

TerraStereo for CAD Quick Guide

Tools overview

TerraStereo for CAD requires Bentley Microstation CE or Bentley Map PowerView CE to run.

TerraStereo MDL Application

This is the main module of the stereo application and it is loaded like any mdl application, for instance by a key-in <mdl load tstereo>. This application requires display mode to be set so that displays 1 and 2 extend the desktop and it requires Microstation to be opened with 3 application windows instead of one or two (configurable via Microstation File/Settings/User/Operation/Open Multiple Application Windows).

Note that applications requiring quad buffered stereo cannot be run at the same time with TerraStereo for CAD. To start these applications close MicroStation first and then set the display mode so that displays 1 and 2 duplicate each other before starting quad buffer stereo applications.

FixScreens Utility

This helper application will set the MicroStation screens so that they are properly set for the stereo usage. It will also move all other windows to main screen. It is in terra64 / tstereo - folder and you can just run it from there with a file explorer or command prompt. This application requires display mode to be set so that displays 1 and 2 extend the desktop.

Before running the command Microstation should be opened with an active dgn file. If it is not open (with a file) then the tool only transfers all windows to main screen without identifying the stereo dedicated screens. Please close down TerraStereo MDL application by closing the tool box before running fixScreens.

Note – currently the command does not affect those windows that are minimized – they will remain minimized and once restored they will relocate to their original places. In this case just rerun the fixScreens utility.

TerraStereo Standalone Application

This is a quad buffered version of TerraStereo that runs outside Microstation. It uses same projects for point clouds that TerraStereo MDL Application but cannot be run at the same time. It also requires the display mode to be set so that displays 1 and 2 duplicate each other (and the quad buffer is on).

Quick Start

First make sure the screen setup is right; screen 2 of MS is the bottom monitor and screen3 of MS is the top. Screen1 is the side monitor.

When TerraStereo is loaded, it will automatically setup views for stereo –operation.

Load some points into the memory using TerraScan. If the dgn file is empty, draw borders around the loaded points by TerraScan tools/Draw Bounding Box –command.

Then use TerraStereo's Update Loaded command and you should see the points shortly in stereo view. If you have problems with the window setup, try one of the view setup commands.

Tool Palette of TerraStereo for Microstation

General



General: Reload

Loads a previously converted TerraScan points into memory (eg. Shortcut to a previously done Update Loaded).

General: Load

Loads a previously converted point cloud into memory or creates one from TerraScan project. Use this command project wide point clouds.

General: Update Loaded

Converts TerraScan loaded points into a stereo viewable model (this same model can later be accessed with Reload command). Use this command for viewing active TerraScan points in stereo.

General: Colortable Export

Colour table export makes it possible to use right classification colouring based on the current design file colours. With this tool the colours shown in classification visualization mode will be shown correctly also on the stand alone TerraStereo.

General: Snap Settings

Snap Settings enables point cloud snapping on stereo view and on the other views.

General: Cursor Settings

Cursor Settings allows customization of the Stereo view cross hair.

View Setup



This toolbox has functions for automatically organizing stereo or mono view(s) and their related cross section views.

Mono mode by default sets view 7 to parallel mode and allows all stereo navigation features to be used in mono mode with a cross sections showing the primary orthogonal cross section (view5) and digitizing plane cross section (view6).

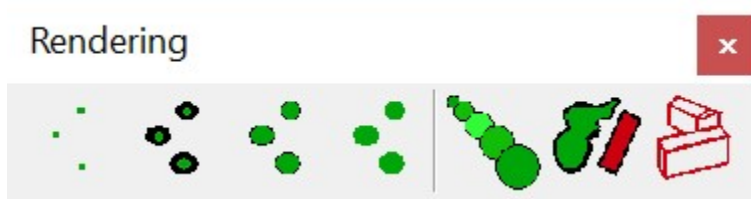
For stereo mode there are four configurations: Full screen with no tool area and two medium and one small screen setups having a small tool area on the right side of the screen 2. The tool area allows actively needed dialogs and cross section views to be placed there so that they will show correctly on both eyes.

If you want to have a full screen stereo with cross section views on the side monitor, you can first select mono system mode and then full screen.

The cross-sections used in stereo views are the primary orthogonal cross section (view5) and 90 degree rotated (around z axis) cross section (view6). The medium view option with a 'H' makes the view 6 cross section horizontal instead.

Cross section views can be adjusted or closed after the view setup. If they are located at the tool area on the stereo screen they should not exceed borders of the area.

