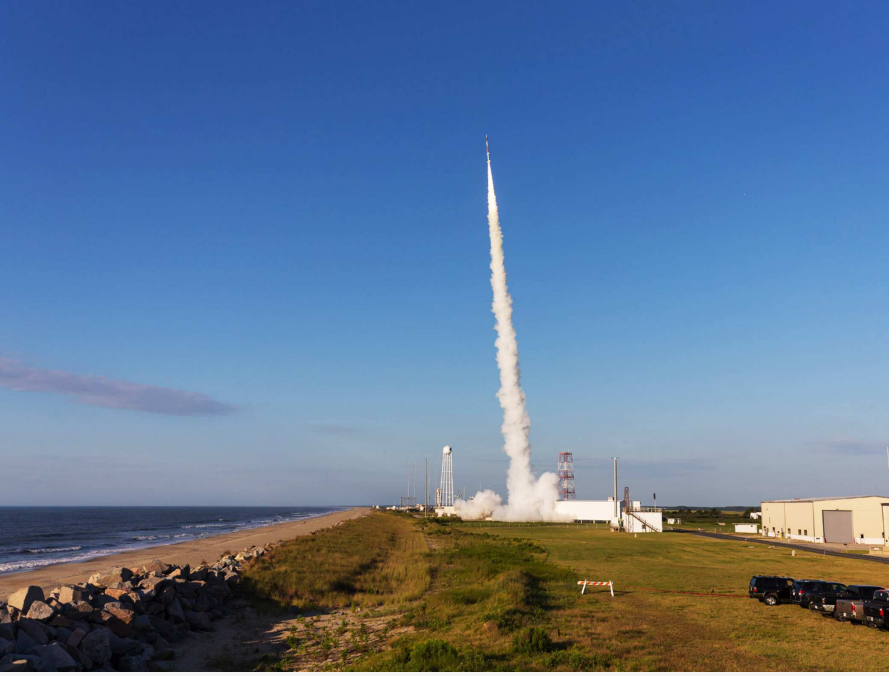

National Aeronautics and Space Administration

Electrical and Electronics

Microcontroller Altimeter (uCA)

Overcoming Limitations of Traditional Altitude Switches

Traditional altitude switch designs for harsh environments are mechanical in nature and operate by means of an inflatable bladder or bellows that mechanically depresses a push-button switch. The altitude trip point is set by mechanically adjusting the distance of the switch to the bellows. The mechanical action of the switch results in a loss of accuracy on the order of several thousand feet, forcing engineers to design interfacing systems with an extremely high error tolerance. Furthermore, these types of systems are typically large and unreliable, difficult to manufacture, and prone to failure under certain operating conditions. The Microcontroller Altimeter (uCA), developed by engineers at NASAs Goddard Space Flight Center, overcomes these limitations by combining the robust and cost-effective nature of modern Printed Circuit Board (PCB) and Solid-state technology to deliver a system that is one third the size of current systems while still maintaining the same switch channel density, and also providing auxiliary user outputs.

BENEFITS

- Inherently safer and more reliable due to solid state circuitry
- Size: ~1/3rd of current systems
- Precision (less than 2% error)
- Efficiency (~1W at idle, less than 3W with all switches actuated)
- Ease of manufacturing
- Overall cost
- Easily customized to multiple applications

APPLICATIONS

- High power switching

technology solution

THE TECHNOLOGY

The uCA combines a high accuracy integrated silicon pressure sensor with MOSFET technology to provide traditional Normally-Open and Normally-Closed switches capable of high power switching for a wide variety of applications. The output of the sensor and switches are provided to the user for real-time altitude determination as well as discrete altitude trip point knowledge. Updates to the altitude trip points are facilitated through USB programming, which allows for in-field adjustment and provides added flexibility late during integration and testing.

PUBLICATIONS

Patent Pending

More Information

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