



HEXAGON
GEOSPATIAL

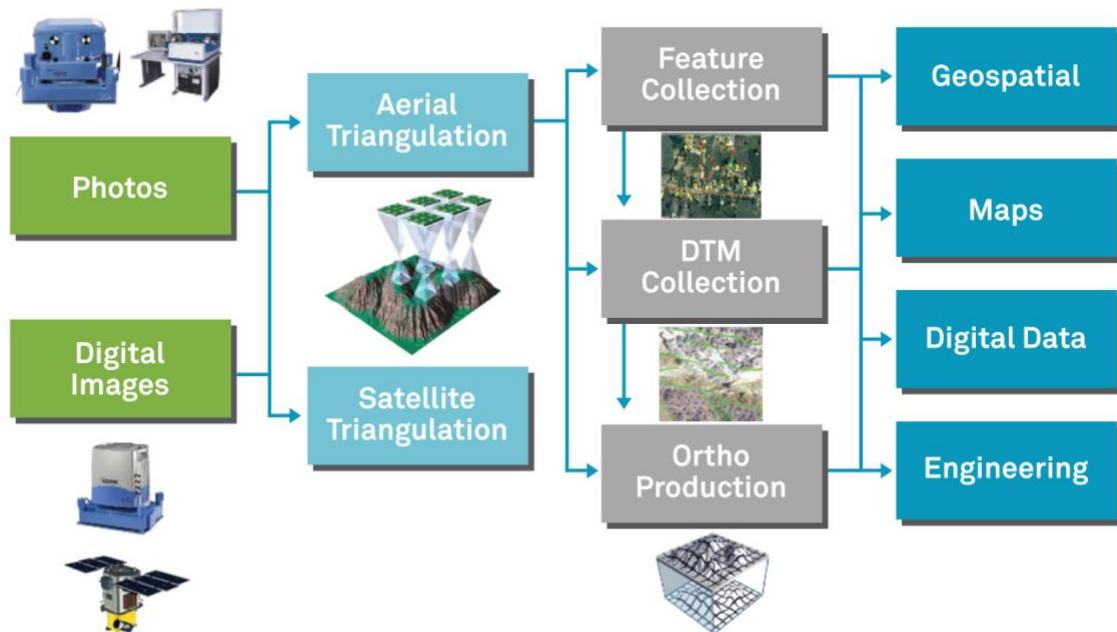
PRODUCT DESCRIPTION

IMAGESTATION[®] 2018


PRODUCT DESCRIPTION

IMAGESTATION FAMILY OF PRODUCTS

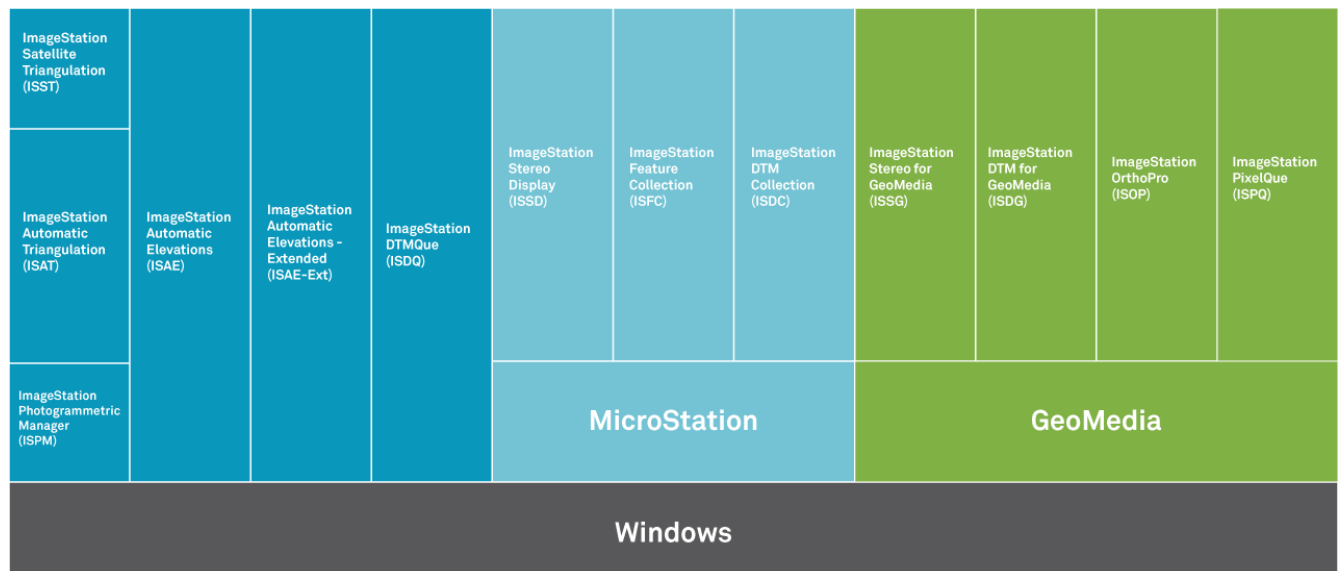
The ImageStation® product family is the result of nearly 40 years of photogrammetric technology development, starting with analytical stereoplotters and progressing through the current full suite of digital softcopy applications. ImageStation includes applications for your entire production workflow including project creation, orientation and triangulation, 3D feature collection and editing, interactive digital terrain model collection and editing, automatic terrain extraction (including dense surface model correlation with semi-global matching), and orthophoto production and editing using aerial frame, ADS line scanner, UAV, and satellite imagery. ImageStation is designed with a high degree of automation for high-volume photogrammetry and production mapping customers who need to process large quantities of raw spatial information rapidly and accurately into an actionable format. The general photogrammetric production workflow is illustrated below:



ImageStation is comprised of a set of integrated products which match the discrete steps of a photogrammetric workflow, as illustrated below. The modular nature of ImageStation products and concurrent licensing and subscription options give you maximum flexibility in selecting and configuring the products across your organization to meet your specific workflows needs.

