SPARK Microsystems

Enabling tomorrow's wireless links

SR1000 Series UWB Wireless Transceiver Evaluation Kit Product Brief

Ultra-Low Power | **Ultra-Short Latency** | **Precise Ranging** | **Low EMI** | **High Data Rate**

About us

SPARK Microsystems offers a unique & innovative wireless transceiver technology that achieves **40x better energy efficiency, 60x lower latency, and 10x more data throughput** as compared to BLE.

The SPARK ultra-wideband (UWB) transceiver has low EMI and does not interfere with other radios such as WiFi, BLE, Zigbee, Z-Wave, or cellular. It also provides very high quality of service connectivity.

About the SR1000 UWB Transceiver Family

The SR1000 UWB transceiver family operates in the license-free UWB spectrum.

The family consists of two transceivers: the SR1010 spanning the 3.1 – 5.75 GHz band and the SR1020 spanning the 6 – 9.5 GHz band. Both chips have identical pinouts and functionalities.

The transceiver can stream data wirelessly from a few kbps to 10 Mbps with ultra-short latency while maintaining an order of magnitude better energy efficiency than other radios such as BLE.

In addition to data transfer, the SPARK transceiver can make accurate distance measurements (i.e., ranging) between two SPARK chips using a robust low power time of flight measurement feature.

Evaluation Kit Overview

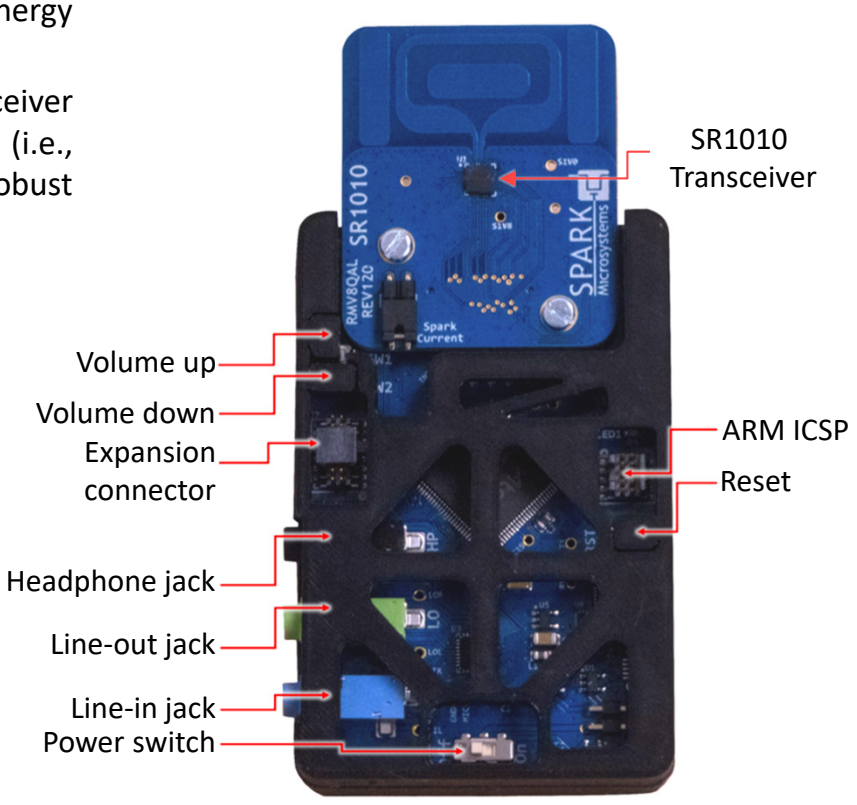
The SPARK SR1000 Series Evaluation Kit demonstrates the capabilities of the SR1000 family of low power, high data rate radio transceivers through audio streaming, gaming hub functionality, data transfers with predefined patterns, and ranging.

The evaluation board leverages an ARM-based Atmel SAM microcontroller to communicate with the SR1010 or SR1020 transceiver and the provided software application.

The intended purpose is to demonstrate the unique qualities of the SR1000 transceiver family in terms of data rate, power consumption, and latency according to different configurable presets.

Specifications

- ARM Cortex-M4 MCU
- Detachable SPARK RF module
- Capable of multi-Mbps data streaming
- Link quality monitor to plot link statistics
- Built in audio input / output for uncompressed high-fidelity audio streaming demo
- Stats mode: evaluate link quality of typical profiles
- Advanced mode: test all configurations of the wireless link
- Ranging mode: test the time of flight ranging capability
- Gaming hub mode: mimic controllers and audio headset in a unified star network
- USB interface
- Expansion header for custom application testing



Carrier board and SR1010 transceiver module with dipole antenna.

