

TerraPhoto

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

For producing orthophotos with airborne laser data

TerraPhoto is epitomized to process raw image frames captured by airborne or on vehicle based survey systems. It creates orthophotos by using laser points and vectors of objects for projection.

TerraPhoto is a natural combination to TerraScan by supporting point classification in all processing steps. Furthermore laser points support image processing.

By working in one environment with seamless integration of all Terrasolid packages you can reach with the least efforts the best quality of delivery products.

New approach to ortho-rectification

TerraPhoto is optimised to process images from medium- and large-format frame cameras. It uses classified laser points in many processing steps. In an optimal project one flies images and laser at the same time. Then both data sets are updated and their position originates from same flight lines.

Whether the flights are separately or together TerraPhoto offers following advantages:

- Single pass method creates directly a mosaic of an orthorectified grid.
- TerraPhoto derives elevation value for each pixel of raw images from TIN of ground laser points.
- Interactive colour correction by thumbnails color points.
- Interactive seamline editing.
- Camera calibration in-situ.



Lidar data points with high-resolution images are the most sophisticated data to create 3D-city models. You can process laser and images in one environment with Terrasolid's packages.

 **Terrasolid**

Email: info@terrasolid.fi <http://www.terrasolid.com>

Tie points for perfect position of orthos

In TerraPhoto one can use three different tie-point types: points on ground, points above ground and known points. By means of high-density laser points the location each pixels of overlapping images is pretty well known before starting the process

TerraPhoto offers manual, semi-automatic or fully automatic methods for tie-point search. Typically one searches first manual a handful of tie-points and then continues with more advanced automatic searches. The method and extend of work depends on initial image orientation, type of survey area and accuracy requirements of final orthos. By using laser points of trees and buildings one can create 'shadow maps' eliminate low quality pixels. This improves and speeds up automatic search. Interactive editing tools let user to control and finish the results after tie-point search.

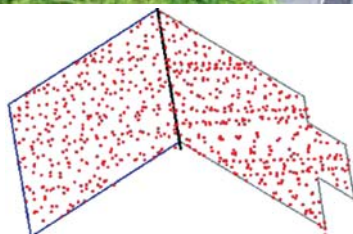
Camera view to control location and vectorizing objects

Each aerial photo is useful alone if one displays it by TerraPhoto as a 'bird-eye view' from camera locations. Before that the final orientation must be defined by tie-point search.

Camera view shows the real location of selected frame on survey area. By measuring the distance between control points seen on images and corresponding control points surveyed on field you can calculate an average xy-shift for all images to get an accurate orthomosaic location. Secondly images can be used as reference for laser points to place and edit building roof edge vectors and other objects above the ground. This allows to create true-orthophotos.



Planar surfaces of roofs can be detected from laser points. Their edges can be edited only manual by using 'bird-eye view' and raw images as reference.



Camera calibration in-situ

Camera information of TerraPhoto includes as follows:

- Focal point x, y and z relative to image plate.
- Heading, roll and pitch misalignment between camera and IMU.
- Radial distortion parameters for the lens.
- Tangential distortion parameters for the lens.

For many reasons the camera calibration defined in laboratory is not valid forever. TerraPhoto offers an interactive method to define full camera calibration in-situ. The calibration should be done regularly as a part of the total system quality safety.

Interactive color correction and seamline editing

By creating thumbnails one can by viewing roughly adjust RGB-values, brightness and contrast of all or selected images. That after 'Color points search' produces a more sophisticated color balancing. Color points are common points for overlapping images. They form a triangulated correction model to find the best correction values to all images. The procedure uses laser points of trees and other high objects, which may cause harmful coverage.

Seamlines are vectors, which TerraPhoto displays automatic. The user can modify them interactively and control the results in real-time. Difficult surfaces like reflective and glittering surface water in sunshine can be faded from one image to another one by given range from seamline.

