ANCOM
Autoritatea Naţională pentru Administrare şi Reglementare în Comunicaţii

Str. Delea Nouă nr.2, Sector 3, 030925 Bucureşti, România
Telefon: 0372 845 400 / 0372 845 454. Fax: 0372 845 402
E-mail: ancom@ancom.ro. Website: www.ancom.ro

RO-IR RLAN

TECHNICAL REGULATION

for the radio interface

regarding radio access systems based on ultra-wide band technology, including radio local area networks (WAS/RLANs)

(Previous coding RO-IR 03 – i.e. RO-IR 03-02 and RO-IR 03-03 specifications)

1. Basic Considerations

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 was implemented in national legislation by Government Decision No. 740/2016 on making available on the market of radio equipment with subsequent amendments and completions.

This technical regulation contains the requirements for license-exempt use of radio spectrum by radio access systems intended for broadband data transmission devices, including radio local area networks (WAS/RLANs), in the specified frequency bands and considers compliance, especially, with the provisions of Article 3 Paragraph 2 and Articles 6-8 of Directive 2014/53/EU.

Nothing in this technical regulation shall preclude the obligation for radio equipment placed on the market or made available on the market in Romania to comply with Directive 2014/53/EU.

The obligations arising from Directive (EU) 2015/1535 of the European Parliament and of the Council of 9 September 2015 laying down a procedure for the provision of information in the field of technical regulations and of rules on Information Society services are met in this regulation (OJ L 241, 17.9.2015, p. 1-15).

All the Romanian technical regulations for the radio interfaces notified under Directive (EU) 2015/1535 shall be published and made available on National Authority for Management and Regulation in Communications (ANCOM) website at: http://www.ancom.ro/reglementari-interfete_2723.

2. Radio Interface Specifications

Radio access systems intended for broadband data transmission systems, including radio local area networks (WAS/RLANs)

Frequency band	**Annex**
5 150 – 5 250 MHz	RO-IR RLAN-01
5 250 – 5 350 MHz	RO-IR RLAN-02
5 470 – 5 725 MHz	RO-IR RLAN-03
5 945 - 6 425 MHz	RO-IR RLAN-04a, RO-IR RLAN-04b

Radio access systems, including radio local area networks (WAS/RLANs) are broadband radio systems that enable wireless access to public and private applications regardless of the underlying network topology.

For the purpose of this technical regulation, *indoor use* means use in an enclosed space that shall provide the necessary attenuation to facilitate sharing with other services. Indoor use can be classified in four use cases, as identified in the technical conditions in the annexes to this regulation, which represent specific scenarios: in buildings, road vehicles, trains and aircraft.

For the purpose of this technical regulation, *equivalent isotropically radiated power (e.i.r.p.)* means the product of the power supplied to the antenna and the antenna gain in a given direction, relative to an isotropic antenna (absolute or isotropic gain).

For the purpose of this technical regulation, *mean equivalent isotropically radiated power (e.i.r.p.)* means e.i.r.p. for the duration of the transmission burst corresponding to the maximum power, if the power control was implemented.

For the purpose of this technical regulation, *non-interference and non-protected basis* means that no harmful interference may be caused to any radio communications service and that no claim may

be made for protection of these systems against harmful interference originating from radio communications services.

The use of radio spectrum by radio access systems intended for broadband data transmission systems, including radio local area networks (WAS/RLANs), is allowed on a non-interference and non-protected basis provided that such systems meet the conditions set out in the Annexes below.

