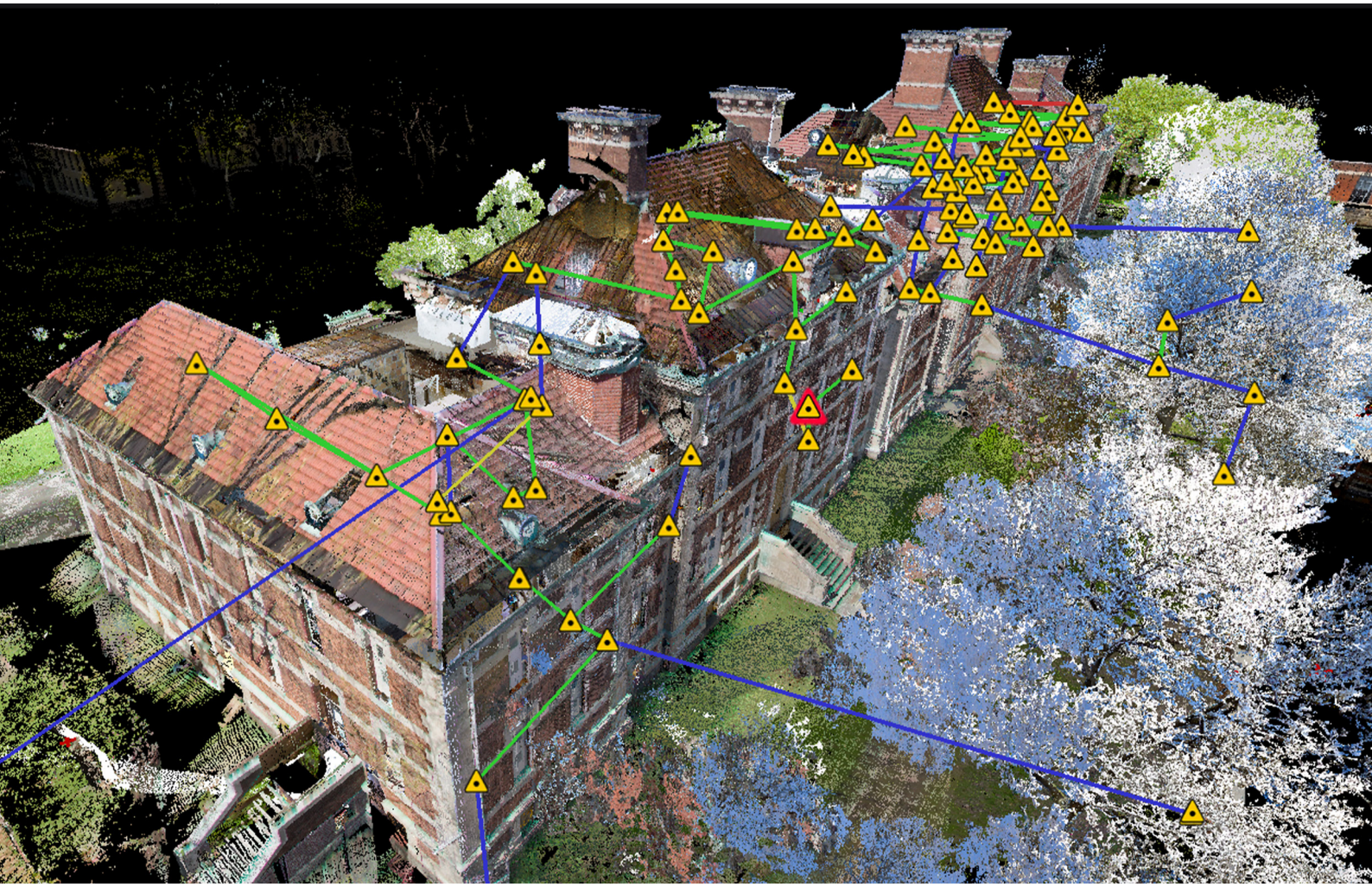
Leica Cyclone
Technical Specifications



Valid as of February 2023

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REGISTRATION, VISUALISATION, MODELLING & QUERY TOOLS	FIELD 360	REGISTER 360 PLUS (BLK Edition)	REGISTER 360 PLUS	MODEL
Large project support		♦	♦	♦
Optimised for Tablets	♦			
Touch navigation, Pan, Zoom	♦			
Project and Setup Explorer	♦			
Scan control	♦			
Complete loop closure registration	♦			
Optimised for smartphones	♦			
3D navigation, Pan, Zoom, Rotate	♦	♦	♦	♦
3D mouse support				♦
Quick Move				♦
Panoramic view mode (points)	♦	♦	♦	♦
Panoramic view mode (image)	♦	♦	♦	♦
Align to surface view mode		♦	♦	
Quick orthographic orientation		♦		
Cloud Level of Detail for fast visualisation	♦	♦	♦	♦
Model Level of Detail for fast visualisation				♦
Decimation of point clouds				♦
Selectable levels of point cloud density				♦
Quickly show/hide point clouds	♦	♦	♦	♦
HDR imagery viewing	♦	♦	♦	
Toggle Visibility				
Setups		♦	♦	♦
Setup labels		♦	♦	♦
Links		♦	♦	♦
GeoTags		♦	♦	♦
Control labels		♦	♦	
Point Cloud Colour Map Viewing Options				
Intensity mapping	♦	♦	♦	♦
Greyscale	♦	♦	♦	♦
Image colour mapping	♦	♦	♦	♦
Infrared	♦	♦	♦	♦
Elevation based colour mapping				♦
Colour clouds per setup		♦	♦	
Colour clouds per bundle		♦	♦	
Gradient Background		♦	♦	♦
Manually map external digital photo to point clouds (Texture cube map, not pano)				♦
Create Multi-image from cube-mapped images		♦	♦	♦
Multi-image blending		♦	♦	♦
Texture map colours onto point clouds	♦	♦	♦	♦
Limit Box for efficient viewing and interaction of selected regions		♦	♦	♦
Limit Box Manager to organise multiple limit boxes				♦
QuickSlice				♦
Colour clouds by setup				♦
TruSlicer		♦	♦	
Slice along X,Y and Z axis		♦	♦	
Colour clouds by setup		♦	♦	
Set Limit Box by fence				♦
Cutplane manager and tools				♦
Auto Bundle (grouping) of scans		♦	♦	
Visualise bundle's Link network	♦	♦	♦	
View multiple setups and bundles in same view		♦	♦	
Global registration of multiple scans		♦	♦	
Geo-Referencing/Control				
Applied control		♦	♦	
Geometric matching of control to bundle		♦	♦	
Cloud-to-Cloud registration	♦	♦	♦	
Auto Align Scans	♦	♦	♦	
Smart Align for Auto Align		♦	♦	
Visual Alignment including tilted scans	♦	♦	♦	
Bundle/Group Visual Alignment		♦	♦	

