1 Sensor System Architectures

1.1 Vehicle (Moving Platform) Applications

In vehicle (moving platform) applications, usually the sensor output is a list of detected **targets** (reflectors) on the sensor CAN bus (referred to as *internal CAN*) with the parameters

- Range
- Angle (Position)
- Radial Speed
- Reflectivity level
- Type of Target (Reliability Figure).

In addition to that, status and diagnose data form the sensor are reported.

Usually the tracking (filtering and smoothing of all detected reflectors over time) is done in an additional unit (central ECU BUMPER-08xx or a PC or the like). If required, those tracking algorithms can also be integrated in the sensor.

The result of the tracking is an **object** list with the following parameters:

- x position
- y position
- x component of the velocity
- y component of the velocity
- type of reflector
- size of reflector.

When multiple sensors are applied, the data fusion algorithms are typically run on the fusion PC or the fusion central ECU BUMPER08xx.

In any case, a visualization both of the **targets** and the **objects** is possible using the DriveRecorder2 software in any PC equipped with a CAN card.

In vehicle applications certain data have to be transmitted to the sensor(s) and (if existing in the system architecture) the fusion / tracking / central ECU.

Every sensor requires the information: actual ego velocity of the host vehicle.

Every sensor fusion / tracking / central ECU setup requires the information: actual ego velocity and yaw rate of the host vehicle.

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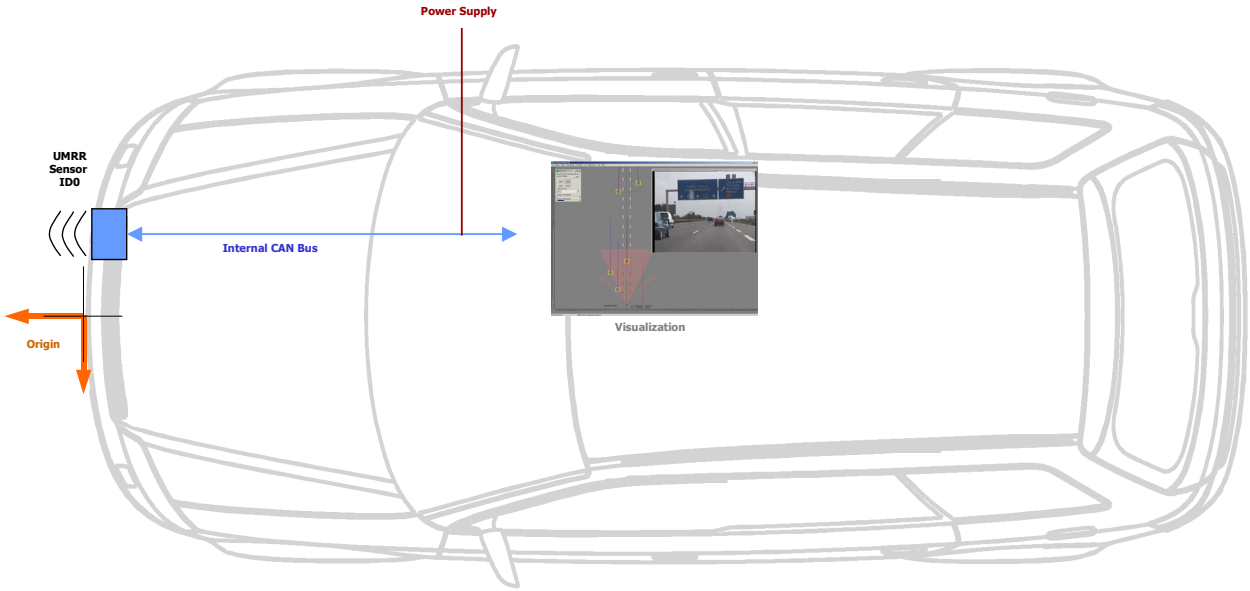
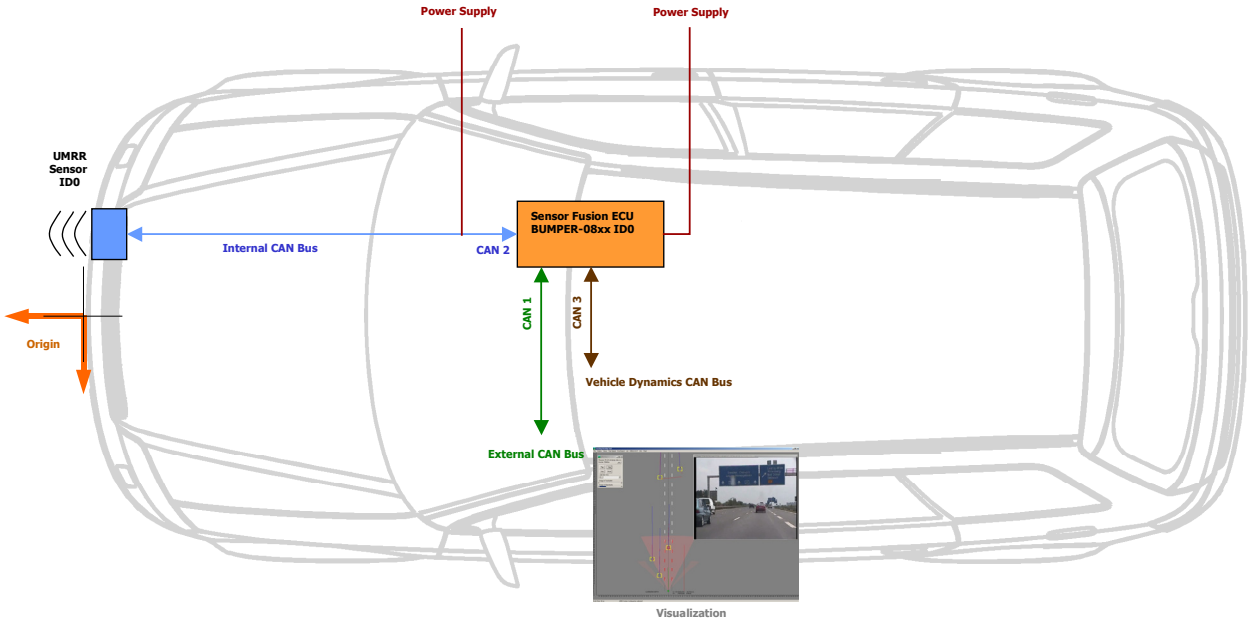
1.1.1 Single Sensor Setup

