

SERIES PRODUCTION



INNOVIZONE

Automotive-Grade LiDAR

InnovizOne is a high-performance, automotive-grade, solid-state LiDAR sensor with unsurpassed 3D perception performance that is targeted at mass-production of Level 2.5 to Level 5 autonomous vehicles.

The rugged, reliable, functionally safe, and cost-effective LiDAR is lightweight, low-power, and is resilient to sunlight and weather conditions. The sensor delivers a dense, highly accurate, 3D point cloud with unrivaled angular resolution at a high frame rate for distances up to 250 meters.

InnovizOne's firmware is delivered with pre-configured functionality including: scanning configuration with Regions of Interest (ROI); vertical FOV; pixel summation structure; frame rate; and number of reflections.

Innoviz's complementary perception software converts the LiDAR's raw point cloud data into high quality perception outputs for outstanding object detection, classification, and tracking; LiDAR calibration; and pixel collision classification (frame-by-frame detection and classification of pixels as possible obstacles within the drivable and non-drivable area.)

KEY PERFORMANCE METRICS

0.5m-250m Detection Range	0.1°x0.1° Angular Resolution (HxV)	115°x25° Maximum Field of View (HxV)	10 or 15FPS Pre-Configured Frame Rate
ASIL B(D) ISO 26262-Compliant	IP6K6K, IP6K9K & IP6K7 Ingress Protection	45x111.4x97.9mm Dimensions (HxWxD)	-15°C to +85C Operating Temperature

UNIQUE FEATURES



Regions of Interest or Uniform Field of View



Multiple Reflections



No Gaps Between Pixels



Equally Distributed VFOV



Resilient to Sunlight & Weather Conditions

MARKET APPLICATIONS



Consumer Vehicles



Robotaxis, Shuttles



Trucking



Heavy Machinery



Construction



Logistics



Smart City

SPECIFICATIONS

OPTICAL PERFORMANCE

Long-Range Detection[1]	**Eagle Configuration (FOV with Region of interest)**		**Falcon Configuration (Uniform FOV)**	
	@10% Reflectivity	**@50% Reflectivity**	**@10% Reflectivity**	**@50% Reflectivity**
Inside ROI @ 0.1°x0.1° Resolution	120m	190m	N/A	N/A
Inside ROI @ 0.2°x0.2° Resolution	180m	245m	N/A	N/A
Outside ROI @ 0.1°x0.1° Resolution	60m	100m	85m	180m
Outside ROI @ 0.2°x0.2° Resolution	100m	160m	120m	245m
Short-Range Detection	0.5-3.5m		0.5-3.5m	
Field of View (HxV)	115°x15°		115°x25°	
Scanned Lines within FOV	160		256	
Frame Rate	15FPS		10FPS	
Region of Interest (HxV)	20°x8° ROI in the center		N/A	
Angular Resolution (HxV)	Native pixels: 0.1°x0.1° Summation pixels: 0.2°x0.2°			
Angular Resolution Accuracy	0.05°@1σ (in nominal conditions[2])			
Range Resolution[2]	Native pixels: 2cm Summation pixels: 30cm			
Range Precision[3]	3cm @1σ			
Long-Range Accuracy (Bias)[3]	< 0.3% (max 15cm for high reflectivity target)			
Short-Range Accuracy (Bias)	30cm			

LASER

Laser Product Class	Class 1, Eye-safe (IEC-60825-1)
Wavelength	905nm

NOTES:

1 20Klux ambient lighting. True Positives = 95% per pixel and False Positives = 5% per pixel based on the above configuration for long-range detection. False positives are configurable from 0.01% to more than 10%.

2 25°C ambient temperature; lighting as defined in the specifications; defined scanning configuration; native VFOV setting; 0° LiDAR roll/pitch; clear weather; no blockage on window; LiDAR is operating in Normal power mode.

