

WINJAW+



Software User Manual WINJAW+

describes included functions up to and including version 5.0
Illustrations in this user manual may differ.

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Please always quote the serial number of the product when making enquiries!

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1 Preface

Dear customers,

we are glad that you have decided to purchase this product. The zebris Medical GmbH has been developing and manufacturing measurement systems with high standards of technology, safety and functionality for use in medicine, rehabilitation, diagnostics, sports and science since 1987.

These operating instructions provide you with basic knowledge on how to operate the WINJAW+ -Software. It extends the installation instructions and gives advice on how to prepare the treatment. Please also observe the safety information contained in the technical instructions for use and keep all instructions in the immediate vicinity of the JMA-Optic system. The instructions are an essential component of the product and will help you to operate the JMA-Optic system as intended.

The zebris Medical GmbH accepts no liability for injury to personnel or patients or damage to the system resulting from non-observance of the information contained in the operating instructions or misuse of the system.

Should you notice any errors while working with the instructions for use or should you have any suggestions, we would be grateful if you could let us know at any time.

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1.1 Applicable documentation

#	Description
1	WINJAW+ Software User Manual
2	JMA-Optic Technical Data and User Manual
3	WINJAW+ Installation Instructions with Licence Code

The software and hardware operating instructions can be displayed in the software as online help (F1 key) WINJAW+. In addition, the documents are available on the enclosed installation data carrier and online at www.zebris.de.



Read these instructions before using the product for the first time to avoid operating errors and damage.

Exact compliance with the instructions in all parts of the manual is a prerequisite for proper use.

1.2 Target group

This document is intended for dentists, practice staff and service personnel.

1.3 Conventions and symbolism used

The following conventions are used in this user manual, warnings are identified as follows:



Warning symbols indicate a potential danger to the health and safety of users and/or patients. The warnings explain the type of danger and how this can be avoided.

Important pieces of information are identified as follows:



The information symbol indicates a potential danger which could lead to damage or destruction of the device. The information explains the type of danger and how this can be avoided.



Information that is relevant for the performance of measurements is identified with this symbol.

The user manual must be placed somewhere where the user can access it and the information that it contains at any time.

Notification of modifications:

To ensure the high quality of our products, we constantly work on improving our product line. It may be the case that the software or hardware configurations have been updated since this user manual was originally printed. As such, some of the figures in this user manual may differ from the product that you actually receive.



Please note that there is not a new version of this user manual published with each software release, as usually the new software releases only contain technical modifications which cannot be seen by the user. You can get the latest version of the user manual from your dealer.

1.4 Compatible Hardware

The WINJAW+ 5.0 is compatible with the following hardware:

#	Hardware:
1	JMA-Optic (REF01170010)
2	JMA-Optic USB (REF01170011)
3	JMA-Optic USB-S (REF01170012)
4	Tizian JMA-Optic WLAN (REF01170021)
5	Tizian JMA-Optic USB (REF01170023)
6	ARCUSdigma 3 WLAN (REF01170040)
7	JMAAnalyser+ (REF01160010)
8	JMAAnalyser+ BT2 (REF01160011)
9	JMAAnalyser+ BT2A2 (REF01160015)
10	JMAAnalyser+ BT2A4 (REF01160016)
11	zebris JMT+ (REF01160020)
12	C-Positioner black (REF01970200) V1 (black)
13	C-Positioner black (REF01970210) V2 (black)
14	C-Positioner black (REF01970211) V3 (black)
15	C-Positioner grey (REF01970212) V4 (grey)
16	T-Pointer (REF01970110)
17	Alignment fork (REF01960430)
18	Alignment fork 2 (REF)
19	Bite fork type SD (REF01960320)
20	Bite fork type SI (REF01960330)
21	Bite fork type UN (REF01960360)
22	Bite fork Adapter UN (REF01960420)
23	Bite fork type PS1 (REF01960341)
24	Occlusal Attachment UN (REF01950280)
25	Para-occlusal Attachment with Lip Arch (REF01960250)
26	Para-occlusal Attachment with Support Surface M (REF01960255)
27	Para-occlusal Attachment with Support Surface L (REF01960254)

#	Hardware:
28	TP-Link WN823N (REF21030010)
29	Wireless Link Adapter (REF01870100)
30	Digital model transfer Adesso Multisplit (REF01560050) Amann Girrbach Artex (REF01560052) KaVo Protar (REF01560054) SAM (REF01560055) Panadent (REF01560056)

2 Software installation and activation

2.1 System requirements WINJAW+

	Minimum requirements	Recommended requirements
CPU	Intel Core i5 / 8th generation or comparable	Intel Core i5 / 11th generation (x64) Intel Core i7 / 11th generation (x64) cf. i7-11800H
RAM	8GB RAM	16GB RAM
Data storage	500 GB SSD technology recommended	1TB SSD
GPU	1 GB available graphics memory (VRAM) OpenGL 4.6 support DirectX 9.0c	1 GB available graphics memory (VRAM) OpenGL 4.6 support DirectX 9.0c
Graphics card		cf: NVIDIA® GeForce RTX™ 3050Ti cf: NVIDIA® T1200
Display	Full HD (1920x1080pixels)	Full HD (1920x1080pixels)
Connections	1 x USB 2.0	1 x USB 3.1, 1 x USB-C
Operating system	Windows 11	Windows 11 22H2 and higher
PDF viewer	Ex: Adobe Reader DC	Ex.: Adobe Reader DC
WINJAW+ Function and Digital Occlusion	-	0
WINJAW+ Splint Designer, Attachment Designer	-	0
WINJAW+ Basic function Articulator	0	0



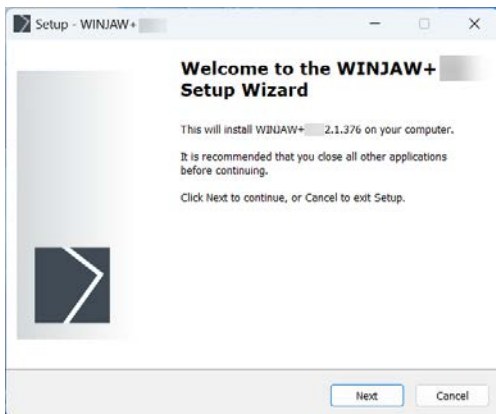
If you have any questions regarding the system requirements listed above, please contact your dealer's support department.

2.2 Installing WINJAW+

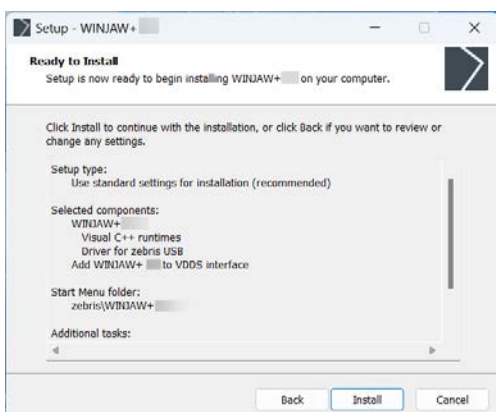
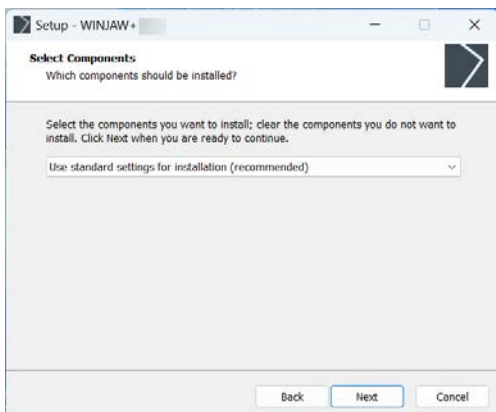


If a message appears during the installation that says that your graphics hardware doesn't support OpenGL 4.6, then you cannot operate the software with this computer. If your graphics hardware has a solution with two graphics chips, please switch to the high-performance chip in the corresponding software. If your graphics hardware should support OpenGL 4.6 according to its specifications, try to update the graphics driver.

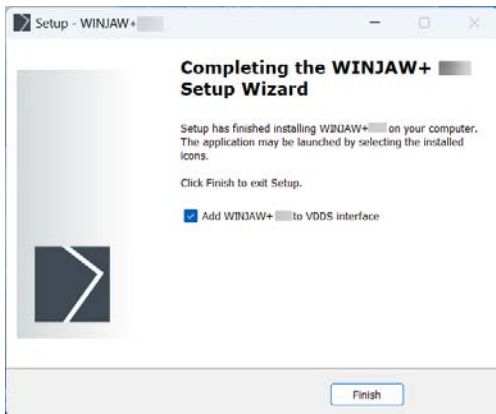
2.2.1 Step by step installation



Open the "Software" folder on the installation disk and launch the installation file named WINJAW+. Then click Next to start the installation.



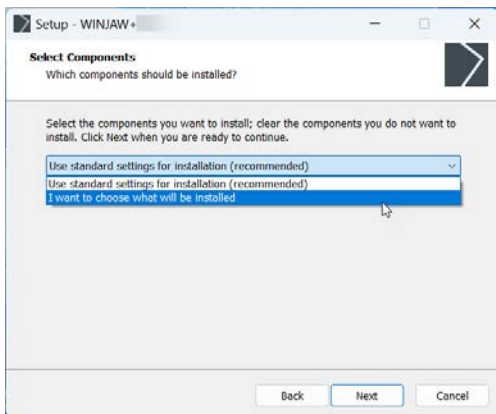
Click Install to start the installation of the software on your computer.



When the installation is complete, the following window will appear. Click "Finish" to complete the installation.

The software is now installed. An icon with the name WINJAW+ will have appeared on the desktop. To start the software, you can either double-click this icon or start from the Start >>Programs >> zebris >> WINJAW+.

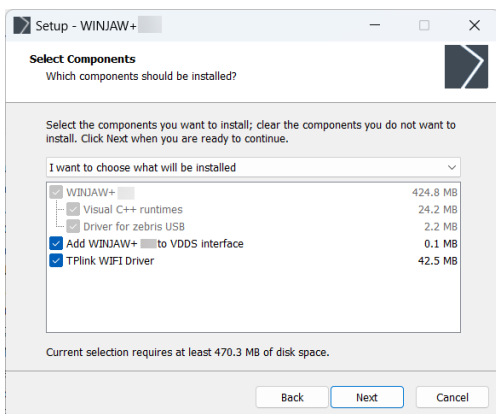
2.2.1.1. Customized installation



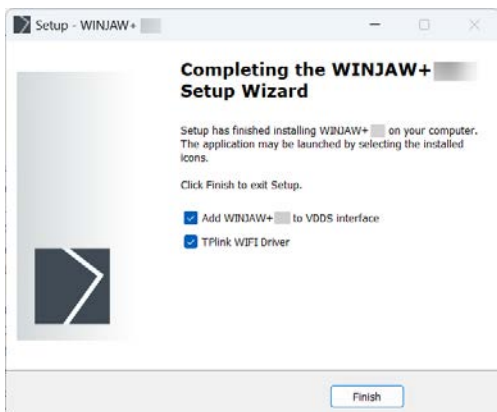
In the Select Components step of the installation wizard, you can also select the option "I want to choose what will be installed" by clicking on the selection list. Proceed with click on "Next".

Then you have the possibility to exclude individual components from the installation by unchecking the box in front of them, or to select non-installed components for installation by default by checking the box in front of them.

The core components of the software cannot be deselected.



Here you have the option to exclude individual components from the installation by removing the check mark or to select components for installation by placing the check mark.

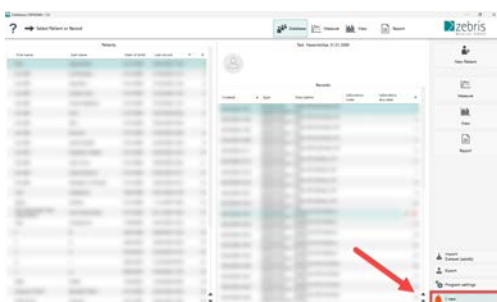


After the installation is completed, the following window appears. Click Finish to complete the installation.

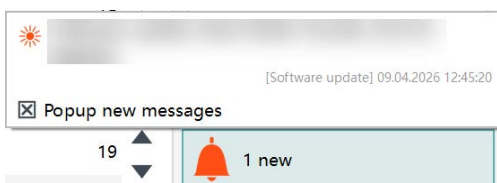
The software is now installed. An icon with the name WINJAW+ has been created on the desktop. To start the software, you can either double-click this icon or start from the Start >> Programs >> zebris >> WINJAW+.

2.2.2 Update installation

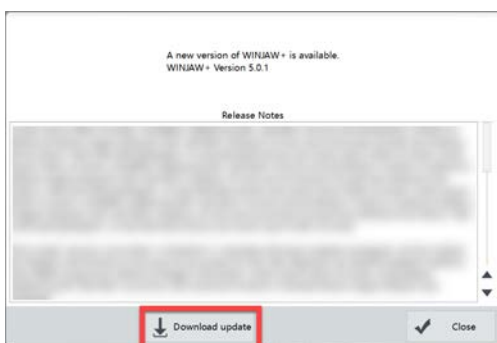
WINJAW+ automatically checks if new updates are available. If so, they are displayed in the Notification Center.



The notification center is located in the bottom right corner of the WINJAW+ Software



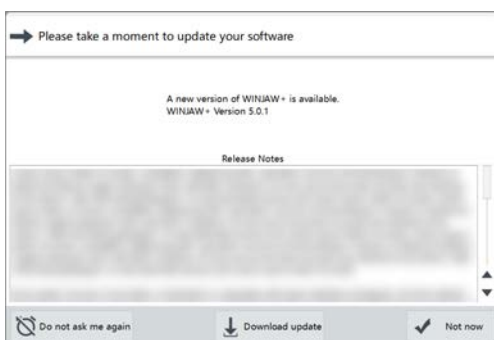
Double-clicking on the notification opens the full text of the notification, as well as the release notes if the notification is an update



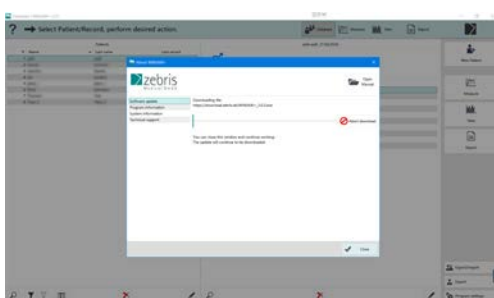
In the Notification you can find the link to download the update version. To start the update click on "Download Update". After querying the download directory, the download starts automatically. In the meantime, you can continue to use the software as usual. After successful download you can install the update directly or at the end of the treatment day.



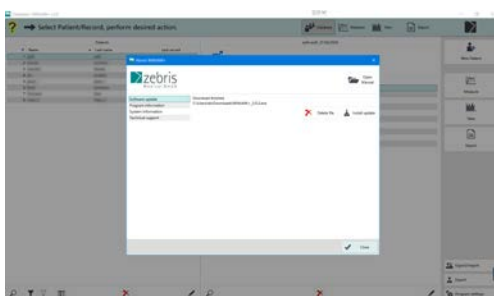
You can also find the updates and release notes in the About Dialog when clicking on the zebbris Medical GmbH -Logo.



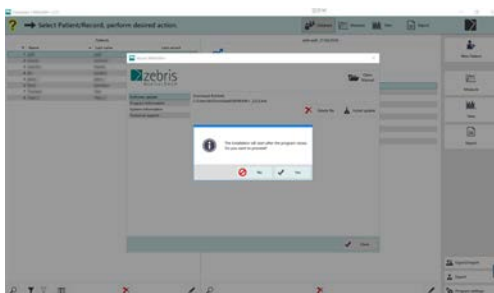
If there is an Update available when starting the software an Update-Dialog will appear.
If you click on "not now" you will be notified again.
If you click on "Do not ask me again" there will be no further notification for this update.



After querying the download directory, the download starts automatically. You have the option to cancel the download at any time. In the meantime, you can continue to use the software as usual. When closing the WINJAW+ software you will get a message if you want to install the update.



After successful download, you can install the update directly. You can also install the update at the end of your treatment day.



The repeated query ensures that you want to perform the installation now. After confirming the YES button the installation of the update starts.

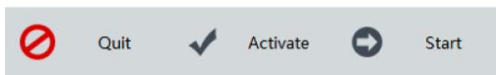


This message appears when the check for update failed.

2.3 Software activation

The installation file contains a selection of modules for unlimited use for 30 starts, after which the software must be activated.

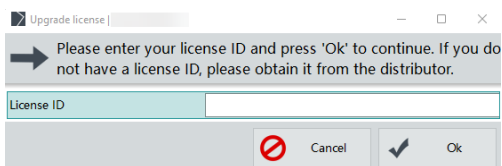
The software can be started 30 times.



Click on Start to run the program in trial mode with all available software modules or click on Activate to enter the license code.

If the application computer is not connected to the Internet, the activation must be done offline.

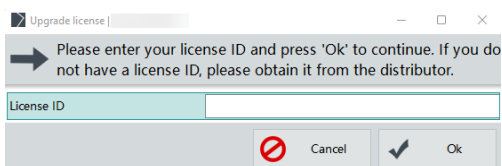
2.3.1 Enter License code



First, the license code (8-digits, e.g. 1234-5678) that you got when you purchased the software must be entered. You can find this license code on the USB storage device that has the software stored on it and in your zebris JMA-Optic System order documents. If you purchased the device through a dealer, they will have given you the license code directly.

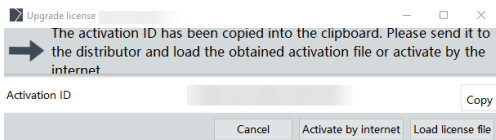
2.3.2 Activation

Then you have two options for activating the software. These are described below.



Via the internet

With this option, the activation is done fully automatically after the activation code transferred from the software has been checked and compared with the registered licenses. If the check comes back with a negative result, a corresponding notification appears.



Offline

With this option, the software is activated by the user communicating the activation code displayed by the software via telephone, fax, e-mail or post.

You will be shown a 20-digit activation code. Please communicate this to your dealer. They will then give you a license file that you can transfer to the computer that needs to be activated by USB stick, for example.

Then click on "Load license" file in the dialog window shown above, select the received license file and confirm. The activation is complete after the software automatically restarts.

Then click on Load license file in the dialog window shown above, select the license file received and confirm.

After an automatic restart of the software, activation is complete.



The new activation will take effect after restart.



Close



Please note that the activation must be done for each computer (workstation) and that the number of activations is limited to 3 workstations as standard. You can obtain further activations by requesting them from your dealer.

3 About WINJAW+



A click on the zebris - Logo opens the About Dialog of WINJAW+.



Software update

Available software updates are listed here.

Program information

You will find information about the software such as version number, licence and activation code. You will also find important information about the dealer and manufacturer.

System information

Here you will find information about your hardware such as operating system, processor, RAM, etc.

Technical Support

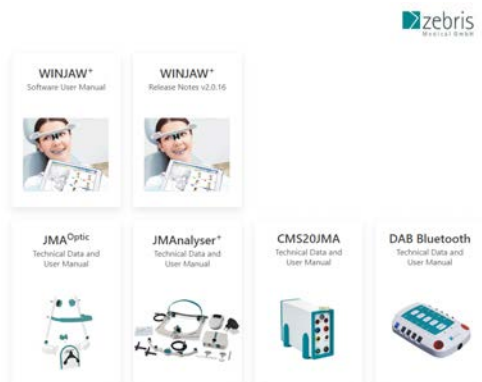
If you need support, you will find all the necessary information here.

3.1 Online Manual



Start Manual Center

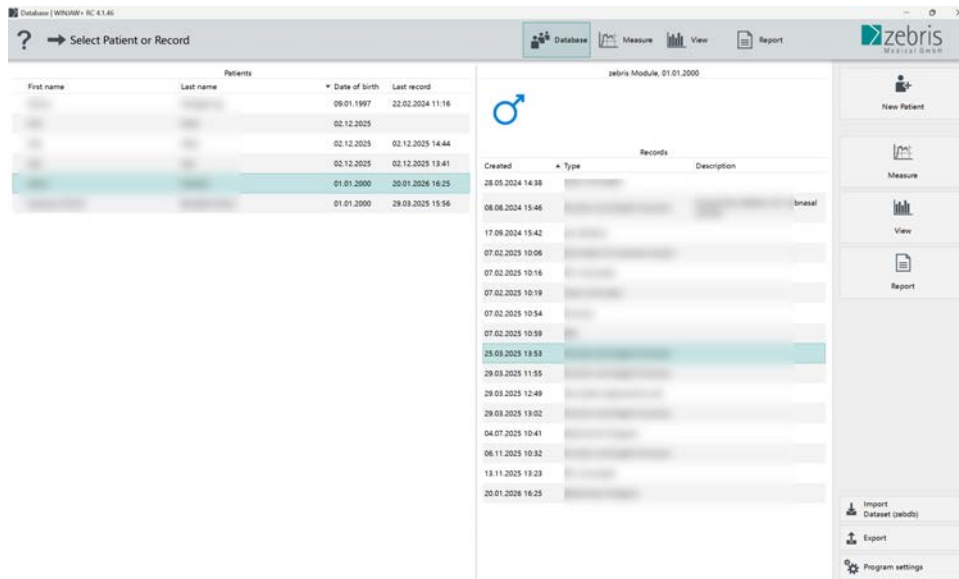
Clicking on the icon or pressing the F1 key starts the manual center.



All manuals including software release notes and short instructions are available here as PDF files. These files are copied to your computer during installation, so no internet is necessary.

4 Patient database

After starting the WINJAW+ Software you are in Patient Database.



Here you can manage the patients as well as previous measurements and have access to import and export functions. In the following you will also find a detailed description on the user interface.

4.1 Information and navigation

→ Select Patient or Record

Information

Help and instructions for using the software.



Navigation

Here you can see which section of the program you are currently in. The section that is currently active is shown in a different colour to the others.

4.2 Operating concept



Database

In the database, you can add, edit and remove patients. You can also add, adjust and remove recordings, comments and descriptions. A import/export Feature makes it possible to archive large amounts of data and use them again at another point in time.



Measure

After creating a patient or choosing an existing patient, this button will take you to the module selection. All the modules that you can use with your license are displayed here.

You can set device and recording settings. You can navigate through the application using two controls.



Viewer

The currently selected recording is opened for viewing and editing.

Depending on the recording module, you can do things like export the data for further processing in CAD/CAM systems, for example.



Report

The reports clearly show the results of the currently selected recording. You can also print the report or export it as a PDF.

Depending on the recording module, you can also export the data as a CSV file for further processing.

4.3 Shortcuts

Shortcut	Action	Mode
Ctrl + U	Show/hide upper jaw	Function and Digital Occlusion
Ctrl + L	Show/hide lower jaw	Function and Digital Occlusion
Ctrl + G	Show/hide grid	Function and Digital Occlusion
Ctrl + S	Show/hide section cut	Function and Digital Occlusion
Ctrl + C	Show/hide contacts	Function and Digital Occlusion
Numpad 1	Back view	Function and Digital Occlusion
Numpad 2	Bottom view	Function and Digital Occlusion
Numpad 3	Frontal view	Function and Digital Occlusion
Numpad 4	Left view	Function and Digital Occlusion
Numpad 5	3D view	Function and Digital Occlusion
Numpad 6	Right view	Function and Digital Occlusion
Numpad 8	Top view	Function and Digital Occlusion
Esc	Abort action	All modes
Enter	Apply, start/stop	All modes
F1	Open manual	All modes

4.4 Patients

#	Name	Last name	Code	Born	Last record
1	Linda	Lung		16.01.1999	12.01.2016 15:48
2	Lindsey	Kalfoops		20.02.1990	12.02.2020 17:41
3	Test	Patient		12.10.2015	12.01.2016 07:34
4	Test	Software		16.09.2013	29.11.2013 14:30
5	Testing	EMG & Relax Site Module		12.01.2016	05.02.2016 12:20
6	Thornstein	Test	KONNUHIBUBUN	04.05.1994	

List of patients

Here, the names of the patients are listed. The currently selected patient is highlighted.

A click on the column header changes sorting, an arrow indicates which column is used for sorting the list (ascending/descending).

You can change the position of columns by drag&drop on the column header.

Search patient

The search function opens when you type in the name in the data base.

Columns

You can select which patient data you want to display in the data base by right mouse-click on the database and choose "Select columns"



Selecting the filter function

If you want to use the filter function you first have to activate it in the program settings. By using the filter function, you determine which patients are shown in the list. Click on "Set filter" to call up the filter settings. Click on "Cancel filter" to display all patients.



Edit patient

With a double-click on the patient or the patient picture in the database the patient properties opens. When you click once on the lines in the database the editing symbol appears.



Deleting a patient

When you click once on the lines in the database the editing symbol appears. After a separate confirmation, the patient is irretrievably deleted together with all the measurements assigned to him.

4.4.1 Filter

The filter function needs to be activated in the program settings before use!

Search parameters

The search parameters include the possibility to filter patients according to specific criteria.

Name contains

Enter the full name of the patient or the parts that you know here.

Gender

Choose between "Female", "Male", "Other" or "Any".

Born after/before

This allows you to narrow down the age of the searched patients using their date of birth.

Code contains

If you use the code field to clearly classify the patients you can use these codes, or parts of them, to filter the entire database

Last record after/before

Narrow down the recording period of the searched recordings.

Labels

If you have split the patients in your database into groups, you can use this information to filter the entire database.

4.5 Patient file/ New patient

When you create a new patient or edit the file of an existing patient, the following dialog appears:

In the following the individual fields and their function are briefly explained.

4.5.1 Properties

Patient data

Please enter the patient data here. Mandatory fields are

- first name
- last name
- gender
- date of birth.

The box "Code" gives you the possibility to assign a unique identification to the patient entry.

4.5.2 Patient Picture

You can use this field to assign a picture to the patients.

Patient picture

Take a new picture/open/remove

Using the buttons, you can either open a connected camera and take a picture of the patient or open a picture that you already have loaded onto your work computer. You can also delete the existing picture.



4.5.3 Labels

Labels assigned

- ☒ cerec
- ☐ Patientengruppe A
- ☐ Patientengruppe B

Allocate the patient to a group

You will then have the possibility of showing only the patients of a certain group in the database.

Therefore, please select this/these group(s) in the filter settings (see Patients [Patient file / New patient](#)) ²⁴

Creating a new label

Enter the name for the new group to be created here and click on "Add".

 Add

The newly created group appears in the list. The tick to the left of it shows that the patient is allocated to this group.

Allocating a patient to several labels

By clicking on the tick you can carry out or cancel the allocation. Groups to which no patients are allocated any longer disappear automatically after closing the dialog.

4.5.4 Comments & Clips

Comments

Define any free text as a comment on patients. These can later be displayed in the report as "patient comments".

Clips

In order to make recurring formulations and standardized designations quickly usable, you can add them as clips.



Comments

Write any free text here as a comment on this patient.

Clips

This list contains all the text clips you have defined.

Creating text clips

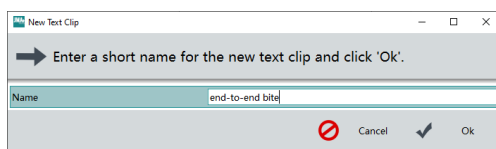


1. Mark the text

Mark the text section in the box "Comments" that you wish to create as a text clip.

2. Save

To save the marked text section as a text clip, click on the button "Save Clip".



3. Enter designation

In this dialog you can select a designation for the text clip your chosen designation is then automatically stored as a suggestion. By clicking on "OK" the text clip is created and appears in the list with the chosen designation.

Inserting the text clip

Comments

Patient has the following characteristics:
end-to-end bite

▲

▼

Clips

end-to-end bite

AaBb

→

AaBb

←



1. Determining the cursor position

Set the cursor by left-clicking at the position where your text clip is to be inserted.

2. Inserting the selected text clip

Select a clip from the list with a left click. This clip is then taken over to its new position in the Comment box by clicking on "Paste Clip".

4.6 Records

List of records

List of all records of the currently selected patient. The actual selected record is highlighted in color.

Records				
#	Created	▲	Type	Description
1	2023-01-01		End-to-end bite	End-to-end bite
2	2023-01-01		End-to-end bite	End-to-end bite
3	2023-01-01		End-to-end bite	End-to-end bite
4	2023-01-01		End-to-end bite	End-to-end bite
5	2023-01-01		End-to-end bite	End-to-end bite



Delete marked items

When you move the mouse over the lines in the database the deleting symbol appears. After a separate confirmation, the selected data will be irretrievably deleted.

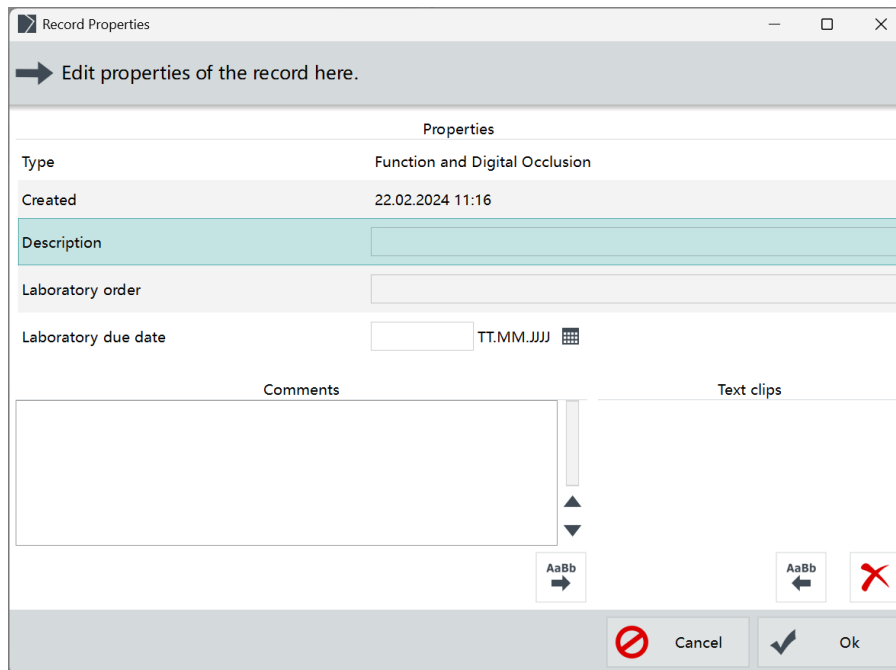


Properties

When you move the mouse over the lines in the database the editing symbol appears. Edit the description and comments about the recording here.

4.6.1 Recording details

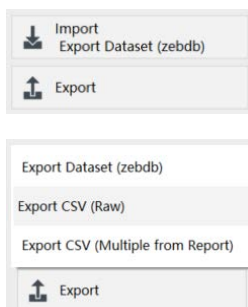
You can open this dialog by clicking Edit record information on the right under the list of recordings. You can change the description of the recording and add a recording comment see [Comments & clips](#)²⁶. Text modules are stored separately from those in the Patient File.



The 'Record Properties' dialog box is titled 'Record Properties' and contains a header bar with the text 'Edit properties of the record here.' Below this is a 'Properties' section with the following fields: 'Type' (Function and Digital Occlusion), 'Created' (22.02.2024 11:16), 'Description' (a text input field), 'Laboratory order' (a text input field), and 'Laboratory due date' (a date picker set to TT.MM.JJJJ). Below the 'Properties' section are two tabs: 'Comments' and 'Text clips'. The 'Comments' tab is active, showing a large text area with a vertical scrollbar and a 'AaBb' button. The 'Text clips' tab is also visible, showing a 'AaBb' button and a red 'X' button. At the bottom of the dialog are 'Cancel' and 'Ok' buttons.

4.7 Export records

You can export patient and admission data from the patient database into the zebris own format "zebdb". This enables you the possibility to exchange individual data records, e.g. with colleagues who also work with the WINJAW+-software. Exported data can be imported with the import function. Furthermore, you can create backup copies of the database in this way.

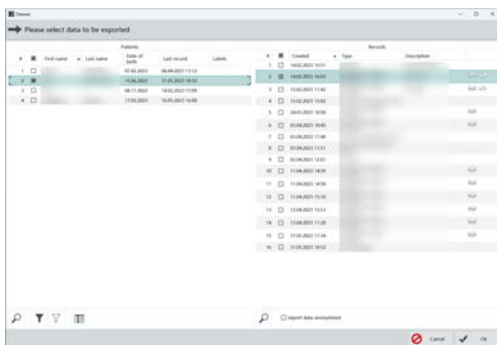


1. Export

Click on the **Export** button at the bottom right of the toolbar.

2. Export datasets

Select **Export dataset** in order to export the desired data from your database.



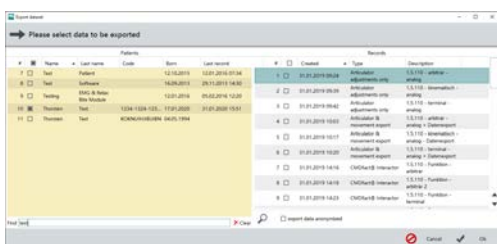
3. Select data

Select all records that are to be exported or saved.

If you want to export or save all admissions of a patient, select the checkbox in the description line.

This selects all patients.

If you click in a row with patient's name, all recordings of the patient will be displayed on the right side. You can then select these individually.

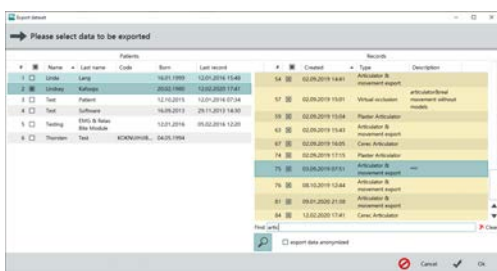


"Anonymised data export"

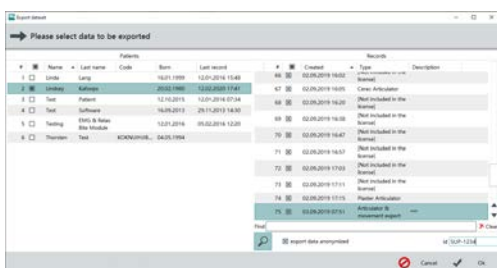
If the "Export data anonymized" checkbox is selected you can export anonymized data.

With this function, you can pass on measurement data or recordings to third parties in anonymized form. The first letters of the first and last name are kept.

First and last name consists of the first letter of the original name + the individual id that you can define.



All other patient information is deleted. The admission description is replaced by the defined id.



4. Choose a location and file name

Select the location from the file browser where you want to save your backup file. You can also change the name. Click on "Save" to proceed.



zebris Medical GmbH expressly recommends that the user is responsible to create backups. zebris also recommends that you regularly back up the patient database. You can find the WINJAW+ database in the user data directory. C:
 \ProgramData\zebris\WINJAW+

ATTENTION! ProgramData is a hidden folder and must first be made discoverable.

4.8 Import Records

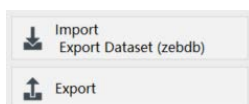
4.8.1 Data import WINJAW+

zebris custom formats (.zebdb/.data)

If you want to import data from old or new software packages, select the file with the extension.zebdb.

