

# Static Deployment Test System

Nowaday airbag test systems are an integral part of all manufactured cars. These passive safety systems must pass a variety of tests before they can be installed in vehicles. Most attempts are made by destructive tests and accompany all phases of the production of an airbag. The static test facility can be also used for quality inspection of mounted airbag modules. This method uses the Static Deployment Test (SDT), which is explained below as a modular system.

The solution for an integrated airbag test facility is based on HuDe's modular design concept and scalable in a wide range.

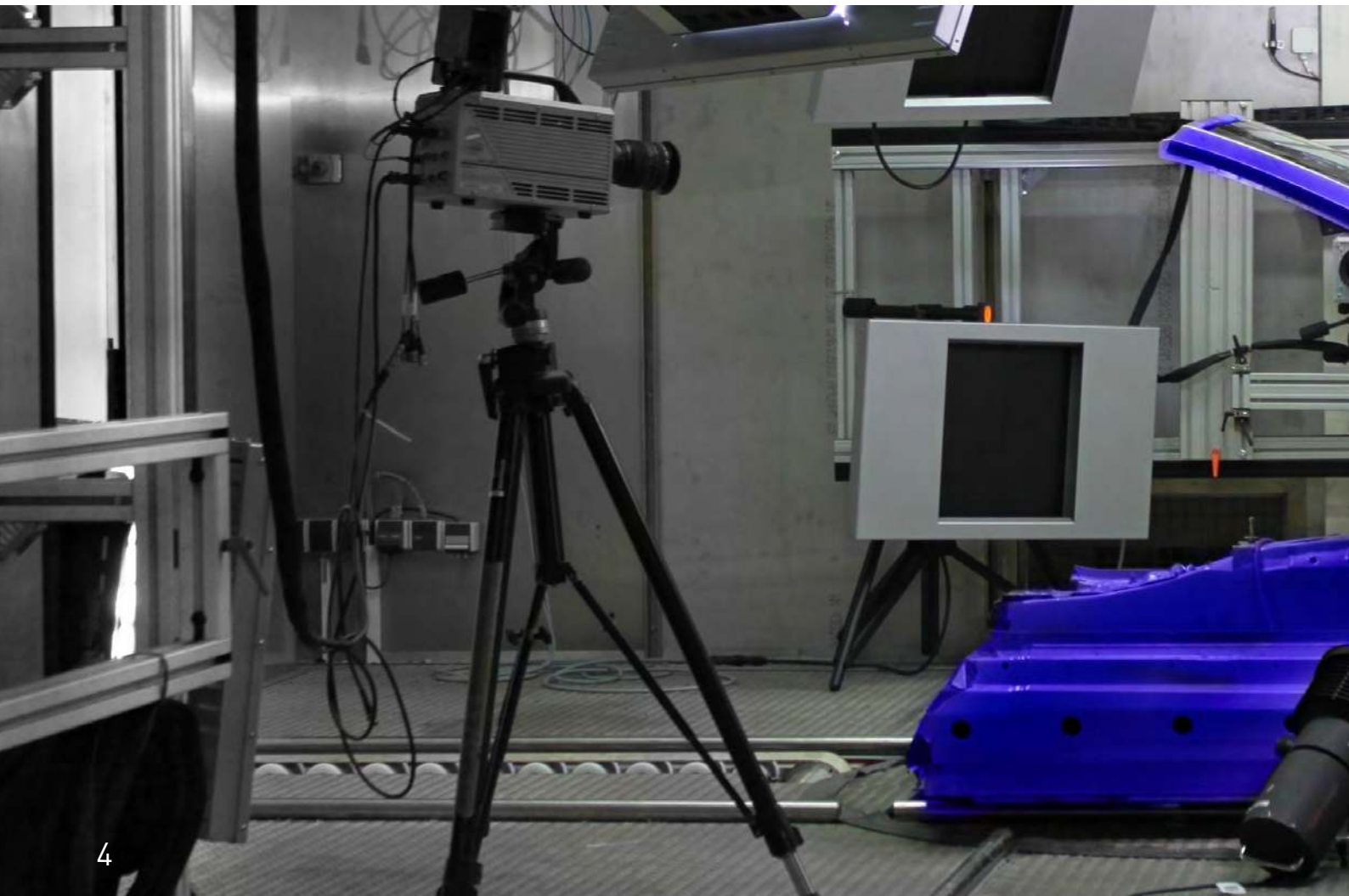
All tests are processed in accordance with AK-LV specification (Arbeitskreis Audi, BMW, DC, VW) and based on international regulations SAE J211, ISO 12097, ISO/TC 13499 and other. The systems are prepared for real temperature testing in range of  $-35^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$  with optionally extended ranges.

