

NetLander Surface Module Electronics Compartment (SEC) Design and Functions

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NetLanders are a versatile suite of geophysical instrumentation to be deployed on Mars. Four Netlanders are planned to form a simultaneous geophysical measurement network. The NetLander instruments are supported by NetLander systems. The unit that will be eventually deployed on the Martian surface is the NetLander Surface Module. The Surface module has thermally controlled compartment for on-board electronics. The electronics are accommodated and supported by SEC (Surface Module Electronics Compartment) which is located inside thermal insulation. SEC provides mechanical mounting, thermal I/F, EMC protection and late access for the batteries and RHU heaters.

Main design drivers for the SEC are extreme mass and volume constraints, high mechanical loads caused especially by entry and landing and difficult thermal conditions. Entry deceleration in martian atmosphere maximum 30 g. Landing impact creates 200 g shock. SEC experiences -50...+50 C temperature variation and has to be able to conduct away excess heat to thermal system (hot case) and transport heat generated by RHUs to electronics and batteries (cool case). SEC must also offer an easy assembly and disassembly for electronics and RHU & battery late access.

State of the art design and construction methods have been used in SEC development. The resulting design is lighter but still stiffer, more compartmentalized and flexible to use than comparable conventional electronics housing types.