



## **Clouds2Max VX: User's Guide**

Version: Beta 1.47 Build #32

Product of ai2-3D

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## **Introduction**

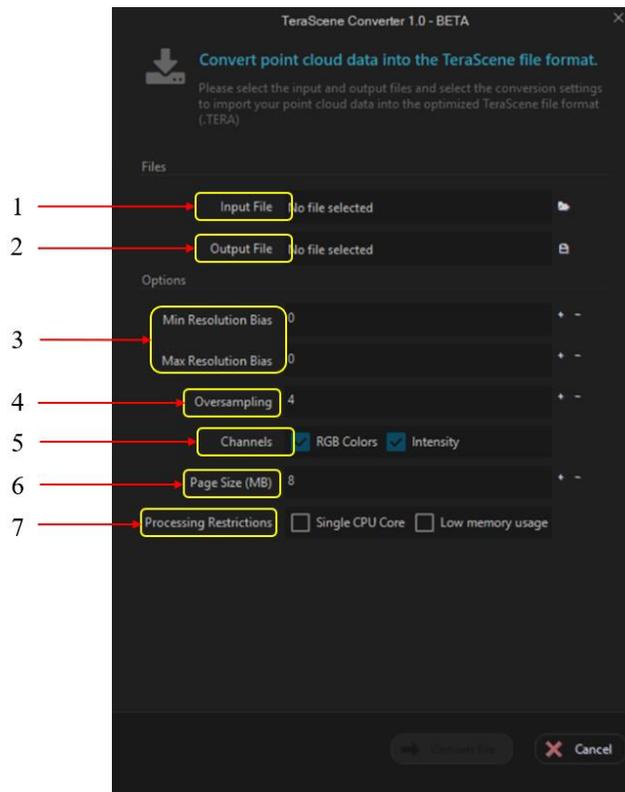
Clouds2Max-VX allows users to convert and import point cloud data into Autodesk 3ds Max. This new version of Clouds2Max has increased performance to allow for point clouds that consist of billions of points. A separate converter (TeraScene) converts point clouds to the new format, which must be done prior to importing into 3ds Max. Currently, there is support for up to 3ds Max 2020.

## **New Features**

- TeraScene Converter 1.0 – Beta
- Compatibility with LAS, LAZ, PLY file formats
- Increased point cloud performance
- Point cloud editing and saving
- Colour output: RGB Colour, Intensity, Height Ramp
- Point Cloud rendering – tested with scanline and shadow maps

## **TeraScene Converter 1.0 – Beta**

TeraScene converts point cloud data into a new format (.tera file) prior to importing into 3ds Max. The software is compatible with: Licia Cyclone, ASCII, Clouds2Max, PLY, E57, LAS file formats.



1. **Input File**  
Choose the file you intend to convert into a .tera file. Compatible with: Lecia Cyclone, ASCII, Clouds2Max, PLY, E57, LAS file formats.
2. **Output File**  
Choose the location on your computer you intend for the converted .tera file to be created. The output file can also be renamed here.
3. **Min/Max Resolution Bias**  
Allows more control over the automatic resolution detection, working in conjunction with the Oversampling option.
4. **Oversampling**  
This controls the adaptive detail of the voxelization. A higher value would result in a more closed surface but would also reduce resolution.

