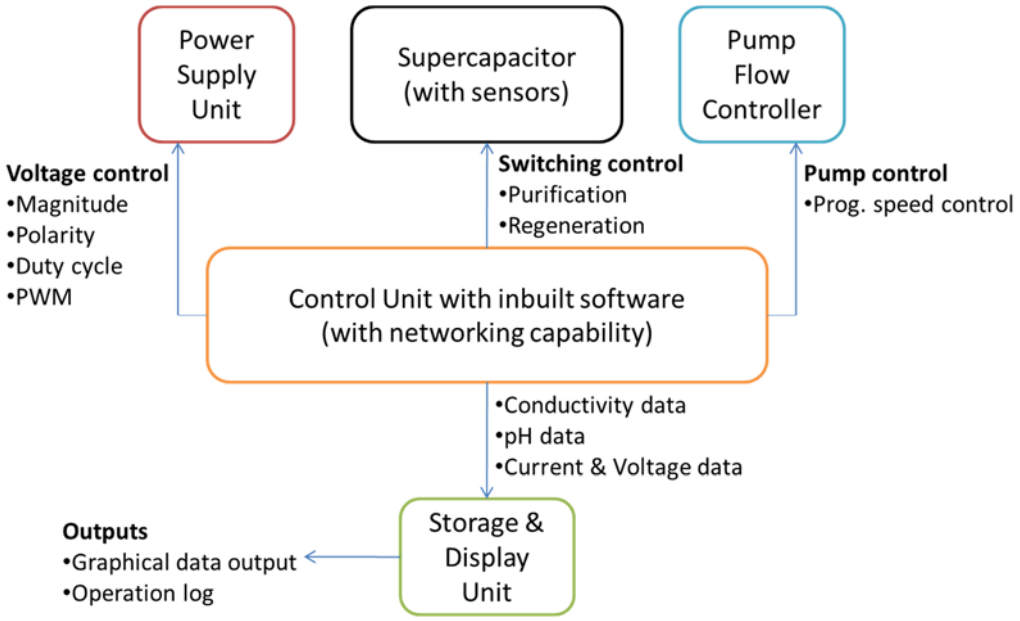
**Functional Materials Division**

## Intelligent supercapacitor for water purification

Water is the next oil of the global economy. Nations which can effectively manage their water cycles will be crucial in orchestrating and propagating the future water technologies and policies. Water cycle management can be broadly classified as resource management (which deals with water allocation, storage & water body protection) and water reclamation (which includes technologies for water purification, re-use, recovery etc.)

At Functional Materials at KTH, we are working on a unique method to reclaim water using a super-capacitor technology, which can purify saline water while storing energy in the process. The efficiency of the super-cap device for water purification is influenced by the mode and timing of its operation. To optimize the device and system working conditions, data from several sensors needs to be processed and fed into a microcontroller and/or microprocessor unit which runs a semi-intelligent software code to operate the super-cap.

The student will build the algorithm and write the software for the microcontroller and/or microprocessor (Arduino or Raspberry Pi). The work will also involve developing a test hardware circuit coupled with the super-cap to verify the software functionality. The control unit software and hardware are part of a bigger project which is focused on developing smart filters and materials for water purification. Upon completion, a working demo prototype of the super-capacitor with the associated control electronics will be installed at test sites in Stockholm and Gotland.

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