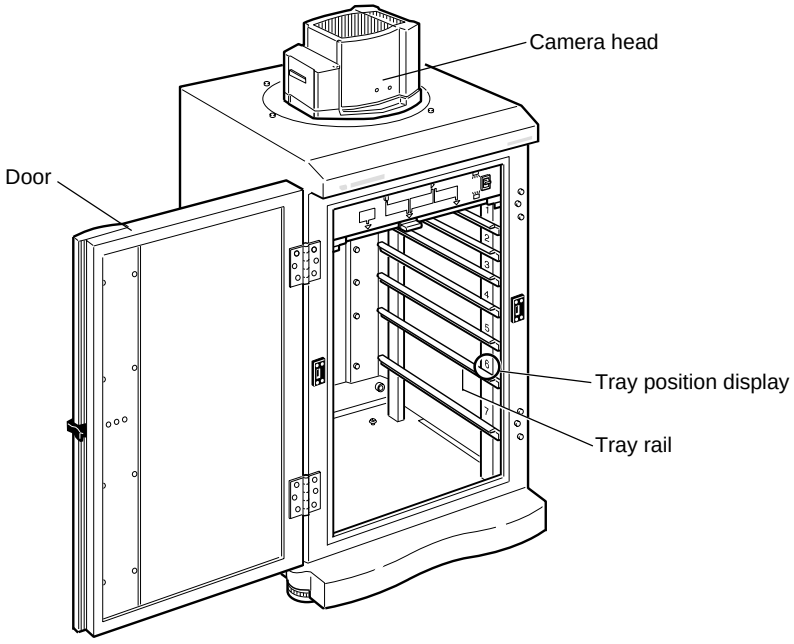


Fig. 4.7 7 stages of the tray position

This allows the size of the field of view (angle of field) to be changed so that the sample can be read on screen at the optimal size.
Size of the field of view, which depends on the height, corresponds to the 7 stages as follows.

Tray rail	High-sensitivity lens
1	7 X 11 cm
2	9 X 14 cm
3	12 X 18 cm
4	14 X 21 cm
5	17 X 25 cm
6	20 X 25 cm
7	25 X25 cm

Shown on the next page are actual sample sizes, 1 ~ 5, when using the high-sensitivity lens.

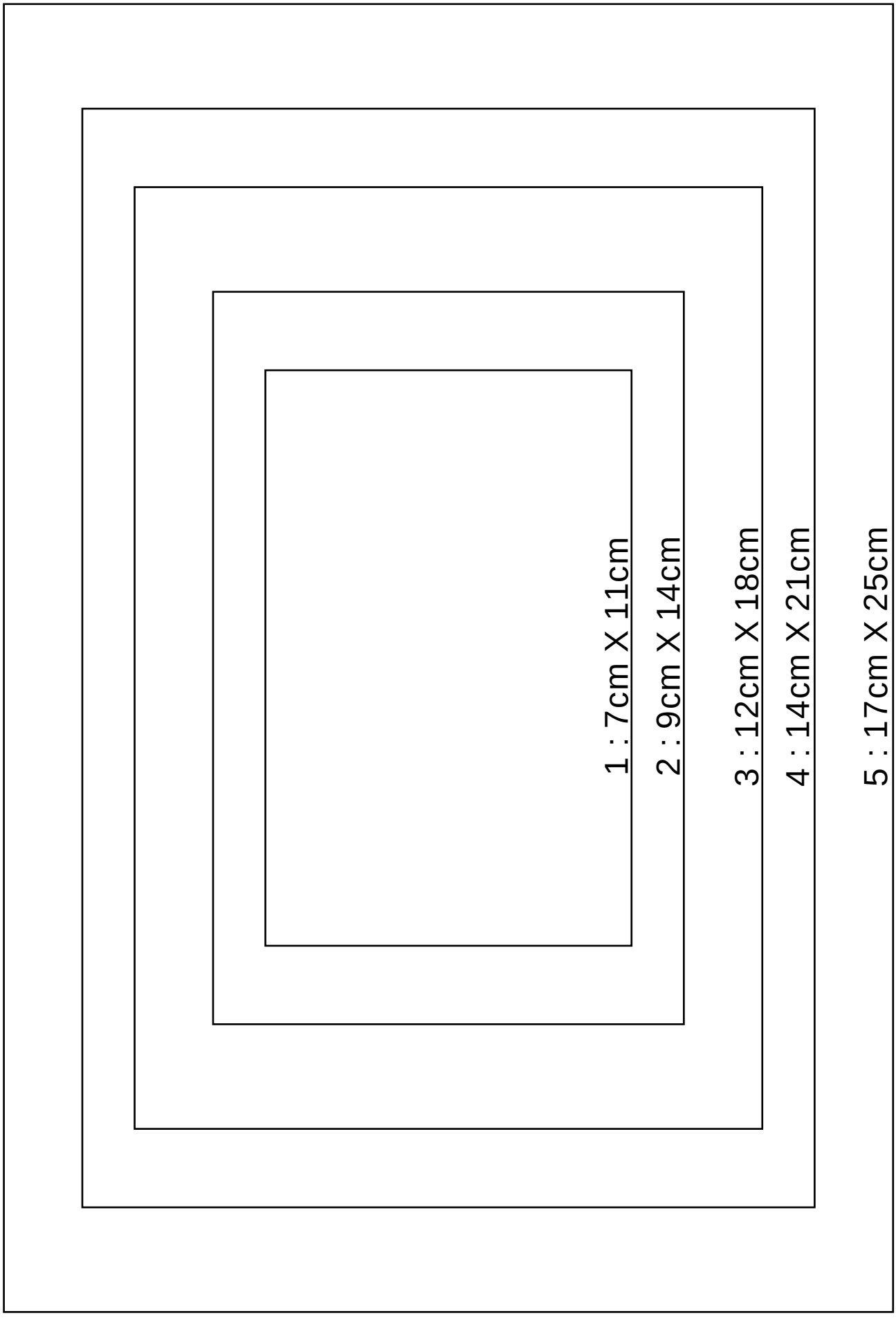
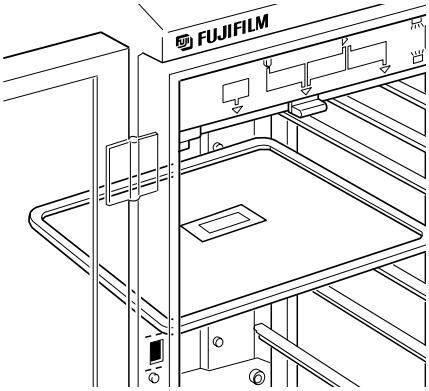


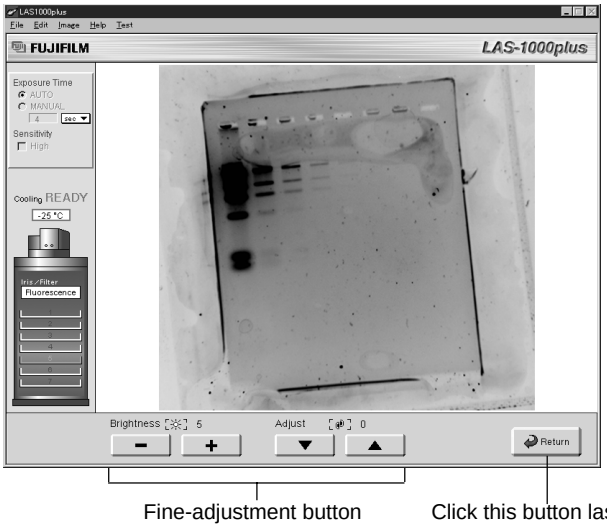
Fig. 4.8 Differences in angle of view (field of view), depending on the height of the sample tray (actual size)

4 Place the sample on the sample tray and set it on the tray rails selected. Shut the door.



5 Adjust the focus.

Click Focusing located at the bottom of the window.
The focusing screen shown below will appear. While observing the image, adjust the focus using the "Brightness" and "Adjust" (focusing) buttons. Once the optimum image has been obtained, click the Return button. This will return the display to the previous screen.

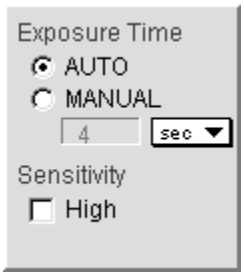


User's Tip:

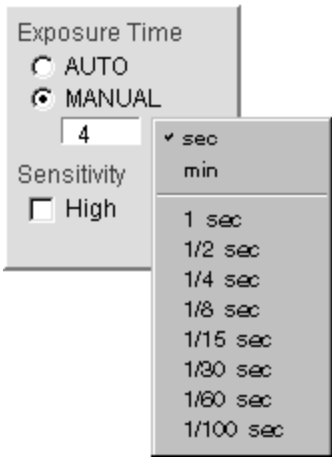
1. If the mouse cursor is placed inside the image, the cursor shape will change to . If the cursor is clicked while is appearing, the image will be magnified 4 times as large as the original size. (If the cursor is clicked again, the image will be displayed in its original size.) "Brightness" and/or "Adjust" (focusing) processing are possible on the magnified image.
2. The focus position undergone fine adjustment with "Adjust" (focusing) processing will be recorded using the Return button, which can be used for next exposure.

6 Set the exposure time.

If "AUTO" is selected, appropriate exposure time of the sample will be set automatically by the software.



To manually set the exposure time, place the mouse cursor in the input column and enter the value (1/100 sec. to 60 min.) directly from the keyboard or set it as desired using the pull-down menu.



7 High-sensitivity mode can be selected. (Binning processing)

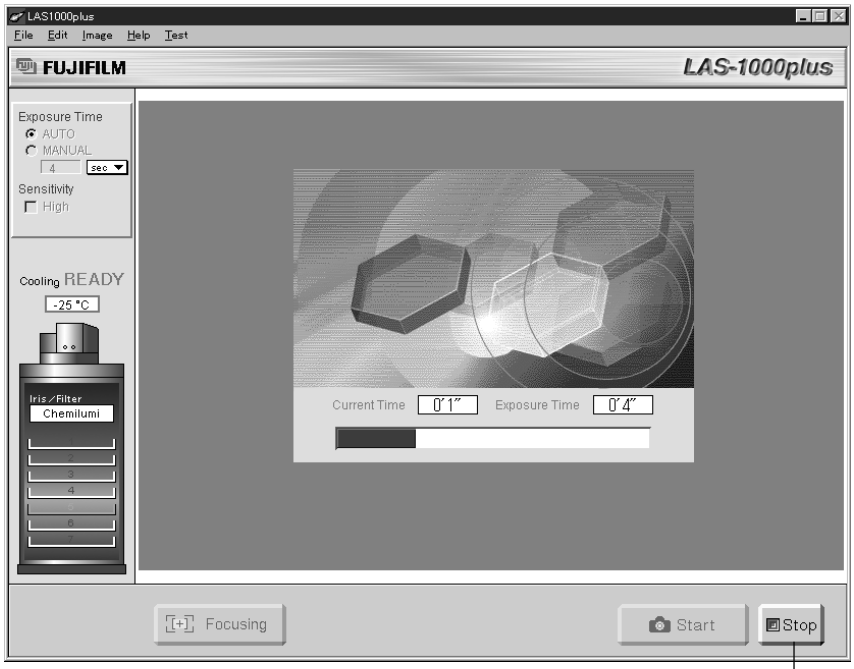
Click ☐ at the left of "High" to have it selected ☑, as required.

User's Tip:

1. High-sensitivity mode is the binning processing function combined with the image processing function.
2. Binning processing digitizes image data after subjecting it to analog processing taking 4 pixels (2 X 2 pixels) as 1 pixel. Though binning processing decreases overall image resolution, it increases sensitivity.
3. In high-sensitivity mode, coarse image due to decreased resolution will be corrected by the software.

8 Start exposure.

Click the Start button. Exposure progression display as shown below will appear to start exposure.

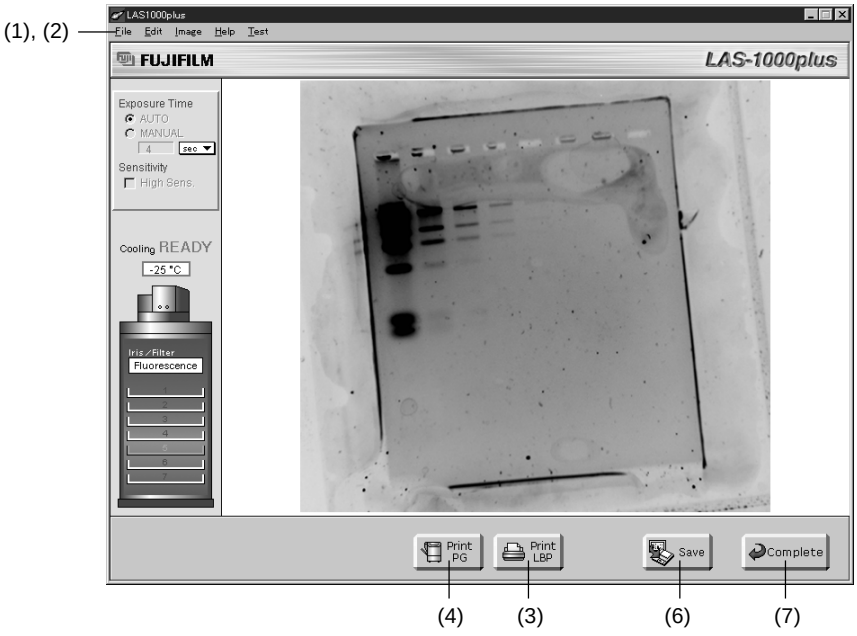


Click to discontinue exposure for any reason.

9 Processing after exposure has been completed.

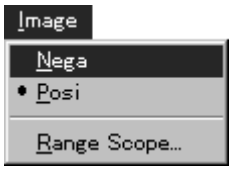
After the completion of exposure, a display as the one shown below will appear.
The following 5 kinds of operations are possible on the display.

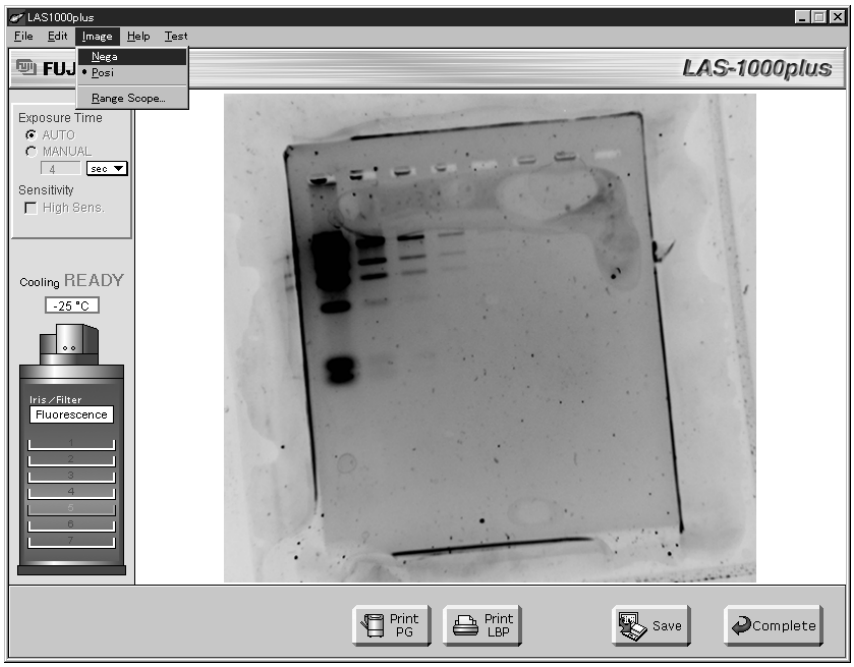
(1)	Selecting negative or positive	See step 9-1.
(2)	Adjusting gradations using the Range Scope function	See step 9-2.
(3)	Printing images to the LBP	See step 9-3.
(4)	Printing images to the Pictrography	See step 9-4.
(5)	Printing images to the video printer (no button on the display)	See step 9-5.
(6)	Saving images	See step 9-6.
(7)	Returning to the top screen after quitting	See step 9-7.

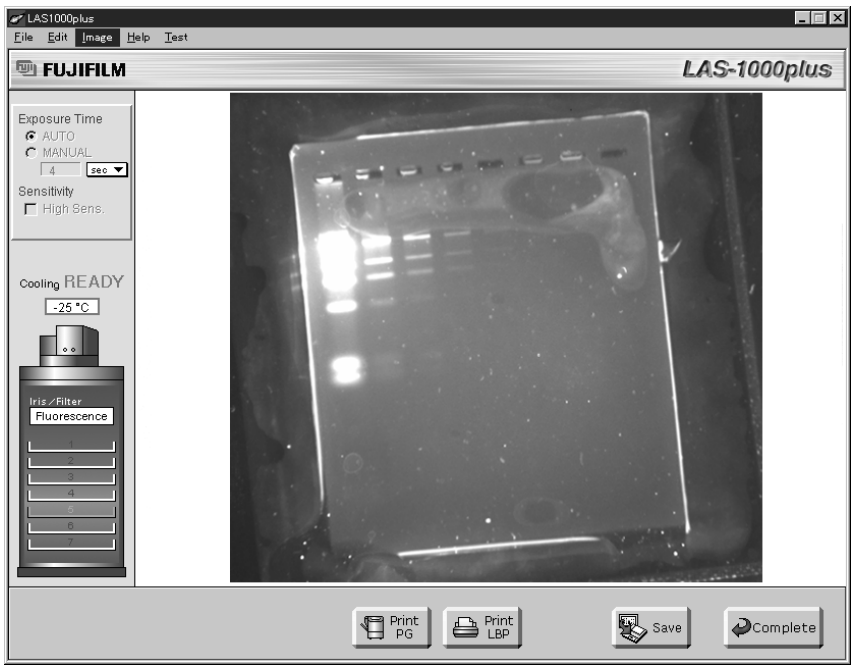


9-1 Selecting negative or positive

Select "Nega" or "Posi" from the Image menu.







