Instruction Manual

ZEISS Autoimmersion Module

Automatic Water Immersion for Demanding Long-Term Experiments

ZEISS Autoimmersion Module

Original Manual

Carl Zeiss Microscopy GmbH
Carl-Zeiss-Promenade 10
07745 Jena
Germany
info.microscopy.de@zeiss.com
www.zeiss.com/microscopy

UK Importer
Carl Zeiss Ltd
1030 Cambourne Business Park, Cambourne
CB23 6DW Cambridge
United Kingdom

Carl Zeiss Microscopy GmbH
Carl-Zeiss-Promenade 10
07745 Jena
Germany

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Table of Contents

1 About this Instruction Manual

This Instruction Manual (further called "document") is considered to be part of the Autoimmersion Module, herein after referred to as "product".

This document contains basic steps and safety information that must be observed during operation and maintenance. Therefore, the document must be read by the operator prior to commissioning and must always be available at the place of use of the product.

This document is an essential part of the product and, if the product is resold, the document must remain with the product or be handed over to the new owner.

1.1 Text Conventions and Link Types

Explanation	Example
Software controls and GUI elements.	Click **Start**.
Hardware controls and elements.	Press the **Standby** button.
Key on the keyboard.	Press **Enter** on the keyboard.
Press several keys on the keyboard simultaneously.	Press **Ctrl + Alt + Del**.
Follow a path in the software.	Select **Tools > Goto Control Panel > Airlock**.
Text to be entered by the user.	Enter *example.pdf* in this field.
Anything typed in literally during programming, for example macro codes and keywords.	Enter `Integer` in the console.
Link to further information within this document.	See: *Text Conventions and Link Types [▸ 5]*.
Link to a website.	https://www.zeiss.com

1.2 Explanation of Warning Messages and Additional Information

DANGER, WARNING, CAUTION, and NOTICE are standard signal words used to determine the levels of hazards and risks of personal injury and property damage.

Always observe the safety and warning messages in **all** chapters of this document. Failure to comply with these instructions and warnings may result in personal injury, property damage, and the loss of any claims for damages.

The following warning messages indicating dangerous situations and hazards are used in this document.

⚠ DANGER

Type and source of danger

DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING

Type and source of danger

WARNING indicates a potentially hazardous situation which, if not avoided, may result in death or serious injury.

⚠ CAUTION

Type and source of danger

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

NOTICE

Type and source of danger

NOTICE indicates a potentially harmful situation which, if not avoided, may result in property damage.

Info

Provides additional information or explanations to help the operator better understand the contents of this document.

1.3 Explanation of Symbols

Symbol	Explanation
	CE marking (Conformité Européene)
	UKCA marking (UK Conformity Assessed)
	Manufacturer
	Date of manufacture
	Serial number
	Catalogue number
	WEEE label: Do not discard as unsorted waste. Send to separate collection facilities for recovery and recycling

Tab. 1: Explanation of symbols

1.4 Further Applicable Documents

Brochures and Certificates

For brochures, declarations of conformity, and other approval certificates ask your ZEISS Sales & Service Partner.

Local and National Health and Safety Regulations

Observe local and national health and safety regulations for the location of installation and during the use of the product.

Consult with your ZEISS Sales & Service Partner if these regulations are in conflict with the installation requirements of the product.

Software

For detailed information on how to use ZEN, refer to its manual (e.g. Online Help, Software Manual) or ask your ZEISS Sales & Service Partner.

Instruction Manuals

For detailed information refer to the following Instruction Manuals of:

- Software ZEN (blue edition) (online version)
- Axio Observer
- Peripheral devices
- User PC and monitor
- Illumination units (e.g. HBO 100, X-Cite XYLIS II, Viluma 7, VIS-LED)
- Incubation system (e.g. PeCon, Ibidi)
- Definite Focus 3
- Apotome 3
- Microscope stage control (e.g. SMC 2009)
- LSM 900/980, ELYRA

1.5 Contact

If you have any questions or problems, contact your local ZEISS Sales & Service Partner or one of the following addresses:

Headquarters

Phone:	+49 1803 33 63 34
Fax:	+49 3641 64 3439
Email:	info.microscopy.de@zeiss.com

Microscopy Courses, Training, and Education

For information on microscopy courses, training, and education visit the ZEISS Academy Microscopy (https://www.zeiss.com/microscopy/en/service-support/training-education/academy-microscopy.html).

ZEISS Portal

The ZEISS Portal (https://portal.zeiss.com/) offers various services that simplify the daily work with your ZEISS systems (machines and software).

Service Germany

Phone:	+49 7364 20 3800
Fax:	+49 7364 20 3226
Email:	service.microscopy.de@zeiss.com

2 Safety

This chapter contains general requirements for safe working practices. Any person using the product or commissioned with installation or maintenance must read and observe these general safety instructions. Knowledge of basic safety instructions and requirements is a precondition for safe and fault-free operation. Operational safety of the supplied product is only ensured if it is operated according to its intended use.

If any work is associated with residual risks, this is mentioned in the relevant parts of this document in a specific note. When components must be handled with special caution, they are marked with a warning label. These warnings must always be observed.

Improper use of the product can easily lead to impairment of their function or even damage them. Damage caused by incorrect operation, negligence, or unauthorized intervention, in particular by removing, modifying, or replacing parts of the product, cannot be held liable by the device manufacturer. Third-party devices or components that are not expressly approved by ZEISS may not be used.

2.1 Intended Purpose

The Autoimmersion Module is an accessory for the Axio Observer 7 microscope and supports its intended purpose. The Autoimmersion Module automatically generates and maintains a film of water immersion liquid between the sample carrier and the microscope objective.

2.2 General Safety Information

This document must be read before commissioning in order to ensure safe and uninterrupted operation. Pay particular attention to all listed safety notes. Make sure, that

- the operating personnel has read and understood this manual, associated documents, and particularly all safety regulations and instructions, and applies them.
- the local and national safety and accident prevention regulations must be observed, as well as the applicable laws and regulations in your country.
- this document is always available at the place of use of the product.
- the product is always in perfect condition.
- in case of defect or damage, the affected parts and the product are taken out of operation immediately and are secured against unintentional use.
- the product is secured against access by unauthorized persons.
- maintenance and repair work, retrofitting, removal or replacement of components, as well as any other intervention in the product not described in this document, may only be carried out by the manufacturer ZEISS or persons expressly authorized by ZEISS to do so.

2.2.1 Requirements for Operators

The product, components, and accessories may only be operated and maintained by authorized and trained personnel. The product may only be used in accordance with this document. If the product is not used as described, the safety of the user may be impaired and/or the product may be damaged.

Any unauthorized intervention or use other than within the scope of the intended use shall void all rights to warranty claims. The regional regulations on health protection and accident prevention must be observed at all times and during all work on and with the product.

Training Authorized ZEISS personnel will provide basic training in operating the product, as well as information on equipment safety and maintenance work that can be conducted by the operator. The training will be documented by ZEISS and its completion is to be confirmed by the operator.

Special application training is offered for a fee. Current training dates, additional information and the registration form can be found at https://www.zeiss.com/microscopy/en/service-support/training-education/academy-microscopy.html.

2.2.2 Safe Operating Condition

If circumstances occur which impair safety and cause changes in operating behavior, the microscope and its components must be shut down immediately and a ZEISS service representative should be informed.

The microscope and its components may only be operated after correct installation by a ZEISS service representative and if the operating conditions are adhered to.

- Do not operate the microscope and its components until you have completely read and understood the entire documentation.
- Make sure that all protective cover panels are installed and all warning labels are available and legible.
- Ensure conditions and take measures to prevent the build up of electrostatic charge on the workplace.

2.2.3 Order and Use of Spare Parts

Using spare parts that are not provided by ZEISS can be hazardous or can lead to property damage.

- Unless authorized by ZEISS, all spare parts should be installed by a ZEISS service representative.
- Contact your ZEISS service representative for information on spare parts order.
- Only genuine parts supplied by ZEISS are to be used in servicing the microscope and its components.

2.2.4 EMC Information

The product is intended to be used in a basic electromagnetic environment.

The product complies with the emission and immunity requirements as a CISPR 11 / EN 55011 / class A group 1 system according to IEC 61326-1. Emissions, which exceed the levels required by CISPR 11 / EN 55011, can occur when the product is connected to other devices.

The following EMC user notice is for Korea only:

기종별	사용자안내문
A급기기(업무용방송통신기자재)	이기기는업무용(A급) 전자파적합기기로서 판매자또는사용자는이점을주의하시기바라며, 가정용 환경에서 사용하는 경우 전파간섭의 우려가 있습니다.

2.3 Prevention of Hazards

This section summarizes potential hazards and recommended safety precautions. Failure to follow the safety instructions and instructions may result in personal injury and property damage.

2.3.1 Mechanical Hazards

Crushing Hazards due to Motorized Components

The microscope contains motorized components. Fingers could be trapped. Do not reach into the working area of motorized components when they are in operation.

2.3.2 Electrical Hazards

Voltage Hazards

Risk of electric injury (shock or burn) in case of contact with live parts.

- Only connect electrical components that are authorized by ZEISS.
- Always use the power cords supplied by ZEISS. When an unsuitable power cord is used, ZEISS can no longer guarantee the electrical safety and functionality of the product.
- Detachable mains supply cords must not be replaced with inadequately rated cords.
- The product must be plugged into a properly installed power socket with protective earth contact using the supplied power cord. The protective earth connection must not be impaired by the use of extension cables.
- Set up and operate the product and its components so that the power cable and all connectors can be easily disconnected at any time.
- Disconnect all power supply units and power cords before cleaning.
- Safe disconnection of the product from the mains supply is ensured exclusively by pulling the power plug.
- Shut down the product whenever it is not used.

2.3.3 Hazards Generated with the Operating Environment

Dirt, Dust, and Moisture

Dirt, dust, and moisture can impair the microscope's functionality.

- Shut down the microscope whenever it is not used and cover it with a dust protection cover.
- Always cover unused openings/ports with the corresponding system component or with blind caps.
- Perform regular maintenance and cleaning according to the instructions in this manual.
- Make sure that no cleaning liquid or moisture gets inside the microscope.
- Make sure that the electrical parts never come into contact with moisture.
- Never expose the microscope to inadmissible climate conditions (high humidity and temperature).