Test objects can be:

- Steering Wheels – with DAB (driver airbag)
- IP – instrument panels with PAB
- SAB – side (seat) airbags
- IC – inflatable curtains
- And many more...

The operation and data acquisition system controls several functions.

- Single, double and multi stage airbag ignition with precise delay
- Fully integrated high speed camera
- Camera positioning system
- Test stand lighting in various groups
- Shuttle control to move test targets
- Control for ventilation system
- Control for temperature chamber opening
- Door lock for test room
- Optional temperature monitoring



# Static Deployment Test System



## Testing

For test principle two basic procedures are, testing inside and testing outside of climate chambers. The test systems for inside chamber testing typically has the necessary lights in the chamber.

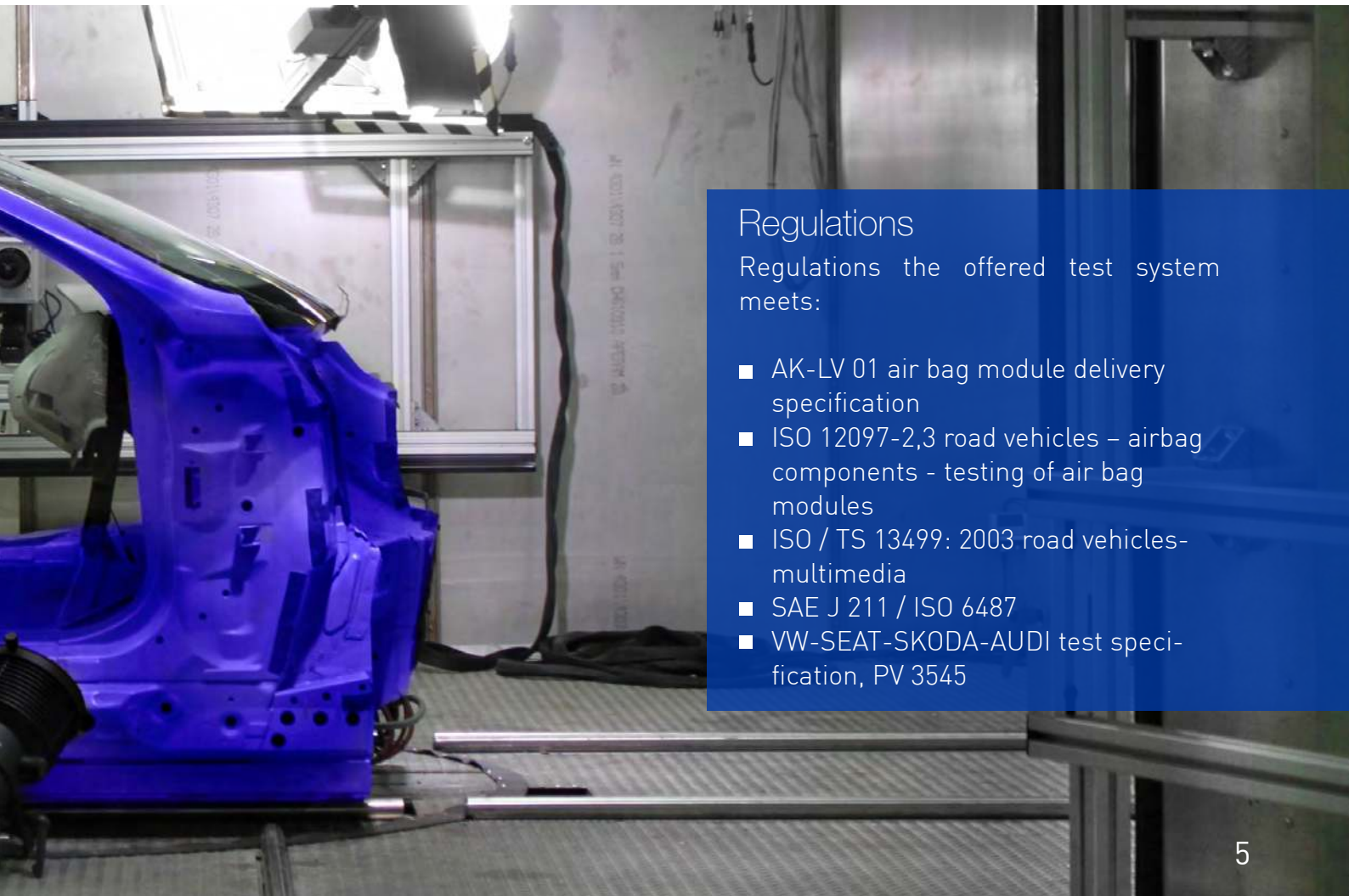
These lights are activated very short before the specimen is fired so the temperature change is minimal.



