EQ Workplace from ZEISS
Software release version 1.10

Document set



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Brands

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Instructions for use

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Personal names and data

All patient, user, and other personal names and data in this document or in the illustrations are fictitious.

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1 Notes on the instructions for use

1.1 Designations

ZEISS EQ Workplace is referred to as “EQ Workplace”, “the software” or “the product” in these instructions for use. The ZEISS Calculation Webservice is also referred to as “the Webservice”.

These instructions for use also mentions other ZEISS products, which are referred to as follows: ZEISS FORUM as “FORUM”, ZEISS CALLISTO eye as “CALLISTO eye”, and ZEISS IOLMaster as “IOLMaster”.

In these instructions for use, “IOLMaster” refers to the device models “ZEISS IOLMaster 500” and “ZEISS IOLMaster 700”. If information refers to a specific model only, this is explicitly stated.

1.2 Scope

These instructions for use apply to EQ Workplace with the software release version 1.10.

1.3 Purpose and safe-keeping of the documentation

These instructions for use explain the safety equipment, the functions and the performance parameters of the product. They provide guidance for safe use.

Proper use of the product is essential for safe and successful operation.

The instructions for use in electronic form (eIFU) can be downloaded from the following link at any time: www.zeiss.com/ifu

You can obtain a printed version of the instructions for use at any time from your local sales partner.

Action

- ▶ Read these instructions for use carefully before using the product.
- ▶ Ensure that all users have access to the instructions for use at all times.
  If you have received the instructions for use in electronic form, store them in a location that is accessible to all users.

1.4 Questions and comments

Action

- ▶ If you have any questions or information on these instructions for use or the software, please contact ZEISS Service.

You can find the ZEISS representative for your country online on the following website: www.zeiss.com/med

1.5 Representations in this document

To improve recognition, certain types of information are specially marked in this document.

1.5.1 Representations of safety and warning instructions

⚠ WARNING!

This is a warning label that warns of hazards where death or serious injury may occur if not avoided.

The warning label states possible consequences.

▶ This is a measure that can be used to prevent hazards.

⚠ CAUTION!

This is a warning label that warns of hazards where injury may occur if not avoided.

The warning label states possible consequences.

▶ This is a measure that can be used to prevent hazards.

NOTE

This is a warning label that warns of hazards where property damage may occur if not avoided.

The warning label states possible consequences.

▶ This is a measure that can be used to prevent hazards.

1.5.2 Representations in all text sections

- This is a list.
  - This is a second-level list.

This is a cross-reference: see Representations in all text sections [▷ 8].

This is an **emphasis**.

This is a `software code` or a `program text`.

Names of software dialogs, fields or menus as well as software messages are marked with quotation marks:

- “View” menu
- “Do you want to save the settings”

The steps in menu and file paths are separated by slashes:

- “File / Save as”
- “My files / Documents”

Keys and buttons are marked with square brackets:

- [Next] button
- [Alt] key

TIP: Tips are marked with a highlighted “TIP:”.

INFO: Important additional information is marked with “INFO:”.

1.5.3 Representations in action sequences

Action sequences are structured as follows:

- Prerequisite
- Procedure
- Result

The representation of the action sequences may vary. There are the following representations of action sequences:

Defined action sequence

Complex actions that must be carried out one after the other in a clear sequence (step by step) are indicated as follows:

Prerequisite
☑ This is a prerequisite that must be met before a complex action.

Action
1. This is a prompt.
2. This is a prompt. **CAUTION! This is a warning that notifies the user of hazards that may occur in combination with a given prompt.**
3. This is a prompt.
   ⇨ This is the intermediate result of a given prompt.

Result
✓ This is the result of a complex action.

Undefined action sequence

Complex actions that need not be carried out one after the other in a clear sequence are indicated as follows:

Prerequisite
☑ This is a prerequisite that must be met before a complex action.

Action
- ▶ This is a prompt.
- ▶ This is a prompt. **CAUTION! This is a warning that notifies the user of hazards that may occur in combination with a given prompt.**
- ▶ This is a prompt.
  ⇨ This is the intermediate result of a given prompt.

Result
✓ This is the result of a complex action.

1.6 Other applicable documents

Document type	Document title
Customer training report	Customer training report
Instructions for use	FORUM from ZEISS
IT manual	FORUM from ZEISS
Instructions for use	IOLMaster from ZEISS
Instructions for use	ZEISS AI IOL Calculator [1]

[1] ZEISS AI IOL Calculator is not available in all countries.

2 Safety notes

2.1 User target group

The software is intended for use by healthcare professionals. Patients only come into contact with the software in the context of patient-doctor consultations with their attending surgeon; however, they themselves do not interact with the product.

The following user profiles are relevant:

- Physicians (ophthalmologists, as well as cataract and refractive specialists)
- Optometrists
- Healthcare technicians (e.g. nurses, medical-technical assistants, biometrists, orthoptists)
- Administrative staff

2.2 Patient target group

Patients requiring a pseudophakic intraocular lens (IOL) implantation:

- Cataract patients
- Ametropia patients and/or patients with astigmatism
- Presbyopic patients requiring an IOL implantation

2.3 Area of use

2.3.1 Intended use

EQ Workplace is a software intended to support a user in selecting intraocular lenses by calculation of intraocular lens power and predicted residual refraction.

Furthermore, it is intended to support a user in cataract and refractive surgery planning and post-surgical data management.

2.3.2 Indications for use

EQ Workplace is indicated for use with patients who are subject to pseudophakic IOL implantation.

2.3.3 Contraindications

No contraindications are known at present.

2.3.4 Product reusability

The product is intended for reuse on multiple patients.

2.4 Responsibility and duties of the operator

2.4.1 Operating staff

The software may only be operated by instructed and trained healthcare professionals. Before putting the software into service, make sure the following points are complied with:

- Ensure that the operating staff are trained and instructed.
- Ensure that the operating staff have read and understood the instructions for use.
- Familiarize yourself thoroughly with the contents of the instructions for use before starting up the software. Also observe the instructions for use of any devices and systems to be connected.
- Keep the instructions for use readily available for the operating staff at all times.
- Familiarize yourself with the user settings of the software.
- Use the software for the intended purpose and as described only.
- To facilitate access to the instructions for use for all operating staff: If required, request additional copies of the instructions for use from ZEISS.
- Ensure that all users (operating staff) have access to the instructions for use at all times.
  If you have received the instructions for use in electronic form, store them in a location that is accessible to all users (see Purpose and safe-keeping of the documentation [▷ 7]).
- Define the competencies for using the software and publish who is authorized to perform which activities.
- Set out and publish a guideline on the user's obligation to report malfunctions and incidents (see Messages to manufacturers and authorities [▷ 13]).
- Regularly check whether the accident prevention and occupational safety requirements applicable in your country are being complied with.

The selection of the formula used, the determination of the target refraction, and the corresponding IOL refractive power as well as the continuous personalization of the IOL constants are the responsibility of the clinical staff and the attending physicians. Basic rules of medicine and the individual patient profile must be observed when doing so.

2.4.2 Installation site and network

- The software may only be operated in secured networks. Appropriate security mechanisms must be installed on the computer systems (e.g. anti-virus programs), and the hardware may only be operated within an operator's environment that is compliant with IT guidelines.
- The operator is responsible for the safety and integrity of the software and network infrastructure. The consequences of attacks cannot be foreseen.
- The user is responsible for ensuring that external storage media (e.g. USB sticks) used for exchanging data is free of viruses and encrypted.
- The operator must take appropriate measures to ensure that only authorized users can access the computers on which the software is installed (e.g. by locking the computer).
- There may be a risk of a data integrity breach and data loss if devices that do not comply with the DICOM conformance statement (Digital Imaging and Communication in Medicine, DICOM) are connected.
- It is recommended that the user analyze and evaluate and, if necessary, mitigate risks. This must be repeated any time changes are made to the network or data connections.
- Data as well as settings generated by the software are included in the FORUM data backup. The operator of the software is responsible for backing up the data on a regular basis.

2.4.3 Messages to manufacturers and authorities

If there is a serious incident in connection with this medical device, which affects the operator or another person, the operator (or responsible person) must report this serious incident to the manufacturer and distributor of the medical device. In the European Union, the operator must also report this serious incident to the competent authority in the respective country. In all other countries, the respective country-specific requirements must be followed.

2.4.4 Data protection and information security

- The user and/or person responsible for IT must ensure compliance with national laws and regulations on data protection.
- Operators of IT systems and IT networks are responsible for establishing the necessary security standards, i.e., for creating the necessary technical and organizational framework conditions.
- Misuse is defined as instances in which protected personal data are collected, processed, or otherwise used without proper authorization.
- Violations of data protection (according to the EU General Data Protection Regulation) must be reported to the person responsible for company data security or the responsible supervisory authority.
- Suitable measures must be taken to ensure that only authorized users can access the computers on which the software is installed (e.g. by locking the computer). For this reason, the software must be operated in protected networks only. The operator is responsible for the security of the network.

Note the following definitions:

- **Personal data:** All information regarding personal or factual circumstances of a particular or identifiable person. All data (e.g., name, age, gender, etc.) that can be directly assigned to a person (patient, employee, customer, supplier) must be protected.
- **Data processing:** The storage, transfer (transmission to third parties outside of the organization), modification (including anonymization and pseudonymization), deletion, and blocking (marking to limit further processing or use) of data
- **Use:** The use of data (e.g., transfer within the company)
- **Recipients:** Persons or entities that receive data
- **Third parties:** Persons or entities that are not part of the entity responsible (legal entity). The transmission of data to third parties is considered as data transfer.

2.5 Patient information

Ensure that all residual risks, including all foreseeable, adverse events or side effects in connection with the use of the medical device or accessories, are explained to the patient. Note the following: Contraindications, safety information, warnings, limitations.

2.6 Warranty and liability

Warranty and liability depend on the contractually stipulated conditions. The manufacturer does not accept any liability for damage caused by unauthorized tampering with the product. Furthermore, this will forfeit any rights to claims under the warranty.
The software must be used for the described purpose only.

Modifications to this product are not permitted. Making modifications to the product that are not described in these instructions for use makes you a manufacturer of a product as defined by the applicable national law (legal manufacturer).

2.7 Product support period

The manufacturer guarantees support for this product for 3 years from the date of purchase.

2.8 Risk overview

In order to identify potential risks associated with the software, a risk assessment has been carried out. The potential risks were assessed and minimized as much as possible, to ensure the safety and operability of the software. The following list of identified potential risks serves as an overview for the user:

- Entering incorrect values (values are outside the permitted range) may result in an inaccurate or incorrect IOL calculation.
  - The biometric data must always be entered to two decimal places and not rounded up or down.
  - Consistently enter either R values or K values.
  - Enter the correct keratometric index. This can be selected from a list of default values.
  - You must check and ensure that the patient's biometric data is entered correctly.
- When planning a toric IOL, check if limbal relaxing incisions are actually required. Planning a toric IOL in combination with limbal relaxing incisions is the responsibility of the surgeon.
- In patients with irregular corneal astigmatism, the axis and refraction values must not be used for the IOL calculation of toric IOLs, especially not with the "Z CALC" formula. For this reason, the results in "IOL calculation" are inconclusive and must not be used.
- Improperly selecting an IOL without a review by a healthcare professional may result in a suboptimal IOL being implanted.

- The user is responsible for ensuring that the biometric data is entered taking into account surgical procedures (e.g. LASIK), the individual's state of health (e.g. eyes with glaucoma), as well as other patient details (e.g. refractive status), and that the data is within the defined range and has been entered correctly.
- The Central Topography serves only as an indicator of irregularities of the cornea and does not function as a complete cornea topography. The surgeon is responsible for verifying the results with other diagnostic methods when in doubt and if multifocal or toric IOLs are to be implanted.
- If a PDF form is created based on incorrect input values, a suboptimal IOL may be ordered and implanted.
- The data on the actual implanted IOL, postoperative refraction, and visual acuity are used to improve IOL calculation methods. This is only possible if this information is correct. Incorrect information could even lead to a deterioration of future results.
- If two users log in simultaneously with the same login data, changed user settings may not be saved. When user settings are changed, only the latest changes are saved and the other user's changes are not applied.
- We recommend that more than the minimally required 11 data records be available for a constant personalization in order to obtain optimal results. Upload sufficient data records to the Webservice and activate use of the data for IOL constant personalization.

2.9 Safe operation

The software is a support system and does not assume any diagnostic functions that are critical to safety. Treatment can be performed without the aid of the software at any time.

If a malfunction occurs that you cannot correct based on these instructions for use, mark the product as non-functional and inform ZEISS Service (see Troubleshooting [▷ 105]).

2.10 Calibrated recording devices and monitors

A color-calibrated recording device and color-calibrated monitor should be used for the medical evaluation of the saved documents. When using non-color-calibrated recording devices and monitors, the reproduced documents may deviate in terms of color, scale, and shape.

This particularly applies when viewing documents on different types of monitors.

2.11 Used IOLMaster report

If the IOLMaster 700 report contains quality warnings, the IOL calculation may lead to suboptimal results. A warning is displayed in the precalculation in this case. Check the biometric data and repeat the measurement on IOLMaster 700 if necessary.

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3 Software description

3.1 Conformity

The product complies with the general safety and performance requirements laid down in Annex I of Regulation (EU) 2017/745 on Medical Devices.

Legal information for the software such as manufacturer address, date of manufacture, and information pertaining to CE marking and other regulatory markings can be viewed using the [Legal information] button in the “User settings” under “System / Workplace administration / EQ Workplace”.

3.2 Explanation of symbols

The following symbols are used on product labels or in these instructions for use:

	General warning symbol
	Reference to electronic instructions for use (eIFU): www.zeiss.com/ifu Observe instructions for use
	Date of manufacture
	Manufacturer
	Medical device
	UDI (unique device identification)
	Authorized representative in Switzerland
	Importer

	Reference number
	UKCA marking

3.3 Functional description

EQ Workplace is software that is integrated into FORUM as a workplace. In addition, a Webservice is available for some functions.

The software essentially supports the workflow for the preparation of cataract und RLE [2] surgeries.

The software enables the precalculation of IOL calculations on the basis of biometric measuring data (from IOLMaster by default) and other available diagnostic reports (e.g. a topography). For the IOL calculation, the software offers diverse calculation formulas (“formulas”) for various toric and non-toric IOLs. An IOL can be selected on the basis of the IOL calculation, and the surgery can be prepared using the assistance parameter planning for CALLISTO eye. The software also provides the option to directly generate an e-mail order for the IOLs selected for the surgery and upload postoperative data to the ZEISS Calculation Webservice. The IOLs can be managed and the IOL constants can be continuously personalized here.

[2] RLE: Refractive lens exchange

3.4 Software components

The following table provides an overview of which functions can be used in the described product components:

Components	Functions
EQ Workplace	■ User-specific configuration ■ Precalculation – K/Precalculation – TK® [3] Display and adjustment of biometric data as well as relevant parameters for the IOL calculation ■ IOL calculation Calculation and selection of IOLs ■ Surgery preparation Creation of plans for CALLISTO eye ■ IOL order ■ Post surgery Postoperative upload of the patient data record to the Webservice
ZEISS Calculation Webservice	■ IOL management Management of the personal IOLs that are available for calculation ■ IOL constant personalization Continuous adjustment of the IOL constants of the personal IOLs ■ Data export (as CSV file)

The software and the Webservice are linked via the Internet. In addition to configuration, the software itself comprises five work steps that are performed step by step.

[3] Depends on the selected keratometry

3.5 Software flowchart

The software is based on FORUM and uses FORUM's patient data management function. The following flowchart illustrates the workflow in the software:

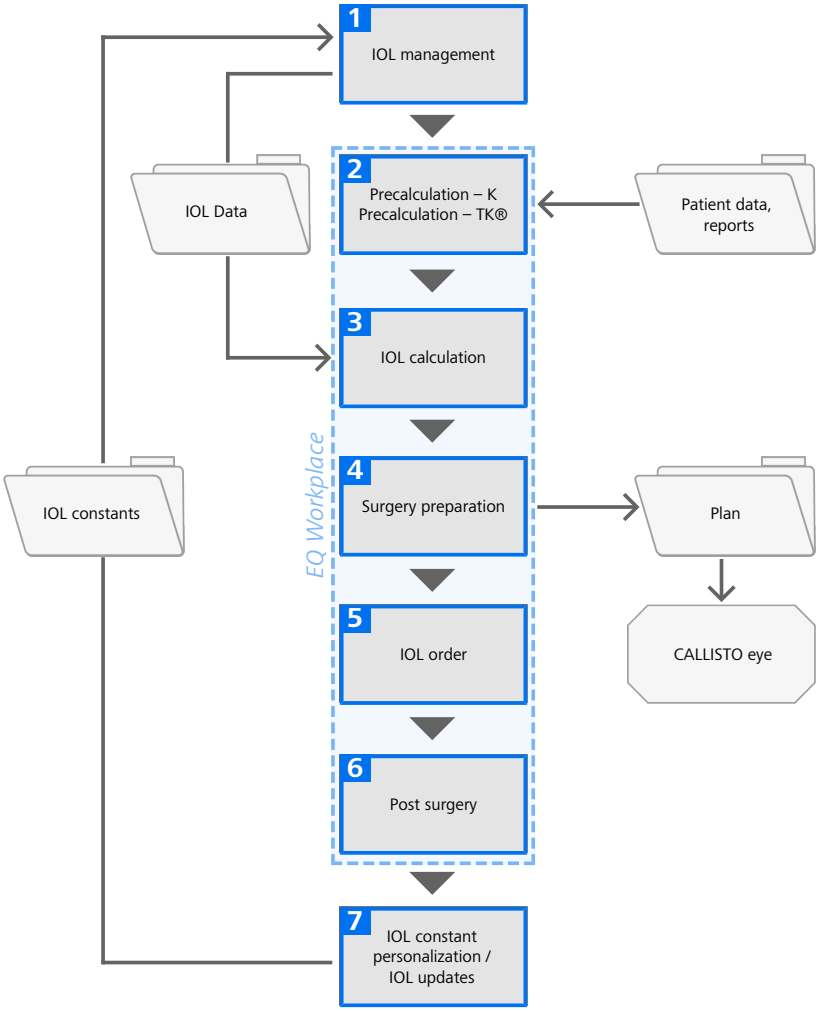


Figure 1: Software flowchart

INFO: The user is responsible for the selection of the formula used, the determination of the target refraction, and the corresponding IOL refractive power as well as the continuous personalization of the IOL constants. Basic rules of medicine and the individual patient requirements must be observed when doing so.

1 IOL management

The personal IOLs are managed in the Webservice. The configuration of the default calculation settings (which IOLs are calculated using which formulas) is performed in the user settings in EQ Workplace. These settings must – insofar as they are not to be changed – only be made during initial use.
For additional information, see IOL management [▶ 42] and Configuring the user settings [▶ 33].

