What’s New in Geomatica 10.1
Table of Contents

Geomatica Software Solutions ................................................................. 1
  Introductions to Geomatica 10.1 ................................................................. 1
  What's new? ............................................................................................ 1
Geomatica 10.1 Improvements .................................................................... 2
  Licensing Changes .................................................................................. 2
  PCIDSK Quadtree compression ................................................................. 2

What's new in OrthoEngine ...................................................................... 3
  New and Upgraded Sensor Support .......................................................... 3
    ALOS Support ....................................................................................... 3
    FORMOSAT-2 ...................................................................................... 3
  Improved GCP Collection Viewer .............................................................. 4
  Automatic Mosaicking ............................................................................... 6

What's new in Focus .................................................................................. 7
  Histograms .............................................................................................. 7
  Overviews ................................................................................................ 7
  Scaling ..................................................................................................... 8
  Math Model Support ................................................................................ 8
  General Data Visualization ..................................................................... 9

Modeler and Algorithm Librarian Improvements ..................................... 10
  Algorithms ............................................................................................. 10
  Automatic Image to Image Registration .................................................. 10

What's new in EASI .................................................................................. 10
  General Improvements .......................................................................... 10
  Algorithms ............................................................................................ 10
  Sensor Support ..................................................................................... 11
Geomatica Software Solutions

Introductions to Geomatica 10.1

As a geospatial software professional, your job is to get the most out of your data, extracting information to help make better decisions about your world. At PCI Geomatics, our job is to provide you with the best tools available to help turn spatial data into information.

With 25 years experience in building image-processing software, we are the image experts. We strive to build technologies that leverage remotely sensed imagery, creating spatially accurate images, extracting information from them, combining them with other spatial layers, and publishing your results.

Geomatica 10.1 represents the culmination of these efforts to date. This release improves and adds to the capabilities for which Geomatica is known, helping you turn your images into answers.

What's new?

Geomatica 10.1 is an update with significant enhancements to the Geomatica 10 suite. This update includes new features, along with improvements in the reliability, performance, usability, and functionality of Geomatica in addition to fixes of customer-identified bugs.
**Geomatica 10.1 Improvements**

**Licensing Changes**
The Sentinel RMS license management system from SafeNet Inc has replaced the licensing mechanism from previous versions. License models and locking techniques offered in Geomatica 10.1 are similar to those of earlier versions of Geomatica.

Clients can expect a more robust and reliable license server mechanism as a result of the Sentinel RMS implementation.

**PCiDSK Quadtree compression**
Quadtree compression capability has been added to the PCiDSK file format for Geomatica 10.1. Quadtree compression is a raster compression technique that can be applied to any file, but is especially effective for files that contain rasters with large regions of the same pixel value, for example, pseudo-coloured and thematic images.

Quadtree tiles are compressed based on the pixel value and regions of pixels with the same value. The compression technique will only store the number of bits required to store the maximum pixel value in a tile. For example, a tile with a maximum pixel value of 1 will only store 1 bit for the pixel value.

The quadtree encoding process continually divides the tile by a factor of 2 in both the x and y, directions until the quadtree cell is a homogeneous value or a quadtree cell represents one raster pixel:

Restrictions on quadtree compression:

- Quadtree compression is limited to unsigned integral data types, such as CHN_8U and CHN_16U.
- Square tile size is restricted to the power of 2.
What's new in OrthoEngine

New and Upgraded Sensor Support

ALOS Support
OrthoEngine now includes support of the three different ALOS satellite sensors; PRISM, AVNIR and PALSAR. These are available as an add-on license to Geomatica Core.

The CDALOS program is part of the satellite orthorectification component used to read ALOS PRISM and AVNIR file format data when satellite orthorectification is required.

PALSAR data is support through the CDSAR command.

Different levels of ALOS product types are available. For orthorectification, the following format should be used:

ALOS 1A, 1B1 and 1B2R

FORMOSAT-2
Improved geometric accuracy of FORMOSAT-2 satellite
Improved GCP Collection Viewer

Multiple views added to the point collection image viewers in OrthoEngine allow users to see a main view, an overview, and a zoom view all at the same time.

This greatly improves the efficiency of point collection by eliminating the need to zoom in and out of the scene to jump to a new area and to place accurate points.

This is especially useful for labor intensive steps of GCP and TP collection, saving the operator significant time savings.

The overview window is used to pan to the rough location of the point. The main viewer allows you to select the location of the point. The zoom viewer then allows you to refine the point location to ensure accuracy.
The viewer layout is customizable to suit your specific needs.

