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1. Introduction

GALILEOS Implant is intended to be used as a planning and simulation software to aid qualified dental professionals in the placement of dental implants and the planning of surgical implant treatments.

GALILEOS Implant is based on medical imaging information which is produced by Sirona medical cone beam scanners and presented by the Sirona GALAXIS 3D viewer. The dental professionals’ input information may be exported from GALILEOS Implant and used as input data for CAD or Rapid Prototyping Systems.

⚠️ CAUTION ⚠️
Make sure that all national requirements are complied with when using GALILEOS Implant.

⚠️ CAUTION ⚠️
Federal Law (USA) restricts use of GALILEOS Implant to or on the order of a physician, dentist or licensed practitioner.

⚠️ CAUTION ⚠️
The use of GALILEOS Implant is restricted to qualified dental professionals.

⚠️ CAUTION ⚠️
Every plan which is intended for treatment of any kind needs to be leges artis.

ⓘ NOTE ⏳
Third-party trademarks, trade names, or product names used in these instructions for use may be the trademarks or registered trademarks of their respective owners.
1. Introduction

1.1. Relation to GALAXIS

GALILEOS Implant is the implant planning extension for the 3D visualization software GALAXIS. Therefore, all features available in GALAXIS are also available in GALILEOS Implant. GALILEOS Implant contains additional features to permit you to plan an implant surgery.

GALAXIS is a product of Sirona Dental Systems GmbH, Bensheim, Germany.

GALILEOS Implant is a product of SICAT GmbH & Co. KG, Bonn, Germany.

1.2. Scope of these instructions for use

These instructions for use describe only those components of GALILEOS Implant which do not exist in GALAXIS.

In order to use GALILEOS Implant, it is therefore necessary not only to read these instructions for use, but also the GALAXIS instructions for use.
2. Installing and Starting GALILEOS Implant

2.1. Requirements

| Minimum system requirements | Processor: | Dual Core 1.6 GHz |
|                            | RAM:       | 2 GB |
|                            | Graphics system: | 128 MB external video card |
|                            |           | 24-bit color at 1024x768 resolution |
|                            |           | Shader Model 3 (for advanced 3D rendering) |
|                            | Hard disk: | 5 GB |
|                            | Drive:    | DVD writer |
|                            | Accessory: | Keyboard, mouse |
|                            | Network:  | 100 MBit/s Ethernet (1 GBit/s Ethernet recommended) |
|                            | Operating system: | Windows XP Professional (32-bit) with SP3 and .NET 2.0 Runtime Libraries or Windows Vista Business (32-bit) with SP2 or Windows 7 Professional (32-bit or 64-bit) with SP1 or Windows 8 (64-bit) or Windows 8.1 (64-bit) |
|                            | Additional software: | SIDEXIS XG 2.6.1 or SIDEXIS 4 4.1.1 (single-station system) or SIDEXIS 4 4.1.2 GALAXIS 1.9 |

**CAUTION**
Before you install GALILEOS Implant please make sure your system complies with the minimum system requirements.

**NOTE**
The monitor should be a high quality (non-interlaced) color monitor to ensure sharp images. Make sure the advertised dot pitch is at most 0.28 mm and the advertised frame rate is at least 50 Hz.
CAUTION
Prior to using GALILEOS Implant, check your monitor for sufficient visualization quality by visualizing the SMPTE test pattern.

NOTE
The advanced 3D rendering will be supported by the following video cards among others:

- NVidia GeForce 66xx series or newer (since approx. 2004)
- NVidia GeForce 2xx series or newer
- ATI Radeon X1300 or newer (since approx. 2005)
- ATI Radeon HD series or newer

NOTE
You will need a high speed internet connection if you choose to send the order data of a SICAT OPTIGUIDE or a SICAT DIGITALGUIDE to SICAT via internet.

NOTE
For printing planning reports you can use any standard Windows printer available on your computer that meets the following requirements: a resolution of at least 300 dpi, DIN A4 or US-Letter paper format and landscape image orientation.

NOTE
CAD/CAM data may be imported from optical impression systems which provide optical surface data in standard STL or SSI format with a resolution of at least 100 µm and covering an area of at least three teeth.
2. Installing

GALILEOS Implant needs the following additional software on your system:

- SIDEXIS XG or SIDEXIS 4
- GALAXIS

SIDEXIS XG or SIDEXIS 4 and GALAXIS are delivered on separate installation CDs. It is necessary to install SIDEXIS XG or SIDEXIS 4 and GALAXIS before installing GALILEOS Implant.

To start the installation of GALILEOS Implant, insert the GALILEOS Implant installation DVD into your DVD drive.

If the installation does not start automatically, switch to the directory containing the content of the GALILEOS Implant installation DVD. Double-click on the file 'Setup.exe' to start the installation.

Follow the installation instructions. GALILEOS Implant and the GALILEOS Implant database will be installed. At the end of the installation the following dialog is displayed:

During the installation of GALILEOS Implant you can configure if GALILEOS Implant requests a GALILEOS Implant license automatically at the start (see Section D.3).
2. Installing and Starting GALILEOS Implant

Tip
By default, GALILEOS Implant installs the full range of implant manufacturers supported by the application. However, you can also install a specific subset of manufacturers. This reduces the disk space required by the installation.

This selection only affects the way implants/abutments are displayed in the application: in general, a realistic way of display is used for implants/abutments of an installed manufacturer. Anyway, you can change the subset of installed manufacturers by re-running the installation process at any time.

NOTE
Please select a directory to which you have write access to. Please ask your system administrator if you encounter any problems concerning access rights.

NOTE
It is also possible to update GALILEOS Implant and GALILEOS Implant database via XGNetDeploy (see SIDEXIS instructions for use).

CAUTION
Do not perform any modification to the installation of GALILEOS Implant. Do not delete or modify any of the components contained within the installation directory of GALILEOS Implant.

CAUTION
Handle the GALILEOS Implant installation DVD with care and store it in an appropriate way.
2.3. Starting

To verify the installation of GALILEOS Implant, start SIDEXIS by clicking on the SIDEXIS icon on the desktop.

Select a patient and a 3D image (see SIDEXIS instructions for use).

**SIDEXIS XG system**

You start GALILEOS Implant from SIDEXIS XG by clicking either on the GALAXIS symbol in the tool bar or on the ‘3D’ button in the upper right-hand corner of a 3D image.

**SIDEXIS 4 system**

You start GALILEOS Implant from SIDEXIS 4 by clicking on the GALILEOS Implant symbol either in the ‘Open in’ window of the ‘Timeline' or in the 'New examination' tool kit of the 'Tools' docking window.

The following start screen appears:

GALILEOS Implant is launching.

While launching GALILEOS Implant checks out the necessary license (see Appendix D).

GALILEOS Implant has been started successfully if the graphical user interface appears (see Chapter 4).
NOTE
If the selected patient dataset is already opened on another computer in a multi-station system, SIDEXIS displays a corresponding message during startup. In this case, proceed as follows:

SIDEXIS XG multi-station system
You cannot execute an implant planning for this patient dataset on your computer at the moment. Select between opening the patient dataset in viewer mode and cancelling the start.

SIDEXIS 4 4.1.1 multi-station system
GALILEOS Implant is not released for SIDEXIS 4 4.1.1 multi-station systems. Do not use GALILEOS Implant in SIDEXIS 4 4.1.1 multi-station systems!

SIDEXIS 4 4.1.2 multi-station system
The patient dataset must be closed on the other computer before you can open the patient dataset on your computer.

CAUTION
Security leaks within your information system environment might allow access to your system threatening the privacy and the integrity of your patient data. Please make sure security policies are established within your organization to monitor and to protect against possible security threats related to your information system environment.

The installation and use of an up-to-date virus scanner is highly recommended. Please make sure your virus scanner pattern files are updated on a regular base.

CAUTION
Unauthorized access to your computer might allow access to your data threatening the privacy and the integrity of your patient data. Please limit the access to properly authorized individuals only.
2. Installing and Starting GALILEOS Implant

2.4. Updating the implant database

To update the implant database, please proceed as follows:

1. Close GALILEOS Implant (see Chapter 12).

2. Download the latest version of the implant database from the SICAT website (www.sicat.com).

3. In order to start the update of your local database, double-click on the file downloaded from the website. Different dialogs guide you through the update process (see Section 2.2).

4. (Re-)Start GALILEOS Implant (see Section 2.3).

2.5. Uninstalling

To uninstall GALILEOS Implant go to Start -> Control panel -> Software. Select ‘GALILEOS Implant 1.9.2’ and click on the ‘Remove’ button. Act accordingly to uninstall the GALILEOS Implant database.
3. What’s new?

This chapter presents important improvements and developments within the GALILEOS Implant software. If you are already familiar with GALILEOS Implant, you can quickly acquaint yourself with new key features by reading the following paragraphs. On the other hand, if you are a first-time user of GALILEOS Implant, you may want to skip this chapter.

3.1. GALILEOS Implant 1.9.2

- GALILEOS Implant supports ordering an additional type of surgical guide: SICAT DIGITALGUIDE - design & STL export (see Section 9.3). The SICAT Surgical Guide Laboratory designs a digital model of the surgical guide and provides this digital model as STL file. You will receive the STL model online and you can have a surgical guide printed in a laboratory of your choice. It is necessary that you have imported and successfully matched (registered) a corresponding optical impression.

- GALILEOS Implant supports two variants of third-party processing of your plan:
  - New: Export plan for third-party processing using optical impressions (see Section C.2). Use this variant e.g. for the CEREC Guide 2 workflow.
  - Export plan for third-party processing using reference bodies (see Section C.3). Use this variant e.g. for the CEREC Guide 1 workflow.

  Compared to the second variant, the first variant does not require reference bodies. Instead, the first variant is based on optical impressions.

- SICAT now also supports the following guided surgery systems (see Section 8.2 and Section 9.3.2):
  - Alphatech – Alphatech Guided Surgery
  - Anthogyr – Anthogyr Guiding System
  - BEGO – BEGO Guide
  - Bicon – Bicon Guided Surgery
  - BioHorizons – BioHorizons Guided Surgery
  - Bredent – Sky PlanX
3. What's new?

- Hiossen – Hiossen Guide
- Implant Direct – Implant Direct Guided Surgery
- Kentec – MJ Guide
- Klockner – Klockner Surgery Guide
- Leone – Digital Service Leone
- Medentis Medical – ICX Safety Guide
- Neoss – Neoss Guide
- Sweden&Martina – Echo Plan
- TRI – TRI Guided Surgery

Additionally, SICAT supports **pilot sleeves** with inner diameter 1.2 mm and inner diameter 1.6 mm. The **SICAT sleeve-in-sleeve system** now also supports the inner diameter 2.1 mm.

- When using the payment method 'Charge Authorization for this single order only' (see Section 9.3.5), GALILEOS Implant now supports the **SEPA Direct Debit Mandate** for banks in SEPA countries.

3.2. GALILEOS Implant V1.9

- GALILEOS Implant now also supports SICAT **OPTIGUIDE** surgical guides (see Section 9.3). The order wizard has been adjusted accordingly:
  - At the beginning of the order process you select the type of surgical guide desired: SICAT **CLASSICGUIDE**, SICAT **OPTIGUIDE** or SICAT **OPTIGUIDE** with stone model scan and registration.
  - Articles/services ordered and prices are displayed on a new confirmation page. To go on accept SICAT’s terms and conditions and confirm your order. This replaces the printing and signing of the order form during the previous order process. You do not have to send a signed order form for your SICAT surgical guide order any more.
  - During the order of a SICAT **OPTIGUIDE** select if you like to send the order data via internet to SICAT or via package/CD.
  - When entering your payment information you can now also mention that you issued SICAT with a recurring charge authorization.
  - GALILEOS Implant supports you in exporting your plan for third-party processing (see Section C.3).
3.3. GALILEOS Implant V1.8

- GALILEOS Implant supports you in planning implants in a way that standard abutments can be used. In addition to the implants the implant database of GALILEOS Implant contains also the standard abutments of different manufacturers (see Chapter 7).

