



TELEDYNE OPTECH
Everywhere you look™

Part of the Teledyne Imaging Group



NEW

CL-90 Compact Lidar Scanner

Survey-grade OEM lidar sensor that employs proven technology in a compact sensor design for integration with UAV platforms.



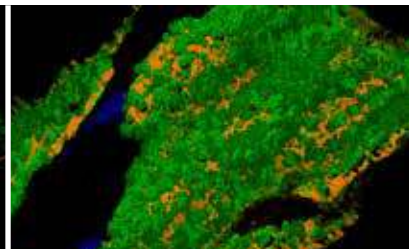
THE CL-90

COMPACT LIDAR SCANNER



The CL-90 is the first of a new line of survey-grade OEM lidar sensors from Teledyne Optech that employ proven technology in a compact sensor design for UAV platforms.

Available as a transceiver for system integration, the CL-90 enables high-quality data in complex environments for discriminating surveyors. Whether it is a deep open-pit mine, or an obscured ruin in dense jungle, or an electrical sub-station, the CL-90 delivers maximum resolution with high measurement precision and accuracy for uncompromising data quality.



Applications

- » Forestry and Agriculture
- » Powerlines and Utilities
- » Topo and Right of Way Mapping
- » Geomorphic Hazards Mapping
- » Stockpile and Open Pit Mining
- » Construction Site Monitoring
- » Asset Mapping, Inspection and Monitoring
- » Archeological Exploration and Heritage Site Documentation

Key Features and Benefits

- » Superior vegetation penetration for excellent ground coverage
- » Long-range performance for maximum productivity at UAS ceilings
- » Best-in-class data precision for tight-tolerance applications
- » Programmable FOV for maximum point density and application flexibility

Can't See the Ground for the Trees?

Whether it is an obscured ruin in dense jungle, or a pipeline easement requiring a detailed ground model, the CL-90 delivers superior canopy penetration to get points on the ground where you need them most.

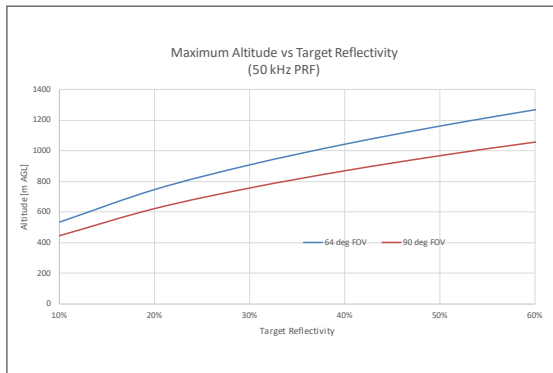
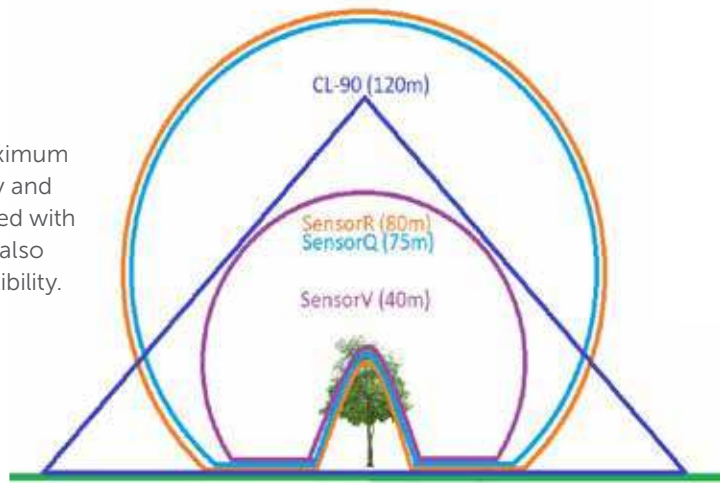
Data Too Noisy?

Tight-tolerance engineering applications demand low measurement noise. The CL-90 provides industry-leading shot-to-shot precision and survey-grade data quality for asset inspection applications, including powerline and transportation corridor mapping.