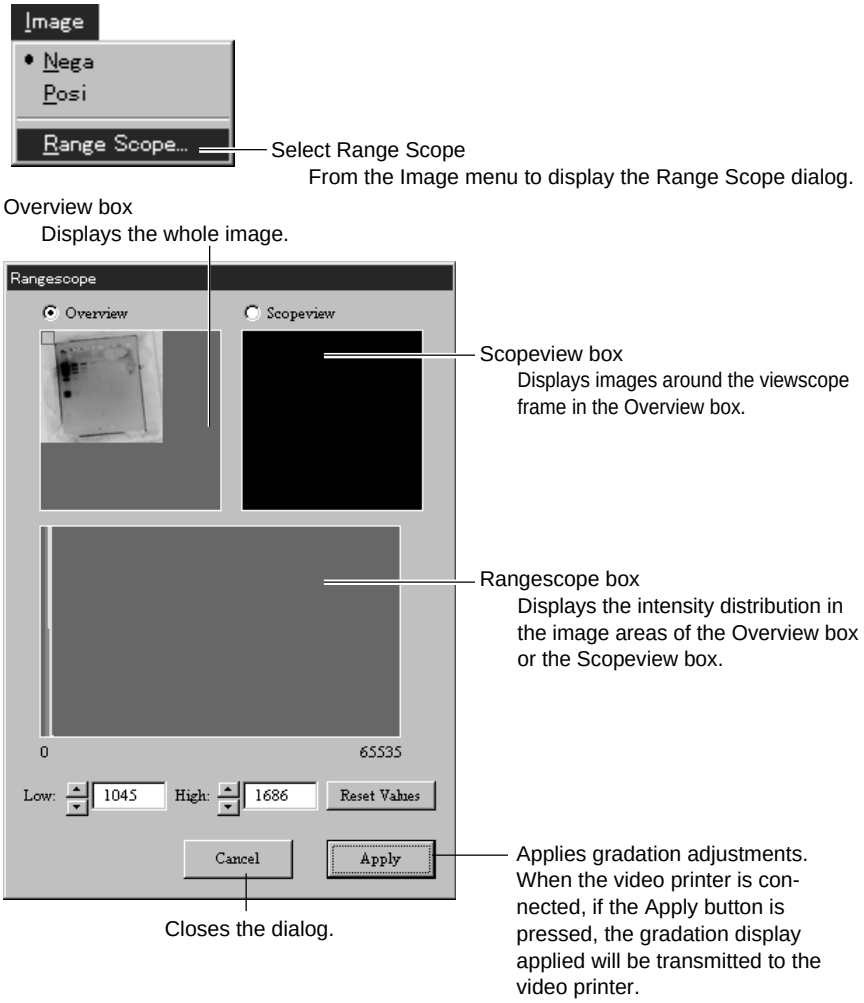
9-2 Adjusting gradations using the Range Scope function

User's Tip:

Range Scope is the function for enhancing gradations on an image file by arbitrarily selecting gradation areas that should be displayed. This function can be used effectively when gradation levels are concentrated in narrow ranges.

Note :

This function changes only gradations viewed on the monitor and does not change pixel intensity of image data.



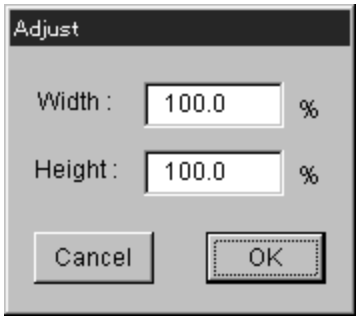
Gradation adjustment : Gradations can be adjusted using either of the following 2 methods.

(1) After adjusting the upper-limit and lower-limit bars (blue/red) in the Rangescope box by dragging the mouse, click the Apply button.

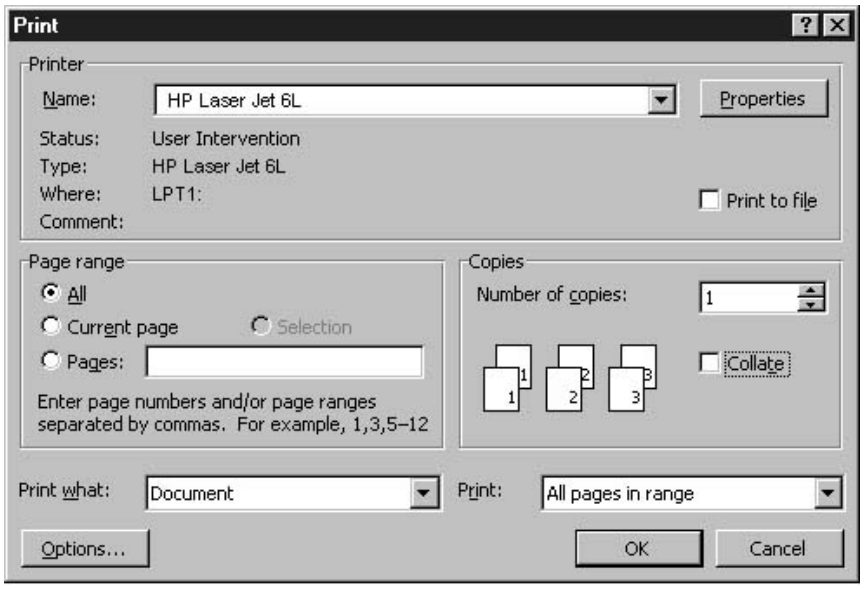
(2) After gradation adjustments by clicking the adjustment dial or by entering values directly from the keyboard with the cursor placed in the input column, click the Apply button.

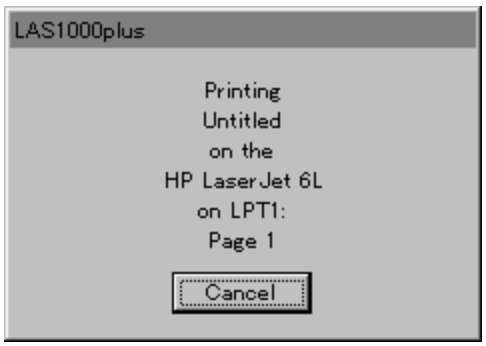
9-3 Printing images to the LBP

If Print LBP is clicked, the Adjust dialog shown below will appear. Set the width and height reduction ratios and then click OK.



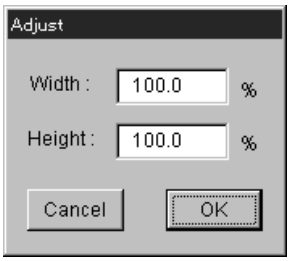
The Print dialog shown below will appear. Set items as necessary and OK. Printing will begin.





9-4 Printing images to the Pictrography

If Print PG is clicked, the Adjust dialog shown below will appear. Set the width and height reduction ratios and then click OK. Printing will begin.



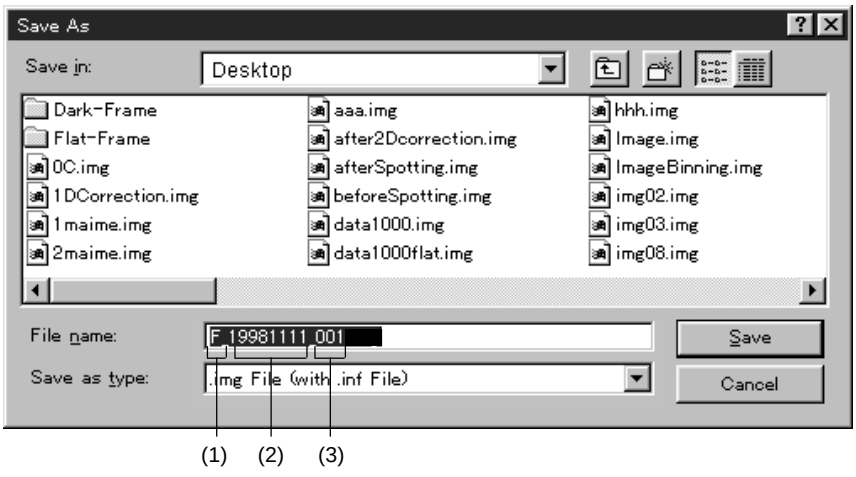
9-5 Printing to the video printer (When optional video printer is connected)

If the video printer's print button is clicked, images will be printed from the video printer.

* Print output to the video printer does not reflect preset corrections. Gradations on an evenly enhanced image can look unnatural. In this case, adjust gradations using the Range Scope function.

9-6 Saving images

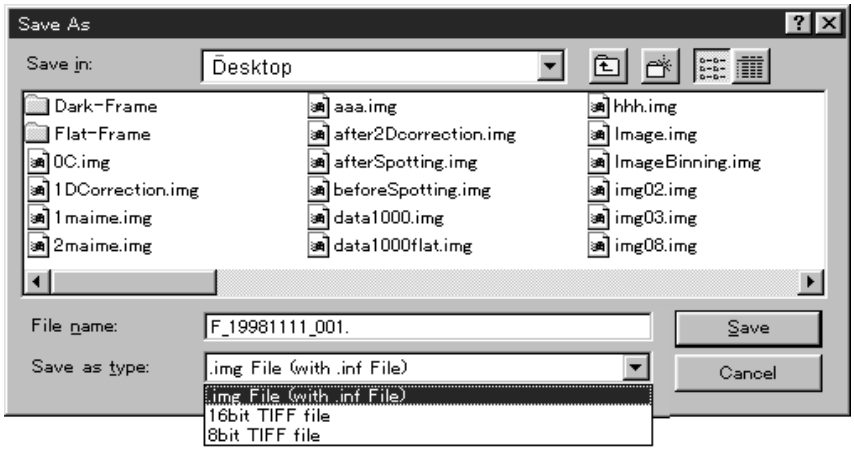
If Save is clicked, the File Save dialog shown below will appear.



File names will be given automatically. Automatically given file names can be changed as desired.
Elements of a file name in the sample above are as follows.

(1) F : Fluorescence (Fluorescence sample)
C : Chemiluminescence (Chemiluminescence sample)
D : Digitizing (Stained gel/film sample)
(2) Date of exposure
(3) Image number (serial number of the day)

File types can be selected from the pull-down menu shown below.



16bit TIFF file ...Stores the file in the format of 16-bit tiff file.
8bit TIFF file ...Stores the file in the format of 8-bit tiff file.
For the 8bit file, an area selected by the adjust bar in the Range scope will be in 8-bit format.

To save a file, specify destination and click Save.

User's Tip:

A file that have the extension of ".img" is the image file. The image information file (.inf) will also be created at the same time as when the image file is created.
Deleting an ".inf" file from the hard disk will cause problems with the ".img" file created as a pair.

9-7 Returning to the top screen after quitting

If Complete is clicked, the display will return to the top screen.

10 Quitting software

Select "Exit" from the File menu on the top screen. This will quit software.

5. Exposing Stained Gel or Film Samples

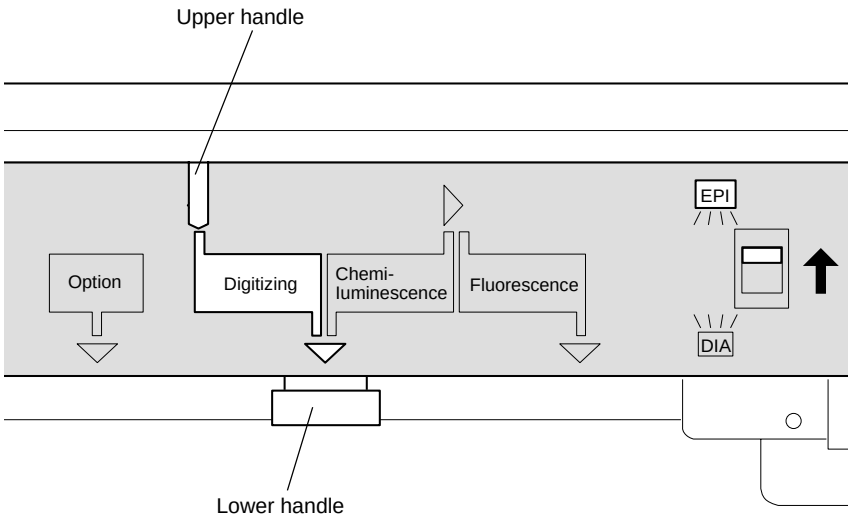
1 Make sure that the entire system has been activated normally.

2 Open the IDXII door and attach the upper and lower handles for exposure of stained gel or film samples (Digitizing).

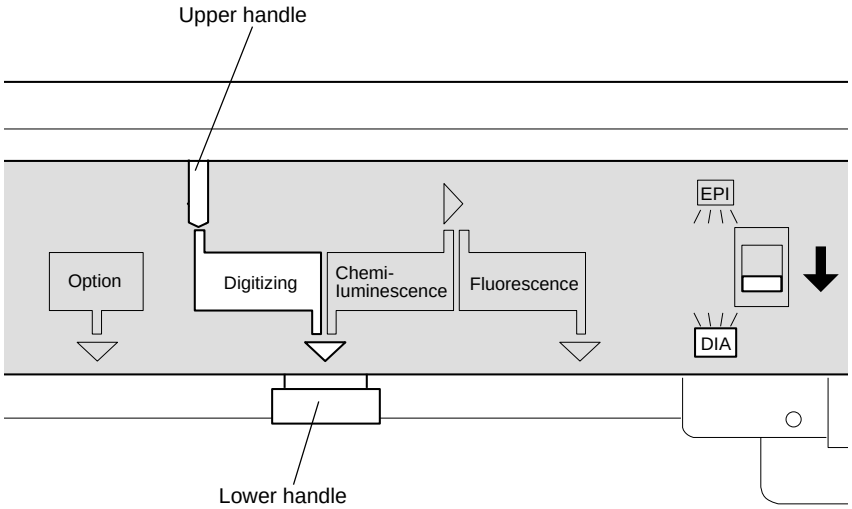
Note :

Attach the handles and correctly set the Transmitted Light (EPI) / Transparent Light (DIA) selector switch. Switching the selection will turn the upper and lower light sources ON / OFF alternately.

Transmitted light method :



Transparent light method :



3 Select the tray position in accordance with the size of the sample.

Angle of field

Inside the intelligent dark box, there are 7 stages of tray rails, making it possible to change the height of the sample tray depending on the position it is inserted in.

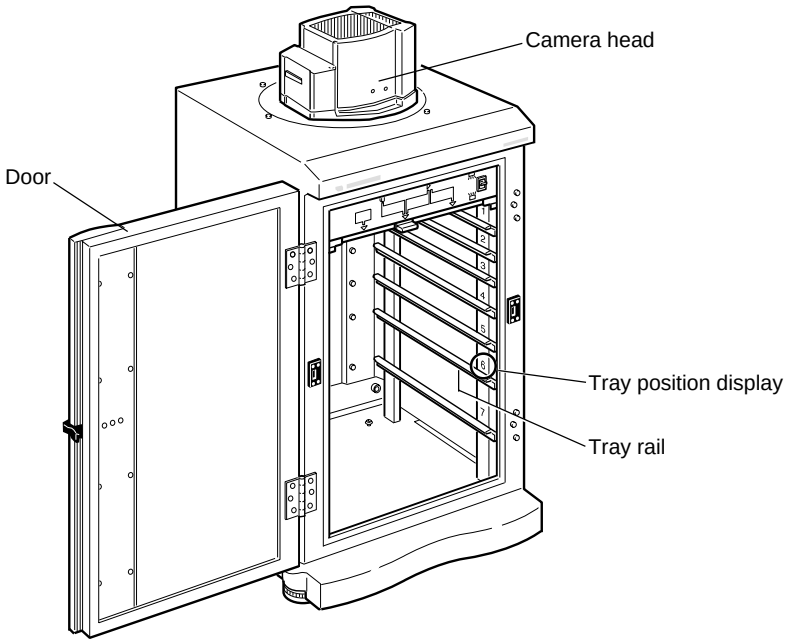


Fig. 4.9 7 stages of the tray position

This allows the size of the field of view (angle of field) to be changed so that the sample can be read on screen at the optimal size.
Size of the field of view, which depends on the height, corresponds to the 7 stages as follows.

Tray rail	High-sensitivity lens
1	7 X 11 cm
2	9 X 14 cm
3	12 X 18 cm
4	14 X 21 cm
5	17 X 25 cm
6	20 X 25 cm
7	25 X 25 cm

Shown on the next page are actual sample sizes, 1 ~ 5, when using the high-sensitivity lens.

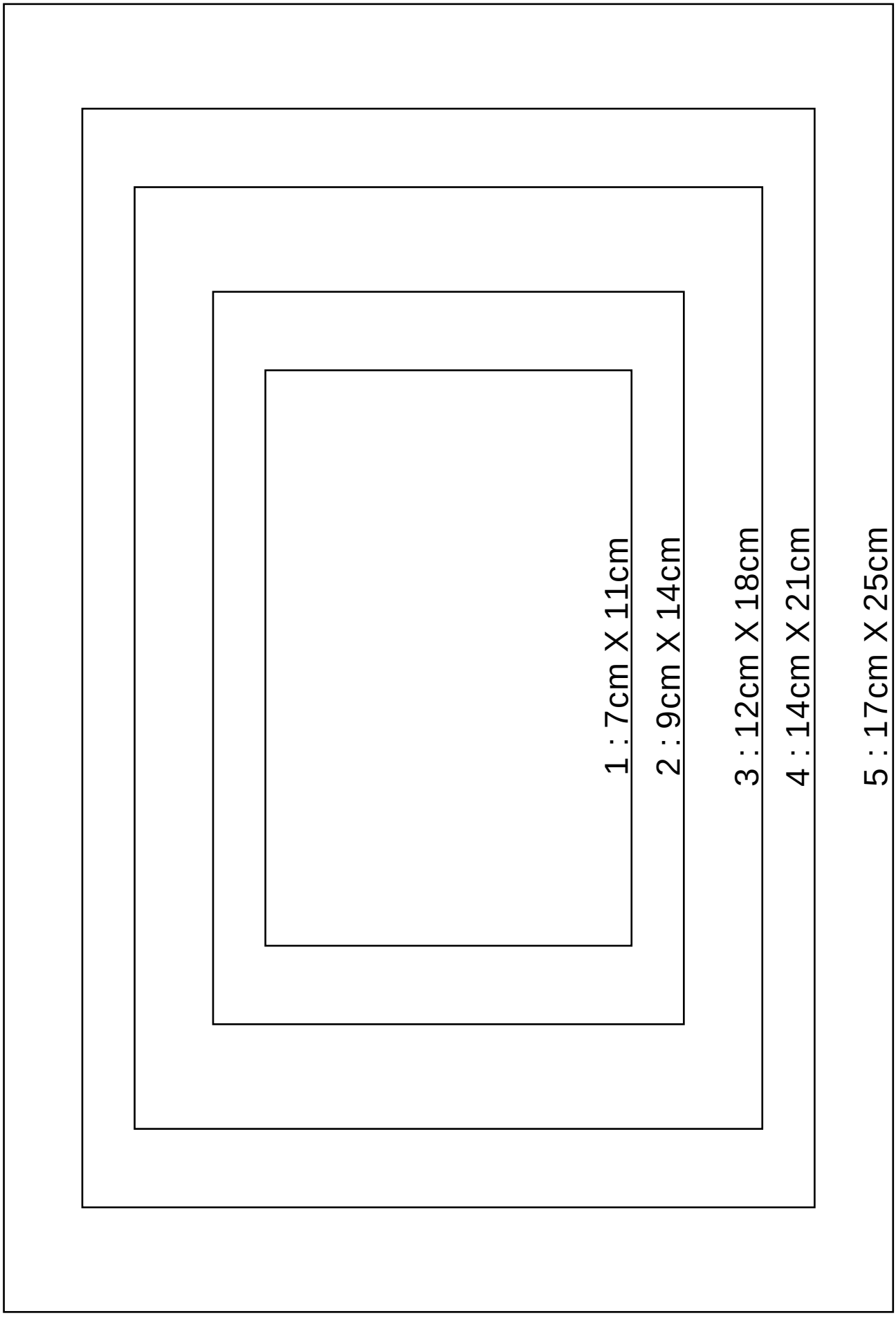
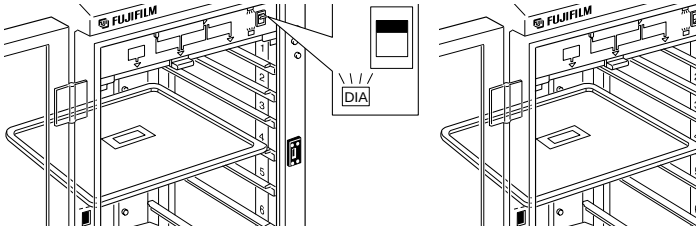


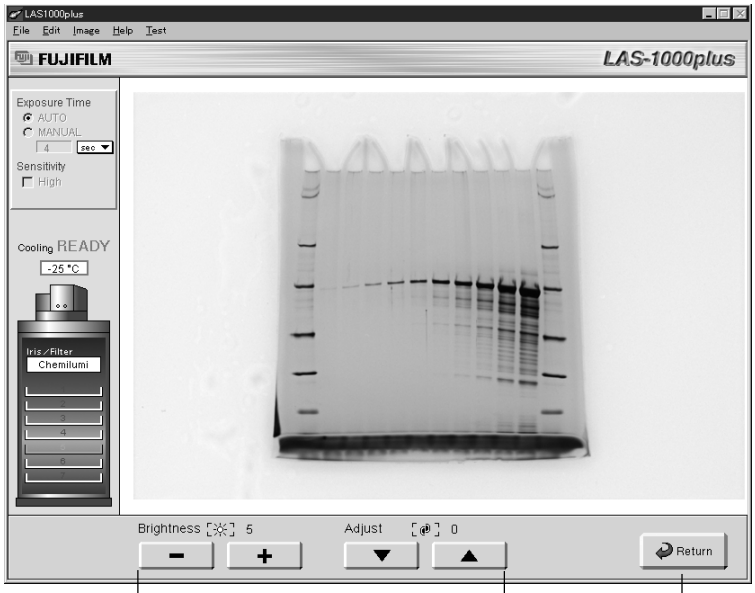
Fig. 4.10 Differences in angle of view (field of view), depending on the height of the sample tray (actual size)

4 Place the sample on the sample tray and set it on the tray rails selected. Shut the door.



5 Adjust the focus.

Click [Focusing] located at the bottom of the window.
The focusing screen shown below will appear. While observing the image, adjust the focus using the "Brightness" and "Adjust" (focusing) buttons. Once the optimum image has been obtained, click the [Return] button. This will return the display to the previous screen.