You can export patient and record data from the patient database into the zebris own format "zebdb". This enables you the option of exchanging individual data records, for example with colleagues who also work with the WINJAW+-software. Exported data can be imported with the restore function. Furthermore, you can create backup copies of the database in this way.

You can import existing patient and admission data of different formats into the database. The exact procedure for doing this is explained below:

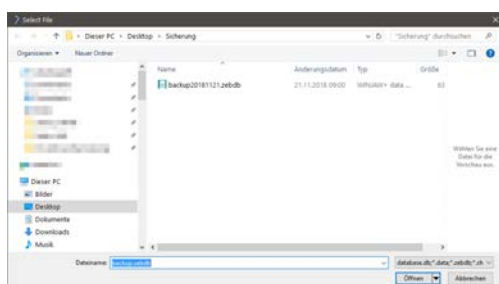


1. Import

Click the Import button at the bottom right of the toolbar.

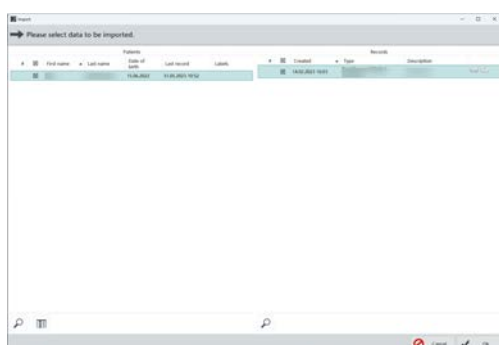
2. Browsing for & selection data

Search for data records, that you would like to import, on your hard disk resp. other storage media connected to your computer.



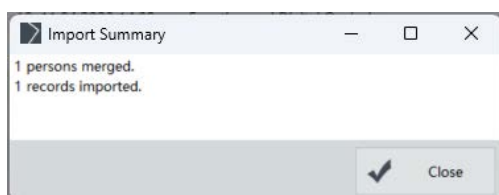
3. Select data records

Place ticks in front of all data records, that you would like to import. In order to import all patients of a group, place the tick in the first column. If you would like to import all records of a patient, simply click on the tick in front of the patient's name. When clicking in a row with the patient name, all records of the patient are displayed on the right. You can then select them individually.



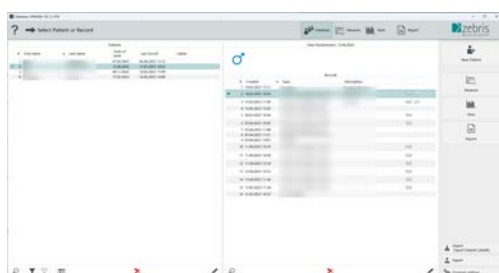
4. Results

After a successful data import the dialog shows you a summary of how many patients and records have been imported. Incorrect data records are shown in the list, as well as patients and measurements that have already been created and were therefore not imported.



5. Restored records

Restored Patients are marked with a grey arrow. This mark remains active until the software is closed and restarted.

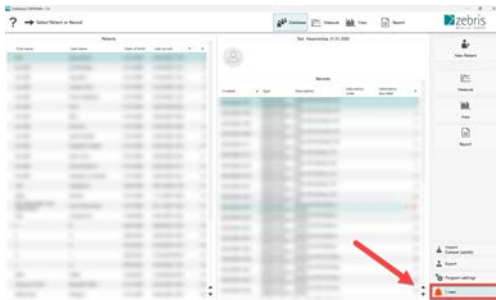


Record name	Person name	Reason
27.08.2015 11:32, Funktion, 27-08-2015 3D-Analyse	Importdaten 3D, 24.01.1960	Record with the same creation time already exists
27.08.2015 11:37, Funktion, 27-08-2015 3D-Analyse 2	Importdaten 3D, 24.01.1960	Record with the same creation time already exists
Schamlerachse bestimmt	Importdaten 3D, 24.01.1960	Record with the same creation time already exists
27.08.2015 11:33, Funktion, 27-08-2015 3D-Analyse	Importdaten 3D, 24.01.1960	Record with the same creation time already exists
Kondylengruppe bestimmt	Importdaten 3D, 24.01.1960	Record with the same creation time already exists
27.08.2015 11:39, Artikulator adjustments only, 27-08-2015	Importdaten 3D, 24.01.1960	Record with the same creation time already exists
Artikulator bestimmt	Importdaten 3D, 24.01.1960	Record with the same creation time already exists
27.08.2015 11:45, Artikulator adjustments only, 27-08-2015	Importdaten 3D, 24.01.1960	Record with the same creation time already exists
Artikulator kinematische Achse	Importdaten 3D, 24.01.1960	Record with the same creation time already exists

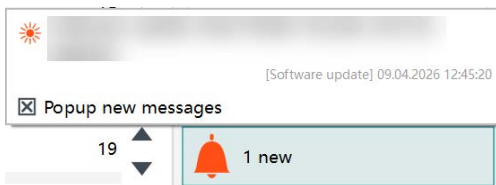
6. Errors/Duplicates

If any errors occur while importing or if you would like to import data records, which already exist in your data base, a summary will be displayed informing you on the corresponding information.

4.9 Notification Center



The notification center is located in the bottom right corner of the WINJAW+ Software



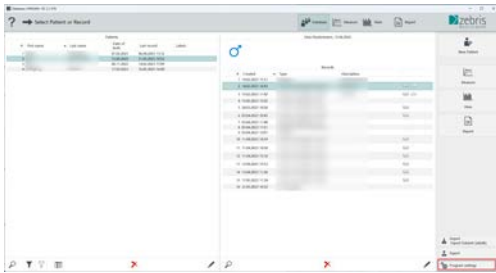
Double-clicking on the notification opens the full text of the notification, as well as the release notes if the notification is an update. (More information about the update installation can be found in chapter Update installation)

Possible notifications can contain:

- Information or warnings about Updates (Software update check failed, update is available, download is ready, update failed)
- Warnings about incompatible data set-formats (e.g. in the Attachment Designer module)
- Warnings about incompatible data (e.g. scan models)

5 Program settings

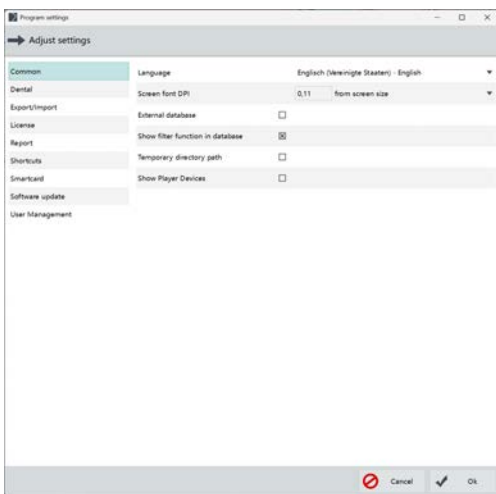
Here you can amongst others change the language and the settings concerning Softwareupdates.



Program settings

To access the program settings click "Program Settings" in the lower right corner of the database.

5.1 Common



Software-Update

Select whether to automatically check for updates when the Internet connection is active or not.

Language

Select the desired translation of the program interface from the list.

Screen font DPI (Zoom factor)

This factor determines the size of all displayed elements in the software.

Select "fixed" in order to enter your own value in dpi. "from screen size" can be used as alternative to the dpi setting. Using the "from system" resets the value to Windows-Standard.

External database

If you purchased the external database feature from your dealer, you can define the path for the external database here.

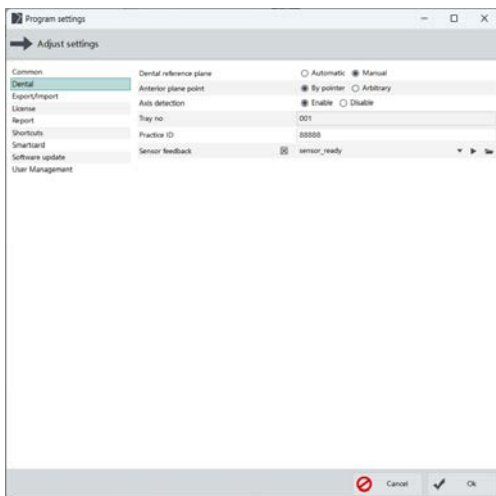
Show filter function in database

If you want to use the filter function in the database you have to activate it first.

Temporary directory path

Possibility to define an external temp destination in case of not big enough hard disk storage.

5.2 Dental



Dental reference plane:

This is the first step to change the reference plane for your measuring. If you are using the JMA-Optic -System the predefined reference plane is the Camper plane. If you want to switch to other reference systems select Manual.

Anterior plane point:

The predefined method to define the anterior plane point is a measuring by pointer. Depending which reference plane is selected, the anterior plane point can be the subnasal or orbital point. If the anterior plane point should be calculated arbitrary, select "arbitrary" in the program settings.

Axis Detection:

The predefined method to detect the condyle position is measuring by C-Positioner. To enable the possibility of measuring the condyle position as Hinge axis or Kinematic axis you first have to enable the "axis detection" in the program settings. The selection which method will be used, is found in the measurement setup.

Tray no/Practice ID:

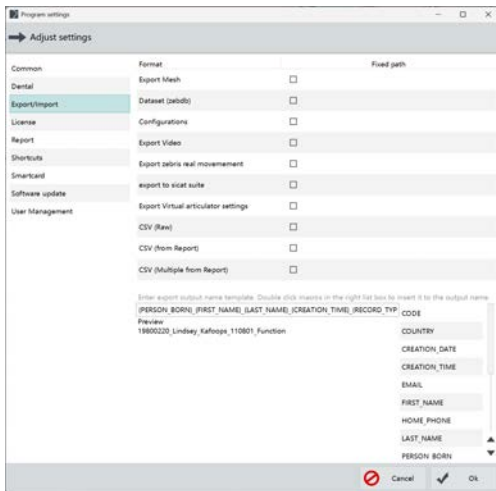
The tray number and the practice ID will be necessary if you want to export your measured data to other softwares (See Chapter dentalProject [export](#) ¹⁵⁴).

Sensor Feedback:

When measuring with C-Positioner, an acoustic signal sounds in the software when the sensor is in the measuring range. You can choose between different sounds, upload your own sound file or disable this function.

5.3 Export

You can set a fixed storage location in "Program Settings" at the database window. When this setting is active, the save dialog will not come up. Instead the export files will automatically be saved to the location you have defined.



1. Export/Import

Click on "Export/Import" on the left hand side of the screen.

2. Enter destination

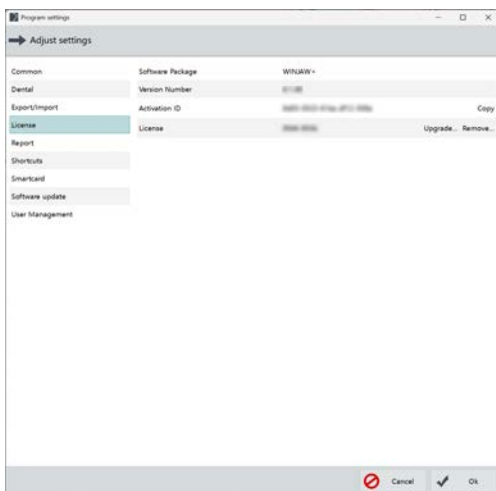
Mark the check box in the column "Fixed path".

You can select another location in your storage by pressing "...". Press "OK" to confirm your changes.

No save dialog ("Enter File Name") will be shown as long as the check box is marked

If you do not set fixed paths, a file save dialog comes up. Select the location to save the export files and enter another file name or just hit "save" if you want to confirm the proposal.

5.4 License



In this section the Software Package, Version Number, Activation ID and License is displayed.

Select license

Click on "License" on the left-hand side of the screen.

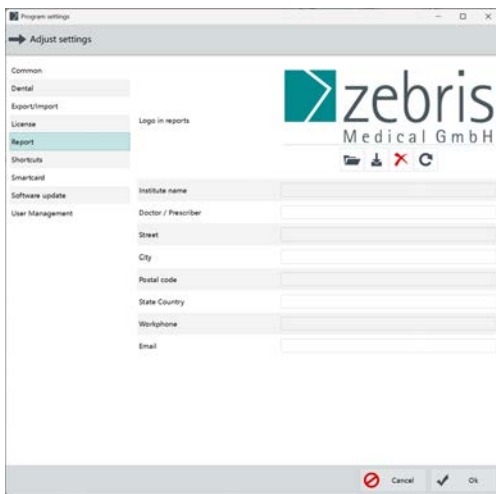
Upgrade license

The current user license is displayed in the right window. Click on the "Upgrade" to get the new Features.

Remove license

If you want to remove the used license from this device click on the "Remove" button.

5.5 Report



Institution name

You can customize the output report by entering the name of your institution.

Customize Report (Logo in Reports)

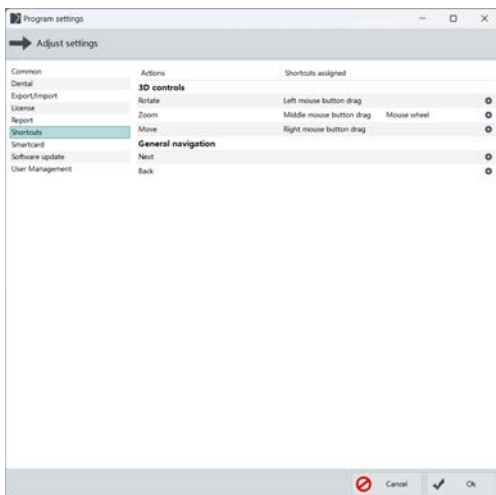
Here you can edit the Report like enter your logo and company address

Logo in reports

Click "Open" to select a logo graphic that appears in the header of all reports.

Click Clear to display no logo graphic, or click Default to restore the original graphic.

5.6 Shortcuts

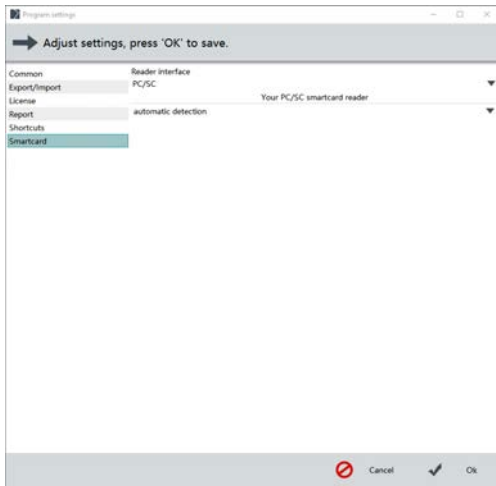


Select shortcuts

Define here which keys you use to move 3D graphics (skull model, tooth models) in space and for general navigation.

5.7 Card reader

Here you can set up your card reader for use with patients' health insurance cards (either KVK or eGK cards). To do this, you must already have either a smart-card reader for eGK cards or a special reading device for KVK cards, like the card keyboard made by the German manufacturer Cherry. The old insurance cards (KVK) only work with installed CT-API drivers.



Card reader

Choose "Smartcard" on the left-hand side of the screen.

Select an interface

On the right-hand side, choose the interface or device that you will use to read the health insurance card (KVK or eGK):

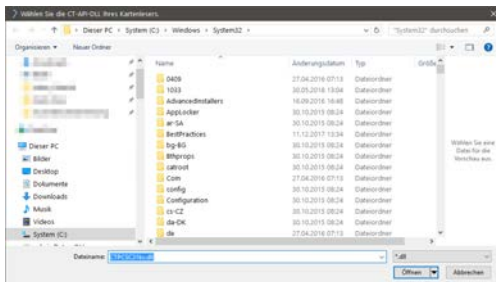
PC/SC for eGK

CT-API for KVK and eGK

If you have chosen PC/SC, confirm this by clicking on "Close".

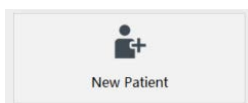
CT-API

CT-API can read both KVK and eGK cards. The default suggested driver is the EHEALTH-BCS keyboard G87-1504 made by Cherry. Then click on Browse to select the corresponding dll file for your CT-API driver.



Select dll driver

Select the corresponding CT-API driver from your hard drive. See the card reader manufacturer's handbook for more details.



Insert card

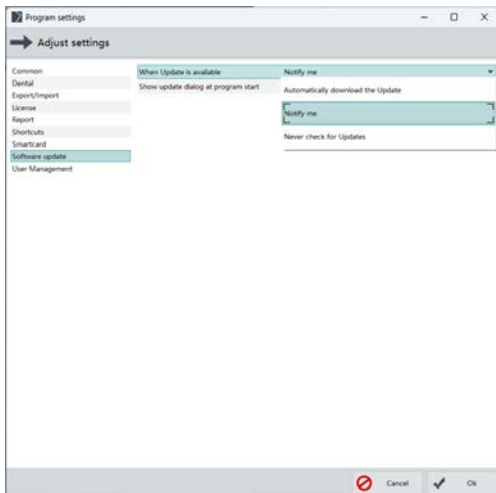
Insert the card into the reader.

Create a new patient

Click on "New patient" and the card data will be automatically added.

5.8 Software update

Define the standard behavior when an update is available.



There are 3 Modes available

Automatically download new software:

The update will be downloaded automatically in the background into the Windows Download directory if no Download location is defined.

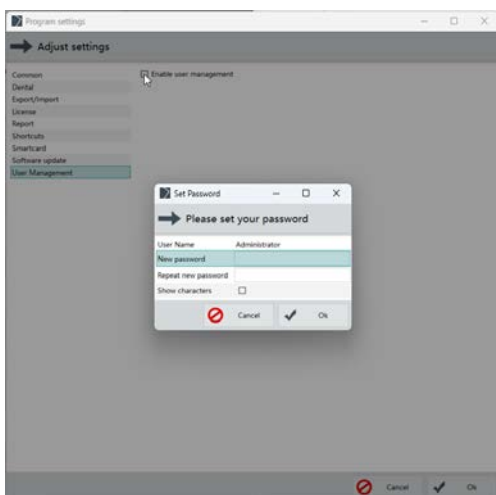
Notify me:

So far as an Update is available, a Dialog will open and inform you about a new Update.

Never check for Update:

The Software will not check if an Update is available.

5.9 User Management



Define User:

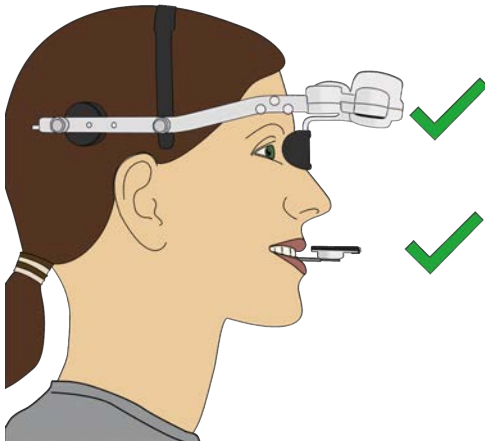
The user management can also be found in the program settings. There you have the possibility to create different user accounts. The first account is available for the Administrator after defining a password. After defining an Administrator you are able to create new user.

6 Measurement preparation

6.1 Fixation of the head bow

The measuring system should be placed on the test person's head at the latest in the measurement preparation step. In doing so, 3 things should be noted:

- Angle and position from camera to mandibular sensor
- Attachment to the lower jaw
- Orientation of the patient



Angle and position of the head bow

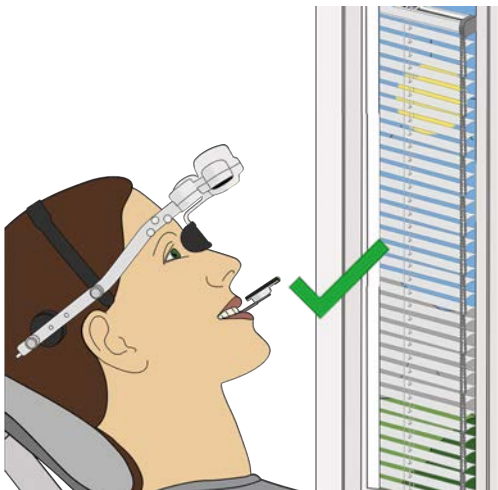
In the upright sitting position, the head bow must be positioned so that the brackets are parallel to the floor.

When attaching the attachment, it is also important to ensure that it is fixed parallel to the occlusal plane.



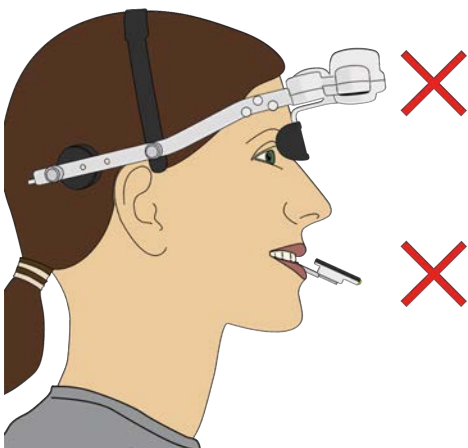
Patient orientation

DO NOT place the patient towards the window.



Patient orientation

If patient is placed towards the window, then there must be protection from the sun's rays.



Incorrectly placed headbow

If the system is placed on the patient's head as shown, it cannot be guaranteed that the sensor will detect all positions and movements to be measured without error.



Orientation of the patient

The patient must be positioned for measurement in such a way that he/she is NOT sitting in the direction of a window or a galley front. The incoming infrared light can under certain circumstances disturb the measurement, causing by

- Signal Interruptions
- Jumps
- not recognizing the mandibular sensor



These instructions must be observed for each measurement. Only if these instructions are observed can a successful measurement of the patient be guaranteed.

6.2 Para-occlusal Attachments fixation

Para-occlusal Attachments (e.g. Para-occlusal Attachment with Lip Arch (REF01960250), Para-occlusal Attachment with Support Surface M (REF01960255)) are required to attach the mandibular sensor (REF01470000) to the patient's lower jaw.

The Para-occlusal Attachments must not become loose or detached from the patient's lower jaw during the measurement. Secure attachment is therefore particularly important.

The patient's dental status can make the attachment of prefabricated Para-occlusal Attachments difficult. In these cases, it may be advisable to fabricate a customised attachment. (see [Attachment Designer](#) ⁶⁴)

Temporary materials or bite registration materials made of silicone are recommended as fixing materials.

6.2.1 Fixation with bite registration material

The following material was used in the example shown:

O-Bite Scan

DMG Chemisch-Pharmazeutische Fabrik GmbH

Elbgaustraße 248

22547 Hamburg / Germany

In the first step, adapt the Para-occlusal Attachments to the shape of the patient's lower jaw.



Apply the material to the Para-occlusal Attachments and place it on the mandibular dentition of your patient. Place the attachment as centrally as possible and in straight alignment. Instruct your patient to close the dentition to avoid interfering contacts.



After the material has completely cured, you can remove the attachment and remove any excess material. For treatment, you can attach the prepared attachment to the teeth with a small amount of tissue adhesive.

Alternatively, you can apply small amounts of thin-bodied impression material to the attachment to obtain additional retention over the interdental spaces and to secure the attachment.

6.2.2 Fixation with temporary material



First adapt the attachment to the shape of the lower row of teeth.

When customizing a prefabricated attachment, preparation on the patient's dental model is recommended.

Ensure in particular that the maxillary teeth do not come into contact with the attachment or the fixing material. This will prevent subsequent, unwanted detachment or buckling of the attachment during a measurement.



Apply the material to the attachment and place it on the lower row of teeth of your patient. Place the attachment as centrally as possible and in a straight position.

If the fixing material has hardened, it can be fixed in place using temporary cement.

Alternatively, a small amount of tissue adhesive can be used to fix it to the teeth.

6.3 Preparation Bite fork



To determine the position of the upper jaw using Bite fork this must be prepared for the measurement. To do this, apply silicone bite registration material to the Bite fork and place it on the rows of teeth of the upper jaw.



Once the material has hardened, the position of the upper jaw can be determined.

In order to match the measurement with scan data, an additional scan of the upper jaw with inserted Bite fork must be made.

Check the interference-free fit of the Bite fork before starting the measurement.

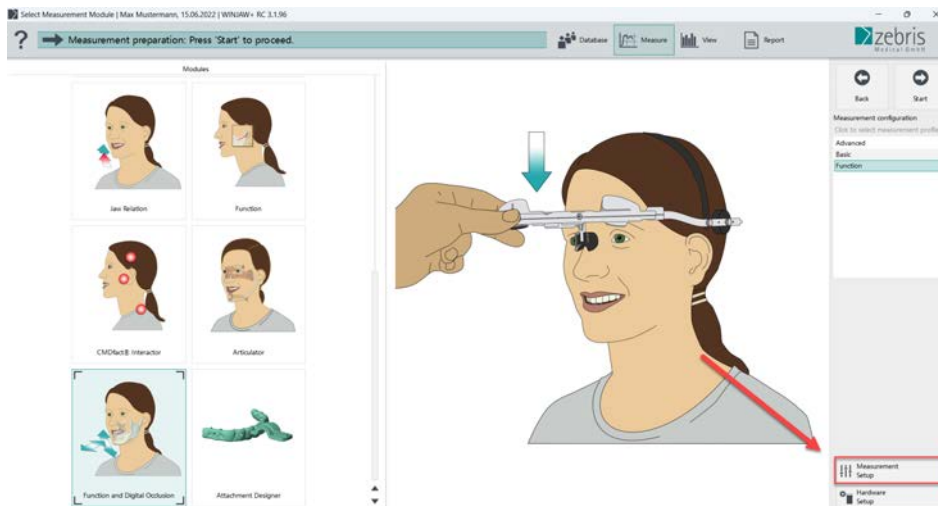


7 Measure

7.1 Common

By clicking on "Measure", you leave the database and the module selection is displayed. Here you can select the application on the left that you would like to start. The selection of applications available depends on which license key you purchased. The software and hardware of the system can be expanded upon. Ask your supplier about further application possibilities. Then you can make settings on the right-hand side, according to the respective application. Details on the settings can be found in the respective section on the application.

The measurement can only be started if the corresponding hardware is selected in the device settings. (see [device settings](#) ⁴²)



After starting the software, you can choose the recording program from the list of applications. You can open and define individual settings with the "Measurement Setup" button on the bottom right of the screen or by double-clicking on the measurement profiles. You can also save various different configurations, e.g. for different treatment and analysis procedures, and then open them again later. The following module chapters explain the measurement-specific settings.

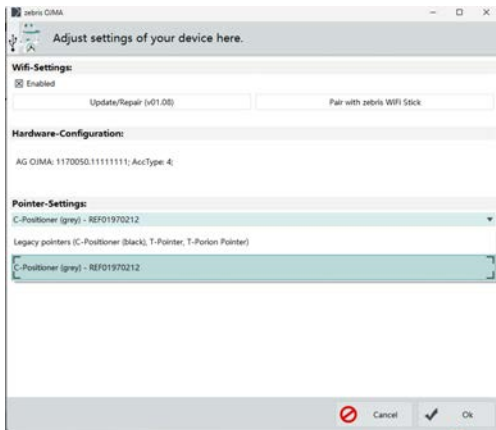
7.2 Device settings

Before you can use your system, you have to create a device profile (i.e. one or more devices in a group). This is the case for those applications for which the "Hardware Setup" button is displayed in the lower right corner after selecting the application.

7.2.1 Device properties JMA-Optic



Connected devices are displayed on the right-hand side of the device settings. The measuring system must be selected in order to be able to use it. Selected devices are displayed on the left-hand side under "Selected devices".



The settings for the selected device can be opened under the cogwheel symbol. Among other things, accessories such as T-Pointer (REF01970110) or C-Positioner grey (REF01970212) V4 (grey) can be selected.

7.2.2 Connection via USB

The Device manager in the Device settings then automatically searches for available devices to connect with the PC and user software. This process can take a few minutes.

Automatic detection

On first start of the hardware setup, an automatic detection will be performed that inserts all currently connected zebris devices into one profile.

To benefit from this automatic process, please plug in the devices you want to use and click "OK".

If automatic detection fails

No devices could be recognized. If you already plugged in your devices, please check the cable connections and power supply. After clicking on "Close" you can add the devices manually to a profile or trigger the automatic detection again by canceling and starting the hardware setup again.

Connect all devices that you want to use to do the recordings to the PC using the USB cables provided. Make sure that the sensors are also connected to the device correctly and that the devices are switched on. After a short wait, all available devices will appear in the WINJAW+ Device manager on the right-hand side of the screen. Select the hardware that you want to use and add it to the left side of the screen.



Profiles

You can create individual profiles if you are using different hardware configurations. This way you can load the right profile for each configuration much faster..

Open device selection

Click on "Add device". A new window opens.

Select device

In this dialog box, all the known devices are shown to you (and enabled according to your license).

Please select the device that you would like to add to your profile and click the "+" button. If this should be a camera, its settings dialog will be displayed.

Repeat this step until you have added all the devices that you would like to take your measurements with.

Finished profile

After you have added all the devices to the profile that you want to take measurements with, you are able to assign a further designation in the input field next to "Hardware profile".

Finally click on "OK".

7.2.3 Connection of the JMA-Optic systems via WiFi connection

The WINJAW+ supports 2 types of wireless connection between JMA-Optic and the PC.

- Connection JMA-Optic and Wireless Link Adapter (REF01870100)
- Connection JMA-Optic and WLAN USB adapter TP-Link WN823N (REF21030010)

From software version 5.0 is supplied as standard with the purchase of the Wireless Link Adapter. Systems purchased before August 2023 have the TP-Link WN823N (REF21030010) included in the package.

Wireless Link Adapter (REF01870100)



TP-Link WN823N (REF21030010)

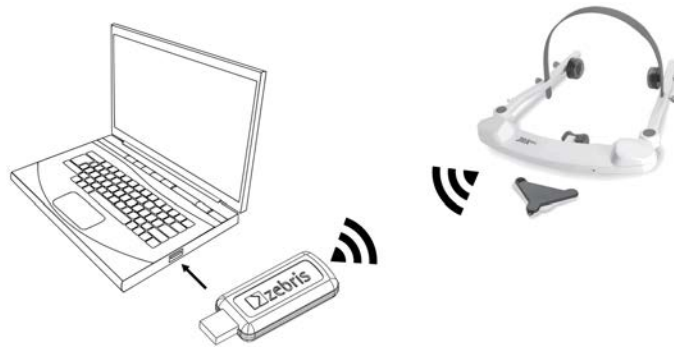


The WiFi connection will only work if the supplied WiFi stick is used.

7.2.3.1. Connection with Wireless Link Adapter (REF01870100)

When using the Wireless Link Adapter (REF01870100), a direct radio connection is established between the adapter and the JMA-Optic is established. The adapter and the JMA-Optic are paired with each other at the factory.

To put the JMA-Optic wirelessly, you only need to insert the adapter into the PC and select the JMA-Optic must be selected in the device settings.



If you have subsequently purchased the Wireless Link Adapter (REF01870100) together with a software update, the adapter must be paired with the JMA-Optic be paired manually.

Manual Pairing of JMA-Optic with Wireless Link Adapter (REF01870100)



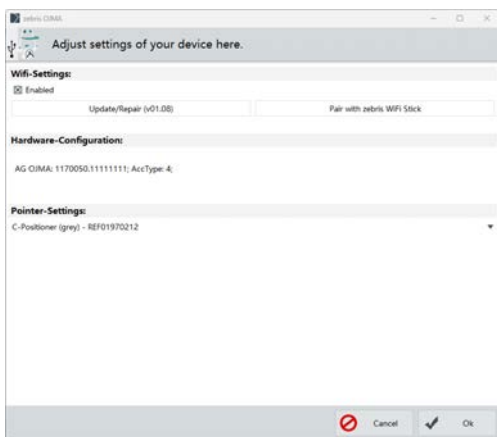
JMA-Optic connect it to the computer with the USB adapter cable and JMA-Optic switch on (green LED lights up).

Wireless Link Adapter (REF01870100) Connect to another free USB port so that the green LED lights up.

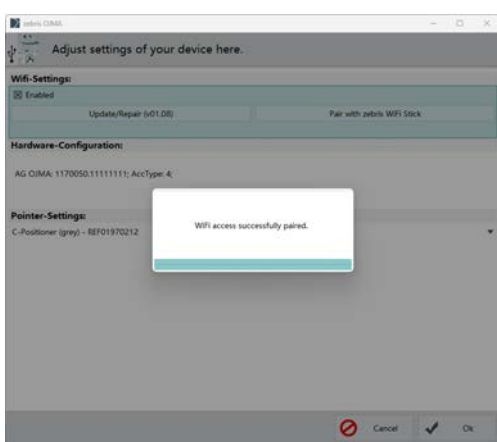
Open thezebris hardware setup and double-click on the USB device to select the device.



The JMA-Optic is now located at selected Devices. Now double-click on the device icon again to open the device dialogue.



Click on the Pair with zebris Wifi Stick button in the device dialogue.



The pairing is carried out automatically. During the pairing process, do not JMA-Optic nor Wireless Link Adapter (REF01870100) from the PC or switch it off.



Then close the device dialogue and remove the USB-device after selected devices. To be able to measure with the WLAN device, it must be selected so that it is on the left side.

7.2.3.2. Connection with TP-Link WN823N (REF21030010)

The following points must be observed when using the device for the first time or when using a new laptop / PC

Plug in WiFi adapter

Please connect the supplied WiFi adapter to your PC.

Install WINJAW+

Now install the WINJAW+ (see chapter [Software installation and activation](#)¹²⁾). At the end of the installation process, the installation of the driver for the WiFi adapter occurs. If necessary, please confirm the installation of the drivers on your PC.

Deactivate internal Wi-Fi-adapters if necessary (esp. for laptops)

If your laptop/PC has additional Wi-Fi-adapters, please disable them (see chapter [Disable internal WIFI adapters](#))⁴⁸⁾

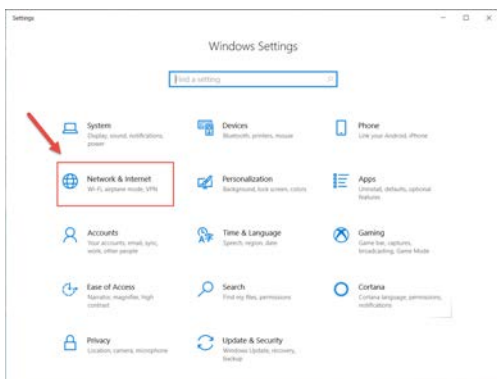
Set up JMA-Optic for Operation with WiFi

Connect your JMA-Optic to your PC via USB cable. Start the WINJAW+ software and click "Measure" on the right side and then "Hardware Setup" in the lower right corner.

After a short time, the JMA-Optic device appears in the Hardware setup with an overlaid icon for the USB connection (see Fig. 2), later another JMA-Optic device with the icon for a WiFi connection (see Fig. 3) is displayed. Double-click this icon into the list of devices you use and close the Hardware setup with "OK". The JMA-Optic is now ready for measurement via WiFi.



