

# Scan strategies for Dentsply Sirona Intra-oral scanners: Omniscam & Primescan

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This document contains the scan strategies for both the Omnicam and Primescan Intra-oral scanners by Dentsply Sirona. The scan strategies contained in this document was taken from the relevant scanner manuals issued by Dentsply Sirona and available on the website:

<https://manuals.sirona.com/en/digital-dentistry/cerec-chairside-solutions.html>

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## Introduction:

When considering the accuracy of full mouth intra-oral scanners it is beneficial to consider the influence of scan strategie on the accuracy and dimentional stability of the scan. Scan strategy directly relates to the way that the images is 'stitched' in the scannign software and this is criti-cally important, especially for full-arch scans. Hence the guided scan strategies for the CEREC Ortho software.

### "Stitching

Imagine using a 15-cm ruler to draw a straight line that is 5 meters long. No matter how meticulous you draw each segment, the final line will not be perfectly straight. If the line is now 50 meters long, it's reasonable to assume a larger deviation will occur, since the errors accumu-late over each 15-centimeter iteration. Scanning a full-arch is very similar. As you move the scan-ner head across a surface, individual images are stitched together rapidly to form the final model. With longer scanning areas, the errors ultimately add up to cause more and more deformations.

So let's go back to our upper- and lower-arch scans. If they are sufficiently deformed, then it is not a surprise that software has a hard time superimposing a third, buccal scan and trying to fig-ure out what the "best-fit" is. This deformation is the crux of the issue in the report from CEREC Doctors, where they investigated the reasoning behind unreliable bite registration in full-mouth scans."

An extract form:Not All Scans Are Equal Full-arch scanning with CEREC Omnicam  
June 4, 2017 by Hsuan

## Omniscam scanning:

Taken from Omnicam manual: 66 54 649 D3696 D3696.201.02.03.02 05.2019 - page 55- 61  
The scanner acquires images which are used during the ongoing measurement in spatial relation to each other (image registration). During the acquisition and then during the ongoing registration process, a distinctive sound can be heard. If the registration cannot be implement-ed, the acquisition flow is suspended. You are informed of this by means of a sound. This is different to the sound emitted during successful acquisition. You can adjust the volume under  
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configuration and select another type of sound (melody).

## IMPORTANT

Registration error

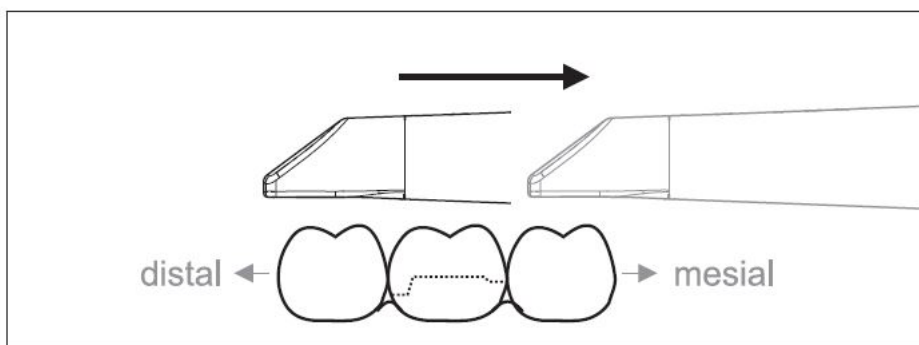
Should a registration error occur, you must return to another acquired point. To start with, practice this procedure on the model and then on intraoral areas. Move the scanner to a position where a successful acquisition was taken. A point that has already been acquired in the occlusal area is best. You will be able to hear the sound for registered acquisitions.

Continue the acquisition.

Divide the acquisition into four consecutive sequences:

1. Occlusal
2. Buccal
3. Lingual
4. Proximal

## Occlusal scan:



## Important:

Ensure that the distance between the coated sapphire glass of the scanner and the scanned surface is observed. The distance must be between 0 - 15 mm (ideally: 5 mm). The scanner does not rest on the teeth or the gums. If the distance is too great, no data will be obtained.

1. Move the scanner to the starting position. For this purpose, the scanner is in the occlusal view of the tooth, which is next to the prepared tooth in the distal direction.
2. Scan in the mesial direction. To do so, move the scanner slowly in the occlusal direction from the distal-positioned tooth over the prepared tooth to the mesial-positioned tooth. With full jaw acquisitions, the scan sequence is different for the transition to anteriors. Scanning begins with the lingual and labial areas, before moving on to the incisors.

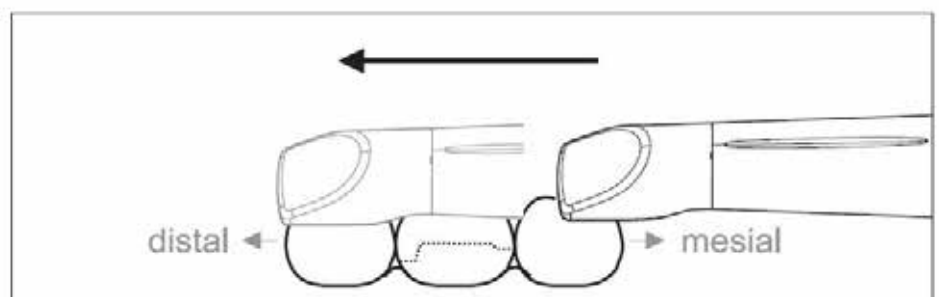
## Buccal scan:

The scanner is on the adjacent tooth, in the mesial direction to the preparation.