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REGISTRATION, VISUALISATION, MODELLING & QUERY TOOLS	FIELD 360	REGISTER 360 PLUS (BLK Edition)	REGISTER 360 PLUS	MODEL
Automatic orientation for Visual Alignment	♦			
Automated registration using Black & White targets		♦	♦	
Automated registration using sphere targets		♦	♦	
Optional prioritisation of target-based registration over Cloud-to-Cloud registration		♦	♦	
Automated registration across Sitemaps		♦	♦	
Automatic registration from RTC360 VIS data	♦	♦	♦	
Loop closure of BLK2GO data		♦	♦	
Merge projects		♦	♦	
Editing target labels/names		♦	♦	
View scanner locations	♦	♦	♦	♦
Live Scanner location tracking	♦			
Unify point clouds				♦
Basic conceptual design & 2D drawing tools				♦
Insertion of modelled objects/geometry				♦
Replication and editing of modelled objects				♦
Planar Patch Editing				
Make Square or Rectangular				♦
Create/Fill Hole				♦
User-defined quality-of-fit checks				♦
Region Growing				
Plane				♦
Cylinder				♦
Sphere				♦
Smooth surface to segment extraneous data		♦	♦	♦
Automated Pipe Run with elbows				♦
Virtual Surveyor™ to assign survey feature codes to points				♦
Mesh				
Creation (basic, complex, TIN)				♦
Intelligent decimation				♦
Decimation based on user-specified grid spacing				♦
Polyline and breakline support				♦
Delete and add faces				♦
Fill in holes				♦
Generate contours from meshes				♦
Scan Cleaning				
Single scan cleaning		♦	♦	
Bundle cleaning		♦	♦	
Cross-SiteMap cleaning		♦	♦	
Support for double scan cleaning		♦	♦	♦
Detect Moved Objects filtering		♦	♦	
Smooth surface cleaning		♦	♦	♦
Surface Deviation				
Cut/fill contours				♦
Table output on user-specified grid				♦
Points on user-specified grid				♦
Generate Cross-Sections through Point Clouds along an alignment				
Alignment/Station Manager				♦
Create Lines at Station				♦
Create COGO Points, Breaklines & Cross Section Lines				♦
Create profiles, plans and sections				♦
Import LandXML Alignment				♦
Create, Save, @ Load Station templates				♦
Secondary Plan View window				♦
Ortho Image extraction		♦	♦	♦
User-defined QA parameters mapped to link and bundle errors				
Color-coded		♦	♦	
Optimised with graphics for colour-blind users		♦	♦	
Station Notation display relative to an alignment				♦
Fit edge template for curve extraction (e.g. curbs, flowlines)				♦
Measure & Dimension Point Clouds & Models				
Simple/Advanced measurement options		♦	♦	

