

## The Commission harmonises radio spectrum in support of the Internet of Things

The Commission has adopted an Implementing Decision to harmonise radio spectrum for short-range devices within the 874-876 and 915-921 MHz frequency bands. It will facilitate a variety of applications in support of the Internet of Things (IoT) and Radio Frequency Identification (RFID).



The Decision is harmonising radio spectrum within the 874-876 and 915-921 MHz frequency bands and will make available additional appropriate spectrum for Internet of Things (IoT) applications based on short-range devices, including next-generation Radio Frequency Identification (RFID) devices. It will facilitate a variety of applications related to smart cities, smart homes, smart farming, transport and logistics and industrial production.

### Benefits for Short Range Devices

The adopted Decision harmonises technical conditions for spectrum use by short-range devices. It seeks to satisfy the spectrum needs of next-generation RFID devices and innovative 'networked short-range devices', an alternative technological approach to connect IoT devices independently of mobile networks.

Short-range devices are typically mass-market and/or portable products that users can easily take and use across borders. They are often very much constrained in terms of, e.g., complexity, battery power, size and/or are low cost. Well-known examples range from simple devices like garage door

openers over hearing aids to products like Wi-Fi routers. Existing regulation provides spectrum for these devices and has been a success story leading to new innovative applications.

In the context of the adopted Decision, simple examples could be low-cost sensors connected to a network access point to gather soil quality data or sensors and actuators installed in the lampposts of a street and connected to a controller to provide smart street lighting. The range of possible applications is manifold and can get much more complex than this.

Devices that are more sophisticated can operate in different bands or different portions of a band according to availability and thus can bridge differences in spectrum availability to a certain degree. However, this does not generally hold for short-range devices. Consequently, differences in spectrum access conditions may for instance increase their production costs and create risks of harmful interference with other radio applications and services due to unauthorised use.

## **Benefits for RFID devices**

RFID devices are already in use in Europe in the 863-870 MHz band to mark objects with RFID tags. For example, warehouses or factories use RFID readers, a technology which can read the tags and identify the objects. The new spectrum availability for next-generation RFID within the 900 MHz range allow enhanced technical limits, which has an impact on, for instance, reader speed, reader accuracy and tag size. However, equally important, the 900 MHz range is used almost globally for RFID, which is beneficial especially in transport and logistics.

Apart from the current usage, further advanced RFID use-cases will emerge. For example, the reduced size will make tagging of smaller objects or tagging of materials, which so far could not be tagged, possible. When using the old and the new band in parallel, it is possible to localise more accurately the tagged items.

The almost global availability of the 900 MHz range is not only beneficial for RFID systems, but will also enable new innovative global applications based on networked short-range devices, such as active global asset tracking.

## **Railway and military sectors**

The adopted Decision will also benefit the railway and military sectors. The Decision reserves 2 x 1.6 MHz (874.4-876 and 919.4-921 MHz) for potential future railway mobile communications use subject to further studies. Due to the diverse and diverging situation of these bands across the EU, the existing degree of fragmentation is high and rapidly increasing. This reservation provides the unique opportunity of an EU-wide coordinated spectrum approach for the future railway communications system. Such an approach would guarantee railway interoperability across the EU to the benefit of the railway service providers and users, an opportunity that would otherwise not exist. Currently only some Member States in some geographical areas are using these bands for the current 2G-based railway mobile communications system GSM-R as part of the so-called GSM-R extension bands (873-876 Mhz and 918-921 MHz). The railway sector will be able to continue using these extension bands in Member States, which anticipate such a need, due to geographical sharing and precaution mechanisms foreseen in the Decision.

Concerning existing military users, the Decision acknowledges the right of Member States under the Radio Spectrum Decision to protect existing use of spectrum for public order and public security purposes. Beyond that, the Decision also develops a strategy for future spectrum use in a currently fragmented situation and hence provides increased clarity for developments and investments to

military users.

Overall, the Decision provides a well-balanced approach, which has benefits for all sectors with an interest in the bands.

## Background

The situation in the 870-876 and 915-921 MHz bands so far is complex. It is characterised by existing and increasing fragmentation. While military use exists in some Member States in different portions of the bands, the bands have also been the object of interest from other spectrum users, the railway and IoT including RFID communities. Consequently, several Member States already have short-range devices in the band, a few have railway use and others have various subsets of all three uses.

The European Commission together with the Member States started their focused discussions on the future of the bands in their quarterly meetings of the Radio Spectrum Committee almost two years ago, which resulted in today's decision.

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