

# **OLYMPUS<sup>®</sup>**

---

## **INSTRUCTIONS**

---

# **DP22/DP27**

## **MICROSCOPE DIGITAL CAMERA**

This instruction manual is for the Olympus microscope digital camera DP22/DP27.

To obtain optimum performance of this camera and to ensure the safety, study this manual thoroughly before operating the camera and keep it on hand during operation of the camera.

Keep this instruction manual in a safe place.

For details of products included in the configuration of this system, see page 16 of this instruction manual.

Optical Microscope Accessory

This product is applied with the requirements of standard IEC/EN61326-1 concerning electromagnetic compatibility.  
- Immunity Applied to industrial and basic environment requirements.



In accordance with European Directive 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 product 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 product is operated in a commercial environment. This product 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 product 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 product.

### For Korea only

B급 기기 (가정용 방송통신기자재)

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

# Table of Contents

<b>Introduction .....</b>	<b>1</b>
<b>Safety precautions.....</b>	<b>2</b>
<b>Handling precautions.....</b>	<b>5</b>
<b>1 System diagram.....</b>	<b>16</b>
<b>2 Nomenclature of respective portions.....</b>	<b>17</b>
<b>3 Assembly.....</b>	<b>18</b>
<b>1</b> Attaching camera head .....	18
<b>2</b> Connecting interface cables .....	20
<b>4 Installation of software.....</b>	<b>21</b>
<b>5 Outline of image acquisition procedures .....</b>	<b>22</b>

<b>6 Specifications.....</b>	<b>23</b>
------------------------------	-----------

<b>7 Troubleshooting.....</b>	<b>26</b>
-------------------------------	-----------

■ Proper selection of the power supply cord.....	32
--	----

# Introduction

With this microscope digital camera DP22/DP27 attached to the Olympus UIS2/UIS series microscope using the camera adapter, the image from the optical microscope can be acquired.

Using this microscope digital camera in combination with microscopes of other manufacturers may not obtain the complete optical performance.

## Contents in this instruction manual

This Instruction Manual covers only the contents concerning the microscope digital camera DP22 and DP27. For operating procedures according to the connection status of the microscope digital camera, refer to the Instruction Manual according to the relevant connection status.

# Safety precautions

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

The following symbols are used in this instruction manual.

 **CAUTION** : Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

 **CAUTION** : Indicates a potentially hazardous situation which, if not avoided, may damage the equipment or other property.

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

## **CAUTION - Installation of microscope -**

**Do not allow the height of the microscope higher than 1 m.**

In order to prevent overturning, do not combine accessories to allow the height of the microscope higher than 1 m.

 **CAUTION - Electric safety -****Always use the power cord provided by Olympus.**

Without using the correct power cord, the electric safety and the EMC (Electro-Magnetic Compatibility) performance of the device cannot be assured.

**Always connect the grounding terminal.**

Connect the grounding terminal of the power cord and the grounding terminal of the power outlet. If the device is not grounded, our intended electric safety and EMC performance of the device can not be assured.

**Do not use the device near the source of strong electromagnetic radiation.**

The proper operation may be interfered. The electromagnetic environment should be evaluated prior to operation of this device.

**In case of emergency, unplug the power cord.**

In case of emergency, be sure to remove the power cord from the power cord connector on the product or from the wall power outlet. Install the product at the location where you can reach the power cord connector or the wall power outlet at hand to remove the power cord quickly.

**Be sure to turn OFF the power of the device before connecting/disconnecting cables.**



**CAUTION - Protection for electric shock -**

**Do not insert any tools or metal fragments in the air vents of the device.**

Doing so could cause electric shock or failure of the product.

**Keep the power cord and cables well away from the lamp housing.**

If the power cord and cables contact a hot area of the lamp housing, they could melt and cause electric shock.



**CAUTION - Protection for burns -**

**Do not keep touching the camera head for long hours.**

The camera head generates heat after long hours of use. Be careful not to allow this device to touch your skin for long period of time to avoid the low temperature burns.

# Handling precautions

## Intended use

This device is intended to be used for the capture of digital images, but not for clinical diagnostic purposes.

## Cautions in use

1. This equipment is a precision instrument. Handle it with care and avoid subjecting it to a sudden or severe impact. Also note that this equipment is not waterproof.
2. Never disassemble any part of the product. Otherwise, failure could be caused.
3. Do not use the camera in areas where it may be subjected to direct sunlight, high temperature and humidity, dust or vibrations.  
(For use environment, refer to "6 Specifications" on 25 page.)
4. The cables are vulnerable to bend or twist. Do not apply excessive force. When connecting cables, make sure of the orientation to insert them.
5. If cables are connected incorrectly, it may cause a failure of the product. Make sure that the cables are connected to respective modules correctly before operating the product.
6. For operating the PC, refer to the instruction manual provided with the PC in use. Pay attention to the precautions and warnings, etc. in the manual.
7. It is recommended to install the antivirus software to the controller to protect from the computer virus. Note, operations of the software cellSens/OLYMPUS Stream may be slower depending on the antivirus software.

