

3D Stereo Mapping Solutions

Solutions for GIS, Photogrammetry, and Engineering



www.datem.com | sales@datem.com

World-Class Digital Photogrammetric Workstation



SUMMIT EVOLUTION™

www.datem.com/summit



Summit Evolution provides a set of powerful tools for extracting 3D information from stereo data. The software includes CAD and GIS interfaces, 3D stereo vector superimposition, automated feature editing, contour generation and many more tools. Through the Capture™ interface, image features from a Summit Evolution project are digitized directly into AutoCAD®, MicroStation®, ArcGIS® or Global Mapper®. With DAT/EM SuperImposition™, those image features are overlaid on the Summit Evolution project for immediate feature verification.

Summit Evolution is available in four stereo-enabled product levels: Professional, Feature Collection, Lite, and Mobile. Summit UAS, shown opposite, is a fifth version for UAS orthophoto-based mono viewing and basic 3D digitizing.

Available Features

- Supports monochromatic, panchromatic, three-channel and multi-channel multispectral imagery.
- Supports scanned aerial film, matrix and push-broom digital airborne cameras, small- and medium-format metric cameras, close-range imagers, orthophotos, RPC satellites, LiDAR, UAS imagery, and synthetic aperture radar.
- Imports third-party softcopy projects, aerotriangulation results, and other orientation files for quick setup.
- Full range of manual and automatic image orientation capabilities.
- Digitizes 3D vectors directly into AutoCAD, MicroStation, ArcGIS or Global Mapper using DAT/EM's Capture interface.
- Robust and easy-to-use user interface for maximum productivity.
- Bird's-eye, Close-up, Project Overview, and 3D Vector Split windows offer a variety of visualization and feedback tools.
- Multiple viewports.
- Unlimited zoom levels, fast pan, and automatic loading of adjacent stereo models, with DAT/EM SuperImposition of CAD and GIS vectors over image view.
- DAT/EM Ortho+Mosaic™ module for easy and precise creation of orthomosaics, including true orthos.
- The Terrain Visualizer tool for dynamic, real-time preview of contours while DTM objects are edited.
- Contour Creator™ for creating and writing the finished contours to the CAD file.
- Interface to the DAT/EM-PCI ProPack to allow use of PCI PIX Imagery. (Requires PCI license)
- Airfield3D™ standards-compliant airspace obstruction mapping tool. (Requires ArcGIS)
- Point Translator for importing, regridding, and converting point data, including LiDAR and other DTM features.
- Summit Evolution Mobile package available which runs on touch screen tablets with Windows 8 in the Summit anaglyph stereo mode.
- 64-bit and 32-bit applications available.

Feature Comparison

PROFESSIONAL

Full-function, fully capable stereoplotter.

FEATURE COLLECTION

For those whose orientation requirements are met elsewhere, but who still require the world-class Capture interface to a CAD or GIS vector editor.

LITE

A low-cost system designed for viewing, terrain following, and simple editing and measurement.

MOBILE

Light-weight Windows-based tablet tool for field data collection.

UAS

Simple monoscopic tool to collect 3D vectors from UAS data.

Vector SuperImposition	■	■	■	■	■
Terrain following and Z digitizing based on DEM files	■	■	■	■	■
One year system support included	■	■	■	■	■
3D Stereo Enabled	■	■	■	■	■
Capture add-on for MicroStation, AutoCAD, ArcGIS or Global Mapper			■	■	■
LandScape Integration Available			■	■	■
Built-in drawing and editing tools	■	■		■	■
Advanced 2D and 3D editing, snapping, attribute handling				■	■
MapEditor automated editing software for AutoCAD or Microstation				■	■
Terrain Visualizer				■	■
Contour Creator				■	■
Point Translator				■	■
Project Status Tracker				■	■
Ortho+Mosaic					■
Airfield3D for ArcGIS					■

DAT/EM Capture, Summit Evolution, Landscape, and the DAT/EM logos are trademarks of DAT/EM Systems International. Trademarks provided under license from Esri. Other product and company names mentioned herein may be the trademarks of their respective owners.



