User Guide

Revision (March 2023)

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Greetings

Thank you for purchasing Medit 3D scanner.

Medit offers high quality table scanners for dental CAD/CAM, including dental plaster models, impressions and prosthesis.

With Medit T-Series scanners, you can efficiently acquire high-quality 3D data in STL and OBJ formats. You can use our scanners with minimal training. Simply place the object in the scanner and follow the on-screen procedure to start scanning.

This manual is a complete guide for installation and usage of the scanner.

※ Note: Please read this manual thoroughly and carefully before installation and operation of the equipment and software.

General Information

Intended Use

Workflow

Scanner and Software

General Information

1.1 Intended Use

The table top dental 3D scanner is intended to be used to digitally record topographical char acteristics of teeth model. The system produces 3D scans for use in computer-assisted design and manufacturing of dental restorations.

The scanner is intended to be used for the following cases:

- Single coping
- Bridges
- Full anatomic crown
- Full anatomical bridge
- Inlay / Onlay / Inlay bridge
- Veneer
- Single wax-up / Wax-up bridge
- Over-press crowns and bridge
- Post and core
- Telescopic crown
- Custom abutments
- Implant bars and bridges
- Removable partial denture
- Orthodontic cases
- Full denture
- Replica denture

- Provisional crown and bridge
- Attachments
- Splints

1.2 Workflow

The workflow is designed to provide high quality scan data in the dental clinic or laboratory for any shape and size.

1) **Model or impression scan**

   Together with the scanner itself, Medit Scan for Labs will scan the model according to the information entered in the order form in Medit scan for labs. This enables you to create a prosthesis directly by scanning the impressions as compared to the conventional methods of prosthesis manufacturing.

2) **CAD processing**

   The prosthesis is designed using CAD program.

3) **CAM processing**

   The prosthesis designed using the CAM program is converted into NC data.

4) **Manufacturing**

   Prosthesis is manufactured using a machine according to the NC data.

5) **Finishing**

   The finishing process for manufactured prosthesis.

1.3 Scanner & Software

The scanner comes equipped with the accompanying software.

1) Scanner: Medit Table Top Scanner (T-series)

The scanner is designed to acquire scan data from a variety of dental models and impressions in a convenient way. A full arch scan takes only 8 seconds.

2) Software: Medit Scan for Las

- Medit Scan for Labs: The accompanying software is designed to be user friendly, making it easy to acquire scanned data.

1.4 For the User

The system can only be used by trained dental professionals or technicians.

You are solely responsible for the accuracy and completion of all the data acquired using your 3D scanner system. The user should verify the accuracy of each scan result and use it to evaluate the applicability of each treatment.

The scanner system must be used in accordance with the accompanying user manual.

Improper use or handling of the scanner system will void your warranty. If you need additional information or assistance in using the equipment, please contact your local service provider.

You cannot modify or change the device of the software system on your own.

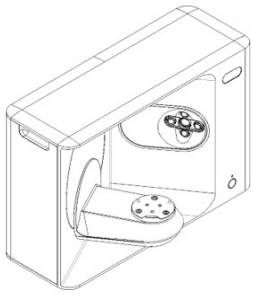
1.5 Product Installation

All the components required to connect the scanner with your computer are included in the package. This product is packaged carefully in order to avoid any damage and breakage during transportation.

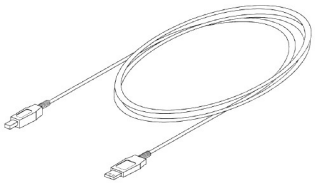
※ Note: Please check all the components when you unbox the product.

1.6 Components

1. Medit 3D Table Top Scanner

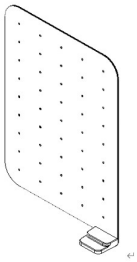


2. USB cable



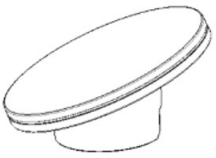
3. Power Cable & External Adapter

4. LED Protector

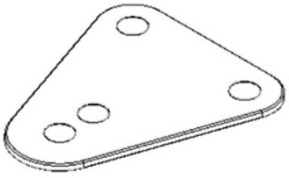


Accessory Components

5. Calibration Panel

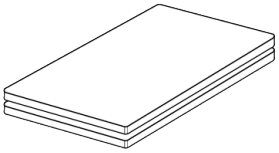


6. Articulator Plate

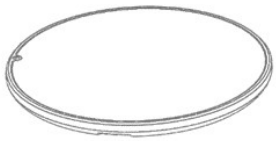


7. USB for Installation (Installation Guide included in the manual)

8. Blu Tack



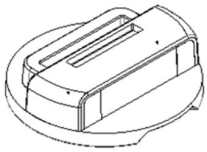
9. Flexible Multi-die



10. 16 single die

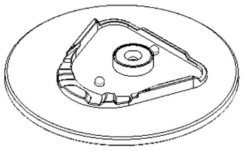
11. Spray Supporter(2ea)

12. Impression Jig
(Not available for T510.)

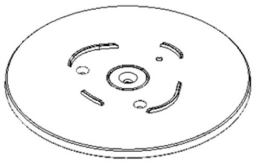


*** Optional Components (purchased separately)**

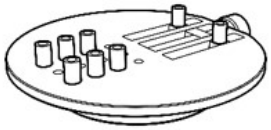
13. KAS Jig



14.AM Jig

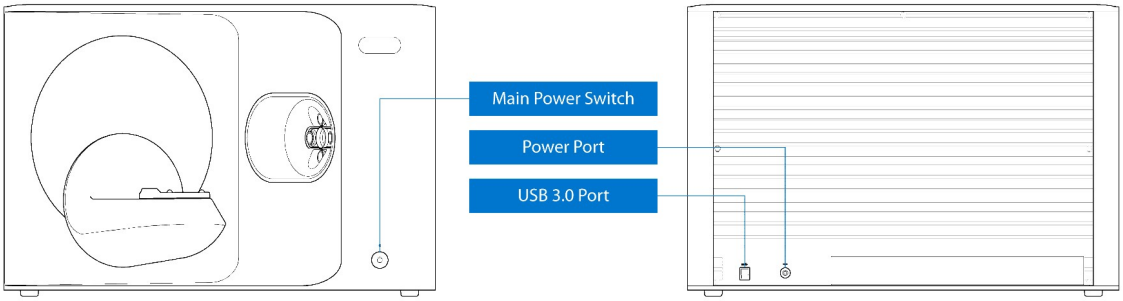


15. Screw Jig



1.7 Hardware Installation

How to connect the scanner:



- You can begin installing the hardware after completing software installation and rebooting your PC.

⚠ **Caution**: The scanner cables should be properly connected to the PC.
(The package includes a power cable and a USB cable.)
*Please use USB 3.0 port only while connecting the scanner to your PC.

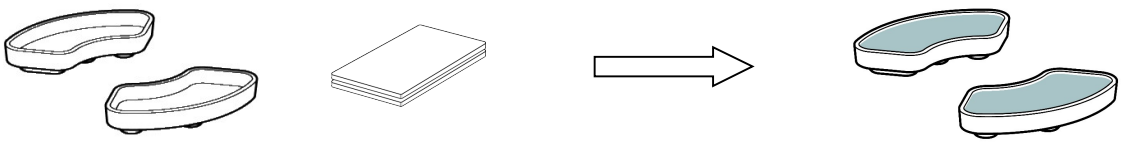
1. Connect the power cable

2. Connect USB cable  **via USB 3.0 (indicated with Blue color) port. (*Important)**

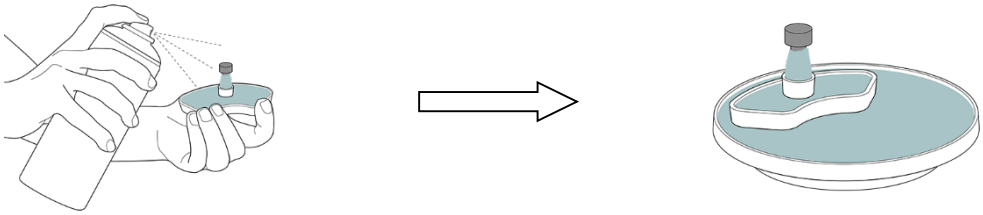
3. Turn on the switch located on the front of Medit 3D scanner device.

1.7.1 Accessories Preparation

1. Fill each of the Spray Supporters (2ea) with Blu Tack.

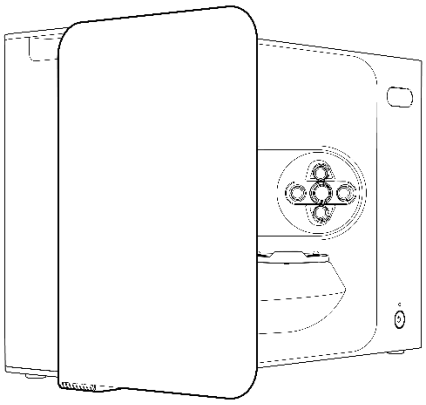


2 . Spray the scan spray onto an object on the spray supporter and fix it to the flexible multi-die for scanning.



3. Prepare Blu Tack to use on the surface of the Flexible Multi-die.

4. Use the LED protector to cover the light of the scanner projector.

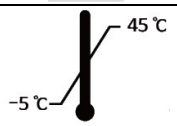
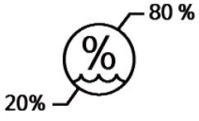
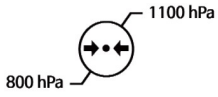


1.8 Specifications

Specification	Details
Model name	MD-ID0400, MD-ID0420
Resolution of Camera	Mono 5.0 (MP)
Point spacing	0.040 mm
Scan Area	100mm x 73mm x 60mm

Scan Principle	Phase-shifting optical triangulation
Size	505mm x 271mm x 340 mm
Weight	15 kg
Light Source	LED, 150 ANSI-lumens
Light color	Blue LED
Color Texture	Color textures
Connection	USB 3.0 B Type
Protection against Electric shock	Class 1
Power	AC 100-240V, 50-60 Hz
Power Consumption	STAND BY: 20W (IDLE: 35W, SCAN: 48W)
Power Requirements	POWER SUPPLY: 100-24VAC, 50/60Hz
EMC	CE/MET Class A, Conduction & Radiation met
Protection	OVP (Over Voltage Protection)
	OCP (Over Current Protection)
Mode of operation	Continuous
DC Adapter (MD-ID0400, MD-ID0420)	
Model name	ATM120T-P240
Input voltage	Universal 100-240 Vac / 50-60 Hz input, without any slide switch
Output	24V⎓, 5A
Case dimension	168.1 x 65.9 x 39 mm
Protection	OVP (Over Voltage Protection)
	SCP (Short Circuit Protection)
	OCP (Over Current Protection)

1.9 Symbols

No	Symbol	Description
1		The serial number of the object
2		Date of manufacturing
3		Manufacturer
4		Caution
5		Warning
6		Caution. Hand Hazard and Optical Hazard
7		Instruction for User Manual
8		The official mark of Europe Certificate
9		Authorized representative in the European Community
10		WEEE Mark
11		MET mark
12		AC
13		DC
14		Protective Earth
15		Temperature Limitation
16		Humidity Limitation
17		Atmospheric Pressure Limitation
18		Fragile

19		Keep Dry
20		Position
21		Three-layer stacking prohibited

Introduction and Overview

Please make sure you reboot the PC after Medit scan for labs installation and before connecting the scanner to the PC.

Introduction and Overview

2.1 Medit Scan for Labs Introduction

Medit Scan for Labs is a software program that allows to perform model and impression scans using the table top scanner series by Medit. Users can edit data, complement it with data from the intraoral scanner and prepare it for the CAD/CAM processes. Explicit explanations and guide messages are accompanying each stage on the left side of the window.

Medit Scan for Labs is to be run only on the computers that meet the specifications outlined below. Otherwise, the device may not function properly. In case Windows is not updated before the installation, USB 3.0 will not work properly.

※ Cautions

- This device is designed to be connected via USB 3.0 port only. Please make sure you are using USB 3.0 for the connection.
- This device is compatible only with Windows 10 and above. It cannot be used on Mac Operating Systems.
- Before installing the scanning S/W, please make sure that the Windows version in use, mainboard, VGA card and USB drivers are up-to-date.

2.2 Minimum Requirements

[Minimum Requirements]

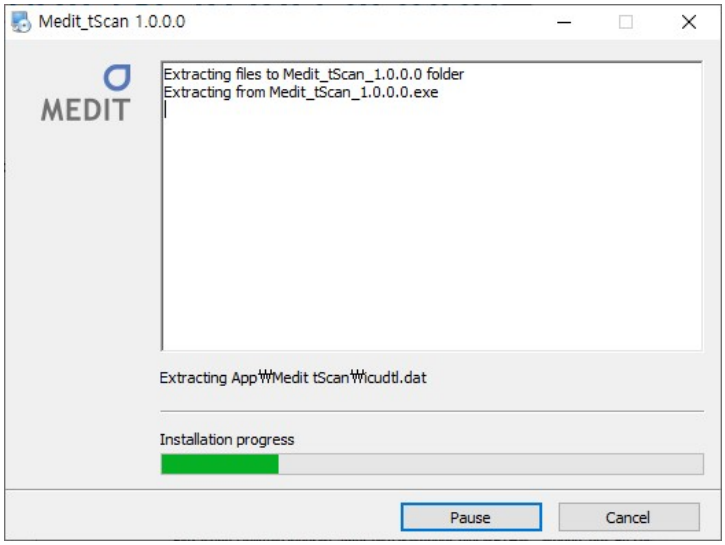
	Notebook	Desktop
CPU	Intel Core i7-8750H and above	Intel Core i7-8700K and above
RAM	16 GB and above	16 GB and above
Graphic	Nvidia Geforce GTX 1060 and above	Nvidia Geforce GTX 1060 and above
OS	Window 10 64-bit	

[Recommended Specifications]

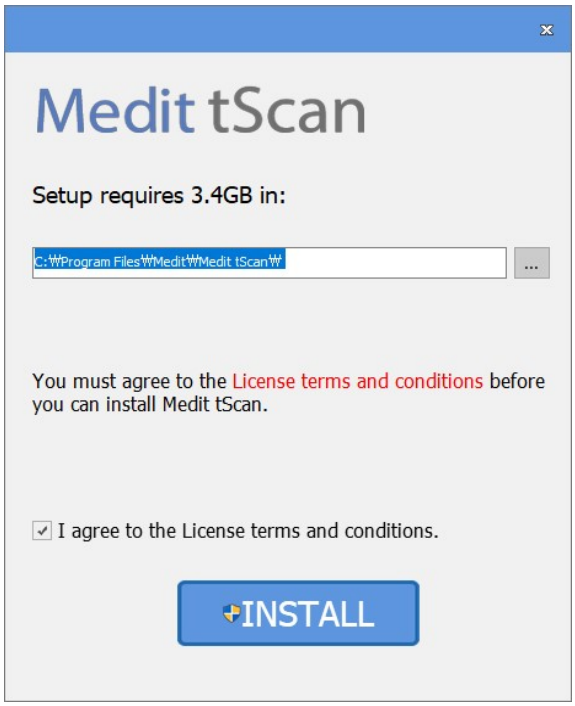
	Notebook	Desktop
CPU	Intel Core i7-8750H and above	Intel Core i7-8700K and above
RAM	32 GB and above	32 GB and above
Graphic	Nvidia Geforce GTX 1060 6G and above	Nvidia Geforce GTX 1060 6G and above
OS	Window 10 64-bit	

2.3 Medit Scan for Labs installation

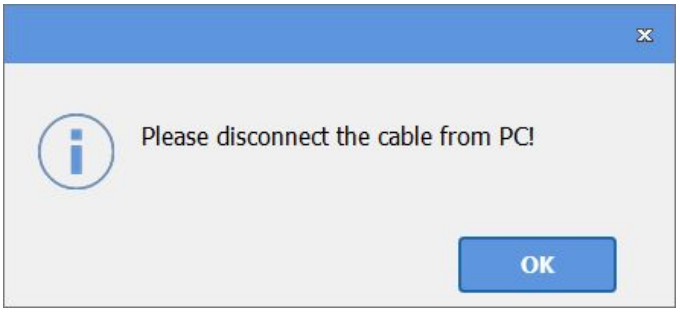
- Run Medit_Medit Scan for Labs_X.X.X.exe



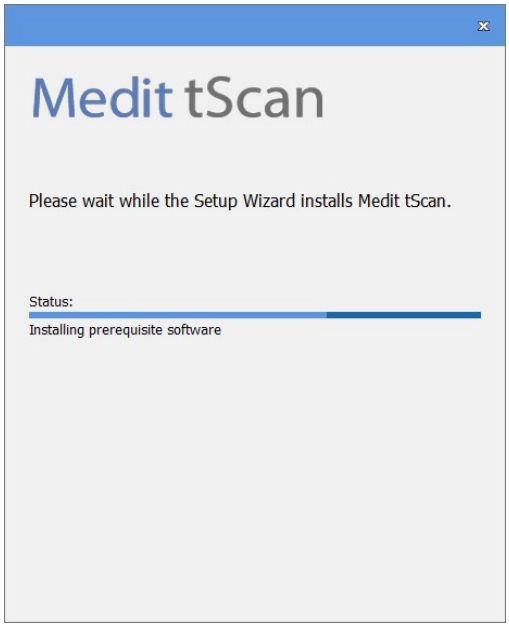
➢ Select the folder for the installation of this program. Please agree to the 'Terms and Conditions' after reading them carefully and then click 'Install'.



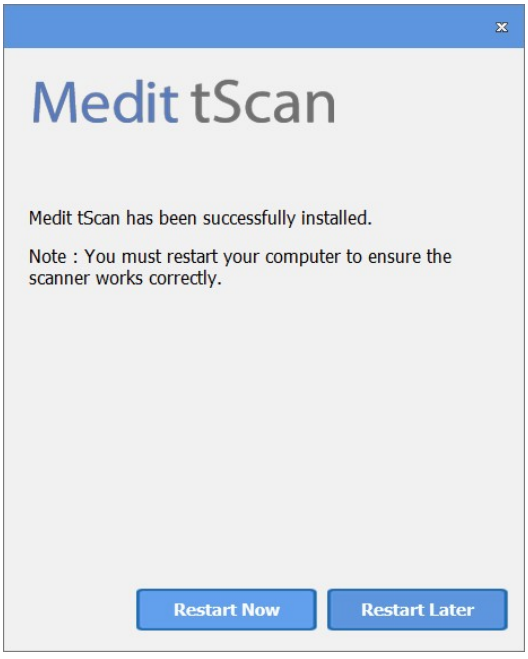
➢ The installation might not proceed normally if 3D SCANNER is connected to the PC. Please make sure you disconnect 3D SCANNER USB 3.0 cable from your PC before installation.



- The program will install automatically, and it may take a few minutes. Do not turn off or unplug your PC until the installation is complete.



- Please restart your PC after the installation is complete. If you do not have a 3D SCANNER you can proceed without restarting the PC.



⚠ Caution: If you do not restart your PC after the installation is complete, your scanner may not function properly.

Medit Scan for Labs: Instruction

Installation Overview

3D Data Management

User Interface Overview

Scan Steps

Scan Strategy

Scan Steps: Scan, Align, Confirm

Medit Scan for Labs: Instruction

3.1 Calibration: Table Top and Intraoral Scanners

Calibration is recommended for proper scanning and performance of the device.

Please calibrate the device if:

- The quality of scan data has decreased as compared to the previous scans.
- The external conditions such as the temperature of device has changed during use.
- If it is already past the configured calibration period.
  - To set the calibration period, go to Menu > Settings > Calibration Period (Days) option.

The calibration panel is a very sensitive component

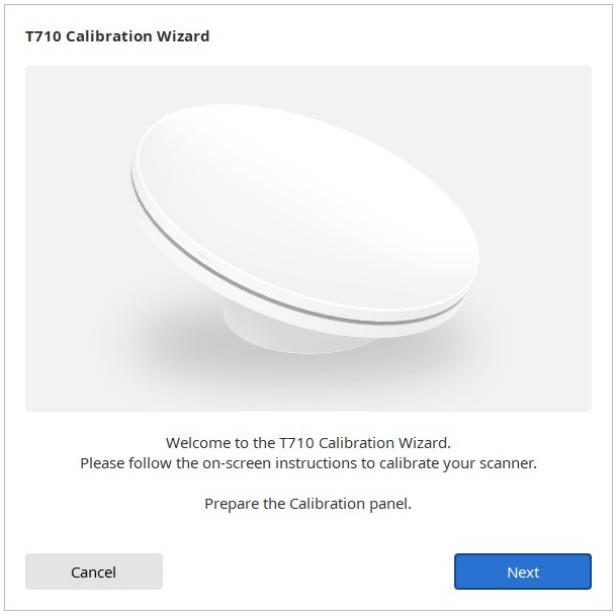
Do not touch the calibration panel directly. Please check the calibration panel if the calibration process does not proceed normally. In case the calibration panel gets contaminated, contact the manufacturer or your local service provider.

It is recommended to calibrate the device periodically

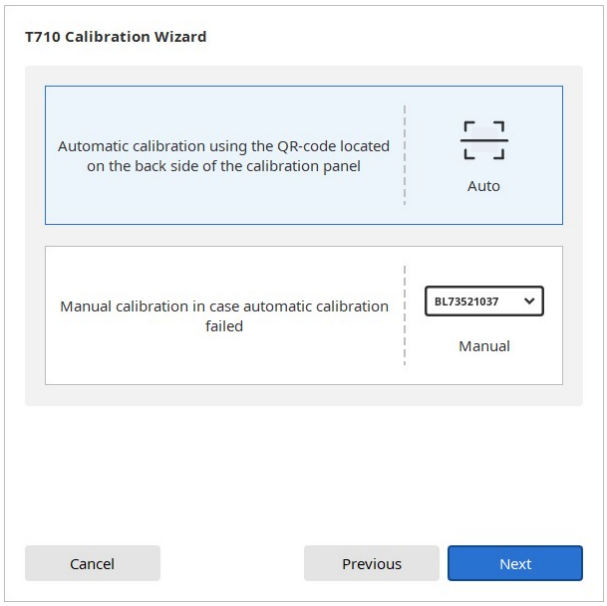
Go to Menu > Settings and configure the calibration period in Calibration Period (Days) option. The default calibration period is 30 days.

3.1.1 Table Top Scanner Calibration

- Turn the device on and make sure that it is discoverable by the program.
- Click on the scanner icon in the bottom left corner  to run the Calibration Wizard.
- Prepare and place the calibration panel as shown on the picture.

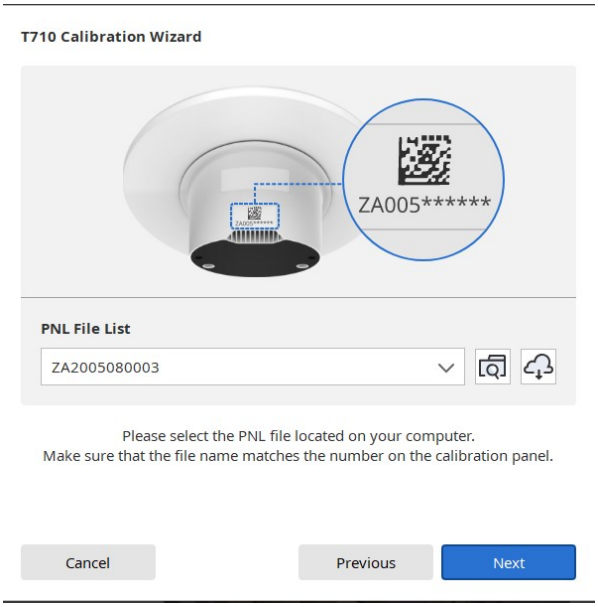


- Select one of the two calibration options: 1) Automatic calibration using the code located on the back side of the calibration panel; or 2) Manual calibration (you have to have the corresponding PNL file to be able to run Manual Calibration), and click 'Next'.



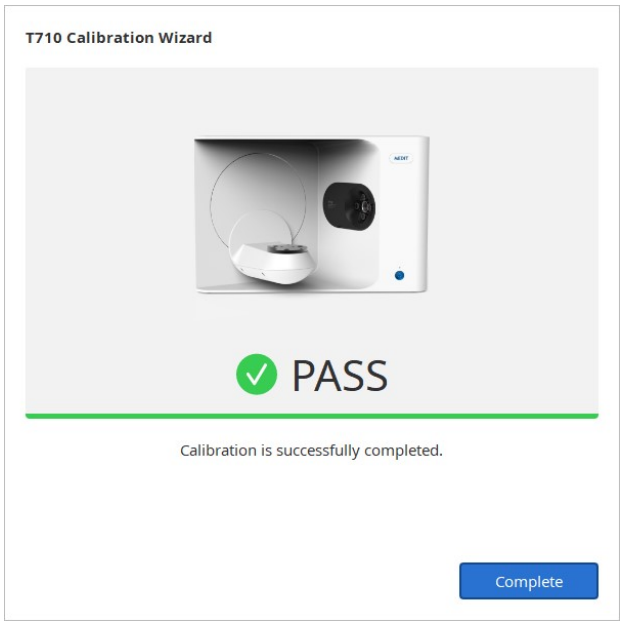
- For Automatic Calibration, the process will be done automatically.
- For Manual Calibration, select the corresponding PNL file from the file list after checking the serial number of calibration panel. Please check if you have a 'PNL' file on the PC or installation USB, in case it cannot be found on the list.

- If you have the file, click  to search for it.
- If you do not have the file, click  and enter the serial number of the scanner.



- Calibration process might take a few minutes. Please do not touch the scanner.

➢ Wait until the calibration is completed successfully.

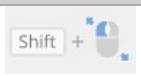
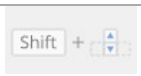
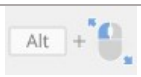
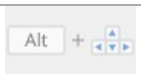
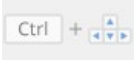


3.2 3D Data Management with mouse

Button	Action	Use	Image
Left	Click	Selects or deletes the entities in view screen when using the polyline selection or polyline trimming tool.	
	Drag	Selects or deletes entities in view screen when using Brush selection or Brush trimming tool.	
	Double Click	Zooms in a specific part by double clicking on the specific spot. Places data in the center by double clicking on the background.	
Wheel	Drag	Moves the data in view screen.	