## Image data

1. The recorded image data may be lost (destroyed) in the following cases. Olympus is not liable for the loss (destruction) of recorded data.
    - When the user or a third party carried out a repair to the product.
    - When the system is terminated or the power cord is unplugged while PC or the control box is recording or deleting (initializing).
    - When the cable is disconnected while acquiring still images or movies.
    - When the data have been kept saved in the recording media such as USB memory beyond the data storage life (approx. from one to several years).
    - When the product failed.
  2. If following phenomena occur even though the camera is working properly, images cannot be restored and the damages are not compensated.
    - The image is abnormal.
    - File properties such as file names, file date, etc. are abnormal.
    - The image was lost.
- Ⓞ In general, as there is a data storage lifetime in the recording media, such as USB memory, HDD, CD-R, DVD-R, etc., the saved files may be lost after several years.
- Ⓞ The image data may be lost (corrupted) unexpectedly, so make frequent backups of the data you acquired. OLYMPUS shall have no liability for any damage (including compensation for the corrupted image data) from the use or incapable use of this product.

- ◎ Make sure that there is no problem in acquiring the specimen images before acquisition. Even though the problem may occur by the acquired images, Olympus is not liable for these problems.

## System compatibility

### Restrictions in use

1. The camera adapter with "O" mark in the following table can be used with this product.

	U-TV0.25XC	U-TV0.35XC U-TV0.35XC-2	U-TV0.5XC U-TV0.5XC-2	U-TV0.5XC-3	U-TV0.63XC	U-TV1XC
DP22-CU	X	X	X	O	O	O
DP27-CU	X	X	X	O	O	O
	U-TV1X-2 +U-CMAD3	MXV-TV0.63XC	MXV-TV1XC	GX-TV0.5XC	GX-TV0.5XC -DP	GX-TV0.7XC
DP22-CU	O	O	O	O	X	O
DP27-CU	O	O	O	O	X	O

O : Usable

X : Not usable with this product due to a matter of optical performance.

- 
2. When two or more intermediate tubes are used in a stack, the periphery of the field of view may be obscured depending on the observation tube and objective used together.

\* Example of using two or more intermediate tubes:

With BX53 : Reflected light illuminator + Intermediate magnification changer

With IX series : IX73P2F, IX83P2ZF

3. If the illumination used with the microscope is the fluorescent light ring illumination or the illumination driven by the alternate current such as the phase control light intensity control method, etc. and also if the light intensity voltage becomes higher and the exposure time becomes shorter when combining the microscope and this camera, the following phenomena occur due to the flickering of the illumination light.

- Flickering in the image displayed
- Variation of exposure

However, if the brightness can be adjusted by adjusting the illumination light level or by attaching/detaching the attenuation filter, these phenomena can be avoided by adjusting the exposure time to 1/50 sec or longer. For details such as the microscope model name which drives the illumination by the alternate current, etc., contact the Olympus distributor.

4. Performance in combination use of this product and non-Olympus microscope has not been evaluated.
5. When observing a low contrast specimen or high reflectance specimen, the spot flare may be noticeable if the aperture iris diaphragm is narrowed down close to the smallest diameter.

6. When observing specimen with high intensity difference and high intensity portions shown in the acquisition area, red line flare may appear. This flare becomes more noticeable if you close the AS (Aperture Stop) and less noticeable if you open the AS (Aperture Stop). (The flare may remain even though the AS is opened.)  
This flare can be reduced by adjusting the exposure.
7. When observing specimen with low contrast (closer to colorless and transparent), red line flare may appear. This flare becomes more noticeable if you close the AS (Aperture Stop) and less noticeable if you open the AS (Aperture Stop). (The flare may remain even though the AS is opened.)
8. If the differences in the brightness or the color are noticeable between the left half and the right half of the live image, perform calibration.  
For details, refer to the Online Help or the Instruction Manual according to the relevant connection status.
9. Specimens with intensity distribution that is not suitable for the metering require using spot metering or compensating exposure.
10. When electronic zoom is used for enlarging the image during focusing, roughness of the image may become noticeable on certain specimens.
11. If the resolution of the live image is different from the resolution for the image to be acquired, intended images may not be obtained.

12. The maximum frame rate according to the resolution of the live image is shown in the table below. The maximum frame rate is given when the exposure time as shown in the table.

DP22-CU:

Resolution	Exposure time (sec)	Frame rate (fps)
1920 x 1440	1/27	25
960 x 720 (Draft)	1/27	25
960 x 720 (Binning)	1/27	25

DP27-CU:

Resolution	Exposure time (sec)	Frame rate (fps)
2448 x 1920	1/16	15
1224 x 960 (Draft)	1/33	30
1224 x 960 (Binning)	1/33	30

13. When observing a specimen which contains little white area, the traceability of auto white balance is deteriorated.
14. When the edge of a non-transmitted object is observed by transmitted illumination under the STM6 (small measuring microscope), the flare may be noticeable due to the difference in brightness between the transmitted sections (over-exposure) and non-transmitted sections (under-exposure).

To reduce the flare, set a lower exposure by using the exposure compensation or by setting the exposure manually.