2 Precalculation – K/Precalculation – TK® [4]

Selecting and analyzing the IOLMaster report and, if necessary, any other documents relating to the patient takes place in the "Precalculation – K/Precalculation – TK®" work step. In addition, further relevant information and measurement values on the patient may be entered. Data from the selected IOLMaster report are used for the IOL calculation in the next step. Use the [IOL calculation] button to start it.
For additional information, see Precalculation [▶ 64].

3 IOL calculation

The data for the IOL calculation are sent to the Webservice, where the calculation is performed, in the "IOL calculation" work step. The results are shown in "IOL calculation" as an overview. The user settings determine which IOLs are calculated with which formulas by default. Calculated IOLs can be compared with each other, additional IOLs can be added, if necessary, and an IOL can be selected.
For additional information, see IOL calculation [▶ 76].

4 Surgery preparation

Assistance parameter planning for the surgery can be performed in the "Surgery preparation" work step. The plan [5] can be released for CALLISTO eye via the Worklist [6] in FORUM or exported using the USB export function. This makes it possible to plan the surgery in advance outside of the operating room.
For additional information, see Surgery preparation [▶ 89].

5 IOL order

The IOL selected for the surgery can be ordered by e-mail in the "IOL order" work step. The plan for the respective laterality must be completed in order to access the work step.
For additional information, see IOL order [▶ 98].

[4] Depends on the selected keratometry
[5] Always only contains data for one laterality
[6] MWL: Modality Worklist

6 Post surgery

Postoperative data for personalization of the IOL constants can be entered and the patient data record can be uploaded to the Webservice in the "Post surgery" work step. The plan for the respective laterality must be completed in order to access this work step.
For additional information, see Post surgery [▶ 100].

7 IOL constant personalization / IOL update

Use postoperative data in the Webservice for constant personalization of personal IOLs. The personalized IOL constants are in turn automatically included in the next IOL calculations.
For additional information, see IOL constant personalization [▶ 47].

If an update for a personal IOL, e.g. changes in the IOL database by the manufacturer or optimizations by ZEISS, is available in the Webservice, the user is notified of IOL updates in the software and in the Webservice. The user can check for these updates in the Webservice and manually update IOLs. After confirmation by the user, the updated IOL data and IOL constants are included in IOL calculations.
For additional information, see IOL management [▶ 42] and Updating IOL data and IOL constants [▶ 51].

3.6 ZEISS ID

NOTE

Unsaved user settings

It is possible for two users to log in simultaneously with the same login data. When user settings are changed, only the latest changes are saved. The other user's changes are not applied.

- ▶ Before making any changes to the user settings, make sure that you are the only user logged in with this login data.

A personal user account ("ZEISS ID") is required to use the software. The ZEISS ID is used to log in to the EQ Workplace user settings and to the ZEISS Calculation Webservice (see Configuring the user settings [▶ 33]). When you log in to the software or the Webservice, the settings saved for the ZEISS ID are loaded. You can obtain the login data for your ZEISS ID from your ZEISS IOL Representative.

You can manage your personal ZEISS ID via the ZEISS ID Self-Service Portal at https://id.zeiss.com. In the ZEISS ID Self-Service Portal, you can view and change personal data such as your name, username, or password.
TIP: You can also download your personal data in a machine-readable format as a UTF-8 encoded CSV file.

INFO: If changes are made to your personal ZEISS ID in the ZEISS ID Self-Service Portal, you must log in again to the EQ Workplace user settings.

The ZEISS ID Self-Service Portal also provides an overview of all applications available to the user with a quick access function.
TIP: The quick access function lets you switch between applications without having to log in again.

You can also completely delete your ZEISS ID user account via the ZEISS ID Self-Service Portal.
INFO: If you delete your ZEISS ID user account, both your user account along with all your personal data and your access to all stored applications are deleted. This step cannot be undone. To have access again, a new ZEISS ID must be created.

Further information about the ZEISS ID can be obtained from ZEISS Service.

3.7 Total Keratometry (TK®)

Not all products, services, or offers are certified or available on every market, and the labeling and notices according to certification may differ from country to country.

The purpose of Total Keratometry (TK®) is to determine the refractive power of the human cornea as a toric model. TK® is comparable to keratometry in terms of the intraocular lens (IOL) calculation. For additional information on IOL calculation with Total Keratometry (TK®), see the “IOLMaster 700 from ZEISS” instructions for use.

Technically, the TK® values are based on a lens model that determines the toric curvature of the anterior corneal surface from the keratometry and the toric curvature of the posterior corneal surface from the optical coherence tomography (OCT).

In accordance with the values used for traditional keratometry, the TK® measurements are referred to as follows:

Keratometry	Total Keratometry (TK®)
R1	TR1
K1	TK1
R2	TR2
K2	TK2
Avg. R	Avg. TR
Avg. K	Avg. TK
Ast. K	Ast. TK

The TK® measurements are equivalent to keratometry in eyes in which measurements of the posterior corneal surface correspond to the Gullstrand model.

3.8 New features in version 1.10

- Changes in supported versions of IOLMaster (see Compatibility [▷ 28])
- Change in ZEISS Calculation Webservice: Last change in constants indicated (see IOL management [▷ 42])
- ZEISS AI IOL Calculator [7] connected (see Information on ZEISS AI IOL Calculator [▷ 84])
- Optional input of SIA for calculations with the "Kane" formula (see Surgical information [▷ 73])
- Performance and graphical interface optimized
- Notifications and messages optimized
- Order email for IOLs optimized
  - Selected product model displayed
  - Position of comment in order email changed

[7] ZEISS AI IOL Calculator is not available in all countries.

4 Installation

4.1 Required knowledge

All installation work described in this section must be performed by a ZEISS Service technician only. Configuration is carried out by a system administrator or a ZEISS Service technician.

The following prerequisites must be met to install and configure the software:

- Knowledge on the subject of configuration and management of software medical devices as a system administrator with the corresponding authorization
- Familiarity with the local hardware and software and the IT network
- System administrator rights for the relevant IT system components
- Knowledge on the subject of configuration of local firewalls, including management and release of ports with the corresponding authorization
- Knowledge on the subject of configuration of the local antivirus software, including the authorization to deactivate this software during installation and the exclusion of certain folders

4.2 Hardware and software requirements

The software is installed on the FORUM server and on the computers ("clients") where FORUM Viewer is installed. This means that the same basic hardware and software requirements apply to the server and the clients as to FORUM (see "FORUM from ZEISS" IT manual). Deviating requirements for correct operation of the software are listed below:

For the software to function properly, the system must meet the following minimum requirements:

Server

- A stable Internet connection
- Installed ZEISS ID login plug-in

Client

- Screen resolution of min. 1280 × 800 pixels.
  A screen resolution of 1920 × 1080 pixels or higher is recommended.
- It is recommended to limit the application to one monitor.
- Standard e-mail program
  - Microsoft® Outlook® (native desktop application)
    The web version of Outlook® and the progressive web app (PWA) are not supported.
  - Apple® Mail

  INFO: An IOL order can only be prepared using the software if one of the listed standard e-mail programs has been installed on the client computer.

ZEISS Calculation Webservice

- Apple® Safari® (Mac®)
- Mozilla® Firefox® (Win®/Mac®)
- Google Chrome® (Win®/Mac®)
- Microsoft Edge® – from Chromium-based version (Win®)

4.3 Compatibility

The software is compatible with the data of the following software or device versions:

- ZEISS ATLAS 9000
- ZEISS CALLISTO eye – version 3.5.1, 3.6.2, 3.7.2, and 5.0
- ZEISS FORUM – version 4.4
- ZEISS IOLMaster 500 – version 7.7 and 7.8
- ZEISS IOLMaster 700 – version 1.14, 1.50, 1.70, 1.80, 1.88, and 1.90

4.4 Installing the software

The software must be installed on the FORUM server.

Prerequisite

- ☑ A user with administrator rights for the operating system is logged on to the server where FORUM Server is installed.
- ☑ The FORUM login data for the admin user account is available.
- ☑ The installation file is available.
- ☑ The FORUM server is running.
- ☑ The minimum hardware requirements for the server are met (see Hardware and software requirements [▷ 27]).

Action

1. Run the installation file.
   - ⇨ An installation wizard is opened.
2. Follow the instructions in the installation wizard.
3. While installing the software, the trustworthiness of the FORUM server certificate is verified.
   To continue with the installation, the certificate must be verified as trustworthy and confirmed. If you have any questions, contact your ZEISS Service technician.
   - ⇨ If the certificate is not accepted, the installation will be canceled.
   - ⇨ If the certificate is accepted, the FORUM user data will be verified.
4. Enter the FORUM login data (user and password for the admin user account).
   If you do not have the admin login data, contact ZEISS Service.

Result

- ✓ When the installation wizard ends, the software has been completely installed and can be licensed (see Licensing [▷ 30]).

4.5 Updating the software

Prerequisite

- ☑ If available: The latest release notes for the installed software version are available and have been read.
  These form part of the scope of delivery when the software is supplied. After the software is updated, you will receive the latest version.
- ☑ The FORUM server is running.
- ☑ The minimum hardware requirements for the server are met (see Hardware and software requirements [▷ 27]).

Action

1. Perform a data backup (see "FORUM from ZEISS" IT manual).
2. Run the installation file.
3. Follow the instructions in the installation wizard.

4. Confirm the uninstallation of the old version.
   ⇨ After successful deinstallation, the latest version begins installing automatically.
5. Follow the instructions in the installation wizard.

Result

✓ The latest version of the software is installed and can be licensed (see Licensing [▶ 30]).

INFO: While the software is updating, the created plans are saved and will once again be available in the new version.

4.6 Licensing

One basic license can be installed per FORUM server. The software is licensed via a user license. The number of users who can access the software at the same time depends on the number of user licenses installed. The software can be licensed via the FORUM server as well as via FORUM Viewer.

4.6.1 Requesting license files

The license files required to enable the software to function correctly must be requested from Carl Zeiss Meditec AG. The license files are linked to the MAC address of the computer on which the software is to be installed and cannot be used for additional/other computers.

Action

▶ To request licenses, contact your ZEISS sales representative or ZEISS Service.

4.6.2 Activating license files

For the connection between FORUM Workplace and the FORUM server, the license files must be stored on the server. An error message is displayed if you try to access FORUM without having saved a valid license file to the installation path.

Action

1. Unpack the license files.
2. Save all license files in the installation directory.
   If FORUM is installed via a local user and not via the Windows system service, the license files will be stored under "C:\Users\<User>\AppData\Local\.forumserver\licenses". If this is not the case, the license files are stored under "C:\ProgramData\.forumserver\licenses". Alternatively, the path can be freely chosen by the user performing the installation.

Result

✓ The license is activated. The software can be used.

✓ All the functions activated by the saved license files are available for the user the next time they log on to the FORUM server.

4.6.3 Uploading license files

Only one license file can be uploaded at a time using FORUM Viewer. To upload multiple license files, the process will need to be repeated.

Prerequisite

☑ There is a valid license file with file extension ".lic".

☑ The software has been installed.

Action

1. In FORUM Viewer, select the menu "Help / Upload license file".
2. Specify the path for the license file.
3. Upload the license file.

Result

✓ The license is uploaded to the server in the FORUM installation directory.

4.7 Logging in for the first time

To be able to use the software, each user needs a user license. This license is requested when the user logs in to FORUM and is released again when they log off. Therefore, the number of users who can work with the software simultaneously is limited by the number of available user licenses.

In addition, a ZEISS ID is required to use the software. Before opening the software for the first time, the login data of the ZEISS ID must be stored in the user settings.

Prerequisite

☑ The FORUM server is running.

☑ The client is connected to the FORUM server via a network.

☑ Required licenses have been installed on the FORUM server (see Licensing [▷ 30]).

☑ The software has been successfully installed (see Installing the software [▷ 29]).

☑ The software has been activated for the active (logged-in) FORUM user.
TIP: In the FORUM user administration, the "EQ Workplace access" checkbox must be activated for the user (see "FORUM from ZEISS" IT manual under "User administration").

☑ The user has a valid ZEISS ID.

☑ A free user license is available.

Action

1. Open FORUM Viewer.
2. Select "System / Workplace administration / EQ Workplace".
3. Open the "User settings".
4. Click on the [Log in with ZEISS ID] button.
   ⇨ The login window opens.

5. Log in with your ZEISS ID.
   ⇨ The login data will be saved for the FORUM user the first time it is entered so that it is not necessary to log in to the software again.
   INFO: For security reasons, you will have to log in again after 90 days. Users will be notified as soon as they must enter their login data.

Result

✓ The software can be used.

INFO: Changes to the ZEISS ID settings require the user to log in again. Otherwise, the changes will not take effect in the software.

Refraction measurement details

After logging in for the first time, the user is prompted to configure refraction measurement details. These details are required to use EQ Workplace. EQ Workplace uses postoperative refraction data to generate optimized IOL constants for each IOL. However, the data can only be used if the measurements are comparable. The details can be adjusted later at any time.

5 Configuration

5.1 Configuring the user settings

The user settings apply to the active user only. Basic settings are made in the user settings regarding the user account, default values, units, and settings for working with the software as well as the IOL order. In addition, the user configures which IOLs are calculated with which formulas by default when ordering an IOL (see Notes on IOL calculation [▶ 77]). The “User settings” can be opened via the “System / Workplace administration / EQ Workplace” menu item.

The following table provides an overview of the functions for user accounts:

Functions	Explanation
Logged in as	Displays the e-mail address of the active user. TIP: If an e-mail address is not displayed, or if you want to switch users, use the [Log in with ZEISS ID] button to log in.
Log in with ZEISS ID	Opens a login window for entering the ZEISS ID User-specific settings are loaded upon login. The login data will be saved for the FORUM user the first time it is entered so that it is not necessary to log in to the software again. When switching users, the login data of the respective FORUM user is loaded. INFO: The ZEISS ID login plug-in must be installed to log in with your ZEISS ID. If it is not possible to log in, contact your local system administrator or ZEISS Service. INFO: The logged-in ZEISS ID user is linked to the FORUM user logged in to FORUM Viewer. Only the user settings for the last logged-in ZEISS ID user are saved in the software. If the same FORUM user account is used by different ZEISS ID users simultaneously on different instances of FORUM Viewer, user-specific settings for the respective ZEISS ID user are only retained for the duration of the FORUM session. As soon as a user logs in to FORUM again, the last logged-in ZEISS ID user and their user-specific settings are automatically loaded. Before working with the software, you should always check which ZEISS ID user is active. INFO: For security reasons, you will have to log in again after 90 days. Users will be notified as soon as they must enter their login data.
ZEISS Calculation Webservice	Opens the ZEISS Calculation Webservice for IOL management and IOL constant personalization in the default web browser. The user must log in there using their ZEISS ID.
ZEISS ID Self-Service Portal	Opens the ZEISS ID Self-Service Portal in the default web browser. The user must log in there using their ZEISS ID. In the ZEISS ID Self-Service Portal, you can make changes to your ZEISS ID user account, such as your username or password. However, changes to your ZEISS ID will not be visible in the software until you log in again with your ZEISS ID. For additional information, see ZEISS ID [▶ 24].

Entered default values can be overwritten manually at any time during the editing of a plan. Changes in the user settings will only be applied to newly created plans. Existing plans are unaffected by the changes. Some standard settings can be configured for both "OD" and "OS".

General

Parameter	Explanation	
Use for calculation	Specifies the default selection for the keratometry used for IOL calculation: ■ Keratometry ■ Total Keratometry Total Keratometry values are only available with an IOLMaster 700 with a corresponding license and corresponding configuration. See also Total Keratometry (TK®) [▶ 25]. If the IOLMaster report does not contain Total Keratometry values, "Keratometry" is preselected in the precalculation despite this default setting.	
Target refraction	Specifies the default value for the target refraction. If you configure a value here, it is preset in the precalculation. A value of "0.00" is entered by default.	
Refractive power unit	Specifies the default unit for Keratometry and Total Keratometry values: ■ Radius: R/mm ■ Refractive power: K/D "K/D" is preselected by default.	
Visual acuity notation	Specifies the unit for entering the visual acuity. "Decimal" is preselected by default.	
Cylinder notation	Positive (+)	Specifies whether the patient's cylinder value is displayed with positive or negative sign.
	Negative (–)	
Visual axes	Specifies the default display for visual axes.	
	Alpha	■ Ix/Iy Displayed as Cartesian coordinates ■ Chord Displayed as polar coordinates
	Kappa	■ Px/Py Displayed as Cartesian coordinates ■ Chord Displayed as polar coordinates
Preferred Central Topography Map in the PDF	Specifies whether the PDF prefers "Total axial power" or "Anterior axial power" for display. "Total axial power" is selected by default. If it is not available for the patient, "Anterior axial power" is displayed.	

OD/OS

The following default settings can be configured separately for OD and OS:

Parameter	Explanation	
SIA optional	Enter the astigmatism induced by the surgeon in D If you configure a value here, it is preset in the precalculation. A value of "0.00" is entered by default.	
Incision position	Incision position for inserting the IOL (main incision) If you configure a value here, it is preset in the precalculation and the "Surgery preparation". By default, "135°" has been configured for "OD" and "45°" for "OS".	
Steep axis used	If this function is activated, the steep axis is used as the incision position by default.	
Incision width optional	Width of the incision for inserting the IOL (main incision)	If you configure a value here, it is preset in the "Surgery preparation".
Paracentesis 1 optional	Position of the incision for draining (first auxiliary incision)	
Paracentesis 2 optional	Position of the incision for draining (second auxiliary incision)	
Surgeon position optional	Superior	Selection of the surgeon position during surgery If you configure a value here, it is preset in the precalculation and the "Surgery preparation".
	Temporal	

Surgery preparation

Parameter	Explanation
Rhexis circle 1 optional	First and second visualization aid for opening the capsular bag
Rhexis circle 2 optional	
Activate CALLISTO eye device selection	Specifies whether one or more CALLISTO eye devices available on the network can be selected when the plan is released. If this function is activated, the desired CALLISTO eye device can be selected as the target device when the plan is released. If only one device is available on the network, it is automatically selected as the target device. If no device is available on the network, the plan cannot be released. You can also release the plan for all CALLISTO eye devices on the network. If this function is deactivated, no target device can be selected for the release in CALLISTO eye. If several devices are available on the network, the plan is automatically released for all CALLISTO eye devices on the network. If no device is available on the network, the plan cannot be released.

Post surgery

Parameter	Explanation	
Upload data to Webservice	Activated Deactivated	Specifies whether data can be uploaded to the Webservice. Uploading data for IOL constant personalization in the "Post surgery" is possible only if this setting has been activated. Furthermore, the uploaded data can only be exported from the Webservice when this setting is activated. INFO: Please note that deactivation will delete all information stored in post surgery as well as all data used in Webservice for IOL constant personalization. It cannot be recovered.