2.3.4 Hazards Generated by Materials and Substances

Hazard of Smoke Inhalation

Turning the nosepiece manually impairs the nosepiece turning control preventing the turning of the nosepiece over 360°. Therefore, the tubing of the autoimmersion can be unplugged or destroyed. Immersion liquid may enter the microscope and cause short circuits that lead to smoke development.

- Do not turn the nosepiece manually, use the motorized function for safe operation.

Consumable Hazards

Incorrect handling of consumables and cleaning agents can lead to property damage or skin and eye injuries. Consumables that are not approved by ZEISS can lead to property damage. Consult your ZEISS Sales & Service Partner to learn what consumables you can order and how to handle them.

2.3.5 Hazards generated by Radiation

Laser Radiation Hazards

When using the Autoimmersion Module on the Axio Observer 7 with laser coupling (e.g. Zeiss LSM systems), the pipette must not be pressed into the laser beam by manual handling on the objective. Laser light can be scattered and lead to eye damage.

2.4 Labels and Lights

This chapter shows labels and, where applicable, indicator lights.

All parts that may pose specific hazards are marked with warning labels.

Always observe **all** warning labels!

- Check all warning labels for availability and legibility.
- Immediately replace damaged or illegible warning labels.

In case a label is missing, contact your ZEISS service representative for free of charge replacement.

2.4.1 Labels on the Autoimmersion Module

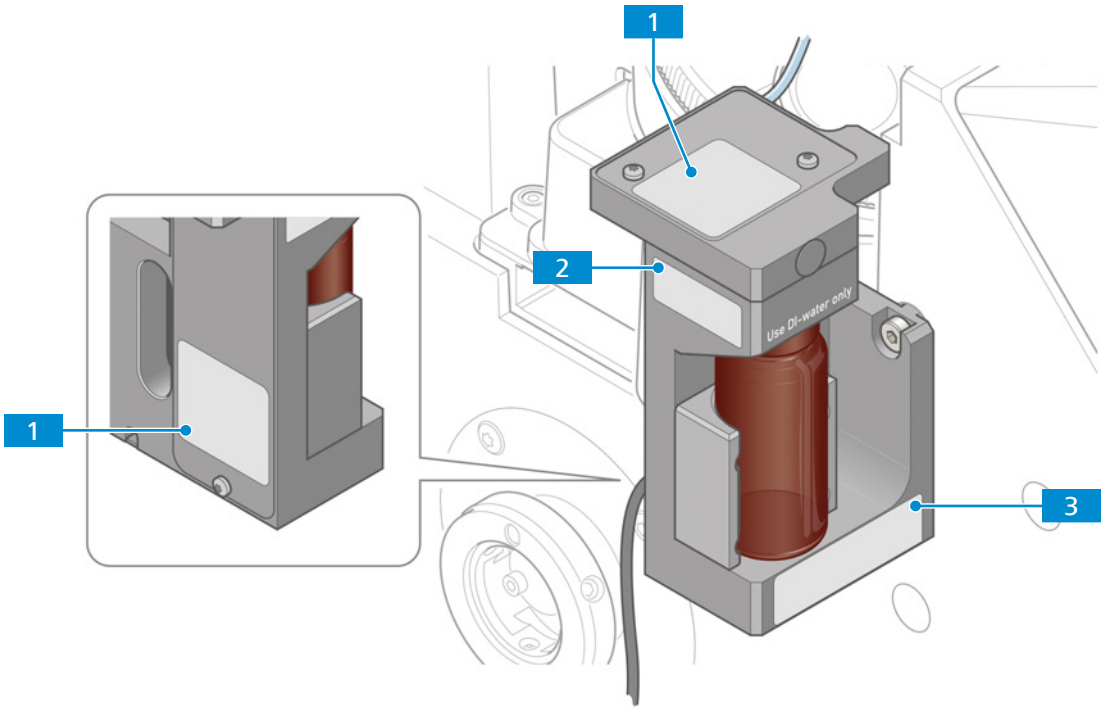
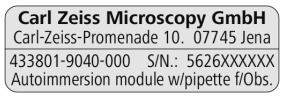


Fig. 1: Labels on the Autoimmersion Module

Pos.	Label or light	Explanation
1		Caution Dangerous voltage when open Do not remove cover

Pos.	Label or light	Explanation
2		Serial number label
3		Type label
*		Crushing Hazards Fingers may be pinched! * Label is placed on the microscope stage.

3 Product and Functional Description

The Autoimmersion Module automatically generates and maintains a film of water immersion liquid between the sample carrier and the microscope objective. The equipment comprises a pump module for supplying the immersion fluid from a liquid reservoir onto the front lens of the objective.

Info

For additional information and detailed descriptions, refer to further applicable documents or ask your ZEISS Sales & Service Partner.

3.1 Main Components

The Autoimmersion Module consists of the following main components:

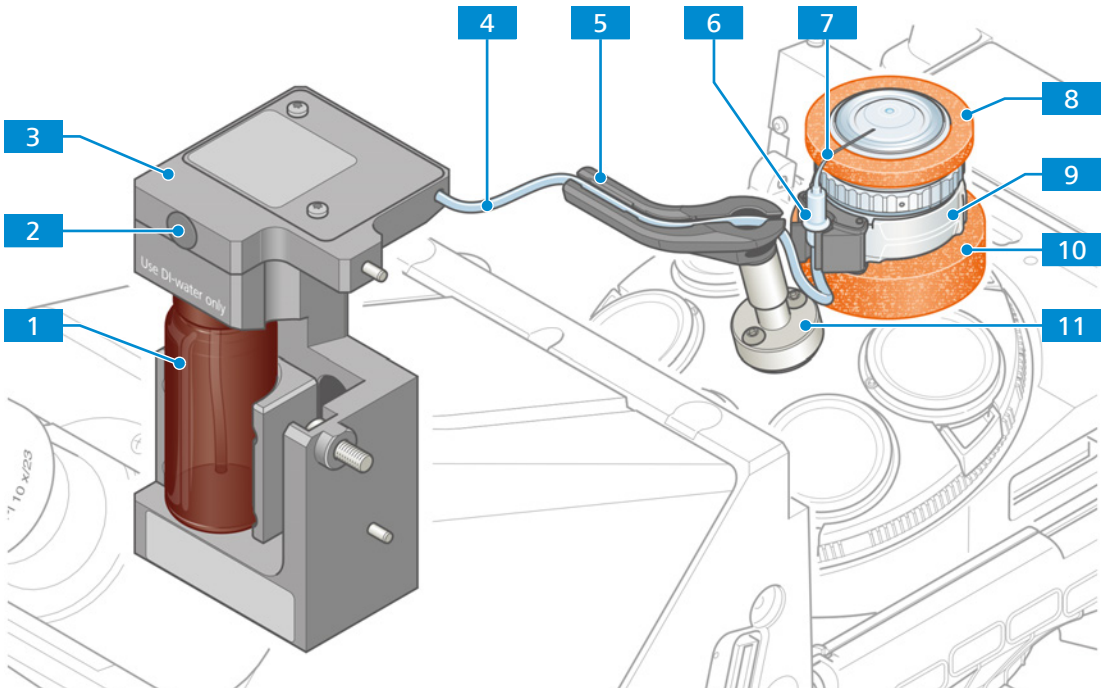


Fig. 2: Main components

1	Liquid reservoir	2	Opening for refilling tube
3	Pump module	4	Tube
5	Tube holder for nosepiece, upper part	6	Adapter for feed pipette
7	Feed pipette with tube	8	Upper water absorption ring
9	Objective ring	10	Lower water absorption ring
11	Tube holder for nosepiece, lower part		

3.2 Software Description

The ZEN (blue edition) software is released with a special version of Windows and a patch.

The following software versions are required:

- Axio Observer 7: firmware version 02.721 or higher
- ZEN (blue edition): version 3.7 or higher

Info

Further information on the software and its operation is available in the software's online help.

3.3 Control Functions on the TFT Display

Function The TFT display offers control functions for the Autoimmersion Module.

Position These control functions can be accessed via **Home > Microscope > Control > Objectives**.

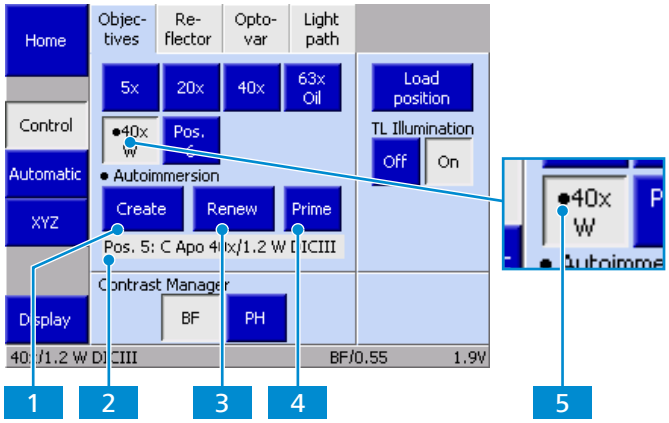


*Fig. 3: Immersion control buttons on the **Objectives** tab*

No.	Parameter	Description
1	**Create** button	To create the first-time immersion, an amount of water is injected which can be set individually for each objective (see *Setting the Amount of Fluid for the Create Immersion Function [▸ 24]*).
2	Display field	Display of the current nosepiece position and the objective type.
3	**Renew** button	A unified dose of water will be injected (this dose is preset and corresponds to approximately 5 µl) to compensate for losses in the immersion column. **Renew** differs from **Create** only in the amount of water used.
4	**Prime** button	This function is primarily used to fill a dry system with water or to prime a system (see *Preparing Immersion [▸ 27]*). It can also be used to rinse/clean the system.
5	Black circle	Marking of the autoimmersion position and the assigned objective.

4 Installation

Perform only the installation work described in this document. All other installation work not described may only be carried out by an authorized ZEISS service representative.

4.1 Assembling the Autoimmersion Module for Maintenance and Cleaning

⚠ CAUTION

Crushing hazard due to moving parts

When assembling the product and its components, fingers can be trapped.

- Switch off the microscope prior to assembling or removing components.
- Do not reach into the working area.

Info

The tube holder on the nosepiece must be assembled by a ZEISS service representative.

