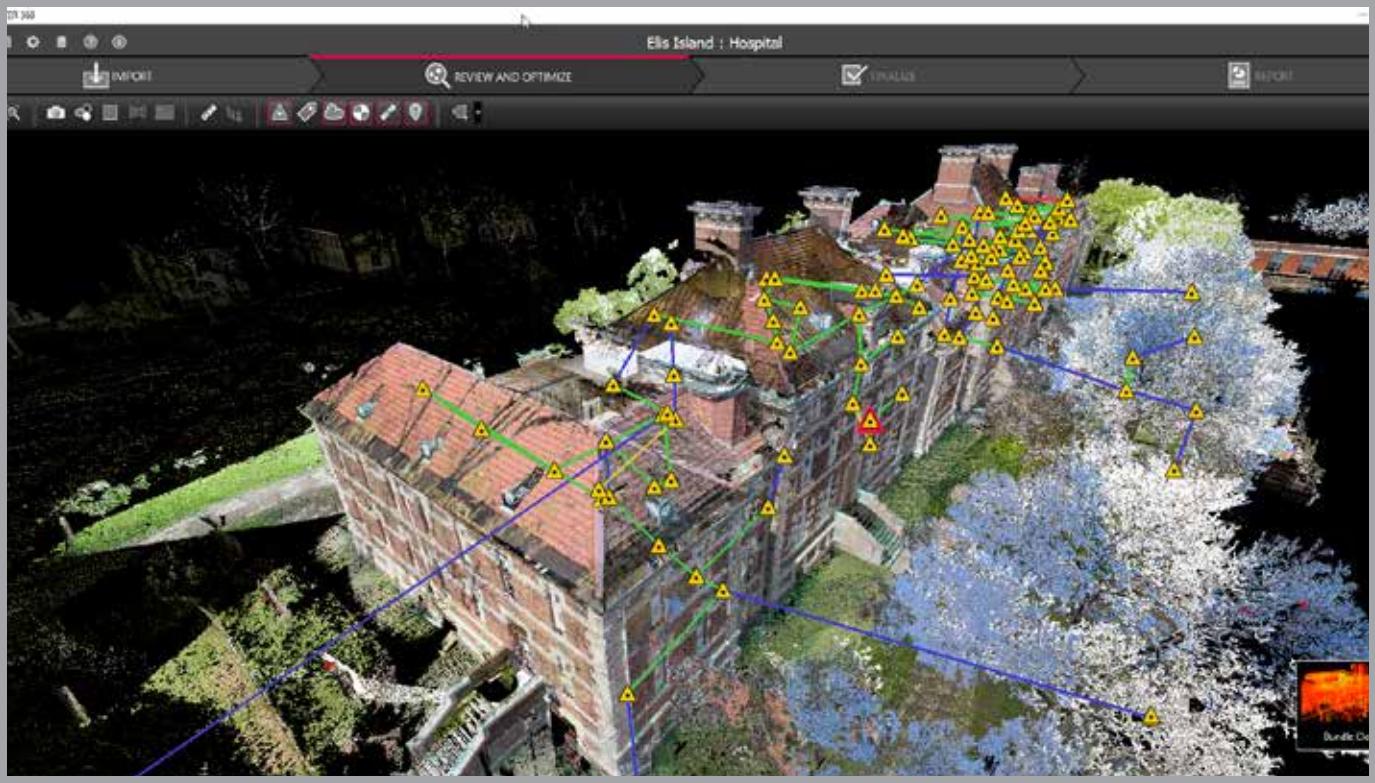
Leica Cyclone
Technical Specifications



Valid as of June 2020

Key	
1	These types can be created using best-fit methods
2	As delivered in database, cannot modify
3	Enabled if licenced copy of CloudWorx is installed on the same machine
†	These types can use catalogue tables
4	No grip editing for size. Enabled with a Cyclone PUBLISHER Pro or Cyclone JetStream PUBLISHER licence
5	Requires TruView Enterprise or Cloud licence
6	Finished registrations are imported as a unified point cloud, unfinished registrations are imported as separate scan worlds into an unfinished registration
7	Requires Cyclone JetStream PUBLISHER license
8	Not in Cyclone REGISTER 360
9	Does not support unstructured data
10	Not supported in Cyclone FIELDWORX
*	Requires Cyclone PUBLISHER, or Cyclone PUBLISHER Pro
x	Requires Cyclone JetStream PUBLISHER or Cyclone PUBLISHER Pro licence
#	Requires Cyclone MODEL VR PUBLISHER licence
+	Requires Cyclone PUBLISHER Pro licence
^	Included free of charge in the Cyclone REGISTER 360 (BLK Edition) licence

