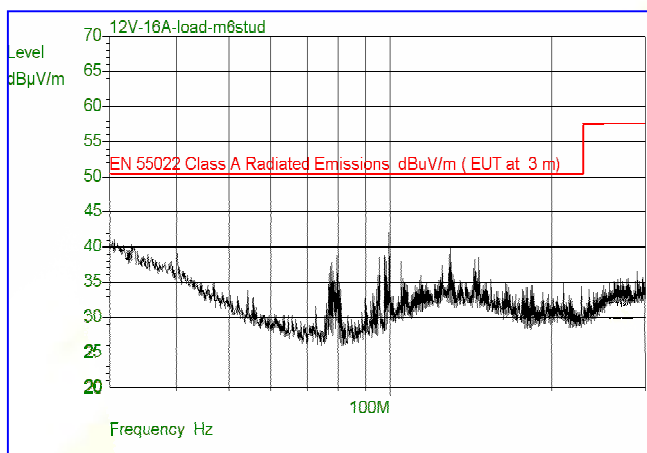
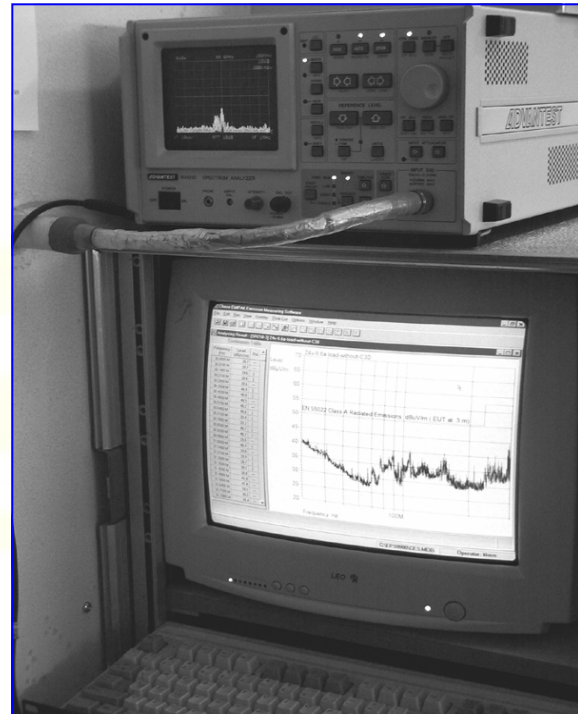


ELECTROMAGNETIC COMPATIBILITY TEST FACILITY



Introduction

Innovative Energies Ltd has an Electromagnetic Compatibility (EMC) test facility available for pre-compliance testing on a hire basis. The facility comprises an Advantest R4131D spectrum analyser, controlled via a GPIB interface from a personal computer.

The computer runs EMC software which allows the automated control of the spectrum analyser to perform the most common compliance standards testing. The test results can be printed, saved to disc or e-mailed for future reference.

To enable the testing of mains borne conducted EMC the system has a Chase MN2050B Line Impedance Stabilisation Network (LISN). This allows single phase mains powered equipment 100-253VAC to be tested (10A max). Radiated EMC testing is provided for a Chase UPA6190B Antenna, which resides in a 20 foot double skinned shipping container that serves as a Faraday cage.

To aid identifying the cause of Electromagnetic Interference (EMI) two Chase near field probes MFP9151 & MFP9150 and a probe pre-amp CPA9231 cover the 9kHz - 1GHz spectrum.

The facility is not officially calibrated and therefore certified compliance testing cannot be performed, however, comparison of results obtained from this facility have shown to closely resemble certified compliance test results.

Terms and Conditions of Hire

Any engineer wishing to hire our facility must first undergo a preliminary training session (see contents attached), which we conduct. This session will take approximately 2 hours and covers the use of our test facility and the fundamentals of EMC testing and compliance.

As the facility can be easily damaged through misuse (e.g. failure to use signal limiters can result in \$1000 damage to the spectrum analyser), the hirer agrees to bear any cost associated with repairing the facility should such damage be caused by the hirer. The time on the facility should be pre booked, preferably at least 1 week in advance, and a minimum charge for 4 hours use will be applied. Should it better suit the hirer, usage may be spread over several small sessions.

Rates

EMC training session (1-2hrs with our engineer) \$200-00 +GST
EMC facility hourly rate (min. 4 hrs) \$120-00 +GST

The nature of EMC pre compliance testing is that only a small percentage of the time involved is take-up with performing the actual testing; however, while modifications are performed to the equipment being tested in preparation for the next test the EMC facility will be tied up. Therefore this rate is applied at a minimum time of 1 hour.

Tools

The hirer must provide all their own tools and components as required.

Training Session Outline (first time users)

Duration - approximately 2 hours

Introduction

Familiarise user(s) with the facility - test chamber, LISN, spectrum analyser, computer, aerial, probes etc. Demonstrate computer log on, location of printer, toilets, tea/coffee facilities.

Background:

- Discuss for purposes of understanding the following -
- Conducted EMC noise
- Radiated EMC noise
- Shielding
- Filtering - CM (common mode) chokes, DM (differential mode) chokes, capacitors
- Show some physical fixes on our own product
- Make available for the hirer to borrow : EMC course notes, Test standards

Practical

- Show some actual testing -
- Radiated test
- Conducted test
- Use of probe
- Use of spectrum analyser in isolation
- Use of computer control of test, saving results