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Wireless Micro-Electro-Opto-Fluidic-Mechanical Foldable Flex System

Researchers at the University of South Florida have invented a highly miniaturized wireless transceiver employing WLAN technology that offers flexible integration with multiple, generic sensing technologies. The invention can be readily integrated with existing sensing technology to enable direct sensor-to-internet communication in environments where wired connections are impractical.

The flexible interconnects provide the necessary connectivity between micro-electro-opto-fluidic-mechanical elements and the wireless telemetry unit. The flexible interconnects can be fabricated from a variety of readily available and known materials. For example, the interconnects can be fabricated using an organic polymer substrate. The flexible interconnects, or liquid crystal polymer (LCP), can include fluidic interconnects, optical interconnects, electro/magnetic interconnects, photonic waveguide interconnects, and/or virtually any of a variety of additional known interconnects to provide the necessary connectivity between subsystem elements. Additionally, the flexible interconnects may be fabricated to eliminate surface mount components by including embedded passive elements.

This novel wireless micro-electro-opto-fluidic-mechanical foldable flex system exhibits a number of unique characteristics and advantages over currently available systems. The subject innovation includes a stand-alone, battery operated, system having a programmable microprocessor, and does not require use of a personal computer or outboard processor to provide a gateway or local control to the Internet. The present invention is capable of interfacing with multiple sensing types, because the platform presents a programmable last metal interconnect grid to allow standard sensors to be easily interconnected into a wireless platform.

ADVANTAGES:

- **Ready-to-use solution for enabling wireless compatibility**
- **Enables integration with new and/or legacy sensor technology**
- **Wireless communication via 802.11x, Bluetooth, Zigbee, UWB, etc.**
- **Low cost, simple, and highly configurable / customizable packaging**

A Flexible MEMS Wireless Sensor Communication Platform

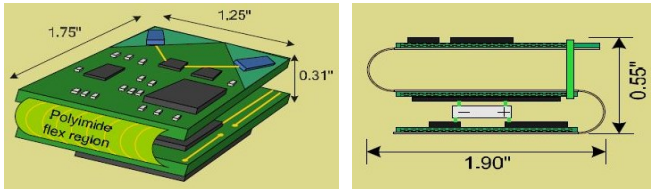

Figure: (Left) Illustrated view of a folded flex micro-electro-opto-fluidic-mechanical (MEMS). (Right) Cross-sectional view of the folded architecture.

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