

OLYMPUS[®]

INSTRUCTIONS

DP21-SAL

STANDALONE CONNECTION KIT

This instruction manual is for the Olympus standalone connection kit DP21-SAL for use in the control of microscope digital camera. To ensure the safety, obtain optimum performance and familiarize yourself fully with the use of this device, 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 8 2 3 3



This device complies with the requirements of directive 2004/108/EC concerning electromagnetic compatibility and of directive 2006/95/EC concerning electrical equipment designed for use within certain voltage limits. CE marking means the conformity to these directives.



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

The touch panel controller of this product uses a Lithium Battery which contains Perchlorate Material -special handling may apply, See www.dtsc.ca.gov/hazardouswaste/perchlorate.

For Korea only

B급 기기 (가정용 방송통신기자재)

이 기기는 가정용(B급) 전자파적합기기로서 주로 가정에서 사용하는 것을 목적으로 하며, 모든 지역에서 사용할 수 있습니다.

CONTENTS

IMPORTANT	1-6
1 SYSTEM CHART	7
2 MODULE NOMENCLATURE	8-11
2-1 Hardware controls	8,9
2-2 MENU / INFO display	10,11
3 INSTALLATION	12-16
4 BASIC IMAGE RECORDING PROCEDURE	17-25
5 RECORDING FUNCTION SETTING / OPERATION (REC)	26-51
5-1 Operation using the hand switch D21-HS	26-29
5-2 Operation using the MENU display	30-36
5-3 Applied Operation	37-51
6 PLAYBACK FUNCTION SETTING / OPERATION (PLAY)	52-55
7 MENU DISPLAY FUNCTIONS	56-62
8 FUNCTIONS INTERLOCKED WITH MICROSCOPE OPERATIONS	63-69
8-1 System chart	63
8-2 Connection	64-66
8-3 Operation	67-69
9 WARNING MESSAGES	70
10 SPECIFICATIONS	71,72
11 TROUBLESHOOTING GUIDE	73-75
■ PROPER SELECTION OF THE POWER SUPPLY CORD	76-77

IMPORTANT

The Stand-alone Connection Kit DP21-SAL is a control box of the microscope digital camera DP21/DP26. Connecting the Olympus microscope digital camera DP21/DP26 to the control box allows you to use the microscope digital camera DP21/DP26 in a stand-alone mode.

Descriptions in Instruction Manual

This Instruction Manual contains only the descriptions of Stand-alone Connection Kit DP21-SAL. For procedures to use the microscope digital camera, refer to the Instruction Manual of the relevant microscope digital camera.

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

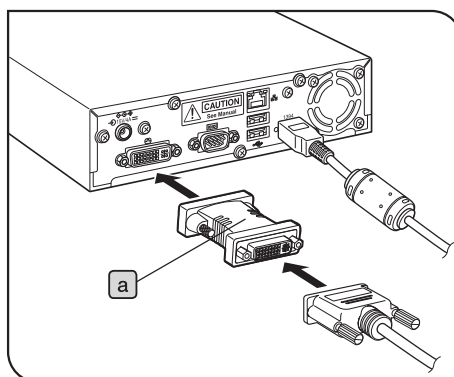
The following symbols are used to set off text in this instruction manual.

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).

⚠ SAFETY PRECAUTIONS

1. Be sure to set the main switch of the all devices to “○” (OFF) before connecting cables.
Also when the connected cable is going to be disconnected, make sure that the main switch is in the “○” (OFF) position.
2. When connecting a cable or power cord, push in the connector all the way before pressing the main switch to ON.
3. Always use the power cord and AC adapter provided by Olympus. If no power cord is provided, please select the proper power cord by referring to the section “PROPER SELECTION OF THE POWER CORD” at the end of this instruction manual. If the proper power cord is not used, the safety and EMC performance of the device can not be assured.
4. Always connect the power cord correctly and ensure that the grounding terminal of the device and that of the wall outlet are properly connected. If the device is not grounded, our intended electric safety and EMC performance of the device can not be assured.
5. In case of emergency, unplug the power cord to stop supplying electricity. Install the control box D21-CB at the location where you can reach the AC adapter connector (rear of the control box D21-CB) or the outlet at hand to disconnect the power cord.
6. When installing the DP21-SAL, route the power cord and cables away from the lamp housing of the microscope.
Should the power cord and cables come in contact with a hot part, the power cord and cables could melt and cause electric shock.
7. After operation or in case of abnormality, be sure to disconnect the power cord from the connector on the AC adapter or from the outlet.
8. Do not permit tools or metal fragments to get into air vents, or other apertures. Doing so could cause failure of the control box D21-CB or electric shock to the user.
9. The cords and cables are vulnerable to bend or twist. Do not apply excessive force to them.
10. The AC adapter, camera head, control box D21-CB 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.
11. Make sure to use the DVI protection adapter **a** always, since some electrical failure may be caused, if the control box D21-CB is directly connected to the display.



Safety Symbols

The following symbols are found on the standalone connection kit DP21-SAL. Study the meaning of the symbols and always use the equipment in the safest possible manner.

Symbol	Explanation
⚠	Indicates a non-specific general hazard. Follow the description given after this symbol or in the instruction manual.

Caution labels

Caution labels are placed at parts where special precaution is required when handling and using the devices. Always pay attentions to the caution labels.

Positions of caution labels	Rear of the control box D21-CB	⚠
-----------------------------	--------------------------------	---

If the caution label becomes dirty or is peeled off, contact Olympus for replacement.

1 Intended use

This product is intended to be used as an ancillary component for use with Olympus DP21 and DP26 cameras for capture and storage of digital images, but not for clinical diagnostic purposes

2 Handling Precautions

1. This device is a precision instrument. Handle it with care and avoid subjecting it to sudden or severe impact.
2. If the standalone connection kit DP21-SAL is used in a manner not specified by this manual, the safety of the user may be imperiled. In addition, the DP21-SAL may also be damaged. Always use the DP21-SAL as outlined in this instruction manual.
3. Do not use the instruments where they are subjected to direct sunlight, high temperature and humidity, dust or vibrations. (For the operating conditions, refer to chapter 10, "SPECIFICATIONS" on page 71.)
4. To prevent malfunction, do not replace modules or connect/disconnect cables while the powers of the devices are set to ON.
5. 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.
6. Since we are not responsible for any image data, please be sure to check images, backup or edit the data on your own.
7. If cables are connected incorrectly, the product may malfunction. Be sure that every unit is connected correctly before operating the product.

3 Maintenance and Storage

1. Do not use organic solvents, which cause painted and plastic parts to deteriorate. Do not use organic solvents to clean the DP21-SAL components other than the glass components. To clean them, use a lint-free, soft cloth slightly moistened with a diluted neutral detergent.
2. Do not disassemble this device. Doing so could cause failure of the device.
3. Before disposing of this product, be sure to follow the regulations and rules of your local government.
4. When the system is not used, store it with the dust cover. Before storage, ensure that the power of the control box D21-CB and the microscope are set to OFF and that the AC adapter and the lamp housing of the microscope are cool enough.
5. When smoking the room for cleaning, etc., move the DP21-SAL 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 devices are brought from cold outdoors into warm indoors.
7. Be sure to observe your local regulations and rules when disposing of this product. Special care is required for the control box D21-CB because it incorporates a lithium ion coin battery (CR2032). If you have any doubt, please consult Olympus.

4 Cautions

Image Data Storage

1. 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 repairs the equipment.
- When the USB memory is affected by static electricity or electromagnetic noise.
- When the PC is shut down, the AC adapter is disconnected or the power cord is unplugged during recording or erasure (formatting) of the PC.
- In case when continuing to save the data for the period exceeding the life time of data storage of USB memory, (approx. 1 to several years).
- When the equipment fails.

2. Please note if following cases may occur though the camera is working properly, the image restoration or the compensation for damages are not guaranteed.

- The image is abnormal.
- File properties e.g. file names, file time, etc. are abnormal.
- The image is lost.

⊙ In general, as the data retention lifetime is set in the electronic memory media, e.g. USB memory, HDD, CD-R, DVD-R, etc., the saved files may be lost after several years.

⊙ The image data may disappear (be destroyed) unexpectedly. Be sure to backup the data on regular base.

⊙ Make sure that there is no problem when recording the subjects before acquisition. Please note that even though the problem may occur caused by the recorded images, Olympus will not be responsible for these problems.

System Compatibility

1. Only the following USB devices function when connected to the control box D21-CB, etc.

Connectable USB devices: USB removable media such as a USB memory

USB mouse

USB keyboard

2. 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.

3. 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 D21-HS.

4. The network connection requirements are as follows.

Applicable PC: DOS/V AT compatible machine

Applicable OS: Windows 7 (32-bit/64-bit), Vista Ultimate (32-bit), Vista Business (32-bit), Windows XP Professional (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-SAL 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-SAL, 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-SAL. (The DP21-SAL does not have the virus check function. Use your PC for virus checking.)
- Ensure that the network and PC to which the DP21-SAL is connected are free of computer viruses.
- Should infection of a computer virus occur or be suspected, turn the DP21-SAL to 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-SAL 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 control box D21-CB 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 D21-CB).

When the battery life has expired, STANDBY LED of the hand switch D21-HS may blink on and off.

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 D21-CB has a ventilation fan. Be careful not to block the ventilation opening. To ensure sufficient ventilation, install the control box D21-CB 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.

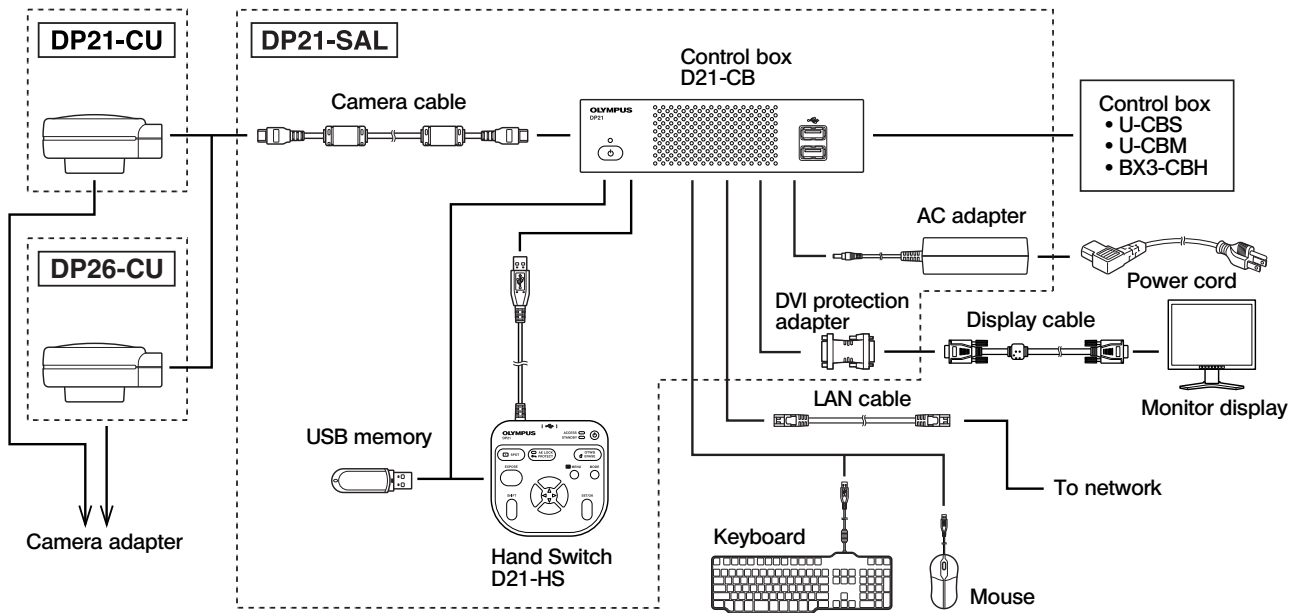
Restrictions in Use

- © Check the restrictions described in the Instruction Manual of the relevant digital camera as well.
1. 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.
When recording the image of the particularly dark specimen, the lack of pixel caused by the cosmic ray effect or the constant bright point may be noticeable, but they are not failures.
 2. Specimens with a distribution that is not suitable for center averaged metering require spot metering or exposure adjustment.
 3. When electronic zoom is used for magnification display during focusing, the image may become noticeably coarse with certain samples.
 4. The live image frame rate of 15 fps is possible when the exposure time is no more than 1/15 sec.
 5. When the scale recording function or measurement function is used, the image capturing time becomes longer than usual.
 6. The trackability of auto white balance control deteriorates when the specimen contains little white area.
 7. The measurement results are simply superimposed on the image and no text file or like is created.
 8. The DP21-SAL 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.
 9. It is not possible to use a special USB memory adopting the security or password lock function.
 10. 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.
 11. There may be the case that date and time of captured image are not correctly displayed on the PC when the image is saved in the NTFS format media such as USB-HDD (external hard disc connected by USB). Set time zone of the DP21-SAL at the same of PC, or format such media to FAT32.

Monitor

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 SYSTEM CHART

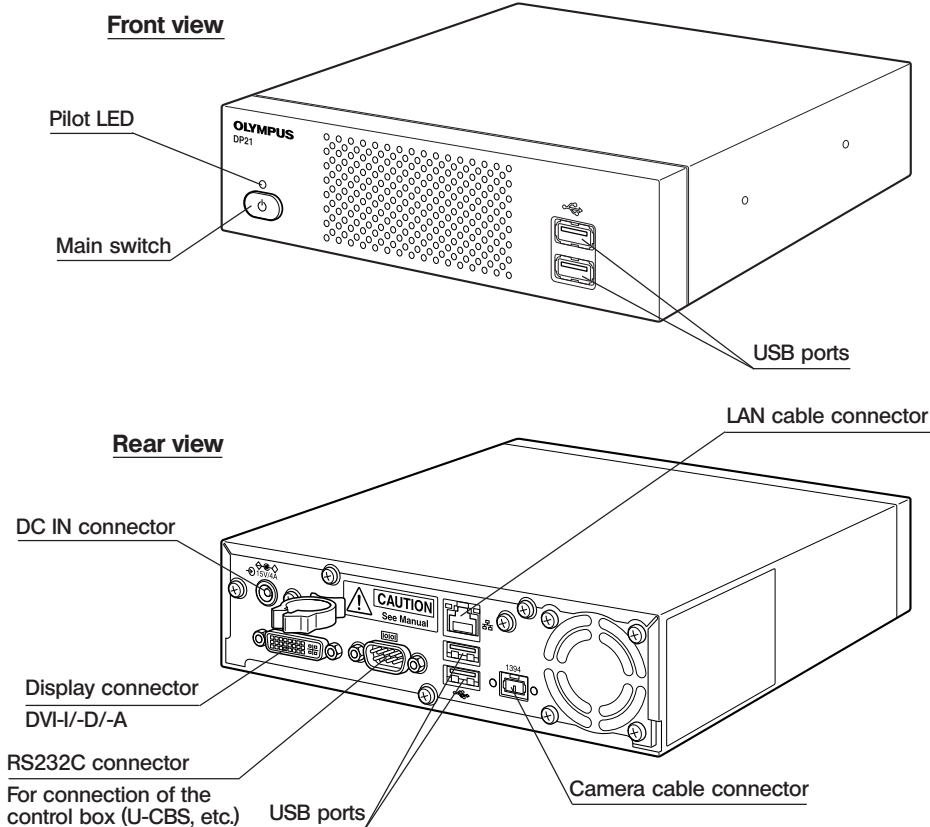


- ◎ Image color setup matching the microscope is required for faithful color reproduction (see page 37 for details).
- ◎ Consult Olympus for the microscope and camera adapter to be used together.