IOL calculation

Parameter	Explanation
Add/edit IOLs in the ZEISS Calculation Webservice	Open the ZEISS Calculation Webservice for IOL management and IOL constant personalization in the default web browser. The user must log in there using their ZEISS ID.
IOL {0} Preferred formulas	Here, IOL formula combinations are configured, which are calculated by default for each IOL calculation and displayed as an overview in the "IOL calculation". Preferred formula(s) for each IOL can be selected from a list of all formulas available for the IOL. {0}: Placeholder for the corresponding IOL Only IOLs that were added to the "My IOLs" list in IOL management in the Webservice are available for selection (see IOL management [▷ 42] or Add an IOL [▷ 46]). The IOLs available for selection are automatically synchronized with those configured in the Webservice. If an IOL has been added, updated, or removed from the "My IOLs" list, they are also added, updated, or removed in the IOL selection. If a (critical) update for an IOL, e.g. changes in the IOL database by the manufacturer or optimizations by ZEISS, is available in the Webservice, the user is notified while creating the plan (see IOL updates [▷ 64]). The updates should then be checked and updated in IOL management in the Webservice. INFO: If changes are made in IOL management in the Webservice, the selection of formulas available for the IOL is automatically updated. In this case, the software displays a loading process. If you do not want to use automatic updates, you can deactivate them in the server settings. To do so, contact your system administrator. Refer to section Notes on IOL calculation [▷ 77] for available formulas and information. A new selection menu automatically appears below after having selected an IOL formula combination. A maximum of 100 IOL formula combinations can be defined. The order selected here also determines the order of display in the "IOL calculation". If an IOL formula combination should no longer be calculated, the setting in the respective field can be reset to "Please select".

IOL order

Parameter	Explanation
Order quantity	Default setting for the number of IOLs to be ordered. This is configured in the IOL order, but it can be changed there if desired. "1" is configured by default.
Preferred product model optional	Specifies which product model of ZEISS IOLs is preferred. The available product models depend on the selection of personal IOLs in the Webservice. The following list provides an overview of the abbreviations used: ■ **M**: MICS (Micro Incision Cataract Surgery) ■ **MP**: MICS, preloaded ■ **MV**: MICS, violet light filter ■ **P**: fully preloaded ■ **PY**: fully preloaded, yellow with blue light filter The selection made here is preselected by default for "IOL calculation" when selecting a ZEISS IOL. If the preferred IOL product model is not available, an available product model can be selected from the list here.
Activate default anonymization	If this function is activated, data is anonymized or displayed without the patient name by default (e.g. for reasons of data protection, for study purposes, or for product optimization). This means that it is no longer possible to associate the plan with the patient. This function is activated for new plans by default. Existing plans cannot be anonymized.
Comment regarding IOL order	Input field for the default text in the "IOL order" comment field (max. 10,240 characters)
Automatically insert comment	If this function is activated, the configured default text is preset in the "IOL order" comment field.
E-mail address (e.g. of ZEISS IOL representative) optional	If an e-mail address is entered here, it is automatically used in the e-mail recipient field when creating an order e-mail in the "IOL order". A maximum of one e-mail address can be entered here.
Additional e-mail address (CC) optional	You can enter an additional e-mail address in this input field. Use the [Add e-mail address (CC)] button to add input fields for additional e-mail addresses (max. 20). All e-mail addresses are automatically added to the CC field when creating an order e-mail.

Additional functions and buttons

Function	Explanation
Configure proxy	Configuring proxy servers [▶ 39]
Legal information	Opens a page with product identification numbers as well as additional legal information about the software
Data protection	Opens the software's data protection regulations
Free and open-source software (FOSS)	Opens the FOSS (free and open-source software) disclosure statement
Save	Saves the changed user settings TIP: If the button is deactivated, you have entered values outside the borderline limit in the input fields for default values. Permitted values will be displayed in a tool tip when the mouse is hovered above the respective field.
Reset	Resets the user settings to the recently saved status. In the process, the settings from the Webservice are also loaded again.
Close	Closes the user settings TIP: If there are unsaved changes to the user settings, a confirmation prompt is displayed.

5.2 Configuring proxy servers

The software requires Internet access. If a proxy server is used, it must be configured in the settings. You can open the proxy server configuration via the “Configure proxy” function in the “User settings” via the “System / Workplace administration / EQ Workplace” menu item:

Parameter	Explanation	
No proxy	Default setting No proxy is used.	
Automatic connection	Automatic searches for a proxy server on the network After saving, the connection can be tested using the “Test” button. If the automatic connection fails, the connection to the proxy server can be configured manually.	
Manual configuration	Settings for the configuration of the connection to the proxy server.	
	Host	The “Host” and “Port” parameters must be entered; the other parameters are optional.
	Port	
	Proxy user	
	Proxy password	
	Do not use proxy for	
Save	Saves the selected settings	
Reset	Resets the settings to the recently saved settings	
Test	Tests the connection to the proxy server If the test fails, this may be due to the following reasons: ■ Proxy not available or incorrect connection data ■ No Internet connection or blocked by the firewall	
Discard changes	Resets the settings to the recently saved settings and closes the window	
Save changes	Saves the changed user settings and closes the window	

5.3 Exporting TK® values from IOLMaster

For TK® values from IOLMaster 700 to be displayed in the software, a certain setting on IOLMaster must be activated during exports to FORUM. Proceed as follows to export:

Prerequisite

☑ A license for TK® is available on IOLMaster 700.

Action

1. Select the setting options for the export in the advanced settings on IOLMaster 700.
2. Make sure that the export of the cornea data is enabled in the DICOM export settings.

Result

✓ TK® measurements are visible in EQ Workplace.

If an IOLMaster report was already exported with disabled cornea data, the export must be repeated with the setting enabled. Once the patient is opened again in der software, planning can be carried out with the new IOLMaster report.

6 Operation – ZEISS Calculation Webservice

6.1 Opening ZEISS Calculation Webservice

Prerequisite

☑ You have logged in the first time after installation (see Logging in for the first time [▶ 31]).

Action

1. Open FORUM Viewer.
2. Select “System / Workplace administration / EQ Workplace”.
   ⇨ The “User settings” open.
3. Click “ZEISS Calculation Webservice”.
   ⇨ The login page opens.
4. Log in using your ZEISS ID login data.
   ⇨ The login data will be saved for the FORUM user the first time it is entered so that it is not necessary to log in to the software again.
   INFO: For security reasons, you will have to log in again after 90 days. Users will be notified as soon as they must enter their login data.

Result

✓ ZEISS Calculation Webservice opens to “IOL management”.

6.2 User interface

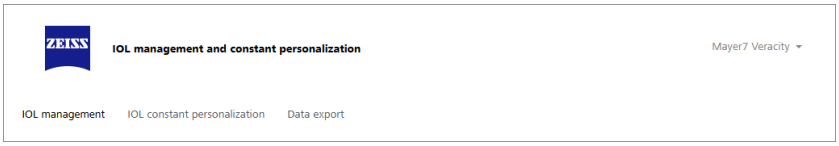


Figure 2: Webservice user interface

The following functions in the Webservice are available after logging in with your ZEISS ID:

Parameter	Explanation
IOL management	IOL management [▶ 42]
IOL constant personalization	IOL constant personalization [▶ 47]
Data export	Data export [▶ 52]
	The user can log out via the drop-down menu labelled with the username.
Legal notice	Opens the legal notice
Data protection	Open the privacy policy
Free and open-source software (FOSS)	Opens the FOSS (free and open-source software) disclosure statement for the ZEISS Calculation Webservice

6.3 IOL management

Only the IOLs selected in IOL management can be used for IOL calculations and personalized in the IOL constant personalization.

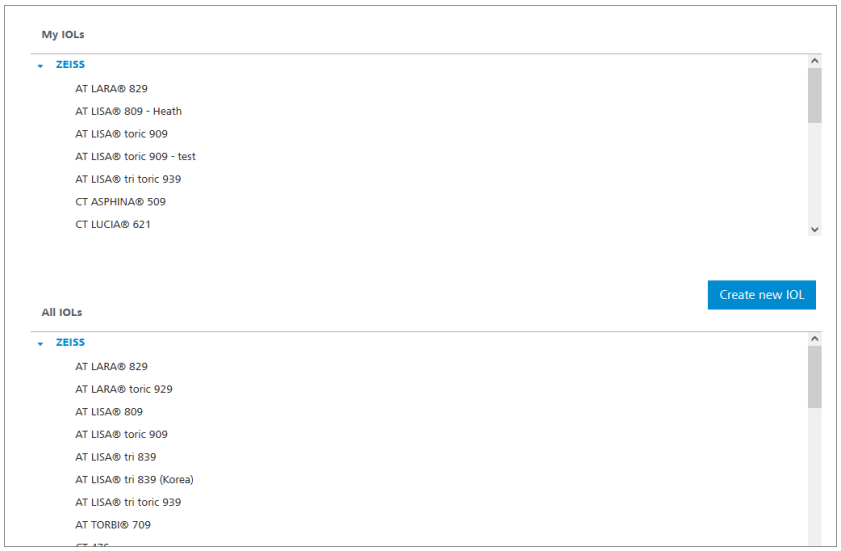


Figure 3: IOL management

After opening IOL management, the personal selection of IOLs used is shown at the top (“My IOLs”). Below is the IOL database with all IOLs available (“All IOLs”). Both lists are grouped by manufacturer and sorted alphabetically within the groups. IOLs can be added to the personal list either by selecting them from the IOL database or by manually creating a new IOL.
For additional information, see Add an IOL [▶ 46].

INFO:

- The IOL data in the IOL database for ZEISS IOLs, including the Z constant for Z CALC, is provided directly by ZEISS.
- The IOL data in the IOL database for IOLs from other manufacturers, including the constants, come from IOL Con.
- By switching from sphere-based to SE-based IOLs, it may occur that specific ZEISS IOLs are no longer available. If sphere-based IOLs that are no longer available are included in the personal list “My IOLs”, the IOLs are marked with a note when selected.

If an update for an IOL is available, e.g. changes in the IOL database by the manufacturer or optimizations by ZEISS, is available in the Webservice, an update notification is shown next to the IOL. The notification indicates whether it is a regular update or a critical update (see Updating IOL data and IOL constants [▶ 51]).
TIP: The software also notifies the user of any available IOL updates (see IOL updates [▶ 64]).

If an IOL is highlighted in one of the two lists (“My IOLs” or “All IOLs”), the “IOL specification” window shows details about the selected IOL.

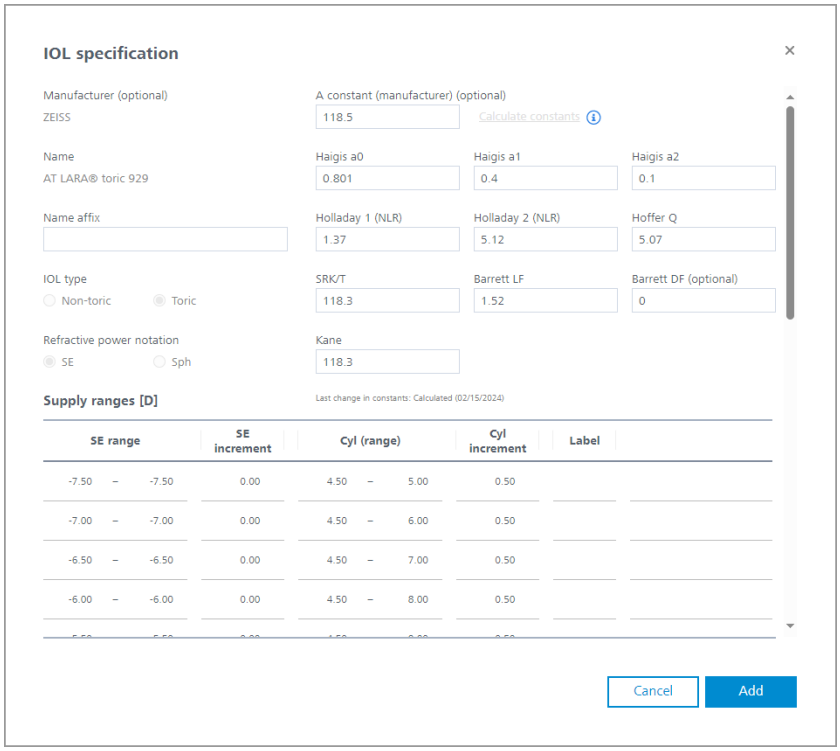


Figure 4: IOL specification

General settings and values

Parameter	Explanation
Manufacturer (optional)	IOL manufacturer Optional field for manually created IOLs
Name	IOL name
Name affix	If an IOL from the IOL database is added to the “My IOLs” list, you can assign a name affix. This lets you leave an individual, personal note. In addition, the same IOL can be added to the “My IOLs” list multiple times with different name affixes for particular uses. The IOLs can then also be personalized separately.

Parameter	Explanation
IOL type	Select whether you are working with a toric or non-toric IOL For toric IOLs, it is additionally necessary to state whether the IOL is based on spheres or SE (refractive power notation). Depending on the selection, the "Supply ranges [D]" section provides different input fields. These are described in the following tables.
Calculate constants	Calculation of IOL constants The manufacturer's A constant or the SRK/T constant must be entered for calculation. All other IOL constants are automatically calculated from that.
A constant (manufacturer)	Manufacturer's A constant
Haigis a0	Constants for IOL calculation with the "Haigis Suite" formulas
Haigis a1	
Haigis a2	
Holladay 1 (NLR)	Constant for IOL calculation with the "Holladay 1 (NLR)" formula
Holladay 2 (NLR)	Constant for IOL calculation with the "Holladay 2 (NLR)" formula The system automatically calculates the "Holladay 2 (NLR)" constant from "Holladay 1 (NLR)". But it can still be manually changed and personalized.
Hoffer Q	pACD constant for IOL calculation with the "Hoffer Q" formula
SRK/T	Constant for IOL calculation with the "SRK/T" formula
Barrett LF [8]	Constant for IOL calculation with the "Barrett Suite" formulas
Barrett DF [9] (optional)	Optional field for manually created IOLs
Kane	Constant for IOL calculation with the "Kane" formula

[8] LF: Lens factor for the "Barrett Suite" formulas
[9] DF: IOL design factor for the "Barrett Suite" formulas

Parameter	Explanation
Last change in constants	Displays the last change in constants Possible causes for the change: ■ Imported – Nominal import – ULIB optimized import – IOL Con optimized import – Kane import ■ Edited ■ Personalized ■ Calculated (only for the automatic calculation of the "Holladay 2 (NLR)" constant from the "Holladay 1 (NLR)" constant) The last change in constants is not shown for every single constant. Only the change to the last updated constant is shown.

Supply ranges [D] – Settings for non-toric IOLs

Parameter	Explanation
SE range	IOL SE range
SE increment	SE increment (0.25 D increments, between 0.25 and 2 D)

Supply ranges [D] – Settings for toric IOLs

Parameter	Explanation	
SE-based IOLs	SE range	IOL SE range
	SE increment	SE increment (0.25 D increments, between 0.25 and 2 D)
Sphere-based IOLs	Sph range	IOL Sph range
	Sph increment	Sph increment (0.25 D increments, between 0.25 and 2 D)
Cyl (range)	Individual value or optionally a range for the IOL cylinder	
Cyl increment	Cyl increment (0.25 D increments, between 0.25 and 2 D). If a cylinder range is entered, the Cyl increment must also be specified.	

Parameter	Explanation
Label	Delivery ranges can be provided with individual labels each to describe a certain cylinder (e.g. T1, T2). Labels are displayed in the IOL calculation and the associated PDF form. Labels can be provided for specific cylinder values only, not for cylinder ranges. Labels must also be unique. Different cylinder values cannot be provided with the same label. Identical cylinder values must be provided with the same label.

6.3.1 Add an IOL

There are several ways to add IOLs to the "My IOLs" list:

- Add an IOL from the "All IOLs" IOL database
- Individually adapt and add an IOL from the "All IOLs" IOL database
- Manually create an IOL

Add

After selecting it from the "All IOLs" IOL database, the desired IOL can be added to the "My IOLs" list using the [Add] button.

Adjusting and adding IOLs

The IOL constants in "All IOLs" are based on the IOL Con data.
If optimized constants are available in the IOL Con, they are used. If not, constants based on manufacturer data are used. After selecting it from the "All IOLs" IOL database, an IOL's IOL constants can be individually adapted and added to the "My IOLs" list using the [Add] button. You can also enter a personal affix in the "Name affix" field.
TIP: The name affix is appended to the name with a dash so that IOLs with the same name can be distinguished.

Manually creating an IOL

INFO: Manually created IOLs cannot be calculated with the "Z CALC" formula.

Action

1. Click on the [Create new IOL] button.
2. Enter the values for the IOL you want to create.
   TIP: Enter positive values without a sign and add "-" to negative values.
   ⇨ After having added the manually created IOL, it is merely possible to edit the IOL constants. It will no longer be possible to retrospectively edit any other values.
3. Click on the [Add] button.

Result

✓ The IOL is added to the "My IOLs" list.

6.3.2 Remove an IOL

You can remove an IOL from the "My IOLs" list permanently by clicking the delete icon (appears when the mouse is hovered over it).

INFO: Please note that if you remove an IOL from the "My IOLs" list, all data relating to the IOL, including all constant personalization results, will be deleted. The data cannot be recovered. This IOL can no longer be calculated when creating a plan. If system IOLs are removed, personalized IOLs based on these system IOLs can still be used.

In completed and/or released plans, the calculation results are archived so that the result for removed IOLs is still available. In created but not yet completed plans and in new plans, a warning is shown that the previously selected old IOL is no longer available. This warning is only shown if the IOL has not yet been updated under "IOL calculation" in the EQ Workplace user settings (see Configuring the user settings [▶ 33]).

6.4 IOL constant personalization

The IOL constants that are included in the calculation formulas can be individually personalized for each user based on postoperative refraction results (see Personalizing IOL constants [▶ 49]).

All IOLs that are included in IOL management in the "My IOLs" list can be selected for IOL constant personalization. IOL constant personalization is performed by comparing the calculated and actual postoperative, subjective residual refraction. The personalized IOL constants are re-used for all newly performed IOL calculations.

Data records already used for an IOL constant personalization are retained and stored independently in the Webservice. The predictability increases with the number of data records and when multiple IOL constant personalizations are performed for different groups of eyes (e.g. short, normal, and long eyes).

Patients who have had pre-, inter-, and postoperative complications that may alter the refraction state must be excluded to obtain optimal constants. The IOL constant personalization calculates the IOL constants for each record as they should be based on the measurement values and the results of the surgery. The mean (sum of all IOL constants divided by the number of patients) and the standard deviation are then calculated. All IOL constants that are more than twice the standard deviation from the mean are not considered for IOL constant personalization. In addition, data records with an IOL refractive power of "0" and other potentially unsuitable data records are not included.

After selecting the IOL to be personalized, all data records uploaded to the Webservice and selected for personalization will be displayed. You can also change the selection of data records intended to be included in the IOL constant personalization of the respective IOL in the Webservice. In addition, information about the pre- and postoperative data and the surgery date is displayed.

