# OLYMPUS®

INSTRUCTIONS

DP71
MICROSCOPE DIGITAL CAMERA

This instruction manual is for the Olympus Microscope Digital Camera Model DP71. To ensure the safety, obtain optimum performance and familiarize yourself fully with the use of this camera, we recommend that you study this manual thoroughly before operating the camera.
For image operations including recording, editing and saving, please refer to the Online Help for the DP-BSW Basic Software.
Retain this instruction manual in an easily accessible place near the work desk for future reference.

—— *This publication is printed on 100% recycled paper* ——

AX7537

CONTENTS

IMPORTANT

The DP71 microscope digital camera is designed to be connected to a camera adapter mounted on an Olympus UIS2/UIS series of optical microscope for use in recording of microscopic magnified images at high speed (about 3 seconds) and highest resolution while maintaining high picture quality and high color reproduction. The DP71 incorporates a variety of functions for supporting image recording under optimum conditions.

When the DP71 microscope digital camera is used with a camera adapter or a microscope from other manufacturer than Olympus, the optical performance may not be manifested fully.

⚠ SAFETY PRECAUTIONS

CAUTION

Never connect or disconnect the interface cable while the main switch of the computer is set to " **I** " (ON). Otherwise, malfunction may result.

1. Before connecting or disconnecting the interface cable, make sure that the main switch of the computer is set to "**O**" (OFF).
   When connecting the interface cable, tighten firmly the lock screws on it and ensure that the connector will not slip out before setting the main switch to " **I** " (ON).
2. The cords and cables are vulnerable to bend or twist. Do not apply excessive force to them.
3. To prevent the microscope from toppling down, avoid using microscope attachments that may make the total height of the microscope above 1 meter when they are attached.
4. When installing the PCI interface board, be sure to hold it by the edge. Never touch the board surface directly, as this will lead to malfunction.

⚠ **The PCI interface board area shown in the illustration on the right becomes very hot during and immediately after use of the camera. Be careful never to touch them during and after use.**

5. Connect the provided power cord correctly and ensure that the **grounding terminal** 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.
6. Lay out the interface cable so that it does not contact the heat generating section such as the lamp housing of the microscope.

Hot part
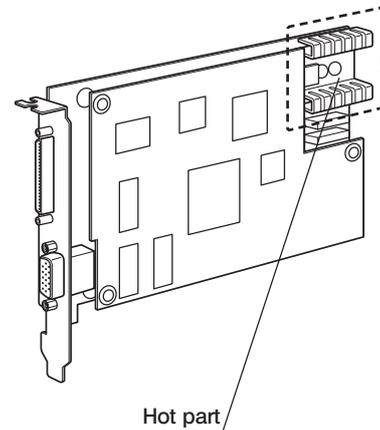
⚠ Computer and Software

The computer data may be destroyed by an unexpected event. Be sure to keep the backup of the data.

1. Olympus will not assume any liabilities for any damage incurred due to the use or non-usability of this system, including compensation for the lost data.
2. The computer used with this system should set up and run Microsoft Windows 2000 or XP.
   For the OS in the computer, the user is requested to create a backup and retain it carefully. (Olympus does not support the matters related to the OS including its backup.)
   For details on the computer and Microscope Windows 2000 or XP, refer to their respective manuals.
3. Olympus guarantees the quality of this product in the factory shipment condition.
   Olympus will not assume any liabilities for the operation errors and functional faults incurred due to the alteration of the environmental setup (including BIOS change), installation of other software or addition of hardware to the computer by the user.
4. When the HD free space reduces, the data processing speed may slow extremely or errors may occur frequently. To prevent this, delete unnecessary data files frequently. For how to delete data files, refer to the manuals for Microsoft Windows 2000 or XP.
5. Never attempt to delete or rename the folders and files recorded in the provided installer software. Otherwise, the software may get unable to be started up.
6. Do not open the enclosure of the computer and touch the power supply or the circuit board's heat generating section right after use as it may burn your hand. Wait until the internal temperature drops sufficiently.
7. Sharp edges inside the computer may cut your fingers, so take extra care.
8. Use a computer that complies with the safety standards of your country.

1 Conformity of the System

Restrictions

1. The recommended camera adapter is the U-TV0.5XC-3, U-TV0.63XC, MVX-TV0.63XC or the combination U-TV1X-2 + U-CMAD3.
   The U-TV0.5XC should not be used because it deteriorates the image flatness.
   A camera adapter with a magnification below 0.5X cannot be used because part of image will be cut off.
2. When the DP71 is connected to the rear port of the U-DPT or U-MPH, the peripheral part of the recorded image may be deteriorated due to the optical performance of the U-DPT or U-MPH.
3. When the U-TV0.5XC-2 or U-TV0.5XC-3 is used, using two or more intermediate attachments* may obscure or cut off the peripheral part of the field of view or may make flare noticeable.
   * Example of two intermediate attachments: BX microscope + Vertical illuminator + Intermediate attachment with a length equivalent to the U-CA
4. Under fluorescent ring illumination or other AC-driven illumination such as a phase control light intensity adjusting illumination system, the following phenomena may be observed when the light intensity is increased and exposure time is decreased:
   - Flickering of the displayed image.
   - Instability in exposure.
   - Hatching patterns in pixel shift recording (4080 x 3072 or 2040 x 1536 pixels).
   However, provided that the brightness can be adjusted using the light intensity control knob is possible or ND filters, the above phenomena may be attenuated by adjusting the brightness so that the exposure time exceeds 1/50 sec.
   For details on the microscope models using AC-driven illumination, consult Olympus.
5. Non-Olympus microscopes and commercially available C-mount lenses can be used provided that they match a CCD with a size of no less than 2/3 inch and the lens projection length from the C-mount body attaching section is no more than 6 mm. However, problems due to optical adaptability, such as shading, may be observed.
6. When the specimen has a low contrast (near transparent) or high reflectance (mirror status) and the aperture iris diaphragm is stopped down near the smallest aperture, spot flare may be noticeable.
7. When the edge of a non-transmitting object is observed under the STM6 transmitted illumination, flare may be noticeable due to the difference in brightness between the transmitted sections (over-exposure) and non-transmitting section (under-exposure). To reduce the flare, set a lower exposure using the exposure correction function or setting the exposure manually.
8. When a low-power objective (below 4X) is used, the peripheral part of the field of view may be obscured. In this case, use an ultralow-magnification condenser (U-ULC-2).
9. When the U-CFU is used, it is required to set the exposure to a longer period than 1/30 sec. using the manual exposure mode and control the brightness by engaging or disengaging ND filters.
10. During recording with image shifting (4080 x 3072 or 2040 x 1536 pixels), the image may be disturbed if the specimen is moved.
11. If the camera or microscope is vibrated during recording of a 4080 x 3072 or 2040 x 1536 pixel image, the image will be disturbed. Note that the factors causing vibrations include operation of the keyboard or mouse on the same desktop where the microscope and camera are installed.

Operating Environment

Temperature: 10 to 35°C. Humidity: 20% to 85% (without condensation).

Recommended Computer Specifications

PC/AT compatible – Pentium 4 type	
CPU	Intel® Pentium4 1.3 GHz or more. [2.6 GHz or more, Hyper-Threading dual-core CPU recommended] Pentium D, Pentium EE
Chipset	Intel® i845*, i850*, i865*, i875*, i915*, i925*, i945*, i955*, i975*. [i865 or later recommended]
RAM	SDRAM, 512 MB or more. [PC2700 or after, dual-channel DDR/DDR2 recommended]
HDD	Free space 500 MB or more
Graphic	Graphic RAM 16 MB or more. Graphic card of the AGP specification with the capability of 32-bit color display of 1280 x 1024 or more, or PCI-Express X16 graphic card. *Onboard graphic also available when the chipset is i915 or after.
PCI bus	PCI Rev. 2.1 or 2.2.
OS	Windows XP Professional SP1a or after. (Not compatible with x64 Edition.) Windows 2000 Professional SP4 (English or Japanese edition)
Drive	CD-ROM (or CD-R/RW, etc.)
Main body	Half-size PCI board compatible. (See 1. below.)
Power supply	250 W or more. (With CE marking)

1. Computer model
   ‹PC/AT compatible machine› The computer should meet the above specifications. The recommended computers are the following models that accept a half-size (106.7 mm x 174.6 mm) PCI interface board.
   Note that some of the following models may not accept such a board due to the internal structures.
       DELL®   : Prevision Series, Dimension Series, OptiPlex Series.
       IBM (Lenovo) : Think Centre Series.
       HP   : dx Series, xw Series.