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REGISTRATION, VISUALISATION, MODELLING & QUERY TOOLS	FIELD 360	REGISTER 360 PLUS (BLK Edition)	REGISTER 360 PLUS	MODEL
Slope distance	♦	♦	♦	♦
ΔX, ΔY, ΔZ distances		♦	♦	♦
Geometric Object Volume				♦
Area (rectangle)		♦	♦	♦
Area (polygon)	♦			
Horizontal and Vertical Clearances				♦
Angle measurement		♦	♦	
Angle to Horizontal				♦
Angle to Vertical				♦
Back angle				♦
Cut/fill volume				♦
Piping takeoff query				♦
Automated visual interference checking				♦
Visualise Cyclone FIELD 360 measurements	♦			♦
Fit cylinders, structural steel from catalogues				♦
Insert piping components from catalogues (reducer, elbow, branch, flange, valve)				♦
Piping Mode to add insulation thickness, Line ID, specification, Symbol Key (SKEY)				♦
Set object creation parameters				♦
Create and manage object annotation				♦
Output feature codes and annotated vertices, spheres, to ASCII				♦
Generate 2D drawings from 3D models				♦
3D redlining				♦
Scanner simulation				♦
UCS Tools				
Multiple coordinate system support		♦	♦	♦
Create UCS from walls		♦	♦	
Create UCS from room corner		♦	♦	
Set XYZ coordinate from pick point		♦	♦	
Assign colours & materials to objects				♦
Layers				
Create Layers				♦
Manage Layers				♦
Save/restore viewpoints				♦
Object Grouping				♦
Geometry Types that can be created:				
HDS spherical targets		♦	♦	
Black/White targets		♦	♦	
Patch (plane)				♦
Extruded patch				♦
Box				♦
Corner				♦
Steel shape(e.g. I-beam)				♦
Cylinder				♦
Sphere				♦
Vertex				♦
Line				♦
Elbow, Reducing Elbow				♦
Cone				♦
Torus				♦
Reducer (Eccentric, Concentric)				♦
Flange (Blind, Weld-Neck)				♦
Pipe Tee				♦
Valve				♦
Polyline, Polygon				♦
Rectangle, Square				♦
Arc, Circle				♦
Ellipse				♦
Cubic spline				♦
Point-of-view camera				♦
Point-of-view camera (Height)				♦
Pointed (Ballistic) cone				♦

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REGISTRATION, VISUALISATION, MODELLING & QUERY TOOLS	FIELD 360	REGISTER 360 PLUS (BLK Edition)	REGISTER 360 PLUS	MODEL
Environmental lighting				♦
Create fly-throughs and output sequence of image files or .AVI (Audio Video Interleave) file				♦
Elevation check				♦
Pipe Modelling user interface				♦
Auto Black & White Target Extraction		♦	♦	
Estimate normals		♦	♦	♦
Scripting				♦
Undo/Redo Operations within Review & Optimise				
SiteMap creation		♦	♦	
Applied control		♦	♦	
Optimisation		♦	♦	
Create/edit targets		♦	♦	
Create/edit GeoTags		♦	♦	
Create/edit Assets		♦	♦	
Delete Setups		♦	♦	
Create/delete/modify links		♦	♦	
TRUSPACE/KEYPLAN/SITEMAP/MAP	**FIELD 360**	**REGISTER 360 PLUS (BLK Edition)**	**REGISTER 360 PLUS**	**MODEL**
Model Library				♦
Automatic Pipe Finder				♦
Auto Generate Patches				♦
ModelSpace inventory				♦
GeoTagging				
In-field GeoTagging	♦			
Create GeoTags	♦	♦	♦	♦
Target Tagging	♦			
Floor Flatness/Floor Levelness				♦
Registration Reporting				
Customisable Registration Report		♦	♦	
Basic Registration Report			♦	
Open\View KeyPlan				♦
Create SiteMap		♦	♦	
Create Map from OpenStreetMap's Slippy map (satellite or streetmap view)		♦	♦	
GPS locate Setups on satellite map		♦	♦	
Create Hyper links in SiteMaps		♦	♦	
Edit Hyperlinks in SiteMaps		♦	♦	
Create KeyPlan				♦
Edit KeyPlan				♦
Open TruSpace				♦
Extract targets in TruSpace				♦
Measurements in TruSpace				♦
View Multi-Image in TruSpace				♦
Change Colour Mapping (RGB, Intensity, Greyscale, Infrared)		♦	♦	♦
Temperature readout within infrared view		♦	♦	♦
Open ModelSpace view from TruSpace				♦
Publish TruView from KeyPlan		♦	♦	♦*
Sync view- TruSpace to ModelSpace				♦
Quick Limit box from TruSpace to ModelSpace				♦
Load Points within Fence				♦
Produce Floor Plans and Models	♦			
DATA IMPORT	**FIELD 360**	**REGISTER 360 PLUS (BLK Edition)**	**REGISTER 360 PLUS**	**MODEL**
ASCII (XYZ, SVY, PTS, PTX (feet and meters), TXT, Customised format)			PTX only	♦
Control file in TXT format		♦	♦	
Control file in CSV format	♦			
PTZ, PTG, PTB			PTG only	♦
Cyclone Object Exchange (COE) format (from AutoCAD, MicroStation, via COE Data Transfer)				♦
ZFS, ZFC, ZFPRJ			♦	♦
BMP, TIFF, JPG, PNG		♦	♦	♦
Batch Import and Auto-Align Images (supports iSTAR, Nodal Ninja, Spheron)		♦	♦	♦
Batch re-import of edited Panoramic images +		♦	♦	♦
LandXML				♦

