

Leica Cyclone 5.5 MODEL & SURVEY

Versatile, powerful 3D point cloud processing software for surveyors, engineers and CAD professionals

Leica Cyclone 5.5 is a powerful software suite that lets users quickly and accurately visualize, navigate, measure, and model laser scan data for a wide variety of High-Definition Surveying™ (HDS™) applications. Cyclone's versatility and performance have made it the industry's most popular point cloud processing software.

Efficient Point Cloud Manipulation

Leica Cyclone has many features that let users work efficiently with rich laser scan data sets. For example, by effectively balancing the amount of detail rendered in real time with navigation smoothness, Cyclone's Level of Detail (LOD) graphics display engine provides highly efficient visualization and manipulation of point clouds and models. Various visualization modes allow users to "see through" walls, apply shaded rendering, or enhance edges for improved comprehension of dense point clouds. Texture mapping tools allow users to accurately "drape" photos of the scanned environment onto point clouds for an even more realistic viewing experience. Cyclone's unique Object Database Client/Server architecture even lets multiple users operate on the same scan data set simultaneously.

High-Performance Modeling for a Wide Range of Applications

Leica Cyclone features the industry's richest set of tools for creating deliverables and for extracting useful information from scans. For example, with Cyclone's Region Grow tools, users can pick just one or more scan points and Cyclone's intelligent fitting algorithms will automatically include only relevant neighboring points to accurately model a selected geometry type, such as pipes, planes, and topographic surfaces. Least-squares fitting and quality-of-fit statistics ensure reliable results, while Cyclone's advanced memory management provides high performance.

Wealth of Plant & Structure-specific Tools

Piping and steel structure models can be created using best-fit algorithms for primitive geometries and/or standard catalogs. Continuous pipe runs,

including elbows, can be modeled automatically. Leica Cyclone's Piping Mode even lets plant designers add intelligent piping component information including piping specification, line ID, insulation thickness and Symbol Keys. Validation of proposed design models - including clash detection - can be done within Cyclone or via export to popular plant design applications.

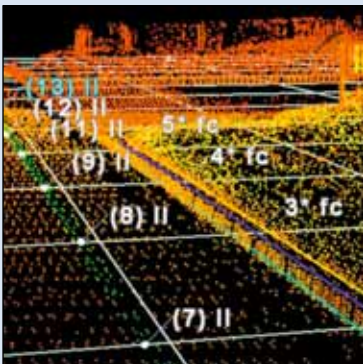
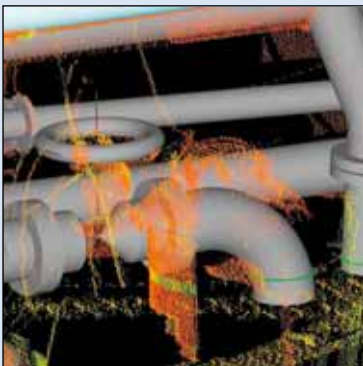
Rich Tool Set for Civil, Architectural and Other Applications

Leica Cyclone effectively addresses a wide range of as-built, topographic, and related applications for surveyors and related professionals. For example, by emulating a traditional field data collector, Cyclone's easy-to-learn Virtual Surveyor™ tool lets surveyors quickly process laser scans into traditional 2D as-built and topographic maps. Coordinates, feature coded points or descriptions and automated layered line-work created using Virtual Surveyor™ can be automatically exported via customizable ASCII, LandXML or DXF formats.

Intelligent mesh decimation minimizes file sizes while retaining accurate geometry. Contours and cross-sections along alignments are easily generated from point cloud data. For excavation and grading, Surface Deviation tools provide accurate quantity calculations. Volume and area for cut and fill are precisely calculated. Output options include volumes, contours, and/or tables including elevation differences at a user-specified grid sample. A Clearance tool even finds and reports absolute minimum vertical and horizontal clearances for overpasses, bridges, interchanges, and overhead sign structures.

Integrated Suite of Leica Software Modules

Other modules include Cyclone SCAN, Cyclone REGISTER, Cyclone SERVER and the free Cyclone VIEWER. Additional Leica point cloud software includes the CloudWorx family of applications that allows users to efficiently view processed scan data within their CAD applications further reducing the learning curve.