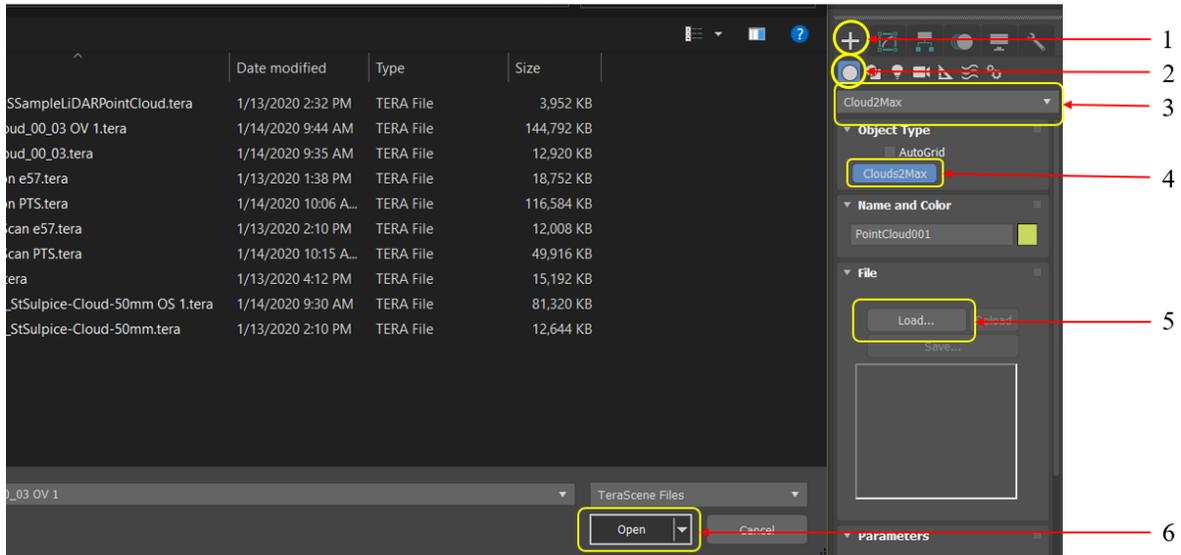
#### Recommendations for Min/Max Resolution Bias and Oversampling Parameters

- A. If the point cloud has a few big outlier points, increase the Min Resolution Bias.
  - B. For greater detail, increase both Min and Max Resolution Bias and decrease Oversampling.
  - C. For more closed (solid) surfaces, decrease both Min and Max resolution Bias and increase Oversampling.
5. **Channels**  
Includes options to select RGB colour and Intensity channels to store in the output file.
  6. **Page Size (MB)**  
Affects the memory (CPU) requirement while rendering and the loading times for different storage hardware. A smaller page size setting would result in a lower memory requirement.
  7. **Processing Restrictions**  
Restricts processing to only use a single CPU core or lower memory (RAM). This is useful as it enables the ability to convert files that would not fit into memory. Also allows the converter to run as a background task when memory (RAM) is being allocated for another task.

## Clouds2Max VX

### Importing converted point cloud (.tera file) into Autodesk 3ds Max

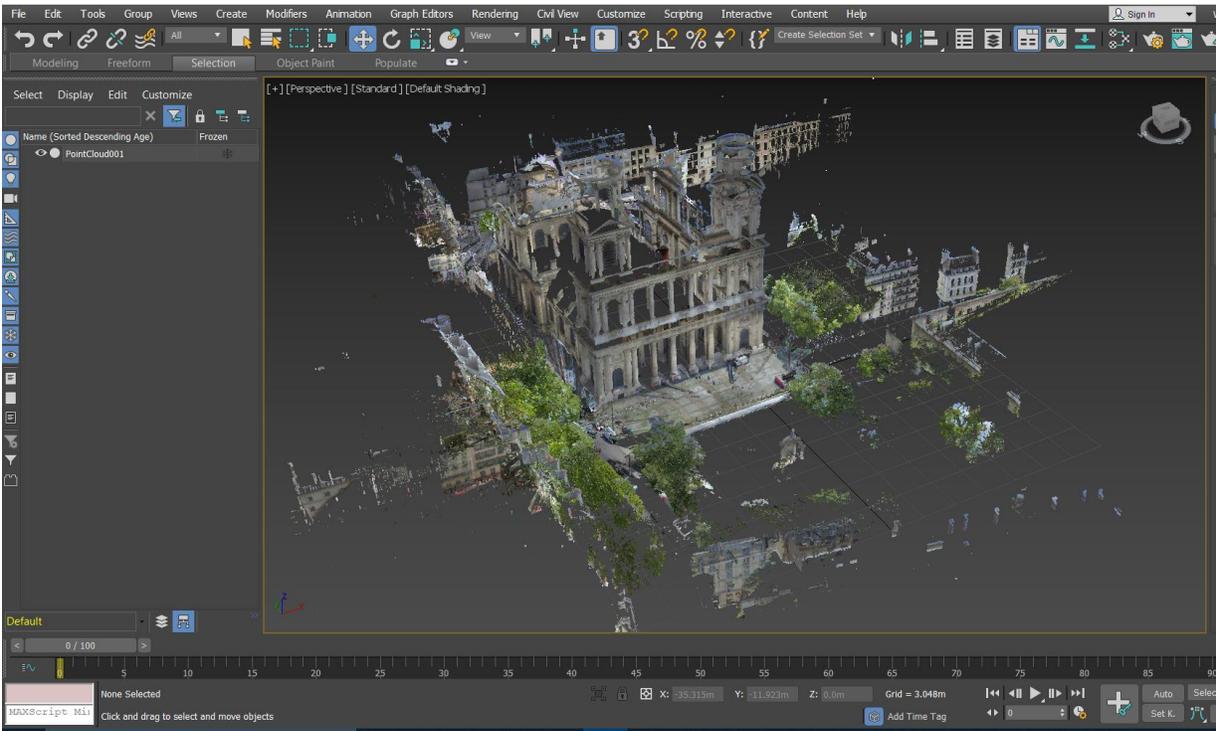
1. 'Create' Tab → 2. 'Geometry' Tab → 3. 'Clouds2Max' (drop down menu) → 4. 'Object Type' - Clouds2Max → 5. File - Load → 6. 'Open' intended .tera file and 'left-click' in the viewport to create the point cloud



