TerraScan

for MicroStation SE/J and V8
Windows NT/2000/XP/ Vista

3D-city maps are easy to produce from airborne laser data and images.

For processing airborne and vehicle based laser data

TerraScan reads-in raw laser points and classifies them to user-defined point classes like ground, vegetation and buildings. Besides built–in formats, like LAS and TerraScan binary, you can define your own formats for reading-in practically any ASCII-survey files.

All processing routines are optimised to apply full performance of your PC. To avoid performance exceeding, TerraScan divides total data sets into smaller, geographical blocks. Processing blocks by user-defined macros automates workflow and increases drastic work efficiency.

Natural combinations to TerraScan are applications as follows:

- *TerraSlave – to execute macros in LAN PCs*
- *TerraMatch – to calibrate data*
- *TerraModeler – to create, edit and display TINs*
- *TerraPhoto – to use images for processing*

With TerraScan and TerraMatch one can process data from moving mobile laser mapper like StreetMapper and Lynx.

From Contors to 3D-City Models

Most users are satisfied, when they just get ground points for surface modelling and making contours. Contors produced from all ground points are very complex. To avoid this TerraScan smartly reduces point number and produces more printable contor maps for publishing purposes.

TerraScan does not stop on ground level but let you take full benefit from all points. One high-end delivery product is a 3D-city model. Its easy to create, if just the point density is high enough and you have updated, high-quality images. Just classify laser points and detect building roof edges using laser points and images. Finally drape true-orthos along the ground and building model. TerraScan identifies point clouds from trees and replaces them automatically by RPC cells to get more photo-realistic illustration.

Terrasolid

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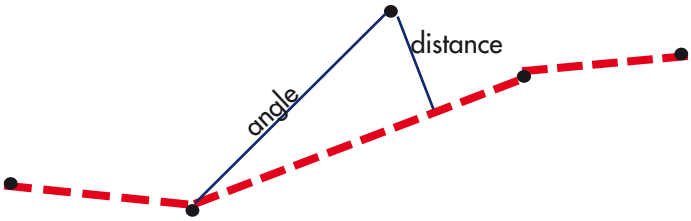
Fast and Reliable Ground Point Classification

Filtering of ground points is one of the most important routines of TerraScan. Many other classification routines of TerraScan compare then the elevation of other points to ground surface.

Ground classification has two phases. First TerraScan searches the initial points and builds-up an initial, temporary TIN model. Triangles of initial model are mostly below the ground and only vertices touch ground. Before starting ground classification real low points have been filtered out from data sets by TerraScan.

In the second phase TerraScan lifts the model upwards. New points will be added to the TIN within angle and distance limits between points and TIN. Each added point makes the model to follow real ground surface more closely.



In ground point iteration user-defined parameters decide if points belongs to ground or not.

Key Features:

- Transforms points from WGS 84 to local co-ordinate systems.
- Adjusts the elevation of points to geoid.
- Views point clouds in 3D.
- Displays points in different colored modes: class, echo, flight line, intensity, height, point color.
- Manual and automated point classification routines.
- Manages trajectories to match points together with TerraMatch and cut overlapping point strips from different flight lines.
- Filters out erroneous like low and high points
- Creates and display by TerraModeler an editable 'Shaded surface'. This allows a visual validation of ground points.
- Thins and smoothens ground points.
- Exports points as raster images and grids.
- Projects points into profiles.
- Displays distances between points and design objects.
- Drapes linear elements like street lines along the elevation of laser points.
- Detects power lines using least squares fitting.
- Outputs ground points to surface modelling by TerraModeler.
- Supports all generally used point formats. User can define his own ASCII formats.
- Generates control reports.
- Automatic contor production with TerraModeler
- Building vectorizaion with TerraPhoto

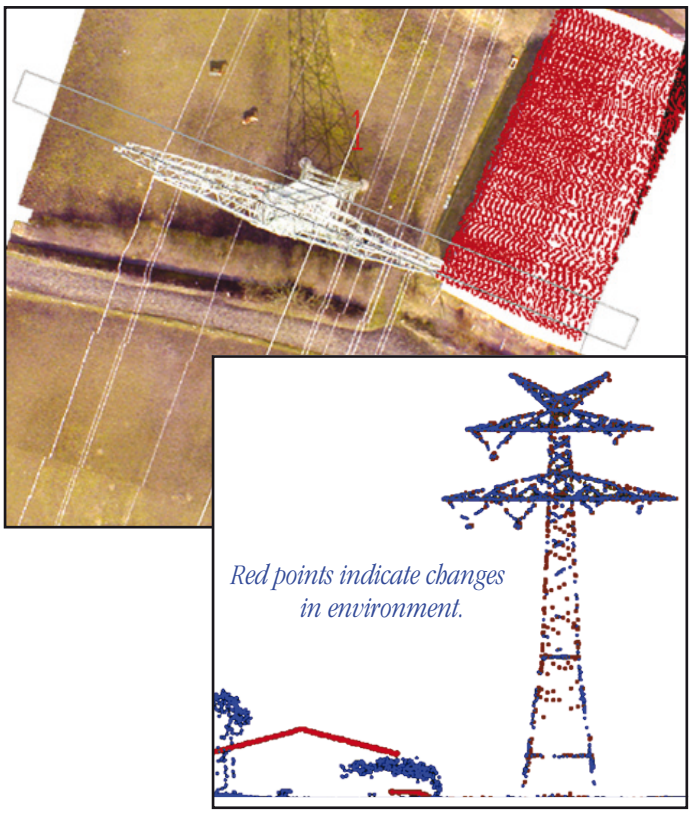
Point classification by automated processes

Laser data processing includes many different processing steps. The main categories are reading-in and transforming points to local co-ordinates, calibrating data, automated processing by macros and finally manual finishing of classification. Extend of each processing steps depends on the final target of the survey project.

Due to the limits of operating systems TerraScan divides total data into smaller geographical blocks, of which size is around 5 - 10 million points. Almost all processing can be automated to perform by user-defined macros. They run blocks one by one. If some task takes lot of time, its more convenient to share processing over LAN with another PCs and let *TerraSlave* there to execute processing.

In general after each processing task the results must be controlled and re-computed if necessary. 3D-viewing and by using different display modes offers an easy way for quick visible data control.

TerraScan produces a control report about the difference of height between known-points and TIN of ground laser points. After the report the user can lift or lower all laser points to their most correct level. Using images as reference and displaying points by their intensity value let user to shift laser points to their correct location.



By comparing data sets surveyed in different dates allows to monitor changes in environment.