3. Document History:

Edition	Changes
Edition 1/2022 (11.10.2022)	According to Commission Implementing Decision (EU) 2022/179 on the harmonised use of radio spectrum in the 5 GHz frequency band for the implementation of wireless access systems including radio local area networks and repealing Decision 2005/513/EC. The history of the frequency bands 5150-5350 MHz and 5470-5725 MHz is available in the technical regulation RO-IR 03 for the radio interface concerning broadband data transmission systems, the 3rd edition.
Edition 2/2024 (07.03.2024)	According to Commission Implementing Decision (EU) 2021/1067 on the harmonized use of radio spectrum in the 5945-6425 MHz frequency band for the implementation of wireless access systems including radio local area networks (WAS/RLANs). According to Commission Implementing Decision (EU) 2022/2307 amending Implementing Decision (EU) 2022/179 as regards designating and making available the 5150-5250 MHz, 5250-5350 MHz and 5470-5725 MHz frequency bands in accordance with the technical conditions set out in the Annex. Added RO-IR RLAN-04a and RO-IR RLAN-04b technical specifications.

ROMANIA	Radio Interface Specification	Radio access systems intended for broadband data transmission devices, including radio local area networks (WAS/RLANs)	RO-IR RLAN-01	Edition 2/2024

	No	Parameter	Description	Comments
Normative part	1	**Radio communications service**	Mobile	
	2	**Application**	Radio access systems intended for broadband data transmission devices, including radio local area networks (WAS/RLANs). Indoor use, including installations in road vehicles, trains and aircraft, and limited outdoor use (note 1). Use by unmanned aircraft systems (UAS) is limited to within 5170-5250 MHz band.	*Note 1: If used outdoors, equipment shall not be attached to a fixed outdoor antenna, fixed infrastructure or to the external body of road vehicles.*
	3	**Frequency band**	5150 – 5250 MHz	*Harmonized radio spectrum in the 5 GHz frequency band (Commission Implementing Decision (EU) 2022/2307 amending Implementing Decision (EU) 2022/179 as regards designating and making available the 5150-5250 MHz, 5250-5350 MHz and 5470-5725 MHz frequency bands in accordance with the technical conditions set out in the Annex)*
	4	**Channelling (channel distribution)**	-	
	5	**Modulation/Occupied bandwidth**	-	
	6	**Direction/Separation**	-	
	7	**Transmit power / Power density**	200mW maximum mean equivalent isotropically radiated power (e.i.r.p.) for in-band emissions, with the following exceptions for in-band emissions: - 40mW maximum mean e.i.r.p. applies for installations inside train carriages with an attenuation loss on average of less than 12 dB; - 40mW maximum mean e.i.r.p. applies for installations inside road vehicles. Maximum mean e.i.r.p. density for in-band emissions is limited to 10 mW/MHz in any band of 1 MHz.	
	8	**Channel occupation and access rules**	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.	
	9	**Authorization regime**	Licence exemption	
	10	**Additional essential requirements (According to**	-	

	No	Parameter	Description	Comments
		Article 3 Paragraph 3 of 2014/53/EU Directive)		
	11	**Assumptions on spectrum planning**	-	
Informative Part	**12**	**Planned changes**	-	
	13	**Reference**	EN 301 893; Commission Implementing Decision (EU) 2022/2307 amending Implementing Decision (EU) 2022/179 as regards designating and making available the 5150-5250 MHz, 5250-5350 MHz and 5470-5725 MHz frequency bands in accordance with the technical conditions set out in the Annex; ECC/DEC/(04)08.	
	14	**Notification number**	-	
	15	**Remarks**	-	

