

October 2023, Version 14.0.0

November 2023, Version 14.0.2 / Version 14.0.3

## Release Notes for UASMaster 14

### **Trimble UASMaster Version 14.0.3.**

Trimble announces the third patch release for Version 14. The reason for this version is bug fixes. A new license is not necessary if version 14 is already running.

### **Trimble UASMaster Version 14.0.2.**

Trimble announces the second patch release for Version 14. The reason for this version is bug fixes. Version 14.0.1 was integrated into TBC version 2023.10 but was not released for UASMaster. A new license is not necessary if version 14 is already running.

### **Trimble UASMaster Version 14.0**

Trimble announces version 14 for UASMaster software.

This major release offers new features in addition to bug fixes.

A new license is required.

For more information, please visit our new website:

<https://geospatial.trimble.com/en/products/software/trimble-inpho-uasmaster>

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## What's new in UASMaster 14!

### Better user experience for deliverables

UASMaster introduces a new local non-OBJ mesh format, which can be handled better from 3rd party viewing software on the market. The local mesh coordinates from the non-OBJ mesh format results in a coordinate system with its origin at the project centroid. UASMaster also simplifies its mesh texture options to prevent user input errors and runs a texturing for all meshes.

For advanced users it is possible to switch off the texture using the "advanced options", allowing the user to remain the capability to produce a pure mesh without texture.

The advanced options include new functionality allowing the user to clip the mesh result based on a SHP, DXF or WNP file giving now the option to create a mesh based on a boundary file, looking cleaner and fitting perfectly to the project extends. Additionally area definition limiters for XY and/or Z have been added, including logical thresholds for the final deliverables, avoiding snippets of texture floating far above or below the project, creating a cleaner and more accurate result.





### New options for 3D reconstruction

The 3D Reconstruct process allows now to define separately whether the values of the focal length, principal point and distortions are held fixed or can be changed (free).

### Integration of new “Control” quality for ground control points

UASMaster is able to send ground control points to Trimble Business Center (TBC) and define the quality of the points in TBC, using the quality categories: Survey, Mapping, and Unknown.

The quality category *Control* is now available and recommended when processing in TBC.

-  "Control" quality indicates the highest quality for a coordinate.
-  "Survey" quality indicates a coordinate value is based on surveyed data of the highest quality.
-  "Mapping" quality indicates a coordinate value is based on surveyed data of low to average quality.
-  "Unknown" quality indicates a coordinate value is based on surveyed data of the lowest or unverified quality. This is the lowest quality for a coordinate.

## Classic Orthophoto Production (DTM)

### Dynamic and faster system load

UASMaster dynamically and automatically resizes the cache based on the system load. Additionally, it also automatically adjusts the workload distribution, taking the hardware and the processing settings into consideration leading to a processing time reduction of 25%!

### Improved blending quality for feature detection

With enhanced blending algorithms for feature detection that reduce and avoid creating visually disturbing seam islands, UASMaster creates the highest quality images from very large projects better than ever.

## True-Orthophoto Production (DSM)

### Improved performance

UASMaster analyzes the area definition and selects a subset of images from the complete project to improve the pre-processing time. New compressed point cloud storage lowers the disc space requirement and reduces the processing time by up to 20% for true-orthophoto generation and up to 10% for 3D mesh generation.

There are more features in this version that will ease your production and can be found in the Release Notes. As usual, the Inpho team has improved the stability and usability through bug fixes in version 14.

