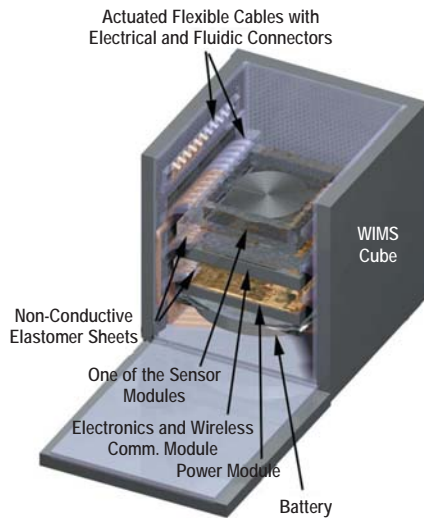


Modular Assembly and Packaging of Multi-Substrate Microsystems: WIMS Cube

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A re-workable and modular packaging/assembly approach for Wireless Integrated MicroSystems (WIMS) consisting of multiple substrates containing circuits, sensors, and actuators has been developed. In this assembly approach, substrates of a microsystem, which are fabricated using different technologies, are “dropped” into a cube (WIMS cube) in sequence, automatically aligned through mechanical registration, and separated using non-conducting elastomer sheets.



Signal transfer (electrical and fluidic) between these dice is achieved using rows of integrated flexible cables attached to the cube walls. Cables are actuated row-by-row during assembly to make pressure contacts to each die. Therefore, connections are not permanent. This allows the microsystem to be disassembled if one of the dice fails after assembly or if a different microsystem with a different set of sensors or actuators is needed for another application. This provides maximum flexibility and modularity, both of which are critical for microsystems and MEMS applications. The figures show a schematic of the WIMS cube and a fabricated WIMS cube with integrated flexible Parylene cables.

