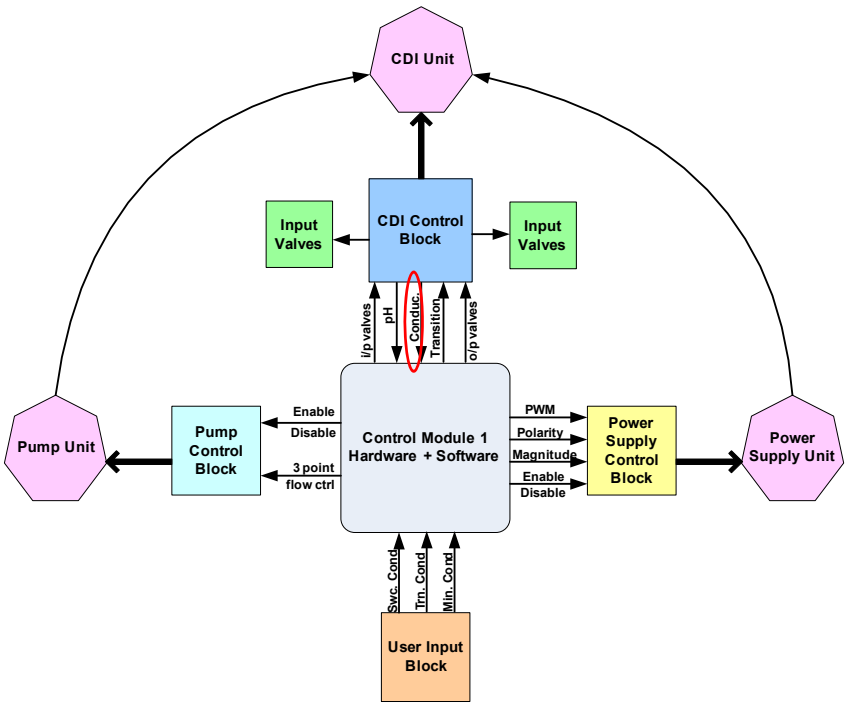
Functional Materials Division

Sensors for super-capacitor applications

Accelerated depletion of the world's water resources has necessitated the development of new methods to purify and re-use water. These technologies need to be energy and water efficient and flexible in their application.

At Functional Materials at KTH, we are working on a unique super-capacitor technology, which can purify water while accumulating charge, leading to a low energy consumption and flexible water purification technology for the future. Laboratory prototypes of the units have been developed and work is now being directed towards the design of a control unit which will automate the purification process and impart intelligence to the device enabling it to make its own decisions. An integral part of the control unit is a water conductivity sensor which needs to be developed based on very specific needs of the super-capacitor.

The student involved in the project will design and develop a water conductivity sensor in-house, tailored to the requirements of the device. The sensor will be able to measure a wide range of water salinity using a combination of configurable software and hardware design (as required). The project will involve a mix of analog hardware design along with a software abstraction layer to provide the required functionality with a graphical user interface (GUI) for easy access. The sensor will be prototyped using an Arduino or Raspberry Pi and tested with the lab scale super-capacitor prototypes available in house. The work is part of a bigger project aimed at building advanced and smart filters for water purification.



Contact: Joydeep Dutta (Joydeep@kth.se) and Karthik Laxman (laxman@kth.se), Functional Materials (FNM), Materials and Nano Physics (MNF), Department of Applied Physics, KTH.