Software user Manual zebris for Ceramill
describes included functions until version 1.0
Pictures and illustrations can differ from the delivered version.

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Am Galgenbuehl 14, D-88316 Isny im Allgaeu

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Preface

1 Preface

Welcome to the zebris for Ceramill software user manual.
Along with your System you receive three user manuals:

- Optic JMA AG hardware user manual,
- zebris for Ceramill software user manual,
- zebris for Ceramill Quick start instructions.

This manual will provide you with the basic information that you will need to use the software. It explains the installation process and gives tips for preparing for a treatment. Please also follow the safety-relevant information in the technical manual and keep all manuals close to the JMA Optic System at all times. The manuals are a key component of the product and will help you to operate the JMA Optic System correctly.

zebris Medical GmbH will not be held liable for any injury to staff or patients or damage to the system that has occurred as a result of the non-observance of the information in the manuals or of the improper use of the system.

If you notice any mistakes when working with the handbook or have any suggestions for improvement, we would really appreciate your feedback.

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Preface

1.1 Conventions and symbols 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.
2 Software installation and activation

2.1 System requirements

- **Processor:** Intel Core i5 or alternatives with a comparable performance
- **Working memory:** at least 8 GB RAM
- **Hard drive:** at least 1 GB free storage space on the system disk for installation of the user software - at least 100 GB are recommended for data storage
- **Graphic card:** 1 GB usable graphics memory
  - OpenGL 4.0 or higher
  - DirectX 9.0c or higher
  - Support of the native monitor resolution
- **Screen:** Monitor with a minimum resolution of 1024x768 pixels
- **Ports:** 1 x USB
- **Betriebssystem:** Windows 10

If you have any questions about the system requirements, please contact your supplier’s support department.

2.2 Installing the user software

If a message appears during the installation that says that your graphics hardware doesn’t support OpenGL 3.3, 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 3.3 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 start the zebris for Ceramill installation file. Then click on Continue to start the installation.

Click Installation to install the software on your computer.

After the installation has finished, click Finish to close the installation.

The software is now installed. An icon with the label zebris for Ceramill will have appeared on the desktop. To start the software, you can either double-click on this icon or start it through the menu by going to the program group Start >> Programs >> Amann Girrbach >> zebris for Ceramill.
Software installation and activation

2.3 Activating the software

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

You can do this either over the internet or by telephone, fax or e-mail.

2.3.1 Entering the 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 Amann Girrbach Optic JMA AG System order documents. If you purchased the device through a dealer, they will have given you the license code directly.

2.3.2 Activation

You then 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.

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 zebris for Ceramill

Looking through “About zebris for Ceramill”

Clicking on the question mark opens the window.
Functional description

The functioning and application of the software is briefly described.

Software-related data

Here, the name, version, installation date and last update of the software are displayed, as is information about the operating system, graphics hardware and the active license used.

Manufacturer information

This field contains all relevant information about the software manufacturer.
4 Features

Database

In the database, you can add, edit and remove patients. You can also add, adjust and remove recordings, comments and descriptions. A **Back-up/Restore 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.

View

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.
The patient database

After the program starts, you will find yourself in the patient database. Here you can manage patients and available recordings and access import and export features. There is a detailed description of the user interface below.

5.1 Information and navigation

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.
5.2 Patients

Patient list

Here, the patients are listed. The patient that is currently selected is highlighted in a different colour to the rest.

Patient search

Users can use the Search feature to filter the patient database via an input line and therefore specifically search for a certain patient. You can hide the search window by pressing “Esc” or by clicking on “Search” again.

Search active

You can see when the Search feature is active as the icon background is a different colour. Only data sets with the relevant information are shown.

Add/remove filter

The left icon adds individually configurable filters and the right icon removes all applied filters from the database. The Filter feature makes it possible for you to search through very large databases in a targeted way.
The patient database

Columns

You can select what patient data you want the software to display.

Editing patient records

You can open a patient record by clicking on “Edit patient record”. You can then make modifications to the patient data in the record.

Delete patient

After a separate confirmation, the patient, and all the recordings assigned to them, is irreversibly deleted from the database.

5.2.1 Filter

Filter settings

Here, you can add parameters to filter all entries in your database and only show the patients/recordings that are relevant to you.

Name contains

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

Choose between “Female”, “Male” and “Not specified”.

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 recording 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.
The patient database

5.3   Patient record/ New patient

If you want to add a new patient or edit an existing patient’s record (button **New patient** and **Properties**), the following dialog appears:

The individual areas and their features will be briefly explained in the following sections.
The patient database

5.3.1 Properties

### Patient data

Please enter the patient data here. The first and surname, as well as gender and date of birth are all obligatory fields.

You can use the “Code” field to assign the patient record a unique identification.

<table>
<thead>
<tr>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>First name*</td>
</tr>
<tr>
<td>Last name*</td>
</tr>
<tr>
<td>Gender*</td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td>Date of birth</td>
</tr>
<tr>
<td>dd.mm.yyyy</td>
</tr>
<tr>
<td>Code</td>
</tr>
<tr>
<td>Email</td>
</tr>
<tr>
<td>Street</td>
</tr>
<tr>
<td>City</td>
</tr>
<tr>
<td>Postal code</td>
</tr>
<tr>
<td>State</td>
</tr>
<tr>
<td>Country</td>
</tr>
<tr>
<td>Work phone</td>
</tr>
<tr>
<td>Home phone</td>
</tr>
</tbody>
</table>

* - mandatory field

5.3.2 Patient picture

You can use this field to add a picture of the patient to their record.