Rendering



Rendering: Contrast

There are four contrast options in the software:

Plain points: Points drawn as single pixels

High: Points are drawn with small bright disks and a dimmed exterior

Medium: Points are drawn with filled bright disks with just a dimmed border

None: Points are drawn with filled bright disks

Rendering: Point Size

The contrast effect will be affected by the size of the disks drawn. Initial values work for some data sets but for optimal values one can interactively adjust the point size to match that which is required by the dataset. The interactive adjustment is performed like a Microstation command – first a datapoint is entered in any view and then the adjustment will go bigger when moving the mouse right and smaller when moving it to the left. Second datapoint will end the adjustment and right click will cancel the command.

Rendering: Visibility

This command pops up a dialog where one can choose between the available channels. If classification channel is available, the user can also enable/disable classification codes that are to be visible. You can also set if you want to view the points in front of or behind of the vectors. You can even set the point clouds display off but still use it on the background for navigation and snapping purposes while viewing just the vectors in stereo.

Optionally you can turn off the snapping. This is useful if you want to use TerraScan for controlling the point cloud snapping, for instance.

Rendering: Update Citymodel (beta)

If you have TerraPhoto and TerraScan loaded and a Terrasolid citymodel in the dgn file this command updates the citymodel to the stereo view.

Navigation in Microstation Stereo Window

Setup Views

You usually need to specify view parameters as wireframe and no grid. Also, you may want to adjust the visible levels.

You must set both view 7 and view 8 to use the same levels and parameters.

Then you define the perspective (that only needs to be done on view 7). Start by selecting normal camera. Then fit the view and use zoom area tool to get closer to the target area.

TerraStereo Specific Navigation Commands

Initialize the stereo view first. Use top orientation and fit the view. If the file covers a large area it is recommended to zoom in to the right area first using zoom area tool.

When you are closer to points and vectors, you can start using mouse wheel **to move** in the dataset – the moving always goes to the cursor direction.

The cursor is set to the tentative point or active z depth. To set tentative point click left and right mouse button together. You can also press space bar to move the cursor to the point cloud.

To **pan using active depth** use a middle button (or wheel button) and either drag or click and move. Note that panning is always related to the depth the cursor was when panning started.

To **rotate around a cursor at active depth** hold down left control and then either move mouse sideways (to rotate around pure z axis) or move it vertically to change the viewing angle. When viewing the model from absolute top view the cross hair is highlighted and a letter 'T' pops up after the elevation value in the right side of the cross hair.

MicroStation rotate command can also be used from the view menu or its' shortcut (shift hold, and wheel button click). Note that you need to have a tentative point set before both operations.

To use default Microstation navigation commands and ignore TerraStereo overrides type keyin <tstereo navigation cad> and to return back to default type <tstereo navigation default>. Perspective navigation with Microstation default commands is a bit tricky but sometimes it works better than TerraStereo overrides; especially when there is no point cloud available and you are viewing just vectors.

TerraStereo Specific Digitizing Functions

Use tentative point and snaps / locks like you would in normal MicroStation operation. Note that if the point cloud is active one can also snap into the points using tentative point snap. To adjust data point into the void location between points first snap into the points close by and then move the cursor to enter the data point using the previously snapped depth.

It is usually best to disable all additional helper utilities like accudraw first.

When moving the cursor over the area one can press shift to immediately drop the cursor to the closest point. If ctrl-key is pressed while the mouse wheel is rotated it will adjust the depth of the cursor manually. To change the resolution of wheel in depth adjustment go to cursor settings.

All these functions work for view 7 only – on other views the only available special function is the point cloud display – no mouse function or navigation is overridden. Note that when navigating in these views the navigation logic is based on the vectors alone, because Microstation itself is not 'seeing' the pointcloud. With Terra Stereo snap settings you can enable point cloud snapping on the other views than stereo, too.

Cross Sections

Cross section views will always show the surroundings of the active depth point in the current cursor position.

If you want to **freeze the cross section**, use tentative point. The freezing is released after performing any other snapping (like holding down left shift). When the cross section is frozen, you can freely move the mouse to a cross section window and digitize directly from it.

To **change the zoom of the sections** either change it from zoom tools of the section window or then use right ctrl + mouse wheel to adjust.

To **change the thickness of the sections** use right shift + mouse wheel to adjust.

Note that with mouse wheel commands one the zoom and layer thickness can be adjusted in the middle of stereo digitizing.

TerraStereo with Vectors only

It is possible to use TerraStereo for CAD without point clouds. This will work for most of the dgn file types, but for some types of elements (like gridmesh of certain type) automatic stereo offset will not work.

For grid mesh elements that do not work with automatic stereo there is a manual setting that one can use to view the dataset from top-down orientation. Set view 7 to top orientation and fit the view. Then move close to the objects in the view. Key in <stereo mode top> and enter datapoint on a view 7. Then slightly adjust the stereo offset by moving mouse left or right and stop adjusting by entering the second datapoint in the view. You should then be able to pan around with reasonable stereo effect and do a bit zoom in / out.