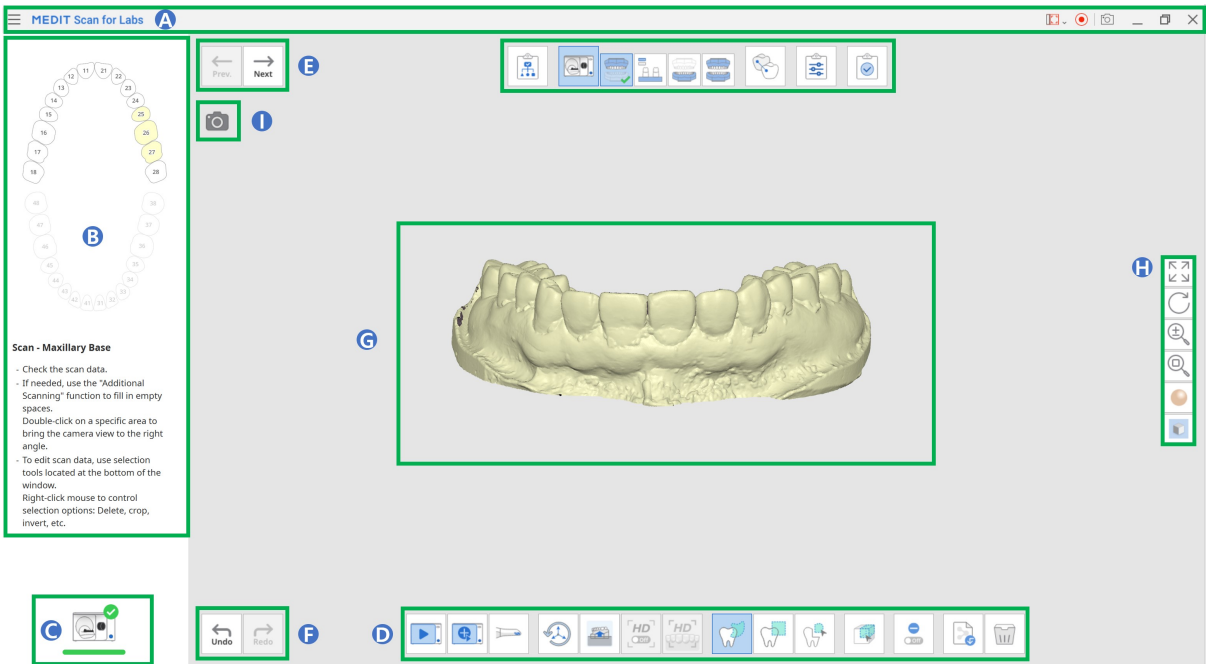
	Scroll	Zooms in/out the data in view screen.	
Right	Click	For data tree, allows to access data view options.	
	Drag	Rotates data in view screen.	

With mouse and keyboard:

Button	Action	Use	Image
Shift	Left Click and Drag	Zooms in / zooms out the model.	
	Up and Down Keys	Zooms in / zooms out the model.	
Alt	Left Click and Drag	Rotates the model.	
	Up, Down, Left and Right Keys	Rotates the model.	
Ctrl	Left Click and Drag	Moves the model.	
	Up, Down, Left and Right Keys	Moves the model.	

For keyboard shortcuts, go to **Settings → Shortcuts**.

3.3 User Interface Overview



A. Title Bar
B. Guide Image and Message
C. Scanner Status
D. Toolbox
E. Stages Control
F. Redo, Undo
G. Model View
H. Side Toolbar
I. Scanner Camera View

3.3.1 Title Bar

The title bar includes menu and options such as minimize/maximize/restore, exit; shows case information.

Menu	The menu includes basic program functions like settings, information, help contents.
Minimize	Minimizes the program window.
Maximize/Restore	Maximizes/Restores the program window.
Exit	Exits the program.

3.3.2 Menu

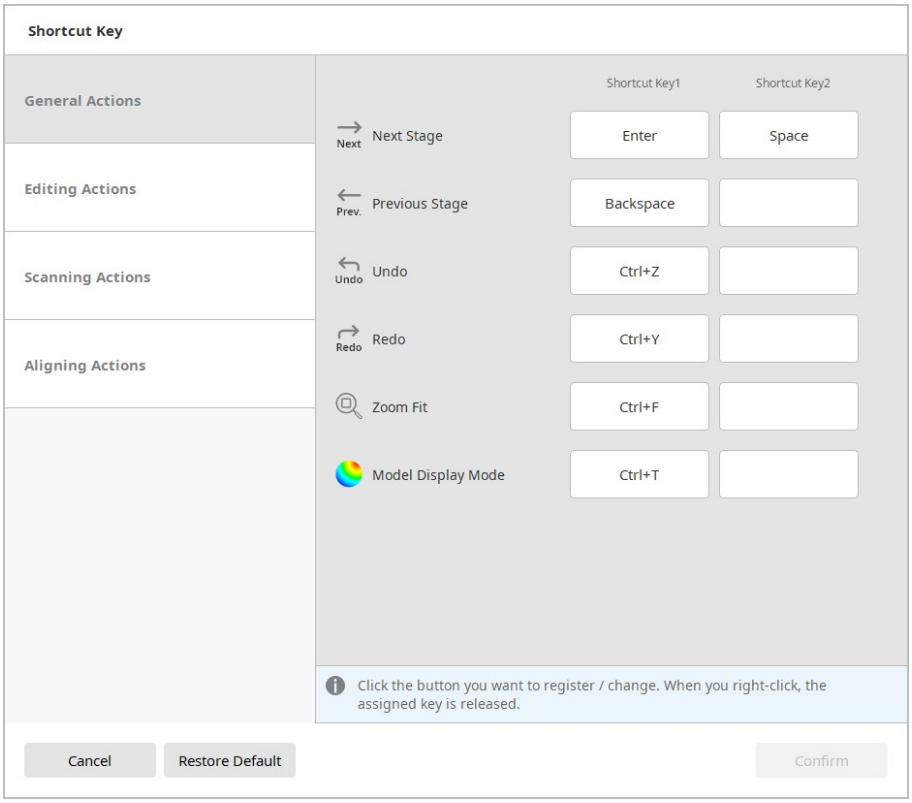
If you click  , you can see all the functions included in the menu.

	Settings	Allows to set scan and calibration options for both table top and intraoral scanners.
	Help Contents	Opens the manual.
	About	Information about the software program and version details.

3.3.3 Settings

General Settings

Adjust Color Texture	You can adjust model brightness. The color of the model shown on the screen is optimized for the scanner, so the acquired results may be displayed in a different color in other programs.
Anonymous Usage Statistics	Select whether you want to send usage statistics anonymously.
Shortcut Keys	Check out the default shortcut keys and configure your own.



※ About Usage Statistics Collection

We strive to provide the best user experience and improve our products by collecting the following information:

- Hardware and software settings, information like operating system and graphics card information;
- Software usage patterns;
- Different diagnostic information for software and hardware.

Usage statistics are collected to analyze software usage patterns and frequently used features for the improvement of the product and user experience.

Medit does not collect users' personal information (username, company name, MAC address).

Table Top Scanner

Calibration Period (Days)	Configure the calibration period of the tabletop scanner.
Scan Path	Configure the scan route for the scanning process. Choosing the detailed scan path will take more time, however will more likely minimize the need for additional scanning.
Sleep Mode	Select the time after which the scanner will go in to Sleep Mode.
Use GPU	Utilize this option to improve the overall computing performance by using the GPU (graphics processing unit).
Set Minimum Scan Height Automatically	When on, sets the minimum scan height automatically.
Set Scan Area Automatically	When on, performs the scanning automatically without selecting the scan area.

i500

Calibration Period (Days)	Configure the calibration period for the i500 – choose any given period (1 day; 3 days; 7 days; 14 days or 30 days).
Use GPU	Utilize this option to improve the overall computing performance by using the GPU (graphics processing unit).

Scan Data

Post-Processing Type	Configure the post-processing type based on the case (orthodontic or prosthetic): speed-based type will allow to reduce the waiting time, while quality-based type might take a while longer. None of the types affect the accuracy of the scan.
Data Display Quality	This option controls the display quality of the scan data, while not having any effect on the final result or the scan data accuracy. If the option is set to 'High', it may affect the overall scanning performance.
File Size – Base	Allows to adjust the file size of the data acquired at Base scan stages.

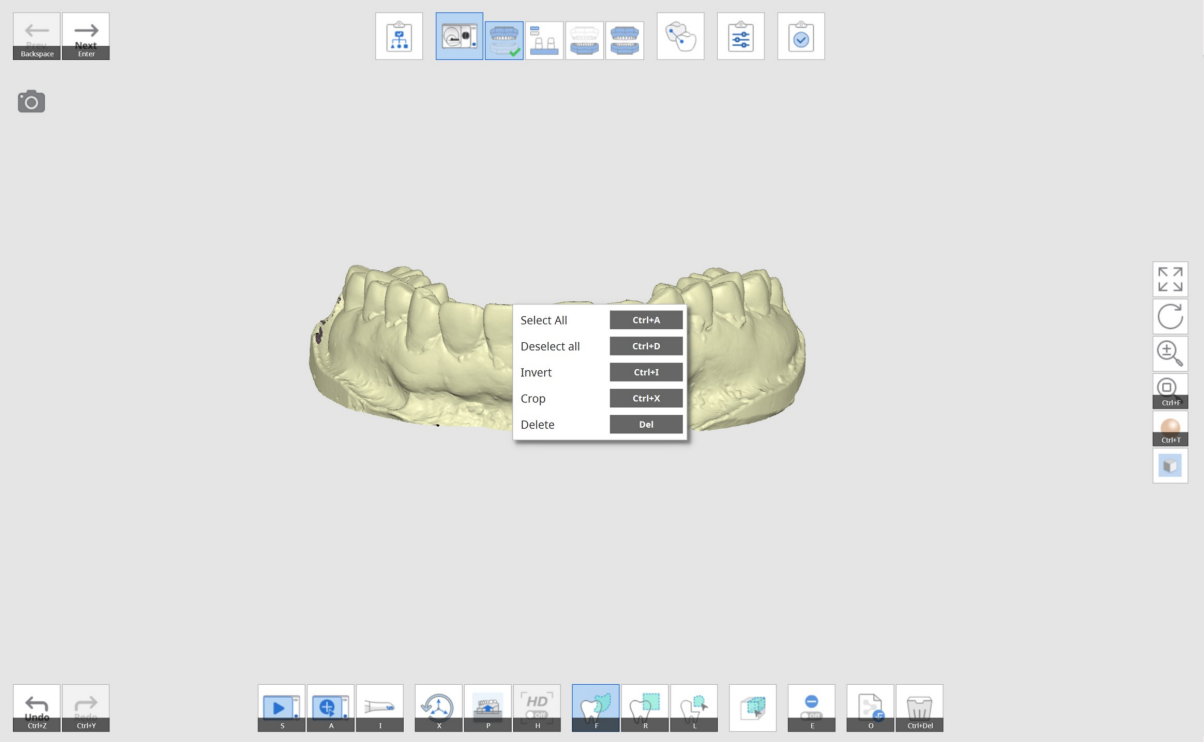
File Size – Prepared Teeth	Allows to adjust the file size of the data acquired at Prepped Teeth scan stages.
Export Occlusion Scan Data	Select whether you want the occlusion data to be saved as a separate file.
Align Occlusion Scan Automatically	Select whether you want the data acquired at the Occlusion stage be aligned automatically or you would like to align it manually.
Align Prep. Scan Data Automatically	Select whether you want the prepared teeth data to be aligned automatically or you would like to align it manually.
Cover Empty Spaces Using the Color of Neighboring Data	Turn this option on if you'd like to fill in the empty spaces in scan data with the color of the data located on its sides.
Use GPU	Utilize this option to improve the overall computing performance by using the GPU (graphics processing unit).
Set Minimum Scan Height Automatically	When on, sets the minimum scan height automatically.
Restore To Default	All the configured settings are set to default.

3.3.4 Shortcut Keys

You can use shortcut keys for most of the Medit Scan for Labs functions.

These shortcut keys can be changed in Settings by selecting and then pressing the new key on the keyboard. Two shortcut keys can be used for the same function.

- Press 'F1' to see the list of configured keys with their functions.



3.3.5 Scanner Status

Following are the indications of scanner status:

	Not Connected	Scanner is not connected.
	Ready	Scanner is ready for use.

3.4 Scan Steps

3.4.1 Basic Scan Steps

There are five basic scan steps, presented below, that can be further divided into sub-steps and complemented with additional scan stages based on the scanning strategy set at the first step.

See the sub-steps by clicking on Scan and Align Data steps icon.

	Scan Strategy	Allows to set the strategy for Flexible Multi-die, model, impression scanning. Select the appropriate scan strategy for required prosthesis.
	Scan	Allows to perform the scanning process by stage. The scanning is done based on the set strategy.
	Align Data	Allows to manually align various scanned data. Align various scanned data (post and core, wax-up, occlusion etc..) with the model.
	Confirm	Allows to check the data and edit it if necessary.
	Merge	Completes scanning and starts a post-processing for final results.

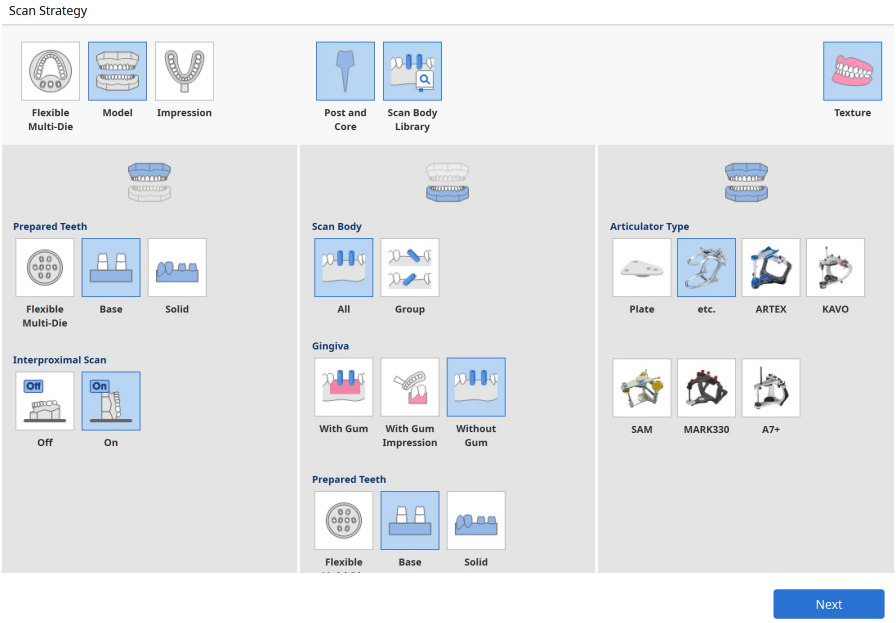
You can change the order of the steps as well by dragging the scan stages icons, or a set of them, with your mouse. You will see the available spaces marked in green.

3.5 Scan Strategy

Once a scanner is connected properly to the PC, the '**Scan Strategy**' page is displayed.

Select the options that will define the scanning process, such as scan type, occlusion scan strategy, scanbody library alignment, wax-up scan etc.

You can change the strategy at any stage, and in case you do so, you will be asked how to utilize already acquired data.



① Scan Type Selection

	**Flexible Multi-die**	Select this type for scanning the model using flexible multi-die which is able to fit not just a base but dies as well. For this scan type, you do not need to have a set pre-defined strategy. You can identify the data acquired from the flexible multi-die after performing the scan.
	**Model**	Select this type for scanning the model.
	**Impression**	Select this type for scanning the impression.

② Scan Stage Options

Based on the chosen options, scan steps will be added to the basic steps.

	**Wax-up (Bottom Side) Scan**	Select this option to scan the inside surface of the wax-up. The wax-up and the inner surface data can be aligned at the Align Data step.

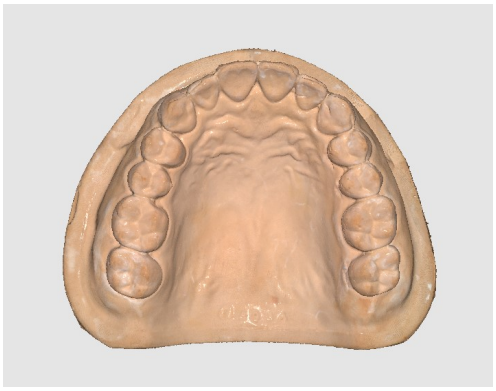
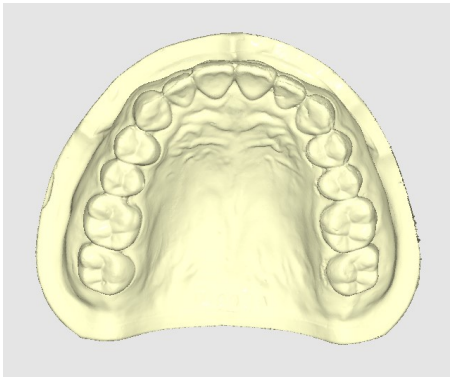
	Scanbody Library Alignment	Select this option to perform the alignment of the acquired scanbody data with the pre-set scanbody library. Assign a scanbody for each tooth based on the form information set in the Medit scan for labs , and their 3D image will be pulled out from the pre-set scanbody library.
	Post and Core Scan	Select this option for post and core cases where you need to scan and merge the base and impression scans in order to get the complete and reliable scan data. Alternatively, use the intraoral scanner to get the complete data. Connect it to the PC, make sure it is calibrated, and then press the 'Scan Using i500' button.

③ Scan Options

	Texture	Select this option if you want the scan data to have the surface color.
	Movement Marker	This function tracks the movement of Mandible.

▷ [Example] Texture

Texture On	Texture Off

④ Occlusion Strategy

Select a suitable accessory for the occlusion relationship scan.

	Plate	Select this option to use the solely the plate and any articulator except the five ones below. Select this option to scan the occlusion between Maxilla and Mandible.
	etc.	Select this option when you want to scan the occlusion using the jig only.
	ARTEX	Select this option if you use ARTEX articulator.
	KAVO	Select this option if you use KAVO articulator.
	SAM	Select this option if you use SAM articulator.
	MARK330	Select this option if you use MARK330 articulator.
	A7+	Select this option if you use A7+ articulator.

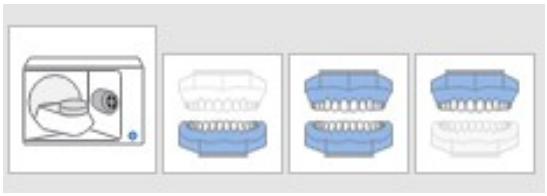
Scanning Mandibular Base

Having chosen the articulator type, you will be asked to choose how you would like to scan the mandibular base.

	Articulator Jig	Select this option to use the articulator jig to install the mandibular base and move it to the position of the virtual articulator.
	Virtual Mounting Plate	In case there is no articulator jig, a part of mounting plate can be used for data alignment and moving the model to the virtual articulator.

▷ [Example] Articulator Jig Usage Example

- The scan steps are as following:

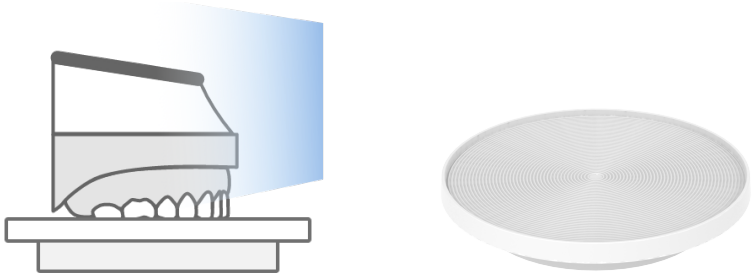


- The scan is performed by using the jig to place mandible model as shown on the picture below.

▷ [Example] Virtual Mounting Plate

- The scan steps are as following:

- The scan is performed by flipping mandible model in the Mounting Plate step as shown on the picture below.



Maxilla and Mandible

Scanning using Flexible multi-die

Alignment: Select how prepared teeth are aligned with the base.

	**Solid Base**	Select this option to scan prepared teeth inside the base.
	**Occlusion**	Select this option to scan the prepared teeth outside of the base on the flexible multi-die. Put them back on to the base when scanning occlusion for alignment.

	**Base**	Select this option to scan the prepared teeth both separately at Prepared Teeth step, and on the base while scanning the arch. Align the data at the Align stage.

Scanbody: Select the scanning strategy for the scanbodies.

	**All**	Select this option to scan scanbodies together with the base.  When using flexible multi-die, choose the 'Model' scan type if you want to scan scanbodies by groups.

If you choose to use flexible multi-die, only '**All'** optio will be available.

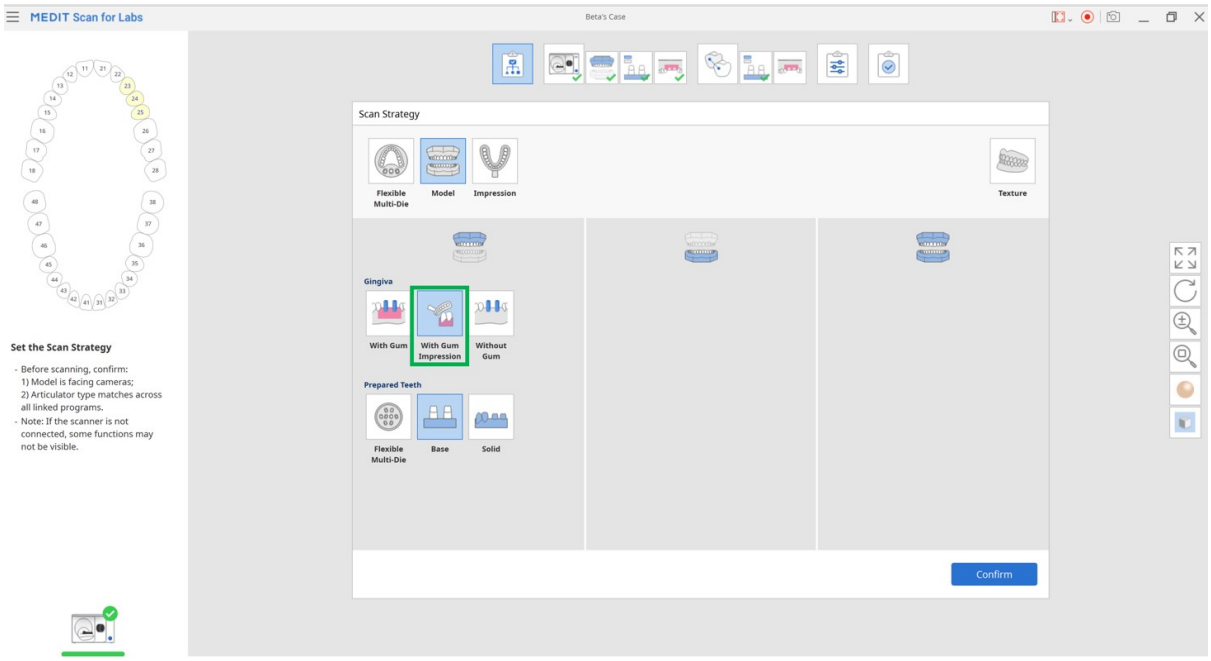
 To get more reliable data for the cases where there are multiple scanbodies in the row, the program will automatically separate them into groups.

Gingiva: Select to perform the scan with or without gingiva.

	**With Gum**	Select this option to scan and align gingiva separately.
	**With Gum Impression**	Select this option to scan the gingiva with the impression. (T710)
	**Without Gum**	In cases where gingiva is absent, there is no separate alignment process for gingiva.

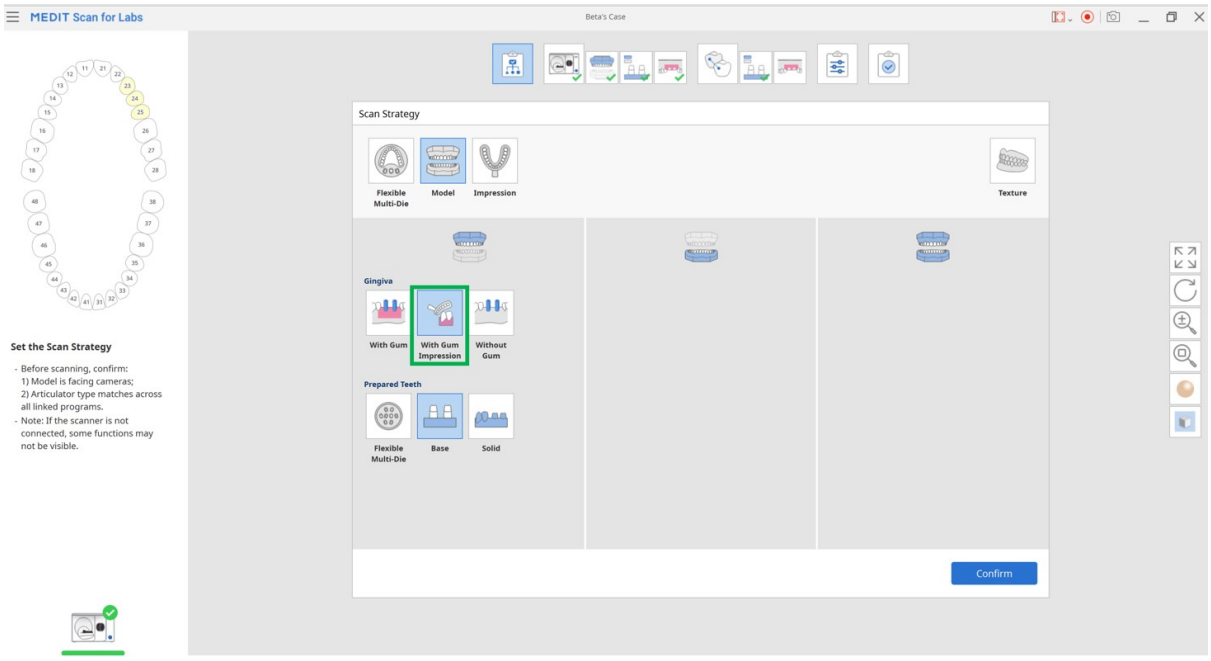
With Gum Impression  (T710)

"With Gum Impression" helps to easily scan the gum by using the impression without having a scan on each model.

