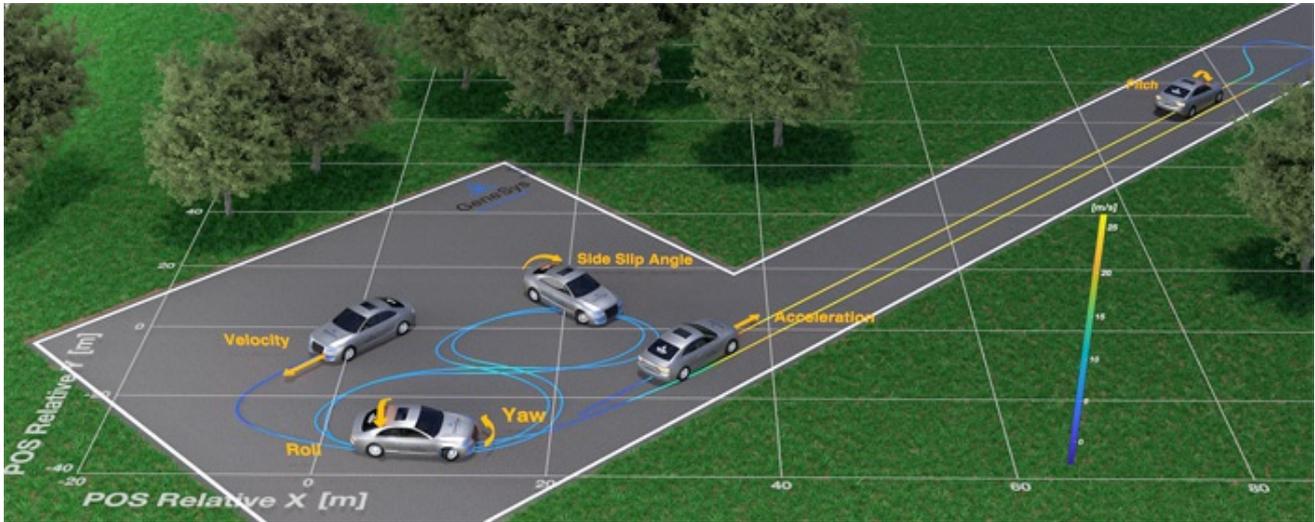


### Vehicle testing, ADAS, and autonomous driving functions

The GNSS-aided inertial system ADMA from Genesys (Germany) was developed specifically for vehicle dynamics testing and ADAS (advanced driver assistance systems) evaluation in the automotive industries.



Initialization due to inertial sensors (Source: Genesys)

The inertial measurement unit (IMU) provides position and motion data of a vehicle "live" and without drift when the vehicle is stationary. The device is configured via web browser. Due to the initialization in its category, the ADMA (automotive dynamic motion analyzer) is ready for operation in a few minutes, explained the company. The product permits dynamic measurements of motion states such as acceleration, speed, position, rotational speed, orientation, and sideslip angle of the vehicle.

#### Initialization

Due to its inertial sensors, commissioning and initialization of the analyzer can be performed. Once the antenna has been mounted on the vehicle roof, the device is installed in the vehicle and the cables are connected, the configuration is completed via the built-in web interface. During the initialization run, the current transient state of the Kalman filter can be displayed in the logger or in any data acquisition system. Maximum performance of the inertial components is achieved with full initialization. Once set up and configured, no further handling is necessary, said the company.

Another challenge is to master the sensor drifts of the IMU, especially when the vehicle is stationary. Due to the sensors installed in the ADMA and signal processing algorithms, the vehicle standstill can be detected, and the sensor drift is compensated. Whether the vehicle is moving or stationary, vehicle movements are always recorded. This eliminates the need for regular re-initialization.



GNSS-aided inertial system with an output rate of 1000 Hz and data latency (Source: Genesys)

#### Data-rate and data latency

The device generation ADMA 3.0 is equipped with output rate of 1000 Hz with unlimited data set and a data latency of less than 1 millisecond. For example, if a vehicle is moving at 100 km/h, the position can be resolved to less than 2 cm. The device includes CAN interfaces for data output, configuration, and driving robots. An interface for connecting a so-called indoor positioning system (IPS) is already prepared. IPS enables indoor driving tests to be carried out to the centimeter under reproducible environmental conditions, explained the company.

The GNSS-aided inertial system is used for application ranges, such as vehicle dynamics testing, brake and acceleration measurements, chassis tuning, tyre testing, driving comfort analysis, road surveying, validation of simulation models, navigation of driving robots, validation of driver assistance systems, and development of automated driving functions.

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