

## About us

SPARK Microsystems offers a unique wireless Ultra Wide Band (UWB) transceiver technology that achieves **40x more energy efficiency, 60x lower latency, and 10x more data throughput over** BLE and 600 times better than ZigBee on power.

Our technology **enables battery-less operation** of when paired with energy harvesting technologies.

## The Problem

Most standard radios consume significant power in order to aggregate up all the data required for the Body Area Networks of the future. This mandates limited battery life forcing frequency battery replacement or recharging.

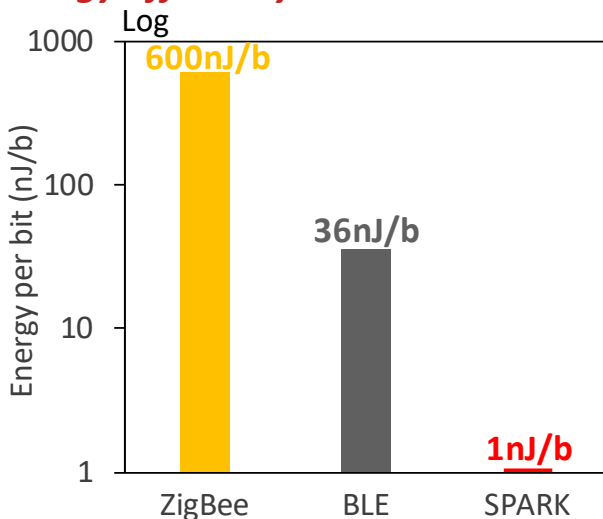
The other problem is that most standard radios have high latency which requires wires for some applications in which the responsiveness is critical.

In addition, most radios use traditional narrow band radios are inherently less secure (easier to intercept) and can have more interference issues.

## Specifications

- Ultra-low power consumption
  - ▶ 1.5 nJ/bit energy efficiency (1 mW @1 Mbps)
  - ▶ 1.8 to 3.3 V supply
  - ▶ 55 nA Hibernate, 750 nA deep sleep (with timing)

## Energy Efficiency



- Scalable data rate at up to 10 Mbps payload
- Ultra-short wireless latency below 50  $\mu$ s @ 1 Kb
  - ▶ Down to 3 ms for uncompressed CD quality audio
- 3-9 GHz configurable ultra-wideband spectrum
- 10 dBm TX power
- 80 dB link budget
- 50 m range @3 Mbps; 100 m range @ 500 Kbps

## The Solution

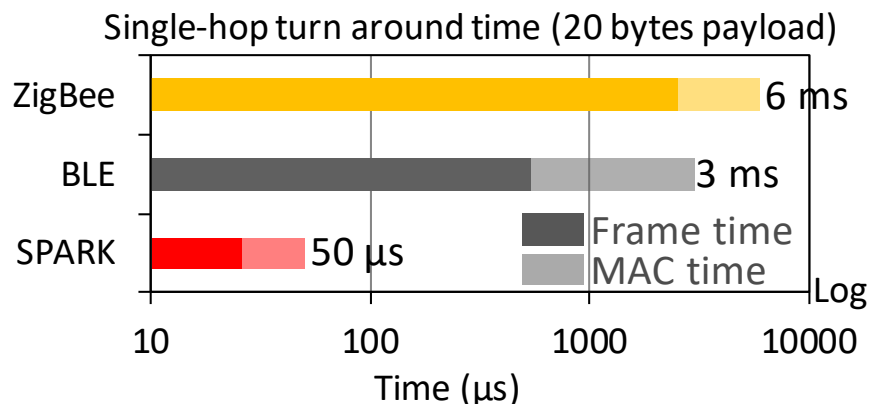
The new SR1000 device family from SPARK Microsystems can communicate with such low energy that it can dramatically improve battery life by as much as 10x as well as improve data bandwidth compared to other standards such as BT or Zigbee by orders of magnitude.

The SPARK radio can be used to aggregate several potential end points for Body Area Networks such as compressed video glasses, audio ear buds, wrist monitors, and other body or equipment sensors.

The SPARK radio has unique capability to operate in the wide UWB spectrum using Time Division Multiplexing (TDM) within a sub-band and Frequency Division Multiplexing (FDM) across various UWB sub-bands making inherently more secure from sniffing.

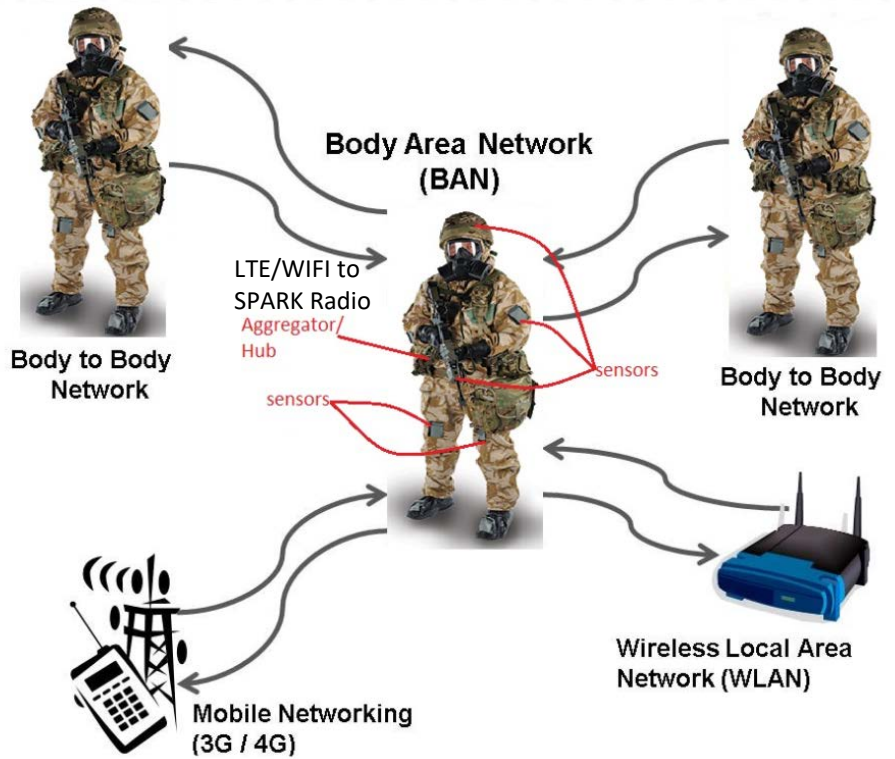
The SR1000 can be deployed in a mesh network to enable long range and agile short-latency communications within dense low-power networks.

## Latency



## Example Solution

SPARK Mesh Network  
Inter-mesh ultra-low-power and ultra-short-latency high bandwidth communication



## Flexibility

- SPARK can support device-to-device, star, and mesh network configurations. These features allow for increased connectivity and reliability, as well as better coverage of large areas. The body aggregator hub can bridge WiFi or LTE to the SPARK Body Network.
- Depending on the amount of data being transmitted SPARK can multiplex hundreds of users/devices in the same wireless bubble.

## Ranging

- In addition to communication, the SPARK technology lends itself to highly accurate location ranging based on time-of-flight: today estimated to within 30cm.
- Using three fixed SPARK radio chips, the exact 3D location of another moving/fixed SPARK radio chip can be determined.

## Wireless Range