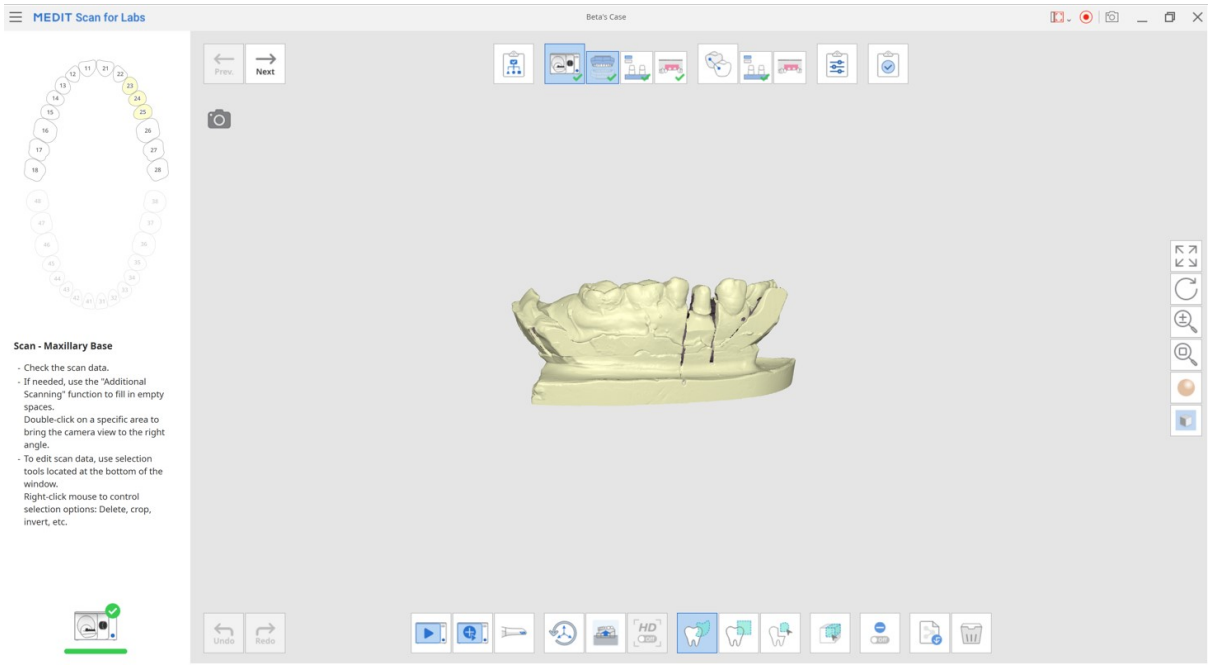


Available on the T710 model which provides "Impression" scans.

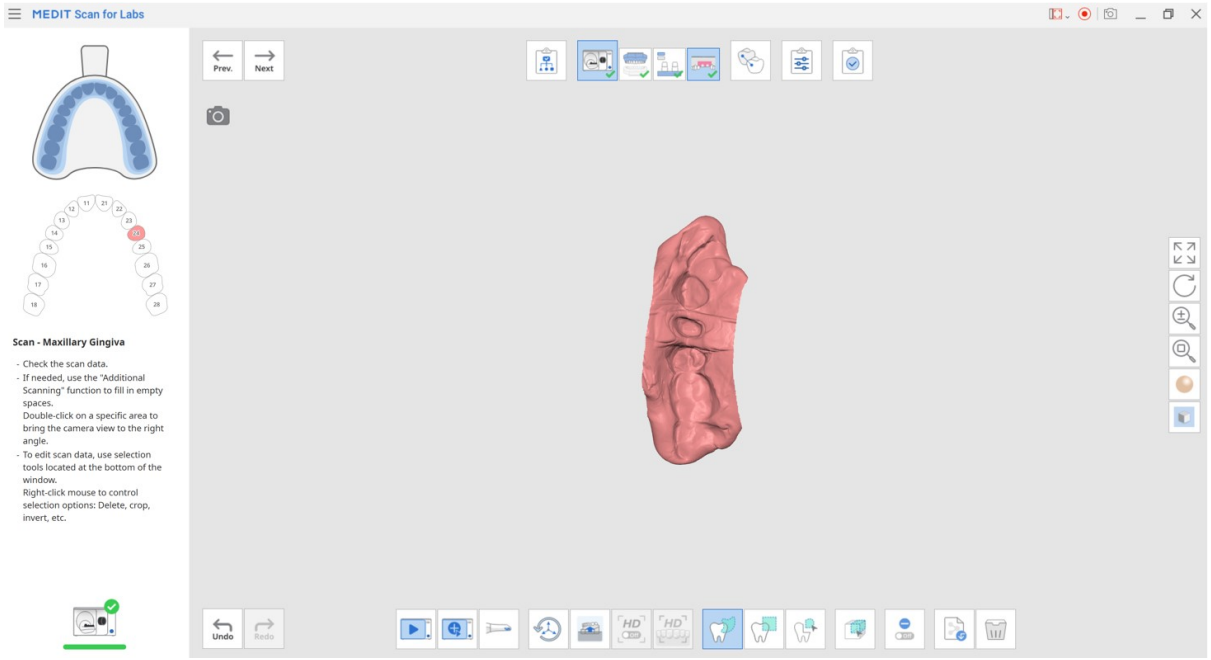
➢ Scan Strategy - From "Gingiva", click  "With Gum Impression".



➢ Scan the base and prepared tooth.

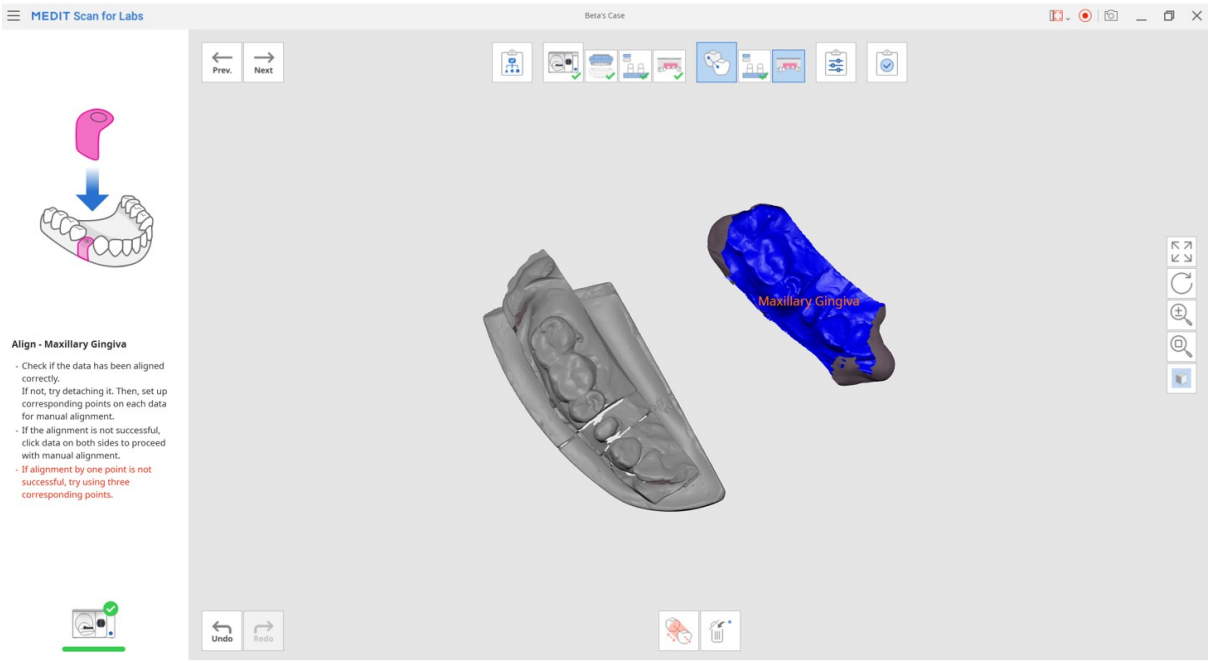


➢ Insert the impression on the" With Gum" stage and perform the scanning.



Delete unnecessary parts from the impression to organize scan data.

➢ Align the base and gum on the alignment stage.



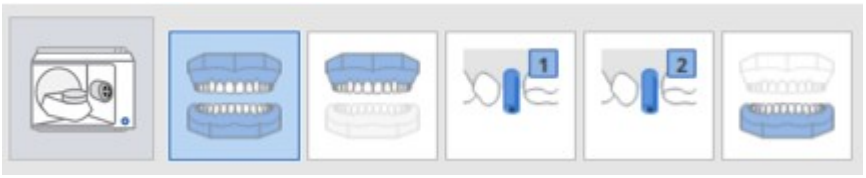
➢ Check the data on the Confirm stage and click "Complete".

Model

Scanbody Alignment: Select the scanning strategy for scanbodies.

	All	Merges and aligns the data from scanbody and base simultaneously.
	Group	Select this option to divide the scanning process into three stages: Scanbody without base, Scanbody Group 1, Scanbody Group 2. Scan them separately by category and align them at Align Data step. This option can be selected when scanbodies are overlapped or when base data is needed for the missing part of scanbody.

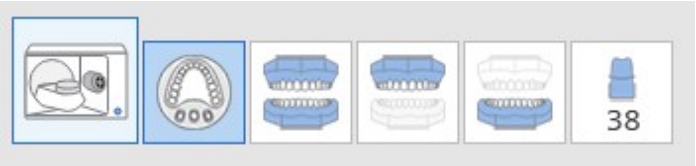
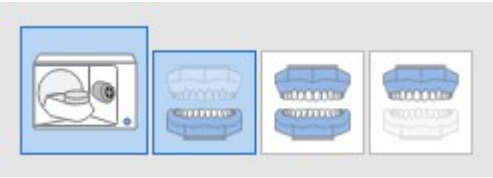
▷ [Example] Scanning Process

All	
Group	

Prepared Teeth: Select the data to be aligned with preparation tooth scan data.

	**Flexible Multi-die**	Select this option to scan the prepared teeth all together using Flexible Multi-die.
	**Base**	Select this option to scan the preparation tooth in the base. Remove all the adjacent teeth from the base and perform the scan by dividing preparation teeth into Group 1 and Group 2.
	**Solid**	Select this option when the prepared tooth cannot be detached from the solid model. There is no separate scan stage for prepared tooth, but the scanning can be done using many cuts.

▷ [Example] Scanning Process

Flexible Multi-die	
Base	
Solid	

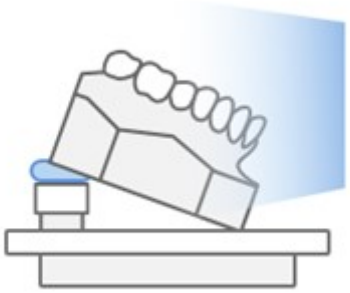
Interproximal: Select this option to acquire additional data for the interproximal areas.

	Off	Scan the arch using the general method.
	On	Select this option for the cases that require additional lingual measurements. Put the model on the buccal side to scan it in the upright position. Align the data after performing the scan.

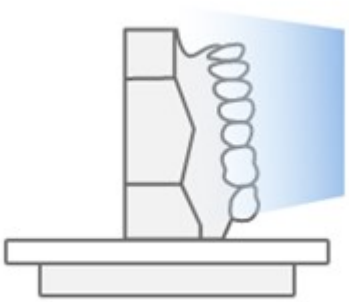
▷ [Example] Interproximal Scanning

- The scan stages are shown below:

The lingual interproximal scan is performed by tilting the model



For buccal interproximal scan, the model is scanned in the upright position



Impression (only available for T710)

Impression Type: Select the type of impression trays.

	**Triple Tray**	Select this option to acquire impression data from Triple Tray.
	**Metal & Triple Tray**	Select this option to acquire impression using the scan data of two Metal Trays and a Triple Tray. Please note that in this case alignment accuracy is not guaranteed.

▷ [Example] Impression Scanning

Triple Tray	

Metal & Triple Tray	

Scan Individual Stump-die: Scanning impression and prepared teeth.

	Off	Select this option to scan the impression only.
	On	Select this option to scan both impression and the prepared teeth on the flexible multi-die.

▷ [Example] Individual Stump-die Scanning

Off	
On	

3.6 Scan Steps

The sequence can be changed for each arch.

You can save the new sequence of steps and use for next scan.

Medit Scan for Labs provides two options for performing a scan with already existing data: 1) Re-scan ('**Scan**') and 2) Add to the existing data ('**Add Another Scanbody**' , '**Additional Scan**' . The first option is to be chosen when you want to delete all the existing data and re-scan, while the second option allows to keep the existing data and only scan the newly added parts.

3.6.1 Scan Sub-Stages

The sub-stages and their number are based on the scan strategy you set for the case.

	**Flexible Multi-die**	Allows to scan materials placed on flexible multi-die.
	Interproximal Area Scan	
	**Interproximal Area (Mandible; Buccal)**	Allows to scan the buccal interproximal areas in Mandible.
	**Interproximal Area (Maxilla; Buccal)**	Allows to scan the buccal interproximal areas in Maxilla.
	**Interproximal Area (Mandible; Lingual)**	Allows to scan the lingual interproximal areas in Mandible.
	**Interproximal Area (Maxilla; Lingual)**	Allows to scan the lingual interproximal areas in Maxilla.
	**Prepared Tooth**	Allows to set the location of extracted prepared tooth in Flexible Multi-die. The number of each tooth appears under the icon.
	**Occlusion Bite**	Allows to scan bite materials placed on the arch model.

Gingiva Scan		
	Gingiva (Mandible)	Allows to scan mandibular gingiva materials.
	Gingiva (Maxilla)	Allows to scan maxillary gingiva materials.
	Mandibular Base (Articulator Jig)	Allows to scan mandibular base with articulator jig.
	Movement Marker	Allows to place and scan a movement marker in maxillary model.
	Post	Allows to insert and scan an extracted post and core. The number of each preparation tooth appears under the icon.
	Scanbody	Allows to insert and scan an extracted Scanbody. The number of each preparation tooth appears under the icon.
	Mounting Plate	Allows to scan the bottom side of the mounting plate.
Impression Scan		
	Impression (Mandible)	Allows to scan mandibular impression.
	Impression (Maxillary)	Allows to scan maxillary impression.
Denture Scan		
	Denture (Mandible; Inner Surface)	Allows to scan the inner surface of mandibular denture.
	Denture (Mandible; Outer Surface)	Allows to scan the outer surface of mandibular denture.

	Denture (Maxilla; Inner Surface)	Allows to scan the inner surface of maxillary denture.
	Denture (Maxilla; Outer Surface)	Allows to scan the outer surface of maxillary denture.
	Occlusion	Allows to scan the occlusion.
	Prepared Teeth (Mandible; Base)	Allows to scan prepared teeth in Mandible by placing them on the base.
	Prepared Teeth (Maxilla; Base)	Allows to scan prepared teeth in Maxilla by placing them on the base.
	Mandibular Scanbody	Allows to scan a scanbody placed in the Mandible model.
	Maxillary Scanbody	Allows to scan a scanbody placed in the Maxilla model.
	Pre-operation Model (Mandible)	Allows to scan the pre-operation model for Mandible.
	Pre-operation Model (Maxilla)	Allows to scan the pre-operation model for Maxilla.
	Wax-up Scan	
	Wax-up (Mandible; Bottom Side)	**Allows to scan the bottom side of a wax-up in Mandible.** Edit the scan data to remove the unnecessary parts.
	Wax-up (Maxilla; Bottom Side)	**Allows to scan the bottom side of a wax-up in Maxilla.** Edit the scan data to remove the unnecessary parts.
	Wax-up (Mandible)	Allows to scan a mandibular wax-up after placing it on the model.

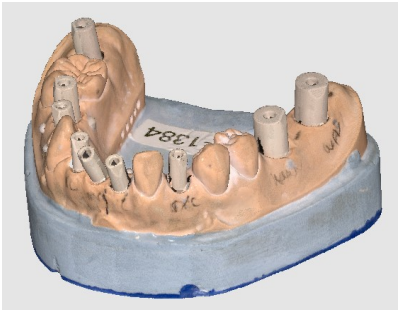
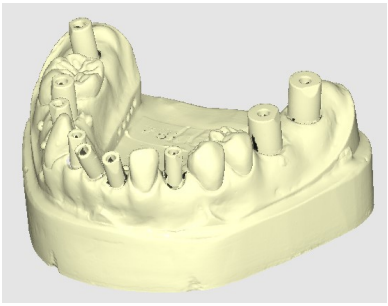
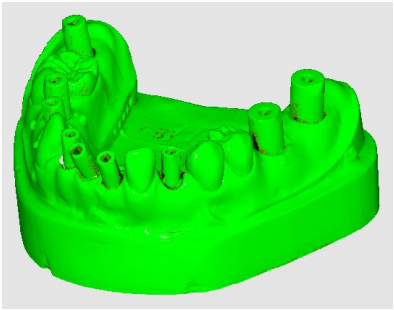
	Wax-up (Maxilla)	Allows to scan a maxillary wax-up after placing it on the model.

3.6.2 Data Control and Display Options

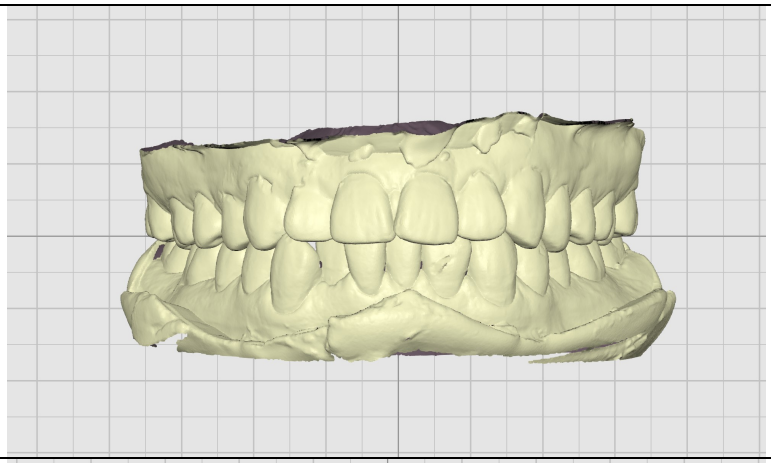
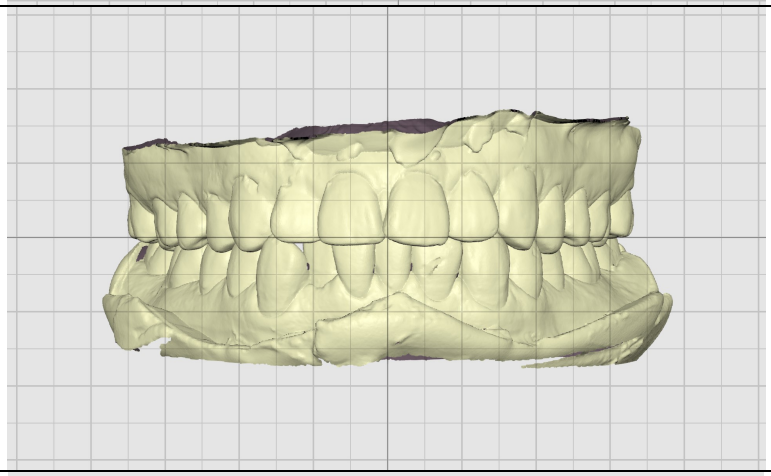
	Move	Moves scan data.
	Rotate	Rotates scan data.
	Zoom In/Out	Zooms data in and out.
	Texture On	Applies various texture colors to the model.
	Texture Off	Applies single texture color to the model.
	Reliability Map	Applies red and green colors to the model to indicate the reliability of scan data. The part with higher reliability is shown as green color.  Perform additional scanning to remove the less reliable areas.
	Grid On	Shows the grid.
	Grid On	Shows the grid.
	Overlay On	Overlays the grid.

 These data control tools are especially useful while working with touch screen.

▷ [Example] Texture

Texture On	
Texture Off	
Reliability Map	

▷ [Example] Grid Settings

Grid On	
Overlay On	
Grid Off	

3.6.3 Scanning

	Scan	Starts the scanning process.

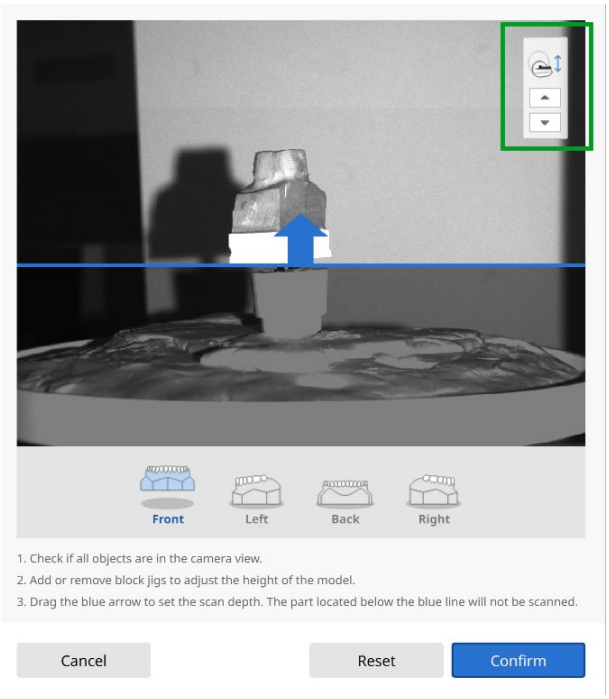
- Place the model in the scanner and press '**Scan'**.

  Before scanning, make sure that 1) the model is facing the cameras; 2) the articulator type settings are same across all linked programs (Medit Link, design program etc.).

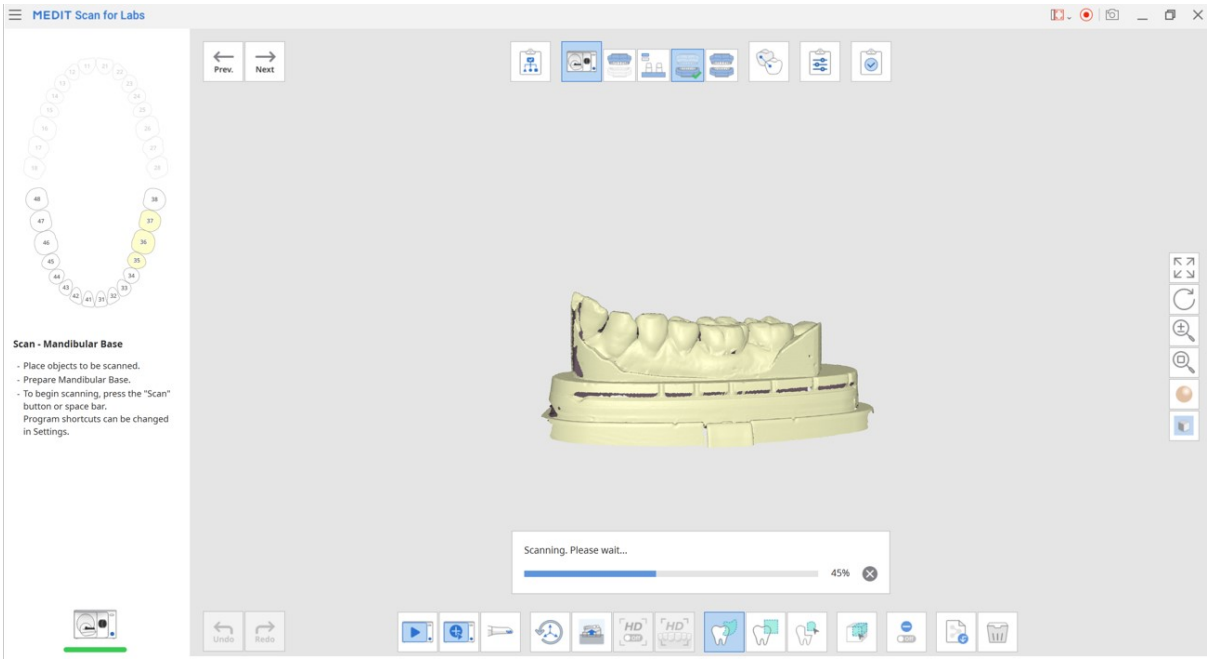
  Try adjusting the Medit Scan for Labs shortcuts for all major functions in the Settings. By default, 'Space' key is set for '**Scan'**.

- Before the scan starts, you will be asked to adjust the scan area.

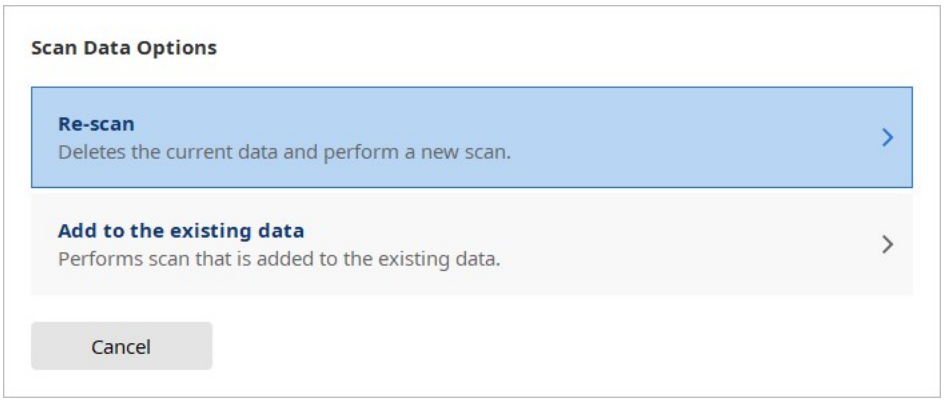
  - Please make sure that the area and side of model you want to scan fits in the camera view. Use the blue line to set the appropriate height and press the '**Confirm'** button.
  - You can adjust the height of the axes manually by using the buttons located at the right top corner of the window.



- The scan starts according to the specified scan path as shown by the image below. Do not touch the scanner while the scan is in progress. It will take a few seconds to complete.

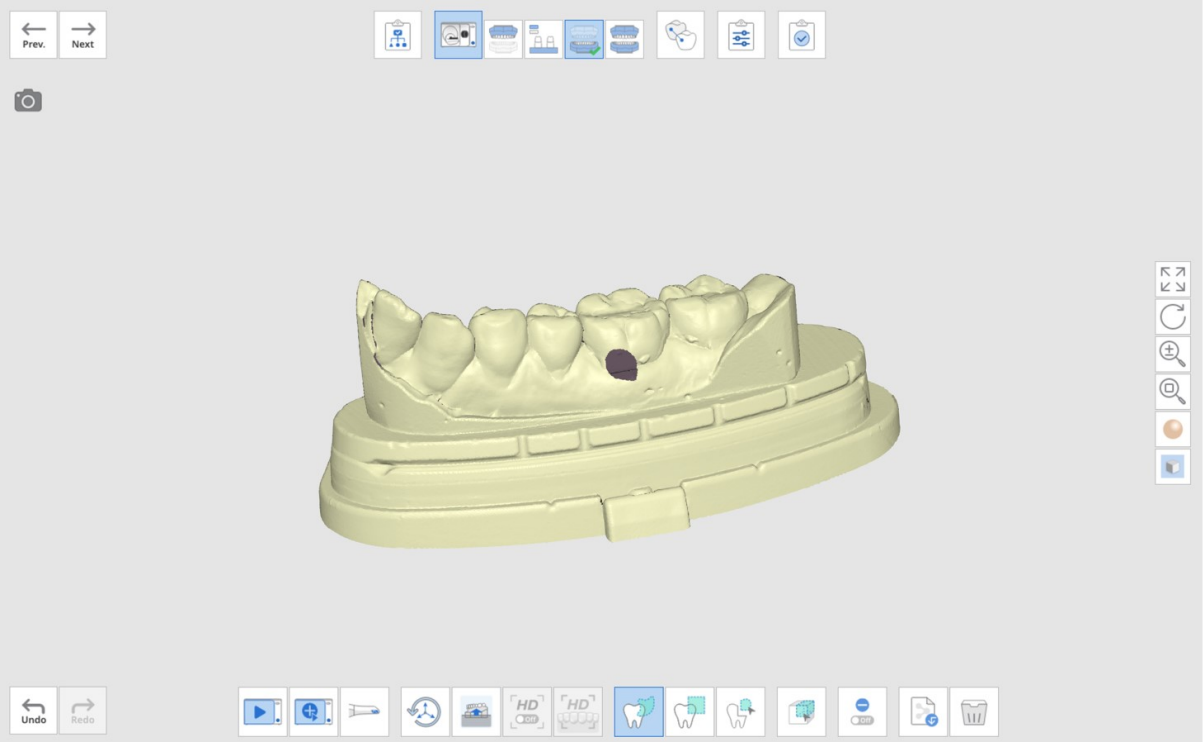


➢ The following message appears if you click '**Scan'** once the scanning is complete. You can choose to delete the scan data or acquire additional data.