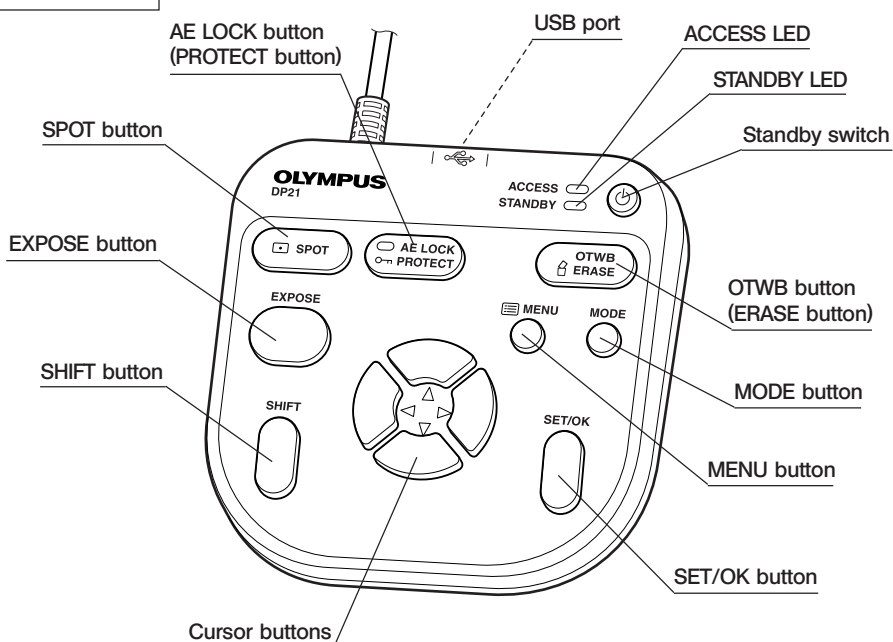
2 MODULE NOMENCLATURE

2-1 Hardware controls

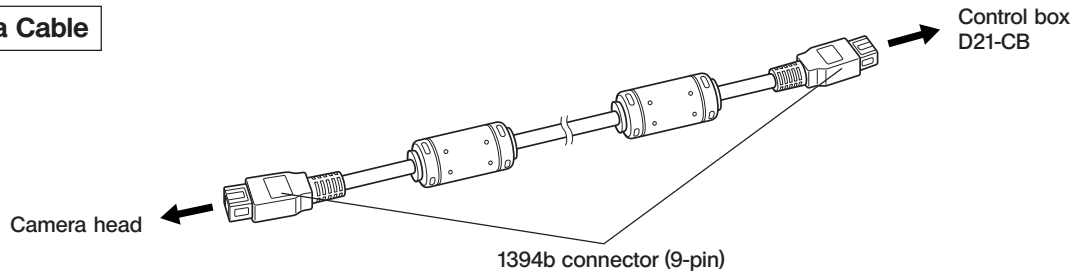
Control Box D21-CB



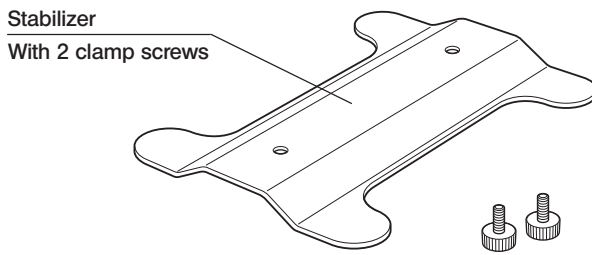
Hand Switch D21-HS



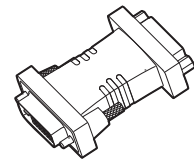
Camera Cable



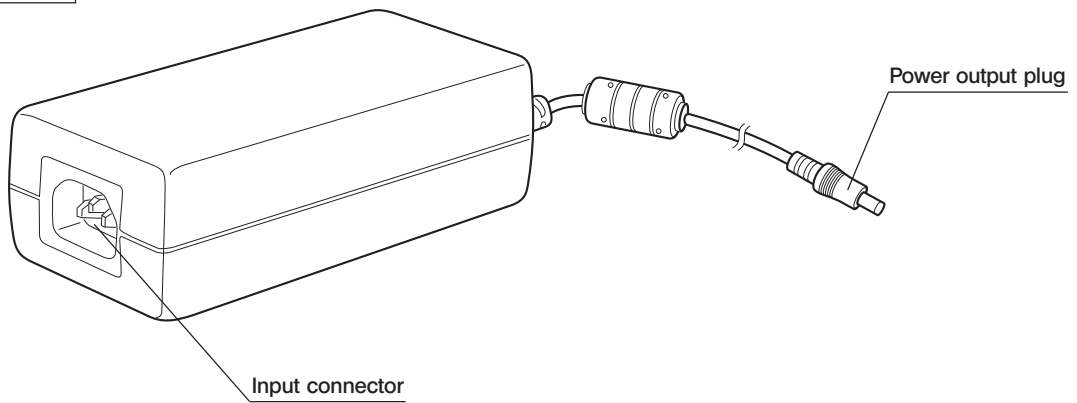
Stabilizer for Vertical Installation



DVI Protection Adapter



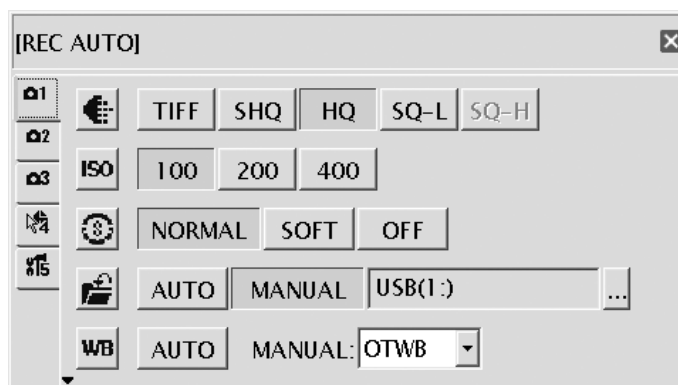
AC adapter



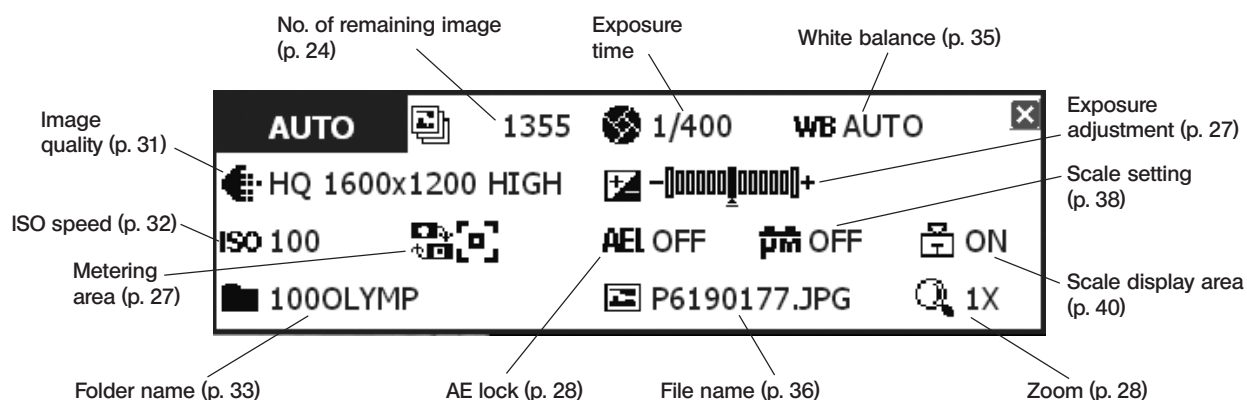
2-2 MENU / INFO display

The screens shown below are those displayed when combined with DP21. When combined with DP26, the screen displayed may be partially different, but the basic functions stay the same. For details, refer to the description of each function.

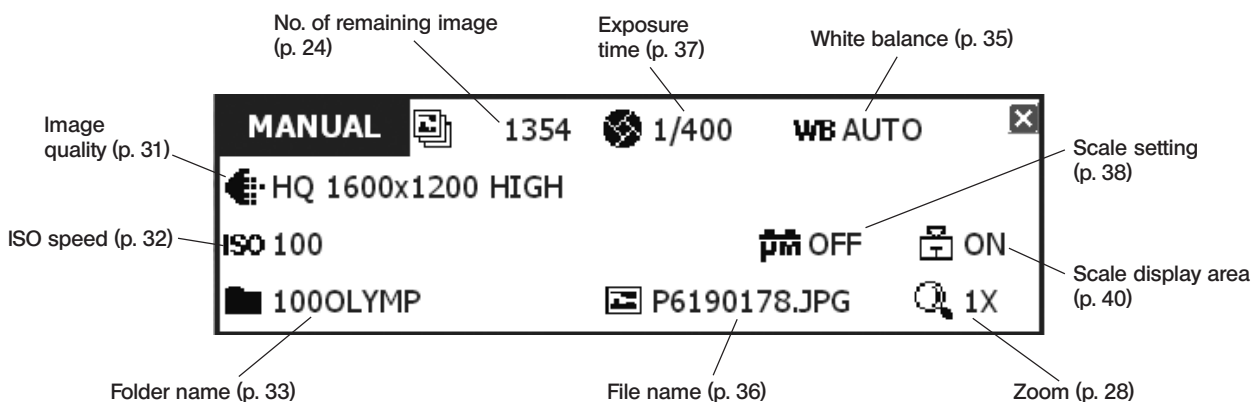
MENU display



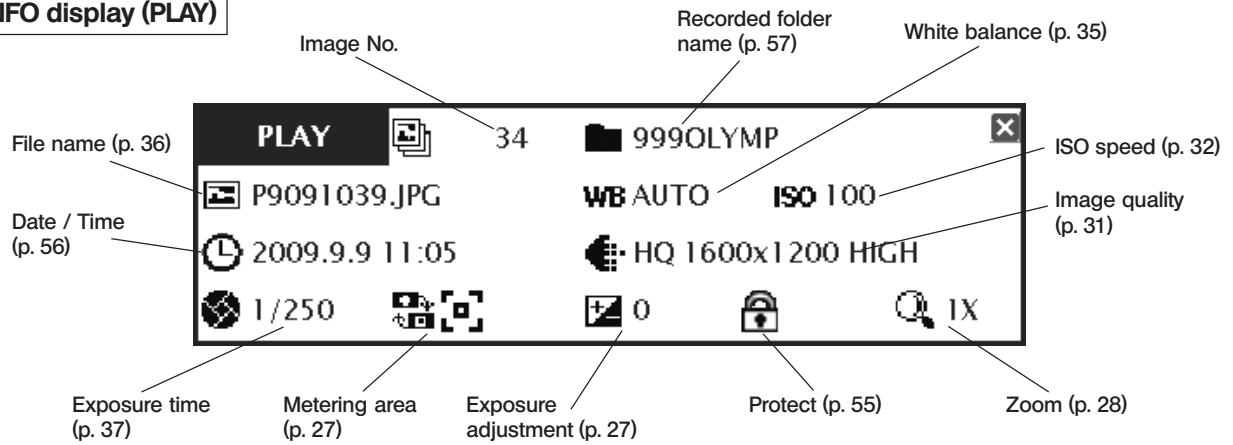
INFO display (REC AUTO)



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.

3 INSTALLATION

This section describes only the procedures to mount the control box D21-CB. For detail descriptions of the microscope, the camera head or the camera adapter, etc. to be used together, refer to the relevant Instruction Manual, and assemble them with careful attention.

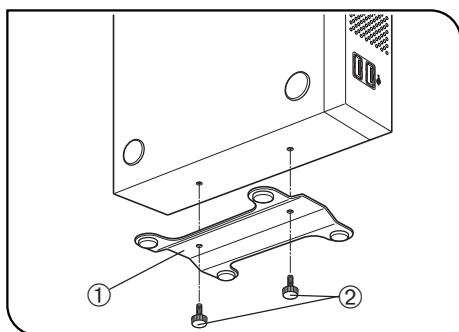


Fig. 1

1 Installing the Control Box D21-CB (Fig. 1)

- Ⓞ The control box D21-CB 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 D21-CB.

Horizontal installation

Place the control box D21-CB on the desktop so that its rubber feet contact the desktop surface.

Vertical installation (Fig. 1)

Attach the stabilizer ① provided with the control box D21-CB on the side of the control box D21-CB using the provided screws ②.

Always use the provided stabilizer for vertical installation.

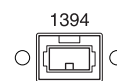
2 Connecting the Camera Cable (Fig. 2)

- 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 D21-CB 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

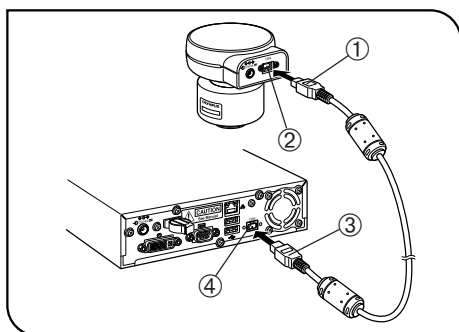


Fig. 2

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 D21-CB.

Ⓞ When you connect the microscope digital camera DP21/DP26 to the control box D21-CB, the microscope digital camera DP21/DP26 is recognized automatically. It is not required to perform any configuration or so after connection.

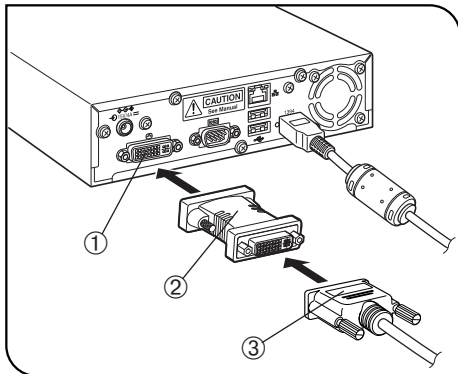


Fig. 3

3 Connecting the Display Cable (Fig. 3)

CAUTION

Make sure to use the DVI protection adapter always, since some electrical failure may be caused, if the control box D21-CB is directly connected to the display.

1. Insert DVI protection adapter ② all the way into the connector ① on the control box D21-CB and secure the clamping screws on both sides of the DVI protection adapter.
2. Insert the connector ③ of the cable provided with the display all the way into the DVI protection adapter ② and secure the clamping screws on both sides of the connector.

- Ⓞ When disconnecting the display cable, disconnect only the connector of the display cable ③, and do NOT disconnect the DVI protection adapter ② from the control box D21-CB.
- Ⓞ Use a DVI cable matching the display as the display cable. The DVI protection adapter is compatible with either the DVI-I, D or A connector.