2. CPU
   We do not guarantee operation if the computer uses a CPU other than Pentium 4, Pentium D, Pentium Extreme Edition or a chipset other than an Intel chipset.
   If the computer uses a CPU other than a Hyper-Threading CPU, the movie frame rate may drop.

3. HD free space
   The HD free space refers to the space that does not cause a special problem even when the system is installed or run. The space required for saving an image file in the HDD is slightly more than 4 MB with a 1360 x 1024-pixel (24-bit) non-compressed image and slightly more than 38 MB with a 4080 x 3072-pixel (24-bit) non-compressed image. In consequence, the HDD should also provide a considerably large space for saving these image files.
   When saving movies in the HDD stack, the space required for saving a movie is about 20 MB (max.) per second. The movie recording time is limited according to the HD free space.

4. RAM
   If a RAM other than a PC2700 or after, dual-channel DDR/DDR2 RAM is used, the movie frame rate may drop.

5. Monitor
   It is recommended to use a monitor capable of 1280 x 1024 or more full-color display.

6. Sequential connection of PCI units
   Up to two PCI units including the DP71 and a PCI interface board of the DP70/DP30BW or FV series can be connected in series. However, their simultaneous operation is not available so it is required to select either PCI interface operation.

2 Getting Ready

1. The camera head uses precision components. Handle it with care and avoid subjecting it to a sudden or severe impact.
2. The image displayed on the monitor may be affected when it is used near equipment generating strong electromagnetic waves. This is not a malfunction and will not affect the actual image being recorded. To avoid interference during operation, keep the system far from any source of electromagnetic waves.
3. When mounting the camera head on a tripod, attach it by using the DP-TRAD tripod adapter, which is separately available.
4. Do not use the camera in areas where it may be subjected to direct sunlight, high temperature and humidity, dust or vibrations. (For the operating environment conditions, see chapter 8, "SPECIFICATIONS" on page 24.)
5. The camera head needs to be calibrated periodically (every 3 months as reference) for the level variations caused by the influence of cosmic rays. For the calibration method, refer to the Camera Calibration Wizard in the Online Help in the DP-BSW software.

3 Maintenance and Storage

1. To clean the lenses and other glass components, simply blow dirt away using a commercially available blower and wipe gently using a piece of cleaning paper (or clean gauze).
   If a lens is stained with fingerprints or oil smudges, wipe it with gauze slightly moistened with commercially available absolute alcohol.
   ⚠ **Since the absolute alcohol is highly flammable, it must be handled carefully.**
   Be sure to keep it away from open flames or potential sources of electric sparks – for example, electrical equipment that is being switched on or off.
   Also remember to always use these chemicals only in a well-ventilated room.
2. Parts other than the glass components should be cleaned by wiping with a clean cloth. Do not use organic solvents to remove major stains. Use a soft cloth slightly moistened with a neutral detergent solution.
3. Do not disassemble any part of the camera as this could result in malfunction or reduced performance.

4 Caution

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

> The following symbols are used to set off text in this instruction manual.
> ⚠ : Indicates that failure to follow the instructions in the warning could result in bodily harm to the user and/or damage to equipment (including objects in the vicinity of the equipment).
> ★ : Indicates that failure to follow the instructions could result in damage to equipment.
> ◎ : Indicates commentary (for ease of operation and maintenance).

1 SYSTEM CHART

DP71

Camera head — Interface cable — PCI interface board

External trigger cable

Computer — Monitor

Resolution 1260 x 1024 or higher.

DP-BSW Basic Software (Ver 3.1 or lator)

U-CMAD3 C-Mount Adapter

GX-TV0.5XC C-Mount camera Adapter

GX-TV0.7XC C-Mount camera Adapter

C-mount lens

DP-TRAD Tripod Adapter

U-TV0.5X camera Adapter

U-TV1X-2 camera Adapter

U-TV0.5XC-3 C-Mount camera Adapter

U-TV0.63XC C-Mount camera Adapter

MVX-TV0.63XC C-Mount camera Adapter

MVX-TV1XC C-Mount camera Adapter

Commercially available tripod

IX81/IX71/IX51 Inverted Microscope

AX80/AX70 BX61/BX51/BX41 CX41/CX31 MX80/MX50/MX40 MX61L/MX61/MX51 Erected Microscope

MVX10

SZX16/SZX10 SZX12/SZX9 SZX7/SZ61 Stereo Microscope

STM6 Measuring Microscope

GX71/GX51 Inverted Metallurgical Microscope

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

2 *NOMENCLATURE*

Camera Head

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

Connector (P. 10)

Tripod adapter mount screw (P. 9)

C-mount thread (P. 9)
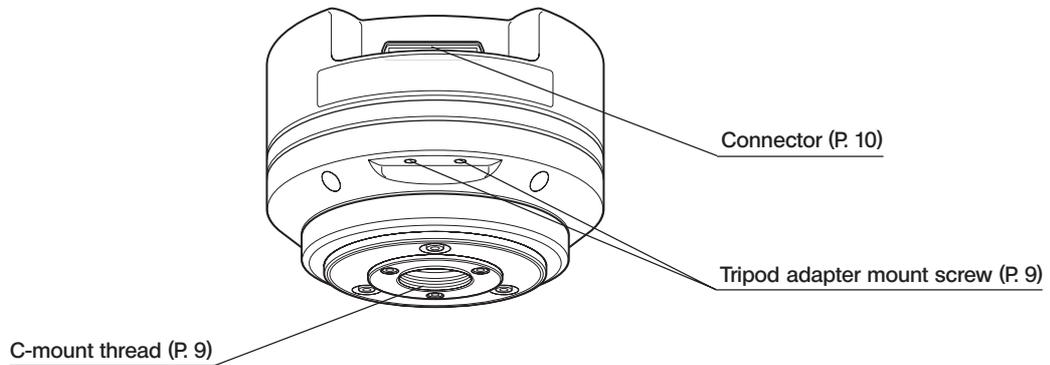
PCI Interface Board	(PCI standard half size)

External trigger cable (P. 10)

Connectors (P. 10)

Interface cable (P. 10)
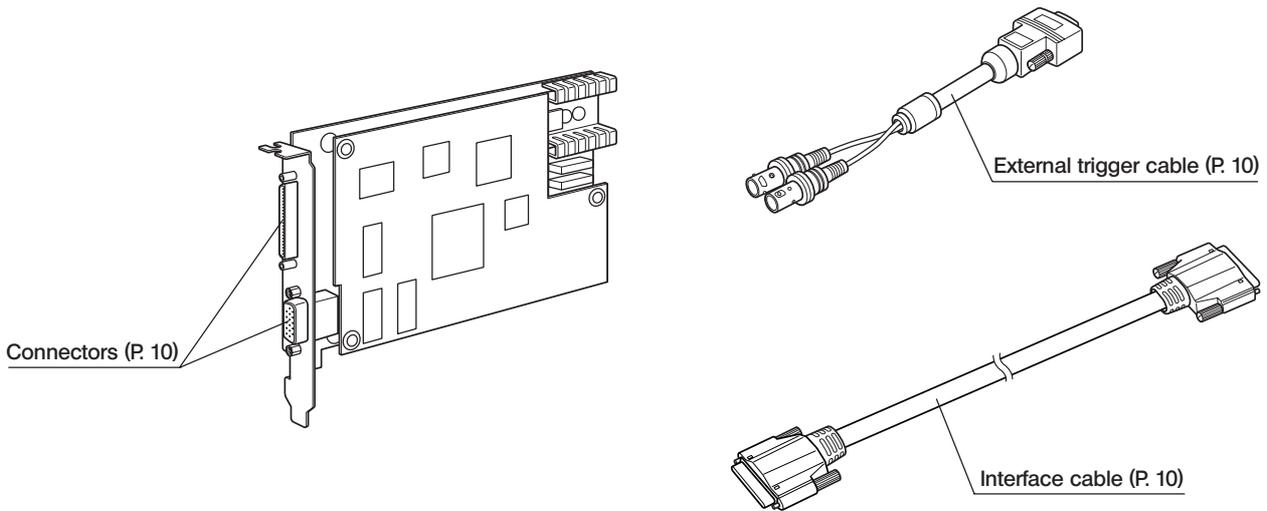
Basic Software	(CD-ROM)
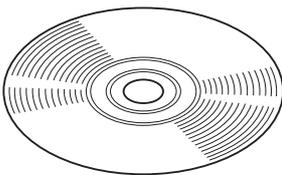
3 *HARDWARE INSTALLATION*

1 Installing the PCI Interface Board   (Figs. 1 & 2)

★ Before installing the PCI interface board in the computer, be sure to read the instruction manuals for the computer in order not to damage them.