	Additional Scanning	Allows to get additional data on the specific area on the model without replacing the existing one.

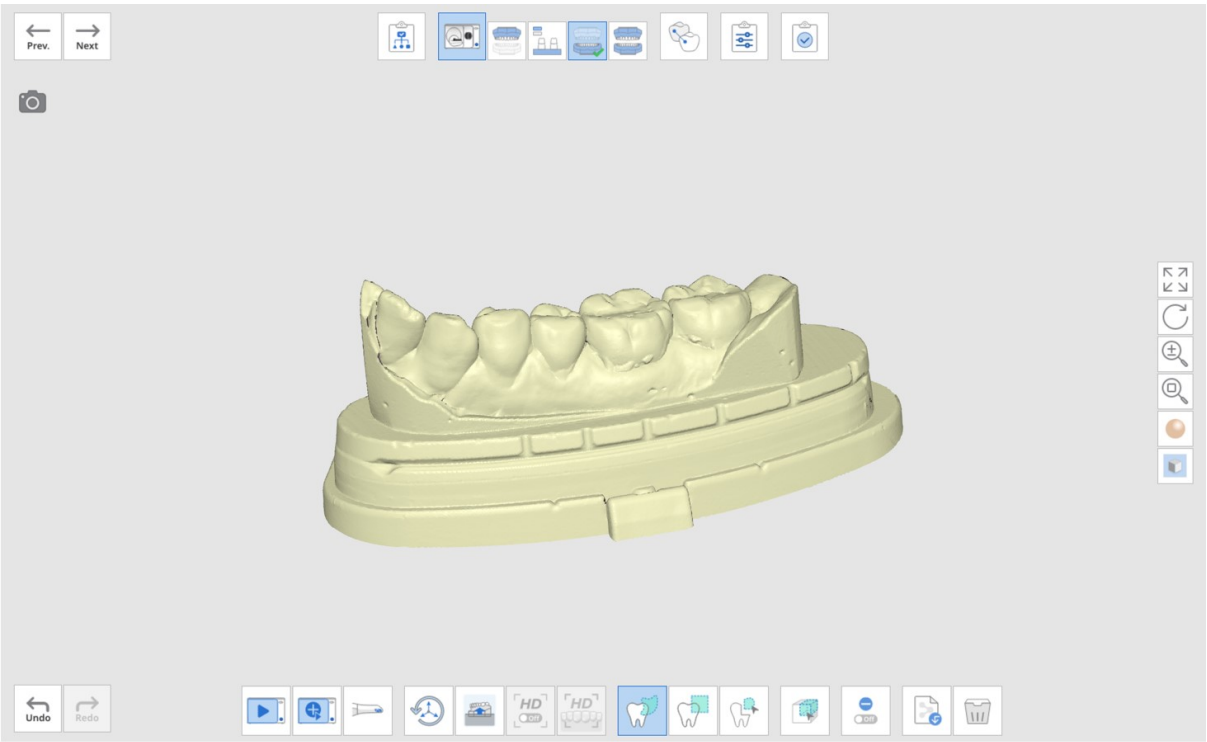
➢ In case you need an additional scan, rotate the model to bring the missing spot to the front, and click '**Additional Scanning'**.

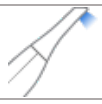


Double-click on the missing spot to turn cameras to the empty spot and press '**Scan'**.

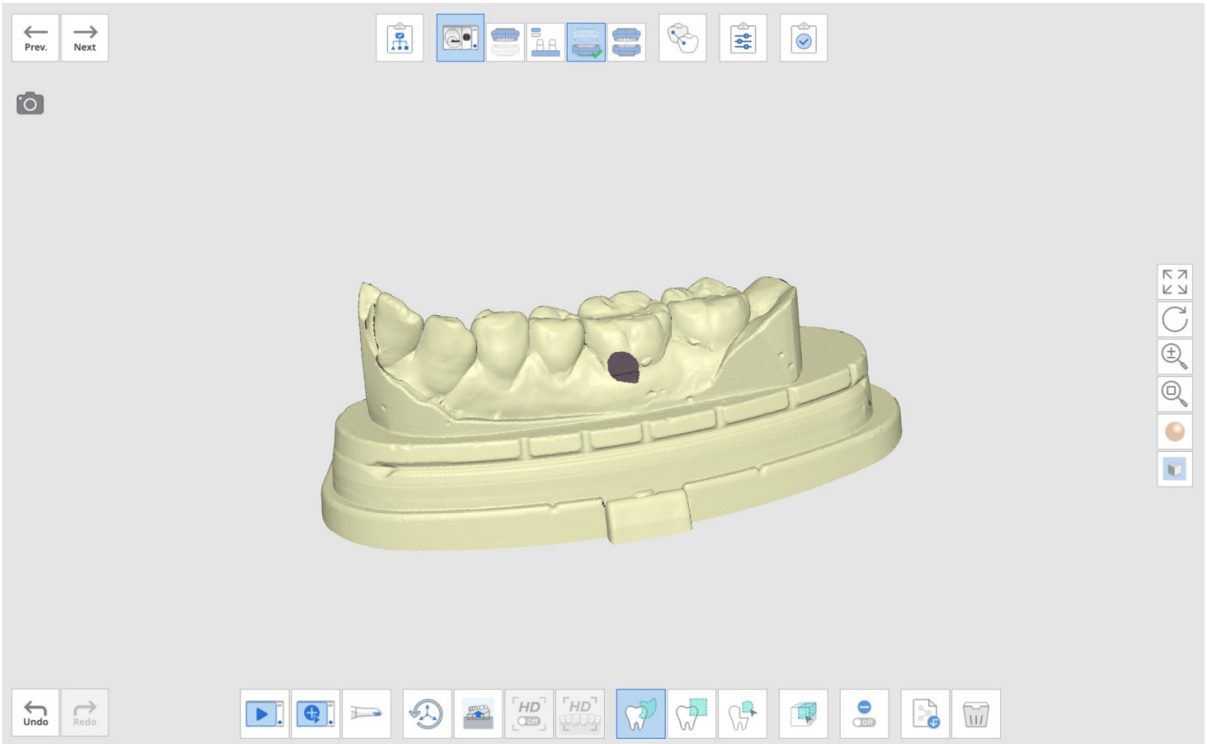
The program will indicate which angles are not available for additional scanning.

➢ The empty space has been filled after performing the additional scan.

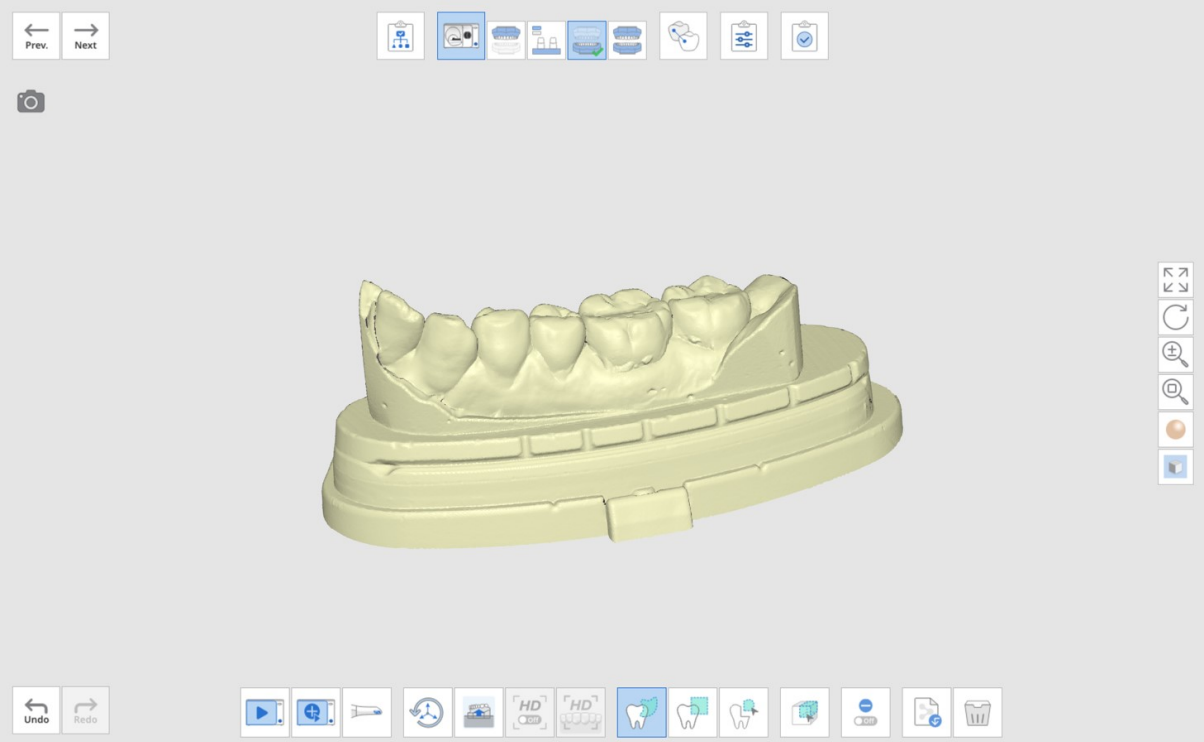


	Scan Using i500	If you have an i500 scanner, the scan will proceed using it in Medit Scan for Labs.

➢ In case you need an additional scan, you can also proceed using the i500.



➢ Connect the i500 to the computer and make sure it is calibrated. Turn it on and click '**Scan Using i500**'.

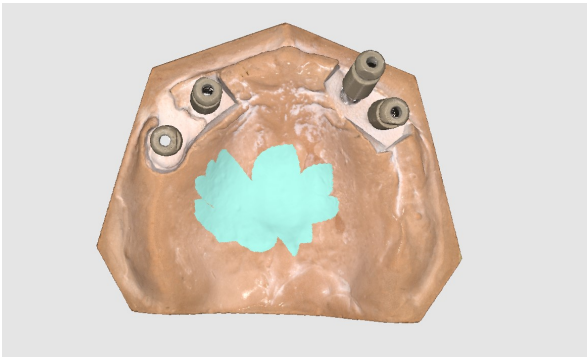


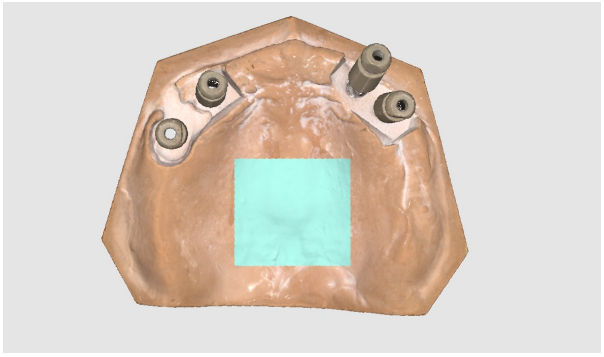
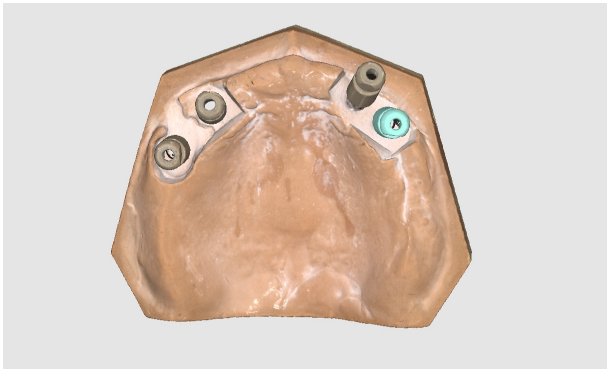
Scanning Toolbox

	Initialize Axes	If the axes of scanner were moved, use this option to reset them.
	Adjust Scan Area	Adjust the scan depth.
	HD Mode	When on, perform a scan in HD mode.
	HD for Shiny Models	Scan shiny models made resin or wax.
	Free Selection	Allows to freely select data.

	Rectangular Selection	Selects data using rectangular shape.
	Island Selection	Selects all connected data by clicking on it.
	Selection Mod Switch	Switch between surface only and all the way through selection.
	Deselection Mode	When on, deselects the area using various tools.
	Import Mesh Data	Imports the 3D file.
	Clear Data	Deletes all the data on the screen.
	Undo	Undoes the previous action like scan, editing etc.
	Redo	Redoes the action.

▷ [Example] Trimming Tools

Freeform	

Rectangle	
Flood	

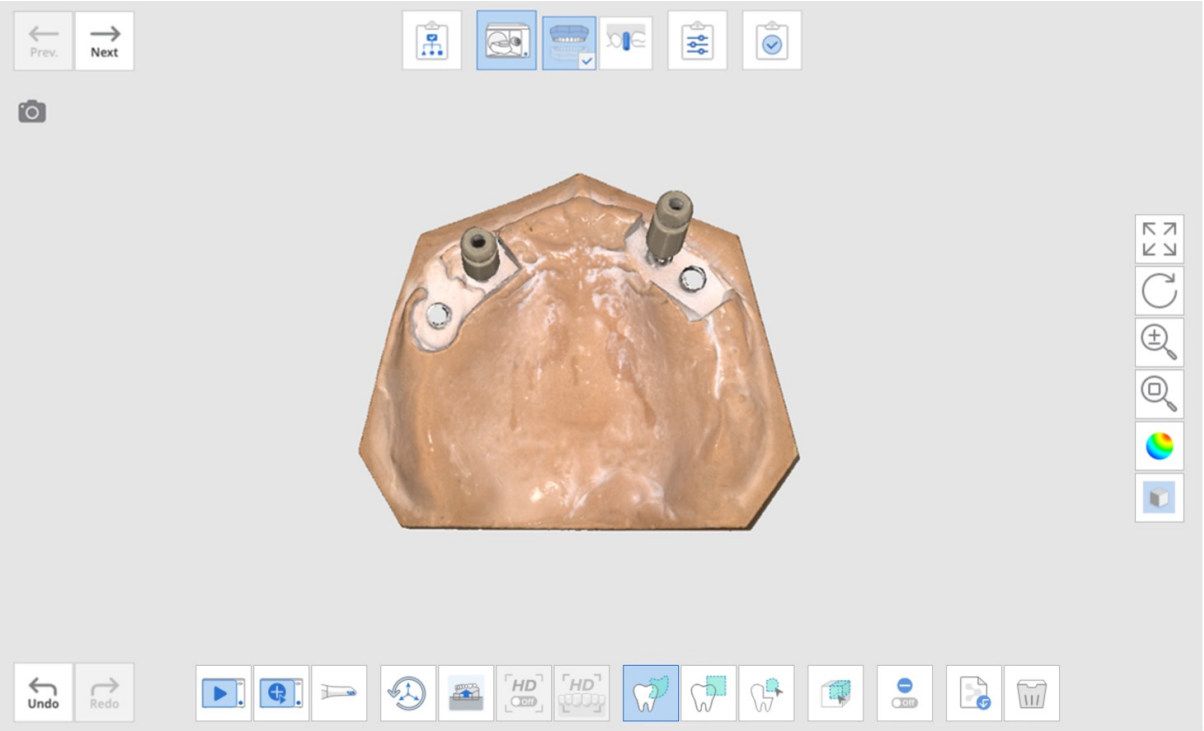
To control the selected data, press RMB to see the following options:

Select All	Selects all the data on the screen.
Deselect All	Cancels the selection of data.
Invert	Swaps the data selection.
Crop	Crops everything out except for the selected area.
Delete	Deletes the selected data.

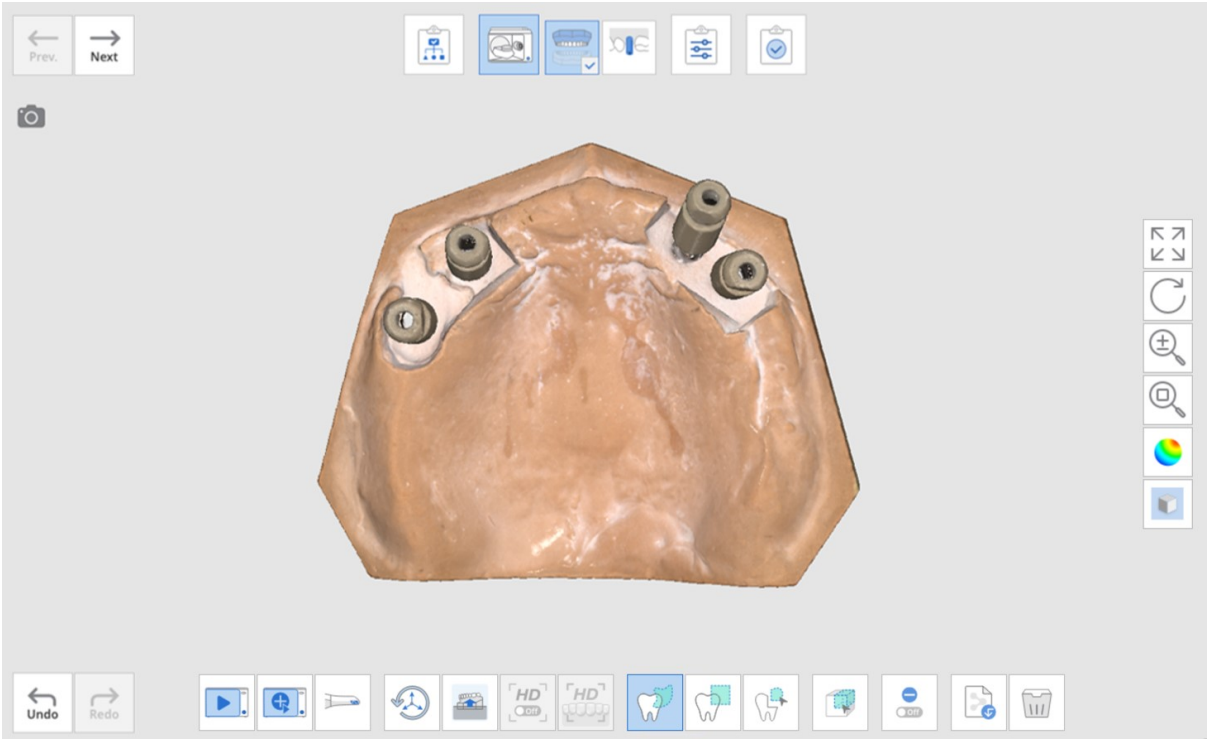
Note that the '**Delete**' button located at the bottom of the screen deletes all scanned data.

	Add Another Scanbody	Allows to perform an additional scanbody scan after switching the position of the scanbody in the base. This function is useful in case you do not have the sufficient number of the scanbodies on your hands: use the inserted scanbody as an additional scanbody.

- Below is an example of a case which requires four scanbodies. In the situation where only two are available, start the '**Scan'** button using these two scan bodies.



- Switch the position of the scanbodies and click the '**Add Another Scanbody'** button. The program will perform the additional scan to complement the existing data.


Prev.
Next
Undo
Redo
HD
HD

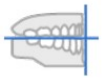
3.7 Data Alignment Steps

The data alignment steps, too, are based on the selected scan strategy.

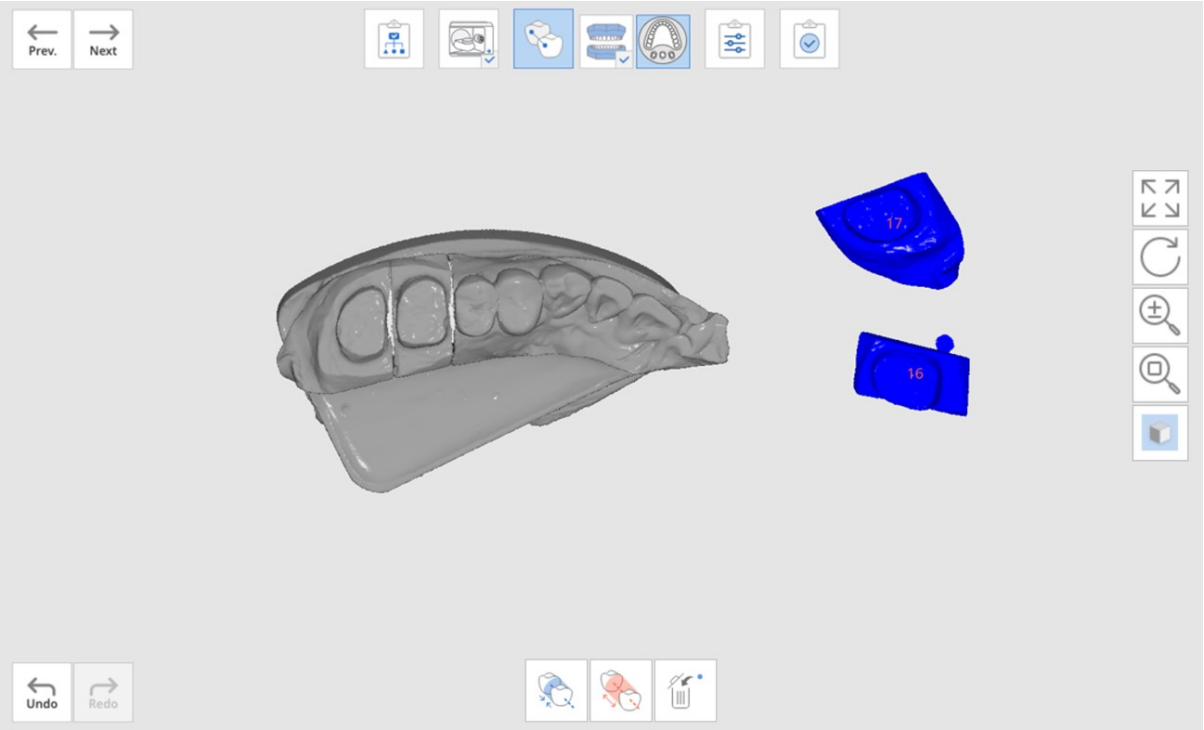
The order of each sub-stage can be changed for the arch. The changed sequence is saved and can be applied to the next scan.

In some cases the occlusion alignment might take a while. In that case, go to **Settings -> Align Occlusion Scan Automatically** and turn it off. That way you can proceed to manual alignment straight away.

Alignment Toolbox

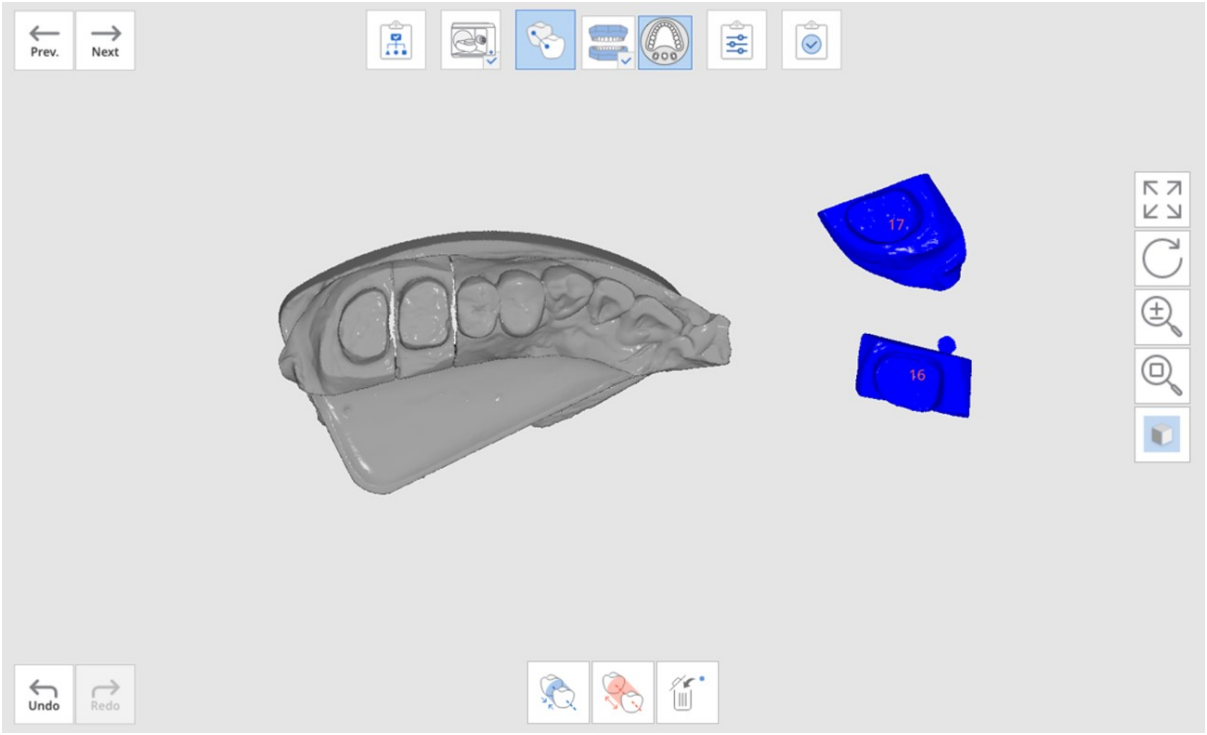
	**Align Automatically**	Automatically aligns all the data displayed on the screen.
	**Detach**	Detaches all the aligned data.
	**Remove Alignment Points**	Deletes the alignment points.
	**Flip Occlusion**	This option is only available in occlusion alignment.
	**Align with Occlusal Plane**	Move data to the occlusal plane of a virtual articulator.

➢ Once you move to this stage, alignment process will start automatically.