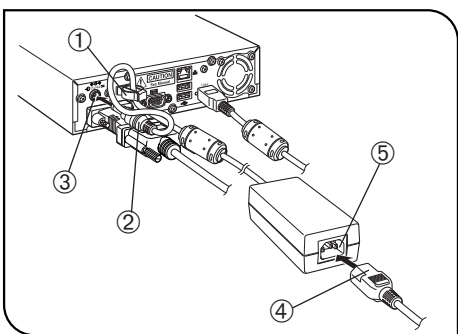


Fig. 4

4 Connecting the AC Adapter (Fig. 4)

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 D21-CB and close the holder ① securely. This measure is required to prevent the cable from easily disconnecting from the control box D21-CB.
2. Insert the output plug ② of the AC adapter into the DC input connector ③ of the control box D21-CB.

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 D21-CB generate heat after long hours of use, but this is not malfunction.

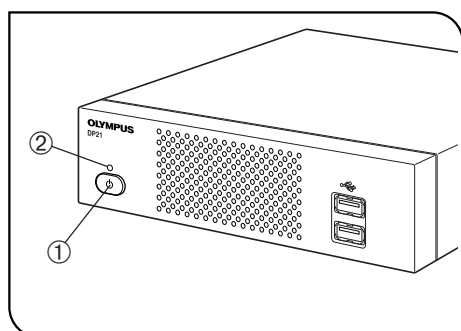


Fig. 5

Disconnecting the AC Adapter

Press the main switch ① of the control box D21-CB to shut down the control box D21-CB 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 output 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 D21-CB, 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 power cord 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.

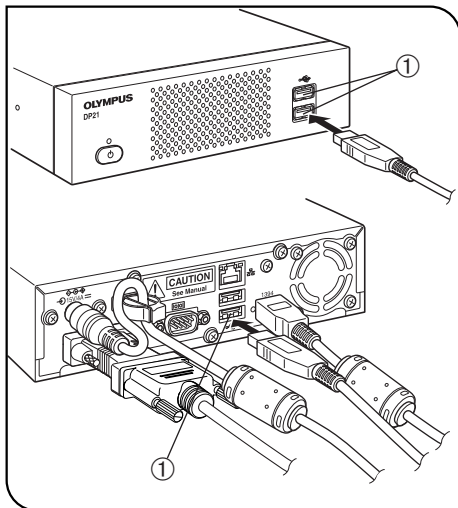


Fig. 6

5 Connecting the Hand Switch D21-HS (Fig. 6)

Insert the USB cable connector of the hand switch D21-HS into one of the USB ports ① of the control box D21-CB.

- Ⓞ The control box D21-CB has a total of four USB ports. The hand switch D21-HS function is identical regardless of the connected USB port so the user can select any USB port as desired.

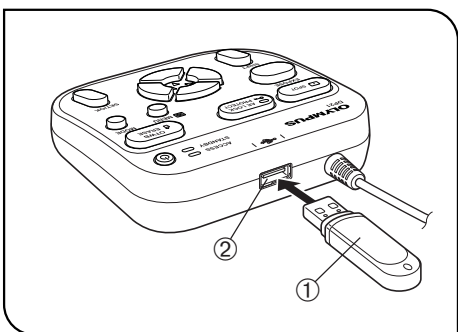


Fig. 7

6 Inserting the USB memory (Fig. 7)

Insert the USB memory ① all the way into the USB port ② of the hand switch D21-HS.

7 Applicability of USB Device

CAUTION USB memory

- Ⓞ Do not connect a USB device other than the USB memory provided with the DP21-SAL into the USB port of the hand switch D21-HS. Otherwise, malfunction may result. If you use a commercially available USB memory, connect it to a USB port of the control box D21-CB. The USB memory provided with the DP21-SAL can also be used by inserting it into a USB port of the control box D21-CB.
- Ⓞ The ACCESS LED of the hand switch D21-HS 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 D21-HS 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.

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

Ⓞ When using a USB keyboard or mouse, connect it to a USB port of the control box D21-CB.

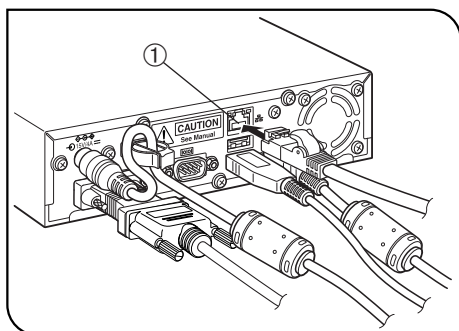


Fig. 8

Connection to a LAN (Fig. 8)

Insert the LAN cable into the LAN connector ① on the rear of the control box D21-CB.

Ⓞ The LAN connection is necessary only when the DP21-SAL 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 60 for details on the network setting.

4 BASIC IMAGE RECORDING PROCEDURE

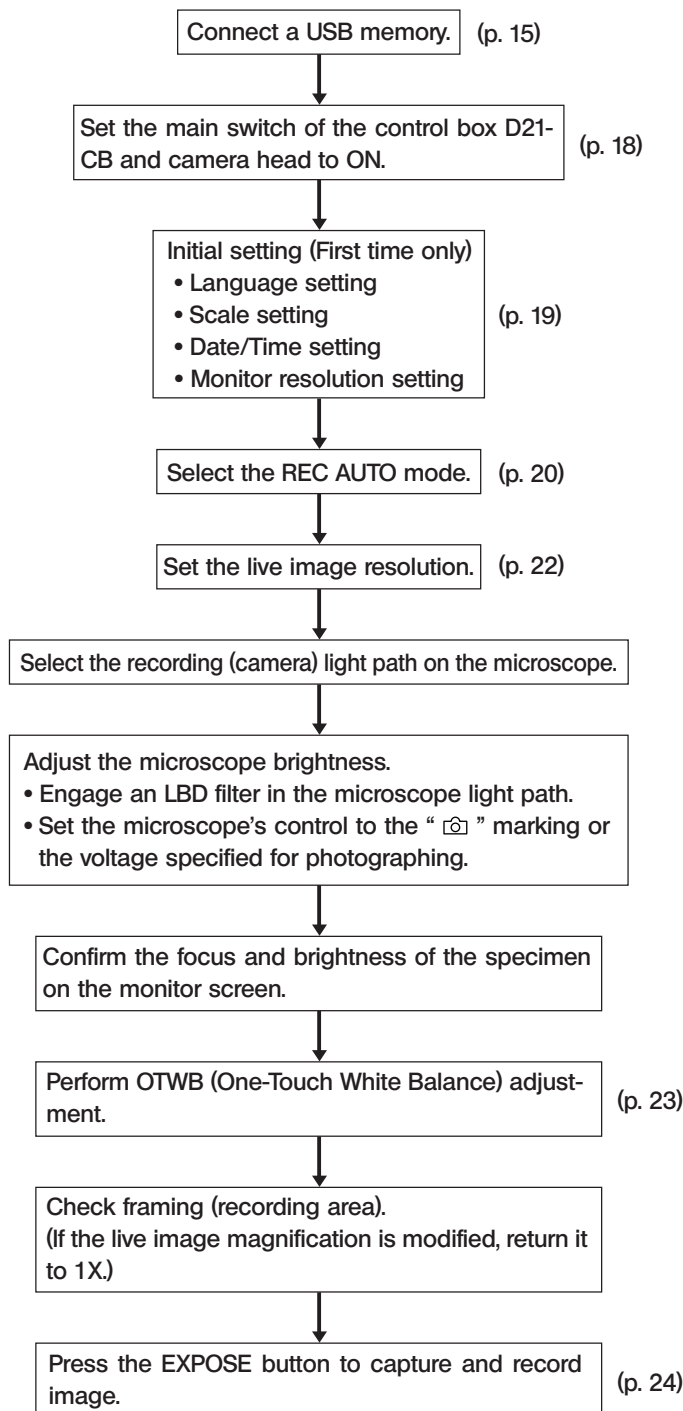
This section describes the basic operating procedure of the microscope digital camera (from turning power ON to image recording) and the initial setting method.

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

Operation flow

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

◎ Adjust the parfocality of the microscope's eyepieces and the live image 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 D21-HS and/or control box D21-CB. 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 → 1:1 (equal size) → 2x → 4x. Focusing will be easier at a high zoom ratio (p. 28).
 - The accurate focusing can be identified easily by displaying the focusing indicator on the monitor screen (p. 40).
 - 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 of the halogen lamp, the color temperature of the illumination may change and affect the recorded image.
- Set the image quality (p. 31), SPOT metering (p. 27), AE LOCK (p. 28) and exposure adjustment (p. 27) as required.
 - The brightness and color tone of the live image displayed on the monitor may sometimes differ from those that are recorded actually.

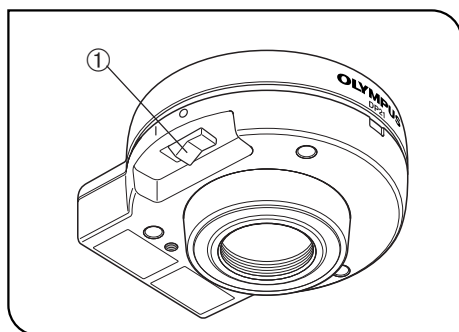


Fig. 9

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 D21-CB to turn it ON.

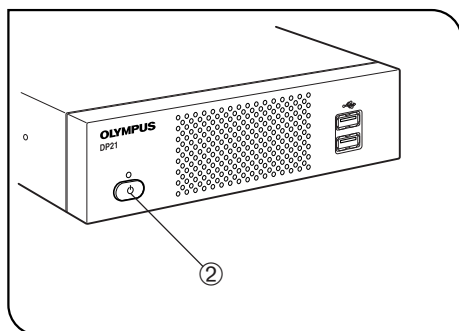


Fig. 10

Turning power OFF

Press the main switch ② of the control box D21-CB to turn it OFF.

- Ⓞ If the main switch is kept pressed (for about 4 seconds or more) when the power is OFF, the control box D21-CB will be forcefully shut down, which may make the MENU settings and scale function unable to be stored in memory. So be careful.
- Ⓞ With the DP21/DP26 system, a main switch is provided on the hand switch D21-HS, (called the standby switch), control box D21-CB and camera head. The following table shows what happens when each of these main switches are set to OFF.

Control box D21-CB	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 D21-HS. The STANDBY LED turns off when the system is shut down.
Hand switch D21-HS	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 DP21/DP26	Switches only the camera OFF. The control box D21-CB and hand switch D21-HS 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 D21-CB or hand switch D21-HS 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 D21-CB to shut down the system whenever possible.
- Ⓞ If the control box D21-CB 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/DP26 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 D21-CB 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 D21-CB to restart the system.

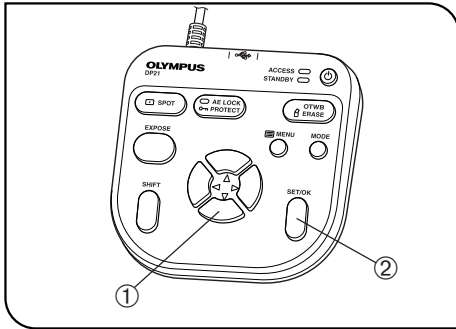


Fig. 11

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 D21-HS and/or control box D21-CB. They can be reconnected after completion of restarting (auto restart) after the setting.

If the control box (U-CBS, etc.) is connected to the control box D21-CB, refer to "FUNCTIONS INTERLOCKED WITH MICROSCOPE OPERATIONS" on page 63 for initial 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 control box D21-CB restarts after completion of the setting.

Ⓞ See page 57 for the language setting and page 38 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. 56)" and "Monitor resolution setting (p. 59)."

Ⓞ 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 D21-HS: 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.

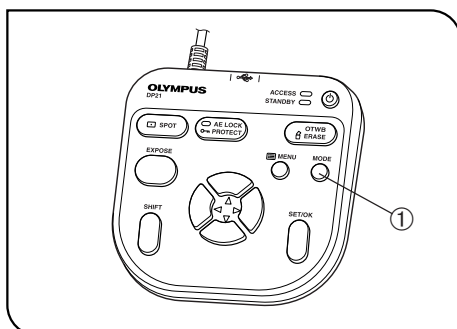


Fig. 12

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 power 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.

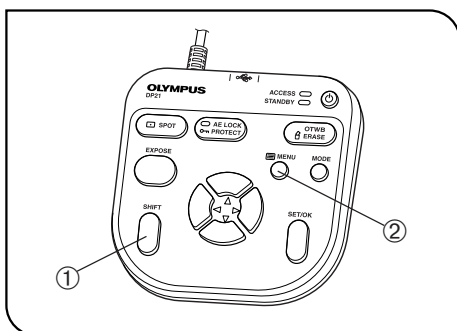
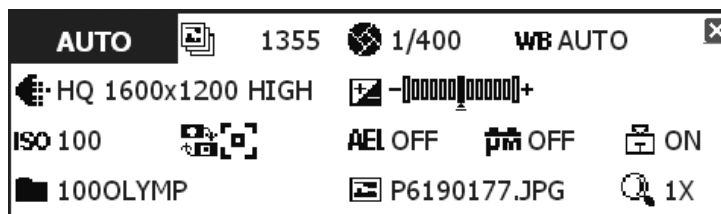


Fig. 13

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.
- Ⓞ The screen displayed may be partially different depending on the camera (DP21 or DP26) to be combined.