The JMA-Optic is always paired with the PC on which it was last used via USB. It can only be paired with one PC at a time.

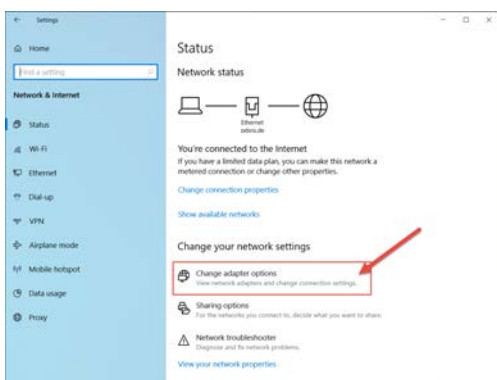


Open Windows settings

Press the Windows key and then click on the gear wheel at the bottom left.

The "Windows settings" will open.

Select Network and Internet



Select Change adapter options



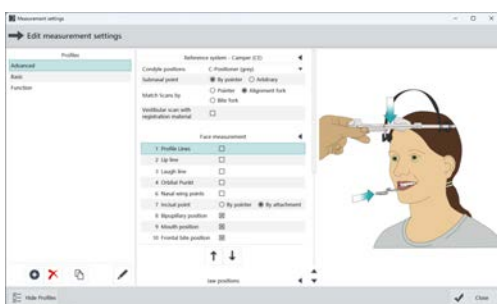
Disable other WIFI adapters

If the network connections are not displayed as shown in the screenshot below (important is the third line with the manufacturer name "TP-Link Wireless USB Adapter"), change the view to "Tiles" by clicking on the checkbox marked with 1.

Now deactivate all other WIFI adapters (in the screenshot only one, marked with the 2) by right-clicking > "Deactivate". After deactivating, the tile is displayed in gray with the note "Deactivated":

After internal WIFI adapters have been deactivated, the PC must be restarted once (the zebris Wireless Stick remains plugged in). The system is then ready for operation.

7.3 Measurement setup

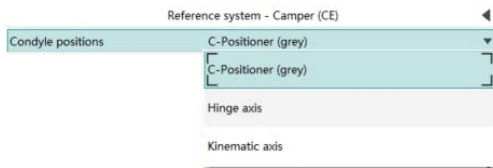


The setting options depend on the connected measuring system and vary depending on the measuring module. The following list is exemplary:

- Measuring profile
- Reference system
- Face measurement
- Lower jaw positions
- Jaw movements

7.3.1 Reference system

The reference system for which the patient exposures are created includes several individual setting options. To use all modules, it is first necessary to enter a skull-related reference plane. Further options for adopting the terminal and kinematic axis are possible.



C-Positioner

Via the anatomical points on the patient's ear picked up with the C-Positioner.

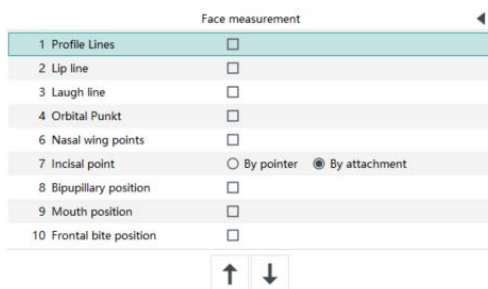
Hinge axis

Via an opening and closing movement of 10-18 mm, the patient performs a pure rotational movement in the terminal condylar position. This can optionally be selected as the reference axis for the acquisition or compared to the center of rotation of the arbitrary axis.

Kinematic axis

The patient makes a maximum opening, closing and protrusion movement. This can be selected as the reference axis for the exposure or compared with the center of rotation of the arbitrary axis.

7.3.2 Face measurement



Striking reference points from the facial symmetry, the oral cavity or lines, e.g. for the facial profile can be entered via the pointer. These can be picked up both statically on the upper jaw and dynamically on the lower jaw and thus displayed in the graphical interface of the software.

7.3.3 Lower jaw positions



Different positions of the lower jaw in relation to the upper jaw can be saved under the predefined wording "Retral Position", "Rest position" and "Jaw relation" on the one hand and added individually by name on the other. The order can be changed using the arrow keys. Individual positions can be added using the "+" symbol.

7.3.4 Jaw movements

1	Protrusion	1	-	+
2	Lateral left	1	-	+
3	Lateral right	1	-	+
4	Opening	1	-	+
5	Chewing	1	-	+
6	Posselt frontal	0	-	+
7	Posselt sagittal	0	-	+

The jaw movements to be performed can be individually determined and preset by switching special movement patterns on and off, as well as their frequency of occurrence. The sequence can be changed using the arrow keys. Individual movements can be added using the "+" symbol.

7.3.5 Measured parameters

Retral position	☒		
Target position	7	-	+
Gothic arch	☒		
Manual correction	☒		
Guided registration	☒		
Bite control	0	-	+

Retral position

The "retral position" refers to the position of the mandible that can be safely guided manually by the operator using the Lauritzen handle or Dawson handle. How many target positions (adduction points) are entered depends, among other things, on the patient's accuracy or coordination ability. Once this procedure is complete, an average of the closest points is determined and used for therapeutic definition of the mandible.

Target Position

The target positions are the ballistic movements to be performed on the jig inserted in the maxilla, which represent the hit field for the averaged abduction point.

Gothic arch

The Gothic bow refers to the arrow angle recording.

Manual correction

Manual correction allows the practitioner to intervene in the positioning of the mandible in a corrective manner.

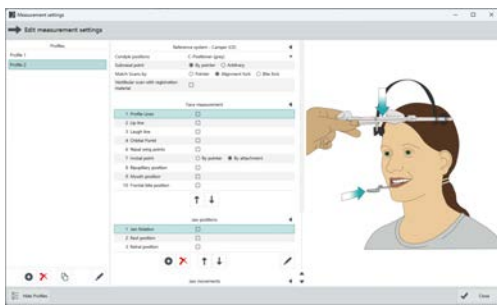
Guided registration

The patient guides the mandible into the target position via visual feedback.

Bite control

The optimized bite can be used to document the correct position.

7.4 Measurement profile management



Profile management

The Profile Management button is located under the respective setting options of a module. Click on this button to change your recording settings or to enable copying to other licensed computers.

Controls



Add a new item

Add a new profile or parameter to the measurement.



Delete item

Delete a profile or a parameter from the measurement.



Duplicate profiles

Duplicate a whole profile from the list.



Rename profiles

Rename profiles by clicking this icon.



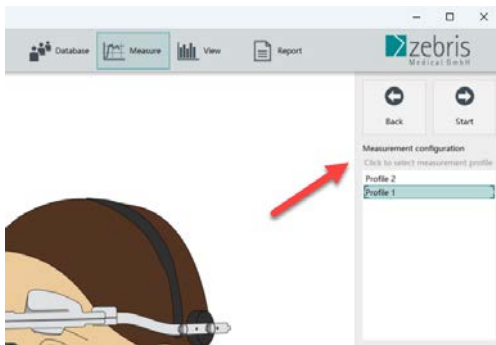
Export profiles

Save configurations of a measurement profile as a file.



Import profiles

Import saved configurations of a measurement profile.



Select measurement profile

If you have created additional profiles, you will find them on the right side of the screen and the navigation buttons Back and Start.

7.5 Measurement execution

The recording of the selected module starts when you press the "Start" button. You can repeat a recording at any time by clicking on the "Back" button.

When a patient is recorded for the first time, the anatomical points for the sensor referencing will be transferred. You can repeat this process during subsequent recordings by clicking on "Redefine reference system". As such, anatomical points are transferred to the virtual environment for each recording setting. Simply follow the instructions to do this.



Type of presentation

The tabs above the skull display refer to the display options. Either a generic skull can be displayed as a "model", or a 3D grid can be displayed.

Zoom

The zoom buttons are used to zoom in "+" or zoom out "-" the skull representation. A click with the left mouse button on the 3D representation determines the point to zoom to. Zooming is also possible with the scroll wheel of the mouse. With "=" the graphic is adapted to the window size.



Perspectives

The buttons to the right of the zoom function allow the selection of a standard perspective. The view from left, right, frontal, back, top and the free perspective are available. The model can be rotated as desired in the graphic using the mouse.



Note on sound signal

The start of recording is signaled with a high-pitched tone and the end with a lower-pitched tone. Recordings such as static point recordings as well as different jaw positions are confirmed with a tone.

Sensor status display



Sensor status displays

The signal field in the sensor test block lights up green when the IR cameras are optimally assigned to the IR-LED's. Glasses, jewellery's and any other objects between the navigation unit and the lower jaw sensor can have an influence on the recording or could even prevent the recording from starting (signal field would be red).

Make sure that the signal field below the pictogram is permanently green during a recording. A red signal field means "Stop"! In this case, please check the recording area for obstacles or the charge level of the lower jaw sensor

If a flickering or permanent red appears in a free recording area, the system should be checked for a defect. If a grey pictogram is displayed, the mandibular sensor is not active and you are currently between two recording times.

Sensor status Ultrasonic systems



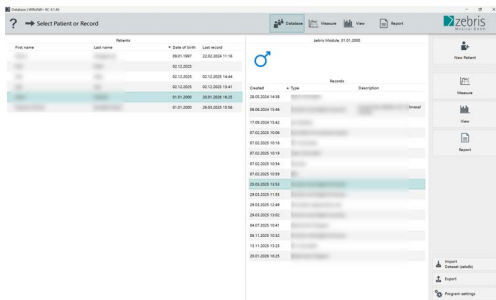
The lights in the sensor check bar at the bottom right light up in the color green during measurement. Successful measurement requires correct calibration to the patient's reference plane.

Eyeglasses, as well as ear jewelry or hair located between the ultrasound transmitter and receiver, can influence the measurement or prevent the measurement from starting. Make sure that the round signal fields 1-4 below the pictogram light up green continuously during a measurement. Red or partially red signal fields mean "stop", please check the measuring section for obstacles or check plug connections and cables.

8 Viewer

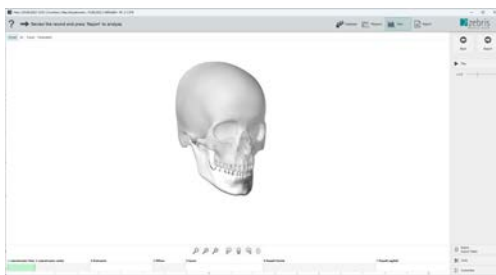
In the "View" mode the measurement can be viewed and analyzed. The individual functions of the view mode are explained in detail below. In the modules, there are deviating representations of the images, which are due to the special application.

8.1 Basics



Select data Record

After selecting a record from the database, the individual images of the patient are listed on the right. Clicking on the View button or double-clicking on an exposure opens the view mode. If an exposure is completed, the system first switches to view mode.



Click on Play in the right toolbar.

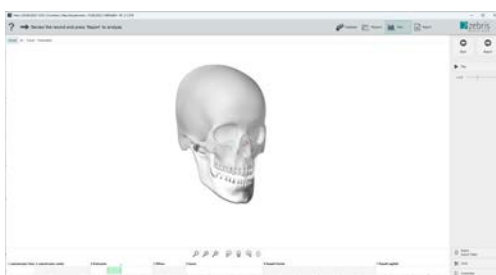
A time display shows the currently displayed time. The time display starts at 0.0 until time X, the end of the recording. An individual time value can be entered or the current time of the recording can be displayed via the cursor position.

Click on Back to return to the database.



Timeline

The current time of the displayed movement sequence is shown here. In the timeline, double-click in the movement fields to hide or show movements



With Zoom (+) and the key combination Shift+left mouse button a certain time section of the movement can be viewed and analyzed selectively.

To select a certain area, move the mouse pointer to an individually selected beginning of the recording in the time bar and set a marker by a left mouse click. The end of the selected area is defined by activating the Shift key and simultaneously setting a marker with the left mouse button. This area is highlighted in green.

8.2 View options

The views can be moved and resized in all spatial directions using the mouse scroll wheel, "+" and "-" keys or the function of touch-enabled PCs.



Model

Clicking the Model tab displays the skull in 3D.



3D

After selecting the 3D tab, the overall view of all points, lines and Bonwill's triangle as well as imported scans are displayed.

Tracks - Incisal

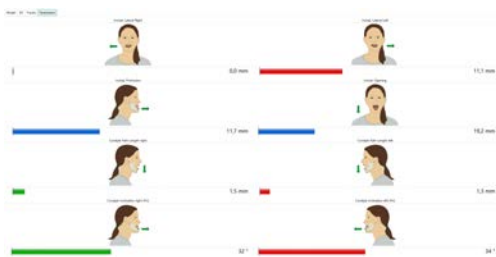
The incisal point view shows the movement of the incisal point from the front and from the side.

In the individual view, the movement trace is also shown from above.



Condyles

The condylar view shows the movement from the front and from the side. The diagrams shown can be displayed both in the model view (Modul: EPA) as well as in the view of the movement tracks.



Parameters (available in Articulator, Function Analysis, CMDfact® Interactor)

The following data can be found on the Parameters tab:

- Incisal point, lateral right/left, protrusion and opening
- Condylar track right/left
- Joint path inclination right/left

The green area marks the reference area in which the range of motion of patients in a reference group lies. The reference values are displayed if the age of the patient is between 20 and 60 years.

The values for the reference range are taken from the publication "Standard an Limit Values of Mandibular Condylar and Incisal Movement Capacity" (International Journal of Computerized Dentistry 2014;17(1); 9-20

Condylar track length

Specifies the determined length of the distance in which the condyle can move. Joint path inclination (reference: Frankfurt horizontal) Indicates the inclination of the joint path on which the condyle can move.

8.3 Controls



Playback

Automatic playback of the recording by clicking this button. The recording will be played and repeated until the Stop button is pressed.

Playback speed

Clicking on the set speed opens a list for selecting the playback speed.



Zoom

The magnifying glass with a minus sign reduces the display by 20%, the magnifying glass with a plus sign enlarges the display by 20%.



Adjust

The 3D display is centered in the view and the zoom factor is automatically adjusted to the acquisition window so that the model is fully visible.



Right View

Shows the 3D skull model from the right.



Left view

Shows the 3D skull model from the left.



Front view

Shows the 3D skull model from the front.



Top view

Shows the 3D skull model from top.



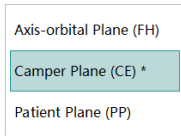
3D view

Shows the 3D skull model in the basic view.



Angle and distance measurement

Draws lines to determine angles and distances in the anatomical reference. The black line can be aligned in the desired direction as a reference line. The green line can then be used to determine distances and angles to the black line.



Reference plane

On the lower control bar, you have the option of switching between different reference planes:

- Axis-orbital Plane
- Camper plane
- Patient plane

The original plane that was measured is marked with an asterisk.



Movement tracks

In the "Tracks" view mode, you have the option of customising the display of the movement tracks. You can choose between the following visualisations:

- Simple motion tracks
- Velocity-coded motion tracks
- Motion tracks and density matrix

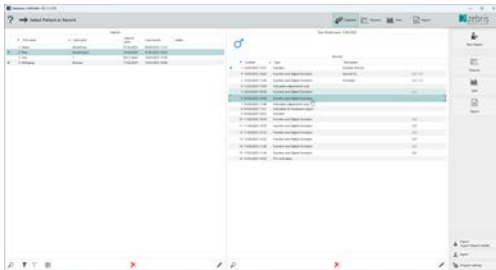
Gradient display

A colour gradient can be added to the display of the condyles in the "Tracks" view mode.

9 Report

The functional parameters that were previously defined in the View mode are evaluated and shown in "Report" mode.

9.1 Common



Open Record

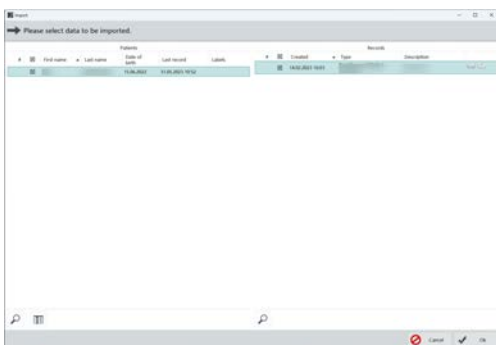
Select a record in the database under Recordings and click "Report" in the right toolbar or switch to the report from "View" mode.



Report output

The report evaluates the measured movements and displays them. These can be printed out or saved as a pdf file. Individual report profiles can be defined under "Customize".

9.1.1 Comparison of two reports



Selecting data records

Two data sets of the same type can be compared. Mark the recordings by means of "Ctrl key" + left mouse button and then open them by clicking on "Report".



Presentation in the comparison report

In the comparison report, the results of record A are shown regular and record B with a grey background. The assignment to the respective admission can also be seen in the header line.

9.1.2 Report controls

View settings



1:1

Displays the report page as a whole.



Page width

Zooms the report page to the full available width.



Whole page

Displays the report pages in their original size. The size may differ from the printer paper size due to different screen resolutions.



Thumbnail view

Shows all report pages as small pictograms for overview.

Export and printer settings



Print

The report will be printed to the printer selected under Printer settings.



Create PDF

The report is exported as a PDF file to any directory or to an external data medium.



Customize

Show and hide individual report parameters.



Printer setup

Here the printer is selected and the settings for printing (e.g. format, page size, etc.) are changed.

Report properties



Customize

Show and hide individual report parameters. See chapter [Report Properties](#) .

9.2 Report structure



Headline

Title, project name, patient name, date of admission and the company logo are located in the header.

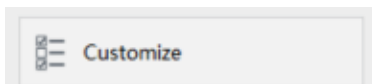
Module-specific data

The visualizations of the recorded data are located below the header. This display differs depending on the selected module. Further information about the displayed data can be found in the respective module.

Comments

A comment field is available in the patient file for individual statements made by the practitioner about the diagnosis and examination. These are then visible in the report.

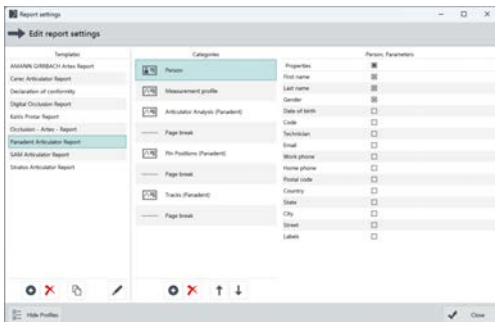
9.3 Report properties



Customize report

To show or hide individual parameters of the report, click Customize and you will be taken to the report settings. This information, which can be switched on and off, can be linked to specific questions for adaptation, e.g. for certain statements or targeted evaluations.

Click the OK button to apply your changes and return to the database.



Edit report properties

Predefined report variants are displayed on the left side. You can adapt and select these templates to your own requirements.

In the middle, the categories are displayed. A category can be shown or hidden using the "Add" (Plus) or "Remove" (X) button. The arrow buttons can be used to adjust the display order of the categories.

On the right side, the parameters to be displayed can be set analogously.



By adding or removing one or more parameters or categories in the menu: Customize, the recorded data is neither changed nor deleted.

9.4 Report contents

Possible report contents are described below. These can be adapted as required as described in the chapter Report Properties. The report options vary depending on the measurement module. Furthermore, several predefined report profiles are available in individual modules. The interpretation of the report contents is described individually in the report chapter of each module.



Person

Patient's properties such as Name, Date of birth etc.



Measurement profile

Settings and parameters for measurement, e.g. measurement module, used attachments, calibration mode



Lower jaw adjustment

Adjustments of the lower jaw position after importing intraoral scan data.



Record information

Scan data, Alignment fork (REF01960430)



Parameters

e.g. condylar parameters, initial center of rotation etc.



Incisal Chewing

Movement traces starting from the incisal point



Chewing analysis

with contact and frequency analysis



Movement traces

e.g. condylar movements sagittal/horizontal or incisal opening



Pictures



Articulators

different ones to choose from



Movement tracks
for different articulators



EPA diagrams
Possible in several modules (not only in the EPA-Module)



EPA protrusion tracks
Possible in several modules (not only in the EPA-Module)



Record Comments
Comments that have been insertet in a specific measurement in the database



Condyle axis movements
Of opening and closing movements



Patient comments
Comments that have been inserted in the patient´s properties



PIN positions
for different articulators



Translation-Rotation Diagrams



Declaration of Conformity
according to Art. XIII Regulation EU2017/745; for the manufacture of splints

10 Attachment Designer

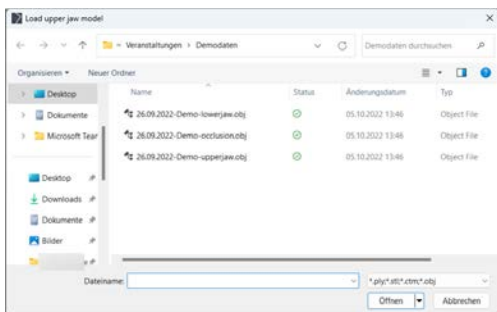
The module Attachment Designer enables the design of a customised attachment for attaching the Lower jaw sensor (REF01470000) to the patient's lower jaw. For this purpose, the patient's scanned jaws are imported into the software. The user can then design an attachment based on the imported models.

10.1 Procedure



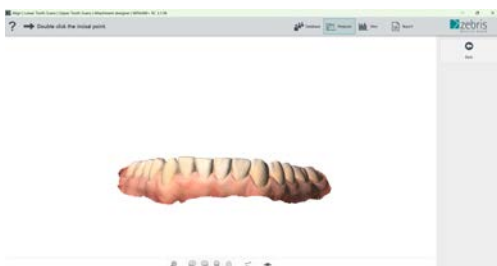
Selecting the module

Select the module on the left-hand side and then click on the Start button.



Import scans

Import the scans on the basis of which a customized attachment is to be constructed.



Determining the incisal point

Determine the incisal point on the imported scan of the lower jaw by double-clicking.



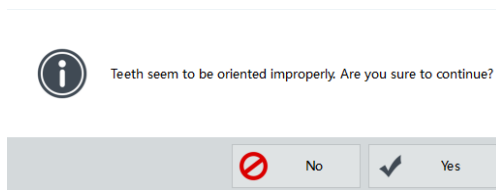
Adjusting the rotation

In the next step, you can adjust the orientation of the imported lower jaw.



Checking the imported scans

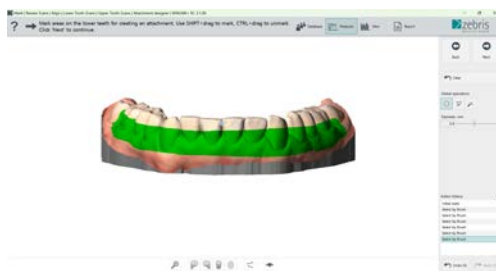
This step is used to check the imported scans. The buccal scan serves as the basis for assigning the lower jaw to the upper jaw scan. It should therefore be checked at the end whether the scans displayed correspond to the real patient situation.



Information

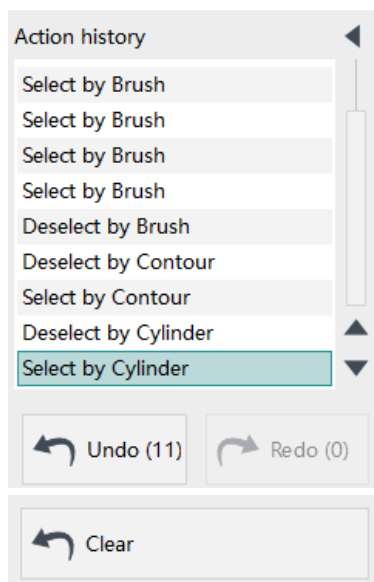
This information is shown when there might be a problem with the orientation of the imported scan data. Please check if they are oriented correctly to each other before continuing the attachment design.

10.2 Design Workflow



Draw in the attachment

Use the design tools to draw the surfaces where the attachment is to be created in the patient's lower jaw. Use the SHIFT + left mouse button shortcut to mark the surface and the CTRL + left mouse button shortcut to remove markings.



Navigation

In the lower part of the toolbar you will find the history of the work steps you have carried out. Here you can see which design steps you have already carried out. You can also use the "Undo" and "Redo" buttons to switch between the individual steps.

Use the "Clear" button to undo all work steps.

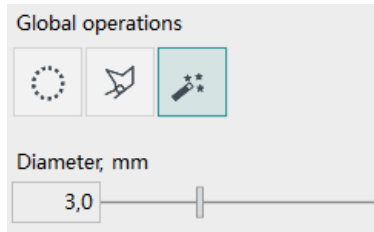
Design tools

Brush: Drawing tool for marking the attachment area. The diameter of the brush can be adjusted. This drawing tool is particularly useful for defining larger areas. The brush can be activated with the shortcut F2.

Contour: Drawing tool for defining edges. The tool draws a line to add or remove areas. This tool is particularly suitable for detailed contours. The contour tool can be activated with the shortcut F3.

Cylinder: This drawing tool works in a similar way to the brush. However, not only the direct surfaces are marked, but also the surfaces behind them. For example, if you mark the labial surfaces of the mandibular anterior teeth, the cylinder also marks the lingual surfaces on the side behind them. This function is helpful if the model has artefacts or tooth surfaces cannot be reached with the brush.

This design tool can be activated with the shortcut F4.



Attachment suggestion

The software now offers you a suggestion for the para-occlusal attachment based on the parameters you have specified.

An attachment adapter is inserted. You then have the option of editing the attachment.

The placement and alignment of the attachment adapter can be changed directly on the adapter itself. Use the arrow symbols to edit the alignment and the square to edit the placement of the adapter.



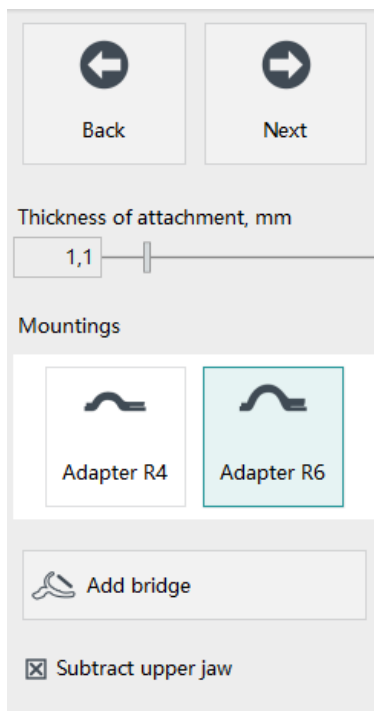
Editing the attachment

Attachment thickness: Use the slider to adjust the thickness of the attachment. The thickness is specified in millimeters.

Attachment adapter: You can choose between two attachment adapters. These differ in the size of the lip arch.

Add bridge: The "Add bridge" function can be used to insert a cylindrical bridge into the attachment. This bridge can be helpful for bridging gaps between teeth or as a printing support.

Subtract the upper jaw: Finally, you have the option of automatically removing any overlapping of the upper jaw on the attachment. The overlapping are color-coded on the attachment design.



Select form

☒ ☐

Diameter, mm

0,5

0.5 1.0 1.5

Rotation, degree

0,0

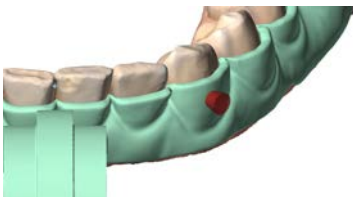
☐ Printing support

Hole diameter, mm

1,05

Hole angle, °

10,6



Clear All

Text

text

Inscriptions height, mm

1,00



Name

Attachment

Color

Add bridge

First define the ends of the bridge by double-click.

After defining the bridge position you can customize the form, diameter and rotation angle of the bridge.

If you want to use the bridge as printing support, you can select "Printing support" for subtracting the jaw model from the designed attachment.

Insert holes

Holes can be inserted into the attachment as the last step in the design process. These can be helpful when mounting the attachment to the lower jaw later, as they can be used to apply fixing materials.

Use the key combination SHIFT + left mouse button to insert holes and CTRL + left mouse button to remove holes again. You can also select the diameter and cone of all inserted holes.

Insert text

To insert text, first enter the desired text in the text field. Then use the slider to determine the height or depth of the text. Then use the SHIFT + left mouse button combination to define the position where the text is to be inserted. Inserted texts can be deleted after insertion, but cannot be edited afterwards. Use the "Undo" button to remove individual texts and the "Clear all" button to remove ALL texts.

Finalizing the design process

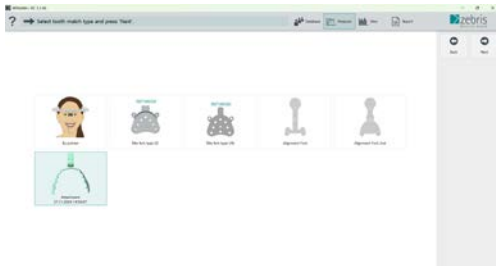
Finally, you can label the attachment and adjust the color as required. Clearly labeling the attachment can be particularly important if the attachment is subsequently to be used as a matching method.



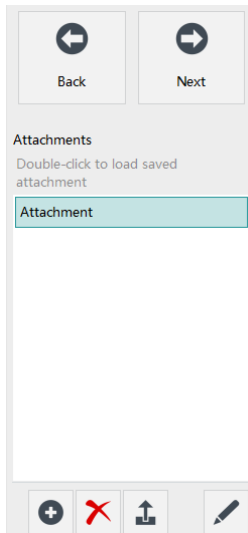
Exit the design process

This warning appears when you are about to exit the design process. If you confirm with 'Yes', all data and settings from the design process will be lost. There is no way to return to it at a later time.

10.3 Attachment as a matching method



The individual attachment you have constructed can be used in the module Function and Digital Occlusion and Cerec Articulator module as a matching method. The use of the tools Alignment fork (REF01960430) or Bite fork type UN (REF01960360) is no longer necessary in this workflow. To use the attachment as a matching method, it must be selected at the start of the measurement.

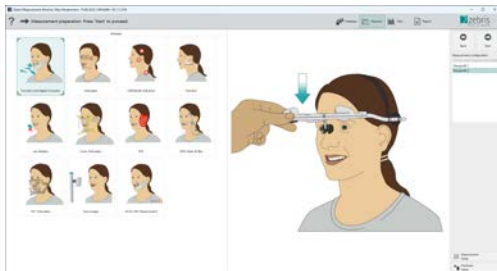


If you have designed several attachments for a patient, the attachment actually used must be selected before starting the measurement. Open the view mode of the selected attachment and click on "Next" to select the attachment for the subsequent measurement.

11 Function and Digital Occlusion

The module is composed of both individual patient movements and the digitized jaw models. You have the option of viewing contact ratios on the occlusal surfaces of the teeth, statically and dynamically, even during the recording. During the analysis, run up to four transversal sectional planes through the models or determine early contacts or which areas are loaded particularly often.

11.1 Perform measurement



Module selection

Select the Function and Digital Occlusion module on the left and then click the Start button.

11.1.1 Measurement Setup

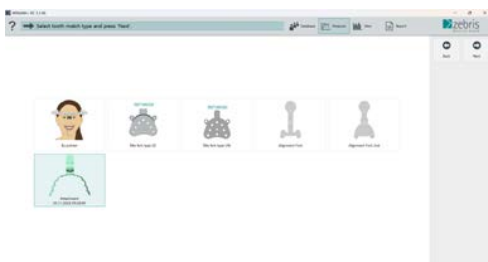
The Function and Digital Occlusion application supports 4 ways of connecting the surface data with the movement data.

- with Pointer
- Alignment fork (REF01960430)
- Bite fork
- with individual Attachment

The variant with Bite fork has been established for years. All other variants are new and differ fundamentally in the further processing of the data. In contrast to the Bite fork workflow, no third scan (intraoral or desktop scanner) is required. You can therefore work with your standard patient data set.

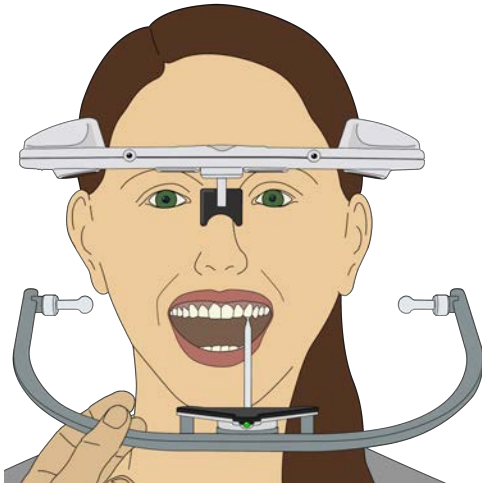
Please note that the scan data must be available BEFORE the start of the measurement.

The selection is made at the start of the measurement with the module Function and Digital Occlusion.



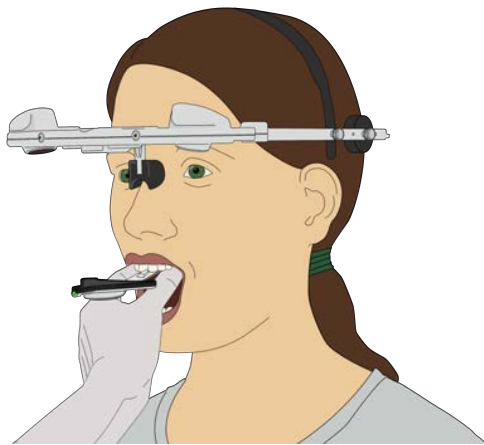
Measurement setup

Selection of the matching of surface data with the movement data



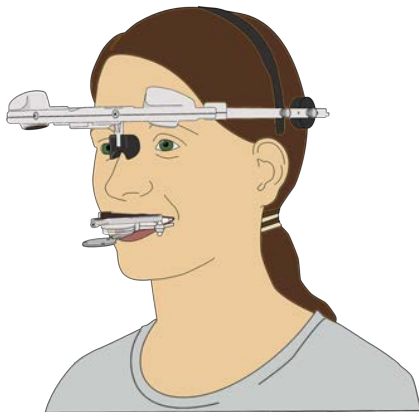
Match Scans by Pointer

With the help of a pointer, 4 points on the teeth of the patient's upper jaw must be localised and measured. Afterwards these localised points are to be marked in the WINJAW+.



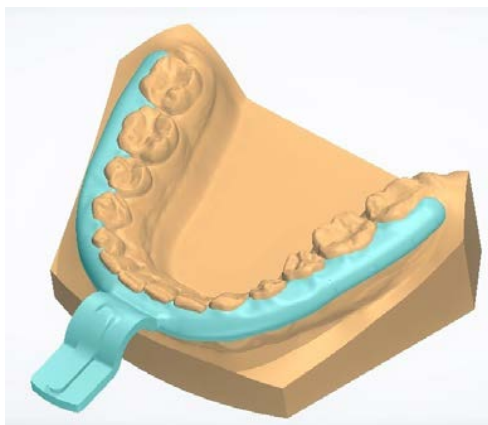
Alignment fork (REF01960430)

In this procedure, the position of the patient's upper jaw is determined with the help of the alignment. The Alignment fork (REF01960430) is necessary.