1. Rotate the scanner between 45° to maximum 90° toward the buccal.
2. Guide the scanner over the entire buccal distance in the distal direction over the prepared tooth. With full jaw acquisitions, limit the buccal scan to no more than a quadrant

Ensure the scanner is held like a flute during buccal scans. Do not tilt it vertically to the direction of motion.

Tip: Practice guiding the scanner between 45° and 90°



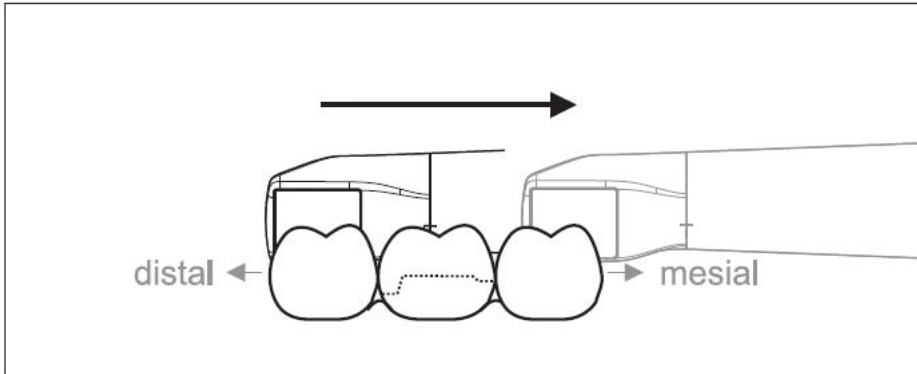
## Lingual scan:

The scanner is on the tooth that is positioned next to the preparation in the distal direction.

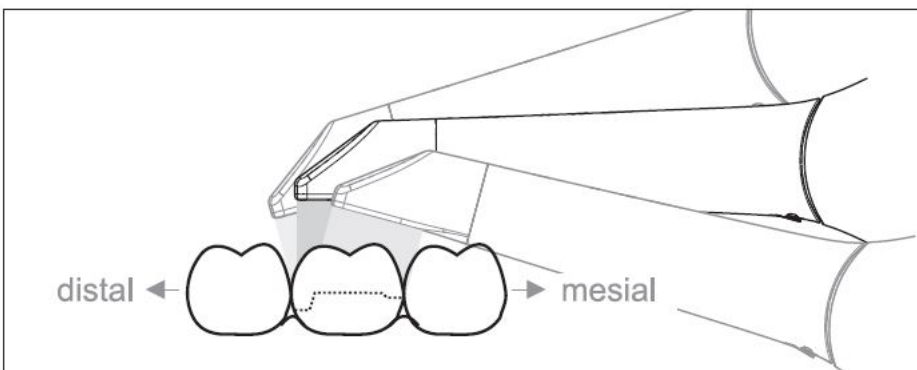
1. Rotate the scanner from 90° in the buccal direction to around 45° to maximum 90°

in the lingual direction on the other side.

2. Guide the scanner over the entire lingual distance in the mesial direction over the prepared tooth.



## Approximal surface scan:



Scan the approximal surfaces of the prepared tooth.

\* Move the scanner in the occlusal direction to the prepared tooth. Acquire the approximal surfaces in the distal and mesial direction by using a wave motion in the occlusal, buccal, and lingual direction over the prepared tooth.

To do so, tilt the surface by 15° in the distal and mesial direction to gain a better view of the approximal contacts.

Notes:

\* Remove the soft tissue.

\* Cut away the moveable gingivae, so that only 2-5 mm gingivae remains around the tooth.

\* When performing this activity, be careful not to accidentally cut out any areas that e.g. are located behind the model or are otherwise cut away from the line.

\* This cut must be completed during the ACQUISITION phase using the cutter.

## Single and multiple buccal registration:

The buccal registration establishes the allocation of jaw exposures.

\* The jaw with the preparation is scanned.

1. Scan the occlusal, buccal and lingual view of the antagonist (see the section “Occlusal scan”, “Buccal scan” and “Lingual scan”).

