



Department of primary metrology of RF electrical quantities – calibration services



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<http://www.cmi.cz>

Who we are?

Czech metrology institute is the national metrology institute of the Czech Republic. The department of primary metrology of RF electrical quantities maintains activities in two main fields:

- fundamental metrology – preservation and development of national measurement standards, research and development in metrology (including national and international metrology projects)
- transfer of measurement units to lower-grade standards, calibration of reference standards and working standards (RF power, s-parameters, attenuation, frequency, EMC, ...)

The institute offers complex services in the legal metrology and industrial metrology, in all measurement fields. This document summarizes the services for high-frequency and microwave measurements up to 50 GHz for use in digital systems, radio communications services, telemetry, identification systems, military and aerospace, EMC and others.

Services of accredited calibration laboratory no. 2022

- calibration of RF power meters and sensors (calibration coefficient, effective efficiency), frequency range (0 to 50) GHz, total power range 100 pW to 300 W **(accredited)**
- s-parameters (reflection/transmission coefficient) magnitude and phase, or Re+j Im, frequency range 9 kHz to 50 GHz **(accredited 0.1 MHz to 50 GHz)**
- calibration of electric field sensors up to 18 GHz, up to 400 V/m at selected frequencies **(accredited for selected frequencies and intensities)**
- calibration of attenuation (0 to 120) dB, 10 MHz to 18 GHz **(accredited up to 110 dB)**
- calibration of oscilloscopes – analogue, digital up to 18 GHz **(accredited up to 3,2 GHz)**
- calibration of EMI receivers – 9 kHz to 40 GHz; QP, AV, PK detectors (CISPR 16-1-1) **(accredited for selected frequencies and ranges)**
- calibration of RF voltmeters up to 100 V and frequency 2 GHz **(accredited)**
- calibration of RF generators and spectrum analyzers up to 50 GHz **(accredited)**
- calibration of ferrite and loop antennas up to 30 MHz
- calibration and service of GSM network testers (Aeroflex/RACAL type 6103, 6104 and 6113) **(accredited)**
- calibration of frequency counters, meas. of period and time interval **(accredited)**
- calibration of equipment for EMC (generators, artificial networks, CDN) **(partly accredited)**

Quality management and international recognition of services

All calibration services are covered by the CMI's quality management system which is in compliance with the ČSN EN ISO/IEC 17025:2018 standard. The Chapter 8, Management system requirements, comes from the standard ČSN EN ISO 9001:2000. This quality management system is documented in the organizational Quality manual of CMI, which is available at

<https://www.cmi.cz/Quality%20Management%20System?language=en>

List of granted accreditation, see

<https://www.cmi.cz/Certificates%20of%20accreditation?language=en>

CMI is the signatory of the CIPM Mutual Recognition Arrangement (CIPM MRA) through which national metrology institutes demonstrate the international equivalence of their measurement standards and the calibration and measurement certificates they issue. Approved calibration and measurement capabilities are publicly available from the KCDB database, see <https://www.bipm.org/kcdb/>



Examples of calibrated devices

- ✓ power meters and power sensors (coaxial, waveguide)
DC – 50 GHz
- ✓ passive components (attenuators, VNA calibration kits, ...)
- ✓ frequency and period counters (incl. non-standard devices)
- ✓ spectrum and signal analyzers, measurement receivers
- ✓ scalar and vector network analyzers, CellMaster etc.
- ✓ RF and microwave signal generators, modulation generators
- ✓ arbitrary waveform generators
- ✓ EMC generators as per EN 61000-4-2 to -4-18 and others
- ✓ EMC coupling/decoupling networks and coupling devices as per EN 61000-4-4, -4-5, -4-6 and other standards
- ✓ EMC artificial networks for automotive (ISO 16750 and others)
- ✓ pulse generators as per CISPR 16-1-1, bands A/B/C/D
- ✓ fields strength meters and antennas
- ✓ flight line test sets Aeroflex (Cobham) IFR 4000/6000
- ✓ non-standard measurement devices
- ✓ interlaboratory comparisons for various quantities



Contact

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