

About us

SPARK Microsystems offers a unique & innovative wireless transceiver that achieves **40x better energy efficiency, 60x lower latency, and 10x more data throughput** as compared to BLE. It also provides very high quality of service connectivity.

The Problem

Gamers buy wired devices to get the best performance. Many audio solutions in the market have a difficult time meeting bandwidth and latency requirements for bidirectional headsets (stereo headset and mic). The additional power requirement drives up the battery size and cost significantly.

For PC gaming, often times a mouse and keyboard along with the headset is required. These peripherals require different wireless connections and thus require different USB dongles.

Overall, the cost, complexity, quality and hassle to users of wireless solutions limits the potential growth over wired solutions.

The Solution

The new SPARK Radio with 10 Mbps over the air data rate can handle CD quality uncompressed audio and multichannel streaming. Given its unique bandwidth and latency, the SPARK Radio can support all the gaming peripherals using a single USB dongle.

The augmented bandwidth capability with full duplex communications provides future proofing capabilities for uncompressed HQ audio for both the stereo headset and the microphone.

The SPARK Radio uses the ultra-wideband (UWB) spectrum and does not interfere with any of the other narrow band standards such as BLE, Bluetooth, cellular, or Wi-Fi.

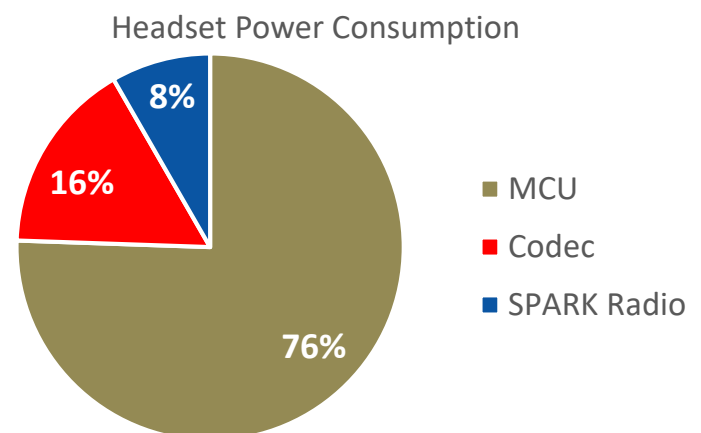
Users can enjoy a low-latency high quality audio experience without the fear of dying peripherals or being forced to connect with a wire. The SPARK Radio brings gamers the benefits of wired peripherals with all the freedom of wireless connectivity.

SPARK Transceiver Specifications

- Dynamically reconfigurable UWB spectrum with up to 3 GHz of bandwidth
 - SR1010: 3.1 – 5.75 GHz band
 - SR1020: 6 – 9.5 GHz band
 - Up to 10 dBm peak TX power
- Scalable data rate up to 10 Mbps
- Ultra-short latency
 - 50 μ s airtime for 1 kb
- High quality of service
 - Capable of 3 ms audio latency for uncompressed CD quality audio streaming
- Ultra-low power consumption
 - Down to 0.25 nJ/bit TX energy efficiency and 1.15 nJ/bit RX energy efficiency
 - Sub-mW TX @3.1 Mbps and sub-mW RX @0.8 Mbps
 - Energy efficient operation down to a few kbps
 - 1.7 to 3.6 V supply
 - 55 nA hibernate, 750 nA deep sleep (with synch)
- Coexistence and non-interference with BLE/WiFi (2.4 & 5 GHz) and cellular
- 50 m range @ 5.5 Mbps; 100 m range @ 600 Kbps
- Low power & low-cost timing using a 32.768 kHz XTAL
- Industrial range: -40 to +85 °C
- Compact 4x 4 mm 28 pin QFN package
- SPI Interface

SPARK Power Consumption

- The SPARK Radio consumes 8% of the power of a gaming headset streaming **uncompressed** 1.5 Mbps audio.
 - Only 6.9 mW of the total power budget of 83 mW.



Key Headset Features

- 3 ms audio latency
- Fully bidirectional audio (headset and mic)
- Data-rate scalable up to 96 kSps, 24-bit, stereo
- Microphone can scale up to 48 kSps, 24-bit
- **Integral bitstream:**
 - No compression
 - No down sampling
 - No masking
- **3x plus longer battery life than other uncompressed audio headsets**
- **5x shorter latency than other low latency headsets**