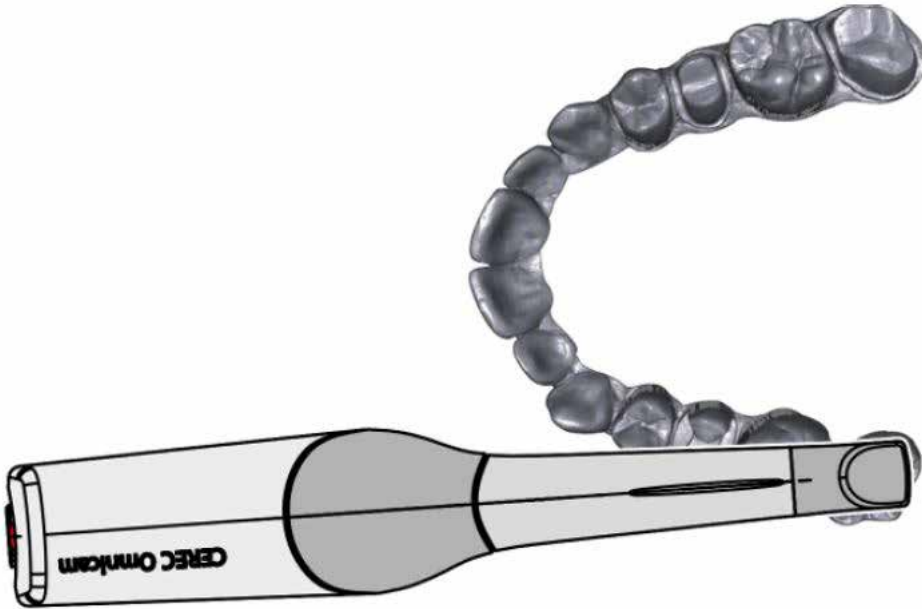
2. Perform a buccal scan of the bite block prior to completing the registration. This buccal scan

should be carried out close-up to the preparation. To acquire sufficient geometry, capture the teeth of the upper and lower jaw as well as 5 mm of the respective gingival areas.

Tip: In the case of multiple or long-span restorations over several quadrants, we recommend generating several buccal exposures close to the restoration.

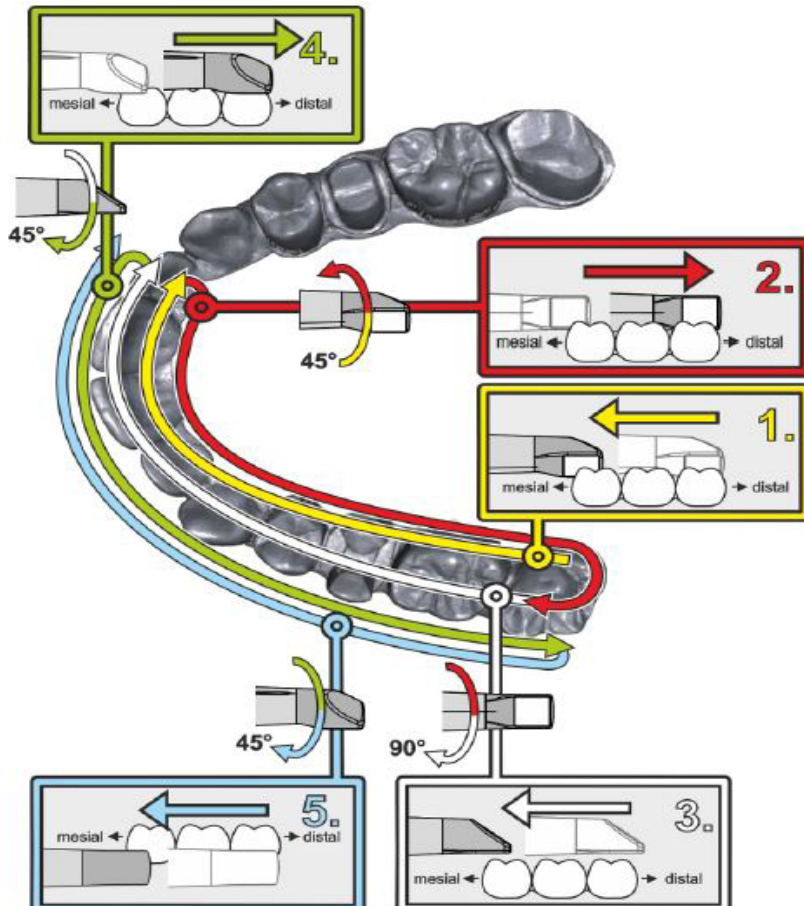
## Scanning the quadrant and jaw

The following scan regulation applies for the acquisition of a complete quadrant or jaw arch. The first (fourth) quadrant is scanned up to the opposite second front tooth by moving the scanner in parallel along the jaw arch. Start the scanning process