### Working with Imported Point Clouds in 3ds Max

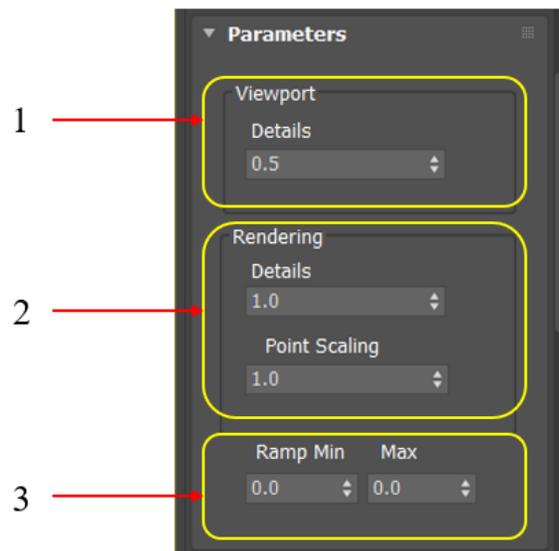
Once imported, an object named "PointCloud001" will be created in the 'Scene Explorer' window. Multiple point clouds can be imported using Clouds2Max and can be renamed in the 'Scene Explorer' window. Point clouds work similar to other objects in 3ds Max, with functions including: Move (W), Rotate (E), Hidden, etc. Scaling (R) is initially locked, but can be unlocked by going to 'Link Info' under the 'Hierarchy' tab.





## Parameter Settings

Parameter settings are found under the 'Modify' tab.

