

OLYMPUS[®]

INSTRUCTIONS

DP21

MICROSCOPE DIGITAL CAMERA

This instruction manual is for the Olympus Microscope Digital Camera Model DP21. To ensure the safety, obtain optimum performance and familiarize yourself fully with the use of this camera, we recommend that you study this manual thoroughly before operating the camera. Retain this instruction manual in an easily accessible place near the work desk for future reference.



A X 7 9 3 1

Notations Used in This Manual

This system is used either in a standalone (SAL) or PC-connection (PC) configuration.

Each page of this manual carries one of notations "Common," "SAL" and "PC" on the top right to indicate the applicable configuration of the descriptions in it. Please read the pages applicable to your configuration.

1. Important (Common)

p.1 to p.4

This chapter describes the cautions related to the safety and operation of the system.

2. Standalone System (SAL)

p.5 to p.66

This chapter describes the operation of the configuration in which the camera head is connected to the control box.

3. PC Connection System (PC)

p.67 to p.81

This chapter describes the operation of the configuration in which the camera head is connected to a desktop or laptop PC.

4. General (Common)

p.82 to p.87

This chapter describes the specifications and troubleshooting information.

This device complies with the requirements of both directive 2004/108/EC concerning electromagnetic compatibility and directive 2006/95/EC concerning low voltage.



In accordance with European Directive 2002/96/EC on Waste Electrical and Electronic Equipment, this symbol indicates that the product must not be disposed of as unsorted municipal waste, but should be collected separately.

Refer to your local Olympus distributor in EU for return and/or collection systems available in your country.

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

FCC WARNING: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

CALIFORNIA USA ONLY

This control box uses a Lithium Battery which contains Perchlorate Material - special handling may apply, See www.dtsc.ca.gov/hazardouswaste/perchlorate.

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1 IMPORTANT (COMMON)

The DP21 microscope digital camera is designed to be connected to a camera adapter mounted on an Olympus UIS2/UIS series microscope for use in recording of microscopic magnified image of the optical microscope.

When the DP21 is used with a camera adapter from other manufacturer than Olympus, the optical performance may not be manifested fully.

1-1 Safety Precautions

1. Before connecting or disconnecting a connection cable or power cord, make sure that the main switch of the control box is set to OFF.

When connecting the cable or power cord, push in the connector all the way before pressing the main switch to ON.

CAUTION To avoid electric shock or equipment failure, never connect or disconnect a cable while the main switch is set to ON.

2. Always use the AC adapter provided by Olympus.

Using a similar but non-Olympus AC adapter does not only allow the camera to manifest its full performance but may also cause an equipment failure as well as a burn or fire hazard due to abnormal heating. Never use such an AC adapter.

3. The cords and cables are vulnerable to bend or twist. Do not apply excessive force to them.

Also distribute the cords and cables away from a heat-generating part such as the lamp housing of the microscope.

4. To prevent the microscope from toppling down, avoid using microscope attachments that may make the total height of the microscope above 1 meter when they are attached.





5. The AC adapter, camera head, control box and USB memory generate heat after they have been used for a long period of time.

To avoid moderate temperature burn, do not leave these parts in extended contact with your skin.

6. Connect the power cord correctly and ensure that the grounding terminals of the power supply and wall outlet are properly connected. If the equipment is not **grounded/earthed**, Olympus can no longer warrant the electrical safety performance of the equipment.

Safety and Operation Symbols

The following symbols are found on the control box, hand switch and camera head. Study the meaning of the symbols and always use the equipment in the safest possible manner.

Symbol	Explanation
	Before use, carefully read the instruction manual. Improper use could result in personal injury to the user and/or damage to the equipment.
	Indicates "I" (ON) or "O" (OFF) of the main switch.
	Use the specified AC adapter (6 V, 2.5 A DC)
	Symbols representing an input connector, display, and USB connector respectively.
1394	Symbol of camera cable (1394) connector.

1-2 Conformity of the System

Restrictions in Use

1. The standard TV adapters are the U-TV1X-2 and U-TV0.5XC-3.
The U-TV0.25xC, U-TV0.35xC (or a TV adapter with magnification below 0.5X), U-TV0.5XC and GX-TV0.5XC-DP cannot be used because of optical performance problems.
2. When the DP21 is connected to the rear port of the U-DPT or U-MPH, the peripheral part of the recorded image may be deteriorated due to the optical performance of the U-DPT or U-MPH.
3. When two or more intermediate attachments are used, the peripheral part of the image may become dark or obscured depending on the observation tube and objective in use.
4. When a fluorescent lamp illumination or an illumination stand of the SZX/SZX2 series is used, the image may flicker.
5. When a non-Olympus microscope or a commercially available C-mount lens is used, problems due to the optical adaptability such as shading may be observed. If a commercially available C-mount lens is used, the thread projection and lens projection from the C-mount body attaching section should be no more than 4.5 mm.
6. When the specimen has a low contrast (near transparent) or high reflectance (mirror status) and the aperture iris diaphragm is stopped down near the smallest aperture, spot flare may be noticeable.
7. When the edge of a non-transmitting object is observed under the STM6 transmitted illumination, flare may be noticeable due to the difference in brightness between the transmitted sections (over-exposure) and non-transmitting section (under-exposure).
To reduce the flare, set a lower exposure using the exposure adjustment function or setting the exposure manually.
(Details of STM6 combination)
Edge observation using the MM6-OB3X/5X/10X objective in combination with the MM6C-VL/MM6-ETR
8. When the SZX16 is combined, the peripheral brightness may become insufficient with a zoom ratio of no more than 10x.
9. The image of dark specimens under reflected light or in the darkfield (specimens that need exposure of 1/2 sec. or more at ISO 100 equivalent) cannot be recorded.
10. Specimens with a distribution that is not suitable for center averaged metering require spot metering or exposure adjustment.
11. When electronic zoom is used for magnification display during focusing, the image may become noticeably coarse with certain samples.
12. The live image frame rate of 15 fps is possible when the exposure time is no more than 1/15 sec.
13. When the scale recording function or measurement function is used, the image capturing time becomes longer than usual.
14. The trackability of auto white balance control deteriorates when the specimen contains little white area.
15. The measurement results are simply superimposed on the image and no text file or like is created.
16. The DP21 can handle files of the FAT and FAT32 formats only, and it is not compatible with other file formats. When using a recording medium of an incompatible format, it is required to convert the format into FAT or FAT32 using a PC.
17. It is not possible to use a special USB memory adopting the security or password lock function.
18. To prevent destruction of the recorded image (data), never perform the following action during recording of a still image or movie;
 - turning power OFF;
 - disconnecting the AC adapter;
 - disconnecting the recording medium such as the USB memory or LAN cable.

Operating Environment

Temperature: 5 to 35°C. Humidity: 20% to 85% (without condensation).

Recommended Monitor Specifications

A monitor with the 800 x 600 or larger full-color display capability (the factory setting is WUXGA 1920 x 1200).
Compliance to the VESA DDC2B standard.

1-3 Getting Ready

1. The camera head uses precision components. Handle it with care and avoid subjecting it to a sudden or severe impact.
2. The image displayed on the monitor may be affected when it is used near equipment generating strong electromagnetic waves. To avoid interference during operation, keep the system far from any source of electromagnetic waves.
3. Do not use the camera in areas where it may be subjected to direct sunlight, high temperature and humidity, dust or vibrations. (For the operating environment conditions, see "SPECIFICATIONS" on page 83.)

1-4 Maintenance and Storage

1. To clean the lenses and other glass components, simply blow dirt away using a commercially available blower and wipe gently using a piece of cleaning paper (or clean gauze).

If a lens is stained with fingerprints or oil smudges, wipe it with gauze slightly moistened with commercially available absolute alcohol.

CAUTION

Since the absolute alcohol is highly flammable, it must be handled carefully. To prevent fire ignition, be sure to keep it away from open flames or potential sources of electric sparks -- for example, electrical equipment that is being switched on or off.

Also remember to always use these chemicals only in a well-ventilated room.

2. Parts other than the glass components should be cleaned by wiping with a clean cloth. Do not use organic solvents to remove major stains. Use a soft cloth slightly moistened with a neutral detergent solution.
3. Do not disassemble any part of the camera as this could result in malfunction or reduced performance.
4. When the system is not used, store it with the dust cover. Before storage, ensure that the main switches of the DP21's control box and the microscope are set to OFF and that the lamp housing is cool enough.
5. When smoking the room for cleaning, etc., move the DP21 to a place not exposed to smoke.
6. Care is required against condensation as this may sometimes cause malfunction. Condensation is the phenomenon in which the vapor in the air is condensed into water drops, which attach to the surface of a metallic plate, etc. It often occurs when the ambient temperature changes suddenly, for example when a camera is brought from cold outdoors into warm indoors.

1-5 Caution

If the equipment is used in a manner not specified by this manual, the safety of the user may be imperiled. In addition, the equipment may also be damaged. Always use the equipment as outlined in this instruction manual.

The following symbols are used to set off text in this instruction manual.

CAUTION : Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or damage to the equipment or other property. It may also be used to alert against unsafe practices.

⊙ : Indicates commentary (for ease of operation and maintenance).

Caution on Image Data Storage

The recorded image data may be lost (destroyed) in the following cases. Note that Olympus will not assume any liabilities for the loss (destruction) of recorded data.

The image data may also be destroyed by an unexpected cause. It is recommended to back up the data periodically.

- When the user or a third party used the USB memory in a wrong way.
- When the user or a third party services or repairs the equipment.
- When the USB memory is affected by static electricity or electromagnetic noise.
- When the USB memory is unplugged, the main switch is set to OFF, the AC adapter is disconnected or the power cord is unplugged during recording or erasure (formatting) of the USB memory.
- When the equipment fails.

Note on Disposal

Be sure to observe your local regulations and rules when disposing of this product. Special care is required for the control box because it incorporates a lithium manganese coin battery (CR2032). If you have any doubt, please consult Olympus.

2 *STANDALONE SYSTEM (SAL)*

Read this chapter if you use the camera head by connecting it to the control box.

2-1 Operating Precautions

System Compatibility

- Only the following USB devices function when connected to the control box, etc.
Connectable USB devices: USB removable media such as a USB memory
USB mouse
USB keyboard
- Even when one of the USB devices is used, it cannot be connected if it needs a special driver or the Explorer function of the PC for operation.
- When a USB device with current consumption above 200 mA (including a USB memory, mouse or keyboard) is connected, it may not function due to insufficient power supply from the hand switch.
- The network connection requirements are as follows.
Applicable PC: DOS/V AT compatible machine
Applicable OS: Windows XP Professional/Vista Business (32-bit)/Vista Ultimate (32-bit)
Standards: IEEE802.3 (10BASE-T Ethernet),
IEEE802.3u (100BASE-TX Fast Ethernet) compliant
Applicable protocol: TCP/IP (Incompatible with IPv6)
Connector: RJ-45 type 8-pole connector
Transmission rate: 10 Mbps (10BASE-T Ethernet)/100 Mbps (100BASE-TX Fast Ethernet)

Even when the connection requirements above are met, connection and operation in any network environment is not guaranteed.

Computer Virus Note

As a countermeasure against computer viruses, the DP21 is set to inhibit write of foreign files in the system domain. Nevertheless, it is not capable of preventing infection by computer viruses that are evolving day by day. To prevent penetration of computer viruses in the DP21, it is also recommended to take the following countermeasures.

- Perform virus check on the removal medium, such as a USB memory, before connecting it to the DP21. (The DP21 does not have the virus check function. Use your PC for virus checking.)
- Ensure that the network and PC to which the DP21 is connected are free of computer viruses.
- Should infection of a computer virus occur or be suspected, turn the control box of the DP21 OFF and unplug its power cord. This clears the RAM and deletes any foreign files.
- If malfunction or a symptom of infection still persists after the above measure, please consult Olympus.

Olympus will not assume any liabilities for a malfunction of the DP21 due to computer viruses as well as any trouble or damage of the user's PC or network incurred due to computer viruses.

Battery Life

The DP21's control box incorporates a lithium ion coin battery (CR2032) for backing up the calendar function. The service life of the battery is 1 to 6 years (it is widely variable because the battery power consumption is reduced during operation connecting the AC adapter to the control box). The camera can be used even after the battery life has expired, but the calendar is reset every time the AC adapter is unplugged.

For the battery replacement, contact Olympus.

Control Box Fan

The control box has a ventilation fan. Be careful not to block the ventilation opening. To ensure sufficient ventilation, install the control box at a distance of 10 cm or more from an obstacle such as a wall.

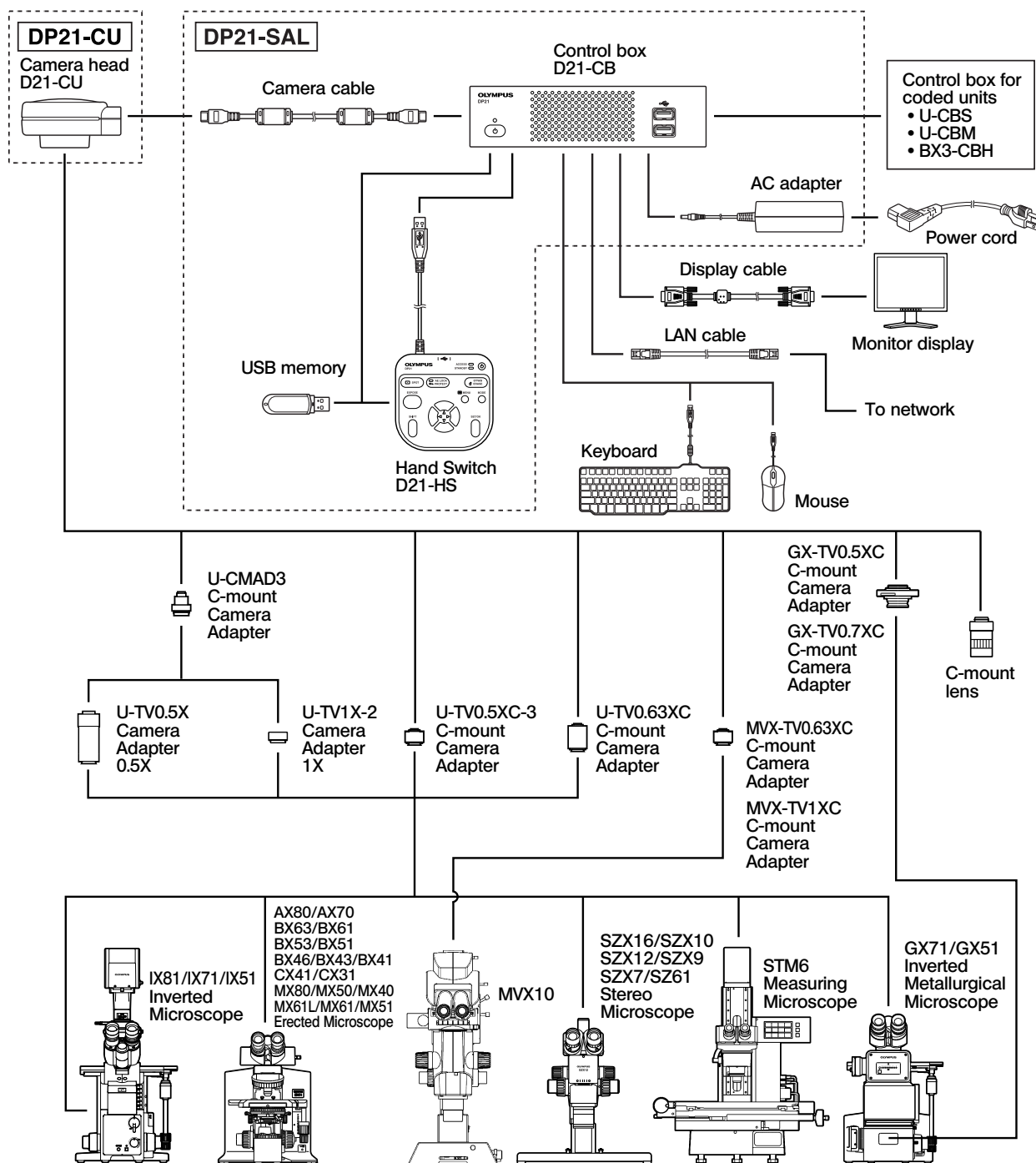
Blocking the ventilation opening will result in malfunction or damage. Additional care is also required against penetration of a foreign object through the ventilation opening because this may result in the fan damage. The rotation speed of the control box fan varies depending on the system internal temperature. As a result, the fan noise may increase in the following cases but this is not malfunction.

- When the ambient temperature is high in summer, etc.
- When the system temperature is high after long hours of use, etc.
- About 10 seconds after startup.

2-2 System Chart

SAL (Standalone) System

© If you use a PC (PC connection) system, read from page 67.



(Note 1) Certain microscopes are also applicable even when they are not mentioned above. Please consult Olympus for details.

(Note 2) Image color setup matching the microscope is required for faithful color reproduction (see page 34 for details).

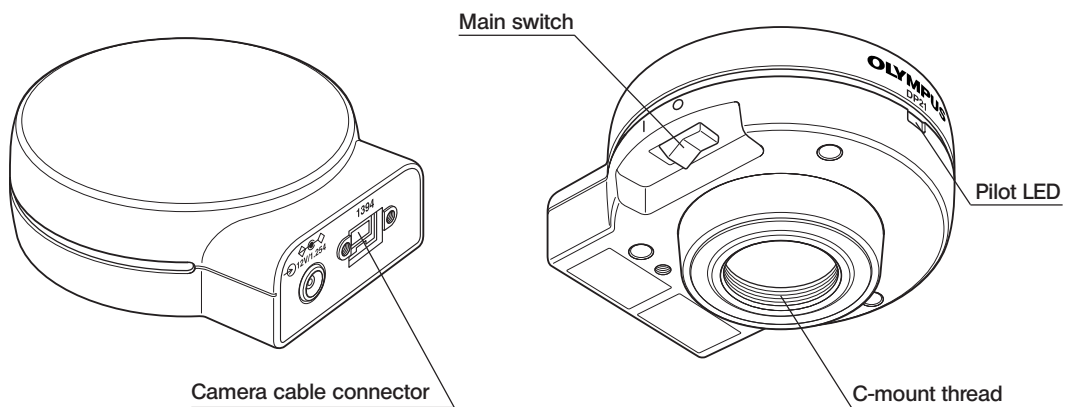
2-3 Nomenclature

2-3-1 Hardware controls

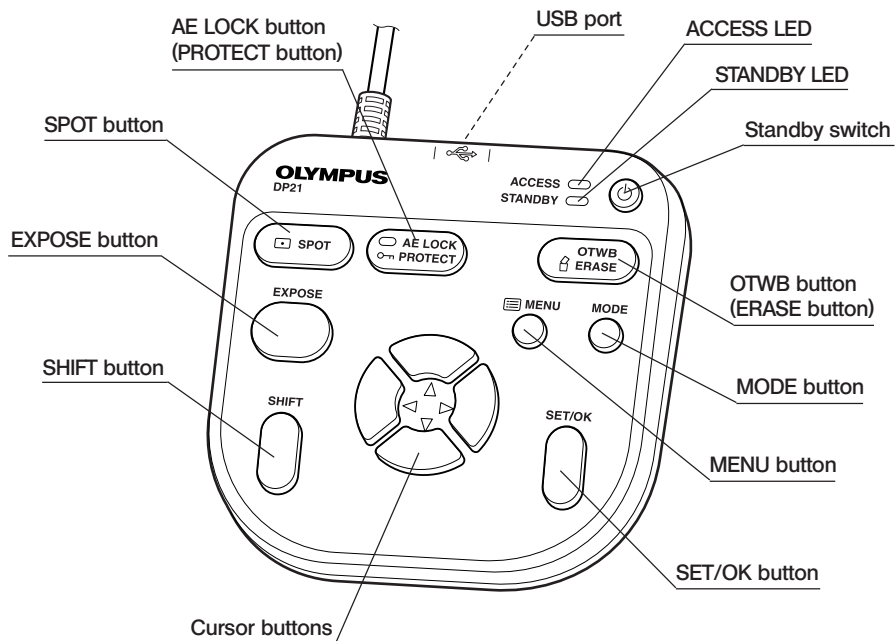
CAUTION

Any equipment connected to the camera head should be an Olympus-designated product or a product in compliance with the requirements of IEC60950 or CISPR22/24. If equipment other than these products is connected, Olympus cannot guarantee any performance of the camera.

Camera Head

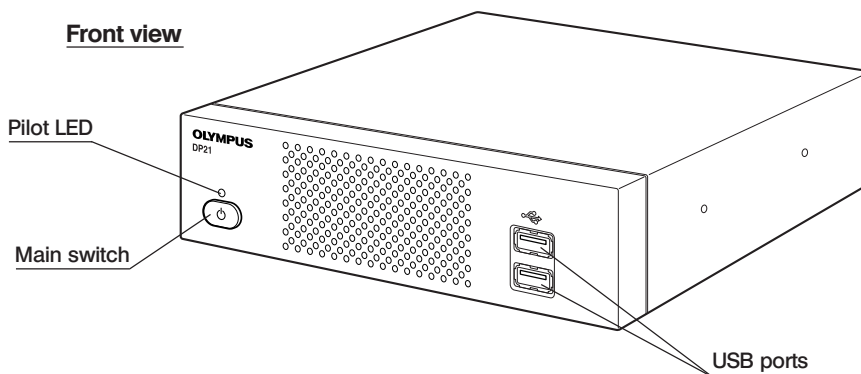


Hand Switch

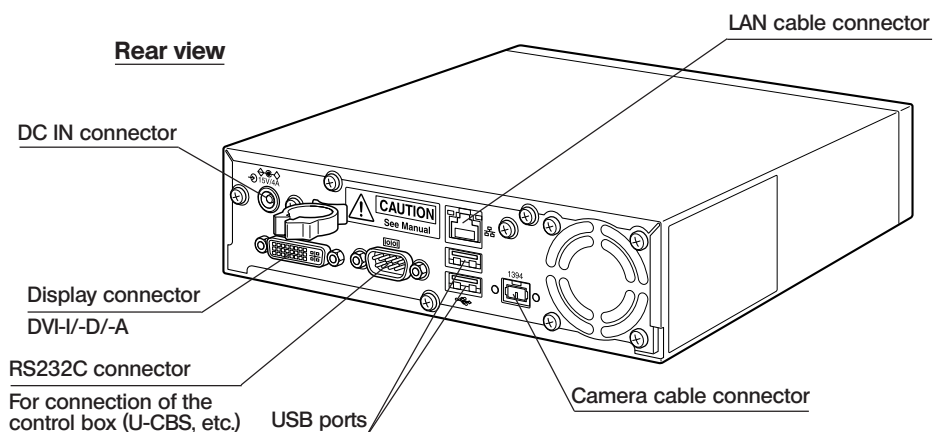


Control Box

Front view

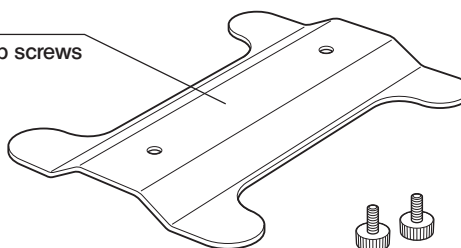


Rear view

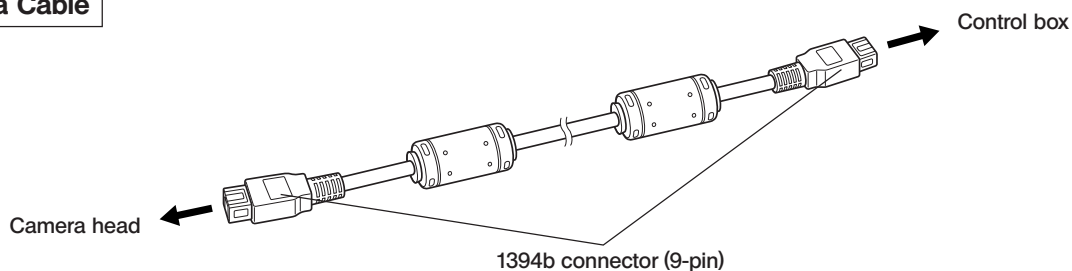


Stabilizer for Vertical Installation

Stabilizer
With 2 clamp screws

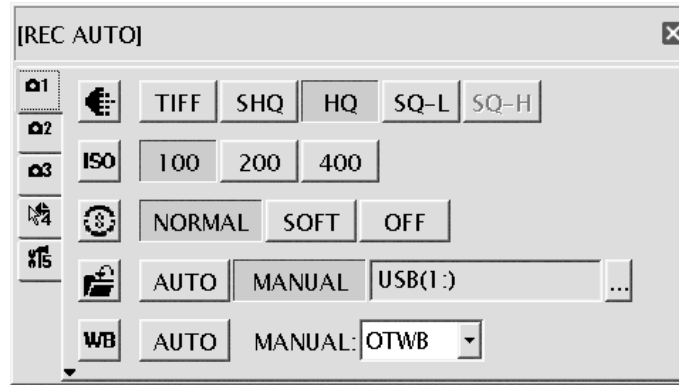


Camera Cable

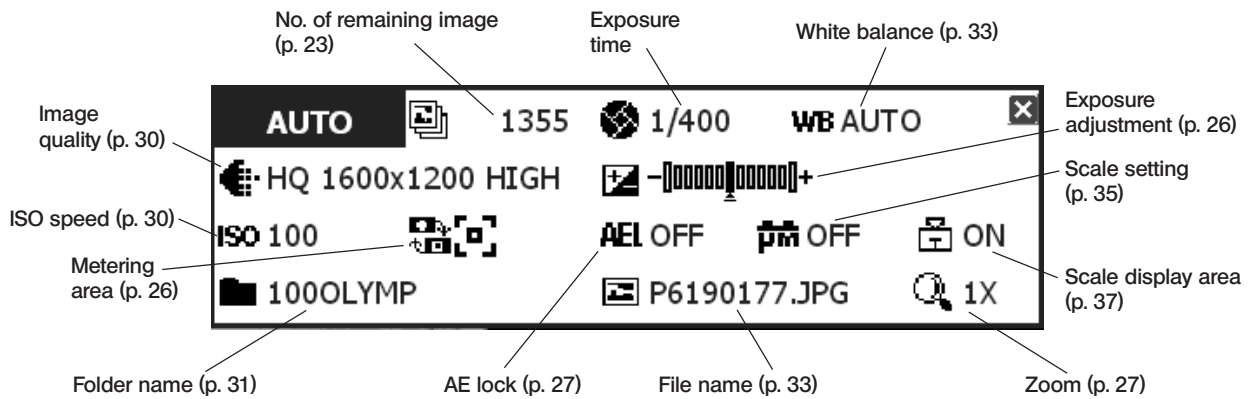


2-3-2 MENU / INFO display

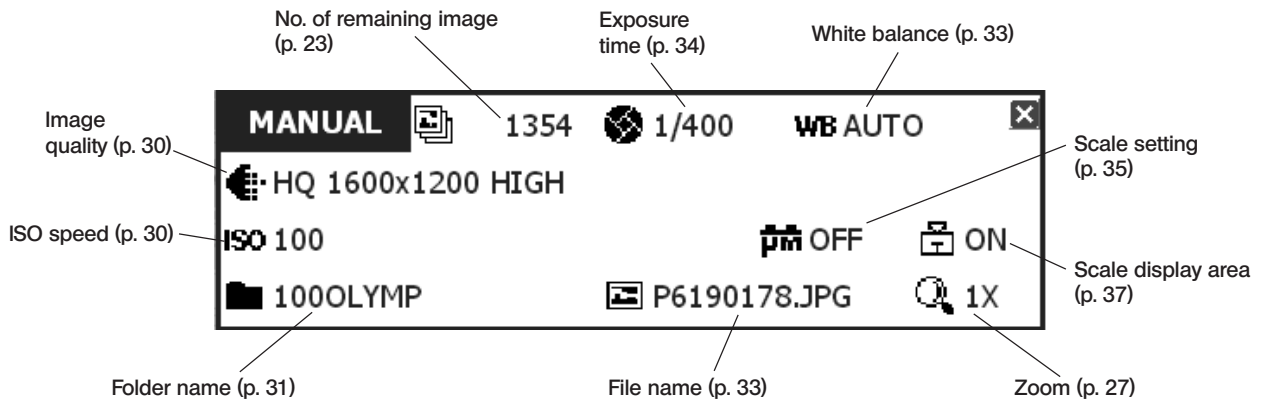
MENU display



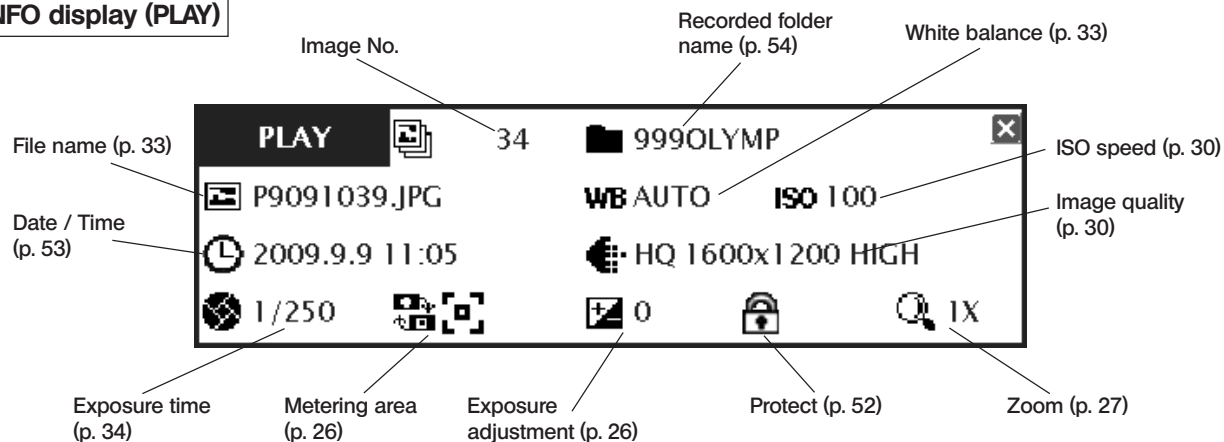
INFO display (REC AUTO)



INFO display (REC MANUAL)



INFO display (PLAY)



If the save destination is set to a network location, the INFO display may sometimes not show the number of remaining image.