## Interfacer

The HuDe Interfacers connects the various components to the main control system. It can be adapted and expanded according to individual requirements.

Due to the modular upgradable design, the Interfacer is also equipped for future technologies.



## Regulations

Regulations the offered test system meets:

- AK-LV 01 air bag module delivery specification
- ISO 12097-2,3 road vehicles – airbag components - testing of air bag modules
- ISO / TS 13499: 2003 road vehicles-multimedia
- SAE J 211 / ISO 6487
- VW-SEAT-SKODA-AUDI test specification, PV 3545

# System Overview

With the innovative HuDe airbag deployment test system (SDT), you will receive your turnkey laboratory from a single source.

The deployment test takes place in the soundproofed test room, which is equipped with automated systems such as lights, cameras, exhausting system, shuttle system and safety components. The arrangement of the climatic chambers ensures rapid test procedures to meet the current requirements of the removal time of 10s.

## Special Request

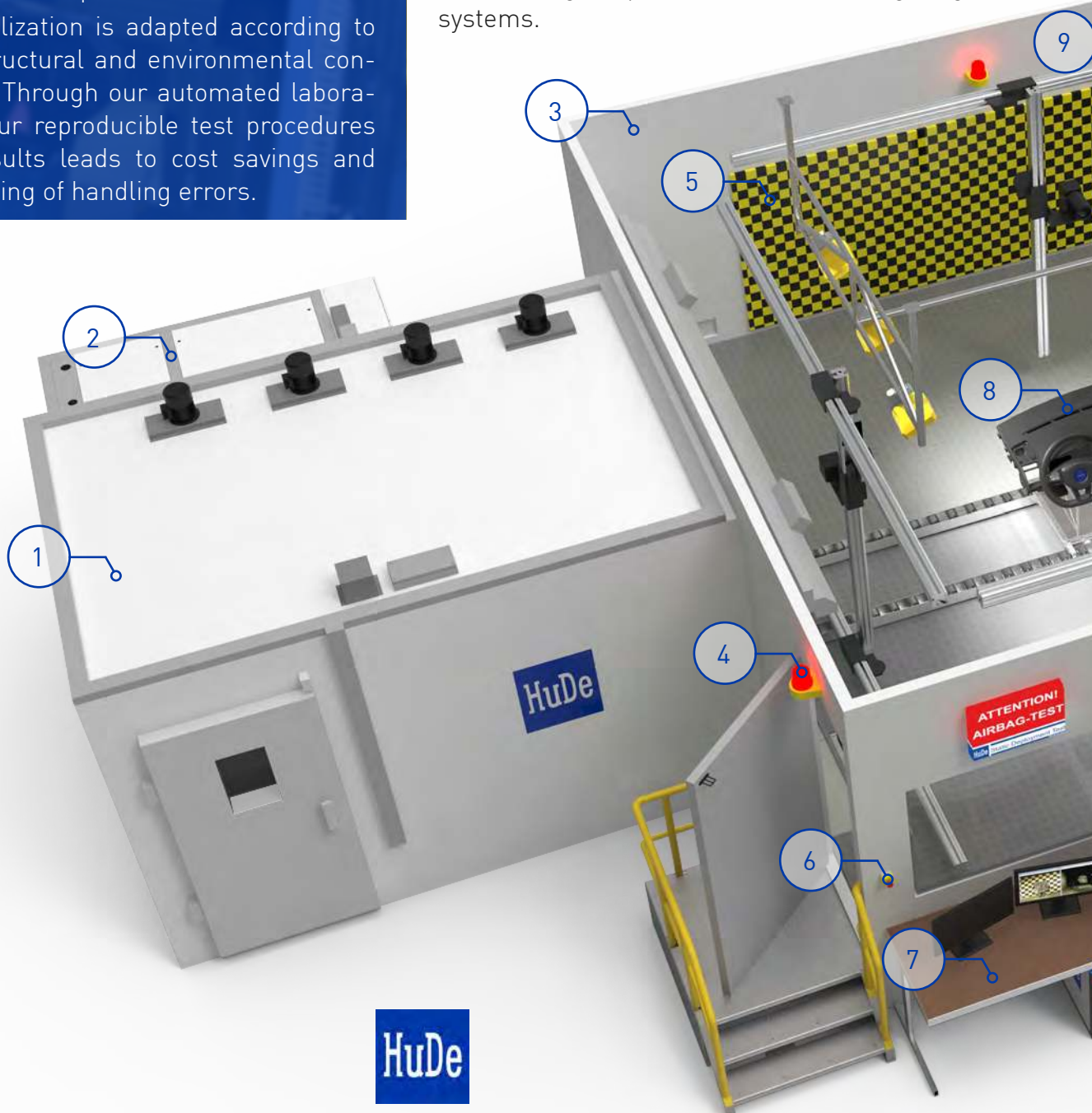
The realization is adapted according to your structural and environmental conditions. Through our automated laboratory, your reproducible test procedures and results leads to cost savings and decreasing of handling errors.