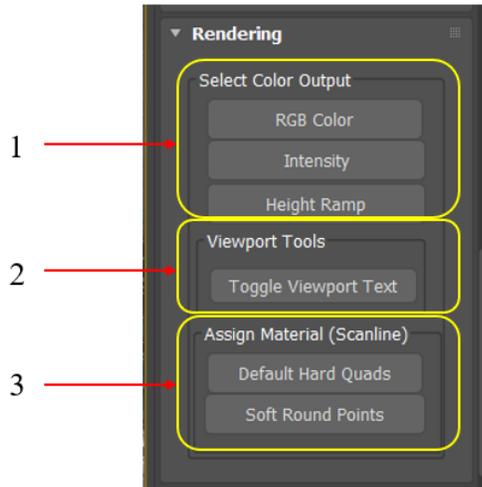


1. Adjustment of point cloud detail in the Viewport. Values range from 0.05 (low detail) to 1.0 (high detail).

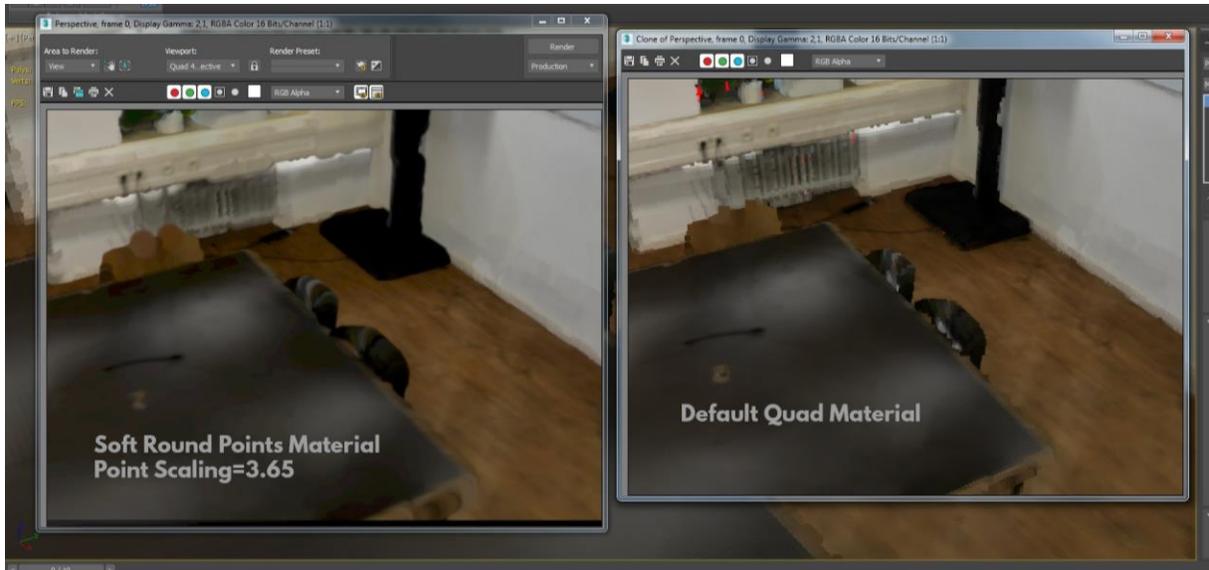
2. Adjustment of point cloud detail and point scaling for rendering. For details, values range from 0.1 (low detail) to 2.0 (high detail). For point scaling, values range from 0.75 (small points) to 5.0 (large points).
3. Adjustment of minimum and maximum values for height ramp. For more information on the height ramp feature please see: ‘Select Colour Output’ under Render Settings.

### Rendering Settings

Rendering settings are found under the ‘Modify’ tab.

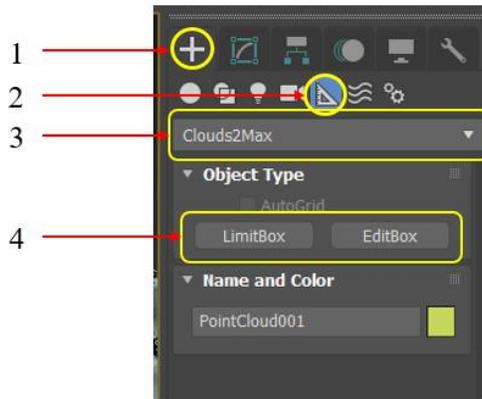


1. Select Colour Output  
Allows for the change of point cloud colour output presented in both the viewport and rendering. RGB color and Intensity will work if the RGB color and intensity data channels were stored when converting the original file with the TeraScene Converter. Minimum and maximum height ramp values can be adjusted in the parameter settings.
2. Viewport Tools  
Provides the ability to toggle the visibility of Viewport Text located on the top left side of the viewport.
3. Assign material (Scanline)  
Selecting ‘Soft Round Points’ allows for the rendering (Scanline) of soft round points. This feature requires the point scaling value to be set greater than 1. Please see example below.