### 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.
The patient database

5.3.3 Groups

<table>
<thead>
<tr>
<th>Labels assigned</th>
</tr>
</thead>
</table>

**Labels**

You can enter a group name in the field on the left-hand side of the screen and add patients to it so that you can order the entries in the database better.

---

5.3.4 Comments and boilerplates

**Comments**

Here you can write free text that you can then add to this patient as a comment. You can then show the comments later in the output report as “Patient comments” and therefore get all the information necessary for the evaluation.

**Boilerplates**

To make repeated formulations and standardised descriptions quick to reuse, you can add them as boilerplates. You can see how to add boilerplates below:

1. **Select the text**

   In the “Comments” field, select the section of text that you want to use to create a boilerplate.

2. **Save**

   To create a boilerplate using the selected sections of text click on **OK**.
3. Enter a name

In this dialog window, you can choose a name for the boilerplate, your selection will be automatically used as a suggestion.

By clicking on OK, the boilerplate is created and it will appear in the list with the name that you have chosen.

4. Set the cursor position

Set the cursor by left-clicking on the place that your boilerplate should be inserted.

5. Insert a boilerplate

By left-clicking, you can choose a boilerplate from the list and then insert it into the current position in the comment field by clicking the insert button.

5.4 Recordings

**List of recordings**

Here, all the recordings relating to the patient that you just selected are listed. The currently selected recording is highlighted in a different colour.

**Delete recordings**

After a separate confirmation, the selected data is irreversibly deleted from the database.
5.4.1 Recording details

You can open this dialog by clicking on the Properties button, which is to the bottom right of the list of recordings.

You can modify the description of the recordings and add comments. Boilerplates are saved separately from those in the patient records.
The patient database

5.5 Creating data backup

You can export patient and recording data from the patient database in Amann Girrbach’ own file format “zebdb”. This allows you to exchange individual data sets with colleagues that also work with zebris for Ceramill, for example. You can import exported data with the Restore feature. You can also add backup copies to the database in the same way.

Amann Girrbach AG expressly states that the user is responsible for backing up their data. Amann Girrbach also recommends that you regularly back up the patient database.

You can find the zebris for Ceramill database in the user data directory.

Windows 7, 8, 10

C:\ProgramData\Amann Girrbach\zebris for Ceramill

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

1. Export

Click on the Back-up/Restore button on the bottom right in the toolbar.

2. Back up

Choose Create back-up to export the data that you want from your database.

3. Select data sets

Select all data sets that you want to export or back up.
If you want to export or back up all of a patient’s recordings, make sure that the box in the description line is ticked. This selects all patients.
If you click on the line that contains the patient’s name, all of the patient’s recordings will be shown on the right-hand side. The recordings can then also be selected individually.

4. Select target folder

Navigate to the location on your hard drive where you want the exported data or the database back-up to be stored. Assign a name and then click on OK.
The patient database

5.6 Restore backup data

You can import existing patient and recording data in various formats into the database. The exact process is described below:

1. Restore

Click on the Back-up/Restore button on the bottom right in the toolbar.

2. Restore

Select Restore backup to import the data that you want into your database.

3. Search for and select data

Search for the data sets that you want to import on your hard drive and on other storage devices connected to your computer. Which files you need to select depends on the format.

4. Select data sets

Select all the data sets that you want to restore.

To import all patients in a group or project, make sure that there is a tick in the top line.

If you want to import all of a patient’s recordings, simply click on the tick in front of the patient’s name.

If you click on the line that contains the patient’s name, all of the patient’s
recordings will be shown on the right-hand side. The recordings can then also be selected individually.

5. Results

After a successful data import, the dialog displays the number of imported patients and recordings. The list shows erroneous data sets, as well as patients and recordings, that have already been added and therefore cannot be restored.

Project names from the old software will be assigned to the patients as a group with the prefix “Project”.

6. Restored data sets

Patients and associated recordings that have been restored from backed-up data are marked with a green dot. This marking remains active until the software is closed and restarted.

7. Errors/Duplicates

Should errors appear during the import, or if you try to import data sets that are already available in your database, you will get a summary at the end that displays the corresponding information.

6 Program settings
You can get to the program settings by clicking on the Program settings button on the bottom right in the toolbar on the start screen.

### General settings

#### Updating software
Choose whether you want the computer to automatically search for updates when it’s connected to the internet or not.

#### Language
Choose the translation of the program interface that you want to use from the list.

### Magnification factor
This determines the size of the display elements in the software. Choose User-defined to enter your own value in DPI in the input field. The relation to screen height can be used as an alternative to the DPI setting. Using the system settings resets the value to the Windows standard.

### External database
If you purchased the external database feature from your dealer, you can enter the path for the external database that you use here.
Program settings

6.2 Export settings with standard path

You can define a target folder for each available export feature in the program settings (database). If this setting is active, the save dialog (“Enter file name”) is not shown and the files are saved directly in the default folder.

Export settings
Click on Export on the left-hand side.

Back up
Activate the check-boxes and choose the directory that you want to use for the data backup. The defined target path will be shown and selected as standard.

zebris Dental
Activate the check-boxes and choose the directory to use to export the data to the CAM/CAD interface.

