Crown Fit

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Medit Crown Fit

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Overview and General Information

Overview

Medit Crown Fit is a software designed to facilitate digital fitting tests of milled prostheses by aligning them with scan data of prepared teeth. Fitting tests can be performed for both crowns and bridges. Additionally, the software enables comparison between milled crown data and its CAD design, aiding in the inspection of milling machine or 3D printer accuracy. Medit Crown Fit also includes features for measurement-taking and data transformation when necessary.

This application can be accessed and utilized from both clinic and lab accounts within Medit Link.

Intended Use and Disclaimer

Medit Crown Fit was not developed for medical or clinical use. As such, it cannot be used for the following purposes:

- diagnosing, treating, mitigating, or preventing diseases/injuries/disorders.
- inspecting, replacing, or transforming a structure or function.

The software is meant to be used as a visual aid during patient consultations or as a tool for analysis tasks. The generated simulation and analysis results should not be used as the sole source of healthcare guidance.

Medit does not take responsibility for any miscommunication or improper use of the software and is not liable to either the user or the patient for any decisions or actions taken based on the information given by the software. The user assumes full responsibility for the following:

- generated results and their further interpretation and communication to the patient
- informing the patients that the results produced by the software may not be precise or reliable
- actions and treatment decisions based on the generated results

System Requirements

Windows

CPU	Intel Core i5 2.6 GHz or higher
RAM	16 GB or higher
Graphics	NVIDIA GeForce GTX 1060 (2 GB) or higher
OS	Windows 10 64-bit, Windows 11 64-bit

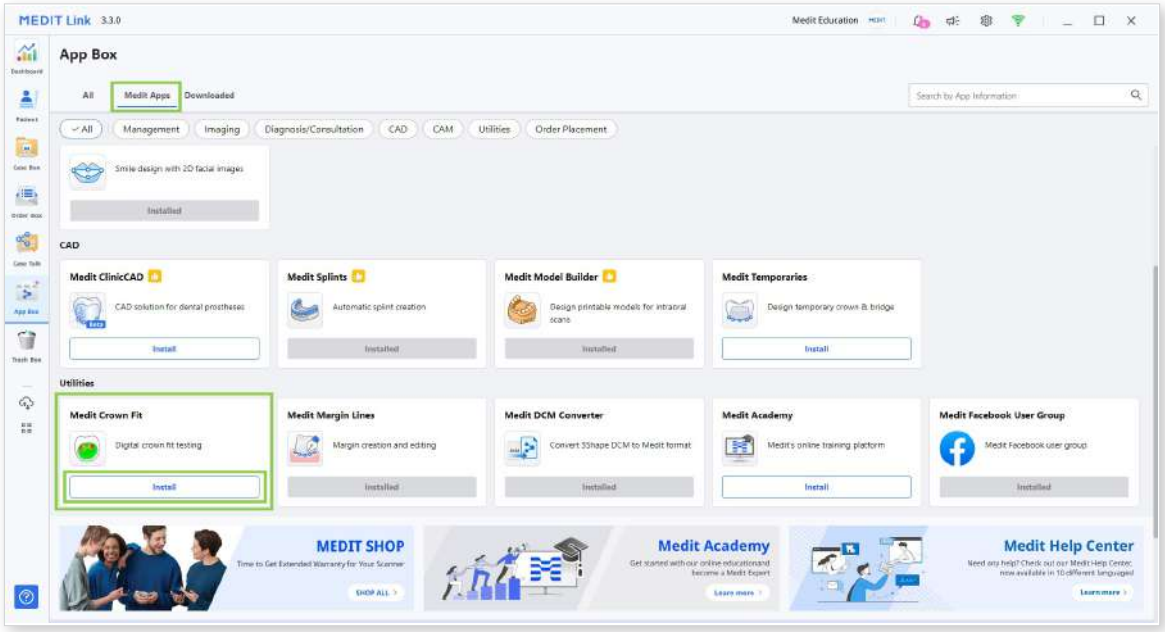
macOS

CPU	8-core or higher
RAM	16 GB or higher
Chip	M1/M2 or higher
OS	Monterey 12

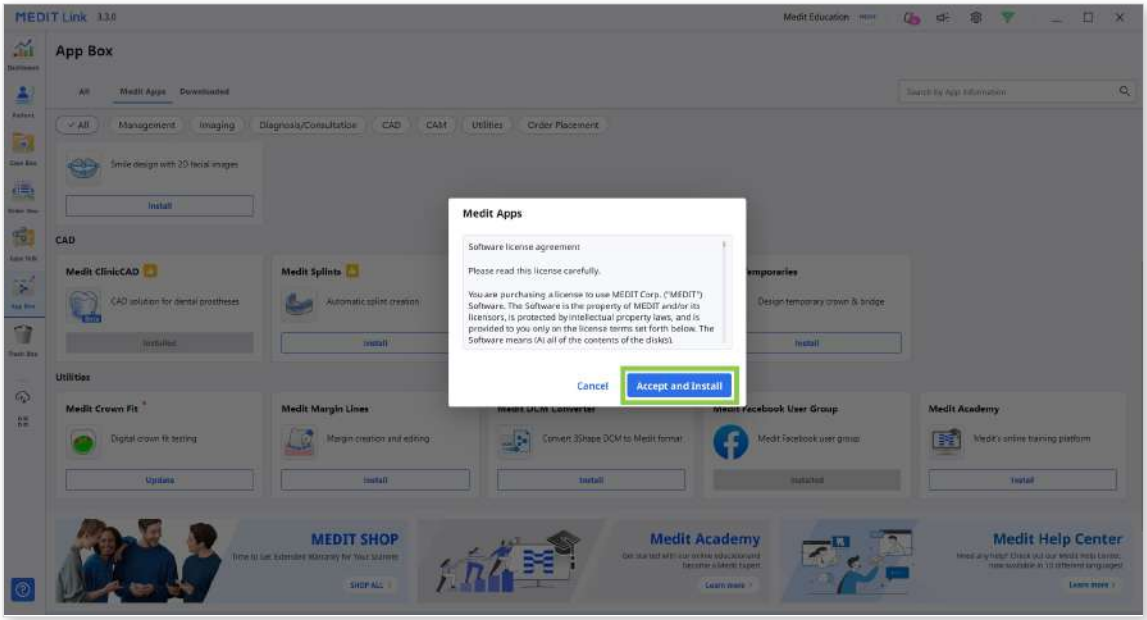
Installation Guide

① Log into your Medit Link account and go to the App Box on the left-hand menu.

② In the Medit Apps tab, find the Medit Crown Fit app and click "Install."



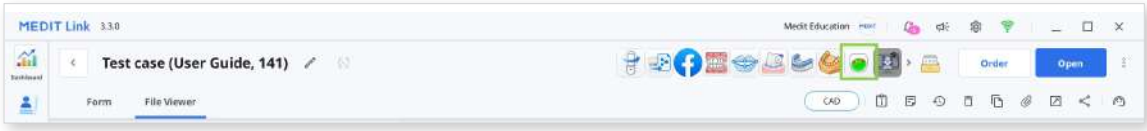
③ Read the Software License Agreement and confirm app installation by clicking "Accept and Install."



④ The app will be downloaded and installed automatically. It may take several minutes to finish the installation process.

> ⚠ Do not turn off the PC or close Medit Link during the installation process.

⑤ Once the app is installed, you can run it from any case in Medit Link by clicking the app icon in the top right corner of the Case Detail window.



Data Management

Preparing Data

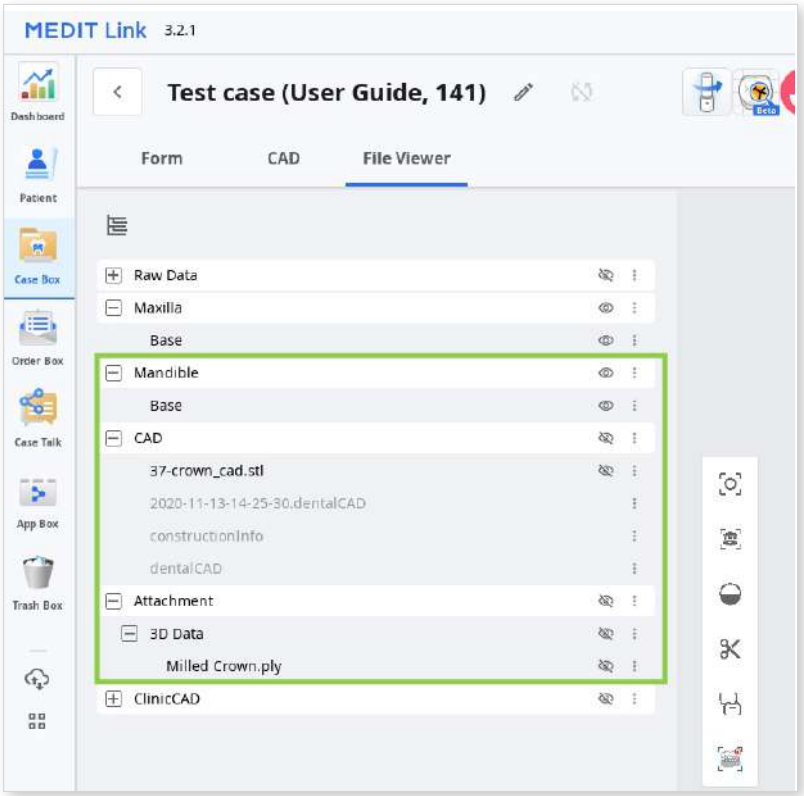
Users must have the following data to use the app:

- CAD design data of the prosthesis (crown/bridge)
- scan data of a milled or printed prosthesis
- intraoral scan data of the corresponding arch

All the above data should be gathered within the same Medit Link case to ensure automatic import into the app upon launch. There are two ways to gather data in one case:

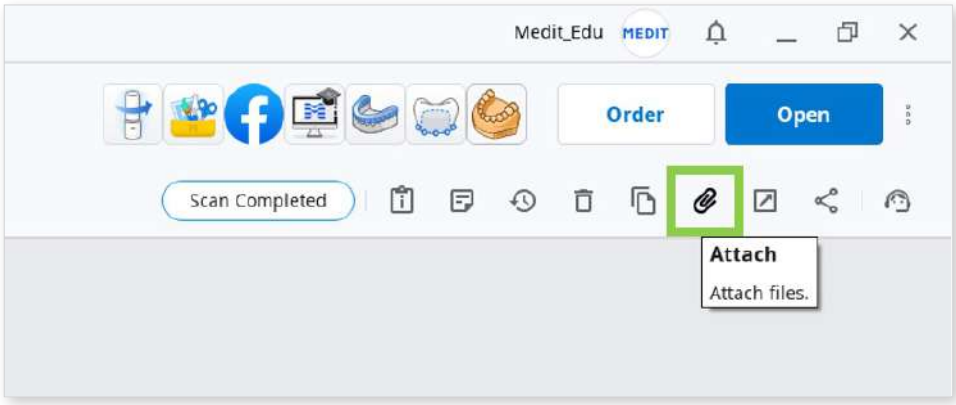
① Complete scanning and design via Medit Link

Complete intraoral scanning in the Medit Scan for Clinics or Labs and design the prosthesis in Medit ClinicCAD or exocad. All created data will be automatically saved within the corresponding case.