★ Be sure to turn off the computer and peripherals and unplug their power cords before installing the PCI interface board.

★ To avoid damage due to static electricity, touch an unpainted metallic surface of the computer with your hand to leak the static electricity before installation.

1. Open the cover ① of the computer.

2. Remove the clamping screw ③ of the slot cover ② of an unused PCI slot on the motherboard and remove the cover.

3. Insert the PCI interface board ④ taking care not to touch the board surface directly by hand, and attach the slot cover using the clamping screw removed above.

4. Attach the computer cover ① to the original position.
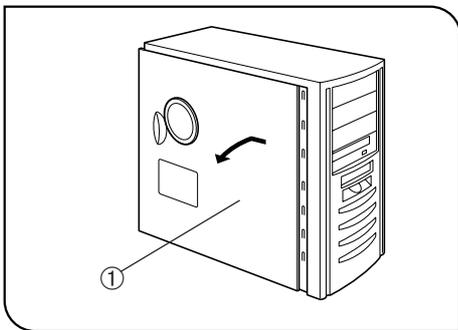
Fig. 1
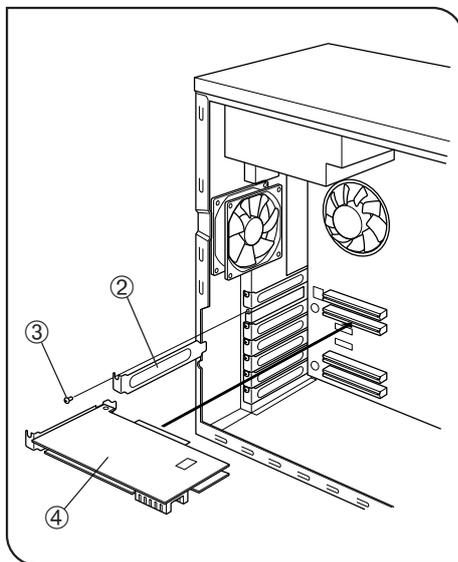
Fig. 2
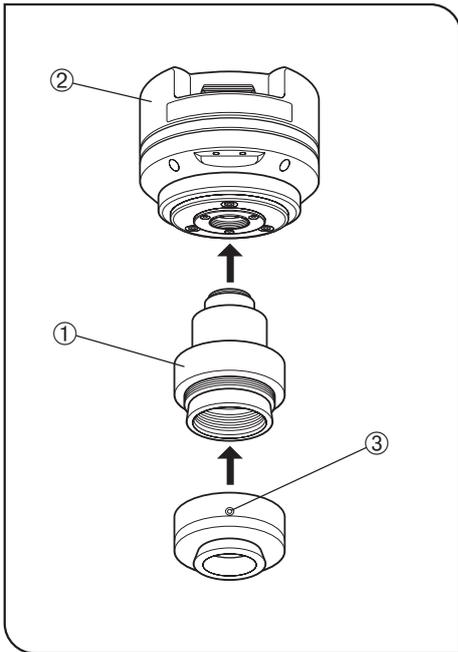
Fig. 3

⚠ **The C-mount screw has a sharp edge that should not be touched.**

⚠ **The camera head and camera adapter are precision modules. Be careful not to drop them during attaching or detaching.**

◎ The following procedure deals with the case using the combination of the U-TV1X-2 camera adapter + U-CMAD3 C-mount adapter.

1. Screw in the U-CMAD3 C-mount adapter ① into the C-mount thread on the bottom of the camera head ②.

   Then, loosen the clamping screw ③ at the bottom of the U-TV1X-2 camera adapter, screw in the camera adapter into the C-mount adapter and tighten the clamping screw.

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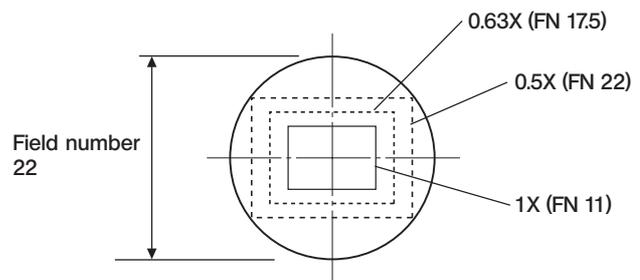

• If a C-mount camera adapter from other manufacturer than Olympus is used, the optical performance of the system may not be manifested fully.

⚠ **Be careful in using other manufacturer's C-mount camera adapter or C-mount lens having a thread length ⓑ over 6 mm. Otherwise, the threaded section will hit the inside of the camera head and cause damage to it.**
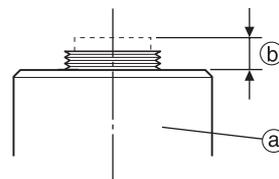

Using a Commercially Available Tripod

◎ The DP-TRAD tripod adapter is provided with two types of screws (2 each) and an Allen wrench. Use only the Phillips screws (x 2) with the DP71.

1. Attach the DP-TRAD tripod adapter ④ to the camera head ⑤ and clamp them using the provided Phillips screws (x 2) with a Phillips screwdriver.

2. Attach the tripod to the tripod adapter ④ and tighten the tripod's clamping knob ⑥ to secure the camera head.
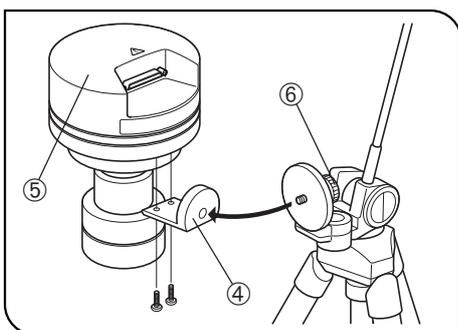
Fig. 4

3 | Connecting the Cables

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

⚠ Be sure to switch off the computer before proceeding to the connections.

⚠ Always use the cables designated by Olympus.

Connecting the Interface Cable

1. Connect the connector ① on one end of the interface cable to the connector ② on the PCI interface board, tighten the lock screws ③ on the interface cable's connector and check that the cable will not slip out.
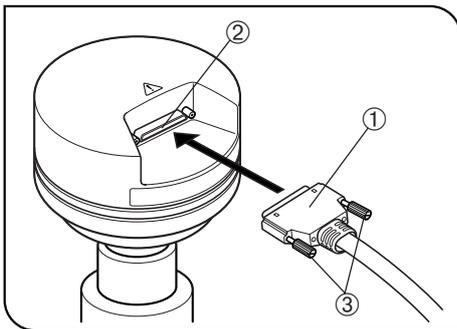

Fig. 5

2. Connect the connector ④ on the other end of the interface cable to the connector ⑤ on the camera head, tighten the lock screws ⑥ on the interface cable's connector and check that the cable will not slip out.
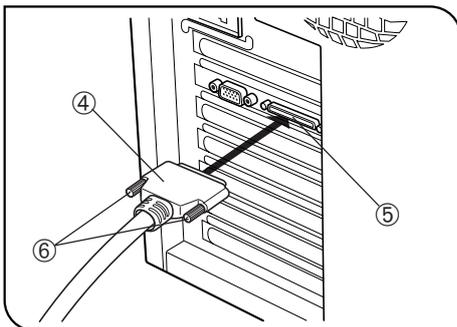
Fig. 6

Connecting the External Trigger Cable

1. Connect the connector ① of the external trigger cable to the connector ② on the PCI interface board, tighten the lock screws ③ on the external triggering cable's connector and check that the cable will not slip out.

2. When using the trigger input, connect the red cable (marked " **|** ") to the BNC connector ④.

3. When using the trigger output, connect the blue cable (marked " **O** ") to the BNC connector ⑤.
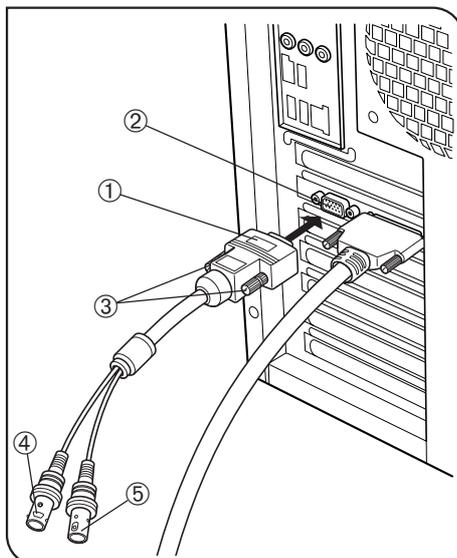

Fig. 7

4 *SOFTWARE INSTALLATION*

◎This chapter describes the installation of the optionally available DP-BSW Basic Software for DP71.