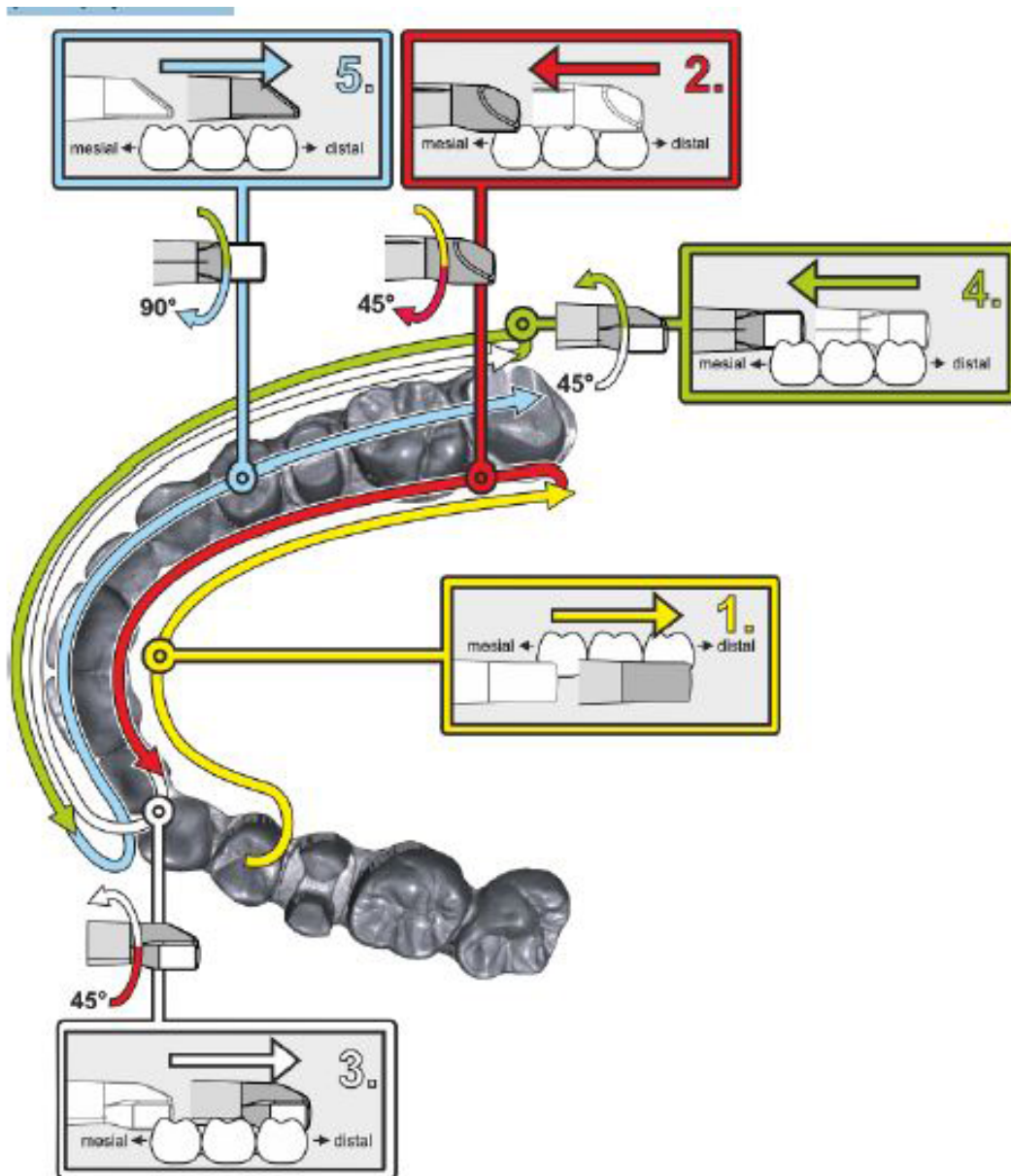
Position the scanner occlusally above the last tooth on the right, to start the scanning process

Completing the scanning process



1. Start as indicated above, on the occlusal surface of the right terminal tooth, and scan it occlusally. Tilt the scanner by 45° in a palatinal direction (oral) and guide it from the distal to the mesial.
2. Tilt the scanner another 45° in a palatinal direction (oral) and move it in a distal direction.
3. Tilt the scanner by 90° on to the occlusal surface and move it in a mesial direction.
4. Tilt the scanner in a 45° buccal direction and move it back towards the distal.
5. Then tilt the scanner a further 45° in a buccal direction to a total of 90° and move it in a mesial direction again.

The following scan sequence is implemented for the opposite second (third) quadrad.



1. Start by placing the device on the occlusal surface of a premolar, that has already been scanned, and guide the scanner palatally (orally) at a mesial tilt of up to 90° across the lingual surface of the front teeth in a distal direction towards the terminal tooth.
2. Slight tilt the scanner by 45°, so that the scanner is only tilted by 45° in a palatinal direction (oral) moving from the distal and back to the mesial to the front teeth.
3. Once you have reached the area of the front tooth, guide the scanner 45° to the buccal side and tilt the scanner by 45° from the mesial to the distal direction.
4. Once you have reached the distal, tilt the scanner by another 45° (total of 90°) further towards the buccal and guide the scanner from the distal back to the mesial direction.
5. Once you have reached the area of the front tooth, tilt the scanner in an occlusal direction and guide the scanner mesially to the occlusal surfaces right to the back distal molars.

## Notes:

- \* Remove the soft tissue.
- \* Cut away the moveable gingivae, so that only 2-5 mm gingivae remains around the tooth
- \* When performing this activity, be careful not to accidentally cut out any areas that e.g. are located behind the model or are otherwise cut away from the line.
- \* This cut must be completed during the ACQUISITION phase using the cutter.

## Completing measurements:

The exposures are complete.

1. Press the "Next" button.

\* The virtual model is calculated and displayed in color.