15. The image of dark specimen under the fluorescence observation or the darkfield observation (specimen that needs exposure of 1/2 sec. or more at ISO 100 equivalent) cannot be acquired. When acquiring the image of the particularly dark specimen, the lack of pixels caused by the cosmic ray or the constant bright points may be noticeable, but they are not phenomena caused by the failure of the equipment.
16. If the illumination light of the microscope is set too bright, the color unevenness may be generated in the acquired image. In such a case, adjust the light intensity of the illumination to an appropriate level (for example, by lowering the lamp voltage or by inserting an attenuation filter). Or use the shading correction function. For details of the shading correction function, refer to the online help and the instruction manual according to the relevant connection status.
17. When combining this equipment with a CX series or CKX series microscope, set the light intensity of the illumination closer to the maximum level in order to gain the best color reproduction.

Recommended specifications of the monitor

Monitor available for full color view of 1280 x 1024 or more.

## PC and software

### Recommended configurations

Common in Desktop PC and Laptop PC (except No. 7)

No.	Item	Operating Environments
1	CPU	Intel® Core i5, Intel® Core i7, Intel® Xeon, (or equivalent)
2	RAM	Recommendation: 8 GB or more (at least 4 GB)
3	HDD	1 GB or more hard disk space for installation SSD is recommended for high speed image acquisition.
4	Display	Resolution 1280 x 1024 (at least 1024 x 768), graphic card available for 32 bit color.
5	Drive	DVD-ROM drive (available for double layer)
6	Communication port	USB 3.0 port
7	PC input device	<ul style="list-style-type: none"><li>• 3-button mouse with wheel is recommended. (At least, 2-button mouse is required.)</li><li>• Keyboard</li></ul>
8	OS	Microsoft® Windows® 10 Pro (32 bit / 64 bit) Microsoft® Windows® 8.1 Pro (32 bit / 64 bit) Microsoft® Windows® 7 Ultimate / Professional (32 bit / 64 bit) SP1
9	OS languages	English, German, Japanese, Simplified Chinese, Russian and other languages which use alphabet
10	Web browser	Microsoft® Internet Explorer® 11 Microsoft® Internet Explorer® 10 Microsoft® Internet Explorer® 9 Microsoft® Internet Explorer® 8

Even though the above mentioned recommended operating environments are satisfied, it does not necessarily guarantee the functions of combination use with all PCs commercially available. Refer to Olympus website to check the PCs whose performances in combination use with this system were confirmed.

#### Trademark

Microsoft, Windows and Internet Explorer are registered trademarks of Microsoft Corporation, USA. All of other brand names and product names mentioned in this manual are trademarks or registered trademarks of their respective owners.

#### Controller

- ◎ When using the controller for the first time, the activation (certified) period of the software cellSens installed in advance may have passed. In such a case, refer to section "Activation" in the "cellSens Installation Manual" (provided separately), and perform activation.
1. Olympus is not liable for any damage due to the use or disability in use of this system, including compensation for lost data.
  2. Microsoft® Windows® has been installed in the controller. Please backup these systems, and keep them in a safe place. (We do not provide a support for backup, etc.). For the controller or Microsoft® Windows®, refer to the instruction manuals provided respectively.
  3. The quality of this product is assured in the factory default status. Olympus is not liable for abnormal operations functional failures caused by changing configurations of the controller (including BIOS change), installing other software or adding other hardware at your side.

- 
4. When the HDD free space is reduced, the data processing speed may be extremely slow or errors may occur frequently. To prevent this, delete unnecessary data files frequently. For procedures to delete data files, refer to the instruction manual of Microsoft® Windows®.
  5. Never delete or change the names of folders and files that are created on the hard disk of the controller on delivery. Deleting or changing the names of folders and files may interfere the software to start
- ☉ For repair of the controller, contact the Olympus distributor.

Desktop PC and laptop PC

1. Olympus is not liable for any damage due to the use or disability in use of this system, including compensation for the lost data.
2. When the HDD free space is reduced, the data processing speed may be extremely slow or errors may occur frequently. To prevent this, delete unnecessary data files frequently.
3. Use the computer complying with the requirements of IEC60950 or CISPR22/24.

## Maintenance and storage

1. Do not leave stains or fingerprints on the lenses and filters. If they get dirty, blow away dust with a commercially available blower and gently wipe the lens or filter with a piece of cleaning paper (or clean gauze).  
Only when cleaning fingerprints and oil stains, slightly moisten a piece of cleaning paper with commercially available absolute alcohol and wipe them off with it.

**CAUTION**

**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 electrical sparks. For example, the electrical equipment that is switched on and off may cause the ignition of a fire. Also, always use absolute alcohol only in a well-ventilated room.**