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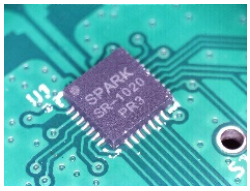
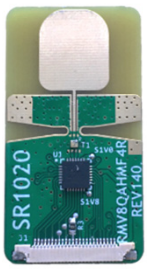
SPARK Transceiver Specifications

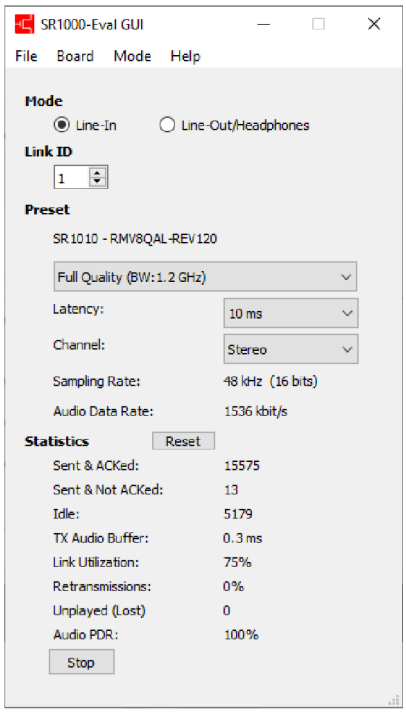
- Dynamically reconfigurable UWB spectrum with up to 3 GHz of bandwidth
  - SR1010: 3.1 – 5.75 GHz band
  - SR1020: 6 – 9.5 GHz band
  - Up to 10 dBm peak TX power
- Ultra-short latency: 50 µs airtime for 1 kb
- High quality of service
  - Capable of 3 ms audio latency for uncompressed 48 kSps 16-bit stereo audio streaming
- Scalable data rate up to 10 Mbps
- Time of flight-based distance measurement capability
  - 30 cm line of sight accuracy from 0.5 to 100 m
- Ultra-low power consumption
  - Down to 0.25 nJ/bit TX energy efficiency and 1.15 nJ/bit RX energy efficiency
  - Sub-mW TX at 3.1 Mbps and sub-mW RX at 0.8 Mbps
  - Energy efficient operation down to a few kbps
  - 55 nA hibernate, 750 nA deep sleep (w/ synch)
  - 1.7 to 3.6 V supply
- 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/cost timing using a 32.768 kHz XTAL
- Industrial operating range: -40 to +85 °C
- Compact 4 x 4 mm 28 pin QFN
- SPI Interface

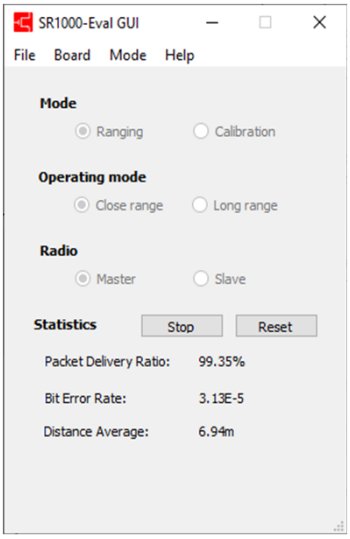


SR1020 chip

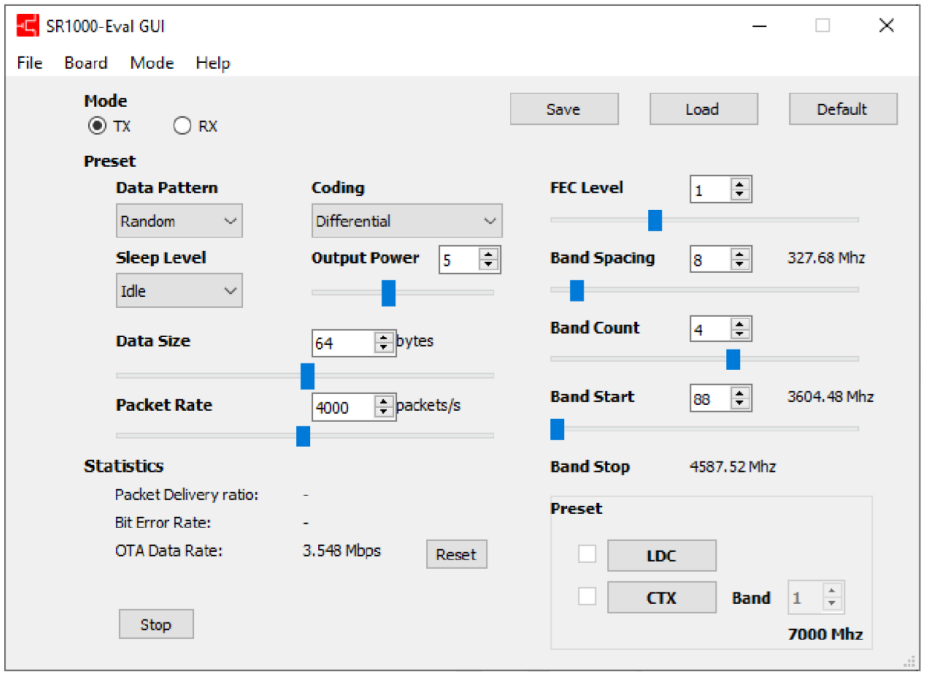


SR1020 module with monopole antenna





Evaluation kit interface in audio mode (left) and ranging mode (right)



Evaluation kit interface in advanced mode

About SPARK Microsystems

SPARK Microsystems is a fabless semiconductor company that is leading the way towards ultra-low power wireless communications for the Internet of Things revolution. With its patented technologies, SPARK Microsystems is bringing to market a high performance wireless transceiver that allows for orders of magnitude improved power consumption and latency while providing higher data rates than competing technologies. For more information, please visit www.sparkmicro.com.

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