



Product Bulletin

Geospatial Office Software
11 April 2016

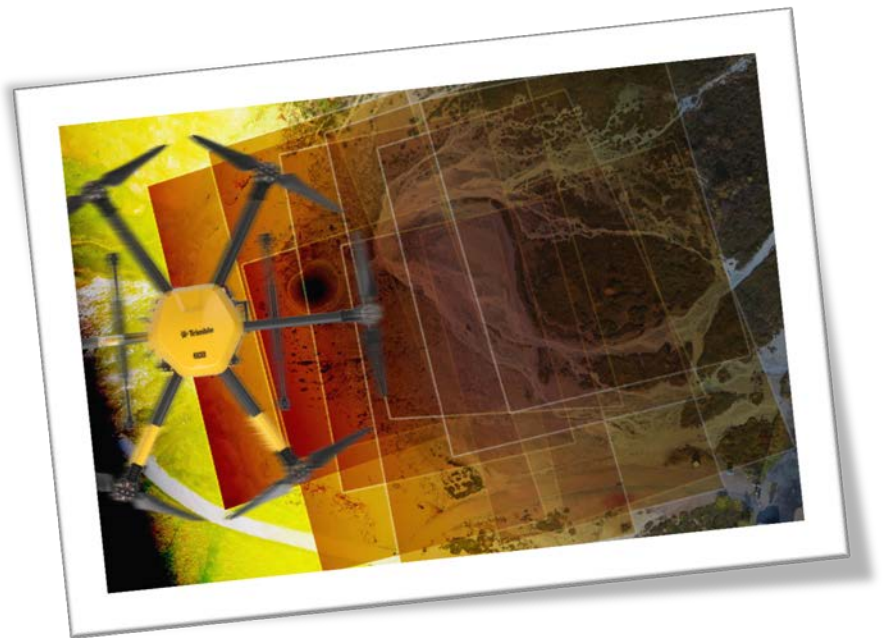
ANNOUNCING UASMASTER 7.1 CURRENT EDUCATIONAL OFFERING

What is UASMaster

UASMaster is one of Trimble's UAS processing software solutions. UASMaster is engineered on the basis of the well-established Inpho advanced airborne photogrammetry / airborne LiDAR processing software suite. It offers full automatic geo-referencing, point-cloud generation as well as orthomosaic generation including refinement and editing tools for all deliverables as well as basic mapping and value adding functionality (e.g. point cloud classification).

Trimble's alternative UAS processing solution within Trimble Business Center TBC APM (Advanced Photogrammetry Module) very much focuses on ease of use combining typical survey workflows and survey data types (GNSS, total stations, v10 data...) within one software. Within TBC, users also find the appropriate tools to add value to their generated data (e.g. calculating volumes, using the CAD module etc.).

UASMaster is outstanding through its high flexibility. UASMaster requires little more expertise but still is much easier to use than traditional photogrammetric software. It offers many more tools to refine results and edit results. More flexible parameters are available as well as pre-defined strategies for different application scenarios and accuracy/performance requirements. Another differentiator is UASMaster's ability to process data from also non-Trimble UAS manufacturers. All the input and output data as well as the complete project environment is compatible to the advanced Inpho modules, so users may step into the professional Inpho software workflow at any point. So



www.trimble.com <http://uas.trimble.com/inpho-uasmaster> <http://www.trimble.com/Imaging/aerial-software.aspx>

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UASMaster is the perfect UAS processing software for photogrammetric specialists as well as ambitious users adopting photogrammetry more and more as a surveying tool.

Generally, Inpho modules are highly automated, providing an outstanding level of accuracy and confidence. Inpho is suited for massive data volumes in processing, refining and editing as well as for visualization of deliverables. Inpho deliverables create the basis for a manifold of vertical applications in different markets such as survey, energy and natural resources, environmental research, cities and buildings, (urban) planning, monitoring, agriculture, cadastre and many more.

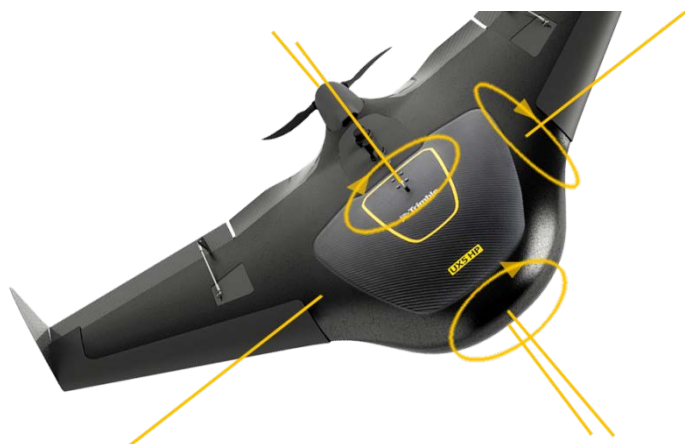
What's new in UASMaster 7.1

UASMaster 7.1 is a new major release of our traditional photogrammetry suite of software modules. Unlike a main release (e.g. 8.0), this major release does not require a new license to be installed, if a valid license for 7.x is existing. A major release typically contains fixes to ensure processing workflows without interruptions and to grant for high quality results. Additionally the major release contains new major features like support for new sensors or new tools and functionality.