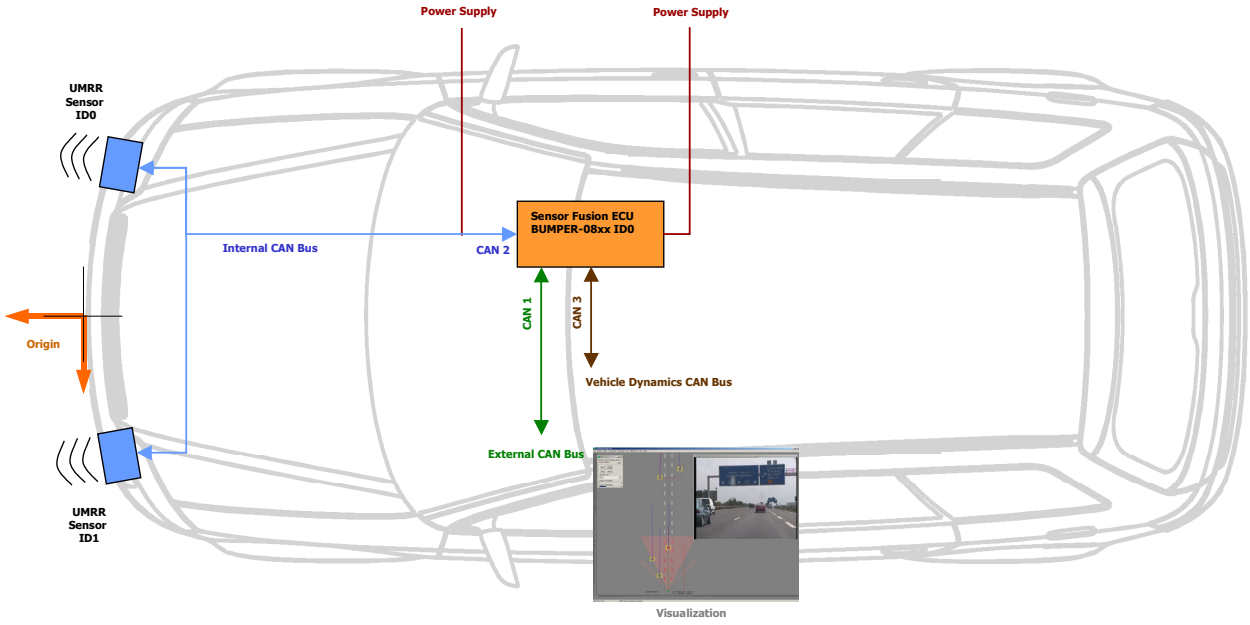


1.1.2 Single Sensor Setup with Central ECU

The central ECU works as a gateway, tracking algorithms and the fusion of vehicle dynamics data and the radar data are executed.



