PearlSoft is the Space Dynamics Laboratory's (SDL) software solution for the Pearl CubeSat platform and the Modular Avionics System (MODAS). PearlSoft operates on the MODAS single board computer (SBC). The MODAS BIC is designed around the radiation tolerant LEON3-FT SPARC V8e microprocessor and provides a configurable 11-89 MIPS processor with a floating point math processor on a PCI-104 backplane.

PearlSoft operates in the VxWorks environment using the POSIX libraries. Future support will be provided for UNIX and real-time Linux operating systems.

PearlSoft uses a task-oriented architecture to provide design modularity. The modularity enables a high level of reuse and adaptability to meet a broad range of satellite mission requirements and to accommodate SDL's evolving miniaturized subsystem technologies. Separate tasks for communications, attitude control, and payload management enable developers to modify or replace PearlSoft tasks without extensive retesting of the satellite system. The payload manager of the PearlSoft software enables companies to develop their own custom payload interface with few modifications to the executor and the telemetry processor (see diagram on back).

SDL developed the PearlSoft software suite in compliance with its ISO-9001 registered software development procedures. These processes include a documented method to control and verify the software development to ensure that the finished product meets specified requirements within schedule and budget constraints. This is accomplished through measurable benchmarks and traceability using statistical and quantitative techniques such as feature-driven status matrixes; formal inspections and peer reviews; formal validation and acceptance tests; managed configuration control and change processes; and deficiency tracking and reporting.
PearlSoft draws its flight heritage from the NASA Aeronomy of Ice in the Mesosphere (AIM) mission, Solar Occultation for Ice Experiment (SOFIE) experiment, which SDL designed, developed, and integrated. The SOFIE software has operated successfully on orbit since April 2007 with no problems.