2-4 Installation

This section pertains only to the installation of the DP21 microscope digital camera. For the installation of the combined microscope, camera adapter, etc., refer to their instruction manuals and install carefully.

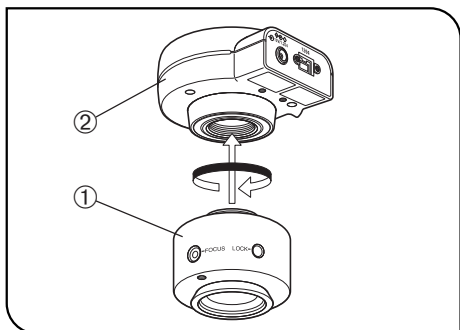
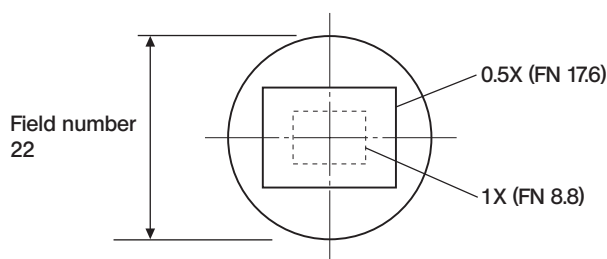


Fig. 1

1 Installing the Camera Head (Fig. 1)

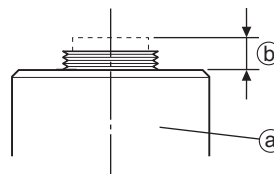
Screw in the U-TV0.5XC-3 C-mount camera adapter ① into the mount thread at the bottom of the camera head ②. If you use a different C-mount TV adapter, follow its instruction manual.

- As the photographed field is as shown below, use a camera adapter having magnification of 0.5X to 1X. (If a 0.35X camera adapter is used, the peripheral part of the image will be obscured.)



- If a C-mount TV adapter from other manufacturer than Olympus is used, the optical performance of the system may not be manifested fully.

CAUTION Be careful in using other manufacturer's C-mount camera adapter or C-mount lens a. Having a thread length over 4.5 mm b. Otherwise, the threaded section will hit the inside of the camera head and cause damage to it.



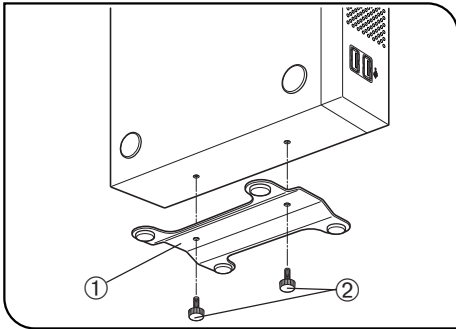


Fig. 2

2 Installing the Control Box

(Fig. 2)

- ⊙ The control box can be installed either horizontally or vertically.
- ⊙ Do not place a heavy object weighing over 10 kg or an object that would make the installation unstable on the control box.

Horizontal installation

Place the control box on the desktop so that its rubber feet contact the desktop surface.

Vertical installation (Fig. 2)

Attach the stabilizer ① provided with the control box on the side of the control box using the provided screws ②.

Always use the provided stabilizer for vertical installation.

3 Connecting the Camera Cable

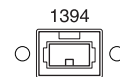
(Fig. 3)

- CAUTION**
- The cords and cables are vulnerable to bend or twist. Do not apply excessive force to them.
 - Be sure to switch off the control box before proceeding to the connection.

NOTE When connecting the cable, insert the connector plug in the proper direction.
(Example: Camera cable)



Cable side



Connector side

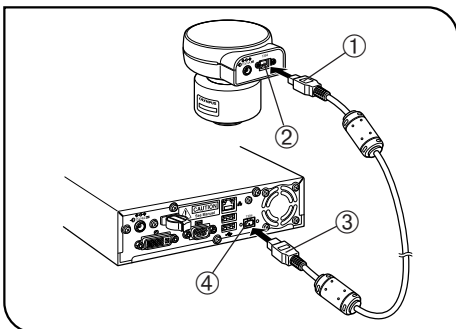


Fig. 3

1. Insert the connector ① on one end of the camera cable into the connector ② on the camera head.
2. Insert the connector ③ on the other end of the camera cable into the connector ④ on the control box.

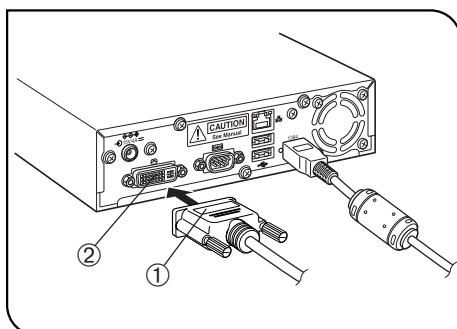


Fig. 4

4 Connecting the Display Cable (Fig. 4)

Insert the connector ① of the cable provided with the display all the way into the connector ② on the control box and secure the clamping screws on both sides of the connector.

Ⓞ Use a DVI cable matching the display as the display cable. The DP21 is compatible with either the DVI-I, D or A connector.

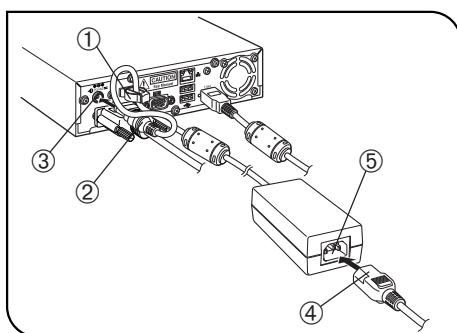


Fig. 5

5 Connecting the AC Adapter (Fig. 5)

CAUTION

- Always use the AC adapter provided by Olympus. Using other AC adapter will result in malfunction or damage.
- The cords and cables are vulnerable to bend or twist. Do not apply excessive force to them.

1. Pass the cable of the AC adapter through the holder ① on the control box and close the holder ① securely. This measure is required to prevent the cable from easily disconnecting from the control box.
2. Insert the output connector ② of the AC adapter into the DC input connector ③ of the control box.

CAUTION Always use the power cord provided by Olympus. If no power cord is provided with the camera head, please select the proper power cord by referring to chapter "PROPER SELECTION OF THE POWER SUPPLY CORD" at the end of this instruction manual.

3. Insert the connector ④ of the power cord into the input connector ⑤ of the AC adapter.
4. Insert the power cord plug into the power outlet. Connect the power cord correctly and ensure that the grounding terminals of the power supply and wall outlet are properly connected. If the equipment is not grounded/earthed, Olympus can no longer warrant the electrical safety performance of the equipment.

Ⓞ The AC adapter and control box generate heat after long hours of use, but this is not malfunction.

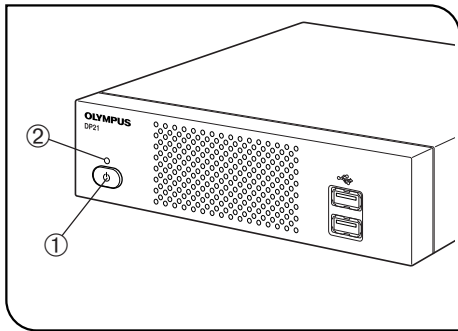


Fig. 6

Disconnecting the AC Adapter

Press the main switch ① of the control box to shut down the DP21 and confirm that the POWER LED ② is turned off completely (about 10 sec.) before unplugging the connector of the AC adapter.

CAUTION Unplugging the connector while POWER LED ② is lit will result in malfunction or damage.

⚠ CAUTION

- ◆ Do not use the system if the AC adapter plug is inserted incompletely.
- ◆ Never plug or unplug the AC adapter plug with a wet hand.
- ◆ In the case of abnormality with the AC adapter or cord, such as abnormal heat generation, scorched smell or smoke, immediately unplug the power cord from the power outlet and stop using the system. Also contact Olympus immediately.
- ◆ Never use an AC adapter other than the designated AC adapter. Otherwise, a failure of the control box, camera head or power supply, or an incident including a fire hazard may result. Note that Olympus will not warrant damage incurred due to the use of a non-designated AC adapter.
- ◆ Never pull, bend, twist the AC adapter cord excessively or use an extension cord.
- ◆ If the AC adapter cord is scratched, the internal conductor is disconnected or the plug has a contact failure, immediately contact Olympus.
- ◆ When the system is not used, be sure to unplug the AC adapter from the power outlet.
- ◆ When connecting the power cord to a wall outlet, do not use a multi-outlet extension or a table tap with multiple outlets. Otherwise, a fire hazard may result.

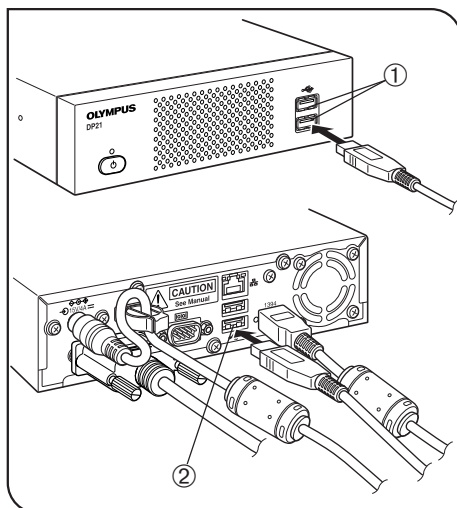


Fig. 7

6 Connecting the Hand Switch

(Fig. 7)

Insert the USB cable connector of the hand switch into one of the USB ports ① of the control box.

- Ⓞ The control box has a total of four USB ports. The hand switch function is identical regardless of the connected USB port so the user can select any USB port as desired.

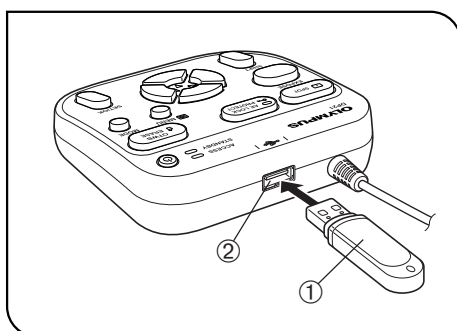


Fig. 8

7 Inserting the USB memory

(Fig. 8)

Insert the USB memory ① all the way into the USB port ② of the hand switch.

8 Applicability of USB Device

CAUTION USB memory

- Ⓞ Do not connect a USB device other than the USB memory provided with the DP21 into the USB port of the hand switch. Otherwise, malfunction may result. If you use a commercially available USB memory, connect it to a USB port of the control box. The USB memory provided with the DP21 can also be used by inserting it into a USB port of the control box.
- Ⓞ The ACCESS LED of the hand switch lights or blinks during data access (for saving the recorded image, etc.). Do not disconnect the USB memory during this period.
- Ⓞ The USB memory can be disconnected without special disconnection processing such as that required with a PC. The USB memory can be disconnected anytime except when the ACCESS LED of the hand switch is lighting or blinking.
- Ⓞ A USB memory with a special function such as the security or password function cannot be used.

CAUTION USB mouse/keyboard

Ⓞ The USB mouse and keyboard are to be purchased separately. If you want to use them, prepare the ones that comply with the following standards or contact Olympus.

USB mouse: Should be compatible with Windows XP and USB2.0.

USB keyboard: Should be compatible with Windows XP, USB2.0 and the alphanumeric keyboard.

For the latest information, visit the Olympus website or consult Olympus.

<http://microscope.olympus-global.com/en/>

Ⓞ It is not possible to install a special driver for the mouse or keyboard in the DP21. As a result, if a device requires a special driver, only the standard functions of the device are available with the DP21.

Ⓞ When using a USB keyboard or mouse, connect it to a USB port of the control box.

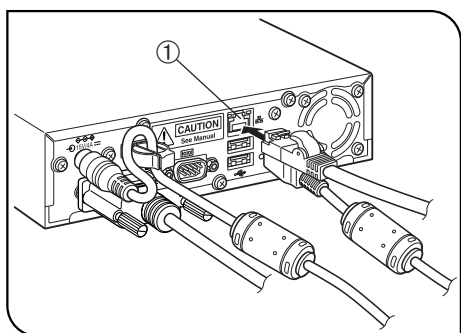


Fig. 9

Connection to a LAN (Fig. 9)

Insert the LAN cable into the LAN connector ① on the rear of the control box.

Ⓞ The LAN connection is necessary only when the DP21 needs to access a PC on a network. It is not necessary when saving the recorded data in a USB memory.

Ⓞ For network connection, the network setting is required in addition to the LAN cable connection. See page 57 for details on the network setting.

2-5 Basic Image Recording Procedure

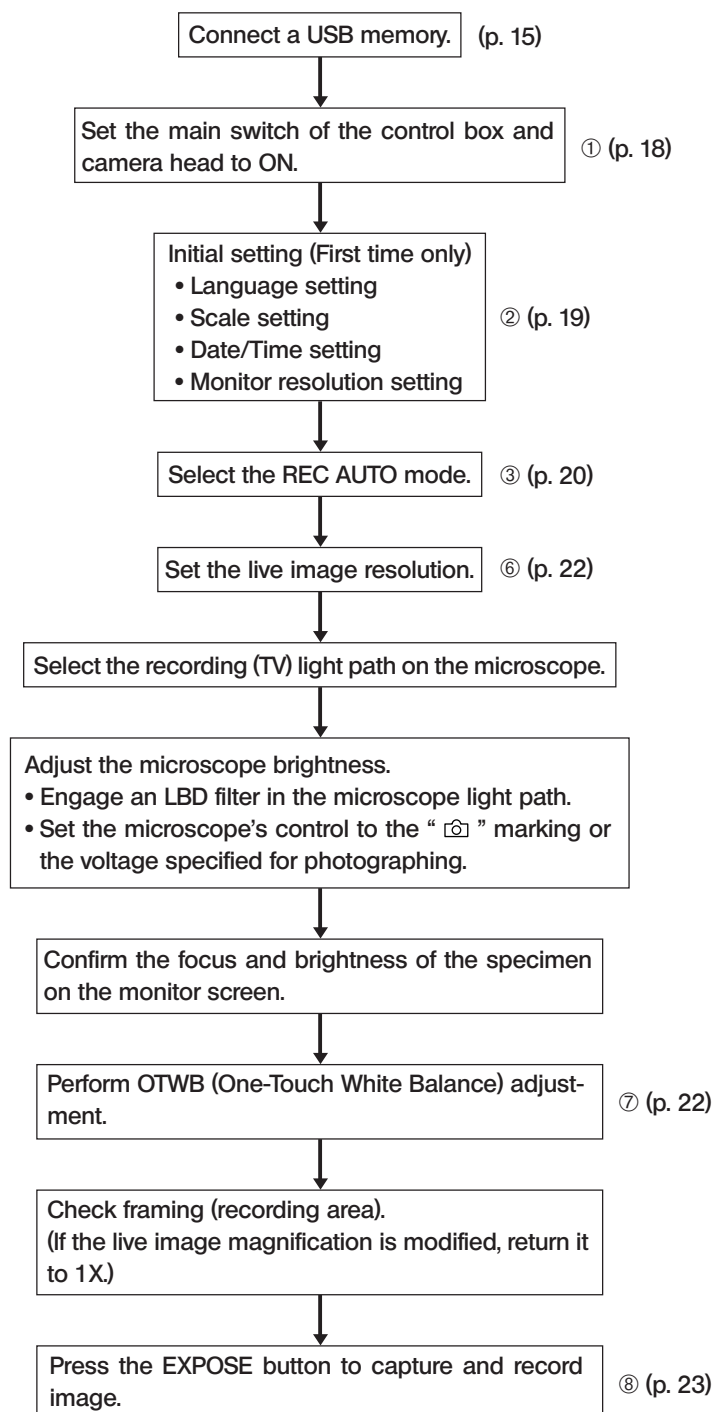
This section describes the basic operating procedure of the DP21 (from turning power ON to image recording) and the initial setting method.

The information in this section is enough for mastering the basic method for recording still images and movies.

2-5-1 Operation flow

Ⓒ Perform the optical adjustments sufficiently before proceeding to the following.

Ⓒ Adjust the parfocality of the microscope's eyepieces and the monitor display using the camera adapter. (For the parfocal adjustment method, refer to the instruction manual for the camera adapter)



Note on initial setting

Before initial setting, disconnect the USB memories (including the removable media devices such as HDD) from the hand switch and/or control box. They can be reconnected after completion of restarting (auto restart) after the setting.

Tip Focusing method

- The live image magnification can be zoomed into 1x → 2x → 4x. Focusing will be easier at a high zoom ratio (p. 27).
- The accurate focusing can be identified easily by displaying the focusing indicator on the monitor screen (p. 37).
- If the image is too bright, dim the brightness using an ND filter(s).

(Note) If the brightness is adjusted by controlling the voltage intensity, the color temperature of the illumination may change and affect the recorded image.

- Set the image quality (p. 30), SPOT metering (p. 26), AE LOCK (p. 27) and exposure adjustment (p. 26) as required.
- The brightness and color tone of the live image displayed on the monitor may sometimes differ from those that are recorded actually.

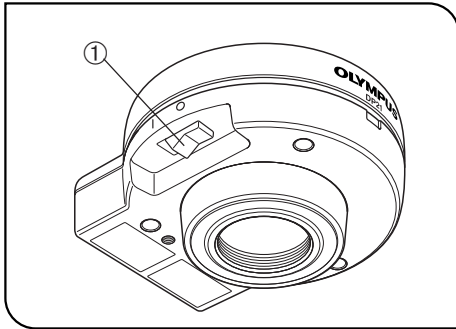


Fig. 10

1 Turning Power ON/OFF

Turning power ON

- 1) Set the main switch of the camera head to "I" (ON).
- 2) Press the main switch ① of the control box to turn it ON.

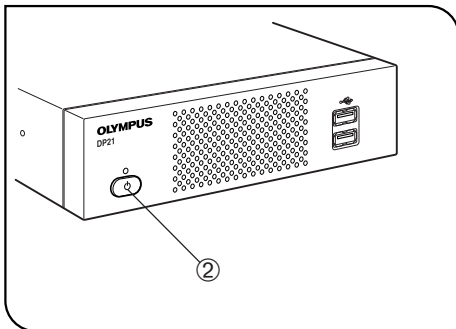


Fig. 11

Turning power OFF

Press the main switch ② of the control box to turn it OFF.

- Ⓞ With the DP21 system, a main switch is provided on the hand switch, (called the standby switch), control box and camera head. The following table shows what happens when each of these main switches are set to OFF.

Control box	Shuts down the system (approx. 30 sec. for startup and 10 sec. for shutdown). Once the system is shut down, it cannot be started up from the hand switch. The STANDBY LED turns off when the system is shut down.
Hand switch	Set the system to standby mode (approx. 10 sec. for startup and 3 sec. for sleep). The STANDBY LED blinks in standby mode.
Camera head	Switches only the camera OFF. The control box and hand switch are left ON. Usually, this switch does not need to be set to "O" (OFF). The pilot LED on the camera head lights when it is ON.

Ⓞ With the standalone system, turning the control box or hand switch OFF automatically turns the camera head OFF, so it is not required to operate the main switch of the camera head. It is recommended to leave the camera head permanently ON.

Ⓞ To protect the system, it is recommended to use the main switch of the control box to shut down the system whenever possible.

Ⓞ If the DP21 system is used for a long period without shutting it down, the system may sometimes resets and restarts automatically (the restart time is about 30 seconds). To protect the system, it is recommended to shut down the system periodically at an interval of about once a week.

If the camera head is switched OFF during use

If the camera head is turned OFF during use of the DP21 by accidentally setting the main switch to OFF or disconnecting the camera cable, the system detects that the camera head is not connected and displays an error message. If this happens, press the main switch of the control box to shut down the system. After this, either set the main switch of the camera head to ON or reconnect the camera cable and then press the main switch of the control box to restart the system.

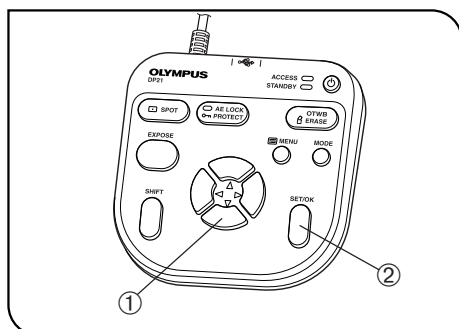


Fig. 12

2 Initial Setting

To use the system correctly, it is required to set the language and scale magnification at the beginning.

Set them by following the window displayed when the system is turned ON for the first time.

- Ⓞ The setting window is not displayed the next time the system is turned ON. Even when they are not set at the first time, they can be set anytime using a menu.
- 1. The setting window appears when the system is turned ON.
- Ⓞ Before initial setting, disconnect the USB memories (including the removable media devices such as HDD) from the hand switch and/or control box. They can be reconnected after completion of restarting (auto restart) after the setting.
- 2. Set the language by following the wizard.
- 3. Also set the scale magnification (magnifications of the camera adapter and objective in use) in the same way. The DP21 restarts after completion of the setting.
- Ⓞ See page 54 for the language setting and page 35 for the scale magnification setting.
- Ⓞ The clock setting and monitor resolution setting windows are not displayed automatically. For their setting methods, see “Date/Time Setting (p. 53)” and “Monitor resolution setting (p. 56).”
- Ⓞ Image recording is possible even when the date/time are not set, but the date/time information in the file name of the recorded image becomes incorrect. To prevent this, it is recommended to set the date and time before recording an image.
- Ⓞ The monitor resolution is usually set automatically but may not be set with certain monitors. To prepare for such a case, it is recommended to set the monitor resolution in advance on this opportunity.

(Example) Language setting Default: English



Operation using the hand switch: Select the language with the cursor buttons ▲ ▼ ① and press the SET/OK button ② to enter the selection.

Operation using the mouse: Click on the scroll button to select the language and click on [FINISH (SET/OK)] to enter the selection.

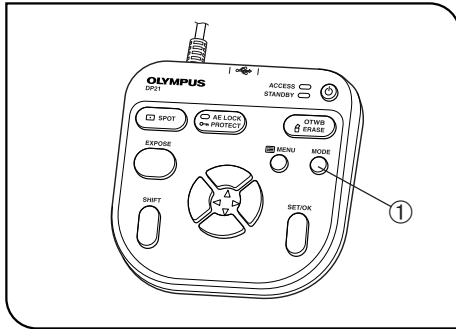


Fig. 13

3 Selecting the Mode

The MODE button ① can be used to select the REC AUTO (auto-exposure recording), REC MANUAL (manual-exposure recording) or PLAY (play-back) mode.

- Ⓞ When the DP21 is turned ON and the REC AUTO or REC MANUAL mode is selected, the live image is displayed on the monitor screen.
- Ⓞ The default setting is REC AUTO. From the next time, the system is started up in the mode selected when it was turned OFF the last time.

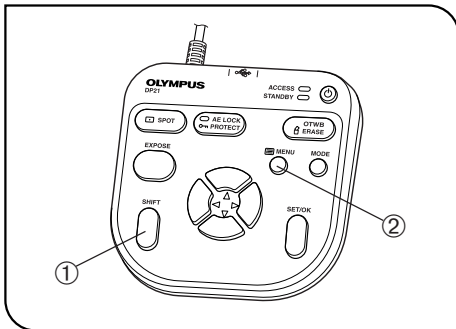
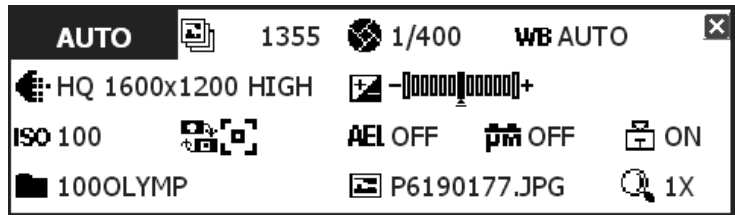


Fig. 14

4 Viewing/Hiding the INFO Display

When the live image is displayed, the INFO display is displayed on the upper right of the screen as shown in the following example (which shows the display in REC AUTO mode). For details on the INFO display, see MENU/INFO display (p. 10).



While holding the SHIFT button ①, press the MENU button ② to view or hide the INFO display alternately.

- Ⓞ Even when the system is turned OFF with the INFO display hidden, it is displayed the next time the system is turned ON.

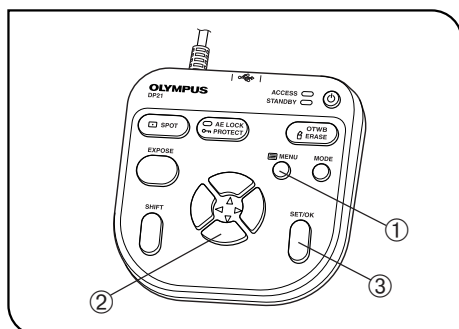
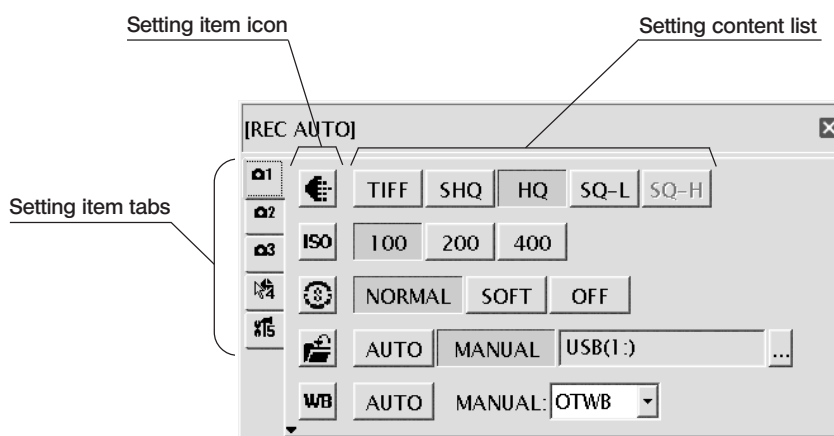


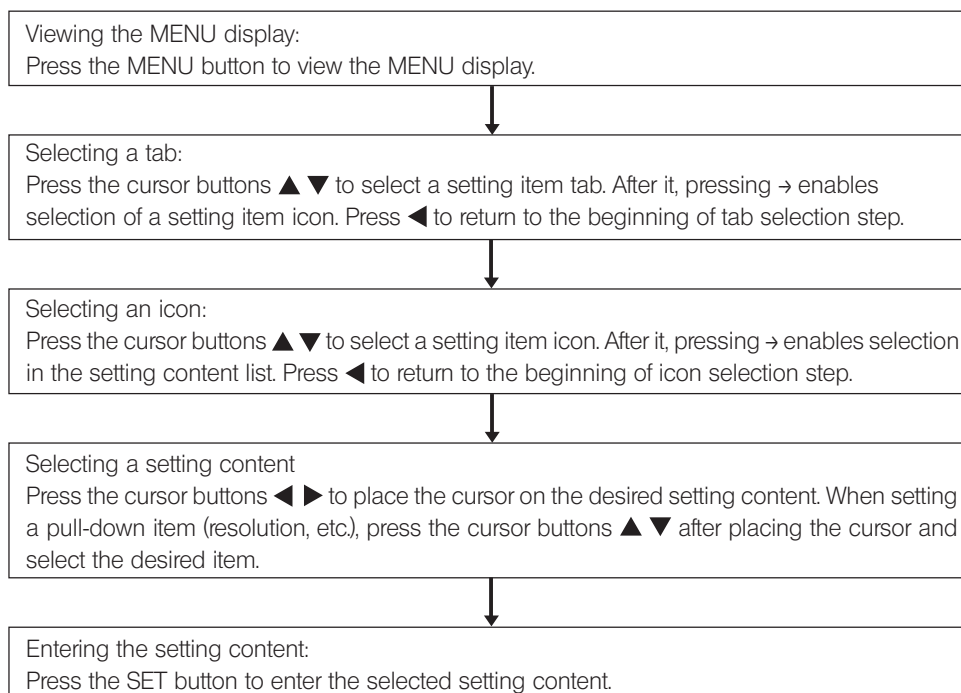
Fig. 15

5 Viewing/Controlling the MENU Display

1. Press the MENU button ① to view or hide the MENU display alternately. For details on the MENU display items, see MENU display (p. 10). The MENU display is hidden with the default setting.
2. Press the cursor buttons ② to select an item and press the SET button ③ to enter the selection.