If you haven’t defined a folder, a dialog will appear in which you can define the storage location and name of the export file. Enter a new file name or simply click on Save to adopt the suggested name.

6.3 License

1. Select license
Click on License on the left-hand side of the screen.

2. Renew license
The current user license is displayed in the right window. To renew the license, click on the Renew license button.

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

Select report
Click on Report on the left-hand side of the screen.

Name of the institution
You can customise the output report by adding the name of your institution.

Logo in reports
Choose a logo image to appear in the header of all your reports by clicking on Open.
Click on Empty if you don’t want to include a logo or click on Standard to restore the original image.

6.5 Shortcuts

Select shortcuts
Here, you can choose which buttons to use to move the 3D graphics (skull model, dental model) around.
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.

1. **Card reader**
   Choose the input Card reader on the left-hand side of the screen.

2. **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 afterwards by clicking on Close.

3. **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.

4. **Select dll driver**
   Select the corresponding CT-API driver from your hard drive. See the card reader manufacturer’s handbook for more details.
5. Insert card
Insert the card into the reader.

6. Create a new patient
Click on New patient and the card data will be automatically added.

6.7 Software update

Set up the update procedure

You can either choose from:

- automatically download new software,
- tell me about new software,
- Do not check for new software.

You can select a specific download path and if you want to be reminded if there are new updates available.
7 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 applies for each module that displays the “Device settings” button on the bottom right of the screen after the module selection.

7.1 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**
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 zebris for Ceramill 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.

**Device recognition failed**
In rare cases, the hardware cannot be added automatically. If you have already connected the devices to your PC, please check the device connection and the power supply. Switch off the devices and disconnect all connection cables. Reconnect all devices and switch them on.

**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.
Device settings

7.2 Connection of Optic JMA AG Systems via WiFi

If you received a WiFi USB dongle with your system, it is possible to connect the system directly from the user software via WiFi.

To do this, you need to plug the supplied WiFi USB dongle into your laptop/PC, open the Device settings in the zebris for Ceramill software and turn your system on.

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.

As soon as your system has been found, it will be displayed on the right-hand side of the Device manager. Please choose a device by double-clicking on the device’s icon.

Alternatively, you can click on the device once to select it, so that it’s highlighted, and then click on the “Add” button.

7.2.1 First Wi-Fi connection between the software and hardware system

You must think about the following points during first-use or when using a new laptop/PC:

- Plug the WiFi dongle into your laptop/PC and start the system
- Install the software from the WiFi USB dongle and restart your laptop
- Connect the Optic JMA AG System to your laptop/PC with a USB cable
- Open the Device settings in your zebris for Ceramill software and wait until the two icons for the Optic JMA AG System appear
- Then disconnect the cable connecting the laptop/PC and the Optic JMA AG System, unplugging it first from the laptop/PC and then from the bayonet connector on the System
- The WiFi connection remains active, your System is now coupled and can be found in the Device manager
Module selection

8 Module selection

8.1 General

You can get to the Module selection from the database by clicking on Record.

The selection of modules 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.

Choose the module that you want to start with from the left-hand side of the screen. You can then do the settings for the selected module on the right-hand side. You can find more details about the settings in the corresponding module chapter.

Before the module can actively support the recording process, you have to select and connect the hardware that you want to use. (see Device Settings)

After starting the software, you can choose the recording program from the list of modules. You can open and define individual settings with the Recording settings button on the bottom right of the screen. 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.
8.2 Recording settings

By opening the tab above the description bar, the individual parameters are opened and can be defined and set. The selection of setting options can vary depending on the selected module.

- Measurement mode
- Reference system
- Jaw positions
- Jaw movements
Dynamic & joint parameters
This mode combines analog and digital data collection. Thus it’s possible to transfer the model to the analog Artex articulator, manufactured by Amann Girrbach, through the coupling bite fork in conjunction with the transfer system.

8.2.2 Reference system
The reference system, in which the patient recordings are being created, has several individual setting options. In order to use all modules, a skull-related reference plane must be entered. You could alternatively use the terminal and kinematic axes instead.

Condyle positions
By porion T-pointer
With this mode a specific T-pointer, utilizing the same porus buttons as the well known facebow, is used to capture the necessary condyle positions.

Kinematic axis
The patient makes a maximum opening, closing and protrusive movement. This can either be chosen as a reference axis for the recording or it can be compared with the centre of rotation of the arbitrary axis.

Hinge axis
Through an opening and closing movement of 10 – 18 mm, the patient performs a clean rotation movement in the terminal condyle position. This can either be chosen as a reference axis for the recording or it can be compared with the centre of rotation of the arbitrary axis.
8.2.3 Lower jaw positions

Different positions of the lower jaw to the upper can either be saved under pre-specified wording like “Habitual occlusion”, “Resting position”, as well as “Jaw relation” or they can be added individually with their own names. The sequence can be changed with the arrow keys.

8.2.4 Jaw movements

The jaw movements that must be carried out can be individually determined and pre-set by starting and stopping specific movement patterns, as well as through their frequency of occurrence. The sequence can be changed with the arrow keys.

8.3 Recording profile management

Profile management
You can find the Configurations button under the setting options of the module that you are working with. Click on this button to modify the recording settings or to copy them to another licensed computer. In the following dialog box, the settings profile can be saved under a name of your choice.
Saving a recording profile
You can add the new name for a modified recording profile under **Name**. The different recording profiles will be saved in numerical order. The modified recording profiles result from the manual adjustment of the user’s recording profile. The profiles are only stored in the used license.