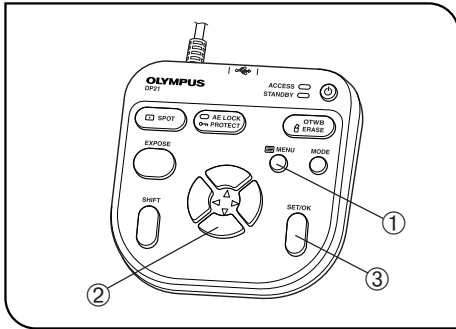
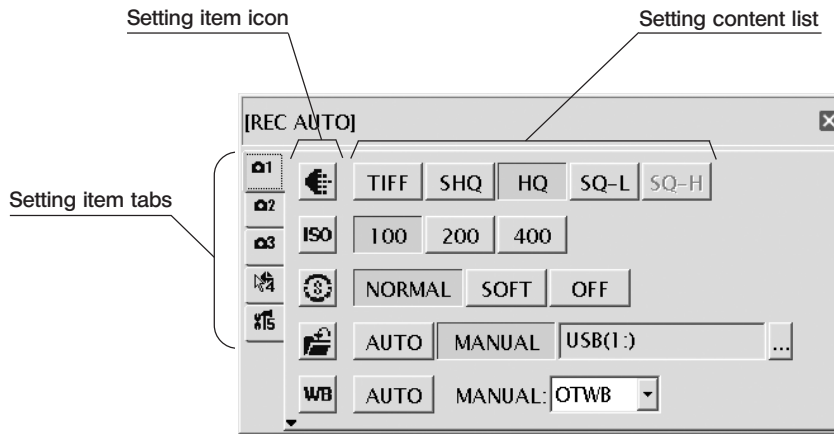


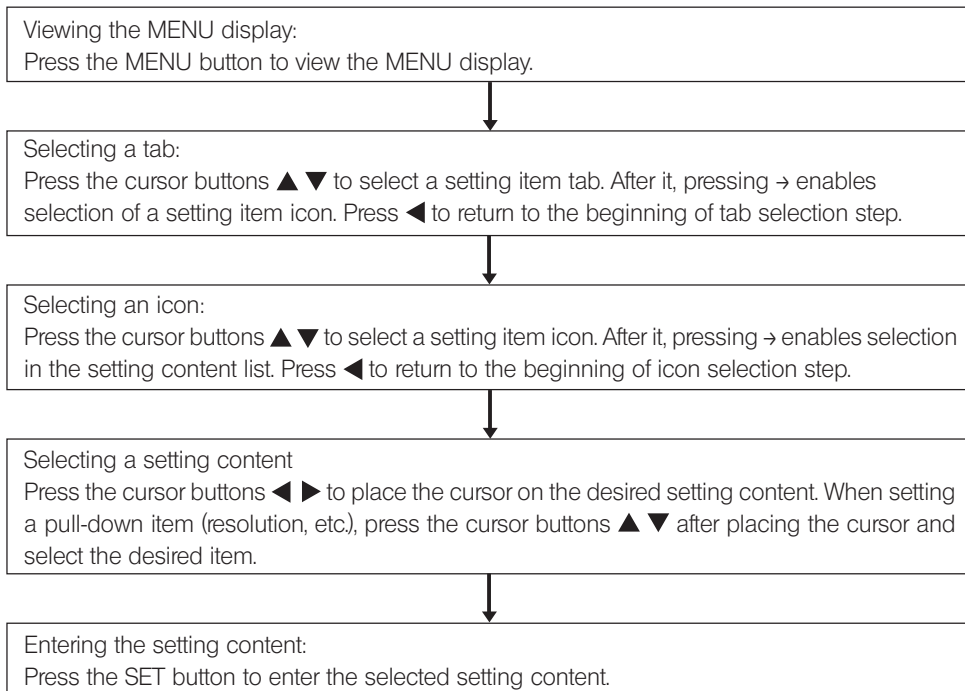
Fig. 14

5 Viewing/Controlling the MENU Display

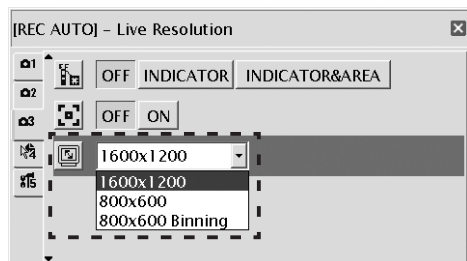
1. Press the MENU button ① to view or hide the MENU display alternately. For details on the MENU display items, see MENU display (p. 10). The MENU display is hidden with the default setting.
2. Press the cursor buttons ② to select an item and press the SET button ③ to enter the selection.



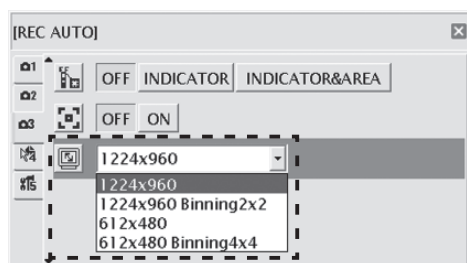
Basic operation flow of the MENU display



DP21



DP26



6 Setting the Live Resolution

You can select the live image resolution.

	DP21	DP26
High resolution	1600 x 1200 Frame rate: 15fps	2448 x 1920 Frame rate: 7fps
Low resolution	800 x 600 Frame rate: 27fps	1224 x 960 Frame rate: 16fps
		612 x 480 Frame rate: 16fps
Binning	800 x 600 Binning Frame rate: 27fps Sensitivity: 4 times higher	1224 x 960 Binning Frame rate: 16fps Sensitivity: 4 times higher
		612 x 480 Binning Frame rate: 16fps Sensitivity: 8 times higher

High resolution: High-definition image observation/recording, which is recommended when viewing clear image on a large monitor screen.

Low resolution: Image observation at a high frame rate displays smooth live images even when the target moves during examination, etc.

Binning: Sensitivity is higher than other modes. Observation and recording of bright image are possible even the target is dark.

Ⓞ 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 59.

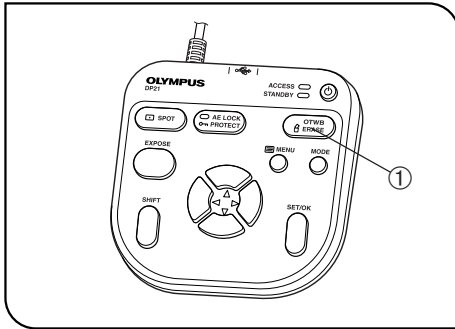


Fig. 15

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. 35).

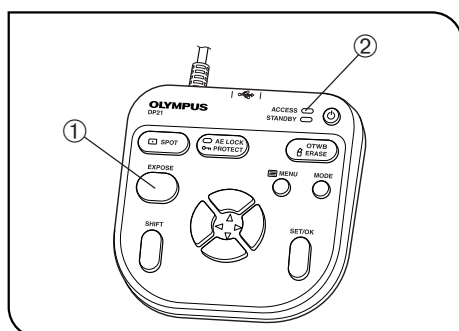


Fig. 16

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. 28) or display the focusing indicator (p. 40).

2. Press the EXPOSE button ① to record the still image, which is saved in the USB memory connected to the control box D21-CB or hand switch D21-HS.

Ⓞ Switching the Rec View setting (p. 37) 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. 33). 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 36 for details.

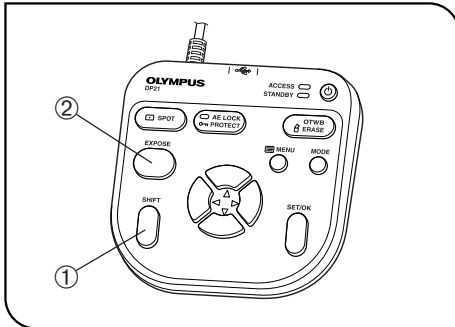
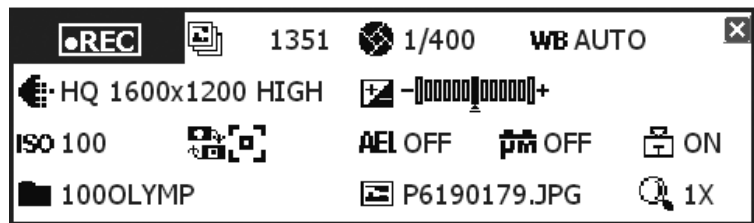


Fig. 17

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 (DP21)
408 x 320 (DP26)
- 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 36 for details.

Tip

The movie save destination can be changed (p. 33). 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).

5 RECORDING FUNCTION SETTING / OPERATION (REC)

5-1 Operation using the hand switch D21-HS

This section describes the method of operating the basic functions using the hand switch D21-HS. The hand switch D21-HS has buttons to which the functions frequently used in microscope observation are assigned to facilitate the recording of clear images.

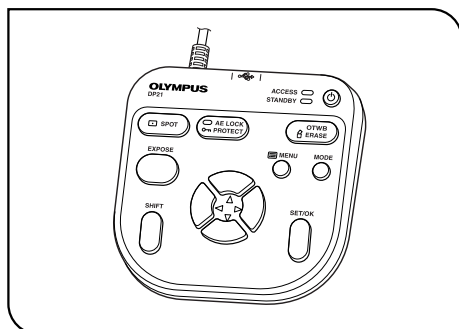


Fig. 18

1 Available Functions

The hand switch D21-HS of the DP21/DP26 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. 27 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.		Set the entire live image white when executing OTWB. See p. 23 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.

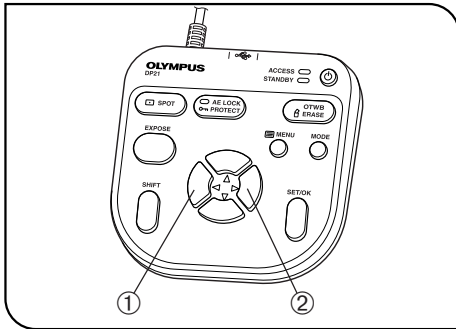


Fig. 19

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 D21-HS to hide it.

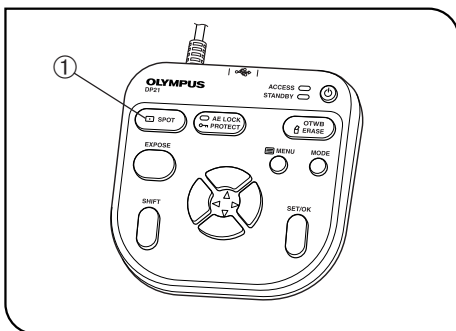


Fig. 20

3 SPOT Metering Setting

REC AUTO mode

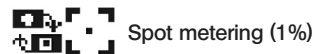
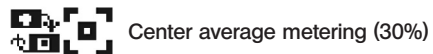
Ⓞ When the observation target is dispersed in the image, the image may become too bright or too dark due to the effect of the background. In such a case, the problem may sometimes be improved by changing the metering area.

Ⓞ 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.

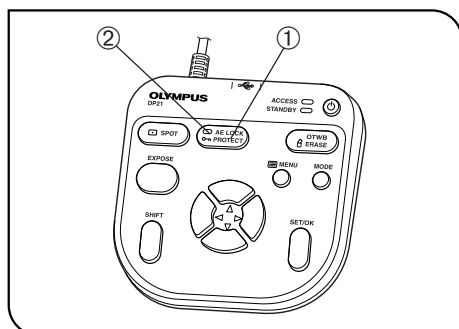


Fig. 21

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.

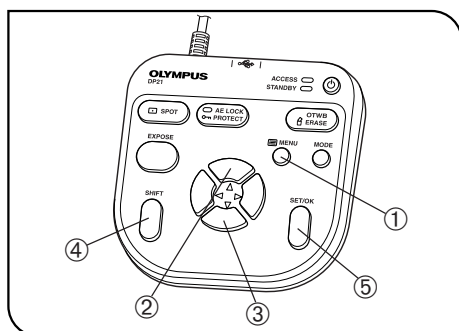


Fig. 22

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 → 1:1 (equal size) → 2x → 4x and ▼ ③ switches it to 4x → 2x → 1:1 (equal size) → 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.
- ⓄDepending on the display resolution, the display changes as: 1x, 2x, 4x.

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.)	28
<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	38
<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	54
<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	25
<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.	59

5-2 Operation using the MENU display

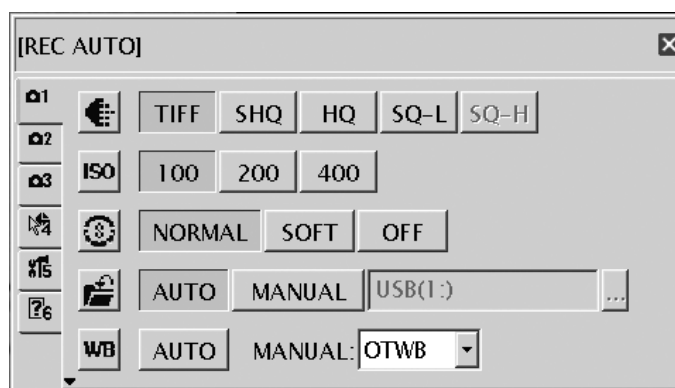
This section describes the operation method of the functions that are available in the MENU display on the monitor screen. This section pertains to the recording operation (in the REC AUTO/REC MANUAL modes). See page 21 for the basic operations and flow of the MENU display.

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. 37).



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 (DP21): HQ

Default (DP26): 2448 x 1920, JPEG-LOW

DP21

Ⓞ Select the quality of the recorded image.

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

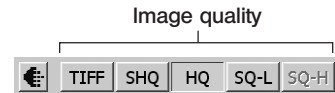
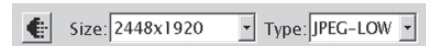


Image quality mode	Compression rate	Save format	Recording pixels	File capacity
TIFF	No compression	TIFF	1600 x 1200	Approx. 5760 KB
SHQ	LOW (1/2.7)	JPEG	1600 x 1200	≤ Approx. 2140 KB
HQ	HIGH (1/8)	JPEG	1600 x 1200	≤ Approx. 720 KB
SQ-L	LOW (1/2.7)	JPEG-LOW	800 x 600	≤ Approx. 535 KB
SQ-H	HIGH (1/8)	JPEG-HIGH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

DP26



Set the number of pixels and the save format of the recorded image.

Item	Specification
Image size	2448 x 1920, 1224 x 960, 612 x 480, 1224 x 960 Binning, 612 x 480 Binning
File format	TIFF, JPEG-LOW, JPEG-HIGH

Ⓞ If the live image resolution is set by Binning (1224 x 960 Binning or 612 x 480 Binning), the same number of pixels are set to Size automatically. For the live image resolution, refer to p. 22.

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

Ⓞ The file capacities of the still image are shown below.

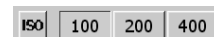
	TIFF	JPEG-LOW	JPEG-HIGH
2448 x 1920	Approx. 14100KB or less	Approx. 5230KB or less	Approx. 1770KB or less
1224 x 960	Approx. 3530KB or less	Approx. 1310KB or less	Approx. 445KB or less
1224 x 960 Binning	Approx. 3530KB or less	Approx. 1310KB or less	Approx. 445KB or less
612 x 480	Approx. 885KB or less	Approx. 330KB or less	Approx. 115KB or less
612 x 480 Binning	Approx. 885KB or less	Approx. 330KB or less	Approx. 115KB or less

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."

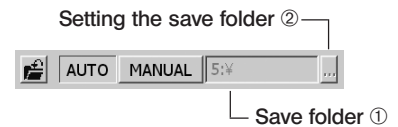
"NORMAL" sharpens the image contours and is suitable for appreciation of prints, etc. "SOFT" reproduces contours in a natural feeling. "OFF" does not apply sharpness correction and is therefore suitable for subjecting to post image processing on a PC, etc. Select the optimum setting according to situations.



5 Save Folder Setting

Default: AUTO

When more than one DP21/DP26 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 D21-HS or control box D21-CB. 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. 36)."

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 D21-HS, 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 D21-HS 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 D21-HS, 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 D21-HS or the mouse.
3. Press the SET/OK button of the hand switch D21-HS 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 D21-HS.

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	<p>The arbitrary white balance value can be set.</p> <p><u>When using DP21</u></p> <p>The white balance can be selected from OTWB or color temperatures (3000K, 3700K, 4000K, 4500K, 5500K or 6500K).</p> <p>OTWB: Retrieves the white balance value which was set when the OTWB button of the hand switch D21-HS was pressed last time.</p> <p>Color Temperature: Specifying the arbitrary color temperature allows you to obtain the color suitable for each color temperature.</p> <p><u>When using DP26</u></p> <p>The white balance can be selected from OTWB or Gain (U Gain or V Gain).</p> <p>OTWB: Retrieves the white balance value which was set when the OTWB button of the hand switch D21-HS was pressed last time.</p> <p>Gain: U Gain or V Gain can be set individually. Set the Gain value according to your preference.</p> <p>Setting Range: 0 to 383</p> <p>Default Value: U 210, V 230</p>

© Pressing the OTWB button of the hand switch D21-HS sets the OTWB mode automatically.

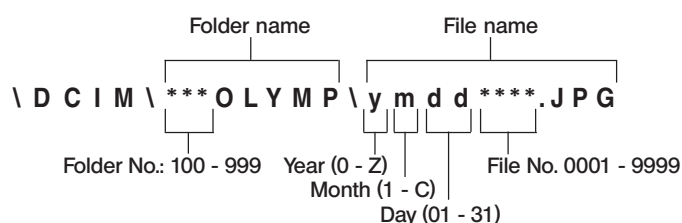
© When OTWB is selected in the MANUAL mode, the white balance value set when the OTWB button on the hand switch D21-HS was last pressed is recalled. Therefore, if the lighting condition such as the brightness was different from the moment the OTWB button was last pressed, the optimum color tone would not be obtained. If this happens, view a white image on the live view and execute the OTWB adjustment operation again (p. 23).