Basic operation flow of the MENU display



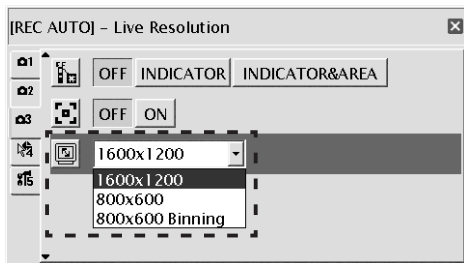


Fig. 16

6 Setting the Live Resolution Default: 1600 x 1200

With the DP21, the resolution of the live image can be selected from three options of UXGA:1600 x 1200, SVGA:800 x 600 and SVGA (binning) 800 x 600. The characteristics of each resolution are as follows.

1600 x 1200	High-definition image observation/recording, which is recommended when viewing clear image on a large monitor screen. Frame rate: 15 fps
800 x 600	Image observation at a high frame rate displays smooth live images even when the target moves during examination, etc. Frame rate: 27 fps
800x 600 (Binning)	Sensitivity is 4 times higher than other modes. Observation and recording of bright image are possible even the target is dark. Frame rate: 27 fps

Ⓞ If the set resolution differs from the resolution available with the monitor, the image is magnified or reduced according to the monitor screen size. When the image is magnified, the noise in it is also magnified and may become noticeable.

Ⓞ Live images are magnified according to the resolution of the monitor. However, the optimum aspect ratio may sometimes not be achieved. To display the images at the optimum aspect ratio, refer to “Monitor resolution setting” on page 56.

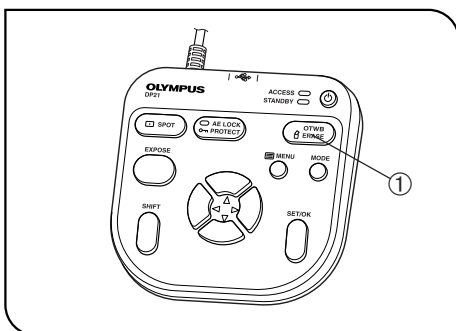


Fig. 17

7 OTWB (One-Touch White Balance)

Adjust the white balance before recording to record image in optimum color tones.

1. Display an exclusively white live image.

- During transmitted light observation, remove the specimen.
- During reflected light observation, set a piece of white paper in place of the specimen.

2. Press the OTWB button ① to adjust the white balance.

3. When the white balance is set, message “White balance setting is completed.” is displayed on the monitor and disappears automatically in 3 seconds. This message can also be switched off by pressing any button other than the main switch.

Ⓞ If the adjustment fails, message “white balance setting failed.” is displayed. As this message does not disappear automatically, press the SET/OK button to switch it off and retry the adjustment.

Ⓞ The white balance adjustment fails when the live image is not completely white, the exposure is inappropriate (too bright or too dark), etc.

Ⓞ The white balance can also be adjusted using AUTO WB and manual (by means of direct entry of color temperature) as well as OTWB (One-Touch White Balance), and the adjustment mode can be selected in the MENU display. For details, see Setting the white balance (WB) mode (p. 33).

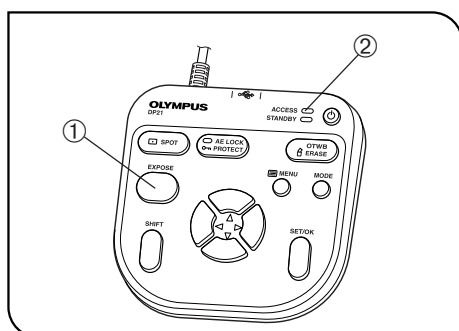


Fig. 18

8 Recording Still Images

1. On the microscope, frame the image to be recorded and focus on it.

Tip

To facilitate focusing, use the zoom display of the live image (p. 27) or display the focusing indicator (p. 37).

2. Press the EXPOSE button ① to record the still image, which is saved in the USB memory connected to the control box or hand switch.

☉ Switching the Rec View setting (p. 34) ON displayed the recorded image temporarily during live image display. (With the default, the recorded image is displayed for 5 second after recording.)

Tip

The image save destination can be changed (p. 31). The image can also be saved in the networked PC by advance setting.

3. The ACCESS LED lights during recording of the image. Message "Saving image" is also displayed on the center of the screen.
4. The INFO display shows the number of remaining image.

CAUTION

When the number of remaining image reaches 0, warning message "MEMORY FULL" is displayed on the monitor screen.

CAUTION

- Do not disconnect the USB memory while the ACCESS LED ② is lighting.
- As the data quantity varies depending on the recording target, more images than the number of remaining image may sometimes be recordable. Also, the counter may not decrement after recording or may not increment even when an image is erased.
- The number of remaining image varies depending on the capacity of the USB memory.
- The USB memory has its own service life. Its capacity may decrease depending on its conditions.
- It is not possible to record more than 10,000 images even when the USB memory has a remaining idle capacity.
- The folder and file names of the recorded images are created automatically. See page 33 for details.

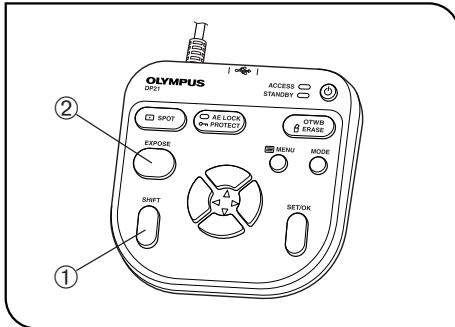
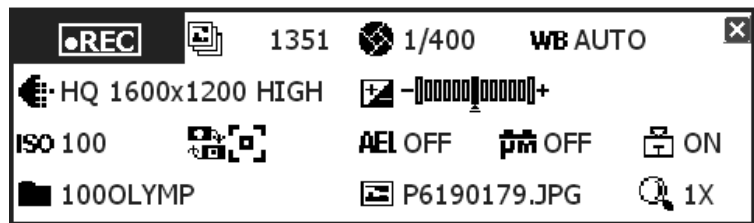


Fig. 19

9 Recording Movies

1. On the microscope, frame the image to be recorded and focus on it.
 2. While holding the SHIFT button ①, press the EXPOSE button ② to start movie recording.
 3. To stop movie recording, press the EXPOSE button ②. The movie is saved in the USB memory.
- Ⓞ The INFO display shows the following information during movie recording (the MODE display shows "REC").



- Ⓞ The image size and format of the recorded movie are as follows and cannot be modified.
Image size: 400 x 300
Format: Non-compressed AVI
- Ⓞ The settings cannot be changed in the middle of movie recording. They should be changed after completing the recording.
- Ⓞ A movie can be recorded for up to 5 minutes (this period is variable depending on the frame rate and storage medium capacity). Movie recording may stop anytime automatically when the maximum file size is reached or the storage medium runs out of capacity.
- Ⓞ "1351" on the INFO display indicates the number of recordable still-image images, and the number of recordable movies is not displayed.
- Ⓞ When the system is turned OFF in the middle of movie recording, the movie ends at that point.
- Ⓞ The folder and file names of the recorded movies are created automatically. See page 33 for details.

Tip

The movie save destination can be changed (p. 31). However, the movie frame rate may drop depending on the data write speed of the recording medium (at the time of playback, such a movie look like a fast-forward movie).

2-6 Recording Function Setting/Operation (REC)

2-6-1 Operation using the hand switch

This section describes the method of operating the basic functions using the hand switch. The hand switch has buttons to which the functions frequently used in microscope observation are assigned to facilitate the recording of clear images.

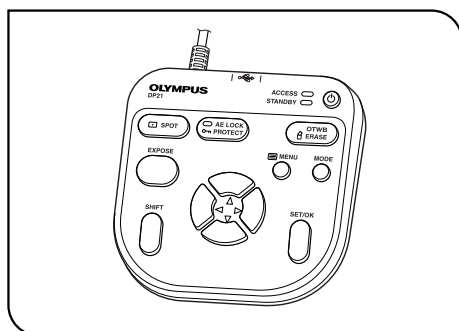


Fig. 20

1 Available Functions

The hand switch of the DP21 incorporates the following functions. For details of each function, see the description in the applicable pages.

Name	Function	Buttons	Remark
Exposure adjustment (AUTO mode)	Modifies the exposure time set by AE (Auto Exposure).		
Exposure time setting (MANUAL mode)	Sets the exposure time by direct entry of the figure.		To enter the exposure time directly, press the MODE button to select the REC MANUAL mode.
SPOT metering	Switches the metering area between normal (30%) and SPOT (1%).		Select the metering area according to the specimen. See p. 26 for details.
AE lock	Locks the exposure time set by AE (Auto Exposure).		
OTWB	To reproduce optimum colors, image a white object, measures the white balance and stores the optimum white balance for actual recording status in the DP21.		Set the entire live image white when executing OTWB. See p. 22 for details.
Scrolling	Scrolls the zoomed image.		Scrolling of the image is also possible by holding the SET/OK button instead of the SHIFT button.

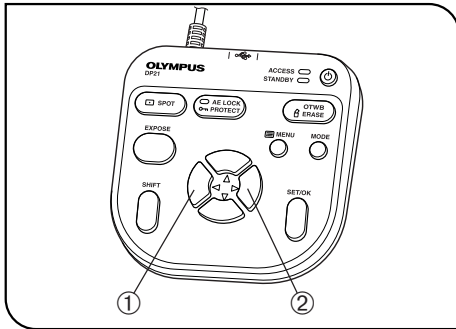


Fig. 21

2 Exposure Adjustment

REC AUTO mode

The exposure time set by AE (Auto Exposure) can be corrected (by up to 2 EV in 1/3 EV steps).

When the specimen is dark, +EV correction will extend the exposure time and give an over-exposure type effect. When it is bright, the -EV correction will shorten the exposure time and give an under-exposure type effect.

Press the cursor button ◀ ① or ▶ ② to set the exposure adjustment value. The setting can be checked on the following scale at the bottom of the INFO display.



⊙ Switch off the MENU display before the exposure adjustment. If the MENU display is shown, press the MENU button on the hand switch to hide it.

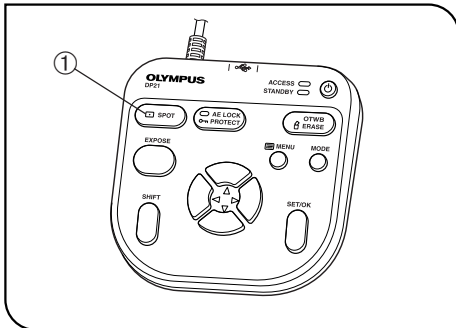


Fig. 22

3 SPOT Metering Setting

REC AUTO mode

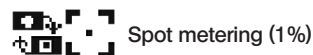
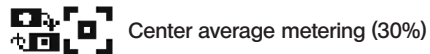
⊙ When the observation target is dispersed in the image, the image may become too bright or too dark due to the effect of the background. In such a case, the problem may sometimes be improved by changing the metering area.

⊙ The center average metering is set normally.

- Center average metering: Photometry of the 30% area on the image center.
- Spot metering: Photometry of the 1% area on the image center.

1. Press the SPOT button ① to switch the metering area between SPOT and Average.

The INFO display shows the current setting.



2. The metering area can be displayed or hidden by setting in the MENU display. When it is set to be hidden, it appears only when the SPOT button is pressed but disappears in 3 sec.

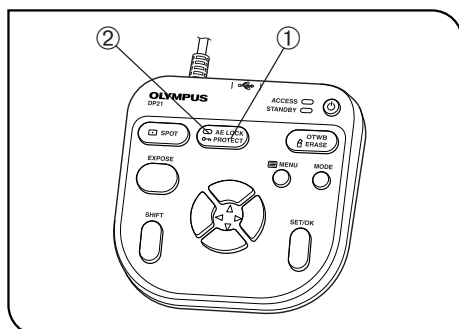


Fig. 23

4 AE Lock Setting

REC AUTO mode only

1. Press the AE LOCK button ① to lock the current exposure time. The AE LOCK LED ② lights and the INFO display shows the locked exposure time.
 2. Press the AE LOCK button ① again to cancel AE LOCK.
When AE LOCK is set, the metering area, ISO speed and exposure adjustment cannot be set.
- ⊙ When a specimen dispersed in dots is observed using AE, moving the stage may sometimes vary the exposure time and make the image too bright or dark. AE LOCK is useful in such a case for observing the target at constant brightness.

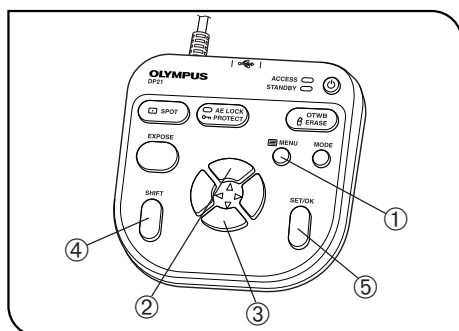


Fig. 24

5 Zooming/Scrolling

1. Press the MENU button ① to hide the MENU display.
 2. Press the cursor button ▲ ② or ▼ ③ to change the electronic zoom ratio of the live image. ▲ ② switches it to 1x → 2x → 4x and ▼ ③ switches it to 4x → 2x → 1x.
 3. Pressing one of the cursor buttons while holding the SHIFT button ④ or SET/OK button ⑤ scrolls the image in the direction indicated by the pressed button. The entire image area can be scrolled even during 2x and 4x zoom display.
- ⊙ A scroll arrow is displayed when the image is zoomed in. Scrolling can be used only when Zoom (2x and 4x) is displayed.

Tip

Zooming and scrolling are not available when the MENU display is displayed.

6 Composite Button Operations

Pressing two buttons makes it possible to perform a quick setting as shown in the following table (○: Possible / ×: Impossible). To perform this, ensure that the MENU display is hidden, hold the “Held button” and press the “Switching button.”

Composite buttons		Mode		Setting operation	Page
Held button	Switching button	REC	PLAY		
<div style="border: 1px solid black; padding: 2px; display: inline-block;">Shift</div> or <div style="border: 1px solid black; padding: 2px; display: inline-block;">SET/OK</div>	Cursor button ▲▼ ◀▶	○	○	Scrolling when the image is zoomed (2x or 4x). (This can also be used in left/right scrolling in the save destination window.)	27
<div style="border: 1px solid black; padding: 2px; display: inline-block;">SET/OK</div>	<div style="border: 1px solid black; padding: 2px; display: inline-block;">MENU</div> or <div style="border: 1px solid black; padding: 2px; display: inline-block;">MODE</div>	○	×	Scale data setting change	35
<div style="border: 1px solid black; padding: 2px; display: inline-block;">Shift</div>	<div style="border: 1px solid black; padding: 2px; display: inline-block;">MENU</div>	○	○	INFO display view/hide switching	20
<div style="border: 1px solid black; padding: 2px; display: inline-block;">Shift</div>	Cursor button ▲▼	×	○	Available only when the index images are displayed. Thumbnail list page switching	51
<div style="border: 1px solid black; padding: 2px; display: inline-block;">Shift</div>	<div style="border: 1px solid black; padding: 2px; display: inline-block;">EXPOSE</div>	○	×	Movie recording starting	24
<div style="border: 1px solid black; padding: 2px; display: inline-block;">MENU</div>	Main switch	○	○	System startup at the resolution of the monitor display (SVGA 800 x 600). After about 30 seconds from the startup with the power switched to ON, the AE lock LED will light for about 1 second. Press only the MENU button while the AE lock LED is on.	56

2-6-2 Operation using the MENU display

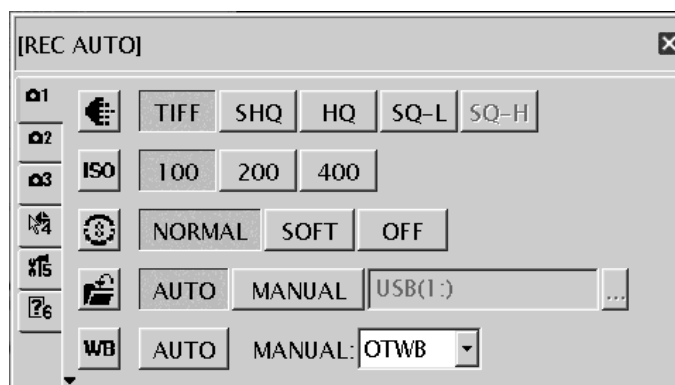
This section describes the operation method of the functions that are available in the MENU display on the monitor screen. This section pertains to the recording operation (in the REC AUTO/REC MANUAL modes). See page 21 for the basic operations and flow of the MENU display.

Settings in the REC modes

- Use the MODE button to select the REC AUTO or REC MANUAL mode.
- Use the MENU button to view the MENU display on the monitor screen.
- Be sure to press the SET/OK button after each setting to enter it.

1 Viewing the MENU Display

1. Press the MENU button to view or hide the MENU display.
 2. Press a cursor button to place the cursor on the desired item.
 3. Press the SET/OK button to enter the selection.
- © For applied functions and settings, see "Applied operations" (p. 34).



Page select tabs

Tab	Content
	Page for the camera's basic functions The image quality mode, ISO speed, etc. can be set in this page.
	Page for the camera's applied functions. Rec View, Scale, etc. can be set in this page.
	Page for the camera's display functions. The focusing indicator, AE area, etc. can be viewed or hidden in this page.
	Page for the measurement functions. Measurements of image can be started from this page.
	Page for options. Selection of the folder of the image to be played and setting of the language and date are available.
	Page for the guidance on microscope. The guidance can be displayed and manipulated. *This page is displayed only when the control box (U-CBS, etc.) is connected.

2 Image Quality Mode Setting

Default: HQ

Ⓞ Select the quality of the recorded image.

The image quality improves as the setting is advanced from "SQ-H" → "SQ-L" → "HQ" → "SHQ" → "TIFF."

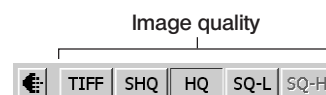


Image quality mode	Compression rate	Save format	Recording pixels	File capacity
TIFF	No compression	TIFF	1600 x 1200	Approx. 5760 KB
SHQ	LOW (1/2.7)	JPEG	1600 x 1200	≤ Approx. 2140 KB
HQ	HIGH (1/8)	JPEG	1600 x 1200	≤ Approx. 720 KB
SQ-L	LOW (1/2.7)	JPEG-LOW	800 x 600	≤ Approx. 535 KB
SQ-H	HIGH (1/8)	JPEG-HIGH	800 x 600	≤ Approx. 180 KB

Ⓞ The quality is fixed at "SQ-HIGH" when the binning is set (p. 22).

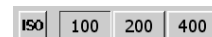
Ⓞ The compression rates are as follows. SHQ (TIFF): No compression; SHQ (JPEG): 1/2.7; HQ (JPEG): 1/8; SQ (JPEG-LOW): 1/2.7; SQ (JPEG-HIGH): 1/8.

3 ISO Speed Setting

Default: 100

Ⓞ Select the sensitivity (ISO speed) in image capturing. The figures are set based on the ISO speeds of photo films.

Three options of 100, 200 and 400 are available. The larger ISO speed is more suitable for recording of dark specimens or quickly-moving objects.



CAUTION The larger ISO speeds are suitable for recording of dark specimens, but they also increase the image noise. Select the optimum setting according to situations.

4 Sharpness Setting

Default: NORMAL

Ⓞ Select the image sharpness. The sharpness refers to the degree of contour enhancement of image.

Three options of "NORMAL," "SOFT" and "OFF" are available.

The contour enhancement attenuates as the setting is changed from "NORMAL" to "SOFT" and then to "OFF."

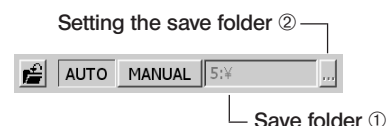
"NORMAL" sharpens the image contours and is suitable for appreciation of prints, etc. "SOFT" reproduces contours in a natural feeling. "OFF" does not apply sharpness correction and is therefore suitable for subjecting to post image processing on a PC, etc. Select the optimum setting according to situations.



5 Save Folder Setting

Default: AUTO

When more than one DP21 unit records and saves images into the same folder in a network PC, etc. at the same timing, an error about the impossibility of saving the recorded images may occur. Wait a while and retry recording the images or save the image files in different folders.



AUTO

When the save destination is set to "AUTO," the images are saved in a USB removable medium such as the USB memory connected to the hand switch or control box. If multiple media are connected, the images are saved in the first connected one. If a single medium is divided into multiple partitions, the images are saved in the first drive.

The recorded images are saved in the folder that is created automatically in the medium. The folder names as well as the file names of the recorded images are created automatically. For details on the folder and file names, see "Folder and File Names (p. 33)."

MANUAL

The user can specify the image save destination, which is shown in ①. The save destination can be set using only the hand switch, but the use of the keyboard is required if the save destination is protected by a password, etc.

1. Place the cursor on "MANUAL" and press the SET/OK button.
2. Similarly, place the cursor on ② and press the SET/OK button. The [Folder Select] window as shown below is displayed.
3. Select the save destination location.

Ⓞ If the save destination folder name is turned into garbled characters due to the use of special characters, etc. malfunction may result.

[Folder Select] window





Specifying the save folder by the address

The save destination can be specified by entering the folder address. In addition, a pull-down menu is also available listing the recently-specified addresses (up to 10 addresses) so that the user can also select the desired address from them.

1. Place the cursor on and press the cursor button .
 2. Press the cursor button to select one of the save destinations listed in the pull-down menu. Alternatively, enter the save destination address directly from the keyboard.
 3. Press the SET/OK button of the hand switch to enter the save destination. If you are using the mouse, click on [OK] in the [Folder Select] window.
 4. To cancel the operation, press the MENU button or click on [CANCEL].
 5. If you want to specify the destination from the folder tree displayed below instead of the address, press the SET/OK button. As this moves the cursor to , select again.
- Ⓞ The direct entry of the address is possible only when the keyboard is connected. When specifying the network PC, enter the full paths including the PC name and folder name.



Specifying the save folder from the tree

The save destination can also be specified from a folder tree. A scroll bar is displayed if the displayed folders have long paths. Up/down scrolling of the folder tree is possible using the up/down cursor buttons of the hand switch, and left/right scrolling is possible using the Shift + left/right buttons.

1. Place the cursor on and press the cursor button .
2. Select the save destination from the folder tree using the cursor button of the hand switch or the mouse.
3. Press the SET/OK button of the hand switch to enter the save destination. If you are using the mouse, click on [OK] in the [Folder Select] window.
4. To cancel the operation, press the MENU button or click on [CANCEL].
5. If you want to specify the destination by the address instead of using the folder tree, place the cursor on "RETURN" above the folder tree and press the SET/OK button. As the cursor moves to , select again.

Ⓞ The following operations are available on the hand switch.

Button	Function
	Moves the cursor up.
	Moves the cursor down.
	Collapses the expanded slave folder so that the master folder can be selected.
	Expands the specified folder if it has slave folders.
SET/OK	Sets the selected folder as the save folder and closes the [Folder Select] window.
MENU	Closes the [Folder Select] window (by cancelling the save folder setting operation).

Ⓞ The setting is sometimes impossible if the save destination folder is specified in the networked PC. If this happens, wait a while and retry the folder specification; this may sometimes make the setting possible.

The trouble mentioned above is caused because the result of the PC search of the specified folder may vary in each search operation.

6 White Balance (WB) Mode Setting

Default: AUTO

The white balance adjustment mode can be selected from the following three options.



Mode	Function/Characteristics
AUTO	Identifies the white part in the live image and adjusts the white balance automatically. The white balance adjustment is executed automatically whenever the illumination brightness changes. However, when the live image contains little white part or with certain specimen type or brightness, the white balance cannot be adjusted properly and the optimum color tone cannot be obtained.
MANUAL	Recalls the white balance value preset for each color temperature. When the user specifies a color temperature, the color toe matching it can be obtained. (Available color temperature settings are OTWB, 3000K, 3700K, 4000K, 4500K, 5500K and 6500K)

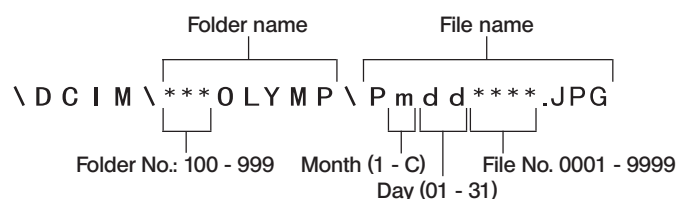
- ◎When OTWB is selected in the MANUAL mode, the white balance value set when the OTWB button on the hand switch was last pressed is recalled. Therefore, if the lighting condition such as the brightness was different from the moment the OTWB button was last pressed, the optimum color tone would not be obtained. If this happens, view a white image on the live view and execute the OTWB adjustment operation again (p. 22).
- ◎Pressing the OTWB button of the hand switch sets the OTWB mode automatically.

7 Folder and File Names

When an image is recorded, the DP21 automatically creates a folder in the image save destination and saves the image file in it. The folder and file names are created automatically as shown below.

Folder and file names

Each image recorded with the DP21 is automatically given the folder and file names as shown below.



*The "month" in the folder name is expressed with "1" to "9" for January to September, "A" for October, "B" for November and "C" for December.

When the save folder setting is "MANUAL" and the folder is specified manually, the folder and file are named as follows.

<User-specified folder>\ Pmddxxx.JPG

The file name extension is set according to the image quality mode as follows.

TIFF : .TIF
 SHQ, HQ, SQ : .JPG
 Movie : .AVI

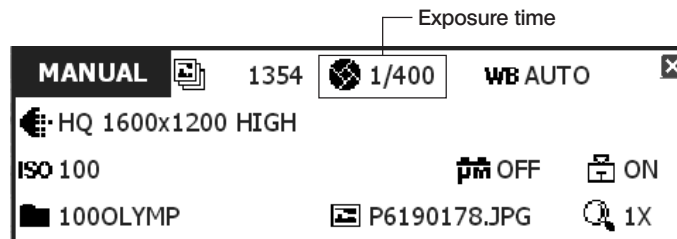
2-6-3 Applied operations

This section describes the applied functions of the DP21. These functions make it possible to record observed images that match the user needs.

1 Manual recording

Manual recording makes it possible to record images by setting the exposure time manually as required.

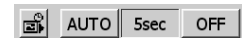
1. Press the MODE button of the hand switch to select the REC MANUAL mode.
2. Press the cursor buttons ◀▶ to set the exposure time. The setting can be confirmed on the INFO display.



2 REC VIEW Setting

Default: 5 sec.

The DP21 has the REC VIEW function, which displays the recorded image temporarily after recording. The REC VIEW function has the following three modes, which can be selected as desired by the user.

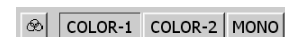


Item	Function/Content
AUTO	After the EXPOSE button is pressed, the recorded image is displayed until the recording operation finishes. The display is switched to the live image display when the recording operation has completed.
5sec	The recorded image is displayed after the EXPOSE button is pressed. In 5 seconds later, it is switched automatically to the live image.
OFF	The REC VIEW function is switched OFF. The live image remains displayed even when an image is recorded.

