OLYMPUS

Instructions for use

VS200

Research Slide Scanner

English

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Original instructions

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Contents

1 About this manual

This manual for the VS200 system is for qualified personnel that have been trained and authorized by Olympus as well as for general users. The manual contains important information on how to operate the VS200 system safely and correctly.

In addition, this manual describes how to unbox and install the system as well as how to install further components. These tasks must expressly only be performed by Olympus. As a user you are not allowed to unbox or install the VS200 system by yourself!

To ensure the safety, obtain optimum performance and to familiarize yourself fully with the use of this product, study this manual thoroughly before installing this product, and always keep this manual at hand when operating this product.

Retain this instruction manual in an easily accessible place near the work area for future reference.

Installing and configuring a liquid dispenser, and upgrading to a VS200 loader are not in the scope of this document. These must only be installed and adjusted by an Olympus service technician.

1.1 Notes on qualifications

Olympus personnel	Instructions for tasks that must only be performed by Olympus are identified with the following note: The units described below must be assembled and adjusted by Olympus. If these units are assembled or adjusted by the customer, the operations are not ensured.

1.2 Intended use

The system is intended to be used for the acquisition of virtual slide images. The system is intended to be used for research only.

If the VS200 system is used in a manner not specified by this manual, the safety of the user may be at risk. In addition, the VS200 system may also be damaged. Always use the VS200 system according to this instruction manual.

Foreseeable misuse

The system is not intended to be used for primary diagnosis.

1.3 Other applicable documents

Familiarize yourself with all of the other manuals for the components of the system. Take special note of the safety instructions they contain.

1.4 Symbols in this documentation

	Tools required for performing the steps
✓	Preconditions for the subsequent steps

2 Safety

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 product as outlined in this manual.

2.1 Categories and symbols in the safety instructions

The safety instructions in this manual use symbols and keywords that are divided into the following categories:

CAUTION
This warning sign and the word **CAUTION** indicate dangerous situations that can lead to minor injury if ignored.

ATTENTION
The exclamation mark and the word **ATTENTION** indicate situations where irreparable damage to the product can occur if ignored.

Useful tips and important information

This symbol indicates useful notes, tips and important information.

2.2 Caution labels

Indicates a non-specific general hazard.

This warning sign indicates that there is a pinching hazard.

2.3 Caution labels on the product

Caution labels have been placed at positions where special care is required when handling and operating the system. Always pay attention to the caution labels.

CAUTION
Moving components can cause injury
Components move around inside the scanner. Gaps open and close. Hands and fingers can get pinched.

- Keep hair, fingers, hands, other body parts, clothes and other objects out of the VS200 system when the VS200 is connected to the power supply.

CAUTION
Moving components can cause injury
Components move around inside the loader. Gaps open and close. Hands and fingers can get pinched.

- Keep hair, fingers, hands, other body parts, clothes and other objects out of the system when it is connected to the power supply.

CAUTION

The stage poses a pinching hazard when it moves

Gaps open and close when the stage moves. Hands and fingers can get pinched.

- Make sure that you are not within the stage's range of movement when it is moving.
- Try never to put your hands or fingers into any gaps.

CAUTION

Pinching hazard when inserting the tray into the VS200 scanner

The motorized drive of the door flap in the scanner poses a pinching hazard. Your hands and fingers risk being pinched when you insert a tray.

- Make sure that the VS200 ASW software isn't performing any functions while you are inserting the tray.

CAUTION

Pinching hazard when replacing the objectives

If the nosepiece or the Z-axis is moving while you are replacing the objectives, hands and fingers can get pinched.

- Make sure that hands and fingers are not within the range of movement.
- Make sure that the VS200 ASW software isn't performing any functions while you are replacing the objectives.

Position of caution labels	
	U-FFWO
	VS200 loader
	SCARA robot arm
	In the VS200 scanner's stage area
	Nosepiece
	Door flap
	Door flap motor

2.4 General safety instructions

- Do not plug anything into or unplug anything from the ports when the system is connected to the power supply.
- The system is not intended to be used for general microscopy tasks.
- Natural disasters are not covered by the warranty of this product.
- No guarantee can be provided for image files. It will not be possible to restore images or to offer compensation if any of the following conditions occur. This is regardless of whether they occur during normal operation or are attributable to user error, malfunctioning of the device, or a potential or actual system failure.
    1. Defective image
    2. Defective file information such as file name or file date and time
    3. Loss of image
- The user is responsible for backing up images. Note that electronic recording media such as USB memory, HDD and DVD-R may become obsolete and saved files may therefore become irretrievable in the future.
- Furthermore, the system is not designed to guarantee authenticity or to be tamper-proof.
- Avoid exposing the system to strong vibrations as they can impair image quality.
- With 3-axis control units for scanning stages and motorized focus drives make sure to:
    1. Handle them with care
    2. Avoid exposure to strong vibrations or risk of explosion
    3. Avoid exposure to extremes of temperature, direct sunlight or strong heat sources
    4. Avoid exposure to high humidity, moisture or water
    5. Avoid exposure to magnetic or electromagnetic radiation from sources in close proximity. Avoid exposure to radioactive contamination
    6. Avoid exposure to chemicals/ toxic substances that are corrosive, potentially infectious, toxic, or otherwise hazardous to health
- With the monitor:
    1. Do not use this product near water.
    2. Do not place this product on an unstable cart, stand or table. If the product falls, it could be seriously damaged.
    3. Slots and openings are provided for ventilation to ensure reliable operation of the product and to protect it from overheating. These openings must not be blocked or covered. The openings should never

be blocked by placing the product on a bed, sofa, rug or other similar surface. This product should never be placed near or over a radiator or heat register, or in a built-in installation unless proper ventilation is provided.

4. Never push objects of any kind into this product through cabinet slots as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind onto or into the product.

» The system must not be used for primary diagnosis.

» Possible data loss or invalid hardware states when forcing application to shutdown. The application has no means of resisting a "forced shutdown" (e.g. due to a forced "Windows Update" or application kill via the "Task Manager", power loss, or a computer reboot). The user is generally required to not initiate such a forced shutdown. If the application is forced to shut down without being properly closed anyway, the following problems may occur:

  The system may not be able to save and restore the current status of the application (including any non-saved states / images / settings).

  It may be necessary for a service technician to check the system to make it operational again.

» Photobleaching possible

  The system has a fluorescence light source with high light intensity. Photo-sensitive samples might become photo-bleached if exposed to high-intensity light for long periods (e.g. 60 s). This can happen when the sample is being viewed in live mode or if it is scanned repeatedly (e.g. 10 times) on the specimen sites that are auto-focused a lot of times. The photobleaching is often only faint and only visible if the 16 bit display limits are set very narrowly. In order to prevent this, it can be useful to create alternative observation methods with reduced light intensity in order to only use as much light as necessary and avoid "overloading" the sample with excitation light.

» Shading / uneven light intensity

  For specimens with very sparse samples with a lot of background and rather small fluorescence emittance (e.g. FISH samples), it can occur that images acquired with fluorescence illumination show a variance in background illumination ("shading").

» If the product is being used in a network environment, note the following points.

  Make sure that the network has appropriate virus protection.

  The installation of operating system service packs, security patches or third party software updates (including runtime libraries) can cause malfunctions.

If anti-virus software is running while you are acquiring images, it can lead to the loss of individual images. It can also slow down the acquisition process or even cause it to be aborted altogether.

2.5 Safety instructions for the laser

1. The VS200 loader uses a laser sensor. Never remove the warning and caution labels on the product. The semiconductor laser for loader incorporated in this product is designated as a product of the following class.

   CLASS 1 LASER PRODUCT (IEC60825-1:2007 / IEC608251:2014)

   This product complies with 21 CFR 1040. 10 and 1040. 11 except for deviations pursuant to Laser Notice No. 56, dated June 24, 2007.

2. Never attempt to remove the cover using a tool. There is a risk of exposure to the internal strong laser beam as well as other malfunction or failure.

2.6 Safety instructions for X-Cite TURBO, X-Cite NOVEM and X-Cite XYLIS

✓ The X-Cite TURBO light source is not available in all countries.

CLASS 1 LASER PRODUCT (IEC60825-1:2007 / IEC608251:2014)

Follow the safety precautions at all times during operation and maintenance of this product. Non-observance may result in eye injury or damage to the system.

CAUTION
Risk of injury to the eyes

- Do not look at operating lamp/LED as it can emit UV light.
- Never look into the light emitting end of the light guide. The light could severely damage the eye if the light is observed directly.

» Always make sure the liquid light guide and X-Cite adapter are securely attached to the VS200 system. This will minimize the risk of exposure to the UV light.

» If the light source has a malfunction please contact Olympus or Excelitas customer support. If the light source is serviced always make sure that the power cord is disconnected.

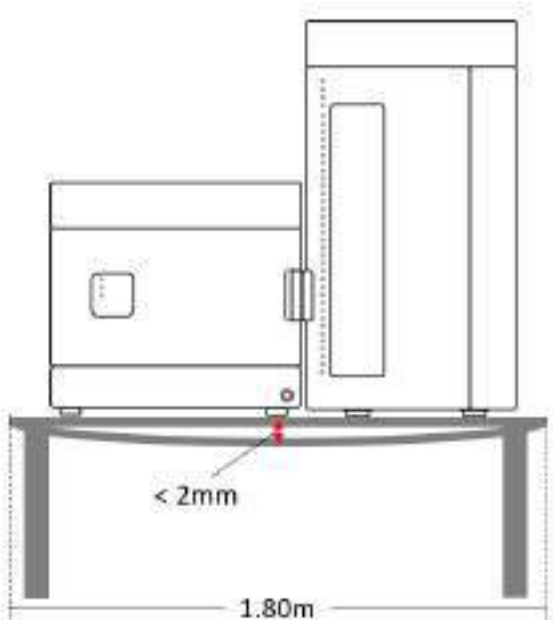
» Place the unit onto a hard, stable surface and make sure the ventilation openings are not covered by something.

3 Notes on placement

» A fully equipped VS200 system weighs approx. 200 kg, so the surface that you place the system on must be able to support at least 200 kg.

» To ensure proper functioning of the system it is mandatory that the VS200 system is placed on a sturdy level table or bench.

» Olympus can only guarantee the functionality of loading and unloading trays from the VS200 slide loader unit to the VS200 scanner if the table does not bend more than 2 mm in the middle of a 1800 mm length.



» When placing the VS200 system on a sturdy level table or bench, take care not to block the ventilation slots of the VS200 scanner and loader. Ensure that there is a minimum distance of 30 cm to the wall and 20 cm to other devices.

» Keep in mind the weight of the VS200 system and the components when you lift them. See Specifications on page 28.

» The devices must only be moved using the designated handles to avoid damage to the device or personal injury.

» Due to the weight of the devices, carry the devices only with two or more people.

» The VS200 system should not be repositioned by the end user. If the system has to be repositioned an Olympus sales representative has to be contacted first.

3.1 Conditions for operating and storing

Positioning the system	Only use the system indoors and in a laboratory or laboratory-like environment
Elevation	2000 m maximum
Ambient temperature	The maximum permissible range for the ambient temperature during operation of the VS200 system is 12 to 28°C.
Humidity	The maximum permissible humidity during operation of the VS200 system is 80% for temperatures up to 31°C (88°F, condensation free) decreasing linearly through 70% at 34°C (93°F) and 60% at 37°C (99°F).
Power supply voltage fluctuation	The power supply should not fluctuate by more than 10% of the nominal voltage.
Pollution degree	2 (in accordance with IEC60664)
Installation category (overvoltage category)	II (in accordance with IEC60664)

Space required for the system

VS200 System without loader		
	Without fluorescence	With fluorescence or camera cover
Height	530 mm	885 mm
Area of work surface (table)	1500 mm x 800 mm	1500 mm x 800 mm

VS200 System with loader		
	Without fluorescence	With fluorescence
Height	885 mm	885 mm
Area of work surface (table)	1800 mm x 800 mm	1800 mm x 800 mm

Storage conditions

The maximum permissible range for the ambient temperature for storage of the VS200 system is -25 to 55°C.
The maximum permissible relative humidity range for storage is 10% to 95%.
The maximum permissible temperature change rate for storage is 30°C/h.
The maximum permissible atmospheric pressure for storage is 70 to 106 kPa.

4 Tools and accessories

» 2.5 mm, 3 mm with ball end, 4 mm, 5 mm hex keys

5 Scope of supply

VS200 ST (Single Tray) or VS200 MTL (Multi Tray Loader)

The term VS200 ST (scanner only) mentioned in this manual is equivalent to the model VS200-BU and item name VS20-BU which are used on the packaging or system.
VS200 MTL (scanner and loader) mentioned in this manual is equivalent to the model VS200-BU-L, item name VS20-BU-L (scanning unit) and model VS200-LOADER, item name VS20-LOADER (loading unit). Both model and item name are used on the packaging or system.

1st pallet	
	VS200 scanner with front door mounted (VS200-BU or VS200-BU-L)
	4 handles to carry the system
2nd pallet	
Box with housing parts	Housing panel left
	Housing panel right (different variant for single tray and multi tray loader)
	Housing panel back
	Housing panel top front
	Housing panel top back
Monitor	HP TFT 27 inch monitor
PC	VS200 standard computer with mouse and keyboard
Accessories	Calibration slide v2.0
	UPLANXAPO20x objective
	PLN2x objective
	U-TLD top lens
	1 1x3 inch tray
	ODB CAN bus cable (30 cm)
	Caution labels for U-FFWO T3
	Set of hex keys
	Olympus standard 3 mm hex key
	Red spacer sleeve (spare part for VS200 scanner in combination with VS200 loader)
	Colored cable clips
	Tray guide rails (spare part for VS200 scanner in combination with VS200 loader)
	Instructions for use VS200 system
	Instruction manual BX3-UCD8A
	Instruction manual U-TV0.63XC camera adapter
	Manual for iDS camera

Additional box	Power supply (not available in all countries)
	Optional hardware

Camera cover (optional)

The camera cover must only be installed by an Olympus service technician.

	Camera cover frame
	Camera cover front cover
	Camera cover side cover
	Camera cover rear cover
	Bag of mounting accessories

VS200 loader

Pallet	VS200 loader with side panels
	Housing panel back
	Housing panel top
	Top front panel
	Right front panel
	4 1x3 inch tray
	2 black round plastic caps

Fluorescence suggestion A	IX3-RFACA
	IX3-RFALFE
	UPFLN4x
	U-FF filter cube
	TV1XC
	U-FFWR
	X-Cite XYLIS

Fluorescence suggestion B	IX3-RFACA
	IX3-RFALFE
	UPFLN4x
	U-FF filter cube
	2x Black-out filter
	1x Glass filter
	U-FFWO T3
	U-FFWR
	X-Cite XYLIS

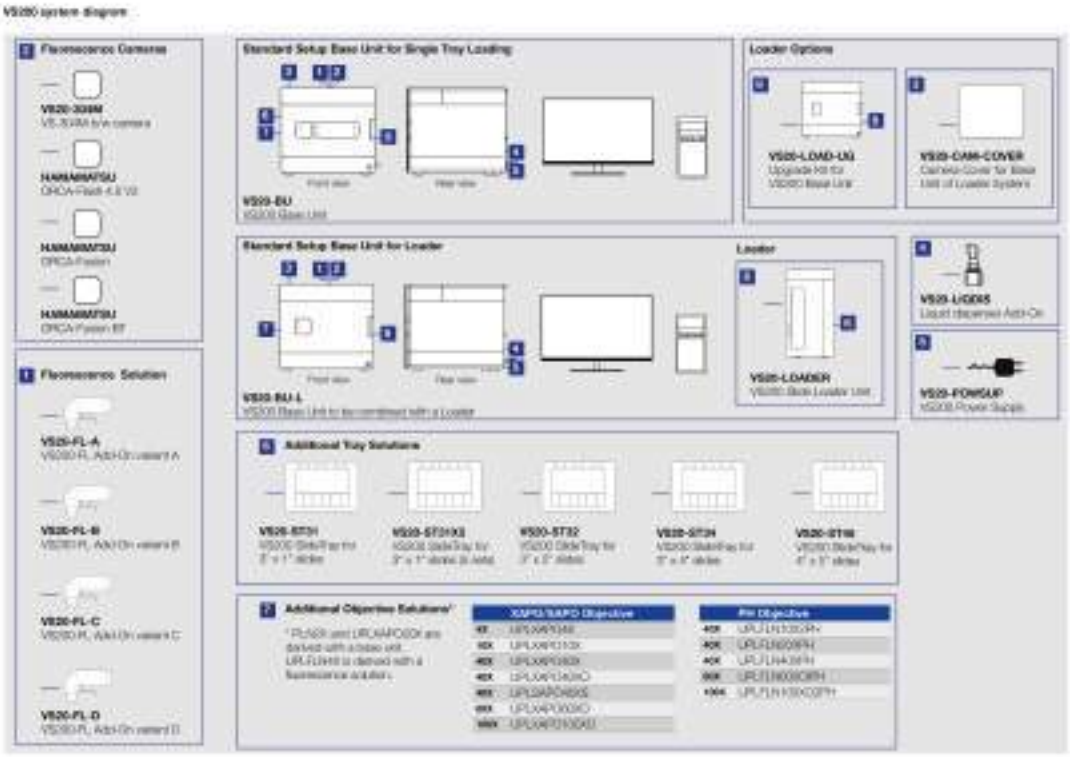
- The Fluorescence suggestion C is not available in all countries.

Fluorescence suggestion C	IX3-RFACA
	IX3-RFALFE
	UPFLN4x
	U-FF filter cube
	2x Black-out filter
	1x Glass filter
	U-FFWO T3
	X-Cite TURBO or X-Cite NOVEM

- The Fluorescence suggestion D is not available in all countries.

Fluorescence suggestion D	IX3-RFACA
	IX3-RFALFE
	UPFLN4x
	U-FF filter cube
	TV1XC
	X-Cite TURBO or X-Cite NOVEM

6 System diagram



6.1 Available fluorescence components

The VS200 system can be ordered with any of four different fluorescence sets. Each set contains a basic configuration plus individual components. Filter sets and cameras are not part of the configuration.

Remark: Configuration C and D are not available in all countries.

Basic configuration				
Component	A	B	C	D
IX3-RFACA	X	X	X	X
IX3-RFALFE	X	X	X	X
UPFLN4X objective	X	X	X	X
U-FF, filter cube (empty)	X	X	X	X

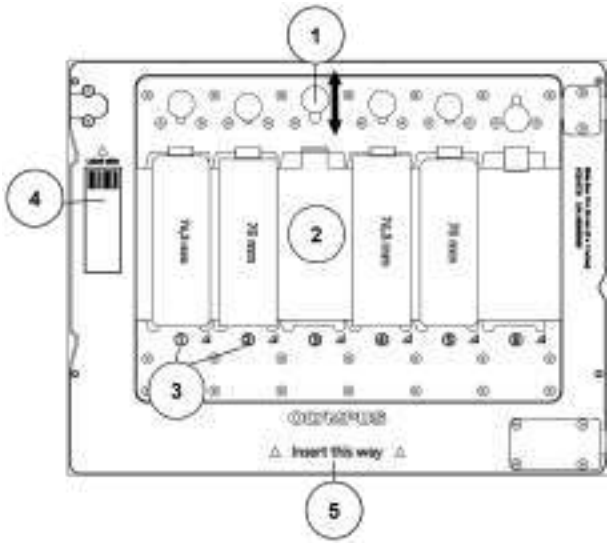
Individual components				
Component	A	B	C	D
TV1XC	X			X
U-FFWR	X	X		
U-FFWO T3		X	X	
X-Cite XYLIS (IR), whitelight LED	X	X		
X-Cite TURBO or X-Cite NOVEM, switchable LED			X	X

Optional - Filter sets				
Component	A	B	C	D
Recommended filter set	single-band exciter multi-band emitter	single-band exciter single-band emitter	single-band exciter single-band emitter	multi-band emitter

Monochrome cameras				
Component	A	B	C	D
VS304M	Optional	Optional	Optional	Optional
ORCA-Flash 4.0		Optional	Optional	Optional
ORCA-Fusion, ORCA-Fusion BT		Optional	Optional	Optional

7 Trays

7.1 Tray description



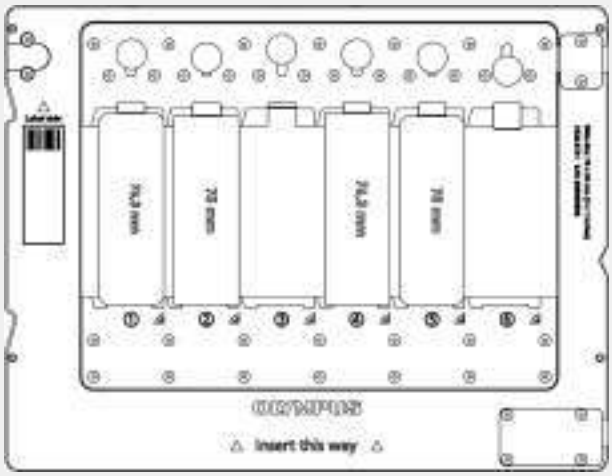
(1)	Button to open/close the spring for inserting a slide
(2)	Slide pocket
(3)	Slide position
(4)	Indicator for label area
(5)	Indicator for tray insertion

7.2 VS200 Tray types

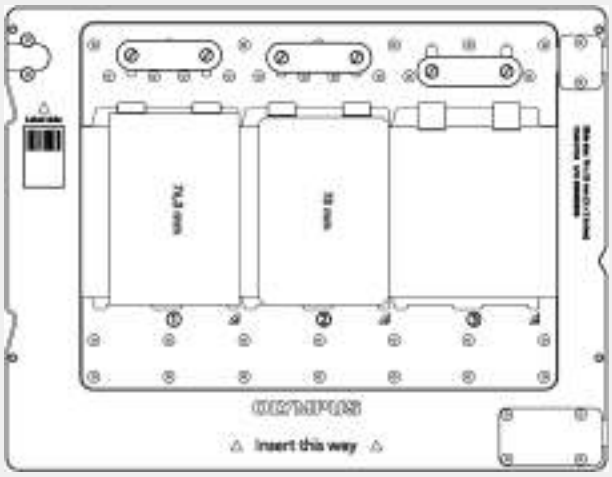
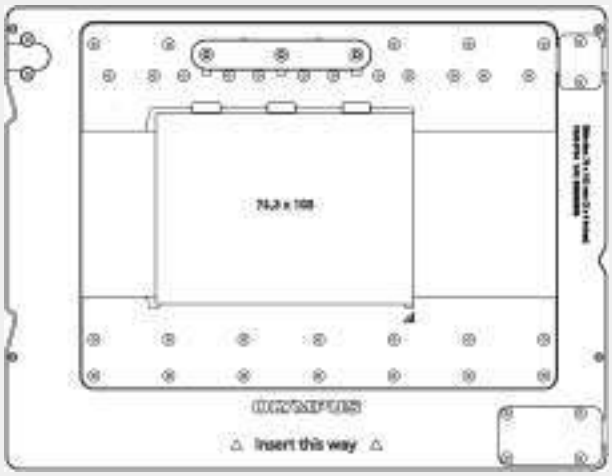
ATTENTION
Risk of damage to device due to improperly inserted tray
If a tray is inserted into the VS200 scanner improperly, the top lens can be damaged.

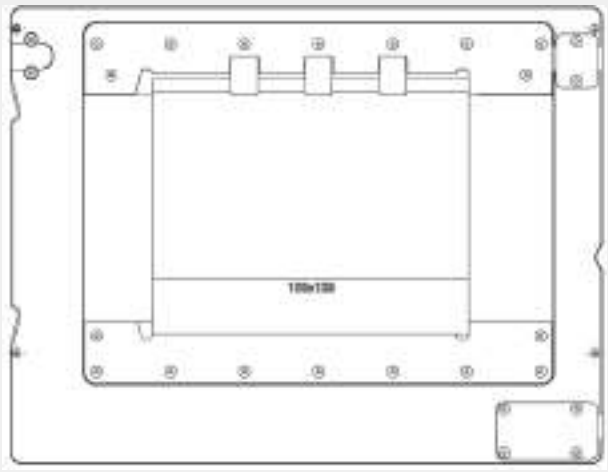
- When inserting a tray, refer to the [Insert this way] lettering and the orientation of the triangles on the tray.

The VS200 systems can be equipped with four different tray types for different slide formats. All trays can be used either with the VS200 ST (Single Tray Load) system or VS200 MTL (Multi Tray Loader) system.

By default every VS200 system is equipped with at least one tray for 6 1x3 inch slides (76,3 × 26 mm, DIN ISO 8037-1).	

Additional tray types

3 slides in 2x3 inch (52 x 76.3 mm)	
1 slide in 3x4 inch (76.3 x 103 mm)	

1 slide in 4x5 inch (103 x 127 mm) (max. possible scan area 76 x 127 mm)	

8 Specifications

		VS200 ST (Single Tray)	VS200 MTL (Multi Tray Loader)
Intended specimen	Observable specimen	Glass slide with coverslip	
	Size of glass slide	Standard tray: width: 25 mm – 26.5 mm, length: 75 mm – 76.5 mm, thickness: 0.9 mm - 1.2 mm Optional trays: 1) Width: 51 mm – 53 mm, length: 75 mm – 76.5 mm, thickness: 0.9 mm - 1.2 mm 2) Width: 100 mm – 102 mm, length: 75 mm – 76.5 mm, thickness: 0.9 mm - 1.2 mm 3) Width: 126 mm – 128 mm (scannable area restricted to 107 mm), length: 75 mm – 76.5 mm, thickness: 1.1 mm - 1.4 mm	
	Size of coverslip	Thickness: 0.12 mm - 0.17 mm	
Optical frame	Illuminator	Built-in Koehler illumination for transmitted light High intensity and high color rendering LED	
	Objectives	Compatible objectives 2x, 4x, 10x, 20x, 30x, 40x, 60x and 100x, selected oil and silicon immersion objectives, Phase objectives	
	Motorized stage	Motorized XY stage with automatic control	
	Focusing	Motorized automatic control	
	Components for fluorescence observation	Fluorescence illuminator with fly-eye lens Motorized fluorescence mirror turret Motorized filter wheel LED Fluorescence light source (Excelitas X-Cite TURBO, X-Cite XYLIS)	
Camera system	Brightfield	Integrated 2/3" CMOS camera, 3.45 µm x 3.45 µm pixel size, high sensitivity, high resolution	
	Fluorescence	Olympus VS304 1" CMOS camera, 3.45 µm x 3.45 µm pixel size, high sensitivity, high resolution or Hamamatsu ORCA-Flash 4.0 V3, 6.5 µm x 6.5 µm pixel size and ORCA-Fusion/ORCA-Fusion BT, 6.5 µm x 6.5 µm pixel size	
Scan	Image correction	Shading correction, auto white balance, true color by using ICC color correction	
	Capacity	6 slides maximum (VS200 single tray)	210 slides maximum (VS200 multi tray loader)
	Pixel resolution (color camera)	20X (NA 0.80): 0.274 µm/pixel Options: 10X (NA 0.40): 0.548 µm/pixel 40X (NA 0.95): 0.137 µm/pixel 40XO (NA 1.40): 0.137 µm/pixel	

		VS200 ST (Single Tray)	VS200 MTL (Multi Tray Loader)
		60XO (NA 1.42): 0.091µm/pixel 100XO (NA 1.45): 0.055µm/pixel	
	Scan time	Approx. 80 sec (20x objective, scan area 15 mm x 15 mm brightfield)	
	Software	Image format: vsi, JPEG, JP2, TIFF/zooming while scanning/annotations/automatic sample detection/ Z stack extended focus imaging/screen capture/step less zooming/synchronized multi-images display automatic stitching/slide loader control	
Environment	Weight	VS200 single tray BF: 69 kg VS200 single tray FL: 77 kg VS200 multi tray loader BF: 142 kg (without trays) VS200 multi tray loader FL: 150 kg (without trays) PC & Monitor: 16 kg 1 tray: 0.6 kg 35 trays (maximum): 21 kg Camera cover (optional): 9 kg	
	Operating Environment	Temperature: 15 – 28 degree centigrade, humidity: 30 % – 80 % (non condensing)	
	Power Consumption	221 W	
Power Supply Ratings	Input	100-240 V AC; 50/60 Hz; 4 A	
	Output	24 V DC, 9.2 A, 221 W MAX	

9 Unboxing

The units described below must be assembled and adjusted by Olympus. If these units are assembled or adjusted by the customer, the operations are not ensured.

9.1 VS200 Scanner

The units described below must be assembled and adjusted by Olympus. If these units are assembled or adjusted by the customer, the operations are not ensured.

CAUTION

Risk of injury and risk of device damage if components are dropped

The scanner or other components might drop when you are moving them. Injury to your feet or damage to the device can result.

- Make sure that all handles for transportation are screwed in completely and tight.
- The system must be carried by two people.

✓ Two people are required to lift the VS200 scanner onto a table.

1. Remove the outer cardboard packaging and take all small boxes out of the package.
2. Take the left, right, back and top panel out of the boxes.

   Some boxes are empty as they are only used to fill the gaps.

3. Unpack the handles.
4. Take the top of the VS200 scanner cardboard packaging off and remove the outer cardboard (it consists of two parts).
5. Open the foil at the top and push it downwards to the bottom (the bottom of the VS200 scanner cardboard packaging can be unfolded) until you can access the two covers to access the threads for the lifting handles on each side.
6. Remove the covers to access the threads for the handles.
7. Remove all blue tape stripes for the faston terminals as well as the tape that secures the front door.
8. Remove the blue tape which secures the top lens holder in the middle of the XY stage as well as the tape around the adjustment lock at the field stop of the condenser underneath the XY stage.
9. In case you have a VS200 loader system, remove the blue tape from the VS200 scanner/VS200 loader connector which you will find at the bottom right side of the scanner unit.
10. Open the door and remove the five desiccant bags.

The desiccant bags are located in the following places: Two on the top left and right from the camera adapter, one on the XY stage and two on the bottom left and right of the condenser unit.

ATTENTION
The system should not be repositioned by the end user. If the system has to be repositioned an Olympus sales representative has to be contacted first.

9.1.1 Mounting of handles - VS200 scanner

The units described below must be assembled and adjusted by Olympus. If these units are assembled or adjusted by the customer, the operations are not ensured.

CAUTION
Risk of injury and risk of device damage if components are dropped
The scanner or other components might drop when you are moving them. Injury to your feet or damage to the device can result.
- Make sure that all handles for transportation are screwed in completely and tight.
- The system must be carried by two people.

1. Mount the four handles (2 on each side) as shown in the image below.
   » Make sure that all handles for transportation are screwed in completely and tight.

2. Lift the system with two people onto a stable table. The main center of gravity is at the back of the system.
3. Make sure that there is a gap of 30 cm between the backside of the system and the wall.
4. Remove the handles and keep them as they might be needed in the future.

9.2 Transportation locks for the VS200 scanner

The units described below must be assembled and adjusted by Olympus. If these units are assembled or adjusted by the customer, the operations are not ensured.

This chapter describes how to remove the transportation locks from the VS200 scanner after shipping.

ATTENTION
The transportation locks must be remounted each time before the unit is transported. Make absolutely sure not to lose the transportation locks and the mounting material.

ATTENTION
Risk of device damage if operated with transportation locks in place
If the scanner is operated without first completely removing the transportation locks, the device can be damaged.

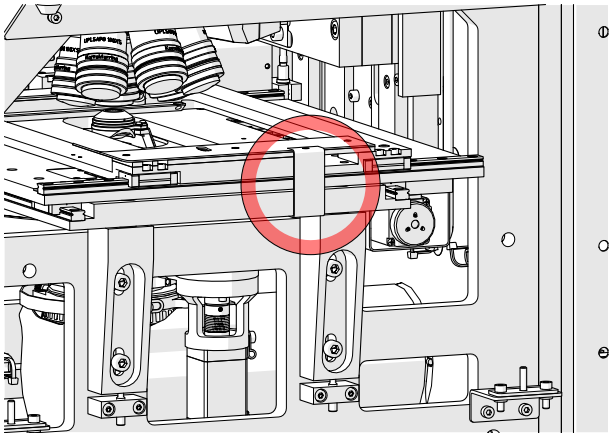
- Make sure to remove all of the transportation locks before operating the scanner.

9.2.1 Removing the transportation lock from the stage

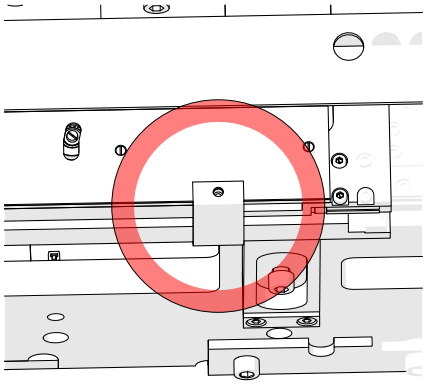
The units described below must be assembled and adjusted by Olympus. If these units are assembled or adjusted by the customer, the operations are not ensured.

» Hex screwdriver (size 2.5 mm)

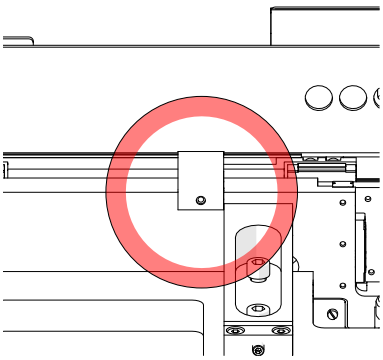
1. Go to the right side of the scanner.
2. Remove the red transportation lock from the microscope stage. To do so, remove the 2 hex screws (size 2.5 mm hex screwdriver).



Side view (from the right)

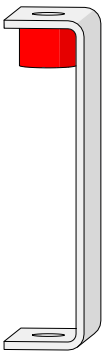


View from above



View from below

3. When the VS200 scanner is to be used with a loader, there is a spacer sleeve between the top of the stage and the top of the transportation lock. Even if the VS200 scanner is intended to be used manually, the spacer sleeve is still provided in case the VS200 system is later upgraded for use with a loader. Keep the spacer sleeve in a safe place. It is an important part of the transportation lock.



9.3 VS200 Loader

The units described below must be assembled and adjusted by Olympus. If these units are assembled or adjusted by the customer, the operations are not ensured.

CAUTION

Risk of injury and risk of device damage if components are dropped

The loader or other components might drop when you are moving them. Injury to your feet or damage to the device can result.

- Make sure that all handles for transportation are screwed in completely and tight.
- The system must be carried by two people.

✓ Two people are required to lift the VS200 loader system onto a table.

1. Remove the outer cardboard packaging and take all small boxes out of the package.
2. Take the top panel, back panel and the two front panels out of the boxes.
3. Unpack the handles.
4. Take the top of the VS200 loader cardboard packaging off and remove the outer cardboard (it consists of two parts).
5. Open the foil at the top and push it downwards to the bottom (the bottom of the VS200 loader cardboard packaging can be unfolded) until you can access the two covers to access the threads for the lifting handles on each side.
6. Remove the covers to access the threads for the handles.

7. Mount the four handles (2 on each side) as shown in the images below.

8. Make sure that all handles for transportation are screwed in completely and tight.
9. Remove all blue tape stripes for the faston terminals as well as the tape that secures the front door.

10. Remove the tape at the bottom left corner and take out the bubble foil pocket which contains the cable for the VS200 loader connection.

11. Open the door and remove the five desiccant bags.

    The desiccant bags are located in the following places: Two bags in the tray hotel, two bags in between the rails on the bottom of the VS200 loader and one bag on the SCARA robot arm.

12. Lift the VS200 loader with two people onto a very stable table to the right side of the VS200 scanner. The center of gravity is at the right backside of the system.
13. Remove the handles and keep them as they might be needed in the future.
14. Cover the two holes on the right side panel of the loader with the two black round plastic caps.

! ATTENTION
The system should not be repositioned by the end user. If the system has to be repositioned an Olympus sales representative has to be contacted first.

9.3.1 VS200 Trays

1. Unbox the VS200 trays carefully and handle them with care. Avoid bending or dropping of a tray at any time.
2. Put the trays aside for later use.

9.3.2 PC and monitor

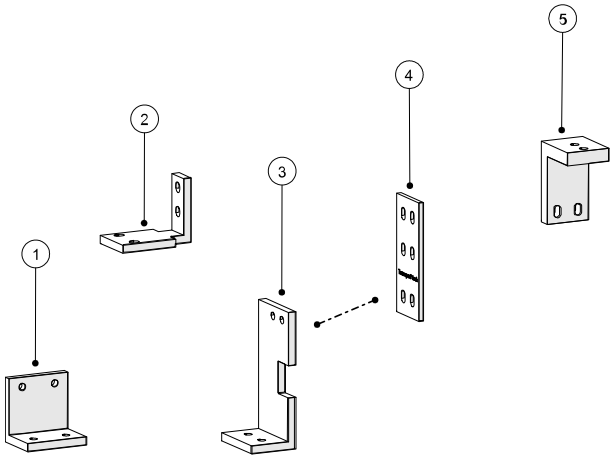
The units described below must be assembled and adjusted by Olympus. If these units are assembled or adjusted by the customer, the operations are not ensured.

1. Take the PC out of it's cardboard packaging.
   » Inside the PC cardboard packaging you find the mouse and keyboard as well.
2. Take the monitor out of it's cardboard packaging and put it onto the table.
   » All necessary cables are inside the cardboard packaging.

9.4 Transportation locks for the VS200 loader

The units described below must be assembled and adjusted by Olympus. If these units are assembled or adjusted by the customer, the operations are not ensured.

This chapter describes how to remove the transportation locks from the VS200 loader after shipping.



Overview - transportation locks

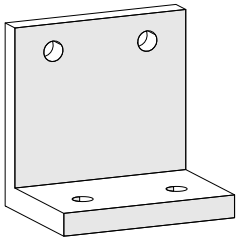
ATTENTION
Risk of device damage if operated with transportation locks in place
If the loader is operated without first completely removing the transportation locks, the device can be damaged.

- Make sure to remove all of the transportation locks before operating the loader.

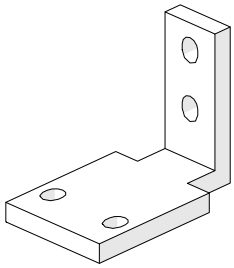
ATTENTION
The transportation locks must be remounted each time before the unit is transported. Make absolutely sure not to lose the transportation locks and the mounting material.

9.4.1 Removing the transportation lock from the VS200 loader's tray hotel

The units described below must be assembled and adjusted by Olympus. If these units are assembled or adjusted by the customer, the operations are not ensured.



Transportation lock (1)

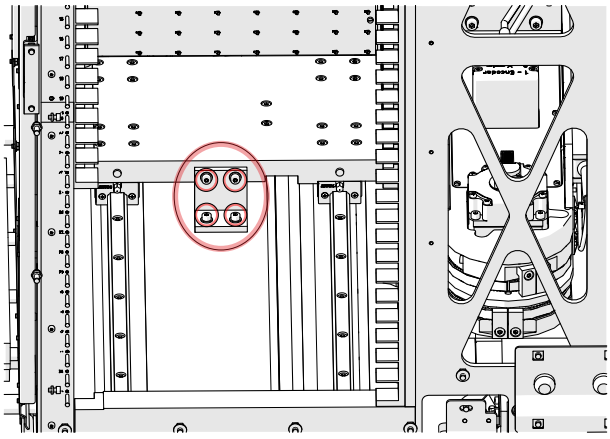


Transportation lock (2)

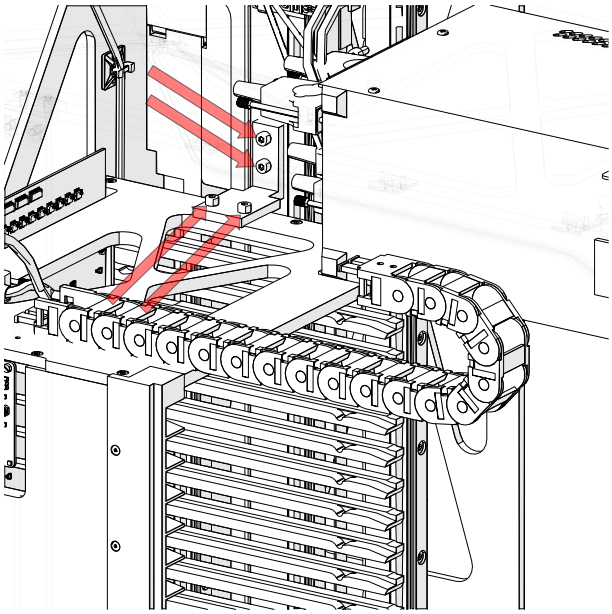
ATTENTION
The transportation locks must be remounted each time before the unit is transported. Make absolutely sure not to lose the transportation locks and the mounting material.

» Hex screwdriver (size 3 mm)

1. Remove the red transportation lock from the bottom of the VS200 loader's tray hotel. To do so, loosen the 4 hex screws (size 3 mm hex screwdriver) indicated in the figure.



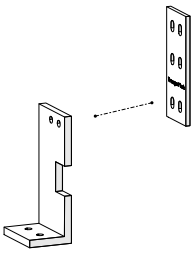
2. Remove the red transportation lock on the VS200 loader's tray hotel that connects the top right of the VS200 loader's tray hotel with the frame. To do so, loosen the 4 hex cylinder screws (size 3 mm hex screwdriver) indicated in the figure.



3. Move the VS200 tray hotel into the park position all the way at the back. To do so, grasp the bottom plate of the VS200 tray hotel.

9.4.2 Removing the transportation lock from the SCARA robotic arm

The units described below must be assembled and adjusted by Olympus. If these units are assembled or adjusted by the customer, the operations are not ensured.

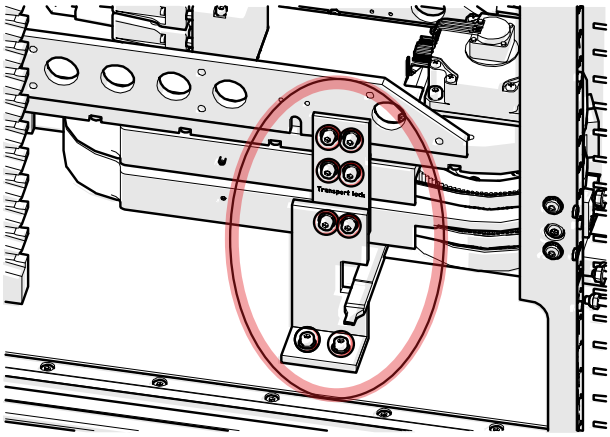


Transportation locks (3) and (4)

ATTENTION
The transportation locks must be remounted each time before the unit is transported. Make absolutely sure not to lose the transportation locks and the mounting material.

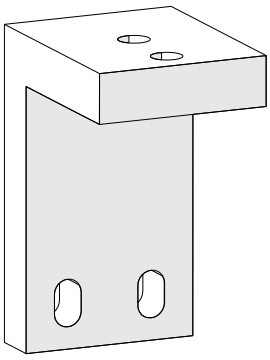
» Hex screwdriver (size 3 mm)

1. Remove the red two-part transportation locks from the SCARA robot arm. To do so, loosen the 8 hex screws (size 3 mm hex screwdriver) indicated in the figure.



9.4.3 Removing the transportation lock from the counterweight of the SCARA robotic arm

The units described below must be assembled and adjusted by Olympus. If these units are assembled or adjusted by the customer, the operations are not ensured.



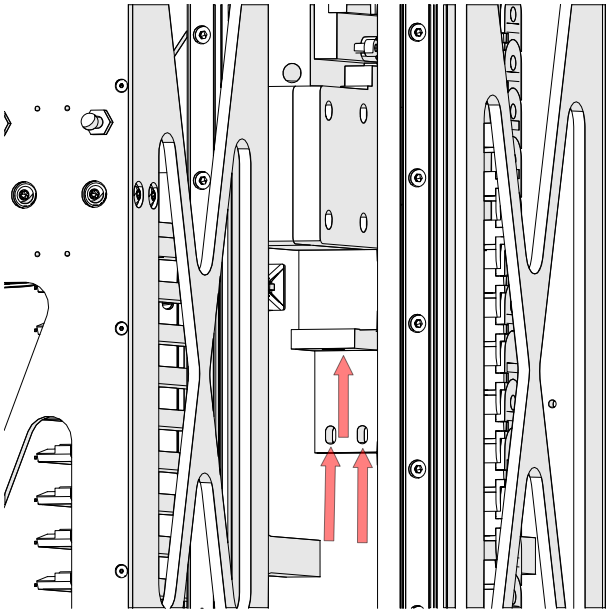
Transportation lock (5)

ATTENTION
The transportation locks must be remounted each time before the unit is transported. Make absolutely sure not to lose the transportation locks and the mounting material.