Growing support for additional sensors e.g. using high quality IMU data as constraint

For a variety of reasons, there is an ever growing demand to support additional sensors that add to more automation or to a better stability and reliability of the whole process.

In version 7.0 Trimble added the support of high quality GNSS data in UAS processing. Now with version 7.1 the process benefits from even more stable computations supported by high quality IMU data if available from the UAS hardware. As well as GNSS dramatically reduces the need for ground control points, IMU data also keeps computations stable and reliable if only a minimum of GCPs are available. Depending on the quality of GNSS/IMU data, for some application scenarios that do not require maximum accuracy, even projects without any ground control can be processed or for rapid response projects direct geo-referencing (directly using GNSS/IMU without performing any further adjustments) might be accurate enough for quick processing and quick decisions.

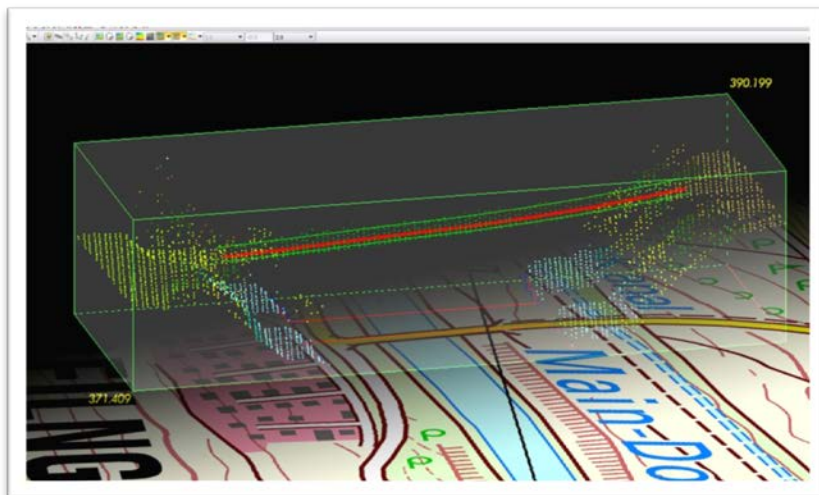


Adding to the support of additional sensors, Trimble also added a new camera template for ZX5 multi-rotor UAS platforms. Camera templates are useful to simplify the project setup with known camera types considerably.

Trimble's current efforts to constantly support more flexible geometries for UAS flights is also adding to much better success with larger oblique viewing angles.

Extended mapping and CAD-drafting capability

As UASMaster is based on the traditional Inpho photogrammetry modules, UAS processing highly benefits from any improvement Trimble is engineering for those high-level photogrammetric software tools. E.g. DTMaster Stereo is the INPHO module for extensive refinement and editing and visualization of massive volumes of point-cloud data as well as for basic mapping (stereo-plotting and mono-plotting). The multi-file / multi-layer CAD drafting functionality is mainly used to digitize 3D vectors for morphology information such as e.g. break-line data. So far users could generate vector maps in



DTMaster via mono-plotting (digitizing in xy e.g. on top of shaded reliefs or orthos and deriving the height from point-clouds) or via stereoscopic measurements (stereoscopic 3D visualization of photogrammetric imagery). New for 7.1 is the capability to use the mapping functions also within the 3D-profile view. All selected data is visualized in a rotatable 3D-box combined with height coded and shaded views or combined with contour lines. All vector functions, snaps, horizontal and vertical movements, selection, create and edit tools can now be performed also inside the profile box. Special keyboard assignments and auto-drape to terrain functionality is used to guide the user. These new features of DTMaster Stereo are now also available in UASMaster 7.1.

Better quality of deliverables (e.g. point clouds) without any ground control points

For photogrammetric processing, typically reference points / ground control points are used to grant for maximum accuracy and reliability. Still, the use of reference points is recommended, if accuracy really is a critical requirement. There are, however, many application scenarios for UAS survey, where it may be impossible to place ground control points or where performance matters more than perfect accuracy. In order to still be able to get the best possible quality deliverables that may be achieved without a reference, it is now possible to do basic camera calibration also with a free un-constrained adjustment. In the point cloud generation strategy has been updated to create more homogeneous point clouds.