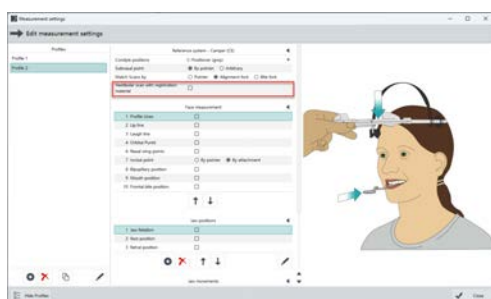
Bite fork

This procedure has been established for years and offers a variety of possibilities. It must be noted that a third scan of the Bite fork with the upper jaw is necessary. Otherwise the data can neither be WINJAW+ nor in exocad be merged.



Individual Attachment

Individually printed attachments that have been constructed using Attachment Designer can subsequently be used as a matching method in the Function and Digital Occlusion module.



Dynamic Mode

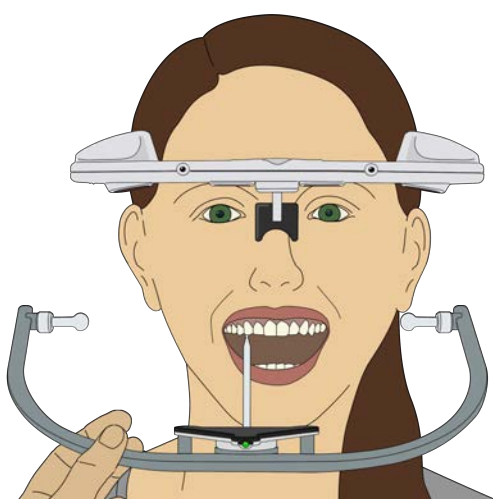
In this mode, the measurement sequence in the module Function and Digital Occlusion module can be individualized. Lower jaw positions and movements can be measured in any order. In this mode, it is possible to start movements from different starting positions.

This function can be useful, for example, for patients with a final bite that cannot be clearly reproduced or when using bite registrations. This makes it possible to carry out scans in a blocked bite and still perform a jaw registration measurement.

This function can also be used as a diagnostic tool. By visualizing variable starting positions at the start of the movement, conclusions can be drawn about the stability and reproducibility of the final bite.

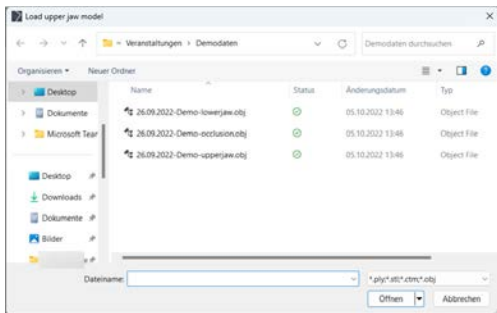
		Position		
1 Jaw Relation		Position		☐
2 Retral position		Position		☐
3 Max. intercuspitation		Position		☐
4 Rest position		Position		☐
5 Protrusion		Movement	2	- +
6 Lateral left		Movement	2	- +
7 Lateral right		Movement	2	- +
8 Opening		Movement	1	- +
9 Tooth guided		Movement	1	- +
10 Posselt frontal		Movement	0	- +
11 Posselt sagittal		Movement	0	- +

11.1.1.1. Import scans with tooth pointer



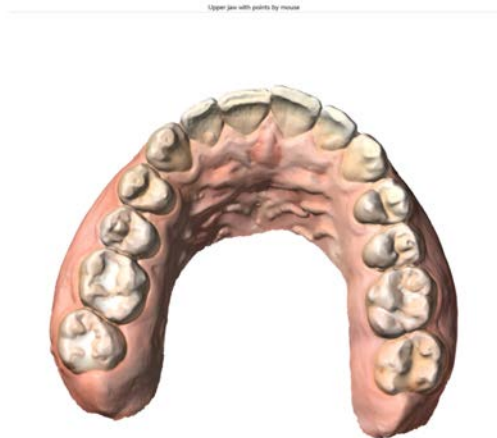
Matching the scan data using the tooth pointer

One way of integrating intraoral scan data into the measurement is to use the tooth pointer. First there have to be defined four reference points on the surface of the upper jaw. (For example: the cusps of 13 and 23 and two in the area of the molars)



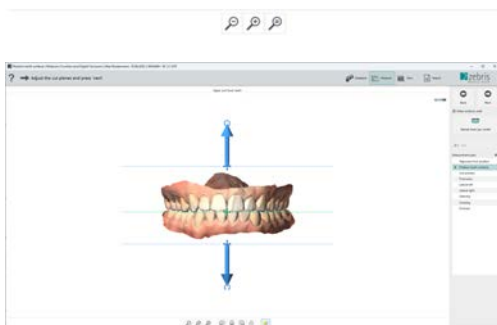
Import intraoral scans

You can then import the intraoral scans of the patient.



Determining the position of the reference points

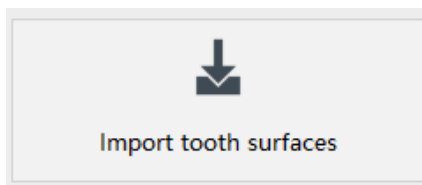
By double-clicking on the reference points at which you placed the tooth pointer during the previous measurement, you determine the appropriate position of the upper jaw scan.



Adjusting the section planes

By moving the blue arrows, the section planes can be adjusted. Digital tooth models are then created from these scans.

11.1.1.2. Import scans with Bite fork



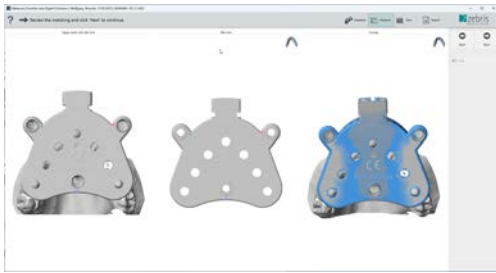
Import tooth surfaces

After starting the measurement with the bite fork as matching method, the tooth surfaces need to be imported. To start the import procedure hit the "Import tooth surfaces"-button on the right side of the user interface.



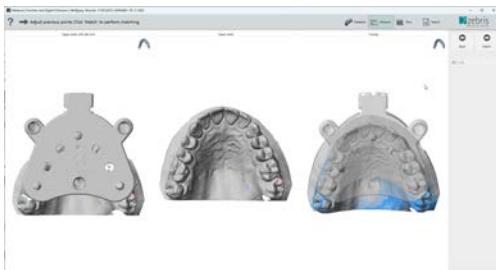
Selecting the Bite fork

First you have to select which bite fork you are using. Second the scans with the bite fork inserted can be imported.



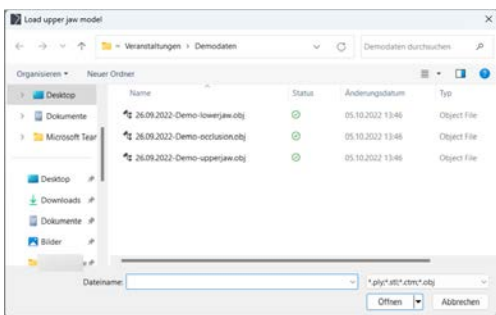
Matching of the scan data in the software

To match the scans with the bite fork into the software, determine reference points on the imported scan by double-click. After defining a reference point select the same point on the Bite fork in the middle. Reference points on the scanned impression material can also be used. After defining three reference points, the scan is matched. You can adjust the reference points at all time in this working step.



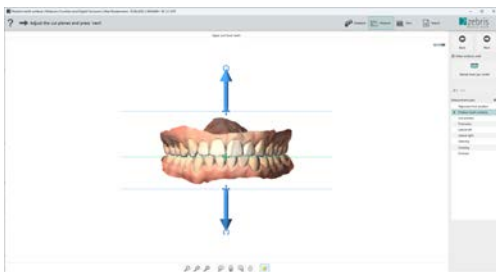
Matching the scan of the upper jaw

To match the scan of the upper jaw into the software, choose the scan and define reference points on the scan on the left side. After defining a reference point select the same point on the scan in the middle. After defining three reference points, the scan is matched. You can adjust the reference points at all time in this working step.



Upload lower jaw model

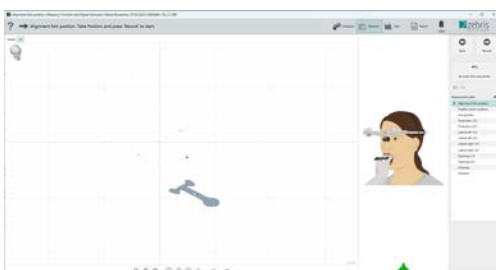
After successful match of the upper jaw model upload the lower jaw model. The scan will be matched automatically.



Adjusting the section planes

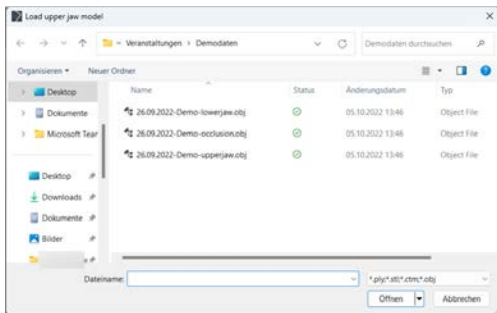
By moving the blue arrows, the section planes can be adjusted. Digital tooth models are then created from these scans.

11.1.1.3. Import scans with Alignment fork (REF01960430)



Matching the scan data using an Alignment fork (REF01960430)

A simple way of integrating intraoral scan data into the measurement is to use the Alignment fork (REF01960430). Ideally, this is positioned with the pointer between 11 and 21 incisally and aligned with the buccal cusps of the premolars and molars. By supporting it at three points in the patient's maxilla, the masticatory plane can be determined.



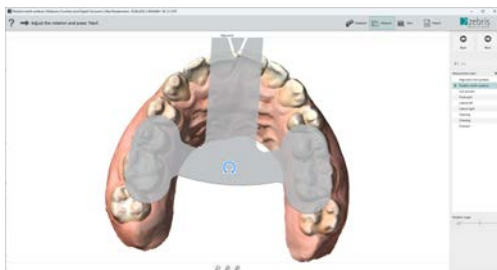
Import intraoral scans

You can then import the intraoral scans of the patient.



Determining the position of the Alignment fork (REF01960430)

By double-clicking on the reference point at which you placed the Alignment fork (REF01960430) during the previous measurement, you determine the appropriate position of the upper jaw scan.



Adjusting the alignment

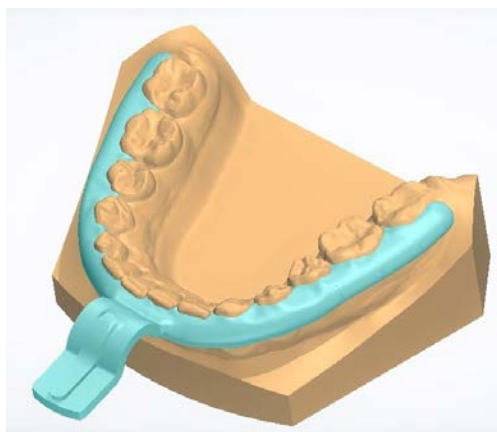
In the next step, the Alignment fork (REF01960430) must be adjusted to the buccal cusps of the premolars and molars.



Adjusting the section planes

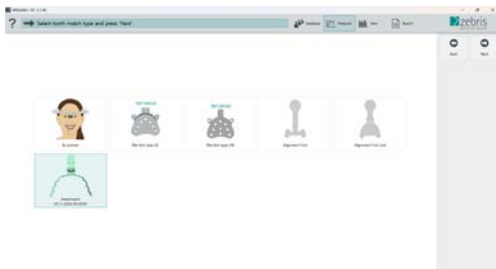
By moving the blue arrows, the section planes can be adjusted. Digital tooth models are then created from these scans.

11.1.1.4. Import Scans with individual Attachment



Matching the scan data using an individual attachment

First you have to select the used attachment in the database. The selected attachment is now displayed in view mode. To select it as a matching method, click on "Next". The selection of the attachment must then be saved.

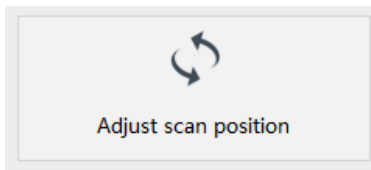


Selection of the matching method

If a measurement is now started in the Function and Digital Occlusion module, a list of all available matching methods opens. The selected individual attachment should also be visible below this.

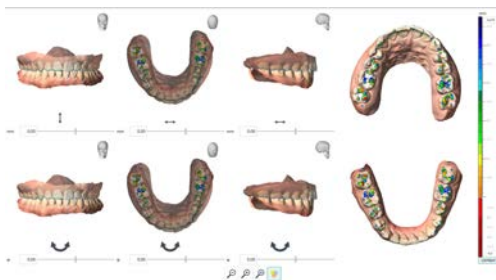
No further matching is necessary during the measurement process.

11.1.1.5. Bite-Optimizer

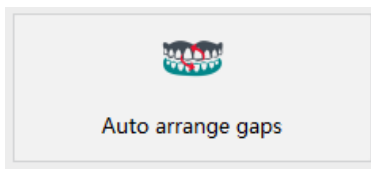


Adjust scan position

The models are assembled in the software based on the vestibular scan. If this is incorrect, you have the option of correcting the inserted models in the model import workflow. To do this, click on the "Adjust scan position" button in the "Review scan position" step.



You can then move, tilt or rotate the position of the lower jaw as required using the number field and slider. The original state can be restored using the "Reset adjustment" button.



Auto arrange gaps

This function resolves possible overlays and closes open bite situations.

11.1.1.6. Measurement Profiles

Profiles
Advanced
Basic
Function

Basic

The basic measuring profile includes the import of intraoral scan data and the measuring of the jaw movements protrusion, lateral, opening and chewing. The measured movements are all related to the camper plane.

Advanced

In addition to the basic movements the advanced measuring profile includes several face measurements (e.g. bipupillary position, mouth position or frontal bite position) and jaw positions (e.g. max. intercuspitation, jaw relation, rest position and retral position).

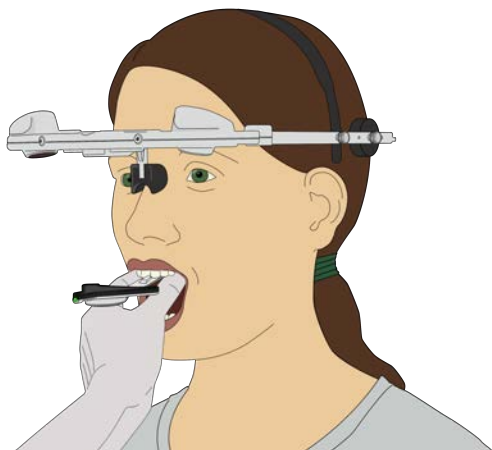
Function

Furthermore the function measuring profile includes the measuring of all jaw movements.

All measuring profiles can be customized and new individual profiles can be added to the predefined profiles.

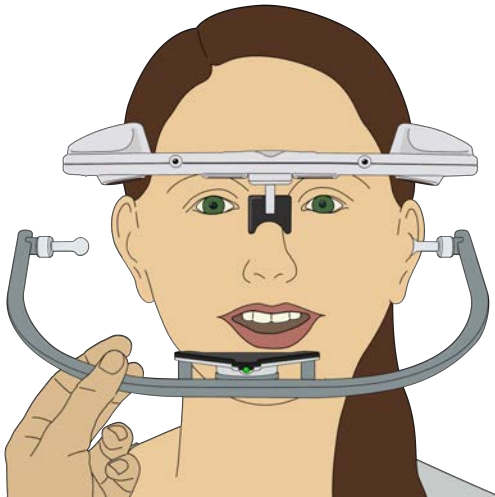
11.1.1.7. Reference plane

The data are related to a plane. If several exposures are to be performed in one session, each of the subsequent exposures can be performed with the reference plane that has already been defined. Otherwise, a new plane is defined using the re-enter lines and points -button.



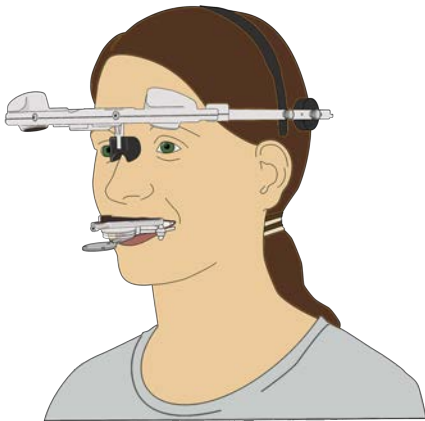
Reference plane Alignment fork (REF01960430)

The Alignment fork (REF01960430) is a simple way of determining the position of the upper jaw. Ideally, this is placed with the pointer incisal between 11 and 21 and aligned with the buccal cusps in the area of the premolars and molars. With the intraoral scan data available and the support at three points on the occlusal surface of the maxilla, the position can be determined. As also shown in the previous chapter, both the incisal reference point and the alignment are reconstructed on the digital models.



Reference plane articulator

The possibility of transferring the images to different articulator systems makes it necessary to mathematically adjust the images to planes such as the Frankfurt horizontal, Camper's plane, and patient plane. This is taken into account in the acquisition via the anatomical reference points.



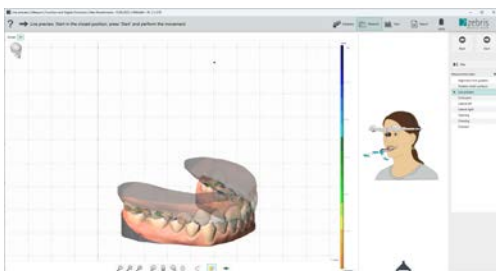
Reference plane bite fork

The data acquisition of movements for transfer to CAD/CAM software, but also for transfer to a mechanical articulator using the zebris transfer table, requires the acquisition of the maxillary position or coordinates via a special bite fork and thus the determination of the mandibular position in habitual occlusion.

In the procedure, it must be ensured that the positioning of the mandible in relation to the maxilla is carried out correctly for the subsequent further processing of the data in the above-mentioned systems.

11.1.2 Procedure

Depending on the defined exposure settings, positions as well as movements are recorded. By using the original tooth surfaces of the patients, the Function and Digital Occlusion module offers a wide range of options to support the assessment of the respective tooth or bite situations.



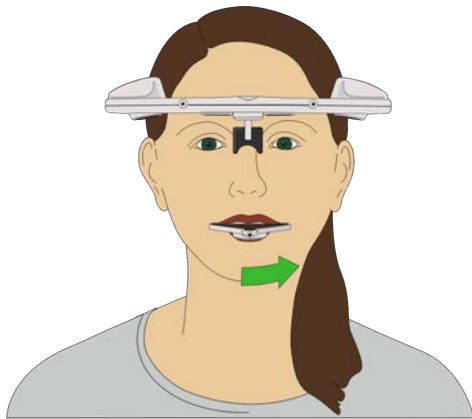
Live Preview

In the Live Preview section, movements can be displayed, checked and illustrated to the patient without saving the values. This mode can also be used to practice special functional movements with the patient. The test movement is activated with **Start** and ended with **Stop**. The recording modes of the selected movements then begin.

11.1.3 Measuring Movements

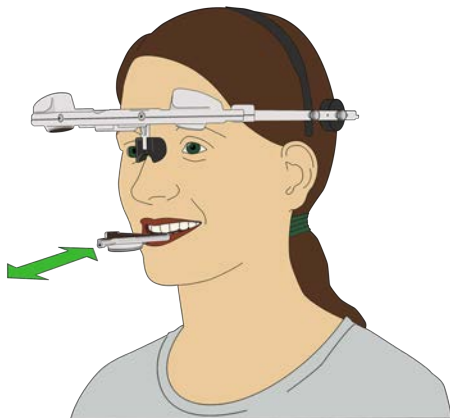
Depending on the selected movement patterns, their number and chronology, these are performed with the patient after the preview. In general, all recording sequences can be individually designed in the configuration. Using the example of some standard movements, you will be guided through the exposure protocol below.

During the measurement, it is possible to display the contact relationships of the teeth in real time. It is also possible to visualize the frequency of tooth contacts.



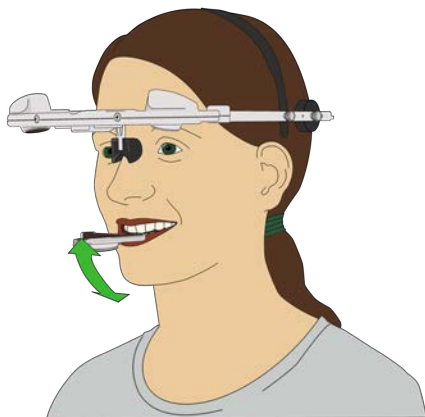
Lateral movement

The recording starts, for example, with the maximum left and right lateral movement to be achieved. The measurement process can be started/stopped by clicking on the Start and Stop button, using the foot switch, the Enter key, and the mouse button. The starting (reference) position is always the habitual occlusion. To complete the movement, the patient returns the jaw to the starting position, and the exposure process is terminated after the return movement.



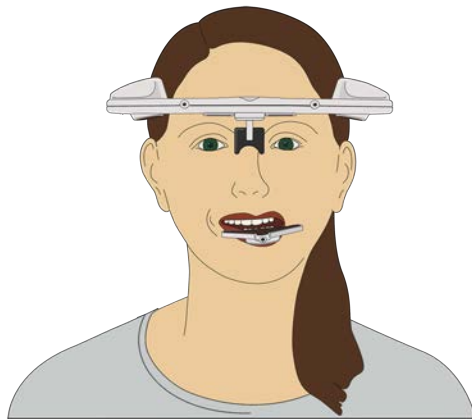
Protrusion movement

Have the patient assume the starting position and perform a maximum protrusion movement from this position. The patient then allows the mandible to slide back to the starting position.



Opening movement

Have the patient assume the starting position and perform a maximum opening movement from this position. The patient then allows the mandible to slide back to the starting position.



Chewing movement

Have the patient assume the starting position and start a chewing movement from this position. It is advisable to work with a standardized chewing block such as gummy bears.



At the end of the measurement, a dialog box appears with the following options:

Discard Record

The measurement is discarded and returns to the preview mode to perform a new measurement.

Save & Repeat

The measurement is saved and returns to the preview mode to perform a new measurement.

Save & Close

The measurement is saved and goes directly to the view of the completed measurement.

11.2 Viewer

The functions that can be used specifically with the Virtual Occlusion module are explained below. The basics for operating the view mode are described in the chapter [Edit measurement \(View mode\)](#)⁵⁵.

11.2.1 Control elements

Control elements

The main control elements are located on the right side of this module. These elements can be used to start individual actions such as importing mesh/model data or analysis functions.

Furthermore, there is the possibility to switch between individual tabs that provide detailed information.



Show/Hide models

in this submenu the following actions can be performed.

- Displaying the mesh data
- Displaying Cross Sections
- Calculating envelopes
- Displaying the grid in the background
- Show/hide the Bonwill triangle
- Show/hide markers
- Show/hide/choose Articulator



True color display

If the mesh data contains color information, this button is displayed. With this button the true colors can be displayed.



Tools for further processing of the measurement data

Various tools for processing the data can be found under the Tools icon.

- Time marks
- Edit comment
- Upper jaw envelope
- Lower jaw envelope
- Show/hide Monson sphere



Angle and distance measurement

Draws lines to determine angles and distances in the anatomical reference. The black line can be aligned in the desired direction as a reference line. The green line can then be used to determine distances and angles to the black line.



Import options

Use the Import button to display the various options.

- Dental models
- 2D images
- 3D facescans



Export options

Use the Export button to display the various options.

- Dental models
- .dentalProject
- Jaw motion
- Video



Occlusion analysis

Four different view options can be chosen:

- Current Static Occlusion
- Frequent Occlusion Contacts
- Summarized Occlusion Contacts
- Section Cut

Add user point here
Copy shown picture to clipboard
3D measurement

Right mouse button

In addition to the control elements, you have the possibility to click with the right mouse button on any position on the jaw model. A small selection menu appears:

- Add user point here: define at any place on the surface a new motion track
- Copy shown picture to clipboard: saves the current image to the clipboard
- 3D measurement: For measuring distances in the projection view

11.2.1.1. Show/Hide menu

The following actions can be performed in the "Show/Hide" submenu.

- ☒ Upper jaw
25
- ☒ Lower jaw
100
- ☐ Bite fork: Bite fork type UN
- ☐ Upper jaw with bite fork
- ☐ Grid
- ☒ Surface triangles
- ☒ Bonwill triangle
- ☐ Intercondylar diagram
- ☐ Section cut
- ☐ Occlusion
- ☐ Articulator

Show/Hide menu

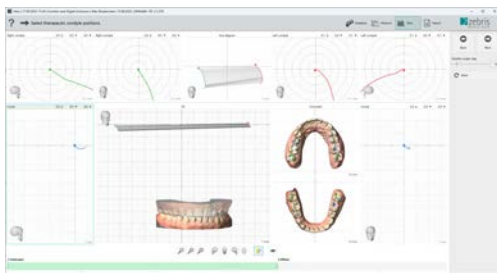
in this submenu the following actions can be performed.

- Displaying the mesh data
- Displaying Cross Sections
- Calculating envelopes
- Displaying the grid in the background
- Show/hide the Bonwill triangle
- Show/hide markers
- Show/hide/choose Articulator
- Show/hide Surface triangles

Transparency

The models can be displayed semi-transparently with a slider

11.2.1.2. Manual Therapeutic Position



Manual therapeutic position

The manual therapeutic position function can be used to determine individual therapeutic positions, based on the recorded movement traces during protrusion/retrusion, opening/closing movement or gothic arch and posselt sagittal when recorded.

- Position name

Manual therapeutic position

- Position color



- Rotation angle, deg

0,3



Reset

- ☒ Distance threshold, mm

0,2

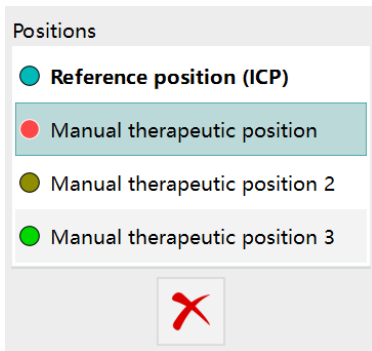
Control elements

Position name/color: It's possible to define multiple manual therapeutic positions. Therefore, it is possible to name the positions and mark them with colors.

Rotation angle: Finally, the models can be rotated to the selected points on the physiological movement path. This function can be useful if the minimum distance cannot be achieved by positioning alone.

Reset: Use the reset-button to reset all adjustments.

Distance: A distance can be set in this mode. If this distance is not reached, this is then visualized in color on the models.



View

The defined manual therapeutic positions can be called up again in view mode for the measured positions.

11.2.1.3. Occlusion analysis



Current Occlusion Contact

Displays the current occlusion contacts



Frequency Analysis

Use this function to find out which contact areas are particularly frequently exposed over a certain period of time.



Summarized Occlusion Contacts

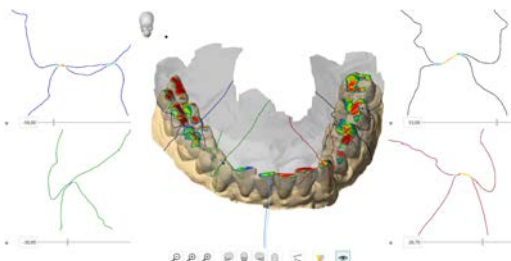
This function visualizes the contact relations on the occlusal surfaces of the jaw scans in color, so that the user can view the contacts and the approximation of the models to each other via an adjustable color filter.

Section cuts

Up to 4 sectional planes can be defined in the model for the analysis of contacts or the approximation of teeth. This tool can also be used to verify the contact points on the splint surface, for example.



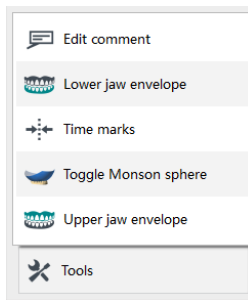
Sample with 4 sections with splint in splint position.



Sample with 4 sections in habitual occlusion.

11.2.1.4. Creating FGP (envelopes)

The functions for displaying and generating FGP (envelopes) are described in detail here.



Select lower jaw envelope in the tools setup

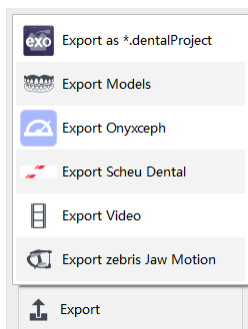


Select the range for calculation in the timeline. by default it will be taken the current interval (marked green) and press Next.

The envelope curve for the lower jaw is visualised in green.

11.2.1.5. Data export

In the measurement application there are different export options:

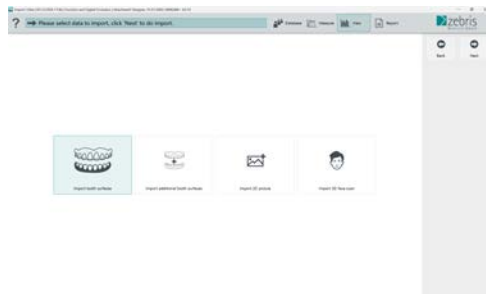


- XML - zebris jaw motion export
- STL - export of mesh/3D models
- dentalProject - prepared data for exocad
- prepared data for Onyxceph and Scheu Dental
- prepared data for Baumann
- Video export

If you have selected a default path in the program settings, the data file will be stored directly in this path. If this is not the case, a task window opens after pressing the button to manually specify a suitable storage location.

The availability of the individual exports depends on how the measurement is performed. For example, the "zebris Jaw Motion" export is not available if the upper jaw position was determined using Alignment fork (REF01960430).

11.2.2 Import Options



Import options

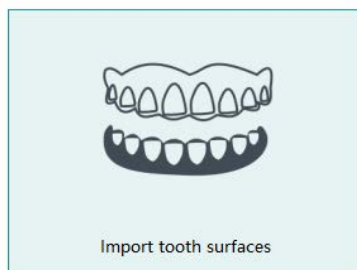
Use the Import button to display the various options.

- Dental models (update existing or add additional models)
- 2D images
- 3D facescans

11.2.2.1. Models

Importing models

This function allows you to import additional models or replace existing models.



Replace models

If models are to be replaced, the scan data must be matched again. To do this, follow the instructions in the software.



Matching

- Selection of the new models
- Alignment in space (occlusal surfaces point towards you, anterior surfaces point upwards)
- Determination of the reference point of the Alignment fork (REF01960430) and alignment



Adding additional models

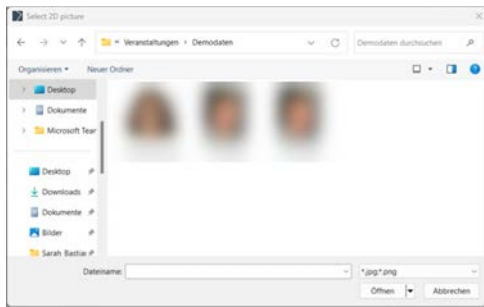
New models can be added to the existing models. To do this, the new models must be matched with the existing models.



Matching

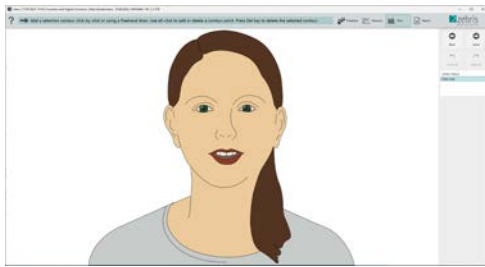
The additional models can be inserted using three-point matching. To do this, three reference points are defined on both models.

11.2.2.2. 2D-Pictures

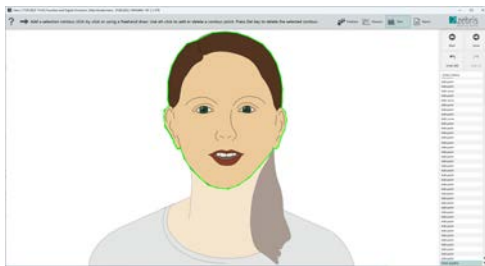


Import 2D images

Select an image to be imported from your image gallery.

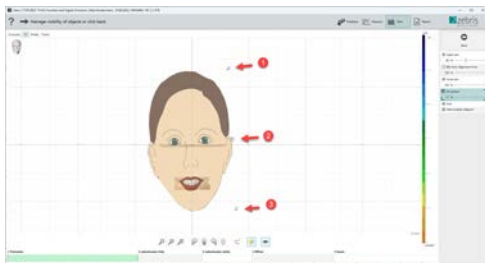


The selected image will now be displayed in the software.



Cut out face

In the next step you have to cut out the parts from the imported image that you want to merge with the models. To do this, you can trace the contour of the head with the mouse button pressed down or connect it click-by-click with points. Repeat the same procedure with the mouth to be cut out.



Adjust position and size

Finally, place the image over the models. You can additionally adjust the image with the marked symbols.

1. magnifying glass icon: Adjust the size of the image
2. box: adjust position of the image
3. arrow symbol: Adjust orientation of the image

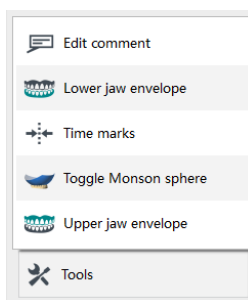
11.2.2.3. 3D-Face scans



Import Face scan

- Select Face scan
- Define pupillary points right and left on the Face scan
- Define subnasal point

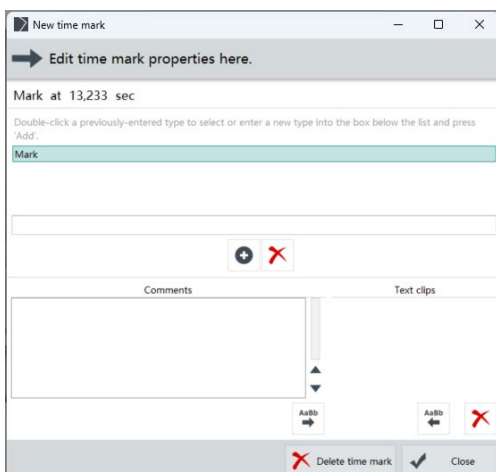
11.2.3 Tools



Tools for further processing of the measurement data

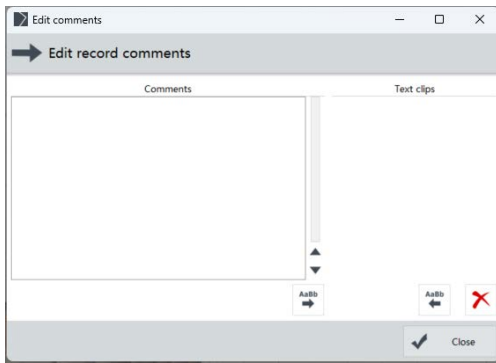
Various tools for processing the data can be found under the Tools icon.