» Hex screwdriver (size 3 mm)

1. Remove the red transportation lock from the brass colored counterweight of the SCARA robot arm. To do this, loosen the 3 hex screws (size 3 mm hex screwdriver) indicated in the figure.

Make sure that the screws to do not fall inside the housing.



» The unit comprised of the SCARA robot arm and counterweight can now move freely.

10 Mounting of components

10.1 VS200 Scanner

10.1.1 Objectives

The VS200 system is shipped with no objective mounted in the IX3-nosepiece.

1. Make sure that the power of the VS200 system is switched off!
2. Open the door of the VS200 scanner.
3. Make sure that the objective is clean and dust free before you mount it.
4. Depending on your VS200 kit you need to mount different objectives.

   The objectives should be mounted into fixed positions, see the following list Position list for objectives on page 45. You can rotate the nosepiece revolver in any direction so that it is easier to mount an objective

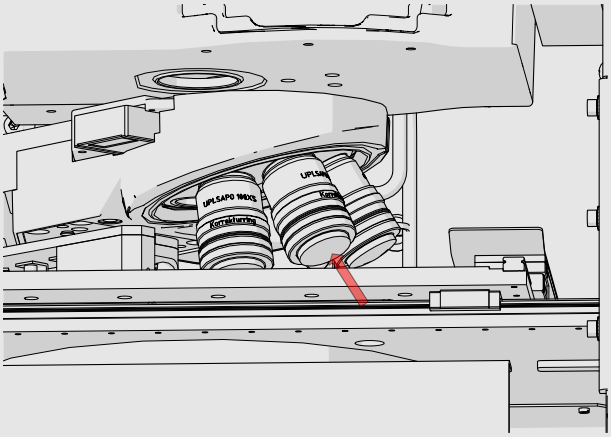
   > By default a VS200 system is shipped with a 2x and 20x objective. Additionally recommended objectives are the 10x and 40x UPLXAPO. Basically, all other Olympus objectives that fit into the IX3-nosepiece can be used and are supported.

5. Remove the small plastic protection cover from the objective position.
6. Screw in the objectives counter clockwise and make sure that the objective is screwed in tightly.

Position list for objectives

The position of the nosepiece is indicated at the center of the IX3-nosepiece.

Nosepiece position	Objective
1	2x PLN
2	20x UPLXAPO
3	10x UPLXAPO
4	40x UPLXAPO
5	Any immersion objective or phase contrast objective
6	4x UPLFLN



If you mount objectives in a different order you must subsequently adjust all device settings and observation methods. In this case refer to chapter Device settings - objectives on page 110 and Device customization on page 113.

If you have a brightfield system only, please continue with chapter Assembly of the housing for the VS200 scanner on page 74.

10.1.2 Immersion Objectives

Pay attention to the following notes when using an immersion medium.

CAUTION
Certain immersion media can contain harmful substances. Make sure to read the manufacturer's safety data sheet before using your immersion medium.

ATTENTION

- It is not possible to change the type of immersion medium once the glass laboratory bottle has been filled with either oil or silicone immersion medium. Otherwise damage can occur to the liquid dispenser.
- Before the VS200 system can be shipped (e.g. for repair) all liquids have to be removed from the system. Please contact the Olympus Customer Support for detailed information.
- Be very careful when using immersion objectives not to contaminate other dry objectives with immersion medium.

As the liquid dispenser was tested with Olympus immersion media the best performance will be obtained with Olympus immersion media (Olympus Type-F Immersion Oil or Olympus Silicon Immersion Oil SIL300CS-30SC).

The VS200 system can be equipped with an automatic liquid dispenser capable of dispensing different types of immersion medium. Once a particular type of immersion medium has been used, you can no longer switch to a different type.

The liquid dispenser can only be installed by an Olympus service technician.

The immersion objectives, oil or silicone, can be installed by anybody however.

Mount the e.g. 60x UPlanXApo O objective into an empty position (e.g. pos. 5) of the IX3 nosepiece.

Refer to chapter Device settings - objectives on page 110 to configure this objective into the device settings.

10.1.3 Phase Contrast (PH) objectives

The default configuration of a VS200 system includes 3 phase contrast inserts in the filter wheel of the BX3 condenser.

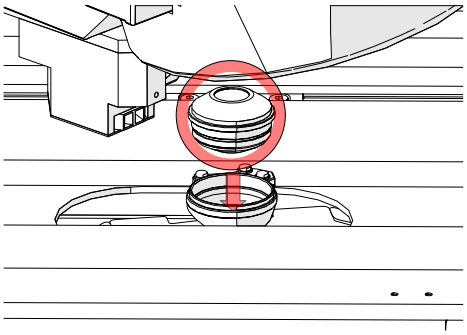
BX3 condenser pos.	Insert
1	U-PH1-S
2	U-PH2-S
3	U-PH3-S

Mount e.g. the 20x UPlanFL N Ph1 objective into an empty position (e.g. pos. 5) of the IX3 nosepiece. Refer to chapter Device settings - objectives on page 110 to include this objective into the device settings.

10.1.4 Mounting the top lens

The units described below must be assembled and adjusted by Olympus. If these units are assembled or adjusted by the customer, the operations are not ensured.

1. Take the top lens out of it's packaging.
2. Open the front door of the VS200 scanner and make sure that the black tamper protection plate is removed.
3. Bring the holder of the top lens manually into the middle position and hold it firmly.
4. Screw the top lens into the round top lens receptive thread.



11 Mounting fluorescence components

Skip this chapter if you have a brightfield system only.

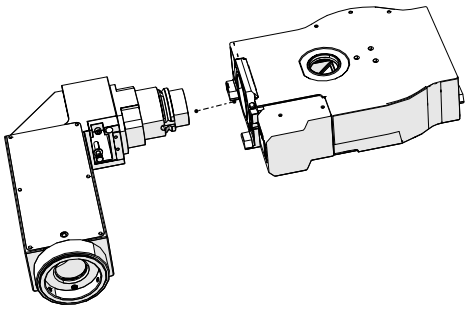
In the box with the fluorescence components (A, B, C or D) you find all parts needed to setup fluorescence for the VS200 system. Carefully unbox all components and follow the instructions.

11.1 IX3-RFACA and IX3-RFALFE

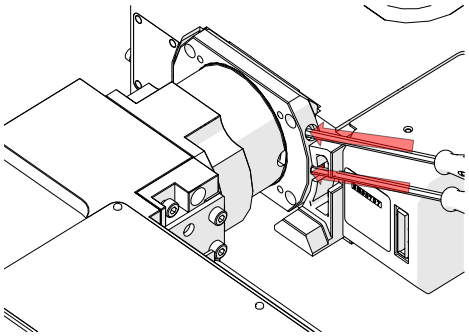
The units described below must be assembled and adjusted by Olympus. If these units are assembled or adjusted by the customer, the operations are not ensured.

» 2.5 mm, 3 mm and 4 mm hex key

1. Take the IX3-RFACA out of its packaging.
2. Take the IX3-RFALFE out of its packaging.
3. Assemble the IX3-RFACA and IX3-RFALFE as shown in the image below. Make sure that the two components are exactly parallel to each other.

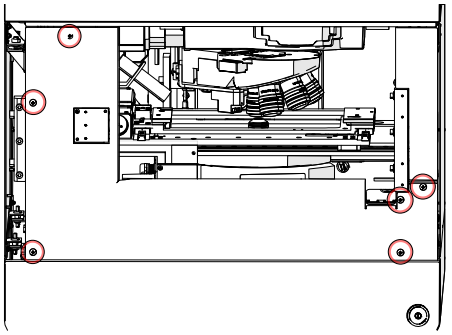


4. Screw the 2 hex screws (size 3mm hex key) at the junction hand-tight.

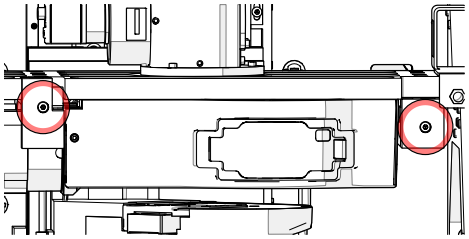


5. Make sure that the field stop is pushed in completely.
6. Go to the VS200 scanner and open the front door.

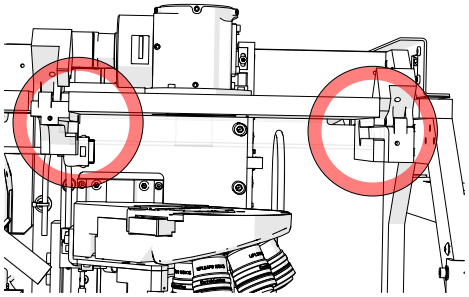
7. Remove the 6 hex screws (size 2.5 mm hex key) which hold the black tamper protection plate as indicated in the figure.



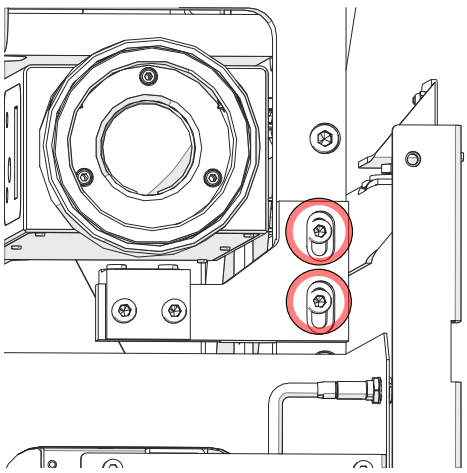
8. Remove the 2 hex socket screws (size 3 mm hex key) from the left and right securing brackets in the VS200 system as indicated in the figure.



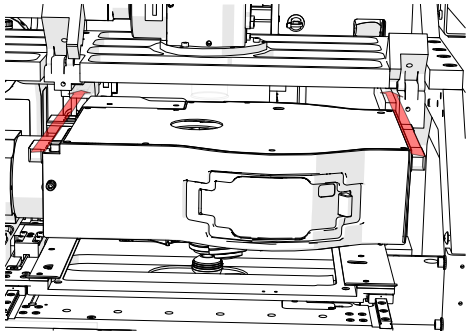
9. Fold up the two securing brackets.

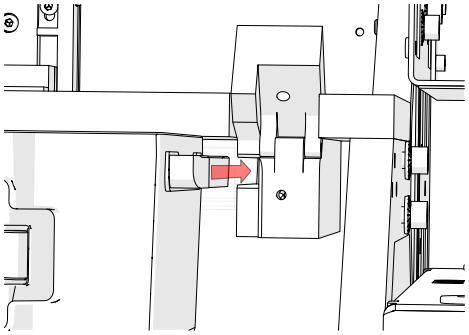


10. Remove the 2 hex socket screws (size 4 mm hex key) from the RFAA supporting bracket, which is attached to the frame at the back of the system.

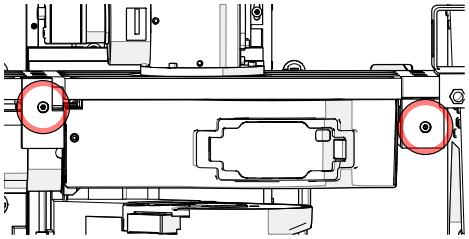


11. Insert the IX3-RFACA/IX3-RFALFE unit into the system. Make sure that it fits into the rails on the left and the right side and flip down the brackets.

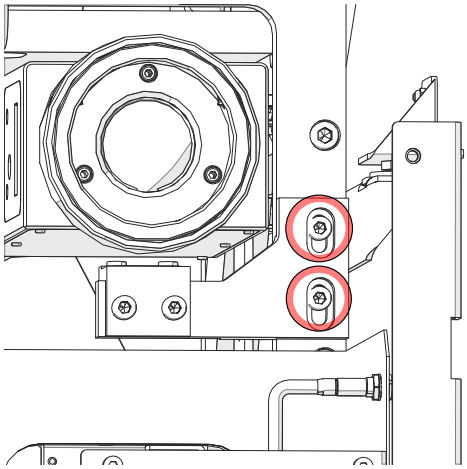




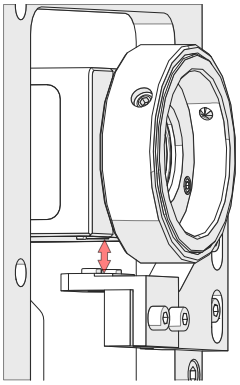
12. Tighten the 2 hex socket screws (size 3 mm hex key) to fix the brackets.



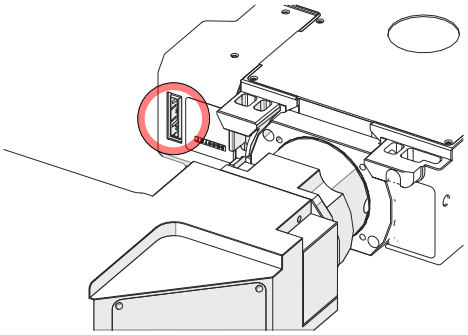
13. Attach the RFALFE supporting bracket again at the back of the system's frame. Insert the 2 hex socket screws (size 4 mm hex key) but don't tighten them.



14. Push the bracket upwards until it attaches to the IX3-RFALFE and tighten the two hex socket screws.

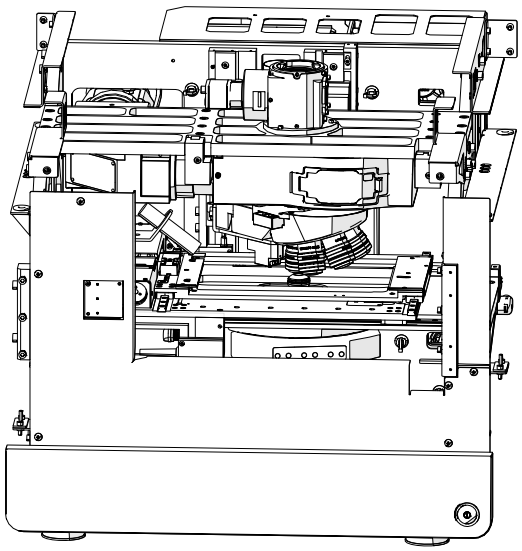


15. Make sure the power is switched off and attach the IX3-RFACA cable to the socket at the back of the IX3-RFACA.



16. Attach the black tamper protection plate again and tighten the 6 hex screws.

» Finally the system should look like on the image below.



11.2 Fluorescence filter wheels or camera adapter for monochrome camera

The units described below must be assembled and adjusted by Olympus. If these units are assembled or adjusted by the customer, the operations are not ensured.

Depending on the customer's configuration you either have to mount only one or two fast filter wheels. The following chapter describes how to mount the different filter wheels.

11.2.1 U-FFWR (Motorized fast reflected light filter wheel)

The units described below must be assembled and adjusted by Olympus. If these units are assembled or adjusted by the customer, the operations are not ensured.

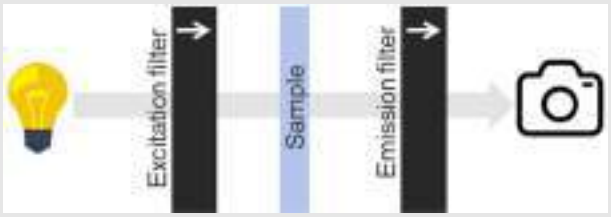
IMPORTANT

Before you mount the U-FFWR make sure you insert all excitation filters into the filter wheel. Note the position of the individual filters as you might need them later for the observation method adjustment. If you mount them as set out in the table below, less adjustments will have to be made later.

U-FFWR position	25 mm excitation filter
1	DAPI
2	FITC
3	CY3
4	CY5
5	CY7
6	Black-out filter
7	Black-out filter
8	Black-out filter

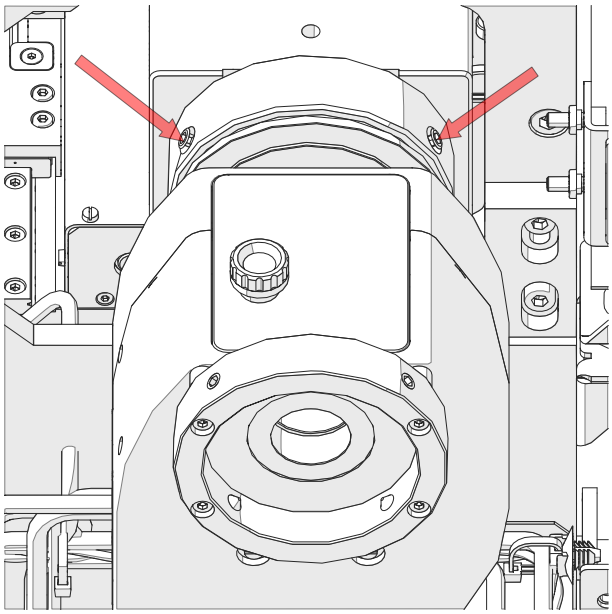
Refer to the chapter about filter insertion in the U-FFWR instruction manual for more information.

The orientation for Semrock emission filters is with the arrow towards the camera.

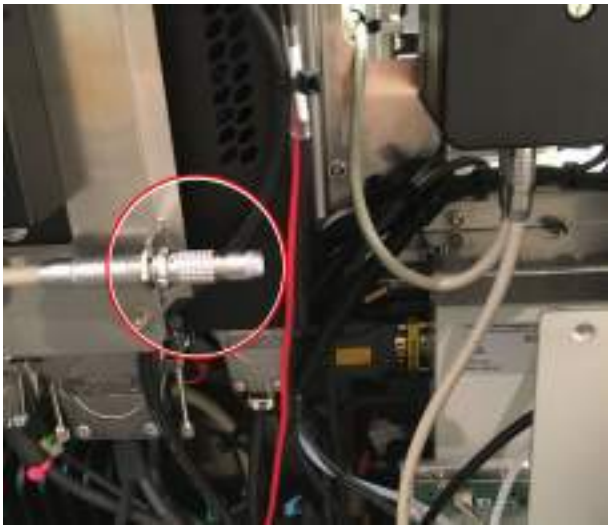


The orientation for Chroma emission filters is with the arrow pointing away from the camera.

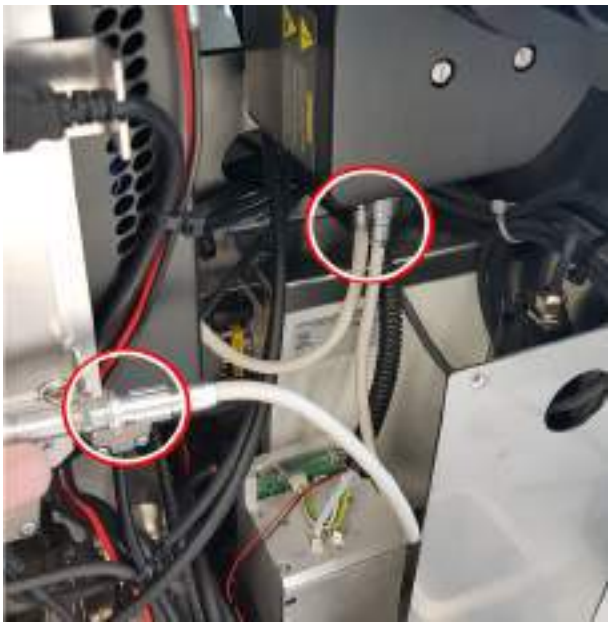
1. Attach the U-FFWR to the flange of the IX3-RFALFE at the back of the system and tighten the two 3 mm headless hex screws.



2. Remove the CAN-terminator from the connector. Keep the CAN-terminator for later use.



3. Use the short CAN bus cable (30cm) which you will find in the accessories box of the VS200 scanner to connect the U-FFWR to the VS200 system. Note the plug orientation indicated by the red dot.



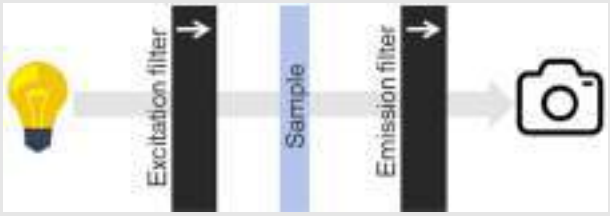
4. In case you do not have a U-FFWO connect the terminator to the second plug at the U-FFWR.

11.2.2 Add or replace filter (U-FFWR)

1. Make sure that the power of the VS200 system is switched off.
2. Remove the backside top panel. See Assembly of the housing for the VS200 scanner on page 74.
3. To add or replace a 25mm emission filter in the U-FFWR open the cover of the filter wheel loosening the knurled head screw.

4. Insert the filter into an empty position. Make sure that you orient the filter correctly when you insert it.
   » Refer to the U-FFWR instruction manual for more information.

The correct orientation for Semrock emission filters is with the arrow towards the camera.



The correct orientation for Chroma emission filters is with the arrow pointing away from the camera.

5. Write down the position number of the filter as you will need it later.
6. Configure the filter in the VS200 ASW software. To do this, open the [Device Settings] dialog box. You can open this dialog box in the [Manual Control] layout.
7. Click the [Additional layouts] button to go to a different layout. You can find the [Additional layouts] button at the top right in the navigation bar on the software's start page.
8. At the top right, on the menu bar click the [Manual Control] button.
9. Select the [Acquire] > [Devices] > [Device Settings] command to open the [Device Settings] dialog box.

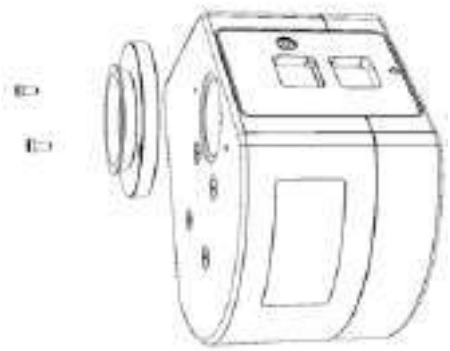
10. Configure the filter. See Device settings - filter on page 111.

11.2.3 U-FFWO T3 (Motorized fast observation filter wheel)

The units described below must be assembled and adjusted by Olympus. If these units are assembled or adjusted by the customer, the operations are not ensured.

- » 2 mm hex key to lock the tubus
- » 3 mm hex key to open the filter wheel
- » Small spanner to adjust the height of the tubus
- » Spanner to fix the tubus

1. Before you can mount the U-FFWO T3 you need to assemble the bottom flange. The bottom flange is fixed with two hex socket screws (size 2 mm hex key).
   - » For details refer to the U-FFWO manual.

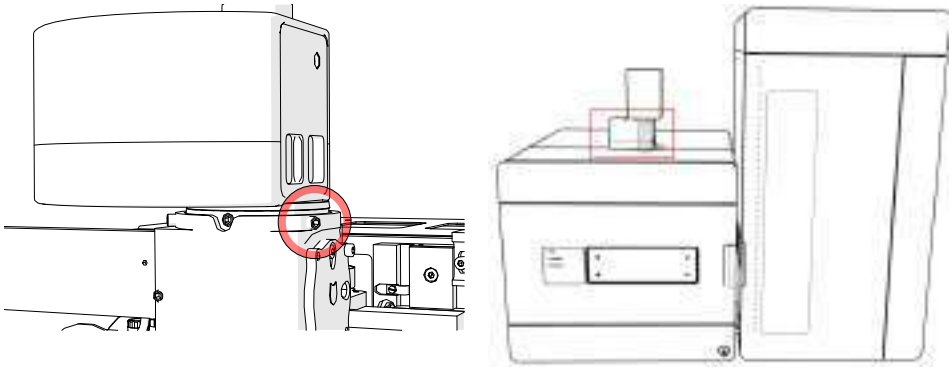


2. Stick the two caution labels on the U-FFWO T3 as shown in the image.

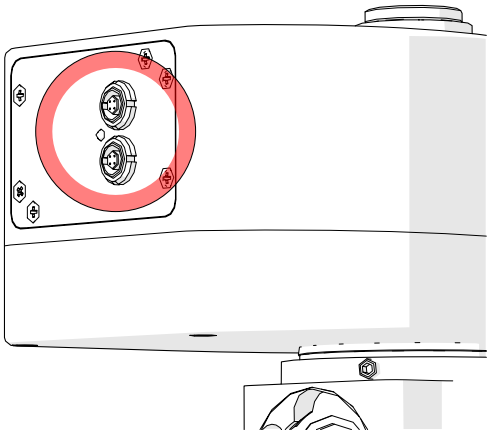
Before you mount the U-FFWO T3, make sure you insert all emission filters into the filter wheel. Note the position of the individual filters as you might need them later for the observation method adjustment. Refer to chapter Add or replace filter (U-FFWO) on page 59 for filter orientation.

U-FFWO T3 position	25 mm emission filter
1	DAPI 432/36
2	FITC 515/30
3	CY3 595/31
4	CY5 680/42
5	CY7
6	Black-out filter
7	Black-out filter
8	25 mm glass

3. Refer to the [Inserting the Optical Filters] chapter in the U-FFWO instruction manual for more information about filter insertion.
4. Mount the U-FFWO T3 with the cable connector facing to the left side onto the beam splitter and tighten the headless hex screw (size 3 mm hex key) facing towards the front. The location of the U-FFWO is indicated in the right figure.



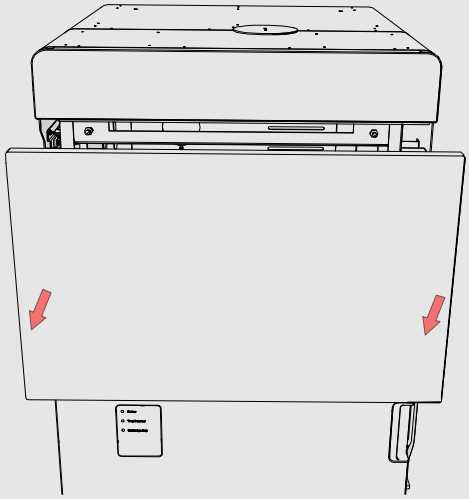
5. Connect the CAN-bus cable (which you find in the inside of the VS200 scanner) to the lower connector and the CAN-terminator to the upper connector.



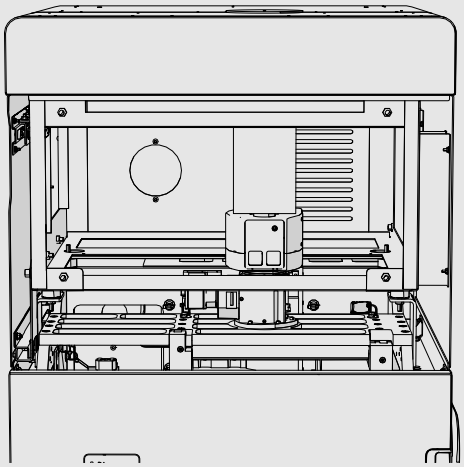
11.2.4 Add or replace filter (U-FFWO)

» Hex key (3 mm)

If your system is equipped with the optional VS200 camera cover, remove the front cover of the VS200 camera cover first to get access to the filter wheel or monochrome camera. Pull the cover towards you by grasping the left and right sides of the cover as shown in the image below.

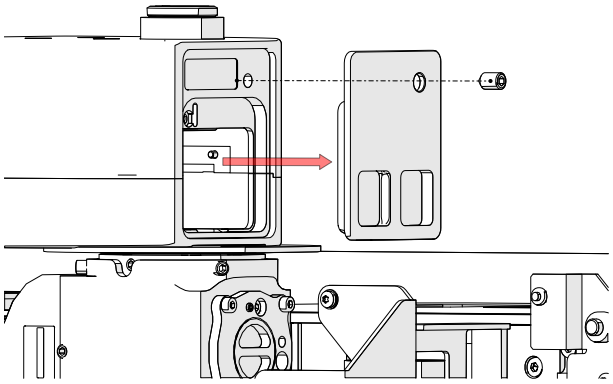


Removing the front cover by grasping the left and right sides of the cover.



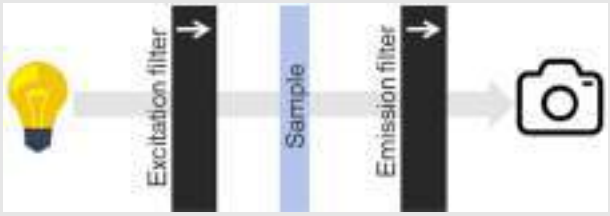
VS200 camera cover without front cover.

1. Make sure that the power of the VS200 system is switched off.
2. To add or replace a 25 mm emission filter in the U-FFWO, open the cover of the filter wheel using a 3 mm hex key.



3. Insert the filter into an empty position. Make sure that you orient the filter correctly when you insert it.
   » Refer to the [Inserting the Optical Filters] chapter in the U-FFWO instruction manual for more information.

The correct orientation for Semrock emission filters is with the arrow towards the camera.



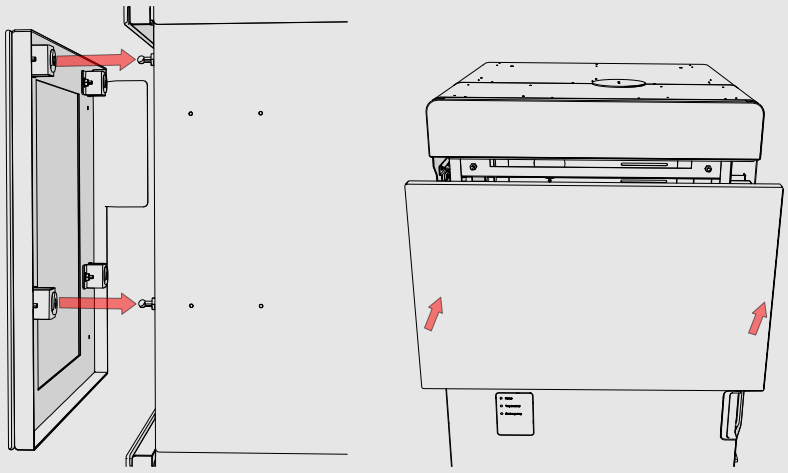
The correct orientation for Chroma emission filters is with the arrow pointing away from the camera.

4. Write down the position number of the filter as you will need it later.
5. Configure the filter in the VS200 ASW software. To do this, open the [Device Settings] dialog box. You can open this dialog box in the [Manual Control] layout.

6. Click the [Additional layouts] button to go to a different layout. You can find the [Additional layouts] button at the top right in the navigation bar on the VS200 ASW software's start page.
7. At the top right, on the menu bar click the [Manual Control] button.
8. Select the [Acquire] > [Devices] > [Device Settings] command to open the [Device Settings] dialog box.
9. Configure the filter. See Device settings - filter on page 111.

If your system is equipped with the optional VS200 camera cover, you will then need to remount the front cover of the VS200 camera cover.

To mount the front cover, place it on the fixing points and press it onto the VS200 camera cover. Refer to the following figures.



11.2.5 TV 1.0x adapter

The units described below must be assembled and adjusted by Olympus. If these units are assembled or adjusted by the customer, the operations are not ensured.

1. If you have a TV1.0x adapter, mount it onto the beam splitter and tighten the headless hex screw (3.0 mm) which is facing towards the front.

11.3 Monochrome camera

The units described below must be assembled and adjusted by Olympus. If these units are assembled or adjusted by the customer, the operations are not ensured.

Depending on the fluorescence configuration, VS200 offers four different monochrome cameras:

- VS-304M (iDS)
- ORCA-Flash 4.0 (V3)
- ORCA-Fusion
- ORCA-Fusion BT

When you switch on an ORCA camera wait at least one minute before you start the VS200 ASW software otherwise the camera will not be recognized.

Do not switch off any ORCA-camera while the VS200 system is operating.

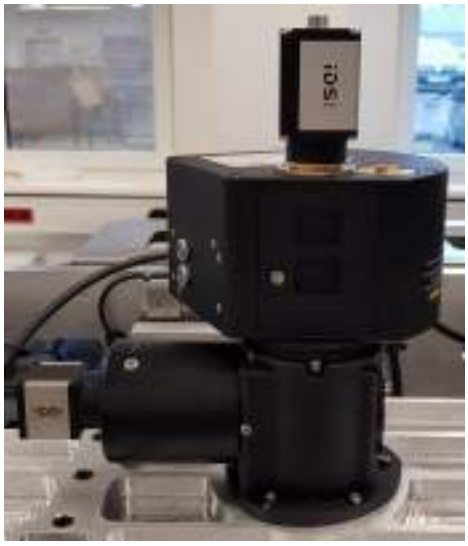
If you have a TV1.0x adapter on top of the beam splitter, screw the camera on top of the adapter. See Orientation of the monochrome camera on page 62 for the orientation of the camera.

11.3.1 Orientation of the monochrome camera

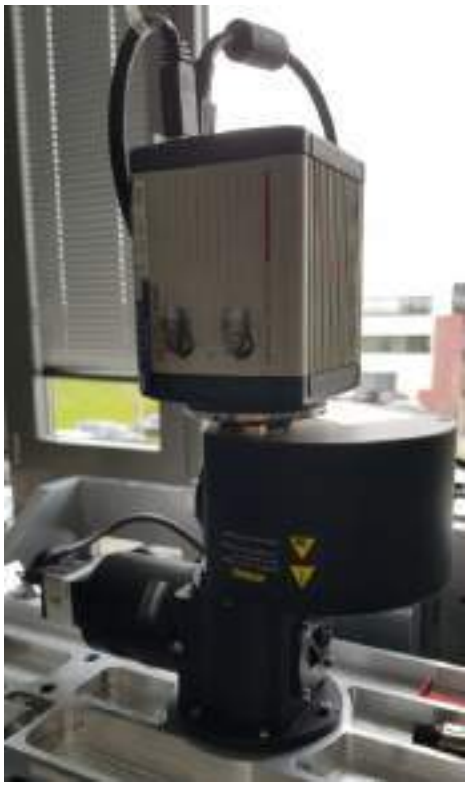
The units described below must be assembled and adjusted by Olympus. If these units are assembled or adjusted by the customer, the operations are not ensured.

The orientation of the monochrome camera is very important!

The orientation of the VS304M camera should be with the iDS logo to the front (angled USB-C cable port to the back). The camera's black metal surface should be on the left side.



The orientation of the ORCA-Flash 4.0 camera should be with liquid cooling connectors to the front (USB 3 and power connector on the left side).



The orientation of the ORCA-Fusion / ORCA-Fusion BT camera should be with the water cooling connectors facing the front side of the system.

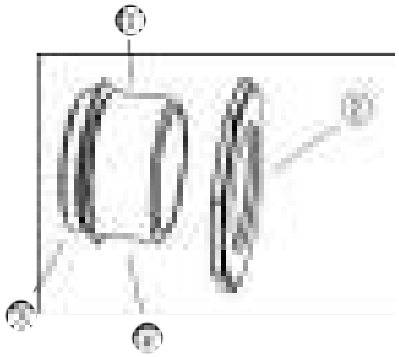
If your fluorescence configuration contains a U-FFWO T3, follow the following instructions to mount a monochrome camera. For more details refer to the U-FFWO manuals.

This example describes how to attach an ORCA-Flash 4.0 camera to the U-FFWO T3. The attachment of VS304M (iDS) and ORCA-Fusion or ORCA-Fusion BT is identical.

11.3.2 Mounting a camera to the U-FFWO

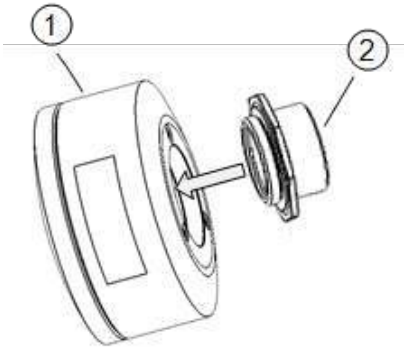
Refer to the [Mounting a camera to the U-FFWO] chapter in the U-FFWO instruction manual for more information.

1. Check that the counternut is pre-installed on the long side of the C-mount adapter. The counternut should be screwed in 3/4 of the thread (4).



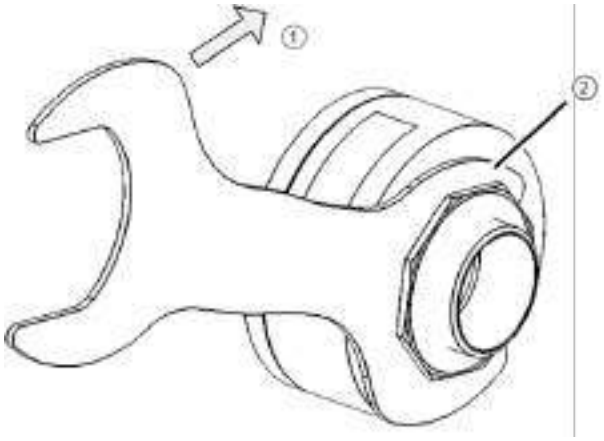
(1)	C-mount adapter
(2)	counternut
(3)	short side
(4)	long side

2. Hand-tighten the short side of the C-mount adapter to the camera clockwise.



(1)	camera
(2)	C-mount adapter and counternut

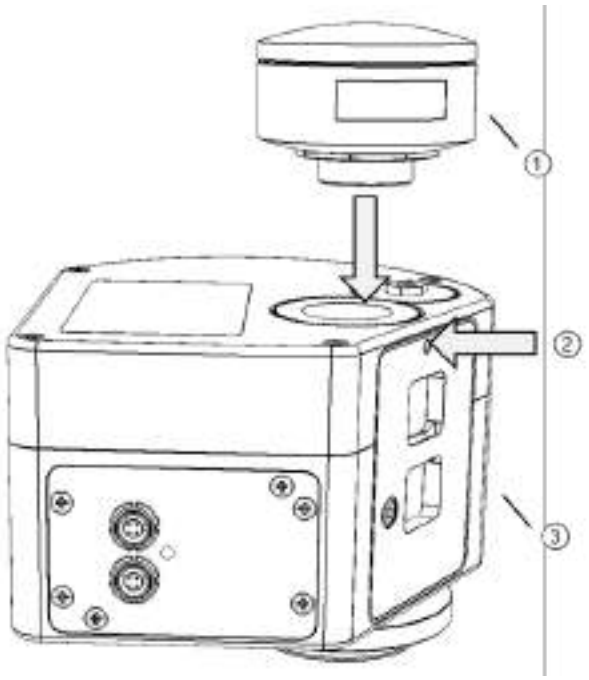
3. Fasten the C-mount adapter (not the counternut) clockwise to the camera by using the large wrench tool as indicated below.



(1)	fasten clockwise
(2)	large wrench, small side

4. Hand-tighten the camera and C-mount adapter to the U-FFWO.

> Make sure to tighten the camera orientation lock first to prevent slippage of the locking mechanism. To do so, tighten the rotation locking screw using a 2 mm hex key.



(1)	camera
(2)	tighten rotation locking screw
(3)	U-FFWO

5. Refer to chapter Camera adapter U-FFWO T3 on page 172 to adjust the parfocality of the C-Mount adapter.

How to adjust the camera adapter (tubus) is described in chapter Camera Adapter on page 172.

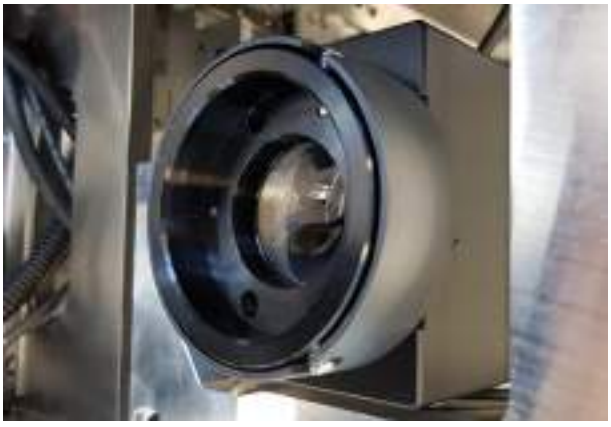
11.4 X-Cite adapter

The units described below must be assembled and adjusted by Olympus. If these units are assembled or adjusted by the customer, the operations are not ensured.

» Hex key (3.0 mm)

X-Cite adapter

1. Depending on the system configuration attach the X-Cite adapter to either the IX3-RFALFE flange (A) directly, or - if a U-FFWR is present - attach it to the flange of the U-FFWR (B).



Option A: IX3-RFALFE flange

Option B: U-FFWR

11.5 4x Objective

For proper system performance when acquiring fluorescence overview images the UPFLN4X has to be mounted on position 6 of the IX3-nosepiece.

See Mounting of components on page 44 for installation instructions.

11.6 LED light source

The units described below must be assembled and adjusted by Olympus. If these units are assembled or adjusted by the customer, the operations are not ensured.

Three LED light sources (X-Cite XYLIS, X-Cite TURBO and X-Cite NOVEM) are available for the VS200 system.

✓ The X-Cite TURBO and X-Cite NOVEM light sources are not available in all countries.

1. Unbox the LED light source and avoid bending or stretching of the liquid light guide.
2. Mount the light guide into the X-Cite adapter and tighten the knurled head screw.
3. Insert the other end of the light guide into the LED light source (see manufacturer's operating manual for detailed information).

Safety information for operation

Follow the safety precautions at all times during operation and maintenance of this product. Non-observance may result in eye injury or damage to the system.

CAUTION
Risk of injury to the eyes

- Do not look at operating lamp/LED as it can emit UV light.
- Never look into the light emitting end of the light guide. The light could severely damage the eye if the light is observed directly.

» Always make sure the liquid light guide and X-Cite adapter are securely attached to the VS200 system. This will minimize the risk of exposure to the UV light.

» If the light source has a malfunction please contact Olympus or Excelitas customer support. If the light source is serviced always make sure that the power cord is disconnected.

» Place the unit onto a hard, stable surface and make sure the ventilation openings are not covered by something.

11.7 Filter set

Depending on the purchased filter set insert the single-band excitation filters into the U-FFWR filter wheel. Refer to chapter Fluorescence filter wheels or camera adapter for monochrome camera on page 52 for the position information.

» Insert the single-band emission filters into the U-FFWO (if available). Refer to chapter Fluorescence filter wheels or camera adapter for monochrome camera on page 52 for position information.

» Put the 25 mm glass filter into position 8 of the U-FFWO.

» Put the black-out filter into all empty filter wheel positions.

The following chapters describe how to mount filter cubes into the IX3-RFACA. The filter set which was delivered together with the VS200 system must be assembled by Olympus. However, additional filters which were purchased later can be installed by the customer.

11.7.1 U-FF filter cube (IX3)

The units described below must be assembled and adjusted by Olympus. If these units are assembled or adjusted by the customer, the operations are not ensured.

1. Open the door of the VS200 scanner.
2. Slide the door of the IX3-RFACA to the left to insert an IX3 filter cube.
3. Insert a new filter cube into the correct position (position 2) as shown in the image.

The correct position is printed inside of the IX3-RFACA and is hard to read as the IX3-RFACA is mounted upside down. If you cannot read it make sure that the filter is placed between the position index 7 and 8 as shown in the image below.

4. After the cube is inserted slide the door of the IX3-RFACA back to the right.

11.7.2 Add or replace filter cube (IX3)

1. Make sure that the power of the VS200 system is switched off.
2. To add or replace an IX3 filter cube into the IX3-RFACA slide the door of the IX3-RFACA to the left.
3. Insert the filter cube into an empty position.
4. Write down the position number of the filter cube as you will need it later.
5. Configure the mirror cube in the VS200 ASW software. To do this, open the [Device Settings] dialog box. You can open this dialog box in the [Manual Control] layout.
6. Click the [Additional layouts] button to go to a different layout. You can find the [Additional layouts] button at the top right in the navigation bar on the software's start page.
7. At the top right, on the menu bar click the [Manual Control] button.
8. Select the [Acquire] > [Devices] > [Device Settings] command to open the [Device Settings] dialog box.
9. Configure the filter cube. See Device settings - filter on page 111.

11.7.3 U-FDICT filter cube

Mount an optional U-FDICT for polarized light acquisition. The U-FDICT should be placed into position 8 of the IX3-RFACA because this position is configured in the default device settings.

1. Insert the U-FDICT into position 8 as shown in the image.

» It is between the index 5 and 6.

