



Engineered to the exacting standards of digital photogrammetry and laser scanning data production

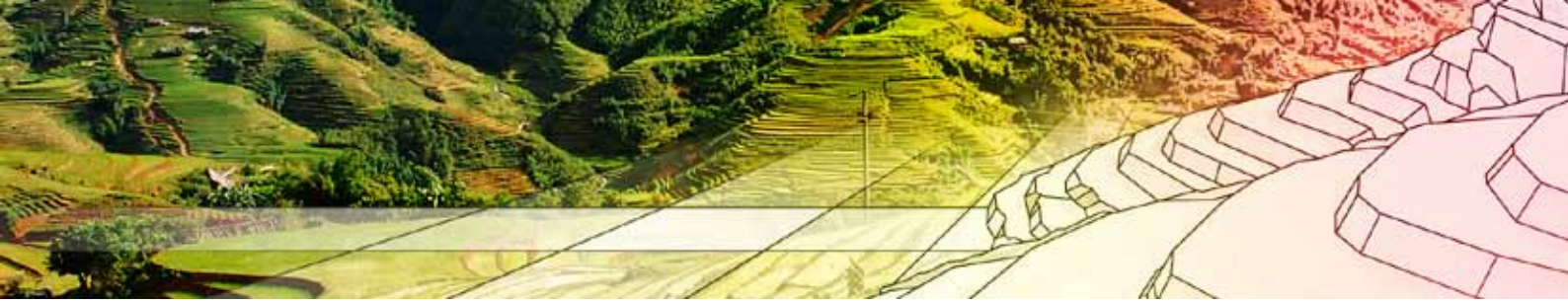
# Industry Leading Geo-Precision Software



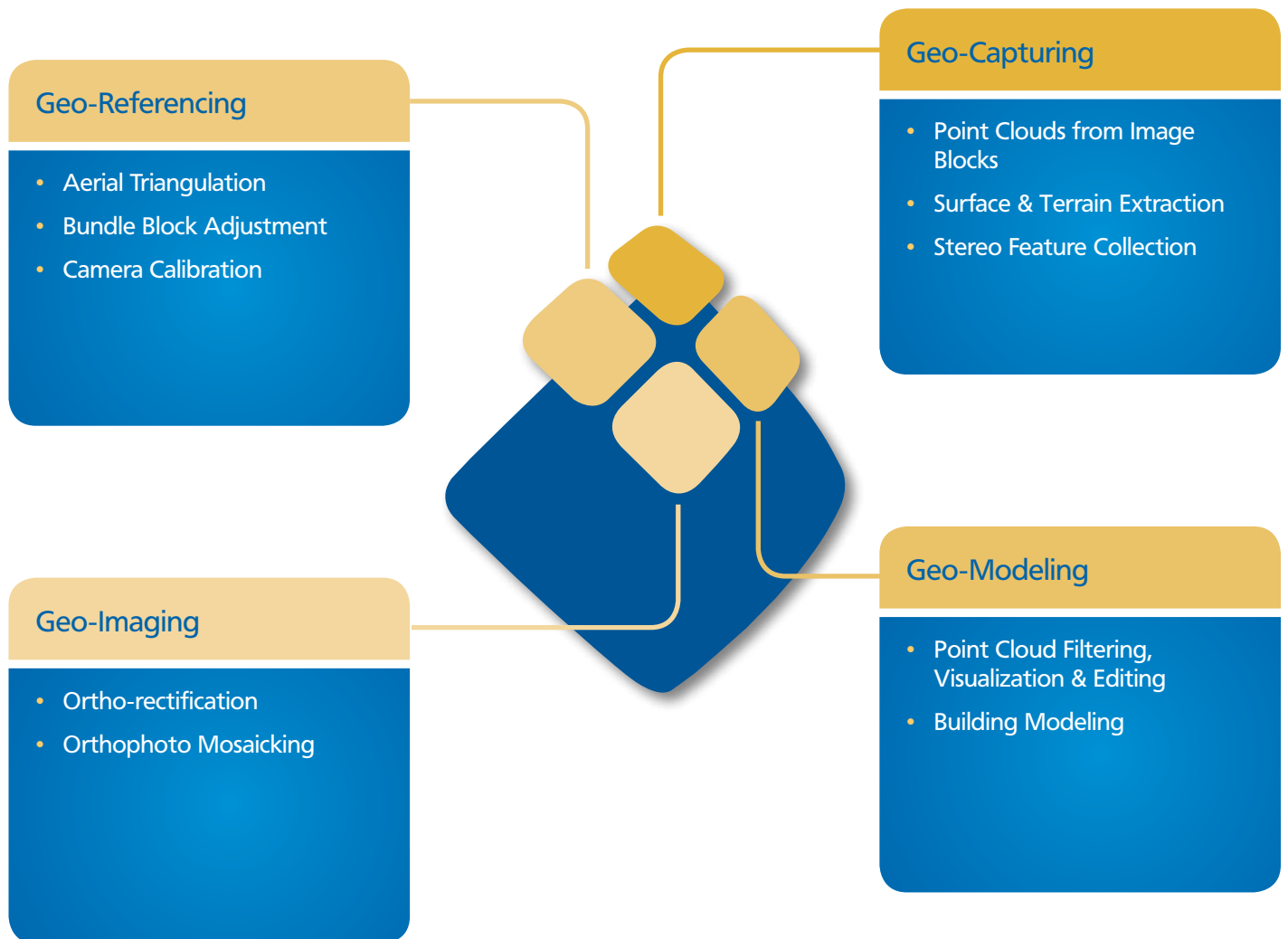
Advanced sensors gather geospatial data from above the earth's surface 24 hours a day – every day. Trimble's Inpho™ software is designed to precisely transform raw aerial and satellite images into consistent and accurate point clouds and surface models, orthophoto mosaics and digitized 3D features using state-of-the-art photogrammetry techniques. These essential processes standardize and enhance geospatial data for national mapping, forestry, agriculture, mining, utility and energy, urban development, defense and disaster response geoinformation workflows.

