

# Controls/IOT Engineer

## About Liveline

Liveline enables dramatic improvements in manufacturing performance through a unique application of artificial intelligence to provide real-time process control and predictive assistants for plant personnel. Our focus is on automating complex processes, not simply providing dashboards for managers and operators.

Our team combines experts in AI with world-class process engineers who can focus on the “last mile” with customers: Extracting data from the process and implementing controls on the shop floor. We speak the language of AI but also industrial controllers.

Our hardware and software offerings are scalable and cost-effective whether customers have one production line or hundreds, delivering an ROI that’s attractive to small and medium-sized enterprises.

We are passionate about democratizing the power of analytics and advanced automation for manufacturers of almost any size. Through our approach, producers can de-mystify complex processes and free up valuable technicians to focus on more advanced tasks instead of constantly monitoring and adjusting equipment parameters.

## Role Description

IOT Engineers at Liveline build the eyes and ears of our intelligent automation systems. They are responsible for implementing the most cost-effective methods for sensing and collecting the necessary data and delivering it from the production line to our data management environment. They also ensure the flow of control signals and other information down to the line equipment and operator interfaces. This role will assist in deploying Liveline solutions to our customers, ensuring a complete integration of Liveline technology with the manufacturing site.

## Primary Responsibilities:

- Responsible for programming and deploying PLC logic, HMI, sensors and other types of electronic devices on the process line.
- Deploy edge device to cloud. Interface with multiple network layers and communication protocols (OPC/UA, MQTT, etc.)
- Experience with network communication and SCADA system, Ignition preferred.
- Create electrical prints and related documentation to support the electrical integration of mechanical equipment using CAD software like AutoCAD
- Controls design and optimizations; Controls support/training during installation of equipment at customer site
- Evaluate and troubleshoot process and control system performance
- Analyze project requirements and perform technical calculations supporting design including electrical requirements, robotic safety standards, and motor controls
- Involvement with PLC (AB or Siemens), control (controller design, network communication, SCADA system), and sensor programming

- Lead integration of IoT including physical and wireless networking (WiFi, Bluetooth, RFID, mesh networks)
- Good understanding on IT connectivity Protocols
- Use technology acumen to provide input to assist with evaluation of new technologies and contribute to the design, lifecycle management, and total cost of ownership of services

### Experience:

- Bachelor's Degree in Engineering (Mechanical, Industrial, Electrical, Chemical preferred)
- Five plus years of experience in controls design and implementation
- Allen Bradley and/or Siemens Experience
- Experience building IoT solutions; networking, sensors, process machine upgrades
- Involvement with wireless communications technology and test equipment
- Experience working with Open Source Software

### Hard Skills:

- Understanding of controller design theory, including non-adaptive (such as PID) and adaptive control (such as MRAC, MIAC, etc.)
- Experience in C, C++ Programming, OOPS, MatLab
- Good to Have Python, Scipy Libraries
- Ability to Test the Integration
- Good understanding on Control/IoT algorithms
- Experience with Ignition
- Experience with Allen Bradley and Siemens PLC
- Ability to apply controller tuning and optimization techniques
- Fundamental understanding of ladder logic, I/O, and network communication
- Understanding of instrumentation, controls, electrical schematics and diagrams
- Knowledge of embedded systems and sensors
- Experience with cloud platforms
- Demonstrates an understanding of data structures and algorithms

### Soft Skills:

- Creative problem-solving skills and patience to evaluate and troubleshoot process and control system performance
- Capable producing innovative solutions to engineering problems and customer operational issues
- Excellent interpersonal, analytical, computer & software skills
- Ability to explain moderately complex information to others in concise manner
- Good written and presentation skills
- Willingness and ability to travel, as necessary

## Questions

Try to find the best candidate with correct skill set, team, flexibility or T-shaped. Questions should be conducted with a qualified interviewer.

This person is a t-shaped controls integrators.

Give me an example of when you used PID tuning in a PLC program?

- What did you control?
- What were the learnings or challenges
- What was your method for optimizing tuning
- How did you measure success of tuning
- Have you done a heating and cooling application
- Were there safety issues

What experience do you have with documenting and designing electrical signals and wiring?

Give a list of sensors (analog and digital) you have worked with and give an example of adding a sensor to a production line?

- How did you select the sensor
- How did you connect
- What steps were needed to integrate the sensor in the PLC

Give an example of networking in a process or plant, for example network addressing, gateways and routing, wireless vs hardwire? How would connect a new PLC to a separate VLAN.

What SCADA experience do you have and give an example?

Have you written a PLC program from scratch and give an example?

Give examples of the sensors you have worked with? Analog, digital, and ethernet. What were their functions, speed of read, triggering, storage.

What is the most complicated IOT implementation you have worked on

Give an example of a vision deployment?

Give an example of bad data or poor data quality? Can you automate the process?

Have you automated data flow from a sensor to a database?

Integration of sensors, MQTT, PLC, database

Give an example of how you have upgraded a manufacturing process with new sensor technology?

What embedded controllers have you used? How do you deploy new software and hardware? Have you integrated with cloud using an edge device?

Have you used a cloud solution? Greengrass, Google IOT, Azure IOT, Freertos (AWS)

## Whiteboard

Sensors to Cloud

Walk us through a sensor to cloud deployment with a scada system as the intermediary

Keys to Success

Sensor to DAQ or PLC, converting the sensor from analog to digital

Saving the data from the PLC to somewhere, historian or local storage

Flat file or data base saving

Connecting to the cloud – credentials and logic, logic can be on the gateway or a secondary batch process

Understands time synchronization

Understands PLC programming, how do we set tags or how do you know its connected

MQTT or OPC/UA

Textbook