\* Beige brown sections highlight data material that is missing from the calculated model.

2. If missing data emerges in the preparation area, carry out further exposures.

## Primescan Scanning:

Taken from Primescan manual: 66 54 573 D3696 D3696.201.01.04.02 05.2019 - page 54-59

The scanner acquires images which are used during the ongoing measurement in spatial relation to each other (image registration). During the acquisition and then during the ongoing registration process, a distinctive sound can be heard. If the registration cannot be implemented, the acquisition flow is suspended. You are informed of this by means of a sound. This is different to the sound emitted during successful acquisition. You can adjust the volume under configuration and select another type of sound (melody).

## IMPORTANT

Registration error

Should a registration error occur, you must return to another acquired point.

To start with, practice this procedure on the model and then on intraoral areas.

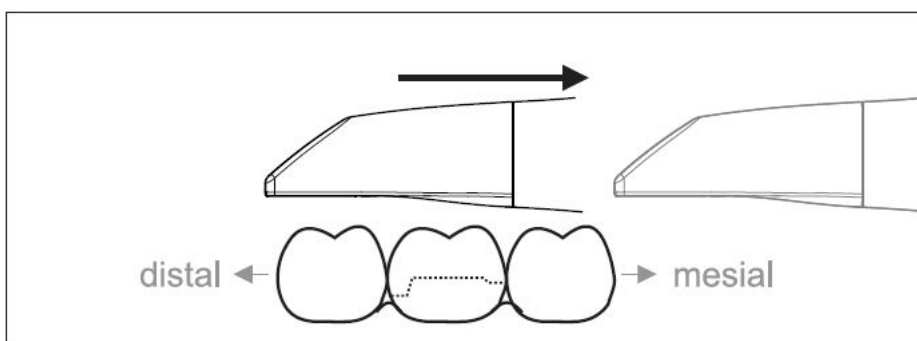
\* Move the scanner to a position where a successful acquisition was taken. A point that has already been acquired in the occlusal area is best. You will be able to hear the sound for registered acquisitions.

\* Continue the acquisition.

**Divide the acquisition into four consecutive sequences:**

1. Occlusal
2. Buccal
3. Lingual
4. Proximal

## Occlusal scan:

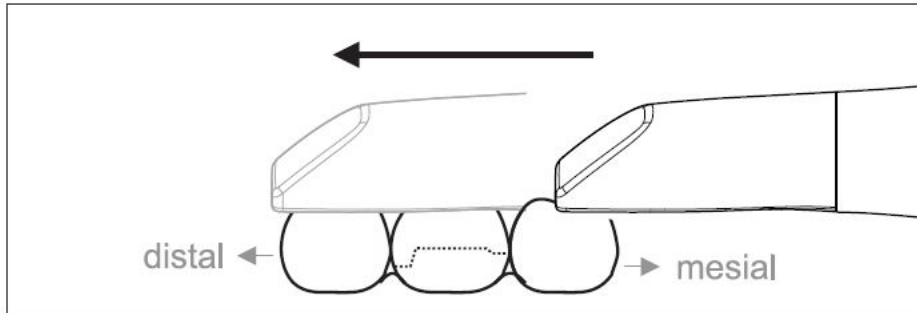


## Important:

Ensure that the distance between the coated sapphire glass of the scanner and the scanned

surface is observed. The distance must be between 0 - 20 mm (ideally: 2 mm) The scanner does not rest on the teeth or the gums.

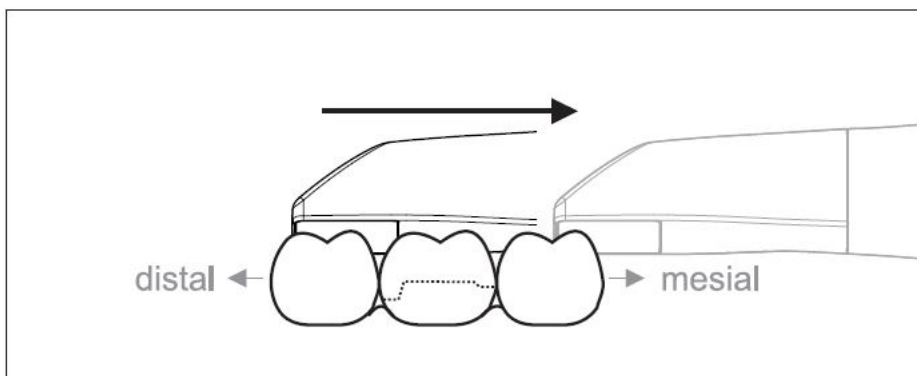
1. Move the scanner to the starting position. For this purpose, the scanner is in the occlusal view of the tooth, which is next to the prepared tooth in the distal direction.
2. Scan in the mesial direction. To do so, move the scanner in the occlusal direction from the distal-positioned tooth over the prepared tooth to the mesial-positioned tooth.



The scanner is on the adjacent tooth, in the mesial direction to the preparation.

1. Rotate the scanner 20° toward the buccal.
2. Guide the scanner over the entire buccal distance in the distal direction over the prepared tooth.

