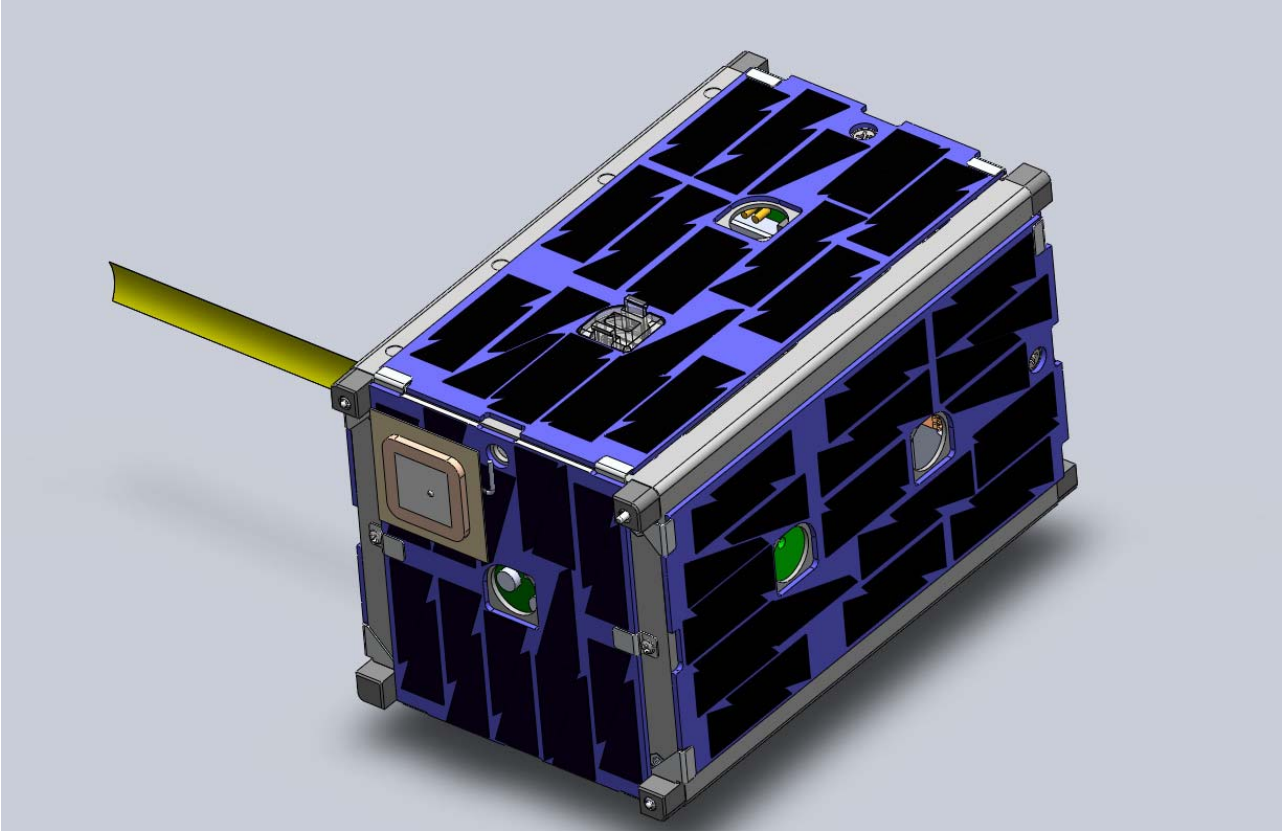
EDSN Satellite Technical Description

The overall goal of the Edison Demonstration of Spacecraft (EDSN) mission is to demonstrate sending a collection of 8 advanced, yet affordable, nanosatellites into space, interacting with one another and with mission control. This can enable a wide array of scientific, commercial, or academic research. Other goals of the mission include, lowering the cost and shortening the schedule of future small spacecraft as well as testing new software applications. .

The ESDN swarm will be launched as a secondary payload from Kauai, Hawaii, October 30, 2013. It will be inserted into an orbit at 505 km apogee and 430 km perigee, on an inclination from the equator of 93 degrees. Transmission will begin upon launch. The planned operations phase is 60 days. Atmospheric friction will slow the satellite and reduce the altitude of the orbit, until de-orbiting occurs 820 days after launch. See the Orbital Debris Assessment Report for details.

The dimensions of each spacecraft are consistent with CubeSat standards. The dimensions of each are 15 cm X 10 cm X 10 cm . The mass of each is about 2 Kg.

Figure 1 EDSN Overview



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The satellite includes the following active subsystems:

Communications subsystem: This includes a UHF beacon transmitter capable of being received by amateur HAM radio stations on the ground, and a Microhard S-Band transceiver for two way communication with Mission Operations

Electrical Power subsystem: The power subsystem consists of the body-mounted solar arrays, battery storage capable of sustaining subsystem operating loads during eclipse, and the remove before flight and separation switch power inhibits.

Guidance, Navigation and Control subsystem: This system will perform attitude determination, and will perform attitude control sufficient for pointing relative to an inertial frame. It will perform orbit estimation and orbit propagation in support of space-to-space communications pointing. Equipment includes on board position determination via GPS; reaction wheels; and magnetic torque coils.

Smart phone technology demonstration package: this includes the camera from a smart phone.

Science payload: this equipment is capable of acquiring and recording space physics measurements.

Control and Data Handling Subsystem: computers software and related, to perform conditional command plan and sequence execution; memory management, and command and telemetry handling. C&DH also includes a watchdog timer to limit radio transmissions if command from earth is lost; a CPU, and I/O for power switching, data, and equipment control.