MFA-110 Measuring & Analyzing System for Magnetic Fields

- Complete system including detection head, Data Acquisition Box, software and PC (optional)
- Gapless recording of field strength in the frequency range 1 Hz to 400 kHz according to all major standards (e. g. ICNIRP, BGV B11)
- High resolution data capturing and storage of raw data
- M-STREAM software for transparent data analysis including comparison with many international and national guidelines in one system
- Open system, own guidelines can be implemented by the user

Low-frequency magnetic fields

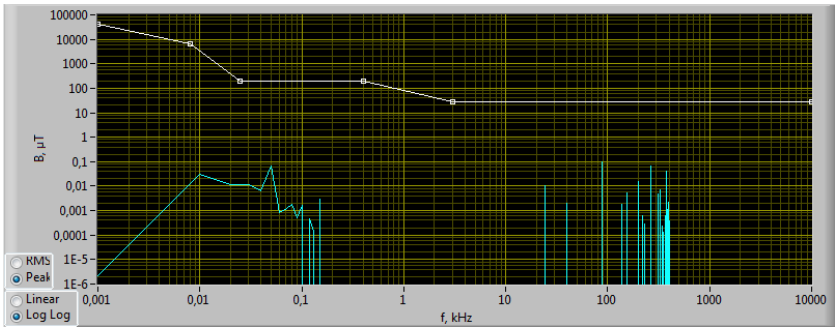
Magnetic fields exist due to moving electric particles like electrons in wires and cables, but also due to ferromagnetic material structures. Although lower frequency fields are considered less harming than high frequency or pulsed fields, they are potentially dangerous, depending on their frequency and intensity. Keeping these critical values is in the responsibility of the producer/builder/maintainer of the area or device. Examples are permanent magnet magnetization devices, emitters, transformer buildings, magnetic yokes, spectroscopic measuring devices, welding machines, inductive heating, high current conductors, e. g. in the chemical industries or power lines for electrical trains, electrical vehicles and may more.

The exposure of professionals and the general public to low-frequency magnetic fields is regulated in national and international guidelines. Within Germany this are either the 26. BImschV (German Federal Immission Control Act) for the general public or/and the trade association rules for health and safety at work BGR B11. International guidelines are the ICNIRP publications (International Commission on Non-Ionizing Radiation Protection). Typically but not necessarily national regulations follow the ICNIRP recommendations.

Measurement and software concept

The MFA-110 is capable of measuring magnetic fields in a wide frequency (gapless) and intensity range. It works vectorial by capturing the field induced electric signals in a standard isotropic 100 cm² probe (or individual probes) in all three orthogonal directions. The signals are amplified and stored as raw data on the PC hard disk. The resolution depends on the selected sample rate and streaming time. Higher sample rates and longer streaming times allow a highly accurate detection of narrow field peaks in the higher frequency range, however require significant processing capacity of the PC/laptop as the data are directly transferred and stored on the hard disk. This process is controlled by buffer monitoring.

The **M-STREAM** software processes the raw data including frequency dependent amplitude analysis via discrete Fourier transformation. Comparisons with various national and international standards or guidelines are already implemented. A customer-adaptable module allows adjustments to specific measuring tasks.



Field strength vs. frequency graph with guideline (example)

The raw data are stored in TDMS format and may be exported in ASCII or MS EXCEL format for individual processing.

Specification MFA-110 (with 100 cm² probe)

Hardware		**Performance data**	
Detector head	Isotropic coil 100 cm²	Frequency range	1 Hz to 400 kHz
Amplifier box	280 x 220 x 50 mm³ (width x length x height) Alu casing, 2.6 kg w/o PC 2 x USB, D-Sub (Sensor), BNC (EXT) Velcro connection of PC	B-Field levels	6 µT … 1.5 T at 1 Hz 70 nT … 20 mT at 100 Hz 50 nT … 15 mT at > 1 kHz (other ranges possible with adjusted probes)
Optional: HP EliteBook Revolve 810 G1 Tablet (optional)	See manufacturer specification	**Software**	**M-STREAM** (compatible with Windows 7, 8 (64 bit), based on LabVIEW®)
Implemented standards	• BGV B11 Exp. 1 • BGV B11 Exp. 2	• ICNIRP 1998 Pub. • ICNIRP 1998 Occ.	• ICNIRP 2010 Pub. • ICNIRP 2010 Occ.