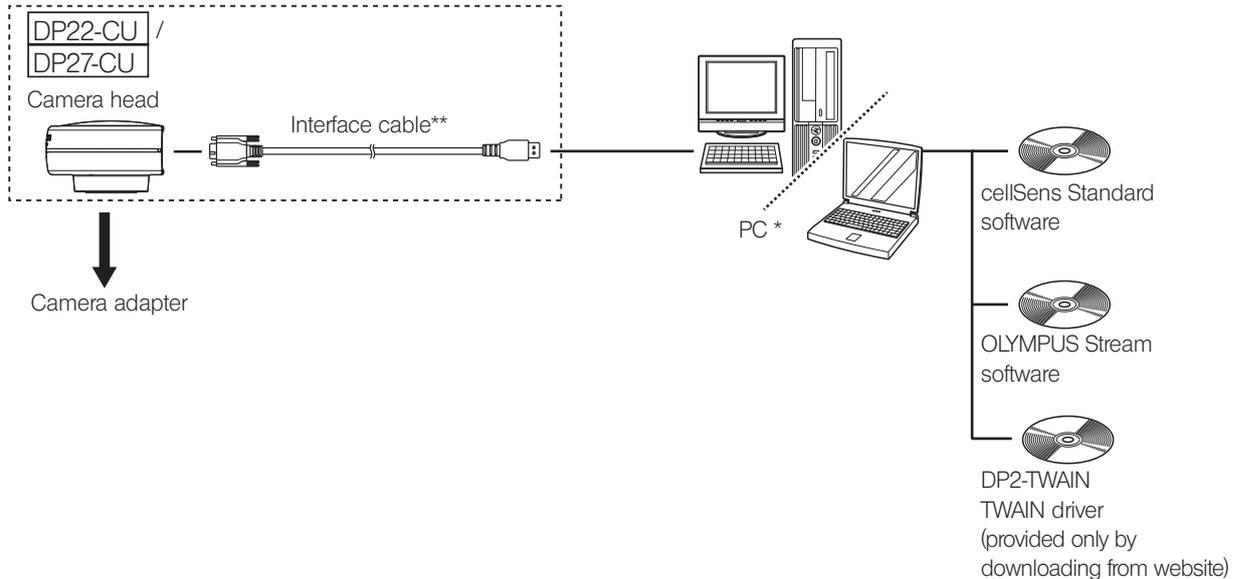
2. Use a diluted neutral detergent to clean the parts other than the glass components. Moisten a soft cloth with diluted neutral detergent and wipe the surfaces of the parts.



**Do not use organic solvents to clean the parts other than the glass components, since it deteriorates painted surfaces or plastic parts.**

3. When disposing of this product, be sure to follow the regulations and rules of your local government. For any inquiry, contact Olympus.
4. When smoking the room for cleaning, etc., move the camera head to a place not exposed to smoke.
5. Be careful about generation of the dew condensation, as this may cause failure of the product. Dew condensation is the phenomenon that the vapor in the air contacts the surface of a metallic plate, etc. and attached as water drops. When the temperature suddenly changes, the dew condensation may be generated, for example when the camera head is suddenly brought from cold place to warm place.
6. This camera turns over easily. When storing this camera, put the C mount area at the bottom.

# 1 System diagram



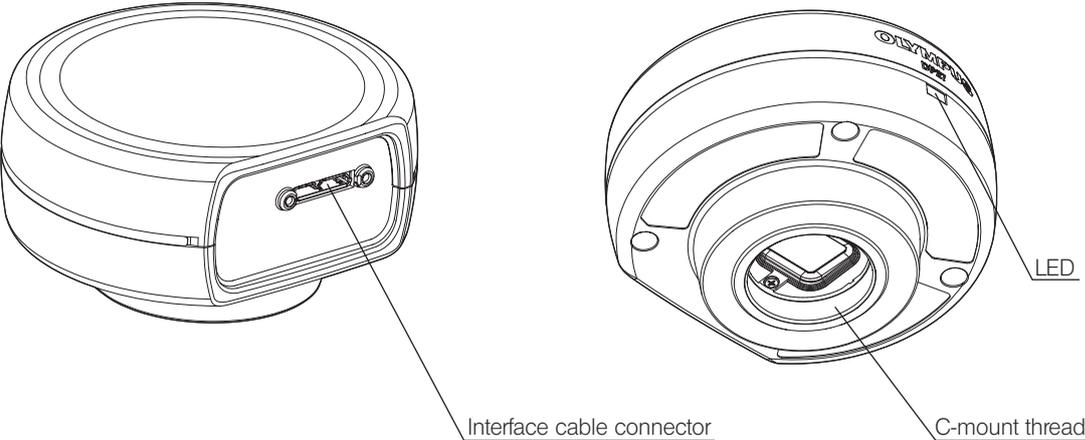
© Consult Olympus for the compatible microscope and camera adapter .

\* The camera head may not work properly in combination with some PCs. Refer to Olympus website to check the PCs whose performances in combination use with this system were confirmed.

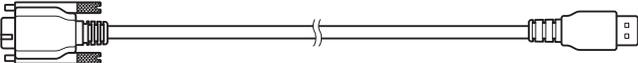
\*\* Do not use the interface cable for the other purpose than intended use.

# 2 Nomenclature of respective portions

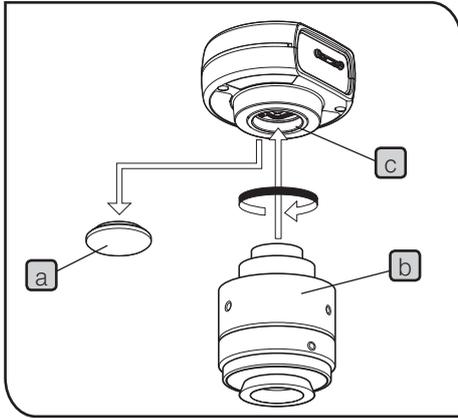
Camera head



Interface cable



# 3 Assembly



## 1 Attaching camera head

**CAUTION** • Do not touch the C-mount thread, since it is sharp.

• Be careful not to drop the camera head and the camera adapter when attaching or detaching them.

