GAMMA Dental Software

Update Information

Version 8.7

GAMMA
Medizinisch-wissenschaftliche
Fortbildungs-GmbH

MD C E 0483

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Version 8.7

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1　Contents

2 Introduction

2.1 About this booklet

On the following pages, we would like to present to you the feature highlights of version 8.7 of GAMMA Dental Software (GDSW). This update includes many improvements and new features for the CADIAX, CADIAS, and CADIAS 3D analysis modules as well as for the patient management in GAMMA Document Browser and GDSW classic.

Several of the changes implemented in this software version have been suggested by our user basis worldwide. If you also have ideas or suggestions for possible improvements, please do not hesitate to contact us.

2.2 Downloading the software

The most recent version of GAMMA Dental Software is available for download via the *Downloads* section of our website at www.gammadental.com. There, you can also find the current operating instructions for all our products and additional information material for free and without registration.

> You can also request a paper copy of the operating instructions by contacting us directly. Shipping within the European Union is free of charge.

After having downloaded the installation package as a setup file, simply execute that file to start the installation.

2.3 Installing from the flash drive

GAMMA Dental Software is also available on a USB flash drive that contains not just the software installation package, but also the operating instructions in PDF format. This flash drive is write-protected and will appear as an additional drive named "*GDSW*" in your file explorer when plugged in.

Figure 1: The *GDSW* flash drive.

To start the installation, simply insert the USB flash drive into a free USB port of your computer. The logo printed on the flash drive should typically be located on the top side. If the installation routine does not start automatically, you can launch it by executing the file *setup.exe* that you can find in the folder *Setup* on the *GDSW* drive. The operating instructions are located in the sub-folder *Manuals.* A suitable PDF viewer application is included with every Windows installation.

2.4   Installation procedure

If an older version of GAMMA Dental Software already exists on your computer, the installation routine will perform an update, which will preserve your personal configuration settings. The update procedure will in no way touch your pre-existing patient files. Nevertheless, **we recommend backing up your patient data before installing the update**. You can easily identify the patient files to back up by their **.fgw* (GDSW classic) and **.gdb* (GAMMA Document Browser) file extensions. The database directory where these files are located is indicated in the respective application.

Do not switch off your computer during the installation. If you are installing the software on a laptop computer, please ensure that it will not run out of power during the installation procedure.

Furthermore, please ensure that you have your license code at hand when launching the installation routine. You can find this code on your license letter that you received as part of the installation package. Contact us if you need a copy of the license letter at a later time.

In the very first steps of the installation procedure, you are asked to choose the language to be used for the software and to accept the license agreement.

Afterwards, please enter your license code and optionally your user information (Figure 2). The latter is used for identifying the workstation and your practice or company on the printouts created by the software. Click *Next* to continue.


Figure 2: Enter your user information and the license code.

In the subsequent step, you can change the directory to which the software will be installed. We recommend to proceed with the predefined settings.

Afterwards, you will be asked to specify the directory in which you want to store your patient data (Figure 3). If you need to access the data from multiple PCs, you can specify a network drive that is accessible to all of them.
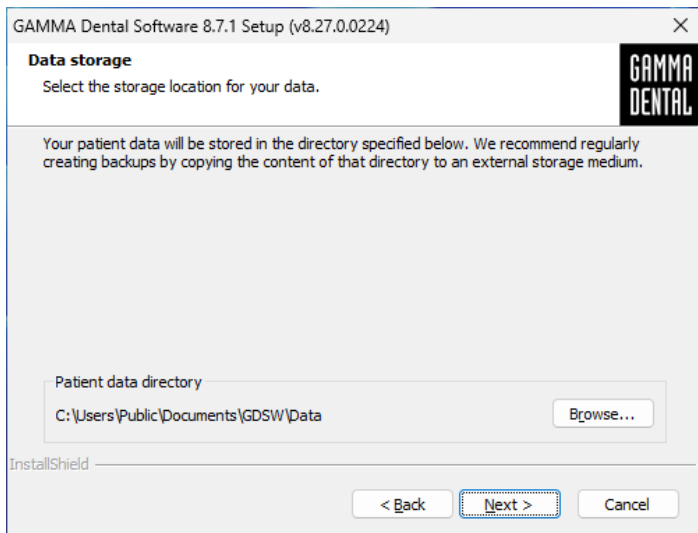

Figure 3: Select the directory in which your patient data should be stored.