Before Installation

When the OS is Windows®XP
The software cannot be installed unless the user account is registered as "computer administrator."
If the user account is registered as a "Restricted account," change it to the "Computer administrator" account.
(For the user account registration, refer to the instruction manuals for your computer.)

When the OS is Windows®2000
Log on as a user with the Administrator authority and make sure that you have the access rights to the following locations.
(For the access rights, refer to the instruction manuals for your computer.)
• Folder for installing this software.
• Windows System folder and System registry.

Trademark Information

Windows is a registered trademark of Microsoft Corporation.
All other brand and product names are trademarks or registered trademarks of their respective owners.

1 Installing the Device Driver

The device driver can be installed automatically during installation of the application software.
It is recommended to use the automatic installation facility for installing the device driver.

1. Windows®XP

Automatic Installation Procedure

1. Ensure that the PCI interface board is installed in the PCI card slot of the computer.
2. Start Windows XP. (Log on with the Computer Administrator account.)
3. When the following window appears in a while, click on the [Cancel] button to close the window.

4. Go to section ("**2** Installing the Application Software" on page 17.
   The device driver will be installed automatically during installation of the application software.

Manual Installation Procedure

1. Ensure that the PCI interface board is installed in the PCI card slot of the computer.
2. Start Windows XP. (Log on with the Computer Administrator account.)
3. When the following window appears in a while, check [No, not this time] and click on the [Next] button.

4. Check [Install from a list or specific location (Advanced)] and click on the [Next] button.
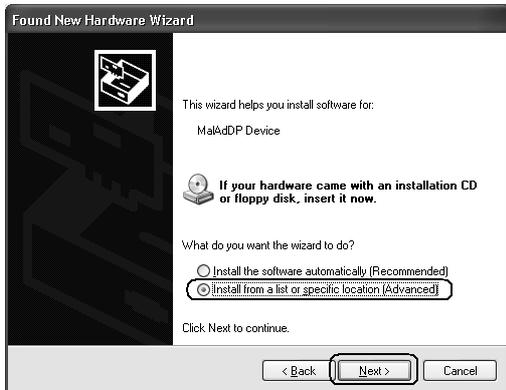

5. Place the CD-ROM in the CD-ROM drive.
6. Check [Search for the best driver in these locations], then check only [Search for the best driver in these locations.] (be sure to uncheck [Search removable media (floppy, CD-ROM...)]) and click on the [Browse] button.
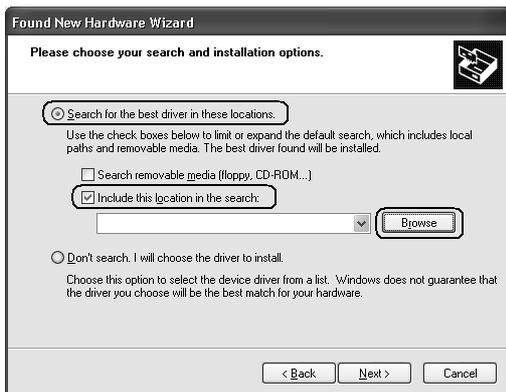
7. Click on [My Computer] → [DP-BSW] → [Drivers], then click on [WINXP] and click on the [OK] button.
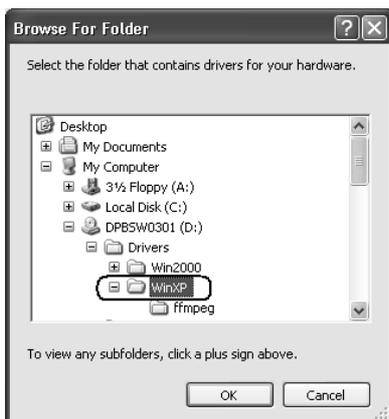
8. Click on the [Next] button.
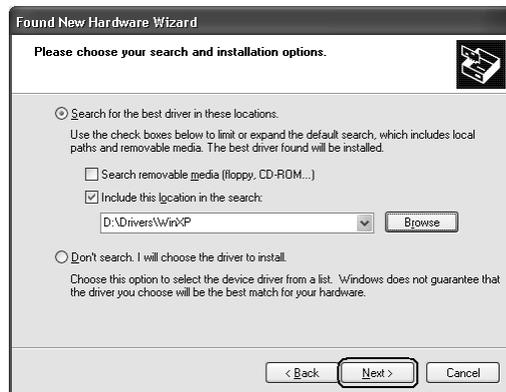
9. The window as shown below may appear. As this window is not important for the installation, simply click on the [Continue Anyway] button. The file copy starts at the moment you click on this button.

When the Olympus software is searched, a message is displayed indicating that it is not Microsoft-authorized software. As there is no problem, just continue. Microsoft has an organization named WHQL to apply authorization procedures on computers and peripherals. For the present, this software is not authorized by this organization.

10. When the following window appears in a while, click on the [Finish] button.

11. Take out the CD-ROM.
12. Click on the ‹Start› button. When the [Start] menu is displayed, click on [Control Panel].
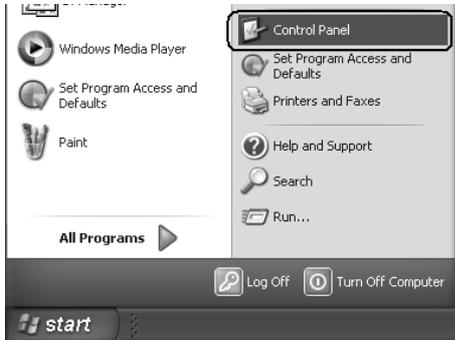
13. When the [Control Panel] dialog box is displayed, click on [Performance and Maintenance].

If the [Control Panel] display is of the classic type, doubleclick on the [System] icon and go to step 15 below.

14. Click on [System].
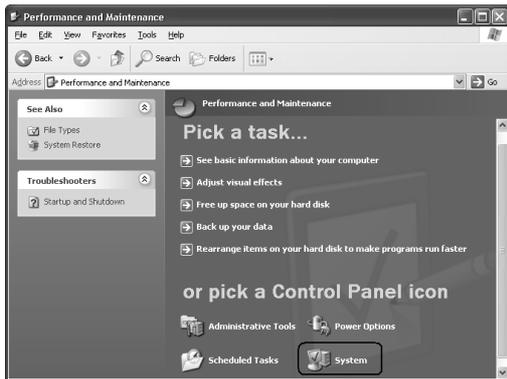
15. When the [System Properties] dialog box is displayed, click on the [Hardware] tab and then click on the ‹Device Manager› button.
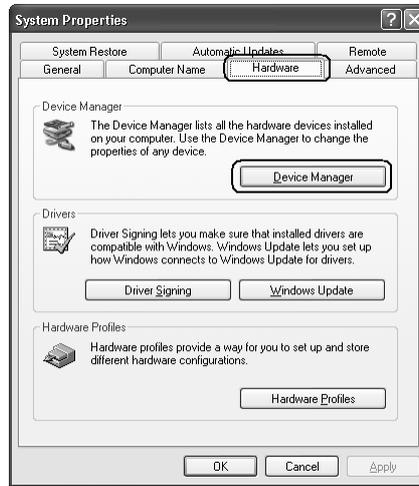
16. If the driver has been properly installed, "MalAd Device" should be displayed as shown below. After confirming this, click on the ‹ ☒ › button.
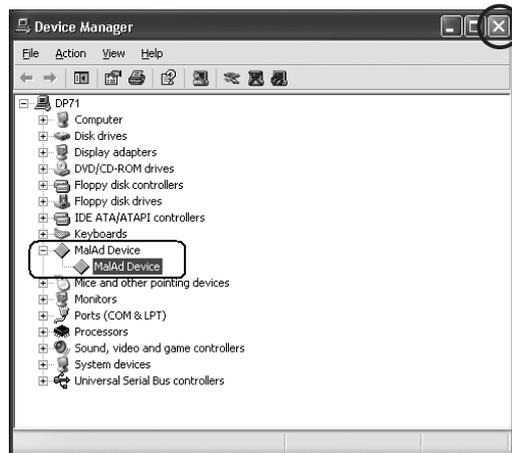
Now the device driver installation is complete.