3 Based on a normal target with Lambertian reflectivity up to 100%.

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OUTPUTS

	Eagle Configuration (FOV with Region of interest)		Falcon Configuration (Uniform FOV)	
Points returned per second for full FOV (native pixels)	**1 Reflection**	**2 Reflections (Outside ROI only)**	**1 Reflection**	**2 Reflections**
	2.8M	5.6M	3M	6M
Points returned per second for full FOV with one reflection (summation pixels)	720K		768K	
Point Cloud Attributes	Per reflection: Distance, reflectivity, and confidence Per-pixel: Timestamp, number of reflections, blockage indication, and angular coordinates of pixel Per frame: Window blockage detection (by region); frame sequence number			
Point Cloud Reflections	Native pixels: up to 2 Summation pixels: 1			
Pixel Latency	<10msec (from first laser pulse of a pixel until the pixel detection is sent to the MIPI interface)			
Time Stamp	10 µsec accuracy for every pixel (with GPS input)			

INTERFACES

Data	MIPI CSI-2 interface (1.5Gbps data rate) aggregated over a two-wire GMSL high-speed LVDS interface
Command and Control	SPI slave interface and GPIO signals aggregated over two-wire GMSL high-speed LVDS interface; Enable~ pin over power connector
Time Synchronization	PPS using $GPRMC time message inputs over SPI interface and GPIO signals

MECHANICAL/ELECTRICAL

		Eagle Configuration (FOV with Region of interest	Falcon Configuration (Uniform FOV)
Power Consumption		17W (typical)	25W (typical)
Operating Voltage		6.5 to 32VDC (window heater operable only over 10V)	
Dimensions		45x111.4x97.9mm (HxWxD)	
Weight		515g	
Connectors	Data	Rosenberger H-MTD® (P/N E6S147-40MT5-A)	
	Power	Rosenberger MQS (P/N MPS104-40MZ1-A)	
Temperature	Operating	-15° to +85°C with airflow/cooling solution (depending on mounting position and environment)	
	Storage	-40° to +105°C	
Lifetime		15 years or 300,000km	
Total Operating Hours		8,000	

REGULATORY COMPLIANCE

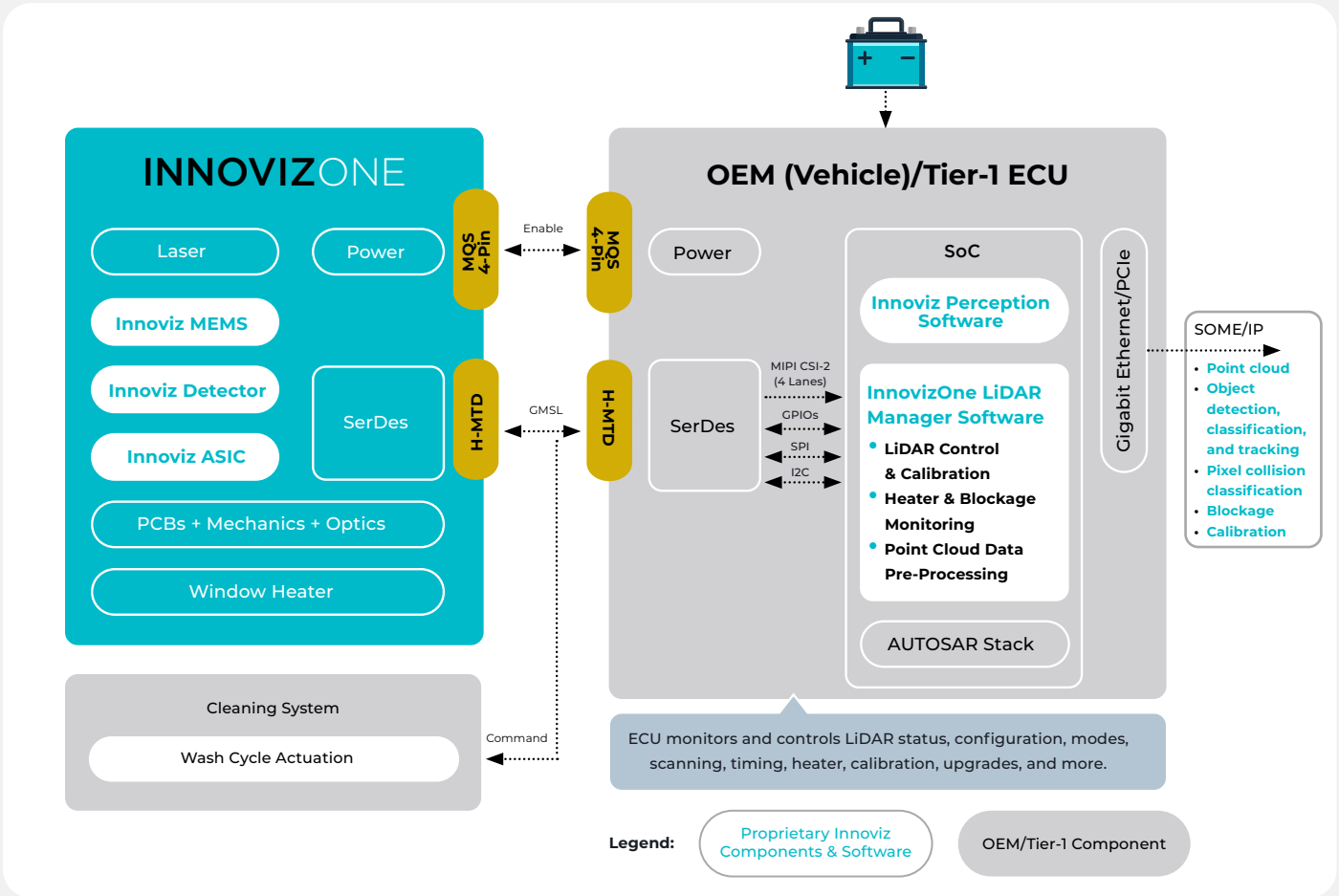
	Standard
Component-Level Safety and Reliability	ASIC: AEC Q100 (Grade 2)
	Laser: AEC Q102
	Detector: AEC Q101 and AEC Q102
	MEMS: AEC Q101 and AEC Q102
System-Level Safety, Reliability and Cybersecurity	IEC60825-1 "Safety of laser products"
	ISO 26262 ASIL B(D) "Road vehicles – Functional safety"
	ISO 21434 "Road vehicles - Cybersecurity engineering"
Electromagnetic Compatibility (EMC)	EN 55035; EN 55032; FCC 47 CFR Part 15, Subpart B; EU Directive 2014/30/EU; CISPR/KN 32; CISPR/KN 35
Environmental	DIN/EN/IEC 60068-2; ISO 16750; ISO 20653 (IP6K6K, IP6K9K & IP6K7); EN 61326-1; EN 62368-1; DIN 75220; Directive 2011/65/EU (RoHS 2); Directive (EU) 2015/863 (RoHS Appendix); REACH (EC 1907/2006-Art. 33)

