



**TELEDYNE OPTECH**  
Everywhereyoulook™

Part of the Teledyne Imaging Group



# POLARIS Laser Scanner

## Compact, Powerful Scanning Technology from Teledyne Optech

The **Optech Polaris Terrestrial Laser Scanner (TLS)** delivers accurate, precise data faster than ever before, bridging the gap between small, light-weight, short-range sensors and large, long-range, pulsed time-of-flight scanners. Built with surveyors in mind, the Polaris has a user-friendly on-board operator interface with menu-driven operations for quickly collecting and georeferencing point cloud data.

With a powerful quad-core processor, an integrated high-resolution camera, a digital compass and inclinometer, an L1 GNSS receiver and weather-proof housing, the Polaris can be deployed in various environments for a wide range of applications, using different workflows and setups. The Polaris leads the market in price versus performance, starting at a price that rivals short-range scanners while outperforming long-range scanners. With accelerated performance and all the built-in features surveyors need, the Polaris offers more flexibility than ever before. Whether on a tripod, vehicle, or moving platform, the outstanding performance of the Polaris makes it the most versatile and efficient terrestrial laser scanner on the market.

[www.teledyneoptech.com](http://www.teledyneoptech.com)



### **APPLICATIONS**

- » Civil Engineering
- » Construction
- » Transportation
- » Mining
- » Architecture
- » Archaeology & Cultural Heritage
- » City Modeling
- » Geology
- » Industrial & Marine
- » Forensics
- » Forestry
- » Entertainment – Virtual Reality
- » And many more...



### **SENSOR FEATURES**

- » Long-range capability
- » High-speed data acquisition
- » 100% scanning efficiency
- » Wide, selectable field of view
- » Multiple lidar returns
- » Internal cameras
- » External camera option

### **HARDWARE FEATURES**

- » Weather-proof housing
- » Internal data storage
- » Internal hot-swappable batteries
- » Flexible external powering options
- » Tilt compensation
- » L1 GNSS receiver
- » Digital compass
- » Large, bright, on-board touchscreen
- » Laser plummet?

### **SOFTWARE FEATURES**

- » Remote operation capability
- » Project planning
- » Direct georeferencing in the field
- » Automatic target recognition
- » Automatic target-free registration
- » Easy upgrades
- » Powerful bundled ATLAScan software

# Specifications

## Laser

Range measurement principle	Pulsed
Wavelength	1550 nm (near infrared)
Laser safety classification	1 <sup>2</sup>
Sample collection rate	Up to 2 MHz <sup>10</sup>
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 $\mu$ rad
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 <sup>9</sup>
Precision, single shot (1 sigma)	4 mm @ 100 m
Angular accuracy	80 $\mu$ rad

## Scanning Characteristics

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

## 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 <sup>4</sup>
On-board target acquisition Retroid	Yes
Pause while scanning	Yes
Multiple scan area selection	Yes, multiple ROIs <sup>3</sup>
On-board planning mode	Yes
Mobile operation	Yes

## System Peripherals

Data storage capacity	240 GB internal SSD
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## Communications / Data Transfer

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



All specifications are subject to change without notice.

## 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

Operating temperature (min.) <sup>9</sup>	-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, 640x480, color
External user interfaces	Tablet, PC

## ATLAScan Software

Remote scanner control	Yes
Geo-referencing	Automatic
Target-free automatic alignment	Yes <sup>5</sup>
Feature / primitive extraction	Yes
Terrain mesh	Yes
3D meshing	Yes
Measurements and calculations	Yes
Monitoring	Yes
Automatic line features extraction	Yes <sup>6</sup>
Vegetation removal	Yes

<sup>1</sup> Max range tested on flat targets, larger than the laser beam diameter, perpendicular angle of incidence and STD Clear visibility (23 km).

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

<sup>3</sup> Definition of multiple ROIs in a single scan is possible using ATLAScan Control module

<sup>4</sup> Using the on-board georeferencing functionality

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

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

<sup>7</sup> Laser plummet is built into the tribrach

<sup>8</sup> Minimum distance that the Polaris is able to separate two range measurements on objects in a similar bearing.

<sup>9</sup> Normal operation to -10°C, extended cold temperature operation to -20°C with Optech Cold Weather package.

<sup>10</sup> With the sensor capturing up to 4 returns, at up to 500 kHz pulse repetition frequency.

## Ordering Information

Contact your local Teledyne Optech representative or an authorized Teledyne Optech dealer.