

4activeSystems

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AEB car-to-car analysis

For evaluating collision avoidance technologies, new test targets enable complex traffic scenarios to be replicated in the real world

In the early 2000s car manufacturers started to implement collision avoidance systems in commercially available vehicles. In the early stages, only frontal crash obstacles, such as stationary cars, were addressed in the avoidance or mitigation of collisions. Over the years, more sophisticated sensor systems were brought to market, able to detect other types of obstacles such as pedestrians and cyclists, but also considering more complex scenarios, such as people at crossings and oncoming traffic. When autonomous vehicles are introduced on roads, an almost infinite number and variety of complex scenarios must be detectable by these systems to ensure safe and comfortable driving.

In 2006 4activeSystems started to develop the first dummy objects and propulsion systems to test AEB in the real world. Introduced first, portal rigs or belt-driven devices have a high accuracy and good usability, but are limited to straight-line paths. In the same way that sensor systems and algorithms have evolved, development of advanced test utilities followed to address the increased complexity of test scenarios. For this reason, 4activeSystems introduced battery-powered, self-driving platforms in 2014.



4active FB-large, battery-powered, self-driving platform

For car-to-car (C2C) evaluation tests, the company developed the Freeboard active FB-large. This unit can accelerate targets to 100km/h (62mph), is equipped with a dual-antenna GPS/GLONASS system combined with a highly precise IMU (RTK L2 accuracy), and can be fully synchronized to every available driving robot on the market. With its stealthy design and special plastic materials, it is nearly invisible to radar-based systems. It can withstand being driven over by heavy trucks (40 ton) and is 100% waterproof (IP67). To support subsequent testing without stops due for

charging, the Freeboard large includes a hot-swap battery system with three high-capacity accumulators (680Wh in total). It is confirmed as an official Euro NCAP test tool.

In the same way as propulsion systems, 4activeSystems' targets for C2C testing have also been improved. Development started with flat, 2.5D rear-end targets, moved on to 3D targets used only for rear approach and oncoming scenarios, and now encompasses state-of-the-art targets such as the 4active C2 GVT, with 360° sensor properties to mimic real cars for all aspect angles. This target is very light (<60kg) to prevent damage to the test vehicle, can be assembled very quickly in about five minutes by two people and can be used for complex scenarios such as those described in current and future Euro NCAP test regulations. ◀



4active C2 GVT, 3D car target, side-view



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