

## Geo-Imaging Accelerator (GXL) System: Data Ingest Module

### DATA INGEST MODULE

The Data Ingest Module (DATIN) allows you to automatically import raw IKONOS, QuickBird and SPOT-5 image scenes, and associated rational polynomial coefficients, to PCIDSK format. DATIN also allows you to automatically collect ground control points on the imported imagery from a PCI chip database, or from a directory of previously processed, GDB supported, reference images.

DATIN supports the following product formats:

- IKONOS: Geo Ortho Kit
- QuickBird: Basic 1B and Ortho Ready
- SPOT-5: Level 1A and 1B

With respect to each data product, DATIN is capable of importing the multispectral, panchromatic, and pansharpened (raw) images. When the input data products are multispectral and panchromatic image pairs, ground control points are collected automatically for the panchromatic images. GCP collection is not required for multispectral images as these will be registered to panchromatic images automatically. When the input data products are raw pansharpened images, ground control points are collected for all scenes.

For each scene contained in the input directory, DATIN produces the following:

- A PCIDSK file containing the multispectral image bands,
- A PCIDSK file containing the panchromatic image band,
- A PCIDSK file of the pansharpened multispectral bands (when input directory contains raw pansharpened data).

Ground control points collected automatically during the data import process are stored in a GCP segment contained in the respective imported PCIDSK file. If GCPs are found for a particular image, a log file is generated in the same directory, with the same filename as the image which contains the GCPs, with a "LOG" tag. This log file is a text file and contains information on the GCP collected and how well it fits the existing rational functions math model.

If reference images are to be used for automated GCP collection, the user must supply a digital elevation model. The digital elevation model can be a single file for the area of interest, or a collection of individual DEM tiles.

Automated GCP collection can be performed utilizing any of the following reference sources:

- Reference image (and associated digital elevation model) using PPF AUTOGCP if a reference image is set
- Polygon vector layer (e.g., lakes) using PPF FFTMPOLY if a polygon vector file is set
- Line vector layer (e.g., road network) using PPF FFTMVEC if a line vector file is set
- Chip database using PPF AUTOCHIP if a chip database file is set

If the number of GCPs collected from all sources is sufficient, those GCPs will be analyzed using PPF GCPPRUNE and then refined using the PPF GCPREFN2 to remove spurious ground control points from the computed model.

In the last step, pyramids will be built on the PCIDSK file(s) using PPF PYRAMID.

## MODULE PREREQUISITES

The Data Ingest Module is included as part of the base Geo-Imaging Accelerator (GXL) System.

There are no prerequisites for this module. The only requirement for this module is that the input data be adequately supported as per the "Supported Satellite Formats" section of this document.

If GCPs are to be collected automatically, then a source for GCP collection must be provided.

## MODULE OPERATORS

The job processor for the data ingest and GCP collection (GXLMasterDataIngest) has the following operators used for job submission:

Job identifiers

- **User:** name of the user submitting the job
- **Priority:** priority of the job
- **Comment:** comment to distinguish the job

Start

- **On Server:** select the processing server to run the job
- **When:** select when the job is to be started

Input Parameter

- **Predefined configurations:** The user can define and select an XML configuration file which automatically sets all parameters for the project. This is useful for when you need to repeat projects.

Workflow values

- **SceneDirectory:** Input directory containing scenes
- **OutputDirectory:** Output directory storing the results
- **DEMSource:** Location for a file, list or folders containing the DEMs
- **ReferenceImages:** List of reference image files
- **ChipDatabase:** Location of the chip database

- **PolygonVectorFile:** location for polygon layers
- **RoadNetworksVectorFile:** file for line vector file containing road networks
- **WaterMaskFile:** a water polygon vector file for refining collected GCPs
- **MathModel:** Define math model to be used (rational or rigorous)
- **OverwriteResult:** indicate if output is to be overwritten

## DATA INGEST TECHNOLOGY

The data ingestion module incorporates the GDB technology for importing various-satellite data formats (with associated rational polynomial coefficients) and the GCP automatic collection technology. Both technologies are PCI GDB APIs or PPFs and while not thread safe, parallel jobs can still take advantage of multi-core or GPU hardware.

## SUPPORTED SATELLITE FORMATS

Data Ingest supports a wide range of high and low-resolution optical satellite sensors.

### Supported Sensors

- IKONOS GEO:
  - GeoTIFF or HDF GEO product
  - 1-2m accuracy with 10 or more ground control points (GCPs)
- IKONOS GEO Ortho Kit:
  - Satellite Orbital Math model can be used without RF coefficients
- QUICKBIRD (Basic and Ortho-Ready):
  - GeoTIFF or NITF with support files (ATT, EPH, GEO, IMD, RPB, TIL)
- SPOT 5: 1A and 1B Products
- SPOT 5 (TIFF): Level 1A Dimap format

### 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)