Project Setup & Management		ImageStation Photogrammetric Manager ImageStation Image Formatter HTCondor for Hexagon Geospatial
Orientation & Triangulation		ImageStation Automatic Triangulation ImageStation Satellite Triangulation
Stereo Feature Collection		ImageStation Stereo for GeoMedia ImageStation Stereo Display ImageStation Feature Collection
DTM Collection & Editing		ImageStation Automatic Elevations ImageStation Automatic Elevations-Extended ImageStation DTM for GeoMedia ImageStation DTM Collection ImageStation DTMQue
Orthomosaic Production & Editing		ImageStation OrthoPro ImageStation PixelQue

In addition to native Windows-based products for project setup, automatic triangulation, automatic elevations, and DTM utilities; ImageStation provides both MicroStation-based and GIS-based interactive feature and DTM collection and editing products to meet customers' organizational and product delivery requirements. ImageStation platforms and prerequisites are illustrated below, and detailed in the individual product descriptions which follow.



With ImageStation, Hexagon Geospatial demonstrates its commitment to providing an efficient, integrated photogrammetric platform for geospatial content producers such as commercial mapping firms, national mapping agencies, or other production mapping customers. Such organizations rely on ImageStation's automation features and optimized tools for manual processing to quickly transform large volumes of incoming data into exploitable spatial information to drive smarter decisions.

PROJECT AND DATA MANAGEMENT

IMAGESTATION PHOTOGRAMMETRIC MANAGER (ISPM)

ImageStation Photogrammetric Manager provides the project creation and management tools required for a photogrammetric production workflow. ISPM provides the interface between supported third-party triangulation packages and ImageStation products to support triangulation/orientation, 3D feature and DTM collection, and orthophoto workflows. Key features and capabilities include:

- Entry/edit menus and wizards to guide user through creating projects, cameras, photos, strips, and blocks
- Tools for importing ADS, satellite, and UAV data
- Bulk input/output of photogrammetric data
- A standard set of data reports
- Automatic interior orientation
- Relative orientation
- Absolute orientation
- Single-photo resection
- Archive/restore of projects
- Includes 4 processing licenses for local or distributed processing of ImageStation Image Formatter (ISIF)

Part Number: SFT00300 (NL), SFT11300 (CC)

Prerequisites: None

IMAGESTATION IMAGE FORMATTER (ISIF)

ImageStation Image Formatter provides a tool for efficiently reformatting images for use within the ImageStation environment. The images can either be reformatted on the user's local system, or the processes can be distributed to other systems on the network using the HTCondor distributed processing system. Key features and capabilities include:

- Efficiently reformat large number of images, generate overviews on-the-fly, and apply LUTs through batching and distributed processing using HTCondor for Hexagon Geospatial.
- Native 64-bit application for increased memory capacity and performance.
- Multi-threaded to take advantage of systems that have multiple cores/CPU's to further enhance processing speeds.

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- Faster than the Many/Raw File Converter that is delivered with ImageStation Raster Utilities (ISRU) because it uses a different processing engine that generates the overviews while it reformats them, thus eliminating an extra read of the image file data.
 - Bundles of 4 processing licenses for local or distributed processing are included with ImageStation Photogrammetric Manager (ISPM), ImageStation OrthoPro (ISOP), and ImageStation PixelQue (ISPQ).

Part Number: n/a, licenses included with ISPM, ISOP, and ISPQ

Prerequisites: None

HTCONDOR FOR HEXAGON GEOSPATIAL

HTCondor is a free, open-source distributed processing engine and a product of the HTCondor Research Project at the University of Wisconsin-Madison (UW-Madison). HTCondor's unique mechanisms effectively harness wasted CPU power from otherwise idle desktop workstations and dedicated processing nodes. It is ideally suited for the High Throughput Computing (HTC) that ImageStation and ERDAS IMAGINE require. HTCondor for Hexagon Geospatial provides simplified installation and configuration of HTCondor. Key features and capabilities include:

- Maximize ImageStation Automatic Elevations (ISAE), ImageStation Automatic Elevations- Extended (ISAE-Ext), and ImageStation Image Formatter (ISIF) throughput with HTCondor for Hexagon Geospatial.
- Intelligently distribute jobs across multiple machines, ensuring jobs get submitted to machines that have the appropriate software.
- Optimize large projects which require advanced and efficient process distribution with a job management utility.

