**Abstract**

The aim of this work was to develop various electronic apparatus built around PIC microcontroller based digital platforms like programmable function generator, digital oscilloscope, voltmeter etc. So, as the name suggests, this project deals with development of a miniature programmable function generator, a digital oscilloscope for showing & analyzing waveforms & a DC voltmeter for steady DC voltage measurement.
Along with these, the project work was aimed to develop digital controllers to control the current and speed of SRM motor drive and to control output of choppers using PIC based digital platforms.
To make a function generator, ADC & DAC, LCD, keyboard have to be interfaced. So, this project work deals with the interfacing techniques of the same and variable waveform generation. Oscilloscope needs a graphical LCD to show waveforms and techniques to analyze the waveforms i.e. to measure the voltage, frequency etc. and show them on LCD screen. Aiming at this, graphical LCD interfacing, development of dc voltmeter have been done as short term goals. On the other hand the digital controllers which are mainly based on ADC programming has been developed.

The results of this work are a function generator, preliminary oscilloscope, digital dc voltmeter for steady DC voltage measurement & digital current controller. The function generator is capable of only generating some predefined fixed value voltage waveforms. This function generator has been simulated till now and its hardware implementation is to be done. The oscilloscope can display low frequency signals(both unipolar and bipolar). This is also only simulated till now. Hysteresis current controller for SRM motor drive has been developed. It has the options for changing upper and lower limit of current.
Modification of the function generator so that it can produce user defined signals are to be done. Modification of the preliminary oscilloscope and some other digital controllers to control chopper, inverters etc. are to be done in future.