

Master 2017

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Realisation of an Automated Near-Field Measurement Test Bed.

ABSTRACT - Masterthesis

This Master Thesis is about creating a measuring setup with which a near-field measuring unit is to test fully automatically a test object with regard to electromagnetic radiation. The test setup will include a two-dimensional test field, which will be run with stepper motors. For this purpose, an XY writer from manufacturer makeblock is used as the basis. This includes a complete structure made of aluminum and corresponding sensors, control units, as well as the required stepper motors in order to be able to move a measuring probe over a test object. This only has to be converted or modified to the desired application become.

The frequency range from 100 MHz to 900 MHz will cover the functionality and can be adapted at any time. Thus, the automated near-field measuring unit becomes more flexible in use in order to be able to test a test object for the desired standard. The probe uses a probe set from AAronia AG. This includes several selectable frequency ranges, depending on which probe is to be mounted. It has a logarithmic behavior in frequency, which must be integrated into the evaluation.

To implement this measurement task freeware should be used. In order to be able to address the stepper motors by means of the control board provided by manufacturer makeblock, the software Arduino IDE is required, as this board is equipped with an Arduino UNO and has a corresponding driver, which is compatible with this software.

To measure the frequency range, a Rohde & Schwarz signal analyzer is used, which is to be controlled via remote control. In order to combine everything, the software Python Anaconda is used, which will control the signal analyzer as well as the stepper motors via the Arduino UNO. A TCP / IP connection is used to control the Signal Analyzer, whereas a USB connection is provided for the Arduino and the corresponding stepper motors. Within the Python Anaconda, the measured data are stored and conditioned. These data are then graphically displayed. They represent the result that can be examined in terms of limits and other viewing features.