

MATLAB programming for high-field magnetic and cryogenic temperature setup

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This special course is for a BSc or MSc student with knowledge on MATLAB programming and general physical principles. During the project you will:

1. **Modify existing MATLAB code that controls the electrical transport measurements under the influence of high magnetic fields up to 16 T and low temperatures down to 2 K.**
2. **Understand and learn how to program drivers for experimental setups**
3. **Prepare a user-friendly measurement program architecture for inexperienced MATLAB users.**

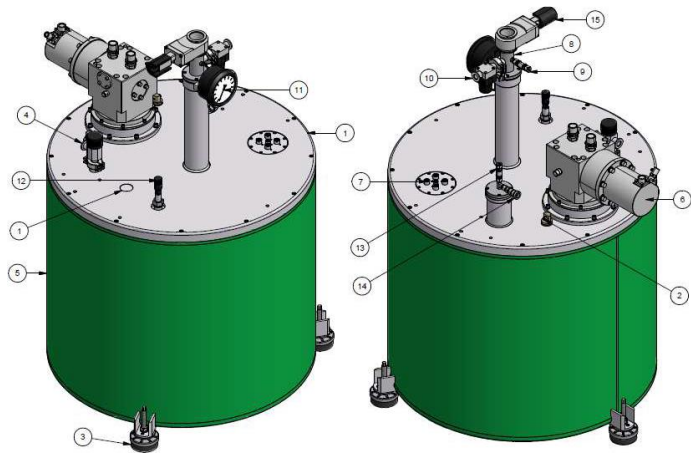


Figure 1 – High-field magnetic and cryogenic temperature setup.

The high-field magnetic and cryogenic temperature setup is located in DTU Energy where we work on next-generation energy materials. The system serves as the work-horse for electrically characterizing materials under high magnetic fields up to 16 T and at temperatures between 2-320 K. In this characterization, we learn about electrical resistance, carrier density and carrier mobility to name a few. Since the user-base in our lab is very versatile, not everyone are experienced MATLAB programmers, therefore there is a need to make the existing measurement program architecture more user-friendly. We frequently add or modify the functionality of the experimental measurement boxes, therefore we are also continuously writing new or updating drivers. If you are interesting in being a part of this existing work where you will learn more about solid-state physics, MATLAB programming and experimental measurement setup drivers, do not hesitate to contact me and sign up for a special course or BSc project.