Computer Engineer – Embedded Systems

Blacksburg, Virginia | Full-Time

About Sentek Instrument

Sentek Instrument LLC is a high-tech company developing and manufacturing advanced optical sensor systems and instruments for demanding applications in aerospace, energy, oil and gas, industrial processing, and other rapidly growing markets.

Located in the Virginia Tech Corporate Research Center in Blacksburg, Virginia, Sentek combines optical sensing, electronics, embedded systems, signal processing, and software to develop unique products that address measurement challenges not well served by conventional commercial offerings.

The Opportunity

We are seeking a talented and highly motivated Computer Engineer to join our engineering team.

This is a hands-on engineering position focused on embedded systems, digital electronics, system integration, and product development. You will work with engineers developing sensor instruments and will have opportunities to work with microcontrollers, FPGA-based systems, high-speed data acquisition, communications, and PC software.

The successful candidate will not be expected to design every part of a system. Instead, you will help perfect existing electronic platforms and turn them into reliable, functioning products through firmware development, FPGA/embedded programming, software integration, testing, and debugging.

This position is particularly well suited to an engineer who enjoys understanding how an electronic system works as a whole and solving problems that cross the boundaries between hardware and software.

Key Responsibilities

- Develop, modify, and debug embedded software for sensor instruments and electronic systems.
- Develop and maintain firmware for microcontrollers and embedded processors.
- Work with FPGA-based systems and support FPGA programming, integration, and debugging.
- Integrate embedded electronics with PC software and graphical user interfaces.
- Develop and debug communication interfaces such as USB, Ethernet, serial, SPI, I²C, and similar interfaces.
- Work with data acquisition systems, including high-speed ADCs and digital data paths.
- Support the integration and testing of electronic boards developed by other engineers.
- Bring up and troubleshoot new and existing electronic systems.
- Use oscilloscopes, logic analyzers, JTAG/debug probes, and other tools to diagnose system problems.
- Develop software and APIs for communication between instruments and external computers or applications.
- Support sensor calibration, characterization, and product testing.
- Participate in the development of new products and improvements to existing products.
- Work closely with engineers on problems involving electronics, firmware, FPGA logic, software, sensors, and measurement systems.
- Document software, firmware, system configurations, test procedures, and technical results.

Required Qualifications

- Bachelor's degree in computer engineering, electrical engineering, computer science, or a closely related field.
- Strong programming skills in Verilog, C and/or C++.
- Experience with embedded systems, microcontrollers, or digital hardware.
- Ability to understand how hardware and software interact in an electronic system.
- Experience with one or more interfaces such as USB, Ethernet, UART/serial, SPI, or I²C.
- Strong debugging and problem-solving skills.
- Ability to read and understand electronic schematics and hardware documentation.
- Experience using laboratory or debugging tools to troubleshoot electronic systems.
- Ability to work with existing code and hardware while developing new functionality.
- Ability to learn unfamiliar hardware, software, and engineering systems quickly.
- Strong communication skills and ability to work effectively in a small multidisciplinary engineering team.

Preferred Qualifications

Experience in one or more of the following areas is highly desirable:

FPGA and Digital Systems

- Xilinx/AMD FPGA or SoC platforms, particularly Zynq-7000 or similar devices.
- FPGA development using Verilog, SystemVerilog, or VHDL.
- High-speed ADCs/DACs and digital data acquisition.
- DDR/DRAM memory interfaces.
- High-speed data transfer between FPGA systems and PCs.
- FPGA-based signal processing.

Embedded Systems

- TI STM32 or TMS320F2837xD Microcontroller platforms.
- Embedded C/C++ development.
- Real-time embedded software.
- JTAG or other embedded debugging tools.

Instrumentation and Software

- Software for scientific, industrial, or test-and-measurement systems.
- Windows application development or GUI programming.
- Data acquisition, signal processing, or real-time data processing.
- Industrial communication protocols such as Modbus, CAN or OPC UA.
- APIs for instrument control.
- HDF5 or other scientific data formats.

PCB design experience is not required. Experience working with and debugging completed electronic boards is more relevant to this position.

What We Are Looking For

- Enjoy building and debugging real electronic systems.
- Like working across hardware and software boundaries.
- Can take an existing electronic platform and figure out how it works.
- Enjoy troubleshooting difficult problems rather than working only within a narrowly defined specialty.
- Are comfortable working in a laboratory with electronic hardware and instruments.

- Have the curiosity and initiative to learn technologies outside your primary area of expertise.
- Want to see your engineering work become a real product used by customers.

You do not need to be an expert in every technology listed above. A strong engineer with solid fundamentals and experience in several of these areas is encouraged to apply.

What We Offer

- Competitive compensation package.
- 401(k) matching and retirement plan.
- Paid time off (PTO) and health benefits.
- Opportunity to work on unique and technically challenging sensor systems.
- Hands-on experience with embedded systems, FPGA technology, electronics, sensors, and scientific instrumentation.
- Opportunity for professional growth and increasing technical responsibility.
- Close collaboration with engineers and scientists in a research-driven environment.
- Opportunity to contribute to products from development through laboratory testing and customer deployment.

Location

Blacksburg, Virginia

Sentek Instrument is located in the Virginia Tech Corporate Research Center, providing a strong technology and research environment. Blacksburg is a vibrant college town with excellent schools, abundant outdoor recreation, and a high quality of life.

Equal Opportunity Employer

Sentek Instrument LLC is an equal opportunity employer committed to providing a professional and inclusive workplace. We value individuals with diverse backgrounds, experiences, and perspectives.

How to Apply

Please send your resume and a brief cover letter to hr@sentekinstrument.com.

Please include “Computer Engineer – Embedded Systems” in the subject line.

In your cover letter, please describe one or two projects in which you developed, integrated, debugged, or brought up an embedded or computer-based electronic system.

We look forward to learning more about you and how you could contribute to Sentek Instrument.