Gain valuable 3D information from your UAS data with DAT/EM Systems International's Summit UAS. An essential component to any UAS workflow, Summit UAS provides a set of tools to critically analyze or compare UAS data by drawing, viewing, editing and defining features. Summit UAS requires no training in photogrammetry and is tailored to resource-grade data analysis with feature collection done in a non-stereo environment. Summit UAS is the newest addition to the DAT/EM Photogrammetric Suite.

Prospective industries and uses include:

- Farming: determine crop yields; conduct fertility time analyses.
- Forestry: analyze remote areas; determine best area for project or harvest; stand typing.
- Surveying: access to remote areas.
- Mineral Extraction: measure stockpiles; assess and monitor mine conditions and environment.
- Conservation: monitor and analyze remote and inaccessible regions.
- Utilities: assess utility corridor infrastructure.
- Emergency Response: situational awareness; hazards mapping.

Summit UAS OneButton™ Bundle

Derive valuable 3D information from your UAS-collected data by combining OneButton™ by Icaros with Summit UAS™ by DAT/EM Systems International. With OneButton™, the user can go from images to accurate, georeferenced and seamless mosaic products by using ready-to-go configurations designed for common project types. Seamlessly open your project in Summit UAS™ to start analyzing your UAS data.

OneButton™ Features

- Extremely Easy to Use – No user interaction after easy initial project setup.
- Go from images to accurate, georeferenced and seamless mosaic products (terrain models, orthoimages, orthomosaics).
- Pre-defined options for various project types.
- Uses your graphics processing units and multiple CPU cores for the fastest possible processing.
- Automatically creates a Summit UAS™ project file during OneButton™ processing.
- Open the Summit UAS file, set the DEM file, and digitize vectors in 3D.

Collect UAS Data



3rd Party Orientation Software

- Use popular, third-party orientation software to process raw UAS imagery and create the orthophotos and DEM necessary for successful import to Summit UAS.
- Some third-party orientation software can create a Summit project file (.smtxml) for easy integration with Summit UAS.



Summit UAS™

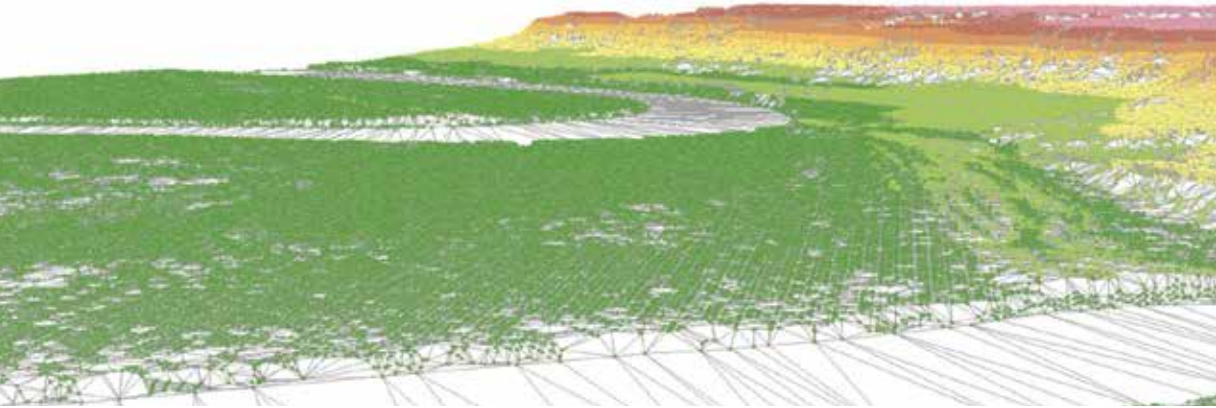
- Requires pre-processed UAS orthophotos and DEM.
- Opens orthophotos and DEMs from several of the most popular pre-processing systems in the market.
- Activates terrain following based on the DEM.
- Utilizes built-in DAT/EM Drawing Tools to draw 3D vector objects at Summit's (x,y) and the DEM surface (z).
- Exports 3D vector objects into Esri® shapefiles, Autodesk® .dwg and .dxf files, and Bentley® .dgn files.
- Upgrade path to the DAT/EM Photogrammetric Suite.
- No stereo equipment required.

