



Zoomlion Heavy Industry N.A., Inc.

Hardware Design Engineer

Department: Engineering

FLSA Status: Exempt

Grade/Level:

Job Type: Regular

Work Schedule:

Weekdays Monday through Friday unless traveling.

Hours flexible to meet project needs.

Job Status: Full Time

Reports To: Engineering Lead, Embedded Systems

Amount of Travel Required: up to 15%

Positions Supervised: None

POSITION SUMMARY

Research, design, develop, and test embedded controller hardware and software. Set operational specifications and formulate and analyze system requirements. Apply principles and techniques of Embedded Design, Real-time Control applications and System Design Practices and Mechatronics.

ESSENTIAL FUNCTIONS

Reasonable Accommodations Statement

To accomplish this job successfully, an individual must be able to perform, with or without reasonable accommodation, each essential function satisfactorily. Reasonable accommodations may be made to help enable qualified individuals with disabilities to perform the essential functions.

Essential Functions Statement(s)

- Experience in at prototype and production development; have a multidiscipline background and a passion for innovation
- Knowledge of manufacturing and prototyping processes, working with fabricators to develop models and rapid prototypes.
- Control hardware design experience including low power logic hardware circuit design, PCB layout with signal integrity and EMI considerations
- Understanding of gate drive design, thermal management, voltage and current sensing techniques and protection circuitry
- Knowledge of digital circuit and analog circuit and specially switching power supply design & test.
- Knowledge in embedded control peripherals (RAM, Flash, FPGA, SPI, I2C, UART, PWM, A/D, Ethernet/MII, CAN), typical design and test equipment (oscilloscopes, spectrum analyzers, logic analyzers, digital signal analyzers), and writing and executing hardware test specifications
- Familiarity with packaging designs for electrical & electronic devices, including design for mechanical robustness, EMC, and thermal considerations
- Experience in the use of modeling tools, i.e. Matlab/Simulink and LTSpice, etc.
- Experience with test equipment (oscilloscopes, spectrum analyzers, logic analyzers, digital signal analyzers), and writing and executing hardware test specifications.

- Experience in PCB tools such as Mentor, Altium, OrCAD etc for schematic capture and PCB layouts and review
- Detailed oriented in the organization of documentation related to design concepts, validation, and product release requirements
- Requirement gathering and analysis to develops hardware solutions by studying system and subsystem needs
- Determines operational feasibility by evaluating analysis, problem definition, requirements, solution development, and proposed solutions.
- Ensure conformance to design and equipment specifications and compliance with operational and safety standards.
- Recommend, plan and hardware development improvement initiatives.
- Participates in Hardware DFMEA activities for major product development initiatives.
- Participates in and/or Leads major product issue resolution initiatives including formal Root Cause Analysis (RCA) on hardware product failures as required.
- Obtains and licenses software by obtaining required information from vendors; recommending purchases; testing and approving products.
- Responsible for continual improvement and monitoring of all Hardware Design and Development processes and procedures.
- Ensures implementation and utilization of state-of-the-art analytical tools and techniques in the area of hardware development and reliability.
- Develop or direct and maintain knowledge base and standards related to hardware development, hardware system testing or validation procedures, quality, and reliability.
- Prepare reports or correspondence concerning project specifications, activities, or status.
- Update job knowledge by studying state-of-the-art in the hardware development process, including circuit simulation & design, component derating, hardware debug & checkout; participating in educational opportunities; reading professional publications; maintaining personal networks; participating in professional organizations.

POSITION QUALIFICATIONS

Competency Statement(s)

- Accountability - Ability to accept responsibility and account for his/her actions.
- Communication, Oral - Ability to communicate effectively with others using the spoken word.
- Communication, Written - Ability to communicate in writing clearly and concisely.
- Creative - Ability to think in such a way as to produce a new concept or idea.
- Technical Aptitude - Ability to comprehend complex technical topics and specialized information.
- Initiative - Ability to make decisions or take actions to solve a problem or reach a goal.
- Detail Oriented - Ability to pay attention to the minute details of a project or task.
- Analytical Skills - Ability to use thinking and reasoning to solve a problem.
- Change Management - Ability to encourage others to seek opportunities for different and innovative approaches to addressing problems and opportunities.
- Judgment - The ability to formulate a sound decision using the available information.
- Conceptual Thinking - Ability to think in terms of abstract ideas.
- Decision Making - Ability to make critical decisions while following company procedures.
- Systems Analysis - Ability to determine how a system should work and how changes in conditions, operations, and the environment will affect outcomes.
- Problem Solving - Ability to find a solution for or to deal proactively with work-related problems.

SKILLS & ABILITIES

Education: BS (4 year) and/or MS in Electrical, Electronics engineering

Experience:

- 4+ years' experience in embedded hardware design for engine, hydraulic, or vehicle control systems.
- 4+ years' experience in Mentor, Altium, OrCad, or equivalent hardware development package.
- 4+ years' experience in power electronics development in the area of motion control systems and/or industrial power conversion equipment.
- 4+ years of experience with digital circuit and analog circuit design and test.
- 4+ years of experience with typical embedded control peripherals (RAM, Flash, FPGA, SPI, I2C, UART, PWM, A/D, Ethernet/MII, CAN), typical design
- Experience with analog design of signal conditioning and filter circuitry
- Design experience developing power electronic circuits (DC power supplies) is a plus
- Component analysis experience and device characterization of IGBTs and MOSFETs is a plus
- Demonstrated knowledge of engineering best practices in the automotive and heavy equipment domain using IEC 61508, ISO 26262 or ISO 13849 standard.
- Experience in designing for EMI/EMC compliance
- Knowledge of common project management practices (8D, FMEA, GAP Analysis, Specification development)
- Familiarity with common automotive standards (J1939 and/or CANOpen)
- Knowledge of Python, Lua or C# is a plus.
- Experience working with automotive PLCs (Bosh/Rexroth, IFM, STW, HED) is a plus.

- Knowledgeable in standards (ISO 16750, ISO 60068, ISO 11452, ISO 10605, ISO 7637, SISTEMA) is a plus
- Understanding of the architecture, specification and hardware design in the area of motion control systems is a plus.
- Understanding of DMADV/DFSS methodology and design analysis (DFMEA) in a product development environment
- Experience with agency approval requirements and design for regulatory compliance (UL, CE)

Computer Skills: Linux OS, MS Windows, Microsoft Office Suite which includes Outlook, Word, Excel, etc. required.

Certifications & Licenses:

Other Requirements:

PHYSICAL DEMANDS

N (Not Applicable) Activity is not applicable to this position.
O (Occasionally) Position requires this activity up to 33% of the time (0 - 2.5+ hrs/day)
F (Frequently) Position requires this activity from 33% - 66% of the time (2.5 - 5.5+ hrs/day)
C (Constantly) Position requires this activity more than 66% of the time (5.5+ hrs/day)

Physical Demands

Stand	F	Lift/Carry	
Walk	F	10 lbs or less	O
Sit	F	11-20 lbs	O
Manually Manipulate	F	21-50 lbs	N
Reach Outward	O	51-100 lbs	N
Reach Above Shoulder	O	Over 100 lbs	N
Climb	N	Push/Pull	
Crawl	N	12 lbs or less	O
Squat or Kneel	N	13-25 lbs	O
Bend	O	26-40 lbs	N
Grasp	O	41-100 lbs	N
Speak	F		

WORK ENVIRONMENT

Office environment in a controlled atmosphere building.