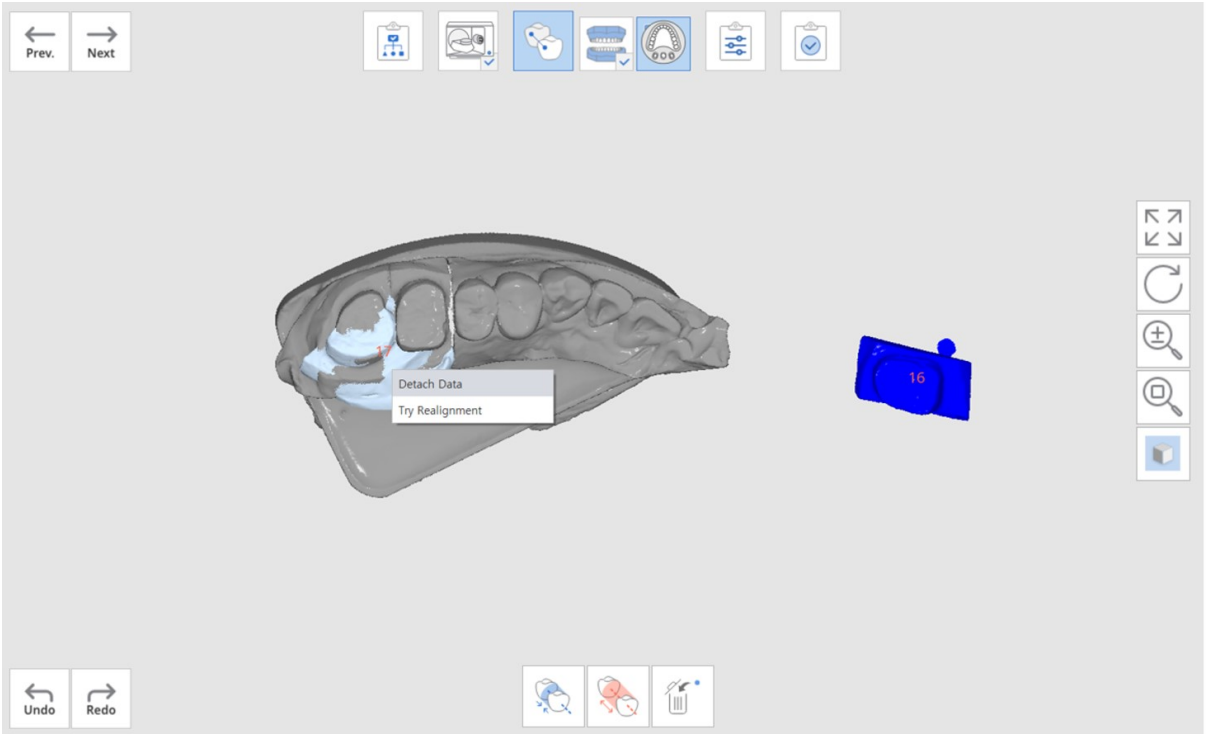


➢ If you want to perform alignment manually, first click **'Detach'** to separate the aligned data and go back to the original position.

➢ On each data, set up to three corresponding points.



The aligned data can be separated individually too. Right-click on the data you want to detach and then click '**Detach**'.



For individual data alignment, clikc RMB to access the following control options:

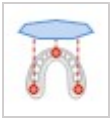
Detach Data	Detaches the specific part of the data.
Automatic Alignment	Automatically aligns only the selected area.
Try Realignment	Realigns the data precisely in case there is a mistake in alignment.

Align with Occlusal Plane 

The user can place the occlusal plane in 11 articulators provided by exocad, which can be utilized by exocad's virtual articulator.

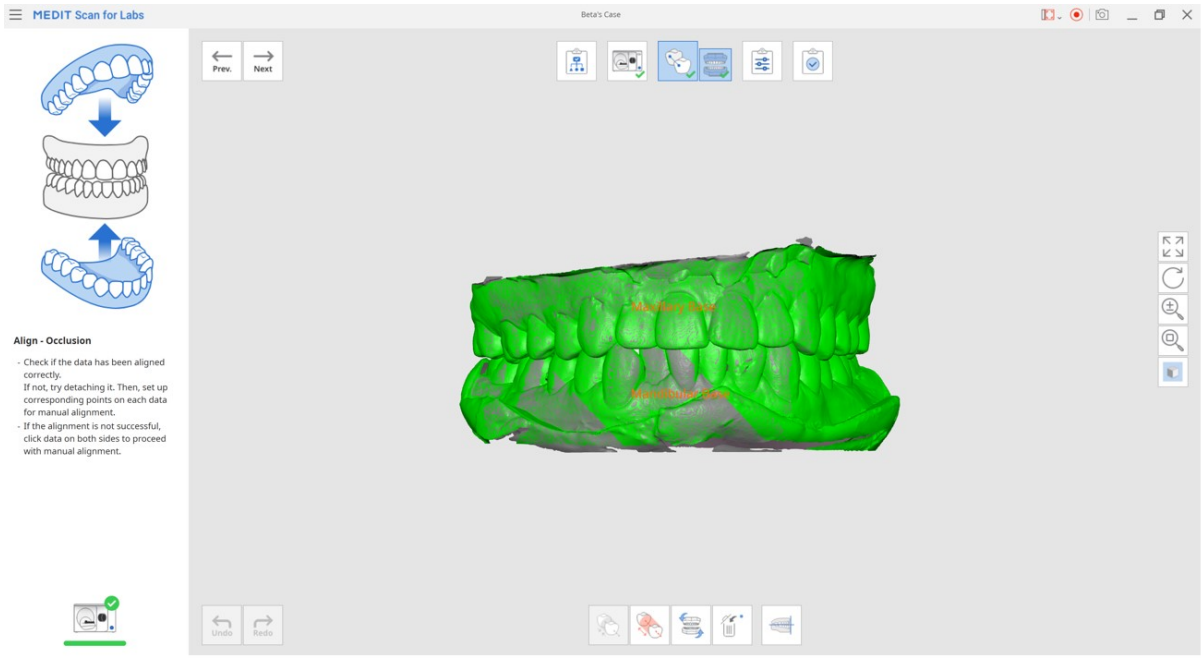
Only available when the "etc." or "Plate" is selected on the "Scan Strategy".

Toolbox

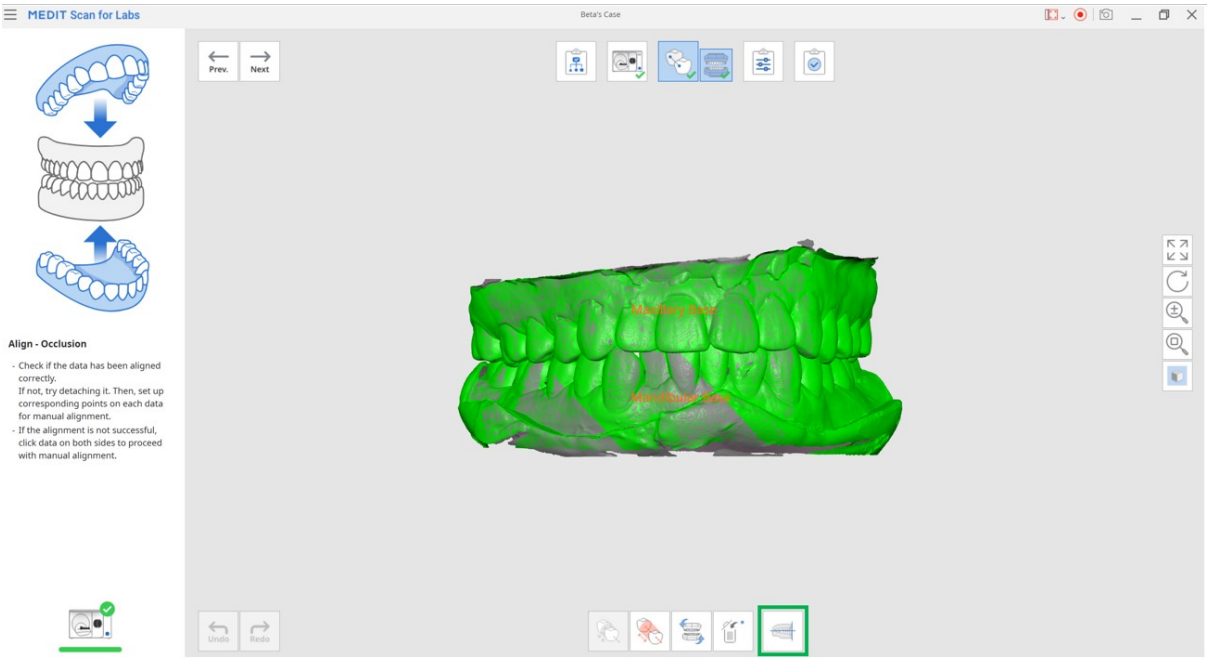
	Select Articulator	Selects the type of articulator where the occlusal plane is placed.
	Align with Occlusal Plane by Three Points	Selects three points on the maxilla or mandible to align with the occlusal plane.
	Align with the Occlusal Plane by Four Points	Selects four points on the maxilla or mandible to align with the occlusal plane. It is beneficial when there are no anterior teeth.

	Delete Marker Point	Removes points which were selected for alignment.
	Detach Data	Separates the aligned data and moves it to the original position.
	Multi View	3D scan data can be viewed from four sides.
	Exit	Exits from the current stage and goes back to the previous stage.

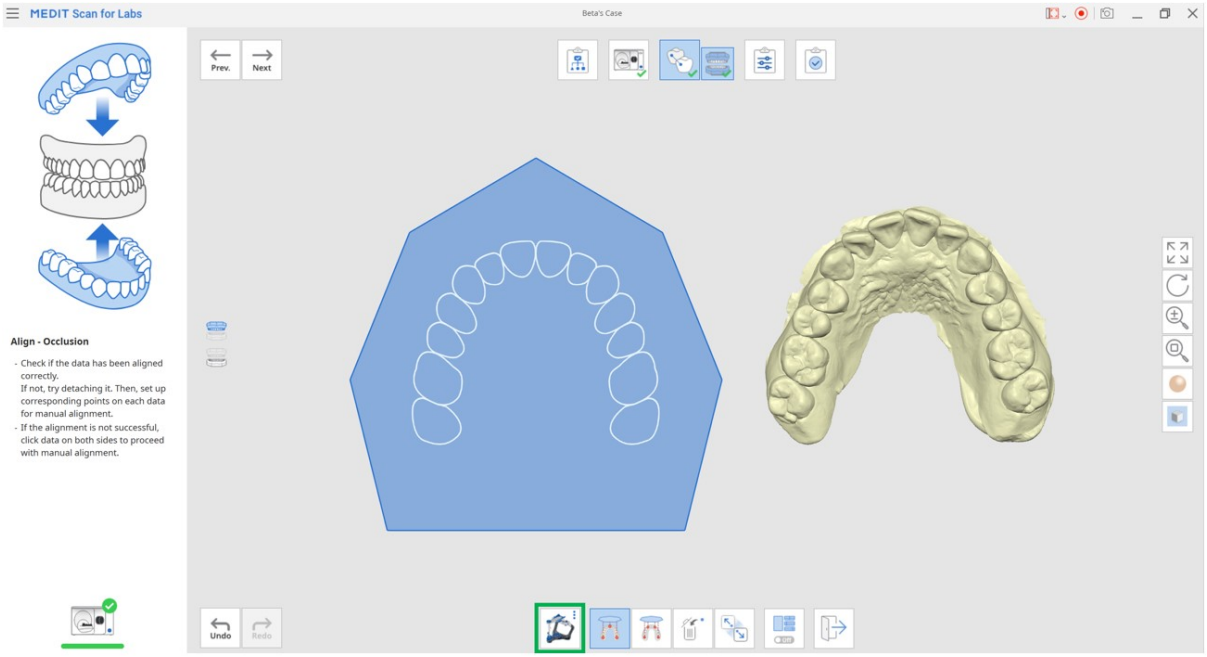
➢ Complete the scanning of maxilla, mandible, and occlusion, and move to the Occlusion Alignment Stage.



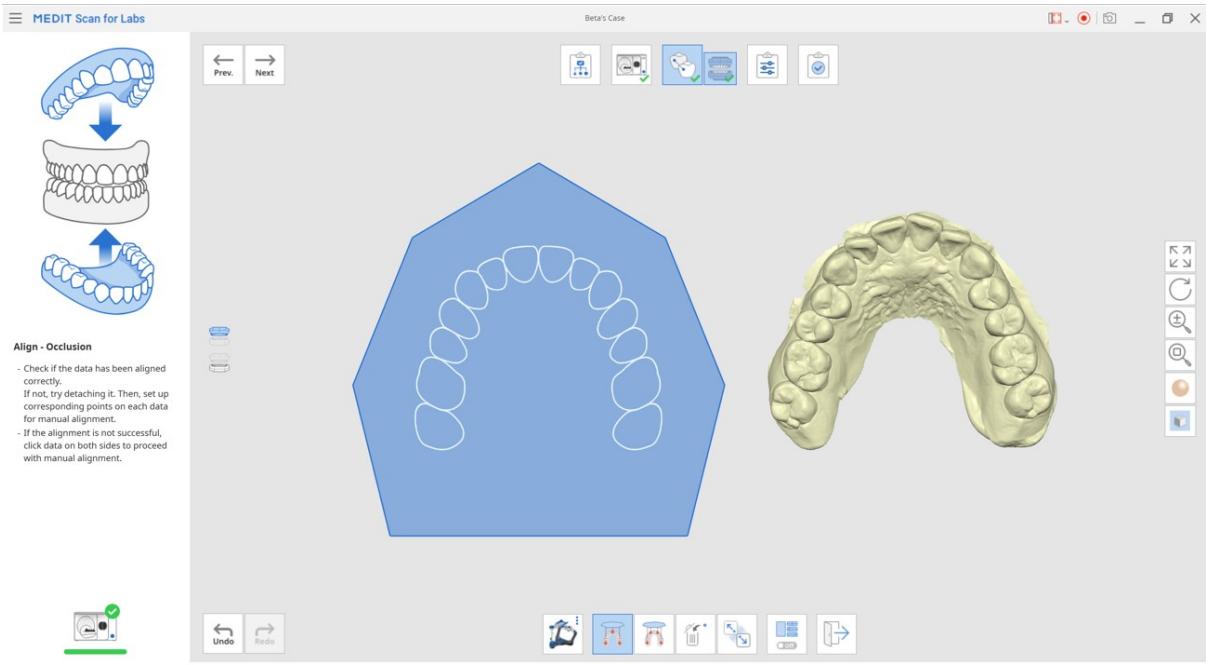
➢ On the Occlusion Alignment Stage, click  "Alignment with Occlusal Plane".



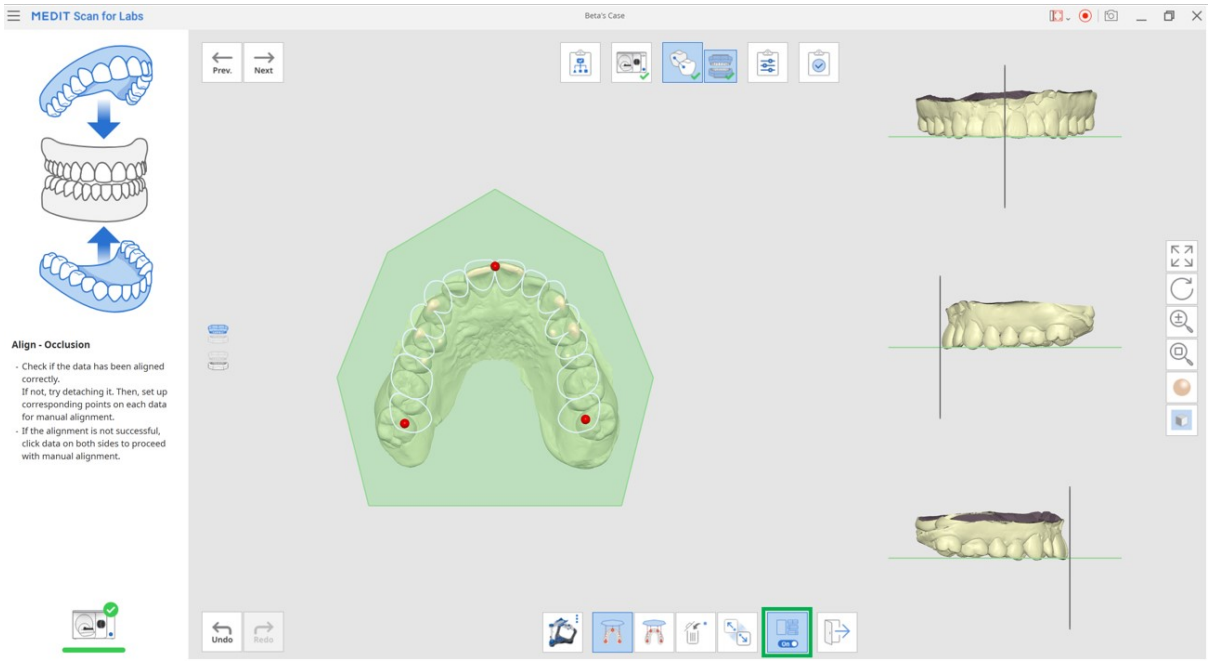
➢ Select the articulator and align the maxilla or mandible on the occlusal plane.



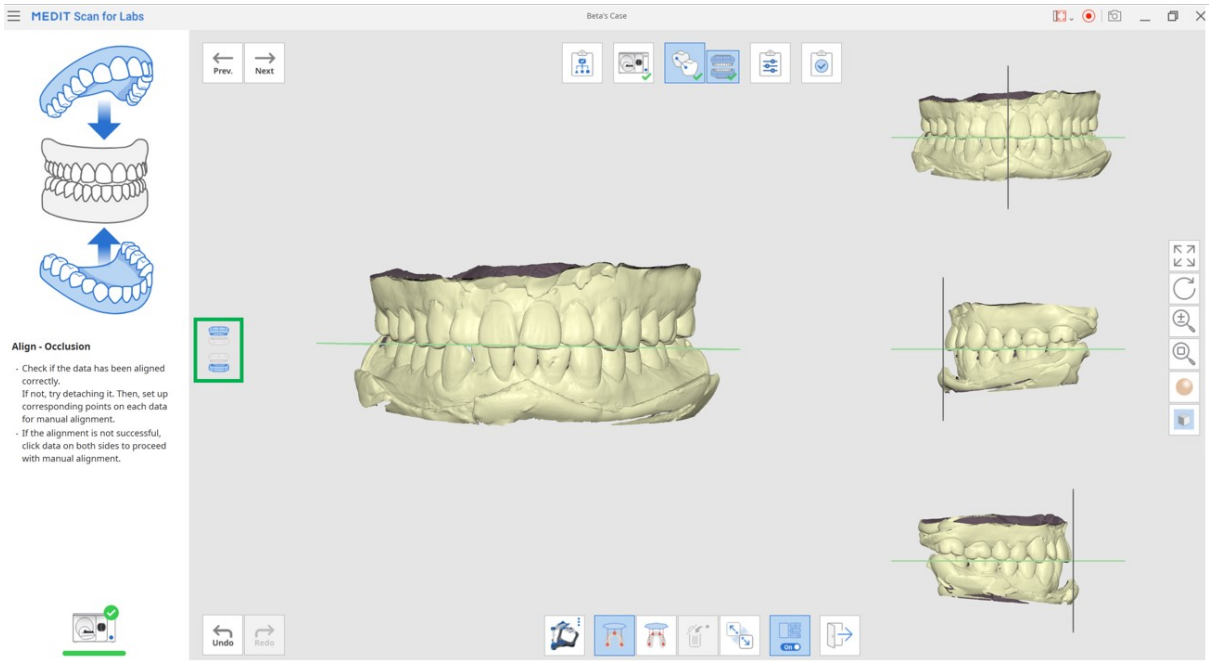
➢ Alignment with three or four points is available on the occlusal plane. Pick a point between functional cusps of molars and incisors. If there are no anterior teeth, select four points on the corresponding teeth on both sides.



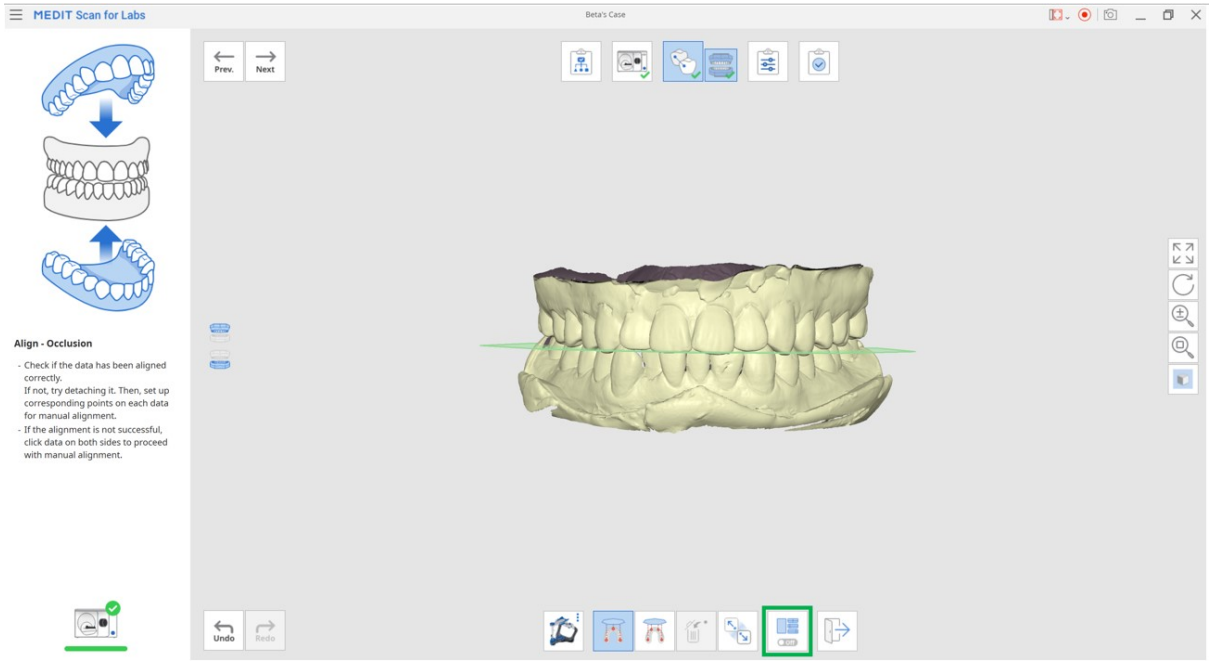
➢ Move the arch data on the right side to adjust the position on the occlusal plane. The user can adjust it from different angles.



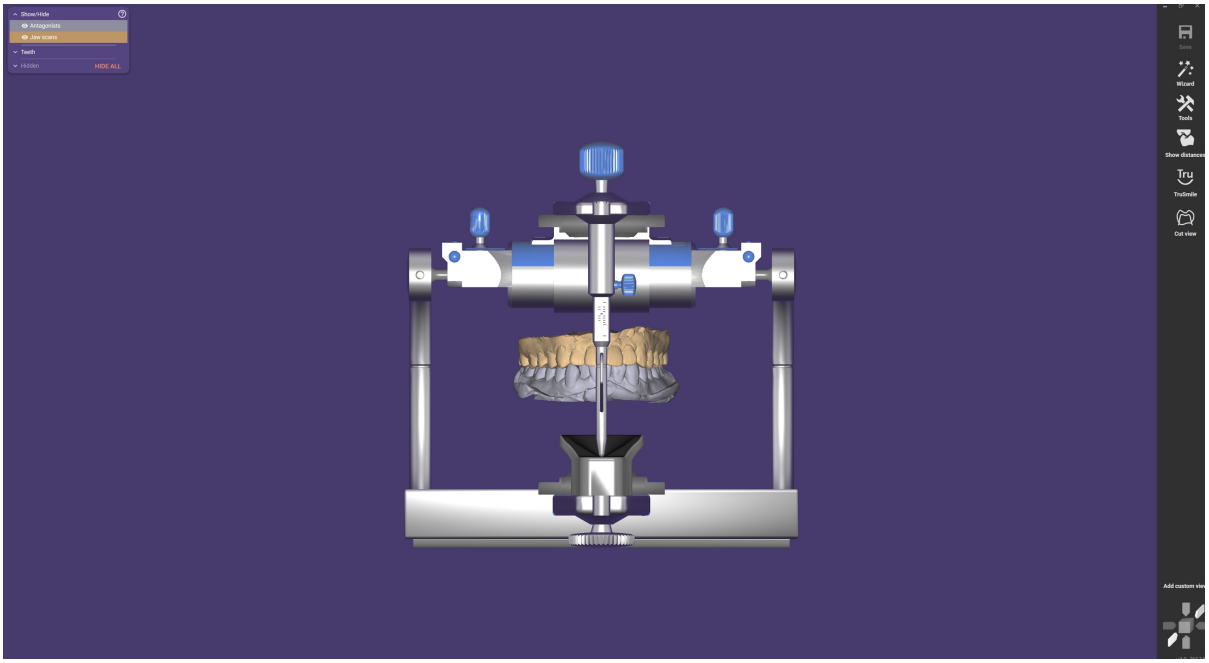
➢ Select all maxilla and mandible on the left icon to check the position of the model and/or the plane.



➢ Turn on/off the split screen.



➢ When the data is loaded from exocad after completion, the scan data will be positioned at the same location as the virtual articulator.


Show/Hide
Antagonists
Jaw scans
Teeth
Hidden
HIDE ALL
Save
Wizard
Tools
Show distances
TruSmile
Cut view
Add custom view

3.7 Confirm

This stage allows to check the overall aligned data and edit it if necessary. Utilize the tools to edit data that is located at the bottom of the window.

	**Free Selection**	Allows to freely select data.
	**Rectangular Selection**	Selects data using rectangular shape.
	**Island Selection**	Selects all connected data by clicking on it.
	**Selection Mod Switch**	Switch between surface only and all the way through selection.
	**Deselection Mode**	When on, deselects the area using various tools.
	**Adjust Occlusion Height**	Adjust the occlusion height using a provided toolbox.

Adjust Occlusion Height 

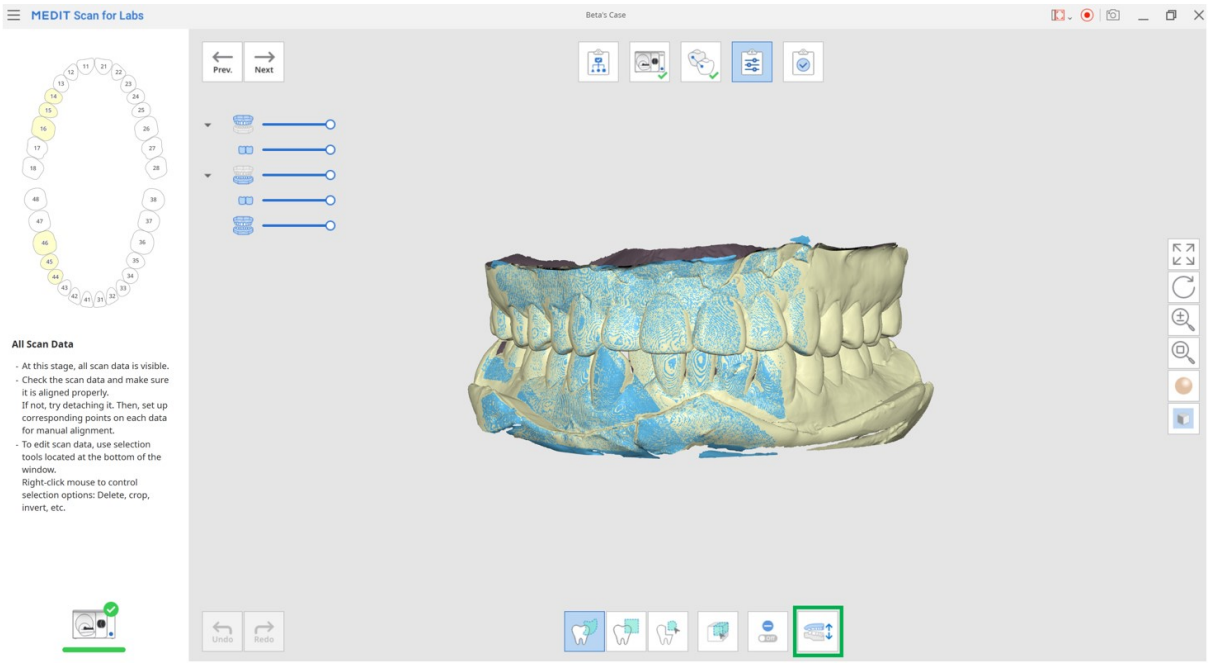
Scan the occlusion and adjust the occlusion height, if necessary. When making splints or dentures, the user can adjust the height without having additional occlusion scans.