Loading a recording profile
Click a profiles name on the right side to use an existing recording profile from the user software.

“Default”
The Default setting allows the user to restore the basic settings.

Exporting a recording profile
Select “Export recording profile” to export one or more of your created recording profiles to a chosen location.

There is the option to adopt individual recording profiles in further software licenses.
Importing a recording profile

To import a recording settings backup for the software, select "Import recording profile". You can load the package with predefined recording profiles that you want through the path finder. It is helpful to know the exact name of the backup files, e.g. with the name of the practitioner.
Module selection
8.4 Recording preparation
8.4.1 Fastening the attachment

The order of the preparation steps can vary depending on the practical organisation. For the start of a recording, the navigation unit and the T-attachment should be securely and correctly fastened to the patient.

As the attachment is for fastening the lower jaw sensor, this must be securely connected to the teeth on the lower jaw. If there is not enough space to fasten the attachment “chair side” due to the state of the patient’s teeth or a very deep bite, an individual solution for fastening the T-attachment can be worked out with the dental laboratory.

If the jaw has no teeth, the attachment can be fastened with a special jaw clamp. If the patient has small interdental gaps or partially missing teeth, individually prepared bite guards can also be used in conjunction with a special anchoring system, e.g. with clamps and ball clasps.

As standard, the T-attachment is fastened to the labial surfaces of the lower teeth. To make use of the entire fastening surface of the teeth and the interdental spaces, the standardised T-attachment can also be extended beyond the length of the mounting area towards the back teeth. The decision how the T-attachment should be prepared on situation models by the dental laboratory must be made on a case-by-case basis.

8.4.1.1 Fastening with bite registration material

With this method, you can finish the individual attachment in the session on the patient straight away. In the example picture, the material

greenbite apple
DETAX GmbH & Co. KG
Carl-Zeiss-Str. 4
76275 Ettlingen/Germany

was used.

In the first step, adjust the arms of the T-attachment to the patient. You can also use a plaster model to help if there is one available.
Apply the material to the T-attachment and place it on the patient’s bottom teeth. Place the attachment carefully so that it is as central and straight as possible.

Ask the patient to bite down on the material in order to avoid any occlusal interference.

After the material has hardened fully, you can remove the attachment and any excess material.

For the treatment, you can fasten the prepared attachment to the teeth with a small amount of tissue adhesive.

Alternatively, you could use small amounts of a light-body impression material on the attachment and so gain additional retention on the interdental spaces, allowing you to fasten the attachment better.
To make the individual attachment, use a plaster model of the present patient situation. Or let your dental laboratory carry out these steps.

The T-attachment must be adjusted to the lower dental arch through bending. The mould will then follow the dental arch as exactly as possible and will not come into contact with the teeth on the upper jaw.

Before applying the material, the metal surfaces of the attachment must be roughened.

Apply the material, e.g.:
Protemp 4,
3M Deutschland GmbH
Carl-Schurz-Str. 1
41453 Neuss/Germany

to the attachment and place it on the prepared plaster model.

Remove excess material, while ensuring that the teeth still provide sufficient stability for the attachment. There must also be sufficient retention areas on the covered teeth to ensure a secure hold.

Take particular care to ensure that the teeth of the upper jaw do not touch the T-attachment or the fastening material. This prevents a subsequent, unwanted detachment or bending of the attachment during a measurement.
If the material between the T-attachment and the labial surfaces of the teeth has hardened it can be secured using temporary cement.

Alternatively, the prepared T-attachment can be affixed to the teeth with a small amount of tissue adhesive.
8.4.2 Preparation

The navigation unit must be placed in a stable position on the patient’s head.

**You must make sure that:**

You first place the headpiece on the patient’s head without any tension on the application devices.

The overhead arch must lie on the patient’s skull and the nose support must be in the nasion area and you must check that they are not too tight.

The elastic band for the back of the head can also be used and should only apply some gentle pressure to the patient’s head.

Ask your patient to get into the correct starting position for the examination method that you will be using.

8.4.3 Coupling bite fork

**Basic information about the coupling bite fork**

The coupling bite fork has a position in relation to the sensors of the Optic JMA AG System that is known in the coordinate system. The determined movement data can be exported as an XML file which means that individual movements and model scans can be brought together. This method makes it possible for users to design splints and prosthetic fittings in CAD software according to a patient’s individual movements and to manufacture them using a CAM system.

**Recording procedure with a coupling bite fork**

To determine the upper jaw position, the coupling bite fork is first covered with a registration material that the patient has to bite into. The material hardens and is then
Module selection

scanned in the desktop scanner with the upper jaw model according to the information provided by the CAD/CAM software manufacturer in order to match up the image and the movement data.

The procedure during the patient recording goes as follows:

The referencing is done using the coupling bite fork. That is to say that with the coupling bite fork, the upper jaw position is connected to the skull symmetry and thus to the reference plane.

1. In the recording process, the patient will first have the coupling bite fork that has been customised in advance with the bite record applied to their upper jaw. Previously the error-free resetting of the fork was tested in the mouth.

2. The lower jaw sensor is then placed on the coupling bite fork. This position is now registered via the rest of the recording process.

3. After the coupling bite fork has been removed, the lower jaw sensor is fixed to the T-attachment and the lower jaw is recorded in its habitual occlusion.