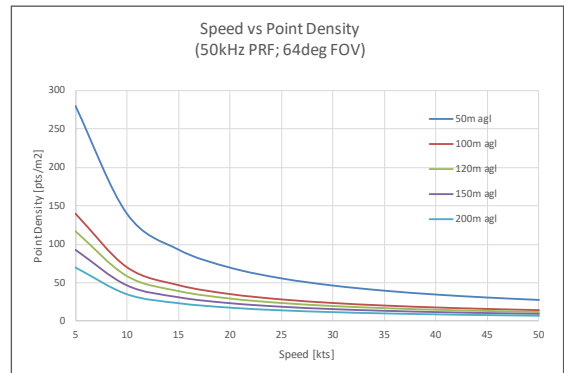
Productivity

The CL-90's long-range performance enables maximum area coverage rates without sacrificing data quality and vegetation penetration at UAS flight ceilings. Coupled with a unique programmable scanning FOV, the CL-90 also provides superior point density and operational flexibility.

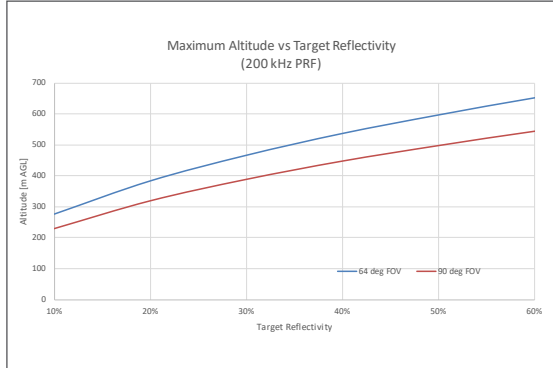
- » Performance expressed as max AGL, instead of max range (more realistic collection scenarios)
- » Unique, programmable FOV enables superior density control



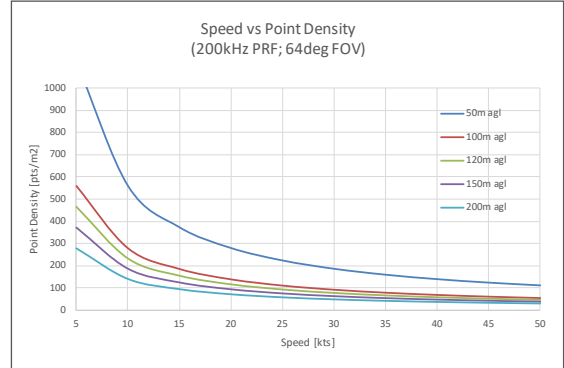
- » 470 m AGL; 64° FOV
- » 390 m AGL; 90° FOV



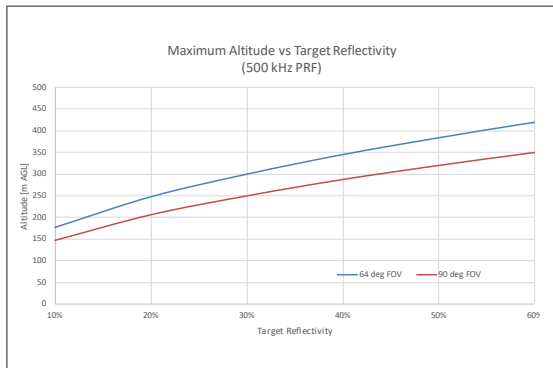
- » 100 m AGL = 78 pts/m²; 10 kts
- » 150 m AGL = 52 pts/m²; 10 kts



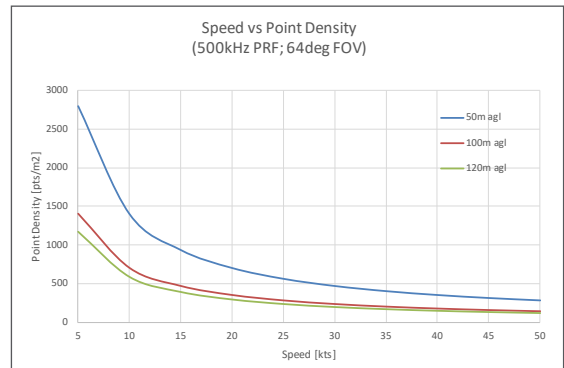
- » 240 m AGL; 64° FOV
- » 200 m AGL; 90° FOV