F1- RTIR Edition:1; Revision:1

	No	Parameter	Description	Comments
Normative part	1	**Radio communications service**	Mobile	
	2	**Application**	Radio access systems intended for broadband data transmission devices, including radio local area networks (WAS/RLANs). Indoor usage: in buildings only. Installations in road vehicles, trains and aircraft are not permitted (Note 2). Outdoor usage is not permitted.	*Note 2: Operation of WAS/RLANs installations in large aircraft (excluding multi-engined helicopters) is permitted until 31 December 2028 with a maximum mean e.i.r.p. for emissions of 100 mW band.* *In accordance with the Commission Regulation (EU) no 1321/2014 a 'large aircraft' means an aircraft, classified as an aeroplane with a maximum take-off mass of more than 5 700 kg, or a multi-engined helicopter. However, multi-engined helicopters are excluded from the scope of Note 2.*
	3	**Frequency band**	5250 – 5350 MHz	*Harmonized radio spectrum in the 5 GHz frequency band (Commission Implementing Decision (EU) 2022/2307 amending Implementing Decision (EU) 2022/179 as regards designating and making available the 5150-5250 MHz, 5250-5350 MHz and 5470-5725 MHz frequency bands in accordance with the technical conditions set out in the Annex)*
	4	**Channelling (channel distribution)**	-	
	5	**Modulation/Occupied bandwidth**	-	
	6	**Direction/Separation**	-	
	7	**Transmit power / Power density**	200 mW maximum mean e.i.r.p. for in-band emissions. Maximum mean e.i.r.p. density shall be limited to 10 mW/MHz in any 1 MHz band.	
	8	**Channel occupation and access rules**	The following mitigation techniques shall 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 Commission Implementing Decision (EU) 2307/2022. 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	*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.* *DFS is described in 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") in order to provide a compatible operation with the radiodetermination systems. DFS ensures that the probability to detect a certain channel is the same for all the available channels in the frequency bands 5250-5350 MHz and 5470-5725 MHz. DFS also ensures on average, a nearly uniform distribution of the spectrum loading.* *WAS/RLAN shall employ a dynamic frequency selection function as a mitigation technique to detect interference from radar systems (radar detection) at least as efficient as DFS, according to the description provided in ETSI EN 301 893 V2.1.1 standard. Any settings (hardware*

	No	Parameter	Description	Comments
			at least equivalent to the performance level associated with those techniques shall be ensured.	*and/or software) related to DFS shall not be accessible to the user if changing those settings result in WAS/RLAN 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 and (b) not accepting software and/or firmware which results in the equipment no longer being compliant with the DFS requirements.*
	9	**Authorization regime**	Licence exemption	
	10	**Additional essential requirements (According to Article 3 Paragraph 3 of 2014/53/EU Directive)**	-	
	11	**Assumptions on spectrum planning**	-	
Informative Part	**12**	**Planned changes**	-	
	13	**Reference**	EN 301 893; Commission Implementing Decision (EU) 2022/2307 amending Implementing Decision (EU) 2022/179 as regards designating and making available the 5150-5250 MHz, 5250-5350 MHz and 5470-5725 MHz frequency bands in accordance with the technical conditions set out in the Annex; ECC/DEC/(04)08.	
	14	**Notification number**	-	
	15	**Remarks**	-	

F1- RTIR Edition:1; Revision:1

ROMANIA	Radio Interface Specification	Radio access systems intended for broadband data transmission devices, including radio local area networks (WAS/RLANs)	RO-IR RLAN-03	Edition 2/2024

	No	Parameter	Description	Comments
Normative part	1	**Radio communications service**	Mobile	
	2	**Application**	Radio access systems intended for broadband data transmission devices, including radio local area networks (WAS/RLANs). Indoor and outdoor usage. Installations in road vehicles are permitted only for WAS/RLANs devices operating in slave mode controlled by a fixed WAS/RLANs device with Dynamic Frequency Selection (DFS) functionality operating in master mode. Installations in trains and aircrafts and use by unmanned aircraft systems (UAS) are not permitted (Note 3).	*Note 3: Operation of WAS/RLANs installations in large aircraft (excluding multi-engined helicopters), except in the frequency band 5600–5650 MHz, is permitted until 31 Decembre 2028, with a maximum mean e.i.r.p. for emissions of 100 mW.* *According to Commission Regulation (EU) No 1321/2014, 'large aircraft' means an aircraft, classified as an aeroplane with a maximum take-off mass of more than 5 700 kg, or a multi-engined helicopter. However, multi-engine helicopters are excluded from the scope of Note 3.* *The slave mode and the master mode are defined in ETSI EN 301 893 V2.1.1 standard.*
	3	**Frequency band**	5470 – 5725 MHz	*Harmonized radio spectrum in the 5 GHz frequency band (Commission Implementing Decision (EU) 2022/2307 amending Implementing Decision (EU) 2022/179 as regards designating and making available the 5150-5250 MHz, 5250-5350 MHz and 5470-5725 MHz frequency bands in accordance with the technical conditions set out in the Annex)*
	4	**Channelling (channel distribution)**	-	
	5	**Modulation/Occupied bandwidth**	-	
	6	**Direction/Separation**	-	
	7	**Transmit power / Power density**	1 W maximum mean e.i.r.p. for in-band emissions. Exception: — 200 mW maximum mean e.i.r.p. applies for installations in road vehicles. Maximum mean e.i.r.p. density for in-band emissions is limited to 50 mW/MHz in any 1 MHz band.	