The next window summarizes the installation settings. To change any of them, go back to the respective step by clicking on *Back*.

2.5   Software activation

After the successful installation of GAMMA Dental Software, you can choose to start either GDSW classic or GAMMA Document Browser. In either case, you will be asked to activate the software (Figure 4).
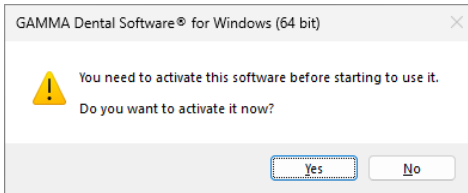
Figure 4: Activation is always performed for the complete GDSW package, regardless of which application invoked it.

The activation procedure has to be carried out only when you start the software for the very first time. Depending on the license code entered during installation, different software modules will be made available. To check your license information or enter a new license code after activation, use the menu *Help > About* in the software.

Warning:

Using GAMMA Dental Software in a virtual environment (e.g., Parallels® Desktop) may cause poor performance or even loss of certain functionalities.

If you plan to use the software in a virtual environment anyway, we strongly recommend updating both your operating system and your virtualization software to the latest version before activating. Subsequent updates of these components can cause a change of the system information that is registered by GAMMA Dental Software, which will render your activation invalid. GAMMA does not take any responsibility for validity of license codes being lost this way. For these reasons, please use a native Windows environment instead (e.g., Boot Camp on Apple macOS computers, if available).

For activating GAMMA Dental Software on a computer with internet connection, simply select *Online activation* in the following dialog (Figure 5) and click on *Activate*. No further steps are required in this case and you can immediately start using the software.
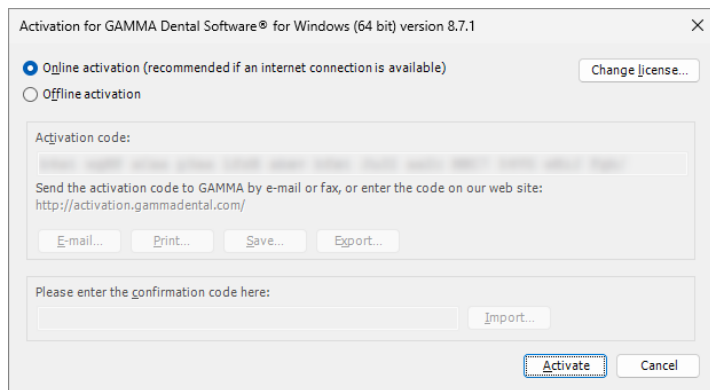
Figure 5: An active internet connection is convenient, but however not necessary when activating GAMMA Dental Software.

If you are installing GAMMA Dental Software on a computer without an active internet connection, please select *Offline activation*. Send the displayed activation code to GAMMA either via e-mail or by fax or visit the GAMMA activation website (Figure 6) on another device to activate your software:

http://activation.gammadental.com/

Enter your customer number and the activation code shown in the software and click on *Activate*. The system provides *Export* and *Import* functionalities on both ends to minimize the risk of typographic mistakes.

The website will return a confirmation code, which you will have to enter in the corresponding input box of the activation dialog (Figure 5). By clicking on *Activate*, software activation is now also completed on a system without internet connection.

Figure 6: Offline activation enables you to activate the software on computers without an internet connection.

GAMMA Dental Software is now ready for use. In case of any questions regarding the installation or usage of the software, please do not hesitate to contact us via:

E-Mail: support@gammadental.com

Phone: **+43 2243 34140**

Fax: **+43 2243 34140 90**

Our hotline is at your disposal from Monday to Friday between 9 AM and 4 PM (local time Vienna).

3 Updates in version 8.7

3.1 CADIAS 3D

Undoubtedly, computerized digital methods are an ongoing important factor in modern dentistry. Typical dental developments in the industry aim directly at the design and manufacturing of prosthetic appliances in the dental laboratory, wherefore digital dentistry nowadays is more a topic for the dental lab than it is for the practitioner's office. The aspects of functional analysis are widely ignored or neglected by those developments.

