

## **Starter/Junior Embedded Hard-/Firmware Engineer HBO/WO**

Are you interested in working for an innovative and growing business?  
Are you interested in developing lithium-ion batteries for different applications?  
Then we are looking for you.

### **Cleantron**

Cleantron develops and produces lithium batteries close to Amsterdam in Nieuw Vennep. Cleantron batteries are used in a variety of markets, at home and abroad. Think of electric vehicles such as special e-Bikes and e-Scooters, Light Electric Vehicles, Automatic Guided Vehicles (AGV's) and Automotive applications.

We put quality of our products central and in order to guarantee this, we continuously work on improving our product designs and production processes.

Good battery design is very important for the manufacturability, safety and battery life. Cleantron is developing batteries for new applications where these aspects are key.

The embedded Battery Management System (BMS), together with the Lithium-ion Cells, form the heart of a Cleantron Battery and guarantees the safety and service life of the Battery. The BMS ensures, among other things, protection against many extreme conditions (over-voltage, under-voltage, over-current, etc.). During the charging process and in some cases during the discharging process, the BMS balances between the different cell groups. In addition, various important data for the customer is collected and calculated, such as the "State of Charge" and the condition of the battery. Finally, based on customer-specific protocols and interfaces, the BMS provides communication between the battery and the battery application (bicycles, robots, e-scooters, cars etc.). These often have to be coordinated with the motor controller of the vehicle so that in an extreme condition (for the battery) the vehicle stops safely or that in an imminent extreme condition the motor controller regulates back in time to prevent the battery from switching off.

### **Tasks Junior Embedded Hard-/Firmware Engineer**

The Junior Engineer works on the BMS design or parts thereof with a focus on Hard- and / or Firmware. He or she works closely with the Senior Engineers to ensure alignment with the final application. The Junior Engineer also performs the validation tests on developed products. He also answers questions from production regarding the BMS.

The Junior Engineer also develops, improves and implements tests for the Cleantron production and development environment (s). This can be simple PC software or hardware for performing tests.

The Team currently consists out of hardware and software engineers. In addition, Cleantron works together with Universities, Colleges and a number of engineering partners. An objective-oriented work attitude and team spirit are therefore important.

## **Education**

Bachelor or Master in Electrical Engineering,  
with a specialization in Hardware or Firmware development

## **Relevant skills**

- Hardware Development (microcontrollers, MOSFETs, power designs, CAN)
- Hardware Design in Altium
- Firmware Development in C
- Software Design in Python
- Experience with validation of Embedded Systems
- Able to make and record structured problem analyzes
- 0 to 5 years of work experience
- You master the English language

## **We offer**

Dynamic working environment in an innovative and growing company, with an enthusiastic team, and room for personal input

Full-time appointment (38 hours), however part-time is also negotiable

A competitive salary, depending on education and experience

Personal training options

## **Interested?**

If you recognize yourself in the profile above, apply by sending your CV and motivation letter to [maarten.kelder@cleantron.nl](mailto:maarten.kelder@cleantron.nl). More information about Cleantron can be found at [www.cleantron.nl](http://www.cleantron.nl), for questions about the vacancy also feel free to contact Maarten Kelder.