
# FUNCTIONAL SAFETY TESTING

## ACCORDING TO ISO 26262

What happens in case of a malfunction of a safety relevant system such as ESP or active steering?

The international standard ISO 26262 addresses such questions by defining requirements, processes and methods to mitigate the effects of systematic faults and random hardware faults in the automotive field.
Together with the leading European car manufacturers DEWETRON has developed a unique measurement system that tests active safety systems.

### YOUR BENEFITS

> Quick system installation and setup
> CAN, FlexRay and XCP support
> Ready-to-print report generator

## TEST PROCEDURE

Any functional safety test consists of two phases: constant phase (pre-trigger) and dynamic phase (post-trigger). The simulation of a sensor error triggers the measurement and separates the pre-trigger phase (constant phase) from the post-trigger phase (dynamic phase).
In the constant phase, the vehicle is driving in a steady state under constant conditions (e.g. constant speed, lateral acceleration, curve radius) in order to get reproducible test results.

01 CONFIGURATION PHASE
02 ARM MEASUREMENT
03 CONSTANT PHASE
04 TRIGGER
05 DYNAMIC PHASE
06 STOP STORING
07 ANALYZE PHASE

## SYNCHRONOUS INPUT SIGNALS

GPS POSITION AND VELOCITIES

DISTANCE TO LINE/CURVE/TRAJECTORY

GYRO DATA

MEASUREMENT STEERING WHEEL

WHEEL SPEEDS

CAN/FLEXRAY BUS DATA

CCP/XCP DATA FROM ECU

## HIGH-PRECISION SENSORS

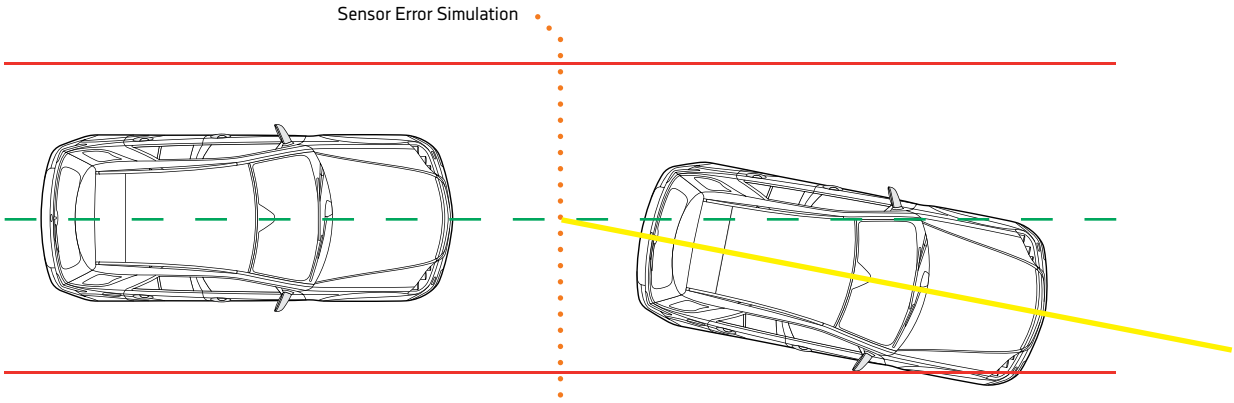
Functional safety measurements for active-safety systems are based on precise measurement of rotation, acceleration and position in all three axes. DEWETRON therefore relies on one of the best motion sensors on the market: the GeneSys ADMA.

The GeneSys ADMA is a 6 DOF motion sensor which combines rotational data (from high-accuracy fiber-optic gyros), acceleration data (from servo-type accelerometers) and position data (from a RTK-enabled GPS receiver) in one compact unit and combines the raw sensor data in a fast Kalman-filter to achieve the best possible accuracy.

**KEY FEATURES**

> Rotation (drift < 1°/h)
> Acceleration accuracy of 1mg
> Position down to 0,02m
> L1/L2 GPS receiver capable of receiving RTK correction data from base station
> Up to 1000 Hz output rate
> Synchronization to DEWETRON measurement systems

# SENSOR ERROR SIMULATION




Measurement of controllability and deviation

## TOUGH & RELIABLE

The industry-approved PXI standard and the new internal construction of the DEWE2 series makes them our most rugged measurement system so far. Tested for shock up to 30g and vibration up to 20 m/s² as well as an operating temperature range of -20°C to +50°C (-4°F to +122°F) the DEWE2 systems are constructed for testing under harsh conditions.

## XCP/CCP AND FLEXRAY SUPPORT

The DEWE2 systems also support the XCP protocol which allows you to record the ECU internal status during your tests and measurements. The upcoming FlexRay bus is supported.

## INTERNAL BUFFER BATTERY & INDEPENDENT POWER SUPPLY

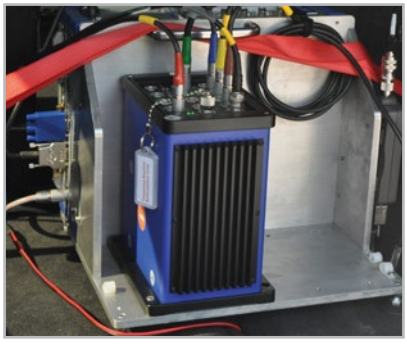
In most cases power to the measurement system and the sensors is supplied by the vehicle battery. This can be problematic however, because the power management of modern vehicles might suddenly cut the supply if a high-priority system (like active-safety systems) requires more battery power. The ECU unit might need a reset – turning the engine off and on again – after an error trigger or system malfunction, or you need a gas refill but don't want to turn off the engine because the measurement should not be stopped...
These short power outages can be cumbersome if you need to get your test-cycles done within a limited time. To resolve these issues, the DEWE2 systems can be upgraded with an internal buffer battery to bridge supply outages of up to 10 minutes.
The scarcity of available energy in modern vehicles make it necessary to be independent from the vehicle power network. DEWETRON offers a fully battery powered solution with hot-swappable batteries for such applications.


# CONFIGURATION EXAMPLES

| | DEWE2-M4-FS (with Functional Safety configuration) | DEWE2-A4-FS (with Functional Safety configuration) |
|---|---|---|
| **Analog input channels** | 2 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 | Internal 13" display |
| **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)** | 318 x 253 x 108 mm (12.5 x 10 x 4.3 in.) | 318 x 253 x 128 mm (12.5 x 10 x 5 in.) |
| **Weight** | Typ. 3.9 kg (8.6 lb) | Typ. 5.9 kg (13 lb.) |
| **Additionally required sensor** | GeneSys ADMA INS/Gyro system | |
| TRION™ and MDAQ series modules are available for almost all kinds of sensors | | |

# SENSORS & ACCESSORIES

MOB-DISP-12
External display



ADMA-MOUNT-KIT

DE-POWERBOX-11
Power distribution box