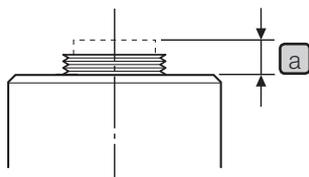
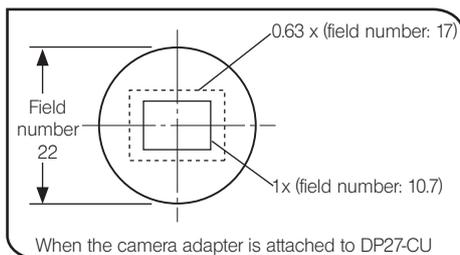
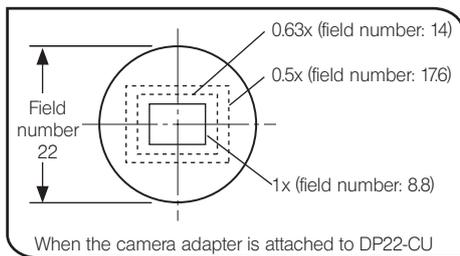
◎ The procedures to attach the camera head when using the camera adapter with C-mount U-TV1XC are described below.

**1** Remove the C-mount lens cap **a**.

**2** Screw the camera adapter with C-mount U-TV1XC **b** into the C-mount thread **c** at the bottom of the camera head until it stops.

**3** Attach the C-mount camera adapter to the camera port of the microscope.

◎ If the camera is not attached in a correct direction, the direction of the image observed through the eyepiece does not match with the direction of the image through the camera. After the camera is attached, compare the image observed through the eyepiece to the live image acquired by the camera, and rotate the camera adapter so that the directions of these images match each other.



- As shown in the left picture, the image area acquired by the camera differs depending on the magnification of the camera adapter. Use the camera adapter with the magnification described below. (If you use the camera adapter with the magnification lower than followings, four corners of the image may be obscured depending on the microscope to be combined.)

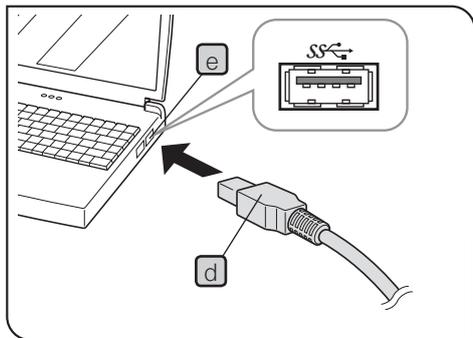
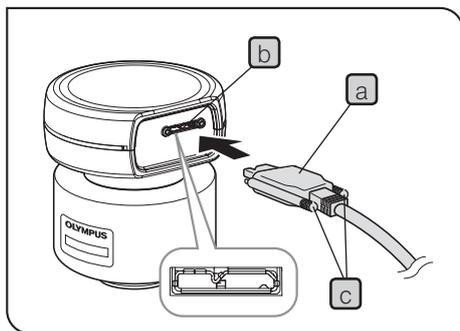
DP22-CU: 0.5x, 0.63x or 1x

DP27-CU: 0.63x or 1x

- The left figure shows an approximate field of view area. Check the actual field of view area by observing the specimen equipped with a scaling function, etc. before use.
- If a C-mount camera adapter of non-Olympus manufacturers is used, the optimum optical performance may not be obtained.

**CAUTION** • Do not use other manufacturer's C-mount camera adapter which has a threaded section **a** longer than 4.5 mm, since it will hit the parts inside the camera head and cause damages to them.

- Be sure to adjust the parfocality between the C-mount camera adapter and the eyepieces. Otherwise, the focus of the image through the eyepieces and the one through the camera will not match each other. For the parfocality adjustment method, refer to the instruction manual for the camera adapter in use.



## 2 Connecting interface cables



**CAUTION** • Be sure to turn OFF the power of the control box or the power of PC before connecting interface cables.

- Always use the interface cable (USB 3.0 cable) provided by Olympus. Using commercially available USB 3.0 cables or hubs does not guarantee the operation of the equipment.
- Keep the interface cables well away from the equipment generating heat, such as the lamp housing of microscope.



**CAUTION** • The interface cable is vulnerable to bend or twist. Be careful not to apply excess force.

- Connect the interface cable in the correct orientation paying attention to the shape of the connector.

**1**

Connect the connector **a** of the interface cable to the connector **b** of the camera head, and tighten the lock screw **c** (2 positions). Make sure that the interface cable is secured completely.



**CAUTION** Be sure to tighten the lock screws with your hand. If you use the tool to tighten the lock screws too firmly, the screw area of the connector of the camera head may be damaged.

**2**

Connect the connector **d** of the other end of the interface cable to the controller or the USB 3.0 connector **e** of the PC.