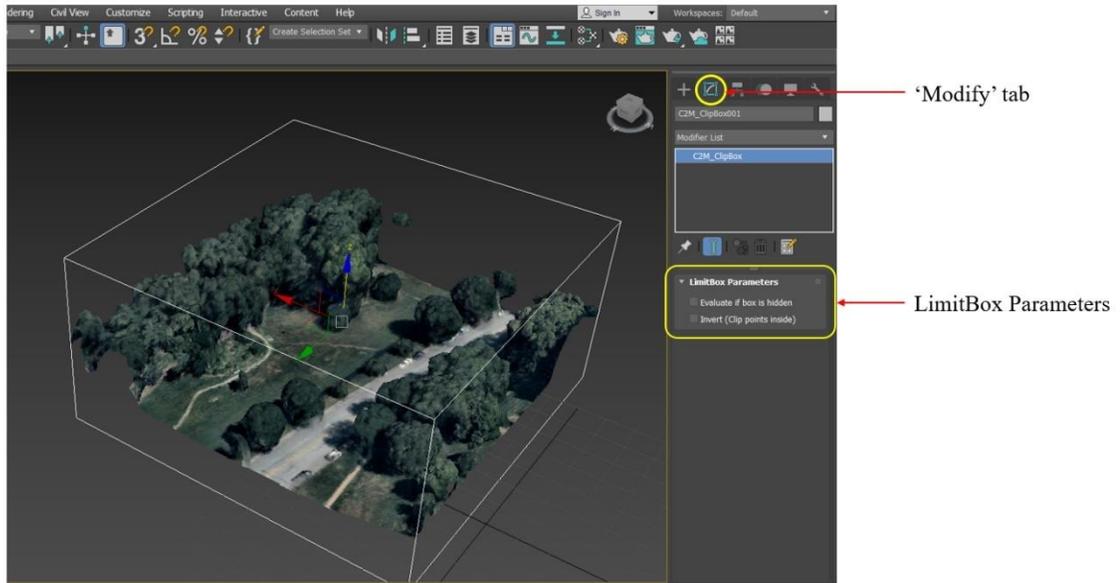
### Limit Box and Edit Box

1. 'Create' Tab → 2. 'Helpers' Tab → 3. 'Clouds2Max' (drop down menu) → 4. Object Type a) LimitBox or b) Editbox

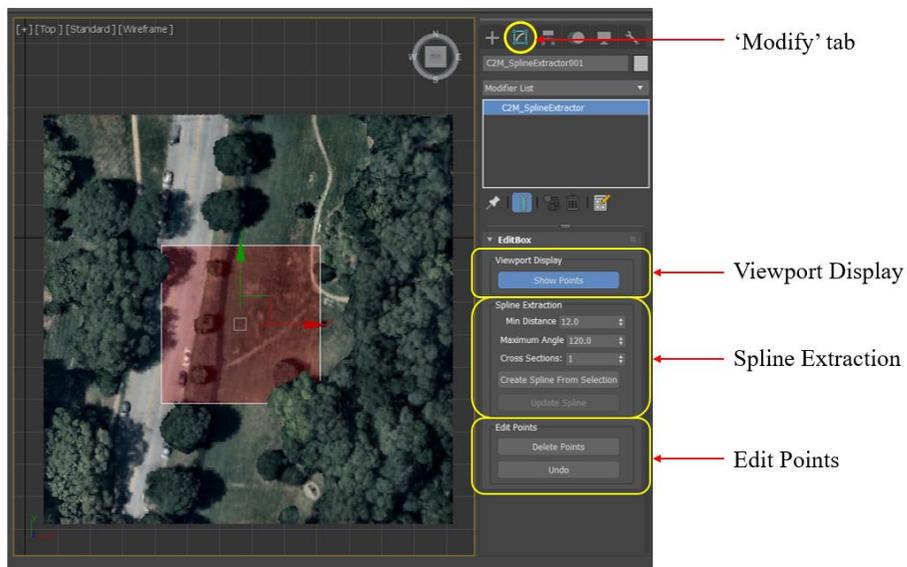


#### a) Limit Box Parameters

The limit box allows the user to hide points without deleting them. After creating a limit box, there is an option under the 'Modify' tab to let the limit box continue to function even when it is hidden. Another available option allows the functionality of the limit box to be inverted (ie. clip points on the inside the box instead of outside). Please see example below.

