

GeoSpatial Office Software
Version 10.0.0, December, 2019
Version 10.0.1, January, 2020

Release Notes for Inpho 10

Trimble announces the release of the main version 10 for all Inpho software products including UASMaster (separate release note). Users can find the following products in Inpho 10 as modules in Applications Master:

MATCH-AT automatic georeferencing (including inBLOCK)

MATCH-3DX and **Meshing Add-On** for automatic generation of 3D point clouds, true ortho mosaics and meshes

MATCH-T DSM automatic 3D point cloud (DSM/DTM) generation

DTMaster Stereo interactive and automated editing of point clouds, DTM/DSM and basic mapping, including Building-Add-on, Building-Generator

OrthoMaster ortho image generation

OrthoVista automatic ortho mosaicking

SATMaster satellite imagery workflow

The license update will be sent automatically if a valid Maintenance contract is available. Please contact imaging_support@trimble.com in case you want to update your software.



<https://geospatial.trimble.com>

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What is Inpho

Trimble Inpho software suite is a comprehensive workflow solution enabling photogrammetrists to rapidly produce highly accurate and quality deliverables for their clients. The modular offering provides the ultimate flexibility depending on whether large frame aerial imagery, LiDAR or Satellite data is being used. Highly automated and refined workflows deliver outstanding productivity to generate point clouds, DTM/DSM's, ortho-mosaics and other highly valuable mapping products.



Highlights in Inpho 10

New Matching Strategy in MATCH-AT

Higher performance in aerial projects with high overlap

Considering the rapid growth of the aerial imagery market and due to the new technologies in Multi-Head-Systems, the photogrammetric blocks are getting larger and more challenging. In addition to the existing robust and powerful algorithms in the former versions of Match-AT, Inpho version 10 offers a *new and efficient* matching strategy to improve the *performance* in aerial triangulation and enhance the *productivity* in large photogrammetric projects.

As a part of the new matching strategy in MATCH-AT, the matching in high overlapping areas is performed with new tie-point extraction algorithms leading to stronger connected images. This increases the quality of image orientation and ensures a reliable dense-matching.

Using this matching strategy, it is possible to observe the quality of the sensor platform which means qualifying the multi-head systems and navigation observation in aerial triangulation. The new strategy can enhance the performance in aerial triangulation significantly compared to the former strategies. Through this special matching all heads can be processed in one aerial triangulation and not only based on the nadir images. Additionally, MATCH-AT version 10 provides a better usage of multi-core systems during the image matching.

Therefore it is strongly recommended to upgrade to this new version for processing of the projects with high overlap. In version 10, the users have also the possibility to choose the former matching strategies as well.

News in Multi-Head workflow

MATCH-AT version 10 introduces the first version of unique multi-head bundle block adjustment.

The GNSS/IMU observations are used to automatically derive a multi-head platform configuration. The configuration is used as observation in the adjustment.

Optionally each camera of the platform can be calibrated separately considering the derived constraints. This feature allows a drift correction on the platform, which leads to higher accuracy and improved stability in orientation.

As this feature offers a better model for adjustment of multi-head systems, it is recommended to upgrade for these project types.



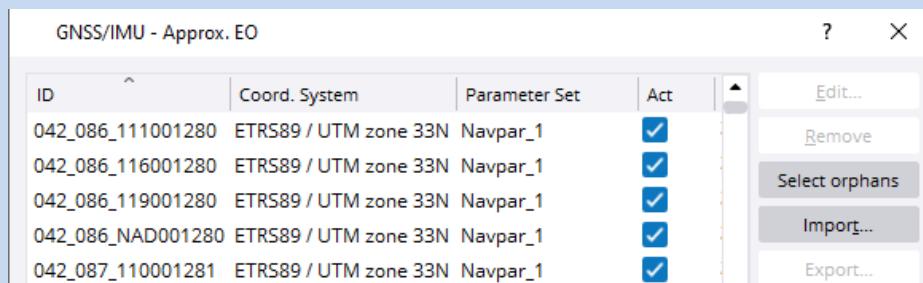
List of Changes

Changes for SATMaster are aligning with changes in the Inpho components associated with satellite processing (ApplicationsMaster, MATCH-AT, MATCH-T DSM, DTMaster Stereo, OrthoMaster, OrthoVista).

