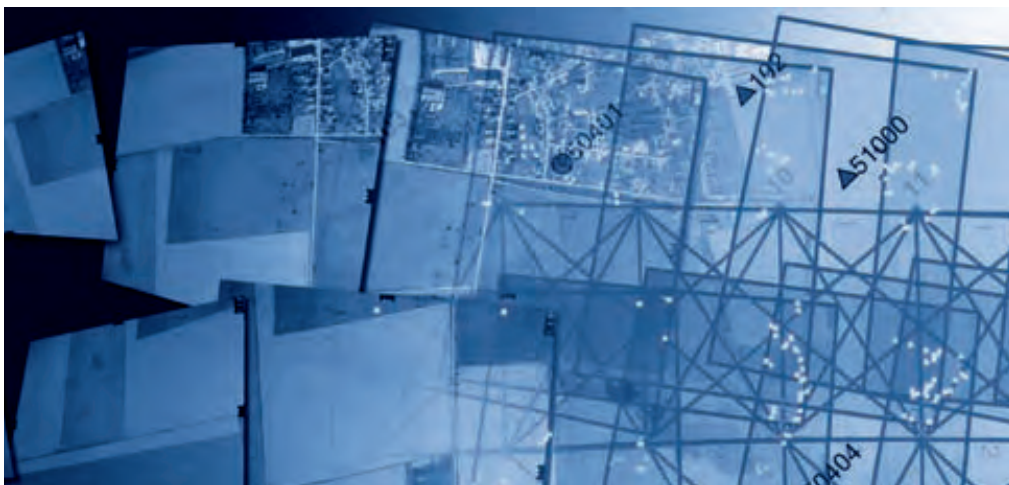




MATCH-AT

MATCH-AT – the synonym for accuracy, reliability and productivity.

MATCH-AT provides high-precision and high-performance digital aerial triangulation based on the advanced and unique image processing algorithms by INPHO. The complete process of aerial triangulation is fully automated, even for large projects.



Automatic tie point matching is done in image areas contributing best to the strength and quality of the block.

All the processing steps of **MATCH-AT** are fully automated to achieve highest productivity. The workflow is logical and easy from the project setup, the precise multi-ray tie point matching and integrated bundle adjustment up to the block analyzing with excellent graphical support.

MATCH-AT is now available in two different versions, MATCH-AT (for frame images) and MATCH-AT Pushbroom (for line sensors). The new pushbroom triangulation module directly references the raw data of the imaging sensor and navigation units. Processing is independent of flight geometry and supports completely arbitrary flight patterns.

There is rigorous support for GPS and IMU data, including calibration of boresight misalignment, as well as shift and drift corrections.

An integrated multi-window stereo module is at hand for both, comfortable stereoscopic verification as well as measurement of control points and additional tie points.

Due to its flexible data exchange capability **MATCH-AT** easily integrates into the workflow of any third-party photogrammetric system.

MATCH-AT is part of INPHO's modular system. It is delivered with ApplicationsMaster, the core of the system, providing a comprehensive collection of essential tools. For details see pages 32ff.

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Features

With frame images:

- Single, automatic process for point selection, point transfer and measurement, along with an integrated robust bundle block adjustment requires minimum user interaction.
- Support of any film or digital frame sensors.
- No limitations for block size, shape or overlap. The software is tested with projects at 90/80 percent overlap and block sizes of up to 10000 images.
- Tie points are automatically collected in image areas best contributing to the strength and quality of the block. Von Gruber positions can be used, or other patterns in case of rectangular image formats or special image overlap situations.
- High precision tie point correlation (0.1 pixel) is achieved by an advanced combination of feature-based and least-squares matching, with multi-threading support.
- Effective tie point matching also in poorly textured, as well as mountainous areas.
- Strong internal quality control of tie points by performing robust bundle block adjustment in each level of the image pyramid.
- Flexible weighting schemes for all types of observations.
- Multi-camera support in one block and camera-specific self-calibration parameter sets (12 or 44 parameters). The results of self-calibration are made available as a dense correction grid for further use in any subsequent applications.
- Fully automatic interior orientation.
- Project-wide photo display with correct topology, and auto image-selection for interactive, guided control point measurement.
- Multiple stereo display for easiest stereoscopic manual point measurement. Optional color anaglyphs available for standard LCD screens.
- Advanced sub-block handling:
 - Sub-blocks enable easy administration, visualization and analysis of large blocks.

- Free block adjustment, i.e. sub-blocks can be adjusted without control points
- Sub-blocks can be merged for final project-wide block adjustment
- GPS data handling with shift and drift determination.
- IMU data handling:
 - Preprocessed GPS/IMU data from POS AV/POSEO by Applanix and AEROCtrl by IGI
 - Attitude data are used as constraints in the integrated block adjustment
 - Boresight misalignment calibration
- Optionally the triangulation can be made in a local space rectangular coordinate system to avoid tensions caused by map projections.
- Powerful graphical block analyzer:
 - Easy visual checking of large data sets
 - Visualization of image footprints, overlaps, ground control and tie points, point and photo connections, residuals, error ellipses and more
- Smooth transfer of exterior orientation data to stereoplotters (e.g. Summit Evolution) and other photogrammetric applications, such as OrthoMaster or MATCH-T DSM.
- Export/import formats: DAT/EM Summit Evolution, BAE Socet Set, Z/I project, AvioSoft Ori, ABC-PC, AP32, Phorex/Pex, PATB, Bluh, Bingo

With pushbroom images:

- MATCH-AT Pushbroom supports ADS line sensors. Other pushbroom sensor models are soon to be integrated.
- Processing supports completely arbitrary flight patterns, including: arbitrary directions (non-cardinal flights), overlaps, crossings and elevations – even turns and changes in elevation during ongoing acquisition.
- The sophisticated math model includes simultaneous rigorous photogrammetric sensor modelling and advanced vehicle/platform dynamics modelling of IPAS or Applanix navigation data.
- Automatic tie point matching for pushbroom data will soon be available.
- 3rd party compatibility is provided through generation of adjusted Leica GPro compatible SUP- and ODF-files.

Versions

- MATCH-AT
 - Geo-referencing of frame images
 - Unrestricted number of images
- MATCH-AT Lite
 - Geo-referencing of frame images
 - Block size restricted to max.100 images
 - Handling of sub-blocks is not available
 - Merging of sub-blocks is not available
- MATCH-AT Pushbroom
 - Geo-referencing of pushbroom sensor data
 - Unrestricted number of images

Benefits

MATCH-AT is well-proven and production-oriented, and offers its users significant benefits:

- Superior productivity through:
 - High processing speed (10–20 sec/image)
 - High level of automation
 - Minimized user interaction for project set-up and data post-processing
- Superior quality through:
 - High accuracy by cutting-edge matching techniques
 - High reliability by unparalleled multi-fold tie point connections, also between photo strips, and by effective quality assurance methods
- Easy integration into any third-party workflow.

Recommendations

- High-end PC workstation
- 4 GB RAM
- High-capacity disk system
- Windows Vista/XP/2000, 32 or 64 bit
- Special hardware for stereoscopic point measurement:
 - Stereo-capable graphics card(s) supporting OpenGL quad-buffer stereo
 - Stereo viewing system

