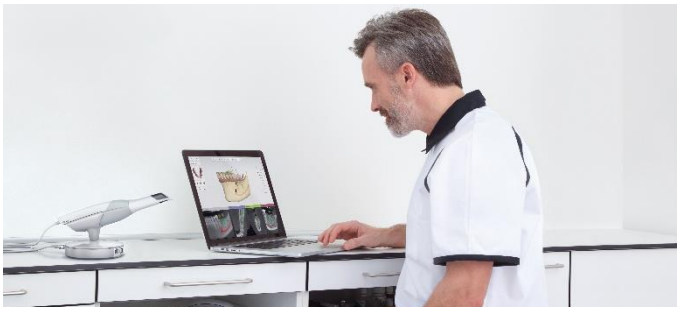


THE DUAL SCAN PROTOCOL WITH IMPLANT STUDIO®



“The secret of being successful with the dual CT scan protocol is, quite simply, good preparation.”

Zach Dalmau

Project Manager
Guided Surgery and Digital Treatment planning
Glidewell Dental Lab, USA

More information

www.3shape.com
www.3shapedental.com
info@3shape.com

Implant Studio® and the dual scan protocol

With **Implant Studio® 2015** you can, for the first time, work with edentulous cases using the well-established *dual scan protocol*. The protocol enables a workflow for prosthetic driven implant planning and surgical guide design, involving a patient specific denture/removable appliance and (CB)CT data.

This “How to”-guide will guide you through how you successfully apply the protocol to achieve the best results and smooth working experience with Implant Studio®.

Contents

The guide is divided into the following sections:

1. How to get started
2. Preparing the denture / removable appliance
3. Scanning the denture / removable appliance and the patient
4. Working with the dual scan protocol in Implant Studio®

Please note!

Any treatment attempt on a patient planned by way of the Implant Studio® software should be planned and made only by a dental professional having with due diligence assessed whether the treatment can actually be implemented without causing damage to the patient. The risks pertaining to any such treatment attempt shall be assumed entirely by the person carrying out the treatment.

3Shape A/S disclaims any and all liability for the results of any treatment attempts made on the basis of the implant planning and surgical guide design generated within the Implant Studio® software.

3Shape Headquarters
Europe, Middle East & Africa
Holmens Kanal 7
1060 Copenhagen, Denmark
Tel: +45 7027 2620

3Shape Asia
Room 906, Tower A of Eton Place
No. 69, Dongfang Road
200120 Shanghai, China
Tel: +86 21 5835 2281

3Shape Latin America
Carrera 13 # 82-91
Oficina 401
110221 Bogotá, Colombia
Tel: +57 1691 9508

3Shape North America
Somerset Hills Corporate Center
10 Independence Boulevard, Suite 150
Warren, New Jersey 07059, USA
Tel: +1 (908) 867 0144

How to get started

You will need the following items to prepare your work for a “dual scan” case:

- Patient denture / removable appliance
Non-metallic! If the denture contains metal, an acrylic copy must be made (see the section *Preparing the denture / removable appliance*).
- CT-Scan markers
Gutta percha material or prefabricated markers like *SureMark* CT-markers or similar.
- Bite registration index for correct bite relationship
Preferably an elastomeric material with a quick setting time should be used.
- Chairside hard reline material
Essential to ensure a good fit of the denture against the gingiva.

Preparing the denture / removable appliance

It is essential that the denture/removable appliance fulfils certain requirements.