3 Image Color Setting

Default: COLOR-1

- ◎ The image can be displayed either in color or monochrome.
 - The color setup is applied to the live image as well as the recorded images.
 - Two color modes (COLOR-1/COLOR-2) are available and offer different color tone reproductions.
- ◎ The basic criterion for selection of COLOR-1 and COLOR-2 is determined by the microscope in use, but the color reproduction can sometimes be improved by changing it according to the specimen or the purpose of observation. Please try and find the best color reproduction.
 - COLOR-1: IX81/71, IX70, BX3, BX2, BX, AX, MX, GX, SZX2 and SZX series microscopes.
 - COLOR-2: CX, CKX, IX51 and IX50 microscopes.
 - MONO: Monochrome display

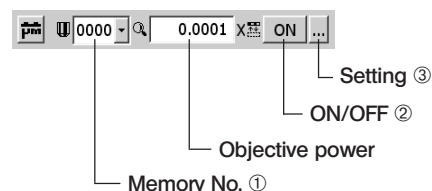


4 Scale Display Setting

Default: OFF

A scale can be displayed in the live image as well as in recorded images.

The scale display setting can be saved and recalled later.

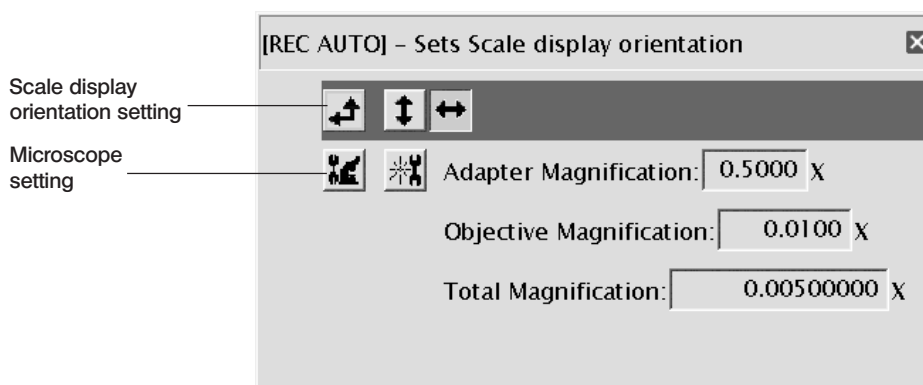


4-1 Displaying a Scale

1. Select the memory number ①.
2. Set ON/OFF ② to ON to display the scale.

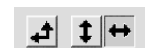
4-2 Setting a scale

1. Select setting ③. The [Scale Setting] window shown below appears.
2. Change the settings in the [Scale Setting] window. Press the SET/OK button to apply the settings and close the [Scale Setting] window.



Scale display orientation setting

The scale can be displayed either horizontally or vertically on the image. Select the icons in the [Scale Setting] window to switch the scale display orientation.



Microscope setting

Set the magnification information required for the scale display.

- Ⓞ Before microscope setting, disconnect the USB memories (including the removable media devices such as HDD) from the hand switch and/or control box. They can be reconnected after completion of restarting (auto restart) after the setting.
- Ⓞ When a control box (U-CBS, etc.) is connected, the setting methods are different from those described below. Please see page 64.

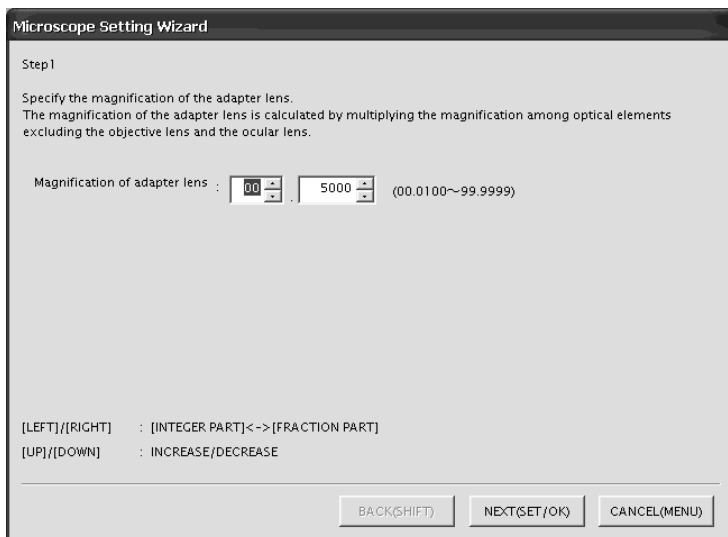
1. Select the microscope setting icon . The [Microscope Setting Wizard] will start.

2. Enter the camera adapter magnification, objective power, etc. following the [Microscope Setting Wizard].

Operation using the hand switch: Adjust the value with the cursor buttons ▲ ▼ and adjust the adjustment position with the cursor buttons ◀ ▶. Press the SET/OK button to advance to the next display page.

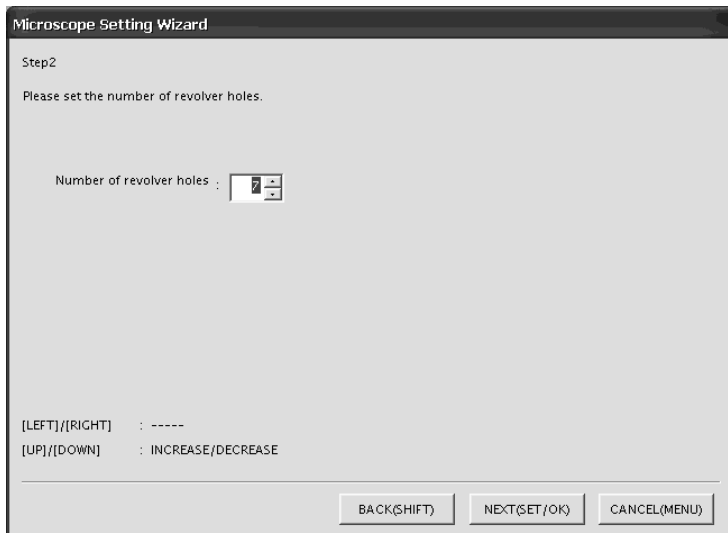
Operation using the mouse: Click on the position to be adjusted and adjust the value by means of scrolling or using the pull-down menu. The value can also be input directly from the keyboard. Click on [Next] to advance to the next display page.

① Enter the camera adapter magnification.



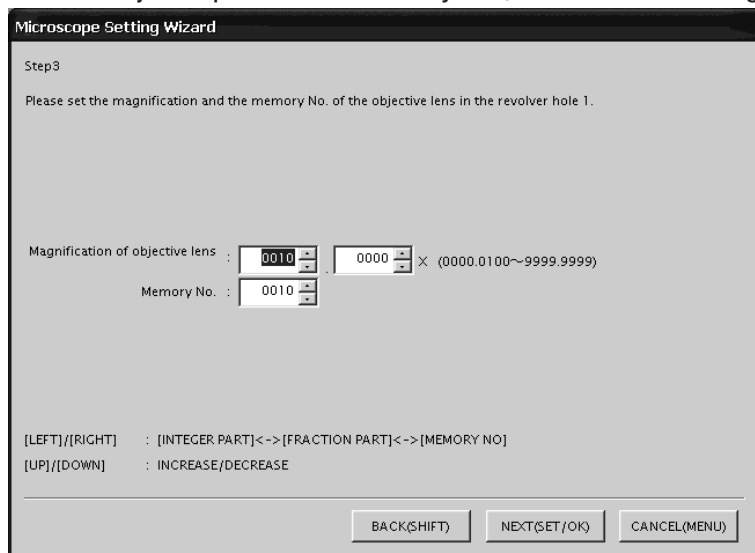
The screenshot shows the 'Microscope Setting Wizard' window at Step 1. The title bar reads 'Microscope Setting Wizard'. The main content area contains the following text: 'Step1', 'Specify the magnification of the adapter lens.', and 'The magnification of the adapter lens is calculated by multiplying the magnification among optical elements excluding the objective lens and the ocular lens.' Below this is a label 'Magnification of adapter lens :' followed by a numeric input field showing '00' and a pull-down menu showing '5000'. To the right of the input field is the range '(00.0100~99.9999)'. At the bottom of the screen, there are three buttons: 'BACK(SHIFT)', 'NEXT(SET/OK)', and 'CANCEL(MENU)'. Below the input field, there are two lines of instructions: '[LEFT]/[RIGHT] : [INTEGER PART]<->[FRACTION PART]' and '[UP]/[DOWN] : INCREASE/DECREASE'.

② Enter the number of revolving nosepiece positions.



The screenshot shows the 'Microscope Setting Wizard' window at Step 2. The title bar reads 'Microscope Setting Wizard'. The main content area contains the following text: 'Step2', 'Please set the number of revolver holes.', and 'Number of revolver holes :'. Below this is a numeric input field showing '7' and a pull-down menu. At the bottom of the screen, there are three buttons: 'BACK(SHIFT)', 'NEXT(SET/OK)', and 'CANCEL(MENU)'. Below the input field, there are two lines of instructions: '[LEFT]/[RIGHT] : -----' and '[UP]/[DOWN] : INCREASE/DECREASE'.

③ Enter the objective power and its Memory No. (enter for each revolving nosepiece position).

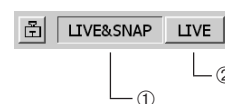


5 Scale Display Range Setting

Default: LIVE & SNAP

When the scale display is ON, it can be displayed in either way below.

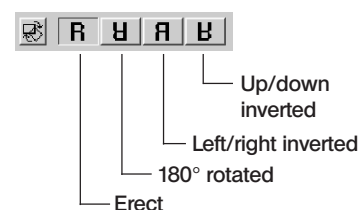
- ① To display the scale in both live and recorded images.
- ② To display the scale only in the live image (the scale is not displayed in the recorded images).
- Ⓞ This setting is also applied to the measurement-related display.



6 Image Orientation Setting

Default: Erect

The image can be displayed in one of the four orientations. This operation is not available in the middle of recording.

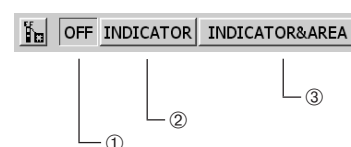


7 Focusing indicator Setting

Default: OFF

The focusing indicator and focusing area can be displayed or hidden.

- ① To hide both the focusing indicator and focusing area.
- ② To display only the focusing indicator.
- ③ To display both the focusing indicator and focusing area.



Focusing indicator

- ⊙ The focusing status of the incident light can be displayed for use as a reference for focusing.

The focusing indicator is displayed as a bar as shown below at the bottom left of the monitor screen. It is switched automatically to the peak level display according to the specimen contrast.

Initial display

The level meter and peak level display are not show immediately after the display is turned ON.



Normal status display

The current level is indicated by the blue bar, and the maximum level by the red bar.



Adjust the focus precisely so that the current level approaches the maximum level.

Display when evaluation is impossible because the level is 0



Display with highest evaluation



- ⊙ The current level is updated every 0.1 second.
- ⊙ The peak level is updated when a higher peak level than before is detected.

Focusing area

- ⊙ The focusing area can be displayed on or hidden from the monitor screen.

The level indicated by the focusing indicator is calculated within this area.

8 AE Area Display Setting

Default: OFF

- Ⓞ The average or spot metering area can be displayed on or hidden from the monitor screen.
See page 26 for the metering area setting.





9 Measurement Functions

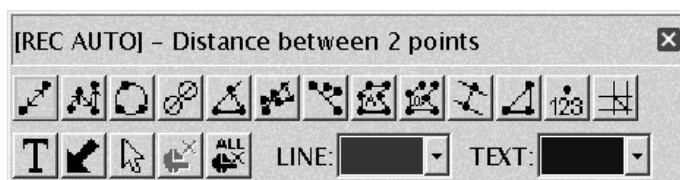
Distances and areas in the image can be measured. The measurements are possible by using the hand switch buttons or the mouse connected to the control box.



- Ⓞ The scale should be set before measurements. For the setting method, see Scale Display Setting (p. 35).
- Ⓞ The measurement data can be displayed either on the live image alone or on both the live and recorded images. For the selection method, see Scale Display Range Setting (p. 37).
- Ⓞ If text input is required, connect the keyboard to the control box.
- Ⓞ The measurement functions are simplified functions based on the CCD pixels and are not suitable for precise measurements. If precise measurements are required, use appropriate measuring instruments.
- Ⓞ The measurement result is displayed to the fourth place of significant figures with the distance, to the fifth places of significant figures with the angle, and to the seventh places of significant figures with the area. The unit used in the measurement result display cannot be changed.
- Ⓞ The display result is displayed near the drawn line or circle. It is not possible to change the display position, the font, the line thickness and the number of displayed digits.

1. Select [START MEASUREMENT]. The MENU display is switched to the measurement menu shown below.
2. Select the desired measurement from the measurement menu. The pointer on the screen turns into " ".
3. Move the pointers to the measurement target positions using the cursor buttons of the hand switch, and press the Shift button to view the measurement result on the screen. The diagram for the measurement method and the results are displayed automatically. The digits of the measurement results are also set automatically. Now the next measurement can be started (up to 20 measurement results, including those of previous measurements, can be displayed on the screen).
4. To end measurements and return to the measurement menu display press the SET/OK button or MENU button (this is also possible by right-clicking of the mouse if this is used). To cancel a measurement in the middle, press the MENU button (or left-click on [END (MENU)] at the top right of the screen if you are using the mouse).
5. To return to the normal MENU display, display the measurement menu by ending measurement, and press the MENU button of the hand switch (or click on  on the upper right of the MENU display if you are using the mouse).

Measurement menu



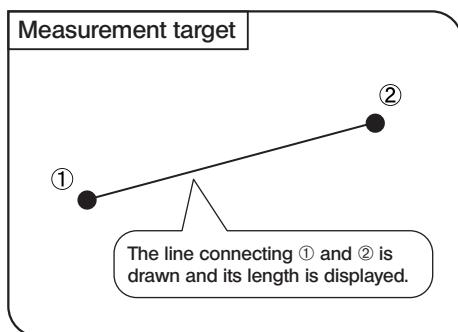
Measurement function list

Icon	Function	Outline	Remark (Restrictions)	Page
	Distance of 2 points	Measures the distance between 2 specified points.	A total of 20 measurements are possible per image including the functions in the range from "Distance" to "XY Distances."	p. 41
	Poly-Line	Measures the total sum of the distances between multiple specified points.	Up to 100 points can be specified per measurement.	p. 41
	3 Points Circle	Draws a circle (based on 3 specified points) and measures its diameter and area.		p. 41
	Distance between 2 Circle Centers	Draws 2 circles and measures the distance between their centers.		p. 42
	3 Points Angle	Draws an angle based on 3 specified points and measures it.		p. 42
	4 Points Angle	Draws 2 lines based on 4 specified points and measures the angle formed at their intersection.		p. 43
	Perpendiculars	Draws a reference line, draws a line segment perpendicular to the reference line and measures the length of the perpendicular line.	Up to 10 perpendicular lines can be drawn from the reference line.	p. 43
	Polygon Area	Draws a polygon and measures its area.	Up to 100 corners can be specified per polygon.	p. 44
	Boundary Length	Draws a polygon and measures the total length of its sides.	Up to 100 corners can be specified per polygon.	p. 44
	Distance of Parallel Lines	Draws 2 parallel lines and measures the distance between them.		p. 45
	XY Distance	Specifies 2 points and measures the XY distances and R distance between them.		p. 45
	Count	Draws markings on the screen.	Up to 50 points can be counted.	p. 46
	Cross Line	Specifies 1 point and measures the distance between the image center (origin point) and it.		p. 46
	Text	A text can be inserted.	Max. 32 characters can be entered. This function is unavailable unless the keyboard is connected.	p. 47
	Arrow	An arrow can be inserted.		p. 47
	Select	Selects one of the displayed measurement results.		p. 47
	Erase	Erases the selected measurement result.		p. 47
	Erase All	Erases all of the displayed measurement results.		p. 48

Distance of 2 Points



This function measures the distance between two points specified by the user.

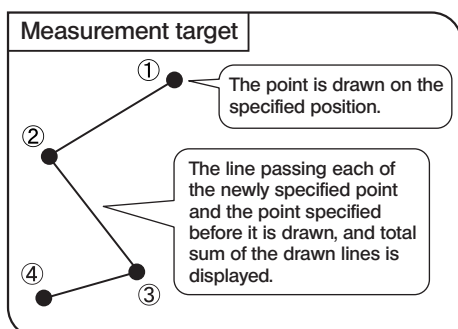


1. When is selected, pointer “” is displayed. The pointer can be moved using the cursor buttons ▲▼◀▶ or the mouse.
2. Press the SHIFT button on each of the points you want to specify (or left-click the mouse if this is in use). To measure another distance, press the SHIFT button at each of the points to be specified newly.
3. To end measurement, press the SET/OK button or MENU button (if you are using the mouse, right-click it or left-click it on [END (MENU)] at the top right of the screen).

Poly-Line



This function draws lines connecting the multiple points specified on the image and measures the total sum of the distances of the drawn lines. Up to 100 points can be specified per measurement.

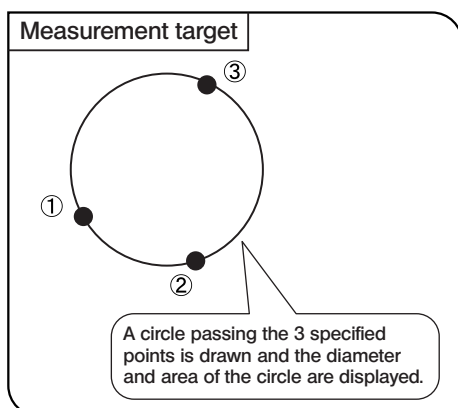


1. When is selected, pointer “” is displayed. The pointer can be moved using the cursor buttons ▲▼◀▶ or the mouse.
2. Press the SHIFT button on each of the points you want to specify (or left-click the mouse if this is in use). From the second point and on, the line connecting the point and the previously specified point is drawn.
3. To end measurement, press the SET/OK button or MENU button (if you are using the mouse, right-click it or left-click it on [END (MENU)] at the top right of the screen).

3 Points Circle



This function draws a circle (based on the three points specified by the user) and measures the diameter and area of the circle.

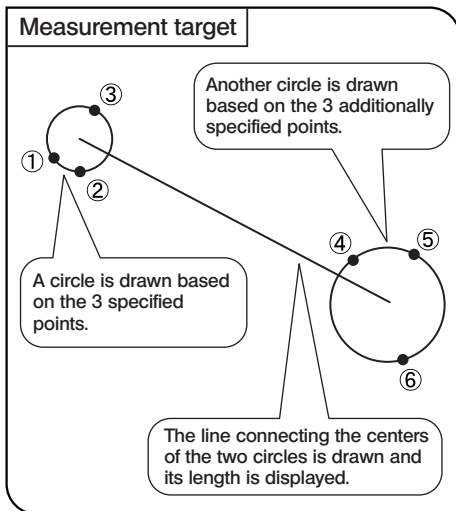


1. When is selected, pointer “” is displayed. The pointer can be moved using the cursor buttons ▲▼◀▶ or the mouse.
2. Press the SHIFT button on each of the points you want to specify (or left-click the mouse if this is in use). To measure another circle, press the SHIFT button at each of the points to be specified newly.
3. To end measurement, press the SET/OK button or MENU button (if you are using the mouse, right-click it or left-click it on [END (MENU)] at the top right of the screen).

Distance between 2 Circle Centers



This function draws two circles (each based on the three points specified by the user) and measures the distance between their centers.

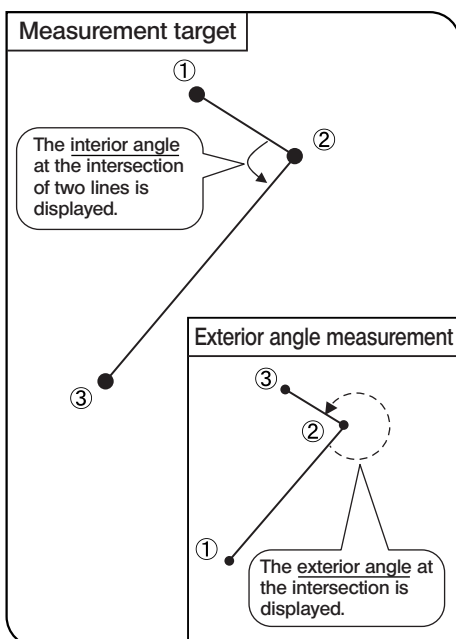


1. When is selected, pointer “” is displayed. The pointer can be moved using the cursor buttons or the mouse.
2. Press the SHIFT button on each of the points you want to specify (or left-click the mouse if this is in use). To measure another couple of circles, press the SHIFT button at each of the points to be specified newly.
3. To end measurement, press the SET/OK button or MENU button (if you are using the mouse, right-click it or left-click it on [END (MENU)] at the top right of the screen).

3 Points Angle



This function draws two lines based on the three points specified by the user and measures the angle formed by them.



1. When is selected, pointer “” is displayed. The pointer can be moved using the cursor buttons or the mouse.
2. Press the SHIFT button on each of the points you want to specify (or left-click the mouse if this is in use). To measure another angle, press the SHIFT button at each of the points to be specified newly.
3. To end measurement, press the SET/OK button or MENU button (if you are using the mouse, right-click it or left-click it on [END (MENU)] at the top right of the screen).

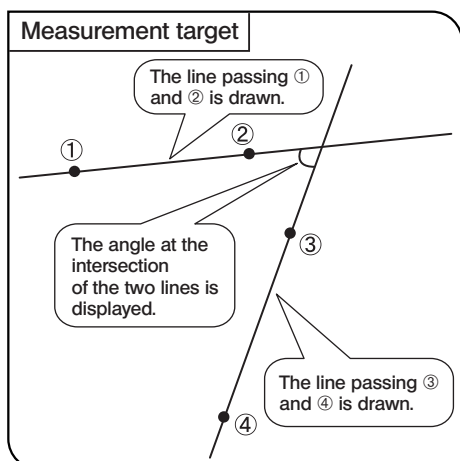
* Interior and exterior angles

The angle of the arch formed by tracing from the first line to the second line in the counterclockwise direction is displayed.

4 Points Angle



This function draws two lines on the image and measures the angle at the intersection of them.

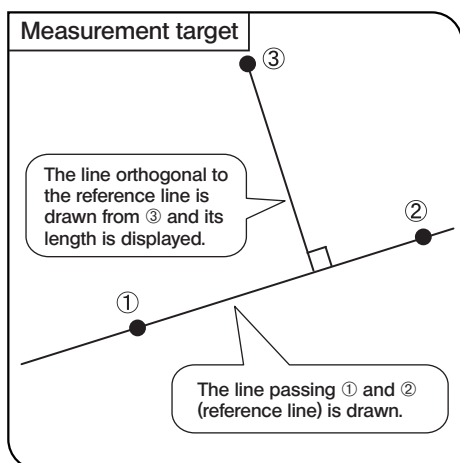


1. When is selected, pointer “” is displayed. The pointer can be moved using the cursor buttons or the mouse.
 2. Press the SHIFT button on the two points you want to specify to draw the reference line (line ①-② in the figure on the left).
 3. Similarly draw another line (line ③-④ in the figure). The angle at the intersection of the two lines is displayed.
 4. To measure another angle, press the SHIFT button at each of the points to be specified newly
 5. To return to the measurement menu, press the SET/OK button.
- Ⓞ If you are using the mouse, left-click it instead of pressing SHIFT and right-click it instead of SET/OK.
 - Ⓞ Either the interior or exterior angle of the intersection can be measured. For details, see “3 Points Angle” above.

Perpendiculars



This function draws a line based on two points specified by the user, then draws a line perpendicular to the reference line based on a point specified by the user, and measures the length of the perpendicular line.



1. When is selected, pointer “” is displayed. The pointer can be moved using the cursor buttons or the mouse.
2. Press the SHIFT button on the desired two points to draw the reference line (line ①-② in the figure on the left).
3. Press the SET/OK button at the desired point to draw a line perpendicular to the reference line from it.

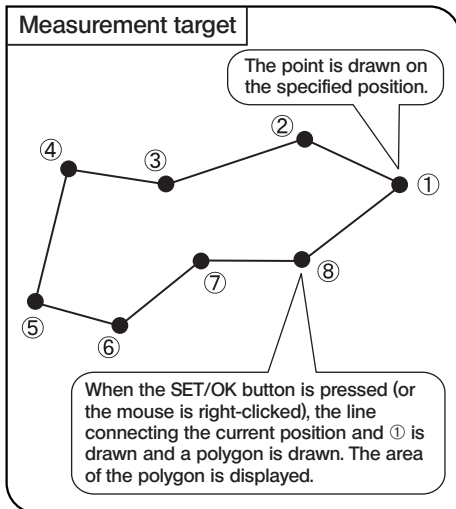
To draw multiple perpendicular lines to the reference line, press the SHIFT button each time. At the last point, press the SET/OK button to draw the perpendicular line.




4. If you want to draw another reference line and perpendicular lines to it, repeat steps 2 and 3 above.
 5. To return to the measurement menu, press the SET/OK button.
- Ⓞ If you are using the mouse, left-click it instead of pressing SHIFT and right-click it instead of SET/OK.

Polygon Area



This function draws a polygon and measures its area. The polygon can have up to 100 corners.

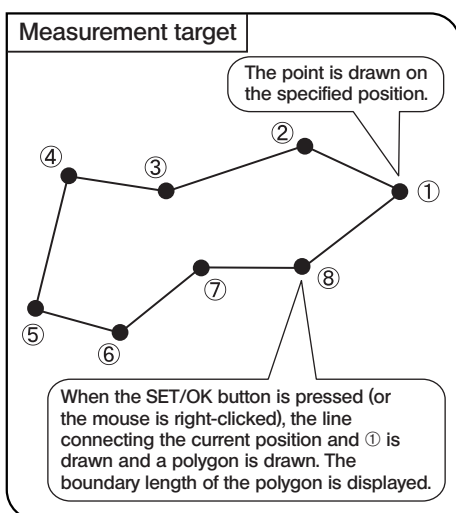





1. When  is selected, pointer “” is displayed. The pointer can be moved using the cursor buttons  or the mouse.
2. Press the SHIFT button (or left-click the mouse if this is in use) on the points desired for drawing a polygon.
3. Press the SET/OK button (or right-click the mouse) to draw a polygon by connecting the current point and the first point.
4. If you want to draw a new polygon, repeat steps 2 and 3.
5. To end measurement, press the SET/OK button or MENU button (if you are using the mouse, right-click it or left-click it on [END (MENU)] at the top right of the screen).

Boundary Length



This function draws a polygon and measures the total length of its sides. The polygon can have up to 100 corners.

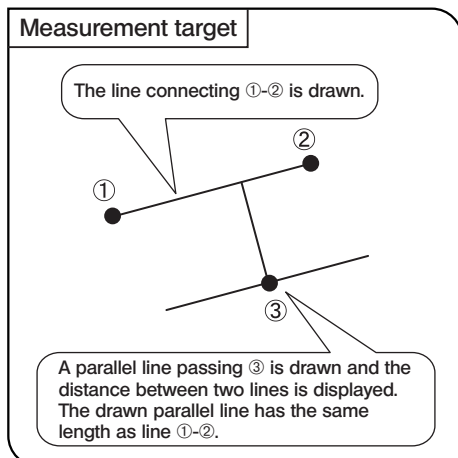


1. When  is selected, pointer “” is displayed. The pointer can be moved using the cursor buttons  or the mouse.
2. Press the SHIFT button (or left-click the mouse if this is in use) on the points desired for drawing a polygon.
3. Press the SET/OK button (or right-click the mouse) to draw a polygon by connecting the current point and the first point.
4. If you want to draw a new polygon, repeat steps 2 and 3.
5. To end measurement, press the SET/OK button or MENU button (if you are using the mouse, right-click it or left-click it on [END (MENU)] at the top right of the screen).

Distance of Parallel Lines



This function draws a couple of parallel lines and measures the distance between them.

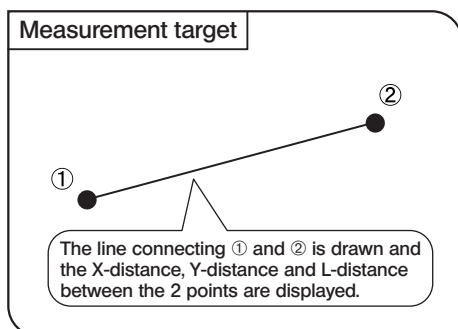


1. When is selected, pointer “” is displayed. The pointer can be moved using the cursor buttons or the mouse.
2. Press the SHIFT button (or left-click the mouse if this is in use) on the points desired for the measurement. If you want to measure the distance of another parallel line, press the SHIFT button on the desired point.
3. To end measurement, press the SET/OK button or MENU button (if you are using the mouse, right-click it or left-click it on [END (MENU)] at the top right of the screen).

XY Distance



This function measures the X-distance, Y-distance and L-distance between the 2 specified points.