## List of Changes

### General notes and information:

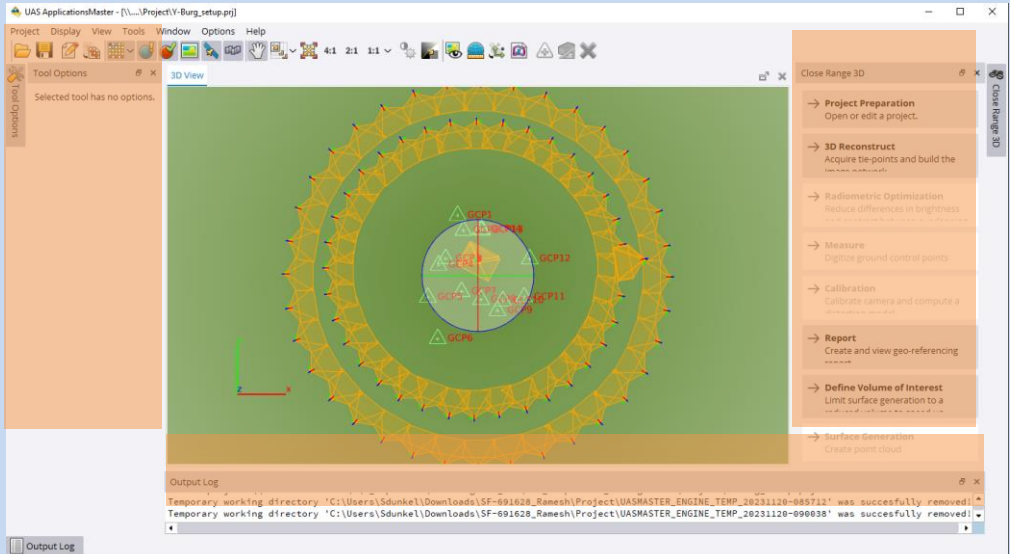
Version 14 needs a license update. Customers with maintenance automatically received the license update. A valid license for version 14 works for all versions down to 11.0.5. Older versions are not supported with the new license.

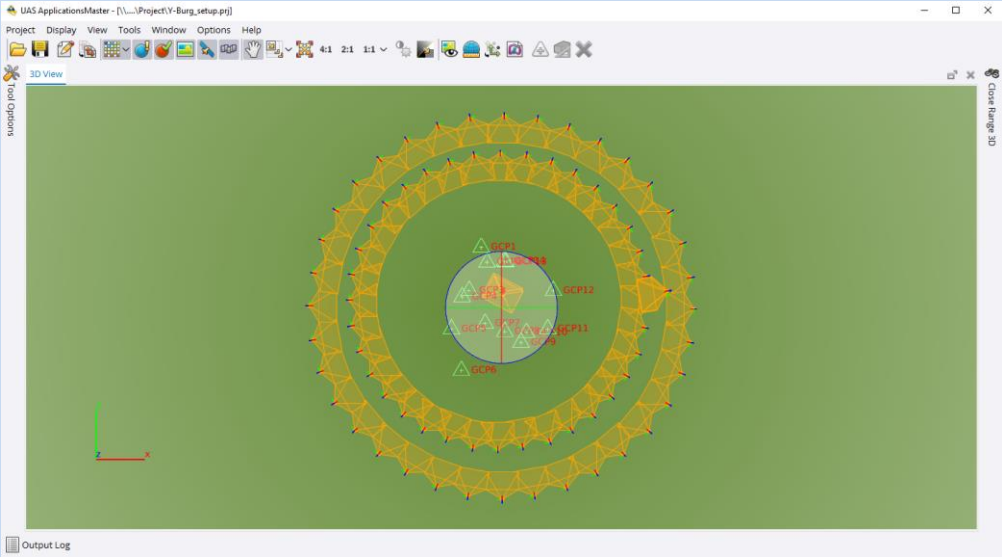
Inpho software offers multi-user support on Server Operating Systems.

