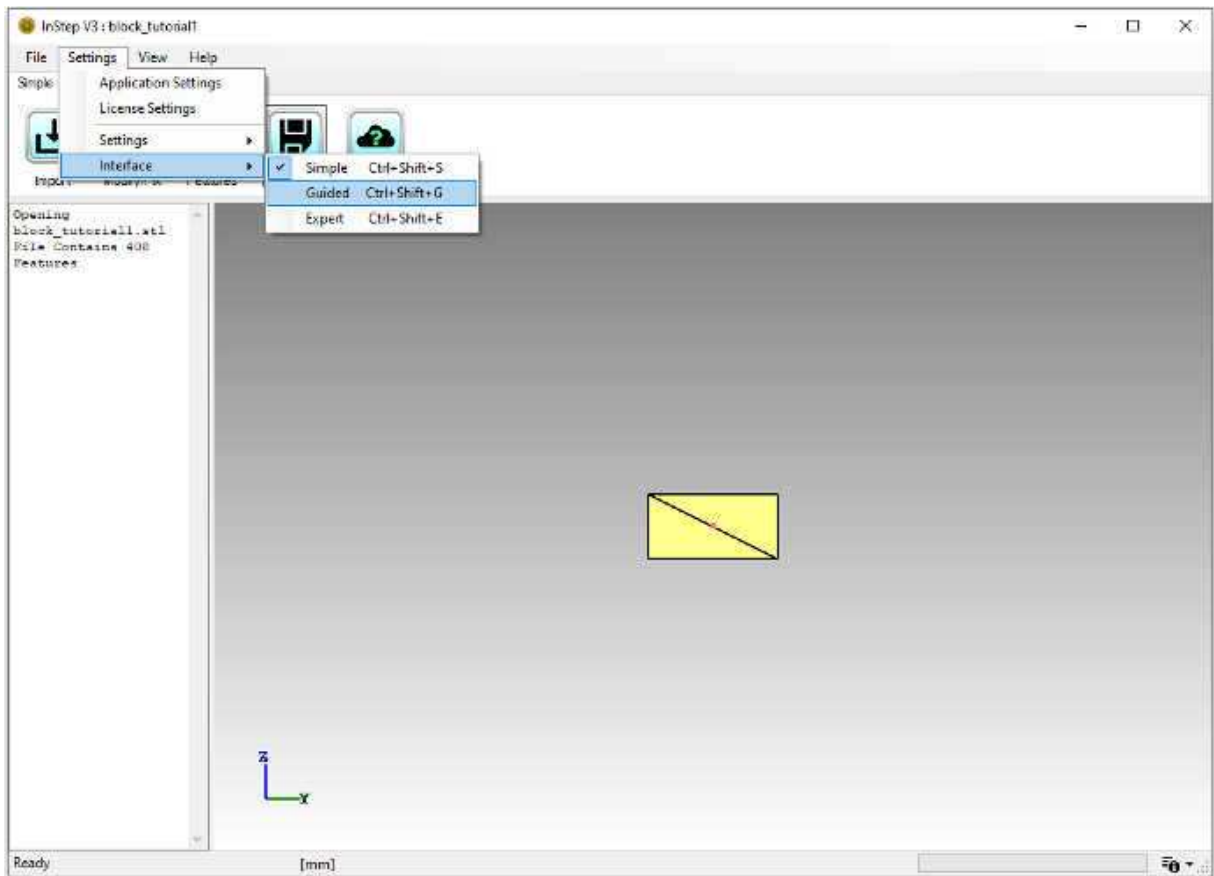


# Tutorial 2 - Settings and the Guided Interface

Building on the information from the [First Tutorial](#) this tutorial will go over some further settings that are useful and takes a look at the Guided Interface option.

Prior to this, it is expected that you have set up and have access to the InStep application and that you went through the first tutorial where you learned about using the mouse to view the data and turn on/off display options.