7 Folder and File Names

When an image is recorded, the DP21/DP26 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/DP26 is automatically given the folder and file names as shown below.



* The last one digit of the file name is used for notation of the year.

The digits "0" to "9" stand for the year "2000" to "2009".

The alphabets A, B, C, ... stand for the years after "2010".

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>\ymddxxx.JPG

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

TIFF	: .TIF
SHQ, HQ, SQ, JPEG-LOW, JPEG-HIGH	: .JPG
Movie	: .AVI

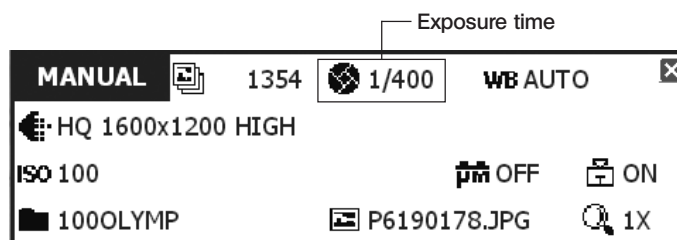
5-3 Applied Operation

This section describes the applied functions of the DP21-SAL. 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.

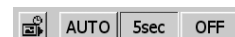
1. Press the MODE button of the hand switch D21-HS to select the REC MANUAL mode.
2. Press the cursor buttons ◀▶ to set the exposure time. The setting can be confirmed on the INFO display.



2 REC VIEW Setting

Default: 5 sec.

The DP21-SAL 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

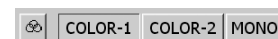
- ◎ The image can be displayed either in color or monochrome.
 - The color setup is applied to the live image as well as the recorded images.
 - Two color modes (COLOR-1/COLOR-2) are available and offer different color tone reproductions.
- ◎ The color reproduction can sometimes be improved by changing color setting according to the specimen or the purpose of observation. Please try and find the best color reproduction.

When using the DP21, the basic criterion for selection of COLOR-1 and COLOR-2 is determined by the microscope in use.

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

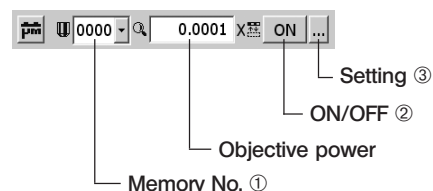


4 Scale Display Setting

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.

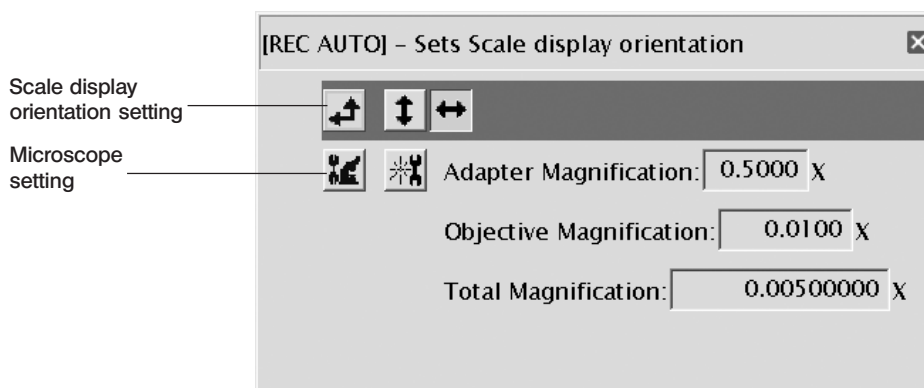


4-1 Displaying a Scale

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

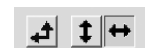
4-2 Setting a scale

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 D21-HS and/or control box D21-CB. 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 67.

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 D21-HS: 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.



Microscope Setting Wizard / 顕微鏡設定ウィザード

Step1

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.
アダプタレンズ倍率を指定してください。アダプタレンズ倍率は、対物レンズと接眼レンズを除く光学素子の倍率を掛け合わせて計算します。

Magnification of adapter lens : (00.0100~99.9999)
アダプタレンズ倍率

[LEFT]/[RIGHT] : [INTEGER PART]<->[FRACTION PART] / [整数]<->[小数]
[UP]/[DOWN] : [INCREASE/DECREASE] / [数値増減]

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

② Enter the number of revolving nosepiece positions.



Microscope Setting Wizard / 顕微鏡設定ウィザード

Step2

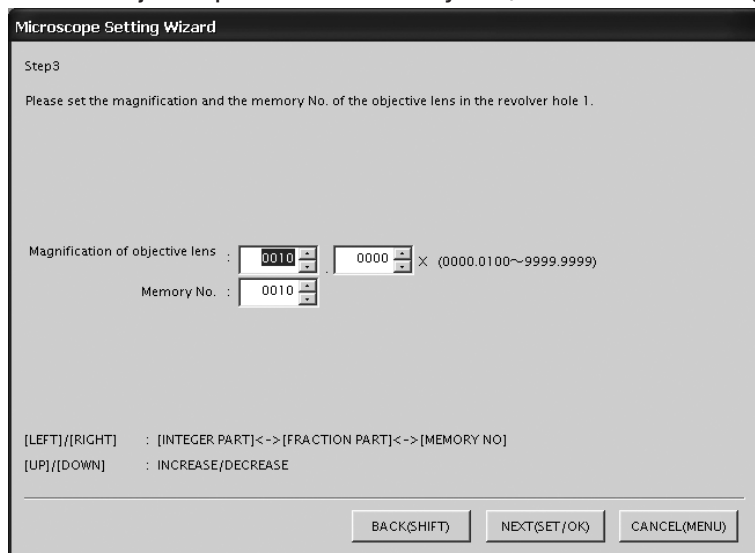
Please set the number of revolver holes.
レボルバの穴数を指定してください。

Number of revolver holes : (1~8)
レボルバ穴数

[LEFT]/[RIGHT] : -----
[UP]/[DOWN] : [INCREASE/DECREASE] / [数値増減]

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

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

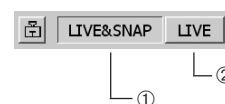


5 Scale Display Range Setting

Default: LIVE & SNAP

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

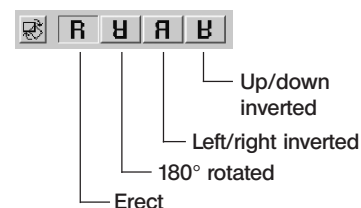
- ① To display the scale in both live and recorded images.
- ② To display the scale only in the live image (the scale is not displayed in the recorded images).
- Ⓞ This setting is also applied to the measurement-related display.



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.

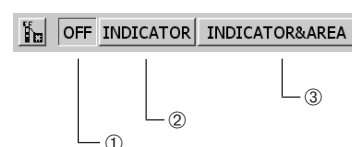


7 Focusing indicator Setting

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

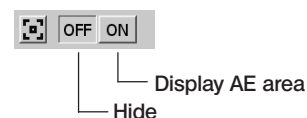
- ⊙ The focusing area can be displayed on or hidden from the monitor screen.

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 27 for the metering area setting.





9 Measurement Functions

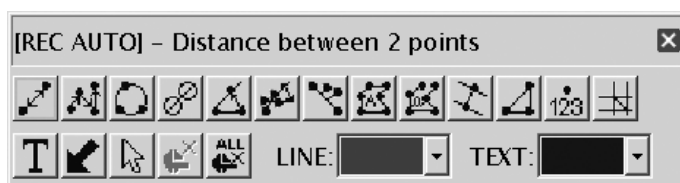
Distances and areas in the image can be measured. The measurements are possible by using the hand switch buttons or the mouse connected to the control box D21-CB.





















- Ⓞ The scale should be set before measurements. For the setting method, see Scale Display Setting (p. 38).
- Ⓞ 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. 40).
- Ⓞ We recommend you to use the same live resolution as the image quality mode during recording.
If the live resolution is different from the image quality mode, the measurement result may be shifted.
- Ⓞ If text input is required, connect the keyboard to the control box D21-CB.
- Ⓞ 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 D21-HS, 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 D21-HS (or click on  on the upper right of the MENU display if you are using the mouse).

Measurement menu



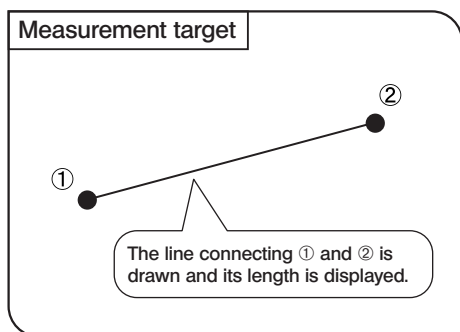
Measurement function list

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. 44
	Poly-Line	Measures the total sum of the distances between multiple specified points.	Up to 100 points can be specified per measurement.	p. 44
	3 Points Circle	Draws a circle (based on 3 specified points) and measures its diameter and area.		p. 44
	Distance between 2 Circle Centers	Draws 2 circles and measures the distance between their centers.		p. 45
	3 Points Angle	Draws an angle based on 3 specified points and measures it.		p. 45
	4 Points Angle	Draws 2 lines based on 4 specified points and measures the angle formed at their intersection.		p. 46
	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. 46
	Polygon Area	Draws a polygon and measures its area.	Up to 100 corners can be specified per polygon.	p. 47
	Boundary Length	Draws a polygon and measures the total length of its sides.	Up to 100 corners can be specified per polygon.	p. 47
	Distance of Parallel Lines	Draws 2 parallel lines and measures the distance between them.		p. 48
	XY Distance	Specifies 2 points and measures the XY distances and R distance between them.		p. 48
	Count	Draws markings on the screen.	Up to 50 points can be counted.	p. 49
	Cross Line	Specifies 1 point and measures the distance between the image center (origin point) and it.		p. 49
	Text	A text can be inserted.	Max. 32 characters can be entered. This function is unavailable unless the keyboard is connected.	p. 50
	Arrow	An arrow can be inserted.		p. 50
	Select	Selects one of the displayed measurement results.		p. 50
	Erase	Erases the selected measurement result.		p. 50
	Erase All	Erases all of the displayed measurement results.		p. 51

Distance of 2 Points



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

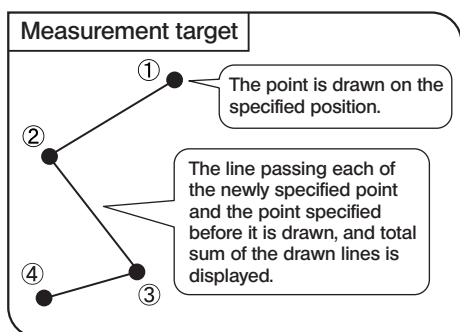


1. When is selected, pointer “ ” is displayed. The pointer can be moved using the cursor buttons ▲▼◀▶ or the mouse.
2. Press the SHIFT button on each of the points you want to specify (or left-click the mouse if this is in use). To measure another distance, press the SHIFT button at each of the points 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.

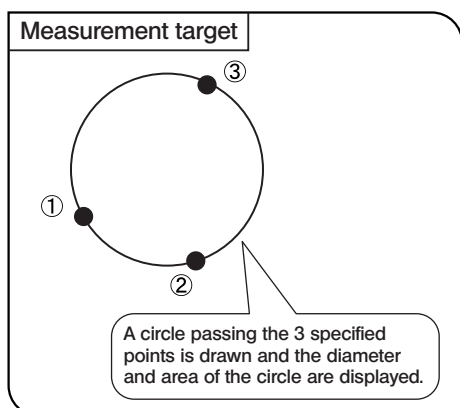


1. When is selected, pointer “ ” is displayed. The pointer can be moved using the cursor buttons ▲▼◀▶ or the mouse.
2. Press the SHIFT button on each of the points you want to specify (or left-click the mouse if this is in use). From the second point and on, the line connecting the point and the previously 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.

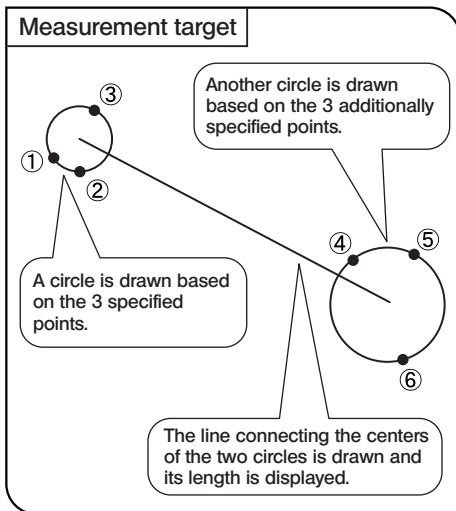


1. When is selected, pointer “ ” is displayed. The pointer can be moved using the cursor buttons ▲▼◀▶ or the mouse.
2. Press the SHIFT button on each of the points you want to specify (or left-click the mouse if this is in use). To measure another circle, press the SHIFT button at each of the points 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.

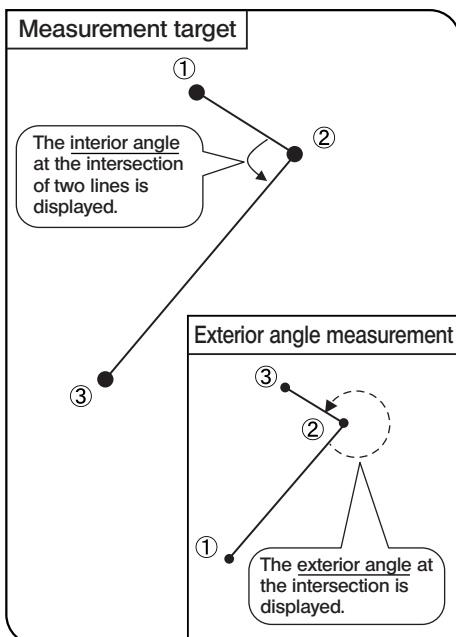


1. When is selected, pointer “” is displayed. The pointer can be moved using the cursor buttons or the mouse.
2. Press the SHIFT button on each of the points you want to specify (or left-click the mouse if this is in use). To measure another couple of circles, press the SHIFT button at each of the points 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).

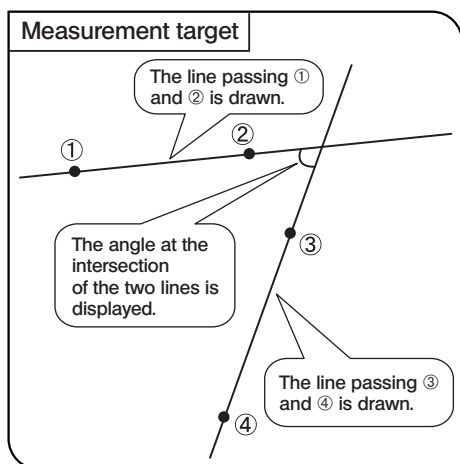
* Interior and exterior angles

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.