- GALILEOS Implant supports you in planning implants in a way that a SICAT surgical guide can be manufactured according to your implant planning. In addition to the implants and abutments the implant database of GALILEOS Implant also contains sleeve systems of different manufacturers (see Chapter 8).

- In the 3D view, parts of the volume can be clipped temporarily ('3D clipping') so you can better diagnose the remaining part of the volume. Additionally, the position of planning objects within the volume can be better evaluated (see Section A.2).

- You can also copy the current page of the planning report into the clipboard. GALILEOS Implant uses your practice logo you loaded up in SIDEXIS for the planning report (see Section 9.2).

- SICAT now supports the guided surgery systems Dentaurum - tioLogic pOsition, DENTSPLY Friadent - ExpertEase, Meisinger - 3D-Navigation-Control, MIS - M-Guide, SIC invent - SIC Guided Surgery and Zimmer Dental - Zimmer Guided Surgery as well as pilot sleeves with inner diameters 1.1 mm, 1.5 mm, 1.8 mm and 2.1 mm.

- The usability of the CAD/CAM functions (see Appendix B) has been improved: For a better differentiation between optical impressions and restorations optical impressions are now labelled with 'I...' and restorations with 'R...'. Using a single-click on the 'eye' symbol shows or hides an optical impression or a restoration. The CAD/CAM functions 'Inserting implants based on a restoration', 'Re-registering an optical impression' and 'Removing an optical impression and its restorations' are available for both, selected optical impression and selected restoration.

- The disk space required by the implant database was reduced by more than one third compared to the previous version.

3.4. GALILEOS Implant V1.7 with SP2

- GALILEOS Implant is now also available in the following languages: Chinese and Taiwanese.
3.5. GALILEOS Implant V1.7

- GALILEOS Implant allows you to visualize GALILEOS X-ray data and superimposed CAD/CAM data simultaneously. You will be able to plan implant treatment based on the anatomical information while taking all prosthetic consequences into account (see Appendix B).

- The visualization of the volume in the 3D view is remarkably improved in quality and speed. Using the new, hardware accelerated display modes (see Section A.1) makes it necessary to have an external video card installed supporting ‘Shader Model 3’ (see Section 2.1).

- The surgical guide order has been edited completely (see Section 9.3). The following guided surgery systems are additionally available during the sleeve system selection: Biomet 3i - Navigator, Camlog Biotechnologies - Camlog Guide, Straumann - Straumann Guided Surgery, Astra Tech - Facilitate and Nobel Biocare - NobelGuide. Not only the order and shipping information but also the payment information can now be entered easily into the order wizard. Moreover the revised ‘order form for the manufacturing of one surgical guide’ will be printed by the wizard.

- It is also possible to update GALILEOS Implant and GALILEOS Implant database via XGNetDeploy (see SIDEXIS instructions for use).

- Volumes for third-party applications can be generated and exported by SIDEXIS XG directly (see SIDEXIS XG instructions for use).

3.6. GALILEOS Implant V1.6

- The disk space required by the implant database was reduced by one third compared to the previous version.

3.7. GALILEOS Implant V1.4

- GALILEOS Implant now allows you to generate a comprehensive planning report. Your plan, prepared in the 3D environment, will be transferred to a 2D output medium to become a substantial part of your documentation (e.g. for surgery). The planning report consists of several pages: the first page provides an overview of all implants followed by one page per implant, containing detailed information for each implant. You can either directly print the report, store it in your file system or export it to SIDEXIS (see Section 9.2).
• The **tool bar 'Surgical Guide'** has been replaced by a new tool bar labeled 'Surgery'. Using the tool bar 'Surgery' you can order a surgical guide as well as generate a planning report (see Chapter 9).

• The **workspace 'Implant-Aligned'** has experienced a significant development from a workspace intended for exactly aligning and positioning implants and performing the final inspection to an all-purpose workspace applicable during all steps of the planning process. To this end, a panoramic view and an implant-aligned cross-sectional view have been added to the workspace (see Section 6.13).

• It is now possible to burn a CD containing your planning data, the volume data and the new 3D viewer software **GALILEOS Viewer**. The recipient of this GALILEOS Viewer CD will be able to view the volume data as well as the planning data interactively without having to install SIDEXIS (see Section 10.9.3).

• **GALILEOS Implant** is now also available in the following **languages**: Japanese, Korean, Dutch, Portuguese and Russian.
4. User Interface

The user interface of GALILEOS Implant consists of a title bar (1), a menu bar (2), several tool bars (3), a status bar (4) and various workspaces (5).
4.1. Workspaces

The workspace ‘Panorama’ is the main workspace for diagnostic purposes. GALILEOS Implant adds an additional workspace to GALAXIS that is especially well suited for working with implants (see Section 6.13).

Each workspace is composed of various views, e.g. Panorama (1), Slicing window (2), 3D (3), Tangential (4), Cross-sectional (5) and Axial (6).

**CAUTION**
Always verify the correct orientation of the displayed patient dataset.
4. User Interface

4.2. Menu bar

The menu bar is located in the upper part of the user interface window.

GALILEOS Implant adds two additional menus to the GALAXIS menu bar. These menus provide functions for working with implants (see Chapter 6), abutments (see Chapter 7) and sleeves (see Chapter 8) as well as functions for working with plans (see Chapter 10).

4.3. Tool bars

GALILEOS Implant tool bars are located at the right hand side of the user interface window. The layout of the tool bar mirrors the steps of a default work routine. Every tool bar provides the features required in the respective step. The selected tool bar is highlighted in orange.

GALAXIS provides the following tool bars:

**Diagnosis** – see GALAXIS instructions for use

**Findings** – see GALAXIS instructions for use

GALILEOS Implant provides additional tool bars for implant planning:

**Nerve** – see Chapter 5

**CAD/CAM** – see Appendix B

**Implant** – see Chapter 6, Chapter 7 and Chapter 8

**Surgery** – see Chapter 9
5. Highlighting/Editing Mandibular Canals

5.1. Opening the tool bar 'Nerve'

GALILEOS Implant offers you the possibility to highlight and edit mandibular canals.

This feature is accessible by a tool bar. Just click on the tab labeled 'Nerve'.

The tool bar 'Nerve' opens:

Using GALILEOS Implant, you can 'draw' mandibular canals shaped like a three-dimensional tube.

To this end you place a series of points along the canal. GALILEOS Implant automatically connects these points drawing a three-dimensional tube.
5.2. Highlighting the mandibular canal

Move the slicing window across the supposed position of the mandibular canal and locate the canal by navigating through the volume with the left mouse button.

Decide whether you want to mark the right or the left canal.

Beginning close to the foramen mandibulare place the points from distal to mesial, ending at the foramen mentale. For placing each point, select the 'Add nerve point' symbol and click at the position where you want to insert the new point.

**Tip**

It is possible to add a nerve point by simply double-clicking at the intended position. In this case, you do not need to select the 'Add nerve point' symbol.

If necessary, move the slicing window in mesial direction and relocate the mandibular canal by navigating through the volume with the left mouse button.

Having set all points you can move the slicing window aside to be able to see the whole canal displayed as a three dimensional tube. The three dimensional tube appears to be on top of the panorama; in reality it is placed inside the volume.
5.3. Changing the diameter

The current diameter used to draw the mandibular canal is displayed in the tool bar. You may change the diameter by clicking on the arrow buttons.

The default is set to 2.5 mm.

5.4. Moving a nerve point

It is possible to reposition single points. To do this, move the mouse to the point you want to reposition, press the left mouse button and keep it pressed while moving the mouse to the new position.

5.5. Selecting a nerve point

A nerve point can be selected by using the arrows ‘previous nerve point’ (1) and ‘next nerve point’ (2) in the tool bar or by clicking directly onto the point within a view. The selected nerve point is highlighted in orange and its number is displayed in the tool bar. If the selection is done via the tool bar, all views are focussed on the selected nerve point.

Tip
To select a nerve point and to focus on it directly, simply double-click on the nerve point in the view.

5.6. Adding a nerve point

It is possible to insert an additional point in-between two existing points. Select the existing nerve point after which you want to insert a new point and add a new nerve point as described above.

5.7. Removing a nerve point

To remove the selected nerve point, click on the symbol in the tool bar.
5.8. Removing a mandibular canal

Remove the whole mandibular canal by first selecting the canal in the tool bar. Then select this [3] symbol next to the combo box. GALILEOS Implant prompts you to confirm the removal of the whole mandibular canal. Confirm this dialog if you are sure you want to remove the whole mandibular canal.
6. Inserting/Editing Implants

6.1. Selecting favorite implant lines

GALILEOS Implant works with a database containing implant models from various manufacturers. For each manufacturer the implant models are arranged in lines. You may select your favorite implant lines before inserting the first implant. When inserting an implant later, GALILEOS Implant provides a list with your preferred lines. This allows an easy and direct access to the implant lines during the planning process. To define your favorites please open the menu ‘Implant’ and select the entry ‘Favorite Implant Lines’. GALILEOS Implant opens the dialog shown below:

The list on the left hand side shows all available implant lines. By selecting one line followed by pushing the ‘Add’ button, you add the line to the favorites list. In the picture a BIOMET 3i’s implant line ‘NanoTite Parallel Walled Certain’ is selected as an example.

Add any available implant line you are working with to the favorites list. When inserting an implant, your favorite implant lines are displayed in the order you define in this dialog. Select a favorite line and click on the ‘Move Up’ or ‘Move Down’ button to change the line’s position in the list.
Select a favorite line and click 'Remove' to remove the line from your favorites list.

Since GALILEOS Implant stores your selection your favorite list has to be defined only once. You may update the list later if you decide to work with different implant lines.

6.2. Opening the tool bar 'Implant'

GALILEOS Implant offers the possibility to insert and edit implants.

This feature is accessible by a tool bar. Just click on the tab labeled 'Implant'.

The tool bar 'Implant' opens:

Move the slicing window to the position where you want to insert a new implant.
6.3. Inserting a new implant

After positioning the slicing window insert a new implant by selecting this icon.

6.3.1. 'Configure Implant' dialog

GALILEOS Implant opens the dialog for configuring the new implant:

6.3.2. Selecting the position

Please identify the implant’s position by selecting the corresponding tooth (tooth number 19 in this example). The selected tooth is highlighted.
NOTE
In these instructions for use, all images and examples feature the ADA tooth chart. GALILEOS Implant also supports the FDI tooth chart:

You can choose the tooth chart you want to work with via SIDEXIS. GALILEOS Implant uses the same tooth chart as SIDEXIS. Be aware of the fact that a change via SIDEXIS becomes visible only after restarting GALILEOS Implant.

The position is used to identify the implant. That's why it is mandatory to select a position. You can close the dialog with the 'OK' button only after you have selected a position.

6.3.3. Selecting the orientation (optional)
Initially, implants are aligned vertically. In case other implants have already been placed with a different alignment it might be useful to align the new implant with an existing one. Simply select the existing implant by its position.

6.3.4. Selecting the implant model
Select the needed implant model by clicking on the model in the table. A preview of the selected model is displayed next to the table.

The table features the models of your favorite implant line. The table rows correspond to the lengths (in mm), the columns to the diameter pairs (occlusal/apical diameters in mm) available in the implant line.
6. Inserting/Editing Implants

**Tip**

A small abutment symbol in the table indicates that at least one compatible standard abutment (see Chapter 7) is available for the respective implant model.

A small sleeve symbol in the table indicates that the respective implant model is compatible with the implant manufacturer’s sleeve system (see Chapter 8).

If you have defined more than one preferred implant line, you can switch to another line by selecting it from the combo box.

**Tip**

In case you can’t find the implant line you need in the list, select the entry ‘More’ to add an additional implant line. GALILEOS Implant automatically adds the selected line to your favorites list.