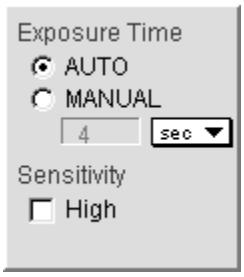


User's Tip:

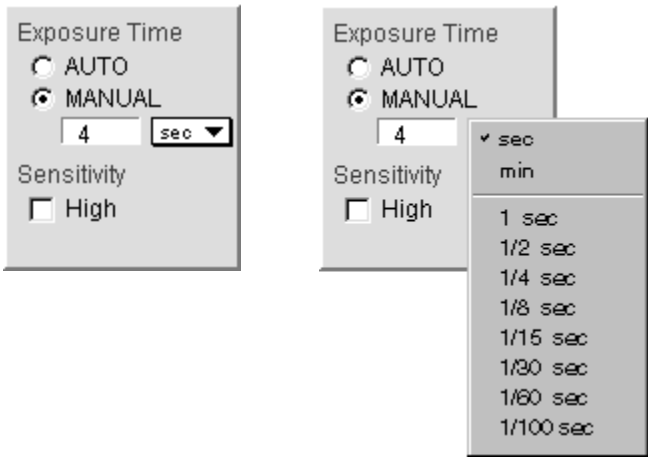
1. If the mouse cursor is placed inside the image, the cursor shape will change to 🔍. If the cursor is clicked while 🔍 is appearing, the image will be magnified 4 times as large as the original size. (If the cursor is clicked again, the image will be displayed in its original size.) "Brightness" and/or "Adjust" (focusing) processing are possible on the magnified image.
2. The focus position undergone fine adjustment with "Adjust" (focusing) processing will be recorded using the [Return] button, which can be used for next exposure.

6 Set the exposure time.

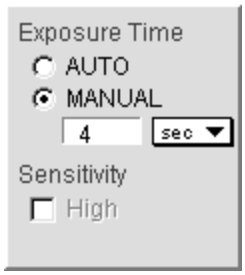
If "AUTO" is selected, appropriate exposure time of the sample will be set automatically by the software.



To manually set the exposure time, place the mouse cursor in the input column and enter the value (1/100 sec. to 60 min.) directly from the keyboard or set it as desired using the pull-down menu.

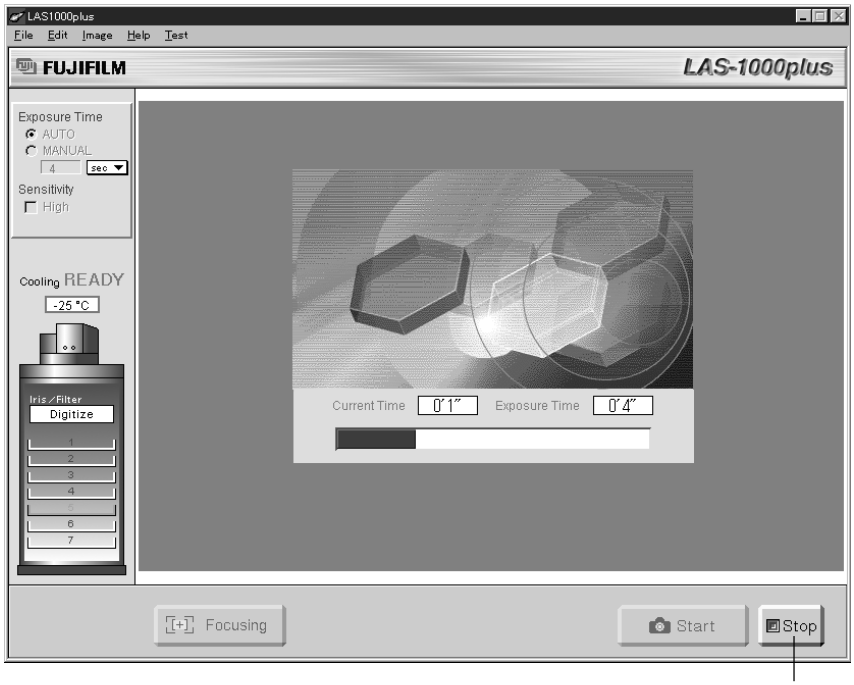


7 High-sensitivity mode cannot be selected for exposure of stained gel or film samples (Digitizing).



8 Start exposure.

Click the Start button. Exposure progression display as shown below will appear to start exposure.



Click to discontinue exposure for any reason.

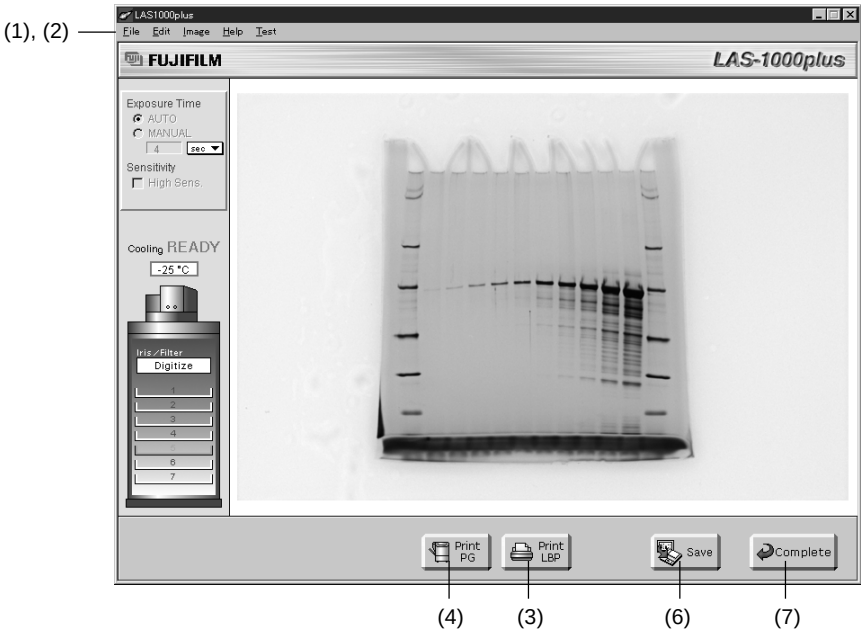
User's Tips:

In Digitizing mode, images for which pixel densities have been inverted automatically will be displayed.

9 Processing after exposure has been completed.

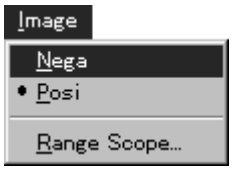
After the completion of exposure, a display as the one shown below will appear.
The following 5 kinds of operations are possible on the display.

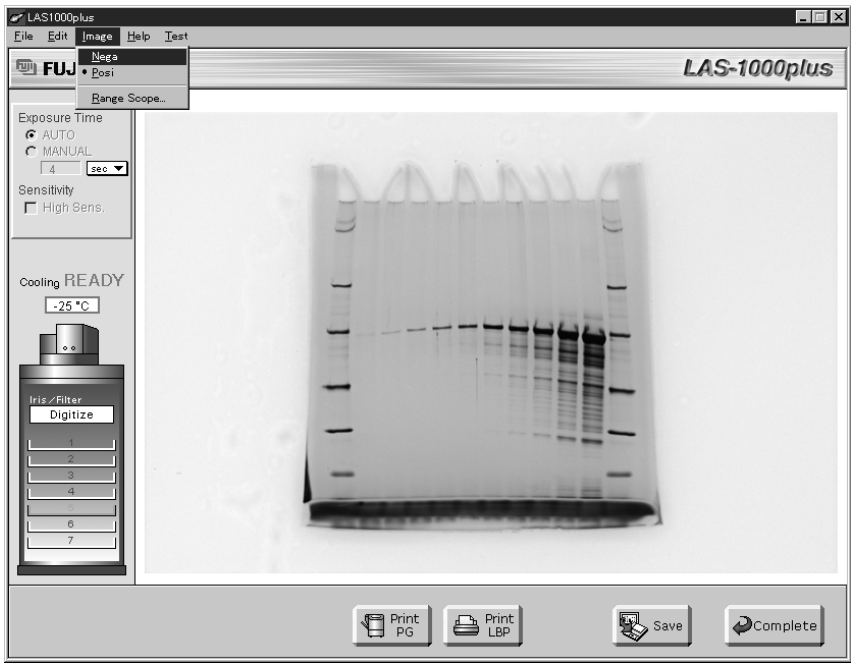
(1)	Selecting negative or positive	See step 9-1.
(2)	Adjusting gradations using the Range Scope function	See step 9-2.
(3)	Printing images to the LBP	See step 9-3.
(4)	Printing images to the Pictrography	See step 9-4.
(5)	Printing images to the video printer (no button on the display)	See step 9-5.
(6)	Saving images	See step 9-6.
(7)	Returning to the top screen after quitting	See step 9-7.

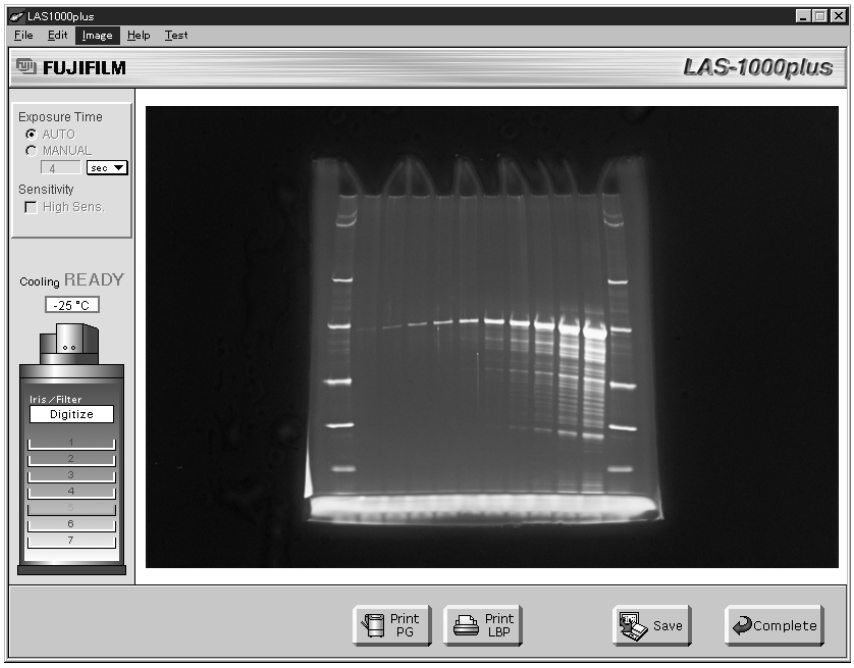


9-1 Selecting negative or positive

Select "Nega" or "Posi" from the Image menu.







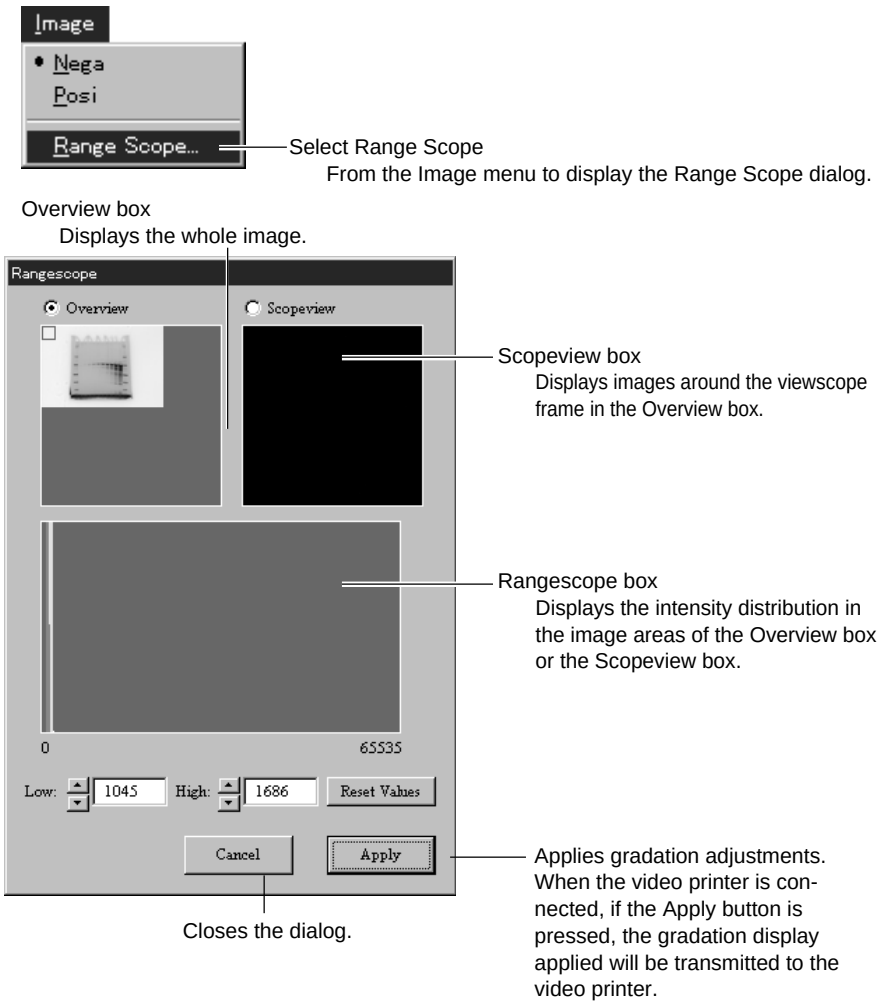
9-2 Adjusting gradations using the Range Scope function

User's Tip:

Range Scope is the function for enhancing gradations on an image file by arbitrarily selecting gradation areas that should be displayed. This function can be used effectively when gradation levels are concentrated in narrow ranges.

Note :

This function changes only gradations viewed on the monitor and does not change pixel intensity of image data.



Gradation adjustment : Gradations can be adjusted using either of the following 2 methods.

(1) After adjusting the upper-limit and lower-limit bars (blue/red) in the Rangescope box by dragging the mouse, click the Apply button.

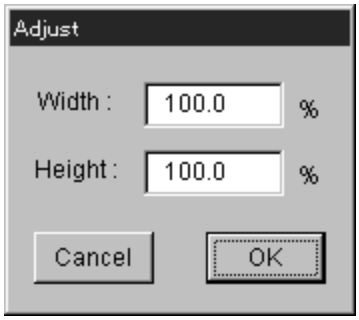
(2) After gradation adjustments by clicking the adjustment dial or by entering values directly from the keyboard with the cursor placed in the input column, click the Apply button.

9-3 Printing images to the LBP

If 

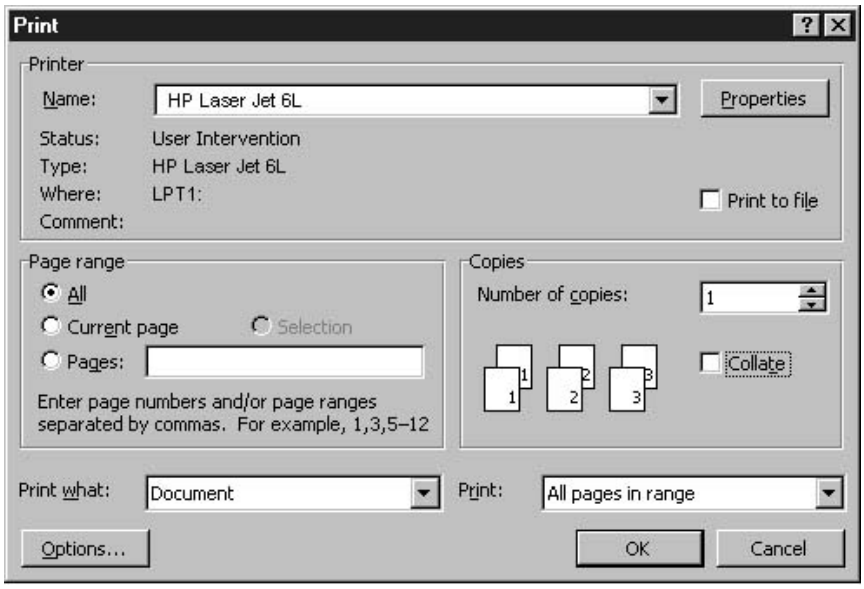
is clicked, the Adjust dialog shown below will appear. Set the width and height reduction ratios and then click 

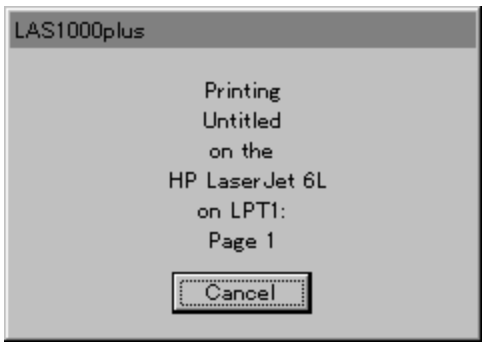
.



