

## Mechanical Engineering & Automation Services

A.H. Mackenzie Design, LLC  
10 Moulton Street  
Suite 1024  
Portland, ME 04101  
(207) 619-1622

## Services Offered

### Mechanical Engineering

- Product & Prototype Development
- Machine Design
- Process & Manufacturing Engineering
- HVAC Design
- CAD Design
  - Modeling & Assemblies
  - Process & Instrumentation Diagrams
  - Electrical Schematics
- Finite Element & Computational Fluid Dynamics Analysis



### Automation & Test

- Data Acquisition Systems Development
- Embedded Systems Development
- LabVIEW Programming
  - Types: Windows OS, Real Time Systems, FPGA
  - Platforms: PC, cDAQ, cRIO, PXI
  - Protocols: CAN, LIN, ModBUS, Serial, SPI, I2C
- PLC & Ladder Logic Programming
- PID & Advanced Control
- Database Integration
- Motion Control & Robotics
- Vision & Inspection
- Electrical Cabinet Design
- User Interface Development
- Circuit Board & Device Testing

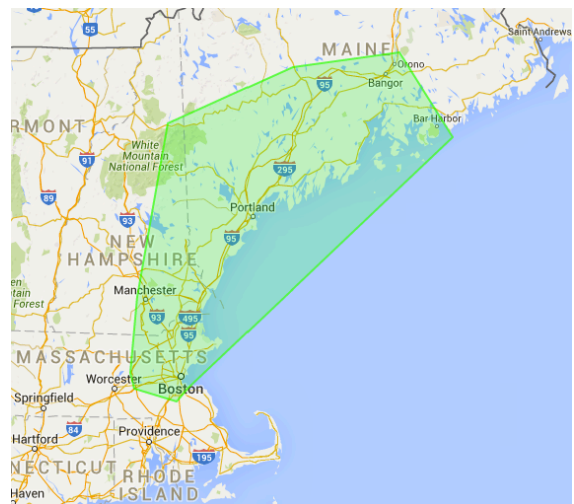


### Software

- National Instruments / LabVIEW
- Autodesk Inventor / AutoCAD

### Credentials

- Maine Licensed Professional Engineers (PE)
- National Instruments Alliance Partner
- LabVIEW Certified Developers



Typical Service Area



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## Customers Served

- **Manufacturers**
  - *Lean & Robust Manufacturing Systems*
  - We design machines to seamlessly integrate into your factory. Our advanced tooling and automation designs ensure high quality production, with Lean practices built in from the start. Clear interfaces and advanced connectivity make key process data readily available to all stakeholders.
    - Tooling & Fixture Design
    - Advanced Automation w/ Embedded Systems or PCs
    - End-of-Line / In Process Test Equipment
- **Product Development & Test Labs**
  - *Equipment for Developing your Next Innovative Product*
  - We engineer test equipment that enables you to make your next break through. Our systems give you precise control and the data you need to quickly react to rapidly changing customer requirements. Our ability to tightly integrate with your engineering team ensures solutions that are exactly what you need.
    - Novel & Unique Test Equipment Design
    - Advanced Signal Processing, Data Acquisition, and Control
    - Clear User Interfaces & Data Management
- **System & Automation Integrators**
  - *Deliver Your System on Time & Spec*
  - Get the engineering horsepower you need, when you need it. From programming an embedded system, to performing complex data processing in real time, to the mechanical design of a station – we'll help you deliver.
    - Station / Sub-Station Design
    - High Precision / High Frequency Data Acquisition & Control
    - Complex Data Processing & Industrial Communication
    - PACs / Industrial PC Development
- **R&D / Custom**
  - *Tailored Engineering Services*
  - Our engineering resources integrate with your team to deliver your unique projects. From universities to start ups, we help our customers achieve their vision.
    - Mechanical Engineering
    - Process Engineering
    - Advanced Data Acquisition & Control
    - System Design & Analysis