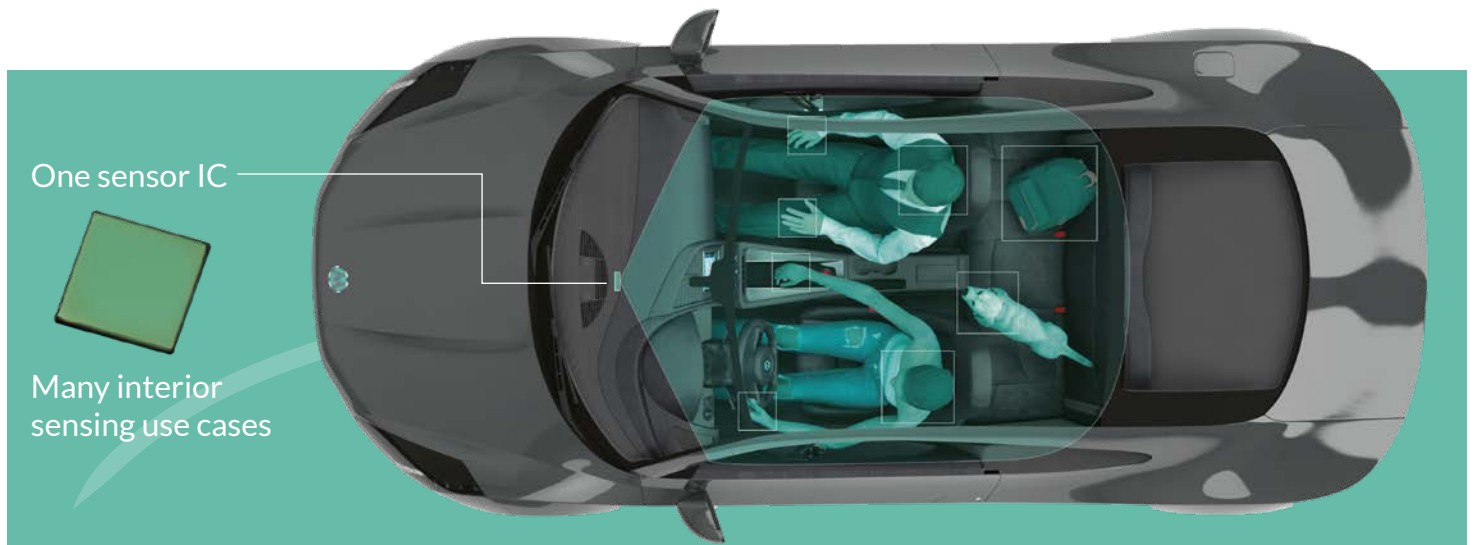


DRIVER MONITORING AND IN-CABIN MONITORING WITH A SINGLE 3D TIME-OF-FLIGHT CAMERA

Nowadays cars are only partially autonomous. The NCAP safety organizations are mandating driver monitoring systems (DMS) to detect driver distraction and drowsiness. Furthermore, the industry is advancing towards greater levels of automation in the coming years, but even then, the driver will still need to be able to take control in certain

circumstances. Real-time monitoring of the driver's attention level, position, and movements is therefore crucial. ToF technology is used today for gesture recognition. The potential scope of ToF, however, goes way beyond this use case: 3D ToF cameras are able to offer driver monitoring and in-cabin monitoring with a single wide field-of-view (e.g. 110°) camera.

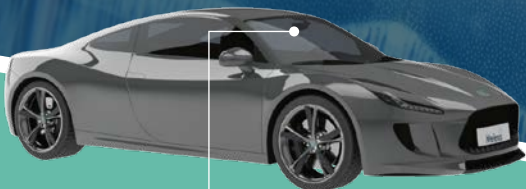


Eyeware and Melexis have joined forces to create advanced driver monitoring system (DMS) demonstrators based on Melexis' 3D ToF evaluation kits. The demonstrators show Eyeware's attention-monitoring technology based on Melexis' automotive qualified 3D ToF sensors to enable robust eye gaze and head tracking for in-cabin driver monitoring.

Solution benefits:

- 3D eye position tracking improves eye detection availability and eye state and eye gaze accuracy.
- higher flexibility for different camera mounting positions (dashboard, rear view mirror, A-pillar, etc.) and car types due to 3D head position detection
- extended head orientation range
- proven robustness versus sunlight (120 klux)





DRIVER MONITORING AND IN-CABIN MONITORING WITH A SINGLE 3D TIME-OF-FLIGHT CAMERA

Gen2 and Gen3 time-of-flight sensors

Feature	Gen2 QVGA chipset MLX75024 + 75123	Gen3 QVGA MLX75026 BGA package	Gen3 VGA MLX75027RTC CBGA package
Resolution	320x240	320x240	640x480
Sensor format	1/3"	1/4"	1/2"
Built-in temp. sensor	Tj accuracy +/- 5 °C absolute		
Max. mod. frequency	Up to 40 MHz	Up to 100 MHz	Up to 100 MHz



Eye gaze and head pose overlay



EVK order codes

Feature	Part number	FOV	Wavelength	Illumination
Gen 2 QVGA	EVK75024-80-940-1	80°	940 nm	LUMILEDS LUXEON LED
Gen 2 QVGA	EVK75024-110-940-1	110°	940 nm	VCSEL
Gen 3 QVGA	EVK75026-110-940-1	110°	940 nm	VCSEL
Gen 3 VGA	EVK75027-110-940-1	110°	940 nm	VCSEL

Contact Eyeware for an eye-tracking software license (contact@eyeware.tech)



Key benefits

Time-of-flight sensors:

- Fast read-out time and high FPS
- Sunlight invariance and robustness
- Operating temperature up to 105 °C ambient temp.
- Automotive grade, reliable CMOS process
- Safety manual for ASIL rated applications

DMS software:

- Gaze tracking
- Multi-person tracking
- Wide head-movement range
- Free positioning of camera
- Real-time 3D gaze vector



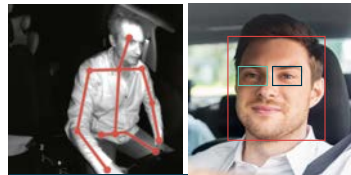
Comfort & UX

- Hand position detect
- Hand gestures
- Intuitive HMI, pointing finger
- Object detection, parcel classification
- Face and body recognition



Safety L3/L4 Legal, NCAP

- NCAP driver drowsiness & distraction, eye state, eye gaze, head pose
- Driver activity detection
- Occupant classification & body pose
- Advanced seatbelt detection
- Child left behind



Security

- Anti-spoof (2D+3D based) face and body recognition
- access control
- secure authentication



Autonomous vehicles

- Blindspot detection
- Collision avoidance
- Autonomous parking
- Vehicle exterior cocoon
- Smart access

More about our products and solutions

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