The following table shows all data records regardless of the laterality:

Parameter	Explanation	
Preoperative data	Date	Date of the IOL calculation
	UDVA	Preoperative patient data for subjective refraction
	CDVA	
	Sph	
	Cyl	
	Axis	
Surgery date	Year and calendar week of the surgery date	

Parameter	Explanation	
Postoperative data	Date	Import date of the postoperative IOLMaster report in FORUM If the data from the post-surgery report has been entered manually, no date is displayed.
	UDVA	Postoperative patient data for visual acuity and subjective refraction
	CDVA	
	Sph	
	Cyl	
	Axis	

Personalizing IOL constants

Prerequisite

☑ More than 10 data records must be available to personalize IOL constants.
INFO: The records need to have been uploaded to the "Post surgery" in the Webservice and selected for IOL constant personalization (see Post surgery [▷ 100]).

☑ For the personalization of the constants "Haigis a0", "Haigis a1", and "Haigis a2", a minimum of 10 data records each of short (14 mm to 22 mm), normal (22 mm to 25 mm), and long (25 mm to 38 mm) eyes – so at least 30 records – must be available.
INFO: If there are insufficient records, only a simple personalization of the "Haigis a0" constant is performed. The constants "Haigis a1" and "Haigis a2" retain the base values.

Action

1. Select the IOLs for which you want to personalize the constants from the drop-down menu.
   ⇨ The current constants are shown on the right.
2. Click on the [Prepare personalization] button.
   ⇨ All data records that have been uploaded to post surgery are listed.
3. Use the checkboxes in the "Use" column to select or deselect the data records you want to personalize.
   TIP: All listed data records are used by default. In addition, information about the pre- and postoperative data and the surgery date is displayed. For additional information, see IOL constant personalization [▷ 47].
4. Check the data.

5. Click on the [Personalize] button.
   ⇨ The IOL constants are personalized.
   ⇨ The old data are shown on the left, the personalized data are shown on the right.



6. Use the checkboxes to select or deselect the IOL constants you want to save.
   TIP: The checkboxes determine whether the respective personalized IOL constant should be saved. This also makes it possible to apply only individual personalized IOL constants or specifically exclude IOL constants from the personalization.
7. To save the personalization for all activated IOL constants via the checkboxes:
   Click on the [Accept] button.
8. To retain the old IOL constants:
   Click on the [Restore] button.
   INFO: It is not possible to reset IOL personalizations later.

Result

✓ IOL constant personalization is complete.

6.5 Updating IOL data and IOL constants

If an update for an IOL is available, e.g. changes in the IOL database by the manufacturer or optimizations by ZEISS, is available in the Webservice, one of the following messages is shown next to the IOL:

Message	Explanation
IOL constant update	An update of the IOL constants is available for the corresponding IOL. After selecting the IOL, the old IOL constants are shown on the left and the updated IOL constants (including the date of the update) are shown on the right. The updates are applied in the "My IOLs" personal list using the [Accept] button.
IOL data update	An update of the IOL data is available for the corresponding IOL. An update is available if changes have been made to the name, manufacturer, or supply range in the database. After selecting the IOL, the old IOL data on the left and the updated IOL data on the right are shown. The updates are applied in the "My IOLs" personal list using the [Accept] button.
Critical IOL data update	A critical update of the IOL data is available for the corresponding IOL. A critical update is available if changes have been made to the IOL type (toric/non-toric) or the refractive power notation in the database. If a critical update of the IOL data is available, the corresponding personal IOL (incl. all personalization data) must be deleted and a new IOL created. You can delete the IOL and remove it from the "My IOLs" personal list using the [Delete current IOL] button. You can delete the IOL and create a new IOL with the updates in the "My IOLs" personal list using the [Delete IOL & create new] button.

6.6 Data export

All patient data records uploaded to the Webservice can be saved as a CSV file in any storage location.

Use the [Download data table] button to start a data export.

INFO: All data is exported that has been uploaded postoperatively to the Webservice in the "Post surgery" work step. The export always contains all data that has been uploaded up to the time of export. For additional information, see Post surgery [▶ 100].

7 Operation – EQ Workplace

7.1 Opening EQ Workplace

EQ Workplace is opened for a patient in the clinical view of FORUM.

To be able to use the software, each user needs a user license. This license is requested when the user logs in to FORUM and is released again when they log off. Therefore, the number of users who can work with the software simultaneously is limited by the number of available user licenses.

Prerequisite

- ☑ The software is installed on the FORUM server.
- ☑ The software has been activated for the active (logged-in) FORUM user.
  TIP: In the FORUM user administration, the "EQ Workplace access" checkbox must be activated for the user (see "FORUM from ZEISS" IT manual under "User administration").
- ☑ You have logged in the first time after installation (see Logging in for the first time [▷ 31]).
- ☑ *If the FORUM user account is a shared account:*
  The right ZEISS ID user is active in the software's user settings (see Configuring the user settings [▷ 33]).
- ☑ Refraction measurement details have been configured (see Refraction measurement details [▷ 32]).
- ☑ A free user license is available.
- ☑ The desired patient has been opened in the Clinical View in FORUM.

Action

1. In the Presets, click on "ZEISS EQ Workplace".
2. Click on the preselection "Plan surgery".

Result

- ✓ The EQ Workplace working area opens.

INFO: If you do not have a licensed version of EQ Workplace, a corresponding message is displayed. In this case, contact your local IOL Representative.

7.2 General operating guidelines

7.2.1 User interface

When the software starts, “ZEISS EQ Workplace” opens with the following elements:

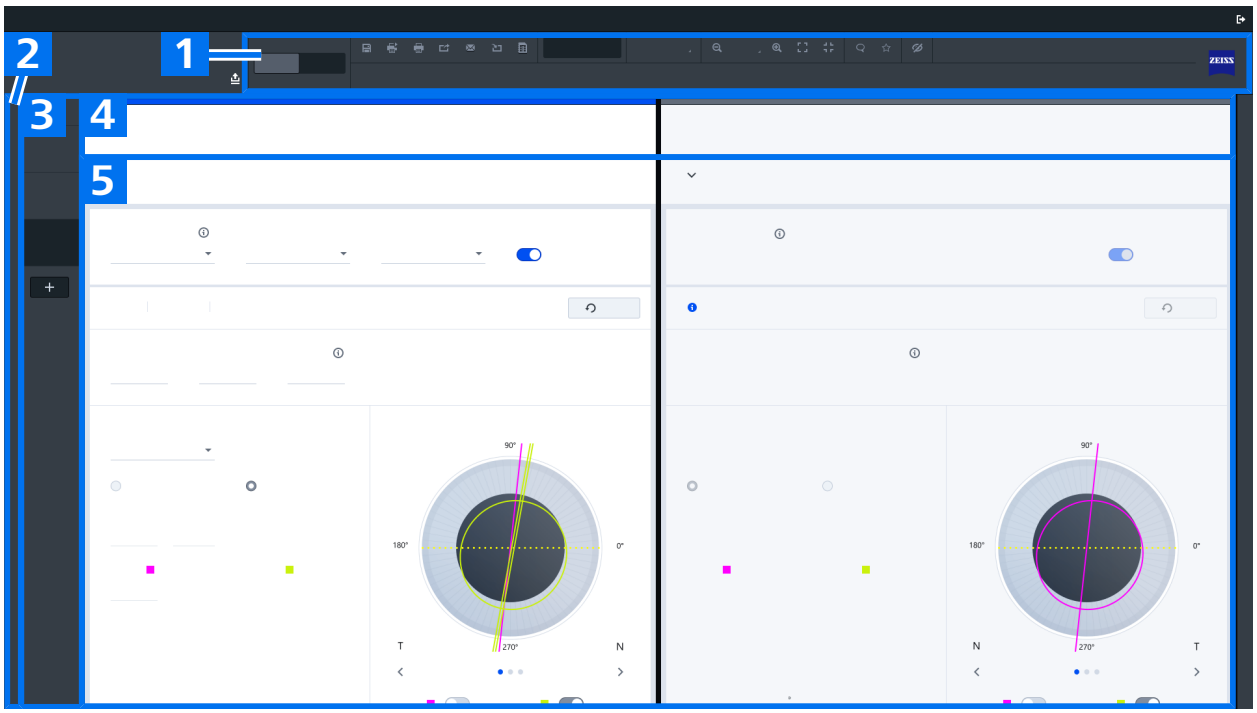


Figure 5: User interface

Item	Designation
1	Toolbar
2	Presets; collapsed
3	Plans [▶ 55]
4	Header [▶ 56]
5	Working area [▶ 57]

7.2.1.1 Plans

All data generated during a process are stored in the software as individual "Plans". Each plan can contain data regarding both eyes. By opening the "Plan surgery" standard workflow, the first plan is automatically created if it does not already exist for the selected patient. This can be seen in the plan overview. The work steps of the plan are visible in the working area during the entire process. The "IOL order" and "Post surgery" work steps are only available after completing the plan.

All plans for a patient are visible in the plan overview and can only be opened and edited in the software. Editing a plan can be interrupted at any time and then restarted at the desired step. Data is continually saved automatically. Each user can only edit the plans they created.

As a result of the workflow, the plan can be completed for each laterality separately. This plan only contains the relevant data for the surgery for **one** laterality. Furthermore, only information on the IOL selected for the surgery is saved.

Once the plan for a laterality has been completed, only the surgery date and the study ID can be changed for this laterality. It is not possible to make any other changes to the plan. After completion, the plan can be released for CALLISTO eye, and an IOL order can be initiated. The completed plans can also be exported to a USB storage medium.
For additional information, see Release for CALLISTO eye [▷ 94].

Up to 10 plans can be created for each patient. The plans for each patient are created in ascending order, starting with "1". When creating or opening a plan, the working area is always opened with the "Precalculation – K/Precalculation – TK®" [10] work step.

The plan overview provides the following functions and buttons:

Function	Explanation
 Create new plan	Creates a new plan The first plan for the patient is automatically created when the software is opened. Up to 10 plans can be created for each patient. The plans for each patient are created in ascending order, starting with "1".
Delete plan	Deletes the currently selected plan Right-click on a plan to show the "Delete plan" function. Plans that have already been completed can no longer be deleted.

[10] Depends on the selected keratometry

The planning status for each plan can be seen in the plan overview for both lateralities:

Icon	Explanation
No icon	Plan has not been completed
	Plan has been completed
	Release plan for CALLISTO eye
	Most recently released plan for CALLISTO eye

7.2.1.2 Header

Additional information on the status of the plan or the respective work step is displayed in the headers of the working area or the work step: The following table shows which information is displayed in which header:

Header	Explanation
Working area	Indicates laterality and, if necessary, provides information that the plan for the respective eye has been completed or released for CALLISTO eye. The laterality "OD" is selected by default when starting the software. TIP: You can switch to the corresponding laterality by clicking on the header of the working area. TIP: You can also switch lateralities by clicking on the header of the working area for the corresponding laterality.
Precalculation – K/ Precalculation – TK® [11]	Information about the eye status and biometric data
IOL calculation	Values for the selected IOL as well as the applied calculation formula
Surgery preparation	Information about the values stored during surgery preparation
IOL order	Creation date of the order e-mail
Post surgery	Status whether IOL constant personalization has been activated/deactivated as well as if and when the data was uploaded to the Webservice

[11] Depends on the selected keratometry

7.2.1.3 Working area

Regardless of the selected laterality, the working area will display the data for the right eye (“OD”) on the left side, and the data for the left eye (“OS”) will be displayed on the right side. The selected laterality is highlighted in white in the working area; the unselected laterality is grayed out. In addition, the working area of the selected laterality is highlighted in blue and can be edited.

Planning can be performed for both lateralities at the same time. As a rule, however, a plan for one eye is completed before planning for the second eye is started. If planning is performed for both eyes at the same time, the data entered is kept when switching between the lateralities.

The work steps of the plan are visible in the working area during the entire process. When moving from one work step to the next, the current work step is minimized and the next one is maximized. By opening a specific work step, targeted changes can be made to one of the work steps.

7.2.1.4 Basic functions

The software has various basic functions that are available in all or several work steps:

Function	Explanation
 OD/OS	Select the laterality “OD” is selected by default when starting the software. The selected laterality is highlighted in white in the working area; the unselected laterality is grayed out. In addition, the working area of the selected laterality is highlighted in blue and can be edited. TIP: You can also switch lateralities by clicking on the header of the working area for the corresponding laterality.
Release IOLMaster report	Right-click on an IOLMaster report in the FORUM thumbnail gallery to open the “Release IOLMaster report” function and to transfer to CALLISTO eye all patient data relevant to CALLISTO eye without creating a plan in EQ Workplace. This function releases the IOLMaster report for CALLISTO eye. No plan is created in EQ Workplace in the process, and no planning data will be transferred to CALLISTO eye. This function is also available in offline mode (see Offline mode [▷ 63]).

Function	Explanation
Open product information in MyZEISS	Opens the “MyZEISS” ZEISS website for more information on the product, such as expert videos, supporting documents as well as answers to frequently asked questions on use and handling.

Specific functions for the individual work steps are described in the respective sections.

Warning and notice icons

The software interface might show the following warning and notice icons:

Icon	Explanation
	Additional information for the user
	Important information about the performed software function
	Negative response if a software function could not be performed or could only be performed to a limited extent

Input fields

Input fields that can be edited are displayed in dark gray in the software. In addition, a line below the input field indicates that this value can be edited manually. Input fields that cannot be edited, e.g. because the data has been loaded from an IOLMaster report, are displayed without a line.

Icon	Explanation
	If you hover the mouse over an info icon, further information will be displayed.
	Indicates next to the respective input field as well as in the header of the respective work step that manual editing is active.
	Indicates next to the respective input field as well as in the header of the respective work step that the workflow cannot be continued. The entered value must be changed.

The input fields change color depending on the entry. The warning symbol indicates manual editing of the value behind it is active. A standard range, a borderline limit, and a range outside the borderline limit are stored behind each input field. When the mouse is hovered over the input field, the configured value ranges are displayed. If the entered value is not within the usual range, a corresponding message also appears.

The following table explains the meaning of the colors and icons:

Icon	Color	Explanation
	Yellow	The value entered is within the borderline limit.
	Red	■ The value entered is outside the borderline limit. ■ The value has been entered incorrectly. ■ No value was entered in a mandatory field. INFO: If colored red, it is not possible to continue with the workflow or it will not be possible to save settings.
	Underlined in yellow (caution)	If the input field or the entered value is underlined as well, this indicates a validation error. See the corresponding notification for details.
	Underlined in orange (warning)	
	Underlined in red (error)	

In addition, plausibility checks are carried out between the values of the two lateralities. If there are anomalies, this is displayed in the form of messages in the software interface.

7.2.2 PDF forms

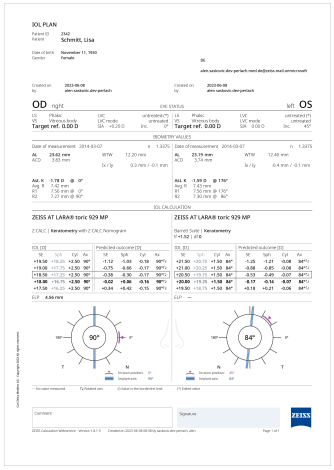
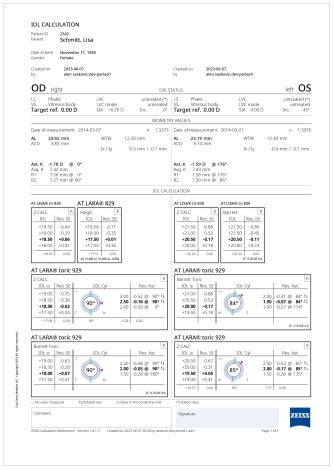
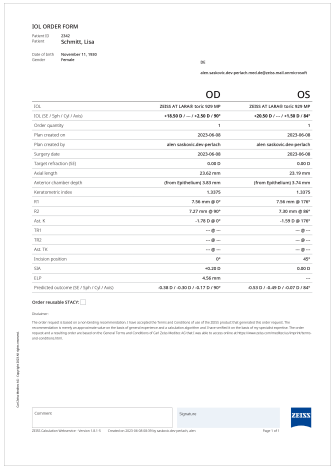
NOTE

Risk of implanting a suboptimal IOL

If a PDF form is created based on incorrect input values, a suboptimal IOL may be ordered and implanted.

- ▶ Always check if the data in the created forms is correct.

You can create the following PDF forms:

Form	IOL plan	IOL calculation	IOL order form
			
Header	Patient data: Patient ID, name, date of birth, gender		
	Creation date, author of the form		Author of the form

Form	IOL plan	IOL calculation	IOL order form
Contents	■ Eye status ■ Biometry values ■ IOL calculation – Formula used – Z CALC nomogram usage information (only when "Z CALC" formula is used) – Selected IOL power or toric power and 4 additional IOL powers [12] Here, the selected IOL is outlined and the recommended IOL [13] is highlighted in bold. ■ Pre-surgery information about the patient ■ Diagrams: – Preferred Topography Map (see "IOL calculation" under Configuring the user settings [▶ 33]) – Schematic diagram of the IOL incl. implant axis and incision position	■ Eye status ■ Biometry values ■ IOL calculation – Selected keratometry (K or TK) – All formulas used – All displayed IOL powers or toric powers and 4 additional IOL powers [12] Here, the recommended IOL [13] is highlighted in bold. ■ Pre-surgery information about the patient ■ Diagrams: – Schematic diagram of the IOL incl. implant axis and incision position	■ Information about the IOL to be ordered ■ Planned surgery date ■ Biometry values
Footnote	Creation date and fields for comments and signature		

If available, the PDF forms always list both lateralities. This can be deactivated for the IOL order form, even if IOLs have been planned for both lateralities (see IOL order [▶ 98]).

[12] For toric IOLs only
"Rotated axis" indicated if the cylinder axis has been reversed.
[13] Recommended IOL: IOL closest to the selected target refraction

PDF forms can be created using the following icons in the toolbar:

Function	Explanation
 Archive IOL plan in FORUM/Archive IOL order form in FORUM/Archive IOL calculation in FORUM	Archives the corresponding form in FORUM INFO: Archiving of the PDF forms in FORUM can be repeated as often as desired. Each archiving results in a new document in FORUM. These can be distinguished by means of the time stamp. To keep the required disk space to a minimum and prevent clutter, it is recommended to only archive the PDF forms once the plan is released.
 Send IOL plan/ Send IOL order form/Send IOL calculation	Creates an e-mail draft The respective form has been added as an attachment. In contrast to the order e-mail, no e-mail addresses and no e-mail text are pre-entered.
 Download IOL plan/ Download IOL order form/ Download IOL calculation	Saves the respective form in a user-defined storage location on the PC
 Show IOL plan/ Show IOL order form/Show IOL calculation	Opens the corresponding form in a PDF viewer Use it to directly print the form.

Which PDF form is created or archived depends on the work step that is currently open:

● = Available
❍ = Not available

Work step	PDF form		
	IOL plan	IOL order form	IOL calculation
Precalculation – K/ Precalculation – TK® [14]	❍	❍	❍
IOL calculation	❍	❍	●
Surgery preparation	●	❍	❍
IOL order	❍	● [15]	❍
Post surgery	❍	❍	❍

The PDF forms can also be opened in the PDF viewer via the PDF functions in the work steps and saved or printed there.

