



Release Notes – MATCH-T DSM V5.1

May 2008

1

MATCH-T DSM V5.1.1

New: Windows XP64 and Windows Vista32/64 versions are available

Patch: No file size restriction on 32 bit and 64 bit operating systems

Restriction: Overlap ratios higher than about 80% / 80% are not handled correctly for DSM processing

Information: Unsuitable overlap ratios for DSM generation

MATCH-T DSM V5.1.0

New Feature: DSM generation

New Feature: Support of Distributed Processing

New Feature: Support of Pushbroom - ADS40 data

New Feature: Starting height for processing can be changed

Patch: Crash because of singularity of the normal equation system

Patch: Problem with restarted height model generation process

Patch: Images with external image pyramids

Patch: 16-bit Tiff images with more than 3 color channels

Change: Optimized image selection

Change: Optimized image access

Change: Automatic generation of image pyramids

Information: New product name of MATCH-T DSM

Information: Processing speed for DSM

Information: Processing speed for DTM

MATCH-T DSM V5.1.1

New: Windows XP64 and Windows Vista32/64 versions are available

INPHO's photogrammetric software supports now the following operating systems: Windows 2000, Windows XP32, Windows XP64, Windows Vista32 and Windows Vista64. The 32 bit and 64 bit versions need different installation setups that can be either downloaded from our home page or are delivered on different DVDs.

The 64 bit versions do have the advantage that the file size limit of 2 GB RAM is no more existing and the processing with certain applications can be faster. By testing different data sets we found the following speed up factors when using 64 bit operating systems compared to processing with Windows XP32:

- MATCH-T DTM - XP64/Vista64 are ~ 35% faster
- MATCH-T DSM - XP64/Vista64 are ~ 15% faster
- OrthoVista – Vista64 is ~ 25% faster, XP64 is ~ 6% faster
- MATCH-AT, OrthoMaster – same processing times on all operating systems
- DTMaster – no information, no speed up tests till now

The Windows Vista operating system has the following limitations:

- No support of stereo viewing but anaglyph color stereo viewing (Microsoft Vista does not support stereo in a window)
- Windows Vista 64bit requires at least 4 GB of RAM
- To take advantage of the 64 bit operating systems we suggest to install anyhow a minimum of 4 GB of RAM
- Windows Vista SP1 must be installed

The Windows 64 bit versions can be only used with the Codemeter dongle from WIBU. The Aladdin hardlocks do not support 64 bit operating systems. Please contact sales@inpho.de to get an offer for replacing the Aladdin hardlock with the Codemeter dongle. Should you have any questions regarding the technical details of software, please contact your Support Team at support@inpho.de.

Please note: The Windows 2000 support will be terminated with the next version of INPHO's photogrammetric software.

Patch: No file size restriction on 32 bit and 64 bit operating systems

MATCH-T DSM 5.1.1 supports reading and writing temporary and permanent files larger than 2 GB on 32 bit and 64 bit operating systems. This enhancement allows processing larger project areas (especially for dense DSM production). It is no longer necessary to divide one project into smaller parts because of file size limitations.

Restriction: Overlap ratios higher than about 80% / 80% are not handled correctly for DSM processing

MATCH-T DSM 5.1.1 does not generate precise digital surface models for projects with very high overlap (higher than about 80% / 80%). At the moment it is recommended reducing the forward and side overlap to about 80% / 80% to overcome this deficiency.