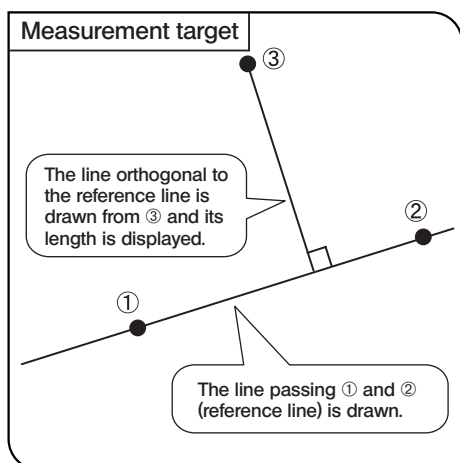


1. When is selected, pointer “” is displayed. The pointer can be moved using the cursor buttons or the mouse.
 2. Press the SHIFT button on the two points you want to specify to draw the reference line (line ①-② in the figure on the left).
 3. Similarly draw another line (line ③-④ in the figure). The 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.

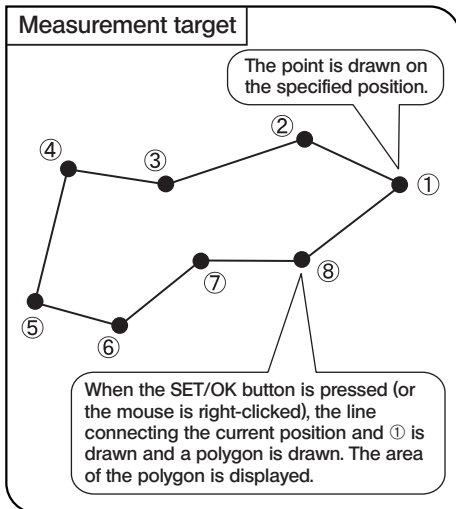
To draw multiple perpendicular lines to the reference line, press the SHIFT button each time. At the last point, press the SET/OK button to draw the perpendicular line.




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.

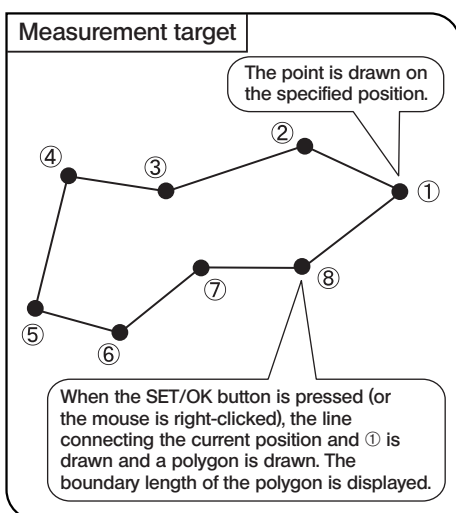





1. When  is selected, pointer “” is displayed. The pointer can be moved using the cursor buttons  or the mouse.
2. Press the SHIFT button (or left-click the mouse if this is in use) on the points desired for drawing a polygon.
3. Press the SET/OK button (or right-click the mouse) to draw a polygon by 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.

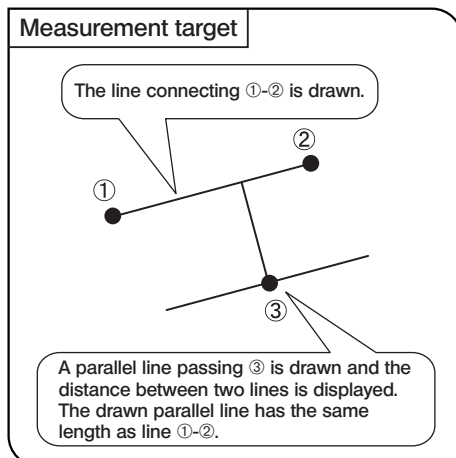


1. When  is selected, pointer “” is displayed. The pointer can be moved using the cursor buttons  or the mouse.
2. Press the SHIFT button (or left-click the mouse if this is in use) on the points desired for drawing a polygon.
3. Press the SET/OK button (or right-click the mouse) to draw a polygon by 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.

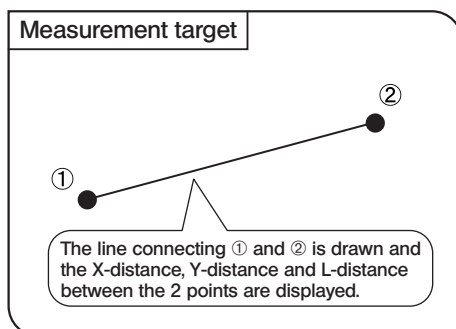


1. When is selected, pointer “” is displayed. The pointer can be moved using the cursor buttons or the mouse.
2. Press the SHIFT button (or left-click the mouse if this is in use) on the points desired for the measurement. If you want to measure the distance of another parallel line, press the SHIFT 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.



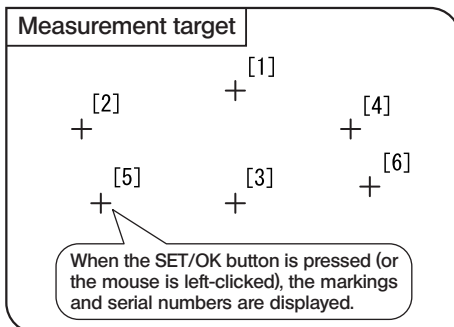
1. When is selected, pointer “” is displayed. The pointer can be moved using the cursor buttons or the mouse.
2. Press the SHIFT button (or left-click the mouse if this is in use) on the points desired for the measurement. If you want to perform another XY distances measurement, press the SHIFT button 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.

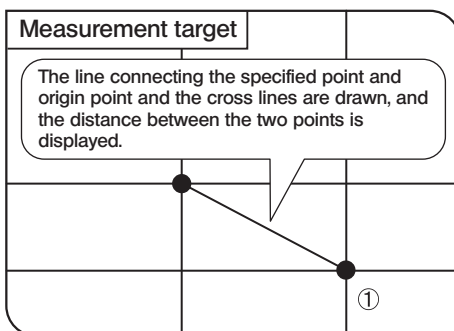





1. When  is selected, pointer “” is displayed. The pointer can be moved using the cursor buttons  or the mouse.
2. Press the SHIFT button (or left-click the mouse if this is in use) on the points to be counted.
3. To end measurement, press the SET/OK button or MENU button (if you are using the mouse,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

Measurement target

Press the SET/OK button (or left click the mouse) to display the edit dialog box for text. Enter text and press the SET/OK button (or left click the mouse) to write the text.






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.




Measurement target

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 D21-HS 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. 40).”
 - Ⓞ 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

6 PLAYBACK FUNCTION SETTING / OPERATION (PLAY)

This section describes the method of image playback using the hand switch D21-HS. The recorded images can be played back and viewed using the hand switch buttons.

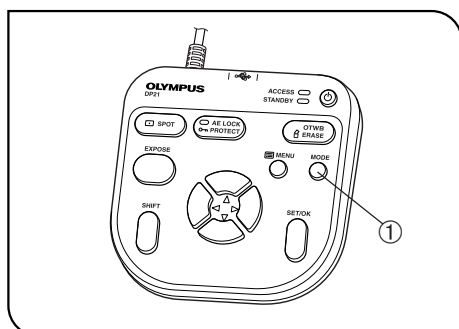


Fig. 23

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.

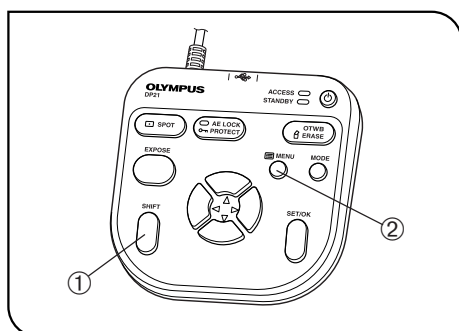
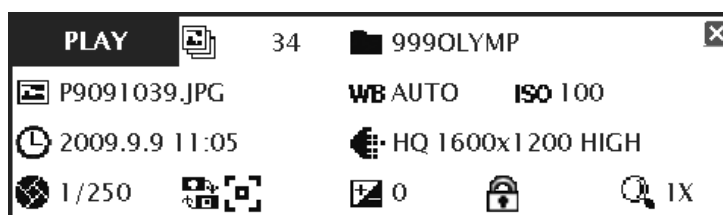


Fig. 24

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.

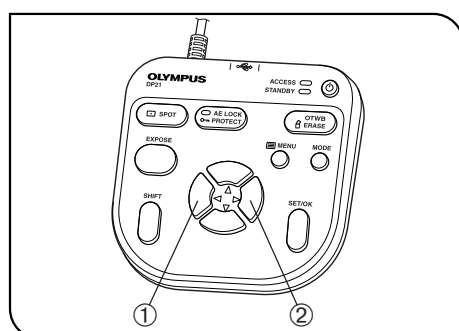


Fig. 25

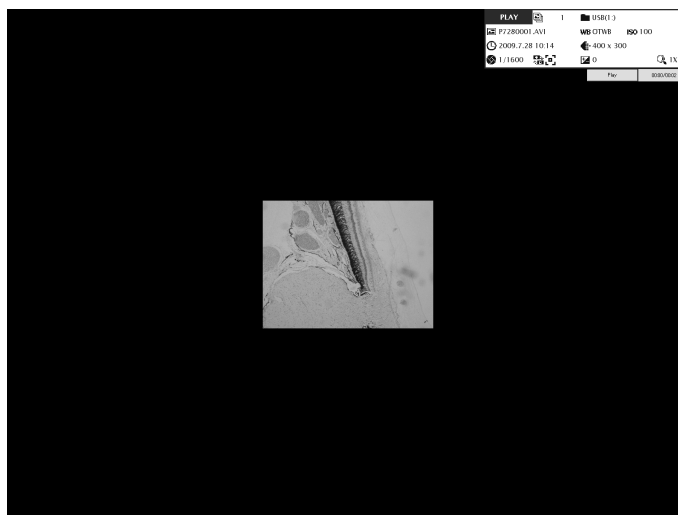
3 Selecting the Played Image

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

- When the PLAY mode is selected, the last recorded image in the folder currently set as the save folder is displayed.
 - 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 57.
- When the folder is changed, the first recorded image in the folder is displayed.
- ◎ When connected to DP21, the 2448 x 1920 image (which can be recorded only when connecting to DP26) cannot be played.

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.

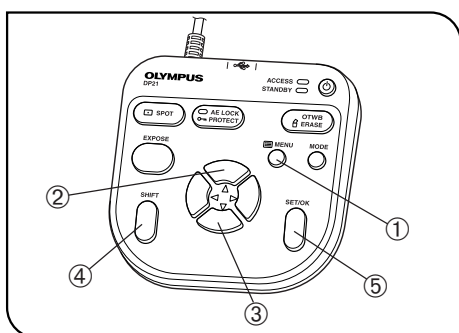


Fig. 26

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 → 1:1 (equal size) → 2x → 4x and ▼ ③ switches it to 4x → 2x → 1:1 (equal size) → 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.

Ⓞ Depending on the display resolution, the display changes as: Index Display, 1x, 2x 4x.

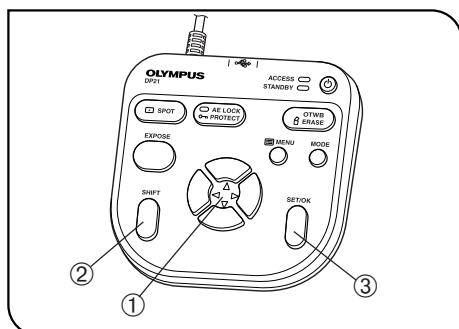
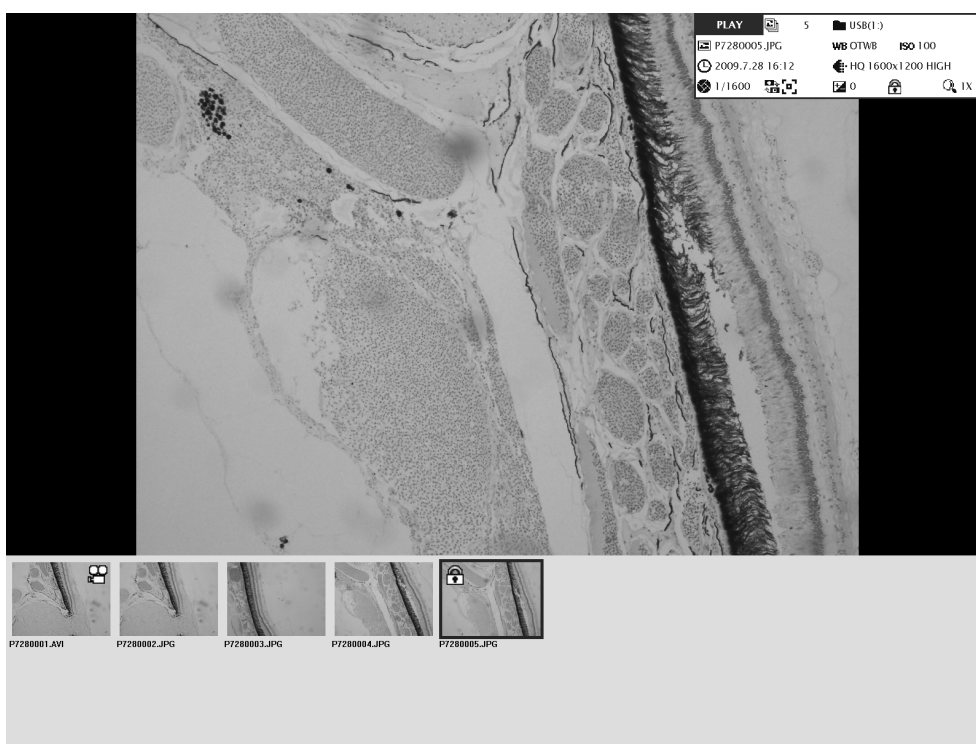


Fig. 27

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. 55) for details.
	Movie file	See "Selecting the Played Image" (p. 52) for details.

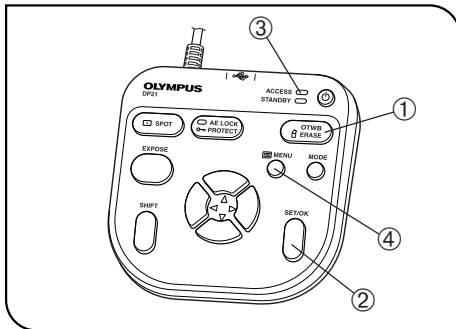


Fig. 28

7 Erasing an Image

An unnecessary image can be erased.

It is also possible to erase all of the images simultaneously (p. 56).

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.

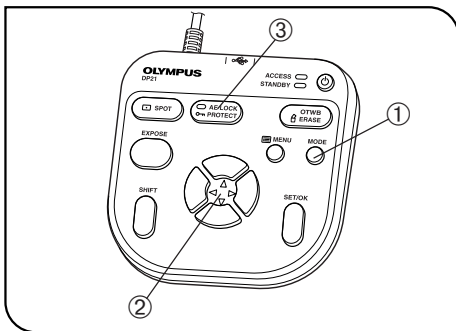


Fig. 29

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. 42)."

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 38.
- Ⓞ 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 or DP26

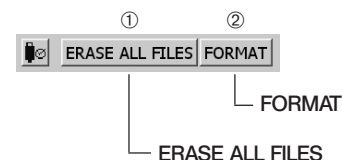


7 MENU DISPLAY FUNCTIONS

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 files in the specified 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. 55) are not erased.

