Summary

This document describes how to use the new features and improvements of the release 3.2.0 of the Dental Wings Open Software (DWOS).

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4. Mirror Anatomy of a natural tooth

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1. Definition of prosthesis type by family and subtype

To simplify finding a prosthesis type among the ever-increasing possibilities, this new version introduces categories, called “prosthesis family”. Thus, the families are: crowns, waxings, pontics, abutments, inlays and diagnostics. Your usual specific prostheses types, plus a few new ones, are grouped as subtypes under these families.

Defining the prosthesis type for your case is not very different from before:

1. Choose a **prosthesis family**.

2. Select the **material** you will use to produce the prosthesis.

3. The available prostheses for the selected material will be displayed in the **Prosthesis Subtype** drop-down menu. Choose a prosthesis subtype.

![Figure 1: Available prosthesis subtypes for Zirconia (custom material) crowns](image1)

![Figure 2: Available prosthesis subtypes for Zirconia (custom material) abutments](image2)

**Note**

The implementation of these categories might impact your material files settings. If you are using a material that was created in an earlier DWOS version, the prosthesis types you had enabled for your favorite materials might be lost, particularly in the inlays and the abutments families. To correct this:

1. Open the **Material Management** station and select the material you wish to edit.

2. Under the **Elements Available** tab, select the checkbox of each prosthesis type you want to make available with this material.
2. ¾ Crown

The ¾ crown is a new prosthesis type that you can select in the Order Creation module. It will create a full crown with a reduction parameter applied on one side of a cut line (usually buccal side). This type of prosthesis provides the greatest overall strength and durability, while enabling a space for natural porcelain finish where is matters. You can make a ¾ crown on a preparation, on a pontic or on a custom abutment.

1. Enable ¾ crown for the material you want to use in the Material Management > Elements available.

2. In Order Creation, define the prosthesis type as ¾ crown in the crowns, pontics or abutments family.

   In the design module, you will get an automatic proposition that you can edit:

3. Right-click on the prosthesis and select ”¾ crown” to access the editor.

4. The cut line edition works like the margin line edition: by moving and adding green dots.

5. Adjust the reduction value (in mm) if needed.

6. The multi-designer editing mode allows you to click on multiple ¾ crowns to edit without having to validate, exit and right-click on another prosthesis.

Figure 3: A bridge made of ¾ crowns

Figure 4: Adjusting the cut lines in multi-designer mode
3. Retention beads

Retention beads can be added to the recessed surface of a ¾ crown and on the thickness surface. This function works as if you were painting textured dots on the surface that will eventually be in contact with the porcelain. Adding retention beads to your ¾ crown increases efficiency of mechanical and chemical bonds between the manufactured prosthesis and finishing coating. They could also be of great help for cases that allow limited space for porcelain. They can only be used with certain materials as they are not compatible with milling manufacturing processes.

1. In the design module, right-click on a ¾ crown and select Add Retention Beads.
2. The editor allows to add, remove or delete the beads.
3. You can set their radius and the radius of the "paintbrush” that applies them.
4. Click on another ¾ crown to continue using the tool on multiple units.

Figure 5: Tools for applying retention beads

Figure 6: Retention beads applied to a bridge made up of 3/4 crowns
4. Mirror anatomy of a natural tooth

In earlier software versions, only a prosthesis' anatomy could be mirrored with the Mirror anatomy function. Now, you can replicate a natural anatomy on its symmetrical with the improved Mirror anatomy tool.

1. When you are scanning the case, make sure you include the anatomy to replicate in the area of interest.

2. In the design module, right-click on the prosthesis on which you want to apply a natural anatomy and select **Mirror Anatomy**.

3. An editor window will guide you through the 3 steps:
   1. Drawing an extraction line on the model.
   2. Adjusting the extracted anatomy’s position over the overlay.
   3. Verifying the anatomy adaptation.

![Figure 8: Mirror anatomy in the contextual menu](image1)

![Figure 9: Adjust extracted model position](image2)

![Figure 10: Refining anatomy adaptation](image3)

![Figure 7: Drawing the model extraction line](image4)
5. Transparency view for handles editing

Clinical handles editing is now done with the restoration displayed in a transparent mode. This new visibility mode eases the design as it renders a 360° view of the handles and shapes you are modifying.

![Figure 11: Transparency view of a custom abutment](image)

6. Saved personalized settings for virtual waxing tools

The virtual waxing tool editor [or **add/remove material**] will remember the **values you entered** for size, amplitude, range and spline after you quit by pressing OK. The next time you enter “add/remove material”, all your settings will be the same as when you left, for each tool: add, remove, smooth, morph and erase.

![Figure 12: Theses values are going to be memorized.](image)
7. Improved computing of inlays and onlays

The software uses a substantially improved algorithm to compute the inlays and onlays. It generates an anatomy that is automatically adapted to the original anatomy that was scanned, so that no other adjustments are required.

The image on the side is the CAD Engine proposition. No transformations were applied. Notice how the shape is a continuation of the natural tooth.