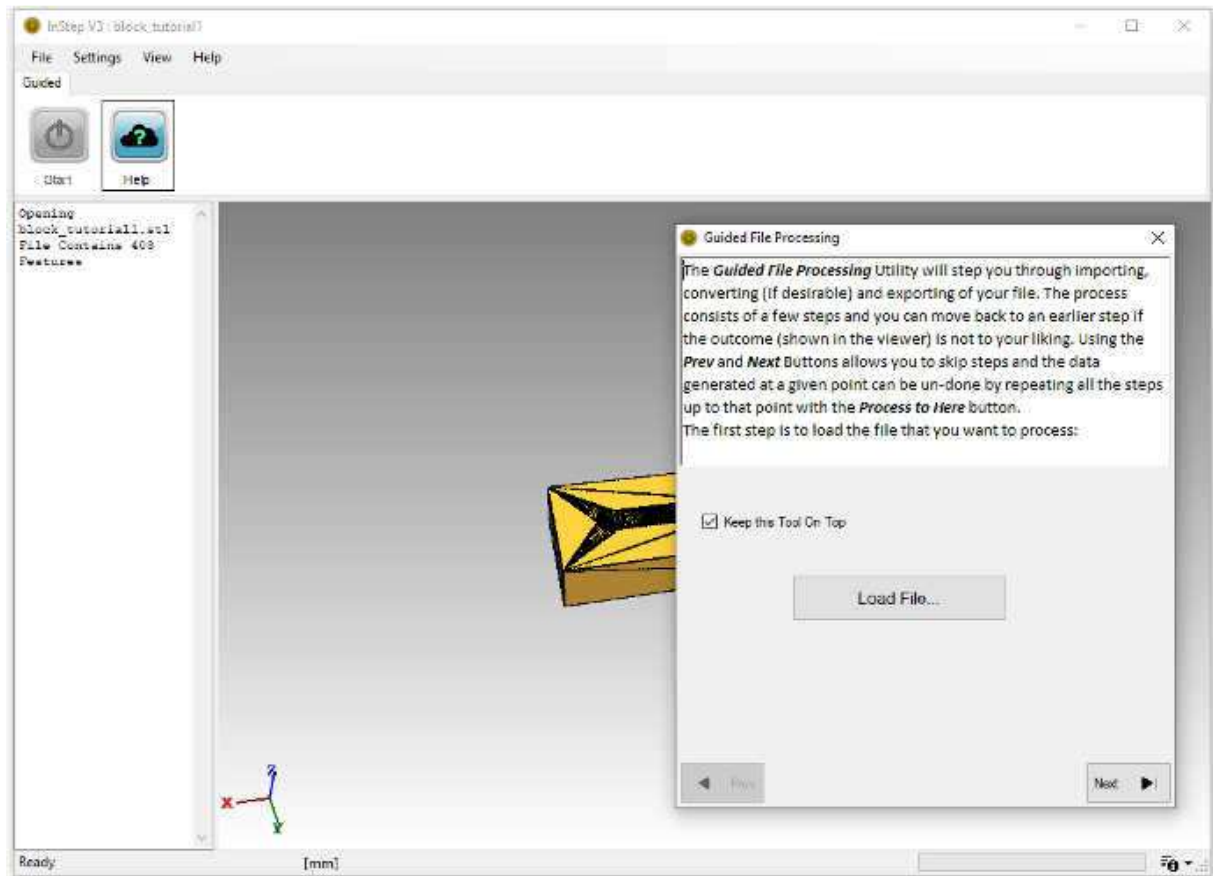
The previous tutorial ended with the export of the block to the Step format. Here we will continue from this point and switch over to the Guided interface. Of course, if you are just starting the application, it may prompt you for the Interface option, in that case, simply pick the Guided option. To switch from any interface to the Guided or any other interface, click on the Settings > Interface > Guided checkbox as shown in the figure below:



## *Switching Interfaces*

Though it is generally possible to switch Interfaces at any time, it is recommended to do so only prior to loading and working with a file as changing at a later stage may introduce changes that the application may find difficult to reconcile.

In general, the Guided interface uses a floating menu to provide the actions to be applied to the loaded data. Entering this process is done by clicking on the Start button:



### *Guided Interface Start Page*

The first step in the interface asks to Load a file. Using this is essentially the same as using the File Menu. The file being used for this tutorial can be downloaded from here:

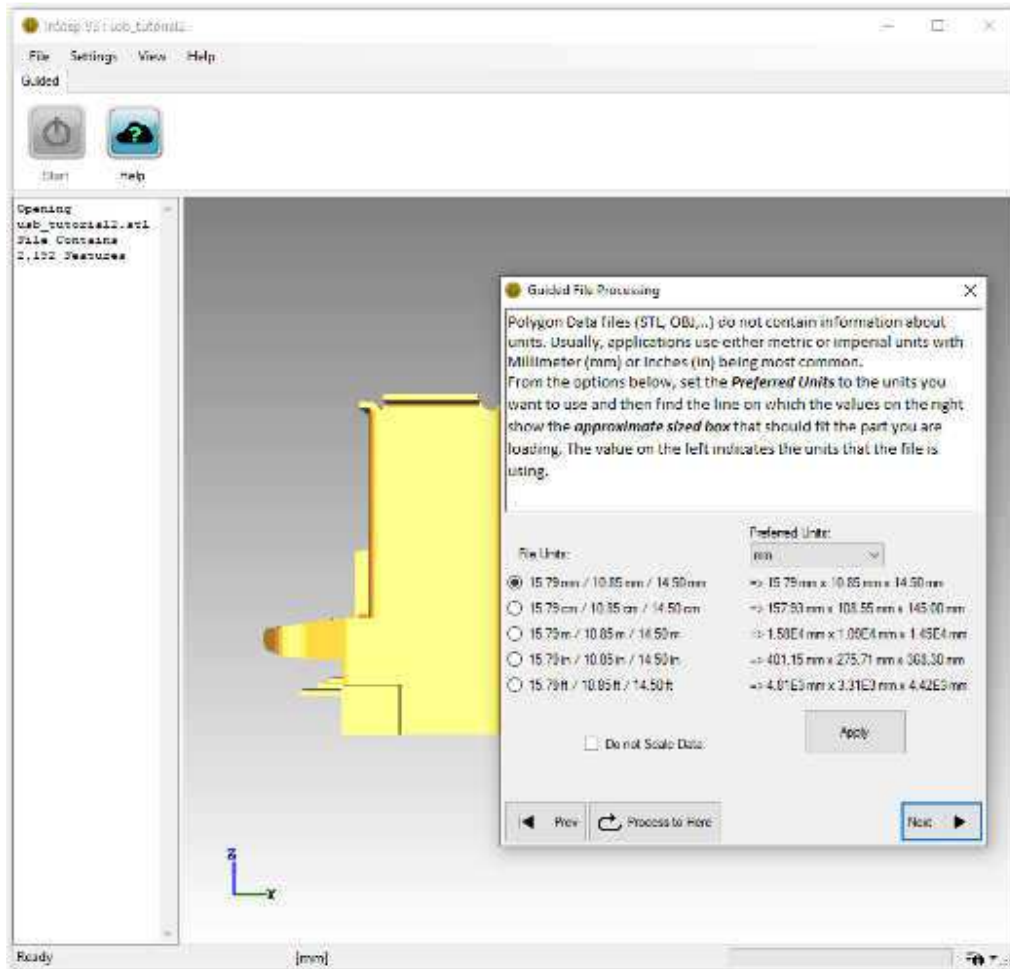
[Example USB Port File \(STL\)](#)

([https://www.solveering.com/instep/webhelp/tutorials/files/usb\\_tutorial2.stl](https://www.solveering.com/instep/webhelp/tutorials/files/usb_tutorial2.stl))

Note that the floating dialog box will be kept visible/on top if the 'Keep this Tool On Top' is left checked. This is recommended when multiple other applications are running as it can otherwise disappear and make working more difficult.

Once the import completes (the message box shows that 2192 Features have been loaded, if the Message field is not visible, see how to turn it on in the previous tutorial), the next step of the conversion is to be defined by moving through the pages using the 'Next' button or, similarly, moving to a previous step using the 'Prev' button. It is important to understand that moving forwards or backwards through the options does not change the data, only by using the actual options on each page can those options be applied. If an issue has been encountered, perhaps data being modified in a way that wasn't desirable, it is possible to revert to the same state by using the 'Process to Here' option which retraces all the steps up to those applied on a given page.

On the second page, the **Units** are made available with the explanation for this step given in the text above the tool:



### Unit Selection in Guided Interface

This step seems perhaps confusing but it is relatively straight forward: mesh/polygon files such as STL, OBJ, PLY and similar do not contain information about what units the data represents. The locations of features are simply values, but what a value of 1.0 represents (1.0 millimeters, 1.0 meters, 1.0 inches?) is not defined by the file. This page provides both the option to define what the original file values represent as well as what the user would like to use as their most comfortable (preferred) measure of unit.