Note: In Version 10 the project file version did not change. Furthermore, projects from Version 9.2 can be used without conversion.

ApplicationsMaster

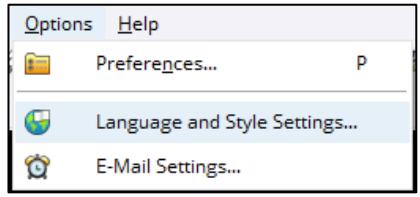
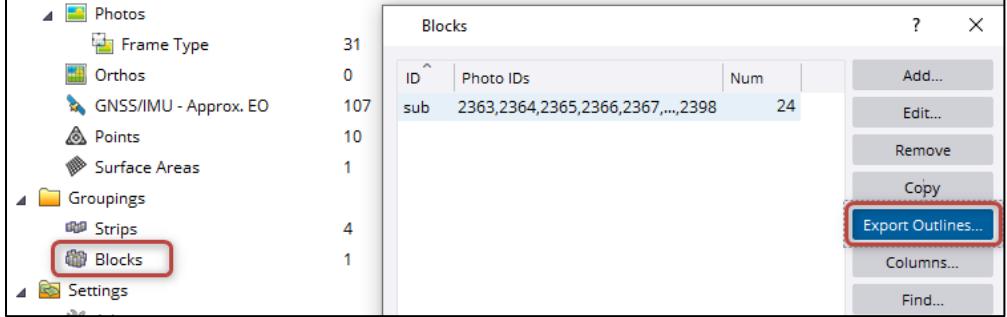
Change	Description
Improvement 10.0.1: Assignment of coordinate system for LSR definition	With version 10.0.1 a reassignment to a coordinate system can be carried out but only for projects set up in the LSR coordinate system. No transformation of the coordinates will be done but it is possible to use the project transformation tool.
Improvement 10.0.1: Sub-block export	With version 10.0.1 the strips resp. stations are adapted to the new configuration when exporting a sub-block as new project.
Improvement 10.0.1: New information in the Image commander	The Image Commander is adapted with a new column showing the image size in megapixel.
New Feature 10.0.1: New column 'MPix' added in the Image Commander	A new column 'MPix' was added to the Image Commander to simplify the sorting to the number of pixels in the images. This helps to detect corrupt images.
New Feature 10.0.1: Select orphans	A new button is added in the GNSS/IMU dialog of the Project Editor. In case a huge amount of the GNSS/IMU records are stored in the project but a less number of images are imported the user can detect with the "orphan" button the unnecessary GNSS/IMU records and can subsequently remove them with the "Remove" button





Fix 10.0.1: Update of US Geoid18	NGS corrected an error in the US Geoid18 file: https://www.ngs.noaa.gov/GEOID/GEOID18/
Fix 10.0.1: Convert 3rd party projects	In version 10.0 the option to convert (import) 3 rd party projects like > ZI (Intergraph) project > DAT/EM SummitEV project > BAE Socet Set image support files was deactivated. With version 10.0.1 this option is available again.
Fix 10.0.1: Project conversion from version 5.x and version 6.0 to version 10	The conversion of projects in version 5.x and 6.0 to version 10 resulted in wrong tie point measurements. The reason was the transition from image to pixel coordinates in version 6.1. With version 10.0.1 the conversion works correctly.
Fix 10.0.1: Crash during project conversion	The crash was caused in a DLL file, which tried to open a TIF file but crashed. The image access routines works through a list of various image formats. In this case the image had external pyramid with extension "pyr". This extension was not associated with any file format. This issue is fixed.
Fix 10.0.1: Azimuth for generated strips	The displayed azimuth in the Strips dialog of generated strips changed to "undefined" after selecting one strip. This is fixed.
Fix 10.0.1: Project transformation	Transforming a project, e.g. from Gauss-Krüger zone 3 (transformation parameters to WGS84 are defined), after a successful aerial triangulation to any other projection does not give the correct result for the exterior orientation of the images. This is fixed.
Fix 10.0.1: Transformation	The project transformation did not take in account available orthophotos. Now the orthophotos are also transformed during the process.
Fix 10.0.1: Improved stability of multi-head adjustment	For very large multi-head projects it could happen, that the processing crashed. The multi-head adjustment in version 10.0.1 is now stable.