TIP: Personal data can be redacted from PDF forms in the "IOL order" work step (see IOL order [▷ 98]).

7.2.3 Offline mode

If an Internet connection is not available, the functions of the software can only be used to a limited extent (offline mode). When opening the "Plan surgery" preselection, a message is shown in the header of the working area stating that an error occurred when loading the user settings and that the Internet connection must be checked. Creating a new plan and editing or completing an existing plan is not possible in offline mode.

Completed plans can also be released offline for CALLISTO eye or exported via USB (see Release for CALLISTO eye [▷ 94]). For this purpose, select the respective plan in the plan selection (highlighted in dark gray) and the corresponding laterality. The stored IOLMaster report of the selected plan can also be released for CALLISTO eye (see "Release IOLMaster report" under Basic functions [▷ 57]).

[14] Depends on the selected keratometry
[15] Possible only if surgery date is not in the past.

7.2.4 IOL updates

If an update for an IOL, e.g. changes in the IOL database by the manufacturer or optimizations by ZEISS, is available in the Webservice, the user is notified of IOL updates in the software and in the Webservice. The notification indicates whether it is a regular update or a critical update. A regular update is available if IOL constants have been updated or if changes have been made to the name, manufacturer, or supply range in the database. A critical update is available if changes have been made to the IOL type (toric/non-toric) or the refractive power notation in the database.

In EQ Workplace, a corresponding notification is shown in the header of the working area. The notification is shown until the plans for both lateralities have been completed. You can click on the "close" cross to hide the notification until the next time you log in to FORUM Viewer. You can open the ZEISS Calculation Webservice directly and check and apply updates in IOL management by clicking on the "ZEISS Calculation Webservice" function (see also Updating IOL data and IOL constants [▷ 51]). Updates do not affect the IOLs already selected in your plans. Click the [Recheck] button to check all IOLs again for updates. If no further updates are available, the notification disappears.
TIP: You can also open the ZEISS Calculation Webservice and check and apply updates in IOL management by clicking on the link in the e-mail notification.

7.3 Precalculation

In the precalculation, the IOLMaster report with the data that should be used for the IOL calculation is selected. In addition, further documents and relevant information as well as measurement values relating to the patient can be viewed and stored in the plan. The user-specific settings of the logged-in user (e.g. default values, preferred units, IOLs to be calculated, and formulas) are loaded. The selected keratometry is shown in the header of the work step: Precalculation – K/Precalculation – TK®

Precalculation contains the following elements:

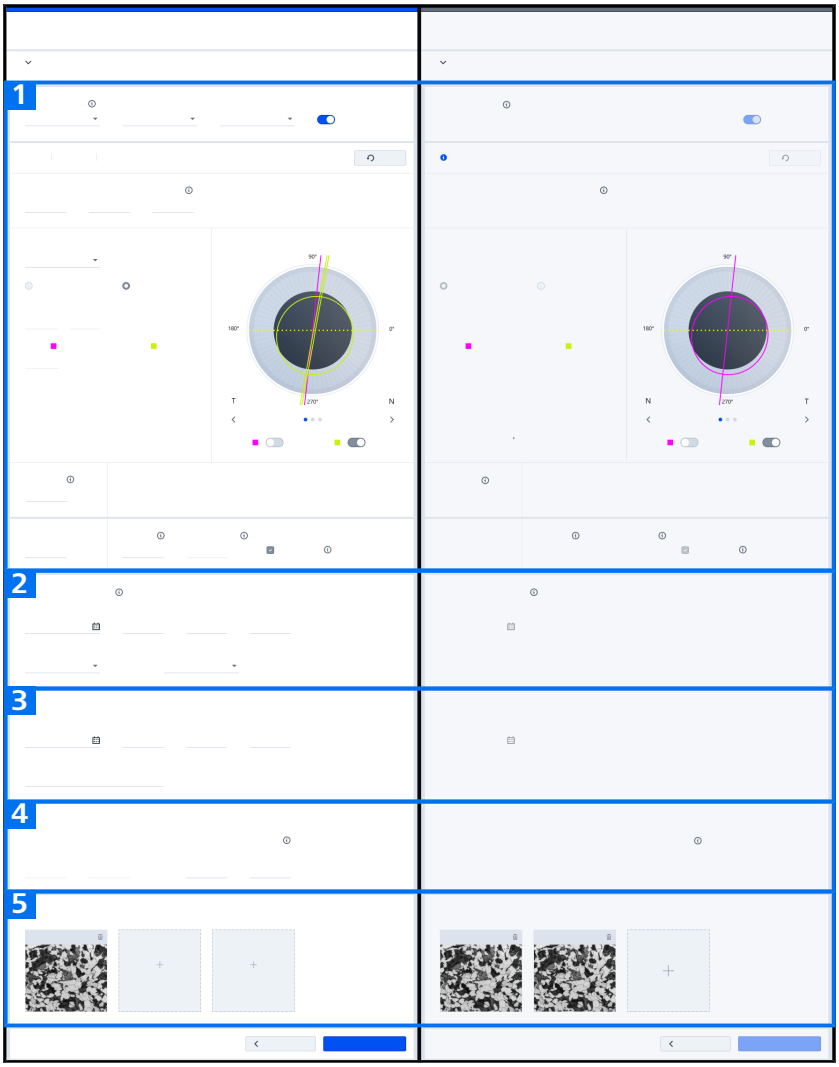


Figure 6: Precalculation – K/Precalculation – TK® (depends on the selected keratometry)

Item	Designation
1	Information for the IOL calculation [▶ 66]
2	Patient's subjective refraction [▶ 74]
3	Patient's objective refraction [▶ 75]
4	Barrett-specific data [▶ 75]
5	Attached documents [▶ 76]

Once all the data for the IOL calculation has been entered, precalculation can be completed using the [Accept & continue] button and the next "IOL calculation" work step can be opened (see IOL calculation [▶ 76]). To proceed with IOL calculation, all mandatory fields must be filled out in the precalculation.

7.3.1 Information for the IOL calculation

Various information that affects the IOL calculation is stored in this area.

In addition to the eye status (see Patient's eye status [▶ 66]) and the patient's biometric data (from an IOLMaster report by default, see Biometric data [▶ 67]), additional data on the surgery is configured (see Surgical information [▶ 73]). Additional values can be entered for specific formulas. Some of the entered data is displayed in the schematic diagram of the eye for visualization.

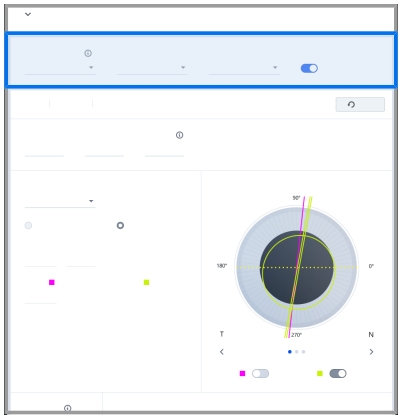
If an IOLMaster report is available for the patient, the included data will automatically be entered. Some of the pre-entered data (e.g. lens and vitreous body status) cannot be changed manually in EQ Workplace, as any adaptation would require re-calculation on IOLMaster.

Depending on the stored data and information (lens status, refractive status), not all formulas can be used for the IOL calculation, or not all configured IOLs can be calculated.

An error message is then listed in the corresponding results table of the IOL calculation instead of the calculation.

7.3.1.1 Patient's eye status

If an IOLMaster report is available for the patient, the eye status entered in IOLMaster is automatically configured here.



Parameter	Explanation
Laser Vision Correction	Select the refractive status: ■ Untreated ■ LASIK, LASEK, or PRK For this selection, you must also select whether the surgery treated "Myopic" or "Hyperopic". ■ RK [16] Depending on the patient's refractive status, it may not be possible to calculate all configured formulas and IOLs. TIP: The "Haigis-L" formula is suitable for patients with previous LVC ("LASIK/LASEK/PRK"), the "Barrett True K Spheric" formula additionally for patients with previous "RK".

[16] RK: Radial keratotomy

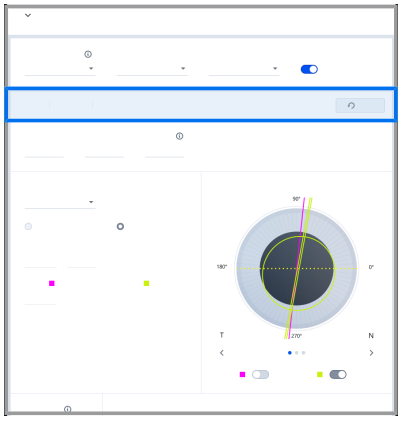
Parameter	Explanation	
Lens status	Preoperative lens status of the patient's eye for the selected laterality Depending on the selection, there may be restrictions on the IOL calculation.	If these values have been pre-entered from an IOLMaster report, they cannot be changed manually.
Vitreous body status	Pre-operative vitreous body status of the patient's eye for the selected laterality: ■ Vitreous body ■ Silicone oil ■ Post-vitrectomy	
Eye status confirmed	Confirm the refractive status, lens status, and vitreous body status in the adjacent selection fields. Users must actively confirm the eye status, otherwise, IOL calculation will not be possible. TIP: Confirmation of the eye status also saves the selection of the stored IOLMaster report. If another IOLMaster report is to be used, this checkbox must first be unchecked.	

7.3.1.2 Biometric data

Biometric data is used for the calculation of IOLs.

If an IOLMaster report for the patient is available, it is loaded automatically, and the biometric data is transferred to the data fields. The data must be reviewed prior to IOL calculation with regard to plausibility. In this process, the most recent IOLMaster report is always pre-selected. If the most recent IOLMaster report does not meet the requirements of the software, a report will not be loaded even if there are older IOLMaster reports. The automatically preselected and most recent IOLMaster report of the patient can be replaced by any of the patient's IOLMaster reports, as long as it contains information on the desired laterality and corresponds to the software requirements. A message is displayed if no IOLMaster report is available for the selected patient. The biometric data can be entered manually. In both cases, manual editing is indicated by a warning sign next to the respective data field and in the header of the work step.

The following functions are available for IOLMaster reports:



Function	Explanation
Replacing an IOLMaster report	For this purpose, the desired IOLMaster report can be dragged and dropped from the thumbnail gallery to the display window. As an aid, the area where you can drag and drop the IOLMaster report is highlighted when you start dragging an IOLMaster report. It is only possible to change the IOLMaster report if the patient's eye status has not yet been confirmed. Please note that if you subsequently replace the IOLMaster report, all settings previously made in "IOL calculation" and "Surgery preparation" will be reset.
Opening an IOLMaster report	Double-click a random area in the display window to open the IOLMaster report in Document Display full-screen view.
Reset	Resets any manual changes made to the biometric data to values from the IOLMaster report, or clears all data fields if there is no IOLMaster report.

⚠ WARNING!

Inaccurate or incorrect IOL calculation due to incorrect entry of the biometric data

The user is responsible for ensuring that the biometric data is entered taking into account surgical procedures (e.g. LASIK), the individual's state of health (e.g. eyes with glaucoma), as well as other patient details (e.g. refractive status), and that the data is within the defined range and has been entered correctly.

- ▶ Always check the entered biometric data for correctness.

⚠ WARNING!

Inaccurate or incorrect IOL calculation

In patients with irregular corneal astigmatism, the axis and refraction values must not be used for the IOL calculation of toric IOLs, especially not with the "Z CALC" formula. For this reason, the results in "IOL calculation" are inconclusive and must not be used.

- ▶ Always check whether the selected IOL is suitable for the patient.
- ▶ Make sure not to use toric IOLs for IOL calculation for patients with irregular corneal astigmatism.

⚠ CAUTION!

Inaccurate or incorrect IOL calculation due to incorrect entry of the biometric data

Entering incorrect values (values are outside the permitted range) may result in an inaccurate or incorrect IOL calculation.

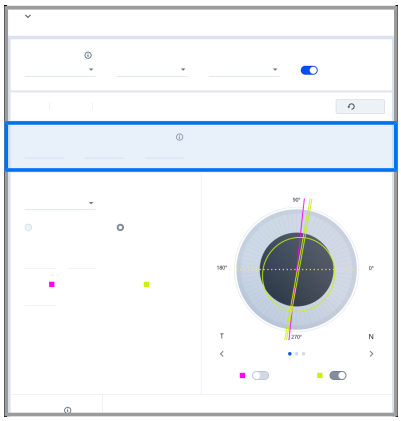
- ▶ The biometric data must always be entered to two decimal places and not rounded up or down.
- ▶ Consistently enter either R values or K values.
- ▶ Enter the correct keratometric index. This can be selected from a list of default values.
- ▶ You must check and ensure that the patient's biometric data is entered correctly.

If an IOLMaster report is available for the patient, the included data will be automatically entered. The data must be reviewed prior to IOL calculation with regard to plausibility. A manual adjustment is possible. If an IOLMaster report is not available, the data can be entered manually. In both cases, a warning sign next to the respective data field and in the work step indicates that manual editing is active. Some of the entered data is displayed in the schematic diagram of the eye for visualization.

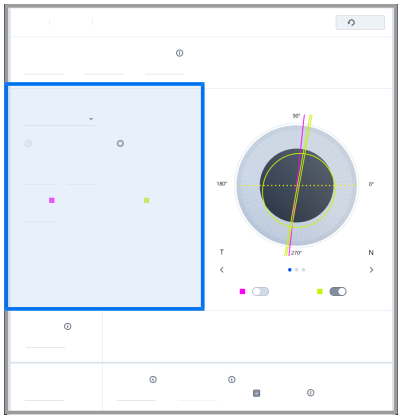
You can choose whether the IOL calculation is based on "Keratometry" or "Total Keratometry". Total Keratometry calculates the total corneal refractive power by measuring the front and back of the cornea, which, in contrast to keratometry, requires no compensation of the values. Total Keratometry data can be measured using IOLMaster 700 with a corresponding license and configuration only. If no Total Keratometry data is available, it can be entered manually for a new/empty patient without an IOLMaster report. The default selection can be defined in the user settings (see Configuring the user settings [▷ 33]).

Whether the refractive power is displayed as radius or diopters is a user-specific setting and can be adjusted in the user settings. "Ast. K" and "Ast. TK" are always shown in "D"; the sign shown depends on the selection for "Cylinder notation" in the user settings (see Configuring the user settings [▷ 33]).

The following biometric data can be configured in the precalculation:

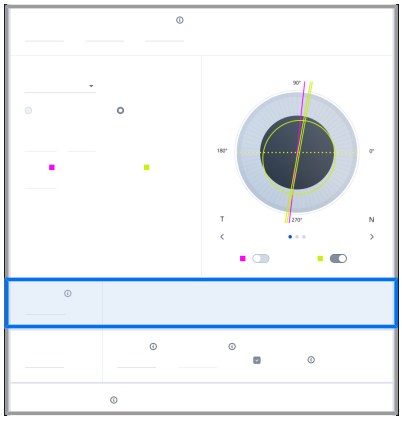


Parameter	Explanation	
AL	Axial length in mm	If the axial length and/or anterior chamber depth are edited, an offset may need to be included. The user is responsible for the correctness of the values.
ACD from epith.	Anterior chamber depth in mm TIP: An anterior chamber depth that is measured from the epithelium is assumed by default.	
LT optional	Lens thickness in mm	If you use the "Barrett Suite" formulas for the calculation, these values – if available – are taken into account during calculation.

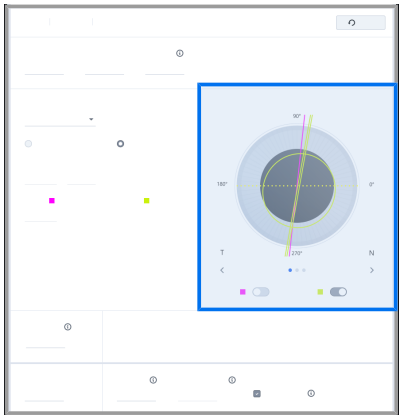


Parameter	Explanation	
Keratometric index	This can be selected from a list of default values.	
K	Keratometry values are used as the basis for IOL calculation.	
	Avg. K/Avg. R	Keratometry values for the corneal curvature and the axes
	R1 flat/K1 flat	
	@ ... °	
	R2 steep/K2 steep	
	Ast. K	

Parameter	Explanation	
TK®	Total Keratometry values are used as the basis for IOL calculation.	
	Avg. TR	IOLMaster Total Keratometry values for the corneal curvature and the axes For additional information, see Total Keratometry (TK®) [▶ 25].
	TR1 flat/TK1 flat	
	@ ... °	
	TR2 steep/TK2 steep	
	Ast. TK	



Parameter	Explanation
WTW optional	White-to-white value in mm If you use the "Barrett Suite" formulas for the calculation, these values – if available – are taken into account during calculation.
Ix, Iy	Displays the optic offset to limbus center (Cartesian coordinates) Distance in mm
Px, Py	Displays the optic offset to the pupil [17] (Cartesian coordinates) Distance in mm
Alpha	Displays the optic offset to limbus center (polar coordinates) ■ Radius in mm ■ Angle in °
Kappa	Displays the optic offset to the pupil [17] (polar coordinates) ■ Radius in mm ■ Angle in °



Different views are displayed on the right side of the working area in the gallery.
INFO: Depending on the available patient data, not all views are available.

[17] Distance of the pupil center from the corneal vertex: highest point of the cornea during fixation on device fixation light, also known as first Purkinje reflex

The following views can be toggled by using the arrows below the gallery:

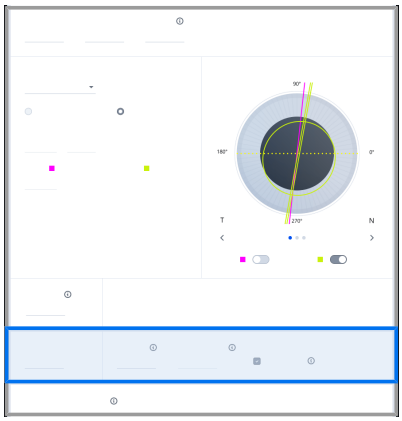
- Keratometry view
  This view visualizes the steep axis of the astigmatism (dashed yellow), the steep axis, its angle (“R2/K2” in violet or “TR2/TK2” in green), and the astigmatism as an ellipse in a schematic diagram of the eye. A circle is displayed if there is no astigmatism. The higher the astigmatism, the more the circle turns into an ellipse. The size of the circle or ellipse depends on how high the K values are. The steep axis and ellipse can be faded in and out with a button.
- IOLMaster Central Topography
  The Central Topography Map is based on the telecentric keratometry of the anterior corneal surface and the OCT-based imaging of the posterior corneal surface. It is visualized in the form of two topography maps:
  - Central Topography – Anterior axial power
    Only available if the Central Topography license is available on IOLMaster 700.
  - Central Topography – Total axial power
    Only available if the Central Topography and TK® licenses are available on IOLMaster 700.

