

## GXL DEM Extraction

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GXL DEM Extraction allows you to automatically create Digital Elevation Models (DEMs) from stereo images and RADAR data. Image correlation is used to extract matching pixels in two overlapping images and then use the sensor geometry from a computed math model to calculate x, y, and z positions. GXL DEM extraction allows you to batch epipolar generation, batch the DEM extraction process, geocode DEMs, and create absolute or relative DEMs.

### *PCI MODULE PREREQUISITES*

GXL DEM Extraction is an add-on to the base system. It requires a GXL system as a prerequisite.

### *SUPPORTED SENSORS*

GXL DEM Extraction supports the following satellite and RADAR sensor types. Sensors must be provided as stereo pairs.

#### **Satellite Sensors**

- ALOS (PRISM)
- ASTER
- CARTOSAT
- EROS
- GEOEYE
- IKONOS
- ORBVIEW
- PLEIADES
- QUICKBIRD
- SPOT 1-5
- WORLDVIEW 1/2

#### **RADAR Sensors**

- RADARSAT 1/2
- ASAR

### *EPIPOLAR PAIRS*

Epipolar pairs increase the correlation process speed and reduce the possibility of incorrect matches. Stereo pairs are reprojected, ensuring that the left and right images have a common orientation, and matching features between the images appear along a common x-axis. Using epipolar pairs, you can:

- Choose from the following pairs:
  - User Select – Manually or automatically search a directory for valid images
  - Maximum Overlapping Pairs – selects the pair with the highest amount of overlap
  - Minimum Percentage Overlap – specifies the lowest percentage of acceptable overlap
  - All Overlapping Pairs – selects all pairs that overlap above a minimum percentage
- Limit the amount of memory used to generate epipolar pairs
- Define a Down-sample factor to reduce an epipolar image resolution
- Set up epipolar-pair start times

## *DEM EXTRACTION*

Using DEM extraction, you can:

- Select the Terrain type from hilly, mountainous, flat
- Apply a Wallis filter, useful for desert data or areas with significant shadows, such as mountainous areas or urban scenes.
- Set the projection and pixel size
- Specify the minimum and maximum elevation to estimate a search-area correlation
- Specify a failure value to represent any failed (uncorrelated) pixel values in the resulting DEM
- Specify a background value to represent any 'no-data' pixel values
- Use a clip percentage to process a specific area only
- Set the DEM detail to extra high, high, medium, or low for the needed level of detail
- Select an output DEM channel type to 16-bit signed or 32-bit real
- Specify a pixel sampling interval for the number of image pixels and lines used to extract one DEM pixel
- Create a Geocoded DEM by using geocoding stored in the project by filtering the DSM to DTM
- Set up DEM extraction start times

## *FUNCTIONS*

With a GXL DEM extraction license, the following functions are activated:

- AUTODEM2 - Generates a digital elevation model from stereo images – OpenMP enabled
- DSM2DTM – Convert a DSM to DTM
- EPIPOLAR2 - Generates epipolar images from stereo pairs or raw images – OpenMP enabled
- GEOCODEDEM2 - geocodes epipolar digital elevation models by reprojecting to the ground coordinate system – OpenMP enabled
- Pyramid – generate overview levels

### **For more information, contact**

PCI Geomatics  
50 West Wilmot Street  
Richmond Hill, ON L4B 1M5  
Canada

**Phone:** 1 905 764 0614  
**Fax:** 1 905 764 9604  
**Email:** [info@pcigeomatics.com](mailto:info@pcigeomatics.com)  
**Web:** [www.pcigeomatics.com](http://www.pcigeomatics.com)