Ⓞ USB 3.0 connector: Depending on PC, the terminal area is blue or "SS" is printed.

Ⓞ If the interface cable is connected to the USB 2.0 connector, the camera head does not work.

# 4 Installation of software

## Software cellSens/OLYMPUS Stream

Refer to the installation manual of cellSens/OLYMPUS Stream before installation. When you purchase DP2-PC-S, cellSens Standard has been installed to the controller in advance.

## Before installing software

1. Close all running applications before installing software.
2. Software cannot be installed unless the user account logging on the Windows® is registered as a “Administrator”. If it is registered as a “User”, change it to a “Administrator”.  
(For the change of user account, refer to the Help of Windows®.)

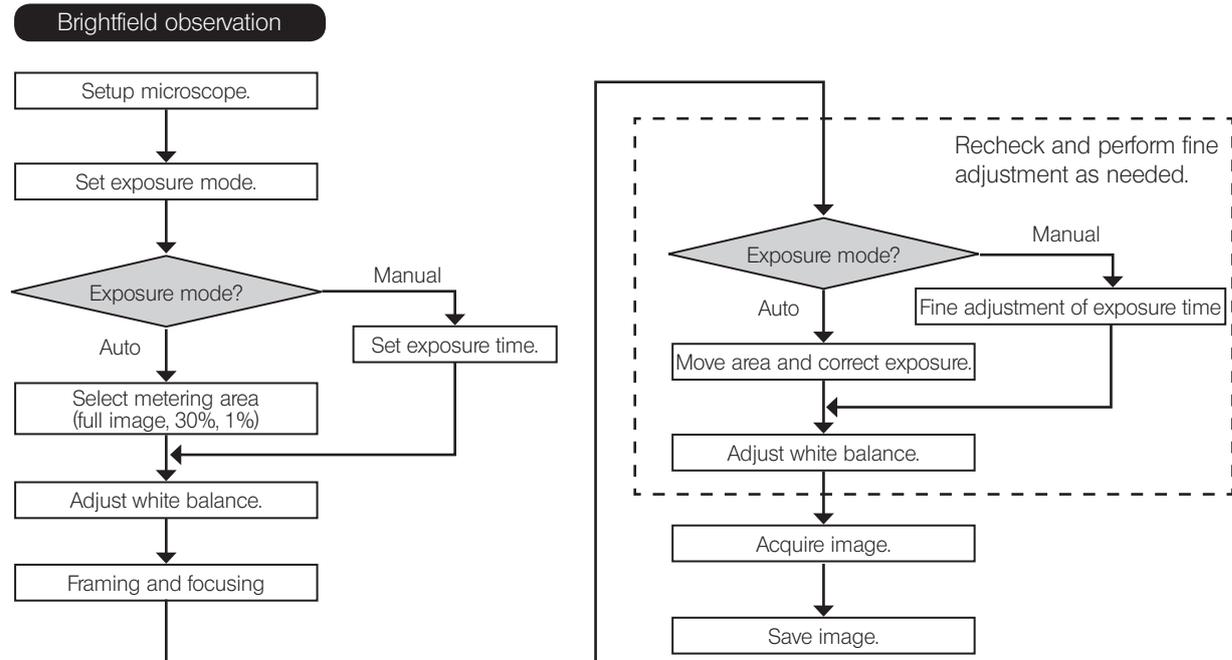
## TWAIN Driver DP2-TWAIN

DP2-TWAIN is not included in this product. Download the installer from Olympus web site.

When using DP2-TWAIN with 64 bit OS, the commercially available software that supports TWAIN in 64 bit native operation is required.

# 5 Outline of image acquisition procedures

For detail use procedures, refer to the instruction manual or Help of software you will use.



Example of procedures to acquire images in brightfield observation

# 6 Specifications

Item		Specifications	
		DP22-CU	DP27-CU
Camera		C-mount CCD camera	
Image pickup device	Size	1/1.8-inch color CCD	2/3-inch color CCD
	Effective pixels	2.83 million pixels (total pixels: 2.98 million pixels)	5.05 million pixels (total pixels: 5.24 million pixels)
	Scanning method	Progressive scanning	
	Color filters	RGB primary color on-chip filters	
	Recording area	708(H) x 5.31(V) mm, diagonal length 8.8 mm	8.4(H) x 6.62(V) mm, diagonal length 10.73 mm
	Max. recording pixels	2.76 million pixels (1920 x 1440)	4.7 million pixels (2448 x 1920)
Image size		1920 x 1440 (1 x 1) 1920 x 1080 (1 x 1) 960 x 720 (1 x 1) 960 x 720 (2 x 2) Cutout of any size at any position (ROI)	2448 x 1920 (1 x 1) 1920 x 1080 (1 x 1) 1224 x 960 (1 x 1) 1224 x 960 (2 x 2) Cutout of any size at any position (ROI)
Camera mount		C-mount	
ISO sensitivity selection		Equivalent to ISO200/400/800	Equivalent to ISO100/200/400