3D Point Cloud Viewing and Editing Software



LANDSCAPE™

www.datem.com/landscape



LandScape provides an advanced and efficient portal into the world of 3-dimensional LiDAR points. It edits large terrain point clouds such as LiDAR and offers tools for viewing stereo imagery, classifying and modifying 3D points (point clouds), and generating new data based on points. LandScape's tools can be configured by the user to enhance understanding of the data view.

The editing tools in LandScape allow easy modification of point cloud data including a single point, all points in a project, or a selection built using LandScape's filtering tools. LandScape includes the DAT/EM Drawing Tools, a simple built-in vector editor which may be used to collect and save vector features in a variety of formats. For more advanced digitizing tools, one or more companion DAT/EM Capture™ modules may be added.

LandScape may optionally integrate with Summit Evolution™ to display the point cloud superimposed over stereo imagery. Use the Summit Evolution cursor to select and edit points and collect vector data.

Features

- View points in perspective stereo with many coloring and viewing options. Roam, zoom, pan, and rotate from any angle or distance.
- Colorize the view of the point cloud by elevation, return, flight line, intensity, RGB color (orthophoto), or classification.
- No limit to the number of simultaneous input files. Tools for controlling the detail on display.
- Full 3D mouse support for navigating, selecting, and digitizing.
- Support for mouse button programming and macro creation using DAT/EM Button Manager.
- Edit and reclassify points. Output the revised point set to a new file.
- Digitize new 3D vectors such as breaklines based on the points.
- View existing .dxf, .dwg, .dgn, or .shp vector files with the points.
- Draw and edit objects with the built-in vector editor, DAT/EM Drawing Tools.
- Optionally, digitize directly into AutoCAD®, MicroStation®, ArcGIS® or Global Mapper® using DAT/EM Capture.
- Use DAT/EM Capture to superimpose existing objects directly from AutoCAD, MicroStation, ArcGIS or Global Mapper.
- Fully integrated with Summit Evolution, DAT/EM's world-class digital photogrammetric workstation.
- Superimpose LandScape's points on a Summit stereo model for direct validation of work.

Several tools for working with large point datasets are incorporated in LandScape and are also available with a Summit Evolution Professional installation:

- **Generate LiDAR Frame**
Generates images and their stereo mates from point data files, enabling 3D stereoscopic viewing.
- **Point Translator**
Management tool to combine, extract, and merge point files in a wide variety of formats, spacings, and orientations.
- **SuperImposition Tool**
Load vector and orthophoto files to view together with the points in LandScape.
- **Brush Z Edit Tool**
An interactive point edit tool for smoothing the points inside the Brush Size circle by using point elevations surrounding the cursor.

3D Vector Digitizing Interface for AutoCAD, MicroStation, ArcGIS, and Global Mapper



CAPTURE™

www.datem.com/capture

DAT/EM Capture is the primary tool for vector information collection (which can be collected directly into one or more companion CAD or GIS programs) from stereo images. Capture works in tandem with DAT/EM's flagship products, the Summit Evolution™ digital photogrammetric workstation and the LandScape™ point cloud editing toolkit. Currently supported companion programs are AutoCAD®, MicroStation®, Esri ArcGIS® and Blue Marble® Global Mapper®. The Capture API (Application Program Interface) is also available to enable development for other CAD and GIS programs, and several third party Capture versions are available.