Improved error handling and error messaging

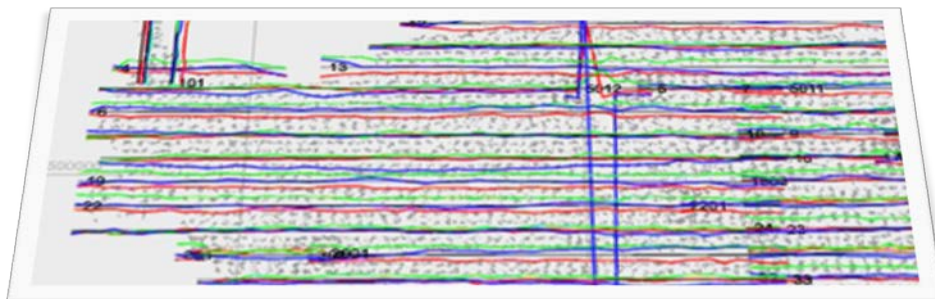
UAS data, depending on the quality of the hardware that was used to acquire images, depending on weather conditions, flight layouts, terrain types etc., might get very challenging for successful full automatic processing. Vignetting effects, image blur, large water areas, forests, low textured areas or of course critical input data errors, in general might cause some imagery not to be able to be processed. These are processing limitations that every photogrammetric processing tool – also competitive software - has to cope with. Therefore it is



essential to provide useful information in processing reports and to automatically take correct decisions in the automatic process, if e.g. an image needs to be skipped to still finish the processing for the remaining imagery. For UASMaster version 7.1 Trimble spent much effort in providing the right answers to any challenging situation.

Reaching a new level of performance, stability, reliability and accuracy

UASMaster 7.1 focuses a lot on customers asking for shorter computation times, less demands on computer hardware (less need for RAM), stability and accuracy. Even if low-cost hardware is used and good approximate photo positions might not be available, strategies to still successfully create the correct geo-reference have been greatly improved.



In some applications, where e.g. cameras could not be calibrated well enough due to lack of information, point-clouds might have been noisy or showed tile-effects. New refinement strategies have been embedded in the point-cloud generation process to grant for a much more homogeneous quality of the resulting surface model. Generally a lot of processes have been optimized regarding the usage of available computational hardware and regarding I/O of data and how data is internally organized for the process. These optimizations result in a much better performance and much shorter computation times.

Current educational offering

Trimble offers all software modules for airborne photogrammetry and remote sensing as attractive EDU-Packs. These packs are available as perpetual licenses, multi-seat licenses, add-on licenses, version updates as well as maintenance renewals.

A proof (official certificate) is requested to grant for educational use of the software, only.

EDU licenses are made available on ONE network dongle for the whole campus. EDU licenses must not be loaned to students for home-use.

Research licenses may be loaned to a student e.g. for doing his master thesis or other research-related work.

Product	Description
Inpho EDU-Package	All Inpho photogrammetry in one package for educational purpose. The package includes the lite versions of MATCH-AT, MATCH-T, SATMaster, DTMaster Stereo, OrthoMaster, OrthoVista. A campus requires one Education Package license and any number of additional Education Package Add-on licenses.
Inpho Research-Package	Includes all Inpho photogrammetry perpetual licenses as full versions (MATCH-AT, MATCH-T, SATMaster, DTMaster Stereo, OrthoMaster, OrthoVista).

	A campus requires one Education Package license and any number of additional Education Package Add-on licenses.
SCOP EDU-Package	Includes all SCOP++ point-cloud and DTM/DSM processing perpetual licenses as full versions (Kernel, Visualizer, Analyzer, LiDAR).
UASMaster EDU	UASMaster EDU is offered as a 1 year temporary license of UASMaster Lite (complete automatic UAS processing – georeferencing, calibration, point-cloud generation and orthomosaic generation) for free.
UASMaster Research	2 seats of the unlimited perpetual UASMaster license are included in the UASMaster Research package. This includes complete automatic UAS processing – georeferencing, calibration, point-cloud generation and orthomosaic generation as well as point-cloud editing and visualization and basic mapping.
Summit Evolution EDU	All versions of Summit Evolution digital stereoplotter (interactive CAD/GIS mapping and feature collection) are available for educational purpose at discounted pricing.
Trimble Remote Sensing Suite – BASE EDU	The Trimble Remote Sensing Suite TRSS is available for educational purpose at discounted pricing. TRSS BASE is limited to satellite sensors and offers complete Inpho workflows (georeferencing, point-cloud generation and editing, basic mapping, orthomosaic generation) in combination with eCognition Essentials for automatic image-based feature extraction and analysis.
Trimble Remote Sensing Suite – Advanced EDU	The Trimble Remote Sensing Suite TRSS is available for educational purpose at discounted pricing. TRSS BASE is limited to satellite sensors and offers complete Inpho workflows (georeferencing, point-cloud generation and editing, basic mapping, orthomosaic generation) in combination with eCognition Developer for unlimited flexibility in automatic image-based feature extraction and analysis.

News on Inpho 7.1 and the Inpho 7.0.3 patch

Inpho 7.1 and Inpho 7.0.3 will be announced in a separate bulletin.

For more information

For more information contact your local Trimble Distribution Partner and see further release information on the web. See <http://www.trimble.com/Imaging/aerial-software.aspx> for software download and release-notes or register at <https://community.trimble.com> in order to track all news on Inpho.

Note: the 7.1 release does not require a new license to be installed. Users with a valid license for 7.0.x are entitled to download and use the new release.

Also note that inpho's WiBU licensing system also is updating their libraries constantly. To guarantee for stable license access, Trimble strongly recommends to update the WiBU libraries (available for download on above mentioned site)