② Attaching data to the case

Use the "Attach" in the Case Detail window to import local files into the Medit Link case.



3D Data Control

Users can control the 3D data using a mouse alone or both mouse and keyboard.

3D data control using a mouse

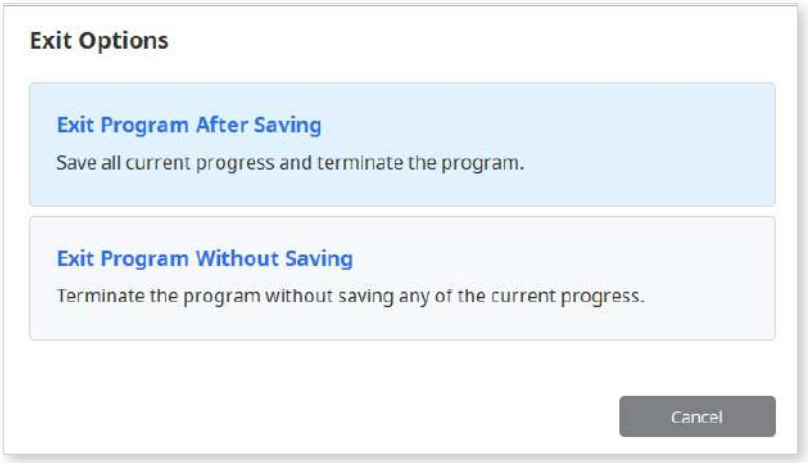
Zoom	Scroll the mouse wheel.	
Zoom Focus	Double-click on the data.	
Zoom Fit	Double-click on the background.	
Rotate	Right-click and drag.	
Pan	Hold both buttons (or wheel) and drag.	

3D data control using a mouse and keyboard

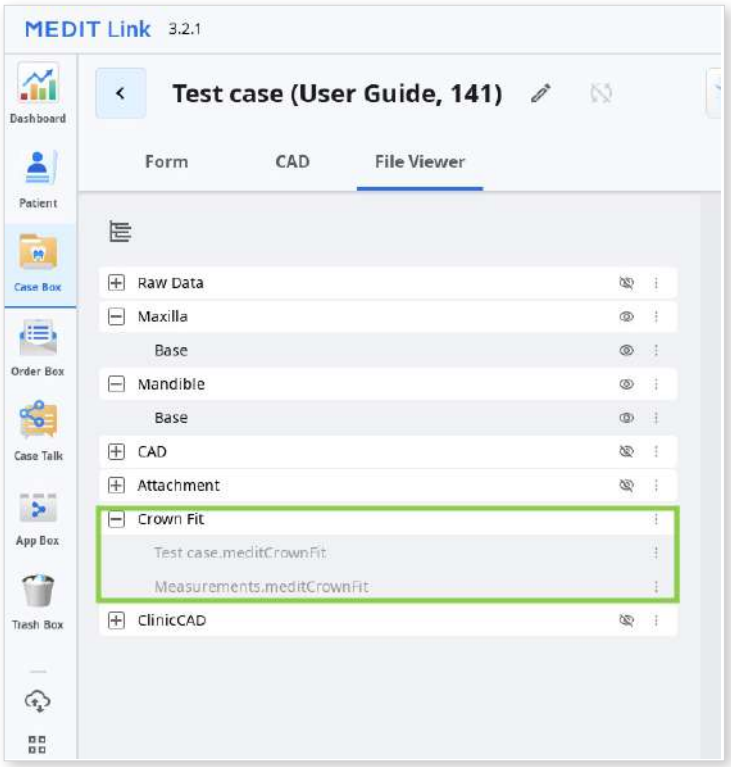
	Windows	macOS
Zoom	Shift +	⇧ +
Rotate	Alt +	⌥ +
Pan	Ctrl +	⌘ +

Saving Project

Medit Crown Fit does not produce any outcome that can be saved as a result file. However, users can preserve their work progress if needed by saving the project when exiting the program.



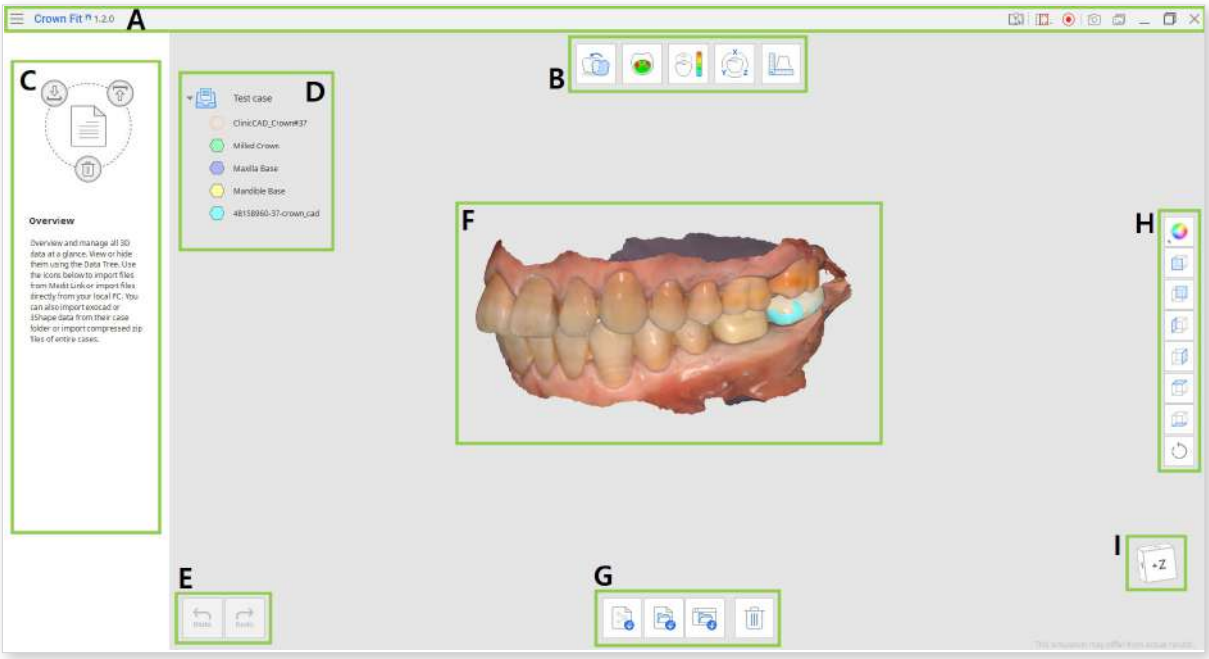
If you choose to save your progress, a project file will be created in the case, containing details on data alignment, transformation, and measurement results. To reopen an existing project, run the app from the same case.



You can also save your measurement results using the "Screenshot" feature in the Title Bar.

User Interface

User Interface at a Glance



A	Title Bar
B	Workflow Steps
C	Guide Message Panel
D	Data Tree
E	Action Control Buttons
F	3D Data
G	Toolbox
H	Side Toolbar
I	View Cube

Title Bar

The Title Bar is the ribbon at the top of the application window that contains basic controls on the right and the program menu on the left. It also shows the app name.

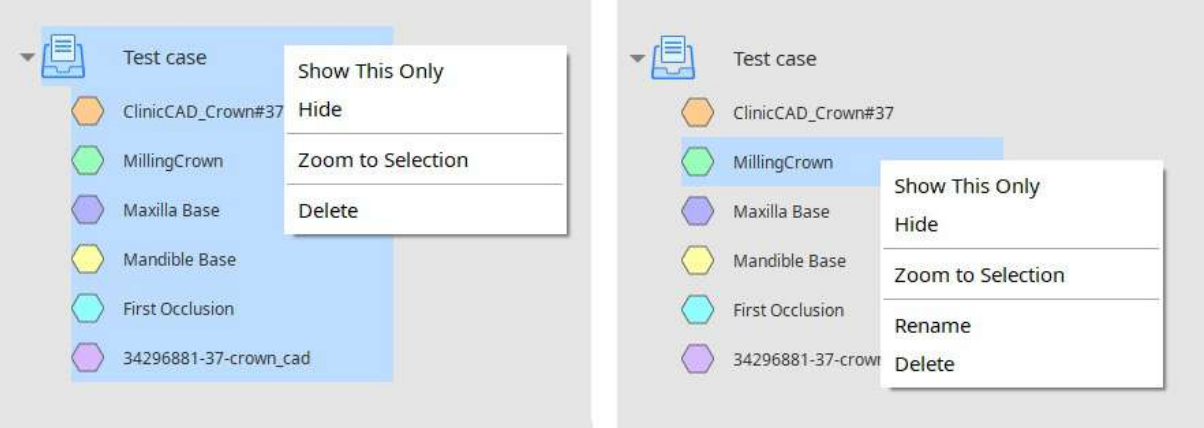
	Menu	Manage the opened project, access available assistance resources (user guide, tutorial page, help center), and check app details and settings.
	Help Center	Go to the Medit Help Center page dedicated to this app.
	Select Video Record Area	Specify which area shall be captured for video recording.
	Start/Stop Video Recording	Start and stop the video recording of the screen.
	Screenshot	Take a screenshot. Capture the app with or without the title bar using automatic selection, or click and drag to capture only the desired area.
	Screenshot Manager	View, export, or delete the screenshots. Upon completion, all captured images will be saved to the case automatically.
	Minimize	Minimize the application window.
	Restore	Maximize or restore the application window.
	Exit	Close the application.