Capture works in the background to send 3D (x, y, z) ground coordinates to the companion application. Simultaneously, 2D or 3D features from the CAD or GIS software are rendered back in true relative 3D position in the stereo display using DAT/EM SuperImposition™ for immediate feedback and feature verification. The user's experience and productivity are enhanced through precise and instantaneous validation of work. The stereo capture capability is very helpful to people trying to interpret imagery such as urban planners, foresters, wetlands biologists and geologists.

Features

- DAT/EM Capture's drawing and editing tools make mapping-specific tasks easy to accomplish
- Custom building-squaring modes
- Choice of 2D and 3D snapping modes
- Spot elevations
- A wide selection of multiple-line offsets
- DTM point collection
- Specialty mapping tools such as contour labeling
- CAD-specific attribute mapping
- 3D digitizing, vertex dragging, and field editing
- Vector data superimposition onto stereo imagery
- Full functionality of the companion vector editor

Full 3D Map Editing for AutoCAD and MicroStation



MAPEDITOR™

www.datem.com/mapeditor

DAT/EM MapEditor is a toolkit with many time-saving tools for AutoCAD® or MicroStation®. MapEditor for AutoCAD works completely within AutoCAD and AutoCAD-based applications. MapEditor for MicroStation is an MDL application that works completely within MicroStation and MicroStation-based applications.

MapEditor for MicroStation Features

- BREAK elements at selected vertices, near points, or on an intersecting element or fence
- BREAKLINE FILTER delete/modify points from the area in or near line string/fences/shapes
- CHANGE ATTRIBUTES standardize or change combinations of level, color, weight and line code
- CHECK ATTRIBUTES a report of unverified objects for interactive editing
- CLOSE LINE STRING turn line strings to shapes
- CROSSCHECK verifies intersections and adds vertex nodes
- CURVE TO LINE STRING turn curves into line string (also works in reverse order)
- DELETE objects based on attributes
- DTM DISTRIBUTOR merge multiple DTM point distributions into one evenly spaced DTM grid
- FIX COMPLEX HEADER verifies, repairs, and compresses, complex line strings and shapes
- JOIN combines line strings
- TOUCH extends or trims lines to create intersections and adds vertex nodes
- VISIT to look at result coordinates

MapEditor for AutoCAD Features

- 3D TO 2D conversion of polylines
- BREAK polylines along cutting edges
- BREAKLINE FILTER changes the layer of DTM points that are located near linework
- CLEANUP fixes polyline errors that AutoCAD AUDIT misses
- CROSSCHECK searches for crossing polylines and adds vertex nodes
- DTM DISTRIBUTOR combines two or more DTM point sets into a grid
- EDITLINE draws or combines existing polylines into a new polyline section
- ELEVATE drapes objects based on a DEM
- EXTEND or trim polylines to meet other polylines
- FILTER reduces number of polyline vertices and maintains initial appearance
- FIX Z values on 2D polylines so vertex shares elevation with starting segment
- GRIDIT inserts a map sheet grid with northing and easting text
- JOIN combines polylines
- POLYLINE LENGTH finds polylines by length or by number of vertices and distance
- VISIT to look at result coordinates

Standards-Compliant Airspace Obstruction Identification Tool



AIRFIELD3D™

www.datem.com/airfield3d

As a component of Summit Evolution™ Professional with Capture™ for ArcGIS®, Airfield3D collects precise 3D geospatial airport and aeronautical data. It uses the stereoplotter engine of Summit Evolution Professional to enable viewing, identification, and attribution of objects penetrating sensitive airspace. Using DAT/EM's world-renowned stereo user interface, Airfield3D offers automatic project set up, automatic field calculation and attribution (with manual override), and visual cueing of obstruction surface violations. Airfield3D collects all data directly into FAA-designed templates for ArcGIS so files are always in delivery format.