With more than thirty years of development and thousands of global implementations, Inpho software is well known for pioneering digital photogrammetry techniques that are today regarded as the industry standard. This commitment to advancing the art and science of geo-precision lives on within the latest generation of Inpho software which is engineered to the exacting standards of digital photogrammetry and laser scanning data production.





Using a modular approach, Inpho software can be deployed as a complete, perfectly tuned system, or as individual components that integrate into geospatial information production workflows.



All software modules are delivered together with the ApplicationsMaster control center which includes basic sensor definition, image preprocessing and DTM tools.



# Geo-Referencing

State-of-the-art camera calibration, bundle block adjustment and automatic digital aerial triangulation for image blocks of any size, overlap or geometry

## MATCH-AT

Precise digital aerial triangulation with exceptional performance

- Geo-reference blocks of aerial imagery
- Automatically extract tie points at optimal locations using multi-ray image matching
- Measure or verify control and tie points mono- or stereoscopically, guided by graphical block analysis
- Orient image blocks using proven bundle block adjustment and quality control tools
- Calibrate boresight misalignment automatically and correct shift and drift of GNSS and IMU data
- Adjust line (pushbroom) sensor data

## inBLOCK

Reconstruct the image orientation for image blocks even for challenging projects

- Calibrate lens and image plane parameters for aerial frame cameras
- Control quality using mathematical modeling and adjustment combined with excellent graphical tools
- Thoroughly analyze image blocks using complete statistical information including variance components, precision, internal & external reliability measures, among others
- Complement standard views (such as vectors or ellipses) with new types of visualization (such as traffic lights) to simplify data inspection and quality control
- The flexible and configurable adjustment engine includes full GNSS and IMU support

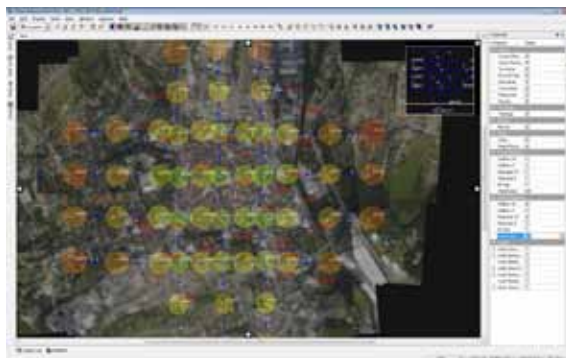


Figure 1  
Streamline quality control using Match-AT visual feedback tools

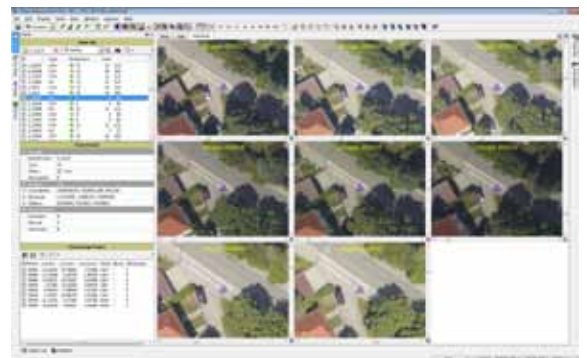


Figure 2  
Precisely measure and control tie points using Match-AT



## Geo-Capturing

Create dense point clouds and surface models from aerial and satellite photo blocks/  
Use interactive stereo data capture to collect geospatial data directly into CAD or GIS

### MATCH-T DSM

Automatically create digital terrain and surface models from aerial or satellite image blocks