If the needed implant line is not in the database, you can work with generic implants by selecting ‘Generic’ from the list. In this case, you can define the implant dimensions freely.

**CAUTION**

In exceptional cases, implants from the database may be displayed schematically. The schematic presentation conforms in length and diameters with the nominal specifications provided by the manufacturer. You need to evaluate how the nominal specifications relate to the real dimensions.
6.3.5. Find the implant’s approximate position

After closing the dialog with the 'OK' button, the new implant is attached to the mouse pointer. You can move the implant through all views (except the 3D view) without clicking.

We recommend that you first position the implant in the slicing window. You can 'drop' the implant at a suitable position with a left-click. Use the tangential view and the cross-sectional view to set the implant’s exact position and alignment.
6.4. Aligning/Moving an implant

To realign an implant, move the mouse pointer over the axis running through the implant’s center. The cursor changes to: ☰. Change the alignment by pressing the left mouse button and moving the mouse to the left or to the right.

An implant cannot be aligned in the panoramic view nor in the slicing window. Work with the tangential view instead.

To reposition an implant, move the mouse pointer over the implant’s body. The cursor changes to: ☳. Press the left mouse button and keep it pressed while moving the mouse pointer to the new position.

Check if the implant fits neatly by navigating through the volume with the left mouse button.

Tip
You can rotate rotationally asymmetric implants (e.g. one piece, angled implants) around the implant axis by proceeding as described in Section 7.5.

6.5. Inserting additional implants

Add additional implants by repeating the steps described above, beginning with Section 6.3.
6.6. Selecting an existing implant

You can select an existing implant by pressing the button to the right of the current implant position in the tool bar.

GALILEOS Implant shows a list featuring all implants existing in your plan. Please select an implant by clicking on the label. The selected implant becomes the current one. The color of the implant changes to orange to indicate that it is the current one. GALILEOS Implant focuses on the implant, i.e. all views align with the current implant.

An alternative way of selecting an implant is by using your mouse: simply click on the implant in any view. GALILEOS Implant does not focus on the implant.

**Tip**
By double-clicking on an implant in any view, GALILEOS Implant selects the implant and focuses on it.

**Tip**
The implant context menu also provides the function 'Focus Implant'.

6.7. Changing an implant

It is possible to change an implant. Simply click on this icon in the tool bar. You can work with the change dialog as described in Section 6.3.1.

**Tip**
The implant context menu also provides the function 'Change Implant'.
6. Inserting/Editing Implants

Tip
Another convenient way to edit the dimensions of the current implant is by selecting the button next to the diameters or length in the tool bar. Depending on the selected implant line you can switch to other diameters and lengths.

Tip
If you change the dimensions of the current implant and if therefore the corresponding abutment (see Chapter 7) is not compatible any longer, the abutment will be adjusted automatically. GALILEOS Implant will select a compatible abutment within the same abutment line which is identical to the original abutment apart from the platform diameter and the emergence diameter, if needed. If there is no such abutment available, the abutment will be removed.

Tip
If you change the dimensions of the current implant and if therefore the corresponding sleeve (see Chapter 8) is not compatible any longer or if therefore the sleeve position is not valid any longer, the sleeve will be adjusted automatically. GALILEOS Implant will select a compatible sleeve model and/or a valid sleeve position within the same sleeve system. If there is no such sleeve available, the sleeve will be removed.

6.8. Removing an implant

Please select this icon in the tool bar to remove the current implant.

Tip
You can trigger the function 'Remove Implant' by both using the implant’s context menu and pressing the 'Del' key.
6.9. Undo

It is easy to undo the last action related to the current implant (aligning, moving, changing or removing). Click on this icon in the tool bar.

Tip

The function 'Undo' is also available in the context menu of an implant.

6.10. Showing/changing the safety margin

A conical safety margin is shown around the current implant. This helps you to graphically estimate distances between the current implant and roots of adjacent teeth, implants, or the mandibular canal.

You can hide or show the safety margin by selecting the entry 'Show safety margin' in the menu 'Implant'.

Tip

The implant context menu also provides the function 'Show safety margin'.

It is possible to change the dimensions of the safety margin (see Appendix E).
6.11. Showing/changing pilot drill paths

GALILEOS Implant provides the possibility to display a cylindrical pilot drill path for each implant belonging to the current jaw (i.e. the jaw containing the current implant). This feature may assist you when aligning and positioning implants or during the final checking, because it helps you to determine whether the pilot drill paths of two adjacent implants overlap. Considering the surgical guide it is essential to avoid any overlapping of pilot drill paths.

Select 'Show Pilot Drill Paths' in the menu 'Implant' to show or hide pilot drill paths.

Tip

The implant context menu also provides the function 'Show Pilot Drill Paths'.

It is possible to change the diameter and the length of the pilot drill paths (see Appendix E).
6.12. Showing/changing the final drill path

In addition to the pilot drill path, GALILEOS Implant provides the possibility to show the final drill path of the current implant, also formed like a cylinder. The diameter of the final drill path always corresponds to the occlusal diameter of the implant. Displaying the final drill path may assist you when aligning and positioning implants or during the final checking, because it helps you to decide whether, for example, the final drill path and an adjacent tooth overlap. Such an overlap may render the insertion of the implant impossible later in the process.

This feature may be used irrespective of displaying the pilot drill paths. Select ‘Show Final Drill Path’ in the menu ‘Implant’ to show or hide the final drill path of the current implant.

Tip

The implant context menu also provides the function ‘Show Final Drill Path’.

It is possible to change the length of the final drill path (see Appendix E).
6.13. Workspace 'Implant-Aligned' 

GALILEOS Implant adds an additional workspace to GALAXIS that is especially designed for the exact alignment and positioning of implants.

Switch to the workspace 'Implant-Aligned' by selecting the tab 'Implant-Aligned'.

The organization of this workspace is very similar to the one used in the workspace 'Panorama'. However, the workspace 'Implant-Aligned' provides a special feature: all slicing views are always aligned with the current implant. As soon as you change the position or alignment of the current implant or switch to another implant, all slicing views are adjusted accordingly. Furthermore, it is possible to rotate the slicing views around the current implant. This allows you to assess the position and alignment of the current implant in an ideal way and adjust it if necessary.

The tangential view (1) and the cross-sectional view (2) always proceed through the axis of the current implant. Use the slider at the bottom of the tangential view (4) to rotate both views around the current implant. To return to the default settings click on the symbol (5).
The axial view (3) is always at right angle with the axis of the current implant. With help of the axial view you can easily navigate along the axis of the current implant.

All slicing views are strongly coupled with each other. They each feature a line showing the other views’ position. To help to keep you orientated the 3D view shows the location of the slicing views.

Tip

The closer the panoramic curve matches the form of the jaw the easier working with implants in the workspace ‘Implant-Aligned’ becomes. We recommend checking the panoramic curve and adjusting it if necessary (see GALAXIS instructions for use). In case the implant-aligned cross-sectional view is not at right angle with the panoramic curve, you can correct the alignment temporarily by using the slider.

Proceed as follows to plan an implant in the workspace ‘Implant-Aligned’:

• Insert a new implant and ‘drop’ it in the panoramic view at roughly the intended location (see Section 6.3). In the panoramic view, there is no information available about the actual depth, so the implant is automatically positioned into the center of the panoramic region.

• Use the slicing views to determine the exact position for the implant. Align the implant using the tangential view and the cross-sectional view (see Section 6.4).

• Check the position and alignment of the implant by rotating completely around it and make corrections if necessary. You may also want to navigate along the axis of the implant.
7. Inserting/Editing Abutments

7.1. Overview

An abutment is the interface between an implant and a prosthetic treatment.

GALILEOS Implant supports you in planning implants in a way that standard abutments can be used.

In addition to the implants the implant database of GALILEOS Implant contains also the standard abutments of different manufacturers. GALILEOS Implant supports straight and angled abutments. The abutment models are organized in abutment lines for each manufacturer.

For each implant you can plan a compatible abutment and you may, if needed, readjust the implant position and its orientation to use a standard abutment.

Tip
The workspace 'Implant-Aligned' is very suitable for planning abutments.

7.2. Opening the tool bar 'Implant'

The functionality for inserting, changing and removing abutments is accessible via the tool bar. Just click on the tab labeled 'Implant'.

7.3. Inserting a new abutment

Click on this button to add a new abutment to the current implant (see Section 6.6).

Tip
The function 'Edit Abutment' for inserting, changing and removing an abutment is also accessible via the context menu of an implant/abutment.
7. Inserting/Editing Abutments

7.3.1. 'Configure Abutment' dialog

GALILEOS Implant opens the dialog for configuring the new abutment:

![Configure Abutment dialog]

**Tip**
Move the 'Configure Abutment' dialog so you can see the implant in the (implant-aligned) tangential view and the (implant-aligned) cross-sectional view. All adjustments made in this dialog are propagated directly into the views so you can configure your abutment in relation to the image data.

7.3.2. Selecting the abutment line

Select the abutment line desired. All abutment lines that are compatible with the current implant are selectable.

**Tip**
If the abutment line desired is not yet available in the implant database, you have the possibility to configure a generic abutment via the entry 'Generic'. In this case, you can enter the angulation and the dimensions as desired.
CAUTION
If you use the nominal specifications provided by the manufacturer for the configuration of a generic abutment, you need to evaluate how these nominal specifications relate to the real dimensions.

7.3.3. Selecting the angulation
If the selected abutment line contains abutment models with different angulations, select the angulation desired.

7.3.4. Selecting the abutment model
Select the abutment model by clicking on the model desired in the table. A preview of the selected model is displayed next to the table.

The table presents all abutment models which meet the following criteria:
• The abutment model belongs to the selected abutment line.
• The abutment model has the selected angulation.
• The abutment model is compatible with the current implant.

The table rows correspond to the different collar and post lengths (in mm) respectively, the columns to the different emergence diameters (in mm).

Close the dialog with 'OK'.

Tip
You can also configure a corresponding abutment while you insert an implant (see Section 6.3). Just click on the tab labeled 'Abutment' after having configured the implant.

Now you can configure the corresponding abutment as described above.
7. Inserting/Editing Abutments

NOTE

The display of a plain, red cylinder instead of an abutment indicates that the implant database is not installed or not installed correctly. Please check the installation of your implant database.

The red cylinder does not correspond to the dimensions of the abutment planned!

7.4. Aligning/Moving an abutment

When you are aligning/moving an implant (see Section 6.4) the corresponding abutment will be aligned/moved accordingly.

7.5. Rotating an angled abutment

If an angled abutment is inserted it will be rotated around the implant axis automatically, so that it is angled lingually.

To rotate an angled abutment around the implant axis move the mouse pointer over the displayed angulation axis in the (implant-aligned) axial view. The cursor changes to :arrow_right:. Rotate the abutment around the implant axis by pressing the left mouse button and moving the mouse around the implant axis.

Tip

Navigate in the (implant-aligned) axial view to a slice near the occlusal end of the abutment, so that you can still see the abutment in the (implant-aligned) axial view. During the rotation of the abutment also check the rotation of the abutment in the (implant-aligned) tangential view and in the (implant-aligned) cross-sectional view.
7.6. Selecting an abutment

You can select a previously inserted abutment by selecting the corresponding implant (see Section 6.6) or by simply clicking on the abutment desired in any view.

The selected (current) abutment will be displayed in orange.

7.7. Changing an abutment

You can change the current abutment by clicking on this button in the tool bar. GALILEOS Implant opens the 'Configure Abutment' dialog (see Section 7.3.1) again.

Tip
The function 'Edit Abutment' for inserting, changing and removing an abutment is also accessible via the context menu of an implant/abutment.

7.8. Removing an abutment

To remove the current abutment please click on this button in the tool bar and select the entry 'No Abutment' in the list of abutment lines.

Tip
If you remove the current implant (see Section 6.8), the corresponding abutment will be removed automatically.

