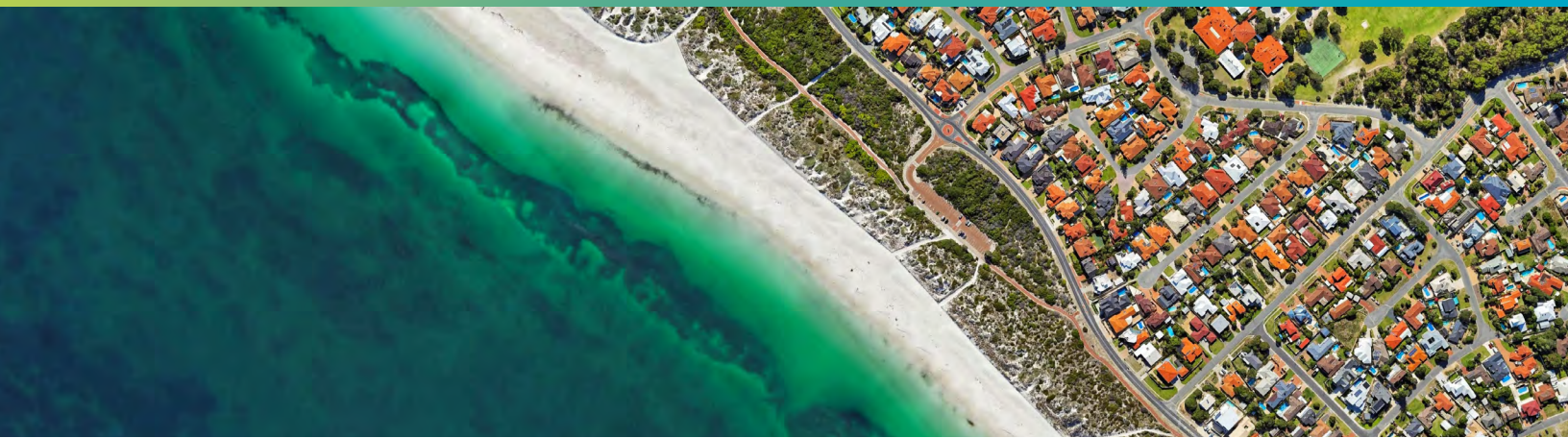


ImageStation OrthoPro

Complete orthomosaic solution for all your workflows



Having trouble managing all those different projections and datums in your data sources? Can't easily corral your disparate data sources into a single mapping project? Need to generate orthomosaics quickly and accurately in your high-volume photogrammetry environment? Hexagon offers an integrated orthorectification product that addresses the complete ortho production workflow from initial project planning through orthorectification, enhancement, seamline definition, tone balancing, mosaicking, and final quality assessment.

ImageStation OrthoPro is integrated into GeoMedia, Hexagon's desktop GIS environment, which supports easy map-based graphical display and interaction with images, elevation data, seamlines, project and product areas, and reference data during your OrthoPro workflow. OrthoPro allows chaining together processing steps for fully automated processing from original input images to final output mosaics, or stepwise processing for more control and checking of intermediate results and reviewing and editing seamlines. Giving you direct access to a variety of input data from different projections and formats without conversion, OrthoPro integrates the orthophoto production process into a highly automated, high capacity, and high-throughput workflow for aerial frame, ADS pushbroom, UAV, and satellite imagery.

Project planning

OrthoPro provides the tools to simplify your project planning workflow. With OrthoPro's project planning, you can:

- Select source images from ImageStation Photogrammetric Manager (ISPM) projects or existing orthophotos such as USGS DOQ, USDA NAIP, or other geocoded image sources
- Define source elevation data from a variety of file formats, including USGS DEM, SDTS, and NED; DTED Level 0, 1, and 2; GeoTIFF; LAS/LAZ; Intergraph grid, TIN, XYZ, and Que; ERDAS IMG; Esri BIL, grid, and float; LandXML; SCOP-WINPUT; and user-defined ASCII
- Directly use the elevation files in their native format to eliminate the time-consuming burden of converting to another format
- Directly use the elevation files in their native coordinate system to eliminate the need for reprojection

- Prioritize elevation sources by resolution and type – this means you can establish the order of your elevation files. The software can use the highest resolution file available in the area of interest and use lower resolution for the remainder of the orthophoto. When creating true orthos, the software can use building, bridge, and other structure tops before using the terrain surface.
- Define project area interactively in a GIS map window or as minimum bounding rectangle (MBR) of the selected source images
- Graphically view and interactively select images and image footprints, elevation footprints, and output products in a GIS map window to verify coverage
- Define a single product output over the entire project area
- Define user-defined products using the User-Defined Product Editor included with OrthoPro, or from a feature class created in GeoMedia or attached from a GIS or CAD warehouse connection
- Directly create USGS DOQ and DOQQ products from a delivered database of predefined product definitions
- Define rotated orthos to follow corridors and minimize the pixel-fill area of your image. This can be defined as a single rotation for all products or a different rotation for each product.
- Single-source workflow for output products that do not require mosaicking

Rectify images

OrthoPro makes it easy to automatically rectify images – this way, there are no surprises when moving from the original input images to output mosaicked products. The software helps you to:

- Reproject on the fly from the input coordinate systems of the input orientation and elevation data to the output coordinate system of the output products
- Perform adaptive radiometric enhancements including dodge, dehaze, and Automatic Dynamic Range Adjustment (ADRA) on the fly during rectification which eliminates the writing of an intermediate image file and speeds overall processing

- Specify an input clipping area to eliminate fiducial information from the final output product and reduce processing time
- Create true orthos from aerial frame imagery using elevation data which includes building, bridge, and other structure tops. True ortho processing eliminates double-mapping by filling hidden areas with data from adjacent images that are not blocked from view.
- Process 1-, 3-, and 4-band images with 8- to 16-bits per band
- Perform 64-bit rectification and enhancements for increased memory capacity and improved performance
- Submit jobs for immediate execution, or schedule jobs for later submission
- Take advantage of multi-core processors to rectify and enhance multiple images in parallel, maximizing throughput and saving you time

Use dodging to improve images

Dodging is an important process prior to mosaicking. Performing dodging on orthorectified images or on imported digital orthophotos to darken bright areas and lighten dark areas caused by uneven lighting conditions to bring out detail in the image. OrthoPro enables you to:

- Correct for common photographic problems such as vignetting and other uneven exposure problems
- Compute average intensity value of the input image to ensure the output image retains the same average intensity
- Perform dodging with user-defined parameters as a separate processing step, or perform automatic dodging as part of the rectification processing step
- Submit jobs for immediate execution, or schedule jobs for later submission
- Take advantage of multi-core processors to dodge multiple images in parallel, maximizing throughput and saving you time





ImageStation OrthoPro provides a complete solution for orthorectification, enhancement, automatic seamline generation, tone balancing, and mosaicking.

Define seamlines

Defining seamlines is another important process prior to mosaicking. Seamlines define the lines between overlapping orthophotos where the images will be mosaicked together. OrthoPro enables you to:

- Define seamlines as automatically calculated, manually drawn, or imported from a GIS or CAD warehouse connection
- Automatically calculate seamlines by smart seam, closest to camera center, butt-matched orthos, or single source methods
- Interactively review and edit automatically calculated seamlines through an efficient semi-automatic workflow that drives you to each seamline, displays the adjacent overlapping images as translucent or as a red/blue composite to highlight areas that are different, and places you in edit mode.

Perform mosaicking and global tone balancing

After defining mosaic boundaries and defining blend types either by default or individually, the mosaicking process runs in batch. During the processing, the images are also tone balanced for optimal viewing and seamless mosaicking. With OrthoPro, you can:

- Review and assign mosaic polygons for manually drawn and imported seamlines
- Feather adjacent images across seamlines based on user-defined parameters
- Tone match and balance the radiometry of all images
- Create mosaics or extracted mosaic products, using either orthorectified images generated by OrthoPro or existing digital orthophotos
- Reproject existing digital orthophotos from their native input coordinate system to the output product coordinate system
- Output images in standard georeferenced formats such as GeoTIFF, BigTIFF, JPEG 2000, and ECW
- Perform 64-bit mosaicking for increased memory capacity and improved performance
- Submit jobs for immediate execution, or schedule jobs for later submission
- Take advantage of multi-core processors to create mosaic products in parallel, maximizing throughput and saving you time

Quality assessment

OrthoPro's quality assessment routine assures accurate and high-quality output of your mosaicked products, helping you:

- Select control points from your photogrammetry project, and automatically drive to them in a GIS map window for quick and easy measurement
- Calculate the absolute error and root mean square error (RMSE) for one or more products. For one product or a group of products in USGS format, you can write an RMSE directly to the file headers.
- Generate a report with control points, the X and Y errors and the magnitude of error for each measured point, absolute error, and RMSE
- Use the complementary ImageStation PixelQue product for semi-automatic systematic quality review and markup of problem areas, queued editing of marked problems, and final enhancement of orthomosaics.

Integrated solutions

The ImageStation product family is the result of over 40 years of photogrammetric technology development, starting with analytical stereoplotters and progressing through the current full suite of digital photogrammetry software applications. ImageStation has applications for your entire production workflow including project creation, triangulation, stereo feature and digital terrain model collection and editing, automatic digital terrain model and digital surface model extraction, 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.

Requirements

- GeoMedia Desktop - Essentials, Advantage or Professional tier
- Includes 1 user interface license and 16 processing licenses for local or distributed processing. Additional processing licenses are available in bundles of 4.
- Includes one ImageStation Photogrammetric Manager (ISPM), one ImageStation PixelQue (ISPQ) license, and 4 processing licenses for local or distributed processing of ImageStation Image Formatter (ISIF)

About Hexagon

Hexagon is a global leader in digital reality solutions, combining sensor, software and autonomous technologies. We are putting data to work to boost efficiency, productivity, quality and safety across industrial, manufacturing, infrastructure, public sector, and mobility applications. Our technologies are shaping production and people-related ecosystems to become increasingly connected and autonomous – ensuring a scalable, sustainable future.

Hexagon's Safety, Infrastructure & Geospatial division improves the resilience and sustainability of the world's critical services and infrastructure. Our solutions turn complex data about people, places and assets into meaningful information and capabilities for better, faster decision-making in public safety, utilities, defense, transportation and government. Learn more at [hexagon.com](https://www.hexagon.com) and follow us [@HexagonAB](https://twitter.com/HexagonAB).

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