Our project at a high level consists of creating the central control unit of a cube satellite that will accompany a larger military satellite and assist in defense and gathering sensor information by co-orbiting with the larger military satellite. With the central control unit of the CubeSat, our system will operate so that our product owner can attach any payload they might need for a future date. These CubeSats will be constantly collecting data about the conditions around them and position data that will be sent back in a data stream to the ground station. A key feature of our product will be its universality as we intend for our central control system to be used for multiple sub-models of CubeSats.

In addition to the physical structure of our cube satellite, our CubeSat will include a few key subsystems. This will include a command data handling system, a communication system, a telemetry and tracking system, and a power system. The protocols our system will use will be I2C between CPU, power, and temperature, UART between the CPU and GPS, and SPI between the CPU and the telecommunication system. These protocols were selected because they are all compatible with Raspberry Pis which we are selecting as our CPU. All these subsystems will be accessed through the command line as our user interface.

The system will have a few kinds of inputs. First, it will have sensors that interface with the CPU, for our purpose these sensors will consist of the telemetry sensor (which has information regarding pressure, temperature, and humidity) and a GPS (including position and attitude). The other kind of input will come from the radio antenna which will facilitate communication including sensor data and CPU commands such as boot and reboot. The third input will come from the solar panels connected via a separate bus to the power supply system.

The system will have two forms of outputs that will be sent out via the radio antenna. The first kind of output will be data about the subsystem, including important status information about CPUs, sensors, power availability, memory left, and the subsystems. The second kind of output will be sensor data, such as the coordinate data from the GPS or telemetry data. This sensor data will all be combined into one sensor data report so it can be sent through the radio antenna.