Toolbox

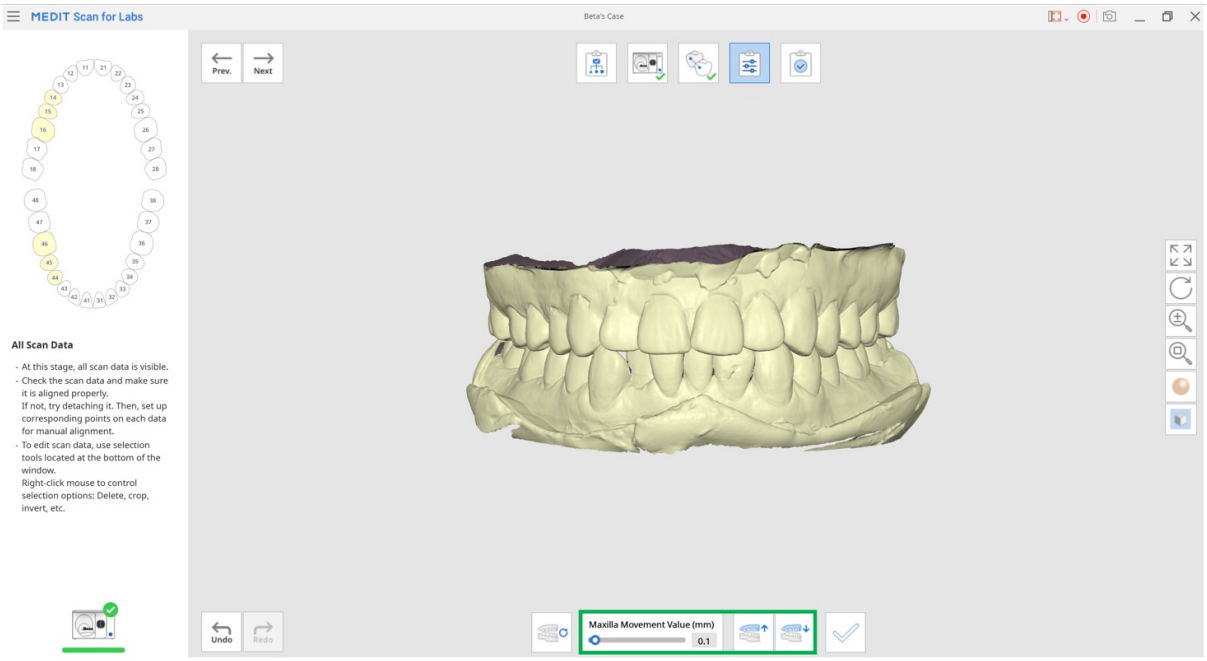
	Reset Occlusion Height	Resets the occlusion height of maxilla.

	Move Maxilla Up (Up)	Moves the maxilla upwards according to the set value.
	Move Maxilla Down (Down)	Moves the maxilla downwards according to the set value.

➢ Complete the scanning of maxilla, mandible, and occlusion. Then, click  "Adjust Occlusion Height" during the Confirm stage.

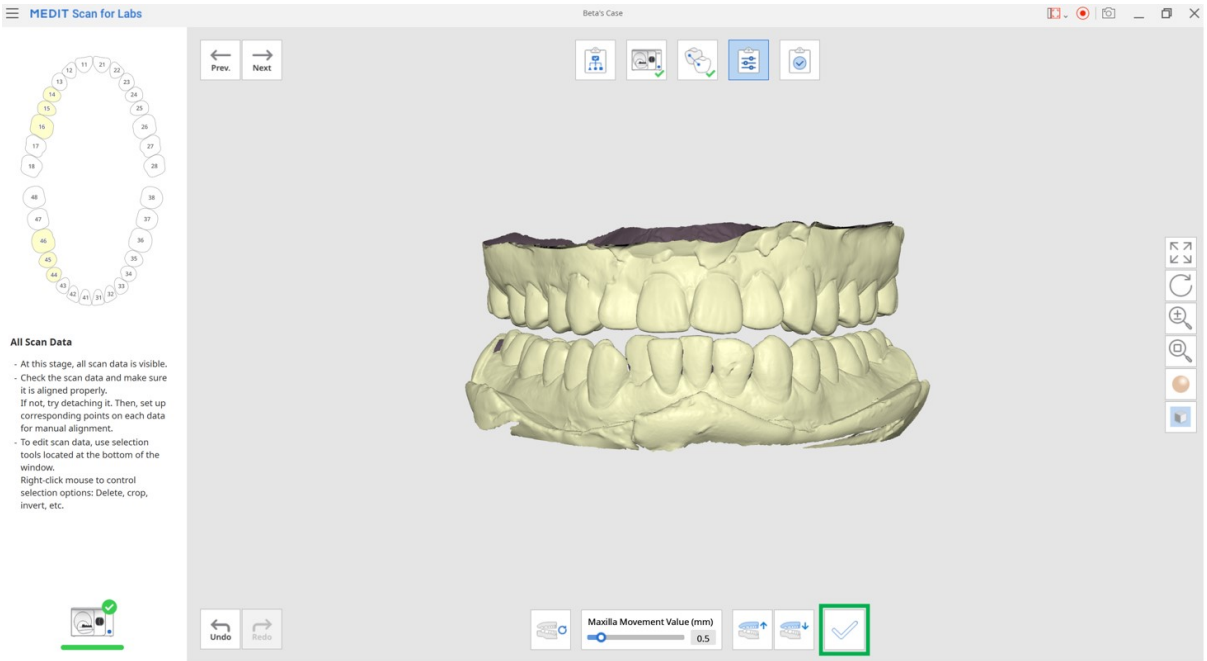


Set the movement value of the maxilla, and move it upwards or downwards according to the value.



Only maxilla will be available to move.

- After movement, click the "Exit" button to complete the adjustment of occlusion height.



Cases and Workflow Examples

Wax-up Bottom Scanning

Scanning and Aligning Scanbodies

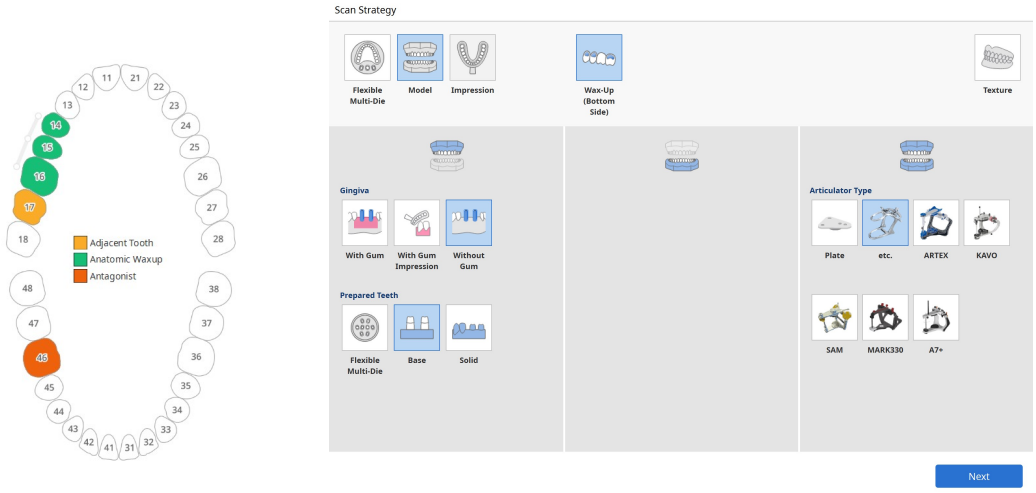
Post and Core

Flexible Multi-die Process

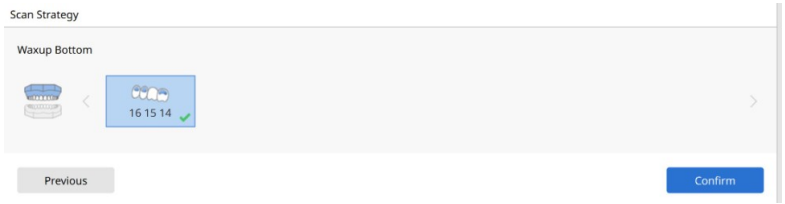
Cases and Workflow Examples

4.1 Scanning the bottom side of the wax-up

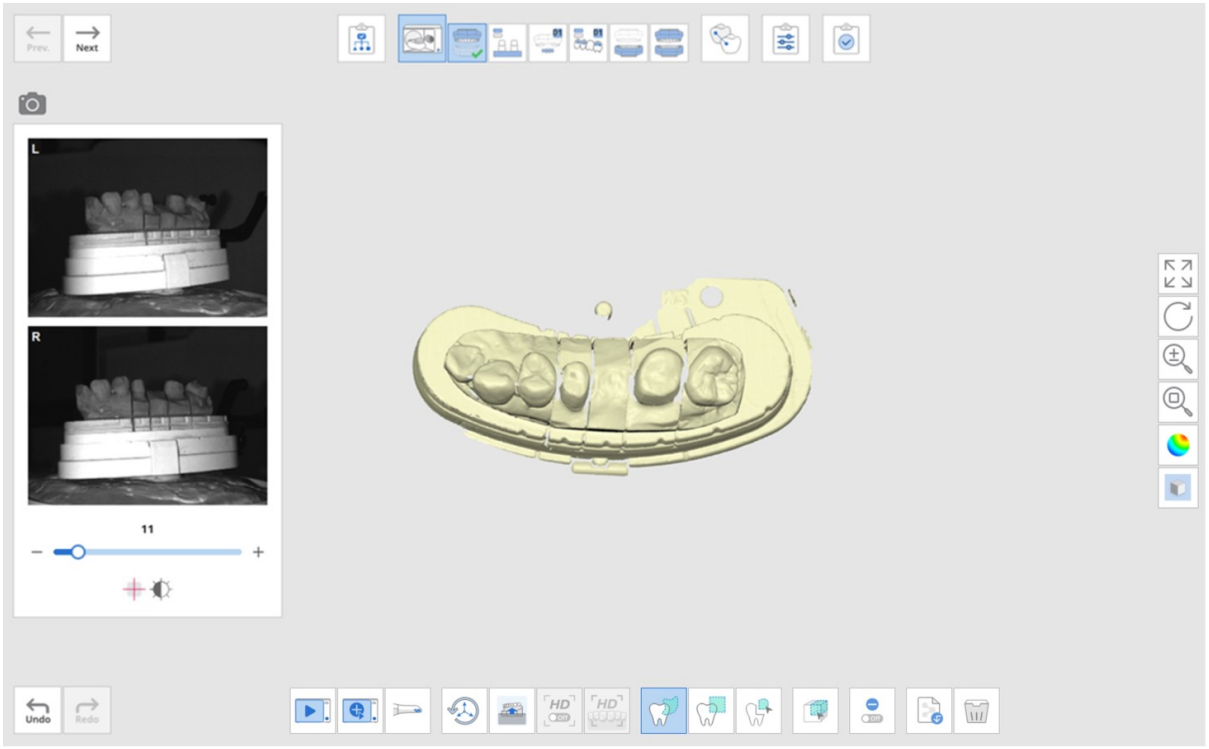
- Here is an example of a maxillary wax-up case. Select **Wax-up Bottom** from the scan strategy and click '**Next**'.

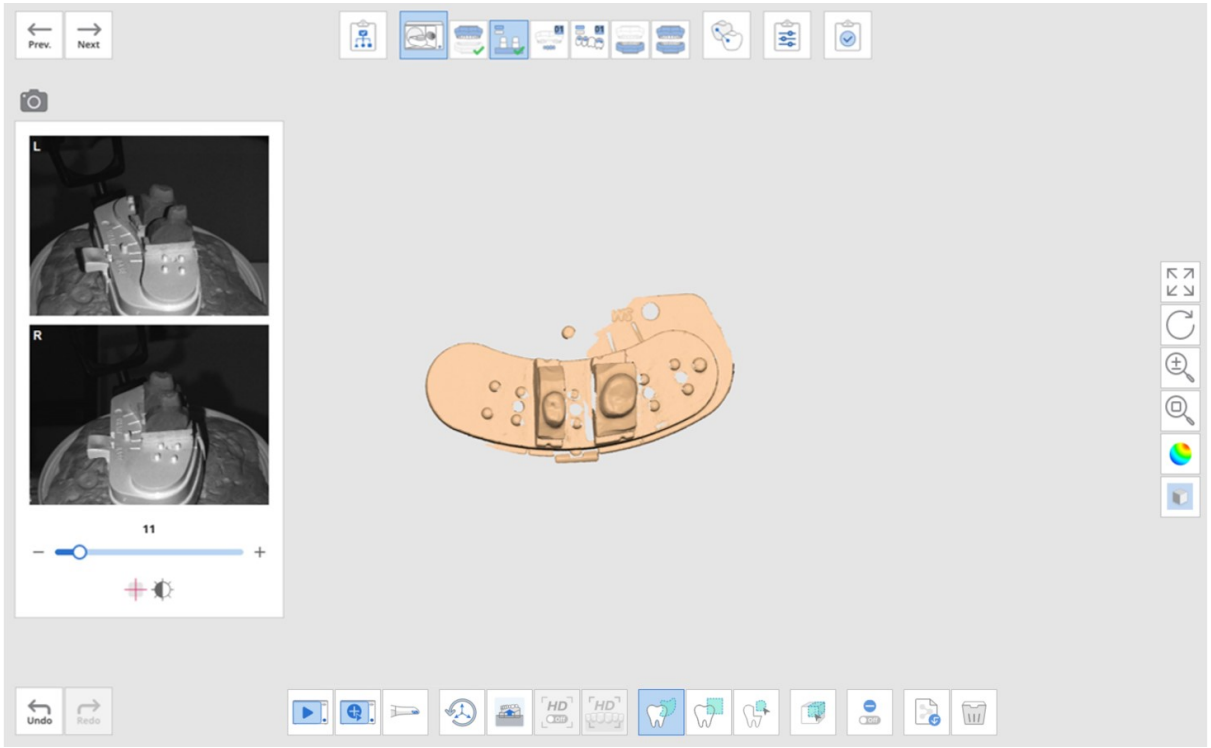


- Select only the wax-ups for which you need the inner surface to be aligned, and click '**Confirm**'.

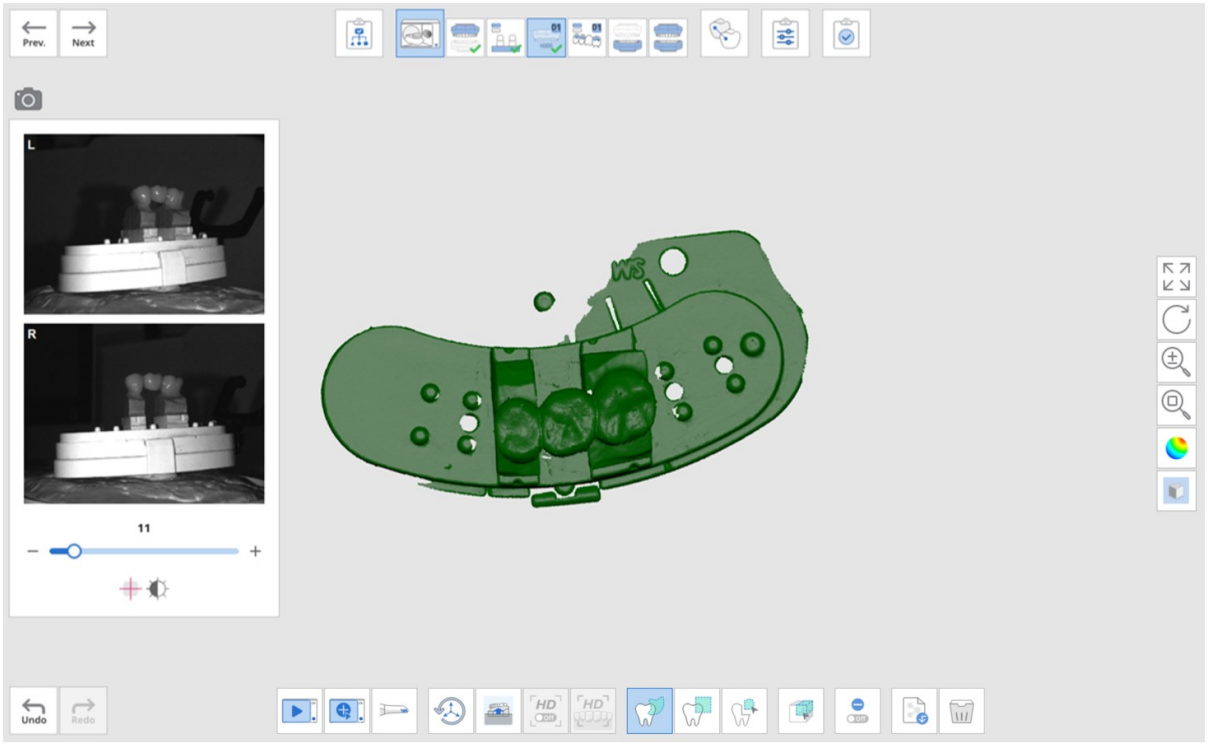


➢ Proceed with scanning the maxillary base, and then move on to scanning only the prepared teeth.

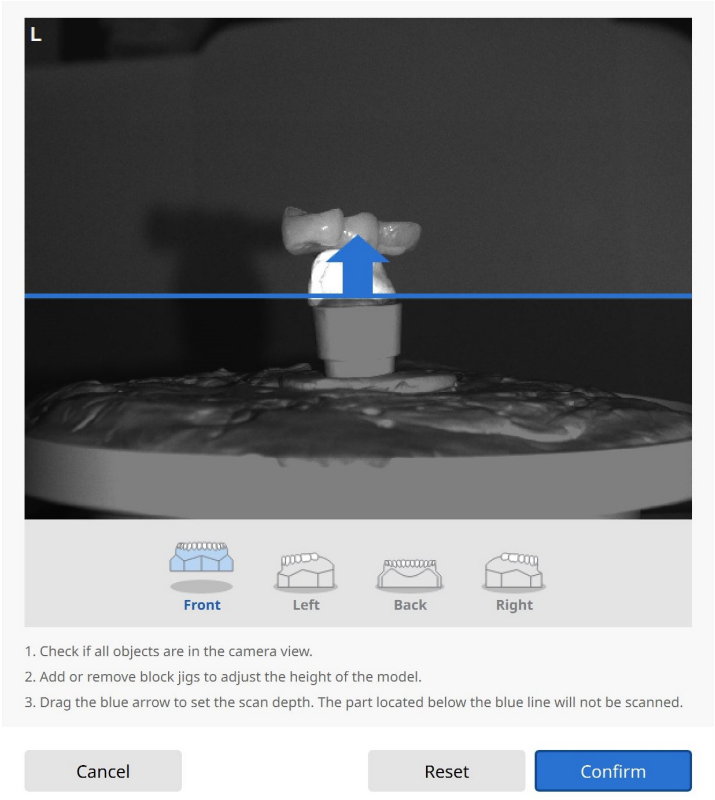




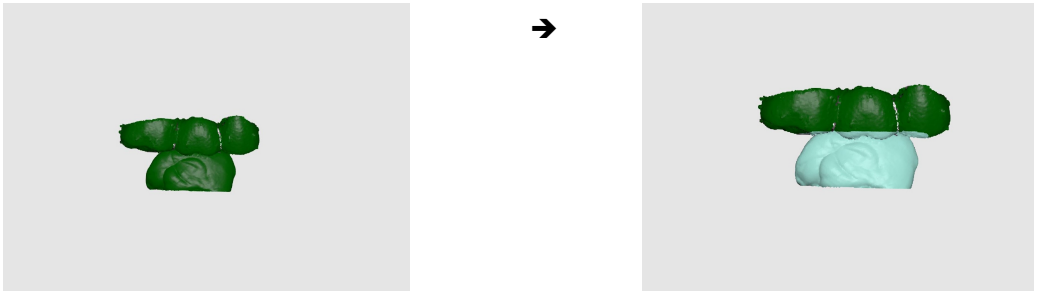
➢ Move on to Maxillary Wax-up step, and perform the scanning.



➢ After finishing scanning the outer surface of the wax-up, move to the next stage. Flip the wax-up and place it on a single die before scanning.

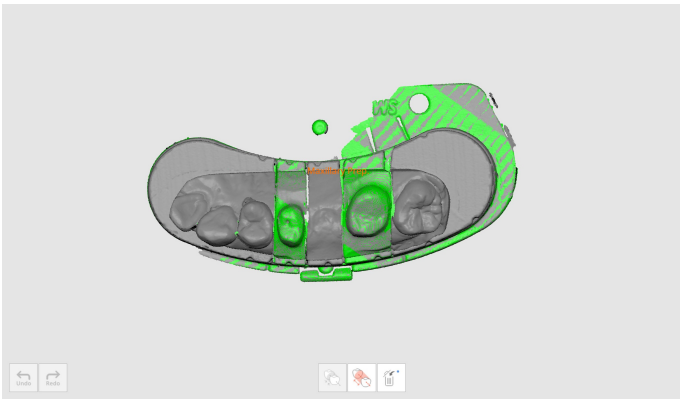


➢ Delete the unnecessary data.

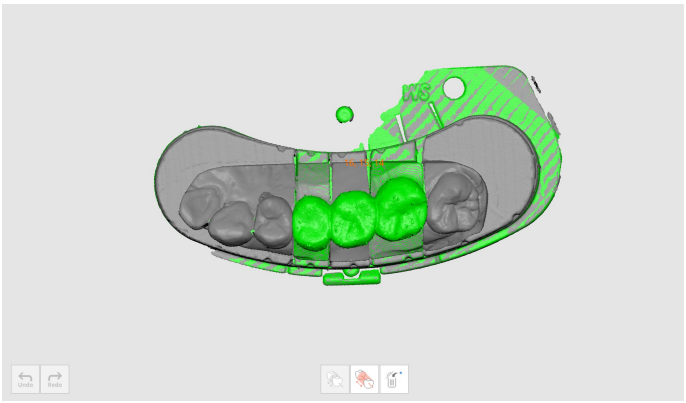


➢ Proceed with scanning the base and occlusion, and move to Align Data stage.

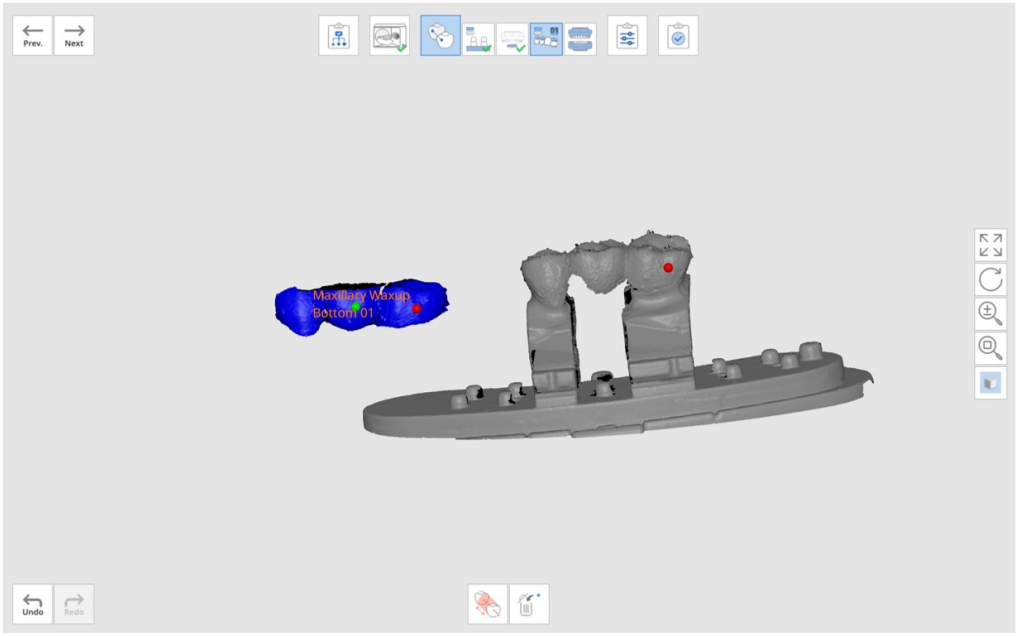
Prepared teeth and base will be aligned automatically.

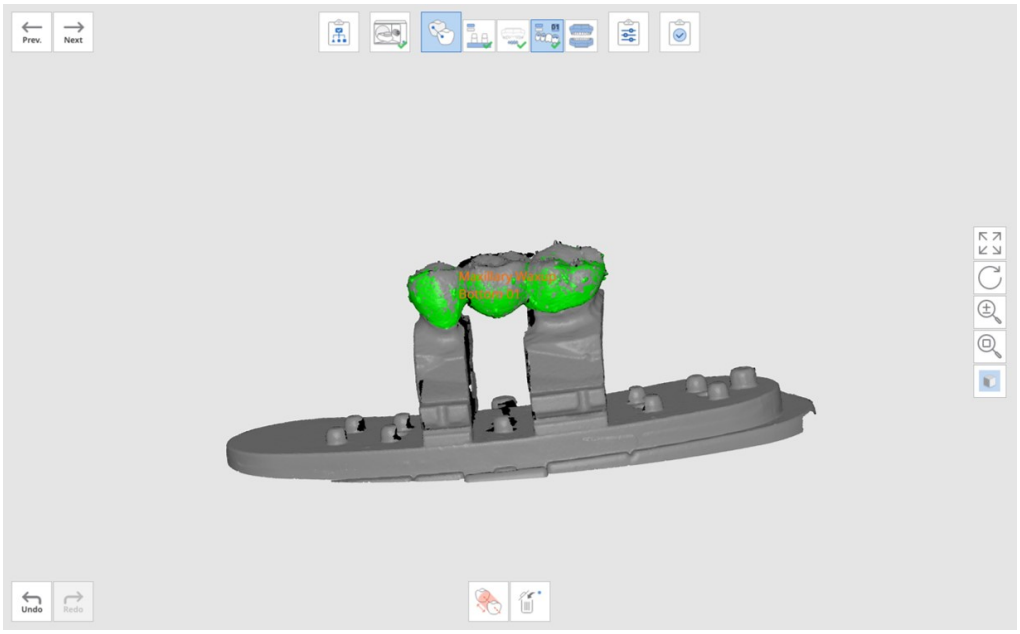


The outer surface of the wax-up and the base will also be aligned automatically.



