Interfaces of the temperature circuit

General context:

The association EPFL Xplore wants to develop a 3D printed parts recycling machine. After one semester of development, a first version of the machine is ready. Nevertheless, to improve the capacity of the machine and the general understanding of the parameters, a lot of work remains to be done. This is why we offer semester projects to EPFL students. The recycling process of 3D printing filament can be decomposed in the following steps: grinding, drying, extrusion, cooling and spooling.

Project description:

For the moment, the heating elements of the extruder are controlled separately with market devices. The first objective of this project is to create one circuit for the control of the three heating elements. Then, the student will design a custom board to optimize the circuit and implement an effective temperature control solution. The circuit and control of the extruder could be added on top of the precedent points.

Furthermore, the student will be a part of the Xplore plastic recycling team, they will need to attend the team meetings as well as the working sessions.

Tasks :
- Strong literature review and familiarization of different subjects :
    o Current temperature sensors
    o Control of heating elements
    o PCB making
- Prototyping of a solution using an Arduino and the actual temperature controllers
- Conception and design of a custom board implementing a final solution.
- Coding the control of the heating elements.