

CS18 LMS

Calibration System Low-Medium-Shock



Sensor Calibration
Crash Test

Applications

- **Secondary calibration** of shock-sensors as well as complete measuring instruments in form of a measuring chain, with very high precision and efficiency, according to **ISO 16063-22** (calibration by the comparison method)
- Secondary calibration of **accelerometer standards**
- **Testing** of small parts (e.g. MEMS)

Range of Use

- **Certified calibration laboratories**
- Departments of **measuring instrument verification** in research and industry, particular in **automotive crash test laboratories**
- **Quality assurance** in sensor manufacturing

Features

- **Traceable** to Physikalisch-Technische Bundesanstalt (PTB) Braunschweig by the SPEKTRA Calibration-Laboratory D-K-15183-01-00 (**DAKKS Calibration Certificate**)
- **Pneumatic shock exciter** with integrated reference standard; **Air Bearing** for Anvil
- **Broad amplitude range** from **5 g_n ... 10,000 g_n**
- **Type of excitation:** shock half sine
- **Pulse duration** up to 5 ms
- Sensor (DUT) mass up to **50 gram** (can be higher for testing applications)
- Excitation axis: **vertical**
- **Good repeatability** of shock
- Realization of **all automatic calibrations** according to own test regime (up to 1 shock/s)
- **Calibration of sensors** with / without signal conditioner
- **Direct connection of piezo-resistive sensors** by means of integrated **PR signal conditioner**
- Determination of **aptitude for calibration** (bridge resistance, offset, drift) of PR sensors in conjunction with software **PR measurement**
- **Upgradeable** to a combined calibration systems, e.g. type CS18 LF / LMS
- Automated regulation of amplitudes up to **600 g_n** is possible



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Components

- Control system **SRS-35** by SPEKTRA with integrated PR signal conditioner
- Shock exciter **SE-201 PN-LMS** by SPEKTRA with **Control box**
- Reference standard transducer **BN-02**
- Standard PC

Performance specification of CS18 LMS with reference standard BN-02

for environmental conditions: temperature 23°C (± 2°C) and relative humidity 30 % ... 75 %

Shock Acceleration	5 g_n ... 10,000 g_n	
Pulse Width	0.1 ms ... 5 ms	
Sensor Mass (DUT)	max. 50 gram	
Expanded Uncertainty ¹⁾	5 g_n ... 20 g_n	< 2,0 %
	> 20 g_n ... 200 g_n	< 1,5 %
	> 200 g_n ... 4,000 g_n	< 1.8 %
	> 4,000 g_n ... 10,000 g_n	< 3,0 %

¹⁾ Determined according to GUM (ISO Guide to the expression of uncertainty in measurement, 1995) with $k = 2$ (coverage factor)

Specification of integrated PR module

Module for supplying power to piezo-resistive sensors or for supplying DC power to sensors (e.g. VC types)

Components of the integrated PR module

- Plug-in module to CS18 electronic unit SRS-35
- External connecting box for individual sensor adaptation
- Software for determining the electrical aptitude for calibration of PR sensors (measurement of bridge resistance, offset and offset drift, offset compensation, shunt calibration, insulations test)

Options for the PR module

- Individual external connection boxes
- TEDS for PR sensors

Technical Data PR module

Bridge Power Supply	4-lead or 6-lead configuration selectable, power will be measured and controlled
Voltage Range	-10 V ... 0 V ... +10 V
Current	maximum 100 mA
Bridge Completion	resistors for completing single-arm and two-arm partial bridges can be integrated in a connecting box (dimensioning according to specific sensor)
Shunt Resistors	2 units can be integrated in a connecting box, resistance values can be stored in an EEPROM
Amplifier	0 ... 42 dB
Gain Steps (DC)	factors to be set by software: 1, 2, 4, 8, 16, 32, 64, 128
Offset	offset measurement and offset compensation can be performed

Options for calibration systems: see leaflet CS18-extras

All data are subject to change without notice

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