# LED Pulser Control Module

This document describes the Control Module (LPCM) to be used with the LED Pulser Module (LPM) tested at the Physics Department – Nuclear and Particle Sector, University of Athens, on 22-2-2008.

The purpose of the LPCM is to control the operation of a number of LEDs mounted on miniature pulser modules (LPMs), each connected to the LPCM by its own set of wires.

The LPCM is designed to provide stable and controllable operating parameters for the LPMs, to assure repeatability in the experiments.

It is also designed to provide a simple and flexible user interface via a USB connector to a host PC where the operating parameters of the LPMs and the operating mode of the LPCM can be monitored.

LPCM Block Diagram
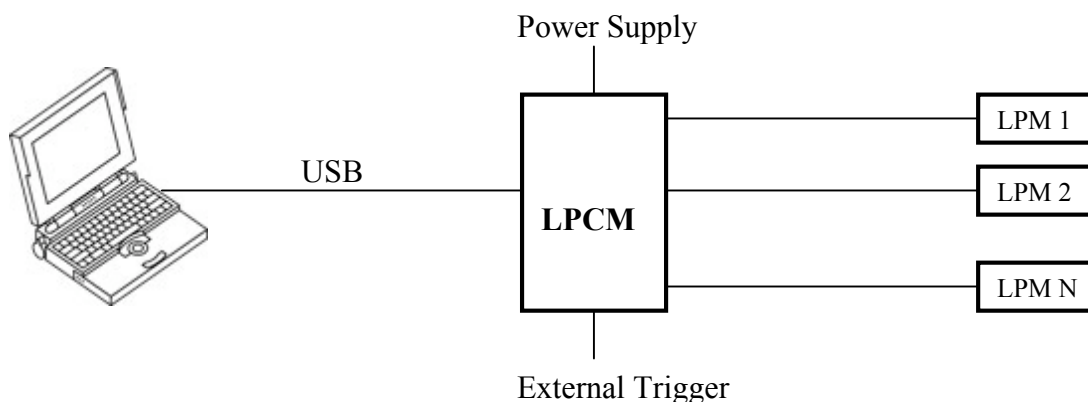
Power Supply: 12V or 24V (from NIM or other)
External Trigger: From NIM, triggers operation of LPMs, simultaneously
LPCM to LPM wires: Currently a 3-wire interface (Vs for supply, Ground, Trigger)
                        Wire length is 1m
USB Connection: Sets LPCM mode of operation and parameters

LPCM modes:
      (1) one-shot (via USB connection)
      (2) auto-trigger (e.g. at 1kHz, from internal clock)
      (3) external trigger (default at power-up)

      Note that <u>all</u> LEDs attached to the same LPCM are activated simultaneously, as selective activation of a defined subset is not considered a necessary feature at present.

Operating parameters:
      (1) Vs is adjustable, from 1 to 10 V, set via USB connection
          Vs is derived from internal 10V precision voltage reference, using a 256-step digital potentiometer, and can be set with a step of $10V/256 = 39mV$

At power-up the default LPCM mode of operation is to activate LEDs on the external trigger signal, using the pre-programmed Vs value stored in the LPCM.

When a PC is connected, other modes of operation can be activated for test purposes, and different values of Vs selected, tested and re-programmed (i.e. stored in non-volatile memory).

An estimate of LPCM board size is 5cm x 5cm, depending on the type of connectors to be used for the LPMs.
An estimate of an LPM board size is 10mm x 15mm.