BARTON SCHAEFER, BSEE

Staff Systems Integration, Release & Production Systems Engineer

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SUMMARY

Electrical Engineer (BSEE, EIT) who treats software, firmware, and hardware as one integrated toolkit—building, securing, troubleshooting, and shipping production systems end-to-end. Across industrial instrumentation, fleet logistics, custody-transfer hardware, and regulated manufacturing, I bridge physical equipment, production software, factory floors, OEM integrators, and end customers.

CORE TECHNICAL CAPABILITIES

- **Digital Systems & Machine-to-Machine (M2M) Communications:** End-to-end physical-to-application systems across 8/16/32-bit MCUs/DSPs *(e.g., ARM/STM32, TI, Microchip)*, serial/fieldbus & wireless modules *(e.g., UART/RS-232/RS-485, USB/VCP, CAN, SPI, I2C, FANUC HSSB; Nordic/Renesas BLE modules)*, power/cabling/EMI & signal-conditioning troubleshooting, metadata-driven device abstraction, and analog/digital sensor diagnostics *(e.g., 4–20 mA, 0–10 V, optical)*.
- **Security, Persistence & Release Engineering:** Hybrid symmetric & asymmetric cryptography *(e.g., X.509 trust anchoring, encrypted firmware containers, tamper-evident data sealing)*; power-loss-safe device settings persistence & cloning; stateless CI/CD signing tooling, multi-MCU bootloader orchestration, incremental CI/CD, static analysis/linters, external contractor release governance, and enterprise application packaging.
- **Production Test, Calibration & Regulated Compliance:** Factory test, metrology & calibration systems *(e.g., flow-loop & environmental-sensor calibration, electronic registration, electronic temperature compensation [ATC] & cumulative totalizer verification, opto-isolator/sensor batch testing, vibration-table test-to-failure qualification)*; Lean/Kaizen production-cell restructuring & Statistical Process Control (SPC); regulatory certification & audit readiness *(e.g., Class I Div 1/2, NIST, UL, CE, 21 CFR Part 11)*.
- **Languages, Data & Tooling:** Systems & application languages *(e.g., C, C++, C#, Python, assembly, TypeScript/JavaScript, Java, T-SQL)*; relational & NoSQL databases *(e.g., SQL Server, PostgreSQL, Oracle, MySQL, SQLite, MongoDB, stored procedures)*; APIs, data & engineering tooling *(e.g., REST/Sockets/TCP-IP, NumPy, Pandas, Git, AWS, TDD, GIS/spatial mapping)*.

PROFESSIONAL EXPERIENCE

Rainier Integration Systems — Independent Systems Integration Engineer Kent, WA | 2024–Present

- **Independent Engineering & Contract Practice:** Contract (1099/C2C/W-2) and technical advisory services focused on M2M device-to-host interfaces, provisioning & settings-persistence suites, factory test/calibration tooling, and host/multi-MCU release engineering.
- **Active Embedded & Verification Prototyping:** Hands-on hardware-software prototyping across ARM/STM32 platforms—covering hardware-security bring-up, motor/sensor control loops, and automated verification harnesses.

Seametrics — Senior Software Engineer Kent, WA | 2023–2024 (Internal Transfer from Onicon)

- **Metering Suite Modernization & Regulated Data Sealing:** Replaced legacy C++ metering software with a unified desktop suite across industrial and irrigation flow-meter lines (still actively distributed and maintained), adding worldwide region-regulated data formatting and hybrid symmetric/asymmetric cryptographic report sealing.
- **$3k–$5k Environmental Sensor Line Rehabilitation (High-Margin Acquired Line):** Reconstructed abandoned 3-year-old build/installer environments and partnered with the hardware design engineer and external firmware contractor to add on-the-fly automated firmware upgrade/downgrade by sensor configuration; identified and fixed calibration-accuracy defects (nominated by production floor for *Quality, Innovation & Partnership*).
- **Production Test Automation & 2-Week ROI Study:** Built factory batch-testing utilities for opto-isolators/sensors and automated SQL Server board serial-number save/restore during firmware flashing; executed a time-motion cost-benefit study justifying a $4K calibration-station upgrade that paid for itself in **2 weeks**.
- **Site-Wide Kaizen & Firmware Release Governance:** Core engineering contributor across **50%+ of site-wide Kaizen events (7+ events)** restructuring production cells, work instructions, and test areas supporting two new production lines and an expanded flow loop; revived 6-year-unmaintained C++ tools, stood up incremental CI/CD, and formalized release procedures for external firmware contractors.