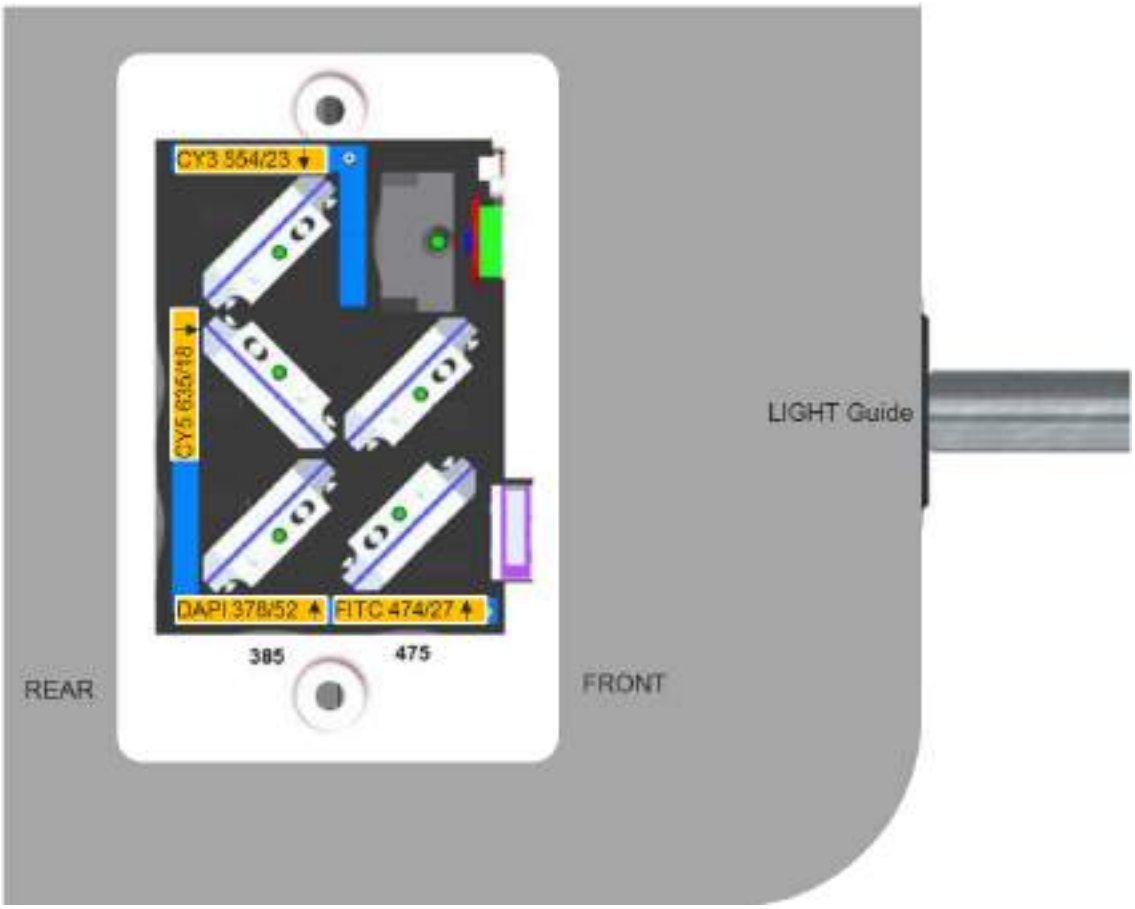
Refer to chapter Activate the motorized polarizer on page 109 and Setup polarization (Pol) observation method on page 118 to configure the system to scan with polarized light.

If you would like to install other filter cubes please make sure that you register them in the dialog box [Device Settings] later. See Device settings - filter on page 111.

11.7.4 X-Cite TURBO

The units described below must be assembled and adjusted by Olympus. If these units are assembled or adjusted by the customer, the operations are not ensured.

The excitation filters in the X-Cite TURBO have to be placed as indicated in the boxes in the picture below (the arrows show the filter orientation). Refer to the X-Cite TURBO manual how to mount the filters.



11.7.5 X-Cite NOVEM

The X-Cite NOVEM comes with exitation filters installed already.

12 Assembly of the housing for the VS200 scanner

Before starting with the assembly of the housing make sure the main power is disconnected!

The VS200 system is shipped with only the front door mounted. Side, back and top panels have to be attached on site.

1. Remove the four handles.

Follow the correct order for mounting the elements of the housing so that you don't run into any trouble.

After assembling the panels

Check if assembling the loader housing was successful. The gap between the individual parts of the housing must be identical.

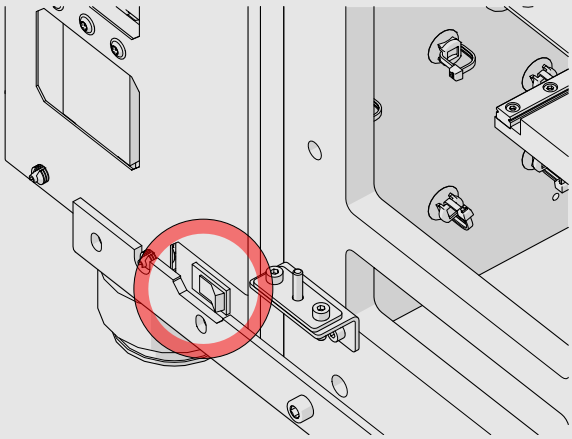
12.1 VS200 camera cover (optional)

The camera cover must only be installed by an Olympus service technician.

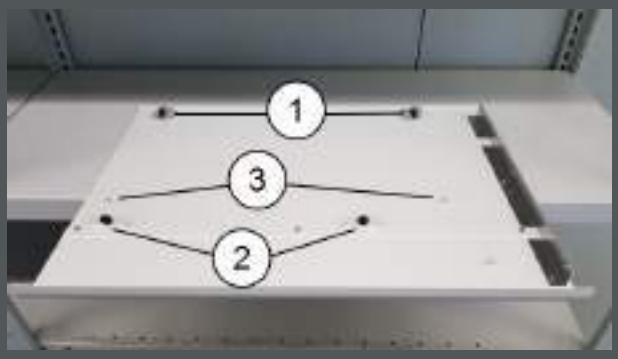
12.2 Left panel

The units described below must be assembled and adjusted by Olympus. If these units are assembled or adjusted by the customer, the operations are not ensured.

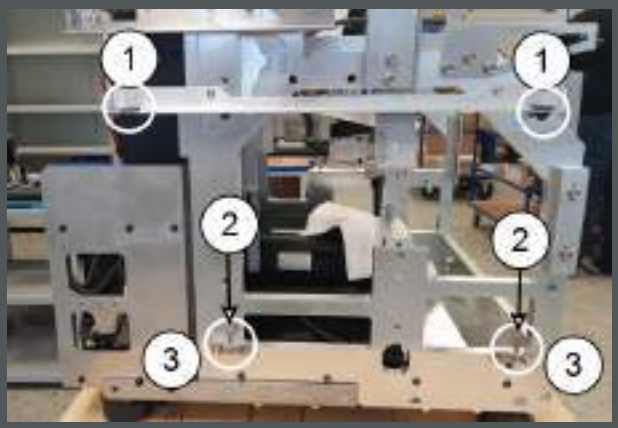
Before you install the left side panel make sure that the power switch of the IX3-CBM is switched on.



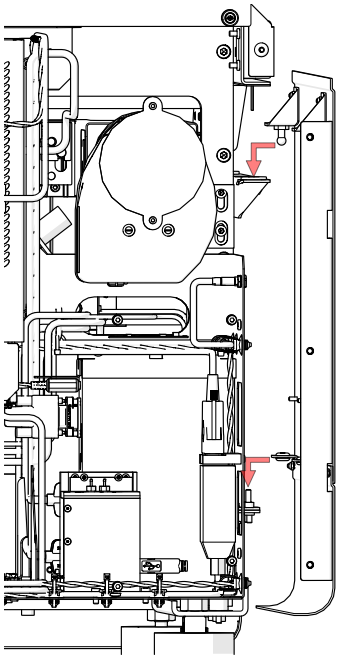
The left side panel has two black quick lock pins (1) at the top and two rubber ring sockets (2) near the bottom. Additionally it has two connectors (3) for the faston terminals which need to be connected with the cables coming from the VS200 frame.



On the left side of the VS200 scanner, you find two quick locks sockets (1) at the top and two small pins (2) close to the bottom as well as two faston terminal connectors with cables attached (3).



1. Place the panel next to the system and connect the two faston terminals to the side panel first.
2. Mount the side panel so that the rubber rings of the panel fit onto the small pin on the VS200 system.
3. Once the pins are inside the rubber rings push the panel towards the frame and finally push it down so that the black quick lock pins of the side panel fit into the sockets.



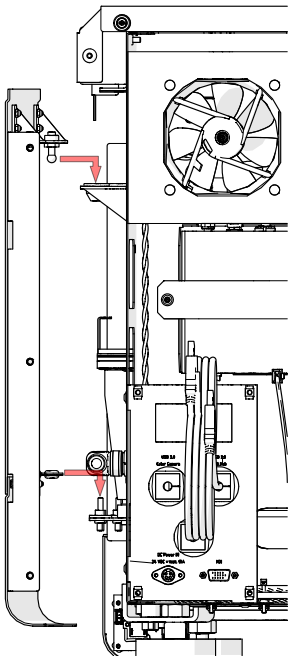
12.3 Right Panel

The units described below must be assembled and adjusted by Olympus. If these units are assembled or adjusted by the customer, the operations are not ensured.

Depending on your system configuration (with or without VS200 loader) the VS200 system comes with two different right side panels. The side panel of the VS200 loader variant has an opening for loading the trays.

The mounting of the right side panel is similar to the left panel. There are two rubber sockets (quick locks at the top) and two small pins close to the bottom of the VS200 scanner and three faston terminals.

1. First connect the two faston terminals to the side panel.
2. Mount the side panel so that the rubber rings of the panel fit onto the small pin on the VS200 system.
3. Once the pins are inside the rubber rings push the panel towards the frame and finally push it down so that the quick lock pins of the side panel fit into the sockets.



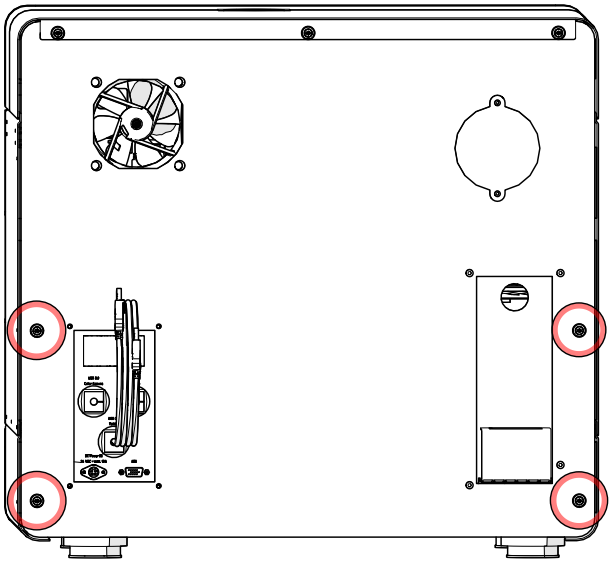
12.4 Back panel

The back panel needs to be attached before mounting the top panels. It is fixed with four knurled head screws.

The three knurled head screws at the top are part of the top panel and are tightened later.

1. Guide the three cables from the backside of the VS200 system through the back panel like shown in the image below.

2. Guide the optional liquid light guide through the hole in the back.
3. Place the back panel against the backside of the system and tighten the four knurled hex screws. No other screws are needed.

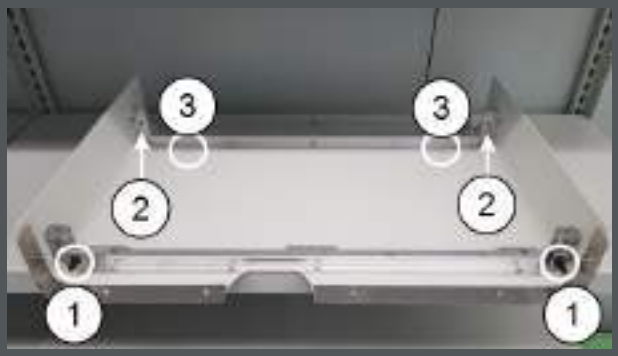


12.5 Top panel

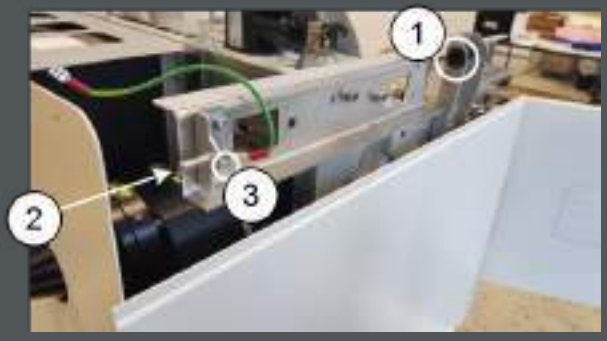
Top panel - first part

The top panel consists of two parts. You have to start with the back part (large part) of the top panel.

The panel has two quick lock pins (1) in the front and two guiding holes in the back (2). Additionally there are two grounding connectors (3) where you have to connect the faston terminals coming from the VS200 frame.

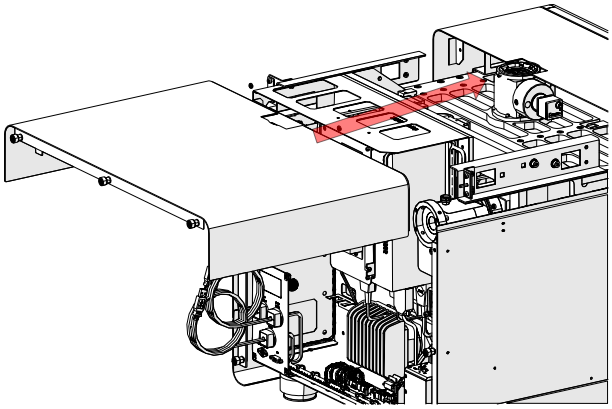


On each side of the VS200 scanner there is a quick lock socket (1) and a small pin (2) as well as one connector with a faston terminal attached (3).



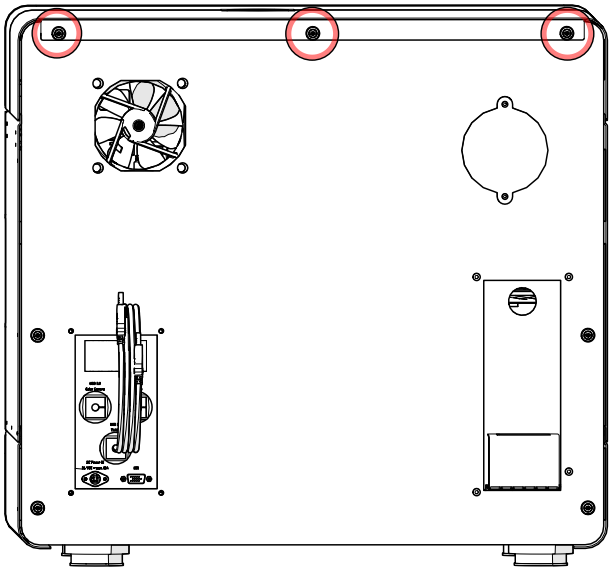
On each side there is the connector (system side) for the faston terminal.

1. Connect the two faston terminals (left and right side) to the top panel.
2. Put the top panel parallel to the VS200 scanner.
3. Gently push the top panel to the front of the system (where the front door is mounted) until the quick lock pins click into the quick lock sockets.



» If the first part of the top panel is correctly mounted it should look like this:

4. Tighten the 3 knurled hex screws at the top back side of the system.



Mounting the top port cover of the dual camera port

If you have a brightfield system you have to mount the top port cover of the dual camera port now.

top view

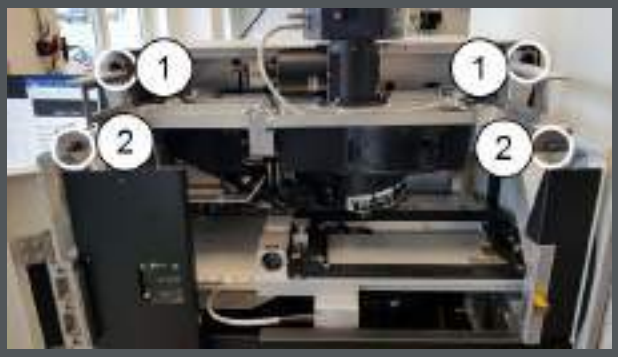
bottom view

1. Put the round cover on top of the beam splitter flange and fix it by tightening the 3mm headless hex screw.

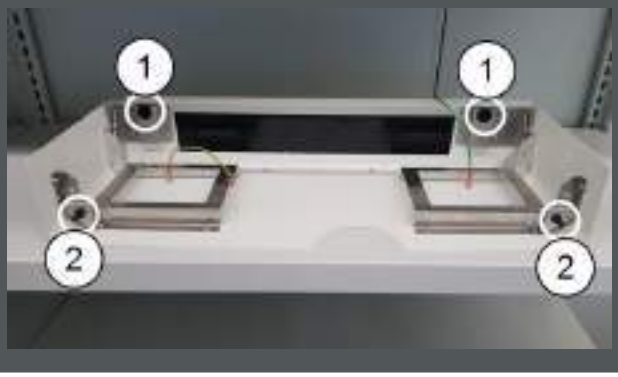
Top panel - second part

To attach the second part of the top panel follow the instructions below.

On the VS200 scanner you find two quick lock sockets (1) and two quick lock pins (2).



On the panel itself you find the corresponding parts; two quick locks sockets (1) and two quick lock pins (2).



1. To make the assembly easier connect the two faston terminals already to the grounding plugs (3) of the top panel.

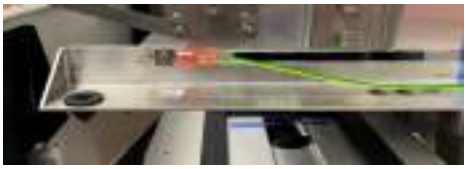
2. Open the front door and put the short top panel parallel on the VS200 scanner.

3. Gently push it towards the back of the system until the pins fit into the quick lock sockets.

4. In case you use a U-FFWO make sure that the cable is guided through the housing as shown in the image below.

» If you have a VS200 system with color camera only (VS-264C) and the top panels are mounted correctly, it should look like this:

5. Connect the two faston terminals to their counter plugs on the right and left side like shown in the image below.



Left side

Right side

13 Cabling

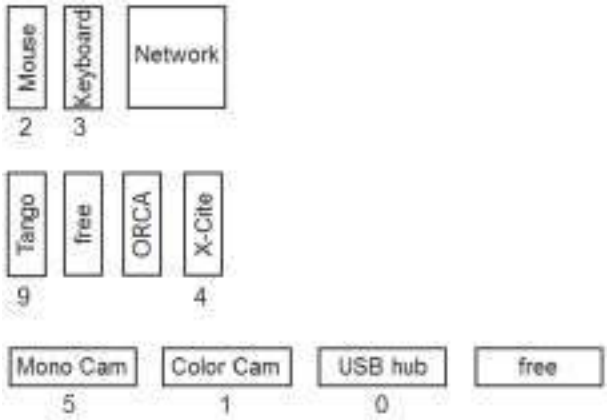
The units described below must be assembled and adjusted by Olympus. If these units are assembled or adjusted by the customer, the operations are not ensured.

ATTENTION
Do not plug anything into or unplug anything from the ports when the system is connected to the power supply.

The VS200 PC has a label on its backside indicating where to plug in the individual cables. Before you plug the cables into the PC, put the colored cable clips which you will find in the accessories box to the following cables to make it easier to identify them:

Clip	Cable
2	Mouse
3	Keyboard
4	X-Cite
5	VS-304M

The USB cables for the Tango controller (clip 9) and the USB hub (clip 0) as well as the color camera (clip 1) are mounted ex works.



It is important to connect all cables according to the connection scheme as otherwise components might not work correctly.

Please refer to the following table:

Cable	Type	Location	PC position number
VS-364M (s/w)	USB 3.0	Top of camera	5
Color camera	USB 3.0	Back of VS200	1
ORCA-Flash/Fusion BT	USB 3.0	Top of camera	ORCA
DC Power In	Power supply	Back of VS200	Power socket
USB 2.0 Tango	USB 2.0	Back of VS200	9
USB 2.0 Hub	USB 2.0	Back of VS200	0
X-Cite TURBO/NOVEM/XYLIS	USB 2.0	Back of X-Cite light source	4
X-Cite TURBO/NOVEM/XYLIS	Power cord	Back of X-Cite light source	Power socket
U-FFWR	CAN Bus	VS200 internal	See chapter U-FFWR (Motorized fast reflected light filter wheel) on page 52.
U-FFWO	CAN Bus	VS200 internal	
HP LCD screen	Display port	Bottom of LCD screen	
HP LCD screen	Power cord	Bottom of LCD screen	Power socket
HP mouse	USB 2.0		2
HP keyboard	USB 2.0		3

14 Assembly of the VS200 loader housing

The units described below must be assembled and adjusted by Olympus. If these units are assembled or adjusted by the customer, the operations are not ensured.

The VS200 loader is shipped with the two side panels already mounted. Follow the order of panel mounting as described in the chapter below.

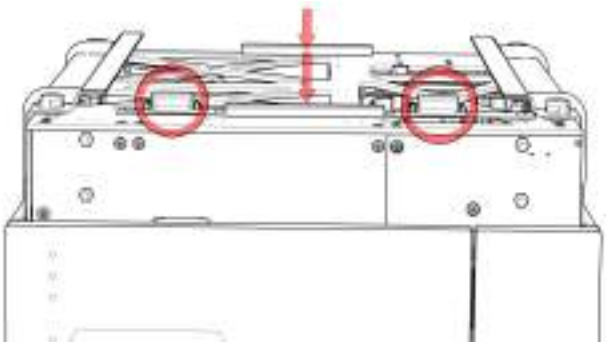
After assembling the panels

Check if assembling the loader housing was successful. The gap between the individual parts of the housing must be identical.

14.1 Top panel

The units described below must be assembled and adjusted by Olympus. If these units are assembled or adjusted by the customer, the operations are not ensured.

1. Place the top panel over the system.



2. Securely attach the two faston terminals at the backside of the VS200 loader to the connectors of the panel like shown in the image below.
3. Position the panel so that it sticks out approximately 1.5 cm at the front.
4. Push it to the back until you hear a "click".

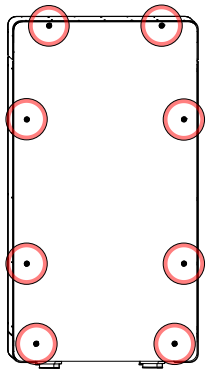
14.2 Back panel

The units described below must be assembled and adjusted by Olympus. If these units are assembled or adjusted by the customer, the operations are not ensured.

The back panel is fixed with 8 knurled screws.

1. Center the back panel on the VS200 loader and start by tightening the middle knurled screws.

2. Subsequently tighten all other knurled screws.



14.3 Front panels

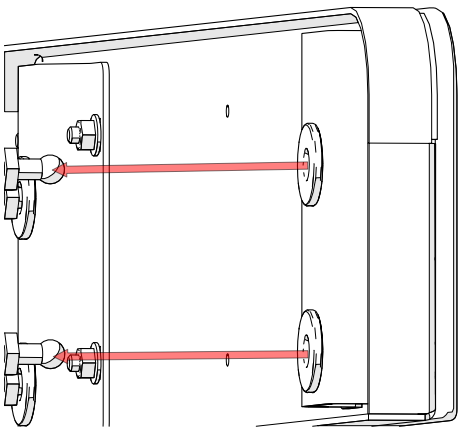
The units described below must be assembled and adjusted by Olympus. If these units are assembled or adjusted by the customer, the operations are not ensured.

1. First, mount the horizontal front panel and then the vertical front panel as described in the following steps.

Before

After

2. Securely connect the two faston terminals to the horizontal panel and push the panel towards the system so that the quick lock sockets of the panel fit onto the quick lock pins of the VS200 loader.



3. Securely connect the faston terminals to the vertical panel and push the panel towards the system so that the quick lock sockets of the panel fit onto the quick lock pins of the VS200 loader.

15 Connection VS200 scanner and VS200 loader

15.1 Mechanical connection between the VS200 scanner and VS200 loader

The units described below must be assembled and adjusted by Olympus. If these units are assembled or adjusted by the customer, the operations are not ensured.

This chapter describes the mechanical connection between the VS200 scanner and the VS200 loader. When you are upgrading a VS200 ST (Single Tray) scanner, first perform the steps for upgrading an ST (Single Tray) system to an MTL (Multi Tray Loader) system.

CAUTION

Risk of injury and risk of device damage if components are dropped

The loader, scanner or other components might drop when you are moving them. Injury to your feet or damage to the device can result.

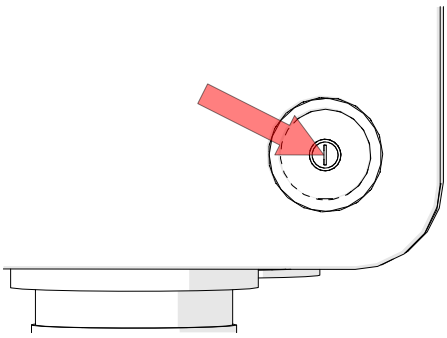
- Make sure that all handles for transportation are screwed in completely and tight.
- The system must be carried by two people.

» Hex screwdriver (size 5 mm)

Notes about the optional camera cover

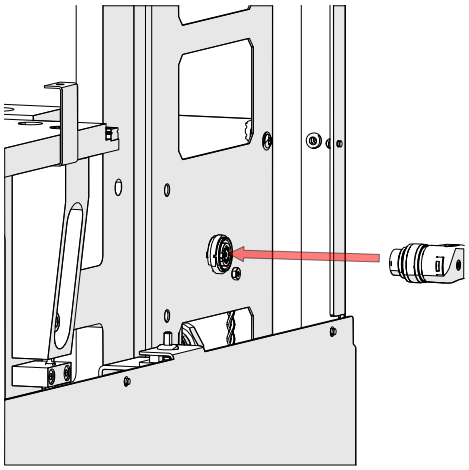
Before connecting the VS200 loader to the VS200 scanner unit, make sure that the optional camera cover is mounted on the VS200 scanner unit.

1. Switch the VS200 system off using the main power switch and disconnect the system from the power supply. To do so, disconnect the external power supply unit from the power supply.



2. Place the VS200 loader to the right of the VS200 scanner, leaving a small gap between them.
3. Remove the handles from the right side of the VS200 scanner and from the left side of the VS200 loader.

4. Check the orientation of the VS200 scanner and the VS200 loader. If the devices have a different orientation or height level, adjust the feet of the VS200 loader. See Adjusting the leveling feet of the VS200 loader on page 223.
5. Remove the jumper plug on the VS200 scanner. The jumper plug is located in the lower right corner of the scanner's right panel (see figure below).
6. Now mount the VS200 scanner's right housing side cover. Note that the right housing side cover will accommodate the operation of the loader. You can identify this part of the housing by its one large and one small opening.
7. Plug the VS200 loader's control cable into the port on the VS200 scanner where the terminator was. The plug should point towards the back.



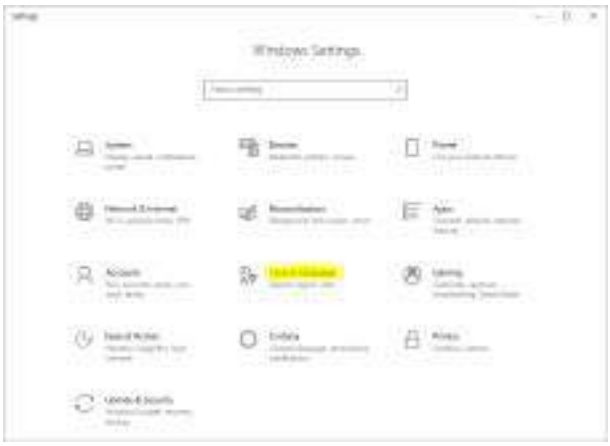
8. With its left housing side cover mounted, slide the VS200 loader onto the VS200 scanner's connector.
9. Tighten the 2 hex screws (size 5 mm hex screwdriver) which attach the connector of the VS200 scanner to the VS200 loader.
10. Remove the remaining handles from the VS200 scanner and the VS200 loader.
11. Reconnect the VS200 system to the power supply.

16 PC operating system language

If you want to change the language of the operating system follow the instructions below.

✓ Japanese and Chinese are pre-installed on the VS200 PC.

1. Open Windows Settings and select [Time & Language].



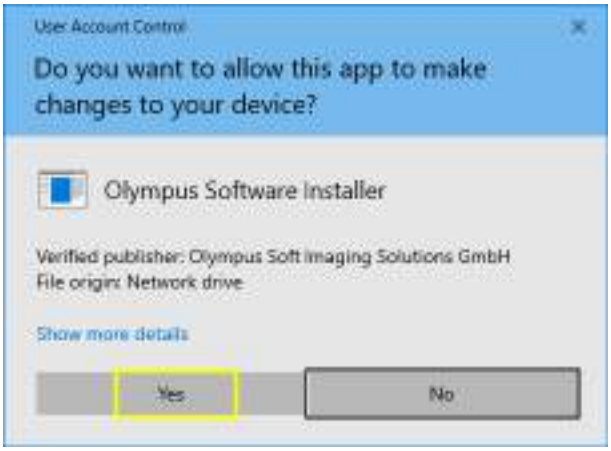
2. Click on the language you would like to use.

17 VS200 ASW software setup

The units described below must be assembled and adjusted by Olympus. If these units are assembled or adjusted by the customer, the operations are not ensured.

This chapter describes the installation of VS200 ASW on a VS200 system PC.

1. Turn on the PC.
2. To start the setup process, go to D:\OLYMPUS_SERVICE_ONLY_DO_NOT_DELETE\SetupMain\ and run the Setup.exe.
3. Click [Yes] to allow changes to the PC device.



4. Select the [Install or maintain imaging software] option and proceed with [Next].

5. To provide the licenses open the envelope of the license cards and enter the license keys. You might have more than one license key depending on the configuration of your kit.

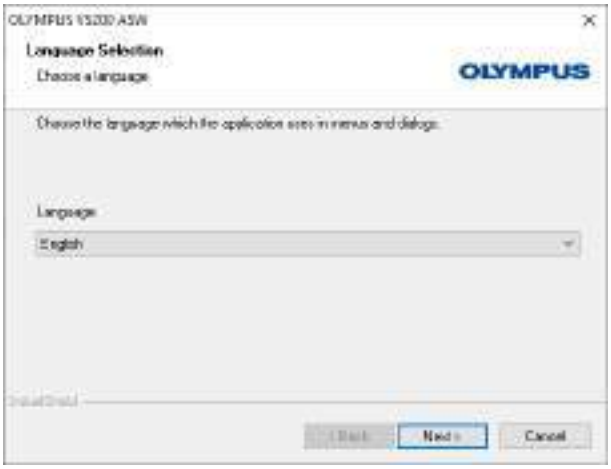
Available license keys are:

- VS200 ASW
- VS-FLUO
- VS-CNV

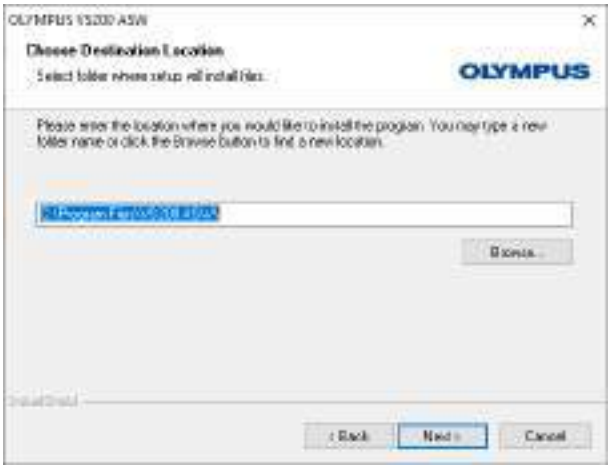
6. Accept the license agreement.

   To activate the licenses at the customer's premises the PC needs internet access. If no internet access is available the licenses can also be activated offline. In this case follow the instruction during the activation process.

7. Change language (English is default). Proceed with [Next].

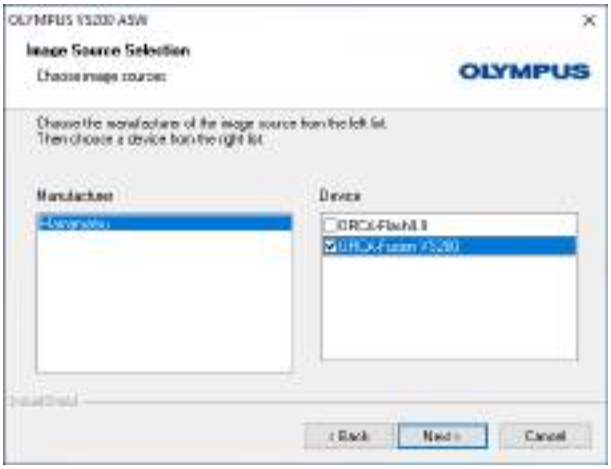


8. Change installation location (not recommended). Proceed with [Next].



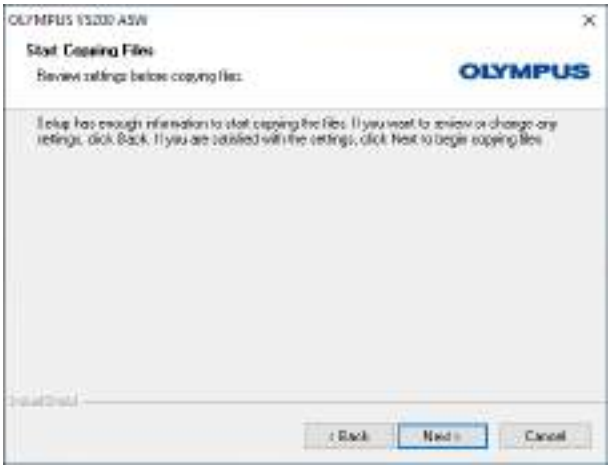
9. Changing the temporary file location (D:\Temp) is not recommended. Proceed with [Next].

10. If your kit includes a different monochrome camera than the iDS-VS-304M select either [ORCA-Flash4.0] or [ORCA-Fusion VS200] and proceed with [Next].

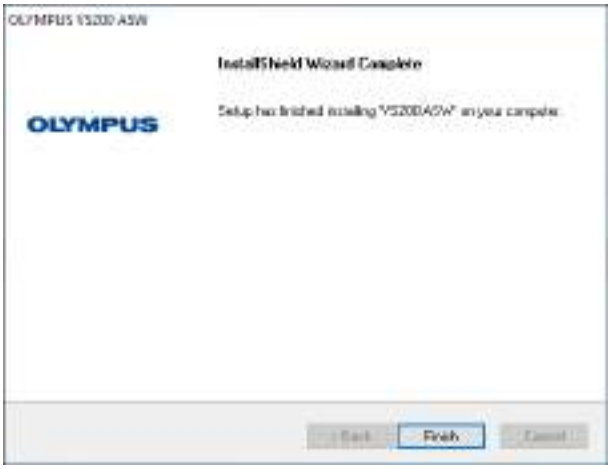


11. Select [Add icon to the desktop] and [Add manuals shortcut to the desktop] and proceed with [Next].

12. Start setup by clicking [Next].

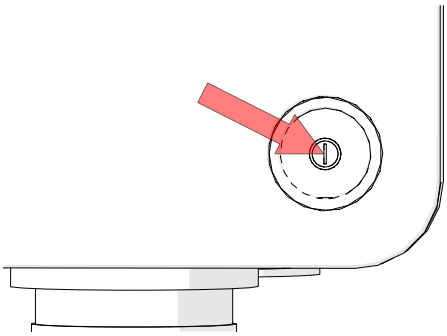


13. Finish the setup process by clicking the [Finish] button.



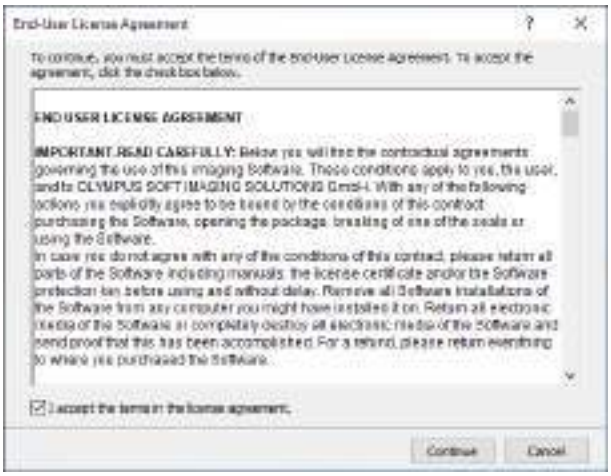
14. In the following dialog box, click the [Close] button and do not install any example data or tools.

15. Turn on the VS200 system.



16. To start the software double-click the VS200 ASW icon.

17. At the first start agree to the End-User License Agreement and proceed with [Continue].



» The following splash screen is displayed while the VS200 system is initializing.

The initialization process might need up to two minutes.

Error messages

» If you see the error message below once the software is up and running please refer to Troubleshooting on page 216.

In most cases this message occurs because you are using a wrong device configuration. Refer to chapter VS200 device configuration on page 108 to change or adapt the VS200 device configuration.

» If you see the following error message it means that you are using a VS200 loader which is not yet configured in the device list.

Refer to chapter VS200 device configuration on page 108 to add the VS200 loader to the system configuration.

18 Driver installation (ORCA cameras and X-Cite light sources)

After the installation of VS200 ASW you will find an icon on the desktop which enables you to install Windows drivers for the X-Cite XYLIS or TURBO light source as well as for the ORCA-Flash, ORCA-Fusion or ORCA-Fusion BT camera.

1. Double-click on the icon to open the installation webpage.

Driver Installation "OLYMPUS VS200 ASW" (build 21655)

The following links refer to the installation disk you used to install the product. Please make sure the disk is inserted in the same drive it was during product installation.
To operate the hardware listed below, the drivers need to be installed.

Hamamatsu ORCA-Flash4.0

Follow the link below and start the driver setup application.

Link to driver setup:
G:\Shared\Devices\Hamamatsu\

Excelitas X-Cite TURBO

Follow the link below and start the driver setup application.

Link to driver setup:
G:\Shared\Devices\Lumen Dynamics\X-Cite Turbo\

Excelitas X-Cite XYLIS

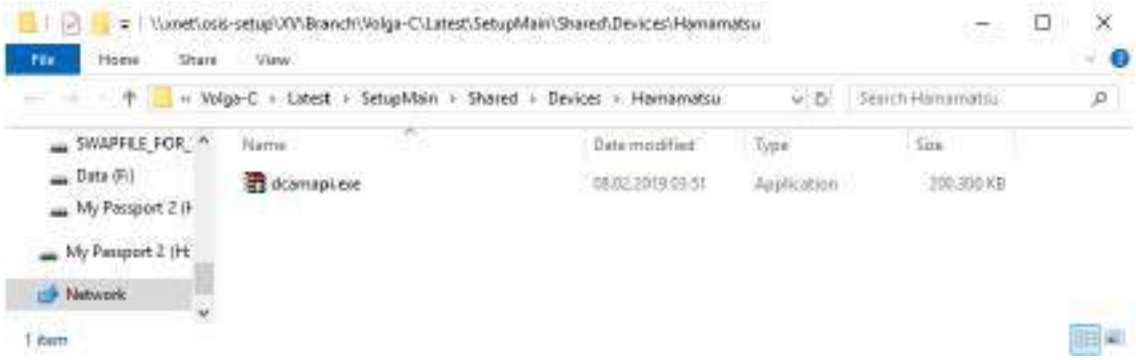
Follow the link below and start the driver setup application.

Link to driver setup:
G:\Shared\Devices\Lumen Dynamics\X-Cite XYLIS\

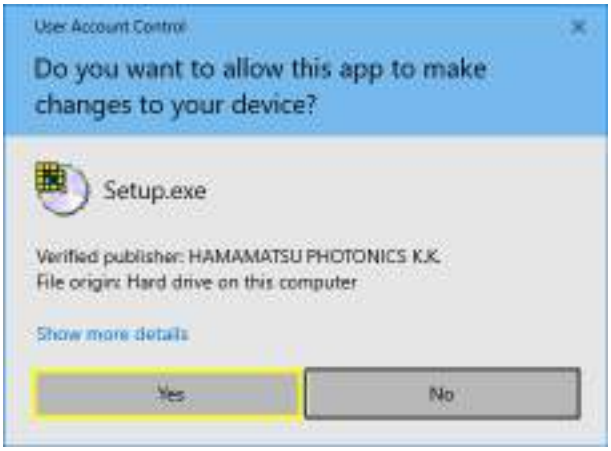
18.1 ORCA camera USB driver installation

The driver installation is for all ORCA cameras identical.

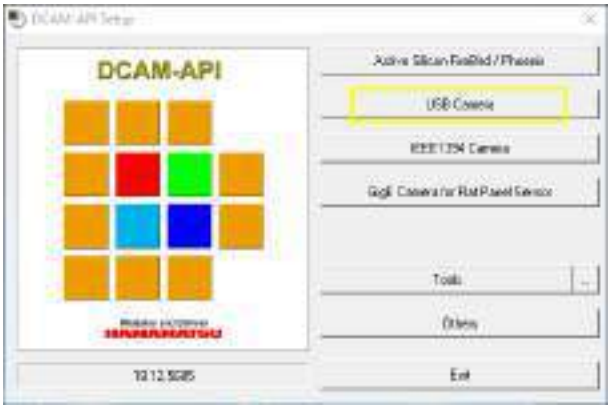
1. Open the link under e.g. ORCA-Fusion and execute the "dcamapi.exe".



2. Click [Yes] to confirm to allow changes to the device.



3. Click the [USB camera] button to install the USB camera.



4. Click [Next] to install the DCAM-API drivers.

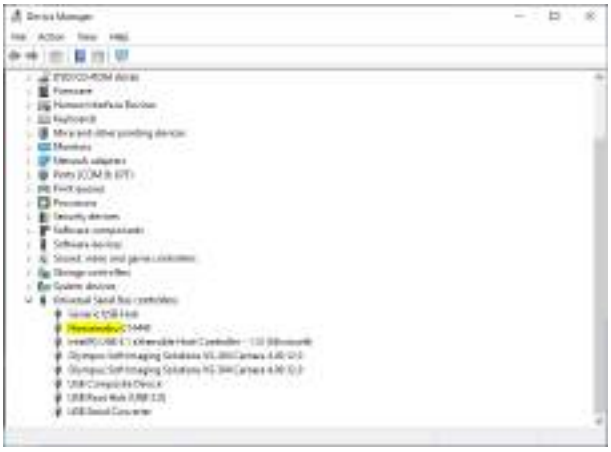
5. Accept the license agreement and proceed with [Next] to install the driver.

» The ORCA-Flash/Fusion can be used now.

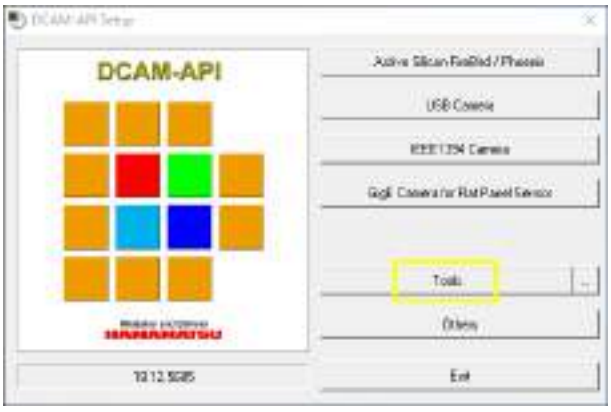
18.1.1 Check the driver installation for the ORCA camera

1. Switch on the ORCA camera and wait at least 2 minutes.
2. Open the Windows [Device manager] dialog box and select the [Universal Serial Bus controllers] section.
   » You should see a Hamamatsu entry.
   » If you do not see the Hamamatsu entry check whether the camera is

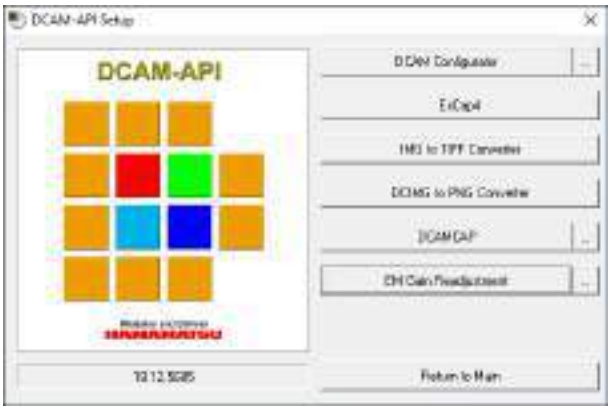
correctly connected and also the power supply is connected.