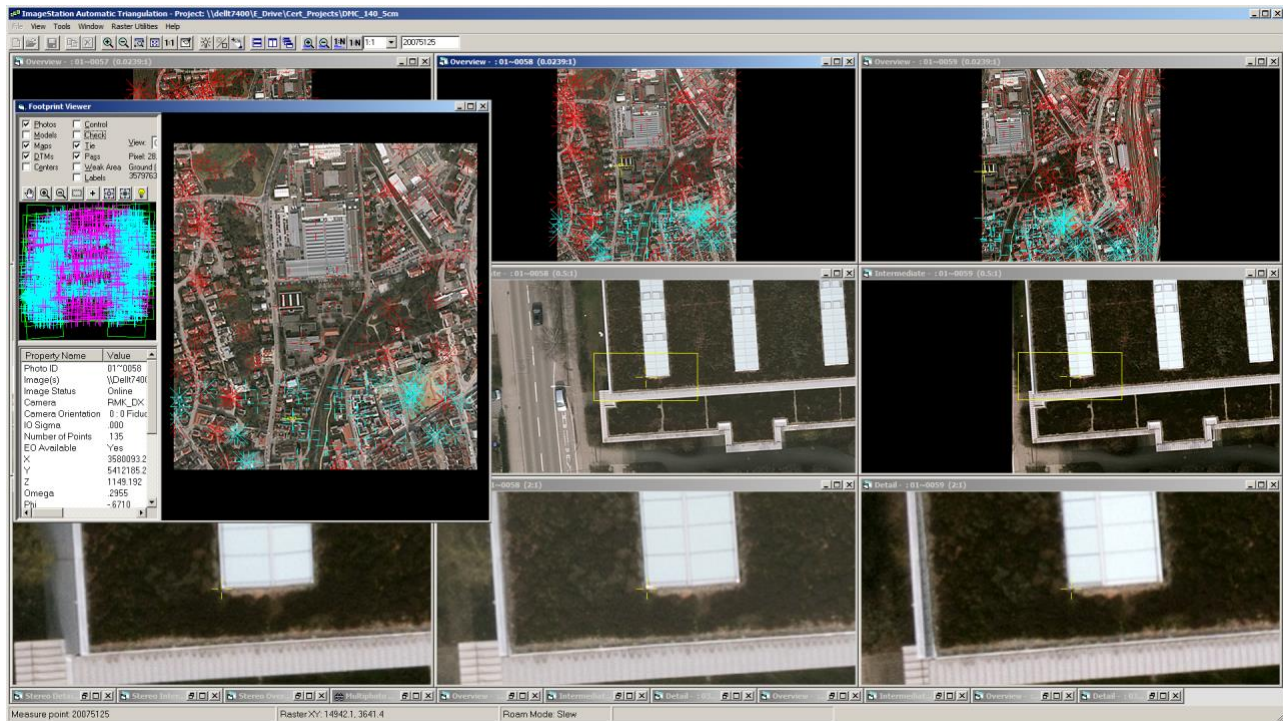
Part Number: n/a, included in ImageStation delivery

Prerequisites: None

ORIENTATIONS AND TRIANGULATION

IMAGESTATION AUTOMATIC TRIANGULATION (ISAT)

ImageStation Automatic Triangulation performs fully automated aerial triangulation – from interior orientation to the determination of tie points to the final block adjustment analysis with delivery of orientation parameters. It lets you graphically select footprints of photos/models/blocks, have unlimited project size using sub-blocks or full block, perform GPS/INS data processing, camera calibration, automatic parameter selection and analysis for self-calibration, graphical vector analysis, and more. ISAT also contains tools that let you ingest and perform triangulation with satellite imagery that contain metadata in the form of Rational Polynomial Coefficient (RPC), or Generic Orbital Pushbroom (GOP) files. Also supports ingest of Replacement Sensor Model (RSM) metadata. Purchase of the ImageStation Satellite Triangulation (ISST) product is not needed for these types of data. Key features and capabilities include:



- Semi-automatic and automatic tie/pass point generation from digital aerial images.
- High degree of automation using hierarchical image data structures and image processing.
- Simultaneous bundle adjustment computes exterior orientation parameters and ground point coordinates of matched tie/pass points.
- 64-bit bundle adjustment used in matching process and also available outside the ISAT environment allows for unlimited block size and increased performance.
- Includes manual point transfer and measurement in stereo or non-stereo mode.
- Image point coordinates generated by ISAT can be used for aero triangulation or can be formatted for input into supported third-party triangulation packages.
- Automatic pass point matching of satellite RPC and GOP projects.
- Includes adjustment of satellite RPCs and GOP metadata based on control and pass points
- Supports the following sensors with RPC, RSM, and GOP metadata:
 - RPC: ALOS PRISM JAXA CEOS (VOL-ALPSM*)
 - RPC: CARTOSAT (*.tif) with external (decrypted) *_rpc.txt file
 - RPC: DEIMOS-2, DMC-3 NRGB (or PAN) TIFF (*.tif) with external RPC file (*.rpc.txt)
 - RPC: Digital Globe (GeoEye, QuickBird, WorldView) (*.TIL with *.RPB)
 - RPC: DPPDB (*[LF|RF].ntf) with IMRFCA embedded tag
 - RPC: DubaiSat-2 (D2_*.tif) with external *_rpc.txt file