Tip
The function 'Edit Abutment' for inserting, changing and removing an abutment is also accessible via the context menu of an implant/abutment.
7. Inserting/Editing Abutments

7.9. Undo

You can undo the last action related to the current abutment (inserting, aligning, moving, rotating, changing or removing). Click on this button in the tool bar.

Tip
The function 'Undo' is also accessible via the context menu of an implant/abutment.

7.10. Showing/Hiding abutments

You can hide all abutments temporarily by clicking on this button in the status bar. Clicking the button a second time shows all abutments again.

Tip
When you hide abutments the functions for editing abutments are temporarily not available. If you want to edit abutments, make sure that abutments are not hidden.
8. Inserting/Editing Sleeves

8.1. Overview

GALILEOS Implant supports you in planning implants in a way that a SICAT surgical guide can be manufactured according to your implant planning.

In addition to the implants and abutments, the implant database of GALILEOS Implant also contains sleeve systems of different manufacturers.

For every implant you can visualize a compatible sleeve according to the manufacturer’s protocol. This helps you to recognize the following collisions early:

- Sleeve with adjacent tooth/prosthesis
- Sleeve with adjacent sleeve
- Sleeve with gingiva

These collisions complicate or even prevent the production of a surgical guide. Adjust your implant planning, if needed, to prevent these collisions.

NOTE

The visualization of sleeves is only for checking if a surgical guide can be manufactured according to your implant planning. The final sleeve positions and if needed sleeve models will be determined by SICAT if not otherwise specified.

Tip

The workspace 'Implant-Aligned' is very suitable for visualizing sleeves.
8.2. Selecting the sleeve system

At first, select the sleeve system desired for your current plan by clicking on the entry 'Properties' within the menu 'Plan'. The sleeve systems supported by SICAT are described in Section 9.3.2.

GALILEOS Implant opens the following dialog:

Select your sleeve system desired and close the dialog with 'OK'.

A corresponding sleeve will be inserted automatically to every implant compatible with the selected sleeve system. This is also true for implants you insert later.

Tip
You only have to select the sleeve system once for your plan. You do not have to select the sleeve system for every single implant.
8.3. Aligning/Moving a sleeve

When you are aligning/moving an implant (see Section 6.4) the corresponding sleeve will be aligned/moved accordingly.

8.4. Opening the tool bar 'Implant'

The functionality for editing sleeves is accessible via the tool bar. Just click on the tab labeled 'Implant'.

8.5. Selecting a sleeve

You can select a previously inserted sleeve by selecting the corresponding implant (see Section 6.6) or by simply clicking on the sleeve desired in any view.

The selected (current) sleeve will be displayed in orange.

8.6. Changing the sleeve position/model

Click on this button to change the sleeve position or if needed the sleeve model of the current sleeve. The change is executed within the selected sleeve system according to the manufacturer’s protocol.

Tip

The function 'Edit Sleeve' for changing the sleeve position/model is also accessible via the context menu of an implant/sleeve.
8.6.1. 'Configure Sleeve' dialog

GALILEOS Implant opens the dialog for configuring the current sleeve:

![Configure Sleeve dialog]

**Tip**

Move the ‘Configure Sleeve’ dialog so you can see the implant in the (implant-aligned) tangential view and the (implant-aligned) cross-sectional view. All adjustments made in this dialog are propagated directly into the views so you can configure your sleeve in relation to the image data.

8.6.2. Verifying/Changing the sleeve system

Verify if the desired sleeve system for your plan is selected. You can also change the sleeve system for your plan here (see Section 8.8).

8.6.3. Selecting the sleeve model

Some manufacturers (e.g. Straumann) offer several compatible sleeve models for their implants.

In this case, select a sleeve model by clicking on the model desired in the table. A preview of the selected model is displayed next to the table.
The table presents all sleeve models which meet the following criteria:

- The sleeve model belongs to the selected sleeve system.
- The sleeve model is compatible with the current implant.

The table rows correspond to the different lengths (in mm), the columns to the different outer/inner diameters (in mm).

### 8.6.4. Adjusting the sleeve position

Adjust the sleeve position as desired. You can enter the sleeve position D1 (distance between the apical end of the sleeve and the occlusal end of the implant) or the sleeve position D2 (distance between the occlusal end of the sleeve and the apical end of the implant). The selectable sleeve positions are limited by the manufacturer’s protocol for the current implant-sleeve combination.

**Tip**

Click on 'Reset' to select the default sleeve position according to the manufacturer’s protocol for the current implant-sleeve combination.

### 8.6.5. Entering a comment

You can enter a comment regarding the current sleeve addressed to the SICAT Surgical Guide Lab, e.g.:

- The sleeve has to be realized exactly according to the plan or
- The final sleeve planning should deviate from the manufacturer’s protocol.

Close the dialog with 'OK'.

**Tip**

You can also configure a corresponding sleeve while you insert an implant (see Section 6.3). Just click on the tab labeled 'Sleeve' after having configured the implant.

You can configure the corresponding sleeve as described above.
8.7. Undo

You can undo the last action related to the current sleeve (changing sleeve position/model). Click on this button in the tool bar.

Tip
The function 'Undo' is also accessible via the context menu of an implant/sleeve.

8.8. Changing the sleeve system

Just select a new sleeve system (see Section 8.2) to change the sleeve system for your current plan.

All sleeves of the previous sleeve system are removed and for each implant compatible with the new sleeve system a respective new sleeve is inserted. The previous sleeve positions are saved as far as the new manufacturer’s protocol allows it.

NOTE
This function refers to all sleeves of your current plan and you cannot undo it!

8.9. Removing all sleeves

Just select the entry 'No Sleeve System' when selecting a sleeve system (see Section 8.2) to remove all sleeves from your current plan.

NOTE
This function refers to all sleeves of your current plan and you cannot undo it!

8.10. Showing/Hiding sleeves

You can hide all sleeves temporarily by clicking on this button in the status bar. Clicking the button a second time shows all sleeves again.
When you hide sleeves the functions for editing sleeves are temporarily not available. If you want to edit sleeves, make sure that sleeves are not hidden.
9. Preparing for Surgery

9.1. Opening the tool bar 'Surgery'

GALILEOS Implant provides an easy and convenient way to generate a comprehensive planning report (e.g. for surgery) at the push of a button as well as to order a surgical guide.

This feature is accessible by a tool bar. Just click on the tab labeled ‘Surgery’.

The tool bar ‘Surgery’ opens:

![Image of GALILEOS Implant planning interface]

9.2. Generating a planning report

You can transfer your 3D plan to a 2D output medium for documentary purposes. The planning report consists of several pages: the first page provides an overview of all implants followed by one page per implant, containing detailed information for each implant. You can either directly
print the report, store it in your file system, copy it to the clipboard or export it to SIDEXIS.

Click on this icon in the tool bar to generate a report based on the current plan (see Chapter 10).

If your plan contains implants for both the maxilla and the mandibula, you can decide for which jaw the report will be generated.

The preview window opens:

The preview displays the first page of the planning report (the overview). Use the buttons (1) to browse through the report and reach the following pages.

There are different ways to export the report:

- Send it to a printer (2): The report is printed in landscape format. DIN A4 and US-Letter size are supported.

- Store it in the file system (3): Each page is saved as a separate image. Supported data formats are BMP and PNG.

- Copy it to the clipboard (4): The current page is copied to the clipboard.

- Export it to the current exam in SIDEXIS (5) or to a new exam in SIDEXIS (6): Each page becomes a separate image in SIDEXIS. In SIDEXIS 4, an exam corresponds to a light box.
Close the preview window after the transfer (7).

The overview page features the panoramic view (1) containing all implants and an implant-aligned cross-sectional view for each implant (2). The report provides information about the position (3), the size and model (4) for each implant.

A page showing detailed information for one implant contains the implant-aligned cross-sectional view (2) as well as the implant-aligned...
tangential view (1) and six views running parallel to the cross-sectional view (3).

**Tip**

It is possible to display your own practice logo on the top right side of the page. Therefore please load up your own practice logo in SIDEXIS (see SIDEXIS instructions for use) using the formats BMP, JPG or PNG.

**Tip**

If the safety margin is visible around the current implant (see Section 6.10), it will also be visible on the detail pages of the report. The pilot drill paths (see Section 6.11) and the final drill path (see Section 6.12) will be handled accordingly.

**Tip**

If you have activated the displaying of abutments (see Section 7.10), your abutments planned will also be displayed on the pages of the planning report. Moreover the serial numbers of the abutments will be listed on the overview page. You will find their dimensions and further model information on the detail pages.

**Tip**

If you want to compile a PDF file from the planning report, we recommend a free PDF printer (e.g. FreePDF). Having installed this tool, you can transfer the report to a printer (2) and select the PDF printer as current printer. The tool then asks for a directory and a file name.
9.3. Ordering a surgical guide

NOTE
Detailed and current information about SICAT surgical guides will be provided on www.sicat.com.

NOTE
Please verify that a SICAT surgical guide can be manufactured according to your implant planning (see Chapter 8).

Please click on this icon in the tool bar to order a surgical guide based on your current plan (see Chapter 10).

Then a dialog opens to select the surgical guide type desired.

9.3.1. Selecting the surgical guide type

Select the surgical guide type desired by clicking on the corresponding button. Then the order wizard will open and guide you through the order process.

The following surgical guide types can be selected:
9.3.1.1. SICAT CLASSICGUIDE surgical guide

The SICAT CLASSICGUIDE surgical guide is based on a patient individual radiographic template the patient is wearing during the X-ray scan.

The radiographic template is fabricated with a SICAT bite plate and can be prepared in one of three possible ways (conventional, direct or for the fully edentulous jaw) depending on the patient situation. Radiographic template, stone model as well as the planning data on CD are sent to SICAT. SICAT transforms your radiographic template according to your plan into a SICAT CLASSICGUIDE surgical guide.

Please make sure that at least four markers are clearly visible in the X-ray volume and that the radiographic template fits well to the patient's jaw.

9.3.1.2. SICAT OPTIGUIDE surgical guide

The SICAT OPTIGUIDE surgical guide is milled according to your plan out of a blank.

It is necessary that you have imported and successfully matched (registered) a corresponding optical impression (see Appendix B). Please make sure that the optical impression covers at least one quadrant and is matched with the X-ray volume with sufficient accuracy. Motion as well as metal artifacts can affect the accuracy of the matching process and thus possibly preclude the fabrication of a SICAT OPTIGUIDE surgical guide.

You can send the order to SICAT completely via the internet or on a CD.

9.3.1.3. SICAT OPTIGUIDE surgical guide with stone model scan and registration

For this type of SICAT OPTIGUIDE, it is necessary that a scannable stone model is sent to SICAT along with the planning data on CD. SICAT generates the optical impression of the stone model.

Please make sure that the stone model exactly corresponds to the patient's current situation. Please make also sure that the quality of the X-ray volume is sufficient to achieve an exact match with the optical impression. Motion as well as metal artifacts can affect the accuracy of the matching process and thus possibly preclude the fabrication of a SICAT OPTIGUIDE surgical guide.
9.3.1.4. SICAT DIGITALGUIDE - design & STL export

The SICAT Surgical Guide Laboratory designs a digital model of the surgical guide and provides this digital model as STL file. You will receive the STL model online and you can have a surgical guide printed in a laboratory of your choice.

It is necessary that you have imported and successfully matched (registered) a corresponding optical impression (see Appendix B). Please make sure that the optical impression covers at least one quadrant and is matched with the X-ray volume with sufficient accuracy. Motion as well as metal artifacts can affect the accuracy of the matching process and can affect the accuracy of the surgical guide.

You can send the order to SICAT completely via the internet or on a CD.

9.3.2. Step 1: Selecting a sleeve system

Tip

If the current plan contains implants for the maxilla and the mandibula, GALILEOS Implant prompts you to define the jaw for which to order the surgical guide.

GALILEOS Implant shows you information about the patient, the current plan's name, and a list of the implants in the plan complete with their
positions, dimensions and information about manufacturer and implant line.