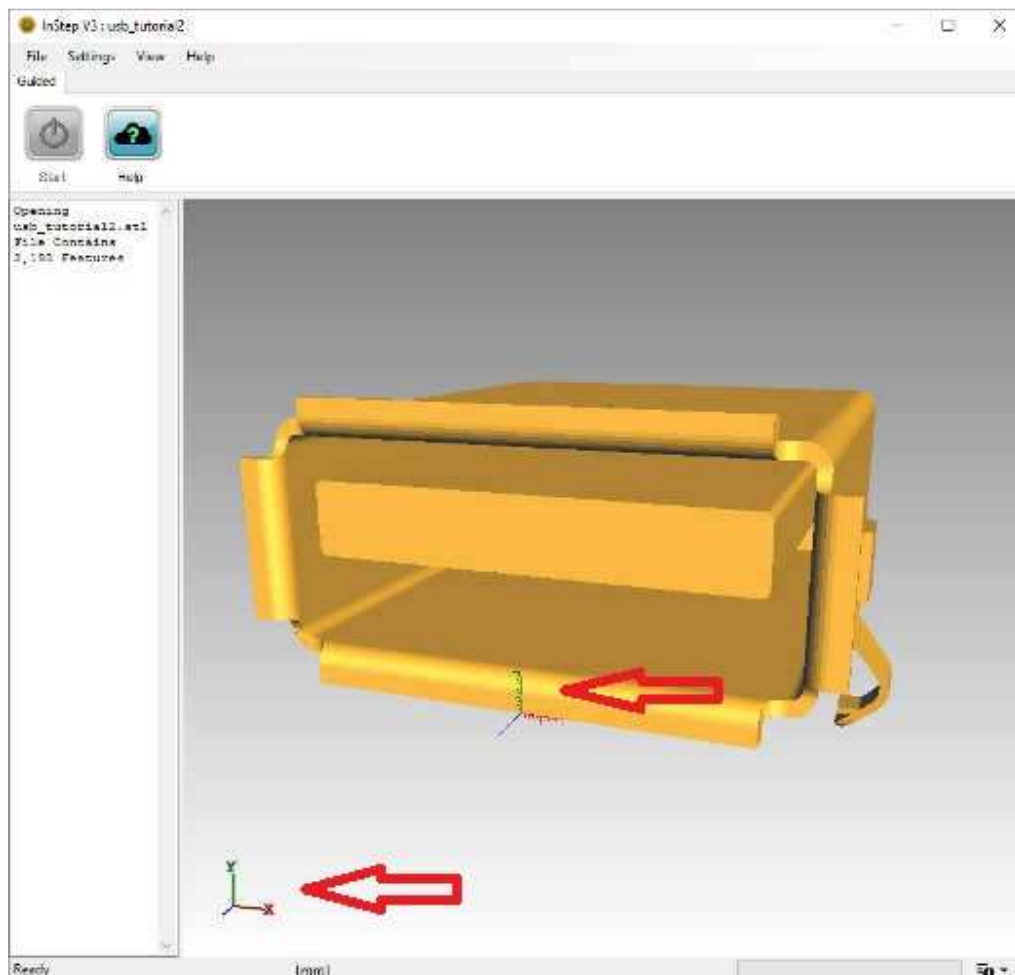
On the left, the page provides the bounding box size (a box that is aligned with the X/Y/Z coordinate system and fully encloses the loaded body) and assigned to that, a unit. On the right, the corresponding box size is given, for the Preferred units selected from the drop-down box above. One of the lines will always be the same on both the right and left sides. In this example, the bounding box size has been found to be 15.79 / 10.85 / 14.50 [units]. From experience we know that this value is in milli-meters (a frequently used unit for these kinds of files). So, the first option (these round selections are called 'Radio' boxes as only one of them can be selected at a time) is the correct value for this file. If we are comfortable working with the millimeter units, then this is all the information that is needed. If we prefer something more "imperial", then the inch or feet units are appropriate. Selecting, for example, 'inch' from the drop-down box and keeping the 'File Units' value on the left at the first, 'mm' entry, we now see that the bounding

box of the original data is, in our preferred units, 0.62 x 0.43 x 0.57 inches.

The purpose of this page is to make something fairly complicated a lot easier, but it can be a bit overwhelming at first. What is important to note is that the Preferred Units being set here are used for a number of tasks, including setting the output units in STEP files and indeed in all numerical processes applied by the application. Getting the units right is also very important as this affects tolerances and other items. The application uses approximations for finding locations that are close to each other and therefore it is important to know whether two items are, for example, 1 millimeter apart or 1 meter. In most cases, the recommended approach is to not apply scaling factors (can be requested through the 'Do not Scale Data' which locks the import to the output unit) and then to apply any scale required only within the CAD application that is to work with the resultant files.

For the purpose of this tutorial, we will use a preferred unit of 'mm' and set the 'Do not Scale Data' which automatically locks the import units to 'mm'.

Clicking Apply performs the conversions, in this case, the size does not change. Note that with this example, there are two visible 'Triads' in the viewer:



*Unit Triads*

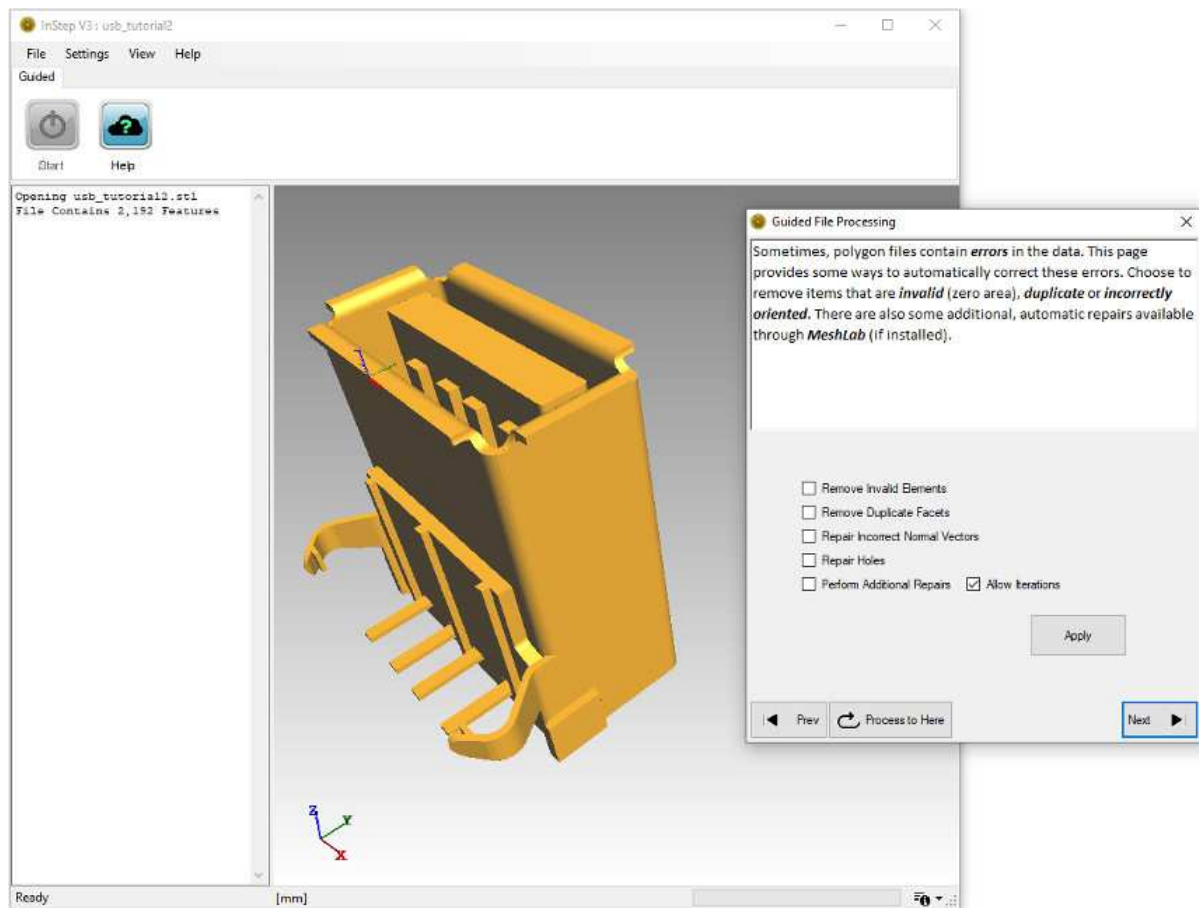
*Global and*

The one in the bottom left corner of the view is considered a 'global' triad and will provide information about the orientation that the part is in. It is a helpful tool for cases where orientation of the part is not obvious. It can be turned on/off using the Alt - 'T' shortcut.

The second item, located on the curved surface of the USB connector, is a 'Unit' Triad. It shows the origin of the data (the 0/0/0 coordinate point) as well as what one unit looks like relative to the data. From this we can see that the bent section at the bottom measures about 1mm which again, makes sense from an experience perspective.

The primary use of the Unit Triad is to give a feeling for the size of the body being imported. If the units are, for example, set to 'mm' and the body being imported is a vehicle yet appears only slightly larger than the unit triad, then the scale is likely incorrect. The unit triad can be disabled using the Settings under View or through the shortcut Alt + 'O' (for Origin).

Moving on with the Guided Process, we come to the page for Error corrections:



### *Basic Error Correction Options*

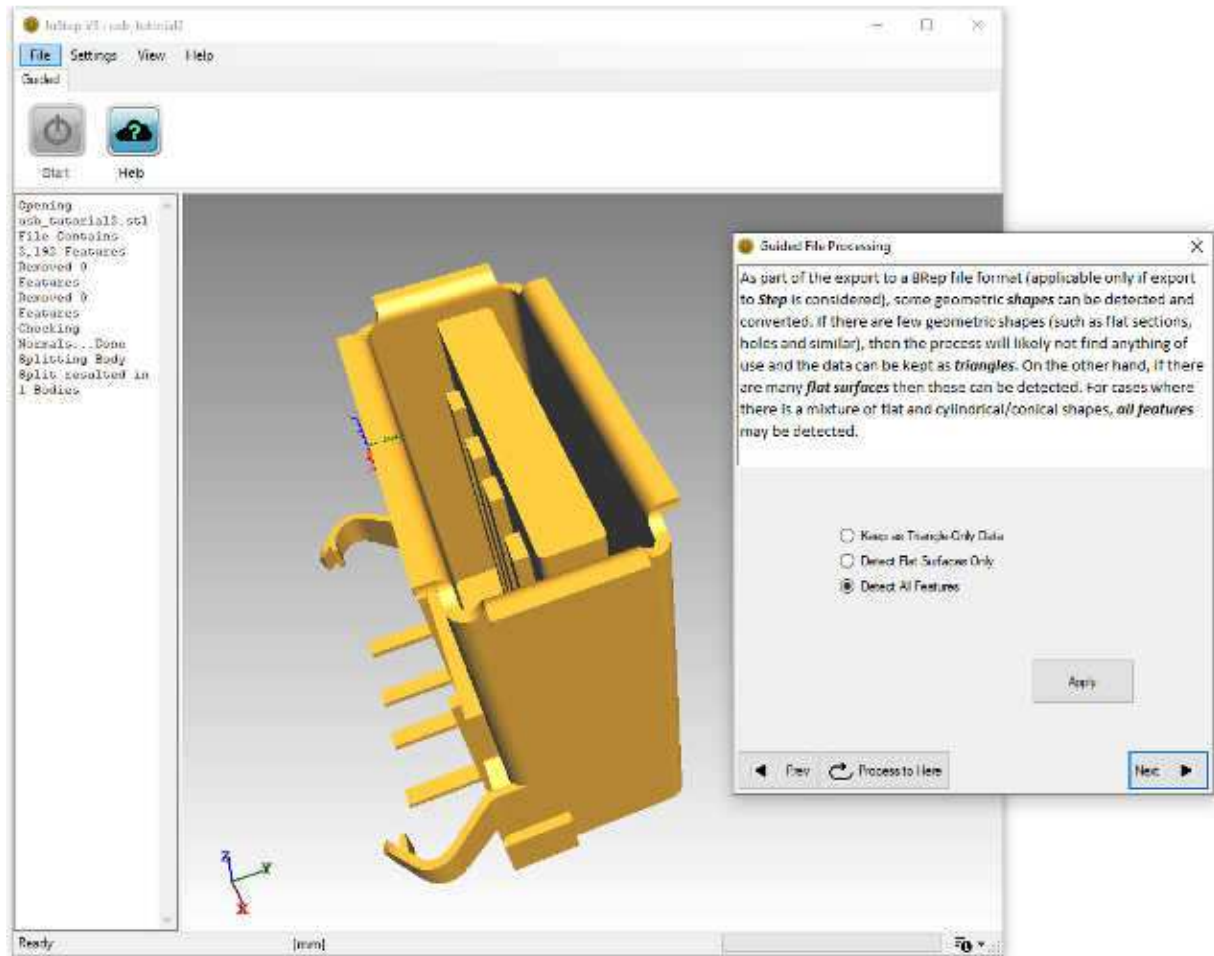
The options we are going to set here are the Removal of Invalid and Duplicate items as well as correction of Normals. Error correction is one area that is receiving continued attention with future releases likely providing additional tools and options. For now, only these options are applied here. The Invalid Elements option looks for triangles that are defined in such a way that they do not have an area (either two corners being the same or all points on a straight line). The

Duplicate Facets option also looks for Triangles (facets) that contain the same three corners, though perhaps not in the same order. Repair of Normal Vectors iteratively looks at neighboring triangles and 'flips' any that have an angle larger than expected. The orientation of these Normals (the direction pointing away from the surface of the body) is important as other processes rely on them being correct.

Upon pressing Apply, the application checks the data and performs any corrections. It is to be noted that the Message panel on the left (see Tutorial 1) provides some feedback about items that have been checked/detected. In this case, 0 features are removed as part of this step. Though the body does not actually contain problematic items, it can be prudent to run these basic checks to verify this.