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- RPC: Gokturk-2 with external RPC.txt file1
 - RPC: IKONOS/GeoEye (*.ntf) or *.tif, *.jp2) with (*_rpc.txt). Also works for UrtheCast sensor data.
 - RPC: KazEOSat-1,2 DIMAP (*.dim)
 - RPC: KOMPSAT-2, KOMPSAT-3 (MSC_*.tif, K3_*.tif)
 - RPC: PeruSat-1 DIMAP (DIM_*.XML) with external RPC_*.XML file
 - RPC: Pleiades DIMAP v2 (DIM_PHR*.XML)
 - RPC: RapidEye (*_metadata.xml) with external *_rpc.xml file
 - RPC: SPOT 6,7 DIMAP (DIM_*.XML) with external RPC_*.XML file
 - RPC: Standalone BGRN (or PAN) TIFF (*.tif) with external RPC file (*_rpc.txt, *.rpc). Also works for Deimos-1, SkySat, PlanetScope (Dove satellite), ZY-3, TH01, and TeLEOS sensor data.
 - RPC: Standalone NITF (*.ntf) with RPC00B embedded tag. Also works for OrbView sensor data.
 - RSM: Standalone NITF (*.ntf) with RSMPCA, RSMIDA embedded tags
 - GOP: ALOS AVNIR-2 JAXA CEOS (VOL-ALAV2*)
 - GOP: ALOS PRISM JAXA CEOS (VOL-ALPSM*)
 - GOP: EROS (*.1A.16bit.tif) and (*.1A) with *.pass and *.tqr files
 - GOP: FORMOSAT-1,2 DIMAP (*.dim)
 - GOP: Gokturk-1, GKT DIMAP (PM_*.XML)
 - GOP: KazEOSat-1 DIMAP (*.dim)
 - GOP: OrbView (*.tif) with *.eph, *.att, *.pvl files
 - GOP: Pleiades DIMAP v2 (DIM_PHR*.XML)
 - GOP: SPOT5 DIMAP (*.dim)
 - GOP: SPOT6,7 DIMAP v2 (DIM_*.XML)
 - GOP: THEOS-1 DIMAP (*.dim)
 - GOP: VNREDSat-1 DIMAP (*.dim)

Part Number: SFT00738 (NL), SFT11738 (CC)

Prerequisite: ISPM

IMAGESTATION SATELLITE TRIANGULATION (ISST)

ImageStation Satellite Triangulation is integrated with ISAT, which provides a powerful multi-image point transfer and measurement environment. Ephemeris data and sophisticated orbital models are used to perform simultaneous bundle adjustment of select digital satellite imagery. Key features and capabilities include:

- Multiple sensor models for triangulation
 - IRS-C and IRS-D
 - Landsat
 - OrbView
 - QuickBird
 - SPOT
 - WorldView
 - GeoEye

Note: RPC-based satellite adjustment capability is included in ISAT

Part Number: SFT00328 (NL), SFT11328 (CC)

Prerequisites: ISPM, ISAT

FEATURE COLLECTION

IMAGESTATION FEATURE COLLECTION (ISFC)

ImageStation Feature Collection provides a low-cost, easy-to-use yet powerful application for collecting map feature data. Its tools let you interactively collect map feature geometry (2D and 3D) and attributes in a MicroStation graphics environment. Key features and capabilities include:

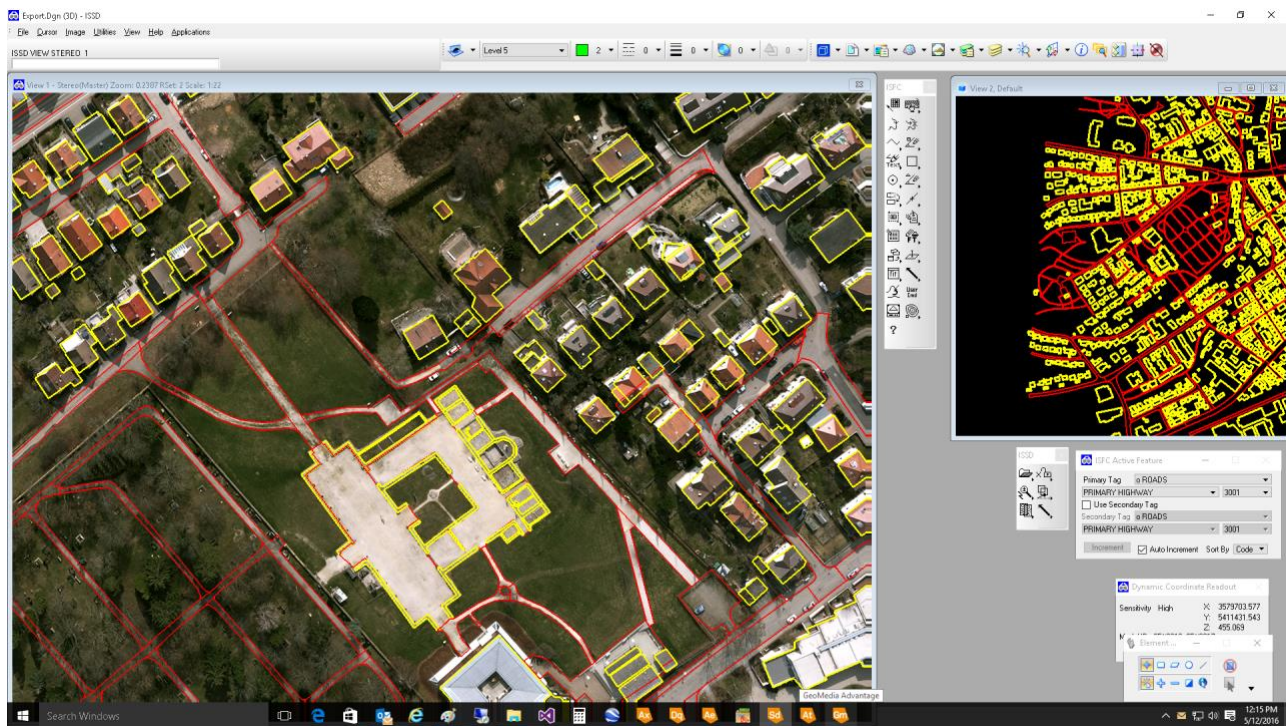
- Interactively collect and edit map feature geometry (2D and 3D) and attributes in stereo or mono.
- Completely integrated with the ImageStation Stereo Display (ISSD) system, allowing digitization of 3D map features from a photogrammetric stereo model.
- Feature Table Editor lets you customize and control characteristics of map features. Using the editor, you can tailor each project to meet your specific needs by creating maps customized to your individual requirements. It also ensures that maps meet specific standards, even when they are created by multiple operators.