The Print dialog shown below will appear. Set items as necessary and 

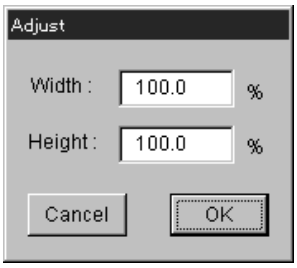
. Printing will begin.





9-4 Printing images to the Pictrography

If Print PG is clicked, the Adjust dialog shown below will appear. Set the width and height reduction ratios and then click OK. Printing will begin.



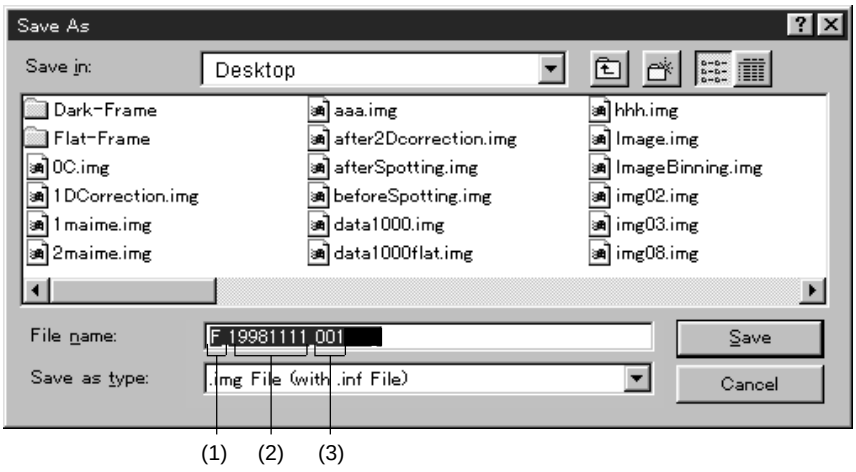
9-5 Printing to the video printer (When optional video printer is connected)

If the video printer's print button is clicked, images will be printed from the video printer.

* Print output to the video printer does not reflect preset corrections. Gradations on an evenly enhanced image can look unnatural. In this case, adjust gradations using the Range Scope function.

9-6 Saving images

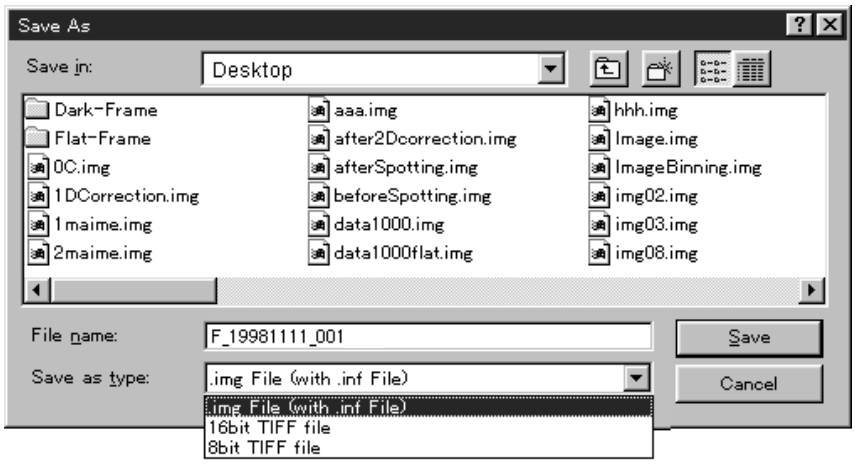
If Save is clicked, the File Save dialog shown below will appear.



File names will be given automatically. Automatically given file names can be changed as desired.
Elements of a file name in the sample above are as follows.

(1) F : Fluorescence (Fluorescence sample)
C : Chemiluminescence (Chemiluminescence sample)
D : Digitizing (Stained gel/film sample)
(2) Date of exposure
(3) Image number (serial number of the day)

File types can be selected from the pull-down menu shown below.



16bit TIFF file ...Stores the file in the format of 16-bit tiff file.
8bit TIFF file ...Stores the file in the format of 8-bit tiff file.
For the 8bit file, an area selected by the adjust bar in the Range scope will be in 8-bit format.

To save a file, specify destination and click Save.

User's Tip:

A file that have the extension of ".img" is the image file. The image information file (.inf) will also be created at the same time as when the image file is created.
Deleting an ".inf" file from the hard disk will cause problems with the ".img" file created as a pair.

9-7 Returning to the top screen after quitting

If Complete is clicked, the display will return to the top screen.

10 Quitting software

Select "Exit" from the File menu on the top screen. This will quit software.

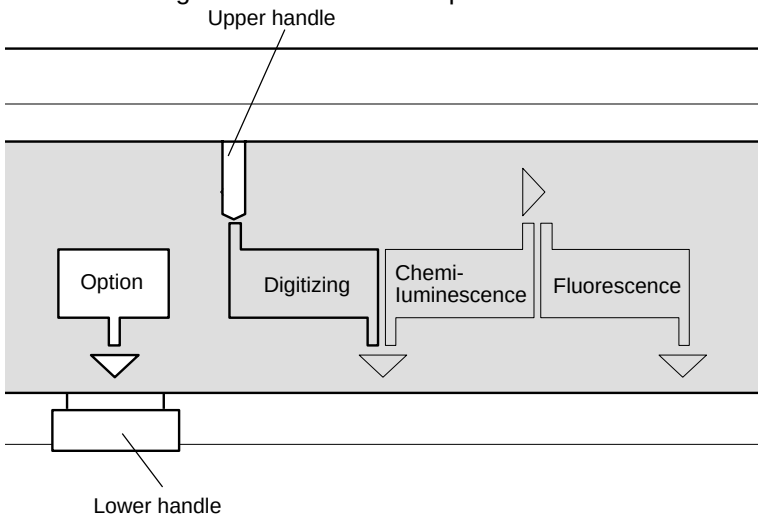
6. Exposing Fluorescent Samples Using Optional Filter

1 Make sure that the entire system has been activated normally.

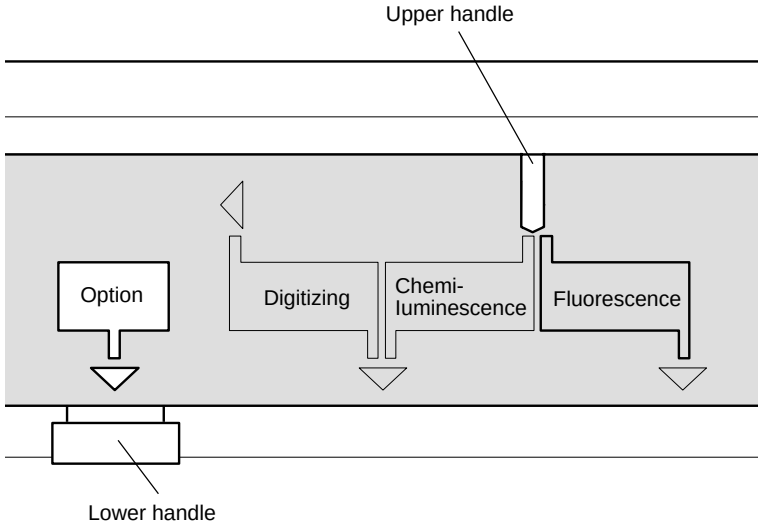
2 Open the IDXII door and attach the upper and lower handles as follows.

When preferring resolution to sensitivity : Set the aperture to 2.8.

* Amount of differences in the result of conversion from light to electricity is 16 times as large in terms of 0.85 of aperture.



When sensitivity is required : Set the aperture to 0.85.



3 Select the light source and filter to be used from the "Option Setting" in the Edit menu.

4 For operations hereafter, see "4. Exposing Fluorescent Samples or Enzyme Amplification Fluorescent Samples (Fluorescence)."

* Make sure to attach optional filter, otherwise correct images cannot be obtained.
* Selection of exposure time in the Option mode is available only in the MANUAL mode.

7. Quitting

1 Quit the Image Reading Software, "Image Reader LAS-1000 Lite."

A dialog like that shown below will appear. Wait for a while.

2 After this software has quit, shut down the OS and then turn the main unit power OFF. (Depending on the machine type, the computer power will turn OFF automatically after the OS has been shut down.

3 Turn OFF the power to the camera controller and the computer's peripheral devices.

⚠ CAUTION

- Do not turn the power to the camera controller ON/OFF very often. Damage could result in the equipment and/or computer system.
- Be sure to quit the image reading software and then turn OFF the power to the camera controller. The cooling system of the equipment could be damaged if the power to the camera controller is turned OFF before quitting the image reading software.

User's Tip:

To reboot this system, turn the power ON again after approx. 10 sec. have passed.

Part 5

Operations II (Image Reader LAS-1000 Pro)

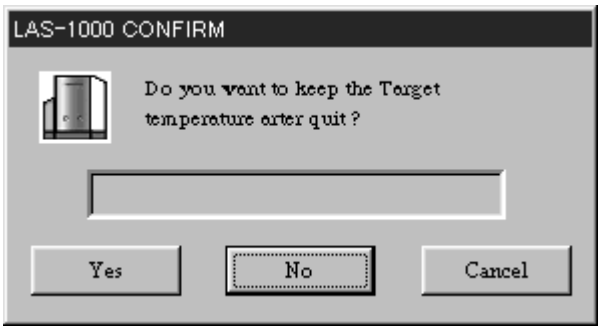
1. Startup and Quitting

1.1 Startup

Double-click the  icon or start from the application registered on the startup menu.
The opening dialog will be displayed for some seconds and the software (Focusing) will start up.

1.2 Quitting

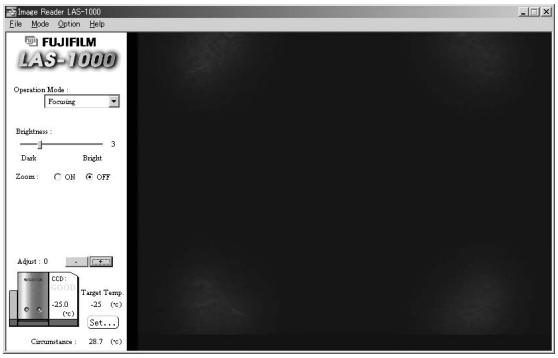
Using the File's pulldown menu, select Quitting (or use the Alt+F4 as a shortcut) (for Macintosh, ⌘+Q) to quit the software. When quitting the software, a dialog like that shown below will appear asking whether or not to stop the cooling process in the camera controller. If you want to stop the cooling process to quit the software, press No, and to quit the software with the cooling process maintained, press Yes.



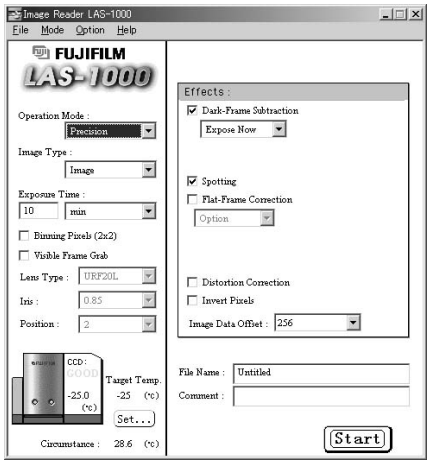
2. 4 Modes

This software consists of the following 4 operation modes.

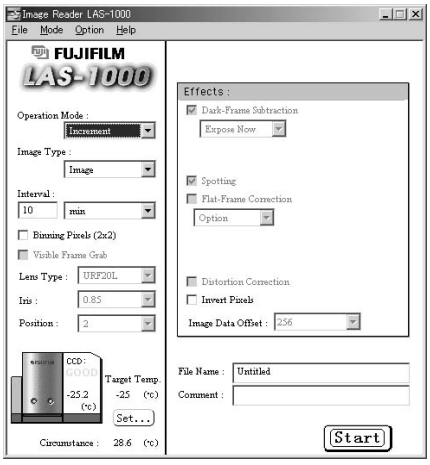
* Focusing (focus mode)
  Used for adjusting camera focus.



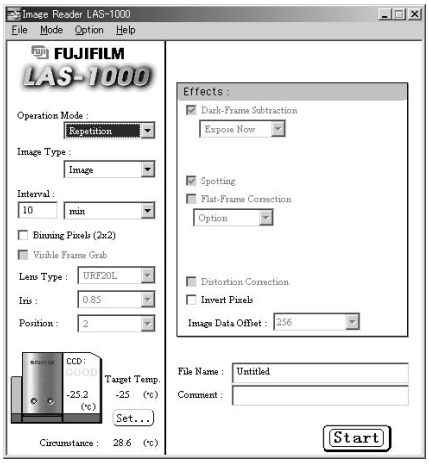
* Precision (normal exposure mode)
  Used for capturing images at a set exposure time.



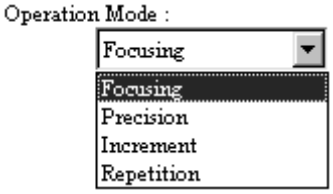
* Increment (consecutive exposure mode)
  Used for capturing images added consecutively at a set, fixed interval of time.

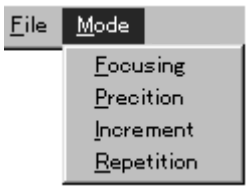


* Repetition (repeating exposure mode)
  Used for capturing images repeatedly under the same exposure conditions.



1 To switch between modes, use the pulldown menu for Operation Mode selection or for Mode menu selection within each mode dialog.





* To use the IIDXII in the Option mode, select the "Option Setting..." from the File menu.

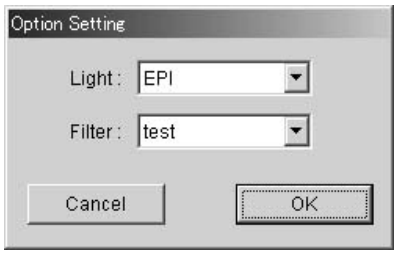
Option Setting... Allows selection of light source and filter type after selecting the Option mode for a photography mode.

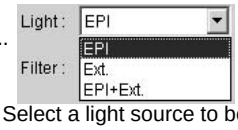
Remember to complete the tasks shown below before selecting the type of filter.

For Windows user:
Create a text file named <FILTER.TXT> in the Image Reader LAS-1000 Folder. (in the same hierarchy as the readme.txt). The extension <.txt> will be automatically in cluded when the WordPad is used.
The file name <FILTER> may be either uppercase or lowercase letters. In the text file, include a name of filter (user definable) installed in the Dark Box II as Option filter in the "harf width" alphanumeric characters.

For Macintosh user:
Create a text file named <FILTER.TXT> in the Image Reader LAS-1000 Folder (in the same hierarchy as the readme.txt) with the Simple Text or other appropriate text editor. Remember to attach the extension <.txt>.
The file name <FILTER> may be either uppercase or lowercase letters. In the text file, include a name of filter (user definable) installed in the Dark Box II as Option filtter in the "harf width" alphanumeric characters.

Setting method of Option Setting



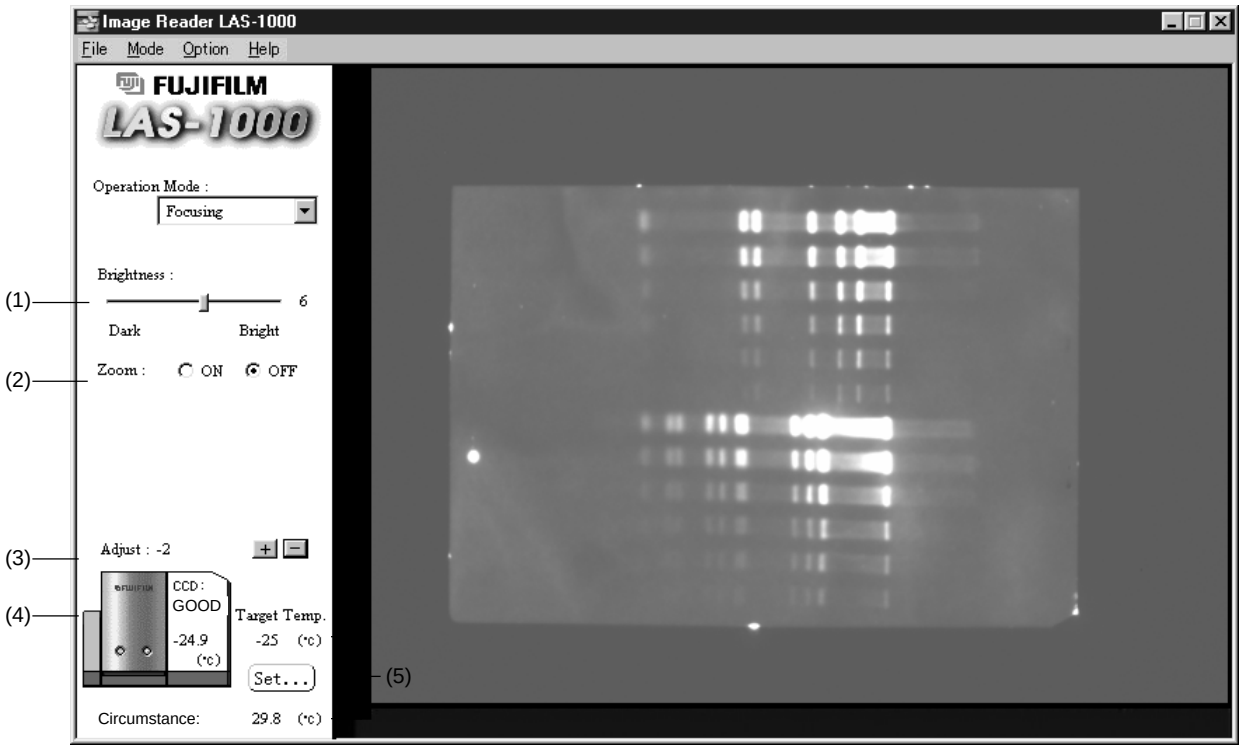
Light..... 

Select a light source to be used as Option mode from the pull-down menu.
EPI.....Select this option to use the vertical illumination incorporated in the IDXII.
Ext.....Select this option to use any external (transmitted) light source.
EPI+Ext.....Select this option to use the vertical light source and any external light source concurrently.
Filter.....Select a name of filter installed as Option filter.

3. Mode Usage Methods

3.1 Focusing

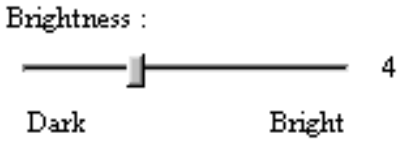
Used for adjusting camera focus.
The image taken with the CCD will be displayed. Adjust the camera lens focus while viewing it.



* For the LAS-1000plus system, the internal light will be turned ON automatically.
* For the LAS-1000C and 1000 systems, open the door to utilize the external light.