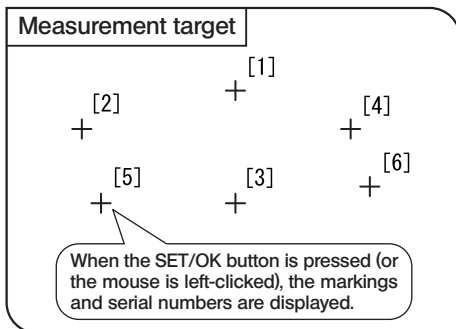
1. When is selected, pointer “” is displayed. The pointer can be moved using the cursor buttons or the mouse.
2. Press the SHIFT button (or left-click the mouse if this is in use) on the points desired for the measurement. If you want to perform another XY distances measurement, press the SHIFT button on the desired points.
3. To end measurement, press the SET/OK button or MENU button (if you are using the mouse, right-click it or left-click it on [END (MENU)] at the top right of the screen).




Count



This function draws markings and serial numbers on the specified positions. Up to 50 markings can be displayed simultaneously.

Ⓞ Even after this measurement is exited or another measurement function is performed, the markings are displayed in order of serial numbers unless they are erased.

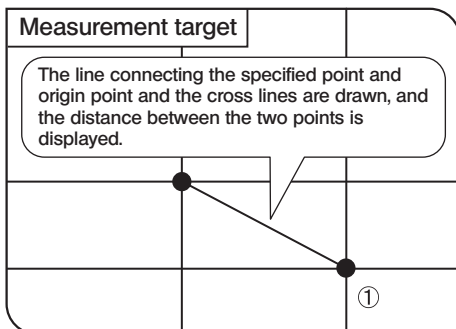





1. When  is selected, pointer “  ” is displayed. The pointer can be moved using the cursor buttons  or the mouse.
2. Press the SHIFT button (or left-click the mouse if this is in use) on the points to be counted.
3. To end measurement, press the SET/OK button or MENU button (if you are using the mouse, right-click it or left-click it on [END (MENU)] at the top right of the screen).

Cross Line



This function measures the distance between the specified point and the origin point (image center).

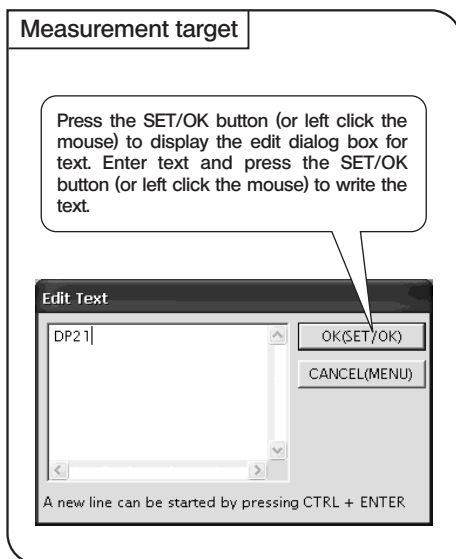




1. When  is selected, pointer “  ” is displayed. The pointer can be moved using the cursor buttons  or the mouse.
2. Press the SHIFT button (or left-click the mouse if this is in use) on the points desired for the measurement. If you want to perform another Cross Line measurement, press the SHIFT button on the desired points.
3. To end measurement, press the SET/OK button or MENU button (if you are using the mouse, right-click it or left-click it on [END (MENU)] at the top right of the screen).

Text



This function inputs a text in the image. The keyboard and mouse are required for the text input.

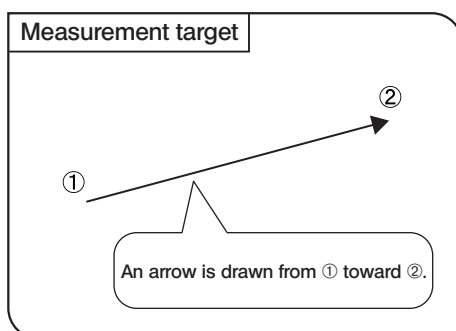







1. When  is selected, pointer “  ” is displayed. The pointer can be moved using the mouse.
2. Left-click the mouse on the position you want to display the text.
3. When the [Edit Text] dialog box appears, enter text from the keyboard.
4. Left-click the mouse on the [OK] button in the [Edit Text] dialog box to draw the text in the area specified in step 2. To input another text, left-click the mouse on the position you want to input it.
5. To end the text input, right-click the mouse or left-click it on [END (MENU)] at the top right of the screen.

Arrow



An arrow can be drawn on the image.






1. When  is selected, pointer “  ” is displayed. The pointer can be moved using the cursor buttons    or the mouse.
2. Press the SHIFT button (or left-click the mouse if this is in use) on the points desired for the measurement. If you want to draw a new arrow, press the SHIFT button on the desired points.
3. To end the arrow display, press the SET/OK button or MENU button (if you are using the mouse, right-click it or left-click it on [END (MENU)] at the top right of the screen).

Erase



This function erases a measurement result displayed on the screen.

1. When  is selected, pointer “  ” is displayed.
 2. Place the cursor on the measurement result to be erased, and press the SHIFT button (or left-click the mouse if this is in use).
 3. Select  to erase the specified measurement result.
- ◎ This function cannot erase more than one measurement result at a time.

Erase All Files



This function erases all of the measurements results displayed on the screen simultaneously.

Select to erase all of the measurement results.

Line/text color setup

This function displays the measurement lines and texts (measured values) in the color specified by the user.



1. In the measurement menu, place the cursor on [LINE].
 2. Press the cursor button ▲▼ of the hand switch to open a pull-down menu listing colors. Select the desired color and press the SET/OK button. If you are using the mouse, click on and select the color.
- Ⓞ The color of texts can also be specified in the same way.
 - Ⓞ The colors of the measurement results drawn in the image cannot be changed. Select the desired color before performing each measurement.

10 Cross lines display

Cross lines can be displayed on the image center.

1. Select the color and thickness of the lines.
 2. Select "ON" in the MENU display to display cross lines on the image.
- Ⓞ The cross lines can be displayed either in the live image only or in both the live and recorded images. For the selection method, see "Scale Display Range Setting (p. 37)."
 - Ⓞ The color setting of the cross lines may sometimes not be displayed correctly due to the block noise. Should this be the case, record images in the TIFF format to display them correctly.



Color Thickness

2-7 Playback Function Setting/Operation (PLAY)

This section describes the method of image playback using the hand switch. The recorded images can be played back and viewed using the hand switch buttons.

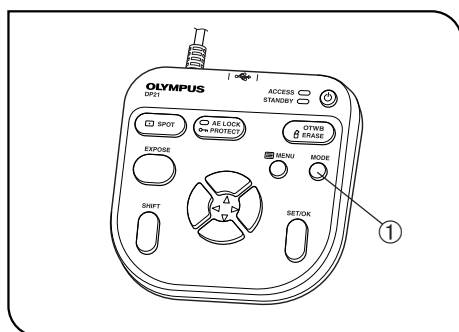


Fig. 25

1 Selecting the Mode

The MODE button ① can be used to select the REC AUTO (auto-exposure recording), REC MANUAL (manual-exposure recording) or PLAY (playback) mode. Select PLAY.

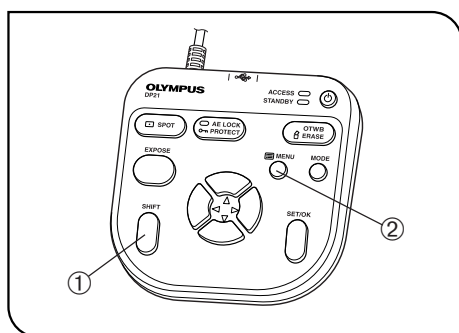
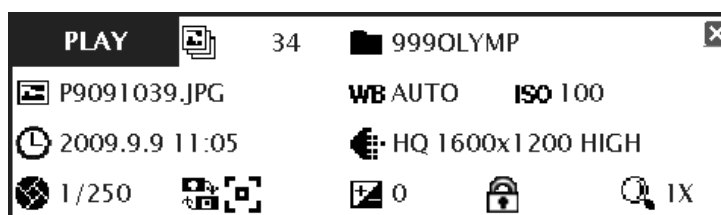


Fig. 26

2 Viewing/Hiding the INFO Display

The INFO display shows the information on the played image (recording settings, etc.). It can be displayed or hidden by the user.



While holding the SHIFT button ①, press the MENU button ② to view or hide the INFO display alternately.

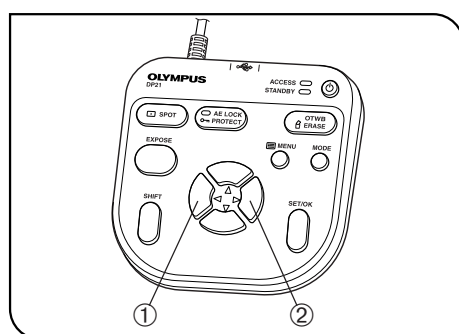


Fig. 27

3 Selecting the Played Image

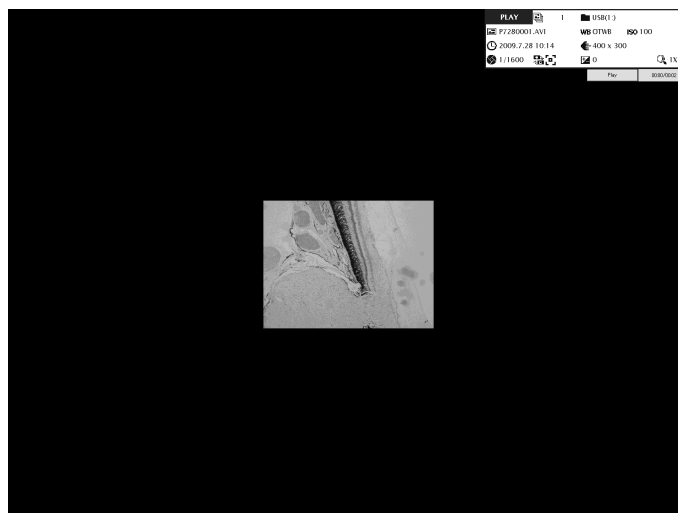
The image to be played can be selected as described below.

1. When the PLAY mode is selected, the last recorded image in the folder currently set as the save folder is displayed.
 2. Press the cursor button ◀ ① or ▶ ② to select the played image. Each press of the button displays the previous or next image. The speed of playback is variable depending on the image size.
- Ⓞ The folder and file names are displayed on the INFO display.
 - Ⓞ To change the folder to be browsed, see page 54.

When the folder is changed, the first recorded image in the folder is displayed.

4 Selecting the Played Movie

When the image selected in “**3 Selecting the Played Image**” is a movie, the display becomes as shown below. Press the SET/OK button to start playing the movie. To let the movie pause temporarily, press the MENU button. The playback can be resumed by pressing SET/OK.



The following operations are not available in movie playback:

Skip / Cue / Fast Forward / Fast Reverse.

During movie playback, other operations including the mode selection and menu operations are not available.

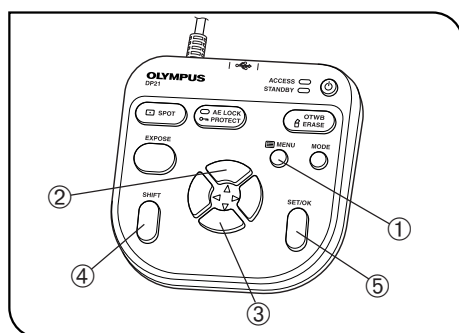


Fig. 28

5 Zooming/Scrolling

The still image being played can be magnified by zooming. Scrolling allows viewing the desired part in the image.

1. Press the MENU button ① to hide the MENU display.
2. Press the cursor button ▲ ② or ▼ ③ to change the electronic zoom ratio of the image. ▲ ② switches it to 1x → 2x → 4x and ▼ ③ switches it to 4x → 2x → 1x → Index display. To switch the index display to the 1x display, press the SET/OK button.
3. Pressing one of the cursor buttons while holding the SHIFT button ④ or SET/OK button ⑤ scrolls the image in the direction indicated by the pressed button. The entire image area can be scrolled even during 2x and 4x zoom display.

Ⓞ Zooming and scrolling are not available when the MENU display is displayed. Before performing zooming/scrolling, press the MENU button to hide the MENU display.

Ⓞ Zooming and scrolling are not available with movies.

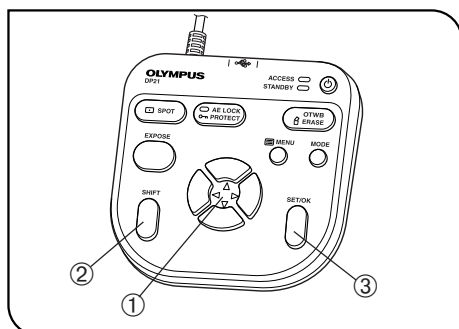
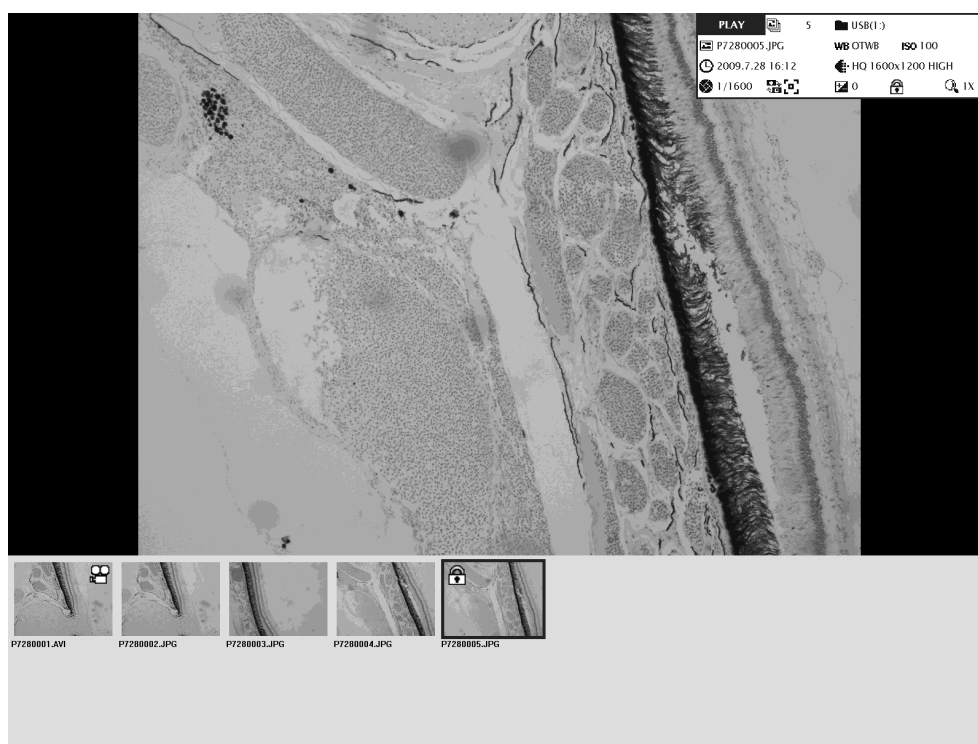


Fig. 29

6 Viewing the Index Display

The index display shows the thumbnails of images in a folder. The played image can be selected from the thumbnails.

1. Press the cursor button ① ▼ during image playback to switch the image to the index display.
2. The cursor can be moved across the thumbnails using the cursor buttons ①.
3. The image in the current cursor position is displayed on the center of the screen.
4. While holding the SHIFT button ②, press ▲ or ▼ to update the thumbnail display page.
5. Press the SET/OK button ③ to view the image in the current cursor position by canceling the index display.



Icons displayed on the played image

Icon	Function	Remark
	Image protection	See "Protecting an Image" (p. 52) for details.
	Movie file	See "Selecting the Played Image" (p. 50) for details.

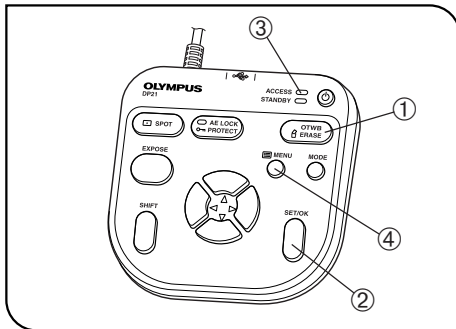


Fig. 30

7 Erasing an Image

An unnecessary image can be erased.

It is also possible to erase all of the images simultaneously (p. 53).

1. Display the image to be erased. If the index display is being viewed, place the blue frame cursor on the image to be erased (using the cursor buttons).
2. Press the ERASE button ①. A confirmation message (YES/NO) is displayed.
3. Press the SET/OK button ②. The ACCESS LED ③ lights and the displayed image is cleared.
- Ⓞ Press the MENU button ④ to cancel the erasure operation.

CAUTION

It is not possible to erase the protected image described in the next item.

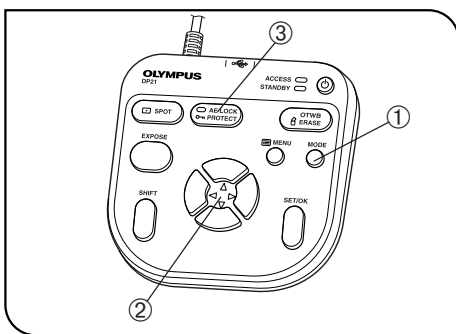


Fig. 31

8 Protecting an Image

Important recorded images can be protected to avoid accidental erasure.

1. Press the MODE button ① to select the PLAY mode.
2. Press the cursor button ② ◀ or ▶ to select the image to be protected.
3. Press the PROTECT button ③. The image being displayed is protected and the INFO display shows the protect symbol.
- Ⓞ To unprotect an image, select a protected image and press the PROTECT button ③ again.

9 Measurement of played image

Measurement is also possible with played images. The operating procedures are identical to those with the live image. See "Measurement Functions (p. 39)."

To record the measurement result in the played image, press the EXPOSE button while the measurement result is displayed on the played image.

- Ⓞ The image data is overwritten when the measurement result is recorded. Once the measurement result has been recorded, the original cannot be restored. So be careful.
- Ⓞ The use of played image means that the correct measurement data cannot be obtained unless the scale display was set (by entering the recording magnification, etc.) at the time of recording. For the scale display setting, see page 35.
- Ⓞ The measurement functions cannot be used when index images are displayed.
- Ⓞ Measurement is not available with the following images.
 - Moving images
 - Images which have been edited with PC
 - Images recorded with a camera other than the DP21

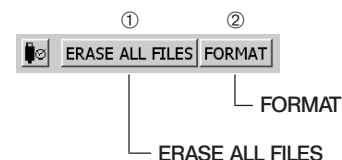


2-8 MENU Display Functions

The MENU display has the functions for use in various settings. To execute a setting function, place the cursor on the applicable item and press the SET/OK button. If you are using the mouse, click it on the applicable item.

1 Media Setup

All of the files in the current save folder can be erased with this function. It is also capable of formatting a connected medium.



1-1 Erasing all files in the folder

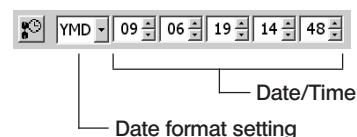
1. Select [ERASE ALL FILES] ① and press the SET/OK button.
 2. When the confirmation message is displayed, press the SET/OK button to erase the files. To cancel the operation, press the MENU button.
- Ⓞ Once [YES] is selected, the all-file erasure operation can no longer be canceled. Confirm well before executing the all-file erasure.
 - Ⓞ The protected images (see p. 52) are not erased.

1-2 Formatting a medium

1. Select [FORMAT] ② and press the SET/OK button.
 2. When the confirmation message is displayed, press the SET/OK button to format the medium. To cancel the operation, press the MENU button.
- Ⓞ Target of formatting
When multiple USB memories are connected, this operation formats only the first connected one. If a single USB memory is divided into multiple partitions, it formats only the first drive.
 - Ⓞ Once [YES] is selected, the formatting operation can no longer be canceled. Confirm well before executing formatting.
 - Ⓞ Formatting erases all of the files in the USB file including the protected images as well as document files.

2 Date/Time Setting

This function sets the date and time of the camera.
The date and time of recording are recorded in the recorded images.



1. Select the date display format using the cursor buttons.
 2. After the above, move the cursor to the date field using the cursor buttons ◀▶.
 3. Set the date using the cursor buttons ▲▼ and press the SET/OK button. The year, month and date should be arranged in the format selected in step 1.
 4. Similarly, set the time of the day using the cursor buttons ▲▼.
- Ⓞ The date and time are applied to the system at the moment they are changed using the cursor buttons ▲▼, but their figures on the MENU display are not updated automatically. To check the latest date and time, hide the MENU display once and display it again.

3 Reset

This function resets the recording-related settings. It is used when you have forgotten the settings you made, etc.

3-1 Resetting the recording-related settings

Select [RESET] and press the SET/OK button.

Reset items and their factory defaults

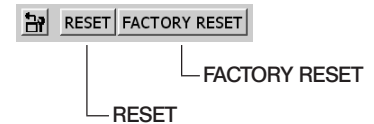
- | | | |
|------------------------------------|--------------------------------------|--|
| • Exposure adjustment: ± 0 | • Image quality: HQ | • ISO: 100 |
| • Sharpness: NORMAL | • WB: AUTO | • Rec View setting: 5 sec |
| • Focusing: OFF | • Metering mode: 30% average | • Resolution setting: UXGA 1600 x 1200 |
| • Manual exposure time: 1/400 | • AE lock: OFF | • Image color: COLOR-1 |
| • Scale display range: LIVE & SNAP | • Image display orientation: Erected | • Zoom magnification: 1X |
| • Cross-line display: OFF | • Measurement line color: Red | • Measurement text color: Blue |

3-2 Resetting the camera to the factory default settings

Select [FACTORY RESET] and press the SET/OK button.

Be careful in using this function because it resets all of the camera settings including those of the network, scale (including magnification settings of objectives, etc.), language and monitor resolution to the factory-set defaults.

When resetting, it restarts automatically. It takes several minutes as it restarts twice. Do not turn the power OFF or draw out AC adapter until it completes restarting.



4 Recorded Folder Setting

The save folder used in recording or the load source folder used in playback can be set. Select the [FOLDER] button to open the file selection window.

For the operation in the file selection window, see "Save Folder Setting" (p. 31). The images in the folder selected in this window can be played back.


- Ⓞ The save folder for the recorded image can be set as described in "Save Folder Setting" (p. 31).
- Ⓞ When an image is recorded, the same folder as the save folder is set automatically as the play folder.



5 Options

This function changes the following settings for use in operation of the DP21.

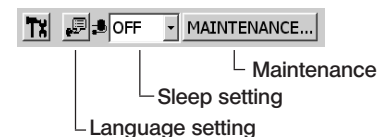
5-1 Language setting Default: English

The language used in the operation can be selected from English and Japanese. When the  button is selected, the [Language Setting Wizard] shown below appears. Select the desired language by following this wizard. The settings are completed by restarting the device by clicking [OK] button. It takes several minutes as it restarts twice. Do not turn the power OFF or draw out AC adapter until it completes restarting.

Even when the Japanese language is selected, some terms in the menus, etc. remain in English, the items that are displayed in Japanese are as follows:

- Notification/warning/confirmation/error messages;
- Balloons and helps displayed with the INFO and MENU display icons when the mouse is placed on them

- Ⓞ Before language setting, disconnect the USB memories (including the removable media devices such as HDD) from the hand switch and/or control box. They can be reconnected after completion of restarting (auto restart) after the setting.





5-2 Sleep setting Default: OFF

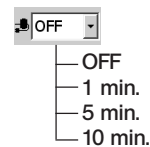
It is possible to turn off the display temporarily when the DP21 has not been controlled for a certain period.

The display is turned on when any button is pressed.

The period until the display power off can be selected from OFF, 1 minute, 5 minutes and 10 minutes.

The sleep mode is canceled when the hand switch, mouse or keyboard is controlled.

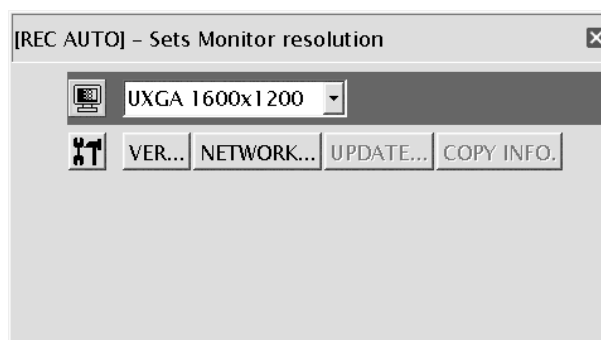
◎A certain time may be required before the setting change is applied.



6 Maintenance Setting

This function performs maintenance settings including the version information checking and network settings.

Place the cursor on [MAINTENANCE] ① in the MENU display and press the [OK] button. The following window appears.



Monitor resolution setting



Set the resolution value of the monitor in use.

The resolution values that cannot be displayed on the connected monitor are not listed.

The following resolution values can be selected.

- 1920 x 1200 WUXGA (image display area 1600 x 1200)
- 1680 x 1050 WSXGA+ (image display area 1280 x 960)
- 1280 x 854 WSXGA (image display area 1024 x 768)
- 1280 x 768 WXGA (image display area 1024 x 768)
- 1024 x 600 WSVGA (image display area 800 x 600)
- 1600 x 1200 UXGA
- 1280 x 1024 SXGA (image display area 1280 x 960)
- 1280 x 960 SXGA
- 1024 x 768 XGA
- 800 x 600 SVGA

Ⓢ If nothing is displayed due to inappropriate resolution, set the main switch to OFF then ON again. In about 30 seconds after the instrument is started up, the AE Lock LED lights up for about 1 second. Press the MENU button while the AE Lock LED is lit. This will start up the instrument with the SVGA 800 x 600 resolution.

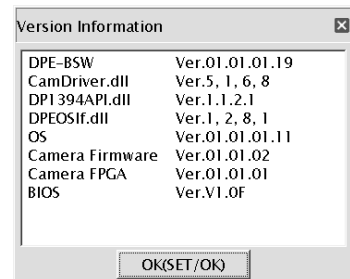
Version information



The version information of the camera can be displayed.

Select the [VER] icon in the MENU display and press the [OK] button. The following version information will be displayed.

- GUI application version (DPE-BSW)
- Library versions (CamDriver.dll, DP1394API.dll, DPEOSif.dll)
- Camera firmware version (Camera Firm)
- Camera FPGA version (Camera FPGA)
- System version (OS)
- BIOS version (BIOS)



Network setting

The DP21 can access PCs on a network when the control box is connected to a LAN.

- Ⓞ The network setting should be performed by the network administrator.
- Ⓞ The keyboard and mouse should be connected for the network setting.

The network setting makes the following operations possible.

- Direct saving of recorded images in a networked PC.
- Playback of recorded images saved in a networked PC on the DP21. (Only the images recorded using the DP21 can be played back on it. Even when an image is recorded using the DP21, it may sometimes be unable to be played if it has been edited on the PC.)

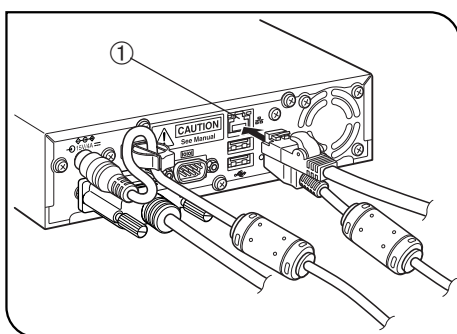
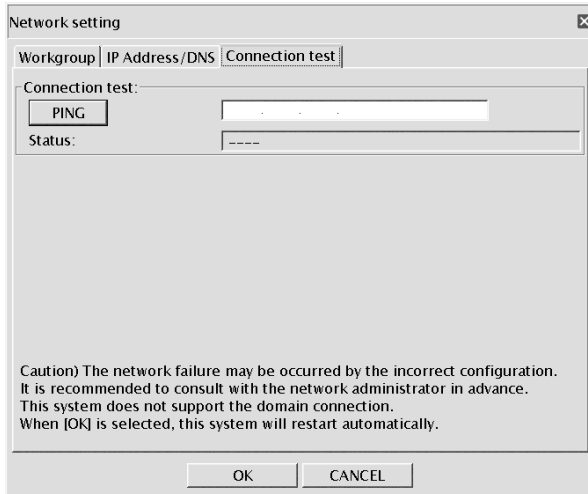
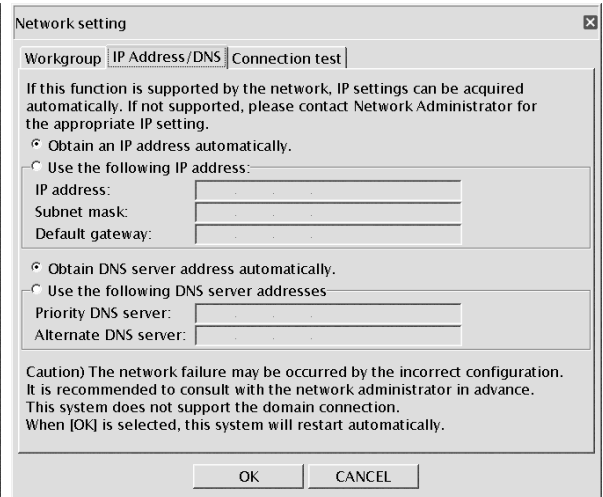
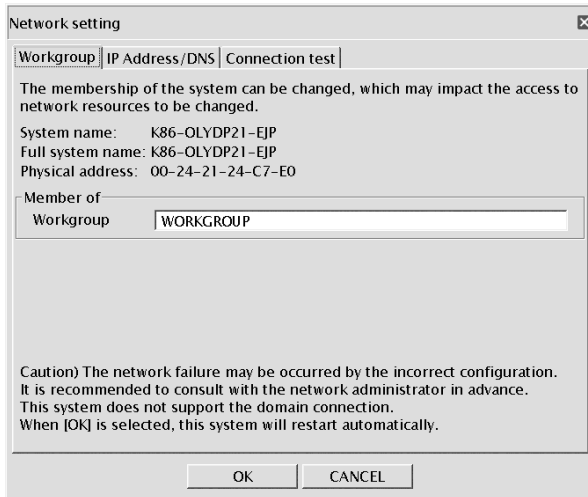
NETWORK...