Part Number: SFT00306 (NL), SFT11306 (CC)

Prerequisite: MicroStation V8i

Recommended: ImageStation Stereo Display (ISSD) for stereo display

IMAGESTATION STEREO DISPLAY (ISSD)



ImageStation Stereo Display provides display and manipulation of aerial frame, ADS, and satellite stereo imagery with photogrammetrically accurate 3D cursor tracking, stereo vector superimposition, stereo roam, and image contrast and brightness adjustments within the MicroStation graphics environment. Key features and capabilities include:

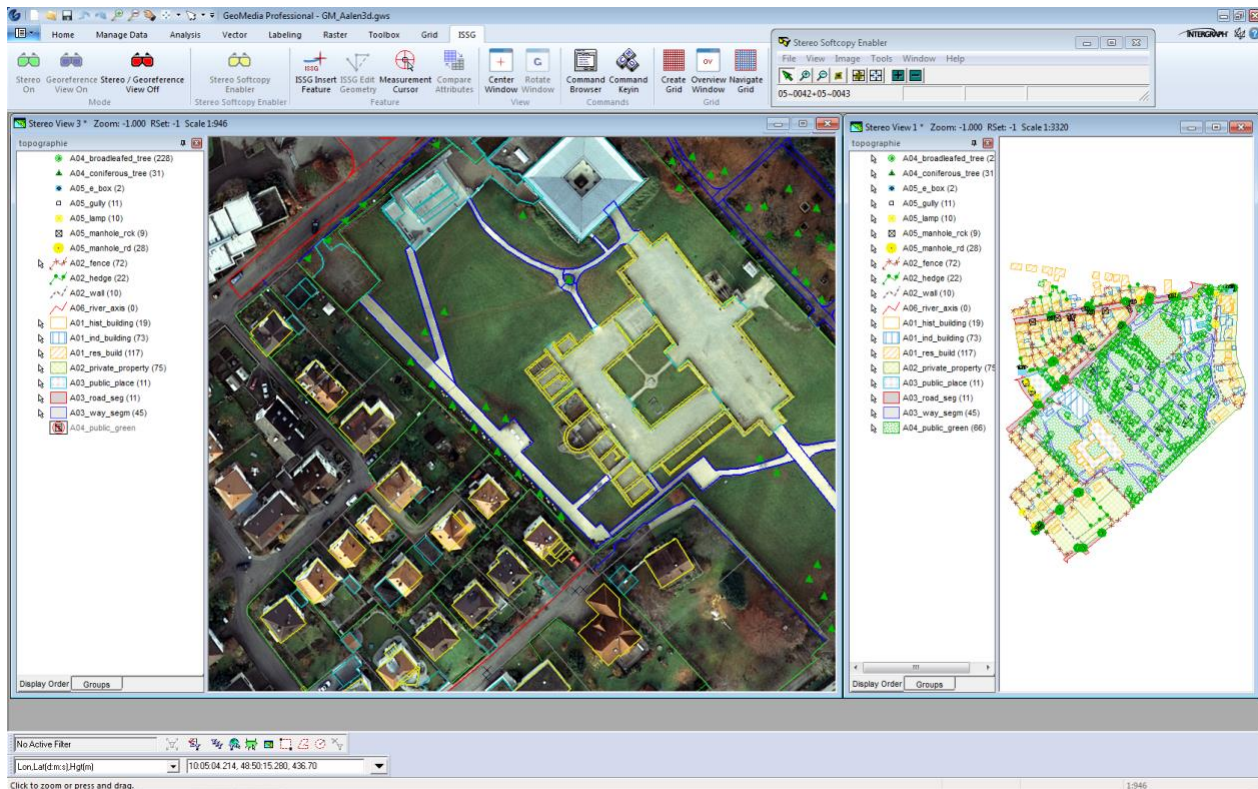
- Photogrammetrically accurate 3D cursor tracking.
- Smooth stereo roam and dynamic zoom.
- Stereo vector superimposition.
- On-the-fly image enhancement – gamma, contrast, brightness, sharpen, continuous auto stretch.
- ImageStation Feature Collection (ISFC) included in bundle part and bundle maintenance.

Part Number:

- ISSD: SFT00304 (NL), SFT11304 (CC)
- Bundle of ISSD and ISFC: SBND00304 (NL), SBND11304 (CC)

Prerequisite: MicroStation V8i

IMAGESTATION STEREO FOR GEOMEDIA (ISSG)



ImageStation Stereo for GeoMedia® enhances the feature collection capabilities of GeoMedia by providing a stereo map window for the display of imagery and 3D feature data. Using ISSG within a photogrammetric workflow involves digitizing, editing, and displaying vector graphics to produce or update a map from aerial frame, ADS, or satellite stereo models. Key features and capabilities include:

- Collect and edit feature geometry and attributes in 2D and 3D using either mono or stereo source imagery.
- Directly connect without import or conversion to multiple common database formats such as Oracle, SQLServer, PostGIS, GeoPackage, Esri File Geodatabase, etc., through GeoMedia data server technology.
- Smooth stereo roam and dynamic zoom within a GeoMedia map window.
- On-the-fly image enhancement – gamma, contrast, brightness, sharpen, continuous auto stretch.
- Z extraction from mono source data via an underlying surface model.
- Tools for editing DTM points in 3D created by ImageStation Automatic Elevations (ISAE) and imported by ImageStation DTM for GeoMedia (ISDG).

