UASMaster
INPHO SOFTWARE

PHOTOGRAMMETRY-GRADE PROCESSING FOR REMOTELY PILOTED AIRCRAFT SYSTEMS (RPAS) / UNMANNED AIRCRAFT SYSTEMS (UAS).

UASMaster is the right tool for complete processing of data acquired with unmanned aircraft systems (UAS). UASMaster combines ease of use with the full power of a photogrammetric workstation.

The software bridges the gap between simple near black-box workflows for non-photogrammetrists and photogrammetry expert workflows. UASMaster includes advanced technology that has been customized to provide high quality results from the special characteristics of UAS data. It easily integrates into the Inpho world of photogrammetry and 3rd party workflows.

With its open market concept UASMaster is able to process data from almost every hardware vendor for UAS. It works with acquired data from fixed-wing vehicles as well as with helicopter-type machines. The software proved successful processing even with survey-balloons and other types of unmanned aircraft systems.

Product Highlights

Modern computer-vision algorithms (e.g. SFM) combined with proven state-of-the-art photogrammetric techniques produce accurate results automatically, with minimal manual interaction.

► Intuitive guided workflow concept for the photogrammetric novice which perfectly integrates into any photogrammetric workflow.

► Interactive context-driven and automated editing capabilities for geo-referencing and point clouds including morphological data creation (e.g. break-line measurements), classification, filtering, and many more.

► UAS-specific local-area ortho editing tools

► Expert tools, simplified for non-photogrammetrists such as automatic correlation-based terrain following, enabling precise stereoscopic measurements without requiring stereo-experience

► Open for any fixed-wing, helicopter-type or other UAS hardware. The technology is optimized for UAS with GPS support (recommended accuracy ±10 m)

► Fully compatible with Inpho photogrammetry modules from Trimble

► Support for weighted high quality GNSS and IMU data to reduce need for ground control points

► Streamlined workflow to automatic feature extraction with eCognition

► Complete engineering workflows including CAD tools, contouring, gridding...

Key Features

► A complete photogrammetric workflow combined in one single product

► Quick black-box or multi-step processing with quality-optimized or performance optimized parameter presets

► Process data from any type of UAS

► Multi-camera support (cameras up to 51 MP)

► Excellent results without requiring specialized photogrammetry knowledge or experience

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TECHNICAL SPECIFICATIONS

FEATURES OVERVIEW

Workflow

- Full automatic georeferencing, camera calibration, point cloud matching and ortho mosaicking
- Sub-area selection for editing and re-processing for georeference, point clouds and orthomosaics
- Best accuracy photogrammetry-grade deliverables
- Task-tracking monitor
- Store camera calibration results for later reference
- Optional black-box one stop or multi-step processing
- Weighted GNSS/IMU and GCP support (availability of high-quality GNSS e.g. with UX5 HP)
  - georeferencing and sensor calibration with minimum ground control, only
  - processing without any ground control points for rapid response projects
- Multi-flight and multi-camera capable
- UASMaster deliverables are the perfect input for eCognition automatic feature extraction and change detection

Georeferencing

- Automatic blunder removal to ensure best quality
- Powerful datum transformations with predefined projections thorough graphical analysis tools and detailed reports.
- Automatic relative and absolute adjustment
- Effective tie point matching also in poorly textured, as well as mountainous areas
- Project-wide photo display with correct topology and auto image-selection for interactive, guided control point measurement
- Powerful intuitive graphical block analyzer:
  - Easy visual checking of large data sets
  - Visualizations
  - image footprints
  - overlaps
  - ground control and tie points
  - point and photo connections
  - residuals
  - error ellipses
  - geometric sector analysis for points and images
  - binning cell analysis for point density/connectivity
  - useful display filters, for example multi-strip connections and more
  - Statistical data tables directly linked to graphics

Point-Clouds and Height Data

- Colored point clouds and surface grids as well as bare earth DTM output
- Effective noise filtering for point clouds
- Sophisticated point cloud filtering and classification to e.g. separate ground from offground

Points

- Stereoscopic and monoscopic editing and visualization
- Context driven editing tools with heads-up-display
- Rigid consideration and measurement of morphological data such as breaklines
- CAD-like multi-layer editing, visualization and basic mapping
- Automatic correlation-based and interpolation based terrain following for 3D digitizing
- High-performance 3D point-cloud viewer for millions of points
- On-the-fly contours and height coding
- Automatic best-fit stereo model selection for stereoscopic visualization and editing
- Batch pointcloud processing (tiling, contouring, gridding)

Orthoimage processing

- Automatic feature based seam-finding and colorbalancing for orthomosaic based on trimble-exclusive OrthoVista technology result in perfect seamless mosaics
- Adaptive blending of orthos into mosaics according to image texture analysis
- Rigid True-Ortho (surface-model-based) as well as classic ortho (bare earth DTM-based) strategy ready for use in GIS
- UAS-specific local-area ortho editing tools
- Support for pre-existing height models for quick processing
- Optional speed-optimized orthoimage generation directly from the colored point cloud without necessary rectification

BENEFITS

- Accurate and reliable results in just a few seconds per image with maximum automation
- Perfectly designed matching strategies lead to maximum ray connections for tie points and highest quality point clouds or mosaics
- Minimized user interaction for project set-up and data postprocessing
- Ease of use combined with photogrammetric expert tools

OPTIONS

- Monthly rental, educational and research offering
- Updates from previous versions available
- Maintenance (1st year included in software price) includes support and version updates
- Available also as bundle with Trimble UX5 hardware
- Automatic feature extraction with Trimble eCognition
- Direct stereoscopic 3D mapping into CAD and GIS is available through the connection to Summit Evolution
- Research Version offering 2 seats for educational, non-profit use, only
- Network licensing
- Alternative entry-level lite version available (limited to 800 images, no point cloud editing capability) including all high quality georeferencing, point cloud matching and ortho capabilities

SYSTEM REQUIREMENTS

- Multicore PC workstation (1 license supports up to 16 cores)
- 16 GB RAM
- High-capacity disk system (SSD preferred)
- Windows 7, 64 bit
- Special hardware for state of the art stereoscopic point measurement:
  - Stereo-capable graphics card(s) supporting OpenGL quad-buffered stereo (e.g. Nvidia quadro series)
  - Stereo viewing system
  - Optional color anaglyphs available for standard non-3D capable monitors
  - Support for professional 3D hardware such as 3D cursors

PERFORMANCE*

- Georeferencing: 10 seconds per image
- Point cloud matching: 3 seconds per image
- Ortho mosaicking: 4 seconds per image
- Reprojection error typically less than 1 pixel
- Height accuracy about 1–2 pixels
- Limited to imagery up to 51 Mpix

SUPPORTED IMAGING HARDWARE

- Open for any UAS hardware, helicopter type or fixed wing:
  - Open for any brand
  - Open for multi-rotor platforms
  - Open for fixed-wing platforms
  - Tested with survey balloons

SUPPORTED FORMATS

- Supported image formats:
  - Georeferenced orthos: GeoTIFF, TiffWorld (tfw)
  - TIFF, JPG, BigTiff
  - EXIF
- Supported point-cloud / morphology formats:
  - LAS(1.2-1.4), LasZIP, XYZ, BXYZ, WNP, SHP, DXF

For prices and distribution partner information please contact: sales@inpho.de

* Figures may vary depending on input data and computer hardware.

SEILER GEOSPATIAL DIVISION
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