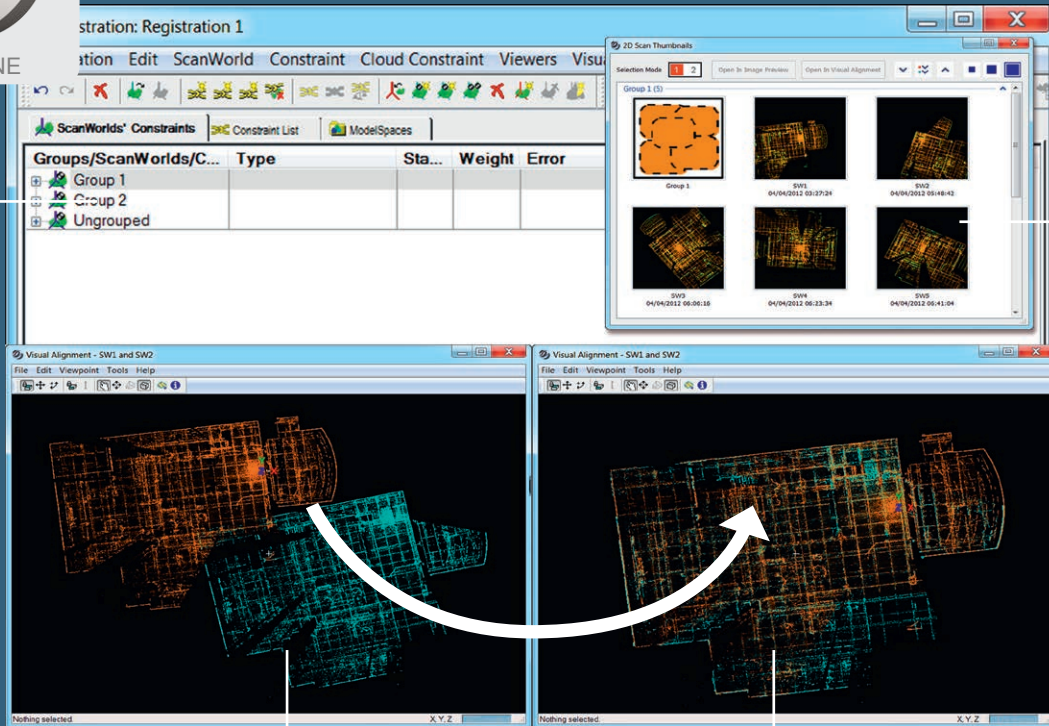# Leica Cyclone REGISTER 9.0
Laser scan registration and Geo-referencing

CYCLONE

User control of registration network, including target weighting

New 2D thumbnail window provides a clear view of all scans in a registration

New Visual Registration enables quick scan alignment for fast and easy registration

For Leica Geosystems quality, project results with complete statistical reports

Leica Cyclone REGISTER is the industry's most popular software for registering and geo-referencing laser scan data to a common coordinate system.

Accurate registration and geo-referencing is a must for successful High Definition Survey™ projects. Cyclone REGISTER is the most rigorous, complete and productive software available for this important process.

Users can take advantage of registration options based on scan targets, scene features, overlapping point clouds, and/or survey data.

Cyclone REGISTER provides detailed statistical reports suitable for inclusion as project deliverables. Reports cover registration accuracy, error statistics and histograms for each target and/or cloud constraint.

Available automation features, friendly wizards and powerful algorithms provide unsurpassed office productivity, even for very large scan data sets.

Features and Benefits
- New! Auto Registration allows fast, automatic alignment of scans
- New! Visual Registration for quick alignment of scans of all types and sizes
- New! 2D Thumbnail Window to easily identify matching scans quickly
- For use with Leica Geosystems and third party scanners
- Automatic target finding and fitting
- Complete in-office management and editing of traverse data
- Cloud-to-cloud registration – standalone or with targets

- when it has to be **right**

Leica Geosystems

Leica Cyclone REGISTER 9.0
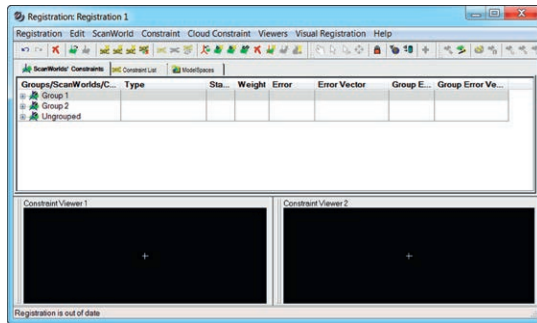
New Auto Registration aligns scans together and creates and opens a Registration automatically for fast and easy Registration project completion.
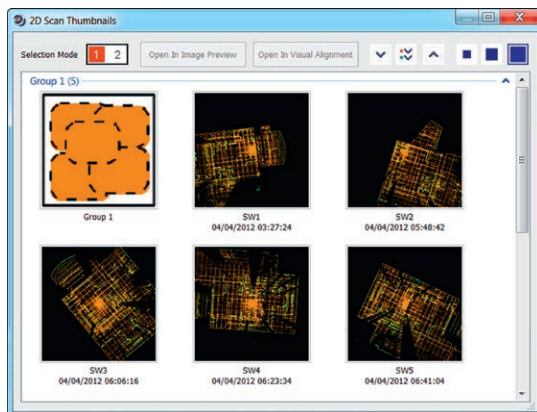
New 2D Scan Thumbnail window provides the user with a clear view of all scans within a project. Scans can now be viewed visually right after import all in one window.

