

## Design of a Stable DC Voltage Source and Computer Controlling of It Using an Indigenously Developed All-Digital Addressing-Cum-Control Hardware

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**Abstract:** We have developed a digitally operated addressing and control module (DACM) for addressing and controlling of equipment from a remote computer using a communication protocol developed in-house. This is useful for automation of an experiment that uses multiple equipment in a pre-decided synchronized manner. We also report design of a multipurpose high voltage direct current (DC) source that provides output of 0–100 V with an average stability of 1.90 (36) mV and has minimum step size of 3 mV. Operation of the DACM is examined by selecting the desired equipment, which in this case is the dc source, and remotely controlling its output from a computer. We also show that this can generate voltage with different waveforms within a 0–10 Hz frequency bandwidth. Such computer controlled ultrastable high voltage sources tuneable to any arbitrary waveforms at low frequencies have many applications such as, driving a piezo for smooth scanning of laser frequencies, tuning length of a Fabry–Perot cavity, biasing of the electrodes in an ion trap and so on.

**Keywords:** Automation; Computer control; Digitally operated addressing and control module; Regulated DC source