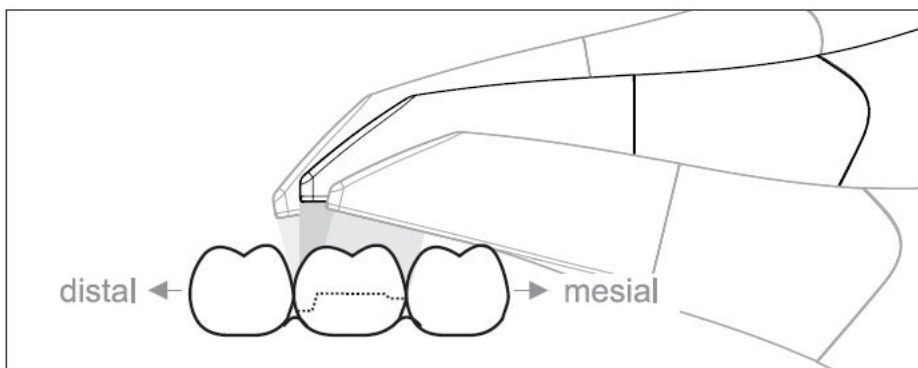
## Lingual scan:



The scanner is on the tooth that is positioned next to the preparation in the distal direction.

1. Rotate the scanner to maximum 20° toward the lingual direction.
2. Guide the scanner over the entire lingual distance in the mesial direction over the prepared tooth.

## Approximal surface scan:



Scan the approximal surfaces of the prepared tooth.

\* Move the scanner in the occlusal direction to the prepared tooth.

Acquire the approximal surfaces in the distal and mesial direction.

## Single and multiple buccal registration:

The buccal registration establishes the allocation of jaw exposures.

\* The jaw with the preparation is scanned.

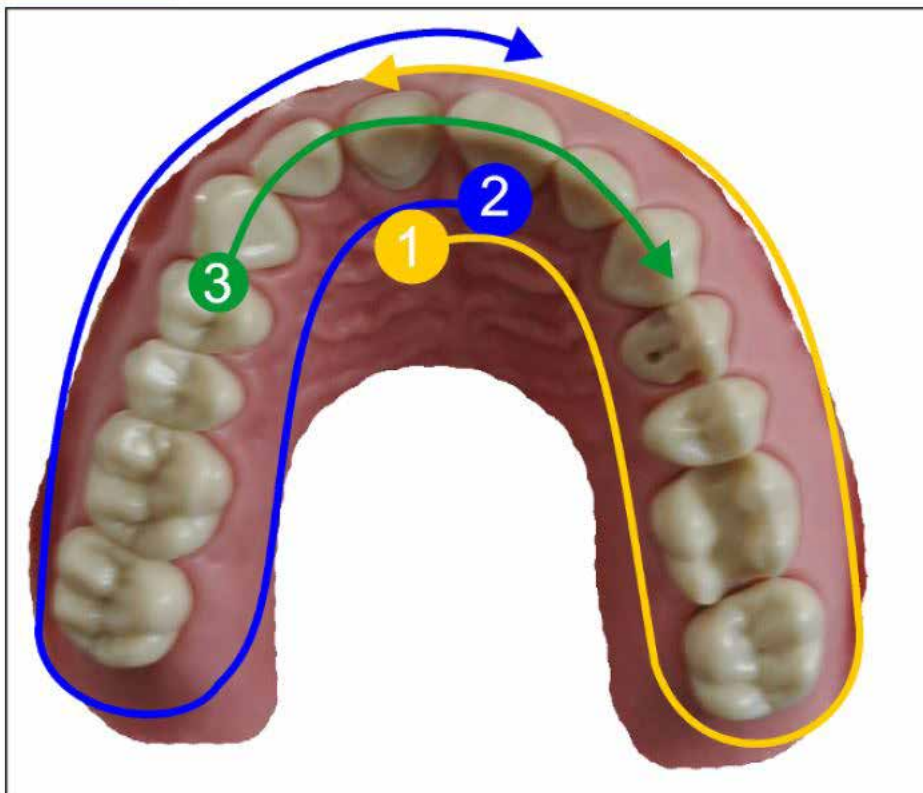
1. Scan the occlusal, buccal and lingual view of the antagonist (see the section “Occlusal scan “Buccal scan and “Lingual scan ).
2. Perform a buccal scan of the bite block prior to completing the registration. This buccal scan should be carried out close-up to the preparation. To acquire sufficient geometry, capture the teeth of the upper and lower jaw as well as 5 mm of the respective gingival areas.
3. Please complete a buccal scan on both sides for a full jaw scan. For this, use the scanner to complete a buccal scan in each case over the premolars of both quadrants.