**CAUTION**

Please make sure that your order is based on the correct plan.

Please select the sleeve system and if needed the inner diameters of the sleeves you plan to work with. In the field 'Additional information' you can give SICAT additional important information concerning the order.

The following sleeve systems are available:

**9.3.2.1. Pilot sleeve**

The surgical guide with pilot sleeves is for pilot osteotomies only. Several sleeves with different inner diameters are available. The outer diameter of the pilot sleeve is 3 mm with a height of 4 mm and 5 mm respectively. The sleeves can be positioned at any requested height, but they will be set at gingival level if not indicated otherwise.

**9.3.2.2. SICAT sleeve-in-sleeve system**

The SICAT sleeve-in-sleeve system consists of an outer sleeve as well as a selection of inner sleeves. The outer sleeve has an outer diameter of 5 mm and an inner diameter of 3.5 mm. Several differently sized inner sleeves are available which can be placed into the outer sleeve one at a time. The SICAT sleeve-in-sleeve system supports pilot osteotomies as well as subsequent osteotomies. The sleeves can be positioned at any requested height, but they will be set at gingival level if not indicated otherwise.
9.3.2.3. Master sleeve for guided surgery systems

SICAT currently supports the following guided surgery systems:

- Alphatech – Alphatech Guided Surgery
- Anthogyr – Anthogyr Guiding System
- BEGO – BEGO Guide
- Bicon – Bicon Guided Surgery
- Biomet 3i – Navigator
- Bredent – Sky PlanX
- Camlog Biotechnologies – Guide System
- Dentaurum – tioLogic pOsition
- Hiossen – Hiossen Guide
- Implant Direct – Implant Direct Guided Surgery
- Kentec – MJ Guide
- Klockner – Klockner Surgery Guide
- Leone – Digital Service Leone
- Medentis Medical – ICX Safety Guide
- Meisinger – 3D-Navigation-Control
- Neoss – Neoss Guide
- SIC invent – SIC Guided Surgery
- Straumann – Straumann Guided Surgery
- Sweden&Martina – Echo Plan
- TRI – TRI Guided Surgery
- Zimmer Dental – Zimmer Guided Surgery

In addition, SICAT supports the instruments and surgical components of the following guided surgery systems:

- Astra Tech – Facilitate
- DENTSPLY Friadent – ExpertEase
- MIS – M-Guide (old)
- Nobel Biocare – NobelGuide

NOTE
For more information on guided surgery systems or the availability of further systems please contact your implant manufacturer and visit www.sicat.com.
9.3.3. Step 2: Entering the purchaser’s information

Enter the purchaser’s name, phone number, email address, and address.
9.3.4. Step 3: Entering the shipping information

Please select a shipping method. In addition, you can enter a shipping address that differs from the purchaser's address.

In this case, you can specify whether the shipping address or the purchaser's address will be used as billing address.

**NOTE**

If you order a SICAT DIGITALGUIDE, this step is omitted.
9.3.5. Step 4: Entering the payment information

Select your preferred method of payment:

**Recurring Charge Authorization**: Choose this option if you have issued SICAT with a recurring charge authorization.

**NOTE**
Please take the following steps to issue SICAT with a recurring charge authorization: Download the right form from [www.sicat.com](http://www.sicat.com). Complete and sign the form and send it to SICAT via package or fax.

**Charge Authorization for this single order only**: Please choose this option if you want to issue SICAT with a Charge Authorization only for this single order. Enter the adequate payment information. Print the completed form while you are going to the next page. Send the payment form signed by the invoice recipient to SICAT via package or fax.

**Tip**
GALILEOS Implant stores the payment form in the order folder (‘PaymentForm.html’). If necessary, you can also print the payment form later.
9.3.6. Step 5: Confirming your order

GALILEOS Implant displays the ordered products/services and prices on this page.

First agree to SICAT’s terms and conditions before you confirm your order and go on to the next step.
9.3.7. Step 6: Transferring the order data

If you order a SICAT CLASSICGUIDE or a SICAT OPTIGUIDE with stone model scan and registration, you will have to send your order data to SICAT via package/CD.

If you order a SICAT OPTIGUIDE without stone model scan and registration or a SICAT DIGITALGUIDE, you can select between sending the order data via package/CD or sending it comfortably and fast via internet to SICAT. The order data is always transferred encrypted.

**NOTE**
You will need a high speed internet connection if you choose to send the order data of a SICAT OPTIGUIDE or a SICAT DIGITALGUIDE to SICAT via internet.

For both transfer methods an order folder containing the whole order data is created. After having transferred the order data you can delete the order folder if needed.

9.3.7.1. Transferring the order data via package/CD

Select how to burn your order data to a CD:

**Express (recommended):** GALILEOS Implant uses the integrated CD burning software to burn the CD.
Manually: GALILEOS Implant saves the order data in the order folder. Open the order folder and make sure that you burn its whole content with the CD burning software of your own choice on a CD.

**CAUTION**
Make sure to burn the correct order data to CD while burning manually.

**CAUTION**
Please label the order CD and - if applicable - the stone model with the patient’s information.

**CAUTION**
Handle order CDs with care and store them in an appropriate way.

### 9.3.7.2. Transferring the order data via internet

![Image of order data transfer interface]

Please click on ‘Prepare data transfer’ to prepare the transfer of the order data via internet to SICAT. Therefore the order data is saved as a single order file in the order folder.
The SICAT upload website opens in your internet browser. Please follow the instructions on this website to upload the order file to SICAT.

**CAUTION**
Make sure that you select the correct order file when you transfer the order data via internet to SICAT.

**NOTE**
According to your internet connection the upload process may take a while. Do not close the upload website in your internet browser. Parallel to this you can switch to the last page of the order wizard to finish your order.

**NOTE**
If the order file has been uploaded successfully, an e-mail confirmation is sent to your e-mail address.

**NOTE**
If the SICAT upload website cannot be opened (e.g. if there is no internet connection available), please transfer the order data via package/CD.
9.3.8. Step 7: Completing your order

Click on the ‘Print’ button to print an order summary for your own documentation.

**Tip**
GALILEOS Implant stores the order summary in the order folder ('OrderSummary.html'). You can also print the order summary later if needed.

If you transfer the order data via package/CD, this page lists all necessary components the package has to contain for ordering the desired surgical guide type.

**CAUTION**
If you transfer the order data via package/CD, make sure that the package is correctly compiled and contains all necessary components listed on the last page of the order wizard.

GALILEOS Implant saves the order together with a copy of the plan it is based upon automatically to SIDEXIS. You can view the plan anytime you wish – but it is not possible to change the plan (see Section 10.5).

Complete the order wizard by clicking 'Finish'.
10. Creating/Editing Plans

10.1. Overview

GALILEOS Implant enables you to create several alternative plans for the same patient dataset. You can switch between plans to compare them to each other in order to decide which one will provide a basis for the surgery.

To this end GALILEOS Implant groups implants into plans. At any given time there is exactly one current plan. The current plan's name is shown in the title bar. When you insert an implant it is added to the current plan. The current plan also provides a basis for ordering a surgical guide and generating a report.

The mandibular canals, all measurements and all CAD/CAM objects (see Appendix B) are not specific to the current plan but are valid for all plans. It is not necessary to highlight the mandibular canal for each plan separately.

You can create new plans, duplicate, select (and make it the current one), rename, remove, export or import existing plans. You can also add a short description to each plan. These functions are accessible by the menu 'Plan'.

10.2. Creating a new plan

To create an additional empty plan, please select 'New Plan'. GALILEOS Implant opens a dialog where you can edit the default name of the plan, select the sleeve system (see Chapter 8) and/or add a short description. The new plan automatically becomes the current plan.

From this point, all implants you insert are added to the new plan. It is possible to switch to the previous plan any time you need to (see Section 10.4).

10.3. Duplicating a plan

Select 'Duplicate Plan' to duplicate the current plan.

This function is similar to creating a new plan. However, there is one essential difference: the newly created plan contains copies of all the implants from the previous plan. This enables you to proceed with your planning based on the previous plan.
10.4. Opening an existing plan

The last part of the menu ‘Plan’ features a list including all created plans. The current plan is marked with a checkmark. The example shows two plans, named ‘Plan 1’ and ‘Plan 2’ while ‘Plan 1’ is the current plan.

To switch to another plan, simply click on the name in the list.

Tip

It is possible to temporarily hide the current plan (including all its implants, abutments, sleeves and mandibular canals) by clicking on the symbol in the status bar. This can be helpful to examine the volume data. Click again on the symbol to redisplay the current plan.

10.5. Opening an order

GALILEOS Implant saves all plans that were used for a surgical guide order as ‘orders’ (see Section 9.3). Orders are listed below the list of plans in the menu ‘Plan’.

To review a plan an order is based upon, select the order from the list. GALILEOS Implant switches to a viewer mode, where you can see all the plan’s data but cannot manipulate it. The title bar displays the name of the order.

You can leave this viewer mode by selecting one of your plans from the list (see Section 10.4).

10.6. Renaming a plan

Select ‘Properties’ to rename the current plan.

GALILEOS Implant opens a dialog where you can enter a new name.

10.7. Showing/changing the description

Also select ‘Properties’ to view or edit the current plan’s short description.
10.8. Removing a plan

Select ‘Remove Plan’ to remove the current plan. GALILEOS Implant prompts you to confirm the removal of the current plan. Confirm this dialog if you are sure you want to remove the current plan.

If there are further plans, GALILEOS Implant selects one of these as the new current plan. Otherwise GALILEOS Implant automatically creates a new and empty plan.

10.9. Exporting/importing plans

10.9.1. Within your SiDEXIS system

On closing GALILEOS Implant automatically saves all plans to SiDEXIS. When re-opening a dataset, GALILEOS Implant automatically loads all the dataset's plans. Plans do not have to be saved or loaded manually with GALILEOS Implant.

10.9.2. Between different SiDEXIS systems

Please take the following steps if you want to exchange plans between different SiDEXIS systems (for example between a stationary computer and a notebook):

- If you exchange the data for the first time, use the DICOM export and import function provided by SiDEXIS. The exchanged data includes both the volume data and the plans.

- For further exchanges use the export and import function for plans described in this section. This exchange only includes the plans, not the volume data.

To export plans to a file, select ‘Export Plans’. GALILEOS Implant lets you choose the plans you want to export.

**CAUTION**

Make sure that the correct plan is displayed and that you only export the plans you really want to export.

To import plans from a file, select 'Import Plans'. In case of conflicting data, GALILEOS Implant lets you decide how to solve the conflict. For example, if a plan already exists with a certain name, you can either keep the local plan, overwrite the local plan with the imported plan, or add the new plan with a different name.
10.9.3. GALILEOS Viewer CD

It is possible to burn a CD containing your planning data, the volume data and the 3D viewer software GALILEOS Viewer. The recipient of this GALILEOS Viewer CD will be able to view the volume data as well as the planning data interactively without having to install SIDEXIS. Please note that the recipient can only view the plans but not alter them.

To create a GALILEOS Viewer CD containing the current patient's data please open the tool bar 'Diagnosis' and click on the symbol.

**Tip**
If the current plan is not visible (see Section 10.4), no plans will be copied to the GALILEOS Viewer CD.

**NOTE**
If your current plan is a normal plan (see Section 10.4), all normal plans will be written onto the GALILEOS Viewer CD. If your current plan is a plan an order is based upon (see Section 10.5), only this single plan will be written on the GALILEOS Viewer CD.

**CAUTION**
Make sure that the correct plan/order is displayed and that you export the plans/order you really want to export.

GALILEOS Viewer provides the recipient of the CD with the full viewing functionality of GALAXIS/GALILEOS Implant. It is, however, not possible to create new plans or alter or remove existing plans.

The way to select the tooth chart differs from GALILEOS Implant: when working with GALILEOS Viewer you can switch between tooth charts using the settings dialog.