Data Tree

The Data Tree is located on the left side of the screen, showing the data you use for the current project in groups. You can control each data visibility by clicking its icon in the tree or change its transparency by moving its slider.

Data grouping will vary depending on the step you are working in and its goals.

Right-click the data or data group to see the context menu for more data control.



Show This Only	Display only the chosen data and hide all others.
Show/Hide	Show or hide the chosen data.
Zoom to This Data	Zoom fit on the chosen data.
Rename	Change the name of the data. Note that the name of the file in Medit Link will not change.
Delete	Delete data from the Data Tree in this project. Note that the file will not be deleted from the case in Medit Link.

Action Control Buttons

There are two buttons for action control - Undo and Redo. Both are located in the bottom left corner of the application window.

Undo	Undo	Undo the previous action.
Redo	Redo	Redo the previous action.

Toolboxes

The Toolbox of each step provides features necessary for completing the primary goal of that step. Below are the explanations for the features provided in each Toolbox across the entire app.

Overview

	Import Medit Link Files	Import 3D files from Medit Link.
	Import Local Files	Import local files saved on your computer.
	Import exocad/ 3Shape Folder	Import an exocad or 3Shape folder.
	Delete Data	Select data to be deleted.

Crown Alignment

	Reassign Data	Change the assignment for prepared teeth, CAD, and milled prosthesis data.
	Align Crown Data	Automatically align milled prosthesis and CAD data.
	Align Selected Areas	Perform alignment of the milled prosthesis and CAD data only within a selected area.
	Detach Data	Detach the aligned data and bring it to the original position.

Crown Fitting Test/Deviation Display

	Reassign Data	Change the assignment for prepared teeth, CAD, and milled prosthesis data.
	Color Map On/Off	Turn the Color Map on and off.
	Delete Measurement Results	Delete deviation measurement results by clicking on each of them.
	Create Sections	Create section lines.

Data Transformation

	Scale	Set values for the X, Y, or Z axes to scale data.

Measurements

	Create Sections	Create section lines.
	View Perpendicularly to Section Line	Orient the view perpendicularly to the section line.
	Measure Distance by One Point	Measure the shortest distance to the adjacent 3D data or line.
	Measure Distance by Two Points	Measure the distance between two points.
	Measure Distance by Three Points	Measure the distance between a point and the line defined by another two points.
	Measure Length by One Point	Measure the length of the section line by one point.
	Measure Length by Two Points	Measure the length of a segment by two points.
	Measure Angle by Three Points	Measure the angle between the lines made with three points.
	Measure Angle by Four Points	Measure the angle between the lines made with four points.
	Calculate Area by One Point	Calculate the area of the section line by one point.
	Calculate Area by Two Points	Calculate the area of the segment by two points.
	Calculate Area by Selection	Calculate the selected area.
	Delete Measurement Results	Delete measurement results and section lines by clicking on each of them.

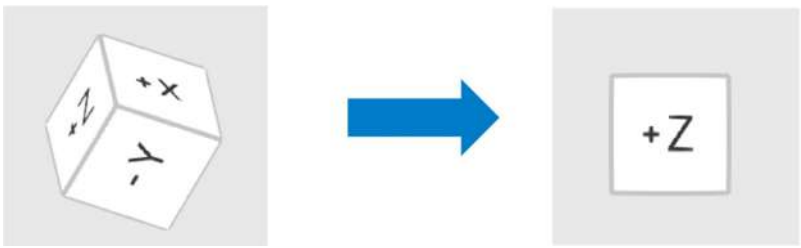
Side Toolbar

The Side Toolbar provides data visualization and control tools that can be used across all workflow steps.

	Data Display Mode	Change between different data display options. (Textured/Textured with Edges/Monochrome/ Monochrome with Edges/Wire-Frame)
	+Z Axis View	See the front view.
	-Z Axis View	See the back view.
	-X Axis View	See the left view.
	+X Axis View	See the right view.
	+Y Axis View	See the top view.
	-Y Axis View	See the bottom view.
	Rotate	Rotate data by click-and-drag.

View Cube

The View Cube shows the 3D view orientation; it rotates simultaneously with the 3D data to help understand data positioning within a three-dimensional space. You can click on the visible faces of the cube to rotate data and see it from a specific viewpoint.



Workflow

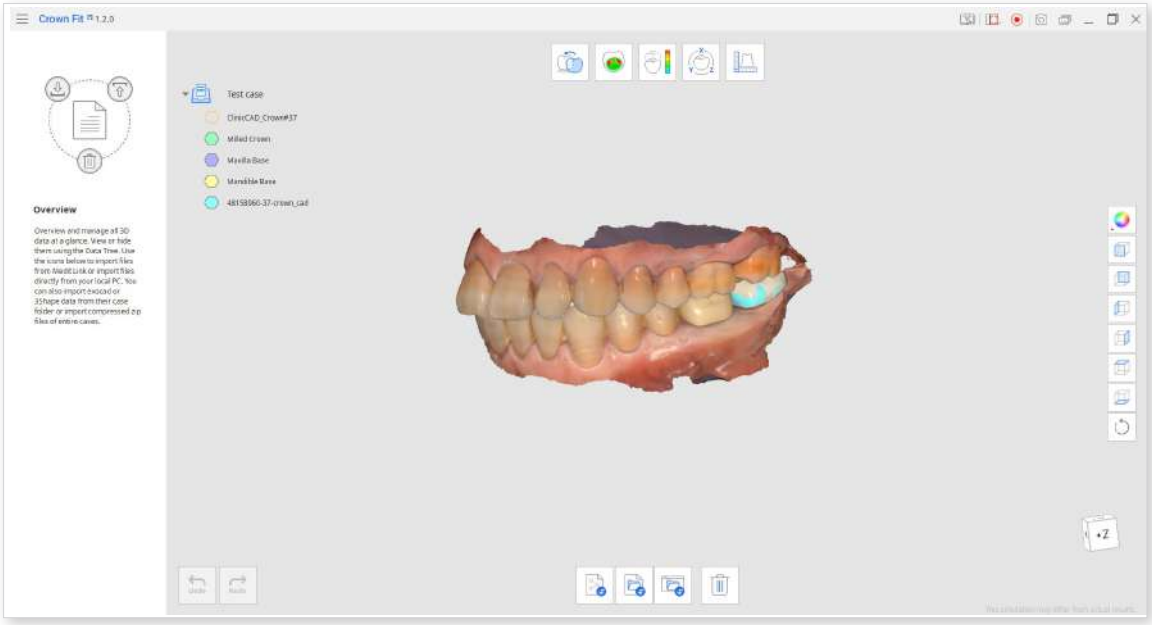
The workflow in Medit Crown Fit includes 6 steps. There is no specific order in which the steps should be used; users can change between them as needed.

Workflow Steps

	Overview	Check the imported scan data. Add or delete data used for the current project. Click the icon of the step you are working in to enter this step.
	Crown Alignment	Align the milled/printed prosthesis with the CAD data to fit it on the prepared teeth data.
	Crown Fitting Test	See the deviation results between the prepared teeth data and the milled/printed prosthesis data to check the crown fitting.
	Deviation Display	See the deviation results between the CAD and milled/printed prosthesis data.
	Data Transformation	Adjust the milled/printed scan data along the axes.
	Measurements	Create section lines to measure distances, angles, and lengths and calculate areas on the 3D data.

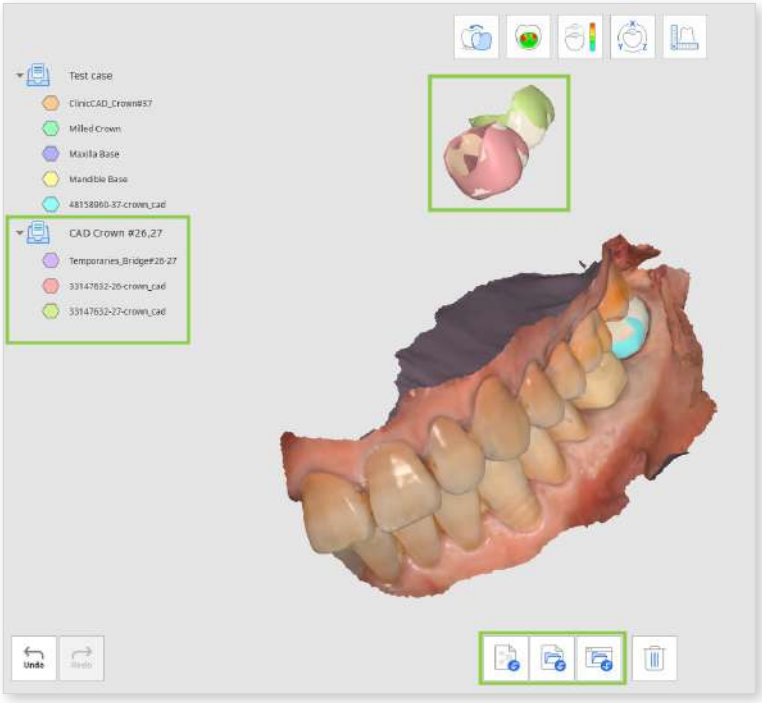
Overview

In this step, users can review data that has been automatically imported from the case. They can also add or remove any data as needed for the current project. To enter this step, click the icon of the step you are currently working in.