	No	Parameter	Description	Comments
	8	**Channel occupation and access rules**	The following mitigation techniques shall 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 Commission Implementing Decision (EU) 2307/2022. 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.	*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 are reduced by 3 dB.* *DFS is described in 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") in order to provide a compatible operation with the radiodetermination systems.* *The DFS mechanism shall ensure that the probability of selecting a certain channel is the same for all available channels within the 5250-5350 MHz and 5470-5725 MHz bands. The DFS mechanism shall also ensure, on average, a near-uniform spread of the loading of the spectrum.* *WAS/RLAN shall implement a dynamic frequency selection providing mitigation against interference to radar at least as efficient as DFS, as described in ETSI EN 301 893 V2.1.1 standard. Settings (hardware and/or software) of WAS/RLANs 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.*
	9	**Authorization regime**	Licence exemption	
	10	**Additional essential requirements (According to Article 3 Paragraph 3 of 2014/53/EU Directive)**	-	
	11	**Assumptions on spectrum planning**	-	
Informative Part	**12**	**Planned changes**	-	
	13	**Reference**	EN 301 893; Commission Implementing Decision (EU) 2022/2307 amending Implementing Decision (EU) 2022/179 as regards designating and making available the 5150-5250 MHz, 5250-5350 MHz and 5470-5725 MHz frequency bands in accordance with the technical conditions set out in the Annex; ECC/DEC/(04)08.	
	14	**Notification number**	-	
	15	**Remarks**	-	

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ROMANIA	Radio Interface Specification	Radio access systems intended for broadband data transmission devices, including radio local area networks (WAS/RLANs)	RO-IR RLAN-04a	Edition 2/2024

	No	Parameter	Description	Comments
Normative part	1	**Radio communications service**	Mobile	
	2	**Application**	Radio access systems intended for broadband data transmission devices, including radio local area networks (WAS/RLANs). Low power indoor (LPI) for WAS/RLANs Restricted to indoor use, including in trains with metal-coated windows (Note 1) and aircraft. Outdoor use, including in road vehicles, is not permitted.	*An LPI access point or bridge that is supplied with power from a wired connection has an integrated antenna and is not battery powered.* *An LPI client device that is connected to an LPI access point or another LPI client device and may or may not be battery powered.* *Note 1: Or similar structures made of material with comparable attenuation characteristics.*
	3	**Frequency band**	5945 – 6425 MHz	*Harmonized radio spectrum in the 6 GHz frequency band (Commission Implementing Decision (EU) 2021/1067 of 17 June 2021 on the harmonised use of radio spectrum in the 5 945-6 425 MHz frequency band for the implementation of wireless access systems including radio local area networks (WAS/RLANs))*
	4	**Channelling (channel distribution)**	-	
	5	**Modulation/Occupied bandwidth**	-	
	6	**Direction/Separation**	-	
	7	**Transmit power / Power density**	23 dBm maximum mean equivalent isotropically radiated power ('e.i.r.p.') for in-band emissions (Note 2) 10 dBm/MHz maximum mean e.i.r.p. density for in-band emissions (Note 2) –22 dBm/MHz maximum mean e.i.r.p. density for out-of-band emissions below 5 935 MHz (Note 2)	*Note 2: The mean e.i.r.p. refers to the e.i.r.p. during the transmission burst which corresponds to the highest power, if power control is implemented.*
	8	**Channel occupation and access rules**	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 Council 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.	
	9	**Authorization regime**	Licence exemption	
	10	**Additional essential requirements (According to Article 3 Paragraph 3 of 2014/53/EU Directive)**	-	