8. Parallel axis groups

This improved insertion axis editor lets you define groups of custom abutments or telescopic copings for which to assign a common axis. Grouping ensures parallelism among the elements. Defining the individual axes is done as usual, during the scan session. Forming the groups takes place in the design module.

1. **Right-click** on a custom abutment or a telescopic coping and select **Adjust Axis**.

2. The tooth you are editing appears circled by a blue lasso when the editor window opens. Select an other tooth and click the **+ sign** to create a group. They now appear in the same blue lasso.

3. Click on a member of the group, rotate the view and click **Set group axis from view**. Repeat for each group.

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**Figure 13:** Example of an inlay automatic proposition

**Figure 14:** Editor window for creating groups

**Figure 15:** 2 parallel axis groups of 3 custom abutments.
9. Implant Bars design

You can now design bars on implants with the Implant module. Here is how:

1. In Material Management, go under Elements Available > Abutments for the material you want to use and activate Bar pillars by check marking its box.

2. While creating the order, define each abutment as a Bar pillar. Select all bar pillars and create a bridge.

3. In the scan session, scan the model alone first, then the model mounted with the jigs, and finally the model with the gingiva.

4. In the Implants module, you can right-click either on a bar or bar pillar and select Edit Implant Bar to access the editor.

5. On top of the Options editor window, you can use either button to switch from bar to pillars to edit both types simultaneously.

6. The editing options include:
   - Adding extensions to the bar (fig.19).
   - Locking the bar design into a plane with the Force bar planarity checkbox.
   - Choosing between a variety of bar profiles.
- Setting the bar **profile axis**.
- Defining a **gingiva spacer** value.

7. You can manually adjust the height of the pillars by dragging the handles.

8. You can define a path for the bar by adding and moving handles in 3 dimensions.

9. Once you click **OK** the result will be computed with the given gingiva spacer parameters.

10. When you exit the CAD station, the elements will be merged and displayed in their final appearance. You can then round and smooth the edges and junctures between the elements.
10. Screw channel extension

This new feature makes it easy to create a protection channel that extends from the framework surface to the intended anatomy surface. This strengthener is helpful on high reduction cases to prevent micro fractures. You can create a screw channel extension on any custom abutment framework: telescopic coping, reduced crown, custom abutment or Ti Base abutment.

1. Create the order with one of the prosthesis types aforementioned.

2. In the design module, right-click on the prosthesis and select Recompute.

![Image of design module interface]

Figure 22: This is how to activate the screw channel extension option.

3. Activate the Custom abutment parameters tab and select the check box Screw Channel Extension. The “minimum thickness” parameter will be applied around the expected screw channel above the custom abutment. Notice in the pictures below, how the top surface is trimmed following the reference anatomy.

![Figure 23: Screw channel top view](image1)

![Figure 24: Screw channel side view](image2)
11. Custom abutments on Titanium base

You can now design a custom abutment on a Titanium base with a new prosthesis type called **TiBase Abutment**. The advantage of this restoration is that, unlike any other custom abutments, you don’t need to import implant kits files: scanning the model mounted with the Titanium base is all you need to detect the implant and design off the base. Here is how to work with this new feature:

1. Enable TiBase Abutment for the material you want to use in the **Material Management > Elements available > Abutments**.

2. While creating the order, define the abutments as **TiBase Abutment**.

3. In the scan session, scan the model alone.

4. On the scan result, right-click on the abutments to select **scan on model**, cover the TiBase with scan spray and place it on the model for the implant precise scan.

5. If your case has more than one custom abutment, repeat step #4 for each one.

6. When it is time to draw the implant margin, place 3 points on the interface limit and press **Compute line** in the window **Detect interface limit**: the line will be computed following the edge of the interface.

7. Enter the screw diameter value into that same window.

8. Edit the margin on the gingiva as usual. A collar line will be generated, but you can change its distance from the interface limit by entering a spacer value in the **Collar position window**.

9. Once you exit the scan session, the rest of the process is similar to other custom abutments design.
12. New parameters within implant editor

It is now possible to set Cervical line angle and Cervical line height directly into the implant kit editor. A different default value can be set for each implant. In the event that you are the implant kit creator, this will help the eventual users getting the appropriate values for the implant. If you are the final user, then you benefit from preset values that matches the product. These values can be adjusted for a particular case in the scan session, during the margin line editing, just as in previous versions.

![Figure 28: New Cervical line parameters in the Implant Kit Editor](image)

13. Scanning a case over more than one multi-die plate

This improvement enables owners of a 6-slot multi-die plate to manage an order of more than 6 dies.

1. In the Multi-die scan session, assign as many dies as you can on the plate.
2. When their scanning is completed, press the “Clear plate” icon.
3. Assign remaining dies to the plate.
4. Only when all dies of an order are scanned you can route the order.

This procedure is valid for any size of multi-die plate: 6, 12, 16 or 30 units. So up to 32 dies can be defined and scanned within a given order, regardless of the multi-die plate size you own.