  The color scale specifies the increment of the Central Topography here. The following applies: Per hue = ± 0.5 D. In addition, the diameter of the Central Topography (Ø) as well as the pupil size are displayed next to the map in mm. The position of the pupil is also shown as a dotted circle in the map.
  INFO: The Central Topography serves only as an indicator of irregularities of the cornea and does not function as a complete corneal topography. The surgeon is responsible for verifying the results with other diagnostic methods when in doubt and if multifocal or toric IOLs are to be implanted.

7.3.1.3 Surgical information

In the user settings, user-specific default values for the target refraction, the SIA, and the incision position can be stored (see Configuring the user settings [▶ 33]). These are pre-filled here, but can be adjusted manually.

The following parameters can be configured:

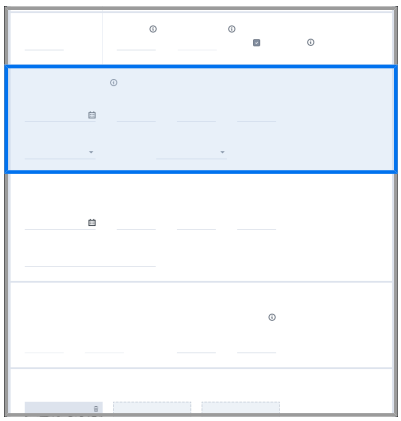


Parameter	Explanation
Target refraction	Target refraction of the eye in D
SIA optional	Astigmatism induced by the surgery in D The entered value can influence the axis value of the calculated IOLs. This is a mandatory field when calculating toric IOLs using the “Haigis Suite” formulas. Optionally, the value for calculations using the “Kane”, “Z CALC”, and “Barrett Suite” formulas can be entered.
Incision position	Position of the incision for placing the IOL in ° (primary incision) Entered as a value for the positioning of the incision in surgery preparation. The entered value can influence the axis and therefore the axis value for the calculated IOLs.
Steep axis used	If this function is activated, the value of the steep axis is used (“R2 steep/K2 steep” or “TR2 steep/ TK2 steep”) as the “Incision position”. In this case, the “Incision position” field is deactivated and cannot be edited.

7.3.2 Patient's subjective refraction

The optional patient information configured in the "Subjective refraction" area is shown in the "IOL constant personalization" in the Webservice (see IOL constant personalization [▶ 47]). If the values are available in the stored IOLMaster report, the fields are preset. If no values are available, this area is collapsed.

The following parameters can be configured:

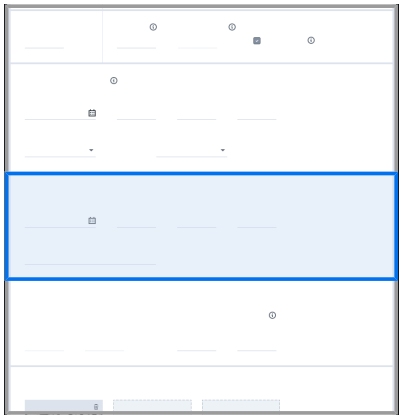


Parameter	Explanation
Measurement	Opens the configured refraction measurement details The refraction measurement details are configured the first time you log in and can be adjusted at any time.
Date of measurement	Date of subjective refraction measurement
Sph	Input fields for the optional input of subjective refraction values of the patient's eye. INFO: The spherical value corresponds to the input under "Post-LVC refraction" in the area for the Barrett-specific input fields (see Barrett-specific data [▶ 75]). If an input field is changed, the system automatically copies this change to the other field as well.
Cyl	
Axis	
Uncorrected Distance Visual Acuity	Selection fields for the visual acuity ("Uncorrected Distance Visual Acuity" = UDVA; "Corrected Distance Visual Acuity " = CDVA) The unit of visual acuity values is defined in the user settings (see Configuring the user settings [▶ 33]).
Corrected Distance Visual Acuity	

7.3.3 Patient's objective refraction

In addition to the subjective refraction, the values for the objective refraction can also be indicated. The optional patient information configured in the "Objective refraction" area is also shown in the "IOL constant personalization" in the Webservice (see IOL constant personalization [▷ 47]).

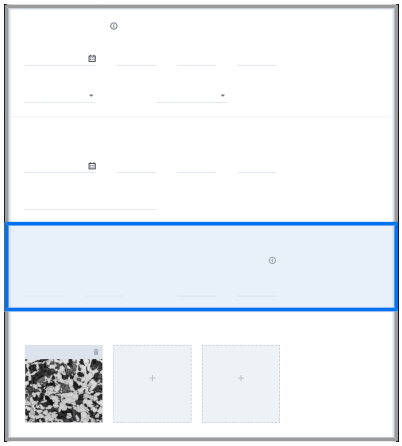
The following parameters can be configured:



Parameter	Explanation
Date of measurement	Date of objective refraction measurement
Sph	Input fields for the optional input of objective refraction values of the patient's eye
Cyl	
Axis	
Measuring device	Device type used to take the objective refraction measurement

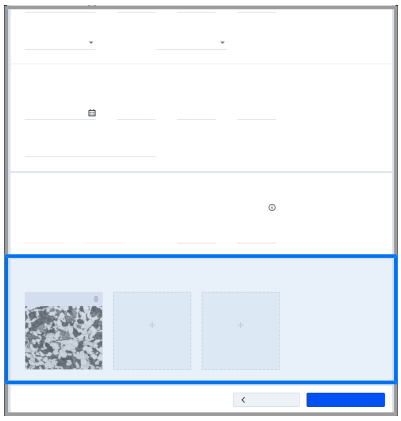
7.3.4 Barrett-specific data

The following optional parameters can be configured in the "Barrett-specific" area for calculations with certain "Barrett Suite" formulas:



Parameter	Explanation	
For IOL calculations with Barrett True K	Pre-LVC refraction	Pre- and postoperative refraction These input fields are only active if the corresponding refractive status was selected in the precalculation. The "Post-LVC refraction" corresponds to the input under "Sph" in the "Subjective refraction" area. If an input field is changed, the system automatically copies this change to the other field as well.
	Post-LVC refraction	
For IOL calculations with Barrett Toric	R1 flat/K1 flat	Optionally, the keratometry values from an additional biometry measurement can be entered in these input fields. These will be used for an IOL calculation to calculate the SE value with the "Barrett Toric" formula. The values entered here must be based on the same keratometric index as the values from the IOLMaster report used.
	R2 steep/ K2 steep	

7.3.5 Attached documents



If available, current topographical reports for the respective laterality are displayed in the “Attached documents” area. If no appropriate report is available for the selected patient, the fields remain empty. Documents matching the laterality can be dragged and dropped from the thumbnail gallery to these fields. Up to three documents per laterality can be added and displayed. IOLMaster reports cannot be added or displayed.
TIP: While dragging with the mouse, the shape of the cursor will show whether the document can be inserted in the respective display window when the mouse pointer is hovered over it. In addition, the area where the document can be dropped is highlighted as soon as a suitable document is moved into these fields.

Double-click a document to open it in Document Display full-screen view.

7.4 IOL calculation

An overview of all calculated formulas and IOLs is displayed in the “IOL calculation”.
TIP: Which formulas and IOLs are calculated depends on the configured user settings (see “IOL calculation” under Configuring the user settings [▶ 33]).

INFO: If the system language for FORUM is changed during IOL calculation for a created but not yet completed plan, error messages may still be displayed in the previously set system language. It is therefore recommended to restart FORUM Viewer after changing the language.

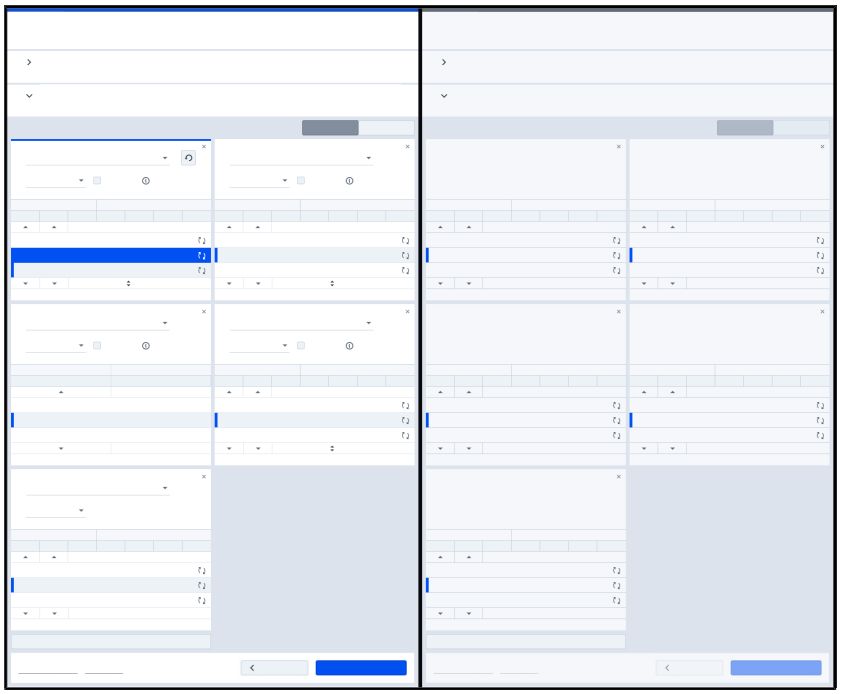


Figure 7: IOL calculation

The following buttons and functions are available in the "IOL calculation":

Function	Explanation
IOL calculation (PDF)	Creates and opens a PDF file containing all displayed IOL formula combinations for the selected IOL calculation
IOL plan (PDF)	Creates and opens a PDF file containing the IOL plan for the selected IOL calculation
Precalculation	Re-opens the previous "Precalculation – K/ Precalculation – TK®" work step
Accept & continue	Closes the IOL calculation and opens the next "Surgery preparation" work step. For additional information, see Surgery preparation [▷ 89]. The selected IOL is used in surgery preparation. TIP: If no IOL is selected, surgery preparation can continue despite the lack of a planned IOL.

7.4.1 Notes on IOL calculation

7.4.1.1 IOL calculation formulas

Different formulas with different measurement parameters to calculate the IOL power are used to calculate the IOL. When selecting the formula, it is important to take into account the IOL type to be calculated (toric or non-toric) as well as also the keratometry type (keratometry or Total Keratometry).

Different biometric data is required depending on the formula used. Some formulas are only approved for IOL calculation with IOLMaster keratometry values. A notification alerts the user in the case of IOL calculations that use manually changed values and these formulas. IOL calculation with Total Keratometry is not possible with other formulas (e.g. the "Haigis Suite" formulas for toric IOLs for patients who've had a previous cornea surgery). A message is displayed to indicate unapproved IOL calculations.

7.4.1.2 Precautionary measures when using Total Keratometry (TK®) for IOL calculation

INFO: Formulas that are not listed here do not permit the use of TK® values to calculate IOLs in the software.

Normal eyes

The following IOL calculation formulas can be used in the software for calculating non-toric IOLs for eyes without previous cornea surgery (in particular without refractive laser treatment):

- Barrett Suite
  The "Barrett TK Universal II" formula is used automatically as part of the "Barrett Suite".
  For additional information, see Information on the "Barrett Suite" [▶ 82].
- Haigis Suite
  The "Haigis" formula is used automatically as part of the "Haigis Suite".
  For additional information, see Information on the "Haigis Suite" [▶ 83]
- Hoffer Q
- Holladay 1 (NLR)/Holladay 2 (NLR)
  For additional information, see Information on the "Holladay 1 (NLR)" and "Holladay 2 (NLR)" formulas [▶ 83].
- Kane
  For additional information, see Information on the "Kane" formula [▶ 83].
- SRK/T
- Z CALC
  For additional information, see Information on the "Z CALC" formula [▶ 84].

Eyes with astigmatism

The following IOL calculation formulas can be used in the software for calculating toric IOLs for eyes without previous cornea surgery (in particular without refractive laser treatment):

- Barrett Suite
  The "Barrett TK Toric" formula is used automatically as part of the "Barrett Suite".
  For additional information, see Information on the "Barrett Suite" [▶ 82].
- Haigis Suite
  The "Haigis-T" formula is used automatically as part of the "Haigis Suite".
  For additional information, see Information on the "Haigis Suite" [▶ 83].
- Kane
  For additional information, see Information on the "Kane" formula [▶ 83].
- Z CALC
  For additional information, see Information on the "Z CALC" formula [▶ 84].

INFO: IOL calculation formulas with a nomogram cannot be used with TK®. This would lead to duplicate compensation, and thus to a calculation of incorrect IOL power.

Post-LVC eyes

Only the following IOL calculation formulas of the latest generation can be used in the software for calculating non-toric IOLs for eyes with previous cornea surgery (in particular with refractive laser treatment):

- Barrett Suite
  The "Barrett TK True K" formula is used automatically as part of the "Barrett Suite".
  For additional information, see Information on the "Barrett Suite" [▶ 82].
- Haigis Suite
  The "Haigis" formula is used automatically as part of the "Haigis Suite".
  For additional information, see Information on the "Haigis Suite" [▶ 83].
- Z CALC
  For additional information, see Information on the "Z CALC" formula [▶ 84].

IOL calculation formulas of the older generation that require a correction of duplicate compensation cannot be used with TK® for IOL calculation with previous cornea surgery.
INFO: However, the software provides these IOL calculation formulas. For unapproved IOL calculations, a corresponding message is displayed instead of the IOL calculation when one of these following IOL calculation formulas is selected:

- Hoffer Q
- Holladay 1 (NLR)/Holladay 2 (NLR)
  For additional information, see Information on the "Holladay 1 (NLR)" and "Holladay 2 (NLR)" formulas [▶ 83].
- SRK/T

IOL calculation formulas developed for values with traditional keratometry for eyes with previous refractive surgery, such as "Haigis-L" as part of the "Haigis Suite" and "Barrett True K" as part of the "Barrett Suite" cannot be used with TK®. Using TK® with these formulas would lead to duplicate compensation, and thus to a calculation of incorrect IOL refractive power.

The following IOL calculation formulas can be used in the software for calculating toric IOLs for eyes with previous cornea surgery (in particular with refractive laser treatment):

- Barrett Suite
  The "Barrett TK Toric True K" formula is used automatically as part of the "Barrett Suite".
  For additional information, see Information on the "Barrett Suite" [▶ 82].
- Z CALC
  For additional information, see Information on the "Z CALC" formula [▶ 84].

It is not possible to calculate toric IOLs for eyes with previous cornea surgery (in particular with refractive laser treatment) using the "Haigis Suite" formulas.
For additional information, see Information on the "Haigis Suite" [▶ 83].

7.4.1.3 Using Keratometry (K) and Total Keratometry (TK®) values in IOL calculation formulas in EQ Workplace

The following table provides an overview of available formulas and their potential application options:

Depending on the keratometry and refractive status, the following formulas are available for toric and non-toric IOLs:

● = Available
❍ = Not available

Formula		Eyes without LVC				Post-LVC eyes			
		Non-toric IOL		Toric IOL		Non-toric IOL		Toric IOL	
		K	TK®	K	TK®	K	TK®	K	TK®
Barrett Suite	Barrett Universal II	●	❍	❍	❍	❍	❍	❍	❍
	Barrett Toric	❍	❍	●	❍	❍	❍	❍	❍
	Barrett True K	❍	❍	❍	❍	●	❍	❍	❍
	Barrett True K Toric	❍	❍	❍	❍	❍	❍	●	❍
	Barrett TK Universal II	❍	●	❍	❍	❍	❍	❍	❍
	Barrett TK Toric	❍	❍	❍	●	❍	❍	❍	❍
	Barrett TK True K	❍	❍	❍	❍	❍	●	❍	❍
	Barrett TK Toric True K	❍	❍	❍	❍	❍	❍	❍	●

Formula		Eyes without LVC				Post-LVC eyes			
		Non-toric IOL		Toric IOL		Non-toric IOL		Toric IOL	
		K	TK®	K	TK®	K	TK®	K	TK®
Haigis Suite	Haigis	●	●	○	○	○	● [18] [19]	○	○
	Haigis-T	○	○	●	●	○	○	○	○
	Haigis-L	○	○	○	○	● [20] [18]	○	○	○
	Haigis-TL	○	○	○	○	○	○	● [20] [18]	○
Hoffer Q		●	●	○	○	○	○	○	○
Holladay 1 (NLR)		●	●	○	○	○	○	○	○
Holladay 2 (NLR)		●	●	○	○	○	○	○	○
Kane		●	●	●	●	○	○	○	○
SRK/T		●	●	○	○	○	○	○	○
Z CALC [21]	Z CALC	●	●	●	●	● [20] [18]	● [20] [18]	● [18]	● [18]
	Z CALC Nomogram	●	○	●	○	○	○	○	○
ZEISS AI IOL Calculator		ZEISS AI IOL Calculator is not available in all countries. See the "ZEISS AI IOL Calculator" instructions for use for information on how to use ZEISS AI IOL Calculator.							

TIP: Depending on the refractive status or lens status of the patient, not all formulas can be used for the IOL calculation. Furthermore, optional fields may be mandatory fields, or other permissible value ranges may apply for some formulas.

The "Haigis Suite" formulas and the "Z CALC" formula can only be used with a phakic anterior chamber depth. The IOL is not calculated with a different lens status. Indicating the patient's gender is mandatory for calculation with the "Kane" formula.

Using standard formulas to calculate the IOL is currently not recommended for eyes that have previously been treated with ReLEx® smile.

[18] Not for eyes with previous laser treatment "RK" (radial keratotomy)
[19] Only for LVC mode "Myopic"
[20] Only approved IOL calculation with IOLMaster keratometry
[21] Only ZEISS IOLs can be calculated with the "Z CALC" formula.

7.4.1.4 Use in patients with certain diseases or pretreatment

Eyes of patients with advanced keratoconus as well as eyes treated with radial keratotomy or DMEK are subject to corneal change, which currently results in unpredictable refractive outcomes with all IOL calculation formulas. It is strongly recommended that alternative assessment or calculation methods be included in the IOL calculation.

7.4.1.5 Information on the "Barrett Suite"

The "Barrett Suite" is a combination of four formulas. Depending on the selected keratometry (keratometry or Total Keratometry), the traditional Barrett formula or the Barrett TK formula is used automatically:

- When using keratometry
  - Barrett Universal II
    For non-toric IOL calculation
  - Barrett True K
    For non-toric IOL calculation in eyes with refractive laser treatment (LASIK, LASEK, PRK, **and** RK)
  - Barrett Toric (from the Barrett Toric Calculator)
    For toric IOL calculation
  - Barrett True K Toric
    For toric IOL calculation in eyes with refractive laser treatment (LASIK, LASEK, PRK, **and** RK)
- When using Total Keratometry (TK®)
  - Barrett TK Universal II
    For non-toric IOL calculation
  - Barrett TK Toric
    For toric IOL calculation
  - Barrett TK True K
    For non-toric IOL calculation in eyes with refractive laser treatment (LASIK, LASEK, PRK, **and** RK)
  - Barrett TK Toric True K
    For toric IOL calculation in eyes with refractive laser treatment (LASIK, LASEK, PRK, **and** RK)

Note the following differences to the "Haigis Suite":

- The "Barrett Suite" additionally allows non-toric IOLs to be calculated in the event of previous radial keratometry (RK).
- The "Barrett Suite" permits the use of manually entered anterior K values in conjunction with previous refractive cornea surgery.