Onicon — Senior Software Engineer Tampa, FL (Remote) | 2019–2023

- **Unified Diagnostic Suite & Metadata-Driven Architecture:** Architected and developed the unified desktop commissioning, calibration, and USB-to-Serial (VCP) diagnostic suite across commercial flow and BTU meter families—featuring a **1 kHz real-time telemetry display**, verified settings backup/secure-flash/restore workflows, and an external metadata-driven attribute database so new meter lines onboard without recompilation; deployed onto shop-floor production PCs.
- **Cryptographic Firmware Tooling & ST (STM32) Reference Bootloader:** Specified a custom encrypted firmware container format and built the embedded/host signing and updater reference implementation on **ST (STM32)**—including a stateless, runtime-injected cryptographic CLI enhancing existing CI/CD steps (zero hardcoded secrets), hybrid symmetric/asymmetric X.509 trust routing, and a timed bootloader capture handshake with hardware gating and pre-commit integrity—subsequently applied by the firmware team across ONICON's product families.

Midwest Computer Register (MID:COM) — Staff Engineer Hampton, IA | 2005–2016

- **Class I, Div 1 & Div 2 Custody-Transfer Registers & Proportional Controllers:** Primary multi-MCU embedded firmware engineer (shipping unified firmware across Class I Div 2 and intrinsically safe Class I Div 1 hardware) and solo host-software engineer; coordinated US/Canada regulatory agency and lab compliance (**NIST**, **W&M**, **UL**, **CE**, **Intertek**, **ETL**), electronic temperature compensation (ATC) and cumulative totalizer verification, and French/Spanish localization.
- **100+ OEM Integrator Ecosystem & Trade-Show Technical Lead:** Primary technical contact for **100+ active OEM, third-party integrator, and truck-builder dev systems** (including Veeder-Root and Canadian ATC distributors); co-led national trade-show technical demos and remotely isolated sub-zero (**−35°C**) HF EMI interference on 4–20 mA control loops for commercial aircraft refuelers.
- **Release Pipelines, Factory Tooling & Hardware Qualification:** Built centralized UART/USB device settings cloning/archiving suites, host software supporting hundreds of legacy I/O formats, and a versioned, linted, rollback-capable release pipeline across ~30 MCU products and ~24 factory/field utilities; conducted vibration-table test-to-failure hardware qualification.

Suburban Software Systems — Staff Engineer Bessemer, AL | 2002–2005 (Intern 1996–1998)

- **Fleet Mapping & Routing Suite:** Architected desktop and in-cab mobile geocoding, multi-tier depot geofencing, daily delivery-queue routing optimization, passive GPS tank-coordinate learning on delivery, and OBD-II vehicle telemetry—pragmatically targeting PC-native mapping for reliable field deployment.
- **Industry-First In-Cab Register Integration:** Engineered the industry's first in-cab UART fuel-register integration platform (**Cover of *BPN Magazine***) across five major register vendors (MID:COM, Liquid Controls, Veeder-Root, TCS, Endress+Hauser) and internal operations tooling for sister company **Suburban Equipment**; introduced version control, PR diffs, and automated linting.

CimWorks / GE Fanuc — Software Engineer / Project Manager Kirkland, WA | 1998–2002

- **Portable SPC Data Collector & Metrology Interface:** Served as de-facto technical PM on a 60-page automotive OEM RFQ (100% requirement verification and mentoring the embedded firmware engineer); ported desktop Statistical Process Control (SPC) software onto constrained handheld hardware with automated UART docking-cradle sync and universal digital metrology gage compatibility.
- **High-Speed CNC Machine Interface & 21 CFR Part 11 Compliance:** Engineered an NDA-covered **FANUC 20 Mbps HSSB** deterministic G-code deployment and shop-floor event monitoring interface (operated live at **IMTS Chicago**, followed by ongoing trade-show technical leadership); project-managed a **21 CFR Part 11** electronic-records compliance retrofit across SQL Server and Oracle; earned **GE Six Sigma Green Belt** (selected 1 of 2 out of ~100 for retention transfer).

EDUCATION & CREDENTIALS

- **B.S. Electrical Engineering (BSEE)** — The University of Alabama at Birmingham (UAB)
- **EIT / FE License #ET11624** — Board of Licensure for Engineers & Land Surveyors, State of Alabama
- **GE Six Sigma Green Belt**