New Feature 10.0: UI in new Trimble Style	The appearance of the user interface was changed to the new <i>TrimbleModus</i> style. Users that prefer the old appearance can switch back to the <i>TrimbleClassic</i> style in the Options menu.	
New Feature 10.0: New export functionality	<p>New export functionality available (more details available in the reference manual):</p> <ul style="list-style-type: none"> • Simple Ori: Export of exterior orientation, GNSS/IMU and GCP's in CSV format (Project menu and Project Editor). • Satellite RPC's: The exterior orientation of satellite images can now be exported (Project Editor). 	
New Feature 10.0: Export of Sub-Project	New export of a sub-block into a new project file (available in the Project menu).	
New Feature 10.0: Export of sub-block outlines	The outlines of a sub-block can be exported in SHP format. This functionality is available in the Project Editor - Blocks dialog.	
New Feature 10.0: US Geoid 18 and UK OSGM 15 Geoid added	GEOID18 covers CONUS, Puerto Rico, and the U.S. Virgin Islands and supersedes GEOID12B in these regions. It is used with coordinates in NAD83.	
Improvement 10.0: Sub-block in Image Commander	Now the Image Commander shows only the list of images from the currently selected sub-block. This makes it possible e.g. to start pyramid generation for a sub-block only.	
Improvement 10.0: Refined import for Ziyuan3 satellite	The import of RPC data from Ziyuan 3 was extended by the GeoEye - RPC Format. Previously the import was only available in the DigitalGlobe - RPB Format. In addition the image import with subdirectories for Ziyuan 3 was enabled.	



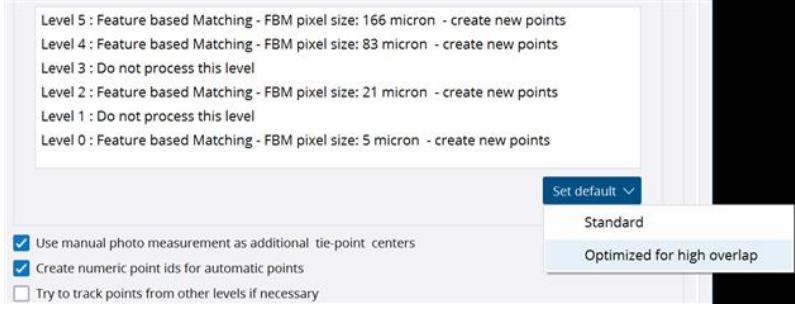
Improvement 10.0: Support of Pleiades 'ortho-ready' images	Satellite images from Pleiades can come in different processing states: Primary (1A) or Ortho-ready. To support also the Ortho-ready images we introduced an additional satellite type for the project setup, called Pleiades Proj.
Improvement 10.0: Export to DAT/EM SummitEV	The batch capabilities of the DAT/EM SummitEV exporter were extended by several new options. Use the command <code>prj2sumev.exe -help</code> in the command line to see all the available options.
Fix 10.0: Space in camera ID	A problem in Multi-Head projects for camera IDs with a space character was solved.
Fix 10.0: Colorizer crash	A problem where the Colorizer crashed was solved.
Information 10.0: Remote Desktop Connection	In case of problems when using the Inpho software over Windows Remote Desktop Connection please contact imaging_support@trimble.com .