- Time marks
- Edit comment
- Upper jaw envelope
- Lower jaw envelope
- Show / hide Monson sphere



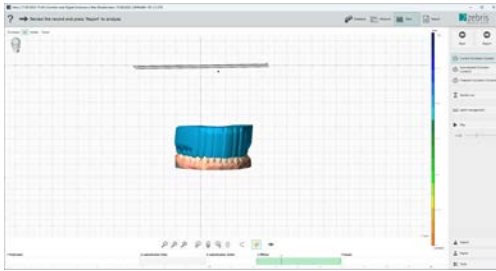
Time marks

With the function time marks, markers can be created in the measured movements.



Edit comments

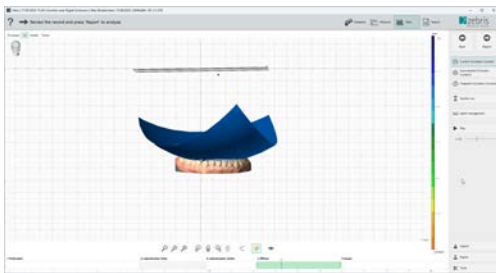
With this function, comments can be added or edited to the existing recordings.



Upper jaw/lower jaw envelope

These functions can be used to calculate envelopes of the upper and lower jaw.

First select the jaw for which the envelope is to be calculated. Then define a time range for calculating the envelope.

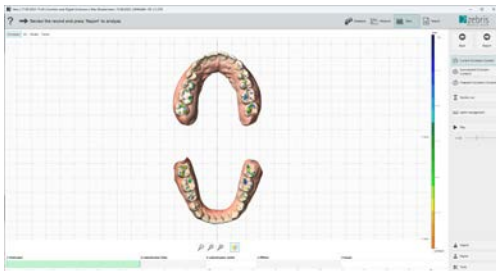


Show/hide monson sphere

You can use this function to show or hide the Monsen sphere.

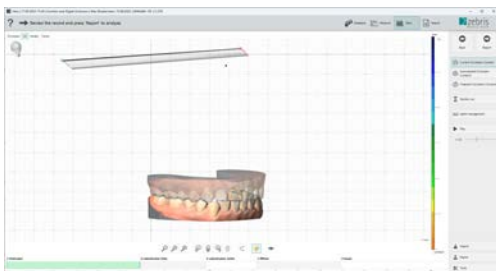
11.2.4 Module-specific parameters

The virtual occlusion module offers various options for analyzing the recordings or the imported model in View mode. The following table explains the tabs and their special functions on the right.



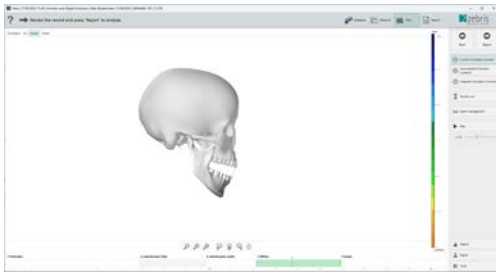
Occlusal

The display of the jaw models in a separate, occlusal view allows you, for example, to visually check the occurrence of contacts during the recorded movement sequences.



3D display

The 3D Display tab shows you the models, the condylar paths as well as the path of the incisal point and the Bonwill triangle. You can display the recorded patient movements using the jaw models and analyze contact conditions, for example.



Model

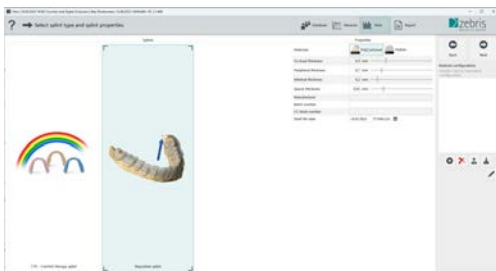
If you do not have any scanned models available, you can have a generic skull displayed in this tab. You can also import scanned model data into the application at this point.



Motion traces

As in the Function Analysis and Articulator modules, the movement traces of the condyles and the incisal point are displayed here.

11.3 Splint Designer

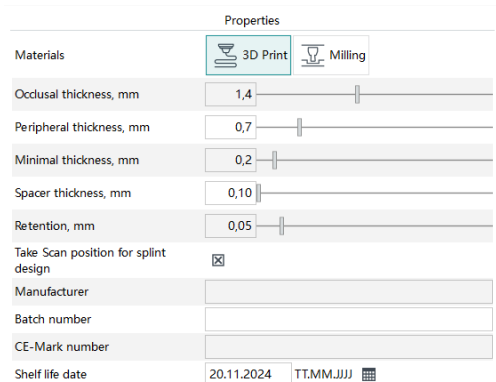


Selecting the Splint type

First you have the choice between two different splint types.

With the PTS - Positioning therapy splint you can choose the parameters of the splint as you wish. On the one hand, you can freely select the jaw and then also the positioning of the splint.

With the CTS - Comfort therapy splint, the lower jaw is predefined and you have the option of creating the splint based on the real opening track of the patient.

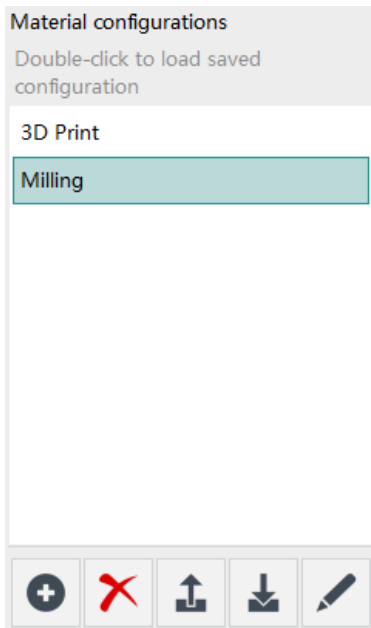


Splint properties

Here you have the option of specifying various properties of the splint in advance:

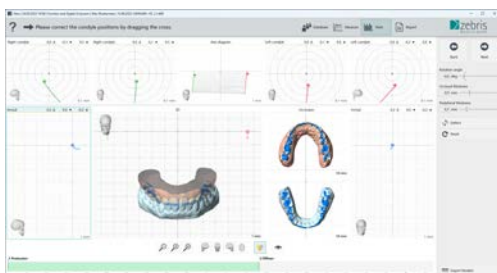
- Splint material
- Occlusal layer thickness
- Peripheral layer thickness
- Minimum material layer thickness
- Spacer layer thickness
- Manufacturer
- Batch number
- CE-Mark number
- Shelf life date

Note: The settings for the splint properties must be made in accordance with the respective manufacturer's specifications for the printing and milling materials.



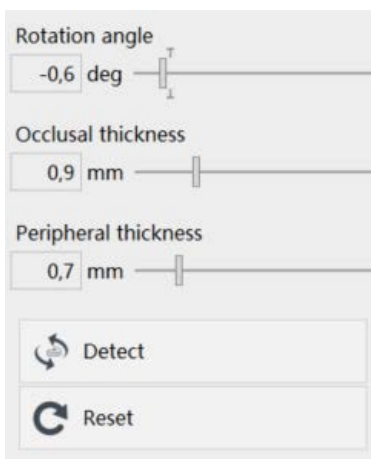
Material configurations:

The set splint properties can be saved as configurations. If, for example, different materials are used to manufacture the splint, you can save the manufacturer's specifications for the individual materials here. These configurations can be exported and imported.



Positioning

Depending on the choice of splint type, you have different options to create a splint. When creating a reposition splint, you have the option of creating splints based on the real opening or protrusion paths. On the other hand, splints can also be designed in artificial positions.



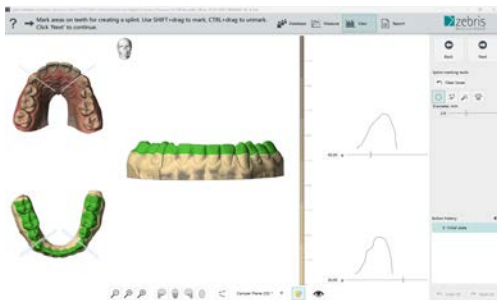
Design parameters

Adjustments regarding the angle of rotation angle, occlusal and peripheral layer thickness can also be made.



Insertion direction

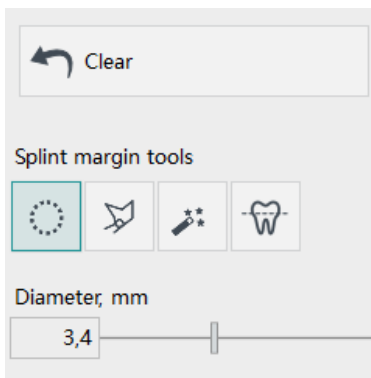
You can then manually define the insertion direction of the splint. To do this, you can use the arrow directly on the model or the sliders on the right-hand control bar.



Marking the splint area

After adjusting the splint parameters, you will receive a suggestion for the areas that will be covered with the splint. These must then be manually adjusted by the practitioner.

The alignment of the models on the left can be reset by right-clicking and selecting 'reset view'.

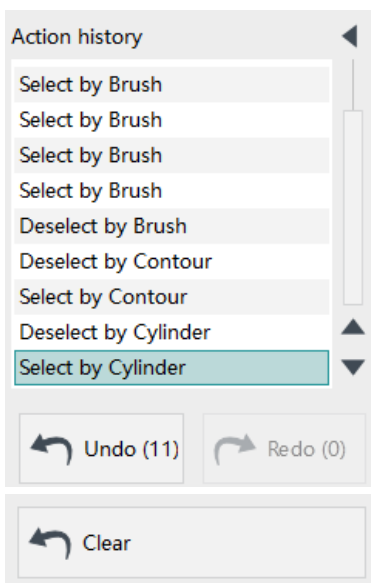


Adjusting the splint edge

The following tools are available for adjusting the splint edge:

- Design tools: Brush, Contour and Cylinder (the diameter of the tool can be adjusted)
- Manual adjustment of the splint edge height

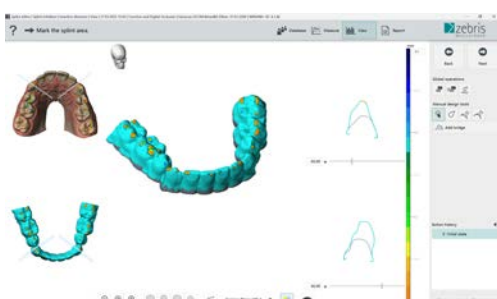
Use the SHIFT + left mouse button shortcut to mark the surface and the CTRL + left mouse button shortcut to remove markings.



Navigation

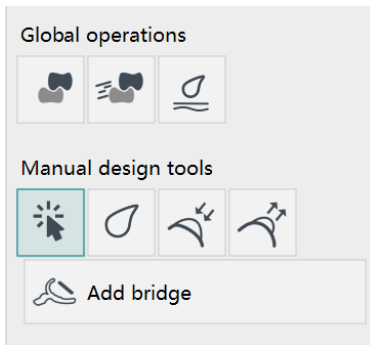
In the lower part of the toolbar you will find the history of the work steps you have carried out. Here you can see which design steps you have already carried out. You can also use the "Undo" and "Redo" buttons to switch between the individual steps.

Use the "Clear" button to undo all work steps.



Adjusting the splint surface

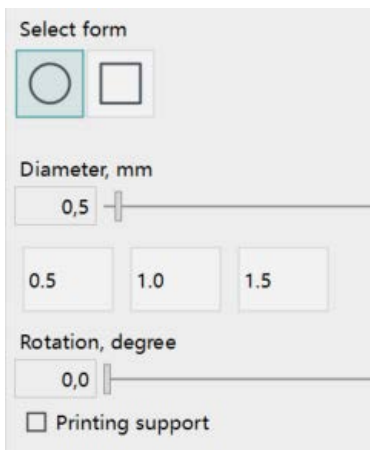
After processing the splint edges, you also have the option of processing the surface of the splint. The existing overlapping are marked in color.



Tools for processing the splint surface

The following tools are available for processing the splint surface:

- **Global Operations:** static and dynamic grinding, based on the recorded movements, global smoothing
- **Manual design tools:** Smoothing of the surface, shrink and expand (both the strength and the diameter of the tool can be adjusted)
- **Add bridge:** To insert the bridge, mark the start and end points of the bridge by double-click. You can then customize the shape and diameter of the bridge.

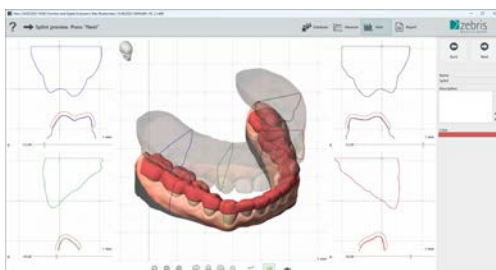


Add bridge

First define the ends of the bridge by double-click.

After defining the bridge position you can customize the form, diameter and rotation angle of the bridge.

If you want to use the bridge as printing support, you can select "Printing support" for subtracting the jaw model from the designed attachment.



Splint preview

Finally, you receive a preview of the created splint. This can then be checked and completed in its entirety and in viewing the section cuts.



Exit the design process

This warning appears when you are about to exit the design process. If you confirm with 'Yes', all data and settings from the design process will be lost. There is no way to return to it at a later time.

Declaration of conformity according to Art. XIII Regulation EU 2017/745

Declaration of conformity

The submission of a declaration of conformity according to Art. XIII Regulation EU 2017/745 can be inserted in the report after the design process.

11.4 Report

In this chapter the predefined report templates of the module Function and Digital Occlusion will be shown. The reports can be customized as described in the [Report](#) ⁵⁹ chapter.

Templates	Contents
AMANN GIRRBACH Artex Report	Articulator parameters, Pin Positions and Tracks for the AMANN GIRRBACH Artex
Cerec Articulator Report	Articulator parameters and Tracks for the Cerec Articulator
EPA Report	EPA Protrusion Tracks and EPA Diagrams
Function Occlusion Report	Record information, Parameter, Incisal Chewing, Chewing analysis and Movement tracks
KaVo Protar Report	Articulator parameters, Pin Positions and Tracks for the KaVo Protar
Occlusion - Artex - Report	Chewing analysis, Incisal Chewing, Record information, Articulator parameters, Pin Positions and Tracks for the AMANN GIRRBACH Artex
Panadent Articulator Report	Articulator parameters, Pin Positions and Tracks for the Panadent Articulator
SAM Articulator Report	Articulator parameters, Pin Positions and Tracks for the SAM Articulator
Stratos Articulator Report	Articulator parameters, Pin Positions and Tracks for the Stratos Articulator

12 Jaw Relation Analysis

The "Jaw Relation" module enables the determination of the correct mandibular and maxillary relation. This can be done with the classic support pin registration, jig, Aqualizer or hand-guided positioning. Furthermore, the targeting of the mandible into a determined position is supported in real time. This is transferred via registration material for diagnostic assessment and prosthetic fitting. This registration can also be used for the determination and diagnostic assessment of temporomandibular joint positions with the aid of the EPA module.

12.1 Description of the neuromuscular relation determination.

This module allows the relation of the lower jaw to the upper jaw to be adjusted to a previously made jig by means of ballistic, fast closing movements.

Before determining the neuromuscular target positions, the jig with plateau is inserted. Then the position of the habitual occlusion is registered without manipulation. This is followed by the relaxation of the masticatory muscles. Then the patient is instructed to close slowly from the maximum opening of the lower jaw up to approx. 8-10 mm before plateau contact. From this position the jig is closed with maximum or ballistic speed. This procedure is repeated several times. The positions are registered. The number of repetitions is set in the recording settings, "Measured parameters". In the diagrams (incisal point, condylar position) the system displays each individual target position as a point on a target. The repetitions can be used to check whether the patient is able to reproduce a neuromuscular centric jaw relation. If several target positions are centered in the target, it can be assumed that the patient is able to reproduce this position. The position can be directly coded with a bite registration in the mouth.

12.2 Principles for execution

Incisal positioning

The blocking is performed in the upper jaw using a plateau, jig, aqualizer or similar. The height depends on the state of occlusion, bite position, vertical dimension and the treatment to be achieved. In principle, any method can be carried out electronically supported by the relation measurement

Habitual on plateau

The habitual position given by the programming of the musculature and repeated swallowing act is registered on the level of the plateau in order to maintain the relation of the subsequent recordings.

Retral position

With the activation of the retral position, it is possible to evaluate the distance of the temporomandibular joint heads from the bilaminar zone. This is possible in the original as well as new mandibular position.

Target position

The target positions are the ballistic movements to be performed on the jig inserted in the maxilla, which represent the hit field for the averaged abduction point.

Gothic arch

The arrow angle plot allows the determination of the centric relation (CR) by displaying the arrow angle apex. It is possible to serve different procedures (methods) in one recording session by combining both recording variants (Target position and gothic arch).

Manual correction

Arrow angle point, as well as adduction point can be therapeutically shifted in their final position immediately after their recording, individually or combined. This point, called averaged target position, can be changed in its position with the left mouse button and simultaneous shifting.

Guided registration

Once the position is determined, the patient can find it by sliding on the plateau via feedback. By visually following the cross to the target position and by a simultaneous acoustic signal, orientation is helpful for the patient. The closer the lower jaw gets to the target point the faster the sound interval becomes. In addition, the timbre changes to a higher tone.

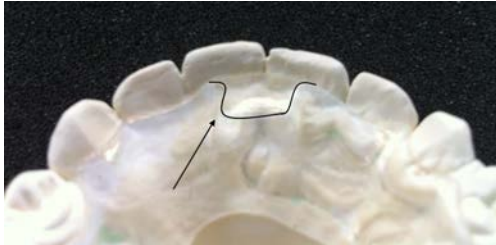
Bite control

For control purposes, the cured bite registration is to be used again via optimization by correction. It is removed from the mouth and ideally trimmed or ground, depending on the registration material used. Fans and interfering areas in the gingival region can be taken into account and removed in this way. This prepared registration is inserted again in the same session. The patient is in the position determined by the registration and the bite control can be triggered.

12.3 Preparation on the patient

Production of the upper jaw plateau

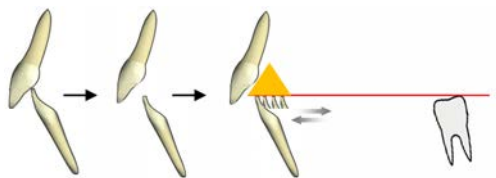
The plateau is designed in such a way that the front teeth of the lower jaw meet the plateau during closing movements without posterior contact, i.e. a slight blocking is initiated. Depending on the tooth status (e.g. missing mandibular anterior teeth), a miniature pin can also be inserted into a mandibular base plate or a modified interim base plate.



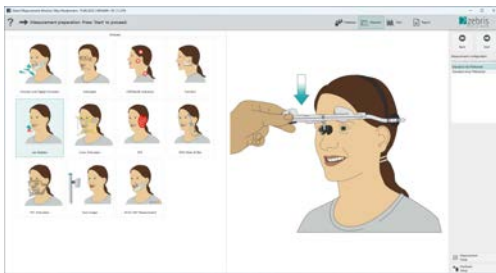
For example, the plateau can be made of an autopolymerizate and can be attached to the upper teeth or palate either with retention elements or temporary cement, adhesive cream or silicone. If the tooth status is appropriate, this plateau can be incorporated into a bite template. The plateau is manufactured parallel to the chewing plane. It is adjusted to a vertical dimension parallel to the occlusal plane, which corresponds to the later, therapeutic bite height or comes as close as possible.



To produce the plateau, the upper and lower models with bite registration are placed in an articulator and locked on the articulator support pin. This ensures a realistic horizontal and vertical alignment of the mandible. The spaces between the upper and lower teeth are checked by lateral control movements and corrected if necessary. The plateau is set to a vertical dimension parallel to the occlusal plane, which is as close as possible to the subsequent therapeutic height. In the habitual final bite situation, the limit of the incisal edges of the mandibular incisors is marked palatally in the upper front and the minimum thickness is specified by another mark.

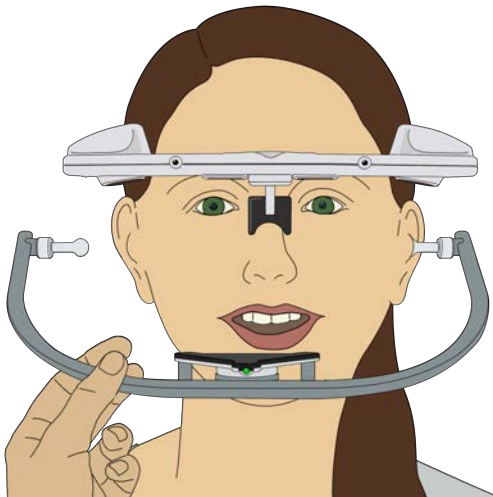


12.4 Perform measurement



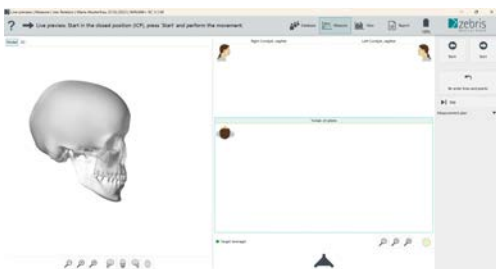
Module selection

Select the Jaw relation module on the left and then click the Start button.



Start recording

Anatomical points are transferred to the virtual environment. These are both Tragus superior in connection with the lowest point at the lower orbital rim, theorbital point (orbitals). This is determined by the nasal support.



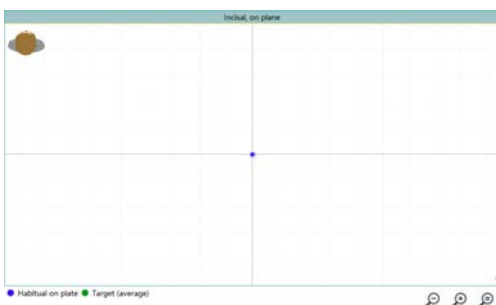
Testbewegung

In the Live Preview section, movements can be displayed, checked and illustrated to the patient without saving the values. This mode can also be used to practice special functional movements with the patient. The test movement is activated with **Start** and ended with **Stop**. The recording modes of the selected movements then begin.



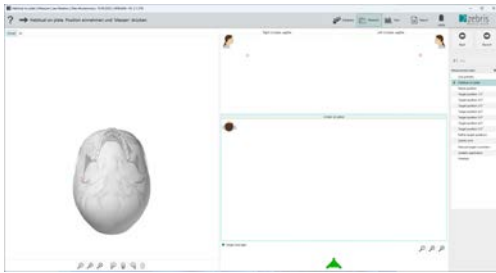
Parameter fields Condylus

The fields of the parameters right and left condyle show the initial position of the condyles and in the following images the change in position from the sagittal view.



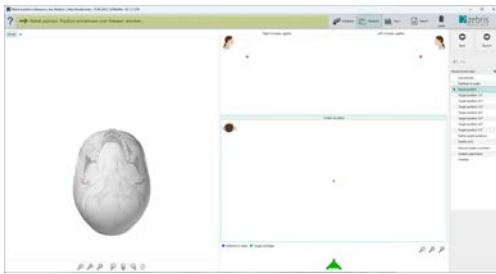
Parameter field incisal point

The field of the incisal point parameter allows the change in position to be viewed from a cranial perspective. The legend provides information about the steps performed with the corresponding points.



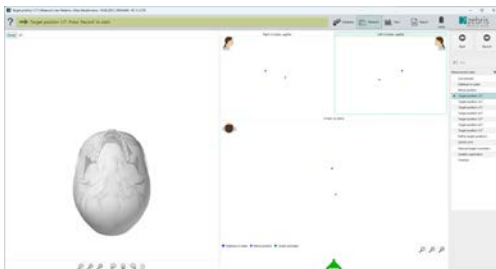
Habituaries on plateau

The initial recording is intended for the usual position. This is done with a tool, jig, plateau or equalizer. The position is displayed as a blue dot in the field.



Retral position

This is registered in the lower jaw's real lower jaw position and is marked as a purple dot.

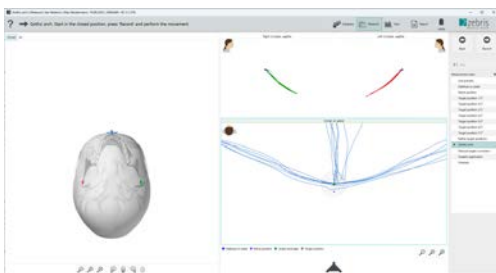


Target positions

After deprogramming the musculature, fast, reflex-like closing movements to the plateau level are performed. This measurement records the ballistic closing movements for the neuromuscular relation.

Hit rate

The quality of the hit field is assessed by the dispersion of the individual target points. After the number of ballistic closing movements has been completed, outliers are automatically deducted. The intersection of the closest points is used for the final target position.

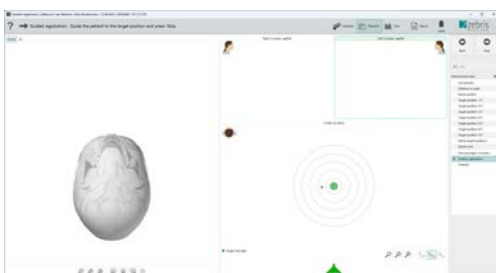


Gothic arch

In addition to the position determination, the recording based on the Gothic arch can be used. This determines the centric condyle position via the arrow head and thus the new position of the lower jaw in relation to the upper jaw.

Change target position

The practitioner can correct this position and take it into account therapeutically. The position can be actively moved to the desired position with the mouse.



Guided registration

The patient is asked to move the target cross to the green dot on the target. A rising and falling signal tone additionally signals the proximity of the moving cross to the target point. The higher and faster the tone, the closer it is to the point.

Registration

A bite registration is made with registration material and the new position of the lower jaw to the upper jaw is fixed.



A dialog box appears at the end of the measurement:

Discard Record

The measurement is discarded and returns to the preview mode to perform a new measurement.

Save & Repeat

The measurement is saved and returns to the preview mode to perform a new measurement.

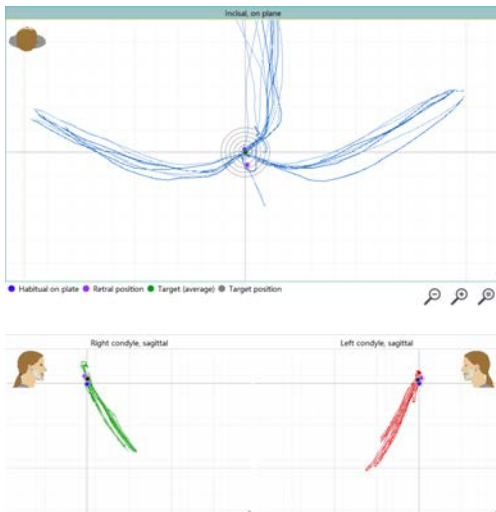
Save & Close

The measurement is saved and goes directly to the view of the completed measurement.

12.5 Viewer

In the following, the parameters that can be recorded specifically with the jaw relation module are explained. Basic functions of the view are described in the chapter [View \(Edit measurement\)](#).⁵⁵

12.5.1 Module-specific parameters



Representation of incisal point on plateau

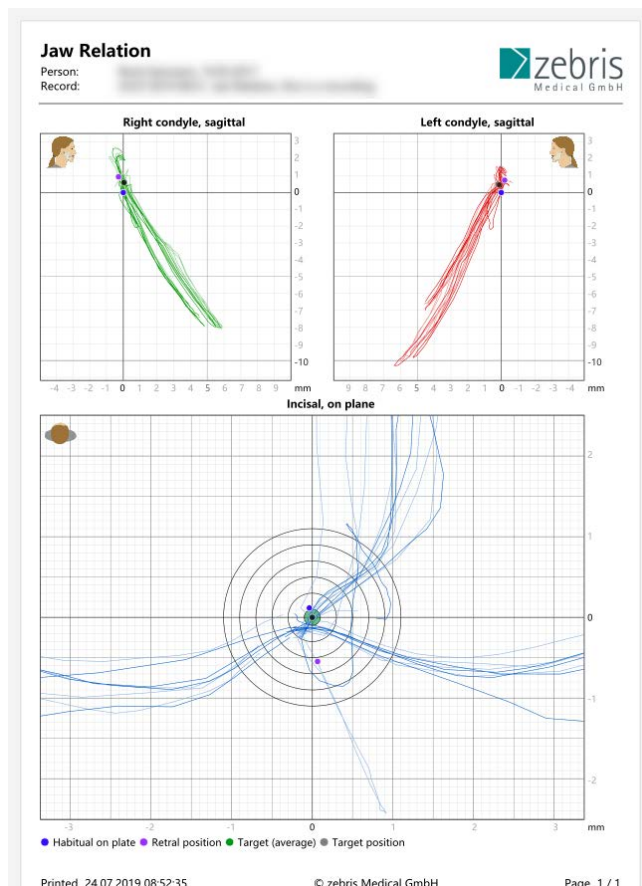
The individual positions of the mandible are recorded during treatment and can be viewed in view mode. In addition to the recorded coordinates, the graphic display shows a picture of the course of movement during treatment.

Representation of condyles sagittal

The individual recorded positions are shown from the condyle position on the left and right. This allows a direct comparison of the differences between the individual recorded positions, e.g. retral position compared to habitual position.

12.6 Report

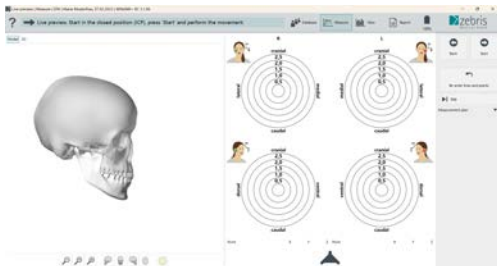
The jaw relation report can be started directly after the recording from the view mode or via the database. The report contains the graphical representation of the target. The position of the recorded positions with relation to the condyles is displayed in sagittal view, separately for the left and right sides. The various recorded positions listed are represented by color-coded dots in the target and condylar views. The motion tracks are also shown in the display field of the target. The basics for operation in report mode are described in the chapter [Report](#)⁵⁹.



13 EPA

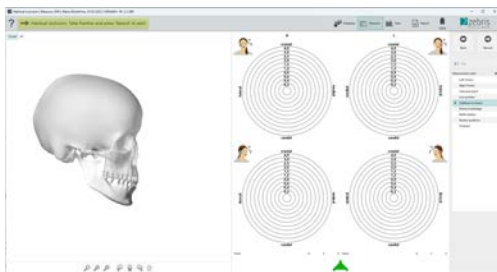
The Electronic Position Analysis allows the position of the condyles to be determined in relation to the upper jaw. Registration material inserted between the rows of teeth can be compared and splint positions can be checked. In addition, points are placed in relation to the condyle track. The diagnosis of pain positions caused by condylar malocclusions can be supported.

13.1 Perform measurement



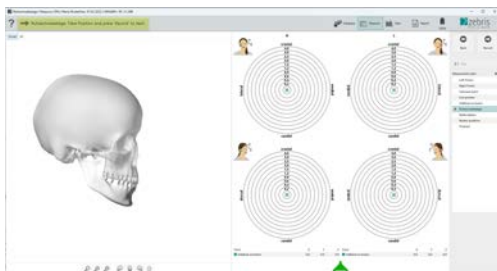
Live Preview

In the Live Preview section, movements can be displayed, checked and illustrated to the patient without saving the values. This mode can also be used to practice special functional movements with the patient. The test movement is activated with **Start** and ended with **Stop**. The recording modes of the selected movements then begin.



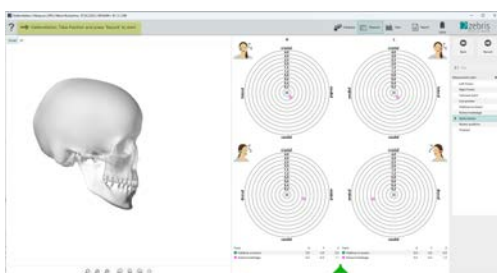
Habitual occlusion

In the first step, a position is registered depending on the specification. This can be, for example, the patient's habitual final bite position.



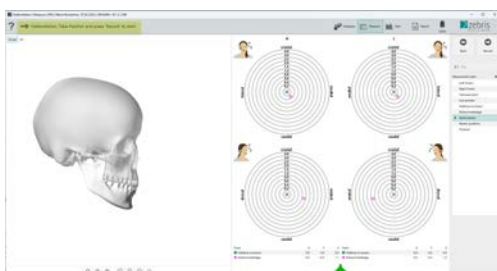
Rest position

The rest position determines the distances between upper and lower jaw with relaxed muscles.



Jaw relation

The measuring of the Jaw Relation determines a new relation between upper and lower jaw.



Protrusion or specific motion recording

Optionally, it is possible to record a motion track.



A dialog box appears at the end of the measurement:

Discard Record

The measurement is discarded and returns to the preview mode to perform a new measurement.

Save & Repeat

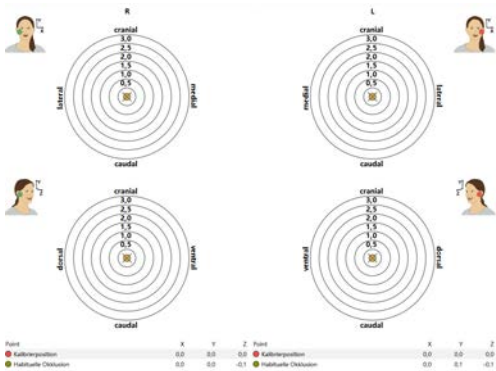
The measurement is saved and returns to the preview mode to perform a new measurement.

Save & Close

The measurement is saved and goes directly to the view of the completed measurement.

13.2 Viewer

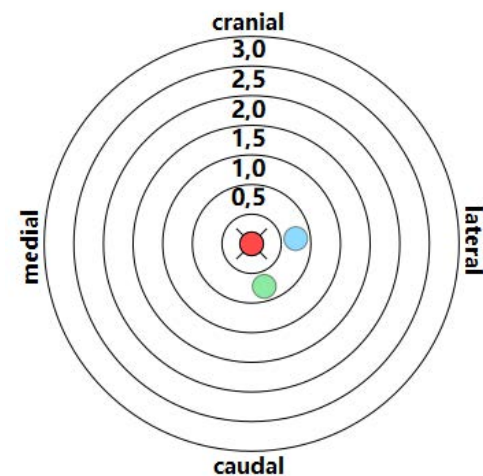
In the following, the display of the reference position and the target position will be explained. The basics for operating the view mode are described in the chapter [Edit measurement \(View mode\)](#) ⁵⁵.



Reference position

The diagrams show the positions of the condyle in the joint space. The frontal view and from the right and left condyle is viewed. The determined positions describe the point of passage of the previously determined axis. This describes, for example, the initial position of the condyles in their current position at the final bite.

The protrusion traces are displayed at this point, as well as live during recording (blue lines).