Information: Unsuitable overlap ratios for DSM generation

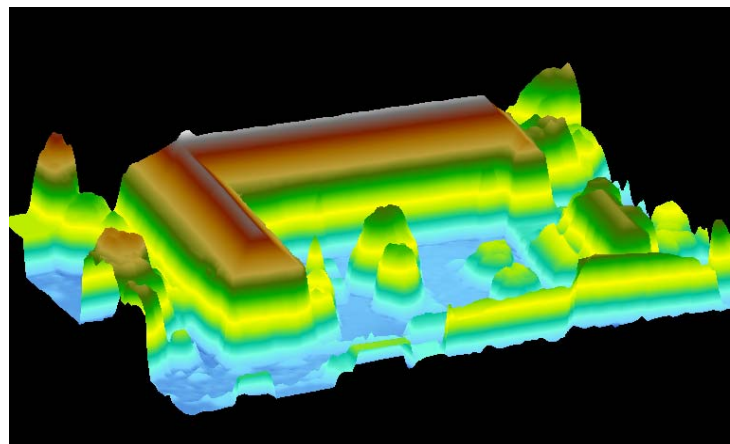
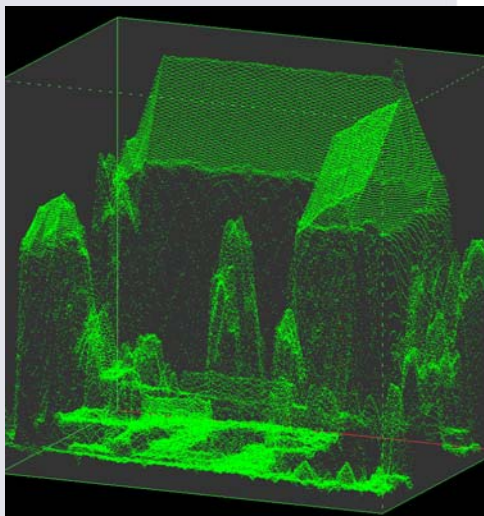
The generation of high quality digital surface models requires sufficient overlap between adjacent images in and across flight direction. Overlap ratios smaller than 60% / 60% are not suitable to achieve dense, accurate and detailed surface models. It is not recommend using the DSM generation function of MATCH-T DSM with projects not fulfilling this minimum condition.

MATCH-T DSM V5.1.0

New Feature: DSM generation

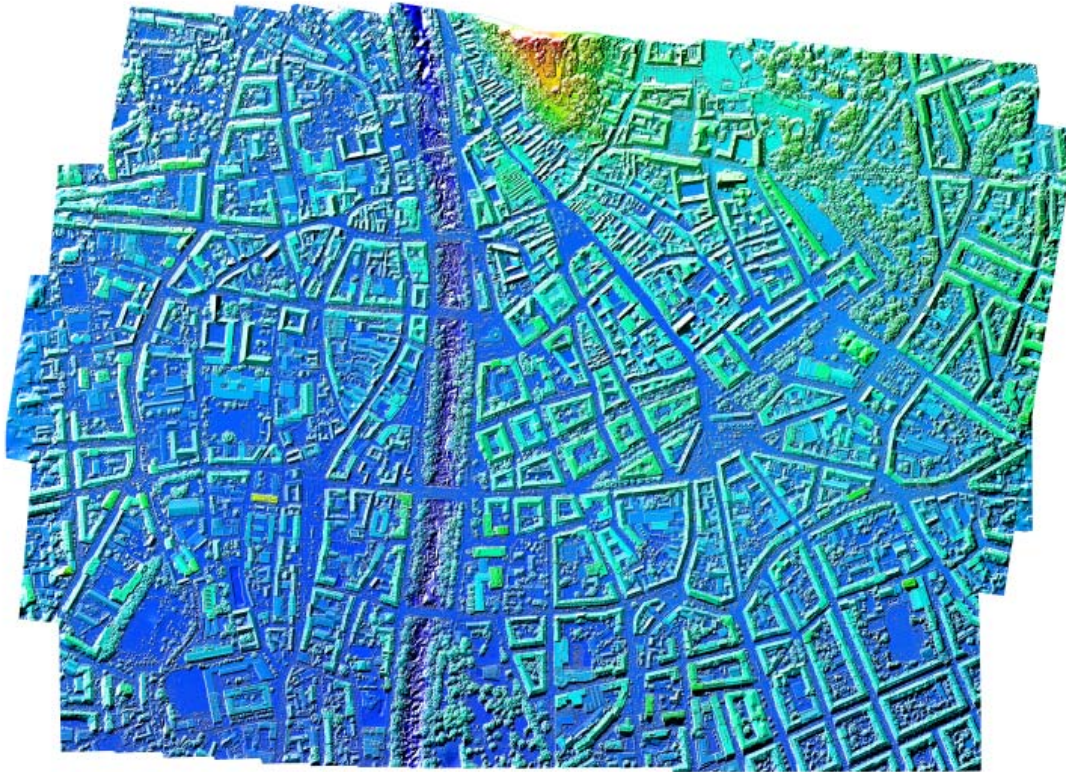
MATCH-T DSM version 5.1 provides significantly improved capabilities for digital surface model (DSM) generation. The new DSM generation procedure delivers surface models with much higher planimetric resolution than version 5.0.2. A DSM raster with up to 5 times the ground sample distance of the aerial images is possible (e.g. 0.5 m DSM raster size for 10 cm input aerial images). This resolution can be compared to point clouds delivered by LIDAR scanners.

