



## HU-Adapter

With a customized calibration system, SPEKTRA can now calibrate testing equipment via the electronic vehicle interface (so-called "HU adapter"). Those are widely used to test electronic components during the general inspection of automobiles in Germany.

### In our service package we include:

- ✓ DAkkS calibration
- ✓ Preventive and corrective maintenance
- ✓ Repairs (if necessary)
- ✓ Review of firmware and releases



[Link to our Website](#)

## On-site calibrations

Your **vibration testing systems** need to be calibrated, but they:

- ✓ cannot be transported
- ✓ are part of a fixed installation
- ✓ must not be absent from the production process for days?

As part of our on-site calibration service for vibration testing systems, we calibrate the entire measurement chain (reference sensor, preamplifier, signal conditioner, vibration control system, power amplifier, exciter). Here, the vibration testing system is excited with both sinusoidal vibrations and shock-type vibration excitations. Before this, the reference sensor is calibrated at DAkkS standards in the SPEKTRA laboratory.

On-site, the vibration testing system is then used to provide vibration accelerations, which are measured using a calibration system that is traced back to DAkkS standards. Here, the calibration is performed by comparing the acceleration indicated by the vibration testing system with the acceleration actually measured by the calibration system.



- ✓ Calibration directly at customer's site
- ✓ Avoid extended downtimes
- ✓ Possible deployment anywhere in the world

## Training courses

Would you like to optimize processes and make your company more successful? Our training courses will get you fit for your area of responsibility. Well-informed, streamlined and perfectly tailored to your requirements.

### Basic training

- ✓ Calibration of vibration measurement systems
- ✓ Calibration of acoustic measuring equipment
- ✓ On-site calibration of vibration testing systems

### Product and user training

- ✓ Calibration system CS18 (vibration, shock, acoustics)
- ✓ Vibration control system VCS

### Advanced training

- ✓ Preparation of measurement uncertainty budgets
- ✓ Customer-specific projects



- ✓ Increase employee potential
- ✓ Optimize business processes
- ✓ Boost motivation

## CS | Services



Your **TESTelligent** partner in the field of

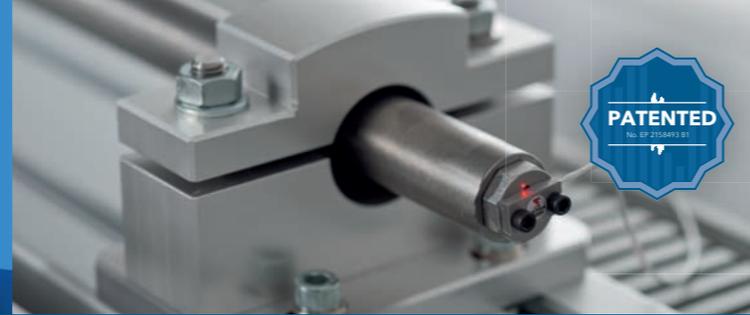
# Calibration

- ✓ Qualified, professional advice
- ✓ Short lead times
- ✓ Lowest measurement uncertainty in the field

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Do you require help with measurement tasks that go beyond these areas? Then we would recommend our solutions in the area of **Device Testing**.



## Acceleration (sinusoidal)

A SPEKTRA CS18 primary calibration system sets global standards, as do the calibration services offered by SPEKTRA for vibration measurement systems. Alongside all types of analog sensors, we can also calibrate digital sensors and trace them back to the national standard.

### Scope of services:

- ✓ Frequency range from 0.05 Hz ... 50 kHz
- ✓ Amplitudes ranging from a few mm/s<sup>2</sup> ... 500 m/s<sup>2</sup>
- ✓ Lowest measurement uncertainties
- ✓ Primary calibration of reference standards
- ✓ Combined total of 17 vibration exciters for calibration of a wide range of different test objects
- ✓ High test object weights of up to 50 kg

### Test equipment:

Vibration sensors (monoaxial, triaxial), impact hammers, geophones, seismometers, tilt sensors, reference laser vibrometers ...

## Acceleration (shock-type)

In the calibration laboratory for shock-type acceleration excitations, we can calibrate a wide range of different shock-type sensors with varying exciters to suit the specific test object. Alongside a simple impact pendulum, our basic array of equipment also includes fully-automated exciters that meet the state of the art. For high shock-type accelerations, our customers trust in the patented solution of our Hopkinson bar.

### Scope of services:

- ✓ Amplitudes up to 200 000 times gravity
- ✓ Shock impulse widths from 10 ms ... 20 μs
- ✓ Fully-automated calibration on SPEKTRA shock-type acceleration measurement systems
- ✓ Calibration with a monopole or dipole shock pulse
- ✓ Use of a patented Hopkinson bar exciter

### Test equipment:

Shock sensors

## Acoustics

As one of just a few laboratories in Germany, SPEKTRA is accredited for "real free-field calibration". The advantages of this type of calibration service are obvious. The free-field microphones largely used in practice are calibrated in precisely their intended acoustic environment. This eliminates the need for conversion calculations from pressure chamber to free-field frequency response and the potential associated errors.

### Scope of services:

- ✓ Real free-field calibration up to 20 kHz for measuring microphones, sound level meters and other acoustic measuring instruments
- ✓ A compact anechoic space can be set up in the laboratory
- ✓ Pressure chamber calibration from 0.1 Hz ... 16 kHz
- ✓ Accredited electrical calibration of sound level meters

### Test equipment:

Calibrators, pistonphones, outdoor microphones for air/road traffic noise measurement, sound level meters, surface microphones

## Audiometry

Since 2015 we have been accredited as the only calibration laboratory in Germany to perform DAkkS-certified calibrations of audiometric calibration instruments and trace them back to the national standard. Our portfolio includes:

### Calibration of artificial mastoids:

DAkkS-accredited calibration of artificial mastoids in accordance with DIN EN 60318-6 (measurement of the mechanical impedance and degree of power transmission).

### Calibration of "artificial ears"

Acoustic calibration of couplers and so-called ear simulators (artificial ears) in accordance with DIN EN 60318 and, beyond this, also DAkkS-certified pressure chamber qualification of the installed measuring microphones in the frequency range from 31.5 Hz to 16 kHz.

### Calibration of an "artificial mouth"

Acoustic calibration of an artificial mouth via measurement of the amplitude frequency response (frequency range: 100 Hz to 10 kHz).



- ✓ Accredited primary and secondary calibration
- ✓ Highly efficient work processes and extremely low measurement uncertainty
- ✓ Support for accreditations, e.g. consultation and preparation of a measuring uncertainty budget



- ✓ Customized shock adapter available for various test objects



- ✓ Real free-field calibration
- ✓ Compact, transportable, anechoic chamber (size: 2 m x 2 m x 2.5 m)
- ✓ Monitoring of measurement instruments in the automotive sector and in aviation



- ✓ The only accredited laboratory in Germany in this sector
- ✓ Accreditation enables the calibration of artificial mastoids and ear simulators in accordance with DIN EN standards