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DATA IMPORT	FIELD 360	REGISTER 360 PLUS (BLK Edition)	REGISTER 360 PLUS	MODEL
SIMA				♦
FARO: fls, fws, frp			♦	
RIEGL: rsp, 3dd				
LAS (feet and metres)				♦
RCP		♦	♦	♦
Import select setups from E57, PTX and PTG (when contained in file)			♦	♦
Cyclone REGISTER 360 PLUS archive file (RAF)			♦	
Import Cyclone REGISTER 360 PLUS registration versions		♦	♦	
Import Cyclone REGISTER 360 PLUS (BLK Edition) archive file (RAF)		♦	♦	
Import Cyclone REGISTER 360 PLUS project				♦
Import project data collected on ScanStation C10			♦	♦
Import project data collected on ScanStation P15/P16/P20/P30/P40/P50			♦	♦
Real-time data streaming from ScanStation P30/P40/P50				
Import project data collected on Pegasus scanners				♦
Import project data collected on Pegasus: Two Ultimate				♦
Direct WiFi import of project data collected on BLK360	♦	♦	♦	♦
Import project data collected on BLK360 imaging laser scanner including Cyclone FIELD 360 links, assets and GeoTags		♦	♦	
Import project data collected on RTC360 and P-series scanners including Cyclone FIELD 360 links, assets and GeoTags			♦	♦
Adaptive image resolution for RTC360 imports with Low and Medium resolution images		♦	♦	
Import preview data collected on RTC360	♦			
Import project data collected on BLK2GO handheld imaging laser scanner		♦	♦	♦
Filter BLK2GO data upon import		♦	♦	♦
E57			♦	♦
DotProduct: dp				♦
HeXML				♦
Import *.blk data from BLK360 Data Manager		♦	♦	♦
LGS (Leica Geosystems Universal project file)				♦
Batch import of B2G via command line interface		♦	♦	
Import scans without images		♦	♦	♦
Import .cmi data from BLK3D		♦	♦	♦
Filter points by range		♦	♦	♦
Command Line Interface Importing of RTC360 and BLK360 data stored locally			♦	
DATA EXPORT/PUBLISH	**FIELD 360**	**REGISTER 360 PLUS (BLK Edition)**	**REGISTER 360 PLUS**	**MODEL**
Publish a sub-selection of setups		♦	♦	♦
Publish contents of a LimitBox		♦	♦	♦
AutoCAD DXF R12				♦
Cyclone Object Exchange (COE) format (to AutoCAD, MicroStation via COE Data Transfer)				♦
ASCII (XYZ, SVY, PTS, PTX, TXT, Customised format)		PTX/PTS	PTX/PTS	♦
PTX as separate Setups (feet and metres)		♦	♦	
PTG		♦	♦	
BMP, TIFF, JPEG, PNG				♦
RCP (unified and separate setups)		♦	♦	♦
LAS (feet and metres)+		♦	♦	
Ortho Image, GeoTIFF, TWF (World File)				♦
Pano Export				
Batch Export of Panoramic images (JPG)		♦	♦	♦
Batch Export of Panoramic images (EXR)+		♦	♦	♦
SDNF 3.0 (Intergraph Steel Detailing Neutral File)				♦
PCF (Alias Piping Component File)				♦
Leica System 1200				♦
LandXML				♦
Cyclone II TOPO CWF & PCI				♦
CloudWorx-VR ALP*				♦
E57 Publish Options				
E57 unified		♦	♦	♦