**CAUTION**
Please do not remove the GALILEOS Viewer data if you like to view the data again at a later time.
11. Displaying Grey Values

GALILEOS Implant provides the possibility to display grey values of the volume in all planar slicing views. This feature is accessible in the toolbar ‘Diagnosis’.

Click on the icon 

Move the mouse pointer to the position (without clicking) where you want to display the grey value. Press the left mouse button and keep it pressed.

The mouse pointer changes to an orange circle labeled with the grey value. GALILEOS Implant averages all grey values inside the circle to generate the result. You can change the position of the mouse while keeping the left button pressed.

After releasing the left mouse button the grey value disappears. To reactivate the displaying of grey values repeat the steps as described above.
12. Closing GALILEOS Implant

There are two possible ways to close GALILEOS Implant:

- Select 'Exit' from the menu 'Workspace'
- Click the icon in the title bar

On closing, GALILEOS Implant automatically saves all plans to SIDEXIS.
Appendix A. 3D View

A.1. Switching/Configuring the 3D Display Mode

In contrast to GALAXIS, GALILEOS Implant offers you the possibility to switch between different display modes presenting the volume data in the 3D view. To change the mode open the context menu by clicking on the right mouse button within the 3D view and select the desired display mode.

If your system meets the hardware requirements needed for advanced 3D rendering (see Section 2.1), the following three hardware accelerated display modes can be selected: ‘Volumetric Mode’, ‘Volumetric Mode with Contours’ and ‘Surface Mode’.

If hardware acceleration is not supported, the following two software based display modes are selectable: ‘Volumetric Mode’ (see GALAXIS instructions for use) and ‘Surface Mode’.

Tip

If your system does not support hardware acceleration properly, you can force the use of software based display modes (see Section E.1).
A.1.1. Volumetric Mode (hardware accelerated)

To configure the currently selected 'Volumetric Mode' please move the mouse pointer into the 3D view, open the context menu by clicking on the right mouse button and select 'Configure Display Mode' from the menu.

A configuration dialog opens up offering the values concerning the density threshold and the transparency which you can interactively change according to your needs.
A.1.2. Volumetric Mode with Contours (hardware accelerated)

In contrast to the 'Volumetric Mode' the 'Volumetric Mode with Contours' offers intensified contours and the soft tissue is displayed additionally.

To configure the currently selected 'Volumetric Mode with Contours' please move the mouse pointer into the 3D view, open the context menu by clicking on the right mouse button and select 'Configure Display Mode' from the menu.

A configuration dialog opens up offering not only the adjustment of the visualization of bones, but also the adjustment of the visualization of soft tissue. Moreover, you are able to switch on or off the visualization of bones or soft tissue.
A.1.3. Surface Mode (hardware accelerated)

To configure the currently selected 'Surface Mode' please move the mouse pointer into the 3D view, open the context menu by clicking on the right mouse button and select 'Configure Display Mode' from the menu.

A configuration dialog opens up offering the values concerning the density threshold and the transparency which you can interactively change according to your needs.
A.1.4. Volumetric Mode (software based)

See GALAXIS instructions for use.

A.1.5. Surface Mode (software based)

To configure the currently selected 'Surface Mode' please move the mouse pointer into the 3D view, open the context menu by clicking on the right mouse button and select 'Configure' from the menu.

A configuration dialog opens up offering the values concerning the density threshold and the transparency which you can interactively change according to your needs.
A.2. Enabling/Configuring 3D clipping

In the 3D view, parts of the volume can be clipped temporarily (‘3D clipping’) so you can better diagnose the remaining part of the volume. Additionally, the position of planning objects within the volume can be better evaluated.

You can clip off the volume along a planar slice (e.g. along the axial or along the cross-sectional slice) and/or along a region of interest. The clipping region is synchronized with the other views. Apart from that you can also lock the adjusted clipping region.

NOTE
The 3D clipping feature is only available for the hardware accelerated 3D display modes (see Section A.1).

A.2.1. Clipping volume along active slice

Please right-click in the 3D view and activate the function ‘Clip Volume along Active Slice’ to clip off the volume along the active slice.

Select the slice along which you like to clip off the volume by simply activating the corresponding slicing view.

Please adjust the active slice as desired by moving the slicing window or by navigating through the volume. The clipping region will be refreshed interactively.
Tip
If you like to have the clipping region updated continuously, please activate the option ‘Update all slices continuously when navigating’ (see GALAXIS instructions for use).

You determine which part of the volume will be clipped off by changing the viewing direction.

Tip
You can lock the adjusted clipping region (see Section A.2.3) to prevent the clipping region from ‘flipping’ while you change the viewing direction.

A.2.2. Clipping volume along region of interest

Please right-click in the 3D view and activate the function ‘Clip Volume along Region of Interest’ to clip the volume along the current region of interest. All parts of the volume outside the region of interest are clipped off.

The dimension of the region of interest depends on the active workspace. In the workspace ‘Panorama’, the region of interest is dimensioned as the slicing window and its depth is the same as the depth of the panoramic region.

The position of the region of interest is synchronized with the other views of the workspace. Moving the slicing window or navigating through the volume in one of the slicing views will move the region of interest. The clipping region will be refreshed interactively.
Tip
You can also activate both clipping functions at the same time.

A.2.3. Locking the clipping region

If you like to lock the adjusted clipping region, right-click in the 3D view and activate the function 'Lock Clipping Region'.

In this case, the clipping region will not be synchronized with the other views any longer. Apart from that the clipping region is prevented from 'flipping' dependent on the viewing direction (see Section A.2.1).
Appendix B. CAD/CAM

B.1. Overview

GALILEOS Implant allows you to visualize GALILEOS X-ray data and superimposed CAD/CAM data simultaneously. You will be able to plan implant treatment based on the anatomical information while taking all prosthetic consequences into account. In addition, the combined visualization makes the surface of the gingiva clearly distinguishable.

A CAD/CAM dataset contains the following CAD/CAM objects:

- An **optical impression** taken by an optical impression system (e.g. CEREC AC)
- Related **restorations** (optional) designed in a CAD/CAM software (e.g. CEREC 3D)

Initially, the CAD/CAM data have to be spatially aligned (registered) with the corresponding X-ray data. GALILEOS Implant features a novel and intuitive semi-automatic registration process. This process only has to be completed once per CAD/CAM dataset. Already imported and registered CAD/CAM datasets are saved under the corresponding patient dataset and automatically loaded with the next opening of the patient dataset.

**CAUTION**

Only use X-ray data and CAD/CAM data that allow a precise registration. Major artifacts in the X-ray data (e.g. motion or metal artifacts) or an optical impression without teeth complicate or even prevent precise registration.

**CAUTION**

CAD/CAM data only provide a secondary (auxiliary) source of information. X-ray data remain the ultimate source of information for implant planning.
B.2. Opening the tool bar 'CAD/CAM'

The functionality related to CAD/CAM data and objects is located in the tool bar 'CAD/CAM'. Click the tab labeled 'CAD/CAM' to activate it.

The tool bar 'CAD/CAM' opens:
B.3. Importing and registering CAD/CAM data

Click this button to import and register a CAD/CAM dataset for the displayed patient dataset. A wizard will open and guide you through the process in three easy steps.

B.3.1. Step 1: Importing CAD/CAM data

Click on the 'Browse' button and select the CAD/CAM file you wish to import. Depending on the available license, GALILEOS Implant supports the following two CAD/CAM file formats:

- STL (Surface Tessellation Language)
- SSI (proprietary SICAT format)

NOTE

CAD/CAM data may be imported from optical impression systems which provide optical surface data in standard STL or SSI format with a resolution of at least 100 µm and covering an area of at least three teeth.

CAUTION

Please make sure to only import CAD/CAM files from CAD/CAM systems cleared as medical devices.

The selected CAD/CAM file will be loaded.
Verify the patient and scan information.

CAUTION
Please make sure that the CAD/CAM dataset corresponds to the patient's data currently open.

CAUTION
Please verify the integrity and quality of the imported CAD/CAM objects.

Verify the CAD/CAM objects. All CAD/CAM objects are visualized in a preview window. You can change the viewing direction, the size of the preview's content or move the preview's content with the familiar mouse buttons. All CAD/CAM objects are also listed in the table ‘CAD/CAM objects’. Any object can be selected from the table using a single mouse click. The selected CAD/CAM object is visualized in the preview in orange color.

Make sure that the tooth numbers of all CAD/CAM objects are correct. You can change or set tooth numbers for a CAD/CAM object by selecting the CAD/CAM object from the table and clicking on the 'Change/Choose tooth number(s)' button. The dialog for the selection of tooth number(s) opens.
Select the applicable tooth number by a single click. If a restoration contains several teeth, it is sufficient to select just the first tooth of the restoration in the tooth diagram.

**Tip**
For an optical impression with corresponding restorations, tooth numbers are automatically adopted from the restorations. It is therefore sufficient to change or set tooth numbers for the restorations.

**NOTE**
Please pay particular attention to the correctness of the tooth numbers. The tooth numbers are used during the registration and for the insertion of implants based on a restoration.

**Tip**
A brief description can be assigned to an optical impression by selecting the optical impression from the table 'CAD/CAM objects' and clicking the 'Edit label' button. By default, the description contains the date when the optical impression was imported. The length of the description is limited to 10 characters.

Click on the 'Next' button to continue with Step 2 of this wizard.
B.3.2. Step 2: Registering CAD/CAM objects

The loaded optical impression and the X-ray data are now visualized in two adjacent windows. The left window shows the optical impression in a 3D view. The right window shows the X-ray data in a panoramic view.

First mark one tooth in the 3D view using a double-click. Then mark the same tooth in the panoramic view using a double-click as well. Repeat this procedure for at least one other tooth. Corresponding reference points are displayed in the same color and with the same consecutive number.

**NOTE**

In both views, place corresponding reference points approximately in the center of the tooth.

**NOTE**

In the 3D view, reference points have to be placed on the buccal side of the optical impression. If needed, change the viewing direction before you start placing the reference points.
Tip
Mark at least the two outer teeth of the optical impression.

Tip
Avoid placing reference points on teeth with metal artifacts.

CAUTION
Select the corresponding reference points carefully in both views.

A pair of corresponding reference points can be removed by selecting it in the list and clicking the \( \checkmark \) button.

Click 'Next' to start the automatic registration process using the selected reference points. After a few seconds (depending on the performance of your computer) the registration wizard proceeds to Step 3.
B.3.3. Step 3: Verifying the registration

Verify the result of the registration and confirm that the optical impression is correctly aligned with the X-ray data.

The optical impression and the X-ray data are displayed superimposed in the workspace ‘Panorama’. You can move the slicing window, navigate through the volume, change the size of the view’s content or move the view’s content with the familiar mouse buttons.

**CAUTION**

Verify that the optical impression is correctly aligned with the X-ray data.

If the registration result is not precise enough, you can click ‘Back’ to return to the previous step and try to improve the placement of reference points. For example, try to mark different or more teeth.

If you are satisfied with the registration result, click the ‘Confirm’ button to complete the wizard. The imported and registered CAD/CAM objects are now visualized in all main views of GALILEOS Implant.
B.4. Working with CAD/CAM objects

B.4.1. Selecting a CAD/CAM object

You can select a previously imported CAD/CAM object by clicking the tooth number(s) of the CAD/CAM object in the list of optical impressions and restorations in the CAD/CAM tool bar. The selected (current) CAD/CAM object is highlighted in the list and visualized in orange color in all views as long as the CAD/CAM tool bar is open.

Alternatively, you can select a CAD/CAM object by clicking the object or its contour in a view as long as the CAD/CAM tool bar is open.

Tip
Using a double click instead of a single click when selecting a CAD/CAM object focuses the object in addition to selecting it, i.e. all views will align with the object.
Appendix B. CAD/CAM

Tip
If you move the mouse pointer over the list of objects, a tooltip appears showing the type of the object and – in the case of an optical impression – its description.

