albatts

Alliance for Batteries Technology, Training and Skills

2019-2023

Controls Engineer

~~~

Co-funded by the Erasmus+ Programme of the European Union
~~~

Battery Material Engineer

A battery controls engineer is responsible for designing, developing, and testing control and management systems for batteries. They work with a team of engineers and scientists to create efficient and safe control systems for electric vehicles, consumer electronics, grid storage, and other applications. They are responsible for the control and monitoring of the battery's state of charge, state of health, and other performance parameters, as well as for the implementation of safety measures and protection of the battery against abuse and malfunction.

They need to have a strong understanding of electrical engineering, control systems, and computer science, as well as experience with battery management systems, safety protocols, and regulations. They also need to be familiar with simulation and modeling tools to predict the performance of the battery systems under different conditions. They need to be able to work closely with other engineers and stakeholders to ensure that the control system meets the requirements of the application and is compatible with the rest of the system. They also need to be familiar with the regulations and standards related to battery controls and safety.

ESCO Occupations - ESCO - Occupations - European Commission (europa.eu)

ID	NAME	Concept URI
2149.2.2	Component engineer	http://data.europa.eu/esco/occupation/1f958638-066f-470c-9549-a9070ba280a6

Context

Minimum EQF	6/7/8
Value Chain	Cell and Components Manufacturing Modules and Packs Battery Integration
Departments	Production and Maintenance RnD
Specialisations	Other job roles that are more specialised but based on this

Co-funded by the Erasmus+ Programme of the European Union

Alliance for Batteries Technology, Training and Skills ALBATTS – Project number 612675-EPP-1-2019-1-SE-EPPKA2-SSA-B. The European Commission support for the production of this publication under the Grant Agreement Nº 2019-612675 does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

	Controls Engineer Functional Safety and Controls Engineer Senior Battery Controls Engineer Facility Controls Engineer Control Systems Integration Engineer Controls Simulation Engineer

Cross-sectoral Specific Competence

Name	Type (S/K)	Description/Context	Level	ESCO
General Programming Languages	K	- Proficiency in Matlab/Simulink, C/C++ programming language, real time operating systems (RTOS)	Expert	computer programming
(Process) Control Systems	S	- Develop, implement, and test control systems as well as build code and implement new features - Install, test, and troubleshoot delivered customer systems (both local and remote) - Managing, servicing, and governing electrical and mechanical industrial control systems (ICS) to include servers, applications, networks, and device infrastructure	Expert	
(Automated) Product Testing	S	- Analysing product or equipment specifications and performance requirements to determine designs which can be produced by existing manufacturing or processing facilities and methods - Directing and coordinating manufacturing or building of prototype products or systems - Test driven development and familiarity with developer driven automated testing - Familiarity with simulation and modelling of battery systems and their performance	Expert	perform product testing
Embedded Systems	K	- Build and modify Simulink code to run on real-time embedded targets - Investigating embedded software problems, understanding causal mechanisms, recommending appropriate action, owning problem resolution and documenting results - Maintain knowledge of vehicle embedded control systems as well as electric and battery related systems - Experience in embedded development in robotics, real-time controls, or system software	Expert	embedded systems
SW Development	K	- Proficiency with professional software engineering practices & standard practices for the full software life cycle, including		software and applications development and

Co-funded by the Erasmus+ Programme of the European Union

Alliance for Batteries Technology, Training and Skills ALBATTS – Project number 612675-EPP-1-2019-1-SE-EPPKA2-SSA-B. The European Commission support for the production of this publication under the Grant Agreement Nº 2019-612675 does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

/ Engineering		coding standards, code reviews, source control management, build processes, testing, and operations - Fluent in software fundamentals including software design and maintainability - Implementation, performance optimization and maintenance of Control software - Develop, implement, and test controls software as well as hardware improvements for existing and future systems - Contribute to software design reviews, architecture reviews, and team best practices - Experience in embedded development in robotics, real-time controls, or system software		analysis
Product Development	S	- Directing and coordinating manufacturing or building of prototype products or systems. - Planning and developing experimental test programs - Lead the development and improvement of work processes and battery controls cross-functionally - Ability to work with all phases of development including concept, design, architecting, prototyping, and production - Experience with development and integration of High Voltage components - Design the Battery Management Architecture	Expert	develop new products
Diagnostics (Performance Prediction/Validation)	K	- Understanding of telematics, diagnostics, and calibration protocols (e.g. XCP) - Implementation of battery monitoring and mitigation strategies	Expert	performance diagnosis
CAN LIN Bus / Communication Protocols	K	- Understanding of networking protocols tools such CAN bus (e.g. J1939) and CAN bus diagnostics tools (e.g. Vector CANalyzer), Ethernet	Expert	ICT communications protocols

Sector Specific Competence

Name	Type (S/K)	Description/Context	Level	ESCO
		-		

Soft Competence

Name	Type (S/K)	Description/Context	Level	ESCO
Problem Solving/Troubleshooting	S	- Programming, installing, and troubleshooting image vision systems such as Keyence and Cognex - Programming, installing, and troubleshooting PLC	Expert	problem solving & troubleshoot

Co-funded by the Erasmus+ Programme of the European Union

Alliance for Batteries Technology, Training and Skills ALBATTS – Project number 612675-EPP-1-2019-1-SE-EPPKA2-SSA-B. The European Commission support for the production of this publication under the Grant Agreement Nº 2019-612675 does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

		systems such as Mitsubishi and Omron - Analysing test data and reports to determine if design meets functional and performance specifications. - Evaluating engineering test results for possible application to developments of systems or other uses - Install, test, and troubleshoot systems for delivered customers - Apply problem-solving skills to identify root causes and define issues - Interpret, analyse and present test results		
Teamwork	K	- Work across teams to define a controls strategy	Practitioner	teamwork principles

General Transversal Competence

Name	Type (S/K)	Description/Context	Level	ESCO
Documentation	S	- Ability to understand, use and produce technical and other documentation - Providing technical information concerning manufacturing or processing techniques, materials, properties, and process advantages and limitations	Practitioner	use technical documentation; observe documents

Academic Competence (can be taken from University programme)

Name	Type (S/K)	Description/Context	Level	ESCO
Mechanical Engineering	K	- Managing, servicing, and governing electrical and mechanical industrial control systems (ICS) to include servers, applications, networks, and device infrastructure deployed	Expert	mechanical engineering
Electrical Engineering (systems)	K	- Electrical Engineering university degree	Expert	Electrical engineering

Co-funded by the Erasmus+ Programme of the European Union

Alliance for Batteries Technology, Training and Skills ALBATTS – Project number 612675-EPP-1-2019-1-SE-EPPKA2-SSA-B. The European Commission support for the production of this publication under the Grant Agreement Nº 2019-612675 does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.