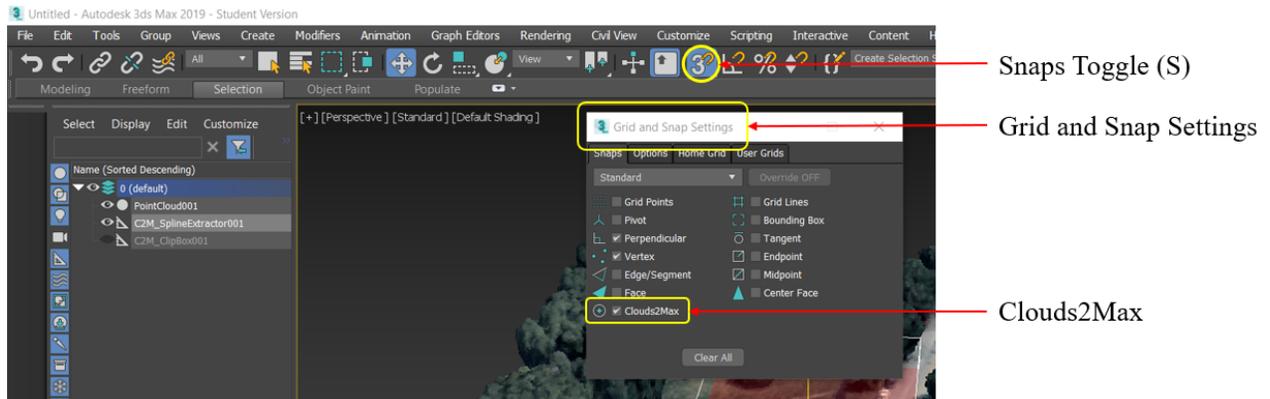


b) Edit Box Parameters



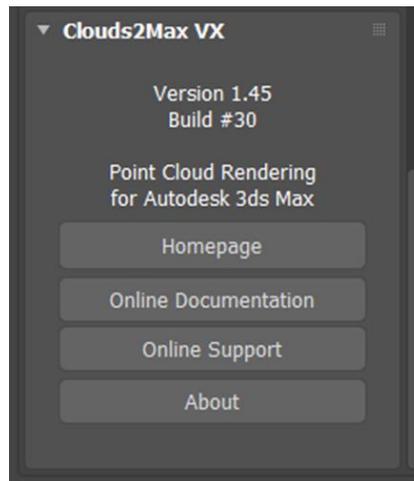
Points that are selected within the edit box are highlighted in red; edit box parameters are found under the 'Modify' tab. Alternatively, they can be clipped by toggling 'Show Points' under 'Viewpoint Display'. 'Spline Extraction' can be used to create or update a spline from the selected points. The tool lets the user adjust the minimum distance, maximum angle, and number of sections of the created spline. 'Edit Points' can be used to delete points that are selected with the edit box. The deleted point information is stored with the .max file, providing the ability to undo the deletion even after saving/loading.

## Point Cloud Snapping



Point cloud snapping gives the user additional control when creating, moving, rotating, and scaling objects by causing the cursor to snap to existing points. To enable this, 'right-click' on the 'Snaps Toggle' button access the 'Grid and Snap Settings'. Check-on 'Clouds2Max' to enable point cloud snapping. Typing the (S) hotkey toggles snapping on and off.

## Support and Information



Support and information for Clouds2Max VX can be accessed in either the 'Create' or 'Modify' tab. Here, users can find version and build number information. Support is also available through the 'Homepage', 'Online Documentation', and 'Online Support' buttons which all currently direct to: <https://www.ai2-3d.com/clouds2max>.