Procedure

1. Switch off the microscope.
2. Remove the microscope stage.
3. *Assemble the pump module [▸ 16]*.
4. *Preparing the autoimmersion tube with syringe [▸ 19]*.
5. *Assemble the objective ring [▸ 20]*.
6. *Assemble [▸ 21]* and *align [▸ 22]* the feed pipette.
7. *Select the Autoimmersion Objective [▸ 23]*.
8. *Set the Amount of Fluid [▸ 24]*.
9. *Perform priming with the TFT settings [▸ 29]*.

4.1.1 Assembling the Pump Module

Parts and Tools

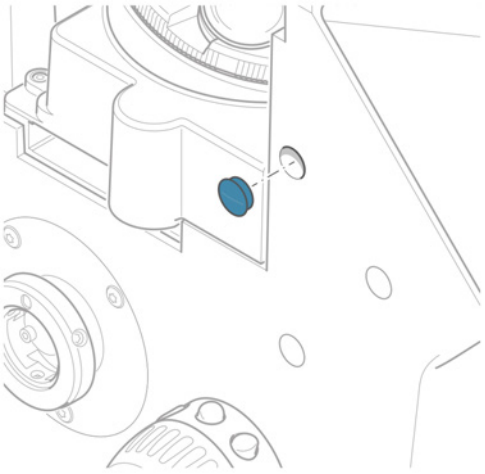
- Hex key, 3.0 mm

Prerequisite

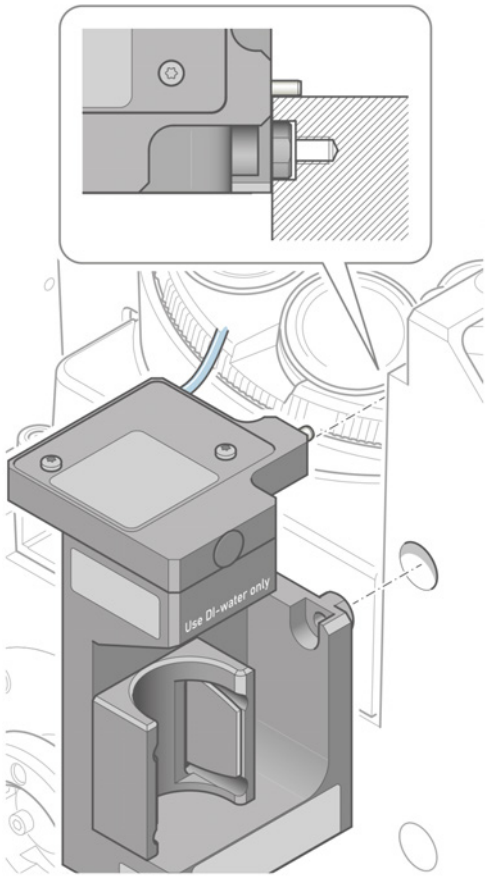
- ✓ The stage is removed from the stand.
- ✓ The microscope is switched off.

Procedure

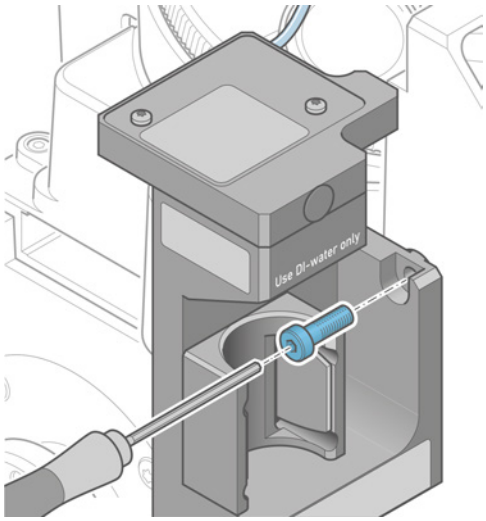
1. Remove the protective cap from the hole on the left side of the stand.



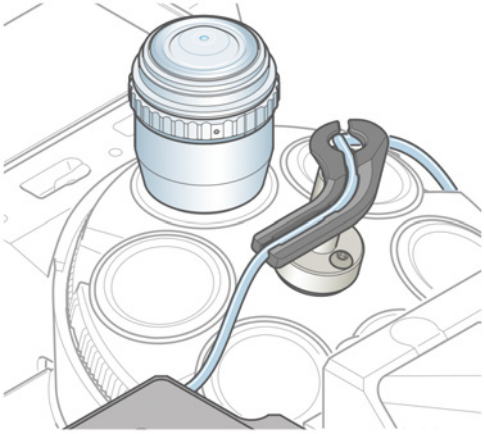
2. Place the pump module so that the lower pin is in contact with the stand.



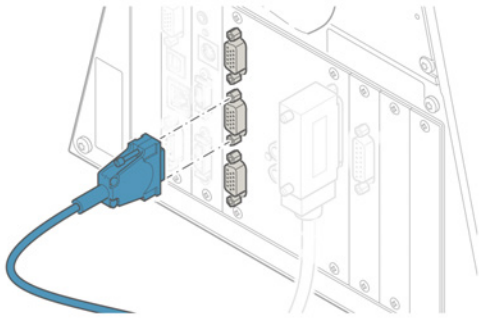
3. Fix the pump module with screw M5x16.



4. *Lead the tube through the tube holder [▸ 36].*
NOTICE **Malfunction due to tight tube routing. The length of tube section between pump module and upper tube holder has to be ~55 mm, to ensure that the tube doesn't get under tension when the nosepiece is turning or moving up and down.**



5. Connect the cable of the pump module to a CAN socket at the rear side of the stand.



6. Tighten the fixing screws on the plug.
7. Assemble the microscope stage.
8. Switch on the microscope.

Proceed in the reverse order for removal.

4.1.2 Filling the Liquid Reservoir

Info

If an incubator XL is installed to the microscope, proceed as described in *Refilling the Liquid Reservoir [▸ 31]*.

NOTICE

Property damage due to incorrect immersion fluid

Salt, dirt, or particles may clog and damage the components.

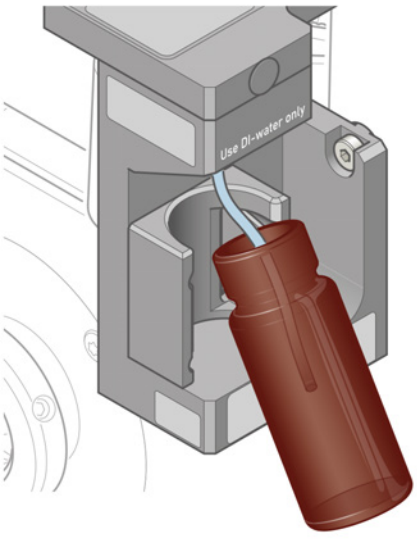
- Use only distilled water, no other liquids.

Parts and Tools

- Distilled water

Procedure

1. Remove the liquid reservoir.



2. Remove the tube from the liquid reservoir.
3. Fill the liquid reservoir with ~25 ml distilled water.
4. Insert the tube into the liquid reservoir.
5. Insert the liquid reservoir into the pump module.

Info

How To - Fill the Liquid Reservoir

In this tutorial, our service experts show you how to fill the liquid reservoir for the first time with simple steps. For service, support and general contact visit www.zeiss.com/microscopy/en/service-support.html.

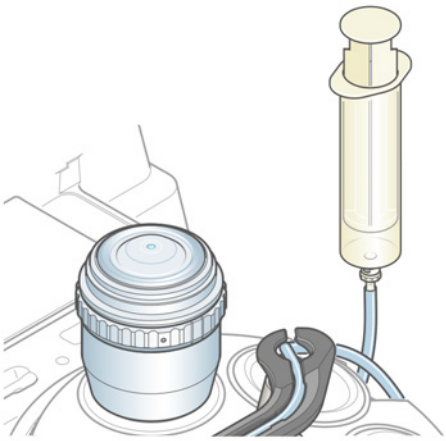
4.1.3 Preparing the Tube with a Syringe

Prerequisite

- ✓ The liquid reservoir is *filled with distilled water [▸ 18]*.
- ✓ The feed pipette is not installed.
- ✓ The adapter for feed pipette is installed to the end of the tube.
- ✓ The syringe is equipped with Luer-Lock to tube adapter with a short piece of tube.

Procedure

1. Connect the syringe to the adapter for feed pipette.



2. Suck the air bubbles with some water (at least 5 ml) into the syringe.
   NOTICE **Do not apply too high forces as this can damage the pump or result in formation of air bubbles. Do not press air or water into the tube.**
3. Remove the syringe.
4. Perform further priming with the TFT **Prime** button or with ZEN.

4.1.4 Assembling the Objective Ring

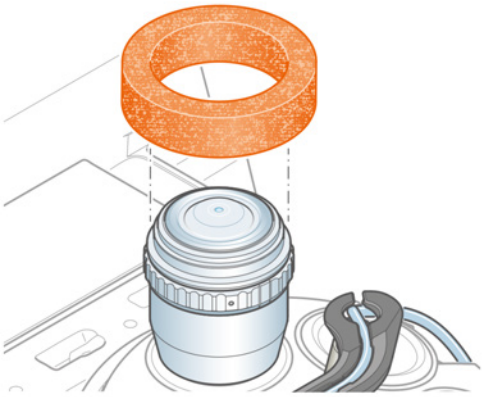
Prerequisite

✓ The pump module is *installed [▸ 16]*.

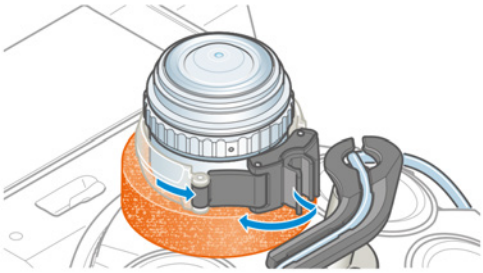
✓ The autoimmersion objective is installed to the nosepiece.
Consult the *table [▸ 44]* for recommended objectives for Autoimmersion Module applications. One of the objectives from the list should be available and installed at the nosepiece.