## Ignition System properties:

Up to 8 channel ignition, fully programmable, 0.5 amps per channel Adjustment of independent timing and triggers in steps of 11s Airbag ignition according to all relevant specs (BMW, GM, Ford, VW, Audi, Porsche, Daimler Chrysler, PSA, Renault).

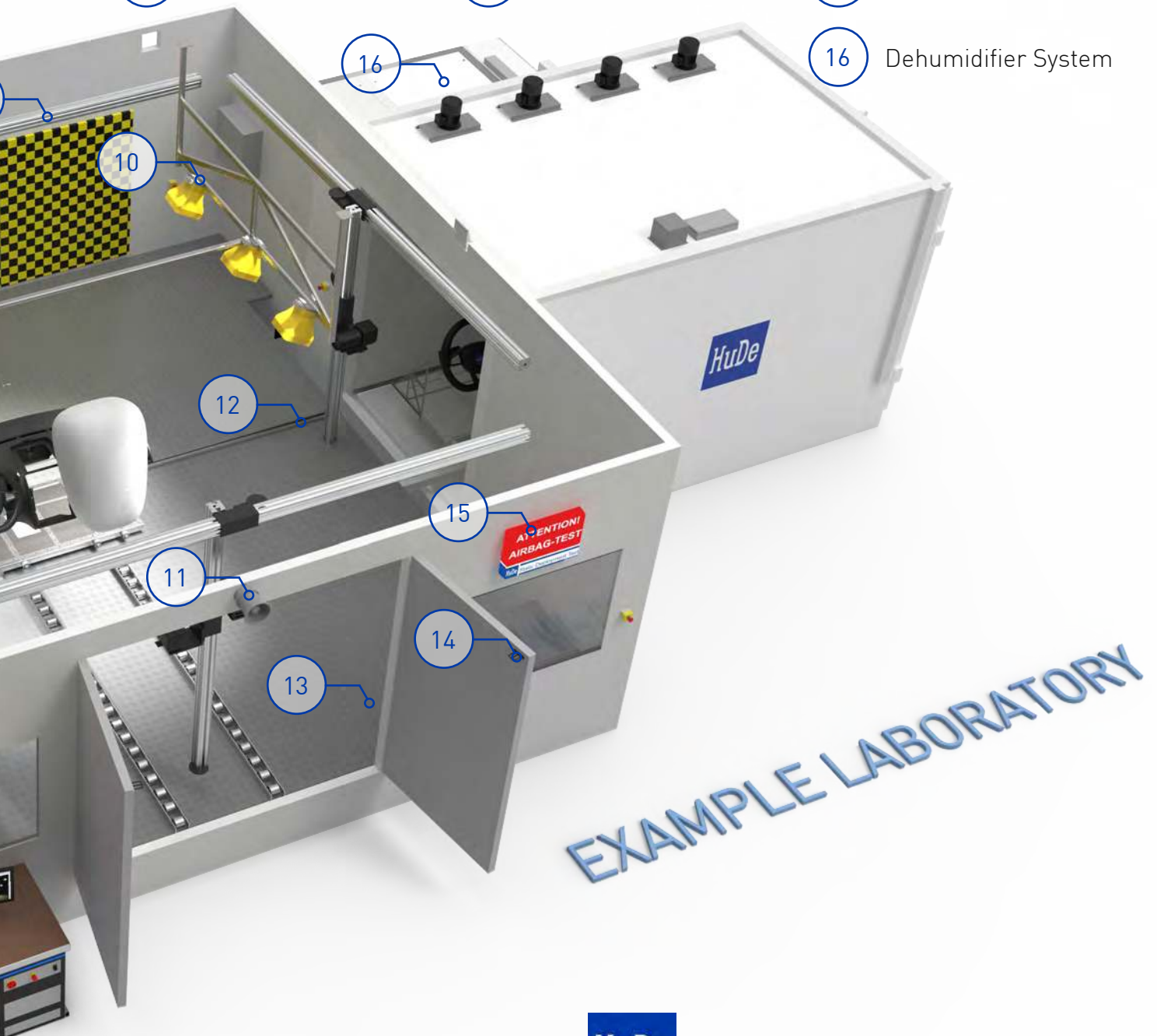
## Data Acquisition System properties:

8 channel data acquisition with sampling rate 100 kHz per channel data acquisition and filtering according to SAE J211 / ISO 6487 sophisticated data storage and backup system high speed camera and lighting systems.



# System Overview

- |    |                    |    |                |    |                                     |
|----|--------------------|----|----------------|----|-------------------------------------|
| 1  | Climate Chamber    | 2  | Control System | 3  | Isolated Test Area                  |
| 4  | Warning Light      | 5  | Checker Panel  | 6  | Emergency Stop Switch               |
| 7  | Operator Workplace | 8  | Test Object    | 9  | Automated Camera Positioning System |
| 10 | Light System       | 11 | Siren          | 12 | Shuttle System                      |
| 13 | Elevated Ground    | 14 | Door Lock      | 15 | Signal Light                        |
|    |                    |    |                | 16 | Dehumidifier System                 |



# Testing Application

## Accessories

### Ergonomics

With our own developed ignition switch, HuDe systems are able to combine and control different test areas with only the Interfacer. At the customized software you can choose the test area as well as configure independently the required setup.

For any kind of errors the SmartNotify started our visual error line. Followed with the Smart Ignition Box our products are prepared for easy handle and visual check of correct operator setup.

Blue:	Neutral mode
Green:	Ready to perform
Red:	Test in progress
Red, Flash:	Emergency stop situation

In addition to the classic safety components such as acoustic signaling devices and flashlights, the colorfully glowing SmartNotify on our control cabinet also indicates the current system status!

The combination of software and state-of-the-art LED technology enables the dynamic display of plant status using intuitive lighting scenarios.

SmartNotify merges meaningful functionality with design and, through its intuitive visualization scenarios, provides a significantly improved perception of the system status and leads to an increase in ease of use.

The Smart Ignition Box displays the current status of the firing channels it can also be seen from the control station.