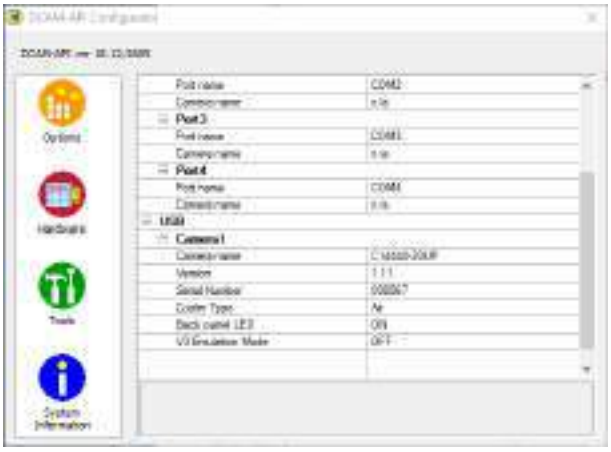
1. Alternatively you can also execute the "dcamapi.exe" again.
2. Click the [Tools] button.



3. Click the [DCAM Configurator] button.

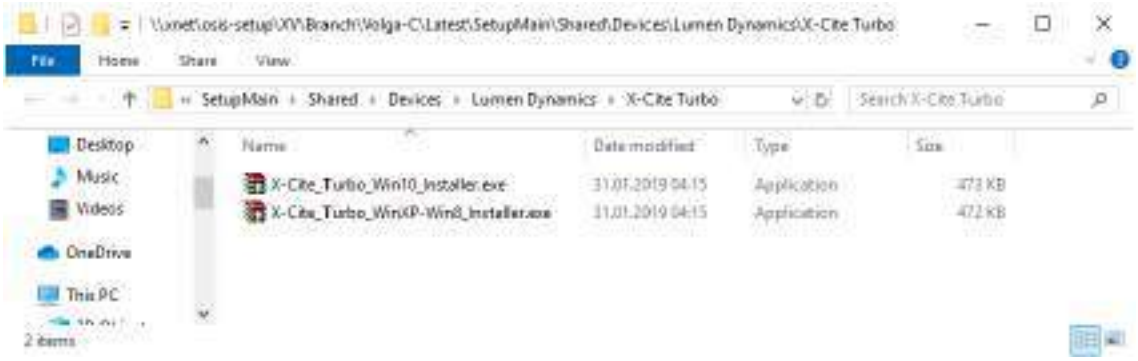


4. In the [DCAM-API Configurator] dialog box you should find a [Camera 1] entry below the [USB] section.

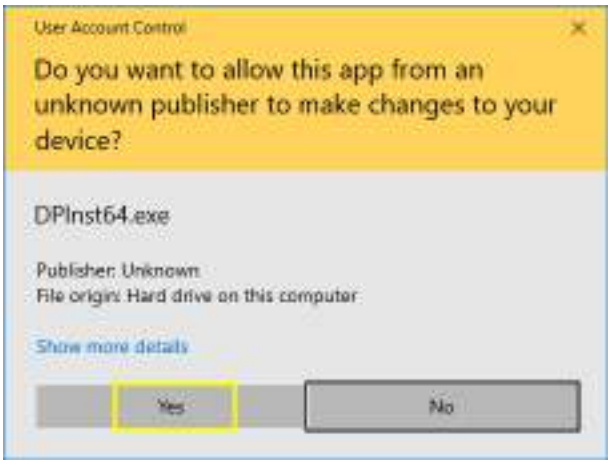


18.2 X-Cite light source driver installation

1. Open e.g. the X-Cite TURBO link and select the "Win10_Installer.exe".



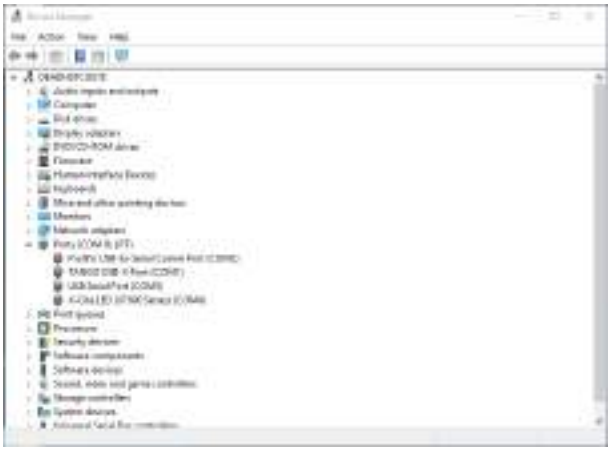
2. Click [Yes] to confirm to allow changes to the device.



» As this is a silent installation you will not see any further notifications.

18.2.1 Check the driver installation for the X-Cite light source

1. Open the Windows [Device manager] dialog box and select the [X-Cite LED] entry in the [Ports (Com & LPT)] section.



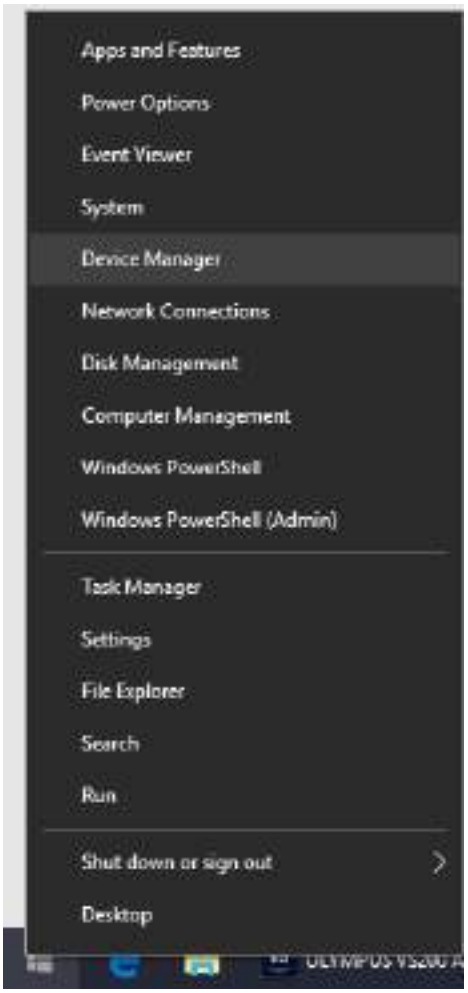
» If you do not see the entry make sure that the light source is connected correctly and switched on.

19 Adjusting WINDOWS COM ports

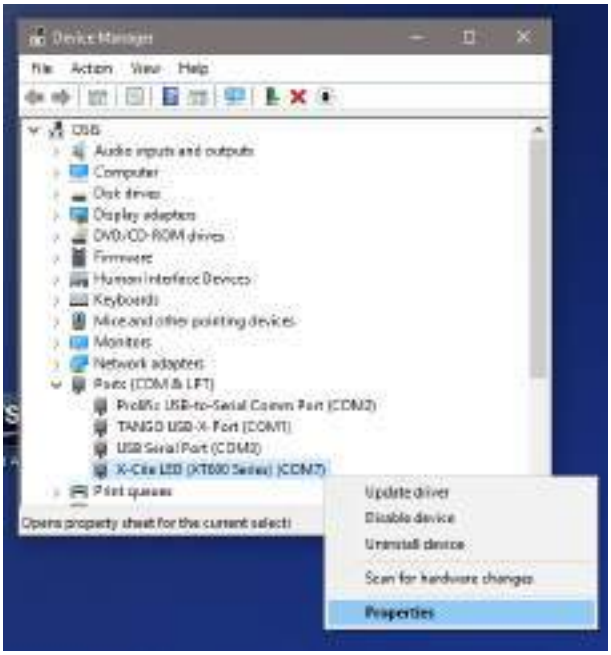
If your VS200 system kit contains the fluorescence option, you have to set the COM port for the fluorescence illumination source (X-Cite XYLIS or X-Cite TURBO).

It is a precondition that all devices have to be attached to the PC (see Cabling on page 84 chapter) and that the VS200 ASW software has to be installed prior to the adjustment of the COM ports.

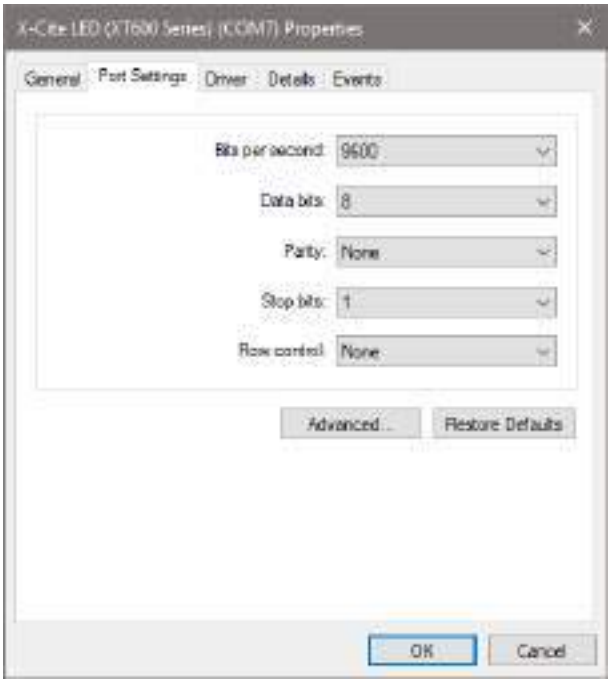
1. Close the VS200 ASW software.
2. Right click the [Start] icon of the Windows OS to open the [Device Manager] dialog box.



3. In the [Device Manager] dialog box select the X-Cite LED. Right click the [X-Cite LED] entry and select the [Properties] entry in the context menu.

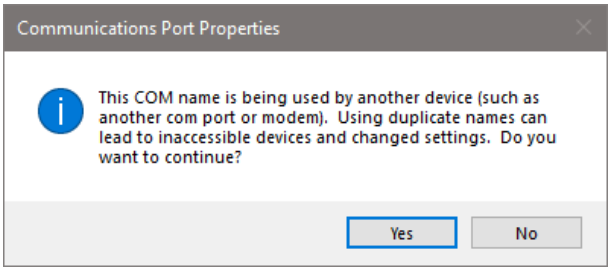


4. Select the [Port Settings] tab and click the [Advanced] button.

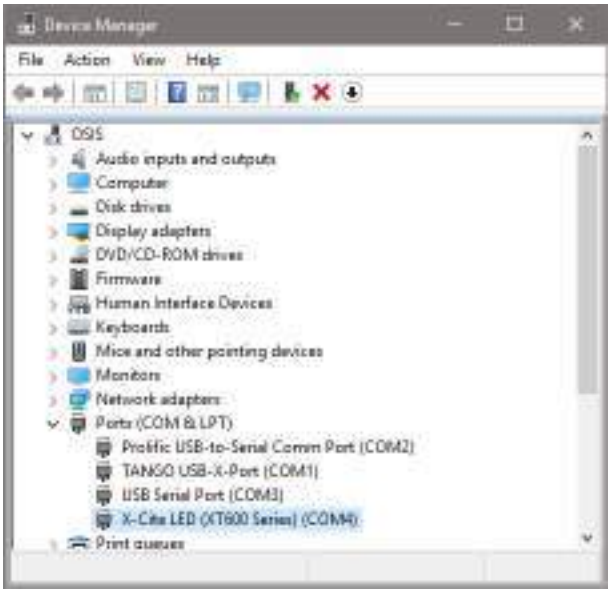


5. Change the COM Port Number to 4 (even though it is listed as in use).

6. Confirm with [OK].
7. Select [Yes] if you get a message saying that the device is already being used by another device.



8. After this procedure the [Device Manager] dialog box should look like the following figure.



9. Restart the PC.

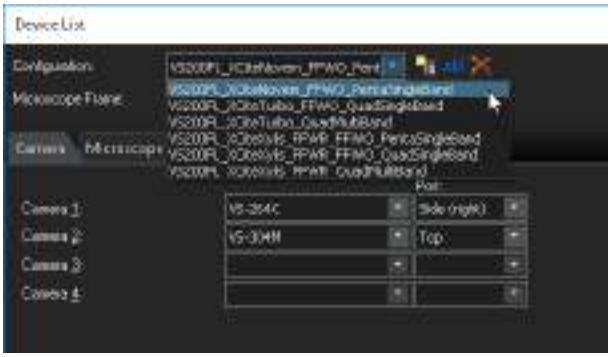
20 VS200 device configuration

1. On the start page of the software click the [Device Settings] button.

» The software will automatically switch to the [Manual Control] layout and open the [Device Settings] dialog box.

2. In the [Device Settings] dialog box click on the [Device List] button to open the [Device List] dialog box.

3. VS200 ASW offers six predefined device configurations to choose from. Depending on the configuration of your VS200 system (FL light source, fast filter wheels and filter set) select one of the six.



If you have a VS200 brightfield system there is only one (VS200) device configuration available.

4. If you are using the VS200 loader select the [Microscope] tab and select in the [Sample loading] list the [VS200L Slide Loader] entry.

20.1 Activate the motorized polarizer

All VS200 systems are equipped with a polarization angle changer. By default the functionality of the motorized polarizer is switched off.

1. Use the [Acquire] > [Devices] > [Device List] command to open the [Device List] dialog box.
2. Select the [Transmitted light path] tab and select the [Polarization Angle Changer] check box.

20.2 Activate the VS200 liquid dispenser

1. Use the [Acquire] > [Devices] > [Device List] command to open the [Device List] dialog box.
2. Select the [Microscope] tab.
3. Make sure that the check box [VS200 Liquid Dispenser] is selected.

20.3 Device settings - objectives

A VS200 system is supplied with a 2x and a 20x objective ex-works. However, the predefined device configuration already contains a 2x, 4x, 10x, 20x and 40x objective.

You need to delete the objectives that are not installed from the nosepiece settings in the [Device Settings] dialog box.

Opening the [Device Settings] dialog box

1. Use the [Additional layouts] button to go to a different layout. You can find the [Additional layouts] button at the top right in the navigation bar on the software's start page.
2. At the top right, on the menu bar click the [Manual Control] button.
3. Select the [Acquire] > [Devices] > [Device Settings] command to open the [Device Settings] dialog box.

Configuring objectives

1. Select the [IX3 nosepiece] entry on the left side and set all objectives that are not installed to the status [Free].

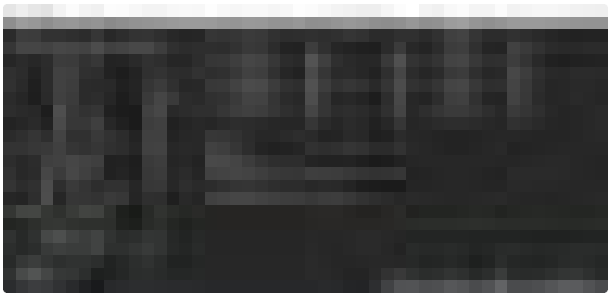
Before

After

2. To add a phase contrast objective select the [Magnification] entry and the correct [Objective Type] entry for e.g. position 5 and add e.g. [PH] in the [Description] field to distinguish between 'normal' 20x and 'PH' 20x.

» Refer to chapter Setup phase contrast (PH) observation method on page 115 to adjust the [Device Customization] dialog box for phase contrast acquisition.

3. In case you want to install and configure an immersion objective please also check that the [Auto-Escape] function is checked.



4. In the [Device List] dialog box make sure that the [VS200 Liquid Dispenser] check box is selected. See Activate the VS200 liquid dispenser on page 109.

20.4 Device settings - filter

If you add new hardware, like a new fluorescence filter, to the VS200 system you need to configure it in the [Device Settings] dialog box.

Opening the [Device Settings] dialog box

1. Use the [Additional layouts] button to go to a different layout. You can find the [Additional layouts] button at the top right in the navigation bar on the VS200 ASW software's start page.
2. At the top right, on the menu bar click the [Manual Control] button.
3. Select the [Acquire] > [Devices] > [Device Settings] command to open the [Device Settings] dialog box.

Configuring filters

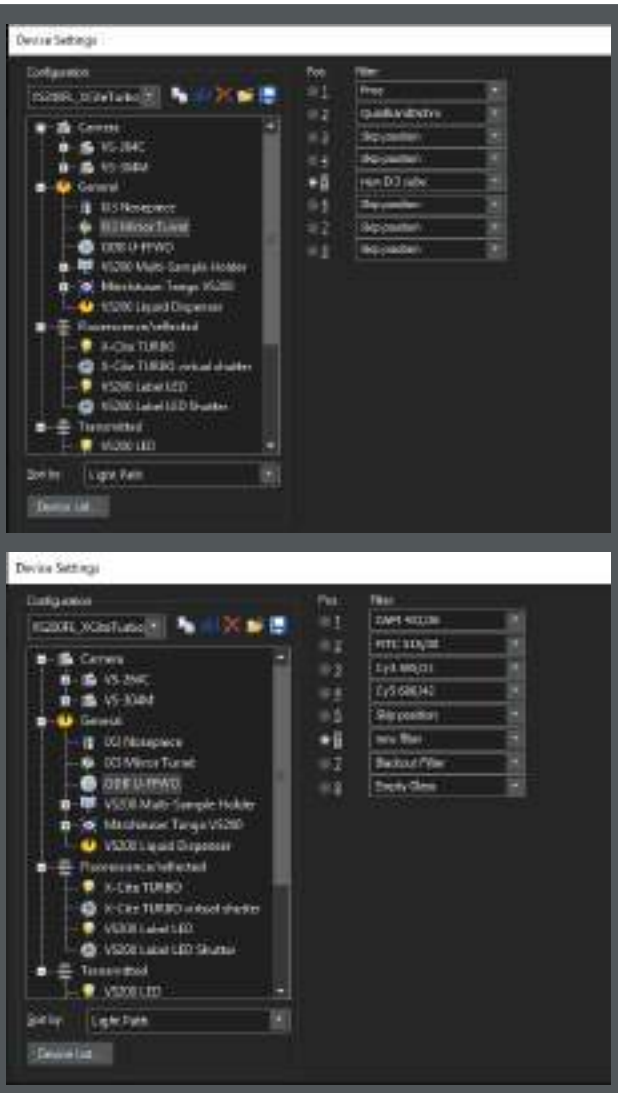
1. On the left of the tree structure, select the device into which you placed the filter.

   The following table shows the possible filter and device combinations.

Filter type	VS200 device
IX3 filter cube	IX3 Mirror turret
25 mm excitation filter	U-FFWR
25 mm emission filter	U-FFWO

2. In the [Pos.] options, select the position where you inserted the new filter.

3. Type in the name of the filter in the [Filter] field.



Example of filter configurations for U-FFWR and U-FFWO in the [Device Settings] dialog box

4. Add additional filters if required by selecting the appropriate position and selecting the name of the filter.
5. Click the [OK] button to save the changes.
6. Subsequently you have to configure an observation method in the [Device Customization] dialog box to be able to use the new filter.

20.5 Manual device configuration

This chapter describes the manual configuration of VS200 hardware devices.

20.5.1 ORCA monochrome camera

If your VS200 kit contains an ORCA-Flash 4.0, ORCA-Fusion or ORCA-Fusion BT camera you need to manually add it to the device list as those two cameras are not part of the default setup.

1. Open the [Device List] dialog box and go to the [Camera] tab.

2. In the [Camera 2] list select either the ORCA-Flash 4.0, ORCA-Fusion or ORCA-Fusion BT.
3. Make sure that the correct camera adapter magnification (1.0x) is selected in the [Device Settings] dialog box. To open the [Device Settings] dialog box use the [Acquire] > [Devices] > [Device Settings] command.

As none of the ORCA cameras are part of the default device configurations each observation method uses an ORCA camera needs to be adjusted manually. See Device customization on page 113 for further information.

20.6 Device customization

In the [Device Customization] dialog box you can make changes to existing observations methods. For example, you can add a different monochrome camera or you can add new observation methods.

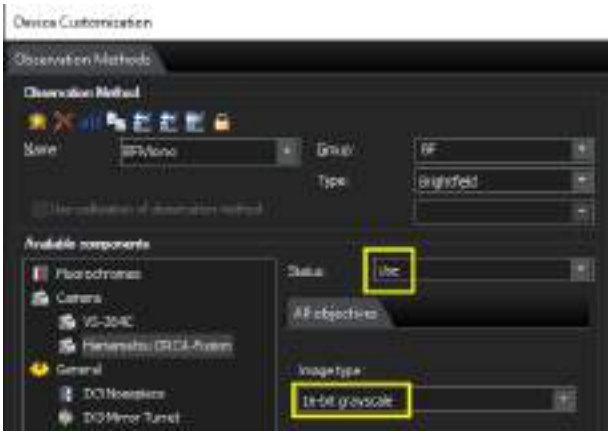
20.6.1 ORCA camera adjustments

1. Select the [Acquire] > [Devices] > [Device Customization] command to open the [Device Customization] dialog box.

2. Select the [BFMono] observation method (OM).

3. Unlock the [BFMono] observation method by clicking on the lock icon.

4. In the [Status] picklist, set the ORCA camera to the status [Use].
5. In the [Image type] picklist, change the [Current] entry to the [16-bit grayscale] entry.



6. Do this for all other mono camera-related observation methods.

7. Set the correct VS200 LED lamp voltages for the individual objectives. Refer to chapter VS200 LED lamp voltages on page 121 for detailed information.

20.6.2 Hamamatsu ORCA-Flash 4.0 special settings

Since the ORCA-Flash 4.0 camera does not support exposure times below 3.2 ms, additional settings must be made in order to guarantee proper functioning of the VS200 system.

1. Insert the IX3 filter cube plus ND6 (neutral density filter) into the IX3-RFACA.
   » Insert the filter cube into position 7 of the IX3-RFACA. How you can insert a filter is described in chapter U-FDICT filter cube on page 72.
2. After installation of the new filter cube make sure that you register it afterwards in the [Device Settings] dialog box. See Device settings - filter on page 111.

3. Configure the [BFMono] observation method to use the IX3 (ND6) filtercube. Refer to chapter ORCA camera adjustments on page 114 and select the IX3 Mirror Turret from the available components.
4. Set the VS200 LED lamp voltages for the [BFMono] observation method as listed in chapter ORCA-Flash 4.0 (monochrome camera) voltages (%) on page 123.
5. Perform the shading correction for the [BFMono] observation method.

20.6.3 Setup phase contrast (PH) observation method

If you want to add a phase contrast observation method do the following:

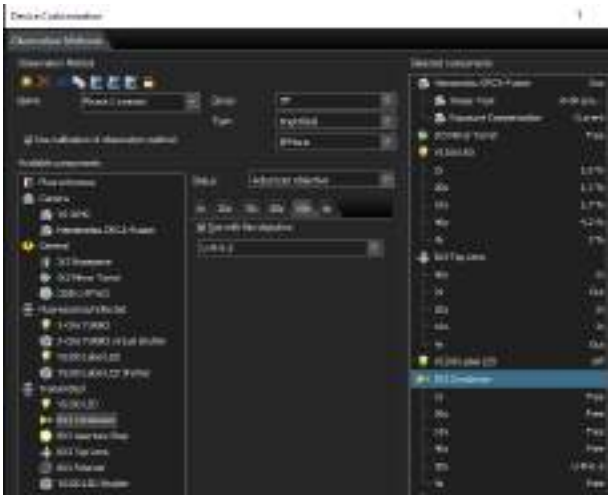
1. Select the [Acquire] > [Devices] > [Device Customization] command to open the [Device Customization] dialog box.
2. Select the [BFMono] observation method.
3. Use the [Copy Observation Method] button to make a copy of the observation method.

4. Type in a name, e.g. "Phase Contrast".

5. In the [Type] picklist select [Phase Contrast].

6. Select the [BX3 Condenser] entry from the available components and choose the [Adjust per objective] entry in the [Status] pick list.

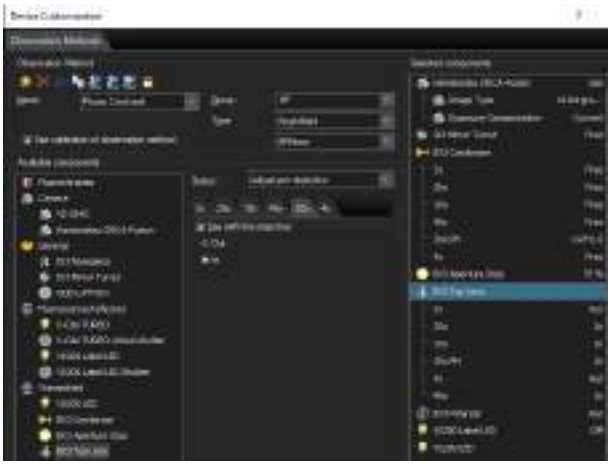
7. Select the e.g. 20x phase contrast objective and select the [Use with this objective] check box.



Refer to the following table for the correct assignment of the different phase contrast inserts to the correct magnification:

Objective magnification	BX3 condenser PH insert
10x	U-PH1-S
20x	U-PH1-S
40x	U-PH2-S
60x	U-PH3-S
100x	U-PH3-S

8. Select the [BX3 Top Lens] entry from the [Available components] and select the [Top Lens] > [In] option for the 20x PH objective.

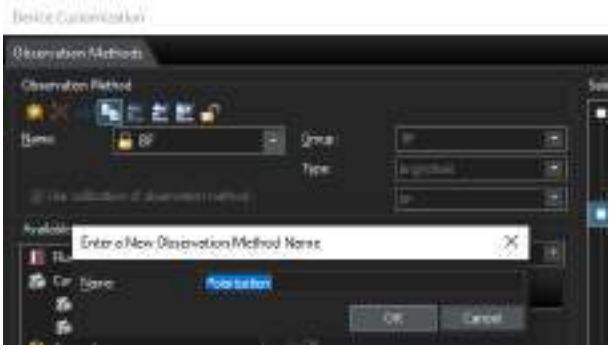


Refer to chapter VS200 LED lamp voltages on page 121 for the correct lamp voltages for phase contrast acquisition.

20.6.4 Setup polarization (Pol) observation method

If you want to add a polarization observation method do the following:

1. Select the [Acquire] > [Devices] > [Device Customization] command to open the [Device Customization] dialog box.
2. In the [Device Customization] dialog box select the [BF] observation method.
3. Use the [Copy Observation Method] button to make a copy of the observation method.
4. Type in a name, e.g. Polarization.

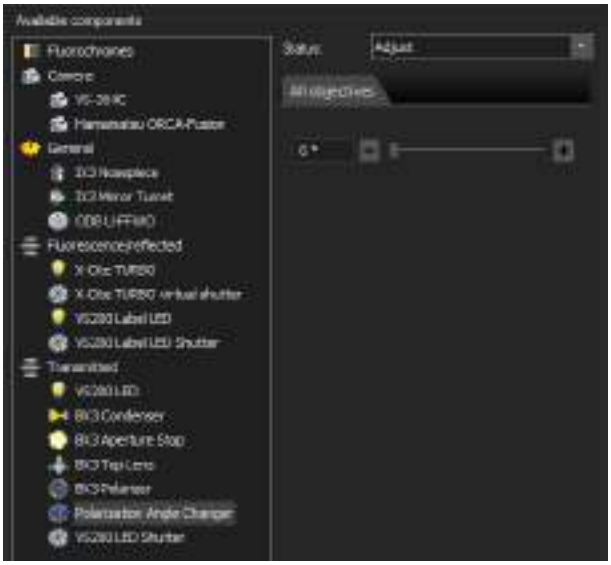


5. In the [Type] picklist select [Polarized].

6. Select the [IX3 Mirror Turret] entry from the available components and choose the [Adjust] entry in the [Status] pick list.
7. In the [All objectives] tab select the [U-FDICT] analyzer for all objectives.

8. Select the [BX3 Polarizer] and set the [Status] field to [Use].

9. Select the [Polarization Angle Changer] entry from the available components and choose the [Adjust] entry in the [Status] pick list.



10. Use the slide control to rotate the motorized polarizer or enter a defined angle value in the field.

20.6.5 Create or adjust an observation method

The easiest way to create a new observation method (OM) e.g. for fluorescence image acquisition is to copy an existing one and adjust the settings according to your needs in the [Device Customization] dialog box.

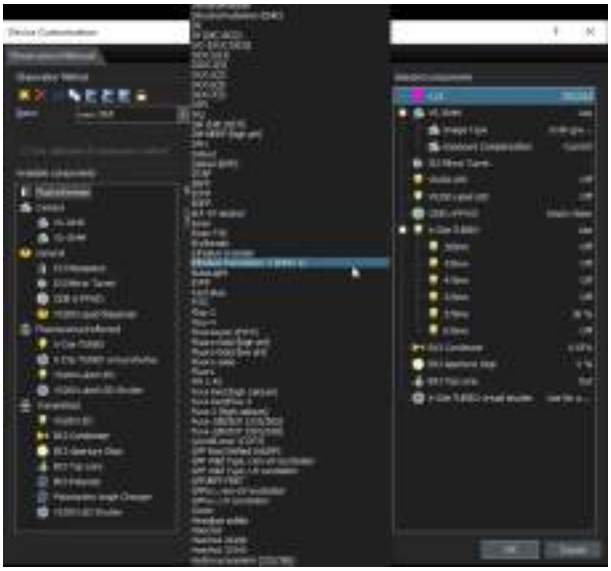
Open the [Device Customization] dialog box

1. Use the [Additional layouts] button to go to a different layout. You can find the [Additional layouts] button at the top right in the navigation bar on the VS200 ASW software's start page.
2. At the top right, on the menu bar click the [Manual Control] button.
3. Select the [Acquire] > [Devices] > [Device Customization] command to open the [Device Customization] dialog box.

Configuring an observation method

1. Select an observation method (e.g. CY3) in the [Name] list. This list contains all of the observation methods that have already been defined.

2. Click the [Copy Observation Method] button to create a copy of the observation method.
3. Enter a name for the observation method in the [Enter a New Observation Method Name] dialog box.
4. In the [Available Components] list select the [Fluorochromes] entry.
5. Select the [Use] entry from the [Status] list.
6. In the [Fluorochrome] list select the fluorochrome that fits to your new filter combination.



7. In the [Available Components] list select the [ODB U-FFWO] entry.
8. Select the new filter you have added.
9. Do the same if you e.g. added a new excitation filter for the ODB U-FFWR or a new IX3 filter cube in the IX3 Mirror Turret.
10. Click [OK] to save the changes.
11. As you created a new observation method you now have to carry out the shading correction. See Shading correction for fluorescence observation methods on page 196.

20.7 VS200 LED lamp voltages

20.7.1 VS-264C (color camera) voltages (%)

	Observation method			
Objective	BF (AS 75%)	DF (AS max)	POL (AS 75%)	PH
2x PLN	60	not supported	100	not supported
4x UPLFLN	100	not supported	100	not supported
10x UPlanXApo	65	100	100	not supported
20x UPLXAPO	64	not supported	100	not supported
40x UPLXAPO	100	not supported	100	not supported
40x UPlanXApoS	100	not supported	100	not supported
60x UPLXAPO	100	not supported	100	not supported
100x UPLXAPO	100	not supported	100	not supported
10x UPLFLNPH	65	100	100	100
20x UPLFLNPH	64	100	100	100
40x UPLFLNPH	100	100	100	100
60x UPLFLNPHO	100	100	100	100
100x UPLFLNPHO	100	not supported	100	100

20.7.2 VS-304M (monochrome camera) voltages (%)

	Observation method		
Objective	BFMono (AS 75%)	DFMono (AS max)	PHMono (AS 75%)
2x PLN	1.6	not supported	not supported
4x UPLFLN	2.0	not supported	not supported
10x UPlanXApo	1.7	100	not supported
20x UPlanXApo	1.7	not supported	not supported
40x UPlanXApo	4.2	not supported	not supported
40xUplanXApoS	4	not supported	not supported
60x UPlanXApoO	5	not supported	not supported
100x UPlanXApoO	7	not supported	not supported
10x UPLFLNPH	1.7	100	100
20x UPLFLNPH	1.7	100	100
40x UPLFLNPH	4.2	100	100
60x UPLFLNPHO	5	100	100
100x UPLFLNPHO	7	not supported	100

20.7.3 ORCA-Flash 4.0 (monochrome camera) voltages (%)

	Observation method		
Objective	BFMono (AS 75%)	DFMono (AS max)	PHMono (AS 75%)
2x PLN	1.3	not supported	not supported
4x UPLFLN	1.2	not supported	not supported
10x UPlanXApo	1.4	60	not supported
20x UPlanXApo	1.5	not supported	not supported
40x UPlanXApo	4.0	not supported	not supported
40xUplanXApoS	4.0	not supported	not supported
60x UPlanXApoO	4.4	not supported	not supported
100x UPlanXApoO	5.0	not supported	not supported
10x UPLFLNPH	1.4	60	10
20x UPLFLNPH	1.5	100	30
40x UPLFLNPH	4.0	100	18
60x UPLFLNPHO	4.4	100	20
100x UPLFLNPHO	5.0	not supported	25

20.7.4 ORCA-Fusion / Fusion BT (monochrome camera) voltages (%)

	Observation method		
Objective	BFMono (AS 75%)	DFMono (AS max)	PHMono (AS 75%)
2x PLN	1.8	not supported	not supported
4x UPLFLN	1.2	not supported	not supported
10x UPlanXApo	1.8	100	not supported
20x UPlanXApo	2.1	not supported	not supported
40x UPlanXApo	5.7	not supported	not supported
40xUplanXApoS	5.7	not supported	not supported
60x UPlanXApoO	6.8	not supported	not supported
100x UPlanXApoO	2.3	not supported	not supported
10x UPLFLNPH	1.8	100	100
20x UPLFLNPH	2.1	100	100
40x UPLFLNPH	5.7	100	100
60x UPLFLNPHO	6.8	100	100
100x UPLFLNPHO	2.3	not supported	100

21 How to insert a slide into a tray

1. To insert a slide into a tray push the button on the tray away from the slide pocket to open.

2. Hold the button in place and put a slide into the slide pocket with the label facing the top as indicated on the tray [Label side].
3. Push the slide to left side and release the button.

If you place a 76x26 mm (3x1 inch) slide into the slide pocket of the tray, the slide will not always be positioned exactly the same. The maximum tolerance for the XY-positioning of the slide in the slide pocket is +/- 150 µm.

21.1 How to insert a tray into the VS200 scanner

CAUTION
Pinching hazard when inserting the tray into the VS200 scanner
The motorized drive of the door flap in the scanner poses a pinching hazard. Your hands and fingers risk being pinched when you insert a tray.

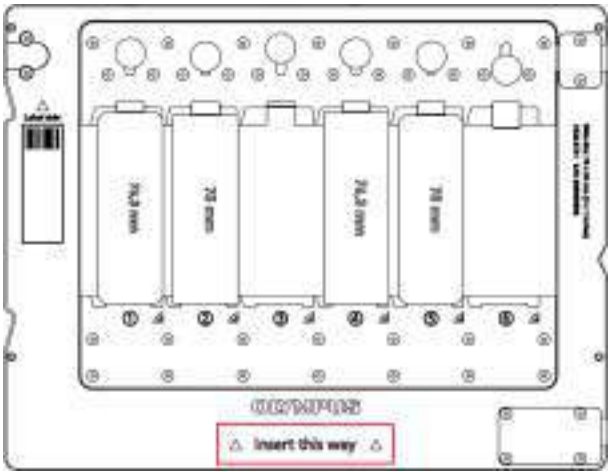
- Make sure that the VS200 ASW software isn't performing any functions while you are inserting the tray.

ATTENTION
Risk of damage to device due to improperly inserted tray
If a tray is inserted into the VS200 scanner improperly, the top lens can be damaged.

- When inserting a tray, refer to the [Insert this way] lettering and the orientation of the triangles on the tray.

1. To insert a tray into the VS200 scanner use the [Exchange Trays] function of the VS200 ASW software to open the door flap.

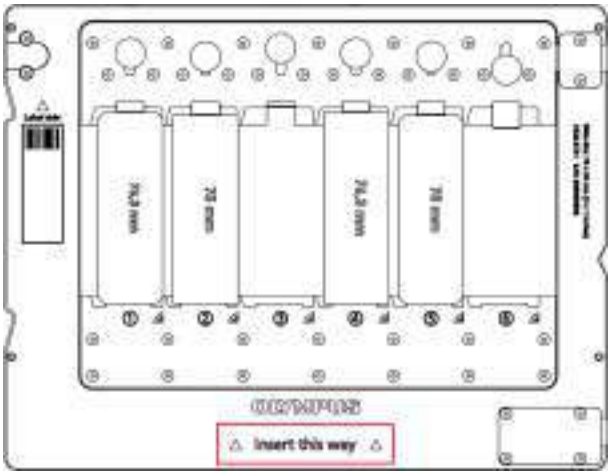
2. Insert the tray horizontally (following the orientation which is printed on the tray [Insert this way]) into the rails and push it inside (about 6cm) until you cannot push it any further.



3. Click the [Close] button to close the door flap and the exchange dialog.

21.2 Insert a tray into the VS200 loader

1. To insert a tray into the VS200 loader use the [Exchange Trays] function of the VS200 ASW software to drive the VS200 loader into the loading/unloading position. Click the [Exchange Trays] button on the start page of the VS200 ASW software.
2. Open the VS200 loader door and insert the tray horizontally following the orientation which is printed on the tray ([Insert this way]) into an empty position.



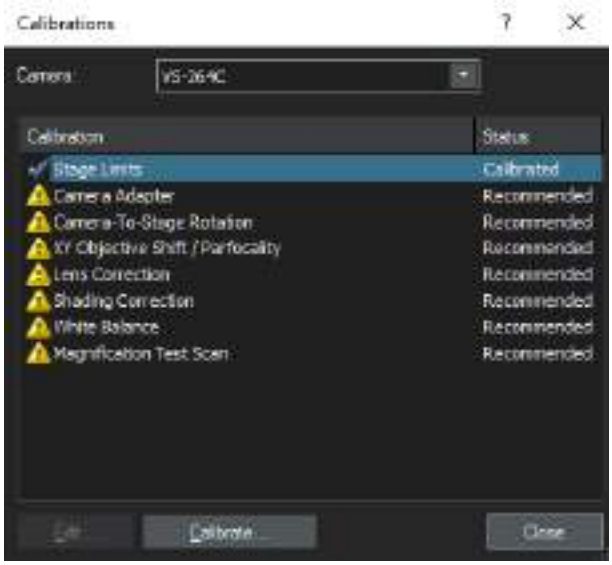
3. Push it all the way in until the tray indicator LED on the left side is green.
4. Close the VS200 loader door and click the [Lock Door] button in the VS200 ASW software.

5. Either use [Select Slide for Calibration] on the start page of the VS200 ASW software to select a slide and tray for calibration or select any scan mode to select and load a tray into the VS200 scanner.

22 Calibrate VS200 using the Olympus Calibration Slide

This chapter describes how to calibrate a VS200 system.

The VS200 ASW software offers a dedicated calibration wizard for all necessary calibrations.



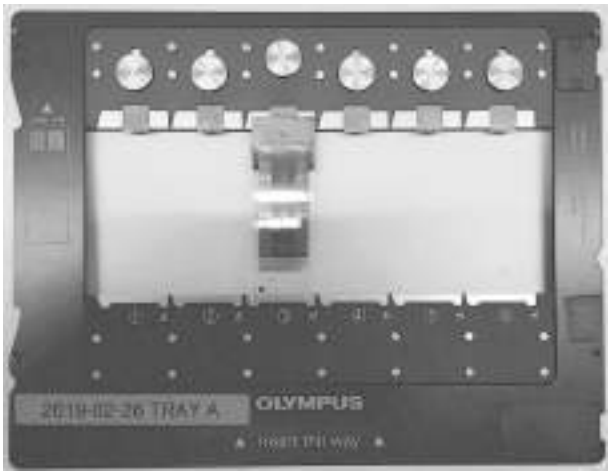
The image shows the [Calibrations] dialog box.

In order to get optimal results, we recommend using the VS Olympus Calibration Slide v2.0 to calibrate the system.

Layout of the Calibration Slide (Version 2.0)

The image shows the layout of the VS Olympus Calibration Slide v2.0. Always insert it with the label-area (left side) towards the defined label-area of the slide tray.

1. Insert the VS-calibration slide into position 3 of the slide tray.



2. Click the [Exchange Trays] button on the start page of the VS200 ASW software to insert the tray.

3. Click the [Select slide for calibration] button.

4. Load the tray (either manually or using the VS200 loader) by clicking the [Load Slide and Calibrate] button.

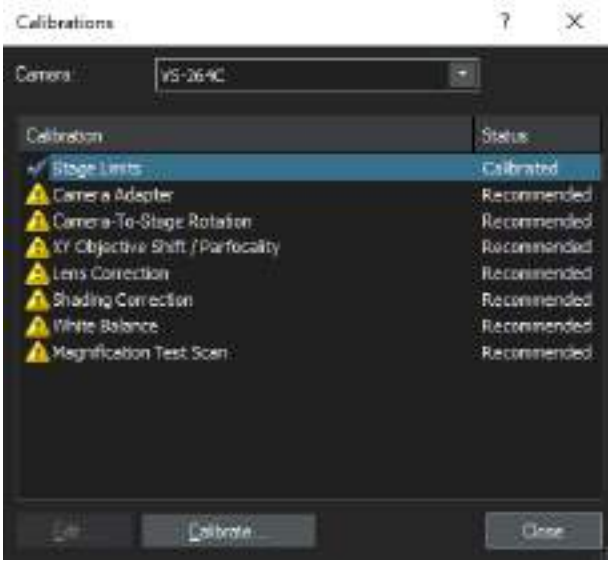
» The software switches to the [Manual Control] layout.

5. In the [Manual Control] layout select the [Acquire] > [Calibrations] command.

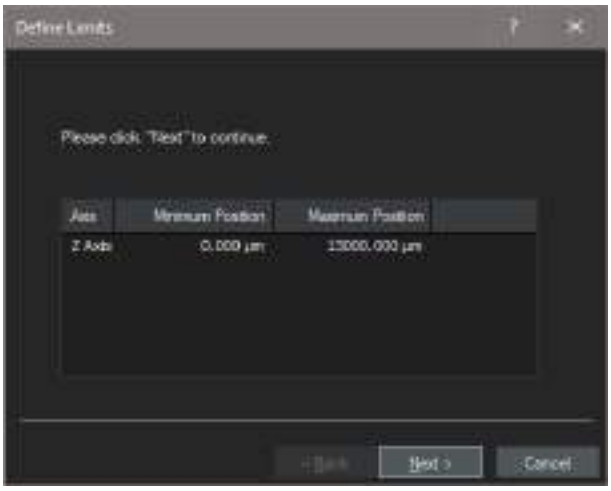
22.1 Stage Limits - Z Axis

The X and Y axes do not have to be calibrated again. However, the Z axis calibration is dependent on the glass slide thickness. Therefore it is necessary to calibrate the Z axis.

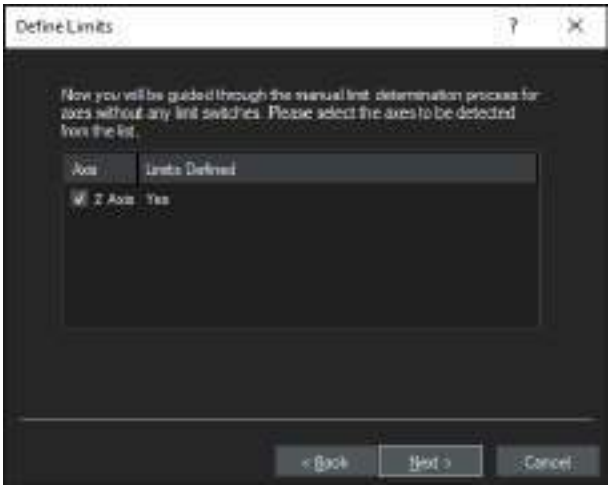
1. In the [Calibrations] dialog box select the [Stage Limits] entry and click the [Calibrate] button.