Part Number: SFT00329 (NL), SFT11329 (CC)

Prerequisite: GeoMedia Advantage or GeoMedia Professional

IMAGESTATION STEREO VIEWER FOR GEOMEDIA (ISSV)

ImageStation Stereo Viewer for GeoMedia provides a subset of the full capabilities of ImageStation Stereo for GeoMedia (ISSG) for viewing stereo imagery and vectors in the GeoMedia environment without feature collection or editing. Key features and capabilities include:

- Smooth stereo roam and dynamic zoom within a separate (non-map) window.
- On-the-fly image enhancement – gamma, contrast, brightness, sharpen, continuous auto stretch.
- 3D linear and area measurements.

Part Number: SFT11325 (CC)

Prerequisite: GeoMedia Essentials, GeoMedia Advantage, or GeoMedia Professional

DIGITAL TERRAIN MODEL GENERATION

IMAGESTATION DTM COLLECTION (ISDC)

ImageStation DTM Collection provides an interactive method for collecting and editing terrain data in stereo models in a MicroStation environment. Key features and capabilities include:

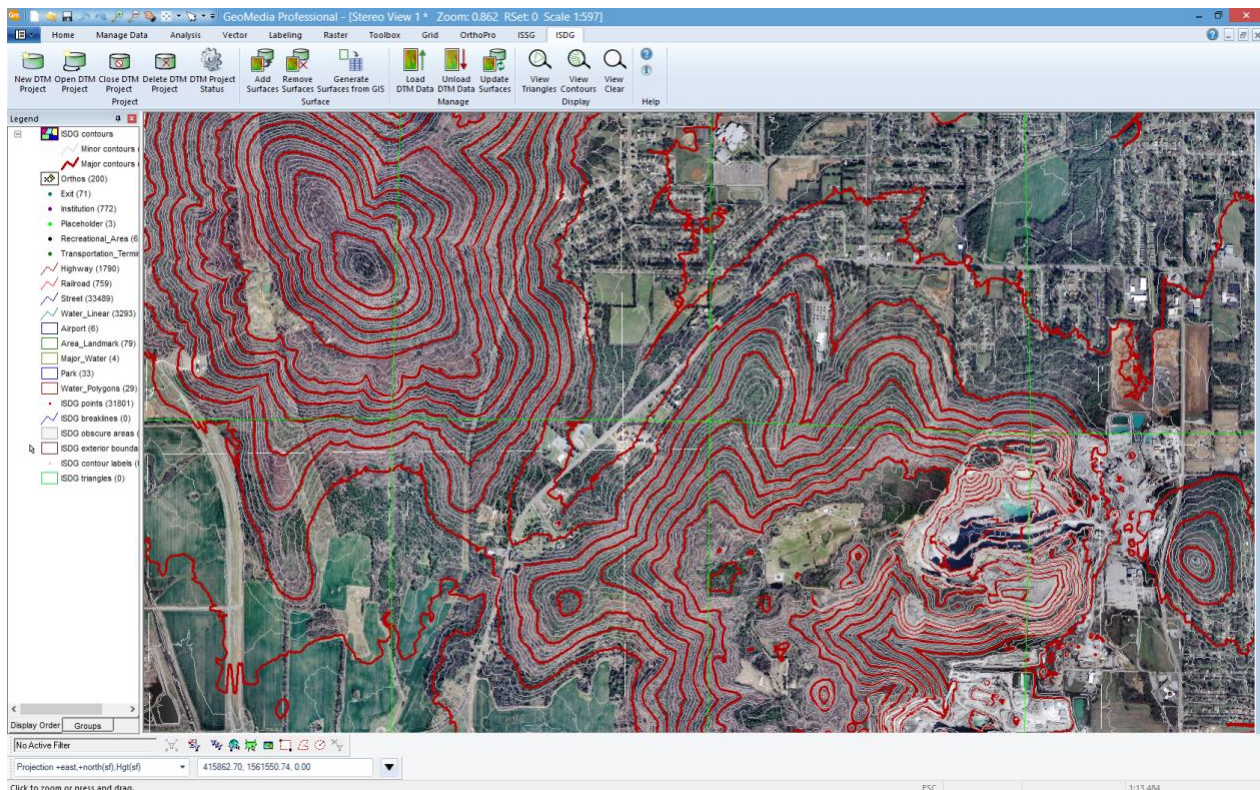
- Collect digital terrain model (DTM) data, elevation points, breaklines, and other geomorphologic features.
- Edit existing DTM data.
- Real-time dynamic editing allows you to immediately see the effect the edits have on the contours or TIN surface.
- Display and edit DTM points that have been automatically generated by the ImageStation Automatic Elevations product.