2. Windows® 2000

Automatic Installation Procedure

1. Ensure that the PCI interface board is installed in the PCI card slot of the computer.
2. Start Windows 2000. (Log on with the Administrator authority.)
3. When the following window appears in a while, click on the [Cancel] button to close the window.

4. Go to section (" **2** Installing the Application Software" on page 17.
   The device driver will be installed automatically during installation of the application software.

Manual Installation Procedure

1. Ensure that the PCI interface board is installed in the PCI card slot of the computer.
2. Start Windows 2000. (Log on with the Administrator authority.)
3. When the following window appears in a while, click on the [Next] button.

4. Check [Search for a suitable driver for my device (recommended)] and click on the [Next] button.

5. Place the CD-ROM in the CD-ROM drive.
6. Check only [Specify a location] (be sure to uncheck other options), and click on the [Next] button.

7. Click on the [Browse] button.

Found New Hardware Wizard

Insert the manufacturer's installation disk into the drive selected, and then click OK.

OK
Cancel

Copy manufacturer's files from:
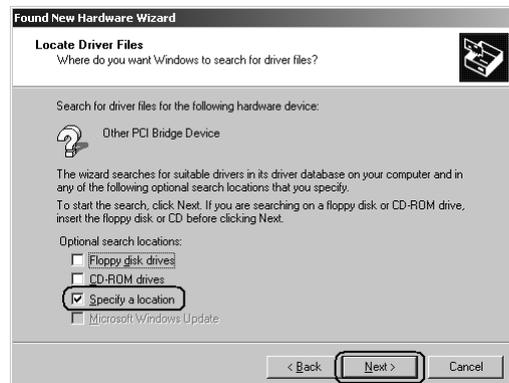
Browse...

8. Click on the [Look in:] pull-down menu to open it and select [DPBSW]. Then, double click on [Drivers] → [Win2000], select [MalAd9054.inf], and click on the [Open] button.

Locate File

Look in: DPBSW0301 (D:)

History
Desktop
My Documents
My Computer
My Network P...

Drivers
setupdir

File name: Autorun.inf   Open
Files of type: Setup Information (*.inf)   Cancel

Locate File

Look in: Drivers

History
Desktop
My Documents
My Computer
My Network P...

Win2000
WINXP

File name: Autorun.inf   Open
Files of type: Setup Information (*.inf)   Cancel

Locate File

Look in: Win2000

History
Desktop
My Documents
My Computer
My Network P...

MalAd9054

File name: MalAd9054.inf   Open
Files of type: Setup Information (*.inf)   Cancel

9. Click on the [OK] button.

Found New Hardware Wizard

Insert the manufacturer's installation disk into the drive selected, and then click OK.

OK
Cancel

Copy manufacturer's files from:

D:\Drivers\Win2000   Browse...

10. Click on the [Next] button.

Found New Hardware Wizard

Driver Files Search Results
The wizard has finished searching for driver files for your hardware device.

The wizard found a driver for the following device:

Other PCI Bridge Device

Windows found a driver for this device. To install the driver Windows found, click Next.

d:\drivers\win2000\malad9054.inf

< Back   Next >   Cancel

11. Click on the [Finish] button.

Found New Hardware Wizard

Completing the Found New Hardware Wizard

MalAd Device

Windows has finished installing the software for this device.

To close this wizard, click Finish.

< Back   Finish   Cancel

12. Take out the CD-ROM.

13. Click the ‹Start› button. When the [Start] menu appears, click [Settings] – [Control Panel].

Windows 2000 Professional

Programs
Documents
Settings   Control Panel
Search   Network and Dial-up Connections
Help   Printers
Run...   Taskbar & Start Menu...
Shut Down...

Start
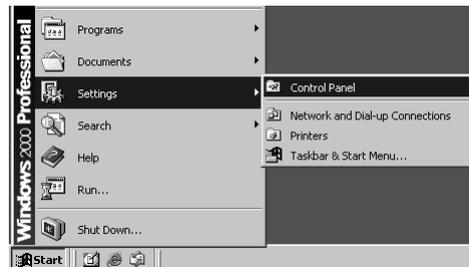
14. When the [Control Panel] dialog box appears, double click [System].
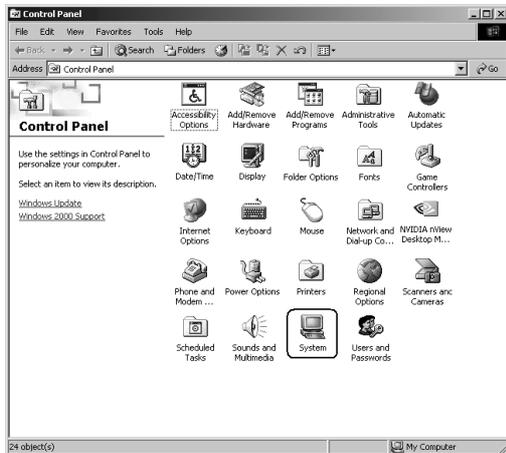
15. When the [System Properties] dialog box appears, click the [Hardware] tab and click the ‹Device Manager› button.
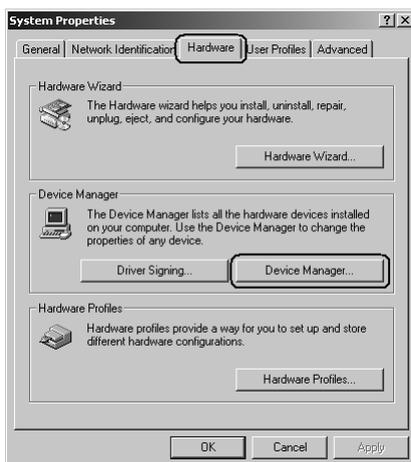
16. If the driver has been properly installed, "MalAd Device" should be displayed as shown below. After confirming this, click on the ‹ ✕ › button.


Now the device driver has been installed.

2 Installing the Application Software

Be sure to complete the installation of the camera hardware before proceeding to the installation of the application software.