Man-made objects are modeled precisely because MATCH-T DSM derives geometric information from several image combinations per computation unit. Different viewing perspectives contribute to dense and accurate object representations. Even small details and objects like chimneys, dormers and lamp posts are extracted and modeled. Such detailed and high-resolution surface models can for instance be used to extract accurate 3D building object models.



Furthermore, MATCH-T DSM differentiates much better between object, vegetation and ground points than version 5.0.2. Narrow streets can be detected even in dense city areas where previous versions created DEM points far above the ground because of the influence of adjacent high buildings. Demanding city areas consisting of building blocks of various size and shape, narrow and broad streets covered partially by vegetation can be reconstructed exactly and detailed.

Digital terrain models may be derived from such dense surface models by applying building, vegetation and other filters implemented in SCOP++ and DTMaster. This approach eliminates the need of running the DEM generation twice.



The user interface of MATCH-T DSM offers different parameter sets for DTM and DSM generation. Additionally the parameters will be adapted automatically in different ways for DTM and DSM models.

Some input data recommendations to obtain the best quality and most accurate results:

Digital calibrated camera

Overlap ratios of at least 60 / 60

Ground resolution of at least 0.25 m

Projects which are not fulfilling these recommendations can be processed as well. However, the results might not be as good and as accurate as they could be.

New Feature: Support of Distributed Processing

MATCH-T DSM projects can now be processed on several computation units (CPUs) and / or workstations in parallel. Huge projects divided into sub-blocks or processing regions can be distributed using the DPMaster module and processed in a fraction of the time required when using just one CPU. The distributed processing is recommended for the DSM generation.

New Feature: Support of Pushbroom - ADS40 data

INPHO's photogrammetric software package supports now pushbroom sensor data of the ADS40 camera from Leica Geosystems. The image format levels 0 and 1 are fully supported and can be used in all applications for image processing and display. ApplicationsMaster allows the definition of projects. MATCH-AT Pushbroom enables the aerial triangulation for the ADS40 images. MATCH-T DSM can be used to automatically measure terrain or surface models which can be then checked and modified by DTMaster. Finally orthophotos can be generated with OrthoMaster. The sensor orientation data formats created by MATCH-AT are compatible with the ones created by GPRO.

MATCH-AT Pushbroom requires a license which can be acquired as an extension to MATCH-AT or as a stand-alone license. All other modules are supporting ADS40 data without an extra license.

In case of processing level 0 images the different bands can't be currently combined to color composites. Such color composites are in preparation for further releases as well as the support of other pushbroom images like the ones from JAS 150.

New Feature: Starting height for processing can be changed

The MATCH-T DSM GUI offers now a possibility to change the mean terrain height of a boundary defining the area to be processed. It is important to specify a correct mean terrain height in order to achieve good height model results.

Patch: Crash because of singularity of the normal equation system

MATCH-T version 5.0.2 might have crashed because of singularity problems of the normal equation system during the MATCH-T generation process. This problem has been solved by correctly determining the various interpolation components.