4. The movement recording is carried out as normal. After the recording is complete, the XML data set can be added to the movement data in the CAD software.
Module selection

8.5 Performing the recording

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 rendering**
You can use the tabs above the image of the skull to choose between the different rendering options. You can either use a generic skull as a “model” or a 3D grid.

**Zoom**
You can use the zoom buttons to enlarge “+” or reduce “-” the skull image. You can determine which point of the 3D rendering should be zoomed in on by left-clicking on the point with your mouse. You can also zoom in and out using the scroll wheel on your mouse. By pressing “=”, you can adjust the image to the size of the window.

**Viewpoints**
The buttons on the right-hand side of the zoom feature can be used to choose a standard viewpoint. You can choose between left, right, front, back and free viewpoint. You can rotate the model with your mouse.
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 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).

Remember to make sure that the signal field beneath the pictogram is always green during a recording.
If a signal field lights up red, you must stop the recording! If this happens, please check the recording area for obstacles and check the battery status of the lower jaw sensor. If there is a blinking or continuous red light when the recording area is empty, you must check the system for defects.
If the pictogram is grey, this means that the lower jaw sensor isn’t currently active and that you are currently in between two recording times.

Information about audio signals
The start of the recording is signalled with a high-pitched sound and the end with a low-pitched sound. Recordings like static point recordings and different jaw positions are confirmed with an audio signal.

9 Edit recording (View mode)
In the “View” mode, you can view, play back and limit the interval of recordings. The individual features of the view mode are explained in detail below. The figures may appear different in the different modules, this depends on the specific application.
Select data set
After choosing a data set from the database, the patient’s individual recordings are listed on the right-hand side of the screen. By clicking on the “View” button or double-clicking on a recording, it will open in Analysis mode. If a recording has been completed, it will initially be switched to View mode.

A superimposed time display shows the current time. The time display starts at 0.0 and goes to time X, the end of the recording. An individual time value can be entered, or the current time of the recording can be shown if you place your cursor on the time bar.

You can return to the database by clicking on “Back”.

Time bar
The current time of the shown movement sequence is displayed.

You can hide or show movements in the time bar by double-clicking in the movement field. Hidden movements turn blue in the time bar.

With Zoom (+) and the key combination Shift + left mouse key, a certain time period of the movement can be viewed and analysed selectively.

To select a certain area, move the cursor to an individually selected beginning of a recording in the time bar and then insert a marker by left-clicking. You can define the end of the selected
Edit recording (View mode)

area by pressing the Shift key and inserting a marker by left-clicking at the same time. This area will be highlighted in yellow.
9.2 Description of the view options

You can move the views in all directions and change the size either with the scroll wheel on your mouse, “+” and “-” buttons or the features of touch-screen PC’s.

**Model**
By clicking on the Model tab, the skull will be shown in 3D.

**3D**
After choosing the 3D tab, the overall view will show all points and lines and the Bonwill triangle.
Edit recording (View mode)

Condyles
The Condyle rendering shows the movement from above and from the sides.

Incisal
The Incisor point rendering shows the movement of the incisor point from the front and from the sides. In the individual review, the movement path will also be shown from above.

View settings
You can select which information you would like to be displayed. By clicking on “Adjust”, a dialog field opens in which you can set the required parameters to activated or deactivated by ticking them. The options selected here will be included in the report. The displayed data can be configured separately in the Report module.
9.3 Features

**Playback**
You can automatically play back the recording by clicking on this button. The recording will continue to be played back and repeated until you press the Stop button.

**Playback speed**
Clicking on this button opens a list of playback speeds for you to choose from.

**Zoom**
The magnifying glass with the minus symbol reduces the size of the image by 20%. The magnifying glass with the plus symbol increases the size of the image by 20%.

**Adjust**
The 3D rendering is centred in the view and the zoom factor is automatically adjusted to the recording window. This means the model is completely visible.

**View from the right**
Shows the 3D skull model from the right.

**View from the left**
Shows the 3D skull model from the left.

**Front view**
Shows the 3D skull model from the front.

**Above view**
Shows the 3D skull model from above.
Edit recording (View mode)

Model 3D view
Shows the 3D skull model in the basic view.

Measure angles and distances
Draws lines to show angles and distances in anatomical terms. The black line can be aligned in the desired direction as reference line. You can then use the green line to determine the distances and angles to the black line.
Edit recording (View mode)

10 Report

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

10.1 Basics

Open a data set
Choose a data set from the “Recordings” section in the database and then either click on Report in the right toolbar or switch from the View mode to the Report mode.

Report output
In the Report view, you can read and evaluate the data as a whole. The data can be printed from the Report level by clicking on the printer icon or it can be saved as a PDF file. You can add and remove the various parameters in the report under “Adjust”.

10.1.1 Comparing two reports

Select data sets
Two data sets from the same category can be directly compared with each other and linked in the Report view. The recordings stored under “Recording” can be selected by pressing “Ctrl + left mouse key” and can then be compared and displayed together through the “Report” view. The report can then be printed or saved as a PDF.
Presentation in the comparison report

In the comparison report, the results from Recording A are highlighted in colour and those from Recording B in black. You can also find the allocation for the respective recordings in the header.

10.1.2 Report controls

View

With these buttons, you can set how many report pages are displayed at the same time. Alternatively, you can use the slider to zoom in/zoom out.