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REGISTRATION, VISUALISATION, MODELLING & QUERY TOOLS	FIELDWORX	BASIC	REGISTER 360 (BLK Edition)	REGISTER 360	REGISTER	MODEL	SURVEY	Free VIEWER
Optimised for Tablets	♦							
Touch navigation, Pan, Zoom	♦							
Project and Setup Explorer	♦							
Scan Control	♦							
Object isolation for picking (point and target)	♦							
Simple add/delete control and targets	♦							
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			♦	♦				
Point Cloud Colour map viewing options								
Intensity mapping	♦	♦	♦	♦	♦	♦	♦	♦*
Greyscale	♦	♦	♦	♦	♦	♦	♦	♦*
Image Colour mapping		♦	♦	♦	♦	♦	♦	♦*
Infrared		♦	♦	♦	♦	♦	♦	♦*
Elevation Based Colour Mapping		♦[2]			♦[2]	♦	♦	♦[2]
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		♦	♦	♦	♦	♦	♦	♦[2]*
Limit Box for efficient viewing and interaction of selected regions		♦	♦	♦	♦	♦	♦	♦[4]*
Limit Box Manager to organise multiple limit boxes		♦			♦	♦	♦	♦[2]*
QuickSlice					♦	♦	♦	
QA Quick Slice					♦			
Slice along X,Y and Z axis					♦			
Colour clouds by setup					♦	♦	♦	
TruSlicer			♦	♦				
Slice along X,Y and Z axis			♦	♦				
Colour clouds by setup			♦	♦				
Set Limit Box by fence		♦			♦	♦	♦	♦*
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	♦		♦	♦	♦			
Cloud-to-Cloud registration			♦	♦	♦			
Auto Align Scans			♦	♦	♦			
Smart Align for Auto Align			♦	♦	♦			
Visual Alignment including tilted scans			♦	♦	♦			
Bundle/Group Visual Alignment			♦	♦	♦			
Automatic orientation for Visual Alignment					♦			
Automated registration using Black and White targets	♦		♦	♦	♦			
Automated registration using sphere targets			♦	♦	♦			
Optional prioritisation of target-based registration over Cloud-to-Cloud registration			♦	♦				
Automated registration across sitemaps			♦	♦				

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REGISTRATION, VISUALISATION, MODELLING & QUERY TOOLS	FIELDWORX	BASIC	REGISTER 360 (BLK Edition)	REGISTER 360	REGISTER	MODEL	SURVEY	Free VIEWER
Automatic registration from RTC360 VIS data		♦	♦	♦				
Editing Target labels/names		♦	♦	♦	♦			
View scanner locations		♦	♦	♦	♦	♦	♦	♦[2]*
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								
Colour-coded	♦		♦	♦				
Optimised with graphics for colour-blind users			♦	♦				
Station Notation display relative to an alignment		♦			♦	♦	♦	♦[2]*
Fit edge template for curve extraction (e.g. curbs, flowlines)						♦	♦	
Measure & dimension point clouds and models								
Slope distance		♦	♦	♦	♦	♦	♦	
ΔX, ΔY, ΔZ distances		♦	♦	♦	♦	♦	♦	
Geometric Object Volume		♦				♦	♦	
Surface area		♦				♦	♦	
Horizontal and Vertical Clearances						♦	♦	
Angel to Horizontal		♦			♦	♦	♦	