Target position

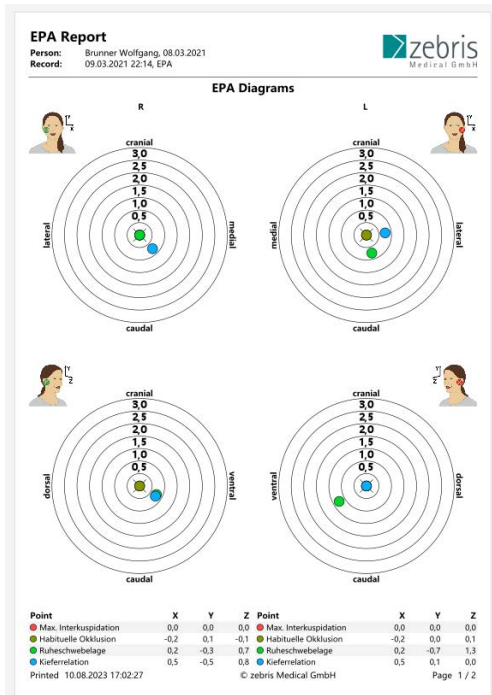
The target position is displayed in measuring distances with a resolution of 0.5 mm; 0.5 mm and 1.0 mm up to a maximum value of 3.0 mm in the radius. The target position of the condyles is thus determined in relation to a reference position.

Point	X	Y	Z	Point	X	Y	Z
Max. Interkondylar	0.0	0.0	0.0	Max. Interkondylar	0.0	0.0	0.0
Kiefergelenkposition	-0.2	0.1	-0.1	Kiefergelenkposition	-0.2	0.0	0.1
Kiefergelenkposition	0.2	-0.3	0.7	Kiefergelenkposition	0.2	-0.7	1.3
Kiefergelenkposition	0.5	-0.5	0.8	Kiefergelenkposition	0.5	0.1	0.0

There is also a legend under the target fields with the exact description of the recorded points.

13.3 Report

Basics for operating the report mode are described in the chapter [Report](#) ⁵⁹.

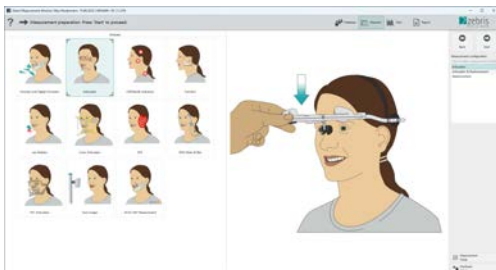


The EPA data set is called up directly after recording or selected via the database. The reports contain the graphical representation of the targets from the frontal as well as sagittal view. The different position recordings are represented in the targets by color-coded points. In addition, the coordinates are listed in the lower report section. The measurement field for the trajectories is attached to the targets.

14 Articulator

This module consists of the movements of protrusion, laterotrusion left and laterotrusion right. The recording results must be viewed in a differentiated manner depending on the movement process by the patient. The articulator values are usually performed under tooth contact. This allows the system to determine the value for setting the individual anterior guidance plate. The same applies to the lateral movements, which are then guided over the posterior teeth or canines. It should be noted that the values for the articulator setting are generated from idle movements. For comparison, additional movements guided by the practitioner on the patient can influence the significance of occlusal movement margins. We recommend that the prosthetic restorations created via the zebris values be subjected to a check under function in the patient's mouth and corrected if necessary.

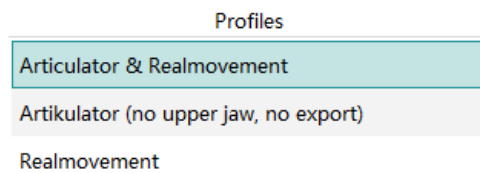
14.1 Measure



Module selection

Select the Articulator module on the left and then click the Start button.

14.1.1 Measurement mode



Articulator (no upper jaw, no export)

In this mode, data is generated exclusively for the analog setting on standard articulators. This setting has the advantage of quickly and easily determining the data with which the user then manufactures individual splints or prosthetic restorations according to patient values.

Articulator and Realmovement

This mode combines analog and digital data acquisition. The Articulator and Real Movement data export modes are combined here. In this mode, the model can be transferred to the Artex analog articulator from Amann Girrbach via the bite fork in conjunction with the Digital model transfer.

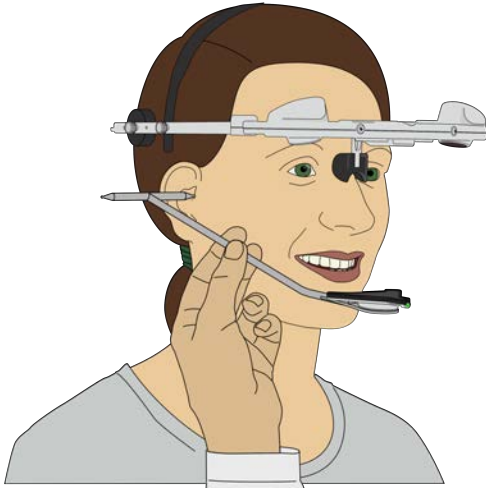
Realmovement

This mode, in conjunction with a bite fork (e.g. Bite fork type SD (REF01960320)), allows movement data and the virtual patient situation to be combined in the digital workflow. Data processing is realized via CAD/CAM system interfaces.

14.1.2 Reference plane

The data are related to a plane. If several exposures are to be performed in one session, each of the subsequent exposures can be performed with the reference plane that has already been defined. Otherwise, a new plane is defined via the Define new reference plane button.

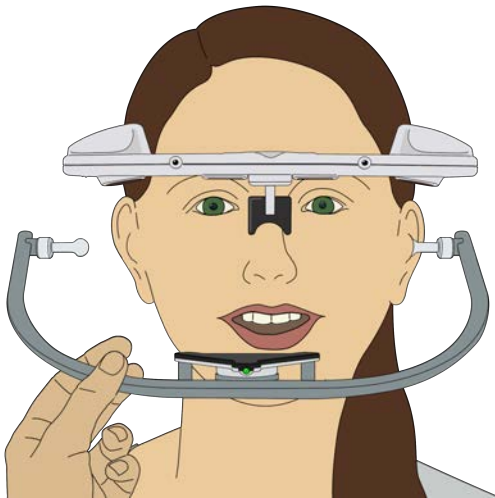
Define reference plane articulator with T-pointer



T-pointer

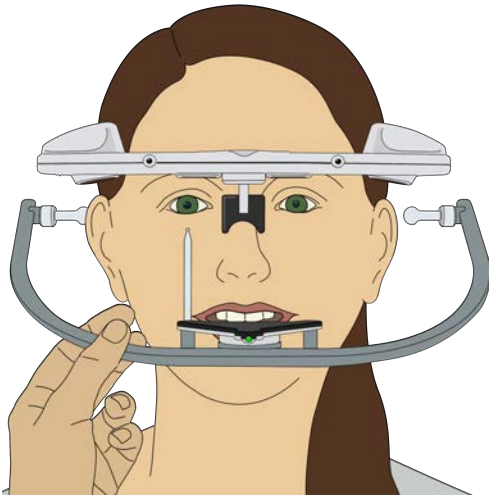
The transfer option to different articulator systems makes it necessary to adjust the exposures to the planes such as the Frankfurt horizontal, Camper's plane and patient plane by calculation. This is taken into account during acquisition via the anatomical reference points.

Defining reference plane with the C-Positioner

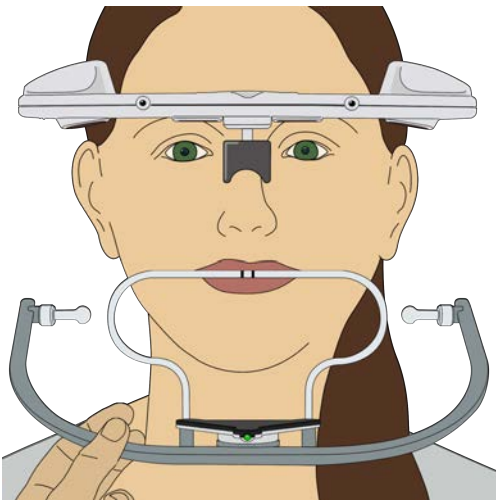


C-Positioner

The C-Positioner is another option for defining the reference plane on the patient. A special feature of the C-Positioner is that the infra-orbital point and the incisal point can also be tapped.

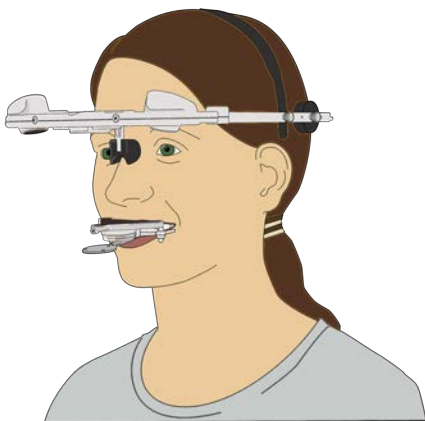


Picking up the infra-orbital point with the pointer. The pointer can also be used to record other facial parameters, such as the subnasal point, profile lines or smile lines.



In addition, the C-Positioner can be used to capture other facial parameters, such as the mouth line or bipupillary line.

Reference plane Bite fork



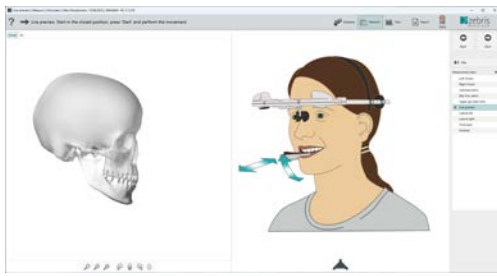
Reference plane Bite fork

The data acquisition of movements for transfer to a CAD/CAM software, but also for transfer to a mechanical articulator using a Digital model transfer, requires the acquisition of the upper jaw position, or coordinates, via a special Bite fork (e.g. Bite fork type UN (REF01960360)) and thus the determination of the mandibular position in habitual occlusion.

In the procedure, it must be ensured that the positioning of the mandible in relation to the maxilla is carried out correctly for the subsequent further processing of the data in the above-mentioned systems.

14.1.3 Measuring Procedure

The patient is instructed on this specific measurement to perform all movements with tooth contact. The patient performs these under the control of the dentist. Not only practicing the movement patterns, but also the controlled standardized execution of the data acquisition brings a higher data security and accuracy.

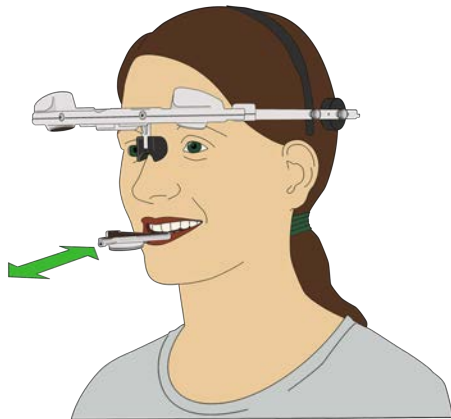


Live Preview

In the Live Preview section, movements can be displayed, checked and illustrated to the patient without saving the values. This mode can also be used to practice special functional movements with the patient. Please activate with Start. The test mode is switched to the subsequent measurement mode with the Stop button, with which the measurement is performed. This function can be switched off under Measurement settings.

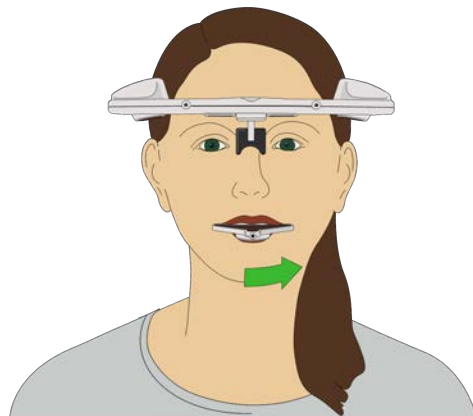
14.1.4 Measuring Movements

Depending on the selected movement patterns, their number and chronology, these are performed with the patient after the preview. In principle, all measurement sequences can be individually designed in the configuration. Using the example of some standard movements, you will be guided through the recording protocol below.



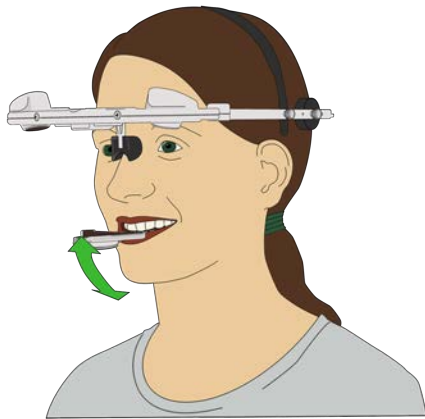
Protrusion movement

The recording starts, for example, with the maximum protrusion movement to be achieved. The measurement process can be started/stopped by clicking on the Start and Stop button using the foot switch, the Enter key, and the mouse button. The starting (reference) position is always the habitual occlusion. To complete the movement, the patient returns the jaw to the starting position, and the exposure process is terminated after the return movement.



Lateral movement

Have the patient assume the starting position and perform a maximum left and right lateral movement from this position. The patient then allows the lower jaw to slide back into the starting position.



Opening movement

Have the patient assume the starting position and perform a maximum opening movement from this position. The patient then allows the lower jaw to slide back into the starting position.



At the end of the measurement, a dialog box appears with the following options:

Discard Record

The measurement is discarded and returns to the preview mode to perform a new measurement.

Save & Repeat

The measurement is saved and returns to the preview mode to perform a new measurement.

Save & Close

The measurement is saved and goes directly to the view of the completed measurement.

14.2 Viewer

The parameters that are to be recorded specifically with the Articulator module are explained below. The basics for operating the view mode are described in the chapter [Edit measurement \(View mode\)](#) ⁵⁵.

Measurements in the Articulator (no upper jaw position, no export) mode

During a measurement in the Articulator mode, only the articulator-relevant data is displayed in the viewports in the view mode. This includes the Model, 3D, Motion Traces and Parameters tabs. As well as the display of the condylar path parameters in the Parameters block.

Measurements in Articulator & Realmovement mode

The same data is reproduced in the view mode as for an exposure in the Articulator mode. In addition, the visible positions of the bite fork are shown in the 3D tab. The XML data can be transferred to corresponding CAD/CAM systems via the zebris jaw motion Export button.

Measurements with the Real Movement only mode

In the Real Movement mode, the movement display is realized via the reference plane assignment of the coupling bucket, via the bite fork positions. The data can be transferred to the interface of the CAD/CAM system via the zebris jaw motion export button.

14.2.1 Data export to CAD/CAM interface



To transfer the data of the acquisition modes "Articulator and data export" and "Real movement only" to the CAD/CAM interface, please click on the zebris jaw motion export button.

If you have selected a default path in the program settings, the data file will be stored directly in this path. If this is not the case, a task window opens after pressing the button to manually specify a suitable storage location.

14.3 Report

Depending on the articulator type, the planes are differentiated between Frankfurt horizontal (SAM S3), Camper's level (KaVo Protar) and patient plane (Amann Girschbach Artex). The scale values of the joint housing and the anterior guidance plates (individual) are adapted to these levels. Inserts (example SAM) for the articular path inclination or the Bennett movement are taken into account in the report and are highlighted in bold. The drawn curves on the second page are used to assess whether the measurements were taken with the correct movements. The data output for digital model transfer with the Artex, as well as the Stratos articulator table, is also given in the "Report".

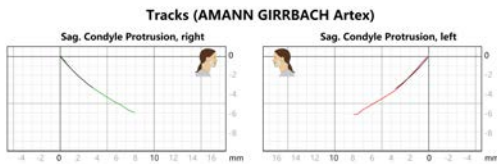
14.3.1 Module-specific parameters

The report consists of the elements described below. Depending on the settings in the exposure settings, certain statements can be read from the report. The patient-specific setting parameters of the respective selected articulator are displayed. In this case, the bars with the colors green/red/blue describe the individual data of the patient being treated.

14.3.2 Explanation of the report contents

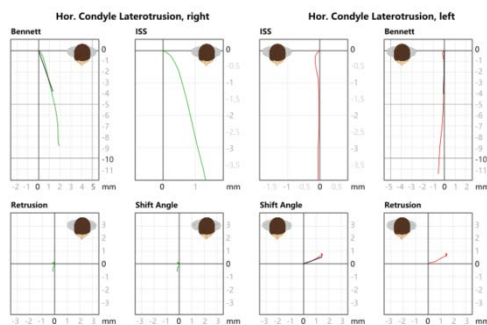
Motion Tracks

The displayed motion tracks are generated from the different movement specifications in relation to both joints and the incisal point. Depending on the selected axis position and reference plane, the condylar paths can be displayed differently in their course and angle.



Sagittal condylar trajectories

The sagittal condylar path inclination is calculated in such a way that the best possible coverage of the recorded curves with the curvature of the articulator is obtained, particularly in the initial area. The diagrams show the condylar path inclination of the protrusion and opening movements.

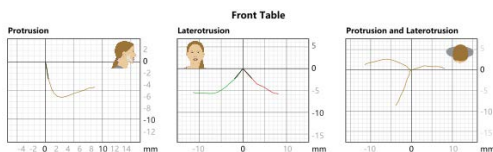


Horizontal condylar path displays

The Bennett angle and the Immediate Sideshift are calculated from the possibility of movement of the mediotrusion condyle or swinging condyle, i.e. the condyle of the non-working side. The lines drawn in black correspond to the averaged curve of the Bennett insert of the articulator. The colored lines (red and green) correspond to the recorded movement traces.

Retrusion is calculated from the sagittal movement of the laterotrusion condyle or resting condyle retro-cranially.

The shift angle controls the condyle from a pure laterotrusion movement of "0°" continuously between a max. latero-retrusion "-20°" and latero-protrusion "+20°".



Anterior plate guide tracks

The angles for anterior guidance are shown here. The anterior plate is adjusted according to the displayed curves. In the articulator, the sagittal, the left-right lateral anterior plate inclination and the inclination in the frontal projection are displayed.

Model transfer via Digital model transfer

This section describes the position data and the setting heights of the positioning screws. This enables the models to be articulated on the basis of the positionally correct upper jaw position.

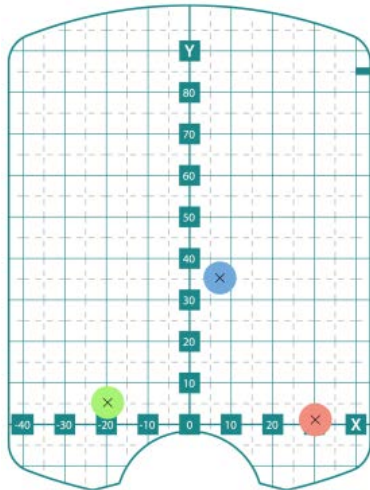
zebris Medical GmbH offers Digital model transfer.

- Adesso Multisplit (REF01560050)
- Amann Girrbach Artex (REF01560052)
- KaVo Protar (REF01560054)
- SAM (REF01560055)
- Panadent (REF01560056)



Reference image

The graphic representation shows the orientation of the bite fork on the transfer table as well as a pictorial representation of how the screw length is measured.



Bite fork positioning

The graphic shows the alignment of the positioning screws on the positioning foil in plan view. For this, the positioning screws must be screwed into the bite fork type (e.g. Bite fork type UN (REF01960360)) at the correct length.

Values transfer table

X	8	31	-19
Y	35	0	5
Pin length	24	12	15

Bite fork parameters

The table is used to determine the orientation of the three positioning screws on the foil, as well as the screw length to be set. With these parameters, the upper jaw can be articulated in the correct position in the Articulator.

15 Cerec Articulator

The measurement consists of the movements of the protrusion, laterotrusion left and right, and an opening movement. The recording results are to be considered in a differentiated way depending on the movement process by the patient. Using an occlusal attachment, patient movements are recorded to determine the settings for the digital Cerec articulator.

15.1 Perform measurement

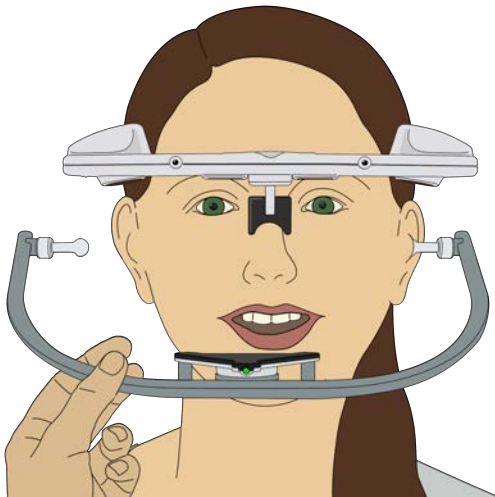


Module selection

Select the Cerec articulator module on the left and then click the Start button.

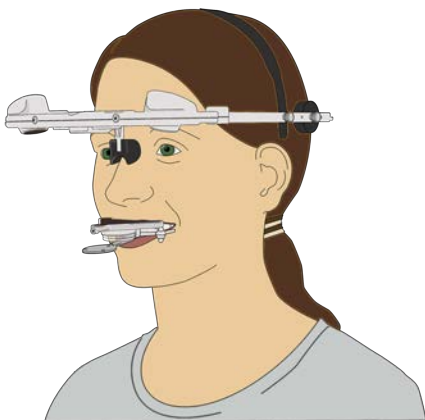
15.1.1 Reference plane

The transfer option to the digital Cerec articulator makes it necessary to adjust the measurement mathematically to the Bite fork used as well as the condylar distance, the leg length and the Balkwill angle.



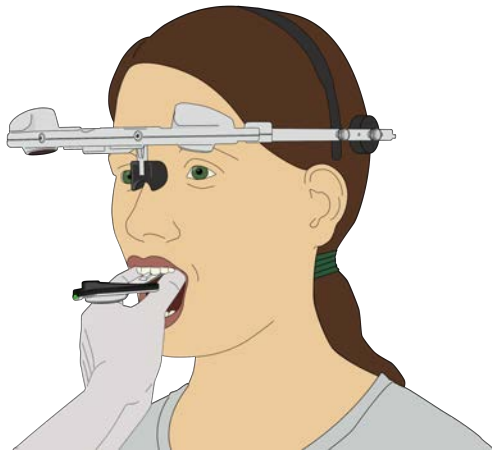
C-Positioner

The C-Positioner is one option for defining the reference plane on the patient. A special feature of the C-Positioner is that the infra-orbital point and the incisal point can also be tapped.



Reference plane Bite fork/attachment

The data acquisition of movements for transfer to the CAD/CAM software requires the recording of the maxillary position, or coordinates, for example, via Bite fork.



Reference plane Alignment fork (REF01960430)

The Alignment fork (REF01960430) is a simple way of determining the position of the upper jaw. Ideally, this is placed with the pointer incisal between 11 and 21 and aligned with the buccal cusps in the area of the premolars and molars. With the intraoral scan data available and the support at three points on the occlusal surface of the maxilla, the position can be determined.

15.1.2 Measuring procedure

Depending on the selected movement patterns, their number and chronology, these are performed with the patient after the preview. In principle, all measurement sequences can be individually designed in the configuration. Using the example of some standard movements, you will be guided through the measurement protocol below.

Somewhat modified as under [Functional analysis](#)^[119], the patient is instructed on this specific measurement, since all movements are to be performed with tooth contact. The patient performs these under the control of the practitioner. Not only the practice of the movement patterns, but also the controlled standardized execution of the data acquisition brings a higher data security and accuracy.

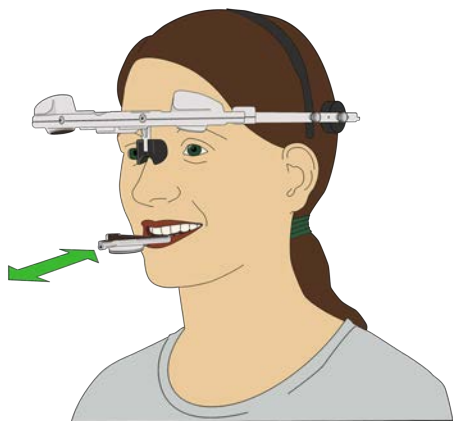
Test movement

In the Test Movement section, movements can be displayed, checked and illustrated to the patient without saving the values. This mode can also be used to practice special functional movements with the patient. Please activate with Start preview. The test mode is switched to the subsequent measurement mode with the Stop button, with which the measurement is performed. This function can be switched off under Measurement settings.



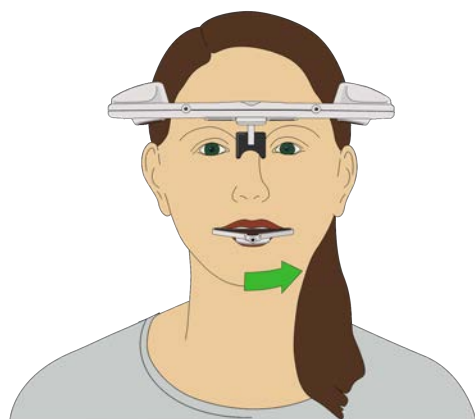
Position of the upper jaw

First, the position of the upper jaw is recorded. Pressing the Measure key also confirms the position of the measuring system on the patient's head. From this point on, the measuring system can no longer be moved.



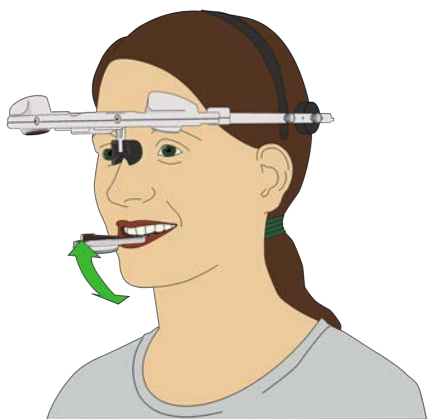
Protrusion movement

The Cerec Articulator measurement starts, for example, with the maximum protrusion movement to be achieved. The measurement process can be triggered by clicking on the Start button using the foot control, the Enter key, and the mouse button. The starting position is always the habitual final bite situation. To complete the movement, the patient returns the jaw to the starting position and the measurement process is terminated after the return movement.



Lateral movement

Have the patient assume the starting position and perform a maximum left and right lateral movement from this position. The patient then allows the mandible to slide back to the starting position.



Opening movement

Have the patient assume the starting position and perform a maximum opening movement from this position. The patient then allows the lower jaw to slide back into the starting position.



At the end of the measurement, a dialog box appears with the following options:

Discard Record

The measurement is discarded and returns to the preview mode to perform a new measurement.

Save & Repeat

The measurement is saved and returns to the preview mode to perform a new measurement.

Save & Close

The measurement is saved and goes directly to the view of the completed measurement.

15.2 Viewer

Basic operation of the view mode is described in the chapter [Edit measurement \(View mode\)](#) ⁵⁵.

15.3 Report

In the Report mode, the parameters that were previously defined under View are displayed and evaluated. The basics of operation are described in the [Report](#) ⁵⁹ chapter.

15.3.1 Module-specific parameters

Depending on the specifications in the exposure settings, certain statements can be read from the report. The patient-specific setting parameters of the digital Cerec articulator are displayed. The bars with the colors green/red/blue describe the individual data of the patient being treated.

15.3.2 Explanation of the report contents

Measurement profile	
Condyles defined by	From attachment
Measurement mode	Cerec Articulator

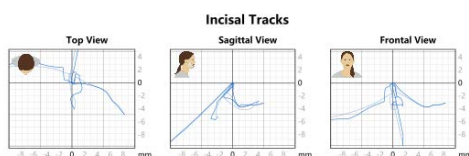
Measurement profile

Information on the definition of the condyles and the measuring mode used is displayed. Comments created in the view are also displayed at this point.

Sagittal Condyle Incl., °		L	6.6	30
		R	18.5	30
Bennett Angle, °		L	23.0	5
		R	-0.4	10
ISS, mm		L	6.0	10
		R	0.0	10
Balkwill-Angle, °			23.0	11
Basis (Condyle distance), mm			110.0	11
Leg length, mm			100.0	11

Articulator parameters

The calculated parameters necessary to adjust the digital Cerec articulator to the individualized patient parameters are displayed here. The sagittal condylar path inclination, the Bennett angle and the immediate side shift are displayed. The parameters Balkwill angle, condylar distance and leg length are predefined.



Traces of movement of the incisal point

The movement traces of the incisal point are displayed from occlusal, sagittal and frontal

16 PlaneFinder PS1

The recording is composed of the movements of protrusion, laterotrusion on the left and laterotrusion on the right. The recording results are to be considered differentiated depending on the movement process by the patient. The articulator values are usually performed under tooth contact. This allows the system to determine the value for setting the individual anterior guidance plate. The same applies to the lateral movements, which are then guided over the posterior teeth or canines. This application supports the Zirkonzahn PS1 3D articulator.

16.1 Perform measurement

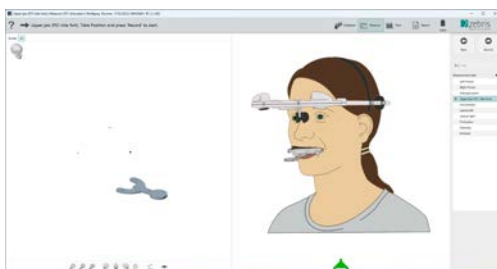


Module selection

Select the PlaneFinder PS1 module on the left and then click the Start button.

16.1.1 Reference plane

The data is related to a plane. To obtain data for the PlaneFinder PS1 system, the reference plane must be set differently from the other images.



PlaneFinder reference plane

The transfer option to the PlaneFinder PS1-3D articulator system makes it necessary to determine patient-specific information, such as the Natural Head Position (NHP) for the exact calculation of the occlusal plane.

Reference points such as the position of the incisal point and the position of the first maxillary molars are determined via the PS1 bite fork. This allows the position of the maxilla to be determined exactly.

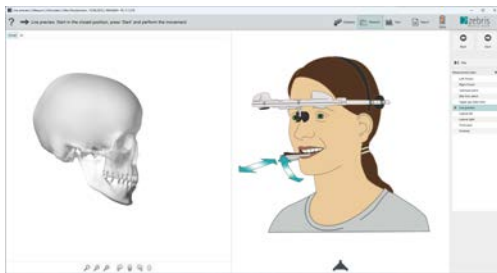
Reference plane Bite fork

The data acquisition for the transfer of the patient data to the CAD/CAM interface PlaneSystem Software Tool, requires the upper jaw position via the bite fork, as well as the determination of the lower jaw position with a bite registration in habitual occlusion.

This acquisition procedure is the only way to ensure that the position of the lower jaw in relation to the upper jaw is correctly reproduced during subsequent processing of the data in the CAD/CAM system.

16.1.2 Measuring Procedure

Somewhat modified as under 3D analysis, the patient is instructed on this exposure, as all movements are performed under tooth contact. The patient performs these under the control of the dentist. The practice of the movement patterns, as well as the controlled standardized execution of the data acquisition, increases the data reliability.

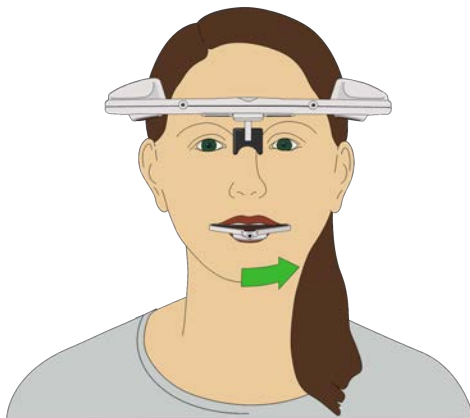


Live Preview

In the Live Preview section, movements can be displayed, checked and illustrated to the patient without saving them. This mode can also be used to practice special functional movements with the patient. The test mode is switched ahead of the acquisition mode.

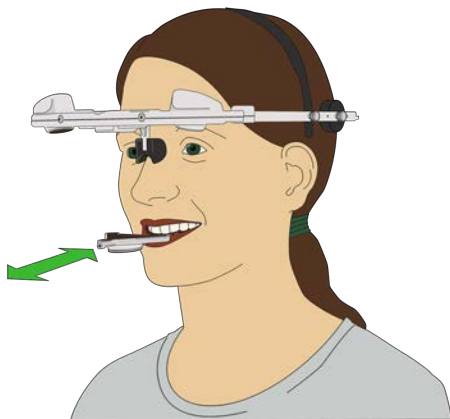
16.1.3 Movement Measurement

In principle, all measuring procedures can be individually designed in the configuration. The following example of some standard movements will guide you through the measurement procedure.



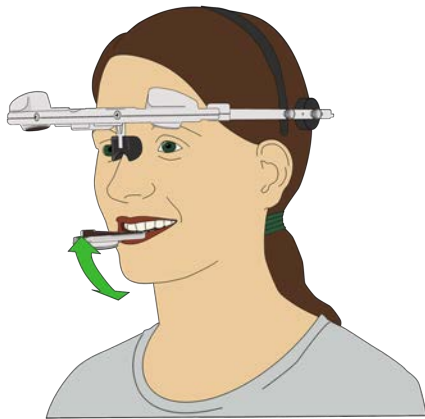
Lateral movement left/right

The Plaster Articulator analysis starts with the left and right lateral movement. The measurement procedure can be started/stopped by the foot switch, the Enter key, as well as by clicking on the Record button of the mouse button. The starting position is always the habitual bite situation. To complete the movement, the patient returns the jaw to the starting position.



Protrusion movement

Have the patient assume the starting position and perform a maximum protrusion movement from this position. The patient then allows the mandible to slide back to the starting position.



Opening movement

The patient assumes the starting position and performs a maximum opening movement. The patient then allows the lower jaw to slide back into the starting position.



A dialog box appears at the end of the measurement.

Discard Record

The measurement is discarded and returns to the preview mode to perform a new measurement.

Save & Repeat

The measurement is saved and returns to the preview mode to perform a new measurement.

Save & Close

The measurement is saved and goes directly to the view of the completed measurement.

16.2 Viewer

In the following, the parameters are explained which can be recorded especially with the function module. The basics for the operation of the view mode are described in the chapter [Edit measurement \(View mode\)](#)⁵⁵.

Measurements with the PlaneFinder PS1 mode

During an exposure in the PlaneFinder PS1mode, only the articulator-relevant data is displayed in the view windows in the view mode. This includes the Model, 3D, Incisal point and Parameters tabs. As well as the reproduction of the condylar path parameters in the Parameters block.

16.3 Report

In the Report mode, the parameters previously defined in the View mode are evaluated and displayed. The basics of using the Report mode are described in the [Report](#)⁵⁹ chapter.

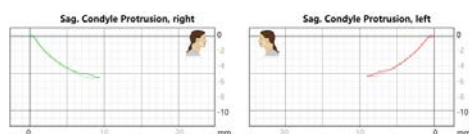
16.3.1 Module-specific parameters

The report consists of the elements described below. Depending on the settings in the exposure settings, certain statements can be read from the report. The patient-specific setting parameters of the PS1 3D articulator are displayed. In this case, the bars with the colors green/red/blue describe the individual data of the patient being treated.

16.3.2 Explanation of the report contents

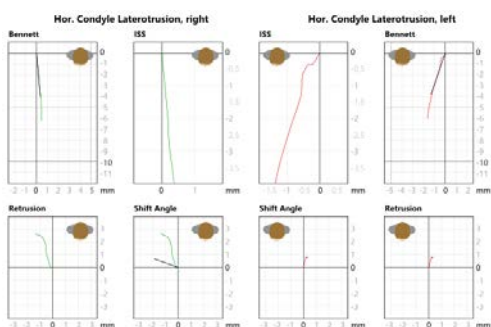
Movement Tracks

The displayed movement tracks are generated from the different movement specifications in relation to both joints and the incisal point. Depending on the selected axis position and reference plane, the condylar paths can be displayed differently in their course and angle.



