

ENSOMOSAIC 7.1

Software specifications

WHAT IS ENSOMOSAIC SOFTWARE?

EnsoMOSAIC is aerial **image processing software** containing all the processing steps in one package, from image orientation to the calculation of orthomosaics. In standard image capture conditions EnsoMOSAIC calculates orthophotos **independently and fully automatically** – no manual measurements, no ground control, no exterior orientation, no external DEM needed.

DATA INPUT AND OUTPUT

Input

- GPS data: ASCII text file
- INS data: ASCII text file
- Ground control data: ASCII text file
- Image data: 1 – n bands, 8 - 16 bits per pixel
- Image format: JPG, TIF, ERS, RAW.
- Digital camera images: small, medium and large format (photogrammetric cameras, UCam)
- Scanned aerial photos with fiducials
- Camera definition: EnsoMOSAIC format text file

Output

- Aerial triangulation results: ASCII text
- DEM: ERS-raster and ASCII text
- Oriented images: ISAT
- Orthomosaic: TIF, JPG, ERS
- Orthoimages: ERS
- Orthomosaics and image locations and footprints: Google Earth KML

COORDINATE SYSTEMS

EnsoMOSAIC supports a wide range of coordinate systems and map projections, and more can be added on request. The most commonly used are:

- Input: WGS 84 geographic
- Output: WGS 84 UTM, and local projections

AUTOMATIC AERIAL TRIANGULATION

The core of EnsoMOSAIC is its automatic aerial triangulation algorithm:

- Suitable for multitude of applications
- Handles various, also non-standard and low-overlap flight configurations
- Tolerates large disturbances
- No limits for maximum image overlap
- Automatic blunder detection and removal
- Visual analysis of measurement stability
- Sophisticated bundle adjustment
- Statistical models and robust weighting for all observation types (GPS coordinates, ground and image points and gyro observations)
- Triangulation with no ground control
- Triangulation with no existing exterior orientation
- Automatic stabilization of single flight lines
- Detailed output for analyzing the adjustment results

TIE POINTS

In addition to the points located by automatic aerial triangulation, these traditional methods are available:

- Automatic and manual image linking and link updating
- Automatic and manual tie point measurement
- Point transfer between images
- Ground control point input (full, horizontal, vertical)
- Point editing: all points, rejected points, by residual (absolute residual; highest and lowest altitudes, both absolute and relative)
- Point display by type (manual, automatic, with or without numbering)
- Point display by pyramid level

IMAGE ENHANCEMENT

Colour balancing and image enhancement algorithms can be utilized individually with images or orthomosaics, or in combination:

- Contrast and brightness setting: all channels or by channel
- Histogram scaling
- Sun angle correction
- Modelling of vignetting and hot-spots (with DigiPreProcess)
- Adaptive histogram matching

ORTHOPRODUCTION

EnsoMOSAIC calculates orthoimages and orthomosaics immediately after automatic aerial triangulation:

- Calculation of single orthoimages and orthomosaics
- Define mosaic's area and pixel size
- Cut pixels from image edges
- Orthomosaicking with internal or external DEM
- Single file or tiled output (batch processing)
- Mosaic resampling by nearest neighbour, bilinear interpolation, weighted average and histogram matching
- Overexposed pixel replacement
- Memory optimization
- Definition of region of interest to exclude / include targets
- Utilization of seam lines
- Exclusion of empty output tiles
- Calculation of an overlap image
- Mosaicking without aerial triangulation and with or without a DEM

SUPPORT

There is a wide selection of supportive functions available for management of image blocks:

- Block editor: define images, map projection, altitude level, background vector maps
- Automatic detection and correction of inaccuracies of image capture
- Support for single and non-parallel flight lines
- Calculation of pyramid images
- Automatic image and block rotation
- Calculation of DEM, interpolation of aerial triangulation results
- Definition of 16 to 8 bit transformation
- Pre-processing of scanned aerial photos
- Flexible license management

CONTACTS

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