Item	Specifications	
	DP22-CU	DP27-CU
Exposure control	AUTO / MANUAL AE lock (enabled when Auto Exposure is selected) Exposure compensation : Area -2EV to +1EV, +side:1/6EV step, - side1/3EV step (enables when Auto Exposure is selected.) Metering method : Full image / 30% / 1% (The metering area can be moved freely)	
Exposure time	Auto            1/20,000 sec to 2 sec Manual         1/20,000 sec to 8 sec	
Binning	2 x 2	
Live image display speed (Frame rate)	Display pixels 1920 x 1440 (1 x 1) : 25 frames/sec Display pixels 960 x 720 (1 x 1) : 25 frames/sec Display pixels 960 x 720 (2 x 2) : 25 frames/sec Display pixels 1920 x 1080 : 30 frames/sec	Display pixels 2448 x 1920 (1 x 1) : 15 frames/sec Display pixels 1224 x 960 (1 x 1) : 30 frames/sec Display pixels 1224 x 960 (2 x 2) : 30 frames/sec Display pixels 1920 x 1080 : 22 frames/sec
Color mode	High fidelity / Normal / Cell culture / Grayscale	
White balance	Area Definition Auto / Full Auto / Manual	
Contrast mode	Normal / Medium / High	
Sharpness filter	OFF / Normal / Strong	
Input/output connectors	Camera head side: USB 3.0 Micro-B Controller or PC side: USB 3.0 Type A	

Item	Specifications	
	DP22-CU	DP27-CU
Applicable OS	Microsoft® Windows® 10 Pro (32 bit / 64 bit) Microsoft® Windows® 8.1 Pro (32 bit / 64 bit) Microsoft® Windows® 7 Ultimate / Professional (32 bit / 64 bit) SP1	
Dimensions and weight	77 (W) x 42.5 (H) x 69.5 (D) mm 160 g	
Power consumption	Max. power consumption: less than 4.5 W	
Rating	5 V 0.9 A DC	
Storage environment		
Ambient temperature: -20 to 60 °C		
Relative humidity: 10 to 90%		
Operating environment		
Indoor use.		
Altitude: Max. 2000 meters		
Ambient temperature: 10 to 35 °C (50 to 95 °F)		
Relative humidity: 80% for temperatures up to 31 °C (88 °F) (without condensation)		
In case of over 31 °C (88 °F), the relative humidity is decreased linearly through 70% at 34 °C(93 °F), 60% at 37 °C(99 °F), to 50% at 40 °C(104 °F).		
Supply voltage fluctuations: ±10%.		
Pollution degree: 2 (in accordance with IEC60664-1)		
Installation category (Overvoltage category): II (in accordance with IEC60664-1)		

# 7 Troubleshooting

Under certain conditions, performance of the camera may not be given properly. If problems occur, please review the following list and take remedial action as needed.

If the phenomena are not improved, please contact Olympus for assistance.

Problem	Cause	Remedy	Page
Camera head does not work.	The interface cable is not connected properly.	Connect the interface cable properly. When the interface cable is connected properly, LED turns ON.	20
Nothing is shown on the display.	The main switch of the display is OFF.	Set the main switch of the display to ON.	-
	The display cable is not connected properly.	Connect the display cable properly.	-
	The resolution of the display is not set appropriately.	Set the resolution of the display appropriately.	-
Live image is not displayed.	The interface cable is not connected properly.	Connect the interface cable properly.	20
	The illumination of the microscope is not turned on. The light path selector of the microscope is not set to the camera side. The illumination intensity of the microscope is not adjusted properly. Focusing of the microscope is not adjusted properly.	Turn on the illumination of the microscope. Set the light path selector of the microscope to the camera side. Adjust the illumination intensity of the microscope properly. Adjust the focusing of the microscope properly.	-
	ISO sensitivity, exposure mode, exposure time and/or level adjustment are not set properly.	Set ISO sensitivity, exposure mode, exposure time and level adjustment properly.	-

Problem	Cause	Remedy	Page
The still image cannot be acquired.	DP2-TWAIN, cellSens or OLYMPUS Stream is performing the processing after acquisition.	Wait until the processing after acquisition is completed, and acquire the next still image.	-
	cellSens or OLYMPUS Stream is performing the processing of file save, etc.	Wait until the processing of file save, etc. is completed, and acquire the next still image.	-
	The memory of the PC is insufficient.	Close other software and acquire the still image. Save the images if you did not save them.	-
The image is too bright.	The exposure compensation is set to the + side beyond the appropriate value.	Set the exposure compensation to the appropriate value.	-
	The dark area of the image is set as the metering area erroneously.	Set the area where you want to meter as the metering area.	-
	The AE lock is set at the longer exposure time than the one required currently.	Cancel the AE lock.	-
	The illumination of the microscope is too bright.	Adjust the brightness by reducing the illumination intensity of the microscope or inserting the attenuation filter in the light path.	-

