

HabiCAT 3D Quick Start Guide (CLI)

To use the application in command line interface (CLI) mode, the user can set `-console` as an application argument. After that, they can start inputting all other commands listed below. Alternatively, the user can proceed with commands in the original argument list, such as:

```
-console -NEXT_COMMAND -NEXT ...
```

To run the built-in test suite instead of commands, use `-console -run_tests`. The results are written to `HabiCAT3D_Tests.xml`.

Command signature:

```
-[COMMAND] [OPTIONS]=[VALUE]
```

Commands:

```
-help
```

Purpose:

Prints help for all commands or for a specific command.

Settings:

- `command_name` (Optional): The name of the command to print help for.
Default: (prints help for all commands)

```
-load
```

Purpose:

Loads a file from the specified path. In CLI mode, `OBJ` meshes, `LAS` and `LAZ` point clouds, and `RUG` files that contain meshes can be loaded. `PLY` files can be loaded only in GUI mode.

Settings:

- `filepath` (Required): The path of the file to load.
- `keep_existing_data` (Optional): Whether to keep existing data when loading a new file. By default, loading a file removes everything that was loaded before. Set it to `"true"` to load several objects into one workspace. All following commands work on the most recently loaded object.
Default: `"false"`

```
-save
```

Purpose:

Saves the current state to a file at the specified path.

Settings:

- `filepath` (Required): The path of the file to save.
-

`-run_script_file`

Purpose:

Execute a sequence of commands from a specified script(text) file. Each command in the file should be on a new line.

Settings:

- `filepath` (Required): The path of the script file to execute.
-

`-complexity`

Purpose:

Creates a job to add complexity layer of a model based on the specified type.

Settings:

- `type` (Required): Specifies the type of complexity calculation.
Possible Values: `'HEIGHT'`, `'AREA'`, `'RUGOSITY'`, `'TRIANGLE_EDGE'`, `'TRIANGLE_COUNT'`, `'VECTOR_DISPERSION'`, `'FRACTAL_DIMENSION'`, `'COMPARE'`, `'POINT_DENSITY'`, `'STRUCTURAL_ROUGHNESS'`
`'POINT_DENSITY'` and `'STRUCTURAL_ROUGHNESS'` require a point cloud. `'FRACTAL_DIMENSION'` works on both meshes and point clouds. All other types require a mesh.
- `resolution` (Optional): Specifies the resolution in meters for the complexity calculation. Alternative to `relative_resolution`.
Default: `Minimal possible`
- `relative_resolution` (Optional): Specifies the resolution as a float between `0.0` and `1.0`, where `0.0` represents the lowest possible resolution and `1.0` represents the highest. Alternative to `resolution`.
Default: `0.0`
- `jitter_quality` (Optional): Specifies the quality of jitter applied to the model. Higher values mean more jitters and potentially smoother results but slower processing.
Possible Values: `1`, `7`, `13`, `25`, `37`, `55`, `73`
Default: `55`
- `run_on_whole_model` (Optional): Specifies if the calculation should be run on the whole model without jitter.
Default: `"false"`
- `triangle_edges_mode` (Optional): Specifies the mode of triangle edges calculation. Relevant only for `'TRIANGLE_EDGE'` complexity type.
Default: `MAX_LENGTH`
- `rugosity_algorithm` (Optional): Specifies the algorithm for rugosity calculation. Relevant only for `'RUGOSITY'` complexity type.
Possible Values: `'AVERAGE'`, `'MIN'`, `'LSF(CGAL)'`
Default: `MIN`

- `rugosity_is_using_unique_projected_area` (Optional): Specifies if the unique projected area should be used for rugosity calculation. Relevant only for `'RUGOSITY'` complexity type.
Default: `"false"`
 - `rugosity_is_unique_projected_area_approximated` (Optional): Specifies if the approximation should be used for unique projected area rugosity calculation (Speeds Up by Over 100x). Relevant only for `'RUGOSITY'` complexity type.
Default: `"true"`
 - `rugosity_delete_outliers` (Optional): Specifies if the outliers should be deleted from the rugosity calculation. Relevant only for `'RUGOSITY'` complexity type.
Default: `"false"`
 - `rugosity_min_algorithm_quality` (Optional): Specifies the quality of the rugosity calculation. Relevant only for `'RUGOSITY'` complexity type and when the `rugosity_algorithm` is set to `'MIN'`.
Possible Values: `1`, `9`, `19`, `33`, `51`, `73`, `91`, `99`, `129`, `163`, `201`, `289`, `339`, `393`, `441`
Default: `91`
 - `fractal_dimension_should_filter_values` (Optional): Specifies if the app should filter values that are less than `2.0`. Relevant only for `'FRACTAL_DIMENSION'` complexity type.
Default: Depends on object type, `"true"` for meshes and `"false"` for point clouds.
 - `is_standard_deviation_needed` (Optional): Specifies if the app should also add layer with standard deviation.
Default: `"false"`
 - `compare_first_layer_index` (Required): Specifies the index of the first layer to compare. Relevant only for `'COMPARE'` complexity type.
 - `compare_second_layer_index` (Required): Specifies the index of the second layer to compare. Relevant only for `'COMPARE'` complexity type.
 - `compare_normalize` (Optional): Specifies if the app should normalize the layers before comparing. Relevant only for `'COMPARE'` complexity type.
Default: `"true"`
-