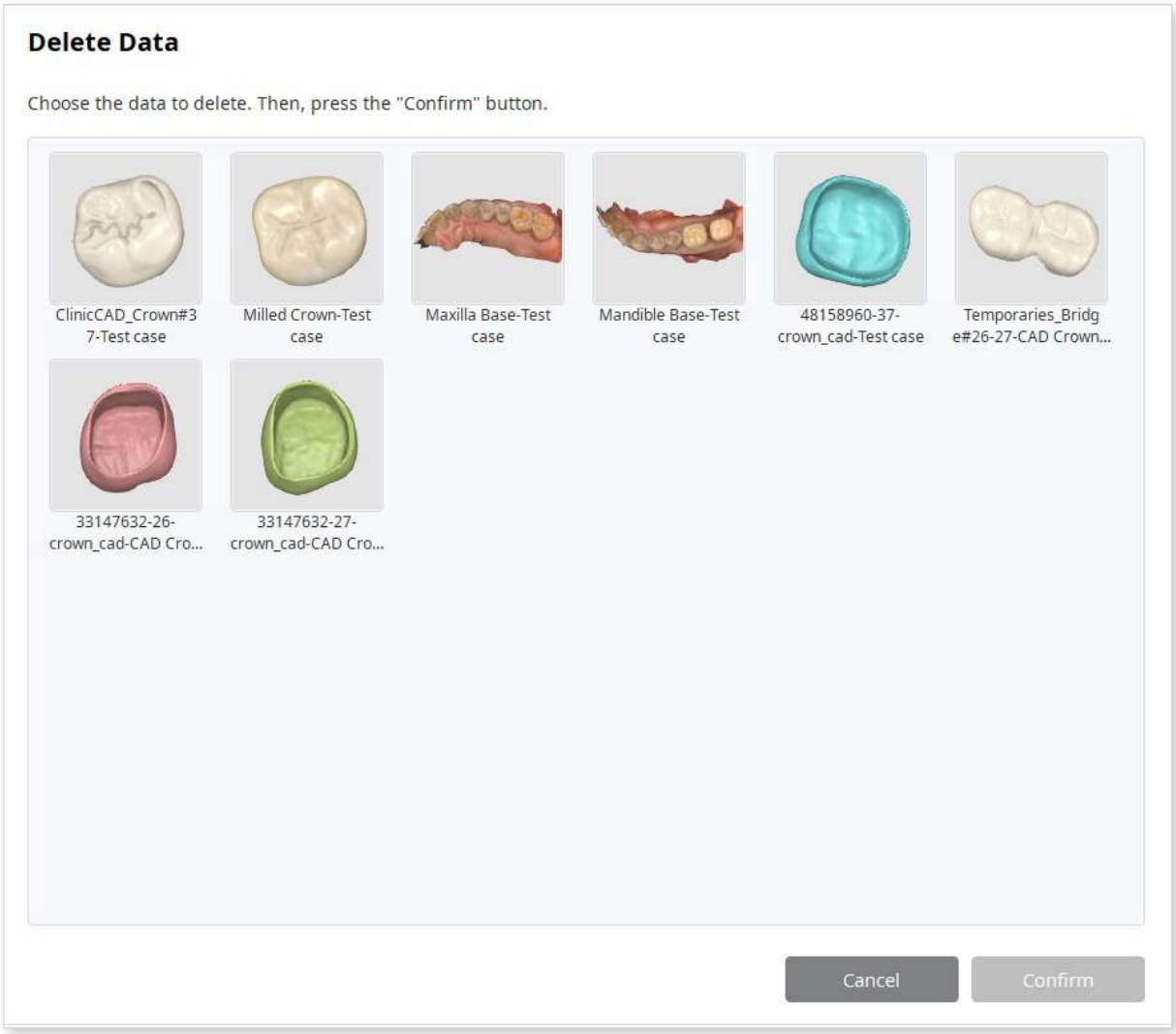
How to add data to the project

To bring in additional data for the opened project, use the import features provided at the bottom of the screen. Using them, you can import data from the other Medit Link cases, any locally stored files, or even a folder with data from exocad or 3Shape. New data will be organized as a separate group in the Data Tree.



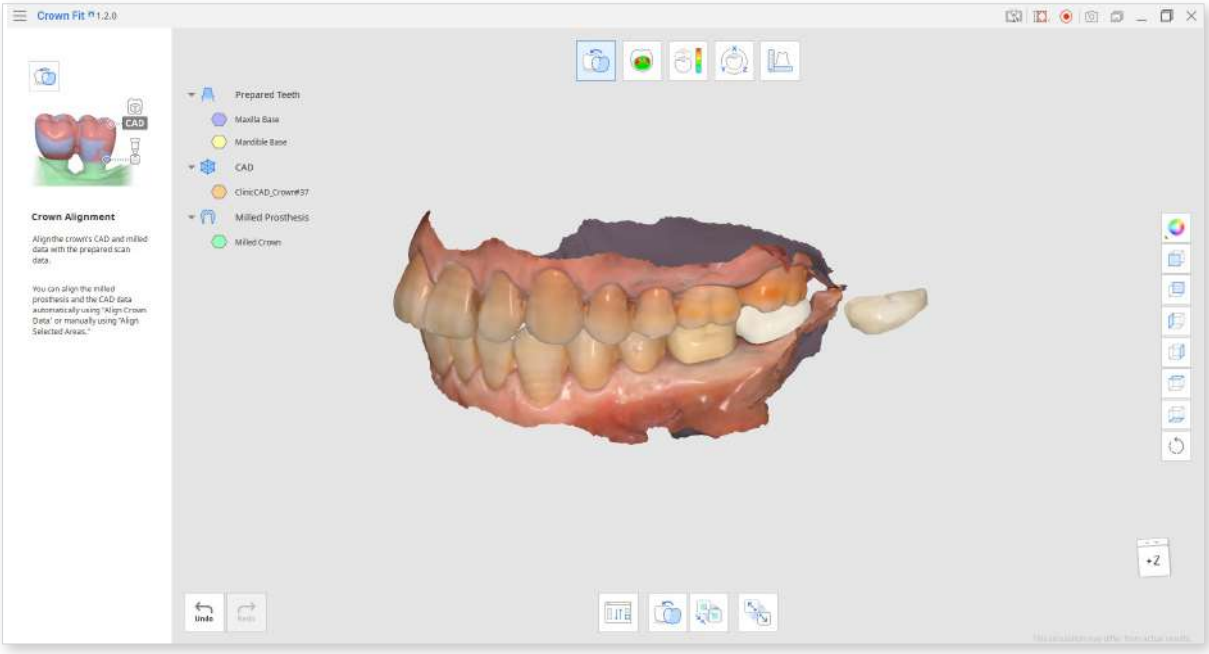
How to remove data from the project

To remove data from the current project, use the "Delete Data" feature at the bottom. In the opened window, select the data you want to remove and click "Confirm."



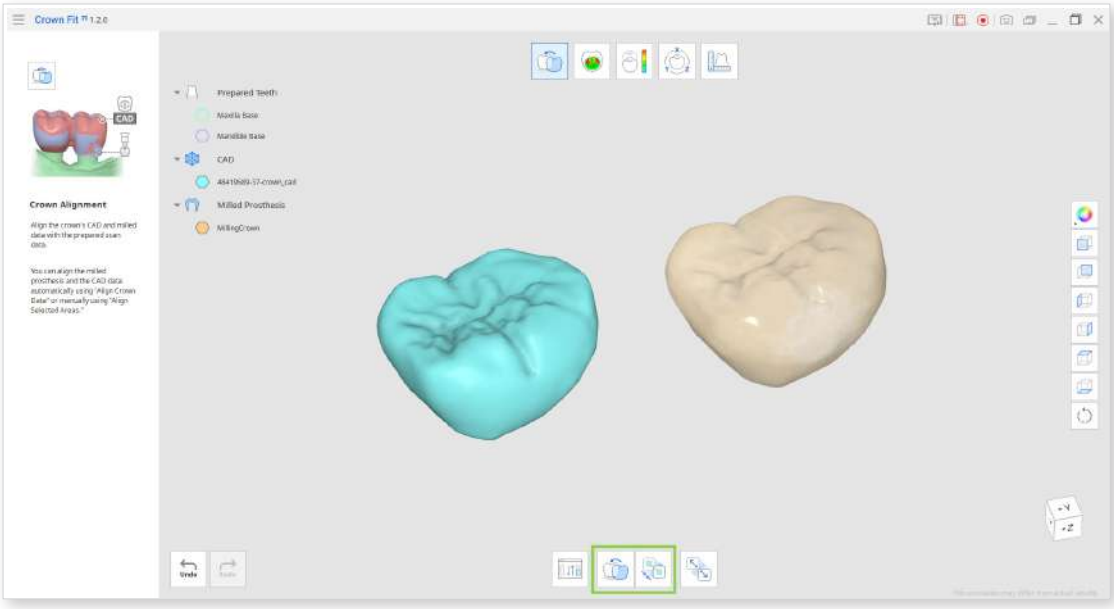
Crown Alignment

In this step, the user can align all imported data to see a simulation of the crown fit test. Aligning data ensures that it is properly positioned and integrated for further analysis.

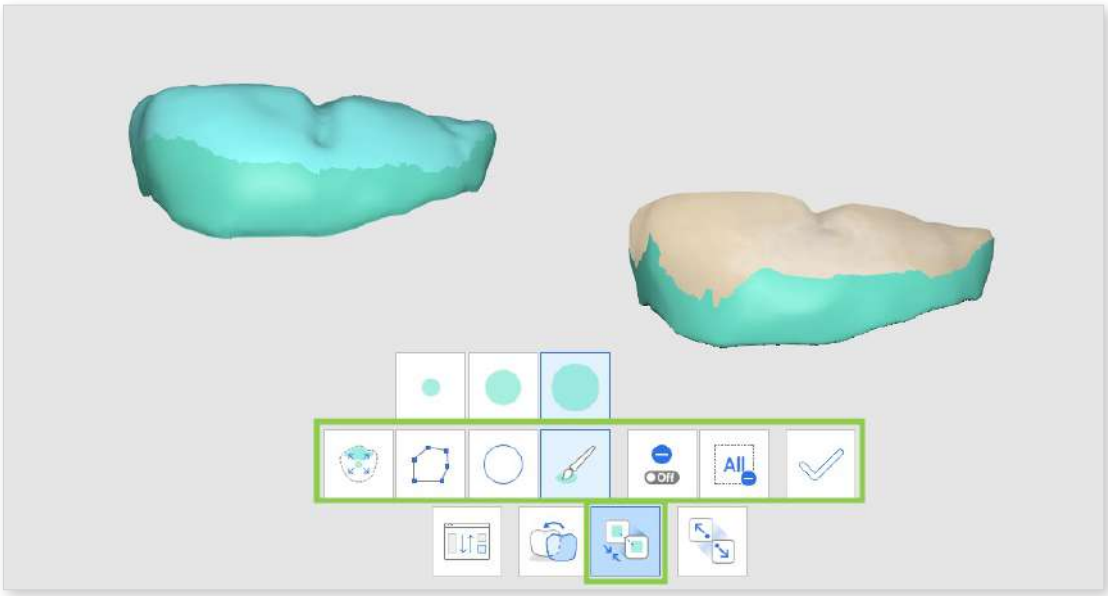


- First, you must align all crown data - the CAD design and the milled/printed crown scan data. This can be done automatically using "Align Crown Data" or manually using "Align Selected Areas."