Procedure

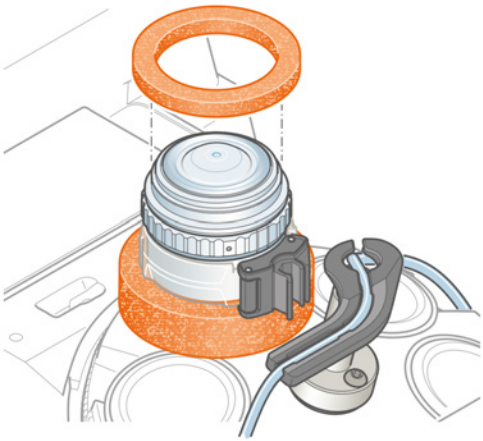
1. Rotate the autoimmersion objective into the light path.
2. Put the lower water absorption ring onto the objective so that it sits on the nosepiece directly and no free space is visible at the objective.



3. Position the objective ring onto the objective with the arrows pointing upwards ↑↑. Clamp the objective ring by closing it in the indicated direction.
NOTICE **To ensure proper functioning of the correction objective, the objective ring must be as high as possible, but the correction ring of the objective must still rotate freely.**



4. Put the upper water absorption ring onto the objective.



Proceed in the reverse order for removal.

Info

How To - Install the Objective Ring

In this tutorial, our service experts show you how to install the objective ring with simple steps. For service, support and general contact visit www.zeiss.com/microscopy/en/service-support.html.

4.1.5 Assembling the Feed Pipette

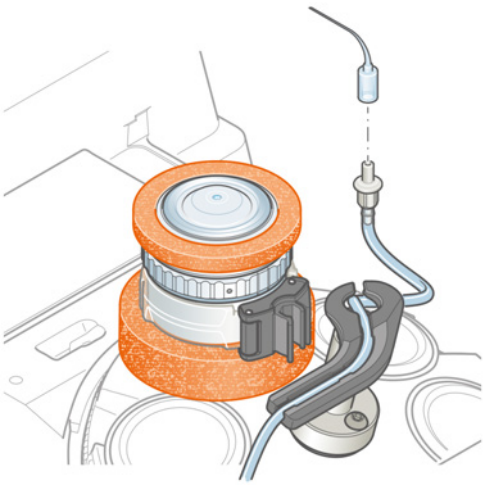
Prerequisite

✓ The objective ring is *installed [▸ 20]*.

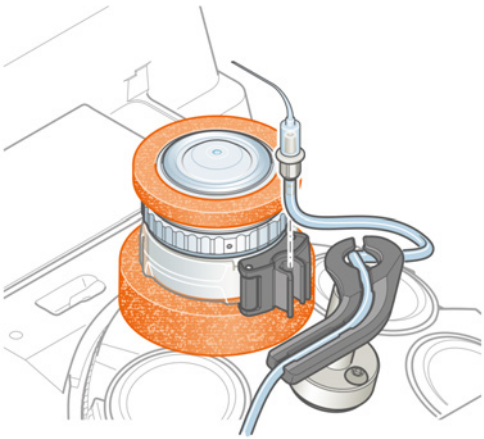
✓ The absorption rings are installed.

Procedure

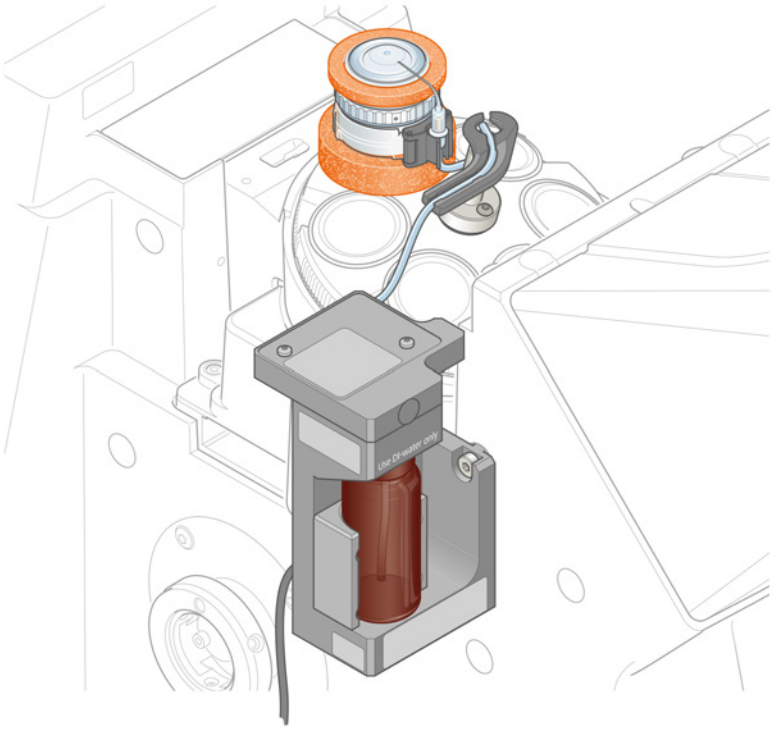
1. Connect the feed pipette to the adapter for feed pipette.
   Make sure the feed pipette is fully pushed onto the connector. The feed pipette must be pushed all the way down.



2. Insert the adapter with feed pipette into the objective ring holder.



3. *Align the feed pipette with the front lens of the objective [▸ 22]*.

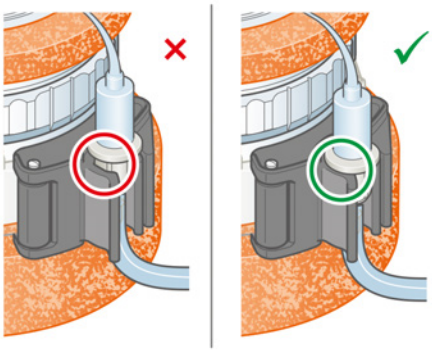


4.1.6 Aligning the Feed Pipette

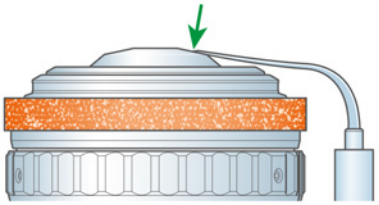
Prerequisite ✓ The feed pipette is *installed [▸ 21]*.

Procedure

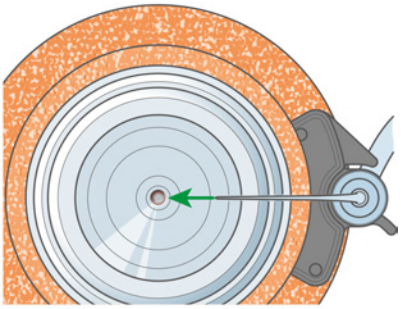
1. Ensure that the adapter is pushed all the way down.



2. Ensure that the feed pipette tip has contact to the objective surface.
   For fine adjustment, the positions of the feed pipette on the adapter and of the objective ring on the objective can be adjusted.



3. Align the feed pipette tip with the center of the objective front lens.



4.2 Selecting the Autoimmersion Objective

NOTICE

Property damage due to incorrect configuration settings

When changing the position of the objective with autoimmersion in the nosepiece, the firmware cannot recognize it automatically.

- Update the configuration settings when changing the autoimmersion position.
- Check the configuration settings after changing the hardware configuration of the microscope.

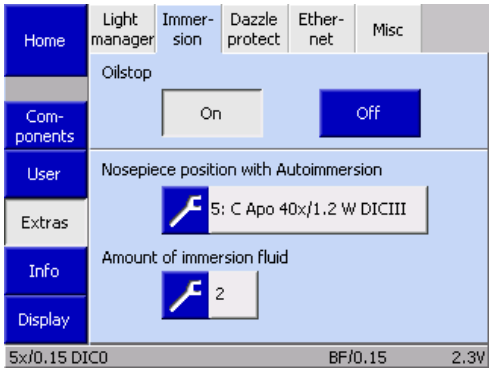
Prerequisite

✓ The Autoimmersion Module is installed.

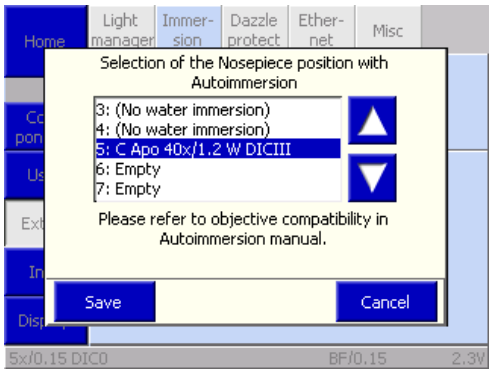
✓ A *compatible objective [▸ 44]* for autoimmersion is installed.

Procedure

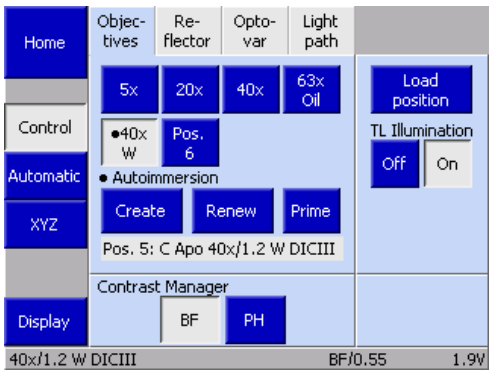
1. Switch on the microscope.
2. On the TFT, select **Home > Settings > Extras > Immersion**.



3. Press the button below **Nosepiece position with Autoimmersion**.
   → A pop-up window opens.
4. Use the **arrow keys** to select the objective position with the autoimmersion set up, which will be used for autoimmersion experiments.



5. Press **Save**, otherwise the selected objective with autoimmersion is not changed.
   → The selected objective is marked on the TFT with a black circle.



4.3 Setting the Amount of Fluid for the Create Immersion Function

Parts and Tools

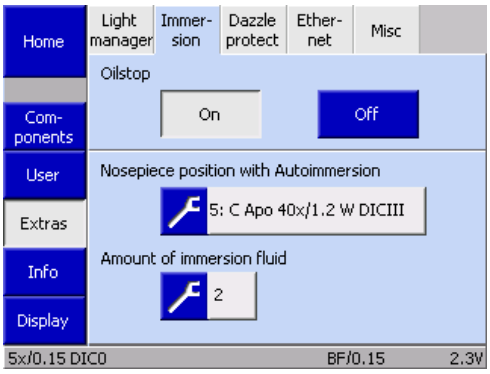
- Lint-free tissues

Prerequisite

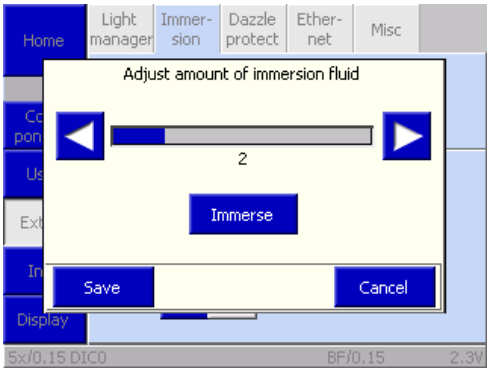
- ✓ The Autoimmersion Module is installed.
- ✓ The liquid reservoir is *filled [▸ 18]*.
- ✓ A sample is positioned on the stage.