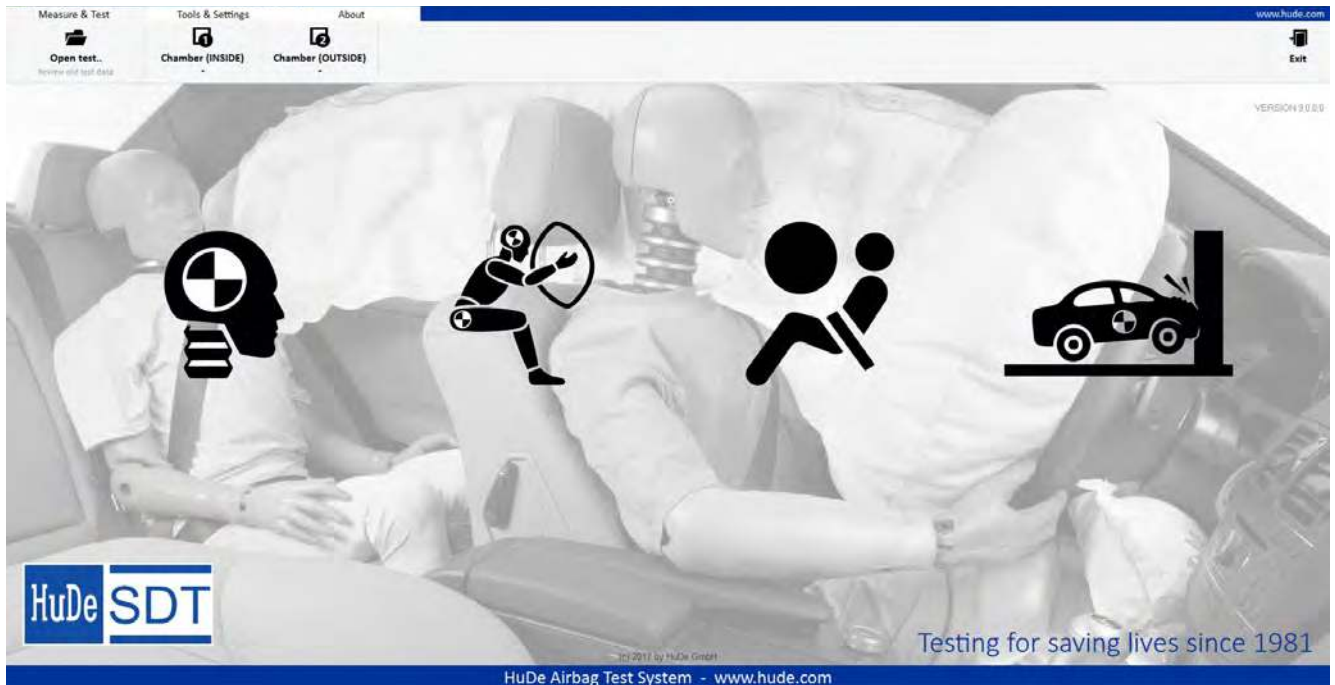
### Additionally available accessories

- Isolated Test Rooms
- Humidity Fire System
- Uninterruptible Power Supply Systems
- Exhausting System
- Ignition Switches
- Camera Connection Boxes
- Sensors
- Tracker Panels
- Warning Lights
- Door Locks
- Sirens
- And many more...



# Safety Accessories

## Software



### UNICam

Many HS-Camera brands like Photron, Phantom, IDT, NAC and more can be controlled with UNICam.



### MultiVid

Video player for synchronized video playback of many video files.



### SNIP-PIC-Modul

Software Application to generate videos from POI in videos.



### Synchronized Video and Data

Synchronization tool for a detailed correlation between video and data according to same frame rate.



### Video Evaluation Tool Box

Video tools for evaluation operations as area measurement, object tracking, edge detection, etc.



### HuDe Web-App

System live control over a tablet device with wifi access. Compatible to common browsers.

# Testing Equipment



## Isolated Test Area

In the closed cabins, tests can be performed regardless of the environment. They also provide soundproofing and fit to individually customer requirements.

We help our customers by planning the test area as well as the isolated test room.



## Light System

In order to achieve the best image quality of the high-speed cameras, a lighting system is absolutely necessary.

The integration of different lighting technologies (LED, HMI, Halogen) ensures sufficient illumination of the impact area. The ceiling mounted lighting system is arranged that no shadows can be seen in pictures.

## Turnkey Solution

Since 1982 HuDe stands for competent complete solutions in Automotive Testing Systems. We advise you during the concept phase and help you to determine the right conditions. We take care of the complete integration of all components and control them through our software. Our turnkey solutions are complemented by a long term service. We have already realized worldwide more than 170 airbag testing laboratories.



# Testing Equipment



## Camera Positioning System

Wherever camera systems are used to record test results, repeatability is an important requirement. Picture section, distance, angle and optical lens setup are important factors in achieving an easy-to-compare video record. The HuDe camera positioning system (CPS) takes care of this task in full car crash test facilities and in component test

laboratories. It offers low operation and maintenance costs and is easy to set up. Video results are accurate, consistent and reliable. If all records of a set of tests show the same area of interest and the optical parameters are similar, it is easy to compare test devices and evaluate differences.

The CPS is a modular rail and drive system that can be adjusted to the facility layout in a few simple steps. Areas of interest, test room dimensions and obstacles such as pillars and beams are taken into account to make a real 3D simulation of the future CPS configuration. The final result is an automatically adjusted multi-axis motion system that provides highly precise linear and angular positioning of several cameras. The CPS can be attached to the ceiling of the test area or fixed on the floor or the ceiling of a climate chamber.