> Hide the prepared teeth data in the Data Tree for more comfort.



When aligning crown data manually, you need to select the same areas on the two data to complete the alignment.



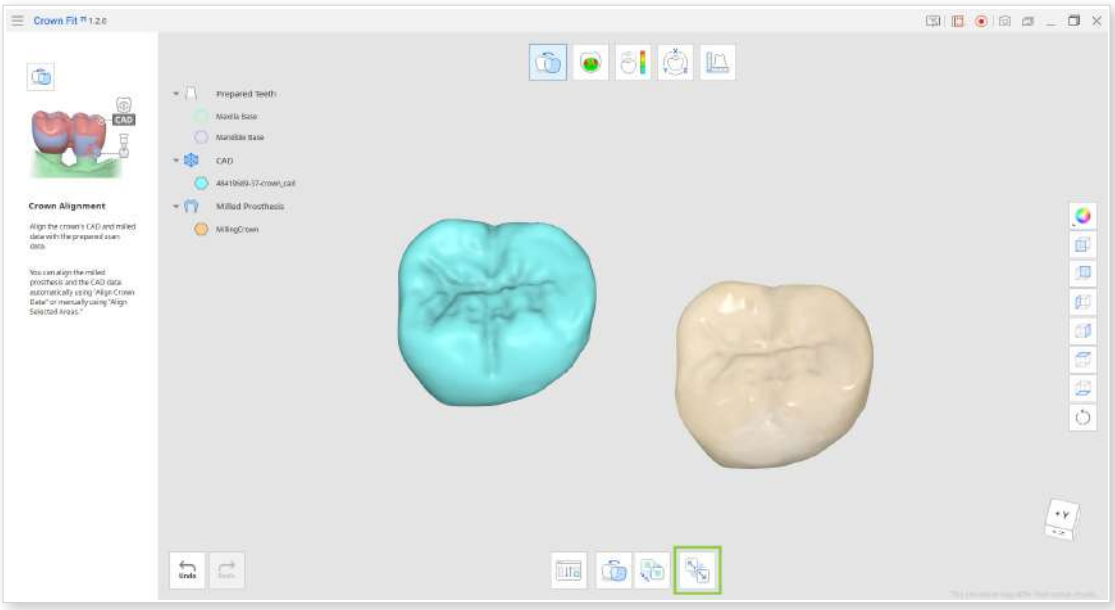
Use one of the below selection tools to designate an area on the data and click "Apply."

	Smart Single Tooth Selection	Automatically select the area of a single tooth with a click. You can click or drag on the tooth.
	Polyline Selection	Select all entities within a polyline shape drawn on the screen.
	Circle Selection	Select all entities within the circular area.
	Brush Selection	Select all entities on a freehand-drawn path on the screen. Only the front face will be selected. The brush comes in 3 different sizes.
	Apply	Complete alignment based on the selected areas.

If needed, the selection tools can also be used to deselect by turning on "Deselection Mode." You can also remove all selections at once with "Clear All Selection."

	Deselection Mode	When on, the user can deselect areas using selection tools.
	Clear All Selection	Clear all selected areas.

- If the alignment is not satisfactory, use the "Detach Data" feature to start over.

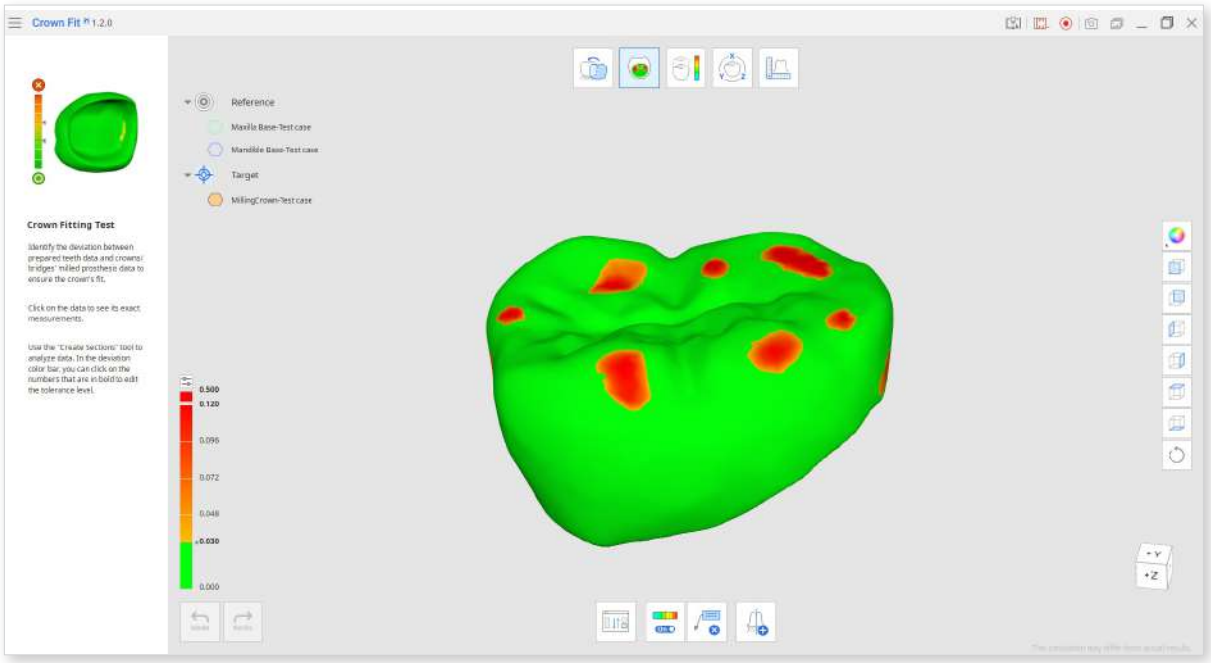


> ⚠ If you detach the data after creating section lines and making measurements in the Measurements step, you will lose all section lines and measurement results.

Crown Fitting Test

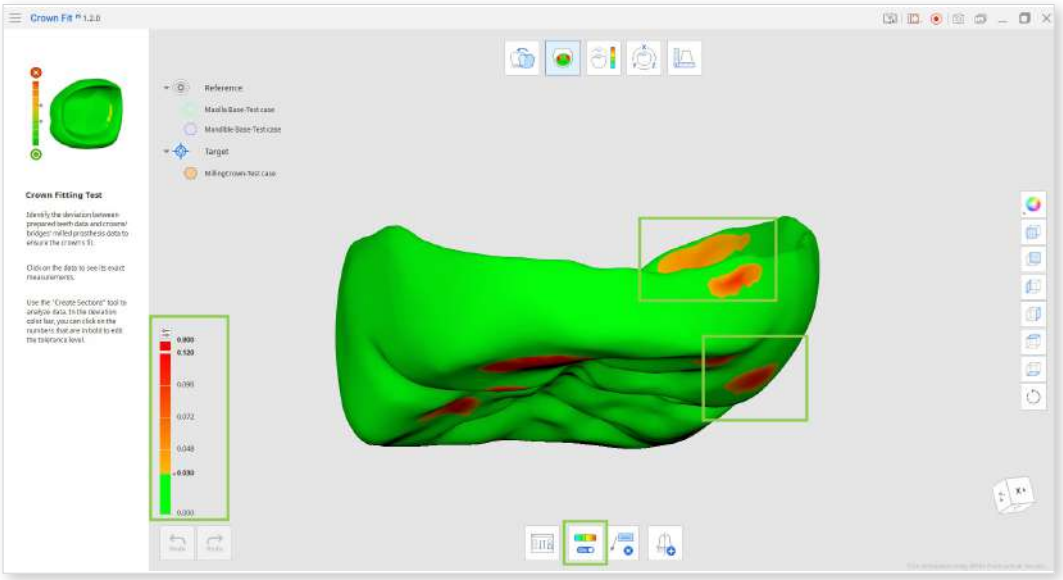
This step shows the deviation between the prepared teeth and milled prosthesis data through color to help ensure the crown's fit. Align your crown data before working in this step.

> As the milled zirconia crown's scale is enlarged before sintering, proceed with the crown fitting test after reducing the size of the milled crown's scan data. To learn how to do it, read the Data Transformation chapter.



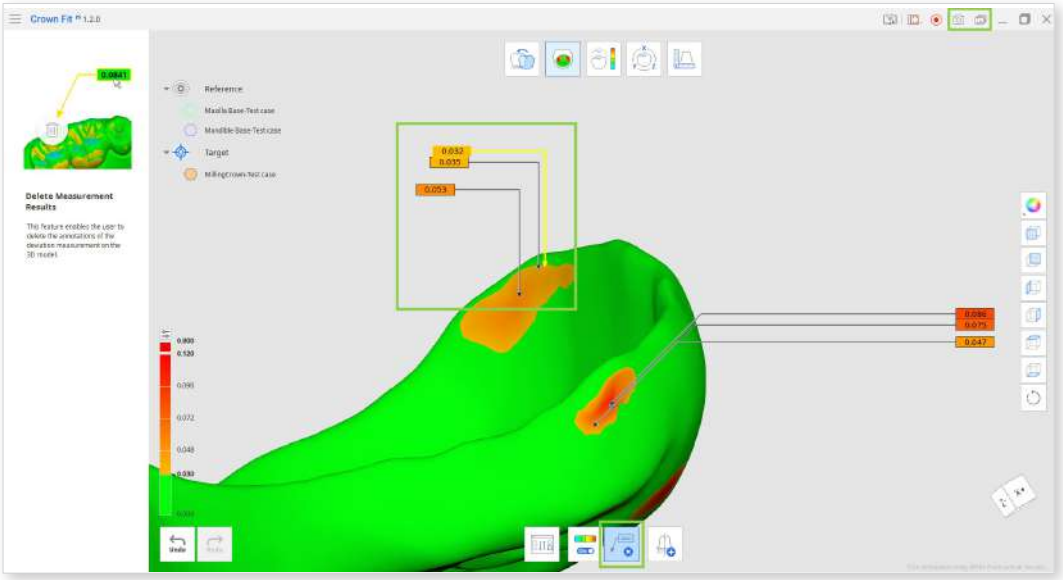
- The color map is turned on by default once you enter this step. Colors other than green signify areas where your reference and target data overlap. Refer to the color bar on the left while reviewing crown fit test results.