- when it has to be **right**

Leica
Geosystems

Leica Cyclone 5.5 MODEL & SURVEY

Features

Large Point Cloud and Model Support

Visualization
Navigation
3D Limit Box Manager for spatial navigation
Interactive visualization of large models and data sets
Efficient loading
Optional resampling of unified point cloud data set

- User-specified average spacing (removes redundant points in overlap area)

Cyclone Object Database Client/Server technology

- Efficient data management

Rendering

Level of Detail (LOD) graphics

- User-defined maximum number of points to render

Intelligent memory management
Shaded lighting effects

Visualization

View point clouds with:

- Intensity mapping
- True color
- Elevation-based color mapping
- One sided mode (front or back)
- Silhouette mode (enhanced edges)

Map external photo to point cloud

3D Modeling

Least-squares fitting of 3D geometric primitives
Fit points inside fence
Grow from pick
User-defined error tolerance
Statistical QA reports

Standard Object Tables

Fit point clouds to object tables

- AISC steel structure, ASME piping tables
- User-defined tables

'Piping Mode' – Manage Plant Attribute Information

Line ID, Specification, Symbol Key (SKEY)
Automatic Pipe Run with elbows

Design and Construction/Fabrication Verification

Compare imported AutoCAD or MicroStation designs with point clouds for:

- Deviations from design, to monitor construction and fabrication
- Potential interferences or clashes
- Highlight interfering points
- User-defined parameters

Virtual Surveyor

Assign descriptor/feature codes to specific points
Export feature codes and point coordinates to ASCII or LandXML
Create and export 2D and 3D line-work to DXF with layer and color information included

Edge Fitting

Fit 2D templates along point cloud data to extract features of interest such as curbs and flow lines

Point Cloud Editing and Cleanup

"Region grow" editing tool to automatically remove extraneous data, such as shrubs or passing vehicles

Clearance Analysis

Horizontal and vertical clearance measurements and reporting

Surface Topography Modeling

TIN mesh

- Intelligent mesh decimation
- Grid sample to point cloud
- Breaklines

Surface Deviation

- Cut/fill volumes and contours
- Grid Table

Cross-sections along an alignment
Contours

Station Notation

Station notation for measurements relative to alignment

Animations and Fly-Throughs

Generate fly-through animations in 3D point clouds and models
Output:

- Sequential image files (.BMP, .JPG)
- Audio Video Interleave files (.AVI)

Robust Data Transfer

Seamless two-way data integration with AutoCAD and MicroStation enabled by:

- Leica's neutral file format, COE (Cyclone Object Exchange)
- Cyclone COE Data Transfer plug-ins (free)

Data Import

ASCII (XYZ, SVY PTS, PTX, TXT, customized format)
Zoller+Fröhlich ZFS, ZFC
Riegl .3DD
COE (Cyclone Object Exchange)
AutoCAD, MicroStation via Cyclone COE Data

- transfer plug-in (free)

BMP, JPEG
CGP
Leica System 1200

Data Export

ASCII / DXF / COE (Cyclone Object Exchange)

- AutoCAD, MicroStation via Cyclone COE Data
- Transfer plug-in (free)

BMP TIFF JPEG
LandXML for civil applications
SDNF and PCF export for pipes
Leica System 1200

Benefits

Fast, Accurate, Comprehensive, Reality-Based As-built Data

Efficient modeling and information extraction tools
Higher confidence as-built projects through sophisticated software algorithms and QA tools

Supports Wide Range of Plant, Civil, Architectural Applications

Accurate 3D as-built models
Engineering planning
As-is condition assessment for range of applications including retrofit and revamp projects

Verify Designs with Detailed Point Cloud Data

Facilitates adjustments to proposed retrofit designs for clash-free installation
Supports construction monitoring

Minimize Project Costs

Unmatched automation and multiple workflow options minimize field and office time
Work-flow integration with CAD software applications and Civil Industry data exchange standard LandXML

Easy to Learn and Easy to Use

Integrated into existing work processes
Customizable interface, toolbars and keyboard shortcuts

Workgroup Support

Data sharing in network environment with Cyclone SERVER

System Requirements

Microsoft Windows XP (SP1 or higher), Windows 2000 (SP3 or higher with up to date security patches)
2.0 GHz Pentium® 4 or higher/ Pentium® M Processor 1.7 GHz or higher
512 MB RAM (1GB or more recommended) SVGA or OpenGL accelerated graphics card Ethernet network card, for licensing

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