**Tip: In the case of multiple or long-span restorations over several quadrants, we recommend generating several buccal exposures close to the restoration.**

## Square and full jaw scan:

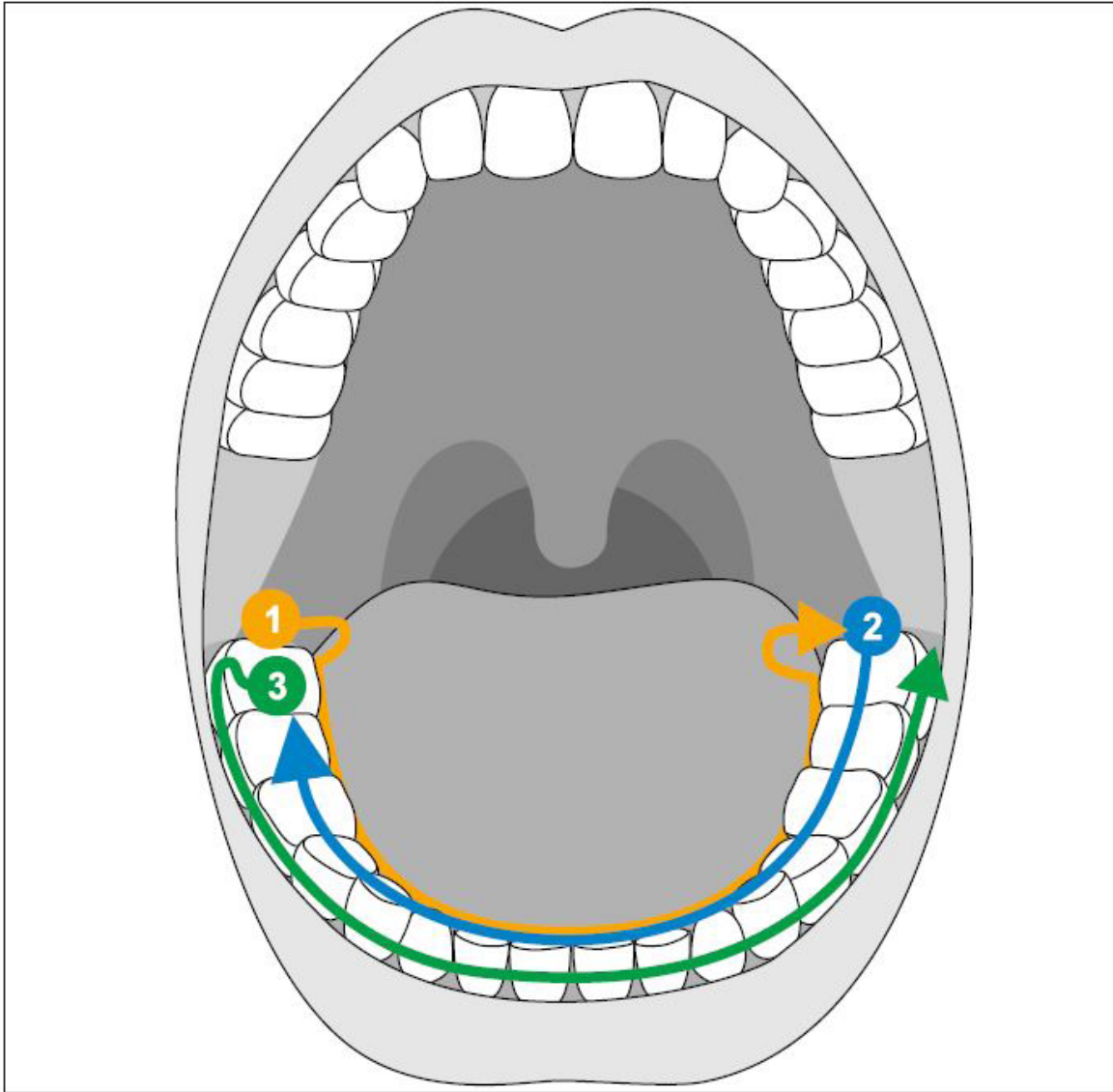
You can use different scanning procedures for scanning a quadrant or a full jaw. Find two procedures as follows to help you gain access should such help be necessary.

### Procedure 1:



1. Start with the oral surface of the anterior teeth and move the scanner in the oral direction along the quadrant. Move the scanner over the distal tooth to the vestibular side and track the first quadrant to the anterior teeth. Gently tilt the scanner approx. 30° in the coronal-apical direction.
2. Move the scanner as shown below (1) for the second quadrant.
3. Then scan the anterior teeth from cuspid to cuspid in the coronal-apical direction. Ensure that both the labial surface and the oral surfaces are visible. Extend this third scan to locations where you can view scan holes.

## Procedure 2:



1. Start occlusally on the distal tooth, tilt the scanner approx.  $60^\circ$  in an oral direction and move it orally along the dental arch up to the opposite distal tooth.
2. Guide the scanner occlusally from the distal tooth across the entire dental arch back to the other side.
3. To complete the scan, tilt the scanner approx.  $60^\circ$  in a buccal direction and move it buccally along the entire dental arch.

## Concluding the optical impressions:

The exposures are complete.

1. Click on the "Next" button.

\* The virtual model is calculated and displayed in color.

\* Beige brown sections highlight data material that is missing from the calculated model.