Patch: Problem with restarted height model generation process

In some cases, the height model generation process deleted the "MATCHT.lock" file. The "MATCHT.lock" file contains intermediate processing results which are required to restart a height model generation process. As a consequence the restart was no longer possible. Now, the "MATCHT.lock" file is stored in the working directory until the height model generation has been finished.

Patch: Images with external image pyramids

In some case with images having external image pyramids the color information for the last image pyramid level was not considered correctly. This problem has been solved.

Patch: 16-bit Tiff images with more than 3 color channels

MATCH-T V5.0.2 stopped processing in case of 16-bit Tiff images with more than 3 color channels (e.g. R,G,B,IR) the image access the process. This problem has been solved.

Change: Optimized image selection

In previous versions, all photos belonging to a selected block were used for the borderline detection even though project area was defined. With the new version, only images are considered that are located completely or partly inside the project area. This reduces the processing time considerably.

Change: Optimized image access

MATCH-T V. 5.0.2 used up to 90 % of the whole processing time for the image access. To speed up the processing, an image caching has been introduced saving up to 80% of the time.

Change: Automatic generation of image pyramids

Image pyramids are automatically computed if they do not exist.

Information: New product name of MATCH-T DSM

The product name has been changed to MATCH-T DSM to emphasize the new capabilities concerning the digital surface model generation.

Information: Processing speed for DSM

MATCH-T DSM V. 5.1 produces high quality digital surface models with planimetric resolutions of up to five times the ground sample distance (GSD) of the aerial images. During the DSM generation process, hundreds of millions of feature points are extracted, checked and managed. The handling and administration of this huge amount of data requires higher processing times than the creation of digital terrain models with maximum planimetric resolutions of up to 25 times the ground sample distance. Distributed processing reduces the necessary time significantly.

At the moment, the following average values are valid for a modern computer (e.g. 2 GB RAM, 3GHz,...) and processing based on one CPU:

Terrain type:	undulating:	15 – 20 min (p. img.)	Grid size: 7 * GSD
	mountainous:	20 – 30 min (p. img.)	Grid size: 6 * GSD
	extreme:	30 – 45 min (p. img.)	Grid size: 5 * GSD

Information: Processing speed for DTM

MATCH-T DSM version 5.1 needs up to 80% less computation time for the DTM generation than version 5.0.2. The following examples should give an idea about possible processing times.

Block Description	Used Computer	Computed Variations	Speed
<p>Block A</p> <p>Images: 984 Camera: UltraCam Resolution: 9µm Format: TiledTiff Endlap: 70% Sidelap 30%</p> <p>Specialty: Some images overlaps about 100%</p>	<p>Dual core Xeon 5160, 3,0 GHz 2 GB RAM Data on network OS: WinXP</p>	<p>Terrain type: flat 6m grid distance <u>Additional output:</u> point cloud file</p>	<p>7 hours 13min per image about 30 sec Resulting DTM file: 130MB</p>
<p>Block B</p> <p>Images: 2743 Camera: UltraCAMD Resolution: 9µm Format: Tiled Tiff Endlap: 65% Sidelap 25%</p>	<p>Dual core Xeon 5140, 2,3 GHz 2 GB RAM Data on network OS: WinXP</p>	<p>Terrain type:undulating 4m grid distance No additional output</p>	<p>21 hours 5 min per image about 25 sec Resulting DTM file: 272MB</p>
<p>Block C</p> <p>Images: 3 strips* 3 L0 images Camera: ADS40 Resolution: 6,5µm Format: Tiled Tiff Endlap: F27, F02, B14 Sidelap 25%</p>	<p>Pentium D 3GHz 2 GB RAM Data: internal HD OS: WinXP</p>	<p>Terrain type: undulating 1m grid distance No additional output</p>	<p>21 hours 01 min per strip about 7 hours Resulting DTM file: 21MB</p>

Should you have any questions regarding the technical details of software, please contact your Support Team at support@inpho.de.