2. Proceed with [Next] and follow the instructions of the wizard.



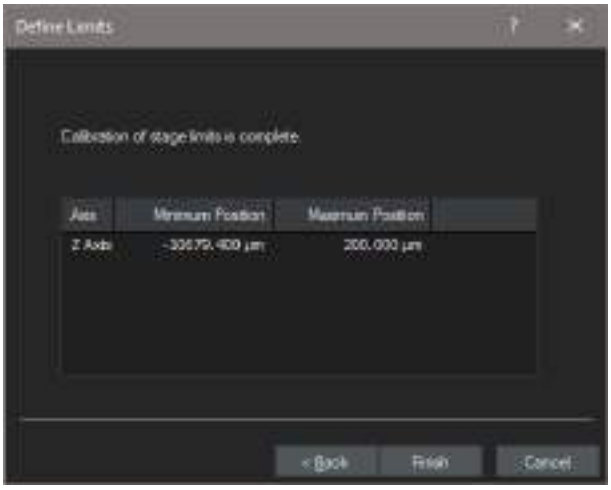
3. Select the [Z Axis] check box and continue with [Next].



4. At the top right in the menu bar click the [Manual Control] entry to switch the layout.
5. In the [Manual Control] layout, change to the 20x objective.
6. In the [Camera Control] tool window click the [Live] button to switch to live mode.
7. Use the stage navigator to move to the center of the slide.
8. Use the [Ctrl] + mouse wheel combination to focus the sample. If you have trouble getting the image into focus, use a lower magnification first.
9. Once the image is in focus click the [Set Focus] button.

» Do not change the value for the Z-limit. The value should be 200.

10. Click the [Finish] button to finalize the calibration process.



22.2 Camera adapter calibration for iDS (VS-264C) camera

- 3 mm hex key with angle
- 3 mm hex key

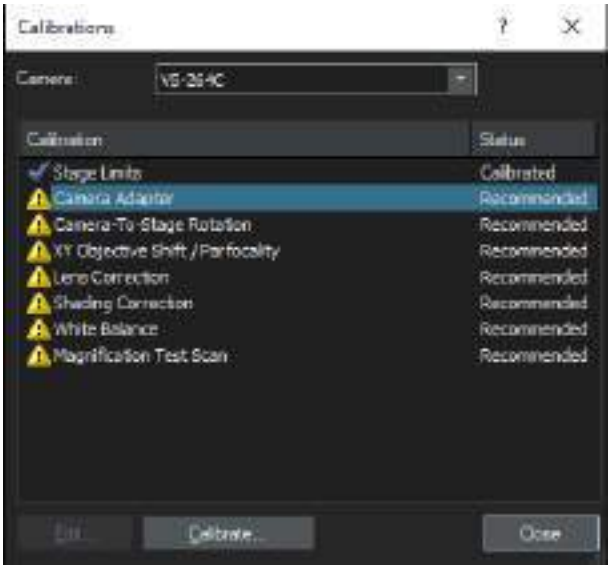
- The iDS color camera is mounted and calibrated ex-works.
  The parfocality might change due to temperature changes. Therefore do not check this calibration with a "cold" system (e.g. directly after assembling the system). Wait at least 30 minutes with the system switched on to heat it up.
- If you use objectives with a coverslip correction collar it is recommended to adjust it prior to all following calibrations.
- The calibration process [Camera Adapter] also works with the 20x objective in case a 40x objective is not part of the system configuration.
- The acceptable tolerance for the focus distance is +/- 20µm.

Prerequisites

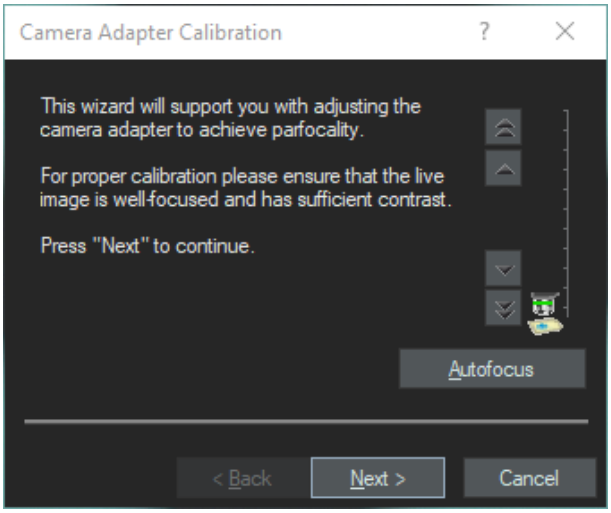
- ✓ If your VS200 kit contains an objective with a coverslip correction collar ask the customer which coverslips they are using and note the thickness.
- ✓ Before you start with the camera adapter calibration make sure that the coverslip correction ring of the objective, for example 40x UPlanXApo, is set correctly. In most cases it should be in-between 0.15 – 0.17.

Follow the instructions below to align the camera adapter.

1. In the [Calibrations] dialog box select the [Camera Adapter] entry and click the [Calibrate] button.

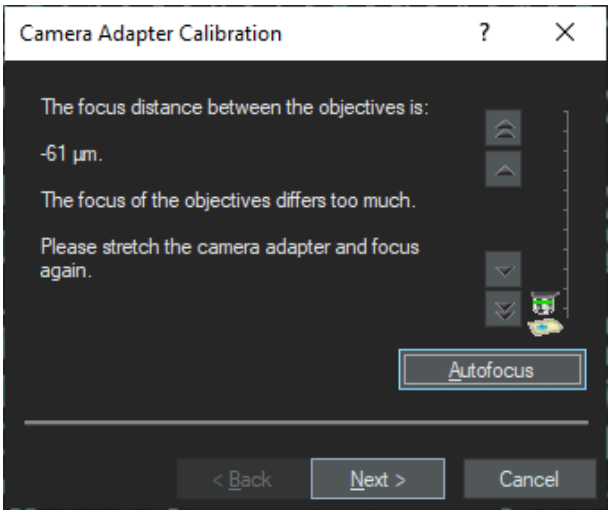


2. The system will use the objective with the highest magnification and switch to live mode. If the image is not in focus click the [Autofocus] button to perform an autofocus.

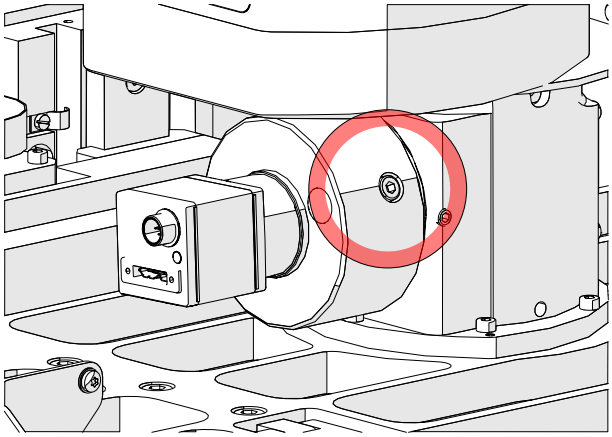


3. Select an area on the calibration slide were it is possible to focus with both the 40x and 2x objectives as shown in the screenshot below.

4. Click the [Next] button to continue.
   » If the focus distance between the objectives differs too much, the wizard tells you to either shorten or stretch the camera adapter.



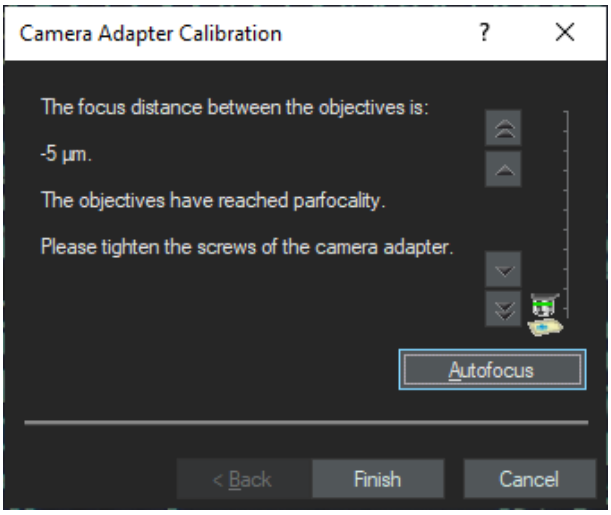
5. To adjust the distance, loosen the [LOCK] hex socket screw slightly and use the [FOCUS] hex socket screw to stretch or shorten the camera adapter. To turn the [FOCUS] screw use the angled hex key.



   » If the value is positive, turn slightly clockwise.

   » If the value is negative, turn slightly counter clockwise.

6. Tighten the [LOCK] screw.
7. Click the [Next] button in the [Camera Adapter Calibration] dialog box.
8. Repeat until the value meets the acceptable tolerance (+/- 20µm or better).



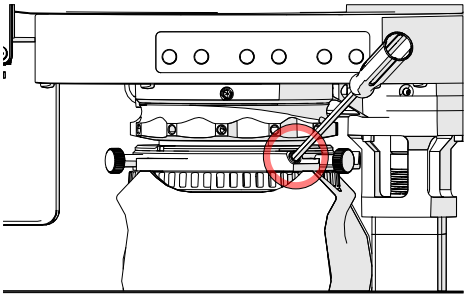
9. Click the [Finish] button to finalize the calibration process.

22.3 Check Koehler illumination

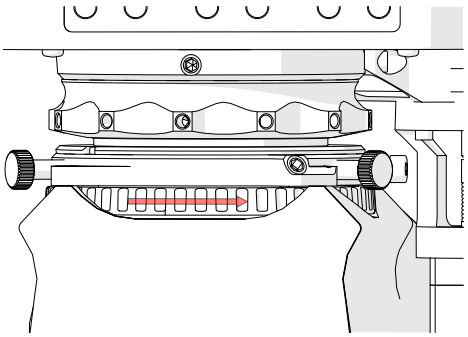
The condensor is centered ex works in XYZ direction and fitted with an adjustment lock. Therefore, a recalibration on site is probably not necessary. The following check of the Koehler illumination must be performed by Olympus before the initial start-up of the VS200 system.

» Hex key (size 3 mm with ball end)

1. Click the [Additional layouts] button to go to a different layout.
2. Select the 10x or 20x objective.
3. Select the BF observation method and switch on live. Focus on a specimen.
4. Open the lock hex screw (size 3 mm hex key with ball end).



5. Close the fieldstop at the bottom of the condenser.



» If the circle you see in the live image is not in the center of the field of view refer to the troubleshoot chapter Setting the Koehler illumination on page 217 to learn how to adjust the Koehler position.

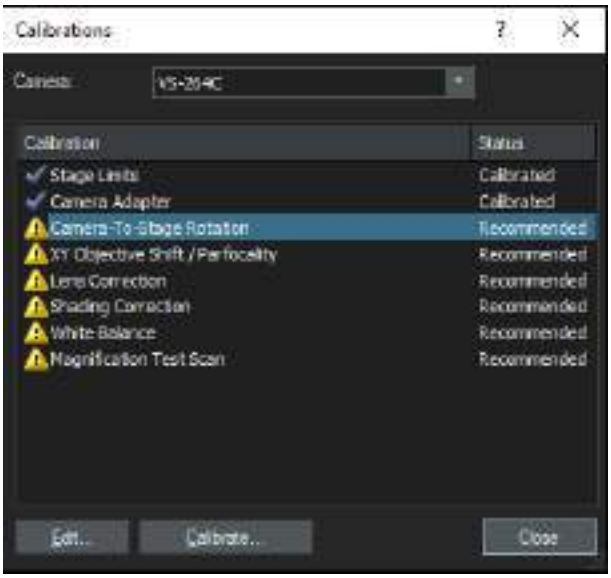
6. If the circle is centered open the field stop completely and close the lock screw again.

In case the field stop is misaligned, the phase contrast rings needs to be adjusted. Contact an Olympus service technician.

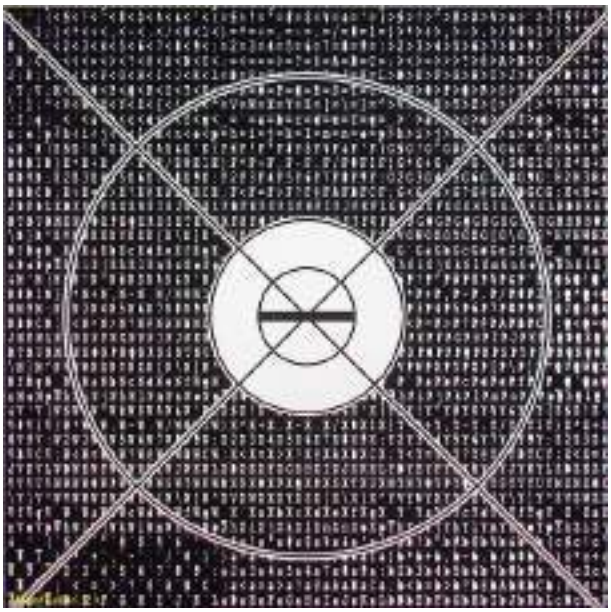
22.4 Camera-To-Stage Rotation

The standard for the camera-to-stage rotation is +/- 0.1°.

1. Select the [Camera-To-Stage Rotation] entry.



2. Click the [Calibrate] button to start the wizard.
3. Use the stage navigator to move to the center of the calibration slide as shown in the image below.



4. Select the 10x or 20x objective from the menu bar.

5. If the value is beyond the acceptable rotation angle, loosen the headless hex screw used to fix the TV 0.63 adapter at the flange of the beam splitter.

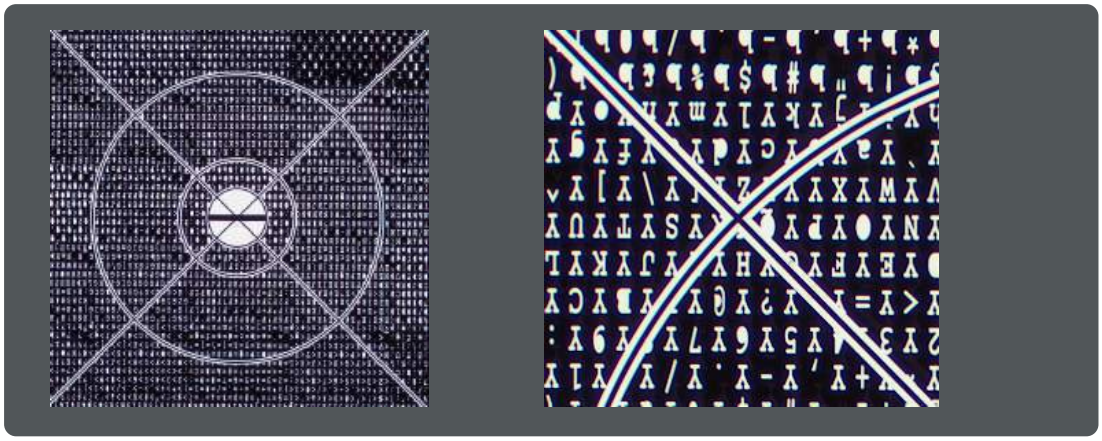
6. After a slight rotation, tighten the screw again.
   - » If the value is negative, tighten the screw counter clockwise.
   - » If the value is positive, tighten the screw clockwise.

   Click the [Back] button in the window. Then click the [Autofocus] button in the next dialog box to perform the test again.
7. Adjust until the standard is met.

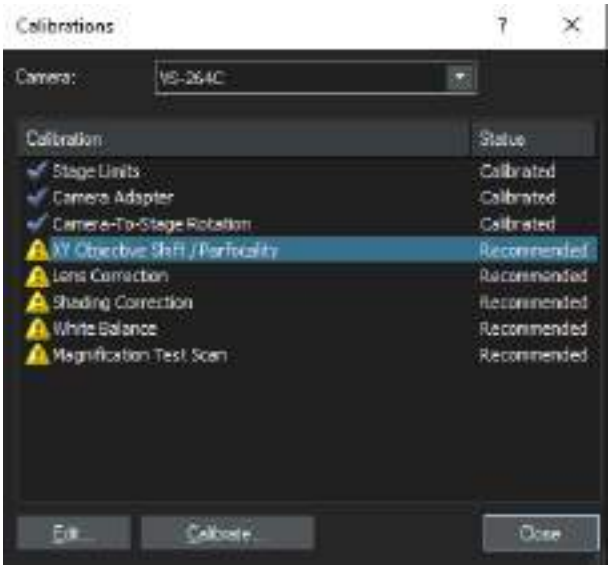
8. Finalize the process by clicking the [Finish] button.

22.5 XY Objective Shift / Parfocality

To carry out a proper XY shift/parfocality calibration use the position of the calibration slide shown in the screenshot below.

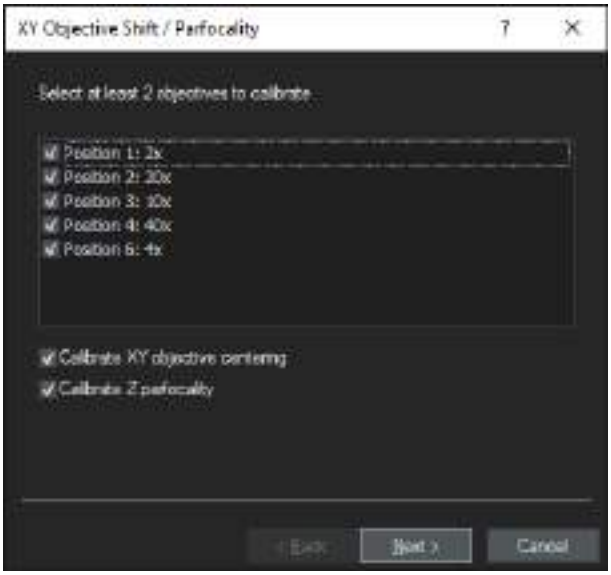


1. In the [Calibrations] dialog box select the [XY Objective Shift / Parfocality] entry.



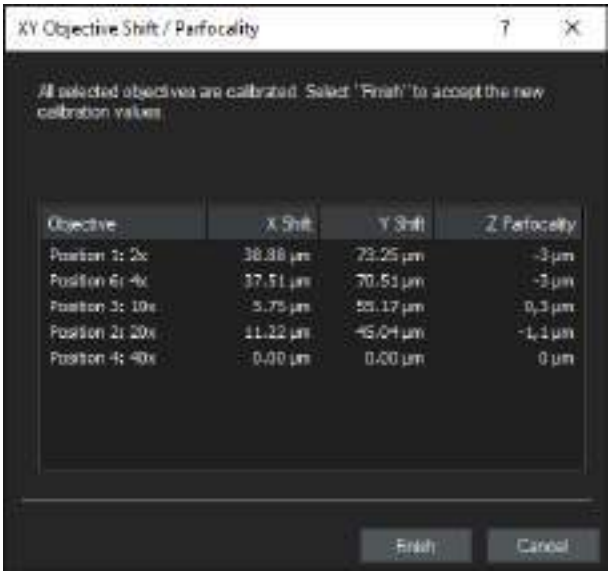
2. Click the [Calibrate] button to start the wizard.

3. Select all objectives. Immersion objectives are calibrated in the same wizard. However the calibration wizard will calibrate all dry objectives first and subsequently select the immersion medium objective(s).



4. Make sure that the functions [Calibrate XY objective centering] as well as [Calibrate Z parfocality] is selected.
5. Proceed with [Next].
6. If the image seems not to be in focus perform an autofocus.

7. The wizard will automatically select all of the objectives that are present and calculate the correction factors.

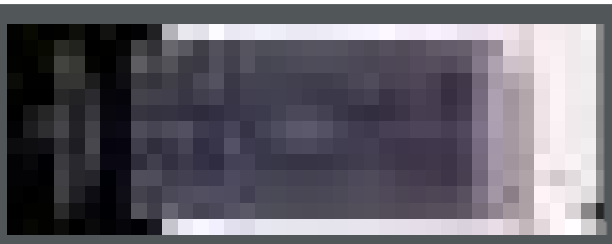


> If the Z parfocality for the 40x, 20x and 10x objectives is below 4µm everything is fine. The Z parfocality distance for the 2x objective should not exceed 20µm.
>
> If the values do not match the standard please check whether all objectives are screwed in completely and whether the calibration slide is clean. Repeat the calibration.

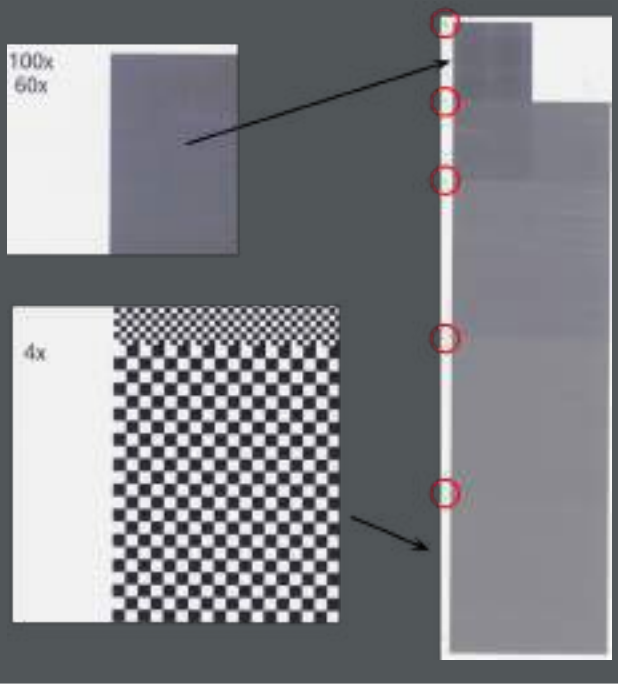
8. Finalize the calibration by clicking the [Finish] button.

ATTENTION
In case you have calibrated an immersion medium objective as well clean the objective and remove immersion medium residues from the calibration slide.
See Cleaning the immersion objective on page 213.

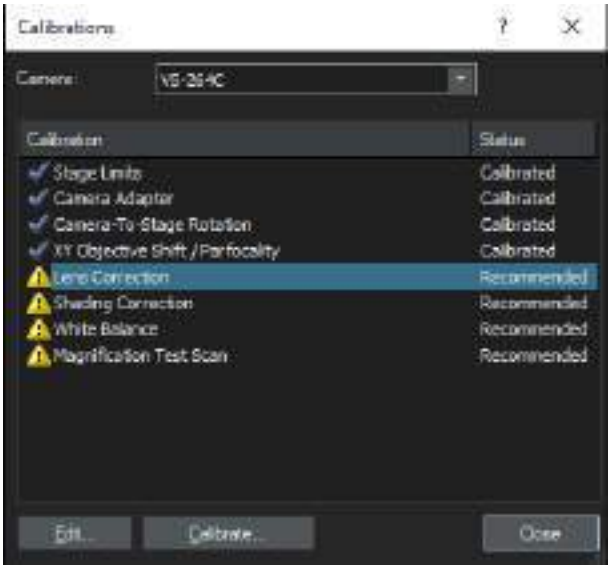
22.6 Lens Correction (Brightfield)



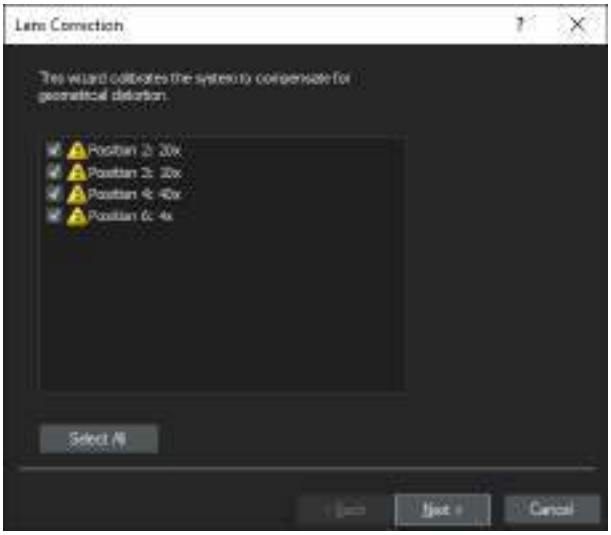
On the calibration slide opposite the label area you find an area with checker-board grids in different sizes. Next to each grid there is a number (see the circle in the example image) for the objective magnification from 4x to 60x/100x which has to be used for the calibration.



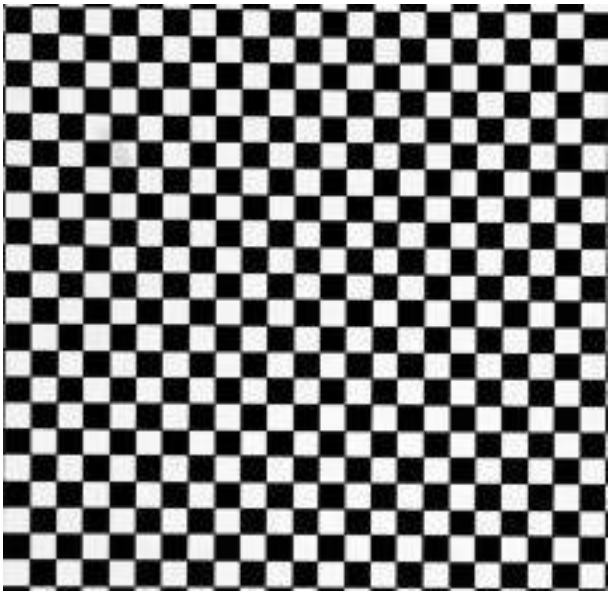
1. In the [Calibrations] dialog box select the [Lens Correction] entry and click the [Calibrate] button.



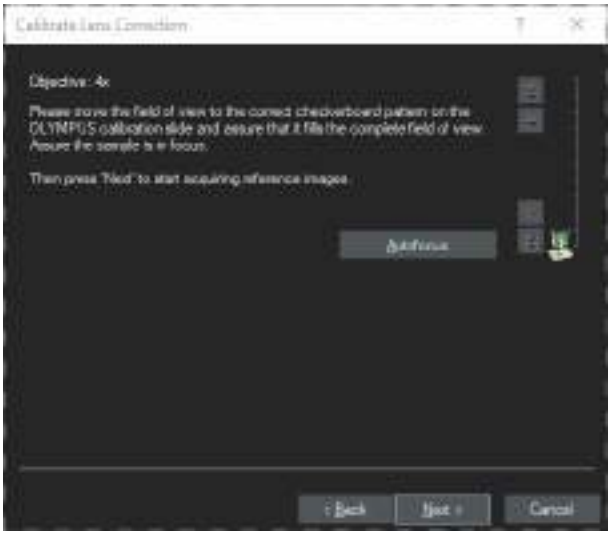
2. Select all available objectives. Immersion objectives are calibrated in the same wizard. However the calibration wizard will calibrate all dry objectives first and subsequently select the immersion medium objective(s).



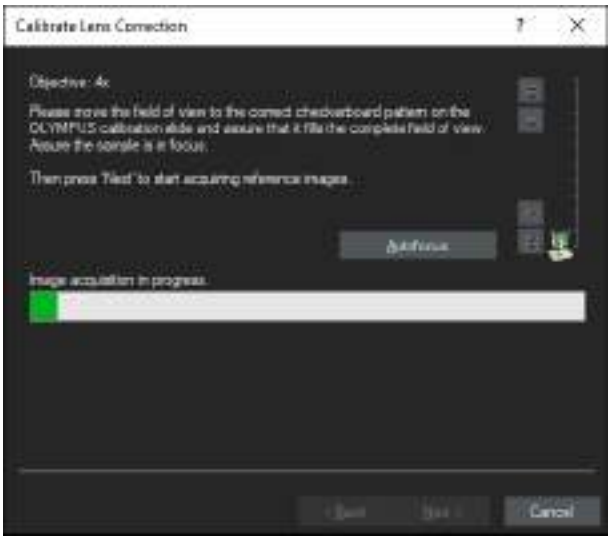
3. Use the stage navigator to move the VS calibration slide to the required checkerboard area.



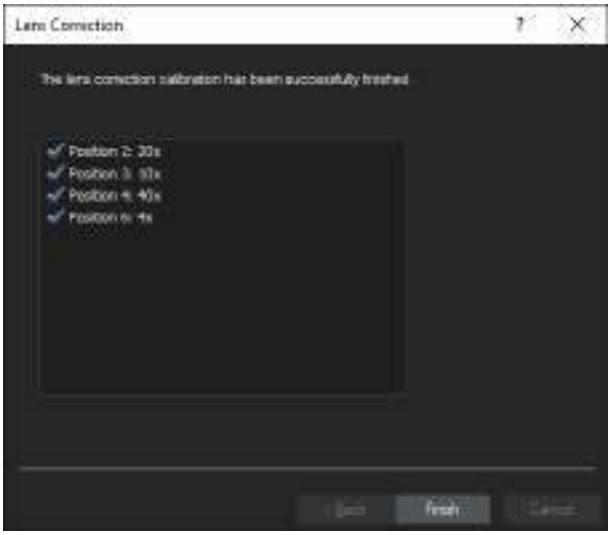
4. Perform an autofocus and proceed with [Next].



» The VS200 system shows the progress during the acquisition.

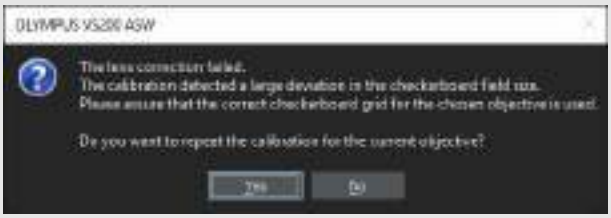


5. Do the same for all other objectives.



6. Finalize the process by clicking the [Finish] button.

If you see the message below please check if you are doing the calibration on the correct checkerboard area.



ATTENTION

In case you have calibrated an immersion medium objective as well clean the objective and remove immersion medium residues from the calibration slide.
See Cleaning the immersion objective on page 213.

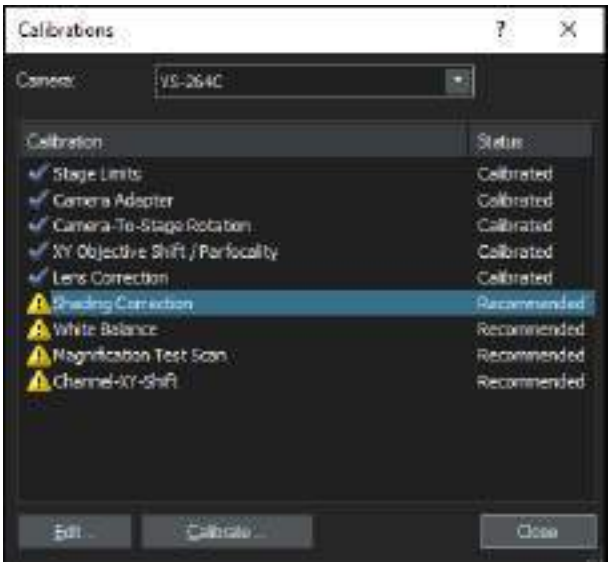
22.7 Shading Correction (Brightfield)

The Koehler position of the system is calibrated ex works. However, it might be necessary to at least check the calibration position. To do so, please refer to chapter Setting the Koehler illumination on page 217.

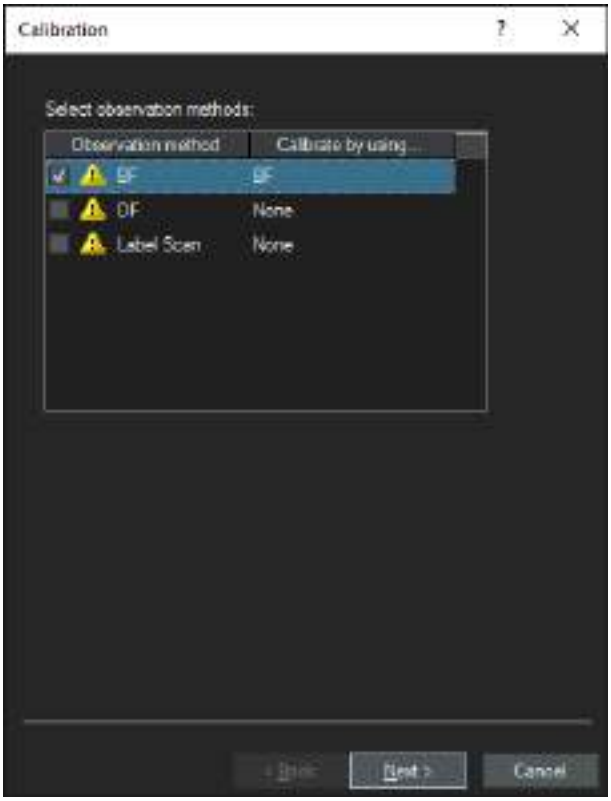
Use the stage navigator to move to the 'empty' area of the calibration slide.

The slide must be very clean (free of dust particles which will disrupt the shading correction procedure).

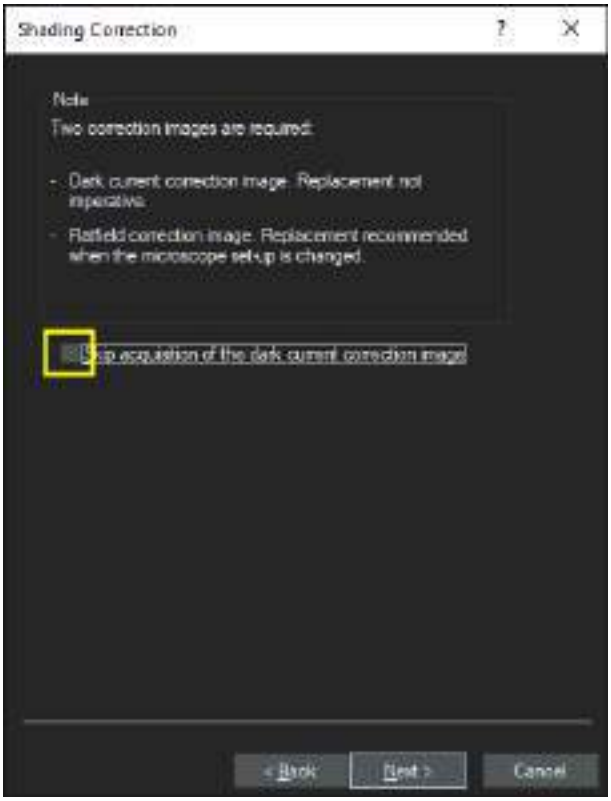
1. In the [Calibrations] dialog box select the [Shading Correction] entry and click the [Calibrate] button.



2. Select the [BF] entry as the observation method and proceed with [Next].



3. When you carry out the calibration for the first time do not skip the acquisition of the dark current correction image. For all future calibrations you can skip the acquisition of the dark current correction image.



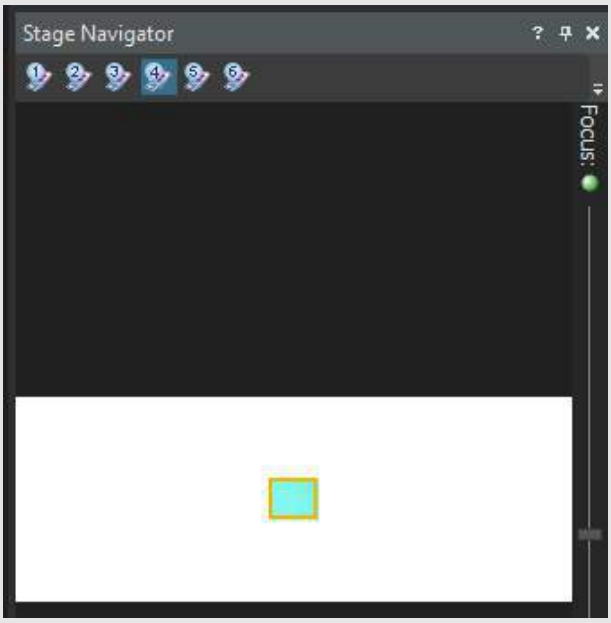
4. Proceed with [Next].

5. After the dark current correction image calibration, select all objectives. Immersion objectives are calibrated in the same wizard. However the calibration wizard will calibrate all dry objectives first and subsequently select the immersion medium objective(s).

6. Make sure that the options for [Shading correction] and [White balance] are checked.

7. Proceed with [Next].

The shading correction for the 2x and 4x objectives has to be done on an empty tray position. Use the stage navigator to move e.g. to position 4. Subsequently go back to the position where the calibration slide is inserted.



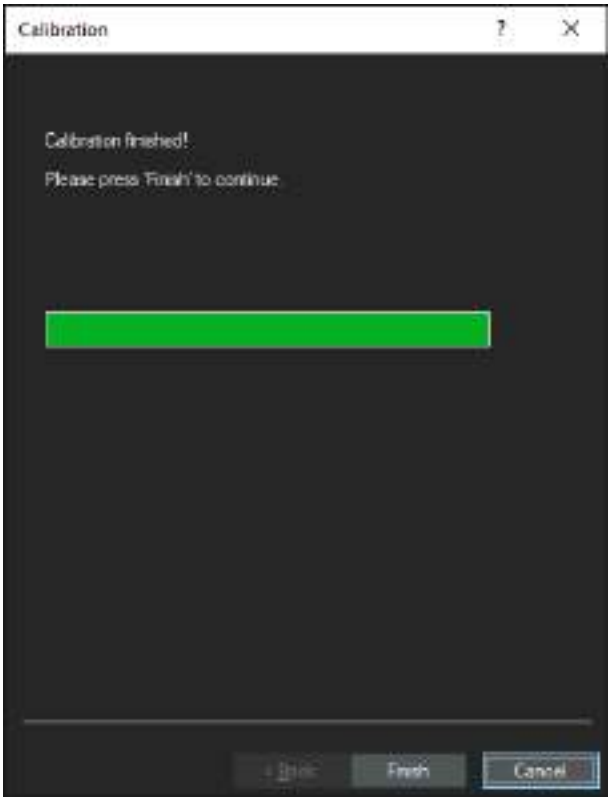
8. Click the [Next] button to start the image acquisition process for the 2x objective.

» After the acquisition is complete, the calibration process automatically moves to the next objective.

> The shading correction for objectives with a magnification equal to or higher than 10x should be done on a sample glass slide with coverslip. You will receive good results if you use the VS-calibration slide.

9. Proceed with all other objectives in the same way.

10. Click the [Finish] button to finalize the calibration process.



ATTENTION
In case you have calibrated an immersion medium objective as well clean the objective and remove immersion medium residues from the calibration slide.
See Cleaning the immersion objective on page 213.

22.8 Shading correction of the label area

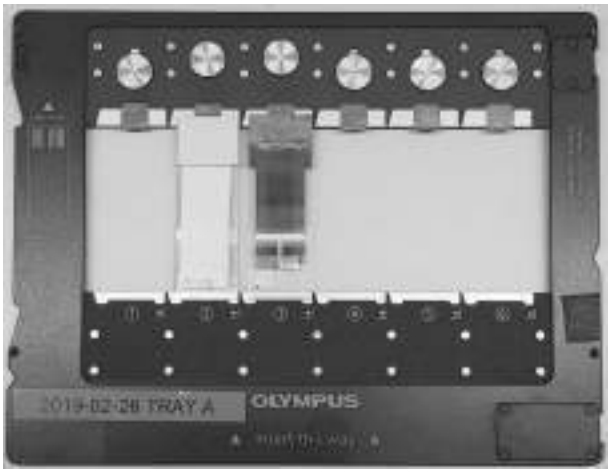
22.8.1 Preparation of calibration slide

For the shading correction calibration of the label scan you need to prepare a proper slide.

If a label printer is used, take an empty sticker and stick it on a normal glass slide as shown in the image below. If the customer does not use a label printer take a piece of white copy paper and glue it onto the slide.

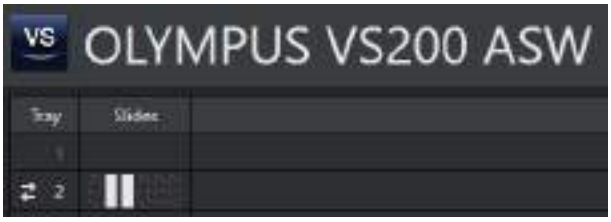
Example of a slide with an empty sticker

1. Insert the VS-calibration slide into position 3 of the slide tray and the prepared label-shading-correction slide in position 2.

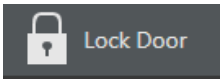


2. Insert the tray by clicking the [Exchange Trays] button on the start page of the VS200 ASW software.

If you use the VS200 loader put the tray in e.g. position 2.

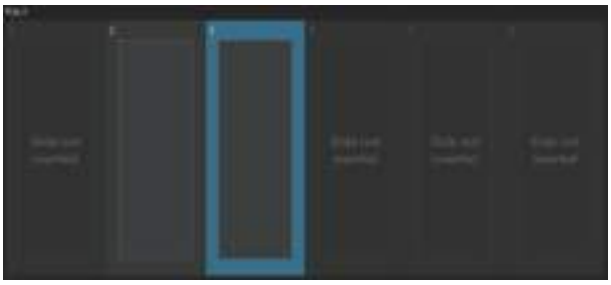


3. Click the [Lock Door] button in the VS200 ASW software to lock the door.



4. Click the [Select Slide for Calibration] button on the start page of the VS200 ASW software.

5. Load the tray (either manually or using the VS200 loader) by clicking the [Load Slide and Calibrate] button.

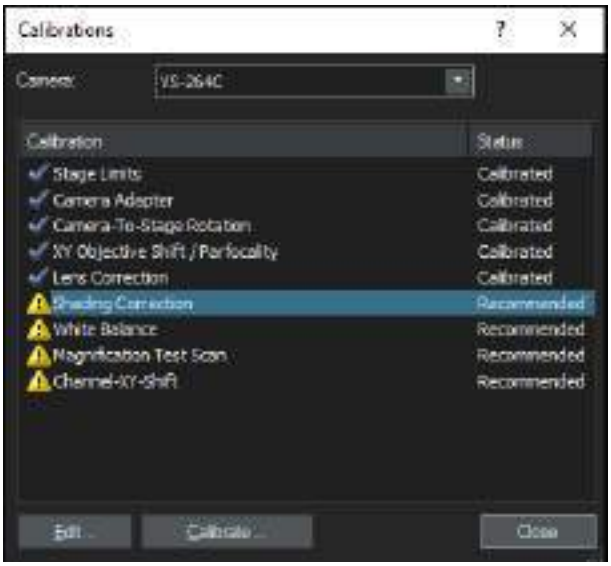


6. In the [Manual Control] layout select the [Acquire] > [Calibrations] command.

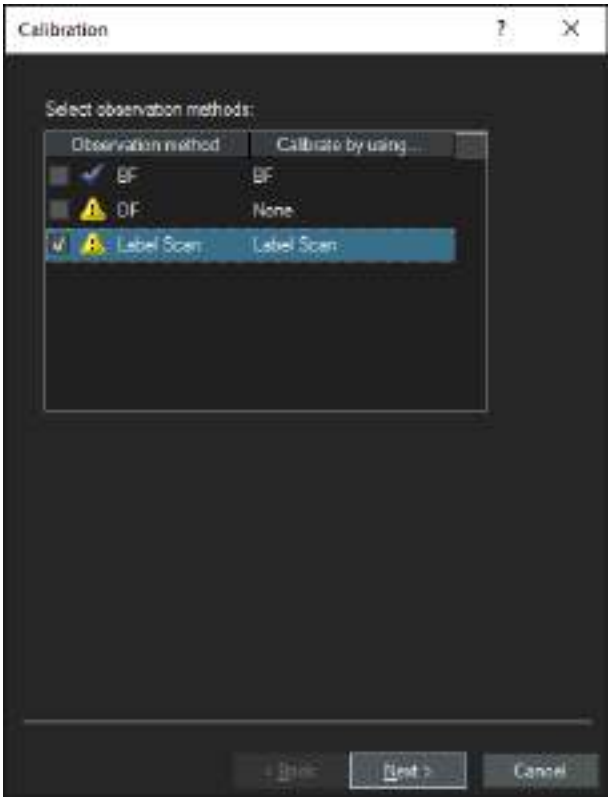
» The [Calibrations] dialog box opens.

Start the calibration

1. In the [Calibrations] dialog box select the [Shading Correction] entry and click the [Calibrate] button.

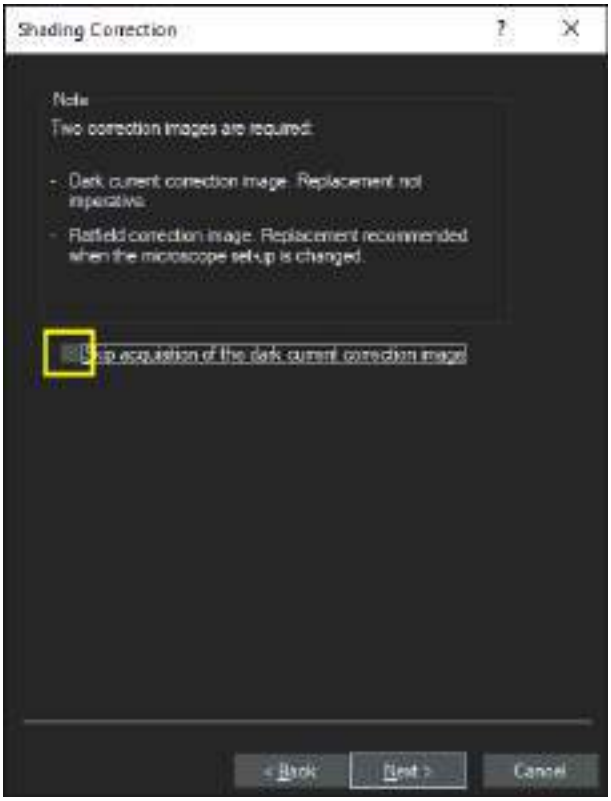


2. Select the [Label Scan] entry for the observation method and proceed with [Next].



3. When you carry out the calibration for the first time do not skip the acquisition of the dark current correction image. For all future calibrations you can skip the acquisition of the dark current correction image.

