Is ADAS Calibration on **your** RADAR?

Automated driving, efficiency & electrification, connectivity & digitalisation as well as individualisation – these are the main current trends in the automotive industry.

For each of these trends, HELLA is developing innovating lighting and electronics solutions. Among these are radar sensors monitoring the vehicle environment, thus taking on a key role for automotive driving functions.

Sensors enable vehicles to recognise their environment

Radar sensors assume the role of sensory organs in vehicles. They continuously record the environment, recognise pedestrians and other traffic participants and objects around the vehicle – and deliver reliable results regardless of weather and lighting conditions. The radar sensors measure the distance and speed of detected objects. Throughout, it sends out radio waves. The quicker they return, the closer the detected object is to the sensor. Since the sensor sends out the radio waves in regular intervals, it can additionally measure, based on the respective distance calculations, how fast an object is moving to or away from the vehicle. These measurement results are then transformed into electric signals, which trigger vehicle safety functions based on pre-defined threshold values. The lane change assistant, for example, causes a signal to appear in the outside mirror once a different vehicle appears within a pre-defined distance.

HELLA is the market leader for 24 GHz radar sensors which offer blind spot detection, lane change assistance, etc.

Sensors used in various driver assistance systems are distinguished by various frequency ranges. HELLA is the market leader in the 24 GHz narrow-band sensor range. Those are typically installed in the rear bumper corners. The sensor systems are ideal for applications that have since become standard functions, such as blind spot detection, lane change assistants and rear-facing parking assistance. To accomplish these tasks, the sensor records speed, angle, and distance information for objects within a distance of up to 70 meters, it then evaluates the information. The fourth generation of 24 GHz sensors provide expanded safety functions, such as exit assistants. This detects dangerous situations, such as passing cars, before exiting the vehicle and warns all passengers.

77 GHz sensors: leader for automated driving functions

The 77 GHz frequency is gaining in importance, especially in view of automated driving functions. As is the case for 24 GHz radar sensors, HELLA is developing this technology mainly for short and middle distances. Due to its greater signal bandwidth, the 77 GHz radar has improved distance resolution. This means at approximately equal distances; the sensor can recognise several objects as separate objects. The spatial resolution for distance detection is more exact while the velocity of detected objects can be measured more accurately. Since the 77 GHz radar has the same design and the same mechanical and electrical interfaces as a 24 GHz radar, sensors can be flexibly exchanged at the identical installation positions. With over 90 million 24GHz sensors, HELLA is one of the world's largest suppliers of radar sensors. With the introduction of the 77GHz radar sensors, the company is now further expanding its leading position in the field of radar technology.

On the way from assisted to autonomous driving, radar sensors have established themselves as one of the core technologies for seamless environment perception. They continuously record the environment, recognise pedestrians and other traffic participants and objects around the vehicle - and deliver reliable results regardless of weather and lighting conditions. Especially with regards to functions such as autonomous parking or automated lane changes, 77GHz technology is becoming increasingly important, as it offers a significantly larger signal bandwidth and thus improved environmental resolution compared to 24GHz. This makes it easier to detect and classify objects on the road.

HELLA is continuously working on further increasing the performance of the 77GHz radar sensors. The second generation 77GHz is characterised by the latest antenna and chip technologies. This increases the range, extends the field of view, and further improves the measuring capability at close range. Objects such as trucks, cars, bicycles, and pedestrians can be detected and tracked even more precisely in this way, which ultimately leads to more informed decision-making rules, for example when initiating a lane change or parking. With this, the position and height of even small objects such as kerbs and roadside posts can also be determined more accurately. The compact design opens up new possibilities for sensor

integration, such as for example in the side of the vehicle. This enables a 360° object detection for identifying moving objects around the vehicle – from cars and bicyclists to pedestrians. This is especially necessary for automated parking.

Understanding ADAS, the components behind the technology and when an ADAS calibration is required, is vital knowledge for today's technicians, with calibration of critical Advanced Driver Assist Systems being an essential procedure to restore a vehicle to the manufacturer's specifications after repair. So, knowing where to find the expertise and support can give peace of mind. Being wholly owned by HELLA, a global leader in vehicle electronics, HELLA GUTMANN SOLUTIONS has the necessary know how and an award-winning, user-friendly, modular camera and radar calibration tool, compatible with most ADAS-equipped vehicle models.

In the next issue of the Panel, we will discuss the requirements for calibrating these radar sensors after removal and refitting as well as considerations after bumper removal and refitting.

For a no obligation discussion with one of our specialists, call 1800 061 729 or email hgscustomersupport@hella.com