Fig. 32

Network connection method

1. Connect a LAN cable to the LAN cable connector ① of the control box.
2. Click on the [NETWORK] icon in the [Maintenance] window. The following [Network Connection Setting] window will appear.
3. Enter the setting items (Member, IP address, DNS server name) by following the instructions in the [Network Connection Setting] window.
 - Ⓞ Enter the setting items according to the connection environment being used. For details, consult your network administrator.
 - Ⓞ The settings are not applied to the system unless the LAN cable is connected.
 - Ⓞ It is not permitted to change the computer name (system name) of the DP21.
 - Ⓞ When setting the network, it restarts automatically in order to reflect the setting items to the system. It takes several minutes as it restarts twice. Do not turn the power OFF or draw out AC adapter until it completes restarting.
 - Ⓞ If the power is turned OFF by operating the control box (including restarting when setting the network, etc.), you may not access to the network for first several minutes after DP21 restarts. This is due to that the network-related system settings are being continued after DP21 starts. In this case, after DP21 starts, please wait for a few minutes prior to using.



For the network requirements (including precautions), see page 5.

Update

UPDATE...

This function can update the items related to the DP21 system such as the camera firmware (items listed in the version information shown on page 56). It is usually not used. Updating is performed to improve the system functions as well as to solve the vulnerability problems. For the latest update information, please visit the following website:
<http://microscope.olympus-global.com/en/>

Copy system information

COPY INFO.

This function copies the system information of the DP21 in the USB memory. It is usually not used. It is intended to be used when the user forwards the version information to Olympus in case of a trouble with the system, etc. Select the [COPY INFO] button to copy the system information in the USB memory.

7 Operation Using Mouse and Keyboard

When the USB mouse is connected to the control box, the DP21 can be controlled using the mouse. However, the functions available with the dedicated buttons on the hand switch, such as OTWB cannot be controlled from the mouse. These functions should be controlled using the hand switch buttons even when the mouse is connected.

Mouse/keyboard connection method

Connect the mouse and keyboard to the desired USB ports of the control box.

- Ⓞ If the mouse or keyboard is connected to the USB port of the hand switch, the mouse or keyboard may sometimes be unable to work due to the insufficient power supply. To prevent this, always connect the mouse and keyboard to the USB ports of the control box.
- Ⓞ For the compatibility of the mouse and keyboard, see page 15.

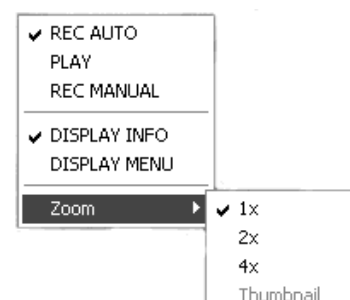
Functions available using the mouse

1. Functions that can be executed with the mouse

- Pop-up menu:

A pop-up menu is opened when the mouse is right-clicked on a window other than the MENU/INFO display. The pop-up menus can be used to control the following functions.

- MODE switching
- MENU/INFO display/hiding
- Zoom setting (Index/1x/2x/4x)



- Settings of MENU display items: Move the cursor with the mouse, place the cursor on the desired function (icon) on the MENU display and left-click the mouse.
- Selection of played image thumbnails: Move the cursor in the index menu with the mouse, place the cursor on the thumbnail to be viewed, and left-click the mouse.
- Hiding the MENU/INFO display: Place the cursor on "ⓧ" on the top right of the MENU/INFO display and left-click the mouse.
- Still image recording: Double-click the mouse when the MENU is not displayed. Note that this cannot start movie recording.

2. Functions that can be simplified by the mouse

- Measurement (The measurement points can be specified directly using the mouse.)

3. Functions that can be used only when the mouse and keyboard are connected

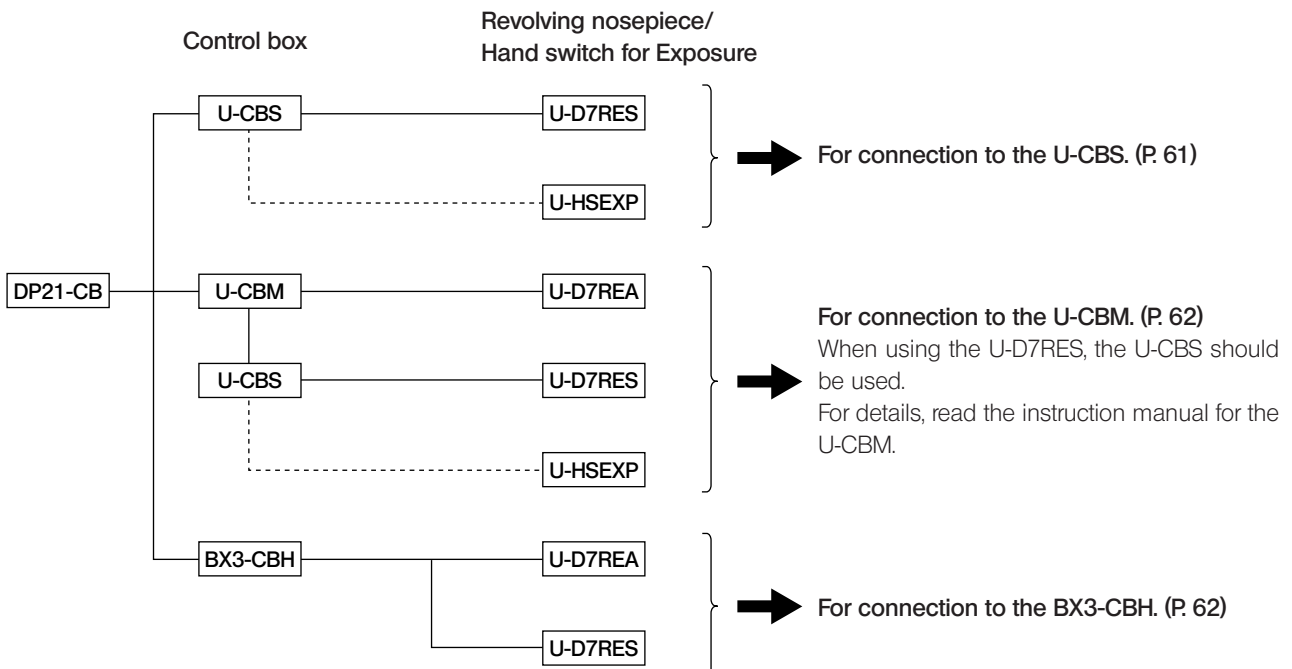
- Text input
- Network setting
- When the save destination on the network has an ID or password set to it
- Save folder setting by direct input of the folder address

2-9 Functions Interlocked with Microscope Operations

When the DP21 is connected to a microscope (BX43, BX53 or BX63) through a control box (U-CBS, etc.), the following functions interlocked with the microscope are available.

Function	Description	Required units
Auto scale switching	When the objective in the revolving nosepiece of the microscope is switched, the displayed scale is automatically switched according to the newly selected observation magnification. *It is necessary to input the magnifications of the objectives in use in advance. For the input method, see "Auto scale switching (page 64)."	<ul style="list-style-type: none"> Control box (U-CBS/U-CBM/BX3-CBH) Revolving nosepiece (U-D7RES/U-D7REA)
Shutter switch	The camera shutter switch can be installed on the microscope to facilitate image recording during observation through the microscope.	<ul style="list-style-type: none"> Control box (U-CBS/U-CBM/BX3-CBH) Revolving nosepiece (U-D7RES/U-D7REA) Hand switch for exposure (U-HSEXP)
Guidance	The guidance on the operating procedures of the microscope and camera can be displayed.	<ul style="list-style-type: none"> Control box (U-CBS/U-CBM/BX3-CBH) Revolving nosepiece (U-D7RES/U-D7REA)

2-9-1 System chart



© It is also possible to connect the camera to the microscope without using the U-HSEXP. In this case, the shutter switch function cannot be used.

2-9-2 Connection

The following units are required for the connection of the microscope.

1. Control box (One of the following units is required.)
U-CBS/U-CBM/BX3-CBH
2. Revolving nosepiece (One of the following units is required.)
U-D7RES/U-D7REA
3. Hand switch for exposure
U-HSEXP

For how to connect the control box to the microscope, read the instruction manual for the control box in use.

CAUTION

- Remove the dust cover only from the areas used for the connections.
- Be sure to connect each connector to the module designated by Olympus. Olympus cannot guarantee any of the system performance if a non-designated module is used.
- Be sure to set the POWER switch of the control box for coded units (U-CBS) to “O” (OFF in the high position) before connecting cables.
- When connecting each connector, align the orientation of the male connector with the female connector and insert all the way. If a connector has the lock screws, also tighten them firmly.
- Do not insert a male connector that does not match the female connector, as this may damage them.

Connection of U-CBS

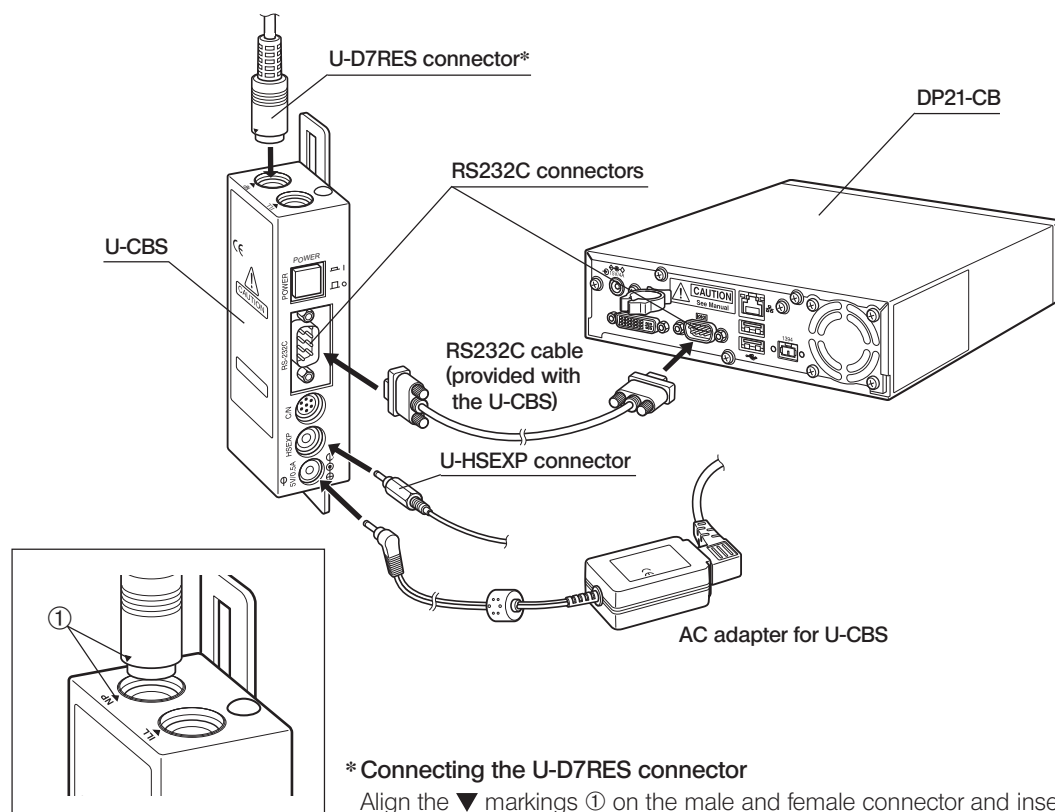
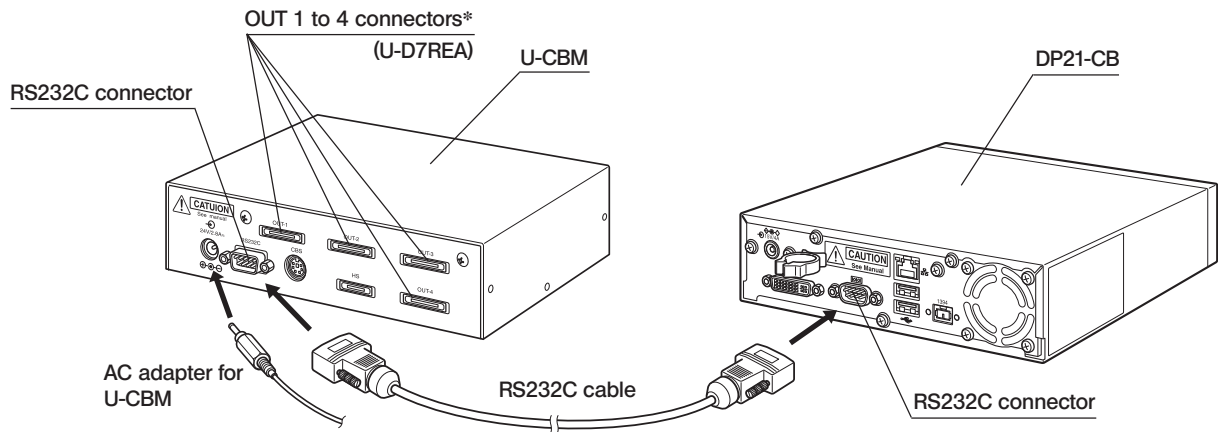


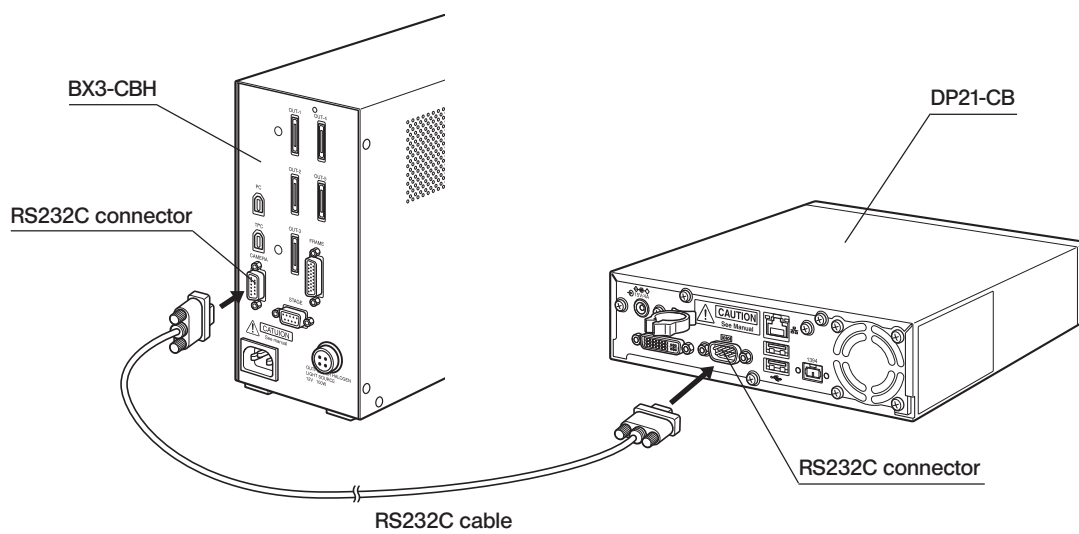
Fig. 1

Connection of U-CBM



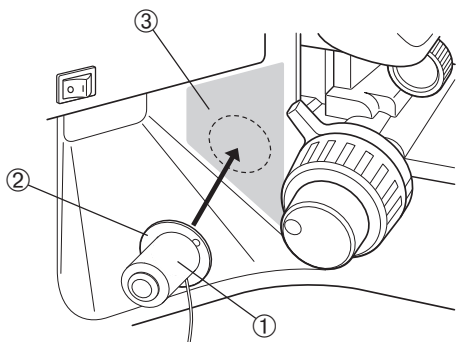
* The OUT 1 to 4 connectors are universal type connectors. The U-D7REA can be connected to any of them.

Connection of BX3-CBH



Installation of U-HSEXP

Ⓞ The U-HSEXP is composed of the U-HSEXP switch (fixed by magnet) and circular iron plates (adhesive). Two circular plates are provided, with one of them intended for use as the spare.



1. Attach the switch ① on the center of the circular plate ② by means of magnet.
Do not remove the backing sheet of the circular plate until the final fixing position is decided.
 2. Decide the final fixing position that is most convenient for controlling the switch from the area ③ (indicated by □ in the figure) near the coarse adjustment knob on the left or right.
- Ⓞ Please note that if the attaching position of U-HSEXP is too close to the coarse adjustment knob, it may touch the pre-focusing lever.
3. Clean the final fixing position with absolute alcohol, remove the backing sheet from the round plate and apply it securely on the final fixing position.

CAUTION

If there is an article with magnetic field near the U-HSEXP, equipment failure or malfunction may result. So do not let such an article as listed below come close to the U-HSEXP.

- PC
- Mobile phone
- Clock/watch
- Credit card
- Bank card
- Floppy disk, etc.

Ⓞ Unless the U-D7RES is connected to the U-CBS, the U-HSEXP does not function. So be careful.

Ⓞ It cannot be recorded by the shutter switch. Use the DP21 hand switch to start/finish recording. (p.24)

2-9-3 Operation

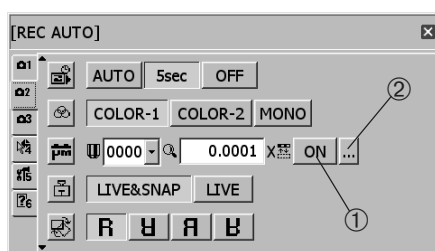
This section describes the functions available when the DP21 is connected to a microscope through a control box.

- Ⓞ The power switches should be set to ON in order of; 1) control box; 2) DP21-CB. Otherwise, the control box cannot be recognized.
- Ⓞ If the revolving nosepiece (U-D7RES or U-D7REA) is not connected to the control box (U-CBS, etc.), the control box cannot be recognized.

Auto scale switching

When the objective in the revolving nosepiece of the microscope is switched, the displayed scale is automatically switched according to the newly selected observation magnification.

To use this function, it is necessary to input the magnifications of the objectives in use in the DP21 in advance. This input can be done by following the Microscope Setting Wizard that is displayed the first time the power is switched ON. If you have already started up the DP21, the objective magnifications can be input with the following procedure.

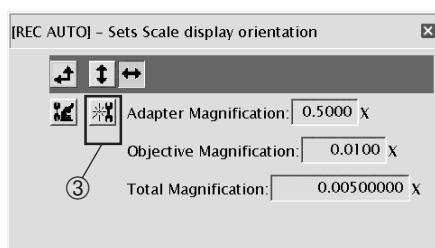


Displaying the scale

Set [ON/OFF] ① in the Menu window to [ON] to display the scale.

Setting the scale magnification

1. Select the scale setting button ② in the Menu window to open the scale setting window.



2. Select the microscope setting button ③. The Microscope Setting Wizard starts.

Operation using the hand switch

Adjust the scale value by pressing cursor buttons ▲▼, and change the adjusted position by pressing cursor buttons ◀▶. Press the SET/OK button to advance to the next window.

Operation using the mouse

Click on the position to be adjusted and adjust its value by means of scrolling of a pull-down menu. The value can also be input directly from the keyboard. Click on [Next] to advance to the next window.

3. Input the camera adapter magnification.

Microscope Setting Wizard

Step 1

Specify the magnification of the adapter lens.
The magnification of the adapter lens is calculated by multiplying the magnification among optical elements excluding the objective lens and the ocular lens.

Magnification of adapter lens : (00.0100~99.9999)

[LEFT]/[RIGHT] : [INTEGER PART]<->[FRACTION PART]
[UP]/[DOWN] : INCREASE/DECREASE

BACK(SHIFT) NEXT(SET/OK) CANCEL(MENU)

4. Input the objective magnification and memory number for each revolving nosepiece position.

Microscope Setting Wizard

Step 2

Repeat followings, and select [NEXT (SET/OK)] after setting all objective lenses.
1) Insert the objective lens to be set in the light path.
2) Set the magnification and the memory number.

Current revolver hole: 1

Magnification of objective lens : × (0000.0100~9999.9999)

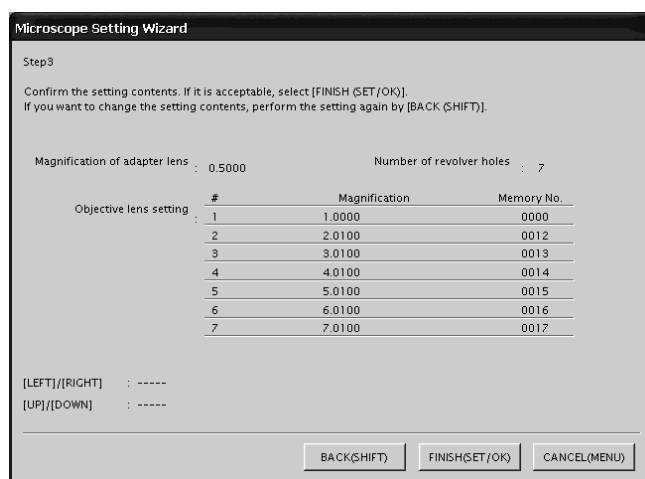
Memory No. :

[LEFT]/[RIGHT] : [INTEGER PART]<->[FRACTION PART]<->[MEMORY NO]
[UP]/[DOWN] : INCREASE/DECREASE

BACK(SHIFT) NEXT(SET/OK) CANCEL(MENU)

- ① Input the magnification and memory number of the objective that is being engaged in the light path.
- ② Rotate the revolving nosepiece to engage the objective in the adjacent position in the light path.
- ③ Input the magnifications and memory numbers of all of the objectives in the nosepiece positions by repeating steps ① and ② for each of them.
- ④ It is not necessary to input the magnifications and memory numbers for the positions in which objectives are not mounted. Just rotate the revolving nosepiece and input the magnifications and memory numbers of the objectives that are present.
- ⑤ When the information of all of the revolving nosepiece positions has been input, press the SET/OK button of the hand switch (or click on [NEXT] if you are using the mouse).
- Ⓞ The information on the current revolving nosepiece position is automatically acquired and displayed inside the frame shown in the figure above.
- Ⓞ The memory numbers can be set arbitrarily. If you input the figures of objective magnifications as the memory numbers, It would be convenient when re-setting the magnifications.
- Ⓞ The default magnification value (1X) is set for the positions for which the magnifications are not input. When an additional objective is mounted, be sure to change the default to the actual magnification.

5. The window for confirmation of the input magnifications is displayed. Check the input information and, if there is no problem, press the SET/OK button of the hand switch (or click on [NEXT] if you are using the mouse). To modify information, press the MENU button of the hand switch (or click on [CANCEL] if you are using the mouse).



Shutter switch

The shutter switch can be installed on the microscope by connecting the U-HSEXP to the U-CBS. This makes it possible to record images while manipulating the microscope.

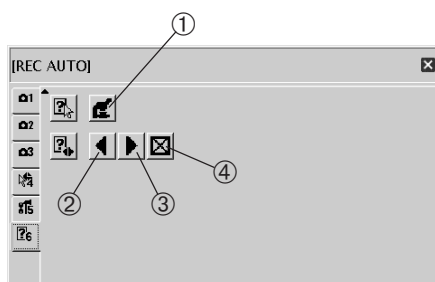
The shutter switch has the same function as the EXPOSE button of the DP21 hand switch. Pressing the shutter switch executes recording and saving of an image.

- Ⓞ See page 61 for the method of connection to the U-CBS.
- Ⓞ See page 63 for the method of installation on the microscope.
- Ⓞ The shutter switch cannot be used unless the control box (U-CBS, etc.) and revolving nosepiece (U-D7RES or U-D7REA) are connected.

It cannot be recorded by the shutter switch. Use the DP21 hand switch to start/finish recording.

Guidance function

This function displays the “Guidance for Shooting Neat Photomicrographs.” The Guidance includes the adjustment procedures of the microscope and camera as well as applied functions that would be convenient for the reader.



1. Open the Menu window.
 2. Select the microscope guidance display button ①.
 3. The Guidance window is displayed on the top left of the screen.
 4. The Guidance is composed of 19 pages. Select ② to return to the previous page or ③ to advance to the next page.
 5. Select ④ to close the Guidance.
- Ⓞ Other functions can be used as usual even when the Guidance is displayed.
 - Ⓞ The Guidance cannot be displayed unless the control box (U-CBS, etc.) and revolving nosepiece (U-D7RES or U-D7REA) are connected.

3 PC CONNECTION SYSTEM (PC)

This chapter describes the operation when the DP21-CU camera head is connected directly to a personal computer.

3-1 Operating Precautions

CAUTION

Never set the main switch of the camera to “○” (OFF) or unplug the camera cable or AC adapter during use of the DP21. Otherwise, the PC application may malfunction.

System Compatibility

- To control the DP21, it is required to install a dedicated 1394 driver for the DP21. When this driver is installed, other 1394 devices cannot be used even when they are connected. The DP21-dedicated driver should be uninstalled before connecting another 1394 device (the DP21 cannot be controlled after the DP21-dedicated driver is uninstalled).
- When connecting the DP21 to the PC, connect the DP21's camera head directly to the 1394 connector of the PC. Connection through a commercially available 1394 hub or conversion connector may lead to malfunction.

Recommended operating environment

- Common to Desktop PC/Laptop PC (except No. 7)

No.	Item	Operating Environment
1	PC	Intel Pentium 4, Intel Xeon or Intel Core Duo (or equivalent)
2	Memory	Vista: 2 GB or more (3 GB or more recommended) XP: 1024 MB RAM
3	HD space	1 GB (before installation)
4	PC monitor	1280 x 1024 recommended (1024 x 768 or more), 32-bit video card
5	Drive	DVD-ROM drive
6	USB	Protection key port x 1 (Unnecessary with DP2-TWAIN)
7	1394	1394a port x 1 • Desktop PC: 6-pin 1394a port • Laptop PC: 4-pin 1394a port (The AC adapter should be connected to the camera head)
8	PC input devices	2-button mouse or 3-button mouse, (Wheel-equipped model recommended) Keyboard
9	OS	Windows Vista Ultimate 32-bit SP2, Windows Vista Business 32-bit SP2 or Windows XP Professional (SP3 or after)
10	OS languages	Japanese, English
11	Web browser	IE6.0 or after

The fact that the recommended operating environment above is met does not necessary guarantee the availability of all of the operations that are usually available with the PC connection system.

Trademark information

Windows is a registered trademark of Microsoft Corporation, USA.

All of other brand names and product names mentioned in this manual are trademarks or registered trademarks of their respective owners.

Before installation

Windows® Vista

Installation is impossible unless your user account is registered as a “Computer Administrator account.”

If you are registered in the “Standard user account,” please change it to the “Computer Administrator account.” (For the user account registration, refer to the manuals for your PC.)

