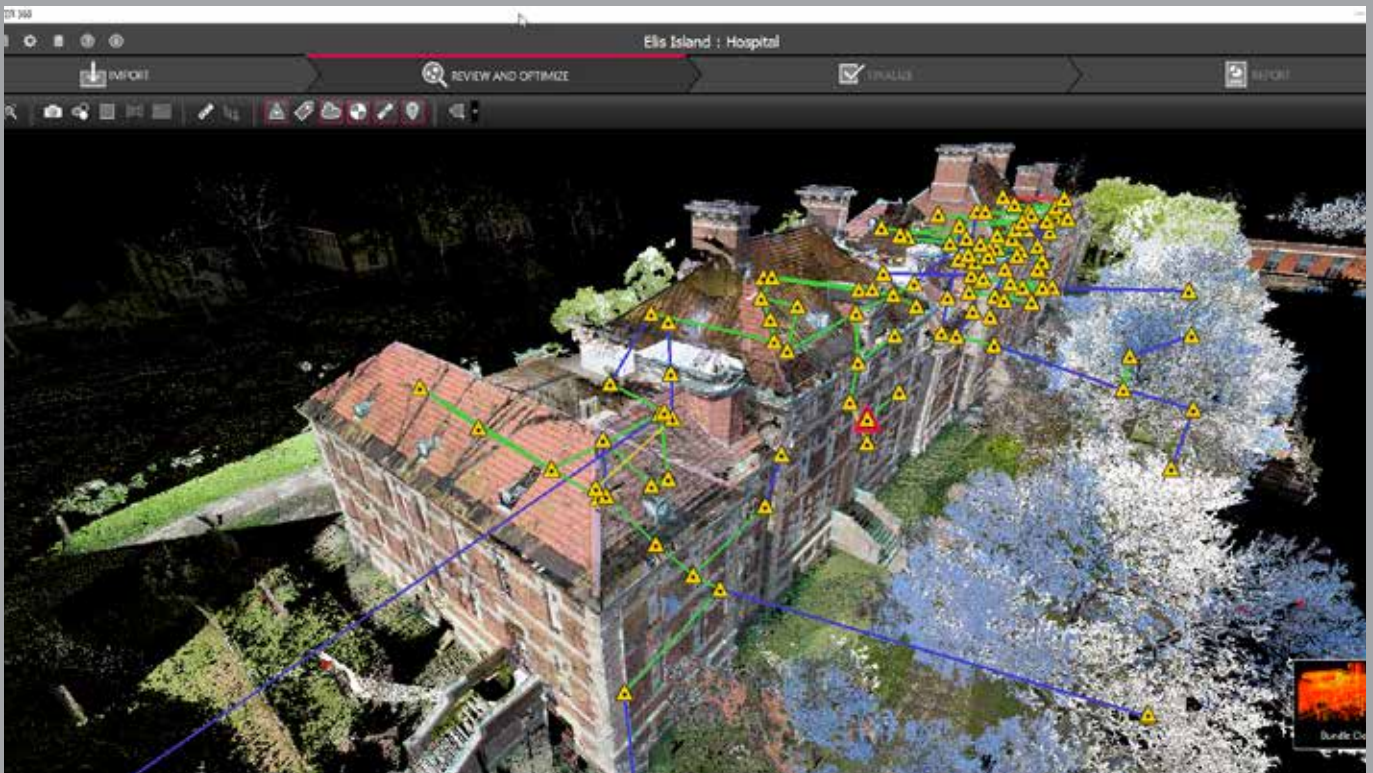


Leica Cyclone

Technical Specifications



Valid as of March 2021

leica-geosystems.com



- when it has to be **right**

Leica
Geosystems



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 TruView 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 licence
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 licence
x	Requires Cyclone JetStream PUBLISHER or Cyclone PUBLISHER Pro licence
+	Requires Cyclone PUBLISHER Pro licence
^	Included free of charge in the Cyclone REGISTER 360 (BLK Edition) licence