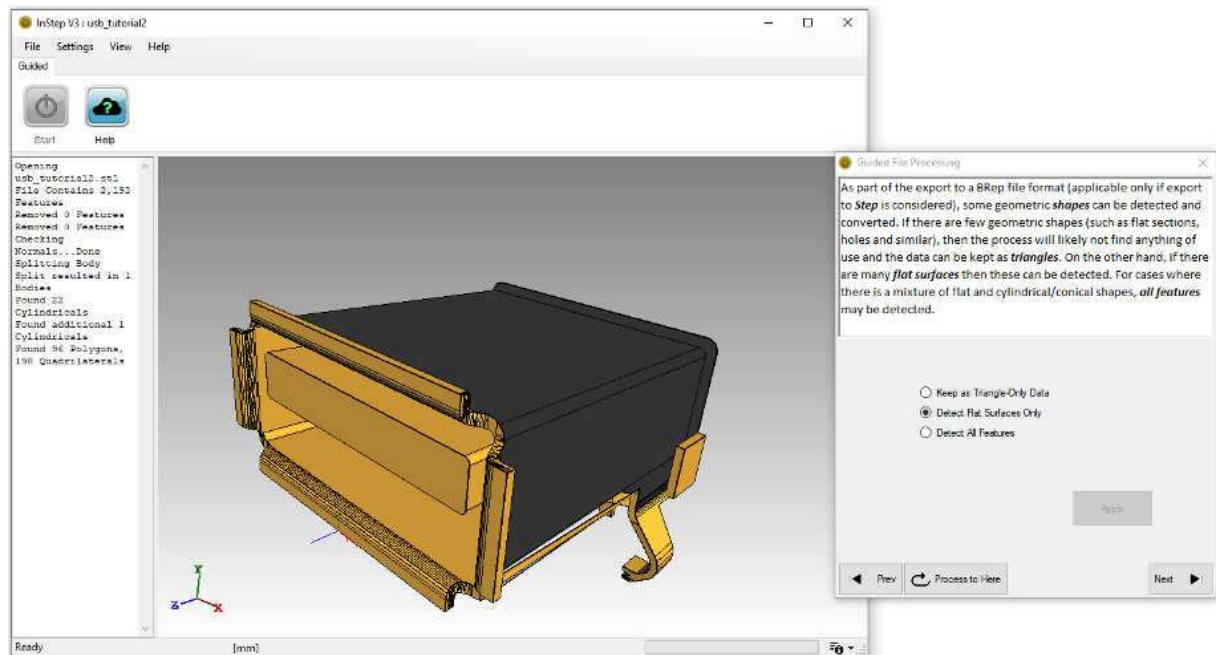
In addition, the application also informs about the 'Splitting Body' operation which resulted in 1 Body. During the repair step, irrespective of what options have been selected, the application checks to make sure that any individual bodies have been separated and are independently represented. This step is important as other processes perform their tasks on a per-body approach, so if multiple bodies are combined into one file, then they need to be separated so that there is no confusion as to what component belongs to what body.

Clicking Next (or alternatively, the 'Process to Here' first if any changes are to be reversed), brings up the Feature Detection page:



### *Feature Detection Options*

This page defines the level to which the application should attempt to convert the triangle data into more advanced features. The first option, Keep as Triangle-Only Data, is not going to perform any conversions and is essentially the same as skipping this page. The option to Detect Flat Surfaces Only, allows surfaces that are oriented in the same direction and connected to each other to be combined in such a way as to be represented by their boundaries only. The last option, Detect All Features, attempt to find and represent flat, conical and cylindrical surfaces. For the purpose of this tutorial, Only Flat Features are to be detected. Clicking Apply, the resultant data is generated:



### Feature Detection Showing Errors

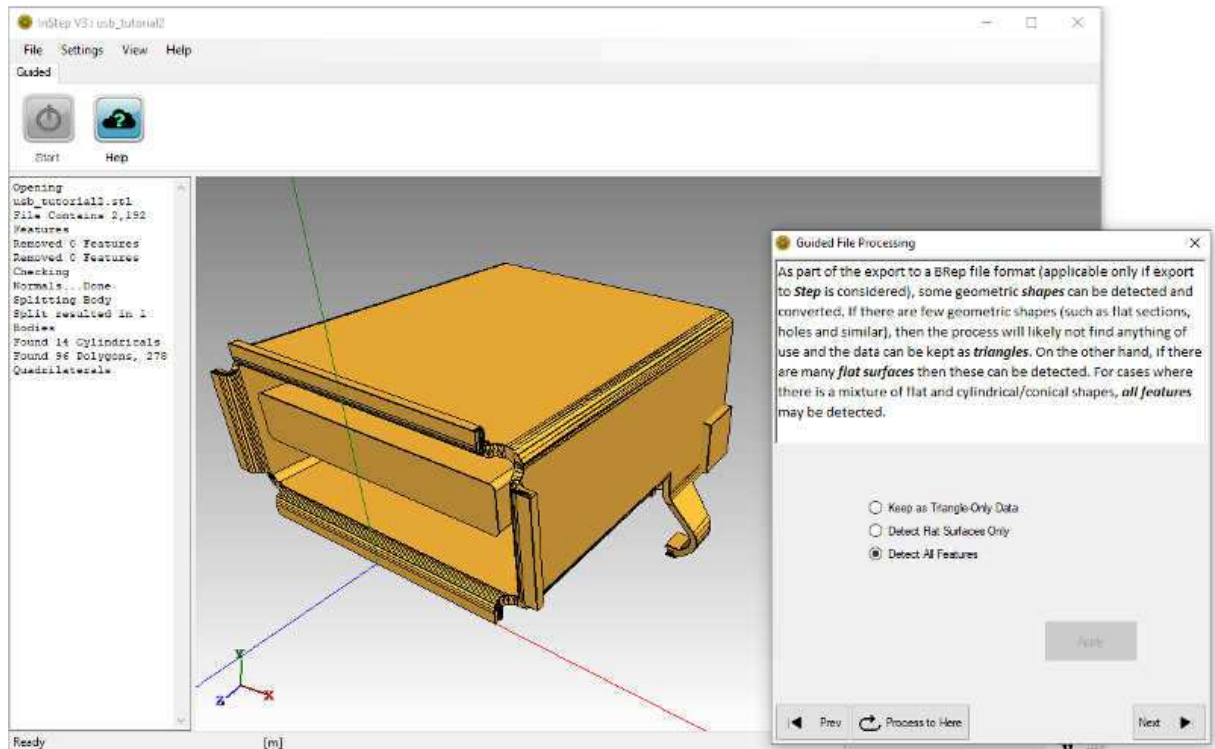
The result of this is not as expected. For one, interior surfaces (those that are in dark grey) are visible and exterior surfaces appear to have been deleted, exposing the interior. The application does not report issues, indicating that the process completed as expected.

