

Accelerometer for Martian lander missions

Petri Makkonen, Teemu Mäkinen, Ari-Matti Harri, Jouni Polkko, Juha Pöysä

The Mars NetLander 2007 mission is aiming at sending four small network landers on the Martian surface. These four NetLanders carry identical scientific payloads for studying the interior of Mars, the atmosphere, the sub-surface, as well as the ionospheric structure and the geodesy. A part of the NetLander payload is the Accelerometer (ACC), which will be used both as a system instrument and a scientific instrument. During the descent and landing phases the ACC will be used to detect atmospheric entry, as well as to assist in timing the sequence. The ACC will confirm the parachute opening, the touchdown and detect when it is safe to deploy the airbags. In addition the ACC descent and landing observations will be used to determine the atmospheric profile. When on surface the ACC will be used to measure the NetLanders' inclination, according to which, the transmission windows will be adjusted. The ACC will be a three-axis, solid-state, accelerometer with two resolutions (fine and coarse). ACC's measurement range will be 1mg - 50g and the resolution will be from a few mg to 10 mg. The current system allocations for the ACC are: power consumption 100 mW, size 5 x 5 x 5 cm³ and mass 150 g.