The field of instrumental functional analysis is one of the key points of the Vienna School of Interdisciplinary Dentistry (VieSID) in the systematic approach to establish valid and patient-specific evaluations. In particular, occlusal analysis of articulated models is of prime importance. With CADIAS 3D, GAMMA has developed a sophisticated 3D software system that aims to fill the gap in digital dentistry to allow occlusal model analysis as part of the computerized workflow.
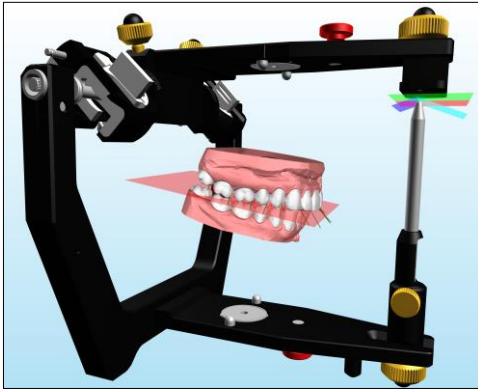

For a complete overview of the features provided by CADIAS 3D, please refer to the operating instructions of GAMMA Dental Software, which you can also access via the *Help* menu in the software. The software comes with a fully documented patient case, named "Test Patient 3", which you can use to get acquainted and experiment with CADIAS 3D. Go ahead and give it a try!

3.1.1   Axis-related transfer of intraoral scans to the virtual articulator

In conventional digital workflows with intraoral scanners, the models are often placed at an average position in the articulator as they possess no defined relationship with a cranial reference plane. For virtual functional analysis however, it is crucial that the jaw models are correctly positioned relative to the articulator's hinge axis. If this relationship does not match the anatomical geometry of the patient, it will distort the measurements of basic parameters such as condylar guidance or occlusion plane inclination as well as static and dynamic occlusal contacts.

GAMMA has developed a new direct digital workflow that, for the first time, allows an axis-related transfer of intraorally scanned jaw models into the virtual articulator without relying on a digital facebow. Our innovative method is characterized by excellent accuracy and ease of use, as well as low cost. It is compatible with existing GAMMA facebows for both anatomical and exact hinge axis and almost all commercially available intraoral scanners.

The direct digital workflow is fully integrated in version 8.7 of GAMMA Dental Software and comprises the following steps:
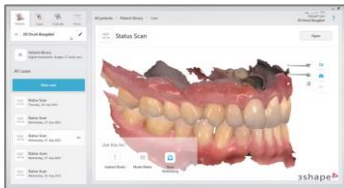

1) Create the intraoral scans of upper and lower jaw in bite relation or in reference position using a centric registrate.


2) Mount the facebow on the patient and take the upper jaw impressions. It should cover the full arch by using silicone, bite registration material, or similar.

3) Mount the facebow in the transfer stand or articulator. Select the transfer block that is suitable for the bite fork position (order no.: 06-230950).
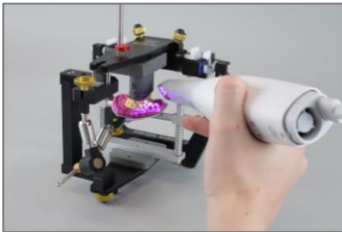
4) Take a scan the upper jaw impressions together with the transfer block, using the intraoral scanner in the transfer stand or articulator.
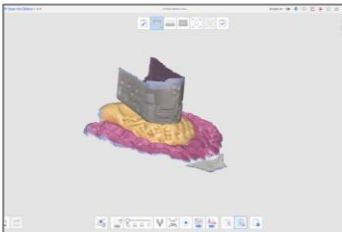
5) The bite fork scan captures the upper jaw position relative to the transfer block. The gap in between may be filled with bite registration material.
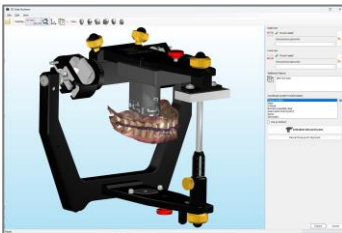

6) During the 3D data import, the intraoral and bite fork scan are aligned to the digital transfer block and thus correctly positioned in the articulator.

