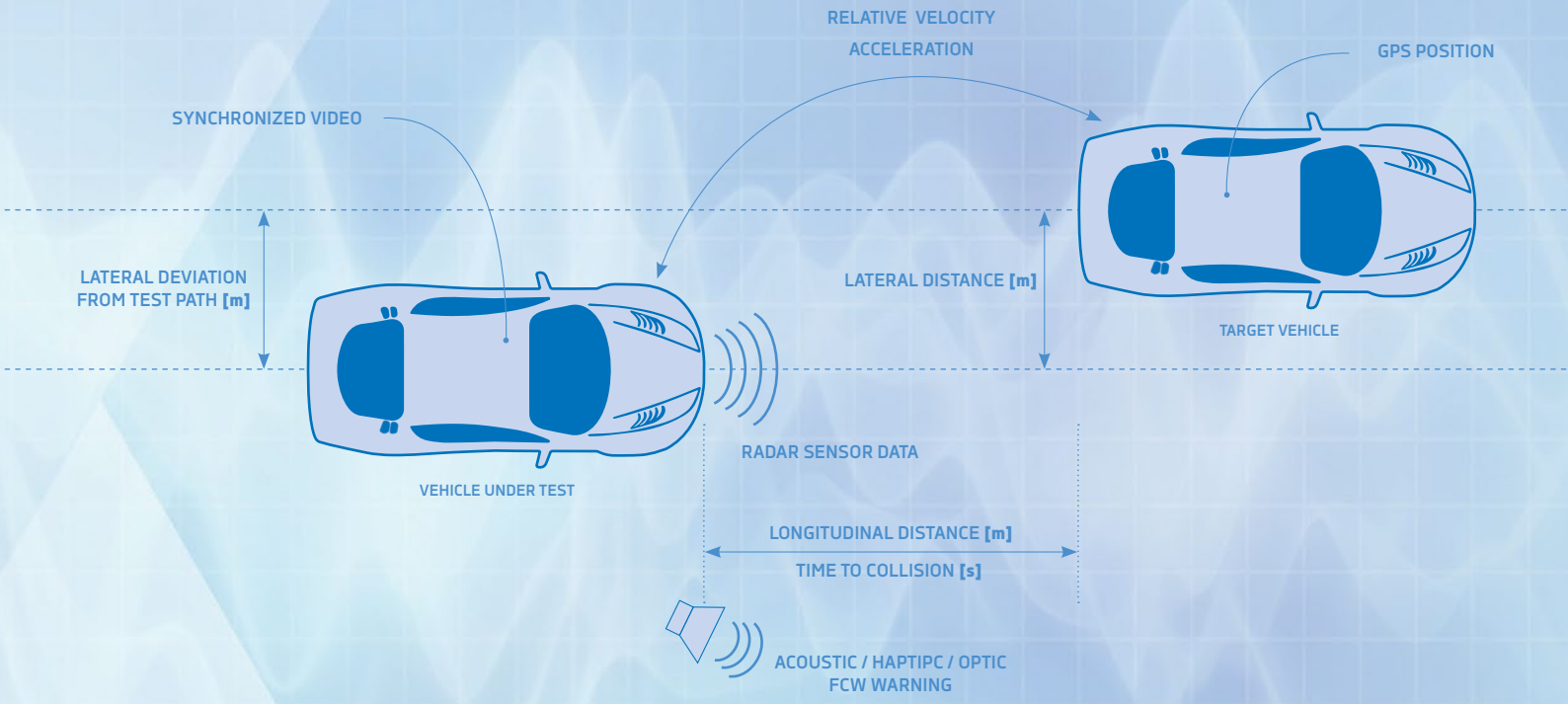


ADVANCED DRIVER ASSISTANCE SYSTEMS

DEWETRON provides the ideal solution for developing and benchmarking Advanced Driver Assistance Systems.

All data between one or more vehicles stays fully synchronized, can be used in online calculations and visualized in a live, 3D display. Based on precision measurement of position and movement with GPS based IMUs (Inertial Measurement Units), this system features position accuracy down to the centimeter range.

YOUR BENEFITS

- All ADAS tests can be done using the same hardware
- Perfect synchronization of all signal sources from two or more cars or moving objects
- Easy mounting, setup, alignment and calibration
- Online data transfer to master system
- High accurate, combined GPS & Gyro data
- Reproducible tests
- Online calculation of relative distance, speed, acceleration, etc.