- The first step is the **fabrication of the bite index**. The index ensures that the prosthesis is well-positioned and stable during the CT-scanning.
 1. Inject the material directly onto the occlusal surface. Usually a 5mm layer is sufficient.
 2. Gently guide the patient to close his/her bite into the desired position during the setting time.
 3. Remove the bite index from the patient’s mouth.
 4. Trim excess material away with a sharp instrument.
- The designed guide using the dual scan protocol with Implant Studio®, will be based on the information of the scanned denture/removable appliance. Therefore, an accurate fitting denture is key to success with this workflow, which is why a **hard reline** of the existing denture should always be performed for poor fitting dentures.
 1. Roughen the area to be relined if necessary.
 2. Inject the reline material directly onto the prosthesis and mount the bite index.
 3. Gently guide the patient to close his/her bite onto the bite index, to ensure proper jaw relation and occlusion.
 4. Remove the denture from the patient’s mouth when the reline material has set.
 5. Finish the reline by trimming, curing etc. depending on the properties of the material you have chosen.
- Before placing any CT-markers on the denture/removable appliance, it is critical to make sure that the existing denture does not contain any metal parts. It is recommended to always use a denture in clear acrylic and be aware that any variation in the composition of acrylic can yield scatter in the resulting CT images. If this cannot be fulfilled with the existing denture, an **acrylic copy of the denture** must be made. Always make sure to check the fit of the copied denture.
- **Marking the denture with CT-markers** is the last step in preparing the denture/removable appliance. This should only be done, when the fit of the denture has been confirmed and when the denture fulfils the material requirements mentioned above.
 1. Dry the denture before adhering any markers – the markers should not move after application.
 2. Place 4-6 markers evenly distributed across the denture surface. Ensure that no markers are placed on the intaglio (soft-tissue) surface.
 - 2a. If you use prefabricated “sticky” markers, then cut the sticky part of the markers if necessary, so they will fit the appliance.
 - 2b. If you use prefabricated markers that do not stick to a marker material like gutta-percha, then use a small round drill to create small cavities, where you want to place markers. Glue the prefabricated (non-sticking) markers into the small cavities, or fill the cavities with the gutta-percha material and let it set.

■ Scanning the denture / removable appliance and the patient

The dual scan protocol can be used with both medical CT and cone-beam CT scanners. Always make sure that scans are taken with the correct settings and that the prepared “scan” denture/removable appliance as well as bite index is used. It is recommended to test the settings for denture CT scanning, with your CT equipment on a test case, before working on clinical cases.

- **Scan the denture / appliance first.**
 1. Place the appliance in the centre of the field-of-view. Position the denture as it sits in the patient’s mouth, on a foam or Styrofoam block.
 2. Scan the denture.
 3. Verify that the markers are clearly visible in the scan and that the edges of the appliance are well represented and not interfered by scatter or artifacts.

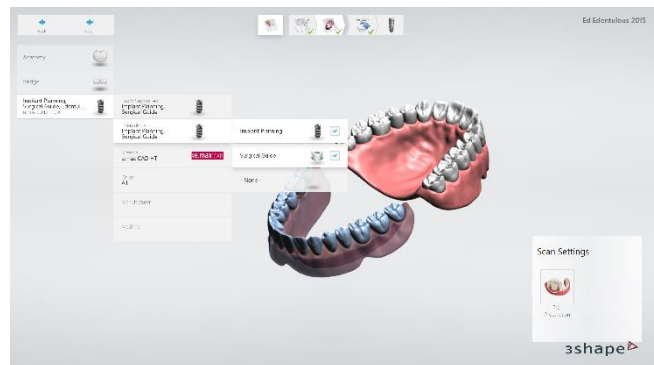
- **Scan the patient** after you have acquired a high quality denture scan.
 1. Place the prepared appliance in its correct position in the patient’s mouth.
 2. Place the bite index in the patient’s mouth and ask the patient to bite firmly on the bite index.
 3. Scan the patient applying your normal “best practice” CT scan routine.
 4. Verify that the markers are clearly visible in the scan and that the appliance looks to be seated properly.

Please see chapter 10 *Information on the CBCT/CT Scanning* in the Implant Studio® 2015 user manual, for more information on recommended CT-scan settings.

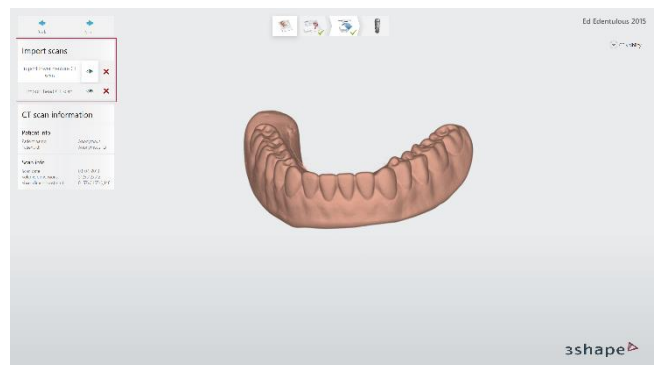
■ Working with the dual scan protocol in Implant Studio®

The dual CT scan protocol is supported in **Implant Studio® 2015** and newer versions. Here are some valuable tips on how to achieve the best results and working experience in **Implant Studio®**.