To start with the alignment of intraoral scans to the bite fork scan and subsequently to the digital transfer block, the 3D Data Assistant provides a button **🕊 Articulate intraoral scans** in the side panel.

3.1.2   Simultaneous import of upper and lower jaw in the 3D Data Assistant

As part of the digital workflow described above, the import procedure for 3D data has been completely revised and now allows the simultaneous import of upper and lower jaw models. The corresponding scan files can simply be loaded via drag-and-drop. The interrelation of the two models will at all times be preserved as it was created by the lab scanner or intraoral scanner.
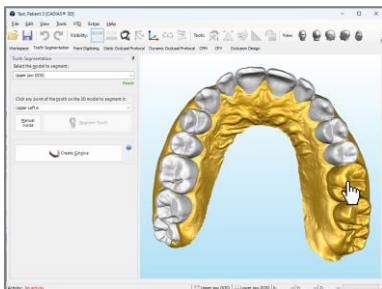
Additionally, the 3D Data Assistant can now be started directly from CADIAS 3D.
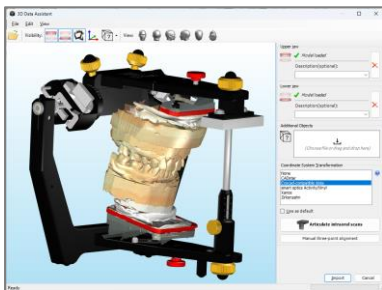
Figure 7: Importing upper and lower jaw model at the same time in the 3D Data Assistant.

3.1.3   Automatic intelligent tooth segmentation

For analyzing static and dynamic tooth contacts in CADIAS 3D, it is necessary to segment the individual teeth of the models. Until now, this segmentation had to be carried out manually by tracing the outline of each tooth.

The update to version 8.7 now includes an intelligent software algorithm that allows automatically segmenting individual teeth with a single click. This significantly simplifies the preparation work required for occlusion analysis.

Figure 8: The segmentation of individual teeth of the dental models can now be carried out with a single mouse click.

3.1.4   Export of graphical analyses for CAD/CAM

Graphical analyses in CADIAS 3D are useful for the visualization of anatomical parameters measured on the jaw models, such as occlusal plane, curve of Spee, or the dental arches of active and passive centric. These visualizations, including the reference planes of the articulator coordinate system, can now be exported as 3D objects via the menu *File > Export* for the use in external CAD/CAM applications. This allows for a verification of the axis-related model position as well as the inclusion of VTO-planned target parameters in the occlusion design.
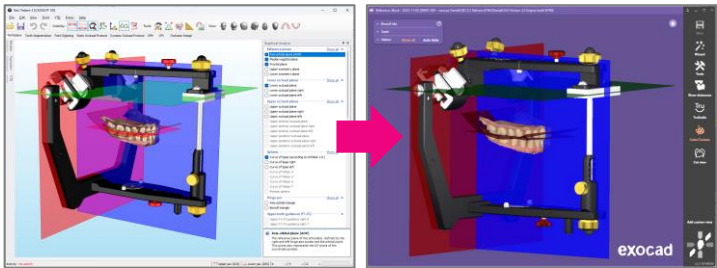

Figure 9: Export of reference planes and graphical analyses for transferring model position and design targets to external CAD/CAM applications.

3.1.5   Lower jaw animation in Occlusion Design

The Occlusion Design view allows defining a series of lower jaw movements guided by the Sequence incisal table. These can subsequently be exported as Jaw Motion files and be used in CAD/CAM software such as Exocad for the virtual wax-up according to the principles of sequential occlusion.

To preview the generated lower jaw movements that are to be exported, the Occlusion Design view now allows replaying the movements directly in the 3D environment.
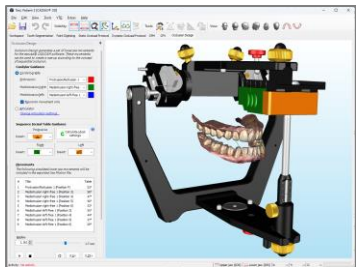

Figure 10: Replay of lower jaw movements guided by the Sequence incisal table in Occlusion Design.