Leica Cyclone Technical Specifications

REGISTRATION, VISUALISATION, MODELLING & QUERY TOOLS	FIELDWORX	BASIC	REGISTER 360 (BLK Edition)	REGISTER 360	REGISTER	MODEL	SURVEY	Free VIEWER
Large project support		◆	◆	◆	◆	◆	◆	◆
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	◆							
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		◆ 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		◆			◆	◆	◆	◆*
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			◆	◆	◆			

Leica Cyclone Technical Specifications

REGISTRATION, VISUALISATION, MODELLING & QUERY TOOLS	FIELDWORX	BASIC	REGISTER 360 (BLK Edition)	REGISTER 360	REGISTER	MODEL	SURVEY	Free VIEWER
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 & 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		♦	♦	♦	♦	♦	♦	♦ ^{2*}
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								

Leica Cyclone Technical Specifications

REGISTRATION, VISUALISATION, MODELLING & QUERY TOOLS	FIELDWORX	BASIC	REGISTER 360 (BLK Edition)	REGISTER 360	REGISTER	MODEL	SURVEY	Free VIEWER
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, flow-lines)						♦	♦	
Measure & Dimension Point Clouds & Models								
Simple/Advanced measurement options			♦	♦				
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 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 [†]						♦		

Leica Cyclone Technical Specifications

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	♦		♦	♦	♦			
Control file in CSV 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, ZFPRJ		♦		♦	♦	♦	♦	♦ 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 metres)		♦			♦	♦	♦	♦ 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
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 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		♦		♦	♦	♦	♦	♦ ³
DotProduct: dp		♦			♦	♦	♦	♦ ³
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	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, Customised format)	PTS	◆	PTX/PTS	PTX/PTS	◆	◆	◆	
PTX as separate Setups (feet and metres)			◆	◆	◆			
Binary Point Cloud (PTZ, PTB)		◆			◆			
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, EXR) ⁺		◆	◆	◆	◆	◆	◆	
Batch export of scan panoramas (JPG, EXR) ⁺			◆	◆				
WayPoint Pano Export (JPG, 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 Publish Options								
E57 unified		◆	◆	◆	◆	◆	◆	
E57 separate Setups	◆	◆	◆	◆	◆	◆	◆	
Setup sub-selection		◆	◆	◆	◆	◆	◆	
LimitBox contents		◆	◆	◆	◆	◆	◆	
Compatibility mode for third-party software			◆	◆				
HDR imagery		◆	◆	◆	◆	◆	◆	◆
Cyclone REGISTER 360 archive file (RAF)				◆				
Imagery Publishing Features								
Publish with/without imagery		◆	◆	◆	◆	◆	◆	◆
Publish HDR imagery		◆	◆	◆	◆	◆	◆	◆
Publish LDR optionally		◆	◆	◆	◆	◆	◆	◆
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		◆*	◆*	◆*	◆*	◆*	◆*	◆*
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 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
Customisable, exchangeable user interface: hotkeys, toolbars ⁸
64-bit large number support
64-bit graphics support
Continuous auto-save
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)
In-app notifications of licences nearing expiration

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 i10 quad core or equivalent at 3.5GHz or higher
RAM	64 GB
Operating System	Windows® 10 (64 bit), excluding Bootcamp for MacOS
Graphics	Nvidia 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 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), excluding Bootcamp for MacOS
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 manufacturer's website.

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

Customer Care Package (CCP) Information

Cyclone 2021.1.0	February 22, 2021
Cyclone REGISTER 360 2021.1.0	February 22, 2021
Cyclone REGISTER 360 (BLK Edition) 2021.1.0	February 22, 2021

Revolutionising the world of measurement and survey for nearly 200 years, Leica Geosystems, part of Hexagon, creates complete solutions for professionals across the planet. Known for premium products and innovative solution development, professionals in a diverse mix of industries, such as aerospace and defence, safety and security, construction, and manufacturing, 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.

Hexagon is a global leader in sensor, software and autonomous solutions. We are putting data to work to boost efficiency, productivity, and quality across industrial, manufacturing, infrastructure, safety, and mobility applications. Our technologies are shaping urban and production ecosystems to become increasingly connected and autonomous – ensuring a scalable, sustainable future.

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