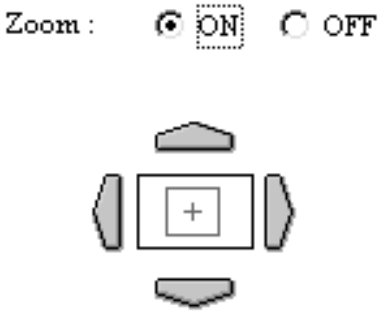
The following adjustments are possible in Focusing.

(1) Brightness adjustment

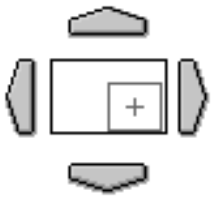


Use this dial to adjust brightness so that the image is easy to see.

(2) Display magnification adjustment



When the Zoom function for the display ratio is OFF, the entire image will be displayed.
To display part of an image in an enlarged state, select ON for the Zoom function.
Adjust the portion to be displayed in an enlarged state by clicking the 4 directional buttons or dragging the rectangular frame.



(3) Focus adjustment
Adjust the focusing finely by clicking the + and − buttons.

* This function cannot be used for the LAS-1000C and 1000 systems.

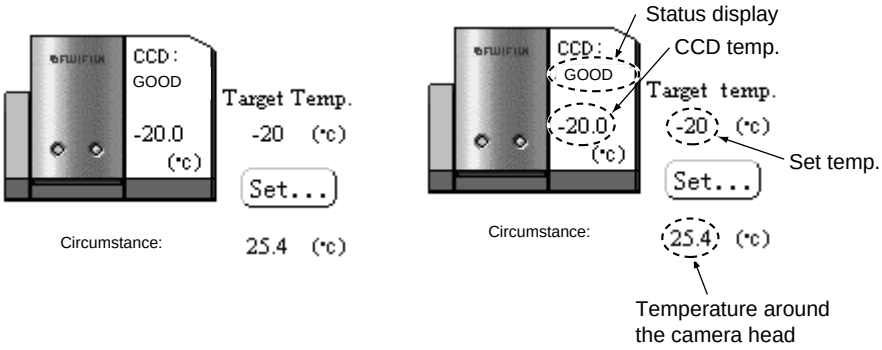
(4) Temperature adjustment

* Automatic control of temperature adjustment will begin when the power supply for the camera controller is turned ON.

Until the temperature adjustment command is received from this software, the camera controller will begin cooling to a target as low as -20°C (-4UV).

The temperature adjustment function is available common to each mode.

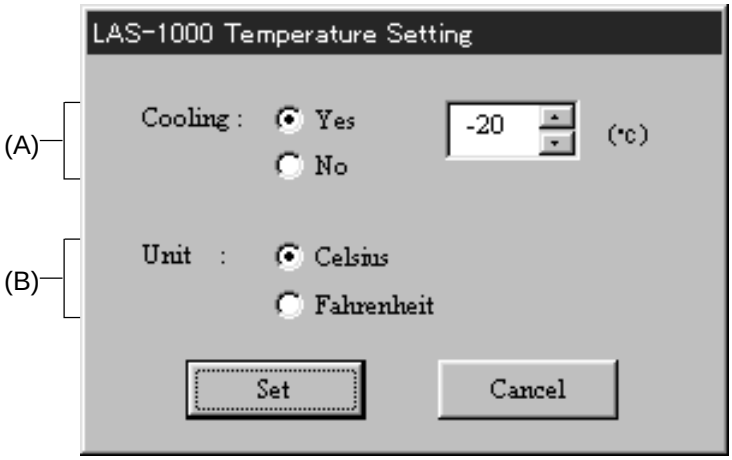
Set the CCD cooling temperature.



Temperature setting is done as follows.

(5) Click the Set... button.

The following temperature setting dialog will be displayed.



Set the cooling temperature and unit in this dialog.

(A)

Select Yes and then set the temperature, from a possible 0°C (32°F) to -35°C (-31°F).

Note :

The cooling capacity of the camera controller is 60°C (108°F) less than the temperature shown in "Ambient temp." on the lower left of the display.

If you select NO, cooling will not occur.
Select the unit for the temperature.

(B)

$T^{o}F=1.8 \times t^{o}C+32$

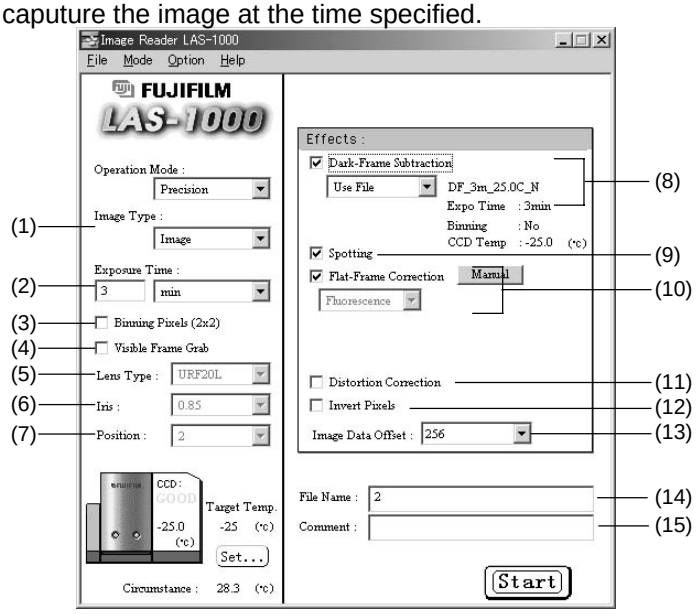
The status display will display <READY> if CCD temperature is within ±0.5°C (±0.9°F)of the set temperature; otherwise, it will display <WAIT>. "Circumstance." on the lower left of the display shows the temperature around the camera head.

3.2 Precision

Used for capturing images at a set exposure time.

3.2.1 Setting method

In this mode, the user sets the desired exposure time. The camera will caputure the image at the time specified.



The following settings and adjustments are possible in this mode.

(1) Image Type

Three types of image can be selected.

(1-1) Image

When the sample will be the image type.

(1-2) Dark-Frame

Exposes the image of the dark current noise pattern with the shutter closed. A low-noise image can be created by subtracting the Dark-Frame from the sample image.

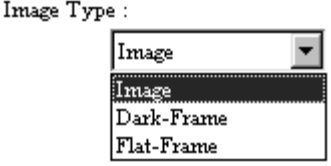
(1-3) Flat-Frame

Conducts exposure with no sample.

Exposes an image of uneven brightness, resulting from lens distortion and corrects optical unevenness. An image of good quantitativeness can be obtained by subjecting the sample image and this Flat-Frame to operation. Used also for correction of optical unevenness.

* The Flat-Frame data for chemiluminescent samples has been installed at the same time with software installation. No data is thus required to be created for chemiluminescence exposure. Data installed includes that for the high-sensitivity lens (URF20L) and the standard lens (CF25B), respectively.

Setting method Set using the pulldown menu, as shown next.

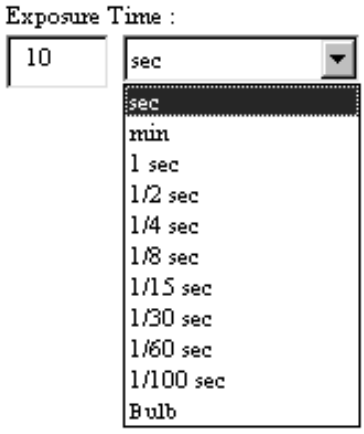


(2) Exposure Time

Exposure time can be set to be automatic from 1/100 sec. to 3600 sec. It can be set in 8 stages from 1/100 sec. to 1 sec. and in 1-sec. increments from 2 sec. to 3600 sec.

For bulb exposure, exposure will continue until the Stop button [Stop], is manually clicked.

Setting method Set using the pulldown menu, as shown below.

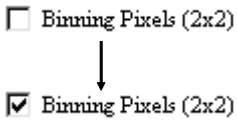


(3) Binning Pixels

After 4 pixels (2x2) undergo analog processing as 1 pixel, they are digitized.

From this processing, resolution of the entire image will decline but sensitivity will increase.

Setting method Select by clicking the box for Binning Pixels.



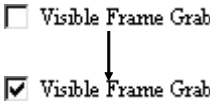
(4) Visible Frame Grab

The chemiluminescence sample usually has a mark, which is invisible unless visible rays are applied, and is not exposed on the captured image.

This is the function to automatically save the image (visible image) obtained by Digitizing mode after sample exposure.

* This function cannot be used for the LAS-1000C or LAS-1000 system.

Setting method Click the box for Visible Frame Grab to select.



(5) Lens Type

The types of lens installed in the LAS-1000 are displayed.

When the LAS-1000 is used, set the lens type using the following pulldown.

For the LAS-1000plus system, URF20L is automatically selected.

(6) Iris

For the LAS-1000plus system, the lens aperture value is automatically selected in accordance with the IDXII setting.
Select either (right) or (left) with upper handle.

When the LAS-1000 or LAS-1000C is used, following selections are necessary.

For a high-sensitivity lens :
Select 0.85, 1, 1.4, 2, 2.8, 4, 5.6, 8, or 11.

For a standard lens :
Select 1.4, 2, 2.8, 4, 5.6, 8, 11, or 16.

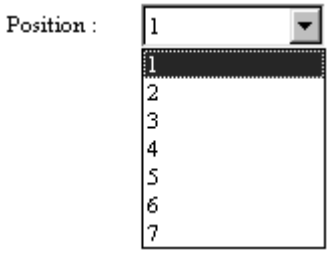
Note :

The lens aperture value set here is used as a parameter when selecting Flat-Frame Correction, (optical unevenness correction) in chemiluminescence but the aperture of the lens installed in the LAS-1000 or LAS-1000C will not be automatically controlled in accordance with it.

(7) Position

The position (from step 1 to step 7) of the specimen (tray) set inside the LAS-1000plus dark box is displayed.

When the LAS-1000 is used, set the position using the following pulldown menu.



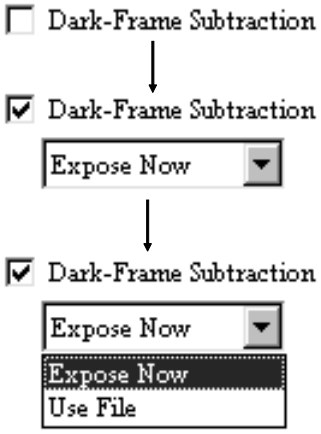
Note :

The specimen position set here is used as a parameter when selecting Flat-Frame Correction (optical unevenness correction) in chemiluminescence but the specimen position inside the LAS-1000 or LAS-1000C dark box will not be automatically controlled in accordance with it.

(8) Dark-Frame Subtraction

With this setting, the Dark-Frame image is subtracted from the specimen image.

Setting method Click the box for Dark-Frame Subtraction to select.



Expose Now : Exposure of both the specimen and the Dark-Frame will be done using the set exposure conditions. The Dark-Frame image once exposed by the Expose Now will be automatically saved in the Dark-Frame folder.

Use File : A Dark-Frame that has been exposed and saved ahead of time will be used.When Use File is selected, the Dark-Frame suitable for the exposure conditions is automatically selected.

Note :

When Use File has been selected, the exposure conditions of the selected Dark-Frame (exposure time, CCD temperature, binning) and the specimen's exposure conditions must be in accord.

User's Tips:

If there is a regular, fixed exposure time, it is convenient to take and save ahead of time the Dark-Frame from that exposure time. If the exposure conditions of exposure time and cooling temperature are in accord, they can be saved as a file and reused.

(9) Spotting

Corrects spotting that occurs in the pixels of the CCD.

Setting method Click the box for Spotting to select.

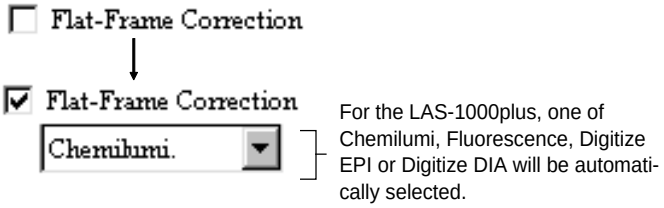
Note :

Only specimen images can be the targets for spotting correction.

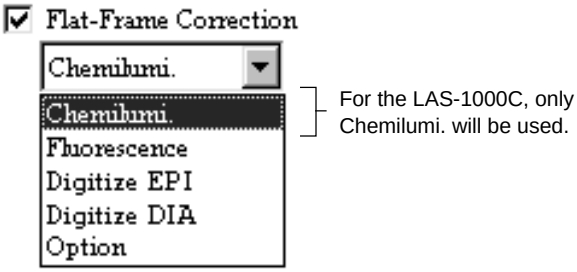
(10) Flat-Frame Correction (Optical Unevenness Correction)
Set Flat-Frame Correction for the specimen image.

Setting method

Click the box for Flat-Frame Correction to select.

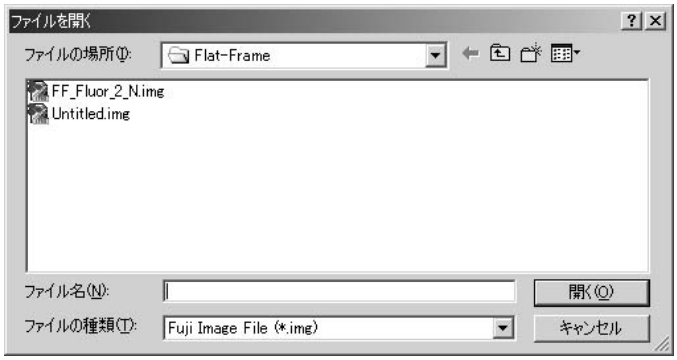


Set the correction method using the pulldown menu, as follows.



Chemilumi : Used for exposure with chemiluminescence. The Flat-Frame Correction data stored in the software ahead of time from the 3 conditions of Lens Type, Aperture, and Position will be used.
Fluorescence : Used for the fluorescent image exposure with blue light.
Digitize EPI : Used for incident light digitizing.
Digitize DIA : Used for transparent system digitizing.
Option : Used for fluorescent sample exposure with optional filter.

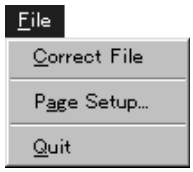
Correction of any opical unevenness is available in two modes, automatic or manual.
Automatic selection.....Unless the Manual button next to Flat-Frame Correction is set active, in any selected mode, the Flat-Frame Folder is scanned for a match in conditions, lens type, aperture, sample position and use or no-use of bining, to find the conditions-matched flat-frame file for proper use.
Manual selection.....To use a particular file as flat-frame file, click on the Manual button. The dialog should open, allowing selection of any desired file for use as a flat-frame.



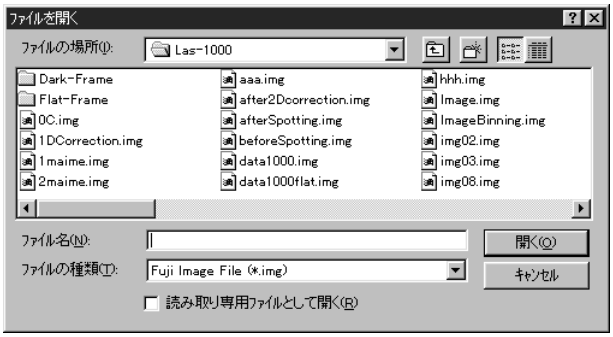
To apply correction of opical unevenness for any image once stored without correction of optical unevenness, follow the step below.

Setting method

Select Correct File on the pulldown File menu.



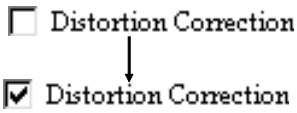
The following selection dialog will be displayed, from which you can select the image data to undergo Flat-Frame Correction.



Click on the Open (O), and the corrected image should be created.

(11) Distortion Correction (Only for high-sensitivity lens)
Corrects the distortion of a lens automatically by software.

Setting method Click the box for Distortion Correction to select.



User's Tips :

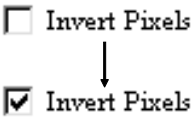
If the settings of the tray position and the lens aperture are incorrect, proper correction cannot be achieved.

(12) Invert Pixels
Supposing that film density will be measured, conducts inversion processing on the intensity of each pixel of image data.

Setting method Click the box for Invert Pixels to select.

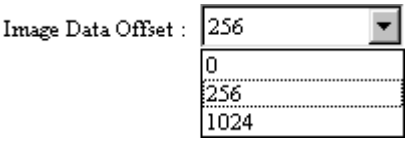
Note :

It is good to conduct Invert Pixels processing at time of image storage.



(13) Image Data Offset
Gives an offset value for the data after processing.

Setting method Select from the pulldown menu.



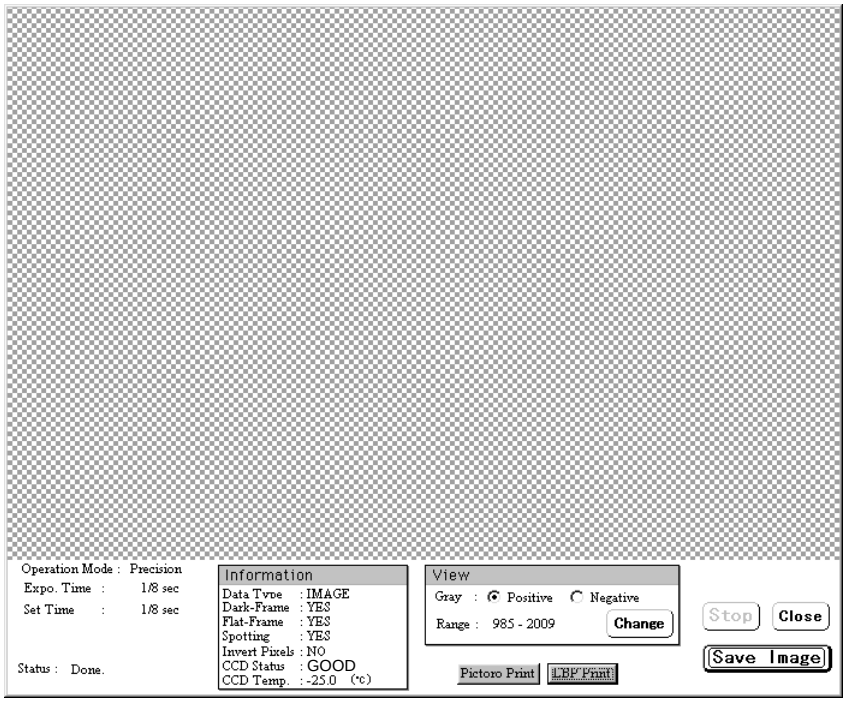
(14) File Name

(15) Comment
Set the file name and comment for the exposed image.