B.4.2. Showing/Hiding a CAD/CAM object

CAD/CAM objects can be shown or hidden individually. Hiding objects can be necessary in case relevant diagnostic information is obscured by a CAD/CAM object.

Click this button to hide the current CAD/CAM object. Clicking the button a second time shows the current CAD/CAM object again.

Currently displayed CAD/CAM objects are represented in the CAD/CAM tool bar by the ☰ symbol. Hidden objects are represented by the ☰ symbol.

Tip
You can show or hide a CAD/CAM object by clicking the corresponding symbol ☰/¤ as well.

B.4.3. Inserting implants based on a restoration

Click this button to insert one or more implants based on the current restoration.

The ‘Configure Implant’ dialog opens (see Section 6.3.1). The tooth numbers of the current restoration are already selected.

The selection of the implant model and the optional change of the orientation is described in Section 6.3.4 and Section 6.3.3.

Close the ‘Configure Implant’ dialog with the ‘OK’ button. The selected implant(s) will be automatically roughly positioned on the basis of the current restoration.

CAUTION
The automatic positioning of implants based on a restoration is only a rough positioning. You still have to adjust the position and the orientation of the inserted implants based on the X-ray data (see Section 6.4).
B.4.4. Re-Registering an optical impression

If you find out later that the registration of the optical impression is not precise enough, you can re-register the optical impression. Use this button to re-register the current optical impression.

The wizard for registering CAD/CAM data (see Section B.3.2) opens directly in the Step 2, allowing you to place new reference points.

B.4.5. Removing an optical impression and its restorations

You can remove the current optical impression and the related restorations by clicking this button.
Appendix C. Exporting Plans for Third-Party Processing

C.1. Overview

GALILEOS Implant allows you to export your plan for third-party processing.

GALILEOS Implant supports two variants of third-party processing of your plan:

- Export plan for third-party processing using optical impressions (see Section C.2). Use this variant e.g. for the CEREC Guide 2 workflow.

- Export plan for third-party processing using reference bodies (see Section C.3). Use this variant e.g. for the CEREC Guide 1 workflow.

Compared to the second variant, the first variant does not require reference bodies. Instead, the first variant is based on optical impressions.

NOTE
Consult the instructions for use of your third-party provider to get information about the possible applications and the selection of the appropriate variant.
C.2. Exporting plans for third-party processing using optical impressions

C.2.1. Overview

Consult the instructions for use of your third-party provider to get precise information about the processing using optical impressions and detailed information about the required workflow in GALILEOS Implant.

Use this variant e.g. for the CEREC Guide 2 workflow.

If you export your plan for third-party processing using optical impressions, it is required that you have imported and registered optical impressions (see Section B.3) that cover all implant positions.

Proceed as follows to export your plan for this variant:

1. Select a sleeve system compatible with third-party processing using optical impressions (see Section C.2.2).

2. Plan the sleeve model and the sleeve position D2 for every implant (see Section C.2.3).

3. Print a planning report containing information about all planned sleeves (see Section C.2.4).

4. Export your plan containing information about all planned sleeves (see Section C.2.5).

Please make sure that you have installed the latest version of the implant database (see Section 2.4).
C.2.2. Selecting a compatible sleeve system

At first, select a sleeve system compatible with third-party processing using optical impressions by clicking on the entry 'Properties' within the menu 'Plan' (see Section 8.2). E.g. for the CEREC Guide 2 workflow, select the sleeve system 'Sirona - CEREC Guide Drill Keys (CEREC Guide 2, SICAT Surgical Guides)'.

**NOTE**
Consult the instructions for use of your third-party provider to get information regarding which sleeve systems are compatible with third-party processing using optical impressions.

**NOTE**
The buttons for the following steps will be displayed only if you select a compatible sleeve system.

C.2.3. Planning the sleeve model and the sleeve position D2

Click on this icon in the tool bar 'Implant' (see Section 6.2) to plan the sleeve model and the sleeve position D2 for the current implant.

**Tip**
The function 'Edit Sleeve' for planning the sleeve model and the sleeve position D2 is also accessible via the context menu of an implant/sleeve.

GALILEOS Implant opens the 'Configure Sleeve' dialog:
Tip
Move the ‘Configure Sleeve’ dialog so you can see the implant in the (implant-aligned) tangential view and the (implant-aligned) cross-sectional view. All adjustments made in this dialog are propagated directly into the views so you can plan the sleeve model and the sleeve position D2 in relation to the image data.

Select the desired sleeve model (see Section 8.6.3) and plan the sleeve position D2 (see Section 8.6.4) according to the requirements of your third-party provider.

**NOTE**
Consult the instructions for use of your third-party provider to get information about the interpretation of the compatible sleeve and the planning of the sleeve model and the sleeve position D2.

**NOTE**
If you select a compatible sleeve system (see Section C.2.2), a corresponding sleeve will be added to every implant at the sleeve position D1=0.
CAUTION
During third-party processing of your plan, the sleeve positions are used exactly as planned by you. The sleeve positions cannot be changed later in the workflow.

C.2.4. Printing the planning report

Click on this icon in the tool bar 'Surgery' to generate and print a planning report with information about all planned sleeves (see Section 9.2).

NOTE
Make sure that the sleeves are shown before you print the planning report (see Section 8.10).

C.2.5. Exporting the plan

Click on this icon in the tool bar 'Surgery' to export your current plan for third-party processing using optical impressions.

NOTE
Make sure that exactly the optical impressions intended for the export and all sleeves are shown before you export your plan (see Section 8.4.2 and Section 8.10).

CAUTION
Only currently shown optical impressions will be exported. Please make sure that these are the optical impressions intended for the export, that they cover all implant positions, and that they are exactly aligned with the 3D X-ray data.

GALILEOS Implant opens a selection dialog offering different possible realizations for your plan (see Section 9.3.1).

NOTE
Instead of an export for third-party processing using optical impressions, you can also order a surgical guide from SICAT. For this purpose, select the desired surgical guide type (see Section 9.3).
Click on this icon in the selection dialog to export your current plan for third-party processing using optical impressions.

GALILEOS Implant opens the following export dialog:

In this dialog, the following data is displayed: the patient data, the name of the current plan, the sleeve system, and a list of all implants of the current plan plus their corresponding positions, dimensions and model information, sleeves, and sleeve positions D2.

**CAUTION**

Please make sure that your export for third-party processing is based on the correct plan.

Proceed as follows to export your plan for third-party processing using optical impressions:

1. Make sure that all implants you intend to export are included in the list with the correct sleeves and sleeve positions.
Appendix C. Exporting Plans for Third-Party Processing

**NOTE**

GALILEOS Implant reminds you via a warning symbol and a warning message if there is an implant for which you have not planned the sleeve position D2 or you have not imported or shown optical impressions for the respective jaw. In this case, please cancel the export and plan the sleeve position D2 or import or show optical impressions. Otherwise the implants concerned will not be exported.

2. If you like to anonymize the patient data, please set the corresponding flag.

3. Select where you want to export the plan.

4. Click on 'Export'.

**CAUTION**

Make sure that you select the correct export file for third-party processing.

**NOTE**

During the export for third-party processing via optical impressions, all visible restorations (see Appendix B) are exported.

**NOTE**

GALILEOS Implant also copies every export file into a subfolder of the order folder (see Section 9.3.7). If the disk space on your hard disk is insufficient, you can remove old export files from that folder.
C.3. Exporting plans for third-party processing using reference bodies

C.3.1. Overview

NOTE
Consult the instructions for use of your third-party provider to get precise information about the processing using reference bodies and detailed information about the required workflow in GALILEOS Implant.

Use this variant e.g. for the CEREC Guide 1 workflow.

If you export your plan for third-party processing using reference bodies, it is required that above every implant being exported markers of a reference body of your third-party provider are visible in the X-ray volume.

Proceed as follows to export your plan for this variant:

1. Select a sleeve system compatible with third-party processing using reference bodies (see Section C.3.2).
2. Detect the corresponding reference body for every implant (see Section C.3.3).
3. Check every implant's position in relation to its reference body and adjust the implant's alignment/position or dimensions if necessary (see Section C.3.4).
4. Plan the sleeve position D2 for every implant (see Section C.3.5).
5. Print a planning report containing information about all detected reference bodies and all planned sleeve positions D2 (see Section C.3.6).
6. Export your plan containing information about all detected reference bodies and all planned sleeve positions D2 (see Section C.3.7).

NOTE
Please make sure that you have installed the latest version of the implant database (see Section 2.4).
C.3.2. Selecting a compatible sleeve system

At first, select a sleeve system compatible with third-party processing using reference bodies by clicking on the entry 'Properties' within the menu 'Plan' (see Section 8.2). E.g. for the CEREC Guide 1 workflow, select the sleeve system 'Sirona - CEREC Guide Drill Keys (CEREC Guide 1)'.

NOTE
Consult the instructions for use of your third-party provider to get information regarding which sleeve systems are compatible with third-party processing using reference bodies.

NOTE
The buttons for the following steps will be displayed only if you select a compatible sleeve system.

C.3.3. Detecting the reference body

Click on this icon in the tool bar 'Implant' (see Section 6.2) to detect the corresponding reference body for the current implant.

Tip
The function 'Edit Reference Body' for detecting the reference body is also accessible via the context menu of an implant.

NOTE
Consult the instructions for use of your third-party provider to get information about detailed information concerning the reference bodies of your third-party provider.

GALILEOS Implant opens the dialog for detecting the reference body:
Proceed as follows to detect the corresponding reference body for the current implant:

1. Rotate the implant-aligned view (see Section 6.13) until you can see three markers of the reference body clearly (preferably the three markers closest to the implant).

2. Please double-click on the three markers successively. The remaining markers and the reference body will be detected and displayed automatically.

**CAUTION**

Check for every detection that the correct type of the reference body is detected and that the detected markers (green circles), the markers in the X-ray volume (circular white region) and the markers in the reference body model (circles colored as the reference body model) are superimposed correctly.

**CAUTION**

Major artifacts in the X-ray data (e.g. motion or metal artifacts) complicate or even prevent precise reference body detection.
C.3.4. Checking/adjusting the implant

Check the position of the current implant in relation to its reference body by using the workspace 'Implant-Aligned' (see Section 6.13) to be sure that the position meets the requirements of your third-party provider. If needed, change the alignment/position of the implant (see Section 6.4) or the dimensions of the implant (see Section 6.7).

NOTE
Consult the instructions for use of your third-party provider to get information about the requirements concerning implant planning in relation to the reference bodies.
C.3.5. Planning the sleeve position D2

Click on this icon in the tool bar 'Implant' (see Section 6.2) to plan the sleeve position D2 for the current implant.

Tip
The function 'Edit Sleeve' for planning the sleeve position D2 is also accessible via the context menu of an implant/sleeve.

GALILEOS Implant opens the 'Configure Sleeve' dialog:

Tip
Move the 'Configure Sleeve' dialog so you can see the implant in the (implant-aligned) tangential view and the (implant-aligned) cross-sectional view. All adjustments made in this dialog are propagated directly into the views so you can plan the sleeve position D2 in relation to the image data.

Plan the sleeve position D2 according to the requirements of your third-party provider.
Appendix C. Exporting Plans for Third-Party Processing

**NOTE**
Consult the instructions for use of your third-party provider to get information about the interpretation of the compatible sleeve and the planning of the sleeve position D2.

**NOTE**
If you select a compatible sleeve system (see Section C.3.2), a corresponding sleeve will be added to every implant at the sleeve position D1=0.

**CAUTION**
During third-party processing of your plan, the sleeve positions are used exactly as planned by you. The sleeve positions cannot be changed later in the workflow.

### C.3.6. Printing the planning report

Click on this icon in the tool bar ‘Surgery’ to generate and print a planning report with information about all detected reference bodies and all planned sleeve positions D2 (see Section 9.2).

**NOTE**
Make sure that the reference bodies and the sleeves are shown before you print the planning report (see Section C.3.3 and Section 8.10).