Procedure

1. Switch on the microscope.
2. On the TFT, select **Home > Settings > Extras > Immersion**.



3. Press the button below **Amount of immersion fluid**.
   → A pop-up window opens.
4. Use the **arrow keys** to select the amount of immersion fluid to be used for creating immersion. The setting can be 1 to 10.
   Info **The default setting is 2, which works for most objectives. For more information on setting this parameter, refer to the table in the Online Help.**



5. **NOTICE** **Property damage due to immersion fluid. The set amount of immersion fluid is dispensed immediately. Soak up with a lint-free cloth, if necessary.**
   Press **Immerse**.
   → The set amount is immersed.
6. Press **Save**, if the amount is adequate or the value for the used objective from the table is set.
   → The set amount is immersed when pressing the **Create** button.
7. Check the immersion layer. Proper volume of immersion is applied, when the space between lens and slide is slightly overfilled, with the sample in the focus of the objective. For recommended default values see *Overview of the Recommended Objectives [▸ 44]*.

Info

How To - Change Objective-Specific Settings

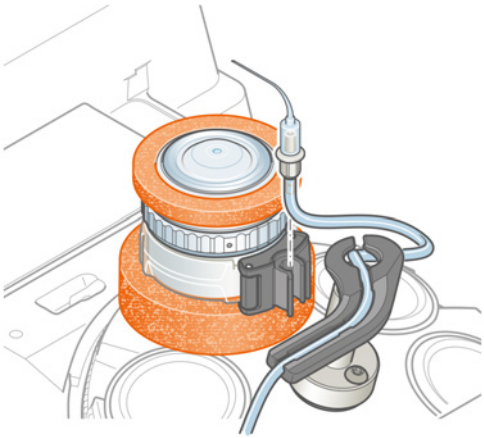
In this tutorial, our service experts show you how to change objective-specific settings with simple steps. For service, support and general contact visit www.zeiss.com/microscopy/en/service-support.html.

4.4 Assembling the Autoimmersion to Another Objective

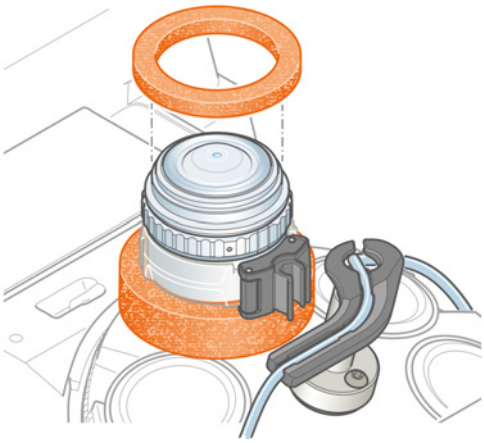
Prerequisite ✓ All components are accessible through the stage opening.

Procedure

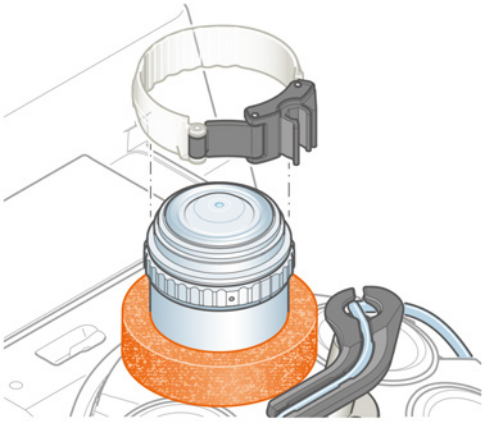
1. Remove the adapter with feed pipette from the objective ring holder.



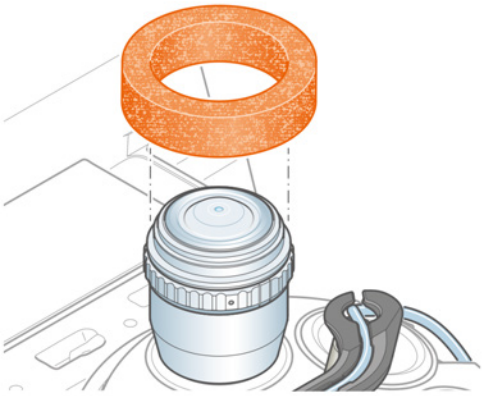
2. Remove the upper absorption ring.



3. Open the objective ring and remove it.



4. Remove the lower absorption ring.



5. Bring the new autoimmersion objective into the beam path.
6. Assemble the removed components to the desired objective in the reverse order.
7. *Align the feed pipette with the front lens of the objective [▸ 22]*.
8. *Change the firmware setting [▸ 23]*.
9. Restart the ZEN (blue edition) software.

Info

How To - Switch the Feed Pipette Between Objectives

In this tutorial, our service experts show you how to switch the feed pipette between objectives with simple steps. For service, support and general contact visit www.zeiss.com/microscopy/en/service-support.html.

5 Operation

5.1 Prerequisites for Commissioning and Operation

NOTICE

Damage to sample or feed pipette due to reduced sample accessibility

Although the feed pipette does not protrude beyond the front plane of the objective, it leads to reduced sample accessibility at the side compared to an objective without feed pipette. These additional limitations only occur in the direction of the feed pipette and depend on the design of the inserts and the objective lens.

- Take care to ensure collision-free navigation to avoid damaging the feed pipette.

The following basic prerequisites are necessary for commissioning and operation:

- The Instruction Manual was read prior to commissioning or operation and kept for further use.
- The chapter **Safety** was read and understood.
- The operator is acquainted with the operation of the microscope.
- The operator is acquainted with the operation of ZEN (blue edition).
- The operator is acquainted with the general Windows-based programs.
- If required: Basic training and safety briefing were successfully completed.

5.2 Preparing Immersion

During the priming process air-bubbles are removed from the immersion system.

Info

Increased robustness of the Autoimmersion Module

The tubes are not completely diffusion resistant. Therefore air bubbles may collect in the tubes, if the Autoimmersion Module has not been used for a day or more.

- Prime the tube before starting an experiment.

Parts and Tools

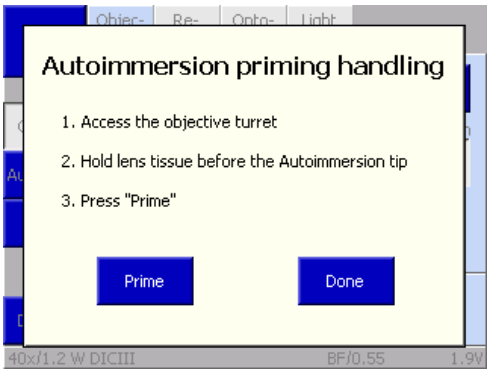
- Lint-free tissues

Prerequisite

- ✓ The microscope is switched on and ready for operation.
- ✓ The microscope is configured for using the Autoimmersion Module.
- ✓ *The liquid reservoir is filled with water [▸ 18].*
- ✓ The objective with autoimmersion is accessible.
- ✓ A sample is positioned on the stage.

Procedure

1. On the TFT, select **Home > Microscope > Control > Objectives**.
2. Press the **Prime** button.
   → A pop-up window opens.



3. Follow the instructions.
4. Press the **Prime** button.
   → The pump starts.
   → The button changes to **Stop**.
5. Check the immersion fluid in the tubing and on the objective for air bubbles.
6. Soak the immersion fluid with the tissues.
7. Let the pump run until it stops automatically.
   → The button changes to **Prime**.
8. Repeat the above steps for up to three times.
   → The tubing is primed and all air bubbles are removed.
   → If the priming process has to be repeated more than six times, *prime the tubing with a syringe [▸ 19]*.
9. Press the **Done** button when finished.

Info

The priming process can be interrupted by pressing the **Stop** button. In this case the pump stops and the button changes to **Prime**.

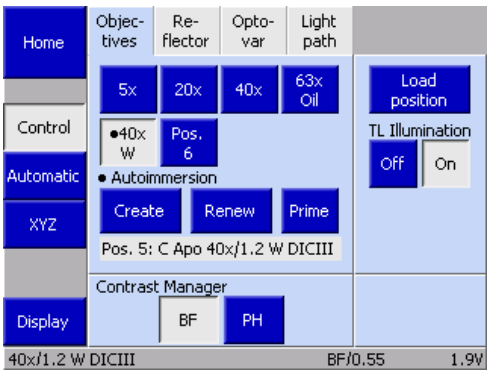
5.3 Operating during Experiments via the TFT

Prerequisite

✓ The microscope is operational.
✓ The tube is *primed [▸ 27]*.
✓ A sample with glass bottom is on the stage.

Procedure

1. Focus on the sample using an air objective.
2. Change to a compatible water immersion objective.
   → The image is blurred
3. On the TFT, select **Home > Microscope > Control > Objectives**.
4. Press the **Create** button.



   → The button turns gray.

5. Release the button.
   → The button turns blue.
   → The set amount of immersion fluid is applied.
6. Focus on the sample.
7. If the immersion gets too low during the experiment, *renew the immersion layer [▸ 29]*.

5.4 Renewing the Immersion Layer

During longer experiments, the immersion liquid partially evaporates. This loss must be compensated regularly.

Renew the immersion layer if one of the following conditions is met:

- The plateau on the objective is not completely covered anymore.
- Artefacts are visible during stage movement.

For a robust auto immersion performance, use a default setting with 50% for stage speed and 50% for stage acceleration. The settings for the stage depend on the used objective and the distances to be traveled. Therefore, these settings can be optimized by the user for different applications (speed vs. robustness).

