Carlson Scan2K

Scalable Scanner from Short Range to 2K Meters

Carlson
BREAK NEW GROUND

The Carlson Scan2K bridges the gap between small, light-weight, short-range sensors and large, long-range, pulsed time-of-flight scanners. Built with surveyors in mind, the Carlson Scan2K has a user-friendly on-board operator interface with menu-driven operations for quickly collecting and referencing data.

With an integrated high-resolution camera, inclinometers, a compass, a L1 GNSS receiver, and weather-proof housing, the Scan2K can be deployed in many environments and orientations. Whether on a tripod, vehicle, or moving platform, the outstanding performance of the Scan2K makes it the most versatile terrestrial laser scanner on the market.

BREAK NEW GROUND
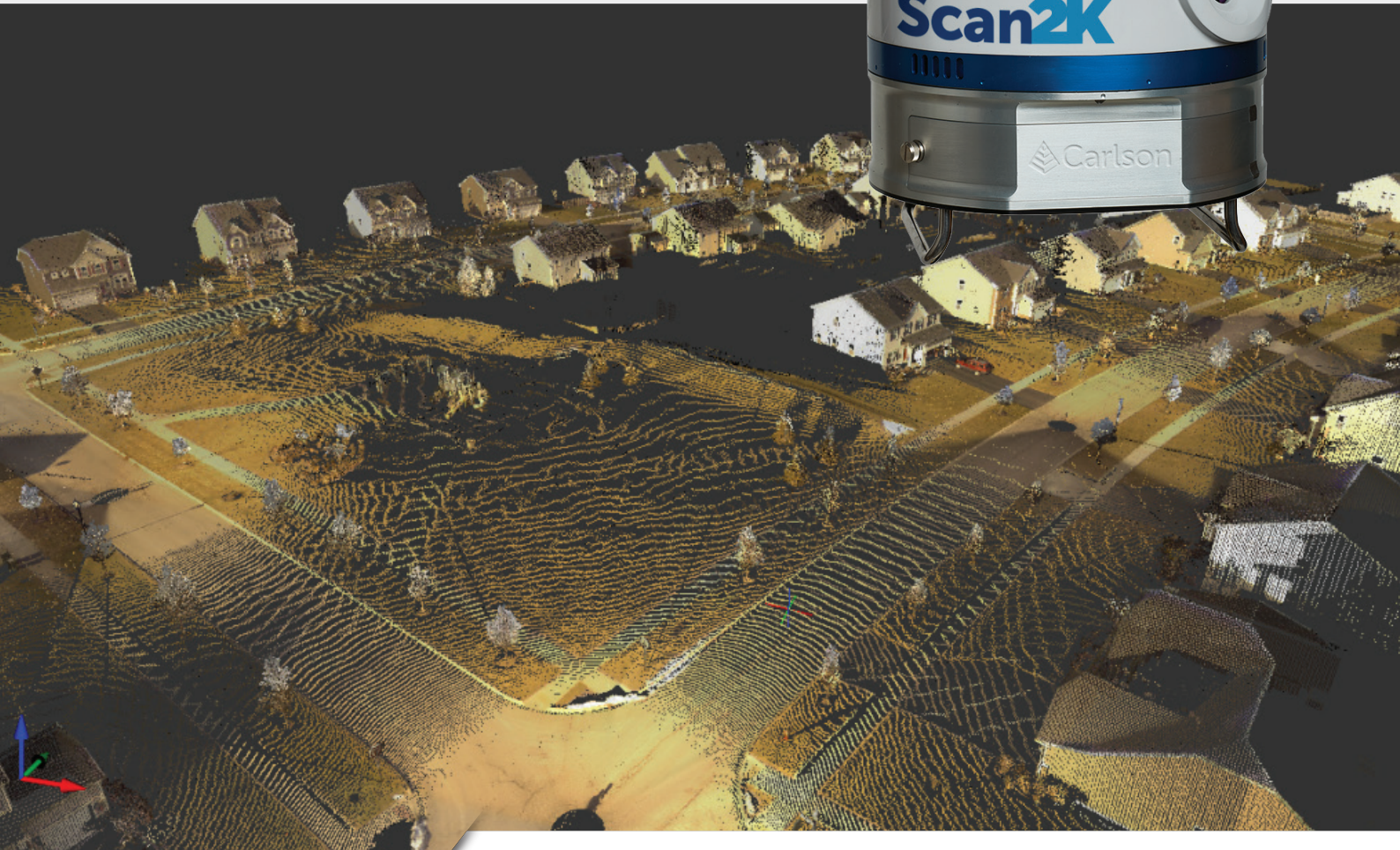
The perfect scanner for all applications, with programmable data collection rates that enable a range up to 2000 meters.[1]

System Performance Range	Short	Medium	Long
Max range capability @90% reflectivity	250 m	750 m	2000 m
Max range capability @20% reflectivity	125 m	400 m	976 m
Laser repetition rate (peak and effective)	500 kHz	200 kHz	50 kHz