> Click the small settings icon above the color bar to adjust the resolution of the color map. You can also click the bold numbers to enter the specific value.



- Click on any spot of higher deviation to annotate it with an exact deviation measurement. If you want to delete any measurement results, activate the "Delete Measurement Results" feature and remove the annotation with a click.

> Measurement results are not saved if you move to another step. Use the "Screenshot" feature in the Title Bar to keep a record if needed.

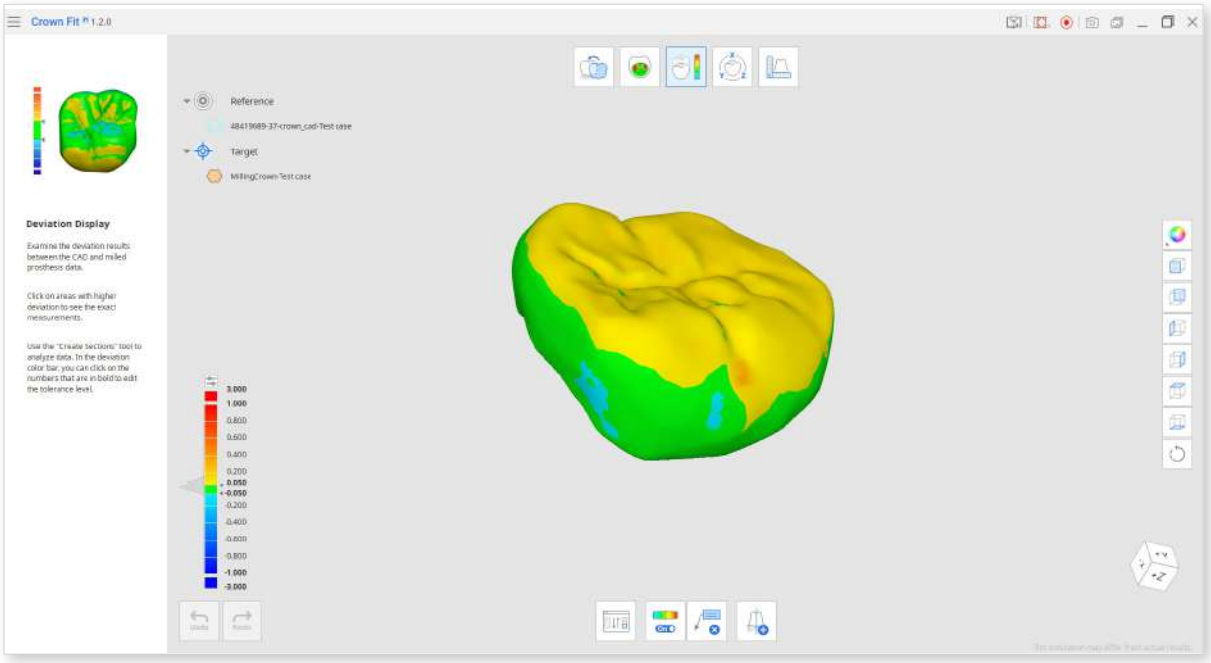


- Use "Create Sections" to draw section lines on the data by picking two points or click-and-drag. Section lines will show you the outlines of both reference and target data; hide data to see them clearer. All created section lines will disappear once the feature is deactivated, yet they will be saved and available in the Measurement step.

- If needed, you can change what data is assigned as reference and target using "Reassign Data."

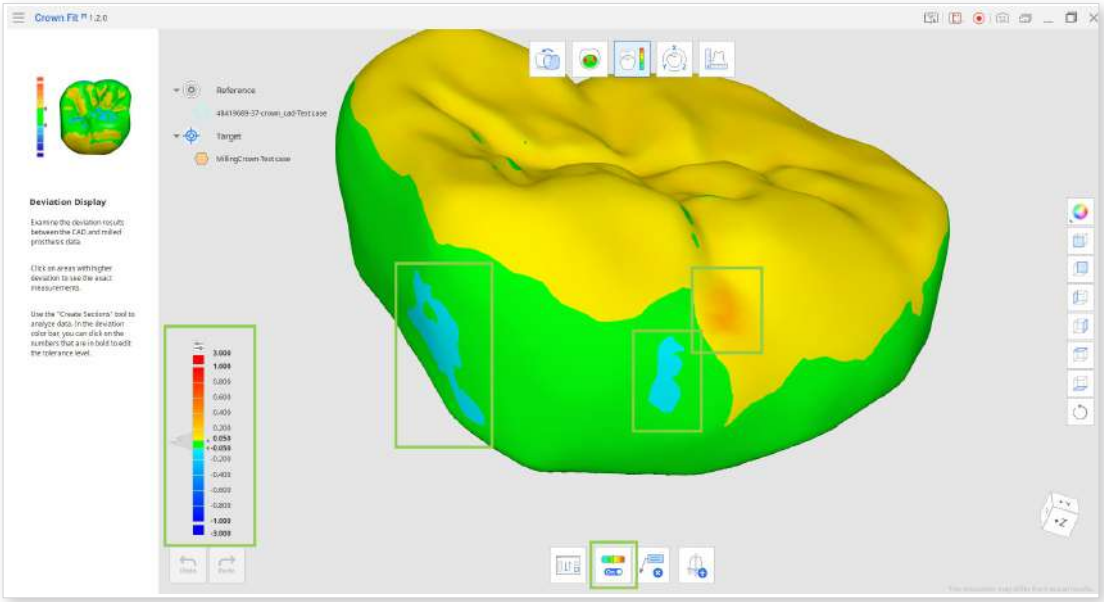
Deviation Display

This step shows the deviation between the CAD design and milled prosthesis data through color to help check for parts needing alterations on the milled prosthesis. Align your crown data before working in this step.



- The color map is turned on by default once you enter this step. Review areas with high deviation in more detail to check whether the milled prosthesis requires additional adjustment.

> Click the small settings icon above the color bar to adjust the resolution of the color map. You can also click the bold numbers to enter the specific values.



- Click on any spot of higher deviation to annotate it with an exact deviation measurement. If you want to delete any measurement results, activate the "Delete Measurement Results" feature and remove the annotation with a click.

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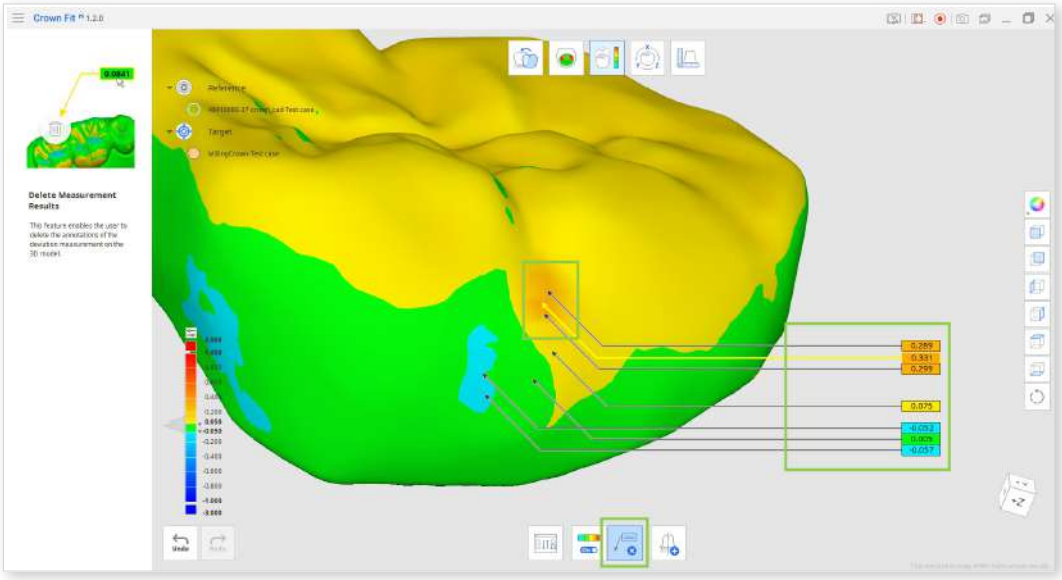
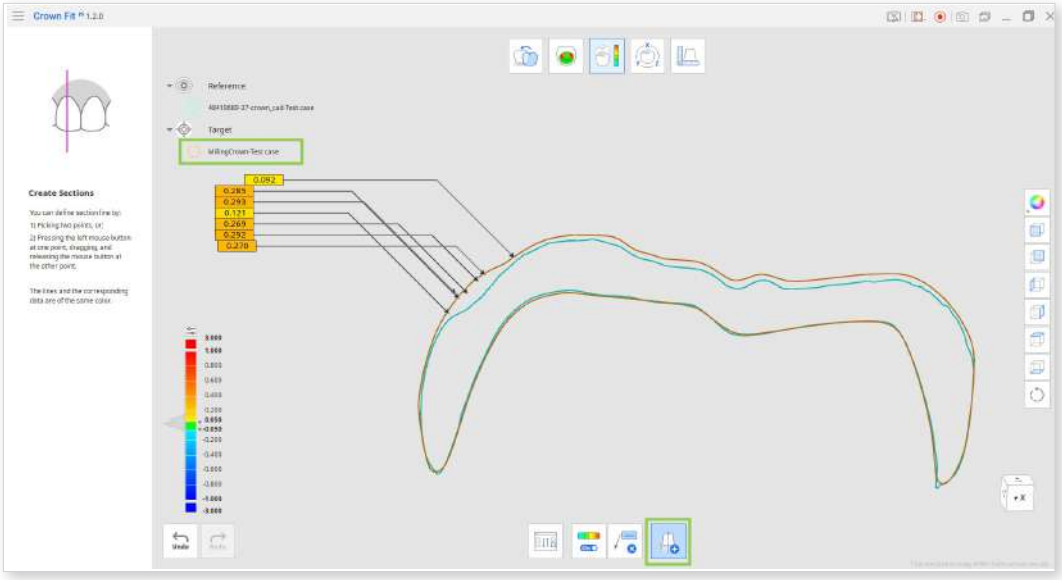