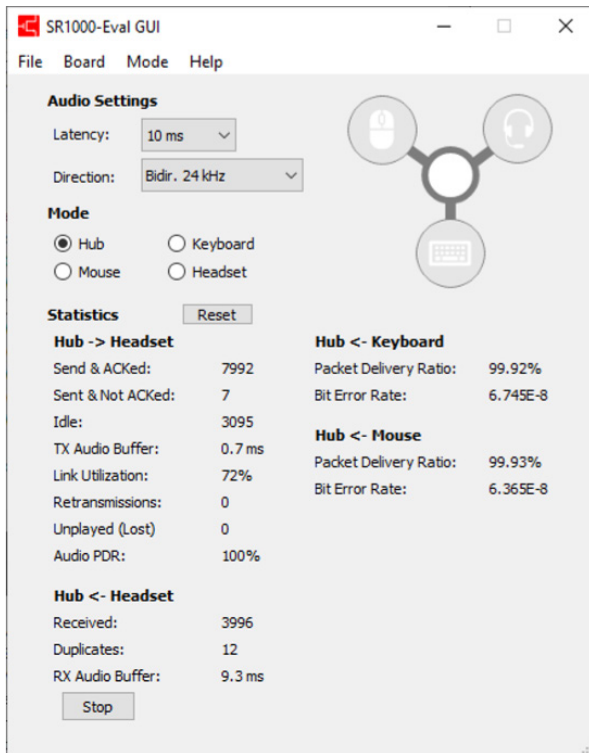


Non-interference with narrow band radios



Sub-ms latency and significant battery life extension for gaming controllers

SPARK Gaming Hub Demo



SR1000-Eval GUI

File Board Mode Help

Audio Settings

Latency: 10 ms

Direction: Bidir. 24 kHz

Mode

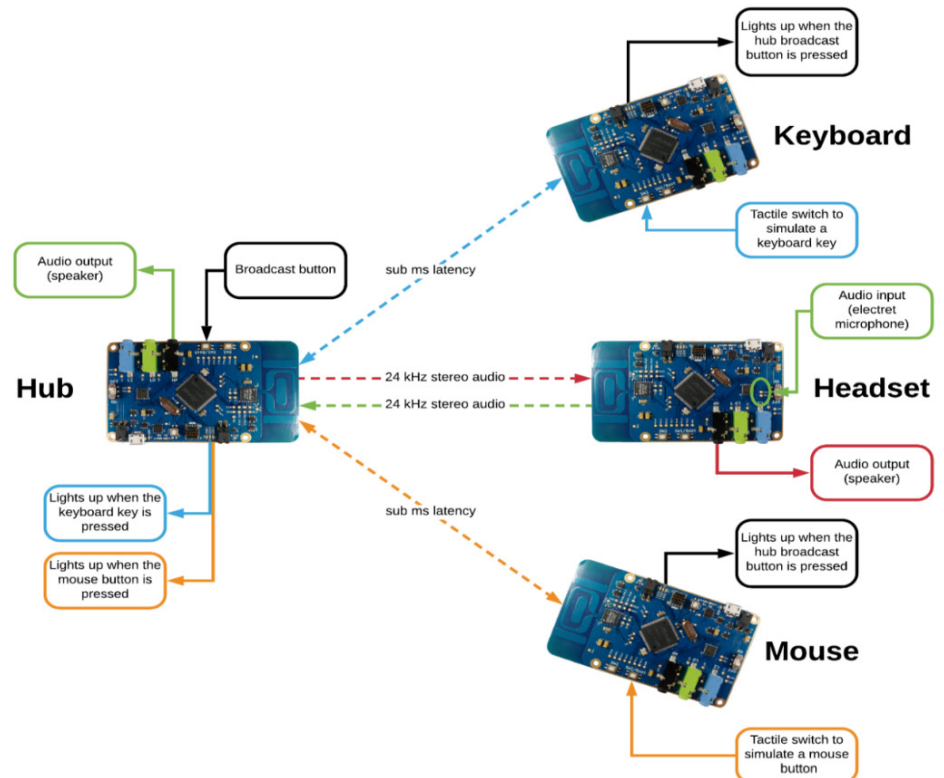
Hub Keyboard

Mouse Headset

Statistics [Reset]

Hub -> Headset		Hub <- Keyboard	
Send & ACKed:	7992	Packet Delivery Ratio:	99.92%
Sent & Not ACKed:	7	Bit Error Rate:	6.745E-8
Idle:	3095		
TX Audio Buffer:	0.7 ms	Hub <- Mouse	
Link Utilization:	72%	Packet Delivery Ratio:	99.93%
Retransmissions:	0	Bit Error Rate:	6.365E-8
Unplayed (Lost):	0		
Audio PDR:	100%		
		Hub <- Headset	
Received:	3996		
Duplicates:	12		
RX Audio Buffer:	9.3 ms		

[Stop]



Link	Data Size
Hub -> Keyboard	1 byte
Hub -> Headset	32 bytes
Hub -> Mouse	1 byte
Keyboard -> Hub	16 bytes @ 1 kHz
Headset -> Hub	32 bytes
Mouse -> Hub	8 bytes @ 1 kHz