`-evaluation`

Purpose:

Creates an evaluation job with the specified settings to test a layer or other objects.

Settings:

- `type` (Required): Specifies the type of evaluation.
Possible Values: `'COMPLEXITY'`
- `subtype` (Required): Specifies the subtype of evaluation.
Possible Values: `'MEAN_LAYER_VALUE'`, `'MEDIAN_LAYER_VALUE'`, `'MAX_LAYER_VALUE'`, `'MIN_LAYER_VALUE'`
- `expected_value` (Required): Specifies the expected value for the evaluation.
- `tolerance` (Required): Specifies the tolerance for the evaluation.

- `layer_index` (Optional): Specifies the index of the layer to evaluate. Relevant only for `'COMPLEXITY'` evaluation type.
Default: `'-1'` Which means the last layer.
-

`-global_settings`

Purpose:

Sets a global setting for the application.

Settings:

- `type` (Required): Specifies the type of global setting.
Possible Values: `'EVALUATION_JOB_TO_SCRIPT'`, `'OUTPUT_LOG_TO_FILE'`
With `'OUTPUT_LOG_TO_FILE'` enabled, the console output is also written to `CONSOLE_LOG.txt` in the working directory.
 - `int_value` (Optional): Specifies the integer value for the global setting.
Default: `0`
 - `float_value` (Optional): Specifies the float value for the global setting.
Default: `0.0`
 - `bool_value` (Optional): Specifies the boolean value for the global setting.
Default: `"false"`
-

`-export_layer_as_image`

Purpose:

Exports a layer as an image. Available only for meshes.

Settings:

- `export_mode` (Required): Specifies the mode of the export.
Possible Values: `'MIN'`, `'MAX'`, `'MEAN'`, `'CUMULATIVE'`
- `save_mode` (Required): Specifies the type of image file.
Possible Values: `'PNG'`, `'GEOTIF'`, `'GEOTIF_32_BITS'`
- `filepath` (Required): Specifies the path of the file to save.
- `resolution` (Required): Specifies the resolution in meters for the image.
- `resolution_in_pixels` (Optional): Specifies the resolution in pixels for the image.
Default:
- `layer_index` (Required): Specifies the index of the layer to export.
- `force_projection_vector` (Optional): Specifies the projection vector for the image.
Possible Values: `'X'`, `'Y'`, `'Z'`
Default: `Calculated on fly`

- `persent_of_area_that_would_be_red` (Optional): Specifies the persent of area that would be considered outliers and would be red.

Default: `5.0`

`-query`

Purpose:

With this command, users can query information to be outputted to the console or log.

Settings:

- `request` (Required): Specifies what to query.
Possible Values: `'EVALUATION_SUMMARY'`
-

`-exit`

Purpose:

Closes the application. Use it as the last command of a script, otherwise the console window stays open and waits for more commands.

Settings:

- None.
-

Examples:

```
-load filepath="C:/data/mesh.obj"
-save filepath="C:/data/processed_mesh.rug"
-complexity type=RUGOSITY rugosity_algorithm=MIN jitter_quality=73
-evaluation type=COMPLEXITY subtype=MAX_LAYER_VALUE expected_value=5.02 tolerance=0.01
```

A script file that calculates two layers on a point cloud, saves the result and closes the application:

```
-load filepath="C:/data/site.laz"
-complexity type=POINT_DENSITY
-complexity type=STRUCTURAL_ROUGHNESS
-save filepath="C:/data/site.rug"
-exit
```

Notes:

- For Boolean settings, use `"true"` or `"false"`.
- Paths must be enclosed in quotes.