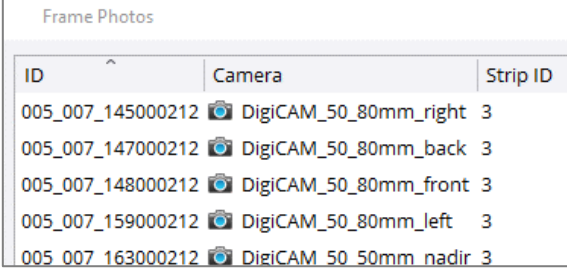
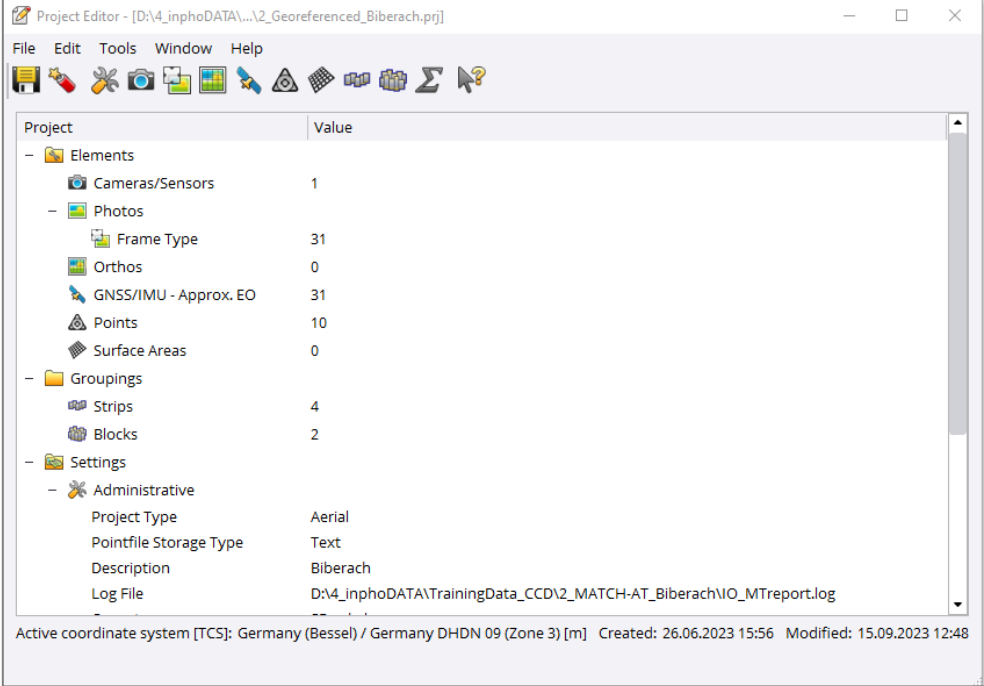
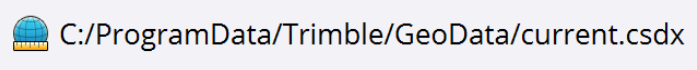

We recommend installing the latest available CodeMeter Runtime version. It is included in the Bundle installation and available on our download page under 3rd Party Products as well on the WIBU homepage ([www.wibu.com](http://www.wibu.com)).

We recommend installing the latest Coordinate System Manager version. It is included in the Bundle installation and available on our download page under Trimble Photogrammetry (Trimble Coordinate Systems (TCS)\_<version>). A new coordinate system database is available too and can be updated when starting the Coordinate System Manager, e.g. new and updated Geoids were added.

## Main window and project handling

Change	Description
<p><b>Fix 14.0.3:</b> <b>Minimizing/Maximizing UI</b></p>	<p>Minimizing the interface and maximizing it again closed all open tab dialogs.</p>  <p>The screenshot shows the UAS ApplicationsMaster software interface. The main window displays a 3D view of a project with a green ground plane and a yellow wireframe mesh representing the point cloud. Several ground control points (GCPs) are marked with red triangles and labeled GCP1 through GCP12. The interface includes a menu bar (Project, Display, View, Tools, Window, Options, Help), a toolbar, and a list of processing steps on the right side, such as Project Preparation, 3D Reconstruct, Radiometric Optimization, Measure, Calibration, Report, Define Volume of Interest, and Surface Generation. An output log window is visible at the bottom, showing messages about temporary working directories.</p>





	
<p><b>Fix 14.0.3: Send2UAS and missing GNSS Parameter Set</b></p>	<p>When using the Send2UAS function in TBC the project is transferred to UASMaster. In the previous version the GNSS Parameter Set was missing when using this workflow to transfer images. This could result in missing display of GNSS entries (Area Mapping/Close Range 3D) and wrong transformation of the coordinates (Close Range 3D only).</p>
<p><b>Improvement 14.0.2: Project loading speed when using Trimble Coordinate Systems</b></p>	<p>The loading speed was increased up to a factor 5 for projects based on a Trimble Coordinate System (TCS).</p>
<p><b>Fix 14.0.2: Issues with binary XPF file format</b></p>	<p>In version 14.0.0, when the point storage type was set to “binary” in the UAS Project Editor, incorrect characters were written into it. The 3D Reconstruction took an unusually long time and ongoing runs should be cancelled. Opening such a project failed and the connection points were deleted.</p>
<p><b>Fix 14.0.2: Inpho Coordinate System (ICS) and NTV2 grid shift</b></p>	<p>No message was displayed when the defined NTV2 grid shift file cannot be opened. An error message now appears in the Project Validator of the UAS Project Editor. Additionally, an error message appears when opening a project file with a project coordinate system that is missing NTV2.</p>
<p><b>We support Windows 11 now.</b>          We are discontinuing the support of the Windows 7 operating system. Although Inpho software may still run on older Windows systems, we are no longer using the systems for testing. We recommend updating the operating system to a newer operating system.</p>	
<p><b>Information: Antivirus software interference</b></p>	<p>After an Inpho software update or antivirus software update, it can happen that previously used modules show malfunctions. The behavior differs from case to case and is therefore not listed in more detail here. A solution is to define exception rules for the corresponding executables and DLLs in the antivirus software. Please contact <a href="mailto:imaging_support@trimble.com">imaging_support@trimble.com</a> for further information.</p>