3.1.6 Exporting cusp movement tracks for CAD/CAM

The Sequence incisal table in the Occlusion Design view of CADIAS 3D defines an incrementally decreasing sequence of laterotrusive guidance angles, which allow for the virtual wax-up according to the principles of sequential occlusion. The resulting movement paths of the cusps of the lower active centric arch are visualized in the 3D environment and animated during the movement replay in the Occlusion Design view.

When using this functionality to export the lower jaw movements as Jaw Motion files, an additional export option now allows those movement tracks to be exported as 3D objects. In external CAD/CAM software, these tracks can then be used as a visual template for the wax-up of the occlusal guidances in the maxillary occlusion or their verification.
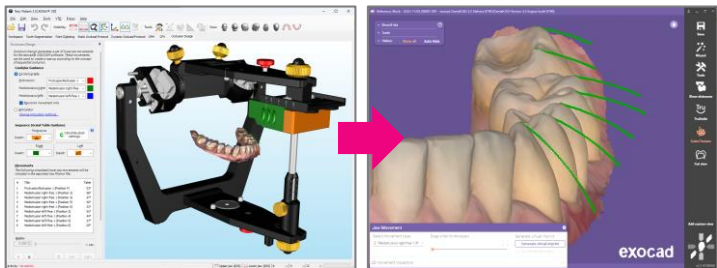
Figure 11: Export of cusp movement tracks as 3D objects for CAD/CAM.

3.1.7 Sequence table integrated in the articulator settings

The Sequence incisal table that was hitherto only available in the Occlusion Design view is now also part of the regular articulator settings that can be adjusted in the Workspace and Dynamic Occlusal Protocol views. Possible adjustments include the color of the inserts as well as the position of the table (F = protrusive, 3 to 6 = laterotrusive). The corresponding guidance angles conveniently appear as tooltips.
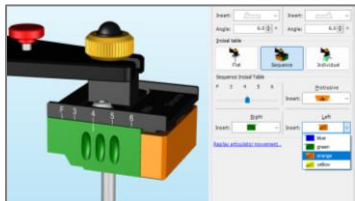
Figure 12: The Sequence incisal table is now part of the articulator settings and adjustable in the Workspace view.

3.1.8   Export of individual lower jaw movements

In addition to exporting lower jaw movements for sequential wax-up using the Occlusion Design view, it is now also possible to export individual condylography or articulator movements via the menu *File > Export* in the Workspace. These movements consider the settings pertaining to the incisal table guidance and model collision that were set in the Dynamics tool window.

3.1.9   Improved CPM computation

Following the calculation of a condyle position measurement (CPM), it is now possible to invert the calculation result without repeating the calculation. This allows for an easier assessment of the bidirectional differences between two condyle positions, such as from intercuspation (ICP) to reference position and vice versa. In addition, the initial calculation speed has been improved significantly.
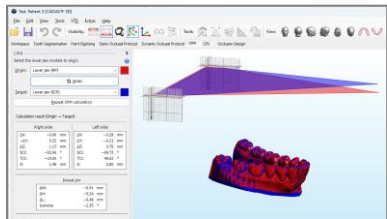
Figure 13: The result of a CPM calculation can now be inverted easily with the press of a button.

3.1.10   Adjustment of background color and rendering GPU

A new Options dialog for CADIAS 3D, which is accessible via the menu *Extras > Options*, now allows adjusting the background color of the 3D environment. This allows you to customize the appearance to your preferences while also simplifying background removal for screenshots.

In the same dialog, it is possible to adjust the GPU that is used for rendering the 3D scene. This can be useful on notebooks with a hybrid setup of integrated and dedicated graphics processor.
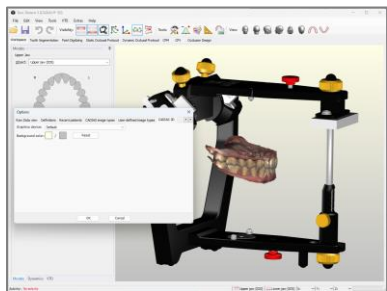
Figure 14: Adjusting the background color and rendering GPU in the new Options dialog of CADIAS 3D.