- Acquire very dense point clouds and high quality surface models directly from stereo imagery
- Use advanced “cost based” multi-image matching to create point clouds as a lower cost alternative to aerial laser scanning, particularly for applications such as city modeling and orthophoto generation
- Take all locally overlapping images into account
- With at least 60/60 percent image overlaps, even narrow urban streets are detected
- Remove non-ground objects and achieve bare earth digital terrain models (DTMs) using robust filter methods
- Expand production capabilities using state-of-the-art multi-threading and distributed processing

### Summit Evolution

Collect 3D features directly into ArcGIS, AutoCAD or MicroStation

- Digital photogrammetric stereo workstation
- Roam seamlessly through projects of any size using a project-based environment for oriented image blocks
- Improve result quality with routines for data generalization, checking and automatic line editing
- Ensure best mapping performance using automatic batch map editing
- Superimpose collected or imported vector data directly onto stereo models for effective and efficient interactive mapping, change detection and GIS updates
- Aerial frame and pushbroom imagery, close-range, satellite, IFSAR, LiDAR intensity and orthophoto imagery are all supported

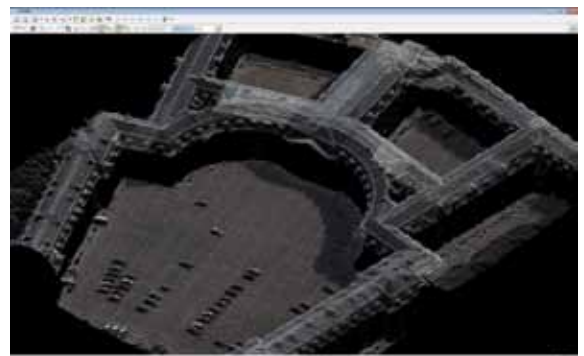
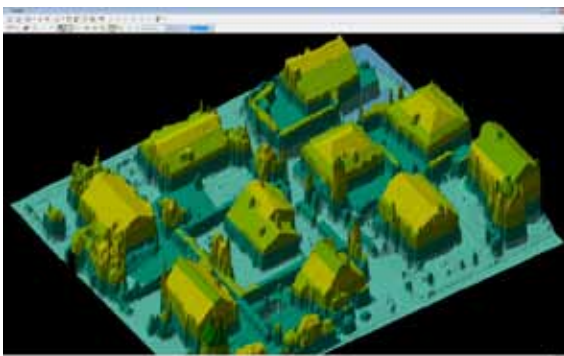


Figure 3 and 4

Create dense point clouds from stereo imagery using Match-T DSM



# Geo-Modeling

Comprehensive surface and terrain modeling including filtering, visualization, editing and analysis of unlimited DSM/DTM points generated by laser scanning or image matching techniques

## DTMaster

Edit digital terrain and surface models quickly and precisely

- Visualize and quality control data using excellent monoscopic or stereoscopic tools
- Easily handle huge DTM projects consisting of billions of points using a tiled data structure
- Underlay DTM data with thousands of orthophotos or complete blocks of aerial stereo photographs
- Expand DTM capabilities using Inpho's DTM Extension for fast point cloud filtering, gap filling and contour output

## 3D City Modeling

Generate and maintain 3D building models on county, state or country level

- Extract vectorized roof surfaces and building shapes from 3D point clouds using Inpho's BuildingGenerator
- Establish a complete city modeling workflow including the creation, quality control and 3D editing of building models using Inpho's Building Add-on for DTMaster

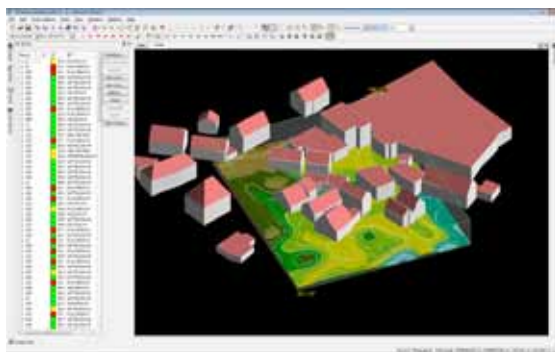


Figure 5  
Generate 3D building models from point clouds

## SCOP++

Manage very large DTM projects with hundreds of millions of points

- Work with points from LiDAR, photogrammetry or other sources
- Filter airborne laser scanning to automatically classify a raw point cloud into terrain and off-terrain points
- Effectively extract true ground points for further DTM processing
- Address contouring, hill-shading, profiling, volume calculations, or slope analysis
- Work with an efficient hybrid DTM data structure and integrated database system
- Flexible interpolation methods and powerful visualization