<p><b>Information: WIBU Codemeter Version 7.60c</b></p>	<p>We strongly recommend installing the new driver version as this will close further security gaps. The Codemeter version 7.60c is added to the Bundle installation of version 14.0.0.</p>																																				
<p><b>Information: Coordinate System Manager Version 3.9.16.0</b></p>	<p>We strongly recommend installing the new Coordinate System Manager. The current version is added to the Bundle installation of version 14.0.0 and will be installed automatically. The version of the current coordinate system database is 107.</p>																																				
<p><b>New Feature 14.0.0: New column in the Project Editor &gt; Frame Photos</b></p>	<p>The “Photos” dialog in the Project Editor has a new column: Strip ID.</p>  <table border="1" data-bbox="529 611 1092 877"> <thead> <tr> <th>ID</th> <th>Camera</th> <th>Strip ID</th> </tr> </thead> <tbody> <tr> <td>005_007_145000212</td> <td>DigiCAM_50_80mm_right</td> <td>3</td> </tr> <tr> <td>005_007_147000212</td> <td>DigiCAM_50_80mm_back</td> <td>3</td> </tr> <tr> <td>005_007_148000212</td> <td>DigiCAM_50_80mm_front</td> <td>3</td> </tr> <tr> <td>005_007_159000212</td> <td>DigiCAM_50_80mm_left</td> <td>3</td> </tr> <tr> <td>005_007_163000212</td> <td>DigiCAM_50_50mm_nadir</td> <td>3</td> </tr> </tbody> </table>	ID	Camera	Strip ID	005_007_145000212	DigiCAM_50_80mm_right	3	005_007_147000212	DigiCAM_50_80mm_back	3	005_007_148000212	DigiCAM_50_80mm_front	3	005_007_159000212	DigiCAM_50_80mm_left	3	005_007_163000212	DigiCAM_50_50mm_nadir	3																		
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<p><b>New Feature 14.0.0: Information about used coordinate system database</b></p>	<p>The Project Editor shows now if either the TCS or ICS coordinate system manager is used.</p>  <table border="1" data-bbox="529 993 1507 1675"> <thead> <tr> <th>Project</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>Elements</td> <td></td> </tr> <tr> <td>  Cameras/Sensors</td> <td>1</td> </tr> <tr> <td>  Photos</td> <td></td> </tr> <tr> <td>    Frame Type</td> <td>31</td> </tr> <tr> <td>    Orthos</td> <td>0</td> </tr> <tr> <td>    GNSS/IMU - Approx. EO</td> <td>31</td> </tr> <tr> <td>    Points</td> <td>10</td> </tr> <tr> <td>    Surface Areas</td> <td>0</td> </tr> <tr> <td>  Groupings</td> <td></td> </tr> <tr> <td>    Strips</td> <td>4</td> </tr> <tr> <td>    Blocks</td> <td>2</td> </tr> <tr> <td>  Settings</td> <td></td> </tr> <tr> <td>    Administrative</td> <td></td> </tr> <tr> <td>      Project Type</td> <td>Aerial</td> </tr> <tr> <td>      Pointfile Storage Type</td> <td>Text</td> </tr> <tr> <td>      Description</td> <td>Biberach</td> </tr> <tr> <td>      