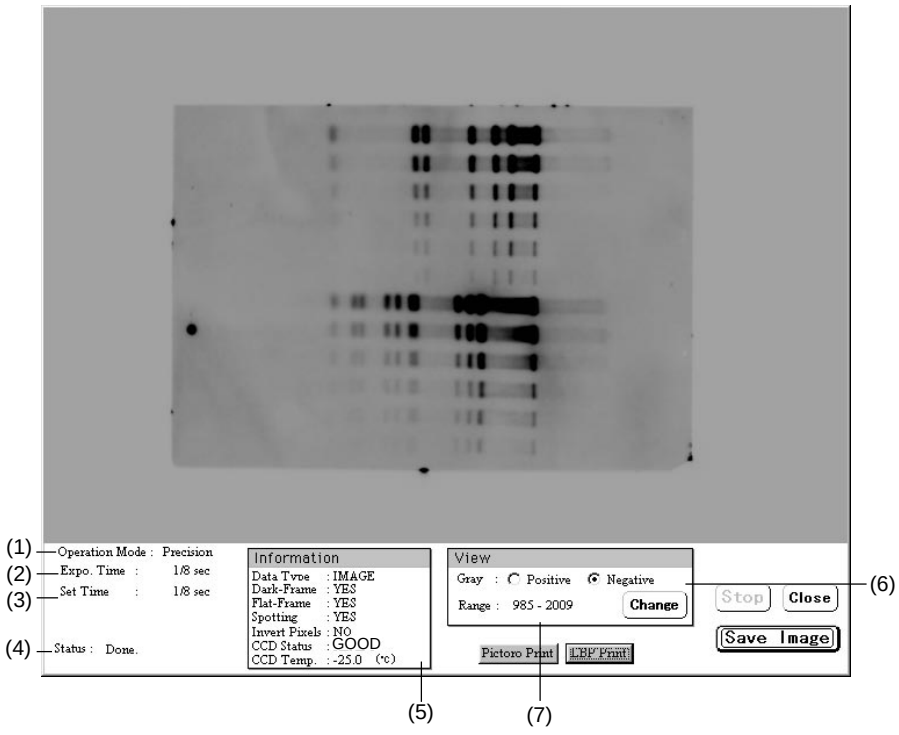
Setting method Input from the keyboard into the boxes for File Name and Comment.
(Exposure is possible even if nothing is input here.)

3.2.2 Exposure Startup

Click the Start button, [Start], to start exposure.



After the set exposure time has elapsed, an image like that shown below is displayed.



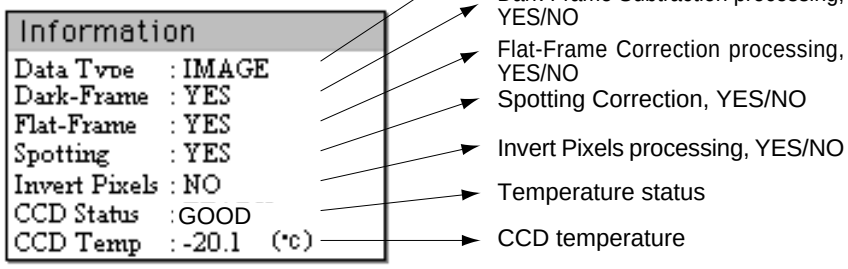
The following dialog will be displayed if any other application is used when exposure has been completed.

The meanings of the indicators below the image are as follows.

(1) Operation Mode : Precision → Selected mode
(2) Expo. Time : 10'00" → Exposure time elapsed
(3) Set Time : 10'00" → Set exposure time
(4) Status : Done. → Status indicator

Exposure conditions

(5)



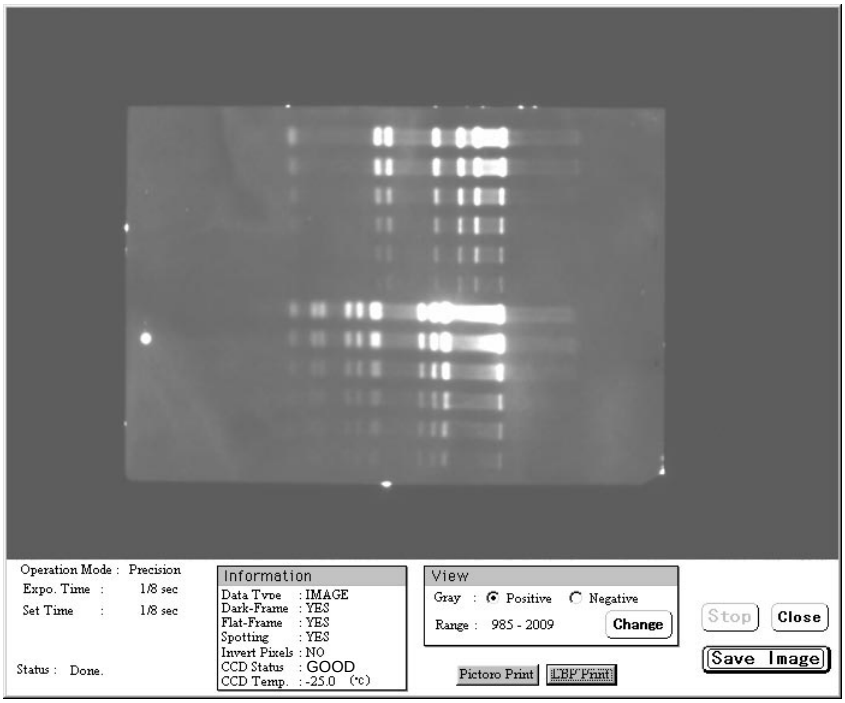
The following adjustments can be made.

(6) Positive/Negative switchover
Perform positive/negative switchover on the image.

Setting method Click the mouse to select.

Gray : Positive Negative

The following is an example of switching over to positive display.



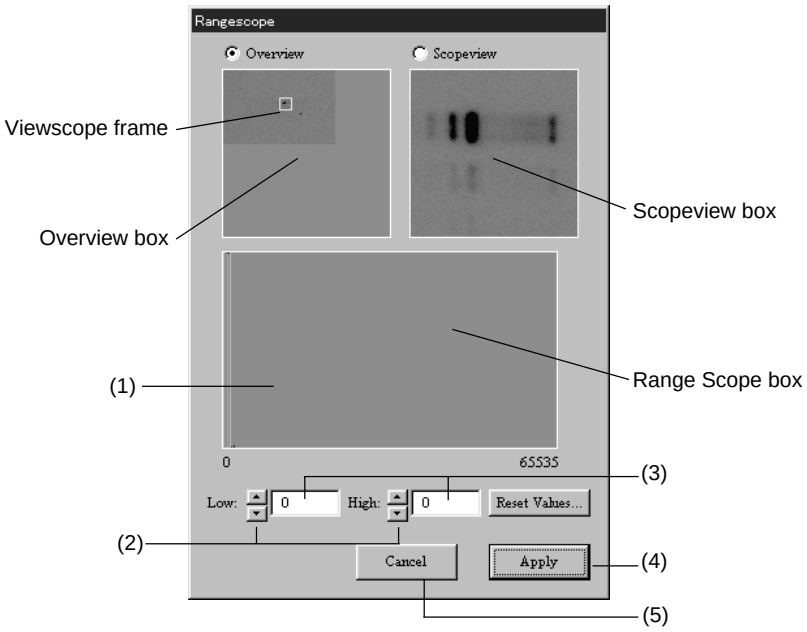
(7) Gradation adjustment using Range Scope
Range Scope is a function for enhancing gradation by selecting the desired gradation portion of an image file that you want to display.
This function is effectively available when gradation levels and concentrated in the narrow range.

Note

This function changes the appearance of the gradation (only on the monitor) and not the pixel intensity of the image data.

Click the change button, Change, next to Range.
The numbers next to Range signify the upper and lower limits of contrast adjustment for the image displayed in the window at the time.

Range : 996 - 1061 Change



Overview box	:	Displays the entire image.
Scopeview box	:	Displays the image near the Viewscope frame within the overview box.
Range Scope box	:	Displays the intensity distribution of the image region selected with the Overview box or Scopeview box.

Adjustment method Adjustment can be done with the following 3 methods.

(1) Adjust by using the mouse to drag the Low bar (red) and High bar (blue) in the Range Scope box.

(2) Adjust by clicking the adjustment dials,  , next to the displayed Low and High values.

(3) Input the Low and High values directly in the appropriate columns next to the adjustment dials  .

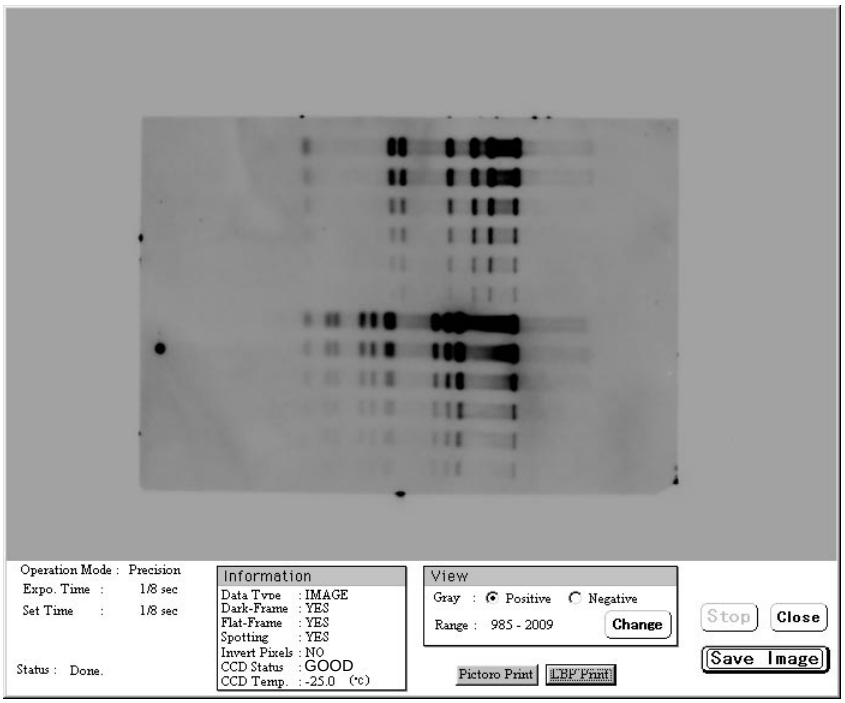
(4) When you have finished the adjustments, click the apply button, Apply ,last.
Image will be redisplayed at the adjusted gradation.

h When the reset button, Reset Values... , is clicked, the gradation adjustment will be cleared off.

User's Tips:

The adjusted image is displayed also on the video printer.

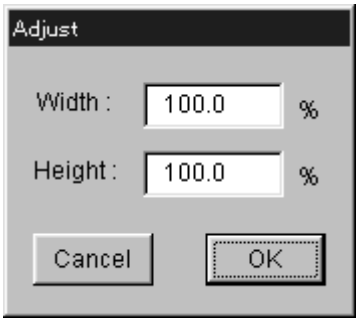
Following is an example of gradation adjustment done with Range Scope.



(5) If you click the Close button after saving the image, the screen will return to the exposure condition setting window in Precision.
If you click the Close button without saving the image, the following dialog will be displayed.

3.2.3 Printing Images

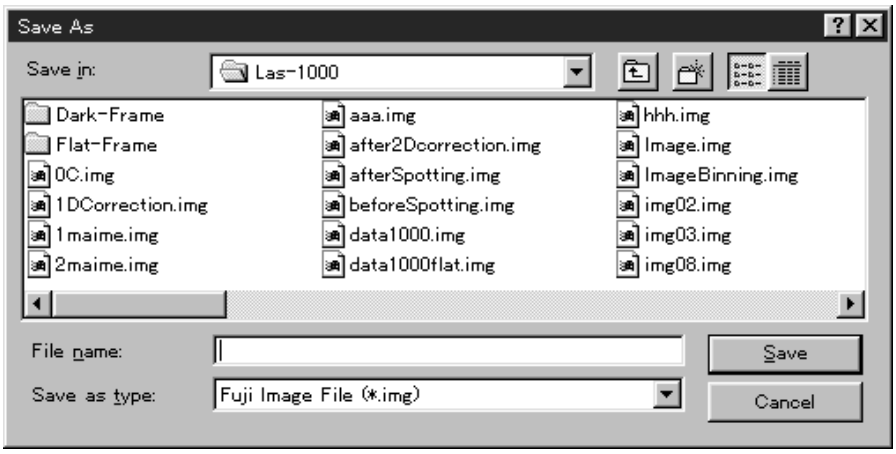
Click Pictro Pictro Print or LBP Print and the following Adjust dialog will be displayed. Set the magnification ratio for width and height and then click OK. Printing will start.



±10% adjustment is possible.

3.2.4 Saving Images

To save an image, click Save Image in the image display window.
The following dialog will be displayed.



Input the file name and comment, for storage purposes, in the above window.
Select the format in which the file should be saved.

Fuji Image Film : Original format unique to this software. Data saved using this format can be quantified with Image Gauge and L Process.

TIFF File : Saves data in 16-bit gray TIFF file format. However, data saved using this format cannot be quantified with Image Gauge or L Process.

User's Tips:

An image file name is added with ".img" as the extension. When an image file is created, a relevant image information file (".inf") will also be created at the same time.

If an ".inf" file is deleted from the hard disk, a problem will result in its relevant ".img" file.

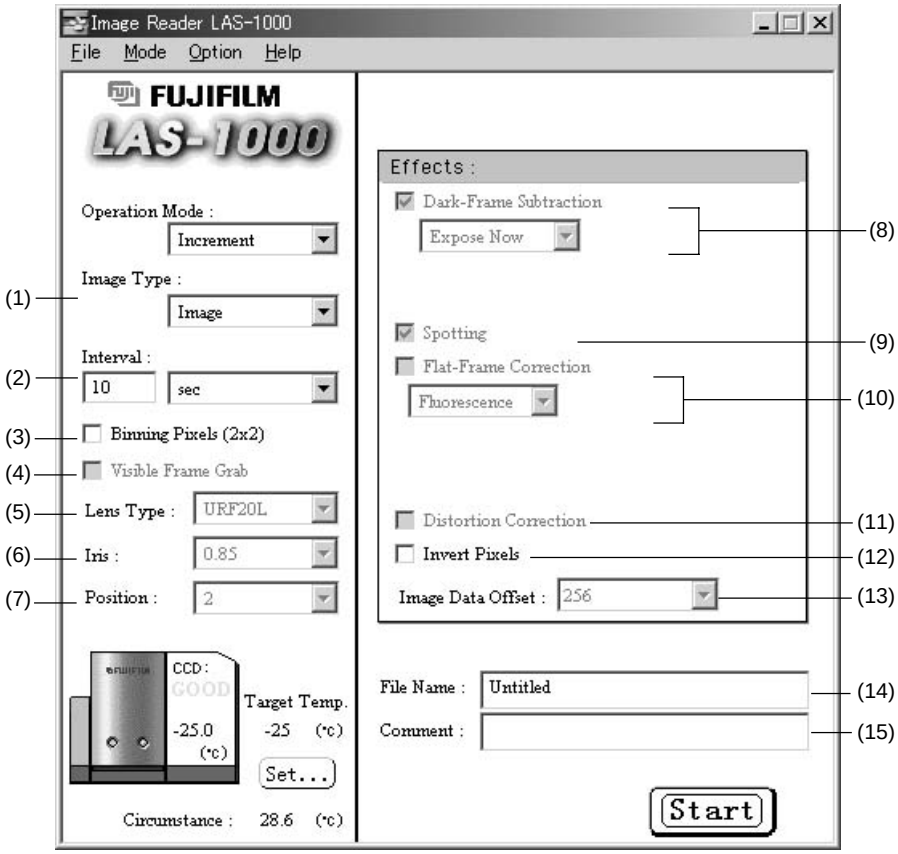
3.3 Increment

3.3.1 Setting method

Used for capturing images added consecutively at a set, fixed interval.
A maximum of 16 images, including the newest one, can be stored.

Notes :

1. With the Image Reader LAS-1000 Pro, an operation that requires a large amount of memory, during Increment or Repetition, using other software, may cause the Image Reader LAS-1000 Pro to drop image data.
2. Shading Correction, Distortion Correction and Video Out functions cannot be used.



The following settings and adjustments are possible in this mode.

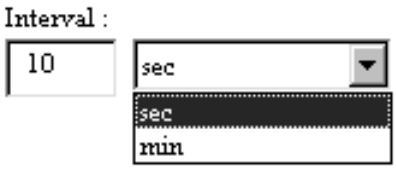
(1) Image Type

* With Increment and Repetition, only Image can be selected for Image Type.

(2) Interval

Exposure is done at the time interval set here and images are consecutively subjected to additive processing.
For Increment, the minimum exposure time interval is 10 sec.
Exposure time can be set from 10 to 3600 sec., only automatically.

Setting method Set sec./min. using the pulldown menu, as follows, and input the time in the numeric column.

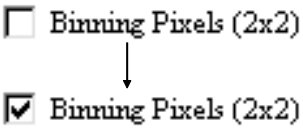


(3) Binning Pixels

* Available in both Precision and Repetition.

After 4 pixels (2x2) undergo analog processing as 1 pixel, they are digitized.
From this processing, resolution of the entire image will decline but sensitivity will increase.

Setting method Select by clicking the box for Binning Pixels.



(4) Visible Frame Grab.

(5) Lens Type

The types of lens installed in the LAS-1000 are displayed.

When the LAS-1000 is used, set using the following pulldown menu, as follows.

In the LAS-1000plus system, URF20L will be automatically selected.

(6) Iris

* Available in both Precision and Repetition.

For the LAS-1000plus system, the lens aperture value is automatically selected in accordance with the IDXII setting.

Select either (right) or (left) with upper handle.

Confirm the iris of the lens that has been installed in the LAS-1000 or LAS-1000C and set the same value.

Note :

The iris of the lens installed in the LAS-1000 or LAS-1000C will not be automatically controlled in accordance with the value set here.

For a high-sensitivity lens :

Select 0.85, 1, 1.4, 2, 2.8, 4, 5.6, 8, or 11.

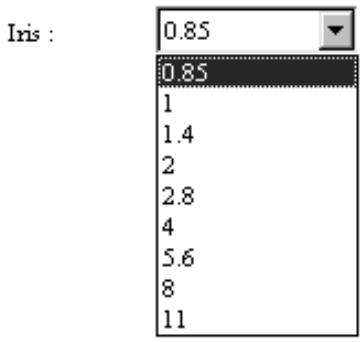
For a standard lens :

Select 1.4, 2, 2.8, 4, 5.6, 8, 11, or 16.

For other lenses :

The iris setting cannot be made.

Setting method Set using the pulldown menu, as follows.



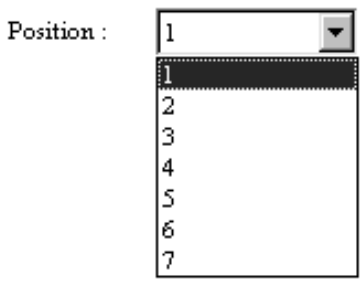
(7) Position

* Available in both Precision and Repetition.

The position (from step 1 to 7) of the specimen (tray) set inside the LAS-1000plus dark box is displayed.

When the LAS-1000 or LAS-1000C is used, set the position using the following pulldown.

Setting method Set the position using the pulldown menu, as follows.



Note

The position of the specimen inside the LAS-1000 or LAS-1000C dark box will not be automatically controlled in accordance with the position set here.

(8) Dark-Frame Subtraction

In Increment, because Dark-Frame Subtraction must be done at each set exposure time, the Dark-Frame Subtraction setting cannot be turned OFF.

