

Big Data and Sensors

The world of big data is being rapidly expanded by a new source of information, the development of inexpensive micro sensors based on the new "Zigbee" devices based on the [802.15.4 wireless specification](#). These devices can be used as sensors, routers or coordinators in a mesh network (personal area network). Networks can support many hundreds of devices and cover a large area. Power consumption is low enough that network components can be run on batteries for years. (The devices can put themselves to sleep to save power). End node devices can not only sense analog and digital inputs, but also switch electronic devices on and off, allowing them to control almost any electric device. Hobbyist projects like [arduino](#) and arduino add-ons like [Xbee](#) have made the technology available to anyone who can program a tiny bit and has some basic electronics knowledge. Consumer products like [NEST](#) and [Zwave](#) devices are bringing these new capabilities into the home and small business arena, promising exciting capabilities in energy saving. These low power, inexpensive low bandwidth (under 250kps, 3000 meter range) fill the gap nicely between Bluetooth and WIFI devices. There are many different types of inexpensive sensors available, starting with temperature, humidity, dust/particles, current, voltage, pressure, wind, ... Most cost under \$5 in volume and are easily connected to a zigbee end node device. Inexpensive relays can be remotely controlled to turn on and off any variety of devices.

[Medical applications](#) are promising as well, but have some obvious privacy and security problems. However, for remote locations they can be used for telemedicine applications.

The big win, would seem to be in smart cities, since the technology is relatively easy to deploy and to integrate with existing broad band and wide area networks.

All of this data is inherently networked and voluminous and hence will demand a "big data" infrastructure to process. In fact, it is predicted that by 2030, 42% of all data will be from sensors, demanding sophisticated analytics to process and understand it.

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