Log File</td> <td>D:\4_inphoDATA\TrainingData_CCD\2_MATCH-AT_Biberach\IO_MTreport.log</td> </tr> </tbody> </table> <p>Active coordinate system [TCS]: Germany (Bessel) / Germany DHDN 09 (Zone 3) [m] Created: 26.06.2023 15:56 Modified: 15.09.2023 12:48</p> <p>The “Single Point Transformation” also shows the used coordinate system and in case of TCS the used coordinate system database file.</p>  <p> C:/ProgramData/Trimble/GeoData/current.csdx</p>	Project	Value	Elements		Cameras/Sensors	1	Photos		Frame Type	31	Orthos	0	GNSS/IMU - Approx. EO	31	Points	10	Surface Areas	0	Groupings		Strips	4	Blocks	2	Settings		Administrative		Project Type	Aerial	Pointfile Storage Type	Text	Description	Biberach	Log File	D:\4_inphoDATA\TrainingData_CCD\2_MATCH-AT_Biberach\IO_MTreport.log
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<p><b>Improvement 14.0.0: Update Trimble Coordinate Systems (TCS), Database 107</b></p>	<p>The Trimble Coordinate System Manager database is updated and equipped with new systems and geoids.</p> <p><b>Austria</b> Updated: Datum Grid and Geoid Model for Austria: austria_mgi_gis_grid_2021_lat &amp; lon.dgf and autgeo13.ggf</p> <p><b>Canada</b> Added: NAD27 datum and zones for the city of Toronto: nad83_csrs_2010_to_nad27_toronto_lat &amp; lon.dgf</p> <p><b>Czechia; Slovakia</b> Support of S-JTSK / Krovak East North</p> <p><b>Finnland</b> Added: Alternative zones and EPSG aliases for Finland</p> <p><b>Germany</b> Added: Geoid Model GCG2016 for Germany gcg2016_deu.ggf</p> <p><b>Japan</b> Updated: Displacement Model for Japan jgd*20230401.xml &amp; cmg</p> <p><b>New Zealand</b> Added: EPSG codes for NZGD2000 projected coordinate systems</p> <p><b>Romania</b> Updated Geoid Model for Romania ro_qgvt407.ggf</p> <p><b>South Africa</b> For the time dependent transformation of South Africa are added new DGF files, new GML files and new XML&amp;CMG files modelling the displacement model.</p> <p><b>Switzerland</b> Added: EPSG Alias 2056 for "CH 1903+ (LV 95)". In addition, a fix was made for the GGF file (chgeo04ht.ggf) and for the geoid "Swiss Geoid 2004 HTRANS".</p> <p><b>USA</b> Added: LDP Zones for Ohio DOT</p>
<p><b>Improvement 14.0.0: Improved performance of project I/O</b></p>	<p>The import/export for very large projects took a long time. With version 14.0.0 these times are improved so that importing and exporting data now takes about a fifth of the time and will be particularly noticeable in large projects.</p>
<p><b>Improvement 14.0.0: Send to TBC – GCP accuracy</b></p>	<p>In the "Send to" Trimble Business Center function in UASMaster is now the highest accuracy group "Control" for ground control points available:</p>



