MAGPy

Smart Probe for WPT Near-Field Compliance

What is MAGPy ?

SPEAG's **M**agnetic **A**mplitude and **G**radient **P**robe S**y**stem (MAGPy) is a cutting-edge all-in-one instrument for fast and reliable testing of compliance with basic restrictions (BR) and reference levels (RL) from 3 kHz to 10 MHz. It greatly reduces the exposure over-estimation for wireless power transfer (WPT) systems and any other near-field sources. The device comprises 24 small time-domain loop sensors arranged at the corners of a cube, for determining the magnetic (H/B) amplitude and gradient, and three dipole sensors, to measure the electric (E-) field amplitude. The incident magnetic and electric fields, as well as conservative estimates of the induced E-fields, current density, and specific absorption rate (SAR) in the human body at any position, are displayed in time or frequency domain by the intuitive graphical user interface (GUI). MAGPy is fully compatible with the latest IEC standards.

MAGPy – The First Field Amplitude and Gradient Probe

Description

MAGPy was specifically designed to test the compliance of magnetic near-field sources, such as inductive WPT systems in the frequency range of 3 kHz – 10 MHz, with basic restrictions, while maintaining the ease-of-use of a hand-held probe.

Applications

MAGPy determines the maximum induced field levels and SAR by measurement of the magnetic field amplitude and gradient, and compares these values with defined basic restrictions. Manufacturers of WPT systems as well as other industries will benefit from this technology, which lowers the overestimation introduced by compliance testing with reference levels by up to 40 dB. Specific applications include:

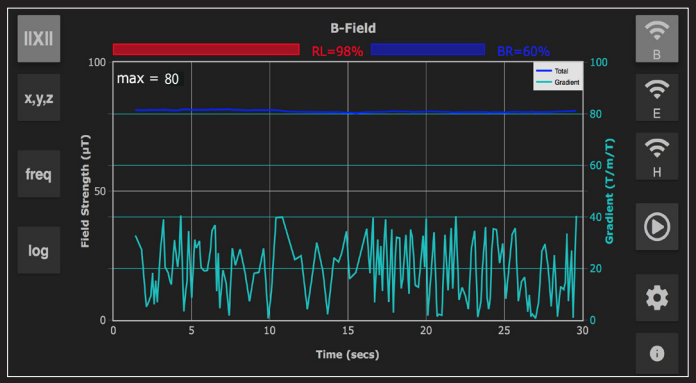
- automotive WPT
- industrial and utility, e.g., industrial welding, induction cooking, electronic article surveillance, and WPT
- energy supply, e.g., installation and operators of WPT networks
- ubiquitous devices equipped with WPT technologies, e.g., mobile phones, implantable medical devices, wearable devices and Internet of Things (IoT)
- high power electromagnetic sources for defense/military, e.g., military power supplies

Guidelines

MAGPy permits testing of compliance of devices with all current guidelines for both the general public and occupational exposures, including: FCC, INCIRP 1998, ICNIRP 2010, IEEE C95.1 2005, EU Directive 2013, HC Code 6, BGV B11, 26.BImSchV.

Graphical User Interface (GUI)

The GUI of MAGPy V2.0+ is browser-based, and therefore compatible with any computer and/or operating system (MAGPy V1.x is Windows compatible only).



MAGPy GUI displaying the B-field amplitude and gradient during a typical measurement. Compliance with both reference levels and basic restrictions are shown as exposure ratios, and are continuously updated during the measurement.

Additional Service

SPEAG's research partner, the IT'IS Foundation, collaborates with the IEC TC 106 to establish new standards for exposure assessment methods for WPT systems. IT'IS also offers customized research services, from design to safety assessments of WPT systems (www.itis.swiss/customized).

Features	Benefits
24 TD H/B-field sensors	Improved isotropy; high spatial resolution (<1 cm^3); determination of field gradients
3 TD E-field sensors	Integrated isotropic E-field probe
Large dynamic range	Measures fields from <1% to up to four times the occupational limits
Wide bandwidth	Covers the entire range of near-field WPT sources (3 kHz – 10 MHz)
Estimation of induced fields through the amplitude and gradient information	Reduced overestimation of exposure by direct comparison with basic restrictions
Reduced interference	Low interaction with measured fields
All-in-one device	Measures incident (H/B/E) fields for assessment of compliance with reference levels and basic restrictions
Turnkey	Fully equipped with web-based GUI and embedded software for compliance testing
Flexible	Compatible with any modern Windows x64-based personal computer or tablet
Standards compliant	Compliance testing procedure in line with the latest safety standards (IEC TC106 PT63184)

Specifications	H/B-field sensors
Frequency range	3 kHz – 10 MHz
Measurement range	90 dB (1.2 x 10^{-4} – 4 mT)
Sampling rate	25 MHz (real-time decimation supported)
Gradient range	0.1 – 80 T/m/T
Sensor type	isotropic (8 field sensors)
Sensor size	1 cm^2

Specifications	E-field sensors
Frequency range	3 kHz – 10 MHz
Measurement range	87 dB (0.08 V/m – 2 kV/m)
Sampling rate	25 MHz
Sensor type	dipoles (3 orthogonal)
Sensor size	5 cm × 5 cm × 5 cm

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