	No	Parameter	Description	Comments
	11	**Assumptions on spectrum planning**	-	
Informative Part	**12**	**Planned changes**	-	
	13	**Reference**	EN 303 687; Commission Implementing Decision (EU) 2021/1067 of 17 June 2021 on the harmonised use of radio spectrum in the 5 945-6 425 MHz frequency band for the implementation of wireless access systems including radio local area networks (WAS/RLANs); ECC/DEC/(20)01	
	14	**Notification number**	-	
	15	**Remarks**	-	

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	No	Parameter	Description	Comments
Normative part	1	**Radio communications service**	Mobile	
	2	**Application**	Radio access systems intended for broadband data transmission devices, including radio local area networks (WAS/RLANs). Very low power (VLP) for WAS/RLAN devices Indoors and outdoors permissible operation. Use on Unmanned Aircraft Systems (UAS) is not permitted.	*The VLP device is a portable device.*
	3	**Frequency band**	5945 – 6425 MHz	*Harmonized radio spectrum in the 6 GHz frequency band (Commission Implementing Decision (EU) 2021/1067 of 17 June 2021 on the harmonised use of radio spectrum in the 5 945-6 425 MHz frequency band for the implementation of wireless access systems including radio local area networks (WAS/RLANs))*
	4	**Channelling (channel distribution)**	-	
	5	**Modulation/Occupied bandwidth**	-	
	6	**Direction/Separation**	-	
	7	**Transmit power / Power density**	14 dBm maximum mean e.i.r.p. for in-band emissions (Note 1) 1 dBm/MHz maximum mean e.i.r.p. density for in-band emissions (Note 1) 10 dBm/MHz narrowband usage maximum mean e.i.r.p. density for in-band emissions (Note 1) (Note 2) –45 dBm/MHz maximum mean e.i.r.p. density for out-of-band emissions below 5 935 MHz (Note 1), the appropriateness of this limit shall be subject to review by 31 December 2024 (Note 3)	*Note 1: The mean e.i.r.p. refers to the e.i.r.p. during the transmission burst which corresponds to the highest power if power control is implemented.* *Note 2: Narrowband (NB) devices are devices that operate in channel bandwidths below 20 MHz. NB devices also require a frequency hopping mechanism based on at least 15 hop channels to operate at a value of in-band power spectral density (PSD) above 1 dBm/MHz.* *Note 3: The appropriateness of this limit shall be subject to review by 31 December 2024. In the absence of justified evidence, a value of -37 dBm/MHz shall apply from 1 January 2025.*
	8	**Channel occupation and access rules**	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 harmonized 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.	
	9	**Authorization regime**	Licence exemption	
	10	**Additional essential requirements (According to**	-	

	No	Parameter	Description	Comments
		Article 3 Paragraph 3 of 2014/53/EU Directive)		
	11	**Assumptions on spectrum planning**	-	
Informative Part	**12**	**Planned changes**	-	
	13	**Reference**	EN 303 687; Commission Implementing Decision (EU) 2021/1067 of 17 June 2021 on the harmonised use of radio spectrum in the 5 945-6 425 MHz frequency band for the implementation of wireless access systems including radio local area networks (WAS/RLANs); ECC/DEC/(20)01	
	14	**Notification number**	-	
	15	**Remarks**	-	

F1- RTIR Edition:1; Revision:1