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REGISTRATION, VISUALISATION, MODELLING & QUERY TOOLS	FIELDWORX	BASIC	REGISTER 360 (BLK Edition)	REGISTER 360	REGISTER	MODEL	SURVEY	Free VIEWER
Angel 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		♦			♦	♦	♦	
Multiple coordinate system support		♦			♦	♦	♦	
Assign colours & materials to objects		♦			♦	♦	♦	♦*
Layers								
Create Layers		♦			♦	♦	♦	
Manage Layers		♦			♦	♦	♦	♦*
Save/restore viewpoints		♦			♦	♦	♦	♦*
Save screen image as image file		♦	♦	♦	♦	♦	♦	♦*
Object Grouping						♦	♦	
Geometry types that can be created:								
HDS flat targets	♦	♦			♦			
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						♦	♦	
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						♦		

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TruSpace\Keyplan\SiteMap\Map	FIELDWORX	BASIC	REGISTER 360 (BLK Edition)	REGISTER 360	REGISTER	MODEL	SURVEY	Free VIEWER
Model Library						♦		
Automatic Pipe Finder						♦		
Auto Generate Patches						♦		
ModelSpace inventory		♦			♦	♦	♦	♦*
Create GeoTags			♦	♦	♦	♦	♦	♦*
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		♦			♦	♦	♦	

DATA IMPORT	FIELDWORX	BASIC	REGISTER 360 (BLK Edition)	REGISTER 360	REGISTER	MODEL	SURVEY	Free VIEWER
ASCII (XYZ, SVY, PTS, PTX (feet and meters), TXT, Customised format)		♦		PTX only	♦	♦	♦	♦[3]
Control file in TXT format	♦		♦	♦	♦			
PTZ, PTG, PTB		♦		PTG only	♦	♦	♦	♦[3]
Cyclone Object Exchange (COE) format (from AutoCAD, MicroStation, via COE Data Transfer)		♦			♦	♦	♦	♦[3]
SCAN, SC2		♦						♦[3]
ZFS, ZFC		♦		♦	♦	♦	♦	♦[3]
BMP, TIFF, JPEG, PNG		♦	♦	♦	♦	♦	♦	♦[3]
Batch Import and Auto-Align Images (supports iSTAR, Nodal Ninja, Spheron)		♦	♦	♦	♦	♦	♦	
Batch re-import of edited Panoramic images +		♦	♦	♦	♦	♦	♦	♦
LandXML		♦			♦	♦	♦	♦[3]
SIMA		♦			♦	♦	♦	
Optech: ixf		♦			♦			
FARO: fls, fws, frp		♦		♦	♦			
RIEGL: rsp, 3dd		♦			♦			
LAS (feet and meters)		♦			♦	♦	♦	♦[3]
RCP*		♦		♦[9]	♦	♦	♦	
Import select setups from E57, PTX and PTG (when contained in file)		♦	♦	♦	♦	♦	♦	
Cyclone REGISTER 360 archive file (RAF)				♦				
Import Cyclone REGISTER 360 registration versions					♦			
Import Cyclone REGISTER 360 (BLK Edition) archive file (RAF)			♦	♦				
Import Cyclone REGISTER 360 Project		♦[6]			♦	♦[6]	♦[6]	
Import project data collected on ScanStation C10		♦		♦	♦	♦	♦	♦[3]
Import project data collected on ScanStation P15/ P16/P20/P30/P40/P50		♦		♦	♦	♦	♦	♦[3]

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DATA IMPORT	FIELDWORX	BASIC	REGISTER 360 (BLK Edition)	REGISTER 360	REGISTER	MODEL	SURVEY	Free VIEWER
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		♦	♦	♦	♦	♦	♦	♦[3]
Import project data collected on BLK360 imaging laser scanner including Cyclone FIELD 360 links, assets and GeoTags			♦	♦	♦			
Import project data collected on RTC360 imaging scanner including Cyclone FIELD 360 links, assets and GeoTags		♦		♦	♦	♦	♦	
Import project data collected on BLK2GO handheld imaging laser scanner		♦		♦	♦	♦	♦	
E57		♦		♦	♦	♦	♦	♦[3]
DotProduct: dp		♦			♦	♦	♦	♦[3]
HeXML		♦			♦	♦	♦	
Import *.blk data from BLK360 Data Manager		♦	♦	♦	♦	♦	♦	♦
LGS (Leica Geosystems Universal project file)		♦			♦	♦	♦	