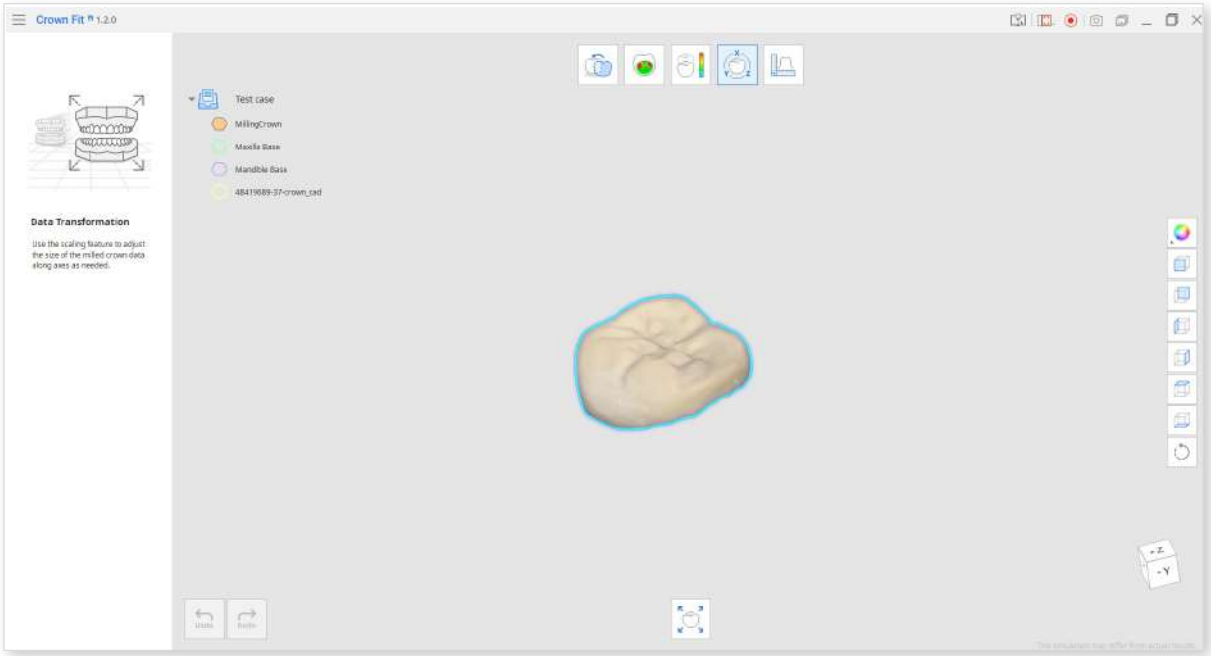
- Use "Create Sections" to draw section lines on the data by picking two points or click-and-drag. Section lines will show you the outlines of both reference and target data; hide data to see them clearer. All created section lines will disappear once the feature is deactivated, yet they will be saved and available in the Measurement step.



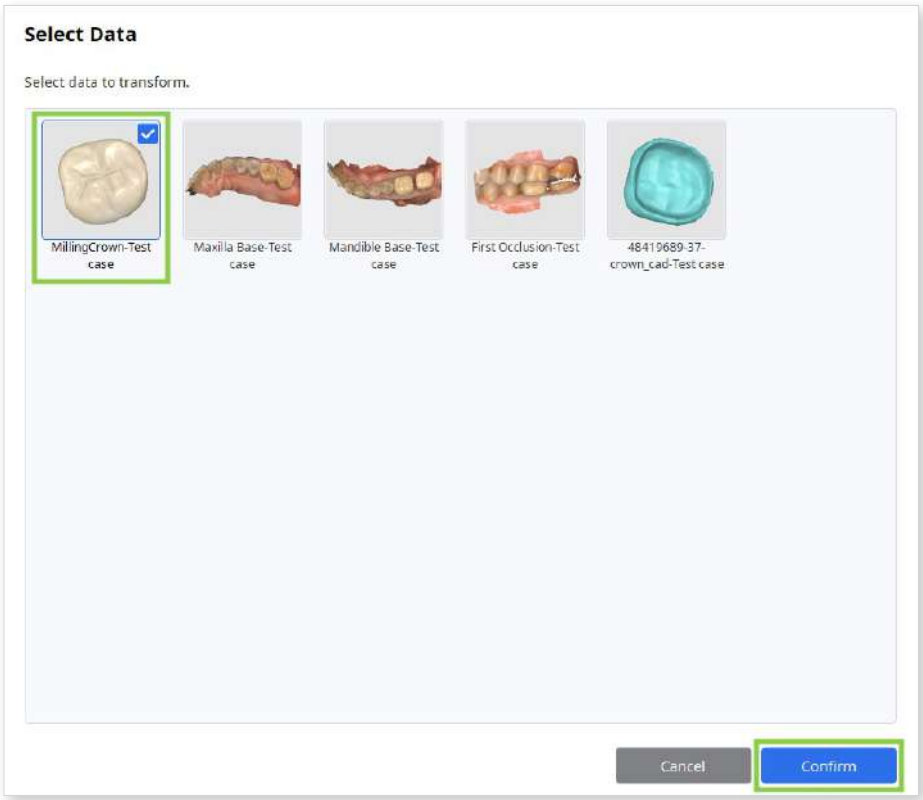
- If needed, you can change what data is assigned as reference and target using "Reassign Data."

Data Transformation

This step allows users to adjust the size of the milled crown data by scaling it along the X, Y, and Z axes.



- Upon entering, you are prompted to select data for transformation. Choose your milled crown data and click "Confirm."



- By default, scaling is set to apply uniformly across all axes with a single value. To set different values for each axis, uncheck the "Uniform" box. Try different values to see how the data size changes accordingly.

> As the milled zirconia crown's scale is enlarged before sintering, the crown's scale must be reduced before the fitting test. To determine the appropriate scaling value, refer to the contraction rate written on the zirconia block.

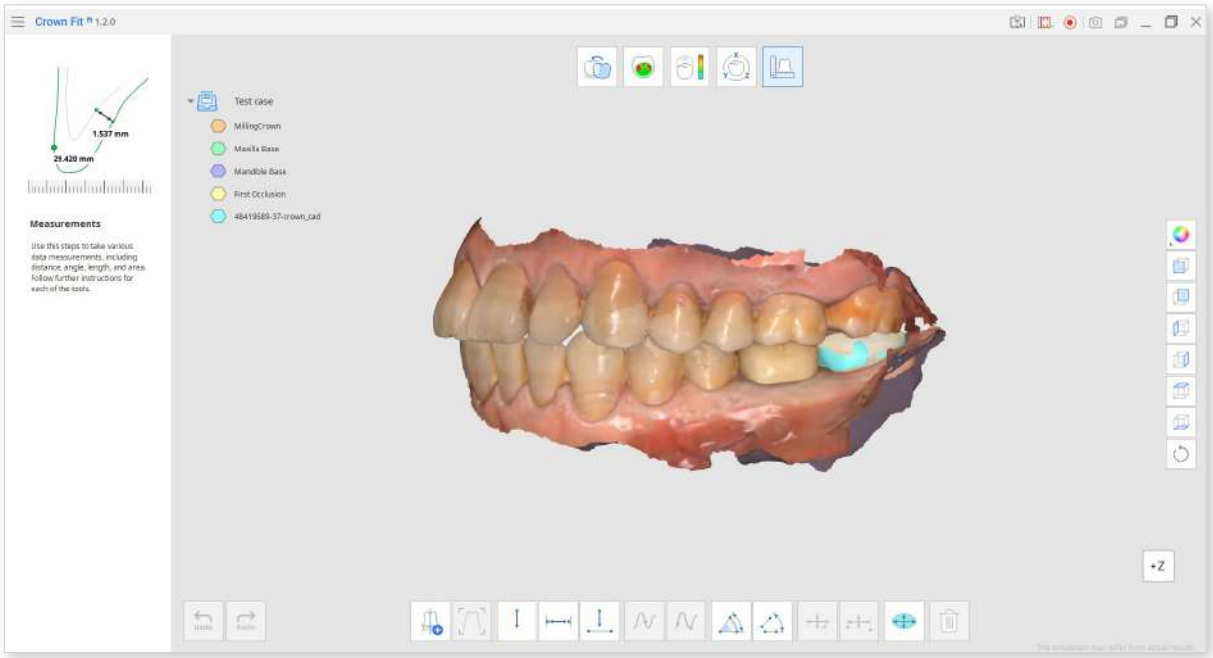
- You can revert to the default values by clicking "Reset."

- When you have decided on the required scaling value, click the "Apply" icon to permanently apply changes to the data across all steps.

> ⚠ After applying changes, the "Reset" feature will not revert to the initial data scale.

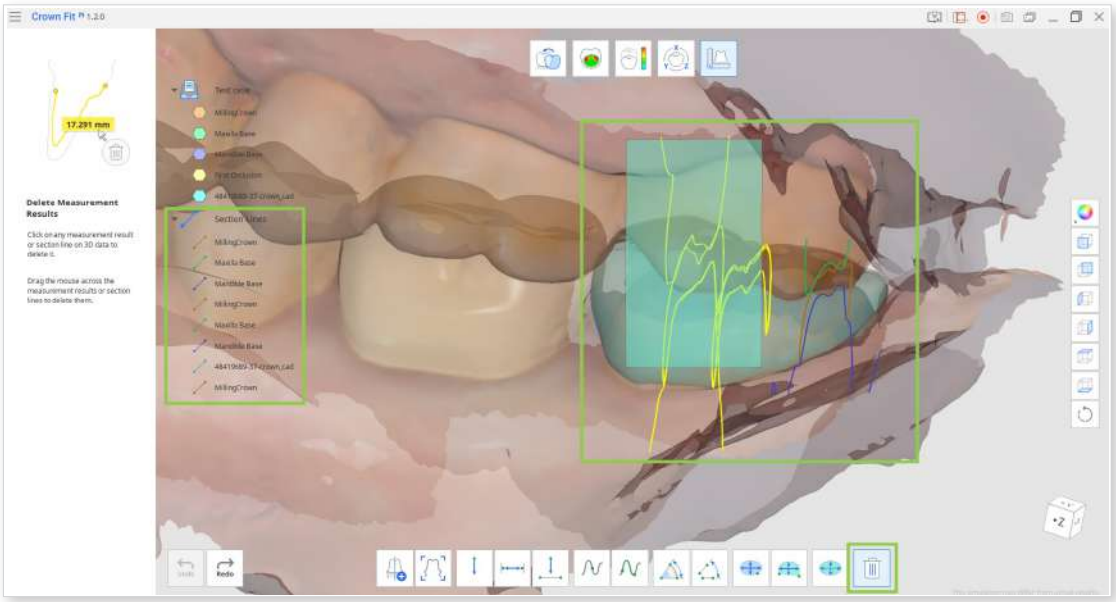
Measurements

This step provides tools for taking various measurements that can assist data analysis, including distances, angles, and areas of the 3D data. Users can take measurements on any data imported for the project.