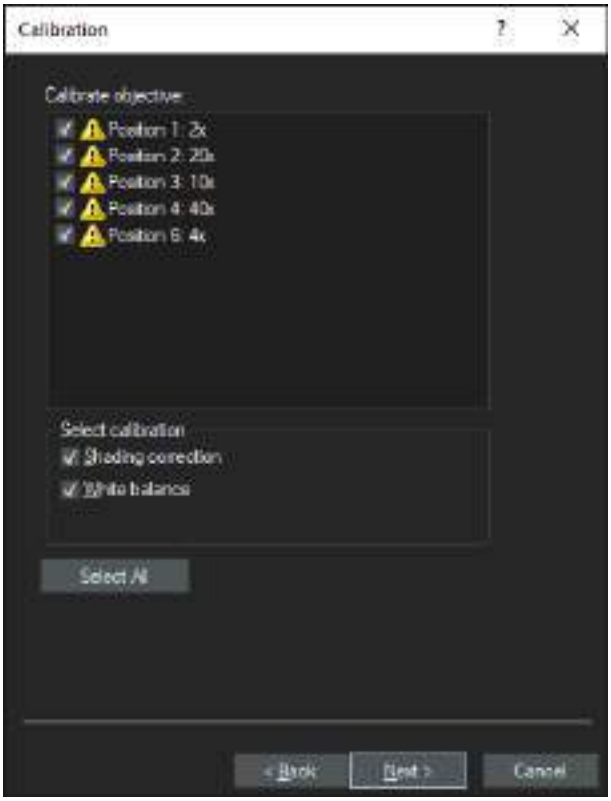
   Proceed with [Next].



4. Proceed with [Next] to start the acquisition process

5. Proceed with [Next].

6. After the dark current image calibration select all non-immersion objectives. Immersion objectives shall be calibrated separately. Proceed with [Next].



> IMPORTANT
>
> Actually, the label shading correction must only be performed for the 2x objective. However you should do it for all other objectives as well as otherwise there will always be an exclamation mark next to the entry.

7. Use the stage navigator to move e.g. to position 2 (where you placed the calibration slide for the label). Make sure you are in the center of the label sticker.

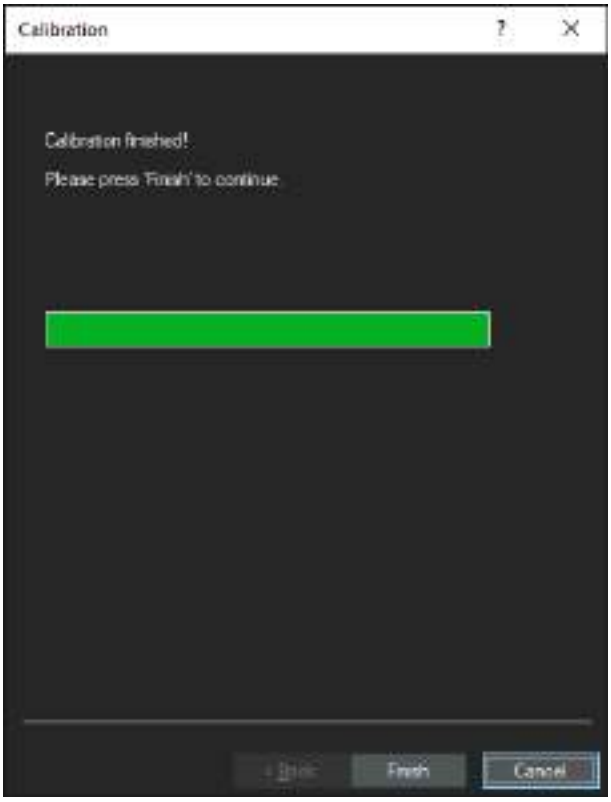
8. Click the [Next] button to start the image acquisition for the 2x objective.

9. Focus on the empty label sticker and click the [Next] button to proceed. Use the focus up and down buttons like shown in the image below.

» After the acquisition is done the calibration process automatically moves to the next objective.

10. Proceed with all other objectives in the same way.

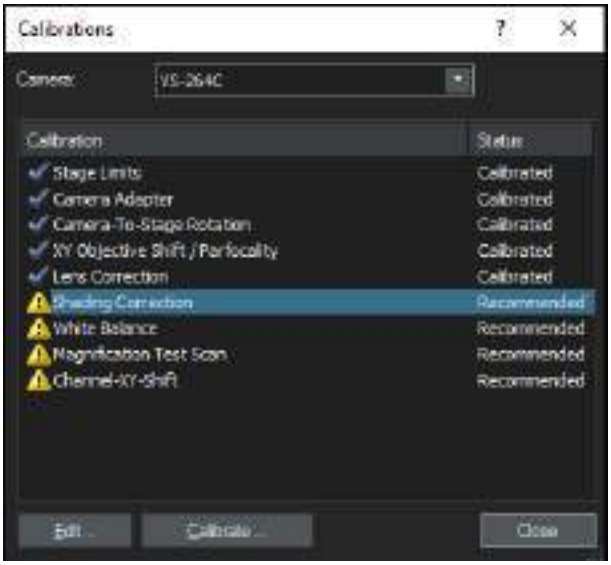
11. Click the [Finish] button to finalize the calibration process.



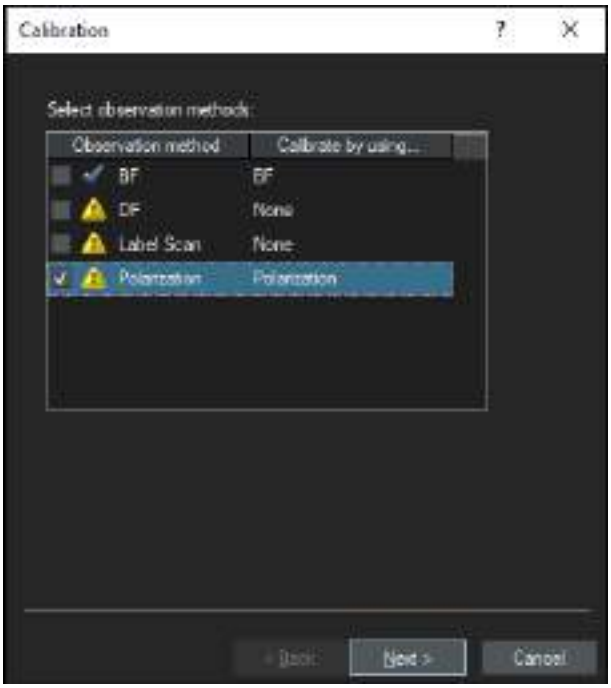
22.8.2 Shading correction for polarization (Pol)

The result of the shading correction for polarization is dependent on the value for the [Polarization Angle Changer] which is set in the Polarization observation method. See Setup polarization (Pol) observation method on page 118. If you change the angle you subsequently have to redo the shading correction.

1. In the [Calibrations] dialog box select the [Shading Correction] entry and click the [Calibrate] button.

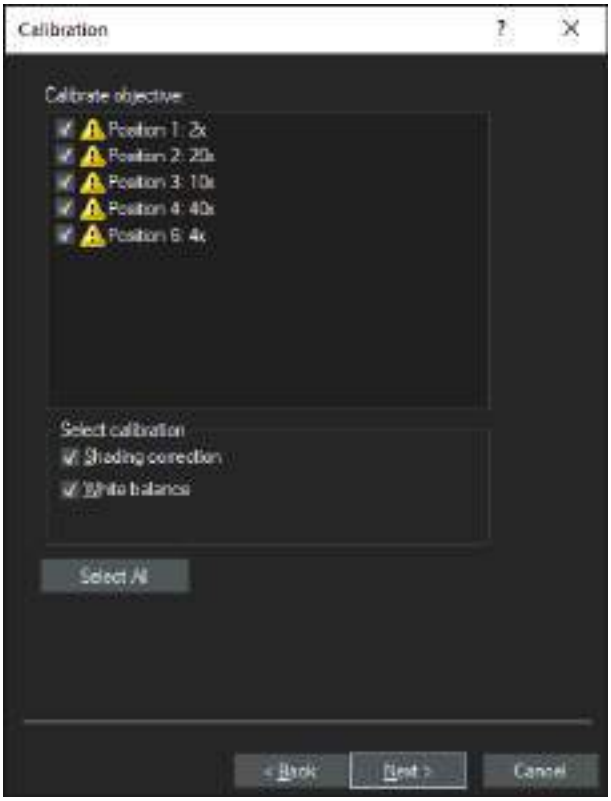


2. Select the [Polarization] observation method.

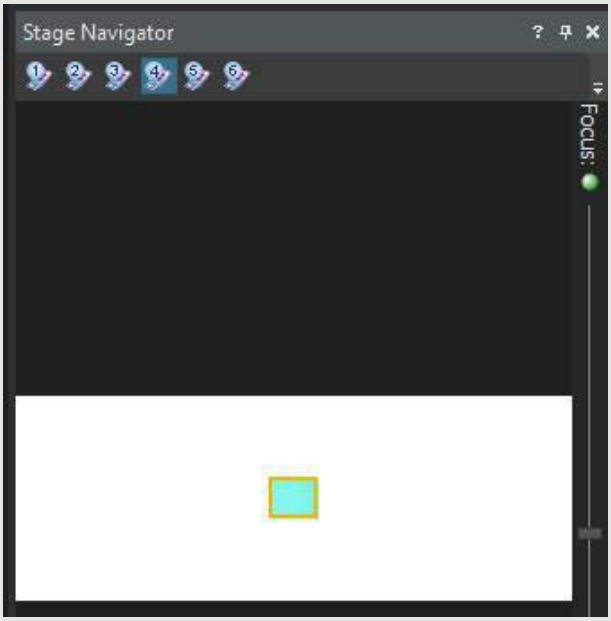


3. Skip the acquisition of the dark current correction image.

4. Select all objectives.



5. Make sure that the options for [Shading correction] and [White balance] are checked.

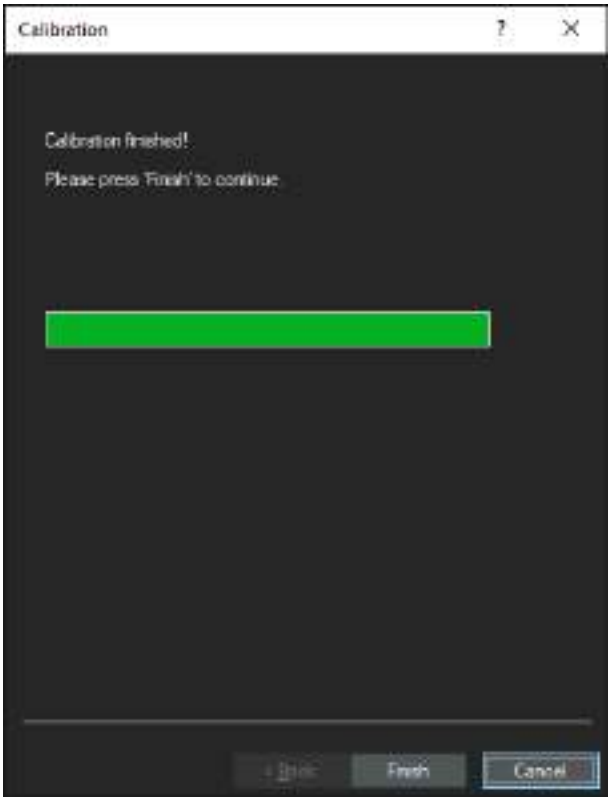
> The shading correction for the 2x and 4x objectives has to be done on an empty tray position. Use the stage navigator to move e.g. to position 4. Subsequently go back to the position where the calibration slide is inserted.
>
> 
>

6. Click the [Next] button to start the image acquisition process for the 2x objective.

» After the acquisition is complete, the calibration process automatically moves to the next objective.

> The shading correction for objectives with a magnification equal to or higher than 10x should be done on a sample glass slide with coverslip. You will receive good results if you use the VS-calibration slide.

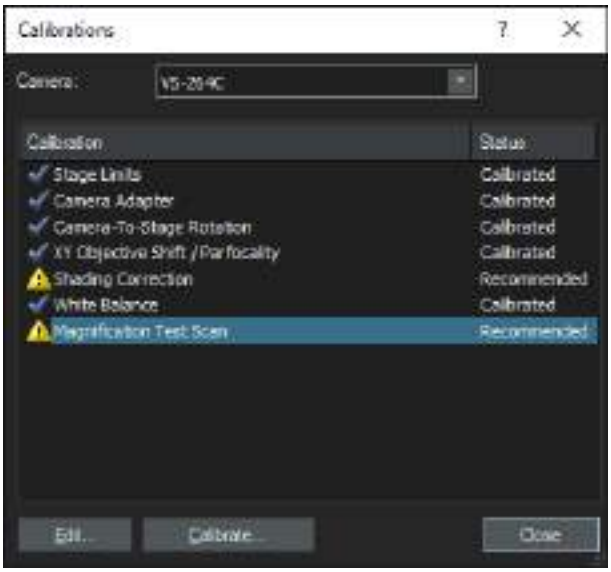
7. Focus on the part of the slide that contains the sample and subsequently move to a very clean area to acquire the shading image.
8. Proceed with all other objectives in the same way.
9. Click the [Finish] button to finalize the calibration process.



ATTENTION
In case you have calibrated an immersion medium objective as well clean the objective and remove immersion medium residues from the calibration slide.
See Cleaning the immersion objective on page 213.

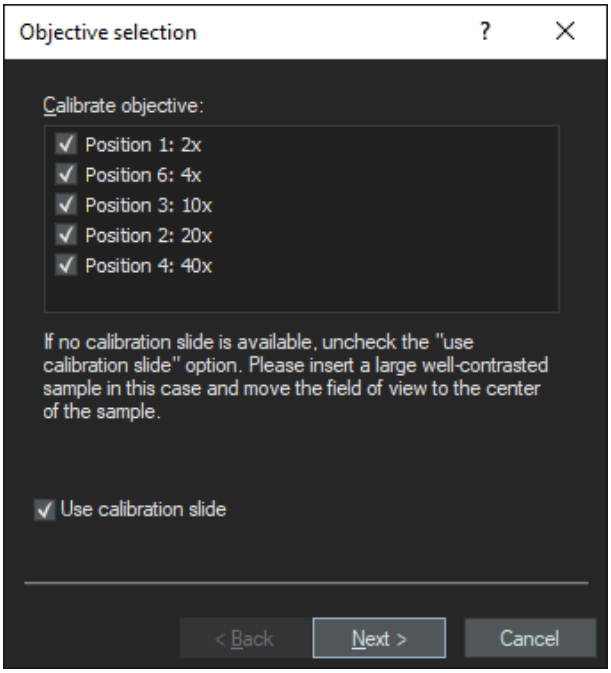
22.9 Magnification Test Scan

1. In the [Calibrations] dialog box select the [Magnification Test Scan] entry and click the [Calibrate] button.



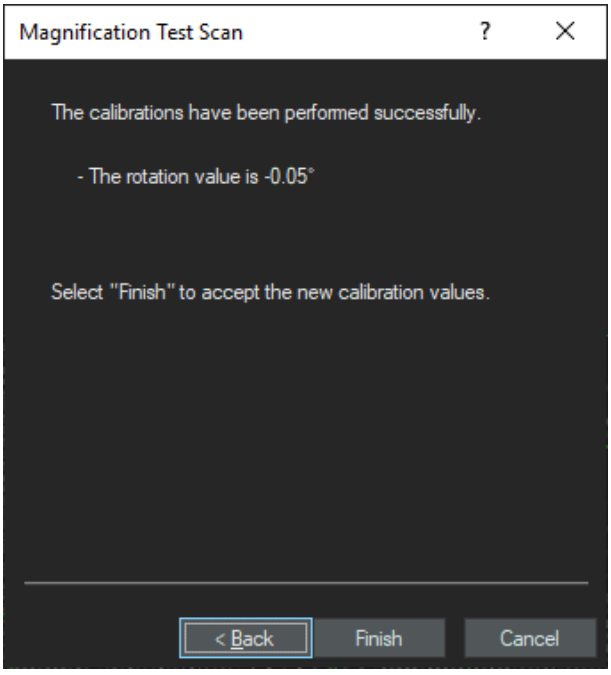
2. Now you can select whether you want to perform the magnification test scan for all objectives or only for certain ones. Immersion medium objectives are calibrated in the same wizard. However the calibration wizard will calibrate all dry objectives first and subsequently select the immersion medium objective(s).

   Select the [Use calibration slide] check box.



3. Use the stage navigator to move to center (cross hair) of slide and autofocus.

4. Proceed with [Next].
5. Click the [Finish] button to finalize the calibration process.

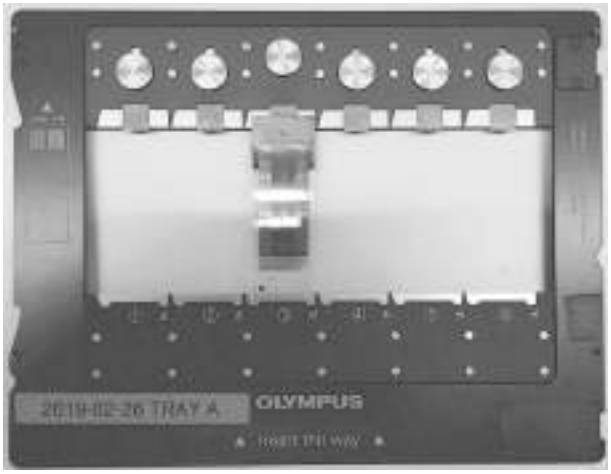


If the calibration value is not within the standard go back to the [Camera-To-Stage Rotation] calibration and redo all calibrations.

ATTENTION
In case you have calibrated an immersion medium objective as well clean the objective and remove immersion medium residues from the calibration slide.
See Cleaning the immersion objective on page 213.

23 Additional calibrations for a fluorescence system

1. Insert the VS-calibration slide into position 3 of the slide tray.



2. Click the [Exchange Trays] button on the start page of the VS200 ASW software to insert the tray.

3. Click the [Select slide for calibration] button.

4. Load the tray (either manually or using the VS200 loader) by clicking the [Load Slide and Calibrate] button.

» The software switches to the [Manual Control] layout.

5. In the [Manual Control] layout select the [Acquire] > [Calibrations] command.

23.1 Camera Adapter

» The parfocality might change due to temperature changes. Therefore do not perform this calibration with a "cold" system (e.g. directly after assembling the system). Wait at least 30 minutes with the system switched on to heat it up.

» If you are using objectives with a coverslip correction collar, it is recommended to adjust it prior to all subsequent calibrations.

» The limit for the focus distance is +/- 20µm.

23.1.1 Camera adapter U-FFWO T3

This example describes the calibration for an ORCA-Flash 4.0. The calibration for the VS-304M as well as the ORCA-Fusion and ORCA-Fusion BT can be done in the same way.

» Small hex key to lock the tubus

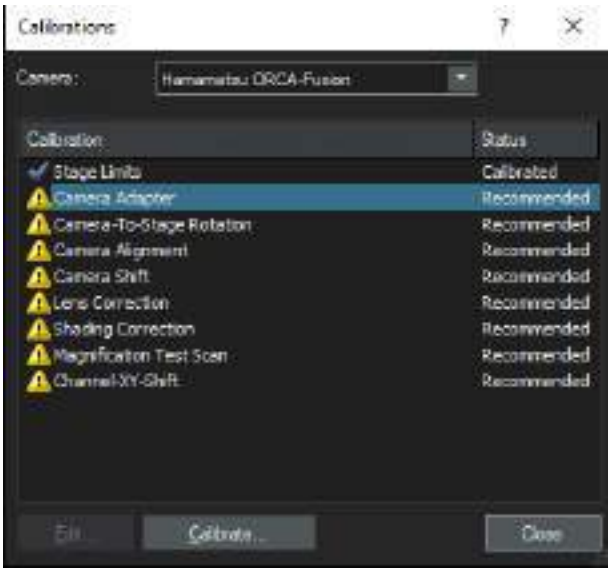
» Hex key to open the filter wheel

» Small spanner to adjust the height of the tubus

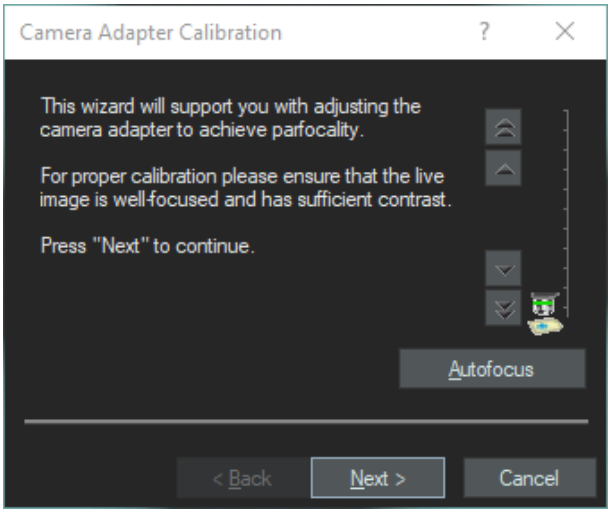
» Spanner to fix the tubus

The acceptable tolerance for the focus distance is +/- 20 µm.

1. In the [Calibrations] dialog box select the [Camera Adapter] entry and click the [Calibrate] button.



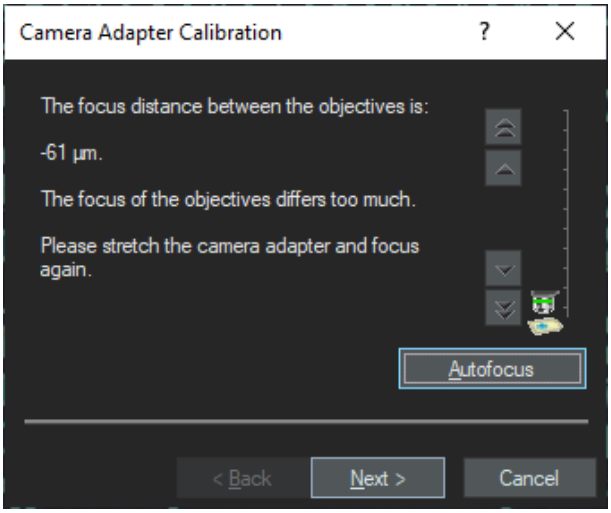
2. Use [Ctrl] + mouse wheel to fine focus.



3. Use the stage navigator to move to a similar position on the calibration slides to that shown in the image below.

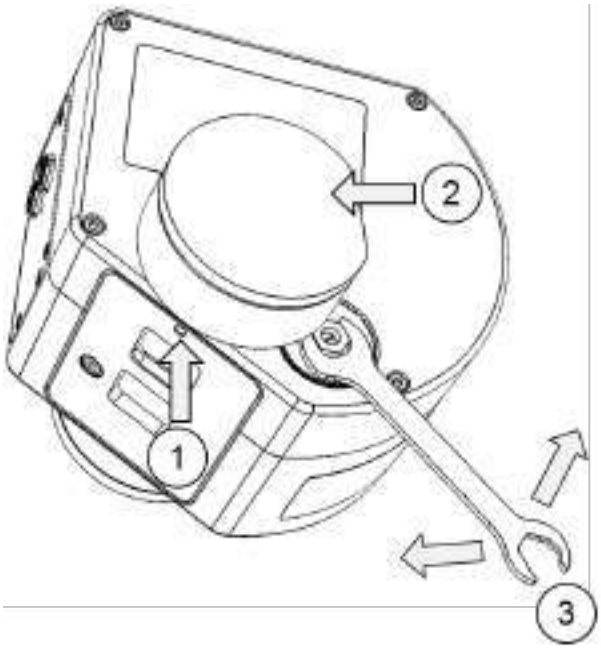
4. Perform an autofocus.

5. If the focus differs too much you need to manually adjust the U-FFWO T3 adapter.



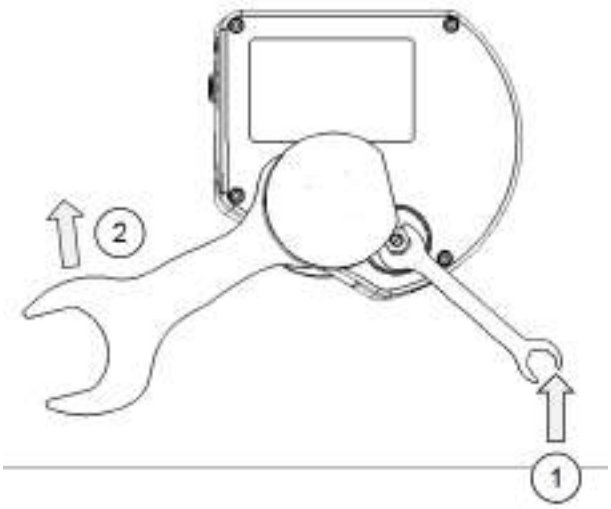
Adjust the camera adapter

1. Release the camera rotation locking screw. Hold the camera with one hand to prevent camera rotation. Use the small wrench to adjust parfocality. Turning the the small hex screw (3) will move the camera up or down. Turn clockwise if the calibration wizard shows a positive distance (shorten the camera adapter), turn counter-clockwise if the calibration wizard shows a negative distance (stretch the camera adapter).



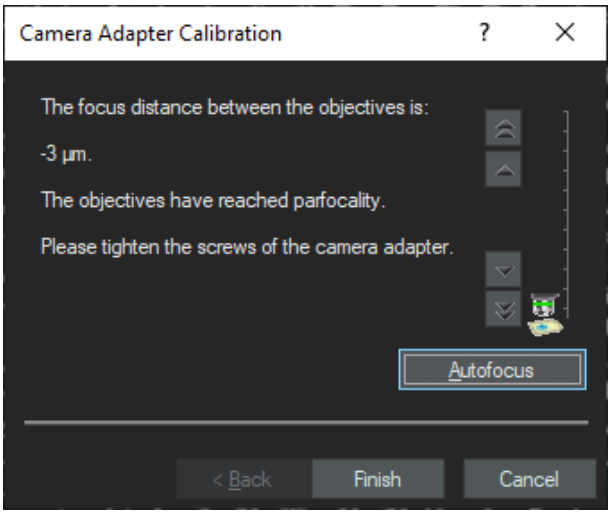
(1)	Release locking screw.
(2)	Keep hold of camera to prevent rotation.
(3)	Adjust parfocality.

2. Lock the parfocal setting by tightening the counternut. To do so, pull the large wrench clockwise to fasten the counternut while holding the small wrench steady.



(1)	Hold steady.
(2)	Fasten clockwise.

3. Execute an autofocus again and check the final result.

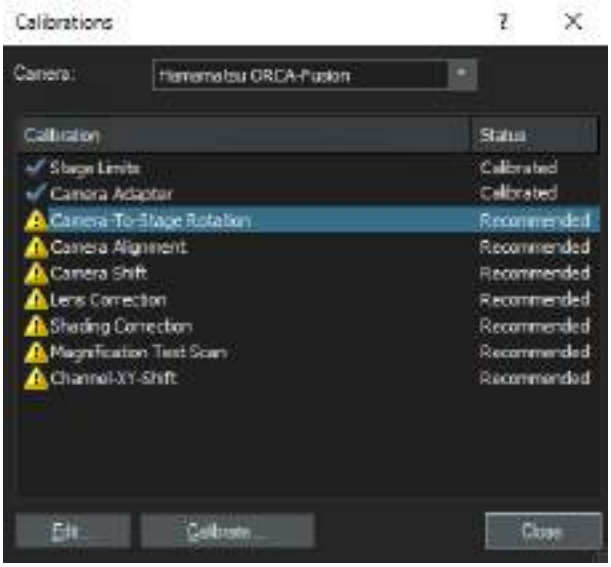


4. Repeat until the camera adapter parfocality meets the acceptable tolerance.
5. Finalize the process by clicking the [Finish] button.

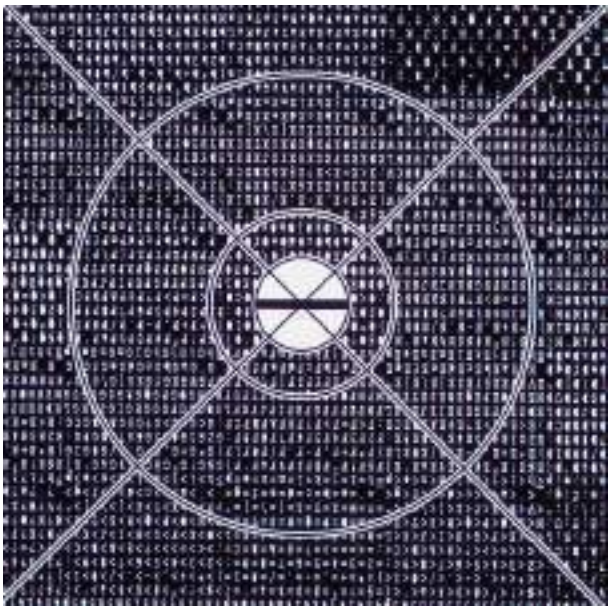
23.2 Camera-To-Stage Rotation

The standard for the camera-to-stage rotation is +/- 0.1°.

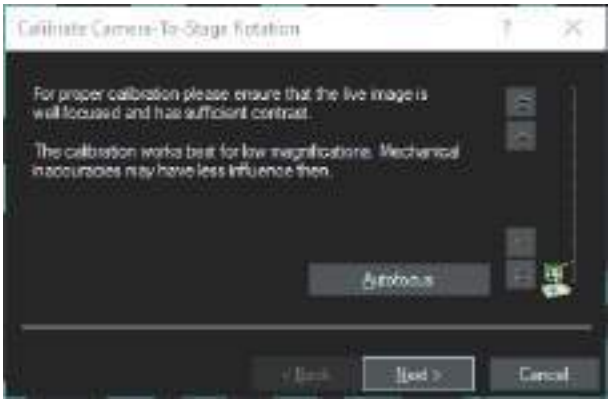
1. In the [Calibrations] dialog box select the [Camera-To-Stage Rotation] entry and click the [Calibrate] button.



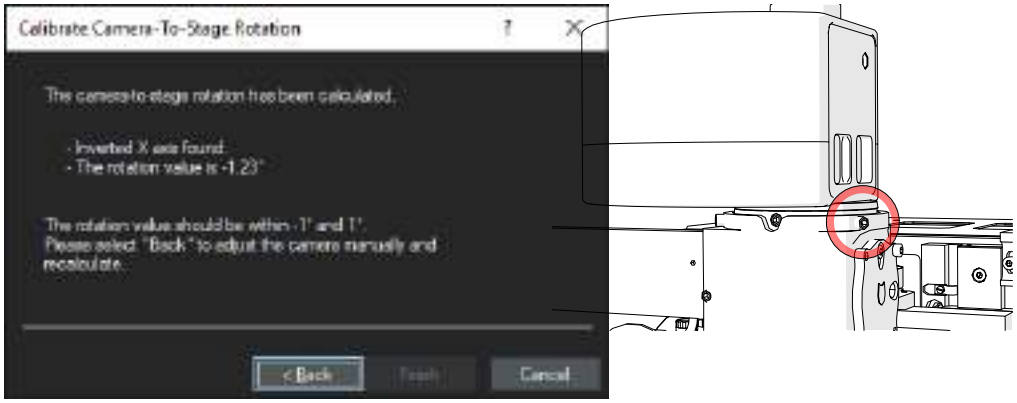
2. Use the stage navigator to move to the center of the calibration slide.



3. Select the 2x objective from the menu bar and perform an autofocus.



4. If the value is beyond the acceptable limits, loosen the screw in the beam splitter flange to rotate the U-FFWO together with the camera.



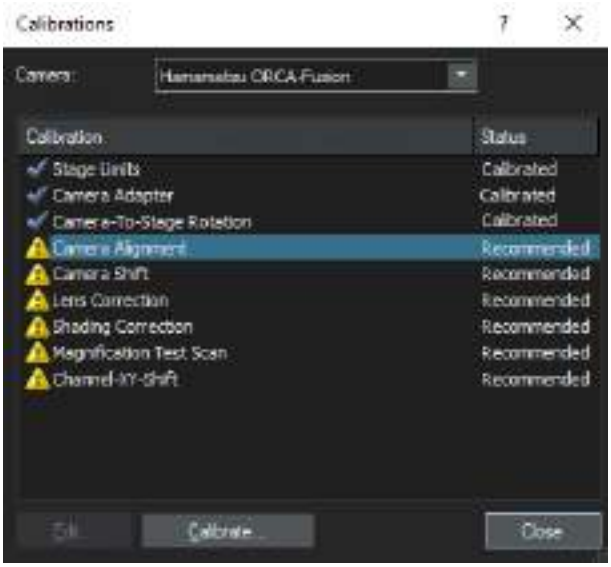
5. After a slight rotation, tighten the screw again and click the [Back] button in the dialog box.
6. Then click the [Autofocus] button in the next dialog box to perform the test again.
7. Repeat until the value meets the standard.

8. Finalize the process by clicking the [Finish] button.

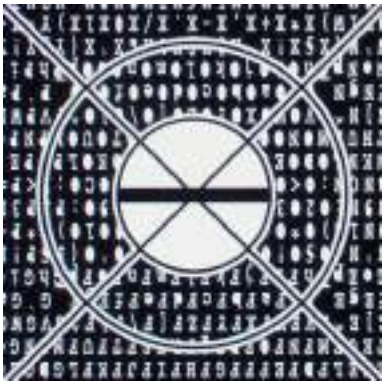
23.3 Camera Alignment

This calibration is essential to precisely adjust the camera rotation of the monochrome camera. In this process the 20x UPlanXApo objective is automatically selected. The standard for the camera alignment rotation is +/- 0.01°.

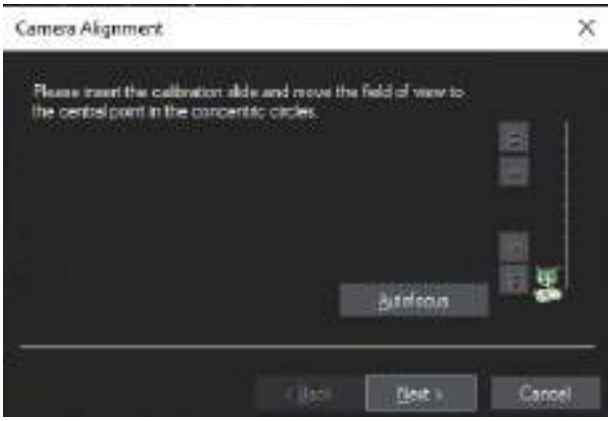
1. In the [Calibrations] dialog box select the [Camera Alignment] entry.
2. Click the [Calibrate] button.



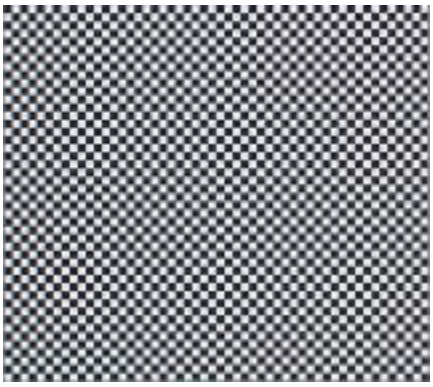
» The system will automatically move to the center of the calibration slide and display the center position.



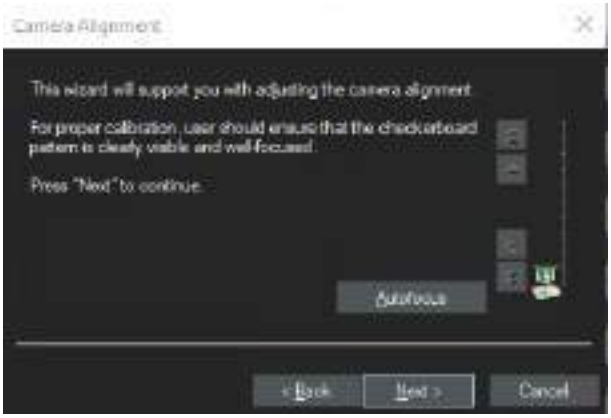
3. Recheck the focus before you proceed with [Next].



» The system automatically moves to the 20x checkerboard position on the calibration slide.



4. Check the focus and proceed with [Next].

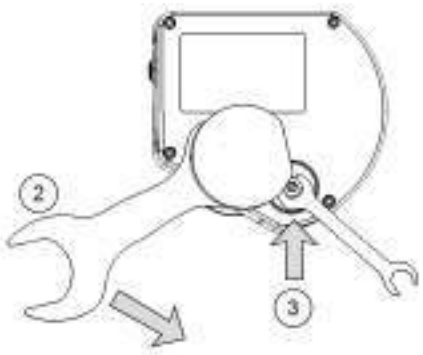


» The VS200 system switches into live mode and displays a window showing the current rotation angle (the angle value might fluctuate a

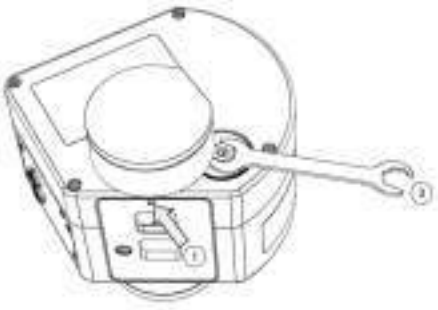
little bit).

If the rotation is out of standard:

1. Release (counter-clockwise) the counter nut (2) a little bit.



2. Release the locking screw (1).

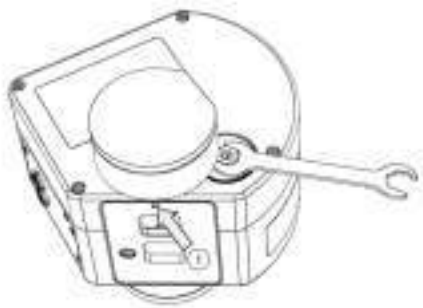


3. Adjust the rotation by turning the brass hex nut using the small spanner (3).
   - » The camera should be able to rotate freely.
   - » Turn counter-clockwise if the rotation angle is negative and clockwise if the rotation angle is positive.

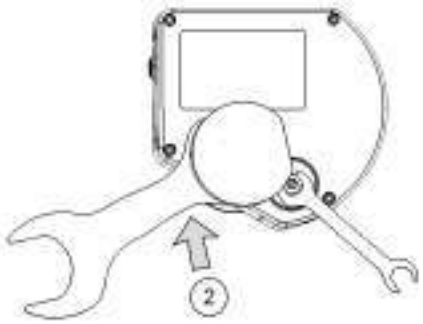
4. Rotate and check the Live-Rotation-Angle until the standard (+/- 0.01°) is achieved.

> If you are only using a TV 1.0x adapter, turn the camera clockwise if the value is negative and counter-clockwise if the value is positive.

5. Tighten the locking screw (1).



6. Tighten the counter nut (2).



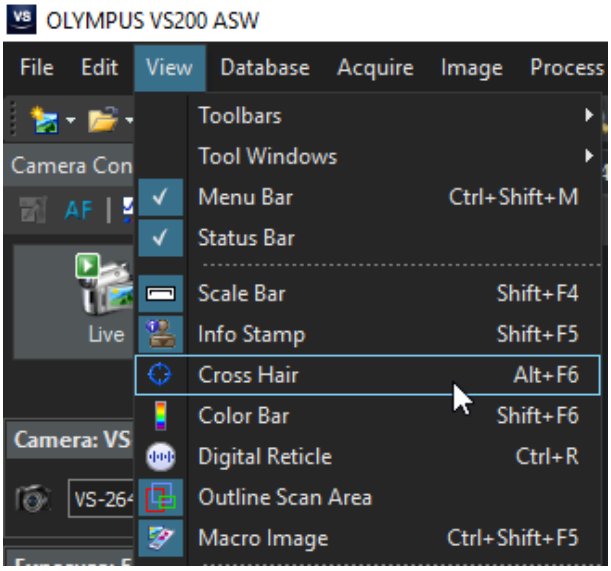
7. Press [Finish] to accept the calibration.

23.4 Camera Shift

The camera shift calibration corrects the shift between the brightfield and monochrome cameras. It is a software-based correction.

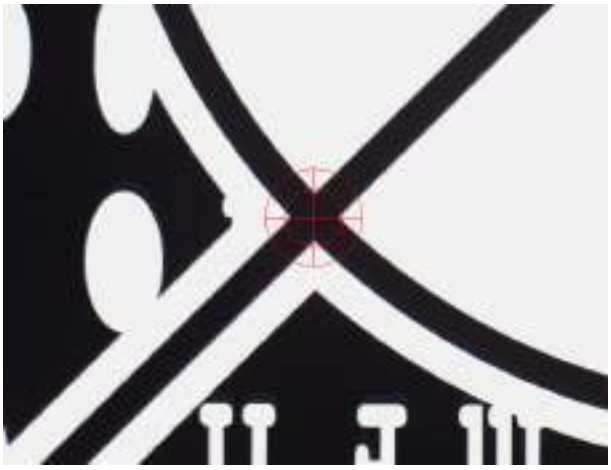
Measure the camera shift between the two cameras

1. Open the [Manual Control] layout.
2. Display the cross hair by selecting the [Cross Hair] entry in the [View] menu.



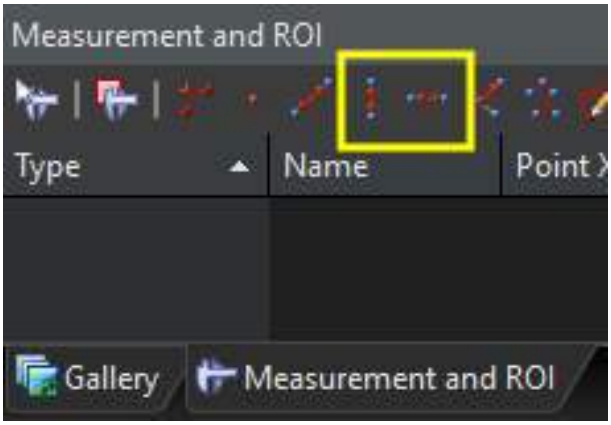
3. Select the 20x objective.
4. Switch to live mode with the BF observation method selected.

5. Use the stage navigator to move the stage so that the cross of the calibration slide is in the middle of the cross hair.

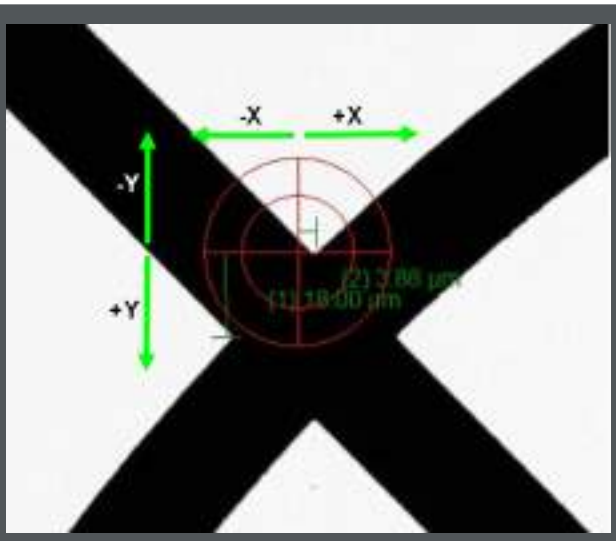


6. Fine focus with [Ctrl] + mouse wheel.
7. Switch off live mode and change to the BFMono observation method.
8. Switch on live mode again.
   » You might recognize a shift.

9. Switch to the [View] layout, go to the [Measurement and ROI] tab and select either the [Vertical Line] button or the [Horizontal Line] button.