- » 100 m AGL = 311 pts/m²; 10 kts
- » 150 m AGL = 207 pts/m²; 10 kts



- » 150 m AGL; 64° FOV
- » 125 m AGL; 90° FOV



- » 100 m AGL = 777 pts/m²; 10 kts
- » 150 m AGL = 518 pts/m²; 10 kts

Note for all graphs: 10% target reflectivity; full laser footprint interception; visibility = standard clear (23 km)

CL-90 Compact Lidar Scanner

Technical Specifications

NEW

Performance Highlights

- » > 600 pts/m² from 120 m AGL (400 ft) and 5 m/s (64° FOV)
- » Shot-to-shot precision of <1 cm for survey applications
- » Maximum AGL of 650 m (20% target reflectivity)
- » Narrow beam divergence of 0.3 mrad 1/e² for superior ground detection and canopy penetration.

The CL-90 is available as a kit for authorized re-sellers for integration with 3rd party INS solutions, imaging sensors and UAV platforms.

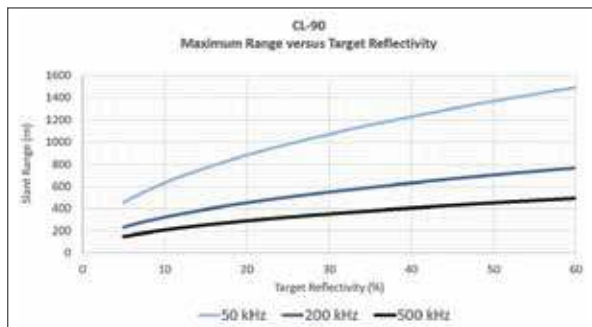
THE KIT INCLUDES:

Hardware

- » CL-90
- » Cable-External CL-90 Ethernet
- » Cable-External Power and Control

Integrator Data Package

- » Hardware Manual
- » Software ICD Manual
- » Mechanical ICD and Step Model
- » Post Processing Software
- » Realtime Control and Processing Library
- » Sample Data



**CLASS 1
LASER PRODUCT**

Ordering Information

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

| ITEM | SPECIFICATION |
|-------------------------------------|---|
| Laser | |
| Range measurement principle | Time of Flight |
| Range Performance ¹ | 176 m (500 kHz) to 633 m (50 kHz) |
| Pulse Repetition Frequency | 500, 200, 50 kHz (Programmable) |
| Beam Divergence (1/e ²) | 0.3 mrad |
| Wavelength | 1550 nm |
| Laser safety classification | 1 |
| Range resolution | 2 mm |
| Intensity recording | 12 bits |
| Maximum number of returns | 4 |
| Minimum range | 1.5 m |
| Range accuracy 1 sigma ² | 10 mm |
| Precision single shot ² | 5 mm |
| Scanning Characteristics | |
| Angular measurement resolution | 12 urad |
| Scan angle [FOV] | 64-90° |
| Lines per second [Scan Frequency] | 20 – 52 lines/sec (10-26 Hz) |
| Scan Product | 860 maximum |
| Scan Pattern | Sawtooth |
| Power | |
| Power Supply Input Voltage | 18 – 36V |
| Power Consumption | 60W |
| Environmental | |
| Operating Temperature (min / max) | -10°/+40° C |
| Storage Temperature (min / max) | -20°/+50° C |
| Vibration | DO-160H Section 8, Category S, Curve M |
| Shock | DO-160H Section 7, Category A, Standard Shock |
| Dimensions | 300 L x 213 W x 209 H mm |
| Weight ³ | 4.1 kg |
| Protection Class | IP64 (Dust and splash proof) |
| Interfaces | |
| Connector 1 | Power, RS232, PPS |
| Connector 2 | 1000 Mbit/sec Ethernet |
| Data Storage | 240 GB SSD |
| Post-Processing Software | Windows |
| Realtime API Library | Windows, Linux |

1. 99% detection probability; 10% reflective target; 23 km visibility; full footprint interception
2. Under Optech Test Conditions, contact for details
3. Nominal Value. Contact for details

Complies with 21 CFG 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007. Max range tested on flat targets, larger than the laser beam diameter, perpendicular angle of incidence and STD Clear visibility (23 km).

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