1.1.3 Dual Sensor Setup with Central ECU Example (Stop&Go)



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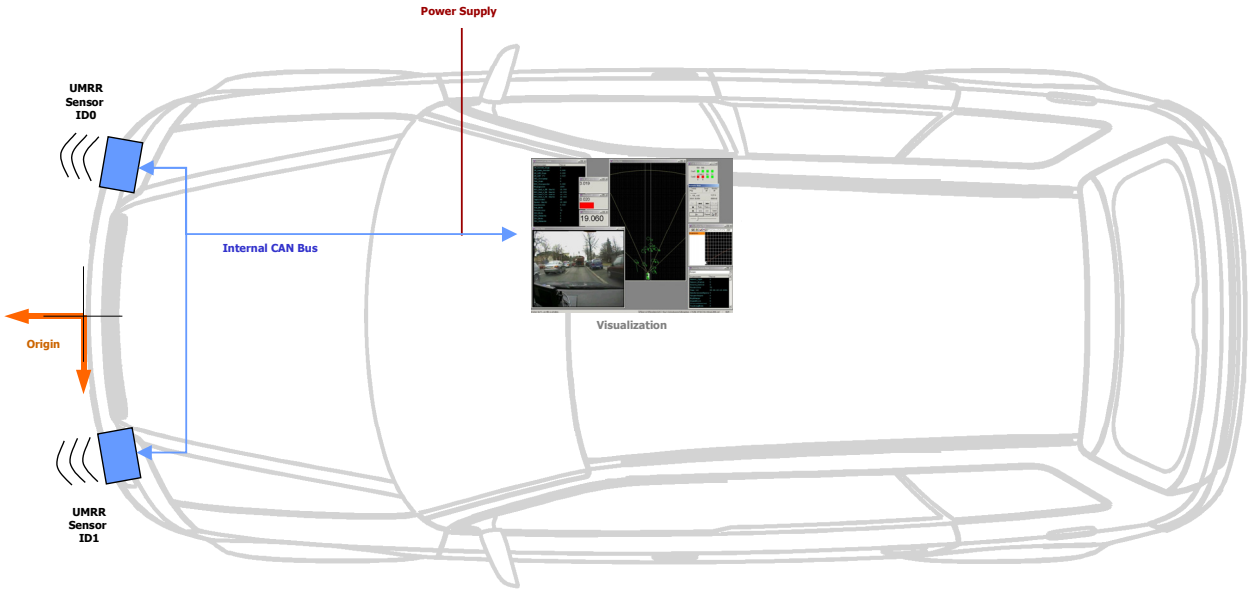
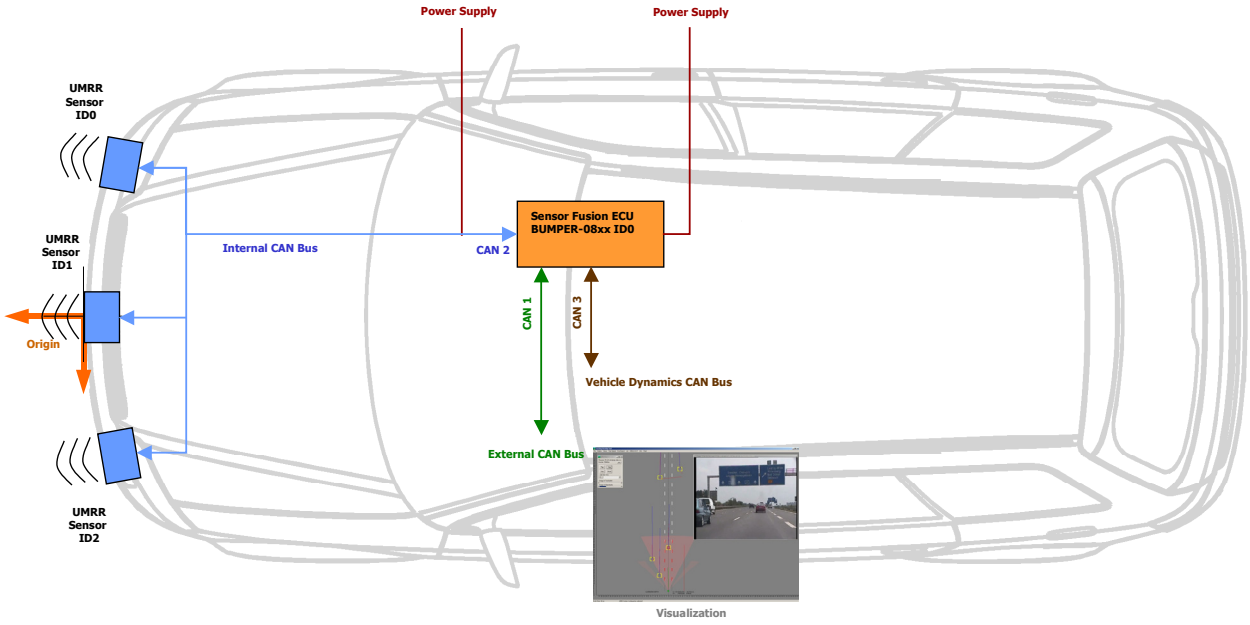
1.1.4 Dual Sensor Setup in Master-Slave Configuration Example (Stop&Go)