**Installation of the Camera Application Software (Common for XP and 2000)**

1. Place the CD-ROM in the CD-ROM driver.
2. Click on the [Start] button in the Windows taskbar.
3. Select [Run].
4. Enter the following and click on the [OK] button.
   D:\setup.exe
   If your CD-ROM drive is not drive D, enter the correct drive character instead of "D." Now the installation program starts up.
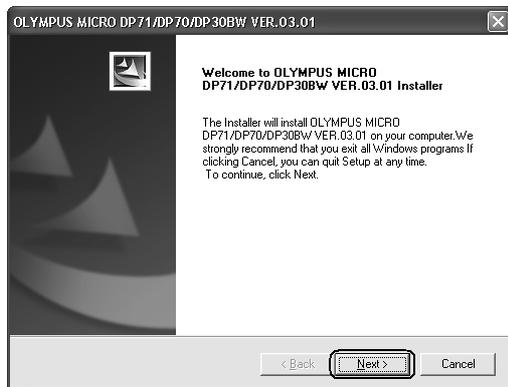
5. Before proceeding to installation, close all running applications.
   Then click on the [Next] button.
6. Read the displayed License Agreement. If you agree with it, click on the [Yes] button.
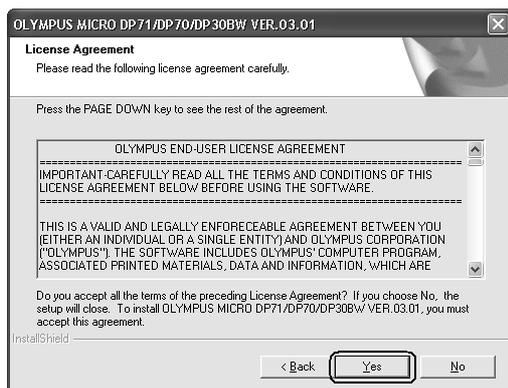
7. The [Choose Destination Location] window appears. If you want to change the installation destination, click on the [Browse] button and specify the new installation destination. Then click on the [Next] button.
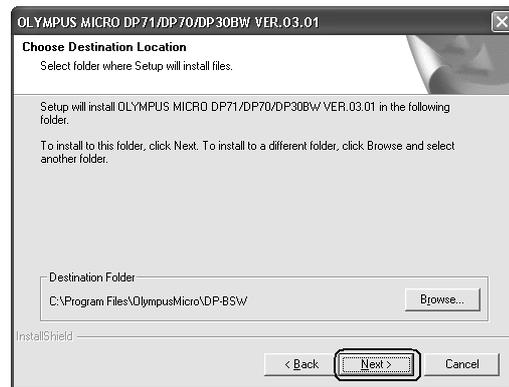
8. The [Select Components] window appears. Check the components to be used and click on the [Next] button.
   a) **DP71/DP70/DP30BW Application Program**
      Checking this installs the application, which allows you to control the DP71 for recording images and manage the images in a simplified manner using thumbnails.
   b) **DP71/DP70/DP30BW TWAIN**
      Checking this installs the program, which allows you to download images directly from the DP71 to another TWAIN/IF-compatible application such as Photoshop.
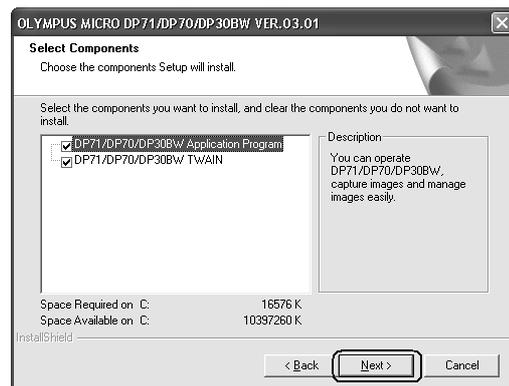
9. The [Select Program Folder] window appears. If you want to change the program folder, change the name under [Program Folders] or select a folder under [Existing Folders]. Then click on the [Next] button.
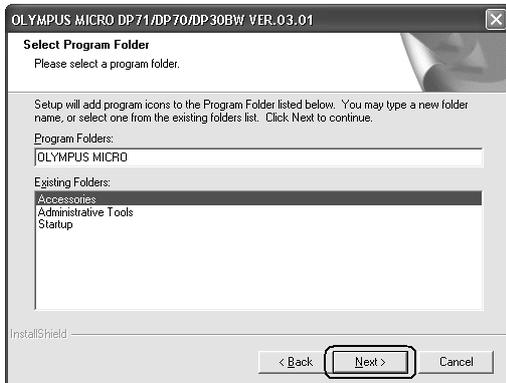
10. The [Start Copying Files] window appears. When the actual installation is ready, click on the [Next] button. This starts installation of the application software.
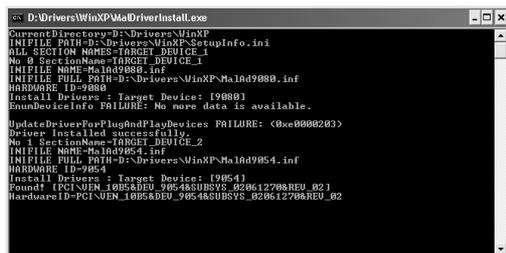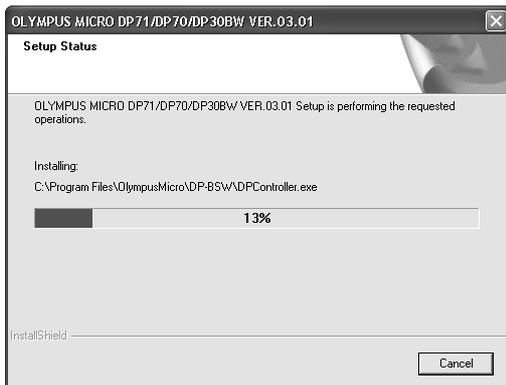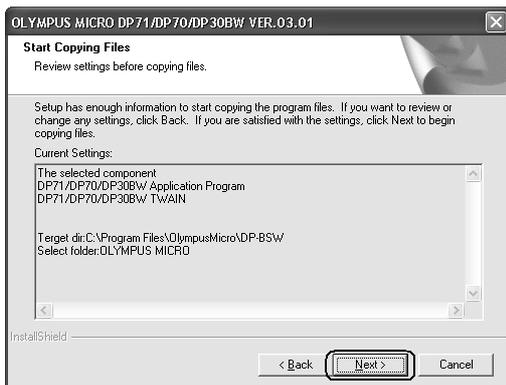
11. When the installation completes, the window below appears. Then click on the [Finish] button.
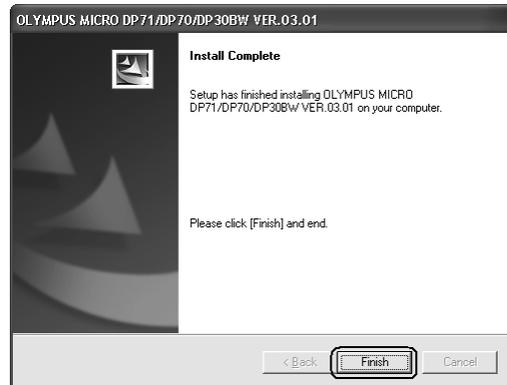
12. Take out the CD-ROM.

Now the application software has been installed.

(Notes) The encircled numbers indicate the control positions in the windows shown on the next page.
For detailed operating procedures, refer to the Online Help for the DP Controller and DP Manager.

Brightfield Observation

- Launch DP Manager.
- Launch DP Controller.
- Set up the microscope.
- Display the preview image. ①
- Set the exposure mode. ②
- Exposure mode? → Manual → Set the exposure time. ③
- Auto
- Select the metering area (30%, 1% or 0.1%). ④
- Perform framing and focusing.
- Exposure mode? → Manual → Fine-adjust the exposure time. ③
- Auto
- Move the metering area and correct exposure. ⑤
- Adjust the white balance. ⑥
- Record an image. ⑦
- Select DP Manager.
- Perform zooming or scrolling. ⑨
- Save the image. ⑩

Fluorescence Observation

- Launch DP Manager.
- Launch DP Controller.
- Set up the microscope.
- Display the preview image. ①
- Set the exposure mode. ②
- Exposure mode? → Manual → Set the exposure time. ③
- SFL Auto
- Select the metering area (30%, 1% or 0.1%). ④
- Perform framing and focusing.
- Exposure mode? → Manual → Fine-adjust the exposure time. ③
- SFL Auto
- Move the metering area and correct exposure. ⑤
- Adjust the black balance. ⑧
- Record an image. ⑦
- Select DP Manager.
- Perform zooming or scrolling. ⑨
- Save the image. ⑩

6 *DISPLAYED WINDOWS*

Image Record Window

◎This window is displayed at the startup and used to record still images and movies. For details, refer to the Online Help of the DP Controller. The Online Help can be viewed by opening the [Help] menu and selecting [Help].

⑥ ⑧

Title bar
Menu bar
Tool bar

Preview area

Control tab

①
⑦

Status bar

③ ⑤ ②
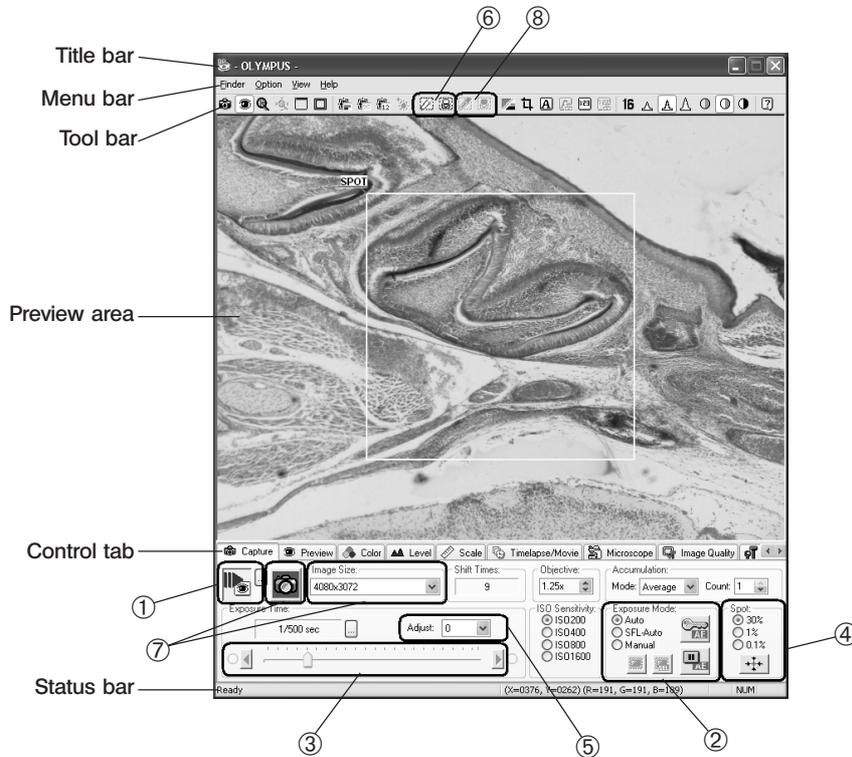
Edit/Save Window

◎This window is sued to edit, save and display images. For details, refer to the Online Help of the DP Manager. The Online Help can be viewed by opening the [Help] menu and selecting [Help].