Powerful, Easy-to-Use Auto Alignment of Scan Data
New to Cyclone REGISTER's suite of features, Auto Registration automatically detects matching surfaces in the overlap areas of scans and creates Cloud-To-Cloud constraints upon import. The user simply has to optimise the constraints to complete the registration process.

New Visual Registration
Scans can now be viewed side-by-side in the same registration area and moved together visually for fast and easy registration. Along with the new 2D scan Thumbnail window, Visual Registration is a great complement to Auto Registration for adding additional scans or aligning scans not initially aligned in the Auto Registration process.

Automatic Target Finding, Fitting and Matching
The automated target finding wizard finds and extracts the exact center point of visible targets. Users review thumbnail views, verify and modify the fit. An automated matching method creates constraints between all setup positions, greatly enhancing the productivity of the entire registration process. This automated process can be used with hundreds of scan positions and thousands of targets. It is most useful with phase-based scanning in interior, industrial and congested urban settings where total collection ranges are restricted. Testing shows it reliably finds and fits more than 90% of the targets within the specified range and angle of incidence.

Manage Field Collected Traverse Data
For scanners with dual-axis level compensation, users can deploy standard survey traverse methods while scanning in the field. This collection method provides for automated registration. Cyclone REGISTER provides complete, in-office traverse management capability for managing, editing, and cleaning up field collected traverse data.

Detailed Registration Diagnostics
Leica Cyclone REGISTER reports the overall accuracy of the registration. Detailed registration statistics include the error for each target constraint and the Root Mean Square (RMS) error and error histogram for each cloud constraint.

Leica Cyclone REGISTER Specifications*		Hardware and System Requirements
Auto registration	Automatically creates Cloud-to-Cloud Constraints upon scan import and automatically creates and opens a Registration	**Minimum Specifications** **Processor:** 2 GHz Dual Core processor or better
Visual registration	Includes the 2D Thumbnail Window and the Visual Alignment window	**RAM:** 2 GB (4 GB for Windows Vista or Windows 7) **Hard Disk:** 40 GB
Constraint management	Cyclone Object Database Technology: fast efficient point cloud mgt. Create cloud constraints from complete or partial point clouds	**Display:** SVGA or OpenGL accelerated graphics card (with latest drivers)
Target management and registration	Target based; geo-referenced to survey control data; highly optimised, wizard driven cloud-to-cloud capability. Accurate results via bundle adjustment techniques Extract HDS Spherical, Planar and Black/White targets Automated overlap and target finding wizards Optimised target acquisition and registration workflows	**Supported operating systems:** Windows XP (SP2 or higher) (32 or 64)***, Microsoft Vista** ***, Windows 7 (32 or 64), or Windows 8 & 8.1 (64bit only) **File System:** NTFS
Diagnostics	Overall accuracy reports Target constraint error reporting Cloud constraint Root Mean Square (RMS) error and error histogram	**Recommended Specifications** **Processor:** 3.0 GHz Quad Core w/ Hyper-threading or higher **RAM:** 32 GB's or more 64 bit OS
Traverse data mgt.	Office-side traverse content management Add, remove, edit targets, re-run traverse, etc.	**Hard disk:** 500 GB SSD Drive **Large project disk option:** RAID 5, 6, or 10 w/ SATA or SAS drives
Import	Data from CAD via COE (Cyclone Object Exchange) Control data from ASCII formats & X-Function DBX	**Display:** Nvidia GeForce GTX 680, Quadro K4000 or ATI Radeon 7850 or better, with 2 GB's memory or more
Export	Point data in standard formats: XYZ, PTS, PTX, DXF, X-Function DBX, Land XML, etc. Point data in special formats: PTG, PTZ, ZFS, TOPO pci & cwf Image and model data: COE, BMP, JPEG, TIFF	**Operating system:** Microsoft Windows 7 – 64bit **File system:** NTFS

Windows is a registered trademark of Microsoft Corporation.
Other trademarks and trade names are those of their respective owners.

* Reference the Leica Cyclone 9.0 Technical Specifications document for a complete listing of product specifications.
** Some systems may not support Windows Vista's Desktop Windows Manager (DWM) with Leica Cyclone and must be operated in Windows Classic Look.
*** Can only borrow or be a floating license client.

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