PebbleLogic

CAPABILITY STATEMENT

Instrument control, data acquisition, and legacy modernization

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Pebble Logic builds the software layer for companies that build instruments: acquisition hardware integrated and verified, the desktop applications that control it, and instrument software moved off platforms it has outlived. We work in Python and Qt, we read datasheets, and we produce documentation that stands up to an audit or a certification review.

CORE COMPETENCIES

- **Data acquisition integration.** LabJack T-series over the LJM library, analog front ends, signal conditioning chains, analog and digital I/O
- **Hardware evaluation and trade studies.** requirements-driven evaluation of candidate devices before application code is written; isolation, resolution and vendor API risk
- **Desktop applications.** Python with PySide6 and Qt on Windows; real-time waveform display, acquisition control, session recording, logging and export
- **Instrument control.** serial protocols, vendor SDKs, and closed-API integration, including working around closed proprietary protocols
- **Legacy modernization.** instrument software on closed vendor protocols and aging acquisition software, moved to Python and Qt; offered, with the first replacement in progress
- **Verification infrastructure.** synthetic waveform injection rigs and regression against known reference signals, independent of the physical sensor
- **Regulated software lifecycle.** development plans, architecture descriptions, dependency risk analysis, traceability and verification evidence (IEC 62304, FDA documentation levels)
- **Real-time signal processing.** streaming biosignal acquisition, feature detection and classification on noisy sensor data, BLE device control
- **Data infrastructure.** high-rate time-series ingest, partitioned and tiered storage, PostgreSQL, Redshift, Elasticsearch, Kafka, AWS

DIFFERENTIATORS

Hardware-literate software engineering.
Computer science with minors in electrical engineering and mathematics, which is why we start at the datasheet. We select acquisition hardware against explicit requirements, build the rigs that prove the signal chain, and design around closed vendor APIs rather than stopping at them.

Documentation discipline from regulated work.
More than five years of the principal's career, before Pebble Logic, on FDA-regulated medical device software, where traceable requirements, architecture documentation, dependency risk analysis and verification records are not optional. Scientific and industrial clients get that discipline without paying for a regulatory program they do not need.

Principal-level engineers.
Three prior CTO roles and more than fifteen years of senior and staff engineering. The person who scopes the work writes the code.

Three people, in Northern California.
On-site work across the Sacramento region and the Bay Area, including Berkeley and Livermore.

CURRENT WORK

Client name withheld under a confidentiality agreement.

Bedside instrument console, federally funded medical device program 2026, current
Windows console application in Python and PySide6 for a real-time physiological pressure instrument, replacing an acquisition path blocked by a vendor's closed proprietary protocol. Signal chain runs from a MEMS pressure sensor through signal conditioning to a LabJack T7, selected by formal trade study against 18 hard and 22 soft requirements. A second LabJack, a T4, injects synthetic waveforms into the T7 analog input so acquisition is verified against known signals. Software lifecycle documentation set supporting an FDA premarket submission, in progress. Subcontracted under a negotiated PO with the prime's written consent; export compliance cleared.

PRINCIPAL'S PRIOR WORK, BEFORE PEBBLE LOGIC

Performed as an employee, before the firm was founded.

Real-time EMG monitoring for physical therapy 2019 to 2021
React Native application streaming from two BLE muscle-activity sensors simultaneously, with signal-processing and classification logic detecting repetitions and sets from raw EMG across differing exercise signatures.

Commercial solar monitoring platform, staff engineer 2017 to 2019
Led the rebuild for a fleet of more than 40,000 installations, sustaining over 9,000 database inserts per second across roughly 500 million rows per month. Dashboard queries spanning months of history reduced from minutes to under two seconds.

Large-scale analytics platform, CTO 2015 to 2017
Led an eight-person engineering team through 6.5x revenue growth. Platform processing more than 3 TB daily, with infrastructure cost halved by consolidating 150 per-customer databases onto containers and multi-tenant stores.

WHERE ENGAGEMENTS START

Signal Chain and Hardware Review
$7,500 fixed · two weeks

Requirements captured with you, candidate acquisition hardware evaluated against them with disqualifications explained, a recommended signal path, a risk register, and a scoped estimate for the build that follows.

Credited in full against a build engagement of $25,000 or more started within 90 days.

Build engagements typically run $25,000 to $120,000 over six to sixteen weeks.

ENTITY	Pebble Logic, LLC California single-member LLC, formed 2026	SAM.GOV	Registered, active	CONTACT	Jim Hickey, Principal jim@pebblelogic.net · 530-830-2211
NAICS	541511 (primary) · 541512 · 541330 · 541690 · 541715	SIZE	California Certified Small Business (Microbusiness) DGS Cert. No. 2056377	INSURANCE	Professional liability and general liability. Certificates of insurance on request.