⑩ ⑨ Movie window

Title bar
Menu bar
Tool bar
Camera icon *
Folder bar

Thumbnail bar

Status bar Window display area
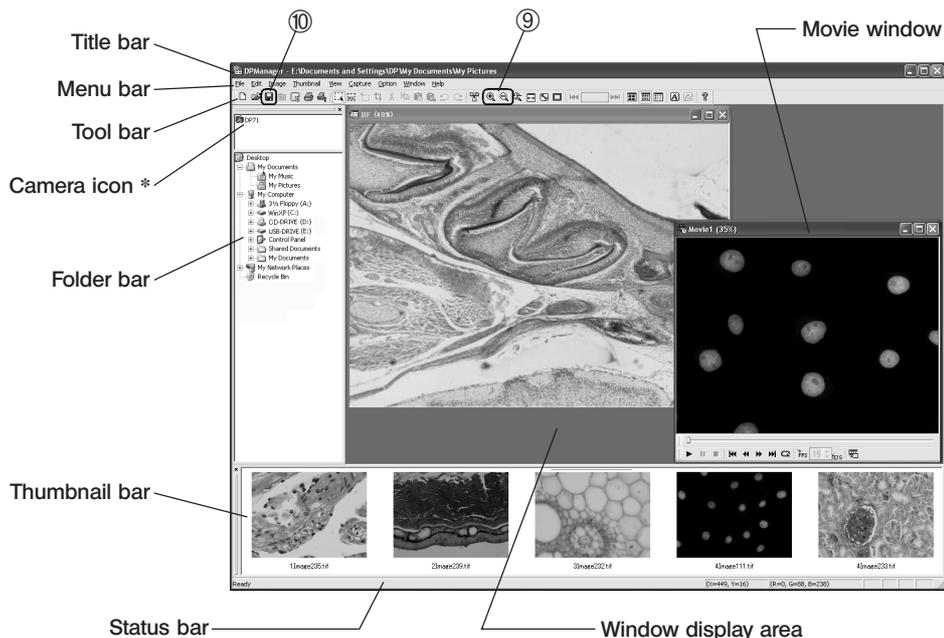
*The camera name shown on the camera icon is the last camera name used with the DP Controller. The camera name shown immediately after installation may be "DP71/DP70/DP30BW."

7 EXTERNAL TRIGGERING

◎The DP71 can record still images or control a commercially available shutter based on an external trigger signal.

Trigger Input

• The trigger input from external equipment can be used to start still image recording using the DP-BSW.
• The trigger input is detected at the edge, and the positive and negative logics can be switched with the DP Controller.
• The trigger input is not compatible with random triggering. Due to a time lag of 150 to 600 ms after the trigger input, the exposure start time cannot be synchronized completely
 For details on the time lag from the trigger input to the start of exposure, see table below.
• The trigger input is a TTL compatible signal.
    V_{IH}: 2.0 V (min.). V_{IL}: 0.8 V (max.).
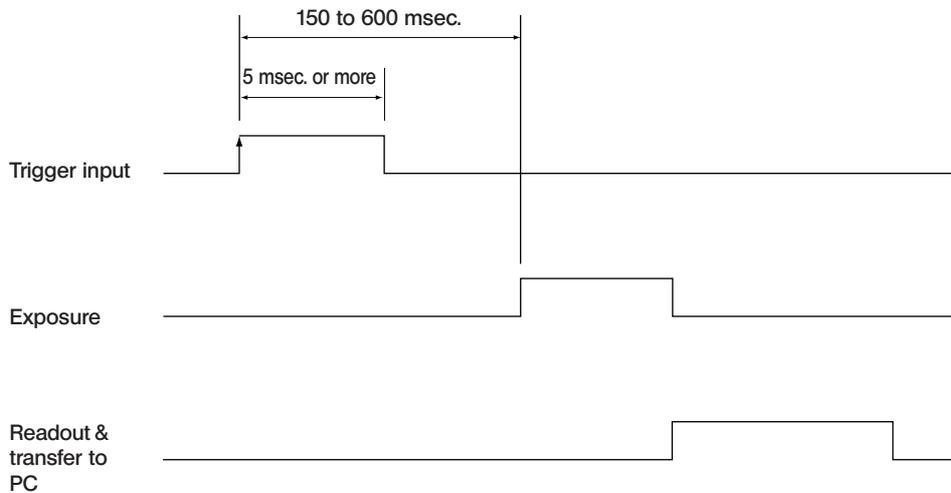
Trigger Input Timing Chart (Positive logic)

Table   Time Lag from Trigger Input to Exposure Start

Recording Image Size	Preview Status at Trigger Input	Time Lag from Trigger Input to Exposure Start (msec.)	
		Min.	Max.
4080 x 3072 2040 x 1536 1360 x 1024 680 x 512	OFF	150	400
	ON	210	600
680 x 510 (2 x 2)	OFF	150	350
	ON	210	500
340 x 250 (4 x 4)	OFF	150	300
	ON	210	350

Trigger Output

- The trigger output can be used to control a commercially available shutter.
- The positive and negative logics of the trigger output can be switched with the DP Controller.
- The trigger output is interlocked with the shutter release/close operations of the DP Controller.
- The external trigger signal is output by starting still image recording when the shutter is closed.
- The time lag from the trigger output to the start of exposure can be set between 0 and 2 sec. on the DP Controller.
- The trigger output is a TTL compatible signal.
  V_{OH}: 2.4 V (min.). V_{OL}: 0.4 V (max.).

Exposure time lag

Trigger output

Exposure

Readout & transfer to PC
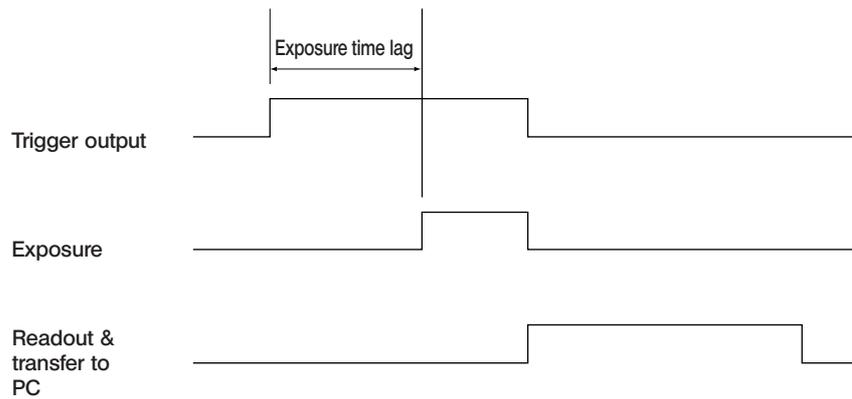
Trigger Output Timing Chart in Still Image Recording (Positive logic)

8 *SPECIFICATIONS*

DP71 Specifications

Item		Specifications
Camera system		Single-CCD color camera (pixel shifting).
Image pickup device		2/3-inch color CCD. Total pixels: 1.5 million pixels. Effective pixels: 1.45 million pixels. Pixel pitch: 6.45 µm (H) x 6.45 µm (V). Scanning method: Progressive scanning.
Cooling		Peltier cooling. Natural air cooling. CCD temperature: Room temperature –10°C (max.)
Recorded image sizes		4080 x 3072 (1 x 1, pixel shifting), 2040 x 1536 (1 x 1, pixel shifting), 1360 x 1024 (1 x 1), 680 x 512 (1 x 1), 680 x 510 (2 x 2), 340 x 250 (4 x 4)
Lens mount		C-mount
ISO speed		ISO 200/400/800/1600 equivalent
A/D		12 bits
Exposure control*	Exposure modes	Auto, SFL Auto, Manual
	AE lock	Available
	AE pause	Available
	Exposure correction	Correction range: ±2.0 EV. Step: 1/3 EV
	Metering area	30%, 1%, 0.1%. The metering area is freely movable.
Exposure time		1/44,000 to 60 sec.
Binning		2 x 2, 4 x 4
Movie frame rate**		1360 x 1024 (1 x 1): 15 fps. 680 x 512 (1 x 1): 15 fps. 680 x 510 (2 x 2): 29 fps. 340 x 250 (4 x 4): 57 fps.
Still image recording time** (From exposure start to display)		4080 x 3072 (1 x 1): Approx.3.0 sec. 2040 x 1536 (1 x 1): Approx.2.5 sec. 1360 x 1024 (1 x 1): Approx.0.7 sec. 680 x 512 (1 x 1): Approx.0.6 sec. 680 x 510 (2 x 2): Approx.0.5 sec. 340 x 250 (4 x 4): Approx.0.4 sec.
Color modes		Color, standard gray scale, custom gray scale
External triggering		Input: Event trigger input. Output: Trigger output. With exposure time lag (0 to 2 sec. in 10 msec. steps). } Compatible with TTL