- How to **set up** a ‘dual scan’ case:
 1. On the order form select a single tooth.
 2. Click the ‘Implant Planning’ tab.
 3. Go to ‘Edentulous’.
 4. Mark the checkbox ‘Implant Planning’. This will require you to load a patient CT-scan as a minimum.
 5. Mark the checkbox ‘Surgical Guide’. This will require you to load a patient CT-scan and a denture CT-scan as a minimum.

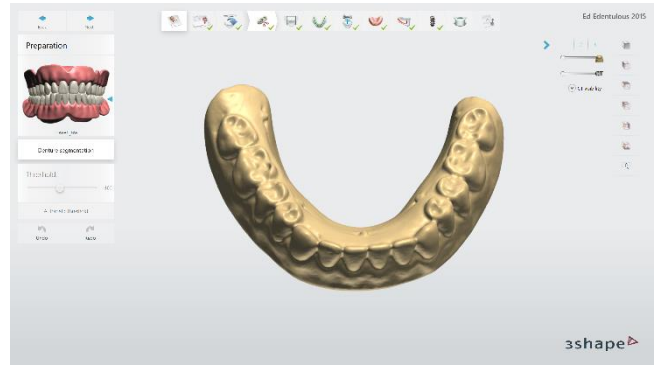


- How to **load** the two scan data sets:
 1. On the scan import page, you can load your two scans by clicking the ‘Import lower/upper denture CT scan’ and ‘Import head CT scan’ buttons.
 2. Browse to the folder where your CT DICOM files are placed.
 3. Double click one of the files, and wait for the 2D previews to appear.
 4. Verify that the loaded scan is the scan you intended to load, by using the sliders to scroll through the content in the 2D cross sections.
 5. Click ‘Select’ to finish loading the scan.



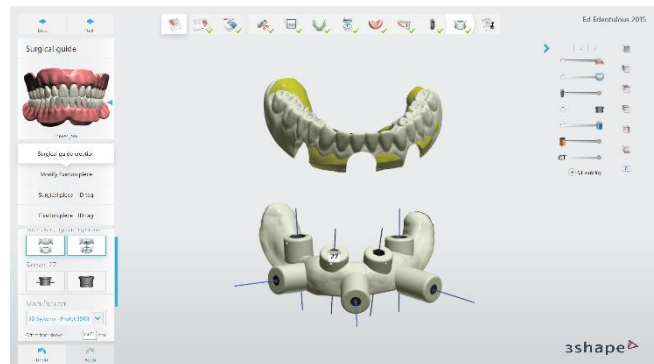
How to adjust the denture CT appearance:

1. Click the 'preparation' icon in the workflow. You will find the 'preparation' icon to the left in the Implant Studio® in the workflow. This step is optional, as the software always automatically calculates a threshold value.
2. To adjust the threshold, use the slider to adjust the intensity level that will be used to generate the denture 3D model.
3. Adjusting the slider will make the software calculate a new 3D model, which normally takes 5-10 sec.
4. Verify the quality of the 3D denture model. The intaglio (soft-tissue) side of the denture must appear as 'clean' as possible, as any scatter or artefact here will affect the fit of the surgical guide.



How to design a gingiva supported surgical guide:

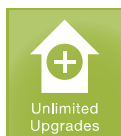
1. Based on the denture CT scan and your implant planning, the gingiva supported surgical guide will automatically be calculated.
2. Adjust the sleeve support cylinders to match your clinical preference.
3. Chose between the default one-piece surgical guide and the two-piece surgical guide, for cases where surgical tool accessibility and guide alignment to the opposing jaw is critical.
4. Add support bars, windows and ID-tags according to your preference.



Backing labs and dentists with care, technology and expertise



Expert
Training



Unlimited
Upgrades



Global
Support

3Shape LABcare™ and CLINICare™ are integral parts of your annual 3Shape subscription. It bundles services that are designed to ensure your investment, secure maximum uptime, and help you get the most from your solution year after year.

Find 3Shape online

