Innovative Wake-up System for Wireless Sensor Nodes

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Wireless sensor are the hot new topic in wireless system design. A miniature unit combines a CPU, a sensor, a radio, and some sort of power suppy. The nodes are spread over the landscape where they self-organize into a network, gather information, and pass this on from time to time. They operate in publicly accessible bands at 434 MHz, 868 MHz, or 2.4GHz. As a typical application, a farmer might distribute small spheres containing the sensor nodes over his field in the spring, giving him accurate information about moisture or fertilizer etc. for the course of a year. The major problem with sensor nodes is their power consumption. This restricts the lifetime so much that most of the beautiful applications are not actually feasible yet. It turns out that the power consumed by the radio receiver is the main culprit, since you want to keep it turned on at all times to keep the node accessible. Research groups over the world are trying to solve the problem with "wake-up receivers." These are special dedicated ultra-low power receivers, optimized to receive only a few bits with the minimal information: "WAKE UP, NODE SO-AND-SO!" An innovative architecture for a system of this type will be presented.