Part Number: SFT00307 (NL), SFT11307 (CC)

Prerequisite: MicroStation V8i

Recommended: ImageStation Stereo Display (ISSD) and ImageStation Feature Collection (ISFC) for stereo display and editing

IMAGESTATION DTM FOR GEOMEDIA (ISDG)



ImageStation DTM for GeoMedia provides a set of tools working in the GeoMedia environment and with ImageStation Stereo for GeoMedia (ISSG) to collect and edit terrain data to generate surface files for photogrammetric, mapping, and engineering workflows. Key features and capabilities include:

- Project management tools to create, open, close, and delete DTM projects consisting of a set of surface files over an area.
- Generate new surface files from boundary features such as project area or stereo model boundaries created in GeoMedia or ISSG.
- Add geomorphic data from GIS features to new surface files.
- Add and remove surface files from the DTM project.
- Load and unload DTM data from surface files in the DTM project into the GeoMedia environment for review and editing in stereo using ISSG.
- Option when updating surface files to triangulate or not triangulate as needed.
- Create surfaces for true ortho for use by ImageStation OrthoPro (ISOP).
- View triangles and contours from surface files in the GeoMedia environment, and in stereo using ISSG.

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- Calculate the cut and/or fill volumes between two surfaces (or between multiple pairs of surfaces) by projecting the triangles from the compare surface onto the base surface.

Part Number: SFT11528 (CC)

Prerequisite: GeoMedia Essentials, GeoMedia Advantage, or GeoMedia Professional

Recommended: GeoMedia Advantage or Professional, and ImageStation Stereo for GeoMedia (ISSG) for stereo display and editing

IMAGESTATION AUTOMATIC ELEVATIONS (ISAE)

ImageStation Automatic Elevations provides a distributed processing-enabled (via HTCondor for Hexagon Geospatial) capability to automatically generate elevation data from stereo imagery. Key features and capabilities include:

- Automatically generate elevation models from aerial frame, ADS, or satellite stereo imagery using a feature-based matching algorithm.
- Highly automated through the use of hierarchical image data structures and image processing methods.
- Eliminate preprocessing through epipolar resampling the stereo imagery on the fly.
- View and modify the generated data with ImageStation DTM Collection (ISDC) or ImageStation DTM for GeoMedia (ISDG), or use it directly in other ImageStation products, such as ImageStation OrthoPro (ISOP) for producing orthophotos.
- Delivers 1 user interface license and 4 processing licenses for local or distributed processing.

Part Number: SFT11308 (CC)

Prerequisites: None

Recommended for stereo display and editing:

- MicroStation V8i, ImageStation Stereo Display (ISSD), ImageStation Feature Collection (ISFC), and ImageStation DTM Collection (ISDC)
- or
- GeoMedia (Advantage or Professional tier), ImageStation Stereo for GeoMedia (ISSG), and ImageStation DTM for GeoMedia (ISDG)

IMAGESTATION AUTOMATIC ELEVATIONS-EXTENDED (ISAE-EXT)

ImageStation Automatic Elevations-Extended is a superset of ImageStation Automatic Elevations (ISAE). In addition to the feature-based matching approach of aerial, ADS, and satellite images found in ISAE, it adds distributed processing-enabled (via HTCondor for Hexagon Geospatial) dense surface model correlation of aerial frame images using the Semi-Global Matching (SGM) correlation methodology. Key features and capabilities of the SGM matching include:

- Supports a broad variety of digital aerial frame source images for SGM, including those from UAS/UAV-type sensors.
- Blockwise matching option reduces amount of redundant coverage and can speed jobs by 3x or more.
- Native 64-bit SGM application for increased memory capacity and performance.

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- Supports a broad variety of output options from SGM, including:
 - Full resolution point cloud
 - Point cloud compressed format
 - Panchromatic encoding
 - RGB encoding
 - CIR encoding
 - RGB plus CIR encoding
 - Multi-band TIFF plus Z, i.e. RGBN-Z
 - Delivers 1 user interface license and 8 processing licenses for local or distributed processing of Semi-Global Matching.
 - Delivers 1 user interface license and 4 processing licenses for local or distributed processing of feature-based matching.

Part Number: SFT11318 (CC)

Prerequisites: None

Recommended for stereo display and editing:

- MicroStation V8i, ImageStation Stereo Display (ISSD), ImageStation Feature Collection (ISFC), and ImageStation DTM Collection (ISDC)
- or
- GeoMedia (Advantage or Professional tier), ImageStation Stereo for GeoMedia (ISSG), and ImageStation DTM for GeoMedia (ISDG)

IMAGESTATION DTMQUE (ISDQ)

ImageStation DTMQue is a set of command line tools for DTM batch processing. Key features and capabilities include:

- Native 64-bit application for increased memory capacity and performance.
- Assemble command line workflows.
- Use graphical editor for creating and running different workflows.
- Convert data from several elevation formats into ImageStation DTM format.
- Convert LAS or LAZ format to Hexagon Point Cloud (HPC) format.
- Perform coordinate transformations, tiling, merging, and triangulation.
- Powerful workflow editor, a simple 3D viewer, and DTM QA/QC tools for assessing the accuracy of the elevation data.
- Supports parallel processing within workflows for increased throughput.1
- Includes a simplified command panel interface for running a number of predefined workflows.

Part Number: SFT11340 (CC)

Prerequisites: None

ORTHOPHOTO GENERATION

IMAGESTATION ORTHOPRO (ISOP)



ImageStation OrthoPro is a high-throughput ortho production system that includes ortho project planning, orthorectification, tone balancing, mosaicking, true ortho capability², automatic seamline generation, and quality assessment of aerial frame, ADS, and satellite imagery. Key features and capabilities include:

- Automatically input data from different projections and datums and integrate them into one mapping project.
- Dodging, dehaze, and Automatic Dynamic Range Adjustment (ADRA) algorithms work automatically by computing a calibration parameter from the overviews and applying it to the full resolution image.
- Multi-threaded 64-bit rectification and enhancements leverage modern multi-core, high memory machines to provide significant performance improvements.
- Delivers 1 user interface license and 16 processing licenses for local or distributed processing. Additional processing licenses available in bundles of 4 (ISOPDP). Also includes 4 processing licenses for local or distributed processing of ImageStation Image Formatter (ISIF).