1:1

Displays one entire report page on the screen.

Page width

Zooms in until the report page fills the width of the screen.

Whole page

Shows the report pages in their original sizes. The size may differ from the print paper size because of different screen resolutions.
Report

Thumbnail view
Shows all report pages as small pictograms in an overview.

Export and printer settings

Print
The Report can be printed from the printer selected under Printer settings.

PDF Export
The Report is exported to a defined directory or external storage device as a PDF file.

Report properties

Printer setup
Here you can choose the printer and modify the printing settings (e.g. format, page size, etc.).
10.2 Report structure

**Header**

The title, project and patient name, date of the recording and company logo are all included in the header.

**Module-specific data**

You can find a visualisation of the recorded data under the header. This visualisation differs depending on the module that you’ve selected. You can find more information about the data displayed in the respective module.

**Comments**

There is a comment field in the patient records where the practitioner can add individual comments about the diagnosis and investigation. These comments can then be seen in the report.
10.3 Report properties

Customize a report

To hide or show the individual parameters of a report, click Customize and you will be taken to the report settings. This information, that can be hidden or shown, can be linked to specific issues for adjustment, e.g. for certain statements or targeted analyses.

By clicking the Ok button your changes will be adopted and you will be returned to the database.

Edit report properties

Pre-defined report types are displayed on the left-hand side. You can adjust and select these templates based on your requirements.

The categories are displayed in the middle. Categories can be hidden or shown with the “Add” (Plus) or “Remove” (X) buttons. The order that the categories are displayed in can be adjusted with the arrow buttons.

On the right-hand side you can also manually set the parameters that you want to be displayed.

By adding or removing one or several parameters or categories in the Adjustment menu, the recorded data will not be modified or deleted.
11 Dynamic & joint parameters

This module consists of the movements of the protrusion, laterotrusion on the left and laterotrusion on the right. The results of the recording are to be viewed differently 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 guide positioner. 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 motions. For comparison, additional movements on the patient guided by the practitioner can influence the significance of occlusal movement margins. We recommend subjecting the prosthetic restorations created with the zebris data to a check-up procedure in the patient's mouth and, if necessary, correcting it.

11.1 Make a recording (Record mode)

Module selection

Choose the Dynamic & joint parameters module from the left-hand side of the screen and then click on the Start button.

11.1.1 Reference plane

The data is put into relation to a plane. If multiple recordings are taken in one sitting, each of the subsequent recordings can be done using the reference plane defined for the first recording. Otherwise a new plane can be defined with the Redefine reference plane button.
Articulator reference plane

As data can be transferred to various articulator systems, the recordings must be adjusted to planes like the Frankfurt horizontal plane, the Camper’s plane and the patient’s plane. This must be taken into consideration during the acquisition of the anatomical reference points.

Coupling spoon reference plane

The data acquisition of movements for transfer to a CAD/CAM Software, and also for transfer to a mechanical articulator via a zebris Transfer Table, requires the recording of the upper jaw position and coordinates with a special bite fork and therefore the determination of the lower jaw position in habitual occlusion.

During the process, you must ensure that the positioning of the lower jaw in relation to the upper jaw for the later further processing of the data in the above-mentioned systems has been performed correctly.

11.1.2 Procedure

The patient will be instructed on how to move for this specific recording, as all movements must be carried out with tooth contact. The patient performs these movements and is monitored by the practitioner. A higher level of data integrity and precision is ensured by practising the movement pattern and by a controlled and standardised implementation of the data acquisition.
Dynamic & joint parameters

Live preview

In the Live Preview section, movements can be displayed, checked and shown to the patient in a way that is easy for them to understand, without the values having to be saved. In this mode, the patient can also practice special functional movements. Please activate with **Start preview**. By pressing the “Stop” button, you will switch from Test mode to Recording mode and can start doing the recording. This feature can be switched off under the Recording settings.

11.1.3 Recording movements

According to the selected movement pattern, their number and their chronology, the movements will be carried out with the patient after the preview. In principle, you can individually design all recording sequences in the configuration. After doing so, you are then guided through the recording process with some of the standard movements being used as examples.

Lateral movement

The articulator recording begins, for example, with the maximum lateral left and right movement that the patient is capable of making. You can start the recording process by clicking on the “Record” button with the foot switch, the enter key or the mouse. The starting position is always the patient’s habitual occlusal position. To complete the movement the patient returns their jaw to the starting position, and the recording process is ended.
Dynamic & joint parameters

Protrusive movement

The patient should take up the starting position and from this make the maximum protrusive movement that they can. Afterwards, the patient must return their lower jaw to the starting position.

Opening movement

The patient should take up the starting position and from this open their mouth as much as they can. Afterwards, the patient must return their lower jaw to the starting position.

After the recording has ended, a dialog window with the following options will appear:

- Type a description for this record and select the desired action.
  - Description
  - Discard Record
  - Save & Repeat
  - Save & Close
## Dynamic & joint parameters

<table>
<thead>
<tr>
<th>Discard recording</th>
<th>Save and continue</th>
<th>Save and close</th>
</tr>
</thead>
<tbody>
<tr>
<td>The recording is discarded, and the user is returned to the Preview mode to make a new recording.</td>
<td>The recording is saved, and the user is returned to the Preview mode to make a new recording.</td>
<td>The recording is saved, and is sent directly to the completed recordings view.</td>
</tr>
</tbody>
</table>

### 11.2 View mode

The parameters that can be specially recorded with the Dynamic & joint parameters module are explained below. The basic instructions for using the View mode are described in the Edit recordings (Analysis mode) chapter.