Sagittal condylar tract imaging

The sagittal condylar path inclination is calculated in such a way that the best possible congruence of the plotted curves with the curvature of the articulator is obtained, particularly in the initial region. The diagrams show the condylar path inclination of the protrusion and opening movements.

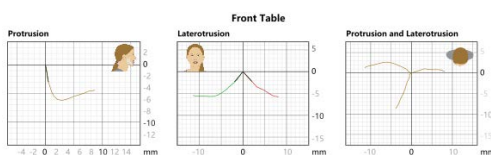


Horizontal condylar path diagrams

The Bennett angle and the Immediate Sideshift are calculated from the possibility of movement of the mediotrusion condyle or oscillating condyle, i.e. the condyle of the non-working side. The lines drawn in black correspond to the averaged curvature of the Bennett insert of the articulator. The colored lines (red and green) correspond to the measured movement traces.

The retrusion is calculated from the sagittal movement of the laterotrusion condyle or resting condyle retro-cranially.

The shift angle controls the condyle from a pure laterotrusion movement of "0°" continuously between a max. latero-retrusion "-20°" and latero-protrusion "+20°".



Front table slideways

At this point, the angles for anterior guidance are displayed. The anterior plate is adjusted according to the displayed curves. In the PS1 3D articulator, the sagittal anterior plate inclination and the inclination to the left and to the right are displayed in the frontal projection.

17 Function Analysis

The individual steps of a 3D analysis are described here using the standard setting. Further movement patterns, their sequence and number can be configured via the acquisition settings.

17.1 Perform measurement



Application selection

In the selection menu of the modules, the corresponding recording method is activated and then the recording process is started via "Start".

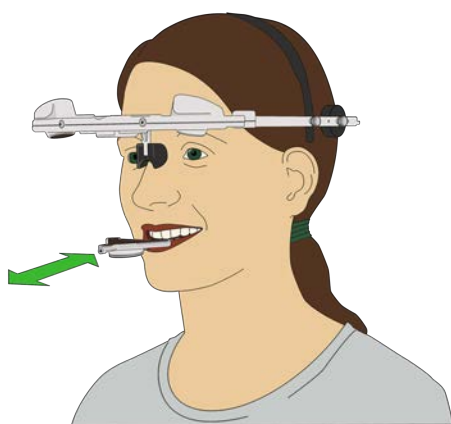
17.1.1 Measuring movements

Depending on the selected movement patterns, their number and their chronology, these are performed with the patient after the preview. In principle, all exposure sequences can be individually designed in the configuration. Using some standard movements as an example, you will be guided through the exposure protocol below.



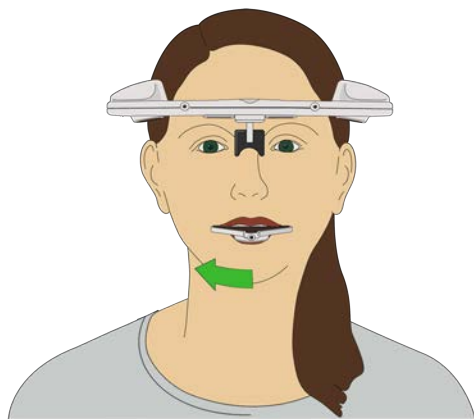
Live preview

In the Live Preview section, movements can be displayed, checked and illustrated to the patient without saving the values. This mode can also be used to practice special functional movements with the patient. The test movement is activated with **Start** and ended with **Stop**. The recording modes of the selected movements then begin.



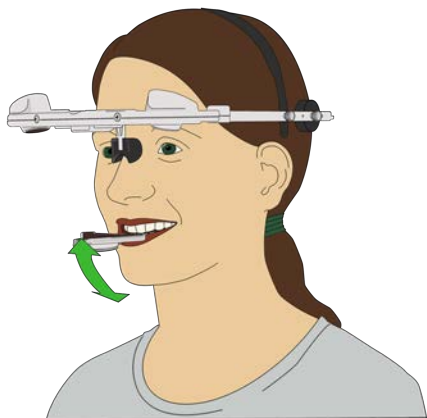
Protrusion movement

The recording starts, for example, with the maximum protrusion movement to be achieved. The measurement process can be started/stopped by clicking on the Start and Stop button using the foot switch, the Enter key, and the mouse button. The starting (reference) position is always the habitual occlusion. To complete the movement, the patient returns the jaw to the starting position, and the exposure process is terminated after the return movement.



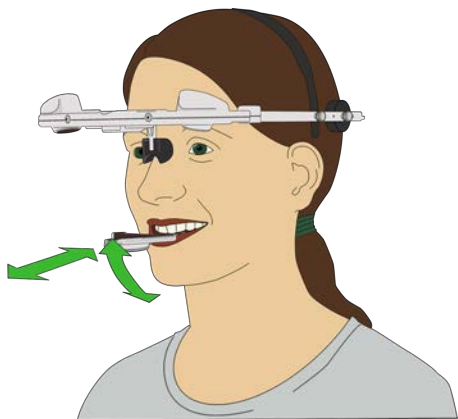
Lateral movement

Let the patient take the starting position and perform a maximum left and right lateral movement from this position. The patient then let the mandible to slide back to the starting position.



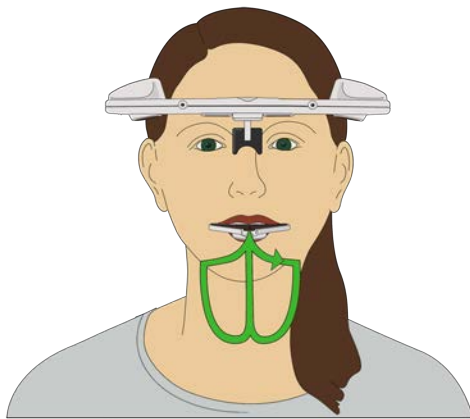
Opening movement

Let the patient take the starting position and perform a maximum opening movement from this position. The patient then let the mandible to slide back to the starting position.



Chewing movement

Let the patient take the starting position and perform a movement in all directions under tooth contacts. The patient then let the mandible slide back to the starting position.



Posselt frontal, Posselt sagittal and user-defined movement patterns

Further optional motion pattern are done analogue to previous described movements.



At the end of the measurement, a dialog box appears with the following options:

Discard Record

The measurement is discarded and returns to the preview mode to perform a new measurement.

Save & Repeat

The measurement is saved and returns to the preview mode to perform a new measurement.

Save & Close

The measurement is saved and goes directly to the view of the completed measurement.

17.2 Viewer

In the following, the parameters are explained which can be recorded especially with the function module. The basics for operating the view mode are described in the chapter [Edit measurement \(View mode\)](#)⁵⁵.

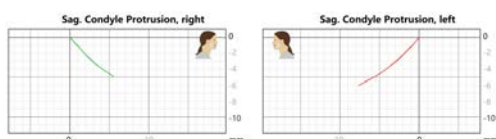
17.3 Report

The report consists of the elements described below. Depending on the specifications in the admission settings, certain statements can be read in the report. The motion data in all spatial directions are queried and displayed in the context of scientifically based mean values. In this case the bars with the colors green/red/blue describe the individual data of the measured patient, which can be immediately compared with the mean values (green pastel shade). This helps the user to be able to make a basic statement as to whether there is a functional disorder or restriction. Basic functions of the report are described in the chapter [Report](#)⁵⁹.

17.3.1 Explanation of the report contents

Motion recording

The displayed movement traces are generated from the different movement specifications in relation to both joints and the incisal point. Depending on the selected axis position, as well as the reference plane, the condylar paths can be displayed differently in their course and angle.



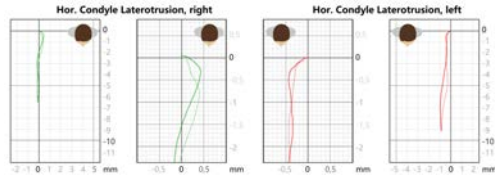
Condylar tracks at jaw opening, sagittal view

The diagrams show the condylar movement during the recording of an opening movement.



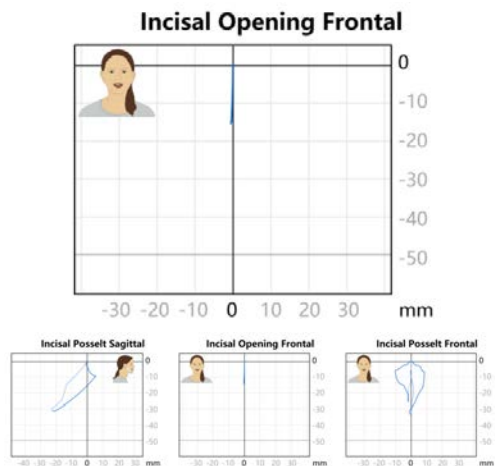
Condylar tracks during protrusion, sagittal view

The diagrams shown each show the condylar movement during the recording of a protrusion movement.



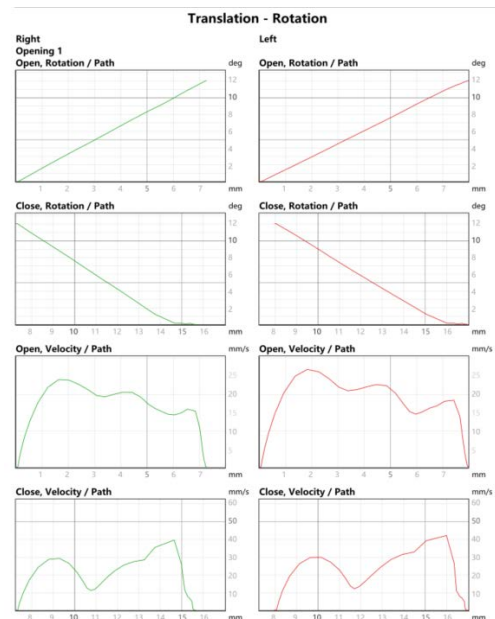
Horizontal condylar tracks, cranial view

The diagrams show the condylar movement during the recording of a laterotrusion movement.



Incisal at jaw opening, frontal/ sagittal view

The diagrams shown in each case show the course of the incisal point during the recording of an opening movement.



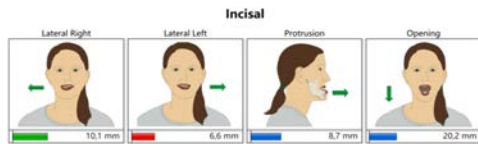
Translation - Rotation

"Opening, rotation" (degrees) / "Closing, rotation" (degrees)

The diagrams show the mouth opening or jaw rotation angle as a function of the speed of the movement. Due to the type of line course, conclusions can be drawn about a trouble-free jaw movement. In the case of a homogeneous movement, the diagram shows a largely smooth and rising curve.

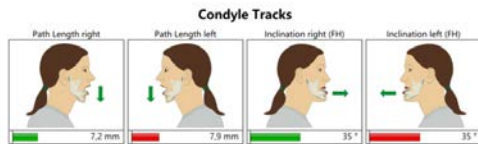
"Opening, speed" (mm/s) / "Closing, speed" (mm/s)

The solid green line represents the speed curve of the right side during mouth opening and closing. The red curve shows the left side. With undisturbed movement of the intercondylar axis, the curves present themselves in a bell shape.



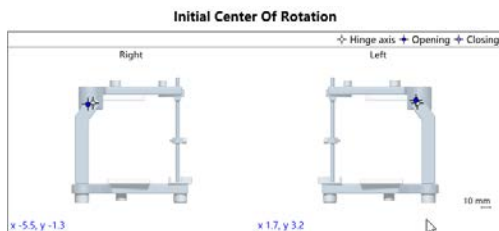
Incisal point

The bar graphs show the extent of the range of motion starting from the incisal point in the frontal and sagittal projections, in left and right laterotrusion, and in protrusion and mouth opening.



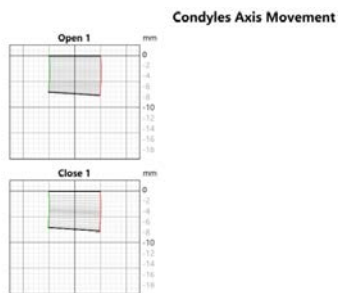
Condyle tracks

The bar graphs show the path length and path inclination of the two condyles during protrusion movement.



Initial center of rotation

The Initial center of rotation tab, the position of the rotation axis during opening and closing is shown in relation to the mean determined rotation axis during the opening movement.



Condylar axis movement

The diagrams shown are phase representations of the intercondylar axis of the opening and closing movements.

18 CMDfact® Interactor

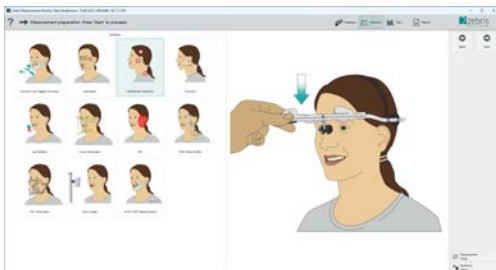
The "CMDfact® Interactor" module enables the functional movement space (movement capacity) and the coordination of mandibular movements to be recorded and evaluated.

It is possible to obtain an impression of the coordination of movement execution via the speed of the condyles in the course of movement. For this purpose, the movement information from the opening and closing movement is specially processed.

As a rule, the speed (acceleration) increases during the opening movement, followed by a decrease in speed when the maximum opening position is reached. In the closing movement, the whole thing is repeated, whereby one first records an increasing and then a decreasing acceleration. A physiological velocity curve is characterized by a largely single-peaked course of the velocity curve during jaw opening and jaw closing.

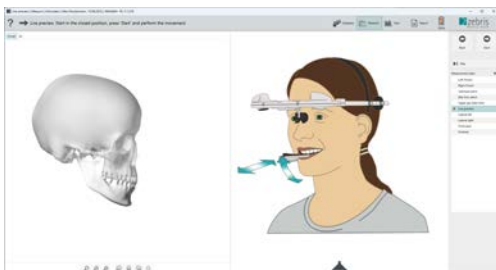
Deviating from this, the condylar velocity behavior can be characterized by two- or multi-peaked profiles, respectively related to jaw opening or jaw closing. Two- and multi-peaked velocity profiles indicate temporary velocity losses due to arthrogenic, sometimes also myogenic problems. Velocity losses during movement related to the right and/or left temporomandibular joint can be interpreted as dysfunction characteristics if they occur repeatedly.

18.1 Perform measurement



Module selection

Select the CMDfact® Interactor module on the left and then click the Start button.

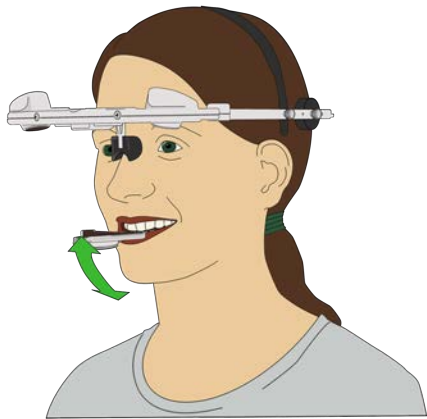


Live Preview

In the Live Preview section, movements can be displayed, checked and illustrated to the patient without saving the values. This mode can also be used to practice special functional movements with the patient. The test movement is activated with **Start** and ended with **Stop**. The recording modes of the selected movements then begin.

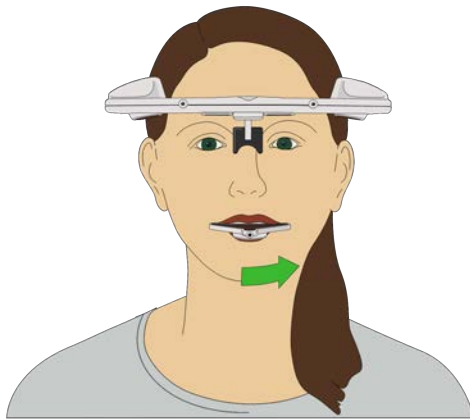
18.1.1 Measuring Movements

Depending on the selected movement patterns, their number and their chronology, these are performed with the patient after the preview. In principle, all exposure sequences can be individually designed in the configuration. Using some standard movements as an example, you will be guided through the exposure protocol below.



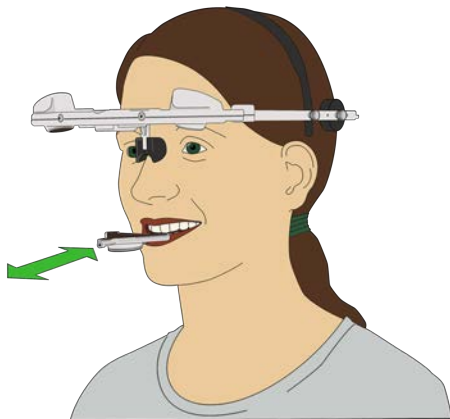
Opening movement

The CMDfact® Interactor measurement starts, for example, with the maximum opening movement to be achieved. The acquisition process can be triggered by clicking on the Start button using the foot control, the Enter key and the mouse button. Have the patient assume the starting position and perform a maximum opening movement from this position. The patient then allows the lower jaw to slide back into the starting position.



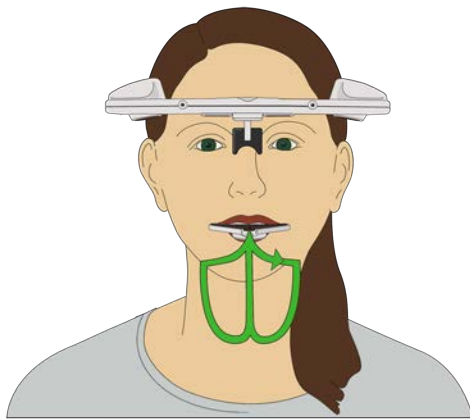
Lateral movement

Recording of the left and right lateral movement. The starting position is always the habitual final bite situation. To complete the movement, the patient guides the jaw back to the starting position, ending the acquisition process after the return movement.



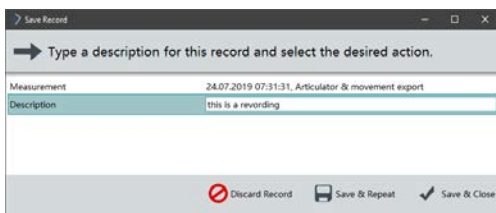
Protrusion movement

Have the patient assume the starting position and perform a maximum protrusion movement from this position. The patient then allows the mandible to slide back to the starting position.



Chewing, posselt frontal, posselt sagittal and user-defined movement patterns

The other optional movement patterns are performed in the same way as the movements described above.



At the end of the measurement, a dialog box appears with the following options:

Discard Record

The measurement is discarded and returns to the preview mode to perform a new measurement.

Save & Repeat

The measurement is saved and returns to the preview mode to perform a new measurement.

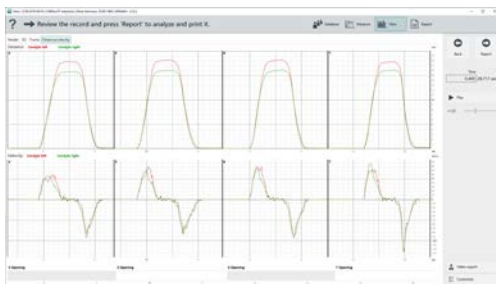
Save & Close

The measurement is saved and goes directly to the view of the completed measurement.

18.2 Viewer

In the following, the parameters are explained which can be recorded especially with the interactor module. The basics for operating the view mode are described in the chapter [Edit measurement \(View mode\)](#)⁵⁵.

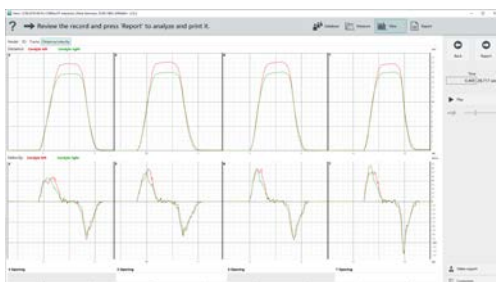
18.2.1 Module-specific parameters



Path / Speed

The Path/Speed tab shows the condylar course during the opening and closing movements. Independent of the other recorded movements, only data of the opening and closing movement is evaluated in this tab.

An example of a single-peaked velocity curve is shown on the left.



If several opening movements are recorded in one measurement, they are shown in series

Further information on this diagram can be found in the following publication: "Motion analysis of the mandible: guidelines for standardized analysis of computer-assisted recording of condylar movements" (International Journal of Computerized Dentistry 2015;18(3); 201-223.

18.3 Report

In the Report mode, those results CMDfact® Interactor measurement are evaluated and displayed which were previously defined in the View mode. The basics for operating the Report mode are described in the [Report](#) ⁵⁹ chapter.

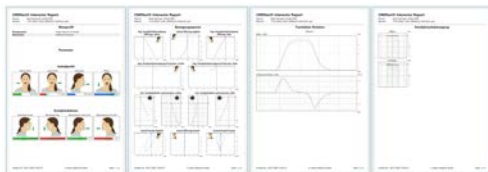
18.3.1 Module-specific parameters

The report consists of the elements described below. Depending on the specifications in the exposure settings, certain statements can be read from the report. The movement data in all spatial directions are queried and displayed in each case in the context of scientifically based mean values. In this case, the bars with the colors green/red/blue describe the individual data of the measured patient, which can be immediately compared with the mean values (green pastel shade). This helps the user to make a basic statement as to whether a functional disorder or restriction is present.

18.3.2 Explanation of the report contents

Motion recording

The displayed movement traces are generated from the different movement specifications in relation to both joints and the incisal point. Depending on the selected axis position, as well as the reference plane, the condylar paths can be displayed differently in their course and angle.



Report structure

The CMDfact® Interactor Report is based on the structure of CMDtrace.

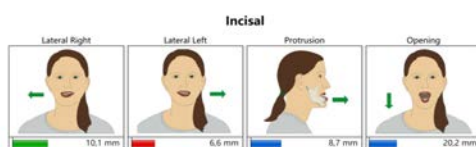
The report template is divided into five sections:

- Measurement profile
- Parameters
- Motion traces
- Translation - Rotation diagrams
- Condylar axis diagrams

Measurement profile	
Condyles defined by	Hinge axis
Measurement mode	Articulator & movement export
Comments	Testpatient Schmerzfrei CMD

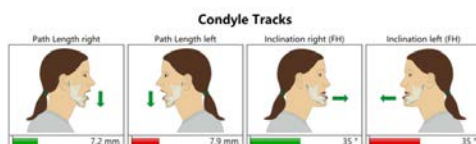
Measurement profile

The Measurement profile section shows the method used to define the reference plane and the module used to perform the measurement.



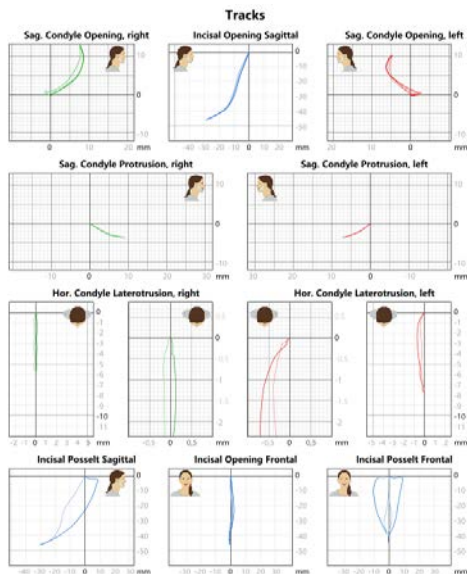
Incisal point

The bar charts show the extent of the range of motion starting from the incisal point in the frontal and sagittal projection, in left and right laterotrusion, and in protrusion and mouth opening.



Condylar trajectories

The bar graphs show the path length and path inclination of the two condyles during protrusion.



Condylar path during protrusion, sagittal view

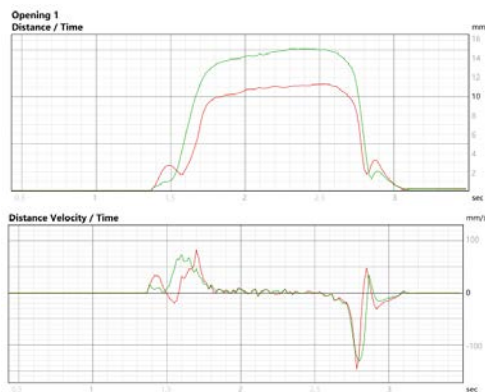
The diagrams shown each show the condylar movement during the recording of a protrusion movement.

Horizontal condylar path, cranial view

The diagrams show the condylar movement during the recording of a laterotrusion movement.

Incisal at jaw opening, frontal/ sagittal view

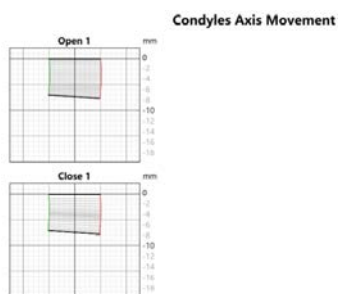
The diagrams shown in each case show the course of the incisal point during the recording of an opening movement.



Translation - rotation

The diagrams show the mouth opening or jaw rotation angle as a function of the speed of the movement. Due to the way the lines are drawn, it is possible to draw conclusions about a smooth jaw movement. In the case of a homogeneous movement, the diagram shows a single-peaked speed curve.

The condylar course during the opening and closing movement is shown here. Irrespective of the other recorded movements, only data from the opening and closing movement is evaluated in this diagram.

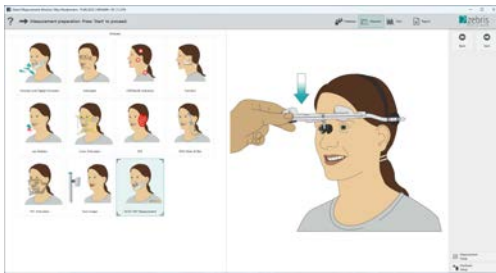


Condylar axis movement

The diagrams show phase representations of the intercondylar axis of the opening and closing movements.

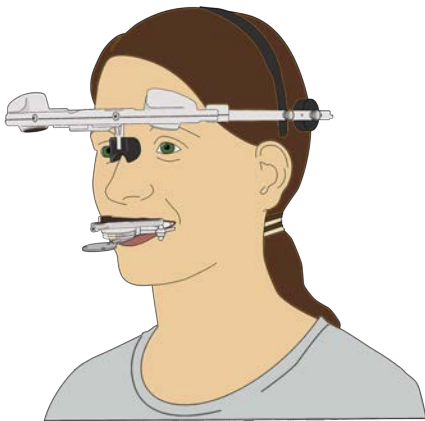
19 SICAT JMT MEASUREMENT

19.1 Perform measurement



Module selection

Select the SICAT JMT MEASUREMENT module on the left and then click the Start button.



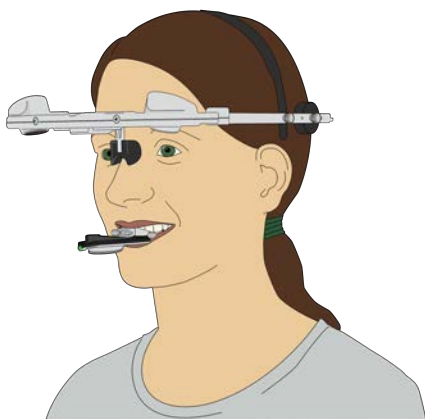
Recording the position of the upper jaw

Before recording the lower jaw movement data, the position of the upper jaw must be determined with the help of a special bite fork.



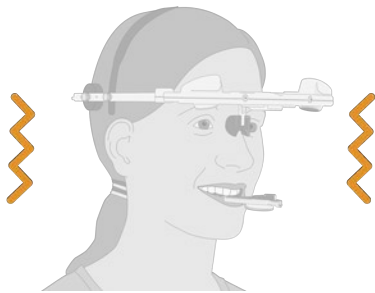
Live Preview

In the Live Preview section, movements can be displayed, checked and illustrated to the patient without saving the values. This mode can also be used to practice special functional movements with the patient. The test movement is activated with **Start** and ended with **Stop**. The recording modes of the selected movements then begin.



Position of the mandibular bite fork

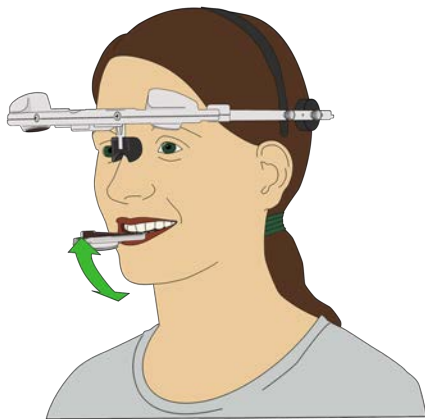
Following the determination of the upper jaw position, an additional measurement is carried out with the upper jaw and lower jaw bite fork at the same time. For this purpose, the bite fork is left in the upper jaw and the lower jaw bite fork is additionally inserted. This measurement is required for the subsequent handling check. Here the user has the possibility to check whether the head bow or the attachment has moved during the measurement.



Handling Check

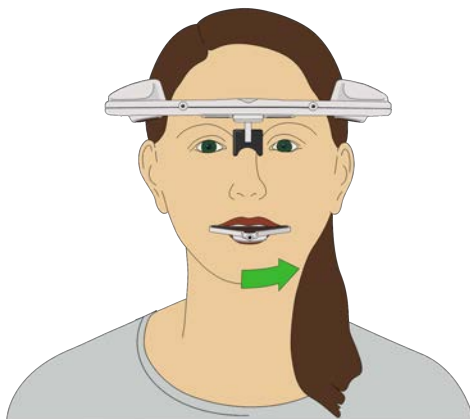
In the inconsistency check, both measurements (upper jaw and lower jaw) are repeated following the measurement of the movement data. If there are deviations, the user is prompted to repeat the measurements. The tolerance with regard to the deviations can be edited in the measurement settings.

19.1.1 Measuring movements JMT



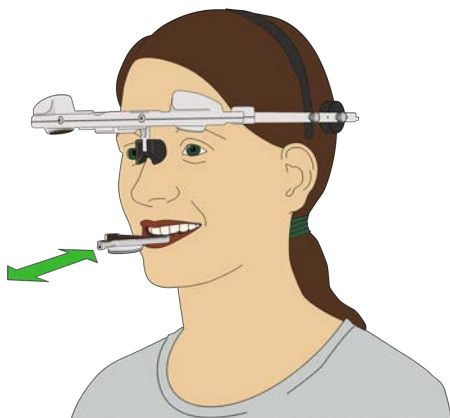
Opening movement

The SICAT JMT MEASUREMENT starts, for example, with the maximum opening movement to be achieved. The recording process can be triggered by clicking on the start button with the foot switch, the enter key and the mouse button. Have the patient assume the starting position and perform a maximum opening movement from this position. Afterwards, the patient lets the lower jaw slide back into the starting position.



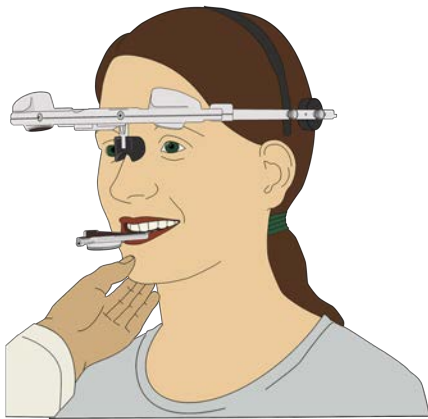
Lateral movement

Recording of the left and right lateral border movement. The starting position is always the habitual final bite situation. To complete the movement, the patient guides the jaw back to the starting position, ending the recording process after the return.



Protrusion movement

Have the patient assume the starting position and perform a maximum protrusion movement from this position. The patient then lets the lower jaw slide back to the starting position.



Guided opening

The guided opening movement is necessary to calculate the hinge axis in the sicat function suite. Via an opening and closing movement of 10-18 mm, the patient performs a pure rotational movement in the terminal condylar position.



After the end of the measurement, a dialogue window appears with the following options:

Discard Record

The measurement is discarded and returns to the preview mode to perform a new measurement.

Save & Repeat

The measurement is saved and returns to the preview mode to perform a new measurement.

Save & Close

The measurement is saved and goes directly to the view of the completed measurement.

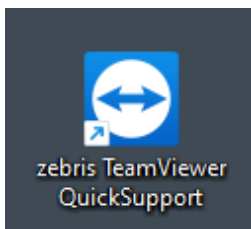
19.2 Viewer

In the following, the parameters are explained which can be recorded especially with the SICAT JMT MEASUREMENT. The basics for operating the view mode are described in the chapter [Editing the Measurement \(View Mode\)](#) ⁵⁵.

20 Troubleshooting

This section contains error messages that occur and the corresponding solution suggestions. If an error message occurs, the solution suggestions given are helpful. If this does not produce the desired solution to the problem, contact customer support.

20.1 zebris TeamViewer QuickSupport



zebris TeamViewer Quicksupport is installed with the installation program and creates a shortcut on the desktop.

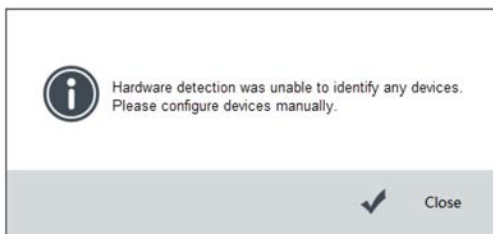
20.2 General

"3D view cannot be created (OpenGL x.y)"; or: "OpenGL error code - 1285."

Possible cause	Solution
OpenGL 4.6 not supported	During the software installation it is checked if your graphics hardware supports OpenGL 4.6, that is necessary for the correct execution of the software.
Graphics driver has been changed	If you receive this error message after the installation, you may have two graphics chips or your graphics driver has been changed in the meantime. Systems with two graphics chips usually offer a switching option. In case of a driver change, please update the graphics drivers.
Minimum requirements/specifications not met	You must determine whether your PC meets the minimum required hardware specifications. This information can be found in the chapter System requirements^[17] of this manual.

"Timeout reading from USB."

Possible cause	Solution
USB cable not plugged in	Connect the USB cable of your device to the PC
Device not switched on	Switch on the device with the corresponding switch or establish the power supply via the power supply unit. Please refer to the hardware user manual for details.

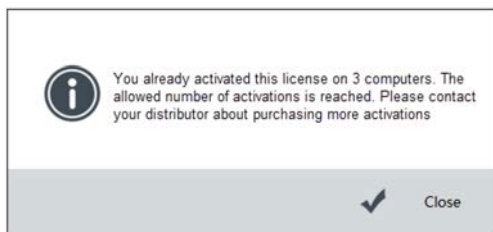


Device detection fails

No devices could be detected. If you have already plugged in the devices, please check the power supply and switch on the plugged-in devices.