SYNCHRONOUS INPUT SIGNALS

GPS POSITION AND VELOCITIES

RELATIVE POSITION TO OTHER OBJECTS

ROLL, PITCH, YAW

DRIVING ROBOTS

ACOUSTIC SIGNALS

LIGHT BARRIER

MEASUREMENT STEERING WHEEL

CAN/FLEXRAY BUS DATA

CCP/XCP DATA FROM ECU

VIDEO DATA

WHEEL PULSE SENSOR

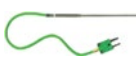
WHEEL VECTOR SENSOR

WHEEL FORCE SENSOR

TIRE TEMPERATURE

BRAKE PRESSURE

ACCELERATION



TEMPERATURE

STRAIN GAGES

ADVANTAGES

WITH DEWETRON'S ADAS TEST SYSTEMS

> Online calculation of relative distance and velocity to multiple objects like lines, curves, cones and vehicles
> Data from all vehicles is recorded fully synchronized
> Online check of the data quality
> Master manages the measurement and the configuration of the slave – so the driver can concentrate on his task
> Online data transfer of selected channels from slave to master
> Measurement data is redundantly stored on each measurement unit and can be transferred after the measurement

ADAS CONFIGURATION

The master unit collects all synchronized data from the master vehicle and the slave unit via WLAN.

The measurement systems are synchronized and send the data to the master measurement unit.

GYRO DATA

The ADAS system uses the GeneSys inertial measurement system ADMA (Automotive Dynamic Motion Analyzer) for six degree of freedom motion analysis in combination with high performance GPS position measurement. This combination avoids the drawbacks of each system – the drift of the gyro platform and outages and jumps in GPS position. Kalman filters are used for optimizing the measured result.

2 CM POSITION ACCURACY WITH RTK

(REAL TIME KINEMATICS)

This technology improves the position accuracy. With the known position of the base receiver, errors in the GPS signal transmission can be calculated. The data from the DGPS corrections are transmitted vie WLAN to a mobile GPS receiver for an online correction of the position data.

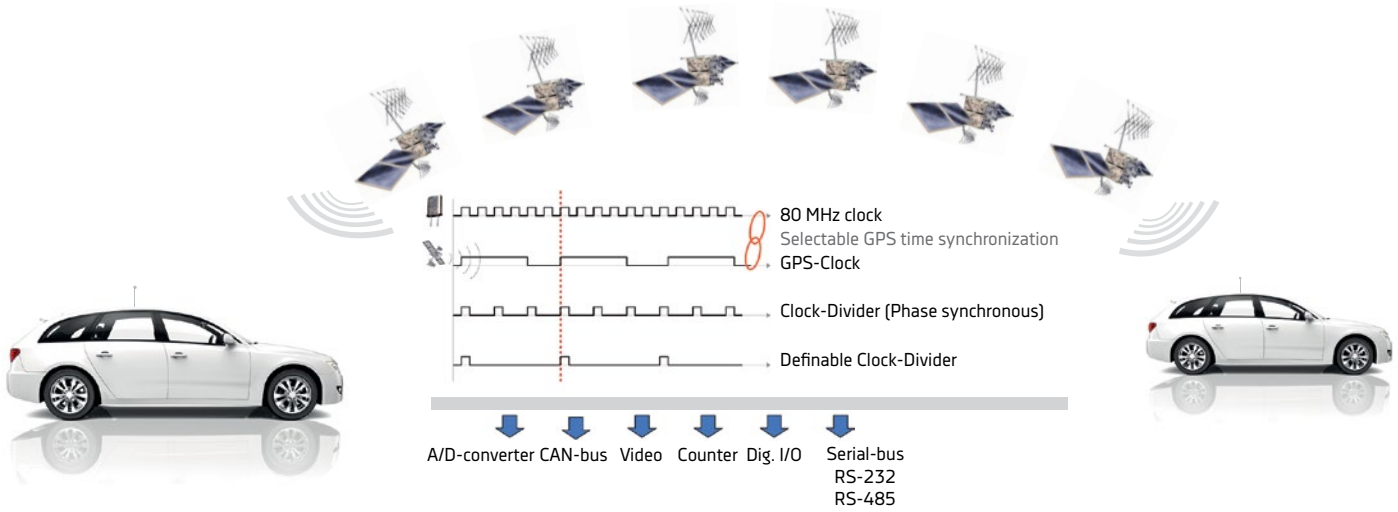
> Elimination of GPS outages
> Suppression of jumps in GPS position
> Residual accuracy is better than Inertial Measurement Unit or GPS accuracy on its own
> Position data with high dynamic and bandwidth
> Highly accurate motion states of a vehicle with low setup time
> All motion states in body-fixed, levelled and NED coordinates
> All motion states in 3D (t, a, v, p, dΦ/dt, Φ) via CAN or RS-232 or Ethernet

HIGH ACCURACY

ADAS requires precision accuracy of the measured parameters. This is achieved using the latest technology of data acquisition, inertial measurement, GPS technology and test methodology.