INNOVIZ™ TECHNOLOGIES

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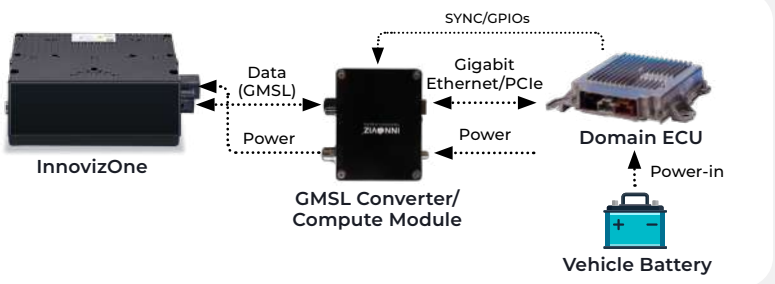
- InnovizOne includes proprietary hardware and software components that maximize its performance.
- The LiDAR's GMSL data output aggregates various communication channels and protocols.
- Innoviz's LiDAR Manager software runs on the OEM's Electronic Control Unit (ECU) and enables command and control of the LiDAR.
- Innoviz's optional perception software ensures optimal processing of the LiDAR's raw point cloud data output; delivers outstanding object detection, classification, and tracking; performs pixel collision classification (see definition on cover page); provides window blockage status; and calibrates the LiDAR.

SYSTEM ARCHITECTURE

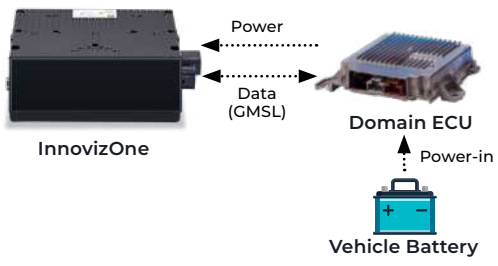


InnovizOne data packets must be converted to the format used by the OEM's perception software. This packet format conversion can be done in an external component or directly in the OEM's ECU.

INNOVIZONE CONNECTED TO ECU VIA COMPUTE MODULE



INNOVIZONE DIRECTLY CONNECTED TO ECU



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