Windows® XP

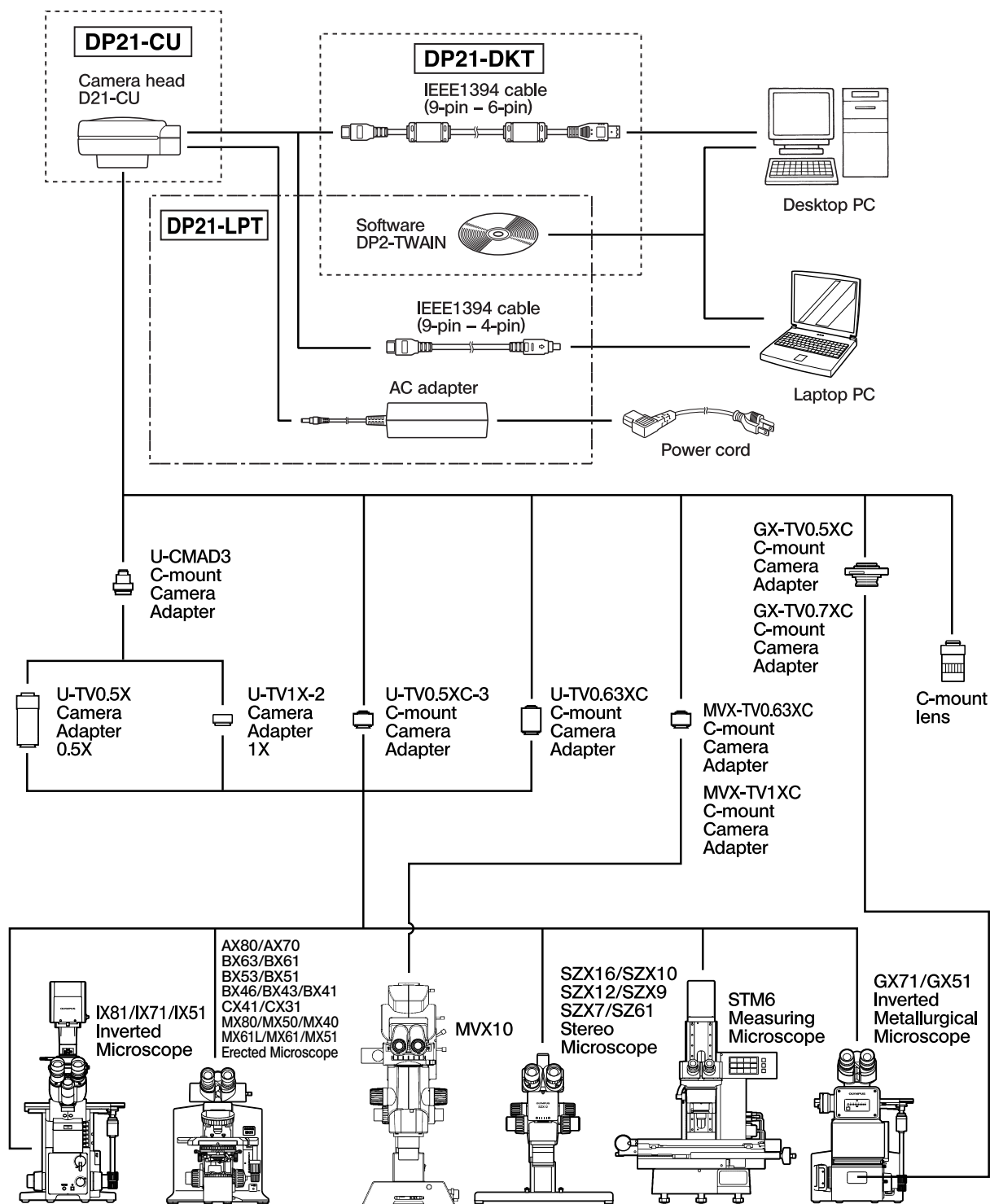
Installation is impossible unless your user account is registered as a “Computer Administrator account.”

If you are registered in the “Restricted account,” please change it to the “Computer Administrator account.”

3-2 System Chart

© If you use a SAL (Standalone) System, read from page 5.

PC (Computer connection) System

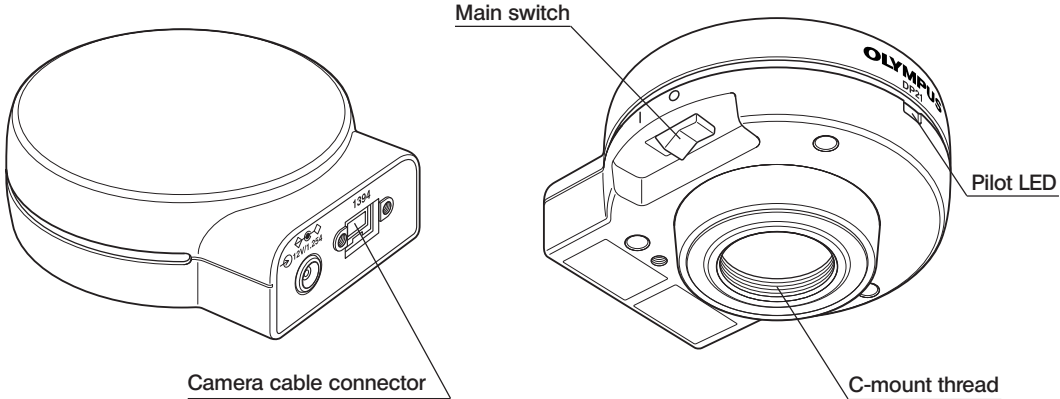


(Note 1)

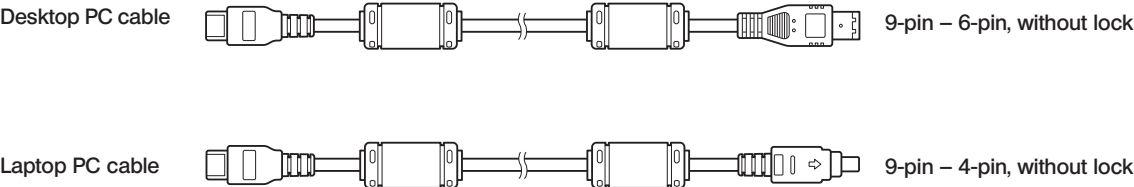
Microscopes that are not listed in the above may also be applicable. For details, please consult Olympus.

3-3 Nomenclature

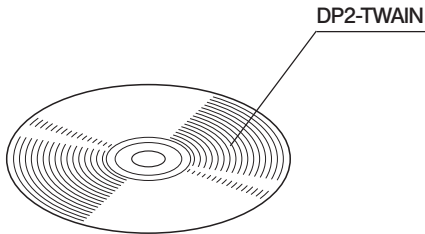
Camera Head



Camera Cable



Driver CD



3-4 Installation

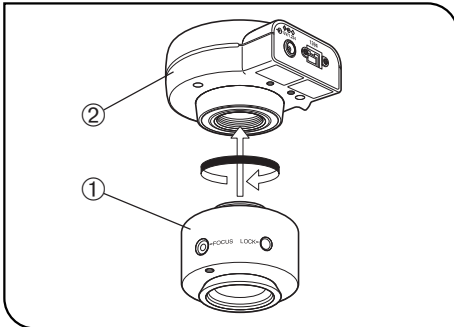
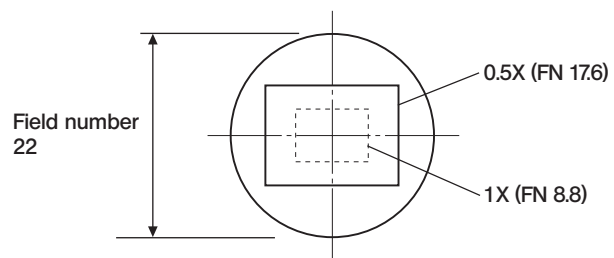


Fig. 33

1 Installing the Camera Head (Fig. 33)

Screw in the U-TV0.5XC-3 C-mount camera adapter ① into the mount thread at the bottom of the camera head ②. If you use a different C-mount TV adapter, follow its instruction manual.

- As the photographed field is as shown below, use a camera adapter having magnification of 0.5X to 1X. (If a 0.35X camera adapter is used, the peripheral part of the image will be obscured.)



- If a C-mount TV adapter from other manufacturer than Olympus is used, the optical performance of the system may not be manifested fully.

CAUTION If the C-mount camera adapter or C-mount lens ③ has a thread length over 4.5 mm ④, it will hit the inside of the camera head and cause damage to it.

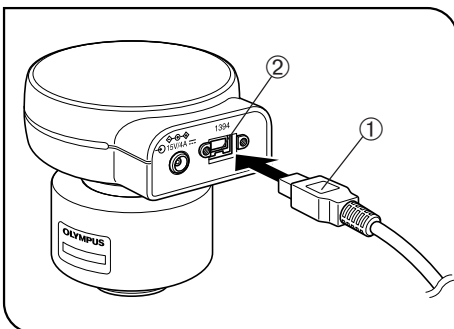
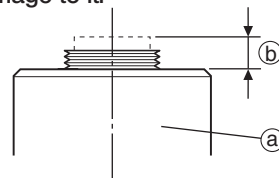


Fig. 34

2 Connecting the Camera Cable (Fig. 34)

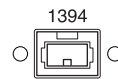
CAUTION

- The cords and cables are vulnerable to bend or twist. Do not apply excessive force to them.
- Be sure to switch off the camera head and PC before proceeding to the connection.

NOTE When connecting the cable, insert the connector plug in the proper direction. (Example: Camera cable)



Cable side



Connector side

- Insert the connector ① on one end of the camera cable into the connector ② on the camera head.
- Insert the connector on the other end of the camera cable into the connector on the PC.

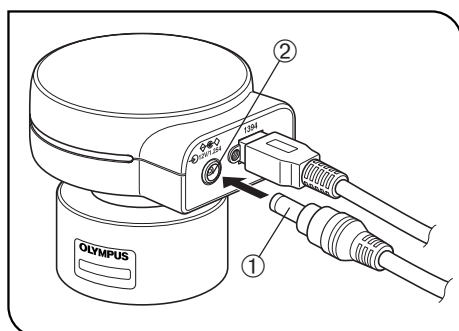


Fig. 35

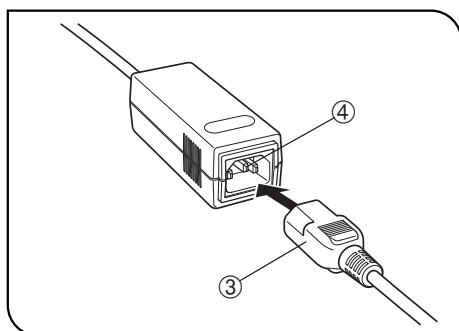


Fig. 36

3 Connecting the AC Adapter (Necessary only when a laptop PC is connected)

- CAUTION**
- Always use the AC adapter provided by Olympus. Using other AC adapter will result in malfunction or damage.
 - The cords and cables are vulnerable to bend or twist. Do not apply excessive force to them.

1. Insert the output connector ① of the AC adapter into the DC input connector ② of the camera head.

- CAUTION**
- Always use the power cord provided by Olympus. If no power cord is provided with the camera head, please select the proper power cord by referring to chapter “PROPER SELECTION OF THE POWER SUPPLY CORD” at the end of this instruction manual.

2. Insert the connector ③ of the power cord into the input connector ④ of the AC adapter.

3. Insert the power cord plug into the power outlet. Connect the power cord correctly and ensure that the grounding terminals of the power supply and wall outlet are properly connected. If the equipment is not grounded/earthed, Olympus can no longer warrant the electrical safety performance of the equipment.

- Ⓢ The AC adapter generates heat after long hours of use, but this is not malfunction.
- Ⓢ The AC adapter of the camera is required only when it is connected to a laptop PC. It is not necessary when it is connected to a desktop PC.

Power supply to the camera

The camera head of the DP21 has the main switch on it. Set this switch to ON when using the camera. The pilot LED on the camera head lights when power is supplied to the camera head.

When a desktop PC is connected

The camera is powered from the desktop PC so the AC adapter is not necessary. The camera is turned OFF automatically when the PC is shut down.

When a laptop PC is connected

Since the laptop PC cannot supply power, the AC adapter is necessary. Since the power is supplied from the AC adapter, the camera remains ON even when the PC is shut down. To turn the camera OFF, set its main switch to OFF.

- Ⓢ There is no problem in shutting down the laptop PC while leaving the camera power ON. The camera power is left ON until the main switch is set to OFF or the AC adapter is unplugged.

3-5 DP2-TWAIN Software Installation

CAUTION When the DP2-TWAIN is installed, the 1394 driver is also replaced with the dedicated driver for the DP21. This makes it impossible to use other IEEE1394 devices. If you want to use an IEEE1394 device other than the DP21, see “DP-21 TWAIN Software Uninstallation (p. 81).”

Before Installation

- Quit all running applications before installing DP2-TWAIN.
- The software cannot be installed unless the user account is registered as “computer administrator.”
If the user account is registered as a “Restricted account,” change it to the “Computer administrator” account.
(For the user account registration, refer to the instruction manuals for your computer.)
When using a commercially available IEEE1394 board, install it in the PC before installing DP2-TWAIN.

Trademark Information

Windows is a registered trademark of Microsoft Corporation.

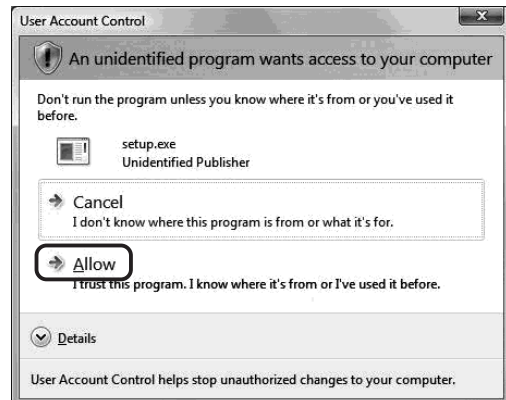
All other brand and product names are trademarks or registered trademarks of their respective owners.

1. Windows® Vista

1. Start Windows Vista. (Log on with the Computer Administrator account.)
2. Insert the CD-ROM in the CD-ROM drive.
3. When the [AutoPlay] window appears, click on [Run setup.exe].



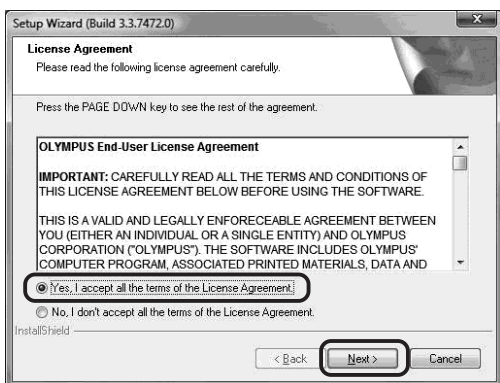
4. When the [User Account Control] window appears, click on the [Allow].



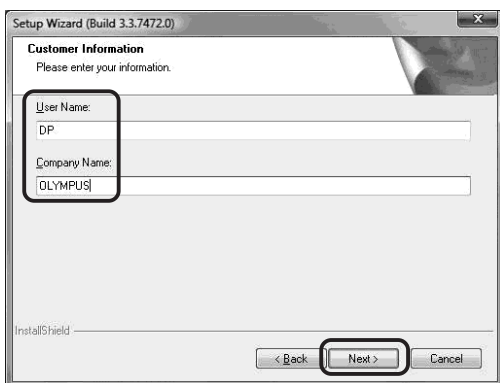
5. Wait a while until the preparation for installation completes and the following window appears.



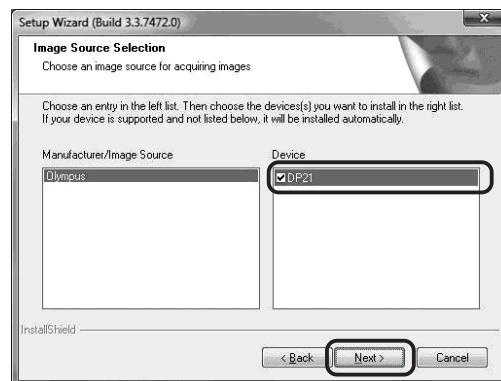
6. Read the displayed Licensing Agreement, check "Yes, I accept all the terms of the Licensing Agreement." and then click on the [Next] button.



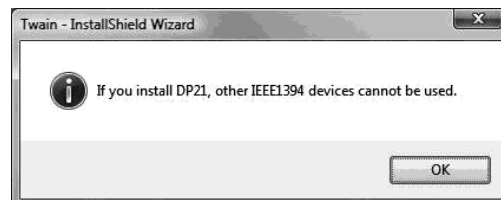
7. Enter the user information (User Name/Company Name) and click on the [Next] button.



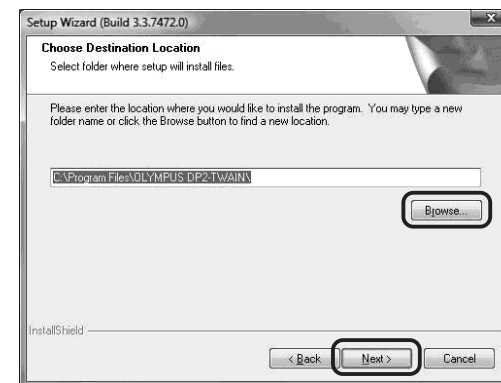
8. Check [DP21] in the Device column.



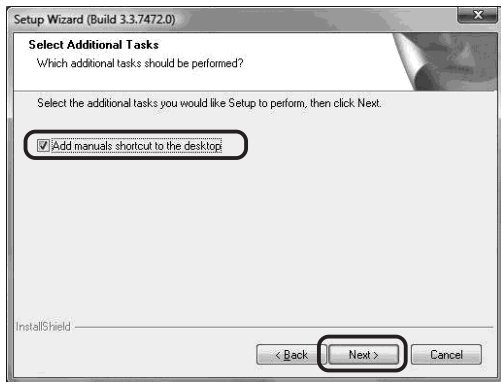
When [DP21] has been checked, the dialogue box shown below appears. Click on the [OK] button to close the box and click on the [Next] button shown above.



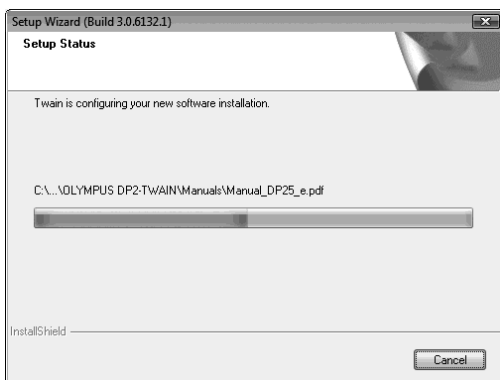
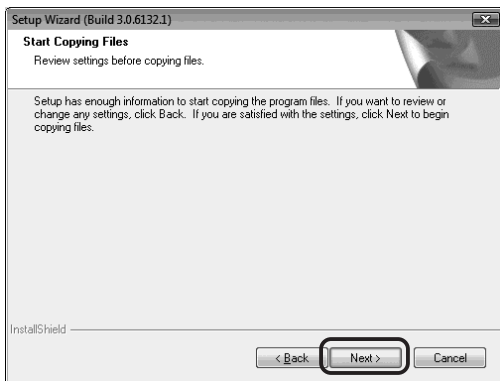
9. The [Choose Destination Location] window appears. If you want to change the destination location, click on the [Browse] button to find a new location. Click on the [Next] button.



10. The [Select Additional Tasks] window appears. Check the task to be used and click on the [Next] button.



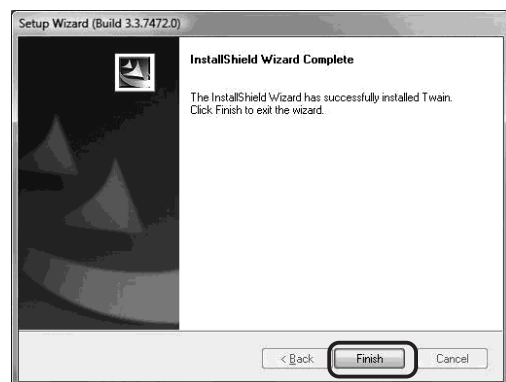
11. The [Start Copying Files] window appears. Click on the [Next] button.



12. When [Windows Security] screen is displayed, click [Install].

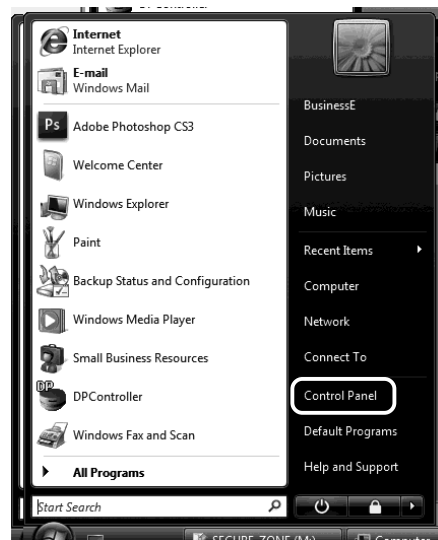


13. When the installation completes, the window below appears. Then click on the [Finish] button.

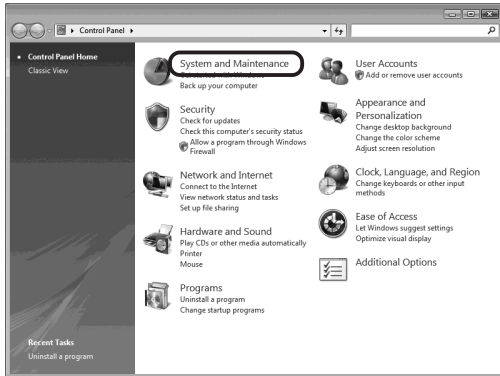


14. Take out the CD-ROM

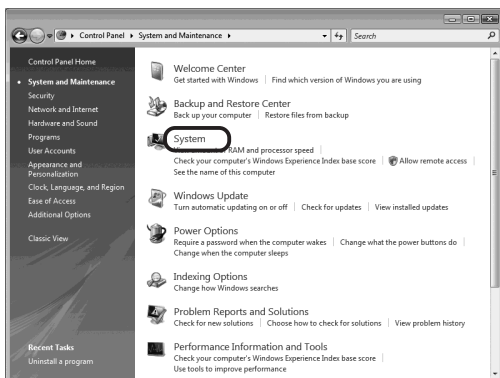
15. To check that the installation is completed successfully, click on [Control Panel].



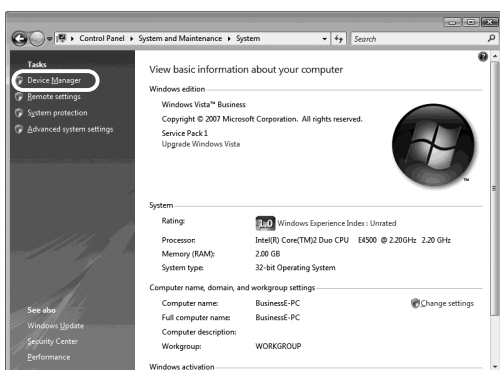
16. Click on [System and Maintenance].
Make sure not to click on [Get started with Windows] or [Back up your computer].



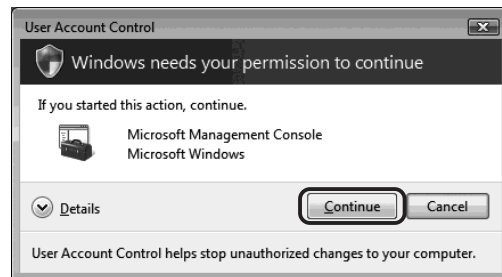
17. Click on [System].



18. Click on [Device Manager].

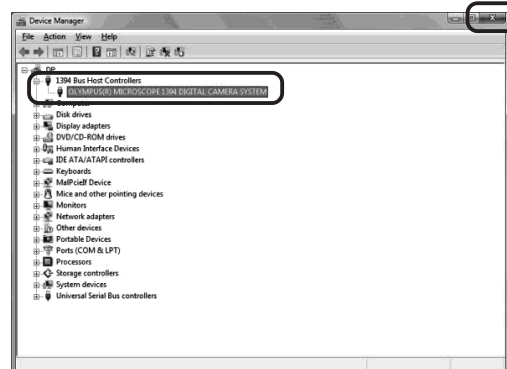


19. When the [User Account Control] dialog box appears, click on the [Continue] button.



20. If there is [OLYMPUS(R) MICROSCOPE 1394 DIGITAL CAMERA SYSTEM] under [1394 Bus Host Controllers], it means the installation has been executed correctly. After confirming it, click on the [X] button.

When multiple 1394 connectors are in PC, DP21 cannot be operated if [OLYMPUS (R) MICROSCOPE 1394 DIGITAL CAMERA SYSTEM] has not been installed to 1394 connector of PC connected to DP21. If DP21 is not operable, please confirm 1394 connector prior to using, and connect DP21 again to 1394 connector to which [OLYMPUS (R) MICROSCOPE 1394 DIGITAL CAMERA SYSTEM] has been installed.

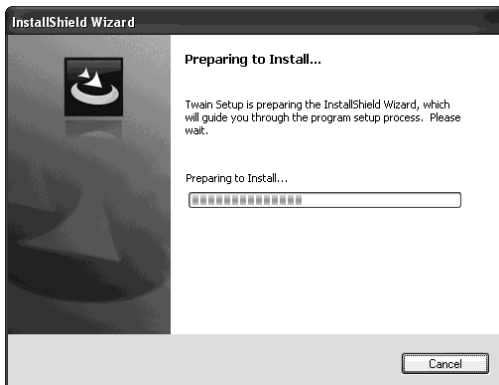


2. Windows® XP

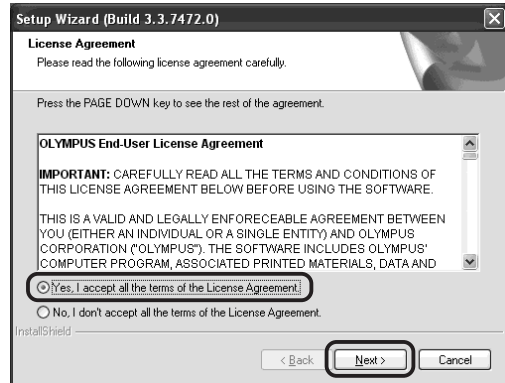
1. Start Windows XP. (Log on with the Computer Administrator account.)
2. When the following dialog box appears in a while, click on the [Cancel] button to close it.



3. Insert the CD-ROM in the CD-ROM drive. Skip to step 7 if the window shown in 6 appears automatically. If not, continue to step 4.
4. Click on the [Start] button and then click on [Run].
5. Select "setup.exe" in the CD-ROM drive folder and click on the [OK] button.
6. Wait a while until the preparation for installation completes and the following window appears.



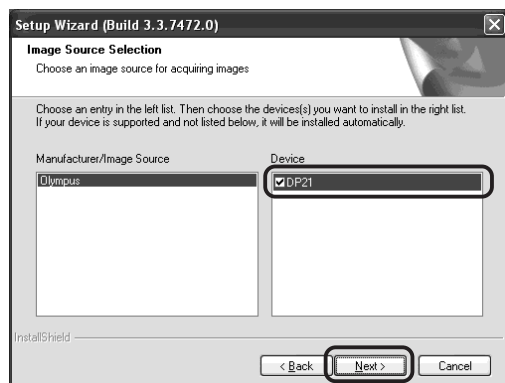
7. Read the displayed Licensing Agreement, check "Yes, I accept all the terms of the Licensing Agreement." and then click on the [Next] button.



8. Enter the user information (User Name/Company Name) and click on the [Next] button.



9. Check [DP21] in the Device column.



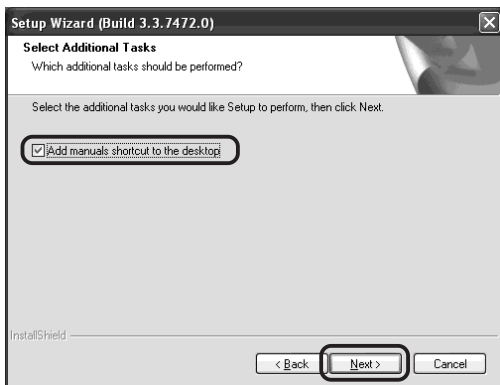
When [DP21] has been checked, the dialogue box shown below appears. Click on the [OK] button to close the box and click on the [Next] button shown above.



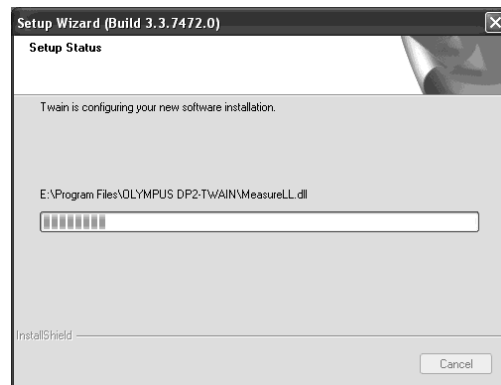
10. The [Choose Destination Location] window appears. If you want to change the destination location, click on the [Browse] button to find a new location. Click on the [Next] button.