2. If missing data emerges in the preparation area, carry out further scans. Change back to the "ACQUISITION" phase. Perform additional scans to complete the model structure

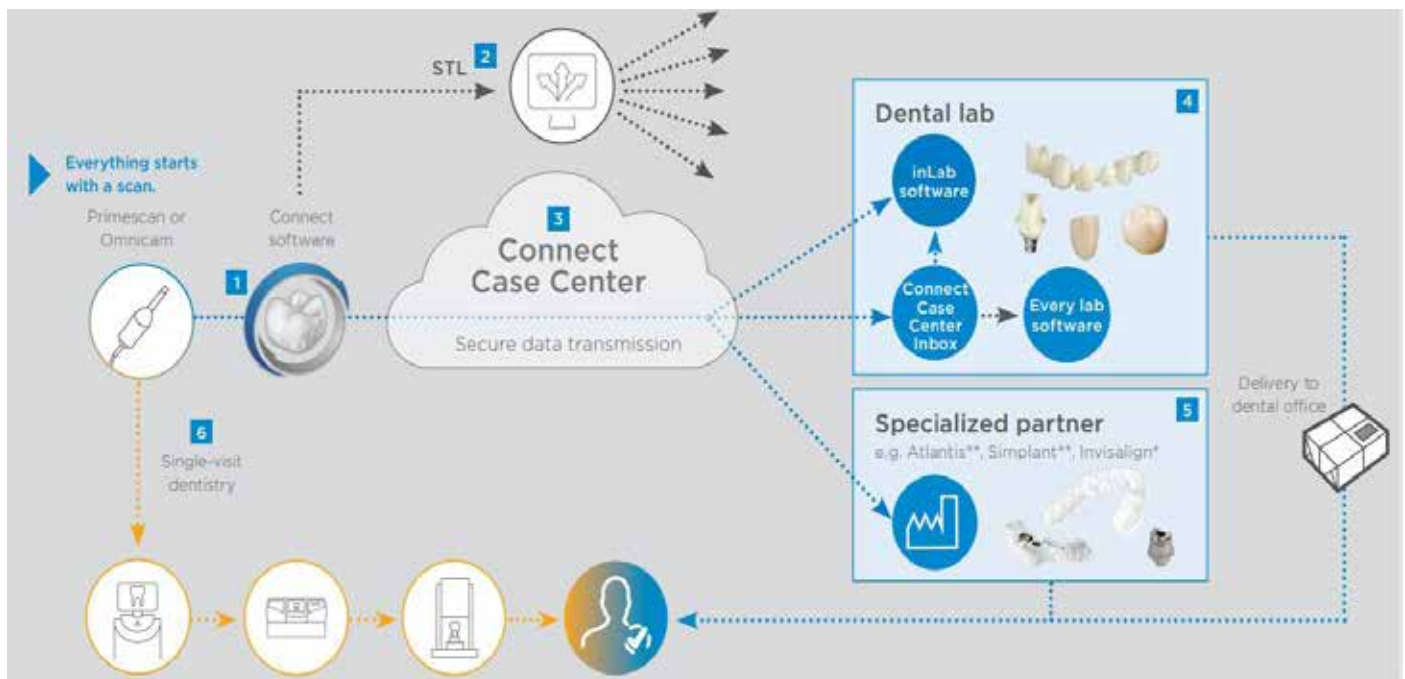
## File format - Exports and Interfaces

CEREC intra-oral scans can be exported as .stl files to be imported into any 3rd party software, or the file may be exported through the free, Connect Case Centre.

Connect Case Center is the central platform for digital impressions. Practices and laboratories have to register just once in order to transmit digital orders via the portal to dental laboratories simply and safely within seconds. Every dental laboratory that registers once for the Connect Case Center can be found by practices, saved permanently as the preferred lab and contacted for Connect orders.

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## Primescan AC with Connect Software:

- \* Supports data transfer options to your preferred partners
- \* Secure and encrypted data transfer through Connect Case Center Inbox
- \* Easy upgradability to full chairside workflow
- \* Touch-enabled and intuitive user interface
- \* CEREC Primescan AC with CEREC Software:
- \* Supports full chairside workflows for single-visit dentistry
- \* Flexible data export options
- \* Automatized workflow thanks to Artificial Intelligence
- \* Touch-enabled and intuitive user interface

Special treatment methods – such as orthodontic procedures – require specialized partners. Besides local dental labs, there are also providers who specialize in certain applications and indications, such as, e.g., orthodontic procedures. Make use of the multitude of indications and options for collaborating with your partners via the Connect Case Center. The transmission to connected partners takes place via the Connect software.

Software for Case connect can be downloaded from the following website:  
<https://www.dentsplysirona.com/en/explore/digital-impression/connect/software.html>

Registration of for Case Connect can by done by a Dentsply Sirona Employee on behalf of the dentist or can be done online at: <https://customer.connectcasecenter.com/register/dentist>. Care must be taken to select the correct timezone when registering. If the incorrect timezone is selected, none of laboratories in the area will be visible and the dentist will not be able to connect with them.

Should you need any additional info, please feel free to contact me on: 060 995 3994

