



Comments of
The Ultra Wide Band (UWB) Alliance
Before
Czech Republic Czech Telecommunications Office (CTU)
***Response to the call for comments on the update of the
Radio Spectrum Management Strategy consultation.***¹

Aug 30, 2023

About the UWB Alliance

The Ultra Wide Band (UWB) Alliance is a global not-for-profit organization that works to collectively establish ultra-wideband (UWB) technology as an open-standards industry. A coalition made up of vendors that either design, manufacture, or sell products that use ultra-wideband technology, the UWB Alliance aims to promote and protect the current allocation of bandwidth as well as promote the continuing globalization of the technology. As part of our mission, we advocate UWB technology and use cases to promote verticals showing the value of UWB for IoT and Industry 4.0 and to build a global ecosystem across the complete UWB value chain, from the silicon to the service. In addition, the Alliance is promoting and assuring interoperability through its work with Standards Development Organizations such as the IEEE and ETSI and then working with members to define upper layers and testing to assure compliance. For more information, please visit us at www.UWBAlliance.org.

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¹ Reference: <https://www.ctu.eu/call-comments-updateradio-spectrum-management-strategy>

Introduction

The Ultra Wide Band Alliance thanks the Czech Republic Czech Telecommunications Office (CTU) for issuing the consultation and providing the opportunity to provide feedback.

Updates on UWB in Section 6.4.4.2: Short-range devices (SRD)

Section 6.4.4.2 of the report states: “Applications using the ultra-wideband technology (UWB) met the expectations only to a very limited extent and tend to be used in industrial applications (cable detection, identification of vehicles and surveillance applications, support of safety in industry, etc.)”.

The UWB Alliance would like to inform the CTU that the application and deployment of UWB technology has changed dramatically since the publication of the report. Today, UWB technology is included in mass market consumer devices, including smartphones, vehicles, and consumer accessories. UWB continues to be a key technology in indoor location tracking, material sensing and other industrial applications. The quantity of UWB devices in use in these critical applications has grown from about 10,000 to more than 10,00,000.

Growth into consumer products, however, is a significant change. Over 800,000 smartphones shipped with UWB by the top phone makers, and the associated accessories, raises the total volume near or over a billion devices.

Current state of the UWB industry

UWB is currently used for data communication, location discovery, and device ranging. Available frequency bands vary by regions, with UWB systems operating in frequency ranges from 3.1 GHz to 10.6 GHz bands. UWB is being increasingly used in many high value applications. The capability of UWB to support secure ranging makes UWB the most popular choice by the automotive industry for improved vehicle access and is growing for premises access systems as well (e.g., accessing hotel rooms securely via a mobile phone app). Mobile handset makers have been including UWB in smartphones since 2019. This is generating significant economic and social value, attracting further interest. A robust and diverse industry ecosystem has developed around UWB technology. For example, the UWB Alliance supports members in many application areas, including but not limited to localization, sensing, low latency high resolution audio and real time human machine interface, as well as secure access.

Advancement of UWB technology and standards continues. For example, project IEEE 802.15.4ab is developing the next generation of UWB standard based on industry needs to fuel the next round of innovative products. This project is developing enhancements including features to improve link budget and/or reduce air-time, sensing capabilities to support presence detection and environment mapping, improved accuracy, precision and reliability for high-integrity ranging, interference mitigation techniques to support greater device density and higher traffic use cases and to provide improved coexistence in the presence of other services in support of different regulatory requirements. Additional mechanisms are being defined to reduce complexity and power consumption, and to enhance support for ultra-low energy and low latency streaming, while ensuring compatibility with the deployed base of products.

Expanded applications and massive growth

It can be noted that the uses which CTU identified in 2015 were, then and still today, critically important uses. UWB is still used for location tracking and material sensing in industrial environments extensively. The market has significantly expanded. Following completion of ECC Report 278 and IEEE Std 802.15.4z-2020, UWB has become ubiquitous and there is much active UWB development and deployments. As noted, UWB is now used to secure passive keyless entry systems in many vehicles and for premises access. Mobile phone manufacturers have also been integrating ultra-wideband in their smart phones.

Sensing based upon UWB is another area of explosive growth. The ultra-low transmit power (at or below unintentional emissions limits) and very high dynamic response of impulse radio-UWB (IR-UWB) enables precise, fast, and accurate sensing for uses such as presence detection of children left in vehicles.

As another example of current market trends, UWB is emerging as a leading technology for ultra-low power, ultra-low latency moderate data rate communications such as real time audio and real-time ultra-low latency human interface devices for gaming.

In summary, while it may have appeared in 2015 that UWB had not lived up to original expectations, presently UWB deployments nearing a billion devices and are growing rapidly. The UWB adoption timeline is consistent with that of other popular license exempt technologies from first rulemaking to mass market adoption.

It is an appropriate time to develop a strategic plan for UWB

Given the increasing importance of UWB, the UWB Alliance would like to encourage the CTU to include a strategy for UWB developments in its radio spectrum management strategy.

Within CEPT, ECC Report 327 led to an update of ECC Decision (06)04 last year, removing the prohibition on fixed outdoor devices, simplifying the use of UWB in vehicular applications and enhancing the transmit power of indoor devices. We would like to encourage the CTU to include these measures in the Czech Republic's national regulations. Harmonization of regulations has many benefits, both technical and economic. In addition, CEPT ECC SE24 is beginning to revisit the UWB regulations in 8.5 GHz to 10.6 GHz.

Furthermore, as the number and variety of applications of IEEE 802.15.4 UWB devices continues to grow, radio spectrum policy and spectrum regulations can help combat climate change by creating conditions conducive to lowering power usage. For example, in ranging and presence detection, UWB provides precision and real-time performance superior to other technologies such as millimeter wave at a small fraction of the energy consumption. Another example is the emerging use of UWB in high-definition low latency audio, where a UWB solution can achieve higher performance and 1/10th the energy consumption of traditional wireless solutions. While individually these differences are small, with billions of devices in use, the savings in energy is substantial.

UWB is also an effective means to share spectrum. With ultra-low transmit power spectral density of -41.3 dBm/1 MHz, or in other terms, 37 nJ/ms, UWB radios cause very little or no interference to other users of the same spectrum), but the ultra-low power UWB signals may become blocked by strong nearby signals. While regulations do not protect UWB radios (or any license exempt technology) from interference, spectrum policy can ensure parts of the spectrum remain suitable for energy efficient low power device use.

In contrast to other more conventional higher power radios, which can operate at from 100,000 to several million times more power than UWB, the ability to reuse spectrum is greatly enhanced. This enables effective and efficient use of the spectrum for a diversity of uses and users.

Conclusion

The UWB alliance again thanks CTU for providing this opportunity to provide updated information on UWB technology and the UWB industry. The UWB industry has grown extensively since 2015. As is typical with license exempt technologies, the time from available spectrum rules, to development of an industry ecosystem to capitalize on the new rules, is typically more than a decade. The UWB industry has grown and matured since 2015 but remains on a very steep innovation and growth curve. UWB provides unique performance characteristics enabling many uses with high economic and social values. UWB presents an efficient way to utilize spectrum for many diverse uses. A long term spectrum strategy should include consideration of, and promotes ongoing innovation, for high value potential of UWB.

Submission information

Deadline: 31 August 2023

Submit to: podatelna@ctu.cz with the subject "STRATEGIE SPEKTRA"

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