

UNIVERSITY COLLEGE SEDAYA INTERNATIONAL

SCHOOL OF ENGINEERING

FINAL REPORT

DESIGN AND CONSTRUCTION OF HARMONIC
METER

STUDENT'S NAME : WONG SENG KIAT

STUDENT ID : 99208790

MAJOR : B. ENG. (HONS) ELECTRICAL &
ELECTRONICS

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Abstract

Harmonic Meter is a device able to measure the value and reading of harmonics generated by non-linear load in a power system. Due to widespread use of non-linear load such as power electronics to achieve efficiency and controllability in today's industry, harmonics problem has become an important topic. Various methods are developed by researchers to measure harmonics in power system.

In this project, the author chose clamp on jaws (current transformer) to draw harmonics signal in a power system. The author has chosen dc motor drive and adjustable frequency ac drive as non-linear load to generate harmonics in the power line. The signal captured by clamp on jaws will then pass through a fundamental reject filter and amplifier which is constructed by passive filter and Op-amp, to strip down the fundamental frequency of the power line (e.g 50Hz). The signal is then amplified so it could be easily view after it is map on the spectrum analyzer for further analysis.

This project is divided into four parts. The first part introduces and explains about the harmonics, its history and why until now it is still a topic of discussion even it is not a new phenomenon. This part is then followed by literature review and research done on power system harmonic. The second part then give the system overview of the project with block diagram plus some basic theory. It is then followed by hardware design in third part. Here, it present about devices use for each stage and it circuit. The author had used "MultiSim" to do a simulation of the amplifier circuit and modifying the circuit to suit the hardware. Finally, in part four it discuss about the project, the problem faces, the limitation and it conclusion. Last but not least, recommendation of further works is

presented. All of these could be useful and contribute for the advancement in power system engineering.