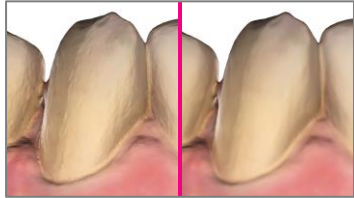### 3.1.11   Improved display of true-color scans

To improve the display quality of tooth surfaces, models that contain true color information, such as intraoral scans, can now also be displayed with smooth shading mode. Using the context menu of objects in the 3D view, it is possible to switch between flat and smooth shading mode and to turn on or off the use of true color. False color may be preferable for occlusal contact analysis.

Figure 15: Display of true-color model scans using flat shading (left) and smooth shading (right).

3.1.12   Miscellaneous improvements

– With VTO mode activated, it is now possible to select multiple models or teeth by holding down the *Ctrl* or *Shift* keys and to reposition them simultaneously.

– In the VTO selection dialog, it is now possible to duplicate VTO items via the context menu. This simplifies scenarios such as the creation of a series of interdependent treatment objectives.

– The custom measurements of points, lines, angles, etc., can now be modified by dragging the individual measurement points on the surface of the model.

– When importing 3D models in the 3D Data Assistant, it is now possible to invert the surface direction of the mesh, which allows correcting potentially erroneous scan data.

– The adjustment range of the articulator's sagittal condylar inclination (SCI) setting has been raised from 70° to 90°.

– The 3D data import now supports meshes comprised of quadrilateral rather than triangular faces.

3.1.13   Fixed issues

– The performance of the image overlay has been improved significantly and a potential related application crash has been resolved.

– Minute numerical imprecisions during the incisal table guidance of lower jaw movements have been fixed.

3.2 General

3.2.1 Revised diagnostic sheet for VieSID and DC/TMD

The diagnostic sheet of GAMMA Document Browser and the CADIAS Analyzer application (when launched from GDSW classic) has been revised in cooperation with experts of the Vienna School of Interdisciplinary Dentistry (VieSID) to conform with the typical patient anamnesis procedure and the associated documentation requirements. The changes include the questionnaire of the dental history analysis, the sequence of muscle palpation, which is now more clearly separated into muscles to be palpated intraorally and extraorally, as well as the input of specific clinical symptoms in the section for myofunctional disturbances.

The diagnostic sheet now also provides additional input fields for documenting the Diagnostic Criteria of Temporomandibular Disorders (DC/TMD)[1], including a graphic for tooth and tongue status.
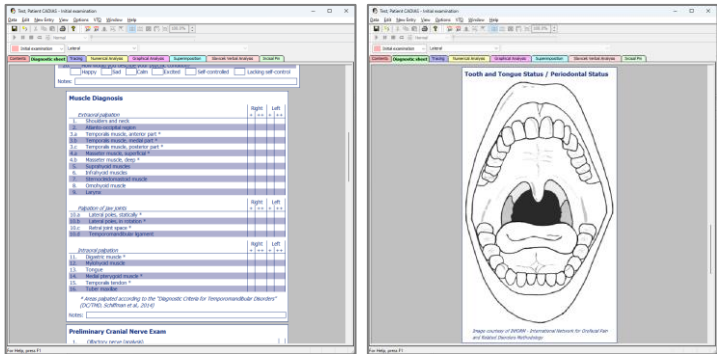
Figure 16: Additional input fields in the diagnostic sheet now allow documenting the patient anamnesis according to the requirements of VieSID and DC/TMD.

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[1] *Schiffman E et al.; International RDC/TMD Consortium Network, International association for Dental Research; Orofacial Pain Special Interest Group, International Association for the Study of Pain. Diagnostic Criteria for Temporomandibular Disorders (DC/TMD) for Clinical and Research Applications: recommendations of the International RDC/TMD Consortium Network* and Orofacial Pain Special Interest Group†. J Oral Facial Pain Headache. 2014 Winter;28(1):6-27. DOI: 10.11607/jop.1151. PMID: 24482784; PMCID: PMC4478082.*

3.2.2   Recovery files for diagnostic sheet

As a safeguard for the diagnostic sheet information created during patient anamnesis, the inputs are now stored as recovery files, which can be restored via the *File* menu in case of a saving error or system crash.

3.2.3   Simplified licensing scheme

The licensing scheme of GAMMA Dental Software has been simplified and now provides module versions "C3D" and "C3D+", which better support the requirements of the digital workflow. The latter module version unifies and replaces the previous "CW", "S", and "LAB" variants.