	<ul style="list-style-type: none"> <li>▪  "Control" quality indicates the highest quality for a coordinate.</li> <li>▪  "Survey" quality indicates a coordinate value is based on surveyed data of the highest quality.</li> <li>▪  "Mapping" quality indicates a coordinate value is based on surveyed data of low to average quality.</li> <li>▪  "Unknown" quality indicates a coordinate value is based on surveyed data of the lowest or unverified quality. This is the lowest quality for a coordinate.</li> </ul>
<b>Fix 14.0.0: Exif import in feet project</b>	The import of data from the image Exif header was wrong when using the unit feet for the project. This is fixed.
<b>Fix 14.0.0: GNSS standard deviations for non-metric project coordinate systems</b>	The GNSS standard deviations were not converted to feet for non-metric project coordinate systems.
<b>Fix 14.0.0: Corrections for 3D Close Range projects</b>	The earth curvature and refraction correction were both activated in case a UASMaster project was sent from TBC (Trimble Business Center). This was changed and the corrections are deactivated for 3D Close Range projects now.
<b>Fix 14.0.0: Project Editor – XPF format</b>	When changing the format of the xpf file (which includes the automatic images measurements) between binary and text, the xpf file no longer gets emptied. Now all automatic image measurements are transferred into the other format.

## Georeferencing

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<b>Improvement 14.0.2: New entries in PDF report</b>	<p>At the customer's request, the report file now contains expanded information about the statistical evaluation of all results (GNSS, IMU, ground control points).</p> <p><b>GNSS residuals (given - adjusted) for 202 positions</b></p> <table border="1"> <thead> <tr> <th></th> <th>X [m]</th> <th>Y [m]</th> <th>Z [m]</th> </tr> </thead> <tbody> <tr> <td>Maximum</td> <td>0.1679</td> <td>-0.2801</td> <td>-0.1120</td> </tr> <tr> <td>Mean</td> <td>-0.0000</td> <td>0.0000</td> <td>-0.0000</td> </tr> <tr> <td>Sigma</td> <td>0.0543</td> <td>0.0646</td> <td>0.0311</td> </tr> <tr> <td>RMSE(x,y,z)</td> <td>0.0541</td> <td>0.0644</td> <td>0.0310</td> </tr> <tr> <td>RMSE(H)</td> <td>0.0841</td> <td colspan="2">SQRT(RMSE<sub>x</sub><sup>2</sup> + RMSE<sub>y</sub><sup>2</sup>)</td> </tr> <tr> <td>RMSE(3D)</td> <td>0.0897</td> <td colspan="2">SQRT(RMSE<sub>x</sub><sup>2</sup> + RMSE<sub>y</sub><sup>2</sup> + RMSE<sub>z</sub><sup>2</sup>)</td> </tr> </tbody> </table> <p><b>IMU residuals (given - adjusted) for 202 positions</b></p> <table border="1"> <thead> <tr> <th></th> <th>Omega (X) [deg]</th> <th>Phi (Y) [deg]</th> <th>Kappa (Z) [deg]</th> </tr> </thead> <tbody> <tr> <td>Maximum</td> <td>0.00661974</td> <td>0.00935881</td> <td>0.00450075</td> </tr> <tr> <td>Mean</td> <td>0.00005951</td> <td>-0.00055075</td> <td>0.00000017</td> </tr> <tr> <td>Sigma</td> <td>0.00214973</td> <td>0.00219880</td> <td>0.00195372</td> </tr> <tr> <td>RMSE(o,p,k)</td> <td>0.00214523</td> <td>0.00226145</td> <td>0.00194887</td> </tr> <tr> <td>RMSE(3D)</td> <td>0.00367618</td> <td colspan="2">SQRT(RMSE<sub>o</sub><sup>2</sup> + RMSE<sub>p</sub><sup>2</sup> + RMSE<sub>k</sub><sup>2</sup>)</td> </tr> </tbody> </table>		X [m]	Y [m]	Z [m]	Maximum	0.1679	-0.2801	-0.1120	Mean	-0.0000	0.0000	-0.0000	Sigma	0.0543	0.0646	0.0311	RMSE(x,y,z)	0.0541	0.0644	0.0310	RMSE(H)	0.0841	SQRT(RMSE <sub>x</sub> <sup>2</sup> + RMSE <sub>y</sub> <sup>2</sup> )		RMSE(3D)	0.0897	SQRT(RMSE <sub>x</sub> <sup>2</sup> + RMSE <sub>y</sub> <sup>2</sup> + RMSE <sub>z</sub> <sup>2</sup> )			Omega (X) [deg]	Phi (Y) [deg]	Kappa (Z) [deg]	Maximum	0.00661974	0.00935881	0.00450075	Mean	0.00005951	-0.00055075	0.00000017	Sigma	0.00214973	0.00219880	0.00195372	RMSE(o,p,k)	0.00214523	0.00226145	0.00194887	RMSE(3D)	0.00367618	SQRT(RMSE <sub>o</sub> <sup>2</sup> + RMSE <sub>p</sub> <sup>2</sup> + RMSE <sub>k</sub> <sup>2</sup> )	
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RMSE(H)									
RMSE(3D)									
ACC(H) (at 95% Confidence Level)									
ACC(V) (at 95% Confidence Level)									
<b>Improvement 14.0.2: Better modeling of distortion</b>	A new algorithm has been implemented to better describe the distortion of the camera.								
<b>Fix 14.0.2: Missing 3D cursors in UAS Measurement</b>	No user-selectable 3D cursors were displayed. That's fixed.								
<b>New Feature 14.0.0: New 3D Reconstruct parameters added</b>	The 3D Reconstruct process is also calibrating the camera; original values for focal length, principal point and distortions can change. It is now possible to define separately which of these parameters are calibrated.								