Range vs Reflectivity

STD CLR (23 km) — Clear (15 km) — Lt Haze (8 km)
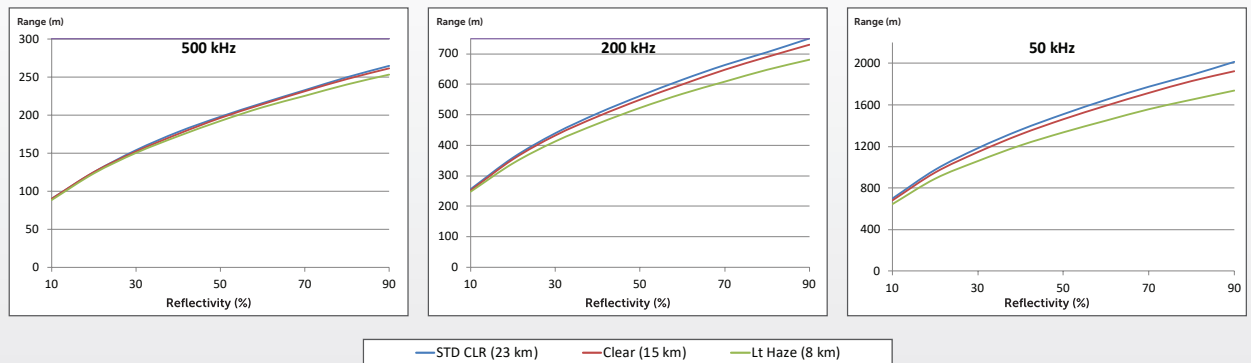
Carlson Scan2K... Simplified, Touch Screen, Menu-Driven Operation

The Scan2K is a stand-alone terrestrial laser scanner that is typically operated via an on-board, sunlight-visible touchscreen. Scans are performed with easy to select density modes from extra coarse to extra fine.

The Scan2K features an adjustable horizontal and vertical field of view for greater scan efficiency saving time in the field. After the scan, data is transferred to a Windows-based computer for further processing.

GRAPHICAL USER INTERFACE:

- Sunlight-visible
- Resistive single touch
- 640 x 480 pixels
- Color TFT LCD

Data Processing and Workflow

The Scan2K software suite is a field-proven, PC-based workflow platform that enables easy operation.

ATLAScan Software:

- Manages all data associated with a scan project, including point clouds, imagery, GNSS, referencing control files, and co-ordinate deliverables.

- Provides tools to view and inspect data, ensuring that your scan coverage is complete and accurate.

- Minimizes processing steps and optimizes functionality to help you shorten your processing times and improve your productivity.

Point Cloud Software:

- Delivers a whole new level of powerful automation for large data sets. It gives laser scanner users the ability to process millions of data points with Carlson Software ease-of-use.

- Provides this powerful ability to go from field scan to finished plat, all with seamless integration to Carlson Survey, Carlson Civil and Carlson Mining.

- Filter or decimate the points, overlay raster images in 3D, snap to edges and code the descriptions for automated field-to finish processing of linework and symbols and create contours, profiles, sections, and breaklines...

Specifications

Laser

Range measurement principle	Pulsed
Wavelength	1550 nm (near infrared)
Laser safety classification	1[2]
Sample collection rate	Up to 2 MHz[9]
Intensity recording	12 bits
Minimum range	1.5 m
Waveform digitizing technology (WFD)	Yes
Number of returns recorded	Up to 4 (first 2 and last 2)

Scanning Resolution

Angular measurement resolution	up to 12 µrad
Max. sample density [point to point spacing]	2 mm @ 100 m

Accuracy and Repeatability

Range accuracy (1 sigma)	5 mm @ 100 m
Range resolution	2 mm[7]
Precision, single shot (1 sigma)	4 mm @ 100 m
Angular accuracy	80 µrad

Scanning Characteristics

Max. field of view (vertical)	120° (-45 to +75°)
Max. field of view (horizontal)	360°
Min. angular step size (vertical)	12 µrad
Min. angular step size (horizontal)	20 µrad

Additional Sensors and Features

Dual-axis inclinometer (accuracy)	Up to 0.01°
GNSS receiver	L1 GPS + GLONASS
External GNSS support	Yes, incl. antenna mount
Compass	Digital
Registration/orientation method	GNSS and compass, backsighting, resection
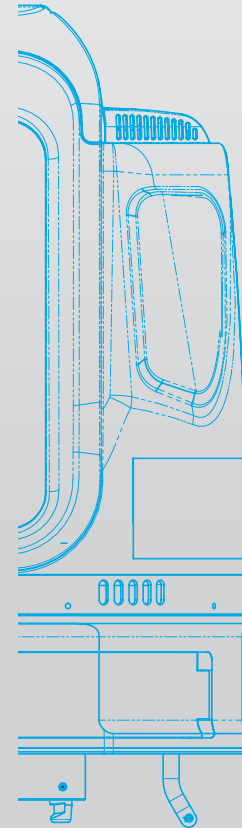
On-board registration data	Yes[4]
On-board target acquisition RetroID	Yes
Pause while scanning	Yes
Multiple scan area selection	Yes, multiple ROIs[3]
On-board planning mode	Yes
Mobile operation	Yes