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DATA EXPORT/PUBLISH	FIELD 360	REGISTER 360 PLUS (BLK Edition)	REGISTER 360 PLUS	MODEL
E57 separate Setups		♦	♦	♦
Setup sub-selection		♦	♦	♦
LimitBox contents		♦	♦	♦
Compatibility mode for third-party software		♦	♦	
HDR imagery		♦	♦	♦
Cyclone REGISTER 360 PLUS archive file (RAF)			♦	
Imagery Publishing Features				
Publish with/without imagery		♦	♦	♦
Publish HDR imagery		♦	♦	♦
Publish LDR optionally		♦	♦	♦
Cyclone REGISTER 360 PLUS (BLK Edition) archive file (RAF)		♦		
LGS (Leica Geosystems Universal project file) including Password-protected		♦	♦	♦
TruView Local dataset		♦	♦	♦
CVR				♦
Publish to TruView Cloud	♦	♦	♦	♦
Publish to JetStream Enterprise		♦	♦	♦
Batch export LGS via command line interface		♦	♦	
Batch export RAF archive file via command line interface		♦	♦	
Publish to Cyclone ENTERPRISE		♦	♦	♦
Decimate point clouds upon publish		♦	♦	♦
Save screen image as image file		♦	♦	♦
Auto-blur faces and licence plates+		♦	♦	
IFC	♦			
DXF	♦			

OTHER GENERAL CYCLONE FEATURES
Metric units of measure
Imperial units of measure
64-bit large number support
64-bit graphics support
Continuous auto-save
Multi-threading to take advantage of multiple processors
Hierarchical project layout
Project Explorer (Cyclone REGISTER 360 PLUS)
Online help
Adjust Capture Settings of BLK360
Scan Density (High, Medium, Low)
Image Quality (HDR or LDR)
Image Exposure (EV-5 to +5)
Adjust Capture Settings of P-Series scanners
Scan Density (12.5mm, 10.0mm, 8.0mm, 6.25mm, 4.0mm, 3.125mm@10m)
Range filter
Delete scans from BLK360
Check Battery level of BLK360
Check internal storage availability of BLK360
Check Serial Number of BLK360
Check Firmware Version of BLK360
Set time on BLK360 internal clock
In-app notifications of licences nearing expiration

KEY	
*	Enabled if licenced copy of CloudWorx is installed on the same machine
^	Finished registrations are imported as a unified point cloud, unfinished registrations are imported as separate scan worlds into an unfinished registration
+	Requires Cyclone WORKFLOW licence

Minimum specification (Desktop Modules):

Processor	Dual core processor running at 2.5GHz
RAM	Minimum 8 GB or more for 64-bit OS
Operating System	Windows® 10 (64 bit), excluding Bootcamp for MacOS
Graphics	Support for OpenGL 3.3 or higher with 1GB video memory
Hard Disk	At least 1GB of free disk space required for install

Note: This spec is recommended only for viewing and\or working on smaller projects.

Recommended Specification for Workstation (Desktop Modules)

Processor	Latest i9 quad core 10th generation at 3.5GHz or higher
RAM	64 GB
Operating System	Windows® 10 (64 bit), excluding Bootcamp for MacOS
Graphics	Nividia Quadro, Nvidia GeForce or AMD Radeon. 8 GB dedicated video memory
Hard Disk	Internal SSD drives. One for writing and one for reading.

Note: To ensure the best performance, it is recommended that you install the latest graphics card drivers from the manufacturer's website.

Note: This spec is recommended when working with Cyclone MODEL and Cyclone REGISTER 360 PLUS.

Recommended Specification for Workstation (Classification)

RAM	4GB Video RAM or better
Graphics Card	Ampere NVIDIA, Volta or Turing, Any RTX, GeForce GTX 1650 or better
GPU	7.0 or better

Recommended Specification for Workstation (Tablet Modules)

Processor	Intel Core i5 2.4 GHz or higher
RAM	16 GB or higher
Operating System	Windows® 10 (64 bit), excluding Bootcamp for MacOS
Graphics	Intel HD graphics 520 or higher
Hard Disk	Internal SSD drive
Port	Ethernet port or Ethernet adapter

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- when it has to be **right**

Leica Geosystems