![Figure 29: Clear plate icon](image)
14. Creation of virtual models with implants

The Model Builder module can now handle intra-oral scans of patients with implants. It can generate a virtual model with precisely localized holes, so that after the model is manufactured, the analogs can be snapped in. Read the following guidelines to this feature and be ready to improve productivity:

1. When the intra-oral scan is being executed, the scan jig must be present on the patient’s implant.

2. Create the order for the custom abutments in the Order Creation station.

3. In the Scan import module, drag the order and import the scan files for it.

4. Right-click on the implant and select Reposition. The repositioning of the implant into the scan file will be done from the implant STL file. So it is mandatory that you have previously imported the corresponding implant kit. Proceed with the margin and the axis then exit this station to open Model Builder. The model will be computed with a precisely calculated hole for the analog. The rest of the procedure is the same as usual, except for the gingiva extraction, which is new:

5. In the contextual menu (upon right-click) select Define gingiva.

6. Draw a contour on the gingiva. The area that you are defining will generate a separate file for manufacturing. The prosthesis design can take place before or after creating the model. When ready for production, you will see in the Administrative application that you have different files for the model, the gingiva and the restoration. You can assign each file to production independently.
15. Fully integrated Model Builder

For your convenience, you can now access your Model Builder module by clicking on its icon, right from the main menu bar.

![Model Builder icon in the main menu bar](image)

16. Geller models

The Model Builder stump extractor can now generate Geller models. Geller models are recommended for printing manufacturing processes. To create one, proceed as follows:

1. When you open your case in Model Builder, right-click on the model and select **Recompute Model**.

2. In the **Model Holder Type** drop-down menu, select **Geller**.

![Recompute Model](image)

![Model holder type: select Geller](image)

![Geller model result (bottom view)](image)

![Geller model result (top view)](image)
17. Survey Model display improvement

The display of undercuts in the Partial module is now more intuitive. Instead of angles, the amplitude of undercuts is given in millimeters. Also, a color scale gives you a direct feedback of the angle efficiency.

![Color scale for undercut angle feedback](image)

18. Waxing scan on 3Series

You can now use any of Dental-Wings’ scanner to **scan a physical wax-up** (bridge or coping) with the intention of **producing it with a CAM process**. Up to this day, this workflow required the use of the impression holder to scan both sides of the wax-up. Now, if you consent to scan the outer surface only, you will be able to achieve this on a 3Series without the need of a different holder: the preparations themselves will serve as a holder.

This procedure has some limitations in cases where other elements are likely to obstruct the camera’s view of the margin area of the wax-up. For that reason, a combination of the following situations will generate better scan results:

- High preparations.
- No adjacents (or removed adjacents).
- Removed gingiva and/or pontic area.

Here follows a description of this new procedure:

1. Enable **Simple coping with waxing** for the material you want to use in **Material Management > Elements available > Waxings**.
2. While creating the order, define the abutments as **Simple coping with waxing**.

3. If you are making a bridge:
   - Do not define the pontics.
   - Select the abutments and press **Create bridge**.

4. The scan session will consist in **scanning the model** first, then the **model with the wax-up** (this is when you will remove from the model every part you can).

5. The CAD Engine will generate a crown or a bridge that is a copy of the wax-up on the outer surface and an offset of the preparation on the inner surface (the offset distance is defined by the **die spacer** parameter).

6. In the design station, once you have merged the surfaces by pressing the “exit” button, you can use the **Add/Remove material** tool to adjust the shapes if needed.

Note: If a part of the wax up needs to be removed, you can do so in the scan or the design station. Right-click on the wax-up and select **Remove scan faces**.

This workflow is also available on 5Series and 7Series with a new option added to the **Scan session configuration** window: the Waxing scan strategy.

<table>
<thead>
<tr>
<th>Waxing scan strategy</th>
<th>Fast Waxing Scan</th>
<th>Complete Waxing Scan</th>
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**Fast Waxing Scan:**
The procedure will be as described above; you will scan only the outer surface of the wax-up, without the impression holder.

**Complete Waxing Scan:**
This will be the usual procedure: you will be asked to place the wax-up on the model, then on the impression holder to scan the top and the bottom sides.
19. CAD Inbox

The Inbox is an integrated interface for receiving orders. It enables your DWOS application to connect to the DHS networks (Dental Hub System) so that when orders are subcontracted to you, whether it be for design or manufacturing, you can import and manage them without leaving your work space.

If you wish to establish a connection, you must first have the access information or a .localconf file. Otherwise, communicate with the DHS network administrator. Once you obtain one or the other, proceed as follows:

1. In the Inbox interface, click Manage Connections button.

2. Click the + icon to connect manually using the credentials (for advanced users) or the command prompt icon to browse to the .localconf file (recommended).

3. Save your settings.

4. A green dot will show at the bottom-right if the connection is operational.

5. If you try the test button, a prompt window will warn you if the connection has failed.