Design Proposal

EMCYCLE4 Control Software

Date: 25 October 2019

Description:

Emcycle4 is a software package for controlling radio frequency (RF) field strength during Electromagnetic Compatibility (EMC) immunity testing.

Concept:

A radio frequency (RF) signal is produced by a RF signal generator, amplified, and fed into a transmission line chamber, or TEM cell. When RF power is injected into a TEM cell, it produces an electromagnetic field, measured in volts per metre (V/m). Injecting more power results in a higher field strength. Measuring devices, such as E-field probes, or a proprietary controller, are used to measure the field strength and communicate the values to a host computer. The host computer calculates and controls the levels, frequencies and modulation. The objective is to generate a calibrated field strength inside a test volume over a range of individual frequencies.

The operational procedure is as follows:

1. Set a target frequency
2. Adjust the output level to reach the target field strength
3. Modulate the output as required for a set ‘dwell’ time
4. Remove the modulation
5. Calculate the next incremental frequency step

Repeat steps 1-5 until the maximum desired frequency has been achieved. It is usual to start at low frequencies and increment positively.

Emcycle4 communicates with three external devices:

A RF signal generator to provide adjustable frequency and level output.

A field probe for measuring field strength.

An external controller with analogue measurement facility and digital signals.

Radio frequency field strength is measured by the field probe and the external controller. The signal from the generator is amplified and fed to a suitable transducer in order to produce the required field.

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Specification:

Frequency:	0.001 to 6000MHz
Modulation:	AM, FM, Pulse 0-100%
Field Strength:	1-500V/m
Dwell time:	0.1-500Seconds
Frequency step	0.001 to 10MHz (fixed), 0.01 to 10% (percentage) – selectable

RF generator comms:	Ethernet
External controller comms:	RS232 (9600, 8,N,1)
Probe	RS232/Optical

Initialisation File:	ASCII, human readable
Data log file:	ASCII, human readable
Calibration file:	ASCII, tabulated, human readable

Schedule:

To be agreed

Cost Estimate:

To be agreed

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