Software module	Viewer	C	C3D	C3D+	AM
GAMMA Document Browser	✓	✓	✓	✓	✓
GDSW classic	✓	✓	✗	✓	✓
CADIAS® 3D virtual occlusion analysis	✓ (*)	✗	✓	✓	✓
CADIAX® condylography analysis	✓ (*)	✓	✗	✓	✓
Condylography with CADIAX® compact 2	✗	✓	✗	✓	✓
Condylography with CADIAX® 4	✗	✗	✗	✗	✓
CADIAS® cephalometric analysis	✓ (*)	✗	✗	✓	✓

(*) read-only access

3.2.4   Discontinuation of 32-bit support

The modern features and software algorithms implemented in this version necessitate the use of a 64-bit operating system for technical reasons. Due to the vanishingly low market share of 32-bit Windows installations and the discontinuation of such an option with actual Windows versions, GAMMA Dental Software is now only available as 64-bit software. This simplifies the installation procedure and also reduces the size of the installation package by roughly 20%, consequently resulting in quicker software downloads.

3.2.5   Miscellaneous improvements

– The user interface has been improved in several locations to better support display scaling on high-definition screens, including the toolbar in CADIAS 3D and the patient tree in GDSW classic.

3.3 GAMMA Document Browser

3.3.1 Automatic image import during GDSW classic conversion

When converting patient files of GDSW classic to the GAMMA Document Browser format, linked image files in CADIAS, such as x-ray images and patient photos, are now automatically imported into the converted patient file – provided the linked image files are accessible.

3.3.2 Copying and pasting images in the Image Assistant

The Image Assistant of GAMMA Document Browser now allows copying the displayed image to the clipboard using the standard keyboard combination *Ctrl+C*, which can subsequently be pasted in external applications. Conversely, it is now also possible to paste already copied images in the Image Assistant using the keyboard combination *Ctrl+V*.

3.3.3 Miscellaneous improvements

– In the Cell Design view, it is now possible to select multiple cell design elements by holding down the *Ctrl* or *Shift* modifier keys and modifying them at once.

– When opening a diagnostic sheet in the Workspace, the form sheet now automatically scrolls to the section displayed in the preview.

– The handling of errors that could occur during the conversion of old Microsoft Access-based patient files into the current format has been improved.

– Support for schema design templates containing cells with a 16:9 aspect ratio has been improved. Predefined sets of schema design templates in the widescreen format are available for download from our website.

3.3.4 Fixed issues

– A possible application hang when closing the diagnostic sheet editor and the patient file in quick succession has been fixed.

– An error that caused imported user-defined image types to only appear when the Options dialog was opened for the first time has been resolved.

3.4 CADIAX

3.4.1 Improved curve selection for articulator calculation

The selection of curves for the calculation of articulator settings in the CADIAX Analyzer application can be carried out via the context menu or the drop-down boxes in the contents list. When scrolling this list with the mouse wheel, it was easily possible to change the curve selection by accident. To prevent this from happening, changing the selection now requires explicitly selecting the respective curve in the list beforehand.
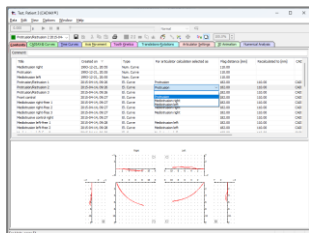
Figure 17: Selection of CADIAX curves for articulator calculation.

3.4.2 Miscellaneous improvements

– The XML and ASCII export/import in the CADIAX *compact* 2 Recorder is now also possible when the application has been started from GAMMA Document Browser or GDSW classic.

3.4.3 Fixed issues

– When opening a recording file of CADIAX *compact* 2 Recorder, the curve selection for articulator calculation is now restored correctly.

– Incorrect designations of measurement units for coordinates and angles in the input mask for numeric curves have been corrected.

3.5 CADIAS

3.5.1 Miscellaneous improvements

– The Xi point that describes the center of mass of the ascending mandibular ramus now supports a more stable calculation mode that prevents positional changes of the point during VTO modifications. For more information to enable the new calculation mode, please contact us directly.

– The error messages shown for incorrectly digitized mandibular ramus contours and the DC point have been revised to better describe the respective error.

Notes