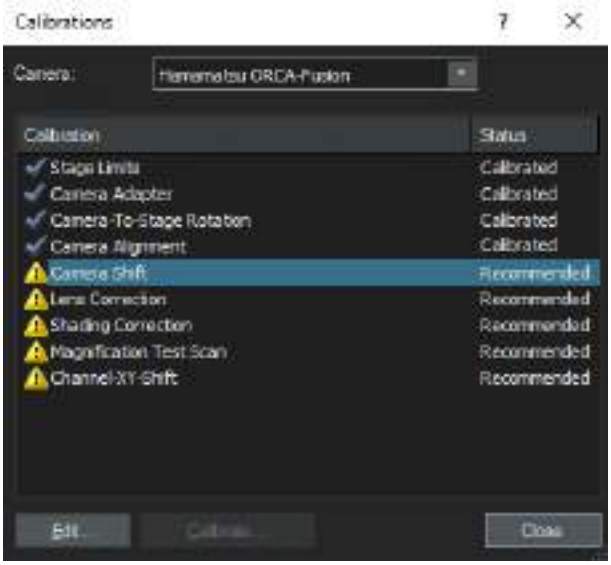
10. Measure the shift between the cross hair and the center structure and note the X and Y values.



In this case the monochrome camera is shifted up an to the left. To adjust the shift the cross hair needs to be 'shifted' to the right (+X) and down (+Y).

11. Remember these values (+3.86µm in X and +18.00µm in Y) to enter them in the [Camera Shift] dialog box in the following steps.

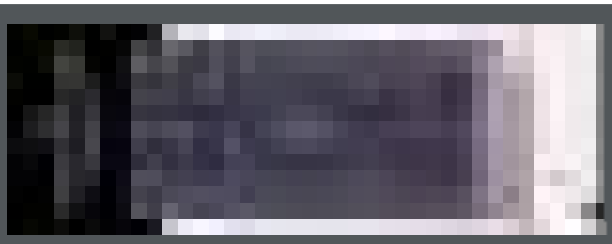
12. In the [Calibrations] dialog box select the [Camera Shift] entry and click the [Edit] button.



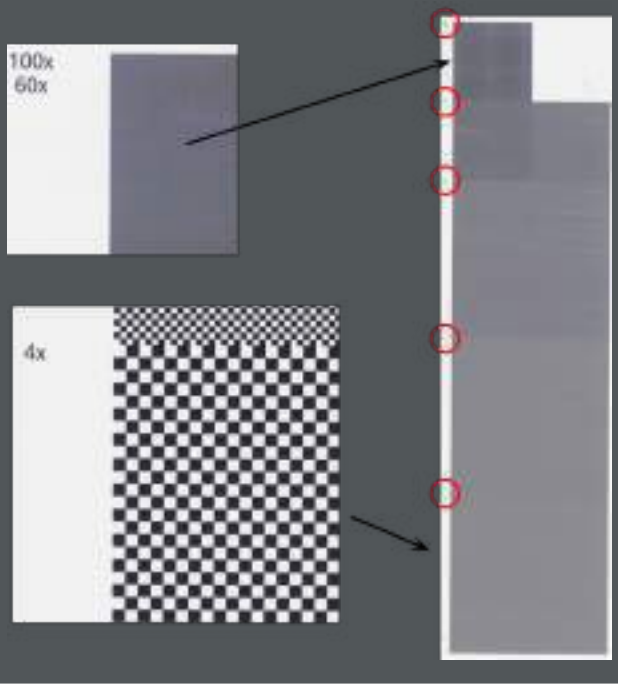
13. In the [Camera Shift] dialog box be sure to select the correct objective (20x) and enter the values you measured manually to align the two cameras being used.

14. Click the [OK] button to finish the calibration process.

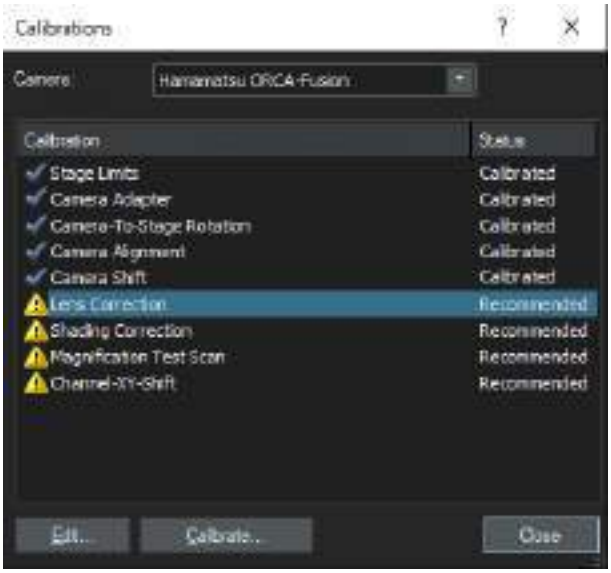
23.5 Lens Correction (Fluorescence)



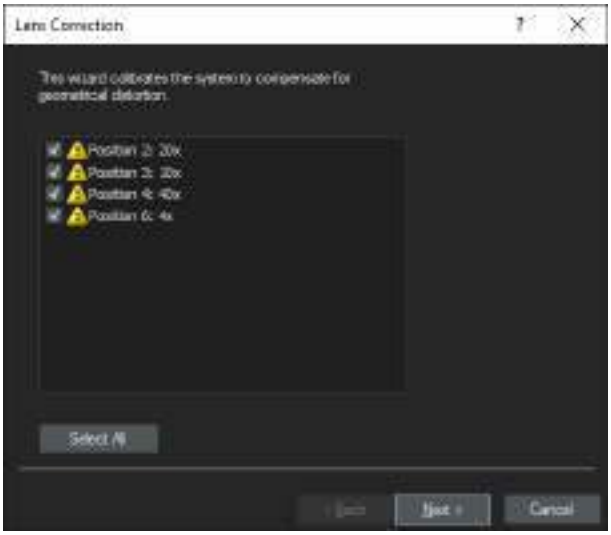
On the calibration slide opposite the label area you find an area with checker-board grids in different sizes. Next to each grid there is a number (see the circle in the example image) for the objective magnification from 4x to 60x/100x which has to be used for the calibration.



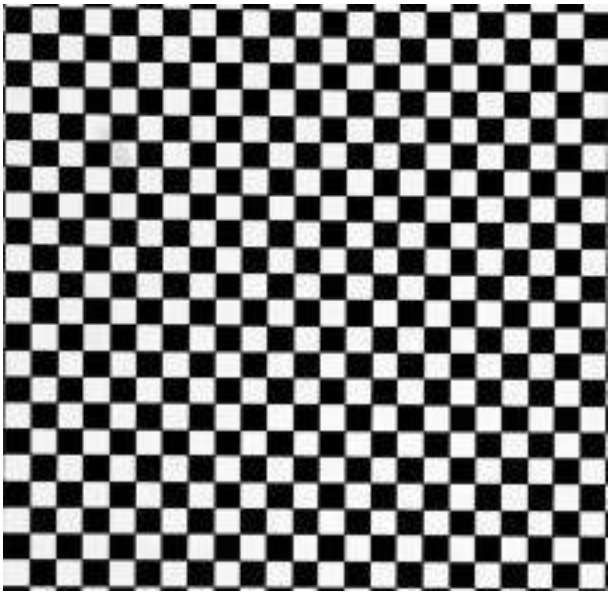
1. In the [Calibrations] dialog box select the [Lens Correction] entry and click the [Calibrate] button.



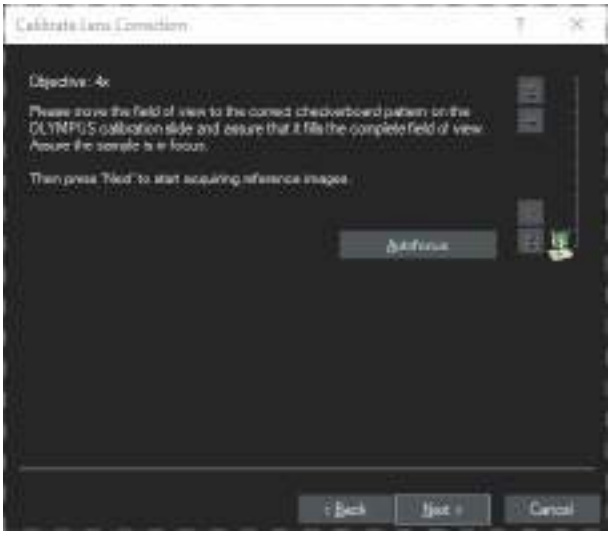
2. Select all available objectives. Immersion objectives are calibrated in the same wizard. However the calibration wizard will calibrate all dry objectives first and subsequently select the immersion medium objective(s).



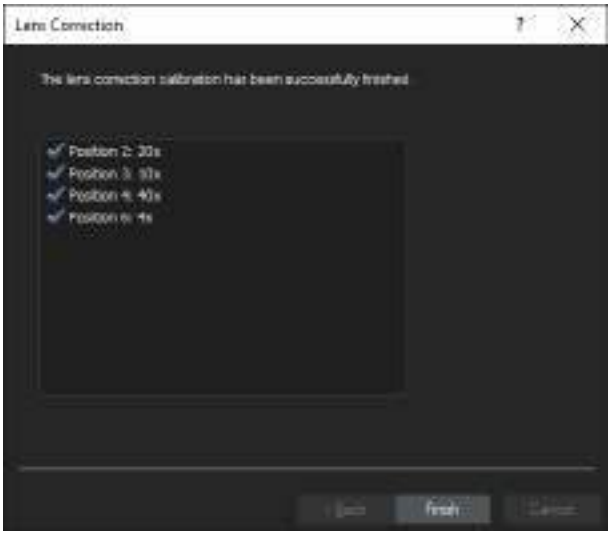
3. Use the stage navigator to move the VS calibration slide to the required checkerboard area.



4. Perform an autofocus and proceed with [Next].

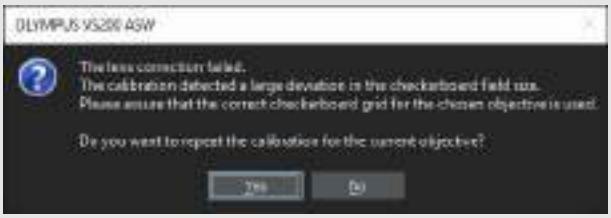


5. Do the same for all other objectives.



6. Finalize the process by clicking the [Finish] button.

If you see the message below please check if you are doing the calibration on the correct checkerboard area.

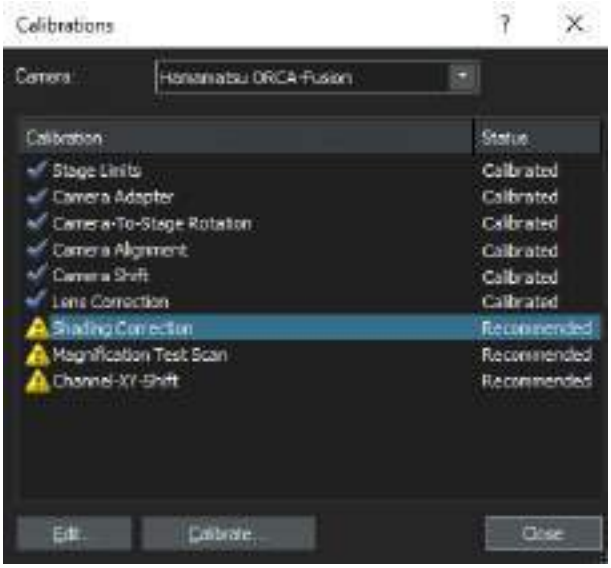


ATTENTION

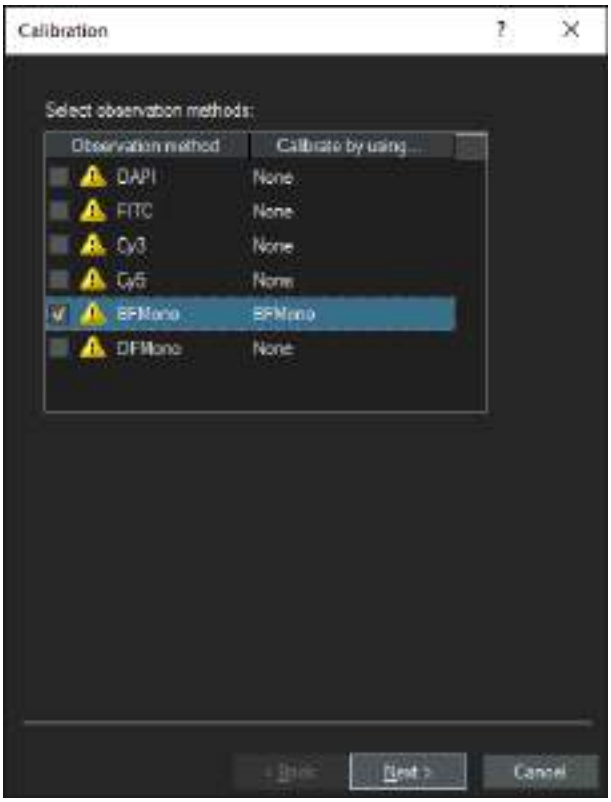
In case you have calibrated an immersion medium objective as well clean the objective and remove immersion medium residues from the calibration slide.
See Cleaning the immersion objective on page 213.

23.6 Shading Correction BFMono

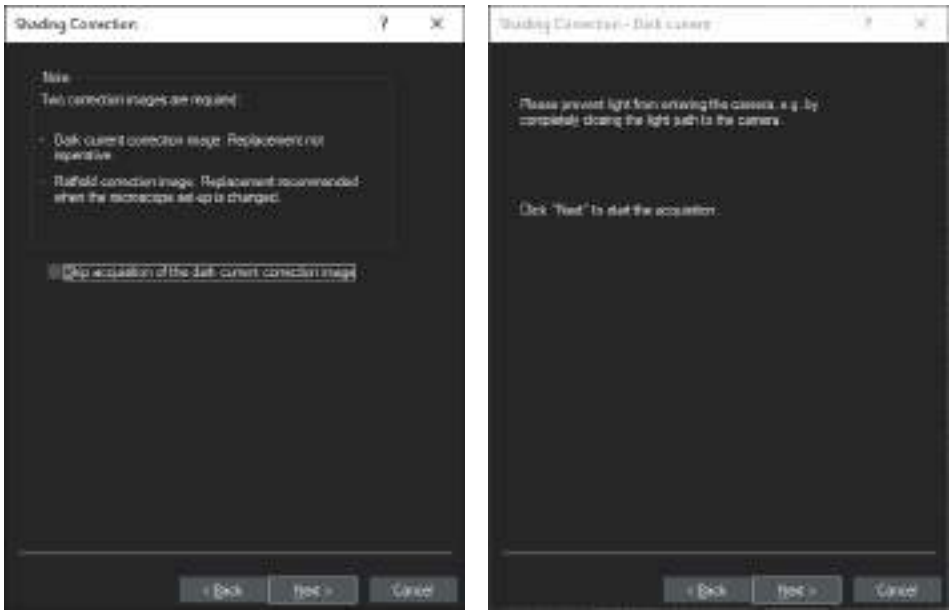
1. In the [Calibrations] dialog box select the [Shading Correction] entry and click the [Calibrate] button.



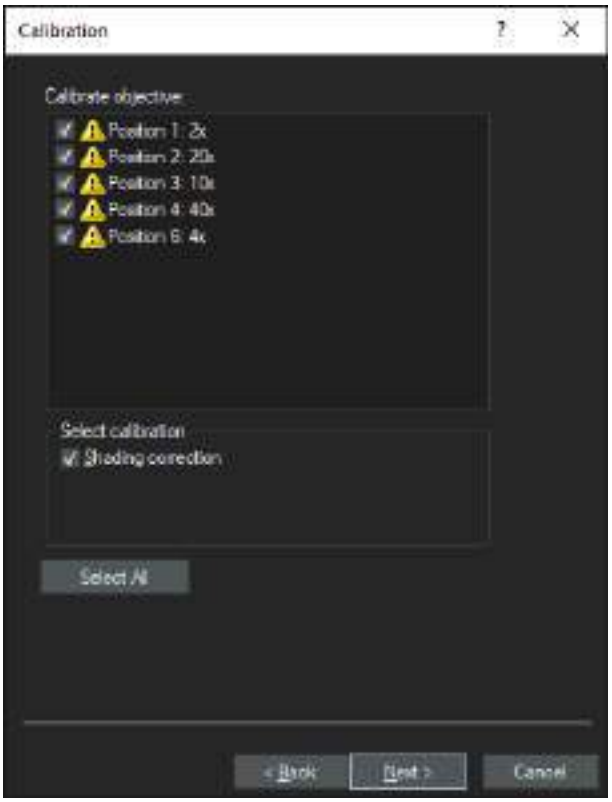
2. Select the [BF Mono] observation method and proceed with [Next].



3. If you are calibrating an out of the box system (no shading correction was done before) start with the acquisition of the dark current correction image.



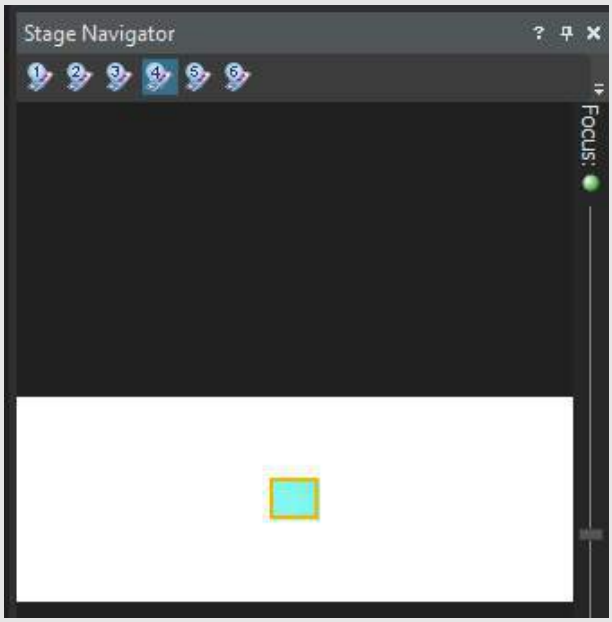
4. After the dark current image calibration select all objectives. Immersion objectives are calibrated in the same wizard. However the calibration wizard will calibrate all dry objectives first and subsequently select the immersion medium objective(s).



5. Make sure the [Shading correction] check box is selected
6. Proceed with [Next].

IMPORTANT

The shading correction for the 2x and 4x objectives has to be done on an empty tray position. Use the stage navigator to move e.g. to position 4.



7. Click the [Next] button to start the image acquisition process for the 2x objective.

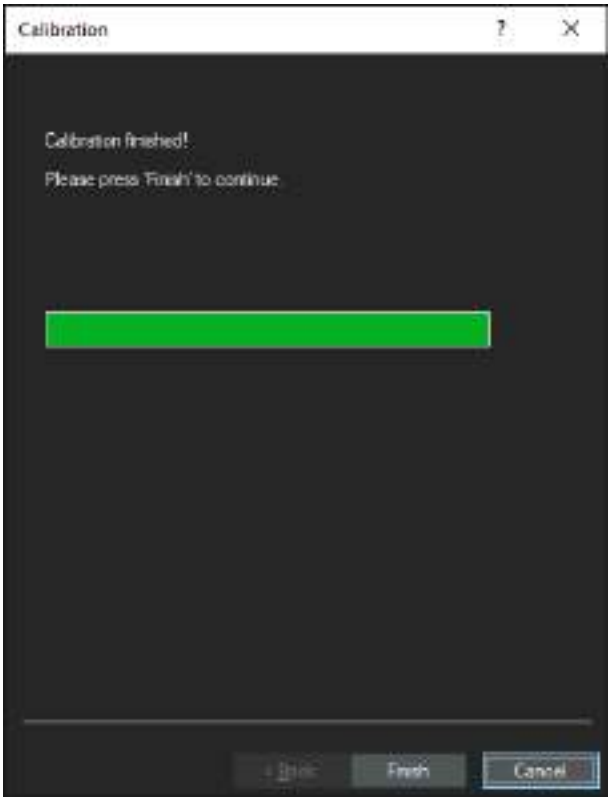
» After the acquisition process is finished, the calibration process automatically moves to the next objective.

IMPORTANT

The shading correction for objectives with a magnification equal to or higher than 10x should be done on a sample glass slide with coverslip. You will receive good results if you use the VS-calibration slide.

8. Proceed with all other objectives in the same way.

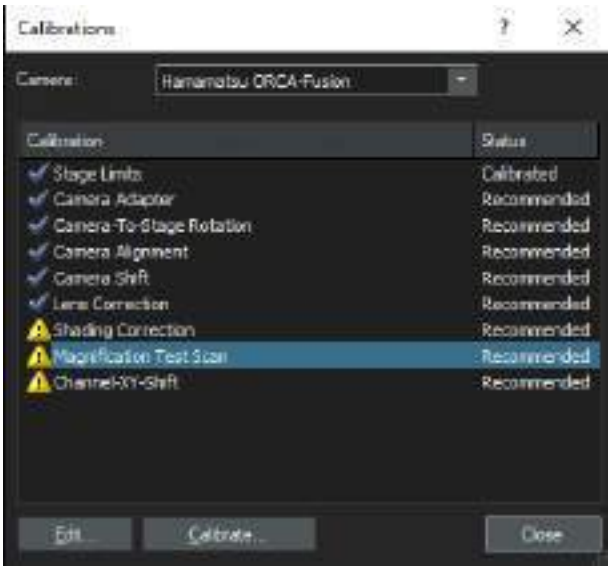
9. Finalize the process by clicking the [Finish] button.



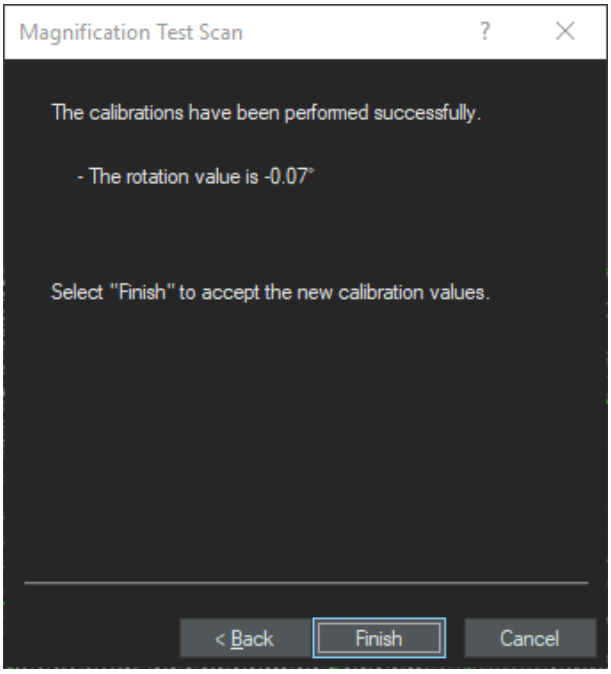
ATTENTION
In case you have calibrated an immersion medium objective as well clean the objective and remove immersion medium residues from the calibration slide.
See Cleaning the immersion objective on page 213.

23.7 Magnification Test Scan

1. In the [Calibrations] dialog box select the [Magnification Test Scan] entry.



2. Click the [Calibrate] button.
   » The magnification test scan for the monochrome camera is identical with the magnification test scan for the color camera. See Magnification Test Scan on page 169.
3. The resulting value should be within a deviation of +/- 0.1 degree.



If the calibration value is not within the standard go back to the [Camera-To-Stage Rotation] calibration and readjust the rotation. This will also effect the shading correction, however. Refer to chapter Shading Correction (Brightfield) on page 148 to redo the shading correction.

23.8 Shading correction for fluorescence observation methods

The shading correction for DAPI, FITC, CY3 and Cy5 can be done on a 'normal' thin, homogenous and large H&E sample using the autofluorescence as shown in the example below.

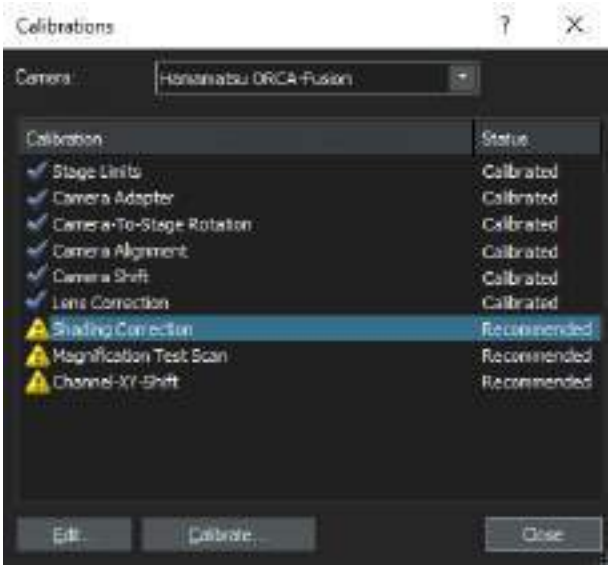
The slide for the shading correction is not part of the system. However, any H&E sample with a minimum size of 1.5 cm x 1.5 cm can be used.

To perform the shading correction for CY7 a real CY7 stained sample is necessary as CY7 does not show any autofluorescence.

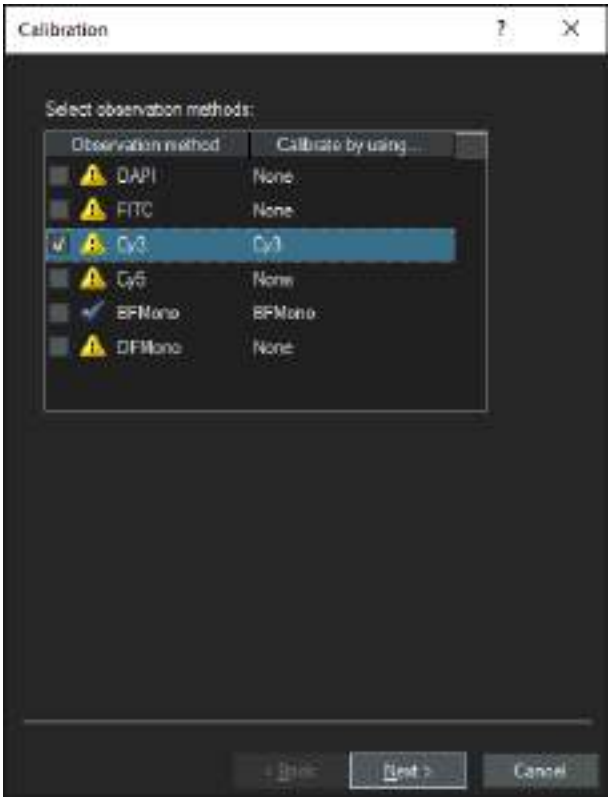
However shading correction is also sample dependent. Especially the thickness of the sample might have an influence on the correction.

It could be necessary to repeat the shading correction if different samples are used.

1. Put a similar slide into a tray and load the tray.
2. In the [Calibrations] dialog box select [Shading Correction] entry.

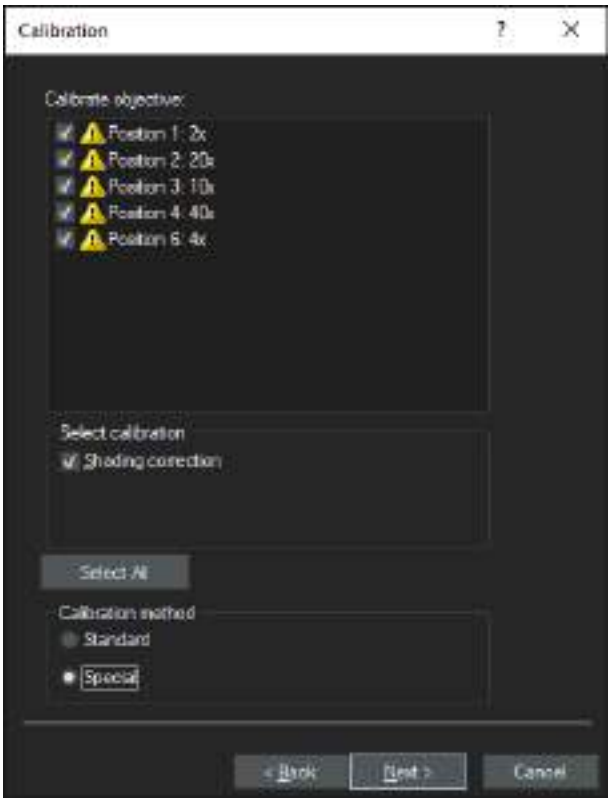


3. Select e.g. the [Cy3] observation method and click [Next].



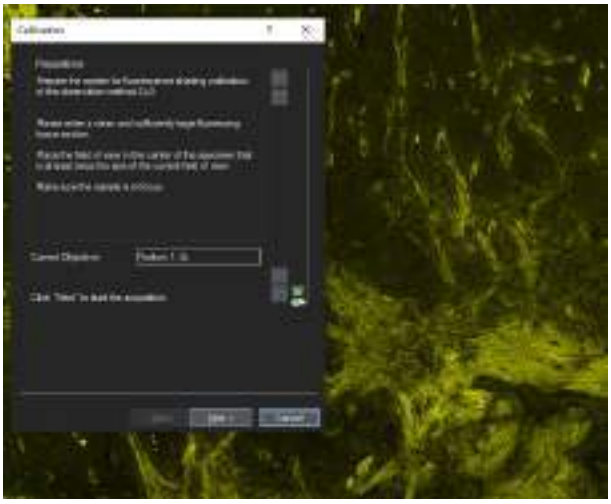
4. Always skip the acquisition of the dark current correction image.

5. Select all objectives. Immersion objectives are calibrated in the same wizard. However the calibration wizard will calibrate all dry objectives first and subsequently select the immersion medium objective(s).
6. It is very important to select in the [Calibration method] group the calibration method [Special]. Only the calibration method [Special] will work on a real sample. The calibration method [Standard] requires different samples and is less effective. Also make sure that the checkbox [Shading correction] is checked.

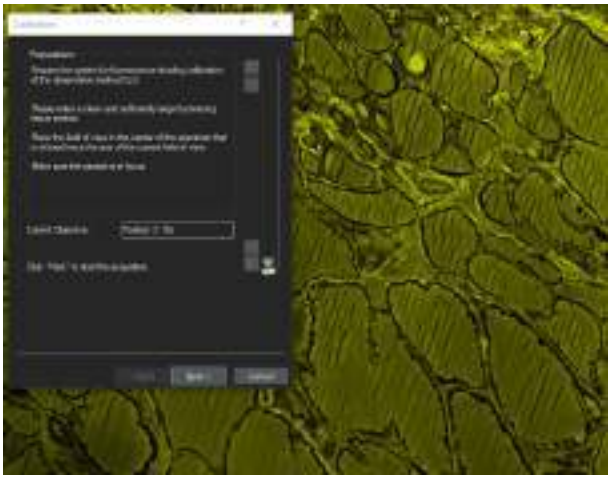


7. Proceed with [Next].
   » The system switches into live mode.

8. Select an area on the slide large enough for a 2x field of view and focus the sample via 'Ctrl' + mouse wheel and proceed with [Next].



For objectives equal or higher than 10x try to find a sample area which is dense and homogenous.



9. Repeat these steps for all other selected objectives.
10. Continue the shading correction for all other fluorescence observation methods.

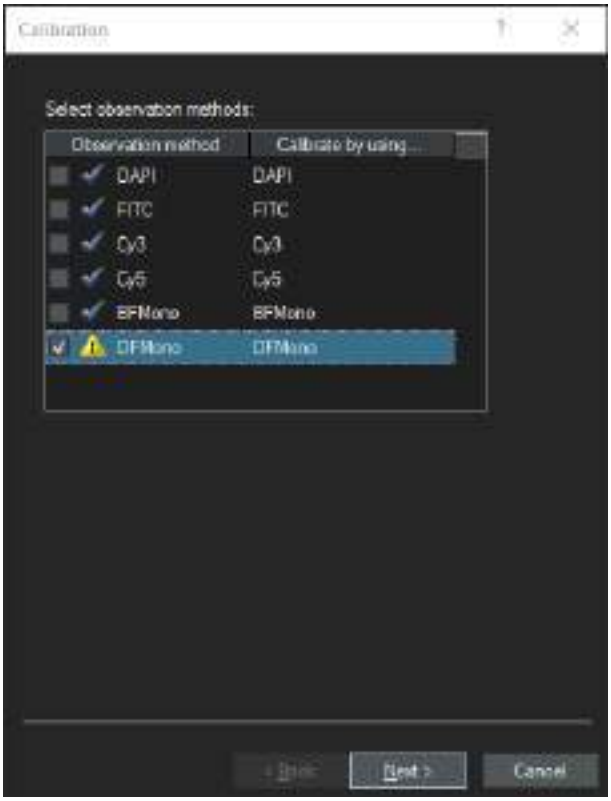
ATTENTION
In case you have calibrated an immersion medium objective as well clean the objective and remove immersion medium residues from the calibration slide.
See Cleaning the immersion objective on page 213.

23.9 Shading correction for darkfield (DFMono)

» The darkfield observation method can be used with an 10x objective only.

» To perform shading correction for DFMono use the checkerboard sections on the VS-calibration slide.

1. In the [Calibrations] dialog box, select the [Shading Correction] entry and click the [Calibrate] button.
2. Select the [DFMono] observation method and proceed with [Next].



3. Skip the acquisition of the dark current correction image. Proceed with [Next].

4. Select only the check box for the 10x objective.

   Make sure that the [Shading correction] check box is selected.

   If necessary, select the [Calibration method] > [Standard] option.

   Proceed with [Next].

» The system will activate the live mode with the 10x objective used.

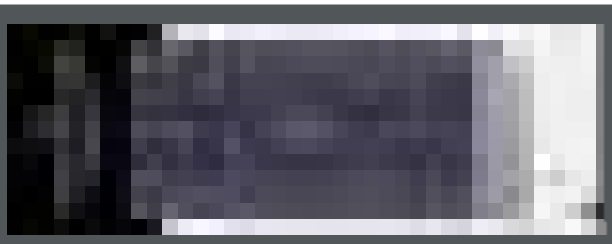
5. Use the [Stage Navigator] tool window to navigate to the 100x/60x checkerboard and focus the sample.
6. Defocus by going down (40µm in Z) until you see a homogenous image (no checkerboards anymore).

In focus Defocused

7. Click the [Next] button to start the shading correction.

8. Click the [Finish] button to finalize the shading correction.

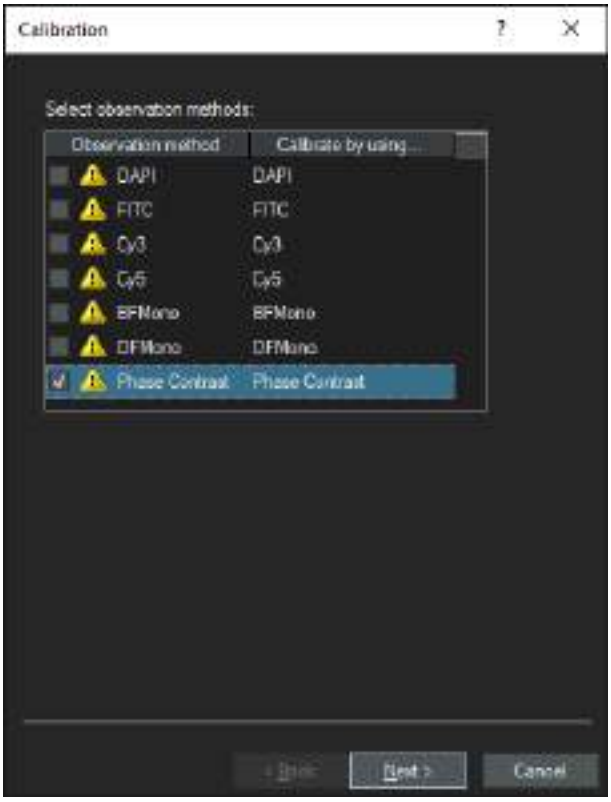
23.10 Shading correction for Phase Contrast (PH)



To perform the shading correction, use the calibration slide delivered with the system.

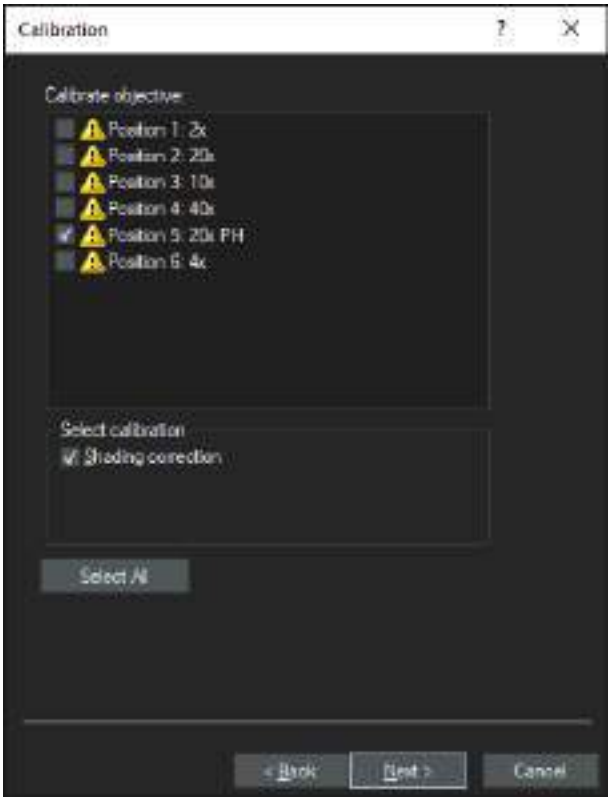
1. In the [Calibrations] dialog box select the [Shading correction] entry.
2. Click the [Calibrate] button.

3. Select the [Phase Contrast] observation method.



4. Skip the acquisition of the dark current correction image.

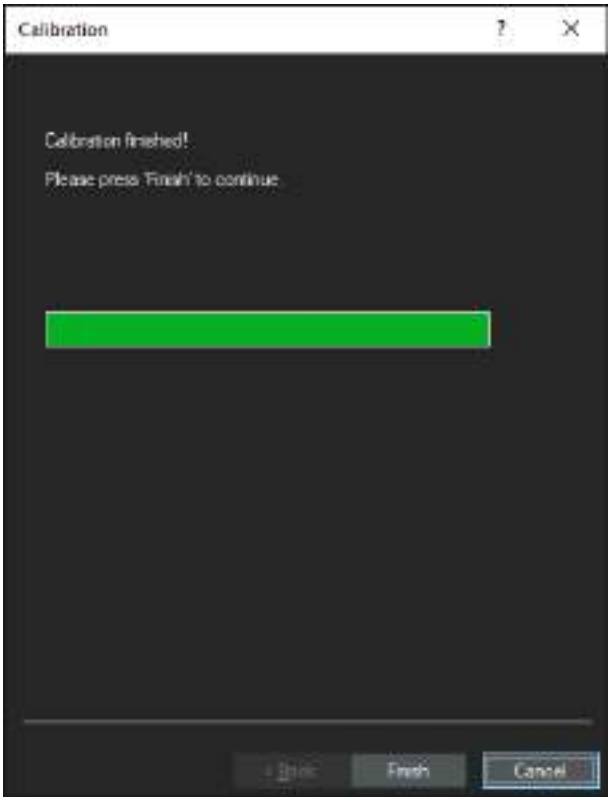
5. Only select the phase contrast objective(s). Make sure that the [Shading correction] check box is selected.



6. Focus on the calibration slide structure. Then go to the right side of the calibration slide to search for a very clean area to acquire the shading image.

7. Proceed with [Next].

8. Finalize the process by clicking the [Finish] button.



23.11 Channel-XY-Shift

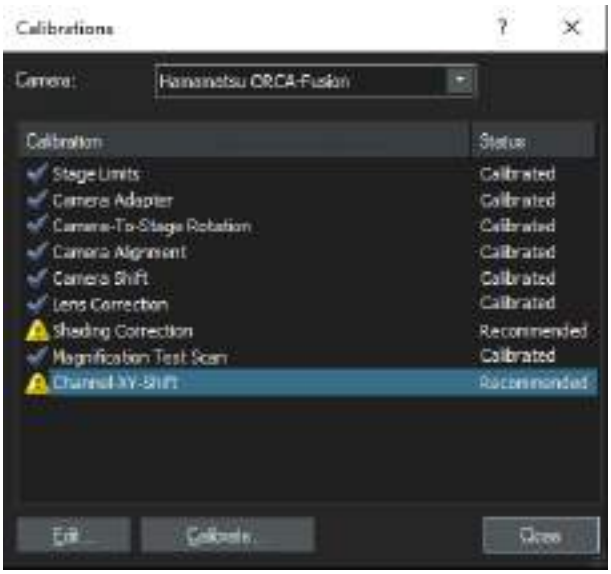
The channel-XY-shift calibration is only needed if multiple fluorescence filters or dichroic mirrors in the IX3-RFACA are used.

If the customer's system setup only contain one dichroic mirror in the IX3-RFACA, this calibration has not to be performed.

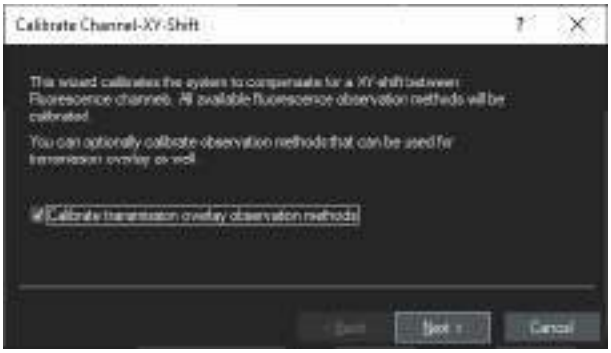
The slide for the XY shift correction is not part of the system. However, any H&E sample with a minimum size of 1.5 cm x 1.5 cm can be used.

It is important to correct a XY pixel shift induced by the different filter cubes.

1. In the [Calibrations] dialog box select the [Channel-XY-Shift] entry.
2. Click the [Calibrate] button.



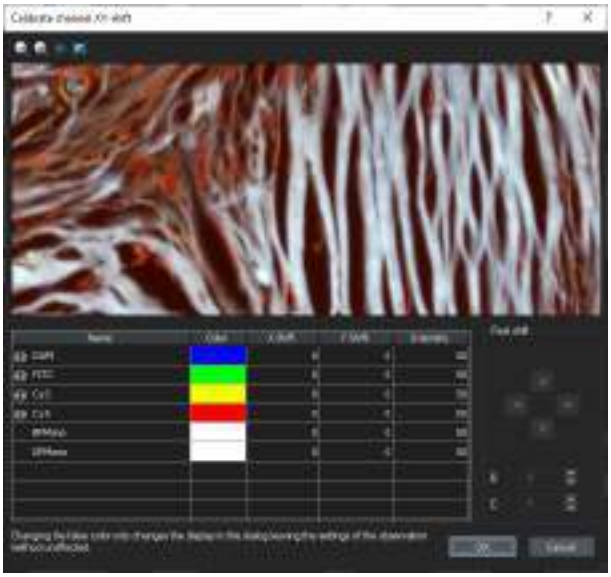
3. Select the [Calibrate transmission overlay observation methods] (bright field) check box.



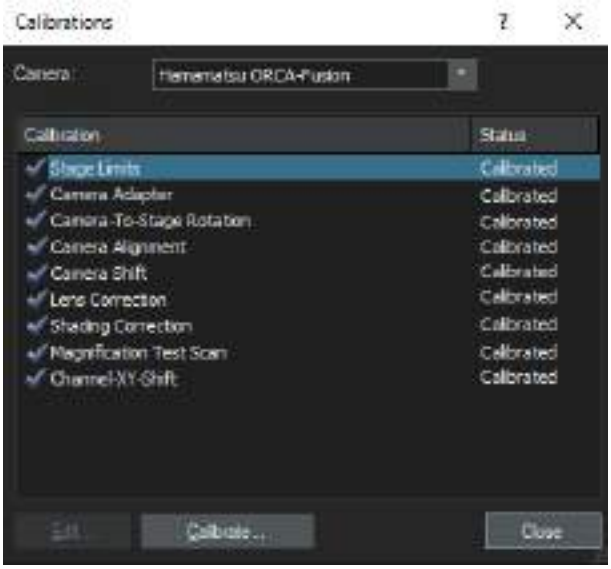
4. Put in a customer fluorescent sample which contains dyes for all of the fluorescent filters that are to be calibrated. Use at least the 20x objective, but preferably the 40x objective.
5. Navigate to an area with high contrast and focus. Then click the [Next] button to start the acquisition process.