(9) Spotting

* The sequential exposure mode (Increment), exposure will be automatically shut off pixel defects, and thus the Disabled (OFF) mode cannot be used.

Sets disabled

(10) Optical Unevenness Correction (Flat-Frame Correction)

Flat-Frame Correction processing cannot be done in Increment.

(11) Lens Distorsion Correction

Cannot be used.

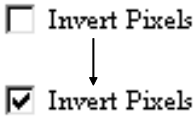
(12) Invert Pixels

Supposing that film density will be measured, conducts inversion processing on the intensity of each pixel of image data.

Setting method Click the box for Invert Pixels to select.

Note :

It is good to conduct Invert Pixels processing at time of image storage.



(13) Image Data Offset

Cannot be used.

(14) File Name

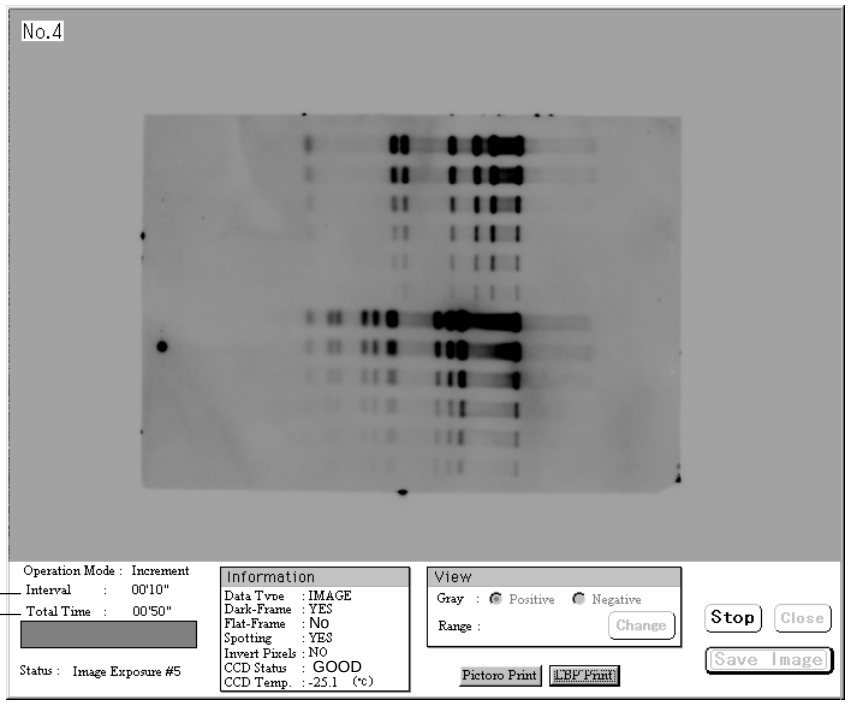
(15) Comment

Sets the file name and comment for the exposed image.

Setting method Input from the keyboard into the boxes for File Name and Comment.
(Exposure is possible even if nothing is input.)

3.3.2 Exposure Startup

Click the Start button, Start , to start exposure.
An image like that shown below will be displayed and images added at each set exposure time will be displayed.
When the targeted image has been obtained while confirming the image, click the stop button, Stop , and quit exposure.

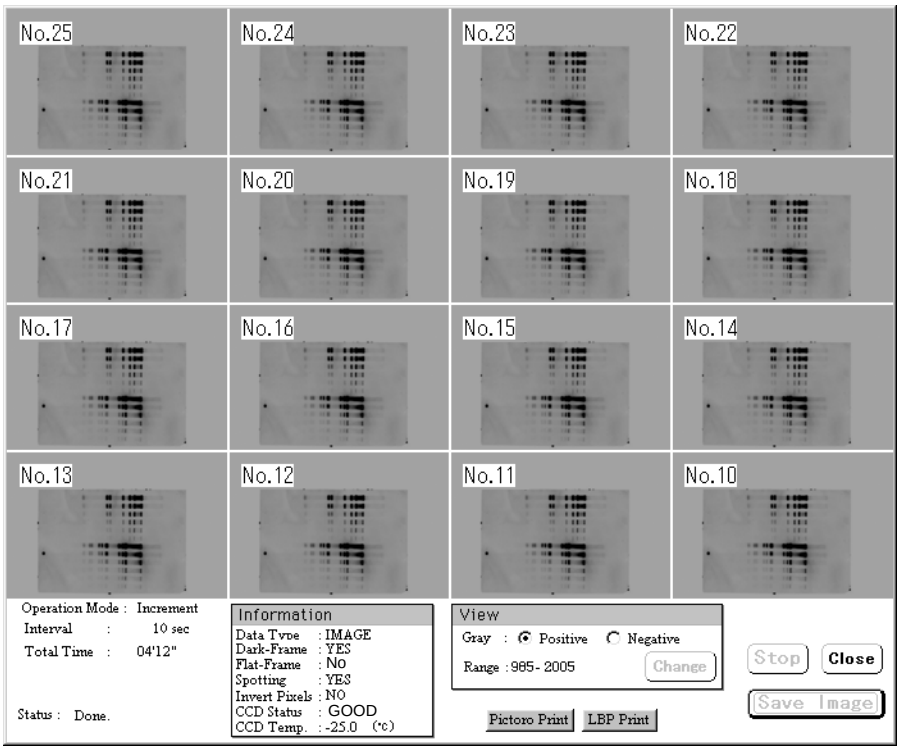


(1) Interval
(2) Total Time

As shown below, the window will be displayed divided in sixteen, and the newest 16 images, including the last one obtained, will be displayed in a time series.

* The indicators below the images, except for the time elapsed ones, are the same as in Precision.

(1) Interval : 00'10" ——→ Exposure time elapsed
(2) Total Time : 00'50" ——→ Total time elapsed



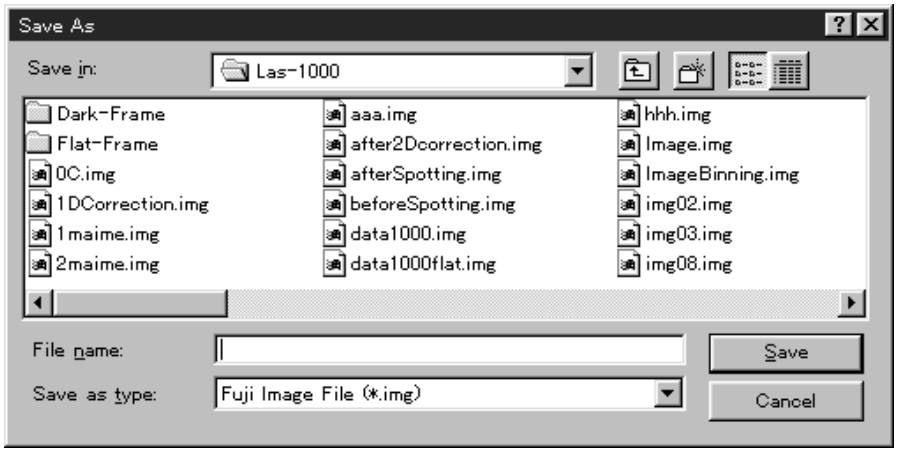
Clicking the **Close** button after saving the image will return the screen to the Increment condition setting window.

*In the sequential exposure mode (Increment), exposure will be automatically shut off when the number of saturated pixels in a given image reaches a predetermined value.

3.3.3 Saving Images

Click the mouse to select the image to be saved. (It will be displayed within a red frame).
Click [Save Image] in the image display window.
The following dialog will be displayed.

If you click the [Close] button without saving the image, the following dialog will be displayed.



* Display content is the same as for Precision and Repetition.

User's Tips:

An image file name is added with ".img" as the extension. When an image file is created, a relevant image information file (".inf") will also be created at the same time.
If an ".inf" file is deleted from the hard disk, a problem will result in its relevant ".img" file.

3.3.4 Printing Images

Printing images is not possible.
Save the images and then output using external software.

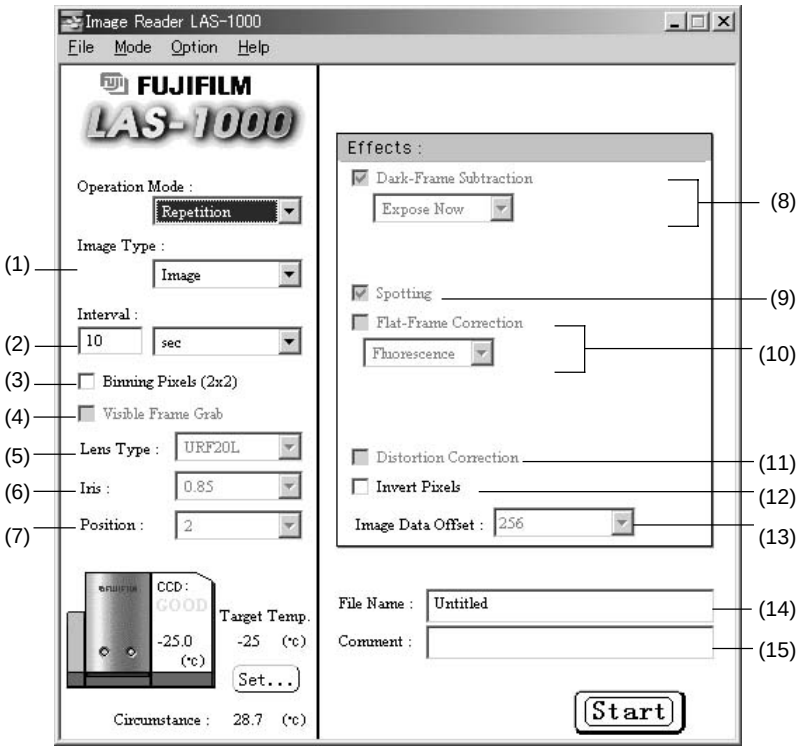
3.4 Repetition

3.4.1 Seeing method

Used for capturing images not repeatedly under the same exposure conditions.
A maximum of 16 images, including the newest one, can be stored.

Notes :

1. Image data may drop out if heavy-load processing, such as file transfer via the network, is done in consecutive exposure mode or repeating exposure mode.
   Please refrain from using the network while the system is in consecutive exposure mode or repeating exposure mode.
2. Shading Correction, Distortion Correction and Video Out functions cannot be used.



The following settings and adjustments are possible in this mode.

(1) Image Type

* In Increment and Repetition, only Image can be selected for Image Type.

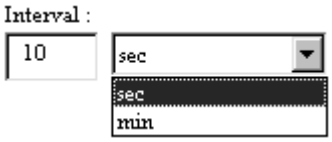
(2) Interval

Exposure will be done at the time interval set here and images are captured.

For Repetition, the minimum exposure time is 10 sec.

Exposure time can be set, automatically only, from 10 sec. to 3600 sec.

Setting method Set sec./min. using the pulldown menu, as follows, and input the time in the numeric column.



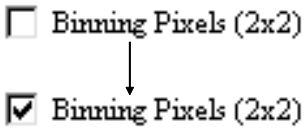
(3) Binning Pixels

* Available in both Precision and Increment.

After 4 pixels (2x2) undergo analog processing as 1 pixel, they are digitized.

From this processing, resolution of the entire image will decline but sensitivity will increase.

Setting method Select by clicking the box for Binning Pixels.



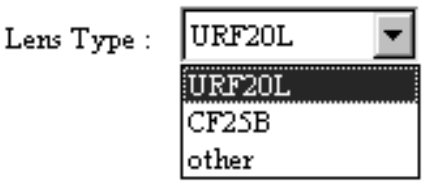
(4) Visible Frame Grab.

Cannot be used.

(5) Lens Type

The type of lens installed in the LAS-1000 or LAS-1000C is displayed.

When the LAS-1000 or LAS-1000C is used, set the Lens Type using the following pulldown menu.



(6) Iris

* Available in both Precision and Repetition.

For the LAS-1000plus system, the lens aperture value is automatically selected in accordance with the IDXII setting.

Select either (right) or (left) with upper handle.

Confirm the iris of the lens that has been installed in the LAS-1000 or LAS-1000C and set the same value.

Note :

The iris of the lens installed in the LAS-1000 will not be automatically controlled in accordance with the value set here.

For a high-sensitivity lens :

Select 0.85, 1, 1.4, 2, 2.8, 4, 5.6, 8, or 11.

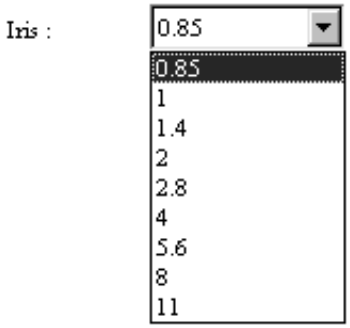
For a standard lens :

Select 1.4, 2, 2.8, 4, 5.6, 8, 11, or 16.

For other lenses :

The iris setting cannot be made.

Setting method Set using the pulldown menu, as follows.



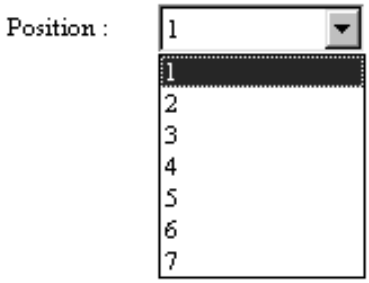
(7) Position

* Available in both Precision and Repetition.

Selects the position (from step 1 to step 7) of the specimen (tray) set inside the LAS-1000plus dark box.

When the LAS-1000 or LAS-1000C is used, set the position using the following pulldown.

Setting method Set using the pulldown menu, as follows. :



Note :

The position of the specimen inside the LAS-1000 or LAS-1000C dark box will not be automatically controlled in accordance with the position set here.

(8) Dark-Frame Subtraction
In Increment, because Dark-Frame Subtraction must be done at each set exposure time, the Dark-Frame Subtraction setting cannot be turned OFF.

(9) Spotting
* The sequential exposure mode (Increment), exposure will be automatically shut off pixel defects, and thus the Disabled (OFF) mode cannot be used.
Sets disabled.

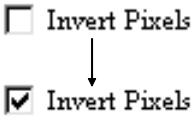
(10) Optical Unevenness Correction (Flat-Frame Correction)
Flat-Frame Correction processing cannot be done in Increment.

(11) Lens Distorsion Correction.
Cannot be used.

(12) Invert Pixels
Supposing that film density will be measured, conducts inversion processing on the intensity of each pixel of image data.

Setting method Click the box for Invert Pixels to select.

Note :
It is good to conduct Invert Pixels processing at time of image storage.



(13) Image Data Offset
Cannot be used.

(14) File Name

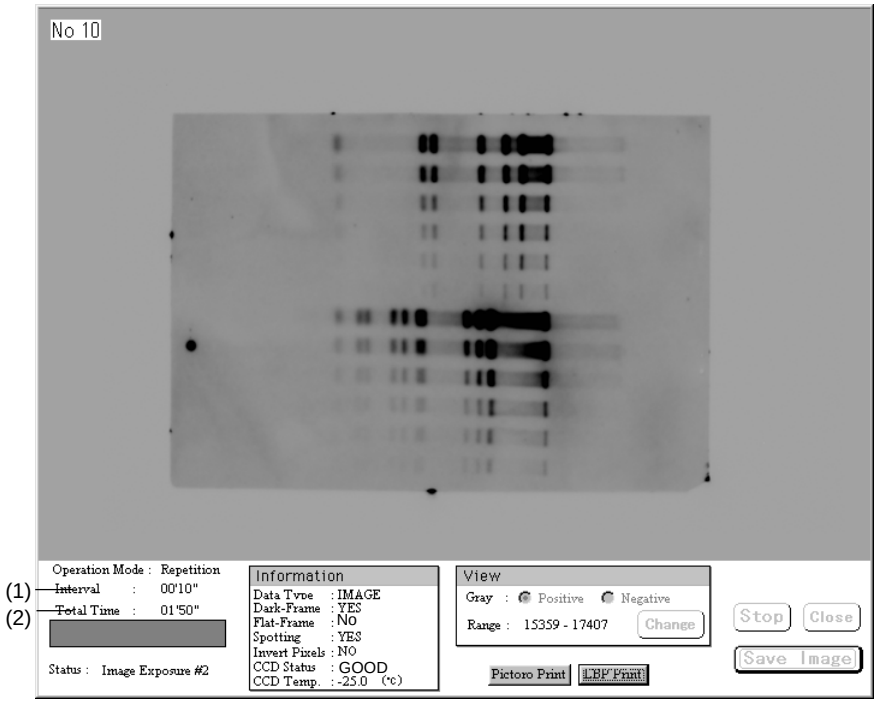
(15) Comment
Set the file name and comment for the exposed image.

Setting method Input from the keyboard into the boxes for File Name and Comment.
(Exposure is possible even if nothing is input.)

3.4.2 Exposure Startup

Click the Start button, [Start] , to start exposure.

A window like the following will be displayed and images added at each set exposure time will be displayed.
When the targeted image has been obtained while confirming the image, click the stop button, [Stop] , and quit exposure.

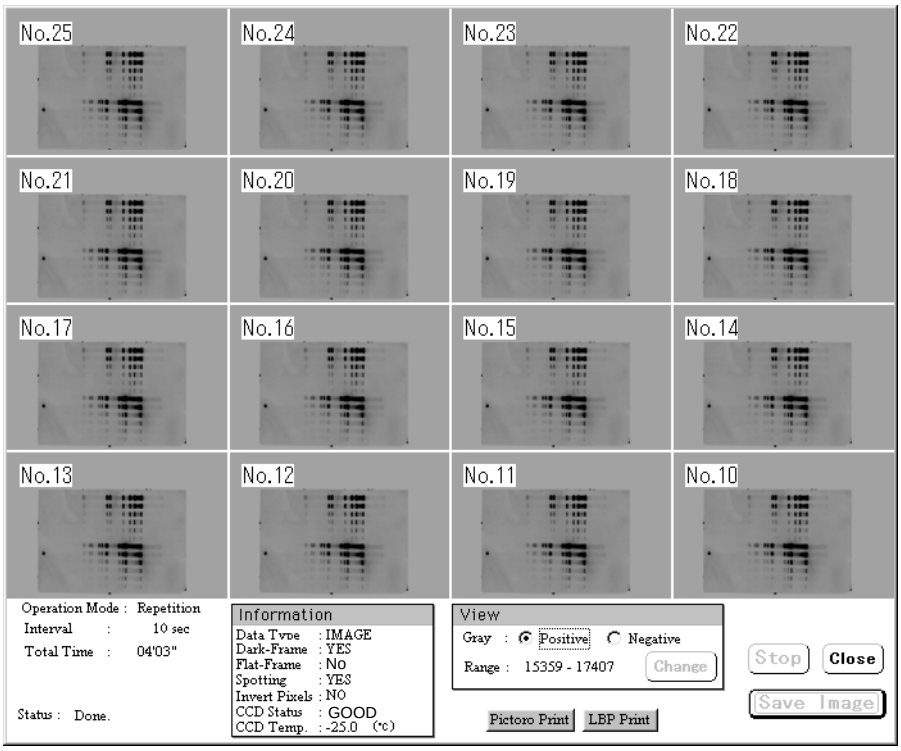


(1)
(2)

As shown below, the window will be displayed divided in sixteen, and the newest 16 images, including the last one obtained, will be displayed in a time series.