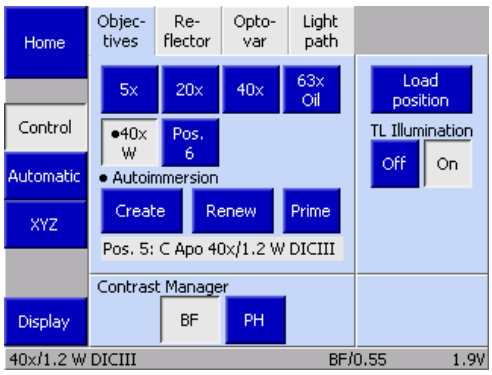
Prerequisite

✓ The microscope is operational.

✓ Immersion was already *created [▸ 28]* with sufficient immersion liquid.

Procedure

1. On the TFT, select **Home > Microscope > Control > Objectives**.
2. Press the **Renew** button.



   → The button turns gray.
3. Release the button.
   → The button turns blue.
   → The immersion layer is renewed by dispensing ~5 µl.

5.5 Refilling the Liquid Reservoir

NOTICE

Property damage due to incorrect immersion fluid

Salt, dirt, or particles may clog and damage the components.

- Use only distilled water, no other liquids.

NOTICE

Property damage due to spilled water

The distilled water can flow out through the refilling tube.

- Secure the loose end of the refilling tube in a position higher than the filling level in the liquid reservoir.
- Make sure the tube is always seated inside the liquid reservoir and the pump module.

The liquid reservoir can be refilled in different ways, depending on the configuration of the microscope:

- When the liquid reservoir can easily be removed, see *Filling the Liquid Reservoir [▸ 18]*.
- When the filling level in the liquid reservoir can be observed during refilling, see *Testing the Filling Level on the Liquid Reservoir [▸ 32]*.
- When an incubator XL is installed, the filling level in the liquid reservoir is not visible. In this case, see *Testing the Filling Level via ZEN [▸ 31]*.

Info

How To - Fill the liquid reservoir with a beaker and with a syringe

In this tutorial, our service experts show you how to fill the liquid reservoir with a beaker and with a syringe with simple steps. For service, support and general contact visit www.zeiss.com/microscopy/en/service-support.html.

5.5.1 Testing the Filling Level via ZEN

Parts and Tools

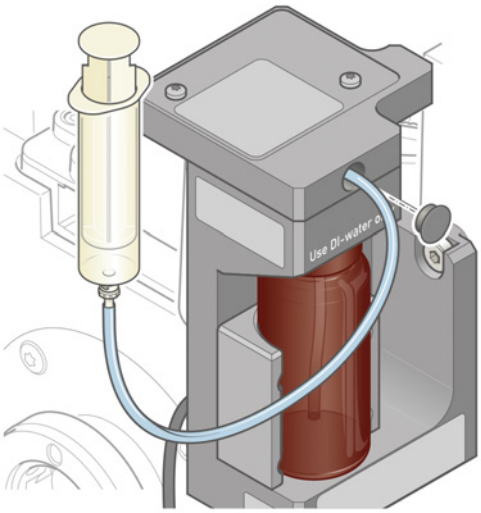
- Distilled water

Prerequisite

- ✓ The **filling level display** in the ZEN (blue edition) software is **LOW**.
- ✓ The refilling tube (25 cm with Luer-Lock adapter) is inserted into the liquid reservoir through the opening in the pump module.

Procedure

1. Fill the syringe with 20 ml distilled water.
2. Connect the syringe to the refilling tube.



3. Fill the liquid reservoir with 20 ml distilled water. Observe the **filling level display** in ZEN.
   → The **filling level display** turns green during filling.
4. Remove the syringe.
5. Secure the loose end of the refilling tube in a position higher than the liquid level in the liquid reservoir.

5.5.2 Testing the Filling Level on the Liquid Reservoir

Parts and Tools

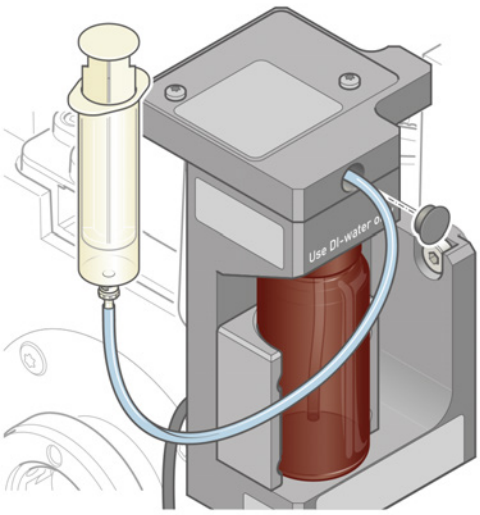
- Distilled water

Prerequisite

- ✓ The filling level of the liquid reservoir can be observed during the refilling process by looking on the liquid reservoir.
- ✓ The refilling tube (25 cm with Luer-Lock adapter) is inserted into the liquid reservoir through the opening in the pump module.

Procedure

1. Fill the syringe with distilled water.
2. Connect the syringe to the refilling tube.



3. Fill the liquid reservoir with distilled water. Observe the filling level in the liquid reservoir.
4. Remove the syringe.
5. Secure the loose end of the refilling tube in a position higher than the liquid level in the liquid reservoir.

5.6 Acquiring Images with Fluorescence Correlation Spectroscopy

Info

If the Autoimmersion Module is used together with Fluorescence Correlation Spectroscopy (FCS), the functions are not synchronized. Therefore, images can be acquired, while applying immersion. This can result in blurred images.

Info

Further information on the software and its operation is available in the software's online help.

6 Care and Maintenance

To ensure the best possible performance of the product, maintenance must be performed on a regular basis. Please keep the service logs for your product.

To maintain operational safety and reliability of the product, we recommend entering into a **ZEISS Protect Service Agreement**.

Info

For additional information and detailed descriptions, refer to further applicable documents or ask your ZEISS Sales & Service Partner.

6.1 Safety During Cleaning and Maintenance

Only conduct preventive measures described here. All tasks of maintenance and cleaning not described may only be performed by an authorized ZEISS service representative.

Any unauthorized intervention or any operation outside the scope of the intended use can lead to injuries and property damage and voids all rights to warranty claims. Only original spare parts from ZEISS may be used.

⚠ DANGER

Electric injury due to live parts

When the microscope and its components are still switched on, coming in contact with live parts can lead to electric shock or burn.

- Switch off the microscope and its components prior to opening or cleaning.
- Disconnect live parts from the power supply.

⚠ CAUTION

Crushing hazard due to moving parts

When assembling the product and its components, fingers can be trapped.

- Switch off the microscope prior to assembling or removing components.
- Do not reach into the working area.

NOTICE

Functional impairment due to dirt and moisture

Dirt, dust, and moisture can impair the microscope functionality and can cause short-circuits.

- Use the dust protection cover if the microscope is not used.
- The ventilation slots must be unobstructed at all times.
- Perform regular maintenance and cleaning according to the instructions in this document and according to the instructions in the applicable documents.
- Make sure that no cleaning liquid or moisture gets inside the microscope and its components.
- In case of damage, the affected parts of the microscope must be taken out of operation.

6.2 Maintenance Schedule

The recommended intervals for maintenance depend on the total uptime of the microscope.

Interval	Part/Component	Activity
as required	Autoimmersion Module	Clean, see *Removing Water-Soluble Contamination [▸ 34]*.
as required	Immersion tube	*Exchange the tube [▸ 36]*.
as required	Feed pipette	*Exchange the feed pipette [▸ 37]*.
as required	Liquid reservoir	Clean the liquid reservoir. Exchange the liquid reservoir.
as required	Pump	Check for proper functioning, see *Testing the Flow Rate of the Pump [▸ 35]*.

Tab. 2: Maintenance Plan

Info

Spare Parts are available from your ZEISS service representative.

6.3 Maintenance Work

6.3.1 Removing Water-Soluble Contamination

NOTICE

Damage of the microscope due to wrong solutions or solvents

During cleaning, incorrectly used or wrong solutions/solvents can harm the microscope.

- Test clean solutions of unknown composition first on a less visible area of the unit.
- Use only tested solutions/solvents.

Parts and Tools

- Clean cloth
- Lint-free cloth

Prerequisite

✓ The microscope and it's components are switched off and disconnected from the power supply.

Procedure

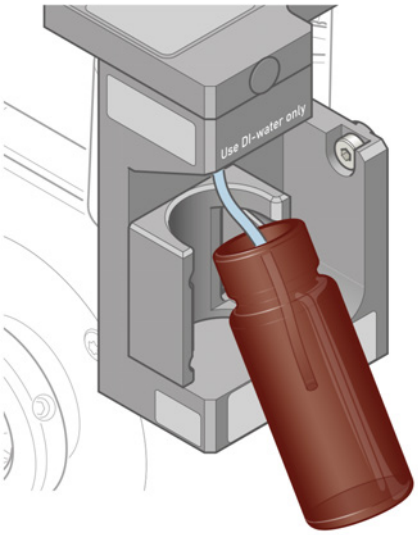
1. Remove dust and loose dirt particles with a soft brush or clean lint-free cloth.
2. If necessary, moisten a clean cloth with water.
   → Stubborn dirt can be cleaned with all commercially available water solutions, benzine or alcohol (no solvent!). For cleaning coated parts, use a linen or leather cloth that is moistened with one of these substances.
   Info Labels on the device may only be cleaned using a dry cloth.
3. Wipe off the area with the cloth.
4. Dry with a lint-free cloth.

6.3.2 Removing the Liquid Reservoir with Installed Incubator

When the incubator is installed, the liquid reservoir is not accessible. Therefore, the incubator has to be lifted and tilted slightly before the liquid reservoir can be removed.

Prerequisite
✓ The microscope is switched off.

Procedure
1. Pull the right drawer of the incubator approx. 5 cm to the right.
2. Pull the left drawer of the incubator to the front and remove it.
3. Tilt the carrier for transmitted-light illumination backwards.
4. Lift the incubator and tilt it slightly backwards at the autoimmersion pump module.
   → The liquid reservoir is accessible.
5. Lift the liquid reservoir slightly and remove it to the front.



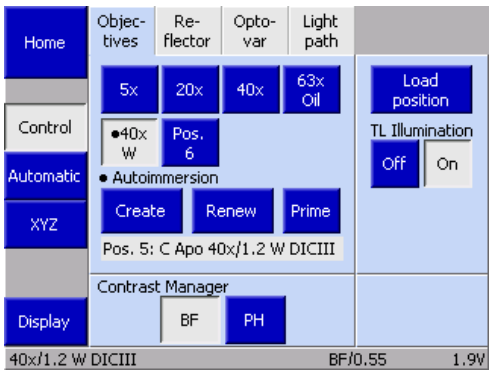
Proceed in the reverse order for installation.