The sensor system may consist of a number of individual sensors (Slaves) while one of them works as central processing unit (Master). The latter controls the whole system, interprets the sensor data and communicates with the vehicle.



1.1.5 Multi-Sensor Setup Example (ACC with Stop&Go)



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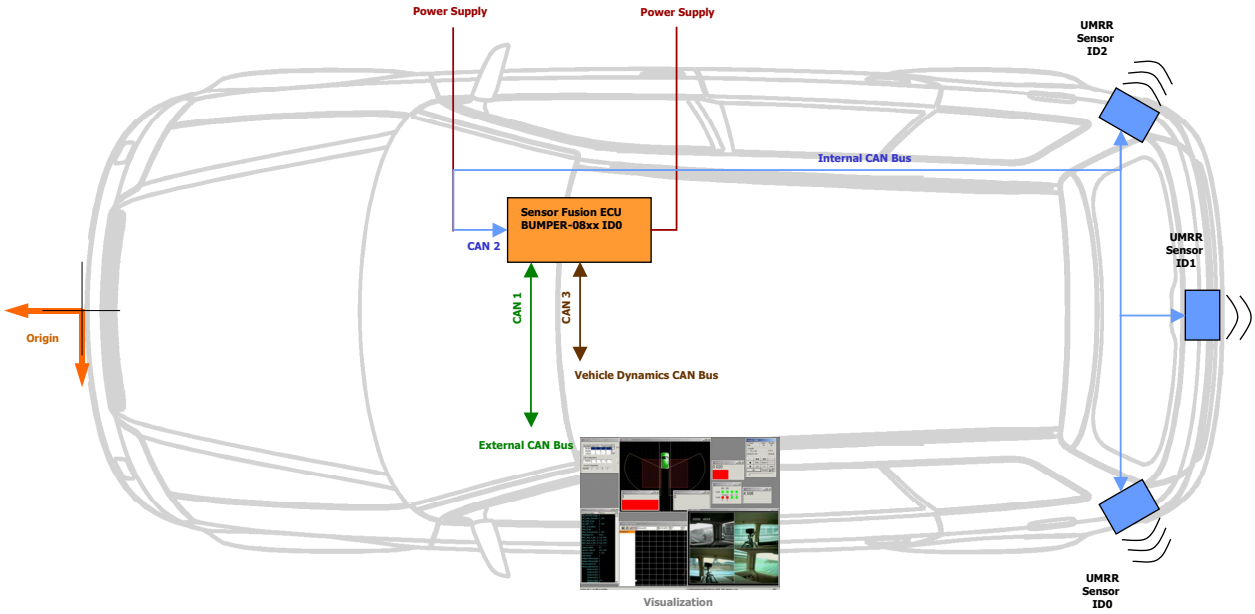
1.1.6 Multi-Sensor Setup Example (Lane Change Assist with Blind Spot Detection)



1.1.7 Multi-Sensor Setup based on FlexRay Bus Example (ACC and Lane Change Assist)