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A US Manufacturer of: Pressure, Temperature, Load/Force/Torque, and Displacement Sensors

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On The Way To Mars

Stellar Technology's Pressure Transducers

On November 26, 2011, NASA launched its next Mars rover—Curiosity. Accompanying this one-ton automobile-sized vehicle will be seven Stellar Technology pressure transducers. These pressure transducers are attached to the heat shield of the Mars Science Laboratory (MSL) and are part of the sensor and instrumentation package named MSL Entry, Descent, and Landing Instrument (MEDLI). The goals of the MEDLI system are to measure the atmospheric conditions and performance of the MSL heatshield as the package containing the Curiosity rover enters Martian atmosphere and descends to it's surface.

The STI pressure sensors are components of the Mars Entry Atmospheric Data System (MEADS). According to NASA's Jet Propulsion Laboratory….. "the data collected from the MEADS sensors will be combined with data from the Inertial Measurement Unit (IMU) to provide data on surface pressure distribution, vehicle orientation, dynamic pressure, Mach number, and the atmospheric density and winds as a function of altitude".

Each Stellar Technology pressure transducer is mounted on the inside of the MSL heatshield and connected to the outside surface thru tubing and a through-hole port in the Thermal Protection System (TPS) material. The heat shield is 4.5 meters in diameter making it the largest ever built for any space craft entering the atmosphere of any planet.

Stellar Technology's ability to design, manufacture, and test special space-rated pressure transducers was the primary reason a special source selection board selected STI transducers for this critical mission.

Each pressure transducer has a range of 0-5 psia, provides a millivolt per volt output, and is required to withstand - 220°F. The high reliability grade 1 electronics for high radiation environments are packaged in a special heated box. The electronics condition sensor signals, provide power to the sensors, and interface to the MSL data acquisition system. In addition, each pressure transducer needed to be characterized with hundreds of thermal and calibration data points. Stellar Technology worked closely with NASA's Jet Propulsion Laboratory during the design, manufacturing, and ATP stages to ensure all performance criteria were met.

Next stop: MARS, August, 2012.

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