Features

- Enforces to U.S. Federal Aviation Administration (FAA) Advisory Circular 150/5300-18B (18B) standard at every step. When finished, data layers are already FAA 18B compliant.
- Includes Part 77 surface definitions and processing.
- Automatically and simultaneously fills in multiple attribute fields based on the obstacle measurement.
- Digitizes into the FAA-designed ArcGIS templates.
- Includes status tools to display how many points are measured for each surface and how many are required.
- Creates complete reports of obstruction data for each surface.

Automatic Digital Surface Modeling and Contour Creation



CONTOUR CREATOR™

www.datem.com/contourcreator

Contour Creator generates and stores permanent contours into CAD or GIS drawings or vector interchange files. Once editing of the terrain model is complete, Contour Creator will generate elevation contours, smooth the resulting lines, symbolize, and place them on their appropriate database category.

Features

- Accepts input from many industry standard point file formats and accepts multiple input formats at one time.
- Allows user to select specific layers or levels from active AutoCAD®, MicroStation®, or ArcGIS®.
- Allows selection of layers or levels from the reference files in AutoCAD and MicroStation.
- Essential tools such as automatic depression contour identification, TIN- or grid-based calculations and contour exclusion removal.

Easy-to-Use Orthophoto and Mosaic Generation



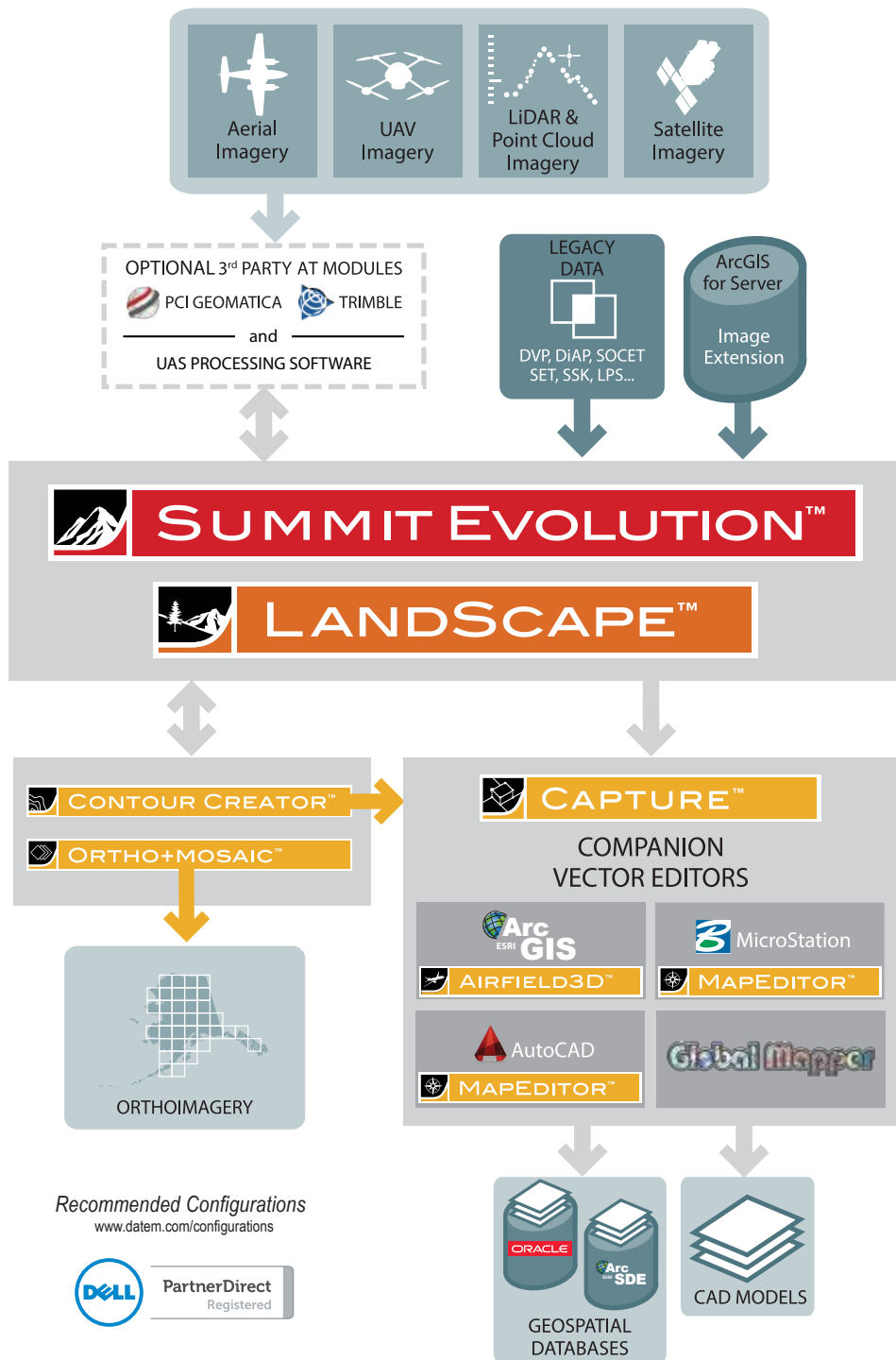
ORTHO+MOSAIC™

www.datem.com/orthomosaic

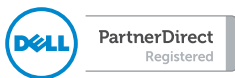
Straightforward tool to create orthophotos and orthophoto mosaics from Summit Evolution™ stereo projects.

Features

- Creates orthophotos and orthomosaics from Summit Evolution projects.
- Improves orthophoto results with a wide variety of point file and vector file input formats. Multiple input formats may be used at the same time.
- Provides orthophoto image adjustments such as histograms, brightness, and channel mappings.
- For mosaics, offers hot spot removal, exclusion areas, image balancing, histogram matching, and other image corrections.
- Advanced automatic mosaic seam line generation, manual editing, and seam line import/export tools.



