



Basics

- Learn
 - [Bluetooth Basics](#)
 - [Benefits of Bluetooth Technology](#)
 - > [How Bluetooth Works](#)
 - > [Bluetooth Technology](#)
 - > [Security](#)
 - [Glossary](#)
- Connect
- Apply
- About the Bluetooth SIG
- Press & Analysts
- [Bluetooth Assembler](#)



Bluetooth Basics

Bluetooth wireless technology is a short-range communications technology intended to replace the cables connecting portable and/or fixed devices while maintaining high levels of security. The key features of Bluetooth technology are robustness, low power, and low cost. The Bluetooth specification defines a uniform structure for a wide range of devices to connect and communicate with each other.

Bluetooth technology has achieved global acceptance such that any Bluetooth enabled device, almost everywhere in the world, can connect to other Bluetooth enabled devices in proximity. Bluetooth enabled electronic devices connect and communicate wirelessly through short-range, ad hoc networks known as piconets. Each device can simultaneously communicate with up to seven other devices within a single piconet. Each device can also belong to several piconets simultaneously. Piconets are established dynamically and automatically as Bluetooth enabled devices enter and leave radio proximity.

A fundamental Bluetooth wireless technology strength is the ability to simultaneously handle both data and voice transmissions. This enables users to enjoy variety of innovative solutions such as a hands-free headset for voice calls, printing and fax capabilities, and synchronizing PDA, laptop, and mobile phone applications to name a few.

Core Specification Versions

- Version 2.0 + Enhanced Data Rate (EDR), adopted November, 2004
- Version 1.2, adopted November, 2003

Specification Make-Up

Unlike many other wireless standards, the Bluetooth wireless specification gives product developers both link layer and application layer definitions, which supports data and voice applications

Spectrum

Bluetooth technology operates in the unlicensed industrial, scientific and medical (ISM) band at 2.4 to 2.485 GHz, using a spread spectrum, frequency hopping, full-duplex signal at a nominal rate of 1600 hops/sec. The 2.4 GHz ISM band is available and unlicensed in most countries

Interference

Bluetooth technology's adaptive frequency hopping (AFH) capability was designed to reduce interference between wireless technologies sharing the 2.4 GHz spectrum. AFH works within the spectrum to take advantage of the available frequency. This is done by detecting other devices in the spectrum and avoiding the frequencies they are using. This adaptive hopping allows for more efficient transmission within the spectrum, providing users with greater performance even if using other technologies along with Bluetooth technology. The signal hops among 79 frequencies at 1 MHz intervals to give a high degree of interference immunity

Range

The operating range depends on the device class:

- Class 3 radios – have a range of up to 1 meter or 3 feet
- Class 2 radios – most commonly found in mobile devices – have a range of 10 meters or 30 feet
- Class 1 radios – used primarily in industrial use cases – have a range of 100 meters or 300 feet

Power

The most commonly used radio is Class 2 and uses 2.5 mW of power. Bluetooth technology is designed to have very low power consumption. This is reinforced in the specification by allowing radios to be powered down when inactive

Data Rate

1 Mbps for Version 1.2; Up to 3 Mbps supported for Version 2.0 + EDR

Imagine

we have tools that will open your mind to new possibilities in connection, communication, and innovation

