

Lowest possible measurement uncertainties are essential for National Metrology Institutes



National Metrology Institutes (NMIs) are at the pinnacle of the calibration hierarchy in each country. They play a critical role in representing the measurement quantities and ensuring traceability of standards. NMIs are responsible for the development and maintenance of calibration procedures and standards, converting international standards to national ones, and performing primary calibrations of reference sensors with the lowest possible measurement uncertainties.

Main challenge: Traceability

As the leading calibration authority, National Metrology Institutes must ensure absolute calibration of reference sensors. All other calibration laboratories in the country trace their standards back to the NMI, making traceability a fundamental requirement.

[National Metrology Institutes](#) (NMIs) are tasked with achieving the lowest possible measurement uncertainty to maintain their credibility and support the calibration needs of other laboratories. This pursuit of precision is critical, as even the smallest deviations can impact the accuracy of measurements across various industries. At the same time, NMIs frequently face the challenge of operating under tight budget constraints while still needing to uphold these high standards of calibration excellence. Balancing limited financial resources with the demand for precision and reliability requires innovative solutions and efficient management of available resources.

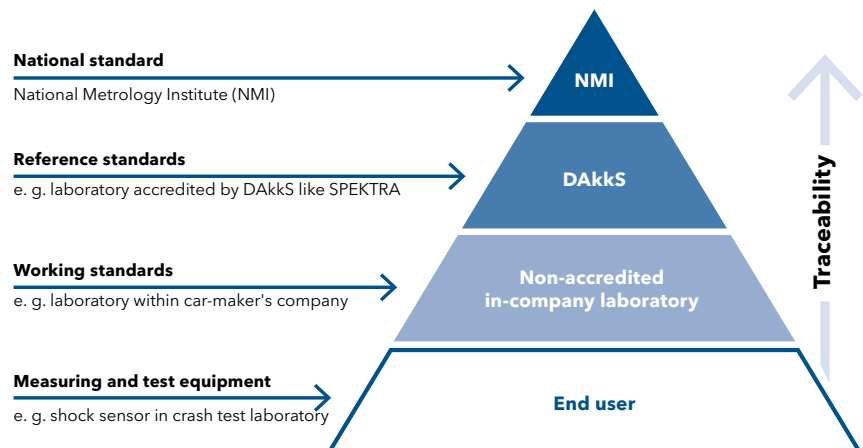


Illustration of the calibration hierarchy

The SPEKTRA solutions

Primary calibration systems [CS Q-LEAP™](#)
P-SINE and P-SHOCK

- based on fundamental physical constants and laws
- lowest measurement uncertainties
- traceable to PTB (German National Metrology Laboratory)
- integrated sensor database
- easy data exchange with ERP systems or measuring equipment databases



Primary calibration of a geophone in the SPEKTRA laboratory

To minimize interference and maximize the accuracy of measurement results, SPEKTRA can assist you with the complete laboratory set-up for special requirements (concrete blocks, compressed air units, temperature monitoring ...).

Key features and benefits

- **Highest calibration standards:** The CS Q-LEAP™ systems provide the highest instance in the calibration hierarchy, ensuring unmatched calibration accuracy
- **Advanced technology:** High-quality exciters and components guarantee precise and reliable calibration
- **Comprehensive solutions:** These systems support the quality assurance of laboratory investigations, verification of measurement uncertainty, and comparison of calibration processes, all compliant with ISO 17025:2018
- **Enhanced traceability:** The integrated database facilitates easy data management and traceability, proving competence to customers, superiors, and authorities

Conclusion

The primary calibration solutions from SPEKTRA empower NMIs to maintain calibration excellence despite resource constraints. By ensuring the lowest measurement uncertainties and robust traceability, SPEKTRA helps NMIs support the broader calibration community effectively.

If you face similar challenges in primary calibration and seek to enhance your calibration capabilities, contact our experts at SPEKTRA for tailored solutions that meet your specific needs.