System Peripherals

Data storage capacity	250 GB internal SSD

Communications / Data Transfer

Wireless LAN	Yes
USB connector	Yes
Ethernet port	Yes
Communications/data transfer	100 Mbps Ethernet, WLAN, USB

Imaging System

Internal cameras	Yes
Internal camera resolution	80-Mpix panoramic image
Export format of internal camera	JPEG
External camera DSLR	Yes with auto trigger
White-balancing DSLR	Yes
Export format of ext. camera	JPEG, NEF

Power

Power supply input voltage	9 to 32-V DC
Battery type	Internal, hot swappable Li-Ion batteries
Battery power	2.5 hours
Power consumption	60 W

Operation Characteristics

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Operating temperature (min.)[8]	-20°C (-4°F)
Operating temperature (max.)	+50°C (122°F)
Storage temperature	-40°C to +80°C (-40°F to +176°F)

Physical Characteristics

Height	323 mm (12.7")
Width	217 mm (8.5")
Total weight	11.2 kg (24.6 lbs.)

Control Options

On-board display	Touchscreen control, sunlight visible, 640×480, color
External user interfaces	Tablet, PC

ATLAScan Software

Remote scanner control	Yes
Geo-referencing	Automatic
Target-free automatic alignment	Yes[5]
Feature / primitive extraction	Yes
Terrain mesh	Yes
3D meshing	Yes
Measurements and calculations	Yes
Monitoring	Yes
Automatic line features extraction	Yes[6]
Vegetation removal	Yes
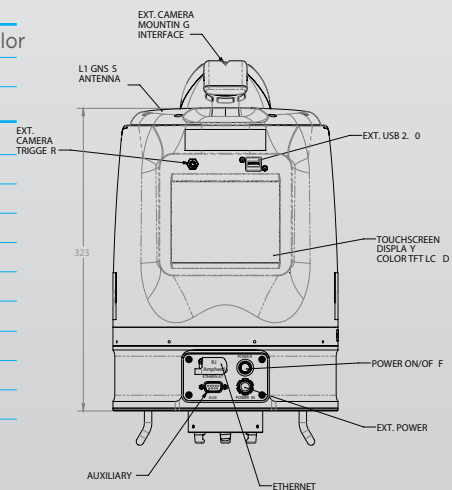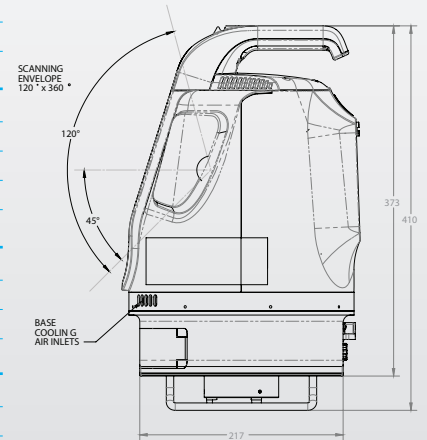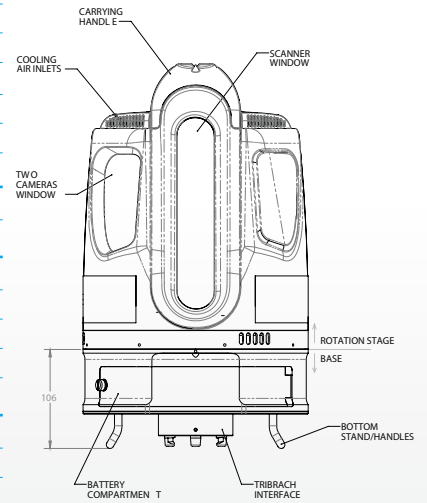
1) Max range tested on flat targets, larger than the laser beam diameter, perpendicular angle of incidence and STD Clear visibility (23 km).

2) Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007.

3) Definition of multiple ROIs in a single scan is possible using ATLAScan Control module

4) Using the on-board georeferencing functionality

5) Successful pre-registration depends on the object geometry, scanning resolution and overlap (min. 20%) between different scanning positions.

6) Automatic line extraction for break lines of a mesh (e.g. crests and toes of a terrain mesh).

7) Minimum distance that the Scan2K is able to separate two range measurements on objects in a similar bearing.

8) Normal operation to -10°C, extended cold temperature operation to -20°C with Optech Cold Weather package.

9) With the sensor capturing up to 4 returns, at up to 500 kHz pulse repetition frequency.

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