The classic viewer from previous version of Geomatica is still available. The position of the main window can be altered and the zoom and overview windows can be removed as desired.

The zoom level of the main and zoom windows are also adjustable to suit the specific coverage and resolution of your data.
Automatic Mosaicking
There have been quite a few changes made to the automatic mosaicking capabilities within PCI software. These have included the following changes in the OrthoEngine panel:

Creating Mosaic File
OrthoEngine now allows for the creation of a mosaic file during the automatic mosaicking process, eliminating the need to wait for the empty mosaic file to be created before proceeding to the automatic mosaicking process.

Global Exclusion Mask
Instead of needing to manipulate masks into each orthoimage file, you can use one file to mask all areas in your mosaic.

This is especially useful when you are doing large area mosaics and you have information about all of the water-bodies

Histogram Match Area
Capability to define the histogram match area for the histogram color balancing with a reference image has been added.

If your input images cover a smaller area than your reference, the histogram matching area parameter allows you to limit the area of the reference image used to calculate the histogram used for color balancing

16-bit Look up Table Support
16-bit look-up table support added to store color balancing results with 16-bit image data sets.
What's new in Focus

Histograms

Geomatica 10.1 now lets you view a histogram of the information under a bitmap mask or in the current view.

These enhancements assist you in creating more accurate histograms in less time.

Select Mask Area
- Bitmap Mask
- Current View
- Entire Raster

Overviews

The process for creating overviews in Geomatica 10.1 has been streamlined making it easier to create overviews and to view information on existing overviews. All tasks required to create an overview can be performed from one panel, which also contains information on existing overviews on the same panel.
Scaling

Geomatica's new 16 and 32 bit data scaling feature improves the display of PCT, grey scale, and RGB images.

Math Model Support

The ability to visualize uncorrected data based on their math model segment has been improved in Version 10.1. Users may now overlay two datasets with different math model information, as well as being able to load them on top of already existing areas/layers.
One benefit of this technology is the ability to leverage the vector editing tool in Focus to digitize vector features for overlay with existing orthorectified imagery.

**General Data Visualization**

PCI has undertaken quite a number of projects to improve the underlying visualization technology in Geomatica Focus. This has resulted in:

- Better memory usage, resulting in smoother panning
- Better performance when reprojecting multiple data layers on-the-fly
- General improved stability in the data rendering chain
Modeler and Algorithm Librarian

Improvements

Algorithms
New orthorectification and mosaicking functions have been added in Geomatica 10.1.

- GCEXPORT
- POLYMODEL

These algorithms are available in both Modeler and Focus environments

Automatic Image to Image Registration
There have been significant improvements to the AUTOGCP algorithm for automatic image to image registration.

AUTOGCP should be used in place of the AUTOIMG function as AUTOGCP has proven to collect more accurate points with reduced potential for collecting erroneous ground control points.

What's new in EASI

General Improvements
All functions in EASI now support a 192 character naming convention.

Algorithms
The following functions are new orthorectification and mosaicking functions that have been added in Version 10.1. They are available via the EASI environment to those who have specific OrthoEngine licenses along with the Desktop Production Engine license.

- APMODEL
- AUTODEM
- AUTOFID
- CAMEXPORT
- CAMIMPORT
- EOEXPORT
- EOIMPORT
- EPIPOLAR
- GCPEXPORT
- GCPIMPORT
- GEOCODEDEM
- MERGEBAND
- POLYMODEL
- QBASEMBLE
- RAW2CHIP
- STITCH
- TPSMODEL
- CRNEAT
- DENSITY
- EDGE
- EDMATCH
- FLAP
- FSTDDEV
- GRATGRID

The following functions were available within the Visual Modeler environment previously and are now also available in the EASI environment.
In Version 10.1, the automatic mosaicking function, AUTOMOS, has been improved with the following features:

- Global and Local exclusion masks to ignore difficult areas (e.g. Water, Clouds, Snow) during the color balancing.
- Enhanced Overlap color balancing algorithm
- Application of an adaptive brightness and contrast filter (dodging) is now available
- User defined histogram match area for the histogram color balancing
- Reference image color balancing option.
- 16 bit LUT support added to store color balancing results with 16bit image data sets.
- Cutlines are saved to the file in the order they were added to the mosaic.
- Performance improvements.

**Sensor Support**

In Version 10.1, the ALOS sensor is supported in EASI in two ways:

- Addition of the CDALOS function for reading PRISM and AVNIR data.
- Upgrade to the CDSAR function to read PALSAR data.