

ELECTRONIC COMMUNICATIONS COMMITTEE

ECC Decision
of 1 December 2006
on the harmonised conditions for devices using
Ultra-Wideband (UWB) technology
with Low Duty Cycle (LDC)
in the frequency band 3.4-4.8 GHz

(ECC/DEC/(06)12)



EXPLANATORY MEMORANDUM

1 INTRODUCTION

This ECC Decision has been developed in response to an EC mandate to CEPT to identify the conditions relating to the harmonised introduction in the European Union of radio applications based on ultra-wideband (UWB) technology. CEPT was mandated to undertake all the necessary work to identify the most appropriate criteria for the timely and harmonised introduction of UWB applications in the European Union.

This ECC Decision complements Decision ECC/DEC/(06)04 on the harmonised conditions for devices using UWB technology in bands below 10.6 GHz and defines conditions of use applicable to UWB technology with Low Duty Cycle (LDC) and studies relating to further mitigation techniques, e.g. Detect And Avoid (DAA) in frequency band 3.4-4.8 GHz.

2 BACKGROUND

The frequency band 6-8.5 GHz has been identified in Europe for long-term UWB operation with a maximum mean e.i.r.p. density of -41.3 dBm/MHz and a maximum peak e.i.r.p. density of 0 dBm/50MHz without the requirement for additional mitigation.

In the frequency band 3.1 to 4.8 GHz, ECC has decided to investigate efficient mitigation techniques, such amongst others DAA (Detect And Avoid) and LDC (Low Duty Cycle) mechanisms in order to ensure compatibility of UWB devices with radio services in the band with a view of allowing UWB devices in the band 3.4-4.8 GHz with maximum mean e.i.r.p. density of -41.3 dBm/MHz. The effectiveness of such mitigation techniques to protect radars below 3.4 GHz will also be investigated.

During the elaboration of the ECC decision, several mitigation techniques were considered in order to increase the maximum e.i.r.p. in the band 3.1 to 4.8 GHz to a level sufficient to enable viable UWB operation in this band whilst ensuring the protection of the Radio Services. Low duty cycle (LDC) mitigation implemented on UWB devices has been identified as one possibility allowing coexistence with radiocommunication services.

Particular attention was paid to Detect and Avoid (DAA) mechanisms, which detect the presence of signals from other radio systems (such as fixed broadband wireless access and mobile services) and reduce the transmitted power of the UWB device down to a level where it does not cause interference to indoor reception of these systems. The reliable implementation of such DAA mechanisms, based on requirements that are to be defined, is not trivial and their feasibility has not yet been validated. Therefore, further research and investigation of DAA is encouraged. Once the effectiveness of DAA mechanism is validated, UWB devices incorporating it will be permitted in the band 3.1-4.8 GHz.

3 REQUIREMENT FOR AN ECC DECISION

The allocation or designation of frequency bands under specified conditions in CEPT member countries is laid down by law, regulation or administrative action. ECC Decisions are required to deal with the carriage and use of equipment throughout Europe. The ECC also recognizes that for UWB devices to be introduced successfully throughout Europe, confidence must be given on the one hand to manufacturers to make the necessary investments and on the other hand to users of existing services that their protection will be ensured.

The harmonisation on a European basis would support the *Directive 1999/5/EC of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity.*

A commitment by CEPT member countries to implement an ECC Decision will provide a clear indication that the required frequency range will be made available on time and on a Europe-wide basis and that the means to ensure protection of existing services will be applied.

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of 1 December 2006**

**on the harmonised conditions for devices using
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“The European Conference of Postal and Telecommunications Administrations,

considering

- a) Decision ECC/DEC/(06)04 on the harmonised conditions for devices using UWB technology in bands below 10.6 GHz;
- b) that the frequency range of 3.1 to 5 GHz has advantages for UWB, because of the lower path loss compared to the range above 5 GHz and the near term availability of technology;
- c) that UWB devices are able to implement mitigation techniques in order to increase protection for radio Services;
- d) that limitations on the duty cycle of UWB devices can improve the coexistence with other radiocommunication systems;
- e) that the effectiveness of the LDC mitigation technique to protect indoor FWA systems in the 3.4 to 4.2 GHz band is presented in ECC Report 94;
- f) that, if the DAA mechanism is defined and its effectiveness is validated, UWB devices implementing DAA will be permitted to operate at a level of -41.3 dBm/MHz in the band 3.4-4.8 GHz and that the effectiveness of such mitigation technique to protect radars below 3.4 GHz will also be investigated;
- g) that UWB devices that are intended to be co-located with other radios of protected services in the same platform, should not transmit if such radios of protected services are present and operating;
- h) that CEPT can continue to study other mitigation technique
- i) that studies have shown that coexistence is possible with current outdoor systems operating in the band 4.2-4.8 GHz;
- j) that Agenda Item 1.4 of the WRC-07 addresses the development of future mobile systems in all bands within the frequency range 2.7-6 GHz. These bands are currently being examined as potential candidate bands for IMT-2000 and systems beyond IMT-2000;
- k) that this Decision will be reviewed as necessary in order to consider protection for future spectrum allocation for systems beyond IMT-2000 after the next World Radio Conference (WRC-07);

DECIDES

1. that this ECC Decision defines harmonised conditions for devices using UWB technology with Low Duty Cycle (LDC) in frequency band 3.4-4.8 GHz;
2. that the devices permitted under this ECC Decision are exempt from individual licensing and operate on a non-interference, non-protected basis;
3. that this ECC Decision is not applicable to:
 - a) flying models,
 - b) outdoor installations and infrastructure, including those with externally mounted antennas,
 - c) devices installed in road and rail vehicles, aircraft and other aviation;
4. that devices covered by the scope of this ECC Decision are not allowed to be used at a fixed outdoor location or connected to a fixed outdoor antenna;
5. that additionally to the technical requirements detailed in Annex 1 of Decision ECC/DEC(06)04, UWB devices employing LDC mitigation techniques and meeting the technical requirements defined in Annex 1 are permitted under this ECC Decision;
6. to further investigate efficient mitigation techniques, such amongst others DAA (Detect And Avoid) mechanisms in order to ensure compatibility of UWB devices with radio services in the band with a view of allowing UWB devices in the band 3.4-4.8 GHz with maximum mean e.i.r.p. density of -41.3 dBm/MHz. The effectiveness of such mitigation techniques to protect radars below 3.4 GHz will also be investigated. ECC will review this Decision in the light of the results of these investigations;
7. that this Decision enters into force on 1 December 2006;
8. that the preferred date for implementation of this Decision shall be 1 June 2007;
9. that CEPT administrations shall communicate the national measures implementing this Decision to the ECC Chairman and the Office when the Decision is nationally implemented.”

Note:

Please check the Office web site (<http://www.ero.dk>) for the up to date position on the implementation of this and other ECC Decisions.

ANNEX 1

Technical Requirements for UWB Devices implementing LDC Mitigation Technique

UWB devices implementing LDC will be permitted to operate at a level of -41.3dBm/MHz in the frequency band 3.4 to 4.8 GHz with the following requirements

<p>Ton max = 5 ms Toff mean \geq 38 ms (averaged over 1 sec) Σ Toff > 950 ms per second Σ Ton < 5% per second and 0.5% per hour</p>
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Ton

Ton is defined as the duration of a burst irrespective of the number of pulses contained.

Toff

Toff is defined as the time interval between two consecutive bursts when the UWB emission is kept idle.