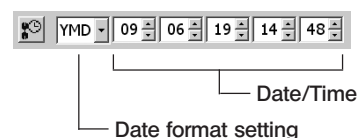
1-2 Formatting a medium

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

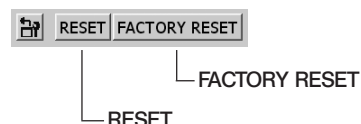
- | | | |
|------------------------------------|--------------------------------------|--|
| • Exposure adjustment: ± 0 | • Image quality: HQ (DP21) | • ISO: 100 |
| • Sharpness: NORMAL | 2448 x 1920, JPEG-LOW (DP26) | • Rec View setting: 5 sec |
| • Focusing: OFF | • WB: AUTO | • Resolution setting: UXGA 1600 x 1200 |
| • Manual exposure time: 1/400 | • Metering mode: 30% average | 1224 x 960 (DP26) |
| • Scale display range: LIVE & SNAP | • AE lock: OFF | • Image color: COLOR-1 |
| • Cross-line display: OFF | • Image display orientation: Erected | • Zoom magnification: 1X |
| • 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. 33). 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. 33).

Ⓞ 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-SAL.

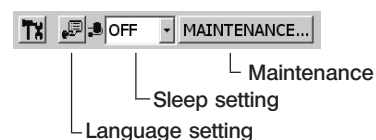
5-1 Language setting Default: English

The language used in the operation can be selected from English and Japanese. When the [Language Setting Wizard] 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 D21-HS and/or control box D21-CB. They can be reconnected after completion of restarting (auto restart) after the setting.





5-2 Sleep setting Default: OFF

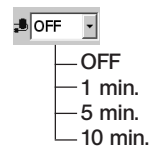
It is possible to turn off the display temporarily when the DP21-SAL has not been controlled for a certain period.

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 D21-HS, mouse or keyboard is controlled.

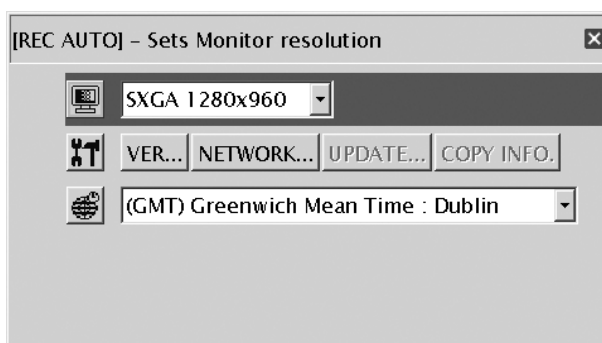
Ⓞ A certain time may be required before the setting change is applied.



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)
- 1920 x 1080 FHD (image display area 1600 x 1080)
- 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.

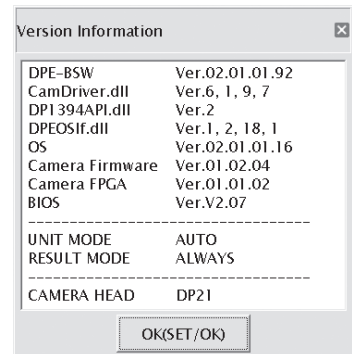
Version information



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)
- System setting version (UNIT MODE, RESULT MODE)
- CAMERA HEAD



Network setting**NETWORK...**

The DP21-SAL can access PCs on a network when the control box D21-CB 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-SAL. (Only the images recorded using the DP21/DP26 can be played back on it. Even when an image is recorded using the DP21/DP26, it may sometimes be unable to be played if it has been edited on the PC.)

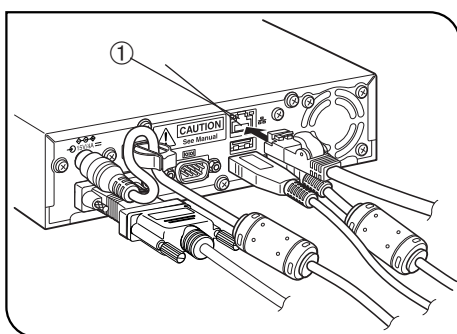
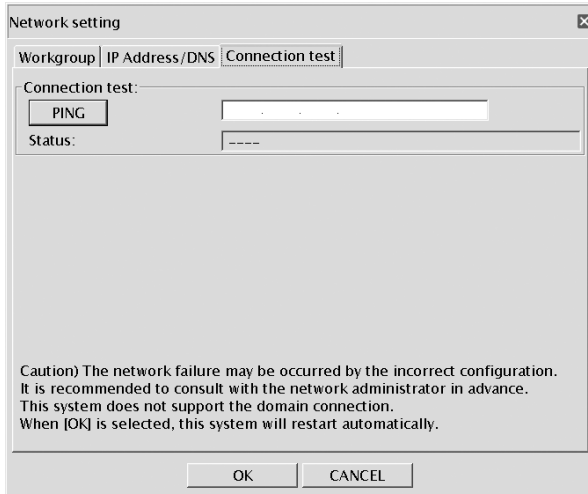
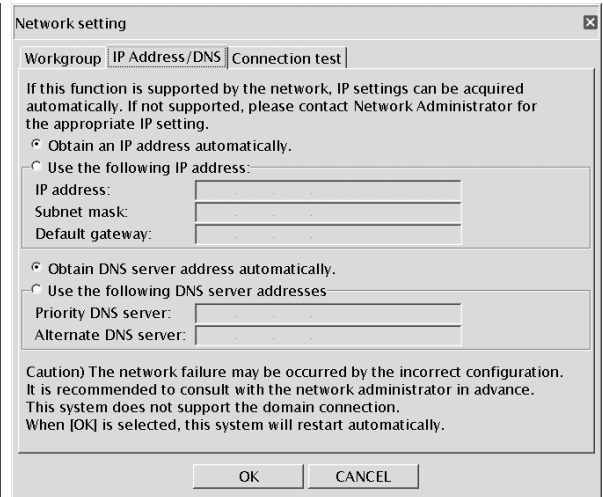
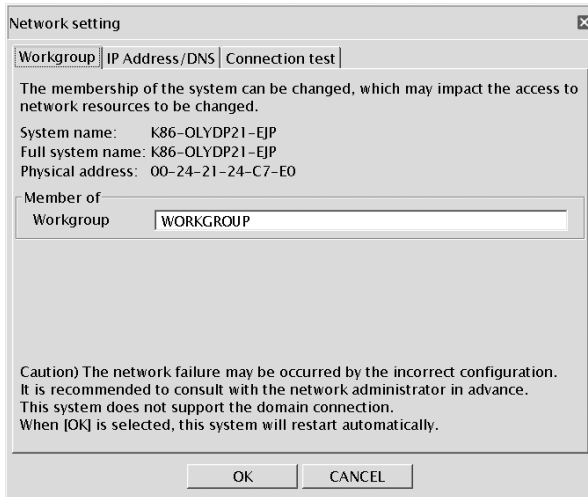


Fig. 30

Network connection method

1. Connect a LAN cable to the LAN cable connector ① of the control box D21-CB.
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-SAL.
 - Ⓞ 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 D21-CB (including restarting when setting the network, etc.), you may not access to the network for first several minutes after DP21-SAL restarts. This is due to that the network-related system settings are being continued after DP21-SAL starts. In this case, after DP21-SAL starts, please wait for a few minutes prior to using.



For the network requirements (including precautions), see page 4.

Update

UPDATE...

This function can update the items related to the DP21/DP26 system such as the camera firmware (items listed in the version information shown on page 59). 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:

. For Life Science

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

. For Industrial Solutions

<http://www.olympus-ims.com/en/service-and-support/downloads/>

Copy system information

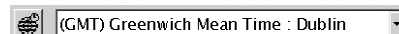
COPY INFO.

This function copies the system information of the DP21/DP26 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.

Time zone



It is possible to set time zone. Set the time zone of the place where you are in.
 (Default position : (GMT) Greenwich Mean Time : Dublin)

7 Operation Using Mouse and Keyboard

When the USB mouse is connected to the control box D21-CB, the DP21-SAL can be controlled using the mouse. However, the functions available with the dedicated buttons on the hand switch D21-HS, 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 D21-CB.

- Ⓞ If the mouse or keyboard is connected to the USB port of the hand switch D21-HS, 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 D21-CB.
- Ⓞ For the compatibility of the mouse and keyboard, see page 15.

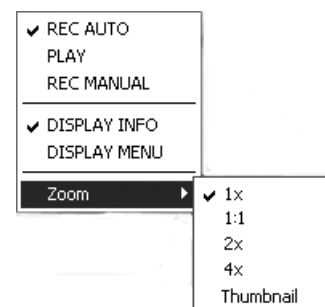
Functions available using the mouse

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/1:1(equal size)/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 "X" 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

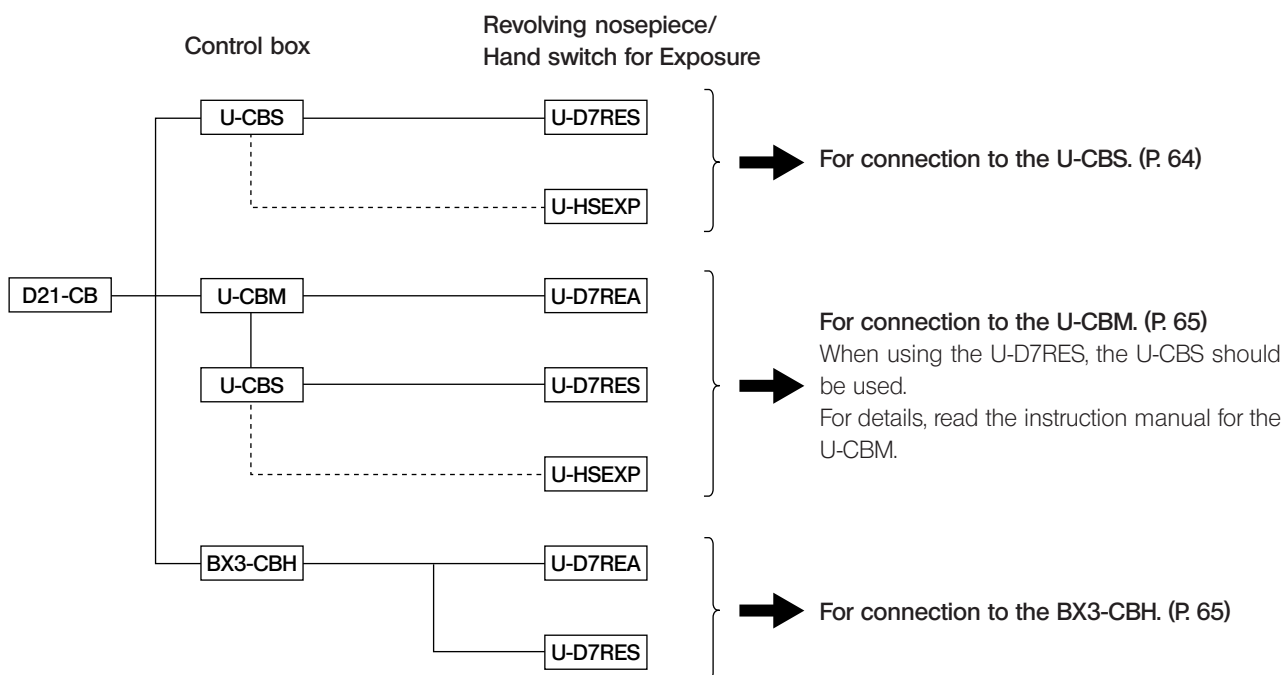
- Text input
- Network setting
- When the save destination on the network has an ID or password set to it
- Save folder setting by direct input of the folder address

8 FUNCTIONS INTERLOCKED WITH MICROSCOPE OPERATIONS

When the DP21-SAL 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 67)."	<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) 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)

8-1 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.

◎ It is also possible to connect the camera to the microscope without the U-D7REM/S. In this case, the auto scale switching function cannot be used.

8-2 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
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

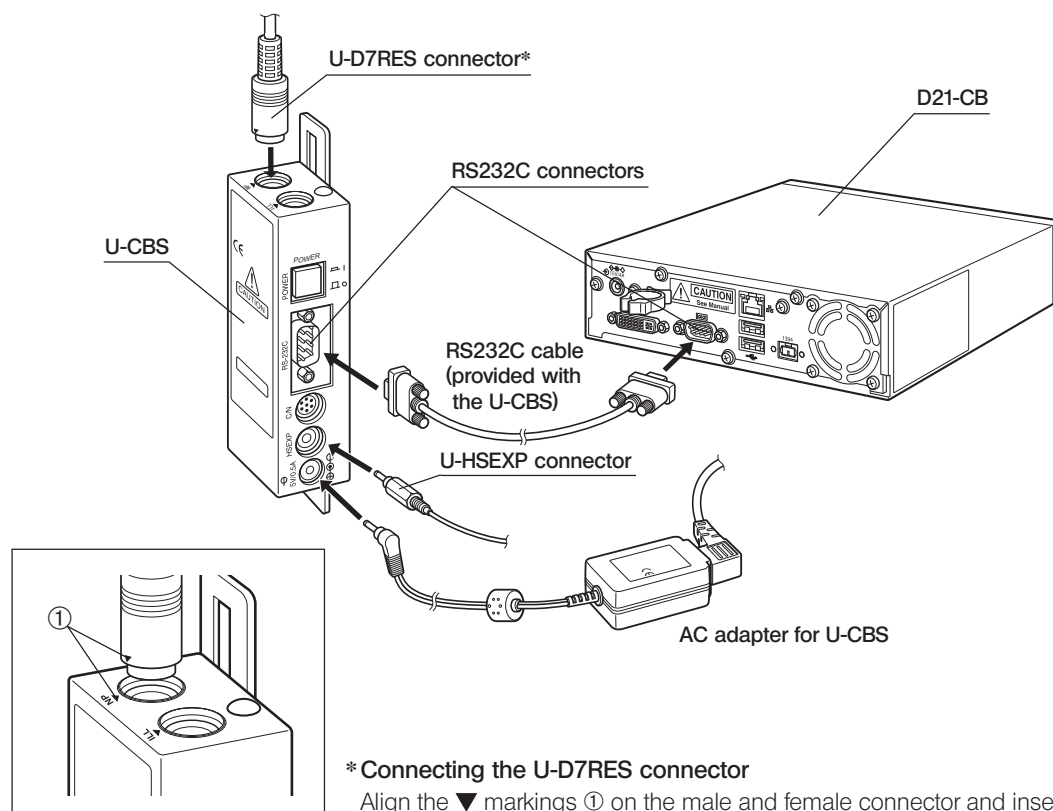
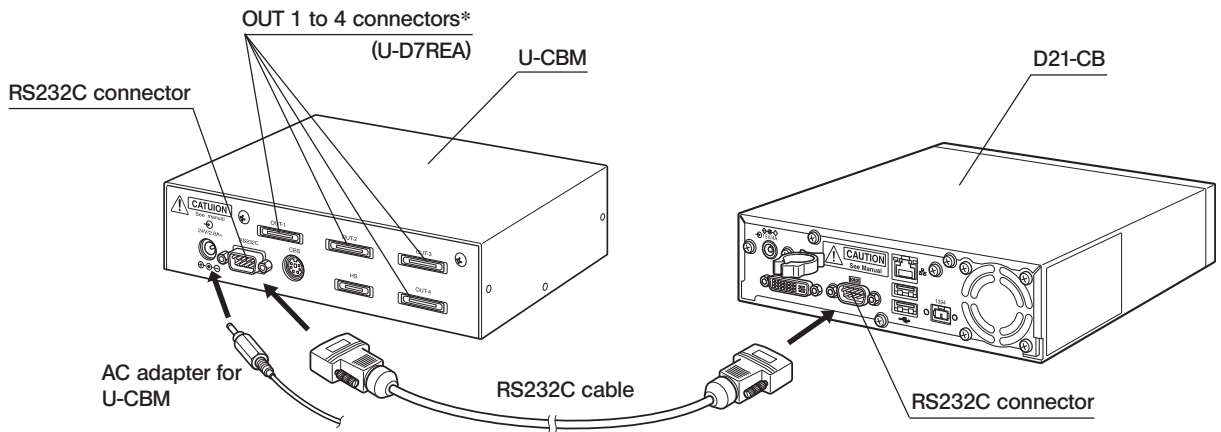