Item		Specifications
Image accumulation*	Modes	Integral, averaging
	Accumulation count	64 frames (max.)
White balance Modes*		Area-specified auto, Entire area-specified auto, Manual
Black balance Modes*		Area-specified auto, Entire area-specified auto, Manual
Contrast modes*		Low, Standard, High, Linear.
Sharpness filter*		Low, Standard, High.
Focus indicator*		Contrast bar, numeric display, histogram.
Interval recording*		Interval: 1 sec. to 24 h.50 m.59 sec. Number of shootable frames: 3000
Image file formats*		TIFF (16/48-bit) with 10 bits/CH effective pixels, TIFF (8/24-bit), JPEG, BMP, PICT, AVI, MPEG-1.
Preview quality modes*		Standard, Medium, High.
Computer interface		PCI bus interface: PCI Rev. 2.1 and 2.2 compatible.
Compatible OS		Windows XP Professional SP1a or after. (Not compatible with the x64 Edition.) Windows 2000 Professional SP4. (English or Japanese edition)
Dimensions & weight	Camera head	112(ϕ) x 75(H) mm (excluding projections), approx. 1,150 grams
	PCI unit	187.4(W) x 125.7(D) x 21.4(H) mm (excluding projections), approx. 250 grams
	Interface cable	Approx. 2.8 meters
	External trigger cable	Approx. 0.2 meter
Operating environment		• Indoor use. • Altitude: Max. 2000 meters • Ambient temperature: 10° to 35°C (50° to 95° F) • Relative humidity: 20% to 85% (without condensation) • Supply voltage fluctuations; ±10%. • Pollution degree: 2 (in accordance with IEC60664) • Installation/Overvoltage category: II (in accordance with IEC60664)

* These items can be set from the DP-BSW. (Ver 3.1 or lator)

** The values of these items are variable depending on the exposure time setting and the computer operating situations.

9 TROUBLESHOOTING GUIDE

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

Problem	Cause	Remedy	Page
a) The computer will not start up.	The PCI interface board is not inserted completely into the computer's PCI slot.	Turn off the computer, unplug the power cord and insert the PCI interface board into the computer's PCI slot securely.	8
b) Software will not start up.	The camera and computer are connected improperly.	Turn off the computer and connect the camera and PCI interface board properly using the interface cable.	8, 10
	The PCI interface board is inserted into the computer's PCI slot improperly.	Turn off the computer, unplug its power cord and insert the PCI interface board into the computer's PCI slot.	8
	The device driver is installed improperly.	Install the device driver.	11-16
c) Live image is not displayed.	The camera and computer are connected improperly.	Turn off the computer and connect the camera and PCI interface board properly using the interface cable.	8, 10
	The microscope illumination is off. The microscope is not set to the camera light path. The illumination or specimen focusing is adjusted improperly.	Turn on the microscope illumination, adjust the lighting and focusing correctly, and select the camera light path.	–
	The ISO speed or exposure time is set improperly.	Set the ISO speed, exposure mode, exposure time and level properly.	(Online manual)
d) Still images cannot be recorded.	The camera and computer are connected improperly.	Turn off the computer and connect the camera and PCI interface board properly using the interface cable.	8, 10
	The DP Controller is processing recording.	Wait until the recording processing completes before starting recording of the next image. In certain cases, it may be required to press the Cancel button of the progress bar and record the image again.	(Online manual)
	The DP Manager is processing file save, etc.	Wait until the processing completes before starting recording of the next image.	(Online manual)
	The computer memory is insufficient.	Close the image being displayed on the DP Manager or close other software before retrying recording.	–
e) Picture is too bright.	Exposure correction is set in the + direction.	Return the exposure correction value to 0 and set the desired exposure correction value.	(Online manual)
	The metering area is set to a dark area outside the region of interest.	Move the metering area to the area where you want to obtain optimum exposure	(Online manual)
	AE lock, which was set when the exposure time was longer than the currently required exposure time, is active.	Cancel AE lock.	(Online manual)
	The input highlight level adjustment is too low.	Reset the current level adjustment and adjust the optimum level again.	(Online manual)
	The microscope illumination is too bright.	Reduce the microscope illumination intensity or engage an ND filter to reduce brightness.	–

Problem	Cause	Remedy	Page
f) Picture is too dark.	Exposure correction is set in the - direction.	Return the exposure correction value to 0 and set the desired exposure correction value.	(Online manual)
	The metering area is set to a bright area outside the region of interest.	Move the metering area to the area where you want to obtain optimum exposure.	(Online manual)
	AE lock, which was set when the exposure time was shorter than the currently required exposure time, is active.	Cancel AE lock.	(Online manual)
	The output highlight level adjustment is too low.	Reset the current level adjustment and adjust the optimum level again.	(Online manual)
	The microscope illumination is too dark.	Increase the microscope illumination intensity or disengage the existing ND filter to increase brightness.	–
g) The colors in the picture are strange.	The area selected in white balance adjustment was improper.	Select a white area as the rectangular white balance adjustment area.	(Online manual)
	The RGB balance is adjusted improperly in manual white balance adjustment.	Perform manual white balance adjustment to adjust the RGB color balance to obtain optimum colors.	(Online manual)
	The area selected in black balance adjustment was improper.	Select a black area as the rectangular black balance adjustment area.	(Online manual)
	The screen color setting of the computer is incorrect.	Set the computer display color to 24-bit color or higher. The recommended setting is 32-bit color.	–
h) The picture is not in focus.	The microscope is not focused properly.	Adjust the focus correctly with the fine adjustment knob.	–
	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.	5
	The microscope and/or camera are subjected to vibration during recording.	Record images in an environment in which the microscope and camera are not vibrated. It is effective to use an anti-vibration bench.	–
i) The 4080 x 3072 and 2040 x 1536 images are not neat.	The camera is subjected to vibration during recording.	Record images in an environment in which the microscope and camera are not vibrated. It is effective to use an anti-vibration bench.	–
j) The DP Controller window is not displayed correctly. Or the menu characters are not displayed correctly.	The resolution setting of the screen is not correct.	Set the resolution setting at 1280 x 1024 or more in the property of the screen.	–
	A large font has been selected in the font size of the screen.	Select a small font in the property of the screen.	–
k) External trigger signal is not output.	External triggering is not enabled.	Enable external triggering on the DP Controller.	(Online manual)
l) Still image cannot be recorded using the external trigger input.	External triggering is not enabled.	Enable external triggering on the DP Controller.	(Online manual)

10 *SOFTWARE UNINSTALLATION*

1. Windows®XP

1. Click on the [Start] button and select [Control Panel].
2. Click on [Add or Remove Programs].
3. When the [Add or Remove Programs] window appears, select [OLYMPUS MICRO DP71/DP70/DP30BW] under [Currently installed programs] and click on the [Change/Remove] button.
4. When the [OLYMPUS MICRO DP71/DP70/DP30BW] window appears, select [Remove] and click on the [Next] button.
5. When the [Confirm File Deletion] window appears, click on the [OK] button.
6. Click on the [Finish] button. Now the application program is deleted.

2. Windows®2000

1. Click on the [Start] button and select [Settings] - [Control Panel].
2. Double-click on [Add/Remove Programs].
3. When the [Add or Remove Programs] window appears, select [OLYMPUS MICRO DP71/DP70/DP30BW] under [Currently installed programs] and click on the [Change/Remove] button.
4. When the [OLYMPUS MICRO DP71/DP70/DP30BW] window appears, select [Remove] and click on the [Next] button.
5. When the [Confirm File Deletion] window appears, click on the [OK] button.
6. Click on the [Finish] button. Now the application program is deleted.

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