6. Once the image has been acquired, the [Calibrate channel XY-shift] tool window opens. The shift between the individual channels is corrected manually here.
   » The visibility of the channels can be changed by activating/deactivating the 'eye' icon next to the channel name.
7. Click on a channel e.g. FITC to activate it and then use the cursor key to move the FITC image around pixel by pixel to match the structure of the underlying DAPI image.
8. Proceed with the other channels the same way.

9. When you have finished, click the [OK] button to save the changes.



» All calibrations should have a blue tick now.



24 Cleaning the system

24.1 Cleaning the VS200 scanner

We recommend cleaning the scanner as required when you can see that it is dirty.

ATTENTION
Ingress of fluid can damage the devices.
An ingress of fluid can cause a short circuit or damage the scanner, individual components of the scanner, the loader, and connected devices.

- Before cleaning the VS200 system, disconnect it from the power supply.
- Protect the scanner, the loader, and individual components from dirt, water and ingress of fluids.
- Clean only the surface of the scanner, the loader and the individual components.

1. Disconnect the scanner from the power supply.
2. Clean the following components with a lint free cleaning cloth.
   » The surface of the scanning stage
   » Liquid dispenser head
   Use a dry cloth for the liquid dispenser head.
3. For more pronounced marks, you can lightly wet the cleaning cloth with water or a mild solvent-free disinfectant or cleaning agent.
4. Clean the clamping mechanism only with a lint free cleaning cloth.
5. If the scanner or individual components were cleaned with a damp cloth, allow them to dry.

24.2 Cleaning the VS200 loader

ATTENTION
Ingress of fluid can damage the devices.
An ingress of fluid can cause a short circuit or damage the scanner, individual components of the scanner, the loader, and connected devices.

- Before cleaning the VS200 system, disconnect it from the power supply.
- Protect the scanner, the loader, and individual components from dirt, water and ingress of fluids.
- Clean only the surface of the scanner, the loader and the individual components.

1. Take all of the trays out of the loader.
2. Disconnect the VS200 system from the power supply.
3. Open the door of the loader.
4. Manually move the SCARA robot arm to the right.
5. Move the tray hotel to the loading position all the way at the front.
6. Clean the following components with a lint free cleaning cloth.
   - » Left side of the tray hotel
   - » Right side of the tray hotel
   - » The bottom panel of the tray hotel
7. For more pronounced marks, you can lightly wet the cleaning cloth with water or a mild solvent-free disinfectant or cleaning agent.
8. Push the tray hotel as far back as it will go to the back panel.
9. Manually move the SCARA robot arm to the left.
10. Clean the gripper only with a lint free cleaning cloth.
11. If the loader or individual components were cleaned with a damp cloth, allow them to dry.

24.3 Cleaning the trays

1. Clean the trays with a lint free cleaning cloth. For more pronounced marks, you can lightly wet the cleaning cloth with water or a mild solvent-free disinfectant or cleaning agent.

24.4 Cleaning the X-Cite TURBO, X-Cite XYLIS and X-Cite NOVEM

✓ The X-Cite light source is not available in all countries.

Refer to the safety instructions in chapter Safety instructions for X-Cite TURBO, X-Cite NOVEM and X-Cite XYLIS on page 15.

Observe the cleaning instructions in the manual of the light source.

1. Clean the optics only by using appropriate fluids and lens paper.
2. To clean the exterior of the unit, use a slightly dampened cloth and a simple water/ detergent solution only.

24.5 Cleaning the immersion objective

ATTENTION
Damage to the objectives and hardware
Objectives and hardware can get sticky after an immersion medium has been used. This can damage them.
- Clean the immersion objective after each use.

CAUTION
Pinching hazard from moving components inside the VS200 system
Mechanical components move around inside the VS200 system. If you attempt to make adjustments inside the system while it is switched on, your hands and fingers can get pinched or your hair and cloths can get caught.
- Make sure not to perform any software functions while you are cleaning the immersion objectives.

1. To clean lenses, remove dust by blowing them with a commercially available blower and wipe them lightly with cleaning paper (or a piece of repeatedly washed gauze). Only if they are stained by fingerprints or oils should you wipe them using cleaning paper slightly moistened with dehydrated alcohol sold at store.

   CAUTION
   Dehydrated alcohol is highly flammable. Do not expose it to heat or flame, and do not turn off or on the power switch of various electrical apparatuses since ignition can be induced by just switching switches on and off. In addition, make sure that the room is well ventilated.

2. Do not use an organic solution to clean parts other than lenses. If a part is heavily stained, wipe it with a soft cloth slightly moistened with a diluted neutral detergent.

   Avoid cleaning lenses with the camera or the lenses removed. Doing so will cause the system to be uncalibrated. All calibrations need to be re-done.

3. Click the [Clean Objective] button on the start page of the VS200 ASW software and follow the instructions in the dialog box.
   » The objective revolver will move up, giving you more space.
   » It is not necessary to unmount an objective to clean it.

4. In the [Select the objective to be cleaned] list select the objective to be cleaned. If you have more than one immersion objective, also select the other objectives in the list.

5. To clean the objective use lens cleaning paper.
6. After cleaning the objective click on the [Finish and set Objective status to 'clean'] button.

25 Installing additional software

25.1 OlyVIA

To install OlyVIA go to D:\OLYMPUS_SERVICE_ONLY_DO_NOT_DELETE\SetupOlyvia and execute the [setup.exe].

25.2 VS200 ASW Desktop

VS200 ASW and VS200 ASW DT cannot be installed on the same customer PC.

The installation requires a VS200 ASW DT licence key during the installation.

To install VS200 ASW DT on a different PC copy the setup files to the desired PC and execute the setup.exe. The setup files can be found on the VS200 ASW system PC under the following link: D:\OLYMPUS_SERVICE_ONLY_DO_NOT_DELETE\SetupMain

25.3 NetImage Server SQL (NIS-SQL) and Webinterface

The NetImageServer SQL can be installed by Olympus service technicians only.

Also the web interface to utilize OlyVIAweb (HTML5-based webviewer) is installed and configured by Olympus service technicians only.

26 Troubleshooting

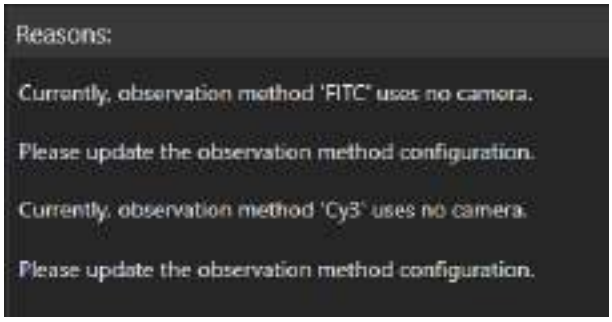
26.1 Hardware not available

If the [IX3 Nosepiece: Hardware is not available] error message appears, do the following:

1. Close the VS200 ASW software.
2. Switch off the VS200 system!
3. Check cabling of IX3-RFACA.

26.2 "No camera" error

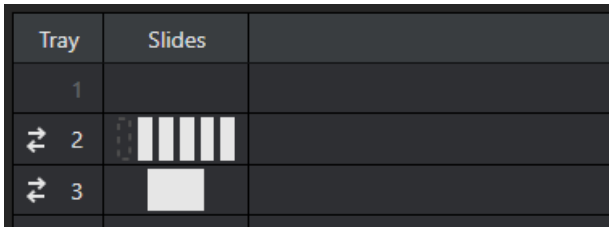
If you see the following error messages after switching to the monochrome camera you need to check whether the correct camera is assigned in the observation methods which use a monochrome camera. See Manual device configuration on page 112.



» If you are using an ORCA camera make sure that it is switched on.

26.3 Tray not active

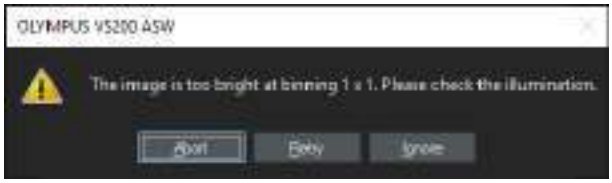
If you see the error message below you possibly inserted a new tray type without having it set up correctly in the VS200 ASW software first.



1. Remove the tray and switch to the [Manual Control] layout.
2. Use the [Acquire] > [Devices] > [Device Settings] command to open the [Device Settings] dialog box.
3. Select the [VS200L Multi-Sample Holder] > [Tray Types] entry in the tree view.
4. Select the check box [Use Tray] next to the tray type you want to use.

26.4 Image too bright

If you see the following error message please adjust VS200 LED lamp voltages. See ORCA camera adjustments on page 114.



26.5 Setting the Koehler illumination

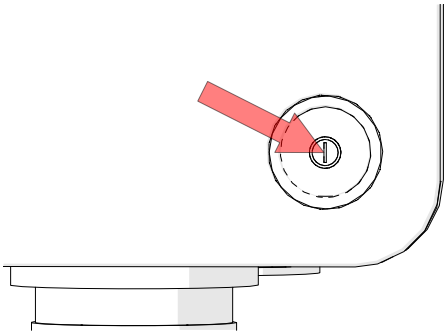
The units described below must be assembled and adjusted by Olympus. If these units are assembled or adjusted by the customer, the operations are not ensured.

This chapter describes how to set the Koehler illumination.

The condensor is centered ex works in XYZ direction and fitted with an adjustment lock. Therefore, a recalibration on site is probably not necessary.

» Hex key (size 2.5mm and 3mm with ball end)
» Wrench (size 8mm)

1. Use the main power switch to switch on the VS200 system.

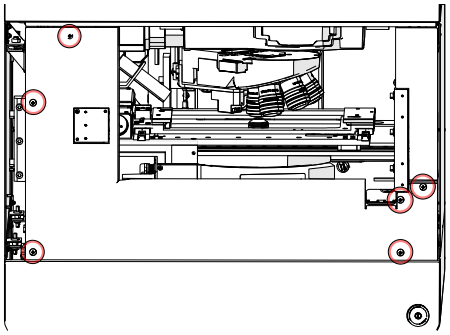


CAUTION
Pinching hazard when initializing the VS200 system
Switching on the VS200 scanner and starting the VS200 ASW software will initialize all components. As a result, various components begin to move.
Gaps open and close when the stage moves. Hands and fingers can get pinched.
- Make sure that you are not within the stage's range of movement when it is moving.
- Try never to put your hands or fingers into any gaps.

2. Start the VS200 ASW software.
3. Take a tray that has a slide in position 3.
4. On your software's start page, click the [Exchange Trays] button to load the tray.
5. Use the [Select Slide for Calibration] function to load the slide.
6. Make sure that the 2x objective is selected.
7. Use the VS200 ASW software to start the live image. To do so, go to the [Manual Control] layout.
8. In the [Camera Control] tool window, click the [Live] button to start the live image. Alternatively, you can also use the [F7] key.

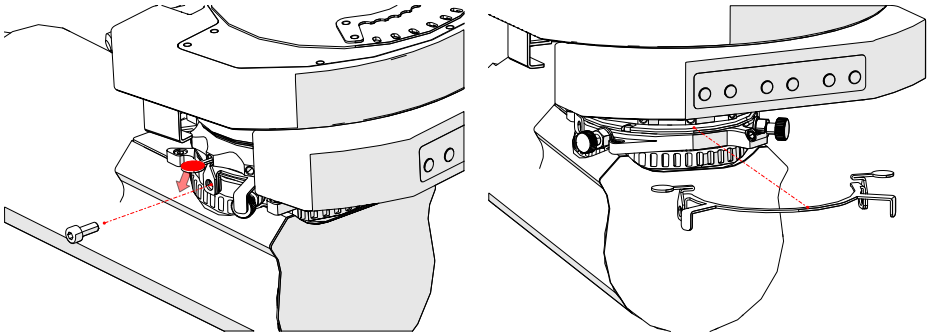
9. Carry out an autofocus.
10. Change to the objective with the magnification 10x or 20x.
11. Carry out an autofocus again.
12. Open the door of the VS200 scanner.

13. Remove the lower tamper protection plate. To do so, loosen the 6 hex screws (size 2.5 mm hex key) indicated in the figure.

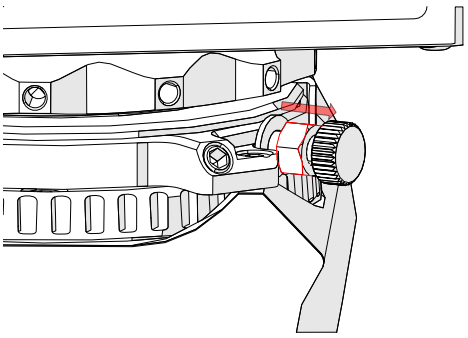


14. Remove the adjustment lock. To do so, loosen the hex screw (size 3mm hex key) indicated in the figure. Then take hold of the tab indicated in the figure and pull it down. This allows the lock to slide out of the slot in the focus ring. Perform these steps on both sides.

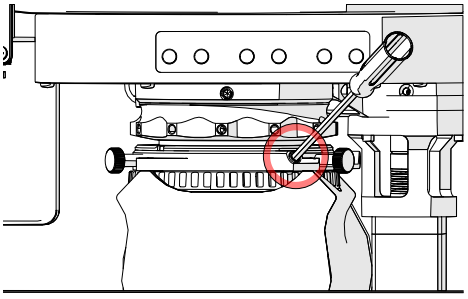
    Then pull the lock forwards to remove it.



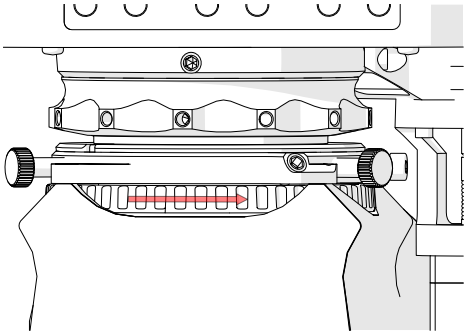
    Also loosen the adjustment lock for the X-Y adjustment screw. An 8 mm wrench can help with this.



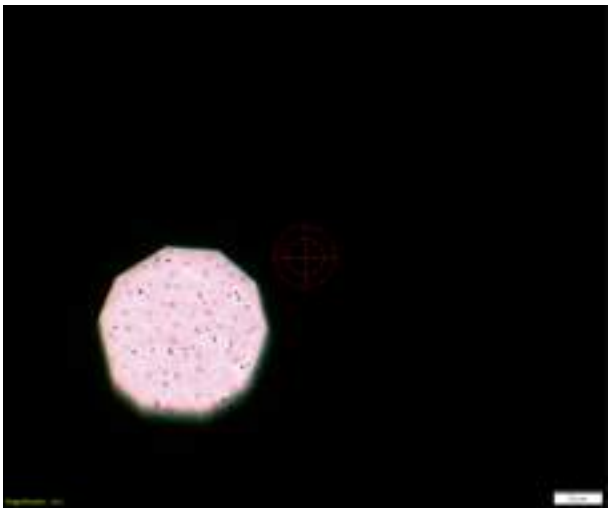
15. Release the fixation in the field stop. To do this, loosen the hex screws (using a 3 mm hex key with ball end) indicated in the figure.



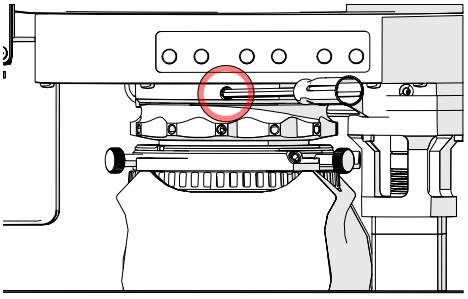
16. Turn the adjustment ring indicated in the figure to close the field stop as far as possible.



» You should now see a bright spot somewhere in the live image. The spot may appear polygonal (10 edges).
Display a cross hair in the live image to help with centering. To do so, use the [View] > [Cross Hair] command in the VS200 ASW software. Alternatively, you can also use the [Alt + F6] keystroke.

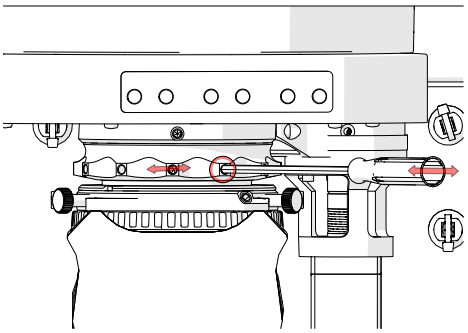


17. Release the field stop's focus setting. To do so, loosen the hex screw (size 3 mm hex key) indicated in the figure.

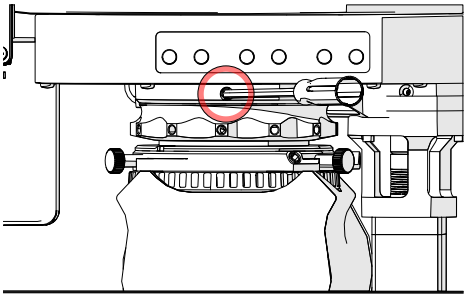


18. Focus the field stop. This can be done by hand. Alternatively, you can insert the hex key into one of the holes indicated in the figure. Move the hex key to the right and to the left to adjust the focus ring.

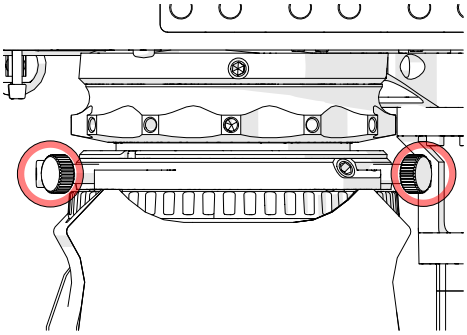
    Set the focus so that the edges of the closed field stop are sharp.

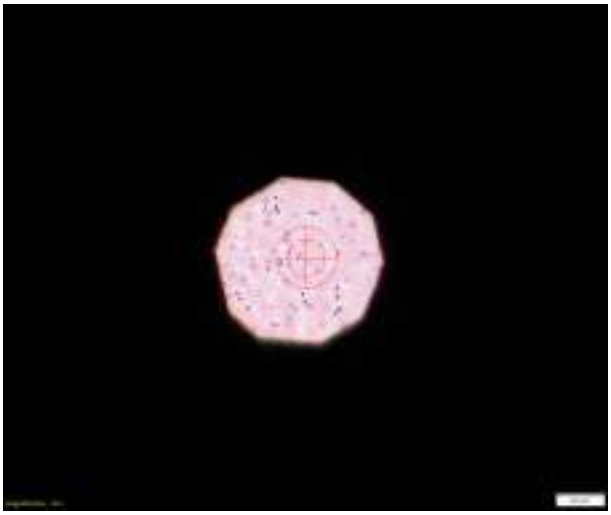


19. Tighten the field stop's focus setting. To do so, use the hex screw (size 3 mm hex key) indicated in the figure.

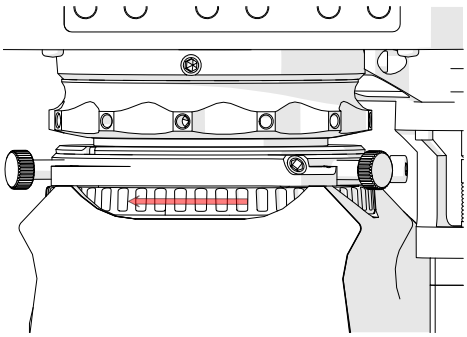


20. Loosen the 2 hex screws (size 3 mm hex key) indicated in the figure. The screws should only have been screwed hand tight.
21. Use the two adjustment screws indicated in the figure to align the bright spot in the center of the cross hair.

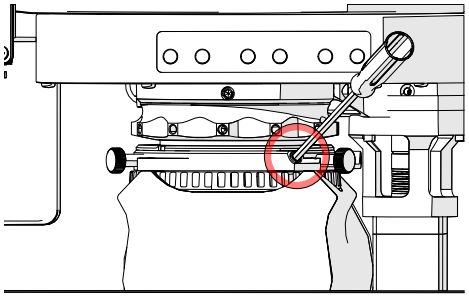




22. Lock the field stop's focus setting. To do so, tighten the hex screw (size 3 mm hex key) loosened before.
23. Open the field stop completely. To do so, turn the adjustment ring shown in the figure to the left as far as possible.



24. Lock the field stop. To do so, tighten the hex screw (size 3 mm hex key) indicated in the figure.



25. Remount the adjustment lock removed in step 14.
26. Mount the black tamper protection plate using the 6 screws and close the door.
27. On your VS200 ASW software's start page, click the [Exchange Trays] button to remove the tray. Confirm that you exchanged the tray so the flap will close again.
28. Close the VS200 ASW software and wait until the VS200 scanner has reached its end positions.
29. Use the main power switch to switch off the VS200 system.

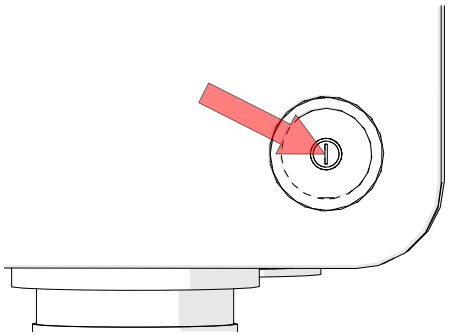
26.6 Adjusting the leveling feet of the VS200 loader

The units described below must be assembled and adjusted by Olympus. If these units are assembled or adjusted by the customer, the operations are not ensured.

This chapter describes how to adjust the leveling feet of the VS200 loader. This adjustment is necessary when the VS200 scanner is operated with a VS200 loader and the height of both devices does not match. In this case, the VS200 scanner and the VS200 loader cannot be connected.

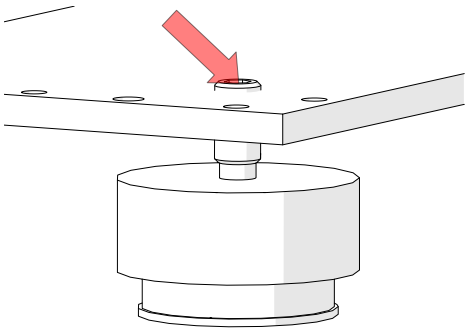
» Hex key (size 6 mm)

1. Switch the VS200 system off using the main power switch and disconnect the system from the power supply. To do so, disconnect the external power supply unit from the power supply.



2. Remove the housing rear cover.
3. To adjust the leveling feet, either turn the leveling feet directly or use a hex key (size 6 mm hex key). Insert the hex key as indicated in the figure.

   Adjust the leveling feet so that you can just slide the loader onto the connector's ground plate.



4. Mount the housing.
5. Reconnect the VS200 scanner to the power supply.

26.7 Barcodes

For further details on how to activate and use the barcode within the VS200 ASW software, please refer to the software's help system.

26.7.1 Supported Barcodes

The VS200 system is able to detect barcodes on the label area of slides. It supports 1D and 2D barcodes of the following types:

1D types	Codabar
	Code 39
	Code 128
	EAN-8
	EAN-13
	GS1 Databar
	GS1-128
	Interleaved 2 of 5
	UPC-A
	UPC-E
2D types	Data Matrix
	PDF-417
	QR Code

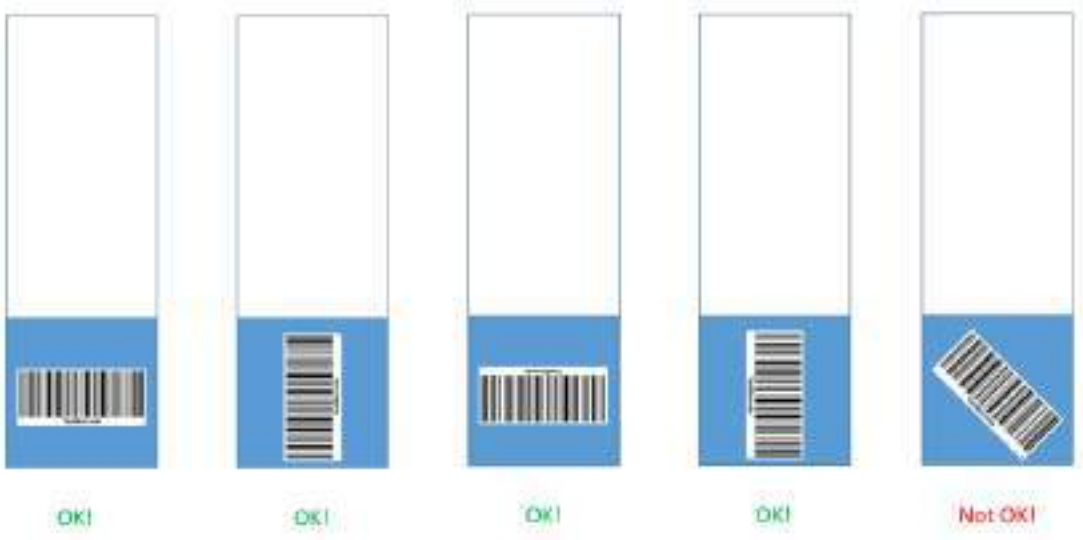
26.7.2 Barcode quality and orientation

It is recommended to print the barcode with a professional label printer of sufficient resolution. A minimum resolution of 300 DPI is strongly recommended.

In any case, the user must choose appropriate label printing settings and label paper to ensure a sufficient barcode quality.

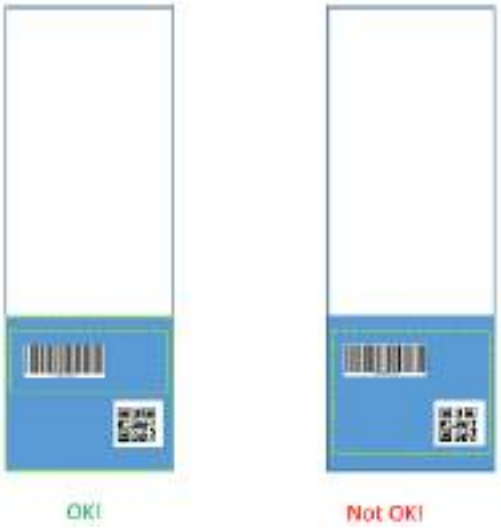
When putting the barcode on the slide, it must not be rotated / tilted too much with respect to the slide edges.

The VS200 system supports all orthogonal barcode directions (with a tolerance of +/- 12 degrees). The system might not be able to correctly detect the barcode if the rotation is larger. See the following figure.



26.7.3 Restrictions

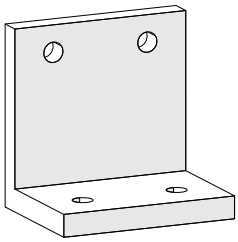
Using multiple barcodes on the same label is not supported by the system. If the system detects multiple barcodes in the configured label area, it will only keep the barcode with the highest, automatically determined confidence. It will output a warning message (in batch scans, this message is written to the log file as well).



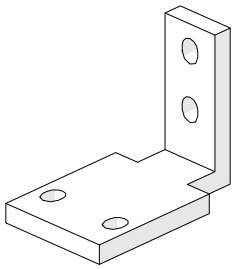
27 Preparing the system for transportation

27.1 Mounting the transportation lock on the VS200 loader's tray hotel

The units described below must be assembled and adjusted by Olympus. If these units are assembled or adjusted by the customer, the operations are not ensured.



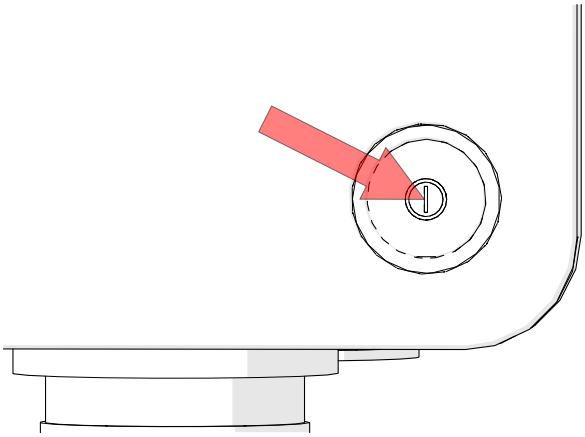
Transportation lock (1)



Transportation lock (2)

» Hex screwdriver (size 3 mm)

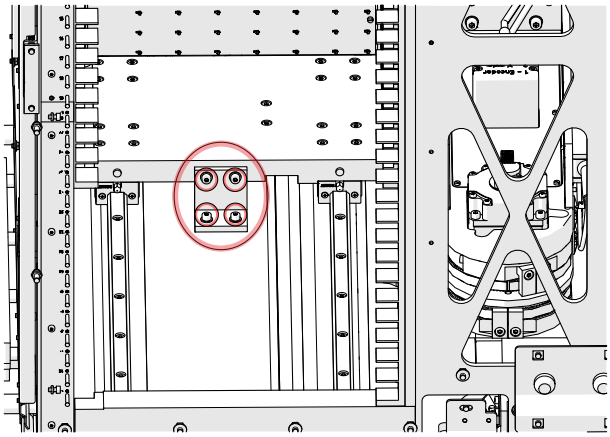
1. Switch the VS200 system off using the main power switch and disconnect the system from the power supply. To do so, disconnect the external power supply unit from the power supply.



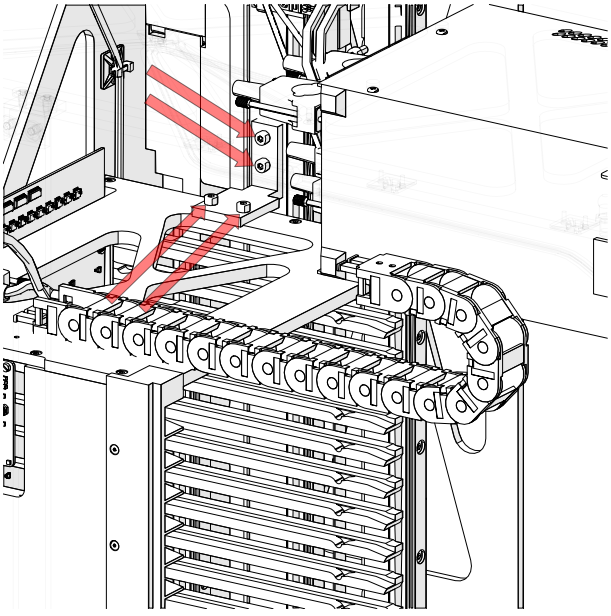
2. Remove the housing.
3. Move the VS200 tray hotel into the park position all the way at the back. To do so, grasp the bottom plate of the VS200 tray hotel.

Make sure that the gripper that is attached to the SCARA robot arm doesn't collide with the tray hotel.

4. Attach the transportation locks to the tray hotel. To position the transportation locks, refer to the following figures. Use the 4 hex screws (size 3 mm hex screwdriver) to attach the lower transportation lock to the tray hotel as well as to the bottom panel of the VS200 loader.

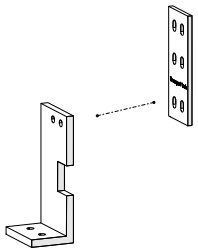


5. Now attach the upper transportation lock that connects the top right of the tray hotel with the right of the frame. To do so, use the 4 hex screws (size 3 mm hex screwdriver) indicated in the figure.



27.2 Mounting the transportation lock on the SCARA robotic arm

The units described below must be assembled and adjusted by Olympus. If these units are assembled or adjusted by the customer, the operations are not ensured.

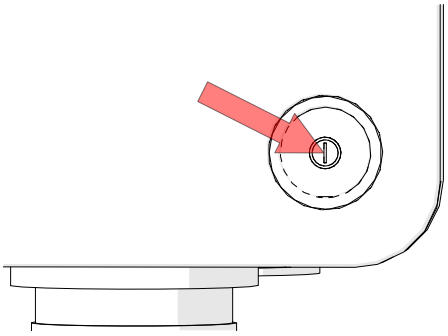


Transportation locks (3) and (4)

ATTENTION
The transportation locks must be remounted each time before the unit is transported. Make absolutely sure not to lose the transportation locks and the mounting material.

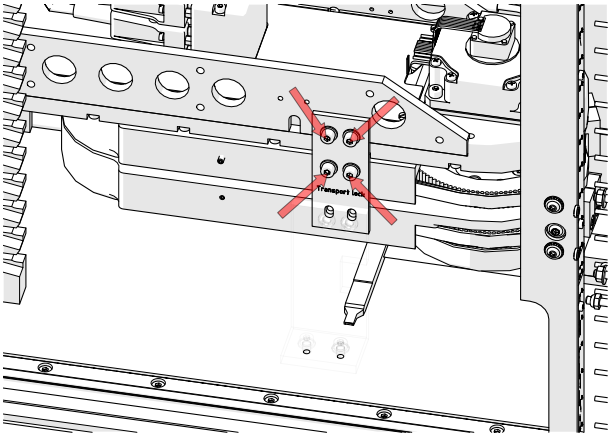
» Hex screwdriver (size 3 mm)

1. Switch the VS200 system off using the main power switch and disconnect the system from the power supply. To do so, disconnect the external power supply unit from the power supply.

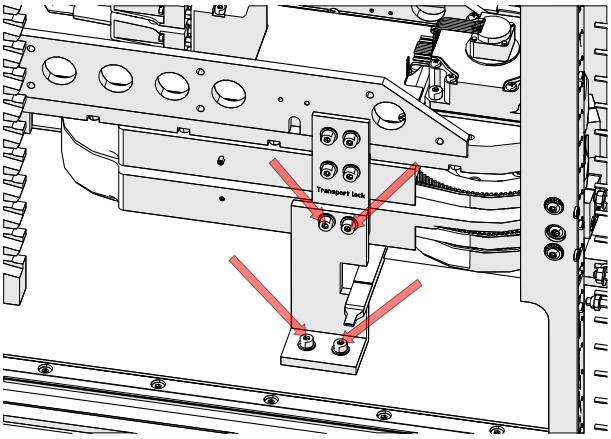


2. Manually move the SCARA robot arm to the right. Move the three parts of the arm so that they are stacked vertically. To move the SCARA robot arm, grasp the segments of the arm.

3. Use the 4 hex screws (size 3mm hex screwdriver) to attach the upper part of the transportation lock.

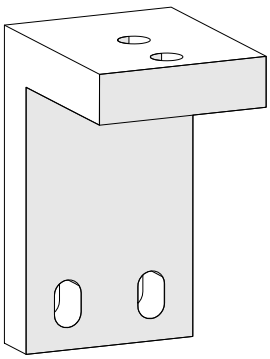


4. Use the 4 hex screws (size 3 mm hex screwdriver) to attach the lower part of the transportation lock.



27.3 Mounting the transportation lock on the counterweight of the SCARA robotic arm

The units described below must be assembled and adjusted by Olympus. If these units are assembled or adjusted by the customer, the operations are not ensured.

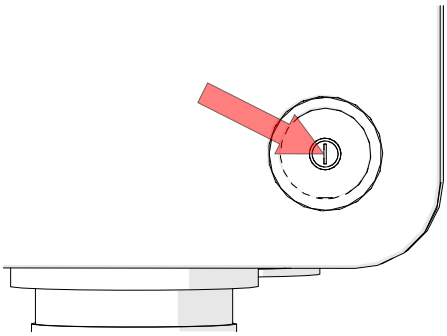


Transportation lock (5)

ATTENTION
The transportation locks must be remounted each time before the unit is transported. Make absolutely sure not to lose the transportation locks and the mounting material.

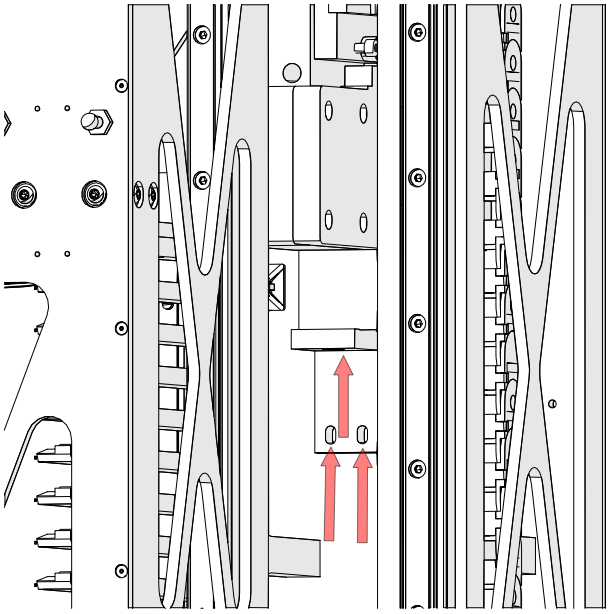
» Hex screwdriver (size 3 mm)

1. Switch the VS200 system off using the main power switch and disconnect the system from the power supply. To do so, disconnect the external power supply unit from the power supply.



2. Remove the right housing side cover.
3. Mount the transportation lock to the SCARA robot arm first. See Mounting the transportation lock on the SCARA robotic arm on page 229.

4. Attach the transportation lock below the counterweight. Refer to the following figure to position the transportation lock correctly.



5. Use the 3 hex screws (size 3mm hex screwdriver) to attach the transportation lock.
6. Reconnect the VS200 scanner to the power supply.
7. Mount the housing.

28 Proper selection of the power supply cord

If no suitable power supply cord has been provided, please select an appropriate power supply cord with a certification mark by referring to the specifications and the table below.

Olympus is not responsible for damage caused by the use of uncertified power cords with Olympus devices.

Specifications

Voltage Rating	125V AC (for 100-120V AC area) or 250 V AC (for 220-240V AC area)
Rated current	9.5 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 - Certification marks for power cords

The power cord has to have a certification mark from one of the bodies listed in table 1 or it must use a cable that has been tested by a body that is listed in table 1 or table 2. The plug has to have at least one certification mark shown in table 1. If you are unable to acquire a cord tested by one of the bodies listed in table 1 in your country, please use a cord that has been tested by a comparable body in your country.

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

Table 2 - HAR Flexible cables

Certification body	Printed or embossed harmonization mark (on the plug or cable insulation)	
Comité Électrotechnique Belge (CEBEC)	CEBEC	<HAR>
VDE Verband der Elektrotechnik Elektronik Informationstechnik e.V.	<VDE>	<HAR>
Union Technique de l'Électricité (UTE)	USE	<HAR>
Istituto Italiano del Marchio di Qualità (IMQ)	IEMMEQU	<HAR>
British Approvals Service for Cables (BASEC)	BASEC	<HAR>
N.V. KEMA	KEMA-KEUR	<HAR>
SEMKO AB Svenska Elektriska Materielkontroll-anstalten	SEMKO	<HAR>
Österreichischer Verband für Elektrotechnik (ÖVE)	<ÖVE>	<HAR>
Danmarks Elektriske Materielkontrol (DEMKO)	<DEMKO>	<HAR>
National Standards Authority of Ireland (NSAI)	<NSAI>	<HAR>
Norges Elektriske Materiellkontroll (NEMKO)	NEMKO	<HAR>
Asociación Electrotécnica Española (AEE)	<UNED>	<HAR>
Hellenic Organization for Standardization (ELOT)	ELOT	<HAR>
Instituto Português da Qualidade (IPQ)	np	<HAR>
Schweizerischer Elektrotechnischer Verein (SEV)	SEV	<HAR>
Elektriska Inspektoratet	SETI	<HAR>

Underwriters Laboratories Inc. (UL)	SV, SVT, SJ oder SJT, 3 X 18AWG
Canadian Standards Association (CSA)	SV, SVT, SJ oder SJT, 3 X 18AWG

29 Declarations of conformity and disposal

29.1 CE Conformity (Europe)

This system complies to the requirements of the following European directives:

- Low Voltage Directive 2014/35/EU
- EMC Directive 2014/30/EU
- Machinery Directive 2006/42/EC
- Radio Equipment Directive (RED) 2014/53/EU

This system complies with the requirements of Directive 2014/30/EU concerning electromagnetic compatibility according to Standard IEC/EN61326-1.

- Emission: Class A
- Immunity: Applied to industrial environment requirements. Operation of this equipment in a residential area may cause interference.

29.2 WEEE declaration (Europe)

In accordance with the European directive on Waste of 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 authority in the EU for return and/or collection systems available in your country.

29.3 RoHS Conformity (Europe)

This product conforms with the European Union directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment 2011/65/EU.

29.4 FCC (USA)

Part 15 Clause 15.21

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

FCC Part 15.19(a) [interference compliance statement], unless the following statement is already provided on the device label:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

RF Exposure guidance to the user on what separation distance to the body/limbs the device must be operated in order to comply with FCC RF Exposure requirements.

FCC Supplier's Declaration of Conformity
Hereby declares that the product
Product name: Optical Microscope
Model Number: VS200
Confirms to the following specifications:
FCC part 15, Subpart B, Section 15.107 and Section 15.109
Supplementary Information:
This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
Responsible Party Name: Olympus Scientific Solutions Americas Corp.
Address: 48 Woerd Ave Waltham, MA 02453, U.S.A.
Phone Number: 781-419-3900

This device generates, uses, and can radiate radio frequency energy. If not installed and used in accordance with the instructions, it may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

1. Reorient or relocate the receiving antenna.
2. Increase the separation between the equipment and receiver.
3. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
4. Consult the dealer or an experienced radio/TV technician for help.

29.5 China RoHS conformity (China)

for China only

10

电器电子产品有害物质限制使用标志

本标志是根据"电器电子产品有害物质限制使用管理办法"以及"电子电气产品有害物质限制使用标识要求"的规定，适用于在中国销售的电器电子产品上的电器电子产品有害物质使用限制标志。
（注意）电器电子产品有害物质限制使用标志内的数字为在正常的使用条件下有害物质有不泄露的期限，不是保证产品功能性能的期间。

产品中有害物质的名称及含量

部件名称		有害物质					
		铅及其化合物 (Pb)	汞及其化合物 (Hg)	镉及其化合物 (Cd)	六价铬及其化合物 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
主体	机构部件	×	○	○	○	○	○
	光学部件	×	○	○	○	○	○
	电气部件	×	○	○	○	○	○
附件		×	○	○	○	○	○

本表格依据SJ/T 11364的规定编制。
○：表示该有害物质在该部件所有均质材料中的含量均在GB/T 26572规定的限量要求以下。
×：表示该有害物质至少在该部件的某一均质材料中的含量超出GB/T 26572规定的限量要求。

29.6 RFID (Canada)

ISED notice:

This device complies with Industry Canada's licence-exempt RSSs. Operation is subject to the following two conditions:

(1) This device may not cause interference; and

(2) This device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

1) l'appareil ne doit pas produire de brouillage;

2) l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement."

29.7 Korea

본 기 기 는 통 상 이 용 상 태 의 경 우 인 체 (머 리 , 몸 통)와 20cm 초 과 하 는 거리 에 서 사 용 되 어 야 합 니 다 .

Manufacturer and Registrant:	Olympus Soft Imaging Solutions GmbH, Germany
기자재명칭(제품명칭) Equipment Name	미약 전계강도 무선기기 Weak electric field strength wireless device

Basic Model Number:	VS200-BU
Series Model Number:	VS200-BU-L
Registration No.:	R-R-OIS-VS200-BU

Basic Model Number:	VS200-LOADER
Registration No.:	R-R-OIS-VS200-LO

29.8 IMDA (Singapore)

Complies with IMDA Standards.

29.9 NCC (Taiwan)

低功率射頻器材技術規範3.8.2警語

取得審驗證明之低功率射頻器材，非經核准，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。低功率射頻器材之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。前述合法通信，指依電信管理法規定作業之無線電通信。低功率射頻器材須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

Without permission granted by the NCC, any company, enterprise, or user is not allowed to change frequency, enhance transmitting power or alter original characteristic as well as performance to a approved low power radio-frequency devices. The low power radio-frequency devices shall not influence aircraft security and interfere legal communications; If found, the user shall cease operating immediately until no interference is achieved. The said legal communications means radio communications is operated in compliance with the Telecommunications Management Act. The low power radio-frequency devices must be susceptible with the interference from legal communications or ISM radio wave radiated devices.

VS20-BU (VS200-BU)	CCAO21LP0470T5
VS20-BU-L (VS200-BU-L)	CCAO21LP047AT7
VS20-LOADER (VS200-LOADER)	CCAO21LP0480T8

For VS20-LOADER (VS200-LOADER) only - Warnings for Class A:

「減少電磁波影響，請妥適使用」

警告使用者： 這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求采取某些適當的對策。

29.10 UKCA (United Kingdom Conformity Assessed)

Complies with the relevant UK legislation.

30 Support

If you have any questions or problems that you can not resolve with the help of this manual, please contact your local service organization.

OLYMPUS

www.olympus-global.com

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