The issue here is one that was briefly mentioned before: tolerances. The default setting for the application is to use an Edge Length based tolerance, set to 0.5x the minimum edge length. In this case, the value leads to surfaces becoming collapsed, exposing the interior.

For now, there is no way around this, and the process would likely best be completed by reverting the changes (Process to Here) and then to choose the Keep as Triangle-Only Data which does not perform the feature detection. For this body, the way to circumvent the default tolerance methods (which are available through the Expert interface and shown in later tutorials), is to use the unit system to better represent the data, so that the tolerance is more appropriate.

Going back to the units page, the Preferred Units are set to Meters ('m') and the changes applied. Looking at the Unit Triad shows how small the part is relative to the units. Working through the next page, the Invalid and Duplicate features are removed and normals corrected (with the same results). Now, on the Feature Detection page, selecting All Features and clicking Apply, results in the data shown in the figure below:





### *Feature Detection Successfully Completed*

Again, the Message Panel shows what the process found and converted. It may appear that there are still 'too many' items that have not been properly converted, however, upon closer inspection, it may become apparent why these items were not correctly converted. Several items with complicated boundaries cannot be properly converted to a geometric representation and are therefore left in their original state. Other, simpler surfaces are correctly converted.

With the processing of the data completed, the remaining step is to export the file using the Save As option on the next page. The process and options available are the same as previously discussed.

So far, there has been little need to modify settings to change the behavior of the application. Nevertheless, it makes sense to briefly discuss where the settings are and what they do.

At the top of the application, in the menu bar, the Settings option expands to give access to:

- Application Settings
- License Settings
- Settings Submenu
- Interface Submenu

These are individually discussed in more detail:

## **Application Settings**

Clicking on the Application Settings item brings up a property panel that lists all generally available settings, each grouped. The settings can be sorted by category or name. Clicking on each setting shows a brief description at the bottom of the panel with some basic information about what the setting applies to.

Generally, there is no need to modify these settings and a number of them will only apply to one tool or another. Nevertheless, if there is a behavior that needs (re-) setting, then this is where that setting would be available. As values are changed, they are stored so there is no need to separately 'save' a setting.

## **License Settings**

The license values can be directly accessed through this option and provides a way to reset any values that have been stored (for example, if a user temporarily saves the login information on one computer, this can be used to 'forget' the values and prompt the user to log in next time the application starts).

In some cases, such as for example if someone is planning on working offline for an extended period of time, it is possible to 'Refresh' the license status, thereby providing the maximum amount of time until the application needs to re-validate the entered credentials. Clicking the 'Show License Options' brings you to the user account page where you can access your license settings. The 'Reset & Log In' option does exactly that: it clears the login information and prompts you to re-enter your credentials.

## **Settings Submenu**

Under the Settings Submenu you will find the option to Save all current settings to a file, load settings from a file as well as to reset any user modified values to their defaults. Note that this will also clear any login information. As different versions of InStep will use different settings and perhaps different default values, any time you upgrade and want to keep some specific values, it is advisable to store those settings prior to upgrading the application. That way you can then re-apply previous settings once the newer version starts.

One item to note is that settings should never be manually changed by editing the settings in an external file (unless specifically told to do so). This may prevent the application from successfully starting or behaving erratically.

## **Interface Submenu**

This is where the different interface options can be selected. It is recommended that switching between interfaces be avoided after a file has been imported as this may cause unexpected behavior.

One last item regarding Settings. Some tools have their own settings which are applicable to that tool alone. Those are discussed separately but will appear when a specific tool is initiated and will generally be displayed by a small symbol of a gear with a wrench inside.