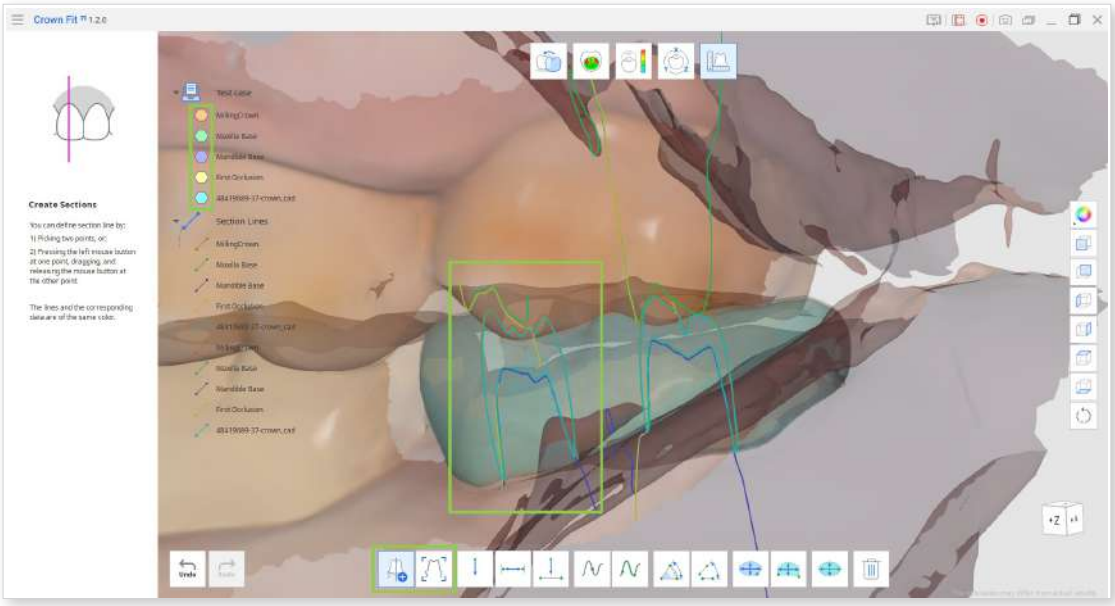
- If you have section lines created in previous steps (Crown Fitting Test or Deviation Display), they will be available here. To delete these section lines, enable the "Delete Measurement Results" feature and drag and drop over the area containing those lines, or click a specific line you do not need.

> Section lines can also be deleted with a right-click in the Data Tree.

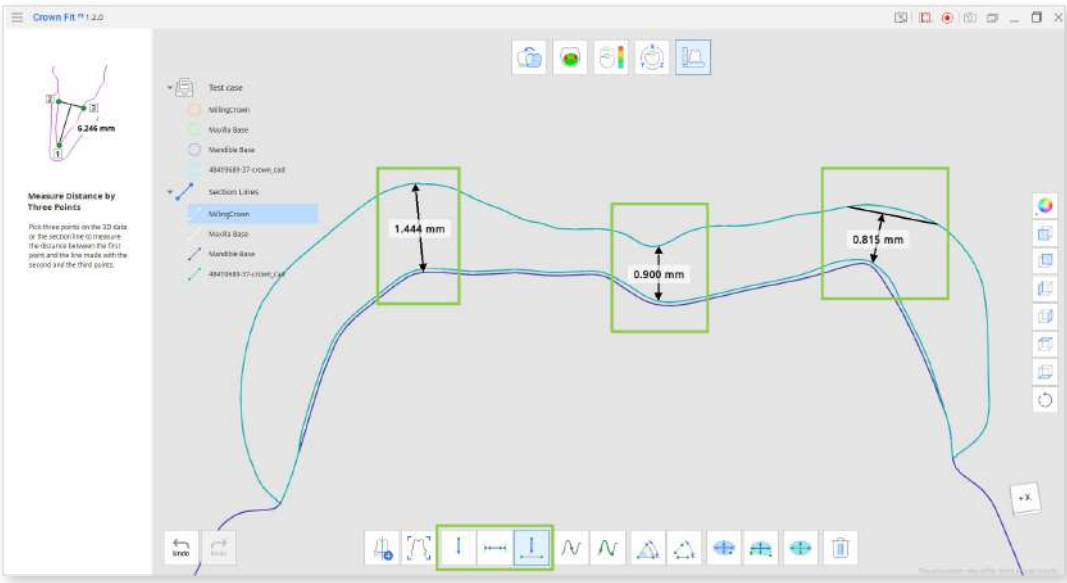


- You can create new section lines using the "Create Sections" feature provided in this step. If you want to orient the data view perpendicularly to any section line, choose the "View Perpendicularly to Section Line" tool and click your desired section line.

> The color of each section line matches the color of the corresponding data in the Data Tree.

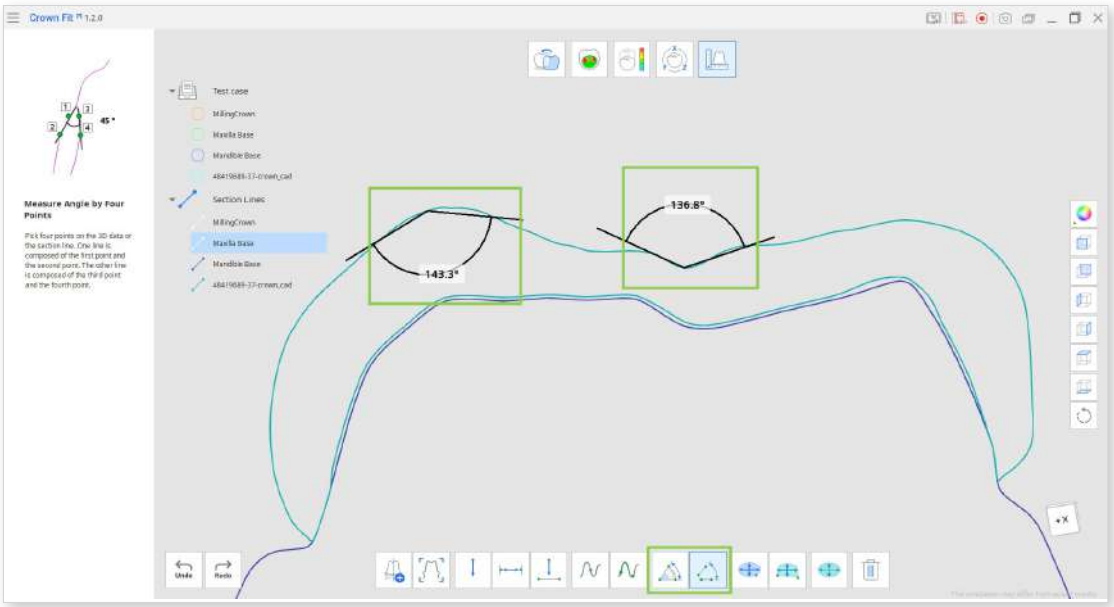


- Measuring distances is possible by one, two, or three points picked on the data or section lines with a mouse.
  - Measure Distance by One Point: this feature will calculate the distance between the set point and the closest adjacent data.
  - Measure Distance by Tree Points: this feature will calculate the distance between the first set point and the line created by the following two points.



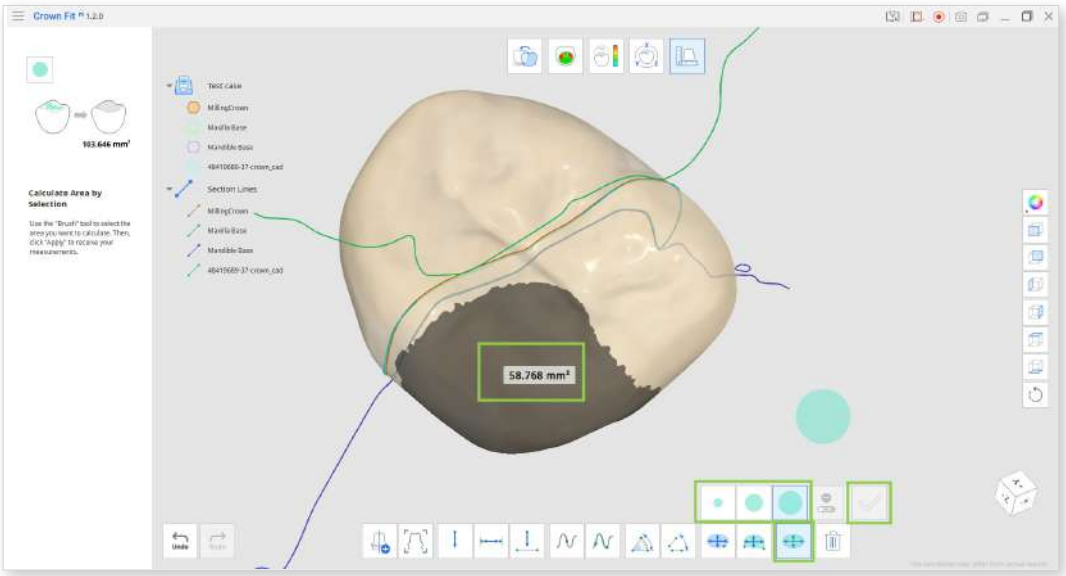
- Measuring lengths is possible by one or two points set on the section lines with a mouse.

- Measuring angles is possible by three or four points set on the section lines with a mouse.



- Calculating an area can be done based on section line or 3D data.
  - Calculate Area by One/Two Points: this feature will calculate an enclosed area within a section line.

  - Calculate Area by Selection: this feature will calculate only the selected area on the 3D data. For this, use the "Brush" subtool to designate the area you want to calculate and click "Apply."



- To delete the created measurement results, choose "Delete Measurement Results" and click the annotation with the results.