- The inner and outer surfaces of the wax-up should be aligned manually. Set up to three corresponding alignment points as shown on the picture below to align the data.



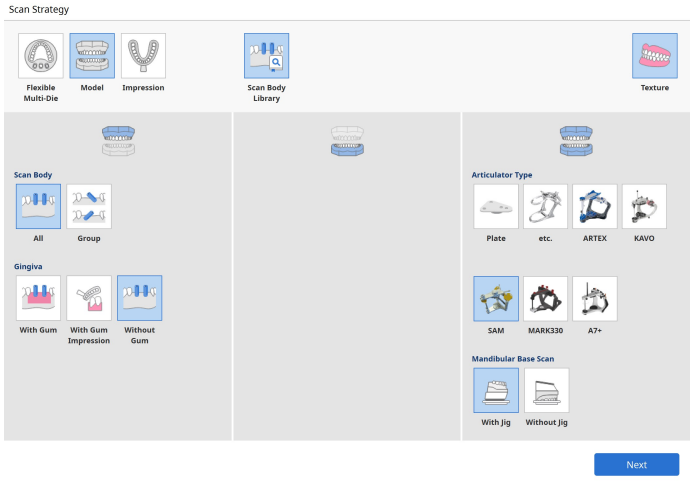


- Occlusion data will also be aligned automatically.
- Proceed to the 'Confirm' step to edit the data if necessary.

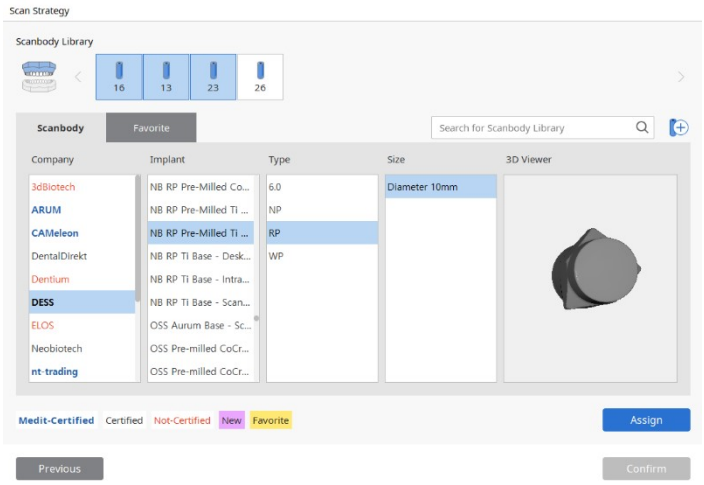
4.2 Scanning and Aligning Scanbody

Medit Scan for Labs has an integrated Scanbody Library which makes it easier and faster to work with the scanbody cases. You can specify which scanbody is corresponding to each tooth, and the program will automatically insert the library data in to the model scan.

- Select the '**Scanbody Library**' option from the **Set Scan Strategy** window and click '**Next**'.



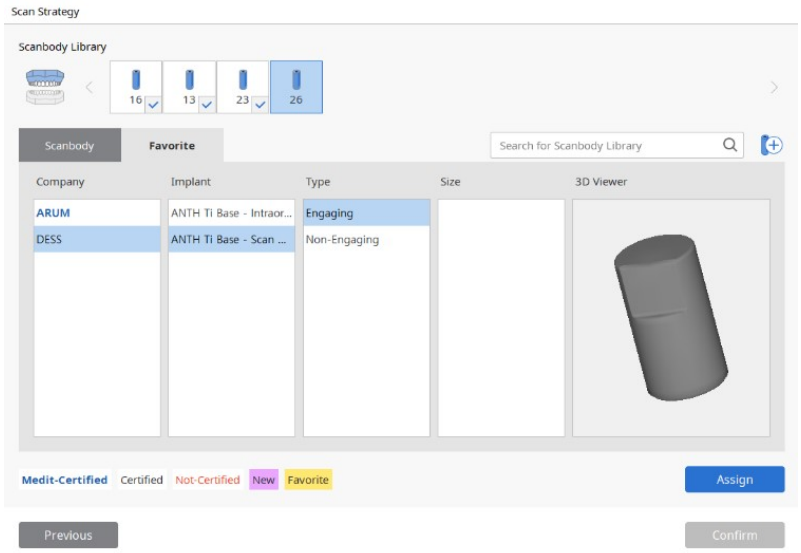
- In the Scanbody Library dialogue window select the tooth number and the corresponding scanbody data from the library (multiple teeth can be selected at once).



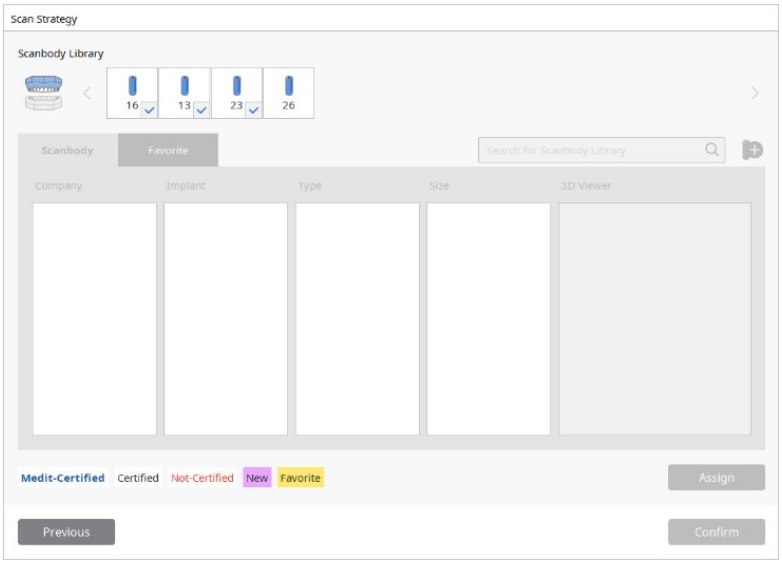
There are several types of scanbodies in the Library:

- Medit-Certified: Advanced Alignment feature certified by Medit
- Certified: CAD S/W Certified Library
- Not-Certified

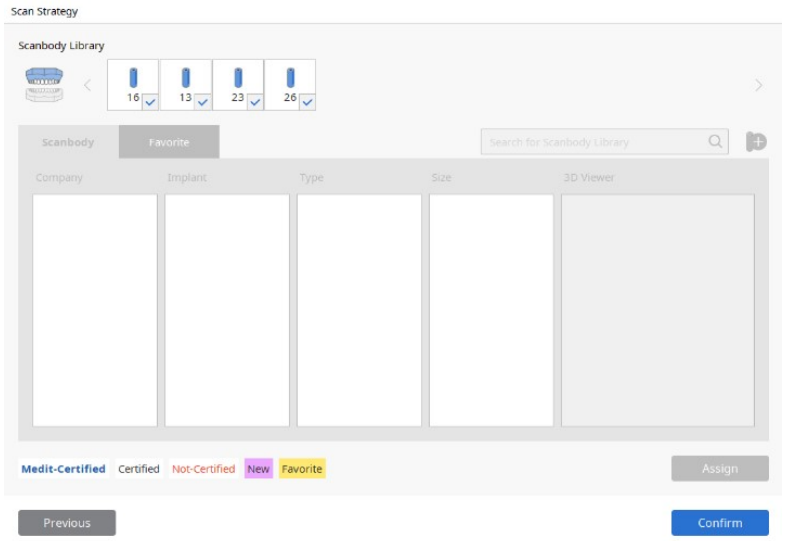
- Add a new library by pressing the '**New**' button.
- Add a library to the favorites and manage it in the **Favorites List.**.



- After selecting the Scanbody library, click '**Assign**' to assign the tooth with the selected scanbody.



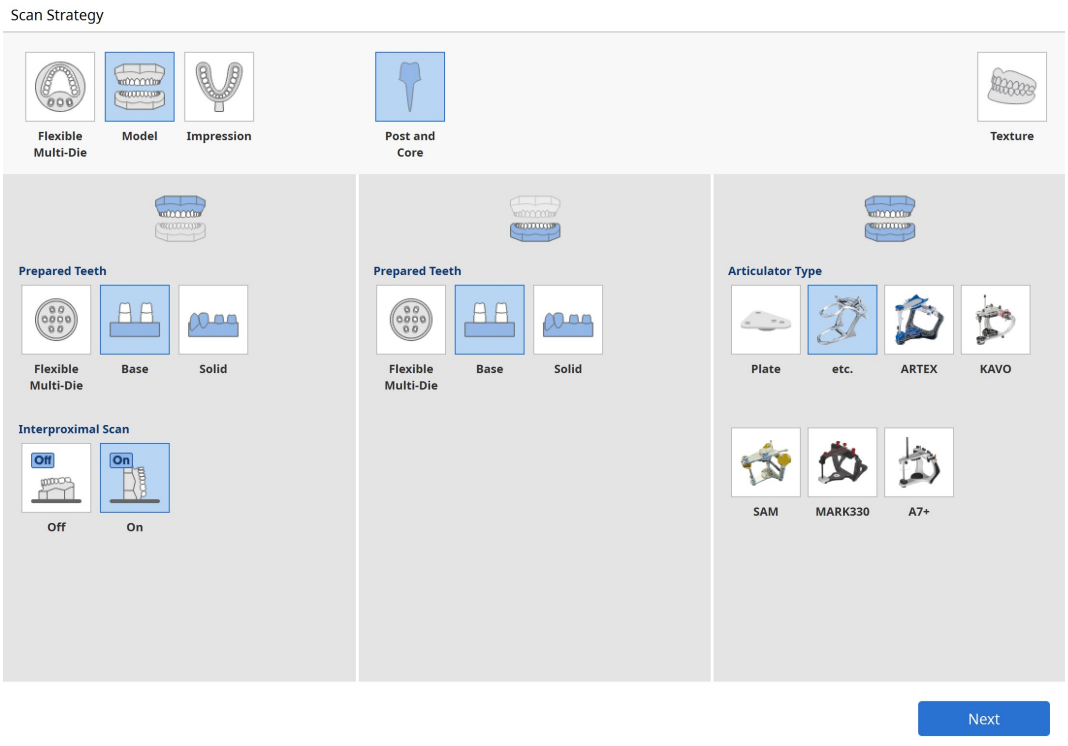
- Once the assignment for all teeth is complete, click '**Confirm**' to finish the process.



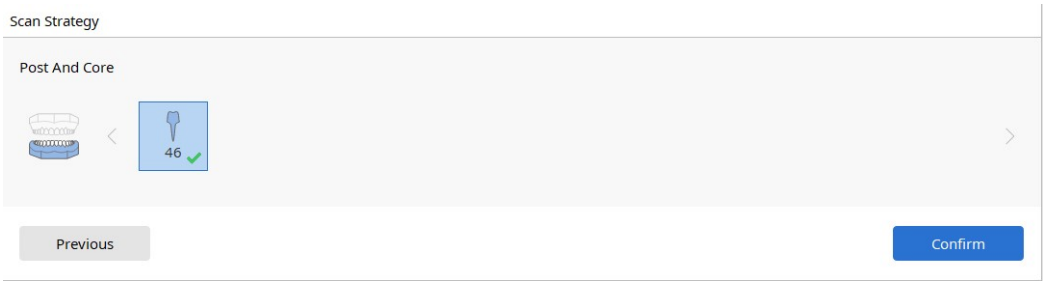
4.3 Post and Core (Only available for T710)

➢ Selecting 'Post and Core' in the Set Scan Strategy dialogue window.

'Post and Core' option is possible for the cases where the form information contains Inlay/Onlay', 'Veneer', 'Telescopic crown'.

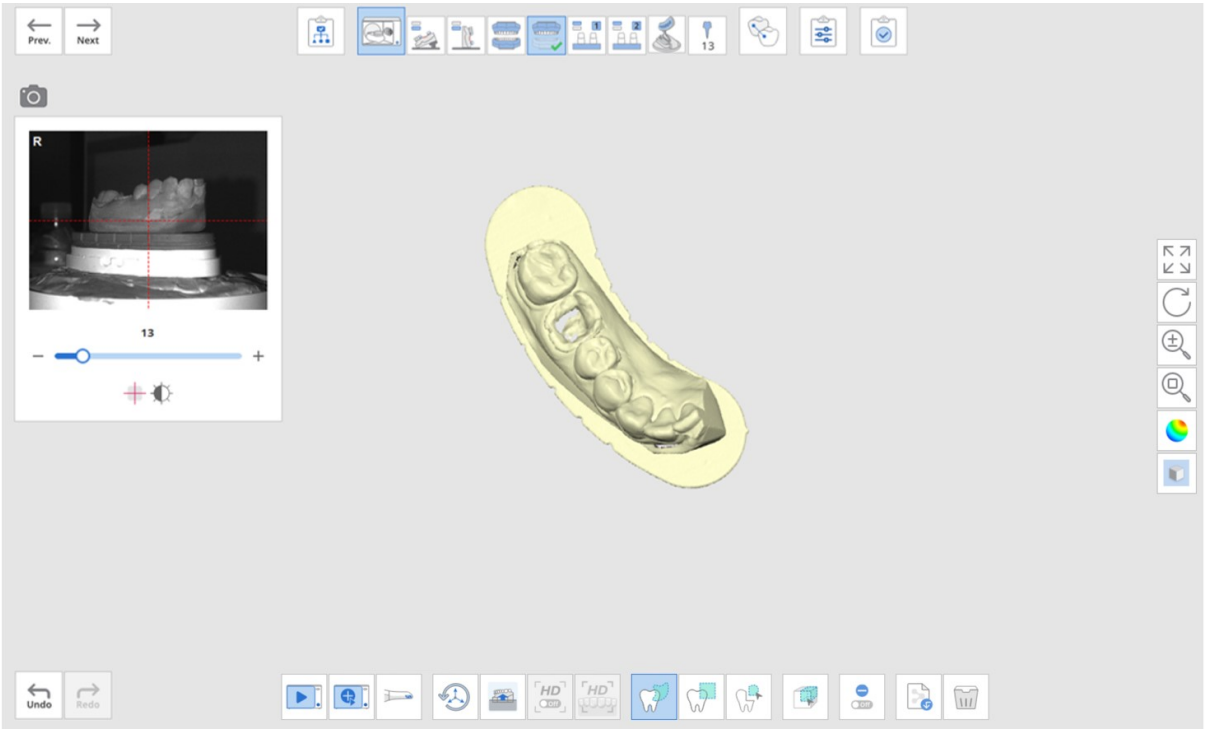


➢ Click '**Confirm**' after selecting the teeth for the Post and Core scan.



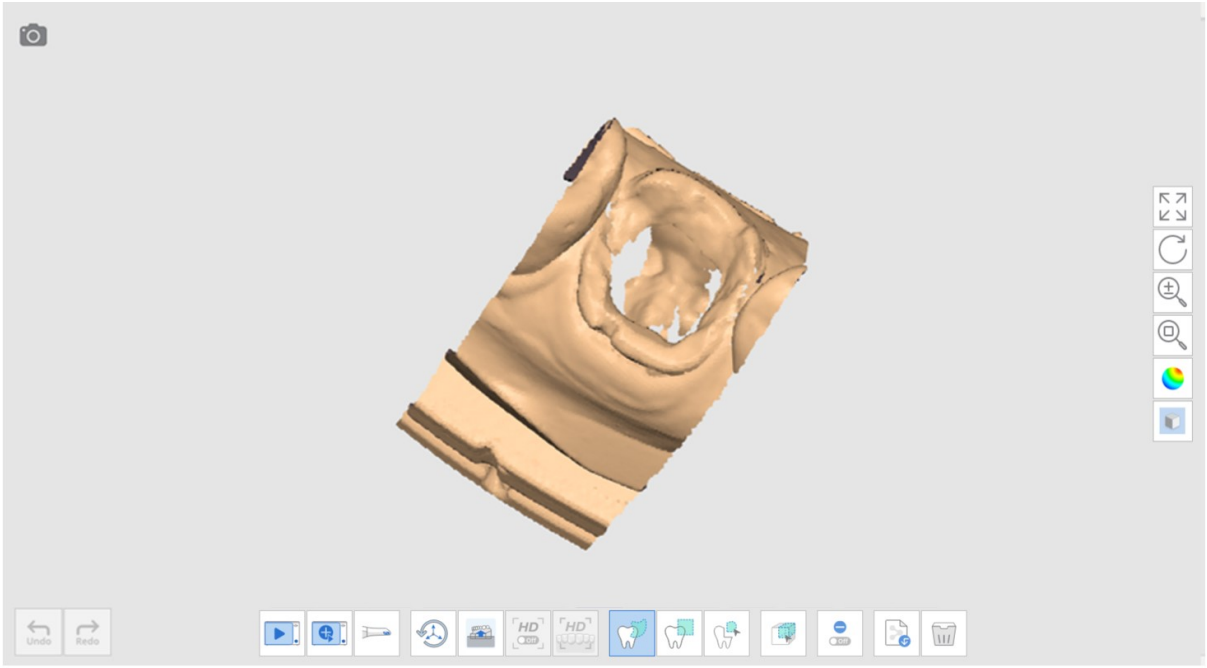
Note that the teeth that you selected must have corresponding impressions.

➢ Perform the scan.

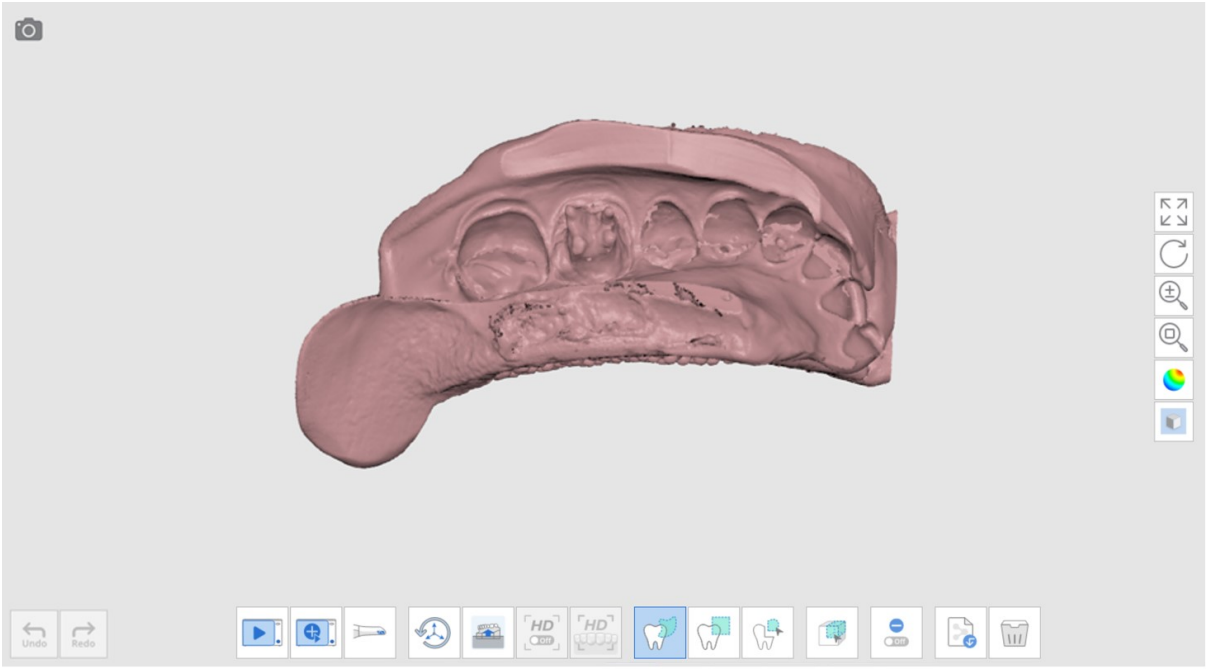


➢ Move to the **Prep. Teeth** stage and scan the trimmed die.

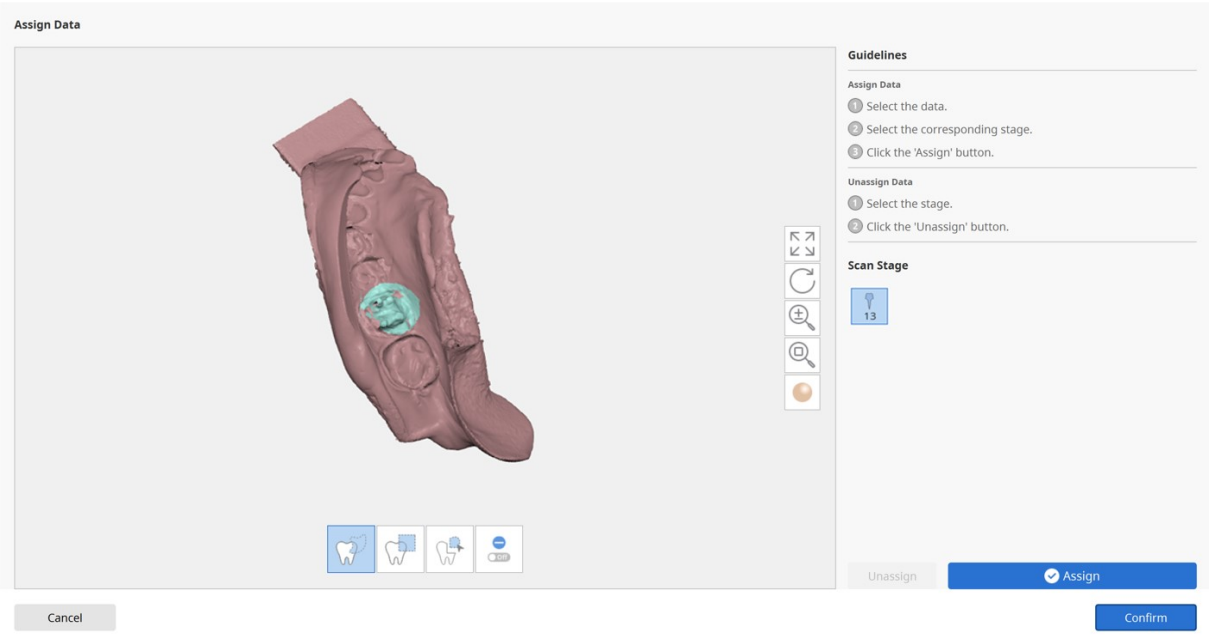
  ➢ If there is no trimmed die, scan the model again at this stage. Edit it to cut the unnecessary parts.



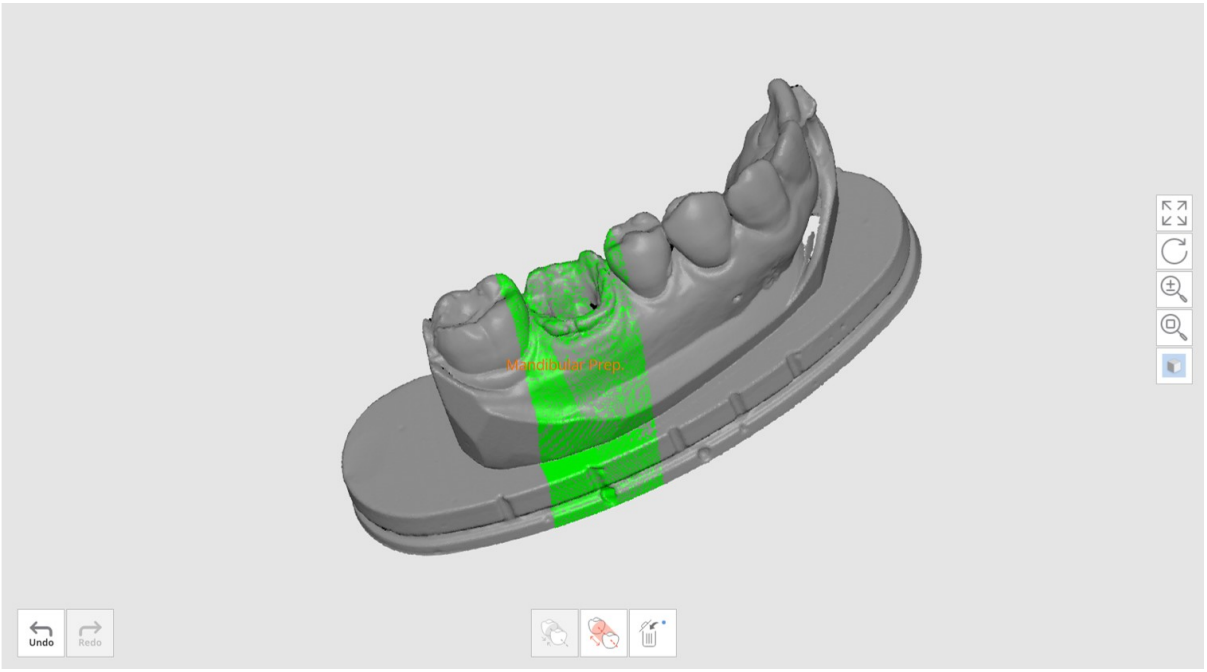
➢ Scan the corresponding impression.



➢ Once you move to the **Post** stage, you will be asked to assign the data for the corresponding tooth.