- Includes one ImageStation Photogrammetric Manager (ISPM) and one ImageStation PixelQue (ISPQ) license. Maintenance for ISOP includes ISPM and ISPQ maintenance.

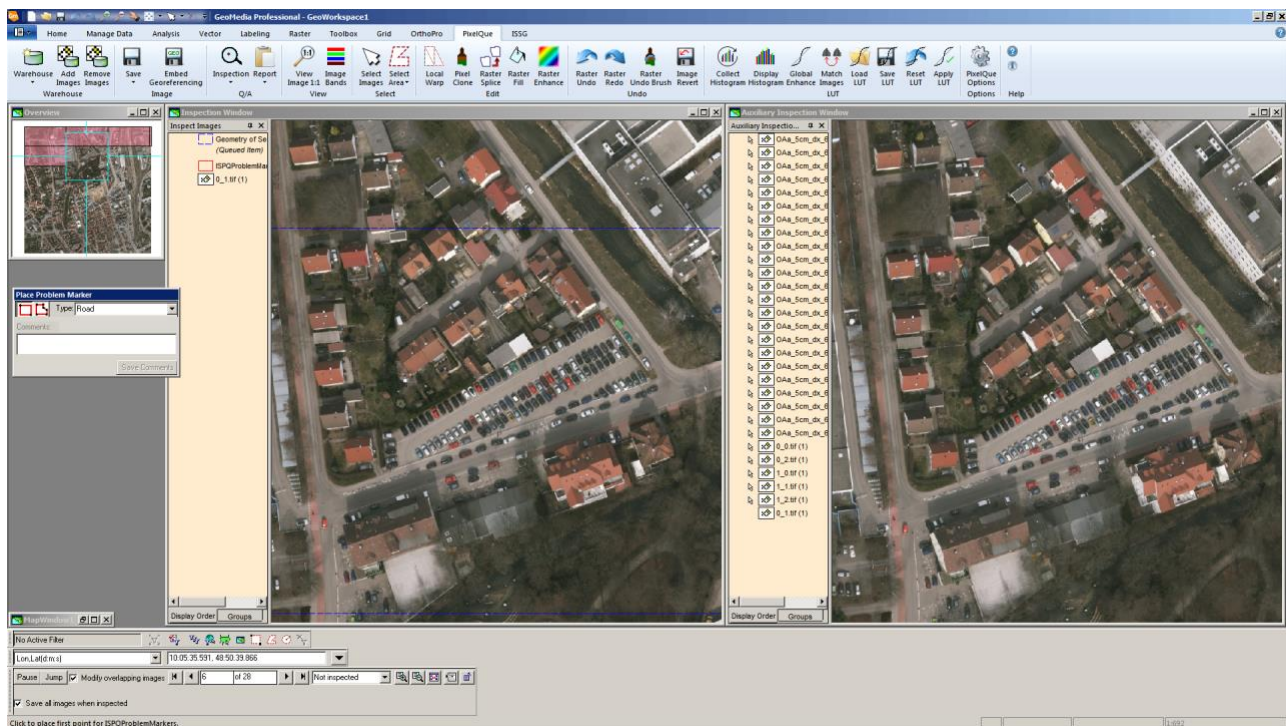
Part Number: SFT11314 (CC)

¹ Requires an ISDQ license for each parallel task within the workflow

² Supports aerial frame imagery

Prerequisite: GeoMedia Essentials, GeoMedia Advantage, or GeoMedia Professional

IMAGESTATION PIXELQUE (ISPQ)



ImageStation PixelQue is designed to provide tools for checking and enhancing the quality of orthophotos and mosaics. It allows users to systematically review and mark up errors, fix errors, and complete image enhancements on an individual or project-wide basis. ISPQ is part of an orthophoto production solution which includes ImageStation OrthoPro (ISOP). ISPQ and ISOP were created to address the needs of producers of large volumes of orthophotos. Together they meet user requirements to increase the throughput and efficiency of orthophoto production through a high degree of automation and efficient, semi-automatic Quality Assurance/Quality Control (QA/QC) review and editing, thus reducing the time and costs associated with a project. Key features and capabilities include:

- Structured review and editing capability to QA/QC images, orthophotos, or mosaics.
- Find and correct problems created in the production process.
- General image clean-up and enhancement tools including look-up table definition.
- Includes 4 processing licenses for local or distributed processing of ImageStation Image Formatter (ISIF).

Part Number: SFT11336 (CC)

Prerequisite: GeoMedia Essentials, GeoMedia Advantage, or GeoMedia Professional

ABOUT HEXAGON GEOSPATIAL

Hexagon Geospatial helps you make sense of the dynamically changing world. Known globally as a maker of leading-edge technology, we enable our customers to easily transform their data into actionable information, shortening the lifecycle from the moment of change to action. Hexagon Geospatial provides the software products and platforms to a large variety of customers through direct sales, channel partners, and Hexagon businesses. For more information, visit hexagongeospatial.com or contact us at marketing@hexagongeospatial.com.

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