



Descartes™

Advanced Processing for Reality Modeling Data

Descartes is a powerful application for integrating and processing reality modeling data, such as reality meshes, point clouds, scalable terrain models, and raster data, for use in information modeling workflows.

WORK WITH REALITY MESHES

Reality meshes are rich, 3D scalable models of the real world, which are usually phototextured and automatically created from imagery ranging from simple smartphone photos to high-end photogrammetric cameras by using Bentley's iTwin® Capture. Descartes enables quick and easy manipulation of meshes of any scale, and can generate cross sections, extract ground and breaklines, and produce orthophotos, 3D PDFs, and iModels. In addition, you can integrate meshes with GIS and engineering data to enable intuitive search, navigation, visualization, and animation of that information within the visual context of the mesh.

WORK WITH RASTER IMAGES

Descartes fully supports raster images in the form of aerial imagery, binary imagery, and raster digital elevation models (DEM). The application provides a comprehensive image management environment with conversion (raster to vector and vector to raster), cleanup, and editing capabilities that extend MicroStation's raster management options.

WORK WITH POINT CLOUDS

You can enrich, segment, and classify point clouds, as well as combine them with engineering models. Descartes' capabilities for advanced 3D modeling,

cross sectioning, breaklines, and ground extraction will quickly and efficiently model as-built conditions and support the design process. You can improve point cloud evaluation and produce more accurate engineering models as a result. Descartes can also produce animations and renderings for presentations.

PRODUCE AND WORK WITH LARGE, SCALABLE TERRAIN MODELS

Descartes can produce very large scalable terrain models from many sources, including point clouds, breaklines, raster digital elevation models, and existing triangulated irregular networks. Scalable terrain models are synchronized with the original data sources to remain up to date. Synchronizing the models provides you with a global, current, integrated representation of all your data with the ability to perform analyses using a variety of display modes and to produce animations and visualizations.

ENSURE INTEROPERABILITY

With support for a wide range of reality modeling and engineering data types, you can take full advantage of your investment in existing data and get a more complete, integrated view of your information. Descartes can also streamline the production of deliverables in most standard industry formats for use in other applications.



You can drape aerial photographs on scalable terrain models.



Perform visual analyses like solar studies. Image courtesy of Track'Air, BV.

SYSTEM REQUIREMENTS

MINIMUM: Windows 7 SP1 (64 bit), Windows 8 (64 bit), or Windows 10 (64 bit), Intel Pentium-based or AMD Athlon-based processor 2.0 GHz or greater, 1 GB memory, 1.25 GB disk space

RECOMMENDED: 2 GB memory

Descartes At-A-Glance

REALITY MESH SUPPORT

- Display of very large, photo-textured reality meshes produced using iTwin Capture
- Mesh editing to remove facets and fill holes
- Automatic ground extraction
- Breakline extraction
- Efficient 3D modeling by using sections and templates
- Mesh classification to enrich meshes with data from many sources
- Orthoimage extraction on any axis
- Generation and manipulation of cross sections
- Production of 3D PDFs and iModels
- Support for streamed reality meshes

RASTER IMAGE PROCESSING

- Fast display and management of large raster images
- Vector to raster conversion
- Raster to vector conversion
- Retouch color raster images
- Cleanup binary raster images
- Register raster images
- Manage display of raster mosaics
- Orthophoto generation
- Thematic display of digital elevation models

POINT-CLOUD PROCESSING

- Fast display and visualization of billions of points
- Drape and snap elements
- Classification editing
- Smart snap
- Batch tile export
- Pointools, POD, LAS, and XYZ file export
- Extraction of planar and cylindrical elements
- Linear feature extraction
- Re-color points for flexible presentation
- Class management for any presentation style
- Definition of custom classes

- Point-cloud colorization from orthophotos
- Clip and section manager
- Support of geographic coordinate systems

SCALABLE TERRAIN MODELING

- Creation of scalable terrain models (STMs)
- High-performance display of very large digital terrain models (DTMs)
- Display modes for smooth shading, smooth shading with shadows, aspect angles, elevations, slopes, and contours
- High-resolution image draping on STM
- STM update and synchronization with DGN files, civil DTMs, point-cloud data, and XYZ files
- Calculate view shed from point or path

RASTER DATA INTEROPERABILITY

- ECW (unlimited), PDF, IMG, JPEG 2000, BIL, DOQ, FLI, SPOT CAP, and Digital Image Map
- TIFF (1-to 32-bit), GEOTIFF, ITIFF, COT, CIT, RLE, CALS, PCX, IMG, BUM, TG4, INT, RGB, TGA, JPEG
- RLC, RS, HMR, BMP, and IKONOS 3 (Red), and 4 (NIR) bands from GeoEye
- Compression schemes: Deflate, Pack-Bits, CCITT3, CCITT4
- Support for lossless compression formats, including ECW, MrSID, and JPEG 2000

VISUALIZATION

- Image draping on DTM
- MicroStation®-based rendering
- Real-life textures
- Lighting effects
- Elevation and perspectives
- Creation of flythroughs and animations
- Creation of 3D PDFs
- Support for engineering data, point clouds, and reality meshes
- Seamless integration with LumenRT™ for real-time, immersive presentations
- Support for traffic animation
- Solar and shading analysis
- Thematic visualization of elements based on height, slope, and aspect angle