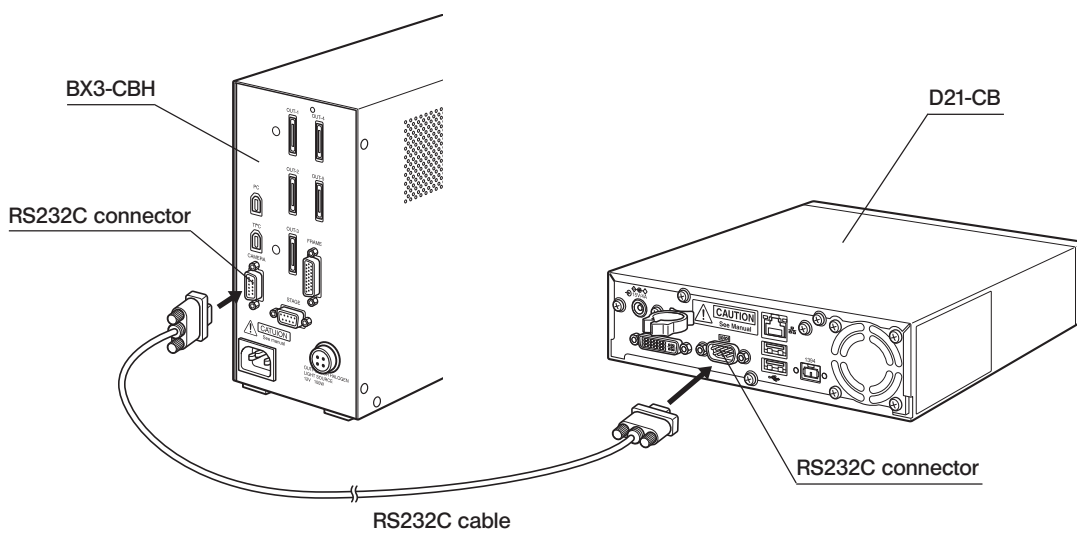
Fig. 31

Connection of U-CBM



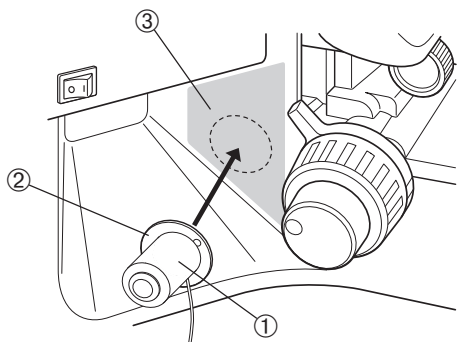
* The OUT 1 to 4 connectors are universal type connectors. The U-D7REA can be connected to any of them.

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.

Ⓞ It cannot be recorded by the shutter switch. Use the hand switch D21-HS to start/finish recording. (p.25)

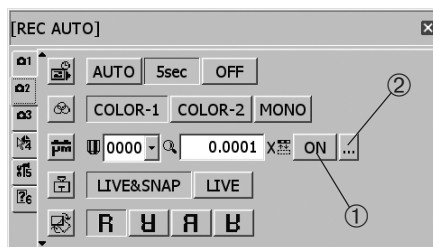
8-3 Operation

This section describes the functions available when the DP21-SAL is connected to a microscope through a control box. Ⓞ The power switches should be set to ON in order of; 1) control box; 2) control box D21-CB. Otherwise, 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-SAL 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-SAL, the objective magnifications can be input with the following procedure.

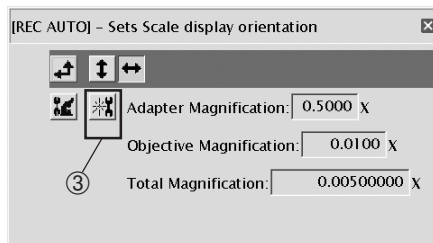


Displaying the scale

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.

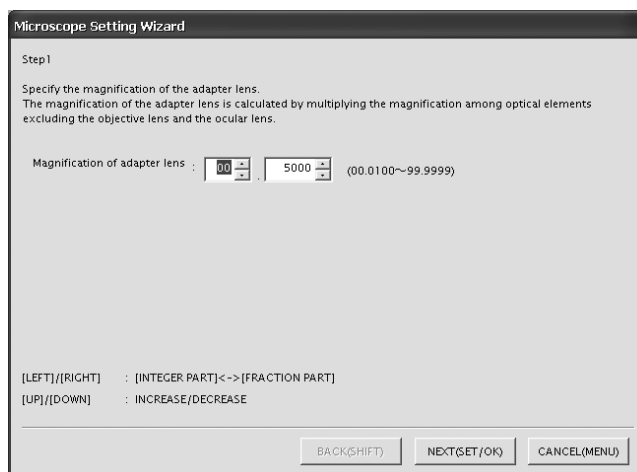
Operation using the hand switch D21-HS

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.

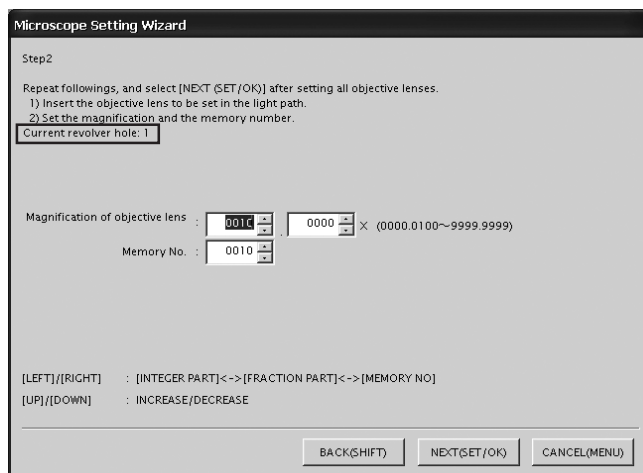
Operation using the mouse

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.

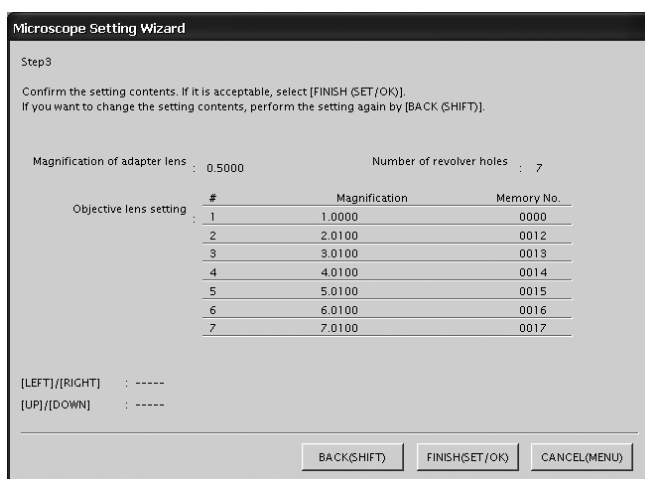


4. Input the objective magnification and memory number for each revolving nosepiece position.



- 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 D21-HS (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 D21-HS (or click on [NEXT] if you are using the mouse). To modify information, press the MENU button of the hand switch D21-HS (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 hand switch D21-HS. Pressing the shutter switch executes recording and saving of an image.

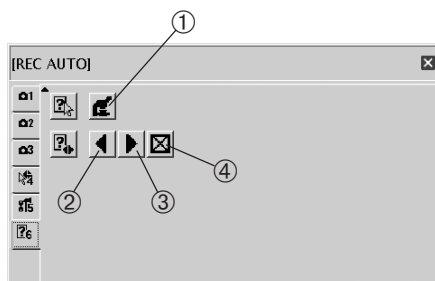
☉ See page 64 for the method of connection to the U-CBS.

☉ See page 66 for the method of installation on the microscope.

It cannot be recorded by the shutter switch. Use the hand switch D21-HS to start/finish recording.

Guidance function

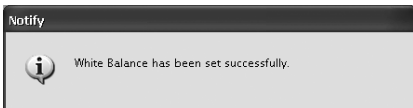

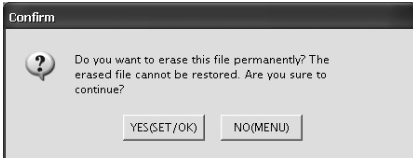
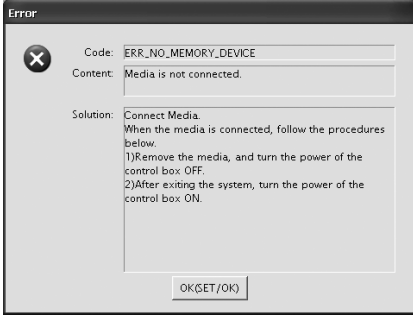
This function displays the “Guidance for Shooting Neat Photomicrographs.” The Guidance includes the adjustment procedures of the microscope and camera as well as applied functions that would be convenient for the reader.



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.) is connected.

9 WARNING MESSAGES

The DP21-SAL 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.	

10 SPECIFICATIONS

Item		Specifications
Image sizes, File formats	DP21	Recording pixels: TIFF (TIFF) 1600 x 1200 (5760KB) SHQ (JPEG) 1600 x 1200 (2140KB or less) HQ (JPEG) 1600 x 1200 (720KB or less) SQ-L (JPEG) 800 x 600 (535KB or less) SQ-H (JPEG) 800 x 600 (180KB or less)
	DP26	Recording pixels: 2448 x 1920 1224 x 960 612 x 480 1224 x 960 Binning 612 x 480 Binning Recording method: TIFF (No compression) JPEG-LOW : Compression rate 1/2.7 JPEG-HIGH : Compression rate 1/8
Compatible monitor		Resolution: 1920 x 1200 WUXGA (Image display area 1600 x 1200) 1920 x 1080 FHD (Image display area 1600 x 1080) 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 1280 x 1024 (Display area 1280 x 960) 1280 x 960 1024 x 768 800 x 600
Image display speed (Frame rate)	DP21	Live image: 15 fps (Displayed pixels 1600 x 1200) 27 fps (Displayed pixels 800 x 600)
	DP26	Live image: 7 fps (Displayed pixels 2448 x 1920) 16 fps (Displayed pixels 1224 x 960, 612 x 480)
Image display (Zooming magnification)		Live image: , 1 x, 2 x (electronic zoom), 4 x (electronic zoom) Played image: Index display, 1 x, 1:1, 2 x, 4 x
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 • mage file format: TIFF (Applicable to still image measurement in PLAY mode)

Item	Specifications
Recording media	USB memories, networked PC
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
Dimensions & weight	Control box D21-CB: 180 (W) x 47 (H) x 215(D) mm · 1600 g Hand switch D21-HS: 102 (W) x 24 (H) x 102 (D) mm · 400 g
Rating (AC adapter)	Output: 15 V \mp 4 A Input: 100-240 V \sim 50/60 Hz 2 A
Power consumption (Control Box D21-CB)	Max. consumption: 24.2 W During shutdown: 0 W (Apparent power: Approx. 2.0 VA) Standby mode: 1.4 W or less
Operating environment	
<ul style="list-style-type: none"> • Indoor use. • Altitude: Max. 2000 meters • Ambient temperature: 10 to 35 °C (50 to 95 °F) (without condensation) • Maximum relative humidity: 80% for temperatures up to 31 °C (88 °F), decreasing 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; \pm10%. • Pollution degree: 2 (in accordance with IEC60664-1) • Installation/Overtoltage category: II (in accordance with IEC60664-1) 	

11 TROUBLESHOOTING GUIDE

Under certain conditions, the performance of the DP21-SAL 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
The hand switch buttons do not work.	The system is OFF or in standby mode.	Press the main switch of the control box D21-CB to ON.	18
	The AC adapter is connected improperly.	Connect the AC adapter correctly to the control box D21-CB and plug the power cord firmly into a power outlet.	13
	The hand switch D21-HS is connected improperly.	Connect the USB cable correctly.	15
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.	24
	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.	55,56
	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.	4,60
	The save folder is protected by password (applicable only when the save destination is a networked PC).	Connect the keyboard to the control box D21-CB and enter the password. Alternatively, contact the network administrator of the save destination PC.	8
	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-SAL, and also disconnect the LAN.	15
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 D21-CB to ON.	58
	The system is not in the PLAY mode.	Press the MODE switch of the hand switch D21-HS to select the PLAY mode.	52
	The USB memory does not contain a recording.	Check the number of remaining image.	10

Problem	Cause	Remedy	Page
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.	19
	The system is in the sleep mode.	Set the display power OFF setting correctly.	19
The image is not in focus.	The microscope is not focused properly.	Press any button or key of the hand switch D21-HS, mouse or keyboard.	—
	The parfocality is not adjusted properly.	Adjust parfocality with the camera 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.	—
The recorded image is too dark or too bright.	The AE LOCK, exposure adjustment and/or metering area are set improperly.	Set them correctly.	27,28
	The brightness is adjusted insufficiently.	Adjust the brightness again.	—
	A fluorescent lamp is used.	Use a light source other than a fluorescent light.	—
The colors in the image are strange.	The white balance is erroneous because of a wrong color temperature setting.	Set the color temperature correctly.	35
	The screen color setup is incorrect.	Correct to the optimum color setup.	37
	The microscope light source is too bright.	Lower the brightness of the microscope light source.	—
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.	33
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.	5

Problem	Cause	Remedy	Page
Functions interlocked with microscope operations do not work.	Cables are connected improperly.	Connect the cables of the microscope, control box (BX3-CBH, etc.) and control box D21-CB correctly.	64,65
	The control box is not recognized.	Set the main switches of the control box (BX3-CBH, etc.) and the control box D21-CB, and set the switches to ON in the order of: 1) control box (BX3-CBH, etc.) ; 2) control box D21-CB.	67
Auto scale switching does not work.	The objective magnifications are not input or set erroneously.	Input the magnifications of the objectives in use.	67
When the power is switched OFF, the MENU and scale settings return to the default settings.	The control box D21-CB was shut down forcefully (the main switch was kept pressed) when the power was OFF.	Do not keep the main switch pressed when the power is OFF. A short press of the main switch turns off the power.	18

■ 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 the 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	
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		U.S.A.	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

MEMO

OLYMPUS[®]

Manufactured by

OLYMPUS CORPORATION

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

Distributed by

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.