TIP: The "Barrett Suite" uses dedicated IOL constants. As is the case for all other formulas, these are managed in the ZEISS Calculation Webservice. Please note that the design factor "DF" is not included for all IOLs in the database. Please contact your IOL manufacturer, if necessary.

TIP: When using the "Barrett True K" formula for cases following refractive cornea surgery, Dr. Barrett recommends entering the optional "Pre-LVC refraction" and "Post-LVC refraction" values if they are known (see Barrett-specific data [▶ 75]).

7.4.1.6 Information on the "Haigis Suite"

The "Haigis Suite" is a combination of four formulas:

- Haigis
  For non-toric IOL calculation
- Haigis-L
  For non-toric IOL calculation in eyes with refractive laser treatment (LASIK, LASEK, PRK) with IOLMaster keratometry
- Haigis-T
  For toric IOL calculation
- Haigis-TL
  For toric IOL calculation in eyes with refractive laser treatment (LASIK, LASEK, PRK) with IOLMaster keratometry

Depending on the selected IOL type (toric and/or non-toric IOL), the "Haigis Suite" automatically uses the "Haigis" or "Haigis-T" formula. The "Haigis-T" formula is used for toric IOLs, and the "Haigis" formula is used for non-toric IOLs. Toric and non-toric IOLs can be calculated at any time and simultaneously.

Depending on the refractive status, the "Haigis-L" is used for keratometry, or the "Haigis" formula is used for Total Keratometry.

7.4.1.7 Information on the "Holladay 1 (NLR)" and "Holladay 2 (NLR)" formulas

The "Holladay 1 (NLR)" and "Holladay 2 (NLR)" formulas can also be used for long eyes from an axial length of 24 mm. This is signaled using the affix "NLR" (non-linear regression) in brackets. The software automatically activates the function for axial lengths above 24 mm.

7.4.1.8 Information on the "Kane" formula

Depending on the selected IOL type (toric and/or non-toric IOL), the toric or non-toric Kane formula is used automatically.

7.4.1.9 Information on the “Z CALC” formula

There are two calculation options for patients without previous cornea surgery as part of the IOL calculation with keratometry values using the “Z CALC” formula:

- With “Z CALC Nomogram”
  “Z CALC Nomogram” automatically determines a mathematical compensation for posterior astigmatism. To prevent duplicate compensation, only values that are comparable to the anterior keratometry values from IOLMaster may be used for IOL calculations with this formula.
- Without “Z CALC Nomogram”
  There is no compensation for posterior astigmatism.

“Z CALC Nomogram” cannot be used for patients with previous refractive cornea surgery and when using Total Keratometry for the IOL calculation with Z CALC.

7.4.1.10 Information on ZEISS AI IOL Calculator

ZEISS AI IOL Calculator is available **as an option** in selected countries. If available in a given country, ZEISS AI IOL Calculator is connected via an interface. It is used the same as the other formulas in the software. Currently, not all IOLs can be calculated with ZEISS AI IOL Calculator; but additional IOLs for calculation are released on an ongoing basis.
See the “ZEISS AI IOL Calculator” instructions for use for more information.

7.4.2 Results tables for IOL calculation

⚠ CAUTION!

Risk of implanting a suboptimal IOL

Improperly selecting an IOL without a review by a healthcare professional may result in a suboptimal IOL being implanted.

- ▶ Always check the predicted outcome of the IOL displayed and make sure it matches the desired outcome.
- ▶ Please particularly ensure that you read the signs for the SE and cylinder values correctly so that you can detect possible over/ undercorrection.
- ▶ Check whether a toric or non-toric IOL is more suitable for your particular case.

The calculation of each IOL formula combination is shown in an individual results table. Open "IOL calculation" to display results tables in the sequence of IOL formula combination configurations defined in the user settings. The results table selected for the plan is highlighted in blue.
If one of the default formulas is not suitable for the patient's refractive status or lens status or the axial length measurement method used, a message appears in the area of the corresponding formula.

Three recommended IOL power or toric power values are calculated for each IOL during IOL calculation, whereby the middle recommendation comes closest to the desired target refraction. This recommendation is always highlighted in bold and blue. Depending on the availability of the respective IOL, the two additional recommendations are above or below the values of the middle recommendation in relation to the SE value (for non-toric IOLs) or to the Cyl value (for toric IOLs). For information on special cases, see Special cases for the IOL calculation [▶ 87].

The following values for the calculated IOLs are displayed in the table according to the IOL and the formula used:

● = Available
❍ = Not available

	IOL			Predicted outcome			
	SE [D]	Cyl [D]	Axis [°]	SE [D]	Sph [D]	Cyl [D]	Axis [°]
Non-toric	●	❍	❍	●	●	❍	❍
Toric	●	●	●	●	●	●	●

The following functions are available in the "IOL calculation":

Function	Explanation
IOL/Formula	Sorts the results tables according to the selection (ordered alphabetically) Neither of the two sorting options has been activated by default. Results tables are displayed according to the sequence of configured IOL formula combinations defined in the user settings.
✕	Removes a results table from the current IOL calculation This is saved in the plan and the results table is no longer available even when it is opened again.

Function	Explanation
	You may select a different IOL as well as a different formula for IOL calculation from the respective drop-down menu. The calculation is updated directly following selection. This selection is saved in the current plan and remains available even after the window has been closed.
	Increases or reduces the IOL values by a certain number of diopters in increments TIP: If you adapt the SE or cylinder value for toric IOLs, the spherical value will automatically be adapted. The increments depend on the availability of the particular IOL.
 Reset	Resets all manual changes to the IOL values to the originally calculated values. TIP: The button is visible only if manual changes were made to the calculated IOLs.
 Rotated axis	Indicates that the cylinder axis has been rotated
Z CALC Nomogram [22]	Indicates that posterior astigmatism compensation was performed during IOL calculation with the “Z CALC” formula For additional information, see Information on the “Z CALC” formula [▶ 84].
ELP [22]	The ELP value (effective lens position) is a theoretical parameter for calculating the IOL power. It does not correspond to any practically measurable, anatomically correct postoperative IOL position.
Add IOL	Adds an additional results table to the current IOL calculation Once an “IOL” and a “Formula” have been selected, the [Add IOL] button is activated. The new calculation is listed below already calculated results tables. Click to sort and the new results table will be sorted according to the selected sort order. Added results tables are saved in the current plan and will also remain available after the window has been closed. If you would like to define the selected IOL formula combination as the default for all plans, it must be configured in the user settings (see Configuring the user settings [▶ 33]).

[22] For calculations using the “Z CALC” formula only

7.4.3 Special cases for the IOL calculation

⚠ CAUTION!

Risk of implanting a suboptimal IOL

Improperly selecting an IOL without a review by a healthcare professional may result in a suboptimal IOL being implanted.

- ▶ Always check the predicted outcome of the IOL displayed and make sure it matches the desired outcome.
- ▶ Please particularly ensure that you read the signs for the SE and cylinder values correctly so that you can detect possible over/undercorrection.
- ▶ Check whether a toric or non-toric IOL is more suitable for your particular case.

During IOL calculation, it may occur that the optimal IOL is outside the supply range. This is the case in particular for patients with very high or very low astigmatism or very long or very short eyes. Instead of calculating no IOL in these cases, the user is presented with an option.

INFO: The decision regarding which IOL is to be used and the responsibility for the use of an IOL which is not optimal must be assumed by the user. The use of a non-toric IOL may also be an option for low cylinder values.

7.4.3.1 Patients with high or low astigmatism

For patients with low astigmatism, it may be useful to calculate the theoretical 0 D cylinder option for a toric IOL. This can be achieved by manually reducing the number of diopters for the cylinder value. The theoretical 0 D cylinder option calculated in this way cannot be selected for implantation.

Case 1 – Delivery of optimal cylinder not possible

It is recommended to use a toric IOL power with the next available higher or lower cylinder. Here, there is an option for editing all adjustable values subject to supply availability (see IOL calculation [▷ 76]). Use of the IOL can result in an over/undercorrection of the cylinder.

Case 2 – Calculated IOL shows 0 D cylinder

The calculated toric IOL power corresponds to a theoretical 0 D cylinder option for the selected IOL. This means that the IOL shows a better predicted outcome with a 0 D cylinder than the IOL with the next available higher cylinder. The use of a non-toric IOL could also be an option.

A message is shown above the calculation, and the calculated toric IOL power cannot be selected. There is an option for selecting the IOL with the next available cylinder (1 D cylinder) by increasing the cylinder value. This could lead to overcorrection of the IOL refractive power. The other values can only be adapted in this case once the cylinder value has been increased.

7.4.3.2 Patients with very long or very short eyes

IOL with optimal SE not available for delivery

Recommended use of an IOL power with the next available higher or lower SE value. Here, there is an option for editing all adjustable values subject to supply availability (see IOL calculation [▶ 76]). Using this IOL may result in hyperopia or myopia of the eye in relation to the desired target refraction.

7.4.3.3 Other special cases

Formula not usable

Unable to use the selected formula for IOL calculation due to the patient's eye status. There is the option to use a different formula for the calculation (see "Add IOL" function under IOL calculation [▶ 76]).

Configured IOL for calculation not available

Unable to carry out IOL calculation as the IOL to be calculated is no longer available. There is the option to select another IOL directly in the IOL calculation and to calculate it (see "Add IOL" under IOL calculation [▶ 76]).

For future IOL calculations, the IOL which is no longer available must be removed from the "My IOLs" list in the IOL management in the Webservice, and the settings for IOL calculations must be adjusted in the user settings.

INFO: By switching from sphere-based to SE-based IOLs, it may occur that specific sphere-based ZEISS-IOLs are no longer available. A subsequent model can be selected in the IOL management. The decision regarding which IOL is to be used and the responsibility for the use of an IOL which is not optimal must be assumed by the user.

7.5 Surgery preparation

Prepare for surgery on the basis of the selected IOL in “IOL calculation” and the measurement values in the “Surgery preparation” work step. In this process, elements including the planned incisions, rhexis circles, and surgeon position of the attending surgeon are determined. Surgery preparation results in one plan (per laterality). The plan can be released for or exported to CALLISTO eye after completion.
For additional information, see Release for CALLISTO eye [▷ 94].

The “Surgery preparation” contains the following elements:

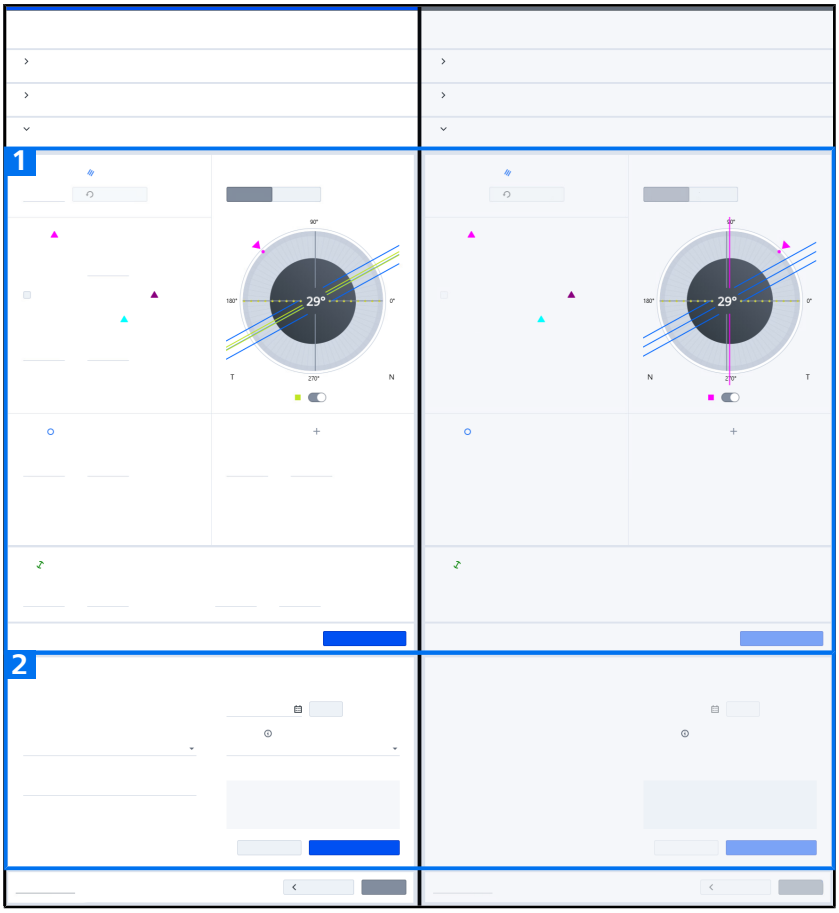


Figure 8: Surgery preparation

Item	Designation
1	Parameters for surgery preparation [▷ 90]
2	Release for CALLISTO eye [▷ 94]

The following functions are available in the “Surgery preparation”:

Function	Explanation
IOL plan (PDF)	Creates and opens a PDF file containing the IOL plan for the selected IOL calculation
IOL calculation	Re-opens the previous “IOL calculation” work step
IOL order	Closes surgery preparation and opens the next “Surgery preparation” work step For additional information, see IOL order [▷ 98].

7.5.1 Parameters for surgery preparation

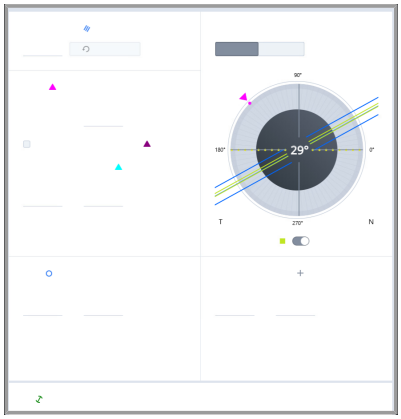
⚠ CAUTION!

Risk of implanting a suboptimal IOL

Improperly selecting an IOL without a review by a healthcare professional may result in a suboptimal IOL being implanted.

- When planning a toric IOL, check if limbal relaxing incisions are actually required. Planning a toric IOL in combination with limbal relaxing incisions is the responsibility of the surgeon.

The following parameters can be configured in “Surgery preparation”:



Parameter	Explanation	
Implant axis	Display of the implant axis (calculated in the “IOL calculation”)	
Surgeon position	Superior	Selection of the surgeon position during surgery (mandatory field) The default setting is defined in the user settings (see Configuring the user settings [▷ 33]).
	Temporal	

Parameter	Explanation	
Incision	Position	Position of the incision for placing the IOL in ° (primary incision) This value depends on the "Steep axis used" function in the precalculation: ■ The "Steep axis used" function is **activated** in the precalculation: The value of the steep axis ("R2 steep/K2 steep" or "TR2 steep/TK2 steep") from the precalculation is applied as the "Position" (see Biometric data [▷ 67]). The "Position" field is deactivated and cannot be edited. ■ The "Steep axis used" function is **deactivated** in the precalculation: The value in the "Incision position" field from the precalculation is applied as the "Position" (see Surgical information [▷ 73]). The "Position" field can be edited.
	Width	Enter the width of the incision for inserting the IOL in mm (main incision)
	SIA	Astigmatism induced by the surgery in D This value cannot be edited in surgery preparation; it is predefined in the precalculation
	Position on the steep axis	Only displayed if the "Steep axis used" function has been activated in the precalculation.
	Opposite Clear Corneal Incision (OCCI)	If this function is activated, a second incision is automatically planned opposite the main incision. The position cannot be edited; it is automatically offset from the main incision by 180°. The width is automatically the same width as the main incision.

Parameter	Explanation	
Paracentesis	Paracentesis 1	Enter the position of the incisions for drainage in °. The positions of the paracenteses should be set relative to the primary incision, not relative to the zero point of the angle scale.
	Paracentesis 2	
Rhexis	Rhexis circle 1	Enter the diameter of the rhexis circles in mm The diameter of the rhexis circles is individually selected by the user. For example, the user can select the desired minimum and maximum limit of the planned rhexis.
	Rhexis circle 2	
	Avg. TR	These values cannot be edited.
	ACD from epith.	
	WTW	
Offset to limbus center	X	Offset to limbus center (visualized through a gray cross in the schematic diagram of the eye) The input range depends on the WTW value specified in the precalculation. The “Ix” and “Iy” values as well as the “Px” and “Py” values or the radius and angle of “Alpha” and “Kappa” are also shown.
	Y	
LRI	LRI 1	Enter the position and width for the limbal relaxing incisions (arcuate incisions) The position for “LRI 2” cannot be edited; it is automatically offset from the position for “LRI 1” by 180°.
	Width	
	LRI 2	
	Width	
	Distance to limbus	Enter the distance of the limbal relaxing incisions to the limbus in mm

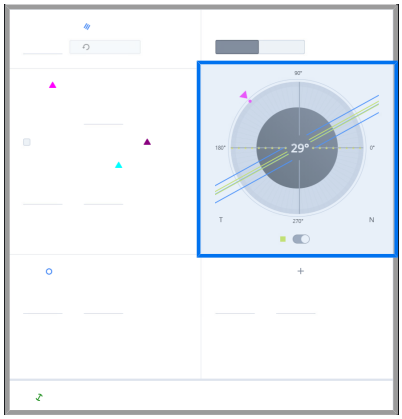
Parameter	Explanation
Complete plan	Completes the plan The button is not activated until all required input fields for the currently selected laterality have been completed. The values for this laterality must be in the valid range. TIP: Completed plans can no longer be edited or deleted. Plans can only be completed by the issuer of the plan. Once the plan has been completed, it is locked against further editing for the corresponding laterality (only the surgery date and study ID can then be changed). After completion, the plan can be released for or exported to CALLISTO eye. For additional information, see Release for CALLISTO eye [▶ 94].

User-specific default values for the position and the width of the incision, the rhexis circles, as well as the paracenteses can be stored in the user settings (see Configuring the user settings [▶ 33]). These are pre-filled here, but can be adjusted manually.

Schematic diagram of the eye

All entered settings and parameters for the assistant functions are visualized directly in the displayed schematic diagram of the eye. The colors of the visualizations correspond to the colors displayed in the input fields. A default WTW value, which may not match the patient's eye, is used for the visualization.