#### Recording in mode

When making a recording in Dynamic & joint parameters mode, only the articulator-relevant data is displayed in the view windows when in View mode. This includes the **Model, 3D, Condyles, Incisor point, Parameter** and **Initial centre of rotation** tabs. Plus, the reproduction of the condyle path parameters in the **Parameter** block. The movement rendering based on the bite fork positions is realized by allocating the reference planes of the coupling bite fork. The data can be transferred to the corresponding CAD/CAM system via the **export to ceramill** button.

#### 11.2.1 Module-specific parameters

**Rendering of incisal ROM**

The following parameters are displayed in the Incisal ROM tab:
- Right/left laterotrusion
- Protrusion
- Opening movement

The normal range of motion as seen in healthy patients is shown with the green area.
Dynamic & joint parameters

**Condyle path lengths**
The determined length indicates the path along which the condyle can move.

**Condyle path inclination (Reference: Frankfurt Horizontal)**
Gives the inclination of the pathway along which the condyle can move.

11.3 Dynamic & joint parameters report

The parameters that were previously defined under View are evaluated and shown in “Report” mode. The basic instructions for using the Report mode are described in the Report chapter.

A distinction is made between the Frankfurt Horizontal (SAM), Camper’s (KaVo) and patient’s (ARTEX) planes depending on the type of articulator. The scale values of the joint pathway housing and the anterior guide plate (individual) are adjusted to these planes. Inserts (such as SAM) for the condyle path inclination or the Bennett movement are documented in the report and printed in bold. The curves drawn on the second page can be used to see if the recording was carried out with the correct movements. The data output for the digital model transfer with the Artex, as well as the Stratos, articulator table will also be given in the “Report” mode.

11.3.1 Data export to the CAD/CAM interface

To transfer data from the recording mode “Dynamic & joint parameters” to the CAD/CAM interface, click on the export to ceramill button.

If you have selected a standard file path in the program settings, the data file will be directly stored to this path. If you haven’t done this, after pressing the button a task window will appear where you can manually choose a suitable storage location.
11.3.2 Explanation of the report contents

Movement paths

The displayed movement paths are generated from the different movement information in relation to both joints and the incisor point. Depending on the selected axis position, as well as the reference plane, the course and angle of the condyle paths can be shown in several different ways.

Sagittal condyle path rendering

The sagittal condyle path inclination is calculated so that a best-possible coverage of the recorded curves with the curvature of the articulator is ensured – particularly in the initial area. The diagrams show the condyle path inclination of the protrusive and opening movement.

Horizontal condyle path rendering

The Bennett angle and the immediate side shift are calculated from the movement capacity of the side shift condyle or advancing condyle, i.e. the condyle on the non-working side. The black line represents the average curvature of the articulator's Bennett insert. The coloured lines (red and green) correspond to the recorded movement paths.

The retraction is calculated from the sagittal movement of the laterotrusion condyle or resting condyle from the retro-cranial position.

The shift angle guides the condyle from a pure laterotrusion movement from "0°" continuously between a maximum latero-
Dynamic & joint parameters

retrusion of “-20°” and a latero-protrusion of “+20°”.

Anterior plate guide path

Here, the angle for the anterior guidance is shown. The anterior plate is set according to the curves shown. With the articulator, the sagittal, left-right lateral anterior plate inclination and the inclination in the frontal projection are shown.

Model transfer via transfer table

This section describes the positioning data and the set heights of the positioning screws. This means that the model can be articulated using the correctly aligned upper jaw position.

Reference image

The graphic representation shows the orientation of the coupling bite fork on the positioning table, as well as a pictorial representation of how the screw lengths are measured.
Bite fork positioning
The image shows the arrangement of the positioning screws on the positioning foil from a top view. Here, the positioning screws must be screwed into the correct length in the SD coupling bite fork.

Bite fork parameters
The arrangement of the three positioning screws on the foil, as well as the screw length that must be set, is determined with the table. With these parameters, the upper jaw can be correctly articulated using the ARTEX or Stratos articulator.

<table>
<thead>
<tr>
<th>Values transfer table</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
</tr>
<tr>
<td>Y</td>
</tr>
<tr>
<td>Fin length</td>
</tr>
</tbody>
</table>
Dynamic & joint parameters

12 Facebow

This module enables the digital acquisition and transfer of the maxillary position relative to the patient’s condyles in the Artex articulator.

It can be worked completely digitally with this workflow. They also have the option of using the digital model transfer system to transfer conventionally-made plaster models or models created in the additive process to the physical articulator.

12.1 Make a recording

Module selection

Choose the Facebow module from the left-hand side of the screen and then click on the Start button.

12.1.1 Reference plane

The data is put into relation to a plane. If multiple recordings are taken in one sitting, each of the subsequent recordings can be done using the reference plane defined for the first recording. Otherwise a new plane can be defined with the Redefine reference plane button.
Articulator reference plane

As data can be transferred to various articulator systems, the recordings must be adjusted to planes like the Frankfurt horizontal plane, the Camper’s plane and the patient’s plane. This must be taken into consideration during the acquisition of the anatomical reference points.

