



Depth Sensing

Add a new dimension to active and passive safety

Through depth sensing, we elevate the capabilities of our driver monitoring and interior sensing solutions by providing a detailed 3D view of the cabin's interior landscape, enhancing both vehicle safety and the user experience.

Our CES 2024 demo showcases how this technology unlocks even more advanced in-cabin functions — beyond the two-dimensional.

Depth sensing provides a deeper understanding of the status and position of each person, object, and surface within the vehicle. This level of detailed insight is crucial for meeting the requirements of adaptive restraint systems across various safety standards and car rating schemes, including FMVSS 208 and Euro NCAP.

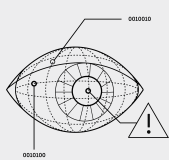
What is Depth Sensing?

Using wide field-of-view cameras, Smart Eye's interior sensing technology captures detailed visual information about the entire vehicle cabin. By fusing these 2D images with depth sensing technology, such as indirect Time of Flight (iToF) and structured light technologies, we can generate highly accurate 3D representations of the vehicle's interior.

This allows us to precisely measure the distance between people, objects, and other surfaces within the cabin, offering a level of spatial awareness and accuracy far superior to traditional 2D systems. This high-precision depth perception ensures more reliable detections and spatial estimations, reducing the likelihood of detection errors.

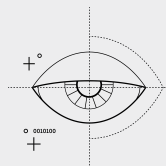
Essential Safety Features Unlocked by Depth Sensing

Depth sensing supports various advanced in-cabin functions, such as:



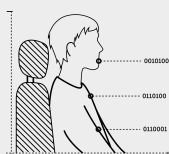
Advanced Body Position Analysis

Contributes to road safety by informing adaptive restraint systems for airbag deployment and pre-crash safety measures.



Dynamic Gesture Detection

Allows for intuitive user interaction with the vehicle's systems through gestures



Secure Driver Authentication

Offers reliable verification of the driver's identity for enhanced security.



Augmented Reality Heads-Up Display (AR HUD)

Enhances the driver's view with vital information displayed directly in their line of sight.

The Key Role of Depth Sensing in New Safety Protocols

As depth sensing technology becomes increasingly important in enhancing adaptive restraint systems in vehicles, it also becomes a key factor for compliance with FMVSS 208 in the U.S. and upcoming changes in Euro NCAP ratings.

Adaptive restraint systems, crucial for occupant protection during crashes, dynamically adjust seat belts and airbags according to the occupant's size, their position, and the crash severity. Depth sensing delivers precise information about the occupants and objects in the cabin, enabling the adaptive systems to customize safety measures, like airbag deployment, for each occupant.

This technology aligns with FMVSS 208's requirements for adaptable crash protection systems and is set to play a significant role in meeting the evolving criteria of Euro NCAP, which evaluates vehicle safety performance in Europe. The integration of depth sensing in adaptive restraint systems is expected to be a key factor in achieving high safety ratings, with Euro NCAP's new protocol anticipated to take effect by 2026.