In addition, the following functions are available in the visualization of the schematic diagram of the eye:

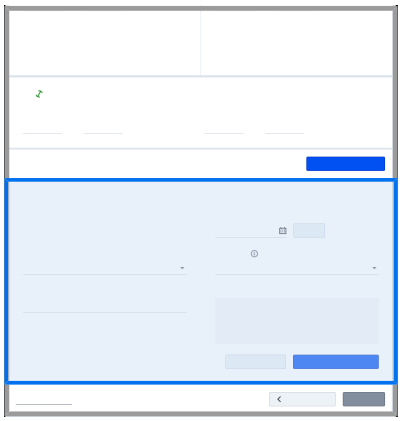


Functions	Explanation	
R2/K2 Steep Axis ({0}°)	If the keratometry "K" has been selected in the precalculation, the steep axis is visualized as a violet line.	Show/hide the steep axis (from the IOLMaster report) {0}: Placeholder for the steep axis values configured during precalculation.
TR2/TK2 Steep Axis ({0}°)	If the Total Keratometry "TK®" has been selected in the precalculation, the steep axis is visualized as a lime green line.	

7.5.2 Release for CALLISTO eye

As soon as a plan has been completed, the surgery date can be specified, further data on the surgery can be entered, and the plan can be released for CALLISTO eye or exported via USB in the “Release for CALLISTO eye” area. Other users besides the issuer of the plan can also enter the surgery date, release or export plans.

The following parameters are available:



Parameter	Explanation	
Plan created by	Displays the planning surgeon (user logged in with ZEISS ID)	
Attending surgeon optional	Optionally, the operating surgeon can be selected.	
Study ID optional	Optionally, a study ID can be entered in this field. The study ID is displayed in the order e-mail (see IOL order [▷ 98]). TIP: The study ID applies to both lateralities and can also be entered or changed after a plan is completed.	
Planned surgery date	The current date is entered as the surgery date by default. The surgery date can either be entered manually or selected using the calendar function. The planned surgery date cannot be in the past. INFO: After being released for CALLISTO eye, the plan can only be imported to CALLISTO eye on or up to three days prior to the surgery date. If you set the surgery date to the current date, the plan can consequently only be imported on the same day.	
	Today	Sets the surgery date to the current date

Parameter	Explanation
Target device	Select the desired CALLISTO eye device (multiple selections are possible) Only devices that are connected to the network are displayed. TIP: By selecting “All devices in the network”, the plan can be released for all devices connected to the network. The plan can then be imported from the desired device using LAN. This selection can only be made if “Activate CALLISTO eye device selection” is activated in the user settings (see Configuring the user settings [▷ 33]). If only one CALLISTO eye device is available on the network, it is automatically selected as the target device. If no device is selected, the plan cannot be released.
Comment	You can optionally also enter a comment on the current plan. TIP: The comment is only displayed for the current laterality in the plan as well as in the PDF form “IOL plan”. The comment is not transferred to CALLISTO eye.

The following functions are available after completing the plan:
TIP: The functions are only activated once a plan has been completed.

Function	Explanation
Release for CALLISTO eye	Releases the plan for CALLISTO eye Depending on the configuration of the system, an order is created in the FORUM worklist (MWL) and a DICOM object is automatically saved in FORUM. TIP: Please contact your system administrator if you have questions on configuring this system. The released plan can be imported to CALLISTO eye on or up to three days prior to the specified surgery date. If another plan for the patient is released in CALLISTO eye before importing the plan, the plan released first will be overwritten. If a plan has already been imported into CALLISTO eye, a new plan (same or different laterality) can only be imported if the patient is deleted in CALLISTO eye before the new plan is imported. From CALLISTO eye 5.0 and higher, two plans can be processed per patient (one for OD and one for OS). After releasing the plan for CALLISTO eye, the working area is locked and grayed out. A highlighted message appears in the header of the working area. This message is visible in all of the patient's plans. It shows how long the plan can be imported at CALLISTO eye. TIP: If it is not possible to select the target device, the plan is automatically released for all CALLISTO eye devices on the network. The plan can then be imported from the desired device using LAN.
Export using USB	Exports the plan to a USB storage device A plan can be exported as a DICOM object to a USB storage medium or a user-defined storage location on the computer. This allows it to be transferred to unconnected FORUM or CALLISTO eye systems. Exporting will also create a DICOM object in FORUM.

The following information and appendices (if available) are saved in a plan released for CALLISTO eye or in an exported plan:

Information/ Appendices	Explanation
Patient identification (from FORUM)	■ First and last name ■ Patient ID ■ Issuer of patient ID ■ Date of birth ■ Gender ■ Ethnicity ■ Comments on the patient
Study information	■ Study date and time ■ Study ID
Eye information	■ Laterality ■ WTW ■ Anterior chamber depth
IOL information	■ Selected IOL ■ Product model ■ Sphere, cylinder, and axis
Data from surgery preparation	■ LRI 1 and 2 (position and width) ■ Incision (position and width) ■ Rhexis circle 1 and 2 ■ Implant axis ■ Surgeon position
Appendices	■ IOLMaster report ■ OD/OS reference image

7.6 IOL order

As soon as a plan has been completed, the order for the IOL selected for the surgery can be prepared in the “IOL order” work step. In addition to information on the selected IOL, the surgery date previously specified in the “Surgery preparation” work step is displayed.

The following elements are displayed in the “IOL order” work step:

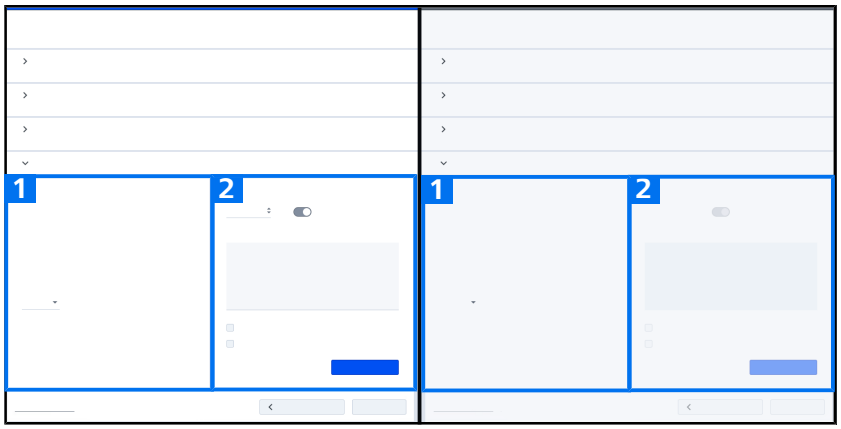


Figure 9: IOL order

Item	Designation
1	Information on the selected IOL [▷ 99]
2	Information on IOL orders [▷ 99]

The following functions are available in this work step:

Function	Explanation
IOL order form (PDF)	Creates and opens a PDF file containing the IOL order form
Surgery preparation	Re-opens the previous “Surgery preparation” work step
IOL order	Closes the IOL order and opens the next “Post surgery” work step For additional information, see Post surgery [▷ 100].

7.6.1 Information on the selected IOL

This area shows an overview of the IOL values of the IOL selected for the surgery and on the formula used:

- Name of the selected IOL
- Name of the selected formula
- IOL values of the selected IOL formula combination

For certain ZEISS IOLs, the "Product model" can also be selected for the selected IOL:

- **M**: MICS [23]
- **MP**: MICS, preloaded
- **MV**: MICS, violet and blue filter (yellow)
- **P**: Fully preloaded
- **PY**: Fully preloaded, yellow

If only one model is available, it is automatically pre-selected. If the user specified a preferred IOL model in the user settings, it will be pre-selected providing it is available for the selected IOL. If the preferred model is not available, the user must actively select a product model from the drop-down menu.
For additional information, see "IOL calculation" under Configuring the user settings [▷ 33].

7.6.2 Information on IOL orders

The "IOL order" provides the following functions:

Function	Explanation
Order quantity	Order quantity for IOLs (selection between 1 and 99) The order quantity can be entered using the arrow keys or by typing the desired number into the field. If an invalid entry is made, the field is reset to the default order quantity. The default quantity is defined in the user settings (see Configuring the user settings [▷ 33]).
Anonymize	Anonymization of PDF files Name, date of birth, and gender will not be shown in the forms and the order e-mail.
Comment	Optional input of a comment about the IOL order The comment is shown in the order email. In the user settings, the user can define a default text for the comment field; it is displayed here. The user can still edit the default text at any time.
Add IOL plan (PDF)	If this function is activated, the IOL plan is also attached as PDF file to the order e-mail.

[23] MICS: Micro incision cataract surgery

Function	Explanation
Include OD in PDFs/Include OS in PDFs	This function has been activated by default if a completed plan is available for the other laterality, but an e-mail order has not yet been triggered. If an order e-mail has already been created for the other laterality, the function is available, but deactivated. If this function is activated, the data from the other laterality is also included in the IOL order. This function is not available if no IOL has been selected for the other laterality.
Open e-mail order	Opens a draft e-mail in the default e-mail program The e-mail contains the most important data on the user, the patient, and the selected IOL. The "IOL order form" has been attached by default. If the "Add IOL plan (PDF)" function is activated, the IOL plan is also attached as PDF. TIP: If the IOL order form as well as the IOL plan are sent in an order e-mail, the e-mail reference is automatically adjusted accordingly. If a main recipient (e.g. e-mail address of the ZEISS IOL Representative) and (if applicable) additional e-mail addresses have been saved in the user settings, these are entered in the CC field as recipients. The date the e-mail order was created is shown in the header of the "IOL order" work step.

INFO: Some selections/settings (e.g. "Anonymize") apply to both lateralities and are synchronized.

7.7 Post surgery

In the "Post surgery", preoperative data on the subjective and objective refraction as well as postoperative data on the keratometry or Total Keratometry (TK®) can be uploaded to the Webservice and used for IOL constant personalization and exporting data.
TIP: There must be at minimum 8 weeks between the surgery and the postoperative examination. The software does not check whether this period has been adhered to. IOL constant personalization must have been activated in the user settings to use these functions (see Configuring the user settings [▷ 33]).

NOTE

Uploading deviating postoperative data

The data on the actual implanted IOL, postoperative refraction, and visual acuity are used to improve IOL calculation methods. This is only possible if this information is correct. Incorrect information could even lead to a deterioration of future results.

- ▶ Check your entries carefully.
- ▶ Do not enter the data if the information is uncertain.

The “Post surgery” contains the following elements:

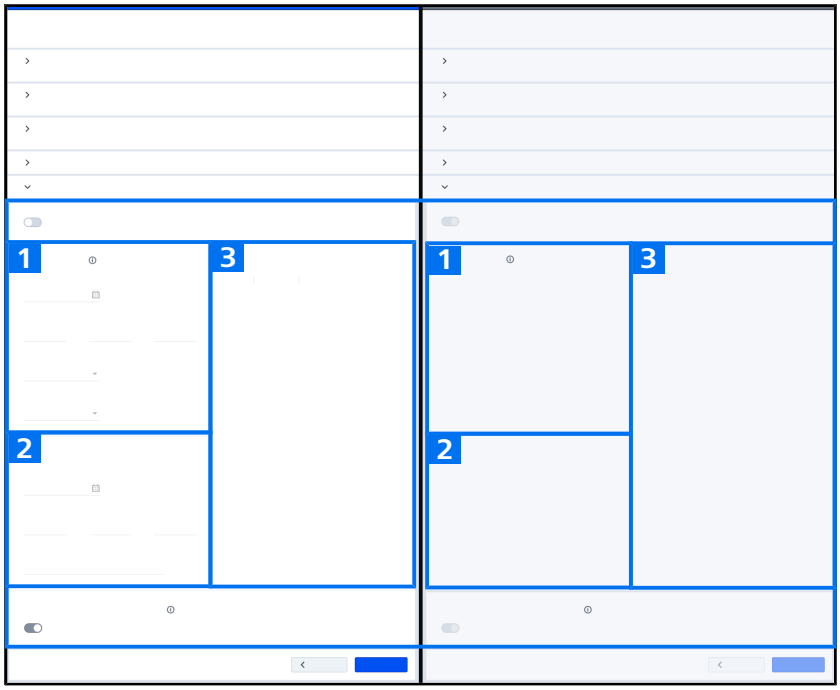


Figure 10: Post surgery

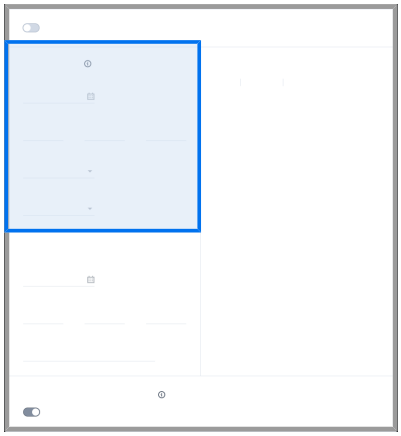
Item	Designation
1	Patient’s subjective refraction [▶ 102]
2	Patient’s objective refraction [▶ 103]
3	Postoperative keratometry [▶ 103]

The following functions are available in the “Post surgery”:
TIP: These functions are only activated after the user has confirmed that the planned IOL was used during surgery.

Function	Explanation
Use data for IOL constant personalization	If this function has been activated, the uploaded data can be used for IOL constant personalization in the Webservice.
	If this function has not been activated, the uploaded data cannot be used for IOL constant personalization in the Webservice. In this case, they can only be used to export data. TIP: When selecting, please note that the data cannot be uploaded again with a different setting.
IOL order	Re-opens the previous “IOL order” work step.
Upload	Uploading the data to the Webservice After having uploaded the data, the button will be deactivated and the date will be displayed in the header of the work step. The data can no longer be edited.

7.7.1 Patient’s subjective refraction

The following postoperative data on visual acuity and subjective refraction are configured in the “Subjective refraction” area:

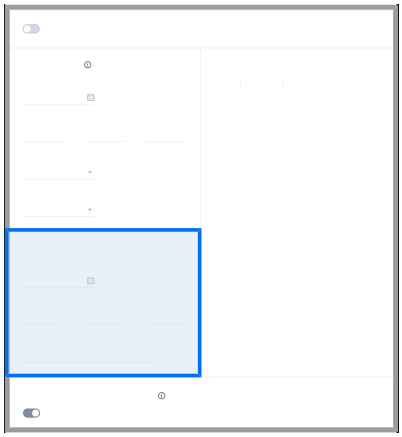


Parameter	Explanation
Measurement	Opens the configured refraction measurement details The refraction measurement details are configured the first time you log in and can be adjusted at any time.
Date of measurement	Enter the postoperative, subjective refraction values of the patient’s eye (optional)
Sph	
Cyl	
Axis	
Uncorrected Distance Visual Acuity	
Corrected Distance Visual Acuity	

INFO: The parameters are not active until the user has confirmed that the planned IOL was also used in surgery.

7.7.2 Patient's objective refraction

The following postoperative data on the objective refraction are configured in the "Objective refraction" area:



Parameter	Explanation
Date of measurement	Enter the postoperative, objective refraction values of the patient's eye (optional)
Sph	
Cyl	
Axis	
Measuring device	

INFO: The parameters are not active until the user has confirmed that the planned IOL was also used in surgery.

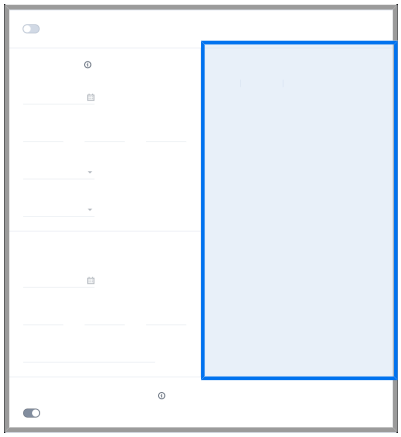
7.7.3 Postoperative keratometry

The postoperative keratometry or Total Keratometry data is displayed and/or configured in the "Postoperative keratometry" area.

Whether the refractive power is displayed as radius or diopters is a user-specific setting and can be adjusted in the user settings. "Ast. K" and "Ast. TK" are always displayed in "D". The sign shown depends on the "Cylinder notation" selection in the user settings. For additional information, see "Refractive power unit" under Configuring the user settings [▶ 33].

If a postoperative IOLMaster report is available, keratometry or Total Keratometry data is automatically entered. Please note that the creation date of the IOLMaster report is later than the surgery date of the completed plan. Depending on the IOLMaster type, not all information may be available. If no IOLMaster report is available, the keratometry data can be entered manually. If an error occurred when importing an IOLMaster 700 report, the Total Keratometry (TK®) data can also be entered manually. Where the values were entered manually, this is indicated by a warning sign next to the respective data field. The warning sign also appears in the header of the work step.

The following parameters can be configured:



Parameter	Explanation	
Keratometric index	This can be selected from a list of default values.	
K	Avg. R	Postoperative keratometry values for the corneal curvature and the axes
	R1 flat/K1 flat	
	@ ... °	
	R2 steep/ K2 steep	
	Ast. K	
TK®	Avg. TR	Postoperative Total Keratometry values for the corneal curvature and the axes
	TR1 flat/TK1 flat	
	@ ... °	
	TR2 steep/ TK2 steep	
	Ast. TK	

INFO: The parameters are not active until the user has confirmed that the planned IOL was also used in surgery.

8 Troubleshooting

8.1 General

Contact ZEISS Service if error messages appear that cannot be corrected with the following descriptions. See Service information [▷ 105].

8.2 Service information

You can find the ZEISS representative for your country online on the following website: www.zeiss.com/med

8.3 Troubleshooting

Error	Cause	Rectification
Unable to establish connection to the Webservice. Check the connection to the network and contact your system administrator if necessary.	Cannot access the Webservice.	▶ Check the connection to the network. ▶ If you are using a firewall, configure the windows service "CZM-EQW-Service" in the firewall as an exception.
Error when loading user settings	The login data in the user settings is incomplete or incorrect, or there is no working Internet connection.	▶ Please check the login data in the "User settings". ▶ Ensure that you are logged in with your ZEISS ID. ▶ Ensure that a working Internet connection is available. ▶ Contact your system administrator or ZEISS Service.

8.4 Malfunctions

Error	Cause	Rectification
The TK® values are not available in the precalculation, although they are displayed on IOLMaster 700.	The TK® values were not exported due to a setting on IOLMaster.	▶ Repeat the export with activated setting to export the cornea data (also see Exporting TK® values from IOLMaster [▷ 40]). ▶ Open the patient again in EQ Workplace and create a new plan with the latest IOLMaster report. ▶ Make sure the setting is activated for future exports.

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Glossary

ACD

Anterior chamber depth

CDVA

Corrected distance visual acuity

D

Diopter (unit of measurement of the refractive power of optical systems)

DF

IOL design factor for "Barrett Suite" formulas

ELP

Effective lens position

IOL

Intraocular lens (artificial lens for the eye)

LF

Lens factor for "Barrett Suite" formulas

LRI

Limbal relaxing incision

LVC

Refractive cornea surgery (laser vision correction), e.g. LASIK

MICS

Micro incision cataract surgery

NLR

Non-linear regression

OCCI

Opposite clear corneal incision

RK

Radial keratotomy

RLE

Refractive lens exchange

SE

The spherical equivalent is the sum of the sphere and half cylinder and is used as a measure of the refractive error.

SIA

Surgery-induced astigmatism

TK

Total Keratometry

UDVA

Uncorrected distance visual acuity

WTW

White-to-white distance

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