

Job Description:

Hardware Engineer



POWEROPTIMAL
THE FUTURE OF ENERGY

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1. Job Purpose

Initially serve as understudy to the inventor / developer of the Elon® Smart solar PV water heater (an IoT device) to get to know and understand all aspects (design, function, firmware, component procurement, manufacturing, testing, etc.), and gradually take over parts of his job role and responsibilities. Location is in the Cape Town area.

2. A day in the life of the Hardware Engineer might look something like this:

Hardware Engineering:

- Design, develop, and optimize hardware for IoT smart home devices, including schematics and PCB layouts.
- Select and source components such as microcontrollers, sensors, and communication modules.
- Collaborate with manufacturers to prototype, test, and bring designs into production.
- Perform hardware validation and debugging using tools like oscilloscopes, logic analyzers, and spectrum analyzers.

Firmware Engineering:

- Develop, test, and debug firmware for microcontrollers and embedded systems using C/C++ and potentially Rust.
- Implement communication protocols such as I2C, SPI, UART, MQTT, or HTTP.
- Optimize power consumption and system performance.
- Ensure robust integration between hardware and firmware to meet functional and performance requirements.
- Create robust tests and automated device and deployment management systems.

Integration and Collaboration:

- Collaborate with software developers to ensure seamless interaction between firmware and application layers.
- Participate in design reviews, code reviews, and quality assurance processes.
- Work closely with QA teams to develop testing strategies and troubleshoot field issues.

Documentation and Compliance:

- Create and maintain detailed documentation, including design specifications, schematics, and firmware codebases.
- Ensure designs meet industry standards and regulatory compliance (such as SANS 60730).

3. Does this sound like you?

- Technical Skills:
 - 3+ years of experience in hardware and firmware development, preferably for IoT or smart home devices.
 - Proficiency in schematic capture and PCB design tools (e.g., Altium, KiCad, or Eagle).
 - Strong programming skills in embedded C/C++ and familiarity with RTOS. Rust experience is not required.

Directors: RA Fearon, FS Moolman, JJ Theron

Company registration number: 2012/099947/07



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- Hands-on experience with hardware debugging and testing tools.
- Knowledge of communication protocols (e.g., Zigbee, Z-Wave, BLE, Wi-Fi).
- Experience with power management Proficiency in CI/CD practices, including automation of cloud infrastructure using tools such as Cloudformation, Terraform, etc.;
- Commitment to implementing and maintaining robust testing processes;
- Excellent project management and organizational skills, with a track record of delivering projects on time and within scope;
- Familiarity with cloud platforms and IoT ecosystems (e.g., AWS IoT, Google Cloud IoT, Matter, Tuya etc.);
- Understanding of manufacturing processes and design for manufacturing / design for testing principles;
- Experience working in an agile development environment.
- Some exposure to the ESP32 and STM families of microprocessors.
- Qualifications:
 - Bachelor's degree in Electrical / Electronic / Computer Engineering, or related field (or strong proven capability and experience in one of these fields);
 - Additional certifications in product management or agile methodologies are a plus.
- Personal qualities:
 - Driven and a self-starter;
 - Strong problem-solving skills and ability to work in a fast-paced environment;
 - Excellent collaboration and communication skills, both written and verbal, to convey complex technical concepts to various stakeholders.

4. Who is PowerOptimal?

PowerOptimal is an African leader in renewable energy technology solutions with an ambition to transform the way hot water is generated and used. We are a small but fast-growing, high-performance team with high standards and big ambitions. We strive for excellence in everything we do. Our aim is to be transformative and collaborative in our work.

We focus on speed, scale, smart resourcefulness and unbounded optimism. We never start with 'no.' We're solution-oriented and focus on the outcome and the impact of any project or priority. We're a curious bunch, creative and a little quirky. We debate things passionately in team meetings and stand-ups. We agree and disagree on how the world should work, but we all agree on making a big difference through our work at PowerOptimal. Which is why we love it here and never take it for granted.

If you are interested, please send your resume, cover letter and a portfolio of relevant projects (if available) to admin@poweroptimal.com with email subject "Hardware Engineer application".

CLOSING DATE 1 MAY 2025

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