

OMAR MAHMOUD MOHAMED ALAMIN

Embedded Hardware Engineer

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PROFESSIONAL SUMMARY

Embedded Hardware & PCB Design Engineer experienced in delivering commercial embedded products end-to-end — from schematic capture and multi-layer PCB layout (KiCad) to firmware (C/C++) and system validation. Designed solutions for medical devices, robotics, BMS, and IoT applications using ESP32, STM32, and Arduino. Strong focus on DFM, power protection, and reliability.

TECHNICAL SKILLS

PCB & Hardware: KiCad (schematic + multi-layer layout), DFM, hardware debugging, PCB assembly & testing
Embedded & Power: ESP32, ESP8266, STM32, Arduino, BMS, buck/boost converters, overcurrent/thermal protection
Software & Tools: Embedded C/C++, Python, PLC programming, IoT/Wi-Fi/Bluetooth integration, ROS basics

KEY PROJECTS

Smart Medical Sterilizer

- Designed embedded hardware and electrical wiring for an ESP32-based medical instrument sterilization system; developed a mobile app for Bluetooth control of pumps, UV/white LEDs, timers, and fully customizable sterilization sequences.

Smart 4S Battery Management System (BMS)

- Designed full hardware architecture, schematic, and multi-layer PCB; implemented overcurrent, overvoltage, and thermal protection with ESP32-based real-time monitoring.

Medical IoT Therapy Vest

- Built complete embedded hardware and PCB for a wearable laser therapy device; developed firmware and mobile app with real-time temperature monitoring and fail-safe shutdown.

Hospital Service Robot Controller

- Designed single-board integrated controller consolidating motor drivers, encoder interfaces, sensors, and power management for a ROS-based autonomous hospital robot.

Smart Wheelchair Controller | 40A embedded PCB with voice-controlled mobile app

- Designed 40A controller PCB with full protection circuits; developed firmware and voice-controlled mobile application for hands-free wheelchair navigation.

Autonomous AI Minesweeper Robot — Graduation Project (Excellent Grade)

- Designed multi-layer PCBs integrating motor control, metal detection, and AI-assisted vision into a complete field-deployable robotic platform.

INDUSTRIAL TRAINING

Manufacturing Engineering Trainee | United Engineering Industries Feb – May 2026

- Trained on CNC machining, production workflows, quality control, and product lifecycle processes.

Automation Trainee | HA Consulting Group Oct 2024 – Feb 2025

- Completed hands-on training in Classic Control Systems, PLC programming, and industrial motor drives.

Electrical & Industrial Systems Trainee | Energya Industries (Elsewedy Helal) Jun – Aug 2024

- Trained in transformer manufacturing, electrical distribution, safety standards, and quality control.

EDUCATION

B.Sc. Mechatronics Engineering — Higher Technological Institute (HTI), Egypt Expected 2026

CERTIFICATIONS & LANGUAGES

Certifications: Classic Control & PLC Programming (HA Consulting Group) | EF SET English B2

Languages: Arabic (Native) | English (C1 Advanced) | German (A2 Basic)