DPMaster Distributed Processing

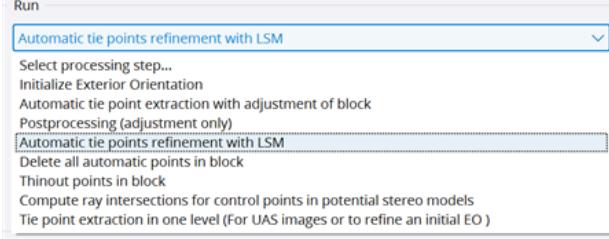
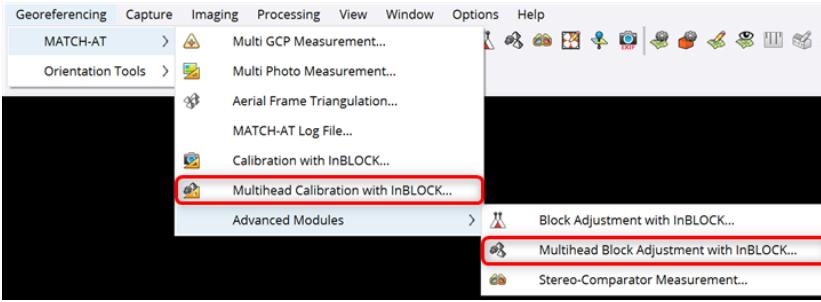
Change	Description
Fix 10.0.1: Distributed OrthoMaster & Match-3DX processing fails	In version 10.0.0 the wrong executable was triggered for the distributed process of OrthoMaster and Match-3DX. It was not possible to run the jobs successfully. This is fixed with version 10.0.1.
Improvement 10.0: New job type for MATCH-3DX	A new job type was added to make the usage of MATCH-3DX with DPMaster more convenient.
Fix 10.0: Job status	The update of the displayed job status was reviewed.



MATCH-AT / Satellite Georeferencing

Change	Description
Improvement 10.0.1: Tie point extraction with less mismatches and improved computation time	The tie point extraction delivers now better results due to the reduction of mismatches. Furthermore, the processing time is optimized for version 10.0.1.
Improvement 10.0.1: Performance enhancement in inBLOCK	The CPU usage in the multi-head calibration with inBLOCK is optimized and the processing time is reduced.
Fix 10.0.1: Too many ground control points	In case a large number of ground control points were imported, e.g. 30000 it could happen, that not all measured ground control points were used in the adjustment. The reason was that for the adjustment a limited number of ground control points were used. In case the measured points were not part of this limited list, they were not used for the adjustment. This is fixed.
Information 10.0.1: Multi-head adjustment with inBLOCK	Multiple workflows for handling multi-head projects in inBLOCK were introduced. Those will be made available in the reference manual soon.
New Feature 10.0: High performance matching strategy for high overlap projects	<p>For projects with high overlap a new strategy was introduced which gives a significant speed improvement in the Automatic Tie Point Extraction process. The setting for this strategy is available in the Strategy tab of the Aerial Frame Triangulation dialog.</p> <p>For multi-head projects this new strategy is the default option for new projects. For standard aerial frame projects the standard strategy is used.</p> <p>The changes affect mainly the FBM steps, which include now an automatic least-squares matching at the end. This influences the results of both strategies in the new version.</p>  <p>Level 5 : Feature based Matching - FBM pixel size: 166 micron - create new points Level 4 : Feature based Matching - FBM pixel size: 83 micron - create new points Level 3 : Do not process this level Level 2 : Feature based Matching - FBM pixel size: 21 micron - create new points Level 1 : Do not process this level Level 0 : Feature based Matching - FBM pixel size: 5 micron - create new points</p> <p><input checked="" type="checkbox"/> Use manual photo measurement as additional tie-point centers <input checked="" type="checkbox"/> Create numeric point ids for automatic points <input type="checkbox"/> Try to track points from other levels if necessary</p> <p>Set default ▾ Standard Optimized for high overlap</p>