DATA EXPORT/PUBLISH	FIELDWORX	BASIC	REGISTER 360 (BLK Edition)	REGISTER 360	REGISTER	MODEL	SURVEY	Free VIEWER
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, Customized format)	PTS	♦	PTX/PTS	PTX/PTS	♦	♦	♦	
PTX as separate Setups (feet and metres)			♦	♦	♦			
E57 as separate Setups	♦	♦	♦	♦	♦	♦	♦	
Binary Point Cloud (PTZ, PTB)		♦			♦			
PTG		♦	♦	♦	♦			
BMP, TIFF, JPEG, PNG		♦			♦	♦	♦	♦*
RCP (unified and separate setups)*		♦	♦^	♦	♦	♦	♦	
LAS (feet and meters)*					♦			
Ortho Image, GeoTIFF, TWF (World File)		♦			♦	♦	♦	♦*
Batch Export of Panoramic images (PNG, 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 [3]		♦			♦	♦	♦	
E57 unified		♦	♦	♦	♦	♦	♦	
E57 separate Setups		♦	♦	♦	♦	♦	♦	
HDR imagery		♦	♦	♦	♦	♦	♦	♦
Cyclone REGISTER 360 archive file (RAF)				♦				
Cyclone REGISTER 360 (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		♦*	♦*	♦*	♦*	♦*	♦*	♦*

OTHER GENERAL CYCLONE FEATURES
Metric units of measure
Imperial units of measure [10]
Decimal Degrees or Degrees, Minutes, Seconds angular units of measure [8]
Bearing unit of measure for Azimuth of Resection [8]
Simultaneous view of video image and scanned data image [8]

OTHER GENERAL CYCLONE FEATURES
Customisable, exchangeable user interface: hotkeys, toolbars [8]
64-bit large number support
64-bit graphics support
Continuous auto-save
Undo/Redo [8]
Client/server object database foundation [8]
Multi-threading to take advantage of multiple processors
Hierarchical project layout
Project Explorer (Cyclone REGISTER 360 and Cyclone FIELDWORX only)
Flexible licence support
Terminal Services support [8]
Multi-user profile configuration management [8]
Incremental, intelligent loading of 3D models [8]
Parametric objects [8]
Online help
Adjust Capture Settings of BLK360
Scan Density (High, Medium, Low)
Image Quality (HDR or LDR)
Image Exposure (EV-5 to +5)
Set capture button delay (up to 60 seconds) [8]
Adjust Capture Settings of P-Series scanners [10]
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
Check Battery level of P-Series [8]
Check Serial Number of P-Series [8]
Check Firmware Version of P-Series [8]
Proscan Calibration (Cyclone REGISTER only)

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 7 (64 bit) or Windows 10 (64 bit)
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 i7 quad core or equivalent at 3.5GHz or higher
RAM	64 GB
Operating System	Windows 7 (64 bit) or Windows 10 (64 bit)
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 manufacture's website.

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

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)
Graphics	Intel HD graphics 520 or higher
Hard Disk	Internal SSD drive
Port	Ethernet port or Ethernet adapter

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

Note: This spec is recommended when working with Cyclone FIELDWORX.

Customer Care Package (CCP) Information:

Cyclone 2020	January 25, 2020
Cyclone REGISTER 360 2020	January 25, 2020

Leica Geosystems – when it has to be right
Revolutionising the world of measurement and survey for nearly 200 years, Leica Geosystems is the industry leader in measurement and information technologies. We create complete solutions for professionals across the planet. Known for innovative product and solution development, professionals in a diverse mix of industries, such as surveying and engineering, building and heavy construction, safety and security, and power and plant trust Leica Geosystems for all their geospatial needs. With precise and accurate instruments, sophisticated software, and trusted services, Leica Geosystems delivers value every day to those shaping the future of our world.

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- when it has to be **right**

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