### C.3.7. Exporting the plan

Click on this icon in the tool bar ‘Surgery’ to export your current plan for third-party processing using reference bodies.

**NOTE**
Make sure that the reference bodies and the sleeves are shown before you export your plan (see Section C.3.3 and Section 8.10).

GALILEOS Implant opens a selection dialog offering different possible realizations for your plan (see Section 9.3.1).
Click on this icon in the selection dialog to export your current plan for third-party processing using reference bodies.

GALILEOS Implant opens the following export dialog:

In this dialog, the following data is displayed: the patient data, the name of the current plan, the sleeve system, and a list of all implants of the current plan plus their corresponding positions, dimensions and model information, detected reference bodies, and sleeve positions D2.

**CAUTION**
Please make sure that your export for third-party processing is based on the correct plan.

Proceed as follows to export your plan for third-party processing using reference bodies:

1. Make sure that all implants you intend to export are included in the list with the correct reference body types and sleeve positions.
2. If you like to anonymize the patient data, please set the corresponding flag.
3. Select where you want to export the plan.
4. Click on 'Export'.

**CAUTION**
Make sure that you select the correct export file for third-party processing.

**NOTE**
During the export for third-party processing using reference bodies, all currently shown optical impressions (see Appendix B) are exported.

**NOTE**
GALILEOS Implant also copies every export file into a subfolder of the order folder (see Section 9.3.7). If the disk space on your hard disk is insufficient, you can remove old export files from that folder.
Appendix D. License System

D.1. Overview

GALILEOS Implant incorporates a copy protection. To work with GALILEOS Implant without restriction a GALILEOS Implant license must be available in the network.

If a GALILEOS Implant license is missing, it is not possible to create or edit implant plans. However, it is possible to open and display plans stored in SIDEXIS. GALILEOS Implant then opens in a special viewer mode. The title bar features the label ‘GALILEOS Implant Viewer’.

D.2. License management

GALILEOS Implant is based upon the license management of Sirona Control Server/Admin. Licenses are stored on dongles and are managed as floating licenses in a network.

If a dongle is present, you can check out the available licenses in SIDEXIS Manager.

D.3. Automatic request for a license

By default, GALILEOS Implant automatically requests a GALILEOS Implant license when starting. This is ideal when working in single user environments (e.g. a notebook).

It is possible to change this configuration during the installation or even later (see Appendix E). When starting, GALILEOS Implant will not request a license but start in the viewer mode instead. This configuration is ideal in multi-station systems where several users share a license. If GALILEOS Implant started in the viewer mode, it is possible to ask for a license later (see Section D.4).

D.4. Licenses on demand

As mentioned above, it is possible to explicitly request a license when it is needed. Simply click on the symbol in the status bar shown on the left.
D.5. Avoiding and correcting errors

To work with GALILEOS Implant without restriction a GALILEOS Implant license must be available in the network. If this license is not available, proceed as described in the following:

- Close GALILEOS Implant on the rival computer to free the license.
- As an alternative you can start GALILEOS Implant in the viewer mode and comply with the restrictions.

Please keep in mind that other computers in your network might depend on a license. In this case, closely coordinate the computers and avoid requesting licenses that are not needed (see Section D.3).

Please do not remove the dongle while the application is running. In this case, GALILEOS Implant is forced to switch to the viewer mode. In this situation it is not possible to switch back to the working mode. You need to restart GALILEOS Implant to request a new license.
Appendix E. Configuration

You can configure GALILEOS Implant to your specific needs, e.g. the dimensions of the safety margin by calling up the function 'Customize' in the menu "View".

The dialog ‘Customize’ opens. Choosing one of the tabs will offer you the category desired:

### E.1. 3D Configuration

You can force the use of software based display modes for the 3D view (see Section A.1). Choose this setting if your system does not support hardware acceleration properly.

### E.2. Implant Configuration

#### E.2.1. Safety Margin

The safety margin (see Section 6.10) is defined by two lateral distances and the distance from the apical end. Set the dimensions of the safety margin according to your needs.
E.2.2. Drill Paths

Adjust the dimension of the pilot drill paths (see Section 6.11) and the final drill path (see Section 6.12) according to your needs.

E.3. General Configuration

Select the tab ‘General’ to configure if GALILEOS Implant requests a GALILEOS Implant license automatically at the start (see Section D.3).
Appendix F. Accuracy

- Visualization accuracy: < 10 μm
- Positioning accuracy: < 100 μm
Appendix G. Monitor Test

The SMPTE (Society of Motion Picture and Television Engineers) test pattern will help you determine whether the contrast and brightness settings of your monitor are acceptable. If not, you can adjust them using the test pattern. Using the SMPTE test pattern, you can also check for limitations in spatial resolution and aliasing of your display.

**CAUTION**
Prior to using GALILEOS Implant, check your monitor for sufficient visualization quality by visualizing the SMPTE test pattern.

**CAUTION**
You may only perform a planning if the environmental conditions (e.g. light) allow for sufficient quality. You can check this with the SMPTE test pattern.

G.1. Displaying the test pattern

To open the SMPTE test pattern, select 'SMPTE Test' from the 'View' menu in the menu bar. The SMPTE test pattern is shown:

To close the SMPTE test pattern, just press 'ESC' or left-click with the mouse pointer located on the test pattern.
G.2. Brightness and contrast

The grey scale is shown as a series of squares in the center of the image that range from black (0%) to white (100%) in a semi-rectangle. The 0% and 100% squares (see arrows on image at left) each contain smaller squares within them that represent signal level steps of 5% and 95%, respectively. You should be able to visually differentiate the inner square from the larger square that contains it.

Be aware that it may be impossible to adjust your monitor to show both of these inner squares perfectly and equally. Most video monitors do better in showing the 95% square than the 5% square. However, you might check if reducing ambient light improves the visibility of the 5% square.

G.3. Spatial resolution and aliasing

The spatial resolution (linearity) and aliasing (distortion) of your monitor are within acceptable limits if the high contrast bar patterns in the test image are distinct as simple patterns of black and white pairs.

In each corner of the image as well as in the very center (see arrows on image at left), inspect the 6 squares. They are filled with varying widths of alternating black/white horizontal and vertical lines. You should be able to differentiate all the lines, from wide to narrow (6 pixels, 4 pixels, and 2 pixels) and both, horizontally and vertically.
Appendix H. Warning Notices

CAUTION
Make sure that all national requirements are complied with when using GALILEOS Implant.

CAUTION
Federal Law (USA) restricts use of GALILEOS Implant to or on the order of a physician, dentist or licensed practitioner.

CAUTION
The use of GALILEOS Implant is restricted to qualified dental professionals.

CAUTION
Every plan which is intended for treatment of any kind needs to be leges artis.

CAUTION
Before you install GALILEOS Implant please make sure your system complies with the minimum system requirements.

CAUTION
Prior to using GALILEOS Implant, check your monitor for sufficient visualization quality by visualizing the SMPTE test pattern.

CAUTION
Do not perform any modification to the installation of GALILEOS Implant. Do not delete or modify any of the components contained within the installation directory of GALILEOS Implant.
CAUTION
Handle the GALILEOS Implant installation DVD with care and store it in an appropriate way.

CAUTION
Security leaks within your information system environment might allow access to your system threatening the privacy and the integrity of your patient data. Please make sure security policies are established within your organization to monitor and to protect against possible security threats related to your information system environment.

The installation and use of an up-to-date virus scanner is highly recommended. Please make sure your virus scanner pattern files are updated on a regular base.

CAUTION
Unauthorized access to your computer might allow access to your data threatening the privacy and the integrity of your patient data. Please limit the access to properly authorized individuals only.

CAUTION
Verify that the displayed patient dataset is associated with the correct patient's name and the correct dataset information.

CAUTION
You may only perform a planning if the environmental conditions (e.g. light) allow for sufficient quality. You can check this with the SMPTE test pattern.

CAUTION
Please contact SICAT GmbH & Co. KG immediately in case you experience any problems related to the cyber security of GALILEOS Implant.
CAUTION
Always verify the correct orientation of the displayed patient dataset.

CAUTION
In exceptional cases, implants from the database may be displayed schematically. The schematic presentation conforms in length and diameters with the nominal specifications provided by the manufacturer. You need to evaluate how the nominal specifications relate to the real dimensions.

CAUTION
If you use the nominal specifications provided by the manufacturer for the configuration of a generic abutment, you need to evaluate how these nominal specifications relate to the real dimensions.

CAUTION
In exceptional cases, sleeves may be displayed schematically. The schematic presentation conforms in length and diameter with the nominal specifications provided by the manufacturer. You need to evaluate how the nominal specifications relate to the real dimensions.

CAUTION
Please make sure that your order is based on the correct plan.

CAUTION
Make sure to burn the correct order data to CD while burning manually.

CAUTION
Please label the order CD and - if applicable - the stone model with the patient’s information.
Appendix H. Warning Notices

CAUTION
Handle order CDs with care and store them in an appropriate way.

CAUTION
Make sure that you select the correct order file when you transfer the order data via internet to SICAT.

CAUTION
If you transfer the order data via package/CD, make sure that the package is correctly compiled and contains all necessary components listed on the last page of the order wizard.

CAUTION
Make sure that the correct plan is displayed and that you only export the plans you really want to export.

CAUTION
Make sure that the correct plan/order is displayed and that you export the plans/order you really want to export.

CAUTION
Please do not remove the GALILEOS Viewer data if you like to view the data again at a later time.

CAUTION
Only use X-ray data and CAD/CAM data that allow a precise registration. Major artifacts in the X-ray data (e.g. motion or metal artifacts) or an optical impression without teeth complicate or even prevent precise registration.
CAUTION
CAD/CAM data only provide a secondary (auxiliary) source of information. X-ray data remain the ultimate source of information for implant planning.

CAUTION
Please make sure to only import CAD/CAM files from CAD/CAM systems cleared as medical devices.

CAUTION
Please make sure that the CAD/CAM dataset corresponds to the patient's data currently open.

CAUTION
Please verify the integrity and quality of the imported CAD/CAM objects.

CAUTION
Select the corresponding reference points carefully in both views.

CAUTION
Verify that the optical impression is correctly aligned with the X-ray data.

CAUTION
The automatic positioning of implants based on a restoration is only a rough positioning. You still have to adjust the position and the orientation of the inserted implants based on the X-ray data.

CAUTION
During third-party processing of your plan, the sleeve positions are used exactly as planned by you. The sleeve positions cannot be changed later in the workflow.
CAUTION
Only currently shown optical impressions will be included in the export for third-party processing using optical impressions. Please make sure that these are the optical impressions intended for the export, that they cover all implant positions, and that they are exactly aligned with the 3D X-ray data.

CAUTION
Please make sure that your export for third-party processing is based on the correct plan.

CAUTION
Make sure that you select the correct export file for third-party processing.

CAUTION
Check for every detection that the correct type of the reference body is detected and that the detected markers (green circles), the markers in the X-ray volume (circular white region) and the markers in the reference body model (circles colored as the reference body model) are superimposed correctly.

CAUTION
Major artifacts in the X-ray data (e.g. motion or metal artifacts) complicate or even prevent precise reference body detection.
Appendix I. Explanation of Labeling Symbols

Caution! Consult accompanying documents.

Consult instructions for use.

Manufacturer

Serial number

The serial number is structured in the following way:

\[ \text{SN/S192011121598} \]

1: Symbol for serial number
2: Proprietary complement to label the serial number
3: Version in the format 'AB' ('19' means 1.9.x)
4: Manufacturing date in the format 'YYYYMMDD' ('20111215' means 12/15/2011)
3 and 4: Lot
5: Consecutive number within the lot
Appendix J. Contact Information

Manufacturer

SICAT GmbH & Co. KG
Brunnenallee 6
53177 Bonn
Germany

Phone: +49 228 85469711
Fax: +49 228 85469799
E-Mail: GALILEOSImplant@sicat.com
We reserve the right to make any alterations which may be required due to technical improvements.