You can manually add devices to a profile by clicking Close.

"Further activation is not possible."



Standard license can be activated on maximum three different PC free of charge. Customer wants to activate it on the fourth PC.

License extension can be purchased for additional activation.

"Unknown data format [...].object."

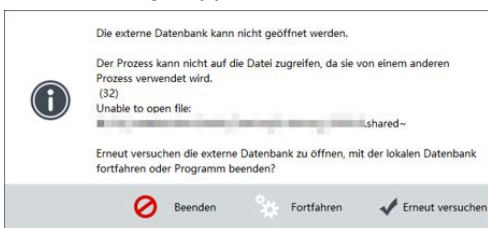


Database is defective, customer backup is necessary.
To solve the problem, first create a backup of your patient database.

- Uninstall WINJAW+
- Directory must be renamed: "C:\ProgramData\zebris\WINJAW+_damaged"
- Reinstall WINJAW+ software

"External database cannot be opened."

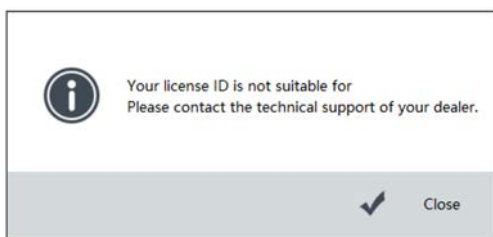
When starting the software, the following error message appears:



External database has already been started on another PC

- close WINJAW+ on all other PC systems and restart WINJAW+ software on your PC
- First work locally on your PC, then merge your data with the external database using the "Backup/Restore" function

"License ID is not compatible with the software version."



Each license code is associated with a specific OEM vendor software. This message indicates that the software key sent does not match the software version supplied.
Contact your dealer's support to solve the problem.

"Could not check for software updates."

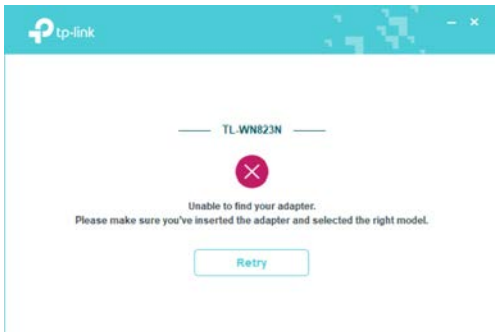


To check for software updates, make sure that your PC has an active Internet connection.

Check your wireless connections or your LAN connections, if applicable, and try the update again.

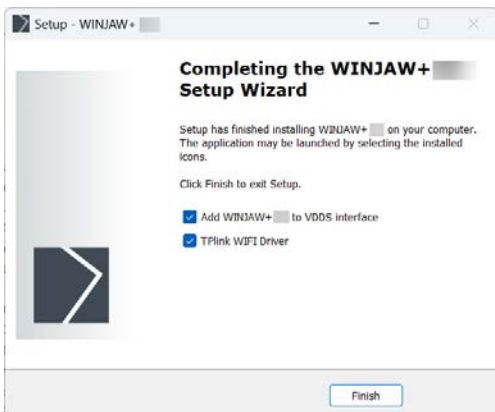
20.3 Installation

"Adapter could not be found."



The following dialog appears during the installation.

Please make sure that the supplied WLAN adapter is connected to your PC.



If you do not want to install the drivers for the WLAN adapter, you can set the selection during the installation so that this step is skipped.

"Error during installation."

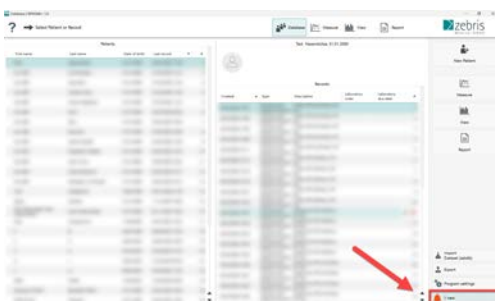


The following dialog appears during installation.

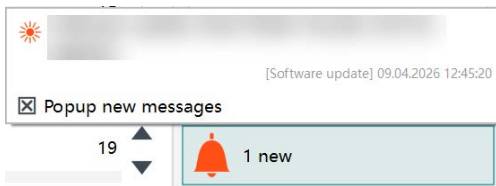
The WINJAW+ software can only be installed from systems with Windows versions that support 64bit architectures.

You must determine if your PC meets the minimum hardware specifications (see [System Requirements](#) ¹²).

20.4 Notifaction Center



The notification center is located in the bottom right corner of the WINJAW+ Software



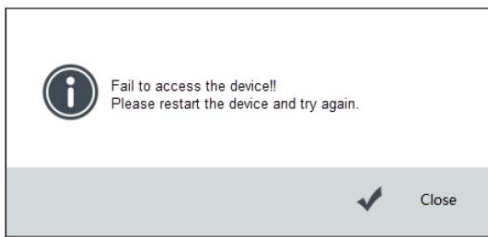
Double-clicking on the notification opens the full text of the notification, as well as the release notes if the notification is an update. (More information about the update installation can be found in chapter Update installation)

Possible notifications can contain:

- Information or warnings about Updates (Software update check failed, update is available, download is ready, update failed)
- Warnings about incompatible data set-formats (e.g. in the Attachment Designer module)
- Warnings about incompatible data (e.g. scan models)

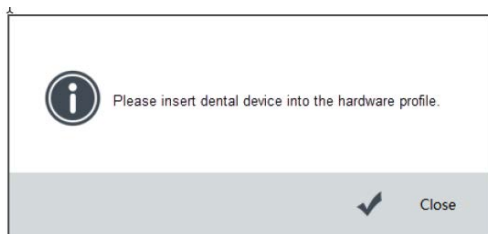
20.5 Perform Measurement

"Error accessing the device."



When starting the measurement, this dialog appears. Make sure that the system is connected and switched on. Add your system via the device manager and restart the acquisition.

"Add device in the device settings."



When selecting the measurement settings, this dialog will appear. Please make sure you have turned on your system, check the device settings and select your system again to add it to the current session.

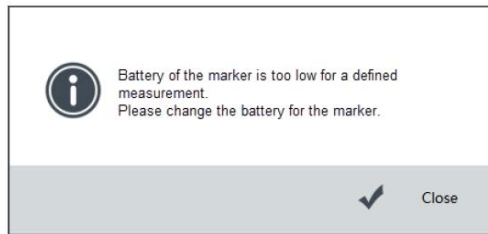
"The battery charge is too low!"



When starting the measurement, this dialog appears. Make sure that the system has sufficiently charged batteries. To be able to perform the measurement, place the system in the charging station or connect the system to your PC via the USB cable.

- 40min Duration Measurement
- Average measurement time 1 min
- 40 measurement possible without charging

"Battery of mandibular sensor is too low for measurement."



This dialog appears when starting the measurement.

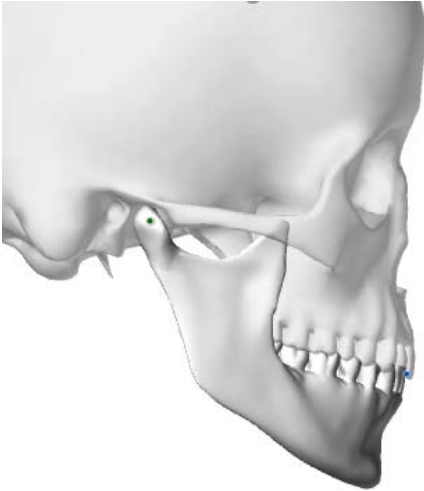
Open the battery compartment with the supplied tool (TORX T6) and insert a new button cell battery (type CR1632).

Start the measurement again.

- 50 h continuous measurement
- Average measurement time 1 min
- 3000 measurements possible without changing the battery

"Lower jaw of 3D skull moves upwards."

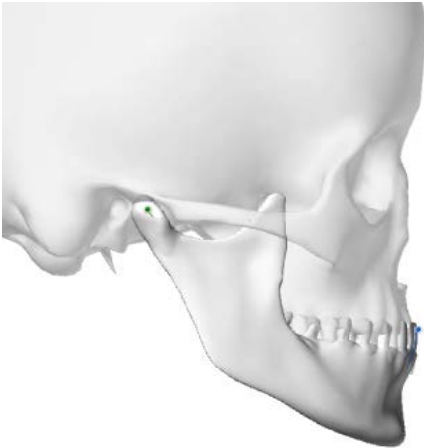
State before movement



When referencing the reference system, "left" and "right" were confound.

Repeat the measurement and pay close attention to the WINJAW+ software instructions.

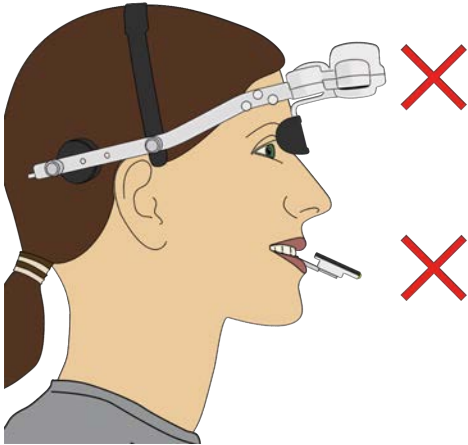
State during opening movement:



20.6 Output values

"Output values are not correct or are not displayed in the report".

If the output values are not displayed correctly in the view or in the report, this can have various reasons.



- Measuring system was not placed on the patient's head as recommended
- Head bow is too low or too high on the patient's head.
- Paraocclusal attachment was not placed parallel to the occlusal plane.



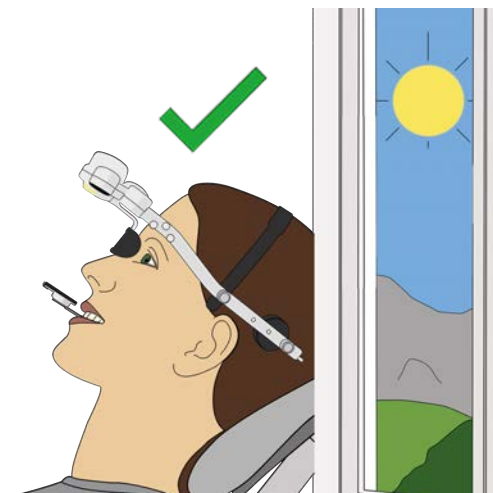
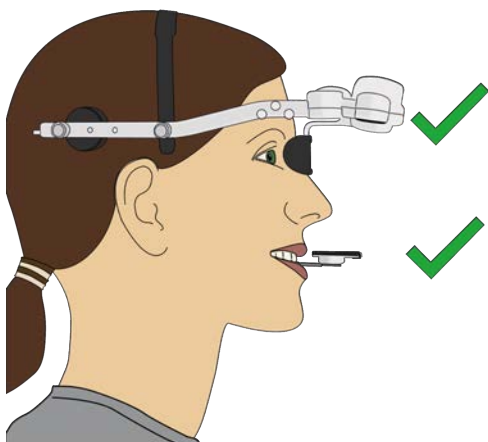
Disturbance of the system during measurement due to direct sunlight on the treatment center.



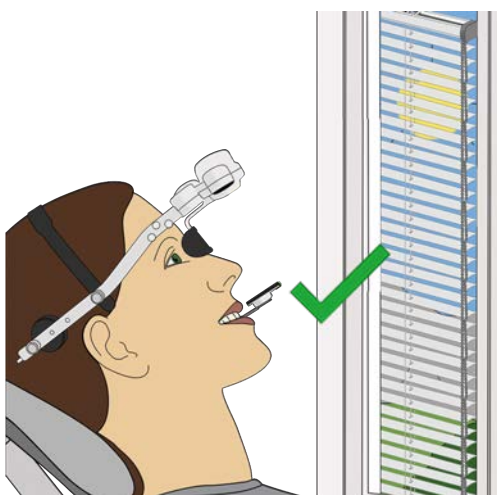
The results include non-physiological cranial movements of the virtual condyles (1), as well as interruptions and jumps (2) within the movement paths.

These problems can be solved by the following measures:

- Properly place the measuring system on the patient.
- Remake the paraocclusal attachment, ensure that it is aligned parallel to the occlusal plane and repeat the measurement.



Reposition the patient or ensure that no direct sunlight is possible on the treatment area.



20.7 WiFi connection does not work

Identify the type of wifi connection. The WINJAW+ supports 2 types of wireless connection between JMA-Optic and the PC.

- Connection JMA-Optic and Wireless Link Adapter (REF01870100)
- Connection JMA-Optic and WLAN USB adapter TP-Link WN823N (REF21030010)

From software version 5.0 is supplied as standard with the purchase of the Wireless Link Adapter (REF01870100). Systems purchased before August 2023 have the TP-Link WLAN USB adapter included in the package.

WLAN USB adapter TP-Link WN823N
(REF21030010)



Wireless Link Adapter (REF01870100)



The WiFi connection will only work if the supplied WiFi stick is used.

In case of WLAN USB adapter TP-Link WN823N (REF21030010):

1. Make sure that the WLAN stick is connected via USB before booting the computer.
2. If the WLAN stick is not plugged in when the computer is started, the computer must be restarted with the WLAN adapter plugged in.
3. If the message "Service is not running, WLAN connections are not possible" appears when opening the device settings, this can possibly be remedied by restarting the computer. If necessary, the driver software supplied on the WLAN stick must be reinstalled.

In case of Wireless Link Adapter (REF01870100):

1. Make sure that the Adapter ist plugged In right and the green led is on.
2. Start the zebris Hardware setup, remove the Device from the left side, select the USB-Device and repeat the device pairing like described in [Connection via Wireless Link Adapter](#) ⁴⁵

20.8 JMAAnalyser - Measurement does not start



One Status LED is red

A marker is defective and the system must be sent to the dealer for repair.



Two adjacent status LEDs are red

A microphone or a microphone segment is defective and the system must be sent to the dealer for repair.



all four status LED's are red

Possible causes may be

- The mandibular sensor is not plugged in.
- The ultrasonic markers of the sensor are covered
- Cable break

In any case, you should contact your dealer.

21 Data import interfaces

WINJAW+ provides some interfaces for data exchange with other software packages, such as practice management software. To find out whether your software is capable of one of these interfaces, please refer to the manufacturer's information.



Mandatory data for the patient database in the WINJAW+-software, the patient's first name, last name and, since version 1.10, date of birth. If images are transferred from older software packages that do not contain a date of birth, the field initially remains empty. However, if a date of birth is required for an action, you will receive a corresponding message.



In each case, the setup of the interface, as well as the available scope, are described below. If the interface is provided by multiple vendors, your third-party vendor's software is referred to below as **third-party software**.

21.1 vdds media

The VDDS media 1.4 interface is officially supported. Further information about this interface can be found directly at VDDS (https://www.vdds.de/wp-content/uploads/vdds_media_1_4_monitor.pdf).

The Patient Management System (PVS) is always the leading system. You maintain patients exclusively in the PVS. The following messages can occur when you start the WINJAW+ from the PVS system.

	Bestand WINJAW+	Änderung durch PVS
Code	1_0	1_0
Vorname	Peter	Peter
Nachname	Beispiel	Beispiel
Geburtsdatum	03.09.1950	03.09.1950

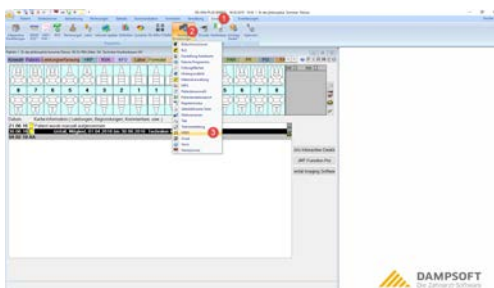
The last name has changed in the PVS system. WINJAW+ checks the name fields and displays a message that the patient name in the WINJAW+ is also updated.

	Bestand WINJAW+	Änderung durch PVS
Code	1_0	1_0
Vorname	Peter	Peter
Nachname	Beispiel	Beispiel
Geburtsdatum	05.09.1950	03.09.1950

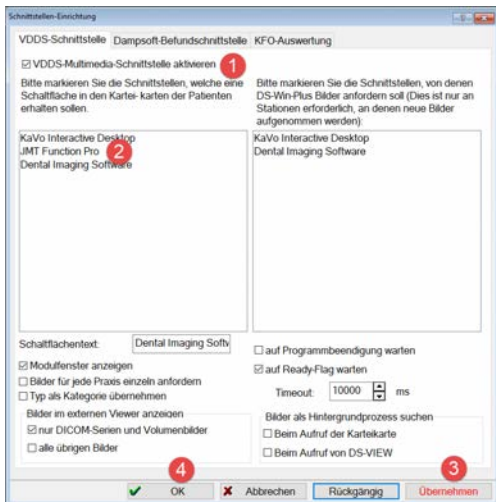
The date of birth has changed in the PVS system. WINJAW+ checks the date of birth and issues a message that the date in the WINJAW+ will also be updated.

21.1.1 Configure VDDS

Configuration of the VDDS 1.4 interface using the example of Dampsoft



1. Open Settings tab
2. Select other settings
3. Select VDDS



1. Activate VDDS
2. WINJAW+ select
3. Apply settings
4. Confirm with "OK"



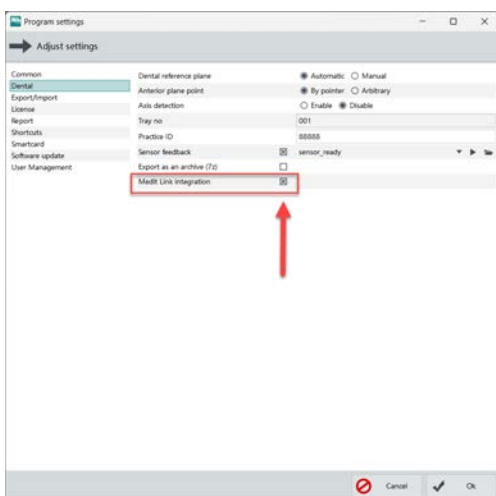
Take over of the patient by clicking on the WINJAW+ button

21.2 MEDIT Interface

There are two options to connect the WINJAW+ Software with the MEDIT-Link Software.

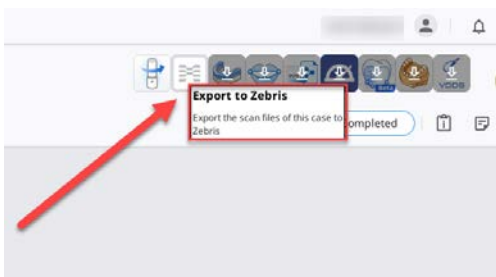
The two workflows depend on the availability of the Scan data. The scan data have to be available for the Export from MEDIT.

21.2.1 Export from MEDIT

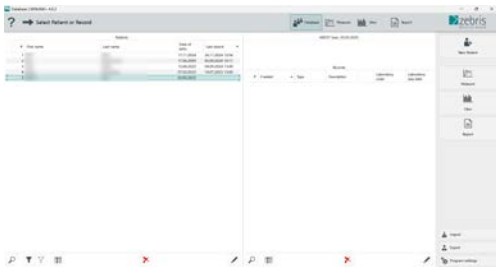


Activation of the interface in the WINJAW+ program settings:

- Database → Program settings → Dental App Setup → MEDIT Link Integration



Open the scan data in MEDIT-Software →
Click on Export to zebris



- WINJAW+ is opened
- Patient information and Scans are imported
- Scans are already stored when a measurement is started

21.2.2 Import to WINJAW+



MEDIT-Software is started from WINJAW+:

- Database →
- Import →
- Get MEDITlink tooth surface →
- MEDIT-Software is opened

New Case Information

Patient Name*

Case Name*

Creating patient information involves consent from the patient.
Patient information can be shared with 3rd parties while placing an order.

Tags

You can add the entered tag with Enter or Spacebar.

You can add up to 10 tags of 100 characters or less.

[Terms & Conditions](#)

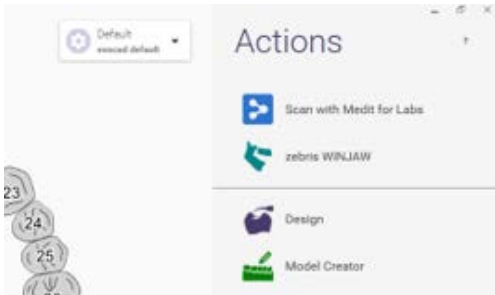
Cancel Register Register & Scan

New case can be started:

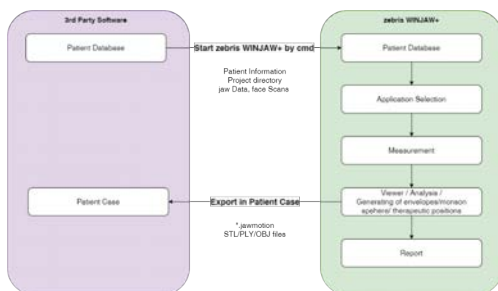
- Import of the patient data from WINJAW+ →
- Recording the Scans →
- Export of the scan data to WINJAW+

21.3 exocad

Function to start the WINJAW+ from the exocad database. The patient will be automatically imported and all exports are assigned to the selected exocad case.



If exocad software is installed on the measuring computer, the zebris icon is displayed in 'Actions'.



If you start the WINJAW+ software from exocad, the patient is transferred into the WINJAW+ software so that the patient does not have to be entered twice.

If an export is carried out within a session, all exports automatically end up in the exocad case of the respective patient.

22 Data export interfaces

WINJAW+ provides an interface for further processing and evaluation of the recorded data with CAD/CAM programs.



Mandatory data for the patient database are specified in the WINJAW+-software the first name, last name, and date of birth of a patient.

22.1 zebris - own formats

For zebris Medical GmbH - own formats, the naming is suggested as follows:

[date of birth YYYYMMDD][first letter first name][first letter last name]_[date of recording YYYYMMDD]-[recording time HHMMSS]_[module name]_[export name (optional)]-[type (optional)]-[subtype (optional)]_[numbering if files with the same name already exist at the destination (optional)].[file extension].

If you have selected a default path in the program settings, the data file will be stored directly in this path. If this is not the case, a task window opens after pressing the button to manually specify a suitable storage location.

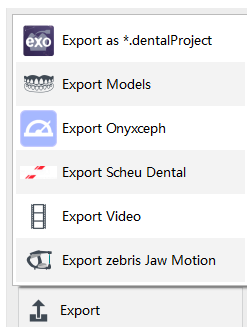
In the measurement application there are 6 different export options in total

- XML - zebris jaw motion export
- CSV export from the report
- CSV export (raw data) from the database
- Video export
- STL - export of mesh/3D models
- dentalProject - prepared data for exocad

22.1.1 XML - Jaw Motion Export

The XML data format is intended for further processing by software packages with XML parser function, which have been coordinated with zebris

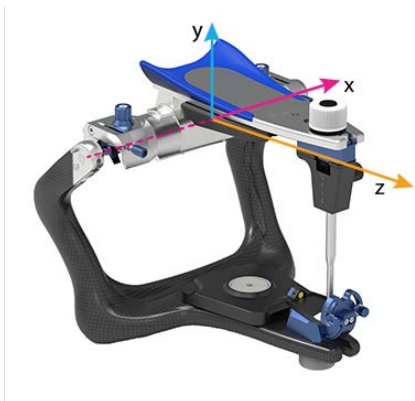
Virtual articulator settings export



This export is available if the acquisition mode "Articulator and Realmovement" or "Function and Digital Occlusion" was selected in the measurement settings.

The generated export file contains the position of the maxilla in the articulator, patient-specific movement paths, articulator setting values and range of motion parameters for laterotrusion, protrusion and opening movement.

Please note that the Jaw Motion Export is only available when a Bite fork was used in the measurement.



Description of the coordinate system of the XML file based on the Amann Girrbach Artex articulator.

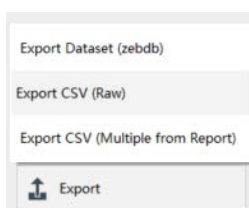
22.1.2 CSV export from the report

This export interface is available in Database mode.

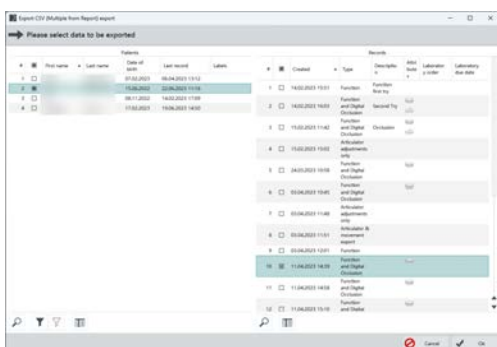
All curves visible in the report are each output as a single CSV file (comma separated values). The format for the CSV file can be selected. Separate CSV files are also created for parameters and patient or measurement information. This file can be opened and edited in a simple way, e.g. in Excel as a table.

The first line contains all designations, starting with the patient and admission information. The standard deviation of parameters is displayed as an extra column, with the name of the parameter and the addition "SD" (standard deviation).

Text qualifiers are the quotation marks ("), separator is the semicolon (;), the default is taken from the defaults of your operating system, you can choose another separator when exporting if necessary.



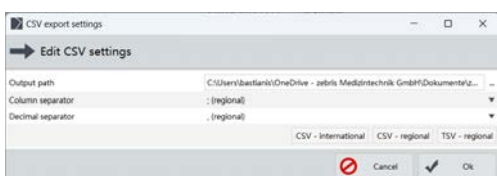
In the first step, open the Database and press the Export button. Click Export CSV (Multiple from Report).



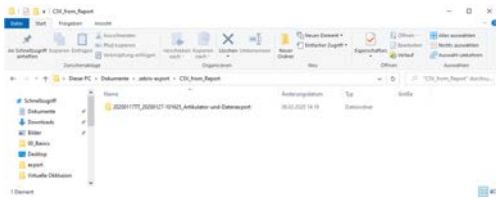
Select the patient or the recording to be exported.

Here you have the additional possibility to search for patient, code or type of measurement and description of the measurement with the quick search.

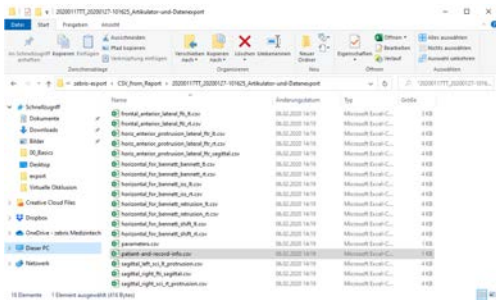
Confirm the selection with OK.



In the next step you have to define the output directory, separator and decimal separator. The default settings are taken from the defaults of your operating system. Confirm with "OK".



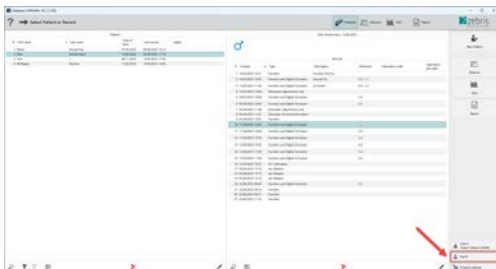
In the export directory, a separate directory is created for each measurement. This directory contains the CSV files for this report.



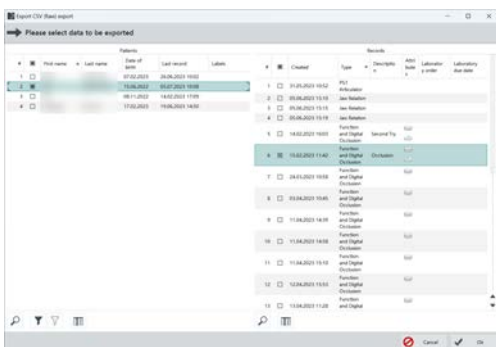
22.1.3 CSV export (raw data) from the database

This export interface is available in the database .

With this export it is possible to receive the raw data of the measurement in CSV format. Raw data means that any defined point, e.g. condylar, incisal or even an anatomical point, can be selected and exported in the export dialog. Text qualifiers are the quotation marks ("), separator is the semicolon (;), the default is taken from the defaults of your operating system, you can choose a different separator when exporting if necessary. The data will be exported in the recorded coordinate system.



Start CSV raw data export in the database by clicking on Export. Click Export CSV (raw).

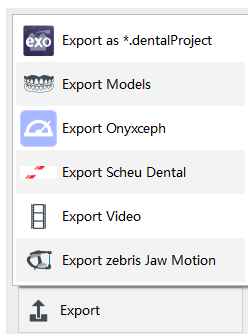


Select the patient or the recording to be exported.

Here you have the additional possibility to search for patient, code or type of measurement and description of the measurement with the quick search.

Confirm the selection with OK.

22.1.4 Video Export



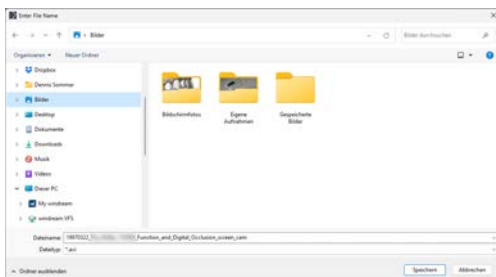
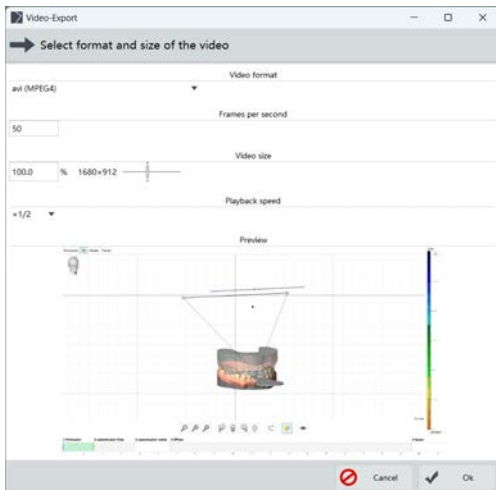
This function allows you to create a video of the displayed image in View mode.

In the video, all buttons are removed and the display elements are shown according to your setting. When you call the function, you will see a preview image of the video and you can make settings that affect the created video.

Video format If your video player has problems playing the video, you can select a different file format here. Please note that the resulting file size varies due to different compression of the formats.

Dimensions (resolution) Here you can change the image size of the video, default setting is the size available on your monitor (100%).

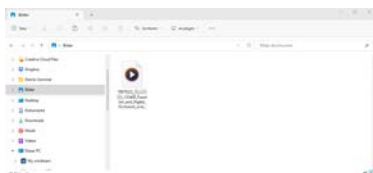
Playback speed Set the playback speed here, please note that exporting the measurement with lower speed will take longer because more intermediate frames are generated.



In the second step you choose a location and a name for the video.



After you confirm the location, the video export will run in live mode. After clicking into the image, you will be asked if you want the video to end at this point. The display speed may vary depending on the processing power of your computer, but the video will always be generated at the playback speed you specify.



You can play the finished video with any video player that supports the generated format.

If errors occur during playback or playback is not possible, try generating the video in a different format or contact the manufacturer of your video player.

22.1.5 Mesh export

Export of model data / meshes

The model data /meshes can be located in 3 different coordinate systems.

1. Axis-orbital system:

If you have defined a reference system on the subject's skull during the measurement.

2. Occlusion Plane:

When exporting rails to the CAM, we recommend this format because the coordinate origin is located in the geometric centre of the object. This makes it easier to place it in the construction space or in the blank.

- **Coordinate system**
zebris ▼
- **File format**
STL ▼
- **Models**
 - ☒ Upper jaw scan
 - ☒ Lower jaw scan
 - ☒ Calibration
 - ☒ Reference position (ICP)
 - ☒ Manual therapeutic position
 - ☒ Manual therapeutic position 2
 - ☒ Manual therapeutic position 3
 - ☐ Upper jaw with bite fork
 - ☐ Bite fork

To export the model data/meshes, it is first necessary to select the desired models.

The maximum configuration here would be:

- Upper jaw
- Lower jaw
- Bite fork/upper jaw
- Bite fork
- Envelope upper jaw
- Envelope lower jaw

- Coordinate system

zebris ▼

- zebris
- exocad
- 3shape
- sirona
- milling

☒ Manual therapeutic position 3

☐ Upper jaw with bite fork

☐ Bite fork

Selection of the coordinate system for the mesh export. In addition to the coordinate system, the file labeling is adapted to exocad or 3shape.

Currently the coordinate systems of the following companies are supported:

- zebris
- exocad
- 3shape
- sirona
- milling

The models are exported in your current situation and situation. This means that you can, for example, define a therapeutic situation and export it for further processing in a third-party program.

- Coordinate system

zebris ▼

- File format

STL ▼

- PLY

OBJ

STL

position

- ☒ Manual therapeutic position 2
- ☒ Manual therapeutic position 3

☐ Upper jaw with bite fork

☐ Bite fork

Meshes can be exported in following formats:

- PLY
- OBJ
- STL

22.2 dentalProject export

The dentalProject export creates a new type of data exchange between dentist and dental technician. The dentist determines which data and which articulator is to be used for the therapeutic restoration. After the export, the dentist provides the technician with the entire project, which he can import into his DentalCAD via the import interface.

Articulator and matching of motion data have already been carried out. The data are axis-calculated in the articulator.



If the articulator is changed after import into Exocad, the alignment of the 3D data is no longer correct. The data is exported in the correct position for the articulator selected by the doctor.

Procedure

- Patient ID

- Articulator

Artex CR



- Models

☒ Upper jaw scan

☒ Lower jaw scan

☒ Calibration

☒ Reference position (ICP)

☒ Manual therapeutic position

☒ Manual therapeutic position 2

☒ Manual therapeutic position 3

☐ Upper jaw with bite fork

☐ Bite fork

- Comment

▲▼

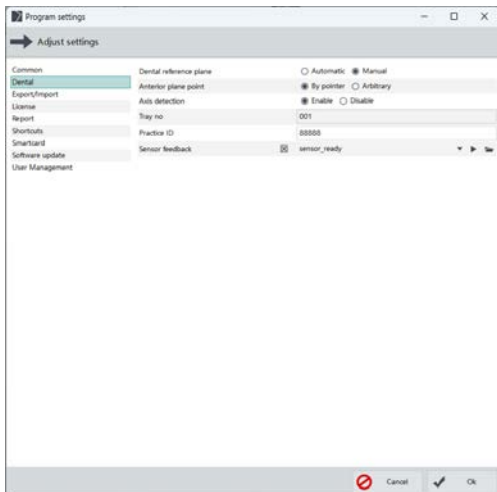
To export the model data/meshes, it is first necessary to select the desired models.

The maximum configuration here would be:

- Upper jaw scan
- Lower jaw scan
- Saved Positions
- Bite fork/upper jaw
- Bite fork
- Envelope upper jaw
- Envelope lower jaw

For the dentalProject-Export it's necessary to define a patient ID and choose the articulator.

Last, you can also insert a comment to the export.



Tray no

defines the tray number for dentalProject export

Practice ID

defines the Practice ID for dentalProject export

This items to be defined in the Program settings of the WINJAW+ Software

