# UltraWideBand – a technology Utopia?


We've all heard of broadband, usually in terms of high-speed PC connectivity, and of wireless broadband, often in the form of Wireless LAN or WiFi. Few have heard about UltraWideBand (UWB), a technology with the potential to serve thousands of applications. UWB is not yet legal in Europe, but industry pressure and rapid technical and regulatory progress in the US is forcing regulators to hasten its introduction.

UWB can deliver low-power, low-cost wireless connectivity, with high data rates and precise positioning capability while causing little or no interference. It promises a technology Utopia, where it's possible to wireless connect a TV set-top box to any other TV in the home, or to remove the cable between a PC and monitor. UWB's ability to locate objects or people to within a few centimetres opens up new opportunities in workplace management – with numerous security and safety implications of knowing where everything is in a local environment.

UWB could be used for all four telecommunications 'plays' – entertainment (video streaming and gaming); internet and data communications; video telephony; and industrial and home control. It could be a 'Holy Grail' – a single technology applicable to almost every short-range application one can think of. Sagentia already has the knowledge and skill to integrate UWB into product designs, delivering new levels of connectivity and enabling the development of breakthrough new products which have remained on the drawing board – until now.

## The science

UWB signals are different to those emitted from conventional radios. They are characterised by their extreme transmission bandwidth and low average RF transmit power (up to 7.5GHz andless than 0.5mW). The unprecedented bandwidth brings the benefits: communications up to 1Gbps, and location ability to 10-30cm, while the low RF transmit power allows it to co-exist with existing spectrum users. Early UWB communication devices were analogue impulse-based delivering moderate data rates (10kbps-10Mbps).

The desire for higher data rates (>100Mbps) and advances in digital technology led to the development of Direct Sequence CDMA (DS-CDMA) as promoted by the Motorola/ FreeScale backed 'UWB forum' and then to Multi-Band Orthogonal Frequency Division Multiplexing (MB-OFDM) pushed by the Intel-led 'MultiBand OFDM Association' (MBOA). These promise data rates up to 480Mbps over 10m while consuming less than 100mW. Each implementation has its merits in a range of applications but there is unlikely to be one solution that fits all.

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