



Q-Vision™ F540 – High-Resolution Industrial 3D Solid-State iToF Smart LiDAR Sensor

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Q-Vision F540 is a high-resolution 3D Solid State iToF LIDAR sensor designed for demanding, accurate industrial applications. Featuring best in class performance for both indoor and outdoor operations, F540 increases the intelligence and real-time decision making in industrial applications thanks to its powerful on-sensor processor by allowing for a broad range of applications to be run at the edge.



Benefits

F540 is ideal for both stationary and dynamic applications that require a large and detailed point cloud for locating and recognizing the presence or absence of objects, both outdoors and indoors:

- Field of view options: 110° x 90°
- Up to 10.8 million points per second
- Accurate object detection
- Fine angular resolution down to 0.14°
- Programmable field of view and resolution to optimize data rate and machine learning.
- The 3D sensor is available with and without an RGB camera
- Optional on-board 2 mega pixel camera registered to depth output
- Industrial temperature range
- Update rates up to 60 frames per second for resolving quickly changing scenes
- A ROS driver for easy integration into applications.
- Option for on-board application

Key Applications

Automated Guided Vehicles (AGV) & Autonomous Mobile Robots (AMR)

F540 enables reliable situational awareness such as:

- Pallet pocket detection
- Object detection for collision avoidance
- Object classification
- Navigation

Very low cross-sensor interference allows effective deployment multiple robots in the same space.

The wide field-of-view versions provide comprehensive situational awareness and broad monitoring around a mobile robot due to its high angular resolution.



Other Industrial Applications

The F540 is ideal solution for:

- Object awareness
- Dimensioning,
- Level monitoring/Object stacking
- and more.

The wide FOV sensor also reduces the number of sensors required for a specific application.

F540's industry-leading resolution captures the environment in more details, with superior clarity allowing for better accuracy and performance.

Software Development Kit (SDK)

The SDK supplies APIs for both host (off-sensor) and on-sensor code development, including sample projects for point cloud capture and processing. Support for various programming options is available, including C, C++, Python, MATLAB, ROS, OpenCV, and PCL.

SPECIFICATIONS

PARAMETER	F540-W - WIDE FoV	F540-W-C - WIDE FoV WITH CAMERA
Application	Object detection & classification in robotics, industrial automation and safety/security	
SDK	C, C++, Python, MATLAB, ROS, OpenCV, PCL	
Embedded OS	Yocto Linux	
Laser Class	Class I (Eye Safe, IEC 60825-1)	
Wavelength	940nm	
Measurement Technique	Indirect Time of Flight (iToF)	
Minimum Range	200 mm (100 mm short range 18% reflective)	
Maximum Range (Indoor)	16 m (80% reflectivity) 7.8 m (18% reflectivity) 6 m (10% reflectivity)	
Range Accuracy	< 1% (up to 6 m) < 2% (full range)	
Frame Rate (update frequency)	6 Hz to 60 Hz (selectable by mode)	
Angular Resolution	0.14° × 0.14°	
Sensor Pixels	804 × 672	
Field of View (FOV)	110° × 90°	
Color Camera	N/A	2 Megapixel RGB camera Registered to depth point cloud output 16:9 aspect ratio
Data Outputs	X, Y, Z, Intensity	X, Y, Z, Intensity, RGB
Output Connection	Ethernet M12 X-coded 8-pin	
Output Rate	Up to 10,800,000 points per second (depends on mode selected)	
Ambient Light Immunity	80,000 lux (with 20% range degradation)	
Nominal Power	~ 8 W typ. / < 40 W peak	
Power & I/O Connector	M12 A-coded 8-pin	
Operating Voltage	24 VDC ±10%	
Operating Temperature	-40°C to +55°C	-20°C to +55°C
Storage Temperature	-40°C to +105°C	
Nominal Weight	620 g	
Dimensions	126 mm (W) × 40 mm (D) × 66 mm (H)	
Mechanical Mounting	1× 1/4-20 Tripod mount & 4× M5 mounting holes	
Shock & Vibration	IEC 60068 2-6,27,64 (Shock 50 g, Vibration 5 g)	
Environmental Protection	IP67	
Certifications & Compliance (pending)	Eye Safe, IEC 60825-1, FCC, CE, UKCA, WEEE, IEC-61010, IEC-61000-2/61004, ISO 9001:2015, REACH SVHC, Conflict Mineral Rules	
Software API options	C, C++, Python, MATLAB, ROS, OpenCV, PCL	

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