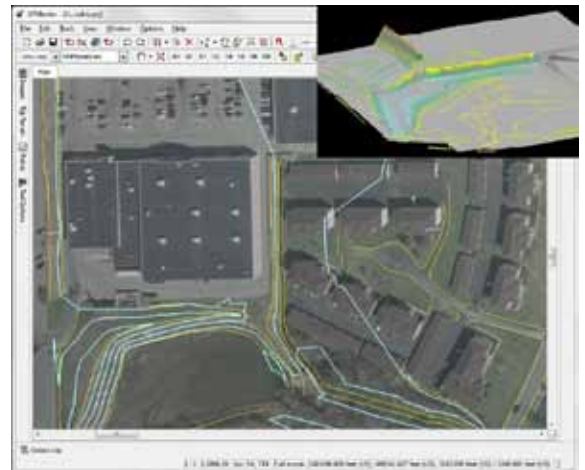


Figure 6  
Measure, edit and control digital terrain models effectively using DTMaster



## Geo-Imaging

Master orthophoto creation and mosaicking of digital aerial or satellite imagery with automatic block-wide operation, rigorous true-ortho capabilities, unsurpassed color balancing and fully automatic seam detection

### OrthoMaster

Professional software for high-quality orthophoto generation

- Ensure digital aerial or satellite imagery with constant scale using orientation and digital terrain models as source data
- Generate true orthophotos for both single images and complete image blocks using advanced computational algorithms
- Derive DTMs directly from point cloud and breakline data
- Optimized for automated, high-performance orthophoto production
- Expand production capabilities using state-of-the-art multi-threading and distributed processing

### OrthoVista

Efficiently process thousands of orthophotos into perfect orthomosaics

- Create seamless, color balanced and geometrically correct orthomosaics
- Automate key ortho-mosaicking functions such as image intensity, color, and radiometric adjustments
- Correct visual effects such as hot spots, lens vignetting, brightness or color variations
- Detect seamlines fully automatically and merge adjacent images perfectly
- Recognize man-made objects without manual intervention to generate high quality results even in urban areas
- Also includes a seam editor for interactive mosaic editing

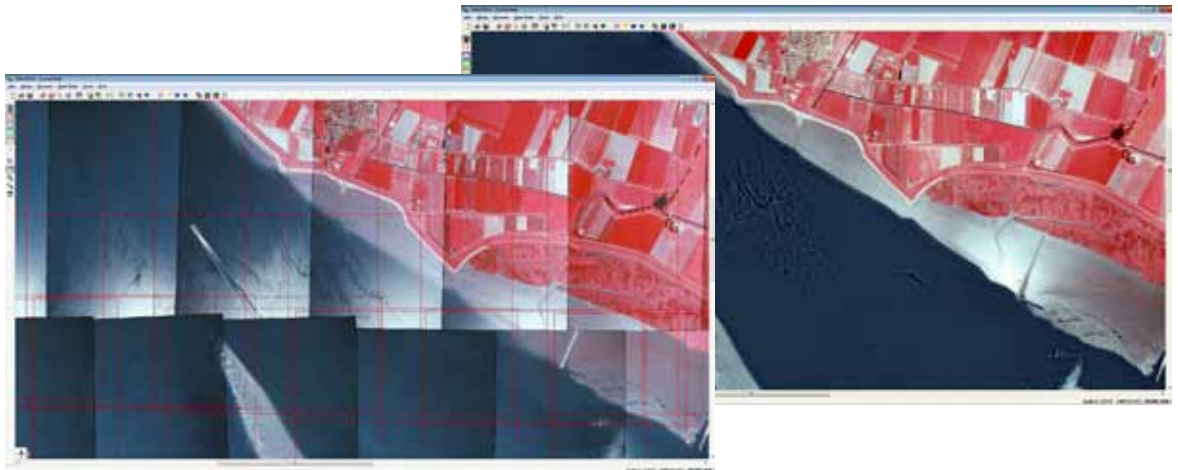


Figure 7  
Create perfect orthophoto mosaics using OrthoVista



Using a modular approach, the Inpho software suite can be deployed as a complete, perfectly tuned system, or as individual components that integrate into geospatial information production workflows

	Geo-Referencing		Geo-Capturing		Geo-Modeling			Geo-Imaging	
	MATCH-AT	inBLOCK	MATCH-T DSM	Summit Evolution	DTMaster	Building Generator	SCOP++	Ortho-Master	Ortho-Vista
Digital Photogrammetry	X	X	X	X	X			X	X
Aerial Triangulation	X	X							
Camera Calibration	X	X							
Surface / Terrain Extraction			X		X				
Orthophoto Production and Mosaicking								X	X
Stereo Data Capture				X	X				
Production Lines for Pushbroom Imagery	X		X	X	X			X	X
Processing of Satellite Imagery			X	X	X			X	X
Laser Scanning Data Processing					X	X	X		
DTM Processing and Management			X				X	X	
City Modeling			X		X	X			
<b>INPHO BUNDLES</b>									
Ortho Box								X	X
DTM Box			X		X				
LiDAR Box					X		X		



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