SYNC-CLOCK™ TECHNOLOGY

To achieve the required accuracy, we implemented a high precision system clock. All data channels, analog and digital signals, CAN information or video are synchronized.



ADAS APPLICATIONS

All ADAS tests can be conducted using the same hardware. DEWETRON offers a flexible measurement system which in combination with the gyro system ADMA from GeneSys and the robot system from Stähle, performs high precision tests. With the hardware synchronization all relevant parameters are already calculated and displayed during the measurement.

ADAPTIVE CRUISE CONTROL (ACC)

One of the challenges when testing the longitudinal control system is synchronized timing because ACC is measuring the relative position and velocity between two or more vehicles. The most important feature for capturing high-quality measurement data is the perfect synchronization of all signal sources.

MEASURED SIGNALS

> Relative distance between the vehicles
> Absolute and relative velocity
> Longitudinal acceleration
> Longitudinal deceleration
> Moment of acoustic, optic and/or haptic warning
> Lateral deviation

FORWARD COLLISION WARNING (FCW)

The primary purpose of FCW tests is to measure the time between when the driver is warned of an imminent crash, and the acoustic/haptic warning.

Before being approved for the US market, vehicle manufacturers who offer FCW must test their system in compliance with the FCW Confirmation Test defined by the National Highway Traffic Safety Administration. The DEWETRON systems for FCW tests are fully compliant to the NHTSA requirements and specifications.

MEASURED SIGNALS

> Position/trajectory of both vehicles
> Speed of both vehicles
> Yaw-rate of both vehicles
> Deceleration of POV
> Acoustic/Optical warning signal
> Request of warning signal

AUTONOMOUS EMERGENCY BRAKE (AEB)

AEB tests, especially the Euro NCAP test, require measurements relative to a virtual vehicle target (balloon car) that does not carry measurement equipment due to the possibility of high impact collisions.

Therefore, the software must accurately calculate the position of the vehicle target.

Driving robotics are needed to control the longitudinal and lateral movement of the vehicles during testing. DEWETRON's capability of synchronously acquiring input signals from all sources is essential for the accuracy and the comparability of the data.

COMPLETE MEASUREMENT SOLUTION

DEWETRON teamed up with other experts in the automotive testing industry to provide a complete measurement solution for AEB tests:

> GeneSys Elektronik G.m.b.H., specialist in gyroscopic and GPS based sensors
> Stähle G.m.b.H, manufacturer of high-end robotic systems
> Technical University of Dresden/ Germany, faculty of transportation science & technology as experienced insider in vehicle testing

LANE SUPPORT

For tests of lateral control systems such as lane departure warning or lane keeping assistant (LDW/LKA), the measurement system calculates the relative position, angle and velocity between the vehicle and stationary objects, such as lines, curbs or traffic signs. The acquisition of synchronized video data is important for such tests.

MEASURED SIGNALS

> Distance to side, middle line or road edge
> Steering angle, moment and velocity
> Lateral acceleration
> Yaw rate
> Moment of acoustic, optic and/or haptic warning
> Driver view (video)

CONFIGURATION EXAMPLES

	DEWE2-M4 (with ADAS configuration)	DEWE2-M13s (with ADAS configuration)
Analog input channels	2 free slots for TRION™ series modules	11 free slots for TRION™ series modules
Digital channels	8 DIO and 2 CTR or 8 DI	
Channel expansion	Yes	
CAN interfaces	4	
Video	DEWE-CAM-GIGE-120 or USB	
Display	External MOB-DISP-x	
Power supply	11 to 32 V_{DC} rated (max. 10 to 36 V_{DC}) isolated; external AC power supply adapter included	
Dimensions (W x D x H)	317 x 252 x 108 mm 12.5 x 9.9 x 4.3 in.	441 x 230 x 177 mm 17.4 x 9.1 x 7 in.
Weight	Typ. 3.9 kg (8.6 lb)	Typ. 13 kg (28.6 lb.)
Additionally required sensor	GeneSys ADMA INS/Gyro system	
TRION™ series modules are available for almost all kinds of sensors		

SENSORS & ACCESSORIES

Seat mounting kit from Stähle

ADMA-G-PRO+

DEWE-CAM-GIGE-120