New Feature 10.0: Automatic tie points refinement with LSM	<p>In case the tie point extraction does not reach the expected accuracy and connectivity there is now the new process <i>Automatic tie points refinement with LSM</i> to improve the results further and add new measurements for the existing tie points.</p> 
New Feature 10.0: Advanced multihead workflow in inBlock	<p>inBlock offers now a better workflow to process and calibrate multihead platforms. The Multihead tab in the adjustment dialog makes the estimation of the position and angle offsets between the nadir head and the oblique heads available.</p> 
New Feature 10.0: Generation of sub-block	<p>In PMT it is now possible to generate a sub-block based on selected images.</p>
New Feature 10.0: Parallel usage of PMT and AT dialog	<p>It is now possible to use the Multi Photo Measurement tool on a second project, while the Aerial Frame triangulation is running.</p>
Improvement 10.0: Number of points per image	<p>A column with the number of points per image was added to the Photo List in the Multi Photo Measurement Tool. When sorted this list can be used to track images with a poor tie point connection.</p>
Improvement 10.0: Usage of shift cameras	<p>The algorithms were adapted to support the usage of shift cameras. Such a shift is observed with a large offset of the principal point.</p>



Improvement 10.0: Extended export of statistic	The ASCII file exporter in the statistic tool was extended to show also a column for the residuals of the XY vector. Up to now the residuals were shown separately for X and Y.
Fix 10.0: Zoom level in Interior Orientation tool	An issue with the wrong display of the available zoom levels in the Interior Orientation tool is fixed
Fix 10.0: Stereo Comparator	There was a display issue in the Stereo Comparator when analog images with different scan rotations were used. Also the assignment of the left/right image did not work properly. Now the correct and original behavior (as in Version 6) was restored.

MATCH-T DSM

Change	Description
Improvement 10.0: Matching in low textured areas	The image matching algorithm (CBM) was improved for areas with low textures, e.g. desert.
Fix 10.0: Wrong file extension for XYZ output	The output of the point cloud in XYZ format was written with the wrong extension (.las). Now the correct extension .xyz is used.

MATCH-3DX / Meshing add-on

Requirements/recommendations:

We recommend an up-to-date computer with at least 32 GB RAM (better more). Furthermore, we recommend an additional hard disk for processing purposes only, the required disk space should be about 2-5 times of the space that the input data requires.

Change	Description
Fix 10.0.1: SGM continuous mode and mesh format	The SGM continue mode after the point cloud generation stored the meshes always in OSGB format. Now the meshes can be stored after the continue mode in different formats.
Improvement 10.0: SHP tiles for Ortho Exporter	For the re-tiling of the SGM 2.5D true orthos we now support the usage of a tile definition in SHP format.



Improvement 10.0: Usage of GPU	The usage of the GPU for processing is changed from an optional setting to the default option.
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DTM/Point Cloud Processing - DTMT toolkit

Change	Description
Fix 10.0: Performance issue	A performance issue that occurred when adding data during <i>Point/vector data processing</i> (with options <i>Tile</i> and <i>Surface Modelling</i>) was solved.

DTMaster Stereo

Change	Description
Improvement 10.0.1: Embankment hatches	Implementation of a client wish to increase the length of the embankment hatches.
Improvement 10.0.1: Performance of Profil View	The performance of zoom and rotation inside the Profile View are improved. The Profile View is now more fluent and smoother in rotation and display.
Fix 10.0: Export of closed polygon	After the export of SHP format, closed polygons are now stored correctly with the first and the last point on the same coordinate (corresponding to the SHP format specification). When importing the same file back to DTMaster the start and end point are treated as one point.

OrthoMaster

Change	Description
Improvement 10.0: Create RGN files	The option for the generation of the region files (*.rgn) is now activated by default and was removed from the UI. The files will be placed next to the corresponding images.
Fix 10.0: Adjust to pixel corner for AOI in feet.	The results of applying Adjust to pixel corners to an AOI in a project that is in survey feet was incorrect. Now the pixel corners are rounded to a multiple of the pixel size correctly.



OrthoVista

Change	Description
Improvement 10.0.1: Import and Export of seam lines	The seam lines stored in the autoseam.dxf file can now be imported and exported in SHP format.
Fix 10.0: Stability fixes for SeamEditor	Crashes in the SeamEditor when opening images in a separate window have been fixed.

LPMaster

Change	Description
End of Life	LPMaster is no longer a part of the Trimble Photogrammetry software. Version 9.2 is the last version that includes LPMaster.

Information

For more information contact your Trimble Inpho Support Team at imaging_support@trimble.com. The software is available for download on www.imaging-download.com