6.3.3 Testing the Flow Rate of the Pump

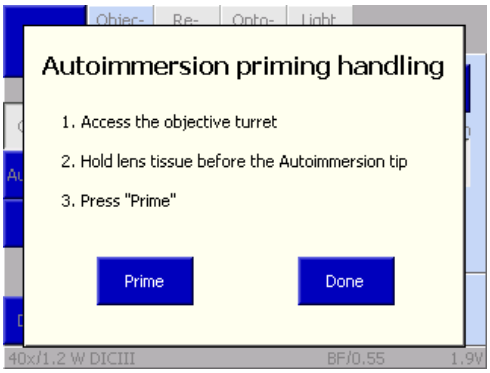
Parts and Tools
Eppendorf tube 2.0 ml with scale

Prerequisite
✓ The microscope is operational.
✓ The liquid reservoir is filled to at least 50%.

Procedure
1. Remove the feed pipette from the hose.
2. On the TFT, select **Home > Microscope > Control > Objectives**.



3. Press the **Prime** button.
   → A pop-up window opens.



4. Hold the empty Eppendorf tube at the end of the tube.
5. Press the **Prime** button.
   → The pump starts.
   → The button changes to **Stop**.
6. Let the pump run until it stops automatically.
   → The pump runs approx. ten seconds.
7. Check the amount of pumped water collected in the Eppendorf tube.
   → The amount should be ~1 ml. It is unlikely that this amount is reached during the commissioning of the new pump module.
   → If after second or third round of priming the volume is < 500 µl, process several milliliters of water through the tubing with the *syringe [▸ 19]* to remove air bubbles. Repeat the previous steps. Use the **Prime** button.
8. Press the **Done** button.

6.3.4 Exchanging the Tube

NOTICE

Property damage due to spilled water

Incorrectly installed tube connections may not be watertight. Water can leak out and cause property damage.

- Make sure the tube ends are fully pushed into/onto the connectors.

Prerequisite ✓ A 175 mm long piece of tube was cut from the spare part kit.

Procedure

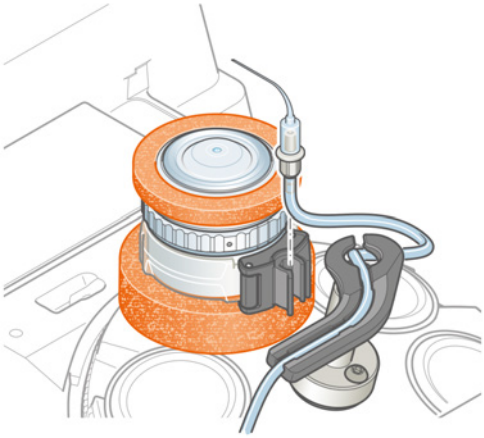
1. Make a mark on the new tube 55 mm from the end. This end connects to the pump module.
2. Disconnect the polluted tube from the pipette adapter.
3. Release the tube from the tube holder.
4. Disconnect the tube from the pump module.
5. Connect the marked end of the new tube to the pump module.
6. Starting form the mark, insert the tube into the tube holder.
7. Connect the adapter for feed pipette to the end of the tube.
8. Apply the *Prime function at the TFT [▸ 27]* repeatedly.
   → The tube is primed with water and air bubbles or contaminations are removed from the tube.

6.3.5 Exchanging the Feed Pipette

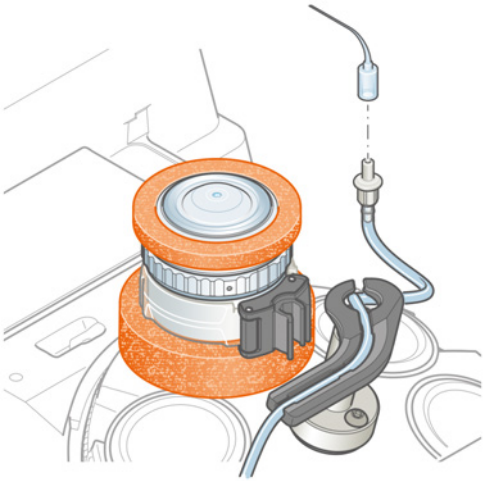
Prerequisite ✓ The stage is positioned in such a way that all components are accessible through the stage opening.

Procedure

1. Remove the adapter with feed pipette from the objective ring holder.



2. Remove the feed pipette from the adapter.



3. Connect the new feed pipette to the adapter for feed pipette.
   Make sure the feed pipette is completely pushed onto the connector. The feed pipette must be pushed all the way down.
4. Insert the adapter with feed pipette into the objective ring holder.
5. *Align the feed pipette with the front lens of the objective [▸ 22].*

7 Troubleshooting

The following table provides information about solving common problems.

Info

If you cannot solve the problem or if you are unsure about a certain technical difficulty, contact your local ZEISS service representative.

Symptom	Cause	Measure
Image artefacts when moving the stage in X and Y	Insufficient immersion layer.	▪ *Apply additional immersion fluid [▸ 29]*. ▪ *Set the amount of immersion fluid [▸ 24]*. ▪ Reduce the stage speed and the acceleration.
Image artefacts during (ZEN) experiments	Periods too long between automated renew events.	Reduce the intervals in experimental settings in ZEN with respect to time or stage travel.
	The immersion fluid is misguided by the sample holder or the stage insert.	Ensure sufficient distance to contact points with the stage inserts.
Insufficient immersion procedure	Water drop on the feed pipette tip deflects the immersion jet so that immersion procedure is insufficient.	Remove the water drop with a lint-free cloth. **NOTICE** **The feed pipette may only be touched with lint-free cloths: There is a risk of lint getting into the pipette opening. For the same reason, the feed pipette may not be touched with your fingers: There is the risk of dandruff getting into the pipette and clogging it.**
Wetting of substrate with immersion not successful	Too much air in the tube.	*Prime the tube [▸ 29]*.
	Poor alignment of the feed pipette, for example after a collision.	*Re-align the feed pipette [▸ 22]*.
	Too far from the focus position.	Focus with an air objective first.
Create, **Renew**, and **Prime** button on the TFT do not work.	TFT does not react specifically with autoimmersion buttons.	Switch the microscope off and on again. If the problem persists, contact your local ZEISS service representative.

Symptom	Cause	Measure
Autoimmersion is not displayed on the TFT.	▪ Cable defective. ▪ The CAN plug is not properly connected. ▪ Corrupted communication between the Autoimmersion Module and the microscope stand.	▪ Check the cable. ▪ Check connection of the CAN plug. ▪ Switch the microscope off and on again.
Immersion volume changes suddenly. Insufficient immersion volume	Feed pipette clogged or used up.	*Exchange the feed pipette [▸ 37]*.
	Tube clogged.	*Exchange the tube [▸ 36]*.
	Pump clogged or defective	Exchange the pump module.
Pump, tube, or feed pipette clogged	Biofilm has developed in the liquid reservoir. When parts of it come loose, they can clog the other components.	▪ Exchange the liquid reservoir. ▪ Exchange the other components if required.
The immersion filling level display in ZEN does not change to green when refilling the liquid reservoir, or does not change state when removing and inserting the full liquid reservoir.	Corrupted event communication between the Autoimmersion Module and the microscope stand.	▪ Restart ZEN. ▪ Switch the microscope off and on again and restart ZEN.
Inadequate immersion volume	Setting parameter not adapted after change of selected immersion objective.	*Set the amount of immersion fluid [▸ 24]*.

8 Decommissioning and Disposal

This chapter contains information on the decommissioning and disposal of the product.

8.1 Decommissioning

If the microscope and its components are not used for an extended period of time such as several months, they should be shut down completely and secured against unauthorized access.

⚠ DANGER

Electric injury due to live parts

When the microscope and its components are still switched on, coming in contact with live parts can lead to electric shock or burn.

- Switch off the microscope and its components prior to opening or cleaning.
- Disconnect live parts from the power supply.

Procedure

1. Switch off the microscope.
2. Pull the power supply plug.

8.2 Transport and Storage

Allowable Temperature

Allowable temperature during transportation to or between sites:

- Between -40 °C and 70 °C

Allowable temperature during storage at site:

- Between 10 °C and 40 °C
- Relative humidity less than 75 % at 35 °C

Info

Detailed information on transport and storage is available from your ZEISS Sales & Service Partner.

8.3 Disposal

The microscope and its components must not be disposed of as domestic waste or through municipal disposal companies. They must be disposed of in accordance with applicable regulations (WEEE Directive 2012/19/EU). ZEISS has implemented a system for the return and recycling of devices in member states of the European Union that ensures suitable reuse according to the EU Directives mentioned.

ZEISS introduced a procedure for the return and recycling of the instruments within the member states of the European Union which ensures suitable recycling procedures conforming to the EU directives.

For more information on disposal and recycling please consult your ZEISS Sales & Service Partner. The microscope may not be disposed of in the household waste or through municipal waste disposal services. If the microscope is resold, the seller shall be obliged to inform the buyer that the microscope must be disposed of in accordance with the regulations.

The customer is responsible for decontamination.

8.4 Decontamination

A decontamination statement must be submitted before returning any used objects to the ZEISS location.

If reliable decontamination cannot be guaranteed, the hazard must be marked according to applicable regulations. In general, a well-visible warning sign must be affixed to the article itself and to the outside of the packaging, together with detailed information on the type of contamination.

9 Technical Data and Conformity

This chapter contains important technical data as well as information on the conformity.

9.1 Performance Data and Specifications

Info

Your ZEISS Sales & Service Partner will provide you with the detailed installation requirements.

Weight and Sizes

Main Components	Width (mm)	Depth (mm)	Height (mm)	Weight (kg)
Pump module	62	39	111	0.4

Component	Volume
Liquid reservoir	25 ml

Location requirements

Installation site	Exclusively inside buildings
Altitude	Max. 2000 m above sea level
Atmospheric pressure	Min. 800 hPa

Air Conditioning and Quality

	Value
Temperature range for operation	10 to 40 °C
Relative humidity	< 65 % at 30 °C
Atmospheric pressure	800 to 1060 hPa
Pollution degree	2

Mains connection

The Autoimmersion Module is supplied with low voltage by the Axio Observer 7 microscope.