Recommended Configurations
www.datem.com/configurations



UAS Workflow

For our UAS solution, check the Summit UAS page of this brochure or visit datem.com/summituas.

Custom Workflows Available

The DAT/EM Photogrammetric Suite allows users to create workflows that best fit their needs. Our software integrates with many third-party software solutions in order to fulfill the additional requirements of our clients. If you are seeking a solution you do not see in our product portfolio, please contact us to discuss a custom workflow.



KeyPad

Single-touch tactile command entry system

The original DAT/EM Keypad is a multipurpose re-programmable touch pad. Versatile and essential, it can be used either as an accessory to DAT/EM softcopy products or as a productivity enhancer for third-party products.



TouchScreen

On-the-fly configurable tactile interface

The 'TouchScreen' from DAT/EM Systems International is a stand-alone LCD monitor with an integrated tactile interface. With a single touch, the TouchScreen allows operators to quickly change command sequences during map compilation.



KeyPad Advantage

Highly configurable wireless keypad

The DAT/EM Keypad Advantage™ is part of the DAT/EM Keypad product line. This option uses any tablet device with an Android® operating system and a Bluetooth® adapter for wireless communication to a desktop or laptop computer.



HandWheels

X, Y, Z precise, and comfortable coordinate entry

The robust and precise HandWheels can be adjusted on three axes with a simple lever; there is no need for tools. The operator can easily set the height, depth, and angle of the handwheels to provide an individualized fit.



www.datem.com | sales@datem.com | +1 907.522.3681 | U.S. toll-free +1 800.770.3681
8240 Sandlewood Place, Suite 101 | Anchorage, Alaska 99507-3122 USA



DAT/EM Systems International is an Alaska-based company that has been developing photogrammetric software since 1987. As a leading developer of photogrammetric hardware and software products and services, DAT/EM specializes in 3D feature collection software with its digital stereoplotter, Summit Evolution, and its 3D stereo point cloud viewing and editing product, LandScape.