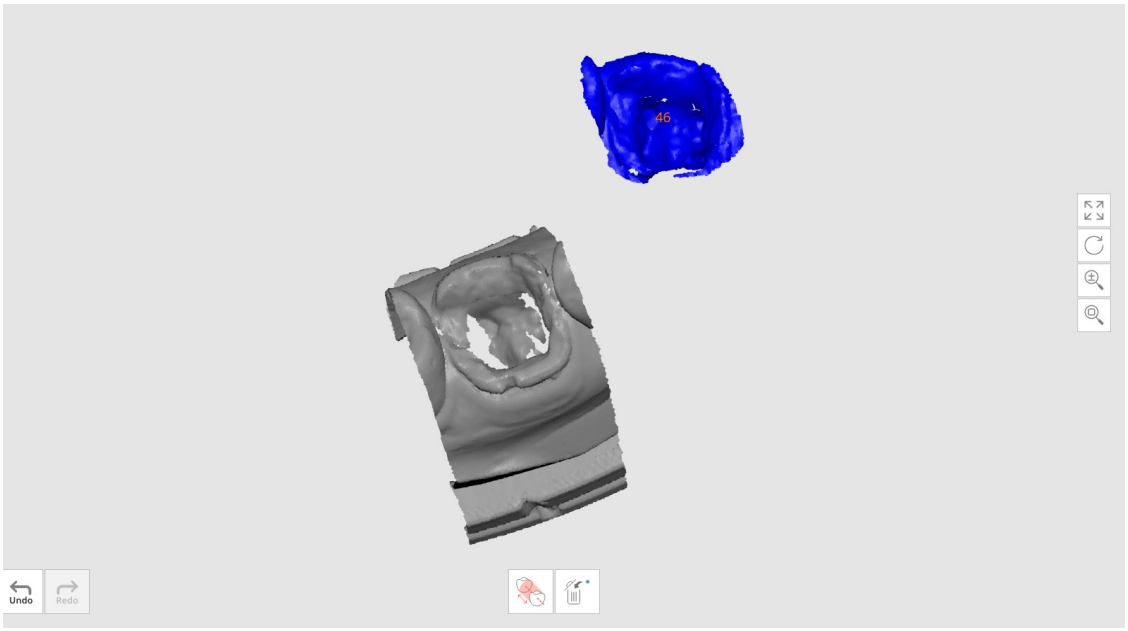


➢ Once you press '**Confirm**', you will be able to align the die scan with the model.

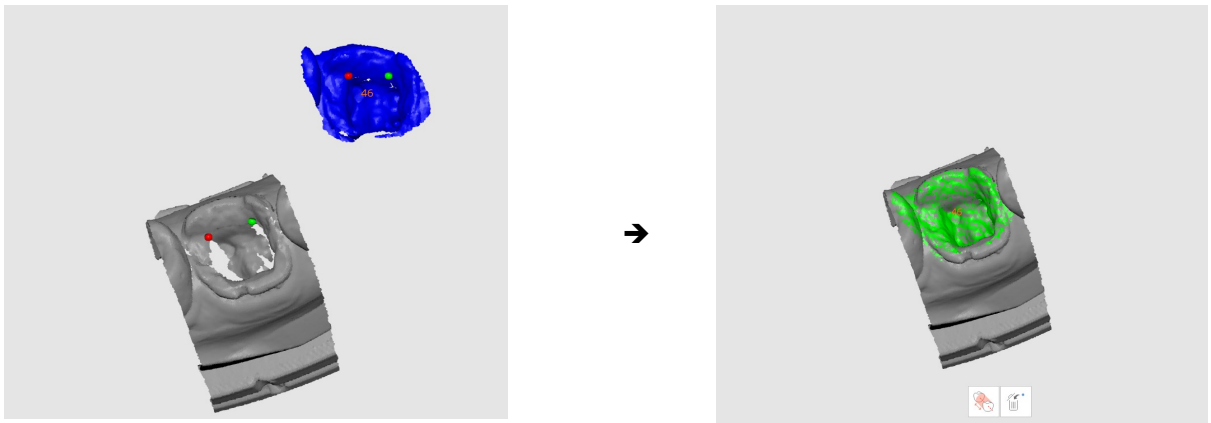


➢ Next, align the model with the impression by setting up to three corresponding points on each

data.

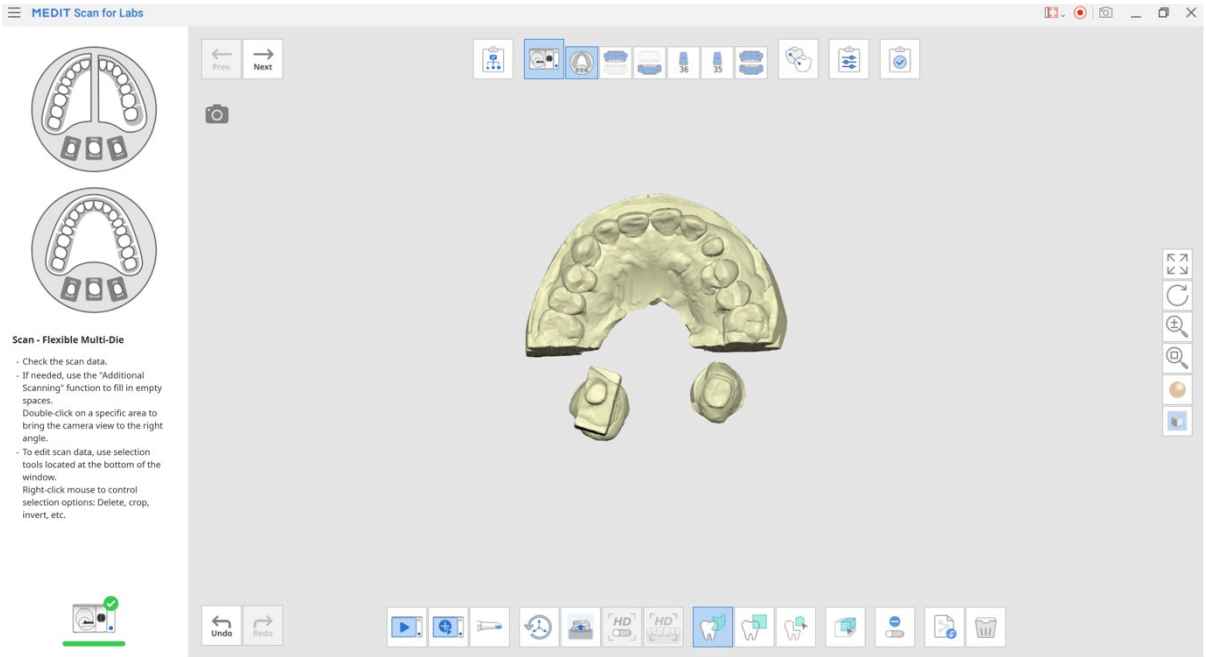


➢ The alignment will be performed as following:

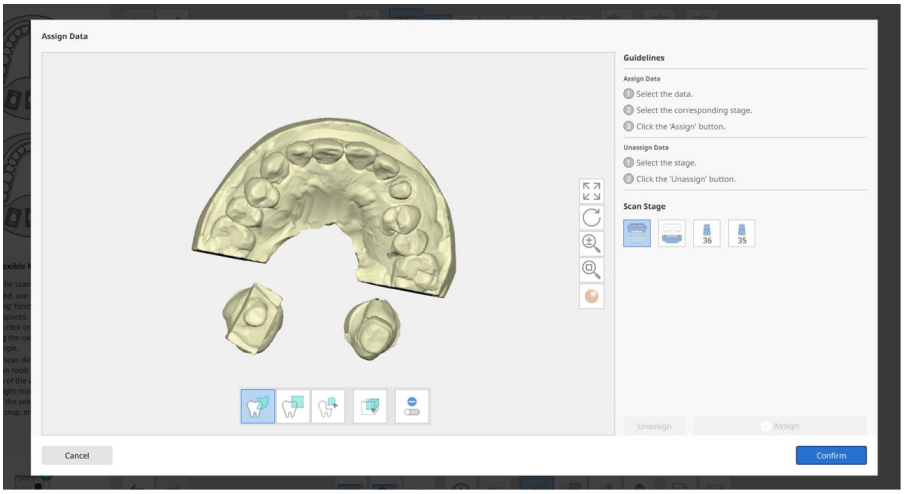


4.4 Flexible Multi-die Process

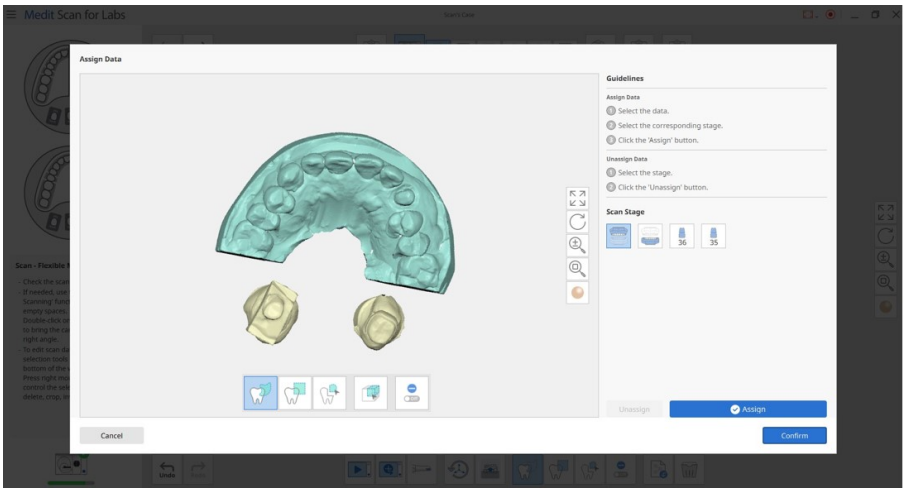
- Flexible multi-die allows to acquire data from a set of a model and prepared teeth at the same time. Its main advantage is that you can perform the scanning in one stage, and then assign the data to the corresponding elements.
  - Scan all the necessary parts at the 'Flexible Multi-die' stage.



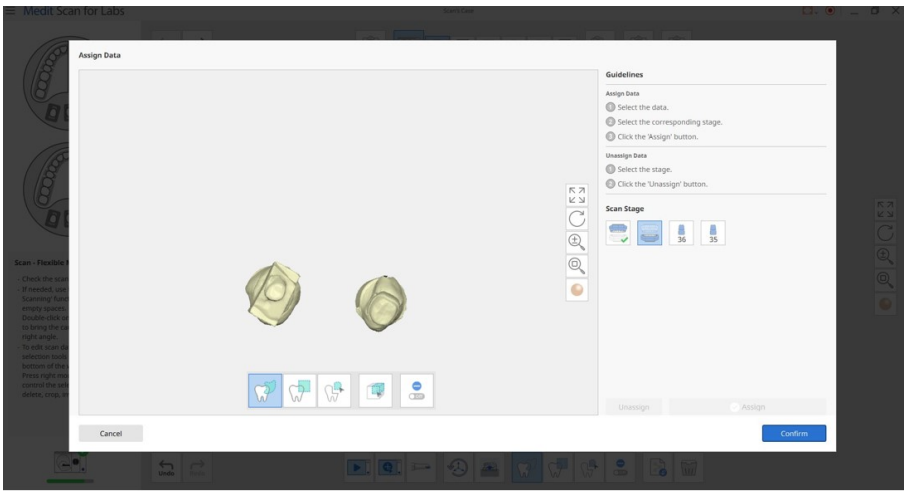
- Click on any of the following stages to select the corresponding data. A dialogue window will open.
  - You can edit the data using the tools located at the bottom of the window before proceeding.



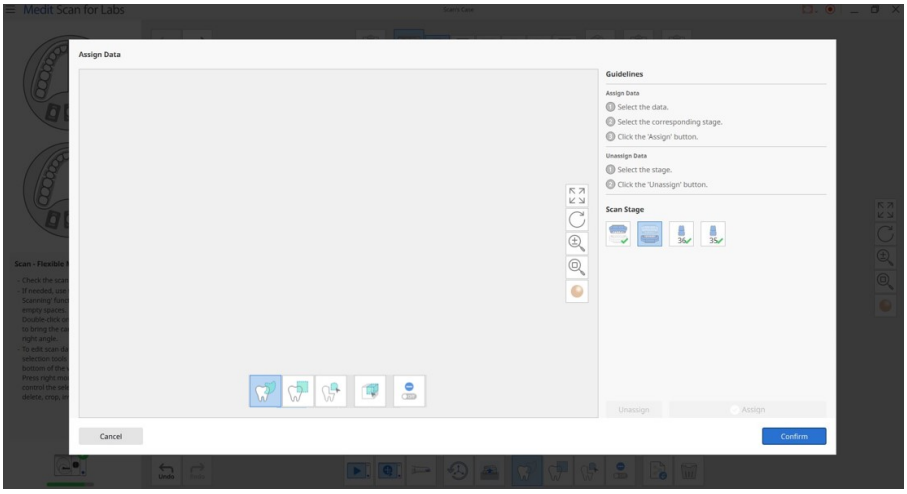
➢ Select the scan data and scan stage for assignment.



➢ Click '**Assign**' to assign the data.



➢ The remaining data is also assigned in the same way.



Precautions for the User

General Precautions

Scanner Electro–magnetic Compatibility Information

Precautions for the User

5.1 General Precautions

- This device should be used only by trained professionals.
- You should have been trained on how to use the system, or you should have read and fully understood this user guide.

▷ During Installation

- This device should be used only by trained professionals.
- Install the device in a dust-free environment with proper ventilation and minimum changes in air pressure, temperature, humidity, natrium and ions.
- Please take note of the safety conditions such as tilting the device, vibration or shock.
- Do not install in a place of a chemical storage or near gas generating points.
- Do not install in a place with poor ventilation.
- Please consider the power requirements and consumption.
- Ensure that all components provided are free from physical damage. Safety cannot be guaranteed if there is any physical damage to the unit.
- Install and use only approved programs to ensure proper functionality of the scanner system.
- Hand Hazard

Keep Hands off while operating the equipment

- To prevent access to the moving parts, distance (1.5 M) should be maintained during the installation of the PC for S/W operation.
- Access should only be made while the Moving part is not working.
- Do not access touch the moving parts during operation) and maintain a distance (1.5M) from the product.

▷ Before Using the Equipment

- Please make sure that all the components and cables are connected properly.
- The device should be recognized by Device Manager.
- Do not move the axis of scanner forcefully.

▷ Equipment Usage

- Make sure that the device does not get any shocks.
- Do not turn off the scanner during use.
- Do not block open spaces on the device while using it.
- If you see smoke or feel smell coming out of the device, turn it off immediately, disconnect the cables and contact the manufacturer.
- Unplug the power cable if the device is unattended or not in use for a long time.
- If there is a problem, do not disassemble or assemble the product on your own. After the confirmation of problem, please contact your local manufacturer for repair.
- Please do not modify the product.
- If the equipment fails to operate normally, such as having issues with accuracy, stop using the product and contact the manufacturer or authorized resellers.
- Access should only be made while the moving part is not working.
  (When turning the scanner on, when placing a model, when turning off the scanner, etc.).
- Do not touch the moving parts during scanning and maintain a distance (1.5 M) from the product.
- Do not position the equipment so that it is difficult to disconnect it.
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
- Do not place objects over 1.5 kg on the moving part.
- In case there is an error during the scanning process, it will be automatically stopped and the LED indicator light on the scanner will turn red.
  - If the LED indicator light on the scanner turns red, press the 'Initialize Axes' button in Medit Scan for Labs to fix the problem.
- LED Caution

sk Group 2

Possibly hazardous optical radiation. Do not stare at the lamp for longer periods of the during operation. Can be harmful to the eyes.

▷ Maintenance

- If the device was not in use for a long time, please make sure it is properly installed and calibrated before reusing it. (The recommended calibration period is one month.)
  - Please check if the device is taking scan data properly.
- Clean the equipment regularly with a dry cloth to avoid getting water inside the equipment.

- Make sure to unplug the power cable before examining the equipment.
- Do not spray the scanning spray into the scanner.
- Do not touch the mirror inside the scanner.
- Any parts replacement should only be done by service personnel.

▷ Disposal

- All components are designed to uphold with following Directives:
  - RoHS, Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (2011/65/EU).
  - WEEE, Waste Electrical and Electronic Equipment Directive. (2012/19/EU).

▷ Electrical Safety

- The MD-ID0400 system is a Class I device.
- To prevent electric shock, the scanner must only be connected to a power source with a protective earth connection. If you are unable to connect the supplied plug of the scanner into the main outlet, contact a qualified electrician to replace the plug or outlet. Do not try to circumvent these safety guidelines.
- There is a risk of electric shock if you attempt to access the internal parts of the scanner. This only should be done by the service personnel.

Do not connect the intraoral scanner to a regular power strip or extension cord as these connections are not as safe as grounded outlets. Failure to adhere to these safety guidelines may result in the following hazards:

- The total short circuit current of all connected equipment may exceed the limit specified in EN / IEC 60601-1.
- The impedance of the ground connection may exceed the limit specified in EN / IEC 60601-1.

- You should only disconnect the scanner from the power supply via its power cord.
- Before disconnecting the power cord, make sure to turn off the power on the device using the power switch on the main unit.
- Only use the power adaptor supplied by Medit. Using other power adaptors may result in damage to the system.
- Avoid pulling on the communication cables, power cables, etc. used in the scanner.
- The radiation characteristics of the MD-ID0400 makes it suitable for use in industry and Hospitals (CISPR 11 class A). If the MD-ID0400 system is used in a residential environment (CISPR 11 class B), it may not provide adequate protection from radio frequency communications.

▷ Storage

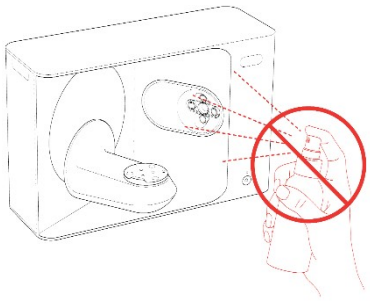
- Wipe the device surface gently with a dry cloth. Make sure that no foreign objects or liquids come in contact with it. In case of contact, wipe the surface immediately.
- Store the device in a safe place to avoid any breakage or damage.

5.2 Environmental Conditions

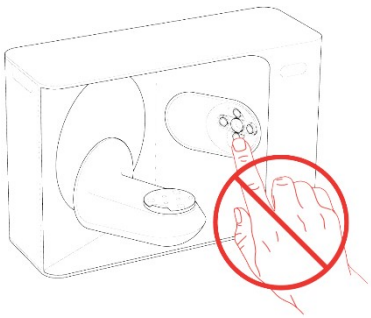
⚠ Warning: Observe the following environmental conditions:

- Operating Conditions
  - Temperature: 18 ~ 28˚C
  - Humidity: 20 ~ 75% (Non-condensing)
  - Atmospheric pressure: 800hPa ~ 1,100hPa
  - Altitude: Up to 2000m
  - Pollution degree 2
  - Indoor use

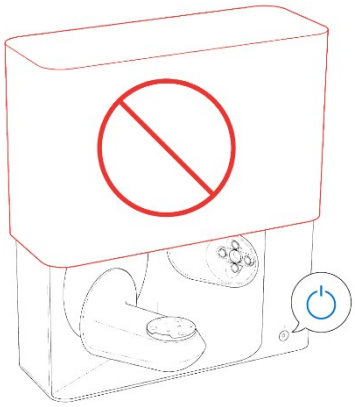
- Storage & Transportation Conditions
  - Temperature: -5˚C ~ 45˚C
  - Humidity: 20 ~ 80% (Non-condensing)
  - Atmospheric pressure: 800hPa ~ 1,100hPa (No condensation)



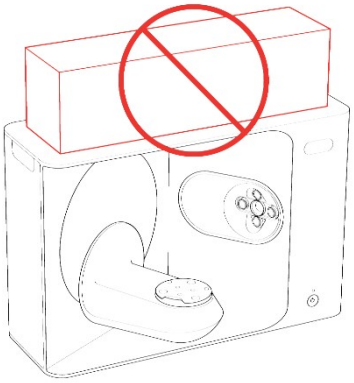
Do not sprinkle spray inside the scanner



Do not touch the mirror



Do not operate the scanner with the cover on



Do not store items on top of the scanner

5.3 Electro–magnetic Compatibility Information

▷ Electro-Magnetic Emissions

This MD-ID0400 is intended for use in the electromagnetic environment as specified below. The customer or the user of the MD-ID0400 should ensure that it is used in such an environment.

Emission Test	Compliance	Electromagnetic Environment - Guidance
RF Emissions CISPR 11	Group 1	The MD-ID0400 uses RF energy only for its internal functions. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF Emissions CISPR 11	Class A	The EUT is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations/ Flicker emissions	Complies	

⚠Warning: This MD-ID0400 is intended for use by healthcare professionals only. This equipment/ system may cause radio interference or may disrupt the operation of nearby equipment. It may be necessary to take mitigation measures, such as re-orienting or relocating the MD-ID0400 or shielding the location.

▷ Electro-Magnetic Immunity

Guidance 1

This MD-ID0400 is intended for use in the electromagnetic environment as specified below. The customer or the user of the MD-ID0400 system should ensure that it is used in such an environment.

Immunity Test	IEC 60601 test level	Compliance level	Electromagnetic environment - guidance
Electrostatic discharge (ESD) IEC 61000-4-2	± 8 kV contact ± 2 kV, ± 4 kV, ± 8 kV, ± 15 kV air	± 8 kV contact ± 2 kV, ± 4 kV, ± 8 kV, ± 15 kV air	Floors should be of wood, concrete or ceramic tiles. If floors are covered with a synthetic material, the relative humidity should be at least 30% is recommended.

Electrical fast transient/burst IEC 61000-4-4	±2 kV (for power supply lines)±1 kV (for input/output lines)	±2 kV (for power supply lines) ±1 kV (for input/output lines)	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±0.5 kV, ±1 kV differential mode ± 0.5 kV, ±1 kV, ±2 kV common mode	±0.5 kV, ±1 kV differential mode ± 0.5 kV, ±1 kV, ±2 kV common mode	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips IEC 61000-4-11	0% U_T (100% dip in U_T) for 0.5 cycle at 50Hz or 1 cycle at 60 Hz	0% U_T (100% dip in U_T) for 0.5 cycle at 50Hz or 1 cycle at 60 Hz	Mains power quality should be that of a typical commercial or hospital environment. If the user of the MD-ID0400 image intensifier requires continued operation during power mains interruptions, it is recommended that the MD-ID0400 image intensifier be powered from an uninterruptible power supply or a battery.
Short interruptions 61000-4-11	70% U_T (30% dip in U_T) for 20 cycles at 50Hz or 30 cycle at 60 Hz	70% U_T (30% dip in U_T) for 20 cycles at 50Hz or 30 cycle at 60 Hz	
Voltage variations on power supply input lines 61000-4-11	0% U_T (100% dip in U_T) for 250 cycles at 50Hz or 300 cycle at 60 Hz	0% U_T (100% dip in U_T) for 250 cycles at 50Hz or 300 cycle at 60 Hz	
Power frequency magnetic fields (50/60Hz) IEC 61000-4-8	30 A/m	30 A/m	Power frequency magnetic fields should be at levels characteristic of a location in a typical commercial or hospital environment.
NOTE: UT is the main voltage (AC) prior to the application of the test level.			

Guidance 2

Recommended separation distances between portable and mobile communication equipment and the MD-ID0400.

The MD-ID0400 is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the MD-ID0400 can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the MD-ID0400 as recommended below, according to

the maximum output power of the communications equipment.

Rated maximum output power of transmitter [W]	Separation distance according to frequency of transmitter [m]				
	IEC 60601-1-2: 2007			IEC 60601-1-2: 2014	
	150 kHz to 80 MHz d = 1.2√P	80 MHz to 800 MHz d = 1.2√P	800 MHz to 2.5 GHz d = 2.3√P	150 kHz to 80 MHz d = 1.2√P	80 MHz to 2.7 GHz d = 2.0√P
0.01	0.12	0.12	0.23	0.12	0.20
0.1	0.38	0.38	0.73	0.38	0.63
1	1.2	1.2	2.3	1.2	2.0
10	3.8	3.8	7.3	3.8	6.3
100	12	12	23	12	20
For transmitters rated at a maximum output power not listed above, the recommended separation distance d in metres (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer. NOTE 1) At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies. NOTE 2) These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection fromtructures, objects and people.					

Guidance 3

The MD-ID0400 is intended for use in the electromagnetic environment specified below. The customer or the user of the MD-ID0400 should assure that it is used in such an environment.

Immunity Test	IEC 60601 test level	Compliance level	Recommended separation distance(d)	Electromagnetic environment - guidance
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz – 80 MHz Outside ISM Bands[c] 6 Vrms 150 kHz – 80 MHz In ISM Bands[c]	3Vrms	d = 1.2√P	Portable and mobile RF communications equipment, including cables, should be used no closer to any part of the MD-ID0400 than the recommended separation distance as calculated using the equation below,

				according to the frequency of the transmitter.
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.7 GHz	6 V/m	IEC 60601-1-2:2007 d = 1.2√P 80 MHz to 800 MHz d = 2.3√P 80 MHz to 2.5 GHz IEC 60601-1-2:2014 d=2.0√P 80 MHz to 2.7 GHz	Where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey[a] should be less than the compliance level in each frequency range[b] Interference may occur in the vicinity of equipment marked with following symbol: 

- NOTE 1: At 80 MHz and 800 MHz, the higher frequency range applies.
- NOTE 2: These guidelines may not apply in all situations, Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

a) Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted heoretically with accuracy.
To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the MD-ID0400 is used exceeds the applicable RF compliance level above, the MD-ID0400 should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the MD-ID0400.

b) When the frequency range exceeds 150 kHz – 80 MHz, the electric field strength should be not higher than 3 V/m.

c) The ISM (Industrial, Scientific and Medical) bands between 150 kHz and 80 MHz are 6.765 MHz to6.795MHz; 13.553 MHz to 13.567 MHz; 26.957 MHz to 27.283 MHz; and 40.66 MHz to 40.70 MHz

Guidance 4

The MD-ID0400 is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. Portable RF communications equipment should be used no closer than 30cm (12 inches) to any part of the MD-ID0400. Otherwise, degradation of the performance of this equipment could result.

Immunity test	Band	Service	Modulation	IEC60601 test level	Compliance level
Proximity fields From RF wireless Communications IEC61000-4-3	380 - 390 MHz	TETRA 400	Pulse modulation 18Hz	27 V/m	27 V/m
	430 – 470 MHz	GMRS 460 FRS 460	FM ±5 kHz deviation 1 kHz sine	28 V/m	28 V/m
	704 – 787 MHz	LTE Band13, 17	Pulse modulation 217Hz	9 V/m	9 V/m
	800 – 960 MHz	GSM800: 900 TETRA 800 iDEN 820 CDMA 850 LTE Band 5	Pulse modulation 18 Hz	28 V/m	28 V/m
	1700 – 1990 MHz	GSM 1800 CDMA 1900 GSM 1900 DECT LTE Band 1,2,4,25 UMTS	Pulse modulation 217Hz	28 V/m	28 V/m
	2400 – 2570 MHz	Bluetooth WLAN 802.11b/g/n RFID 2450 LTE Band 7	Pulse modulation 217Hz	28 V/m	28 V/m
	5100 – 5800 MHz	WLAN 802.11a/n	Pulse modulation 217Hz	9 V/m	9 V/m

● NOTE: If necessary to achieve the IMMUNITY TEST LEVEL, the distance between the transmitting antenna and the ME EQUIPMENT or ME SYSTEM may be reduced to 1m. The 1m test distance is permitted by IEC 61000-4-3.
a) For some services, only the uplink frequencies are included. b) The carrier shall be modulated using a 50% duty cycle square wave signal. c) As an alternative to FM modulation, 50% pulse modulation at 18 Hz may be used because while it does not represent actual modulation, it would be worst case.

Manufacturer

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