* The indicators below the images, except for the time elapsed ones, are the same as in Precision.

(1) Interval : 00'10" ⟶ Exposure time elapsed
(2) Total Time : 01'50" ⟶ Total time elapsed

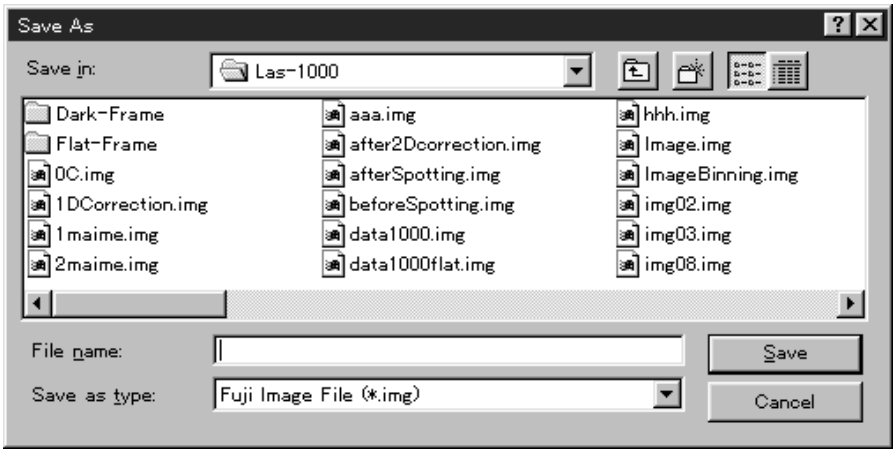


After saving the image, click the Close button to return to the Repetition exposure condition setting window.

3.4.3 Saving Images

Click the mouse to select the image to be saved. (It will be displayed within a red frame).
Click Save Image in the image display window.
The following dialog will be displayed.

If you click the Close button without saving the image, the following dialog will be displayed.



* Available in both Precision and Increment.

User's Tips:

An image file name is added with ".img" as the extension. When an image file is created, a relevant image information file (".inf") will also be created at the same time.
If an ".inf" file is deleted from the hard disk, a problem will result in its relevant ".img" file.

3.4.4 Printing Images

Printing images is not possible.
Save the images and then output using external software.

Part 6

Flat-Frame Maker Operation

1. Introduction

Flat-Frame Maker is the software to create original data for optical unevenness correction of the Image Reader LAS-1000 Lite.
The reading noise for Increment/Repetition exposures using the Image Reader LAS-1000 Pro with LAS-1000C or LAS-1000 is created with this Flat-Frame Maker.

2. Operation Procedures

The operation procedures are as follows.

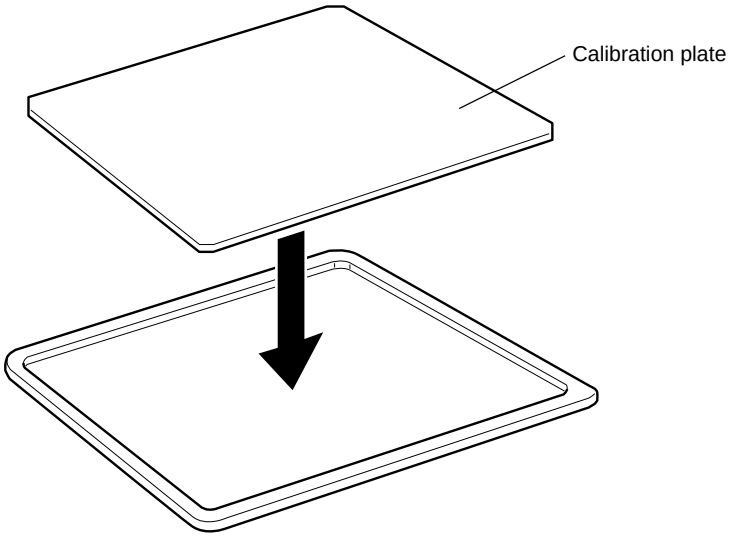
1 Adjust focus using the Image Reader. Adjust focus on the tray surface beforehand using the tray for incident light.

2 Set the tray in the dark box as follows.

For fluorescence / Digitize : EPI

Put the calibration plate on the sample tray and set it to the dark box.

* Set the sample tray with the rough surface facing up (the seal surface facing down)



For Digitize : DIA

Set the transparent tray in the dark box placing nothing on it.

User's Tip :

Proper correction will not be possible unless preset focusing is correct.

* In the Option mode, select an appropriate method for the type of light source used.

3 Start up the Flat-Frame Maker and set each item.

After the dialog prompting focusing has been displayed, the initial screen like that shown below will be displayed.

<IDX-II Status>
- CCD Status
- CCD Temp
- Selected Method
- Position

Software will automatically check these items.

<Progress>

		1	2	3	4	5	6	7
Fluorescence	:	X	X	X	X	X	X	X
Digitize (EPI)	:	X	X	X	X	X	X	X
Digitize (DIA)	:	X	X	X	X	X	X	X

The X mark will change to the O mark for the combination (Mode + Tray position) whose exposure is completed.

<Exposure Method>

Auto(Navigator)

When Auto is selected, exposure will be done with the pre-set exposure time.

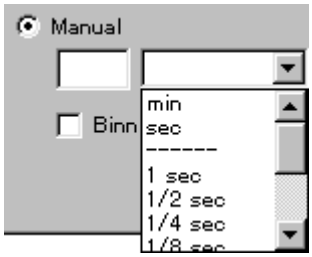
Any combination can be exposed first but order on and after the second will be fixed. For example, if tray position 3 in the fluorescence mode is exposed, order of exposure on and after the second will be as follows.

Fluorescence mode 4->7, then Digitize (EPI)1->7, Digitize (DIA)1->7, and at last, Fluorescence mode 1->2.

Note :

When Auto is selected, Binning cannot be selected.

Manual
Exposure is possible with desired exposure time. When Manual is selected, Binning can be selected.



Creation of flat frame for the Option mode is available only in the Manual mode.
Select the light source, filter and use or no-use of bining, and then set the expowure coonditions for use.

4 After settings have been completed, click the Start button.
Exposure will start.

5 After the operation has been terminated, click the Quit button to quit the software.

Part 7

Troubleshooting

1. Error Codes Displayed on the Analyzing Unit and Countermeasures

Take the following procedures when an error occurs in the system, causing to display its relative error code in the analyzing unit.

1 Take note of the error code message.

2 Turn OFF the power to the camera controller and the analyzing unit and turn it ON again after approx. 10 sec.

3 When the error recurs, fill in the necessary items and the error code in the TROUBLE SHEET attached to the end of this document, and then contact your sales dealer.

2. Troubles and Countermeasures

2.1 Camera Head Trouble Cause Analysis

If the error still remains uncorrected even after the following countermeasures have been taken, fill in the necessary items and the error code in the TROUBLE SHEET attached to the end of this document, and contact your sales dealer.

Phenomenon	Cause	Countermeasure
Camera head LED (POWER) does not light.	Signal cable installation failure	Correctly connect the signal cable.
Camera head generates strange noise.	Camera head failure	Contact your sales dealer.
Analyzing unit CCD temperature indication does not change to [READY] or does not come closer to the set temperature after a sufficient time — about 15 min. — has elapsed since the start of cooling.	1 Surrounding temperature too high	Set surrounding temperature below 28Åé.
	2 CCD set temperature too low	Set CCD temperature to higher (only for Image Reader Pro).
	3 Camera head DC power cable installation failure	Correctly connect the camera head DC power cable.
	4 Camera head's exhaust port is covered.	Make sure that nothing covers the camera head exhaust port.

2.2 Camera Controller and Reading Software Trouble Cause Analysis

Phenomenon	Cause	Countermeasure
Controller generates strange odor.	Camera controller failure.	Turn OFF the controller's power immediately and contact your sales dealer.
Controller LED does not light. (At time of startup diagnosis, all LEDs light.)	1 Supply voltage dropped	Check the supply voltage.
	2 AC power cable installation failure	Correctly connect the AC power cable.
Image is not displayed on monitor in Focusing mode.	1 EIA/CCIR changeover SW setting failure	Correctly set the EIA/CCIR changeover SW.
	2 Video cable installation failure	Correctly connect the video cable.
	3 Brightness of the image reading software is low.	Increase Brightness of the image reading software.
	4 Video Overlay Board failure or setting failure. (for Windows)	See the Operation Manual of the Video Overlay Board.
The image reading software does not recognize the LAS-1000plus system. (Error is displayed.)	1 SCSI ID setting failure	Set the SCSI ID to [4] and make sure not to specify the same SCSI ID for different devices.
	2 SCSI cable installation failure	Correctly connect the SCSI cable.
	3 IDX communication cable connection failure	Confirm the connection of the IDX communication cable.
	4 SCSI board connection failure (only for Windows)	Connect the LAS-1000 with asynchronous mode.
Even when the set exposure time has elapsed, reading operation does not end.	1 Camera controller power has been turned OFF halfway exposure.	Reboot the camera controller.
After exposure, no image is displayed on monitor.	1 Exposure time is short.	Make the exposure time longer.
	2 Focus is not correctly adjusted.	Adjust focus.

Phenomenon	Cause	Countermeasure
It takes longer time than usual to start up.	More than one week has elapsed from the previous acquisition of corrected data. (only for Lite version)	Data is being acquired again on the camera side. It will take about 3 minutes.
Software does not proceed to the Exposure mode.	Surrounding temperature is too high.	Set the surrounding temperature below 28ºC.
	IDX door is open.	Close the door.
	Power of the camera controller had once been turned off.	Restart the reading software.
Exposure cannot be done even though the start button has been pressed.	Correction file has been lost. Or Correction file is not ready.	Check the inside of the Flat-Frame folder and the Dark-Frame folder.
	IDX door is open.	Close the door.
	Tray is not inserted to the depth.	Insert the tray to the depth.
	Function setting handle of IDX is not set to the correct position.	Align the handle properly with the mark in IDX.
The Image Reader does not start up.	The Meteor II driver is not installed. (for Windows)	Install the Meteor II driver.

2.3 Dark Box Trouble Cause Analysis

Phenomenon	Cause	Countermeasure
Dark box door cannot be opened/closed. Dark box cannot be locked.	Foreign object is present in the locking section or door sensor.	Remove foreign object.
Abnormal sound is audible when dark box is opened/closed.	Hinge creaks.	Apply grease to the hinge.
Illumination does not light.	1 Dark box DC power cable installation failure	Correctly connect the dark box DC power cable.
	2 Dark box internal connector disconnected.	Correctly connect the dark box internal connector.
	3 (When the door is opened) Software is not in the Focusing mode.	Enter in the Focusing mode on the computer.
	4 Foreign object is present in the door sensor.	Remove foreign object.

2.4 Image Trouble Cause Analysis

Phenomenon	Cause	Countermeasure
It looks as if there is mist on the image.	Moisture condensation in the optical system.	Quit the reading software normally, wait as it is and see Part 2,2 "Specifications" to make the operation environment meet the specifications.
Read data is abnormal.	1 Exposure dose is high.	Make the exposure time shorter.
	2 Focus is not correctly adjusted.	Correctly adjust focus.
	3 Insufficient cleaning of the tray.	Clean the tray thoroughly.
	4 Lens filter is dirty.	See Part 8 " Regular Maintenance."
There is fogging on the image.	Exposure to direct sunlight.	Avoid direct sunlight.
Image does not appear appropriately.	1 Size of the target to be exposed and the exposure angle do not match.	Set the angle so that the size of the target shall be within 80% of the angle.
	2 IDX function selection and the target to be exposed do not match.	Match the function and the target.
	3 LED illumination does not light at time of fluorescent measurement.	Turn ON the LED.
	4 The aperture is stopped or released too much.	Readjust the aperture or change the exposure time.
	5 Underexposure.	(Change Auto to Manual if not, and) make the exposure time Auto.
	6 Exposure dose is high.	Make the exposure time shorter.

3. Error Display Contents and Countermeasures

Explained here are the contents of the error messages that can appear when using this software and related countermeasures.

* If trouble recurs even after countermeasures have been taken, please contact your sales dealer.

NO	Error message	Content	Countermeasure
1	LAS-1000 not ready. Please wait.	Diagnosis during startup.	Wait until READY is displayed.
2	LAS-1000 error: Exposure failed. Key: 4H Code: 8100H	Abnormal exposure termination error. Error when the CCD cut-in has not occurred within 4 seconds after exposure termination.	Wait until READY is displayed.
3	LAS-1000 error: Shutter error. Turn off Camera Controller and restart LAS-1000. Key: 4H Code: 830xH LAS-1000 error: Shutter error. Key: 4H Code: 830x	Shutter error. Error such as the one of the mechanical shutter resettting which is done when an abnormal status prior to start of exposure is detected during startup diagnosis.	Restart the system.
4	LAS-1000 error: Shutter error. Key: 4H Code: 830xH	Shutter error. When the shutter is abnormal before the start trigger of the on and after the second exposure in Increment mode, etc.	Restart the system.
5	LAS-1000 error: Shutter error. Key: 4H Code: 830xH	Shutter error. Error in the Focusing mode.	Restart the system.
6	LAS-1000 error: Camera head cooling system error. Turn off Camera Controller and restart LAS-1000. Key: 4H Code: 8x00H	Camera fan status error. Camera temperature status error.	Restart the system.
7	LAS-1000 error: Camera unit communication error. Turn off Camera Controller. Check connections between Camera Head and Camera Controller. Key: 4H Code: 8700H	Camera head communication error.	Turn the power OFF and check cable connections.
8	LAS-1000 error: DRAM access error. Turn off Camera Controller and restart LAS-1000. Key: 4H Code: 8800H	DRAM access error. Error when the DRAM writing/ reading has not terminated normally during startup diagnosys.	Restart the system.

NO	Error message	Content	Countermeasure
9	LAS-1000 error: Camera Controller error. Turn off Camera Controller and restart LAS-1000. Key: 4H Code: 8900H	Camera Controller. Error was detected in the Fan status and Heat Thing temperature in the Camera Controller.	Restart the system.
10	LAS-1000 error: Invalid request error. Key: 5H Code: xxxxH	Error was detected in the operation code detection of the unsupported command operation code, etc.	Click OK to continue.
11	LAS-1000 error: Aborted command error. Key: BH Code: xxxxH	Message error was detected. Invalid message was detected.	Click OK to continue.

Error Messages Appearing at Start/Termination of Exposure

NO	Error message	Content	Countermeasure
1	IDX-II setup error. Check tray and panel condition.	When the Start button has been selected (exposure has been started) in the incorrect IDX-II setup status.	Check panel settings, whether tray is present or not and that tray is firmly set.
2	Door of IDX-II is open. Please close it.	When the Start button has been selected (exposure has been started) with the IDX-II door open.	Close the door.
3	CCD temperature has not reached set level yet.	When the Start button has been selected (exposure has been started) with the WAIT status of the CCD cooling.	Wait until READY is displayed.
4	The IDX-II setting is "Option." Continue?	When the Start button has been selected (exposure has been started) with the IDX-II setting "Option."	If optional selection is OK, continue.
5	Set exposure time to between 2 and 3600 sec. or 1 and 60 min.	When the Start button has been selected (exposure has been started) with incorrect Exposure Time set with Manual.	Correctly set the exposure time.
6	Door of IDX-II possibly open during exposure.	Displayed immediately after the image had been displayed after the exposure temination if the door of IDX-II had been opened during exposure.	Recorded image data is not effective.
7	Cannot find Flat-Frame correction on distortion correction file for the current IDX-II's panel setting.	Displayed if the Start button has been selected when the shading correction and distortion correction data could have not been found at the time of start of exposure.	Check a Flat-Frame file that matches the 2 SHD_URF20L_Op85.dat and DST_URF20L.dat files.

Software Startup/Quit Operation, etc.

NO	Error message	Content	Countermeasure
1	LAS-1000plus not connected to SCSI port.	LAS-1000plus is not connected. (at the time of Software startup).	Turn the power OFF and check cable connections.
2	LAS-1000plus not ready. Please wait.	Camera Controller is under startup operation (at the time of Software startup).	Wait until READY is displayed.

Part 8

Regular Maintenance

* Intelligent dark box and camera controller maintenance

Use a soft dry cloth to clean dirt on the exterior. To clean dirt that is hard to remove, use a soft cloth slightly damped with neutral detergent and then clean with a new dry cloth.
To clean the dark box interior, use a non-fluorescent cleanser for biochemical use. If a neutral cleanser for household use is used, the cleanser residue could produce fluorescence at time of fluorescent image recording. Do not use organic solvent because it damages the paint.

* Sample tray maintenance

After using the sample tray, wash it in water using soft sponge slightly damped with neutral detergent and the like. Do not use a cleaner such as nylon scrubbing brush which is likely to damage the tray surface. After cleaning, leave the tray for natural drying.

* Camera head, lens and optical filter maintenance

Use only a soft dry cloth to clean the exterior.
To prevent image quality from deteriorating, observe all cautions concerning optical parts.

(1) Never touch the optical parts (camera lens surface, camera head optical window, fluorescent filter, glass material of the LED unit) with your bare hands.

(2) Use an air blower available on the market to blow off all dirt, dust, etc. If you mistakenly touch the lens glass or the like with your bare hands, use lens cleaning paper, that is available on the market, slightly dampened with lens cleaner solution also available on the market to lightly and gently wipe off the surfaces touched. If touched surfaces are not uncleaned, the sebum left on them will degenerate and become not only difficult to remove but a cause of mold as well.

(3) Do not unnecessarily loosen or securely tighten fixing screws or tie rings, or optical part performance will deteriorate severely.

(4) Remove the protective caps attached to the camera head and camera lens when unit installation work is completed, as a rule. Before removing units, make sure to first attach the caps. In keeping, customers should store these caps carefully.

Part 9

After-Sale Service

1. Warranty

(1) The warranty period will expire 1 year from the date the system was delivered.

(2) Fujifilm will make repairs free of charge for failure resulting during the warranty period, provided that normal usage conditions and the instructions given in this manual, etc., are followed.

(3) Repair of the following failures will be charged for even if the warranty period has not yet expired.

i. Troubles caused by incorrect usage and/or by any products other than those authorized by Fuji and/or troubles caused by other equipment.

ii. Troubles and/or damages due to moving, transport and/or falling.

2. Repairs

(1) Before asking for repairs, see Part 7 “Troubleshooting” of this manual.
(2) If failure results, fill out the TROUBLE FAX SHEET attached hereto and contact your sales dealer.

To :

TROUBLE FAX SHEET

Date:

Client's information

(1) Person in	
(2) Company name	
(3) Tel	
(4) Fax	

LAS-1000plus system information

(5) Serial no.

Camera head	
Camera controller	
Other	

(6) Analyzing unit type

Usage environment	Macintosh	Windows
Machine model		

(7) Usage frequency

(8) Trouble occurrence

(9) Error code / failure