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Digibaro pressure instrument onboard the Phoenix Lander

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The Phoenix Lander landed successfully on the Martian northern polar region. The mission is part of the National Aeronautics and Space Administration's (NASA's) Scout program. Pressure observations onboard the Phoenix lander were performed by an FMI (Finnish Meteorological Institute) instrument, based on a silicon diaphragm sensor head manufactured by Vaisala Inc., combined with MDA data processing electronics. The pressure instrument performed successfully throughout the Phoenix mission.

The pressure instrument had 3 pressure sensor heads. One of these was the primary sensor head and the other two were used for monitoring the condition of the primary sensor head during the mission. During the mission the primary sensor was read with a sampling interval of 2 s and the other two were read less frequently as a check of instrument health. The pressure sensor system had a real-time data-processing and calibration algorithm that allowed the removal of temperature dependent calibration effects. In the same manner as the temperature sensor, a total of 256 data records (8.53 min) were buffered and they could either be stored at full resolution, or processed to provide mean, standard deviation, maximum and minimum values for storage on the Phoenix Lander's Meteorological (MET) unit.The time constant was approximately 3s due to locational constraints and dust filtering requirements. Using algorithms compensating for the time constant effect the temporal resolution was good enough to detect pressure drops associated with the passage of nearby dust devils.