Problem	Cause	Remedy	Page
The image is too dark.	Exposure compensation is set to the - side beyond the appropriate value.	Set the exposure compensation to the appropriate value.	-
	The bright area of the image is set as the metering area erroneously.	Set the area where you want to meter as the metering area.	-
	The AE lock is set at the shorter exposure time than the one required currently.	Cancel the AE lock.	-
	The illumination of the microscope is too dark	Adjust the brightness by increasing the illumination intensity of the microscope or removing the attenuation filter from the light path.	-
The colors of the image are strange.	The reference area for white balance is not selected appropriately.	Select the area where nothing is shown on the background as the reference area for white balance.	-
	The RGB balance for manual white balance is not adjusted appropriately.	Adjust the RGB balance appropriately.	-
	The screen color of the PC is not set appropriately.	Set the screen color of the PC to 24 bit or higher. 32 bit is recommended.	-
	The image color is not selected appropriately.	Select the color mode which is suitable for your microscope, observation method and specimens.	-

Problem	Cause	Remedy	Page
There is a difference in the brightness or color between the left half and the right half of the image.	The 2-channel multi-CD is in use.	Make the observation object brighter and set the ISO sensitivity minimum (DP27-CU: ISO100, DP22-CU: ISO200). Use the calibration to correct the intensity difference. For procedures to use the calibration, refer to the online help and the instruction manual according to the relevant connection status.	-

Problem	Cause	Remedy	Page
The acquired image is not in focus.	The specimen is not brought into focus.	Bring the specimen into focus accurately.	-
	The parfocality between the camera adapter and the eyepieces is not adjusted properly.	Adjust the parfocality between the camera adapter and the eyepieces properly.	-
	The aperture iris diaphragm of the condenser is open too wide.	Narrow down the aperture iris diaphragm appropriately and bring the specimen into focus accurately.	-
	The field iris diaphragm is open too wide.	Narrow down the field iris diaphragm appropriately and bring the specimen into focus accurately.	-
	Lens components of the microscope and the cover glass on the bottom of the camera head are dirty.	Clean the objective, condenser, window lens of the microscope, and the cover glass on the bottom of the camera head.	15
	The microscope and camera are subjected to vibration during acquisition.	Acquire images in an environment where the microscope and camera are not vibrated. It is effective to use an anti-vibration table.	-

Problem	Cause	Remedy	Page
The window of the DP2-TWAIN, cellSens or OLYMPUS Stream is not displayed properly. Or characters of in the menu are not displayed properly.	The resolution of the display is not set appropriately.	Set the resolution of the display appropriately.	-
	The large font is selected as the font size of the display.	Select the small font as the font size of the display.	-

#### Repair request

If the phenomena are not improved even after you took the above remedial action, contact Olympus.

Please provide us the following information at that time. If this product is combined with PC, please provide us the PC model name, OS, free space in HDD, memory, and CPU.

- Product name and abbreviated name (Example: Camera head of DP22)
- Product number
- Problem: If the error code (4-digit number) is displayed, please inform us as well.

The repair parts are kept for the period of five years after purchase.

## ■ 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	125 V AC (for 100-120 V AC area) or, 250 V AC (for 220-240 V AC area)
Current rating	6 A 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 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		USA	UL	
Ireland	NSAI				

**Table 2 HAR flexible cord**

Approval organizations and cordage harmonization marking methods

Approval organization	Printed or embossed harmonization marking (May be located on jacket or insulation of internal wiring)		Alternative marking utilizing black-red-yellow thread (Length of color section in mm)		
			Black	Red	Yellow
Comite Electrotechnique Belge (CEBEC)	CEBEC	<HAR>	10	30	10
Verband Deutscher Elektrotechniker (VDE) e.V. Prüfstelle	<VDE>	<HAR>	30	10	10
Union Technique de l'Electricite' (UTE)	USE	<HAR>	30	10	30
Instituto Italiano del Marchio di Qualita' (IMQ)	IEMMEQU	<HAR>	10	30	50
British Approvals Service for Electric Cables (BASEC)	BASEC	<HAR>	10	10	30
N.V. KEMA	KEMA-KEUR	<HAR>	10	30	30
SEMKO AB Svenska Elektriska Materielkontrollanstalter	SEMKO	<HAR>	10	10	50
Österreichischer Verband für Elektrotechnik (ÖVE)	<ÖVE>	<HAR>	30	10	50

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
Danmarks Elektriske Materialkontroll (DEMKO)	<DEMKO>	<HAR>	30	10	30
National Standards Authority of Ireland (NSAI)	<NSAI>	<HAR>	30	30	50
Norges Elektriske Materiellkontroll (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

# OLYMPUS®

---

[www.olympus-global.com](http://www.olympus-global.com)

Manufactured by

**OLYMPUS CORPORATION**

Shinjuku Monolith, 2-3-1 Nishi-Shinjuku, Shinjuku-ku, Tokyo 163-0914, Japan

Distributed by

**OLYMPUS EUROPA SE & CO. KG**

Wendenstrasse 14-18, 20097 Hamburg, Germany

**OLYMPUS SCIENTIFIC SOLUTIONS AMERICAS CORP.**

48 Woerd Avenue Waltham, MA 02453, U.S.A.

**OLYMPUS SINGAPORE PTE LTD**

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

**OLYMPUS AUSTRALIA PTY. LTD.**

3 Acacia Place, Notting Hill VIC 3168, Australia

**OLYMPUS LATIN AMERICA, INC.**

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

**OLYMPUS KOREA CO., LTD.**

8F Olympus Tower, 446 Bongeunsa-ro, Gangnam-gu, Seoul, 06153 Korea