12.1.2 Procedure

Bite fork

The data acquisition of movements for the transfer into a CAD / CAM software, as well as for the transfer into a mechanical articulator by means of zebris transfer system, requires the recording of the upper jaw position, or coordinates via a special bite fork.

12.2 View mode

In view mode, the location of the patient axis in relation to the maxillary bite fork is shown.
12.3 Facebow report

In "report" mode, the recorded data is displayed in a prepared form. The basics for operation are described in the Report chapter.

The data for the analogue model transfer with the Artex articulator table is also given in "Report" mode.

The recorded data can be exported in this step for use in CAD / CAM systems.

12.3.1 Explanation of the report contents

Modelltransfer via zebris transfer system

This report describes the positioning data and the setting heights of the positioning screws. Thus, the fixation of models in the articulator based on the upright position of the upper jaw is possible.

Reference image

The graphic representation shows the orientation of the coupling bite fork on the positioning table, as well as a pictorial representation of how the screw lengths are measured.

Bite fork positioning

The image shows the arrangement of the positioning screws on the positioning foil from a top view. Here, the positioning screws must be screwed into the correct length in the SD coupling bite fork.
Bite fork parameters
The arrangement of the three positioning screws on the foil, as well as the screw length that must be set, is determined with the table. With these parameters, the upper jaw can be correctly articulated using the ARTEX or Stratos articulator.

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<tbody>
<tr>
<td>X</td>
</tr>
<tr>
<td>Y</td>
</tr>
<tr>
<td>Pin length</td>
</tr>
</tbody>
</table>

12.3.2 Data export to the CAD/CAM interface

To transfer data from the recording mode “Facebow” to the CAD/CAM interface, click on the export to ceramill button.

If you have selected a standard file path in the program settings, the data file will be directly stored to this path. If you haven’t done this, after pressing the button a task window will appear where you can manually choose a suitable storage location.
Facebow

13 Troubleshooting

This section covers error messages that may occur and suggests corresponding solutions. If an error message appears, these suggested solutions could help to remedy it. Should these suggestions not result in the desired solution, please contact customer support.

13.1 General

<table>
<thead>
<tr>
<th>Notifications</th>
<th>Possible causes</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>“3D display not possible, your graphics driver doesn’t support OpenGL 3.3 (Irrlicht).”</td>
<td>OpenGL 3.3 is not supported</td>
<td>During the software installation, it will be checked to see whether your graphics hardware supports OpenGL 3.3, as it is required for the proper execution of the software.</td>
</tr>
<tr>
<td>“3D view cannot be created (OpenGL x.y)”</td>
<td>Graphics driver has been modified</td>
<td>Should you get this error message after the installation, you may have two graphics chips, or your graphics driver may have been changed in the meantime. In most cases, systems with two graphics chips give the user the options to switch between them. If there is a modification to a driver, please update the graphics driver.</td>
</tr>
</tbody>
</table>
# Troubleshooting

<table>
<thead>
<tr>
<th>Notifications</th>
<th>Possible causes</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>“Timeout reading from USB”</strong></td>
<td>USB cable not plugged in</td>
<td>Plug the USB cable of your device into the PC</td>
</tr>
<tr>
<td>Device not switched on</td>
<td>Device not switched on</td>
<td>Switch on the device with the appropriate switch or connect to the power supply via the mains unit. For more details see the hardware user manual.</td>
</tr>
</tbody>
</table>

**Device recognition failed**

The devices could not be recognised. If you have already connected the devices to your PC, please check the power supply and turn on the plugged-in device.

By clicking on Close, you can add devices to a profile manually.

## 13.2 WiFi connection doesn't work

Care must be taken to ensure that the WiFi dongle is plugged into one of the laptop’s USB ports before the laptop is started up.

If the dongle should not be plugged in before the laptop is started up and is instead plugged in later, the laptop must be restarted.

Should the message “Service not executed, WiFi connections not possible” appear when you open the device settings, then you may need to restart your laptop. If necessary, the driver software supplied with the WiFi dongle must be re-installed.
zebris for Ceramill provides some interfaces for data exchange with other software packages, such as practice management software for example. Please read the information from your software provider to see if your software supports one of these interfaces.

Obligatory information for the patient database in the zebris for Ceramill-software includes the patient’s first name, surname and, since Version 1.10, their date of birth. If recordings from older software packages that do not contain a date of birth are transferred, the field will remain empty to begin with. However, if a date of birth is required in order to carry out a certain action, a corresponding message will appear on your screen.

The setup of the interface, as well as the available scope is described below. If the interface is supplied by multiple providers, the software from your third-party provider is referred to as third-party software.

zebris for Ceramill provides an interface that allows you to further process and evaluate the recorded data with CAD/CAM programs.

You can access the “zebris Real Movement” interface, when in View mode in the Articulator module.

Obligatory information for the patient database in the zebris for Ceramill-software includes the patient’s first name, surname and, since Version 1.10, their date of birth. If recordings from older software packages that do not contain a date of birth are transferred, the field will remain empty to begin with. However, if a date of birth is required in order to carry out a certain action, a corresponding message will appear on your screen.
Data export interfaces

15.1 XML export format

You can access the export interface when in View mode in the Articulator module. The XML data format is intended for further processing through software packages with an XML parser feature that has been coordinated with Amann Girrbach.

Alongside meta-information, like patient and recording data, the patient’s movement data, which can later be combined with the lower jaw scan data, is provided, among others.
Data export interfaces

16 Notes