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ANNEX

ANNEX

to the

Commission Implementing Decision

**on the harmonised use of radio spectrum in the 5 GHz frequency band for the
implementation of wireless access systems including radio local networks and repealing
Decision 2005/513/EC**

ANNEX

Harmonised technical conditions for WAS/RLANs in the 5 150-5 250 MHz, 5 250-5 350 MHz and 5 470-5 725 MHz frequency bands

Table 1: WAS/RLANs in the 5 150-5 250 MHz frequency band

Parameter	Technical conditions
Frequency band	5 150-5 250 MHz
Permissible operation	Indoor, including installations inside road vehicles, trains and aircraft, and limited outdoor use (note 1). Use by unmanned aircraft systems (UAS) is limited to within the 5 170-5 250 MHz band.
Maximum mean equivalent isotropically radiated power (e.i.r.p.) for in-band emissions	200 mW Exceptions: <ul style="list-style-type: none">• 40 mW maximum mean e.i.r.p. applies for installations inside train carriages with an attenuation loss on average of less than 12 dB;• 40 mW maximum mean e.i.r.p. applies for installations inside road vehicles.
Maximum mean e.i.r.p. density for in-band emissions	10 mW/MHz in any 1 MHz band

Note 1: If used outdoors, equipment shall not be attached to a fixed installation or to the external body of road vehicles, a fixed infrastructure or a fixed outdoor antenna.

Techniques to access spectrum and mitigate interference that provide an appropriate level of performance to comply with the essential requirements of Directive 2014/53/EU of the European Parliament and of the Council¹ shall be used. Where relevant techniques are described in harmonised standards or parts thereof the references of which have been published in the *Official Journal of the European Union* in accordance with Directive 2014/53/EU, performance at least equivalent to the performance level associated with those techniques shall be ensured.

¹ Directive 2014/53/EU of the European Parliament and of the Council of 16 April 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC (OJ L 153, 22.5.2014, p. 62.).

Table 2: WAS/RLANs in the 5 250-5 350 MHz frequency band

Parameter	Technical conditions
Frequency band	5 250-5 350 MHz
Permissible operation	Indoor use: inside buildings only. Installations in road vehicles, trains and aircraft are not permitted. Outdoor use is not permitted.
Maximum mean e.i.r.p. for in-band emissions	200 mW
Maximum mean e.i.r.p. density for in-band emissions	10 mW/MHz in any 1 MHz band
Mitigations techniques to be used	Transmitter power control (TPC) and dynamic frequency selection (DFS). Alternative mitigation techniques may be used if they ensure at least an equivalent performance and level of spectrum protection in order to comply with the corresponding essential requirements of Directive 2014/53/EU and if they respect the technical requirements of this Decision.
Transmitter power control (TPC)	TPC shall provide, on average, a mitigation factor of at least 3 dB on the maximum permitted output power of the systems; or, if transmitter power control is not in use, the maximum permitted mean e.i.r.p. and corresponding mean e.i.r.p. density limit shall be reduced by 3 dB.
Dynamic frequency selection (DFS)	DFS is described in Recommendation ITU-R M. 1652-1 ⁽²⁾ to ensure compatible operation with radiodetermination systems. The DFS mechanism shall ensure that the probability of selecting a given channel is the same for all available channels within the 5 250-5 350 MHz and 5 470-5 725 MHz bands. The DFS mechanism shall also ensure, on average, a near-uniform spread of the loading of the spectrum.

² Recommendation ITU-R M. 1652-1, "Dynamic frequency selection in wireless access systems including radio local area networks for the purpose of protecting the radiodetermination service in the 5 GHz band"

Parameter	Technical conditions
	WAS/RLAN shall implement a dynamic frequency selection providing a mitigation against interference to radar at least as efficient as DFS as described in ETSI Standard EN 301 893 V2.1.1. Settings (hardware and/or software) of WAS/RLAN related to DFS shall not be accessible to the user if changing those settings results in the WAS/RLANs no longer being compliant with the DFS requirements. This includes (a) not allowing the user to change the country of operation and/or the operating frequency band if that results in the equipment no longer being compliant with the DFS requirements and (b) not accepting software and/or firmware which results in the equipment no longer being compliant with the DFS requirements.

Techniques to access spectrum and mitigate interference that provide an appropriate level of performance to comply with the essential requirements of Directive 2014/53/EU shall be used. Where relevant techniques are described in harmonised standards or parts thereof the references of which have been published in the *Official Journal of the European Union* in accordance with Directive 2014/53/EU, performance at least equivalent to the performance level associated with those techniques shall be ensured.

Table 3: WAS/RLANs in the 5 470-5 725 MHz frequency band

Parameter	Technical conditions
Frequency band	5 470-5 725 MHz
Permissible operation	Indoor and outdoor use. Installations in road vehicles, trains and aircraft and use for UAS are not permitted.
Maximum mean e.i.r.p. for in-band emissions	1 W
Maximum mean e.i.r.p. density for in-band emissions	50 mW /MHz in any 1 MHz band
Mitigations techniques to be used	Transmitter power control (TPC) and dynamic frequency selection (DFS). Alternative mitigation techniques may be used if they ensure at least an equivalent performance and level of

Parameter	Technical conditions
	spectrum protection in order to comply with the corresponding essential requirements of Directive 2014/53/EU and if they respect the technical requirements of this Decision.
Transmitter power control (TPC)	TPC shall provide, on average, a mitigation factor of at least 3 dB on the maximum permitted output power of the systems; or, if transmitter power control is not in use, the maximum permitted mean e.i.r.p. and the corresponding mean e.i.r.p. density limit shall be reduced by 3 dB.
Dynamic frequency selection (DFS)	<p>DFS is described in Recommendation ITU-R M. 1652-1 to ensure compatible operation with radiodetermination systems.</p> <p>The DFS mechanism shall ensure that the probability of selecting a given channel is the same for all available channels within the 5 250-5 350 MHz and 5 470-5 725 MHz bands. The DFS mechanism shall also ensure, on average, a near-uniform spread of the loading of the spectrum.</p> <p>WAS/RLAN shall implement a dynamic frequency selection providing a mitigation against interference to radar at least as efficient as DFS described in ETSI Standard EN 301 893 V2.1.1. Settings (hardware and/or software) of WAS/RLAN related to DFS shall not be accessible to the user if changing those settings results in the WAS/RLANs no longer being compliant with the DFS requirements. This includes (a) not allowing the user to change the country of operation and/or the operating frequency band if that results in the equipment no longer being compliant with the DFS requirements and (b) not accepting software and/or firmware which results in the equipment no longer being compliant with the DFS requirements.</p>

Techniques to access spectrum and mitigate interference that provide an appropriate level of performance to comply with the essential requirements of Directive 2014/53/EU shall be used. Where relevant techniques are described in harmonised standards or parts thereof the references of which have been published in the *Official Journal of the European Union* in accordance with Directive 2014/53/EU, performance at least equivalent to the performance level associated with those techniques shall be ensured.