	Value
Nominal DC voltage	24 VDC
Power consumption	max. 1 W

9.2 Applicable Standards and Regulations

The Auto Immersion Module is a product for research purposes only. It conforms to current international standards as well as to harmonized standards of the applied EU directives.

The Auto Immersion Module complies with the following EU directives:

2011/65/EU and delegated directive (EU) 2015/863	Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS), amended by Commission Delegated Directive (EU) 2015/863 of 31 March 2015
2012/19/EU	WEEE Directive
2014/30/EU	Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonization of the laws of the Member States relating to electromagnetic compatibility
2014/35/EU	Directive 2014/35/EU of the European Parliament and of the Council of 26 February 2014 on the harmonization of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits
(EC) No 1907/2006	Regulation concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)
EN IEC 61010-1	Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 1: General requirements IEC 61010-1:2010 in consideration of CSA and UL directives

Not for therapeutic use, treatment, or medical diagnostic evidence. Not all products are available in every country. Observe all general and country-specific safety regulations as well as applicable environmental protection laws and regulations.

ZEISS conforms to the following management system standards: ISO 9001, ISO 13485, ISO 14001, and ISO 50001.

10 Accessories and System Expansions

When the microscope is equipped with this product, only the following accessories may be used, as their safe use has been confirmed by ZEISS. Only original parts from ZEISS may be used. Check in advance whether your microscope can be retrofitted with a system expansion or accessories.

After installation or conversion it must be carefully checked whether the microscope and its system expansions/accessories are in a safe operational state and whether unused ports are closed. For details and safety measures please refer to the associated documents.

Info

For additional information and detailed descriptions, refer to further applicable documents or ask your ZEISS Sales & Service Partner.

10.1 Overview of the Recommended Objectives

Info

For additional information and detailed descriptions, refer to further applicable documents or ask your ZEISS Sales & Service Partner.

Name	Description/Info	Recommended setting for *Create immersion [▸ 24]*
LD LCI Plan-Apochromat 25x/0.8 Imm Corr DIC M27	420852-9871-000	3
LD LCI Plan-Apochromat 25x/0.8 Imm Corr DIC M27	420852-9871-799	3
C-Achroplan 32x/0.85 W Corr M27	420967-9970-000	3
LD C-Apochromat 40x/1.1 W Corr M27	421867-9970-000	2
LD LCI Plan-Apochromat 40x/1.2 Imm Corr DIC M27	420862-9970-000	2
LD LCI Plan-Apochromat 40x/1.2 Imm Corr DIC M27	420862-9970-799	2
C-Apochromat 40x/1.2 W Corr M27	421767-9971-000	2
C-Apochromat 40x/1.2 W Corr M27	421767-9971-711	2
C-Apochromat 40x/1.2 W Corr M27	421767-9973-000	2
C-Apochromat 40x/1.2 W Corr FCS M27	421767-9973-713	2
C-Apochromat 40x/1.2 W Corr M27	421767-9973-799	2
LD C-Apochromat 63x/1.15 W Corr M27	421887-9970-000	2
C-Apochromat 100x/1.25 W Corr M27	421797-9970-000	2

10.2 Approved System Configurations and Accessories

Stands The Autoimmersion Module is compatible with the following microscope stands:

Name	Description/info
Microscope stand Axio Observer 7	431007-9904-000

Stages The Autoimmersion Module is compatible with the following microscope stages:

Name	Description/info
Scanning stage 130x100 PIEZO	432027-9001-000
Scanning stage 130x100 PIEZO	432027-9002-000
Scanning stage 130x100 STEP	432029-9903-000
Scanning stage 130x100 STEP	432029-9904-000

Objectives See *Overview of the Recommended Objectives [▸ 44]*.

More detailed information on available and recommended objectives can be found at https://www.micro-shop.zeiss.com/de/de/shop/objectives or ask your ZEISS Sales & Service Partner.

Mounting Frames and Stage Inserts The Autoimmersion Module is compatible with the following mounting frames and stage inserts:

Name	Description/info
Universal mounting frame K-Duo	000000-1116-078
Universal mounting frame K-M	000000-1272-644
Z-Piezo stage insert WSB 500	000000-2248-929
Heating insert P S1	411860-9020-000
Heating insert P Lab-Tek™ S1	411860-9025-000
Heatable universal mounting frame K-H-R S1	411860-9081-000
Heatable universal mounting frame K-H-L S1	411860-9082-000
Stage insert Z PIEZO WSB 500 Universal (for stage attachment Z PIEZO WSB 500)	432339-9082-000
Stage insert Z PIEZO WSB 500 for multi well plates (for stage attachment Z PIEZO WSB 500)	432339-9040-000
Stage insert Z PIEZO WSB 500 for heating inserts P S1 / Mxx S1	432339-9050-000
Stage insert Z PIEZO WSB 500 level adjustable	432339-9080-000
Stage insert Z PIEZO WSB 500 level adjustable with 2 inserts	432339-9090-000
Insert for universal mounting frame K-M, Petri dish 35	432340-9000-000
Insert for universal mounting frame K-M, Petri dish 60	432340-9010-000
Insert for universal mounting frame K-M, 2x Petri dish 35	432340-9020-000

Name	Description/info
Insert for universal mounting frame K-M, POC-RS	432340-9030-000
Insert for universal mounting frame K-M, slides and chambers	432340-9040-000
Universal mounting frame K-M	432341-9100-000
Universal mounting frame K-SF	432342-9000-000
Mounting frame K multiwell plates, ibidi	433617-9060-000
Mounting frame K for specimen slider 76x26 mm	451341-0000-000
Universal mounting frame K	451352-0000-000
Universal mounting frame K-X	451353-0000-000

Microscope Accessories

The Autoimmersion Module is compatible with the following microscope accessories:

Name	Description/info
Incubator for superresolution microscopy	000000-2018-945
Air duct tube, extension, 1m	000000-2180-519
CO2 Module S1	411857-9010-000
Incubator PM S1	411857-9020-000
Heating Unit XL S2	411857-9031-000
O2 Module S1	411857-9040-000
Heating Device Humidity S1	411857-9050-000
Control Sensor T S1	411857-9080-000
CO2-Cover PM S1	411857-9110-000
Incubator XLmulti S2 DARK Standard	411857-9310-000
Incubator XLmulti S2 DARK Premium	411857-9320-000
Incubator XLmulti S1	411857-9400-000
Slide-in module standard XLmulti / XLmulti RED S1	411857-9511-000
Slide-in module XLmulti S2 DARK Standard, right	411857-9570-000
TempModule S1	411860-9010-000
Temperable Insert P S1	411882-9010-000
Thermostat S1 (220V), Julabo	411882-9020-000
Definite Focus.2 incl. 6-position nosepiece H DIC M27 mot. ACR	424533-9003-000
Definite Focus.2 upgrade incl. nosepiece mot. ACR	424533-9013-000
Definite Focus 3 incl. 6-position nosepiece H DIC M27 mot. ACR	424533-9110-000
Definite Focus 3 upgrade incl. nosepiece mot. ACR	424533-9120-000
Definite Focus 3 incl. 6-position nosepiece H DIC M27 mot. ACR	424533-9111-000

Name	Description/info
Definite Focus 3 upgrade incl. nosepiece mot. ACR	424533-9121-000
LD condenser 0.55 mot.; AI Sample Finder	428400-9000-000
Stage attachment Z-PIEZO WSB 500	432339-9000-000
Glass Lid CO2/O2 heated, ibidi	433617-9000-000
Heated plate K with 3 inserts, ibidi	433617-9010-000
Temperature Controller, ibidi	433617-9020-000
Gas Mixer System CO2, ibidi	433617-9030-000
Glass Lid CO2/O2 unheated, ibidi	433617-9050-000
Gas Mixer System CO2/O2, ibidi	433617-9070-000

The Autoimmersion Module is **NOT** compatible with the following microscope accessories:

Name	Description/info
Incubator XLmulti with Slide-in modules CSU-X1	411857-9520-000
Incubator XLmulti with Slide-in modules CSU-X1	411857-9550-000
Heating insert M06 S1	411860-9030-000
Heating insert M12 S1	411860-9040-000
Heating insert M24 S1	411860-9050-000
Heating insert M96 S1	411860-9060-000
Heatable universal mounting frame M-H S1	411860-9086-000
Heating insert M06 S1	411860-9130-000
Heating insert M12 S1	411860-9140-000
Heating insert M24 S1	411860-9150-000
Heating insert M96 S1	411860-9160-000
Heating insert P S1 compact	411861-9902-000
Temperable objective ring 22.5/32.5 mm S1	411882-9081-000
Aqua Stop II	431716-0000-000
All additional hardware on objectives (e.g. objective heatings)	
ELYRA 7 and predecessors	
Spinning disk	

10.3 Approved Slides

NOTICE

Damage to sample or feed pipette due to reduced sample accessibility

Although the feed pipette does not protrude beyond the front plane of the objective, it leads to reduced sample accessibility at the side compared to an objective without feed pipette. These additional limitations only occur in the direction of the feed pipette and depend on the design of the inserts and the objective lens.

- Take care to ensure collision-free navigation to avoid damaging the feed pipette.

The Autoimmersion Module is recommended to be used with slides with glass bottom, for example:

- Petridishes 35 mm glass bottom
- Petridishes 60 mm glass bottom
- All multiwells with glass bottom
  Info **When using multiwells with 96 wells, ensure that the edge height does not exceed 0.4 mm to get access to all wells.**
- Lab-Tek™ chambers
- Chamberslides
- Inverted specimen slides with cover glass
- Specimen slides with fixed sample

Revision History

Revision	Date of Issue	Introduced Modifications
1	05/2024	▪ New material number as successor of 433801-7051-101, revision 1 ▪ Adaptation to Directive 2014/35/EU (LVD) ▪ Editorial rework ▪ Corrections in chapters 4.1.4, 6.3.3, 10.3

Tab. 3: Revision History

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For the latest revision of the manual and available translations, refer to
www.zeiss.com/axioobserver#manuals

Carl Zeiss Microscopy GmbH
Carl-Zeiss-Promenade 10
07745 Jena
Germany

phone: +49 1803 33 63 34
fax: +49 3641 64 3439

info.microscopy.de@zeiss.com
www.zeiss.com/microscopy

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