## Surface and Orthophoto Generation

Change	Description					
<b>Fix 14.0.3: Meshes are not moved</b>	If the working directory and the project directory were on different drives, the generated meshes were not moved from the working directory to "3D Mesh" folder in the project directory, but remained in the working directory.					
<b>Fix 14.0.3: Application of earth curvature and refraction correction in SGM</b>	The earth curvature and refraction corrections were not considered correctly for projects with high flying altitude. This could lead to a height shift of the SGM results.					
<b>Fix 14.0.2: SLPK Mesh export</b>	Because the geoid file was saved in the wrong folder, the export of the SLPK mesh failed. That's fixed					
<b>New Feature 14.0.0: Introduction of a new local non-LOD mesh format</b>	<p>Besides the already existing OBJ (double precision) solution, it is now possible to create a local OBJ in single precision. The new output has a non-LOD structure.</p> <table border="1"> <tr><td>local obj</td></tr> <tr><td>tilde obj</td></tr> <tr><td>single obj</td></tr> <tr><td>tilde dae</td></tr> <tr><td>single dae</td></tr> </table>	local obj	tilde obj	single obj	tilde dae	single dae
local obj						
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<p><b>New Feature 14.0.0: Dynamic caching for Classic Orthophoto generation</b></p>	<p>The Classic Orthophoto generation handles the caching for the complete process dynamically, resulting in a better performance and better usage of the hardware capabilities. The dynamic caching as well as the number of parallel processes also take care in case child processes are started and are having an impact to the processing performance.</p> <p>For large and high overlapping projects, the performance of the Global Tilting (color balancing) was improved during the "Inserting Image Equations" step.</p> <p>All this can lead to a performance improvement of up to 20%.</p>
<p><b>Improvement 14.0.0: Simplification of the user interface</b></p>	<p>As meshes should always be generated with texture, the additional checkbox to activate/deactivate texturing has been removed from the UI.</p>
<p><b>Improvement 14.0.0: More efficient handling of areas in large projects</b></p>	<p>The footprints are checked against the area border before the images are accessed and analyzed. Therefore, the analysis step is faster because only image within the specified range is used for preprocessing steps.</p>
<p><b>Improvement 14.0.0: Enhanced meshing algorithm</b></p>	<p>To further reduce the likelihood of unwanted effects such as isolated objects or holes, version 14 has integrated an improved 3D meshing algorithm.</p>
<p><b>Improvement 14.0.0: Runtime improvements for, mesh, true ortho generation and more</b></p>	<p>The runtime is improved by up to 10% for the 3D mesh generation and up to 20% for true ortho generation.</p> <p>The retexturing of meshes containing edited tiles has become significantly faster.</p> <p>The streaming performance of SLPK and 3D Tiles meshes as well as the OBJ mesh conversion performance has been improved.</p>
<p><b>Fix 14.0.0: Problem with roughness layer cells</b></p>	<p>DSM roughness layer cells now use "NaN" values instead of "+inf" when no observation is available in the local neighborhood.</p>
<p><b>Fix 14.0.0: Unrecognized vertical grid format</b></p>	<p>Fixed an issue that would trigger an error regarding an unrecognized vertical grid format when providing the grid file for DHHN2016 heights.</p>
<p><b>Fix 14.0.0: Search for corresponding pairs of images</b></p>	<p>The search for corresponding pairs of images and orientations was revised and made more robust.</p>
<p><b>Fix 14.0.0: Visualization behavior of LOD meshes</b></p>	<p>Fixed the visualization behavior of LOD meshes, leading to sharper texture representations.</p>
<p><b>Fix 14.0.0: Clearer error handling</b></p>	<p>Version 14 has clearer error handling for the SLPK export in the project coordinate system functionality when passing parameters that do not conform to the "i3s" specification.</p>
<p><b>Fix 14.0.0: Out-of-memory</b></p>	<p>An issue is fixed that could lead to an out-of-memory in the DSM step.</p> <p>Fixed an issue where the color adjustment computation step could run out-of-memory.</p>

<b>Fix 14.0.0: Soup is not a mesh error</b>	Fixed an issue that could lead to “Soup is not a mesh” error in the 3D mesh postprocessing step.
<b>Fix 14.0.0: Generation of straight seamlines in classic orthophoto</b>	A problem with straight seamlines (transitions) in the classic orthophoto mosaic was fixed.
<b>Change 14.0.0: Number of stereo models entry in the las file</b>	For point cloud results, the number of stereo models encoded in the LAS field “Number of returns / Return number” has been removed for compatibility with third-party applications.

## Information

For more information, please contact your Trimble Inpho Support Team at [imaging\\_support@trimble.com](mailto:imaging_support@trimble.com). The software is available for download on <https://geospatial.trimble.com/en/links?dcs=Collection-87795>