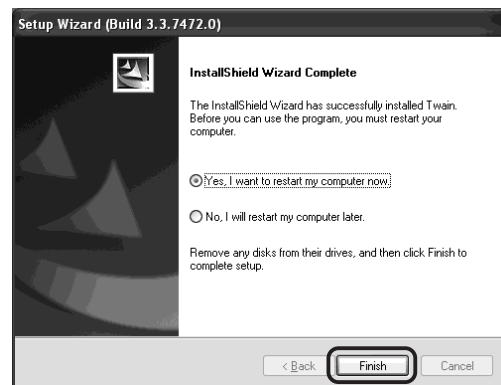
11. The [Select Additional Tasks] window appears. Check the task to be used and click on the [Next] button.



12. The [Start Copying Files] window appears. Click on the [Next] button.



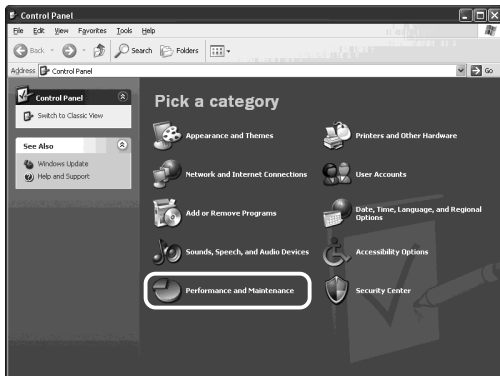
13. When the installation completes, the window below appears. Then click on the [Finish] button.



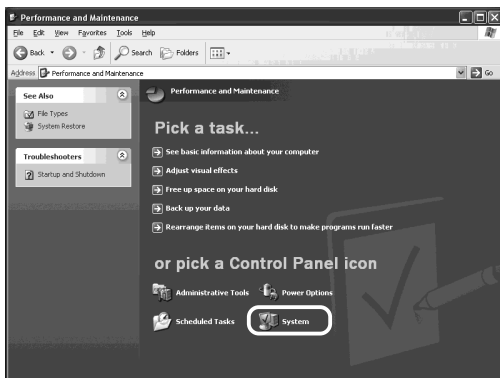
14. Take out the CD-ROM.
15. To check that the installation is completed successfully, click on the [Start] button and then click on [Control Panel].



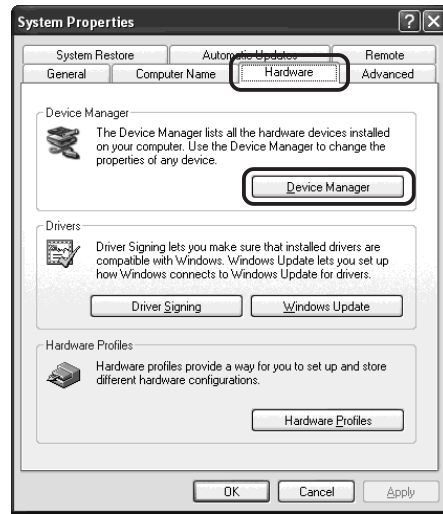
16. Click on [Performance and Maintenance].



17. Click on [System].

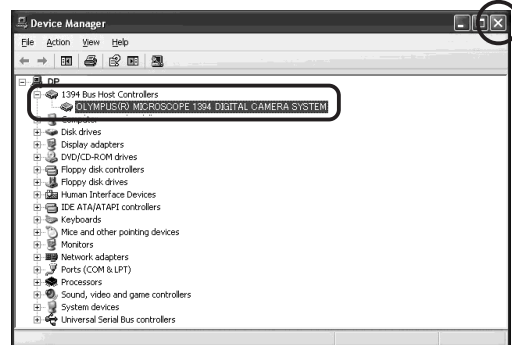


18. When the [System Properties] dialog box appears, click on [Hardware] and then on [Device Manager].



19. If there is [OLYMPUS(R) MICROSCOPE 1394 DIGITAL CAMERA SYSTEM] under [1394 Bus Host Controllers], it means the installation has been executed correctly. After confirming it, click on the [X] button.

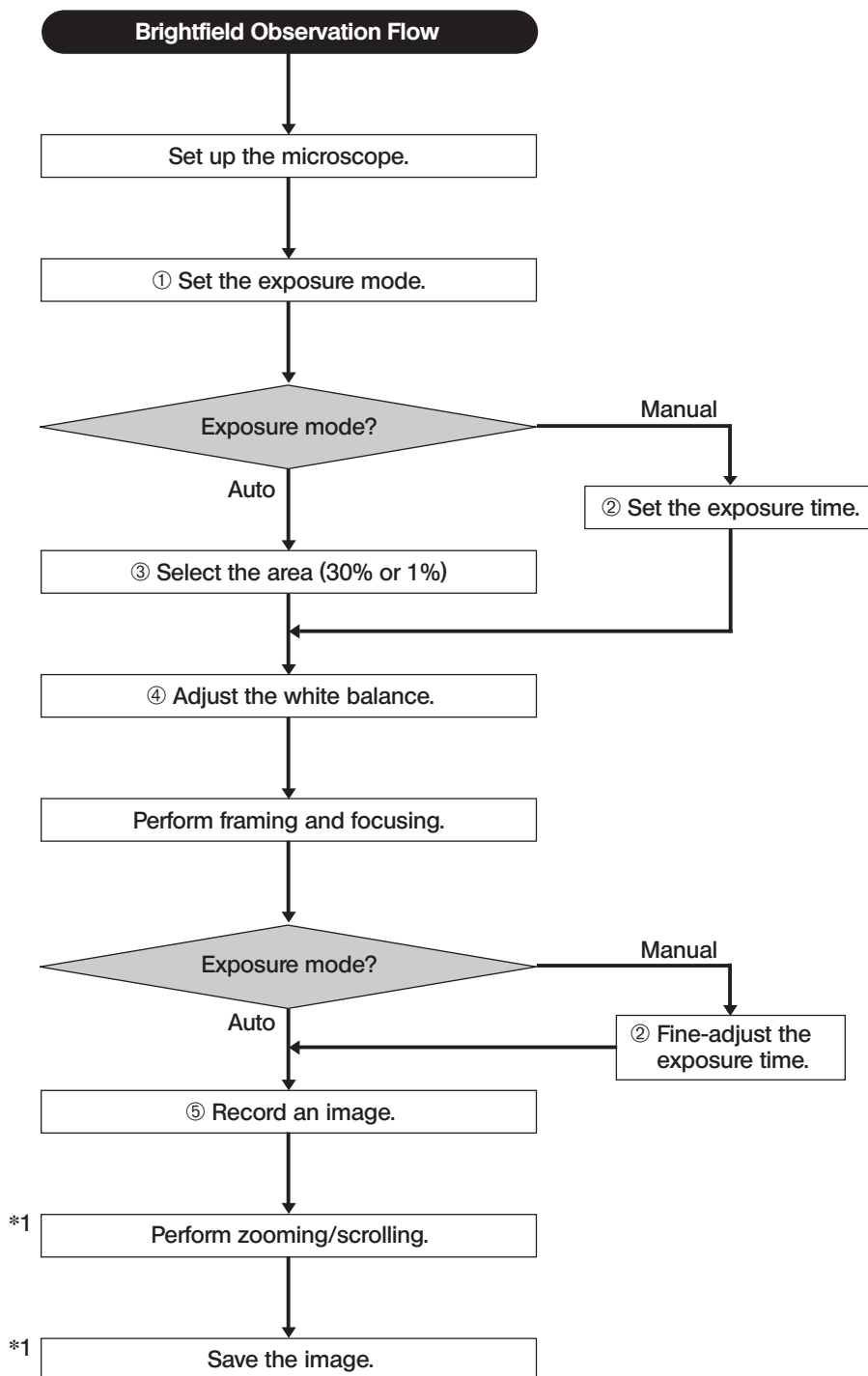
⊗ If your PC has multiple 1394 connectors, the DP21 cannot operate unless "OLYMPUS® MICROSCOPE 1394 DIGITAL CAMERA SYSTEM" is installed for the PC's 1394 connector to which the DP21 is connected. If the DP21 does not run, check the connected 1394 connector and make sure to connect the DP21 is to a connector for which "OLYMPUS® MICROSCOPE 1394 DIGITAL CAMERA SYSTEM" is installed.



3-6 Image Recording Procedure Using DP21-TWAIN

(Notes) For detailed operating procedures, refer to the instruction manual for the DP2-TRAIN.

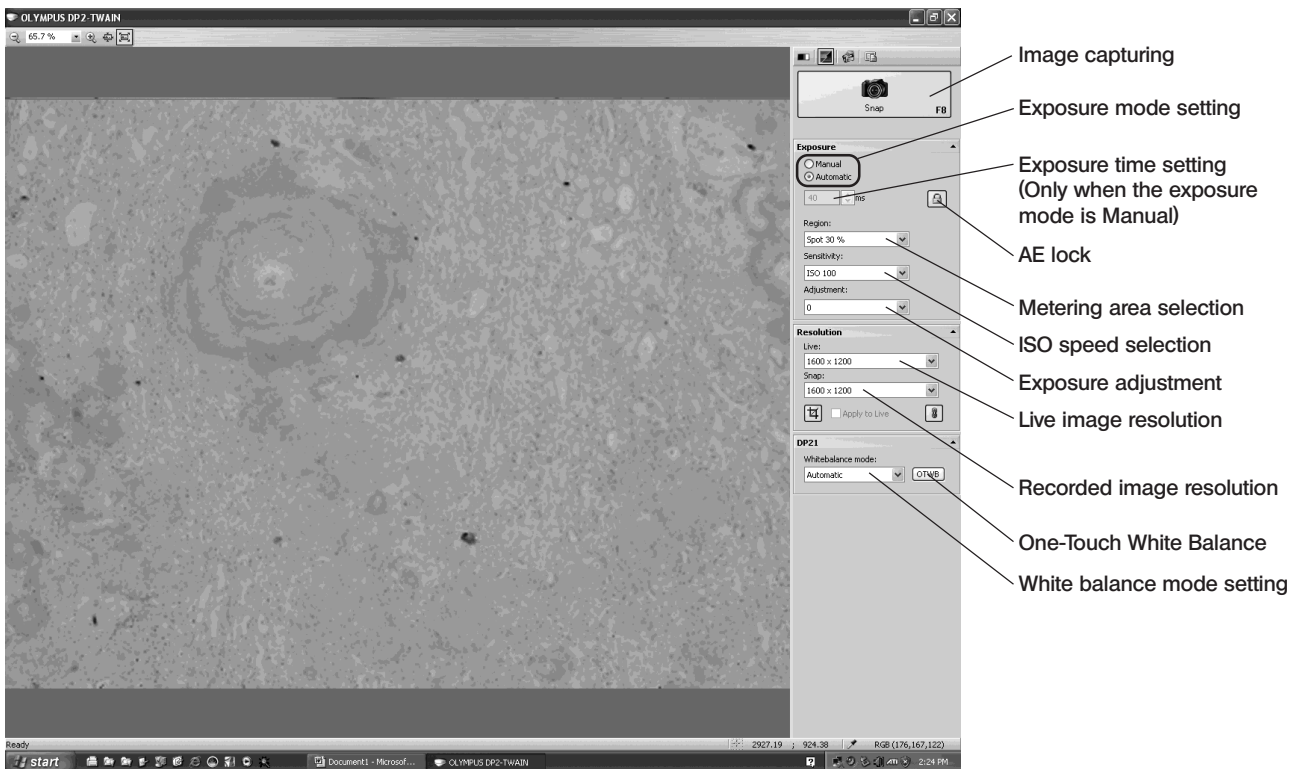
*1. For zooming, scrolling and image saving, refer to the manual for the TWAIN-compatible application.



3-7 Displayed Windows of DP2-TWAIN

Image Record Window

© This window is displayed at the startup and used to record still images and movies. For details, refer to the DP2-TWAIN instruction manual.



3-8 DP2-TWAIN Software Uninstallation

1. Windows® Vista

1. Click on the [Start] button and select [Control Panel].
2. Click on [Uninstall a Program] under [Programs].
3. When the [Uninstall or change a program] window appears, select [OLYMPUS DP2-TWAIN] and click on the [Uninstall] button.
4. The [User Account control] dialog box appears to ask you "Windows needs your permission to continue". Click on the [Continue] button.
5. The [Question] dialog box appears to ask you "Do you really want to uninstall OLYMPUS DP2-TWAIN?". Click on the [Yes] button. Uninstalling will start.
6. The [Question] dialog box appears again to ask you "Do you want to retain the application's user specific settings?". Click on the [Yes] button to retain the settings. If you do not want to retain the settings, click on the [No] button.
7. When the [Maintenance Complete] dialog box appears, click on the [Finish] button. Now the application is deleted.

2. Windows® XP

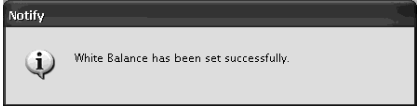

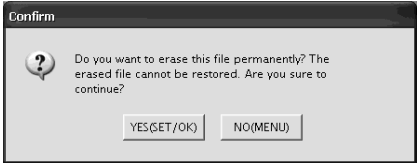
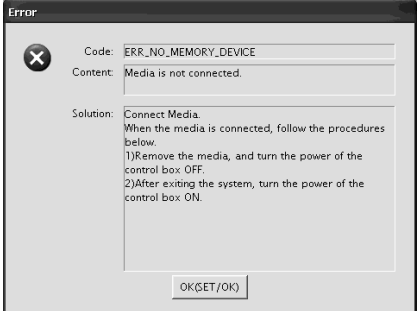
1. Click on the [Start] button and select [Control Panel].
2. Click on [Add or Remove Programs].
3. When the [Add or Remove Programs] window appears, select [OLYMPUS DP2-TWAIN] under [Currently installed programs] and click on the [Remove] button.
4. The [Question] dialog box appears to ask you "Do you really want to uninstall OLYMPUS DP2-TWAIN?". Click on the [Yes] button. Uninstalling will start.
5. The [Question] dialog box appears again to ask you "Do you want to retain the application's user specific settings?". Click on the [Yes] button to retain the settings. If you do not want to retain the settings, click on the [No] button.
6. When the [Maintenance Complete] dialog box appears, click on the [Finish] button. Now the application is deleted.

Even when OLYMPUS DP2-TWAIN is uninstalled, the 1394 driver is not uninstalled, which means that an IEEE1394 device other than the DP21 is still unusable. If you want to use an IEEE1394 device other than the DP21, open the Device Manager and update the driver software of "OLYMPUS(R) MICROSCOPE 1394 DIGITAL CAMERA SYSTEM" under "1394 Bus Host Controllers".

4 GENERAL (Common)

4-1 Warning Messages

The DP21 sometimes displays a message according to the camera status and operation.

Type	Content	Example
Notification	Notification of information on the camera status, end of processing, etc. The message disappears in 3 seconds after it is displayed or when any button is pressed.	
Warning	Displayed in case of an error with low severity (when the operation can be continued by redoing, etc.). The message is kept displayed until [OK (ANY KEY)] is clicked.	
Confirm	Confirmation of an operation such as image erasure. The user is requested to select either [Yes] or [No] (left-clicking of the mouse can be used).	
Error	Displayed in case of an error with high severity. The error details and countermeasures are also displayed so the user should manipulate the camera as instructed by the message.	

4-2 Specifications

Common

Item		Specifications
Image pickup device	Size	1/1.8-inch color CCD
	Effective pixels	2.01 megapixels (total pixels 2.11 megapixels)
	Scanning method	Progressive scanning
	Color filters	RGB primary color on-chip filters
	Recording area	7.04(H) x 5.28(V) mm, diagonal length 8.8 mm
	Max. recording pixels	1.92 million pixels (1600 x 1200)
Camera mount	C-mount	
ISO speeds	100, 200, 400	
Metering method	Center 1%, Center 30% average metering	
Exposure control	AUTO / MANUAL AE lock: Possible only during Auto Exposure. Exposure correction: ± 2 EV in 1/3 EV steps, possible only during Auto Exposure.	
Exposure time	AUTO: 2 to 1/20,000 sec. MANUAL: 8 to 1/20,000 sec.	
Storage environment	-20 to 60°C 10% to 90% (without condensation)	
Operating environment	<ul style="list-style-type: none"> • Indoor use. • Altitude: Max. 2000 meters • Ambient temperature: 5° to 35°C (41° to 95° F) • Relative humidity: 20% to 80% below 31°C (without condensation) • At 31°C or above, the operating environment humidity decreases linearly through 70% at 34°C (93°F), 60% at 37°C (99°F) to 50% relative humidity at 40°C (104°F). • Supply voltage fluctuations; $\pm 10\%$. • Pollution degree: 2 (in accordance with IEC60664) • Installation/Overvoltage category: II (in accordance with IEC60664) 	

Standalone configuration

Item	Specifications
System	C-mount CCD camera unit / Control box / Hand switch configuration
Image sizes, File formats	Recording pixels TIFF (TIFF) 1600 x 1200 (5760 kB) SHQ (JPEG) 1600 x 1200 (Approx. 2140 kB or less) HQ (JPEG) 1600 x 1200 (Approx. 720 kB or less) SQ-L (JPEG) 800 x 600 (Approx. 535kB or less) SQ-H(JPEG) 800 x 600 (Approx. 180 kB or less)
Compatible monitor	Resolution 1920 x 1200 WUXGA (Image display area 1600 x 1200) 1680 x 1050 WSXGA+ (Image area 1280 x 960) 1280 x 854 WSXGA (Image area 1024 x 768) 1280 x 768 WXGA (Image display area 1024 x 768) 1024 x 600 WSVGA (Image display area 800 x 600) 800 x 480 WVGA (Image display area 640 x 480) 1600 x 1200 UXGA 1280x1024 (Display area 1280 x 960) SXGA 1280x960 SXGA 1024x768 XGA 800x600 SVGA © Pressing the MENU button when the AE lock LED lights during startup resets the resolution to 800 x 600 (SVGA).

Item	Specifications
Recording media	USB memories, networked PC
Image display speed (Frame rate)	Live image: 15 fps (Displayed pixels 1600 x 1200), 27 fps (Displayed pixels 800 x 600) Display magnifications: 1x, 2x (electronic zoom), 4x (electronic zoom) Played image magnification: Index display, 1x, 2x, 4x
Input/output connectors	DC input: Main power supply Camera: IEEE 1394b Interface: USB2.0 Monitor output: DVI-I Digital/Analog RGB) Wired LAN: 100Base-TX/10Base-T Serial ports: RS-232C, D-SUB 9-pin
Scale display	View scale/Hide scale Available microscope total magnification: 00.01x to 9999.99x Ⓞ Up to 8 total magnifications can be set
Measurement functions	Distance of 2 Points, Poly-Line, 3 Points Circle, Distance between 2 Circle Centers, 3 Points Angle, 4 Points Angle, Perpendiculars, Polygon Area, Boundary Length, Distance of Parallel Lines, XY Distance, Count, Cross Line Ⓞ The following conditions are required to enable the measurement functions. <ul style="list-style-type: none"> • Scale display: ON • Scale setting: Entry of objective power • Image file format: TIFF (Applicable to still image measurement in PLAY mode)
Power consumption (Control Box)	Max. consumption: 24.2 W During shutdown: 0 W (Apparent power: Approx. 2.0 VA) Standby mode: 1.4 W or less

PC connection configuration

Item	Specifications
System	C-mount CCD camera unit
Image display speed (Frame rate)	Live image: 7.5 fps (Displayed pixels 1600 x 1200), 27 fps (Displayed pixels 800 x 600)
Input/output connectors	DC input: Main power supply Camera: IEEE 1394b
Image sizes, File formats	Dependent on compatible application
Applicable OS	Windows Vista Ultimate 32-bit SP2, Windows Vista Business 32-bit SP2, Windows XP Professional (SP3 or after)
Power consumption (Camera head)	Max. consumption: 2.6 W When the camera head is switched OFF: 0.1 W or less

4-3 Troubleshooting Guide

Under certain conditions, the performance of the camera may be adversely affected by factors other than defects. If problems occur, please review the following list and take remedial action as needed. If you cannot solve the problem after checking the entire list, please contact Olympus for assistance.

Problem	Cause	Remedy	Page
a) The hand switch buttons do not work.	The system is OFF or in standby mode.	Press the main switch of the control box to ON.	18
	The AC adapter is connected improperly.	Connect the AC adapter correctly to the control box and plug the power cord firmly into a power outlet.	13
	The hand switch is connected improperly.	Connect the USB cable correctly.	15
b) Pressing the EXPOSE button cannot record an image.	Data is being written in memory.	Release the EXPOSE button, wait for more than 1 sec., and press the EXPOSE button again.	23
	The USB memory is full.	Use another USB memory, erase unnecessary images, or transfer image data into a PC and then erase all image files.	52,53
	The USB memory is connected improperly.	Insert all the way into the connector.	15
	The LAN cable is connected improperly (applicable only when the save destination is a networked PC).	Connect the LAN cable correctly.	16
	The save destination PC cannot be accessed due to a network trouble, etc. (applicable only when the save destination is a networked PC).	Contact the network administrator of the save destination PC.	5,57
	The save folder is protected by password (applicable only when the save destination is a networked PC).	Connect the keyboard to the control box and enter the password. Alternatively, contact the network administrator of the save destination PC.	9
	The camera operation is affected due to a connected USB device or a problem in the network.	Remove USB devices other than those provided with the DP21, and also disconnect the LAN.	11
c) The played image is not displayed on the monitor.	The system is OFF or in sleep mode.	Press the main switch of the control box to ON.	55
	The system is not in the PLAY mode.	Press the MODE switch of the hand switch to select the PLAY mode.	49
	The USB memory does not contain a recording.	Check the number of remaining image.	10

Problem	Cause	Remedy	Page
d) Nothing is displayed on the monitor.	The monitor is not ON.	Turn it ON.	—
	The display cable is connected improperly.	Connect the display cable correctly.	13
	The monitor resolution is set improperly.	Set the correct monitor resolution.	15
	The system is in the sleep mode.	Set the display power OFF setting correctly.	15
e) The image is not in focus.	The microscope is not focused properly.	Press any button or key of the hand switch, mouse or keyboard.	—
	The parfocality is not adjusted properly.	Adjust parfocality with the TV adapter.	—
	The aperture iris diaphragm of the condenser is open too wide.	Close the aperture iris diaphragm a little.	—
	The field iris diaphragm is not set properly.	Adjust the field iris diaphragm until the image circumscribes the field of view.	—
	Lens components of the microscope are contaminated or the cover glass on the front of the camera is stained.	Clean the objective, photography lens, condenser and/or window lens of the microscope, or clean the cover glass on the bottom of the camera head.	—
f) The recorded image is too dark or too bright.	The AE LOCK, exposure adjustment and/or metering area are set improperly.	Set them correctly.	26,27
	The brightness is adjusted insufficiently.	Adjust the brightness again.	—
	A fluorescent lamp is used.	Use a light source other than a fluorescent light.	—
g) The colors in the image are strange.	The white balance is erroneous because of a wrong color temperature setting.	Set the color temperature correctly.	33
	The screen color setup is incorrect.	Correct to the optimum color setup.	34
h) Another 1394 device cannot be used simultaneously.	The DP21-dedicated driver is installed.	When the DP21 is connected to a PC, other 1394 devices cannot be used on the same PC.	65
i) The played movie is fast forwarded spontaneously.	The save folder is located on the network so the frame rate is slow.	The movie files should be saved in the USB memory.	31
j) The calendar is reset every time.	The built-in battery is exhausted.	The battery can be replaced only by the manufacturer's personnel (paid service). Please contact Olympus.	6

Problem	Cause	Remedy	Page
k) Functions interlocked with microscope operations do not work.	Cables are connected improperly.	Connect the cables of the microscope, control box for coded units and DP21 correctly.	61,62
	The control box for coded units is not recognized.	Set the main switches of the control box for coded units and DP21-CB, and set the switches to ON in order of: 1) control box; 2) DP21-CB.	64
	The code revolving nosepiece is not connected to the control box for coded units.	Connect the coded revolving nosepiece to the control box for coded units.	64
i) Auto scale switching does not work.	The objective magnifications are not input or set erroneously.	Input the magnifications of the objectives in use.	64

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■ PROPER SELECTION OF THE POWER SUPPLY CORD

If no power supply cord is provided, please select the proper power supply cord for the equipment by referring to “ Specifications ” and “ Certified Cord ” below:

CAUTION: In case you use a non-approved power supply cord for Olympus products, Olympus can no longer warrant the electrical safety of the equipment.

Specifications

Voltage Rating	125V AC (for 100-120V AC area) or, 250V AC (for 220-240V AC area)
Current Rating	6A minimum
Temperature Rating	60°C minimum
Length	3.05 m maximum
Fittings Configuration	Grounding type attachment plug cap. Opposite terminates in molded-on IEC configuration appliance coupling.

Table 1 Certified Cord

A power supply cord should be certified by one of the agencies listed in Table 1 , or comprised of cordage marked with an agency marking per Table 1 or marked per Table 2. The fittings are to be marked with at least one of agencies listed in Table 1. In case you are unable to buy locally in your country the power supply cord which is approved by one of the agencies mentioned in Table 1, please use replacements approved by any other equivalent and authorized agencies in your country.




















Country	Agency	Certification Mark	Country	Agency	Certification Mark
Argentina	IRAM		Italy	IMQ	
Australia	SAA		Japan	JET, JQA, TÜV, UL-APEX / MITI	
Austria	ÖVE		Netherlands	KEMA	
Belgium	CEBEC		Norway	NEMKO	
Canada	CSA		Spain	AEE	
Denmark	DEMKO		Sweden	SEMKO	
Finland	FEI		Switzerland	SEV	
France	UTE		United Kingdom	ASTA BSI	
Germany	VDE		USA	UL	
Ireland	NSAI				

Table 2 HAR Flexible Cord

APPROVAL ORGANIZATIONS AND CORDAGE HARMONIZATION MARKING METHODS

Approval Organization	Printed or Embossed Harmonization Marking (May be located on jacket or insulation of internal wiring)		Alternative Marking Utilizing Black-Red-Yellow Thread (Length of color section in mm)		
			Black	Red	Yellow
Comite Electrotechnique Belge (CEBEC)	CEBEC	⟨HAR⟩	10	30	10
Verband Deutscher Elektrotechniker (VDE) e.V. Prüfstelle	⟨VDE⟩	⟨HAR⟩	30	10	10
Union Technique de l'Electricite' (UTE)	USE	⟨HAR⟩	30	10	30
Instituto Italiano del Marchio di Qualita' (IMQ)	IEMMEQU	⟨HAR⟩	10	30	50
British Approvals Service for Electric Cables (BASEC)	BASEC	⟨HAR⟩	10	10	30
N.V. KEMA	KEMA-KEUR	⟨HAR⟩	10	30	30
SEMKO AB Svenska Elektriska Materielkontrollanstalter	SEMKO	⟨HAR⟩	10	10	50
Österreichischer Verband für Elektrotechnik (ÖVE)	⟨ÖVE⟩	⟨HAR⟩	30	10	50
Danmarks Elektriske Materialkontroll (DEMKO)	⟨DEMKO⟩	⟨HAR⟩	30	10	30
National Standards Authority of Ireland (NSAI)	⟨NSAI⟩	⟨HAR⟩	30	30	50
Norges Elektriske Materielkontroll (NEMKO)	NEMKO	⟨HAR⟩	10	10	70
Asociacion Electrotecnica Y Electronica Espanola (AEE)	⟨UNED⟩	⟨HAR⟩	30	10	70
Hellenic Organization for Standardization (ELOT)	ELOT	⟨HAR⟩	30	30	70
Instituto Portages da Qualidade (IPQ)	np	⟨HAR⟩	10	10	90
Schweizerischer Elektro Technischer Verein (SEV)	SEV	⟨HAR⟩	10	30	90
Elektriska Inspektoratet	SETI	⟨HAR⟩	10	30	90

Underwriters Laboratories Inc. (UL)
Canadian Standards Association (CSA)

SV, SVT, SJ or SJT, 3 X 18AWG
SV, SVT, SJ or SJT, 3 X 18AWG

MEMO

OLYMPUS[®]

OLYMPUS CORPORATION

Shinjuku Monolith, 3-1, Nishi Shinjuku 2-chome, Shinjuku-ku, Tokyo, Japan

OLYMPUS EUROPA HOLDING GMBH

Wendenstrasse 14-18, 20097 Hamburg, Germany

OLYMPUS AMERICA INC.

3500 Corporate Parkway, Center Valley, Pennsylvania 18034-0610, U.S.A.

OLYMPUS SINGAPORE PTE LTD.

491B River Valley Road, #12-01/04 Valley Point Office Tower, Singapore 248373

OLYMPUS AUSTRALIA PTY. LTD.

31 Gilby Road, Mount Waverley, VIC., 3149, Melbourne, Australia

OLYMPUS LATIN AMERICA, INC.

5301 Blue Lagoon Drive, Suite 290 Miami, FL 33126, U.S.A.

