

Beyond OCT imaging Inner Vision LiDAR

The **Inner Vision LiDAR** (Light Detection and Ranging) system combines Santec's Swept Source OCT (SS-OCT) technology with the High Speed Scanning Laser (HSL) series to go beyond OCT imaging and provides FMCW (Frequency-Modulated CW) LiDAR solutions.

Santec is the pioneer for scanning lasers and SS-OCT technology with cutting-edge performance in our OCT systems.

The **Inner Vision LiDAR** system can be used for various applications, not only in the medical and industrial fields where SS-OCT systems have already been used but also in other fields, including mobility, robotics, and 3D mapping, etc.

With our experienced team, we can provide great solutions to any integration and customization needs with continuous support.



Features

► FMCW LiDAR detection

- Santec's extensive SS-OCT technology allows for sophisticated FMCW detection based on coherent heterodyne detection.
- FMCW detection has longer- range detection and higher sensitivity with lower optical power than TOF (Time-of-Flight) detection which is based on direct pulsed laser detection.
- FMCW LiDAR is immune to solar light, ambient light (from surroundings) and light from other LiDAR sensors.

► Tunable VCSEL swept source

- Santec's **HSL-1** (Based on an electrically pumped Vertical Cavity Surface Emitting Laser) delivers high performance, including long coherence length (single-mode lasing), variable scan speed with low signal noise.



HSL-1	Unit	Specification (Typical)	
Center Wavelength	nm	1060 ±5	
Scan Range	nm	>70 (selectable)	
Scan Speed	kHz	0.3* to 400 (bi-directional)	*Preliminary
Coherence Length	mm	>3,000	
Output power	mW	>25 (peak)	

*Please note, these specifications are subject to change. Please contact to us for the details.

► Dual mode (FMCW LiDAR & SS-OCT)

- The Inner Vision LiDAR system can simultaneously output FMCW LiDAR data as a 3D point cloud (X,Y,Z) and SS-OCT data as a set of 2D density plots.



Camera image

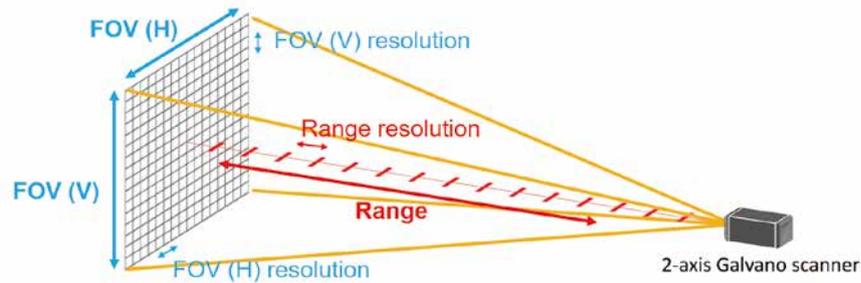


LiDAR data (depth map)



OCT data (density plots)

Performance



Inner Vision LiDAR	Unit	Specification (Typical)		
Center Wavelength	nm	1060±15		
Detection Range	m	>1	>5	>200*
Range resolution	mm	>0.06	>0.3	>12
Scan rate (per point)	kHz	>50	>10	>1
Output power	mW	>5		
Field-of-view (FOV) (Maximum)	°	> 20 (H) x 20 (V) (Variable)		
Lines (Maximum)		> 1000 (H) x 1000 (V) (Variable)		
FOV resolution	°	≥ FOV/Lines		
Frame rate	Hz	≤ $\frac{\text{Scan Rate}}{\text{H Lines} \times \text{V Lines}}$		
Data sampling rate	GS/s	1		
Data output style		3D point cloud (X,Y,Z), density (OCT data)		

*Coming soon

*Please note, these specifications are subject to change. Please contact to us for the details.

Applications

- Industrial non-invasive inspection
- Transportation
- Robotics
- 3D mapping and modeling
- Object detection and tracking
- Security systems
- Biomedical imaging



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